

SONY®

VIDEOCODER

BVH-2000PS



The function control panel, side panels and handles in this photograph shown are optionally available.

Le panneau de contrôle des fonction, les panneaux latéraux et les poignées présentés sur cette photographie sont disponibles comme équipements en option.

Das hier abgebildete Bedienungspult, die Seitenteile und die Griffe sind gesondert lieferbares Zubehör.



OPERATION AND MAINTENANCE MANUAL

Volume 1 3rd Edition (Revised 4)

Serial No. 33401 and Higher

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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The BVH-2000PS is a 1-inch helical scanning VTR designed in accordance with the EBU TYPE "C" standard.

Sony's unparalleled experience gained from the sales of thousands of VTRs and the technical know-how accumulated in the production of the BVH-1100PS/BVH-500PS series has enabled us to develop this high reliability, high performance compact VTR. Performance has been enhanced by the adoption of special new devices originally developed by Sony. The BVH-2000PS is an all new VTR for use in broadcast or business. The small size of the VTR system has been made possible by using plug-in type TBC and the time code boards, while easy tape threading is achieved by the incorporation of a highly accurate movable guide system. Complete control of all servo system functions is now a reality thanks to a sophisticated built-in computer servo system. Three control panels are available and simply changing the control panel allows the VTR function to be expanded. The BVH-2000PS VTR is compact enough to use in mobile applications as well as a making a perfect studio console.

Le BVH-2000PS est un magnétoscope de 1 pouce à balayage hélicoïdal, fabriqué selon les normes EBU de Type "C".

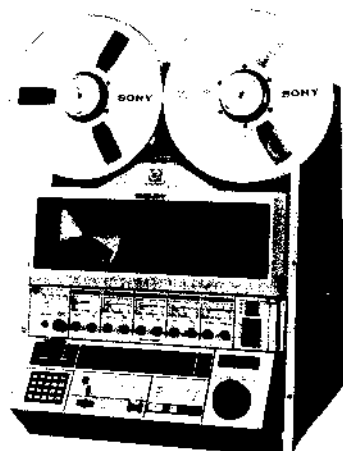
L'expérience sans précédent, acquise par la vente de milliers de magnétoscopes et les connaissances techniques accumulées par la production des appareils de Série BVH-1100PS/BVH-500PS ont permis à SONY de mettre au point ce nouveau magnétoscope compact et très fiable. Ses performances remarquables ont été encore améliorées par l'introduction de nouveaux dispositifs spéciaux, mis au point par la firme. Destiné à des applications professionnelles, le BVH-2000PS est un magnétoscope entièrement nouveau dont la compacité a été rendu possible par incorporation d'un correcteur et de plaquettes de correction de base de temps de type enfichable, tandis qu'un cheminement aisé de la bande vidéo s'accomplit grâce à l'adoption d'un système de guidage mobile d'une haute précision. Un contrôle total des fonctions asservies est désormais possible parce que Sony a fait appel à un système ultramoderne d'asservissement par microprocesseur. Sony propose maintenant trois panneaux de contrôle qui, par simple changement, permettent un élargissement considérable des fonctions du magnétoscope. D'une grande compacité, le BVH-2000PS s'avèrera l'outil de travail idéal, tant pour les applications en déplacement qu'installé dans une console de studio.

Bei dem BVH-2000PS handelt es sich um einen Schrägspurrecorder, der nach der EBU „C“-Norm arbeitet.

Hinter diesem hochwertigen, kompakten und gleichzeitig auch zuverlässigen Gerät stecken die Erfahrungen und das technische Know-How, das Sony aufgrund des tausendfachen Verkaufs und der Entwicklung der BVH-1100/BVH-500 Serie gewinnen konnte. Durch den Einsatz speziell für dieses Gerät entwickelter Bauteile konnte die Qualität wesentlich verbessert werden, so daß dieses Gerät alle Anforderungen für den Einsatz im kommerziellen Bereich und bei Rundfunkanstalten erfüllt. Dank steckbarer TBC- und Zeitcode-Leiterplatten konnten die Abmessungen dieses Videorecorders äußerst kompakt gehalten werden. Weiterhin beachtenswert ist die sehr exakte, bewegliche Bandführung, die eine bequeme Bänderfädelung ermöglicht, und die Steuerung aller Servosystem-Funktionen durch eines modernen Mikroprozessor. Es sind drei verschiedene Bedienungspulte lieferbar, die leicht ausgewechselt werden können und die Einsatzmöglichkeiten dieses Videorecorders noch erweitern. Der BVH-2000PS stellt somit eine ausgereifte Studio-Anlage dar, die sich aber dank ihrer Kompaktheit auch bestens für portablen Betrieb eignet.

This manual covers six models of the BVH-2000PS: BVH-2000PS(00)(10), BVH-2000PS(02)(12) and BVH-2000PS(04)(14). Almost all of the functions are the same except for the following points. The different points are identified by the BVH-2000PS(00)(10), BVH-2000PS(02)(12) or BVH-2000(04)(14) in this manual.

	Dymanic tracking function	Audio and video confidence function	Audio channel-4	Sync track
BVH-2000PS(00)	No	No	No	Yes
BVH-2000PS(10)				No
BVH-2000PS(02)	Yes	Yes	No	Yes
BVH-2000PS(12)				No
BVH-2000PS(04)	Yes	Yes	Yes	Yes
BVH-2000PS(14)				No



BVH-2000PS(04)

Ce manuel traite de six modèles, à savoir les BVH-2000PS(00)(10), BVH-2000PS(02)(12) et BVH-2000PS(04)(14) dont la majorité des fonctions sont identiques, à l'exception des points identifiés dans le tableau suivant.

	Alignement dynamique	Confiance audio et vidéo	Canal audio 4	Piste de synchronisation
BVH-2000PS(00)	Non	Non	Non	Oui
BVH-2000PS(10)				Non
BVH-2000PS(02)	Oui	Oui	Non	Oui
BVH-2000PS(12)				Non
BVH-2000PS(04)	Oui	Oui	Oui	Oui
BVH-2000PS(14)				Non

Diese Bedienungsanleitung gilt für sechs Ausführungen des BVH-2000PS: BVH-2000PS(00)(10), BVH-2000PS(02)(12) und BVH-2000PS(04)(14). Die Funktionen dieser sechs Ausführungen sind, abgesehen von den in der Tabelle unten angegebenen Punkten, genau gleich.

	Dynamische Spurlage	Audio- und Video-Monitorfunktion	Audio-Kanal 4	Synchronspur
BVH-2000PS(00)	Nein	Nein	Nein	Ja
BVH-2000PS(10)				Nein
BVH-2000PS(02)	Ja	Ja	Nein	Ja
BVH-2000PS(12)				Nein
BVH-2000PS(04)	Ja	Ja	Ja	Ja
BVH-2000PS(14)				Nein

The following three types of the VTR are available:

The following three function control panels (option) are provided for the BVH-2000PS. Select and use the optimum panel to suit your needs.

Sony propose les trois types de magnétoscopes suivants:

Parmi les trois panneaux de contrôle des fonctions ci-dessous (équipements en option), destinés au BVH-2000PS, on choisira celui qui répond le mieux aux travaux à effectuer.

Die folgenden drei Videorecorder-Typen sind lieferbar:

Die Typen unterscheiden sich durch die Bedienungspulte (Sonderzubehör). Wählen Sie das Bedienungspult aus, das am besten auf Ihre Anforderungen zugeschnitten ist.



Type I:

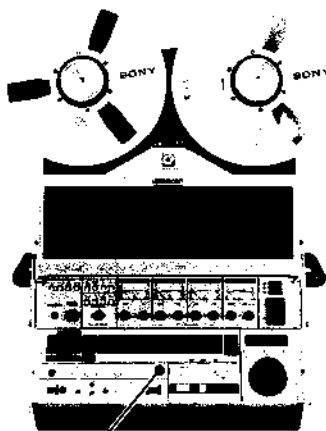
The BKH-2011 control panel is installed. VTR for Record/Playback only, with the main functions only.

Type I:

Installation du panneau de contrôle BKH-2011. Seules les principales fonctions du magnéscope pour enregistrement/lecture sont disponibles.

Typ-I:

Das Bedienungspult BKH-2011 ist installiert. Der Videorecorder ist nur für Aufnahme/Wiedergabe und nur für die Hauptfunktionen verwendbar.



Type II:

The BKH-2012 control panel is installed. Standard VTR with edit functions.

Type II:

Installation du panneau de contrôle BKH-2012. Magnéscope standard, doté des fonctions de montage.

Typ-II:

Das Bedienungspult BKH-2012 ist installiert. Typ-II ist ein Standard-Videorecorder mit Schnittbetriebsmöglichkeit.



Type III:

The BKH-2013 control panel is installed. Multi function editing VTR with data processing functions and 20 key pad.

Type III:

Installation du panneau de contrôle BKH-2013. Magnéscope pour montage à fonctions multiples et fonctions informatiques, avec bloc de 20 touches.

Typ-III:

Das Bedienungspult BKH-2013 ist installiert. Multifunktionaler Videorecorder mit Mikroprozessor-Steuerung und Tastatur.

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Volume 2

A. BLOCK DIAGRAMS

B. SEMICONDUCTOR PIN ASSIGNMENTS

C. SCHEMATIC DIAGRAMS AND BOARD LAYOUT

D. REPLACEABLE PARTS AND OPTIONAL FIXTURE

E. CHANGED PARTS

SECTION 1 OPERATION

1-1. FEATURES

Compact and Lightweight

The BVH-2000PS features a compact, high-output switching power supply and DC motor, which, together with the compact tape transport and electronics have made a considerable decrease in weight possible.

High performance and reliability, plus compactness and light weight make it ideal for all broadcast applications, Electronic Field Production, etc.

Rational VTR System (Plug-in TBC & Time Code)

Simplification of the system has been achieved through the use of time base corrector comprising from four boards which can be plugged into the VTR, and one-board plug-in time code board (with VITC).

Easy Tape Threading

The tape transport has been greatly simplified. A high-precision movable guide system (inclined entrance and exit guide, erase head, and movable audio head cover) allow easy tape threading.

2-hour REC and PB

Two-hour REC and PB are possible by using Sony V-16-126 tape (11.75 inch reel), giving a much wider range of applications.

Computer Servo System

All data are input to the CPU data bus for instant processing. Feedback data is sent to the four direct drive brushless DC motors, and the VTR function controls (e.g. drum, reel, and capstan servo control) are all optimized.

The BVH-2000PS has high-speed access capability and very short servo lock time, and 2-hour reels or spot reels also can be used without any change to the system condition.

High-speed Dynamic Tracking* System

High-speed digital tracking control gives smooth, reliable DT operation.

Expanded DT Playback Range (BVH-2000PS(02)(12) and BVH-2000PS(04)(14))

Noiseless PB is now possible from -1 to 3 times normal speed thanks to the new DT head. It is especially useful for special effect PB and searching for editing points.

Program Play (BVH-2000PS(02)(12) and BVH-2000PS(04)(14))

The DT function and microprocessor allow correct variable-speed playback up to $\pm 20\%$ normal speed in 0.1% steps, and the tape playback time can be increased or decreased.

Variable Memory (Control Panel Type-III of the BVH-2000PS(02)(12) and BVH-2000PS(04)(14))

PB speed can be preset in the DT variable-speed PB range (-1 to 3 times normal) and repeated playback determined by the memory is possible. This is specially effective when editing special effects.

Complete Editing Function

In addition to improved automatic editing functions, many extra functions (described below) make the BVH-2000PS even easier to use.

Simple Connection (Serial Code System)

For two-machine editing, communication between the BVH-2000 and BVU-800 series VTRs is possible using a single 9-pin interface cable.

The player can be controlled from the recorder control panel.

Easy-to-read dot matrix type fluorescent indicator is used. Timer, in and out points, tape speed, and error messages are displayed on the indicator. (Functions vary depending on the control panel used.)

20-key keyboard (Control panel Type-III)

Audio split editing (Control panel Type-III)

Independent spot erase button (Control panel Type-II/III)

Capstan override function

($\pm 15\%$ increase or decrease in speed in 3% steps.)

Reaction and preroll time setting function

Front Panel Operation Mechanism

All operational switches and controls are functionally arranged in function and level control sections. All boards, such as the plug-in TBC/time code, have the main switches and VRs mounted at the front for the ease of accessibility.

Five Remote Control Connectors

There are five remote control connectors in all, TBC, monitor select, and three function control connectors. These connectors make the BVH-2000PS easy to install in just about every application.

Video/Audio Confidence PB Monitor (BVH-2000PS(02)(12) and BVH-2000PS(04)(14))

The video system has a confidence head in addition to the normal PLAY head, and it can be used as a spare head in PB mode. The audio system is also provided with a confidence head, and can monitor the recording status of the AUDIO-1/2/3/4 and CTL tracks.

*Dynamic Tracking is the trademark of Sony Corporation.

High Picture and Sound Qualities

High-fidelity REC/PB has been obtained through the use of specially developed components such as new video and audio heads and by improvements of the auto equalization circuit for RF signal.

High Reliability

Overall reliability has been designed in. In addition to the high reliability, high precision components, such as Sony designed high-output brushless DC motors and long-life LED indicators used in the function control block make the BVH-2000PS one of the most reliable machines available.

Alarm Functions

Numerous "alarms" are provided such as no-signal alarm, drum non-rotation alarm, power supply and motor drive circuit overheating alarms, tape slack alarm, and servo/system communication abnormal alarm.

Tape Protection Mechanism

A tension release mechanism is provided to protect the tape. The abnormal tension detector and the movable entrance and exit guides open prior to tape end to give maximum tape protection.

Installation

The BVH-2000PS has been designed for the ease of operation in every aspect. Configuration can be easily changed according to individual needs.

1-2. SPECIFICATIONS

General

Power requirements	AC 100 - 120/220 - 240V \pm 10% (selectable) 50/60 Hz
Power consumption	550W max
Operating temperature	5°C to 40°C (41°F to 104°F)
Humidity	10 to 90% (non-condensing)
Weight	70 kg (155 lbs)
Dimensions (include handle & foot) (w/h/d)	570 x 680 x 588 mm (22 1/2 x 26 7/8 x 23 1/8 inches)
Recording format	EBU Type-C 1 head for Video track, 1 head for Sync track (BVH-2000PS (00), (02), (04) only)
Tracks	Video track: 1 Sync track: 1 Audio track: 3 for the BVH-2000PS (00) and the BVH-2000PS(02), and 4 for the BVH-2000PS(04) (Audio 3 track is also used for time code and cue) Control track: 1
Tape Speed	23.98 cm/sec
Writing Speed (Relative Speed)	21.39 m/sec
Recording Time	128 min. with 11.75-inch reel
Time Base Stability	Within 3 μ s p-p
Servo Lock Time	Within 3 sec (with 4 field lock mode from standby mode)
Tape Timer Accuracy	\pm 1 frame (with continuous control signal)
Fast Forward/Rewind Time (Transfer Time)	Within 110 sec (with 1 hour tape)
Recommended Tapes	Sony's One-inch High Density Tape or its equivalent
Reel Size	Max. 11.75-inch type

Video

Video Bandwidth	Flat to 5.0 MHz: ± 0.5 dB 5.5 MHz: -3 dB
S/N Ratio	Better than 44 dB (unweighted), self recording Better than 43 dB (unweighted), interchanged base [peak-to-peak composite video to rms noise measured with a Rohde & Schwarz noise meter]
Differential Gain	Less than 4% (with Sony TBC)
Differential Phase	Less than 4 degree (with Sony TBC)
Transient Response "K" factor (2T pulse)	Less than 1
Tilt (Hor. & Vert.)	Less than 1%
Moire	Less than -35 dB (75% Color Bars) Less than -32 dB (100% Color Bars)
Chrominance/Luminance Delay	Less than 25ns
Low Frequency Linearity	Better than 0.98

Audio

Audio Frequency Response	CH-1, CH-2, CH-3 & CH-4* 50 Hz to 15 kHz $+1.5$ dB -3.0 dB 200 Hz to 7.5 kHz ± 1.0 dB
S/N Ratio	CH-1, CH-2 & CH-4*: Better than 56 dB (from 3% distortion level) CH-3: Better than 50 dB (from 3% distortion level)
Distortion (at 1 kHz)	CH-1, CH-2, CH-3 & CH-4* Less than 1% (at operating level)
Wow & Flutter	Less than 0.1% CCIR weighted
Crosstalk (at 1 kHz)	Between any two channels Less than -60 dB

Input signal

Video In	1.0 \pm 0.3 Vp-p (75 ohms)
Ext Reference In	1.0 \pm 0.3 Vp-p (75 ohms), Video
CF Pulse In	TTL level, 6.25 Hz
Audio Line In	CH-1, CH-2, CH-3 & CH-4* $+20$ to -30 dBm (600 ohms/10 kohms, balanced)
Audio-3 Mic In	CH-3 -60 dBs (high impedance, unbalanced)
Time code In	CH-3 0.5 Vp-p (75 ohms), for EBU time code

Output signal

Video Out-1/-2/-3	1.0 Vp-p (75 ohms)
WFM Select	Selected Video/CTL/RF Envelope/ Spare
Video Monitor Select	Input Video/Demod Out/TBC Out/ Spare
Frame Pulse	TTL level, Color Frame/Frame (selectable)
Ref Video	1 Vp-p nominal (75 ohms), for ext TBC
DO Signal	TTL level/RF Output (selectable)
Audio Line Out	CH-1, CH-2, CH-3 & CH-4* 8 dBm nominal (600 ohms, balanced) (can be converted to 150 or 37.5 ohms)
Time Code Out	CH-3 0.5 Vp-p (75 ohms), for EBU time code
Headphones Out	8 ohms, unbalanced, variable level control
Monitor Out (L/R CH)	8 dBm (600 ohms, balanced), variable level control
Audio Monitor Select	BVH-2000PS(02)(12): CH-1/CH-2/CH-1, CH-2/CH-3 (selectable) BVH-2000PS(04)(14): CH-1/CH-2/CH-3/CH-4/CH-1, CH-2 (selectable)

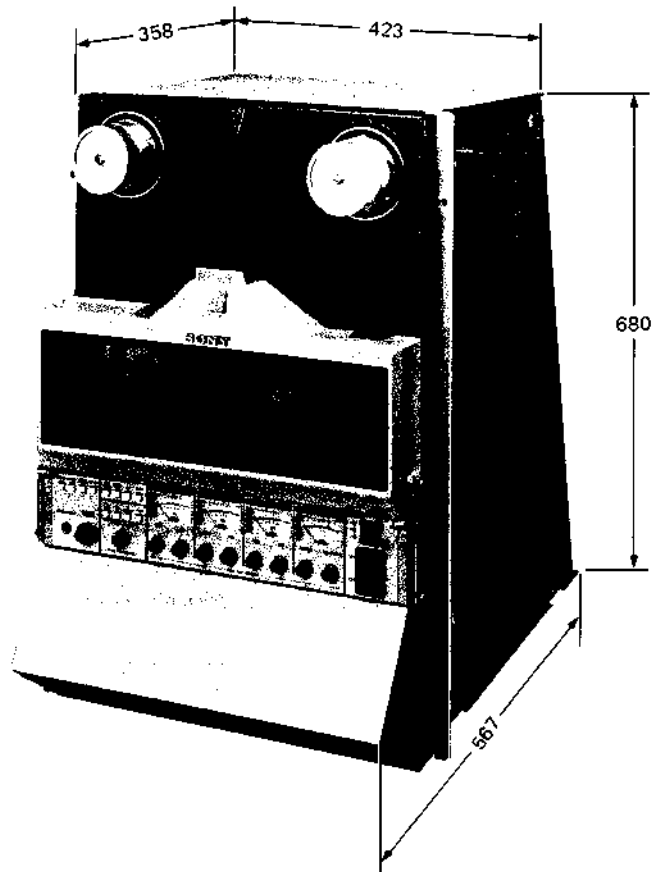
Others

TBC Out (BVH-2000PS(00), (02), (04) only)	To TBC (Sony BVT-2000P/2 000S) for Dynamic Tracking
Remote Out-1 (BVH-2000PS(00), (02), (04) only)	For CCJ Converter
Remote Out-2	For 9-pin Interface
Remote Out-3	For Parallel Communication
Aux	For Plug-in TBC Remote Control
Monitor Select	For Monitor Select Remote Control

*CH-4 is equipped only on the BVH-2000PS(04)(14).

Dimensions

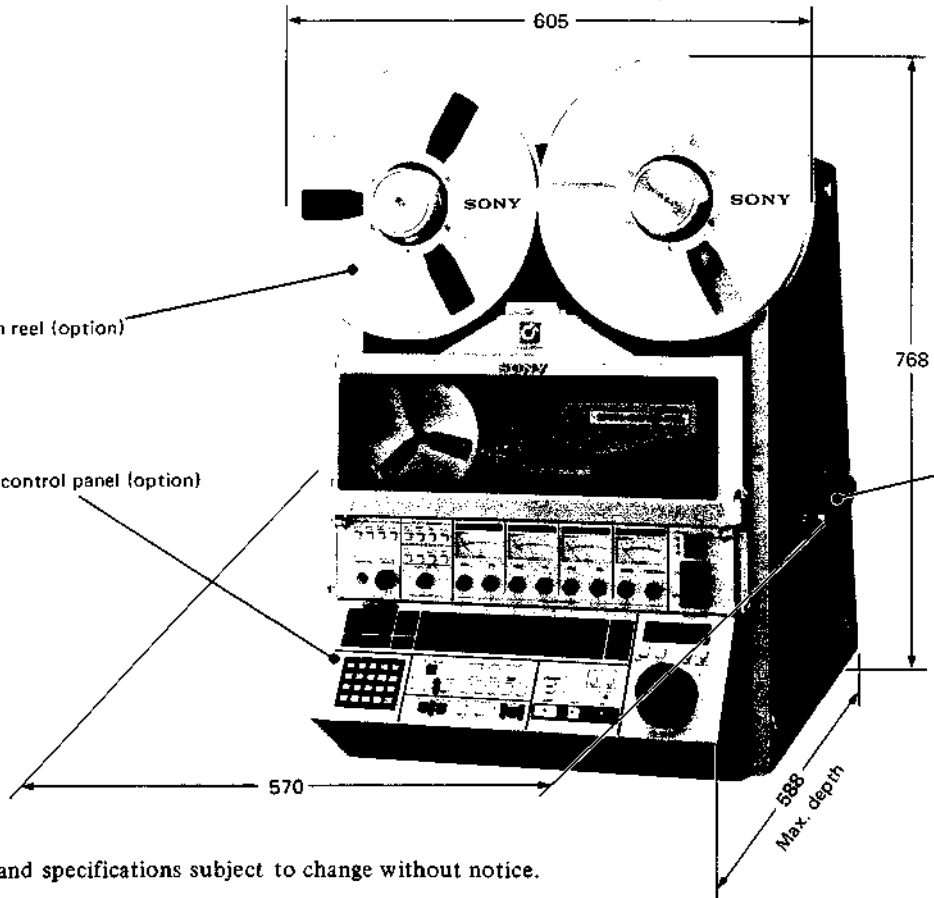
Main unit



11.75 inch reel (option)

Function control panel (option)

Side panel and handle (option)



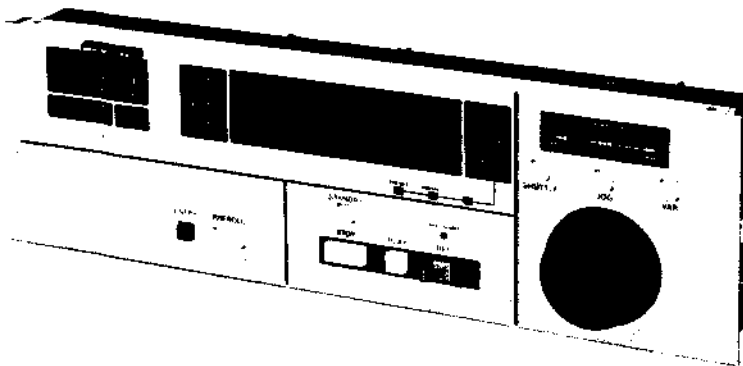
Design and specifications subject to change without notice.

Unit: mm

1-3. OPTIONAL PARTS AND ACCESSORIES

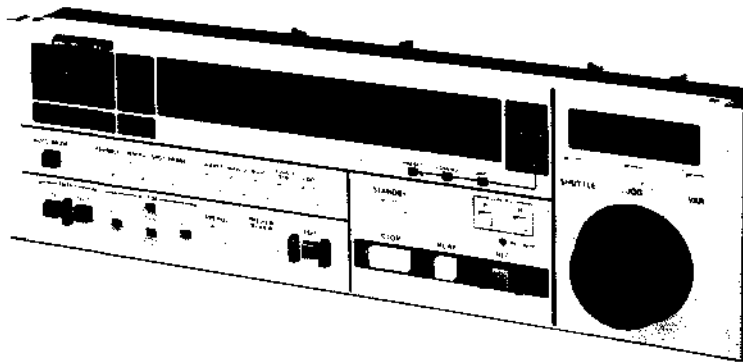
Function Control Panels

Three panels are available for the BVH-2000PS. Select and use the panel best suited for your need.



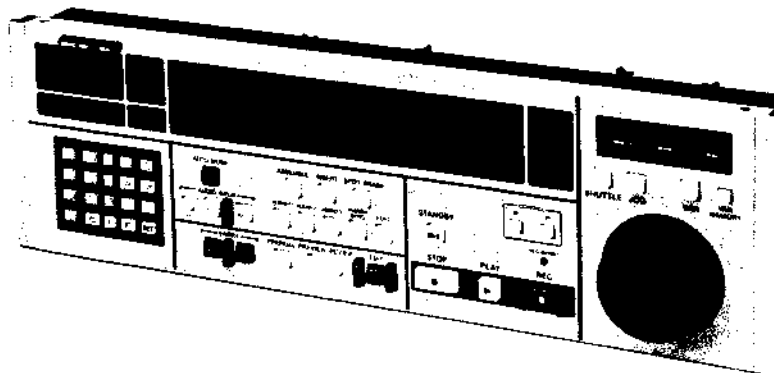
BKH-2011 control panel (Type-I)

This panel is provided to perform recording, playback, search, and preroll point search (cue) functions. This panel controls basic functions for record/playback process. (Refer to 1-4-3 for details.)



BKH-2012 control panel (Type-II)

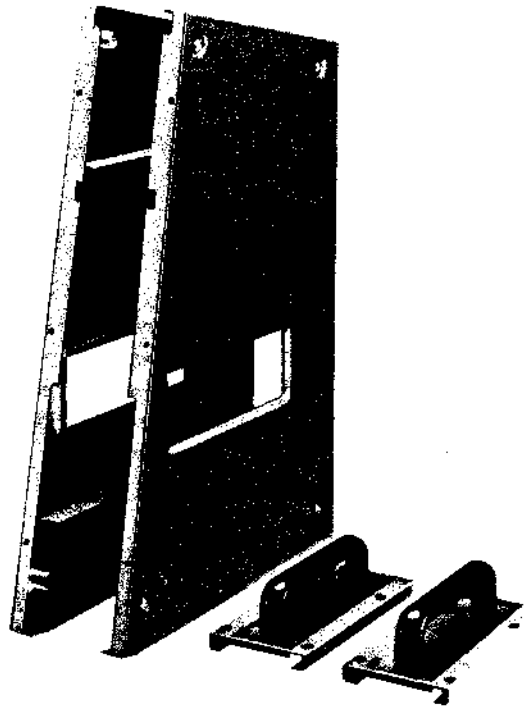
This panel is provided to perform editing functions in addition to the type I panel. With this panel, the BVH-2000PS is a standard editing VTR. (Refer to 1-4-4 for details.)



BKH-2013 control panel (Type-III)

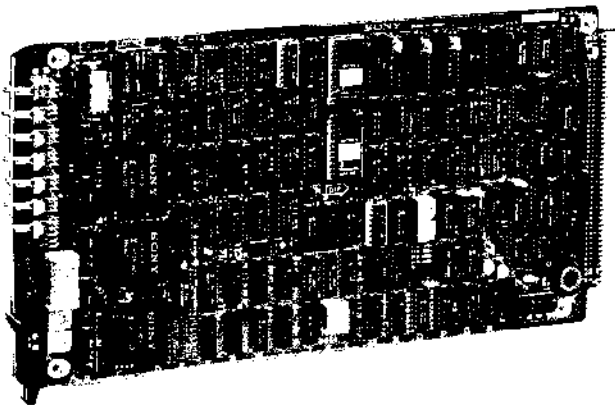
This panel is provided with excellent editing functions (such as AUDIO SPLIT EDIT, SPOT ERASE, VAR MEMORY, etc.) in addition to the above functions. With this panel, the BVH-2000PS is the multi function editing VTR equipped with various data processing functions. (Refer to 1-4-5 for details.)

BKH-2014 side panel kit



The side panels and handles are used when the BVH-2000PS used as stand alone machine.

BKH-2015/BKH-2015A time code generator/reader



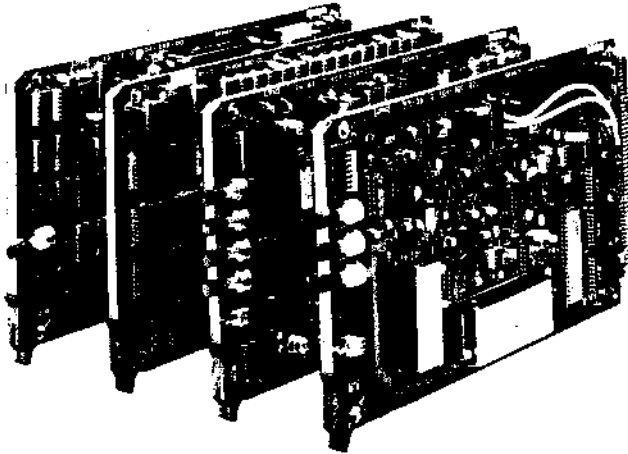
The BKH-2015/BKH-2015A is a plug-in board with generator and reader for EBU time code, VITC and user bit, as well as a character generator assembled together on one board. The position and size of the generated characters on the screen can be adjusted and black and white letters can be reversed.

If this board is installed in the VTR, external time code equipment is not needed.

BKH-2200 digital time base corrector (for PAL color system)

BKH-2300 digital time base corrector (for PAL/SECAM color system)

BKH-2350 digital time base corrector (for PAL/SECAM color system)



BKH-2200/BKH-2300

These four boards comprise a plug-in type TBC. The BKH-2200 or BKH-2300 allows color playback at normal speed and black and white playback speeds of up to ± 50 times normal. This makes it possible to check the recorded signals when searching. (However, in high speed search, the horizontal size of the picture changes.) This board allows the VTR to go ON AIR without preparing an external TBC or, if necessary, an external TBC (Sony's BVT-2000P/2000S) can be connected to the BVH-2000PS at the same time.

Note

An external TBC cannot be connected to the BVH-2000PS (10), (12) and (14).

BKH-2350

The BKH-2350 is a plug-in type time base corrector composed from four circuit boards. A high quality color picture can be obtained in normal playback and in dynamic tracking playback of -1 to $+3$ times normal speed. A picture can be searched in color up to ± 7 times normal speed and in black and white up to ± 50 times normal speed, so that it is possible to check the recorded signals. These four boards make it possible to broadcast the playback signals from the VTR without an external TBC.

Note

The BKH-2350 can be installed into a BVH-2000PS with serial numbers 33401 and higher.

BKH-2016 CCJ converter (Available for BVH-2000PS (00), (02) and (04) only)



This is a converter to interface the BVH-2000PS to conventional VTRs or editing control units with CCJ type (round 10-pin) REMOTE connector. It is attached to the rear panel of the BVH-2000PS for use.

Machines to be connected:

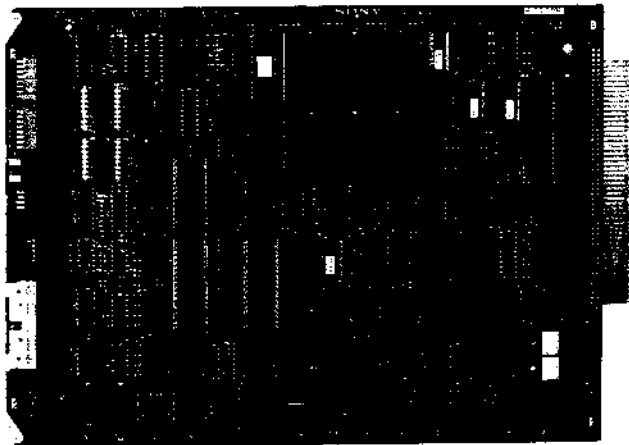
Editing control unit: BVE-500ACE, BVE-500OP, etc.

VTR: BVH-1100PS, BVH-1100APS, BVH-1180PS, etc.

Others: IF-1000CE*, BVR-1000, DTR-1100, etc.

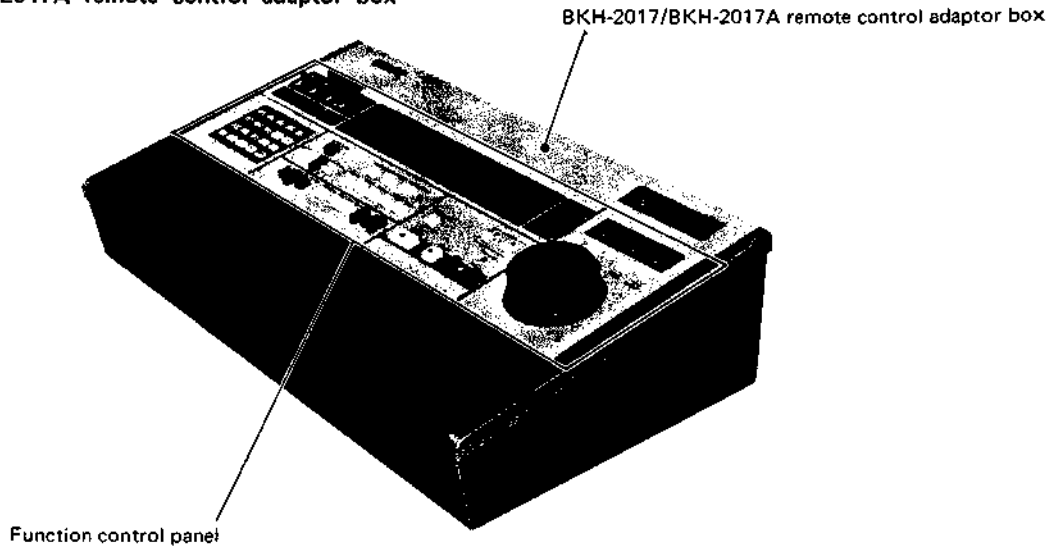
* When the IF-1000CE is used, the PU-2016 power unit is necessary.

BK-5005 BVE-5000P interface board



This is an interface board for interfacing the BVH-2000PS to the BVE-5000P automatic editing control unit. It is installed in the BVE-5000P. Two D-sub 9-pin connectors are provided with the board. (If this board is installed in the BVE-5000P, the BKH-2016 CCJ converter is unnecessary.)

BKH-2017/BKH-2017A remote control adaptor box



When you wish to remote control the BVH-2000PS, install the BKH-2011/2012/2013 function control panel in this box. The VTR can then be remotely controlled. The box is angled for easy operation, and an RS422 serial communication circuit and power supply are built-in. Up to 1,000 meters of extension is possible.

BKH-2018 9P-CCJ converter



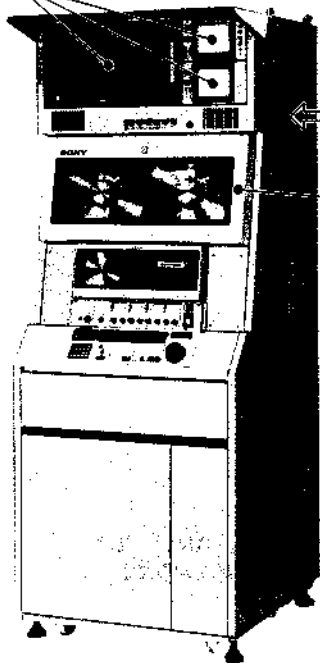
This converter is employed when the BVH-1100PS/1100APS/1180PS is controlled by the BVH-2000PS.

Rack Options

Picture monitor
Waveform monitor
Vectorscope

SUA-911
monitor console

SU-910
console unit

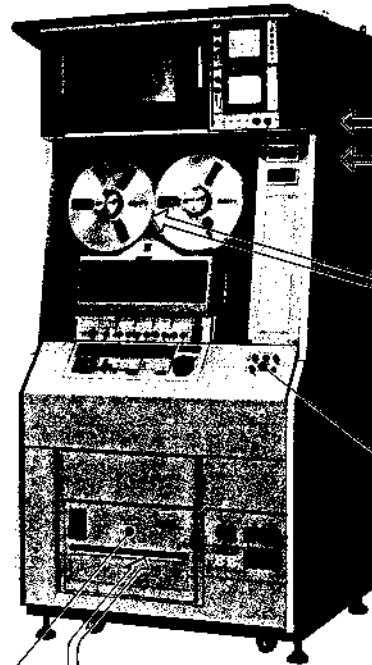


SUA-913 console top panel
This is the top panel for the SU-910 console unit. When the SUA-911 monitor console is not installed, attach this panel.

SUA-912 dust cover

SUA-901
monitor console

SU-900
console unit

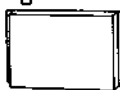


SUA-905 console top panel
This is the top panel for the SU-900 console unit. When the SUA-901 monitor console is not installed, attach this panel.

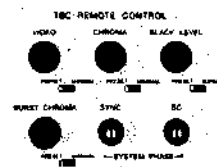
SUA-903 slant base plate

SUA-902 dust cover

BVT-2000P/2000S
time base corrector



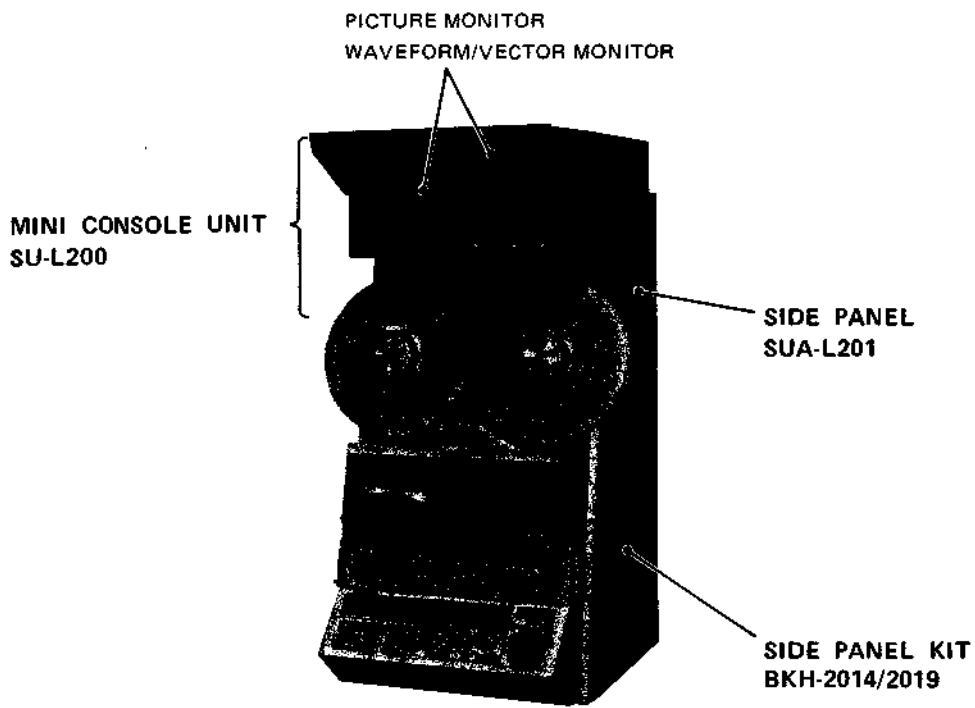
SUA-904 blank panel
When the BVT-2000P/2000S time base corrector is not installed, this panel is attached.



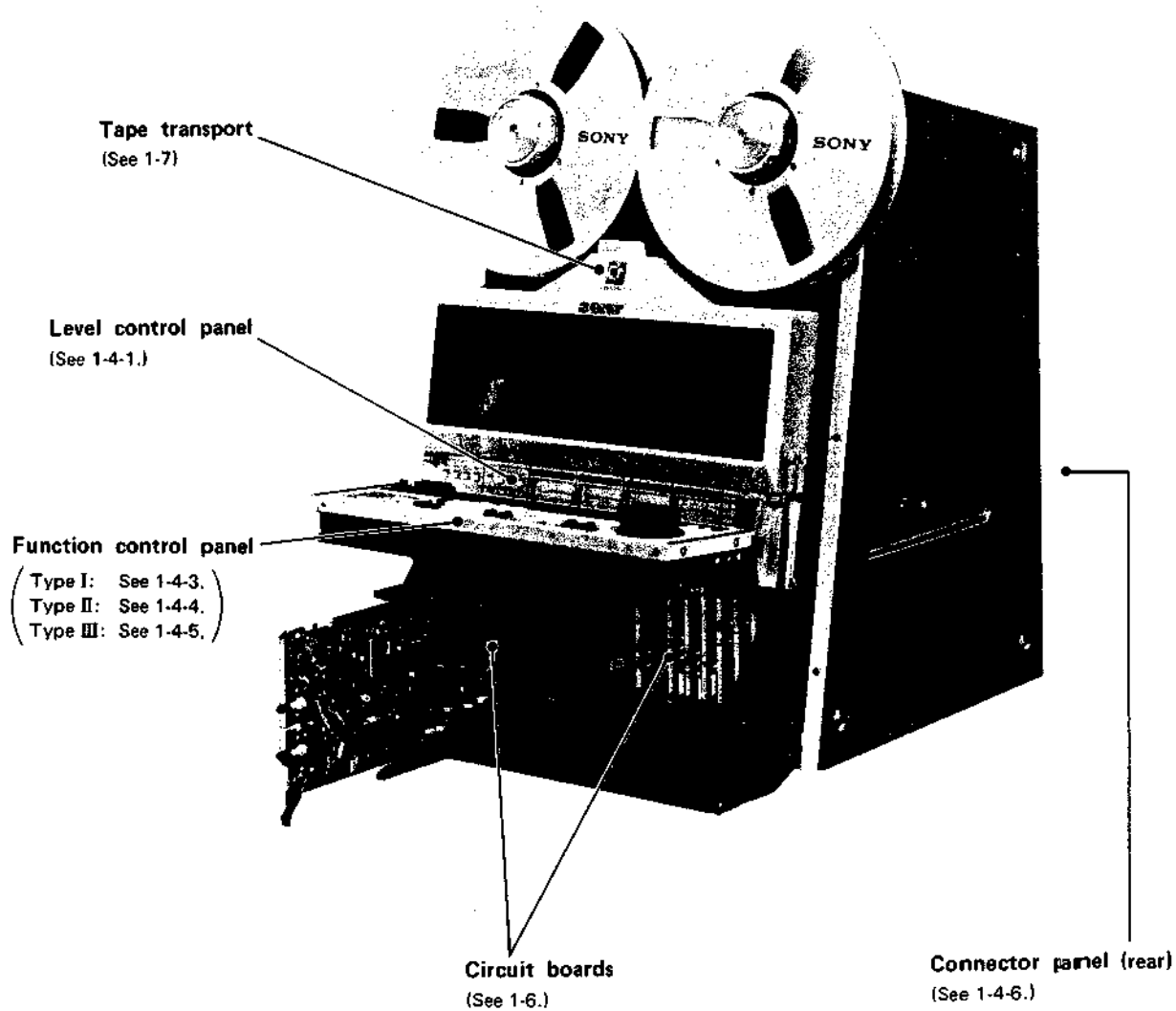
BK-2007 TBC remote control panel
This panel relocates the main controls of BVT-2000P and BKH-2200/2300/2350 digital time base correctors. It can be installed in any convenient location on the SU-900 and makes it possible to remotely control the BVT-2000P or the BKH-2200/2300/2350.

- Ask your Sony salesman for details of the optional units.

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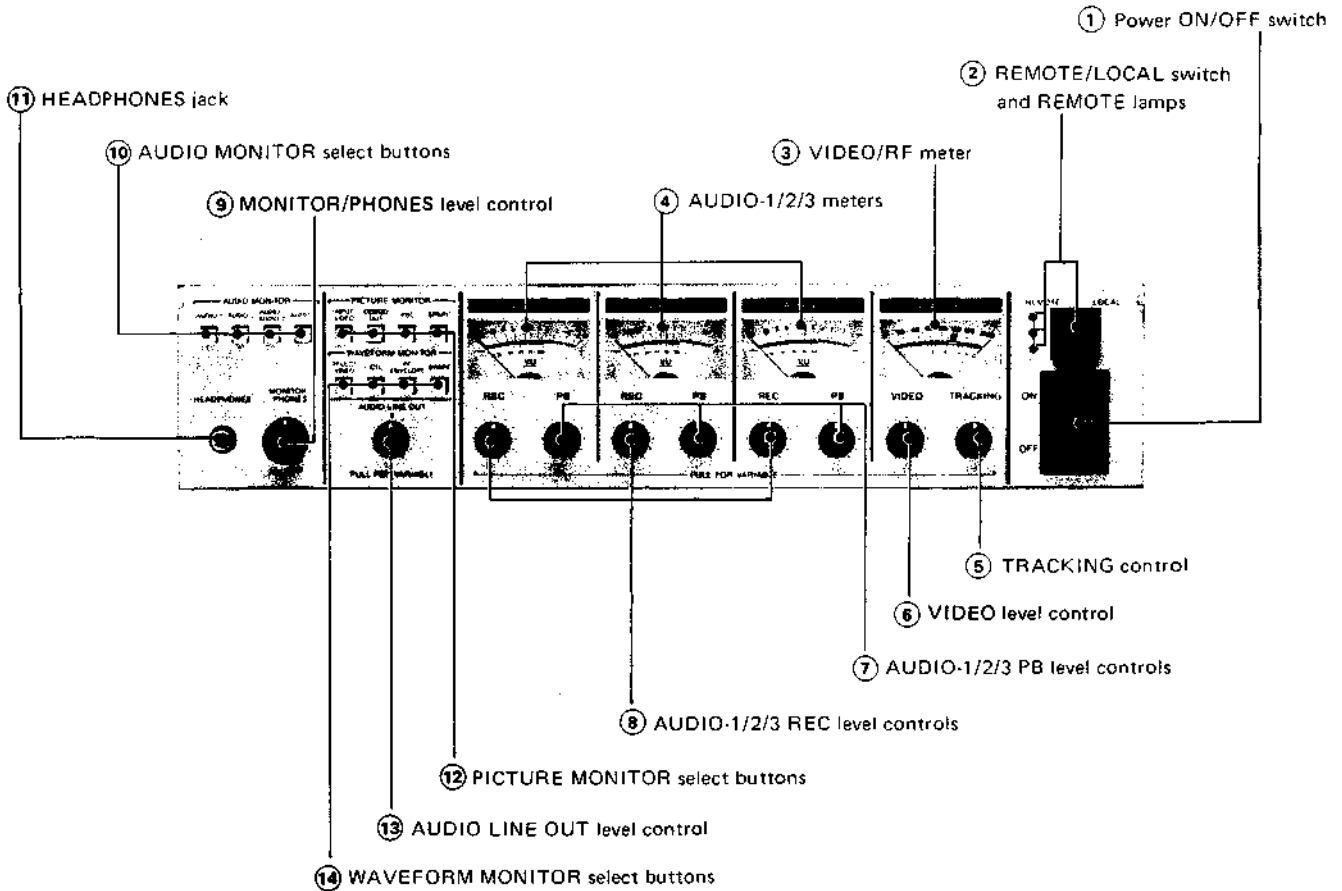


1-4. LOCATION AND FUNCTION OF PARTS

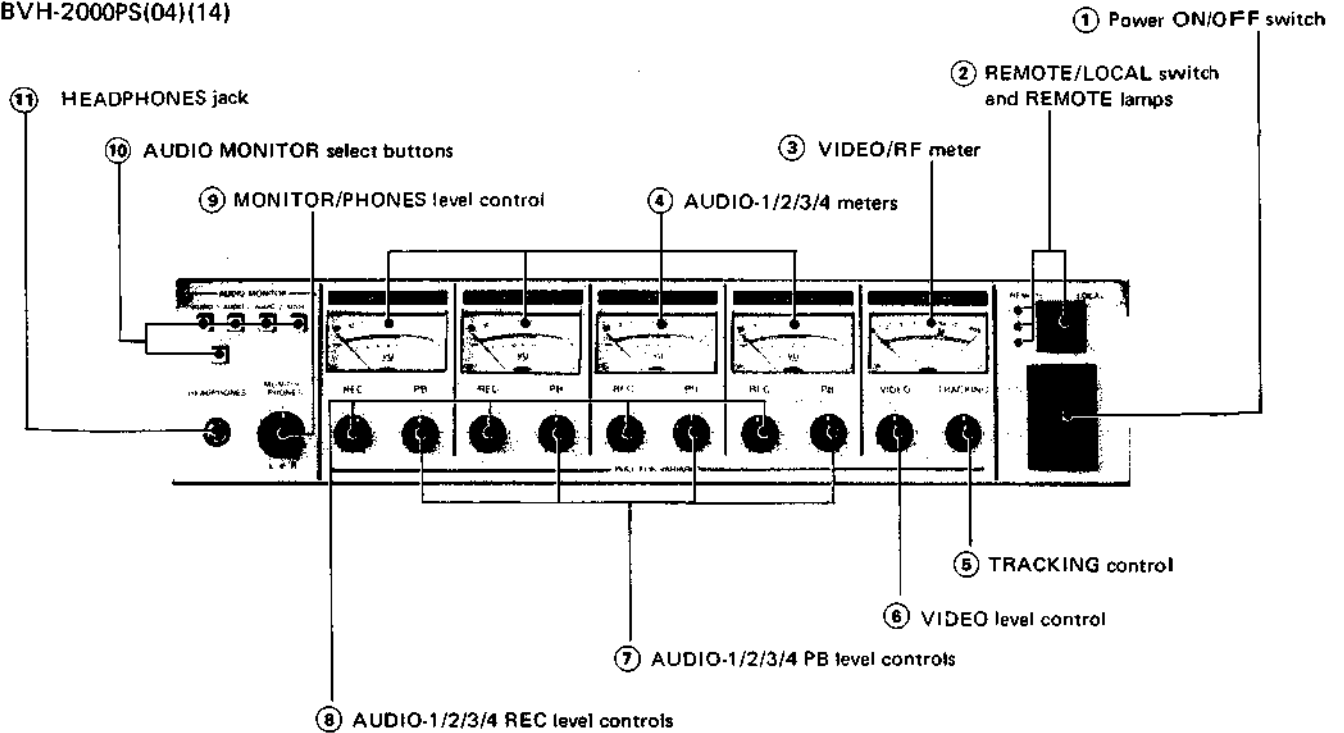


1-4-1. Level Control Panel

BVH-2000PS(00)(10) and BVH-2000PS(02)(12)



BVH-2000PS(04)(14)



① **Power ON/OFF switch**

When this switch is turned on, the display on the function control panel lights up, "INITIAL" is displayed on the type II or type III control panel and the VTR is set automatically to the STOP mode after 2 seconds.

② **REMOTE/LOCAL switch and REMOTE lamps**

REMOTE: When the remote control signal from another VTR or an editing control unit is connected to one of the REMOTE 1, 2 or 3 connectors and when the REMOTE switch on the SY-79 is set to the position corresponding to the control signal connection, the BVH-2000PS is remotely controlled with the external equipment.

In this position, all switches and buttons on the function control panel are made inoperative because they are remotely controlled with the external equipment. The lamps and the timer display maintain the same condition as before the switch selection to REMOTE.

However, the following operations are possible by switching the S9 switch on the SY-79 board:

S9-5 (REM LOC STOP EN):
Only the STOP button operates.

S9-4 (REM LOC KEY EN):
The STOP, REC, PLAY, SHUTTLE, JOG, VAR and STANDBY buttons and SEARCH dial operate.

(Refer to the Section 2 and follows for details.)

LOCAL: Use this position to operate the BVH-2000PS alone or to remotely control another VTR connected to the REMOTE connector with the BVH-2000PS for parallel operation or editing.

REMOTE lamps (three)

One of the REMOTE lamps 1/2/3 lights up in the REMOTE mode to indicate the number of the REMOTE connector (rear) currently used.

Lamp 1: Lights when the REMOTE-1 connector is being used. (Remote control via the BKH-2016 CCJ converter)

Lamp 2: Lights when the REMOTE-2 connector is being used. (Remote control via the RS-422 serial code)

Lamp 3: Lights when the REMOTE-3 connector is being used. (Remote control via the parallel IN/OUT signals)

Note

The Lamp 1 lights when the REMOTE/LOCAL switch is set to the corresponding position, however, that position is not available as the REMOTE-1 connector is not equipped on BVH-2000PS(10), (12) and (14).

③ **VIDEO/RF meter**

This indicates the video signal level. The following display is selected with the METER switch on the MD-14 board.

Position of the switch	Meter display
RF (V)	In the E-to-E mode, the level of the input video signal. During playback, the level of the RF signal from the video head.
INPUT	Always the level of the input video signal.
RF (S) (BVH-2000PS(00), (02), (04) only)	In the E-to-E mode, the level of the input video signal. During playback, the level of the RF signal from the sync head.

④ **AUDIO-1/2/3/4 meters***

These indicate the audio signal level. The signal selected by the TAPE/EE selector on the function control panel is indicated on the meter.

VTR operation mode Position of TAPE/EE selector	STOP mode	REC mode or EDIT mode	Other modes
	TAPE	TAPE	TAPE *3 (MONITOR)
TAPE/EE	EE *1	EE	TAPE
INPUT *2	INPUT	INPUT	INPUT

*1 • Only the AUDIO-3 meter indicates the TAPE level. The AUDIO-3 meter displays the E-to-E signal level when the TAPE/EE selector is once set to INPUT. After that, when the operation mode of the VTR is changed, this meter indicates the TAPE level.

*2 • At the INPUT position, meters indicate the signal level controlled by the REC level controls ⑧.
• When the EE switch (S9-3) on the SY-80 board is set to ON, the VTR is set to the enforced E-to-E mode and the meter displays the level of the E-to-E signal even in the INPUT position.

*3 • On the BVH-2000PS(00)(10), the E-to-E signal is obtained.

⑤ **TRACKING control**

PULL: Compensates the tracking error during playback. Turn this control for the maximum indication on the VIDEO/RF meter.

PUSH: This is the preset position.

⑥ **VIDEO level control**

PULL: Adjusts the video recording level. Adjust this control so that the meter pointer comes within the blue zone on the VIDEO/RF meter.

PUSH: This is the preset position.
(Refer to 1-6-2 for presetting.)

* Only the BVH-2000PS(04)(14) has the AUDIO-4 meter.

⑦ AUDIO-1/2/3/4 PB level controls*

PULL: The audio playback level can be adjusted. During playback, adjust these controls so that the meter pointers of the AUDIO-1/2/3 meters indicate 0 VU at the peak.

PUSH: This is the preset position. (Refer to 1-6-2 for presetting.)

⑧ AUDIO-1/2/3/4 REC level controls*

PULL: The audio recording level can be adjusted for recording and editing. Adjust these controls so that the meter pointers of the AUDIO-1/2/3/4 meters indicate 0 VU at the peak.

PUSH: This is the preset position. (Refer to 1-6-2 for presetting.)

- The AUDIO-3 meter can be used to indicate the MIC input level from the MIC INPUT connector on the rear panel. The LINE input and MIC input are selected by the A-3 SEL switch on the AE-03 board (refer to 1-6-3).
- When the A-3 SEL switch is set to TC mode and the time code input selector to INT or EXT-1, the AUDIO-3 REC control is inoperative.

⑨ MONITOR/PHONES level control

This is used to control the listening level of the headphones or the output level of the AUDIO MONITOR OUTPUT connectors on the rear panel. When headphones are connected, the audio signal is not output to the AUDIO MONITOR OUT connectors. (The headphones have priority.)

⑩ AUDIO MONITOR select buttons

These buttons are used to select the signals, fed to the HEADPHONES jack and the MONITOR OUTPUT connectors as follows.

Select button \ Audio channel	L	R
	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4
AUDIO-1 AUDIO-2	AUDIO-1	AUDIO-2

Stereo output is obtained with the AUDIO-1
AUDIO-2 button.

⑪ HEADPHONES jack

This jack is used to connect 8-ohm headphones. The audio output signals selected by the AUDIO MONITOR select buttons ⑩ can be monitored through the headphones. When the headphones are disconnected, the audio signals are supplied to the AUDIO MONITOR OUT connectors. (The headphones have priority.)

⑫ PICTURE MONITOR select buttons**

These are used to select the signals fed to the VIDEO MONITOR OUTPUT connector on the rear panel.

INPUT VIDEO: For the video signal connected to the VIDEO INPUT connector.

DEMOD OUT: For the video signal output from the demodulator.

TBC: For the video signal connected to the TBC MONITOR INPUT connector.

SPARE: For the signal connected to the SPARE MONITOR INPUT connector. If the optional plug-in digital time base corrector is installed, the signal generated from the installed board is output instead of the SPARE MONITOR INPUT signal by resetting the SI on the VM-01 board. (Refer to 1-4-6.)

- When the TAPE/EE selector is set to INPUT, the INPUT VIDEO is automatically selected. When the selector is returned to the position other than INPUT, the output signal previously selected is automatically selected.

⑬ AUDIO LINE OUT level control**

PULL: This controls the audio playback level of audio channel 1 and 2 simultaneously which are output from the AUDIO-1/2 LINE OUTPUT connectors. The adjustable range is ± 6 dB of the level which has been adjusted by the AUDIO-1/2 PB level controls respectively.

PUSH: In this position, the control is inoperative.

⑭ WAVEFORM MONITOR select buttons**

These are used to select the output signal fed to the WFM MONITOR OUTPUT connector on the rear panel.

SELECTED VIDEO: For the output signal selected by the PICTURE MONITOR select buttons ⑫.

CTL: For the playback CTL signal of the recorded tape.

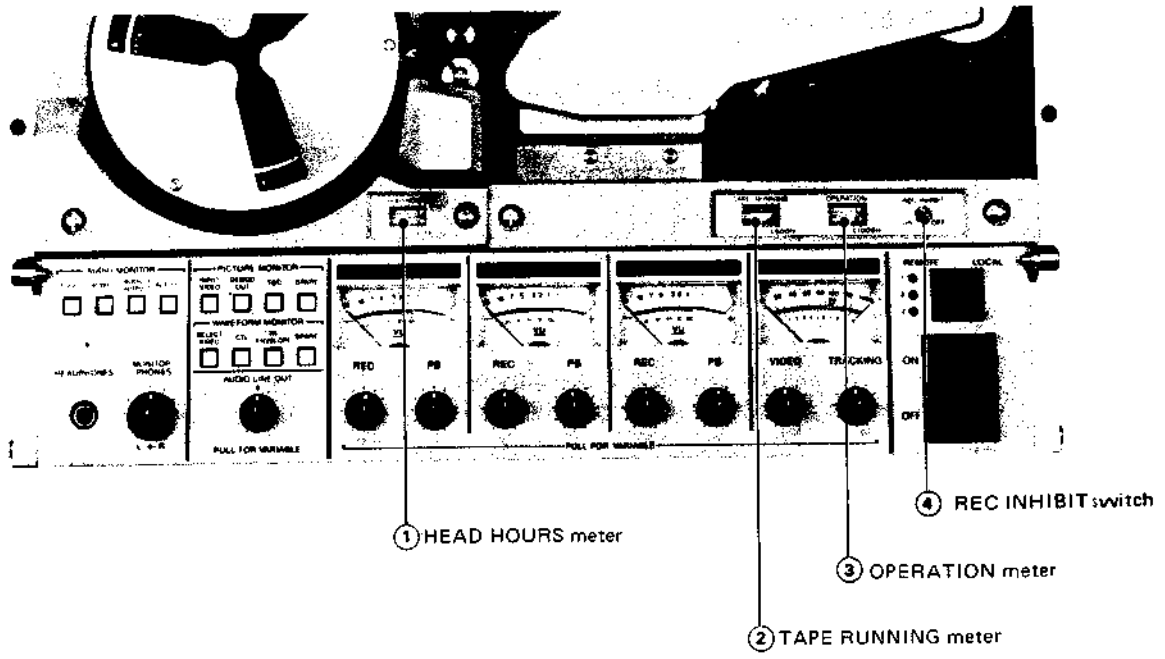
RF ENVELOPE: For the RF envelope signal of the FM carrier played back by the video head.

SPARE: (Not connected)

* Only the BVH-2000PS(04)(14) has the AUDIO 4 PB level control, the AUDIO-4 REC level control and the AUDIO-4 button.

** The BVH-2000PS(00)(10) and the BVH-2000PS(02)(12) has these control and buttons. The function of these control and buttons on the BVH-2000PS(04)(14) is activated only when it is mounted in the rack which has the corresponding control and buttons.

1-4-2. Level Control Panel Peripherals



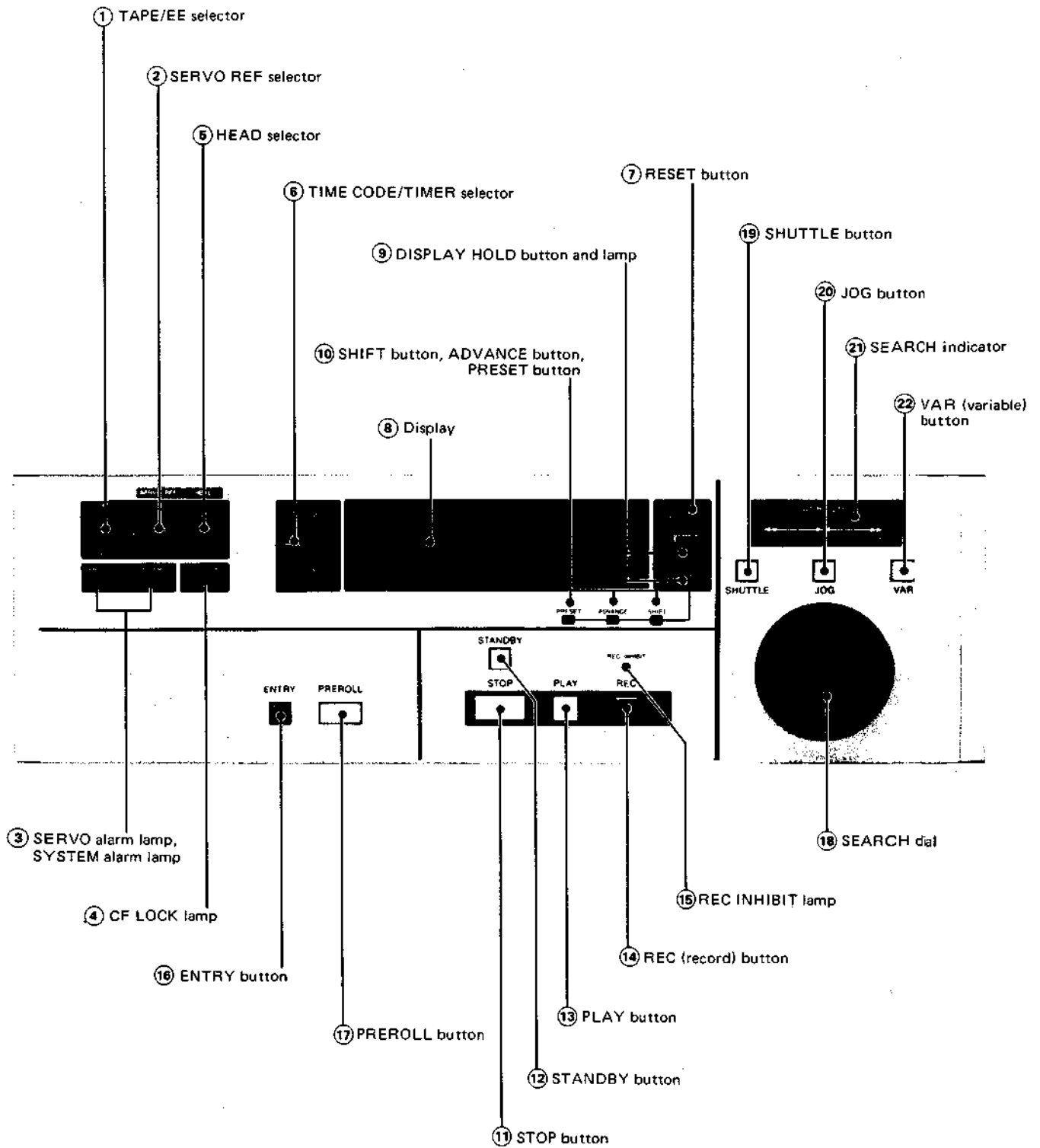
- ① **HEAD HOURS meter**
This records the time elapsed up to 1,000 hours. It starts operating when the drum rotates with the tape loaded.
- ② **TAPE RUNNING meter**
This records the time elapsed up to 5,000 hours. It records the tape run time in the tape run modes except STOP.
- ③ **OPERATION meter**
This records the time elapsed up to 10,000 hours. It starts operating when the POWER switch is turned on and it records the time the VTR is used.

- ④ **REC INHIBIT switch**
This is used to inhibit the REC and EDIT REC modes.
ON: The VTR will not go into the REC mode even if the REC button/EDIT button on the control panel are pressed. Even when the VTR is remotely controlled, the record command is not accepted.
OFF: The REC/EDIT button can be used normally.
Note: In accordance with the setting of the switches on the front panel and LG-02 board, the REC INHIBIT switch operates as shown in the table below.

REC INHIBIT switch		REC INHIBIT state
Front panel	LG-02 board	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

When the REC INHIBIT switch on the front panel is mainly put to use, set the switch on the LG-02 board to OFF or remove it.

1-4-3. Function Control Panel – Type I



① **TAPE/EE selector**

Selects the output signal from the VIDEO OUTPUT, AUDIO OUTPUT and MONITOR OUTPUT connectors. The output signal is decided by the position of this switch and the operation mode of the VTR as follows.

VIDEO

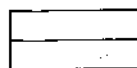

BVH-2000PS(00)(10)

The position of the TAPE/EE selector ①	Operation mode of the VTR				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

• The HEAD selector does not affect on the output of the BVH-2000PS(00)(10).

BVH-2000PS(02)(12) and BVH-2000PS(04)(14)

The position of the HEAD selector ⑤	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	

 : output signal of the VIDEO OUTPUT connectors
 : output signal of the VIDEO MONITOR OUTPUT connectors

*1 If the SW9-1 on the SY-80 board is set to ON, the E-to-E signal will be output in the REC or EDIT REC mode even if the TAPE/EE selector is set to TAPE.

*2 If the SW8-5 switch on the SY-80 board is set to ON and the BKH-2015/2015A is installed, the output will be black between the IN and OUT points.

*3 If the SW9-3 switch on the SY-80 board is set to ON, the E-to-E signal will be output in all modes even if the TAPE/EE selector is set to INPUT.

Note: If either VIDEO or SYNC channel is in the EDIT-REC mode, see the REC/EDIT REC column in the table even if the other channel is in the playback mode.

*4 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.

AUDIO

1. OPERATION JJJJJJJJJ

AUDIO channel	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONFI *6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONFI *6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

: output signal of the AUDIO LINE OUTPUT connectors
 : output signal of the AUDIO MONITOR OUTPUT connectors

- *1 If the playback speed is 5 times normal or more, the output will be attenuated.
- *2 If the SW8-5 on the SY-80 board is set to ON, the output will be muted between the IN and OUT points.
- *3 If the SW9-3 on the SY-80 board is set to ON, the E-to-E signal will be output in all modes when the INPUT position is selected.
- *4 When the INPUT position is selected in the STOP mode, the E-to-E signal on the AUDIO-3 channel will be latched, and the E-to-E signal will be output from the AUDIO OUTPUT and MONITOR OUTPUT connectors even if the TAPE or TAPE/EE position is selected afterwards. When the VTR is entered into the another mode, the latch will be released.
- *5 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.
- *6 The E-to-E signal is output from the BVH-2000PS(00)(10).

② SERVO REF (reference) selector

Selects the reference signal for servo lock.

EXT: The signal connected to the REF VIDEO INPUT connector ③ on the video connector panel (composite video signal) becomes the reference signal.

AUTO: In the REC, EDIT REC or EDIT preset mode, the input video signal becomes the reference signal. In the PLAY mode, the external reference signal becomes the reference signal (selected automatically).

INPUT: The signal connected to the VIDEO INPUT connector on the video connector panel becomes the reference signal.

- The amount of the sync signal to be advanced necessary for playback can be changed by the ADVANCE switch on the CD-17 board (refer to 1-6-3).

③ **SERVO alarm lamp (red)/SYSTEM alarm lamp (red) (Refer to 1-14.)**

These lamps warn of improper VTR operation.

SERVO alarm lamp

The lamp lights until the servo locks or when the servo does not lock.

SYSTEM alarm lamp

The lamp lights when the system control does not correctly function.

④ **CF LOCK lamp (green)**

This lamp lights when the VTR is operating with its color framing locked. Color frame/non-color frame is set by the switches on the CD-17 and SR-15 boards (refer to 1-6-3).

⑤ **HEAD selector**

Selects the playback head of the video signal.

R/P: Playback with the R/P (record/playback) head.

PLAY: Playback with the PLAY head. VTRs equipped with the dynamic tracking function can perform dynamic tracking playback.

In the REC or EDIT REC mode, the R/P head is selected automatically for recording and edit-recording regardless of the position of this switch.

- This selector functions only on the BVH-2000PS (02)(12) and BVH-2000PS(04)(14). On the BVH-2000PS(00)(10), the R/P head always operates at any position.

⑥ **TIME CODE/TIMER selector**

This switch selects one of the following three kinds of tape run time display on the display ⑧.

TIME CODE: This is used to indicate the EBU time code. The CH3 INPUT switch on the AE-03 board (refer to 1-6-3.) should be set to the TC position. The A-3 SEL switch on the AE-03 board is used to select an external time code or internal time code (when the optional BKH-2015/2015A is installed). The TC/U-BIT switch on the BKH-2015/2015A (TC-14/14A) is used to change over the time code or user bit indicator. Normally this indicates a value read by the time code reader but when the TAPE/EE selector ① is set to INPUT, it indicates an input from the time code generator. If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to the VITC position, the preroll function doesn't work.

TIMER-1: This is used to indicate the tape run time by counting the CTL signal on the tape. It is possible to zero reset at any position on the tape with the RESET button ⑦. After reset, the new tape run time is indicated from this point.

TIMER-2: This is used to indicate the tape run time by counting the CTL signal on the tape. When the tape is threaded, zero reset of the TIMER-2 cannot be performed.

The data of the TIME CODE, TIMER-1 or TIMER-2 selected by this switch, which is indicated on the display, can be entered as the preroll point.

- Both TIMER-1 and 2 start counting the tape run time when the machine is in an mode except the STOP mode. The TIMER-2 zero point is the position where the operation mode is designated after the tape has been threaded. For TIMER-1, it is possible to zero reset any position on the tape.
- When the power is turned OFF with the tape installed, the data of TIMER-1 and 2 is retained for 12 hours by means of a built-in back-up capacitor, so that the data can be used again within this period.

⑦ **RESET button**

(1) **TIMER-1 Reset**

After the TIME CODE/TIMER selector has been set to TIMER-1, by pressing the RESET button at any position, the TIMER-1 data indicated on the display ⑧ can be reset to zero. For TIMER-2, zero reset cannot be operated.

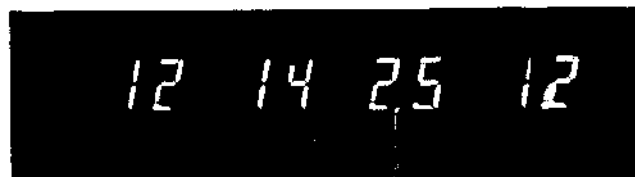
(2) **TIME CODE reset**

After the TIME CODE/TIMER selector is set to TIME CODE, by setting the TAPE/EE selector ① to INPUT, the input from the time code generator is indicated on the display. The time code generator is reset to zero by pressing the RESET button in this state.

When the user bit is displayed, the user bit is reset to zero.

⑧ **Display**

This is a 7-segment 8-column fluorescent display. The display color is green.



Cursor

⑨ DISPLAY HOLD button and lamp

If this button is pressed, at any position, the data displayed on the display ⑧ is held. At the same time, the lamp lights up to indicate the DISPLAY HOLD mode. When this button is pressed again, the lamp goes off and the data which is currently being read is displayed.

⑩ SHIFT button/ADVANCE button/PRESET button

Preset the TIMER-1 and TIME CODE to the value desired. Not applicable for TIMER-2. When the DISPLAY HOLD button ⑨ is set to ON, the buttons work as follows.

SHIFT button: Moves the cursor displayed in the lower part of the display. One push moves the cursor up by one digit. After the top digit, the cursor returns to the last digit.

ADVANCE button: Changes the number indicated by the cursor. Each push increases the value by one.

PRESET button: After setting all the digits to the desired value, the PRESET button inputs them as data.

(1) Data input to TIMER-1

Set the TIME CODE/TIMER selector ⑥ to TIMER-1 and hold the data using the DISPLAY HOLD button ⑨. Then operate the three buttons to input data as required.

The data preset cannot be done when the TIMER-1 is in the +/- display mode (the S9-5 on the SY-80 board is set to ON).

(2) Data input to TIME CODE

Set the TIME CODE/TIMER selector ⑥ to TIME CODE. Set the VTR to STOP/STANDBY mode and hold the display using the DISPLAY HOLD button ⑨. Then set the time code generator starting point to the place desired by operating the above three buttons. When the user bit is displayed the user bit can be set to the value desired.

Set the TAPE/EE selector ① to INPUT, and the input from the time code generator will be displayed.

⑪ STOP button

Pressing the STOP button stops all modes. The reel motor stops and the pinch roller is retracted from the tape.

- About 30 seconds after the STOP button has been pressed, the tension release mechanism is operated and the machine enters the STANDBY mode (reduced tape tension). The TENSION OFF ENABLE switch (S9-7) on the SY-79 board can be turned OFF so that the tension release mechanism does not operate.
- The machine goes into the STOP mode automatically after the power is turned on or if the tape is out of the tape sensor.
- The STOP lamp flashing shows that no reference signal is being supplied to the servo system.
- In the STOP or STANDBY mode, if the tape is too slack, the slack will be taken up automatically.

⑫ STANDBY button

This push on/push off button is used to start the drum rotating. In normal use, after the STANDBY button has been pressed, the SERVO alarm lamp ③ is checked to see that it is off and then the desired mode button is pressed. However, it is also possible to go into that mode by pressing the desired button directly without the STANDBY button having been pressed. When about 9 minutes has elapsed without any button being pressed after the STANDBY button has been pressed, the STANDBY mode is released automatically.

- If the STANDBY OFF ENABLE switch (S9-8) on the SY-79 board is OFF, automatic release of the STANDBY mode does not operate.
- If the tape sticks when the head drum starts to rotate, the tension release mechanism operates to slacken the tape.
- The STANDBY lamp flashes to show that the head drum is rotating abnormally for some reason, or is not rotating at all.

⑬ PLAY button

When the PLAY button is pressed, the PLAY and STANDBY lamps light and the machine enters the normal playback mode (normal speed in the forward direction). To cancel, press the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- It is possible to select playback by the R/P or PLAY head by means of the HEAD selector ⑤ when the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used.
- If a slight compensation of the playback tape speed is necessary for synchronizing two BVH series VTRs, turn the SEARCH dial ⑱ clockwise (faster) or counterclockwise (slower) keeping the PLAY button pressed. The degree of compensation is determined by the rotation angle, and the range is within ±15% of the normal speed (capstan override function). Releasing the PLAY button will return the VTR to the normal speed.

⑭ REC (record) button

When the PLAY button is pressed keeping the REC button pressed, both the REC and PLAY lamps light and the machine enters the record mode. To release, press either the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- Recording is performed by the R/P head regardless of the position of the HEAD selector ⑤.
- When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, the simultaneous playback picture can be monitored during recording by setting the TAPE/EE selector ① to TAPE.
- When the REC INHIBIT lamp ⑮ is on, the machine enters the PLAY mode without recording.
- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the STOP mode, the BVH-2000PS(00)(10) enters the REC TEST mode by pressing the REC button. (For details, refer to page 1-74(E).)

⑮ REC INHIBIT lamp

This lamp shows that the VTR is in the REC INHIBIT mode. This lamp lights when the REC INHIBIT switch is set to ON, and REC mode is inhibited. If recording is attempted while this lamp is on, the machine will go into the play mode.

- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the REC TEST mode, the REC INHIBIT lamp blinks. (For details, refer to page 1-74(E).)

⑯ ENTRY button

This button is used to memorize the entry point. When the ENTRY button is pressed at the desired position on the tape, this position is memorized. Even if the tape is then run to another position, it can be returned to the preroll point (the position prior to the entry point by the preroll time) by pressing the PREROLL button ⑰, after which it stops. Entry is performed for the TIME CODE/TIMER-1/2 data which is displayed on the display ⑧. Therefore, in addition to the present tape run point, it is possible to enter the input and displayed data by means of the PRESET button ⑩.

- While the DISPLAY HOLD lamp is lit, the ENTRY point can be displayed by pressing the ENTRY button.

⑰ PREROLL button

If the PREROLL button is pressed, the tape returns to the entry point preset by the ENTRY button then stops at a position several seconds before the entry point (preroll point).

The number of seconds of preroll can be set from 0 to 15 seconds on a one second basis using the P.ROL TIME switch on the SY-79 board.

- If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to VITC and the TIME CODE/TIMER selector ⑥ is set to TIME CODE, the preroll function does not work.

⑱ SEARCH dial

This dial is used to change the tape run.

- (1) By turning this dial during the JOG, SHUTTLE, or PROGRAM JOG mode (refer to pages 1-21(E), 22(E)), it is possible to change the direction and speed of the tape run.
- (2) If this dial is turned during the STOP, STANDBY, PLAY, or REC modes, the SEARCH indicator lights, and it is possible to previously set the next direction and speed of tape run in the PROGRAM JOG mode.

⑲ SHUTTLE button

When the SHUTTLE button is pressed, the lamp lights and the machine enters the SHUTTLE mode. In this state, if the SEARCH dial ⑱ is turned to either the right or left and stopped at any position, playback will be at the corresponding speed (1/32 to 50 times normal). At the center position, the still picture is obtained. The SEARCH dial clicks at the center and ± 50 positions.

- For fast winding in the forward direction, the winding speed is reduced automatically at the tape end, and the unit stops automatically. If you wish to wind the tape completely, turn the SEARCH dial again to the right or set the EOT STOP switch on the SY-80 board to OFF.
- For fast winding in the reverse direction (rewinding), the tape speed is reduced automatically at the tape top and stops automatically near the TIMER-2 zero set position.
- If you wish to rewind the tape completely, turn the SEARCH dial again to the left or set the EOT STOP switch on the SY-80 board to OFF.
- If the still mode is held for 3 minutes or more, the machine enters the STOP mode automatically to prevent damage to the tape. If you don't want the machine to stop, set the STILL OFF ENABLE switch (S9-6) on the SY-79 board to OFF.

⑳ JOG button

When the JOG button is pressed, the lamp lights and the machine enters the JOG mode. In this state, when the SEARCH dial is turned to either the left or right, the playback speed depends on the speed of rotation (0 to several times normal). When turning stops, the picture will be still at that dial position. The SEARCH dial does not click.

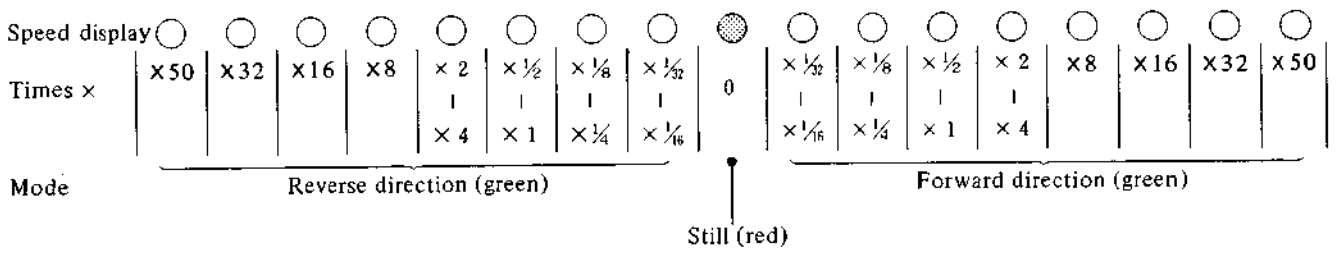
- If the STILL mode is held for 3 minutes or more, the machine will go into the STOP mode automatically. If you don't want the machine to stop, set the STILL OFF ENABLE switch (S9-6) on the SY-79 board to OFF.

⑳ SEARCH indicator

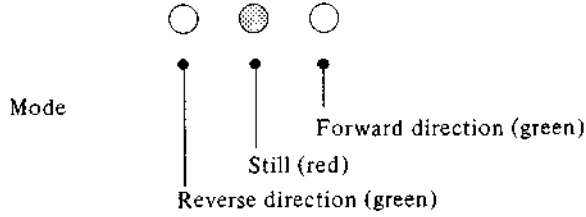
This indicates the operation mode of the SEARCH dial. While in the SHUTTLE, JOG or PROGRAM JOG mode (described in ㉔), the lamps light as shown in the illustration according to the dial operation to indicate the speed and direction of the tape.

Note: When the tape comes near to the end, the still, forward or reverse direction indicators blink.

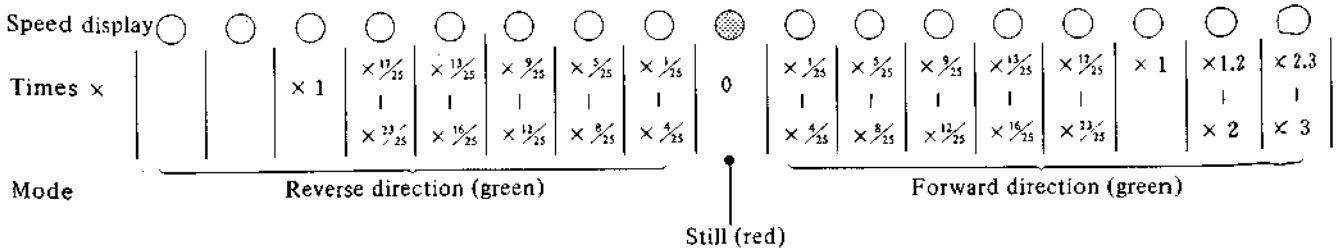
SHUTTLE mode



JOG mode



PROGRAM JOG mode

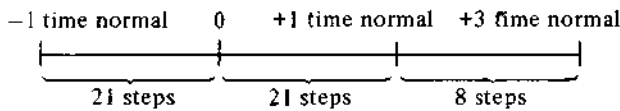


② VAR (variable) button

When the VAR button is pressed, the lamp lights and the machine enters the PROGRAM JOG or PROGRAM PLAY mode. These modes are selected by the VAR switch on the SY-79 board.

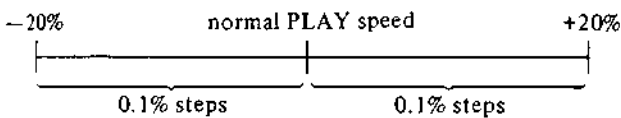
PROGRAM JOG mode:

After the VAR switch on the SY-79 board has been set to the P.JOG position, pushing the VAR button places the machine in the PROGRAM JOG mode. If the SEARCH dial is turned to the left or right and the rotation is stopped at any position, playback will be at a speed (-1 to +3 times normal) corresponding to the dial position. The dial clicks at the -1, 0, +1, and +3 times normal position. When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible over the entire range (-1 to +3 times normal) of the dial in this mode by setting the HEAD selector ① to the PLAY position. This mode is also available as a vernier function in the usual SHUTTLE mode (-50 to +50 times normal). The speed can be set to the following 50 steps:



PROGRAM PLAY mode:

VAR button and PLAY button can turn the mode into PROGRAM PLAY if pushed altogether after setting the VAR switch on the SY-79 board to P.PLY. Then turn the SEARCH dial to the left or right pushing at the same time the VAR button and stop at the position desired, and playback is performed at the speed corresponding to the dial position (-20% to +20%). When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible in this mode as in the PROGRAM JOG mode over the entire dial range. This mode can be used, in the same way as above, as a vernier function in the usual SHUTTLE mode. Speed setting is adjustable in 0.1% units up to ±20% the normal PLAY speed.

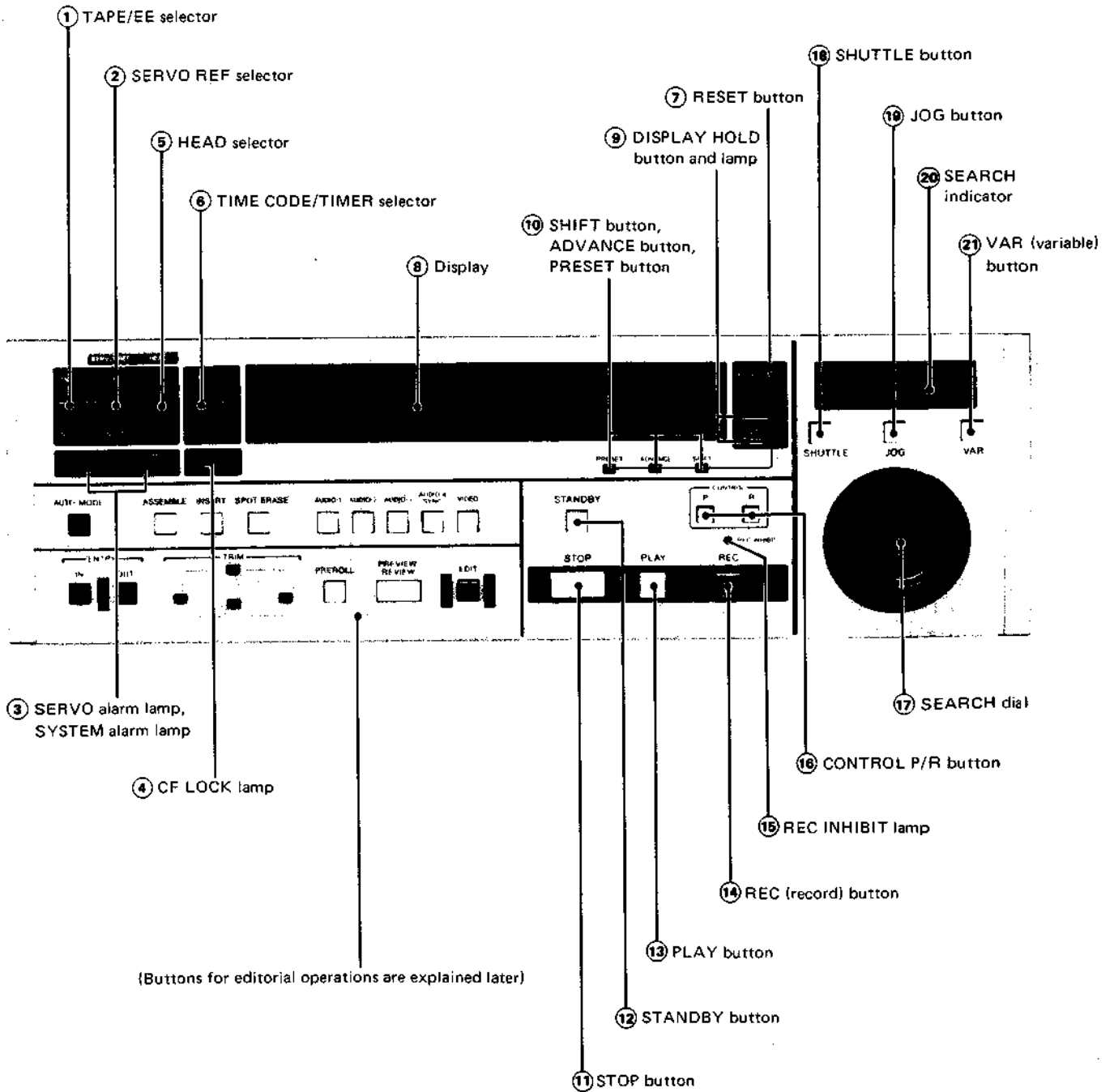


Tape speed presetting is possible by turning the SEARCH dial with the VAR button pressed in STOP, STANDBY, PLAY or REC mode. After setting, program play begins at the preset speed by pushing the PLAY button and VAR button at the same time.

The set speed is displayed on the display ⑧ in % while the VAR button is pressed.

1-4-4. Function Control Panel — Type II

1. OPERATION INITIALS



① **TAPE/EE selector**

Selects the output signal from the VIDEO OUTPUT, AUDIO OUTPUT and MONITOR OUTPUT connectors. The output signal is decided by the position of this switch and the operation mode of the VTR as follows.

VIDEO


BVH-2000PS(00)(10)

The position of the TAPE/EE selector ①	Operation mode of the VTR				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

• The HEAD selector does not affect on the output of the BVH-2000PS(00)(10).

BVH-2000PS(02)(12) and BVH-2000PS(04)(14)

The position of the HEAD selector ⑤	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	

 : output signal of the VIDEO OUTPUT connectors

 : output signal of the VIDEO MONITOR OUTPUT connectors

*1 If the SW9-1 on the SY-80 board is set to ON, the E-to-E signal will be output in the REC or EDIT REC mode even if the TAPE/EE selector is set to TAPE.

*2 If the SW8-5 switch on the SY-80 board is set to ON and the BKH-2015/2015A is installed, the output will be black between the IN and OUT points.

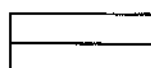
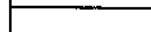
*3 If the SW9-3 switch on the SY-80 board is set to ON, the E-to-E signal will be output in all modes even if the TAPE/EE selector is set to INPUT.

Note: If either VIDEO or SYNC channel is in the EDIT-REC mode, see the REC/EDIT REC column in the table even if the other channel is in the playback mode.

*4 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.

AUDIO

AUDIO channel	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONF1*6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONF1*6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

 : output signal of the AUDIO LINE OUTPUT connectors
 : output signal of the AUDIO MONITOR OUTPUT connectors

- *1 If the playback speed is 5 times normal or more, the output will be attenuated.
- *2 If the SW8-5 on the SY-80 board is set to ON, the output will be muted between the IN and OUT points.
- *3 If the SW9-3 on the SY-80 board is set to ON, the E-to-E signal will be output in all modes when the INPUT position is selected.
- *4 When the INPUT position is selected in the STOP mode, the E-to-E signal on the AUDIO-3 channel will be latched, and the E-to-E signal will be output from the AUDIO OUTPUT and MONITOR OUTPUT connectors even if the TAPE or TAPE/EE position is selected afterwards. When the VTR is entered into the another mode, the latch will be released.
- *5 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.
- *6 The E-to-E signal is output from the BVH-2000PS(00)(10).

② SERVO REF (reference) selector

Selects the reference signal for servo lock.

EXT: The signal connected to the REF VIDEO INPUT connector ③ on the video connector panel (composite video signal) becomes the reference signal.

AUTO: In the REC, EDIT REC or EDIT preset mode, the input video signal becomes the reference signal. In the PLAY mode, the external reference signal becomes the reference signal (selected automatically).

INPUT: The signal connected to the VIDEO INPUT connector on the video connector panel becomes the reference signal.

- The amount of the sync signal to be advanced necessary for playback can be changed by the ADVANCE switch on the CD-17 board (refer to 1-6-3).

③ **SERVO alarm lamp (red)/SYSTEM alarm lamp (red) (Refer to 1-14.)**

These lamps warn of improper VTR operation.

SERVO alarm lamp

The lamp lights until the servo locks or when the servo does not lock.

SYSTEM alarm lamp

The lamp lights when the system control does not correctly function.

④ **CF LOCK lamp (green)**

This lamp lights when the VTR is operating with its color framing locked. Color frame/non-color frame is set by the switches on the CD-17 and SR-15 boards (refer to 1-6-3).

⑤ **HEAD selector**

Selects the playback head of the video signal.

R/P: Playback with the R/P (record/playback) head.

PLAY: Playback with the PLAY head. VTRs equipped with the dynamic tracking function can perform dynamic tracking playback.

In the REC or EDIT REC mode, the R/P head is selected automatically for recording and edit-recording regardless of the position of this switch.

- This selector functions only on the BVH-2000PS (02)(12) and BVH-2000PS(04)(14). On the BVH-2000PS(00)(10), the R/P head always operates at any position.

⑥ **TIME CODE/TIMER selector**

This switch selects one of the following three kinds of tape run time display on the display ⑧.

TIME CODE: This is used to indicate the EBU time code. The CH3 INPUT switch on the AE-03 board (refer to 1-6-3.) should be set to the TC position. The A-3 SEL switch on the AE-03 board is used to select an external time code or internal time code (when the optional BKH-2015/2015A is installed). The TC/U-BIT switch on the BKH-2015/2015A (TC-14/14A) is used to change over the time code or user bit indicator. Normally this indicates a value read by the time code reader but when the TAPE/EE selector ① is set to INPUT, it indicates an input from the time code generator.

If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to the VITC position, the preroll function doesn't work.

TIMER-1: This is used to indicate the tape run time by counting the CTL signal on the tape. It is possible to zero reset at any position on the tape with the RESET button ⑦. After reset, the new tape run time is indicated from this point.

TIMER-2: This is used to indicate the tape run time by counting the CTL signal on the tape. When the tape is threaded, zero reset of the TIMER-2 cannot be performed.

The data of the TIME CODE, TIMER-1 or TIMER-2 selected by this switch, which is indicated on the display, can be entered as the edit IN or OUT point.

- Both TIMER-1 and 2 start counting the tape run time when the machine is in an mode except the STOP mode. The TIMER-2 zero point is the position where the operation mode is designated after the tape has been threaded. For TIMER-1, it is possible to zero reset any position on the tape.
- When the power is turned OFF with the tape installed, the data of TIMER-1 and 2 is retained for 12 hours by means of a built-in back-up capacitor, so that the data can be used again within this period.

⑦ **RESET button**

(1) **TIMER-1 Reset**

After the TIME CODE/TIMER selector has been set to TIMER-1, by pressing the RESET button at any position, the TIMER-1 data indicated on the display ⑧ can be reset to zero. For TIMER-2, zero reset cannot be operated.

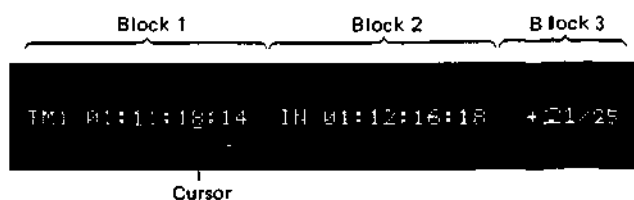
(2) **TIME CODE reset**

After the TIME CODE/TIMER selector is set to TIME CODE, by setting the TAPE/EE selector ① to INPUT, the input from the time code generator is indicated on the display. The time code generator is reset to zero by pressing the RESET button in this state.

When the user bit is displayed, the user bit is reset to zero.

⑧ **Display**

This is a one line, 40 character dot matrix display divided into the following 3 blocks:



- 8 columns of digits show 00 hours/00 minutes/00 seconds/00 frames.
- 24-hour display is standard for TIMER-1 and 2. If the S9-5 switch on the SY-80 board is set to ON, a +/- display will also be possible.

Block 1

This block shows the tape run time of the recorder or player which is being operated. The selection of either the time code or CTL count data is performed by the TIME CODE/TIMER selector (6).

The meaning of the head letters displayed is as follows:

- TCR: Read value of the time code reader
- TCG: Value from the time code generator
- TM1: TIMER-1 data
- TM2: TIMER-2 data
- UBR: Read value of the user bit
- UBG: Generated value of the user bit

- Note that when the A-3 SEL switch on the AE-03 board (refer to 1-6-3) is set to a position other than TC, all columns display "*" instead of digits even if the time code is accessed.

Block 2

This block shows the displays the data of IN/OUT points for editing when they are entered. It can be used for calling and correcting various data or duration display as well.

The meaning of the head letters displayed is as follows:

- IN: Video or audio IN point
- OUT: Video or audio OUT point
- AI: Audio IN point
- AO: Audio OUT point
- DUR: Duration (time period between IN-OUT points) by TIMER-1
- LAP: Duration by TIMER-2

Block 3

This block shows the tape run speed when the VTR is operated. It also indicates the running speed in the PROGRAM JOG or PROGRAM PLAY mode (described in VAR button (21)) previously set by the SEARCH dial.

The tape speed is indicated as a fraction when it is less than the normal speed and as a multiple when it is over the normal speed.

This block indicates malfunctions with flashing error messages.

The meaning of the letters displayed is as follows:

- SYS ERR: Indicates a system error, showing that the system control CPU is not operating normally.
- OVER HEAT: Indicates overheating of the power supply system or motor drive amplifier.
- LINE ERR: Indicates a line error, when remote control communication is not performed correctly.
- ABORT: Indicates that an editing operation is not performed correctly.
- LOST LCK*: Indicates when servo lock is lost during recording.
- NEGATIVE: Indicates that the edit OUT point is placed before the edit IN point.

DATA ERR: Indicates that an invalid numerical value is set as time data (for example, 65 seconds 35 frames, etc.).

TAPE OUT: Indicates that the tape is not loaded correctly.

REC TEST: Indicates that the REC TEST switch (BVH-2000PS is set to ON, the REC INHIBIT switch (00)(10) is set to OFF and the BVH-2000PS only) (00)(10) is in the STOP or REC TEST mode.

- * The addresses where the LOST LCK errors have occurred during recording and editing are memorized and can be displayed in block 2 afterward. (Only for the unit incorporating the system ROM with the version No. 3-5 and higher. For details, refer to 1-14-2. Lost Lock Indication.)

(9) DISPLAY HOLD button and lamp

If this button is pressed, at any position, the data displayed on the display (8) is held. At the same time, the lamp lights up to indicate the DISPLAY HOLD mode. When this button is pressed again, the lamp goes off and the data which is currently being read is displayed.

(10) SHIFT button/ADVANCE button/PRESET button

Preset the TIMER-1 and TIME CODE to the value desired. Not applicable for TIMER-2. When the DISPLAY HOLD button (9) is set to ON, the buttons work as follows.

SHIFT button: Moves the cursor displayed in the lower part of the display. One push moves the cursor up by one digit. After the top digit, the cursor returns to the last digit.

ADVANCE button: Changes the number indicated by the cursor. Each push increases the value by one.

PRESET button: After setting all the digits to the desired value, the PRESET button inputs them as data.

(1) Data input to TIMER-1

Set the TIME CODE/TIMER selector (6) to TIMER-1 and hold the data using the DISPLAY HOLD button (9). Then operate the three buttons to input data as required.

The data preset cannot be done when the TIMER-1 is in the +/- display mode (the S9-5 on the SY-80 board is set to ON).

(2) Data input to TIME CODE

Set the TIME CODE/TIMER selector (6) to TIME CODE. Set the VTR to STOP/STANDBY mode and hold the display using the DISPLAY HOLD button (9). Then set the time code generator starting point to the place desired by operating the above three buttons. When the user bit is displayed the user bit can be set to the value desired.

Set the TAPE/EE selector (1) to INPUT, and the input from the time code generator will be displayed.

⑪ STOP button

Pressing the STOP button stops all modes. The reel motor stops and the pinch roller is retracted from the tape.

- About 30 seconds after the STOP button has been pressed, the tension release mechanism is operated and the machine enters the STANDBY mode (reduced tape tension). The TENSION OFF ENABLE switch (S9-7) on the SY-79 board can be turned OFF so that the tension release mechanism does not operate.
- The machine goes into the STOP mode automatically after the power is turned on or if the tape is out of the tape sensor.
- The STOP lamp flashing shows that no reference signal is being supplied to the servo system.
- In the STOP or STANDBY mode, if the tape is too slack, the slack will be taken up automatically.

⑫ STANDBY button

This push on/push off button is used to start the drum rotating. In normal use, after the STANDBY button has been pressed, the SERVO alarm lamp (3) is checked to see that it is off and then the desired mode button is pressed. However, it is also possible to go into that mode by pressing the desired button directly without the STANDBY button having been pressed. When about 9 minutes has elapsed without any button being pressed after the STANDBY button has been pressed, the STANDBY mode is released automatically.

- If the STANDBY OFF ENABLE switch (S9-8) on the SY-79 board is OFF or if either the AUTO MODE button or one of the channel preset button is lit, automatic release of the STANDBY mode does not operate.
- If the tape sticks when the head drum starts to rotate, the tension release mechanism operates to slacken the tape.
- The STANDBY lamp flashed to show that the head drum is rotating abnormally for some reason, or is not rotating at all.

⑬ PLAY button

When the PLAY button is pressed, the PLAY and STANDBY lamps light and the machine enters the normal playback mode (normal speed in the forward direction). To cancel, press the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- It is possible to select playback by the R/P or PLAY head by means of the HEAD selector (5) when the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used.

- If a slight compensation of the playback tape speed is necessary for synchronizing two BVH series VTRs, turn the SEARCH dial (17) clockwise (faster) or counterclockwise (slower) keeping the PLAY button pressed. The degree of compensation is determined by the rotation angle, and the range is within $\pm 15\%$ of the normal speed (capstan override function). Releasing the PLAY button will return the VTR to the normal speed.

⑭ REC (record) button

When the PLAY button is pressed keeping the REC button pressed, both the REC and PLAY lamps light and the machine enters the record mode. To release, press either the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- Recording is performed by the R/P head regardless of the position of the HEAD selector (5).
- When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, the simultaneous playback picture can be monitored during recording by setting the TAPE/EE selector (1) to TAPE.
- When the REC INHIBIT lamp (9) is on, the machine enters the PLAY mode without recording.
- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the STOP mode, the BVH-2000PS(00)(10) enters the REC TEST mode by pressing the REC button. (For details, refer to page 1-74(E).)

⑮ REC INHIBIT lamp

This lamp shows that the unit is in the REC INHIBIT mode. This lamp lights when the REC INHIBIT switch is set to ON, and the REC or REC EDIT mode is inhibited. If recording or edit-recording is attempted while this lamp is on, the machine will go into the PLAY mode.

- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the REC TEST mode, the REC INHIBIT lamp blinks. (For details, refer to page 1-74(E).)

⑩ CONTROL P/R buttons

With another VTR connected to the REMOTE-2 connector on the rear panel and the REMOTE switch on the SY-79 board set to REMOTE-2, set the REMOTE/LOCAL switch on the level control panel to LOCAL and the VTR works as a recorder. The following controls can be performed by these buttons (refer to 1-11-3):

P button lights: When the P button is pressed and the lamp lights, the editing and tape transport buttons operate the connected player, enabling remote control of the player. The displays are also those of the player. However, it is impossible to operate the SERVO REF ②, HEAD ⑤, and TIME CODE/TIMER ⑥ selectors and these selectors must be set at the player side.

R button lights: When the R button is pressed and the lamp lights, the buttons operate this VTR as a recorder. If the AUTO MODE button ⑨ is then pressed, the recorder and the player go into the control mode, enabling PREVIEW, AUTO EDIT, REVIEW to be performed.

Both P & R buttons light:

When both P and R buttons are pressed and light, the two VTRs can be operated synchronously. However, it is necessary to set the PARA-RUN switch on the SY-79 board to ON.

Both P & R buttons off:

When both these button lamps are off, only this VTR can be operated or the communication between the recorder and player is impossible.

⑪ SEARCH dial

This dial is used to change the tape run.

- (1) By turning this dial during the JOG, SHUTTLE, PROGRAM JOG, or PROGRAM PLAY modes (refer to 1-9), it is possible to change the direction and speed of the tape run.
- (2) If this dial is turned during the STOP, STANDBY, PLAY, or REC mode, it is possible to previously set the next direction and speed of tape run in the PROGRAM JOG or PROGRAM PLAY mode. The set speed is displayed in block 3 on the display ⑧.
- (3) While keeping the STOP button depressed during STOP mode or while keeping the STANDBY button depressed during recording or editing, rotate the search dial so that the addresses of LOST LCK errors that have occurred during preceding recording or editing appear on the display.
(Only for the unit incorporating the system ROM with the version No. 3-5 and higher. For details, refer to 1-14-2. Lost Lock Indication.)

⑫ SHUTTLE button

When the SHUTTLE button is pressed, the lamp lights and the machine enters the SHUTTLE mode. In this state, if the SEARCH dial ⑪ is turned to either the right or left and stopped at any position, playback will be at the corresponding speed (1/32 to 50 times normal). At the center position, the picture is still. The SEARCH dial has "clicks" at the center and ± 50 positions.

- For fast winding in the forward direction, the winding speed is reduced automatically at the tape end, and the unit stops automatically. If you wish to wind the tape completely, turn the SEARCH dial again to the right or keep the EOT STOP switch on the SY-80 board OFF.
- For fast winding in the reverse direction (rewinding), the tape speed is reduced automatically at the tape top and stops automatically near the TIMER-2 zero set position.
- If you wish to rewind the tape completely, turn the SEARCH dial again to the left or set the EOT STOP switch on the SY-80 board OFF.
- If the still mode is held for 3 minutes or more, the machine enters the STOP mode automatically to prevent damage to the tape. If you don't want the machine to stop, turn off the STILL OFF ENABLE switch (S9-6) on the SY-79 board.

⑬ JOG button

When the JOG button is pressed, the lamp lights and the machine enters the JOG mode. In this state, when the SEARCH dial is turned to either the left or right, the playback speed depends on the speed of rotation (0 to several times normal). When turning stops, the picture will be still at that dial position. The SEARCH dial is not identified by clicks.

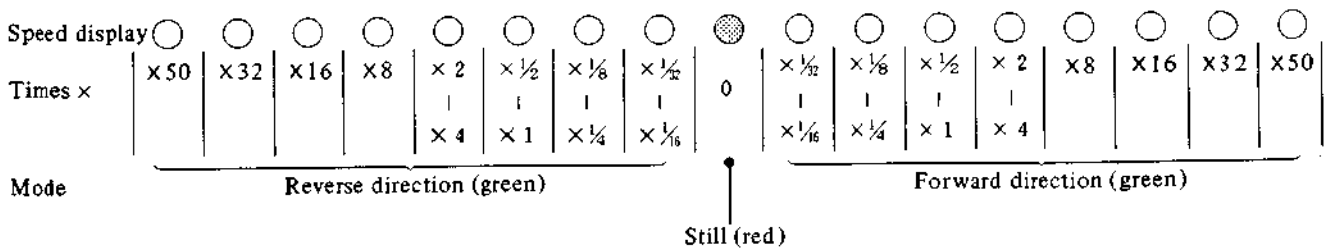
- If the STILL mode is held for 3 minutes or more, the machine will go into the STOP mode automatically. If you don't want the machine to stop, turn off the STILL OFF ENABLE switch (S9-6) on the SY-79 board.

⑳ **SEARCH indicator**

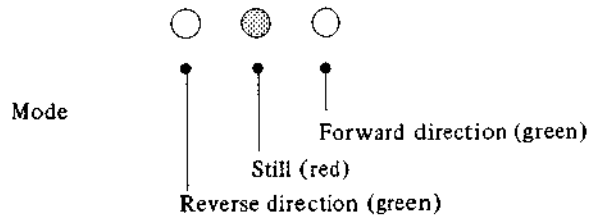
This indicates the operation mode of the SEARCH dial. While in the SHUTTLE, JOG or PROGRAM JOG mode (described in ㉑), the lamps light as shown in the illustration according to the dial operation to indicate the speed and direction of the tape.

Note: When the tape comes near the end, the still, forward or reverse direction indicators blink.

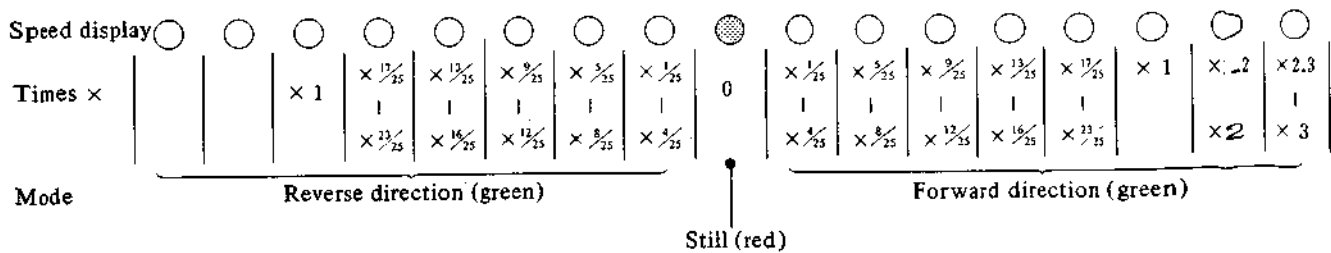
SHUTTLE mode



JOG mode



PROGRAM JOG mode

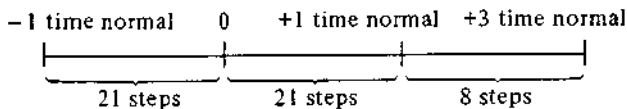


②① **VAR (variable) button**

When the VAR button is pressed, the lamp lights and the machine enters the PROGRAM JOG or PROGRAM PLAY mode. These modes are selected by the VAR switch on the SY-79 board.

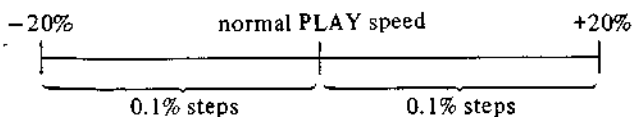
PROGRAM JOG mode:

After the VAR switch on the SY-79 board has been set to the P.JOG position, pushing the VAR button places the machine in the PROGRAM JOG mode. If the SEARCH dial is turned to the left or right and the rotation is stopped at any position, playback will be at a speed (-1 to +3 times normal) corresponding to the dial position. The dial clicks at the -1, 0, +1, and +3 times normal position. When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible over the entire range (-1 to +3 times normal) of the dial in this mode by setting the HEAD selector ① to the PLAY position. This mode is also available as a vernier function in the usual SHUTTLE mode (-50 to +50 times normal). The speed can be set to the following 50 steps:



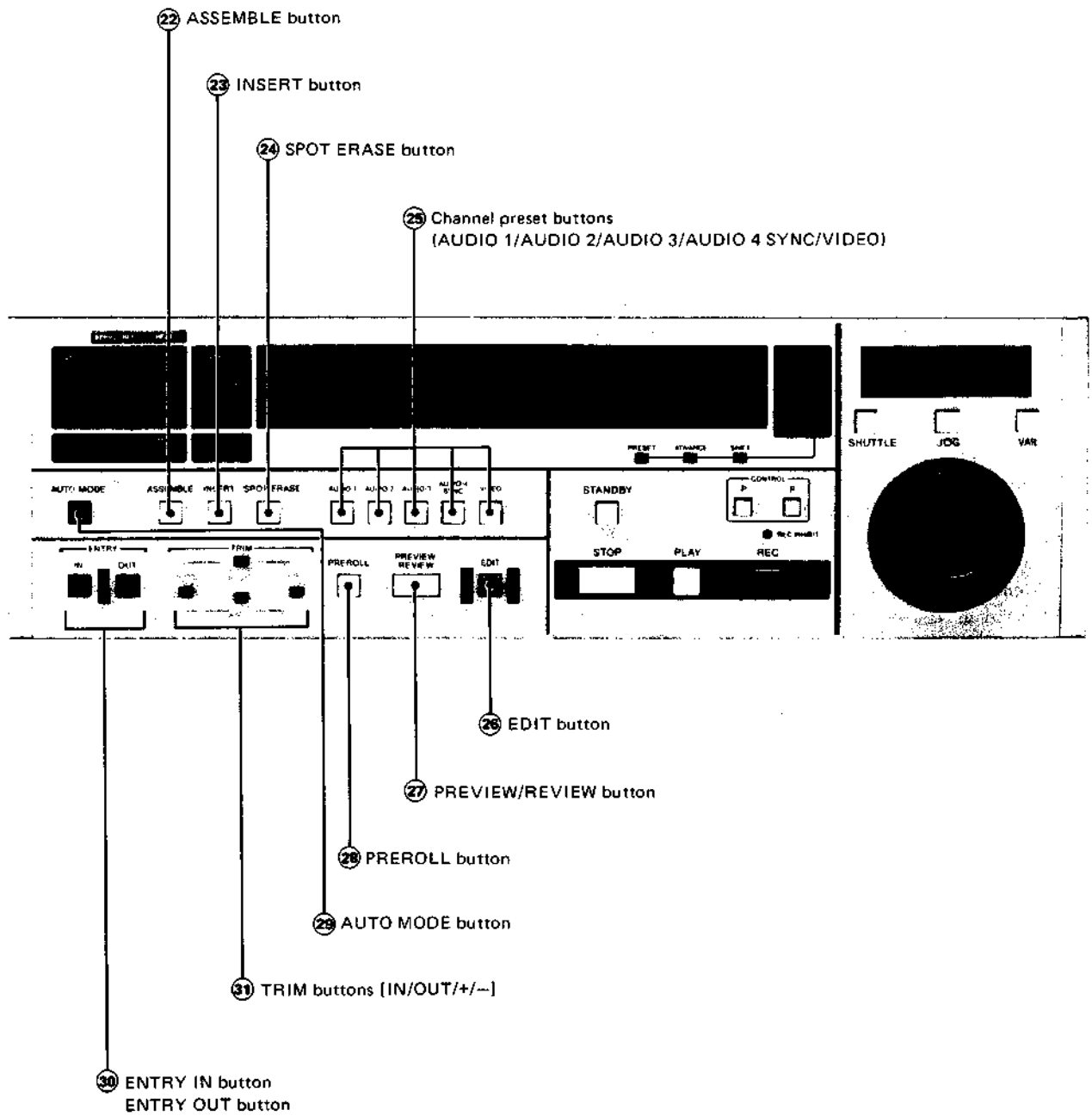
PROGRAM PLAY mode:

VAR button and PLAY button can turn the mode into PROGRAM PLAY if pushed altogether after setting the VAR switch on the SY-79 board to P.PLY. Then turn the SEARCH dial to the left or right pushing at the same time the VAR button and stop at the position desired, and playback is performed at the speed corresponding to the dial position (-20% to +20%). When the BVH-2000PS (02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible in this mode as in the PROGRAM JOG mode over the entire dial range. This mode can be used, in the same way as above, as a vernier function in the usual SHUTTLE mode. Speed setting is adjustable in 0.1% units up to ±20% the normal PLAY speed.



Tape speed presetting is possible by turning the SEARCH dial with the VAR button pressed in STOP, STANDBY, PLAY or REC mode. After setting, program play begins at the preset speed by pushing the PLAY button and VAR button at the same time.

Edit function panel



22 ASSEMBLE button

If the ASSEMBLE button is pressed while in the STOP or PLAY mode, an ASSEMBLE edit can be made. To stop edit, press the button again. In an ASSEMBLE editing, the video signal and simultaneously the CTL signal are recorded on the tape. Pressing the ASSEMBLE button turns on all the channel preset buttons 23 (the lamps light). Press the buttons for channels not used for editing to turn them off (lights out). If all of the channel preset buttons are turned OFF, the machine will not go into the ASSEMBLE mode. Since both the VIDEO and SYNC channels are interlocked, it is impossible to record only one of the two channels. When assembling only the AUDIO, it is necessary for the VIDEO signal to be pre-recorded and the capstan servo has been locked by the CTL. The AUDIO channel can be switched ON or OFF while performing an ASSEMBLE editing; however, the VIDEO channel cannot be released while editing because once it has been switched ON, the state is held.

When assemble-editing the video signal only, the sound being monitored is affected by the CTL signal and the sound quality is deteriorated, but the CTL signal does not affect on the recorded sound.

- No audio and no video part occurs just behind the OUT point of the assemble editing.

23 INSERT button

Pressing the INSERT button while in the STOP or PLAY mode allows insert-editing. To release, press the button again. For insert-editing, the CTL signal, which has already been recorded on the tape, is used as the reference signal. Therefore, the playback picture is not distorted at the edit IN or OUT points. Even if the INSERT button is pressed, each channel preset button 23 is kept OFF (lamps off), so press the desired channel select buttons to turn ON. Each channel can be switched ON or OFF while insert-editing.

- Setting the V/S SIMUL switch (S1-1) on the LG-02 board to ON allows both sync and video signals to be selected simultaneously; turning it OFF allows either of them to be selected independently.

24 SPOT ERASE button

This button is used to partially erase the AUDIO channel.

(1) Manual spot erase

If the SPOT ERASE button is pressed while in the STOP or STANDBY mode, the machine enters the SPOT ERASE mode. Select the AUDIO channel to be erased using the channel preset buttons 23 and press the EDIT button. While the EDIT button is pressed, the signal or the selected channel is erased. Rotating the take-up reel (right side) by hand to make the tape run manually to the right and left several times allows that portion to be erased. To release the MANUAL SPOT ERASE mode, press the SPOT ERASE button again or push another operation button.

Note: Be sure to release the EDIT button during running the tape.

(2) Auto spot erase

Press the AUTO MODE button 29 (the lamp lights) and enter the cut in/cut out points to be erased with the ENTRY IN/OUT buttons. Press the SPOT ERASE button and the machine enters the auto spot erase mode. Then press the AUDIO SPLIT button 31 and select the audio channel to be erased using the channel select button 25. After that, when the PREVIEW button 27 is pressed, the audio is muted between the in and out points and no-signal playback is performed. This makes it possible to check the suitability of the erased interval. Pushing the EDIT button 26 allows the actual erase to take place. The AUTO SPOT ERASE mode is released automatically after the erase.

25 Channel preset buttons (AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO)

When ASSEMBLE EDITING, INSERT EDITING or making a SPOT ERASE modes, select the desired channel with one of these buttons.

- AUDIO-1: The AUDIO-1 channel is selected.
- AUDIO-2: The AUDIO-2 channel is selected.
- AUDIO-3: The AUDIO-3 channel is selected.

- Turning ON the TC INS INHIBIT switch (S1-2) on the LG-02 board allows the insert mode to be inhibited when the AUDIO-3 channel is in the TIME CODE input mode.

AUDIO-4: The sync or AUDIO-4 channel is selected according to the setting of the MODE SEL switch on the LG-02 board as follows:

The position of the MODE SEL switch	Available BVH-2000PS model	Selected channel
SYNC	(00), (02), (04)	The sync channel is selected
OFF	(00), (02), (04)	Neither of the sync channel nor the AUDIO-4 channel is selected.
1HD	(10), (12), (14)	
A4	(04), (14)	The AUDIO-4 channel is selected

- On the BVH-2000PS(00) and the BVH-2000PS(02), be sure to set the MODE SEL switch to SYNC or OFF.
- Turning ON the V/S SIMUL switch (S1-1) on the LG-02 board allows both the sync and video channels to be selected simultaneously.

VIDEO: The video channel is selected.

26 EDIT button

This button is used to carry out the editing.

Manual editing:

If one of the INSERT/ASSEMBLE buttons is pressed (the lamp lights) and the system is servo locked while in PLAY mode, pressing the EDIT button allows manual editing to be performed. To release, press the button again.

Automatic editing:

When one of the INSERT/ASSEMBLE/SPOT ERASE buttons and the AUTO MODE button are pressed (the lamps light) and the ENTRY IN button is pressed (the lamp lights), pressing the EDIT button allows an automatic edit to be performed.

- Edits are done on a frame basis. However, in manual editing of AUDIO only, the edit is done on a field basis.
- The even/odd field of the editing IN/OUT points is designated by the EDIT switch on the SY-80 board.
- To perform the SPOT ERASE, both the IN and OUT points should be entered.
- Even if all the channel preset buttons are set to OFF during editing, the EDIT button is still lit and the edit mode is kept. Press the appropriate channel preset button and the recording of the channel will start again.

27 PREVIEW/REVIEW buttons

This is a combination button for PREVIEW and REVIEW. After the data necessary for automatic editing has been entered by operating the buttons, if the edit has not yet performed, the button operates as a PREVIEW button. If the edit has been carried out and if the next edit data has not been set yet, the button operates as a REVIEW button.

PREVIEW:

After the AUTO MODE button and one of the ASSEMBLE, INSERT or SPOT ERASE buttons have been pressed and the edit IN and OUT points have been entered, the PREVIEW operation is carried out if the PREVIEW button is pressed.

The following four PREVIEW operations are available:

- (1) Full PREVIEW of the recorder and player:
Pressing the CONTROL R button (16) (the lamp lights) of the VTR operated and pressing the PREVIEW button allows the recorder/player to have full PREVIEW operation. The rehearsal picture and the audio can be checked for the whole period of the edit by the recorder monitor.
- (2) PREVIEW of the Player:
After pressing the CONTROL P button (16) (the lamp lights) of the VTR operated, pressing the PREVIEW button allows only the Player to be operated.

(3) PREVIEW of the Recorder:

After turning OFF the CONTROL P/R buttons (the lamps go off) of the VTR operated, pressing the PREVIEW button allows only the recorder to be operated.

(4) PREVIEW of the OUT point (refer to 1-11-8.):

If the PREVIEW button is pressed keeping the OUT button (31) pressed, the part near the OUT point can be previewed.

The preview time can be set by the P.ROL TIME switch on the SY-79 board.

The VTR to be operated at OUT point PREVIEW can be selected by the CONTROL P/R buttons as in the above items (1), (2) and (3).

- In the assemble-editing mode, the VTR plays back the picture to the IN point and stops there, and the E-to-E picture can be seen for about 2 seconds.

28 PREROLL button

When the ENTRY IN button (30) has been pressed, pressing this button makes the tape run to the point several seconds – the number of seconds has been set in advance – before the ENTRY IN point and the tape stops there. Push either of the following buttons and the PREROLL button at the same time and the tape will stop at the preroll point.

TRIM IN button : IN point

TRIM OUT button : OUT point

After the buttons are pushed, the tape runs and stops at the preroll point.

The preroll time can be set in units of one second from 0 to 15 seconds using the P.ROL TIME switch on the SY-79 board.

- If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to VITC and the TIME CODE/TIMER selector (6) is set to TIME CODE, the preroll function does not work.

29 AUTO MODE button

This button is used to set the automatic editing mode. Pushing this button ON (lights) allows ENTRY IN, ENTRY OUT, PREROLL, PREVIEW, AUTO EDIT, and REVIEW to be performed. To release, press the AUTO MODE button again (light out).

30 ENTRY IN/ENTRY OUT buttons

This button is used for editing point entry. When the AUTO MODE button (29) is ON, if the ENTRY IN (or ENTRY OUT) button is pressed, the data displayed in block 1 on the display (8) is entered as the IN point (or OUT point) and the lamp lights. The data is used for PREROLL, PREVIEW, AUTO EDIT, and REVIEW operations.

- If the ENTRY IN or OUT button is pressed while in the PLAY or REC mode (the tape is running), the reaction time is subtracted from the display section's indicated data and this value is entered as the IN or OUT point. Reaction time is the compensation for the delay due to the manual operation of the buttons. It can be set from 0 to 25 frames on a 2-frame basis using the REACT TIME switch on the SY-79 board.
- If the OUT point entered is before the IN point, an alarm message "NEGATIVE" flashes on the display and neither PREVIEW nor AUTO EDIT can be performed. If this happens, enter the IN/OUT points again correctly.
- Between the IN and OUT point during automatic editing, IN point for the next editing operation can be entered by pressing the ENTRY IN button. (Only for the unit incorporating the system ROM with the version No. 3-5 and higher)

③① TRIM buttons

When the editing points (IN/OUT points) have been entered, the editing points can be called for correction and the editing duration can be displayed by operating the four TRIM buttons (IN/OUT/+/-). In every case, the editing points to be corrected are shown in block 2 of the display ⑧.

(1) Editing point calling – CALL –

The editing points can be called for confirmation. TRIM IN button calls the IN point and the TRIM OUT button, the OUT point.

(2) Editing point correction – TRIM –

Editing points can be corrected in units of one frame. While holding down the TRIM IN (or OUT) button, push the + or – button to correct.

+ button: advances by 1 frame each push

– button: reverses by 1 frame each push

The display figures change correspondingly.

(3) Editing range duration display

– DURATION & LAP –

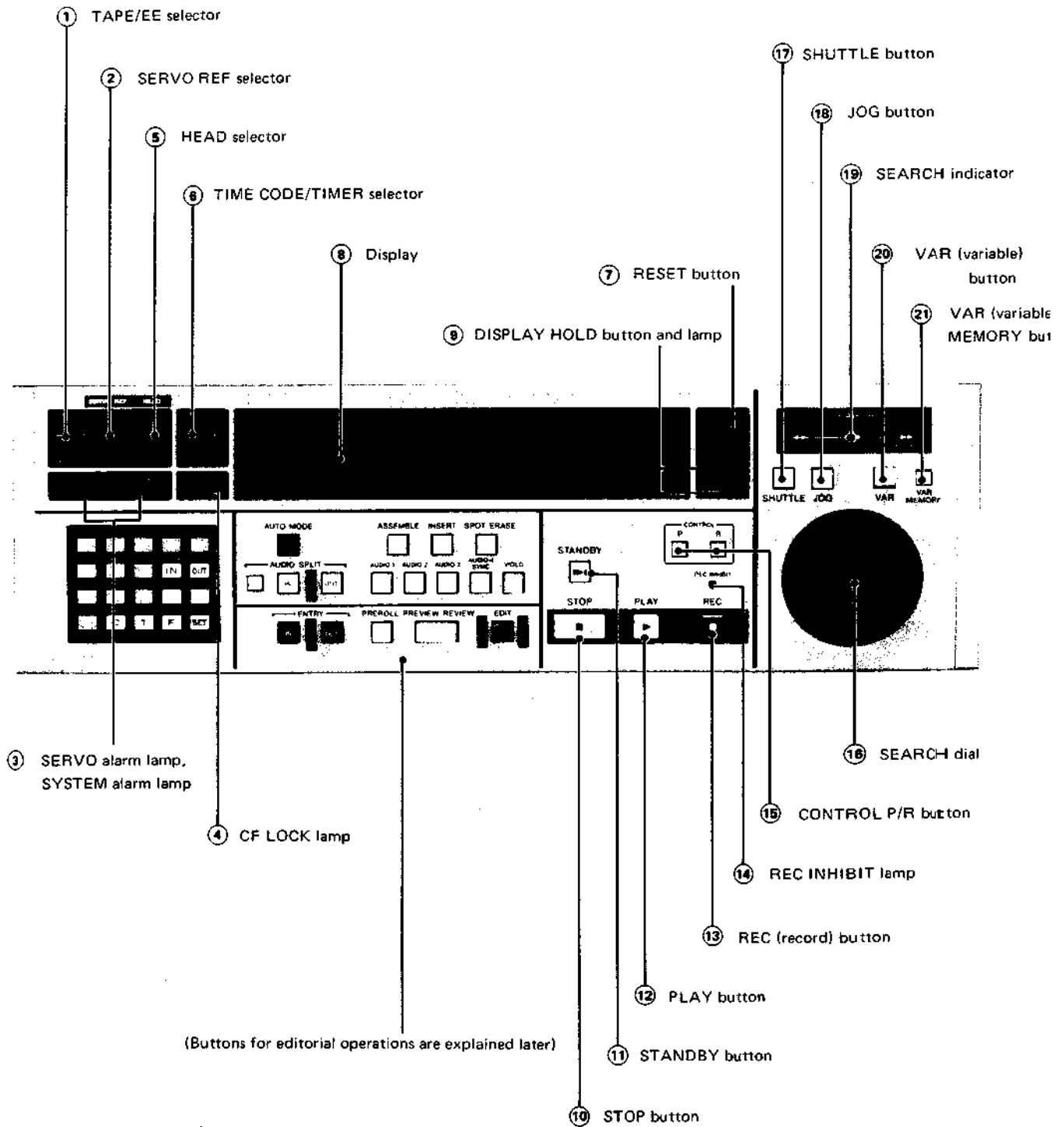
Push the TRIM IN and OUT buttons together to display the editing duration (between IN and OUT points).

When display shows the TIMER-1 data, "DUR" appears and when it shows the TIMER-2 data, "LAP" appears.

- In any of the above operations (1) (2) or (3), the editing points of either the player or the recorder can be selected using the CONTROL P/R buttons

⑩ .

1-4.5. Function Control Panel – Type III



① **TAPE/EE selector**

Selects the output signal from the VIDEO OUTPUT, AUDIO OUTPUT and MONITOR OUTPUT connectors. The output signal is decided by the position of this switch and the operation mode of the VTR as follows.

VIDEO

BVH-2000PS(00)(10)

The position of the TAPE/EE selector ①	Operation mode of the VTR				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

• The HEAD selector does not affect on the output of the BVH-2000PS(00)(10).

BVH-2000PS(02)(12) and BVH-2000PS(04)(14)

The position of the HEAD selector ⑤	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

 : output signal of the VIDEO OUTPUT connectors
 : output signal of the VIDEO MONITOR OUTPUT connectors

*1 If the SW9-1 on the SY-80 board is set to ON, the E-to-E signal will be output in the REC or EDIT REC mode even if the TAPE/EE selector is set to TAPE.

*2 If the SW8-5 switch on the SY-80 board is set to ON and the BKH-2015/2015A is installed, the output will be black between the IN and OUT points.

*3 If the SW9-3 switch on the SY-80 board is set to ON, the E-to-E signal will be output in all modes even if the TAPE/EE selector is set to INPUT.

Note: If either VIDEO or SYNC channel is in the EDIT-REC mode, see the REC/EDIT REC column in the table even if the other channel is in the playback mode.

*4 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.

AUDIO

AUDIO channel	The position of the TAPE/EE selector ①	Operation mode of the VTR				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY & others	Between the IN and OUT points of the recorder in the PREVIEW mode *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONF1*6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONF1*6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

: output signal of the AUDIO LINE OUTPUT connectors
 : output signal of the AUDIO MONITOR OUTPUT connectors

- *1 If the playback speed is 5 times normal or more, the output will be attenuated.
- *2 If the SW8-5 on the SY-80 board is set to ON, the output will be muted between the IN and OUT points.
- *3 If the SW9-3 on the SY-80 board is set to ON, the E-to-E signal will be output in all modes when the INPUT position is selected.
- *4 When the INPUT position is selected in the STOP mode, the E-to-E signal on the AUDIO-3 channel will be latched, and the E-to-E signal will be output from the AUDIO OUTPUT and MONITOR OUTPUT connectors even if the TAPE or TAPE/EE position is selected afterwards. When the VTR is entered into the another mode, the latch will be released.
- *5 If the REC INHIBIT switch is set to ON, the TAPE signal will be output.
- *6 The E-to-E signal is output from the BVH-2000PS(00)(10).

② SERVO REF (reference) selector

Selects the reference signal for servo lock.

EXT: The signal connected to the REF VIDEO INPUT connector ③ on the video connector panel (composite video signal) becomes the reference signal.

AUTO: In the REC, EDIT REC or EDIT preset mode, the input video signal becomes the reference signal. In the PLAY mode, the external reference signal becomes the reference signal (selected automatically).

INPUT: The signal connected to the VIDEO INPUT connector on the video connector panel becomes the reference signal.

- The amount of the sync signal to be advanced necessary for playback can be changed by the ADVANCE switch on the CD-17 board (Refer to 1-6-3).

③ **SERVO alarm lamp (red)/SYSTEM alarm lamp (red)** (Refer to 1-14.).

These lamps warn of improper VTR operation.
SERVO alarm lamp

The lamp lights until the servo locks or when the servo does not lock.

SYSTEM Alarm

The lamp lights when the system control does not correctly function.

④ **CF LOCK lamp (green)**

This lamp lights when the VTR is operating with its color framing locked. Color frame/non-color frame is set by the switches on the CD-17 and SR-15 boards (Refer to 1-6-3).

⑤ **HEAD selector**

Selects the playback head of the video signal.

R/P: Playback with the R/P (record/playback) head.

PLAY: Playback with the PLAY head. VTRs equipped with the dynamic tracking function can perform dynamic tracking playback.

In the REC or EDIT REC mode, the R/P head is selected automatically for recording and edit-recording regardless of the position of this switch.

- This selector functions only on the BVH-2000PS (02)(12) and BVH-2000PS(04)(14). On the BVH-2000PS(00)(10), the R/P head always operates at any position.

⑥ **TIME CODE/TIMER selector**

This switch selects one of the following three kinds of tape run time display on the display ⑧.

TIME CODE: This is used to indicate the EBU time code. The CH3 INPUT switch on the AE-03 board (refer to 1-6-3.) should be set to the TC position. The A-3 SEL switch on the AE-03 board is used to select an external time code or internal time code (when the optional BKH-2015/2015A is installed). The TC/U-BIT switch on the BKH-2015/2015A (TC-14/14A) is used to change the time code or user bit indicator. Normally this indicates a value read by the time code reader but when the TAPE/EE selector ① is set to INPUT, it indicates an input from the time code generator. If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to the VITC position, the preroll function doesn't work.

TIMER-1: This is used to indicate the tape run time by counting the CTL signal on the tape. It is possible to zero reset at any position on the tape with the RESET button ⑦. After reset, the new tape run time is indicated from this point.

TIMER-2: This is used to indicate the tape run time by counting the CTL signal on the tape. When the tape is threaded, zero reset of the TIMER-2 cannot be performed.

The data of the TIME CODE, TIMER-1 or TIMER-2 selected by this switch, which is indicated on the display, can be entered as the edit IN or OUT point.

- Both TIMER-1 and 2 start counting the tape run time when the machine is in a mode except the STOP mode. The TIMER-2 zero point is the position where the operation mode is designated after the tape has been threaded. For TIMER-1, it is possible to zero reset any position on the tape.
- When the power is turned OFF with the tape installed, the data of TIMER-1 and 2 is retained for 12 hours by means of a built-in back-up capacitor, so that the data can be used again within this period.

⑦ **RESET button**

(1) **TIMER-1 Reset**

After the TIME CODE/TIMER selector has been set to TIMER-1, by pressing the RESET button at any position, the TIMER-1 data indicated on the display ⑧ can be reset to zero. For TIMER-2, zero reset cannot be operated.

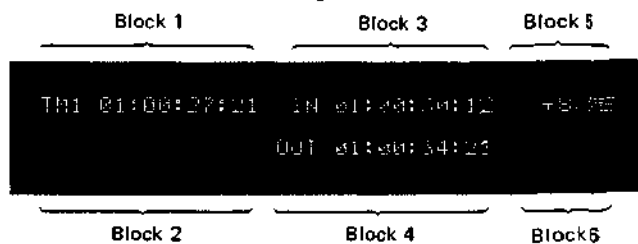
(2) **TIME CODE Reset**

After the TIME CODE/TIMER switch is set to TIME CODE, by setting the TAPE/EE selector ① to INPUT, the input from the time code generator is indicated on the display. The time code generator is reset to zero by pressing the RESET button in this state.

When the user bit is displayed, the user bit is reset to zero.

⑧ **Display**

This is a two line, 40 character dot matrix display divided into the following 6 blocks:



- 8 columns of digits show 00 hours/00 minutes/00 seconds/00 frames.
- The data display is in the +/- mode when the S9-5 on the SY-80 board is set to ON, and in the 24-hour mode when the S9-5 is set to OFF.

Block 1

This block shows the tape run time of the recorder or player which is being operated. The selection of either the time code or CTL count data is performed by the TIME CODE/TIMER selector (6).

The meaning of the head letters displayed is as follows:

TCR: Read value of the time code reader
TCG: Value from the time code generator
TM1: TIMER-1 data
TM2: TIMER-2 data
UBR: Read value of the user bit
UBG: Generated value of the user bit

- Note that when the A-3 SEL switch on the AE-03 board (refer to 1-6-3) is set to a position other than TC, all columns display "*" instead of digits even if the time code is accessed.

Block 2

This block shows the time code or TIMER data of the player during operation in the AUTO mode when the VTR is in combination with two BVH-2000PSs or a BVH-2000PS and a BVU-800P/800S/820P/820S.

Block 3

This block shows the scroll memory register in block 4 below. The data indicated in block 4 is shifted to block 3 by the subsequent operation step. The meaning of the head letters displayed is as follows:

IN: Audio or video IN point
OUT: Audio or video OUT point
AI: Audio IN point
AO: Audio OUT point

Block 4

This block shows the data input by the 20 keys (33). It also indicates data accessed by the same keys. The meaning of the head letters displayed is as follows:

IN: Video IN point
OUT: Video OUT point
AI: Audio IN point
AO: Audio OUT point
DUR: Duration (time period between IN and OUT points) by TIMER-1
LAP: Duration by TIMER-2

Block 5

Jog mode: blank

Shuttle, program jog or program play mode: tape speed

Other mode: memorized tape speed of the program jog or program play mode

The tape speed is indicated as a fraction when it is less than the normal speed and as a multiple when it is over the normal speed.

On the BVH-2000PS(00)(10), REC TEST is displayed when the VTR is in the STOP or REC TEST mode with the REC TEST switch ON and the REC INHIBIT switch OFF.

Block 6

This block indicates malfunctions with flashing error messages.

The meaning of the letters displayed is as follows:

SYS ERR: Indicates a system error, showing that the system control CPU is not operating normally.
OVER HEAT: Indicates overheating of the power supply system or motor drive amplifier.
LINE ERR: Indicates a line error, when remote control communication is not performed correctly.
ABORT: Indicates that an editing operation is not performed correctly.
LOST LCK*: Indicates when servo lock is lost during recording.
NEGATIVE: Indicates that the edit OUT point is placed before the edit IN point.
DATA ERR: Indicates that an invalid numerical value is set as time data (for example, 65 seconds 35 frames, etc.).
TAPE OUT: Indicates that the tape is not loaded correctly.

- * The addresses where the LOST LCK errors have occurred during recording and editing are memorized and can be displayed in block 4 afterward. (Only for the unit incorporating the system ROM with the version No. 3-5 and higher. For details, refer to 1-14-2. Lost Lock Indication.)

9 DISPLAY HOLD button and lamp

If this button is pressed, at any position, the data displayed on the display (8) is held. At the same time, the lamp lights up to indicate the DISPLAY HOLD mode. When this button is pressed again, the lamp goes off and the data which is currently being read is displayed.

10 STOP button

Pressing the STOP button stops all modes. The reel motor stops and the pinch roller is retracted from the tape.

- About 30 seconds after the STOP button has been pressed, the tension release mechanism is operated and the machine enters the STANDBY mode (reduced tape tension). The TENSION OFF ENABLE switch (S9-7) on the SY-79 board can be turned OFF so that the tension release mechanism does not operate.
- The machine goes into the STOP mode automatically after the power is turned on or if the tape is out of the tape sensor.
- The STOP lamp flashing shows that no reference signal is being supplied to the servo system.
- In the STOP or STANDBY mode, if the tape is too slack, the slack will be taken up automatically.

⑪ STANDBY button

This push on/push off button is used to start the drum rotating. In normal use, after the STANDBY button has been pressed, the SERVO alarm lamp ③ is checked to see that it is off and then the desired mode button is pressed. However, it is also possible to go into that mode by pressing the desired button directly without the STANDBY button having been pressed. When about 9 minutes has elapsed without any button being pressed after the STANDBY button has been pressed, the STANDBY mode is released automatically. However, if the INSERT or ASSEMBLE buttons are pressed, the STANDBY mode is not released.

- When the STANDBY OFF ENABLE switch (S9-8) on the SY-79 board is OFF or if either the AUTO MODE button or one of the channel preset buttons is lit, automatic release of the STANDBY mode does not operate.
- If the tape sticks when the head drum starts to rotate, the tension release mechanism operates to slacken the tape.
- The STANDBY lamp flashes to show that the head drum is rotating abnormally for some reason, or is not rotating at all.

⑫ PLAY button

When the PLAY button is pressed, the PLAY and STANDBY lamps light and the machine enters the normal playback mode (normal speed in the forward direction). To cancel, press the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- It is possible to select playback by the R/P or PLAY head by means of the HEAD selector ⑤ when the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used.
- If a slight compensation of the playback tape speed is necessary for synchronizing two BVH series VTRs, turn the SEARCH dial ⑩ clockwise (faster) or counterclockwise (slower) keeping the PLAY button pressed. The degree of compensation is determined by the rotation angle, and the range is within $\pm 15\%$ of the normal speed (Capstan override function). Releasing the PLAY button will return the VTR to the normal speed.

⑬ REC (record) button

When the PLAY button is pressed keeping the REC button pressed, both the REC and PLAY lamps light and the machine enters the recording mode. To release, press either the STOP, JOG, SHUTTLE, VAR or PREROLL button.

- Recording is performed by the R/P head regardless of the position of the HEAD selector ⑤.
- When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, the simultaneous playback picture can be monitored during recording by setting the TAPE/EE selector ① to TAPE.
- When the REC INHIBIT lamp ⑭ is on, the machine enters the PLAY mode without recording.

- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the STOP mode, the BVH-2000PS(00)(10) enters the REC TEST mode by pressing the REC button. (For details, refer to page 1-74(E).)

⑭ REC INHIBIT lamp

This lamp shows that the unit is in the REC INHIBIT mode. This lamp lights when the REC INHIBIT switch is set to on, and the REC or REC EDIT mode is inhibited. If recording or edit-recording is attempted while this lamp is on, the machine will go into the PLAY mode.

- When the REC TEST switch on the SY-79 board is set to ON and the BVH-2000PS(00)(10) is in the REC TEST mode, the REC INHIBIT lamp blinks. (For details, refer to page 1-74(E).)

⑮ CONTROL P/R buttons

With another VTR connected to the REMOTE-2 connector on the rear panel and the REMOTE switch on the SY-79 board set to REMOTE-2, set the REMOTE/LOCAL switch on the level control panel to LOCAL and the VTR works as a recorder. The following controls can be performed by these buttons (refer to 1-11-3):

P button lights: When the P button is pressed and the lamp lights, the editing and tape transport buttons operate the connected player, enabling remote control of the player. The displays are also those of the player. However, it is impossible to operate the SERVO REF ②, HEAD ⑤, and TIME CODE/TIMER ⑥ selectors and these selectors must be set at the player side.

R button lights: When the R button is pressed and the lamp lights, the buttons operate this VTR as a recorder. If the AUTO MODE button ⑲ is then pressed, the recorder and the player go into the control mode, enabling PREVIEW, AUTO EDIT, REVIEW to be performed.

Both P & R buttons light:

When both P and R buttons are pressed and light, the two VTRs can be operated synchronously. However, it is necessary to set the PARA-RUN switch on the SY-79 board to on.

Both P & R buttons off:

When both these button lamps are off, only this VTR can be operated.

⑩ SEARCH dial

This dial is used to change the tape run.

- (1) By turning this dial during the JOG, SHUTTLE, PROGRAM JOG, or PROGRAM PLAY modes (refer to 1-9), it is possible to change the direction and speed of the tape run.
- (2) If this dial is turned during the STOP, STANDBY, PLAY, or REC mode, it is possible to previously set the next direction and speed of tape run in the PROGRAM JOG or PROGRAM PLAY mode. The set speed is displayed in block 3 on the display ⑧.
- (3) While keeping the STOP button depressed during STOP mode or while keeping the STANDBY button depressed during recording or editing, rotate the search dial so that the addresses of LOST LCK errors that have occurred during preceding recording or editing appear on the display.
(Only for the unit incorporating the system ROM with the version No. 3-5 and higher. For details, refer to 1-14-2. Lost Lock Indication.)

⑪ SHUTTLE button

When the SHUTTLE button is pressed, the lamp lights and the machine enters the SHUTTLE mode. In this state, if the SEARCH dial ⑩ is turned to either the right or left and stopped at any position, playback will be at the corresponding speed (1/32 to 50 times normal). At the center position, the still picture is obtained. The SEARCH dial clicks at the center and ± 50 positions.

- For fast winding in the forward direction, the winding speed is reduced automatically at the tape end, and the unit stops automatically. If you wish to wind the tape completely, turn the SEARCH dial again to the right or set the EOT STOP switch on the SY-80 board to off.
- For fast winding in the reverse direction (rewinding), the tape speed is reduced automatically at the tape top and stops automatically near the TIMER-2 zero set position.
- If you wish to rewind the tape completely, turn the SEARCH dial again to the left or set the EOT STOP switch on the SY-80 board to off.
- If the still mode is held for 3 minutes or more, the machine enters the STOP mode automatically to prevent damage to the tape. If you don't want the machine to stop, set the STILL OFF ENABLE switch (S9-6) on the SY-79 board to off.

⑫ JOG button

When the JOG button is pressed, the lamp lights and the machine enters the JOG mode. In this state, when the SEARCH dial is turned to either the left or right, the playback speed depends on the speed of rotation (0 to several times normal). When turning stops, the picture will be still at that dial position. The SEARCH dial does not click.

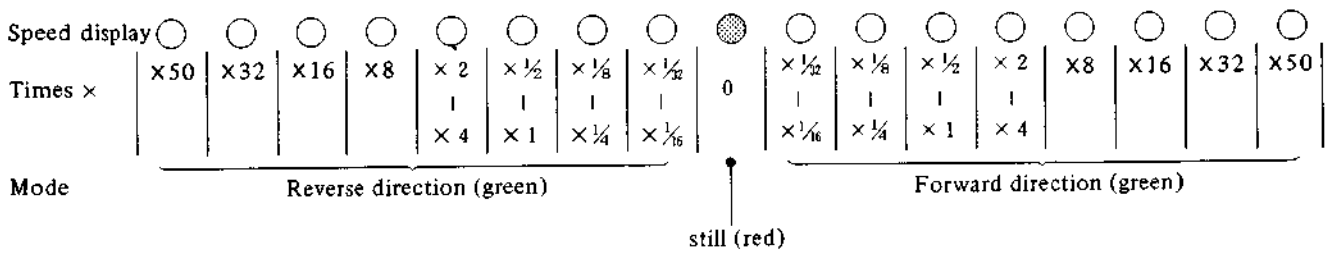
- If the STILL mode is held for 3 minutes or more, the machine will go into the STOP mode automatically. If you don't want the machine to stop, set the STILL OFF ENABLE switch (S9-6) on the SY-79 board to off.

⑲ SEARCH indicator

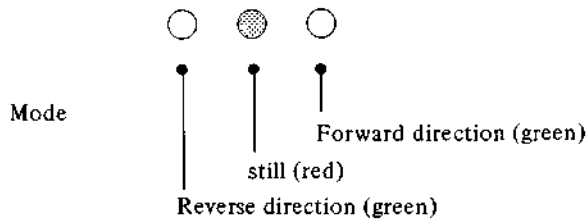
This indicates the operation mode of the SEARCH dial. While in the SHUTTLE, JOG or PROGRAM JOG mode (described in ⑳), the lamps light as shown in the illustration according to the dial operation to indicate the speed and direction of the tape.

Note: When the tape comes near to the end, the still, forward or reverse direction indicators blink.

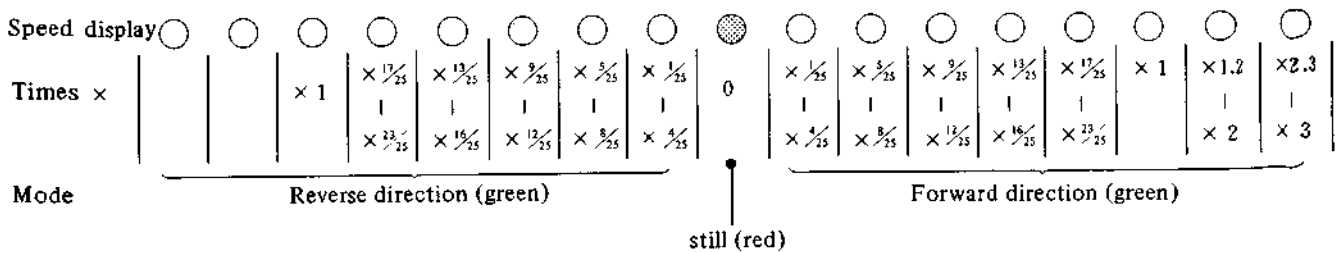
SHUTTLE mode



JOG mode



PROGRAM JOG mode



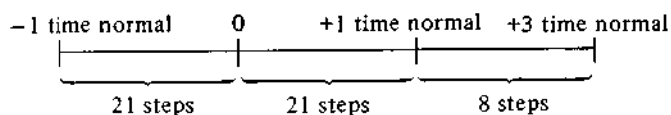
⑳ VAR (variable) button

When the VAR button is pressed, the lamp lights and the machine enters the PROGRAM JOG or PROGRAM PLAY mode. These modes are selected by the VAR switch on the SY-79 board.

PROGRAM JOG mode:

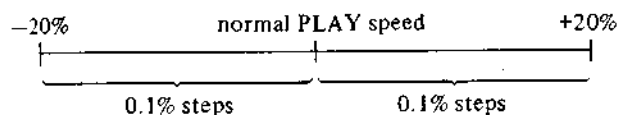
After the VAR switch on the SY-79 board has been set to the P.JOG position, pushing the VAR button places the machine in the PROGRAM JOG mode. If the SEARCH dial is turned to the left or right and the rotation is stopped at any position, playback will be at a speed (-1 to +3 times normal) corresponding to the dial position. The dial clicks at the -1, 0, +1, and +3 times normal position.

When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible over the entire range (-1 to +3 times normal) of the dial in this mode by setting the HEAD selector ① to the PLAY position. This mode is also available as a vernier function in the usual SHUTTLE mode (-50 to +50 times normal). The speed can be set to the following 50 steps:



PROGRAM PLAY mode:

VAR button and PLAY button can turn the mode into PROGRAM PLAY if pushed altogether after setting the VAR switch on the SY-79 board to P.PLY. Then turn the SEARCH dial to the left or right pushing at the same time the VAR button and stop at the position desired, and playback is performed at the speed corresponding to the dial position (-20% to +20%). When the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used, noiseless playback is possible in this mode as in the PROGRAM JOG mode over the entire dial range. This mode can be used, in the same way as above, as a vernier function in the usual SHUTTLE mode. Speed setting is adjustable in 0.1% units up to $\pm 20\%$ the normal PLAY speed.



Tape speed presetting is possible by turning the SEARCH dial with the VAR button pressed in STOP, STANDBY, PLAY or REC mode. After setting, program play begins at the preset speed by pushing the PLAY button and VAR button at the same time.

The set speed is displayed on block 5 on the display ⑧. PROGRAM JOG speed is displayed as a fraction or decimal point and PROGRAM PLAY as %.

㉑ VAR (variable) MEMORY button

The SEARCH dial operations (change of speed and direction of tape run) in the PROGRAM JOG mode are memorized, so that the operations stored can be performed again.

(1) Press both the AUTO MODE and VAR MEMORY buttons.

(2) Start the tape running and store the start point to be memorized using the ENTRY IN button.

Preset the initial speed using the SEARCH dial.

(3) Press the PREROLL and PREVIEW/REVIEW buttons simultaneously.

(4) When the tape passes the IN point, a buzzer rings.

After that, when the SEARCH dial is operated, the operation curve of the dial is memorized.

(5) Stop the tape running with the STOP button.

(6) Press the PREVIEW button and the changes of the SEARCH dial from the start to stop points will be reproduced and the tape will run according to the change curve.

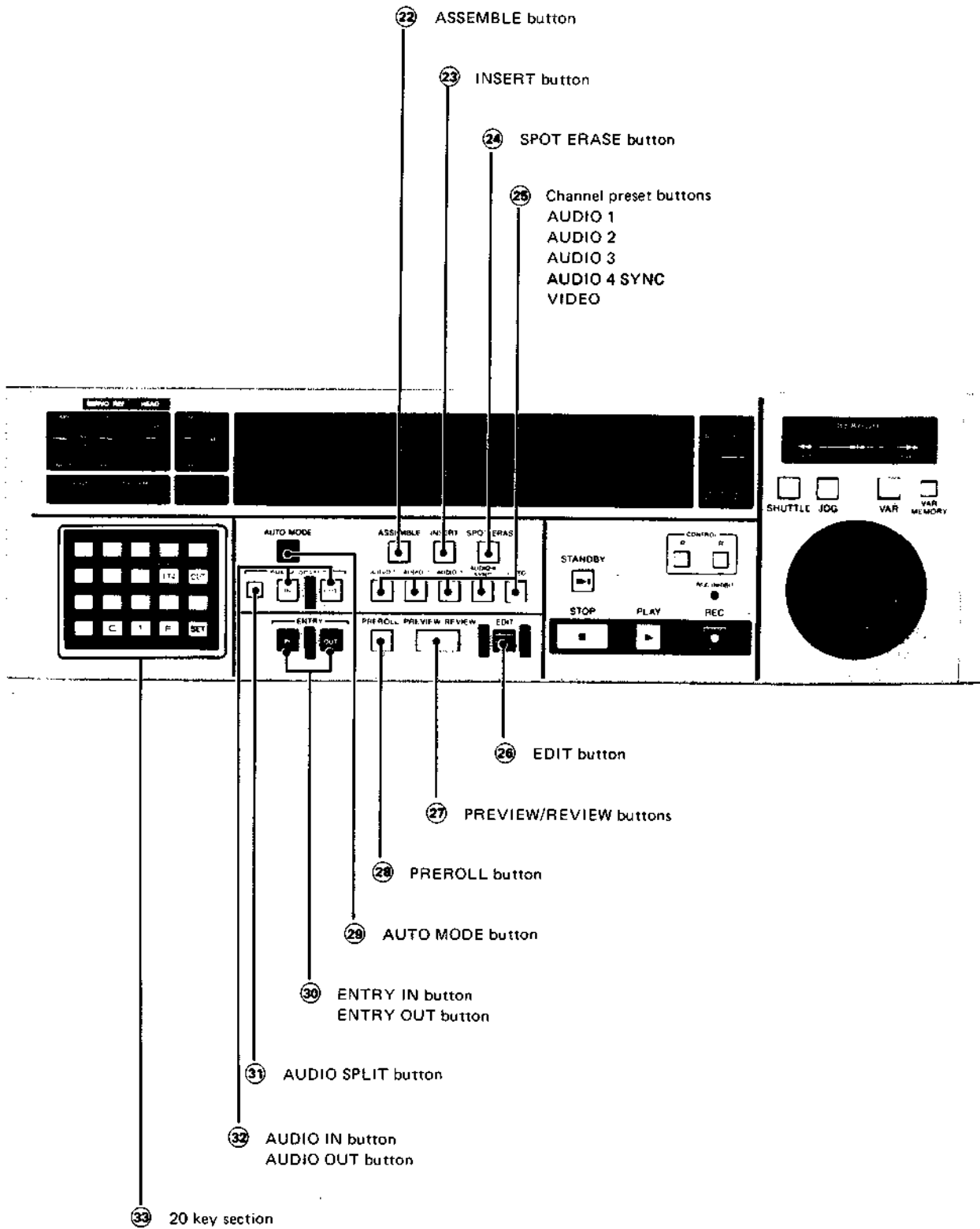
- The VAR MEMORY button lamp flashes until the change curve memory becomes full.

If flashing turns into continuously lit condition further dial operations cannot be stored.

- On the BVH-2000PS(00)(10), the noiseless playback is impossible.

- When the PREROLL button is pressed, the tape runs to the point, [IN-point - preroll time (second) \times initial speed], and stops. To start playback, press the PREVIEW/REVIEW button. At the IN-point, the preset initial speed is obtained and the playback at the memorized speed continues.

Edit function panel



22 ASSEMBLE button

If the ASSEMBLE button is pressed while in the STOP or PLAY mode, an ASSEMBLE edit can be made. To release, press the button again. In an ASSEMBLE editing, the video signal and simultaneously the CTL signal are recorded on the tape. Pressing the ASSEMBLE button turns on all the channel preset buttons 23 (the lamps light).

Press the buttons for channels not used for editing to turn them off (lights out). If all of the channel preset buttons are turned OFF, the machine will not go into the ASSEMBLE mode. Since both the VIDEO and SYNC channels are interlocked, it is impossible to record only one of the two channels. When assembling only the AUDIO, it is necessary for the VIDEO signal to have already been prerecorded and the capstan servo has been locked by the CTL. The AUDIO channel can be switched ON or OFF while performing an ASSEMBLE editing; however, the VIDEO channel cannot be released while editing because once it has been switched ON, the state is held.

When assemble-editing the video signal only, the sound being monitored is affected by the CTL signal and the sound quality is deteriorated, but the CTL signal does not affect on the recorded sound.

- No audio and no video part occurs just behind the OUT point of the assemble editing.

23 INSERT button

Pressing the INSERT button while in the STOP or PLAY mode allows insert-editing. To release, press the button again. For insert-editing, the CTL signal, which has already been recorded on the tape, is used as the reference signal. Therefore, the playback picture is not distorted at the edit IN or OUT points. Even if the INSERT button is pressed, each channel preset button 23 is kept OFF (lamps off), so press the desired channel select buttons to turn ON. Each channel can be switched ON or OFF while insert-editing.

- Setting the V/S SIMUL switch (S1-1) on the LG-02 board to on allows both sync and video signals to be selected simultaneously; turning it OFF allows either of them to be selected independently.

24 SPOT ERASE button

This button is used to partially erase the AUDIO channel.

(1) Manual spot erase

If the SPOT ERASE button is pressed while in the STOP or STANDBY mode, the machine enters the SPOT ERASE mode. Select the AUDIO channel to be erased using the channel preset buttons 23 and press the EDIT button. While the EDIT button is pressed, the signal on the selected channel is erased. Rotating the takeup reel (right side) by hand to make the tape run manually to the right and left several times allows that portion to be erased. To release the MANUAL SPOT ERASE mode, press the SPOT ERASE button again or push another operation button.

Note: Be sure to release the EDIT button during running the tape.

(2) Auto spot erase

Press the AUTO MODE button 29 (the lamp lights) and enter the cut in/cut out points to be erased with the ENTRY IN/OUT buttons. Press the SPOT ERASE button and the machine enters the auto spot erase mode. Then press the AUDIO SPLIT button 31 and select the audio channel to be erased using the channel preset button 23. After that, when the PREVIEW button 27 is pressed, the audio is muted between the in and out point and no-signal playback is performed. This makes it possible to check the suitability of the erased interval. Next pushing the EDIT button 26 allows the actual erase to take place. The AUTO SPOT ERASE mode is released automatically after the erase.

25 Channel preset buttons (AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO)

When assemble-editing, insert-editing or making a SPOT ERASE, select the desired channel with one of these buttons.

AUDIO-1: The AUDIO-1 channel is selected.

AUDIO-2: The AUDIO-2 channel is selected.

AUDIO-3: The AUDIO-3 channel is selected.

- Turning ON the TC INS INHIBIT switch (S1-2) on the LG-02 board allows the insert mode to be inhibited when the AUDIO-3 channel is in the TIME CODE input mode.

AUDIO-4: The sync or AUDIO-4 channel is selected according to the setting of the MODE SEL switch on the LG-02 board as follows:

The position of the MODE SEL switch	Available BVH-2000PS model	Selected channel
SYNC	(00), (02), (04)	The sync channel is selected
OFF	(00), (02), (04)	Neither of the sync channel nor the AUDIO-4 channel is selected.
1HD	(10), (12), (14)	
A4	(04), (14)	The AUDIO-4 channel is selected

- On the BVH-2000PS(02) and the BVH-2000PS(00), be sure to set the MODE SEL switch to SYNC or OFF.
- Turning ON the V/S SIMUL switch (S1-1) on the LG-02 board allows both the sync and video channels to be selected simultaneously.

VIDEO: The video channel is selected.

26 EDIT button

This button is used to carry out editing.

Manual editing:

If one of the INSERT/ASSEMBLE buttons is pressed (the lamp lights) and the system servo locked while in PLAY mode, pressing the EDIT button allows manual editing to be performed. To release, press the button again.

Automatic editing:

When one of the INSERT/ASSEMBLE/SPOT ERASE buttons and the AUTO MODE button are pressed (the lamps light) and the ENTRY IN button is pressed (the lamp lights), pressing the EDIT button allows an automatic edit to be performed.

- Edits are done on a frame unit basis. However, in manual editing of AUDIO only, the edit is done on a field unit basis.
- The even/odd field of the editing IN/OUT points is designated by the EDIT switch on the SY-80 board.
- To perform the SPOT ERASE, both the IN and OUT points should be entered.
- Even if all the channel preset buttons are set to OFF during editing, the EDIT button is still lit and the edit mode is kept. Press the appropriate channel preset button and the recording of the channel will start again.

27 PREVIEW/REVIEW buttons

This is a combination button for PREVIEW and REVIEW. After the data necessary for automatic editing has been entered by operating the buttons, if the edit has not yet been performed, the button operates as a PREVIEW button. If the edit has been carried out and if the next edit data has not been set yet, the button operates as a REVIEW button.

PREVIEW:

After the AUTO MODE button and one of the ASSEMBLE, INSERT or SPOT ERASE buttons have been pressed and the edit IN and OUT points have been entered, the PREVIEW operation is carried out if the PREVIEW button is pressed.

The following four PREVIEW operations are available:

- (1) Full PREVIEW of the recorder and player:
Pressing the CONTROL R button (13) (the lamp lights) of the VTR operated and pressing the PREVIEW button allows the recorder/player to have full PREVIEW operation. The rehearsal picture and the audio can be checked for the whole period of the edit by the recorder monitor.
- (2) PREVIEW of the player:
After pressing the CONTROL P button (15) (the lamp lights) of the VTR operated, pressing the PREVIEW button allows only the player to be operated.
- (3) PREVIEW of the recorder:
After turning OFF the CONTROL P/R buttons (the lamps go off) of the VTR operated, pressing the PREVIEW button allows only the recorder to be operated.

(4) PREVIEW of the OUT point (refer to 1-11-8.):

If the PREVIEW button is pressed keeping the TRIM OUT button (33) pressed, the part near the OUT point can be previewed.

The preview time can be set by the P.ROL TIME switch on the SY-79 board.

The VTR to be operated at OUT point PREVIEW can be selected by the CONTROL P/R buttons as in the above items (1), (2) and (3).

28 PREROLL button

If one or more of the ENTRY IN, ENTRY OUT, AUDIO IN, or AUDIO OUT buttons is pressed to enter the editing point, the editing point can be prerolled. When the PREROLL button is pressed, the tape runs and stops at the prerolled point.

The preroll time can be set from 0 to 15 seconds in units of one second using the P.ROL TIME switch on the SY-79 board.

The following two preroll operations are available:

- (1) To cue the preroll point:
If the PREROLL button only is pressed, the tape stops at the point several seconds before the ENTRY IN point.
- (2) Preroll of the video or audio IN/OUT points:
If one of the following buttons on the 20-key section (33) is held down and then the PREROLL button is pressed, the following type of preroll occurs:

20 keys	{	IN button: video IN point
		OUT button: video OUT point
		AUDIO IN button: audio IN point
		AUDIO OUT button: audio OUT point

- If the READ switch on the BKH-2015/2015A (TC-14/14A) is set to VITC and the TIME CODE/TIMER selector (6) is set to TIME CODE, the preroll function does not work.

29 AUTO MODE button

This button is used to set the automatic editing mode. Pushing this button ON (lights) allows ENTRY IN, ENTRY OUT, AUDIO SPLIT IN/OUT, PREROLL, PREVIEW, AUTO EDIT and REVIEW to be performed. To release, press the AUTO MODE button again (light out).

30 ENTRY IN/ENTRY OUT button

This button is used for editing point entry. When the AUTO MODE button (29) is ON, if the ENTRY IN (or ENTRY OUT) button is pressed, the data displayed in block 1 on the display (8) is entered as the IN point (or OUT point) and the lamp lights. The data is used for PREROLL, PREVIEW, AUTO EDIT and REVIEW operations.

- If the ENTRY IN or OUT button is pressed while in the PLAY or REC mode (the tape is running), the reaction time is subtracted from the display section's indicated data and this value is entered as the IN or

OUT point. Reaction time is the compensation for the delay due to the manual operation of the buttons. It can be set from 0 to 25 frames on a 2-frame basis using the REACT TIME switch on the SY-79 board.

- If the OUT point is entered before the IN point, an alarm message "NEGATIVE" flashes on the display and neither PREVIEW nor AUTO EDIT can be performed. If this happens, enter the IN/OUT points again correctly.
- When the AUTO MODE button is OFF, the entered data is used for the PREROLL operation.
- Between the IN and OUT point during automatic editing, IN point for the next editing operation can be entered by pressing the ENTRY IN button.
(Only for the unit incorporating the system ROM with the version No. 3-5 and higher)

③① **AUDIO SPLIT button**

When this button is pressed, the VTR is set to the AUDIO SPLIT mode (lamp lights) and the audio IN/OUT points are entered independently of the video using the AUDIO IN/OUT buttons ③②. The ENTRY

IN/OUT buttons operate as the entry buttons for the video and sync. Pressing this button again to turn it OFF returns the unit to the state where both the video and audio editing points are entered with the ENTRY IN/OUT buttons.

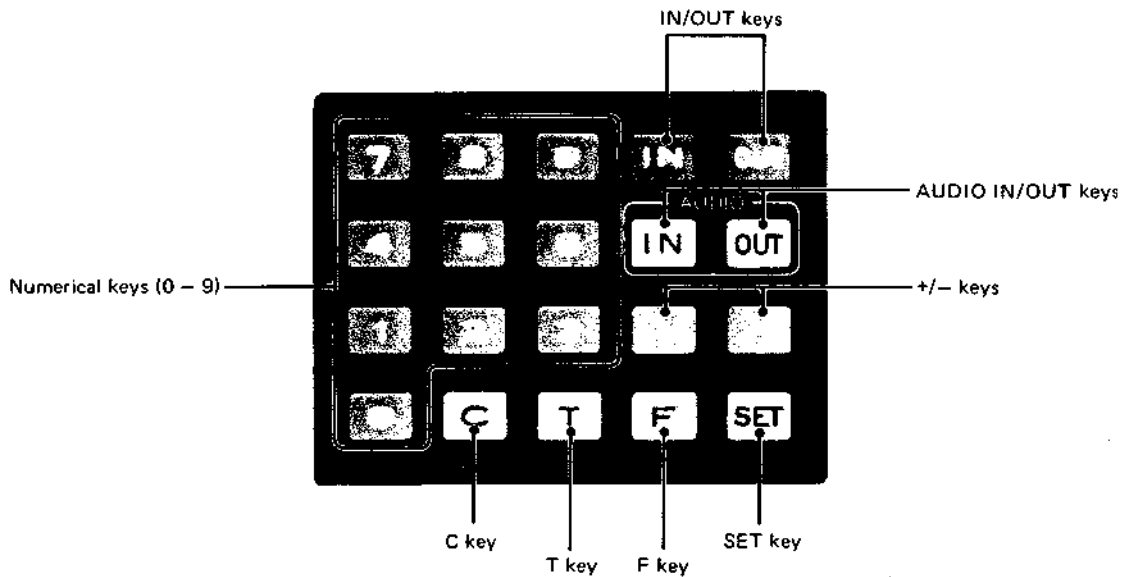
③② **AUDIO IN/AUDIO OUT buttons**

These buttons are used to enter the AUDIO IN/OUT points while in the AUDIO SPLIT mode. When the AUDIO IN or AUDIO OUT button is pressed, the display data in block 1 on the display is entered as the AUDIO IN or OUT point and the lamp lights. This data is used for PREROLL, PREVIEW, AUTO EDIT, and REVIEW.

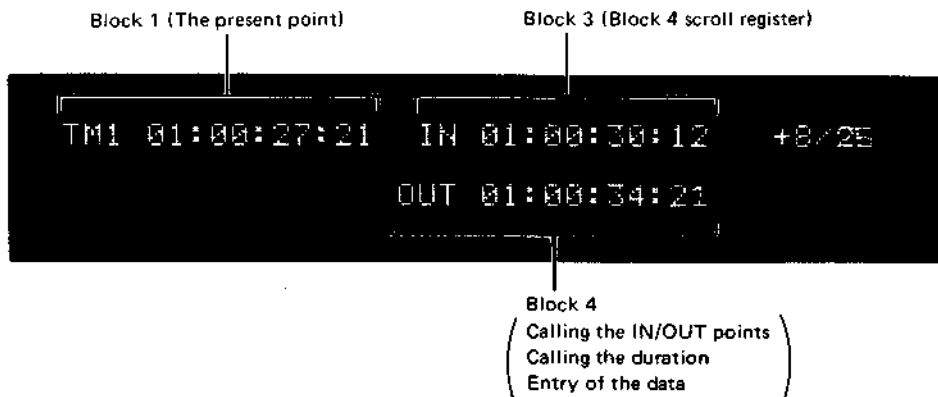
- If the AUDIO IN/OUT button is pressed during PLAY or REC mode, the value of the display data on the display subtracted by the reaction time is entered as the AUDIO IN/OUT points. The reaction time can be set from 0 to 25 frames using the REACT TIME switch on the SY-79 board.

③③ **20 key section**

The 20 key section consists of the following keys:



Display relating to the 20 keys



Numerical keys (0 – 9):

These keys are used to input numerals. When the keys are pressed, the numerals enter block 4.

F key:

Function key. This key is used to input hexadecimal numbers. Keys from 0 to 5 are pressed at the same time as the F key to create the hexadecimal values A-F. The combinations are as follows:

F & 0 : A	F & 3 : D
F & 1 : B	F & 4 : E
F & 2 : C	F & 5 : F

SET key:

After confirming that the numerals input to block 4 by the numerical keys or F key are correct, the numerals are set by pressing the SET key.

C key:

Clear key. This key is used if wrong numbers have been entered. The numerals displayed in block 4 can be deleted.

+/- keys:

These keys are used to add to or subtract from the display data in block 4. Press the + key or – key, then the numerical keys then press the SET key. The result of the addition or subtraction is displayed in the block 4.

T key:

Time key. Pressing this key allows the data in block 4 to be entered to block 1. It is used to change the data displayed in block 1.

IN/OUT keys:

These keys have the following three functions:

- (1) To call the editing point – CALL –
When the IN key is pressed, the IN point data and when the OUT key is pressed, the OUT point data is called to block 4.
- (2) To trim the editing point entry – TRIM –
When the data is displayed in block 4, the data in block 4 is entered as the IN point when the IN key is pressed and as the OUT point when the OUT key is pressed. Trim may be in frame units. The trimmed result is displayed in block 4.
- (3) To indicate the length of the edit interval – DURATION and LAP –
When the IN and OUT buttons are pressed simultaneously, the length of the edit interval (from IN point to OUT point), that is, the duration, is displayed in block 4.
When the displayed data is that of TIMER-1, "DUR" is displayed and when the data is that of TIMER-2, "LAP" is displayed.

AUDIO IN/OUT keys:

These keys are used during AUDIO SPLIT.

These keys have the following three functions similar to the IN/OUT keys:

- (1) To call the audio edit point
 - (2) To trim the audio edit point
 - (3) To indicate the length of the audio edit interval
- Operation is the same as for the IN/OUT keys.

The audio channel to be called, trimmed or indicated is designated by the channel preset buttons (25). The length of the edit interval in item (3) can also be indicated with any two of the IN/OUT/AUDIO IN/AUDIO OUT keys. (For example, if both the IN and AUDIO OUT keys are pressed simultaneously, the duration between the video IN point and the audio OUT point is displayed.)

- In any operation of the 20 keys, the editing point of either the player or recorder can be selected with the CONTROL P/R button (15).

Example:

Setting the TIME CODE

- Preparation
- VTR → STOP or STANDBY mode
 - The TC-14/14A board must be installed.
 - Set to the TIME CODE display mode.
(Set the TC/U-BIT switch on the TC-14/14A board (BVH-2015/2015A) to TC. If TIME CODE has been set to REC RUN mode, setting is easy since the TIME CODE display is not changed.)
 - TIME CODE/TIMER selector ⑥ → TIME CODE

Operation

Display

Comment

1. TAPE/EE selector ①
→INPUT

TCG 01 : 00 : 27 : 21		

The generated time code of the time code generator is displayed in block 1.

2. 0, 0, 0, 0, 3, 0, 0, 0,
SET

TCG 01 : 00 : 27 : 21		
	SET 00 00 30 00	

Input the desired data using the numerical keys. The data is first of all input to block 4.

- If wrong data was entered, delete it by using the **C** key and input the correct data.

3. T

TCG 00 : 00 : 30 : 00		

The desired data is entered to block 1 and set as the generation value start point of the generator.

Setting the user bit

- Preparation
- VTR → STOP or STANDBY mode
 - Set to the user bit display mode.
Set the TC/U-BIT switch on the TC-14/14A board (BKH-2015/2015A) to U-BIT.
 - TIME CODE/TIMER selector ⑥ → TIME CODE

Operation	Display	Comment						
1. TAPE/EE selector ① → INPUT	<table border="1"> <tr> <td>UBG 01 00 30 15</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	UBG 01 00 30 15						The generated user bit of the time code generator is displayed in block 1.
UBG 01 00 30 15								
2. [0], [F] & [0] (push simultaneously), [0], [0], [2], [0], [1], [0], [SET]	<table border="1"> <tr> <td>UBG 01 00 30 15</td> <td></td> <td></td> </tr> <tr> <td></td> <td>SET 0A 00 20 10</td> <td></td> </tr> </table>	UBG 01 00 30 15				SET 0A 00 20 10		The desired data is entered to block 4. • By pushing the [F] and [0] keys simultaneously, a hexadecimal number can be input.
UBG 01 00 30 15								
	SET 0A 00 20 10							
3. [T]	<table border="1"> <tr> <td>UBG 0A 00 20 10</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	UBG 0A 00 20 10						The desired data is entered to block 1 and is set as the user bit.
UBG 0A 00 20 10								

Setting the TIMER-1

Preparation: TIME CODE/TIMER selector ⑥ → TIMER-1

Operation	Display	Comment						
1. Run the tape and stop it at any position.	<table border="1"> <tr> <td>TM1 01 : 00 : 27 : 21</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TM1 01 : 00 : 27 : 21						The present data of TIMER-1 is displayed in block 1.
TM1 01 : 00 : 27 : 21								
2. [0], [0], [0], [0], [3], [0], [0], [0], [SET]	<table border="1"> <tr> <td>TM1 01 : 00 : 27 : 21</td> <td></td> <td></td> </tr> <tr> <td></td> <td>SET 00 00 30 00</td> <td></td> </tr> </table>	TM1 01 : 00 : 27 : 21				SET 00 00 30 00		Input the desired data to block 4. • If "DATA ERR" flashes, invalid time data has been entered. Input the correct data after pushing the [C] key.
TM1 01 : 00 : 27 : 21								
	SET 00 00 30 00							
3. [T]	<table border="1"> <tr> <td>TM1 00 : 00 : 30 : 00</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TM1 00 : 00 : 30 : 00						The desired data is entered to block 1 and is set as the present point of TIMER-1.
TM1 00 : 00 : 30 : 00								

- The data cannot be preset when the TIMER-1 is in the +/- display mode.

Entry of the editing point

Operation	Display	Comment						
1. 0.1.1.0.1.5.1.6 SET	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>SET 01 10 15 16</td><td></td></tr> </table>					SET 01 10 15 16		Input the desired data to block 4.
	SET 01 10 15 16							
2. IN	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>IN 01 : 10 : 15 : 16</td><td></td></tr> </table>					IN 01 : 10 : 15 : 16		The IN point data which has been entered is called to block 4. The OUT and AUDIO IN/OUT points can also be entered in the same way.
	IN 01 : 10 : 15 : 16							

CALL/TRIM of the editing point

Operation	Display	Comment						
1. IN	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> </table>					IN 01 : 20 : 13 : 00		The desired IN point data is displayed in block 4. The OUT and AUDIO IN/OUT points can also be displayed in the same way.
	IN 01 : 20 : 13 : 00							
2. + (or -)	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td></td><td>+</td></tr> </table>		IN 01 : 20 : 13 : 00				+	This is an example of trim by addition. The IN point data is shifted to block 3. "+" enters in block 4.
	IN 01 : 20 : 13 : 00							
		+						
3. 4.0.0.0	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td></td><td>+40 00</td></tr> </table>		IN 01 : 20 : 13 : 00				+40 00	Enter the number which you want to add in block 4.
	IN 01 : 20 : 13 : 00							
		+40 00						
4. SET	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td>SET 01 20 53 00</td><td></td></tr> </table>		IN 01 : 20 : 13 : 00			SET 01 20 53 00		The result of the addition is displayed in block 4.
	IN 01 : 20 : 13 : 00							
	SET 01 20 53 00							
5. OUT	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td>OUT 01 : 20 : 53 : 00</td><td></td></tr> </table>		IN 01 : 20 : 13 : 00			OUT 01 : 20 : 53 : 00		The desired data is entered as the OUT point and displayed in block 4. <ul style="list-style-type: none"> • If "NEGATIVE" flashes, the IN point has been set after the OUT point, and should be corrected.
	IN 01 : 20 : 13 : 00							
	OUT 01 : 20 : 53 : 00							

Display of duration

Operation

Press the IN and OUT keys simultaneously.

Display

	DUR 00 : 10 : 37 : 14	

Comment

The duration of the edit interval between the IN point and OUT point is displayed in block 4.

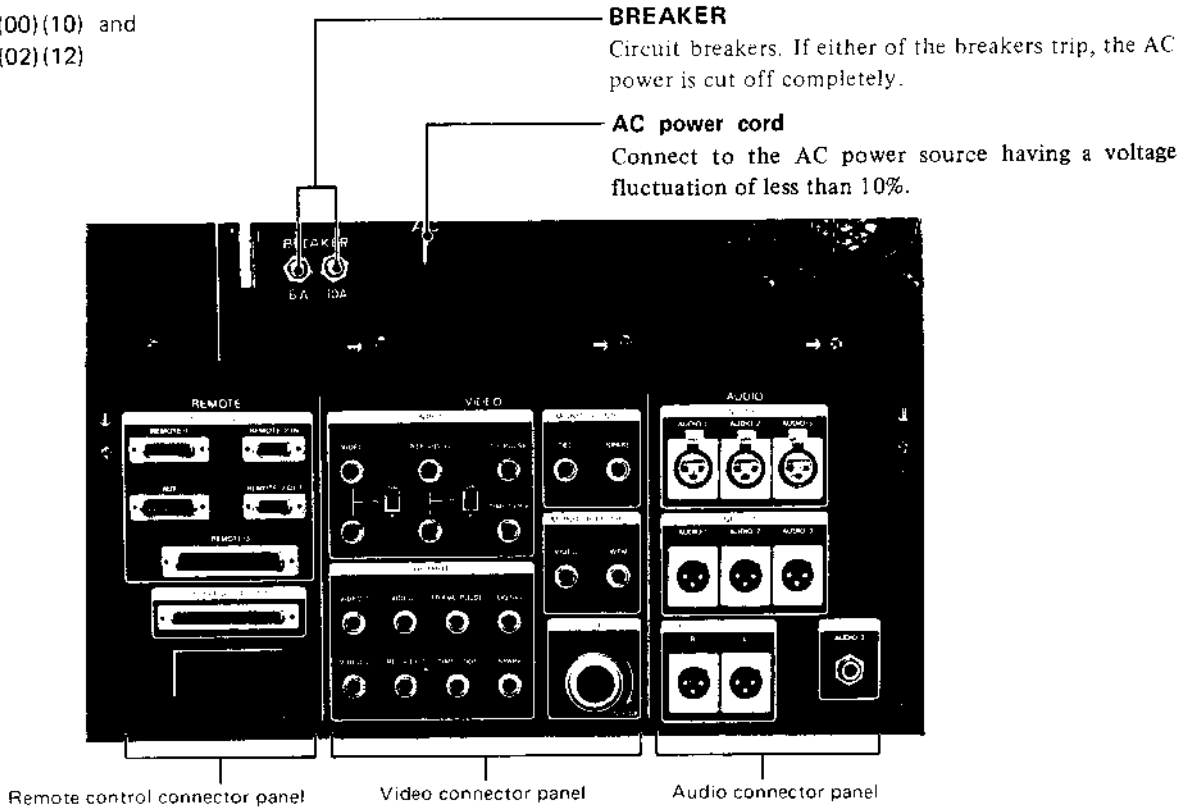
- Duration between any two of the IN/OUT/AUDIO IN/AUDIO OUT points can be displayed.
- If the display is of TIMER-1 data, "DUR" is displayed and if it is that of TIMER-2, "LAP" is displayed. After the tape has been loaded, TIMER-2 cannot be reset to zero. Therefore, it is recommended that the 1st editing event IN point be previously entered in TIMER-2 of the recorder and the actual IN/OUT points be entered with TIMER-1 or TIME CODE. After the editing of several events has been performed, display the data of the TIMER-2 of the recorder and press the IN and OUT button. Doing this makes it possible to know the total edit duration (LAP) of all the events up to that moment.

1-4-6. Connector panel

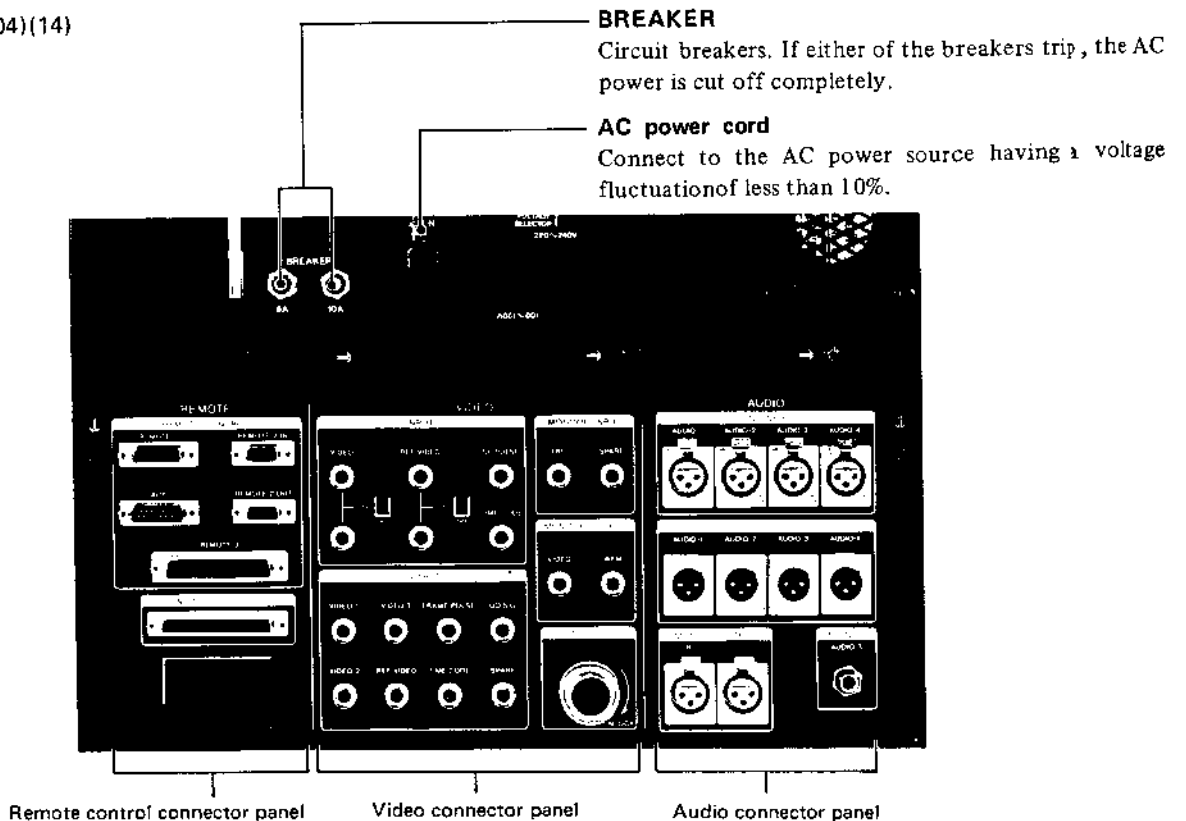
Note

The REMOTE-1 and TO TBC connectors are not equipped on the BVH-2000PS(10), (12) and (14).

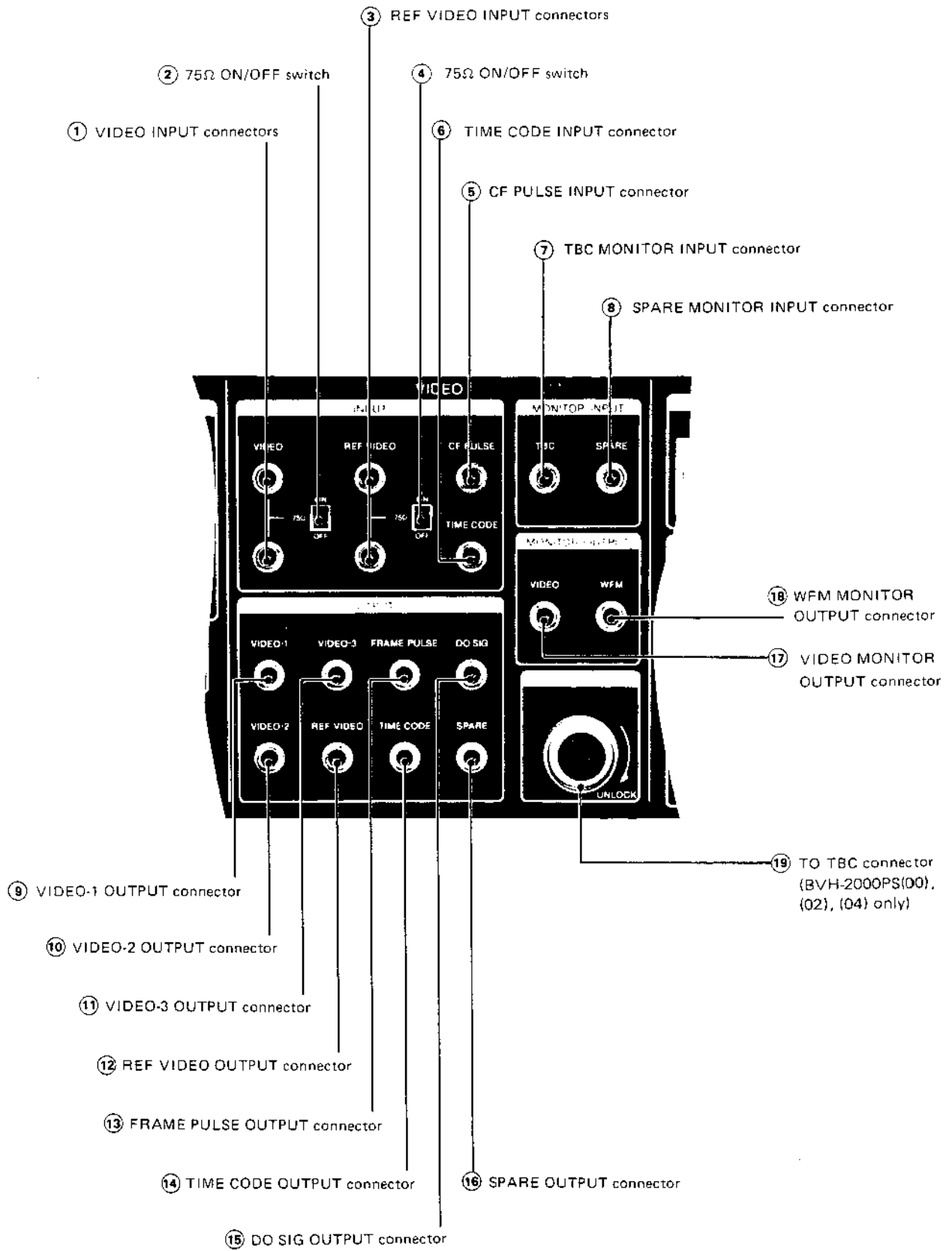
BVH-2000PS(00)(10) and
BVH-2000PS(02)(12)



BVH-2000PS(04)(14)



Video connector panel



1. OPERATIONAL INFORMATION

① **VIDEO INPUT connectors**

Connect a video signal of 1.0 Vp-p. One of the two connectors can be used as a looping output (bridge connection) connector to other video equipment.

② **75Ω ON/OFF switch**

This is the VIDEO INPUT connector ① 75 ohm termination switch.

ON: Normal position

OFF: Open circuit. Used for bridge connections.

③ **REF VIDEO INPUT connectors**

Connect a 1.0 Vp-p video signal used for external sync. These are the reference signal connectors for the servo circuit when the SERVO REF select switch on the function control panel is set to EXT or AUTO. One of the two connectors can be used as a looping output (bridge connection) connector to other video equipment.

④ **75Ω ON/OFF switch**

This is the REF VIDEO INPUT connector ③ 75 ohm termination switch.

ON: Normal position

OFF: Open circuit. Used for bridge connections.

⑤ **CF PULSE INPUT connector**

TTL level. Receives external COLOR FRAME PULSE when the CF switch on the SR-15 board is set to EXT.

⑥ **TIME CODE INPUT connector**

0.5 Vp-p. Use when an external TIME CODE is input.

- When using this connector, set the MIC/LINE/TC switch on the AE-03 board to TC and the INT/EXT-1/EXT-2 switch to EXT-1. (Refer to 1-6-3.)

⑦ **TBC MONITOR INPUT connector**

Connect a video signal to be monitored by a video monitor (for example, video output signal of the BVT-2000P/2000S time base corrector).

The input from this connector is routed to the VIDEO MONITOR OUTPUT connector ⑭ when the TBC button of the PICTURE MONITOR select buttons ⑫ on the level control panel is pressed. This signal is also sent to the WFM MONITOR OUTPUT connector ⑮ when the SELECT VIDEO button of the WAVEFORM MONITOR select buttons ⑰ is pressed.

⑧ **SPARE MONITOR INPUT connector**

Connects a signal to be monitored by a video monitor. The input from this connector is routed to the VIDEO MONITOR OUTPUT connector ⑭ when the SPARE button of the PICTURE MONITOR select buttons is pressed. The signal is also sent to the WFM MONITOR OUTPUT connector ⑮ when the SELECT VIDEO button of the WAVEFORM MONITOR select buttons is pressed.

- If the optional plug-in digital time base corrector is installed, the signal generated from the installed board is output instead of the SPARE MONITOR INPUT signal by resetting the S1 on the VM-01 board.

⑨ ⑩ ⑪ **VIDEO-1/2/3 OUTPUT connectors**

1.0 Vp-p 75 ohm video signal output connectors. VTR demodulator output. The following output signals are obtained depending on whether the optional plug-in TBC board are installed or not.

	Optional board (Not installed)	Optional TBC board (Installed)
VIDEO-1 connector *1	DEMOD output	TBC output
VIDEO-2 connector *1	DEMOD output	TBC output
VIDEO-3 connector	DEMOD output	TBC/DEMOD output *2

*1 The output can be changed with the S3 switch on the VM-01 board.

*2 The TBC output and demodulator output are changed over by the S2 switch on the VM-01 board in the VTR. (Refer to page 1-58(E).)

⑫ **REF VIDEO OUTPUT connector**

Reference video signal output selected by the SERVO REF selector ② on the function control panel.

⑬ **FRAME PULSE OUTPUT connector**

TTL level. Playback color frame pulse output. Three kinds of output pulse, REF-2, REF-8 and PB CF can be selected by the PULSE OUT switch on the SR-15 board. (Refer to 1-6-3.)

⑭ **TIME CODE OUTPUT connector**

Time code output connector is 0.5 Vp-p. The generated time code of the installed BKH-2015/2015A time code generator/reader or external input time code is fed out when recording. When playing back, the time code being displayed on the display is output.

⑮ **DO SIG(signal) OUTPUT connector**

Negative polarity TTL level. This is a drop out detector output to an external drop out compensator (DOC). When an external TBC is connected to the TO TBC connector ⑲, this signal is fed out through the TBC. A pulse or RF output can be selected using the jumper on the EQ-02 board.

⑯ **SPARE OUTPUT connector**

Spare connector.

⑰ **VIDEO MONITOR OUTPUT connector**

This is the video output connector for picture monitor; 1.0 Vp-p 75 ohms.

The signal is fed out by selecting the PICTURE MONITOR select button ⑫ on the level control panel.

⑱ **WFM MONITOR OUTPUT connector**

This is the video output connector for a waveform monitor; 1.0 Vp-p 75 ohms (nominal).

This signal is fed out by selecting the WAVEFORM MONITOR select button ⑰ on the level control panel.

**⑲ TO TBC connector (18-pin connector)
(equipped on BVH-2000PS(00), (02), (04) only)**

Used when connecting the BVT-2000P/2000S using a multi cable. If the BVH-2000PS(02) or the BVH-2000PS(04) is used, the dynamic tracking will not operate without this connection.

When an optional BKH-2350 digital time base corrector is installed into the unit, the dynamic tracking will operate irrespective of the connection at this connector.

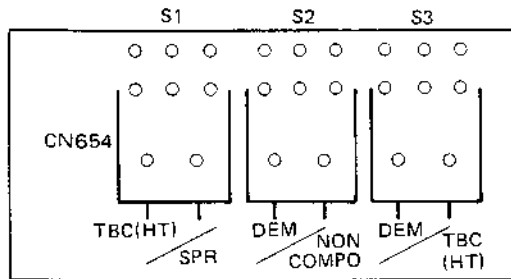
Pin No.	Signal	Signal level
A		
B	GND	
1	VIDEO OUT 50Ω	1Vp-p
2	VIDEO OUT (GND)	
3	DT V	TTL, HIGH IMPEDANCE
4	DT V (GND)	
5	OFF TAPE: H	TTL, HIGH IMPEDANCE
6	DO PULSE: L	TTL, HIGH IMPEDANCE
7	DO PULSE (GND)	
8	PLAY STATUS: H	TTL, HIGH IMPEDANCE
9	COLOR INF	TTL, HIGH IMPEDANCE
10	FH	TTL, HIGH IMPEDANCE
11	FH (GND)	
12	CONFI: L	TTL, HIGH IMPEDANCE
13		
14	GND	TTL, HIGH IMPEDANCE Ω CONNECT
15	DT MODE: L	TTL, HIGH IMPEDANCE
16	FR PULSE: L	TTL, HIGH IMPEDANCE

L: Low active

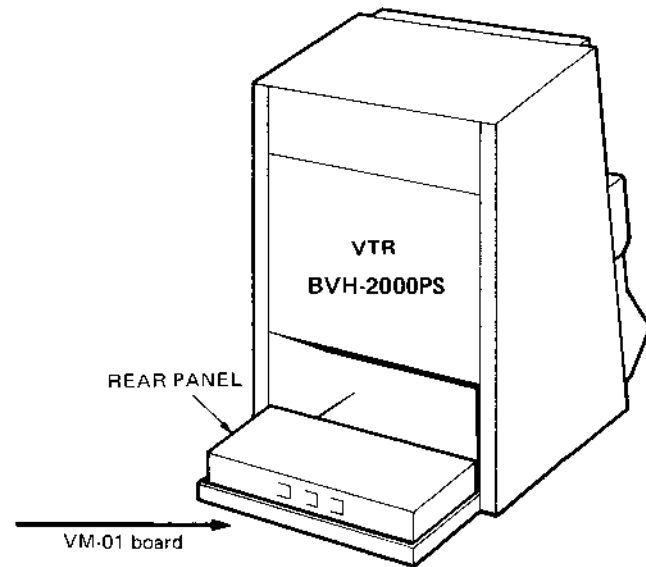
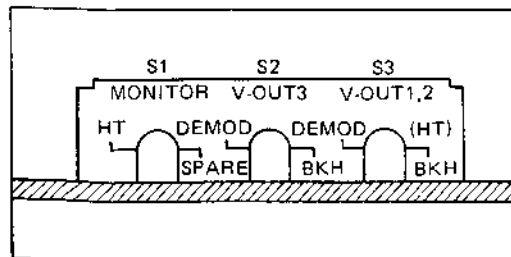
H: High active

Switches on the VM-01 board

Serial No. 10001 - 10299

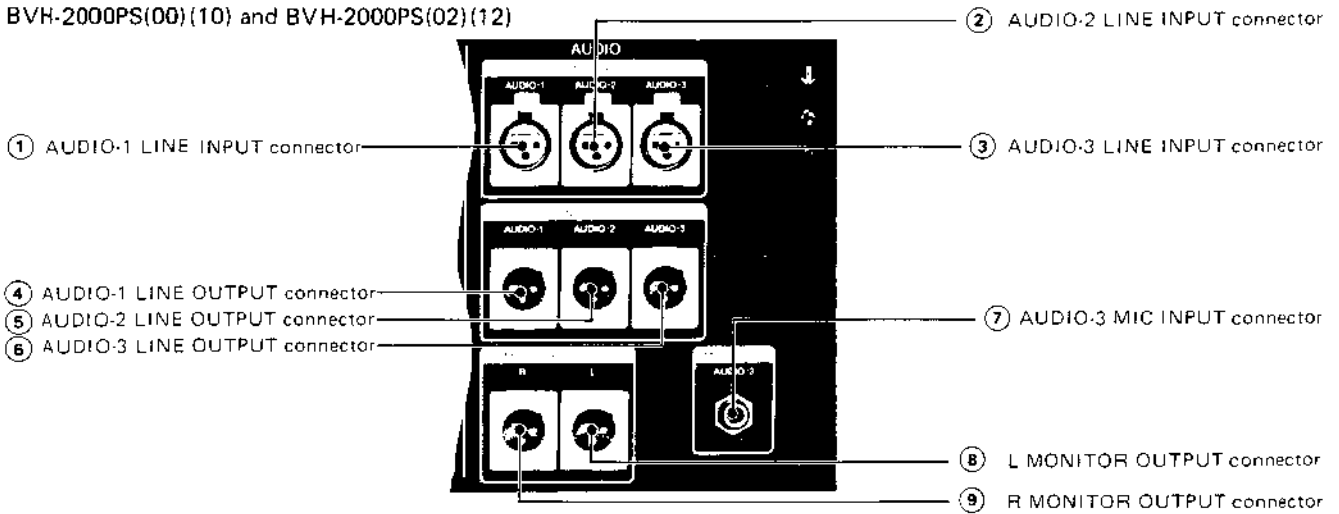


Serial No. 10301 and over

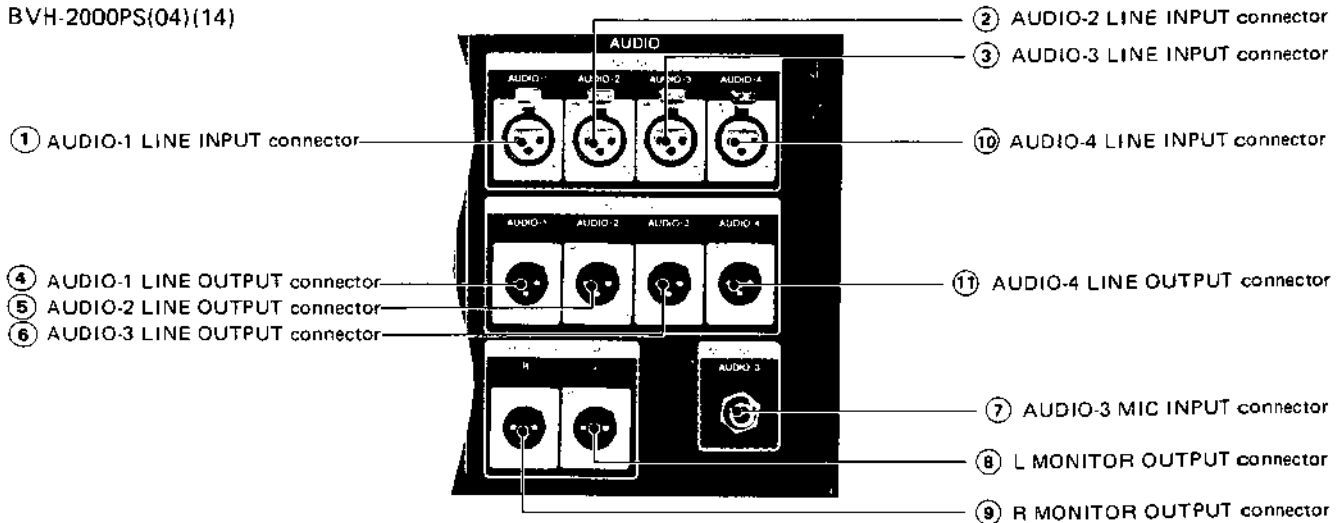


Audio connector panel

BVH-2000PS(00)(10) and BVH-2000PS(02)(12)



BVH-2000PS(04)(14)



① ② ⑩ AUDIO-1/AUDIO-2/AUDIO-4* LINE INPUT connectors

3P-XLR CANNON connectors, audio channel 1 and 2 input connectors

③ AUDIO-3 LINE INPUT connector

3P-XLR CANNON connector. Used to input the AUDIO signal or external TIME CODE signal. The AUDIO input signal from this connector can be recorded by setting the MIC/LINE/TC switch on the AE-03 board to LINE. An external TIME CODE input signal from this connector can be recorded by setting the switch to TC and the INT/EXT-1/EXT-2 switch on the same board to EXT-2. (Refer to 1-6-3.)

④ ⑤ ⑥ ⑪ AUDIO-1/AUDIO-2/AUDIO-3/AUDIO-4* LINE OUTPUT connectors

Audio channels 1, 2 and 3 output connectors. The output impedance is 600 ohms. It can be switched to 150 ohms or 37.5 ohms by shorting the conductive trace on the LA-02 board in the VTR. (Refer to 2-10.)

⑦ AUDIO-3 MIC INPUT connector

Audio channel 3 mic input connector. The MIC input signal can be recorded by setting the MIC/LINE/TC switch on the AE-03 board to MIC.

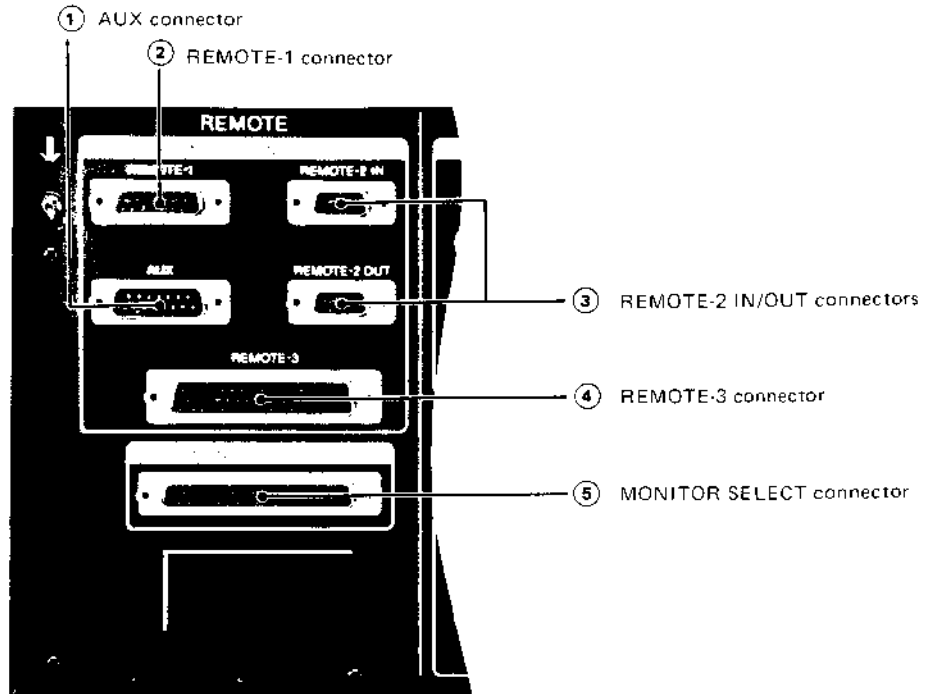
⑧ ⑨ L/R MONITOR OUTPUT connectors

Audio channel 1 (L) and 2 (R) monitor output connectors – 3P-XLR CANNON connectors. The following signals are sent out by setting the AUDIO MONITOR select buttons ⑩ on the level control panel.

Connector Select buttons	L connector	R connector
AUDIO-1	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-1/AUDIO-2	AUDIO-1	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4

*The AUDIO-4 LINE INPUT and OUTPUT connectors and AUDIO-4 button are equipped on the BVH-2000PS(04)(14) only.

Remote control connector panel



① AUX connector

To remotely control the optional plug-in digital time base corrector when it is installed, connect the BK-2007 remote control unit to this connector.

② REMOTE-1 connector (equipped on BVH-2000PS (00), (02), (04) only)

D sub 15-pin IN/OUT connector for remote control. A VTR or editing control unit with a CCJ (10-pin) REMOTE IN/OUT connector may be connected here using the BKH-2016 CCJ converter.

– Connectable machines –

Editing control units: BVE-500ACE, BVE-5000P
 (May be connected to the REMOTE-2 connector using the BK-5005 board instead of the BKH-2016.)

VTRs: BVH-1100PS, BVH-1100APS, BVH-1180PS

Interface box: IF-1000CE

③ REMOTE-2 IN/OUT connectors

D sub 9-pin IN/OUT connectors for remote control. Used for connecting VTR or editing control units with serial input/output remote control signals (RS-422) to the BVH-2000PS. Since the IN/OUT connectors are loop through, bridge connection of the remote control signals is possible.

– Connectable machines –

Editing control units: BVE-800, BVE-5000P (the BK-5005 board is necessary.)

VTRs: BVH-2000PS, BVU-800P/800S/820P/820S

Dynamic control unit: DTR-2000

④ **REMOTE-3 connector**

D-SUB 50-pin IN/OUT connector for remote control. Used for connecting VTR or editing control units with parallel input/output remote control signals to the BVH-2000PS.

I/O signals at the REMOTE-3 connector

Pin No.	Signal		
1	FF	IN	COMMAND INPUT (ACTIVE LOW)
19	STBY ON	IN	
20	REW	IN	
21	ENTRY	IN	
34	PLAY	IN	
35	STOP	IN	
36	REC	IN	
18	PREROLL	IN	
22	STBY OFF	IN	
2	REC SW	OUT	COMMAND RETURN (ACTIVE LOW)
3	PLAY SW	OUT	
4	STOP SW	OUT	
5	ENTRY SW	OUT	
37	REV LAMP	OUT	SHUTTLE, JOG. VARIABLE (ACTIVE LOW)
40	FWD LAMP	OUT	
46	STBY ON	OUT	STATUS OUT (ACTIVE LOW)
47	PLAY	OUT	
43	STOP	OUT	
24	REC	OUT	
50	PREROLL	OUT	
48	REMOTE	OUT	
49	ALARM	OUT	
39	A1 PRESET	OUT	
38	A2 PRESET	OUT	
42	A3 PRESET	OUT	
41	SYNC PRESET	OUT	Interface to TC-14A board
44	VIDEO PRESET	OUT	
26	ASSEMBLE PRESET	OUT	
45	INSERT PRESET	OUT	
27	EDIT	OUT	
23	SYNC 6 LACK	OUT	
25	VIDEO 6 LACK	OUT	
6	REF ERROR	OUT	
7	CF LOCK	OUT	
8	DRUM LOCK	OUT	
9	CAP LOCK	OUT	Not used
12	DVT		
13	DRD		
14	CK		
15	DATA-1		
32	DATA-2		
16	DATA-4		
17	DATA-8		
28	DTM		
29	DGN		
30	MP		
31	K4		
33	GND		
10	SP-2		
11	SP-1		

Note: When the REMOTE-1/2/3 connectors are used, be sure to set the REMOTE switch on the SY-79 board to 1, 2 or 3, depending upon the connector being used.

⑤ **MONITOR SELECT connector**

D-SUB 37-pin input connector for remote control of monitor switching. It is possible to connect the signal to this connector so that the output signal to the VIDEO MONITOR OUTPUT, WFM MONITOR OUTPUT and L/R MONITOR OUTPUT connectors can be switched.

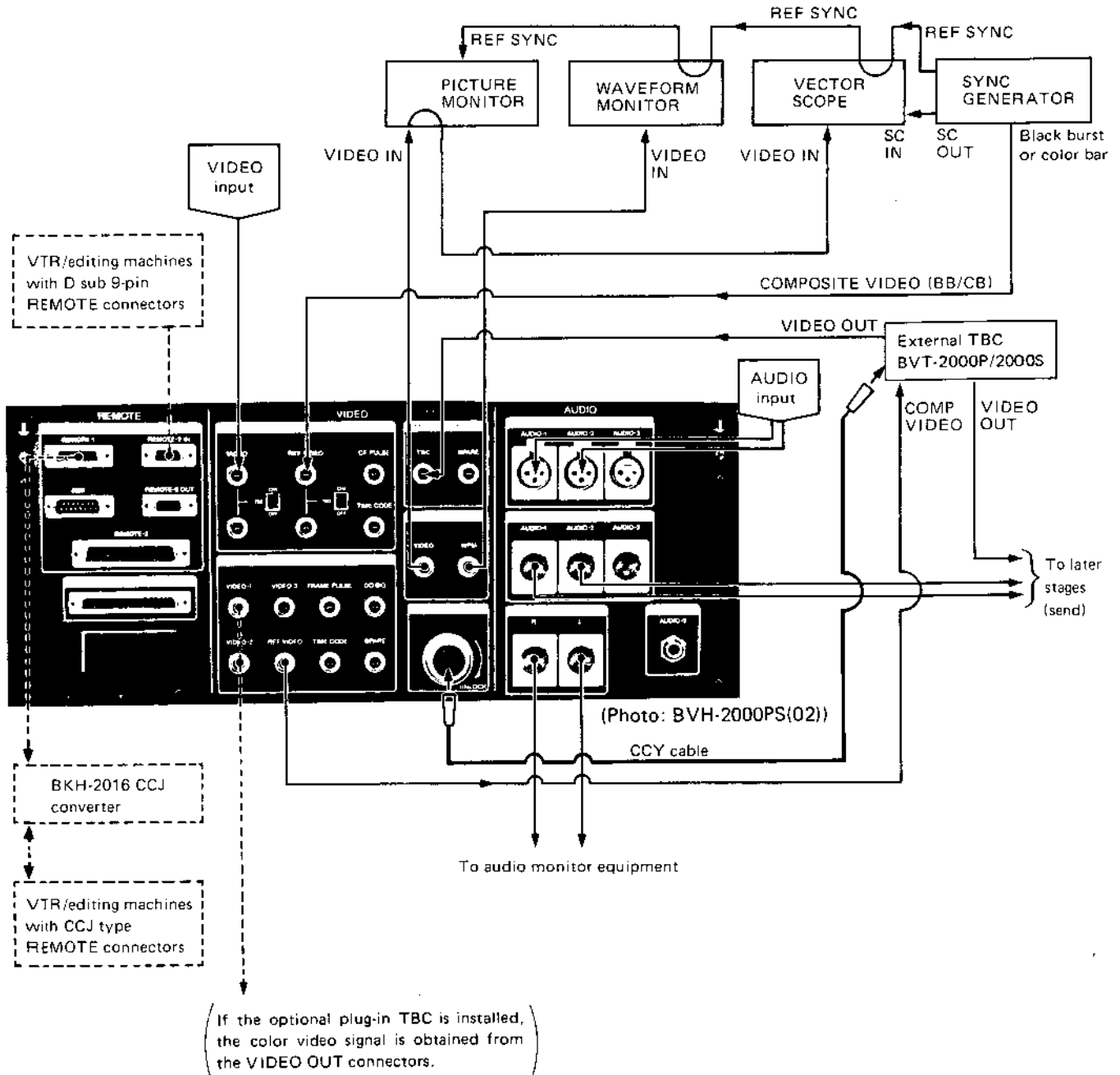
I/O signals at the MONITOR SELECT connector

Pin No.	COMMAND IN	Pin No.	STATUS OUT
9	INPUT VID	13	INPUT VID
28	DEMOD	32	DEMOD
10	TBC	14	TBC
29	SPARE (PICTURE)	33	SPARE (PICTURE)
11	SELECTED VID	15	SELECTED VID
30	CTL	34	CTL
12	RF ENVELOPE	16	RF ENVELOPE
31	SPARE (WFM)	35	SPARE (WFM)
20	AUDIO-1	4	AUDIO-1
2	AUDIO-2	23	AUDIO-2
21	AUDIO-1/2	5	AUDIO-1/2
3	AUDIO-3	24	AUDIO-3
22	(AUDIO-4)	6	(AUDIO-4)
1	+5V (AUDIO)	8	+5V (VIDEO)
7	GND (AUDIO)	17	GND (VIDEO)
26	GND (AUDIO)	36	GND (VIDEO)

COMMAND IN: ACTIVE LOW

STATUS OUT: ACTIVE LOW. SINK CURRENT Max. 350 mA

1-5. CONNECTIONS



Notes

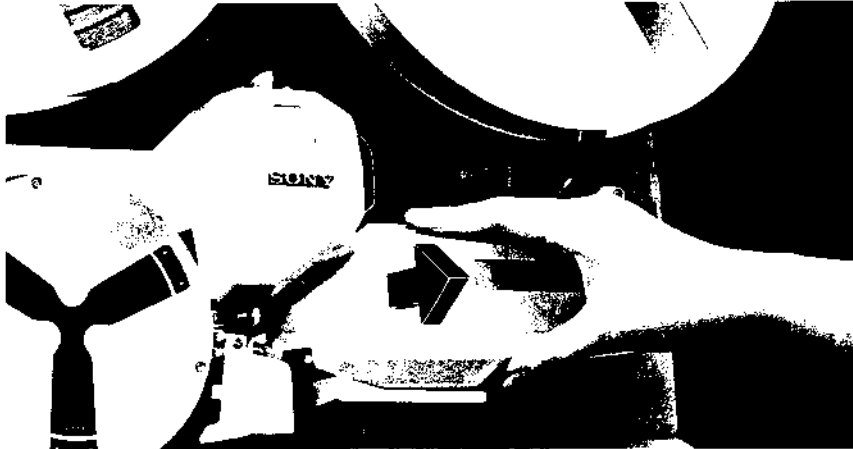
- The REMOTE-1 connector is not equipped on BVH-2000PS(10), (12) and (14).
- The TO TBC connector is not equipped on BVH-2000PS (10), (12) and (14). Use the plug-in type TBC.

1-6. PREADJUSTMENT

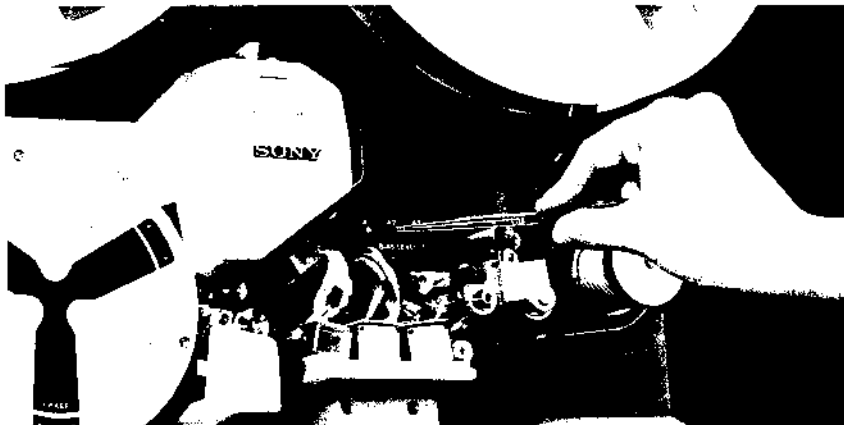
1-6-1. Record bias

The audio record bias current can be adjusted to suit the characteristics of the tape used.

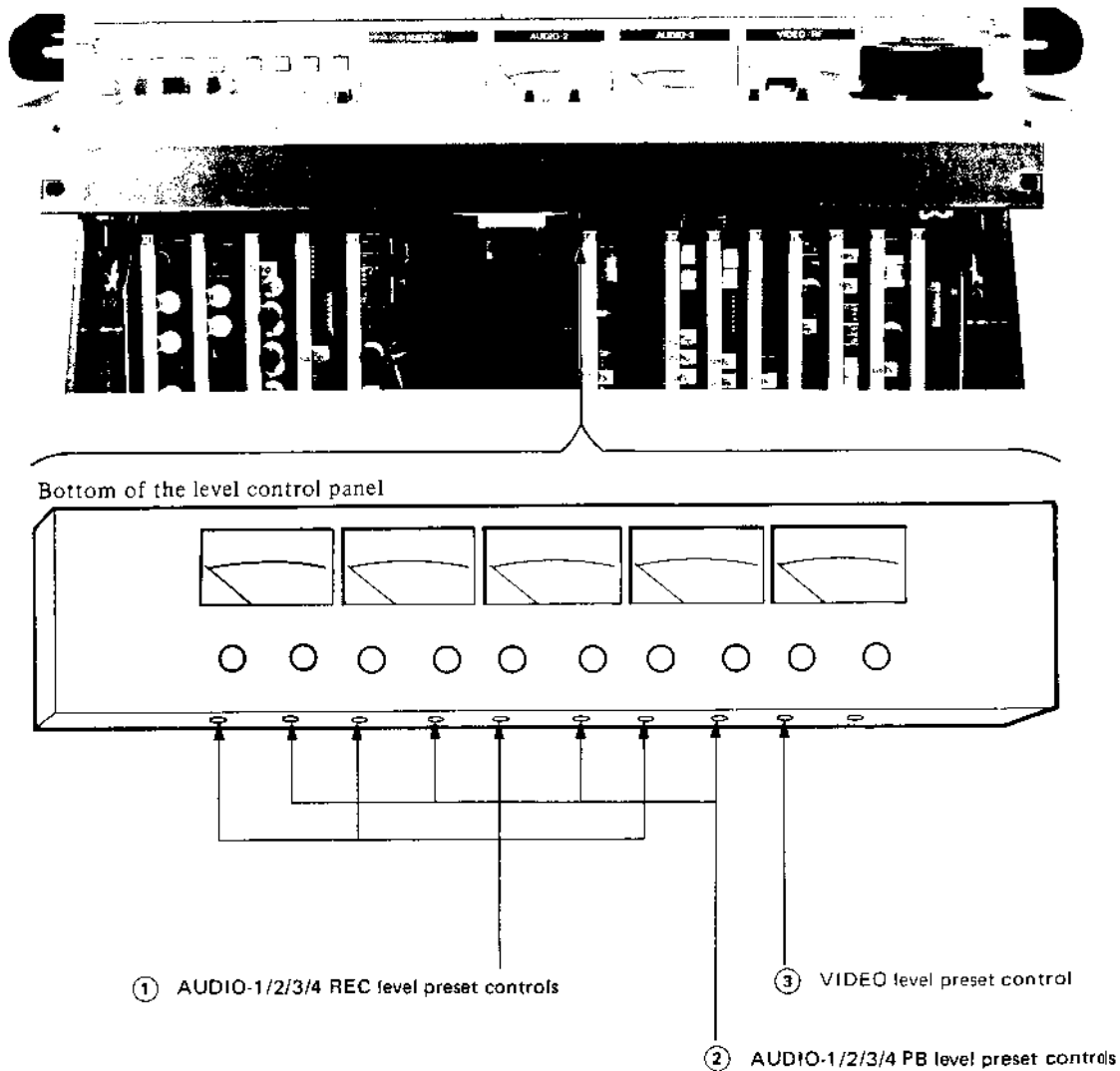
1. Pull and remove the head cover.



2. Input a standard level audio signal and set the VTR to the REC mode. Adjust the AUDIO-1/2/3/4 BIAS LEVEL adjusters using an insulated screwdriver.



1-6-2. REC/PB level preset



① AUDIO-1/2/3/4 REC level preset controls*

When the AUDIO REC level controls (1-4-1. ⑧) are pushed in, the preset level can be preadjusted. Input a standard level audio signal and set the VTR to the REC mode, then adjust the AUDIO-1/2/3/4 levels using an insulated screwdriver.

② AUDIO-1/2/3/4 PB level preset controls*

When the AUDIO PB level controls (1-4-1. ⑦) are pushed in, the preset level can be preadjusted. Play back standard tape and adjust the AUDIO-1/2/3/4 levels using an insulated screwdriver.

③ VIDEO level preset control

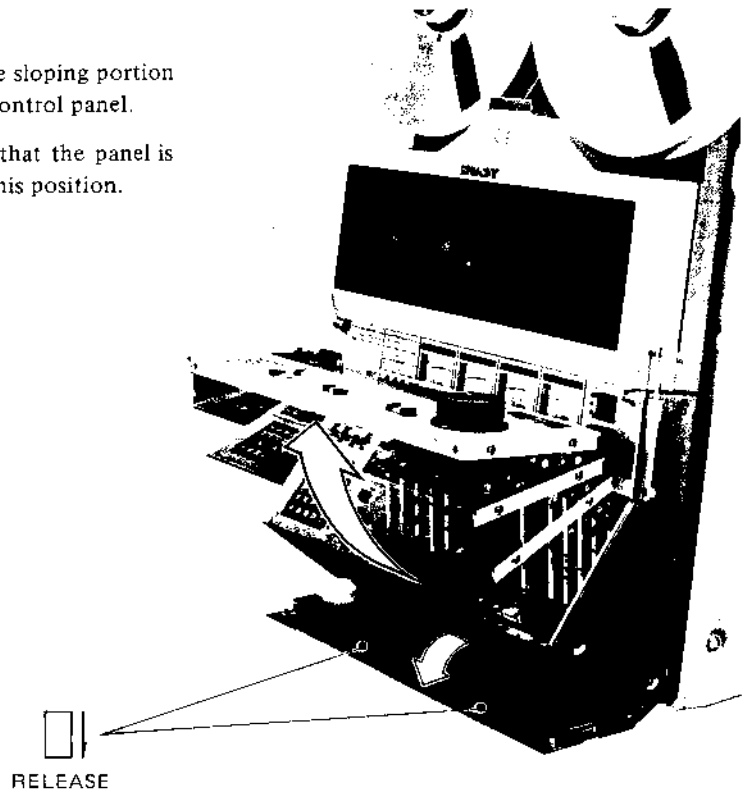
When the VIDEO level control (1-4-1. ⑥) is pushed in, the preset level can be preadjusted. Input a 1 Vp-p standard video signal and set the VTR to the REC mode. Adjust the level using an insulated screwdriver.

*Only the BVH-2000PS(04)(14) has the AUDIO-4 REC level preset control and the AUDIO-4 PB level preset control.

1-6-3. Board adjustment

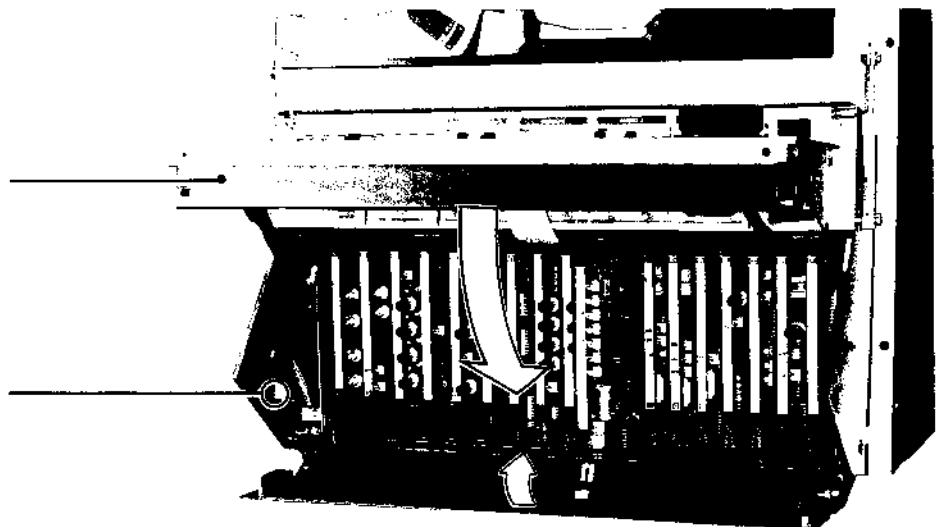
Opening

1. Depress the right and left bosses on the sloping portion under the front surface to release the control panel.
2. Lift up the function control panel so that the panel is almost horizontal. The panel locks in this position.

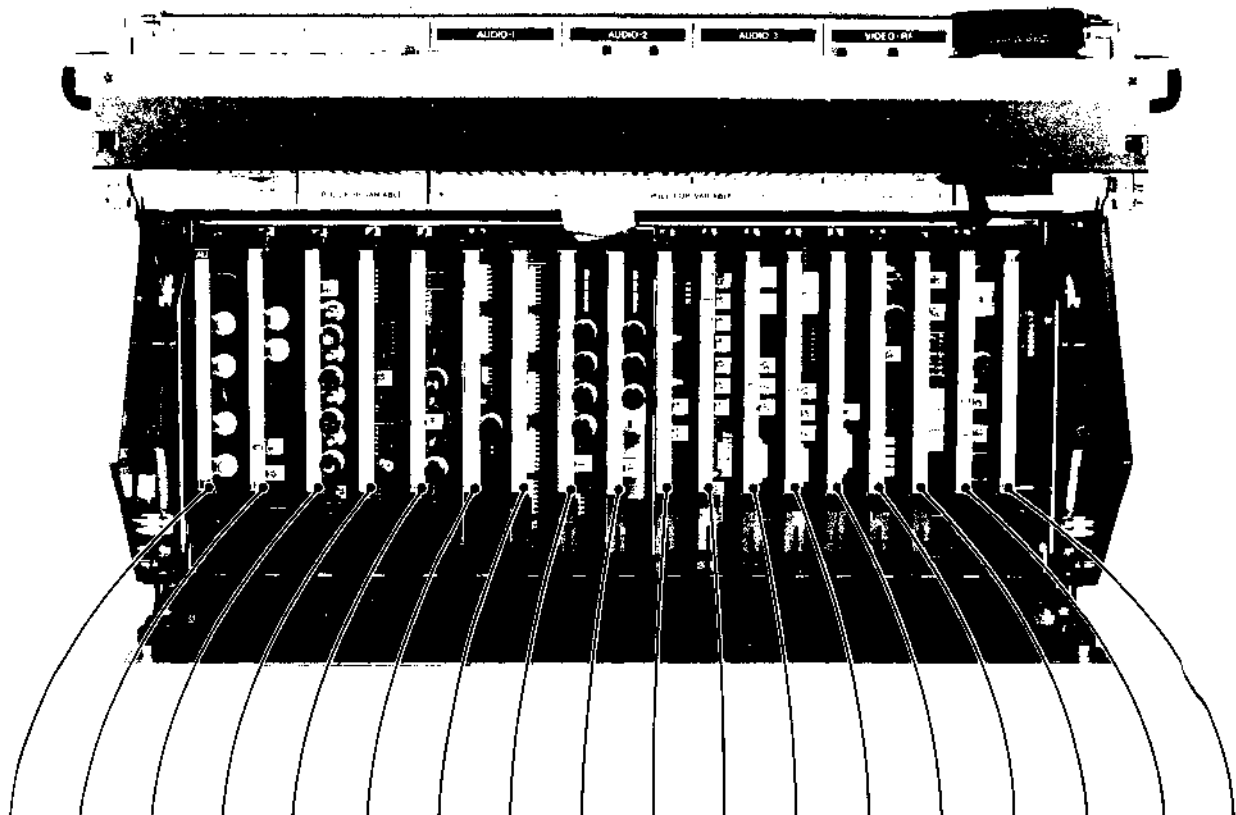


Closing

1. Hold the panel so that it does not drop suddenly.
2. Depress the white button to release the lock. Close the panel.



Board Extraction and Insertion



AU -27 Board	AE -03 Board	EQ -02 Board	DM -25 Board	MD -14 Board	AD Board	MY Board	SG Board	PR Board	LG -02 Board	TC Board	SY -79 Board	SY -80 Board	SV -43 Board	RL -12 Board	CD -17 Board	SR -15 Board	DT -05* Board
(AUDIO 1 & 2)	(AUDIO 3 & 4)	(EQUALIZER)	(DEMODULATOR)	(MODULATOR)	(A/D CONVERTER)	(MEMORY)	(SYNC GENERATOR)	(PROCESSOR)	(LOGIC)	(TIME CODE)	(SYS-CPU 1)	(SYS-CPU-2)	(SERVO-CPU)	(REEL SERVO)	(CAPSTAN & DRUM)	(SERVO REF)	(DYNAMIC TRACKING)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

BKH-2200/2300/2350
digital time base corrector
(option)

BKH-2015/BKH-2015A time code generator/receiver (option)

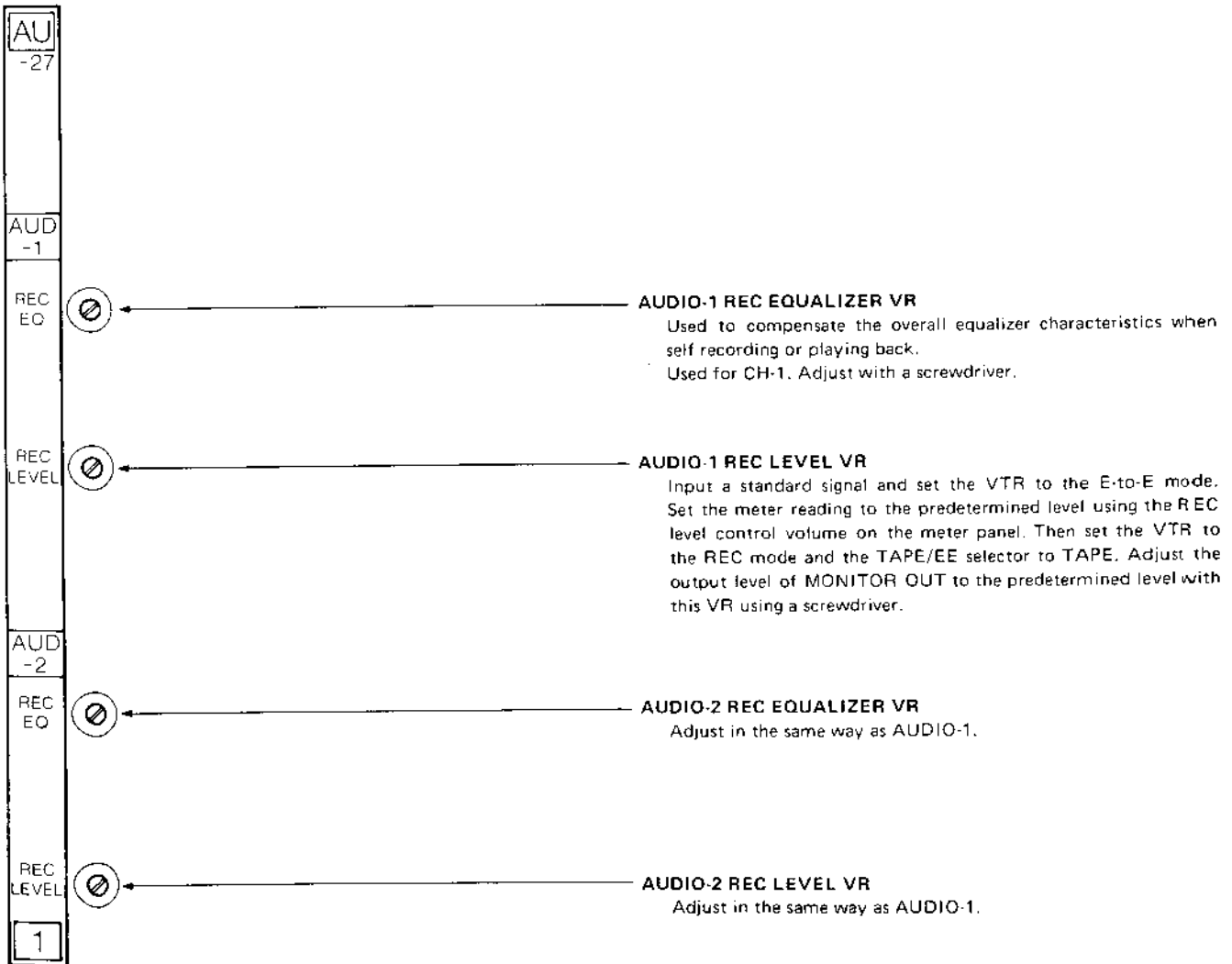
* The DT-05 board is installed into the BVH-2000PS(12)(12) and the BVH-2000PS(04)(14).

If it becomes necessary to remove boards, observe the following rules.

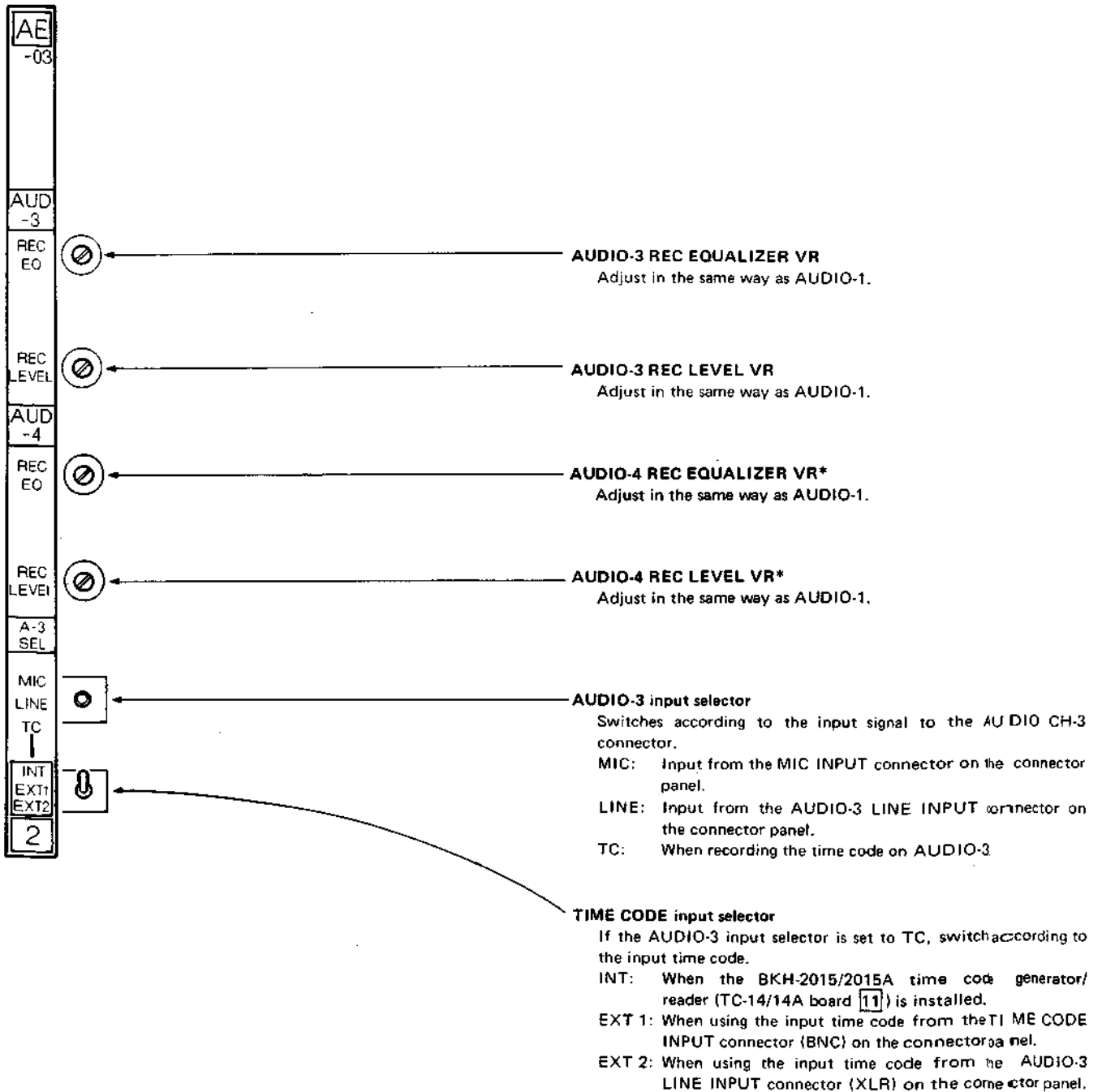
- Be sure that the power is off.
- Put in the board so that the printed circuit board number agrees with the designated number on the bottom of the VTR. Numbers 1 - 18 are in numerical order from left to right.

If the power is turned on with a board in the wrong position, damage to the board may result.

AU-27 board 1 (AUDIO-1/2)



AE-03 board **2** (AUDIO-3/4)

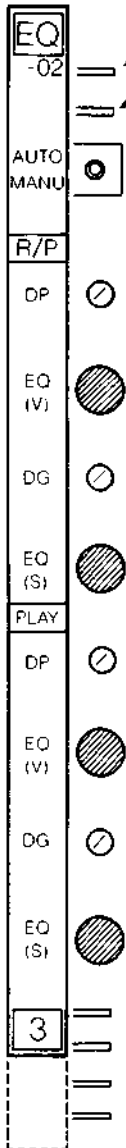
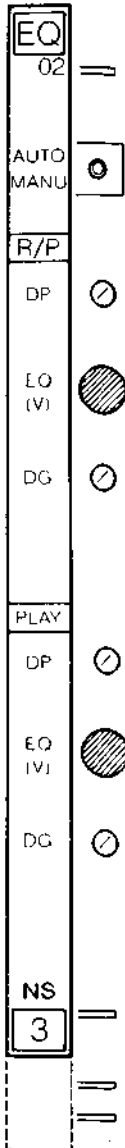


* Only the BVH-2000PS(04) has these VRs.

EQ-02 board 3 (EQUALIZER)

BVH-2000PS(10), (12), (14)

BVH-2000PS(00), (02), (04)
Serial No. 10401 and higher



Test point (for waveform observation)

- TP-1: RF output waveform of the R/P video head
- TP-2: RF output waveform of the R/P sync head

Video equalizer AUTO/MANUAL switch

Switches the AUTO/MANUAL mode of the chroma level adjustment of the playback VIDEO signal.

AUTO: Automatically adjusted to the chroma level preset by the switches on this board.

MANU: Manually adjusted by the EQ VRs described below.

R/P HEAD SYSTEM

DP VR

Adjusts the DP characteristic of the video signal played back by the R/P video head.

EQ (VIDEO) VR

Adjusts the equalizer level of the playback signal of the R/P video head. With knob.

DG VR

Adjusts the DG characteristic of the video signal played back by the R/P video head.

EQ (SYNC) VR

Adjusts the equalizer level of the playback signal of the R/P sync head. With knob.

PLAY HEAD SYSTEM*

DP VR

Adjusts the DP characteristic of the video signal played back by the PLAY video head.

EQ (VIDEO) VR

Adjusts the equalizer level of the playback signal of the PLAY video head. With knob.

DG VR

Adjusts the DG characteristic of the video signal played back by the PLAY video head.

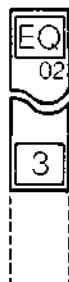
EQ (SYNC) VR

Adjusts the equalizer level of the playback signal of the PLAY sync head. With knob.

Test point (for waveform observation)

- TP-3: RF output waveform of the PLAY video head*
- TP-4: RF output waveform of the PLAY sync head*
- TP-5: RF waveform after VIDEO and SYNC switching
- TP-6: GND

Serial No. 10001 - 10400

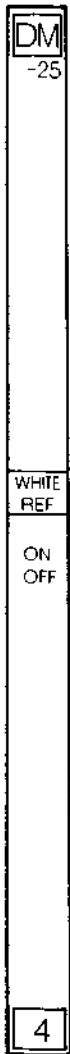


Test point (for waveform observation)

- TP-1: RF output waveform of the R/P video head
- TP-2: RF output waveform of the R/P sync head
- TP-3: RF waveform after VIDEO and SYNC switching
- TP-4: RF output waveform of the PLAY sync head*
- TP-5: RF output waveform of the PLAY video head*

* These volumes and test points do not function on the 8 VH-2000PS(00)(10).

DM-25 board 4 (DEMODULATOR)

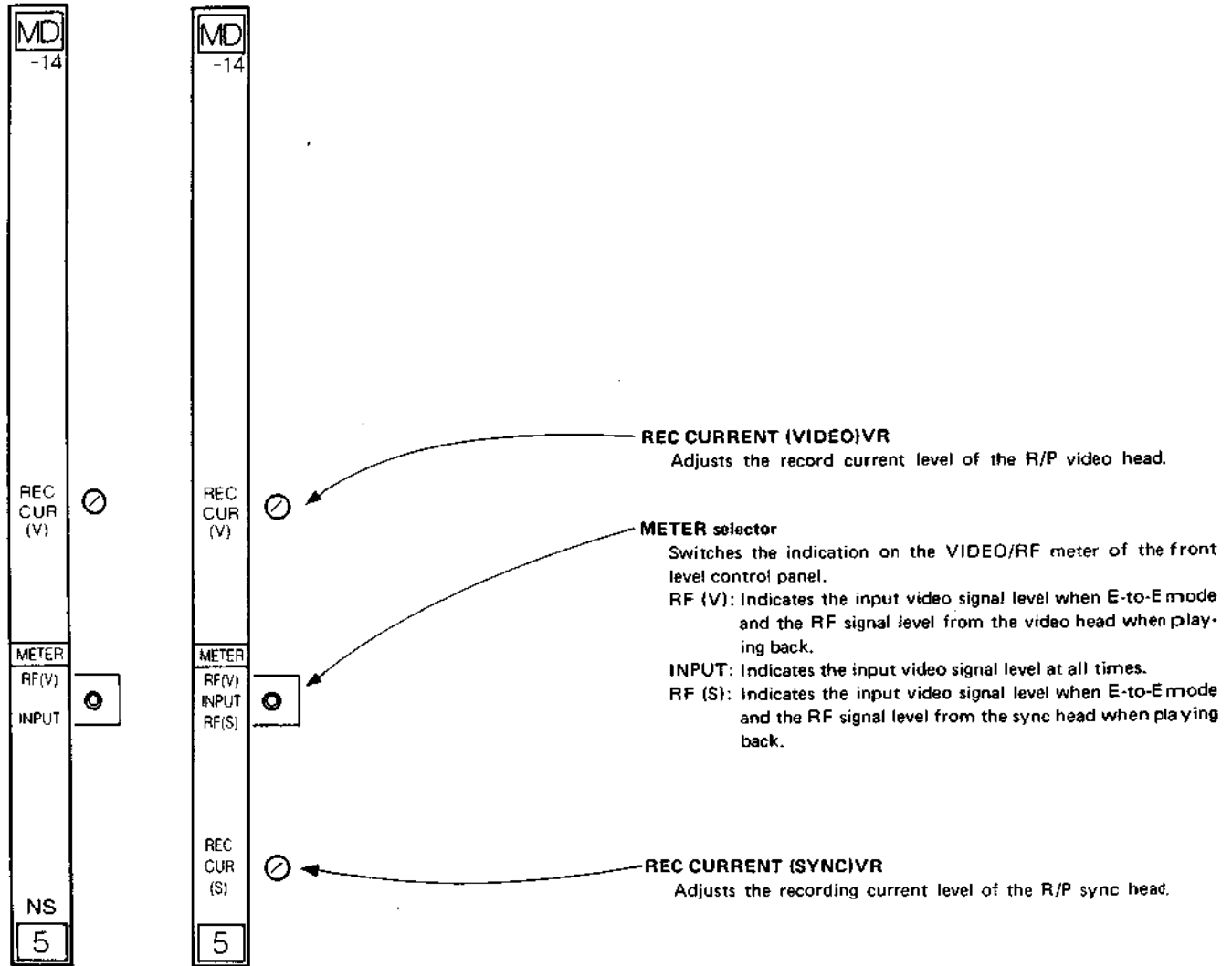


WHITE REFERENCE switch

- ON: The white reference signal is added to the demodulator output signal. Deviation level can be adjusted by setting the white peak level of the input video signal to the white reference signal level.
- OFF: Normal position. The white reference signal is not added.

MD-14 board **5** (MODULATOR)

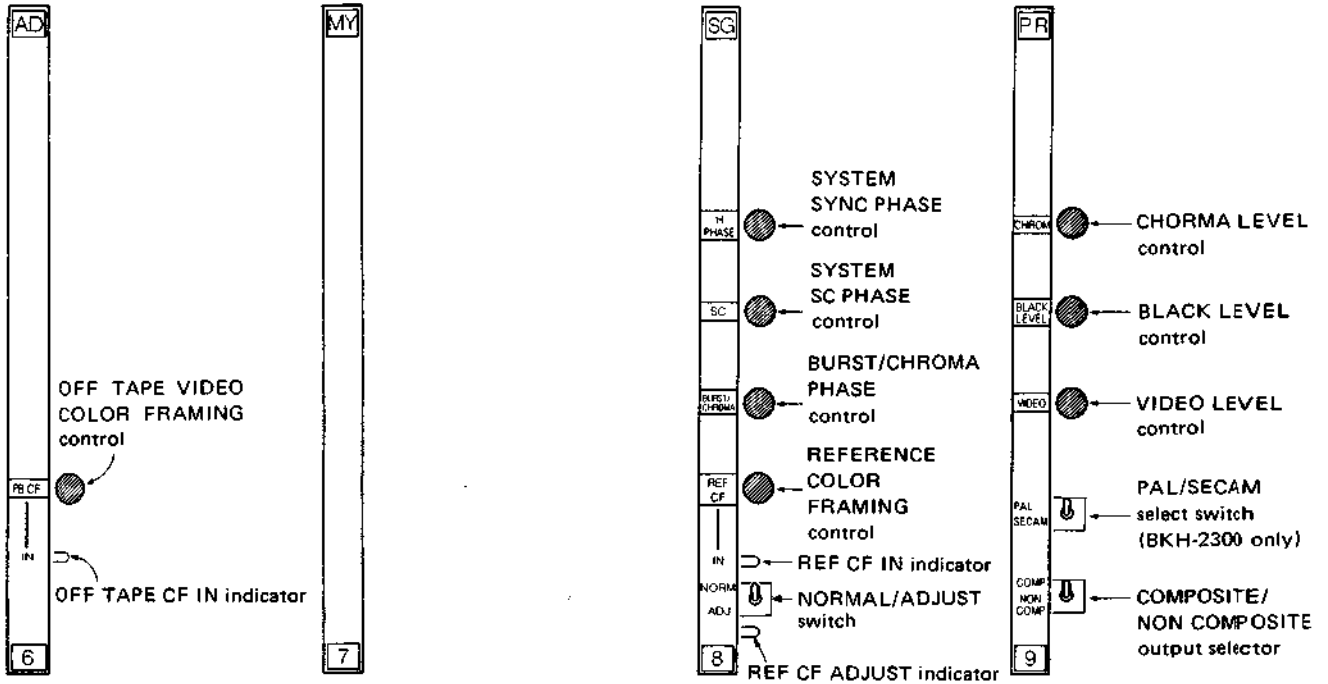
BVH-2000PS(10), (12), (14) BVH-2000PS(00), (02), (04)



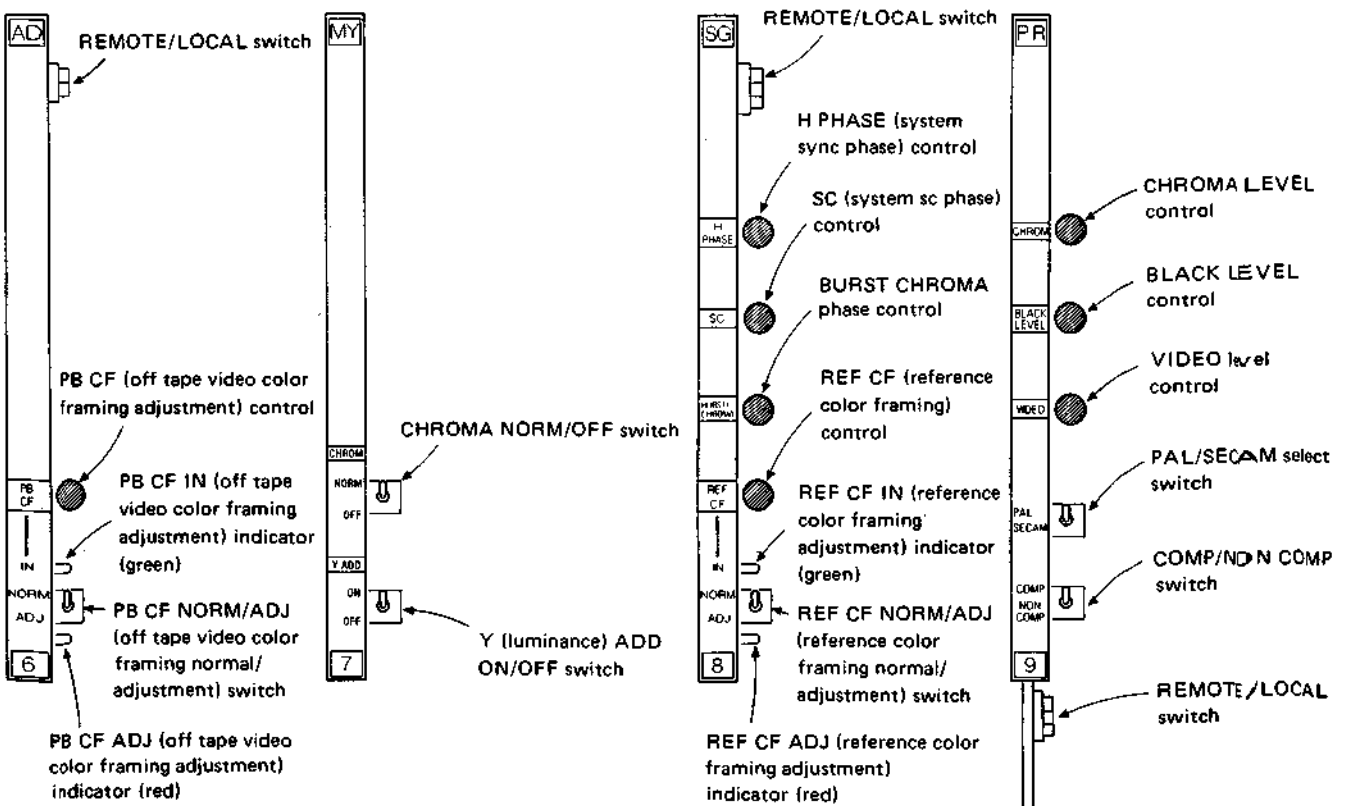
1. OPERATION (continued)

- AD board 6
 - MY board 7
 - SG board 8
 - PR board 9
- (optional BKH-2200/BKH-2300/BKH-2350 plug-in TBC)

BKH-2200/BKH-2300: For details, please refer to the operation and maintenance manual of the plug-in TBC.



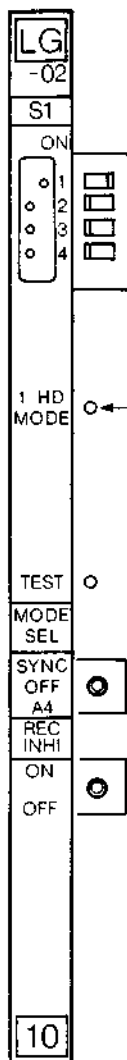
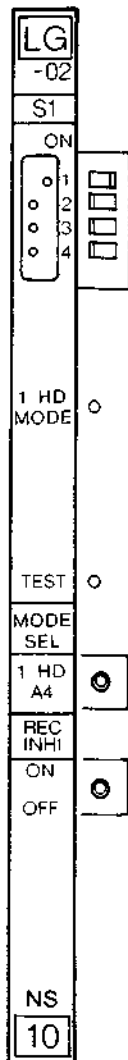
BKH-2350: For details, please refer to the operation and maintenance manual of the plug-in TBC.



LG-02 board 10 (LOGIC)

BVH-2000PS(10),
(12), (14)

BVH-2000PS(00),
(02), (04)



Lights when the MODE SEL switch is set to OFF or A4.

MODE SEL switch

- SYNC: The VIDEO and SYNC signals are recorded and played back.
- OFF/1HD: The VIDEO signal is recorded and played back, but the SYNC signal is not recorded nor played back.
- A4: For recording and playing back the audio channel 4 (only for the BVH-2000PS(04) (14))

REC INHIBIT switch

- Inhibits the REC and EDIT REC modes.
- ON: The VTR will not go into the record mode even if the REC button/EDIT button on the control panel are pressed. When the VTR is remotely controlled, the record command is not accepted.
- OFF: The REC/EDIT button can be used normally.

Note: In accordance with the setting of the switches on the front panel and LG-02 board, the REC INHIBIT switch operates as shown in the table below.

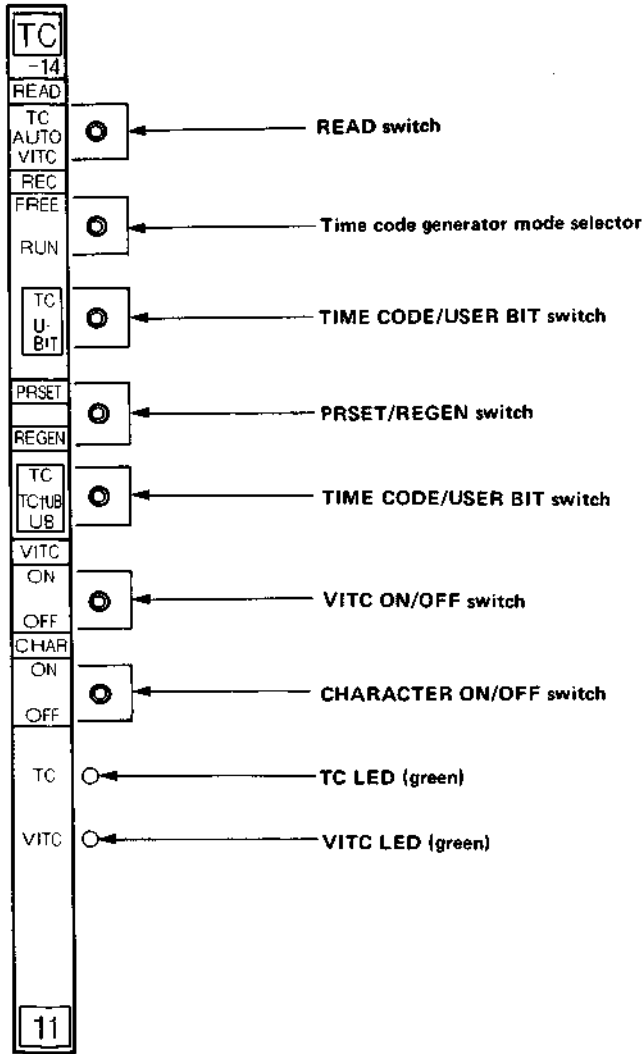
REC INHIBIT switch		REC INHIBIT state
Front panel	LG-02 board	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

When the REC INHIBIT switch on the front panel is mainly put to use, set the switch on the LG-02 board to OFF, or remove it.

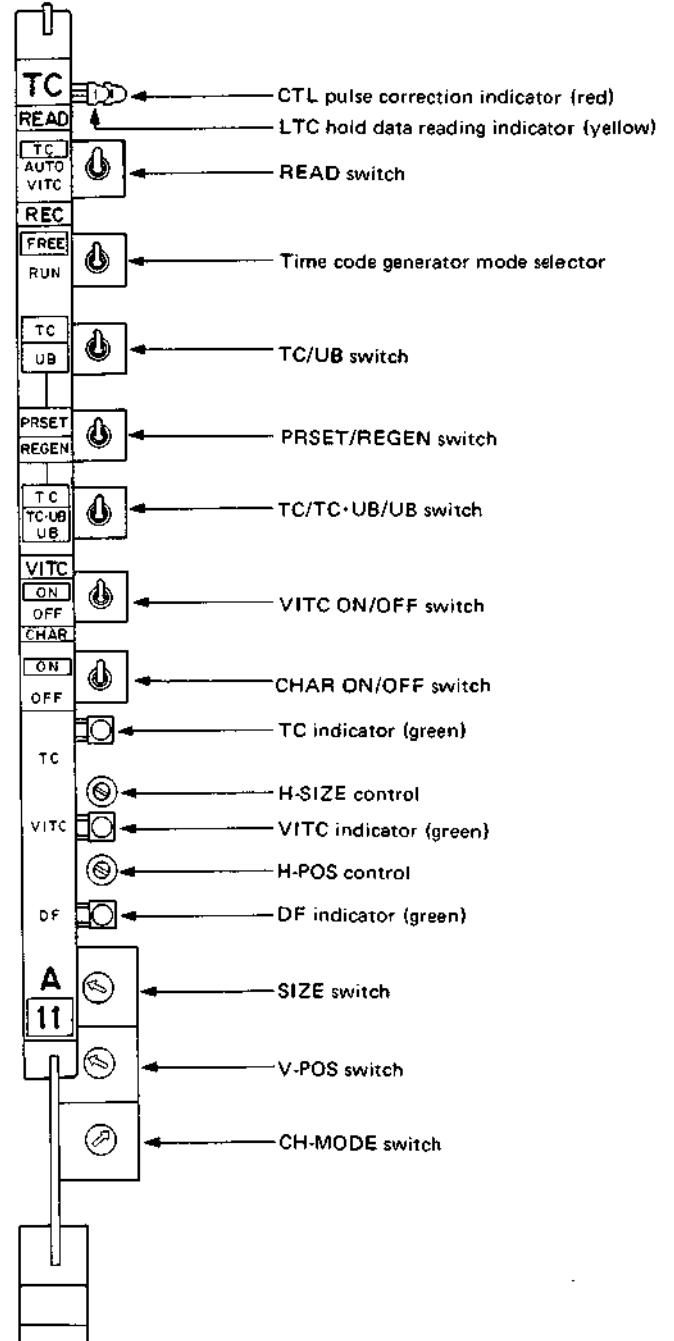
1. OPERATION INHIBITION

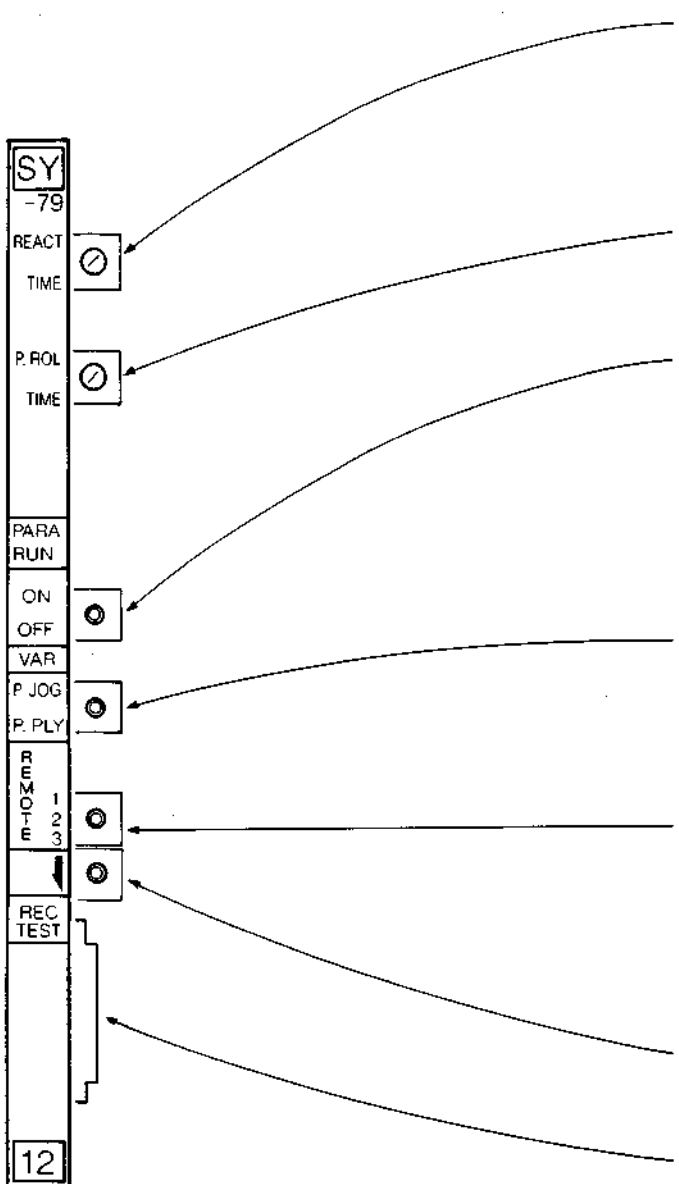
TC-14/14A board **11** (optional BKH-2015/BKH-2015A)

BKH-2015



BKH-2015A





REACTION TIME switch

Sets the reaction time to compensate for the delay due to manual button operation. When the ENTRY IN/OUT buttons, etc, are pressed, the display data of the display section is decreased by the value set by this switch and the result is memorized as the edit point. Frames from 0 to 25 can be set in two-frame units, (16-position rotary switch)

PREROLL TIME switch

Sets the preroll time when cueing the edit point, which can be set in one-second units from 0 to 15 seconds. (16-position rotary switch)

PARA RUN switch

Can make two VTRs work synchronously.
ON: Both lamps light when the CONTROL P/R buttons on the control panel are pressed. If the buttons on the control panel are pressed, both the VTRs work in that mode.
OFF: Normal position. Either of the CONTROL P/R lamps lights. The player or recorder works corresponding to the P or R lamp which lights. Set to this position when only one VTR is operated.

VARIABLE switch

Switches the VAR button functions on the control panel.
P. JOG: Program jog function
 (Variable speed playback at -1 to +3 times normal)
P. PLY: Program play function
 (Variable speed playback at -20% to +20% normal)

REMOTE switch

Switches according to the connections of the REMOTE-1/2/3 connectors on the connector panel.
 1: When the REMOTE-1 connector is used
 2: When the REMOTE-2 connector is used
 3: When the REMOTE-3 connector is used
 One of the REMOTE-1/2/3 lamps on the level control panel lights corresponding to the position of this switch.

REC TEST switch (on the BVH-2000PS(00)(10) only)

Press to the arrow direction and the VTR enters the REC TEST standby mode.

LED. For servicemen

Adjusting the record current level on the BVH-2000PS(00)(10)

1. Set the VTR to the STOP mode.
2. Set the REMOTE/LOCAL switch to LOCAL.
3. Set the REC INHIBIT switch to OFF.
4. Press the REC TEST switch on the SY-79 board to the arrow direction. The "REC TEST" appears on the display and the REC INHIBIT lamp blinks.
5. Press the REC button. The REC button blinks and the BVH-2000PS(00)(10) repeats the recording and playback, and the REC INHIBIT lamp goes off.
6. Adjust the record current level.

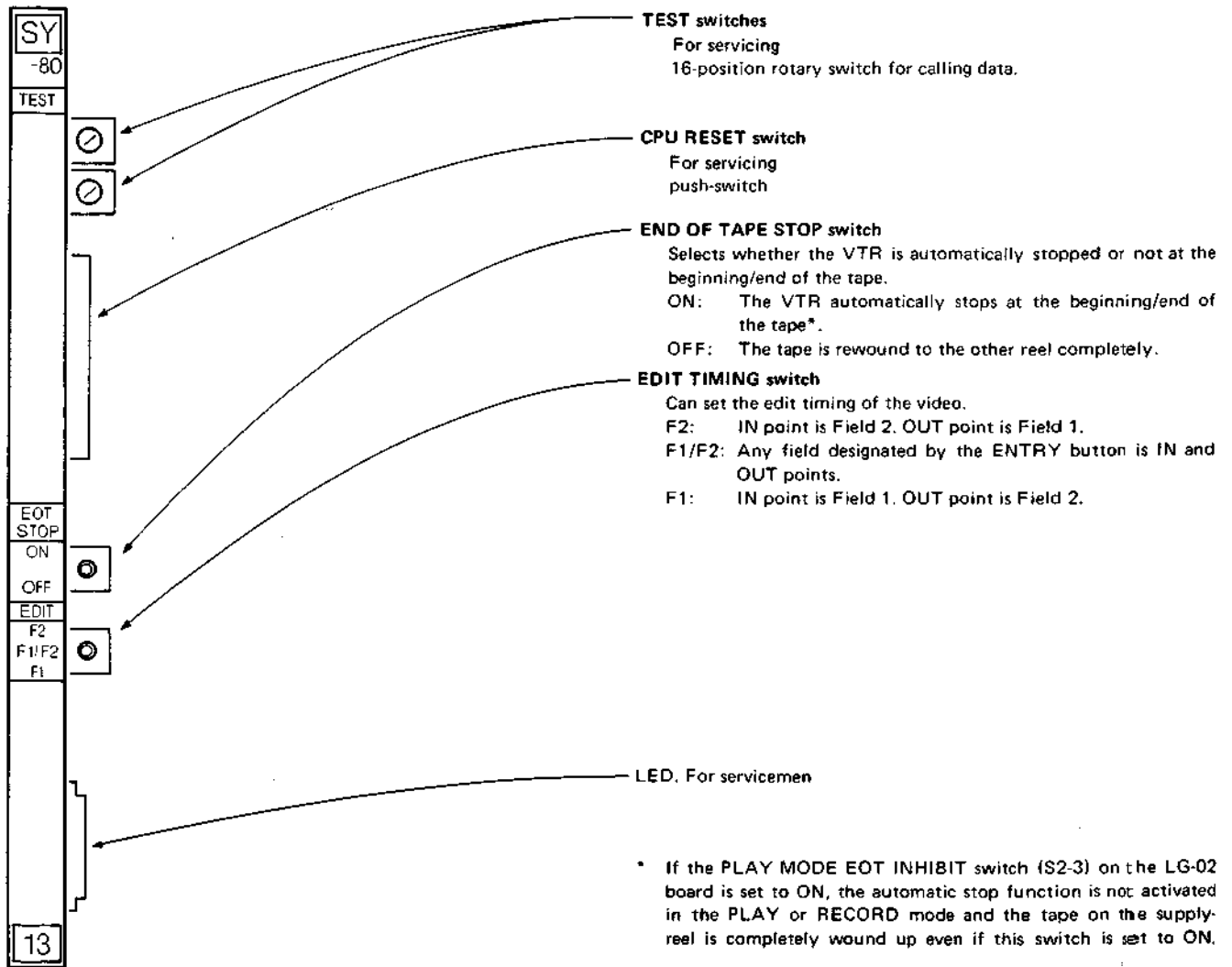
Adjustment of the video head

Set the METER selector on the MD-14 board to RF(V) and turn the REC CUR (V) VR so that the VIDEO/RF meter pointer swings to the point where the indication comes just maximum.

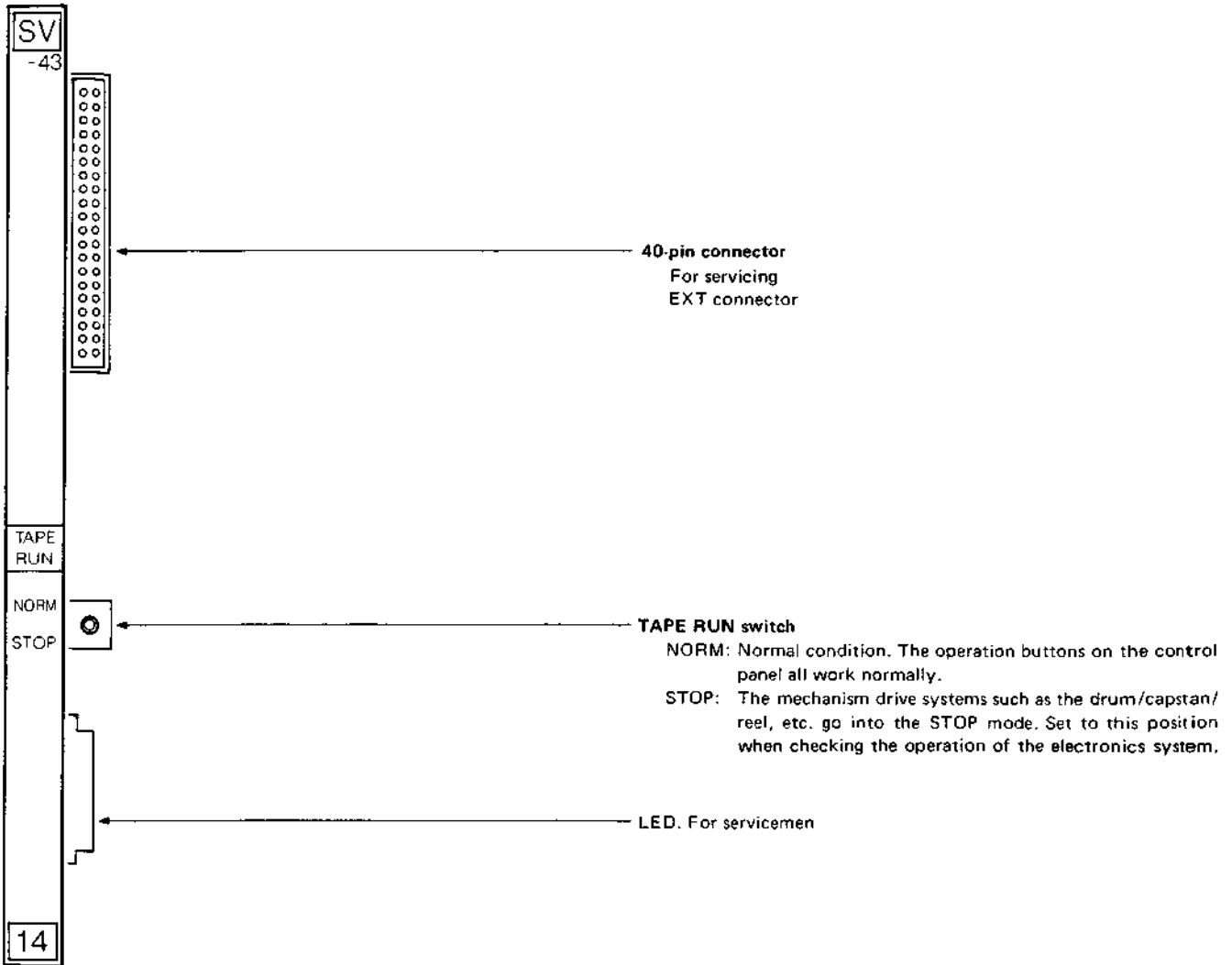
Adjustment of the sync head (for BVH-2000PS(00), (02), (04) only)

Set the METER selector on the MD-14 board to RF(S) and turn the REC CUR (S) VR so that the VIDEO/RF meter pointer swings to the point where the indication comes just maximum.

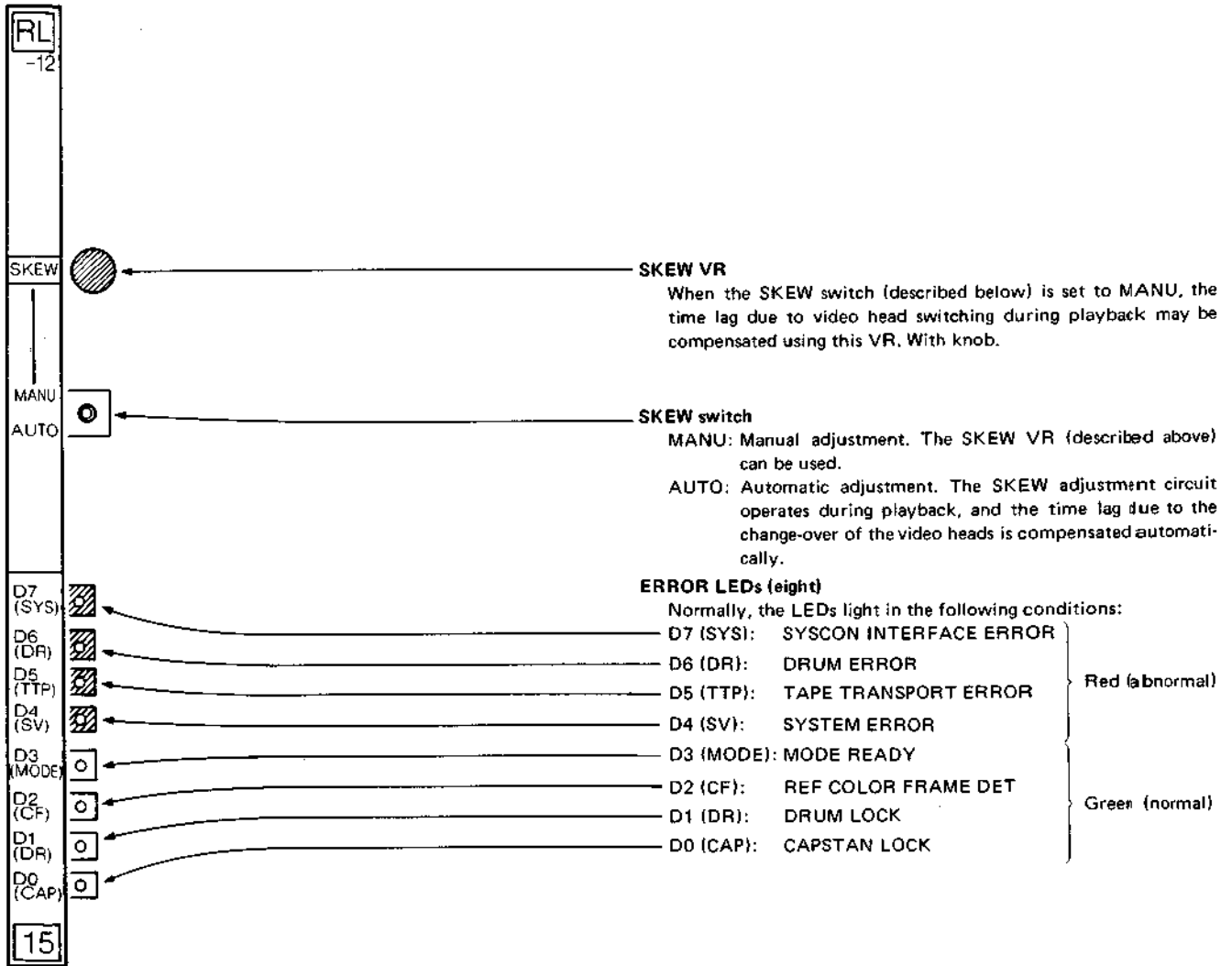
7. When the adjustment is finished, press the REC button, and the BVH-2000PS(00)(10) enters the STILL mode. If the STOP button is pressed, the VTR enters the STOP mode.
- The steps 1 to 5 should be completely satisfied, or the adjustment cannot be done.
 - When the REC TEST mode continues more than 3 minutes, the VTR automatically enters the STOP mode.
 - "REC TEST" is displayed on the block 3 of the Type II control panel or on the block 5 of the Type III control panel. If error message is displayed on the block 3 of the Type II, REC TEST is not displayed.
 - When the adjustment is stopped by pressing the REC button, the VTR enters the REC TEST mode again by pressing the REC button. Thus the REC TEST and STILL modes are repeated by pressing the REC button.
 - If any of the condition of steps 1 to 5 is cancelled during adjusting, the adjustment automatically stops.



SV-43 board 14 (SERVO-CPU)



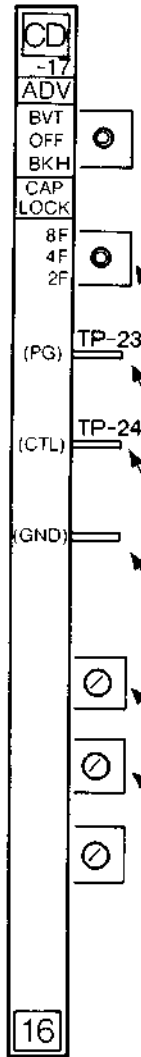
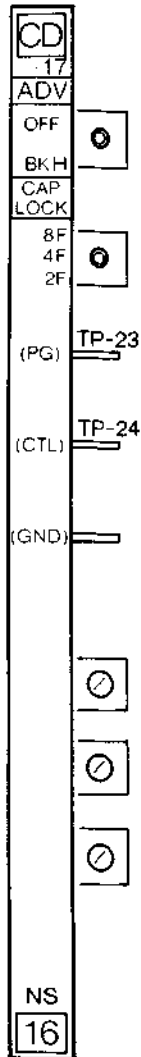
RL-12 board **15** (REEL SERVO)



CD-17 board **16** (CAPSTAN & DRUM)

BVH-2000PS(10),
(12), (14)

BVH-2000PS(00),
(02), (04)



ADVANCE switch

Sets the advanced value of the SYNC required for playback. Changes over corresponding to the TBC used as follows:
BVT: When the BVT-2000P/2000S (external TBC) is used. The advanced value is set using the 16-position rotary switch on this board. Set the rotary switch to 12H for dynamic tracking machines and 4H for machines without dynamic tracking.
OFF: The playback signal synchronizes with the reference signal.
BKH: When the optional plug-in TBC (6)–(9) is installed. The drum phase is automatically set.

CAPSTAN LOCK switch

Determines the capstan servo lock phase for the reference signal when playing back.
8F: Locked to the color frame mode (8 Field)*
4F: Locked by the 4-field unit
2F: Locked by the 2-field unit

TEST POINT (for waveform observation)

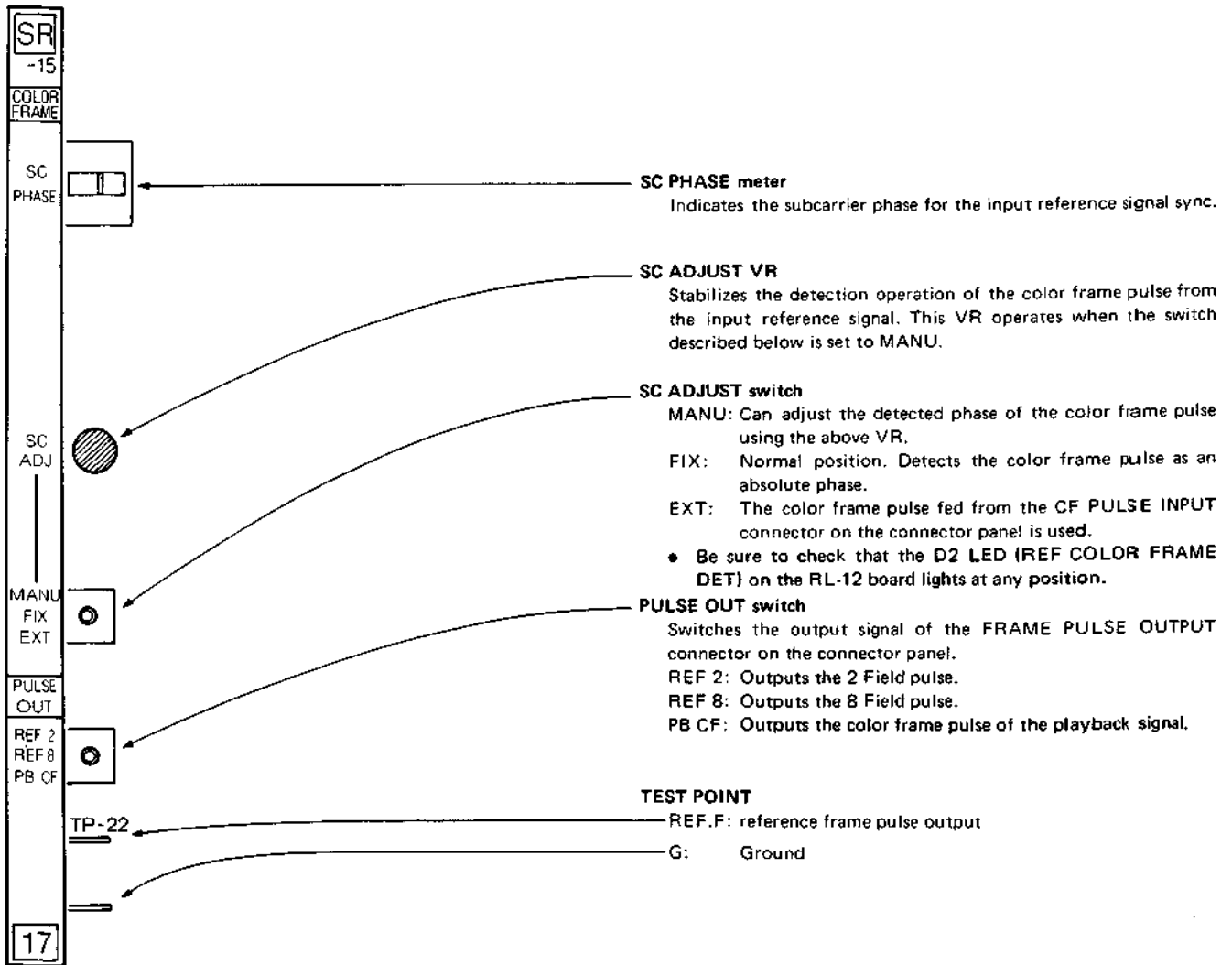
PG: Output of the DRUM PG signal
CTL: Output of the CTL signal
GND: Ground

TEST mode switches

For test use. Three 16-position rotary switches

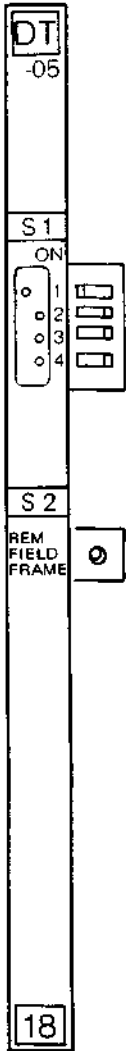
* The SECAM signal is locked by the 4-field unit even if the switch is set to 8F.

1. OPERATION



DT-05 board **18** (BVH-2000PS(02)(12) and BVH-2000PS(04)(14) only)

Serial No. 10701 and higher



Dynamic tracking playback switch (S2)

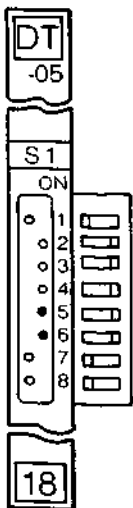
REM: The selection of the field jog or frame jog mode is remotely controlled.

FIELD: Field jog mode

FRAME: Frame jog mode

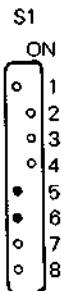
(In the frame jog mode, the dynamic tracking playback with keeping the interlace is possible between the still and the x2 normal speed.)

Serial No. 10001 - 10699

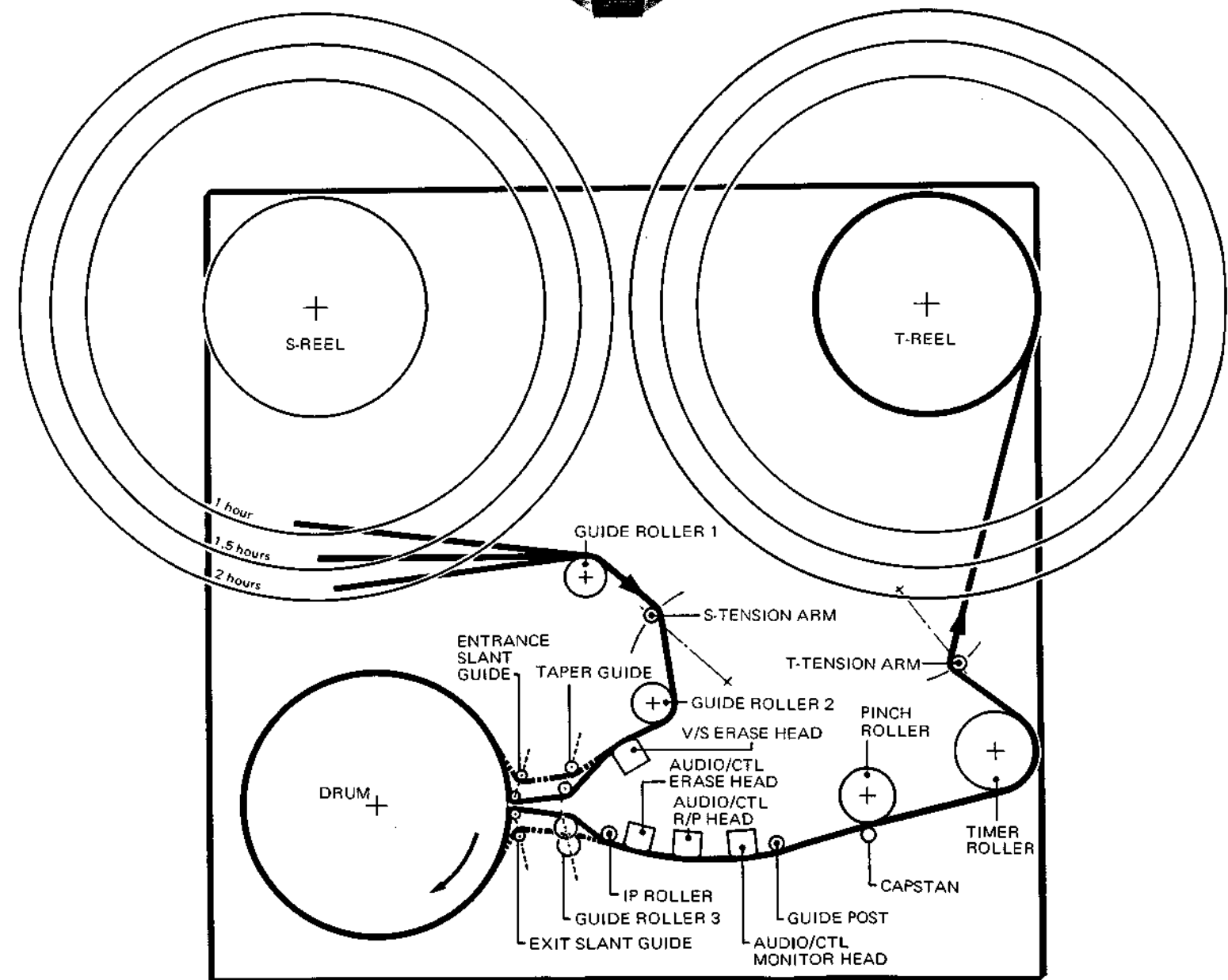
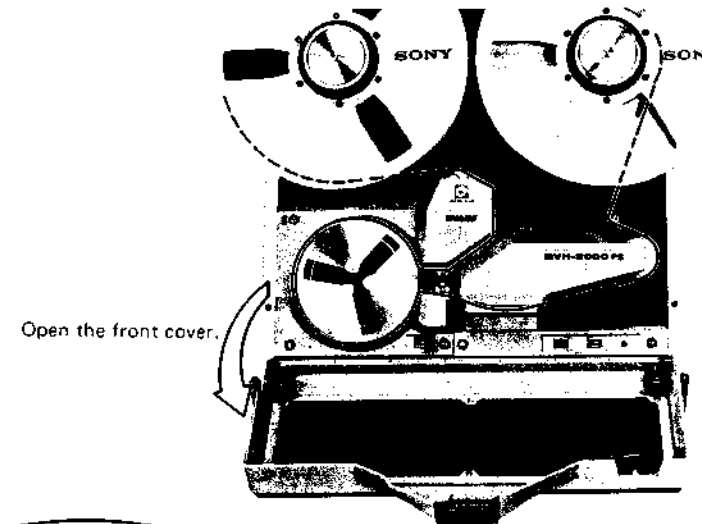
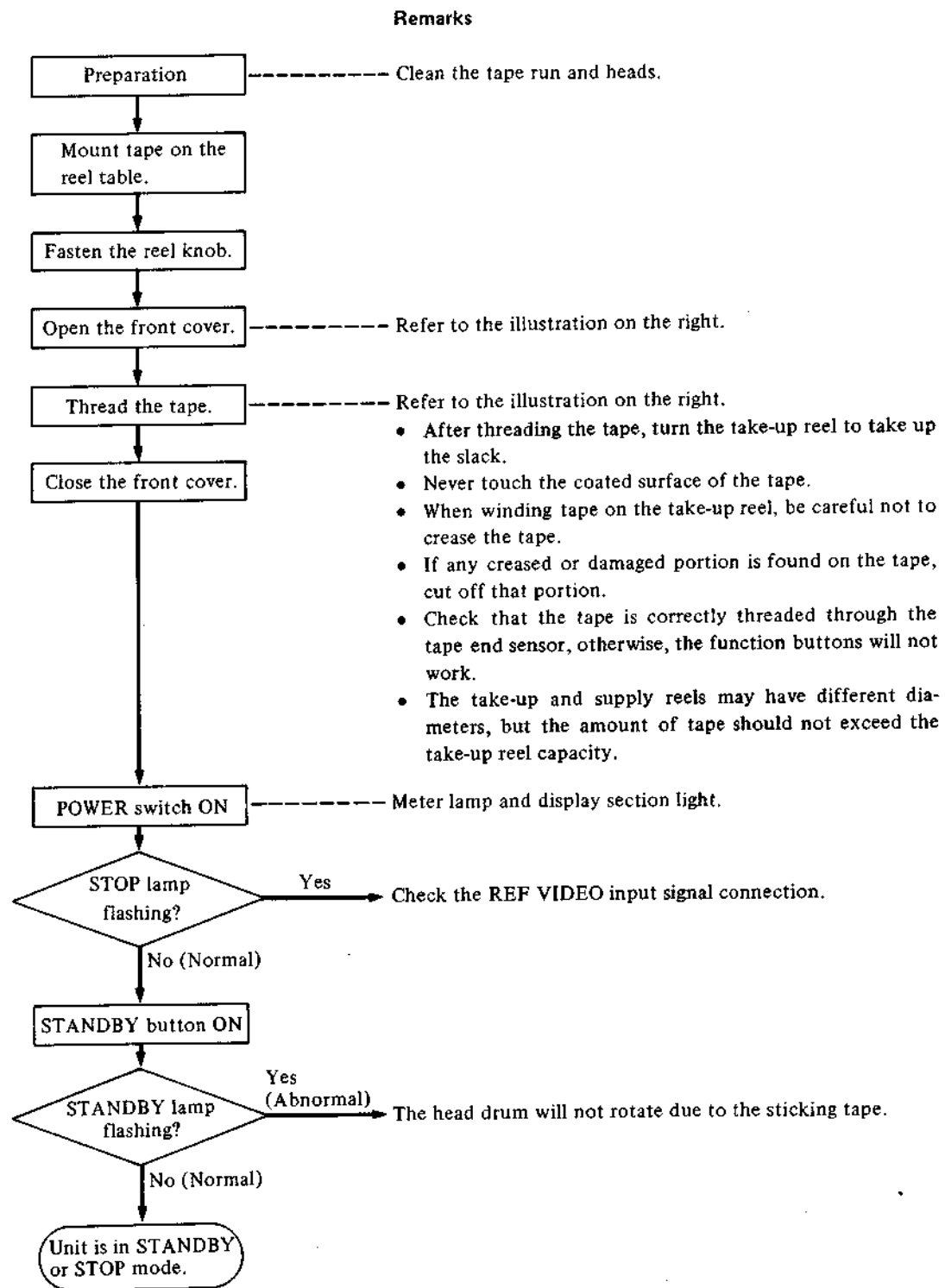


For the dynamic tracking playback with keeping the interlace, change the setting of the No. 5 and No. 6 switches of the S1. (This is effective between the still and the x2 normal speed.)

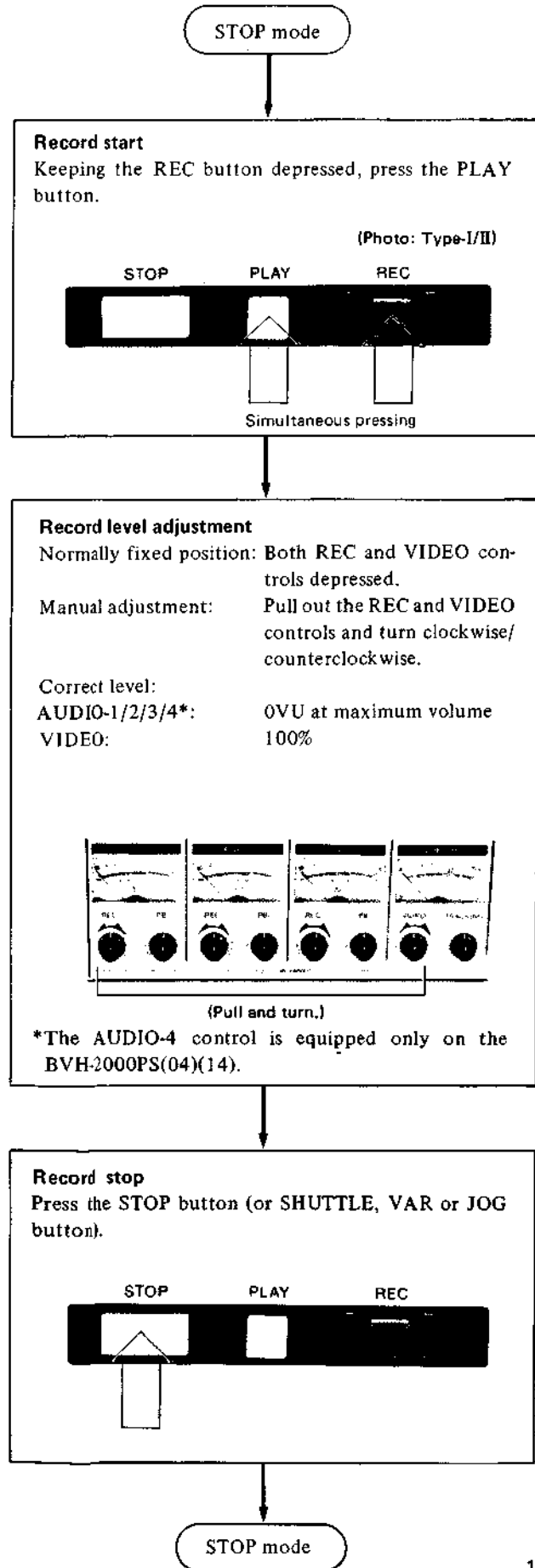
Frame jog mode.



1-7. TAPE THREADING



1-8. RECORDING



Remarks

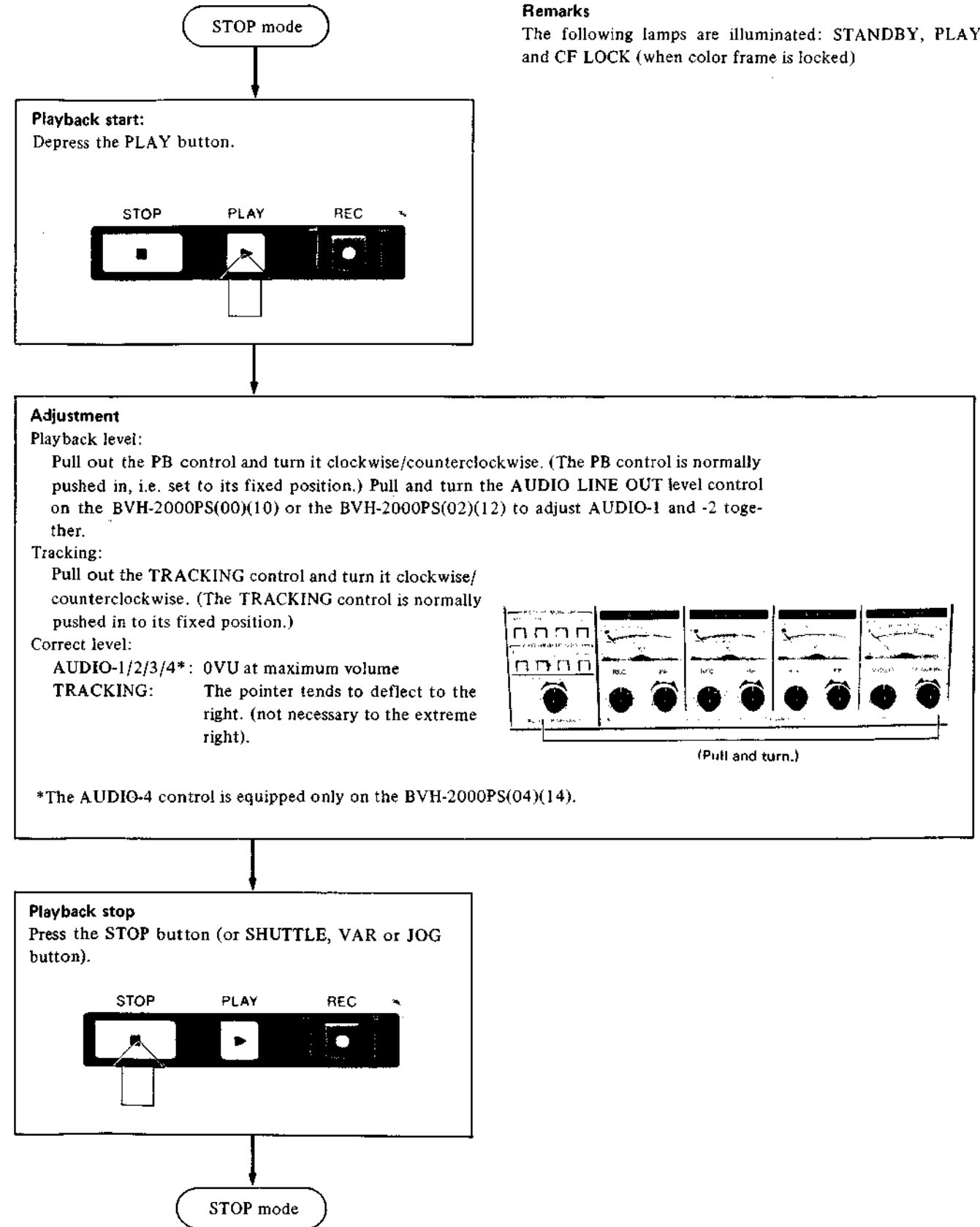
- The following lamps are illuminated: STANDBY, REC, PLAY and CF LOCK (when color frame is locked)
(Note) Recording is impossible while the REC INHIBIT lamp is on. Set the REC INHIBIT switch to OFF.

- Video Monitor
A picture can be monitored by setting the PICTURE MONITOR button and TAPE/EE selector appropriately.
- Audio Monitor
Audio can be monitored by setting the AUDIO MONITOR button and TAPE/EE selector appropriately.

1-85(E)

1-9. PLAYBACK

1-9-1. Normal Speed Playback



Remarks

The following lamps are illuminated: STANDBY, PLAY and CF LOCK (when color frame is locked)


1-86(E)

1-9-2. SHUTTLE

STOP mode

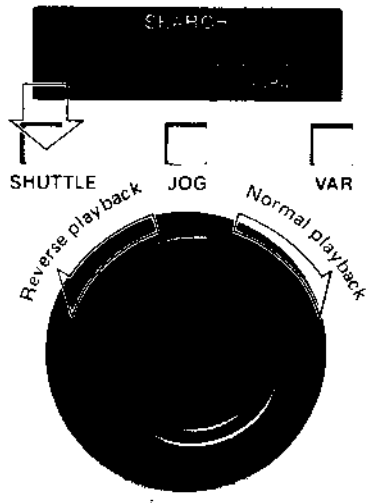
Remarks
SHUTTLE mode can also be set directly from another mode.

For DT playback*, set the HEAD selector to PLAY.



*Noiseless playback from -1 to +3 times the normal speed is possible when the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14) is used.

Press the SHUTTLE button (lamp ON).
Turn the search dial.



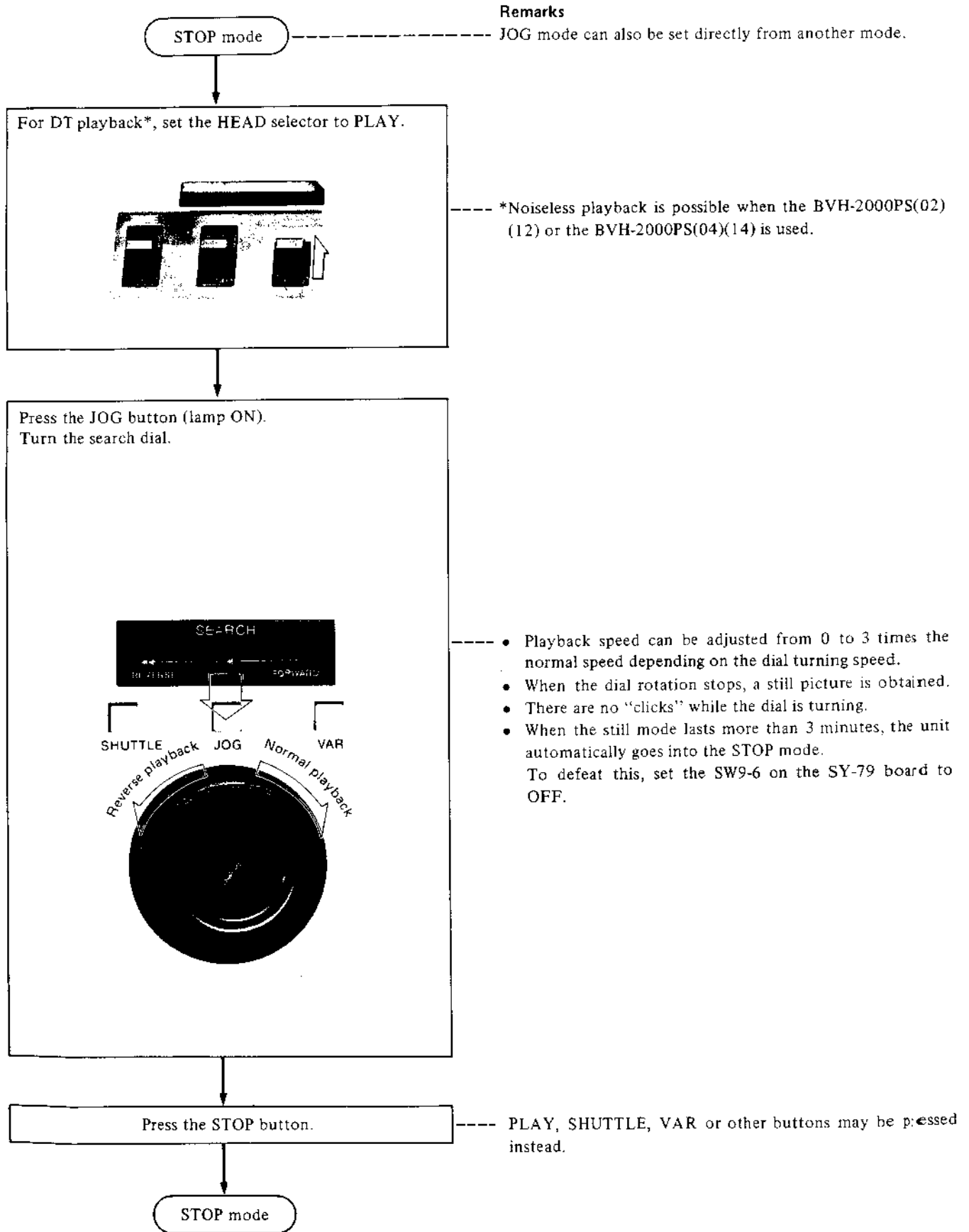
(Photo: Type-I/II)

- Playback speed can be adjusted from 1/32 to 50 times the normal speed depending on the setting position of the dial.
- A still picture is obtained when the dial is set to the center position.
- The dial has a click at the still position, ± 1 and ± 50 times normal speed positions.
- When the still mode lasts more than 3 minutes, the unit automatically goes into the STOP mode. To defeat this, set the SW9-6 on the SY-79 board to off.

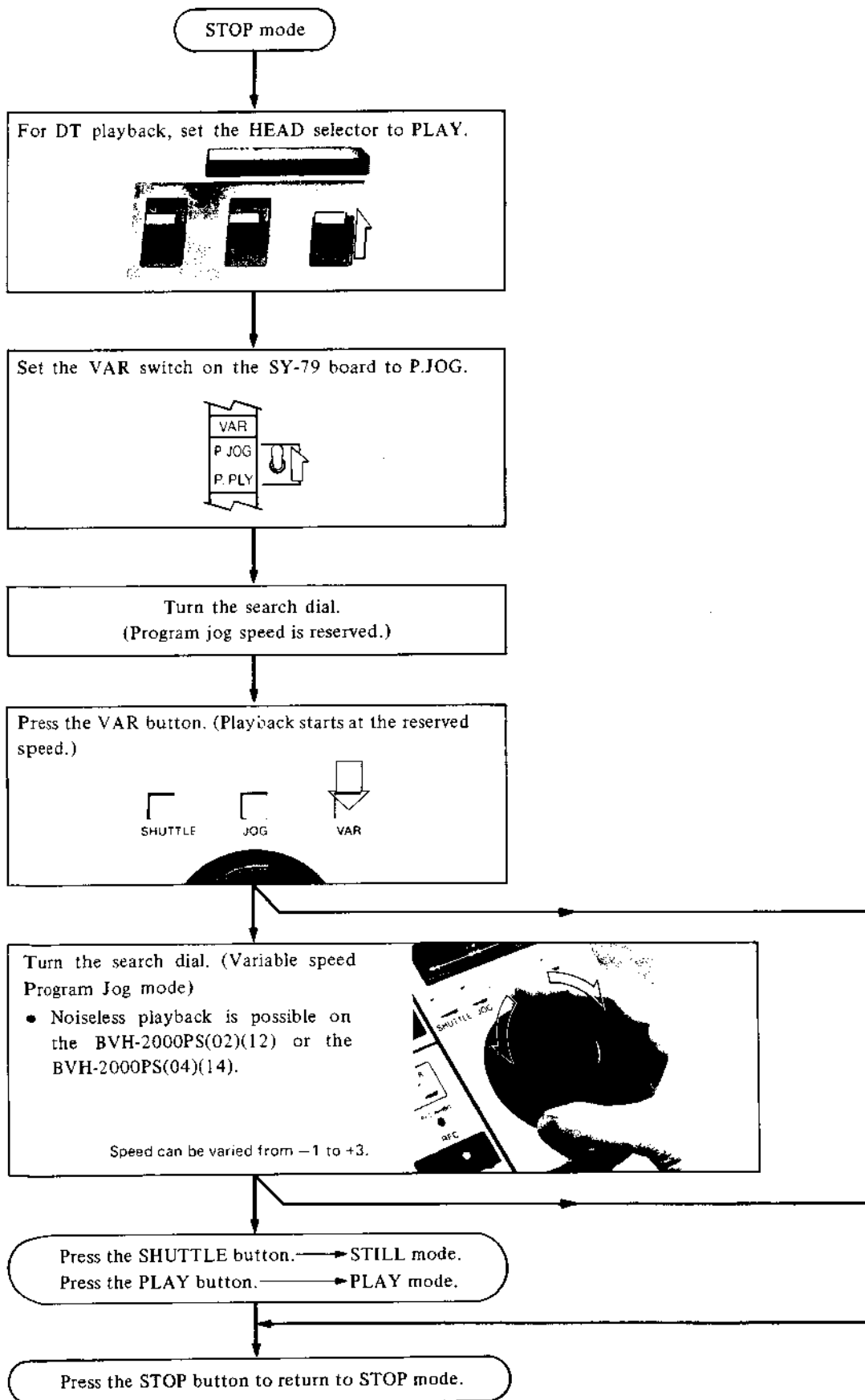
Press the button other than SHUTTLE.

SHUTTLE mode is turned OFF.

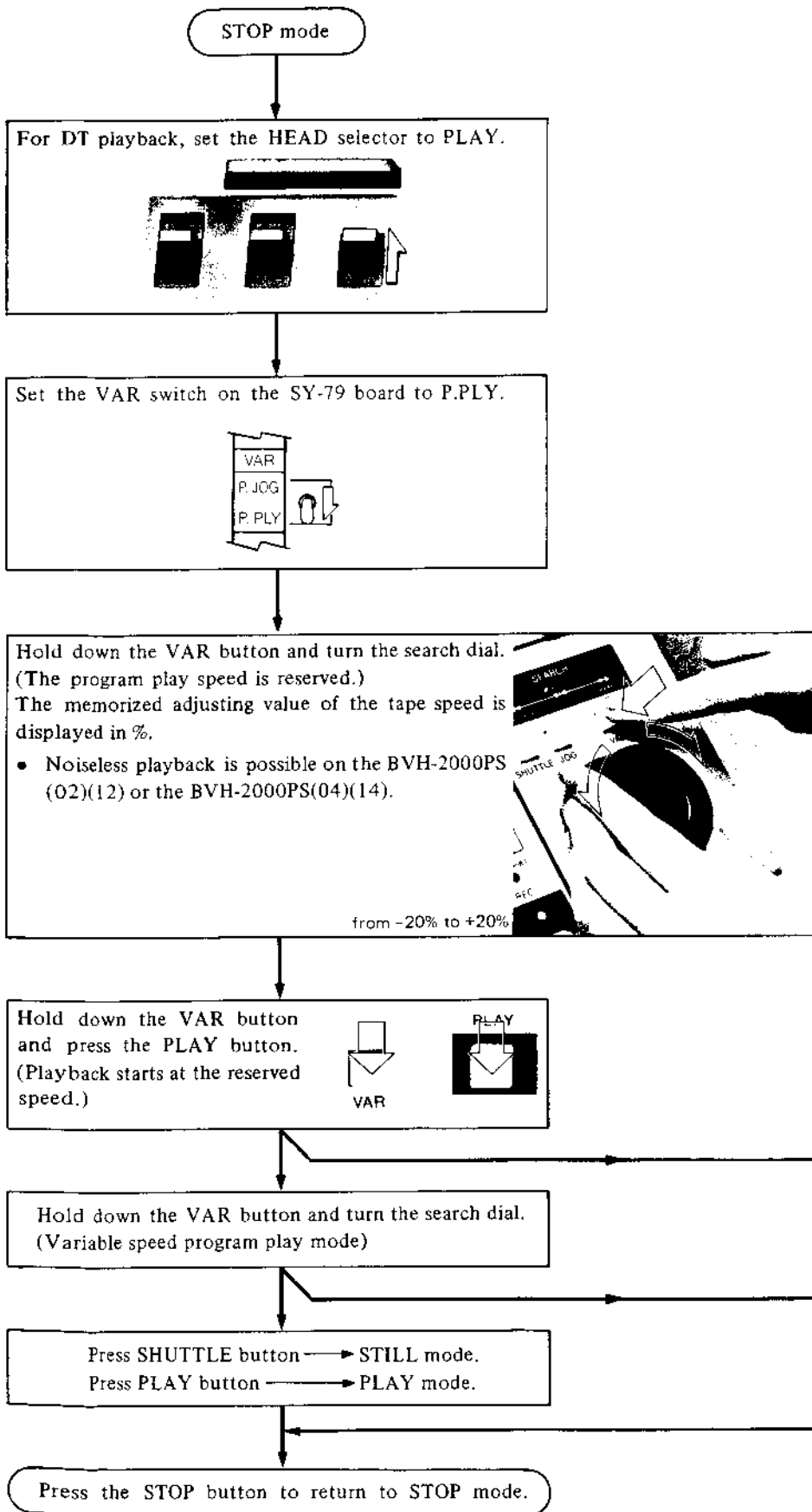
1-9-3. JOG



1-9-4. PROGRAM JOG

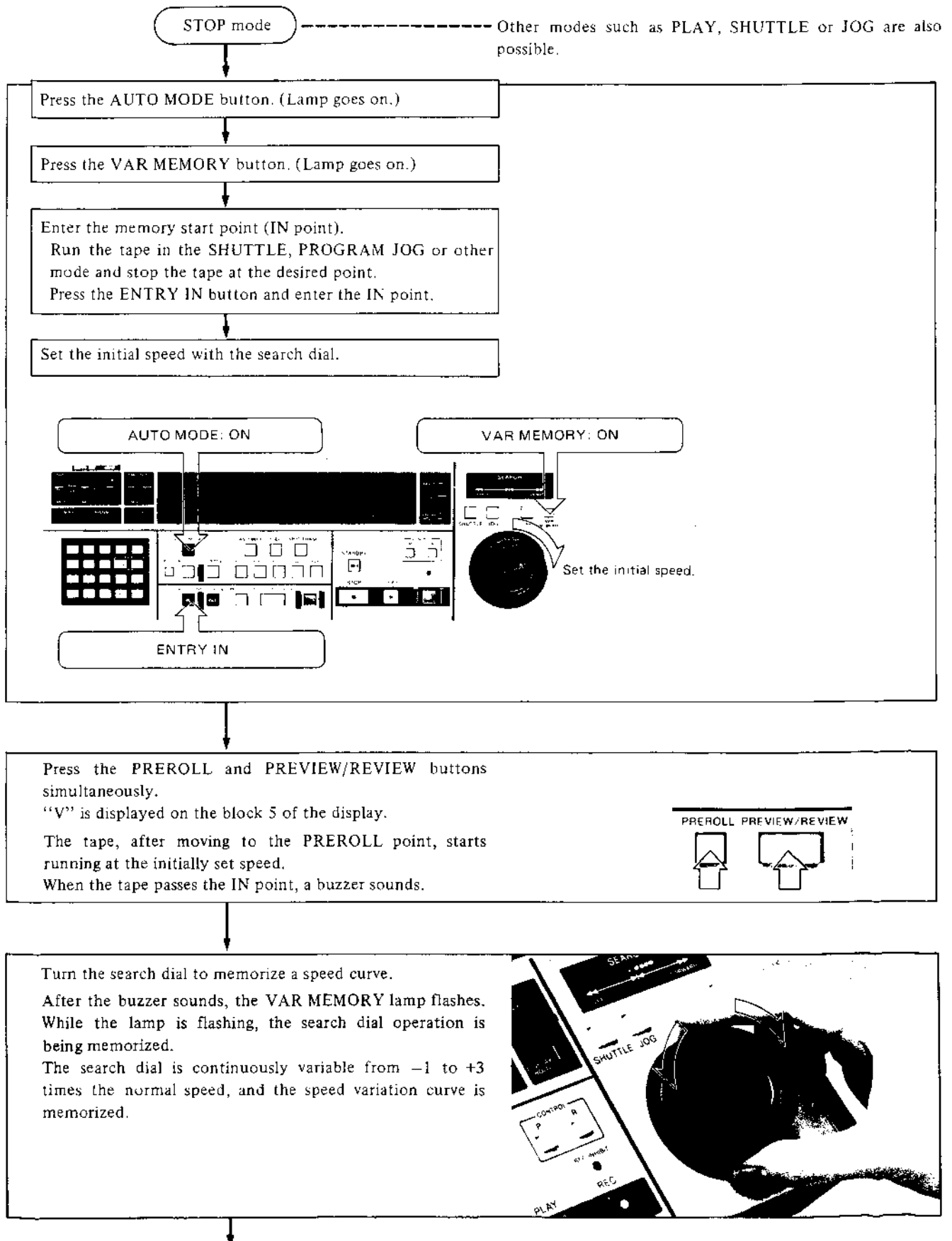


1-9-5. PROGRAM PLAY



1-9-6. VAR MEMORY (Type-III only)

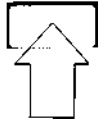
- Noiseless playback is possible on the BVH-2000PS(02)(12) or the BVH-2000PS(04)(14).



Press the STOP button to stop the memory operation.

Press the PREVIEW button. (Playback will be performed according to the memorized curve.)

PREVIEW REVIEW



1. The tape runs to the preroll point, $[(IN\ point) - (PREROLL\ time\ (sec) \times initial\ speed)]$.
 2. After the PREROLL run, the tape starts running at the set initial speed.
 3. When the tape passes the IN point, the buzzer sounds and the display indication begins flashing. At this time, the tape is played back according to the curve stored in memory.
 4. When the tape reaches the memory end, the display is turned off and the normal PROGRAM JOG mode is set.
- To play back this section once more, press the PREVIEW button.

Standby mode for the VAR memory playback

When only the PREROLL button is pressed, the tape runs to the preroll point and stops there (standby mode for the VAR memory playback).

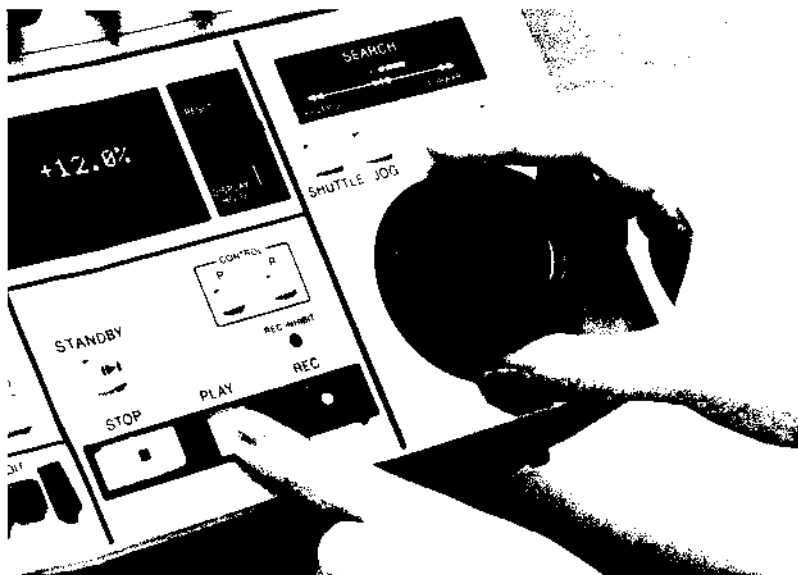
To start playback at the desired time, press the PREVIEW/REVIEW button before the start time by the preroll time and the playback at the memorized curve will begin at that time.

1-9-7. Capstan Override

To synchronize with another VTR, turn the search dial during playback with the PLAY button depressed. Adjustment can be made in the range of $\pm 15\%$ of normal speed.

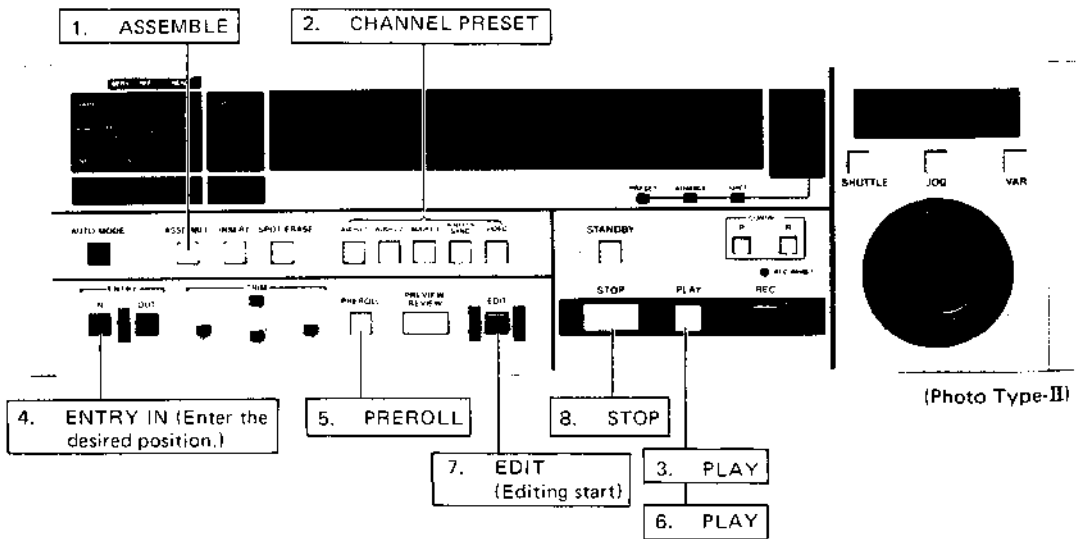
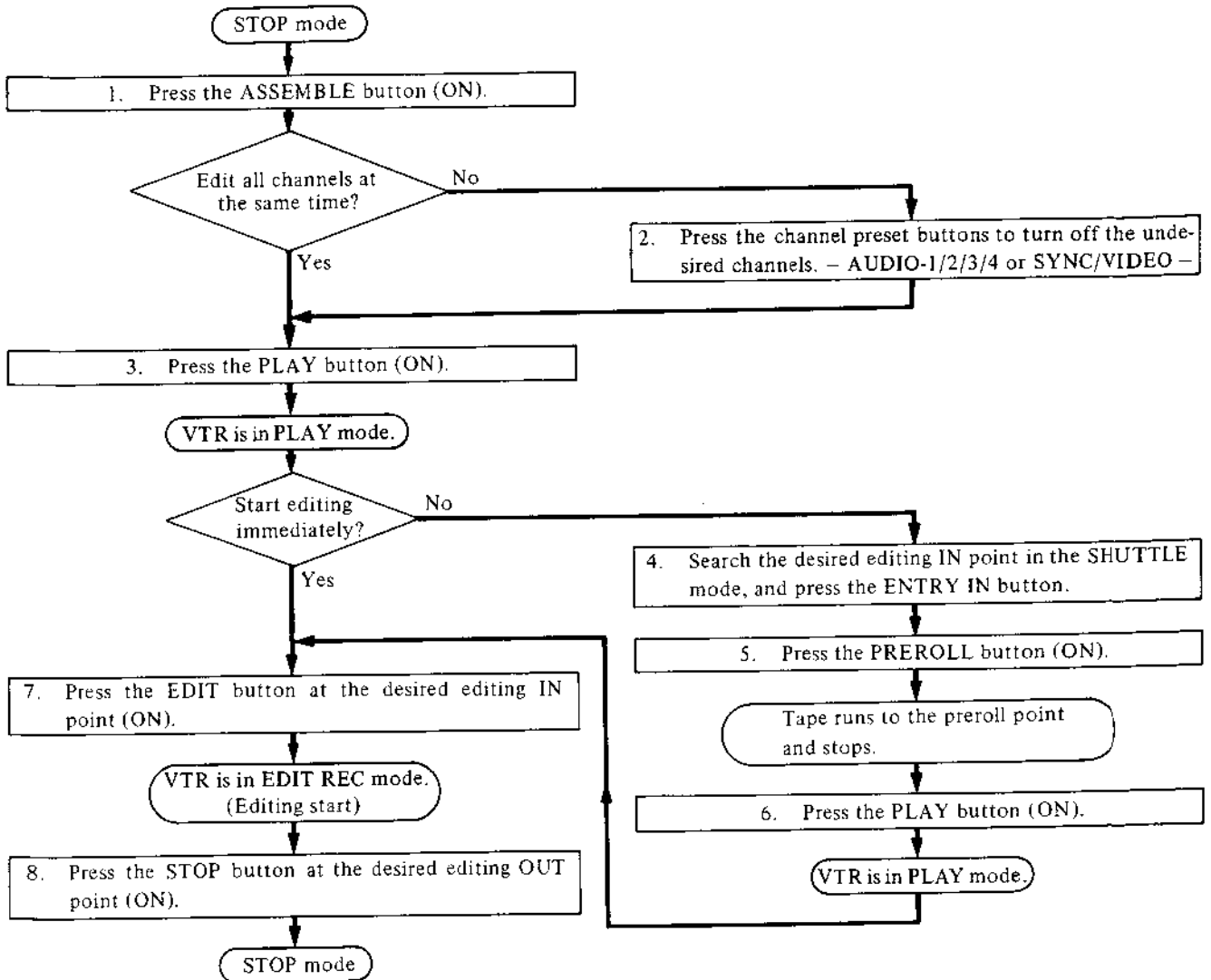
The tape speed during this operation is indicated in % on the display (Type-II/III).

When the PLAY button is released, the speed returns to the normal (x1) playback speed.

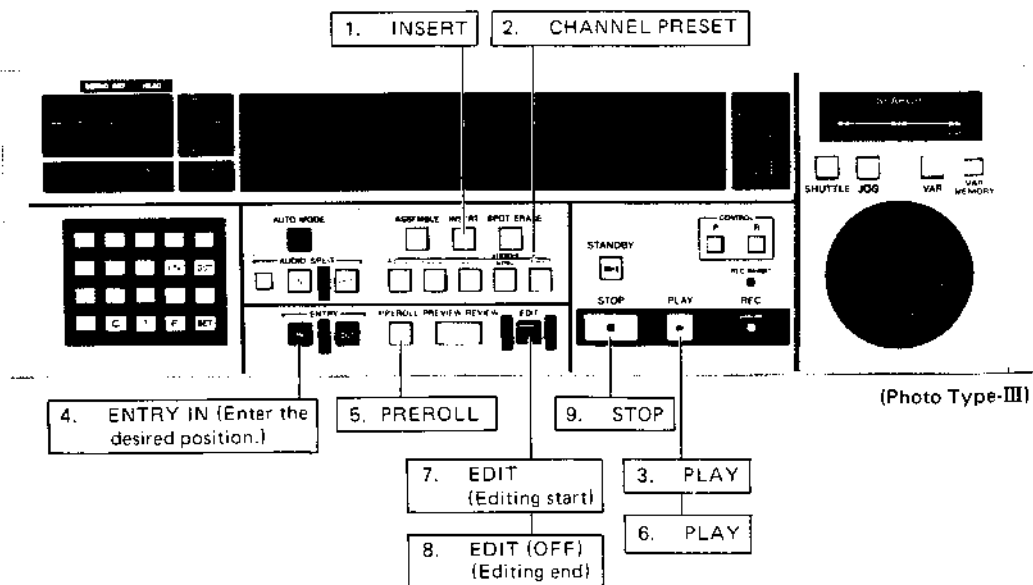
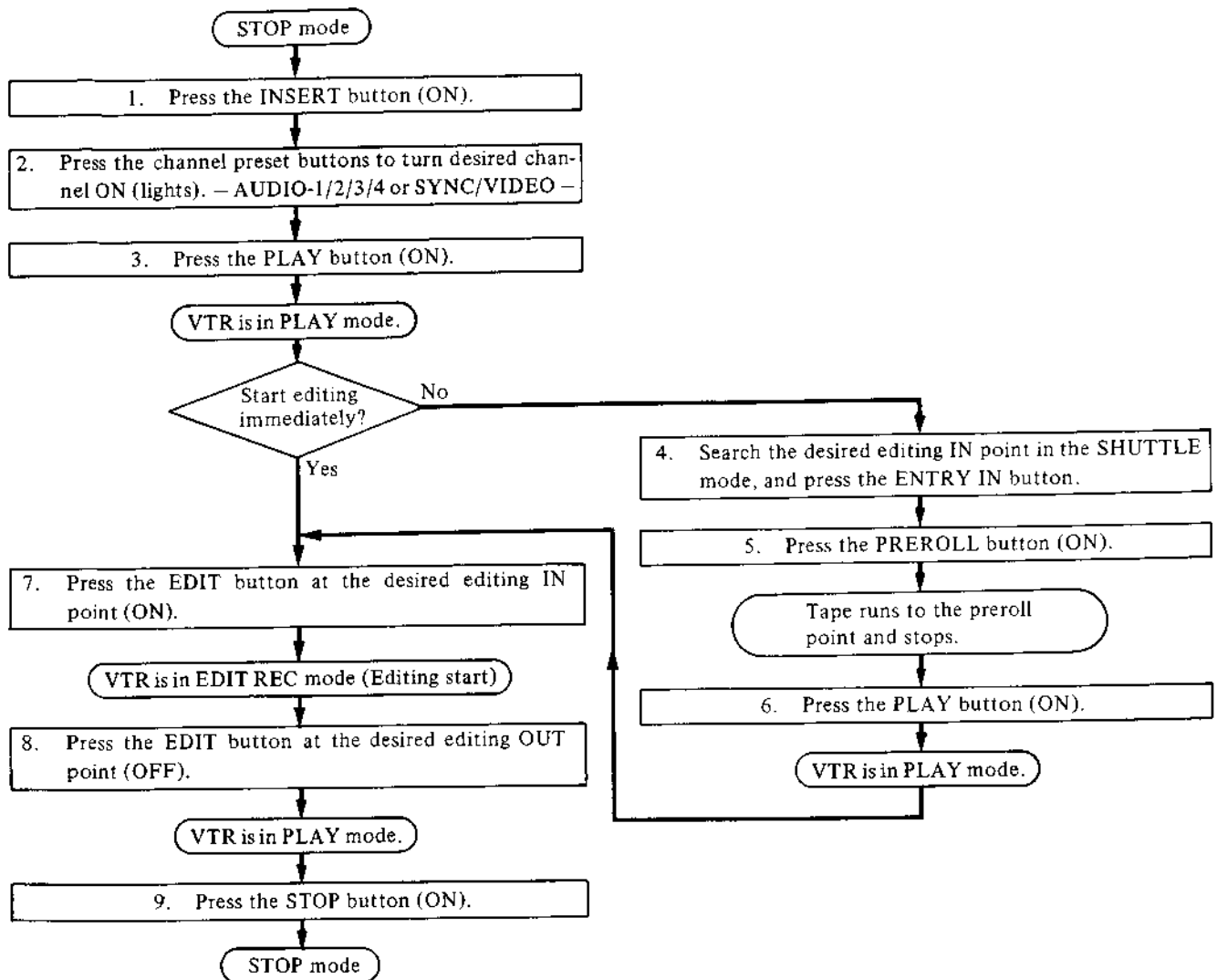


1-10. MANUAL EDITING

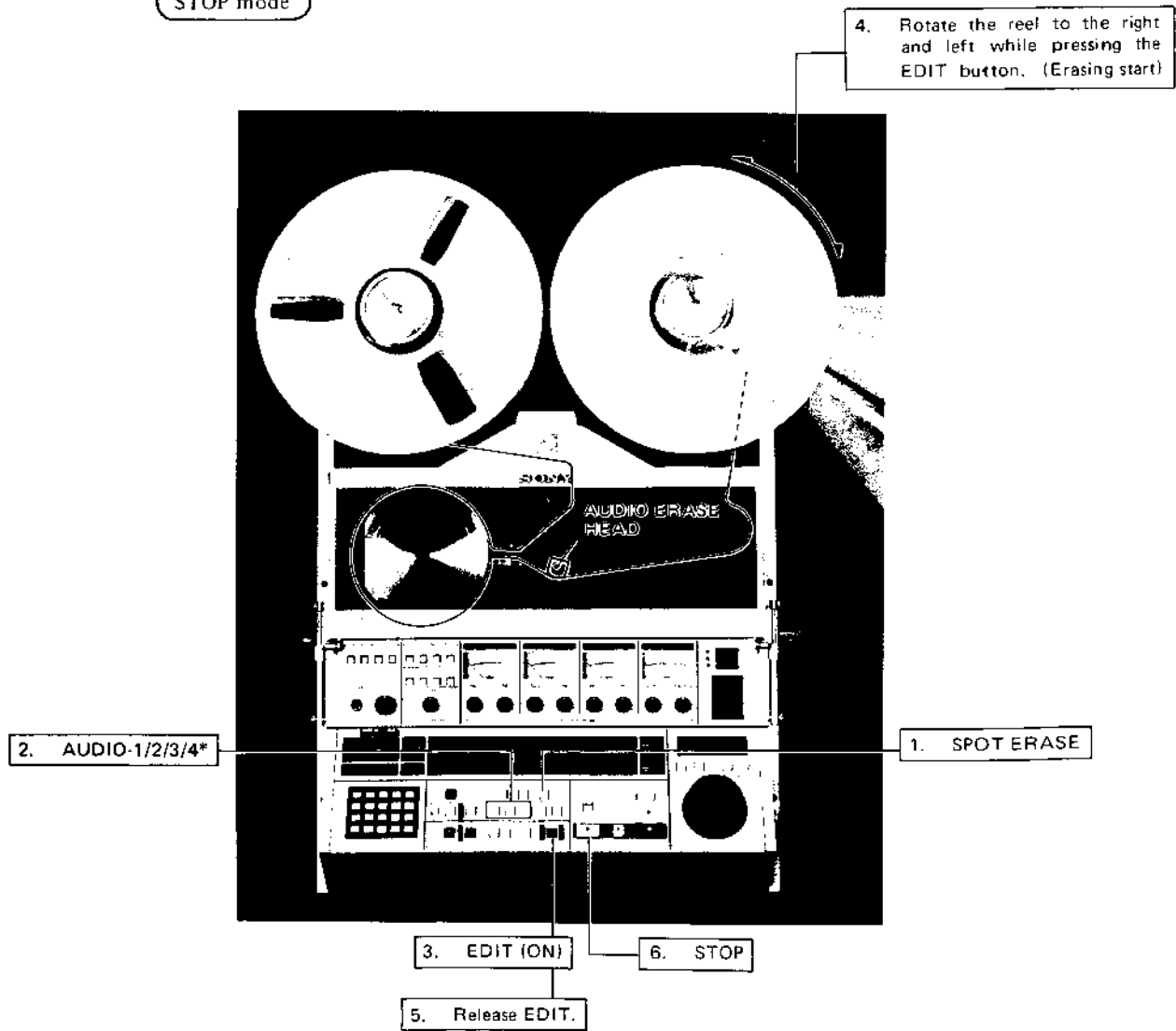
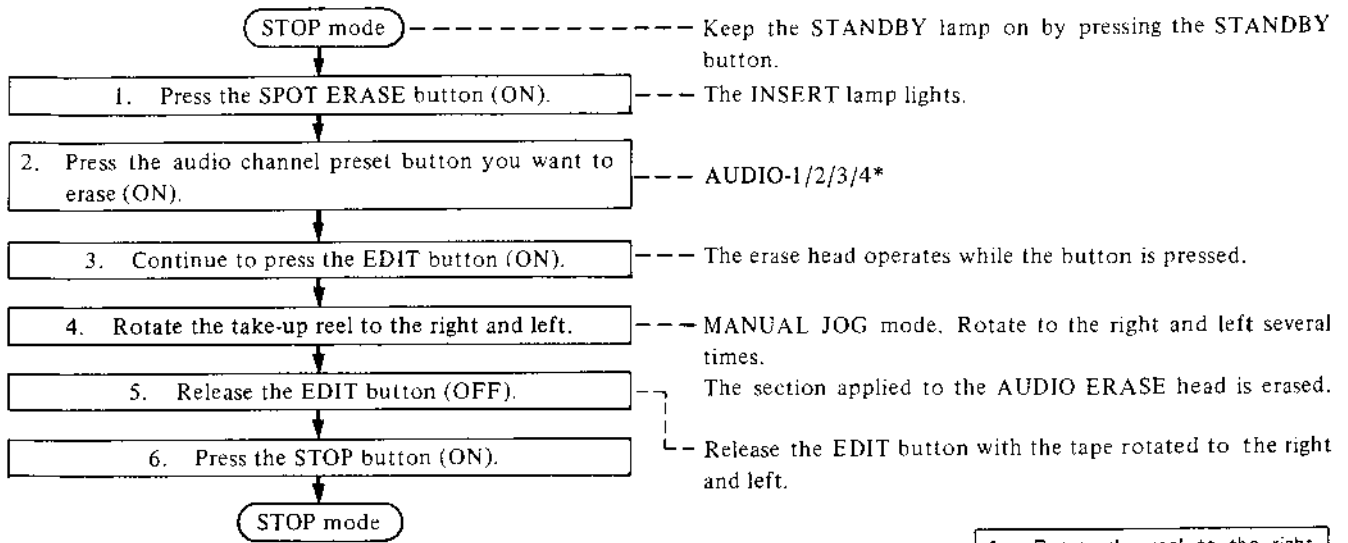
1-10-1. Assemble Editing



1-10-2. Insert Editing



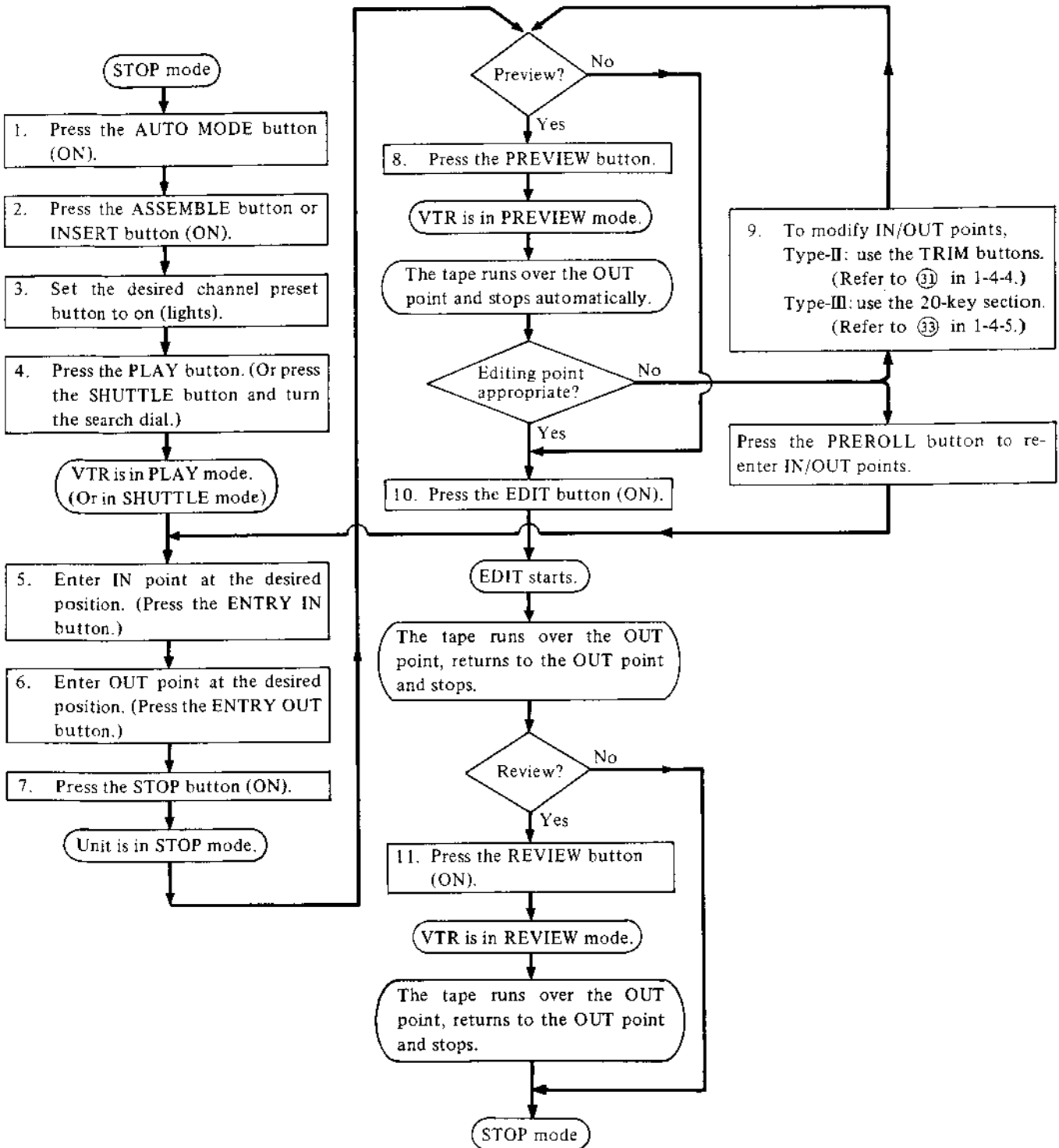
1-10-3. Spot Erase

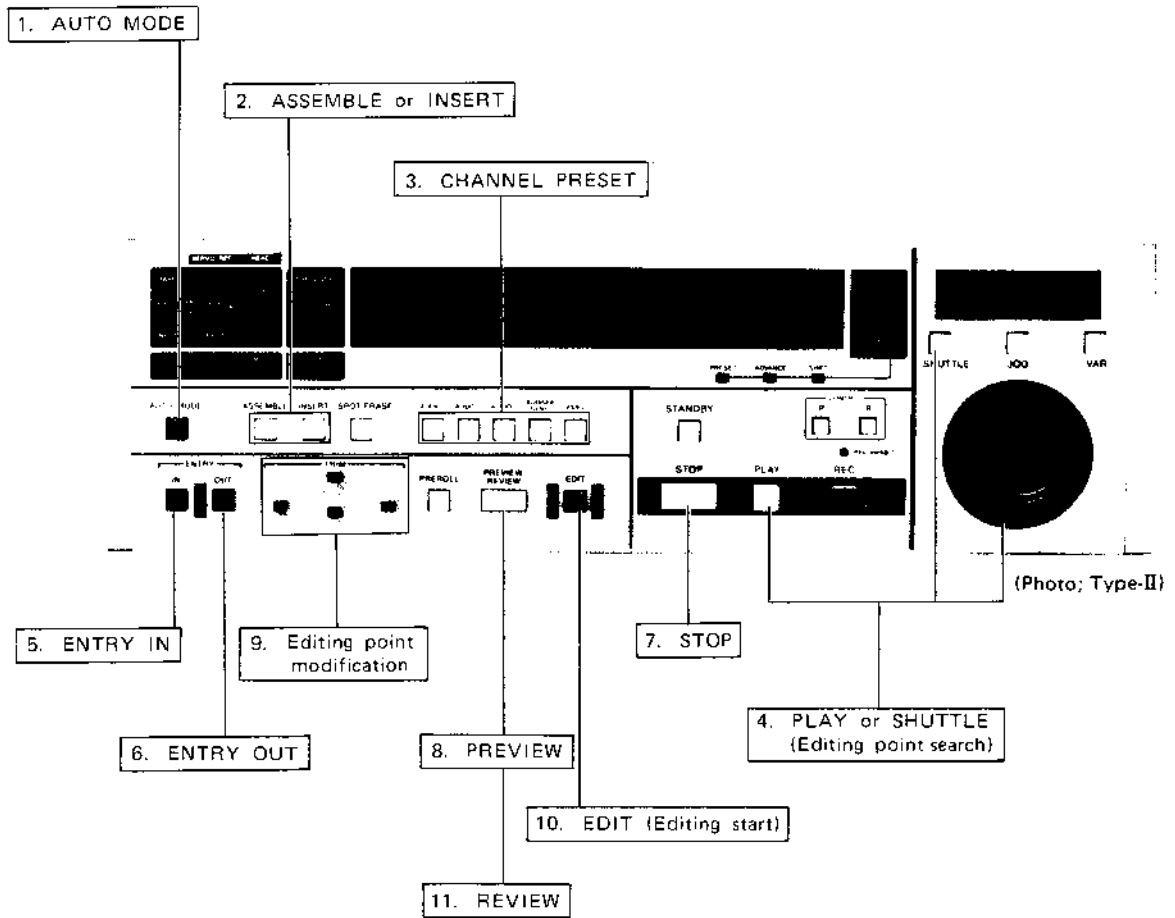


*The AUDIO-4 button is equipped only on the BVH-2000PS(04)(14).

1-11. AUTO EDITING

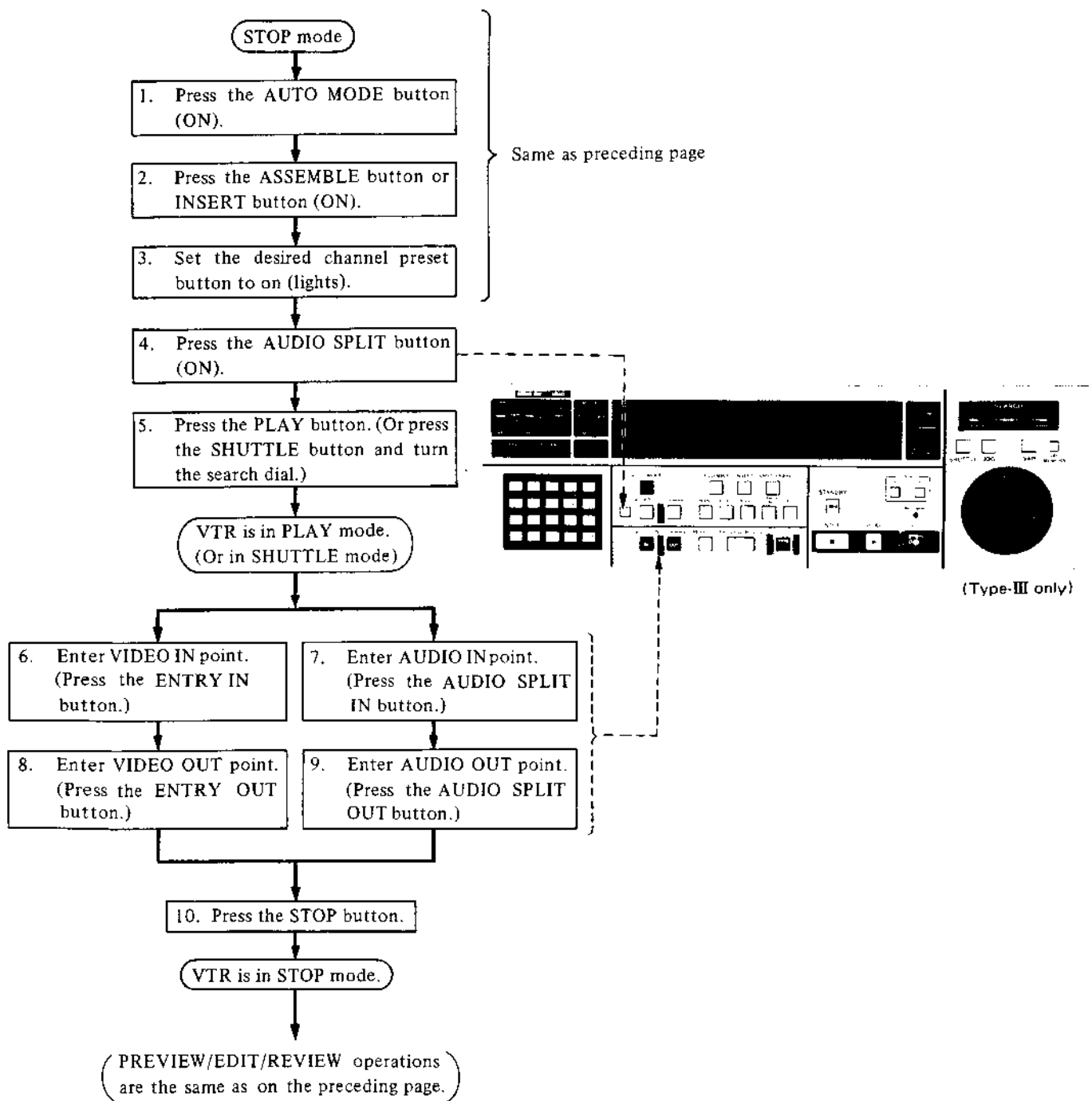
1-11-1. Basic Operation





1-11-2. AUDIO SPLIT EDITING (Type-III only)

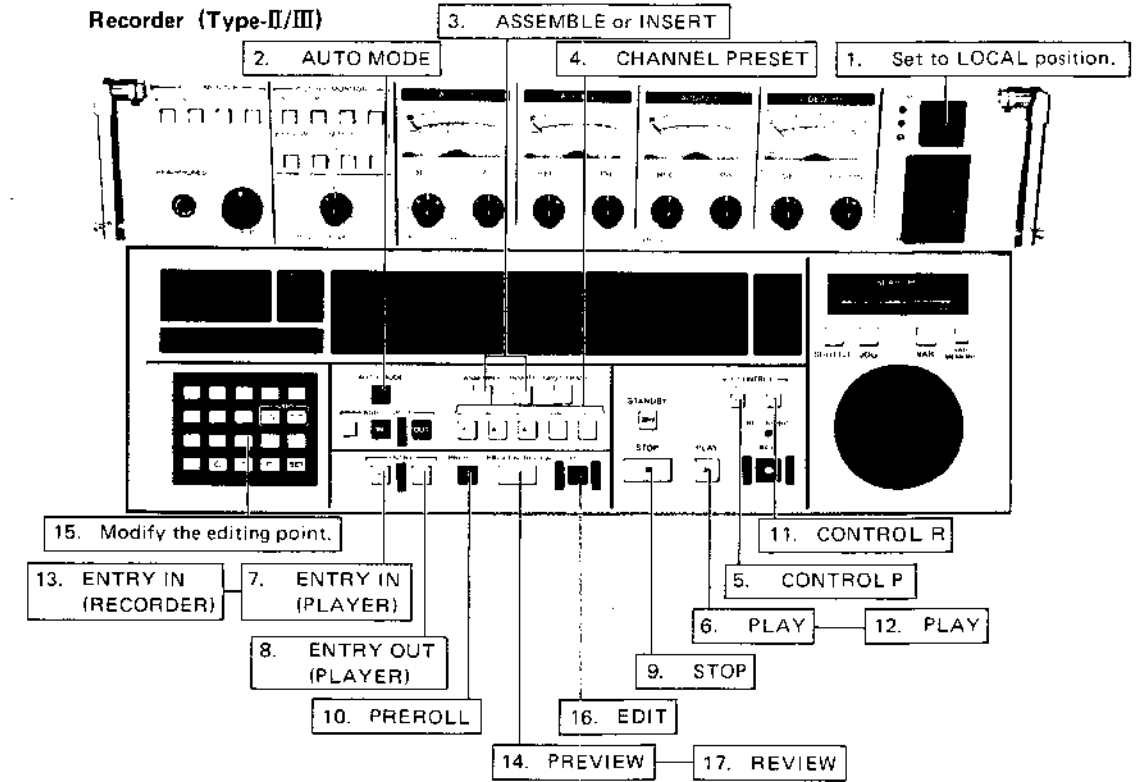
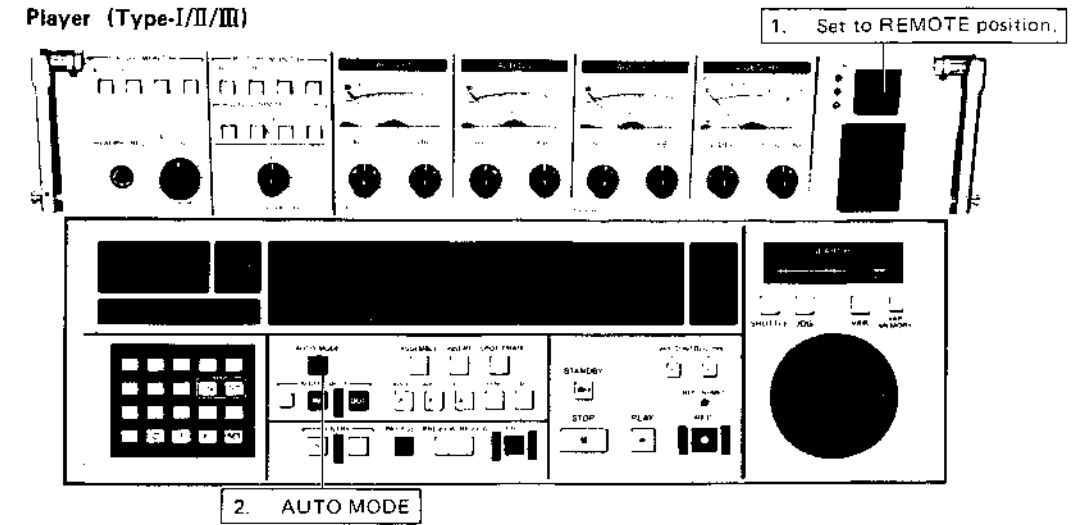
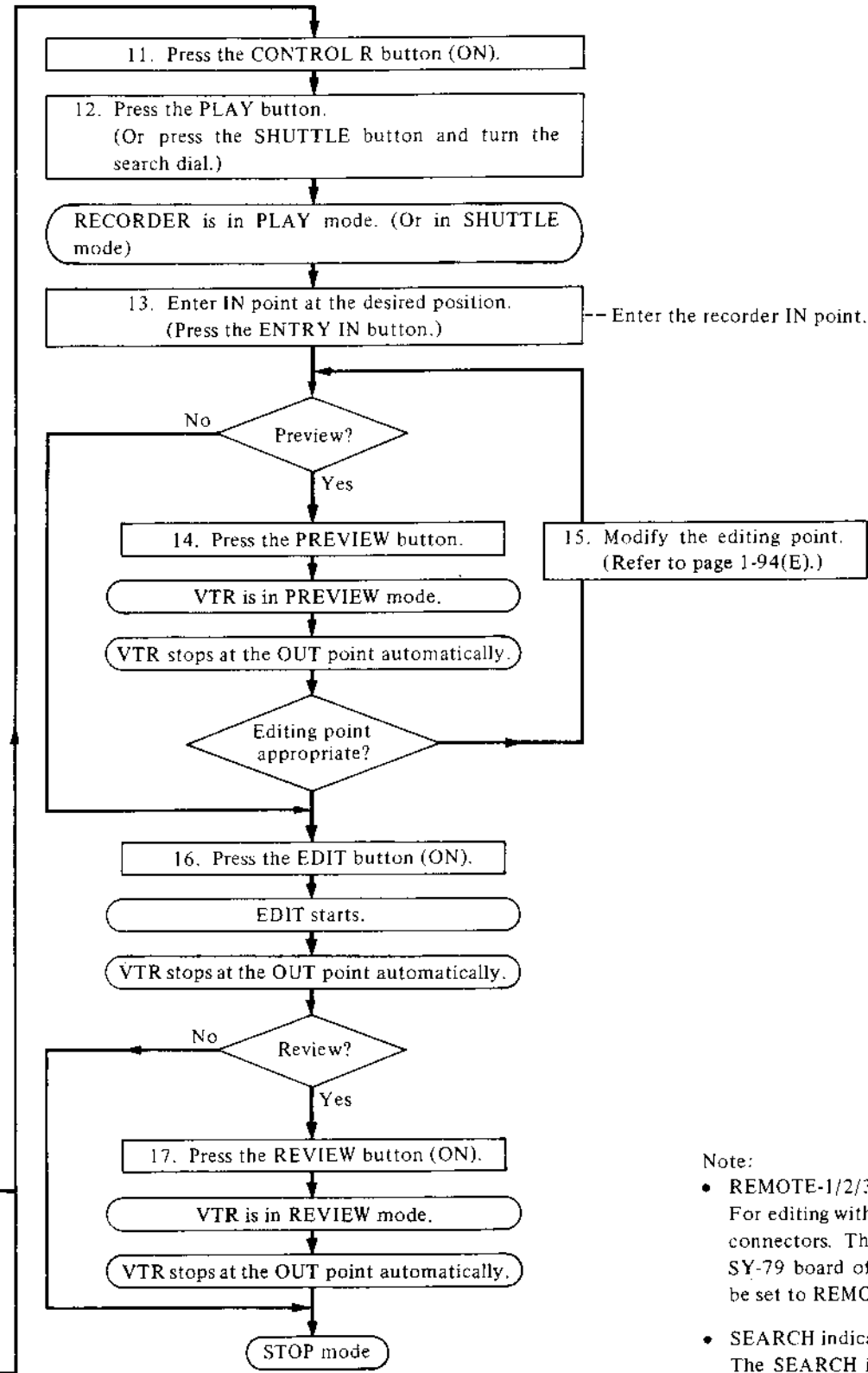
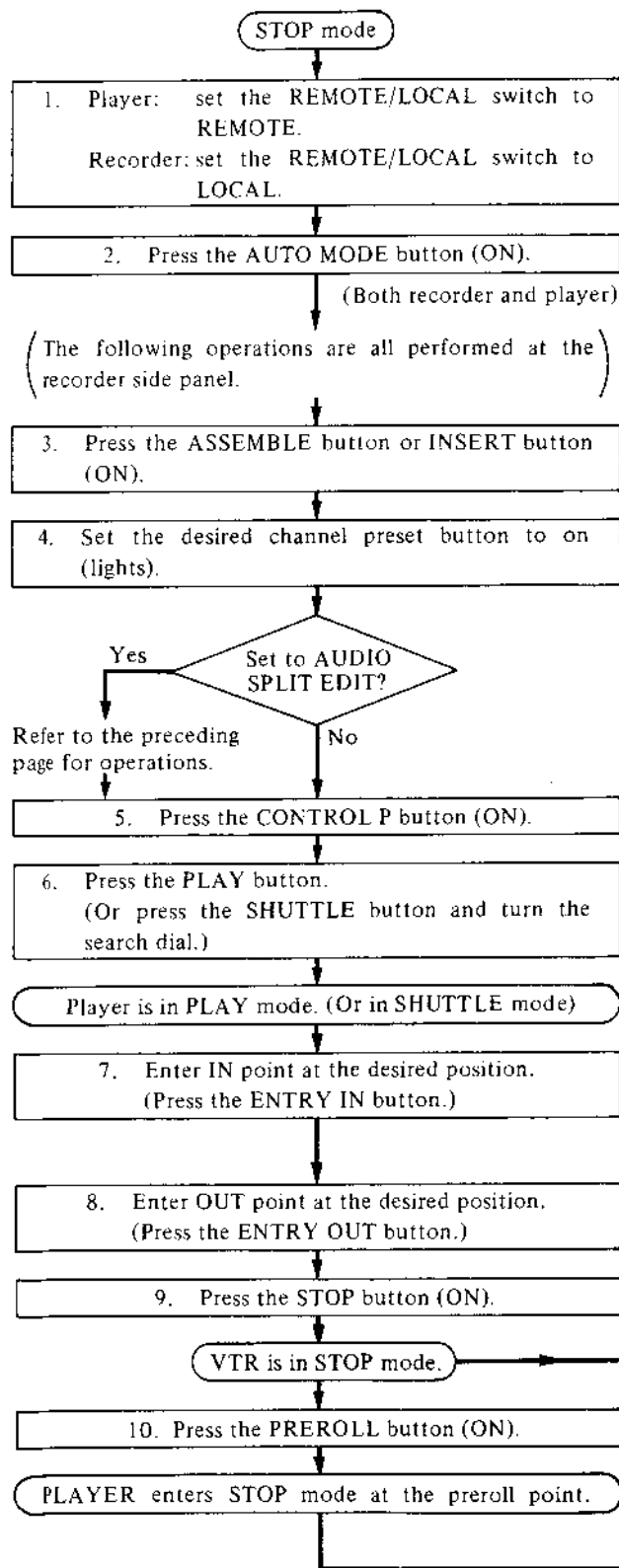
Enter the AUDIO and VIDEO IN and OUT points respectively so as to set to audio split edit. Apart from this, operations are basically the same as those described on the preceding page.



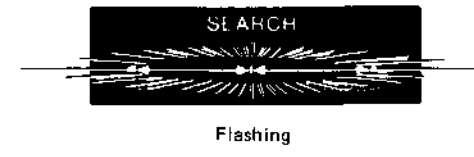
- Editing point modification following PREVIEW is also the same as on the preceding page. In brief, modify using the 20-key section (including AUDIO IN/OUT keys), or re-enter the editing point after PREROLL.

- After AUDIO SPLIT editing start, the AUDIO SPLIT lamp continuous to light. Therefore, when AUDIO SPLIT editing is completed, press the button to be turned off (lamp goes off).

1-11-3. Editing with Two VTRs
(Player - Recorder)



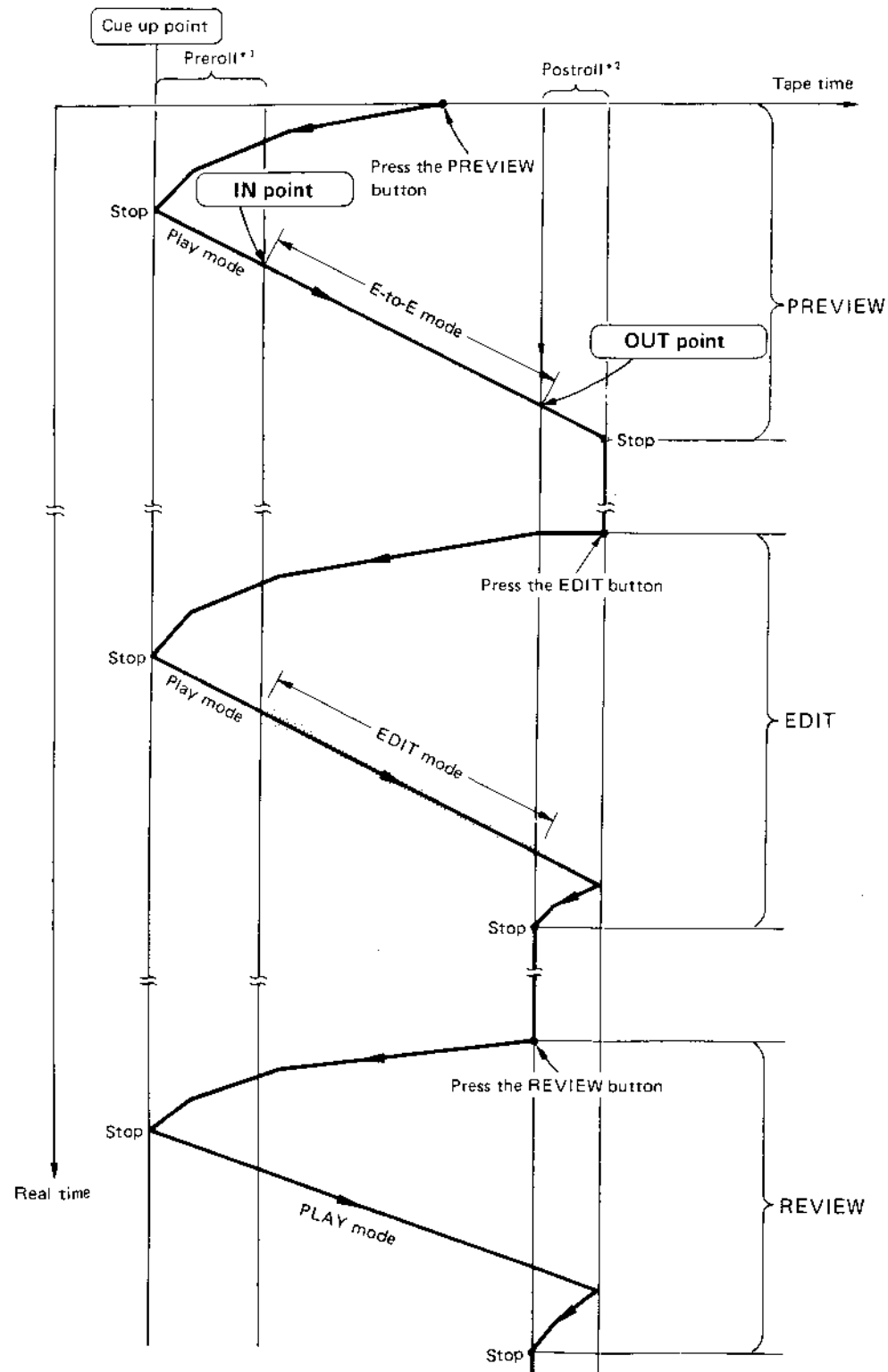
- Note:
- REMOTE-1/2/3 selection
For editing with two VTRs, connect using the REMOTE-2 connectors. Therefore, the REMOTE switches on the SY-79 board of the recorder and the player also should be set to REMOTE-2.
 - SEARCH indicator flashing
The SEARCH indicator flashes when entering the mode which cannot be controlled on the existing operation panel in LOCAL mode. For example, the SEARCH indicator on the player flashes to attract the operator's



attention because the panel on the player cannot indicate INSERT if selected to LOCAL after setting a player with Type-I panel to REMOTE and remote-controlling from the RECORDER to INSERT mode. (Operation is normal even if the indicator flashes.)

The PREVIEW, EDIT and REVIEW timing chart in the auto editing mode is shown in the figure below.

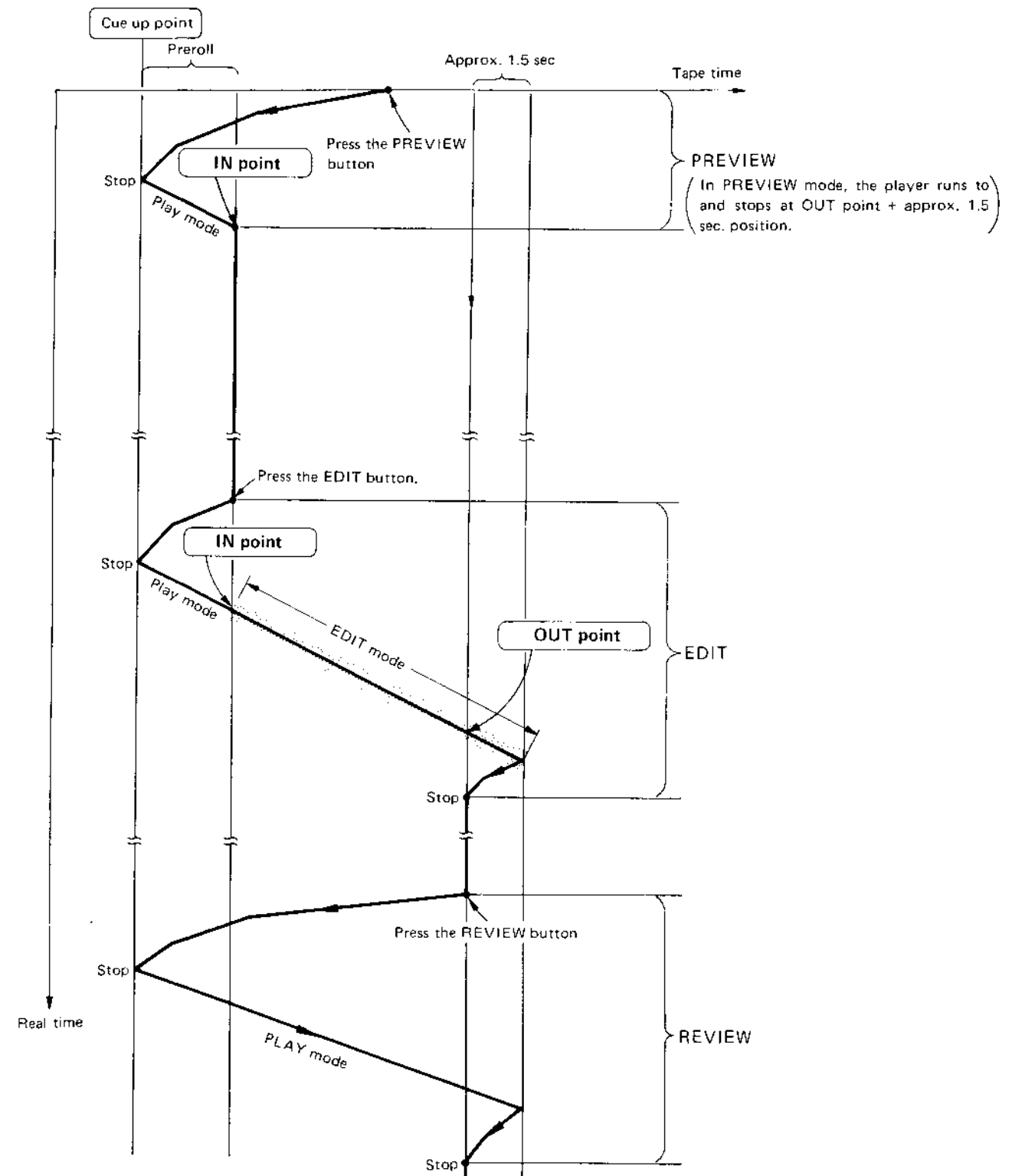
INSERT Editing



*1. The PREROLL time can be changed in the range of 0 to 15 seconds using the PREROLL TIME switch on the SY-79 board.

*2. The POSTROLL time is the same as the PREROLL time.

ASSEMBLE Editing



1-11-4. Editing Monitor

The monitor output signal in the PREVIEW and EDIT modes varies as in the table below depending on the setting of the HEAD and TAPE/EE selectors. The signal phase changes at the points indicated with an X in the table and consequently the monitor picture may be disturbed. However, the disturbance occurs only on the monitor picture and the editing is performed normally.

VIDEO monitor

HEAD selector in R/P head position

	TAPE/EE selector	IN point		OUT point		
PREVIEW	TAPE	R/P head OFF TAPE		EE	R/P head OFF TAPE	
	TAPE/EE	R/P head OFF TAPE		EE	R/P head OFF TAPE	
EDIT	TAPE	R/P head OFF TAPE	X	BVH-2000PS(00)(10): EE BVH-2000PS(02)(12), BVH- 2000PS(04)(14): PLAY head (CONFI) OFF TAPE	X	R/P head OFF TAPE
	TAPE/EE	R/P head OFF TAPE		EE		R/P head OFF TAPE

HEAD selector in PLAY head position (for the BVH-2000PS(02)(12) and BVH-2000PS(04)(14)) (The auto skew and auto PG are set to OFF.)

	TAPE/EE selector	IN point		OUT point	
PREVIEW	TAPE	R/P head OFF TAPE		EE	R/P head OFF TAPE
	TAPE/EE	R/P head OFF TAPE		EE	R/P head OFF TAPE
EDIT	TAPE	PLAY head OFF TAPE		PLAY head OFF TAPE	PLAY head OFF TAPE
	TAPE/EE	PLAY head OFF TAPE	X	EE	X	PLAY head OFF TAPE

AUDIO monitor

LINE OUTPUT connector

	TAPE/EE selector	IN point		OUT point	
PREVIEW	TAPE	R/P head OFF TAPE		EE	R/P head OFF TAPE
EDIT	TAPE/EE				

MONITOR OUTPUT connector

	TAPE/EE selector	IN point		OUT point	
PREVIEW	TAPE	R/P head OFF TAPE		EE	R/P head OFF TAPE
	TAPE/EE				
EDIT	TAPE	BVH-2000PS(00)(10): R/P head BVH-2000PS(02)(12), BVH- 2000PS(04)(14): MONITOR head OFF TAPE		BVH-2000PS(00)(10): EE BVH-2000PS(02)(12), BVH- 2000PS(04)(14): MONITOR head OFF TAPE	BVH-2000PS(00)(10): R/P head BVH-2000PS(02)(12), BVH- 2000PS(04)(14): MONITOR head OFF TAPE
	TAPE/EE	R/P head OFF TAPE		EE	R/P head OFF TAPE

1-11-5. Flashing and lighting of lamps in auto edit mode

The various lamps flashing in the AUTO EDIT mode shown in the table below when the S8-8 on the SY-80 board is set to ON, guide the editing operation. Pressing in turn the desired lamp (button) from one of the flashing lamps makes the editing operation possible.

X : off ● : Flashing ○ : on

Steps	Lamps	ENTRY IN	ENTRY OUT	A-IN	A-OUT	PREVIEW /REVIEW	EDIT	Remarks
1	AUTO MODE OFF	X	X	X	X	X	X	
2	AUTO MODE ON	●	●	X	X	X	X	
3	A AUDIO SPLIT ON	●	●	●	●	X	X	
4	U T ENTRY IN only	○	●	X (●)*	X (●)	●	X	When CHANNEL PRESET is turned off.
							●	When CHANNEL PRESET is turned on.
5	ENTRY OUT only	●	○	X (●)	X (●)	X	X	
6	M Both ENTRY IN and OUT	○	○	—	—	●	X ●	
7	0 PREROLL button ON	○	—	—	—	X	X	
8	D PREVIEW button ON	○	—	—	—	○	X	PREVIEW mode
9	E EDIT button ON	○	—	—	—	X	○	
10	0 EDIT mode end	X	X	X	X	●	X	
11	N REVIEW button ON	X	X	X	X	○	X	REVIEW mode Return to step 2 after REVIEW mode is finished.

* AUDIO SPLIT mode is shown in ().

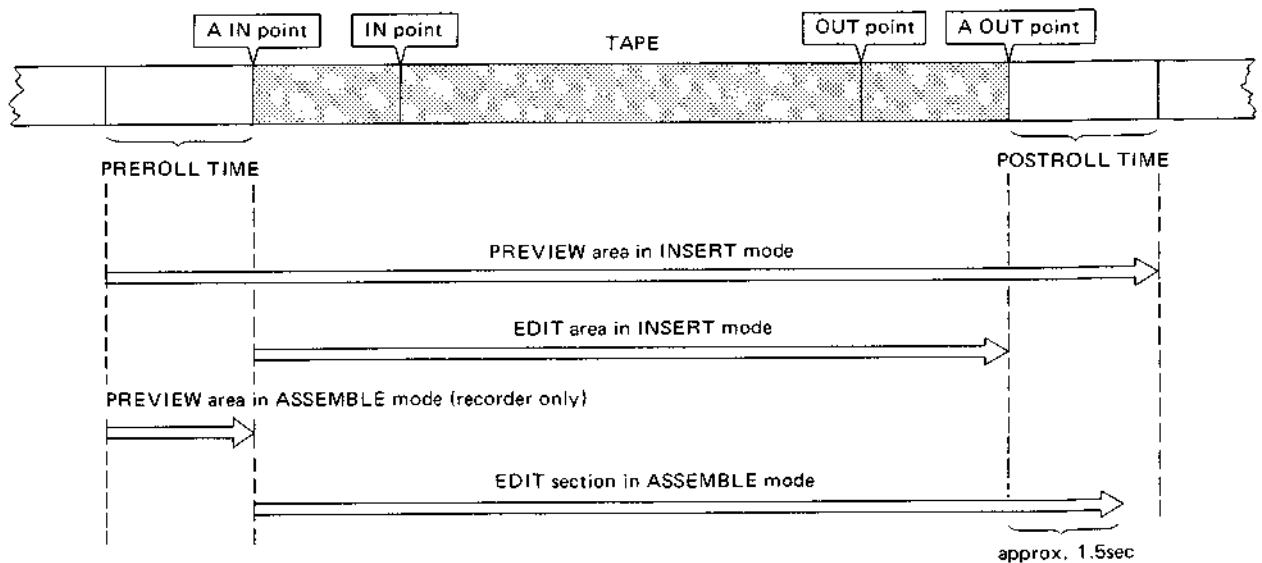
1-11-6. AUDIO SPLIT EDIT area

For audio split editing, the video and audio editing points are entered at different positions on the tape. In this case, the reference editing points are automatically set as follows.

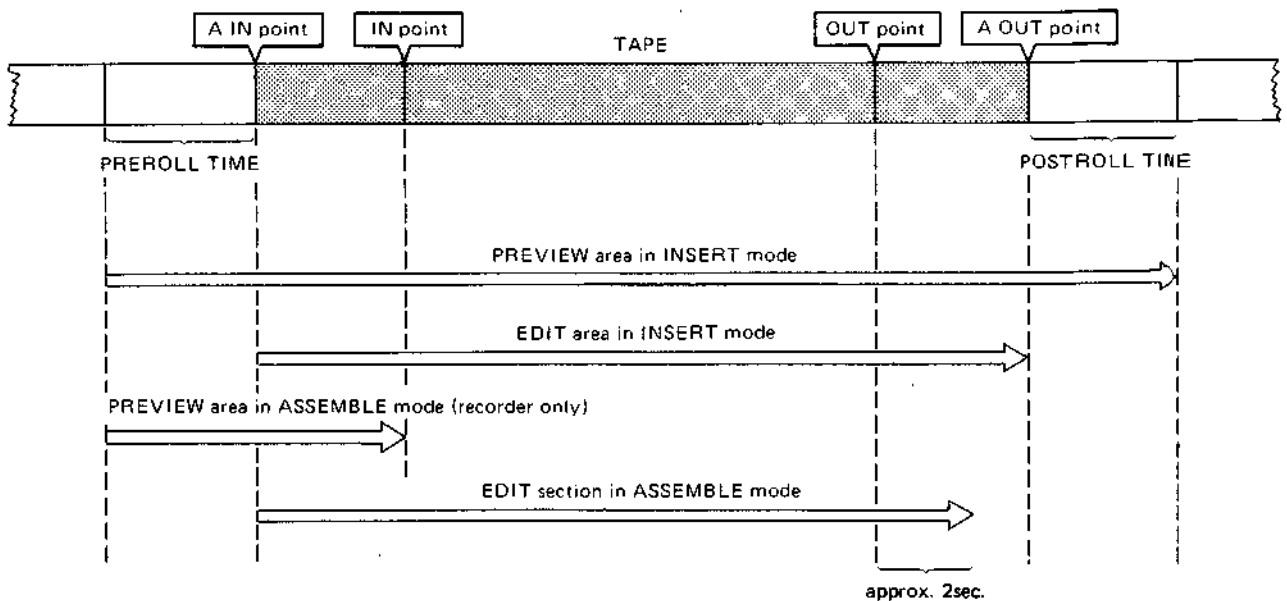
The lower value is the reference point.
(In this example, the A IN point is the reference point.)

The higher value is the reference point.
(In this example, the A OUT point is the reference point.)

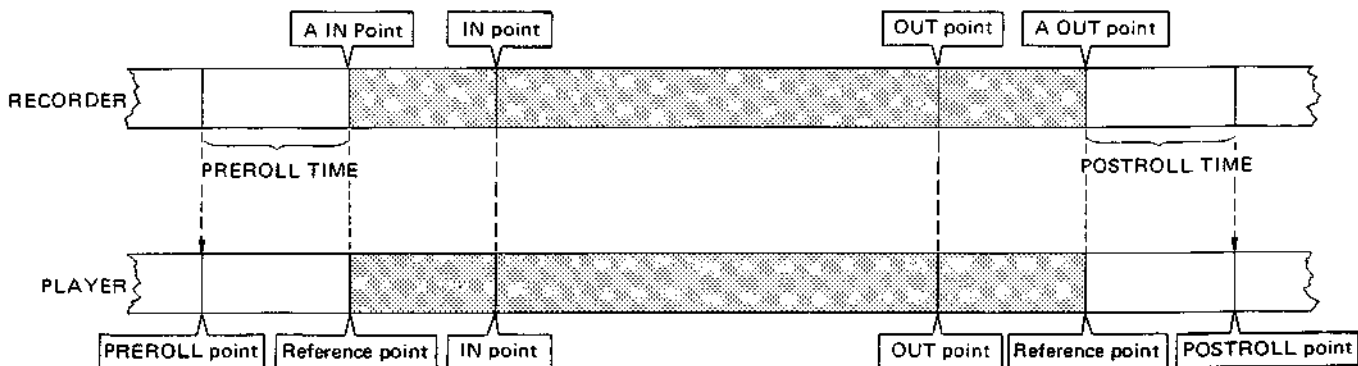
For the model with the serial No. 10001 to 10699



For the model with the serial No. 10701 and higher



For audio split editing in the INSERT mode using two VTRs, the edit points on the player are normally defined by the IN and OUT points of the video signal. In this case, the reference points on the player is decided by the reference points on the recorder as follows.



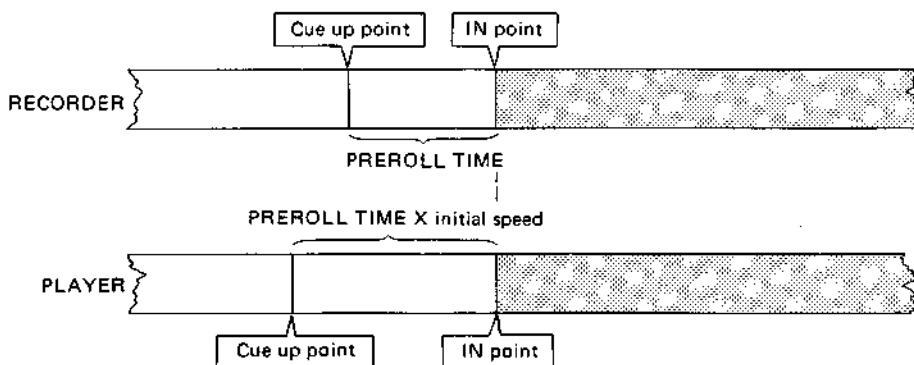
1-11-7. VAR MEMORY mode editing (for the BVH-2000PS(02)(12) and BVH-2000PS(04)(14))

While playing back a tape with the speed of a curve memorized in the VAR MEMORY mode, the playback picture can be recorded on the recorder (VAR MEMORY mode editing).

Refer to 1-9-6 for player operation.

Recorder operation is the same as normal editing operations.

The cue up points are as follows.



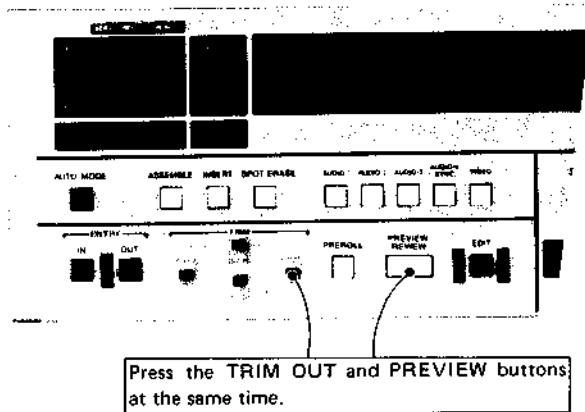
Thus, the initial speed in the VAR MEMORY mode is not necessarily one times the normal speed, so the player cue up point will be different from that of the recorder. This is because the player and recorder have to run at the same time at the IN point.

1-11-8. OUT point PREVIEW

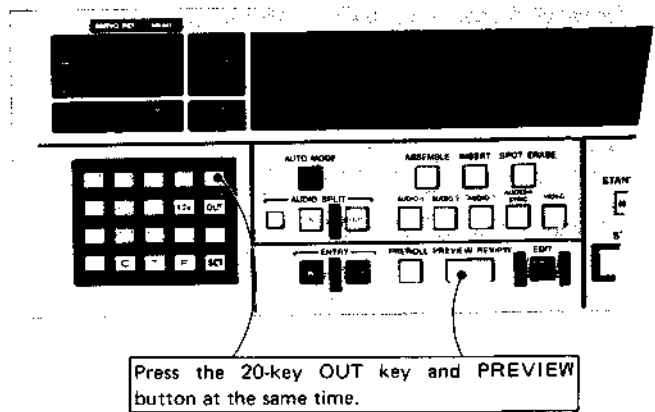
Editing with one VTR:

If the buttons shown in the figure below are pressed when the IN and OUT points have been entered in the INSERT mode, the OUT points can be previewed.

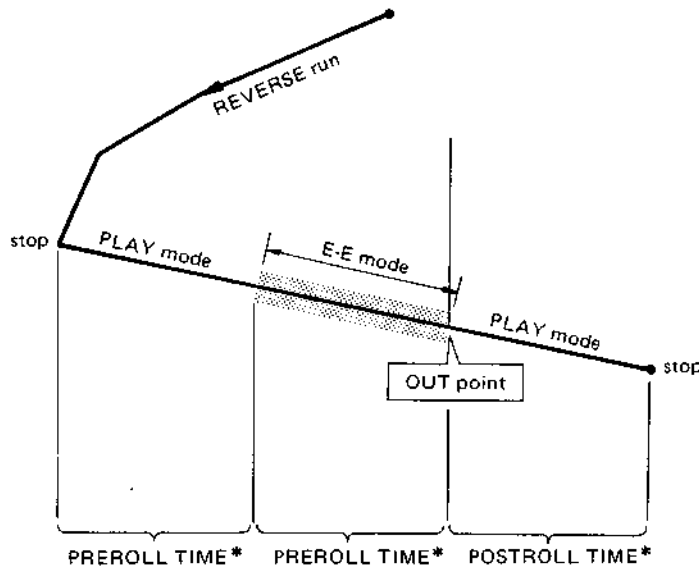
Type-II



Type-III



As shown below, the tape runs and the OUT point can be monitored.



Editing with two VTRs:

In the INSERT mode, pressing the recorder button as described above when both recorder and player IN points have been entered and either recorder or player OUT points have been entered makes the recorder and player tape run possible and the OUT point can be monitored, as in the figure above.

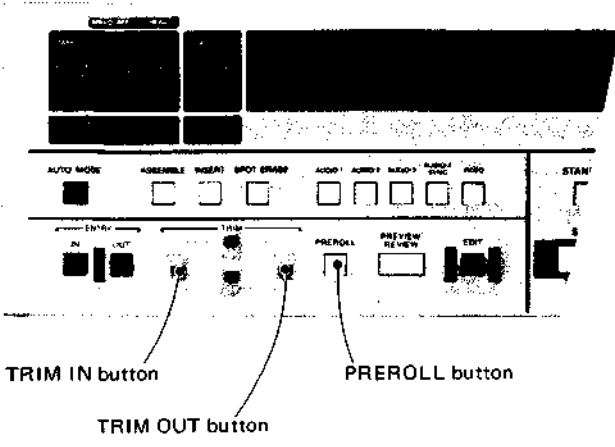
- If the PREVIEW button is pressed and the STOP button is pressed at any point after having passed the IN point so as to stop PREVIEW, the IN point only can be monitored.

* The PREROLL time and the POSTROLL time can be set by the PREROLL TIME switch on the SY79 board in second from 0 to 15 seconds.

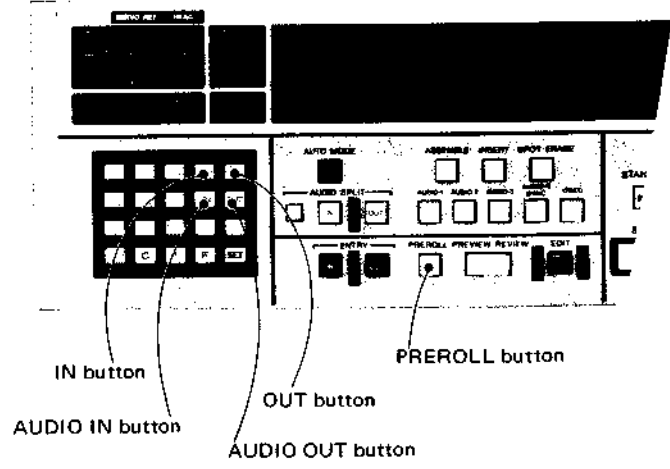
1-12. PREROLL

PREROLL operation can be performed using the following buttons.

Type-II



Type-III



When AUTO MODE is turned off.

The IN/OUT points can be entered (lamp does not light). If operations are performed as follows when the IN/OUT points have been entered, PREROLL is possible.

- Press the PREROLL button.
 →Preroll to [IN point – preroll time] position.
- Press the PREROLL and TRIM IN buttons.
 →Preroll to IN point.
- Press the PREROLL and TRIM OUT buttons.
 →Preroll to OUT point.

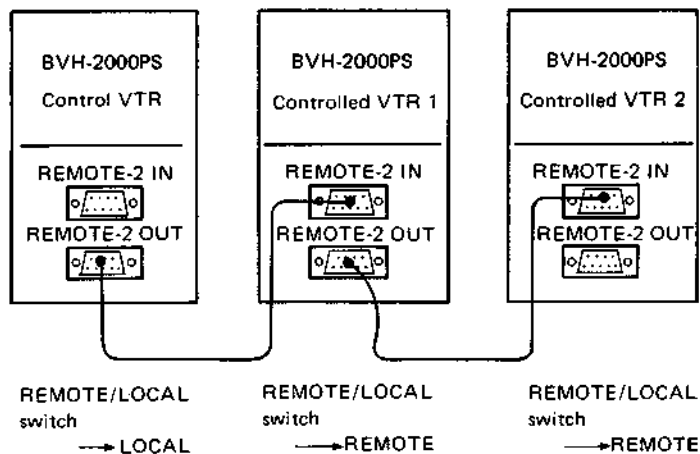
When AUTO MODE is turned on.

- Press the PREROLL button.
 Preroll to [IN point – preroll time] position.
- Press the PREROLL and TRIM IN buttons.
 →Preroll to IN point.
- Press the PREROLL and TRIM OUT buttons.
 →Preroll to OUT point.
- Press the PREROLL and AUDIO IN buttons.
 →Preroll to AUDIO IN point*.
- Press the PREROLL and AUDIO OUT buttons.
 →Preroll to AUDIO OUT point*.

* When AUDIO SPLIT mode is turned on (Type-III).

1-13. PARALLEL OPERATION

Connect as shown below to operate two BVH-2000PSs (or more) simultaneously in the same mode. Operating the control VTR allows all the other VTRs to operate in the same mode as the master.



Note: All PARA RUN switches on the SY-79 board should be turned on.

1-14. WARNING FUNCTIONS

1-14.1. Alarm

If one of the VTRs malfunctions, the respective alarm lamp lights or flashes and a buzzer sounds. These are illustrated in the table below.

○ : on ● : Flashing - : off

	STOP lamp	STAND BY lamp	SERVO ALARM	SYSTEM ALARM	Buzzer	VTR operation
VTR malfunction	-	-	○	○	SOUND	STOP
DRUM UNLOCK *	-	-	○	-	-	CONTINUE
CAPSTAN UNLOCK	-	-	○	-	-	CONTINUE
Movable guide malfunction (tape guide)	-	-	-	○	SOUND	STOP
tape out (disengaged)	-	-	-	-	-	STOP
Power supply over heat	-	-	-	○	SOUND	CONTINUE
Tape sticking	-	●	-	○	SOUND	STOP
No SERVO REF signal	●	-	-	-	-	CONTINUE
Key short**	-	-	-	○	SOUND	CONTINUE

In addition to these, various error conditions are displayed on the display on Types II and III (Refer to ⑧ in 1-4-4 and 1-4-5).

The sound volume of the buzzer can be adjusted with the following volumes on the BKH-2011-2013 circuit boards.

BKH-2011 and 2012: RV1 and RV2

BKH-2013: RV3 and RV4

* If the drum is unlocked for more than 15 seconds, the STANDBY lamp flashes, the SYSTEM ALARM lamp lights and the buzzer sounds – the same condition as the tape sticking.

** Only for the unit incorporating the system ROM with the version No. 3-5 and higher.

“Key short” condition indicates that a key is kept depressed for more than 30 seconds when operational keys (STOP, PLAY, REC, VAR, JOG, SHUTTLE, and STANDBY buttons) are usable, that is, in the following mode:

- (1) LOCAL mode (REMOTE/LOCAL selector is set to LOCAL)
- (2) REMOTE mode in the LOCAL KEY ENABLE mode (REMOTE/LOCAL selector is set to REMOTE and either S9-4 or S9-5 on the SY-79 board is set to ON.)

1-14-2. Lost Lock Indication (Only for the unit incorporating the system ROM with the version No. 3.5 and higher)

When lost lock error occurs during recording and editing, the error message "LOST LCK" blinks in block 6 (BKH-2013) or block 3 (BKH-2012) of the display, and the VTR stores the position (address) in its memory up to the first 10 positions.

The memorized addresses can be checked afterwards.

Note

After 9 LOST LCK error positions are memorized, positions where LOST LCK error occurs are not memorized since the last error that occurs before the VTR is set in the STOP mode is memorized as the 10th error.

To check the addresses of LOST LCK errors in STOP mode

1. Set the VTR in the STOP mode by pressing the STOP button on the VTR.
2. While keeping the STOP button depressed, turn the search dial.

By turning the search dial clockwise, the LOST LCK error positions are displayed, preceded by the numbers #0 to #9 in the order in which the errors occurred.

When the dial is turned counterclockwise, the memory is read reverse.

The error numbers and addresses are displayed in block 4 (BKH-2013) or block 2 (BKH-2012) as shown below.

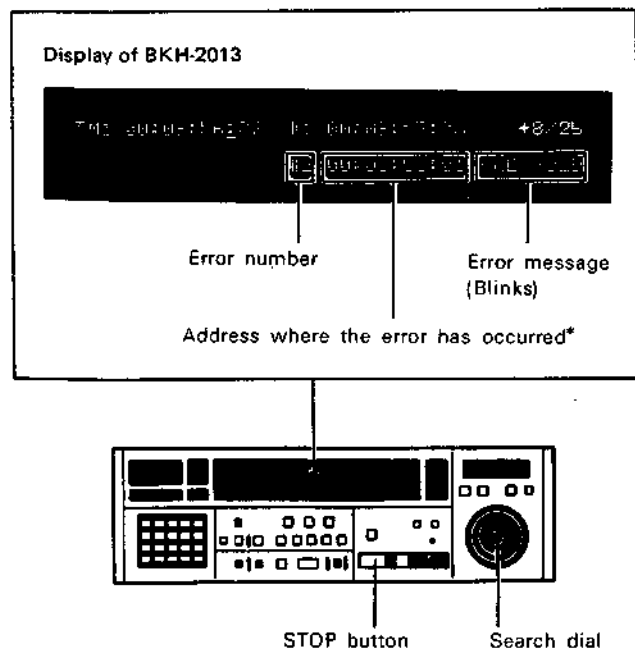
To check the addresses during recording or editing

1. Keep the STANDBY button depressed in the REC or EDIT REC mode.
2. Rotate the search dial.
The LOST LCK error addresses are displayed in the same way as in the STOP mode.

To erase the memorized addresses

The memorized addresses are erased in the following operations.

- (1) By starting recording or playback, addresses of LOST LCK errors which have occurred in the last recording or editing are erased.
- (2) By pressing the RESET button while keeping the STANDBY button depressed during recording or editing, the addresses which have been memorized so far are erased.



* The addresses are indicated by the time code or TIMER-1 or TIMER-2 data, depending upon the setting of the TIME CODE/TIMER selector.

SECTION 1

FONCTIONNEMENT

1-1. CARACTERISTIQUES

Compacité et légèreté

Le BVH-2000PS se distingue par son alimentation compacte à sortie élevée et son moteur CC qui, joints à un mécanisme réduit du transport de bande et à une utilisation maximale de l'électronique, ont rendu possible une réduction considérable du poids de l'ensemble.

Performances et fiabilité de premier ordre, alliées à une compacité et une légèreté remarquables font de cet appareil l'outil de travail idéal pour les applications de télédiffusion, lors de la réalisation électronique de programmes en extérieur, etc.

Systématisation rationnelle (CBT et code de temps enfichables)

Une remarquable simplification du système a été réalisée grâce à l'emploi d'un correcteur de base de temps, se composant de quatre plaquettes qui s'enfichent dans le magnétoscope, et d'une plaquette de code de temps également enfichable (avec code de temps à intervalle vertical).

Facilité de la mise en place de la bande

De remarquables simplifications ont été apportées au dispositif de transport de la bande et, par conséquent à sa mise en place, par l'emploi d'un système de guidage mobile de haute précision (entrée inclinée et guide de sortie, tête d'effacement et cache mobile de la tête audio).

Durée d'enregistrement et de lecture: 2 heures

En utilisant une bande Sony V-16-126 (bobine de 11,75 pouces), deux heures d'enregistrement/lecture sont désormais possibles, ce qui élargit le champ des applications.

Asservissement par microprocesseur

Toutes les informations sont instantanément analysées par l'unité centrale de traitement (CPU). Les données sont alors transmises aux quatre moteurs CC sans balai à commande directe, tandis que les commandes de fonction du magnétoscope (asservissement de cabestan, tambour, bobines, etc.) sont toutes optimisées.

Le BVH-2000PS autorise un accès très rapide et la durée de servoverrouillage est très courte; sans aucune modification particulière, le système se prête à l'utilisation de bobines de 2 heures ou de bobines spot.

Alignement dynamique* ultra rapide

Un réglage d'alignement numérique à vitesse élevée fournit un fonctionnement fiable et en douceur.

* L'expression "Alignement dynamique" (Dynamic Tracking) est une marque déposée de Sony Corporation.

Élargissement de la plage de lecture à alignement dynamique (pour les BVH-2000PS(02),(12) et BVH-2000PS(04),(14))

Grâce à une nouvelle tête DT (alignement dynamique), une reproduction sans parasite est désormais possible de -1 à 3 fois la vitesse normale, ce qui s'avère particulièrement utile pour une lecture à effets spéciaux et la recherche des seuils de montage.

Programmation de la lecture

(pour les BVH-2000PS(02),(12) et BVH-2000PS(04),(14))

La fonction DT (alignement dynamique) et un microprocesseur autorisent, par paliers de 0,1%, une lecture à vitesse variable exacte jusqu'à $\pm 20\%$ de la normale, ce qui permet une augmentation ou une réduction de la durée de lecture de la bande.

Mémoire variable (Panneau de contrôle de Type III des BVH-2000PS(02),(12) et BVH-2000PS(04),(14))

Dans la plage de lecture à vitesse variable DT (càd. de -1 à 3 fois la normale), la vitesse de lecture peut se prérégler, tandis qu'une lecture répétée, déterminée par la mémoire, est faisable, chose particulièrement appréciable lors d'un montage à effets spéciaux.

Fonction de montage encore améliorée

Outre des améliorations apportées aux fonctions de montage automatique, de nombreux ajoutes, décrits par la suite, rendent encore plus simple l'emploi du BVH-2000PS.

Simplicité des connexions (Système à code en série)

Lors d'un montage à deux appareils, une communication est réalisable entre des magnétoscopes de série BVH-2000 et BVH-800 grâce à un simple câble d'interface à 9 broches. Possibilité de contrôle du lecteur à partir du panneau de l'enregistreur

Utilisation d'indications fluorescentes lisibles par points matriciels

Les informations relatives à la minuterie, aux seuils d'entrée et de sortie, à la vitesse de bande et aux messages d'erreur apparaissent sur l'affichage. (Les fonctions varient selon le panneau de contrôle utilisé.)

Clavier à 20 touches (Panneau de contrôle de Type III)

Montage divisé audio (Panneau de contrôle de Type III)

Touche indépendante d'effacement local (Panneau de contrôle de Type II/III)

Fonction de priorité au cabestan

(augmentation ou réduction de vitesse de l'ordre de $\pm 15\%$ par paliers de 3%)

Réglage de durée de réaction et de préenroulement

Agencement rationnel sur le panneau avant

En tenant compte de la facilité d'opération, toutes les touches et commandes ont été judicieusement disposées par sections. Pour la facilité de leur accès, tous les commutateurs et résistances variables essentiels, agissant sur les plaquettes, comme celle de CBT/code de temps enfichable, ont été regroupés sur l'avant.

Cinq connecteurs pour télécommande

Le BVH-2000PS est doté de cinq connecteurs de commande à distance, à savoir pour le CBT, la sélection du moniteur et trois pour le contrôle des fonctions; ils en font un appareil d'installation simple, quel que soit le genre d'application envisagé.

Surveillance de lecture par tête de confiance vidéo/audio (pour les BVH-2000PS(02),(12) et BVH-2000PS(04), (14))

Outre sa tête de lecture normale, le système vidéo est muni d'une tête de "confiance" qui peut servir comme réserve en mode de lecture. De son côté, le système audio en possède une également, destinée à permettre un contrôle de l'état d'enregistrement sur les pistes AUDIO-1/2/3/4 et CTL.

Image et son de haute qualité

Tant à l'enregistrement qu'à la lecture, une haute fidélité est atteinte par l'emploi de composants, tels que de nouvelles têtes vidéo et audio, qui ont fait l'objet d'une mise au point spéciale et par des améliorations apportées au circuit d'égalisation automatique du signal haute fréquence.

Fiabilité sans précédent

Pour assurer des travaux sans faille, Sony a fait appel à des composants de haute précision, tels que ses moteurs CC sans balai à forte sortie, et des indicateurs à diodes photo-émissives longue durée, utilisés dans les panneaux de contrôle des fonctions, qui font du BVH-2000PS une des machines les plus sûres du marché.

Fonctions d'alarme

De nombreuses "alarmes" sont prévues et elles fonctionnent, par exemple, dans les cas suivants: absence de signal, non rotation du tambour, échauffement des circuits d'alimentation ou des moteurs, relâchement de la bande, anomalie de communication.

Mécanisme de protection de la bande

Pour la protection de la bande, Sony a prévu un mécanisme de relâchement de tension, un détecteur de tension excessive, une entrée mobile et des guides de sortie qui s'ouvrent avant l'extrémité du ruban magnétique.

Installation

Sous tous les aspects, la facilité de l'exploitation a été recherchée dans la réalisation du BVH-2000PS, dont la configuration se pliera aisément aux besoins individuels.

1-2. SPECIFICATIONS

Données générales		Inclinaison (Hor. & Vert.)	Inférieure à 1%
Alimentation électrique	Secteur 100 – 120/220 – 240V ± 10% (réglable), 50/60 Hz	Moiré	Inférieur à -35 dB (barres couleur 75%) Inférieur à -32 dB (barres couleur 100%)
Consommation électrique	550 W max.	Retard de chrominance/luminance	Inférieur à 25ns
Limites des températures d'utilisation	De 5°C à 40°C (de 41°F à 104°F)	Linéarité basse fréquence	Supérieure à 0,98
Taux d'humidité	De 10 à 90% (sans condensation)	Données audio	
Poids	70 kg (155 livres)	Réponse de fréquence audio	CH-1, CH-2, CH-3 & CH-4*: De 50 Hz à 15 kHz $\pm 1,5$ dB De 200 Hz à 7,5 kHz $\pm 1,0$ dB
Dimensions hors tout	570 x 680 x 588 mm (l/h/p) (22 1/2 x 26 7/8 x 23 1/8 pouces)	Rapport signal/bruit	CH-1, CH-2 & CH-4*: Supérieur à 56 dB (à partir du niveau de distorsion de 3%) CH-3: Supérieur à 50 dB (à partir du niveau de distorsion de 3%)
Format d'enregistrement	EBU Type C 1 tête pour piste vidéo 1 tête pour piste de synchronisation (BVH-2000PS(00), (02), et (04) uniquement)	Distorsion (à 1 kHz)	CH-1, CH-2, CH-3 & CH-4* Inférieure à 1% (au niveau d'exploitation)
Pistes	Piste vidéo: 1 Piste de synchronisation: 1 pour les BVH-2000PS(00), (02) et (04) uniquement Piste audio: 3 pour les BVH-2000PS(00) et (02), et 4 pour le BVH-2000PS(04) (La piste audio 3 s'emploie aussi pour le code de temps et le repérage.) Piste de contrôle: 1	Pleurage et scintillement	Inférieur à 0,1% CCIR pondéré
Vitesse de défilement de bande	23,98 cm/sec.	Diaphonie (à 1 kHz)	Entre deux canaux au hasard Inférieure à -60 dB
Vitesse (relative) d'écriture	21,39 cm/sec.	Signal d'entrée	
Durée d'enregistrement	128 min. sur bobine de 11,75 pouces	Entrée vidéo	1,0 $\pm 0,3$ V _{c-c} (75 ohms)
Stabilité de base de temps	A 3 μ s c-c près	Entrée référence ext.	1,0 $\pm 0,3$ V _{c-c} (75 ohms), vidéo
Durée de servoverrouillage	A 3 sec. près (en mode de verrouillage à 4 trames à partir du mode d'attente)	Entrée impulsion CF	Niveau TTL, 6,25 Hz
Précision de minuterie de bande	± 1 cadre (avec signal de contrôle continu)	Entrée ligne audio	CH-1, CH-2, CH-3 & CH-4* +20 à -30 dBm (600 ohms/10 kohms, symétrique)
Durée d'avance rapide/rebobinage (Durée de transfert)	Moins de 110 sec. (avec bande d'une heure)	Entrée micro audio 3	CH-3, -60 dBs (haute impédance, asymétrique)
Bandes recommandées	Bande Sony de un pouce à haute densité ou équivalente	Entrée code de temps	CH-3, 0,5 V _{c-c} (75 ohms), pour code de temps EBU
Dimension de bobine	Max. 11,75 pouces	Signal de sortie	
Données vidéo		Sortie vidéo 1/-2/-3	1,0 V _{c-c} (75 ohms)
Largeur de bande vidéo	De zéro à 5,0 MHz: $\pm 0,5$ dB 5,5 MHz: -3 dB	Sélection WFM	Vidéo choisi/CTL/Enveloppe HF/libre
Rapport signal/bruit	Supérieur à 44 dB (non pondéré), auto enregistrement Supérieur à 43 dB (non pondéré), base interchangeée (vidéo composite crête-à-crête au bruit rms mesuré avec un compteur de bruit Rohde & Schwarz)	Sélection moniteur vidéo	Vidéo entrée/Sortie démod/Sortie CBT/libre
Gain différentiel	Inférieur à 4% (avec CBT Sony)	Impulsion d'image	Niveau TTL, image couleur/image (au choix)
Phase différentielle	Inférieur à 4° (avec CBT Sony)	Vidéo de réf.	1 V _{c-c} nominal (75 ohms), pour CBT ext.
Facteur "K" en réponse transitoire (impulsion 2T)	Inférieur à 1		

* Seul le BVH-2000PS(04)/(14) est doté du CH-4 (canal 4).

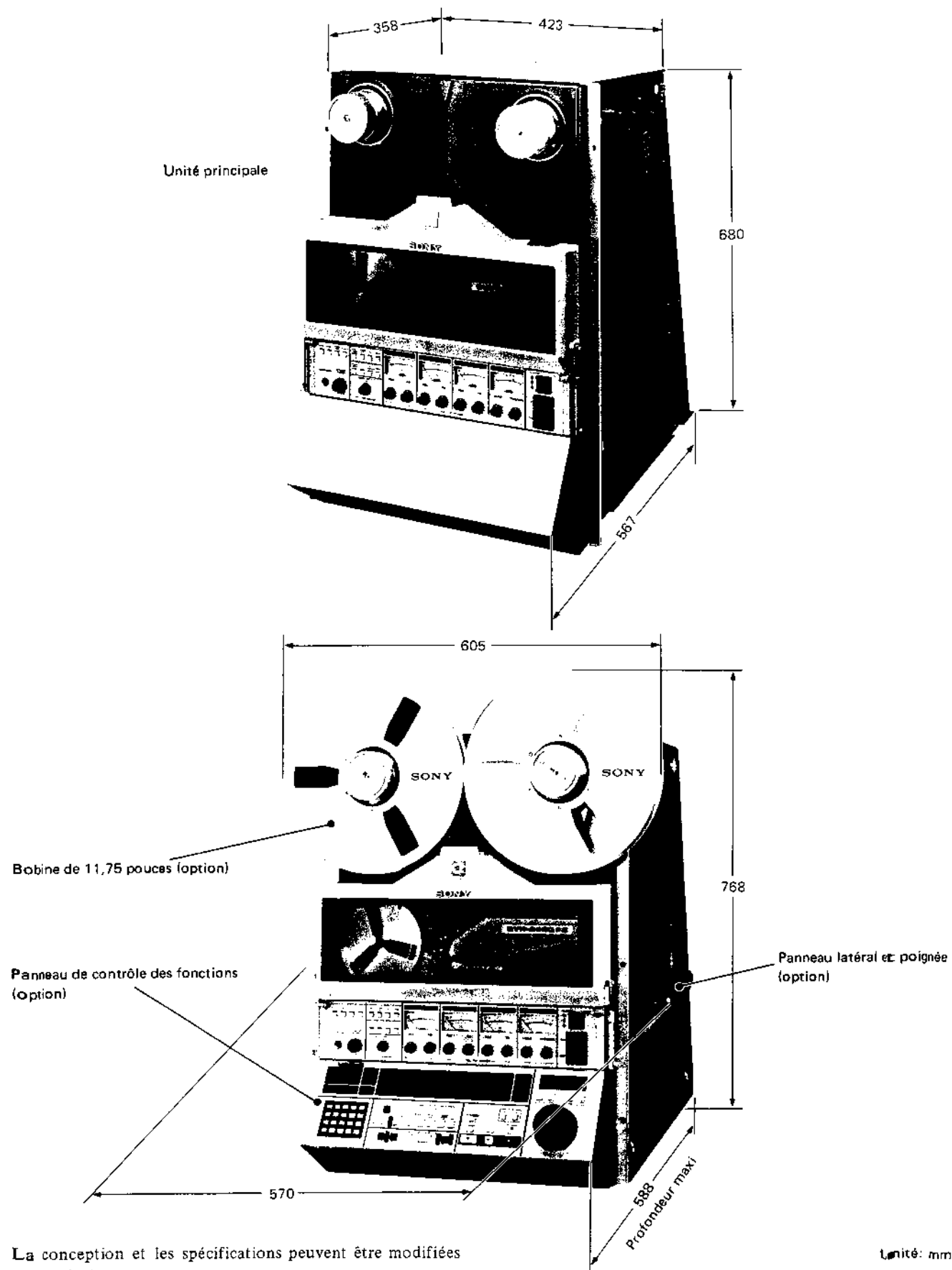
Signal DO	Niveau TTL/Sortie HF (au choix)
Sortie ligne audio	CH-1, CH-2, CH-3 & CH-4* 8 dBm nominal (600 ohms, symétrique) (peut être converti à 150 ou 37,5 ohms)
Sortie de code de temps	CH-3, 0,5 Vc-c (75 ohms), pour code de temps EBU
Sortie au casque	8 ohms, asymétrique, réglage de niveau variable
Sortie moniteur (can. gauche/droit)	8 dBm (600 ohms, symétrique), réglage de niveau variable
Sélection moniteur audio	BVH-2000PS(02), (12): CH-1/CH-2/CH-1, CH-2/CH-3 (réglable) BVH-2000PS(04), (14): CH-1/CH-2/CH-3/CH-4/CH-1, CH-2 (réglable)

Données diverses

Sortie CBT (BVH-2000PS(00), (02) et (04) uniquement)	Au CBT (Sony BVT-2000P/2000S) pour alignement dynamique
Sortie-1 télécommande (BVH-2000PS(00), (02) et (04) uniquement)	Pour convertisseur CCJ
Sortie-2 télécommande	Pour interface à 9 broches
Sortie-3 télécommande	Pour communication parallèle
Auxiliaire	Pour télécommande de CBT enfichable
Sélecteur de moniteur	Pour télécommande de sélection du moniteur

* Seul le BVH-2000PS(04)/(14) est doté du CH-4 (canal 4).

Dimensions

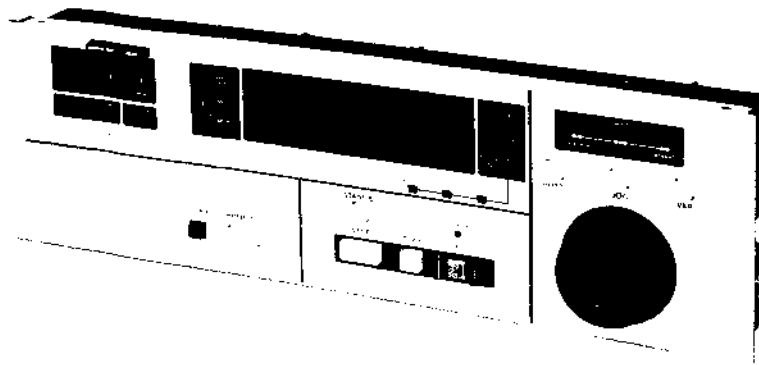


La conception et les spécifications peuvent être modifiées sans préavis.

1-3. COMPOSANTS ET ACCESSOIRES EN OPTION

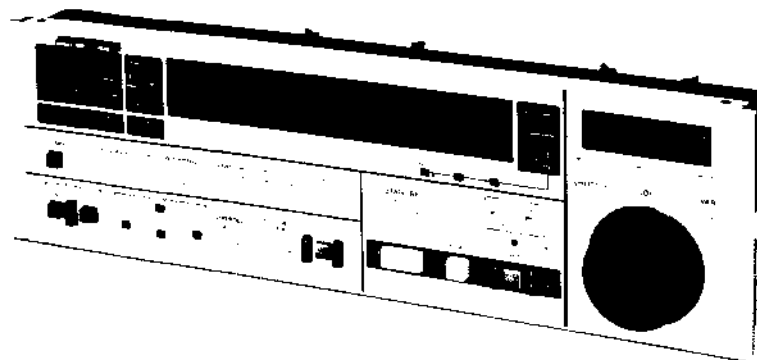
Panneaux de contrôle des fonctions

Pour le BVH-2000PS, trois panneaux sont disponibles et l'on choisira celui qui répond le mieux aux travaux à effectuer.



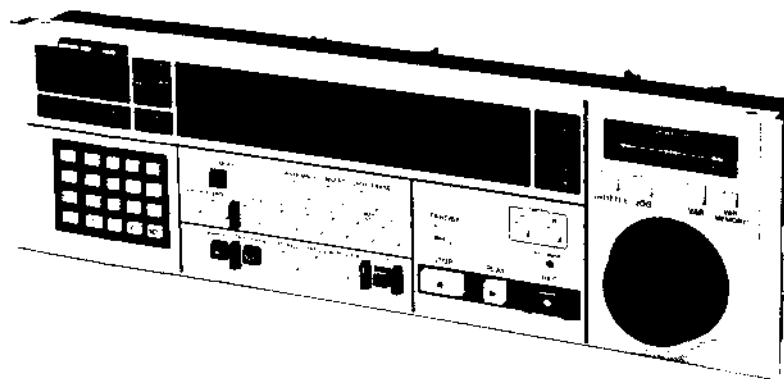
Panneau de contrôle BKH-2011 (Type I)

Doté des fonctions fondamentales, il est destiné à permettre les fonctions d'enregistrement, lecture, recherche et recherche du seuil de préenroulement (repérage). Voir les détails en 1-4-3.



Panneau de contrôle BKH-2012 (Type II)

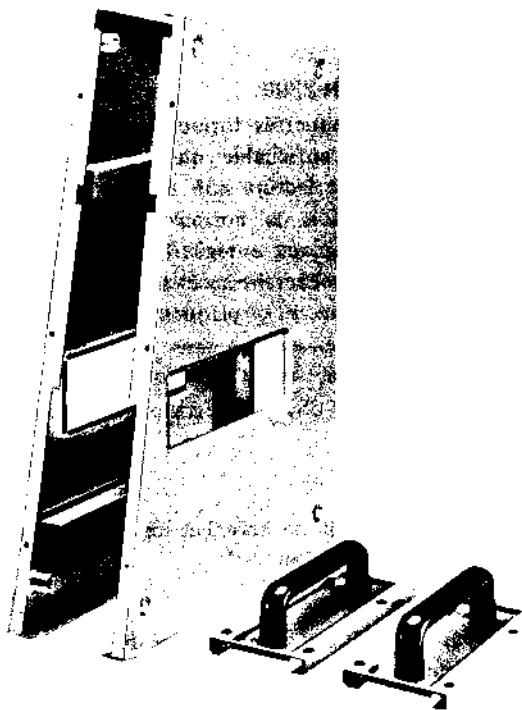
Outre les fonctions qu'autorise le panneau de Type I, ce panneau fournit celles du montage. Grâce à lui, le BVH-2000PS devient un magnétoscope de montage standard. Voir les détails en 1-4-4.



Panneau de contrôle BKH-2013 (Type III)

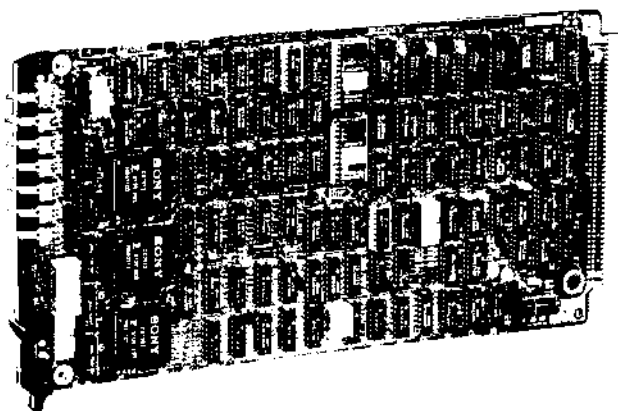
Outre les fonctions des deux panneaux précédents, celui-ci, plus complet, dispose des fonctions de montage divisé audio, d'effacement local, de mémoire variable, etc. Grâce à lui, le BVH-2000PS devient un magnétoscope de montage à fonctions multiples, équipé de diverses fonctions de traitement des informations. Voir les détails en 1-4-5.

Ensemble de panneau latéral BKH-2014



Ces panneaux latéraux et ces poignées s'emploient quand le BVH-2000PS fonctionne comme machine autonome.

Générateur/lecteur de code de temps BKH-2015/BKH-2015A



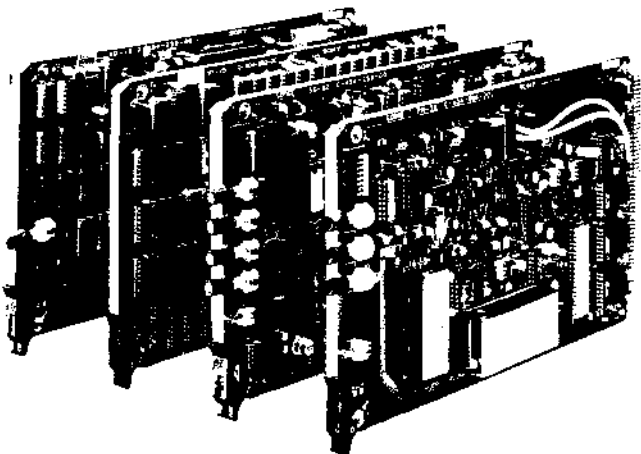
Le BKH-2015/BKH-2015A est une plaquette enfichable sur laquelle sont regroupés un générateur et un lecteur de code de temps EBU, un code de temps à intervalle vertical et bit d'utilisateur, ainsi qu'un générateur de caractères. La position et la dimension des caractères produits sur l'écran peuvent se régler, tandis que les lettres noires et blanches peuvent être inversées.

Lorsque cette plaquette est installée dans le magnétoscope, un équipement de code de temps extérieur n'est pas nécessaire.

Correcteur de base de temps numérique BKH-2200 (pour le système couleur PAL)

Correcteur de base de temps numérique BKH-2300 (pour le système couleur PAL/SECAM)

Correcteur de base de temps numérique BKH-2350 (pour le système couleur PAL/SECAM)



BKH-2200/BKH-2300

Ces quatre plaquettes forment un correcteur de base de temps (CBT) enfichable qui rend possible une lecture couleur ou une lecture noir et blanc à des vitesses allant jusqu'à ± 50 fois la normale. Il est ainsi possible de surveiller les signaux enregistrés au cours de la recherche. (Toutefois, en recherche accélérée, la dimension horizontale de l'image change.) Ces plaquettes permettent au magnétoscope d'entrer en service sans préparer un CBT extérieur ou, au besoin, un CBT extérieur (comme le Sony BVT-2000P/2000S) peut être connecté simultanément au BVH-2000PS.

Remarque

Il est impossible de brancher un CBT externe sur le BVH-2000PS(10), (12) ou (14).

BKH-2350

Le BKH-2350 est un correcteur de base de temps de type enfichable composé de quatre plaquettes de circuits. Il permet d'obtenir une image couleur de qualité pendant la lecture à vitesse normale ou la lecture à alignement dynamique de -1 à $+3$ fois la vitesse de défilement normal. Grâce à la fonction de recherche à ± 7 fois la vitesse normale des images couleur et à ± 50 fois la vitesse normale des images monochromes, l'utilisateur est assuré d'une grande facilité de contrôle sur les signaux enregistrés. Ces quatre plaquettes de circuits permettent l'émission des signaux de lecture depuis un magnétoscope non équipé de CBT externe.

Remarque

Le BKH-2350 peut être installé dans un BVH-2000PS numéro 33401 et supérieur.

Convertisseur CCJ BKH-2016

(pour les BVH-2000PS(00), (02) et (04) uniquement)



Ce convertisseur sert d'interface entre le BVH-2000PS et des magnétoscopes conventionnels ou des unités de contrôle de montage dotés d'un connecteur REMOTE de type CCJ (rond à 10 broches). Il se fixe sur le panneau arrière du BVH-2000PS.

Machines pouvant être raccordées:

Unité de contrôle de montage:

BVE-500ACE, BVE-5000P, etc.

Magnétoscope: BVH-1100PS, BVH-1100APS,

BVH-1180PS, etc.

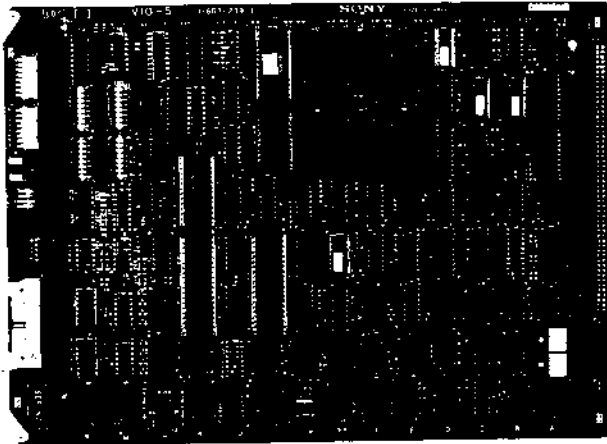
Autres équipements:

IF-1000CE*, BVR-1000,

DTR-110, etc.

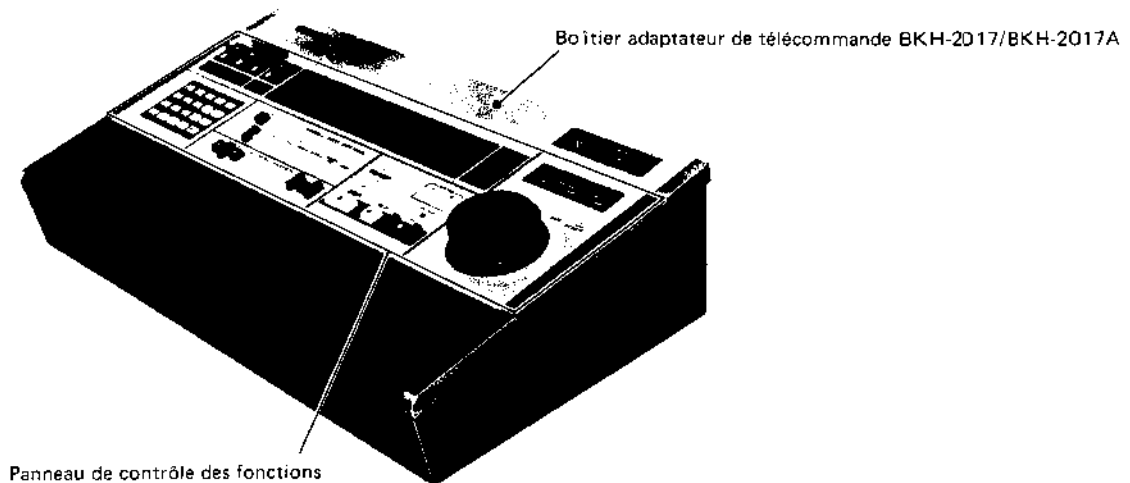
* A l'emploi du IF-1000CE, l'unité d'alimentation PU-2016 est nécessaire.

Plaque d'interface de BVE-5000P BK-5005



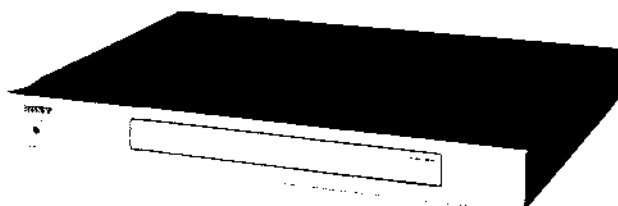
Elle sert d'interface entre le BVH-2000PS et l'unité de contrôle de montage automatique BVE-5000P et elle s'installe sur ce dernier. Deux connecteurs D-sub à 9 broches sont fournis avec la plaque. (Si elle est installée dans la BVE-5000P, le convertisseur CCJ BKH-2016 n'est pas nécessaire.)

Boîtier adaptateur de télécommande BKH-2017/BKH-2017A

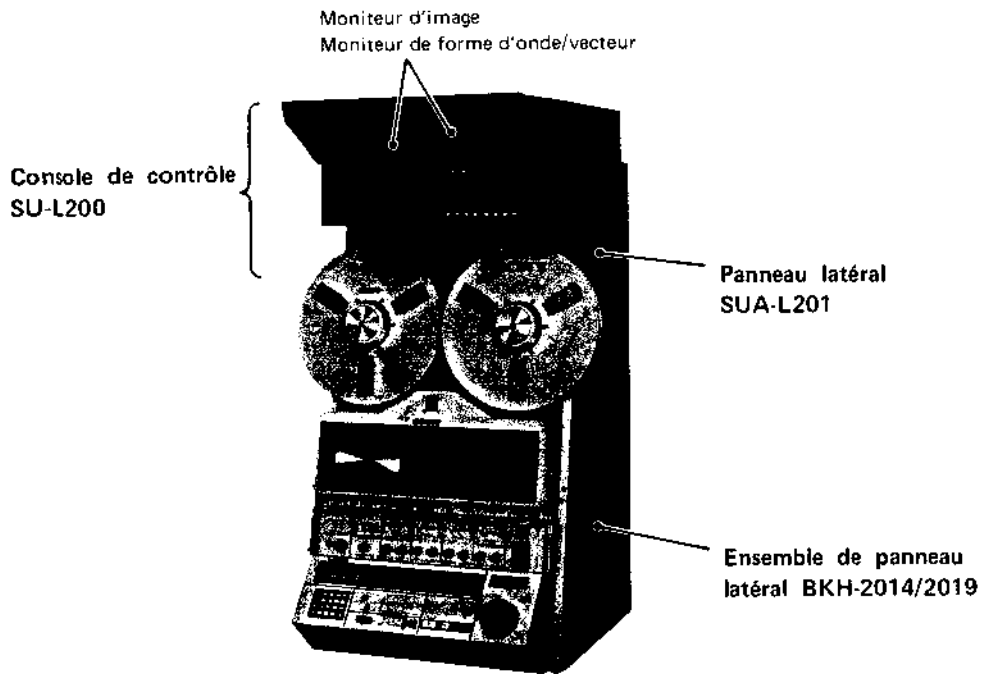


Lorsqu'on désire contrôler le BVH-2000PS à distance, on installera le panneau de contrôle des fonctions BKH-2011/2012/2013 dans ce boîtier, qui peut être incliné pour la facilité de son utilisation et qui comprend un circuit de communication en série RS422 et une unité d'alimentation électrique. La télécommande du BVH-2000PS peut s'accomplir jusqu'à 1000 mètres de distance.

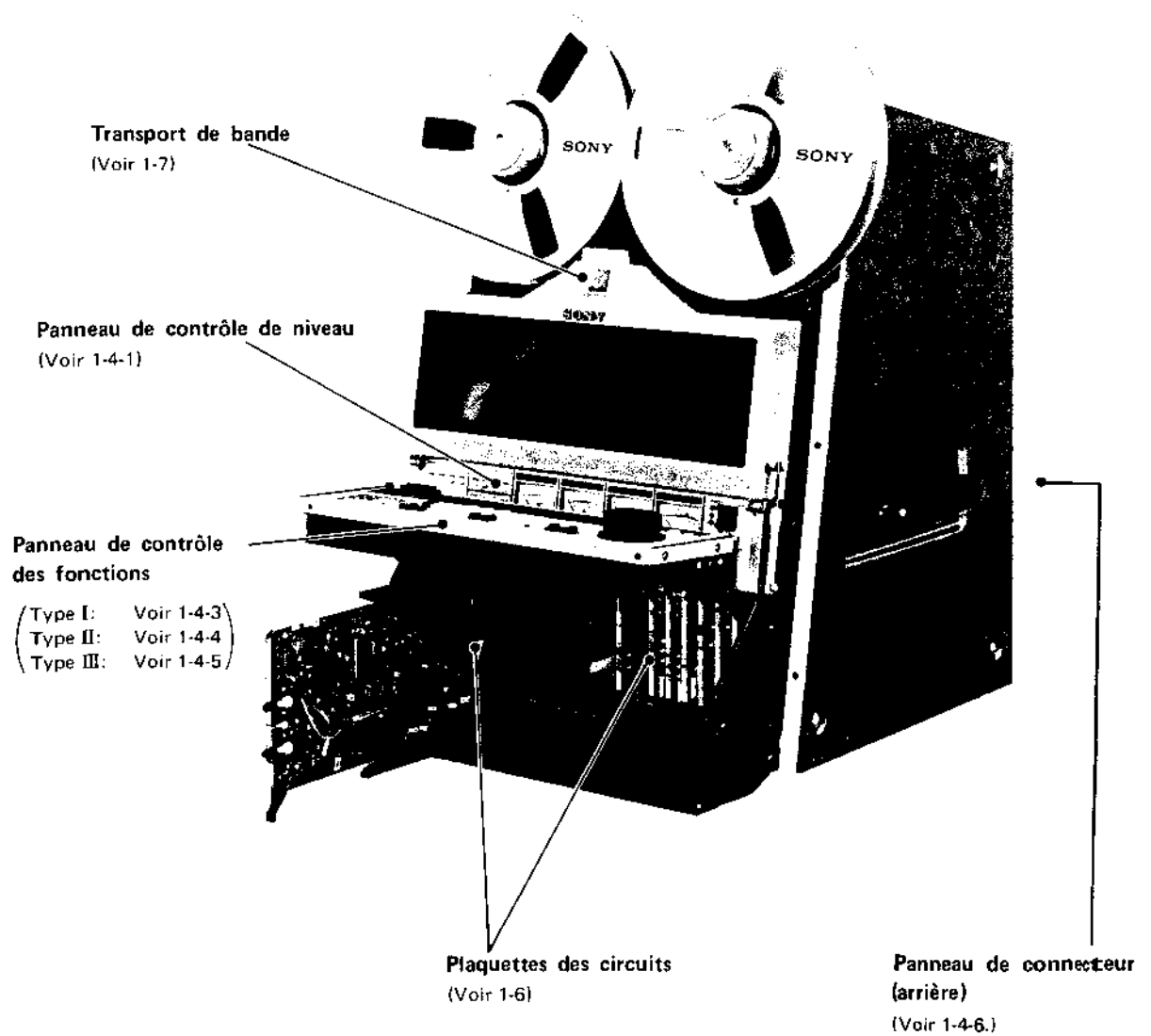
Convertisseur 9P-CCJ BKH-2018



Se servir de ce convertisseur lorsque l'on contrôle le BVH-1100PS/1100APS/1180PS par le BVH-2000PS.

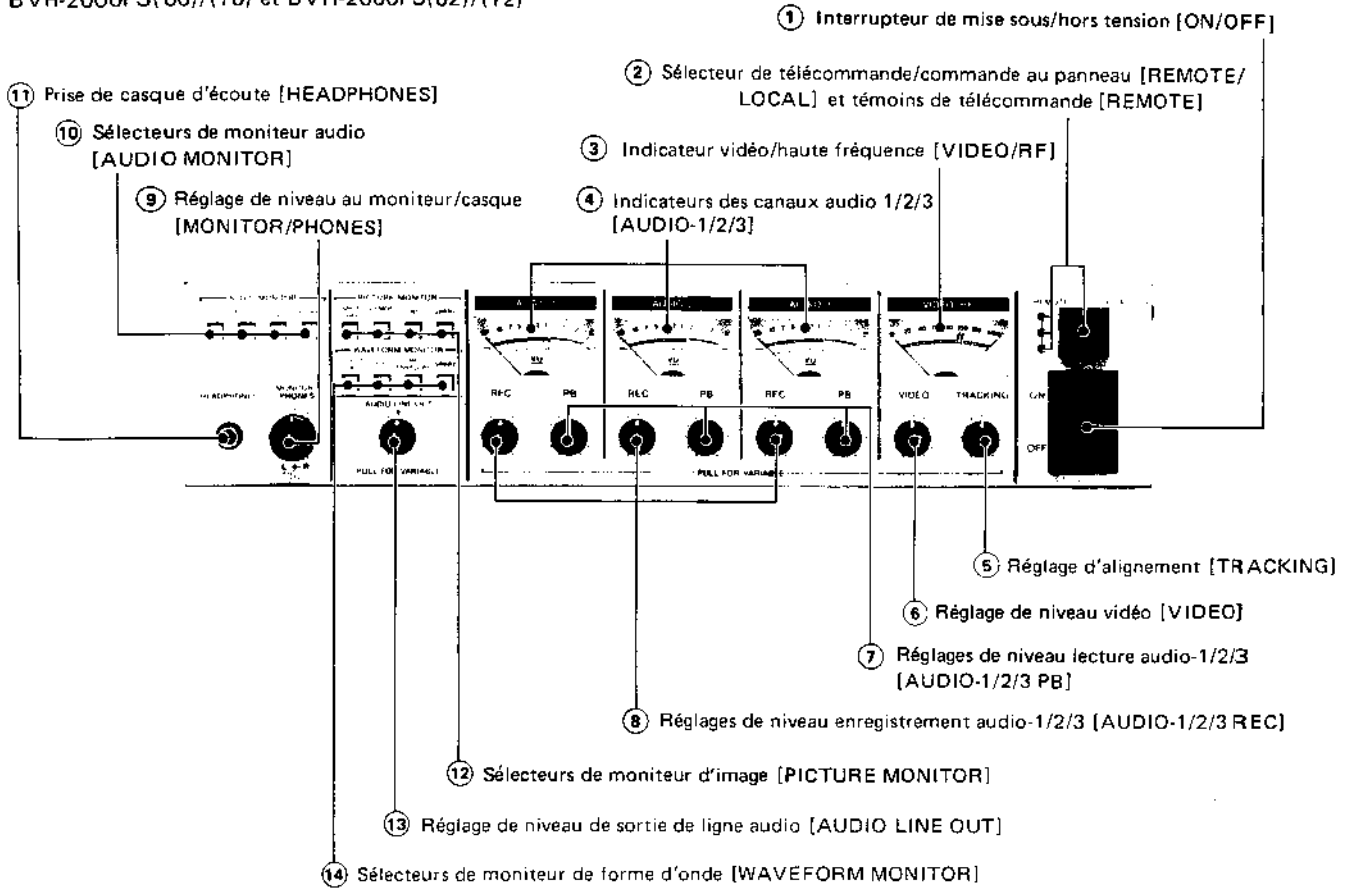


1-4. LOCALISATION ET FONCTION DES ORGANES

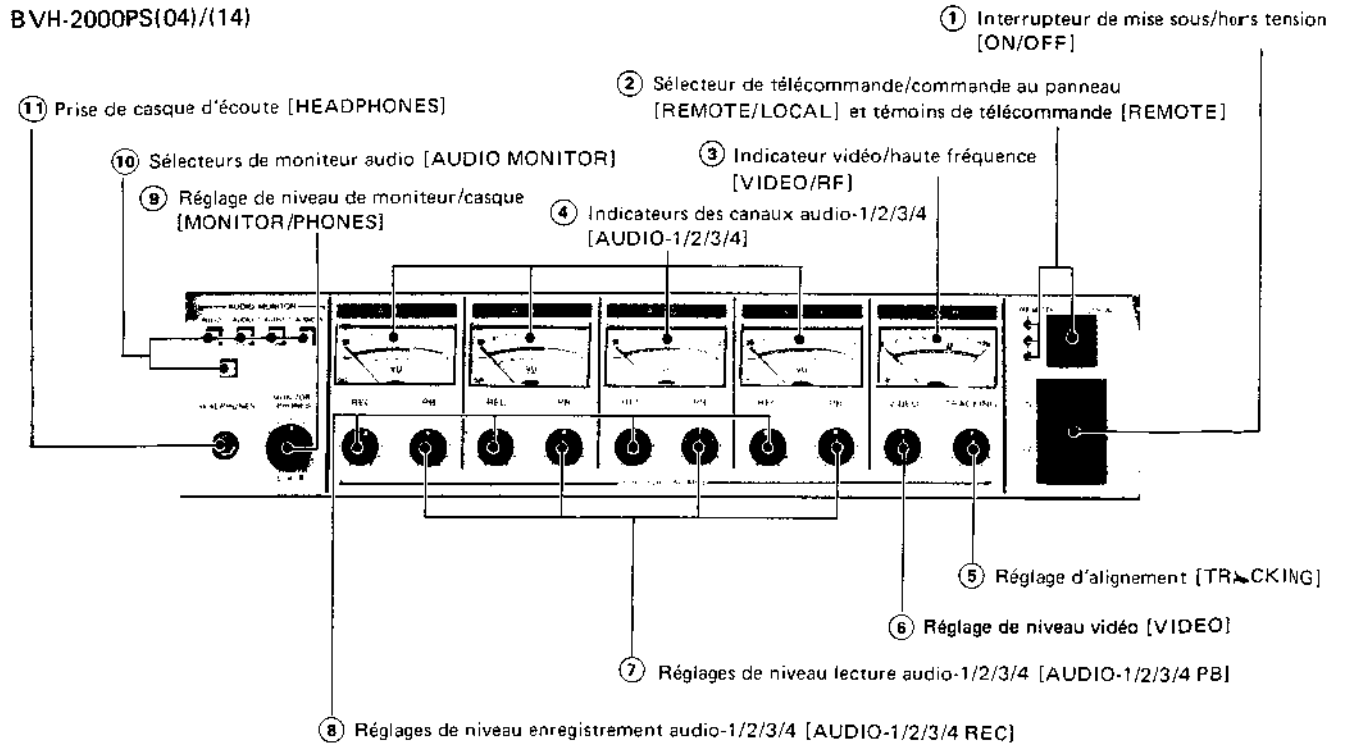


1-4-1. Panneau de contrôle de niveau

BVH-2000PS(00)/(10) et BVH-2000PS(02)/(12)



BVH-2000PS(04)/(14)



① **Interrupteur de mise sous/hors tension [ON/OFF]**

Lorsqu'il est enclenché, l'affichage du panneau de contrôle des fonctions s'allume, "INITIAL" apparaît sur le panneau de contrôle de Type II ou Type III et le magnétoscope est automatiquement placé en mode d'arrêt (STOP) après 2 secondes.

② **Sélecteur de télécommande/commande au panneau [REMOTE/LOCAL] et témoins de télécommande [REMOTE]**

REMOTE: Quand le signal de télécommande provenant d'un autre magnétoscope ou d'une unité de contrôle de montage est raccordé à un des connecteurs REMOTE 1, 2 ou 3 et que l'interrupteur REMOTE de la plaquette SY-79 est réglé à la position correspondant à la connexion du signal de contrôle, le BVH-2000PS est commandé à distance par l'équipement externe.

A cette position, tous les interrupteurs et boutons du panneau de contrôle des fonctions sont inopérants, étant donné qu'ils sont contrôlés à distance par l'équipement externe. L'état des témoins et de l'affichage de minuterie reste identique à celui d'avant le réglage de l'interrupteur sur REMOTE.

Toutefois, les opérations suivantes sont possibles par déplacement de l'interrupteur S9 sur la plaquette SY-79:

S9-5 (REM LOC STOP EN):

Seule la touche STOP fonctionne.

S9-4 (REM LOC KEY EN):

Les touches STOP, REC, PLAY, SHUTTLE, JOG, VAR, STANDBY et la bague de recherche [SEARCH] fonctionnent.

(Voir la Section 2 et se conformer aux explications.)

LOCAL: Choisir cette position pour utiliser le BVH-2000PS seul ou pour commander à distance un autre magnétoscope raccordé au connecteur REMOTE avec le BVH-2000PS en vue d'un fonctionnement parallèle ou d'un montage.

Témoins REMOTE (trois)

En mode de télécommande, un des trois témoins REMOTE 1/2/3 s'allume pour signaler le numéro du connecteur REMOTE (du panneau arrière) actuellement en service.

Témoin 1: S'allume à l'emploi du connecteur REMOTE-1. (Télécommande via le convertisseur CCJ BKH-2016)

Témoin 2: S'allume à l'emploi du connecteur REMOTE-2. (Télécommande via le code de série RS-422)

Témoin 3: S'allume à l'emploi du connecteur REMOTE-3. (Télécommande via les signaux IN/OUT en parallèle)

Remarque

Le témoin 1 s'allume conformément au réglage du sélecteur REMOTE/LOCAL. Mais cela ne signifie rien lors de l'emploi du BVH-2000PS(10), (12) ou (14) qui n'est pas doté du connecteur REMOTE-1.

③ **Indicateur vidéo/haute fréquence [VIDEO/RF]**

Il affiche le niveau du signal vidéo. Selon sa position, le sélecteur d'indicateur METER de la plaquette MD-14 fournit les affichages suivants:

Position du sélecteur	Affichage
RF(V)	En mode E à E, le niveau du signal vidéo d'entrée. A la lecture, le niveau du signal HF provenant de la tête vidéo.
INPUT	Toujours le niveau du signal vidéo d'entrée.
RF(S) (BVH-2000PS (00), (02), (04) uniquement)	En mode E à E, le niveau du signal vidéo d'entrée. A la lecture, le niveau du signal HF provenant de la tête de synchronisation.

④ **Indicateurs des canaux audio-1/2/3/4* [AUDIO-1/2/3/4]**

Ils affichent le niveau du signal audio; celui qui est choisi par le sélecteur TAPE/EE du panneau de contrôle des fonctions est affiché sur cet indicateur.

Mode d'exploitation du magnétoscope Position du sélecteur TAPE/EE	Mode STOP	Mode REC ou mode EDIT	Autres modes
	TAPE	TAPE	TAPE*3 (MONITOR)
TAPE/EE	EE *1	EE	TAPE
INPUT *2	INPUT	INPUT	INPUT

*1 • Seul l'indicateur AUDIO-3 affiche le niveau de bande (TAPE). L'indicateur AUDIO-3 affiche le niveau du signal E à E quand le sélecteur TAPE/EE est réglé une fois sur INPUT. Par la suite, quand le mode d'exploitation du magnétoscope est changé, cet indicateur affiche le niveau de bande (TAPE).

*2 • A la position INPUT, les indicateurs affichent le niveau du signal contrôlé par les réglages de niveau REC ⑧.

• Quand l'interrupteur EE (S9-3) de la plaquette SY-80 est réglé sur ON, le magnétoscope est réglé en mode E à E imposé et l'indicateur affiche le niveau du signal E à E, même à la position INPUT.

*3 • Sur les BVH-2000PS(00) et (10), le signal E à E est obtenu.

* Seul le BVH-2000PS(04)/(14) est doté d'un indicateur AUDIO-4.

⑤ **Réglage d'alignement [TRACKING]**

Retiré: A la lecture, une compensation est apportée à l'erreur d'alignement. Tourner ce réglage pour obtenir une indication maximale sur l'indicateur VIDEO/RF.

Poussé: Position préréglée.

⑥ **Réglage de niveau vidéo [VIDEO]**

Retiré: Il ajuste le niveau d'enregistrement vidéo et on fera en sorte que l'aiguille arrive dans la zone bleue de l'indicateur VIDEO/RF.

Poussé: Position préréglée. (Pour ce préréglage, se reporter à 1-6-2.)

⑦ **Réglages de niveau lecture audio-1/2/3/4 [AUDIO-1/2/3/4 PB] ***

Retiré: Le niveau de lecture audio peut être ajusté. A la lecture, on les ajustera de sorte que les aiguilles des indicateurs AUDIO-1/2/3 arrivent à 0 VU en présence d'une crête.

Poussé: Position préréglée. (Pour ce préréglage, se reporter à 1-6-2.)

⑧ **Réglages de niveau enregistrement audio-1/2/3/4 [AUDIO-1/2/3/4 REC] ***

Retiré: Le niveau d'enregistrement audio peut être réglé pour l'enregistrement et le montage. Les ajuster de sorte que les aiguilles des indicateurs AUDIO-1/2/3/4 arrivent à 0 VU en présence d'une crête.

Poussé: Position préréglée. (Pour ce préréglage, se reporter à 1-6-2.)

- L'indicateur AUDIO-3 peut servir pour afficher le niveau d'entrée du micro (MIC) provenant du connecteur MIC INPUT de panneau arrière. Le choix entre l'entrée LINE et l'entrée MIC s'accomplit par le sélecteur A-3 SEL de la plaquette AE-03 (se reporter à 1-6-3).

- Quand le sélecteur A-3 SEL est réglé en mode TC et que le sélecteur d'entrée de code de temps est sur INT ou EXT-1, le réglage AUDIO-3 REC est opérant.

⑨ **Réglage de niveau de moniteur/casque [MONITOR/PHONES]**

Il ajuste le niveau d'écoute au casque ou le niveau de sortie des connecteurs AUDIO MONITOR OUTPUT sur le panneau arrière. Lorsque le casque est branché, le signal audio ne parvient plus aux connecteurs AUDIO MONITOR OUTPUT car le casque obtient la priorité.

⑩ **Sélecteurs de moniteur audio [AUDIO MONITOR]**

Ils servent à fournir comme suit les signaux qui sont alimentés à la prise HEADPHONES ou aux connecteurs MONITOR OUTPUT.

Sélecteur \ Canal audio	L (gauche)	R (droit)
AUDIO-1	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4
AUDIO-1 AUDIO-2	AUDIO-1	AUDIO-2

Une sortie en stéréophonie est disponible avec le sélecteur

AUDIO-1
AUDIO-2

⑪ **Prise de casque d'écoute [HEADPHONES]**

Quand un casque de 8 ohms y est branché, il est possible de surveiller les signaux de sortie audio, choisis par les sélecteurs AUDIO MONITOR ⑩. Comme le casque a la priorité, il devra être débranché pour que les signaux puissent être audibles aux connecteurs AUDIO MONITOR OUTPUT.

⑫ **Sélecteurs de moniteur d'image [PICTURE MONITOR] ****

Ils servent à choisir les signaux alimentés au connecteur VIDEO MONITOR OUTPUT du panneau arrière.

INPUT VIDEO: Pour obtenir le signal vidéo raccordé au connecteur VIDEO INPUT (entrée vidéo).

DEMOD OUT: Pour la sortie du signal vidéo provenant du démodulateur.

TBC: Pour le signal vidéo raccordé au connecteur TBC MONITOR INPUT.

SPARE: Pour le signal raccordé aux connecteurs SPARE MONITOR INPUT. Si l'on a installé le correcteur de base de temps numérique enfichable (en option), le signal produit par la plaquette installée est fourni au lieu du signal SPARE MONITOR INPUT en déplaçant S1 sur la plaquette VM-01. (Se reporter à 1-4-6.)

- Lorsque le sélecteur TAPE/EE est réglé sur INPUT, le signal d'entrée INPUT VIDEO est automatiquement choisi. Quand ce sélecteur est ramené à une position autre que INPUT, c'est le signal de sortie préalablement choisi qui est sélectionné.

* Seul le BVH-2000PS(04)/(14) est doté du réglage de niveau AUDIO-4 PB, du réglage de niveau AUDIO-4 REC et du bouton AUDIO-4.

** Le BVH-2000PS(00)/(10) et le BVH-2000PS(02)/(12) sont dotés de ces sélecteurs. La fonction fournie par ces sélecteurs est disponible sur le BVH-2000PS(04)/(14) uniquement s'il est installé dans un rack qui est équipé des sélecteurs correspondants.

⑬ Réglage de niveau de sortie de ligne audio
[AUDIO LINE OUT] *

Retiré: Il contrôle simultanément le niveau de lecture du canal audio 1 et 2, fournis par les connecteurs AUDIO-1/2 LINE OUTPUT. La plage de réglage est de ± 6 dB respectivement par rapport au niveau qui a été donné par les réglages de niveau de lecture AUDIO-1/2 PB.

Poussé: A cette position, ce réglage est inopérant.

⑭ Sélecteurs de moniteur de forme d'onde
[WAVEFORM MONITOR] *

Ils servent à choisir le signal de sortie alimenté au connecteur WFM MONITOR OUTPUT du panneau arrière.

SELECTED VIDEO: Pour obtenir le signal de sortie choisi par les sélecteurs PICTURE MONITOR ⑬.

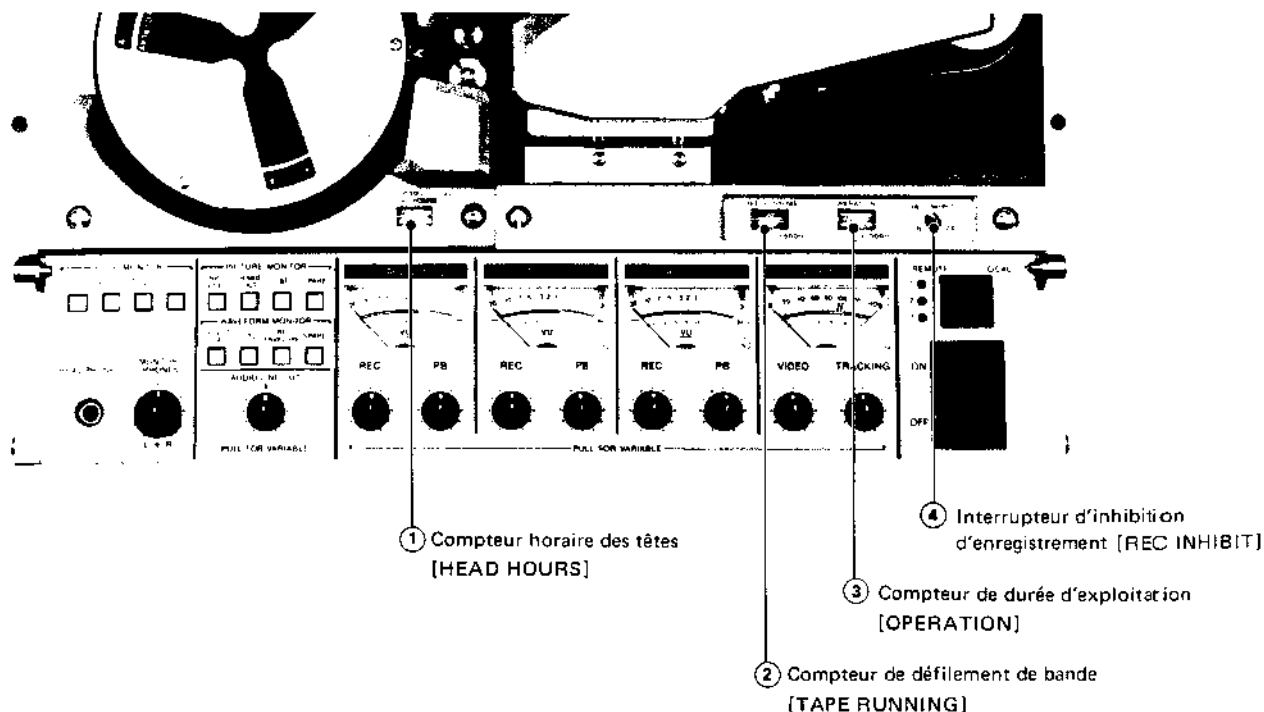
CTL: Pour obtenir le signal CTL de lecture de la bande enregistrée.

RF ENVELOPE: Pour obtenir le signal d'enveloppe HF de la porteuse FM reproduite par la tête vidéo.

SPARE: (non connecté)

* Le BVH-2000PS(00)/(10) et le BVH-2000PS(02)/(12) sont dotés de ce réglage et de ce sélecteur. La fonction fournie par ce réglage et ce sélecteur est disponible sur le BVH-2000PS(04)/(14) uniquement s'il est installé dans un rack qui est équipé du réglage et du sélecteur correspondants.

1-4-2. Equipements périphériques du panneau de contrôle des fonctions



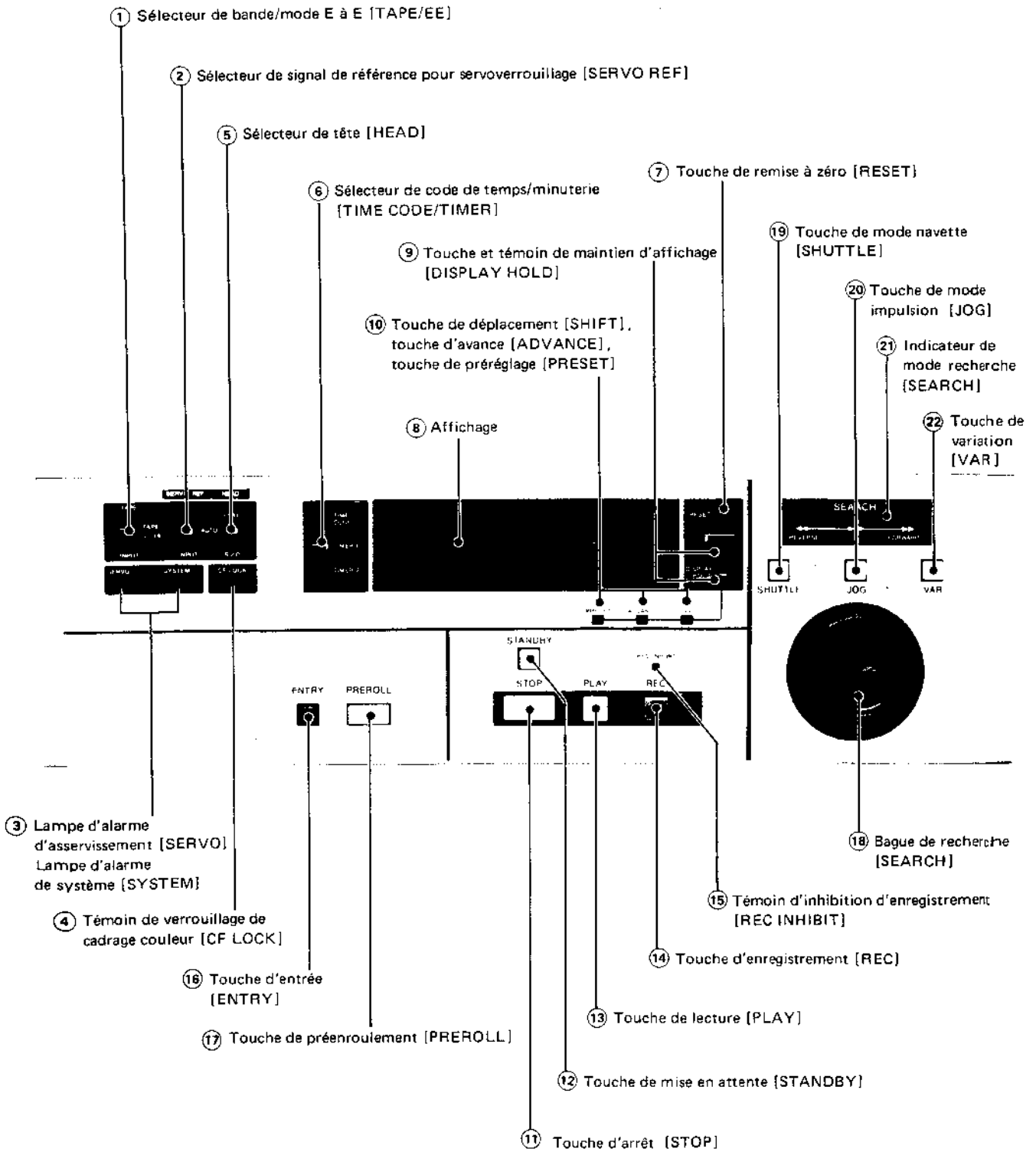
- ① **Compteur horaire des têtes [HEAD HOURS]**
Entrant en service dès que le tambour tourne et qu'une bande est installée, il enregistre la durée écoulée jusqu'à concurrence de 1 000 heures.
- ② **Compteur de défilement de bande [TAPE RUNNING]**
Totalisant la durée de défilement de la bande, sauf en mode STOP, il enregistre la durée écoulée jusqu'à concurrence de 5 000 heures.
- ③ **Compteur de durée d'exploitation [OPERATION]**
Entrant en service lorsque l'interrupteur POWER est allumé et que le magnétoscope fonctionne, il enregistre la durée d'utilisation jusqu'à concurrence de 10 000 heures.

- ④ **Interrupteur d'inhibition d'enregistrement [REC INHIBIT]**
Il sert à inhiber les modes REC et EDIT REC.
ON: Le magnétoscope ne se mettra pas en mode d'enregistrement, même si les touches REC et EDIT du panneau de contrôle sont enfoncées. Même dans le cas où le magnétoscope est télécommandé, l'enregistrement ne sera pas accepté.
OFF: Les touches REC et EDIT peuvent être sollicitées normalement.
Remarque: L'interrupteur REC INHIBIT fonctionnera de la manière indiquée dans le tableau ci-dessous en fonction du réglage des interrupteurs du panneau frontal et de la plaquette LG-02.

Interrupteur REC INHIBIT		Etat REC INHIBIT
Panneau frontal	Plaquette LG-02	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

En général, quand l'interrupteur REC INHIBIT du panneau frontal est sollicité, mettre l'interrupteur de la plaquette LG-02 en position OFF ou l'enlever.

1-4-3. Panneau de contrôle des fonctions – Type I



① **Sélecteur de bande/mode E-à-E [TAPE/EE]**

Il choisit le signal de sortie provenant des connecteurs VIDEO OUTPUT, AUDIO OUTPUT et MONITOR OUTPUT. Le signal de sortie est déterminé comme suit par la position donnée à ce sélecteur et par le mode d'exploitation du magnétoscope.

VIDEO

BVH-2000PS(00)/(10)

Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnétoscope				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

• Le sélecteur HEAD est sans effet sur la sortie du BVH-2000PS(00)/(10).

BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14)

Position du sélecteur HEAD ⑤	Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnétoscope				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
INPUT		INPUT	INPUT	INPUT	INPUT	

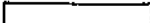
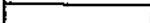
☐ : signal de sortie des connecteurs VIDEO OUTPUT
 ☐ : signal de sortie des connecteurs VIDEO MONITOR OUTPUT

*1 Si le sélecteur SW9-1 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en mode REC ou EDIT REC, même si le sélecteur TAPE/EE est réglé sur TAPE.
 *2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON et que le générateur/lecteur de code de temps BKH-2015/2015A est installé, la sortie sera noire entre les seuils d'entrée (IN) et de sortie (OUT).

*3 Si le sélecteur SW9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes, même si le sélecteur TAPE/EE se trouve sur INPUT.
 Remarque: Si le canal VIDEO ou SYNC est en mode EDIT-REC, tenir compte de la colonne REC/EDIT REC du tableau, même si l'autre canal est en mode lecture.
 *4 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui sera fourni.

AUDIO

Canal AUDIO utilisé	Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnéscope				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONFI *6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONFI *6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

 : signal de sortie des connecteurs AUDIO LINE OUTPUT
 : signal de sortie des connecteurs AUDIO MONITOR OUTPUT

- *1 Si la vitesse de lecture est 5 fois la normale ou davantage, la sortie sera atténuée.
- *2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON, la sortie sera assourdie entre les seuils IN et OUT.
- *3 Si le sélecteur SW9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes quand la position INPUT sera choisie.
- *4 Quand on choisit la position INPUT en mode STOP, le signal E-à-E du canal AUDIO-3 sera verrouillé, et le signal E-à-E sera fourni à partir des connecteurs AUDIO OUTPUT et MONITOR OUTPUT même si la position TAPE ou TAPE/EE est choisie après plusieurs quartiers. Ce verrouillage est libéré lorsque le magnéscope est placé dans un autre mode.
- *5 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui est fourni.
- *6 Le signal E-à-E est fourni à partir du BVH-2000PS(00)/(10).

② Sélecteur de signal de référence pour servo-verrouillage [SERVO REF]

Il choisit le signal de référence pour le verrouillage asservi.

EXT: Le signal raccordé au connecteur REF VIDEO INPUT ③ sur le panneau de connecteur vidéo (signal vidéo composite) devient le signal de référence.

AUTO: En mode REC, EDIT REC ou EDIT préréglé, le signal vidéo d'entrée devient le signal de référence. En mode PLAY, le signal de référence externe (choisi automatiquement) devient le signal de référence.

INPUT: Le signal raccordé au connecteur VIDEO INPUT sur le panneau de connecteur vidéo devient le signal de référence.

- Par la commande ADVANCE de la plaquette CD-17, il est possible de modifier le degré d'avance du signal de synchronisation nécessaire pour la lecture (se reporter à 1-6-3).

③ Lampe d'alarme (rouge) d'asservissement [SERVO] / lampe d'alarme (rouge) de système [SYSTEM] (Se reporter à 1-14.)

Elles signalent que le magnétoscope est utilisé d'une manière inappropriée.

Lampe SERVO

S'allume jusqu'à ce que le dispositif d'asservissement se verrouille ou quand il ne se verrouille pas.

Lampe SYSTEM

S'allume quand le contrôle du système ne fonctionne pas convenablement.

④ Témoin (vert) de verrouillage de cadrage couleur [CF LOCK]

S'allume quand le cadrage couleur du magnétoscope est verrouillé. Le choix entre image couleur/image monochrome est déterminé par les sélecteurs sur les plaquettes CD-17 et SR-15 (se reporter à 1-6-3).

⑤ Sélecteur de tête [HEAD]

Il choisit la tête de lecture du signal vidéo.

R/P: Lecture par la tête R/P (enregistrement/lecture).

PLAY: Lecture par la tête PLAY. Une lecture à alignement dynamique (DT) est possible si les magnétoscopes utilisés sont pourvus de cette fonction.

En mode REC ou EDIT REC, le choix de la tête R/P est automatique pour l'enregistrement ou l'enregistrement à montage, quelle que soit la position de ce sélecteur.

- Ce sélecteur n'agit qu'avec les BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14). Sur le BVH-2000PS(00)/(10), c'est toujours la tête R/P qui est en service, quelle que soit la position du sélecteur.

⑥ Sélecteur de code de temps/minuterie [TIME CODE/TIMER]

Il permet de choisir un des trois modes d'indication de la durée de défilement de la bande sur l'affichage ⑧.

TIME CODE: Position utilisée pour indiquer le code de temps EBU. Le sélecteur CH3 INPUT de la plaquette AE-03 (se reporter à 1-6-3) doit se trouver à la position TC. Le sélecteur A-3 SEL de la même plaquette AE-03 sert à choisir un code de temps externe ou un code de temps interne (quand le générateur/lecteur BKH-2015/2015A en option est installé). Le sélecteur TC/U-BIT du BKH-2015/2015A (TC-14/14A) permet de permuer entre l'indicateur de code de temps et celui de bit d'utilisateur. Normalement, ce compteur affiche une valeur obtenue par le lecteur de code de temps, mais quand le sélecteur TAPE/EE ① est placé sur INPUT, il affiche une entrée provenant du générateur de code de temps. Lorsque le sélecteur READ du générateur/lecteur BKH-2015/2015A (TC-14/14A) est réglé sur VITC, la fonction de préenroulement est inopérante.

TIMER-1: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Quelle que soit la position de la bande, un retour à zéro est possible par la touche RESET ⑦, le comptage reprenant alors à zéro à partir de ce point.

TIMER-2: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Pendant le cheminement de la bande, le retour à zéro du compteur TIMER-2 est impossible.

La donnée, indiquée sur l'affichage TIME CODE, TIMER-1 ou TIMER-2 choisi par ce sélecteur, peut être entrée comme seuil de préenroulement.

- Dès que la machine est mise en un des modes d'exploitation autre que le mode STOP, les compteurs TIMER-1 et 2 commencent à enregistrer la durée de défilement de la bande. Le point zéro du compteur TIMER-2 correspond à la position où le mode d'exploitation est désigné après cheminement de la bande. Pour le compteur TIMER-1, le retour à zéro est possible à n'importe quelle position de la bande.
- Lorsque l'interrupteur POWER est coupé (OFF) mais que la bande reste installée sur la machine, la donnée affichée sur TIMER-1 et 2 est préservée pendant 12 heures grâce à un condensateur de secours incorporé; pendant cet intervalle, elle peut donc encore être utilisée.

⑦ Touche de remise à zéro [RESET]

(1) Remise à zéro de TIMER-1

Après avoir amené le sélecteur TIME CODE/TIMER sur TIMER-1, la donnée du compteur TIMER-1 indiquée sur l'affichage ⑧ peut être ramenée à zéro par une poussée sur la touche RESET. Ce retour est impossible pour le compteur TIMER-2.

(2) Remise à zéro de TIME CODE

Après avoir amené le sélecteur TIME CODE/TIMER sur TIME CODE, l'entrée du générateur de code de temps est indiquée sur l'affichage ⑧ en plaçant le sélecteur TAPE/EE ① sur INPUT. Le générateur de code de temps sera ramené à zéro par une poussée sur la touche RESET dans cet état.

Quand le bit d'utilisateur est affiché, il sera ramené à zéro.

⑧ Affichage

Affichage fluorescent par 7 segments sur 8 colonnes, de couleur verte.



Curseur

⑨ Touche et témoin de maintien d'affichage [DISPLAY HOLD]

En toute position, la donnée présente sur l'affichage ⑧ est maintenue quand cette touche est enfoncée et, simultanément, le témoin s'allume pour signaler l'emploi de ce mode. Une nouvelle poussée éteint le témoin et la donnée présente est affichée.

⑩ Touche de déplacement [SHIFT], touche d'avance [ADVANCE], touche de pré réglage [PRESET]

Pour le pré réglage de TIMER-1 et TIME CODE à la valeur souhaitée. Non utilisable pour TIMER-2. Lorsque la touche DISPLAY HOLD ⑨ est réglée sur ON, les touches ont l'effet suivant:

Touche SHIFT: Elle déplace, d'un chiffre par poussée, le curseur visible dans le bas de l'affichage qui, arrivé au premier chiffre, retourne au dernier.

Touche ADVANCE: Elle fait avancer, d'une unité par poussée, le chiffre indiqué par le curseur.

Touche PRESET: Une fois que tous les chiffres sont réglés à la valeur souhaitée, la touche PRESET les entre comme donnée.

(1) Entrée d'une donnée pour l'affichage TIMER-1

Régler le sélecteur TIME CODE/TIMER ⑥ sur TIMER-1 et maintenir la donnée à l'aide de la touche DISPLAY HOLD ⑨. Agir ensuite sur les trois touches pour poser la donnée appropriée.

Il n'est pas possible de pré régler une donnée quand l'affichage TIMER-1 se trouve en mode d'affichage +/- (le S9-5 de la plaquette SY-80 étant réglé sur ON).

(2) Entrée d'une donnée pour l'affichage TIME CODE

Régler le sélecteur TIME CODE/TIMER ⑥ sur TIME CODE. Régler le magnétoscope en mode STOP/STANDBY et maintenir la donnée affichée à l'aide de la touche DISPLAY HOLD ⑨. Régler ensuite le seuil de départ du générateur de code de temps à la place souhaitée à l'aide des trois touches précédentes. Lorsque le bit d'utilisateur est affiché, il peut être posé comme valeur.

Régler le sélecteur TAPE/EE ① sur INPUT: l'entrée du générateur de code de temps sera alors affichée.

⑪ Touche d'arrêt [STOP]

Pour arrêter tous les modes d'exploitation, appuyer sur la touche STOP, ce qui arrête le moteur de bobine et écarte de la bande le galet-presseur.

- Environ 30 secondes après que la touche STOP a été actionnée, le mécanisme de libération de tension entre en service et l'appareil se place en mode STANDBY (tension réduite sur la bande). L'interrupteur TENSION OFF ENABLE (S9-7) de la plaquette SY-79 peut être coupé (OFF) de sorte que le mécanisme de libération de tension ne fonctionne pas.

- La machine se place d'elle-même en mode STOP quand elle est mise sous tension ou si la bande devait sortir du senseur de bande.

- Le témoin STOP clignote pour indiquer qu'aucun signal de référence n'est alimenté au servosystème.

- En mode STOP ou STANDBY, tout "mou" éventuel de la bande serait automatiquement rattrapé sur une bobine.

⑫ Touche de mise en attente [STANDBY]

Ce poussoir de mise en marche/arrêt sert à déclencher la rotation du tambour. Normalement, après avoir appuyé sur la touche STANDBY, on vérifiera si la lampe d'alarme SERVO ③ est éteinte et on appuiera sur la touche du mode souhaité. Cependant, il est aussi possible de passer directement au mode voulu en appuyant sur la touche correspondante sans actionner la touche STANDBY au préalable. Si aucune touche n'est actionnée dans les 9 minutes qui suivent la poussée sur la touche STANDBY, le mode de mise en attente (STANDBY) sera automatiquement libéré.

- Si l'interrupteur STANDBY OFF ENABLE (S9-8) de la plaquette SY-79 est sur OFF, la libération automatique du mode STANDBY ne se produit pas.

- Si la bande adhère quand le tambour commence sa rotation, le mécanisme de relâchement de tension entre en service pour détendre la bande.
- Le témoin **STANDBY** clignote pour signaler que, pour une raison ou l'autre, le tambour des têtes ne tourne pas normalement ou ne tourne pas du tout.

⑬ Touche de lecture [PLAY]

Une poussée sur cette touche allume les témoins **PLAY** et **STANDBY** et la machine entre en mode de lecture normale, (c.à.d. à vitesse normale en marche avant). Pour annuler ce mode, appuyer sur la touche **STOP**, **JOG**, **SHUTTLE**, **VAR** ou **PREROLL**.

- A l'aide du sélecteur **HEAD** ⑤ si l'on emploie le **BVH-2000PS(02)/(12)** ou le **BVH-2000PS(04)/(14)**, on peut choisir la tête **R/P** ou **PLAY** pour la lecture.
- Si, en vue d'une synchronisation de deux magnétoscopes de série **BVH**, une légère compensation de la vitesse de la bande à la lecture est requise, maintenir la touche **PLAY** enfoncée et tourner la bague **SEARCH** ⑬ dans le sens des aiguilles d'une montre pour accélérer la vitesse, ou dans le sens opposé pour la ralentir. L'importance de cette compensation se détermine par l'angle de rotation dans une plage de $\pm 15\%$ de la vitesse normale (fonction de priorité au cabestan). Le magnéto- scope revient à la vitesse normale dès que la touche **PLAY** est relâchée.

⑭ Touche d'enregistrement [REC]

Lorsqu'on appuie sur la touche **PLAY** en maintenant la touche **REC** enfoncée, les témoins **REC** et **PLAY** s'allument et la machine se place en mode d'enregistrement. Pour annuler ce mode, appuyer sur la touche **STOP**, **JOG**, **SHUTTLE**, **VAR** ou **PREROLL**.

- Quelle que soit la position du sélecteur **HEAD** ⑤, l'enregistrement s'accomplit par la tête **R/P**.
- A l'emploi du **BVH-2000PS(02)/(12)** ou du **BVH-2000PS(04)/(14)**, l'image en lecture simultanée peut être surveillée pendant l'enregistrement en réglant le sélecteur **TAPE/EE** ① sur **TAPE**.
- Quand le témoin **REC INHIBIT** ⑮ est allumé, l'appareil entre en mode de lecture sans enregistrer.
- Quand l'interrupteur **REC TEST** de la plaquette **SY-79** est réglé sur **ON** et que le **BVH-2000PS(00)/(10)** se trouve en mode **STOP**, cet appareil entrera en mode d'essai d'enregistrement (**REC TEST**) par une poussée sur la touche **REC**.
(Pour les détails, se reporter en page 1-78(F).)

⑮ Témoin d'inhibition d'enregistrement [REC INHIBIT]

Il indique que le magnéto- scope se trouve en mode d'inhibition d'enregistrement. Il s'allume quand est réglé sur **ON** l'interrupteur **REC INHIBIT** et l'enregistrement est alors inhibé. Si l'on essaie quand même d'enregistrer, bien que ce témoin soit allumé, l'appareil se placera en mode de lecture.

- Quand l'interrupteur **REC TEST** de la plaquette **SY-79** est placé sur **ON** et que le **BVH-2000PS(00)/(10)** est en mode **REC TEST**, le témoin **REC INHIBIT** clignote. (Pour les détails, se reporter en page 1-78(F).)

⑯ Touche d'entrée [ENTRY]

Elle sert à la mémorisation du seuil d'entrée. Le fait d'appuyer sur cette touche en un point donné de la bande mémorise cette position. Si, par la suite, on fait défiler la bande jusqu'à une autre position, on pourra la ramener au seuil de préenroulement (position antérieure au seuil d'entrée par la durée de préenroulement) par simple poussée sur la touche **PREROLL** ⑰, après quoi, la bande s'arrêtera. L'entrée s'effectue pour les données **TIME CODE/TIMER-1/2** qui sont indiquées sur l'affichage ⑧. Dès lors, en plus du seuil de défilement de bande actuel, il est possible d'introduire les données d'entrée et les données affichées au moyen de la touche **PRESET** ⑩.

- Pendant que le témoin **DISPLAY HOLD** est allumé, il est possible d'afficher le seuil **ENTRY** par une poussée sur la touche **ENTRY**.

⑰ Touche de préenroulement [PREROLL]

Si la touche **PREROLL** est actionnée, la bande revient au seuil d'entrée pré-réglé par la touche **ENTRY**, puis elle s'arrête à une position précédant de quelques secondes le seuil d'entrée (seuil de préenroulement).

Le nombre de secondes du préenroulement peut se déterminer entre 0 et 15 secondes, par incrément d'une seconde, au moyen du sélecteur **P.ROL TIME** de la plaquette **SY-79**.

- Si le sélecteur **READ** du générateur/lecteur **BKH-2015/2015A (TC-14/14A)** est placé sur **VITC** et le sélecteur **TIME CODE/TIMER** ⑥ est placé sur **TIME CODE**, la fonction de préenroulement est inopérante.

⑱ Bague de recherche [SEARCH]

Elle sert à modifier le défilement de la bande.

- (1) La rotation de cette bague pendant le mode **JOG**, **SHUTTLE** ou **PROGRAM JOG** (voir pages 1-23(F), 24(F)) permet de changer la direction et la vitesse du défilement.
- (2) Sa rotation pendant le mode **STOP**, **STANDBY**, **PLAY** ou **REC** allume le témoin **SEARCH** et il est alors possible de régler à l'avance la direction et la vitesse du défilement qui seront ensuite utilisées en mode **PROGRAM JOG**.

⑲ Touche de mode navette [SHUTTLE]

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode **SHUTTLE**. Dans cet état, une rotation de la bague **SEARCH** ⑬ vers la gauche ou vers la droite, suivie de son maintien à une position quelconque, fournira une lecture à la vitesse correspondante à la rotation, vitesse pouvant aller de 1/32e à 50 fois la normale. A la position centrale, une image fixe est obtenue. La bague **SEARCH** présente un encliquetage à la position centrale et aux positions ± 50 .

- Lors d'un enroulement accéléré en marche avant, la vitesse se réduit d'elle-même en fin de bande et l'arrêt de la machine est automatique. Si l'on désire enrouler complètement la bande, tourner la bague **SEARCH** à nouveau vers la droite ou placer sur **OFF** l'interrupteur **EOT STOP** de la plaquette **SY-80**.

- Lors d'un enroulement accéléré en marche arrière (rebobinage), la vitesse se réduit d'elle-même au début de la bande et l'arrêt est automatique près de la position du réglage à zéro du TIMER-2.
- Si l'on désire enrouler complètement la bande, tourner la bague SEARCH vers la gauche ou placer sur OFF l'interrupteur EOT STOP de la plaquette SY-80.
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

⑳ **Touche de mode impulsion [JOG]**

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode JOG. Dans cet état, la vitesse de la lecture dépend de la vitesse de la rotation imprimée à la bague SEARCH, vitesse de lec-

ture pouvant aller de 0 à plusieurs fois la normale. Dès que la rotation est arrêtée, l'on obtient une image fixe à la position de la bague. Dans ce cas, la bague SEARCH n'a pas d'encliquetage.

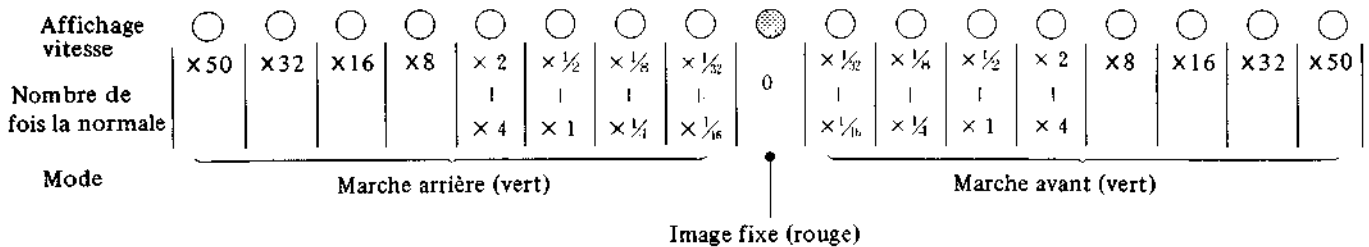
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

㉑ **Indicateur de mode recherche [SEARCH]**

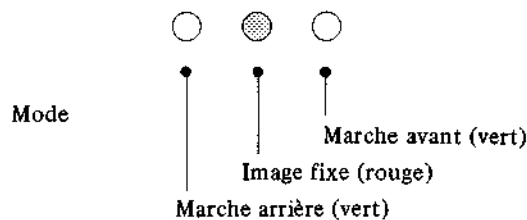
Il affiche le mode d'utilisation de la bague de recherche. En mode SHUTTLE, JOG ou PROGRAM JOG (décrit en ㉒), les témoins s'allument comme indiqué sur l'illustration d'après l'utilisation de la bague SEARCH et ils indiquent la vitesse et la direction de la bande.

Remarque: Quand la bande approche de son extrémité, le témoin "fixe" ou les témoins de marche avant ou arrière clignotent.

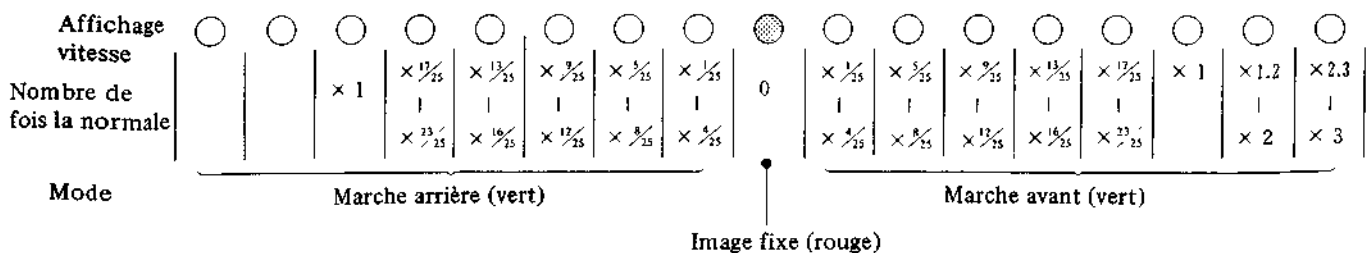
Mode navette (SHUTTLE)



Mode impulsion (JOG)



Mode impulsion programmée (PROGRAM JOG)



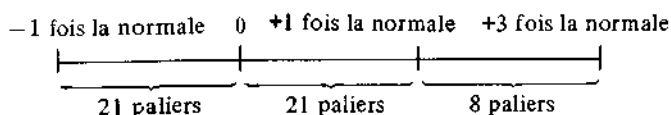
② **Touche de variation [VAR]**

Sa poussée allume le témoin correspondant et place la machine en mode PROGRAM JOG ou PROGRAM PLAY. Ces modes sont choisis par le sélecteur VAR sur la plaquette SY-79.

Mode PROGRAM JOG:

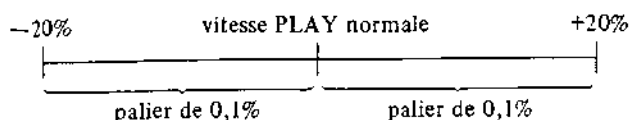
Après avoir placé le sélecteur VAR de la plaquette SY-79 à la position P.JOG, une poussée sur la touche VAR place l'appareil en mode PROGRAM JOG. Si la bague SEARCH est tournée à droite ou à gauche et que la rotation est arrêtée à une position quelconque, la lecture s'accomplira à une vitesse (de -1 à +3 fois la normale) correspondant à la position donnée à la bague qui présente des positions d'encliquetage à -1, 0, +1 et +3 fois la normale.

A l'emploi du magnéscope BVH-2000PS(02)/(12) ou BVH-2000PS(04)/(14), une lecture non parasitée sera possible sur toute la plage (de -1 à +3 fois la normale) de la bague si le sélecteur de tête HEAD ① se trouve à la position PLAY. Ce mode fait aussi office de fonction vernier en mode SHUTTLE habituel (de -50 à +50 fois la normale). La vitesse peut alors être réglée à un des 50 paliers suivants:



Mode PROGRAM PLAY:

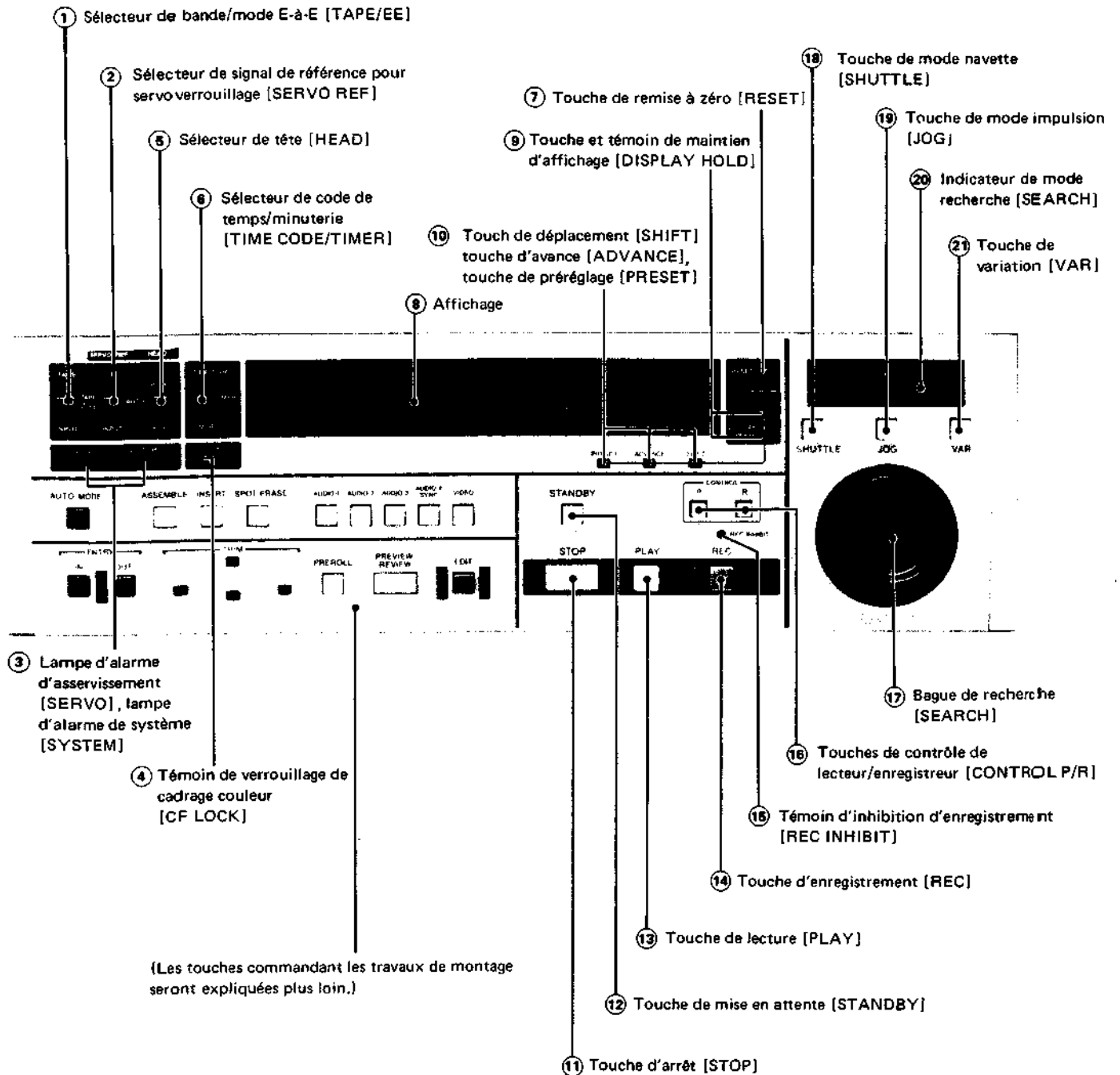
Si elles sont actionnées simultanément après que le sélecteur VAR de la plaquette SY-79 est réglé sur P.PLY, les touches VAR et PLAY permettent de faire passer l'appareil au mode de lecture programmée (PROGRAM PLAY). Tourner ensuite la bague SEARCH vers la gauche ou vers la droite en poussant en même temps la touche VAR et arrêter à la position souhaitée: la lecture s'accomplit alors à la vitesse correspondant à la position de la bague (de -20% à +20%). A l'emploi du BVH-2000PS(02)/(12) ou du BVH-2000PS(04)/(14), une lecture non parasitée est possible dans ce mode, comme en mode PROGRAM JOG, sur toute la plage couverte par la bague. Comme dans le cas précédent, cette touche peut aussi remplir la fonction de vernier en mode SHUTTLE habituel. La vitesse peut se régler par paliers de 0,1% jusqu'à ±20% de la vitesse de lecture (PLAY) normale.



Un pré-réglage de la vitesse de bande est possible par rotation de la bague SEARCH pendant que la touche VAR est enfoncée en mode STOP, STANDBY, PLAY ou REC. Après le réglage, la lecture programmée commence à la vitesse pré-réglée par une poussée simultanée sur les touches PLAY et VAR.

La vitesse réglée apparaît à l'affichage ⑧ en pourcentage tant que la touche VAR est appuyée.

1-4-4. Panneau de contrôle des fonctions – Type II



① Sélecteur de bande/mode E-à-E [TAPE/EE]

Il choisit le signal de sortie provenant des connecteurs VIDEO OUTPUT, AUDIO OUTPUT et MONITOR OUTPUT. Le signal de sortie est déterminé comme suit par la position donnée à ce sélecteur et par le mode d'exploitation du magnétoscope.

VIDEO

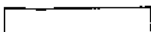

BVH-2000PS(00)/(10)

Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnétoscope				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

- Le sélecteur HEAD est sans effet sur la sortie du BVH-2000PS(00)/(10).

BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14)

Position du sélecteur HEAD ⑤	Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnétoscope				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

 : signal de sortie des connecteurs VIDEO OUTPUT
 : signal de sortie des connecteurs VIDEO MONITOR OUTPUT

*1 Si le sélecteur SW9-1 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en mode REC ou EDIT REC, même si le sélecteur TAPE/EE est réglé sur TAPE.

*2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON et que le générateur/lecteur de code de temps BKH-2015/2015A est installé, la sortie sera noire entre les seuils IN et OUT.

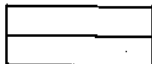
*3 Si le sélecteur SW9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes, même si le sélecteur TAPE/EE se trouve sur INPUT.

Remarque: Si le canal VIDEO ou SYNC est en mode EDIT-REC, tenir compte de la colonne REC/EDIT REC du tableau, même si l'autre canal est en mode lecture.

*4 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui sera fourni.

AUDIO

Canal AUDIO utilisé	Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnéscope				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONFI *6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONFI *6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT



: signal de sortie des connecteurs AUDIO LINE OUTPUT

: signal de sortie des connecteurs AUDIO MONITOR OUTPUT

- *1 Si la vitesse de lecture est 5 fois la normale ou davantage, la sortie sera atténuée.
- *2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON, la sortie sera assourdie entre les seuils IN et OUT.
- *3 Si le sélecteur SW-9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes quand la position INPUT sera choisie.
- *4 Quand on choisit la position INPUT en mode STOP, le signal E-à-E du canal AUDIO-3 sera verrouillé, et le signal E-à-E sera fourni à partir des connecteurs AUDIO OUTPUT et MONITOR OUTPUT même si la position TAPE ou TAPE/EE est choisie après plusieurs quartiers. Ce verrouillage est libéré lorsque le magnéscope est placé dans un autre mode.
- *5 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui est fourni.
- *6 Le signal E-à-E est fourni à partir du BVH-2000PS(00)/(10).

② **Sélecteur de signal de référence pour servo-verrouillage [SERVO REF]**

Il choisit le signal de référence pour le verrouillage asservi.

EXT: Le signal raccordé au connecteur REF VIDEO INPUT ③ sur le panneau de connecteur vidéo (signal vidéo composite) devient le signal de référence.

AUTO: En mode REC, EDIT REC ou EDIT pré-réglé, le signal vidéo d'entrée devient le signal de référence. En mode PLAY, le signal de référence externe (choisi automatiquement) devient le signal de référence.

INPUT: Le signal raccordé au connecteur VIDEO INPUT sur le panneau de connecteur vidéo devient le signal de référence.

- Par la commande ADVANCE de la plaquette CD-17, il est possible de modifier le degré d'avance du signal de synchronisation nécessaire pour la lecture (se reporter à 1-6-3).

③ **Lampe d'alarme (rouge) d'asservissement [SERVO] / lampe d'alarme (rouge) de système [SYSTEM]**
(Se reporter à 1-14.)

Elles signalent que le magnétoscope est utilisé d'une manière inappropriée.

Lampe SERVO

S'allume jusqu'à ce que le dispositif d'asservissement se verrouille ou quand il ne se verrouille pas.

Lampe SYSTEM

S'allume quand le contrôle du système ne fonctionne pas convenablement.

④ **Témoin (vert) de verrouillage de cadrage couleur [CF LOCK]**

S'allume quand le cadrage couleur du magnétoscope est verrouillé. Le choix entre image couleur/image monochrome est déterminé par les sélecteurs sur les plaquettes CD-17 et SR-15 (se reporter à 1-6-3).

⑤ **Sélecteur de tête [HEAD]**

Il choisit la tête de lecture du signal vidéo.

R/P: Lecture par la tête R/P (enregistrement/lecture).

PLAY: Lecture par la tête PLAY. Une lecture à alignement dynamique (DT) est possible si les magnétoscopes utilisés sont pourvus de cette fonction.

En mode REC ou EDIT REC, le choix de la tête R/P est automatique pour l'enregistrement ou l'enregistrement à montage, quelle que soit la position de ce sélecteur.

- Ce sélecteur n'agit qu'avec les BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14). Sur le BVH-2000PS(00)/(10), c'est toujours la tête R/P qui est en service, quelle que soit la position du sélecteur.

⑥ **Sélecteur de code de temps/minuterie [TIME CODE/TIMER]**

Il permet de choisir un des trois modes d'indication de la durée de défilement de la bande sur l'affichage ⑧.

TIME CODE: Position utilisée pour indiquer le code de temps EBU. Le sélecteur CH3 INPUT de la plaquette AE-03 (se reporter à 1-6-3) doit se trouver à la position TC. Le sélecteur A-3 SEL de la même plaquette AE-03 sert à choisir un code de temps externe ou un code de temps interne (quand le générateur/lecteur BKH-2015/2015A en option est installé). Le sélecteur TC/U-BIT du BKH-2015/2015A (TC-14/14A) permet de permuter entre l'indicateur de code de temps et celui de bit d'utilisateur. Normalement, ce compteur affiche une valeur obtenue par le lecteur de code de temps, mais quand le sélecteur TAPE/EE ① est placé sur INPUT, il affiche une entrée provenant du générateur de code de temps. Lorsque le sélecteur READ du générateur/lecteur BKH-2015/2015A (TC-14/14A) est réglé sur VITC, la fonction de pré-enroulement est inopérante.

TIMER-1: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Quelle que soit la position de la bande, un retour à zéro est possible par la touche RESET ⑦, le comptage reprenant alors à zéro à partir de ce point.

TIMER-2: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Pendant le cheminement de la bande, le retour à zéro du compteur TIMER-2 est impossible.

La donnée, indiquée sur l'affichage TIME CODE, TIMER-1 ou TIMER-2 choisi par ce sélecteur, peut être entrée comme seuil d'entrée (IN) ou de sortie (OUT) de montage.

- Dès que la machine est mise en un des modes d'exploitation autre que le mode STOP, les compteurs TIMER-1 et 2 commencent à enregistrer la durée de défilement de la bande. Le point zéro du compteur TIMER-2 correspond à la position où le mode d'exploitation est désigné après cheminement de la bande. Pour le compteur TIMER-1, le retour à zéro est possible à n'importe quelle position de la bande.
- Lorsque l'interrupteur POWER est coupé (OFF) mais que la bande reste installée sur la machine, la donnée affichée sur TIMER-1 et 2 est préservée pendant 12 heures grâce à un condensateur de secours incorporé; pendant cet intervalle, elle peut donc encore être utilisée.

⑦ Touche de remise à zéro [RESET]

(1) Remise à zéro de TIMER-1

Après avoir amené le sélecteur TIME CODE/TIMER sur TIMER-1, la donnée du compteur TIMER-1 indiquée sur l'affichage ⑧ peut être ramenée à zéro par une poussée sur la touche RESET. Ce retour est impossible pour le compteur TIMER-2.

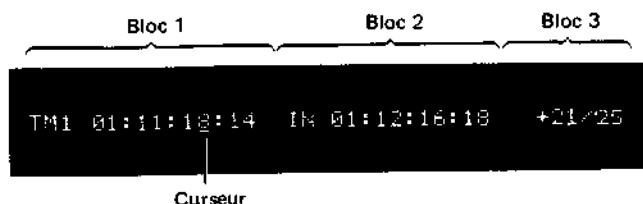
(2) Remise à zéro de TIME CODE

Après avoir amené le sélecteur TIME CODE/TIMER sur TIME CODE, l'entrée du générateur de code de temps est indiquée sur l'affichage ⑧ en plaçant le sélecteur TAPE/EE ① sur INPUT. Le générateur de code de temps sera ramené à zéro par une poussée sur la touche RESET dans cet état.

Quand le bit d'utilisateur est affiché, il sera ramené à zéro.

⑧ Affichage

Cet affichage par points matriciels à 40 caractères sur une ligne se divise en trois blocs:



- 8 colonnes numériques indiquent 00 heures/00 minutes/00 secondes/00 cadres.
- L'affichage standard pour les minuteriers TIMER-1 et 2 se fait en cycle de 24 heures. Si l'interrupteur S9-5 de la plaquette SY-80 est réglé sur ON, un affichage +/- est également possible.

Bloc 1

Ce bloc indique la durée de défilement de la bande sur l'enregistreur ou le lecteur en service. Le choix entre les données du code de temps ou les données de comptage CTL s'effectue par le sélecteur TIME CODE/TIMER ⑥.

La signification des trois lettres apparaissant à la gauche du Bloc 1 est la suivante:

TCR: Valeur du lecteur de code de temps
TCG: Valeur du générateur de code de temps
TM1: Donnée de minuterie TIMER-1
TM2: Donnée de minuterie TIMER-2
UBR: Valeur du bit d'utilisateur
UBG: Valeur produite du bit d'utilisateur

- Remarquer que quand le sélecteur A-3 SEL de la plaquette AE-03 (se reporter à 1-6-3) est réglé à une position autre que TC, des astérisques "*" apparaissent dans toutes les colonnes à la place des chiffres, même si l'on a pris accès au code de temps.

Bloc 2

Ce bloc affiche les données des seuils d'entrée/sortie

(IN/OUT) de montage lorsqu'elles sont entrées. Elles peuvent servir pour le rappel ou la correction de diverses données, ainsi que pour l'affichage de durée.

La signification des lettres apparaissant à la gauche du Bloc 2 est la suivante:

IN: Seuil d'entrée (IN) vidéo ou audio
OUT: Seuil de sortie (OUT) vidéo ou audio
AI: Seuil d'entrée (IN) audio
AO: Seuil de sortie (OUT) audio
DUR: Durée (c.à.d. la période entre les seuils IN et OUT) calculée par TIMER-1
LAP: Durée par TIMER-2

Bloc 3

Ce bloc affiche la vitesse de défilement de la bande pendant l'exploitation du magnétoscope. Il indique également la vitesse de défilement en mode PROGRAM JOG ou PROGRAM PLAY (dont les explications se trouvent en ② Touche VAR), préalablement déterminée par la bague SEARCH.

La vitesse de bande est indiquée sous forme d'une fraction quand elle est inférieure à la normale et sous forme d'un multiple quand elle lui est supérieure.

Ce bloc indique aussi les défaillances sous forme de messages d'erreur clignotants.

La signification des lettres affichées est la suivante:

SYS ERR: Indique une erreur du système, c.à.d. que l'unité centrale de traitement CPU ne fonctionne pas normalement.
OVER HEAT: Indique une surchauffe de l'unité d'alimentation électrique ou de l'ampli de commande du moteur.
LINE ERR: Indique une erreur de ligne quand la communication télécommandée ne s'effectue pas correctement.
ABORT: Indique que les travaux de montage ne s'accomplissent pas normalement.
LOST LCK*: Indique que le verrouillage asservi est perdu au cours d'un enregistrement.
NEGATIVE: Indique que le seuil de sortie (OUT) de montage est placé avant le seuil d'entrée (IN).
DATA ERR: Indique qu'une valeur numérique inacceptable a été posée comme donnée horaire (p. ex. 65 secondes 35 cadres, etc.).
TAPE OUT: Indique que la bande n'est pas convenablement installée.
REC TEST (Pour les BVH-2000PS(00) et (10) uniquement):
Indique que l'interrupteur REC TEST est sur ON, l'interrupteur REC INHIBIT est sur OFF et que le BVH-2000PS(00)/(10) se trouve en mode STOP ou REC TEST.

- * Les adresses où les erreurs LOST LCK se sont produites pendant l'enregistrement et le montage sont mémorisées et peuvent être affichées au bloc 2 plus tard (seulement pour l'appareil qui possède le

système ROM avec la version N° 3-5 et au dessus; pour plus de détails, se reporter à 1-14-2. Indication de perte de verrouillage asservi).

⑨ **Touche et témoin de maintien d'affichage [DISPLAY HOLD]**

En toute position, la donnée présente sur l'affichage ⑧ est maintenue quand cette touche est enfoncée et, simultanément, le témoin s'allume pour signaler l'emploi de ce mode. Une nouvelle poussée éteint le témoin et la donnée en cours de lecture est affichée.

⑩ **Touche de déplacement [SHIFT], touche d'avance [ADVANCE], touche de préréglage [PRESET]**

Pour le préréglage de TIMER-1 et de TIME CODE à la valeur souhaitée. Non utilisable pour le TIMER-2. Lorsque la touche DISPLAY HOLD ⑨ est réglée sur ON, les touches remplissent les fonctions suivantes:

Touche SHIFT: Elle déplace, d'un chiffre par poussée, le curseur visible dans le bas de l'affichage qui, arrivé au premier chiffre retourne au dernier.

Touche ADVANCE: Elle fait avancer, d'une unité par poussée, le chiffre indiqué par le curseur.

Touche PRESET: Une fois que tous les chiffres sont réglés à la valeur souhaitée, la touche PRESET les entre comme données.

(1) **Entrée d'une donnée pour la minuterie TIMER-1**
Régler le sélecteur TIME CODE/TIMER ⑥ sur TIMER-1 et maintenir la donnée sur l'affichage à l'aide de la touche DISPLAY HOLD ⑨. Agir ensuite sur les trois touches pour poser la donnée appropriée.

Il n'est pas possible de préréglage une donnée quand l'affichage TIMER-1 se trouve en mode d'affichage +/- (l'interrupteur S9-5 de la plaquette SY-80 étant réglé sur ON).

(2) **Entrée d'une donnée pour l'affichage TIME CODE**
Régler le sélecteur TIME CODE/TIMER ⑥ sur TIME CODE. Régler le magnéto-scope en mode STOP/STANDBY et maintenir la donnée affichée à l'aide de la touche DISPLAY HOLD ⑨. Régler ensuite le seuil de départ du générateur de code de temps à la place souhaitée à l'aide des trois touches précédentes. Lorsque le bit d'utilisateur est affiché, il peut être posé comme valeur.

Régler le sélecteur TAPE/EE ① sur INPUT: l'entrée du générateur de code de temps sera alors affichée.

⑪ **Touche d'arrêt [STOP]**

Pour arrêter tous les modes d'exploitation, appuyer sur la touche STOP, ce qui arrête le moteur de bobine et écarte de la bande le galet-presseur.

• Environ 30 secondes après que la touche STOP a été actionnée, le mécanisme de libération de tension entre en service et l'appareil se place en mode STANDBY (tension réduite sur la bande).

L'interrupteur TENSION OFF ENABLE (S9-7) de la plaquette SY-79 peut être coupé (OFF) de sorte que le mécanisme de libération de tension ne fonctionne plus.

• La machine se place d'elle-même en mode STOP quand elle est mise sous tension ou si la bande devait sortir du capteur de bande.

• Le témoin STOP clignote pour indiquer qu'aucun signal de référence n'est alimenté au servo-système.

• En mode STOP ou STANDBY, tout "mou" éventuel de la bande serait automatiquement rattrapé sur une bobine.

⑫ **Touche de mise en attente [STANDBY]**

Ce poussoir de mise en marche/arrêt sert à déclencher la rotation du tambour. Normalement, après avoir appuyé sur la touche STANDBY, on vérifiera si la lampe d'alarme SERVO ③ est éteinte et on appuiera sur la touche du mode souhaité. Cependant, il est aussi possible de passer directement au mode voulu en appuyant sur la touche correspondante sans actionner la touche STANDBY au préalable. Si aucune touche n'est actionnée dans les 9 minutes qui suivent la poussée sur la touche STANDBY, le mode de mise en attente sera automatiquement libéré.

• Si l'interrupteur STANDBY OFF ENABLE (S9-8) de la plaquette SY-79 est sur OFF, ou bien si la touche AUTO MODE ou une des touches de préréglage de canal est allumée, la libération automatique du mode STANDBY ne se produit pas.

• Si la bande adhère quand le tambour commence sa rotation, le mécanisme de relâchement de tension entre en service pour détendre la bande.

• Le témoin STANDBY clignote pour signaler que, pour une raison ou une autre, le tambour des têtes ne tourne pas normalement ou ne tourne pas du tout.

⑬ **Touche de lecture [PLAY]**

Une poussée sur cette touche allume les témoins PLAY et STANDBY et la machine entre en mode de lecture normale (c.à.d. à la vitesse normale en marche avant). Pour annuler ce mode, appuyer sur la touche STOP, JOG, SHUTTLE, VAR ou PREROLL.

• A l'aide du sélecteur HEAD ⑤ si l'on emploie les BVH-2000PS(02) et (12) ou les BVH-2000PS(04) et (14), on peut choisir la tête R/P ou PLAY pour la lecture.

• Si, en vue d'une synchronisation de deux magnéto-scopes de série BVH, une légère compensation de la vitesse de bande à la lecture est requise, maintenir la touche PLAY enfoncée et tourner la bague SEARCH ⑰ dans le sens des aiguilles pour accélérer, ou dans le sens opposé pour ralentir la vitesse. L'importance de cette compensation se détermine par l'angle de rotation dans une plage de $\pm 15\%$ de la vitesse normale (fonction de priorité au cabestan). Le magnéto-scope revient à la vitesse normale dès que la touche PLAY est relâchée.

⑭ Touche d'enregistrement [REC]

Lorsqu'on appuie sur la touche PLAY en maintenant la touche REC enfoncée, les témoins REC et PLAY s'allument et la machine se place en mode d'enregistrement. Pour annuler ce mode, appuyer sur la touche STOP, JOG, SHUTTLE, VAR ou PREROLL.

- Quelle que soit la position du sélecteur HEAD ⑤, l'enregistrement s'accomplit par la tête R/P.
- A l'emploi du BVH-2000PS(02)/(12) ou du BVH-2000PS(04)/(14), l'image en lecture simultanée peut être surveillée pendant l'enregistrement en réglant le sélecteur TAPE/EE ① sur TAPE.
- Quand le témoin REC INHIBIT ⑬ est allumé, l'appareil entre en mode de lecture sans enregistrer.
- Quand l'interrupteur REC TEST de la plaquette SY-79 se trouve sur ON et que le BVH-2000PS(00)/(10) est en mode STOP, ce dernier se place en mode REC TEST par une poussée sur la touche REC. Pour les détails, se reporter en page 1-78(F).

⑮ Témoin d'inhibition d'enregistrement [REC INHIBIT]

Il indique que le magnétoscope se trouve en mode d'inhibition d'enregistrement. Il s'allume quand est réglé sur ON l'interrupteur REC INHIBIT et l'enregistrement est alors inhibé. Si l'on essaie quand même d'enregistrer, bien que ce témoin soit allumé, l'appareil se placera en mode de lecture.

- Quand l'interrupteur REC TEST de la plaquette SY-79 est placé sur ON et que le BVH-2000PS(00)/(10) est en mode REC TEST, le témoin REC INHIBIT clignote. (Pour les détails, se reporter en page 1-78(F).)

⑯ Touches de contrôle de lecteur/enregistreur [CONTROL P/R]

Quand un autre magnétoscope est raccordé au connecteur REMOTE-2 sur le panneau arrière et que le sélecteur REMOTE de la plaquette SY-79 est réglé sur REMOTE-2, placer sur LOCAL le sélecteur REMOTE/LOCAL du panneau de contrôle de niveau et le magnétoscope fonctionnera comme appareil enregistreur. Les contrôles suivants peuvent être accomplis par ces touches (se reporter à 1-11-3):

Touche "P" allumée:

Quand la touche P est enfoncée et que son témoin s'allume, les touches de montage et de transport de la bande commandent le lecteur raccordé, permettant sa télécommande. Les affichages sont aussi ceux de l'appareil lecteur. Toutefois, les sélecteurs SERVO REF ②, HEAD ⑤ et TIME CODE/TIMER ⑥, qui doivent être réglés au côté lecteur, ne fonctionnent pas.

Touche "R" allumée:

Quand la touche R est enfoncée et que son témoin s'allume, les touches font fonctionner ce magnétoscope comme

appareil enregistreur. Si la touche AUTO MODE ⑲ est alors enfoncée, le lecteur et l'enregistreur entrent en mode de contrôle, permettant d'effectuer le prévisionnement (PREVIEW), le montage automatique (AUTO EDIT) et la revue (REVIEW).

Touches "P" et "R" allumées:

Quand les deux touches sont enfoncées et allumées, les deux magnétoscopes peuvent fonctionner en synchronisation. Toutefois, il est nécessaire, dans ce cas, de régler sur ON l'interrupteur PARA-RUN de la plaquette SY-79.

Touches "P" et "R" éteintes:

Quand les témoins de ces deux touches sont éteints, seul ce magnétoscope peut être utilisé ou la communication entre l'enregistreur et le lecteur est impossible.

⑰ Bague de recherche [SEARCH]

Elle sert à modifier le défilement de la bande.

- (1) La rotation de cette bague pendant le mode JOG, SHUTTLE, PROGRAM JOG ou PROGRAM PLAY (se reporter à 1-9) permet de changer la direction et la vitesse du défilement.
- (2) Sa rotation pendant le mode STOP, STANDBY, PLAY ou REC allume le témoin SEARCH et il sera alors possible de régler à l'avance la direction et la vitesse du défilement qui seront ensuite utilisées en mode PROGRAM JOG ou PROGRAM PLAY. La vitesse déterminée est indiquée sur le Bloc 3 de l'affichage ⑧.
- (3) Tout en gardant la touche STOP enfoncée pendant le mode STOP ou lorsque l'on garde la touche STANDBY enfoncée pendant l'enregistrement ou le montage, faire tourner la bague de recherche de façon à ce que les adresses des erreurs LOST LCK qui se sont produites pendant l'enregistrement ou le montage précédent apparaissent sur l'affichage (seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus; pour plus de détails, se reporter à 1-14-2. Indication de perte de verrouillage asservi).

⑱ Touche de mode navette [SHUTTLE]

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode SHUTTLE. Dans cet état, une rotation de la bague SEARCH ⑰ vers la gauche ou vers la droite, suivie de son maintien à une position quelconque, fournira une lecture à la vitesse correspondante à la rotation, vitesse pouvant aller de 1/32e à 50 fois la normale. A la position centrale, une image fixe est obtenue. La bague SEARCH présente un encliquetage à la position centrale et aux positions ± 50 .

- Lors d'un enroulement accéléré en marche avant, la vitesse se réduit d'elle-même en fin de bande et l'arrêt de la machine est automatique. Si l'on désire enrouler complètement la bande, tourner la bague SEARCH à nouveau vers la droite ou placer sur OFF l'interrupteur EOT STOP de la plaquette SY-80.
- Lors d'un enroulement accéléré en marche arrière (rembobinage), la vitesse se réduit d'elle-même au début de la bande et l'arrêt est automatique près de la position du réglage à zéro du TIMER-2.
- Si l'on désire enrouler complètement la bande, tourner la bague SEARCH vers la gauche ou placer sur OFF l'interrupteur EOT STOP de la plaquette SY-80.
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

⑲ **Touche de mode impulsion [JOG]**

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode JOG. Dans cet état, la vitesse de la lecture dépend de la vitesse de la rotation imprimée à la bague SEARCH, vitesse de lecture pouvant aller de 0 à plusieurs fois la normale. Dès que la rotation est arrêtée, l'on obtient une image fixe à la position de la bague. Dans ce cas, la bague SEARCH n'a pas d'encliquetage.

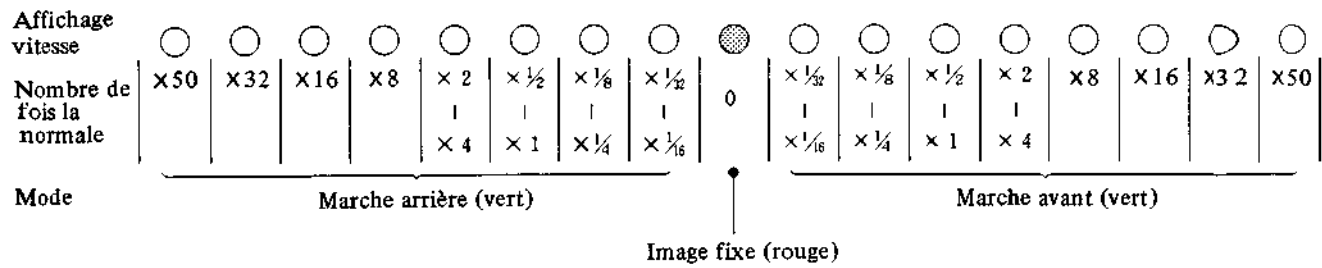
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

⑳ **Indicateur de mode recherche [SEARCH]**

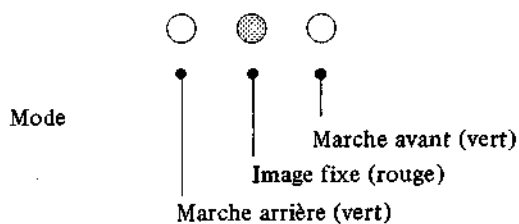
Il affiche le mode d'utilisation de la bague de recherche. En mode SHUTTLE, JOG ou PROGRAM JOG (décrit en ⑳), les témoins s'allument comme indiqué sur l'illustration d'après l'utilisation de la bague SEARCH et ils indiquent la vitesse et la direction de la bande.

Remarque: Quand la bande approche de son extrémité, le témoin "fixe" ou les témoins de marche avant ou arrière clignotent.

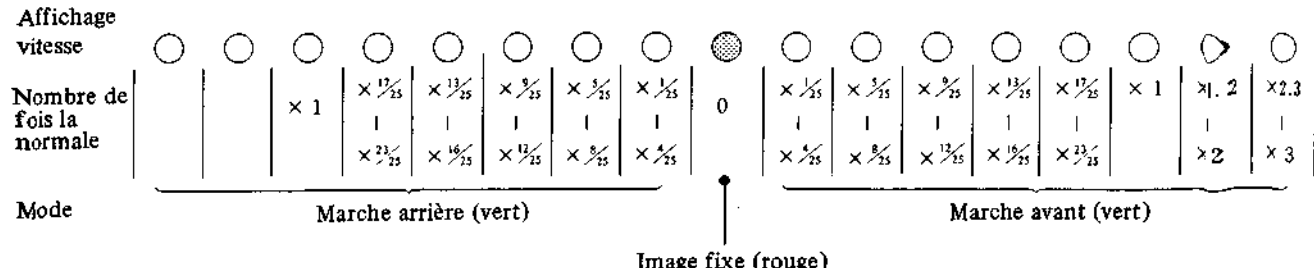
Mode navette (SHUTTLE)



Mode impulsion (JOG)



Mode impulsion programmée (PROGRAM JOG)



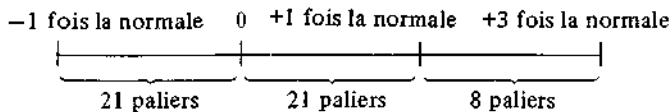
②) **Touche de variation [VAR]**

Sa poussée allume le témoin correspondant et place la machine en mode PROGRAM JOG ou PROGRAM PLAY. Ces modes sont choisis par le sélecteur VAR sur la plaquette SY-79.

Mode PROGRAM JOG:

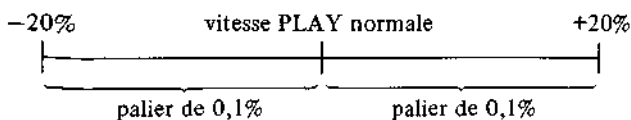
Après avoir placé le sélecteur VAR de la plaquette SY-79 à la position P.JOG, une poussée sur la touche VAR place l'appareil en mode PROGRAM JOG. Si la bague SEARCH est tournée à droite ou à gauche et que la rotation est arrêtée à une position quelconque, la lecture s'accomplira à une vitesse (de -1 à +3 fois la normale) correspondant à la position donnée à la bague qui présente des positions d'encliquetage à -1, 0, +1 et +3 fois la normale.

A l'emploi du magnétoscope BVH-2000PS(02)/(12) ou BVH-2000PS(04)/(14), une lecture non parasitée sera possible sur toute la plage (de -1 à +3 fois la normale) de la bague si le sélecteur de tête HEAD ① se trouve à la position PLAY. Ce mode fait aussi office de fonction vernier en mode SHUTTLE habituel (de -50 à +50 fois la normale). La vitesse peut alors être réglée à un des 50 paliers suivants:



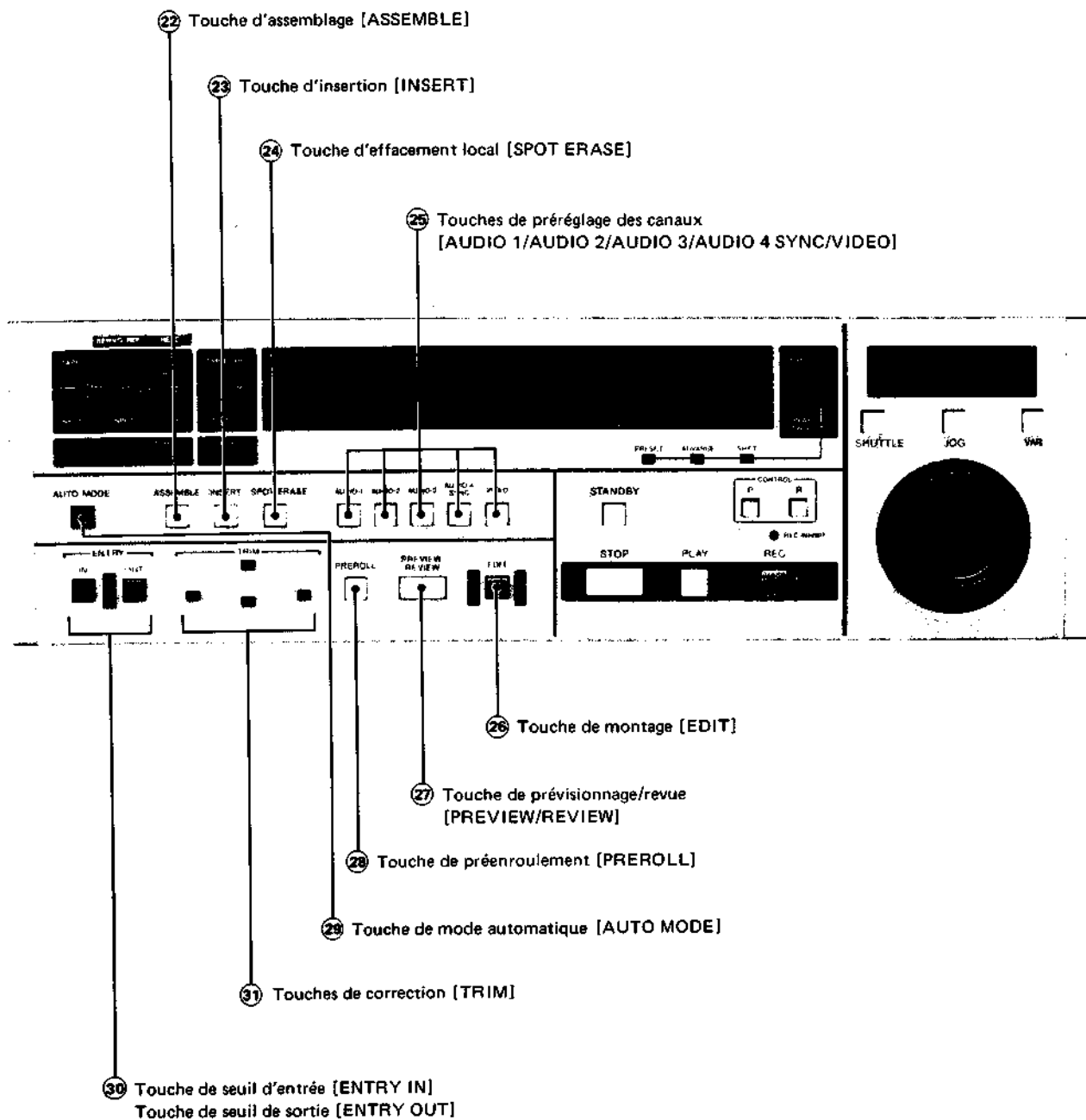
Mode PROGRAM PLAY:

Si elles sont actionnées simultanément après que le sélecteur VAR de la plaquette SY-79 est réglé sur P.PLY, les touches VAR et PLAY permettent de faire passer l'appareil au mode de lecture programmée (PROGRAM PLAY). Tourner ensuite la bague SEARCH vers la gauche ou vers la droite en poussant en même temps la touche VAR et arrêter à la position souhaitée: la lecture s'accomplit alors à la vitesse correspondant à la position de la bague (de -20% à +20%). A l'emploi du BVH-2000PS(02)/(12) ou du BVH-2000PS(04)/(14), une lecture non parasitée est possible dans ce mode, comme en mode PROGRAM JOG, sur toute la plage couverte par la bague. Comme dans le cas précédent, cette touche peut aussi remplir la fonction de vernier en mode SHUTTLE habituel. La vitesse peut se régler par paliers de 0,1% jusqu'à ±20% de la vitesse de lecture (PLAY) normale.



Un pré réglage de la vitesse de bande est possible par rotation de la bague SEARCH pendant que la touche VAR est enfoncée en mode STOP, STANDBY, PLAY ou REC. Après le réglage, la lecture programmée commence à la vitesse pré réglée par une poussée simultanée sur les touches PLAY et VAR.

Panneau des fonctions de montage



②② Touche d'assemblage [ASSEMBLE]

Une poussée sur la touche ASSEMBLE pendant que l'appareil est en mode STOP ou PLAY permet d'effectuer un montage par assemblage (ASSEMBLE) qui est arrêté par une nouvelle poussée sur cette même touche. En mode de montage par assemblage, le signal vidéo et le signal CTL sont simultanément enregistrés sur la bande. Une poussée sur la touche ASSEMBLE met toutes les touches de préréglage de canal ②⑤ en service et leur témoin s'allume. Appuyer sur les touches non utilisées pour le montage de manière à les mettre hors service et à éteindre leur témoin. Si toutes ces touches sont hors service (OFF), l'appareil ne sera pas en mode ASSEMBLE. Etant donné que les canaux vidéo et de synchronisation sont interverrouillés, il n'est pas possible d'enregistrer l'un sans l'autre. Pour procéder à un assemblage du signal AUDIO uniquement, il est nécessaire que le signal VIDEO soit pré-enregistré et que le servomécanisme de cabestan soit verrouillé par le signal CTL. Le canal AUDIO peut être mis en ou hors service pendant la réalisation d'un montage par assemblage; cependant, le canal VIDEO ne peut pas être libéré pendant le montage parce qu'une fois qu'il est mis en service, l'état est maintenu.

Lors d'un montage par assemblage du signal vidéo uniquement, le son surveillé est affecté par le signal CTL et sa qualité est détériorée, mais le signal CTL n'exerce aucune influence sur le son enregistré.

- Aucune partie audio ni vidéo ne se produit juste après le seuil de sortie du montage par assemblage.

②③ Touche d'insertion [INSERT]

Une poussée sur la touche INSERT pendant que l'appareil est en mode STOP ou PLAY permet d'effectuer un montage par insertion. Pour libérer ce mode de travail, appuyer à nouveau sur cette touche. Pour un montage par insertion, le signal CTL, préalablement enregistré sur la bande, est utilisé comme signal de référence. Dès lors, l'image reproduite n'est pas distordue aux seuils d'entrée (IN) ou de sortie (OUT) de montage. Même si la touche INSERT est enfoncée, chacune des touches de préréglage de canal ②⑤ reste sur OFF (témoin éteint); dès lors, appuyer sur la touche de préréglage de canal souhaitée pour la mettre en service. Chaque canal peut être mis en/hors service pendant un montage par insertion.

- Le fait de placer sur ON l'interrupteur V/S SIMUL (S1-1) de la plaquette LG-02 permet de choisir simultanément les signaux de synchronisation et vidéo; le fait de le placer sur OFF permet de choisir l'un d'eux de façon indépendante.

②④ Touche d'effacement local [SPOT ERASE]

Elle sert à effacer partiellement le canal AUDIO.

(1) Effacement local manuel

Si la touche SPOT ERASE est enfoncée pendant que l'appareil est en mode STOP ou STANDBY, ce dernier se place en mode d'effacement local (SPOT ERASE). Choisir le canal AUDIO à effacer à l'aide des touches de préréglage de canal ②⑤ et appuyer sur la touche EDIT. Pendant qu'elle est enfoncée, le signal du canal choisi est effacé. Une rotation par la main de la bobine réceptrice (de droite), de manière à faire défiler manuellement la bande vers la gauche ou vers la droite, a pour effet d'effacer cette portion. Pour annuler le mode d'effacement local manuel, appuyer à nouveau sur la touche SPOT ERASE ou appuyer sur une autre touche de fonctionnement.

Remarque: Veiller à relâcher la touche EDIT pendant le défilement de la bande.

(2) Effacement local automatique

Appuyer sur la touche AUTO MODE ②⑨, ce qui allume son témoin, et, par les touches ENTRY IN/OUT, déterminer les seuils d'entrée/sortie de coupure du passage à effacer. Appuyer sur la touche SPOT ERASE et l'appareil se place en mode d'effacement local automatique. Appuyer ensuite sur la touche AUDIO SPLIT ③① et choisir le canal audio qu'il y a lieu d'effacer à l'aide des touches de préréglage de canal ②⑤.

Ensuite, pendant que la touche PREVIEW ②⑦ est enfoncée, le son est mis en sourdine entre les seuils d'entrée et de sortie et une lecture sans signal s'accomplit. De cette façon, il est possible de vérifier si l'intervalle à effacer est approprié. Une poussée sur la touche EDIT ②⑥ fait s'accomplir l'effacement proprement dit. Après effacement, la libération du mode d'effacement local automatique s'accomplit d'elle-même.

25 Touches de préréglage de canal [AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO]

Avant de procéder à un montage par assemblage, à un montage par insertion ou à un effacement local, choisir le canal approprié à l'aide d'une des touches suivantes:

AUDIO-1: Sélection du canal AUDIO-1.

AUDIO-2: Sélection du canal AUDIO-2.

AUDIO-3: Sélection du canal AUDIO-3.

- Le fait de placer sur ON l'interrupteur TC INS INHIBIT (S1-2) de la plaquette LG-02 permet d'inhiber le mode d'insertion quand le canal AUDIO-3 est en mode d'entrée de code de temps (TIME CODE).

AUDIO-4: Le canal de synchronisation ou le canal SYNC AUDIO-4 est choisi comme suit par la position donnée au sélecteur MODE SEL de la plaquette LG-02:

Position du sélecteur MODE SEL	Modèles du BVH-2000PS	Canal choisi
SYNC	(00), (02), (04)	Sélection du canal de synchronisation.
OFF	(00), (02), (04)	Ni le canal de synchronisation ni le canal AUDIO-4 n'est choisi.
1HD	(10), (12), (14)	
A4	(04), (14)	Sélection du canal AUDIO-4.

- A l'emploi du BVH-2000PS(00) ou du BVH-2000PS(02), veiller à placer le sélecteur MODE SEL sur SYNC ou sur OFF.
- Le fait de régler sur ON l'interrupteur V/S SIMUL (S1-1) de la plaquette LG-02 permet de choisir simultanément les canaux vidéo et de synchronisation.

VIDEO: Sélection du canal vidéo.

26 Touche de montage [EDIT]

Elle permet d'effectuer des montages de bande.

Montage manuel:

Si une des touches INSERT ou ASSEMBLE est enfoncée (son témoin s'allume) et que le système est servoverrouillé en mode de lecture (PLAY), une poussée sur la touche EDIT permet d'accomplir des montages manuels. Pour libérer ce mode de travail, appuyer à nouveau sur la touche EDIT.

Montage automatique:

Lorsqu'une des touches INSERT/ASSEMBLE/SPOT ERASE ainsi que la touche AUTO MODE sont enfoncées (leur témoin respectif s'allume), puis que la touche ENTRY IN est enfoncée (le témoin s'allume), le fait d'appuyer sur la touche EDIT permet d'accomplir des montages automatiques.

- Les travaux de montage s'accomplissent sur la base d'une image; par contre, en mode de montage manuel du son (AUDIO) uniquement, ils se font sur la base d'une trame.

- La trame paire/impair des seuils d'entrée/sortie (IN/OUT) de montage est déterminée par le sélecteur EDIT de la plaquette SY-80.

- Pour un effacement local (SPOT ERASE), les seuils d'entrée (IN) et de sortie (OUT) doivent être introduits.

- Même si toutes les touches de présélection de canal sont en position OFF au cours du montage, la touche EDIT reste allumée et le mode de montage est maintenu. Appuyer sur la touche de présélection de canal appropriée et l'enregistrement du canal reprendra.

27 Touche de prévisionnage/revue [PREVIEW/REVIEW]

Cette touche combinée permet le prévisionnage et la revue. Après avoir introduit, par les touches, les données nécessaires au montage automatique, la touche fait office de commande de prévisionnage si le montage n'est pas accompli. Par contre, si le montage est effectué, elle fait office de commande de revue aussi longtemps que la donnée de montage suivante n'est pas définie.

PREVIEW:

Après que la touche AUTO MODE et une des touches, INSERT, ASSEMBLE ou SPOT ERASE ont été enfoncées et que les seuils IN et OUT de montage ont été introduits, les opérations de prévisionnage s'accomplissent quand la touche PREVIEW est actionnée.

On dispose des 4 possibilités de prévisionnage suivantes:

- (1) Prévisionnage complet de l'enregistreur et du lecteur:

Le fait d'appuyer sur la touche CONTROL R (16) (allumage de son témoin) du magnétoscope utilisé et sur la touche PREVIEW a pour résultat de mettre l'enregistreur/lecteur en mode de prévisionnage complet. De cette façon, il est possible, sur le moniteur de l'enregistreur, de procéder à une vérification de l'image et du son pour toute la durée de montage envisagée.

- (2) Prévisionnage du lecteur:

Après avoir appuyé sur la touche CONTROL P (16) (allumage du témoin) du magnétoscope utilisé, le fait d'appuyer sur la touche PREVIEW permet de faire fonctionner uniquement l'appareil lecteur.

- (3) Prévisionnage de l'enregistreur:

Après avoir mis sur OFF les touches CONTROL P/R (ce qui éteint leur témoin) du magnétoscope utilisé, le fait d'appuyer sur la touche PREVIEW permet de faire fonctionner uniquement l'appareil enregistreur.

(4) Prévissionnage du seuil de sortie (OUT) (se reporter à 1-11-8):

Si l'on appuie sur la touche PREVIEW tout en maintenant enfoncée la touche OUT (31), il sera possible d'effectuer un prévissionnage de la partie proche du seuil de sortie (OUT).

La durée du prévissionnage peut se régler à l'aide du sélecteur P.ROL TIME de la plaquette SY-79.

Comme pour les trois modes (1), (2) et (3) ci-dessus, les touches CONTROL P/R permettent de choisir celui des magnétoscopes qui fonctionnera en mode de prévissionnage du seuil de sortie.

- En mode d'assemblage-montage, le magnétoscope se charge de la reproduction de l'image jusqu'au point IN et s'arrête à ce point; l'image E-à-E peut alors être aperçue pendant 2 secondes environ.

28 Touche de préenroulement [PREROLL]

Quand la touche ENTRY IN (30) a été enfoncée, le fait d'appuyer sur cette touche PREROLL déclenche le défilement de la bande jusqu'à un nombre de secondes, déterminé à l'avance, avant le seuil d'entrée (ENTRY IN) et la bande s'y arrête. Appuyer simultanément sur une des touches suivantes et sur la touche PREROLL et la bande s'arrêtera au seuil de préenroulement:

Touche TRIM IN: Seuil d'entrée IN

Touche TRIM OUT: Seuil de sortie OUT

Après que les touches ont été actionnées, la bande défile et elle s'arrête au seuil de préenroulement. A l'aide du sélecteur P.ROL TIME de la plaquette SY-79, on pourra programmer la durée du préenroulement entre 0 et 15 secondes, par incrément d'une seconde à la fois.

- Si le sélecteur READ du BKH-2015/2015A (TC-14/14A) est placé sur VITC et si le sélecteur TIME CODE/TIMER (6) est placé sur TIME CODE, le préenroulement ne pourra s'effectuer.

29 Touche de mode automatique [AUTO MODE]

Elle sert à mettre l'appareil en mode de montage automatique. Enfoncée, cette touche qui s'allume permet d'introduire les seuils d'entrée et de sortie, et d'effectuer le préenroulement, le prévissionnage, le montage automatique et la revue. Pour annuler ce mode, appuyer à nouveau sur la touche AUTO MODE, ce qui éteint son témoin.

30 Touches d'introduction des seuils d'entrée et de sortie [ENTRY IN/ENTRY OUT]

Elles servent à introduire les seuils de montage. Quand la touche AUTO MODE (29) est sur ON, une poussée sur la touche ENTRY IN (ou ENTRY OUT) permet d'introduire comme seuil d'entrée IN (ou de sortie OUT) la donnée apparaissant au Bloc 1 de l'affichage (8), tandis que le témoin s'allume. Cette donnée est alors utilisée pour les travaux de préenroulement, de prévissionnage, de montage automatique ou de revue.

- Si la touche ENTRY IN ou OUT est actionnée pendant que l'appareil est en mode PLAY ou REC (et que la bande défile, par conséquent), la durée de

réaction est soustraite de la donnée indiquée sur l'affichage et cette valeur résultante est entrée comme seuil d'entrée IN ou de sortie OUT. Cette durée de réaction consiste en une compensation au retard provoqué par l'action manuelle des touches utilisées. Sur une base de 2 cadres, elle peut se régler entre 0 et 25 cadres à l'aide du sélecteur REACT TIME de la plaquette SY-79.

- Si le seuil de sortie précède celui d'entrée, un message d'alarme "NEGATIVE" clignote sur l'affichage et, ni les travaux de prévissionnage ni ceux de montage automatique ne peuvent s'accomplir. Dans ce cas, corriger l'introduction des seuils IN/OUT.
- Entre les points IN et OUT pendant le montage automatique, le point d'entrée (IN) pour l'opération de montage suivante peut être entré en appuyant sur la touche ENTRY IN (seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus).

31 Touches de correction [TRIM]

Une fois que les seuils de montage (IN/OUT) ont été introduits, ils peuvent être rappelés en vue d'une correction et la durée du montage peut être affichée par utilisation des quatre touches TRIM (IN/OUT/+/-). Dans chacun de ces cas, les seuils de montage à corriger sont indiqués au Bloc 2 de l'affichage (8).

(1) Rappel des seuils de montage - CALL -

Pour les vérifier, on pourra rappeler le seuil d'entrée IN par la touche TRIM IN et celui de sortie OUT par la touche TRIM OUT.

(2) Correction des seuils de montage - TRIM -

Les seuils de montage peuvent se corriger par unité de cadre. A cet effet, maintenir enfoncée la touche TRIM IN (ou TRIM OUT) et appuyer sur la touche + ou - selon le cas.

Touche +: Chaque poussée fait avancer d'un cadre.

Touche -: Chaque poussée fait reculer d'un cadre.

Les valeurs de l'affichage changent en conséquence.

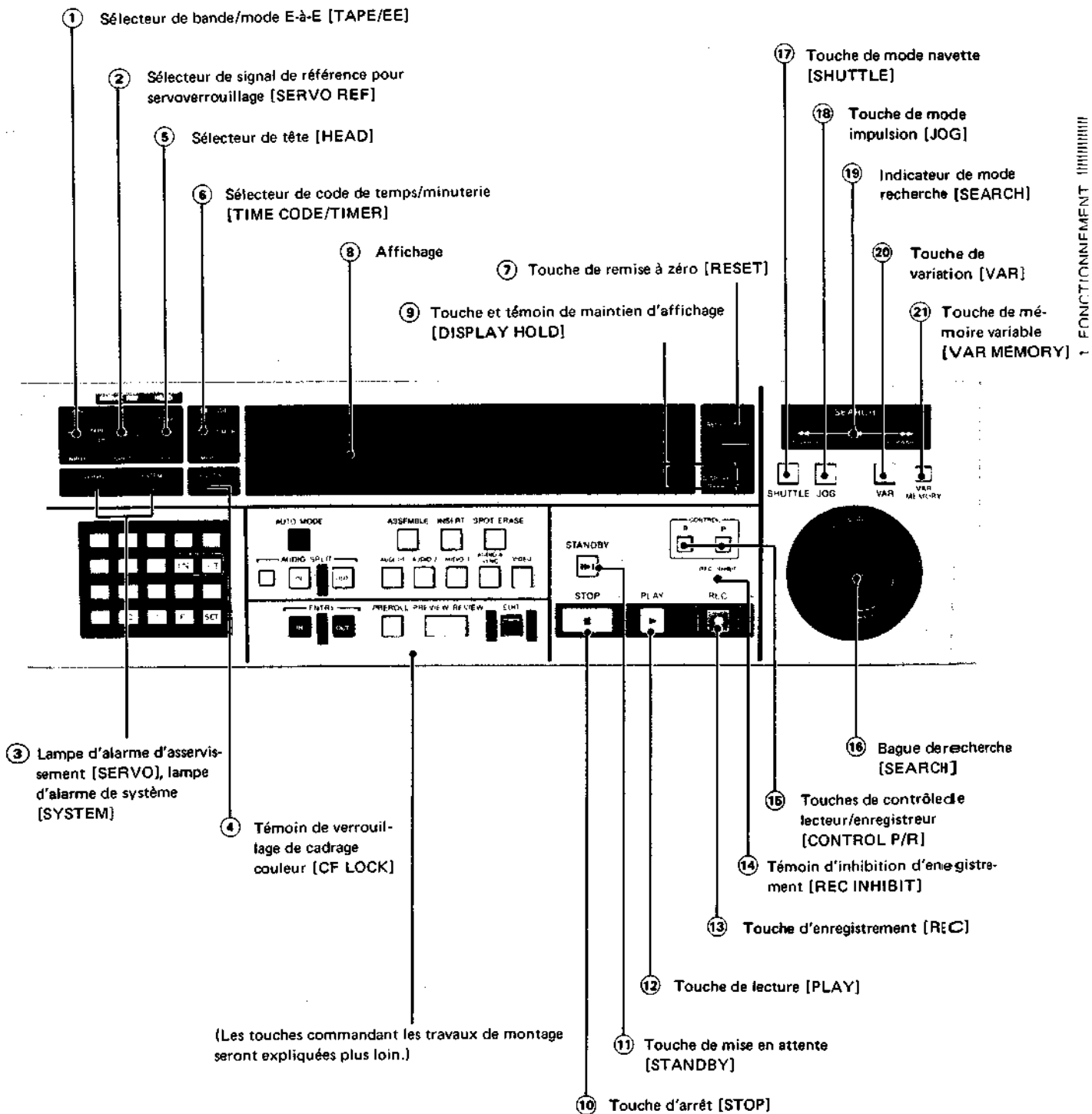
(3) Affichage de la durée du montage - DURATION & LAP -

Une poussée simultanée sur les touches TRIM IN et OUT affiche la durée du montage, comprise entre les seuils IN et OUT.

Quand l'affichage indique la donnée de TIMER-1 (minuterie 1), le symbole "DUR" apparaît; quand il indique la donnée de TIMER-2 (minuterie 2), le symbole "LAP" apparaît à sa gauche.

- Pour chacune des opérations (1), (2) ou (3) ci-dessus, il est possible de choisir les seuils de montage destinés à l'appareil lecteur ou à l'appareil enregistreur en se servant des touches CONTROL P/R (16).

1-4-5. Panneau de contrôle des fonctions – Type III



① **Sélecteur de bande/mode E-à-E [TAPE/EE]**

Il choisit le signal de sortie provenant des connecteurs VIDEO OUTPUT, AUDIO OUTPUT et MONITOR OUTPUT. Le signal de sortie est déterminé comme suit par la position donnée à ce sélecteur et par le mode d'exploitation du magnéscope.

VIDEO

BVH-2000PS(00)/(10)

Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnéscope				
	STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
TAPE	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
	R/P TAPE	R/P TAPE	EE	R/P TAPE	EE
TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT	INPUT	INPUT	INPUT	INPUT

• Le sélecteur HEAD est sans effet sur la sortie du BVH-2000PS(00)/(10).

BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14)

Position du sélecteur HEAD ⑤	Position du sélecteur TAPE/EE ⑦	Mode d'exploitation du magnéscope				
		STANDBY OFF	STANDBY ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
R/P	TAPE	R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
		R/P TAPE	R/P TAPE	PB TAPE *1	R/P TAPE	EE
	TAPE/EE	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
	INPUT *3	EE	EE *4 (R/P TAPE)	EE	R/P TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
PLAY	TAPE	PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
		PB TAPE	PB TAPE	PB TAPE *1	PB TAPE	EE
	TAPE/EE	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
	INPUT *3	EE	EE *4 (PB TAPE)	EE	PB TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

☐ : signal de sortie des connecteurs VIDEO OUTPUT
 ☐ : signal de sortie des connecteurs VIDEO MONITOR OUTPUT

*1 Si le sélecteur SW9-1 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en mode REC ou EDIT REC, même si le sélecteur TAPE/EE est réglé sur TAPE.

*2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON et que le générateur/lecteur de code de temps BKH-2015/2015A est installé, la sortie sera noire entre les seuils IN et OUT.

*3 Si le sélecteur SW9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes, même si le sélecteur TAPE/EE se trouve sur INPUT.

Remarque: Si le canal VIDEO ou SYNC est en mode EDIT-REC, tenir compte de la colonne REC/EDIT REC du tableau, même si l'autre canal est en mode de lecture.

*4 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui sera fourni.

AUDIO

Canal AUDIO utilisé	Position du sélecteur TAPE/EE ①	Mode d'exploitation du magnéscope				
		STANDBY *4 OFF	STANDBY *4 ON	REC EDIT REC	PLAY et autres modes	Entre les seuils IN et OUT de l'enregistreur en mode PREVIEW *2
A1, A2	TAPE	TAPE	TAPE	EE	TAPE *1	EE
		TAPE	TAPE	CONFI *6	TAPE *1	EE
	TAPE/EE	EE	EE (TAPE) *5	EE	TAPE *1	EE
		EE	EE (TAPE) *5	EE	TAPE *1	EE
	INPUT *3	EE	EE (TAPE) *5	EE	TAPE *1	EE
		INPUT	INPUT	INPUT	INPUT	INPUT
A3	TAPE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	CONFI *6	TAPE	EE
	TAPE/EE	TAPE	TAPE	EE	TAPE	EE
		TAPE	TAPE	EE	TAPE	EE
	INPUT	EE	EE	EE	TAPE	EE
		INPUT	INPUT	INPUT	INPUT	INPUT

: signal de sortie des connecteurs AUDIO LINE OUTPUT
 : signal de sortie des connecteurs AUDIO MONITOR OUTPUT

- *1 Si la vitesse de lecture est 5 fois la normale ou davantage, la sortie sera atténuée.
- *2 Si le sélecteur SW8-5 de la plaquette SY-80 est réglé sur ON, la sortie sera assourdie entre les seuils IN et OUT.
- *3 Si le sélecteur SW-9-3 de la plaquette SY-80 est réglé sur ON, le signal E-à-E sera fourni en tous modes quand la position INPUT sera choisie.
- *4 Quand on choisit la position INPUT en mode STOP, le signal E-à-E du canal AUDIO-3 sera verrouillé, et le signal E-à-E sera fourni à partir des connecteurs AUDIO OUTPUT et MONITOR OUTPUT même si la position TAPE ou TAPE/EE est choisie après plusieurs quartiers. Ce verrouillage est libéré lorsque le magnéscope est placé dans un autre mode.
- *5 Si l'interrupteur REC INHIBIT est réglé sur ON, c'est le signal TAPE qui sera fourni.
- *6 Le signal E-à-E est fourni à partir du BVH-2000PS(00)/(10).

② **Sélecteur de signal de référence pour servo-verrouillage [SERVO REF]**

Il choisit le signal de référence pour le verrouillage asservi.

EXT: Le signal raccordé au connecteur REF VIDEO INPUT ③ sur le panneau de connecteur vidéo (signal vidéo composite) devient le signal de référence.

AUTO: En mode REC, EDIT REC ou EDIT préréglé, le signal vidéo d'entrée devient le signal de référence. En mode PLAY, le signal de référence externe (choisi automatiquement) devient le signal de référence.

INPUT: Le signal raccordé au connecteur VIDEO INPUT sur le panneau de connecteur vidéo devient le signal de référence.

- Par la commande ADVANCE de la plaquette CD-17, il est possible de modifier le degré d'avance du signal de synchronisation nécessaire pour la lecture (se reporter à 1-6-3).

③ **Lampe d'alarme (rouge) d'asservissement [SERVO] / lampe d'alarme (rouge) de système [SYSTEM] (Se reporter à 1-14.)**

Elles signalent que le magnétoscope est utilisé d'une manière inappropriée.

Lampe SERVO

S'allume jusqu'à ce que le dispositif d'asservissement se verrouille ou quand il ne se verrouille pas.

Lampe SYSTEM

S'allume quand le contrôle du système ne fonctionne pas convenablement.

④ **Témoin (vert) de verrouillage de cadrage couleur [CF LOCK]**

S'allume quand le cadrage couleur du magnétoscope est verrouillé. Le choix entre image couleur/image monochrome est déterminé par les sélecteurs sur les plaquettes CD-17 et SR-15 (se reporter à 1-6-3).

⑤ **Sélecteur de tête [HEAD]**

Il choisit la tête de lecture du signal vidéo.

R/P: Lecture par la tête R/P (enregistrement/lecture).

PLAY: Lecture par la tête PLAY. Une lecture à alignement dynamique (DT) est possible si les magnétoscopes utilisés sont pourvus de cette fonction.

En mode REC ou EDIT REC, le choix de la tête R/P est automatique pour l'enregistrement ou l'enregistrement à montage, quelle que soit la position de ce sélecteur.

- Ce sélecteur n'agit qu'avec les BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14). Sur les BVH-2000PS(00) et (10), c'est toujours la tête R/P qui est en service, quelle que soit la position du sélecteur.

⑥ **Sélecteur de code de temps/minuterie [TIME CODE/TIMER]**

Il permet de choisir un des trois modes d'indication de la durée de défilement de la bande sur l'affichage ⑧.

TIME CODE: Position utilisée pour indiquer le code de temps EBU. Le sélecteur CH3 INPUT de la plaquette AE-03 (se reporter à 1-6-3) doit se trouver à la position TC. Le sélecteur A-3 SEL de la même plaquette AE-03 sert à choisir un code de temps externe ou un code de temps interne (quand le générateur/lecteur BKH-2015/2015A en option est installé). Le sélecteur TC/U-BIT du BKH-2015/2015A (TC-14/14A) permet de permuter entre l'indicateur de code de temps et celui de bit d'utilisateur. Normalement, ce compteur affiche une valeur obtenue par le lecteur de code de temps, mais quand le sélecteur TAPE/EE ① est placé sur INPUT, il affiche une entrée provenant du générateur de code de temps. Lorsque le sélecteur READ du générateur/lecteur BKH-2015/2015A (TC-14/14A) est réglé sur VIȚC, la fonction de préenroulement est inopérante.

TIMER-1: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Quelle que soit la position de la bande, un retour à zéro est possible par la touche RESET ⑦, le comptage reprenant alors à zéro à partir de ce point.

TIMER-2: Position utilisée pour indiquer la durée de défilement de la bande par comptage des signaux CTL de celle-ci. Pendant le cheminement de la bande, le retour à zéro du compteur TIMER-2 est impossible.

La donnée, indiquée sur l'affichage TIME CODE, TIMER-1 ou TIMER-2 choisi par ce sélecteur, peut être entrée comme seuil d'entrée (IN) ou de sortie (OUT) de montage.

- Dès que la machine est mise en un des modes d'exploitation autre que le mode STOP, les compteurs TIMER-1 et 2 commencent à enregistrer la durée de défilement de la bande. Le point zéro du compteur TIMER-2 correspond à la position où le mode d'exploitation est désigné après cheminement de la bande. Pour le compteur TIMER-1, le retour à zéro est possible à n'importe quelle position de la bande.
- Lorsque l'interrupteur POWER est coupé (OFF) mais que la bande reste installée sur la machine, la donnée affichée sur TIMER-1 et 2 est préservée pendant 12 heures grâce à un capaciteur de secours incorporé; pendant cet intervalle, elle peut donc encore être utilisée.

⑦ Touche de remise à zéro [RESET]

(1) Remise à zéro de TIMER-1

Après avoir amené le sélecteur TIME CODE/TIMER sur TIMER-1, la donnée du compteur TIMER-1 indiquée sur l'affichage ⑧ peut être ramenée à zéro par une poussée sur la touche RESET. Ce retour est impossible pour le compteur TIMER-2.

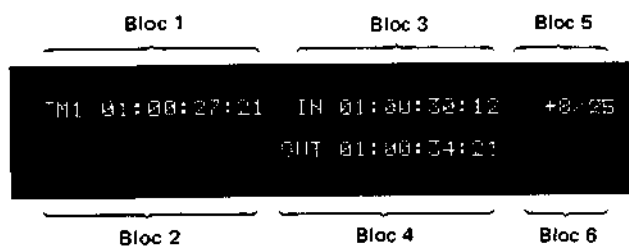
(2) Remise à zéro de TIME CODE

Après avoir amené le sélecteur TIME CODE/TIMER sur TIME CODE, l'entrée du générateur de code de temps est indiquée sur l'affichage ⑧ en plaçant le sélecteur TAPE/EE ① sur INPUT. Le générateur de code de temps sera ramené à zéro par une poussée sur la touche RESET dans cet état.

Quand le bit d'utilisateur est affiché, il sera ramené à zéro.

⑧ Affichage

Cet affichage, par points matriciels à 40 caractères sur deux lignes, se divise en 6 blocs.



- Les 8 colonnes numériques indiquent 00 heures/00 minutes/00 secondes/00 cadres.
- L'affichage des données se fait en mode +/- quand l'interrupteur S9-5 de la plaquette SY-80 est sur ON; il est en cycle de 24 heures quand cet interrupteur S9-5 est réglé sur OFF.

Bloc 1

Ce bloc indique la durée de défilement de la bande sur l'enregistreur ou le lecteur en service. Le choix entre les données du code de temps ou les données de comptage CTL s'effectue par le sélecteur TIME CODE/TIMER ④.

La signification des trois lettres apparaissant à la gauche du Bloc 1 est la suivante:

- TCR: Valeur lue du lecteur de code de temps
- TCG: Valeur du générateur de code de temps
- TM1: Donnée de minuterie TIMER-1
- TM2: Donnée de minuterie TIMER-2
- UBR: Valeur du bit d'utilisateur
- UBG: Valeur produite du bit d'utilisateur

- Remarquer que quand le sélecteur A-3 SEL de la plaquette AE-03 (se reporter à 1-6-3) est réglé à une position autre que TC, des astérisques "*" apparaissent dans toutes les colonnes à la place des chiffres, même si l'on a pris accès au code de temps.

Bloc 2

Ce bloc affiche le code de temps ou la donnée de minuterie TIMER de l'appareil lecteur pendant le fonctionnement en mode AUTO quand le magnétoscope est combiné avec deux BVH-2000PS ou avec un BVH-2000PS et un BVU-800P/800S/820P/820S.

Bloc 3

Ce bloc affiche le registre de mémoire journal du Bloc 4 ci-dessous. En effet, la donnée affichée au Bloc 4 est déplacée au Bloc 3 par la démarche suivante. La signification des lettres affichées est la suivante:

- IN: Seuil d'entrée IN audio ou vidéo
- OUT: Seuil de sortie OUT audio ou vidéo
- AI: Seuil d'entrée IN audio
- AO: Seuil de sortie OUT audio

Bloc 4

Ce bloc affiche la donnée entrée par les 20 touches du clavier ③, ainsi que les données recherchées par ces mêmes touches. La signification des lettres affichées est la suivante:

- IN: Seuil d'entrée IN vidéo
- OUT: Seuil de sortie OUT vidéo
- AI: Seuil d'entrée IN audio
- AO: Seuil de sortie OUT audio
- DUR: Durée (c.à.d. la période entre les seuils IN et OUT) calculée par TIMER-1
- LAP: Durée par TIMER-2

Bloc 5

Mode JOG: aucun affichage.

Mode SHUTTLE, PROGRAM JOG ou PROGRAM PLAY: Affichage de la vitesse de la bande.

Autre mode: Vitesse de bande mémorisée en mode d'impulsion programmée (PROGRAM JOG) ou de lecture programmée (PROGRAM PLAY).

La vitesse de bande est indiquée sous forme d'une fraction quand elle est inférieure à la normale et sous forme d'un multiple quand elle lui est supérieure.

Sur les BVH-2000PS(00) et (10), REC TEST est affiché lorsque le magnétoscope se trouve en mode STOP ou REC TEST, l'interrupteur REC TEST se trouvant sur ON et l'interrupteur REC INHIBIT sur OFF.

Bloc 6

Ce bloc indique les défaillances sous forme de messages d'erreur clignotants:

La signification des lettres affichées est la suivante:

- SYS ERR: Indique une erreur du système, c.à.d. que l'unité centrale de traitement CPU ne fonctionne pas normalement.
- OVER HEAT: Indique une surchauffe de l'unité d'alimentation électrique ou de l'amplificateur de commande du moteur.
- LINE ERR: Indique une erreur de ligne quand la communication télécommandée ne s'effectue pas correctement.
- ABORT: Indique que les travaux de montage ne s'accomplissent pas normalement.

- LOST LCK*:** Indique que le verrouillage d'asservissement est perdu au cours d'un enregistrement.
- NEGATIVE:** Indique que le seuil de sortie (OUT) de montage est placé avant le seuil d'entrée (IN).
- DATA ERR:** Indique qu'une valeur numérique inacceptable a été posée comme donnée horaire (p.ex. 65 secondes 35 cadres, etc.)
- TAPE OUT:** Indique que la bande n'est pas convenablement installée.

* Les adresses où les erreurs LOST LCK se sont produites pendant l'enregistrement et le montage sont mémorisées et peuvent être affichées au bloc 4 plus tard (seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus; pour plus de détails, se reporter à 1-14-2. Indication de perte de verrouillage asservi).

⑨ Touche et témoin de maintien d'affichage [DISPLAY HOLD]

En toute position, la donnée présente sur l'affichage ⑧ est maintenue quand cette touche est enfoncée et, simultanément, le témoin s'allume pour signaler l'emploi de ce mode. Une nouvelle poussée éteint le témoin et la donnée en cours de lecture est affichée.

⑩ Touche d'arrêt [STOP]

Pour arrêter tous les modes d'exploitation, appuyer sur la touche STOP, ce qui arrête le moteur de bobine et écarte de la bande le galet-presseur.

- Environ 30 secondes après que la touche STOP a été actionnée, le mécanisme de libération de tension entre en service et l'appareil se place en mode STANDBY (tension réduite sur la bande). L'interrupteur TENSION OFF ENABLE (S9-7) de la plaquette SY-79 peut être coupé (OFF) de sorte que le mécanisme de libération de tension ne fonctionne plus.
- La machine se place d'elle-même en mode STOP quand elle est mise sous tension ou si la bande devait sortir du capteur de bande.
- Le témoin STOP clignote pour indiquer qu'aucun signal de référence n'est alimenté au servosystème.
- En mode STOP ou STANDBY, tout "mou" éventuel de la bande serait automatiquement rattrapé sur une bobine.

⑪ Touche de mise en attente [STANDBY]

Ce poussoir de mise en marche/arrêt sert à déclencher la rotation du tambour. Normalement, après avoir appuyé sur la touche STANDBY, on vérifiera si la lampe d'alarme SERVO ③ est éteinte et on appuiera sur la touche du mode souhaité. Cependant, il est aussi possible de passer directement au mode voulu en appuyant sur la touche correspondante sans actionner la touche STANDBY au préalable. Si aucune touche n'est actionnée dans les 9 minutes qui suivent la

poussée sur la touche STANDBY, le mode de mise en attente sera automatiquement libéré. Toutefois, il ne sera pas si les touches INSERT ou ASSEMBLE sont enfoncées.

- Si l'interrupteur STANDBY OFF ENABLE (S9-8) de la plaquette SY-79 est sur OFF, ou bien si la touche AUTO MODE ou une des touches de pré-régla de canal est allumée, la libération automatique du mode STANDBY ne se produit pas.
- Si la bande adhère quand le tambour commence sa rotation, le mécanisme de relâchement de tension entre en service pour détendre la bande.
- Le témoin STANDBY clignote pour signaler que, pour une raison ou une autre, le tambour des têtes ne tourne pas normalement ou ne tourne pas du tout.

⑫ Touche de lecture [PLAY]

Une poussée sur cette touche allume les témoins PLAY et STANDBY et la machine entre en mode de lecture normale, (c.à.d. à la vitesse normale en marche avant). Pour annuler ce mode, appuyer sur la touche STOP, JOG, SHUTTLE, VAR ou PREROLL.

- A l'aide du sélecteur HEAD ⑤, si l'on emploie le BVH-2000PS(02)/(12) ou le BVH-2000PS(04)/(14), on peut choisir la tête R/P ou PLAY pour la lecture.
- Si, en vue d'une synchronisation de deux magnétoscopes de série BVH, une légère compensation de la vitesse de bande à la lecture est requise, maintenir la touche PLAY enfoncée et tourner la bague SEARCH ⑬ dans le sens des aiguilles pour accélérer, ou dans le sens opposé pour ralentir la vitesse. L'importance de cette compensation se détermine par l'angle de rotation dans une plage de $\pm 15\%$ de la vitesse normale (fonction de priorité au cabestan). Le magnétoscope revient à la vitesse normale dès que la touche PLAY est relâchée.

⑬ Touche d'enregistrement [REC]

Lorsqu'on appuie sur la touche PLAY en maintenant la touche REC enfoncée, les témoins REC et PLAY s'allument et la machine se place en mode d'enregistrement. Pour annuler ce mode, appuyer sur la touche STOP, JOG, SHUTTLE, VAR ou PREROLL.

- Quelle que soit la position du sélecteur HEAD ⑤, l'enregistrement s'accomplit par la tête R/P.
- Quand l'interrupteur REC TEST de la plaquette SY-79 se trouve sur ON et que le BVH-2000PS(00)/(10) est en mode STOP, ce dernier se place en mode REC TEST par une poussée sur la touche REC. (Pour les détails, se reporter en page 1-78(F).)
- Quand le témoin REC INHIBIT ⑭ est allumé, l'appareil entre en mode de lecture sans enregistrer.
- A l'emploi du BVH-2000PS(02)/(12) ou du BVH-2000PS(04)/(14), l'image en lecture simultanée peut être surveillée pendant l'enregistrement en réglant le sélecteur TAPE/EE ① sur TAPE.

⑭ **Témoin d'inhibition d'enregistrement [REC INHIBIT]**

Il indique que le magnéscope se trouve en mode d'inhibition d'enregistrement. Il s'allume quand est réglé sur ON l'interrupteur REC INHIBIT et l'enregistrement est alors inhibé. Si l'on essaie quand même d'enregistrer, bien que ce témoin soit allumé, l'appareil se placera en mode de lecture.

- Quand l'interrupteur REC TEST de la plaquette SY-79 est placé sur ON et que le BVH-2000PS(00)/(10) est en mode REC TEST, le témoin REC INHIBIT clignote. (Pour les détails, se reporter en page 1-78(F).)

⑮ **Touches de contrôle de lecteur/enregistreur [CONTROL P/R]**

Quand un autre magnéscope est raccordé au connecteur REMOTE-2 sur le panneau arrière et que le sélecteur REMOTE de la plaquette SY-79 est réglé sur REMOTE-2, placer sur LOCAL le sélecteur REMOTE/LOCAL du panneau de contrôle de niveau et le magnéscope fonctionnera comme appareil enregistreur. Les contrôles suivants peuvent être accomplis par ces touches (se reporter à 1-11-3):

Touche "P" allumée:

Quand la touche P est enfoncée et que son témoin s'allume, les touches de montage et de transport de la bande commandent le lecteur raccordé, permettant sa télécommande. Les affichages sont aussi ceux de l'appareil lecteur. Toutefois, les sélecteurs SERVO REF ②, HEAD ③ et TIME CODE/TIMER ⑥, qui doivent être réglés au côté lecteur, ne fonctionnent pas.

Touche "R" allumée:

Quand la touche R est enfoncée et que son témoin s'allume, les touches font fonctionner ce magnéscope comme appareil enregistreur. Si la touche AUTO MODE ⑨ est alors enfoncée, le lecteur et l'enregistreur entrent en mode de contrôle, permettant d'effectuer le prévisionnement (PREVIEW), le montage automatique (AUTO EDIT) et la revue (REVIEW).

Touches "P" et "R" allumées:

Quand les deux touches sont enfoncées et allumées, les deux magnétoscopes peuvent fonctionner en synchronisation. Toutefois, il est nécessaire, dans ce cas, de régler sur ON l'interrupteur PARA-RUN de la plaquette SY-79.

Touches "P" et "R" éteintes:

Quand les témoins de ces deux touches sont éteints, seul ce magnéscope peut être utilisé.

⑯ **Bague de recherche [SEARCH]**

Elle sert à modifier le défilement de la bande.

- (1) La rotation de cette bague pendant le mode JOG, SHUTTLE, PROGRAM JOG ou PROGRAM PLAY (se reporter à 1-9) permet de changer la direction et la vitesse du défilement.
- (2) Sa rotation pendant le mode STOP, STANDBY, PLAY ou REC allume le témoin SEARCH et il sera alors possible de régler à l'avance la direction et la vitesse du défilement qui seront ensuite utilisées en mode PROGRAM JOG ou PROGRAM PLAY. La vitesse déterminée est indiquée sur le Bloc 3 de l'affichage ⑧.
- (3) Tout en gardant la touche STOP enfoncée pendant le mode STOP ou lorsque l'on garde la touche STANDBY enfoncée pendant l'enregistrement ou le montage, faire tourner la bague de recherche de façon à ce que les adresses des erreurs LOST LCK qui se sont produites pendant l'enregistrement ou le montage précédent apparaissent sur l'affichage (seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus; pour plus de détails, se reporter à 1-14-2. Indication de perte de verrouillage asservi).

⑰ **Touche de mode navette [SHUTTLE]**

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode SHUTTLE. Dans cet état, une rotation de la bague SEARCH ⑯ vers la gauche ou vers la droite, suivie de son maintien à une position quelconque, fournira une lecture à la vitesse correspondante à la rotation, vitesse pouvant aller de 1/32e à 50 fois la normale. A la position centrale, une image fixe est obtenue. La bague SEARCH présente un encliquetage à la position centrale et aux positions ± 50 .

- Lors d'un enroulement accéléré en marche avant, la vitesse se réduit d'elle-même en fin de bande et l'arrêt de la machine est automatique. Si l'on désire enrouler complètement la bande, tourner la bague SEARCH à nouveau vers la droite ou placer sur OFF l'interrupteur EOT STOP de la plaquette SY-80.
- Lors d'un enroulement accéléré en marche arrière (rebobinage), la vitesse se réduit d'elle-même au début de la bande et l'arrêt est automatique près de la position du réglage à zéro du TIMER-2.
- Si l'on désire enrouler complètement la bande, tourner la bague SEARCH vers la gauche ou placer sur OFF l'interrupteur EOT STOP de la plaquette SY-80.
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

18 Touche de mode impulsion [JOG]

Une poussée sur cette touche allume le témoin correspondant et place l'appareil en mode JOG. Dans cet état, la vitesse de la lecture dépend de la vitesse de la rotation imprimée à la bague SEARCH, vitesse de lecture pouvant aller de 0 à plusieurs fois la normale. Dès que la rotation est arrêtée, l'on obtient une image fixe à la position de la bague. Dans ce cas, la bague SEARCH n'a pas d'encliquetage.

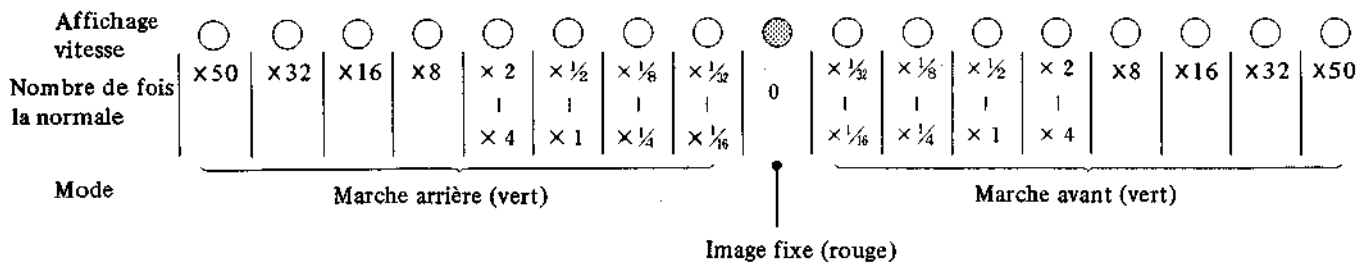
- Si le mode image fixe (STILL) est maintenu pendant plus de 3 minutes, l'appareil passe automatiquement en mode STOP pour éviter d'endommager la bande. Si l'on désire éviter cet arrêt de la machine, régler sur OFF l'interrupteur STILL OFF ENABLE (S9-6) de la plaquette SY-79.

19 Indicateur de mode recherche [SEARCH]

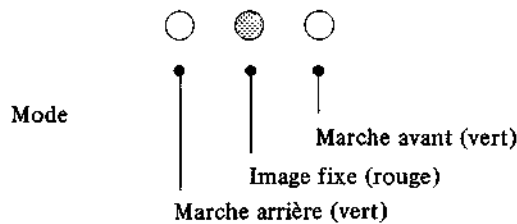
Il affiche le mode d'utilisation de la bague de recherche. En mode SHUTTLE, JOG ou PROGRAM JOG (décrit en 20), les témoins s'allument, comme indiqué sur l'illustration, d'après l'utilisation de la bague SEARCH et ils indiquent la vitesse et la direction de la bande.

Remarque: Quand la bande approche de son extrémité, le témoin "fixe" ou les témoins de marche avant ou arrière clignotent.

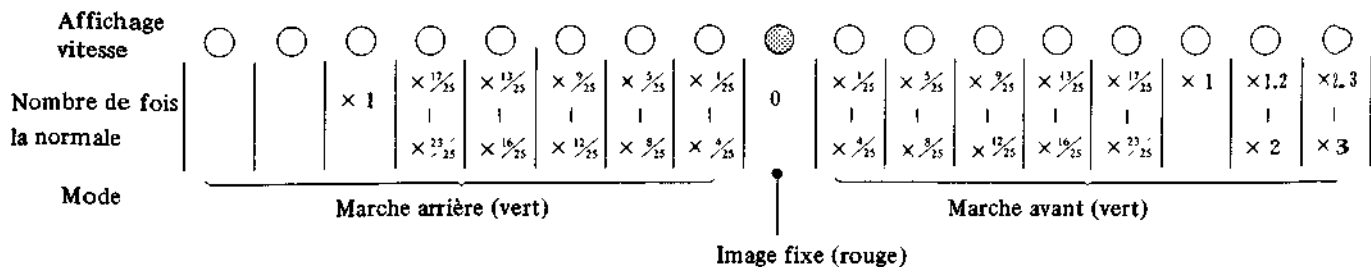
Mode navette (SHUTTLE)



Mode impulsion (JOG)



Mode impulsion programmée (PROGRAM JOG)



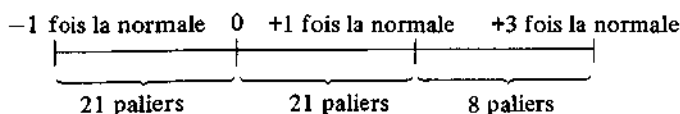
② Touche de variation [VAR]

Sa poussée allume le témoin correspondant et place la machine en mode PROGRAM JOG ou PROGRAM PLAY. Ces modes sont choisis par le sélecteur VAR sur la plaquette SY-79.

Mode PROGRAM JOG:

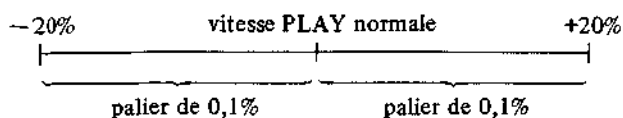
Après avoir placé le sélecteur VAR de la plaquette SY-79 à la position P.JOG, une poussée sur la touche VAR place l'appareil en mode PROGRAM JOG. Si la bague SEARCH est tournée à droite ou à gauche et que la rotation est arrêtée à une position quelconque, la lecture s'accomplira à une vitesse (de -1 à +3 fois la normale) correspondant à la position donnée à la bague qui présente des positions d'encliquetage à -1, 0, +1 et +3 fois la vitesse normale.

A l'emploi du magnéscope BVH-2000PS(02)/(12) ou BVH-2000PS(04)/(14), une lecture non parasitée sera possible sur toute la plage (de -1 à +3 fois la normale) de la bague si le sélecteur de tête HEAD ① se trouve à la position PLAY. Ce mode fait aussi office de fonction vernier en mode SHUTTLE habituel (de -50 à +50 fois la normale). La vitesse peut alors être réglée à un des 50 paliers suivants:



Mode PROGRAM PLAY:

Si elles sont actionnées simultanément après que le sélecteur VAR de la plaquette SY-79 est réglé sur P.PLY, les touches VAR et PLAY permettent de faire passer l'appareil au mode de lecture programmée (PROGRAM PLAY). Tourner ensuite la bague SEARCH vers la gauche ou vers la droite en poussant en même temps la touche VAR et arrêter à la position souhaitée: la lecture s'accomplit alors à la vitesse correspondant à la position de la bague (de -20% à +20%). A l'emploi du BVH-2000PS(02)/(12) ou du BVH-2000PS(04)/(14), une lecture non parasitée est possible dans ce mode, comme en mode PROGRAM JOG, sur toute la plage couverte par la bague. Comme dans le cas précédent, cette touche peut aussi remplir la fonction de vernier en mode SHUTTLE habituel. La vitesse peut se régler par paliers de 0,1% jusqu'à $\pm 20\%$ de la vitesse de lecture (PLAY) normale.



Un pré-réglage de la vitesse de bande est possible par rotation de la bague SEARCH pendant que la touche VAR est enfoncée en mode STOP, STANDBY, PLAY ou REC. Après le réglage, la lecture programmée commence à la vitesse pré-réglée par une poussée simultanée sur les touches PLAY et VAR.

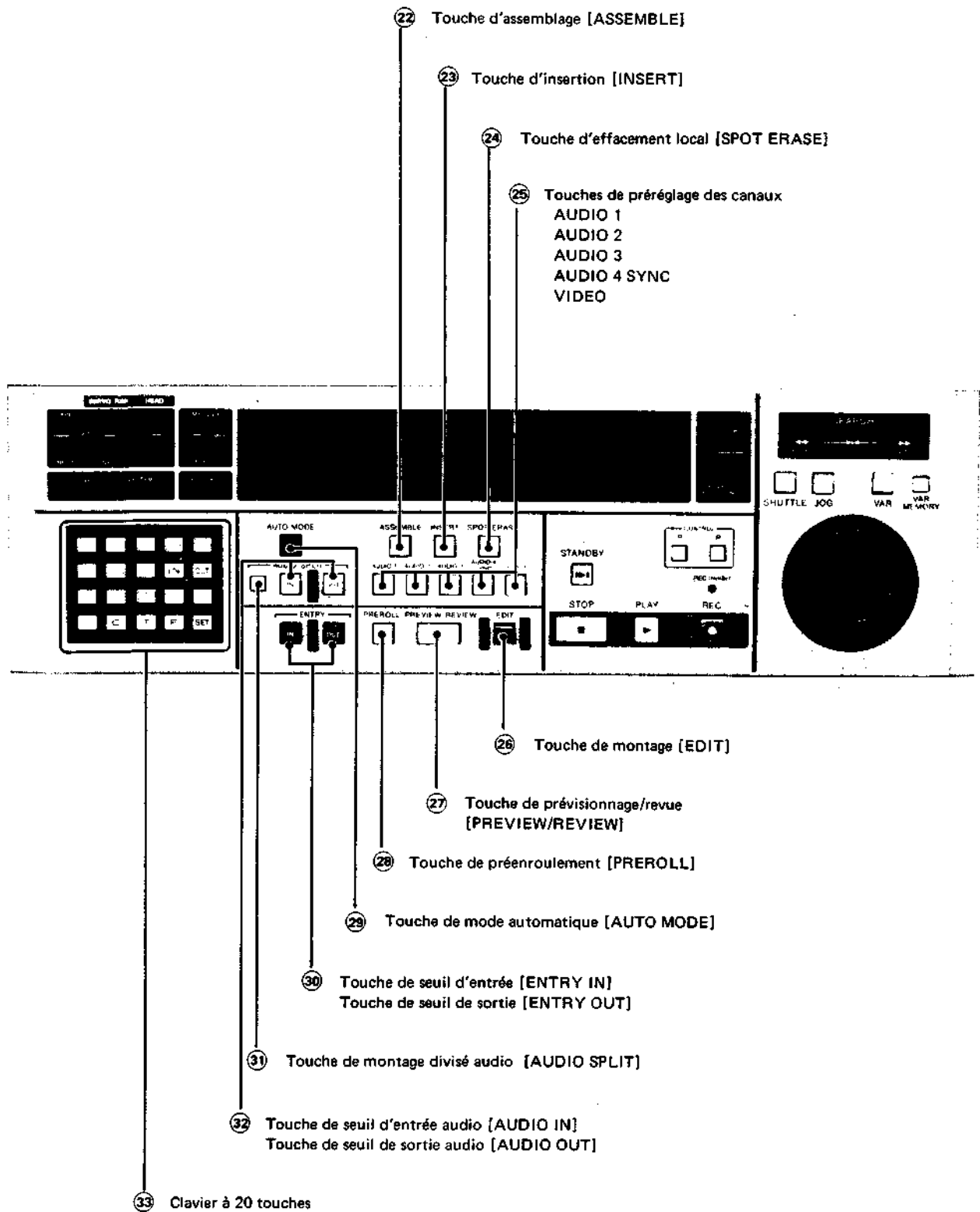
La vitesse choisie est indiquée sur le Bloc 5 de l'affichage ⑧. La vitesse à impulsion programmée (PROGRAM JOG) apparaît sous forme d'une fraction ou à point décimal et la lecture programmée (PROGRAM PLAY) en pourcent (%).

③ Touche de mémoire variable [VAR MEMORY]

Etant donné que les mouvements de la bague SEARCH (changement de vitesse et de direction de défilement de la bande) sont mémorisés en mode d'impulsion programmée (PROGRAM JOG), ils peuvent être exécutés à nouveau.

- (1) Appuyer sur les touches AUTO MODE et VAR MEMORY.
 - (2) Faire défiler la bande et mémoriser le seuil de départ à l'aide de la touche ENTRY IN. Pré-régler la vitesse initiale à l'aide de la bague de recherche (SEARCH).
 - (3) Appuyer en même temps sur les touches PREROLL et PREVIEW/REVIEW.
 - (4) Quand la bande arrive au seuil IN, un avertisseur retentit. Par la suite, quand la bague SEARCH est actionnée, sa courbe de fonctionnement est mémorisée.
 - (5) Arrêter le défilement de la bande par la touche STOP.
 - (6) Appuyer sur la touche PREVIEW: les changements imprimés à la bague SEARCH entre les seuils du début et l'arrêt seront reproduits et la bande défilera conformément à la courbe de changement imprimée à la bague.
- Le témoin de la touche VAR MEMORY clignote jusqu'à ce que la mémoire de la courbe de changement de la bague ne soit saturée. Si ce clignotement se transforme en un éclairage continu du témoin, c'est le signe que de nouvelles opérations de la bague ne peuvent plus être mémorisées.
 - Sur les BVH-2000PS(00) et (10), une lecture non parasitée n'est pas possible.
 - Lorsque la touche PREROLL est enfoncée, la bande défile jusqu'à la position [(Seuil IN) moins (Durée de pré-enroulement en secondes) multiplié par (Vitesse initiale)] et s'arrête. Pour commencer la lecture, enfoncer la touche PREVIEW/REVIEW. Au seuil IN, la vitesse initiale pré-réglée est obtenue et la lecture à la vitesse mémorisée continue.

Panneau des fonctions de montage



22 Touche d'assemblage [ASSEMBLE]

Une poussée sur la touche ASSEMBLE pendant que l'appareil est en mode STOP ou PLAY permet d'effectuer un montage par assemblage (ASSEMBLE) qui est arrêté par une nouvelle poussée sur cette même touche. En mode de montage par assemblage, le signal vidéo et le signal CTL sont simultanément enregistrés sur la bande. Une poussée sur la touche ASSEMBLE met toutes les touches de pré-réglage de canal (25) en service et leur témoin s'allume. Appuyer sur les touches non utilisées pour le montage de manière à les mettre hors service et à éteindre leur témoin. Si toutes ces touches sont hors service (OFF), l'appareil ne sera pas en mode ASSEMBLE. Etant donné que les canaux vidéo et de synchronisation sont interverrouillés, il n'est pas possible d'enregistrer l'un sans l'autre. Pour procéder à un assemblage du signal AUDIO uniquement, il est nécessaire que le signal VIDEO soit pré-enregistré et que le servomécanisme de cabestan soit verrouillé par le signal CTL. Le canal AUDIO peut être mis en ou hors service pendant la réalisation d'un montage par assemblage; cependant, le canal VIDEO ne peut pas être libéré pendant le montage parce qu'une fois qu'il est mis en service, l'état est maintenu.

Lors d'un montage par assemblage du signal vidéo uniquement, le son surveillé est affecté par le signal CTL et sa qualité est détériorée, mais le signal CTL n'exerce aucune influence sur le son enregistré.

- Aucune partie audio ni vidéo ne se produit juste après le seuil de sortie du montage par assemblage.

23 Touche d'insertion [INSERT]

Une poussée sur la touche INSERT pendant que l'appareil est en mode STOP ou PLAY permet d'effectuer un montage par insertion. Pour libérer ce mode de travail, appuyer à nouveau sur cette touche. Pour un montage par insertion, le signal CTL, préalablement enregistré sur la bande, est utilisé comme signal de référence. Dès lors, l'image reproduite n'est pas distordue aux seuils d'entrée (IN) ou de sortie (OUT) de montage. Même si la touche INSERT est enfoncée, chacune des touches de pré-réglage de canal (29) reste sur OFF (témoin éteint); dès lors, appuyer sur la touche de pré-réglage de canal souhaitée pour la mettre en service. Chaque canal peut être mis en/hors service pendant un montage par insertion.

- Le fait de placer sur ON l'interrupteur V/S SIMUL (S1-1) de la plaquette LG-02 permet de choisir simultanément les signaux de synchronisation et vidéo; le fait de le placer sur OFF permet de choisir l'un d'eux de façon indépendante.

24 Touche d'effacement local [SPOT ERASE]

Elle sert à effacer partiellement le canal AUDIO.

(1) Effacement local manuel

Si la touche SPOT ERASE est enfoncée pendant que l'appareil est en mode STOP ou STANDBY, ce dernier se place en mode d'effacement local (SPOT ERASE). Choisir le canal AUDIO à effacer à l'aide des touches de pré-réglage de canal (25) et appuyer sur la touche EDIT. Pendant qu'elle est enfoncée, le signal du canal choisi est effacé. Une rotation par la main de la bobine réceptrice (de droite), de manière à faire défiler manuellement la bande vers la gauche ou vers la droite, a pour effet d'effacer cette portion. Pour annuler le mode d'effacement local manuel, appuyer à nouveau sur la touche SPOT ERASE ou appuyer sur une autre touche de fonctionnement.

Remarque: Veiller à relâcher la touche EDIT pendant le défilement de la bande.

(2) Effacement local automatique

Appuyer sur la touche AUTO MODE (29), ce qui allume son témoin, et, par les touches ENTRY IN/OUT, déterminer les seuils d'entrée/sortie de coupure du passage à effacer. Appuyer sur la touche SPOT ERASE et l'appareil se place en mode d'effacement local automatique. Appuyer ensuite sur la touche AUDIO SPLIT (31) et choisir le canal audio qu'il y a lieu d'effacer à l'aide des touches de pré-réglage de canal (29).

Ensuite, pendant que la touche PREVIEW (27) est enfoncée, le son est mis en sourdine entre les seuils d'entrée et de sortie et une lecture sans signal s'accomplit. De cette façon, il est possible de vérifier si l'intervalle à effacer est approprié. Une poussée sur la touche EDIT (26) fait s'accomplir l'effacement proprement dit. Après effacement, la libération du mode d'effacement local automatique s'accomplit d'elle-même.

25 Touches de prééclage de canal (AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO)

Avant de procéder à un montage par assemblage, à un montage par insertion ou à un effacement local, choisir le canal approprié à l'aide d'une des touches suivantes:

AUDIO-1: Sélection du canal AUDIO-1.

AUDIO-2: Sélection du canal AUDIO-2.

AUDIO-3: Sélection du canal AUDIO-3.

- Le fait de placer sur ON l'interrupteur TC INS INHIBIT (S1-2) de la plaquette LG-02 permet d'inhiber le mode d'insertion quand le canal AUDIO-3 est en mode d'entrée de code de temps (TIME CODE).

AUDIO-4: Le canal de synchronisation ou le canal SYNC AUDIO-4 est choisi comme suit par la position donnée au sélecteur MODE SEL de la plaquette LG-02:

Position du sélecteur MODE SEL	Modèles du BVH-2000PS	Canal choisi
SYNC	(00), (02), (04)	Sélection du canal de synchronisation.
OFF	(00), (02), (04)	Ni le canal de synchronisation ni le canal AUDIO-4 n'est choisi.
1HD	(10), (12), (14)	
A4	(04), (14)	Sélection du canal AUDIO-4.

- A l'emploi du BVH-2000PS(00) ou du BVH-2000PS(02), veiller à placer le sélecteur MODE SEL sur SYNC ou sur OFF.
- Le fait de régler sur ON l'interrupteur V/S SIMUL (S1-1) de la plaquette LG-02 permet de choisir simultanément les canaux vidéo et de synchronisation.

VIDEO: Sélection du canal vidéo.

26 Touche de montage [EDIT]

Elle permet d'effectuer des montages de bande.

Montage manuel:

Si une des touches INSERT ou ASSEMBLE est enfoncée (son témoin s'allume) et que le système est servoverrouillé en mode de lecture (PLAY), une poussée sur la touche EDIT permet d'accomplir des montages manuels. Pour libérer ce mode de travail, appuyer à nouveau sur la touche EDIT.

Montage automatique:

Lorsqu'une des touches INSERT/ASSEMBLE/SPOT ERASE ainsi que la touche AUTO MODE sont enfoncées (leur témoin respectif s'allume), puis que la touche ENTRY IN est enfoncée (le témoin s'allume), le

fait d'appuyer sur la touche EDIT permet d'accomplir des montages automatiques.

- Les travaux de montage s'accomplissent sur la base d'une image; par contre, en mode de montage manuel du son (AUDIO) uniquement, ils se font sur la base d'une trame.
- La trame paire/impair des seuils d'entrée/sortie (IN/OUT) de montage est désignée par le sélecteur EDIT de la plaquette SY-80.
- Pour un effacement local (SPOT ERASE), les seuils d'entrée (IN) et de sortie (OUT) doivent être introduits.
- Même si toutes les touches de présélection de canal sont en position OFF au cours du montage, la touche EDIT reste allumée et le mode de montage est maintenu. Appuyer sur la touche de présélection de canal appropriée et l'enregistrement du canal reprendra.

27 Touche de prévisionnage/revue [PREVIEW/REVIEW]

Cette touche combinée permet le prévisionnage et la revue. Après avoir introduit, par les touches, les données nécessaires au montage automatique, la touche fait office de commande de prévisionnage si le montage n'est pas accompli. Par contre, si le montage est effectué, elle fait office de commande de revue aussi longtemps que la donnée de montage suivante n'est pas définie.

PREVISIONNAGE:

Après que la touche AUTO MODE et une des touches INSERT, ASSEMBLE ou SPOT ERASE ont été enfoncées et que les seuils IN et OUT de montage ont été introduits, les opérations de prévisionnage s'accomplissent quand la touche PREVIEW est actionnée.

On dispose des 4 possibilités de prévisionnage suivantes:

(1) Prévisionnage complet de l'enregistreur et du lecteur:

Le fait d'appuyer sur la touche CONTROL R (13) (allumage de son témoin) du magnétoscope utilisé et sur la touche PREVIEW a pour résultat de mettre l'enregistreur/lecteur en mode de prévisionnage complet. De cette façon, il est possible, sur le moniteur de l'enregistreur, de procéder à une vérification de l'image et du son pour toute la durée de montage envisagée.

(2) Prévisionnage du lecteur:

Après avoir appuyé sur la touche CONTROL P (15) (allumage du témoin) du magnétoscope utilisé, le fait d'appuyer sur la touche PREVIEW permet de faire fonctionner uniquement l'appareil lecteur.

(3) Prévisionnage de l'enregistreur:

Après avoir mis sur OFF les touches CONTROL P/R (ce qui éteint leur témoin) du magnétoscope utilisé, le fait d'appuyer sur la touche PREVIEW permet de faire fonctionner uniquement l'appareil enregistreur.

- (4) **Prévisionnage du seuil de sortie (OUT)** (se reporter à 1-11-8):

Si l'on appuie sur la touche **PREVIEW** tout en maintenant enfoncée la touche **TRIM OUT** (33), il sera possible d'effectuer un prévisionnage de la partie proche du seuil de sortie (OUT).

La durée du prévisionnage peut se régler à l'aide du sélecteur **P.ROL TIME** de la plaquette SY-79.

Comme pour les trois modes (1), (2) et (3) ci-dessus, les touches **CONTROL P/R** permettent de choisir celui des magnétoscopes qui fonctionnera en mode de prévisionnage du seuil de sortie (OUT).

(28) **Touche de préenroulement [PREROLL]**

Si une ou plusieurs des touches **ENTRY IN**, **ENTRY OUT**, **AUDIO IN** ou **AUDIO OUT** est actionnée en vue de l'entrée d'un seuil de montage, celui-ci pourra servir de point de préenroulement. Ainsi, quand on appuiera sur la touche **PREROLL**, la bande défilera et elle s'arrêtera à ce point de préenroulement.

La durée de ce préenroulement peut être programmée entre 0 et 15 secondes, par incrément d'une seconde à la fois, à l'aide du sélecteur **P.ROL TIME** de la plaquette SY-79.

Les deux opérations de préenroulement suivantes sont possibles:

- (1) **Repérage du point de préenroulement:**

Si seule la touche **PREROLL** est enfoncée, la bande s'arrête au point de préenroulement qui précède de quelques secondes le seuil d'entrée **ENTRY IN**.

- (2) **Préenroulement aux seuils IN/OUT vidéo ou audio:**

Si une des touches du clavier (33) est maintenue enfoncée et que l'on appuie sur la touche **PREROLL**, le type suivant de préenroulement s'accomplit:

20 touches	}	Touche IN : Seuil d'entrée IN vidéo.
		Touche OUT : Seuil de sortie OUT vidéo
		Touche AUDIO IN : Seuil d'entrée IN audio
		Touche AUDIO OUT : Seuil de sortie OUT audio

- Si le sélecteur **READ** du BKH-2015/2015A (TC-14/14A) est placé sur **VITC** et si le sélecteur **TIME CODE/TIMER** (6) est placé sur **TIME CODE**, le préenroulement ne pourra s'effectuer.

(29) **Touche de mode automatique [AUTO MODE]**

Elle sert à mettre l'appareil en mode de montage automatique. Enfoncée, cette touche qui s'allume permet d'introduire les seuils d'entrée et de sortie, ceux d'entrée/sortie divisé audio, et d'effectuer le préenroulement, le prévisionnage, le montage automatique et la revue. Pour annuler ce mode, appuyer à nouveau sur la touche **AUTO MODE**, ce qui éteint son témoin.

(30) **Touches d'introduction des seuils d'entrée et de sortie [ENTRY IN/ENTRY OUT]**

Elles servent à introduire les seuils de montage. Quand la touche **AUTO MODE** (29) est sur **ON**, une poussée

sur la touche **ENTRY IN** (ou **ENTRY OUT**) permet d'introduire comme seuil d'entrée **IN** (ou de sortie **OUT**) la donnée apparaissant au Bloc 1 de l'affichage (8), tandis que le témoin s'allume. Cette donnée est alors utilisée pour les travaux de préenroulement, de prévisionnage, de montage automatique ou de revue.

- Si la touche **ENTRY IN** ou **OUT** est actionnée pendant que l'appareil est en mode **PLAY** ou **REC** (et que la bande défile, par conséquent), la durée de réaction est soustraite de la donnée indiquée sur l'affichage et cette valeur résultante est entrée comme seuil d'entrée **IN** ou de sortie **OUT**. Cette durée de réaction consiste en une compensation au retard provoqué par l'action manuelle des touches utilisées. Sur une base de 2 cadres, elle peut se régler entre 0 et 25 cadres à l'aide du sélecteur **REACT TIME** de la plaquette SY-79.

- Si le seuil de sortie précède celui d'entrée, un message d'alarme "NEGATIVE" clignote sur l'affichage et, ni les travaux de prévisionnage ni ceux de montage automatique ne peuvent s'accomplir. Dans ce cas, corriger l'introduction des seuils **IN/OUT**.

- Lorsque la touche **AUTO MODE** se trouve sur **OFF**, la donnée entrée est utilisée pour l'opération de préenroulement.

- Entre les points **IN** et **OUT** pendant le montage automatique, le point d'entrée (**IN**) pour l'opération de montage suivante peut être entré en appuyant sur la touche **ENTRY IN** (seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus).

(31) **Touche de montage divisé audio [AUDIO SPLIT]**

Lorsqu'elle est enfoncée, le magnéto est mis en mode divisé audio (**AUDIO SPLIT**) et le témoin s'allume. Les seuils **IN/OUT** audio sont alors introduits indépendamment du signal vidéo à l'aide des touches **AUDIO IN/OUT** (32). Les touches **ENTRY IN/OUT** deviennent les touches d'introduction pour le signal vidéo et celui de synchronisation. Une nouvelle poussée sur cette touche, qui la ramène à **OFF**, rétablit l'appareil dans l'état où les seuils de montage vidéo et audio sont introduits par les touches **ENTRY IN/OUT**.

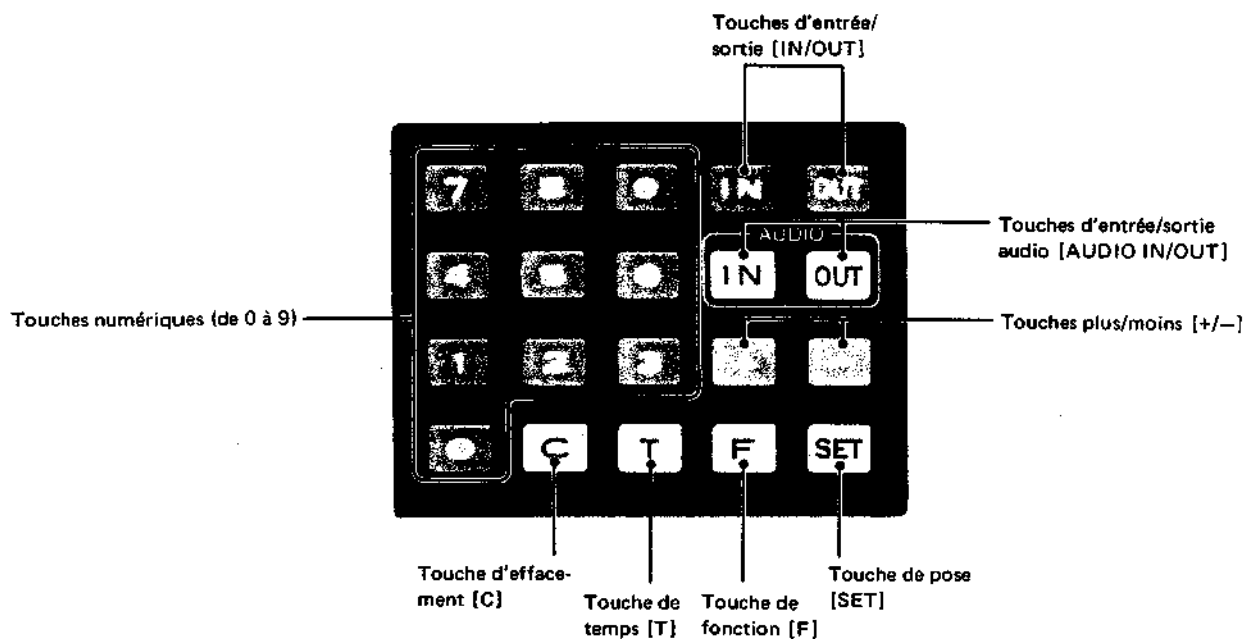
(32) **Touches de seuil d'entrée/sortie audio [AUDIO IN/AUDIO OUT]**

Elles servent à l'introduction des seuils d'entrée/sortie audio (**AUDIO IN/OUT**) pendant que l'appareil se trouve en mode **AUDIO SPLIT**. Une poussée sur la touche **AUDIO IN** ou **AUDIO OUT** introduit comme seuil d'entrée ou de sortie audio (**AUDIO IN** ou **AUDIO OUT**) la donnée indiquée au Bloc 1 de l'affichage (8), tandis que le témoin s'allume. Cette donnée est alors utilisée pour le préenroulement, le prévisionnage, le montage automatique ou la revue.

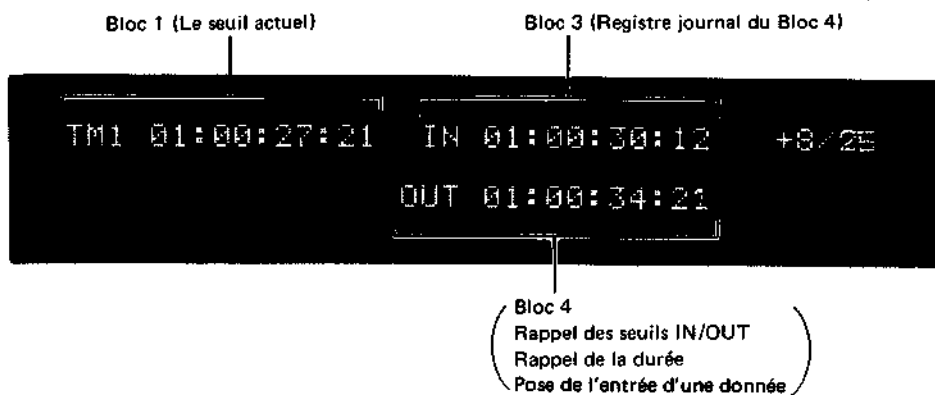
- Si la touche **AUDIO IN/OUT** est actionnée pendant le mode **PLAY** ou **REC**, ce sera la valeur de la donnée affichée moins la durée de réaction qui sera introduite comme seuil d'entrée/sortie audio (**AUDIO IN/OUT**). Le sélecteur **REACT TIME** de la plaquette SY-79 permet de régler, de 0 à 25 cadres, la durée de réaction ci-dessus mentionnée.

33 Clavier à 20 touches

Ce clavier comporte les touches suivantes:



Affichage obtenu par les 20 touches



Exemple:

Réglage du code de temps [TIME CODE]

- Préparatifs
- Magnétoscope → mode STOP ou STANDBY
 - La plaquette TC-14/14A doit être installée.
 - Régler au mode d'affichage TIME CODE. (Régler sur TC le sélecteur TC/U-BIT de la plaquette TC-14/14A (générateur/lecteur BKH-2015/2015A). Si le code de temps a été réglé en mode REC RUN, le réglage est plus facile étant donné que l'affichage de code de temps ne change pas.)
 - Sélecteur TIME CODE/TIMER ⑥ → sur TIME CODE.

Exécution

Affichage

Commentaire

1. Sélecteur TAPE/EE ①
→ INPUT

TCG 01 : 00 : 27 : 21		

Le code de temps du générateur de code de temps est affiché sur le Bloc 1.

2. 0,0,0,0,3,0,0,0,
SET

TCG 01 : 00 : 27 : 21		
	SET 00 00 30 00	

Introduire la donnée souhaitée à l'aide des touches numériques. Elle est affichée tout d'abord au Bloc 4.

- En cas d'erreur à l'introduction, l'effacer par la touche [C], puis entrer la donnée correcte.

3. T

TCG 00 : 00 : 30 : 00		

La donnée souhaitée est introduite au Bloc 1 et posée comme seuil de départ de la valeur du générateur.

Réglage du bit d'utilisateur

- Préparatifs
- Magnétoscope → mode STOP ou STANDBY
 - Régler au mode d'affichage du bit d'utilisateur.
Régler sur U-BIT le sélecteur TC/U-BIT de la plaquette TC-14/14A (générateur/lecteur BKH-2015/2015A).
 - Sélecteur TIME CODE/TIMER ⑥ → sur TIME CODE

Exécution	Affichage	Commentaire						
1. Sélecteur TAPE/EE ① → INPUT	<table border="1"> <tr> <td>UBG 01 00 30 15</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	UBG 01 00 30 15						Le bit d'utilisateur produit par le générateur de code de temps est affiché au Bloc 1.
UBG 01 00 30 15								
2. 0, F & 0 (enfoncées simultanément), 0, 0, 2, 0, 1, 0, SET	<table border="1"> <tr> <td>UBG 01 00 30 15</td> <td></td> <td></td> </tr> <tr> <td></td> <td>SET 0A 00 20 10</td> <td></td> </tr> </table>	UBG 01 00 30 15				SET 0A 00 20 10		La donnée souhaitée est introduite au Bloc 4. ● La poussée simultanée des touches F et 0 permet d'entrer une valeur hexadécimale.
UBG 01 00 30 15								
	SET 0A 00 20 10							
3. T	<table border="1"> <tr> <td>UBG 0A 00 20 10</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	UBG 0A 00 20 10						La donnée souhaitée est entrée au Bloc 1 et est posée comme bit d'utilisateur.
UBG 0A 00 20 10								

Réglage de la minuterie 1 (TIMER-1)

- Préparatifs : Sélecteur TIME CODE/TIMER ⑥ → sur TIMER-1

Exécution	Affichage	Commentaire						
1. Faire défiler la bande et l'arrêter à une position quelconque.	<table border="1"> <tr> <td>TM1 01 : 00 : 27 : 21</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TM1 01 : 00 : 27 : 21						La donnée actuelle du TIMER-1 est affichée au Bloc 1.
TM1 01 : 00 : 27 : 21								
2. 0, 0, 0, 0, 3, 0, 0, 0, SET	<table border="1"> <tr> <td>TM1 01 : 00 : 27 : 21</td> <td></td> <td></td> </tr> <tr> <td></td> <td>SET 00 00 30 00</td> <td></td> </tr> </table>	TM1 01 : 00 : 27 : 21				SET 00 00 30 00		Entrer la donnée souhaitée au Bloc 4. ● Si le message "DATA ERR" clignote, une donnée inacceptable a été entrée. La corriger après une poussée sur la touche C.
TM1 01 : 00 : 27 : 21								
	SET 00 00 30 00							
3. T	<table border="1"> <tr> <td>TM1 00 : 00 : 30 : 00</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	TM1 00 : 00 : 30 : 00						La donnée souhaitée est entrée au Bloc 1 et est posée comme seuil actuel de TIMER-1.
TM1 00 : 00 : 30 : 00								

- Les données ne peuvent pas être préréglées lorsque la minuterie TIMER-1 se trouve en mode d'affichage +/-.

Entrée d'un seuil de montage

Exécution	Affichage	Commentaire						
1. 0,1,1,0,1,5,1,6 SET	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>SET 01 10 15 16</td><td></td></tr> </table>					SET 01 10 15 16		Entrer la donnée souhaitée au Bloc 4.
	SET 01 10 15 16							
2. IN	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>IN 01 : 10 : 15 : 16</td><td></td></tr> </table>					IN 01 : 10 : 15 : 16		La donnée du seuil IN qui a été entrée est rappelée au Bloc 4. Les seuils OUT et AUDIO IN/OUT peuvent être entrés de la même façon.
	IN 01 : 10 : 15 : 16							

Rappel/correction d'un seuil de montage (CALL/TRIM)

Exécution	Affichage	Commentaire						
1. IN	<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> </table>					IN 01 : 20 : 13 : 00		La donnée du seuil IN souhaité est affichée au Bloc 4. Les seuils OUT et AUDIO IN/OUT peuvent être affichés de la même façon.
	IN 01 : 20 : 13 : 00							
2. + (ou -)	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td></td><td>+</td></tr> </table>		IN 01 : 20 : 13 : 00				+	Exemple d'une correction par addition. La donnée du seuil IN est déplacée au Bloc 3. Le signe "+" apparaît au Bloc 4.
	IN 01 : 20 : 13 : 00							
		+						
3. 4,0,0,0	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td></td><td>+ 40 00</td></tr> </table>		IN 01 : 20 : 13 : 00				+ 40 00	Entrer sur le Bloc 4 la valeur que l'on désire ajouter.
	IN 01 : 20 : 13 : 00							
		+ 40 00						
4. SET	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td>SET 01 20 53 00</td><td></td></tr> </table>		IN 01 : 20 : 13 : 00			SET 01 20 53 00		Le résultat de l'addition est affiché au Bloc 4.
	IN 01 : 20 : 13 : 00							
	SET 01 20 53 00							
5. OUT	<table border="1"> <tr><td></td><td>IN 01 : 20 : 13 : 00</td><td></td></tr> <tr><td></td><td>OUT 01 : 20 : 53 : 00</td><td></td></tr> </table>		IN 01 : 20 : 13 : 00			OUT 01 : 20 : 53 : 00		La donnée souhaitée est entrée comme seuil OUT et affichée au Bloc 4. <ul style="list-style-type: none"> Si le message "NEGATIVE" clignote, c'est que les seuils IN et OUT sont à l'envers et qu'ils doivent donc être changés.
	IN 01 : 20 : 13 : 00							
	OUT 01 : 20 : 53 : 00							

Affichage de durée

Exécution	Affichage	Commentaire						
Appuyer simultanément sur les touches IN et OUT.	<table border="1"><tr><td></td><td></td><td></td></tr><tr><td></td><td>DUR 00 : 10 : 37 : 14</td><td></td></tr></table>					DUR 00 : 10 : 37 : 14		La durée de l'intervalle de montage, compris entre les seuils IN et OUT, est affichée au Bloc 4.
	DUR 00 : 10 : 37 : 14							

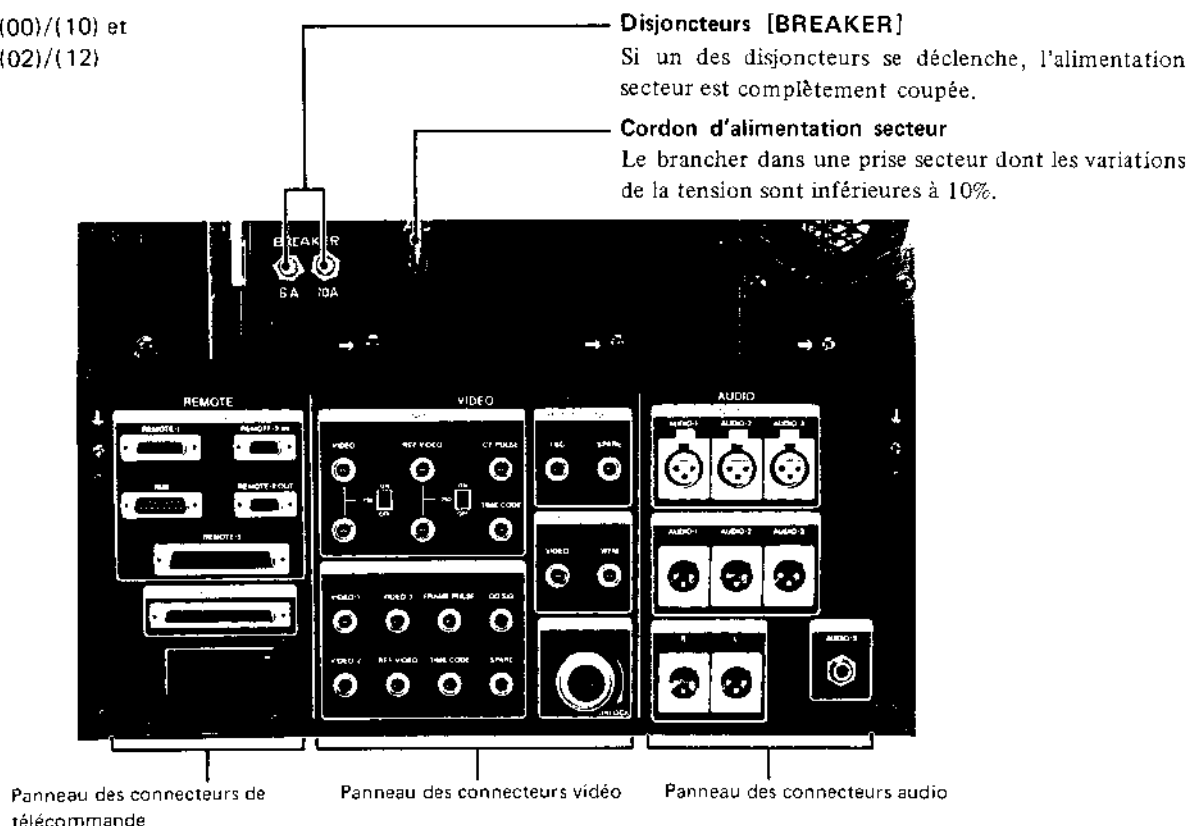
- Il est possible d'afficher la durée de n'importe quel intervalle de montage compris entre les seuils IN/OUT/AUDIO IN et AUDIO OUT.
- Si l'on a affiché la donnée de minuterie 1 (TIMER-1), le symbole "DUR" la précède; dans le cas de TIMER-2, le symbole "LAP" apparaît. Après que la bande ait été installée, l'affichage de la minuterie 2 (TIMER-2) ne peut plus être remis à zéro. C'est pourquoi, nous recommandons d'introduire au préalable le seuil d'entrée (IN) de la première scène à monter sur la minuterie 2 (TIMER-2) de l'appareil enregistreur et que les seuils IN/OUT réels soient entrés par TIMER-1 ou TIME CODE. Après avoir monté plusieurs scènes, afficher la donnée de la minuterie 2 (TIMER-2) de l'appareil enregistreur et appuyer sur les touches IN et OUT. De cette façon, on pourra connaître la durée totale (LAP) du montage de toutes les scènes jusqu'à ce moment-là.

1-4-6. Panneau des connecteurs

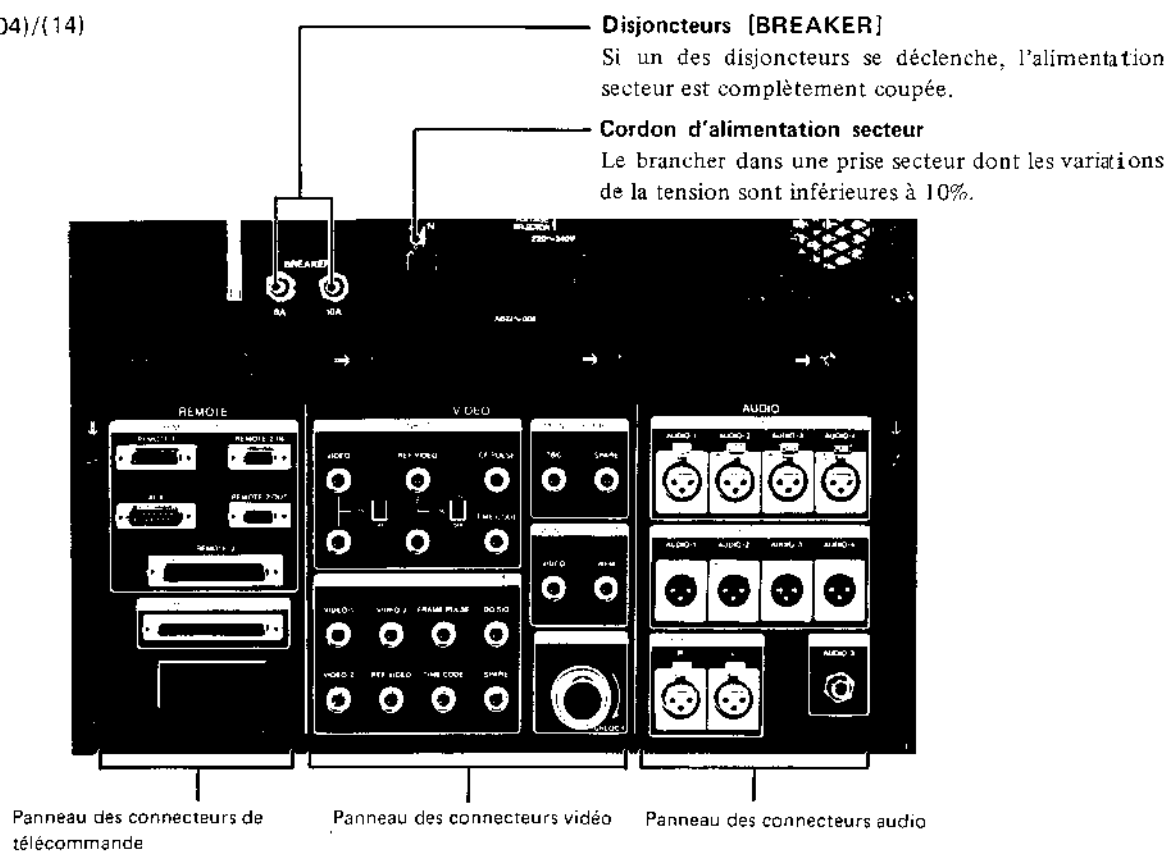
Remarque

Les BVH-2000PS(10), (12) et (14) ne sont pas dotés des connecteurs REMOTE-1 et TO TBC.

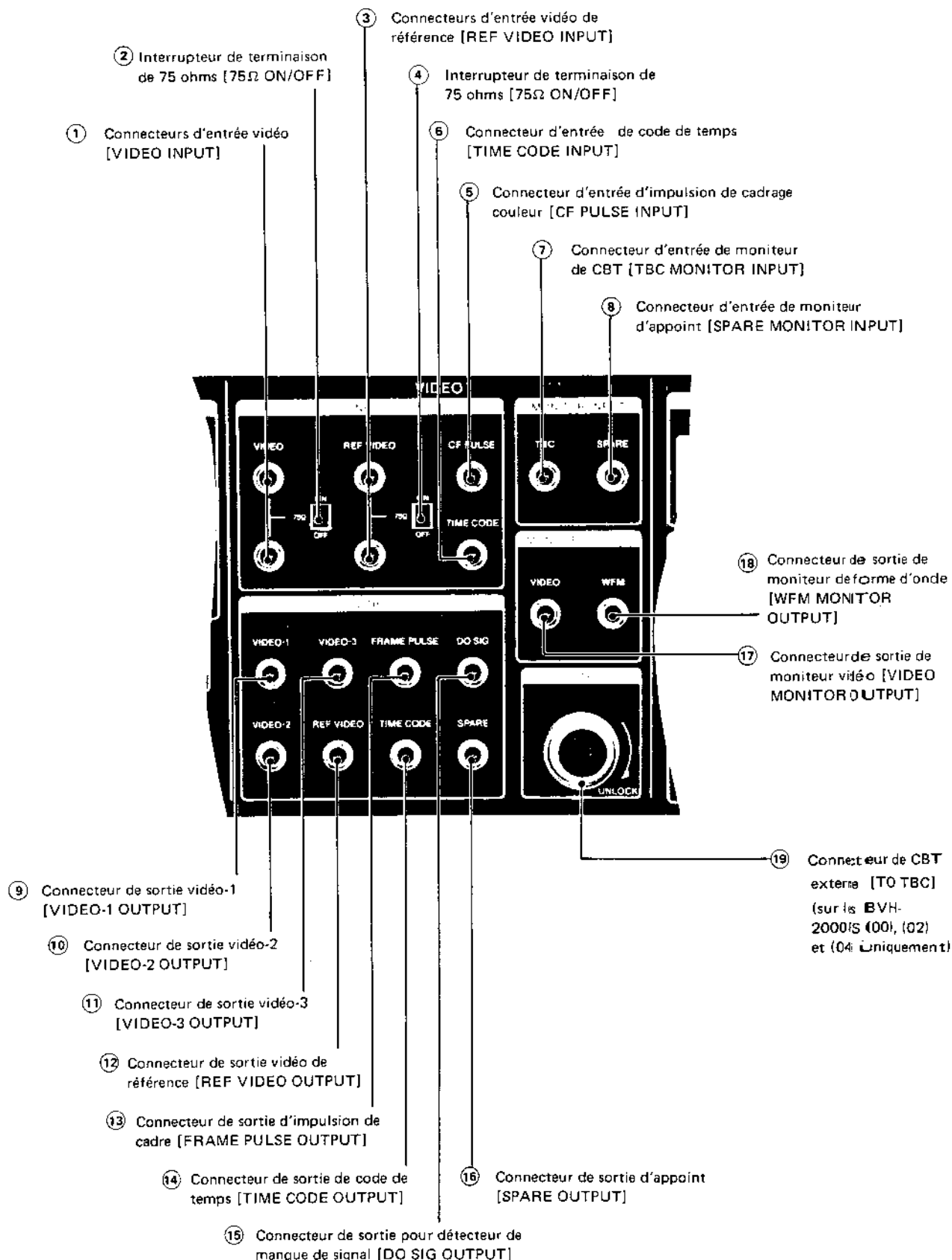
BVH-2000PS(00)/(10) et
BVH-2000PS(02)/(12)



BVH-2000PS(04)/(14)



Panneau des connecteurs vidéo



① **Connecteurs d'entrée vidéo [VIDEO INPUT]**

Raccorder un signal vidéo de 1 Vc-c. Un de ces deux connecteurs peut servir comme sortie en boucle (connexion en pont) pour un autre équipement vidéo.

② **Interrupteur de terminaison de 75 ohms [75Ω ON/OFF]**

Il s'agit de l'interrupteur de terminaison 75 ohms du connecteur VIDEO INPUT ①.

ON: Position normale.

OFF: Circuit ouvert. Utilisé pour connexions en pont.

③ **Connecteurs d'entrée vidéo de référence [REF VIDEO INPUT]**

Raccorder un signal vidéo de 1 Vc-c pour la synchronisation externe. Ces connecteurs de signal de référence pour le circuit d'asservissement servent quand le sélecteur SERVO REF du panneau de contrôle des fonctions est réglé sur EXT ou AUTO. L'un de ces deux connecteurs peut servir comme sortie en boucle (connexion en pont) pour un autre équipement vidéo.

④ **Interrupteur de terminaison de 75 ohms [75Ω ON/OFF]**

Il s'agit de l'interrupteur de terminaison 75 ohms du connecteur REF VIDEO INPUT ③.

ON: Position normale.

OFF: Circuit ouvert. Utilisé pour connexions en pont.

⑤ **Connecteur d'entrée d'impulsion de cadrage couleur [CF PULSE INPUT]**

Niveau logique transistor-transistor (TTL). Il reçoit l'impulsion externe de cadrage couleur quand le sélecteur CF de la plaquette SR-15 est réglé sur EXT.

⑥ **Connecteur d'entrée de code de temps [TIME CODE INPUT]**

Signal de 0,5 Vc-c. A utiliser quand un code de temps extérieur est fourni.

- Quand ce connecteur est utilisé, régler le sélecteur MIC/LINE/TC de la plaquette AE-03 sur TC et le sélecteur INT/EXT-1/EXT-2 sur EXT-1. (Se reporter à 1-6-3.)

⑦ **Connecteur d'entrée de moniteur de CBT [TBC MONITOR INPUT]**

Raccorder le signal vidéo qu'il y a lieu de surveiller sur un moniteur vidéo (p.ex. le signal de sortie vidéo du correcteur de base de temps BVT-2000P/2000S).

Le signal provenant de ce connecteur est passé au connecteur VIDEO MONITOR OUTPUT ⑰ quand la touche TBC des sélecteurs PICTURE MONITOR ⑫ du panneau de contrôle de niveau est enfoncée. Le signal est également envoyé au connecteur WFM MONITOR OUTPUT ⑱ quand la touche SELECT VIDEO des sélecteurs WAVEFORM MONITOR ⑭ est enfoncée.

⑧ **Connecteur d'entrée de moniteur d'appoint [SPARE MONITOR INPUT]**

Permet la connexion d'un signal à surveiller sur un moniteur vidéo. L'entrée provenant de ce connecteur est passée au connecteur VIDEO MONITOR OUTPUT ⑰ quand le poussoir SPARE des sélecteurs PICTURE MONITOR est enclenché. Le signal est également envoyé au connecteur WFM MONITOR OUTPUT ⑱ quand le poussoir SELECT VIDEO des sélecteurs WAVEFORM MONITOR est enclenché.

- Si le correcteur de base de temps numérique enfichable (en option) est installé, le signal produit par la plaquette installée est fourni à la place du signal SPARE MONITOR INPUT en déplaçant le SI de la plaquette VM-01.

⑨ ⑩ ⑪ **Connecteurs de sortie vidéo-1/2/3 [VIDEO-1/2/3 OUTPUT]**

Connecteurs de sortie de signal vidéo de 1,0 Vc-c, 75 ohms. Sortie de démodulateur du magnétoscope. Selon que la plaquette CBT enfichable en option est installée ou non, on obtient les signaux de sortie suivants:

	Plaquette en option (Non installée)	Plaquette CBT en option (installée)
Connecteur VIDEO-1 *1	Sortie DEMOD	Sortie CBT
Connecteur VIDEO-2 *1	Sortie DEMOD	Sortie CBT
Connecteur VIDEO-3	Sortie DEMOD	Sortie CBT/DEMOMOD *2

*1 La sortie peut se changer à l'aide du sélecteur S3 de la plaquette VM-01.

*2 La sortie CBT et celle de démodulateur se changent à l'aide du sélecteur S2 de la plaquette VM-01 dans le magnétoscope. (Se reporter en page 1-61(F).)

⑫ **Connecteur de sortie vidéo de référence [REF VIDEO OUTPUT]**

La sortie du signal vidéo de référence se choisit par le sélecteur SERVO REF ② du panneau de contrôle des fonctions.

⑬ **Connecteur de sortie d'impulsion de cadre [FRAME PULSE OUTPUT]**

Niveau logique transistor à transistor (TTL). Sortie d'impulsion de cadrage couleur à la lecture. Un choix entre 3 sortes d'impulsion de sortie, à savoir REF-2, REF-8 et PB CF, est possible par le sélecteur PULSE OUT de la plaquette SR-15. (Se reporter à 1-6-3.)

⑭ **Connecteur de sortie de code de temps [TIME CODE OUTPUT]**

Connecteur de sortie de code de temps de 0,5 Vc-c. Le code de temps produit par le générateur/lecteur BKH-2015/2015A ou un code de temps à entrée extérieure est alimenté pendant l'enregistrement. A la lecture, le code de temps apparaissant sur l'affichage est fourni.

15 Connecteur de sortie pour détecteur de manque de signal [DO SIG OUTPUT]
 Niveau logique transistor à transistor de polarité négative. Il s'agit de la sortie détecteur de manque de signal pour un compensateur (DOC) externe de manque de signal. Quand un CBT externe est raccordé au connecteur TO TBC **19**, ce signal est alimenté par le CBT. Une impulsion ou une sortie haute fréquence peut être choisie à l'aide du cavalier de la plaquette EQ-02.

16 Connecteur de sortie d'appoint [SPARE OUTPUT]
 Connecteur supplémentaire.

17 Connecteur de sortie de moniteur vidéo [VIDEO MONITOR OUTPUT]
 Il s'agit du connecteur de sortie vidéo pour la surveillance de l'image: 1,0 Vc-c, 75 ohms.
 Le signal est alimenté en choisissant le sélecteur PICTURE MONITOR **12** du panneau de contrôle de niveau.

18 Connecteur de sortie de moniteur de forme d'onde [WFM MONITOR OUTPUT]
 Il s'agit du connecteur de sortie vidéo pour un moniteur de forme d'onde: 1,0 Vc-c, 75 ohms (nominal).
 Le signal est alimenté en choisissant le sélecteur WAVEFORM MONITOR **14** du panneau de contrôle de niveau.

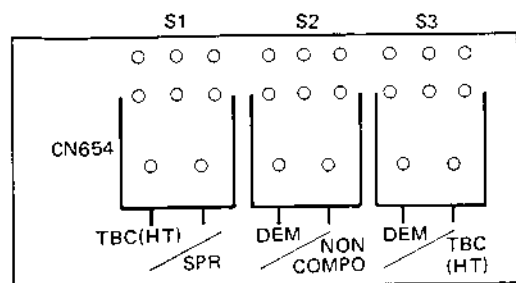
19 Connecteur de CBT externe [TO TBC]
 (connecteur à 18 broches)
 (sur les BVH-2000PS(00), (02) et (04) uniquement)
 Utilisé pour le branchement du BVT-2000P/2000S à l'aide d'un câble multi-connexions. A l'emploi du BVH-2000PS(02) ou du BVH-2000PS(04), l'alignement dynamique (DT) ne fonctionnera pas si cette connexion n'est pas réalisée.
 Quand un correcteur de base de temps BKH-2350 en option est installé dans l'appareil, l'alignement dynamique est opérationnel quelle que soit la connexion effectuée à ce connecteur.

N° de broche	Signal	Niveau de signal
A		
B	GND	
1	VIDEO OUT 50Ω	1Vc-c
2	VIDEO OUT (GND)	
3	DT V	TTL, HIGH IMPEDANCE
4	DT V (GND)	
5	OFF TAPE: H	TTL, HIGH IMPEDANCE
6	DO PULSE: L	TTL, HIGH IMPEDANCE
7	DO PULSE (GND)	
8	PLAY STATUS: H	TTL, HIGH IMPEDANCE
9	COLOR INF	TTL, HIGH IMPEDANCE
10	FH	TTL, HIGH IMPEDANCE
11	FH (GND)	
12	CONFI: L	TTL, HIGH IMPEDANCE
13		
14	GND	TTL, HIGH IMPEDANCE Ω CONNECT
15	DT MODE: L	TTL, HIGH IMPEDANCE
16	FR PULSE: L	TTL, HIGH IMPEDANCE

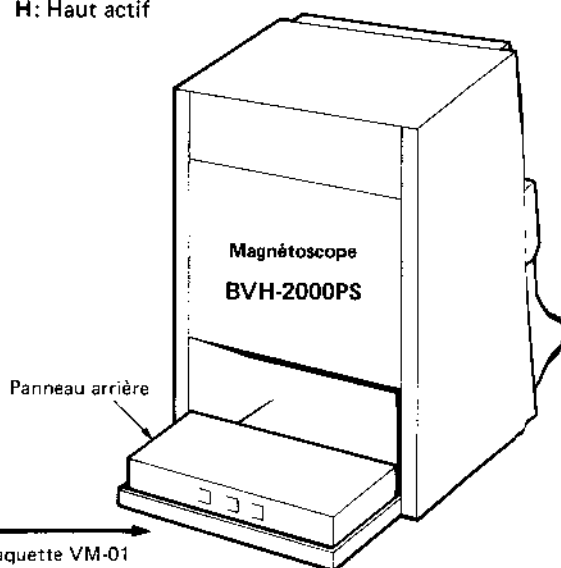
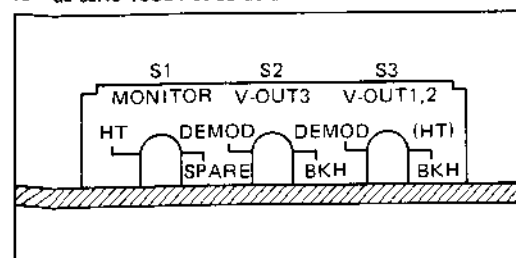
L: Bas actif
 H: Haut actif

Sélecteurs de la plaquette VM-01

N° de série de 10001 à 10299

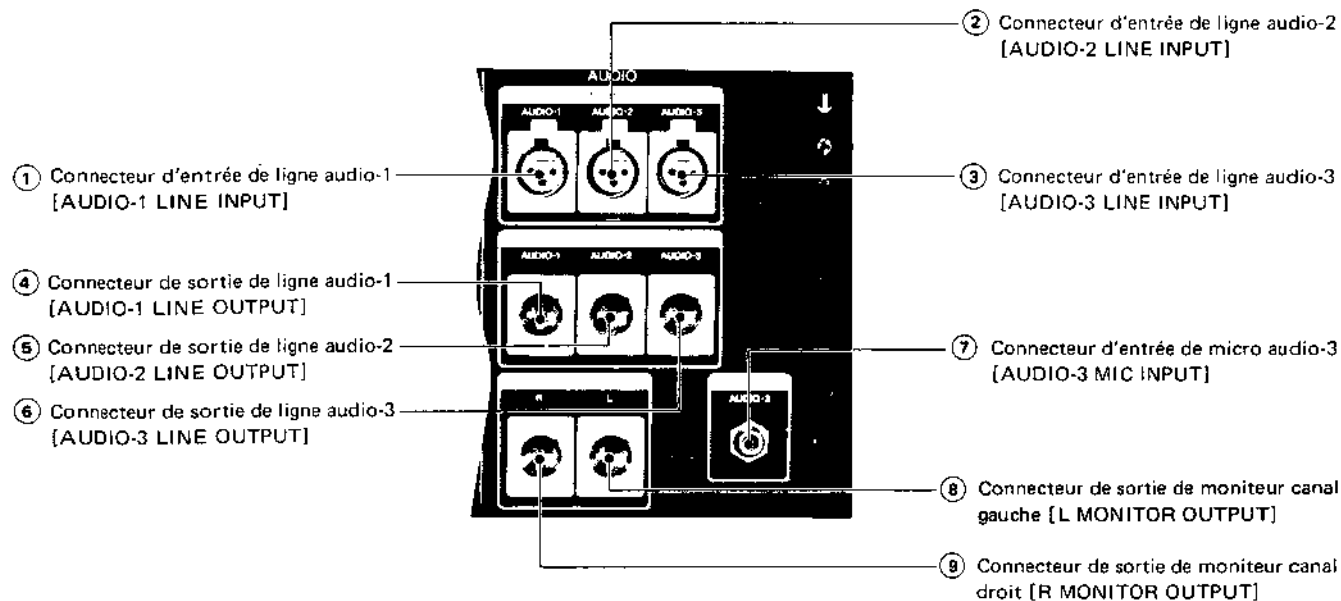


N° de série 10301 et au-delà

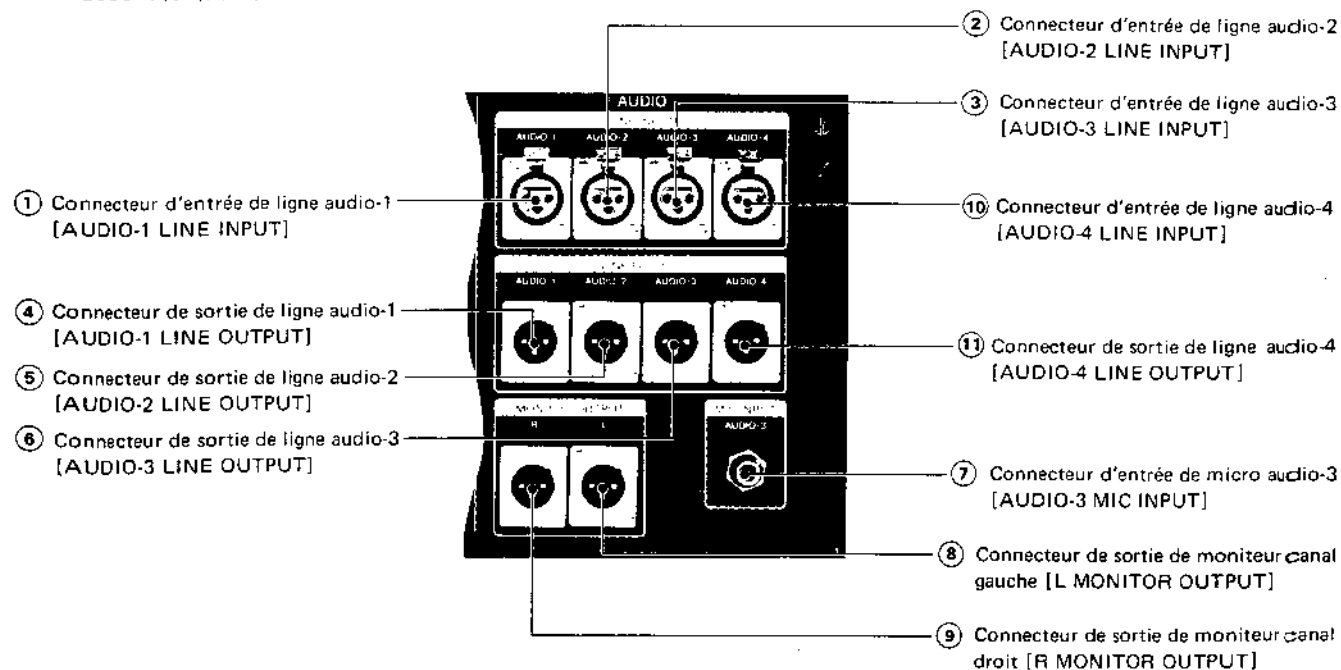


Panneau des connecteurs audio

BVH-2000PS(00)/(10) et BVH-2000PS(02)/(12)



BVH-2000PS(04)/(14)



① ② ⑩ **Connecteurs d'entrée de ligne de canal audio-1/2/4 [AUDIO-1/AUDIO-2/AUDIO-4* LINE INPUT]**

Connecteurs d'entrée des canaux audio 1 et 2 à prise 3P-XLR CANNON.

③ **Connecteur d'entrée de ligne de canal audio-3 [AUDIO-3 LINE INPUT]**

Connecteur à prise 3P-XLR CANNON. Utilisé pour l'entrée du signal AUDIO ou du signal de code de temps externe. Le signal d'entrée audio provenant de ce connecteur peut être enregistré en réglant sur LINE le sélecteur MIC/LINE/TC de la plaquette AE-03. Par contre, pour enregistrer le signal d'entrée de code de temps externe provenant de ce connecteur, régler sur TC ce sélecteur et en plaçant sur EXT-2 le sélecteur INT/EXT-1/EXT-2 de la même plaquette. (Se reporter à 1-6-3.)

④ ⑤ ⑥ ⑪ **Connecteurs de sortie de ligne de canal audio-1/2/3/4* [AUDIO-1/2/3/4* LINE OUTPUT]**

Connecteurs de sortie pour les canaux audio 1, 2, 3 et 4. L'impédance de sortie de 600 ohms peut être changée à 150 ohms ou 37,5 ohms en court-circuitant le contact de la plaquette LA-02 dans le magnéto-scope. (Se reporter à 2-10.)

⑦ **Connecteur d'entrée de micro du canal audio-3 [AUDIO-3 MIC INPUT]**

Connecteur d'entrée pour micro au canal audio-3. L'enregistrement du signal d'entrée micro est possible en réglant sur MIC le sélecteur MIC/LINE/TC de la plaquette AE-03.

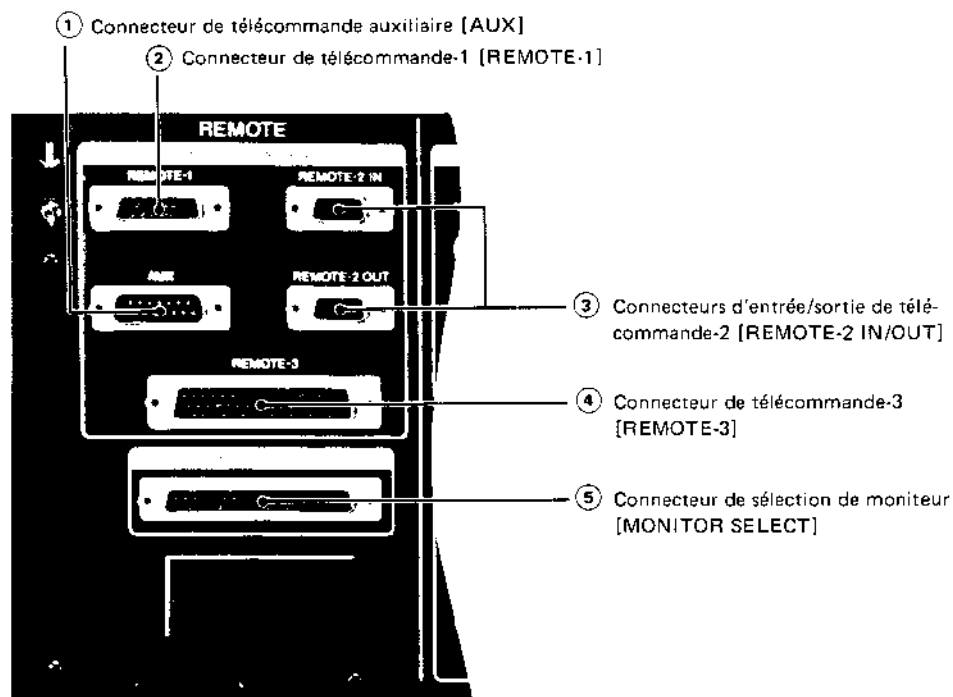
⑧ ⑨ **Connecteurs de sortie de moniteur canal gauche/droit [L/R MONITOR OUTPUT]**

Connecteurs de sortie de moniteur des canaux audio 1 et 2 gauche/droit, à prise 3P-XLR CANNON. Selon le réglage des sélecteurs AUDIO MONITOR ⑩ du panneau de contrôle de niveau, on obtient les signaux suivants:

Connecteur Sélecteurs	Connecteur L (gauche)	Connecteur R (droit)
AUDIO-1	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-1/AUDIO-2	AUDIO-1	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4

* Les connecteurs AUDIO-4 LINE INPUT et OUTPUT et la touche AUDIO-4 n'existent que sur le BVH-2000PS (04)/(14).

Panneau des connecteurs de télécommande



① Connecteur de télécommande auxiliaire [AUX]

Pour commander à distance le correcteur de base de temps numérique enfichable quand il est installé, raccorder l'unité de télécommande BK-2007 à ce connecteur.

② Connecteur de télécommande-1 [REMOTE-1] (sur les BVH-2000PS(00), (02) et (04) uniquement)

Connecteur d'entrée/sortie à 15 broches sous D pour le contrôle à distance. Un magnétoscope ou une unité de contrôle de montage, doté d'un connecteur CCJ (10 broches) REMOTE IN/OUT peut y être raccordé en faisant appel à un convertisseur CCJ BKH-2016.

— Appareils pouvant être raccordés —

Unités de contrôle de montage:

BVE-500ACE, BVE-5000P

(Elles peuvent se raccorder au connecteur REMOTE-2 avec emploi de la plaquette BK-5005 au lieu de la BKH-2016.)

Magnétoscopes: BVH-1100PS, BVH-1100APS, BVH-1180PS

Boîtier d'interface: IF-1000CE

③ Connecteurs d'entrée/sortie de télécommande-2 [REMOTE-2 IN/OUT]

Connecteurs d'entrée/sortie à 9 broches sous D pour le contrôle à distance. Destinés à raccorder au BVH-2000PS un magnétoscope ou une unité de contrôle de montage avec signaux de télécommande entrée/sortie en série (RS-422). Etant donné que les connecteurs IN/OUT sont à boucle ouverte, une connexion en pont des signaux de télécommande est possible.

— Appareils pouvant être raccordés —

Unités de contrôle de montage:

BVE-800, BVE-5000P (la plaquette BK-5005 est nécessaire.)

Magnétoscopes: BVH-2000PS, BVU-800P/800S/820P/820S

Unité de contrôle dynamique: DTR-2000

④ Connecteur de télécommande 3 (REMOTE-3)

Connecteur d'entrée/sortie à 50 broches D-SUB pour le contrôle à distance. Destiné à raccorder au BVH-2000PS un magnétoscope ou une unité de contrôle de montage avec les signaux de télécommande d'entrée/sortie en parallèle.

Signaux d'entrée/sortie au connecteur REMOTE-3

Numéro de broche	Signaux		
1	FF	IN	} ENTREE COMMANDE (BAS ACTIF)
19	STBY ON	IN	
20	REW	IN	
21	ENTRY	IN	
34	PLAY	IN	
35	STOP	IN	
36	REC	IN	
18	PREROLL	IN	
22	STBY OFF	IN	
2	REC SW	OUT	} RETOUR COMMANDE (BAS ACTIF)
3	PLAY SW	OUT	
4	STOP SW	OUT	
5	ENTRY SW	OUT	
37	REV LAMP	OUT	} NAVETTE, IMPULSION, VARIABLE (BAS ACTIF)
40	FWD LAMP	OUT	
46	STBY ON	OUT	} SORTIE ETAT (BAS ACTIF)
47	PLAY	OUT	
43	STOP	OUT	
24	REC	OUT	
50	PREROLL	OUT	
48	REMOTE	OUT	
49	ALARM	OUT	
39	A1 PRESET	OUT	
38	A2 PRESET	OUT	
42	A3 PRESET	OUT	
41	SYNC PRESET	OUT	
44	VIDEO PRESET	OUT	
26	ASSEMBLE PRESET	OUT	
45	INSERT PRESET	OUT	
27	EDIT	OUT	
23	SYNC 6 LACK	OUT	} SORTIE ALARME (BAS ACTIF)
25	VIDEO 6 LACK	OUT	
6	REF ERROR	OUT	
7	CF LOCK	OUT	
8	DRUM LOCK	OUT	
9	CAP LOCK	OUT	
12	DVT		} Interface à plaquette TC-14A
13	DRD		
14	CK		
15	DATA-1		
32	DATA-2		
16	DATA-4		
17	DATA-8		
28	DTM		
29	DGN		
30	MP		
31	K4		
33	GND		
10	SP-2		} Inutilisé
11	SP-1		

Remarque: quand les connecteurs REMOTE-1/2/3 sont en usage, placer sans faute le sélecteur REMOTE de la plaquette SY-79 sur 1, 2 ou 3, selon le connecteur sollicité.

⑤ **Connecteur de sélection de moniteur
(MONITOR SELECT)**

Connecteur d'entrée à 37 broches D-SUB pour commuter à distance les moniteurs. Il permet le branchement du signal par lequel sera commuté le signal de sortie aux connecteurs VIDEO MONITOR OUTPUT, WFM MONITOR OUTPUT et L/R MONITOR OUTPUT.

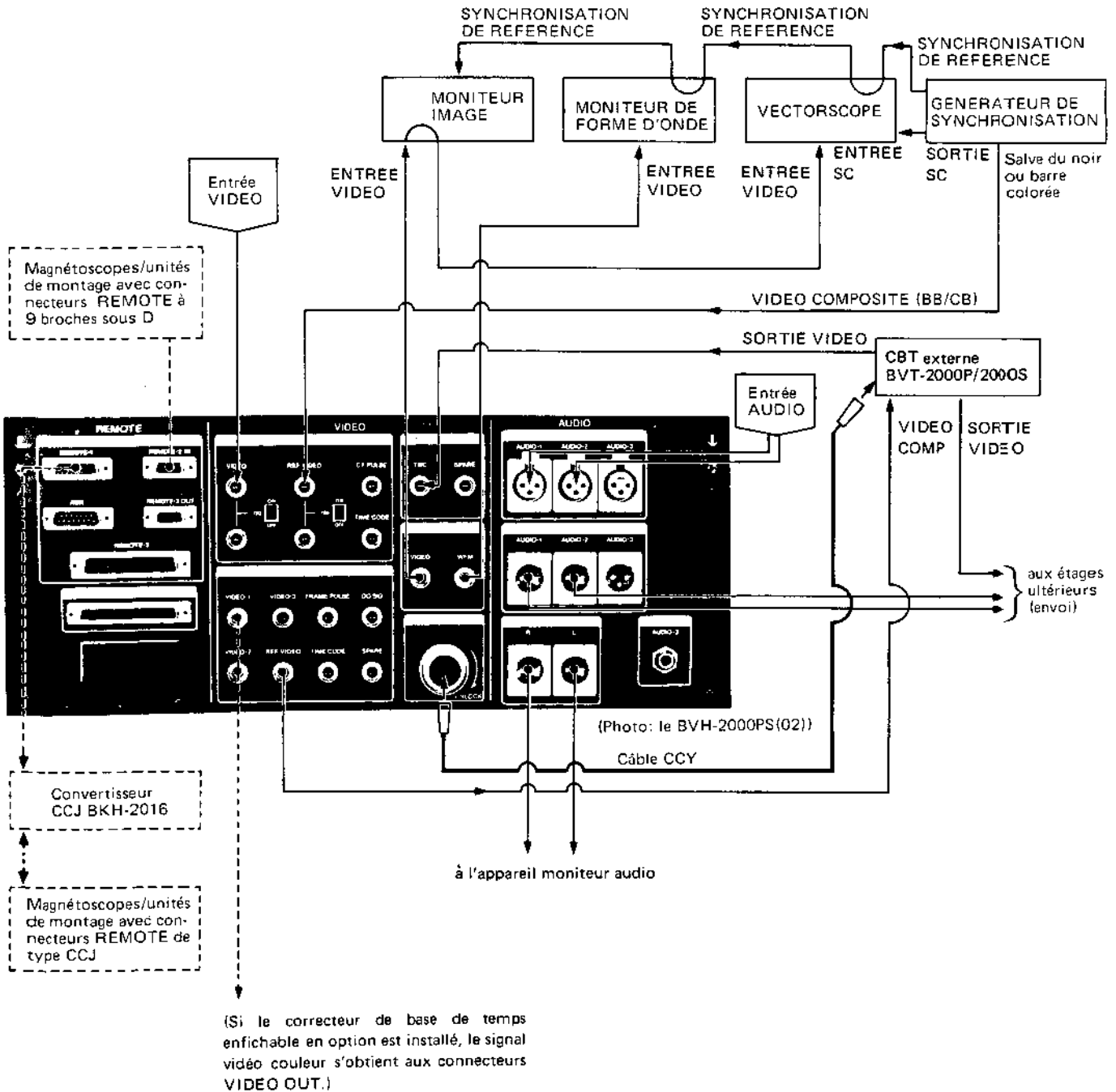
Signaux d'entrée/sortie au connecteur MONITOR SELECT

Numéro de broche	ENTREE COMMANDE	Numéro de broche	SORTIE ETAT
9	INPUT VID	13	INPUT VID
28	DEMOD	32	DEMOD
10	TBC	14	TBC
29	SPARE (PICTURE)	33	SPARE (PICTURE)
11	SELECTED VID	15	SELECTED VID
30	CTL	34	CTL
12	RF ENVELOPE	16	RF ENVELOPE
31	SPARE (WFM)	35	SPARE (WFM)
20	AUDIO-1	4	AUDIO-1
2	AUDIO-2	23	AUDIO-2
21	AUDIO-1/2	5	AUDIO-1/2
3	AUDIO-3	24	AUDIO-3
22	(AUDIO-4)	6	(AUDIO-4)
1	+5V (AUDIO)	8	+5V (VIDEO)
7	GND (AUDIO)	17	GND (VIDEO)
26	GND (AUDIO)	36	GND (VIDEO)

ENTREE COMMANDE: BAS ACTIF

SORTIE ETAT: BAS ACTIF, COURANT maxi 350 mA

1-5. CONNEXIONS



Remarques

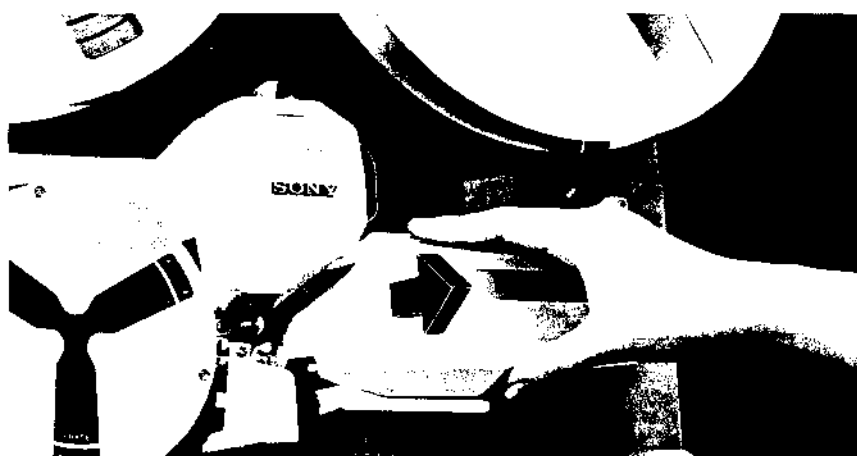
- Les BVH-2000PS(10), (12) et (14) ne sont pas dotés du connecteur REMOTE-1.
- Les BVH-2000PS(10), (12) et (14) ne sont pas dotés du connecteur TO TBC. Se servir d'un CBT de type enfichable.

1-6. REGLAGES PRELIMINAIRES

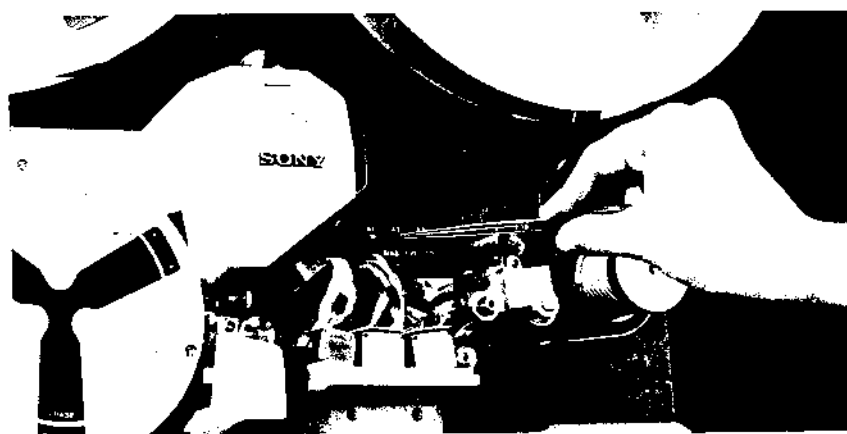
1-6-1. Polarisation d'enregistrement

Le courant de polarisation pour l'enregistrement du son peut être ajusté pour convenir aux caractéristiques de la bande utilisée.

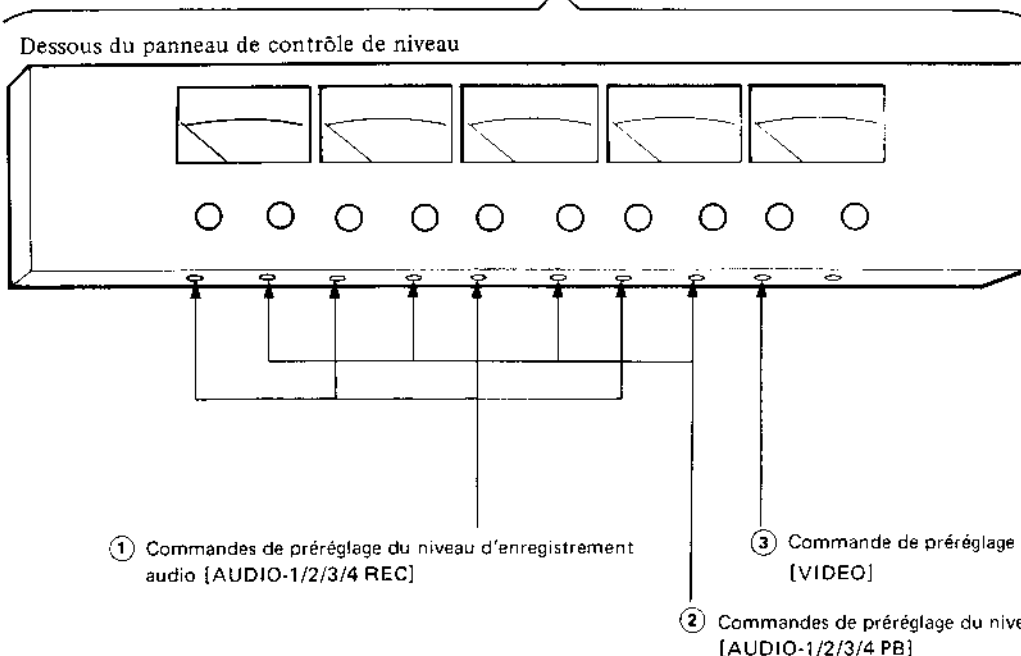
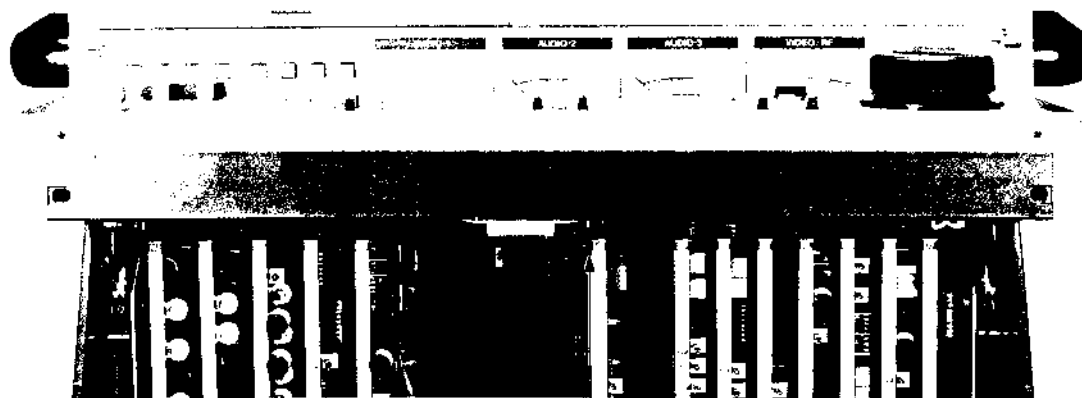
1. Tirer sur le cache des têtes de manière à l'enlever.



2. Alimenter un signal audio de niveau standard et régler le magnétope en mode d'enregistrement. A l'aide d'un tournevis isolé, ajuster les dispositifs de réglage AUDIO-1/2/3/4 BIAS LEVEL.



1-6-2. Préréglage du niveau d'enregistrement/lecture



① Commandes de préréglage du niveau d'enregistrement audio [AUDIO-1/2/3/4 REC]*

Quand les commandes de niveau AUDIO REC (voir 1-4-1. ⑥) sont enclenchées, il est possible de prérégler le niveau du son. Alimenter un signal audio de niveau standard et placer le magnétoscope en mode d'enregistrement; à l'aide d'un tournevis isolé, ajuster alors les niveaux AUDIO-1/2/3/4.

② Commandes de préréglage du niveau de lecture audio [AUDIO-1/2/3/4 PB]*

Quand les commandes de niveau AUDIO PB (voir 1-4-1. ⑦) sont enclenchées, il est possible de prérégler le niveau du son à la lecture. Reproduire une bande standard et, à l'aide d'un tournevis isolé, ajuster les niveaux AUDIO-1/2/3/4.

③ Commande de préréglage de niveau vidéo [VIDEO]

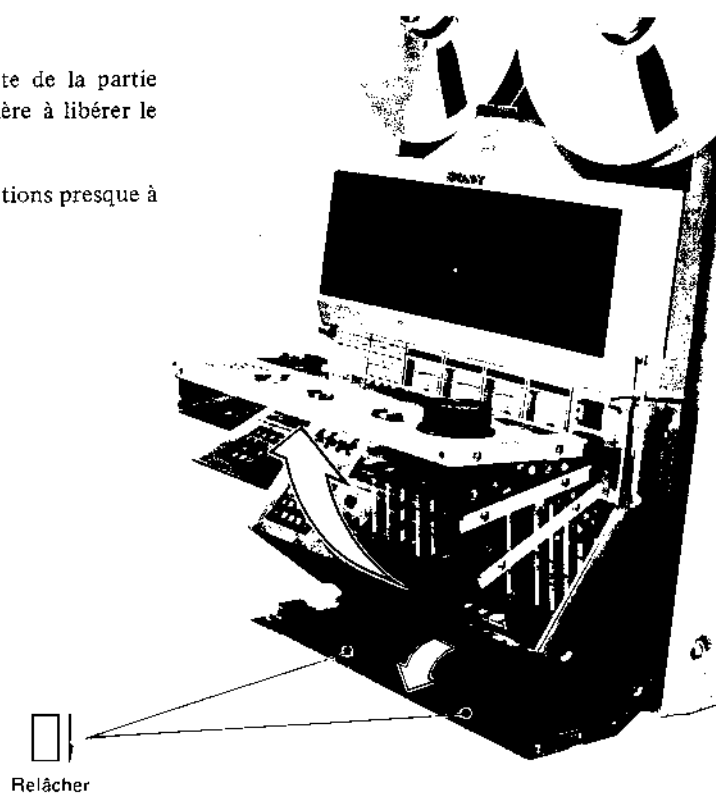
Quand la commande de niveau VIDEO (voir 1-4-1. ⑥) est enclenchée, il est possible de prérégler le niveau de l'image. Alimenter un signal vidéo standard de 1 Vc-c et régler le magnétoscope en mode d'enregistrement. A l'aide d'un tournevis isolé, ajuster le niveau vidéo.

* Seul le BVH-2000PS(04)/(14) est doté de la commande de préréglage de niveau d'enregistrement/lecture AUDIO-4 REC et AUDIO-4 PB.

1-6-3. Réglage des plaquettes

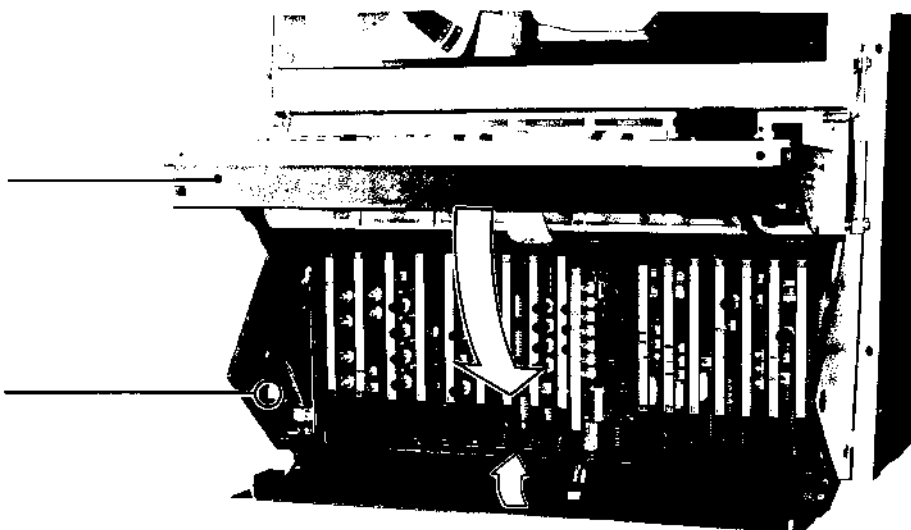
Ouverture

1. Appuyer sur les saillies gauche et droite de la partie inclinée de la surface frontale de manière à libérer le panneau de contrôle.
2. Relever le panneau de contrôle des fonctions presque à l'horizontale, position où il se bloque.

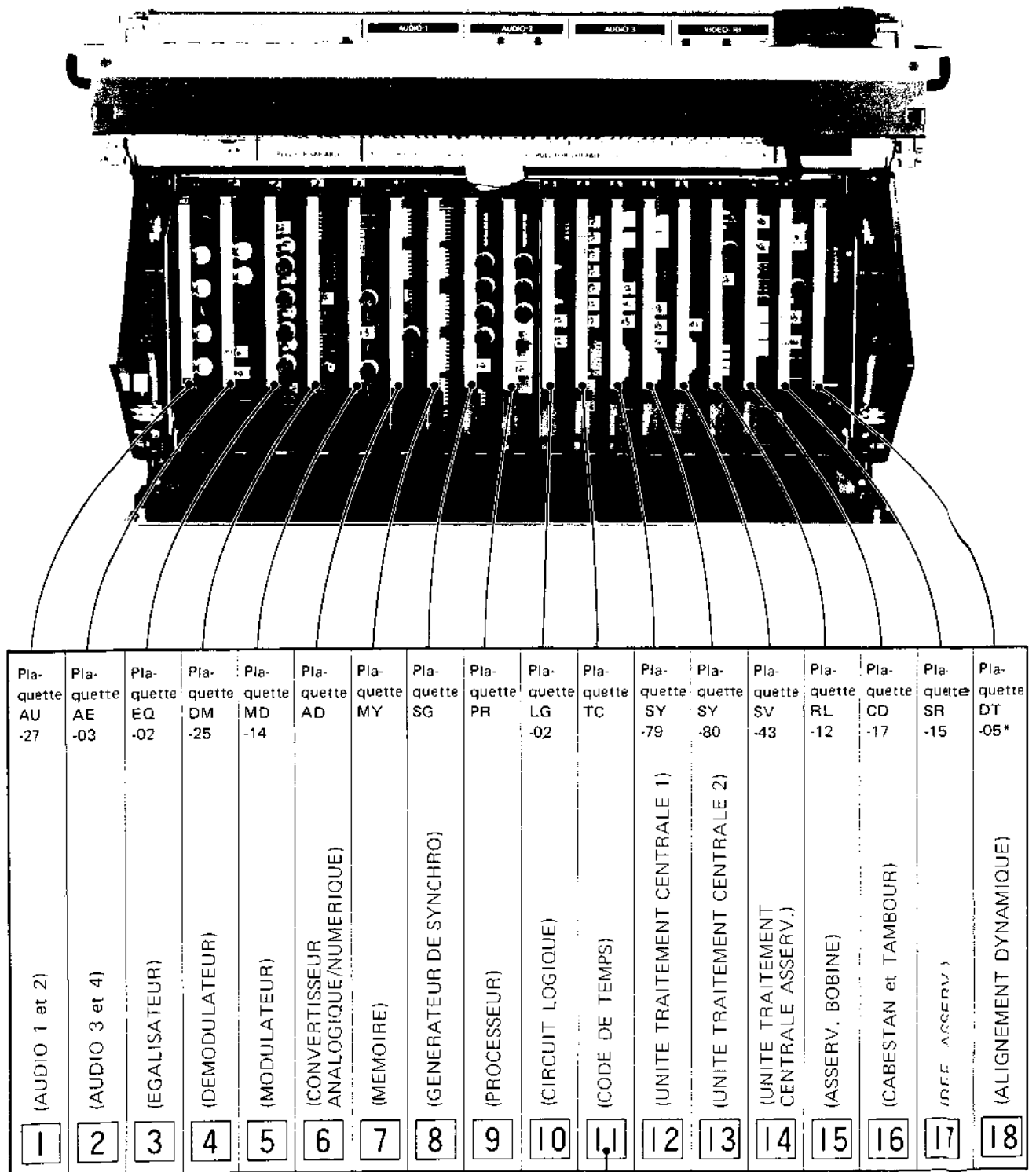


Fermeture

1. Soutenir le panneau pour qu'il ne retombe pas brusquement.
2. Appuyer sur le bouton blanc pour relâcher le verrou et refermer le panneau.



Mise en place et retrait des plaquettes



Correcteur de base de temps numérique BKH-2200/2300/2350 (en option)

Générateur/lecteur de code de temps BKH-2015/BKH-2015A (en option)

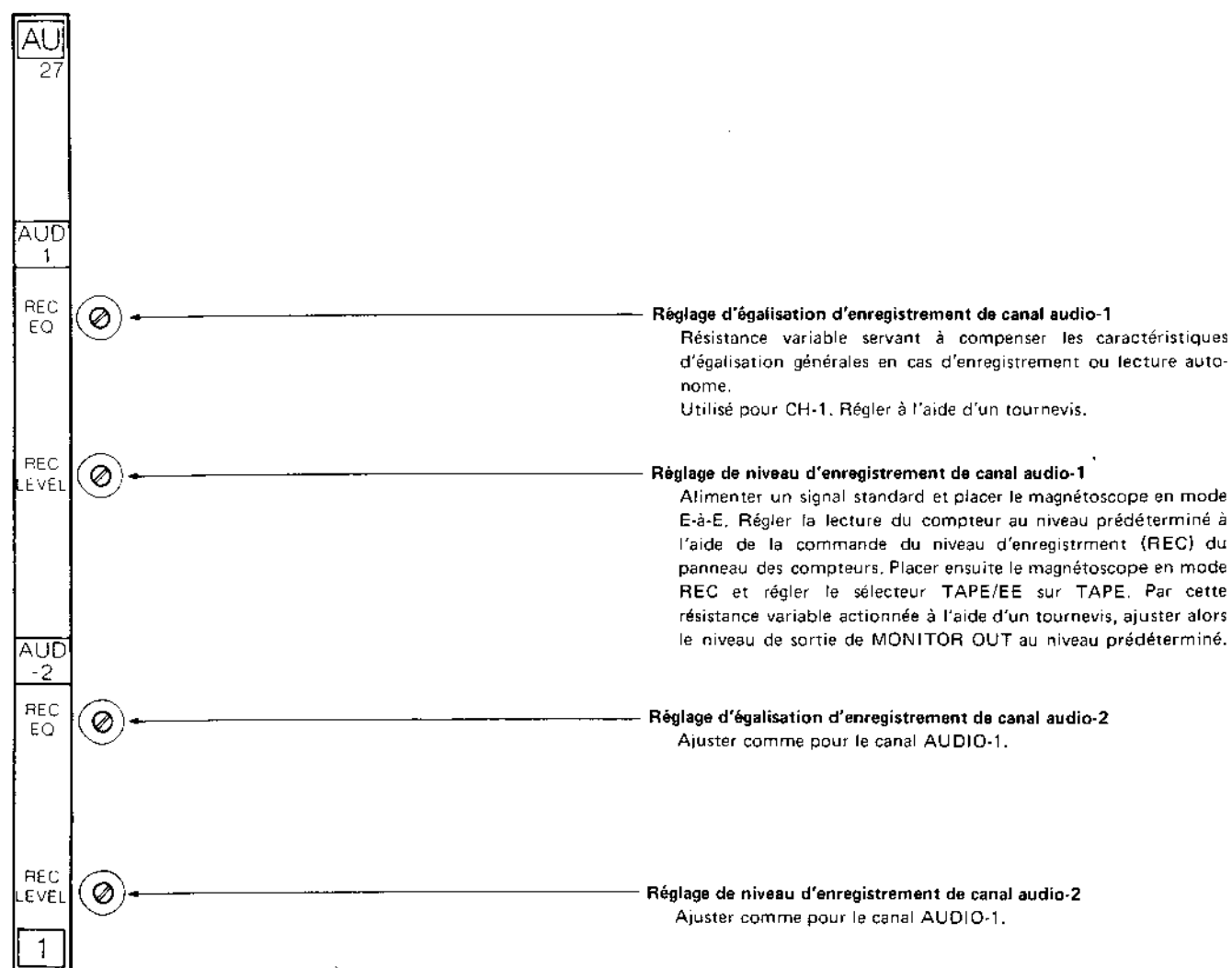
* La plaquette DT-05 est installée dans le BVH-2000PS(02)/(12) et le BVH-2000S(04)/(14).

Lors d'une mise en place ou d'un retrait des plaquettes, observer les points suivants:

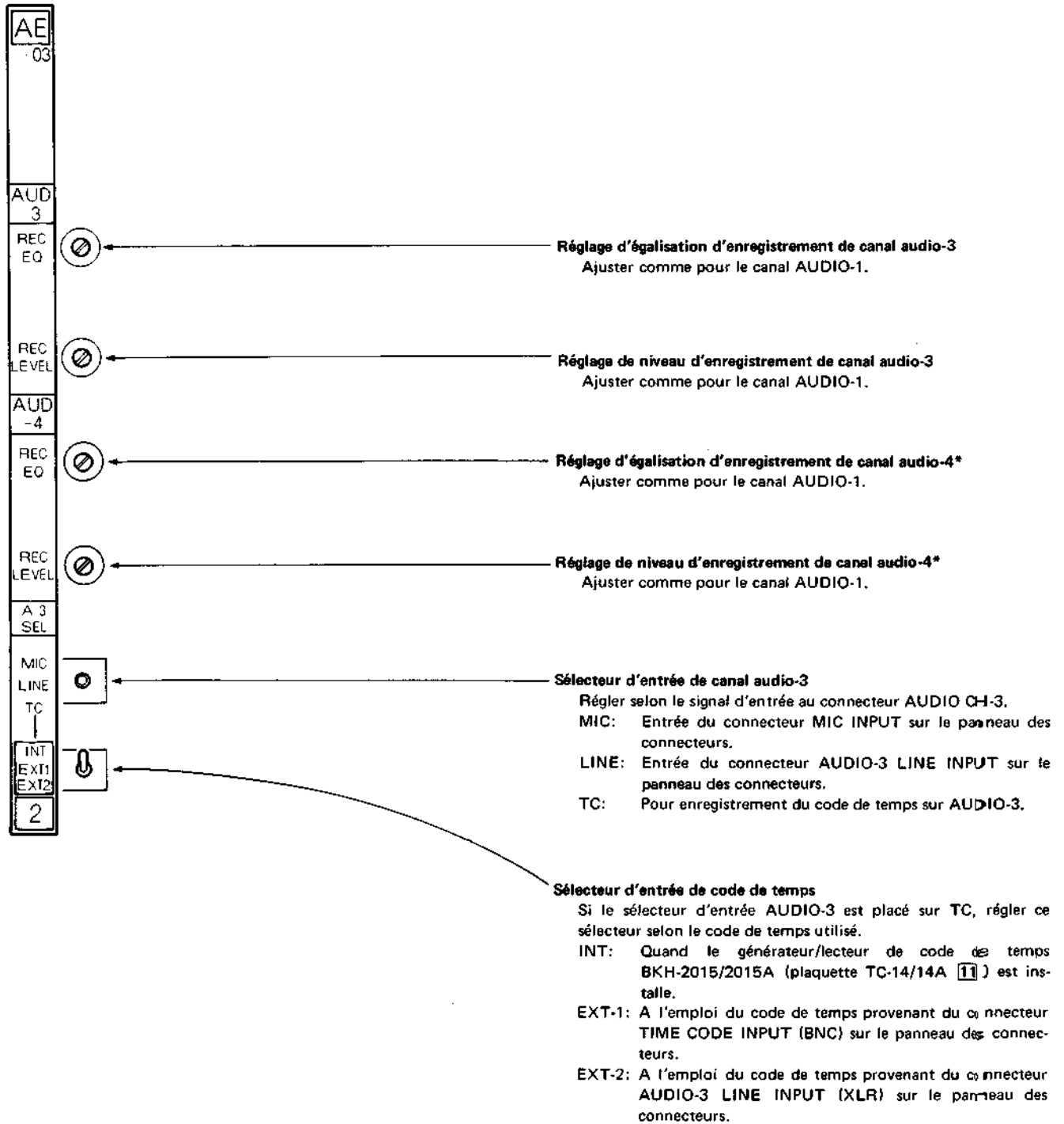
- S'assurer que l'alimentation électrique est coupée.
- Replacer les plaquettes en faisant correspondre leur numéro (de **1** à **18** dans le sens gauche-droite) avec celui qui est inscrit dans le bas du magnétoscope.

Les plaquettes seront endommagées si elles ne sont pas à la place qui leur convient quand l'appareil est remis sous tension.

Plaquette AU-27 **1** (Canaux audio 1/2)



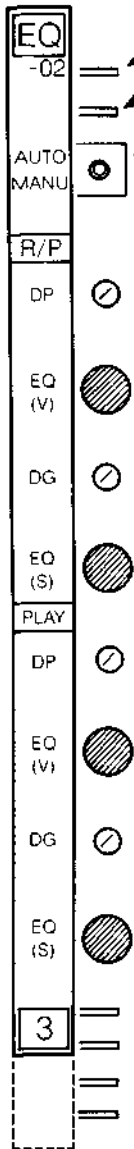
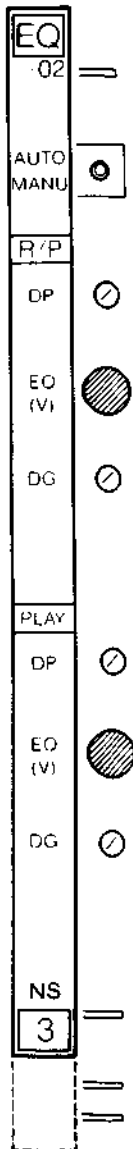
Plaquette AE-03 **2** (Canal audio-3/4)



* Seul le BVH-2000PS(04) est doté de ces résistances variables.

Plaquette EQ-02 **3** (EGALISATEUR)

BVH-2000PS(10)/ (12)/(14)
 BVH-2000PS(00)/ (02)/(04)
 N° de série 10401 et au-delà



Point d'essai (pour observation de forme d'onde)
 TP-1: Forme d'onde de sortie HF de tête vidéo R/P
 TP-2: Forme d'onde de sortie HF de tête de sync R/P

Sélecteur AUTO/MANUAL d'égalisateur vidéo
 Il choisit le mode automatique/manuel du réglage du niveau chromatique du signal VIDEO à la lecture.
 AUTO: Réglage automatique au niveau chromatique pré-réglé par les sélecteurs de cette plaquette.
 MANU: Réglage manuel par les résistances variables d'égalisation, décrites ci-dessous.

Système de tête d'enregistrement/lecture
Réglage DP
 Il ajuste la caractéristique DP du signal vidéo reproduit par la tête vidéo R/P.

Réglage d'égalisation (vidéo)
 Il ajuste le niveau d'égalisation du signal de lecture reproduit par la tête vidéo R/P. Doté d'un bouton.

Réglage DG
 Il ajuste la caractéristique DG du signal vidéo reproduit par la tête vidéo R/P.

Réglage d'égalisation (sync)
 Il ajuste le niveau d'égalisation du signal de lecture reproduit par la tête de synchronisation R/P. Doté d'un bouton.

Système de tête de lecture*
Réglage DP
 Il ajuste la caractéristique DP du signal vidéo reproduit par la tête vidéo PLAY.

Réglage d'égalisation (vidéo)
 Il ajuste le niveau d'égalisation du signal de lecture de la tête vidéo PLAY. Doté d'un bouton.

Réglage DG
 Il ajuste la caractéristique DG du signal vidéo reproduit par la tête vidéo PLAY.

Réglage d'égalisation (sync.)
 Il ajuste le niveau d'égalisation du signal de lecture de la tête de synchronisation PLAY. Doté d'un bouton.

Point d'essai (pour observation de forme d'onde)
 TP-3: Forme d'onde de sortie HF de la tête vidéo PLAY*
 TP-4: Forme d'onde de sortie HF de la tête de sync PLAY*
 TP-5: Forme d'onde HF après commutation VIDEO et SYNC
 TP-6: GND (masse)

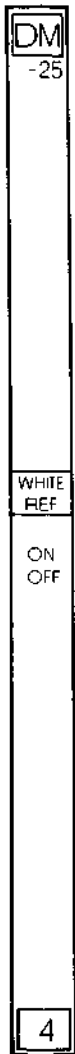
N° de série de 10001 à 10400



Point d'essai (pour observation de forme d'onde)
 TP-1: Forme d'onde de sortie HF de la tête vidéo R/P
 TP-2: Forme d'onde de sortie HF de la tête sync. R/P
 TP-3: Forme d'onde HF après commutation VIDEO et SYNC
 TP-4: Forme d'onde de sortie HF de la tête sync PLAY*
 TP-5: Forme d'onde de sortie HF de la tête vidéo PLAY*

* Ces réglages et points d'essai ne fonctionnent pas sur le BVH-2000PS(00)/(10).

Plaque DM-25 **4** (DEMODULATEUR)

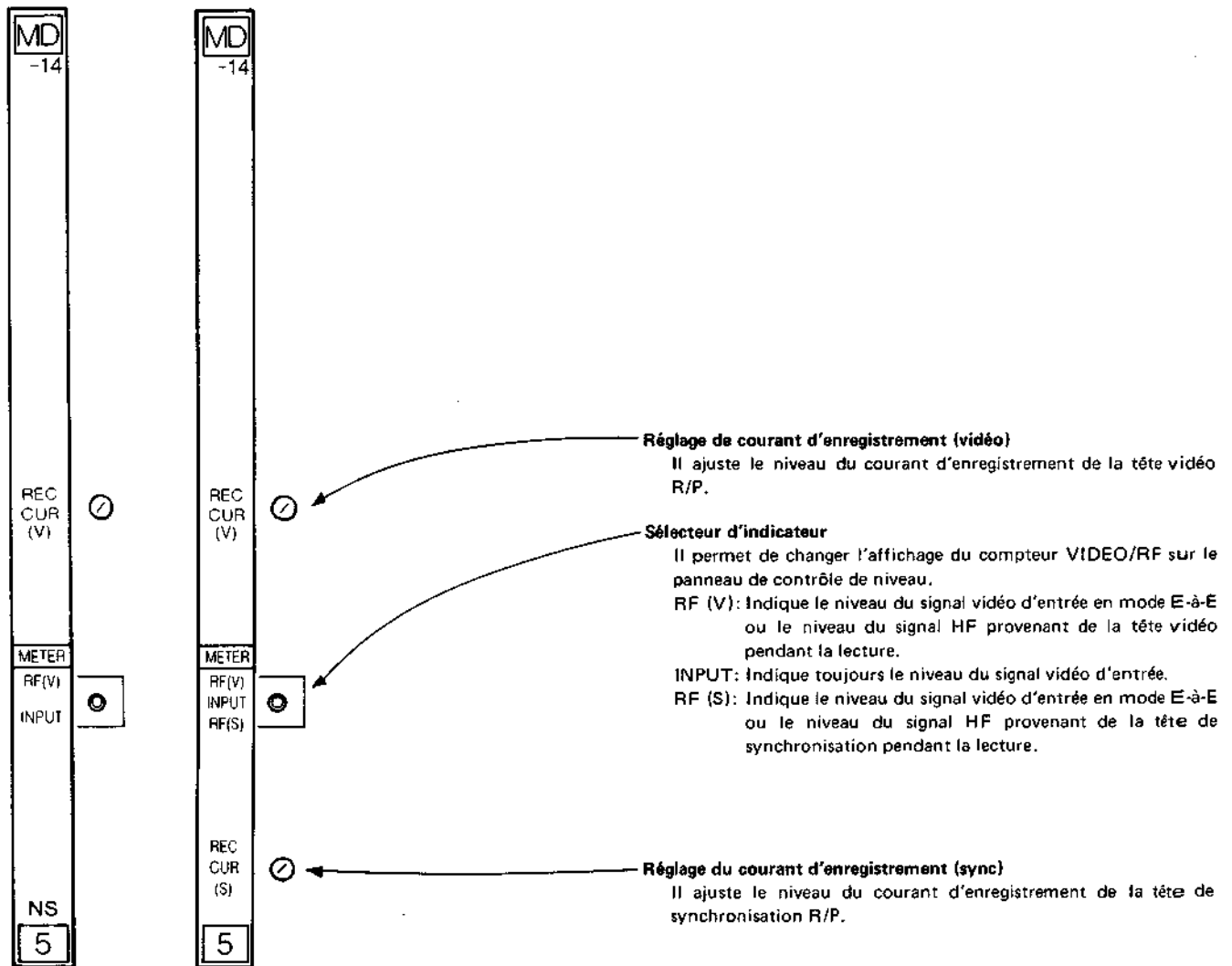


Interrupteur du blanc de référence

- ON: Le signal du blanc de référence est ajouté au signal de sortie demodulateur. Le niveau de deviation peut être ajusté en réglant le niveau de crête du blanc du signal vidéo d'entrée au niveau du signal du blanc de référence.
- OFF: Position normale. Le signal du blanc de référence n'est pas ajouté.

Plaquette MD-14 **5** (MODULATEUR)

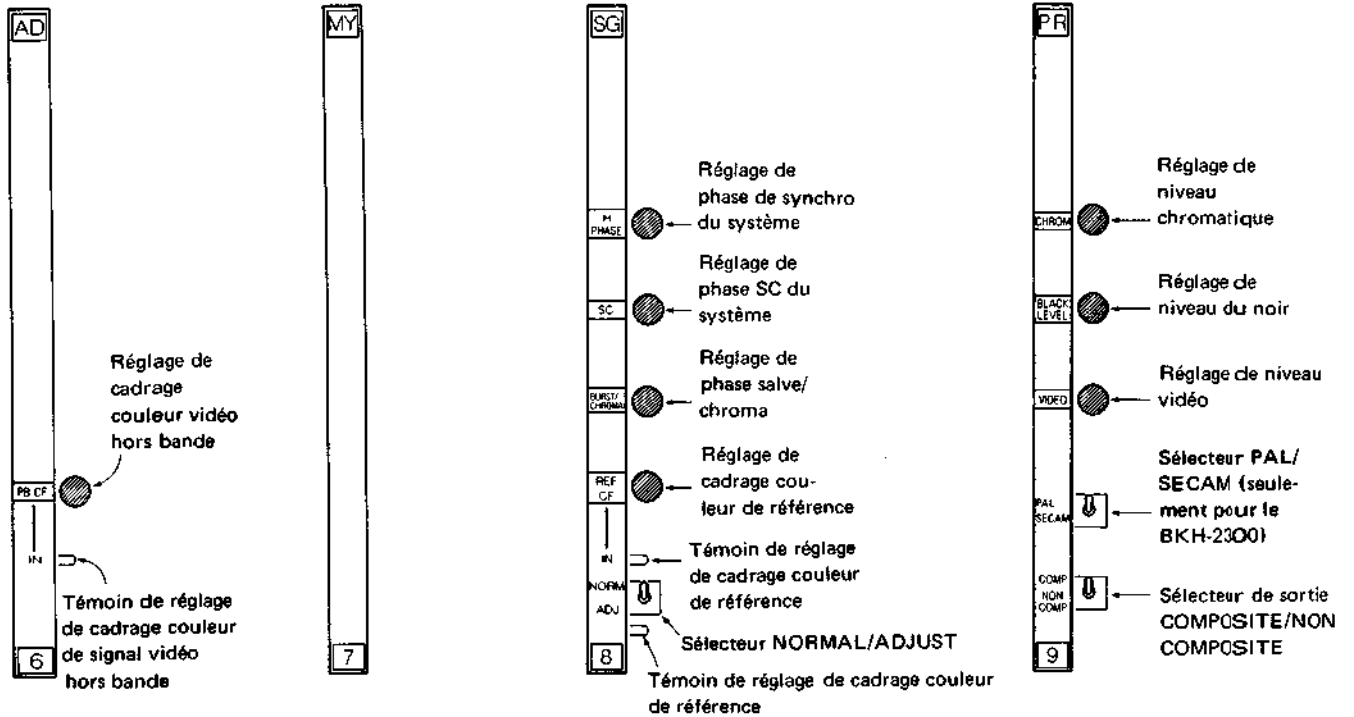
BVH-2000PS(10)/
(12)/(14) BVH-2000PS(00)/
(02)/(04)



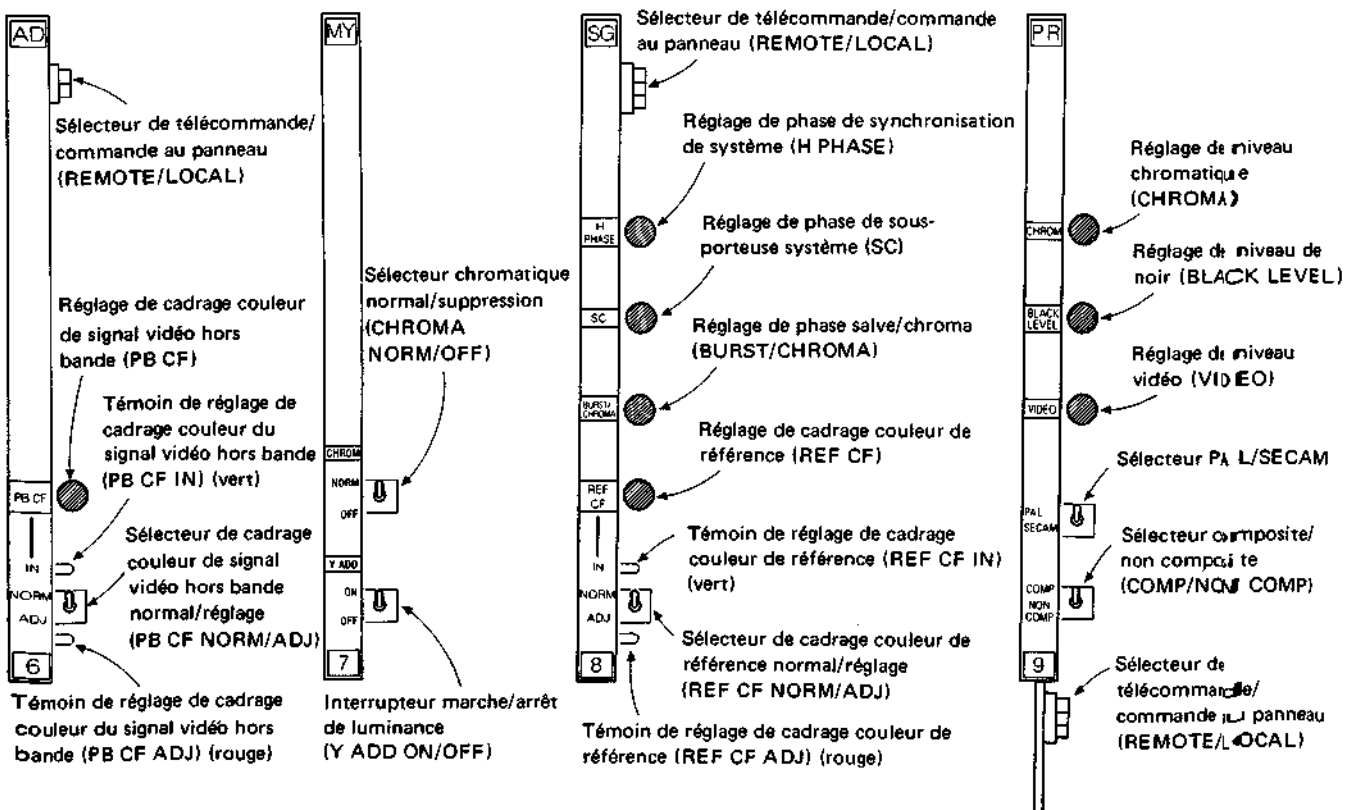
- Plaque AD 6
- Plaque MY 7
- Plaque SG 8
- Plaque PR 9

Plaquettes de CBT enfichable BKH-2200/BKH-2300/BKH-2350 (en option)

BKH-2200/BKH-2300: Pour les détails, prière de se reporter au manuel d'exploitation et d'entretien du CBT enfichable.



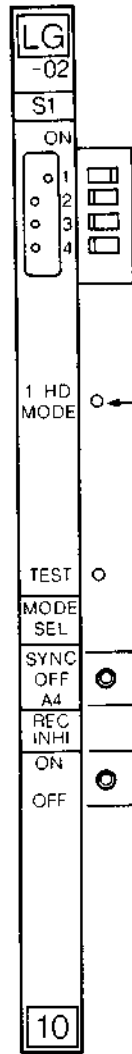
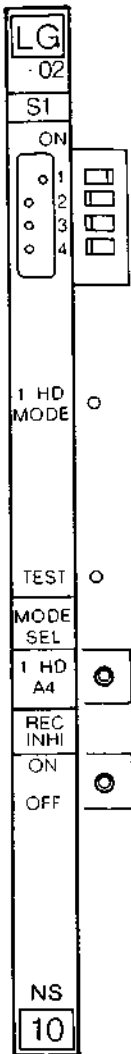
BKH-2350: Pour les détails, prière de se reporter au manuel d'exploitation et d'entretien du CBT enfichable.



Plaquette LG-02 **10** (CIRCUIT LOGIQUE)

BVH-2000PS(10)/
(12)/(14)

BVH-2000PS(00)/
(02)/(04)



S'allume quand le sélecteur MODE SEL est sur OFF ou A4.

Sélecteur de mode

SYNC: Les signaux vidéo et de synchronisation sont enregistrés et reproduits.

OFF/1HD: Le signal vidéo est enregistré et reproduit, mais le signal de synchronisation n'est ni enregistré ni reproduit.

A4: Pour enregistrement et lecture du signal audio-4 (seulement pour le BVH-2000PS(04)/(14)).

Interrupteur d'inhibition d'enregistrement

Il permet l'inhibition des modes d'enregistrement et d'enregistrement à montage.

ON: Le magnétoscope ne se placera pas en mode d'enregistrement, même si la touche REC ou la touche EDIT du panneau de contrôle est enclenchée.

Quand le magnétoscope est contrôlé à distance, la commande d'enregistrement n'est pas acceptée.

OFF: La touche REC/EDIT peut s'employer normalement.

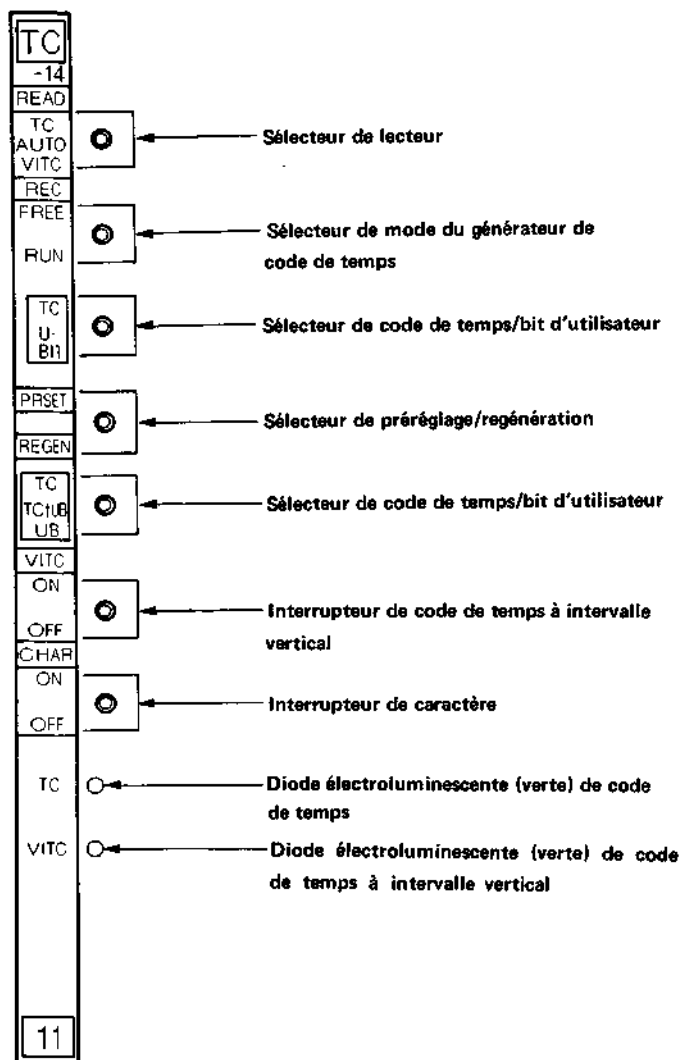
Remarque: L'interrupteur REC INHIBIT fonctionnera de la manière indiquée dans le tableau ci-dessous en fonction du réglage des interrupteurs du panneau frontal et de la plaquette LG-02.

Interrupteur REC INHIBIT		Etat REC INHIBIT
Panneau frontal	Plaquette LG-02	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

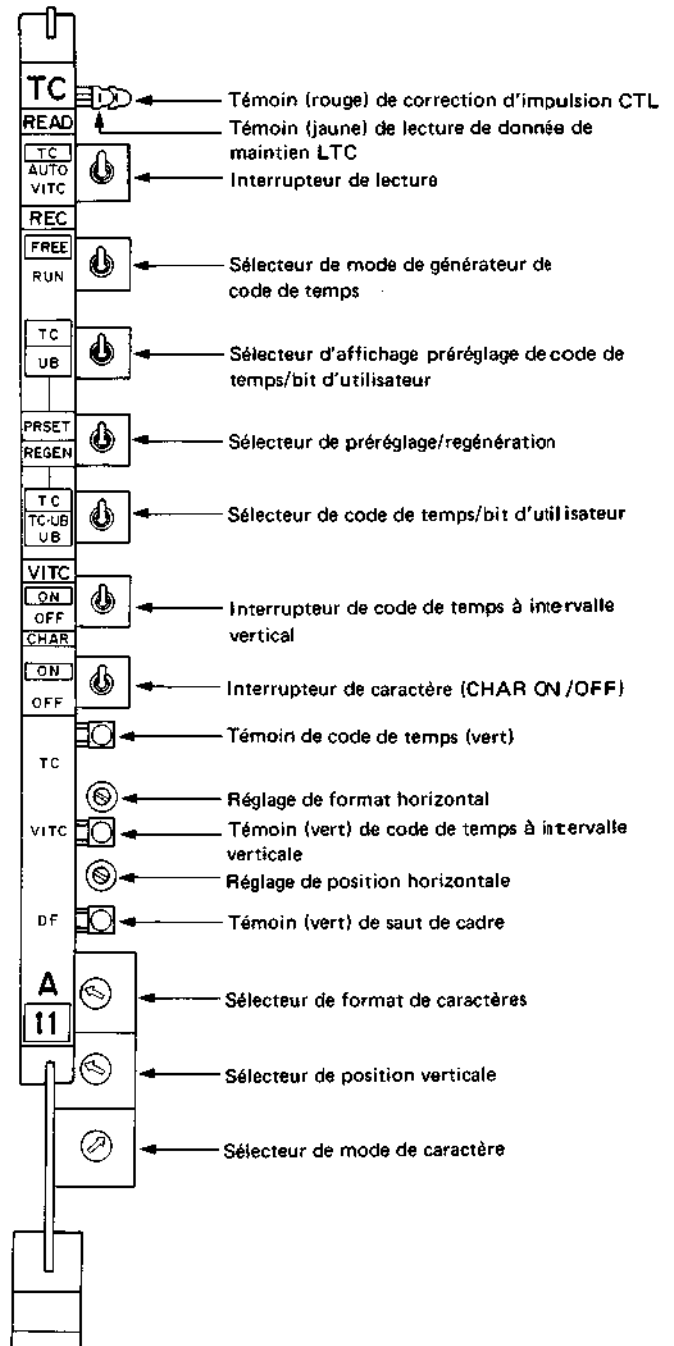
En général, quand l'interrupteur REC INHIBIT du panneau frontal est sollicité, mettre l'interrupteur de la plaquette LG-02 en position OFF ou l'enlever.

Plaquette TC-14/14A **11** (BKH-2015/BKH-2015A en option)

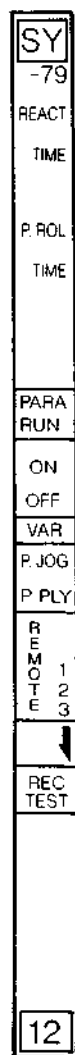
BKH-2015



BKH-2015A



Plaquette SY-79 **12** (UNITE DE TRAITEMENT CENTRALE-1 SYSTEME)



Réglage de durée de réaction

Il permet de programmer la durée de réaction et de compenser ainsi le retard causé par le fonctionnement manuel des touches. Quand les touches ENTRY IN/OUT, etc. sont actionnées, la valeur déterminée par ce réglage est soustraite de la donnée affichée et le résultat de ce calcul est mémorisé comme seuil de montage. Ce réglage rotatif à 16 positions permet de choisir entre 0 et 25 cadres sur une base de 2 cadres.

Réglage de durée de préenroulement

Ce réglage rotatif à 16 positions permet de déterminer, de 0 à 15 secondes sur une base de 1 seconde, la durée du préenroulement en vue du repérage du seuil de montage.

Interrupteur de défilement parallèle

Permet de faire fonctionner deux magnétoscopes en synchronisation.

ON: Les deux témoins s'allument quand les touches CONTROL P/R du panneau de contrôle sont enclenchées pour faire fonctionner les magnétoscopes dans ce mode.

OFF: Position normale. Un des deux témoins CONTROL P/R s'allume. Selon l'allumage du témoin "P" ou "R", c'est le lecteur ou l'enregistreur qui fonctionne. Choisir cette position quand un seul magnétoscope est en service.

Sélecteur de variation

Il commande les fonctions de la touche VAR du panneau de contrôle.

P.JOG: Fonction d'impulsion programmée (Lecture à vitesse variable entre -1 et +3 fois la normale.)

P.PLY: Fonction de lecture programmée. (Lecture à vitesse variable entre -20% et +20% de la normale.)

Sélecteur de télécommande

Choisir la position correspondant aux branchements sur les connecteurs REMOTE-1/2/3 du panneau des connecteurs.

1: A l'emploi du connecteur REMOTE-1.

2: A l'emploi du connecteur REMOTE-2.

3: A l'emploi du connecteur REMOTE-3.

Sur le panneau de contrôle de niveau, le témoin REMOTE-1/2/3 correspondant à la position de ce sélecteur s'allume.

Réglage d'essai d'enregistrement (sur les BVH-2000PS(00) et (10) seulement)

Appuyer dans le sens de la flèche et le magnétoscope entre en mode d'attente pour essai d'enregistrement (REC TEST).

Diode électroluminescente. Pour le personnel de service.

Réglage du niveau du courant d'enregistrement sur le BVH-2000PS(00)/(10)

1. Mettre le magnétoscope en mode d'arrêt (STOP).
2. Régler le sélecteur REMOTE/LOCAL sur LOCAL.
3. Régler sur OFF l'interrupteur REC INHIBIT.
4. Appuyer sur le réglage REC TEST de la plaquette SY-79 dans le sens de sa flèche. Le message "REC TEST" apparaît sur l'affichage et le témoin REC INHIBIT clignote.
5. Appuyer sur la touche REC, ce qui fait clignoter le témoin REC: le BVH-2000PS(00)/(10) répète l'enregistrement et la lecture tandis que le témoin REC INHIBIT s'éteint.

6. Régler le niveau du courant d'enregistrement.

Réglage de la tête vidéo

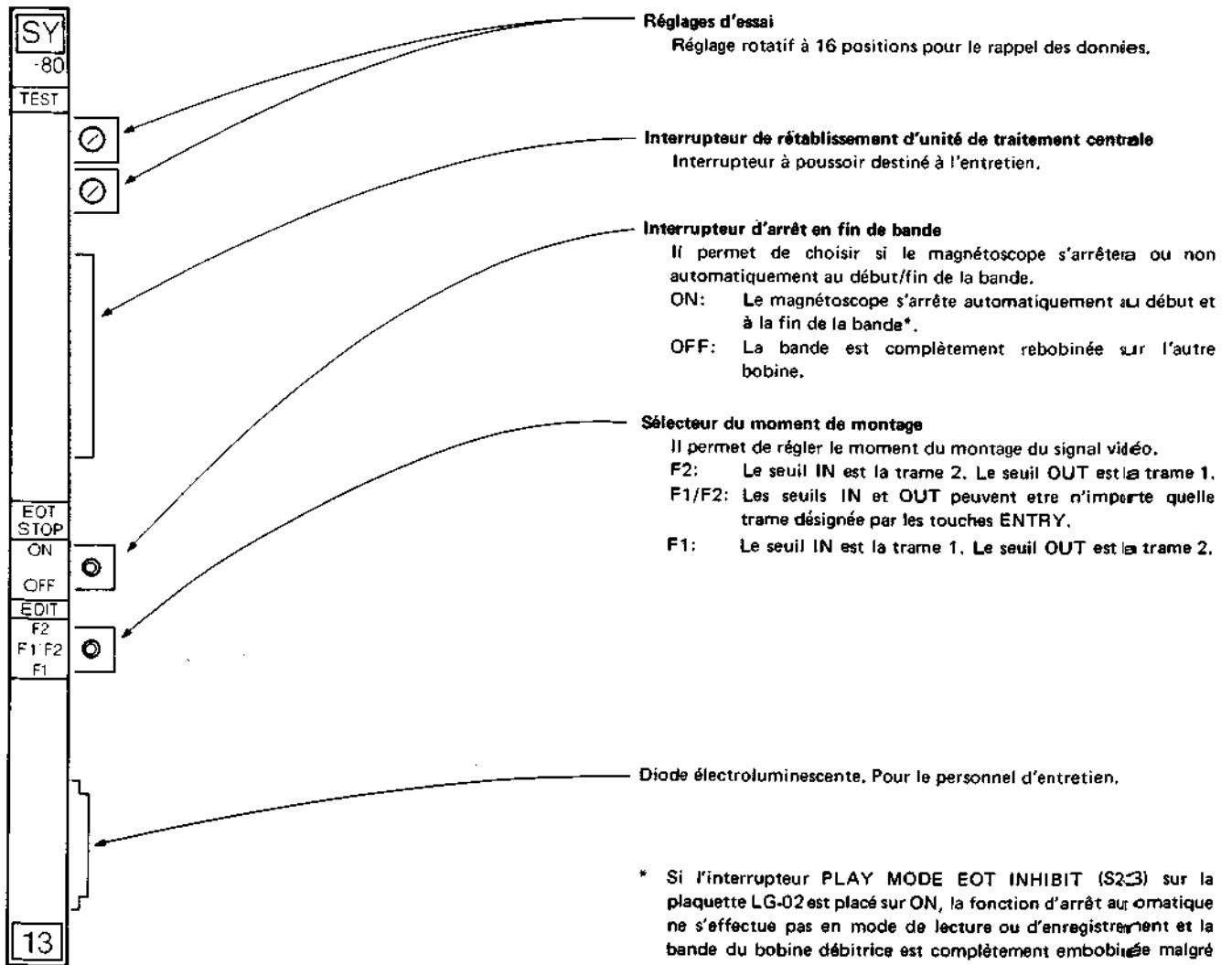
Régler le sélecteur METER de la plaquette MD-14 sur RF(V) et tourner la résistance variable REC CUR (V) de sorte que l'aiguille de l'indicateur VIDEO/RF dévie jusqu'au point où l'indication devient juste maximale.

Réglage de la tête de synchronisation (pour les BVH-2000PS(00), (02) et (04) uniquement)

Régler le sélecteur METER de la plaquette MD-14 sur RF(S) et tourner la résistance variable REC CUR (S) de sorte que l'aiguille de l'indicateur VIDEO/RF dévie jusqu'au point où l'indication devient juste maximale.

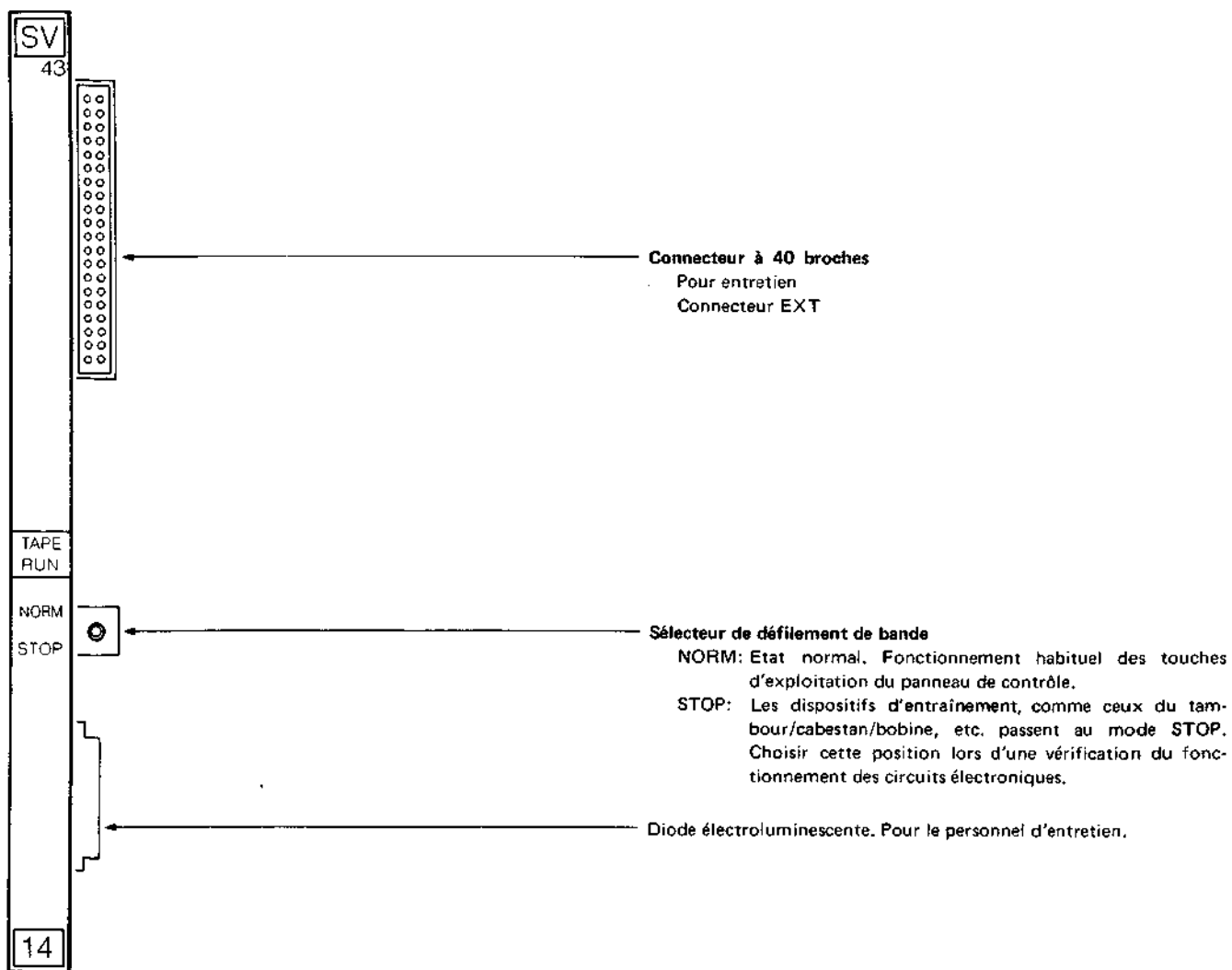
7. Quand ce réglage est terminé, appuyer sur la touche REC et le BVH-2000PS(00)/(10) se place en mode image fixe (STILL). Si la touche STOP est actionnée, le magnétoscope se place en mode d'arrêt (STOP).
- Pour que le réglage soit possible, les explications des points 1 à 5 doivent être parfaitement respectées.
 - Si le mode REC TEST se prolonge pendant plus de 3 minutes, le magnétoscope passe automatiquement au mode d'arrêt (STOP).
 - Le message "REC TEST" apparaît sur le Bloc 3 du panneau de contrôle de Type II ou sur le Bloc 5 du panneau de Type III. Si un message d'erreur est affiché sur le Bloc 3 du panneau de Type II, l'indication "REC TEST" n'apparaît pas.
 - Lorsque le réglage a été arrêté par une poussée sur la touche REC, le magnétoscope entre à nouveau en mode REC TEST par une poussée sur la touche REC. Par conséquent, les modes REC TEST et STILL sont répétés par poussée sur la touche REC.
 - Si une des conditions des points 1 à 5 est annulée au cours du réglage, celui-ci s'arrête automatiquement.

Plaquette SY-80 **13** (UNITE DE TRAITEMENT CENTRALE-2 SYSTEME)



* Si l'interrupteur PLAY MODE EOT INHIBIT (S23) sur la plaquette LG-02 est placé sur ON, la fonction d'arrêt automatique ne s'effectue pas en mode de lecture ou d'enregistrement et la bande du bobine débitrice est complètement embobinée malgré que l'interrupteur d'arrêt en fin de bande soit placé sur ON.

Plaque SV-43 **14** (UNITE DE TRAITEMENT CENTRALE-ASSERVISSEMENT)



Plaquette RL-12 **15** (ASSERVISSEMENT BOBINE)



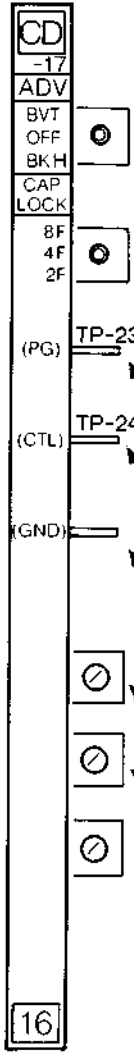
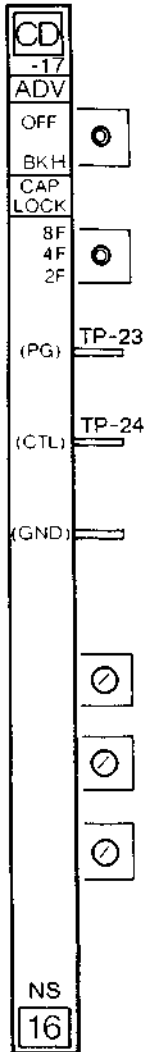
- Réglage de distorsion en parallélogramme**
 Quand le sélecteur SKEW (voir ci-dessous) est réglé sur MANU, le retard provoqué par la commutation de la tête vidéo pendant la lecture peut être compensé par cette résistance variable, dotée d'un bouton.
- Sélecteur de correction de distorsion en parallélogramme**
 MANU: Le réglage SKEW (voir ci-dessus) peut servir pour un ajustement manuel.
 AUTO: Le circuit de réglage entre en service à la lecture et le retard provoqué par la commutation des têtes vidéo est automatiquement compensé. Ajustement automatique.
- Diodes électroluminescentes d'erreur (8)**
 Normalement, elles s'allument dans les situations suivantes:

D7(SYS):	ERREUR INTERFACE SYSCON	} Rouge (anomalie)
D6(DR):	ERREUR AU TAMBOUR	
D5(TTP):	ERREUR DU TANSPOUR DE BANDE	
D4(SV):	ERREUR DU SYSTEME	
D3(MODE):	PRET POUR LE MODE	} Verte (normal)
D2(CF):	CADRAGE COULEUR REF DETERM.	
D1(DR):	VERROUILLAGE TAMBOUR	
D0(CAP):	VERROUILLAGE CABESTAN	

Plaquette CD-17 **16** (CABESTAN et TAMBOUR)

BVH-2000PS(10)/
(12)/(14)

BVH-2000PS(00)/
(02)/(04)



Sélecteur d'avance

Il fixe la valeur d'avance de synchro requise pour la lecture.

La permutation selon le CBT utilisé est la suivante:

BVT: A l'emploi du BVT-2000P/2000S (CBT externe). La valeur avancée est définie à l'aide du réglage rotatif à 16 positions de cette plaquette. Amener le réglage sur 12H pour des appareils à alignement dynamique et sur 4H pour ceux qui ne l'ont pas.

OFF: Synchronisation du signal de lecture et du signal de référence.

BKH: Quand le CBT enfichable (en option) (plaquettes **6** à **9**) est installé. La phase du tambour est automatiquement ajustée.

Sélecteur de verrouillage du cabestan

Il détermine la phase de verrouillage asservi du cabestan pour le signal de référence à la lecture.

8F: Verrouillé au mode de cadrage couleur (8 trames)*

4F: Verrouillé par unité de 4 trames

2F: Verrouillé par unité de 2 trames

Point d'essai (pour observation de forme d'onde)

PG: Sortie du signal PG du tambour

CTL: Sortie du signal CTL

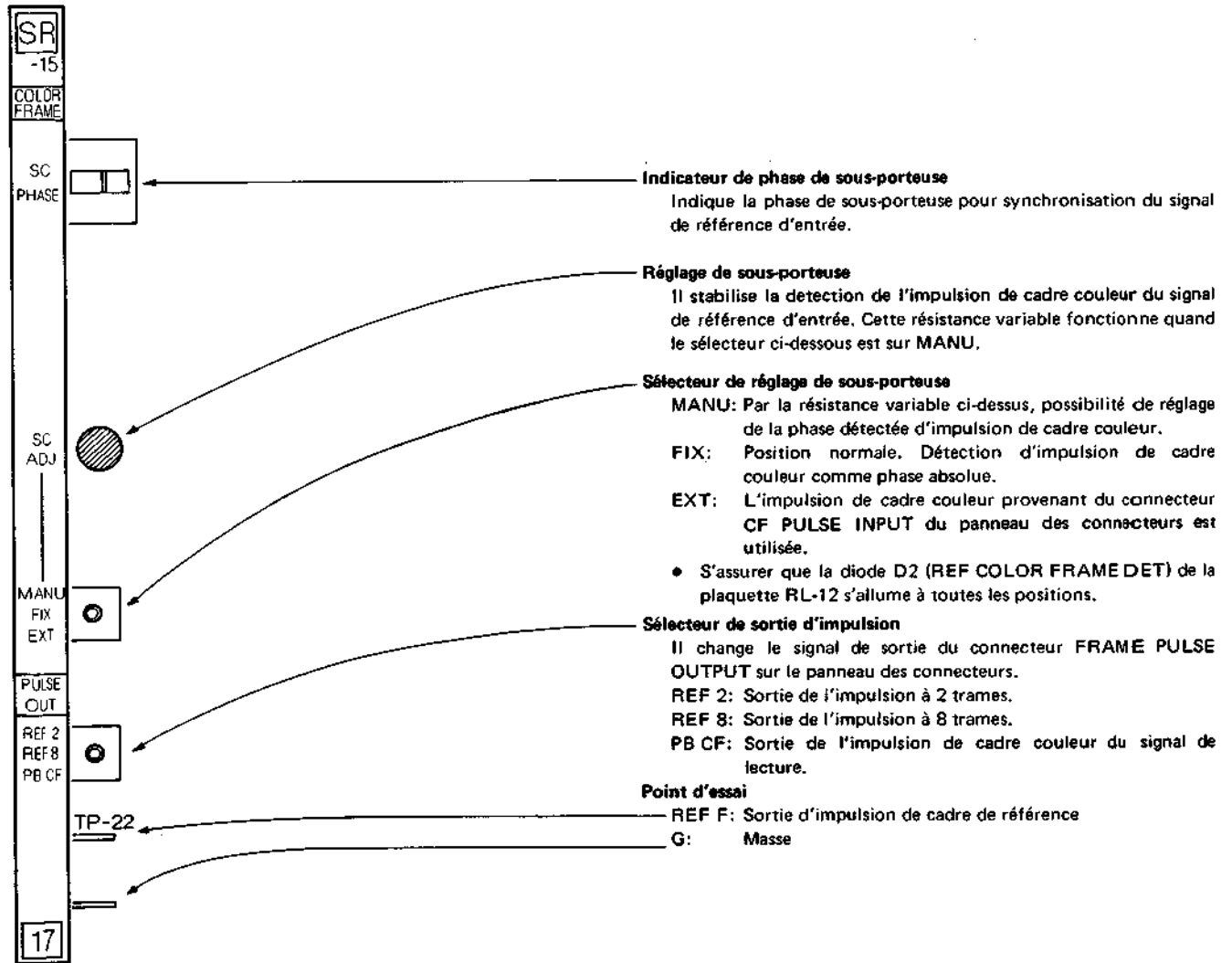
GND: Masse

Réglages de mode d'essai

Trois réglages rotatifs à 16 positions destinés aux essais.

* Le signal SECAM est verrouillé par unité de 4 trames, même si le sélecteur est réglé sur 8F.

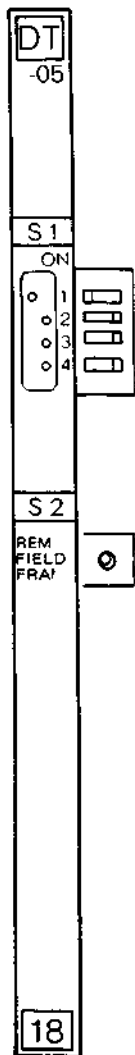
Plaquette SR-15 **17** (REF. ASSERVISSEMENT)



1. FONCTIONNEMENT

Plaque DT-05 **18** (Uniquement BVH-2000PS(02)/(12) et BVH-2000PS(04)/(14))

N° de série 10701 et au-delà



Sélecteur de lecture à alignement dynamique (S2)

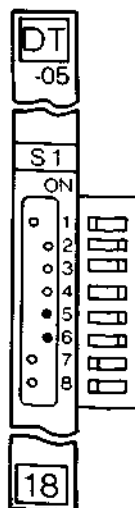
REM: Le choix entre le mode d'impulsion de trame et celui d'impulsion de cadre est télécommandé.

FIELD: Mode d'impulsion de trame

FRAME: Mode d'impulsion de cadre

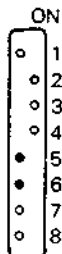
(En mode d'impulsion cadre, une lecture à alignement dynamique avec maintien d'entrelacement est possible entre l'image fixe et 2 fois la vitesse normale.)

N° de série de 10001 à 10699

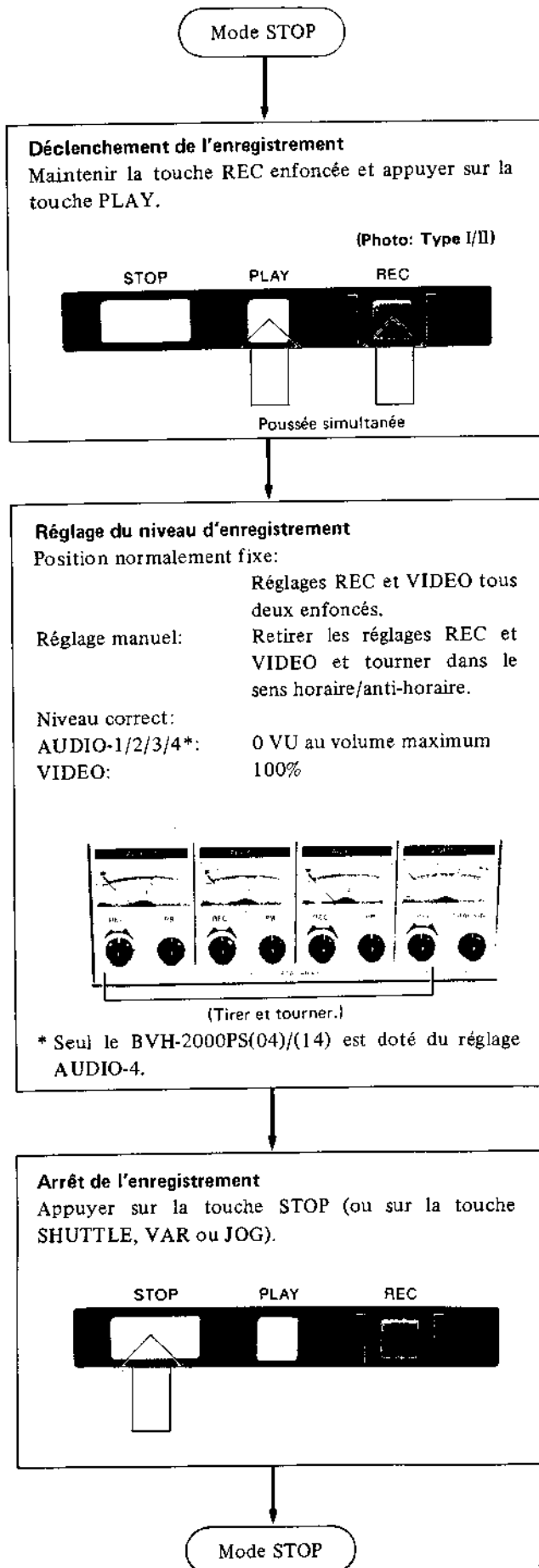


Pour une lecture à alignement dynamique avec maintien d'entrelacement, changer la position des réglages N° 5 et N° 6 du S1. (Cette lecture est effective entre l'image fixe et 2 fois la vitesse normale.)

Mode d'impulsion de cadre



1-8. ENREGISTREMENT



Remarques

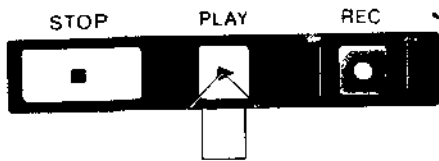
- Les témoins suivants s'allument: STANDBY, REC, PLAY et CF LOCK (quand le cadrage couleur est verrouillé)
 (Note) L'enregistrement est impossible quand le témoin REC INHIBIT est allumé. Placer sur OFF l'interrupteur REC INHIBIT.
- Moniteur vidéo
 L'image peut être surveillée en réglant comme il convient la touche PICTURE MONITOR et le sélecteur TAPE/EE.
- Moniteur audio
 Le son peut être surveillé en réglant comme il convient la touche AUDIO MONITOR et le sélecteur TAPE/EE.

1-9. LECTURE

1-9-1. Lecture à vitesse normale

Mode STOP

Déclenchement de la lecture:
Appuyer sur la touche PLAY.



Remarques

Les témoins suivants sont allumés: STANDBY, PLAY et CF LOCK (quand le cadrage couleur est verrouillé).

Réglage

Niveau de lecture:

Tirer sur le réglage PB et le tourner dans le sens horaire/anti-horaire. (Normalement, ce réglage PB est laissé à sa position fixe, c.à.d. repoussée.) Tirer et tourner le réglage de niveau AUDIO LINE OUT du BVH-2000PS(00)/(10) ou du BVH-2000PS(02)/(12) et ajuster simultanément AUDIO-1 et 2.

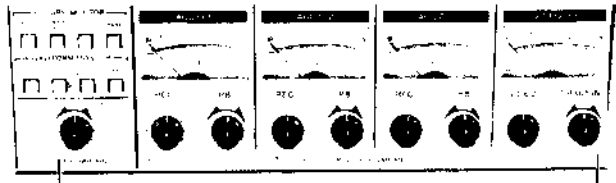
Alignement:

Tirer sur le réglage TRACKING et le tourner dans le sens horaire/anti-horaire. (Normalement, le réglage TRACKING est laissé à sa position fixe, enfoncée.)

Niveau correct:

AUDIO-1/2/3/4*: 0 VU au volume maximum.

TRACKING: L'aiguille a tendance à dévier vers la droite, mais pas nécessairement jusqu'à l'extrême-droite.



(Tirer et tourner.)

* Seul le BVH-2000PS(04)/(14) est doté du réglage AUDIO-4.

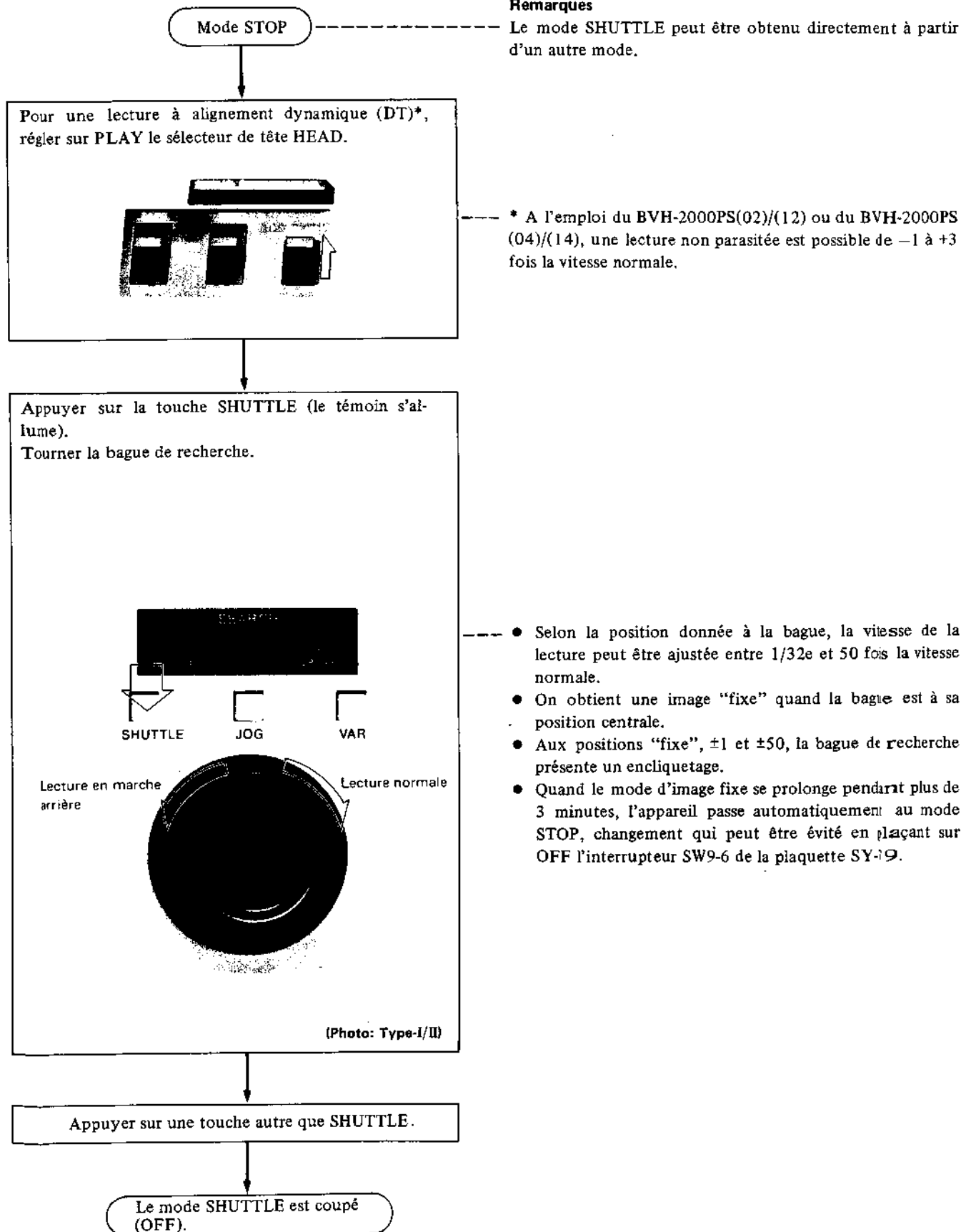
Arrêt de la lecture

Appuyer sur la touche STOP (ou sur la touche SHUTTLE, VAR ou JOG).

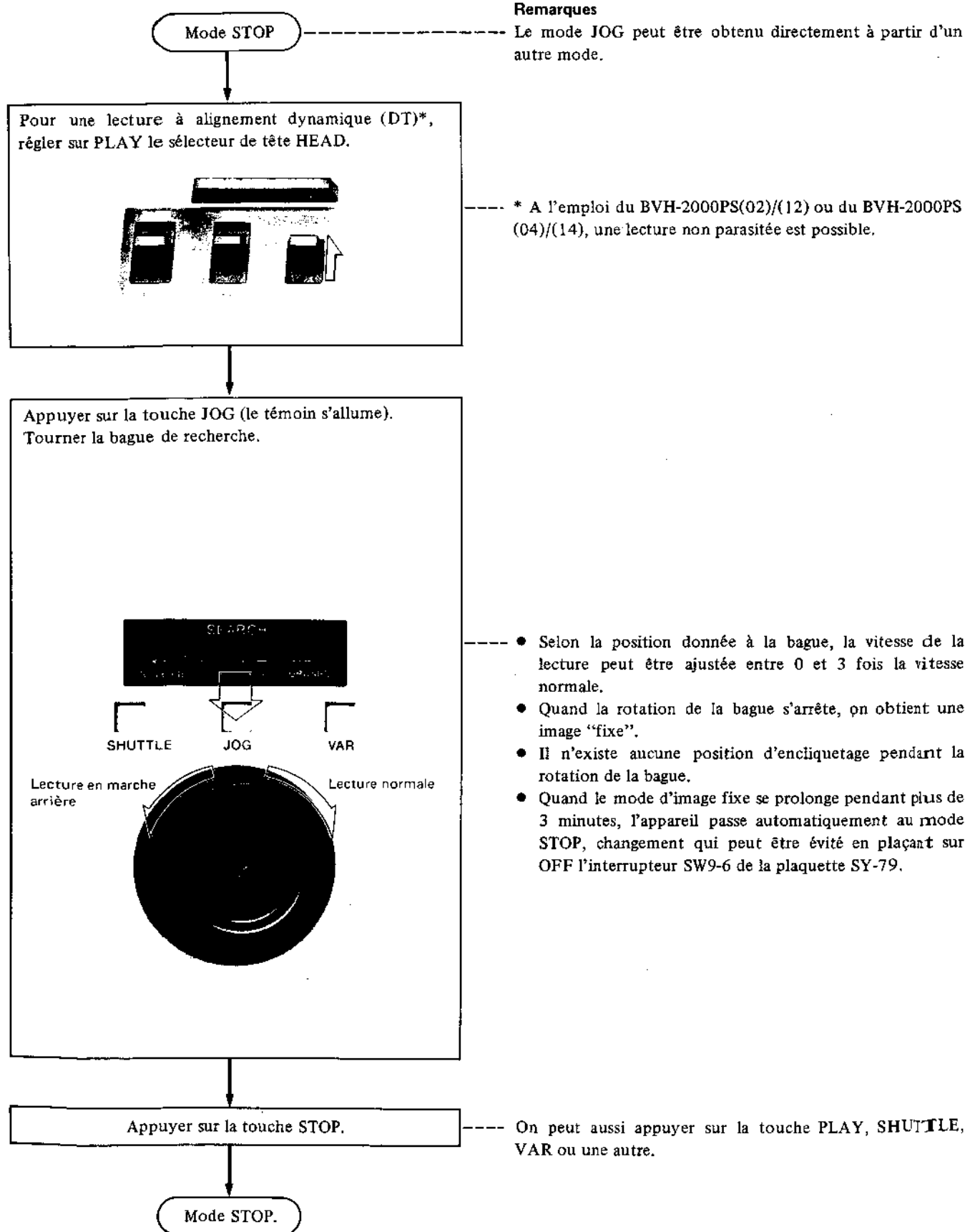


Mode STOP

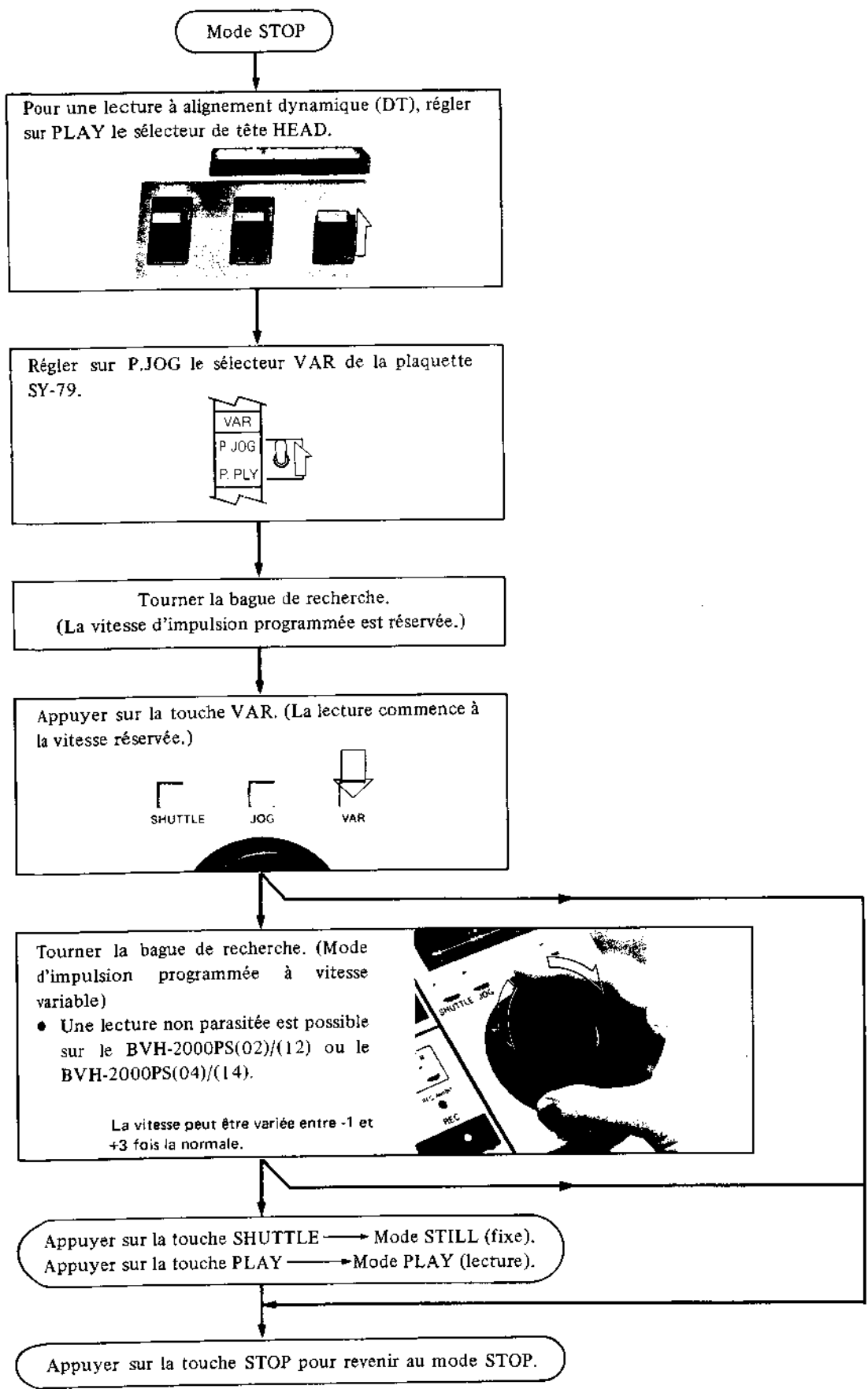
1-9.2. Lecture en mode navette (SHUTTLE)



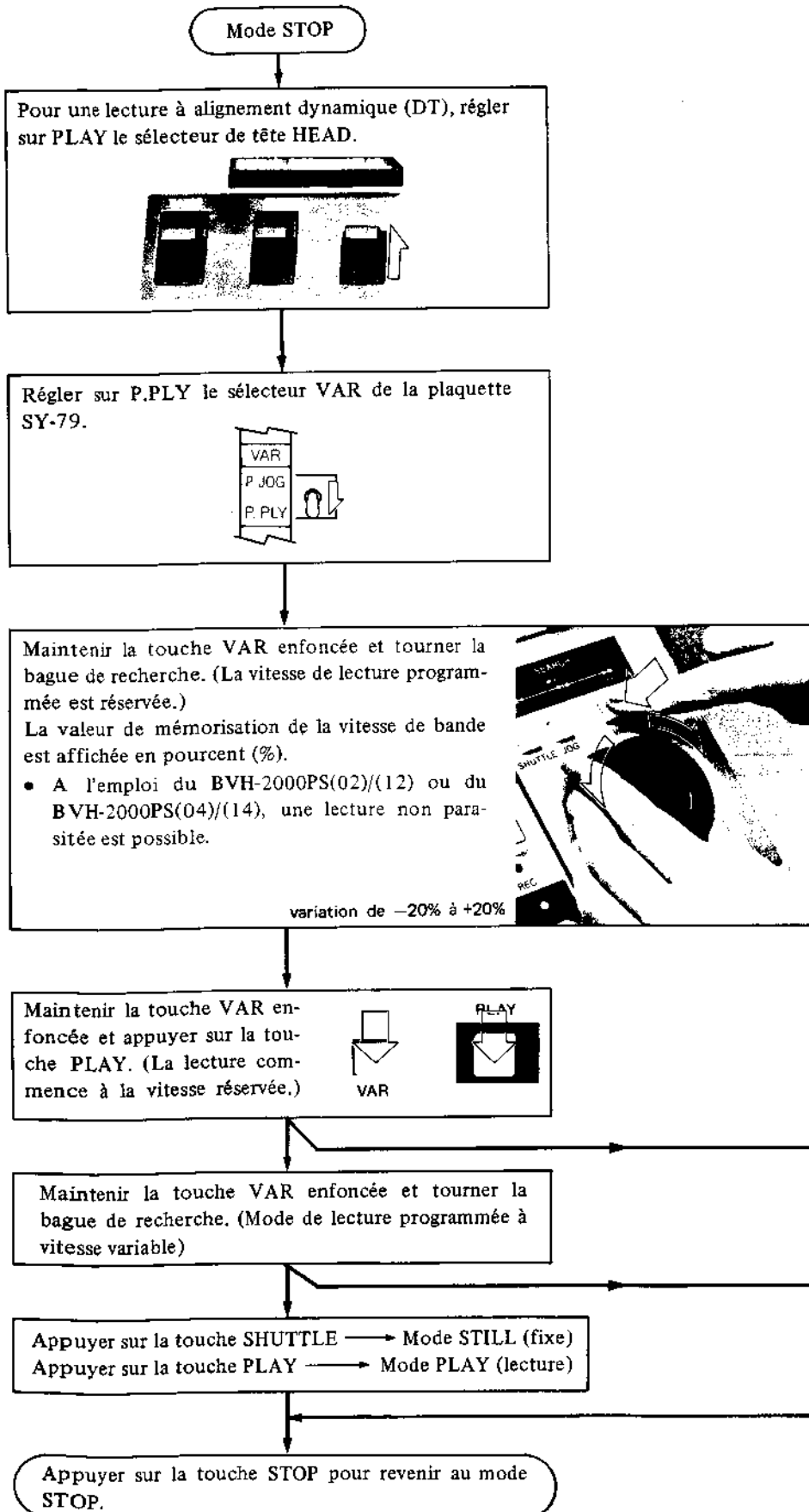
1-9-3. Lecture en mode impulsion (JOG)



1-9.4. Impulsion programmée

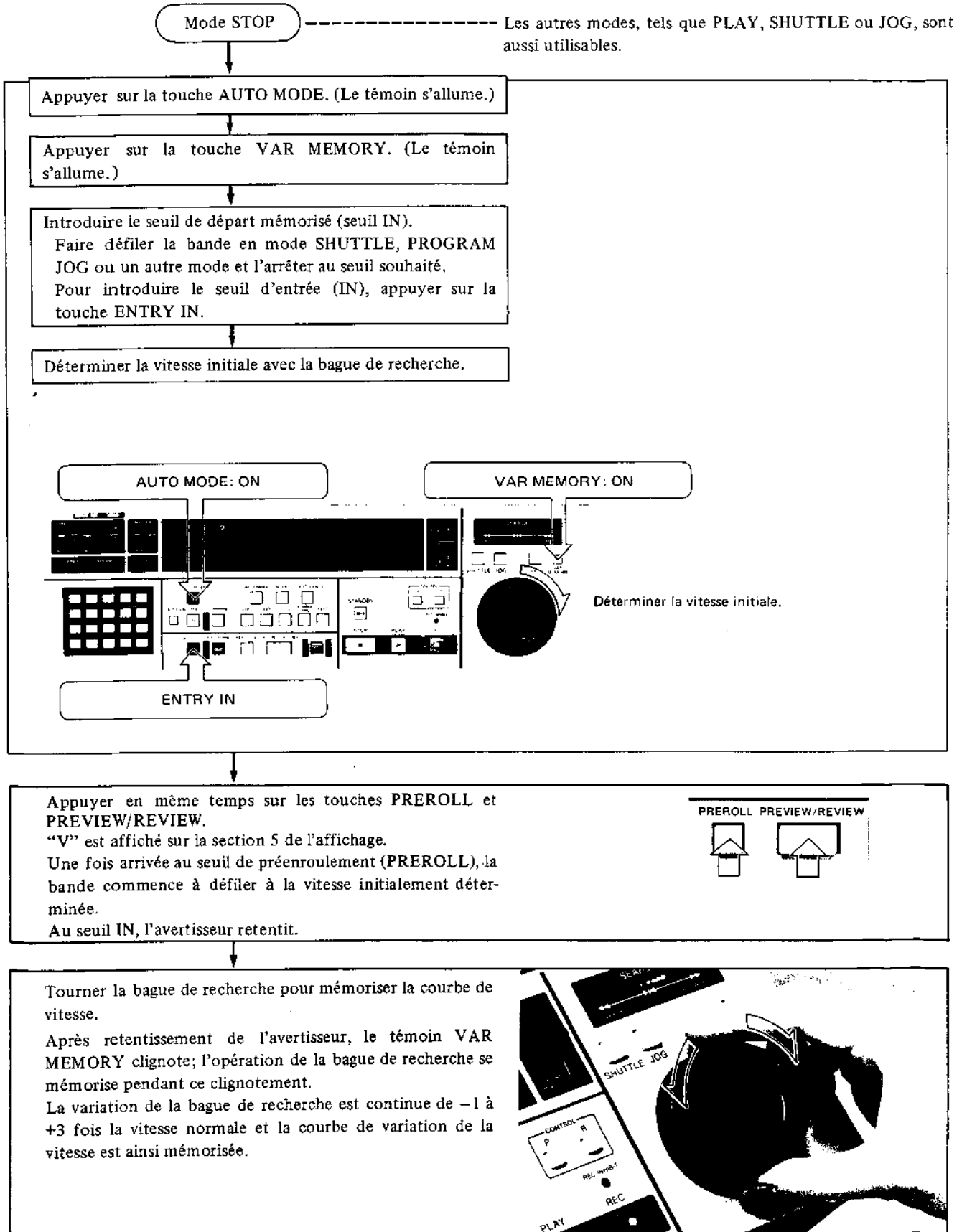


1-9-5. Lecture programmée



1-9-6. Mémoire variable (Type-III seulement)

- Une lecture non parasitée est possible sur le BVH-2000PS(02)/(12) ou sur le BVH-2000PS(04)/(14).



Appuyer sur la touche STOP pour arrêter l'opération mémorisée.

Appuyer sur la touche de prévisionnement (PREVIEW). (La lecture s'accomplira selon la courbe qui a été mémorisée.)



1. La bande défile jusqu'au seuil de préenroulement [(Seuil IN) moins (Durée de préenroulement en secondes) multiplié par (Vitesse initiale)].
 2. Après le défilement du préenroulement, la bande commence à défiler à la vitesse initialement déterminée.
 3. Lorsque la bande passe au seuil IN, l'avertisseur retentit et l'affichage commence à clignoter. A ce moment, la lecture de la bande s'accomplit en conformité à la courbe qui a été mémorisée.
 4. Lorsque la bande est arrivée à la fin de la mémorisation, l'affichage s'éteint et l'appareil revient au mode d'impulsion programmée (PROGRAM JOG) normal.
- Pour recommencer la lecture de cette section, appuyer sur la touche PREVIEW.

Mode d'attente pour la lecture à vitesse variable mémorisée

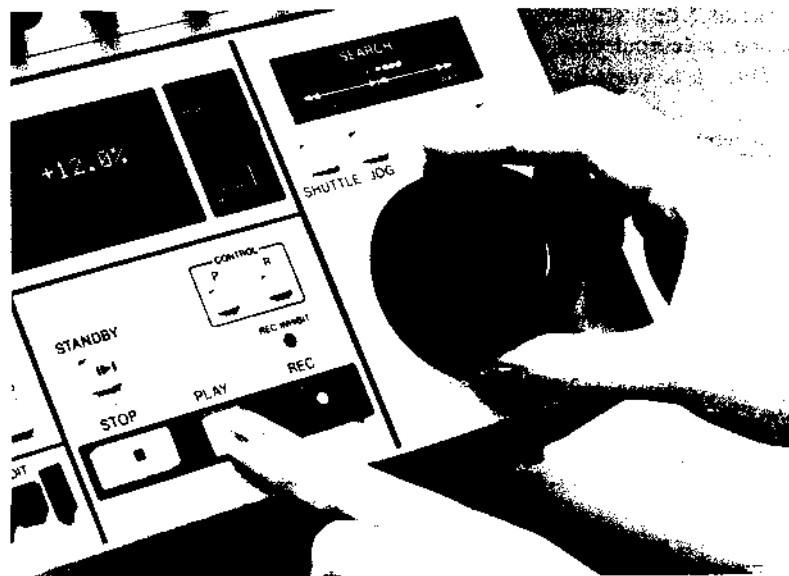
Quand seule la touche PREROLL est enfoncée, la bande défile jusqu'au seuil de préenroulement et s'arrête (mode d'attente pour la lecture à vitesse variable mémorisée). Pour commencer la lecture à l'heure exacte, enfoncer la touche PREVIEW/REVIEW en tenant compte du temps de préenroulement. La lecture s'accomplit en conformité à la courbe qui a été mémorisée.

1-9-7. Priorité au cabestan

Pour synchroniser la lecture avec celle d'un autre magnéto-scope, maintenir la touche PLAY enfoncée et tourner la bague de recherche pendant la lecture. Un réglage est possible dans une plage de $\pm 15\%$ de la vitesse normale.

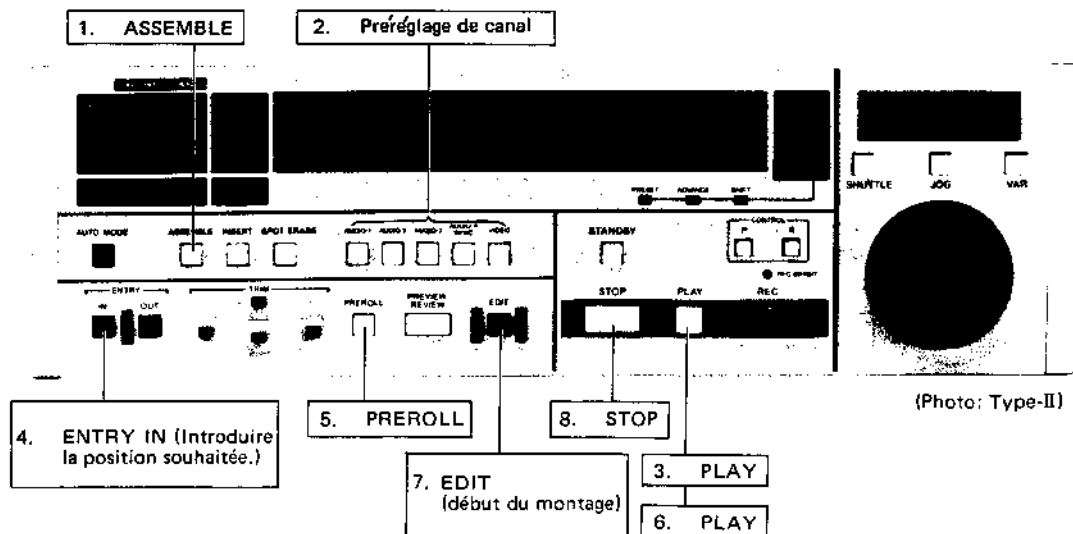
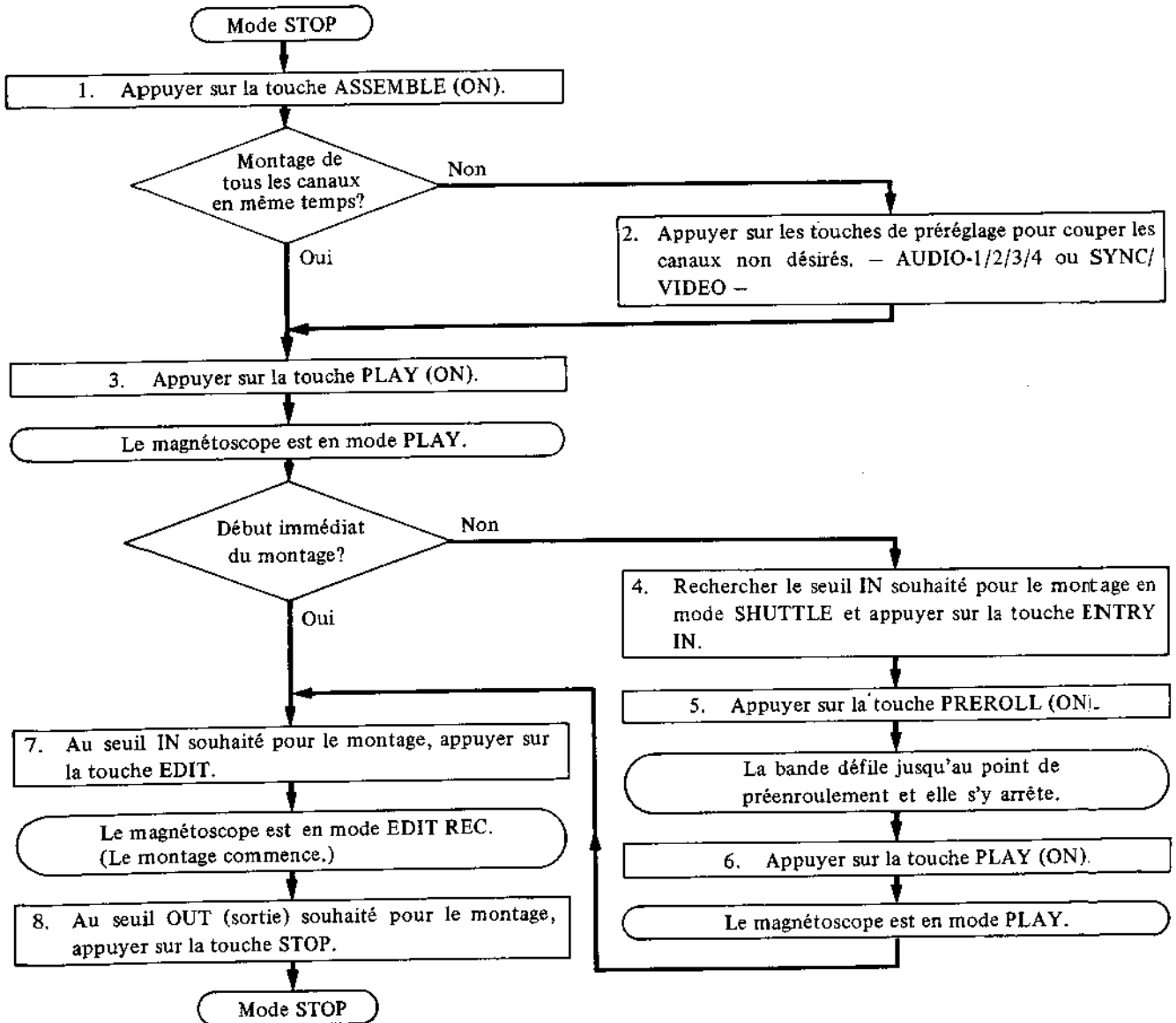
Pendant cette opération, la vitesse de la bande est indiquée en pourcent (%) sur l'affichage (Type-II/III).

Dès que la touche PLAY est relâchée, la vitesse revient à la vitesse de lecture normale (x1).

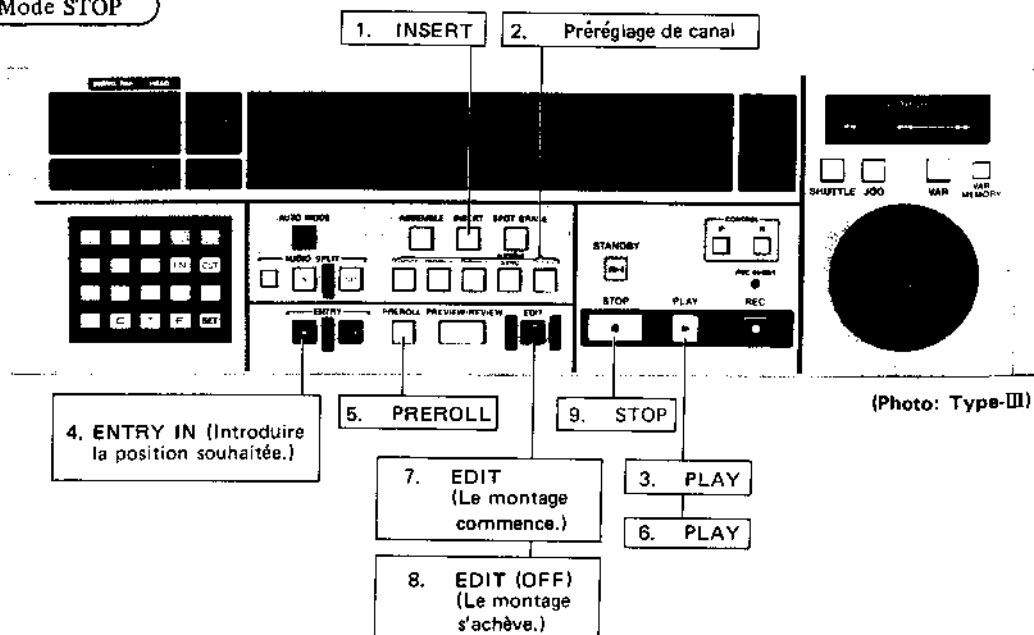
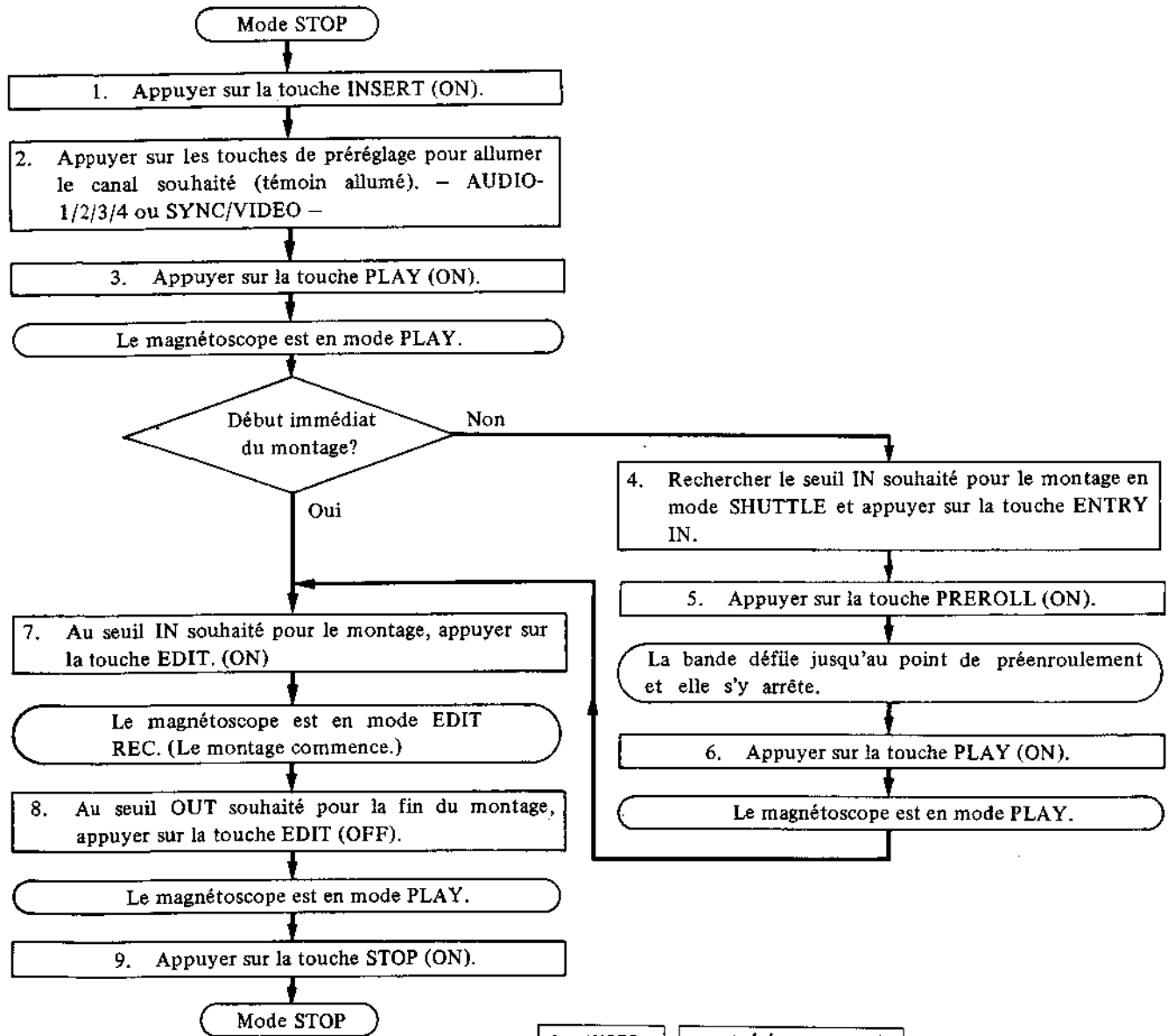


1-10. MONTAGE MANUEL

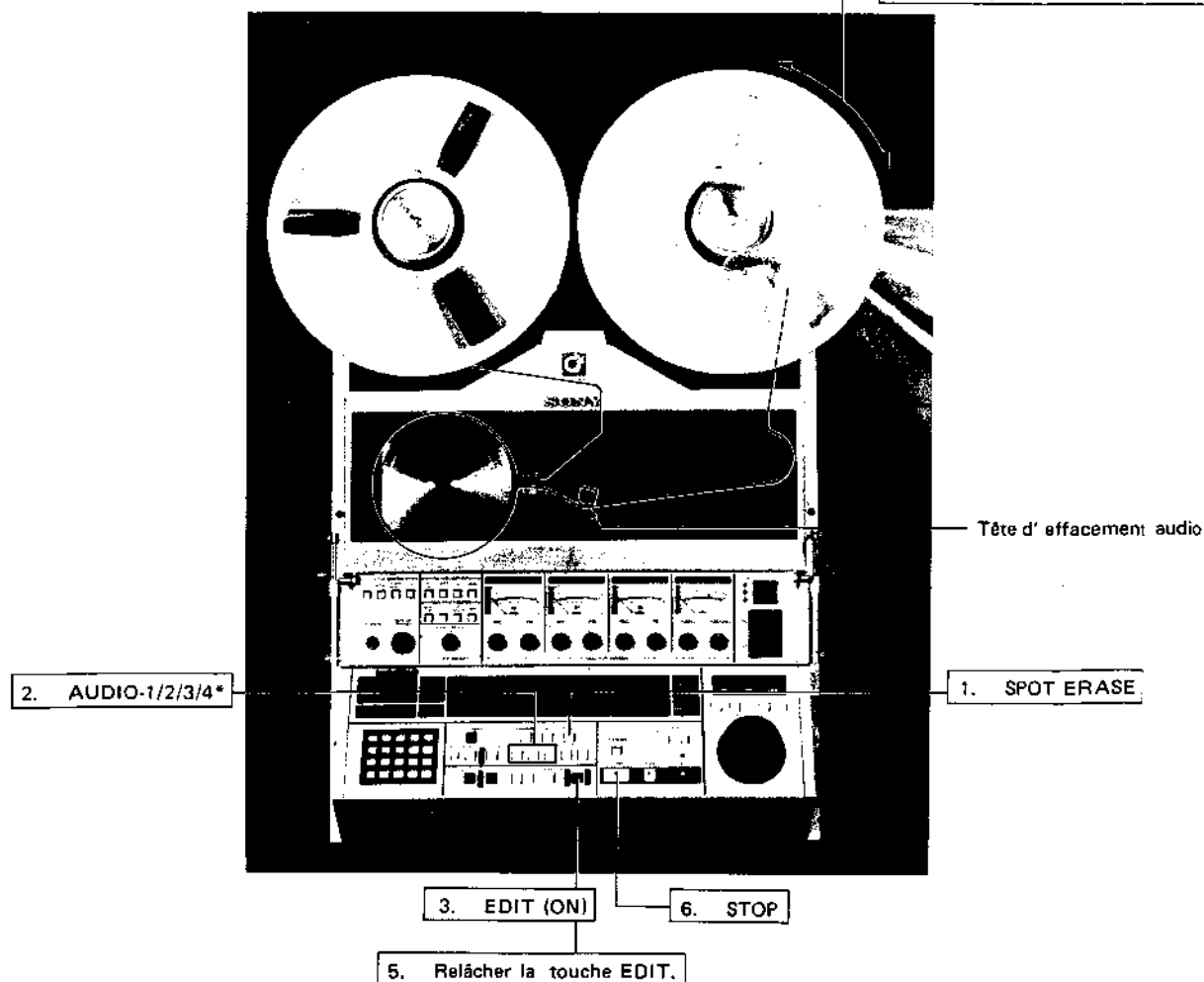
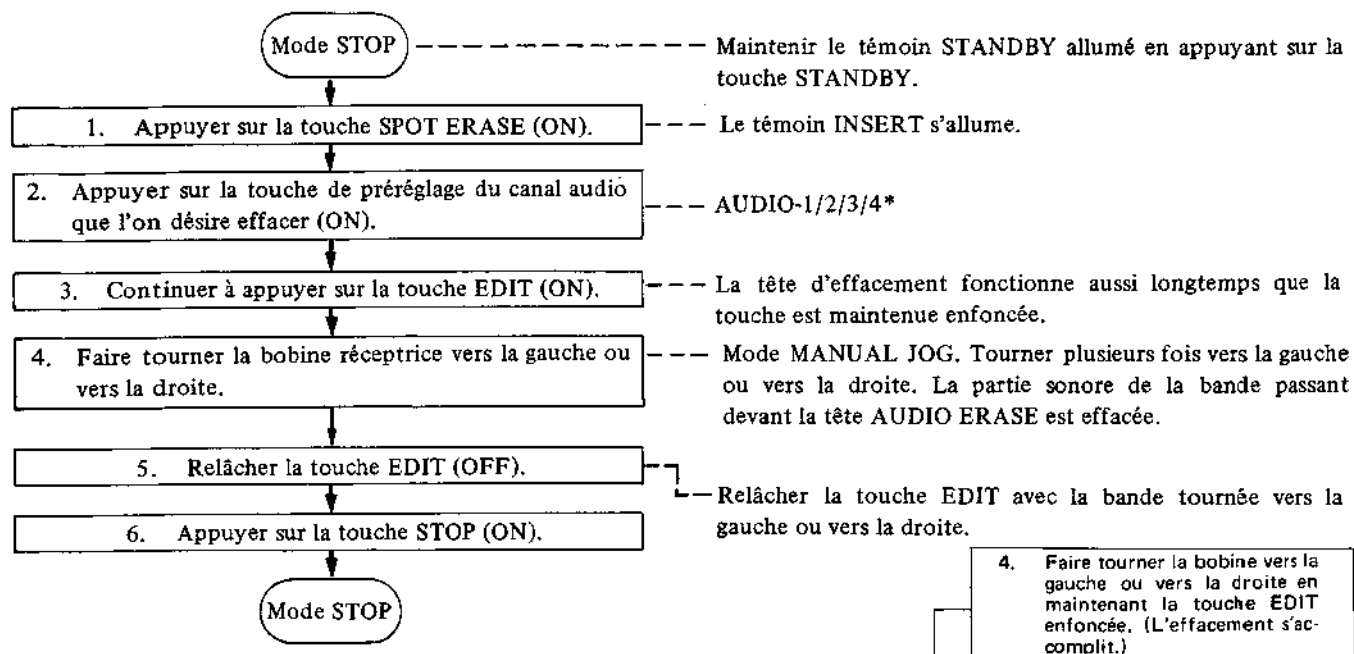
1-10-1. Montage par assemblage



1-10-2. Montage par insertion



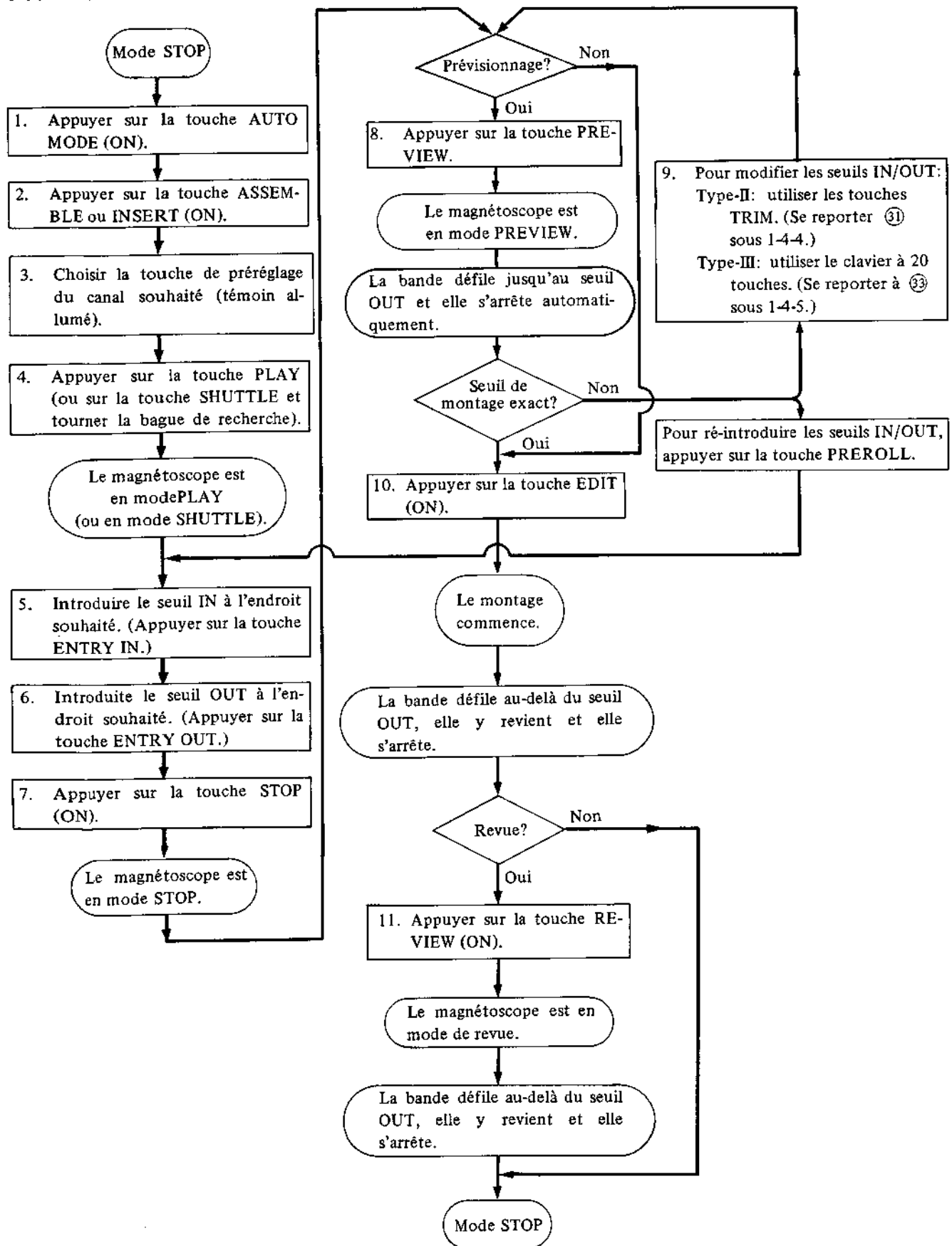
1-10-3. Effacement local

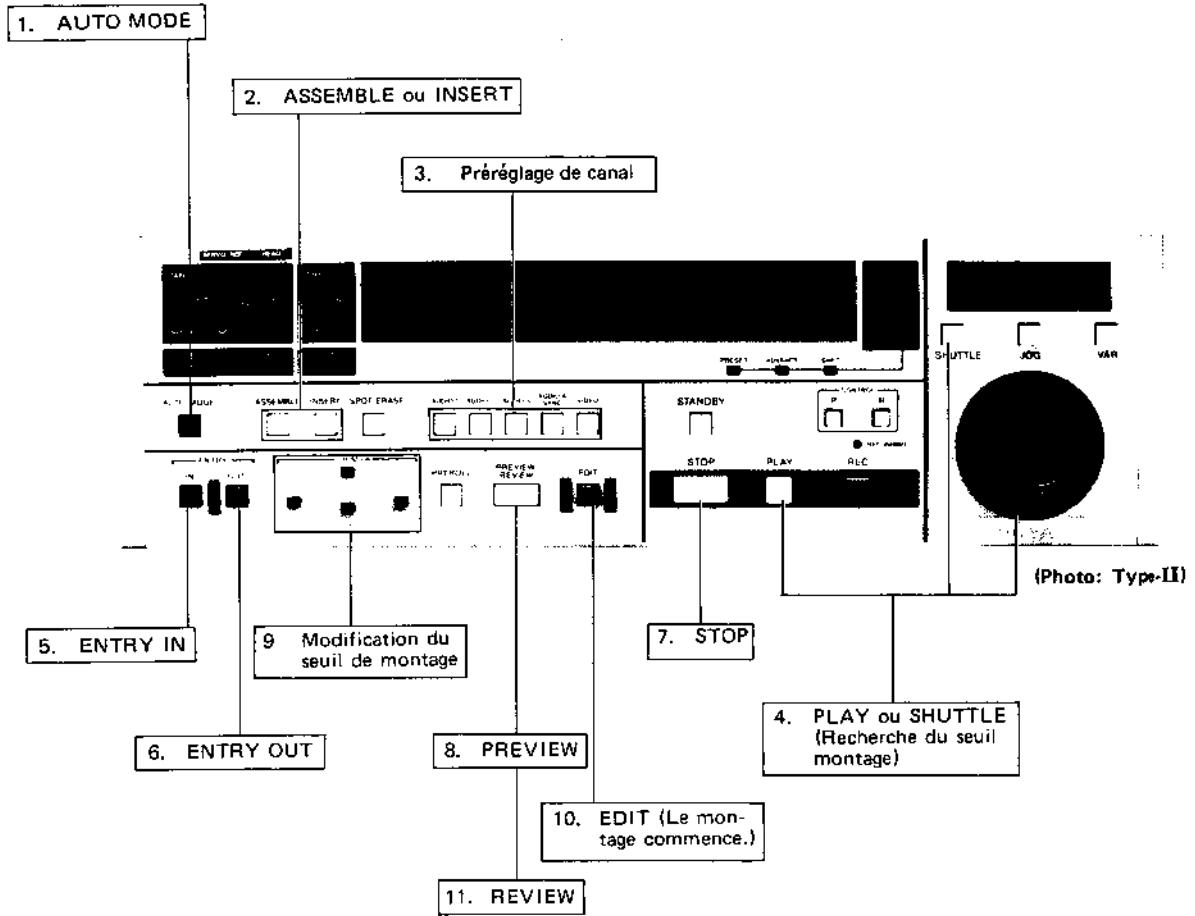


* Seul le BVH-2000PS(04)/(14) est doté de la touche AUDIO-4.

1-11. MONTAGE AUTOMATIQUE

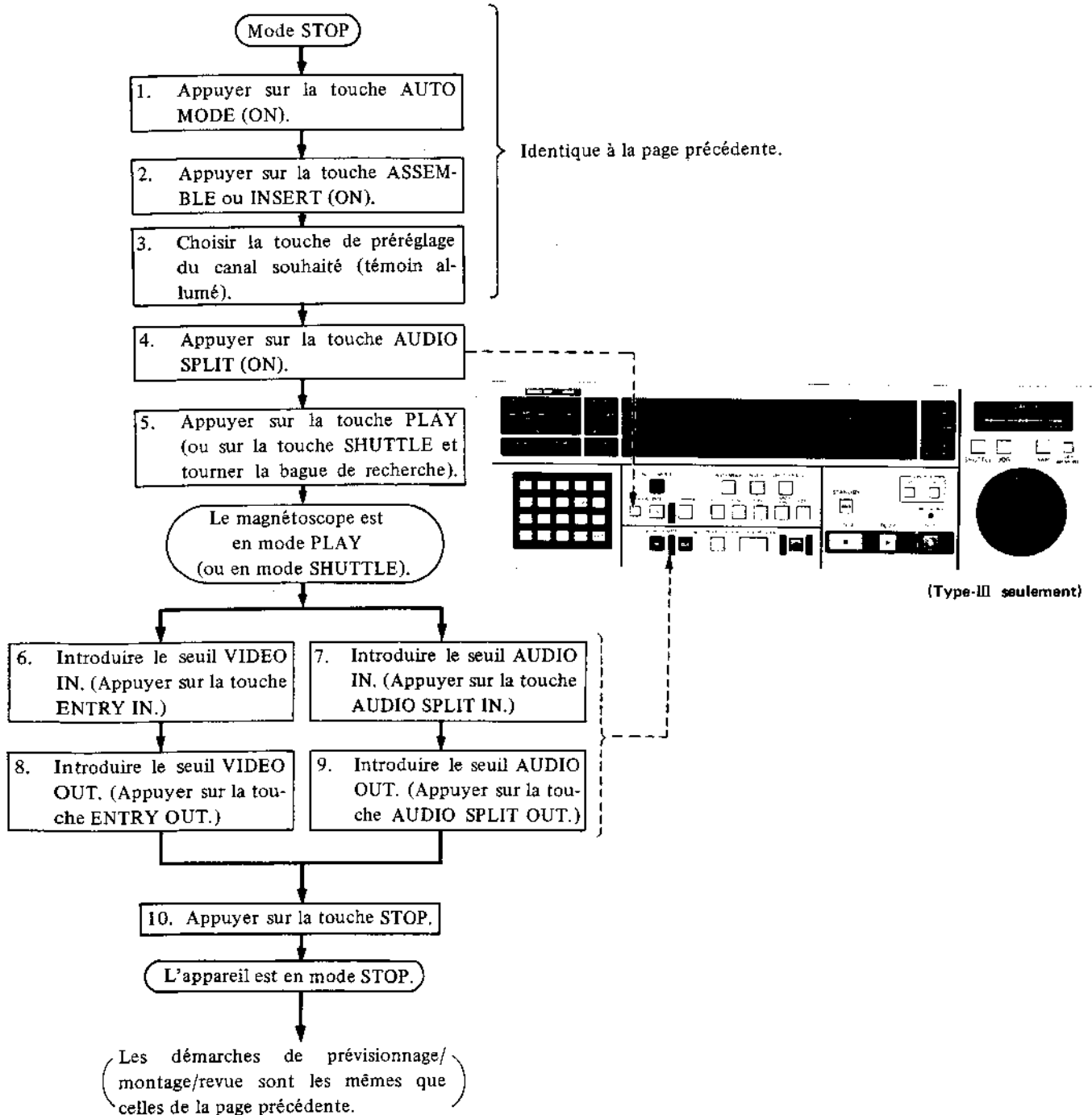
1-11-1. Démarches fondamentales





1-11-2. Montage audio divisé (Type-III seulement)

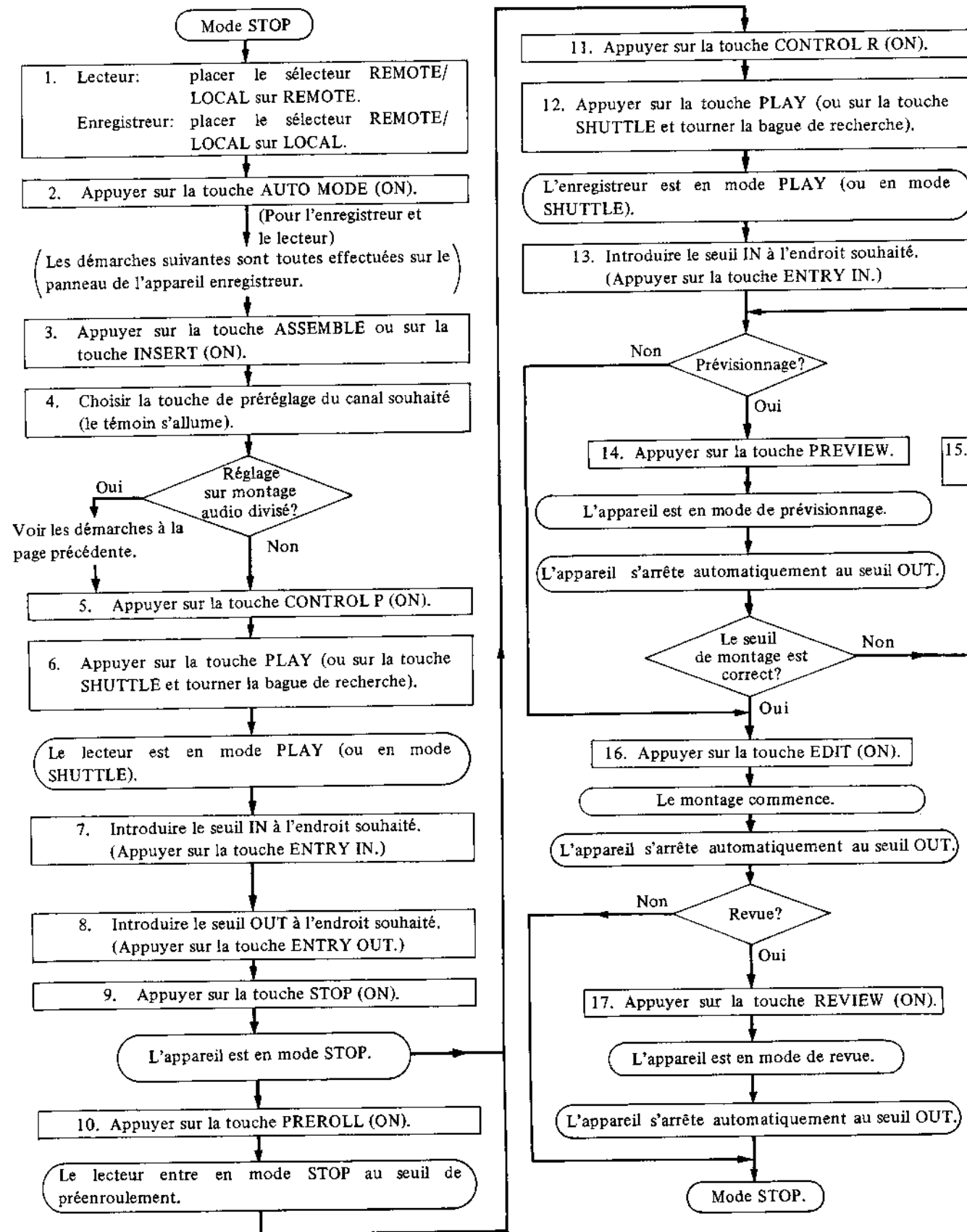
Pour permettre le montage audio divisé, introduire respectivement les seuils d'entrée (IN) et de sortie (OUT) audio et vidéo. Les autres démarches sont fondamentalement les mêmes que celles décrites à la page précédente.



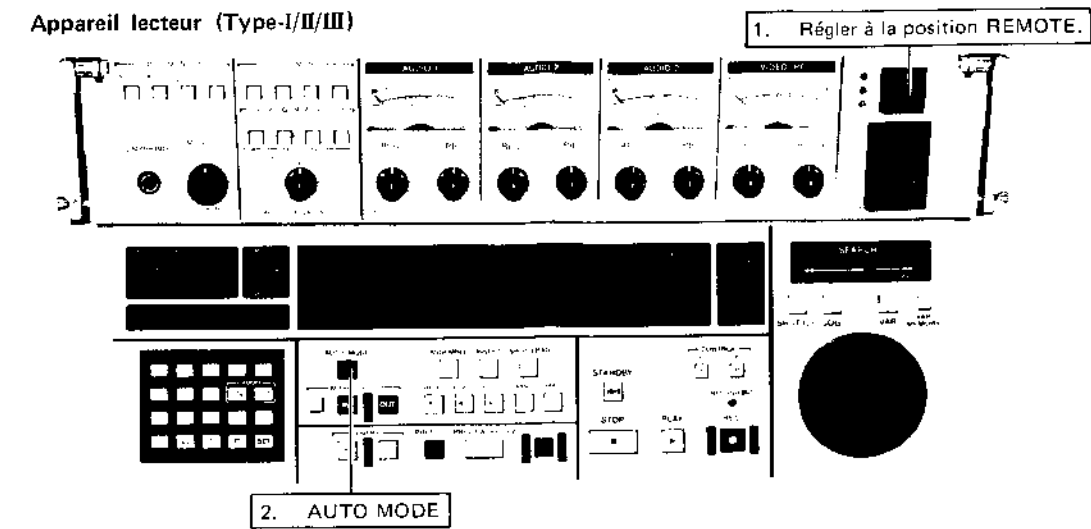
- Pour la modification des seuils de montage après prévisionnage, les démarches sont identiques à celles de la page précédente. En bref, apporter les modifications à l'aide du clavier à 20 touches (y compris les touches AUDIO IN/OUT), ou ré-introduire le seuil de montage après pré-enroulement.

- Le témoin AUDIO SPLIT reste allumé après que le montage audio divisé a commencé; dès lors, quand il est achevé, appuyer sur la touche pour éteindre ce témoin.

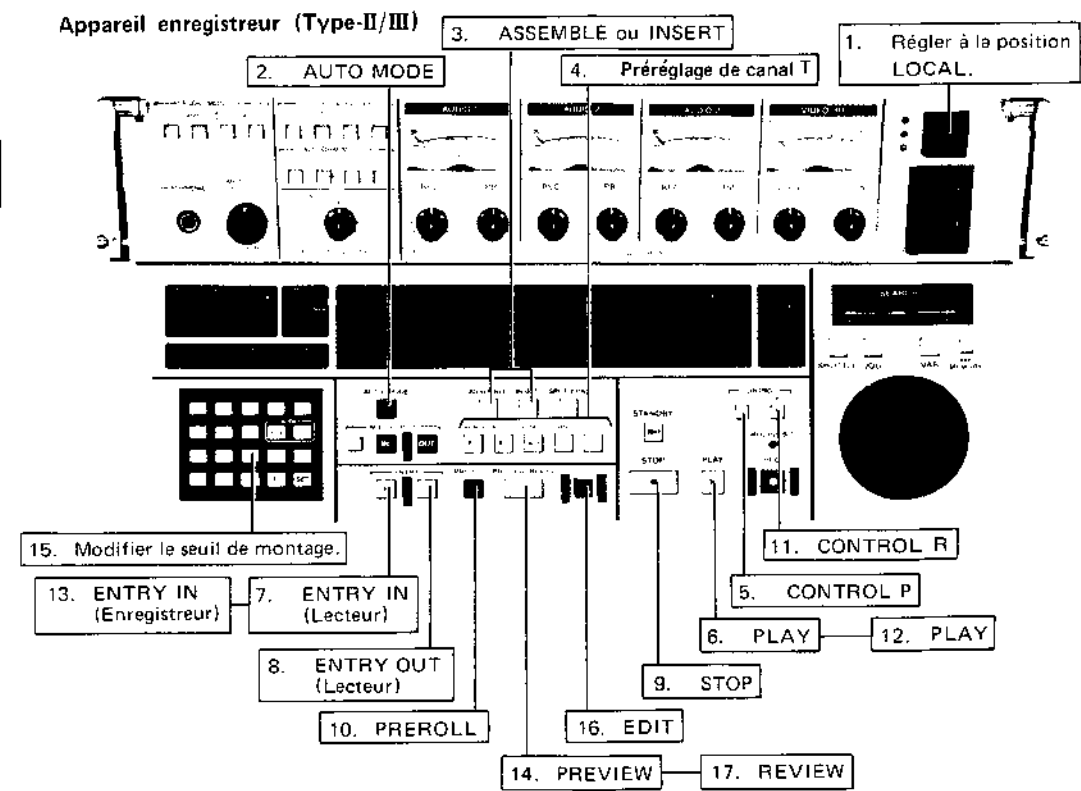
**1-11-3. Montage avec deux magnétoscopes
(Lecteur - Enregistreur)**



Appareil lecteur (Type-I/II/III)



Appareil enregistreur (Type-II/III)



Note:

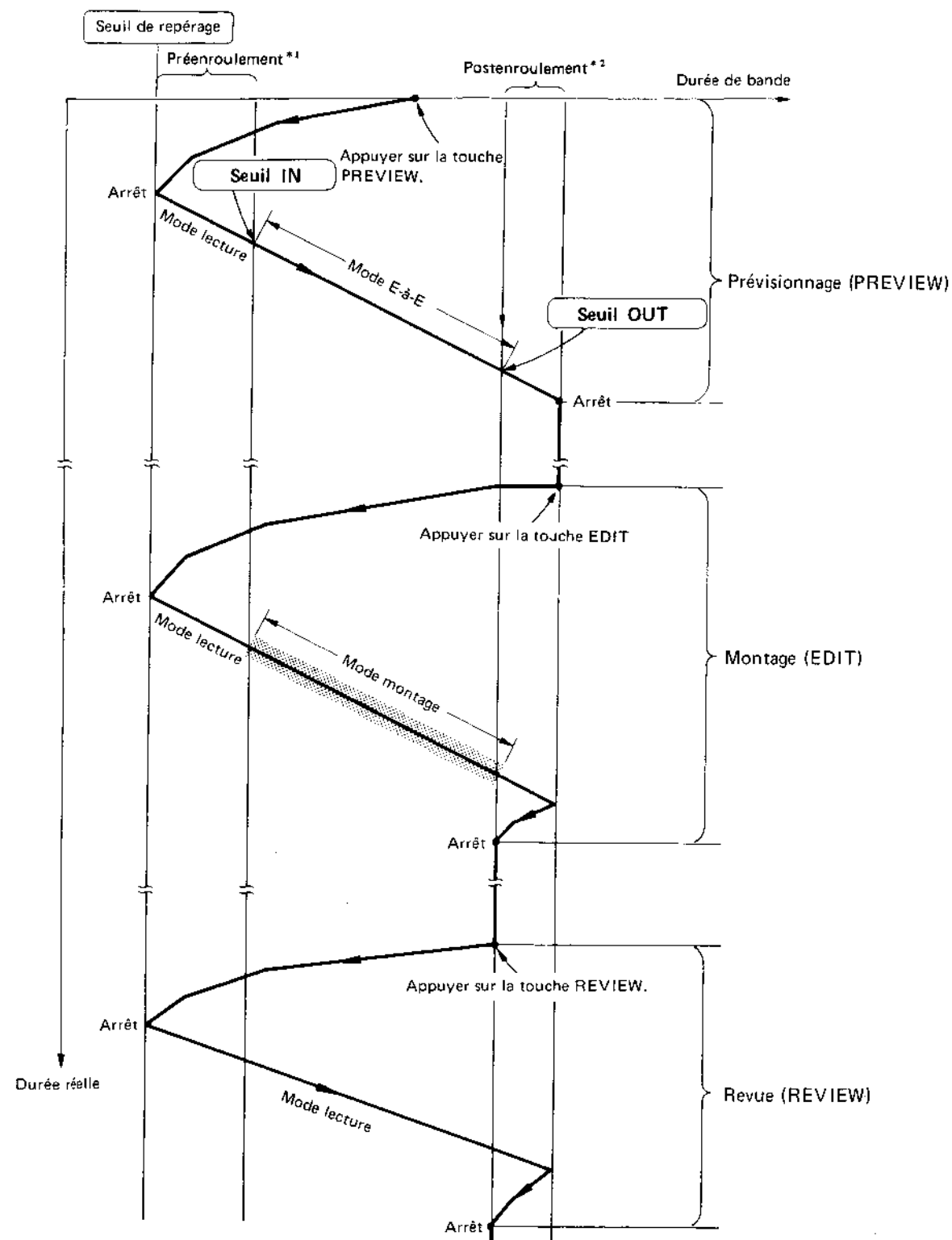
- Sélection de télécommande REMOTE-1/2/3
En vue d'un montage avec deux magnétoscopes, utiliser les connecteurs REMOTE-2 pour les raccordements. Par conséquent, les sélecteurs REMOTE de la plaquette SY-79 de l'enregistreur et du lecteur doivent se trouver sur REMOTE-2.
- Clignotement du témoin SEARCH
Le témoin SEARCH clignote quand on arrive à un mode qui ne peut être contrôlé en mode LOCAL sur le panneau existant. Ainsi par exemple, ce témoin clignotera sur le lecteur pour attirer l'attention de l'utilisateur



car le panneau du lecteur ne peut indiquer le mode INSERT s'il est réglé sur LOCAL après avoir réglé un lecteur doté d'un panneau de Type-I sur REMOTE et avoir transmis la commande de mode INSERT à partir de l'enregistreur. (Toutefois, le fonctionnement est normal, même si ce témoin clignote.)

Le schéma ci-dessous fournit une illustration du prévisionnage, du montage et de la revue en mode de montage automatique.

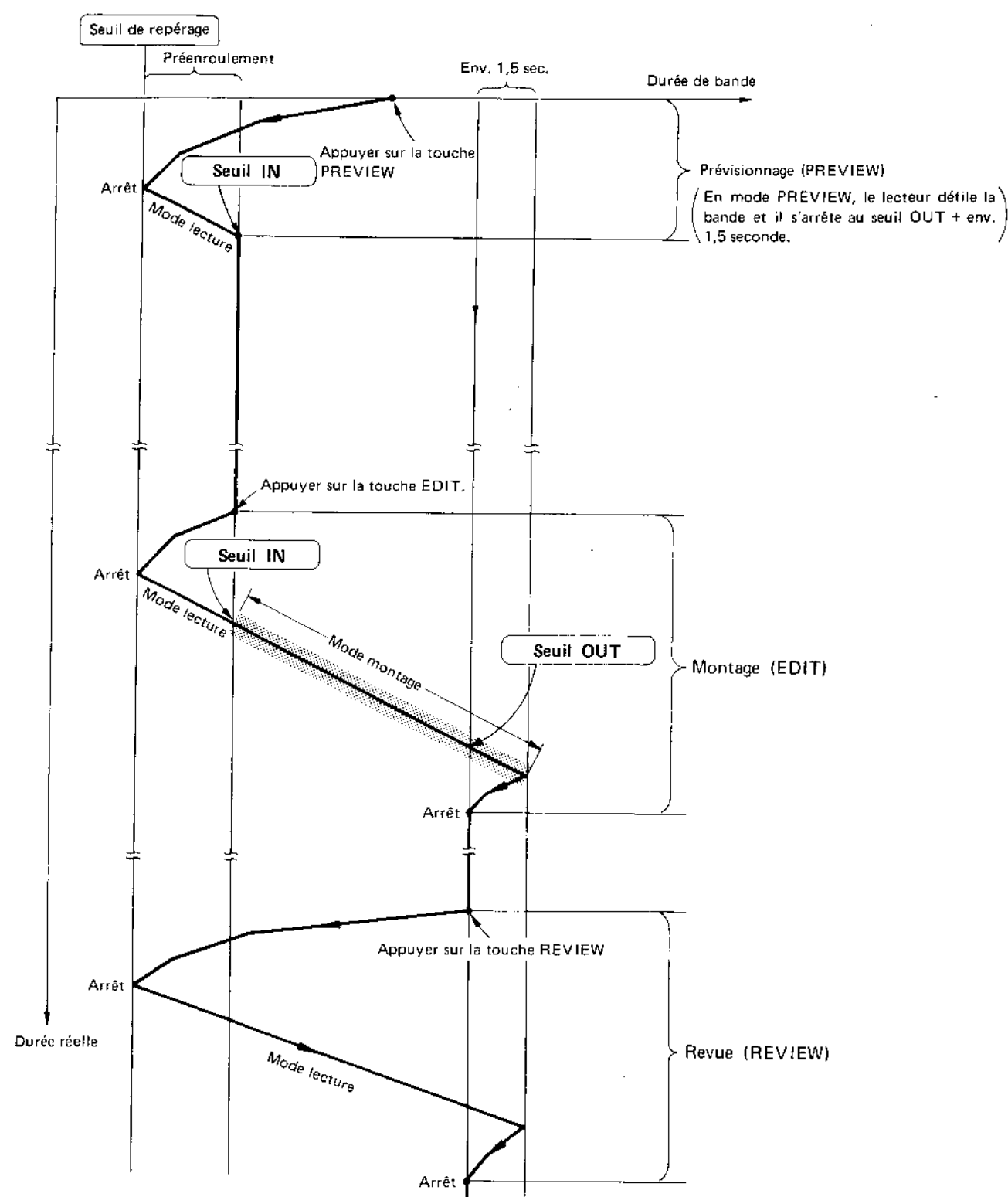
Montage par insertion (INSERT)



*1. La durée du préenroulement peut être modifiée dans une plage de 0 à 15 secondes à l'aide du sélecteur PREROLL TIME de la plaquette SY-79.

*2. La durée de postenroulement est identique à celle du préenroulement.

Montage par assemblage (ASSEMBLE)



1-11-4. Surveillance du montage

En modes de prévisionnage (PREVIEW) et de montage (EDIT), le signal de sortie au moniteur varie comme sur le tableau ci-dessous selon le réglage des sélecteurs HEAD et TAPE/EE. Etant donné que la phase du signal change aux

seuils indiqués par un "X" dans le tableau, il se peut que l'image du moniteur soit perturbée. Toutefois, cette perturbation ne se produit que sur l'image du moniteur et le montage s'accomplit normalement.

Moniteur VIDEO

Sélecteur de tête HEAD à la position R/P

	Sélecteur TAPE/EE	Seuil IN	Seuil OUT
PREVIEW	TAPE	Tête R/P OFF TAPE	EE
	TAPE/EE	Tête R/P OFF TAPE	EE
EDIT	TAPE	Tête R/P OFF TAPE	BVH-2000PS(00)/(10): EE BVH-2000PS(02)/(12), BVH- 2000PS(04)/(14): tête PLAY (CONF1) OFF TAPE
	TAPE/EE	Tête R/P OFF TAPE	EE

Sélecteur de tête HEAD à la position PLAY (pour le BVH-2000PS(02)/(12) et le BVH-2000PS(04)/(14))
(Les commandes de distorsion en parallélogramme automatique et PG automatique sont réglées sur OFF.)

	Sélecteur TAPE/EE	Seuil IN	Seuil OUT
PREVIEW	TAPE	Tête R/P OFF TAPE	EE
	TAPE/EE	Tête R/P OFF TAPE	EE
EDIT	TAPE	Tête PLAY OFF TAPE	Tête PLAY OFF TAPE
	TAPE/EE	Tête PLAY OFF TAPE	EE

Moniteur AUDIO

Connecteur LINE OUTPUT

	Sélecteur TAPE/EE	Seuil IN	Seuil OUT
PREVIEW	TAPE	Tête R/P OFF TAPE	EE
EDIT	TAPE/EE		

Connecteur MONITOR OUTPUT

	Sélecteur TAPE/EE	Seuil IN	Seuil OUT
PREVIEW	TAPE	Tête R/P OFF TAPE	EE
	TAPE/EE		
EDIT	TAPE	BVH-2000PS(00)/(10): tête R/P BVH-2000PS(02)/(12), BVH- 2000PS(04)/(14): tête MONITOR OFF TAPE	BVH-2000PS(00)/(10): EE BVH-2000PS(02)/(12), BVH- 2000PS(04)/(14): tête MONITOR OFF TAPE
	TAPE/EE	Tête R/P OFF TAPE	EE

1-11-5. Clignotement et allumage des témoins en mode de montage automatique

Les divers témoins qui clignotent comme sur le tableau ci-dessous en mode de montage automatique quand l'interrupteur S-8-8 de la plaquette SY-80 est allumé (ON) ont pour mission d'aider l'utilisateur dans les travaux de montage. Le fait d'enclencher la touche dont le témoin incorporé clignote permet de réaliser les travaux de montage.

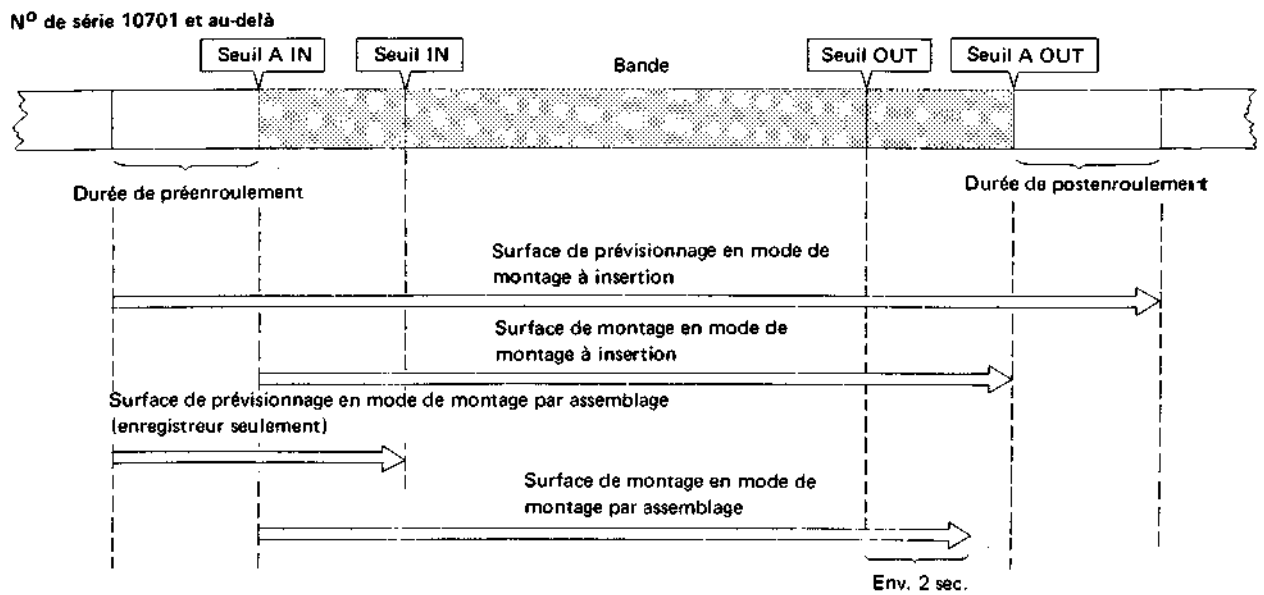
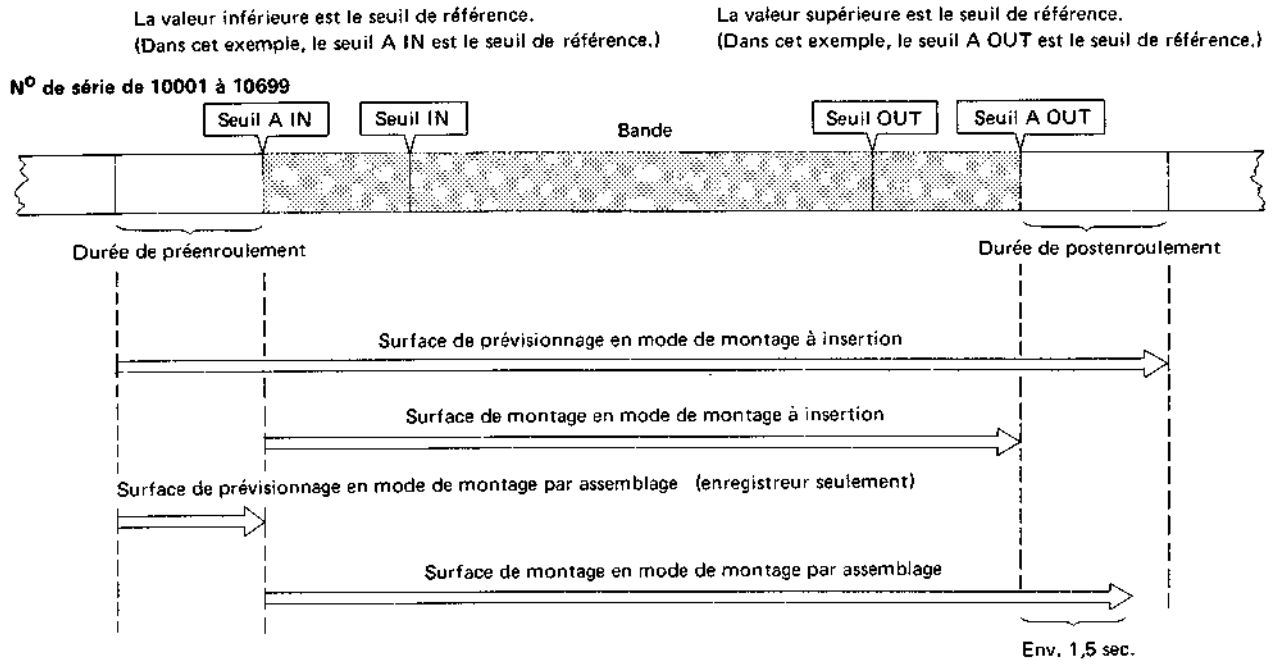
X : éteint ● : clignotant ○ : allumé

Démarches	Témoins	ENTRY IN	ENTRY OUT	A-IN	A-OUT	PREVIEW /REVIEW	EDIT	Remarques
1	AUTO MODE éteinte	X	X	X	X	X	X	
2	AUTO MODE allumée	●	●	X	X	X	X	
3	A AUDIO SPLIT en service	●	●	●	●	X	X	
4	U T ENTRY IN seulement	○	●	X (●)*	X (●)	●	X	Quand CHANNEL PRESET est éteint. Quand CHANNEL PRESET est allumé.
							●	
5	ENTRY OUT seulement	●	○	X (●)	X (●)	X	X	
6	M ENTRY IN et ENTRY OUT	○	○	-	-	●	X ●	
7	O Touche PREROLL allumée	○	-	-	-	X	X	
8	D Touche PREVIEW allumée	○	-	-	-	○	X	Mode PREVIEW
9	E Touche EDIT allumée	○	-	-	-	X	○	
10	O Fin du mode EDIT	X	X	X	X	●	X	
11	N Touche REVIEW allumée	X	X	X	X	○	X	Mode REVIEW Revenir à la démarche 2 quand le mode REVIEW est terminé.

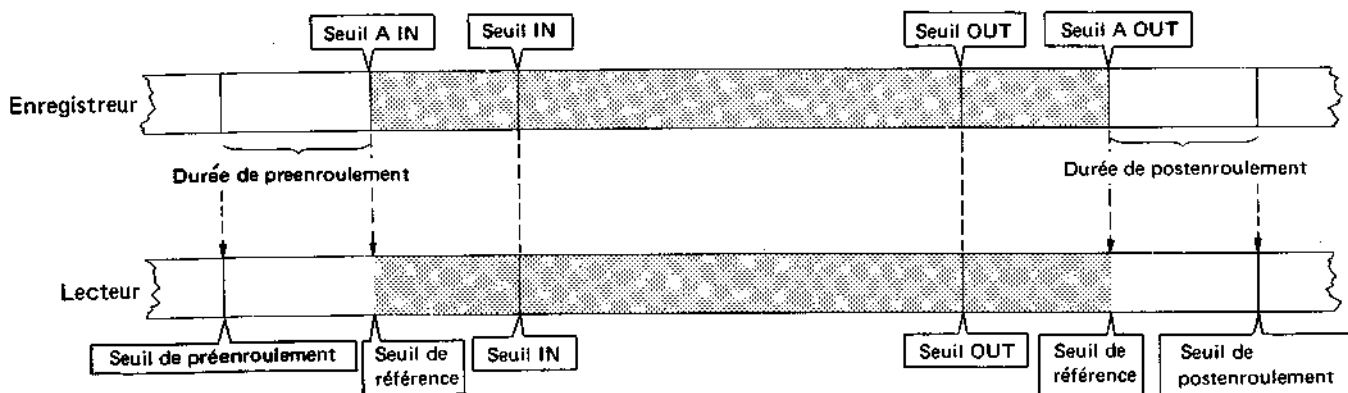
* Le mode audio divisé (AUDIO SPLIT) est indiqué entre parenthèses.

1-11-6. Surface de montage audio divisé (AUDIO SPLIT EDIT)

Pour un montage audio divisé, les seuils de montage vidéo et audio sont introduits sur la bande à des positions différentes. Dans ce cas, les seuils de montage de référence sont fixés automatiquement comme suit:



Pour un montage audio divisé en mode de montage à insertion avec deux magnétoscopes, les seuils de montage du lecteur sont normalement définis par les seuils IN et OUT du signal vidéo. Dans ce cas, les seuils de référence du lecteur sont déterminés comme suit par les seuils de référence de l'enregistreur.

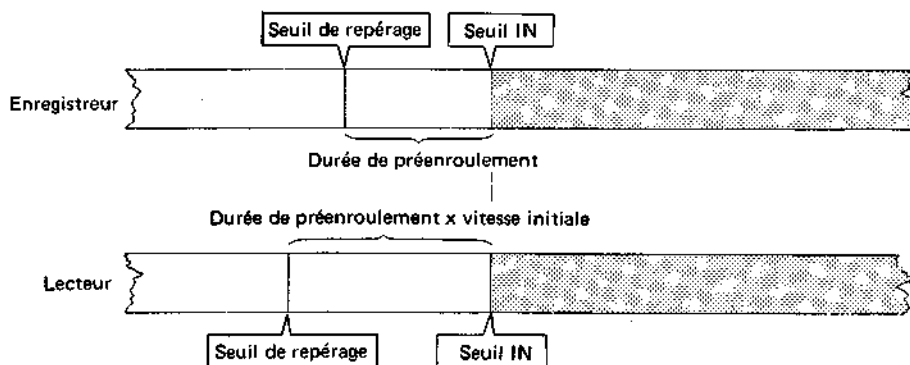


1-11-7. Montage en mode de mémoire variable (pour le BVH-2000PS(02)/(12) et le BVH-2000PS(04)/(14))

Pendant que l'on effectue la lecture d'une bande à une vitesse dont la courbe a été mémorisée en mode VAR MEMORY, son image peut être enregistrée sur l'appareil enregistreur et c'est ce que l'on appelle le montage en "mode de mémoire variable".

Pour l'utilisation du lecteur, se reporter à 1-9-6.

Les démarches à effectuer sur l'enregistreur sont les mêmes que pour un montage normal et les seuils de repérage sont les suivants:

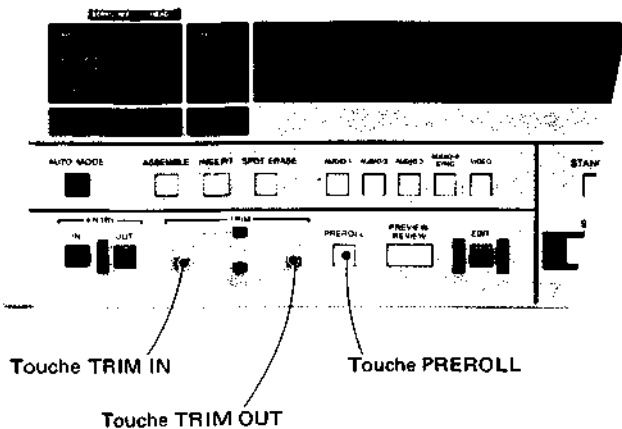


Par conséquent, la vitesse initiale en mode de mémoire variable n'est pas nécessairement une fois la vitesse normale; aussi, le seuil de repérage du lecteur sera-t-il différent de celui de l'enregistreur. Ceci provient du fait que le lecteur et l'enregistreur doivent défiler au même moment au seuil d'entrée IN.

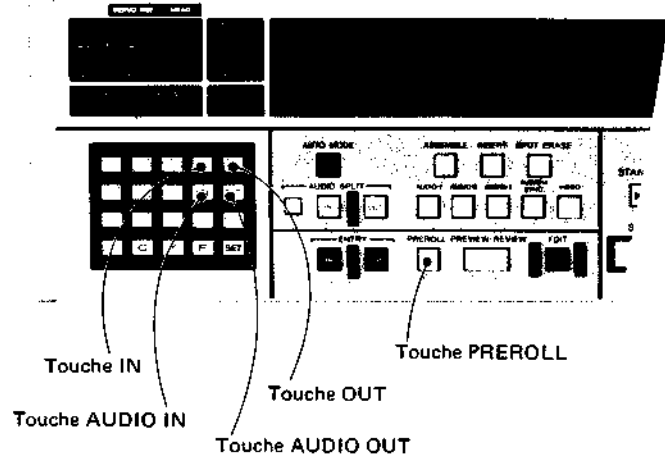
1-12. PREENROULEMENT

Le préenroulement s'accomplit à l'aide des touches suivantes.

Type-II



Type-III



Quand le mode automatique (AUTO MODE) est hors service.

Les seuils IN/OUT peuvent être introduits (le témoin ne s'allume pas).

Si les démarches sont accomplies comme suit quand les seuils IN/OUT ont été introduits, le préenroulement est possible.

- Appuyer sur la touche PREROLL.
 - >Préenroulement jusqu'à: (Seuil IN moins durée de préenroulement).
- Appuyer sur les touches PREROLL et TRIM IN.
 - >Préenroulement jusqu'au seuil IN.
- Appuyer sur les touches PREROLL et TRIM OUT.
 - >Préenroulement jusqu'au seuil OUT.

Quand le mode automatique (AUTO MODE) est en service.

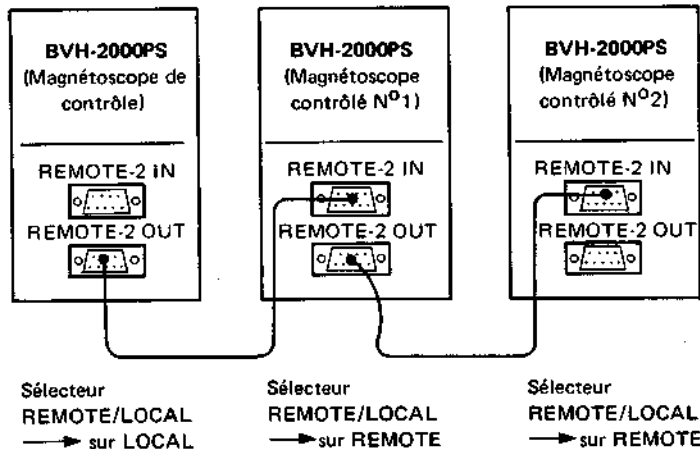
- Appuyer sur la touche PREROLL.
 - >Préenroulement jusqu'à: (Seuil IN moins durée de préenroulement).
- Appuyer sur les touches PREROLL et TRIM IN.
 - >Préenroulement jusqu'au seuil IN.
- Appuyer sur les touches PREROLL et TRIM OUT.
 - >Préenroulement jusqu'au seuil OUT.
- Appuyer sur les touches PREROLL et AUDIO IN.
 - >Préenroulement jusqu'au seuil AUDIO IN.*
- Appuyer sur les touches PREROLL et AUDIO OUT.
 - >Préenroulement jusqu'au seuil AUDIO OUT.

* Quand le mode AUDIO SPLIT est en service (Type-III).

1-13. EXPLOITATION PARALLELE

Pour utiliser deux ou plusieurs BVH-2000PS simultanément dans un même mode d'exploitation, effectuer les connexions illustrées ci-dessous. L'utilisation du magnétoscope de contrôle comme appareil principal permet de faire fonctionner tous les autres dans le même mode.

Note: Tous les interrupteurs PARA RUN (exploitation parallèle) de la plaquette SY-79 doivent être allumés (ON).



1-14. FONCTIONS D'ALARME

1-14-1. Dispositifs d'alarme

Comme illustré dans le tableau ci-dessous, en cas d'une défaillance d'un des magnétoscopes, le témoin correspondant s'allume ou clignote et un avertisseur retentit.

○ : allumé ● : clignotant — : éteint

	Témoin STOP	Témoin STANDBY	Alarme SERVO	Alarme SYSTEM	Avertisseur	Fonctionnement du magnétoscope
Défaillance du magnétoscope	—	—	○	○	Son	Arrêt
Tambour non asservi*	—	—	○	—	—	Continuation
Cabestan non asservi	—	—	○	—	—	Continuation
Défaillance de guide mobile (guide de bande)	—	—	—	○	Son	Arrêt
Fin de bande (libérée)	—	—	—	—	—	Arrêt
Surchauffe de l'alimentation électrique	—	—	—	○	Son	Continuation
Adhérence de la bande	—	●	—	○	Son	Arrêt
Absence de signal SERVO REF	●	—	—	—	—	Continuation
Touche courte**	—	—	—	○	Son	Continuation

Outre celles ci-dessus, diverses situations d'erreur sont signalées sur l'affichage dans le cas des Types II et III (se reporter à ⑧ sous 1-4-4 et 1-4-5).

Le volume sonore de l'avertisseur peut se régler par les commandes suivantes des plaquettes BKH-2011 à 2013:
 BKH-2011 et 2012: Résistances variables RV1 et RV2
 BKH-2013: Résistances variables RV3 et RV4.

* Quand le tambour n'est plus asservi pendant plus de 15 secondes, le témoin STANDBY clignote, le témoin SYSTEM ALARM s'allume et l'avertisseur retentit, comme dans le cas d'une adhérence de la bande.

** Seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus.

La condition "touche courte" indique que la touche est gardée enfoncée pendant plus de 30 secondes lorsque les touches opérationnelles (STOP, PLAY, REC, VAR, JOG, SHUTTLE et STANDBY) sont utilisables dans les modes suivant:

- (1) En mode local (LOCAL) (le sélecteur REMOTE/LOCAL est réglé sur LOCAL)
- (2) Mode REMOTE dans le mode LOCAL KEY ENABLE (le sélecteur REMOTE LOCAL est réglé sur REMOTE et soit l'interrupteur S9-4 ou S1-5 sur la plaquette SY-79 est réglé sur ON)

1-14-2. Indication de perte de verrouillage asservi

(seulement pour l'appareil qui possède le système ROM avec la version N° 3-5 et au dessus)

Lorsque des erreurs de pertes de verrouillage asservi se produisent pendant l'enregistrement et le montage, le message d'erreur "LOST LCK" clignote au bloc 6 (BKH-2013) ou au bloc 3 (BKH-2012) de l'affichage et le magnétoscope range jusqu'aux 10 premières positions (adresses) dans sa mémoire.

Les adresses mémorisées peuvent être vérifiées après coup.

Remarque

Une fois que 9 positions d'erreurs LOST LCK sont mémorisées, les positions où l'erreur LOST LCK s'est produite ne sont pas mémorisées jusqu'à la dernière erreur produite avant la mise en mode STOP du magnétoscope, mémorisée comme 10ème erreur.

Pour vérifier les adresses des erreurs LOST LCK en mode STOP

- 1 Mettre le magnétoscope en mode STOP en appuyant sur la touche STOP sur le magnétoscope.
- 2 Tout en gardant la touche STOP enfoncée, faire tourner la bague de recherche.

En tournant la bague de recherche dans le sens des aiguilles d'une montre, on peut afficher les positions d'erreur LOST LCK précédant des numéros de #0 à #9 par ordre des erreurs qui se sont produites.

Quand on la tourne en sens inverse, la mémoire est lue en arrière.

Les numéros d'erreurs et les adresses sont affichés au bloc 4 (BKH-2013) ou au bloc 2 (BKH-2012) comme montré ci-dessous.

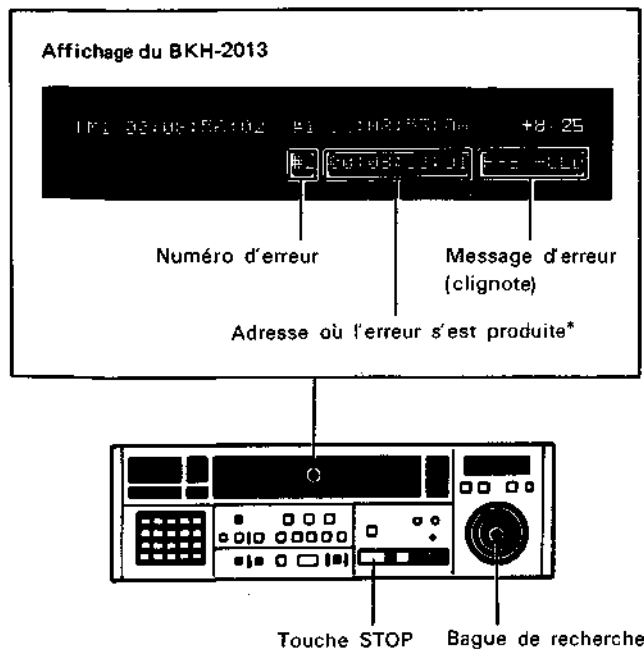
Pour vérifier les adresses pendant l'enregistrement ou le montage

- 1 Garder la touche STANDBY enfoncée en mode REC ou EDIT REC.
- 2 Faire tourner la bague de recherche.
Les adresses d'erreur LOST LCK sont affichées de la même façon qu'en mode STOP.

Pour effacer les adresses mémorisées

Les adresses mémorisées sont effacées en effectuant les opérations suivantes.

- (1) En commençant l'enregistrement ou la lecture, les adresses des erreurs LOST LCK qui se sont produites dans le dernier enregistrement ou montage sont effacées.
- (2) En appuyant sur la touche de réinitialisation tout en gardant la touche STANDBY enfoncée pendant l'enregistrement ou le montage, les adresses mémorisées plus loin sont effacées.



* Les adresses sont indiquées par le code de temps ou les données TIMER-1 ou TIMER-2, en fonction du réglage du sélecteur TIME CODE/TIMER.

TEIL 1

BETRIEB

1-1. BESONDERE MERKMALE

Kompaktheit und geringes Gewicht

Ein kompaktes pulsgeregeltes Hochleistungs-Netzteil und ein Gleichstrommotor ermöglichen zusammen mit einem kompakten Bandtransport-Mechanismus und einer kompakten Elektronik ein sehr geringes Gewicht dieses Videorecorders.

Dank der Kompaktheit, des geringen Gewichts und der hohen Zuverlässigkeit ist dieses hochwertige Gerät ideal für Anwendungen im Rundfunkbereich (Live-Aufnahmen etc.) geeignet.

Praktisches Videorecorder-System (einsteckbare TBC- und Zeitcode-Leiterplatten)

Eine Vereinfachung des Systems konnte durch Verwendung eines aus vier Leiterplatten bestehenden Time-Base-Correctors und einer Zeitcode-Leiterplatte (mit VITC), die jeweils in den Videorecorder eingesteckt werden können, erzielt werden.

Leichte Bandeinfädung

Der Bandtransport-Mechanismus wurde wesentlich vereinfacht, und ein äußerst präzise arbeitendes bewegliches Bandführungssystem (abgeschrägte Eingangs- und Ausgangs-Umlenkbolzen, Löschkopf sowie abnehmbare Tonkopf-Abdeckung) ermöglicht leichte Bandeinfädung.

2-stündiger Aufnahme- und Wiedergabebetrieb

Bei Verwendung des Sony Bandes V-16-126 (11,75 Zoll-Spule) kann 2 Stunden aufgenommen oder wiedergegeben werden, wodurch sich vielfältige Anwendungsmöglichkeiten eröffnen.

Mikroprozessorgesteuertes Servosystem

Alle eingegebenen Daten werden über den Datenbus an die CPU zur sofortigen Verarbeitung weitergeleitet. Die Ausgangsdaten werden dann zu den vier direktgetriebenen bürstenlosen Gleichstrommotoren geleitet, und alle Funktionssteuerungen des Videorecorders (d.h. Kopftrommel-, Spulen- und Capstan-Servoreglung) werden optimiert.

Der BVH-2000PS bietet schnellen Zugriff und äußerst kurze Servoverriegelungszeit. Sowohl 2-Stunden-Spulen als auch Spot-Spulen können verwendet werden, ohne das System zu ändern.

Schnelles dynamisches Spurlage-System (Dynamic Tracking*)

Eine schnelle digitale Spurlagenreglung gewährleistet sanften und zuverlässigen DT-Betrieb.

*Dynamic Tracking ist ein eingetragenes Warenzeichen der Sony Corporation.

Vergrößerter DT-Wiedergabebereich

(BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Dank eines neuen DT-Kopfes ist nun eine störungsfreie Wiedergabe von -1-facher bis +3-facher Normalgeschwindigkeit möglich. Dies ist besonders bei Wiedergabe mit Spezialeffekten und beim Aufsuchen von Schnittpunkten sehr vorteilhaft.

Programmierte Wiedergabe (BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Die DT-Funktion und der Mikroprozessor ermöglichen ein exaktes Variieren der Wiedergabegeschwindigkeit in 0,1% Schritten bis zu $\pm 20\%$, so daß die Band-Wiedergabezeit verlängert oder verkürzt werden kann.

Variier-Memory (Bedienungs-pult Typ-III des BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Innerhalb des DT-Bereiches (-1-fache bis +3-fache Normalgeschwindigkeit) kann eine beliebige Wiedergabegeschwindigkeit vorgewählt werden, und es ist eine vom Memory gesteuerte Wiederhol-Wiedergabe möglich.

Komplette Schnittfunktion

Zusätzlich zu der hochwertigen automatischen Schnittfunktion sind noch etliche Sonderfunktionen (weiter unten beschrieben) vorgesehen, die den BVH-2000PS noch leichter bedienbar machen.

Einfacher Anschluß (Seriencode)

Beim Schnittbetrieb mit zwei Geräten ist zum Datenaustausch zwischen dem BVH-2000PS und Videorecorder der BVU-800 Serie nur ein einziges 9-poliges Interface-Kabel erforderlich.

Das Wiedergabegerät kann vom Bedienungs-pult des Aufnahme-geräts aus bedient werden.

Leicht abzulesendes Punkt-Matrix Fluoreszenz-Display

Timer, IN- und OUT- Punkte, Bandgeschwindigkeit und Störungen werden auf dieser Anzeige angezeigt. (Die Funktionen sind von Bedienungs-pult zu Bedienungs-pult verschieden.)

Tastatur (Bedienungs-pult Typ-III)

Separater Tonschnitt (Bedienungs-pult Typ-III)

Teil-Lösch-Taste (Bedienungs-pult Typ-II/III)

Capstan-Geschwindigkeitskorrektur

(Geschwindigkeitsänderung um $\pm 15\%$ in 3 $\frac{1}{2}$ Stufen)

Einstellmöglichkeit für Schnittpreinlauf- und Reaktionszeit

Bedienungselemente an der Vorderseite

Alle Schalter und Regler sind zur besseren Übersicht in ein Funktions- und ein Pegelregler-Teil aufgeteilt. Bei allen Leiterplatten (z.B. TBC- oder Zeitcode-Leiterplatten) sind die wichtigsten Schalter und Regler bequem zugänglich an der Vorderseite untergebracht.

Fünf Fernbedienungs-Anschlüsse

Fernbedienungs-Anschlüsse für TBC, Monitor-Wahl sowie drei Anschlüsse für Funktionssteuerungen sind vorgesehen, so daß der BVH-2000PS in praktisch allen Anwendungsbereichen bequem mit den anderen Geräten zusammengeschaltet werden kann.

Audio/Video-Wiedergabe-Prüf-Monitor

(BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Der Video-Teil des BVH-2000PS besitzt zusätzlich zu dem normalen Wiedergabe-Kopf noch einen Monitor-Kopf. Auch der Audio-Teil besitzt zur Überprüfung der AUDIO-1/2/3/4- und CTL-Signale einen zusätzlichen Monitor-Kopf.

Hohe Bild- und Tonqualität

Dank speziell entwickelter neuer Komponenten wie z.B. neue Video- und Tonköpfe sowie einer Verbesserung des automatischen HF-Signal-Entzerrungskreises ist eine hochqualitative Aufnahme und Wiedergabe möglich.

Hohe Zuverlässigkeit

Bei der Entwicklung wurde großen Wert auf hohe Zuverlässigkeit gelegt. Es kommen Komponenten hoher Präzision zur Anwendung, wie z.B. ein von Sony speziell entwickelter bürstenloser Hochleistungs-Gleichstrommotor und langlebige LED-Indikatoren im Bedienungspult, die den BVH-2000PS zu einem der zuverlässigsten Geräte auf dem Markt machen.

Warn-Funktionen

Der BVH-2000PS besitzt verschiedene „Warn-Funktionen“, wie z.B. die „Kein-Signal-Warnung“, die „Kopftrommel-Stillstand-Warnung“, die „Band-Durchhang-Warnung“ sowie Warnungen bei Netzteil- oder Motorantriebs-Überhitzung und bei Abnormalitäten der Servo/System-Kommunikation.

Bandschutz-Mechanismus

Zum Schutz des Bandes ist ein Bandspannungs-Abschaltmechanismus vorgesehen. Der Fühler für abnormale Spannung sowie die beweglichen Eingangs- und Ausgangs-Umlenkbolzen deaktivieren bereits vor Erreichen des Bandendes, so daß maximaler Bandschutz gewährleistet ist.

Installation

Bei der Entwicklung des BVH-2000PS wurde in jeder Hinsicht auf einfache Bedienbarkeit geachtet. Je nach den jeweiligen Anforderungen kann die Gerätezusammenstellung leicht geändert werden.

1-2. TECHNISCHE DATEN

Allgemeines

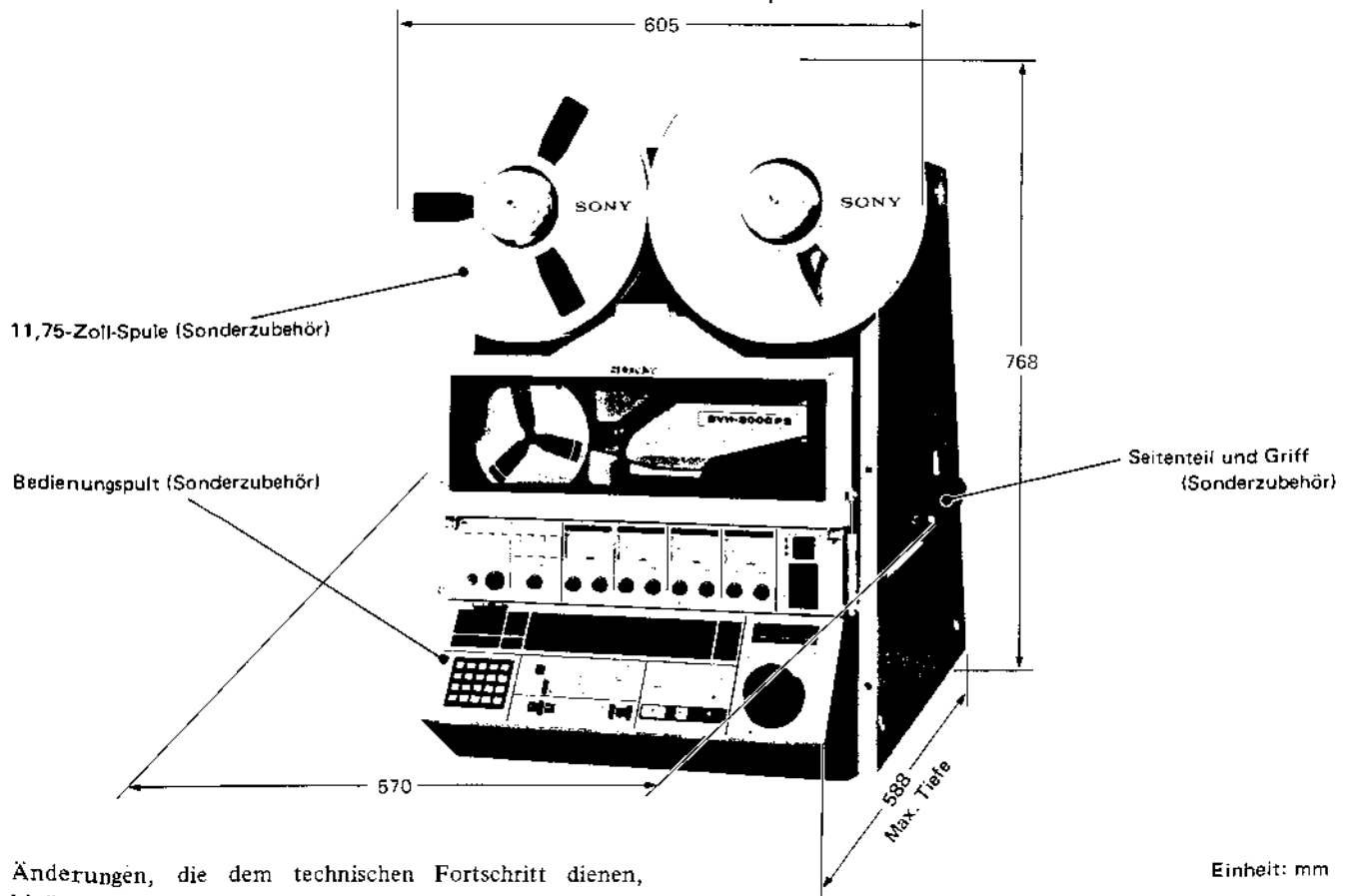
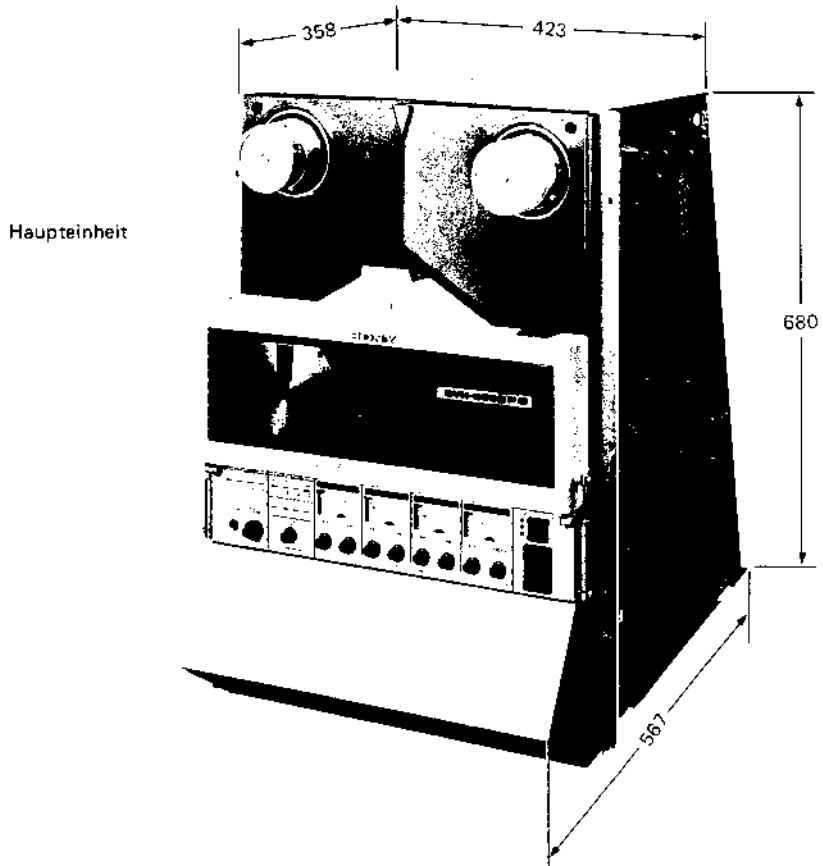
Spannungsversorgung	100 – 120/220 – 240V Wechselspannung $\pm 10\%$ (einstellbar) 50/60 Hz
Leistungsaufnahme	550W max
Betriebstemperatur	5°C bis 40°C
Feuchtigkeit	10 bis 90% (nicht kondensiert)
Gewicht	70 kg
Abmessungen (einschl. Griffe und Füße) (B x H x T)	570 x 680 x 588 mm
Aufnahmeformat	EBU-Typ-C 1 Kopf für Videospur 1 Kopf für Synchronspur (nur bei BVH-2000PS(00), (02), (04))
Spuren	Video-Spur: 1 Sync-Spur: 1 (nur bei BVH-2000PS(00), (02), (04))
Spuren	Video-Spur: 1 Sync-Spur: 1 Audio-Spur: 3 bei BVH-2000PS(00) und BVH-2000PS(02); 4 bei BVH-2000PS(04) (Audio-Spur 3 dient für Zeitcode- und Cue-Signale) Kontroll-Spur: 1
Bandgeschwindigkeit	23,98 cm/sec
Abtastgeschwindigkeit (Relativgeschwindigkeit)	21,39 m/sec
Aufnahmezeit	128 Min. mit 11,75-Zoll-Band
Zeitbasisstabilität	Innerhalb 3 μ s
Servoverriegelungszeit	Innerhalb 3 sec (von Bereitschaftsbetrieb in 4-Halbbild-Verriegelung)
Band-Timer-Genauigkeit	± 1 Halbbild (bei kontinuierlichem Kontrollsignal)
Vorspul/Rückspulzeit (Umspulzeit)	Innerhalb 110 sec (bei einem 1-Stunden-Band)
Empfohlene Bänder	Sony 1-Zoll High Density Band oder entsprechendes
Spulengröße	max. 11,75-Zoll
Video	
Video-Bandbreite	Flach bis 5,0 MHz: $\pm 0,5$ dB (5,5 MHz: -3 dB)
Signal-Rauschabstand	Besser als 44 dB (unbewertet), Selbstaufnahme Besser als 43 dB (unbewertet), wechselnde Basis (Spitze-Spitze FBAS-Signal zu Rausch-RMS mit Rhode & Schwarz Rauschmesser gemessen)

Differentialgewinn	Weniger als 4% (mit Sony TBC)
Differentialphase	Weniger als 4° (mit Sony TBC)
Einschwingverhalten (K-Faktor, 2T-Impuls)	Kleiner als 1
Verzeichnung (Hor. und Vert.)	Weniger als 1%
Moire	Weniger als -35 dB (75% Farbbalken) Weniger als -32 dB (100% Farbbalken)
Chroma-/Luminanz-Verzögerung	Weniger als 25 ns
Linearität niedriger Frequenzen	Besser als 0,98
Audio	
Audio-Frequenzgang	CH-1, CH-2, CH-3 & CH-4* 50 Hz - 15 kHz $\begin{matrix} +1,5 \\ -3,0 \end{matrix}$ dB 200 Hz - 7,5 kHz $\pm 1,0$ dB
Signal-Rauschabstand	CH-1, CH-2 & CH-4*: Besser als 56 dB (bei Klirrfaktor von 3%) CH-3: Besser als 50 dB (bei Klirrfaktor von 3%)
Klirrgrad (bei 1 kHz)	CH-1, CH-2, CH-3 & CH-4*: Weniger als 1% (bei Betriebspegel)
Gleichlaufschwankungen	Weniger als 0,1% effektiv, CCIR-bewertet
Übersprechen (bei 1 kHz)	Weniger als -60 dB zwischen zwei beliebigen Kanälen
Eingangssignale	
Video-Eingang	1,0 \pm 0,3 Vss (75 Ohm)
Referenzsignal-Eingang	1,0 \pm 0,3 Vss (75 Ohm), Video
Farbträgerverkoppelter Halbbildimpuls	TTL-Pegel, 6,25 Hz
Audio-Direkteingang	CH-1, CH-2, CH-3 & CH-4* +20 bis -30 dBm (600 Ohm/10 kOhm, symmetrisch)
Audio-3-Mikrofoneingang	CH-3: -60 dB (hohe Impedanz, asymmetrisch)
Zeitcode-Eingang	CH-3: 0,5 Vss (75 Ohm), für EBU-Zeitcode

*Nur der BVH-2000PS(04) ist mit CH-4 ausgestattet.

Ausgangssignale	
Video-1/2/3-Ausgang	1,0 Vss (75 Ohm)
Wellenform-Monitor-Wahl	Gewähltes Videosignal/CTL/HF-Hüllkurve/Reserve
Video-Monitor-Wahl	Video-Eingang/Demodulator-Ausgang/TBC-Ausgang/Reserve
Halbbild-Impuls	TTL-Pegel (auf farbträgerverkoppelten Halbbildimpuls und Halbbildimpuls umstellbar)
Referenz-Video-Signal	1 Vss (Nennwert, 75 Ohm) für externen TBC
Drop-Out-Signal	TTL-Pegel/HF-Ausgang (umstellbar)
Audio-Direktausgang	CH-1, CH-2, CH-3 & CH-4*: 8 dBm (Nennwert, 600 Ohm, symmetrisch) (auf 150 oder 37,5 Ohm umstellbar)
Zeitcode-Ausgang	CH-3: 0,5 Vss (75 Ohm) für EBU-Zeitcode
Kopfhörer-Ausgang	8 Ohm, asymmetrisch, einstellbarer Pegel
Monitor-Ausgang (L/R CH)	8 dBm (600 Ohm, symmetrisch) einstellbarer Pegel
Audio-Monitor-Wahl	BVH-2000PS(02)(12): CH-1/CH-2/CH-1, CH-2/CH-3 (wählbar) BVH-2000PS(04)(14): CH-1/CH-2/CH-3/CH-4/CH-1, CH-2 (wählbar)
Sonstiges	
TBC-Ausgang (nur bei BVH-2000PS(00), (02), (04))	An Sony TBC (Sony BVT-2000P/2000S) für dynamische Sperrlage
Fernbedienungs-Ausgang-1 (nur bei BVH-2000PS(00), (02), (04))	Für CCJ-Konverter
Fernbedienungs-Ausgang-1	Für CCI-Konverter
Fernbedienungs-Ausgang-2	Für 9-pol-Interface
Fernbedienungs-Ausgang-3	Für Parallel-Übertragung
Aux	Zur Fernbedienung eines eingesteckten TBCs.
Monitor-Wahl	Zur fernbedienten Monitor-Wahl

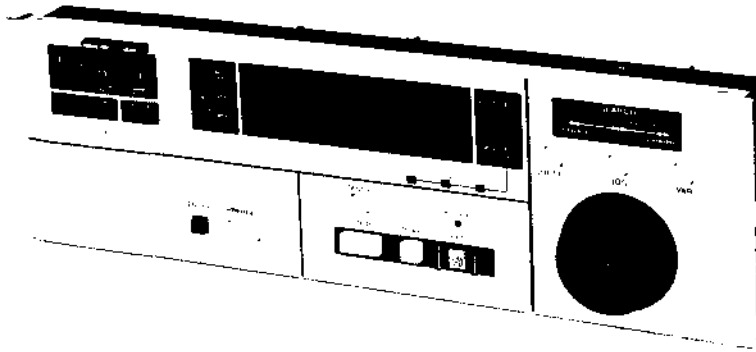
Abmessungen



1-3. SONDERZUBEHÖR

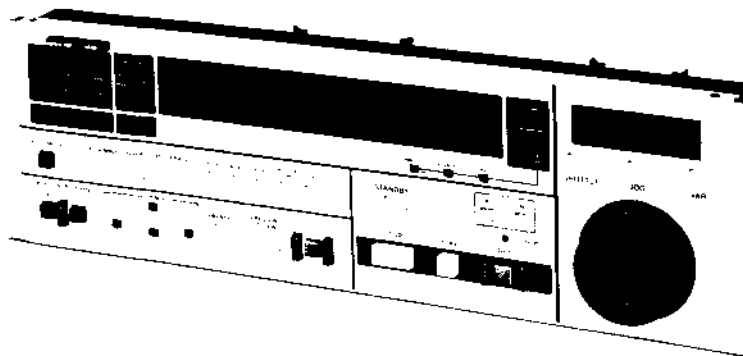
Bedienungspulte

Für den BVH-2000PS sind drei verschiedene Bedienungspulte erhältlich. Wählen Sie das am besten auf Ihre Anforderungen zugeschnittene aus.



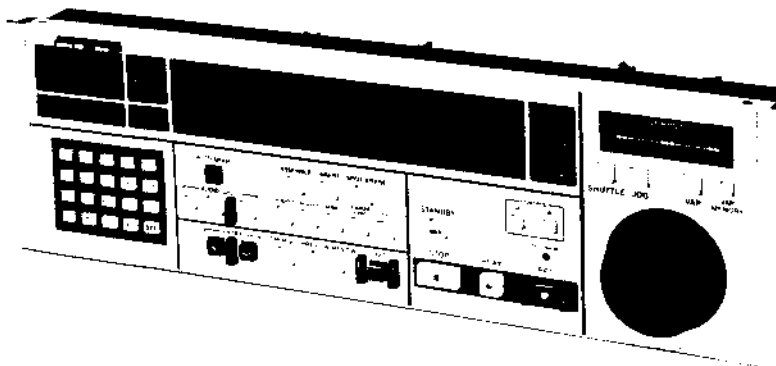
Bedienungspult BKH-2011 (Typ-I)

Dieses Pult dient zur Steuerung der Haupt-Aufnahme/Wiedergabe-Funktionen: Durchführung von Aufnahme und Wiedergabe, Suchlauf sowie Aufsuchen des Schnittpunktes (Cue-Funktion). (Genaueres siehe Kapitel 1-4-3.)



Bedienungspult BKH-2012 (Typ-II)

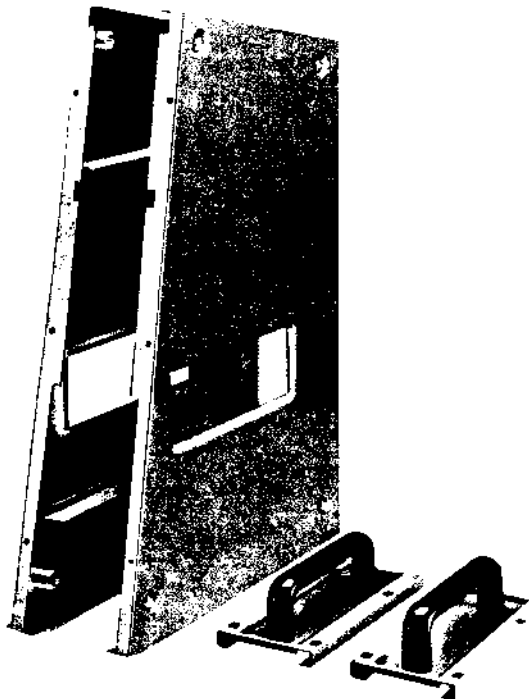
Mit diesem Pult können zusätzlich zu den Funktionen des Typ-I-Pultes noch Schnittfunktionen durchgeführt werden. Bei Verwendung dieses Pultes wird der BVH-2000PS zu einem Standard-Video-recorder für Schnittbetrieb. (Genaueres siehe Kapitel 1-4-4.)



Bedienungspult BKH-2013 (Typ-III)

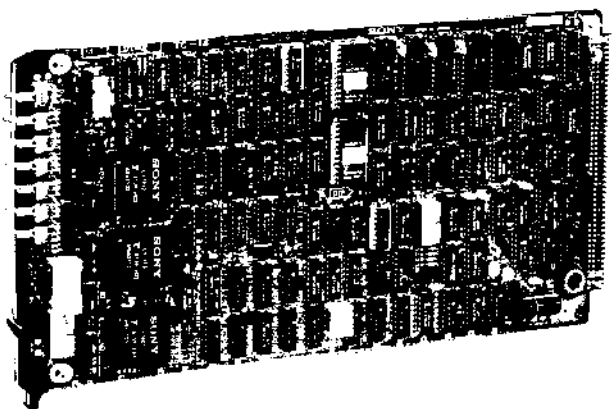
Dieses Pult ermöglicht zusätzlich zu den Funktionen der obigen Pulte hochwertige Schnittfunktionen (wie z.B. separater Tonschnitt, Teil-Lösch-Funktion und Memory für Geschwindigkeitsvariation). Aus dem BVH-2000PS wird ein multifunktionaler Videorecorder mit Datenverarbeitungs-Funktionen. (Genaueres siehe Kapitel 1-4-5.)

BKH-2014 Seitenteil-Satz



Die Seitenteile und die Griffe sind zu verwenden, wenn der BVH-2000PS als Einzel-Standgerät betrieben wird.

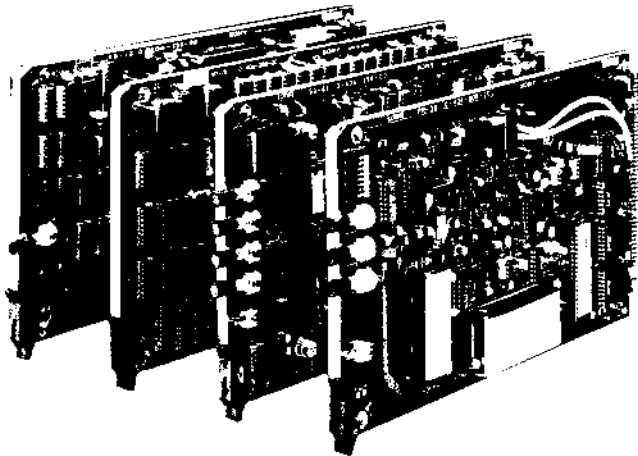
BKH-2015/BKH-2015A Zeitcode-Generator/Leser



Auf der steckbaren Leiterplatte BKH-2015/BKH-2015A sind ein EBU-Zeitcode-Generator und -Leser, VITC und Benutzer-Bits sowie ein Zeichengenerator untergebracht. Größe und Position der auf dem Bildschirm erscheinenden Zeichen können eingestellt und Schwarz-Weiß kann umgekehrt werden.

Wird diese Leiterplatte in den Videorecorder eingesetzt, so sind keine externen Zeitcode-Geräte erforderlich.

- BKH-2200 Digitaler Time-Base-Corrector (für PAL-Farbsystem)**
- BKH-2300 Digitaler Time-Base-Corrector (für PAL/SECAM-Farbsystem)**
- BKH-2350 Digitaler Time-Base-Corrector (für PAL/SECAM-Farbsystem)**



BKH-2200/BKH-2300

Diese vier Leiterplatten stellen einen steckbaren TBC dar. Der BKH-2200 oder BKH-2300 ermöglicht Farb-Wiedergabe mit Normalgeschwindigkeit und Schwarzweiß-Wiedergabe mit max. ± 50 -facher Normalgeschwindigkeit, so daß das aufgenommene Signal beim Suchlauf beobachtet werden kann. (Bei Suchlauf mit hoher Geschwindigkeit ändert sich jedoch die Horizontal-Größe des Bildes.) Mit diesen Leiterplatten kann der Videorecorder direkt, ohne Verwendung eines externen TBCs, auf den Sender geschaltet werden. Falls erforderlich kann jedoch auch gleichzeitig noch ein externer TBC (z.B. Sony BVT-2000P/2000S) angeschlossen werden.

Hinweis

An den BVH-2000PS(10), (12) und (14) kann kein externer TBC angeschlossen werden.

BKH-2350

Der BKH-2350 ist ein aus vier Leiterplatten bestehender, einsteckbarer Time-Base-Corrector. Er liefert ein hochqualitatives Bild bei normaler Wiedergabegeschwindigkeit und bei Dynamic-Tracking-Wiedergabe mit -1 - bis $+3$ -facher Normalgeschwindigkeit. Bis zur ± 7 -fachen Normalgeschwindigkeit ist ein Bildsuchlauf in Farbe und bis zur ± 50 -fachen Normalgeschwindigkeit in Schwarzweiß möglich, so daß die Aufnahme schnell überprüft werden kann. Außerdem ermöglicht der TBC, das Videorecorder-Wiedergabesignal direkt – d.h. ohne externen TBC – auf den Sender zu schalten.

Hinweis

Der BKH-2350 kann in die Videorecorder BVH-2000PS mit einer Seriennummer von über 33401 eingesetzt werden.

- BKH-2016 CCJ-Konverter (nur bei BVH-2000PS(00), (02) und (04))**



Dieser Konverter dient als Interface zum Anschluß des BVH-2000PS an einen konventionellen Videorecorder oder an eine Schnitt-Steuereinheit mit einem CCJ-Typ (10-polig, rund) Fernbedienungs-Anschluß. Er kann an der Rückseite des BVH-2000PS angebracht werden.

Anzuschließende Geräte:

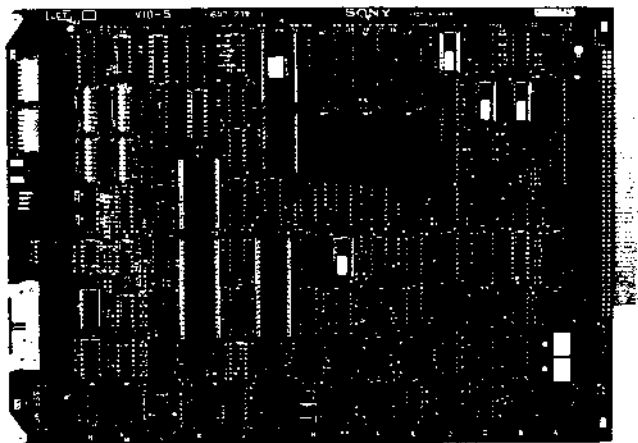
Schnitt-Steuereinheit: BVE-500ACE, BVE-5000P etc.

Videorecorder: BVH-1100PS, BVH-1100APS, BVH-1180PS etc.

Sonstige Geräte: IF-1000CE*, BVR-1000, DTR-1100 etc.

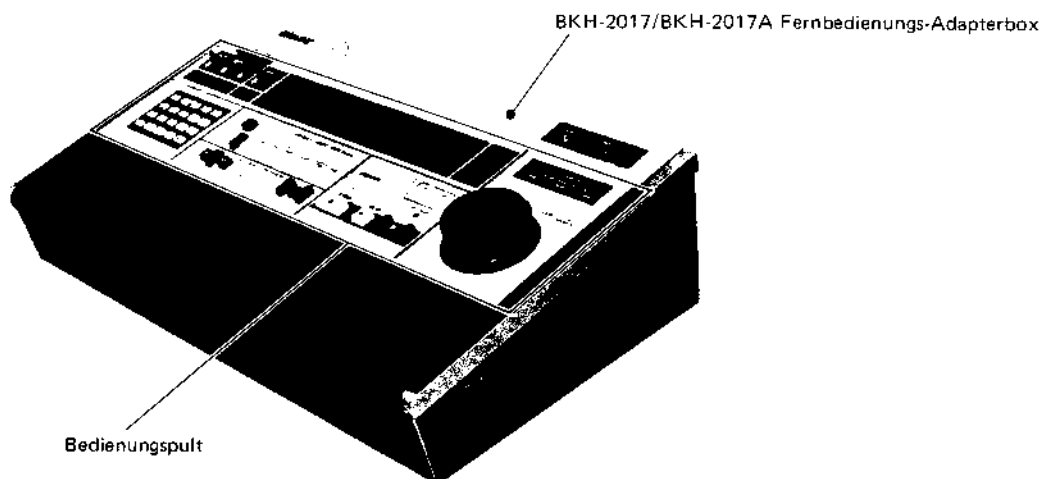
* Bei Verwendung des IF-1000CE ist das Netzteil PU-2016 (Sonderzubehör) ebenfalls erforderlich.

BK-5005 BVE-5000P-Interface-Leiterplatte



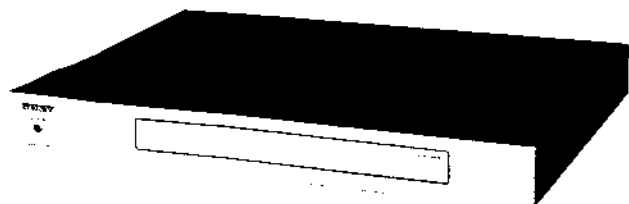
Diese Interface-Leiterplatte ermöglicht Anschluß des BVH-2000PS an die automatische Schnitt-Steuereinheit BVE-5000P. Zwei 9-pol D-sub Anschlüsse werden bei der Leiterplatte mitgeliefert. (Wird diese Leiterplatte in die BVE-5000P eingesetzt, so ist der BKH-2016 CCJ-Konverter nicht erforderlich.)

BKH-2017/BKH-2017A Fernbedienungs-Adapterbox



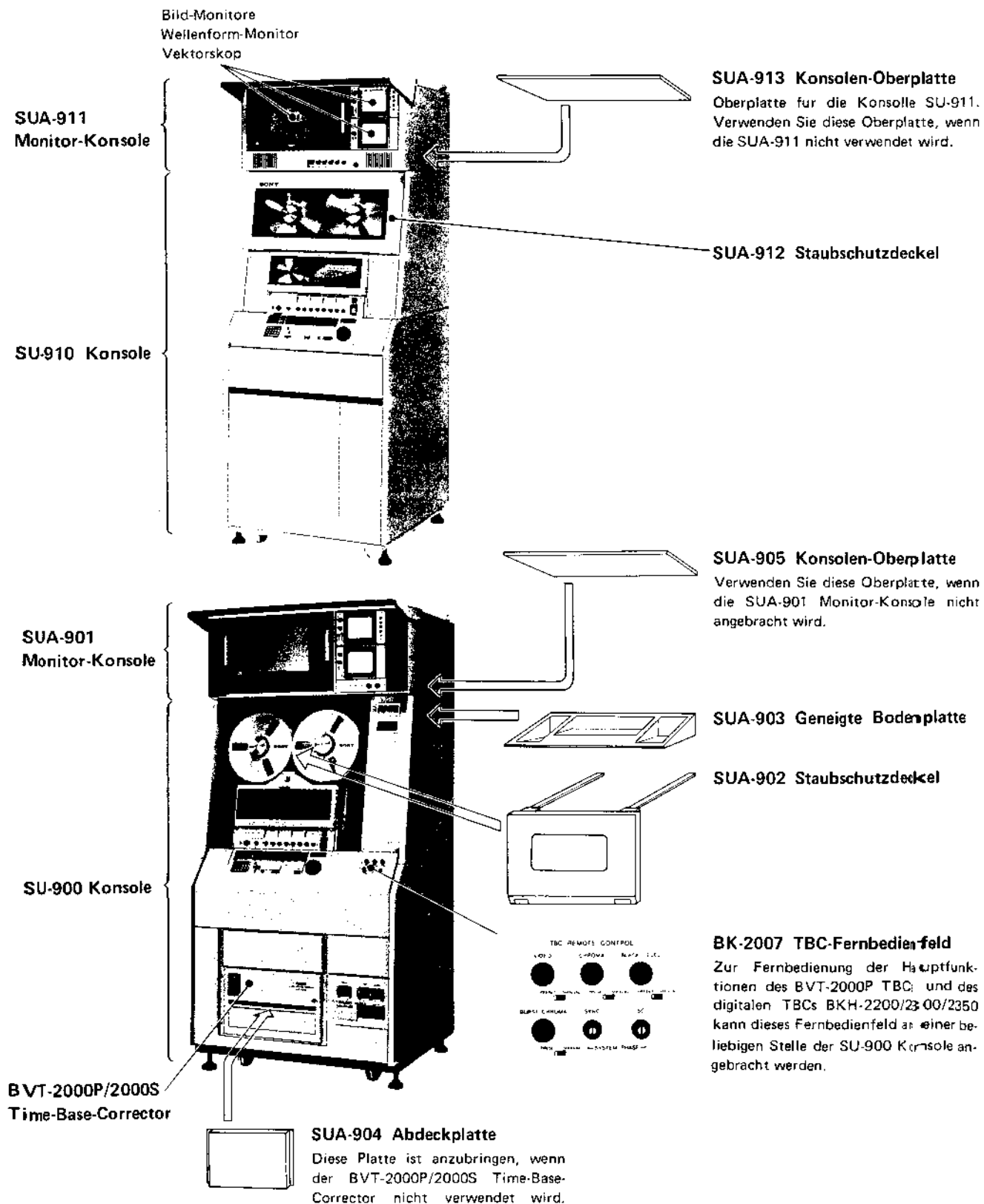
In diese Box können die Bedienungs-pulte BKH-2011/2012/2013 eingebaut werden, um den BVH-2000PS fernzu-bedienen. In der Box ist ein Serien-Datenverarbeitungssystem sowie ein Netzteil eingebaut, und zur bequemeren Bedie-nung ist das Gehäuse abgeschrägt. Das Anschlußkabel kann bis auf 500m verlängert werden.

BKH-2018 9P-CCJ Konverter

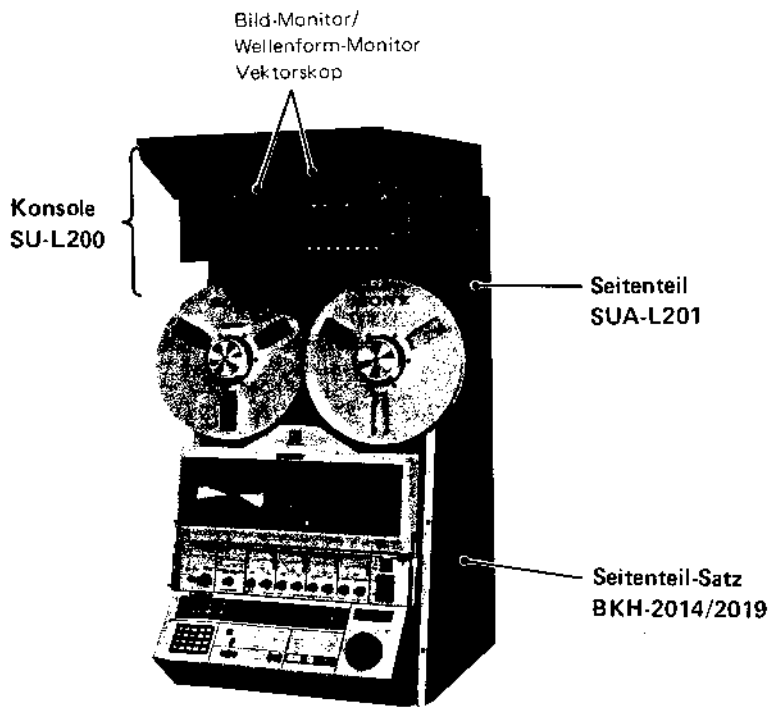


Verwenden Sie diesen Konverter, wenn der BVH-1100PS/1100APS/1180PS mit dem BVH-2000PS bedient werden soll.

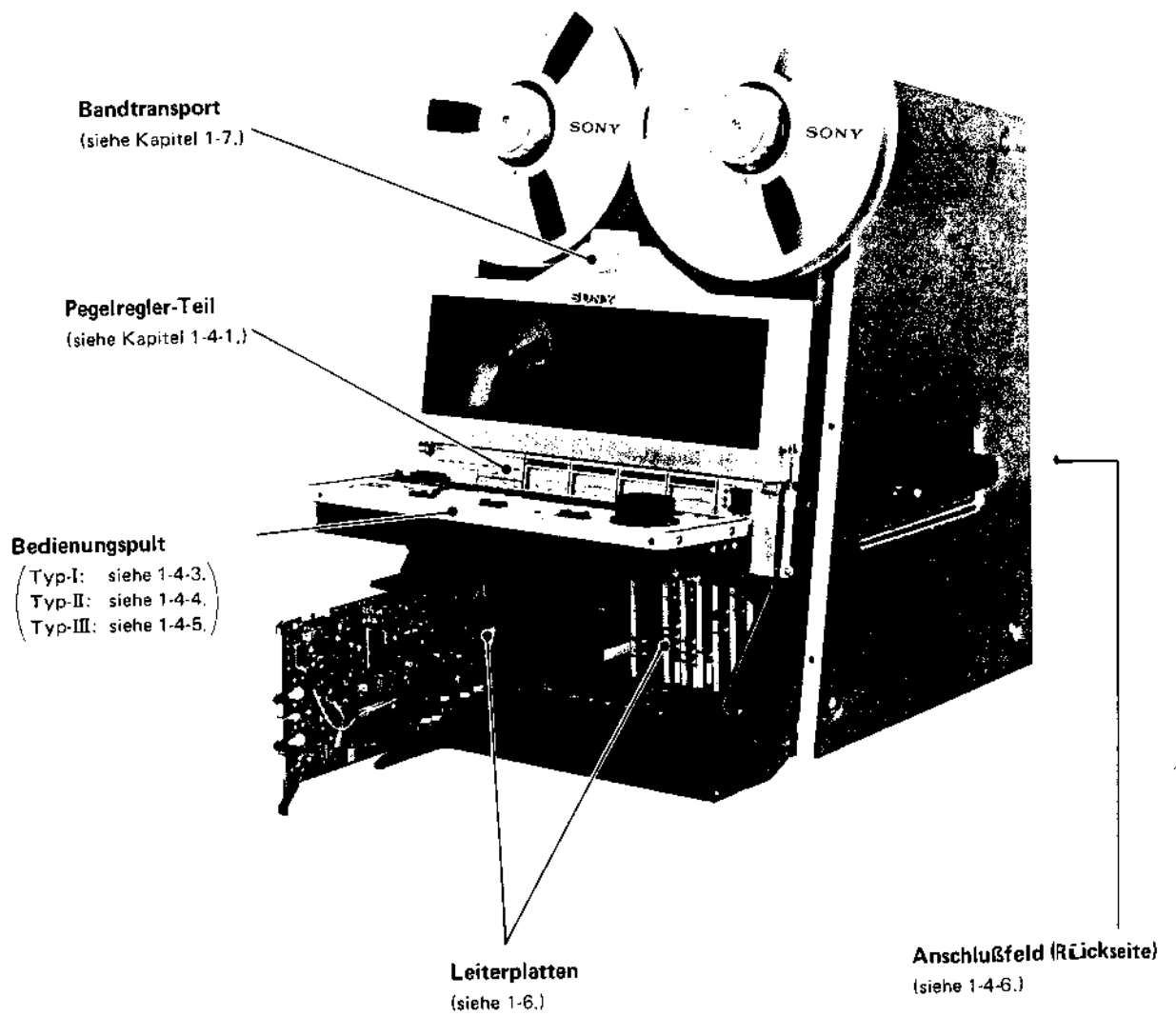
Rack-Sonderzubehör



- Ihr Sony Händler gibt Ihnen gerne weitere Auskünfte zu den Sonderzubehörteilen.

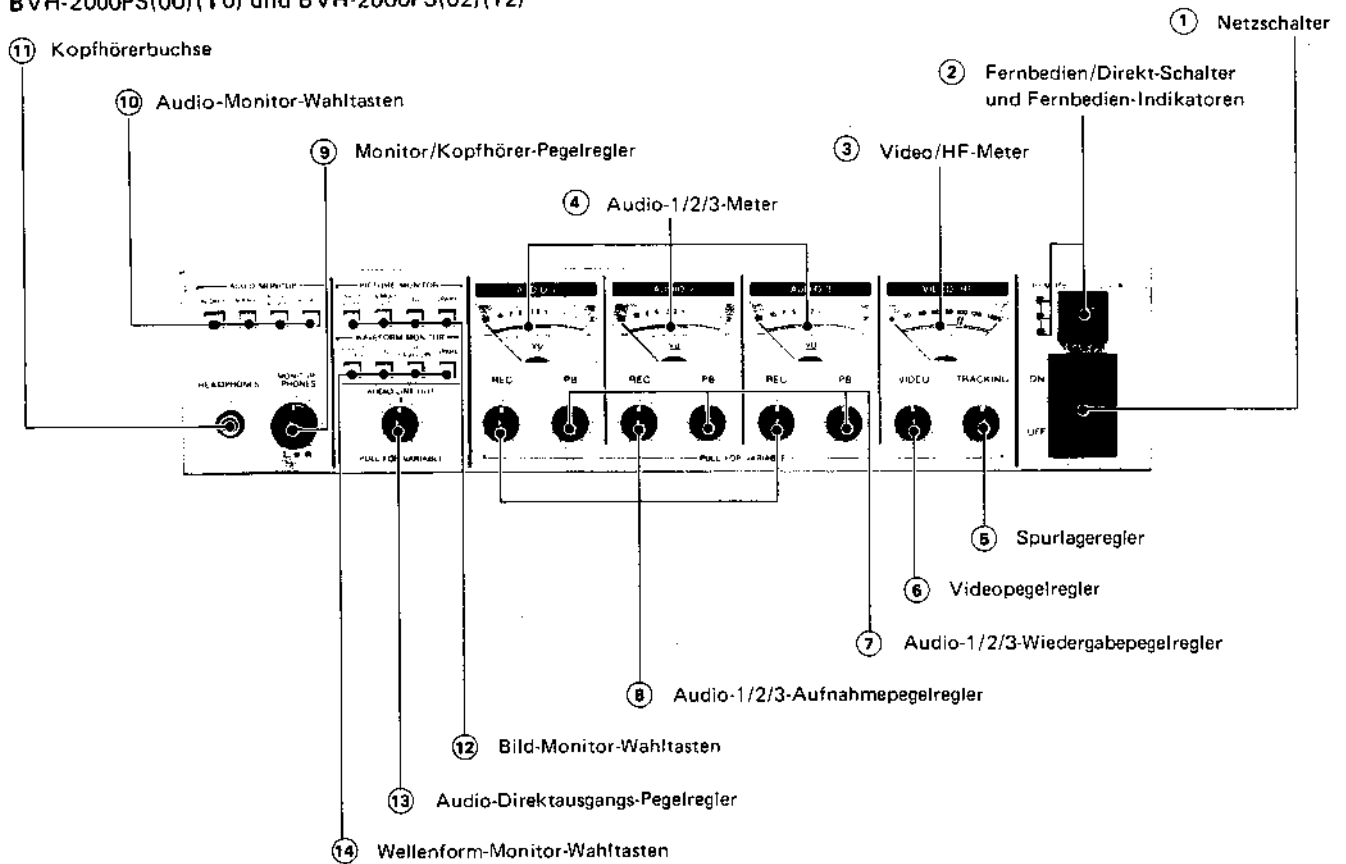


1-4. LAGE UND FUNKTION DER TEILE

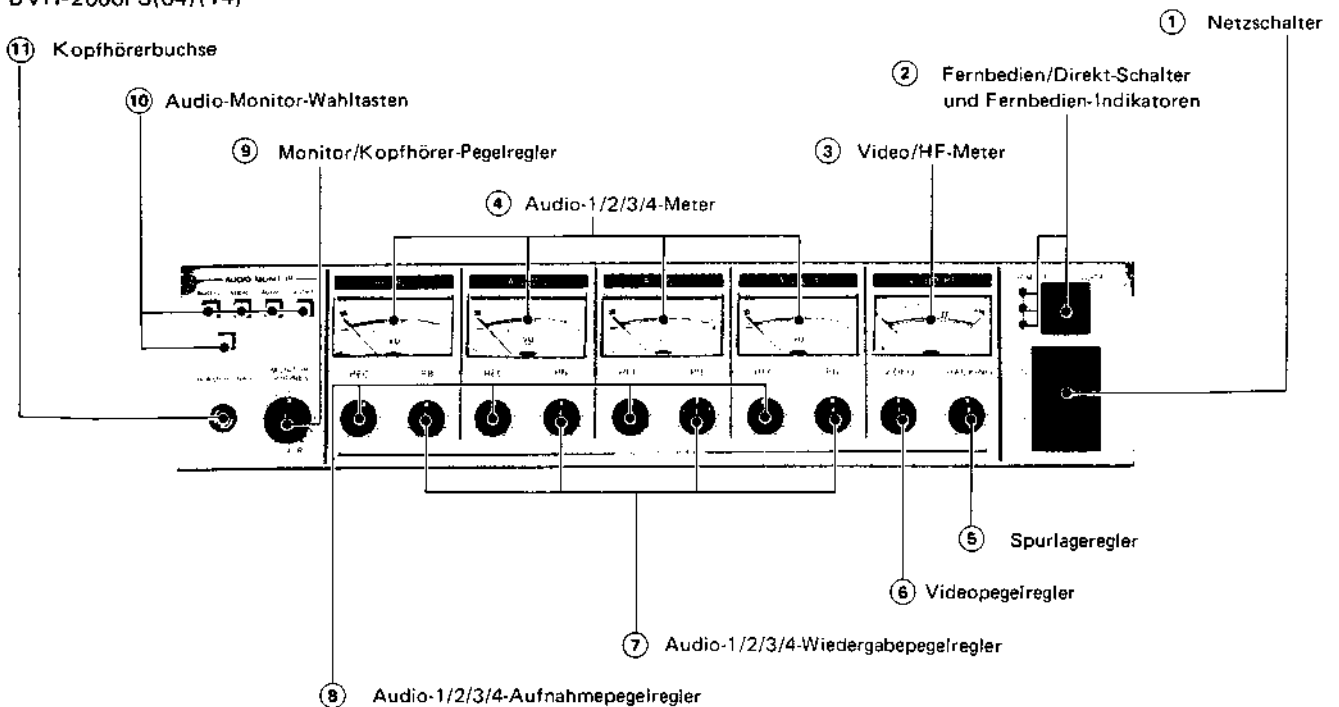


1-4-1. Pegelregler-Teil

BVH-2000PS(00) (10) und BVH-2000PS(02) (12)



BVH-2000PS(04) (14)



① **Netzschalter [ON/OFF]**

Wird dieser Schalter eingeschaltet, leuchtet das Display des Bedienungspultes auf, wird auf den Typ-II- bzw. Typ-III-Bedienungspult „INITIAL“ angezeigt, und der Videorecorder schaltet automatisch nach 2 Sekunden die Stop-Funktion.

② **Fernbedien/Direkt-Schalter und Fernbedien-Indikatoren [REMOTE/LOCAL]**

REMOTE: Wird ein Fernbedienungssignal von einem anderen Videorecorder oder von einer Schnitt-Steuereinheit an den REMOTE 1-, 2- oder 3-Anschluß geleitet und ist der REMOTE-Schalter der SY-79 Leiterplatte auf das entsprechende Fernbedienungssignal eingestellt, so wird der BVH-2000PS von den externen Geräten fernbedient.

In dieser Stellung sind alle Bedienungselemente des Bedienungspultes wirkungslos, da alle Funktionen von dem externen Gerät fernbedient werden. Die Indikatoren und die Timer-Anzeige zeigen weiterhin den gleichen Zustand an, wie vor der Umstellung des Schalters auf REMOTE. Durch Umstellung des Schalters S9 auf der SY-79-Leiterplatte ist auch die folgende Betriebsart möglich:

S9-5 (REM LOC STOP EN):

Nur die STOP-Taste arbeitet.

S9-4 (REM LOC KEY EN):

Die STOP-, REC-, PLAY-, SHUTTLE-, JOG-, VAR- und STANDBY-Tasten und der Suchlaufknopf arbeiten.

(Genauere Informationen siehe Teil 2 ff.)

LOCAL: Verwenden Sie diese Stellung, wenn der BVH-2000PS alleine betrieben wird oder wenn ein weiterer, am REMOTE-Anschluß angeschlossener Videorecorder für Parallel- oder Schnittbetrieb vom BVH-2000PS fernbedient werden soll.

Fernbedien-Indikatoren [REMOTE] (drei)

Zur Anzeige des momentan verwendeten REMOTE-Anschlusses leuchtet beim Fernbedienungsbetrieb einer dieser Indikatoren (1, 2 oder 3) auf.

Indikator 1: Leuchtet bei Verwendung von REMOTE-1-Anschluß.

(Fernbedienung über BKH-2016 CCJ-Konverter)

Indikator 2: Leuchtet bei Verwendung von REMOTE-2-Anschluß.

(Fernbedienung über RS-422 Seriencode)

Indikator 3: Leuchtet bei Verwendung von REMOTE-3-Anschluß.

(Fernbedienung über parallele IN/OUT-Signale)

Hinweis

Bei der entsprechenden Einstellung des REMOTE/LOCAL-Schalters leuchtet der Indikator 1, was aber beim BVH-2000PS(10), (12), und (14) bedeutungslos ist, da diese Geräte keinen REMOTE-1-Anschluß besitzen.

③ **Video/HF-Meter [VIDEO/RF]**

Zeigt den Video-Signalpegel an. Mit dem METER-Schalter auf der MD-14-Leiterplatte können folgende Anzeigen eingestellt werden.

Schalterstellung	Anzeige
RF(V)	Bei E-zu-E-Betrieb wird der Eingangspegel des Videosignals angezeigt und bei Wiedergabe der Pegel des HF-Signals vom Videokopf.
INPUT	Es wird stets der Videosignaleingangspegel angezeigt.
RF(S) (nur bei BVH-2000PS (00), (02), (04))	Bei E-zu-E-Betrieb wird der Eingangspegel des Videosignals angezeigt und bei Wiedergabe der Pegel des HF-Signals vom Sync-Kopf.

④ **Audio-1/2/3/4-Meter* [AUDIO-1/2/3/4]**

Zur Anzeige des Audio-Signalpegels. Der Signalpegel des mit dem TAPE/EE-Wähler am Bedienungspult gewählten Signals wird hier angezeigt.

* Nur der BVH-2000PS(04)(14) ist mit einem AUDIO-4-Meter ausgestattet.

Video-Recorder-Funktion Stellung des TAPE/EE-Wählers	STOP-Funktion	REC- oder EDIT-Funktion	Sonstige Funktionen
TAPE	Band	Band*3 (MONITOR)	Band
TAPE/EE	E-zu-E*1	E-zu-E	Band
INPUT*2	Eingang	Eingang	Eingang

*1 • Nur das AUDIO-3-Meter zeigt den Bandpegel an. Das AUDIO-3-Meter zeigt den E-zu-E-Signalpegel an, wenn der TAPE/EE-Wähler einmal auf INPUT gestellt wird. Sobald danach die Videorecorder-Funktion geändert wird, zeigt dieses Meter den Band-Pegel an.

*2 • In der Stellung INPUT wird der an den REC-Reglern eingestellte Signalpegel angezeigt.

• Steht der EE-Schalter (S9-3) der SY-80-Leiterplatte auf ON, so befindet sich der Videorecorder in der Zwangs-E-zu-E-Funktion und der Pegel des E-zu-E-Signals wird selbst in der Stellung INPUT angezeigt.

*3 • Beim BVH-2000PS(00)(10) erhält man ein E-zu-E-Signal.

⑤ **Spurlagerregler [TRACKING]**

Herausgezogen: Kompensation von Spurlagfehlern bei Wiedergabe. Stellen Sie den Regler so ein, daß das VIDEO/RF-Meter maximal ausschlägt.

Gedrückt: Voreingestellte Spurlage.

⑥ **Videopegelregler [VIDEO]**

Herausgezogen: Zur Einstellung des Video-Aufnahmepegels. Stellen Sie diesen Regler so ein, daß der Zeiger des VIDEO/RF-Meters bis in die blaue Zone ausschlägt.

Gedrückt: Voreingestellter Pegel.
(Zur Voreinstellung siehe Kapitel 1-6-2.)

⑦ **Audio-1/2/3/4-Wiedergabepegelregler**
[AUDIO-1/2/3/4 PB] *

Herausgezogen: Zur Einstellung der Audio-Wiedergabepegel. Stellen Sie die Regler so ein, daß die AUDIO-1/2/3-Meter in den Spitzen bis 0VU ausschlagen.

Gedrückt: Voreingestellter Pegel.
(Zur Voreinstellung siehe Kapitel 1-6-2.)

⑧ **Audio-1/2/3/4-Aufnahmepegelregler**
[AUDIO-1/2/3/4 REC] *

Herausgezogen: Der Audio-Aufnahmepegel kann für den Aufnahme- und Schnittbetrieb eingestellt werden.

Stellen Sie die Regler so ein, daß die AUDIO-1/2/3/4-Meter in den Spitzen bis 0VU ausschlagen.

Gedrückt: Voreingestellter Pegel.
(Zur Voreinstellung siehe Kapitel 1-6-2.)

- Das AUDIO-3-Meter kann zur Anzeige des am MIC INPUT-Anschluß (Rückseite) anliegenden Mikrophon-Eingangssignales verwendet werden. Die Wahl zwischen LINE- und MIC-Eingang erfolgt am Schalter A-3 SEL auf der AE-03-Leiterplatte (siehe Kapitel 1-6-3.).
- Wenn der A-3 SEL-Schalter auf TC-Betrieb und auf INT oder EXT-1 gestellt ist, arbeitet der AUDIO-3 REC-Regler nicht.

⑨ **Monitor/Kopfhörer-Pegelregler**
[MONITOR/PHONES]

Zur Einstellung der Kopfhörer-Lautstärke und des Ausgangspegels an den AUDIO MONITOR OUTPUT-Anschlüssen (Rückseite). Beim Anschluß eines Kopfhörers wird das Audio-Signal nicht an die AUDIO MONITOR OUTPUT-Anschlüsse geleitet. (Der Kopfhörer besitzt Vorrang.)

⑩ **Audio-Monitor-Wahltasten [AUDIO MONITOR]**

Mit diesen Tasten können die an der HEADPHONES-Buchse und an den MONITOR OUTPUT-Buchsen anliegenden Signale wie folgt gewählt werden:

Gedrückte Taste \ Audio-Kanal	L	R
	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4
AUDIO-1 AUDIO-2	AUDIO-1	AUDIO-2

Stereoton erhält man durch Drücken der

AUDIO-1
AUDIO-2

-Taste

⑪ **Kopfhörerbuchse [HEADPHONES]**

Zum Anschluß eines 8-Ohm Kopfhörers. Die mit den AUDIO MONITOR-Wahltasten ⑩ gewählten Aus-

gangssignale können über Kopfhörer mitgehört werden. Bei herausgezogenem Kopfhörer werden die Audio-Signale an die AUDIO MONITOR OUTPUT-Anschlüsse geleitet. (Der Kopfhörer besitzt Vorrang.)

⑫ **Bild-Monitor-Wahltasten [PICTURE MONITOR]****

Zur Wahl des am VIDEO MONITOR OUTPUT-Anschluß auf der Rückseite anliegenden Signals.

INPUT VIDEO: Für das am VIDEO INPUT-Anschluß angeschlossene Video-Signal.

DEMOD OUT: Für das Video-Signal am Demodulator-Ansgang.

TBC: Für das Video-Signal vom TBC MONITOR INPUT-Anschluß.

SPARE: Für das dem SPARE MONITOR INPUT-Anschluß zugeleitete Signal. Falls der digitale Time-Base-Corrector BKH-2200/2300/2350 eingesetzt ist, wird das Video-Ausgangssignal des BKH-2200/2300/2350 gewählt, wenn der Schalter S1 der VM-01-Leiterplatte entsprechend eingestellt wird. (Siehe Kapitel 1-4-6.)

- Steht der TAPE/EE-Wähler auf INPUT, so wird automatisch auf INPUT VIDEO geschaltet. Wird der Wähler auf eine andere Postion (nicht INPUT) zurückgestellt, so wird automatisch auf das vorher gewählte Ausgangssignal geschaltet.

⑬ **Audio-Direktausgangs-Pegelregler**
[AUDIO LINE OUT]**

Herausgezogen: Die an den AUDIO-1/2 LINE OUTPUT-Anschlüssen anliegenden Audio-Wiedergabepegel von Kanal 1 und 2 können gleichzeitig eingestellt werden. Die Pegel können um ± 6 dB gegenüber der Einstellung an den AUDIO-1/2 PB-Reglern variiert werden.

Gedrückt: Die Regler bleiben wirkungslos.

⑭ **Wellenform-Monitor-Wahltasten**
[WAVEFORM MONITOR]**

Zur Wahl des dem WFM MONITOR OUTPUT-Anschluß auf der Rückseite zugeleiteten Signals.

SELECTED VIDEO: Für das mit den PICTURE MONITOR-Wahltasten ⑫ gewählte Ausgangssignal.

CTL: Für das CTL-Wiedergabesignal.

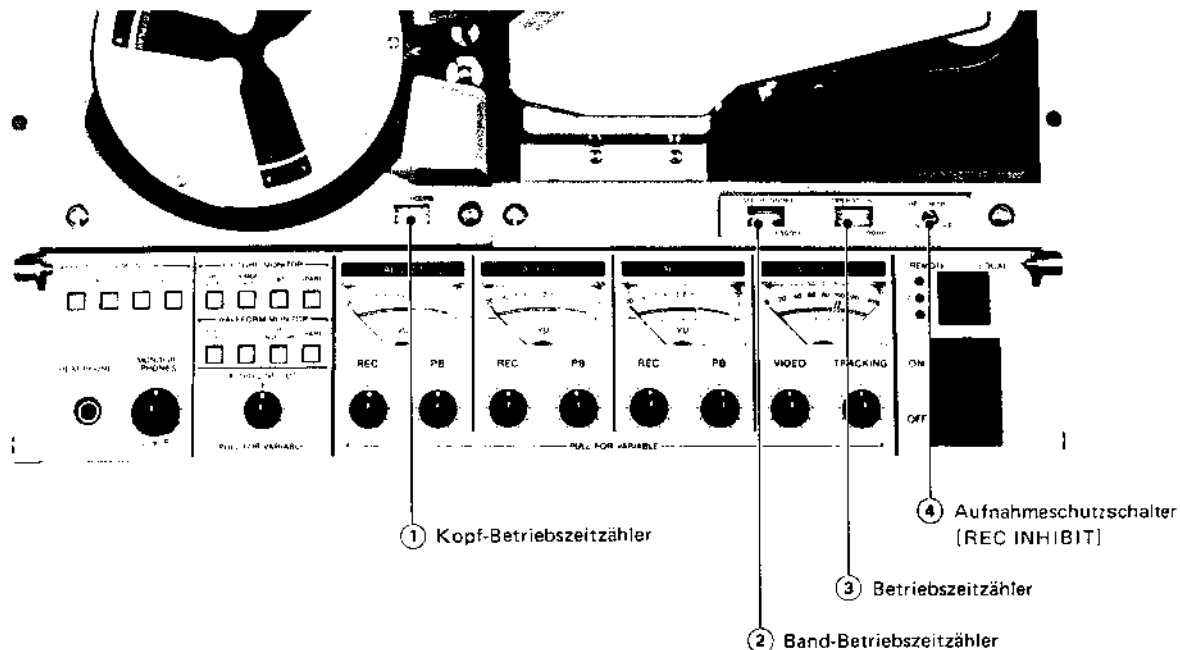
RF ENVELOPE: Für die HF-Hüllkurve des vom Videokopf wiedergegebenen FM-Signals.

SPARE: (kein Anschluß)

* Nur der BVH-2000PS(04)(14) ist mit einem AUDIO-4 REC-Regler, AUDIO-4 PB-Regler und einer AUDIO-4-Taste ausgestattet.

** Der BVH-2000PS(00)(10) und der BVH-2000PS(02)(12) sind mit diesem Regler bzw. diesen Tasten ausgestattet. Dieser Regler bzw. diese Tasten des BVH-2000PS(04)(14) arbeiten nur, wenn das Gerät in einem Rack mit den entsprechenden Bedienelementen eingebaut ist.

1-4.2. Pegelregler-Peripherie



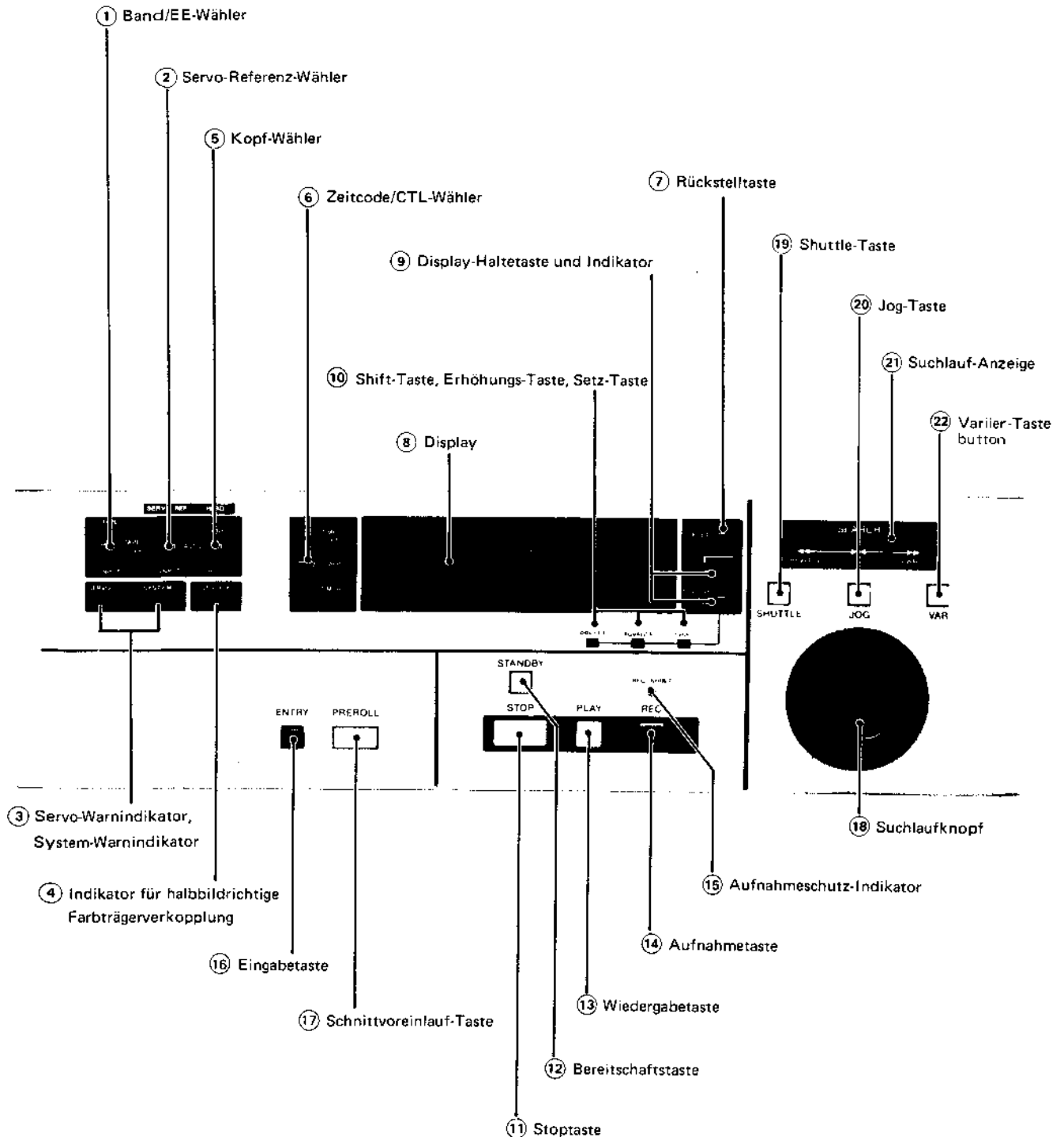
- ① **Kopf-Betriebszeitähler [HEAD HOURS]**
Zeigt die bis zum Erreichen von 1000 Stunden noch verbleibende Zeit an. Der Zähler startet, sobald sich die Kopftrommel dreht und das Band eingelegt ist.
- ② **Band-Betriebszeitähler [TAPE RUNNING]**
Zeigt die bis zum Erreichen von 5000 Stunden noch verbleibende Zeit an. Der Zähler arbeitet nicht in der Stop-Funktion.
- ③ **Betriebszeitähler [OPERATION]**
Zeigt die bis zum Erreichen von 10.000 Stunden noch verbleibende Zeit an. Der Zähler arbeitet, sobald der ON/OFF-Schalter eingeschaltet ist, und registriert die Gesamt-Betriebszeit des Videorecorders.
- ④ **Aufnahmeschutzschalter [REC INHIBIT]**
Dieser Schalter dient zum Schutz vor der Aufnahme- und Schnittaufnahmefunktion.
ON: Der Videorecorder nimmt nicht auf, selbst wenn die REC- oder EDIT-Taste auf dem vorderen Bedienungspult gedrückt wird. Selbst wenn der Videorecorder mit Fernbedienung betrieben wird, nimmt er den Aufnahmebefehl nicht an.
OFF: Die REC/EDIT-Tasten können normal bedient werden.

Hinweis: In Abhängigkeit von der Stellung der Schalter auf dem vorderen Bedienungspult und der LG-02-Leiterplatte hat der REC INHIBIT-Schalter die in der nachfolgenden Tabelle aufgeführten Funktionen.

REC INHIBIT-Schalter		REC INHIBIT-Betrieb
Vorderes Bedienungspult	LG-02-Leiterplatte	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

Wenn hauptsächlich der REC INHIBIT-Schalter auf dem vorderen Bedienungspult verwendet wird, lassen Sie den Schalter auf der LG-02-Leiterplatte auf OFF stehen oder entfernen Sie ihn.

1-4-3. Bedienungspult – Typ 1



- ① **Band/EE-Wähler [TAPE/EE]**
 Zur Wahl des Ausgangssignals an den VIDEO OUTPUT-, AUDIO OUTPUT- und MONITOR OUTPUT-Anschlüssen. Das Ausgangssignal hängt wie folgt von der Position dieses Wählers und der Betriebsart des Videorecorders ab.

AUDIO

AUDIO-Kanal	Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				
		STANDBY*4 ausgesch.	STANDBY*4 eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT- Punkten des Recorders im PREVIEW- Betrieb*2
A1, A2, A4	TAPE	Band	Band	EE	Band *1	EE
		Band	Band	Mon.*6	Band *1	EE
	TAPE/EE	EE	EE (Band)*5	EE	Band *1	EE
		EE	EE (Band)*5	EE	Band *1	EE
	INPUT*3	EE	EE (Band)*5	EE	Band *1	EE
		Eingang	Eingang	Eingang	Eingang	Eingang
A3	TAPE	Band	Band	EE	Band	EE
		Band	Band	Mon.*6	Band	EE
	TAPE/EE	Band	Band	EE	Band	EE
		Band	Band	EE	Band	EE
	INPUT	EE	EE	EE	Band	EE
		Eingang	Eingang	Eingang	Eingang	Eingang

: Ausgangssignal an AUDIO LINE OUTPUT-Anschlüssen
 : Ausgangssignal an AUDIO MONITOR OUTPUT-Anschlüssen

- *1 Wird mit 5-facher oder höherer Normalgeschwindigkeit wiedergegeben, so erfolgt eine Bedämpfung des Ausgangssignals.
- *2 Ist der Schalter SW8-5 auf der SY-80-Leiterplatte auf ON gestellt, so wird das Ausgangssignal zwischen den IN- und OUT-Punkten unterbrochen.
- *3 Steht der Wähler auf INPUT und ist der Schalter SW9-3 auf der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang in allen Betriebsarten das E-zu-E-Signal an.
- *4 Wird in der Stop-Funktion auf INPUT gestellt, so wird das E-zu-E-Signal auf dem AUDIO-3-Kanal gehalten und liegt selbst dann noch an den AUDIO LINE OUTPUT- und MONITOR OUTPUT-Anschlüssen an, wenn danach auf TAPE oder TAPE/EE umgeschaltet wird. Das Halten des E-zu-E-Signals wird abgebrochen, sobald der Videorecorder in eine andere Betriebsart umgeschaltet wird.
- *5 Ist der REC INHIBIT-Schalter auf ON gestellt, liegt am Ausgang das Bandsignal an.
- *6 Beim BVH-2000PS(00)(10) liegt das E-zu-E-Signal am Ausgang an.

② Servo-Referenz-Wähler [SERVO REF]

Zur Wahl des Referenzsignals für die Servoverriegelung.

EXT: Das am REF VIDEO INPUT-Anschluß ③ am Video-Anschlußfeld angeschlossene Signal (FBAS-Signal) wird Referenzsignal.

AUTO: In der Aufnahme-, Schnittaufnahme- und Schnitt-Funktion wird das Video-Eingangssignal zum Referenzsignal. In der Wiedergabe-Funktion wird das externe Referenzsignal herangezogen (automatische Umschaltung).

INPUT: Das am VIDEO INPUT-Anschluß am Video-Anschlußfeld angeschlossene Signal wird zum Referenzsignal.

- Der bei Wiedergabe notwendige Vorlauf des Synchronsignals kann am ADVANCE-Schalter auf der CD-17-Leiterplatte eingestellt werden (siehe Kapitel 1-6-3).

③ SERVO-Warnindikator (rot)/SYSTEM-Warnindikator (rot)

(Siehe Kapitel 1-14.)

Diese Indikatoren warnen vor inkorrektem Betrieb des Videorecorders.

SERVO-Warnindikator

Zeigt an, daß das Servosystem nicht richtig arbeitet oder noch nicht synchronisiert ist.

SYSTEM-Warnindikator

Zeigt an, daß die System-Steuerung nicht einwandfrei arbeitet.

④ Indikator für halbbildrichtige Farbträgerverkopplung [CF LOCK] (grün)

Leuchtet auf, wenn der Videorecorder mit halbbildrichtiger Farbträgerverkopplung arbeitet. Die Ein- und Ausschaltung der halbbildrichtigen Farbträgerverkopplung erfolgt an den Schaltern der CD-17- und SR-15-Leiterplatten (siehe Kapitel 1-6-3).

⑤ Kopf-Wähler [HEAD]

Zur Wahl des Wiedergabekopfes für das Video-Signal.

R/P: Die Wiedergabe erfolgt mit dem Aufnahme/Wiedergabe-Kopf.

PLAY: Die Wiedergabe erfolgt mit dem Wiedergabe-Kopf. Die Wiedergabe erfolgt mit dynamischer Spurlage, wenn der Videorecorder mit einer entsprechenden Funktion ausgestattet ist.

Der Schnitt- und der Schnittaufnahme-Betrieb werden stets mit dem Aufnahme/Wiedergabe-Kopf durchgeführt, unabhängig von der Stellung des Kopf-Wählers.

- Dieser Wähler arbeitet nur beim BVH-2000PS(02) (12) und BVH-2000PS(04)(14). Beim BVH-2000PS(00)(10) arbeitet unabhängig von der Position stets der Aufnahme/Wiedergabe-Kopf.

⑥ Zeitcode/CTL-Wähler [TIME CODE/TIMER]

Zur Wahl der auf dem Display ⑧ erscheinenden Bandlaufzeit-Anzeigeart.

TIME CODE: Zur Anzeige des EBU-Zeitcodes. Der CH3 INPUT-Schalter auf der AE-03-

Leiterplatte ist auf TC zu stellen (siehe Kapitel 1-6-3). Der A-3 SEL-Schalter auf der AE-03-Leiterplatte dient zur Wahl zwischen externem und internem Zeitcode (sofern die getrennt lieferbare BKH-2015-Leiterplatte eingesetzt ist). Der TC/U-BIT-Schalter auf der BKH-2015/2015A-Leiterplatte (TC-14/14A) dient zur Wahl zwischen Zeitcode- und Benutzer-Bit-Anzeige. Normalerweise wird der vom Zeitcode-Leser gelesene Wert angezeigt; steht jedoch der TAPE/EE-Wähler ① auf INPUT, wird das Signal des Zeitcode-Gebers angezeigt. Steht der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC, so arbeitet die Schnitvovoreinlauf-Funktion nicht.

TIMER-1: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. Durch Drücken der RESET-Taste ⑦ kann an jeder beliebigen Bandstelle auf null zurückgestellt werden. Es wird dann eine neue, an dieser Bandstelle beginnende Bandlaufzeit angezeigt.

TIMER-2: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. In dieser TIMER-2-Stellung ist jedoch keine Rückstellung auf null mehr möglich, nachdem das Band einmal eingefädelt ist.

Die auf dem Display angezeigten TIME CODE-, TIMER-1-bzw. TIMER-2-Daten können auch als Schnitvovoreinlauf-Punkte eingegeben werden.

- Sowohl bei TIMER-1 als auch bei TIMER-2 beginnt das Zählen der Bandlaufzeit, sobald das Gerät in eine Betriebsfunktion (außer Stop-Funktion) gestellt wird. Bei TIMER-2 erhält man stets den Punkt als Nullpunkt, an dem nach dem Einfädeln des Bandes auf eine Betriebsfunktion umgeschaltet wurde. Rückstellen der Anzeige an einem beliebigen Bandpunkt ist nur bei TIMER-1 möglich.
- Wird das Gerät bei eingelegtem Band ausgeschaltet, so bleiben die TIMER-1- und TIMER-2-Daten dank einem eingebauten Puffer-Kondensator 12 Stunden lang abgespeichert, so daß sie innerhalb dieses Zeitraumes stets wiederverwendet werden können.

⑦ Rückstelltaste [RESET]

(1) TIMER-1-Rückstellung

Steht der TIME CODE/TIMER-Wähler auf TIMER-1, so können die auf dem Display ⑧ angezeigten TIMER-1-Daten auf null zurückgestellt werden. Rückstellung der TIMER-2-Daten ist nicht möglich.

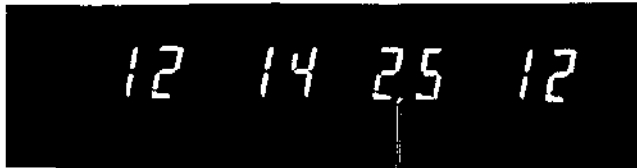
(2) TIME-CODE-Rückstellung

Steht der TIME CODE/TIMER-Wähler auf TIME CODE und der TAPE/EE-Wähler ① auf INPUT, so wird das vom Zeitcode-Generator gelieferte Signal

auf dem Display angezeigt. Durch Drücken der RESET-Taste kann der Zeitcode-Generator auf null zurückgesetzt werden. Wenn die Benutzer-Bits auf dem Display angezeigt werden, so werden die Benutzer-Bits auf null zurückgesetzt.

⑧ **Display**

Dieses grüne Fluoreszenz-Display besitzt 7 Segmente und 8 Spalten.



Cursor

⑨ **Display-Haltetaste und Indikator [DISPLAY HOLD]**

Wird diese Taste an einer beliebigen Bandstelle gedrückt, so werden die gerade auf dem Display ⑧ angezeigten Daten gehalten, und der DISPLAY HOLD-Indikator leuchtet auf. Durch erneutes Drücken erlischt dieser Indikator wieder, und es werden die gerade gelesenen Daten angezeigt.

⑩ **Shift-Taste [SHIFT], Erhöhungstaste [ADVANCE], Setztaste [PRESET]**

Zum Eingeben von beliebigen TIMER-1- und TIME CODE-Daten. Die Tasten sind jedoch nicht verwendbar für TIMER-2. Ist die DISPLAY HOLD-Taste ⑨ gedrückt, so haben diese Tasten folgende Funktionen:

- SHIFT-Taste:** Um den Cursor auf dem Display nach vorne zu bewegen. Bei jedem Drücken bewegt sich der Cursor um eine Stelle nach vorne. Ist er an der ersten Stelle angelangt, kehrt er wieder zur letzten Stelle zurück.
- ADVANCE-Taste:** Zum Ändern der über dem Cursor angezeigten Ziffer. Bei jedem Drücken wird der Wert um eins erhöht.
- PRESET-Taste:** Wird an allen Stellen der gewünschte Wert angezeigt, so können durch Drücken dieser Taste die Werte als Daten eingegeben werden.

(1) **Daten-Eingabe für TIMER-1**

Stellen Sie den TIME CODE/TIMER-Wähler ⑥ auf TIMER-1 und halten Sie die Daten durch Drücken der DISPLAY HOLD-Taste ⑨. Geben Sie dann die gewünschten Daten unter Verwendung der drei Tasten ein. Das Eingeben der Daten ist nicht möglich, wenn sich TIMER-1 in der „+/-“ Anzeig-Funktion (Schalter S9-5 der SY-80-Leiterplatte steht auf ON) befindet.

(2) **Dateneingabe für TIME CODE**

Stellen Sie den TIME CODE/TIME-Wähler ⑥ auf TIME CODE. Stellen Sie nun den Videorecorder auf STOP/STANDBY und halten Sie die Anzeige durch Drücken der DISPLAY HOLD-Taste ⑨. Stellen Sie dann den Startpunkt des Zeitcode-Generators wunschgemäß mit den obigen 3 Tasten ein. Werden die Benutzer-Bits angezeigt, so können diese wunschgemäß eingestellt werden. Stellen Sie den TAPE/EE-Wähler ① auf INPUT. Das vom Zeitcode-Generator gelieferte Signal wird dann angezeigt.

⑪ **STOP-Taste**

Durch Drücken der STOP-Taste werden alle Betriebsfunktionen gestoppt. Der Spulen-Motor stoppt, und die Andruckrolle fährt vom Band zurück.

- Ca. 30 Sekunden nach Drücken der STOP-Taste spricht der Spannungs-Abschaltmechanismus an, und das Gerät geht in den Bereitschaftsbetrieb über (geringere Bandspannung). Ist der Spannungs-Abschaltmechanismus nicht erwünscht, so stellen Sie den TENSION OFF ENABLE-Schalter (S9-7) der SY-79-Leiterplatte auf OFF.
- Das Gerät schaltet automatisch in die Stop-Funktion, wenn es eingeschaltet wird oder wenn sich kein Band am Band-Sensor befindet.
- Ein Blinken des STOP-Indikators zeigt an, daß dem Servosystem kein Referenzsignal zugeleitet wird.
- Wenn in der Stop- oder Bereitschafts-Funktion ein Band-Durchhang auftritt, so wird das Band automatisch nachgespannt.

⑫ **Bereitschaftstaste [STANDBY]**

Diese Taste dient zum Starten der Kopftrommel-Rotation. Drücken Sie bei normalem Betrieb zunächst diese STANDBY-Taste, überprüfen Sie, ob der SERVO-Indikator ③ erloschen ist, und schalten Sie dann in die gewünschte Betriebsfunktion um. Es kann jedoch auch direkt, ohne vorheriges Drücken der STANDBY-Taste, auf die gewünschte Funktion geschaltet werden. Ist ca. 9 Minuten nach Drücken der STANDBY-Taste noch keine andere Taste gedrückt worden, so wird die Bereitschafts-Funktion automatisch abgeschaltet.

- Wird der STANDBY OFF ENABLE-Schalter (S9-8) der SY-79-Leiterplatte auf OFF gestellt, so arbeitet die automatische Abschaltung der Bereitschafts-Funktion nicht.
- Hakt das Band beim Starten der Kopftrommel, so spricht der Bandspannungs-Abschaltmechanismus an und lockert das Band.
- Rotiert die Kopftrommel nicht oder ist die Rotation abnormal, so blinkt der STANDBY-Indikator.

13 Wiedergabetaste [PLAY]

Wird die PLAY-Taste gedrückt, so leuchten der PLAY- und der STANDBY-Indikator auf, und das Gerät geht in die Wiedergabe-Funktion über (mit Normalgeschwindigkeit in Vorwärtsrichtung). Drücken Sie zum Löschen die STOP-, JOG-, SHUTTLE-, VAR- oder PREROLL-Taste.

- Am HEAD-Wähler ⑤ kann bei Verwendung des BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) auf Wiedergabe mit dem Aufnahme/Wiedergabe-Kopf oder mit dem Wiedergabe-Kopf umgeschaltet werden.
- Ist zur Synchronisierung zweier Videorecorder der BVH-Serie eine geringfügige Korrektur der Wiedergabe-Geschwindigkeit erforderlich, so halten Sie die PLAY-Taste gedrückt und drehen Sie den Suchlaufknopf ⑱ nach rechts (schneller) oder links (langsamer). Der Grad der Geschwindigkeitskorrektur hängt vom Drehwinkel des Knopfes ab und liegt max. bei etwa $\pm 15\%$ der Normalgeschwindigkeit (Capstan-Geschwindigkeitskorrektur). Wird die PLAY-Taste losgelassen, schaltet der Videorecorder auf Normalgeschwindigkeit zurück.

14 Aufnahmetaste [REC]

Wird die REC-Taste gedrückt gehalten und gleichzeitig noch die PLAY-Taste gedrückt, geht das Gerät in die Aufnahme-Funktion über, und es leuchten sowohl der REC- als auch der PLAY-Indikator. Zum Abschalten der Aufnahme-Funktion drücken Sie die STOP-, JOG-, SHUTTLE-, VAR- oder PREROLL-Taste.

- Die Aufnahme wird unabhängig von der Stellung des HEAD-Wählers ⑤ stets mit dem Aufnahme/Wiedergabe-Kopf durchgeführt.
- Bei Verwendung des BVH-2000PS(02)(12) und BVH-2000PS(04)(14) kann während des Aufnehmens ein Kontroll-Wiedergabebild mitverfolgt werden, wenn der TAPE/EE-Wähler ① auf TAPE steht.
- Leuchtet der REC INHIBIT-Indikator ⑮, so nimmt das Gerät nicht auf, sondern schaltet in die Wiedergabe-Funktion.
- Wenn der REC TEST-Schalter der SY-79-Leiterplatte auf ON steht und der BVH-2000PS(00)(10) sich in der Stop-Funktion befindet, so schaltet der BVH-2000PS(00)(10) auf die Aufnahme-Test-Funktion um, wenn die REC-Taste gedrückt wird. (Genaueres dazu siehe Seite 1-77(G).)

15 Aufnahmeschutz-Indikator [REC INHIBIT]

Dieser Indikator leuchtet, wenn der REC INHIBIT-Schalter auf ON gestellt ist und sich der Videorecorder dadurch in der Aufnahmeschutz-Funktion befindet. Wird versucht, auf Aufnahme zu schalten, während dieser Indikator leuchtet, so geht der Videorecorder in die Wiedergabe-Funktion über.

- Steht der REC TEST-Schalter der SY-79-Leiterplatte auf ON und befindet sich der BVH-2000PS(00)(10) in der Aufnahme-Test-Funktion, so blinkt der REC INHIBIT-Indikator. (Genaueres siehe Seite 1-77(G).)

16 Eingabetaste [ENTRY]

Diese Taste dient zur Speicherung des Eingabepunktes. Wird die ENTRY-Taste an der gewünschten Bandstelle gedrückt, so wird diese Stelle abgespeichert. Auch wenn das Band dann zu einer anderen Stelle weitergefaufen ist, kann es durch Drücken der PREROLL-Taste ⑰ zum Schnittpereinlauf-Punkt (Punkt, der um die Schnittpereinlauf-Zeit vor dem IN-Punkt liegt) zurückgespult werden. Das Band stoppt dann dort. Es werden die auf dem Display ⑧ angezeigten TIME CODE/TIMER-1/2-Daten eingegeben. Außer des momentanen Bandpunktes können unter Verwendung der PRESET-Taste ⑩ auch andere, manuell eingegebene und auf dem Display angezeigte Daten eingegeben werden.

- Leuchtet der DISPLAY HOLD-Indikator, so kann der eingegebene Punkt durch Drücken der ENTRY-Taste angezeigt werden.

17 Schnittpereinlauf-Taste [PREROLL]

Wird diese Taste gedrückt, spult das Band bis zu einem Punkt zurück, der einige Sekunden vor dem an der ENTRY-Taste eingegebenen Punkt liegt (Schnittpereinlauf-Punkt) und stoppt dort.

Die Schnittpereinlauf-Zeit kann am P.ROL TIME-Schalter auf der SY-79-Leiterplatte zwischen 0 und 15 Sekunden in 1-Sekunden-Schritten eingestellt werden. Wird der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC gestellt und der TIME CODE/TIMER-Wähler auf TIME CODE gestellt, so arbeitet die Schnittpereinlauf-Funktion nicht.

18 Suchlaufknopf

Dieser Knopf dient zur Steuerung des Bandlaufes.

- (1) Durch Drehen dieses Knopfes in der JOG-, SHUTTLE- oder PROGRAM JOG-Funktion (siehe Seite 1-21(G), 22(G)), kann die Bandlauf-Geschwindigkeit und -Richtung geändert werden.
- (2) Wird dieser Knopf in der Stop-, Bereitschafts-, Wiedergabe- oder Aufnahme-Funktion gedreht, so leuchtet der SEARCH-Indikator und es kann die Bandlauf-Geschwindigkeit und -Richtung für den PROGRAM JOG-Betrieb vorgewählt werden.

19 Shuttle-Taste [SHUTTLE]

Wird die SHUTTLE-Taste gedrückt, so leuchtet der Indikator auf und das Gerät geht in den Shuttle-Betrieb über. Wird der Suchlaufknopf ⑱ nun nach links oder rechts gedreht und an einer beliebigen Stelle angehalten, so wird die Wiedergabe mit der so eingestellten Geschwindigkeit durchgeführt (1/32 bis 50-fache Normalgeschwindigkeit). In der Mittelstellung erhält man ein Standbild. Der Suchlaufknopf rastet in der Mittelstellung und in den ± 50 Stellungen ein.

- Beim Vorspulen wird die Geschwindigkeit vor dem Erreichen des Bandendes bereits automatisch reduziert, und das Band stoppt automatisch. Soll das Band vollkommen vorgespult werden, drehen Sie den Suchlaufknopf erneut nach rechts oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.

- Auch beim Rückspulen wird die Geschwindigkeit am Bandanfang automatisch reduziert, und das Band stoppt automatisch in der Nähe des Punktes, an dem der TIMER-2 auf null zurückgestellt wurde.
- Soll das Band vollkommen zurückgespult werden, so drehen Sie den Suchlaufknopf erneut nach links oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.
- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion, um das Band zu schonen. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

20 Jog-Taste [JOG]

Wird die JOG-Taste gedrückt, so leuchtet der Indikator auf, und das Gerät geht in den JOG-Betrieb über. Wird der Suchlaufknopf nun nach links oder rechts gedreht, entspricht die Wiedergabegeschwindigkeit der Dreh-

geschwindigkeit des Knopfes (0 bis zu einigen Vielfachen der Normalgeschwindigkeit). Wird der Suchlaufknopf an einer beliebigen Stelle angehalten, so erhält man ein Standbild. Der Suchlaufknopf rastet an keiner Stelle ein.

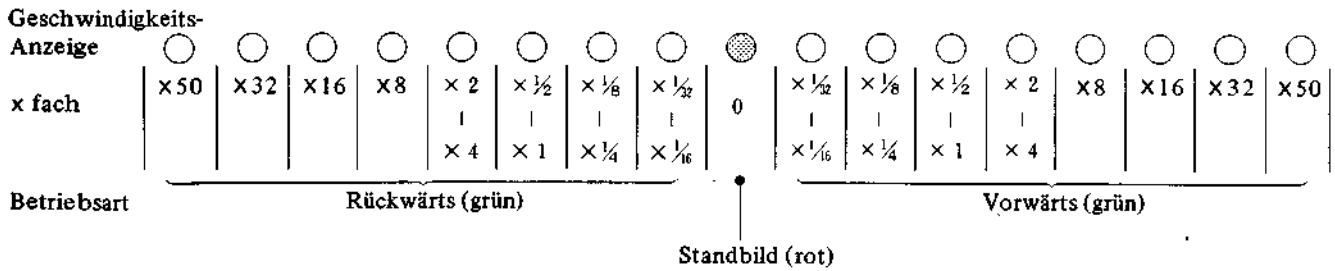
- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

21 Suchlauf-Anzeige [SEARCH]

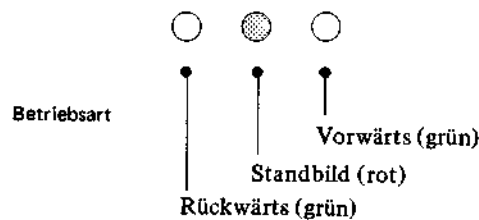
Zeigt die Betriebsfunktion des Suchlaufknopfes an. In der SHUTTLE-, JOG- oder PROGRAM JOG-Funktion (siehe 22) zeigen diese Indikatoren, wie in der Abb. unten dargestellt, die Bandlauf-Geschwindigkeit und -Richtung an.

Hinweis: Nähert sich das Band dem Ende, so blinkt der Standbild-, der Vorwärts- oder der Rückwärts-Indikator.

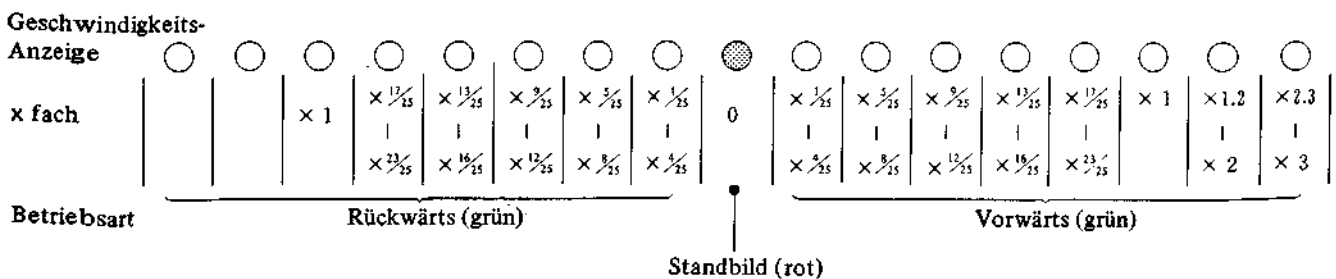
SHUTTLE-Funktion



JOG-Funktion



PROGRAM JOG-Funktion

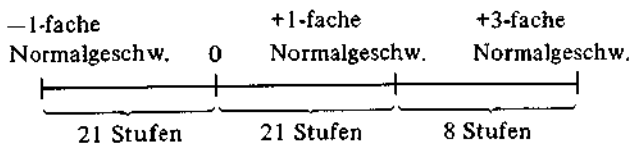


② **Variier-Taste [VAR]**

Wird die VAR-Taste gedrückt, leuchtet der Indikator auf, und das Gerät geht in den PROGRAM JOG- oder den PROGRAM PLAY-Betrieb über (einstellbar am VAR-Schalter der SY-79-Leiterplatte)

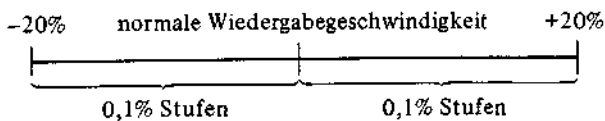
PROGRAM JOG-Betrieb

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.JOG, so kann das Gerät durch Drücken der VAR-Taste in den PROGRAM JOG-Betrieb geschaltet werden. Wird der Suchlaufknopf nach links oder rechts gedreht und dann angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-1-fache bis +3-fache Normalgeschwindigkeit). Der Knopf rastet in den Stellungen für -1-, 0-, +1- und +3-fache Normalgeschwindigkeit ein. Steht der HEAD-Wähler ① auf PLAY und wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man im PROGRAM JOG-Betrieb über den gesamten Geschwindigkeitsbereich (-1-fache bis +3-fache Normalgeschwindigkeit) ein störungsfreies Wiedergabebild. Diese Betriebsart kann auch im SHUTTLE-Betrieb (-50-fache bis +50-fache Normalgeschwindigkeit) zur Feineinstellung verwendet werden. Es ist eine Geschwindigkeitsregelung in den folgenden 50 Stufen möglich:



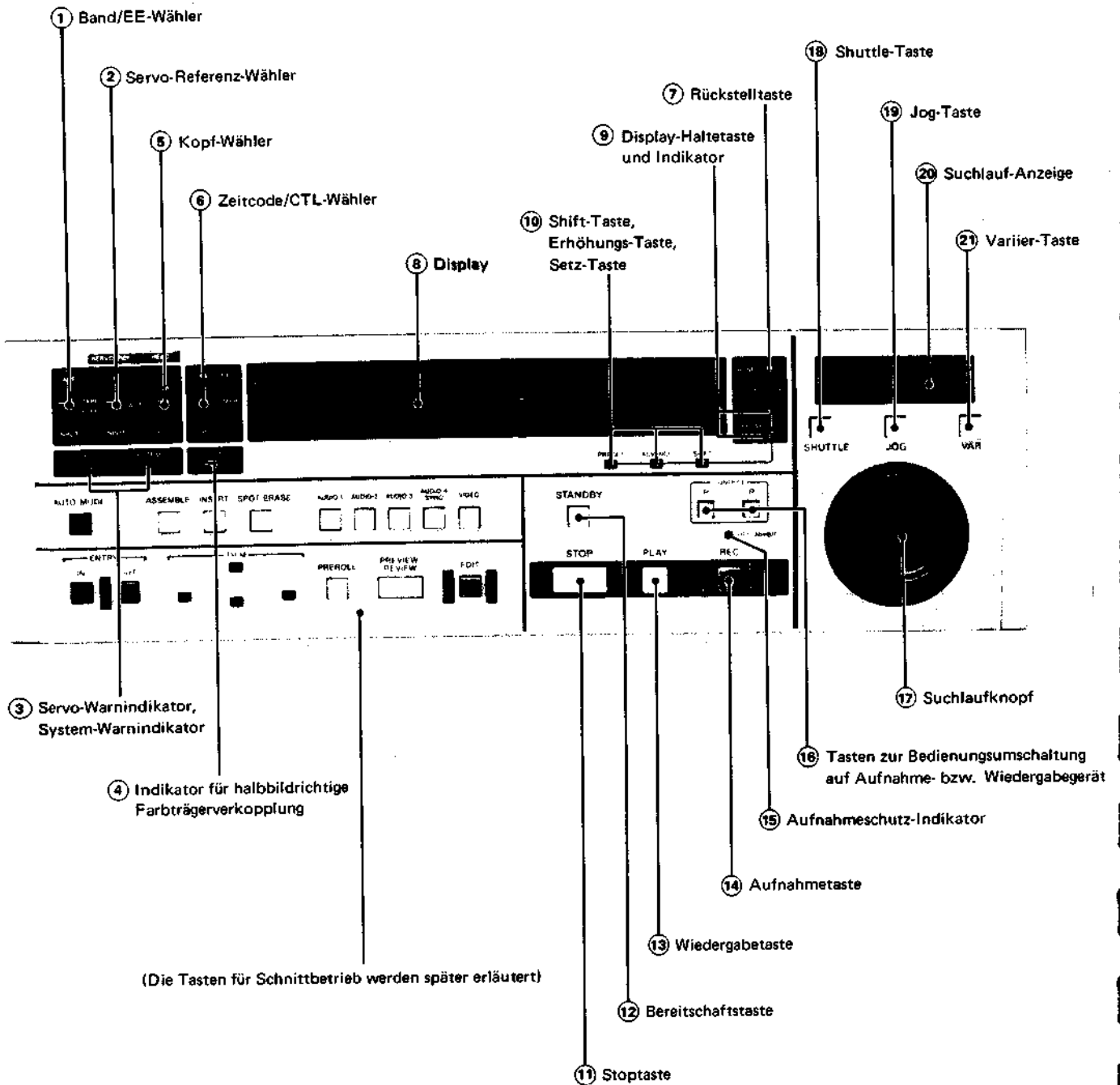
PROGRAM PLAY-Betrieb

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.PLY, so kann das Gerät durch gleichzeitiges Drücken der VAR- und der PLAY-Taste in den PROGRAM PLAY-Betrieb geschaltet werden. Wird nun bei gedrückter VAR-Taste der Suchlaufknopf nach links oder rechts gedreht und dann an einer beliebigen Stelle angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-20% bis +20%). Wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man genau wie im PROGRAM JOG-Betrieb über den gesamten Bereich ein störungsfreies Wiedergabebild. Wie der PROGRAM JOG-Betrieb kann auch der PROGRAM PLAY-Betrieb zur Feineinstellung im SHUTTLE-Betrieb verwendet werden. Die Geschwindigkeit ist dann in 0,1% Stufen bis ±20% gegenüber der normalen Wiedergabegeschwindigkeit veränderbar.



Auch eine Vorwahl der Bandgeschwindigkeit ist möglich, indem der Suchlaufknopf bei gedrückter VAR-Taste in der Stop-, Bereitschafts-, Wiedergabe-, oder Aufnahme-Funktion gedreht wird. Die Programm-Wiedergabe beginnt dann mit der vorgewählten Geschwindigkeit, wenn gleichzeitig die PLAY- und die VAR-Taste gedrückt wird. Die vorgewählte Geschwindigkeit wird an dem Display ⑧ in % angezeigt, während die VAR-Taste gedrückt wird.

1-4-4. Bedienungspult – Typ II



① **Band/EE-Wähler [TAPE/EE]**

Zur Wahl des Ausgangssignals an den VIDEO OUTPUT-, AUDIO OUTPUT- und MONITOR OUTPUT-Anschlüssen. Das Ausgangssignal hängt wie folgt von der Position dieses Wählers und der Betriebsart des Videorecorders ab.

VIDEO

BVH-2000PS(00)(10)

Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				
	STANDBY ausgesch.	STANDBY eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb *2
TAPE	Band A/W	Band A/W	EE	Band A/W	EE
	Band A/W	Band A/W	EE	Band A/W	EE
TAPE/EE	EE	EE*4 (Band A/W)	EE	Band A/W	EE
	EE	EE*4 (Band A/W)	EE	Band A/W	EE
INPUT*3	EE	EE*4 (Band A/W)	EE	Band A/W	EE
	Eingang	Eingang	Eingang	Eingang	Eingang

• Der HEAD-Wähler hat keinen Einfluß auf das Ausgangssignal des BVH-2000PS(00)(10).

BVH-2000PS(02)(12) und BVH-2000PS(04)(14)

Stellung des HEAD-Wählers ⑤	Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				
		STANDBY ausgesch.	STANDBY eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb*2
R/P	TAPE	Band A/W	Band A/W	Band WG*1	Band A/W	EE
		Band A/W	Band A/W	Band WG*1	Band A/W	EE
	TAPE/EE	EE	EE*4 (Band A/W)	EE	Band A/W	EE
		EE	EE*4 (Band A/W)	EE	Band A/W	EE
	INPUT*3	EE	EE*4 (Band A/W)	EE	Band A/W	EE
		Eingang	Eingang	Eingang	Eingang	Eingang
PLAY	TAPE	Band WG	Band WG	Band WG*1	Band WG	EE
		Band WG	Band WG	Band WG*1	Band WG	EE
	TAPE/EE	EE	EE*4 (Band WG)	EE	Band WG	EE
		EE	EE*4 (Band WG)	EE	Band WG	EE
	INPUT*3	EE	EE*4 (Band WG)	EE	Band WG	EE
		Eingang	Eingang	Eingang	Eingang	Eingang

☐ : Ausgangssignal an VIDEO OUTPUT-Anschlüssen
 ☐ : Ausgangssignal an VIDEO MONITOR OUTPUT-Anschlüssen

- *1 Ist der Schalter SW9-1 der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang im REC- oder EDIT REC-Betrieb das E-zu-E-Signal an, selbst wenn der TAPE/EE-Wähler auf TAPE gestellt ist.
- *2 Ist der Schalter SW8-5 auf der SY-80-Leiterplatte auf ON gestellt, und die BKH-2015/2015A-Leiterplatte eingesteckt, so wird das Ausgangssignal zwischen den IN- und OUT-Punkten unterbrochen.

- *3 Ist der Schalter SW9-3 auf der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang in allen Betriebsarten das E-zu-E-Signal an, selbst wenn der TAPE/EE-Wähler auf INPUT gestellt ist.

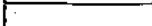
Hinweis: Befindet sich entweder der Video- oder der Sync-Kanal in der EDIT REC-Funktion, so beziehen Sie sich auf die REC/EDIT REC-Spalte der Tabelle, selbst wenn sich der andere Kanal in der Wiedergabe-Funktion befindet.

- *4 Ist der REC INHIBIT-Schalter auf ON gestellt, so liegt am Ausgang das Band-Signal an.

AUDIO

AUDIO-Kanal	Stellung des TAPE/EE-Wähler ①	Betriebsart des Videorecorders				
		STANDBY*4 ausgesch.	STANDBY*4 eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb*2
A1, A2	TAPE	Band	Band	EE	Band *1	EE
		Band	Band	Mon. *6	Band *1	EE
	TAPE/EE	EE	EE (Band) *5	EE	Band *1	EE
		EE	EE (Band) *5	EE	Band *1	EE
	INPUT *3	EE	EE (Band) *5	EE	Band *1	EE
		Eingang	Eingang	Eingang	Eingang	Eingang
A3	TAPE	Band	Band	EE	Band	EE
		Band	Band	Mon. *6	Band	EE
	TAPE/EE	Band	Band	EE	Band	EE
		Band	Band	EE	Band	EE
	INPUT	EE	EE	EE	Band	EE
		Eingang	Eingang	Eingang	Eingang	Eingang

 : Ausgangssignal an AUDIO LINE OUTPUT-Anschlüssen

 : Ausgangssignal an AUDIO MONITOR OUTPUT-Anschlüssen

- *1 Wird mit 5-facher oder höherer Normalgeschwindigkeit wiedergegeben, so erfolgt eine Bedämpfung des Ausgangssignals.
- *2 Ist der Schalter SW8-5 der SY-80-Leiterplatte auf ON gestellt, so wird das Ausgangssignal zwischen den IN- und OUT-Punkten unterbrochen.
- *3 Steht der Wähler auf INPUT und ist der Schalter SW9-3 der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang in allen Betriebsarten das E-zu-E-Signal an.

- *4 Wird in der Stop-Funktion auf INPUT gestellt, so liegt das E-zu-E-Signal stets am AUDIO-3-Kanal an und liegt selbst dann noch an den AUDIO LINE OUTPUT- und MONITOR OUTPUT-Anschlüssen an, wenn danach auf TAPE oder TAPE/EE umgeschaltet wird. Das Halten des E-zu-E-Signals wird abgebrochen, sobald der Videorecorder in eine andere Betriebsart umgeschaltet wird.

- *5 Ist der REC INHIBIT-Schalter auf ON gestellt, liegt am Ausgang das Bandsignal an.

- *6 Beim BVH-2000PS(00)(10) liegt das E-zu-E-Signal am Ausgang an.

② Servo-Referenz-Wähler [SERVO REF]

Zur Wahl des Referenzsignals für die Servoverriegelung.

EXT: Das am REF VIDEO INPUT-Anschluß ③ am Video-Anschlußfeld angeschlossene Signal (FBAS-Signal) wird Referenzsignal.

AUTO: Im REC-, EDIT REC- und EDIT-Vorwahl-Betrieb wird das Video-Eingangssignal zum Referenzsignal. Im Wiedergabe-Betrieb wird das externe Referenzsignal herangezogen (automatische Umschaltung).

INPUT: Das am VIDEO INPUT-Anschluß am Video-Anschlußfeld angeschlossene Signal wird zum Referenzsignal.

- Der bei Wiedergabe notwendige Vorlauf des Synchronsignals kann am ADVANCE-Schalter der CD-17-Leiterplatte eingestellt werden (siehe Kapitel 1-6-3).

③ SERVO-Warnindikator (rot)/SYSTEM-Warnindikator (rot) (Siehe Kapitel 1-14.)

Diese Indikatoren warnen vor inkorrektem Betrieb des Videorecorders.

SERVO-Warnindikator

Zeigt an, daß das Servosystem nicht richtig arbeitet oder noch nicht synchronisiert ist.

SYSTEM-Warnindikator

Zeigt an, daß die System-Steuerung nicht einwandfrei arbeitet.

④ Indikator für halbbildrichtige Farbträgerverkopplung [CF LOCK] (grün)

Leuchtet auf, wenn der Videorecorder mit halbbildrichtiger Farbträgerverkopplung arbeitet. Die Ein- und Ausschaltung der halbbildrichtigen Farbträgerverkopplung erfolgt an den Schaltern der CD-17- und SR-15-Leiterplatten (siehe Kapitel 1-6-3).

⑤ Kopf-Wähler [HEAD]

Zur Wahl des Wiedergabekopfes für das Video-Signal.

R/P: Die Wiedergabe erfolgt mit dem Aufnahme/Wiedergabe-Kopf.

PLAY: Die Wiedergabe erfolgt mit dem Wiedergabe-Kopf. Die Wiedergabe erfolgt mit dynamischer Spurlage, wenn der Videorecorder mit einer entsprechenden Funktion ausgestattet ist.

Der Aufnahme- und Schnittaufnahme-Betrieb wird stets mit dem Wiedergabe-Kopf durchgeführt, unabhängig von der Stellung des Kopf-Wählers.

- Dieser Wähler arbeitet nur beim BVH-2000PS(02)(12) und BVH-2000PS(04)(14). Beim BVH-2000PS(00)(10) arbeitet unabhängig von der Position stets der Aufnahme/Wiedergabe-Kopf.

⑥ Zeitcode/CTL-Wähler [TIME CODE/TIMER]

Zur Wahl der auf dem Display ⑧ erscheinenden Bandlaufzeit-Anzeigeart.

TIME CODE: Zur Anzeige des EBU-Zeitcodes. Der CH3 INPUT-Schalter auf der AE-03-Leiterplatte ist auf TC zu stellen (siehe Kapitel 1-6-3). Der A-3 SEL-Schalter auf der AE-03-Leiterplatte dient zur Wahl zwischen externem und internem Zeitcode (sofern die getrennt lieferbare BKH-2015/2015A-Leiterplatte eingesetzt ist). Der TC/U-BIT-Schalter auf der BKH-2015/2015A-Leiterplatte (TC-14/14A) dient zur Wahl zwischen Zeitcode- und Benutzer-Bit-Anzeige. Normalerweise wird der vom Zeitcode-Leser gelesene Wert angezeigt; steht jedoch der TAPE/EE-Wähler ① auf INPUT, wird das Signal des Zeitcode-Generators angezeigt. Steht der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC, so arbeitet die Schnitvoreinlauf-Funktion nicht.

TIMER-1: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. Durch Drücken der RESET-Taste ⑦ kann an jeder beliebigen Bandstelle auf Null zurückgestellt werden. Es wird dann eine neue, an dieser Bandstelle beginnende Bandlaufzeit angezeigt.

TIMER-2: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. In dieser TIMER-2-Stellung ist jedoch keine Rückstellung auf Null mehr möglich, nachdem das Band einmal eingefädelt ist.

Die auf dem Display angezeigten TIME CODE-, TIMER-1- bzw. TIMER-2-Daten können auch als Schnitvoreinlauf-Punkte eingegeben werden.

- Sowohl bei TIMER-1 als auch bei TIMER-2 beginnt das Zählen der Bandlaufzeit, sobald das Gerät in eine Betriebsfunktion (außer Stop-Funktion) gestellt wird. Bei TIMER-2 erhält man stets den Punkt als Nullpunkt, an dem nach dem Einfädeln des Bandes auf eine Betriebsfunktion umgeschaltet wurde. Rückstellen der Anzeige an einem beliebigen Bandpunkt ist nur bei TIMER-1 möglich.
- Wird das Gerät bei eingelegtem Band ausgeschaltet, so bleiben die TIMER-1- und TIMER-2-Daten dank einem eingebauten Puffer-Kondensator 12 Stunden lang abgespeichert, so daß sie innerhalb dieses Zeitraumes stets wiederverwendet werden können.

⑦ Rückstelltaste [RESET]

(1) TIMER-1-Rückstellung

Steht der TIME CODE/TIMER-Wähler auf TIMER-1, so können die auf dem Display ⑧ angezeigten TIMER-1-Daten auf Null zurückgestellt werden. Rückstellung der TIMER-2-Daten ist nicht möglich.

(2) TIMER-CODE-Rückstellung

Steht der TIME CODE/TIMER-Wähler auf TIME CODE und der TAPE/EE-Wähler ① auf INPUT, so wird das vom Zeitcode-Generator gelieferte Signal auf dem Display angezeigt. Durch Drücken der RESET-Taste kann der Zeitcode-Generator auf Null zurückgesetzt werden. Wenn die Benutzer-Bits auf dem Display angezeigt werden, so werden die Benutzer-Bits auf Null zurückgesetzt.

⑧ Display

Bei diesem Display handelt es sich um eine Punkt-Matrix-Anzeige mit einer Zeile und 40 Zeichen, die in 3 Blöcke unterteilt sind:



- Die 8 Stellen zeigen 00 Stunden/00 Minuten/00 Sekunden/00 Vollbilder an.
- Bei TIMER-1 und -2 handelt es sich um eine normale 24-Stunden-Anzeige. Wird der Schalter S9-5 der SY-80-Leiterplatte auf ON gestellt, so ist auch eine „+/-“ Anzeige möglich.

Block 1

Zeigt die Bandlaufzeit des gerade betriebenen Aufnahme- oder Wiedergabegeräts. Am TIME CODE/TIMER-Wähler ⑥ kann zwischen Zeitcode- und CTL-Daten umgeschaltet werden.

Die am Anfang des Displays erscheinenden Zeichen haben folgende Bedeutungen:

- TCR: Vom Zeitcode-Leser gelesener Wert
- TCG: Vom Zeitcode-Generator gelieferter Wert
- TM1: TIMER-1-Daten
- TM2: TIMER-2-Daten
- UBR: Gelesener Benutzer-Bit-Wert
- UBG: Erzeugter Benutzer-Bit-Wert

- Steht der A-3 SEL-Schalter der AE-03-Leiterplatte (siehe Kapitel 1-6-3) nicht auf TC, so erscheint an allen Stellen der Anzeige das Zeichen „*“, selbst wenn auf Zeitcode geschaltet ist.

Block 2

Zeigt die für den Schnittbetrieb eingegebenen Daten der IN/OUT-Punkte. Dieser Block kann zum Abrufen und Korrigieren verschiedener Daten sowie zur Anzeige der Schnittdauer verwendet werden.

Die am Anfang dieses Blocks erscheinenden Zeichen haben folgende Bedeutung:

- IN: Video- oder Audio-IN-Punkt
- OUT: Video- oder Audio-OUT-Punkt
- AI: Audio-IN-Punkt
- AO: Audio-OUT-Punkt
- DUR: Dauer (Zeit zwischen IN- und OUT-Punkt) von TIMER-1
- LAP: Dauer von TIMER-2

Block 3

Zeigt beim Betreiben des Videorecorders die Bandlaufgeschwindigkeit. In der PROGRAM JOG- und PROGRAM PLAY-Funktion (bei der VAR-Taste ② beschrieben) wird auch die am Suchlaufknopf voreingestellte Bandlaufgeschwindigkeit angezeigt.

Ist die Geschwindigkeit geringer als die Normalgeschwindigkeit, so wird im Block 3 der entsprechende Bruchteil angegeben, ist sie höher, so wird der entsprechende Multiplikator angegeben.

In diesem Block werden auch folgende Störungsmeldungen durch Blinken angezeigt:

- SYS ERR: System-Fehler; die Zentral-Steuer-einheit (CPU) arbeitet nicht normal.
- OVER HEAT: Überhitzung des Netzteils oder des Motor-Treiberverstärkers
- LINE ERR: Übertragungsfehler; die Übermittlung der Fernbedienungs-Daten arbeitet nicht korrekt.
- ABORT: Ein Schnitt wurde nicht korrekt durchgeführt.
- LOST LCK*: Ausfall der Servo-Synchronisation während der Aufnahme.
- NEGATIVE: Der Schnitt-OUT-Punkt liegt vor dem Schnitt-IN-Punkt.
- DATA ERR: Für die Zeit-Daten wurde ein ungültiger numerischer Wert eingegeben (z.B. 65 Sek., 35 Vollbilder).
- TAPE OUT: Falsch eingelegtes Band
- REC TEST (Nur bei BVH-2000PS(00)(10)): Zeigt an, daß der REC TEST-Schalter auf ON und der REC INHIBIT-Schalter auf OFF steht. Der BVH-2000PS (00)(10) befindet sich dann in der Stop- order in der Aufnahme-Test-Funktion.

* Die Adressen, an denen LOST LCK-Fehler beim Aufnehmen oder Schneiden aufgetreten sind, werden abgespeichert und können in Block 2 abgerufen werden. (Dies gilt jedoch nur für Geräte mit einem System ROM de Version Nr. 3-5 und höher. Genaueres dazu finden Sie unter 1-14-2. LOST LCK-Anzeige.)

⑨ **Display-Haltetaste und Indikator [DISPLAY HOLD]**

Wird diese Taste an einer beliebigen Bandstelle gedrückt, so werden die gerade auf dem Display ⑧ angezeigten Daten gehalten und der DISPLAY HOLD-Indikator leuchtet auf. Durch erneutes Drücken erlischt dieser Indikator wieder, und es werden die gerade gelesenen Daten angezeigt.

⑩ **Shift-Taste [SHIFT], Erhöhungs-Taste [ADVANCE], Setz-Taste [PRESET]**

Zum Eingeben von beliebigen TIMER-1- und TIME CODE-Daten. Die Tasten sind jedoch nicht verwendbar für TIMER-2. Ist die DISPLAY HOLD-Taste ⑨ eingeschaltet, so haben diese Tasten folgende Funktionen:

SHIFT-Taste: Um den Cursor auf dem Display nach vorne zu bewegen. Bei jedem Drücken bewegt sich der Cursor um eine Stelle nach vorne. Ist er an der ersten Stelle angelangt, kehrt er wieder zur letzten Stelle zurück.

ADVANCE-Taste: Zum Ändern der über dem Cursor angezeigten Ziffer. Bei jedem Drücken wird der Wert um eins erhöht.

PRESET-Taste: Wird an allen Stellen der gewünschte Wert angezeigt, so können durch Drücken dieser Taste die Werte als Daten eingegeben werden.

(1) **Daten-Eingabe für TIMER-1**

Stellen Sie den TIME CODE/TIMER-Wähler ⑥ auf TIMER-1 und halten Sie die Daten durch Drücken der DISPLAY HOLD-Taste ⑨. Geben Sie dann die gewünschten Daten unter Verwendung der drei Tasten ein. Das Eingeben der Daten ist nicht möglich, wenn sich TIMER-1 in der „+/-“ Anzeige-Funktion (Schalter S9-5 der SY-80-Leiterplatte steht auf ON) befindet.

(2) **Dateneingabe für TIME CODE**

Stellen Sie den TIME CODE/TIMER-Wähler ⑥ auf TIME CODE. Stellen Sie nun den Videorecorder auf STOP/STANDBY und halten Sie die Anzeige durch Drücken der DISPLAY HOLD-Taste ⑨. Stellen Sie dann den Startpunkt des Zeitcode-Generators wunschgemäß mit den obigen 3 Tasten ein. Werden die Benutzer-Bits angezeigt, so können diese wunschgemäß eingestellt werden. Stellen Sie den TAPE/EE-Wähler ① auf INPUT. Das vom Zeitcode-Generator gelieferte Signal wird dann angezeigt.

⑪ **STOP-Taste**

Durch Drücken der STOP-Taste werden alle Betriebsfunktionen gestoppt. Der Spulen-Motor stoppt, und die Andruckrolle fährt vom Band zurück.

- Ca. 30 Sekunden nach Drücken der STOP-Taste spricht der Spannungs-Abschaltmechanismus an, und das Gerät geht in den Bereitschaftsbetrieb über (geringere Bandspannung). Ist der Spannungs-Abschaltmechanismus nicht erwünscht, so stellen Sie den TENSION OFF ENABLE-Schalter (S9-7) der SY-79-Leiterplatte auf OFF.
- Das Gerät schaltet automatisch in die Stop-Funktion, wenn es eingeschaltet wird oder wenn sich kein Band am Band-Sensor befindet.
- Ein Blinken des STOP-Indikators zeigt an, daß dem Servosystem kein Referenzsignal zugeleitet wird.
- Wenn in der Stop- oder Bereitschafts-Funktion ein Band-Durchhang auftritt, so wird das Band automatisch nachgespannt.

⑫ **Bereitschaftstaste [STANDBY]**

Diese Taste dient zum Starten der Kopftrommel-Rotation. Drücken Sie bei normalem Betrieb zunächst diese STANDBY-Taste, überprüfen Sie, ob der SERVO-Indikator ③ erloschen ist, und schalten Sie dann in die gewünschte Betriebsfunktion um. Es kann jedoch auch direkt, ohne vorheriges Drücken der STANDBY-Taste, auf die gewünschte Funktion geschaltet werden. Ist ca. 9 Minuten nach Drücken der STANDBY-Taste noch keine andere Taste gedrückt worden, so wird die Bereitschafts-Funktion automatisch abgeschaltet.

- Wird der STANDBY OFF ENABLE-Schalter (S9-8) der SY-79-Leiterplatte auf OFF gestellt oder ist die AUTO MODE- oder eine der Kanalvorwahltasten eingeschaltet, so arbeitet die automatische Abschaltung der Bereitschafts-Funktion nicht.
- Hakt das Band beim Starten der Kopftrommel, so spricht der Bandspannungs-Abschaltmechanismus an und lockert das Band.
- Rotiert die Kopftrommel nicht oder ist die Rotation abnormal, so blinkt der STANDBY-Indikator.

⑬ **Wiedergabetaste [PLAY]**

Wird die PLAY-Taste gedrückt, so leuchtet der PLAY- und der STANDBY-Indikator auf, und das Gerät geht in die Wiedergabe-Funktion über (mit Normalgeschwindigkeit in Vorwärtsrichtung). Drücken Sie zum Löschen die STOP-, JOG-, SHUTTLE-, VAR- oder PREROLL-Taste.

- Am HEAD-Wähler ⑤ kann bei Verwendung des BVH-2000PS(02)(12) oder des BVH-2000PS(04)(14) auf Wiedergabe mit dem Aufnahme/Wiedergabe-Kopf oder mit dem Wiedergabe-Kopf umgeschaltet werden.
- Ist zur Synchronisierung zweier Videorecorder der BVH-Serie eine geringfügige Korrektur der Wiedergabe-Geschwindigkeit erforderlich, so halten Sie die PLAY-Taste gedrückt und drehen Sie den SEARCH-Knopf ⑰ nach rechts (schneller) oder links (langsamer). Der Grad der Geschwindigkeitskorrektur hängt vom Drehwinkel des Knopfes ab und liegt max. bei etwa $\pm 15\%$ der Normalgeschwindigkeit (Capstan-Geschwindigkeitskorrektur). Wird die PLAY-Taste losgelassen, schaltet der Videorecorder auf Normalgeschwindigkeit zurück.

⑭ **Aufnahmetaste [REC]**

Wird die REC-Taste gedrückt gehalten und gleichzeitig noch die PLAY-Taste gedrückt, geht das Gerät in die Aufnahme-Funktion über, und es leuchten sowohl der REC- als auch der PLAY-Indikator. Zum Abschalten der Aufnahme-Funktion drücken Sie die STOP-, JOG-SHUTTLE-, VAR- oder PREROLL-Taste.

- Die Aufnahme wird unabhängig von der Stellung des HEAD-Wählers ⑤ stets mit dem Aufnahme/Wiedergabe-Kopf durchgeführt.
- Bei Verwendung des BVH-2000PS(02)(12) und BVH-2000PS(04)(14) kann während des Aufnehmens ein Kontroll-Wiedergabebild mitverfolgt werden, wenn der TAPE/EE-Wähler ① auf TAPE steht.
- Leuchtet der REC INHIBIT-Indikator ⑮, so nimmt das Gerät nicht auf, sondern schaltet in die Wiedergabe-Funktion.
- Wenn der REC TEST-Schalter der SY-79-Leiterplatte auf ON steht und der BVH-2000PS(00)(10) sich in der Stop-Funktion befindet, so schaltet der BVH-2000PS(00)(10) auf die Aufnahme-Test-Funktion um, wenn die REC-Taste gedrückt wird. (Genaueres dazu siehe Seite 1-77(G).)

⑮ **Aufnahmeschutz-Indikator [REC INHIBIT]**

Dieser Indikator leuchtet, wenn der REC INHIBIT-Schalter auf ON gestellt ist und sich der Videorecorder dadurch in der Aufnahmeschutz- oder Schnittaufnahmeschutz-Funktion befindet. Wird versucht, auf Aufnahme oder Schnittaufnahme zu schalten, während dieser Indikator leuchtet, so geht der Videorecorder in die Wiedergabe-Funktion über.

- Steht der REC TEST-Schalter der SY-79-Leiterplatte auf ON und befindet sich der BVH-2000PS(00)(10) in der Aufnahme-Test-Funktion, so blinkt der REC INHIBIT-Indikator. (Genaueres siehe Seite 1-77(G).)

⑯ **Tasten zur Bedienungsumschaltung auf Aufnahme- oder Wiedergabegerät [CONTROL P/R]**

Der BVH-2000PS arbeitet als Aufnahmegerät und ein weiterer am REMOTE-2-Anschluß des rückseitigen Anschlußfeldes angeschlossener Videorecorder arbeitet als Wiedergabegerät, wenn der REMOTE-Schalter der SY-79-Leiterplatte auf REMOTE-2 steht und der REMOTE/LOCAL-Schalter am Pegelregler-Teil auf LOCAL gestellt wird. Folgende Bedienungsarten sind durch Drücken dieser Tasten möglich (siehe Kapitel 1-11-3):

P-Taste leuchtet: Wird die P-Taste gedrückt (Taste leuchtet), so steuern die Schnitt- und Bandlauf-Tasten das angeschlossene Wiedergabegerät, so daß es fernbedient werden kann. Auch die Display-Anzeigen gelten für das Wiedergabegerät. Die SERVO REF ②-, HEAD ⑤- und TIME CODE/TIMER ⑥-Wähler arbeiten jedoch nicht und müssen am Wiedergabegerät selbst entsprechend eingestellt werden.

R-Taste leuchtet: Wird die R-Taste gedrückt (Taste leuchtet), so steuern die Bedienungselemente den BVH-2000PS (Aufnahmegerät). Ist die AUTO MODE-Taste ⑳ gedrückt, so befinden sich Aufnahme- und Wiedergabegerät in einer gemeinsamen Steuerfunktion, so daß Vorschau-, Rückschau- und automatischer Schnittbetrieb möglich ist.

P- und R-Taste leuchten gleichzeitig:

Sind beide Tasten gedrückt (Tasten leuchten), so können beide Videorecorder synchron bedient werden. Es ist dazu allerdings notwendig, daß der PARA-RUN-Schalter der SY-79-Leiterplatte auf ON gestellt ist.

P- und R-Tasten leuchten nicht:

Ist keine der beiden Tasten gedrückt (Tasten leuchten nicht), so wird nur der BVH-2000PS gesteuert, und es besteht keine Kommunikation zwischen Aufnahme und Wiedergabegerät.

⑰ **Suchlaufknopf**

Dieser Knopf dient zur Steuerung des Bandlaufes. (1) Durch Drehen dieses Knopfes in der JOG-, SHUTTLE-, PROGRAM JOG- oder PROGRAM PLAY-Funktion (siehe Kapitel 1-9) kann die Bandlauf-Geschwindigkeit und -Richtung geändert werden.

- (2) Wird dieser Knopf in der Stop-, Bereitschafts-, Wiedergabe- oder Aufnahme-Funktion gedreht, so kann die Bandlauf-Geschwindigkeit und -Richtung für den PROGRAM JOG- oder PROGRAM PLAY-Betrieb vorgewählt werden. Die eingestellte Geschwindigkeit wird im Block 3 des Displays ⑧ angezeigt.
- (3) Halten Sie die STOP-Taste in der Stopp-Funktion gedrückt bzw. halten Sie die STANDBY-Taste in der Aufnahme- oder Schnitt-Funktion gedrückt und drehen Sie den Suchlaufknopf, bis die Adressen der im vorhergehenden Schnitt- oder Aufnahmebetrieb aufgetretenen LOST LCK-Fehler auf dem Display erscheinen. (Dies gilt jedoch nur für Geräte mit einem System-ROM der Version Nr.3-5 und höher. Genaueres dazu finden Sie unter 1-14-2. LOST LCK-Anzeige.)

⑱ Shuttle-Taste [SHUTTLE]

Wird die SHUTTLE-Taste gedrückt, so leuchtet der Indikator auf, und das Gerät geht in den Shuttle-Betrieb über. Wird der Suchlaufknopf ⑰ nun nach links oder rechts gedreht und an einer beliebigen Stelle angehalten, so wird die Wiedergabe mit der so eingestellten Geschwindigkeit durchgeführt. (1/32 bis 50-fache Normalgeschwindigkeit). In der Mittelstellung erhält man ein Standbild. Der Suchlaufknopf rastet in der Mittelstellung und in den ± 50 Stellungen ein.

- Beim Vorspulen wird die Geschwindigkeit vor dem Erreichen des Bandendes bereits automatisch reduziert, und das Band stoppt automatisch. Soll das Band vollkommen vorgespult werden, drehen Sie den Suchlaufknopf erneut nach rechts oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.
- Auch beim Rückspulen wird die Geschwindigkeit am Bandanfang automatisch reduziert, und das Band stoppt automatisch in der Nähe des Punktes, an dem der TIMER-2 auf Null zurückgestellt wurde.
- Soll das Band vollkommen zurückgespult werden, so drehen Sie den Suchlaufknopf erneut nach links oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.
- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion, um das Band zu schonen. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

⑲ Jog-Taste [JOG]

Wird die JOG-Taste gedrückt, so leuchtet der Indikator auf, und das Gerät geht in den JOG-Betrieb über. Wird der Suchlaufknopf nun nach links oder rechts gedreht, entspricht die Wiedergabegeschwindigkeit der Drehgeschwindigkeit des Knopfes (0 bis zu einigen Vielfachen der Normalgeschwindigkeit). Wird der Suchlaufknopf an einer beliebigen Stelle angehalten, so erhält man ein Standbild. Der Suchlaufknopf rastet an keiner Stelle ein.

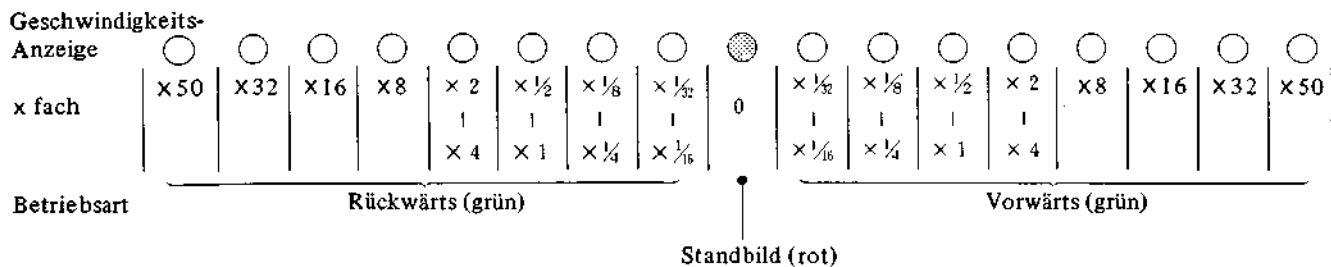
- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

⑳ **Suchlauf-Anzeige [SEARCH]**

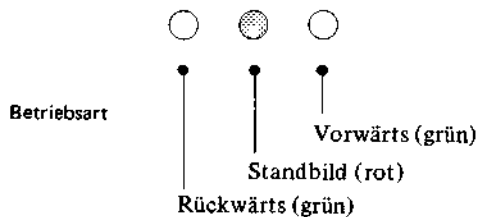
Zeigt die Betriebsfunktion des Suchlaufknopfes an. In der SHUTTLE-, JOG- oder PROGRAM JOG-Funktion (siehe ㉑) zeigen diese Indikatoren, wie in der Abb. unten dargestellt, die Bandlauf-Geschwindigkeit und -Richtung an.

Hinweis: Nähert sich das Band dem Ende, so blinkt der Standbild- oder der Vorwärts- bzw, Rückwärts-Indikatoren.

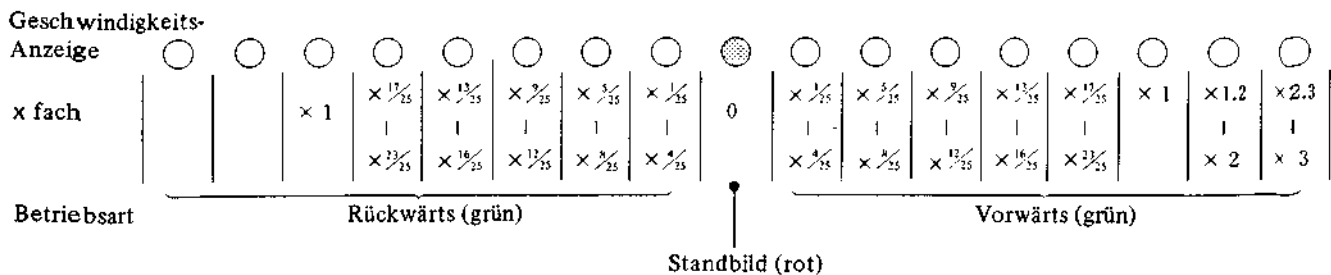
SHUTTLE-Funktion



JOG-Funktion



PROGRAM JOG-Funktion

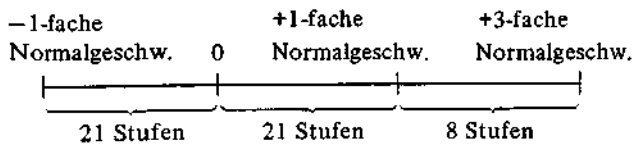


② **Variier-Taste [VAR]**

Wird die VAR-Taste gedrückt, leuchtet der Indikator auf, und das Gerät geht in den PROGRAM JOG- oder den PROGRAM PLAY-Betrieb über (einstellbar am VAR-Schalter der SY-79-Leiterplatte)

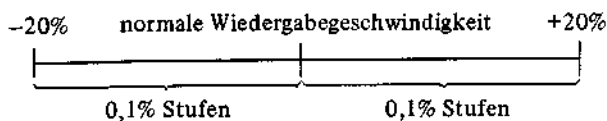
PROGRAM JOG-Betrieb

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.JOG, so kann das Gerät durch Drücken der VAR-Taste in den PROGRAM JOG-Betrieb geschaltet werden. Wird der Suchlaufknopf nach links oder rechts gedreht und dann angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-1-fache bis +3-fache Normalgeschwindigkeit). Der Knopf rastet in den Stellungen für -1-, 0-, +1- und +3-fache Normalgeschwindigkeit ein. Steht der HEAD-Wähler ① auf PLAY und wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man im PROGRAM JOG-Betrieb über den gesamten Geschwindigkeitsbereich (-1-fache bis +3-fache Normalgeschwindigkeit) ein störungsfreies Wiedergabebild. Diese Betriebsart kann auch im SHUTTLE-Betrieb (-50-fache bis +50-fache Normalgeschwindigkeit) zur Feineinstellung verwendet werden. Es ist eine Geschwindigkeitsregelung in den folgenden 50 Stufen möglich:



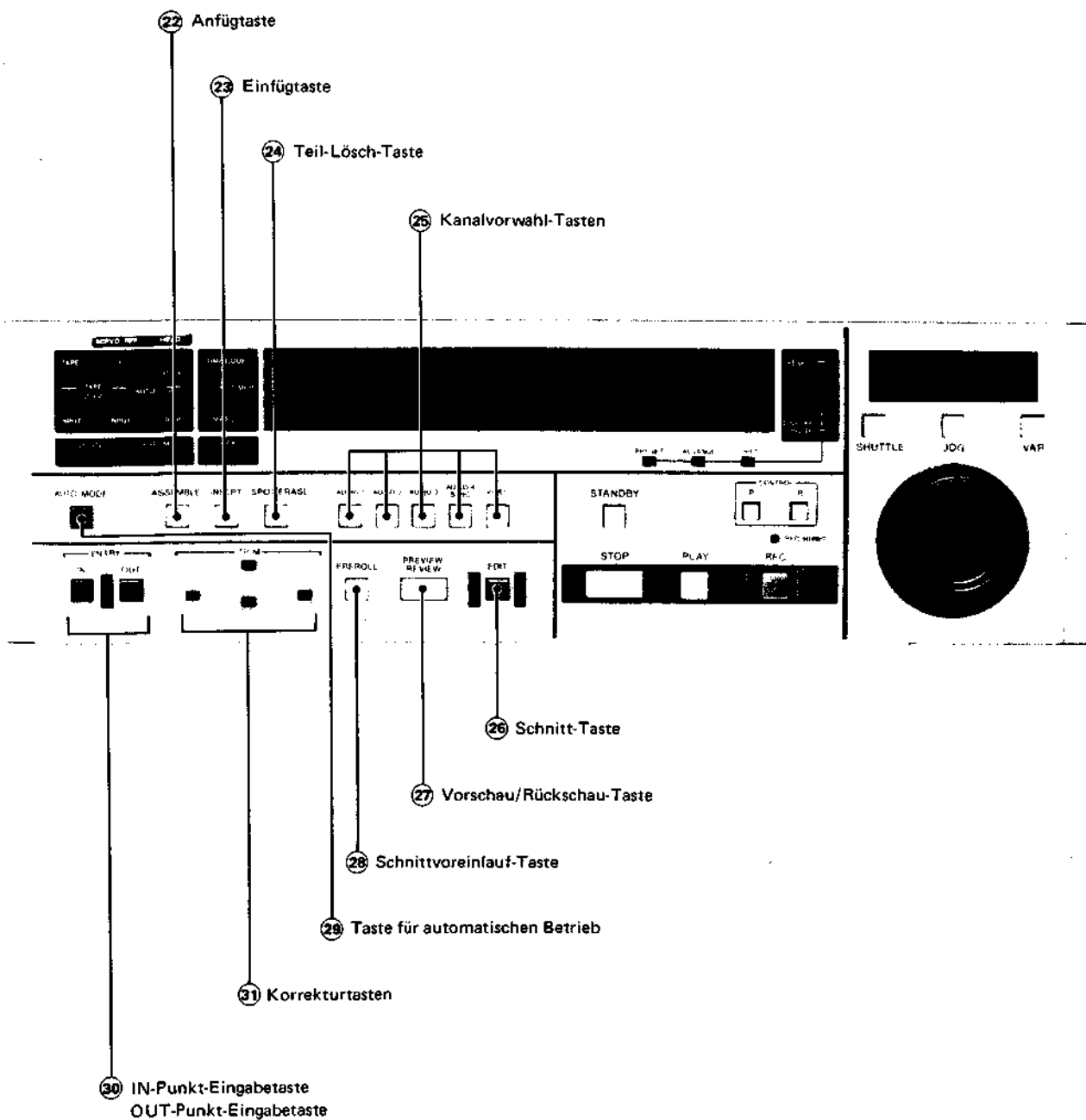
PROGRAM PLAY-Betrieb

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.PLY, so kann das Gerät durch gleichzeitiges Drücken der VAR- und der PLAY-Taste in den PROGRAM PLAY-Betrieb geschaltet werden. Wird nun bei gedrückter VAR-Taste der Suchlaufknopf nach links oder rechts gedreht und dann an einer beliebigen Stelle angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-20% bis +20%). Wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man genau wie im PROGRAM JOG-Betrieb über den gesamten Bereich ein störungsfreies Wiedergabebild. Wie der PROGRAM JOG-Betrieb kann auch der PROGRAM PLAY-Betrieb zur Feineinstellung im SHUTTLE-Betrieb verwendet werden. Die Geschwindigkeit ist dann in 0,1% Stufen bis ±20% gegenüber der normalen Wiedergabegeschwindigkeit veränderbar.



Auch eine Vorwahl der Bandgeschwindigkeit ist möglich, indem der Suchlaufknopf bei gedrückter VAR-Taste in der Stop-, Bereitschafts-, Wiedergabe- oder Aufnahme-Funktion gedreht wird. Die Programm-Wiedergabe beginnt dann mit der vorgewählten Geschwindigkeit, wenn gleichzeitig die PLAY- und die VAR-Taste gedrückt wird.

Schnitt-Bedien-Teil



②② Anfügtaste [ASSEMBLE]

Durch Drücken dieser Taste in der Stop- oder Wiedergabe-Funktion kann ein Anfügschnitt durchgeführt werden. Durch erneutes Drücken wird der Schnittvorgang gestoppt. Bei Anfügschnitt-Betrieb wird das Video- und gleichzeitig das CTL-Signal auf das Band aufgenommen. Beim Drücken der ASSEMBLE-Taste werden alle Kanalvorwahltasten ②③ eingeschaltet (die Tasten leuchten). Drücken Sie zum Ausschalten die Tasten der Kanäle, die nicht beim Schnittbetrieb verwendet werden (die betreffenden Tasten erlöschen). Werden alle Kanalvorwahl-Tasten ausgeschaltet, so ist kein Anfügbetrieb möglich. Da die VIDEO- und SYNC-Kanäle verkoppelt sind, ist es nicht möglich, nur auf eine der beiden Spuren aufzunehmen. Soll nur das Audio-Signal geschnitten werden, so muß ein Video-Signal bereits aufgezeichnet und der Capstan-Servo mit dem CTL-Signal verriegelt sein. Während des Schnittvorgangs kann der Audio-Kanal ein- und ausgeschaltet werden; eine Ausschaltung des Video-Kanals ist jedoch nicht möglich. Sobald der Video-Kanal einmal eingeschaltet ist, bleibt dieser Zustand erhalten. Wenn im Anfügbetrieb nur das Video-Signal geschnitten wird, so verursacht das CTL-Signal Störungen im Mithörton. Das aufgenommene Signal bleibt jedoch störungsfrei.

- Gleich nach dem OUT-Punkt eines Anfügschnittes erhält man kein Audio- und kein Video-Signal.

②③ Einfügtaste [INSERT]

Durch Drücken dieser Taste in der Stop- oder Wiedergabe-Funktion kann ein Einfügschnitt durchgeführt werden. Durch erneutes Drücken kann die Funktion wieder ausgeschaltet werden. Bei Einfügschnitt-Betrieb wird das bereits auf dem Band aufgezeichnete CTL-Signal als Referenzsignal verwendet, so daß am IN- und OUT-Punkt keine Störungen des Wiedergabebildes auftreten. Nach dem Drücken der INSERT-Taste sind die Kanalvorwahl-Tasten ②③ zunächst ausgeschaltet (Tasten leuchten nicht) und der gewünschte Kanal ist durch Drücken der entsprechenden Taste einzuschalten. Auch während des Einfügschnitt-Vorgangs kann ein beliebiger Kanal ein- und ausgeschaltet werden.

- Ist der V/S SIMUL-Schalter (S1-1) der LG-02-Leiterplatte auf ON gestellt, so kann das Video- und Synchronsignal gleichzeitig gewählt werden. Steht er auf OFF, kann jedes Signal unabhängig gewählt werden.

②④ Teil-Lösch-Taste [SPOT ERASE]

Mit dieser Taste können die Audio-Kanäle teilweise gelöscht werden.

(1) Manuelle Teil-Löschung

Wird die SPOT-ERASE-Taste während der Stop-, oder Bereitschafts-Funktion gedrückt, so befindet sich das Gerät in der Teil-Lösch-Funktion. Wählen Sie mit den Kanalvorwahl-Tasten ②⑤ den zu löschenden Kanal, und drücken Sie dann die EDIT-Taste. Während diese Taste gedrückt ist, wird das Signal bzw. der gewählte Kanal gelöscht. Zum Löschen ist die Aufwickelspule (rechte Seite) per Hand einige Male nach rechts und links zu drehen. Durch erneutes Drücken der SPOT ERASE-Taste oder Umschalten in eine andere Betriebsfunktion kann die manuelle Teil-Lösch-Funktion wieder abgeschaltet werden.

Hinweis: Achten Sie darauf, daß beim Bewegen des Bandes die EDIT-Taste ausgeschaltet ist.

(2) Automatische Teil-Löschung

Drücken Sie die AUTO MODE-Taste ②⑨ (Taste leuchtet) und geben Sie mit den ENTRY IN/OUT-Tasten die IN- und OUT-Punkte des zu löschenden Intervalls ein. Schalten Sie durch Drücken der SPOT ERASE-Taste auf die automatische Teil-Lösch-Funktion um. Drücken Sie dann die AUDIO SPLIT-Taste ③① und wählen Sie mit den Kanalvorwahl-Tasten ②⑤ den zu löschenden Audio-Kanal.

Wird nun die PREVIEW-Taste ②⑦ gedrückt, so wird bei der Wiedergabe der Ton zwischen den IN- und OUT-Punkten unterdrückt, so daß überprüft werden kann, ob das Löschintervall an der richtigen Stelle liegt. Durch Drücken der EDIT-Taste ②⑥ wird der Löschvorgang dann wirklich ausgeführt, und die automatische Lösch-Funktion wird automatisch am Ende des Löschvorgangs abgeschaltet.

25 Kanalvorwahl [AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO]

Drücken Sie beim Anfügschnitt-, Einfügschnitt- oder Teil-Lösch-Betrieb eine dieser Tasten zur Wahl des gewünschten Kanals.

AUDIO-1: Für AUDIO-1-Kanal

AUDIO-2: Für AUDIO-2-Kanal

AUDIO-3: Für AUDIO-3-Kanal

- Steht der TC INS INHIBIT-Schalter (S1-2) der LG-02-Leiterplatte auf ON, so kann kein Einfügschnitt durchgeführt werden, wenn sich der AUDIO-3-Kanal im Zeitcode-Eingabebetrieb befindet.

AUDIO-4: Der Sync- und AUDIO-4-Kanal kann SYNC folgendermaßen am MODE SEL-Schalter der LG-02-Leiterplatte gewählt werden:

Stellung des MODE SEL-Schalters	Ausführung des BVH-2000PS	gewählter Kanal
SYNC	(00), (02), (04)	der Sync-Kanal wird gewählt
OFF	(00), (02), (04)	weder der Sync- noch der AUDIO-4-Kanal wird gewählt
1HD	(10), (12), (14)	der AUDIO-4-Kanal wird gewählt
A4	(04), (14)	der AUDIO-4-Kanal wird gewählt

- Achten Sie beim BVH-2000PS(00) und BVH-2000PS(02) darauf, den MODE SEL-Schalter auf SYNC oder OFF zu stellen.
- Steht der V/S SIMUL-Schalter der LG-02-Leiterplatte auf ON, so können Synchron- und Video-Kanal gleichzeitig gewählt werden.

VIDEO: Für Video-Kanal

26 Schnitt-Taste [EDIT]

Diese Taste dient zum Ausführen des Schnittes. Manueller Schnitt:

Ist entweder die INSERT- oder die ASSEMBLE-Taste gedrückt (gedrückte Taste leuchtet) und befindet sich das System in servoverriegeltem Wiedergabe-Betrieb, so kann durch Drücken der EDIT-Taste ein manueller Schnitt ausgeführt werden. Durch erneutes Drücken der EDIT-Taste kann diese Funktion wieder ausgeschaltet werden.

Automatischer Schnitt:

Ist entweder die INSERT-, die ASSEMBLE- oder die SPOT ERASE-Taste und zusätzlich die AUTO MODE- sowie die ENTRY IN-Taste gedrückt (gedrückte Tasten leuchten auf), so kann durch Drücken der EDIT-Taste auf automatischen Schnittbetrieb geschaltet werden.

- Die Schnitte erfolgen auf Vollbild-Basis. Nur der manuelle Schnitt des Audio-Signals erfolgt auf Halbbild-Basis.
- Die Umschaltung zwischen gradzahligen und ungradzahligen IN/OUT-Punkt-Halbbildern erfolgt am EDIT-Schalter der SY-80-Leiterplatte.
- Um eine Teil-Löschung durchführen zu können, müssen sowohl IN- als auch OUT-Punkt eingegeben worden sein.
- Selbst wenn alle Kanalvorwahltasten beim Schnittbetrieb ausgeschaltet sind, leuchtet die EDIT-Taste weiter und das Gerät befindet sich weiter im Schnittbetrieb. Wenn die gewünschte Kanalwahltaste dann gedrückt wird, startet die Aufnahme für diesen Kanal erneut.

27 Vorschau/Rückschau-Taste [PREVIEW/REVIEW]

Diese Taste dient sowohl für Vorschau- als auch für Rückschau-Betrieb. Wurden die für den automatischen Schnitt notwendigen Daten bereits eingegeben, der Schnitt aber noch nicht durchgeführt, so arbeitet diese Taste als Vorschau-Taste. Wurde dagegen der Schnitt bereits ausgeführt, wurden aber noch keine neuen Daten für den nächsten Schnitt eingegeben, so arbeitet diese Taste als Rückschau-Taste.

Vorschau:

Ist die AUTO MODE-Taste, sowie eine der ASSEMBLE-, INSERT- oder SPOT ERASE-Tasten gedrückt und sind die IN- und OUT-Punkte bereits eingegeben, so wird bei Drücken der PREVIEW-Taste ein Vorschau-Betrieb ausgeführt.

Folgende Vorschau-Betriebesarten sind möglich:

- (1) Vollständige Vorschau von Aufnahme- und Wiedergabegerät:
Durch Drücken der CONTROL R-Taste (16) (Taste leuchtet) des betriebenen Videorecorders und Drücken der PREVIEW-Taste ist ein vollständiger Vorschau-Betrieb von Aufnahme- und Wiedergabegerät möglich. An den Monitorgeräten des Aufnahmegeräts kann dann für alle Schnitte ein Bild- und Ton-Probeschnitt (Vorschau) verfolgt werden.
- (2) Vorschau von Wiedergabegerät:
Wird die CONTROL P-Taste (19) (Taste leuchtet) des betriebenen Videorecorders und die PREVIEW-Taste gedrückt, so wird der Vorschau-Betrieb nur für das Wiedergabegerät durchgeführt.
- (3) Vorschau von Aufnahmegerät:
Werden die CONTROL P/R-Tasten (19) des betriebenen Videorecorders ausgeschaltet (Tasten leuchten nicht) und die PREVIEW-Taste gedrückt, so wird der Vorschau-Betrieb nur für das Aufnahmegerät durchgeführt.

- (4) **Vorschau des OUT-Punktes** (siehe Kapitel 1-11-8.):
Wird die PREVIEW-Taste gedrückt und gleichzeitig die OUT-Taste ⑩ gedrückt gehalten, so ist eine Vorschau in der Nähe des OUT-Punktes möglich.

Die Vorschau-Zeit kann am P.ROL TIME-Schalter der SY-79-Leiterplatte eingestellt werden.

Die Wahl des Videorecorders, für den die Vorschau des OUT-Punktes durchgeführt wird, kann genau wie in den obigen Punkten (1), (2) und (3) an den CONTROL P/R-Tasten erfolgen.

- Beim Anfügschnitt-Betrieb gibt der Videorecorder das Bild bis zum IN-Punkt wieder, stoppt dort und das E-zu-E-Bild ist ca. 2 Sekunden lang zu sehen.

②⑧ **Schnittvorauslauf-Taste [PREROLL]**

Wenn die ENTRY IN-Taste ⑩ gedrückt wurde, so läuft das Band durch Drücken dieser Taste zu einem einige Sekunden (die Zeit wurde zuvor eingestellt) vor dem ENTRY IN-Punkt liegenden Punkt und stoppt dort. Drücken Sie dazu die PREROLL-Taste zusammen mit einer der folgenden Tasten:

TRIM IN-Taste : Für IN-Punkt
TRIM OUT-Taste : Für OUT-Punkt

Das Band spult dann zu dem Schnittvorauslauf-Punkt und stoppt dort.

Die Schnittvorauslauf-Zeit kann in 1-Sekunden-Schritten von 0 bis 15 Sekunden am P.ROL TIME-Schalter der SY-79-Leiterplatte eingestellt werden.

- Wird der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC gestellt und der TIME CODE/TIMER-Wähler auf TIME CODE gestellt, so arbeitet die Schnittvorauslauf-Funktion nicht.

②⑨ **Taste für automatischen Betrieb [AUTO MODE]**

Drücken dieser Taste (Taste leuchtet) ermöglicht automatische Betriebsfunktionen: IN- und OUT-Punkt-Eingabe, Schnittvorauslauf, Vorschau, automatischer Schnittbetrieb sowie Rückschau. Durch erneutes Drücken werden diese Funktionen wieder ausgeschaltet (Taste erlischt).

③⑩ **IN/OUT-Punkt-Eingabetasten [ENTRY IN/ENTRY OUT]**

Zur Eingabe der Schnittpunkte. Ist die AUTO MODE-Taste ②⑨ gedrückt und wird die ENTRY IN- oder ENTRY OUT-Taste gedrückt, so werden die im Block 1 des Displays ⑧ angezeigten Daten als IN- bzw. OUT-Punkt eingegeben und die Taste leuchtet auf. Die Daten werden dann für Schnittvorauslauf, Vorschau, automatischer Schnittbetrieb und Rückschaubetrieb verwendet.

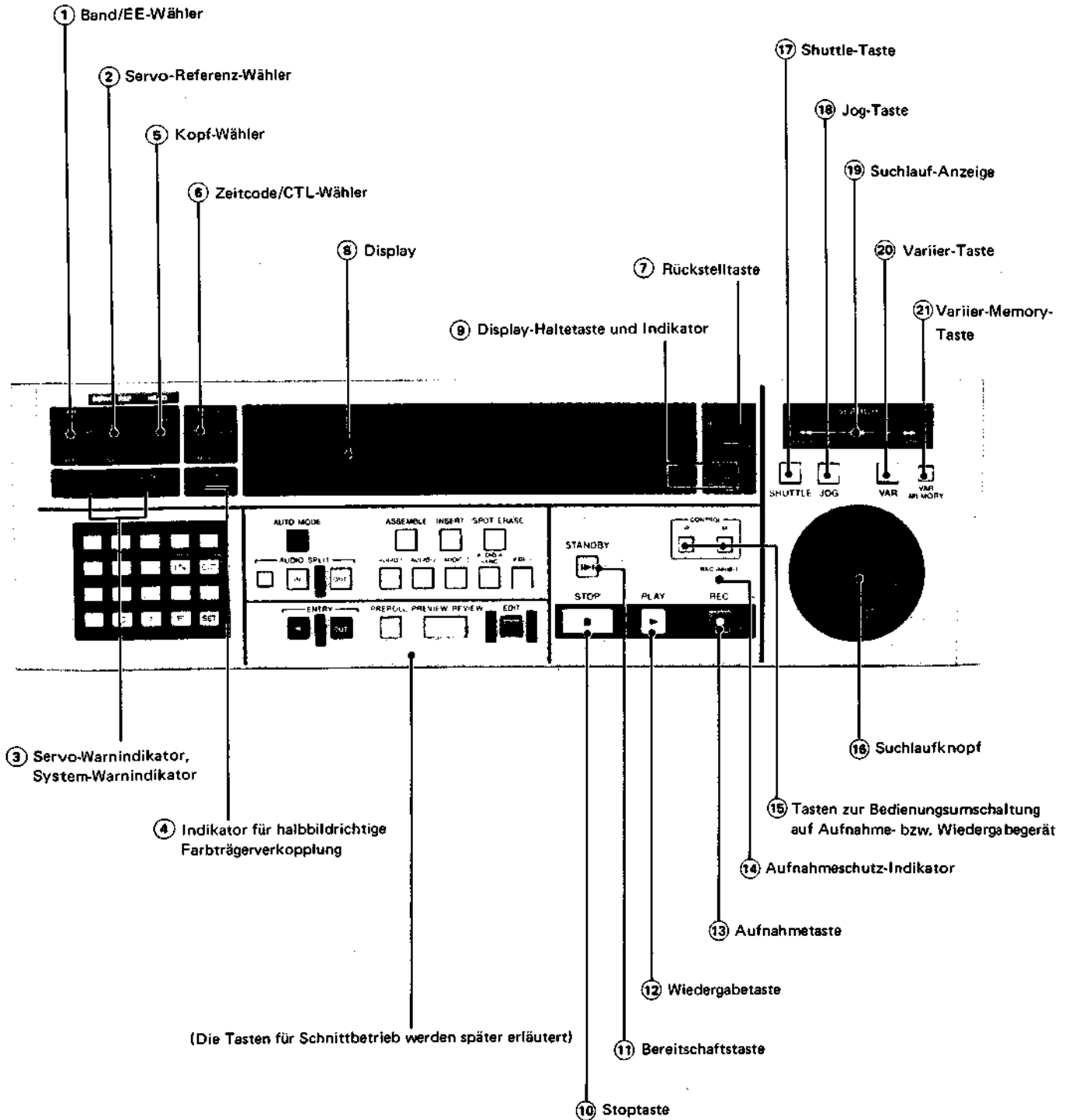
- Wird die ENTRY IN- oder OUT-Taste in der Wiedergabe- oder Aufnahme-Funktion (Band läuft) gedrückt, wo wird die Reaktionszeit von den Display-Daten abgezogen und dieser Wert dann als IN- bzw. OUT-Punkt eingegeben. Bei der Reaktionszeit handelt es sich um die beim manuellen Bedienen der Tasten entstehende Verzögerungszeit. Sie kann am REACT TIME-Schalter der SY-79-Leiterplatte von 0 bis 30 Vollbildern in 2-Vollbild-Schritten eingestellt werden.
- Wird ein OUT-Punkt eingegeben, der vor dem IN-Punkt liegt, so blinkt als Störungsmeldung auf dem Display der Hinweis „NEGATIVE“, und weder der Vorschau- noch der automatische Schnittbetrieb kann durchgeführt werden. Geben Sie in diesem Fall die richtigen IN/OUT-Punkte ein.
- Wenn sich das Band beim automatischen Schnittbetrieb zwischen dem IN- und OUT-Punkt befindet, kann der nächste IN-Punkt durch Drücken der ENTRY IN-Taste eingegeben werden. (Dies gilt jedoch nur für Geräte mit einem System-ROM der Version Nr. 3-5 und höher.)

③⑪ **Korrekturtasten [TRIM]**

Die eingegebenen IN- und OUT-Punkte können durch Drücken dieser Tasten (IN/OUT/+/-) zur Überprüfung und Korrektur abgerufen werden, und weiterhin kann auch die Schnittdauer auf dem Display ⑧ angezeigt werden. Die zu korrigierenden Schnittpunkte erscheinen im Block 2 des Displays.

- (1) Abrufen der Schnittpunkte – CALL –
Durch Drücken der TRIM IN- oder TRIM OUT-Taste können die IN- bzw. OUT-Punkte zur Überprüfung abgerufen werden.
 - (2) Korrektur der Schnittpunkte – TRIM –
Die Schnittpunkte können um eine bestimmte Anzahl von Vollbildern korrigiert werden. Halten Sie dazu die TRIM IN- (bzw. TRIM OUT-) Taste gedrückt und drücken Sie zur Korrektur gleichzeitig noch die + oder – Taste.
+ Taste: Bei jedem Drücken erfolgt eine Erhöhung um ein Vollbild.
– Taste: Bei jedem Drücken erfolgt eine Erniedrigung um ein Vollbild.
 - (3) Anzeige der Schnittdauer – DUR & LAP –
Durch gleichzeitiges Drücken der TRIM IN- und OUT-Taste wird die Schnittdauer (Zeit zwischen IN- und OUT-Punkt) angezeigt.
Zeigt das Display die TIMER-1-Daten, so erscheint der Hinweis „DUR“, zeigt es die TIMER-2-Daten, so erscheint der Hinweis „LAP“.
- In den oben angegebenen Fällen kann mit den CONTROL P/R-Tasten ⑩ jeweils zwischen Aufnahme- und Wiedergabegerät gewählt werden.

1-4-5. Bedienungspult – Typ III



① **Band/EE-Wähler [TAPE/EE]**

Zur Wahl des Ausgangssignals an den VIDEO OUTPUT-, AUDIO OUTPUT- und MONITOR OUTPUT-Anschlüssen. Das Ausgangssignal hängt wie folgt von der Position dieses Wählers und der Betriebsart des Videorecorders ab.

VIDEO

BVH-2000PS(00)(10)

Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				
	STANDBY ausgesch.	STANDBY eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb *2
TAPE	Band A/W	Bnad A/W	EE	Band A/W	EE
	Band A/W	Band A/W	EE	Band A/W	EE
TAPE/EE	EE	EE*4 (Band A/W)	EE	Band A/W	EE
	EE	EE*4 (Band A/W)	EE	Band A/W	EE
INPUT*3	EE	EE*4 (Band A/W)	EE	Band A/W	EE
	Eingang	Eingang	Eingang	Eingang	Eingang

• Der HEAD-Wähler hat keinen Einfluß auf das Ausgangssignal des BVH-2000PS(00)(10).

BVH-2000PS(02)(12) und BVH-2000PS(04)(14)

Stellung des HEAD-Wählers ⑤	Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				
		STANDBY ausgesch.	STANDBY eingesch.	REC EDIT REC	PLAY od. Sonstiges	Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb *2
R/P	TAPE	Band A/W	Band A/W	Band WG *1	Band A/W	EE
		Band A/W	Band A/W	Band WG *1	Band A/W	EE
	TAPE/EE	EE	EE *4 (Band A/W)	EE	Band A/W	EE
		EE	EE *4 (Band A/W)	EE	Band A/W	EE
	INPUT *3	EE	EE *4 (Band A/W)	EE	Band A/W	EE
		Eingang	Eingang	Eingang	Eingang	Eingang
PLAY	TAPE	Band WG	Band WG	Band WG *1	Band WG	EE
		Band WG	Bnad WG	Bnad WG *1	Band WG	EE
	TAPE/EE	EE	EE *4 (Band WG)	EE	Bnad WG	EE
		EE	EE *4 (Band WG)	EE	Band WG	EE
	INPUT *3	EE	EE *4 (Band WG)	EE	Band WG	EE
		Eingang	Eingang	Eingang	Eingang	Eingang

☐ : Ausgangssignal an VIDEO LINE OUTPUT-Anschlüssen
 ☐ : Ausgangssignal an VIDEO MONITOR OUTPUT-Anschlüssen

- *1 Ist der Schalter SW9-1 der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang im REC- oder EDIT REC-Betrieb das E-zu-E-Signal an, selbst wenn der TAPE/EE-Wähler auf TAPE gestellt ist.
- *2 Ist der Schalter SW8-5 der SY-80-Leiterplatte auf ON gestellt und die BKH-2015/2015A-Leiterplatte eingesteckt, so wird das Ausgangssignal zwischen den IN- und OUT-Punkten unterbrochen.

- *3 Ist der Schalter SW9-3 der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang in allen Betriebsarten das E-zu-E-Signal an, selbst wenn der TAPE/EE-Wähler auf INPUT gestellt ist.

Hinweis: Befindet sich entweder der Video- oder der Sync-Kanal in der EDIT REC-Funktion, so beziehen Sie sich auf die REC/EDIT REC-Spalte der Tabelle, selbst wenn sich der andere Kanal in der Wiedergabe-Funktion befindet.

- *4 Ist der REC INHIBIT-Schalter auf ON gestellt, so liegt am Ausgang das Band-Signal an.

AUDIO

AUDIO-Kanal	Stellung des TAPE/EE-Wählers ①	Betriebsart des Videorecorders				Zwischen den IN- und OUT-Punkten des Recorders im PREVIEW-Betrieb*2
		STANDBY*4 ausgesch.	STANDBY*4 eingesch.	REC EDIT REC	PLAY od. Sonstiges	
A1, A2	TAPE	Band	Band	EE	Band*1	EE
		Band	Band	Mon.*6	Band*1	EE
	TAPE/EE	EE	EE (Band)*5	EE	Band*1	EE
		EE	EE (Band)*5	EE	Band*1	EE
	INPUT*3	EE	EE (Band)*5	EE	Band*1	EE
		Eingang	Eingang	Eingang*6	Eingang	Eingang
A3	TAPE	Band	Band	EE	Band	EE
		Band	Band	Mon.	Band	EE
	TAPE/EE	Band	Band	EE	Band	EE
		Band	Band	EE	Band	EE
	INPUT	EE	EE	EE	Band	EE
		Eingang	Eingang	Eingang	Eingang	Eingang

: Ausgangssignal an AUDIO LINE OUTPUT-Anschlüssen
 : Ausgangssignal an AUDIO MONITOR OUTPUT-Anschlüssen

- *1 Wird mit 5-facher oder höherer Normalgeschwindigkeit wiedergegeben, so erfolgt eine Bedämpfung des Ausgangssignals.
- *2 Ist der Schalter SW8-5 der SY-80-Leiterplatte auf ON gestellt, so wird das Ausgangssignal zwischen den IN- und OUT-Punkten unterbrochen.
- *3 Steht der Wähler auf INPUT und ist der Schalter SW9-3 der SY-80-Leiterplatte auf ON gestellt, so liegt am Ausgang in allen Betriebsarten das E-zu-E-Signal an.

- *4 Wird in der Stop-Funktion auf INPUT gestellt, so liegt das E-zu-E-Signal stets am AUDIO-3-Kanal an und liegt selbst dann noch an den AUDIO LINE OUTPUT- und MONITOR OUTPUT-Anschlüssen an, wenn danach auf TAPE oder TAPE/EE umgeschaltet wird. Das Halten des E-zu-E-Signals wird abgebrochen, sobald der Videorecorder in eine andere Betriebsart umgeschaltet wird.

- *5 Ist der REC INHIBIT-Schalter auf ON gestellt, liegt am Ausgang das Bandsignal an.

- *6 Beim BVH-2000PS(00)(10) liegt das E-zu-E-Signal am Ausgang an.

② Servo-Referenz-Wähler [SERVO REF]

Zur Wahl des Referenzsignals für die Servoverriegelung.

EXT: Das am REF VIDEO INPUT-Anschluß ③ am Video-Anschlußfeld angeschlossene Signal (FBAS-Signal) wird Referenzsignal.

AUTO: Im REC-, EDIT REC- und EDIT-Vorwahl-Betrieb wird das Video-Eingangssignal zum Referenzsignal. Im Wiedergabe-Betrieb wird das externe Referenzsignal herangezogen (automatische Umschaltung).

INPUT: Das am VIDEO INPUT-Anschluß am Video-Anschlußfeld angeschlossene Signal wird zum Referenzsignal.

- Der bei Wiedergabe notwendige Vorlauf des Synchronsignals kann am ADVANCE-Schalter der CD-17-Leiterplatte eingestellt werden (siehe Kapitel 1-6-3).

③ SERVO-Warnindikator (rot)/SYSTEM-Warnindikator (rot) (Siehe Kapitel 1-14.)

Diese Indikatoren warnen vor inkorrektem Betrieb des Videorecorders.

SERVO-Warnindikator

Zeigt an, daß das Servosystem nicht richtig arbeitet oder noch nicht synchronisiert ist.

SYSTEM-Warnindikator

Zeigt an, daß die System-Steuerung nicht einwandfrei arbeitet.

④ Indikator für halbbildrichtige Farbträgerverkopplung [CF LOCK] (grün)

Leuchtet auf, wenn der Videorecorder mit halbbildrichtiger Farbträgerverkopplung arbeitet. Die Ein- und Ausschaltung der halbbildrichtigen Farbträgerverkopplung erfolgt an den Schaltern der CD-17- und SR-15-Leiterplatten (siehe Kapitel 1-6-3).

⑤ Kopf-Wähler [HEAD]

Zur Wahl des Wiedergabekopfes für das Video-Signal.

R/P: Die Wiedergabe erfolgt mit dem Aufnahme/Wiedergabe-Kopf.

PLAY: Die Wiedergabe erfolgt mit dem Wiedergabe-Kopf. Die Wiedergabe erfolgt mit dynamischer Spurlage, wenn der Videorecorder mit einer entsprechenden Funktion ausgestattet ist.

In der REC- oder EDIT REC-Funktion wird der Schnitt- bzw. der Schnittaufnahme-Betrieb stets mit dem Aufnahme/Wiedergabe-Kopf durchgeführt, unabhängig von der Stellung des Kopf-Wählers.

- Dieser Wähler arbeitet nur beim BVH-2000PS(02) (12) und BVH-2000PS(04)(14). Beim BVH-2000PS(00)(10) arbeitet unabhängig von der Position stets der Aufnahme/Wiedergabe-Kopf.

⑥ Zeitcode/CTL-Wähler [TIME CODE/TIMER]

Zur Wahl der auf dem Display ⑧ erscheinenden Bandlaufzeit-Anzeigeart.

TIME CODE: Zur Anzeige des EBU-Zeitcodes. Der CH3 INPUT-Schalter auf der AE-03-Leiterplatte ist dazu auf TC zu stellen (siehe Kapitel 1-6-3). Der A-3 SEL-Schalter auf der AE-03-Leiterplatte dient zur Wahl zwischen externem und internem Zeitcode (sofern die getrennt lieferbare BKH-2015/2015A-Leiterplatte eingesetzt ist). Der TC/U-BIT-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) dient zur Wahl zwischen Zeitcode- und Benutzer-Bit-Anzeige. Normalerweise wird der vom Zeitcode-Leser gelesene Wert angezeigt; steht jedoch der TAPE/EE-Wähler ① auf INPUT, wird das Signal des Zeitcode-Generators angezeigt. Steht der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC, so arbeitet die Schnitvoreinlauf-Funktion nicht.

TIMER-1: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. Durch Drücken der RESET-Taste ⑦ kann an jeder beliebigen Bandstelle auf Null zurückgestellt werden. Es wird dann eine neue, an dieser Bandstelle beginnende Bandlaufzeit angezeigt.

TIMER-2: Zur Anzeige der Bandlaufzeit durch Zählen der CTL-Signale des Bandes. In dieser TIMER-2-Stellung ist jedoch keine Rückstellung auf Null mehr möglich, nachdem das Band einmal eingefädelt ist.

Die auf dem Display angezeigten TIME CODE-, TIMER-1- bzw. TIMER-2-Daten können auch als Schnitvoreinlauf-Punkte eingegeben werden.

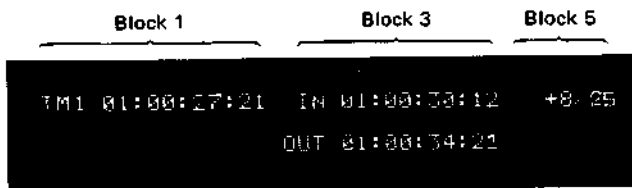
- Sowohl bei TIMER-1 als auch bei TIMER-2 beginnt das Zählen der Bandlaufzeit, sobald das Gerät in eine Betriebsfunktion (außer Stop-Funktion) gestellt wird. Bei TIMER-2 erhält man stets den Punkt als Nullpunkt, an dem nach dem Einfädeln des Bandes auf eine Betriebsfunktion umgeschaltet wurde. Rückstellen der Anzeige an einem beliebigen Bandpunkt ist nur bei TIMER-1 möglich.
- Wird das Gerät bei eingelegtem Band ausgeschaltet, so bleiben die TIMER-1- und TIMER-2-Daten dank einem eingebauten Puffer-Kondensator 12 Stunden lang abgespeichert, so daß sie innerhalb dieses Zeitraumes stets wiederverwendet werden können.

⑦ Rücksteltaste [RESET]

- (1) **TIMER-1-Rückstellung**
Steht der TIME CODE/TIMER-Wähler auf TIMER-1, so können die auf dem Display ⑧ angezeigten TIMER-1-Daten auf Null zurückgestellt werden. Rückstellung der TIMER-2-Daten ist nicht möglich.
- (2) **TIMER-CODE-Rückstellung**
Steht der TIME CODE/TIMER-Wähler auf TIME CODE und der TAPE/EE-Wähler ① auf INPUT, so wird das vom Zeitcode-Generator gelieferte Signals auf dem Display angezeigt. Durch Drücken der RESET-Taste kann der Zeitcode-Generator auf Null zurückgesetzt werden. Wenn die Benutzer-Bits auf dem Display angezeigt werden, so werden die Benutzer-Bits auf Null zurückgesetzt.

⑧ Display

Bei diesem Display handelt es sich um eine Punkt-Matrix-Anzeige mit zwei Zeilen und 40 Zeichen, die in 6 Blöcke unterteilt sind:



- Die 8 Stellen zeigen 00 Stunden/00 Minuten/00 Sekunden/00 Vollbilder
- Steht der Schalter S9-5 der SY-80-Leiterplatte auf ON, so werden die Daten mit „+/-“ angezeigt; steht er auf OFF, so handelt es sich um eine 24-Stunden-Anzeige.

Block 1

Zeigt die Bandlaufzeit des gerade betriebenen Aufnahme- oder Wiedergabegeräts. Am TIME CODE/TIMER-Wähler ⑥ kann zwischen Zeitcode- und CTL-Daten umgeschaltet werden.

Die am Anfang des Displays erscheinenden Zeichen haben folgende Bedeutungen:

- TCR: Vom Zeitcode-Leser gelesener Wert
- TCG: Vom Zeitcode-Generator gelieferter Wert
- TM1: TIMER-1-Daten
- TM2: TIMER-2-Daten
- UBR: Gelesener Benutzer-Bit-Wert
- UBG: Erzeugter Benutzer-Bit-Wert

- Steht der A-3 SEL-Schalter der AE-03-Leiterplatte (siehe Kapitel 1-6-3) nicht auf TC, so erscheint an allen Stellen der Anzeige das Zeichen „*“, wenn auf Zeitcode geschaltet ist.

Block 2

Dieser Block zeigt während der Betriebs in der automatischen Schnitt-Funktion die Zeitcode- oder TIMER-Daten des Wiedergabegeräts an, wenn der Videorecorder zusammen mit zwei BVH-2000PS oder mit einem BVH-2000PS und einem Gerät aus der BVU-800P/800S/820P/820S-Serie betrieben wird.

Block 3

Zeigt den Inhalt des Verschieberegisters von Block 4. Die Daten von Block 4 werden in den Block 3 verschoben, sobald der nächste Bedienungsschritt ausgeführt wird. Die Zeichen am Anfang dieses Blocks haben folgende Bedeutung:

- IN: Audio- oder Video-IN-Punkt
- OUT: Audio- oder Video-OUT-Punkt
- AI: Audio-IN-Punkt
- AO: Audio-OUT-Punkt

Block 4

Zeigt die an der Tastatur eingegebenen oder aufgerufenen Daten. Die Zeichen am Anfang dieses Blocks haben folgende Bedeutung:

- IN: Video-IN-Punkt
- OUT: Video-OUT-Punkt
- AI: Audio-IN-Punkt
- AO: Audio-OUT-Punkt
- DUR: Dauer (Zeit zwischen IN- und OUT-Punkten) von TIMER-1
- LAP: Dauer von TIMER-2

Block 5

Jog-Funktion: Keine Anzeige

Shuttle-, Program Jog-, Program Play-Funktion: Bandgeschwindigkeit

Andere Funktionen:

Abgespeicherte Bandgeschwindigkeit der Program Jog- oder Program Play-Funktion
Ist die Geschwindigkeit geringer als die Normalgeschwindigkeit, so wird im Block 3 der entsprechende Bruchteil angegeben, ist sie höher, so wird der entsprechende Multiplikator angegeben.

Beim BVH-2000PS(00)(10) erscheint auf dem Display die Anzeige „REC TEST“, wenn der REC TEST-Schalter auf ON und der REC INHIBIT-Schalter auf OFF steht und sich das Gerät in der Aufnahme-Test-Funktion befindet.

Block 6

In diesem Block werden folgende Störungsmeldungen durch Blinken angezeigt:

- SYS ERR: System-Fehler; die Zentral-Steuer-einheit (CPU) arbeitet nicht normal.
- OVER HEAT: Überhitzung des Netzteils oder des Motor-Treiberverstärkers
- LINE ERR: Übertragungsfehler; die Übermittlung der Fernbedienungs-Daten arbeitet nicht korrekt.
- ABORT: Ein Schnitt wurde nicht korrekt durchgeführt.
- LOST LCK*: Ausfall der Servo-Synchronisation während der Aufnahme
- NEGATIVE: Der Schnitt-OUT-Punkt liegt vor dem Schnitt-IN-Punkt.
- DATA ERR: Für die Zeit-Daten wurde ein ungültiger numerischer Wert eingegeben (z.B. 65 Sek., 35 Vollbilder).
- TAPE OUT: Falsch eingelegtes Band

- * Die Adressen, an denen LOST LCK-Fehler beim Aufnehmen oder Schneiden aufgetreten sind, werden abgespeichert und können in Block 4 abgerufen werden. (Dies gilt jedoch nur für Geräte mit einem System-ROM der Version Nr. 3-5 und höher. Genaueres dazu finden Sie unter 1-14-2. LOST LCK-Anzeige.)

⑨ Display-Haltetaste und Indikator [DISPLAY HOLD]

Wird diese Taste an einer beliebigen Bandstelle gedrückt, so werden die gerade auf dem Display ⑧ angezeigten Daten gehalten und der DISPLAY HOLD-Indikator leuchtet auf. Durch erneutes Drücken erlischt dieser Indikator wieder, und es werden die gerade gelesenen Daten angezeigt.

⑩ STOP-Taste

Durch Drücken der STOP-Taste werden alle Betriebsfunktionen gestoppt. Der Spulen-Motor stoppt, und die Andruckrolle fährt vom Band zurück.

- Ca. 30 Sekunden nach Drücken der STOP-Taste spricht der Spannungs-Abschaltmechanismus an, und das Gerät geht in den Bereitschaftsbetrieb über (geringere Bandspannung). Ist der Spannungs-Abschaltmechanismus nicht erwünscht, so stellen Sie den TENSION OFF ENABLE-Schalter (S9-7) der SY-79-Leiterplatte auf OFF.
- Das Gerät schaltet automatisch in die Stop-Funktion, wenn es eingeschaltet wird oder wenn sich kein Band am Band-Sensor befindet.
- Ein Blinken des STOP-Indikators zeigt an, daß dem Servosystem kein Referenzsignal zugeleitet wird.
- Wenn in der Stop- oder Bereitschafts-Funktion ein Band-Durchhang auftritt, so wird das Band automatisch nachgespannt.

⑪ Bereitschaftstaste [STANDBY]

Diese Taste dient zum Starten der Kopftrommel-Rotation. Drücken Sie bei normalem Betrieb zunächst diese STANDBY-Taste, überprüfen Sie, ob der SERVO-Indikator ③ erloschen ist, und schalten Sie dann in die gewünschte Betriebsfunktion um. Es kann jedoch auch direkt, ohne vorheriges Drücken der STANDBY-Taste, auf die gewünschte Funktion geschaltet werden. Ist ca. 9 Minuten nach Drücken der STANDBY-Taste noch keine andere Taste gedrückt worden, so wird die Bereitschaftsfunktion automatisch abgeschaltet.

- Wird der STANDBY OFF ENABLE-Schalter (S9-8) auf der SY-79-Leiterplatte auf OFF gestellt oder ist die AUTO MODE- oder eine der Kanalvorwahltasten eingeschaltet, so arbeitet die automatische Abschaltung der Bereitschaftsfunktion nicht.
- Hakt das Band beim Starten der Kopftrommel, so spricht der Bandspannungs-Abschaltmechanismus an und lockert das Band.
- Rotiert die Kopftrommel nicht oder ist die Rotation abnormal, so blinkt der STANDBY-Indikator.

⑫ Wiedergabetaste [PLAY]

Wird die PLAY-Taste gedrückt, so leuchtet der PLAY- und der STANDBY-Indikator auf, und das Gerät geht in die Wiedergabe-Funktion über (mit Normalgeschwindigkeit in Vorwärtsrichtung). Drücken Sie zum Abschalten der Funktion die STOP-, JOG-, SHUTTLE-, VAR- oder PREROLL-Taste.

- Bei Verwendung des BVH-2000PS(02)(12) oder des BVH-2000PS(04)(14) kann am HEAD-Wähler ⑤ auf Wiedergabe mit dem Aufnahme/Wiedergabe-Kopf oder mit dem Wiedergabe-Kopf umgeschaltet werden.
- Ist zur Synchronisierung zweier Videorecorder der BVH-Serie eine geringfügige Korrektur der Wiedergabe-Geschwindigkeit erforderlich, so halten Sie die PLAY-Taste gedrückt und drehen Sie den Suchlaufknopf ⑬ nach rechts (schneller) oder links (langsamer). Der Grad der Geschwindigkeitskorrektur hängt vom Drehwinkel des Knopfes ab und liegt max. bei etwa $\pm 15\%$ der Normalgeschwindigkeit (Capstan-Geschwindigkeitskorrektur). Wird die PLAY-Taste losgelassen, schaltet der Videorecorder auf Normalgeschwindigkeit zurück.

⑬ Aufnahmetaste [REC]

Wird die REC-Taste gedrückt gehalten und gleichzeitig noch die PLAY-Taste gedrückt, geht das Gerät in die Aufnahme-Funktion über, und es leuchten sowohl der REC- als auch der PLAY-Indikator. Zum Abschalten der Aufnahme-Funktion drücken Sie die STOP-, JOG-SHUTTLE-, VAR- oder PREROLL-Taste.

- Die Aufnahme wird unabhängig von der Stellung des HEAD-Wählers ⑤ stets mit dem Aufnahme/Wiedergabe-Kopf durchgeführt.
- Bei Verwendung des BVH-2000PS(02)(12) und BVH-2000PS(04)(14) kann während des Aufnehmens ein Kontroll-Wiedergabebild mitverfolgt werden, wenn der TAPE/EE-Wähler ① auf TAPE steht.
- Leuchtet der REC INHIBIT-Indikator ⑭, so nimmt das Gerät nicht auf, sondern schaltet in die Wiedergabe-Funktion.
- Wenn der REC TEST-Schalter der SY-79-Leiterplatte auf ON steht und der BVH-2000PS(00)(10) sich in der Stop-Funktion befindet, so schaltet der BVH-2000PS(00)(10) auf die Aufnahme-Test-Funktion um, wenn die REC-Taste gedrückt wird. (Genaueres dazu siehe Seite 1-77(G).)

⑭ Aufnahmeschutz-Indikator [REC INHIBIT]

Dieser Indikator leuchtet, wenn der REC INHIBIT-Schalter auf ON gestellt ist und sich der Videorecorder dadurch in der Aufnahmeschutz- oder Schnittaufnahmeschutz-Funktion befindet. Wird versucht, auf Aufnahme oder Schnittaufnahme zu schalten, während dieser Indikator leuchtet, so geht der Videorecorder in die Wiedergabe-Funktion über.

- Steht der REC TEST-Schalter der SY-79-Leiterplatte auf ON und befindet sich der BVH-2000PS(00)(10) in der Aufnahme-Test-Funktion, so blinkt der REC INHIBIT-Indikator. (Genaueres siehe Seite 1-77(G).)

15 Tasten zur Bedienungsumschaltung auf Aufnahme- oder Wiedergabegerät [CONTROL P/R]

Der BVH-2000PS arbeitet als Aufnahmegerät und ein weiterer am REMOTE-2-Anschluß des rückseitigen Anschlußfeldes angeschlossener Videorecorder arbeitet als Wiedergabegerät, wenn der REMOTE-Schalter der SY-79-Leiterplatte auf REMOTE-2 steht und der REMOTE/LOCAL-Schalter am Pegelregler-Teil auf LOCAL gestellt wird. Folgende Bedienungsarten sind durch Drücken dieser Tasten möglich (siehe unter 1-11-3):

P-Taste leuchtet: Wird die P-Taste gedrückt (Taste leuchtet), so steuern die Schnitt- und Bandlauf-Tasten das angeschlossene Wiedergabegerät, so daß es fernbedient werden kann. Auch die Display-Anzeigen gelten für das Wiedergabegerät. Die SERVO REF ② -, HEAD ③ - und TIME CODE/TIMER ⑥ Wähler arbeiten jedoch nicht und müssen am Wiedergabegerät selbst entsprechend eingestellt werden.

R-Taste leuchtet: Wird die R-Taste gedrückt (Taste leuchtet), so steuern die Bedienelemente den BVH-2000PS (Aufnahmegerät). Ist die AUTO MODE-Taste ⑨ gedrückt, so befinden sich Aufnahme- und Wiedergabegerät in einer gemeinsamen Steuerfunktion, so daß Vorschau-, Rückschau- und automatischer Schnittbetrieb möglich ist.

P- und R-Taste leuchten gleichzeitig:

Sind beide Tasten gedrückt (Tasten leuchten), so können beide Videorecorder synchron bedient werden. Es ist dazu allerdings notwendig, daß der PARA-RUN-Schalter der SY-79-Leiterplatte auf ON gestellt ist.

P- und R-Tasten leuchten nicht:

Ist keine der beiden Tasten gedrückt (Tasten leuchten nicht), so wird nur der BVH-2000PS gesteuert.

16 Suchlaufknopf

Dieser Knopf dient zur Steuerung des Bandlaufes.

(1) Durch Drehen dieses Knopfes in der JOG-, SHUTTLE- PROGRAM JOG- und PROGRAM PLAY-Funktion (siehe Kapitel 1-9) kann die Bandlauf-Geschwindigkeit und -Richtung geändert werden.

(2) Wird dieser Knopf in der Stop-, Bereitschafts-, Wiedergabe- oder Aufnahme-Funktion gedreht, so kann die Bandlauf-Geschwindigkeit und -Richtung für den PROGRAM PLAY- und den PROGRAM JOG-Betrieb vorgewählt werden. Die eingestellte Geschwindigkeit wird im Block ③ des Displays ⑧ angezeigt.

(3) Halten Sie die STOP-Taste in der Stopp-Funktion gedrückt bzw. halten Sie die STANDBY-Taste in der Aufnahme- oder Schnitt-Funktion gedrückt und drehen Sie den Suchlaufknopf, bis die Adressen der im vorhergehenden Schnitt- oder Aufnahmebetrieb aufgetretenen LOST LCK-Fehler auf dem Display erscheinen. (Dies gilt jedoch nur für Geräte mit einem System-ROM der Version Nr.3-5 und höher. Genaueres dazu finden Sie unter I-14-2. LOST LCK-Anzeige.)

17 Shuttle-Taste [SHUTTLE]

Wird die SHUTTLE-Taste gedrückt, so leuchtet der Indikator auf, und das Gerät geht in den Shuttle-Betrieb über. Wird der Suchlaufknopf ⑩ nun nach links oder rechts gedreht und an einer beliebigen Stelle angehalten, so wird die Wiedergabe mit der so eingestellten Geschwindigkeit durchgeführt. (1/32 bis 50-fache Normalgeschwindigkeit). In der Mittelstellung erhält man ein Standbild. Der Suchlaufknopf rastet in der Mittelstellung und in den ± 50 Stellungen ein.

- Beim Vorspulen wird die Geschwindigkeit vor dem Erreichen des Bandendes bereits automatisch reduziert, und das Band stoppt automatisch. Soll das Band vollkommen vorgespult werden, drehen Sie den Suchlaufknopf erneut nach rechts oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.

- Auch beim Rückspulen wird die Geschwindigkeit am Bandanfang automatisch reduziert, und das Band stoppt automatisch in der Nähe des Punktes, an dem der TIMER-2 auf Null zurückgestellt wurde.

- Soll das Band vollkommen zurückgespult werden, so drehen Sie den Suchlaufknopf erneut nach links oder stellen Sie den EOT STOP-Schalter der SY-80-Leiterplatte auf OFF.

- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion, um das Band zu schonen. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

18 Jog-Taste [JOG]

Wird die JOG-Taste gedrückt, so leuchtet der Indikator auf, und das Gerät geht in den JOG-Betrieb über. Wird der Suchlaufknopf nun nach links oder rechts gedreht, entspricht die Wiedergabegeschwindigkeit der Drehgeschwindigkeit des Knopfes (0 bis zu einigen Vielfachen der Normalgeschwindigkeit). Wird der Suchlaufknopf an einer beliebigen Stelle angehalten, so erhält man ein Standbild. Der Suchlaufknopf rastet an keiner Stelle ein.

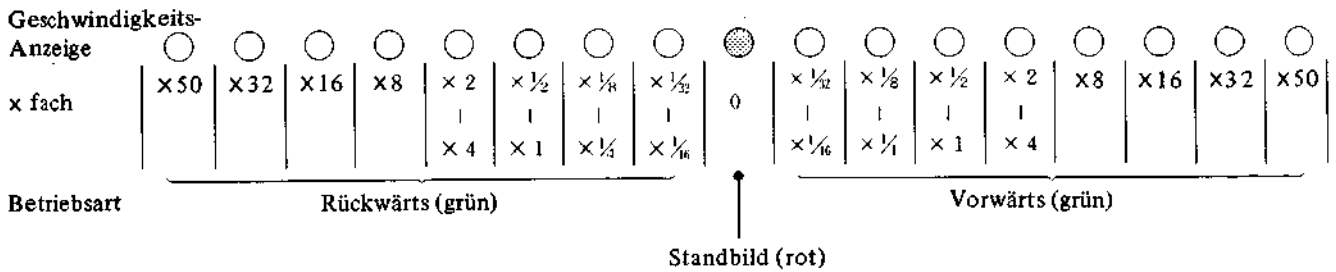
- Wird das Gerät für 3 Minuten oder mehr in der Standbild-Funktion belassen, so schaltet es automatisch auf Stop-Funktion. Ist diese automatische Umschaltung auf die Stop-Funktion nicht erwünscht, so stellen Sie den STILL OFF ENABLE-Schalter (S9-6) der SY-79-Leiterplatte auf OFF.

⑲ Suchlauf-Anzeige [SEARCH]

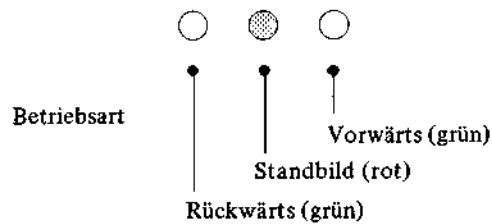
Zeigt die Betriebsart des Suchlaufknopfes an. In der SHUTTLE-, JOG- oder PROGRAM JOG-Funktion (siehe ⑳) zeigen diese Indikatoren, wie in der Abb. unten dargestellt, die Bandlauf-Geschwindigkeit und -Richtung an.

Hinweis: Nähert sich das Band dem Ende, so blinkt der Standbild- oder der Vorwärts- bzw. Rückwärts-Indikatoren.

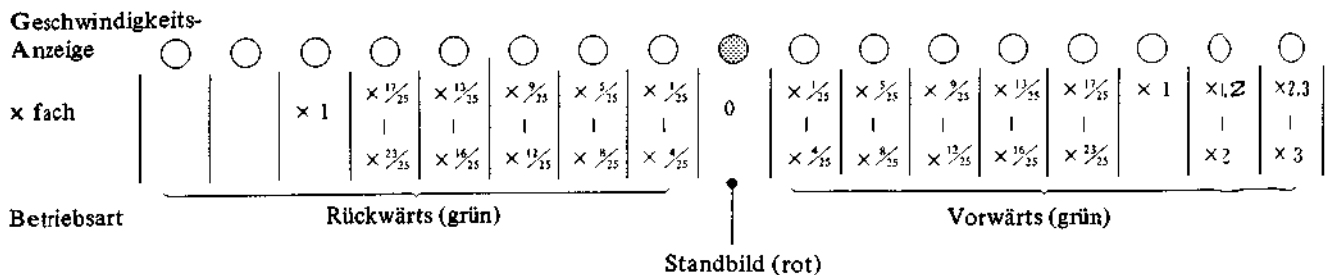
SHUTTLE-Funktion



JOG-Funktion



PROGRAM JOG-Funktion

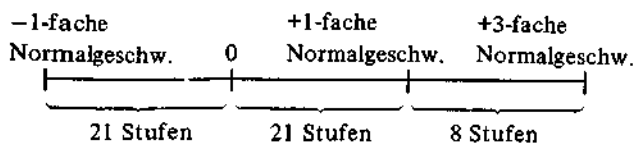


20 Variier-Taste [VAR]

Wird die VAR-Taste gedrückt, leuchtet der Indikator auf, und das Gerät geht in den PROGRAM JOG- oder den PROGRAM PLAY-Betrieb über (einstellbar am VAR-Schalter der SY-79-Leiterplatte).

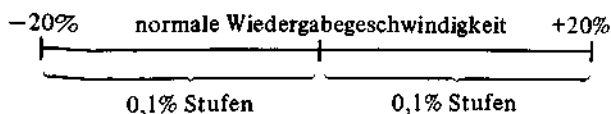
PROGRAM JOG-Betrieb:

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.JOG, so kann das Gerät durch Drücken der VAR-Taste in den PROGRAM JOG-Betrieb geschaltet werden. Wird der Suchlaufknopf nach links oder rechts gedreht und dann angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-1-fache bis +3-fache Normalgeschwindigkeit). Der Knopf rastet in den Stellungen für -1-, 0-, +1- und +3-fache Normalgeschwindigkeit ein. Steht der HEAD-Wähler ① auf PLAY und wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man im PROGRAM JOG-Betrieb über den gesamten Geschwindigkeitsbereich (-1-fache bis +3-fache Normalgeschwindigkeit) ein störungsfreies Wiedergabebild. Diese Betriebsart kann auch im SHUTTLE-Betrieb (-50-fache bis +50-fache Normalgeschwindigkeit) zur Feineinstellung verwendet werden. Es ist dann eine Geschwindigkeitsregelung in den folgenden 50 Stufen möglich:



PROGRAM PLAY-Betrieb:

Steht der VAR-Schalter der SY-79-Leiterplatte auf P.PLY, so kann das Gerät durch gleichzeitiges Drücken der VAR- und der PLAY-Taste in den PROGRAM PLAY-Betrieb geschaltet werden. Wird nun bei gedrückter VAR-Taste der Suchlaufknopf nach links oder rechts gedreht und dann an einer beliebigen Stelle angehalten, so erfolgt die Wiedergabe mit einer der Knopfstellung entsprechenden Geschwindigkeit (-20% bis +20%). Wird der BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) verwendet, so erhält man genau wie im PROGRAM JOG-Betrieb über den gesamten Bereich ein störungsfreies Wiedergabebild. Wie der PROGRAM JOG-Betrieb kann auch der PROGRAM PLAY-Betrieb zur Feineinstellung im SHUTTLE-Betrieb verwendet werden. Die Geschwindigkeit ist in 0,1% Stufen bis $\pm 20\%$ gegenüber der normalen Wiedergabegeschwindigkeit veränderbar.



Auch eine Vorwahl der Bandgeschwindigkeit ist möglich, indem der Suchlaufknopf bei gedrückter VAR-Taste in der Stop-, Bereitschafts-, Wiedergabe-, oder Aufnahme-Funktion gedreht wird. Die Programm-Wiedergabe beginnt dann mit der vorgewählten Geschwindigkeit, wenn gleichzeitig die PLAY- und die VAR-Taste gedrückt wird.

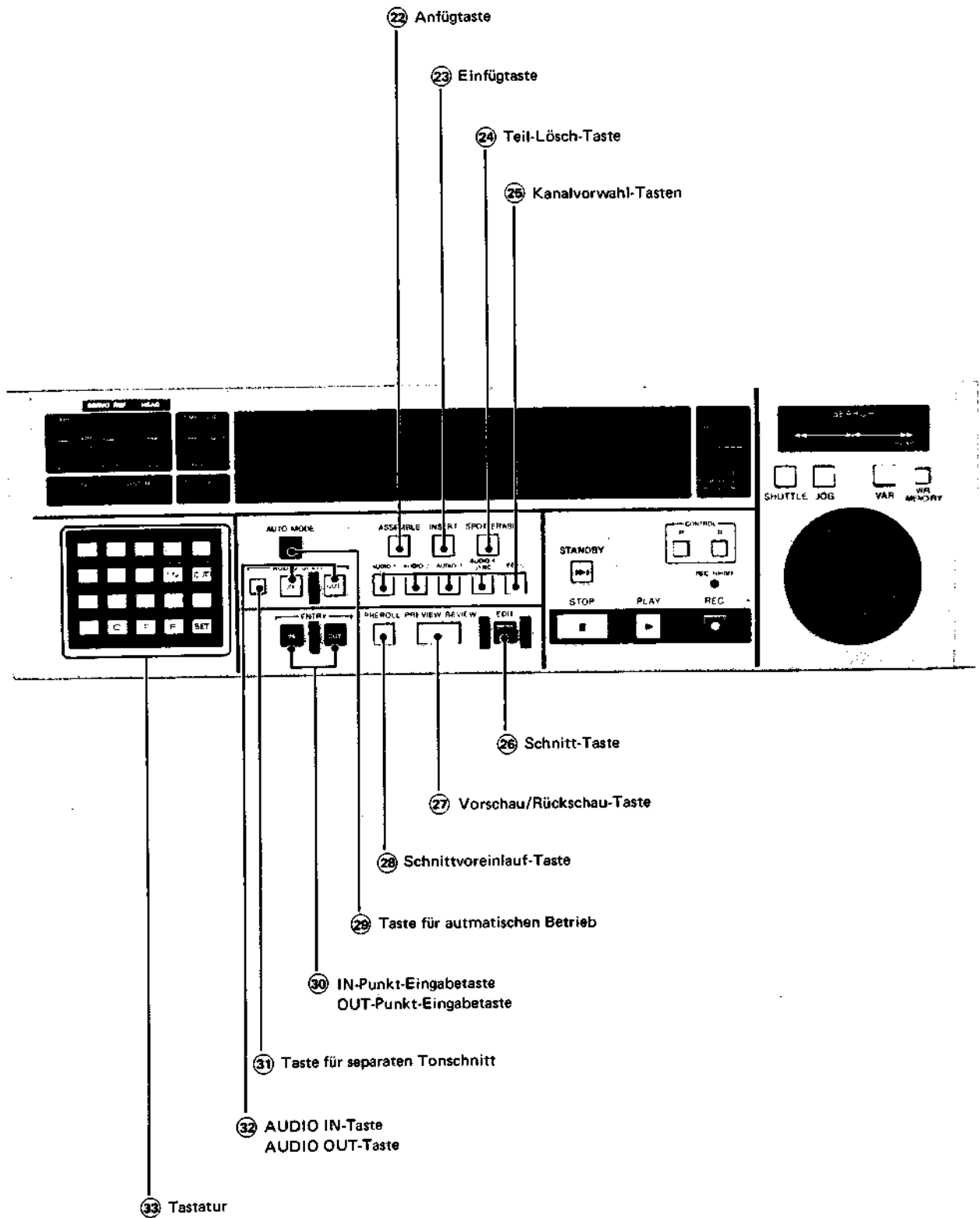
Die eingestellte Geschwindigkeit wird im Block 5 des Displays ⑧ angezeigt. Im PROGRAM JOG-Betrieb erfolgt die Anzeige als Bruchteil oder Dezimalzahl; im PROGRAM PLAY-Betrieb erfolgt sie in „%“.

21 Variier-Memory-Taste [VAR MEMORY]

Die im PROGRAM JOG-Betrieb durchgeführten Bedienungen des Suchlaufknopfes (Änderungen der Band-Geschwindigkeit und -Richtung) können abgespeichert und später wieder abgerufen werden.

- (1) Drücken Sie die AUTO MODE- und die VAR MEMORY-Taste.
- (2) Starten Sie den Bandlauf und speichern Sie den gewünschten Startpunkt durch Drücken der ENTRY IN-Taste ab.
Wählen Sie am Suchlaufknopf die Anfangsgeschwindigkeit vor.
- (3) Drücken Sie gleichzeitig die PREROLL- und PREVIEW/REVIEW-Tasten.
Das Band läuft dann mit der vorgewählten Anfangsgeschwindigkeit.
- (4) Sobald das Band den IN-Punkt erreicht, ertönt ein Summton. Wird danach der Suchlaufknopf bedient, so wird die Kurve des Bedienungsvorgangs abgespeichert.
- (5) Stoppen Sie den Bandlauf durch Drücken der STOP-Taste.
- (6) Wird nun die PREVIEW-Taste gedrückt, so läuft das Band entsprechend der abgespeicherten Kurve des Suchlaufknopf-Bedienungsvorgangs.
 - Solange die VAR MEMORY-Taste blinkt, ist das Variier-Memory noch nicht voll.
Leuchtet die Taste dagegen konstant auf, so ist das Memory voll, und es können keine weiteren Bedienungsvorgänge mehr abgespeichert werden.
 - Beim BVH-2000PS(00)(10) ist kein störungsfreies Wiedergabebild möglich.
 - Ist die PREROLL-Taste gedrückt, so läuft das Band zu folgendem Punkt und stoppt dort: [IN-Punkt] - [Anfangsgeschwindigkeit (Sek.)] x [Anfangsgeschwindigkeit].
Zum Starten der Wiedergabe drücken Sie die PREVIEW/REVIEW-Taste. Am IN-Punkt erhält man dann die voreingestellte Anfangsgeschwindigkeit und die Wiedergabe wird mit der abgespeicherten Geschwindigkeit fortgesetzt.

Schnitt-Bedien-Teil



1. BETRIEB

②② Anfügtaste [ASSEMBLE]

Durch Drücken dieser Taste in der Stop- oder Wiedergabe-Funktion kann ein Anfügschnitt durchgeführt werden. Durch erneutes Drücken wird der Schnittvorgang gestoppt. Bei Anfügschnitt-Betrieb wird das Video- und gleichzeitig das CTL-Signal auf das Band aufgenommen. Beim Drücken der ASSEMBLE-Taste werden alle Kanalvorwahl-Tasten ②⑤ eingeschaltet (die Tasten leuchten). Drücken Sie zum Ausschalten die Taste der Kanäle, die nicht beim Schnittbetrieb verwendet werden (die betreffenden Tasten erlöschen). Werden alle Kanalvorwahl-Tasten ausgeschaltet, so ist kein Anfügbetrieb möglich. Da die VIDEO- und SYNC-Kanäle verkoppelt sind, ist es nicht möglich, nur auf eine der beiden Spuren aufzunehmen. Soll nur das Audio-Signal geschnitten werden, so muß ein Video-Signal bereits vor aufgezeichnet und der Capstan-Servo mit dem CTL-Signal verriegelt sein. Während des Schnittvorgangs kann der Audio-Kanal ein- und ausgeschaltet werden; eine Ausschaltung des Video-Kanals ist jedoch nicht möglich. Sobald der Video-Kanal einmal eingeschaltet ist, bleibt dieser Zustand erhalten. Wenn im Anfügbetrieb nur das Video-Signal geschnitten wird, so verursacht das CTL-Signal Störungen im Mithörton. Das aufgenommene Signal bleibt jedoch störungsfrei.

- Gleich nach dem OUT-Punkt eines Anfügschnittes erhält man kein Audio- und kein Video-Signal.

②③ Einfügtaste [INSERT]

Durch Drücken dieser Taste in der Stop- oder Wiedergabe-Funktion kann ein Einfügschnitt durchgeführt werden. Durch erneutes Drücken kann die Funktion wieder ausgeschaltet werden. Bei Einfügschnitt-Betrieb wird das bereits auf dem Band aufgezeichnete CTL-Signal als Referenzsignal verwendet, so daß am IN- und OUT-Punkt keine Störungen des Wiedergabebildes auftreten. Nach dem Drücken der INSERT-Taste sind die Kanalvorwahl-Tasten zunächst ausgeschaltet (Tasten leuchten nicht) und der gewünschte Kanal ist durch Drücken der entsprechenden Taste einzuschalten. Auch während des Einfügschnitt-Vorgangs kann ein beliebiger Kanal ein- und ausgeschaltet werden.

- Ist der V/S SIMUL-Schalter (S1-1) der LG-02-Leiterplatte auf ON gestellt, so kann das Video- und Synchronsignal gleichzeitig gewählt werden. Steht er auf OFF, kann jedes Signal unabhängig gewählt werden.

②④ Teil-Lösch-Taste [SPOT ERASE]

Mit dieser Taste können die Audio-Kanäle teilweise gelöscht werden.

(1) Manuelle Teil-Löschung

Wird die SPOT ERASE-Taste während der Stop-, oder Bereitschafts-Funktion gedrückt, so befindet sich das Gerät in der Teil-Lösch-Funktion. Wählen Sie mit den Kanalvorwahl-Tasten ②⑤ den zu löschenden Kanal, und drücken Sie dann die EDIT-Taste. Während diese Taste gedrückt ist, wird das Signal bzw. der gewählte Kanal gelöscht. Zum Löschen ist die Aufwickelpule (rechte Seite) per Hand einige Male nach rechts und links zu drehen. Durch erneutes Drücken der SPOT ERASE-Taste oder Umschalten in eine andere Betriebsfunktion kann die manuelle Teil-Lösch-Funktion wieder abgeschaltet werden.

Hinweis: Achten Sie darauf, daß beim Bewegen des Bandes die EDIT-Taste ausgeschaltet ist.

(2) Automatische Teil-Löschung

Drücken Sie die AUTO MODE-Taste ②⑨ (Taste leuchtet) und geben Sie mit den ENTRY IN/OUT-Tasten die IN- und OUT-Punkte des zu löschenden Intervalls ein. Schalten Sie durch Drücken der SPOT ERASE-Taste auf die automatische Teil-Lösch-Funktion um. Drücken Sie dann die AUDIO SPLIT-Taste ③① und wählen Sie mit den Kanalvorwahl-Tasten ②⑤ den zu löschenden Audio-Kanal.

Wird nun die PREVIEW-Taste ②⑦ gedrückt, so wird bei der Wiedergabe der Ton zwischen den IN- und OUT-Punkten unterdrückt, so daß überprüft werden kann, ob das Löschintervall an der richtigen Stelle liegt. Durch Drücken der EDIT-Taste ②⑥ wird der Löschvorgang dann wirklich ausgeführt, und die automatische Lösch-Funktion wird automatisch am Ende des Löschvorgangs abgeschaltet.

25 Kanalvorwahl-Tasten [AUDIO-1, AUDIO-2, AUDIO-3, AUDIO-4/SYNC, VIDEO]

Drücken Sie beim Anfügschnitt-, Einfügschnitt- oder Teil-Lösch-Betrieb eine dieser Tasten zur Wahl des gewünschten Kanals.

AUDIO-1: Für AUDIO-1-Kanal

AUDIO-2: Für AUDIO-2-Kanal

AUDIO-3: Für AUDIO-3-Kanal

- Steht der TC INS INHIBIT-Schalter (S1-2) der LG-02-Leiterplatte auf ON, so kann kein Einfügschnitt durchgeführt werden, wenn sich der AUDIO-3-Kanal im Zeitcode-Eingabebetrieb befindet.

AUDIO-4: Der Sync- und AUDIO-4-Kanal kann folgendermaßen am MODE SEL-Schalter der LG-02-Leiterplatte gewählt werden:

Stellung des MODE SEL-Schalters	Ausführung des BVH-2000PS	gewählter Kanal
SYNC	(00), (02), (04)	der Sync-Kanal wird gewählt
OFF	(00), (02), (04)	weder der Sync- noch der
1HD	(10), (12), (04)	AUDIO-4-Kanal wird gewählt
A4	(04), (14)	der AUDIO-4-Kanal wird gewählt

- Achten Sie beim BVH-2000PS(02) und BVH-2000PS(00) darauf, den MODE SEL-Schalter auf SYNC oder OFF zu stellen.
- Steht der V/S SIMUL-Schalter der LG-02-Leiterplatte auf ON, so können Synchron- und Video-Kanal gleichzeitig gewählt werden.

VIDEO: Für Video-Kanal

26 Schnitt-Taste [EDIT]

Diese Taste dient zum Ausführen des Schnittes. Manueller Schnitt:

Ist entweder die INSERT- oder die ASSEMBLE-Taste gedrückt (gedrückte Taste leuchtet) und befindet sich das System in servoverriegeltem Wiedergabe-Betrieb, so kann durch Drücken der EDIT-Taste ein manueller Schnitt ausgeführt werden. Durch erneutes Drücken der EDIT-Taste kann diese Funktion wieder ausgeschaltet werden.

Automatischer Schnitt:

Ist entweder die INSERT-, die ASSEMBLE- oder die SPOT ERASE-Taste und zusätzlich die AUTO MODE- sowie die ENTRY IN-Taste gedrückt (gedrückte Tasten leuchten auf), so kann durch Drücken der EDIT-Taste auf automatischen Schnittbetrieb geschaltet werden.

- Die Schnitte erfolgen auf Vollbild-Basis. Nur der manuelle Schnitt des Audio-Signals erfolgt auf Halb-bild-Basis.
- Die Umschaltung zwischen gradzahligen und

ungradzahligen IN/OUT-Punkt-Halbbildern erfolgt am EDIT-Schalter der SY-80-Leiterplatte.

- Um eine Teil-Löschung durchführen zu können, müssen sowohl IN- als auch OUT-Punkt eingegeben worden sein.
- Selbst wenn alle Kanalvorwahl-tasten beim Schnittbetrieb ausgeschaltet sind, leuchtet die EDIT-Taste weiter und das Gerät befindet sich weiter im Schnittbetrieb. Wenn die gewünschte Kanalwahl-taste dann gedrückt wird, startet die Aufnahme für diesen Kanal erneut.

27 Vorschau/Rückschau-Taste [PREVIEW/REVIEW]

Diese Taste dient sowohl für Vorschau- als auch für Rückschau-Betrieb. Wurden die für den automatischen Schnitt notwendigen Daten bereits eingegeben, der Schnitt aber noch nicht durchgeführt, so arbeitet diese Taste als Vorschau-Taste. Wurde dagegen der Schnitt bereits ausgeführt, wurden aber noch keine neuen Daten für den nächsten Schnitt eingegeben, so arbeitet diese Taste als Rückschau-Taste.

Vorschau:

Ist die AUTO MODE-Taste, sowie eine der ASSEMBLE-, INSERT- oder SPOT ERASE-Tasten gedrückt und sind die IN- und OUT-Punkte bereits eingegeben, so wird bei Drücken der PREVIEW-Taste ein Vorschau-Betrieb ausgeführt.

Folgende Vorschau-Betriebsarten sind möglich:

- (1) Vollständige Vorschau von Aufnahme- und Wiedergabegerät:
Durch Drücken der CONTROL R-Taste (15) (Taste leuchtet) des betriebenen Videorecorders und Drücken der PREVIEW-Taste ist ein vollständiger Vorschau-Betrieb von Aufnahme- und Wiedergabegerät möglich. An den Monitorgeräten des Aufnahmeapparats kann dann für alle Schritte ein Bild- und Ton-Probenschnitt (Vorschau) verfolgt werden.
- (2) Vorschau von Wiedergabegerät:
Wird die CONTROL P-Taste (13) (Taste leuchtet) des betriebenen Videorecorders und die PREVIEW-Taste gedrückt, so wird der Vorschau-Betrieb nur für das Wiedergabegerät durchgeführt.
- (3) Vorschau von Aufnahmeapparät:
Werden die CONTROL P/R-Tasten (13) des betriebenen Videorecorders ausgeschaltet (Tasten leuchten nicht) und die PREVIEW-Taste gedrückt, so wird der Vorschau-Betrieb nur für das Aufnahmegerät durchgeführt.
- (4) Vorschau des OUT-Punktes (siehe Kapitel 1-1-8.):
Wird die PREVIEW-Taste gedrückt und gleichzeitig die OUT-Taste (13) gedrückt gehalten, so ist eine Vorschau in der Nähe des OUT-Punktes möglich. Die Vorschau-Zeit kann am P.ROL TIME-Schalter der SY-79-Leiterplatte eingestellt werden.
Die Wahl des Videorecorders, für den die Vorschau des OUT-Punktes durchgeführt wird, kann genau wie in den obigen Punkten (1), (2) und (3) an den CONTROL P/R-Tasten erfolgen.

28 Schnittvoreinlauf-Taste [PREROLL]

Wurde zur Schnittpunkt-Eingabe die ENTRY IN-, ENTRY OUT- oder AUDIO OUT-Taste gedrückt (oder wurden mehrere dieser Tasten gedrückt), so kann das Band durch Drücken der PREROLL-Taste zum Schnittvoreinlauf-Punkt gespult und dort gestoppt werden.

Am P.ROL TIME-Schalter der SY-79-Leiterplatte kann die Schnittvoreinlauf-Zeit zwischen 0 und 15 Sekunden in 1-Sekunden-Schritten eingestellt werden.

(1) Umspulen zum Schnittvoreinlauf-Punkt:

Wird nur die PREROLL-Taste gedrückt, so stoppt das Band einige Sekunden vor dem mit der ENTRY IN-Taste eingegebenen IN-Punkt.

(2) Umspulen zu den Video- oder Audio-IN/OUT-Schnittvoreinlauf-Punkten:

Wird eine der folgenden Tasten der Tastatur 33 gedrückt gehalten und gleichzeitig noch die PREROLL-Taste gedrückt, so wird der folgende Schnittvoreinlauf durchgeführt.

Tastatur	{	IN-Taste: Video-IN-Punkt
		OUT-Taste: Video-OUT-Punkt
		AUDIO IN-Taste: Audio-IN-Punkt
		AUDIO OUT-Taste: Audio-OUT-Punkt

Wird der READ-Schalter der BKH-2015/2015A-Leiterplatte (TC-14/14A) auf VITC gestellt und der TIME CODE/TIMER-Wähler auf TIME CODE gestellt, so arbeitet die Schnittvoreinlauf-Funktion nicht.

29 Taste für automatischen Betrieb [AUTO MODE]

Drücken dieser Taste (Taste leuchtet) ermöglicht automatische Betriebsfunktionen: IN-Punkt und OUT-Punkt-Eingabe, Schnittvoreinlauf, Vorschau, automatischer Schnittbetrieb sowie Rückschau. Durch erneutes Drücken wird diese Taste wieder ausgeschaltet (Taste erlischt).

30 IN/OUT-Punkt-Eingabetasten [ENTRY IN/ENTRY OUT]

Zur Eingabe der Schnittpunkte. Ist die AUTO MODE-Taste 29 gedrückt und wird die ENTRY IN- oder ENTRY OUT-Taste gedrückt, so werden die im Block 1 des Displays 8 angezeigten Daten als IN- bzw. OUT-Punkt eingegeben und die Taste leuchtet auf. Die Daten werden dann für Schnittvoreinlauf, Vorschau, automatischen Schnittbetrieb und Rückschaubetrieb verwendet.

- Wird die ENTRY IN- oder OUT-Taste in der Wiedergabe- oder Aufnahme-Funktion (Band läuft) gedrückt, so wird die Reaktionszeit von den Display-Daten abgezogen und dieser Wert dann als IN- bzw. OUT-Punkt eingegeben. Bei der Reaktionszeit handelt es sich um die beim manuellen Bedienen der Tasten entstehende Verzögerungszeit. Sie kann am REACT TIME-Schalter der SY-79-Leiterplatte von 0 bis 25 Vollbildern in 2-Vollbild-Schritten eingestellt werden.

- Wird ein OUT-Punkt eingegeben, der vor dem IN-Punkt liegt, so blinkt als Störungsmeldung auf dem Display der Hinweis „NEGATIVE“, und weder der Vorschau- noch der automatische Schnittbetrieb kann durchgeführt werden. Geben Sie in diesem Fall die richtigen IN/OUT-Punkte ein.
- Ist die AUTO MODE-Taste ausgeschaltet, so werden die eingegebenen Daten für den Vorschaubetrieb verwendet.
- Wenn sich das Band beim automatischen Schnittbetrieb zwischen dem IN- und OUT-Punkt befindet, kann der nächste IN-Punkt durch Drücken der ENTRY IN-Taste eingegeben werden. (Dies gilt jedoch nur für Geräte mit einem System-ROM der Version Nr. 3-5 und höher.)

31 Taste für separaten Tonschnitt [AUDIO SPLIT]

Durch Drücken dieser Taste wird der Videorecorder auf separaten Tonschnittbetrieb geschaltet (AUDIO SPLIT-Taste leuchtet), und die Audio-IN/OUT-Punkte können mit den AUDIO IN/OUT-Tasten 32 unabhängig von den Video-IN/OUT-Punkten eingegeben werden. Die ENTRY IN/OUT-Tasten dienen in diesem Fall ausschließlich zur Eingabe der Video- und Sync-IN/OUT-Punkte.

Durch erneutes Drücken kann die AUDIO SPLIT-Taste wieder ausgeschaltet werden, und die ENTRY IN/OUT-Tasten dienen dann wieder zur gleichzeitigen Eingabe der Video- und Audio-Schnittpunkte.

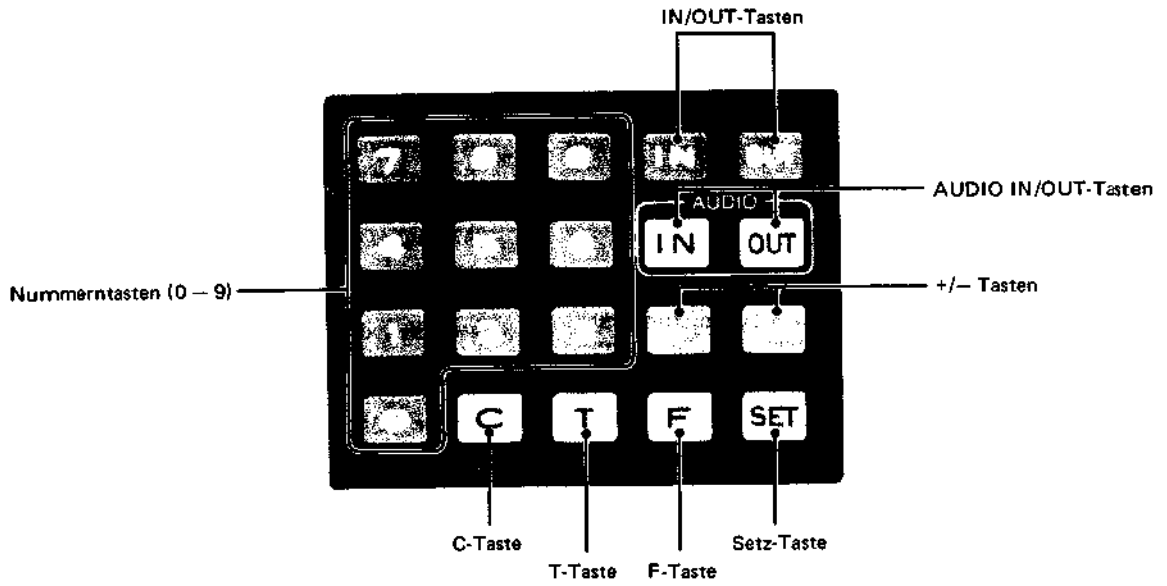
32 AUDIO IN/AUDIO OUT-Tasten

Zur Eingabe der Audio-IN/OUT-Punkte beim separaten Tonschnittbetrieb. Wird die AUDIO IN- oder OUT-Taste gedrückt, so werden die im Block 1 des Displays angezeigten Daten als Audio-IN- bzw. Audio-OUT-Punkt eingegeben und die Taste leuchtet auf. Diese Daten werden dann für den Schnittvoreinlauf-, Vorschau-, automatischen Schnittbetrieb und den Rückschau-Betrieb verwendet.

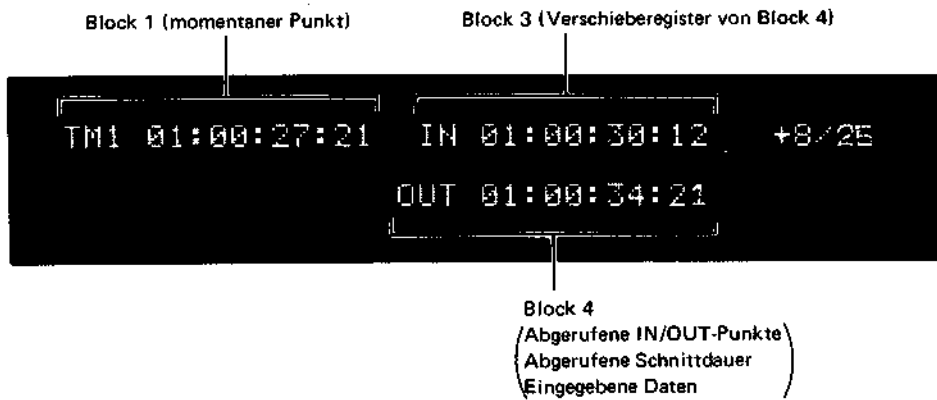
- Wird die AUDIO IN- oder OUT-Taste in der Wiedergabe- oder Aufnahme-Funktion (Band läuft) gedrückt, so wird die Reaktionszeit von den Display-Daten abgezogen und dieser Wert dann als Audio-IN- oder OUT-Punkt eingegeben. Die Reaktionszeit kann am REACT TIME-Schalter der SY-79-Leiterplatte von 0 bis 25 Vollbildern eingestellt werden.

33 **Tastatur**

Die Tastatur besteht aus folgenden 20 Tasten:



Mit der Tastatur in Zusammenhang stehende Display-Anzeigen



Nummerntasten (0 – 9):

Zur Eingabe von numerischen Daten. Die Anzeige dieser Daten erfolgt im Block 4.

F-Taste:

Diese Taste (Funktionstaste) dient zur Eingabe von Hexadezimal-Zahlen. Wird diese Taste zusammen mit einer Nummerntaste zwischen 0 und 5 gedrückt, so erhält man die folgenden Hexadezimal-Zahlen:

F & 0 : A	F & 3 : D
F & 1 : B	F & 4 : E
F & 2 : C	F & 5 : F

Setz-Taste [SET]:

Überprüfen Sie, daß die an den Nummerntasten und der F-Taste für Block 4 eingegebenen Daten stimmen, und geben Sie die Daten dann durch Drücken der SET-Taste ein.

C-Taste:

Diese Taste dient als Löschtaste für falsch eingetippte Werte. Die im Block 4 angezeigten Daten können gelöscht werden.

+/- Tasten:

Diese Tasten dienen zum nachträglichen Erhöhen oder Erniedrigen der im Block 4 angezeigten Daten. Drücken Sie die + oder - Taste, dann die gewünschten Nummerntasten und schließlich die SET-Taste. Das Ergebnis der Addition bzw. Subtraktion erscheint im Block 4.

T-Taste:

Zur Eingabe der Zeit-Daten. Durch Drücken dieser Taste werden die Daten von Block 4 in Block 1 eingegeben, und die Block 1 Daten können dadurch geändert werden.

IN/OUT-Tasten:

Diese Tasten haben folgende Funktionen:

- (1) Abrufen der Schnittpunkte – CALL –
Durch Drücken der IN- oder OUT-Taste können die Daten in Block 4 abgerufen werden.
- (2) Korrigieren der Schnittpunkte – TRIM –
Durch Drücken der IN- oder OUT-Taste können die Daten von Block 4 als IN- bzw. OUT-Punkt eingegeben werden. Ein Korrigieren der Schnittpunkte ist auf Vollbild-Basis möglich, und das Ergebnis der Korrigierung erscheint jeweils im Block 4.
- (3) Anzeige der Schnittdauer – DURATION & LAP –
Durch gleichzeitiges Drücken der IN- und OUT-Tasten wird im Block 4 die Schnittdauer (Zeit zwischen IN- und OUT-Punkt) angezeigt.
Zeigt das Display die TIMER-1-Daten, so erscheint der Hinweis „DUR“, zeigt es die TIMER-2-Daten, so erscheint der Hinweis „LAP“.

AUDIO IN/OUT-Tasten:

Diese Tasten werden beim separaten Tonschnittbetrieb verwendet. Ähnlich wie die IN/OUT-Tasten haben diese Tasten folgende Funktionen:

- (1) Abrufen von Schnittpunkten
- (2) Korrektur von Schnittpunkten
- (3) Anzeige der Audio-Schnittdauer

Die Bedienung dieser Tasten ist genau wie bei den IN/OUT-Tasten durchzuführen.

Der abzurufende, zu korrigierende oder anzuzeigende Audio-Kanal kann an den CHANNEL PRESET-Tasten (25) gewählt werden. Auch durch Drücken zweier beliebiger Schnittpunkt-Tasten (IN/OUT/AUDIO IN/AUDIO OUT) kann die Schnittdauer (Punkt 3) angezeigt werden. (Werden z.B. die IN- und die AUDIO OUT-Tasten gleichzeitig gedrückt, so wird die Dauer zwischen dem Video-IN- und dem Audio-OUT-Punkt angezeigt.)

- Bei allen Bedienungsvorgängen der Tastatur kann an der CONTROL P/R-Taste (13) zwischen Aufnahme- oder Wiedergabegeräte-Schnittpunkten gewählt werden.

Beispiel:

Setzen des Zeitcodes

- Vorbereitung
- Videorecorder → Stop- oder Bereitschafts-Funktion
 - Die TC-14/14A-Leiterplatte muß eingesetzt sein.
 - Schalten Sie auf Zeitcode-Anzeige. (Stellen Sie den TC/U-BIT-Schalter der TC-14/14A-Leiterplatte (BKH-2015/2015A) auf TC. Wurde der Zeitcode auf REC RUN-Betrieb gestellt, so ist die Einstellung einfach, da sich die Zeitcode-Anzeige nicht ändert.)
 - TIME CODE/TIMER-Wähler ⑥ → TIME CODE

Bedienung

1. TAPE/EE-Wähler ① → INPUT

Display

TCG 01 : 00 : 27 : 21		

Kommentar

Der vom Zeitcode-Generator erzeugte Zeitcode wird im Block 1 angezeigt.

2. 0,0,0,0,3,0,0,0, SET

TCG 01 : 00 : 27 : 21		
	SET 00 00 30 00	

Die an den Nummern-tasten eingegebenen Daten erscheinen zunächst im Block 4.

- Wurden falsche Daten eingegeben, so löschen Sie diese durch Drücken der C-Taste und geben Sie dann die richtigen Daten ein.

3. T

TCG 00 : 00 : 30 : 00		

Die gewünschten Daten werden im Block 1 eingegeben und legen den Anfangspunkt des Generators fest.

Setzen des Benutzer-Bits

- Vorbereitung
- Videorecorder → Stop- oder Bereitschafts-Funktion
 - Schalten Sie auf Benutzer-Bit-Anzeige.
Stellen Sie den TC/U-BIT-Schalter der TC-14/14A-Leiterplatte (BKH-2015/2015A) auf U-BIT.
 - TIME CODE/TIMER-Wähler ⑥ → TIME CODE

Bedienung

Display

Kommentar

1. TAPE/EE-Wähler ① → INPUT

UBG 01 00 30 15		

Der von Zeitcode-Generator erzeugte Zeitcode wird im Block 1 angezeigt.

2. 0, F & 0 (gleichzeitig drücken),
0, 0, 2, 0, 1, 0,
SET

UBG 01 00 30 15		
	SET 0A 00 20 10	

Die gewünschten Daten werden in Block 4 eingegeben.

- Durch gleichzeitiges Drücken der F-Taste und der Taste 0 wird die Hexadezimal-Zahl A eingegeben.

3. T

UBG 0A 00 20 10		

Die gewünschten Daten werden in Block 1 eingegeben und als Benutzer-Bit gesetzt.

Setzen von TIMER-1

Vorbereitung: TIME CODE/TIMER-Wähler ⑥ → TIMER-1

Bedienung

Display

Kommentar

1. Das Band starten und an einer beliebigen Stelle stoppen.

TM1 01 : 00 : 27 : 21		

Die momentanen Daten von TIMER-1 werden im Block 1 angezeigt.

2. 0, 0, 0, 0, 3, 0, 0, 0,
SET

TM1 01 : 00 : 27 : 21		
	SET 00 00 30 00	

Die gewünschten Daten werden in Block 4 eingegeben.

- Blinkt der Hinweis „DATA ERR“, so wurden unzulässige Daten eingegeben. Drücken Sie in diesem Fall zunächst die C-Taste und geben Sie dann die richtigen Daten ein.

3. T

TM1 00 : 00 : 30 : 00		

Die gewünschten Daten werden in Block 1 eingegeben und als momentaner TIMER-1-Punkt gesetzt.

- Ein Setzen der Daten ist nicht möglich, wenn sich TIMER-1 in der „+/-“ Anzeige-Funktion befindet.

Eingabe von Schnittpunkten

Bedienung

Display

Kommentar

1. **0,1,1,0,1,5,1,6,**
SET

	SET 01 10 15 16	

Die gewünschten Daten werden in Block 4 eingegeben.

2. **IN**

	IN 01 : 10 : 15 : 16	

Die eingegebenen IN-Punkt-Daten werden in Block 4 angezeigt. In gleicher Weise können auch die OUT- und AUDIO IN/OUT-Punkte eingegeben werden.

Abrufen und Korrektur von Schnittpunkten

Bedienung

Display

Kommentar

1. **IN**

	IN 01 : 20 : 13 : 00	

Die gewünschten IN-Punkt-Daten werden in Block 4 angezeigt. In gleicher Weise können auch die OUT- und AUDIO IN/OUT- Punkte angezeigt werden.

2. **+**
(oder **-**)

	IN 01 : 20 : 13 : 00	
		+

Als Korrektur-Beispiel wird hier eine Erhöhung durchgeführt. Die IN-Punkt-Daten werden in Block 3 verschoben. Das „+“ Zeichen erscheint im Block 4.

3. **4,0,0,0**

	IN 01 : 20 : 13 : 00	
		+ 40 00

Die zu addierenden Zahl wird in Block 4 eingegeben.

4. **SET**

	IN 01 : 20 : 13 : 00	
	SET 01 20 53 00	

Das Ergebnis der Addition erscheint im Block 4.

5. **OUT**

	IN 01 : 20 : 13 : 00	
	OUT 01 : 20 : 53 : 00	

Die gewünschten Daten werden als OUT-Punkt eingegeben und in Block 4 angezeigt.

- Blinkt der Hinweis „NEGATIVE“, so liegt der OUT-Punkt vor dem IN-Punkt, und die Punkte müssen vertauscht werden.

Anzeige der Schnittdauer

Bedienung

Display

Kommentar

Gleichzeitig IN- und OUT-Tasten drücken.

	DUR 00 : 10 : 37 : 14	

Im Block 4 wird die Zeit zwischen IN- und OUT-Punkten (Schnittdauer) angezeigt.

- Jedes beliebige Intervall zwischen den IN/OUT/AUDIO IN/AUDIO OUT-Punkten kann angezeigt werden.
- Bei der Anzeige von TIMER-1-Daten erscheint der Hinweis „DUR“ und bei Anzeige von TIMER-2-Daten der Hinweis „LAP“. Ist das Band erst einmal eingefädelt, so kann TIMER-2 nicht mehr auf Null zurückgesetzt werden. Es empfiehlt sich daher die IN-Punkt-Daten des ersten Schnitvorgangs als TIMER-2-Daten für das Aufnahmegerät einzugeben; die späteren IN/OUT-Punkte dann aber als TIMER-1-oder Zeitcode-Daten einzugeben. Wenn Sie dann nach der Durchführung einiger Schnitte die TIMER-2-Daten des Aufnahmegeräts in das Display abrufen und die IN- und OUT-Taste drücken, erfahren Sie die gesamte bis zum momentanen Punkt verstrichene Schnittdauer (LAP).

1-4-6. Anschlußfeld

Hinweis

Am BVH-2000PS(10), (12) und (14) sind keine Fernbedienungs-I- und TBC-Multi-Anschlüsse Vorhanden.

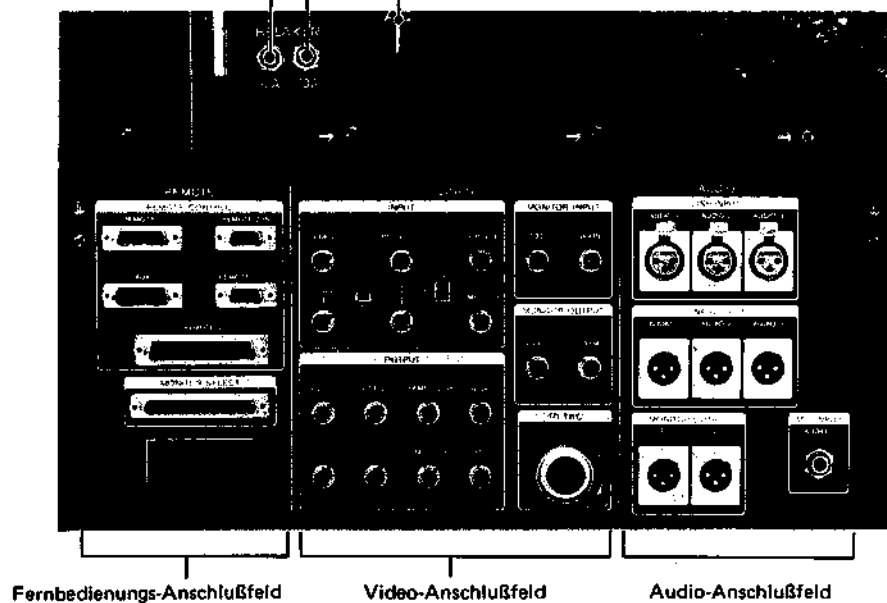
BVH-2000PS(00)(10) und BVH-2000PS(02)(12)

Sicherungen

Falls eine der Sicherungen anspricht, wird das Gerät total vom Netz abgetrennt.

Netz Kabel

Das Kabel ist an eine Netzstromquelle anzuschließen, die eine Spannungsdrift von weniger als 10% aufweist.



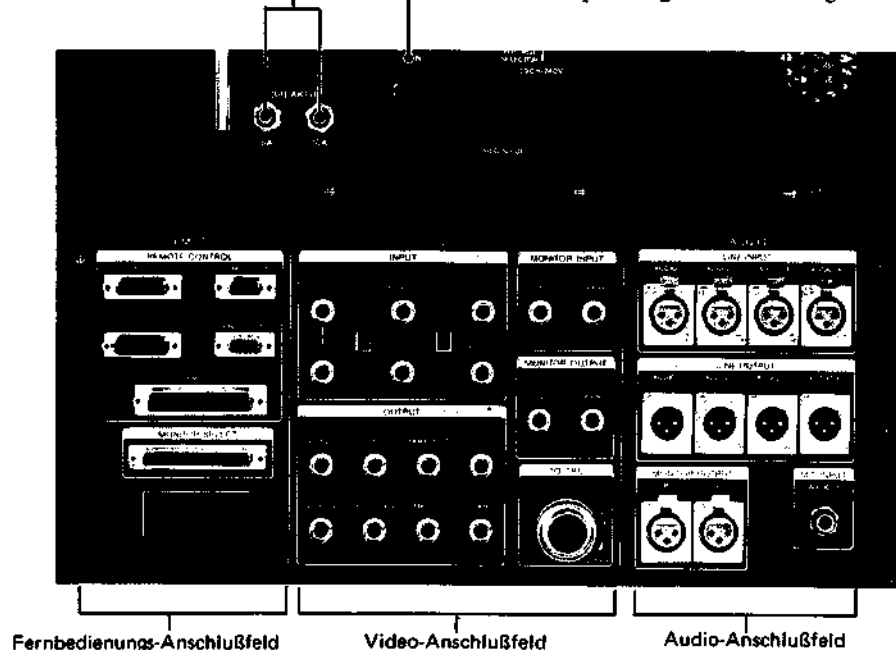
BVH-2000PS(04)(14)

Sicherungen

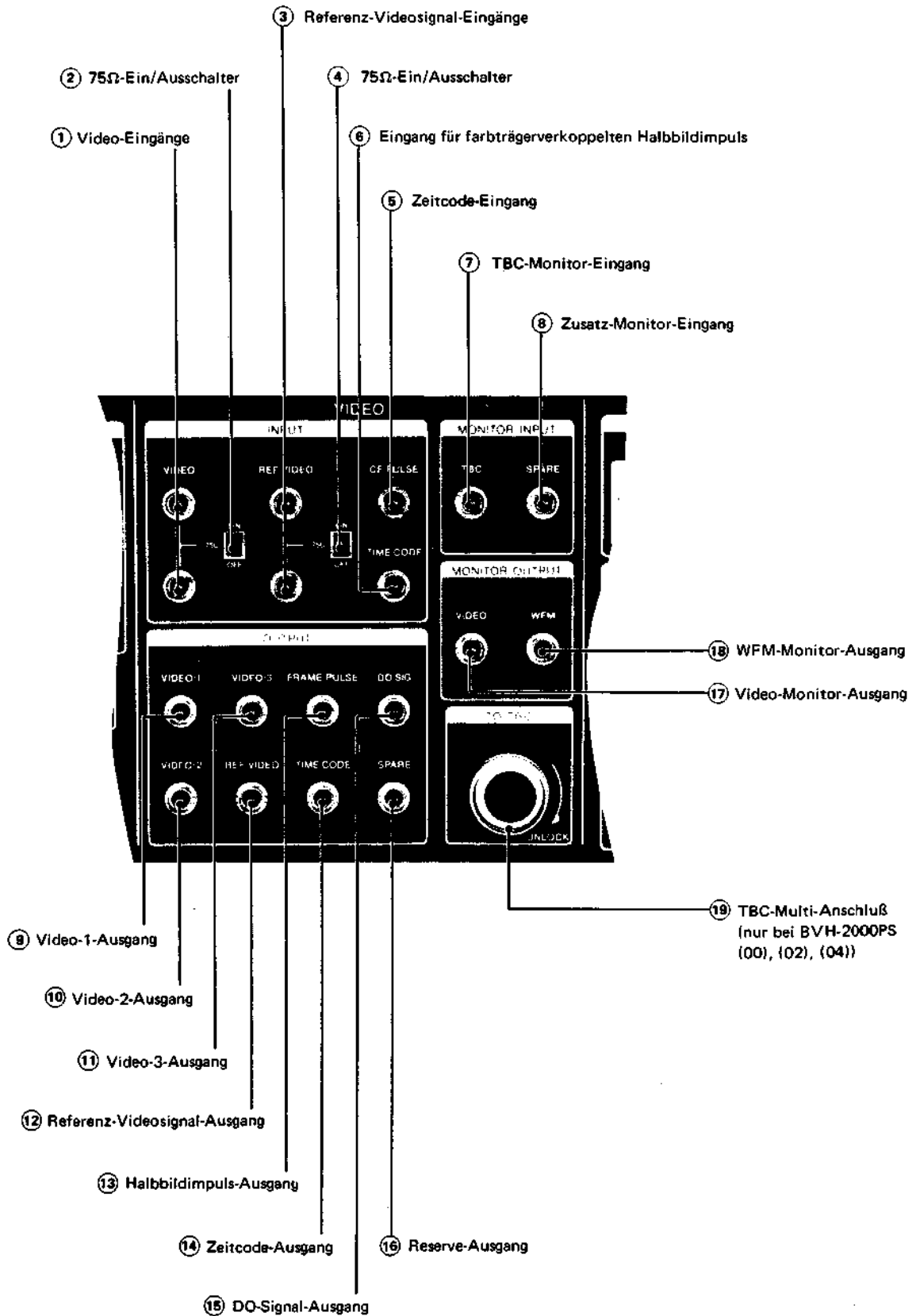
Falls eine der Sicherungen anspricht, wird das Gerät total vom Netz abgetrennt.

Netz Kabel

Das Kabel ist an eine Netzstromquelle anzuschließen, die eine Spannungsdrift von weniger als 10% aufweist.



Video-Anschlußfeld



① **Video-Eingang [VIDEO INPUT]**

Zum Anschluß eines Videosignals von 1,0 Vss. Einer der beiden Anschlüsse kann als Schleifenausgang (Brückenschaltung) zum Anschluß anderer Video-Anlagen verwendet werden.

② **75Ω-Ein/Ausschalter [75Ω ON/OFF]**

Dieser Schalter dient zum Abschließen des VIDEO INPUT-Anschlusses ① mit 75 Ohm.
ON: Normalstellung
OFF: Offen; für Brückenschaltung

③ **Referenz-Videosignal-Eingänge [REF VIDEO INPUT]**

Ein Video-Signal von 1, 0 Vss kann hier zur externen Synchronisierung angeschlossen werden. Steht der SERVO REF-Wähler des Bedienungspultes aus EXT oder AUTO, so dient das an diesen Anschlüssen angeschlossene Signal als Referenzsignal für den Servo-Kreis. Einer der beiden Anschlüsse kann als Schleifen- ausgang (Brückenschaltung) zum Anschluß anderer Video-Anlagen verwendet werden.

④ **75Ω-Ein/Ausschalter [75Ω ON/OFF]**

Dieser Schalter dient zum Abschließen des REF VIDEO INPUT-Anschlusses ③ mit 75 Ohm.
ON: Normalstellung
OFF: Offen; für Brückenschaltung

⑤ **Eingang für farbträgerverkoppelten Halbbildimpuls [CF PULSE INPUT]**

TTL-Pegel. Steht der CF-Schalter der SR-15-Leiterplatte auf EXT, so kann hier ein externer farbträgerverkoppelter Halbbildimpuls zugeleitet werden.

⑥ **Zeitcode-Eingang [TIME CODE INPUT]**

Zur Zuleitung eines externen Zeitcode-Signals von 0,5 Vss.

- Bei Verwendung dieses Anschlusses ist der MIC/LINE/TC-Schalter der AE-03-Leiterplatte auf TC und der INT/EXT-1/EXT-2-Schalter auf EXT-1 zu stellen. (Siehe Kapitel 1-6-3.)

⑦ **TBC-Monitor-Eingang [TBC MONITOR INPUT]**

Zum Anschluß eines auf dem Video-Monitor abzubildenden Video-Signals (z.B. Video-Ausgangssignal von BVT-2000P/2000S Time-Base-Corrector).

Das diesem Eingang zugeleitete Signal wird zum VIDEO MONITOR OUTPUT-Anschluß ⑰ weitergeleitet, wenn an den PICTURE MONITOR-Wahltasten ⑫ am Pegelregler-Teil die TBC-Taste eingeschaltet ist. Das Signal wird dem WFM MONITOR OUTPUT-Anschluß zugeleitet ⑱, wenn an den WAVEFORM MONITOR-Wahltasten ⑭ die SELECT VIDEO-Taste eingeschaltet ist.

⑧ **Zusatz-Monitor-Eingang [SPARE MONITOR INPUT]**
Zum Anschluß eines auf dem Video-Monitor abzubildenden Signals.

Das diesem Eingang zugeleitete Signal wird zum VIDEO MONITOR OUTPUT-Anschluß ⑰ weitergeleitet, wenn an den PICTUR MONITOR-Wahltasten am Pegelregler-Teil die SPARE-Taste gedrückt ist. Das Signal wird dem WFM MONITOR OUTPUT-Anschluß ⑱ zugeleitet, wenn an den WAVEFORM MONITOR-Wahltasten die SELECT VIDEO-Taste gedrückt ist.

- Ist der einsteckbare digitale Time-Base-Corrector (Sonderzubehör) eingesetzt und wird der Schalter S1 der VM-01-Leiterplatte umgestellt, so liegt statt des SPARE MONITOR INPUT-Signals das Signal vom Time-Base-Corrector an.

⑨ ⑩ ⑪ **Video-1/2/3-Ausgänge [VIDEO-1/2/3]**

Hier liegt das Ausgangssignal vom Videorecorder-Demodulator an (1, 0 Vss, 75 Ohm). Abhängig davon, ob die einsteckbare TBC-Leiterplatten eingesetzt sind oder nicht, erhält man folgende Ausgangssignale:

	TBC-Leiterplatte (Sonderzubehör) nicht eingesetzt	TBC-Leiterplatte (Sonderzubehör) eingesetzt
VIDEO-1-Anschluß*1	DEMOD-Ausgang	TBC-Ausgang
VIDEO-2-Anschluß*1	DEMOD-Ausgang	TBC-Ausgang
VIDEO-3-Anschluß	DEMOD-Ausgang	TBC/DEMOD-Ausgang*2

*1 Das Ausgangssignal kann am Schalter S3 der VM-01-Leiterplatte umgeschaltet werden.

*2 Am Schalter S2 an der VM-01-Leiterplatte des Videorecorders kann zwischen TBC- und Demodulator-Ausgang umgeschaltet werden. (Siehe Seite 1-60(G).)

⑫ **Referenz-Videosignal-Ausgang [REF VIDEO OUTPUT]**

Hier liegt das am SERVO REF-Wähler ② am Bedienungspult gewählte Signal an.

⑬ **Halbbildimpuls-Ausgang [FRAME PULSE OUTPUT]**

TTL-Pegel. Der wiedergegebene farbträgerverkoppelte Halbbildimpuls liegt hier an. Am PULSE OUT-Schalter der SR-15-Leiterplatte kann zwischen drei Arten von Impulsen gewählt werden: REF-2, REF-8 und PB CF. (Siehe Kapitel 1-6-3.)

⑭ **Zeitcode-Ausgang [TIME CODE OUTPUT]**

Hier liegt während der Aufnahme der vom eingesetzten Zeitcode-Generator/Leser BKH-2015/2015A erzeugte Zeitcode oder der extern zugeleitete Zeitcode an (0, 5 Vss). Bei Wiedergabe liegt der auf dem Display angezeigte Zeitcode an.

15 DO-Signal-Ausgang [DO SIG OUTPUT]

Negatives TTL-Signal. Hier liegt das Ausgangssignal des Drop-Out-Detektors an, das an einen Drop-Out-Kompensator (DOC) weitergeleitet werden kann. Ist am TO TBC-Anschluß 19 ein TBC angeschlossen, so liegt dieses Signal am Ausgang des TBCs an. Mit einer Brücke an der EQ-02-Leiterplatte kann zwischen Impuls und HF-Signal gewählt werden.

16 Reserve-Ausgang [SPARE OUTPUT]

Zusätzlicher Ausgang.

17 Video-Monitor-Ausgang [VIDEO MONITOR OUTPUT]

Video-Ausgang zum Anschluß eines Bild-Monitors (1,0 V_{ss}, 75Ω).

Das an diesem Ausgang anliegende Signal kann mit den PICTUR MONITOR-Wahltasten 12 am Pegelregler-Teil gewählt werden.

18 WFM-Monitor-Ausgang [WFM MONITOR OUTPUT]

Video-Ausgang zum Anschluß eines Wellenform-Monitors (1,0 V_{ss}, 75Ω, Nennwert).

Das an diesem Ausgang anliegende Signal kann mit den WAVEFORM MONITOR-Wahltasten 14 am Pegelregler-Teil gewählt werden.

19 TBC-Multi-Anschluß [TO TBC] (18-polig) (nur bei BVH-2000PS(00), (02), (04))

Zum Anschluß eines BVT-2000P/2000S unter Verwendung eines Mehrfachkabels. Wird der BVH-2000PS(02) oder BVH-2000PS(04) verwendet, so arbeitet diese Funktion nur, wenn dieser Anschluß verwendet wird.

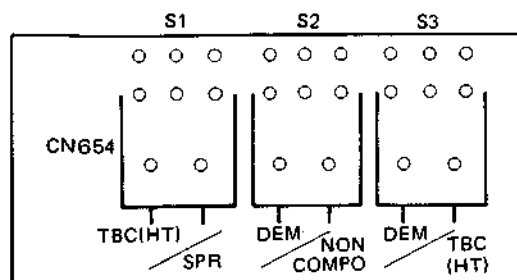
Bei eingesetztem digitalem Time-Base-Corrector BKH-2350 (Sonderzubehör) arbeitet die Dynamic-Tracking-Funktion unabhängig von dem Anschluß an diese Buchse.

Stift-Nr.	Signal	Signalpegel
A		
B	GND	
1	VIDEO OUT 50Ω	1 V _{ss}
2	VIDEO OUT (GND)	
3	DT V	TTL HOHE IMPEDANZ
4	DT V (GND)	
5	OFF TAPE	TTL HOHE IMPEDANZ (H)
6	DO PULSE	TTL HOHE IMPEDANZ (L)
7	DO PULSE (GND)	
8	PLAY STATUS	TTL HOHE IMPEDANZ (H)
9	COLOR INF	TTL HOHE IMPEDANZ
10	FH	TTL HOHE IMPEDANZ
11	FH (GND)	
12	CONF	TTL HOHE IMPEDANZ (L)
13		
14	GND	TTL HOHE IMPEDANZ Ω ANSCHLUSS(L)
15	DT MODE	TTL HOHE IMPEDANZ (L)
16	FR PULS	TTL HOHE IMPEDANZ (L)

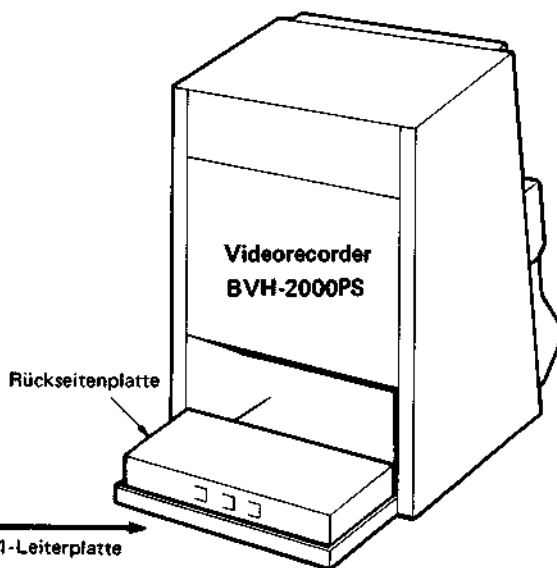
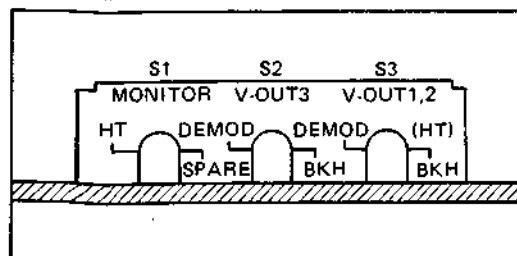
L: hoch, aktiv
H: niedrig, aktiv

Schalter der VM-01-Leiterplatte

Seriennummern 10001 – 10299

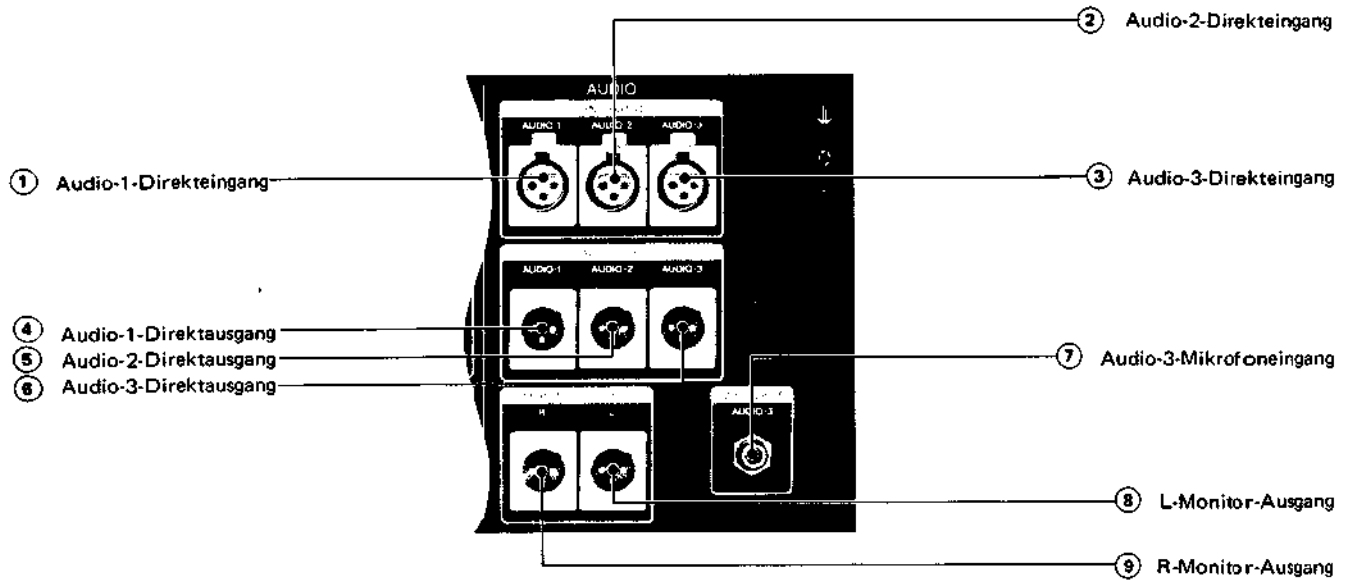


Seriennummern 10301 und höher

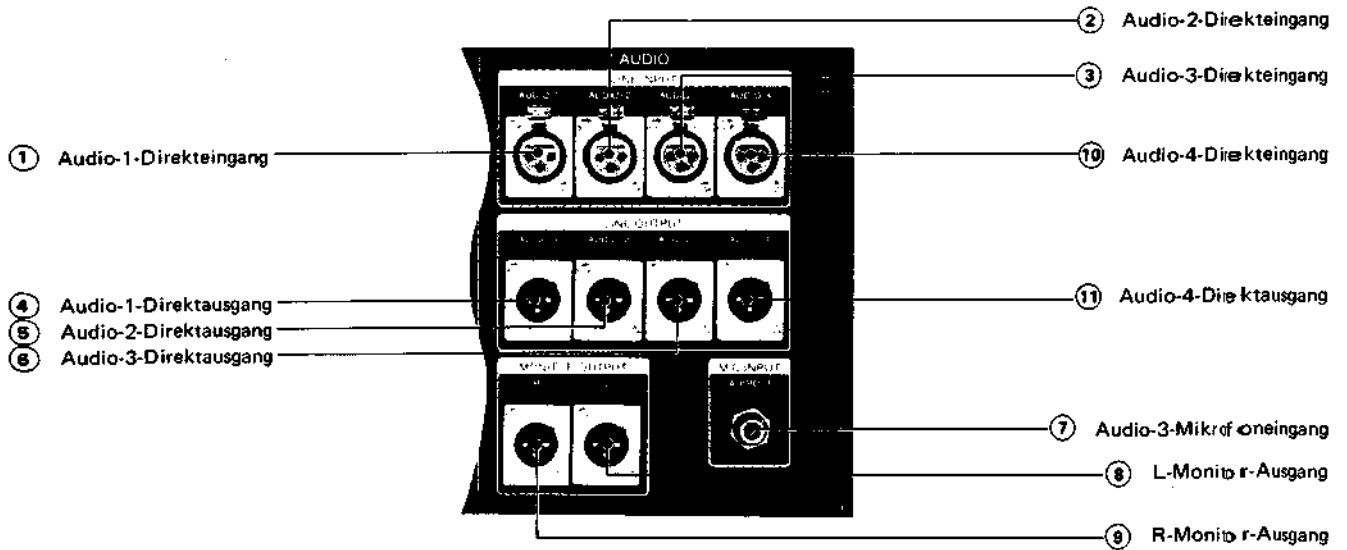


Audio-Anschlußfeld

BVH-2000PS(00)(10) und BVH-2000PS(02)(12)



BVH-2000PS(04)



① ② ⑩ **Audio-1/2/4*-Direkteingänge**

[AUDIO-1/AUDIO-2/AUDIO-4 LINE INPUT]

Für Audio-Kanal 1, 2 und 4 (3-poliger XLR Cannon-Anschluß).

③ **Audio-3-Direkteingang [AUDIO-3 LINE INPUT]**

Für Audio-Signal oder externes Zeitcode-Signal (3-poliger XLR Cannon-Anschluß). Ein diesem Eingang zugeleitetes Audio-Eingangssignal kann aufgenommen werden, wenn der MIC/LINE/TC-Schalter der AE-03-Leiterplatte auf LINE steht. Ein diesem Eingang zugeleitetes externes Zeitcode-Eingangssignal kann aufgenommen werden, wenn der Schalter auf TC und der INT/EXT-1/EXT-2-Schalter der gleichen Leiterplatte auf EXT-2 steht. (Siehe Kapitel 1-6-3.)

④ ⑤ ⑧ ⑪ **Audio-1/2/3/4*-Dierktausgänge**

[AUDIO-1/2/3/4 LINE OUTPUT]

Ausgänge von Audio-Kanäle 1, 2 und 3 (Ausgangs-impedanz 600Ω). Durch Anbringung einer Kurzschlußbrücke an der LA-02-Leiterplatte des Videorecorders kann auf eine Impedanz von 150Ω oder 37,5Ω umgeschaltet werden. (Siehe Kapitel 2-10.)

⑦ **Audio-3-Mikrofoneingang [AUDIO-3 MIC INPUT]**

Zum Anschluß eines Mikrofonsignals für Kanal 3. Zum Aufnehmen des Mikrofonsignals ist der MIC/LINE/TC-Schalter der AE-03-Leiterplatte auf MIC zu stellen.

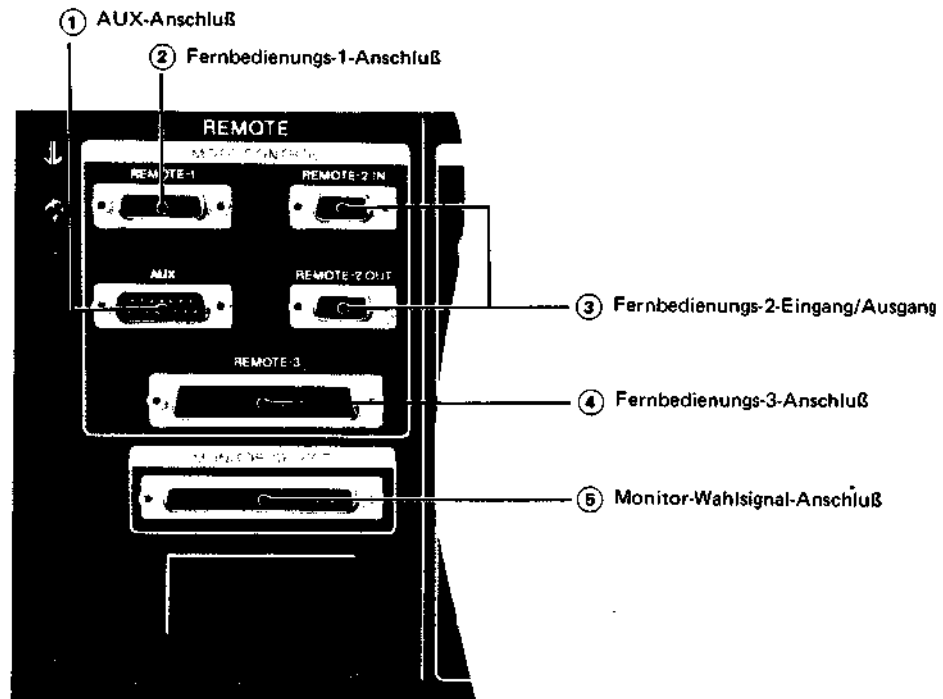
⑧ ⑨ **L/R-Monitor-Ausgänge [L/R MONITOR OUTPUT]**

Ausgänge von Audio-Kanälen 1 (L) und 2 (R) (3-poliger XLR Cannon-Anschluß). An den AUDIO MONITOR-Wahltasten ⑩ des Pegelregler-Teils können folgende Signale gewählt werden.

gedrückte Wahltaste	Anschluß	
	L	R
AUDIO-1	AUDIO-1	AUDIO-1
AUDIO-2	AUDIO-2	AUDIO-2
AUDIO-1/AUDIO-2	AUDIO-1	AUDIO-2
AUDIO-3	AUDIO-3	AUDIO-3
AUDIO-4*	AUDIO-4	AUDIO-4

* Nur der BVH-2000PS(04)(14) ist mit AUDIO-4 LINE INPUT/OUTPUT-Anschlüssen und einer AUDIO-4-Taste ausgestattet.

Fernbedienungs-Anschlußfeld



① AUX-Anschluß

Schließen Sie hier die Fernbedieneinheit BK-2007 an, um den eingesetzten digitalen Time-Base-Corrector (einsteckbarer Typ) fernzubedienen.

② Fernbedienungs-1-Anschluß [REMOTE-1] (nur bei BVH-2000PS(00), (02), (04))

15-poliger D-sub Ein-/Ausgangsanschluß zur Fernbedienung. Unter Verwendung des BKH-2016 CCJ-Konverters kann hier ein Videorecorder oder eine Schnitt-Steuereinheit mit 10-poligem CCJ Fernbedienungs-Ein-/Ausgang angeschlossen werden.

– Anschließbare Geräte –

Schnitt-Steuereinheiten: BVE-500ACE, BVE-5000P
(Auch an REMOTE-2-Anschluß anschließbar, wenn statt der BKH-2016-Leiterplatte die BK-5005 verwendet wird.)

Videorecorder: BVH-1100PS, BVH-1100APS,
BVH-1180PS

Interface-Box: IF-1000CE

③ Fernbedienungs-2-Eingang/Ausgang [REMOTE-2 IN/OUT]

9-poliger D-sub Ein-/Ausgangsanschluß zur Fernbedienung. Hier kann ein Videorecorder oder eine Schnitt-Steuereinheit mit Serien-Fernbedienungs-Ein/Ausgang (RS-422) an den BVH-2000PS angeschlossen werden. Da es sich bei den Ein/Ausgängen um Schleifenanschlüsse handelt, ist auch eine Brückenschaltung von Fernbedienungs-Signalen möglich.

– Anschließbare Geräte –

Schnitt-Steuereinheit: BVE-800, BVE-5000P (BK-5005-Leiterplatte ist erforderlich)

Videorecorder: BVU-800P/800S/820P/820S

Dynamik-Steuereinheit: DTR-2000

④ Fernbedienungs-3-Anschluß (REMOTE-3)

50poliger D-SUB Ein/Ausgangsanschluß zur Fernbedienung.
Hier kann ein Videorecorder oder eine Schnitt-Steuereinheit mit Parallel-Fernbedienungssignal-Ein/Ausgang an den BVH-2000PS angeschlossen werden.

E/A-Signals am REMOTE-3-Anschluß

Stift-Nr.	Signal		
1	FF	EIN	BEFEHLSSEINGANG (NIEDRIGER PEGEL, AKTIV)
19	STBY ON	EIN	
20	REW	EIN	
21	ENTRY	EIN	
34	PLAY	EIN	
35	STOP	EIN	
36	REC	EIN	
18	PREROLL	EIN	
22	STBY OFF	EIN	
2	REC SW	AUS	BEFEHLSRÜCKMELDUNG (NIEDRIGER PEGEL, AKTIV)
3	PLAY SW	AUS	
4	STOP SW	AUS	
5	ENTRY SW	AUS	
37	REV LAMP	AUS	SHUTTLE, JOG, VARIABLE (NIEDRIGER PEGEL, AKTIV)
40	FWD LAMP	AUS	
46	STBY ON	AUS	STATUS-AUSGANG (NIEDRIGER PEGEL, AKTIV)
47	PLAY	AUS	
43	STOP	AUS	
24	REC	AUS	
50	PREROLL	AUS	
48	REMOTE	AUS	
49	ALARM	AUS	
39	A1 PRESET	AUS	
38	A2 PRESET	AUS	
42	A3 PRESET	AUS	
41	SYNC PRESET	AUS	
44	VIDEO PRESET	AUS	
26	ASSEMBLE PRESET	AUS	
45	INSERT PRESET	AUS	
27	EDIT	AUS	
23	SYNC 6 LACK	AUS	WARN-AUSGANG (NIEDRIGER PEGEL, AKTIV)
25	VIDEO 6 LACK	AUS	
6	REF ERROR	AUS	
7	CF LOCK	AUS	
8	DRUM LOCK	AUS	
9	CAP LOCK	AUS	
12	CVT		Schnittstelle für TC-14A-Leiterplatte
13	DRD		
14	CK		
15	DATA-1		
32	DATA-2		
16	DATA-4		
17	DATA-8		
28	DTM		
29	DGN		
30	MP		
31	K4		
33	GND		
10	SP-2		Nicht verwendet.
11	SP-1		

Hinweis: Werden die REMOTE-1/2/3-Anschlüsse verwendet, so achten Sie darauf, den REMOTE-Schalter der SY-79-Leiterplatte entsprechend auf REMOTE-1/2/3 zu stellen.

⑤ **Monitor-Wahlsignal-Anschluß (MONITOR SELECT)**

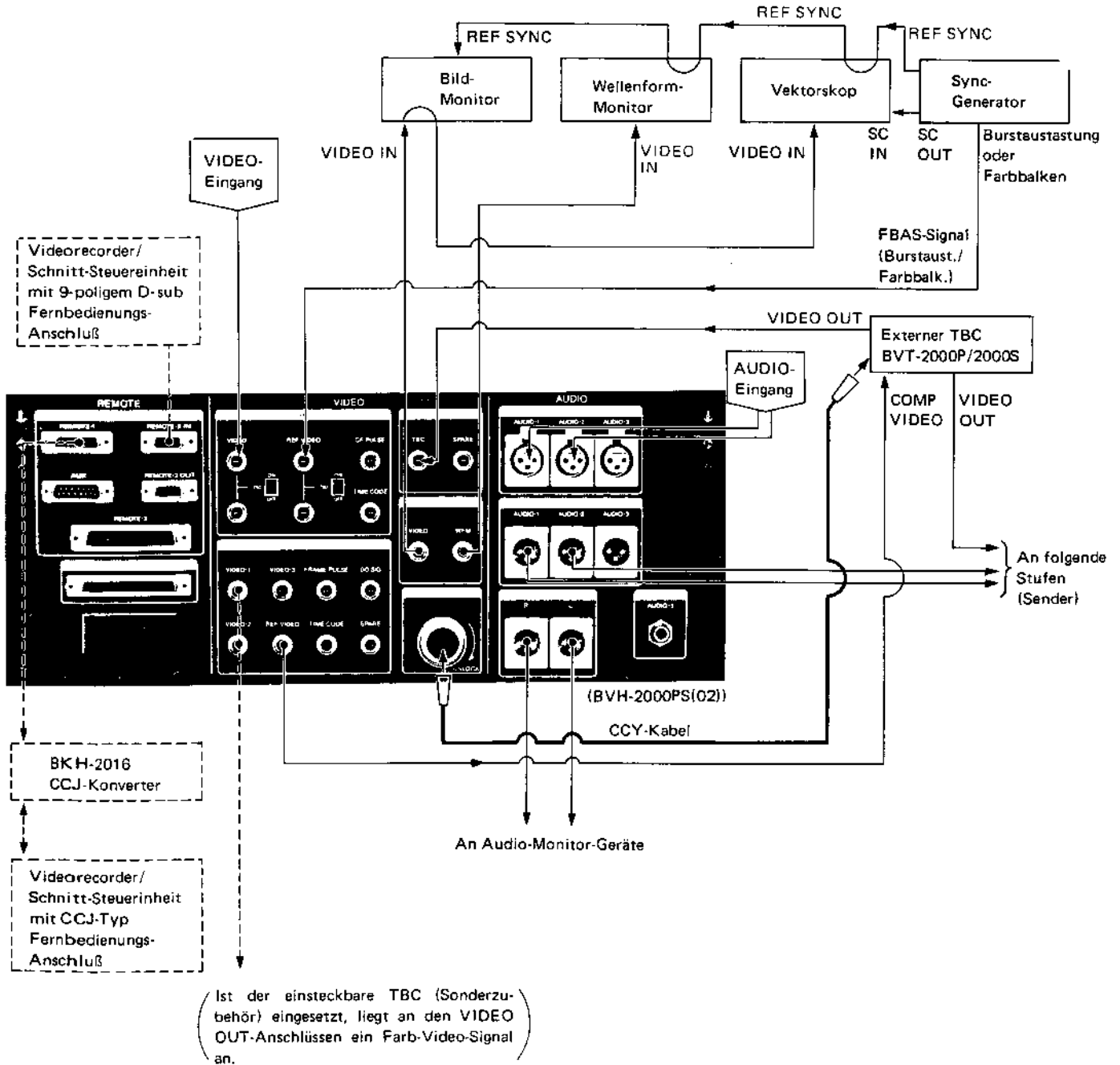
37poliger D-SUB Eingangsanschluß zur fernbedienten Monitor-Umschaltung. Hier kann ein Signal zugeleitet werden, da die Ausgangssignale zu den VIDEO MONITOR OUTPUT-, WFM MONITOR OUTPUT- und L/R MONITOR OUTPUT-Anschlüssen schaltet.

E/A-Signal am MONITOR SELECT-Anschluß

Stift-Nr.	BEFEHLS-EINGANG	Stift-Nr.	STATUS-AUSGANG
9	INPUT VID	13	INPUT VID
28	DEMOD	32	DEMOD
10	TBC	14	TBC
29	SPARE (PICTURE)	33	SPARE (PICTURE)
11	SELECTED VID	15	SELECTED VID
30	CTL	34	CTL
12	RF ENVELOPE	16	RF ENVELOPE
31	SPARE (WFM)	35	SPARE (WFM)
20	AUDIO-1	4	AUDIO-1
2	AUDIO-2	23	AUDIO-2
21	AUDIO-1/2	5	AUDIO-1/2
3	AUDIO-3	24	AUDIO-3
22	(AUDIO-4)	6	(AUDIO-4)
1	+5V (AUDIO)	8	+5V (VIDEO)
7	GND (AUDIO)	17	GND (VIDEO)
26	GND (AUDIO)	36	GND (VIDEO)

BEFEHLS-EINGANG: NIEDRIGER PEGEL, AKTIV
 STATUS-AUSGANG: NIEDRIGER PEGEL, AKTIV,
 VERLUSTSTROM max. 350 mA

1-5. ANSCHLÜSSE



Hinweise

- Am BVH-2000PS(10), (12) und (14) ist kein Fernbedienungs-I-Anschluß vorhanden.
- Am BVH-2000PS(10), (12) und (14) ist kein TBC-Multi-Anschluß vorhanden. Verwenden Sie einen steckbaren TBC.

1-6. VOREINSTELLUNGEN

1-6-1. Aufnahme-Vormagnetisierung

Der Audio-Aufnahme-Vormagnetisierungsstrom kann auf die Charakteristik des verwendeten Bandes eingestellt werden.

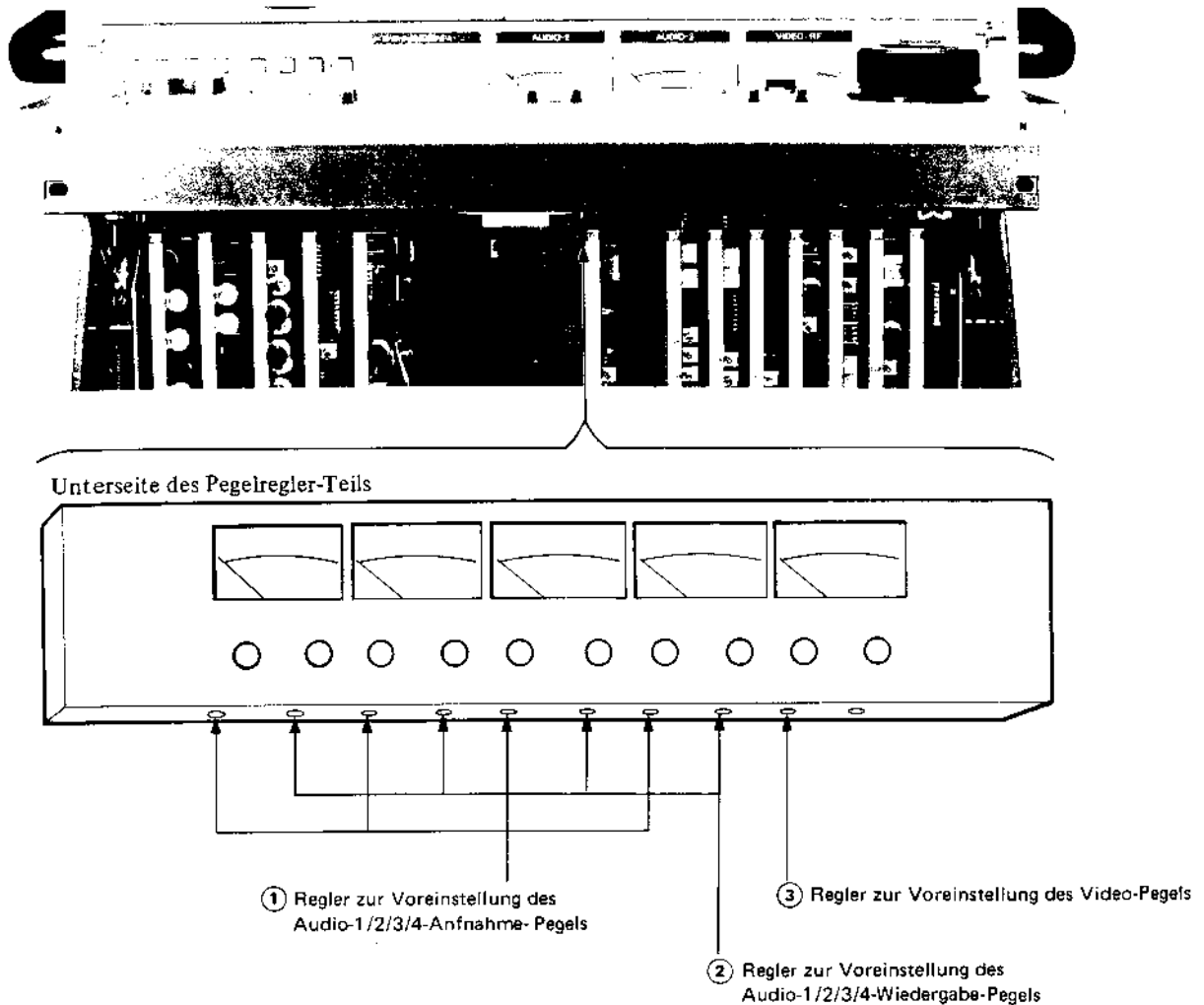
1. Nehmen Sie die Kopf-Abdeckung ab.



2. Leiten Sie ein Audio-Signal mit normalem Pegel zu und stellen Sie den Videorecorder auf Aufnahme. Stellen Sie dann die Vormagnetisierung mit einem isolierten Schraubenzieher an den AUDIO-1/2/3/4 BIAS LEVEL-Reglern ein.



1-6-2. Voreinstellung des Aufnahme/Wiedergabepegels



① **Regler zur Voreinstellung des Audio-1/2/3/4-Aufnahme-Pegels [AUDIO-1/2/3/4 REC] ***

Sind die AUDIO REC-Regler (1-4-1. ⑧) gedrückt, so kann der Pegel voreingestellt werden. Leiten Sie ein Audio-Signal mit normalem Pegel zu, stellen Sie den Videorecorder auf Aufnahme und stellen Sie dann die Audio-1/2/3/4 Pegel unter Verwendung eines isolierten Schraubenziehers ein.

② **Regler zur Voreinstellung des Audio-1/2/3/4-Wiedergabe-Pegels [AUDIO-1/2/3/4 PB] ***

Sind die AUDIO PB-Regler (1-4-1. ⑦) gedrückt, so kann der Pegel voreingestellt werden. Geben Sie ein normales Band wieder und stellen Sie die Audio-1/2/3/4 Pegel unter Verwendung eines isolierten Schraubenziehers ein.

③ **Regler zur Voreinstellung des Video-Pegels [VIDEO]**

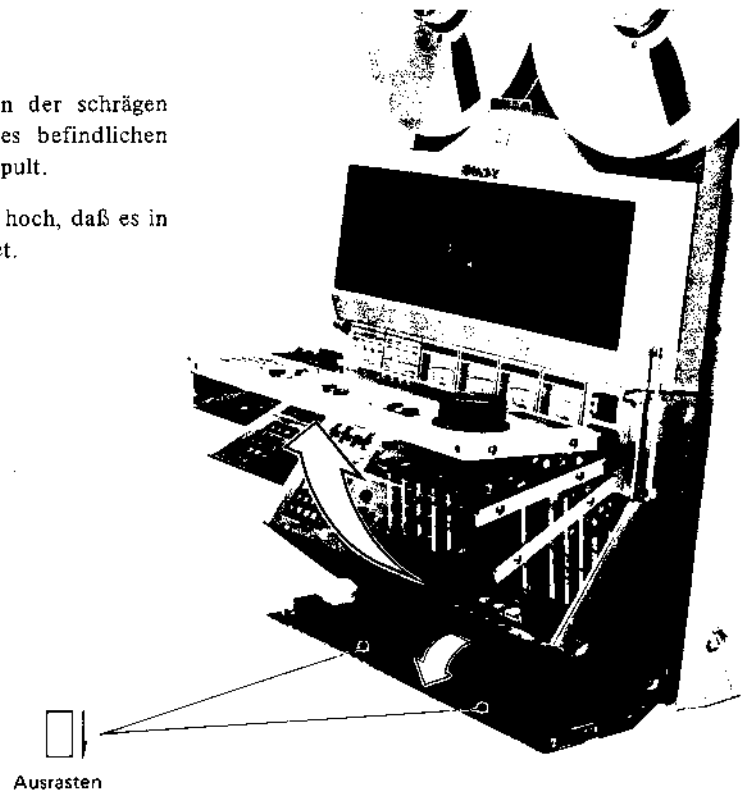
Ist der VIDEO LEVEL-Regler (1-4-1. ⑥) gedrückt, so kann der Pegel voreingestellt werden. Leiten Sie ein normales Video-Signal (1 Vss) zu, stellen Sie den Videorecorder auf Aufnahme, und stellen Sie dann den Pegel unter Verwendung eines isolierten Schraubenziehers ein.

* Nur der BVH-2000PS(04)(14) ist mit Reglern zur Voreinstellung des Audio-4-Aufnahme- und Audio-4-Wiedergabe-Pegels ausgestattet.

1-6-3. Einstellungen an den Leiterplatten

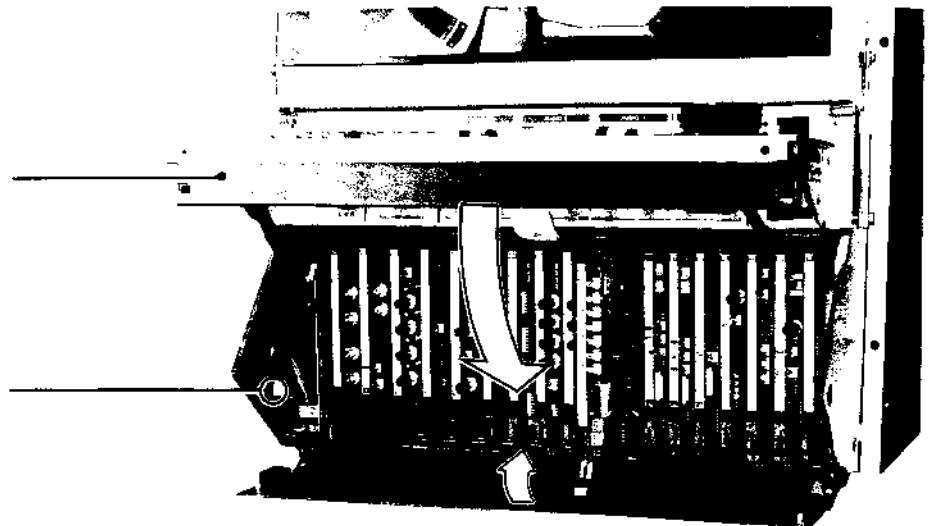
Öffnen

1. Drücken Sie die rechts und links an der schrägen Platte unterhalb des Bedienungspultes befindlichen Knöpfe, und öffnen Sie das Bedienungspult.
2. Heben Sie das Bedienungspult so weit hoch, daß es in einer fast horizontalen Position einrastet.

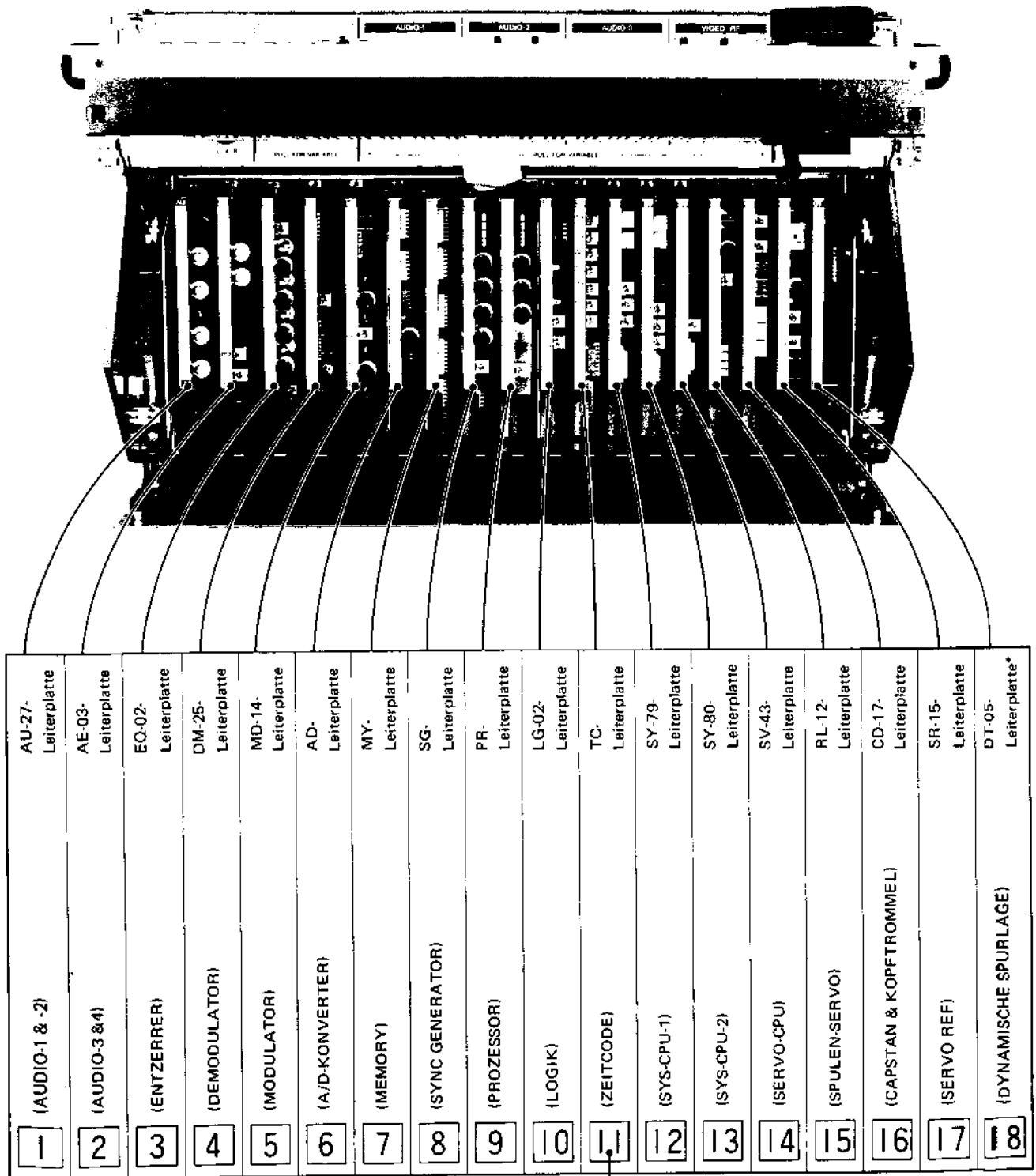


Schließen

1. Halten Sie das Pult fest, damit es nicht plötzlich herunterfällt.
2. Drücken Sie die weißen Knöpfe zum Öffnen der Verriegelung und schließen Sie das Pult.



Herausnehmen und Einsetzen der Leiterplatten

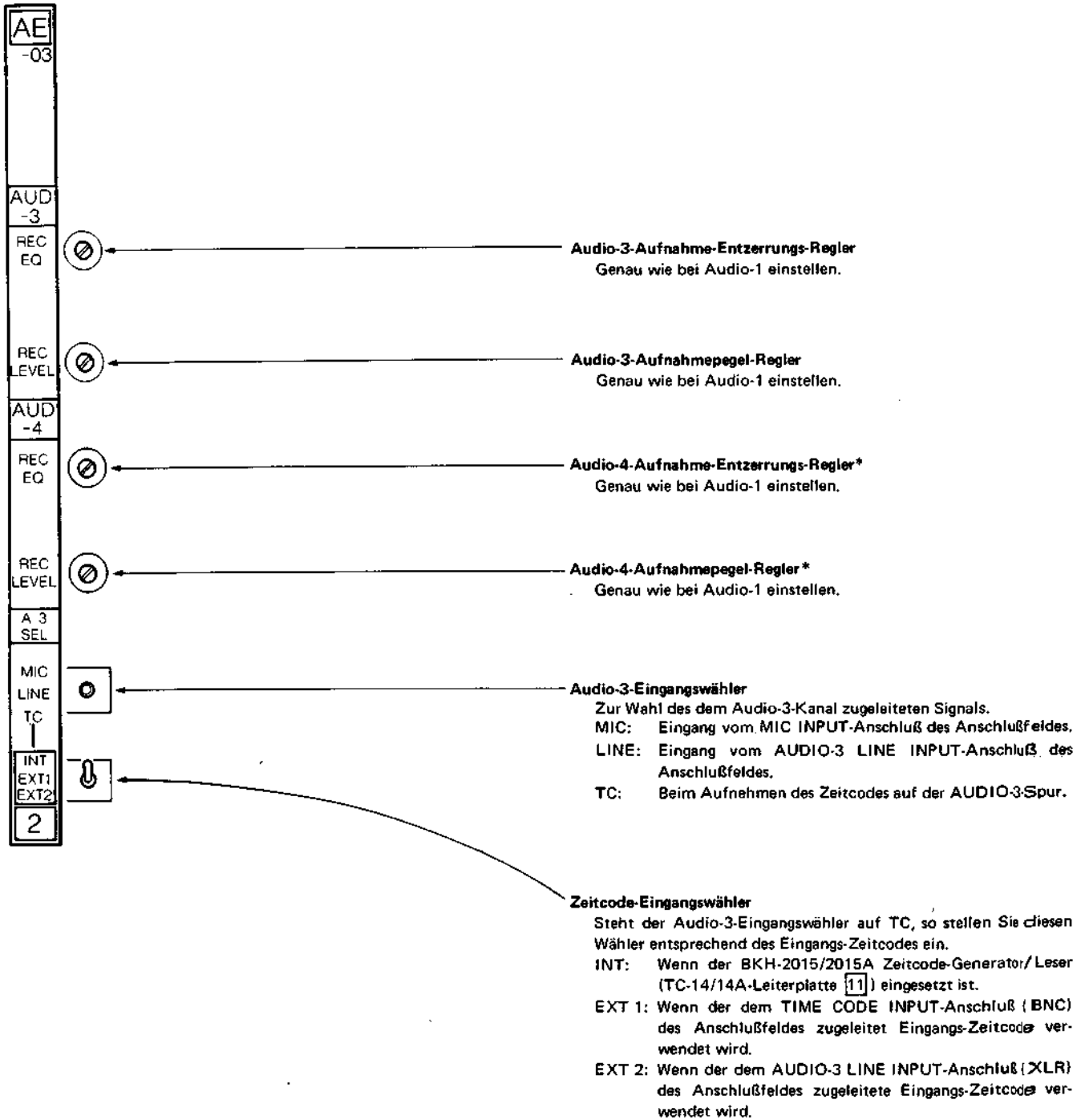


Digitaler Time-Base-
Corrector BKH-2200/2300/
2350 (Sonderzubehör)

BKH-2015/BKH-2015A Zeitcode-Generator/Leser (Sonderzubehör)

* Die DT-05-Leiterplatte ist im BVH-2000PS(02) und im BVH-2000PS(04) eingebaut.

AE-03-Leiterplatte **2** (AUDIO-3/4)



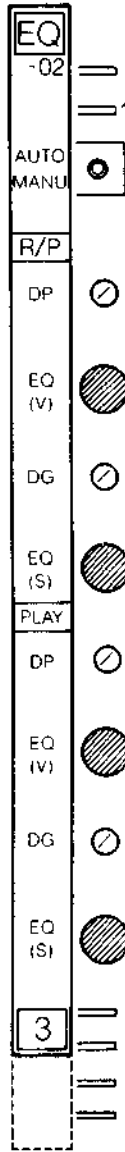
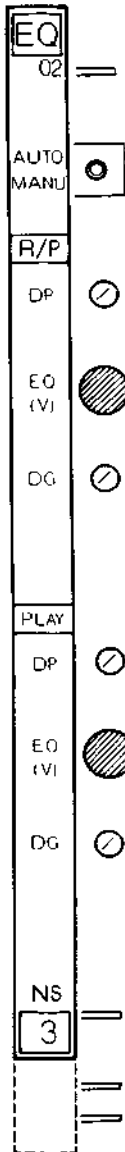
* Nur der BVH-2000PS(04) besitzt diesen Regler.

EQ-02-Leiterplatte 3 (ENTZERRER)

BVH-2000PS(10),
(12), (14)

BVH-2000PS(00),
(02), (04)

Seriennummer 10401 und höher



Testpunkte (für Wellenform-Beobachtung)

- TP-1: HF-Ausgangs-Wellenform des A/WG-Videokopfes
- TP-2: HF-Ausgangs-Wellenform des A/WG-Sync-Kopfes

Auto/Manuell-Schalter für Video-Entzerrer

Zur Auto/Manuell-Umschaltung der Chromapegel-Einstellung des wiedergegebenen Video-Signals.
AUTO: Automatische Einstellung auf den an dieser Leiterplatte voreingestellten Chromapegel.
MANU: Manuelle Einstellung an den weiter unter beschriebenen EQ-Reglern.

A/WG-KOPF-SYSTEM

DP-Regler
 Zur Einstellung der DP-Charakteristik des vom A/WG-Video-kopf wiedergegebenen Video-Signals.

EQ (Video-Entzerrung)-Regler
 Zur Einstellung der Entzerrung des vom A/WG-Video-kopf wiedergegebenen Video-Signals. (Mit Knopf)

DG-Regler
 Zur Einstellung der DG-Charakteristik des vom A/WG-Video-kopf wiedergegebenen Video-Signals.

EQ (Sync-Entzerrung)-Regler
 Zur Einstellung der Entzerrung des vom Sync-A/WG-Video-kopf wiedergegebenen Signals. (Mit Knopf)

WIEDERGABE-KOPF-SYSTEM*

DP-Regler
 Zur Einstellung der DP-Charakteristik des vom Wiedergabe-Kopf wiedergegebenen Video-Signals.

EQ (Video-Entzerrung)-Regler
 Zur Einstellung der Entzerrung des vom Wiedergabe-Kopf wiedergegebenen Video-Signals. (Mit Knopf)

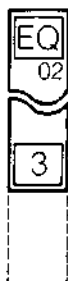
DG-Regler
 Zur Einstellung der DG-Charakteristik des vom Wiedergabe-Kopf wiedergegebenen Video-Signals.

EQ (Sync-Entzerrung)-Regler
 Zur Einstellung der Entzerrung des vom Wiedergabe-Sync-Kopf wiedergegebenen Signals. (Mit Knopf)

Testpunkte (zur Wellenform-Beobachtung)

- TP-3: HF-Ausgangs-Wellenform des Wiedergabe-Videokopfes*.
- TP-4: HF-Ausgangs-Wellenform des Wiedergabe-Sync-Kopfes*.
- TP-5: HF-Wellenform nach der Video- und Sync-Schätzung.
- TP-6: Masse

Seriennummer 10001 - 10400

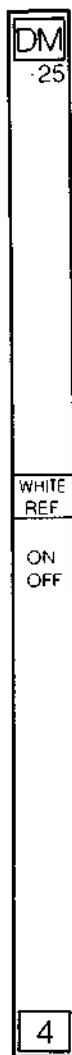


Testpunkte (für Wellenform-Beobachtung)

- TP-1: HF-Ausgangs-Wellenform des A/WG-Videokopfes .
- TP-2: HF-Ausgangs-Wellenform des A/WG-Sync-Kopfes .
- TP-3: HF-Wellenform nach der Video- und Sync-Schätzung.
- TP-4: HF-Ausgangs-Wellenform des Wiedergabe-Sync-Kopfes*.
- TP-5: HF-Ausgangs-Wellenform des Wiedergabe-Videokopfes*.

* Diese Regler und Testpunkte arbeiten nicht beim BVH-2000PS(00)(10).

DM-25-Leiterplatte **4** (DEMODULATOR)



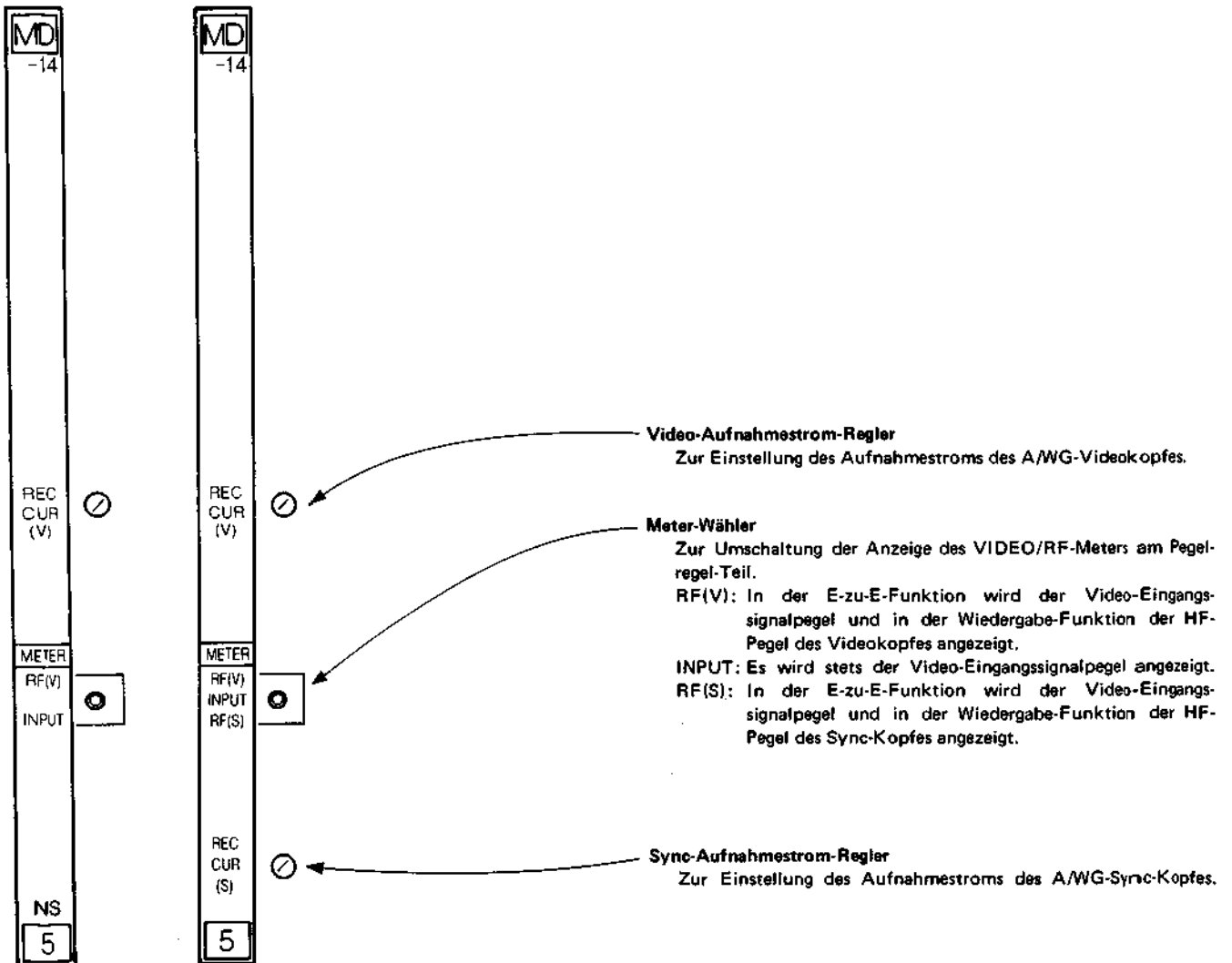
Weiß-Referenz-Schalter

- ON: Das Weiß-Referenz-Signal wird zum Demodulator-Ausgangssignal hinzugefügt. Pegelunterschiede können ausgeglichen werden, indem die Weiß-Spitzenpegel des Video-Eingangssignals auf das Referenzsignal eingestellt werden.
- OFF: Normalstellung. Das Weiß-Referenz-Signal wird nicht hinzugefügt.

MD-14-Leiterplatte 5 (MODULATOR)

BVH-2000PS(10),
(12), (14)

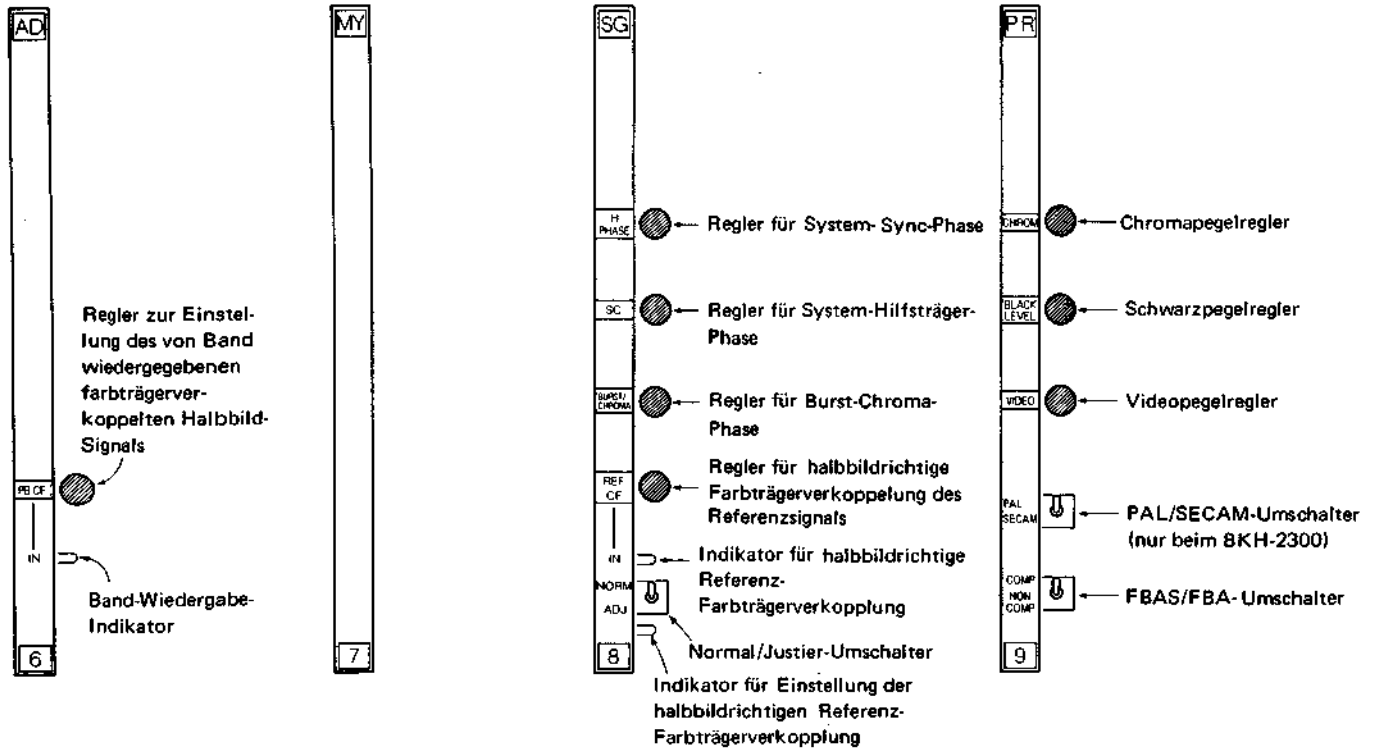
BVH-2000PS(00),
(02), (04)



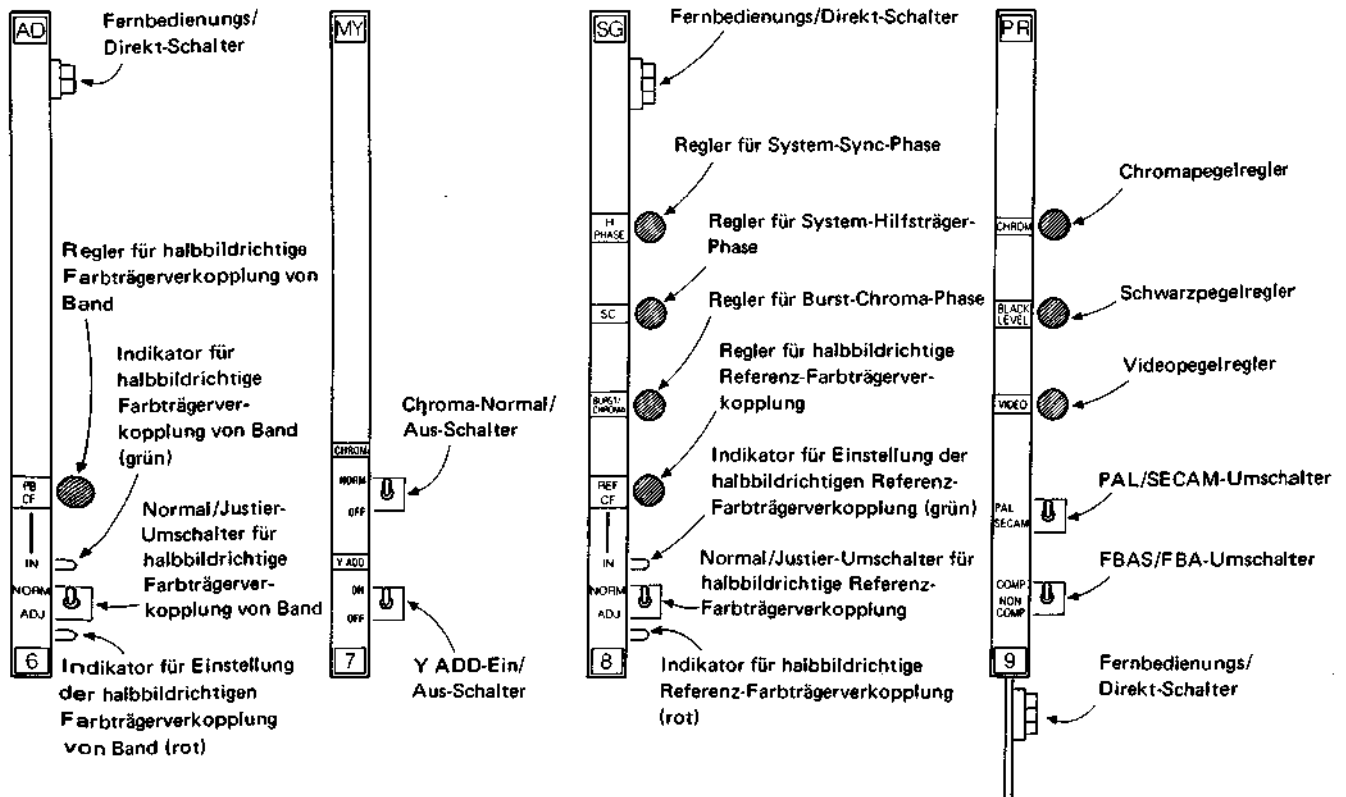
AD-Leiterplatte **6**
 MY-Leiterplatte **7**
 SG-Leiterplatte **8**
 PR-Leiterplatte **9**

Einsteckbare TBC BKH-2200/
 BKH-2300/BKH-2350 (Sonderzubehör)

BKH-2200/BKH-2300: Genaueres entnehmen Sie bitte der Bediungs- und Wartungsanleitung des einsteckbaren TBC.



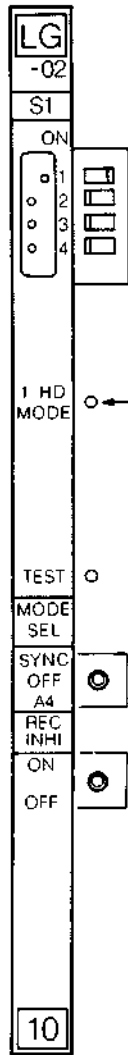
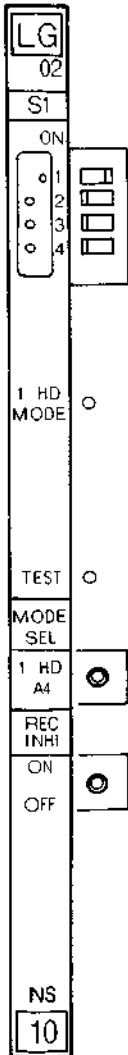
BKH-2350: Genaueres entnehmen Sie bitte der Bediungs- und Wartungsanleitung des einsteckbaren TBC.



LG-02-Leiterplatte 10 (LOGIK)

**BVH-2000PS(10),
(12), (14)**

**BVH-2000PS(00),
(02), (04)**



Leuchtet, wenn der MODE SEL-Schalter auf OFF oder A4 gestellt ist.

Betriebsarten-Schalter
SYNC: Die Video- und Sync-Signale werden aufgenommen und wiedergegeben.
OFF/1HD: Das Video-Signal wird aufgenommen und wiedergegeben, nicht jedoch das Sync-Signal.
A4: Zur Aufnahme und Wiedergabe von Audio-Kanal 4 (nur bei BVH-2000PS(04)(14)).

Aufnahmeschutz-Schalter
ON: In Stellung ON ist Aufnahme- und Schnittaufnahme-Betrieb nicht möglich.
OFF: Selbst wenn die REC- oder EDIT-Taste des Bedienungspultes gedrückt wird, schaltet der Videorecorder nicht auf Aufnahme. Auch bei Fernbedienung des Videorecorders wird der Aufnahme-Befehl nicht ausgeführt.
OFF: REC- und EDIT-Tasten können normal verwendet werden.

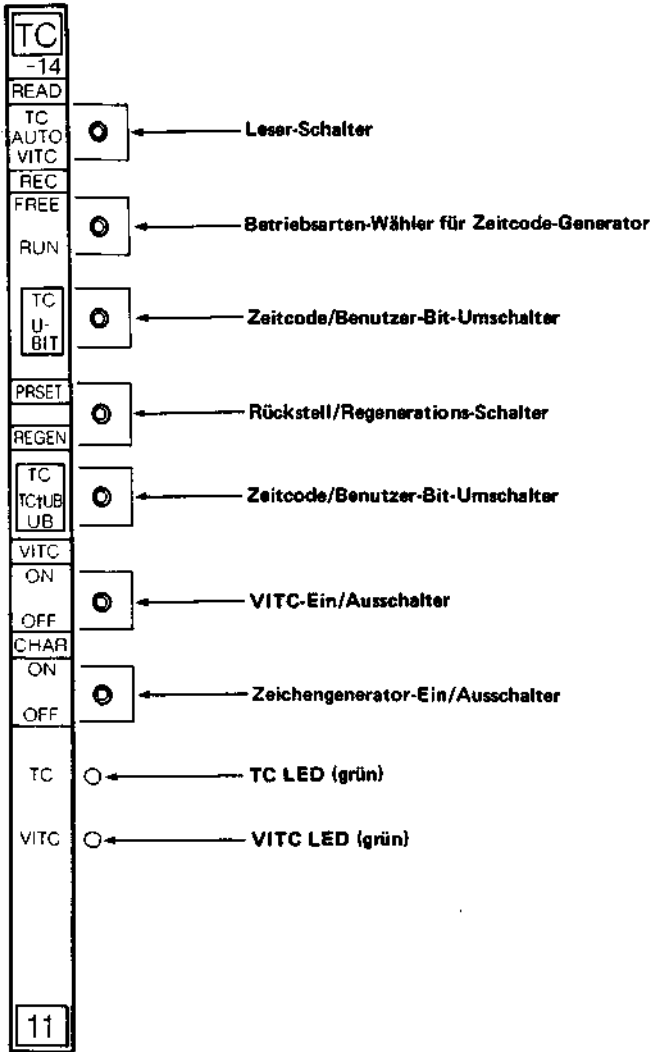
Hinweis: In Abhängigkeit von der Stellung der Schalter auf dem vorderen Bedienungspult und der LG-02-Leiterplatte hat der REC INHIBIT-Schalter die in der nachfolgenden Tabelle aufgeführten Funktionen.

REC INHIBIT-Schalter		REC INHIBIT-Betrieb
Vorderes Bedienungspult	LG-02-Leiterplatte	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

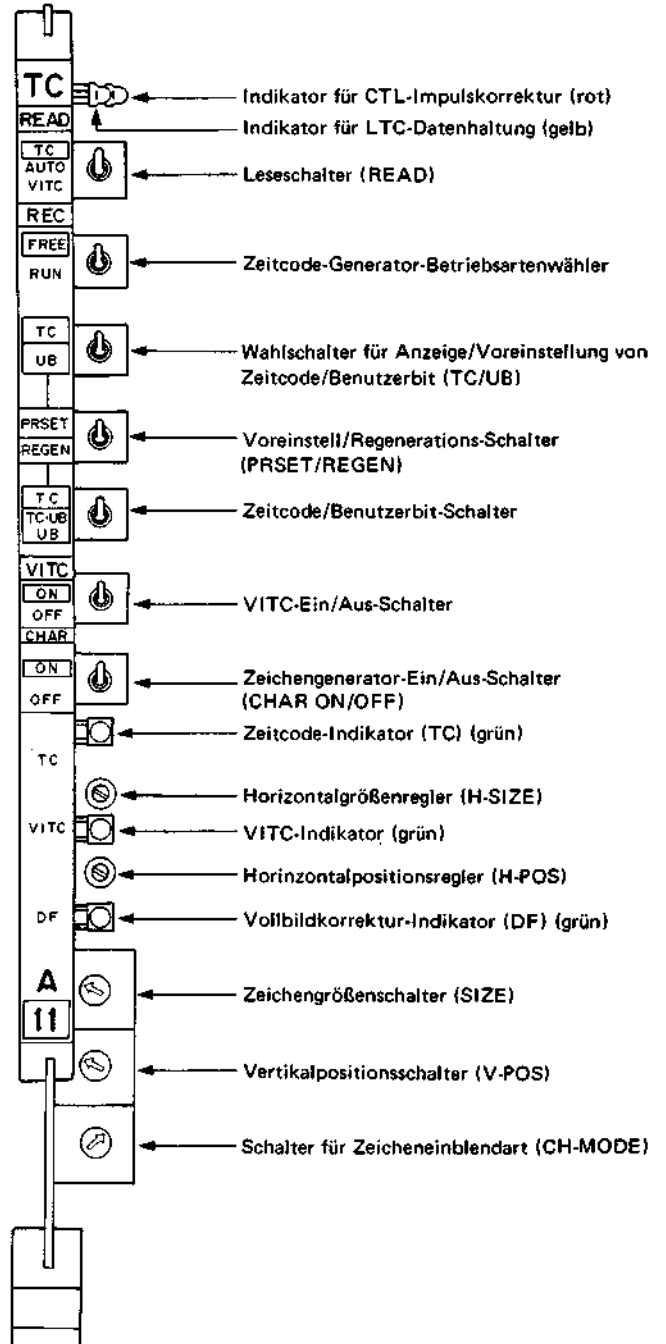
Wenn hauptsächlich der REC INHIBIT-Schalter auf dem vorderen Bedienungspult verwendet wird, lassen sie den Schalter auf der LG-02-Leiterplatte auf OFF stehen oder entfernen Sie ihn.

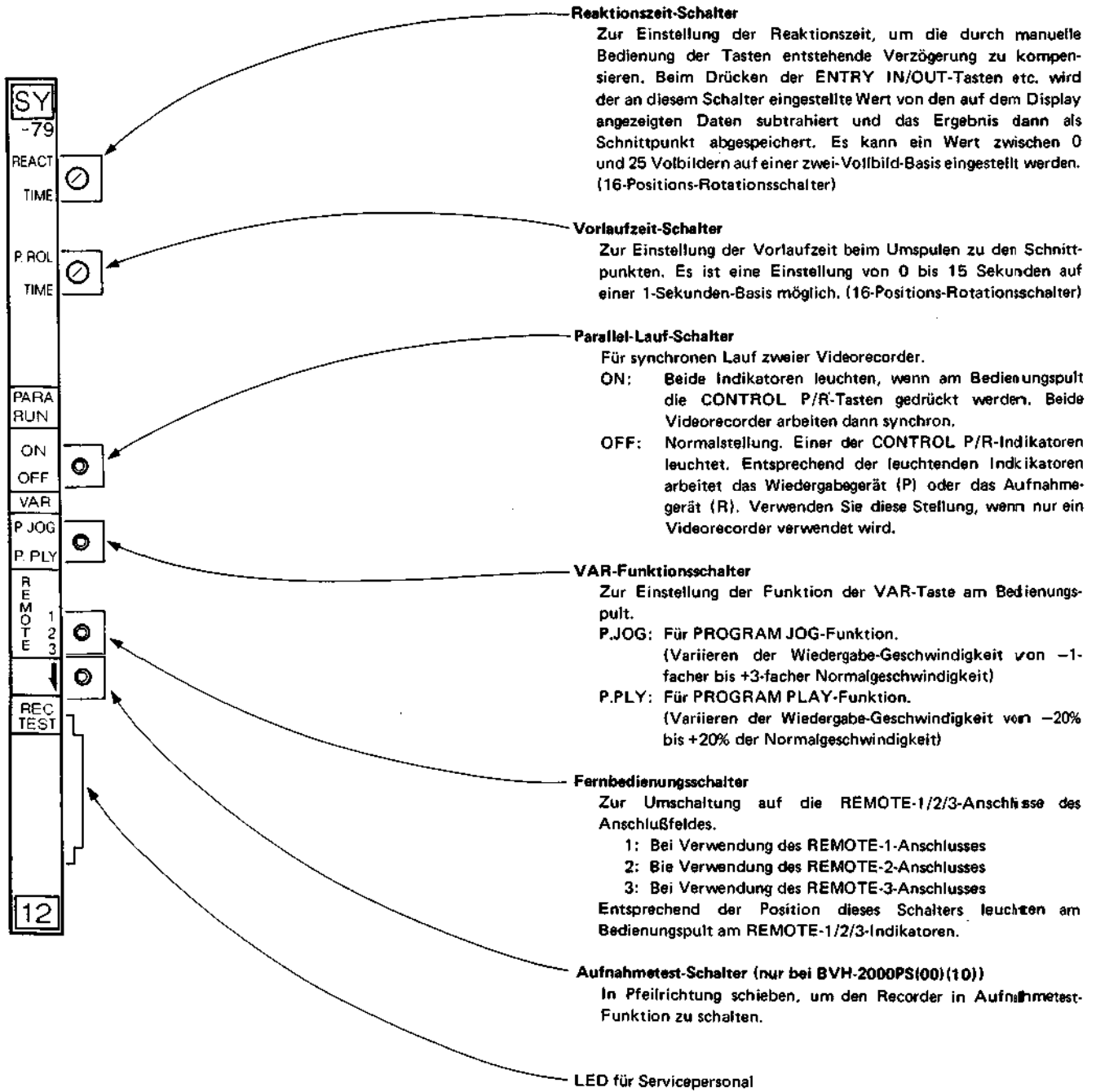
TC-14/14A-Leiterplatte **11** (BKH-2015/BKH-2015A, Sonderzubehör)

BKH-2015



BKH-2015A





1. BETRIEB unvollständig

Einstellung des Aufnahmestrompegels beim BVH-2000PS(00)(10)

1. Stellen Sie den Videorecorder in die Stop-Funktion.
2. Stellen Sie den REMOTE/LOCAL-Schalter auf LOCAL.
3. Stellen Sie den REC INHIBIT-Schalter auf OFF.
4. Drücken Sie den REC TEST-Schalter der SY-79-Leiterplatte in Pfeilrichtung. Auf dem Display erscheint dann die Anzeige „REC TEST“ und der REC INHIBIT-Indikator blinkt.
5. Drücken Sie die REC-Taste. Die REC-Taste blinkt dann, der BVH-2000PS(00)(10) wiederholt die Aufnahme und Wiedergabe und der REC INHIBIT-Indikator erlischt.
6. Stellen Sie den Aufnahmestrompegel ein.

Einstellung für den Videokopf

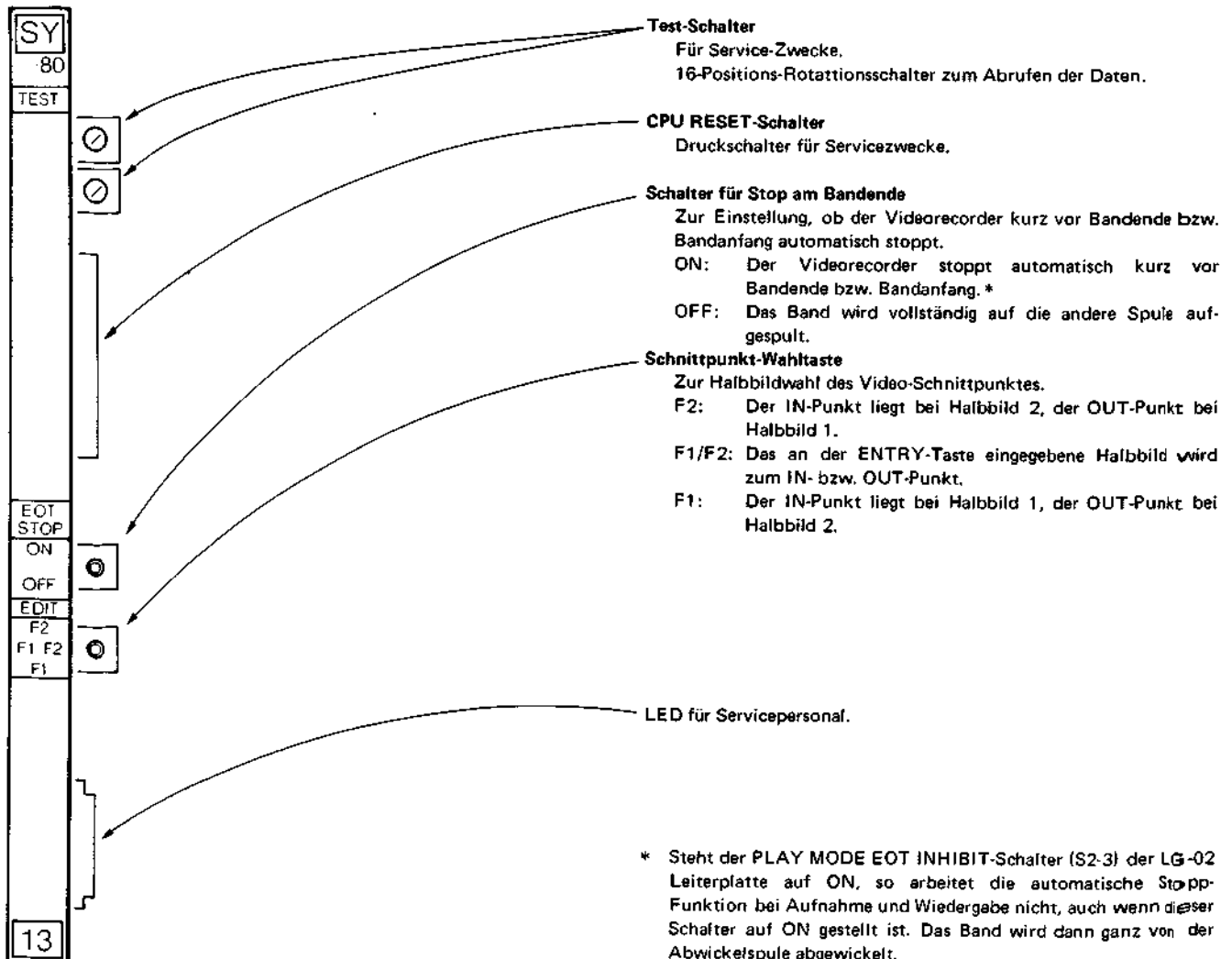
Stellen Sie den METER-Wähler der MD-14-Leiterplatte auf RF(V) und regeln Sie den REC CUR (V)-Regler so ein, daß der Zeiger des VIDEO/RF-Meters gerade maximalen Ausschlag anzeigt.

Einstellung für den Sync-Kopf (nur bei BVH-2000PS(00), (02), (04))

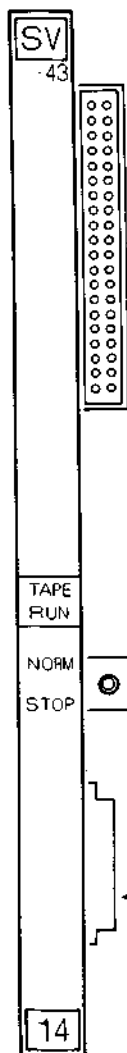
Stellen Sie den METER-Wähler der MD-14-Leiterplatte auf RF(S) und regeln Sie den REC CUR (V)-Regler so ein, daß der Zeiger des VIDEO/RF-Meters gerade maximalen Ausschlag anzeigt.

7. Drücken Sie am Ende der Einstellung die REC-Taste. Der BVH-2000PS(00)(10) geht dann in die Standbild-Funktion über. Wird die STOP-Taste gedrückt, schaltet der Videorecorder in die Stop-Funktion.
- Eine Einstellung ist nur möglich, wenn die Schritte 1 bis 5 richtig durchgeführt wurden.
 - Befindet sich der Videorecorder länger als 3 Minuten in der Aufnahme-Test-Funktion, so schaltet er automatisch auf die Stop-Funktion um.
 - Die Anzeige „REC TEST“ erscheint bei Bedienungspult Typ-II im Block 3 des Displays und bei Bedienungspult Typ-III im Block 5. Wenn im Block 3 des Typ-II-Bedienungspultes gerade eine Fehlermeldung angezeigt wird, so erscheint die Anzeige „REC TEST“ nicht.
 - Wenn die Einstellung durch Drücken der REC-Taste gestoppt wurde, so kann der Videorecorder durch erneutes Drücken der REC-Taste wieder in die Aufnahme-Test-Funktion zurückgeschaltet werden. Mit der REC-Taste ist es also möglich, zwischen der Aufnahme-Test- und der Standbild-Funktion hin- und herzuschalten.
 - Wenn während der Einstellung die in den Punkten 1 bis 5 angegebenen Zustände geändert werden, so wird die Einstellung automatisch gestoppt.

SY-80-Leiterplatte 13 (SYSTEM-CPU-2)



SV-43-Leiterplatte 14 (SERVO-CPU)



40-poliger Anschluß
EXT-Anschluß für Servicezwecke

Bandlauf-Schalter
 NORM: Normalstellung. Die Tasten des Bedienungspultes arbeiten normal.
 STOP: Alle mechanischen Antrieb-Systeme wie Kopfstrommel, Capstan, Spulen etc. schalten in die Stop-Funktion. Stellen Sie den Schalter zur Überprüfung der Elektronik in diese Position.

LED für Servicepersonal.

RL-12-Leiterplatte 15 (SPULEN-SERVO)



Schrägfehlerkompensations-Regler

Steht der unten beschriebene Schrägfehlerkompensations-Schalter auf MANU, so kann hier die bei der Wiedergabe durch die Umschaltung der Videoköpfe entstehende Zeitverzögerung ausgeglichen werden. (Mit Knopf)

Schrägfehlerkompensations-Schalter

MANU: Manuelle Einstellung. Der Schrägfehlerkompensations-Regler (siehe oben) kann verwendet werden.

AUTO: Automatische Einstellung. Bei der Wiedergabe arbeitet der Schrägfehlerkompensations-Kreis und kompensiert automatisch die beim Umschalten der Videoköpfe entstehende Zeitverzögerung.

Fehler-LEDs (acht)

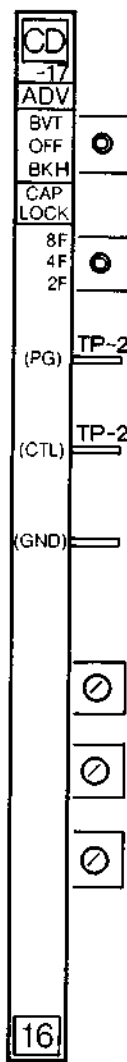
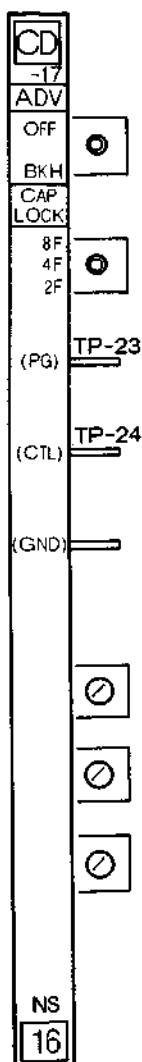
Diese LEDs zeigen folgende Zustände an:

- | | | |
|------------|--|---------------------|
| D7 (SYS): | SYSCON INTERFACE FEHLER | } rot
(abnormal) |
| D6 (DR): | KOPFTROMMEL FEHLER | |
| D5 (TTP): | BANDTRANSPORT FEHLER | |
| D4 (SV): | SYSTEM FEHLER | |
| D3 (MODE): | BETRIEBSBEREIT | } grün
(normal) |
| D2 (CF): | FARBTRÄGERVERKOPPELTE HALBBILDREFERENZ | |
| D1 (DR): | KOPFTROMMEL VERRIEGELUNG | |
| D0 (CAP): | CAPSTAN VERRIEGELUNG | |

CD-17-Leiterplatte **16** (CAPSTAN & KOPFTROMMEL)

BVH-2000PS(10),
(12), (14)

BVH-2000PS(00),
(02), (04)



Vorlauf-Schalter

Zur Einstellung des bei Wiedergabe erforderlichen Vorlaufs des Synchronsignals. Dieser Schalter ist folgendermaßen entsprechend des verwendeten TBCs einzustellen:

BVT: Bei Verwendung des BVT-2000P/2000S (externer TBC). Der Vorlauf kann an dem 16-Positions-Rotationsschalter der Leiterplatte eingestellt werden. Stellen Sie den Schalter bei Geräten mit dynamischer Spurlage auf 12H und bei Geräten ohne dynamische Spurlage auf 4H.

OFF: Das Wiedergabesignal wird mit dem Referenzsignal synchronisiert.

BKH: Bei Verwendung der als Sonderzubehör lieferbaren, einsteckbaren TBC-Leiterplatten (6 - 9). Die Kopf-trommel-Phase wird automatisch eingestellt.

Capstan-Verriegelungsschalter

Zur Wahl der Capstan-Verriegelungsphase gegenüber dem Referenzsignal bei Wiedergabe.

8F: Für halbbildrichtige Farbtägerverkopplung (8 Halbbilder)*
4F: 4-Halbbild-Verriegelung
2F: 2-Halbbild-Verriegelung

Testpunkte (zur Wellenform-Beobachtung)

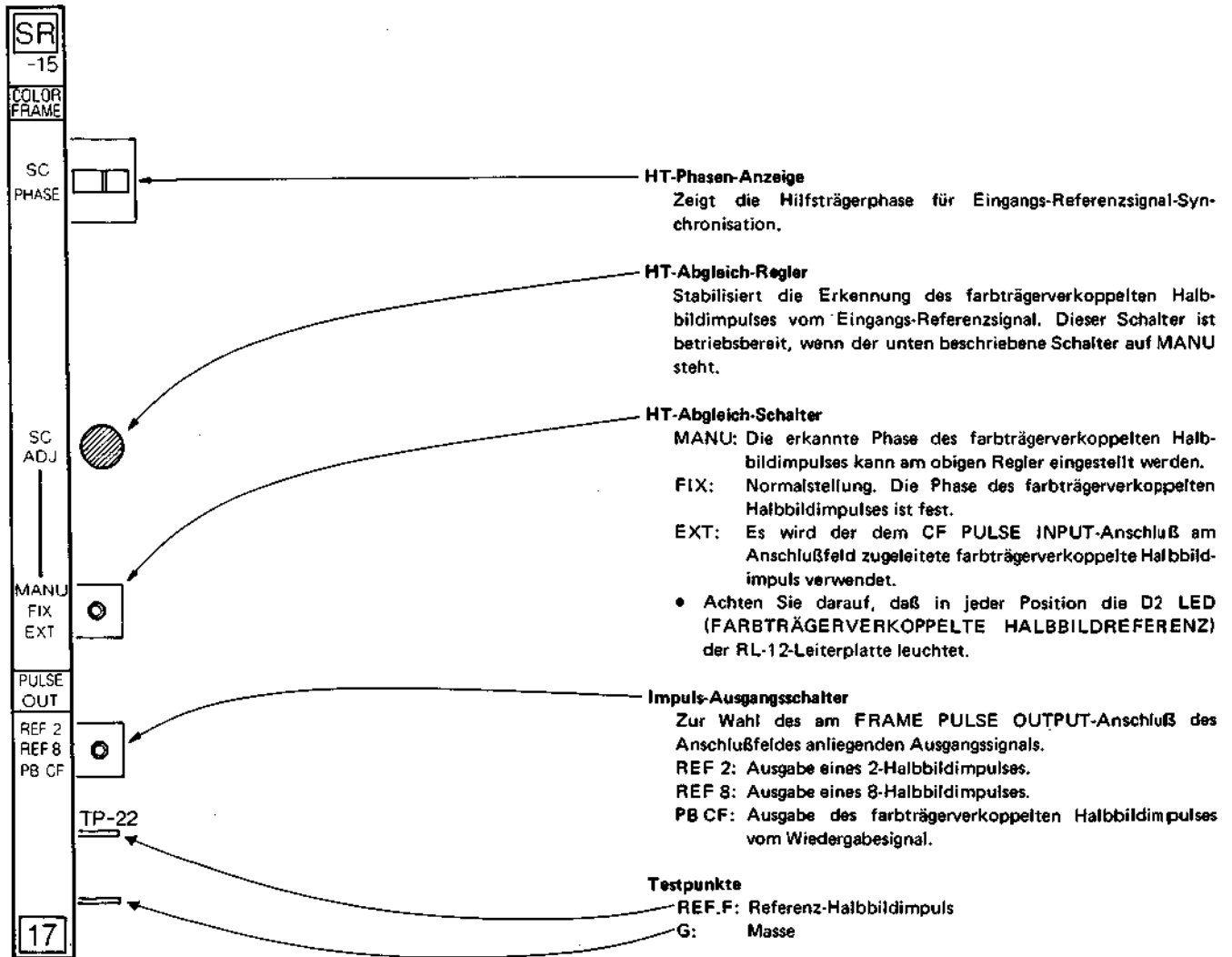
PG: Ausgang des DRUM PG-Signals
CTL: Ausgang des CTL-Signals
GND: Masse

Test-Schalter

Drei 16-Positions-Rotationsschalter für Testzwecke.

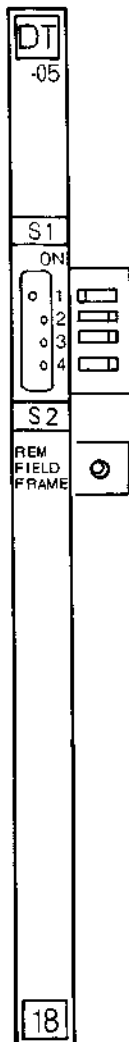
* Bei SECAM-Signalen wird eine 4-Halbbildverkopplung durchgeführt, selbst wenn der Schalter auf 8F gestellt ist.

SR-15-Leiterplatte **17** (SERVO REF)



DT-05-Leiterplatte **18** (Dynamische Spurlage) (nur bei BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Seriennummer 10701 und höher



Schalter für dynamische Spurlagenbetriebsart (S2)

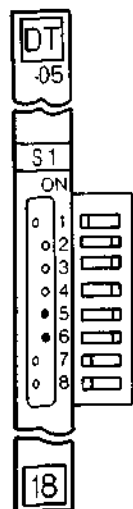
REM: Die Wahl zwischen Halbbild-Jog- und Vollbild-Jog-Betrieb erfolgt fernbedient.

FIELD: Halbbild-Jog-Betrieb

FRAME: Vollbild-Jog-Betrieb

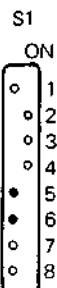
(Bei Vollbild-Jog-Betrieb ist von Standbild bis doppelte Normalgeschwindigkeit eine Wiedergabe mit dynamischer Spurlage unter Einbehaltung des Zeilensprungs möglich.)

Seriennummer 10001 – 10699



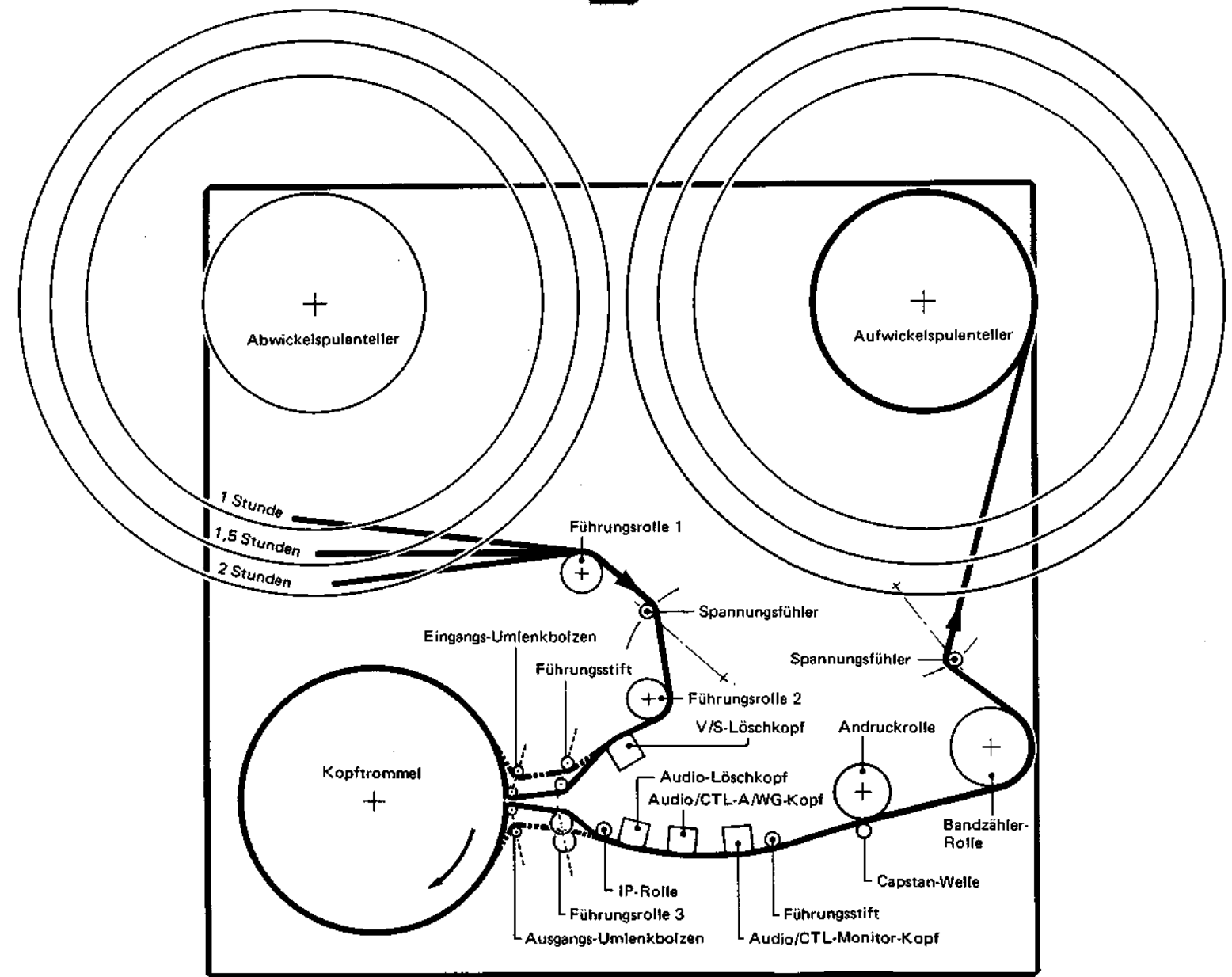
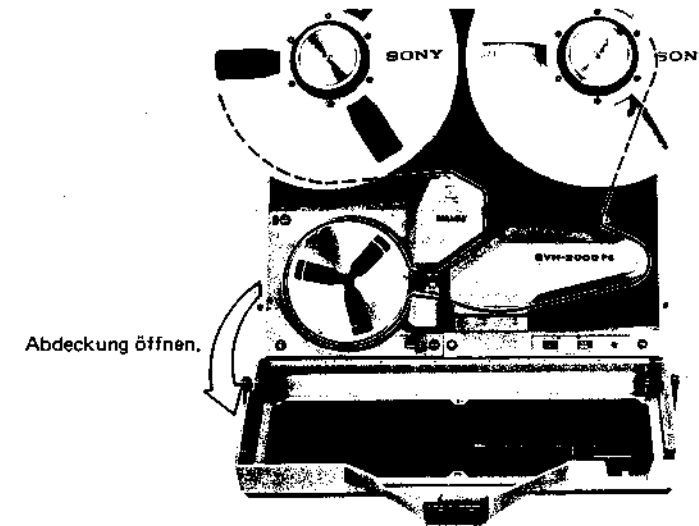
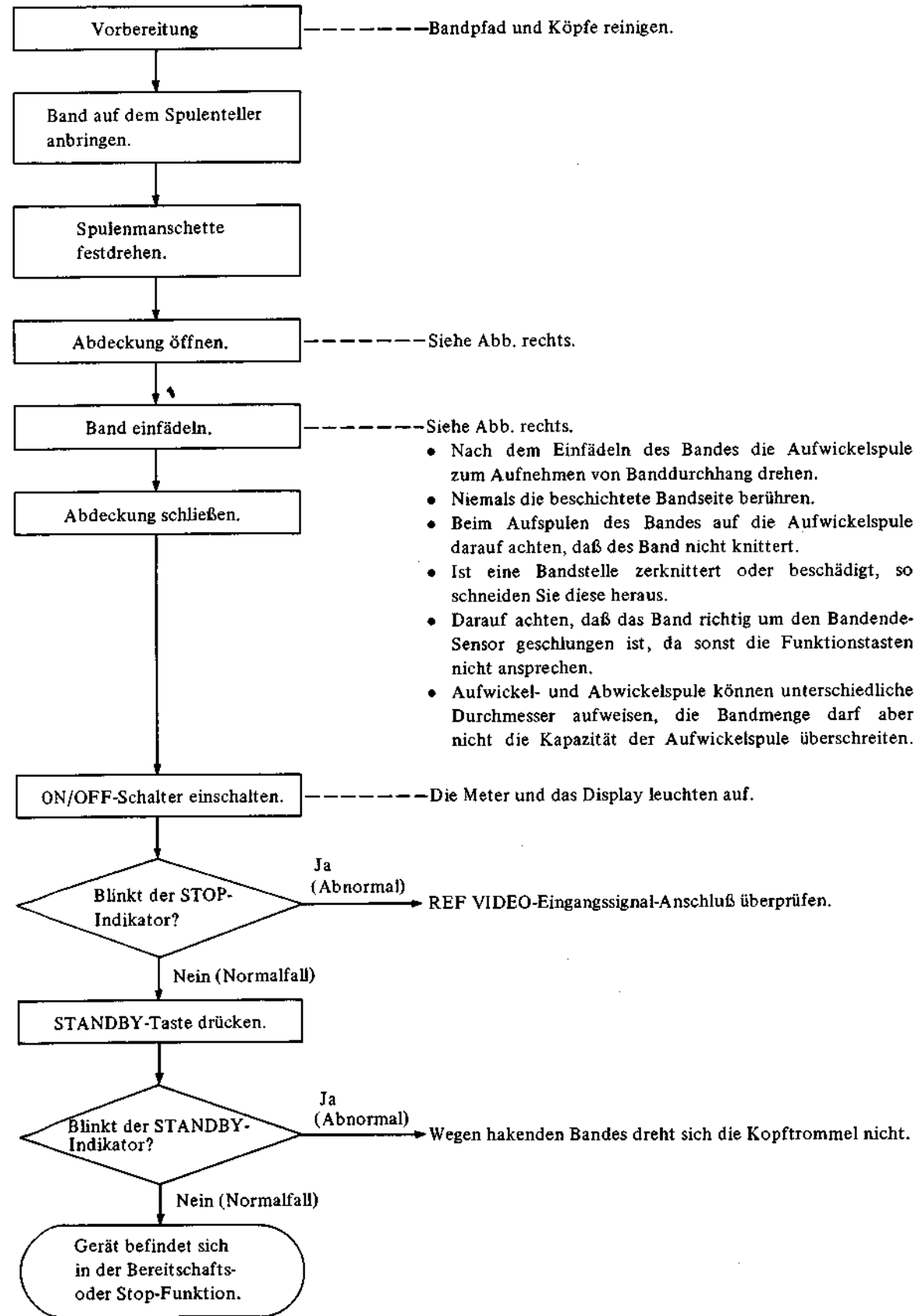
Für Wiedergabe mit dynamischer Spurlage unter Einhaltung des Zeilensprungs ändern Sie die Stellung der Schalter Nr. 5 und Nr. 6 von S1. (Wirksam zwischen Standbild und doppelter Normalgeschwindigkeit.)

Vollbild-Jog-Betrieb

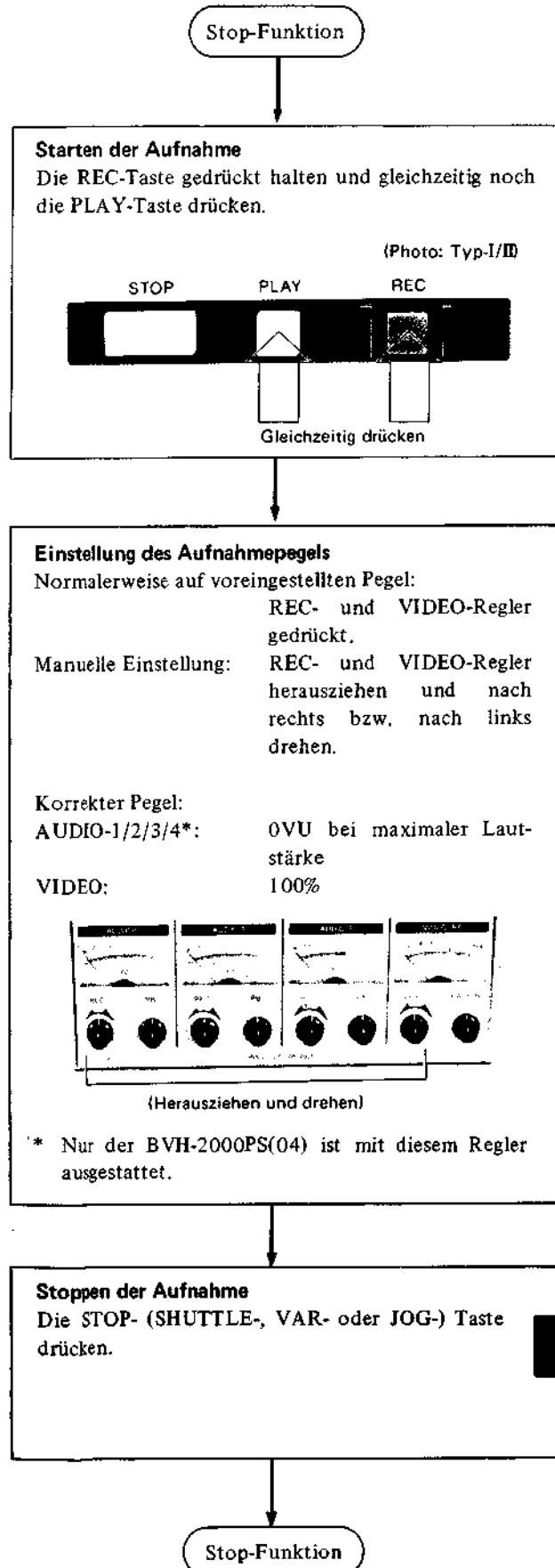


1-7. BANDEINFÄDELUNG

Bemerkungen



1-8. AUFNAHME



Bemerkungen

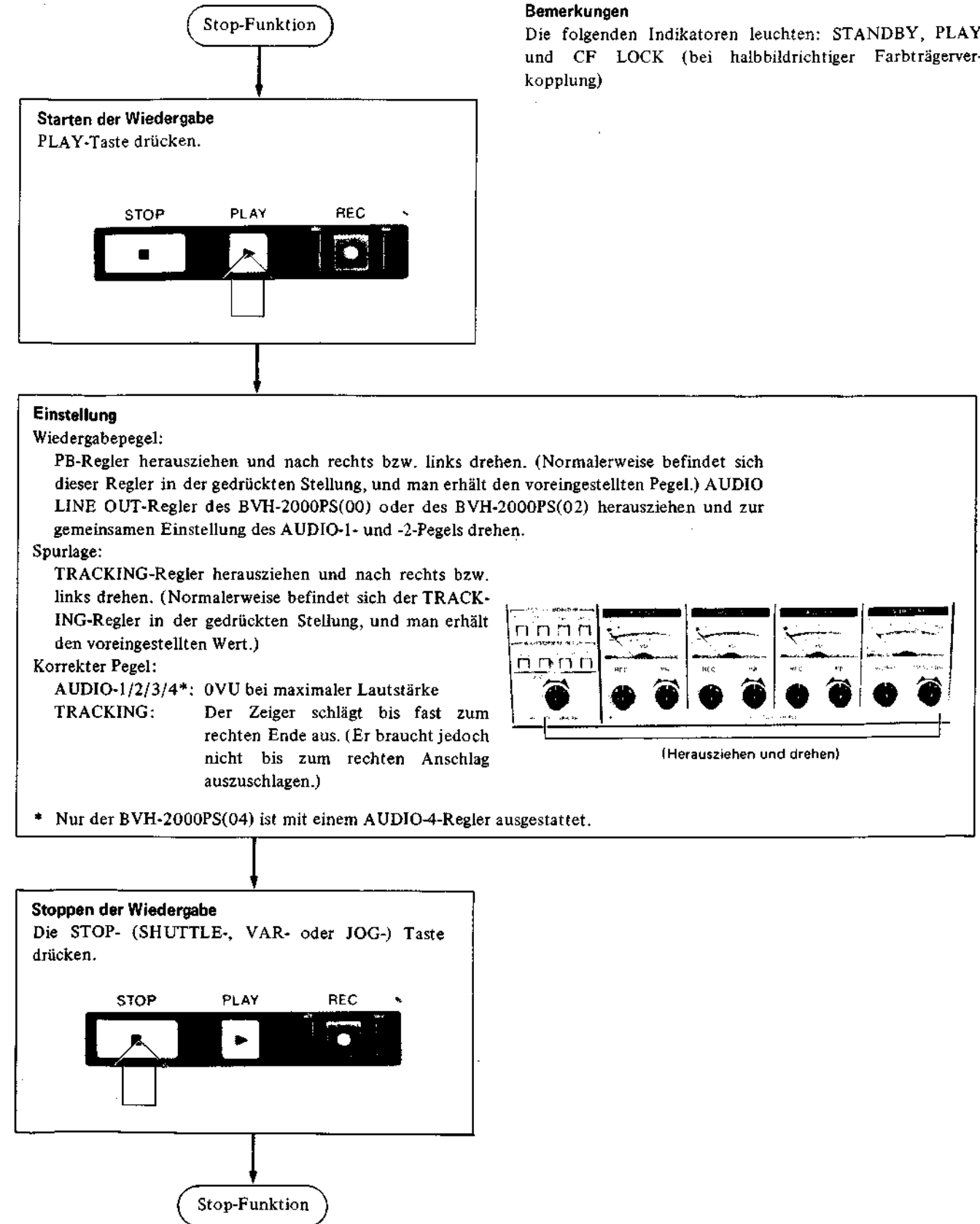
- Folgende Indikatoren leuchten: STANDBY, REC, PLAY und CF LOCK (bei halbbildrichtiger Farbträgerverkopplung)
Hinweis: Aufnehmen ist nicht möglich, wenn der REC INHIBIT-Indikator leuchtet. Stellen Sie den REC INHIBIT-Schalter auf OFF.

- Video-Monitor
Bei entsprechender Einstellung der PICTURE MONITOR-Tasten und des TAPE/EE-Wählers kann das Bild auf dem Monitor verfolgt werden.
- Audio-Monitor
Bei entsprechender Einstellung der AUDIO MONITOR-Tasten und des TAPE/EE-Wählers kann der Ton mitgehört werden.

1-89(G)

1-9. WIEDERGABE

1-9-1. Wiedergabe mit Normalgeschwindigkeit

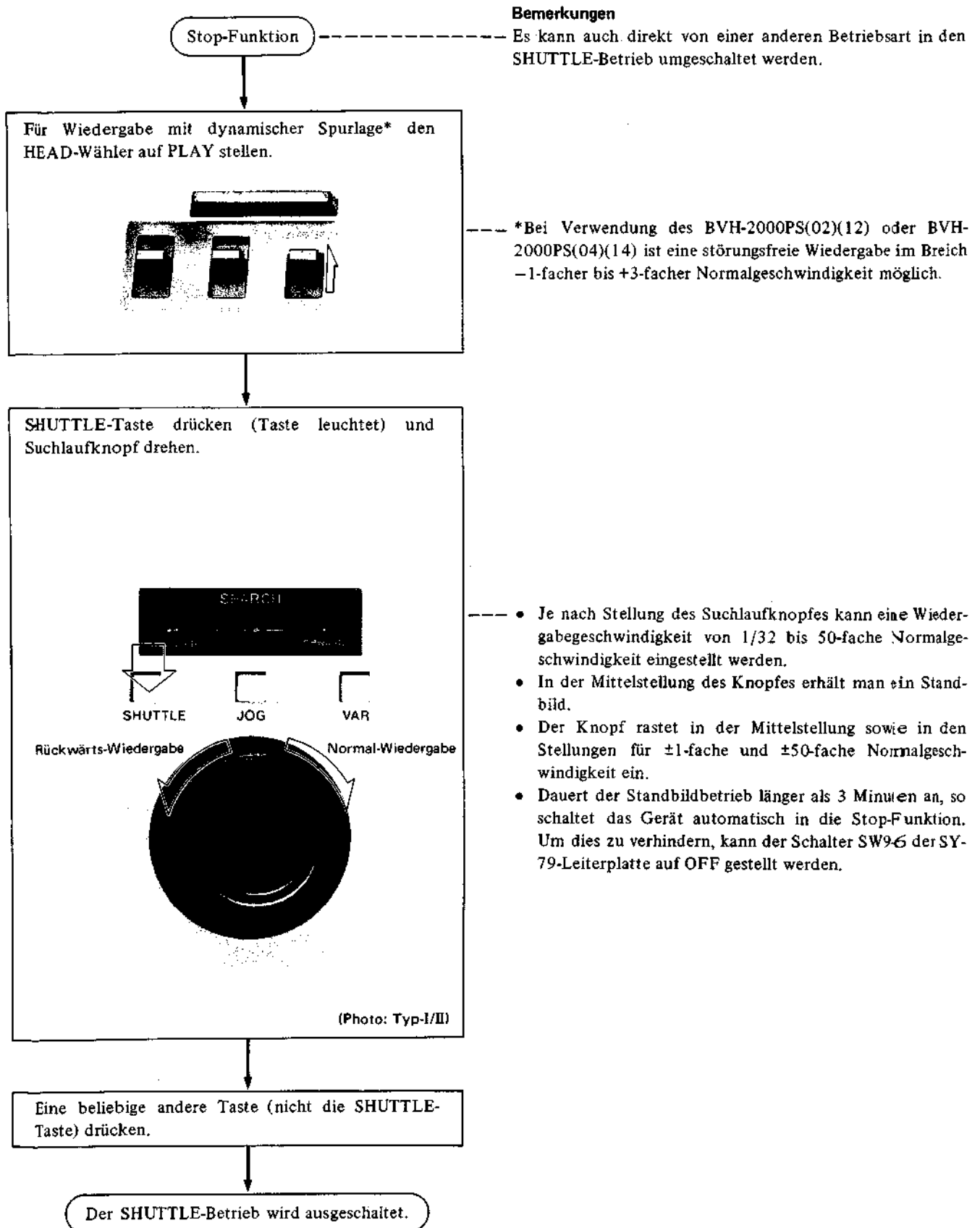


Bemerkungen

Die folgenden Indikatoren leuchten: STANDBY, PLAY und CF LOCK (bei halbbildrichtiger Farbträgerverkopplung)

1-90(G)

1-9-2. SHUTTLE-Betrieb



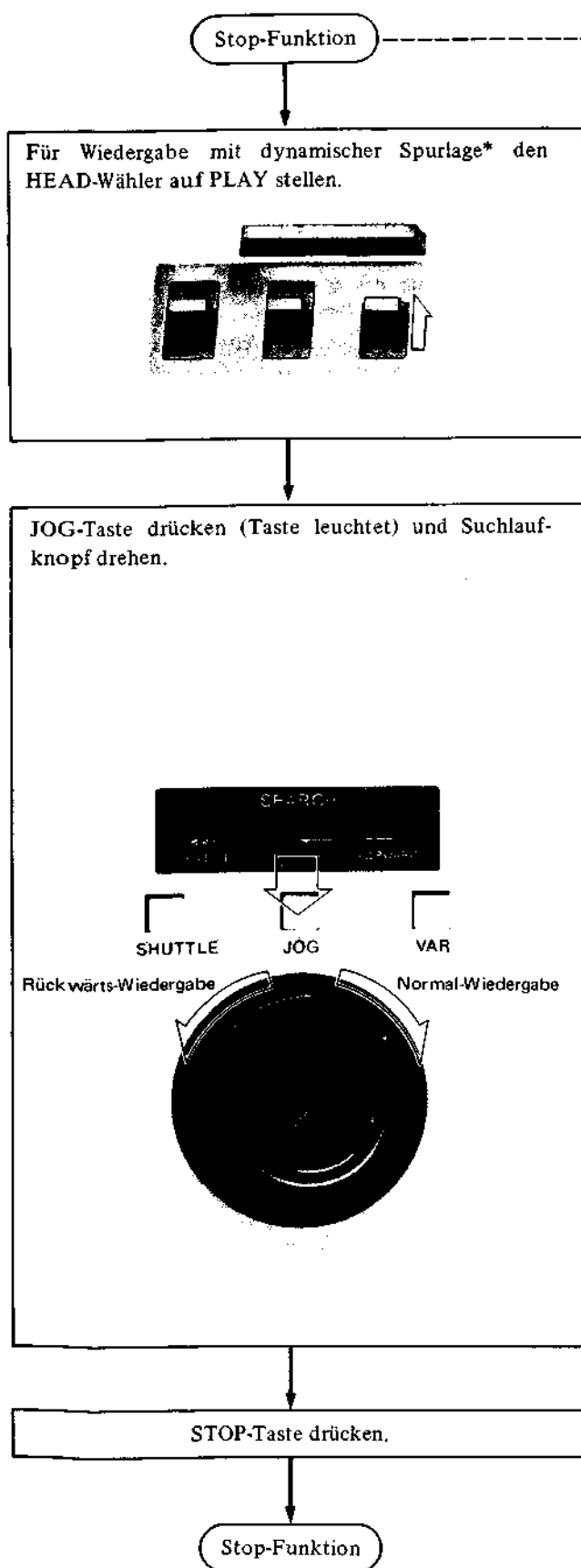
Bemerkungen

Es kann auch direkt von einer anderen Betriebsart in den SHUTTLE-Betrieb umgeschaltet werden.

*Bei Verwendung des BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) ist eine störungsfreie Wiedergabe im Bereich -1-facher bis +3-facher Normalgeschwindigkeit möglich.

- Je nach Stellung des Suchlaufknopfes kann eine Wiedergabegeschwindigkeit von 1/32 bis 50-fache Normalgeschwindigkeit eingestellt werden.
- In der Mittelstellung des Knopfes erhält man ein Standbild.
- Der Knopf rastet in der Mittelstellung sowie in den Stellungen für ± 1 -fache und ± 50 -fache Normalgeschwindigkeit ein.
- Dauert der Standbildbetrieb länger als 3 Minuten an, so schaltet das Gerät automatisch in die Stop-Funktion. Um dies zu verhindern, kann der Schalter SW96 der SY-79-Leiterplatte auf OFF gestellt werden.

1-9-3. JOG-Betrieb



Bemerkungen

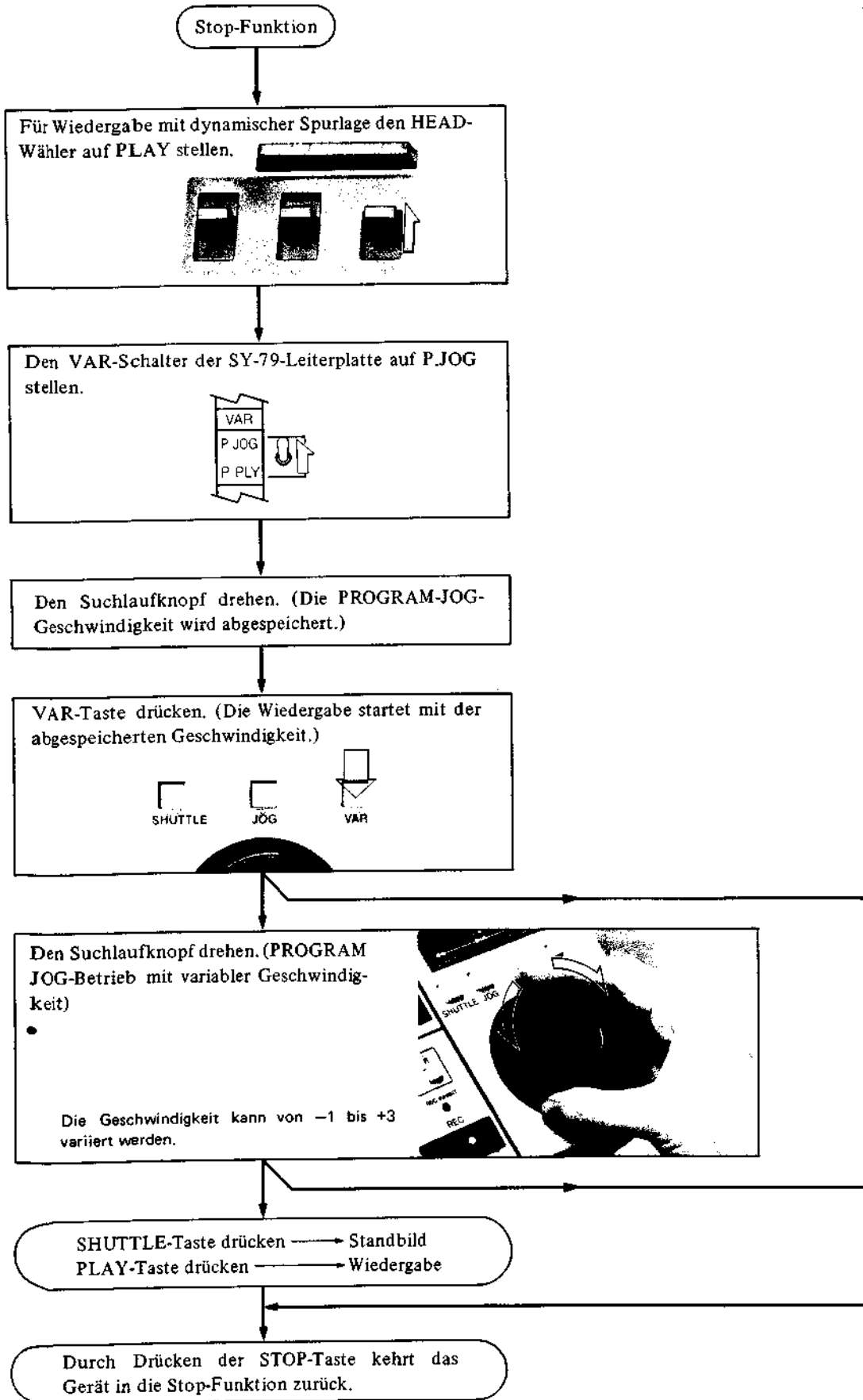
Es kann auch direkt von einer andern Betriebsart in den JOG-Betrieb umgeschaltet werden.

*Bei Verwendung des BVH-2000PS(02)(12) oder BVH-2000PS(04)(14) ist eine störungsfreie Wiedergabe möglich.

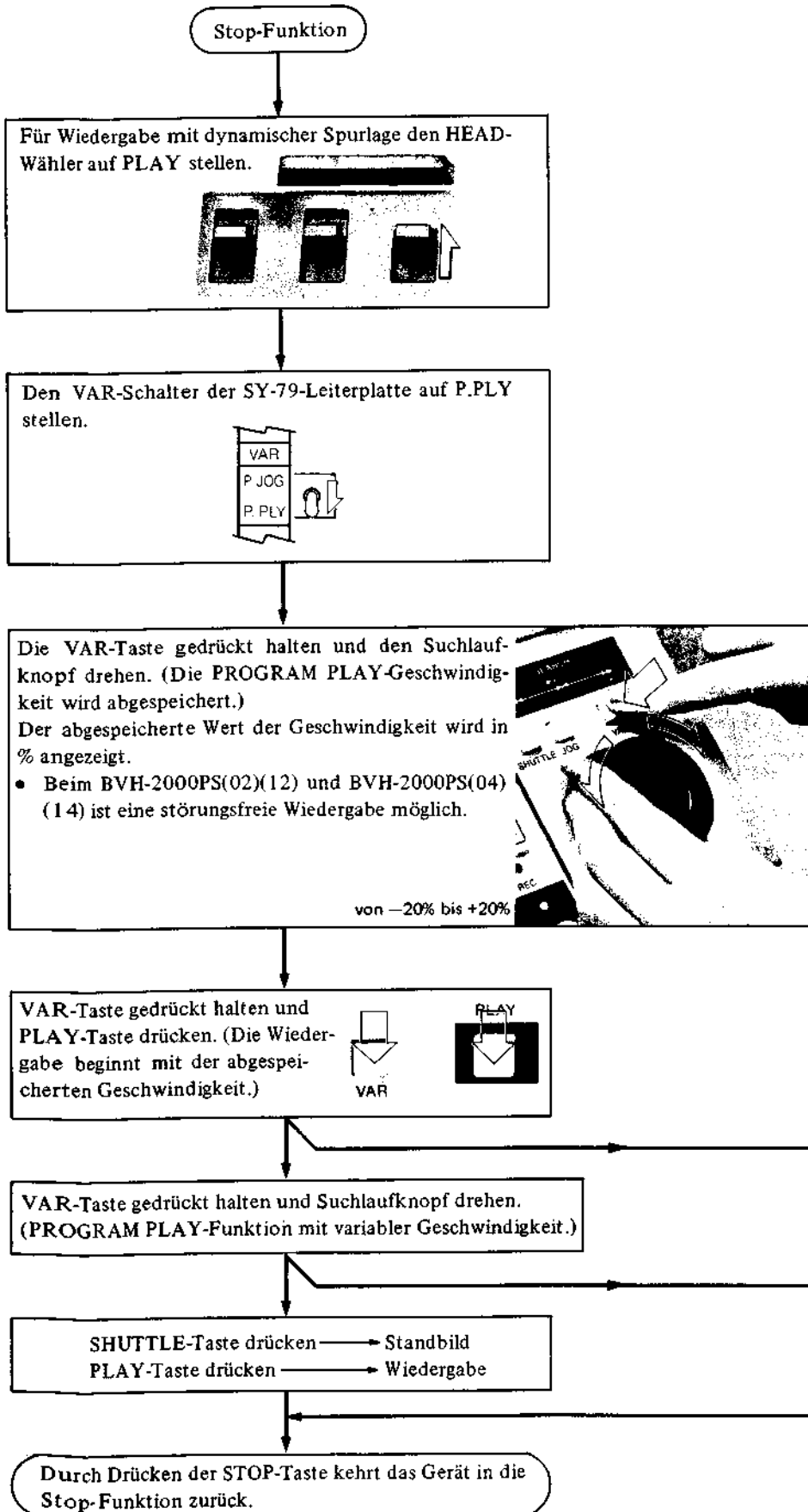
- Entsprechend der Drehgeschwindigkeit des Suchlaufknopfes ist eine Wiedergabe-Geschwindigkeit von 0 bis 3-fache Normalgeschwindigkeit möglich.
- Wird der Suchlaufknopf angehalten, erhält man ein Standbild.
- Der Knopf rastet an keiner Stelle ein.
- Dauert der Standbildbetrieb länger als 3 Minuten an, so schaltet das Gerät automatisch in die Stop-Funktion. Um dies zu verhindern, kann der Schalter SW9-6 der SY-79-Leiterplatte auf OFF gestellt werden.

Wahlweise können auch die PLAY-, SHUTTLE- oder VAR-Tasten gedrückt werden.

1-9-4. PROGRAM-JOG

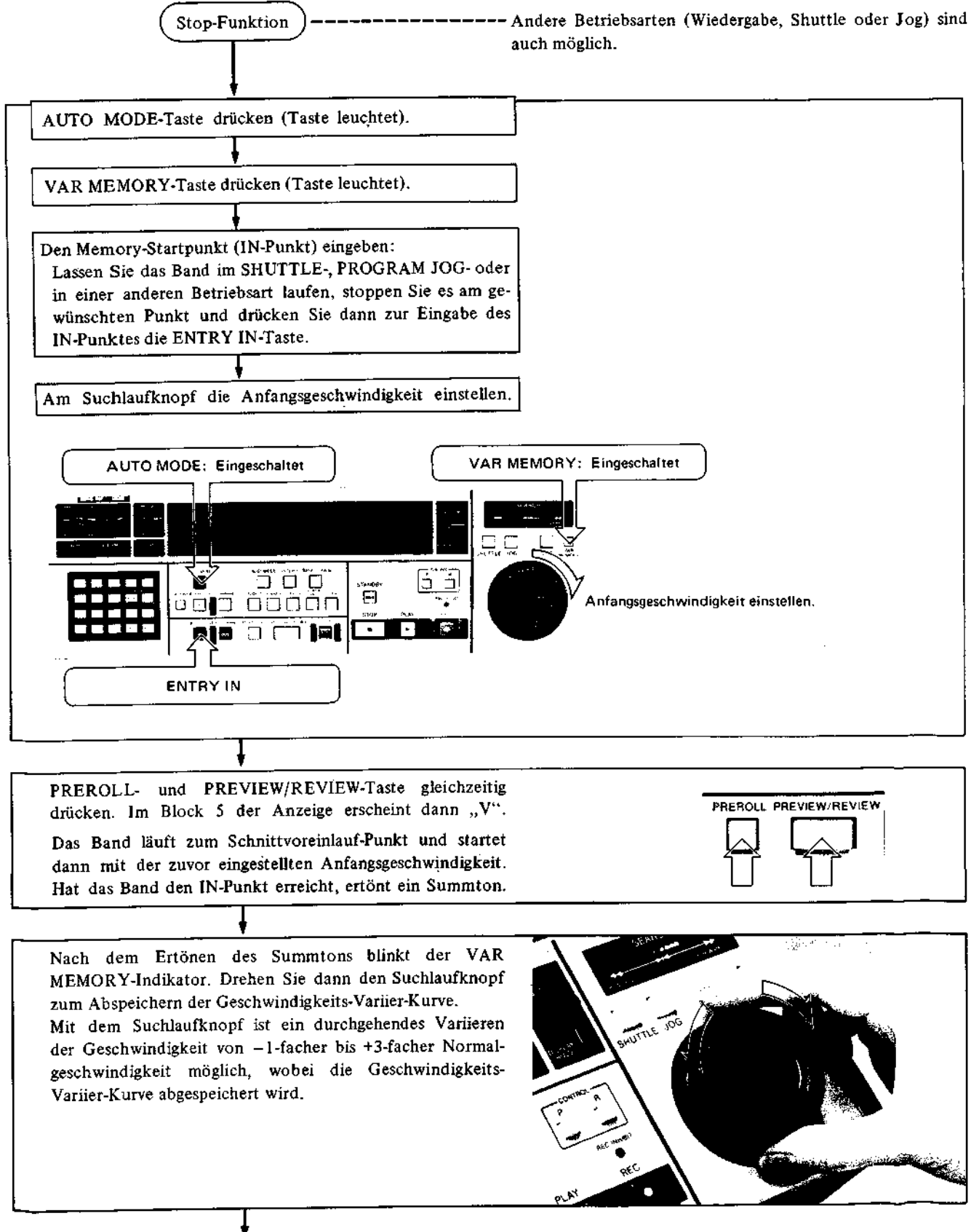


1-9-5. PROGRAM-PLAY



1-9.6. Variier-Memory (nur bei TypIII)

- Beim BVH-2000PS(02)(12) und BVH-2000PS(04)(14) ist eine störungsfreie Wiedergabe möglich.



STOP-Taste zum Abschalten der Memory-Funktion drücken.

PREVIEW-Taste drücken. (Die Wiedergabe erfolgt entsprechend der abgespeicherten Geschwindigkeits-Variier-Kurve.)



1. Das Band spult zu folgendem Punkt:
(IN-Punkt) – (Schnittvorauslaufzeit (sec) x Anfangsgeschwindigkeit)
 2. Hat das Band diesen Punkt erreicht, startet es mit der zuvor eingestellten Anfangsgeschwindigkeit.
 3. Sobald das Band den IN-Punkt erreicht, ertönt ein Summton und die Display-Anzeige beginnt zu blinken. Danach beginnt die Wiedergabe entsprechend der im Memory abgespeicherten Geschwindigkeits-Variier-Kurve.
 4. Ist die im Memory abgespeicherte Kurve durchlaufen, so erlischt die Display-Anzeige und das Gerät schaltet in den PROGRAM JOG-Betrieb.
- Durch erneutes Drücken der PREVIEW-Taste kann der Vorgang wiederholt werden.

Bereitschaftsbetrieb bei Wiedergabe mit Variier-Memory

Wenn nur die PREROLL-Taste gedrückt wird, läuft das Band zum Schnittvorauslauf-Punkt und stoppt dort (Bereitschaft für Wiedergabe mit Variier-Memory).

Um die Wiedergabe am gewünschten Zeitpunkt zu starten, drücken Sie die PREVIEW/REVIEW-Taste, zu einem um die Schnittvorauslaufzeit vorher liegenden Punkt.

1-9-7. Capstan-Geschwindigkeitskorrektur

Zur Synchronisation mit einem anderen Videorecoder halten Sie die PLAY-Taste gedrückt und drehen Sie den Suchlaufknopf. Die Normalgeschwindigkeit kann dadurch um $\pm 15\%$ geändert werden, wobei die Änderung auf dem

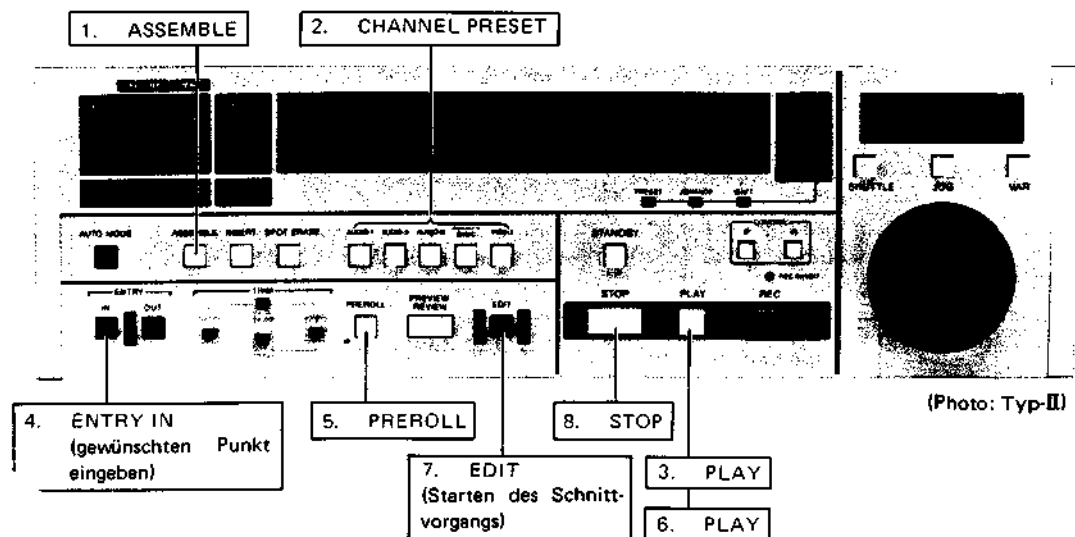
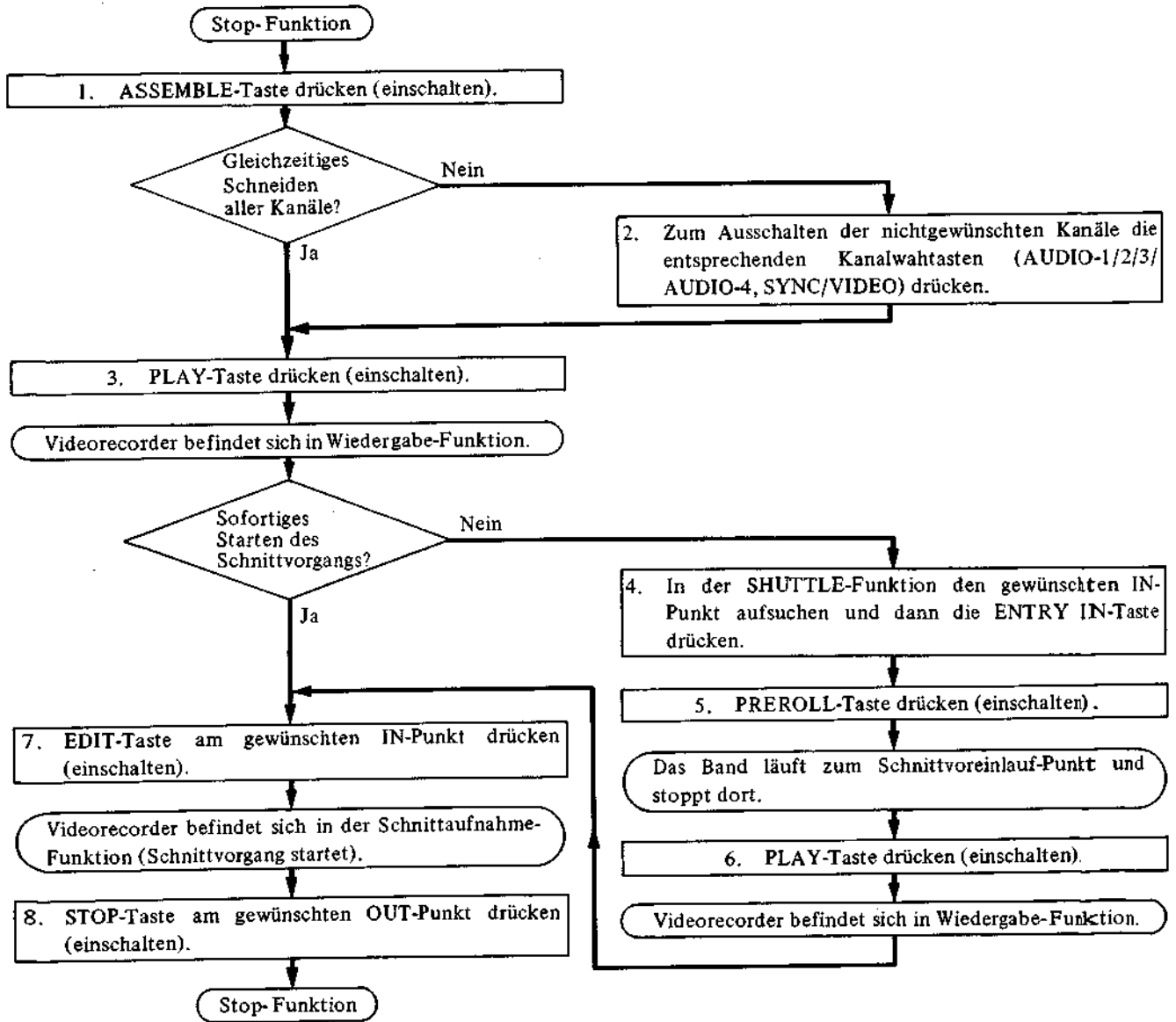
Display in % angezeigt wird (Typ-II/III).

Beim Loslassen der PLAY-Taste schaltet das Gerät wieder auf Normalgeschwindigkeit (x1).



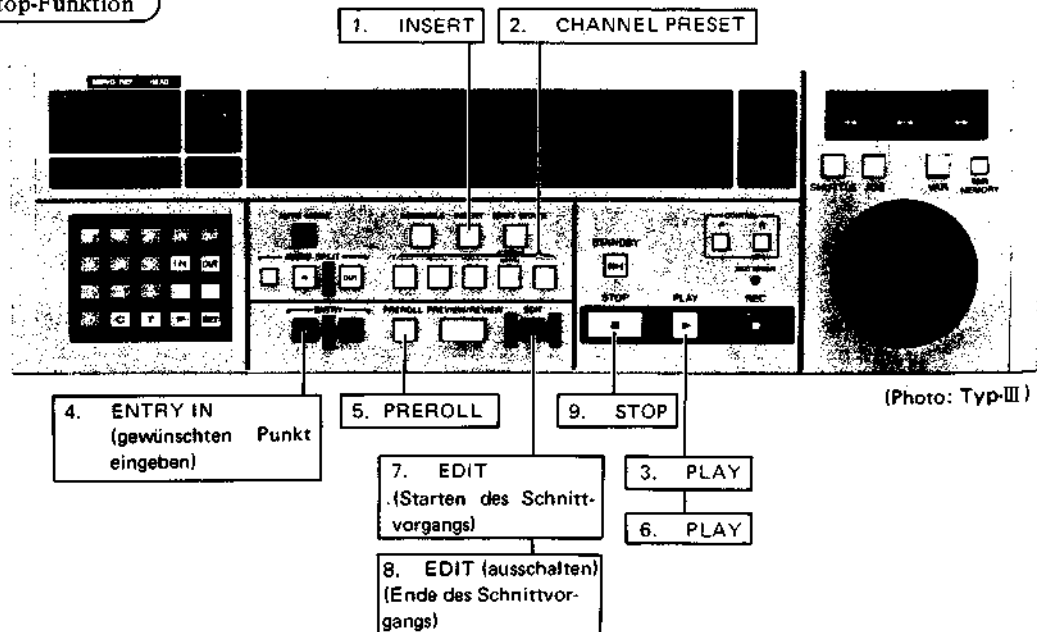
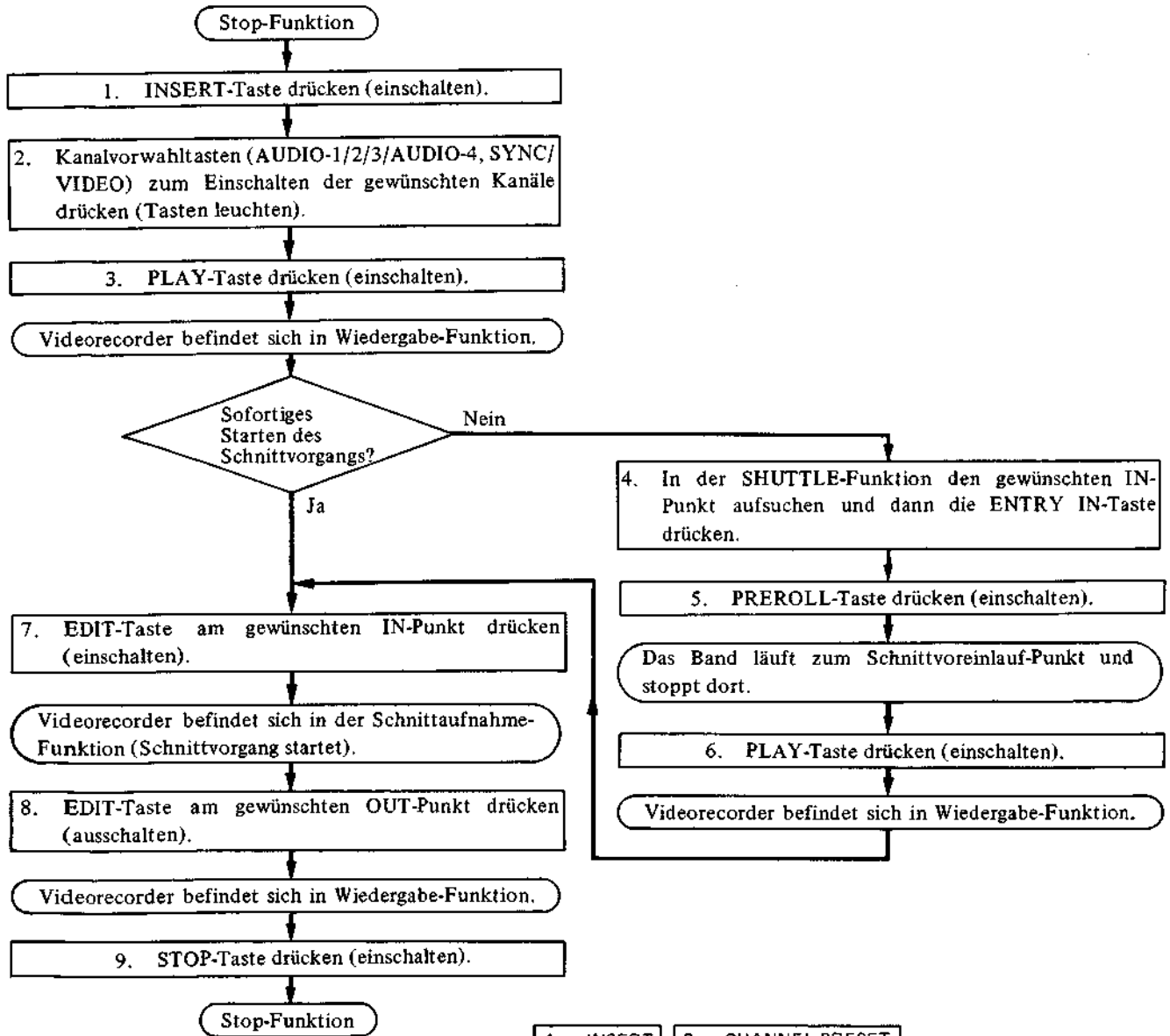
1-10. MANUELLER SCHNITTBETRIEB

1-10-1. Anfügschnitt

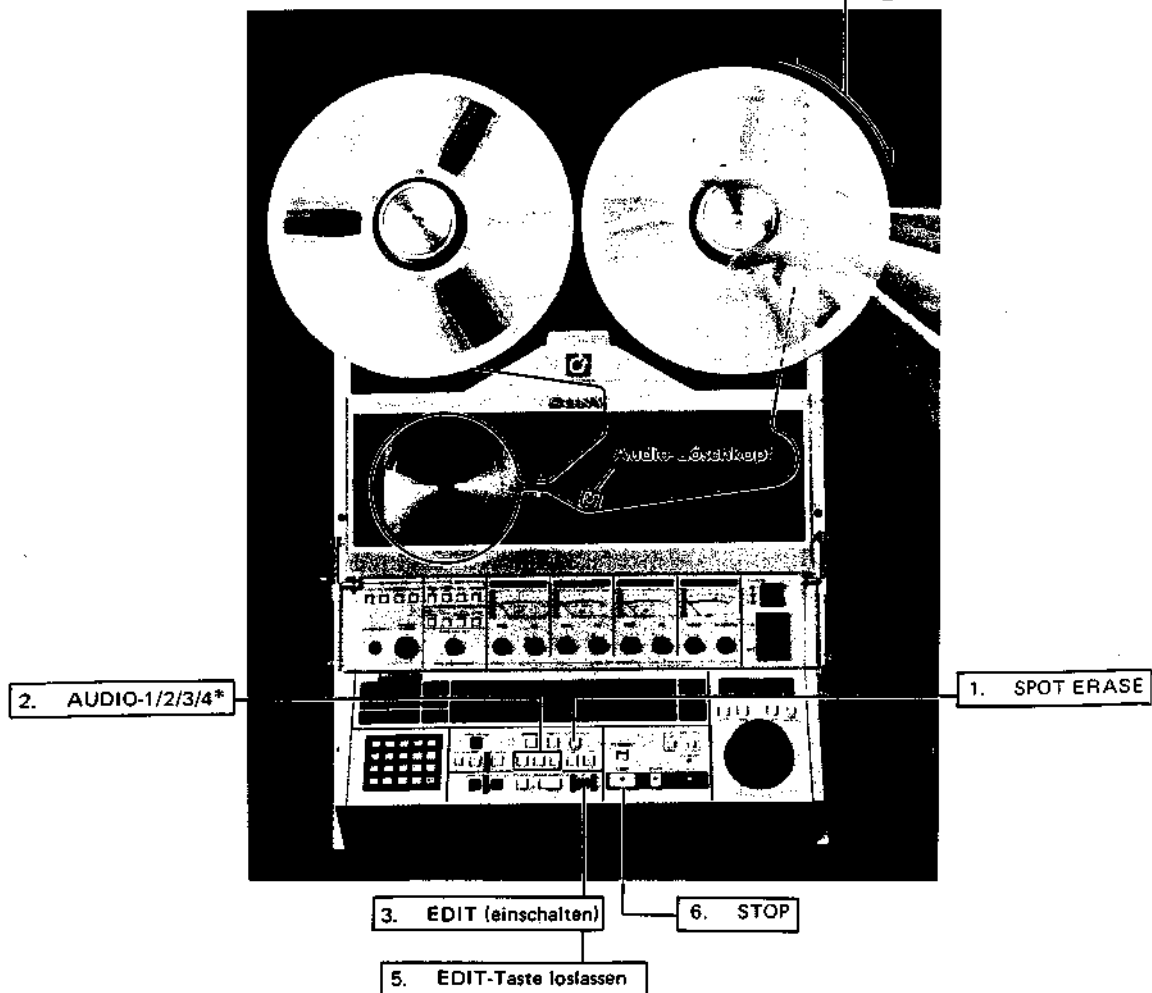
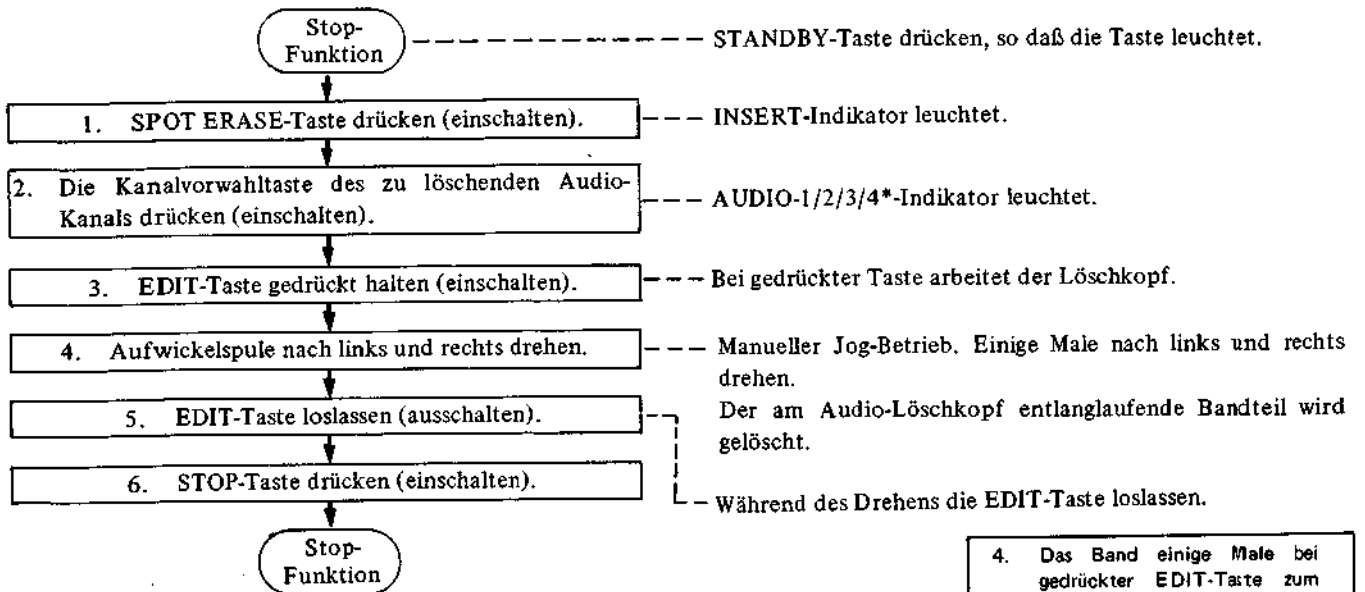


(Photo: Typ-II)

1-10-2. Einfügschnitt



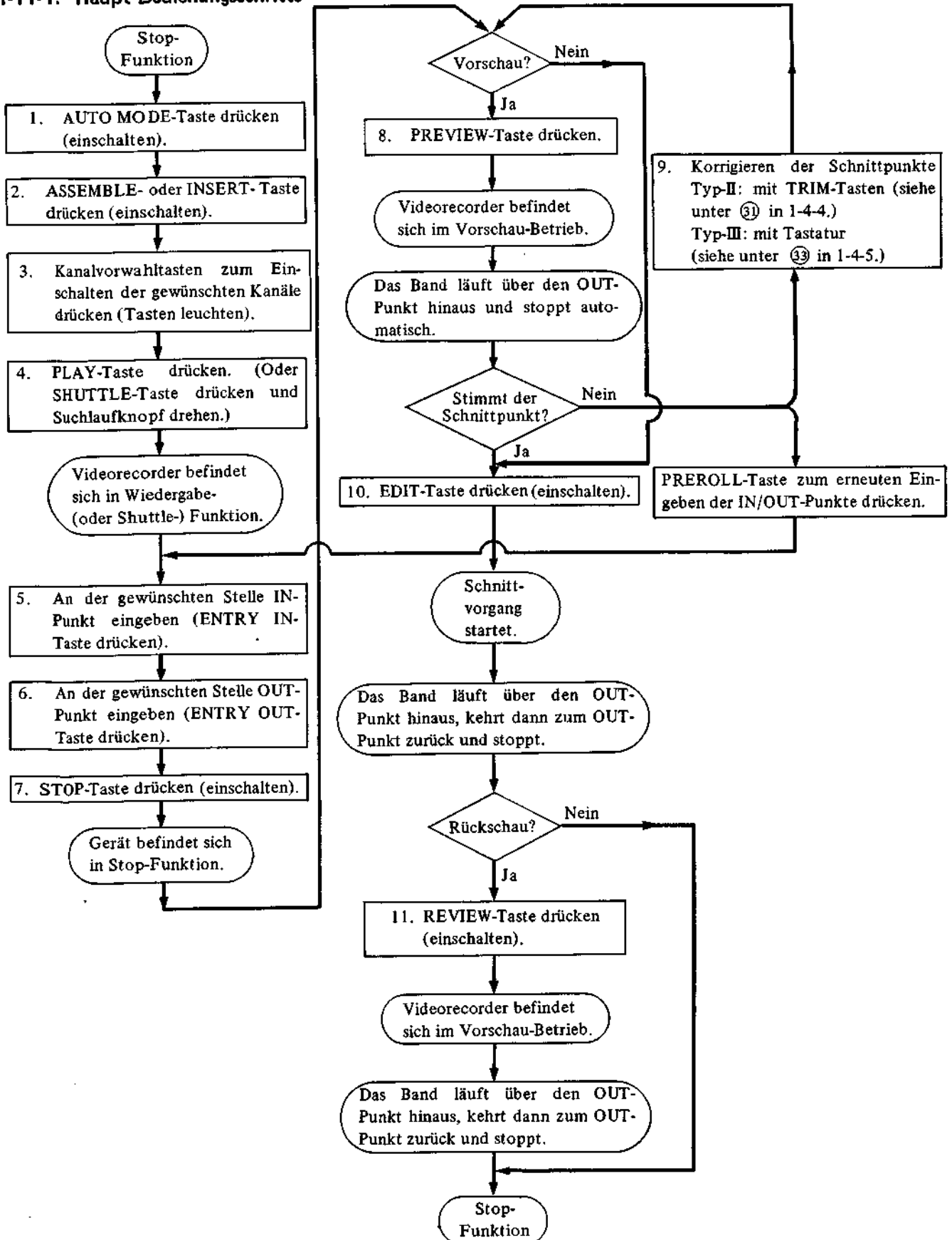
1-103. Teil-Löschung



*Nur der BVH-2000PS(04) ist mit einer AUDIO-4-Taste ausgestattet.

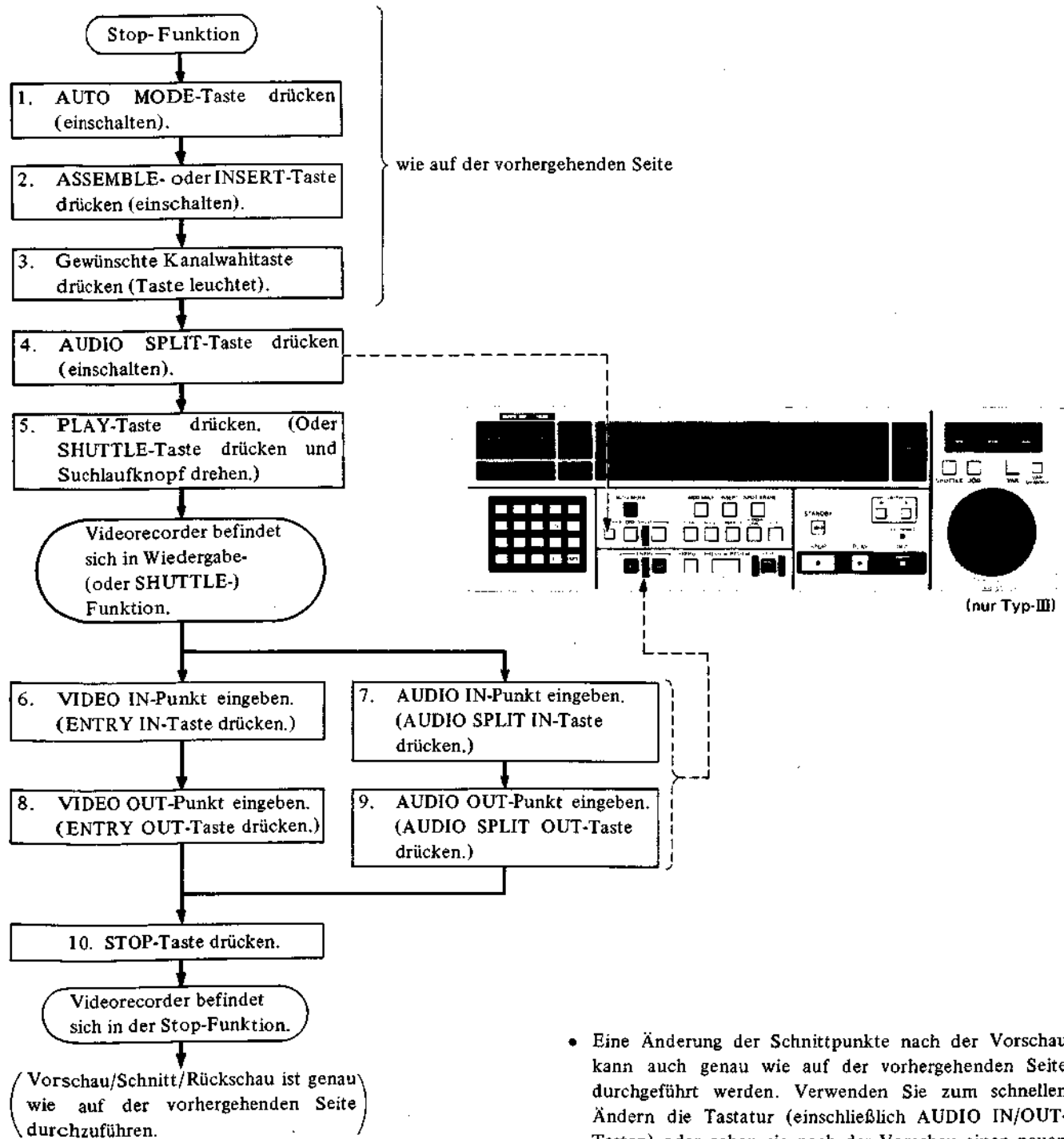
1-11. AUTOMATISCHER SCHNITTBETRIEB

1-11-1. Haupt-Bedienungsschritte



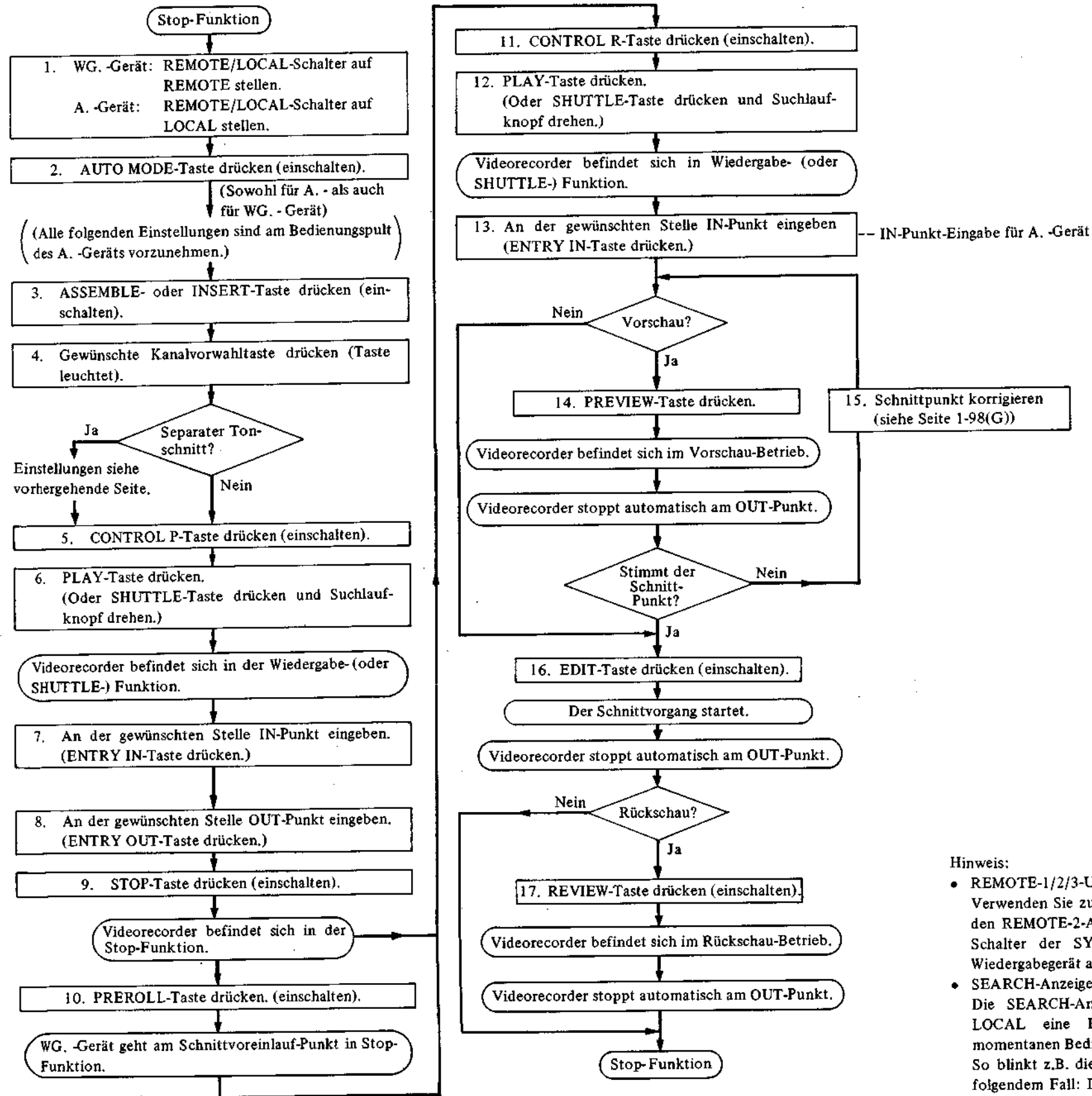
1-11-2. Separater Tonschnitt (nur bei Typ III)

Geben Sie bei separatem Tonschnitt getrennte AUDIO IN/OUT- und VIDEO IN/OUT-Punkte ein. Die anderen Bedienungsschritte sind im wesentlichen genau wie auf der vorhergehenden Seite.

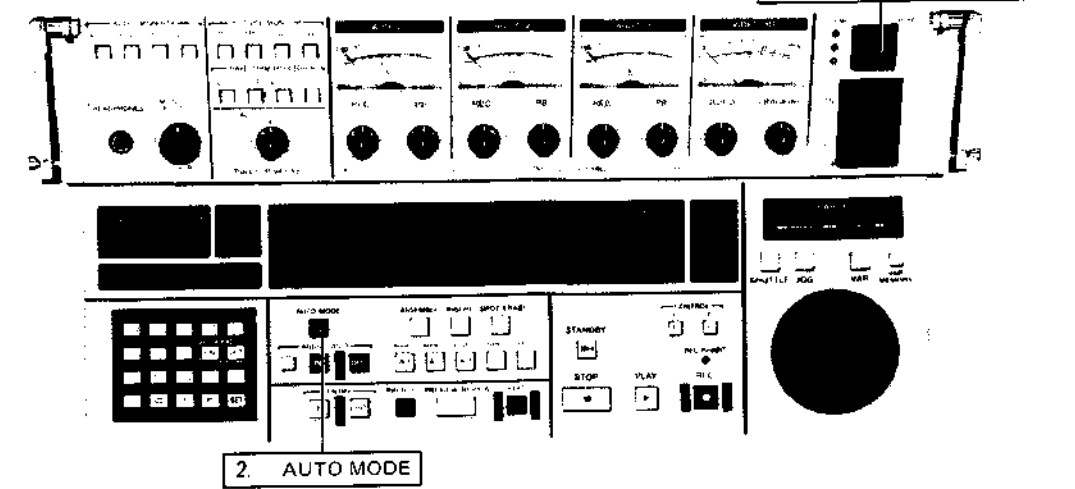


- Eine Änderung der Schnittpunkte nach der Vorschau kann auch genau wie auf der vorhergehenden Seite durchgeführt werden. Verwenden Sie zum schnellen Ändern die Tastatur (einschließlich AUDIO IN/OUT-Tasten) oder geben sie nach der Vorschau einen neuen Schnittpunkt ein.
- Nach dem Start des separaten Tonschnittbetriebs bleibt der AUDIO SPLIT-Indikator erleuchtet. Schalten Sie am Ende des separaten Tonschnittbetriebs die AUDIO SPLIT-Taste aus, so daß der Indikator erlischt.

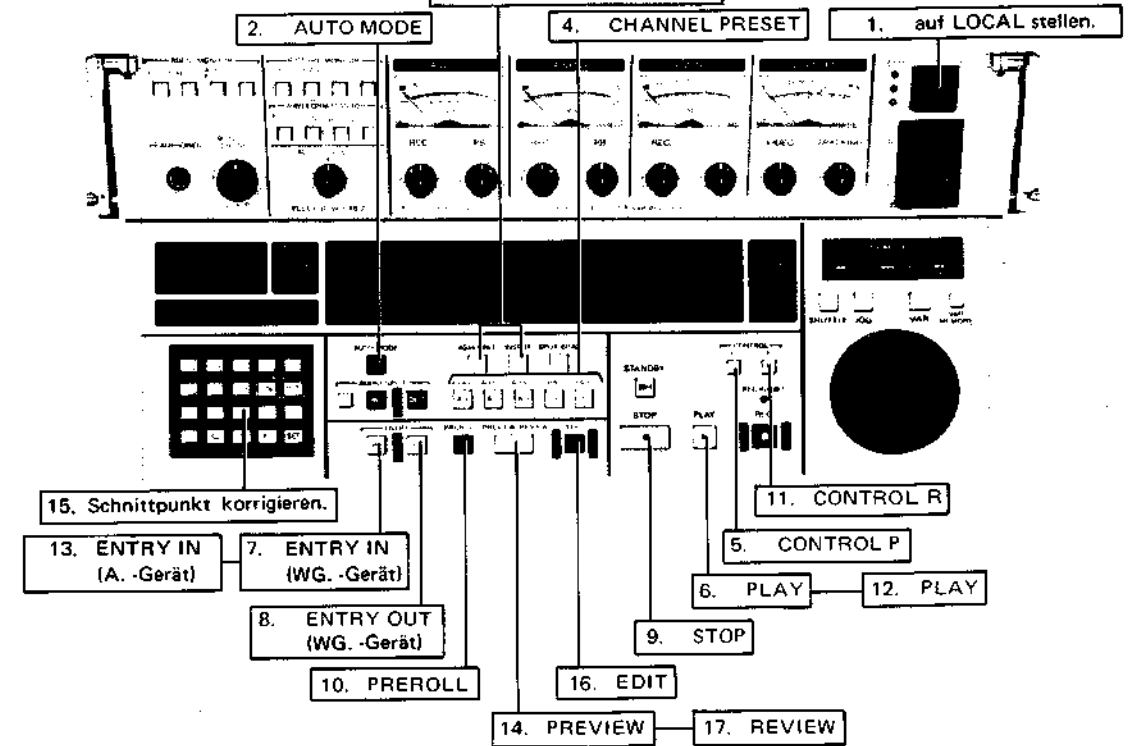
1-11-3. Schnittbetrieb mit zwei Videorecordern
(Wiedergabe- und Aufnahmegerät)



Wiedergabegerät (Typ-I/II/III)

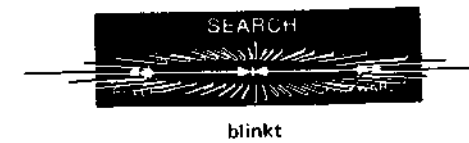


Aufnahmegerät (Typ-II/III)



Hinweis:

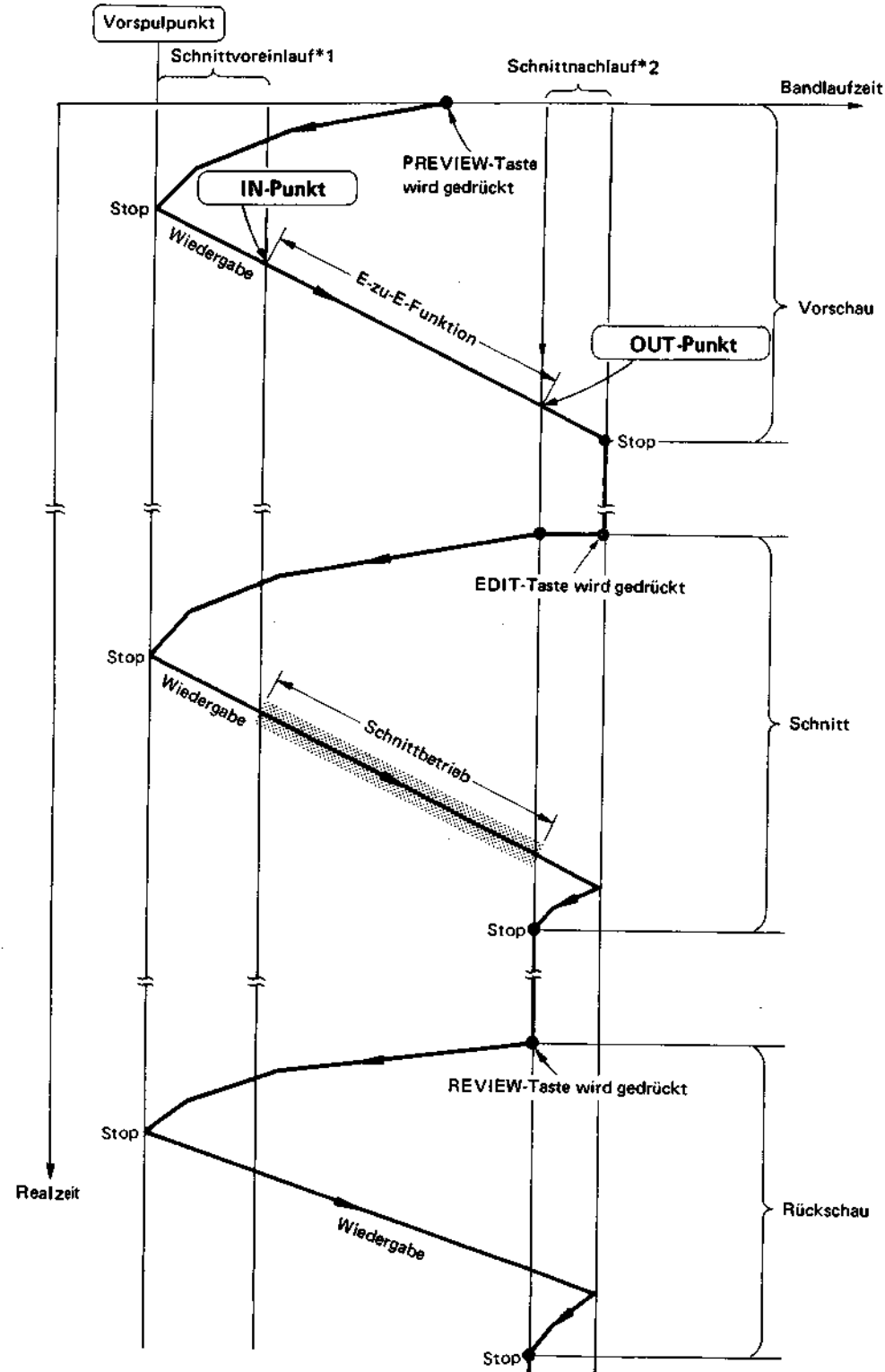
- REMOTE-1/2/3-Umschaltung
Verwenden Sie zum Schneiden mit zwei Videorecordern den REMOTE-2-Anschluß und stellen Sie die REMOTE-Schalter der SY-79-Leiterplatte am Aufnahme- und Wiedergabegerät auf REMOTE-2.
- SEARCH-Anzeige blinkt
Die SEARCH-Anzeige blinkt, wenn in der Stellung LOCAL eine Bedienungsfunktion nicht mit dem momentanen Bedienungspult ausgeführt werden kann. So blinkt z.B. die SEARCH-Anzeige des WG.-Geräts in folgendem Fall: Das WG.-Gerät besitzt ein Bedienungspult vom Typ-I und steht auf REMOTE. Vom A.-Gerät



aus wird das WG.-Gerät dann auf Einfüg-Betrieb geschaltet und anschließend das WG.-Gerät von REMOTE auf LOCAL umgeschaltet. Am WG.-Gerät kann dann der Einfüg-Betrieb nicht durch Aufleuchten des INSERT-Indikators angezeigt werden und die SEARCH-Anzeige blinkt. (Trotz Blinken der Anzeige ist jedoch der Betrieb normal.)

Die Abbildung unten zeigt die Zeit-Diagramme bei automatischem Schnittbetrieb für die Vorschau-, Schnitt- und Rückschau-Funktionen.

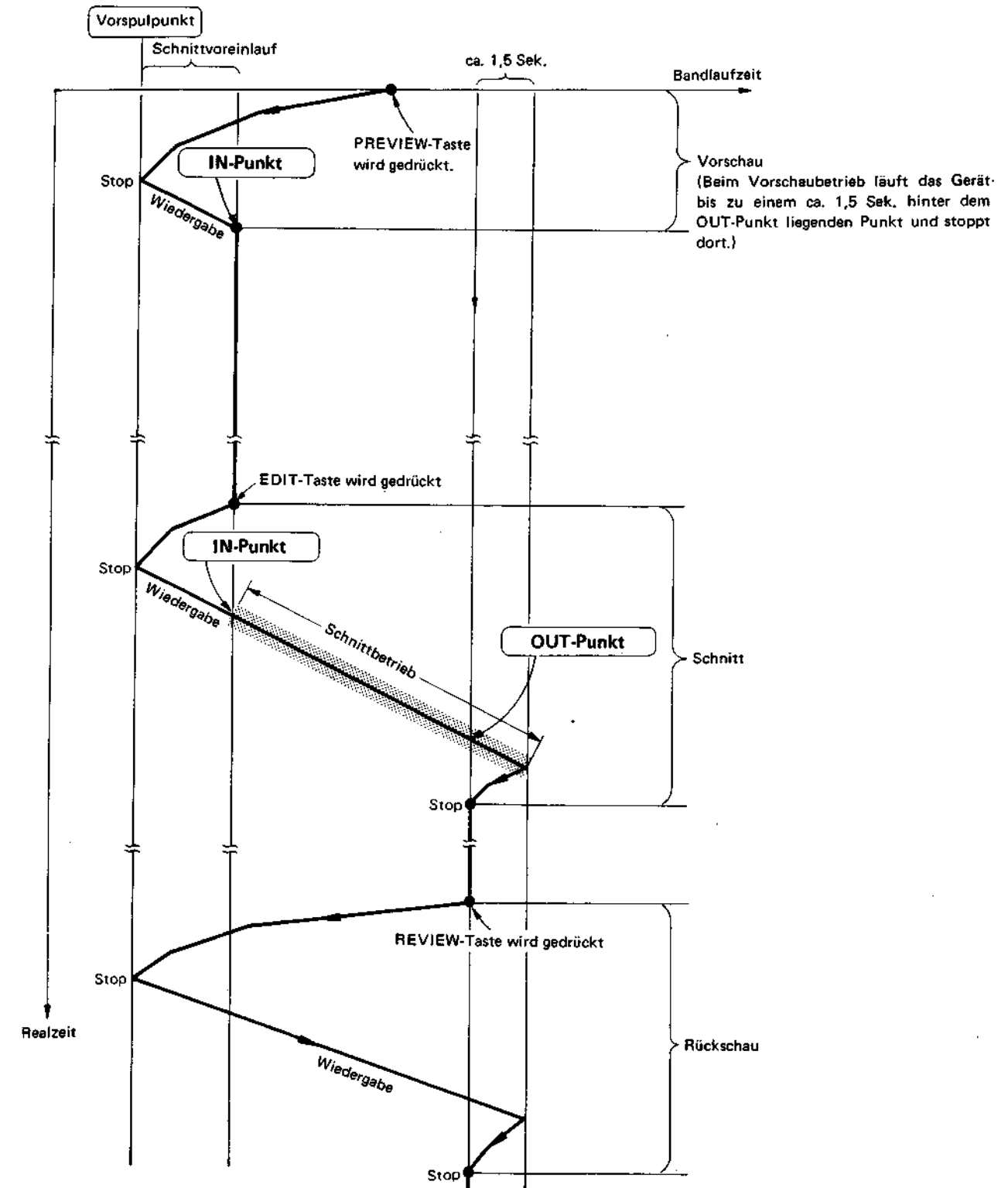
Einfügschnitt-Betrieb



*1. Die Schnittvorauslauf-Zeit kann am PREROLL TIME-Schalter der SY-79-Leiterplatte in einem Bereich von 0 bis 15 Sekunden eingestellt werden.

*2. Die Schnittnachlauf-Zeit hat den gleichen Wert wie die Schnittvorauslauf-Zeit.

Anfügschnitt-Betrieb



1-11-4. Schnitt-Überwachung

Im Vorschau- und Schnittbetrieb hängt das Monitor-Ausgangssignal wie in den Tabellen unten dargestellt von der Stellung des HEAD- und TAPE/EE-Wählers ab. An den mit „X“ gekennzeichneten Stellen ändert sich die Signalphase, und das Monitorbild ist folglich gestört. Die Störung ist jedoch nur auf dem Monitorbild zu sehen, der eigentliche Schnitt wird störungsfrei ausgeführt.

VIDEO-Monitor

HEAD-Wähler in R/P-Stellung

	TAPE/EE-Wähler	IN-Punkt	OUT-Punkt
Vorschau	TAPE	Band-WG. mit A./WG. -Kopf	EE
	TAPE/EE	Band-WG. mit A./WG. -Kopf	EE
Schnitt	TAPE	Band-WG. mit A./WG. -Kopf	BVH-2000PS(00)(10): EE BVH-2000PS(02)(12), BVH-2000PS(04)(14): Band WG. mit WG-Kopf (Mon.)
	TAPE/EE	Band-WG. mit A./WG. -Kopf	EE

HEAD-Wähler in PLAY-Stellung (bei BVH-2000PS(02)(12) und BVH-2000PS(04)(14)) (AUTO SKEW und AUTO PG werden auf OFF gestellt.)

	TAPE/EE-Wähler	IN-Punkt	OUT-Punkt
Vorschau	TAPE	Band-WG. mit A./WG. -Kopf	EE
	TAPE/EE	Band-WG. mit A./WG. -Kopf	EE
Schnitt	TAPE	Band-WG. mit WG. -Kopf	Band WG. mit WG. -Kopf
	TAPE/EE	Band-WG. mit WG. -Kopf	EE

AUDIO-Monitor

LINE OUTPUT-Anschluß

	TAPE/EE-Wähler	IN-Punkt	OUT-Punkt
Vorschau	TAPE	Band-WG. mit A./WG. -Kopf	EE
Schnitt	TAPE/EE	Band-WG. mit A./WG. -Kopf	Band-WG. mit A./WG. -Kopf

MONITOR OUTPUT-Anschluß

	TAPE/EE-Wähler	IN-Punkt	OUT-Punkt
Vorschau	TAPE	Band-WG. mit A./WG. -Kopf	EE
	TAPE/EE	Band-WG. mit A./WG. -Kopf	Band-WG. mit A./WG. -Kopf
Schnitt	TAPE	BVH-2000PS(00)(10): A./WG.-Kopf BVH-2000PS(02)(12), BVH-2000PS(04)(14): Mon. Band-WG.	BVH-2000PS(00)(10): EE BVH-2000PS(02)(12), BVH-2000PS(04)(14): Mon. Band-WG.
	TAPE/EE	Band-WG. mit A./WG. -Kopf	EE

1-11-5. Blinkende und leuchtende Indikatoren bei automatischem Schnittbetrieb

Steht der Schalter S8-8 der SY-80-Leiterplatte auf ON, so blinken beim automatischem Schnittbetrieb zur Anzeige der Bedienungsabfolge die in der Tabelle unten angegebenen Indikatoren. Drücken Sie jeweils eine der gewünschten Tasten.

X: ausgeschaltet ●: blinkt ○: eingeschaltet

Schritte	Indikatoren	ENTRY IN	ENTRY OUT	A-IN	A-OUT	PREVIEW /REVIEW	EDIT	Bemerkungen
1	AUTO MODE-Taste ausgeschaltet	X	X	X	X	X	X	
2	AUTO MODE-Taste eingeschaltet	●	●	X	X	X	X	
3	AUDIO SPLIT-Taste eingeschaltet	●	●	●	●	X	X	
4	nur ENTRY IN	○	●	X (●)*	X (●)	●	X	Bei eingeschalteter Kanalvorwahltaste.
							●	Bei ausgeschalteter Kanalvorwahltaste.
5	nur ENTRY OUT	●	○	X (●)	X (●)	X	X	
6	sowohl ENTRY IN als auch OUT	○	○	-	-	●	X ●	
7	PREROLL-Taste eingeschaltet	○	-	-	-	X	X	
8	PREVIEW-Taste eingeschaltet	○	-	-	-	○	X	Vorschaubetrieb
9	EDIT-Taste eingeschaltet	○	-	-	-	X	○	
10	EDIT-Betrieb-Ende	X	X	X	X	●	X	
11	REVIEW-Taste eingeschaltet	X	X	X	X	○	X	Rückschaubetrieb Am Ende des Rückschaubetriebs zu Schritt 2 zurückgehen.

*Separater Tonschnitt steht in ().

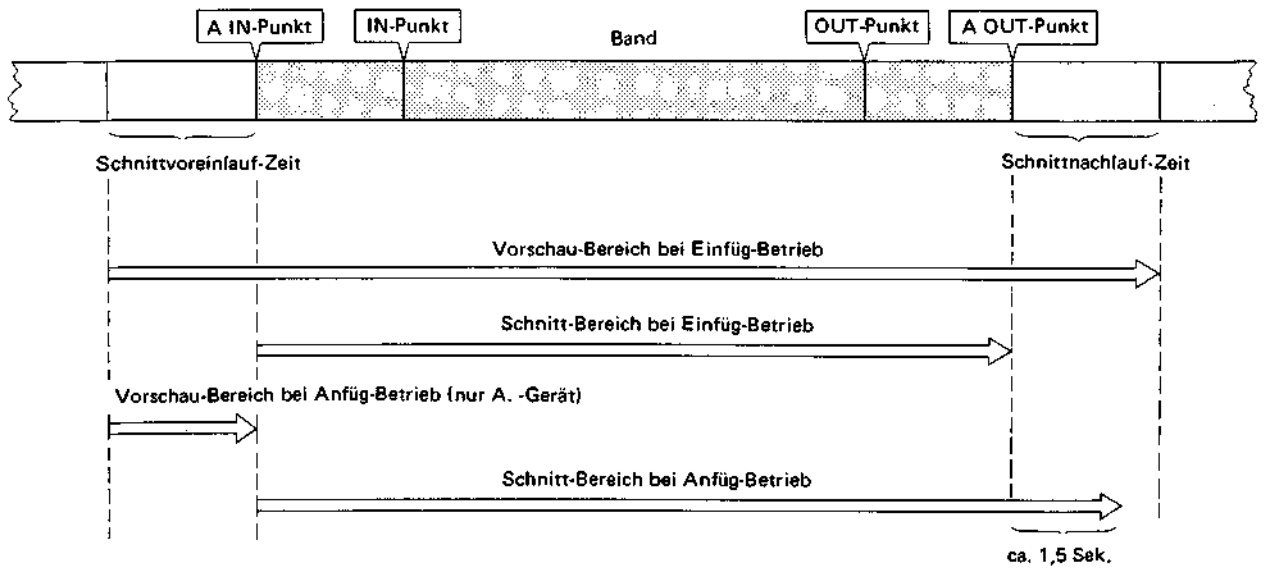
1-11.6. Bereiche bei separatem Tonschnitt

Bei separatem Tonschnittbetrieb werden als Video- und Audio-Schnittpunkte unterschiedliche Bandstellen eingegeben. Die Referenz-Schnittpunkte werden dann automatisch folgendermaßen festgelegt.

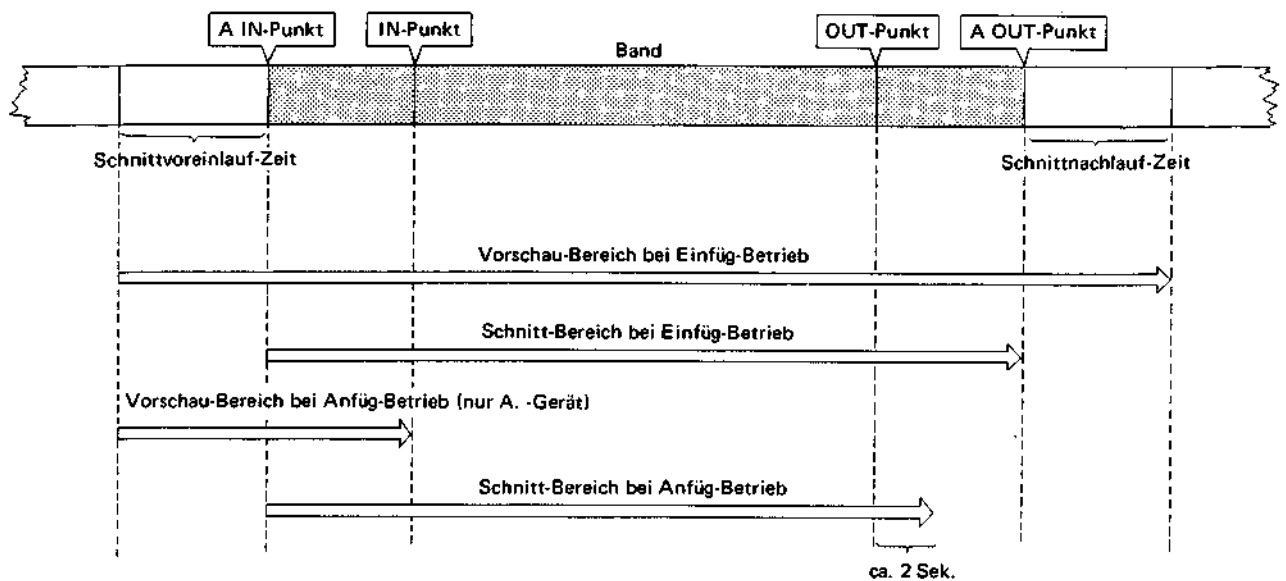
Der untere Wert ist der Referenzpunkt.
(In diesem Beispiel ist der A IN-Punkt der Referenzpunkt.)

Der höhere Wert ist der Referenzpunkt.
(In diesem Beispiel ist der A OUT-Punkt der Referenzpunkt.)

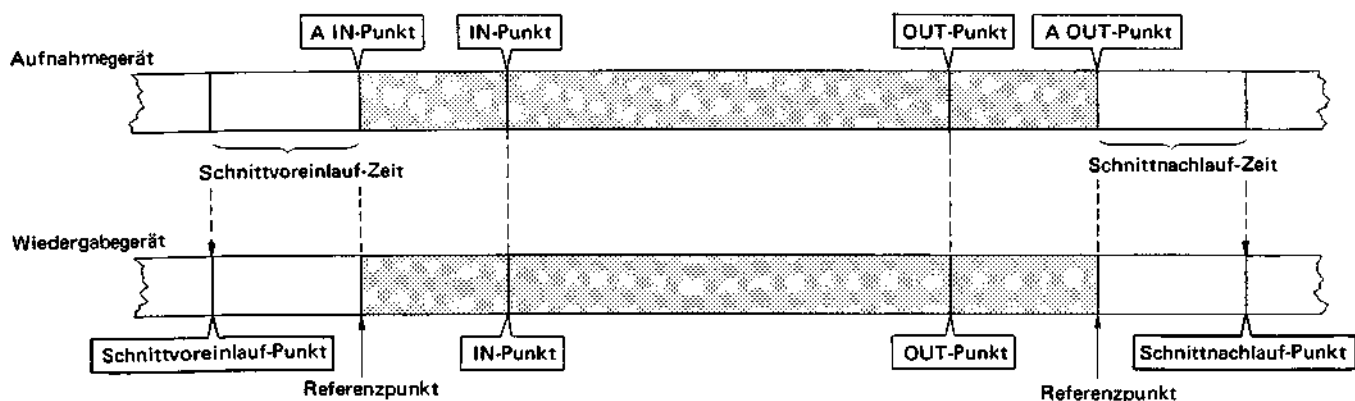
Bei Modellen mit den Seriennummern 10001 bis 10699



Bei Modellen mit der Seriennummer 10701 oder höher



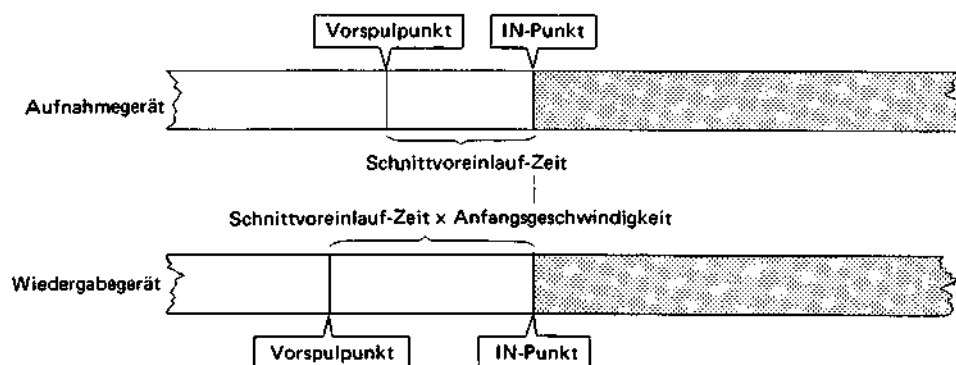
Bei separatem Tonschnitt (Einfüg-Betrieb) mit zwei Videorecordern werden die Schnittpunkte des Wiedergabegeräts normalerweise von dem IN- und OUT-Punkten des Video-Signals bestimmt. In diesem Fall werden die Referenzpunkte des Wiedergabegeräts folgendermaßen durch die Referenzpunkte des Aufnahmegeräts festgelegt.



1-11-7. Schnittbetrieb mit Variier-Memory (bei BVH-2000PS(02)(12) und BVH-2000PS(04)(14))

Wird ein Band mit der im Variier-Memory abgespeicherten Geschwindigkeits-Variier-Kurve wiedergegeben, so kann das Wiedergabebild mit dem Aufnahmegerät aufgenommen werden (Schnittbetrieb mit Variier-Memory).

Zur Bedienung des Wiedergabegeräts siehe Kapitel 1-9-6. Die Bedienung des Aufnahmegeräts ist genau wie bei normalem Schnittbetrieb. Es ergeben sich folgende Vorspulpunkte:



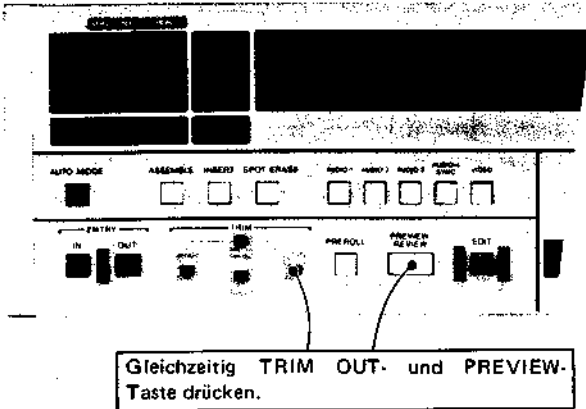
Da die im Variier-Memory abgespeicherte Anfangsgeschwindigkeit nicht unbedingt die Normalgeschwindigkeit sein muß, ist der Vorspulpunkt des Wiedergabegeräts unterschiedlich vom Vorspulpunkt des Aufnahmegeräts. Wiedergabe- und Aufnahmegerät passieren dadurch zur gleichen Zeit den IN-Punkt.

1-11-8. Vorschau des OUT-Punktes

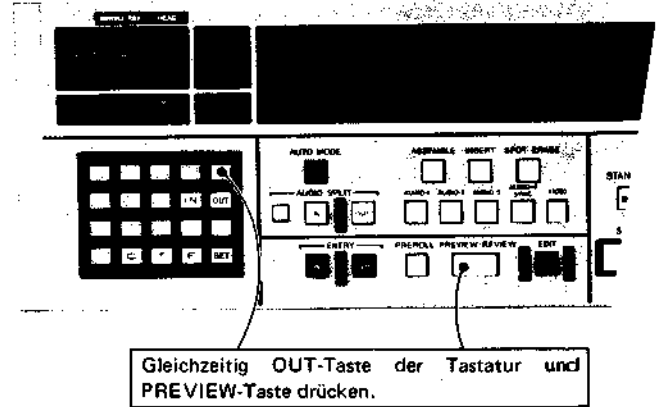
Schneiden mit einem Videorecorder:

Sind im Einfüg-Betrieb die IN- und OUT-Punkte eingegeben, so kann durch Drücken der in der Abbildung unten angegebenen Tasten eine Vorschau für den OUT-Punkt durchgeführt werden.

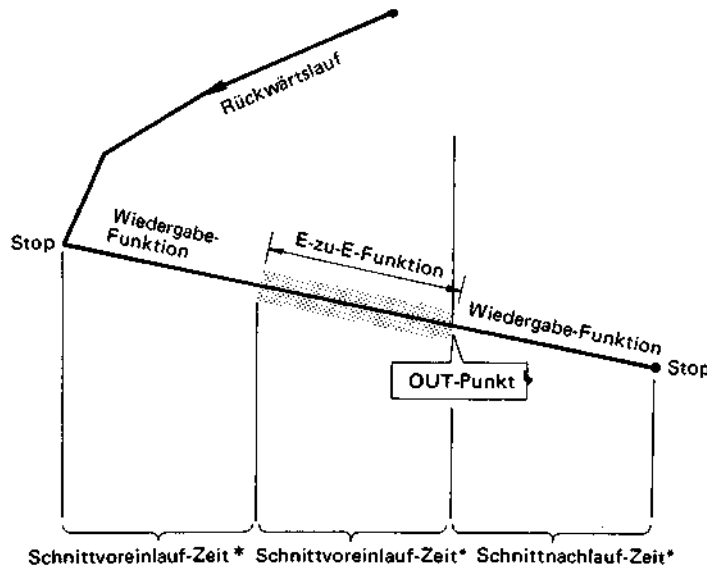
Typ-II



Typ-III



Das Bild unten zeigt den Bandlauf zur Vorschau des OUT-Punktes.



Schneiden mit zwei Videorecordern

Sind im Einfüg-Betrieb sowohl für das Aufnahme- als auch das Wiedergabegerät IN-Punkte eingegeben und außerdem entweder für das Aufnahme- oder das Wiedergabegerät OUT-Punkte eingegeben, so kann durch Drücken der oben angegebenen Tasten des Aufnahmeegeräts eine Vorschau für den OUT-Punkt durchgeführt werden, wobei das Aufnahme- und Wiedergabegeräteband genau wie im obigen Diagramm dargestellt läuft.

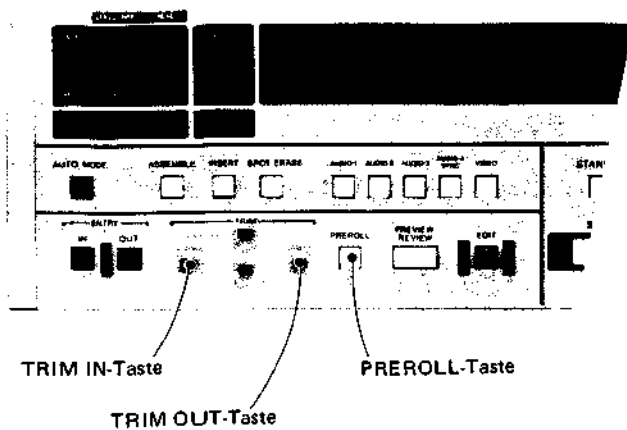
- Auch eine Vorschau des IN-Punktes ist möglich, indem zuerst die PREVIEW-Taste gedrückt wird und die Vorschau dann nach Passieren des IN-Punktes durch Drücken der STOP-Taste abgebrochen wird.

* Schnittvorauslauf- und Schnittnachlauf-Zeit können am PREROLL TIME-Schalter der SY-79-Leiterplatte in einem Bereich von 0 bis 15 Sek. eingestellt werden.

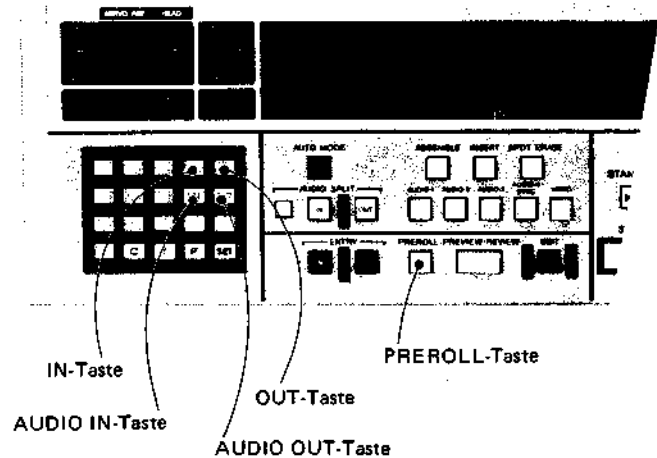
1-12. SCHNITTVOREINLAUF

Zum Schnittvoreinlauf sind folgende Tasten zu drücken.

Typ-II



Typ-III



Bei ausgeschalteter AUTO MODE-Taste

Die IN/OUT-Punkte können eingegeben werden (Tasten leuchten nicht). Nach Eingabe der IN/OUT-Punkte ist durch Drücken der PREROLL-Taste ein Schnittvoreinlauf zu folgenden Punkten möglich.

- PREROLL-Taste drücken.
→ Schnittvoreinlauf zu [IN-Punkt – Schnittvoreinlauf-Zeit].
- PREROLL- und TRIM IN-Tasten drücken.
→ Schnittvoreinlauf zum IN-Punkt.
- PREROLL- und TRIM OUT-Tasten drücken.
→ Schnittvoreinlauf zum OUT-Punkt.

Bei eingeschalteter AUTO MODE-Taste.

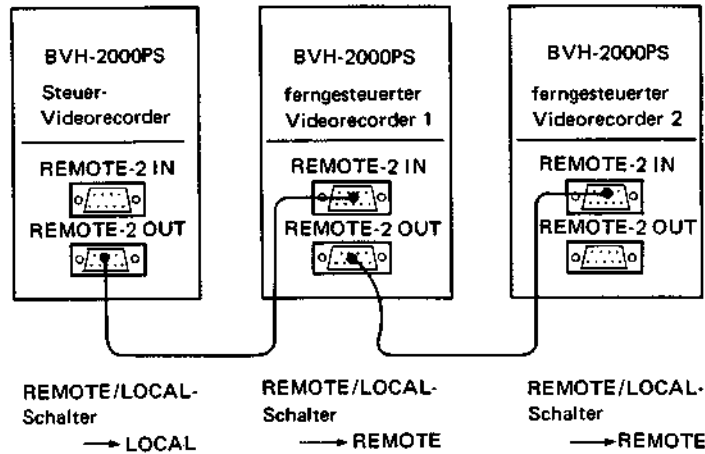
- PREROLL-Taste drücken.
→ Schnittvoreinlauf zu [IN-Punkt – Schnittvoreinlauf-Zeit].
- PREROLL- und TRIM IN-Tasten drücken.
→ Schnittvoreinlauf zum IN-Punkt.
- PREROLL- und TRIM OUT-Tasten drücken.
→ Schnittvoreinlauf zum OUT-Punkt.
- PREROLL- und AUDIO IN-Tasten drücken.
→ Schnittvoreinlauf zum AUDIO IN-Punkt*.
- PREROLL- und AUDIO OUT-Tasten drücken.
→ Schnittvoreinlauf zum AUDIO OUT-Punkt*.

* Bei eingeschalteter AUDIO SPLIT-Taste (Typ-III).

1-13. PARALLEL-BETRIEB

Durch unten gezeigten Anschluß können zwei (oder mehr) BVH-2000PS gleichzeitig in der gleichen Funktion betrieben werden. Die an einem Steuer-Videorecorder durchgeführten Bedienungsvorgänge werden von allen Videorecordern simultan ausgeführt.

Hinweis: Alle PARA RUN-Schalter der SY-79-Leiterplatte sind einzuschalten.



1-14. WARN-EINRICHTUNGEN

1-14-1. Warn-Funktionen

Bei abnormalem Betrieb eines der Videorecorder leuchtet oder blinkt zur Warnung der entsprechende Indikator, und ein Summton ertönt wie in der folgenden Tabelle dargestellt.

○ : leuchtet ● : blinkt - : leuchtet nicht

	STOP-Indikator	STANDBY-Indikator	SERVO-Indikator	SYSTEM-Indikator	Summer	Videorecorder
Funktionsstörung des Videorecorders	-	-	○	○	ertönt	stoppt
Kopftrommel nicht synchronisiert*	-	-	○	-	-	läuft weiter
Capstan nicht synchronisiert	-	-	○	-	-	läuft weiter
Störung der beweglichen Bandführung	-	-	-	○	ertönt	stoppt
Kein Band	-	-	-	-	-	stoppt
Netzteil-Überhitzung	-	-	-	○	ertönt	läuft weiter
Band hakt	-	●	-	○	ertönt	stoppt
Kein Servo-Referenzsignal	●	-	-	-	-	läuft weiter
Key short**	-	-	-	○	ertönt	läuft weiter

Bei Typ-II und -III werden noch etliche Störungsmeldungen zusätzlich im Display angezeigt (siehe ⑧ in Kapitel 1-4-4 und 1-4-5).

Die Lautstärke des Summtons kann an folgenden Reglern eingestellt werden.

Leiterplatten BKH-2011 und BKH-2012: RV1 und RV2

Leiterplatte BKH-2013: RV3 und RV4

* Ist die Kopftrommel für mehr als 15 Sekunden nicht synchronisiert, blinkt der STANDBY-Indikator, der SYSTEM-Indikator leuchtet und es ertönt ein Warnton genau wie beim Haken des Bandes.

** Nur bei Geräte mit einem System-ROM der Version Nr. 3-5 und höher. Der Zustand „Key short“ zeigt an, daß eine Taste länger als 30 Sekunden lang gedrückt gehalten wurde, während die Bedienelemente (STOP, PLAY, REC, VAR, JOG, SHUTTLE und STANDBY) funktionsfähig sind, also in folgenden Fällen:

- (1) Direkt-Modus (REMOTE/LOCAL-Wähler steht auf LOCAL).
- (2) Fernbedienungs-Modus (REMOTE/LOCAL-Wähler steht auf REMOTE und entweder der Schalter S9-4 oder S9-5 der Leiterplatte SY-79 steht auf 0 N).

1-14-2. LOST LCK-Anzeige

(Nur bei Geräten mit einem System-ROM der Version Nr. 3-5 und höher)

Wenn LOST LCK-Fehler während des Aufnahme- oder Schnittbetriebs auftreten, blinkt die Fehlermeldung „LOST LCK“ im Block 6 (bei BKH-2013) bzw. im Block 3 (beim BKH-2012) des Display und der Videorecorder speichert die Adresse der Fehlerposition. (Die ersten 10 Positionen werden gespeichert.)

Später können die gespeicherten Adressen dann überprüft werden.

Hinweis

Nach Auftreten des 9ten LOST LCK-Fehlers können keine weiteren Positionen gespeichert werden, da der beim Umschalten des Videorecorders in die Stopp-Funktion auftretende Fehler als 10ter Fehler gespeichert wird.

Überprüfen der Adressen der LOST LCK-Fehler in der Stopp-Funktion

- 1 Schalten Sie den Videorecorder in die Stopp-Funktion, indem Sie die STOP-Taste des Videorecorders drücken.
- 2 Halten Sie die STOP-Taste gedrückt, und drehen Sie den Suchlaufknopf.

Durch Drehen des Knopfes nach rechts werden die LOST LCK-Fehlerpositionen angezeigt. Die vorangestellten Zahlen \$0 bis \$9 geben dabei die Reihenfolge an, in der die Fehler aufgetreten sind.

Durch Drehen des Knopfes nach links erfolgt das Auslesen der Fehler in umgekehrter Reihenfolge. Die Fehler-Nummern und -Adressen erscheinen wie unten gezeigt in Block 4 (bei BKH-2013) oder Block 2 (bei BKH-2012):

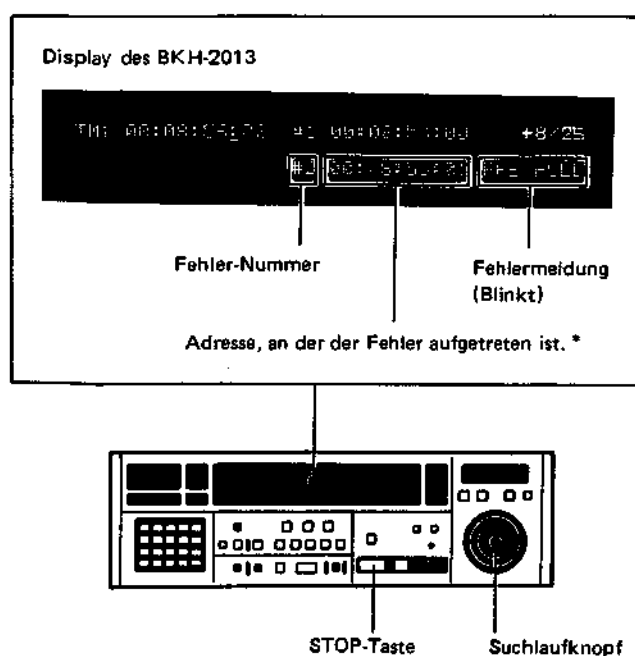
Überprüfen der Adresse in der Aufnahme- oder Schnitt-Funktion

- 1 Halten Sie die STANDBY-Taste in der Aufnahme- oder Schnitt-Funktion gedrückt.
- 2 Drehen Sie den Suchlaufknopf.
Die Adressen der LOST LCK-Fehler werden dann in der gleichen Weise angezeigt wie in der Stopp-Funktion.

Löschen der gespeicherten Adressen

Durch folgende Bedienungsvorgänge werden die gespeicherten Adressen gelöscht:

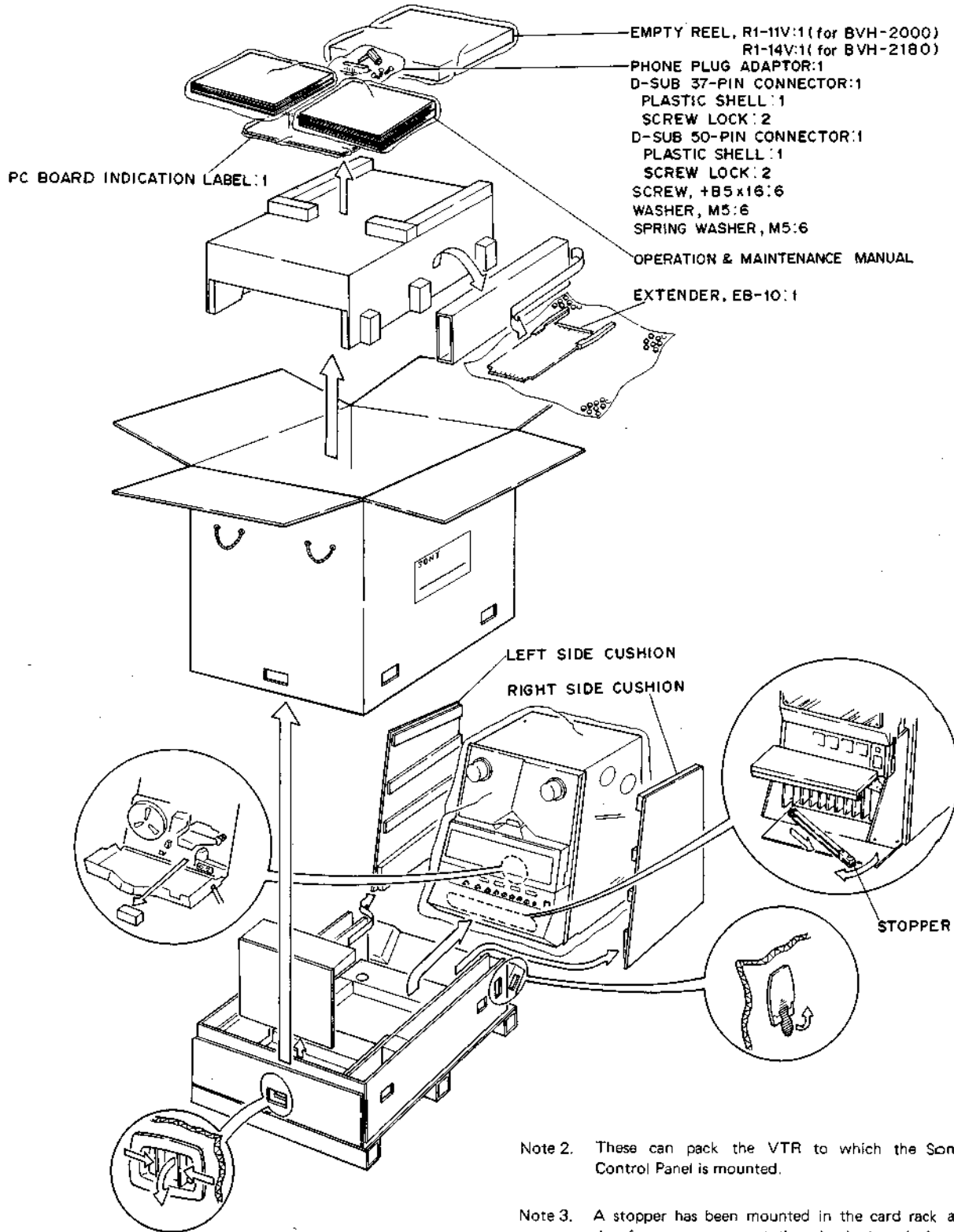
- (1) Starten der Aufnahme oder Wiedergabe. Die Adressen der beim letzten Aufnahmen oder Schneiden aufgetretenen LOST LCK-Fehler werden in diesem Fall gelöscht.
- (2) Drücken der RESET-Taste, während die STANDBY-Taste bei Aufnahme- oder Schnittbetrieb gedrückt ist. Die bis zu diesem Zeitpunkt gespeicherten Adressen werden in diesem Fall gelöscht.



* Die Adressen werden je nach Einstellung des TIME CODE/TIMER-Wählers als Zeitcode-, TIMER-1- oder TIMER-2-Daten angezeigt.

SECTION 2 INSTALLATION

2-1. UNPACKING AND REPACKING



Note 1. When packing the VTR to which the Sony Side Panel Kit is mounted, remove the left and right side cushion.

Note 2. These can pack the VTR to which the Sony Control Panel is mounted.

Note 3. A stopper has been mounted in the card rack at the factory to prevent the plug-in boards from coming off in transit. Usually, the stopper is not necessary, however, it should be mounted again when transporting to a distance place.

2-2. ACCESSORIES SUPPLIED

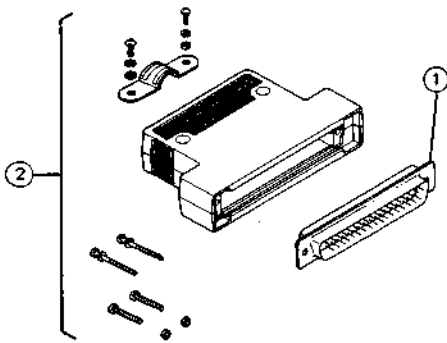
11.75" Empty Reel Sony R1-11V: 1 (for BVH-2000/2700)

14" Empty Reel Sony R1-14V: 1 (for BVH-2180)

D-sub 37-pin Connector (Male)

A plug for [MONITOR SELECT] connector and consists of the following parts. Used for controlling each [AUDIO MONITOR], [PICTURE MONITOR], and [WAVEFORM MONITOR] selector remotely.

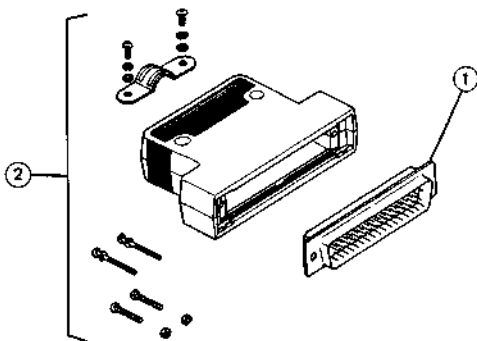
- ① D-sub 37-pin Connector (Male): 1
- ② Plastic Shell: 1



D-sub 50-pin Connector (Male)

A plug for [REMOTE-3] connector and consists of the following parts. Used for connecting a parallel type remote controller to the VTR.

- ① D-sub 50-pin Connector (Male): 1
- ② Plastic Shell: 1



Phone Plug Adapter: 1

If headphones are connected through this adapter, the plug will project less.



Screws B5x16: 6

Washers M5: 6

Spring Washers M5: 6

Used when VTR is mounted in the Sony Console Unit.

PC Board Indication Label: 1

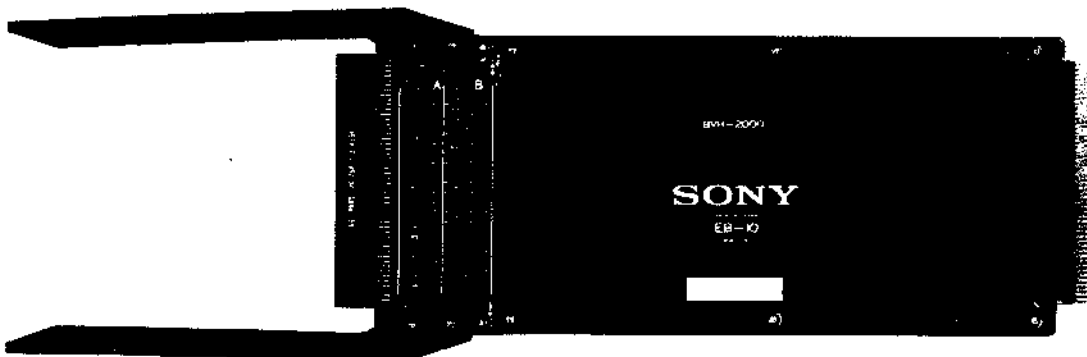
Switches and Controls at the front of each plug-in boards are indicated. Usually, this label is stuck inside the bottom lid. When mounting the VTR in a rack or console unit, stick it to the appropriate place according as necessity.

Operation & Maintenance Manual

Operation & maintenance manuals are supplied.

Extender EB-10: 1

Used for checking and repairing the plug-in circuit board in the card rack.



2-3. MATCHING CONNECTORS AND CABLES

BVH-2000 Connectors

Used for	Type	Type	Sony Part No.
REMOTE connector panel			
REMOTE-1	D-sub, 15-pin, Female	CVK-1 Cable Assy	1-560-409-00 (Note 1)
AUX	D-sub, 15-pin, Male	RM Flat Cable Assy	1-933-305-00 (Note 2)
REMOTE-2 IN, OUT	D-sub, 9-pin, Female	D-sub, 9-pin, Male	1-508-158-XX
		RCC-5G Cable Assy	Optional Accessory (Note 3)
		RCC-10G Cable Assy	Optional Accessory (Note 3)
		RCC-30G Cable Assy	Optional Accessory (Note 3)
REMOTE-3	D-sub, 50-pin, Female	D-sub, 50-pin, Male	1-560-772-00 (Note 4)
MONITOR SELECT	D-sub, 37-pin, Female	D-sub, 37-pin, Male	1-560-771-00 (Note 5)
		MS Flat Cable Assy	1-933-306-00 (Note 6)
VIDEO Connector Panel			
TO TBC	Round, 18-pin, Female	CCY Cable Assy	1-551-807-00 (Note 7)
Others	BNC	BNC	
AUDIO Connector Panel			
AUDIO-1, 2, 3, 4 INPUT	XLR, 3-pin, Female	XLR, 3-pin, Male	1-508-084-00 (Note 8)
AUDIO-1, 2, 3, 4 OUTPUT	XLR, 3-pin, Male	XLR, 3-pin, Female	1-508-083-00 (Note 9)
MIC INPUT	6φ Phone Jack	6φ Phone Plug	
Level Control Panel			
HEADPHONES	6φ Phone Jack	6φ Phone Plug	

(Note 1) CVK-1 Cable Assy 1-556-409-00
One cable (40 cm in length) is supplied to BKH-2016 Sony CCJ Converter.

(Note 2) RM Flat Cable Assy 1-933-305-00
One cable (2 m in length) is supplied to BK-2006, 2007 or 2008 Sony TBC Remote Control Unit and SUA-911 Sony Monitor Console.

(Note 3) RCC-5G/10G/30G Cable Assy
Used for connecting the two BVH-2000PS or connecting the BVU-800/820P/S to the BVH-2000PS.
The length of the cables are 5 m, 10 m and 30 m.
The BVU-800/820P/S has the RCC-5G as an accessory.

(Note 4) D-sub 50-pin Male Connector 1-560-772-00
(Note 5) D-sub 37-pin Male Connector 1-560-771-00
Each one connector is supplied to BVH-2000PS.

(Note 6) MS Flat Cable Assy 1-933-306-00
SUA-901/SUA-911 Sony Monitor Console is equipped with one cable, 1.7 or 1.85 m in length.

(Note 7) CCY Cable Assy 1-551-807-00
One cable (3 m in length) is supplied to BVT-2000P/S Sony Time Base Corrector.

(Note 8) XLR 3-pin Male Connector 1-508-084-00
Equivalent to CANNON XLR-3-12C.

(Note 9) XLR 3-pin Female Connector 1-508-083-00
Equivalent to CANNON XLR-3-11C.

2-4. POWER REQUIREMENTS

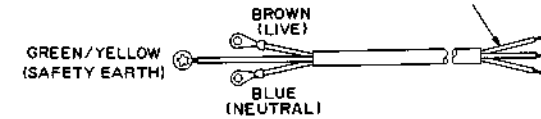
Power Line Voltage	AC 90 to 132V or 180 to 265V selectable
Power Line Frequency	50/60 Hz
Power Consumption	550W max.

Note 1. Includes the following.

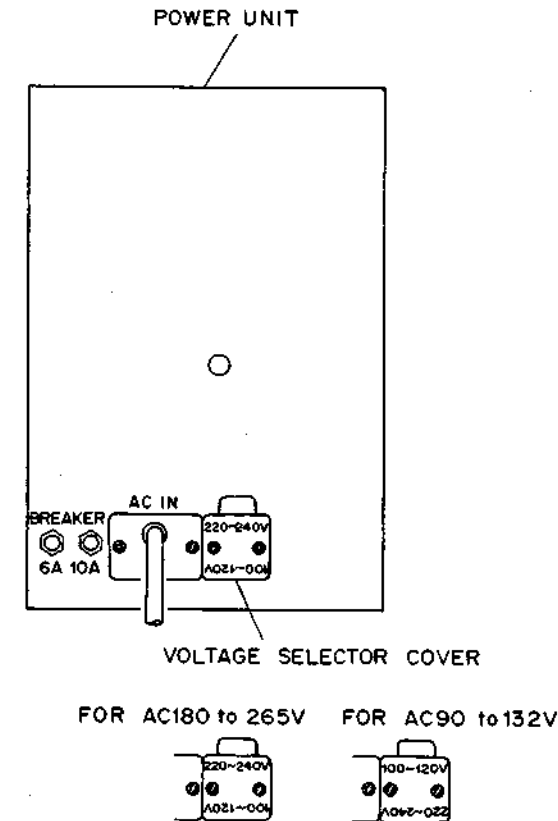
BKH-2011, 2012 or 2013
BKH-2015A
BKH-2016
BKH-2200 or 2300 or 2350
BK-2006, 2007 or 2008

Note 2. When the power switch turn to ON, approx. 10A input current for AC 90-132V or 6A for 180-265V will flow and the surge currents will be three or four times as much.

Power Cord Approx. 2.4 m in length
An AC plug should be locally prepared and mounted.



Power Line Voltage Selector.



2-5. INSTALLATION CONDITIONS

Operating Temperature	+5°C to +40°C
Storage Temperature	-20°C to +60°C
Humidity	10% to 90% (noncondensing)

Mount on a flat, stable base.

The BVH-2000PS total weight is approx. 77 kg, including the Function Control Panel, Side Panel Kit, Plug-in TBC and BKH-2015A.

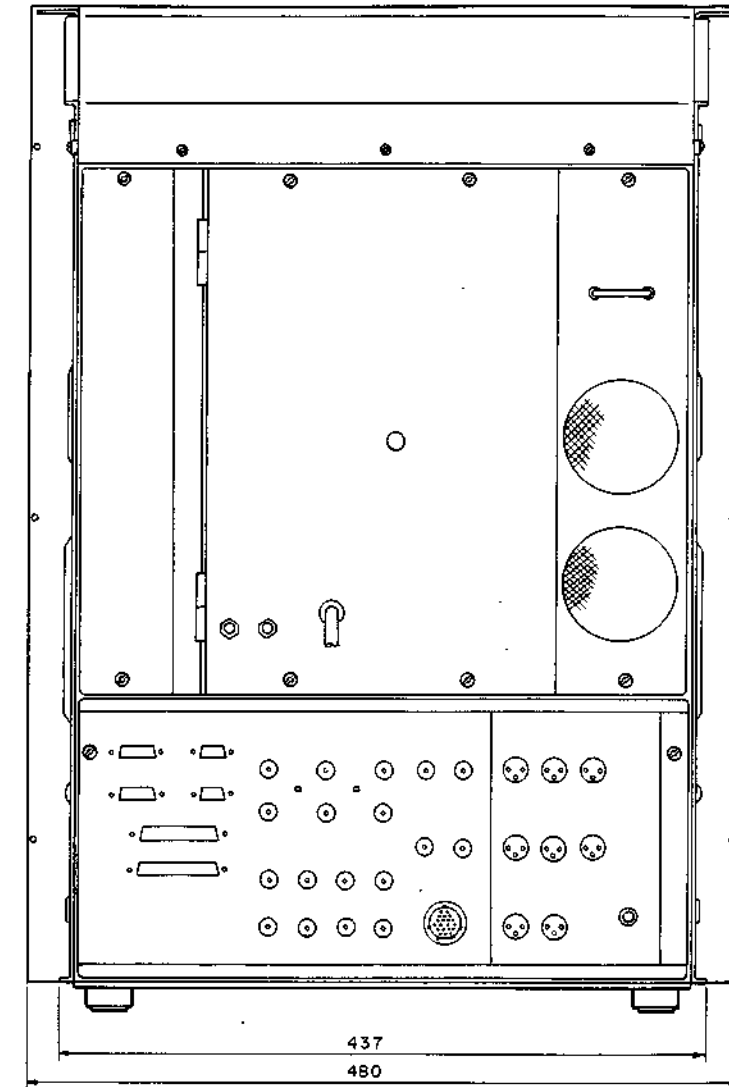
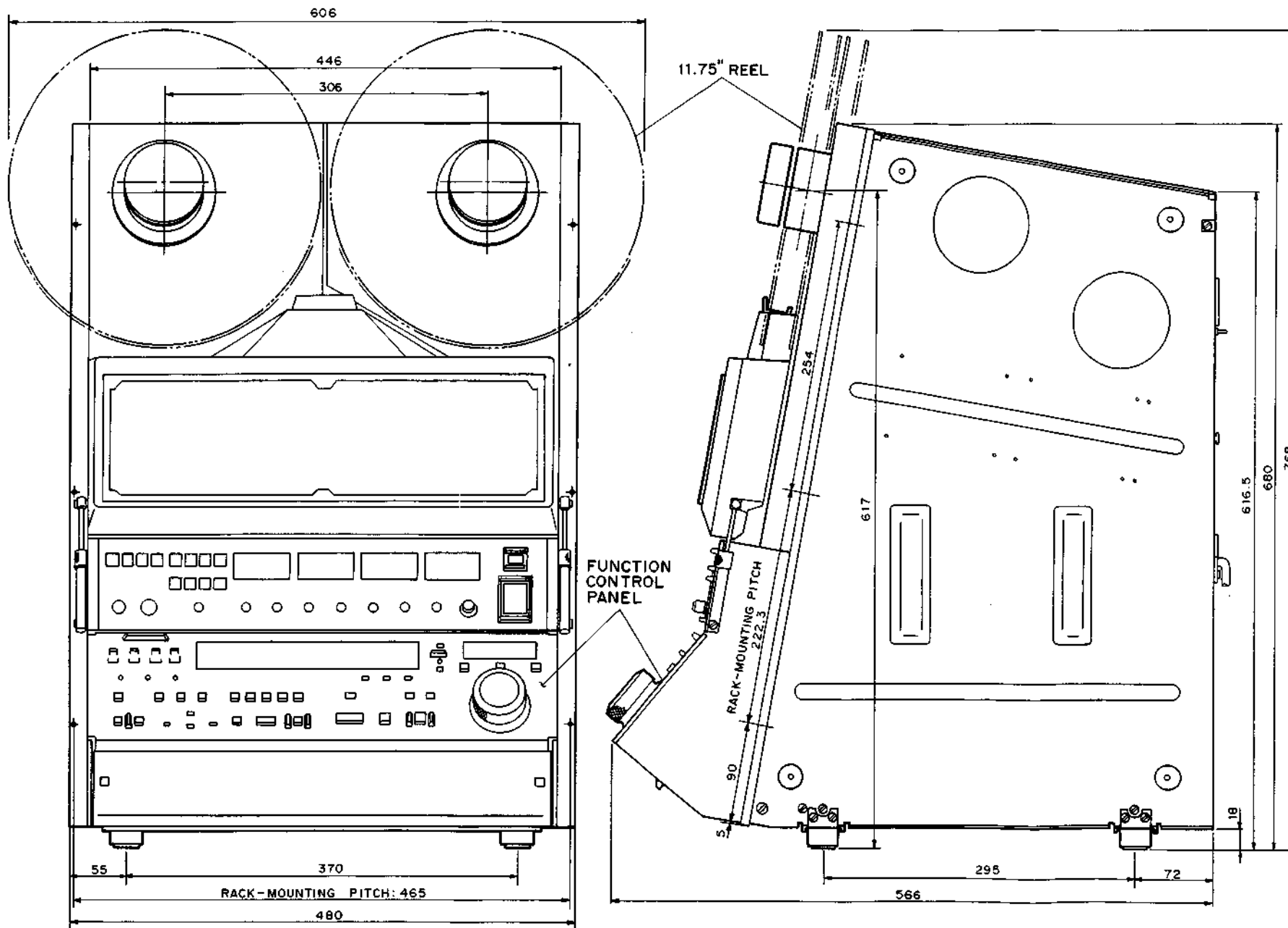
The total weight of the SU-900/910 Console Unit and SUA-901/911 Monitor Console Unit, is approx. 300 kg including the BVH-2000PS, the BVT-2000P/S and monitors etc.

Do not install in the following types of location.

- Places exposed directly to sun light or powerful light
- Dusty places
- Places subjected to vibration
- Places exposed to strong electric or magnetic fields

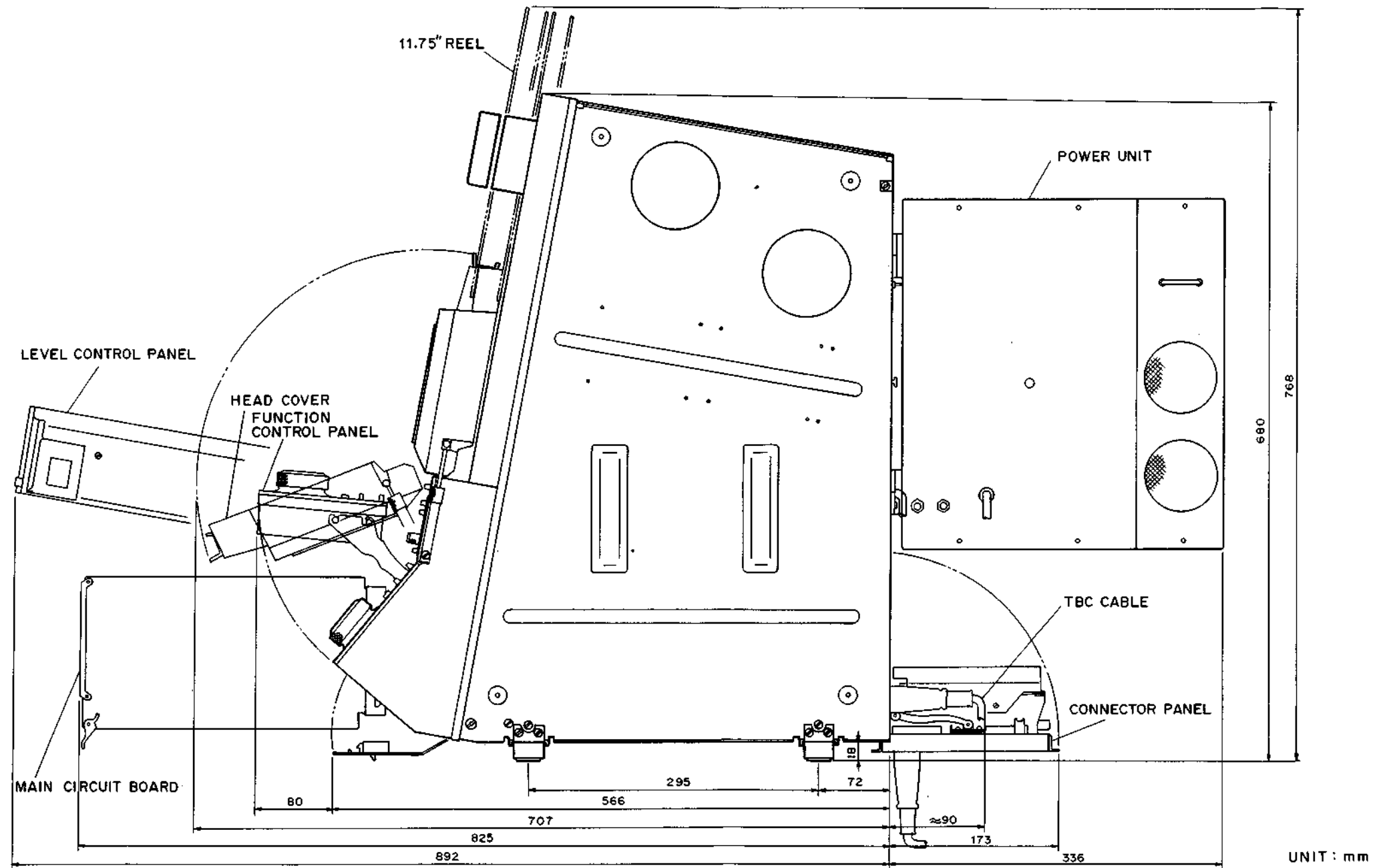
2-6. INSTALLATION SPACE

External Dimensions

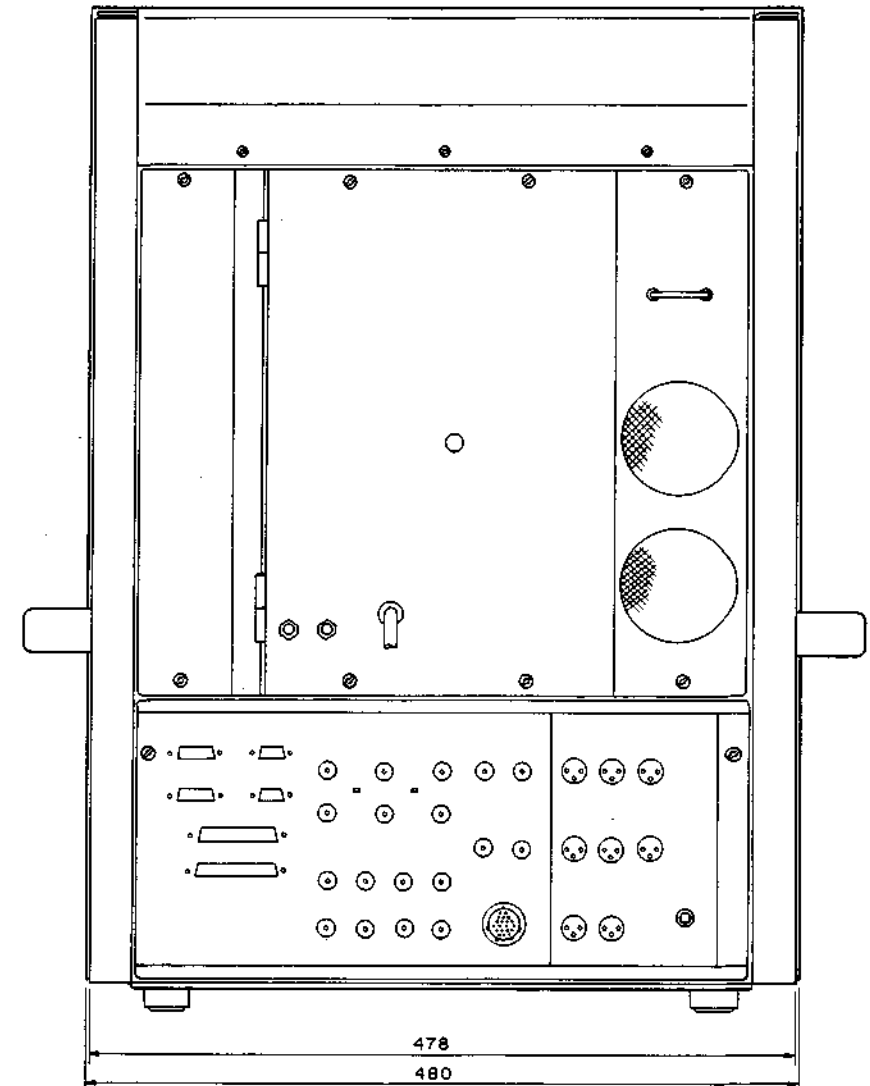
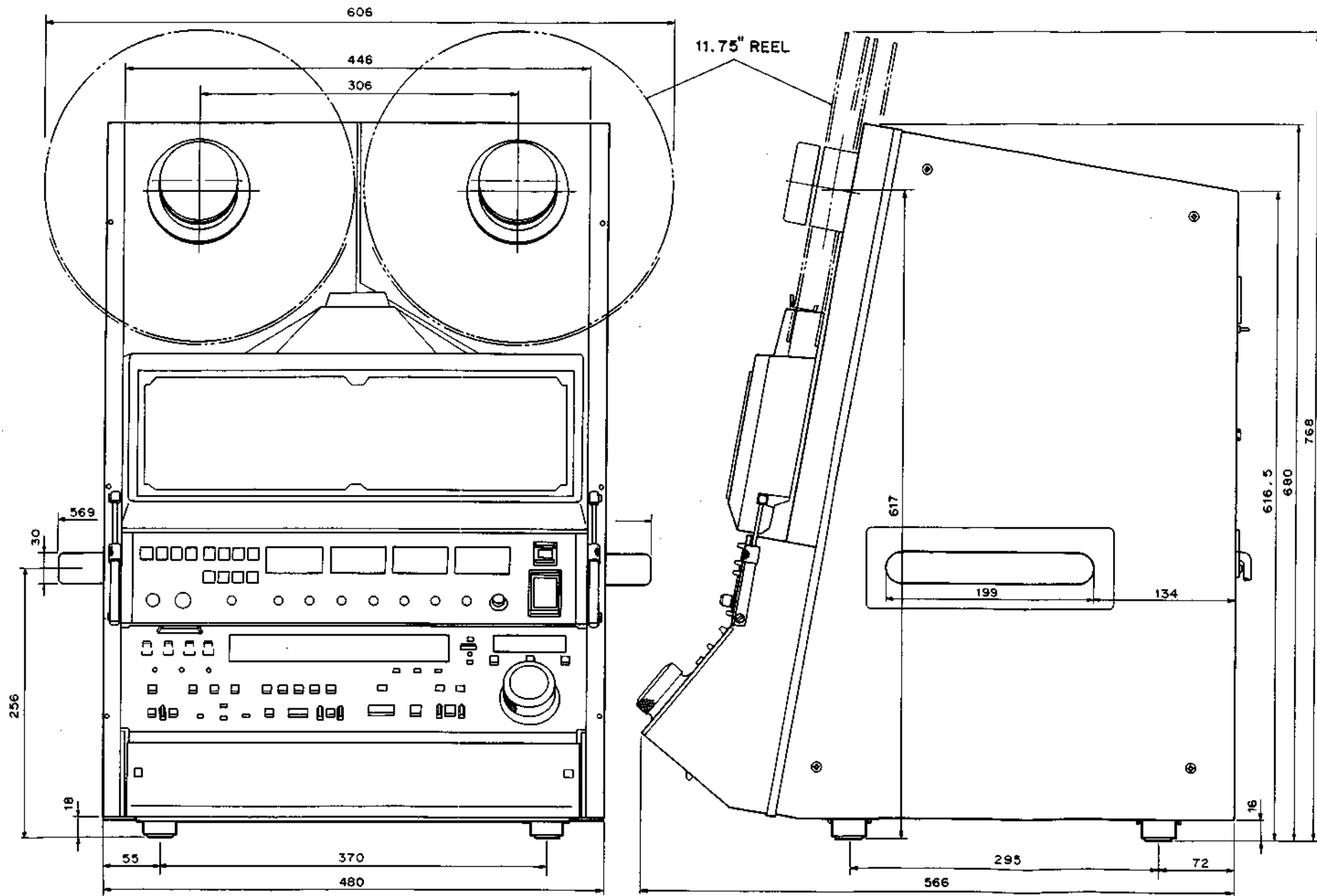


UNIT : mm

Working Space

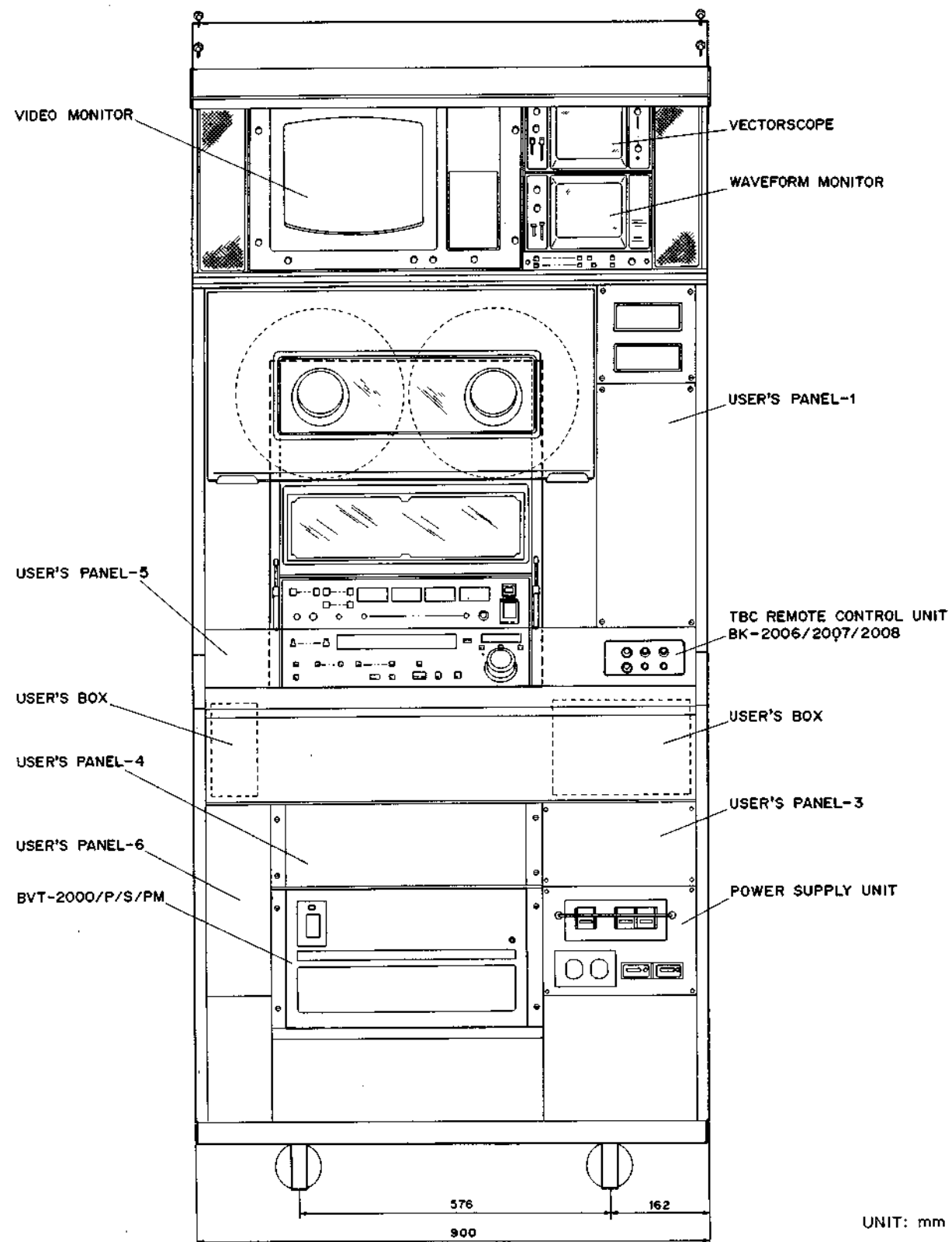


External Dimensions: When mounting BKH-2014

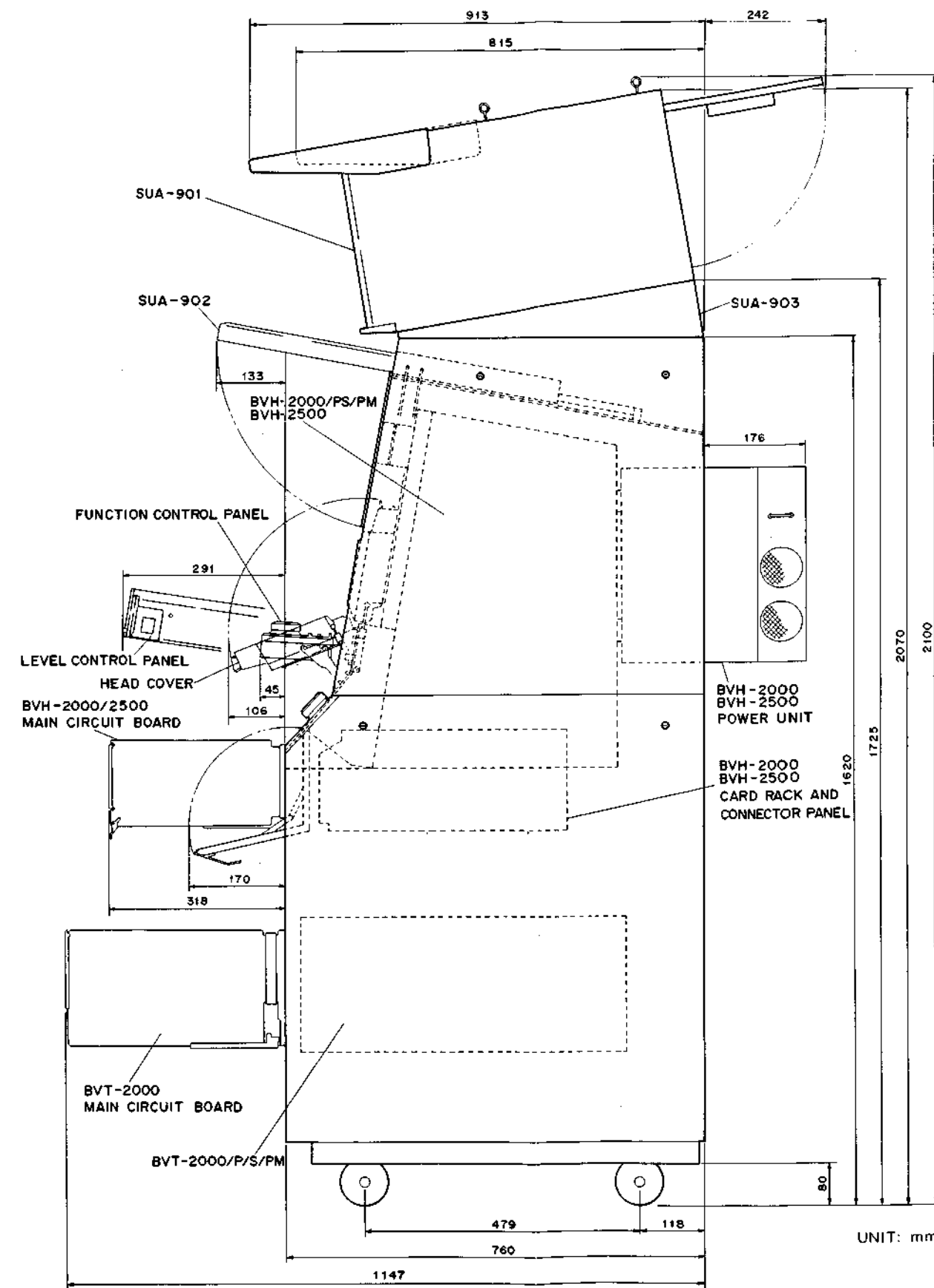


UNIT: mm

External Dimensions/Working Space: When mounting to SU-900

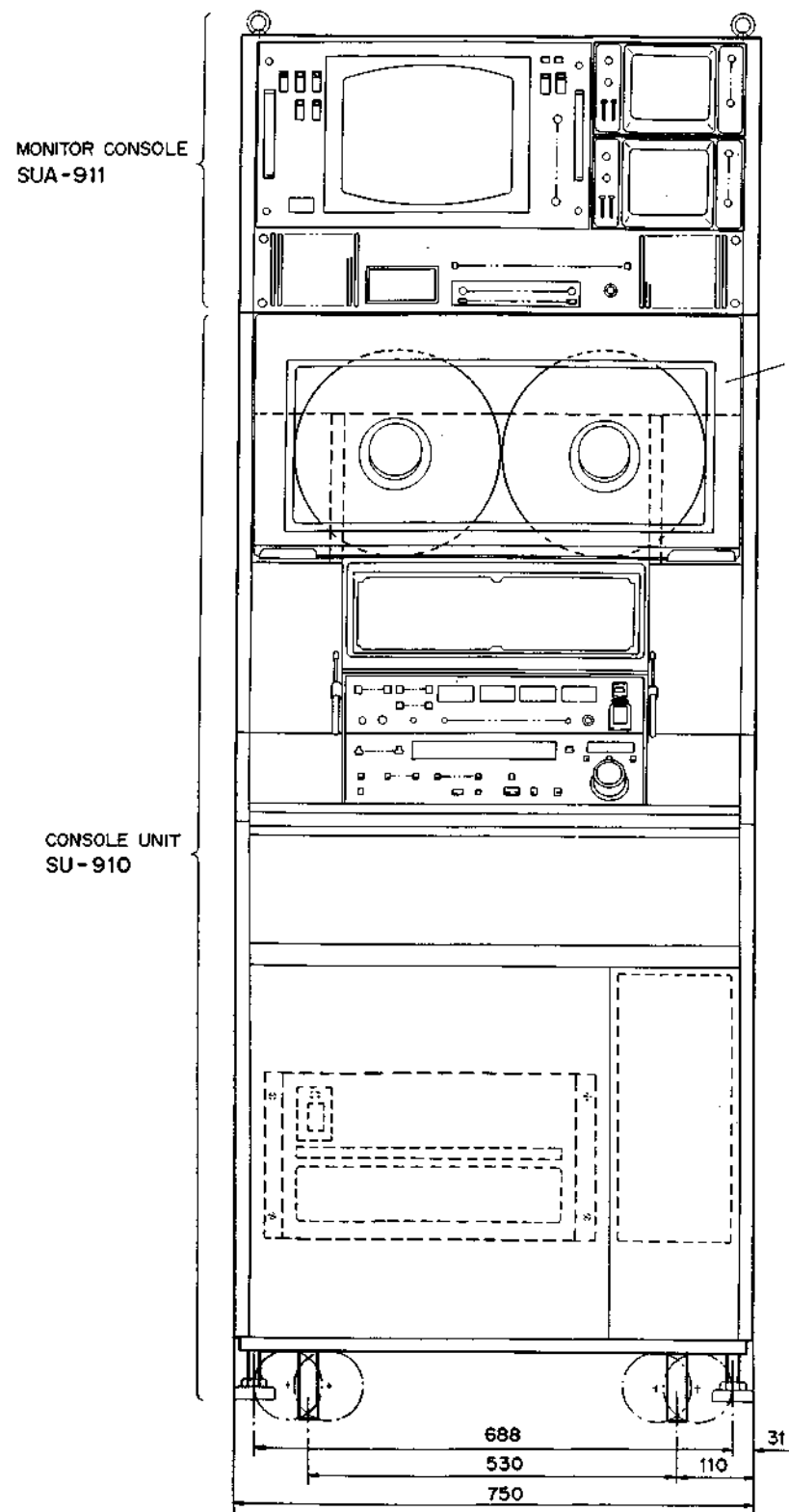


UNIT: mm

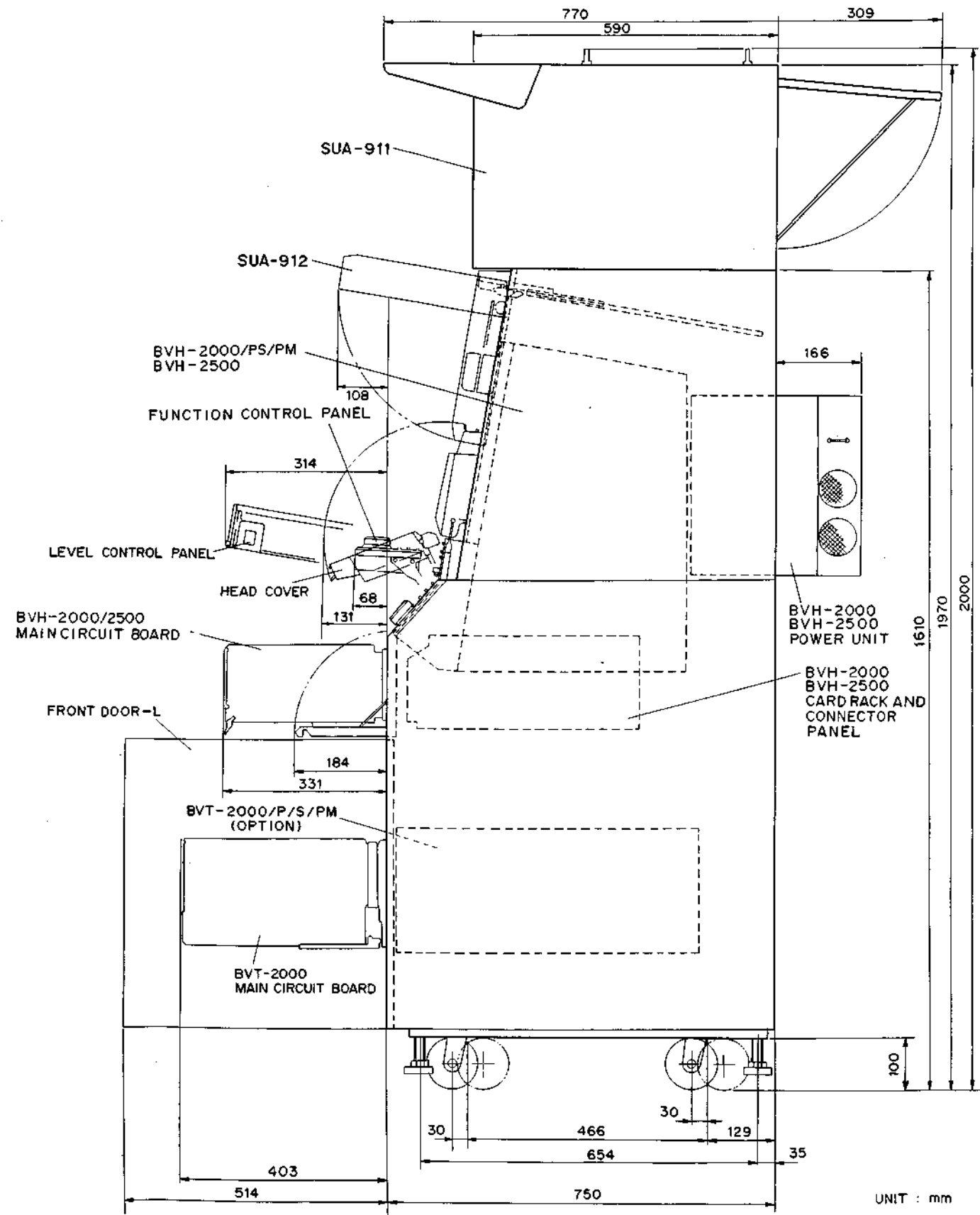


UNIT: mm

External Dimensions/Working Space: When mounting to SU-910



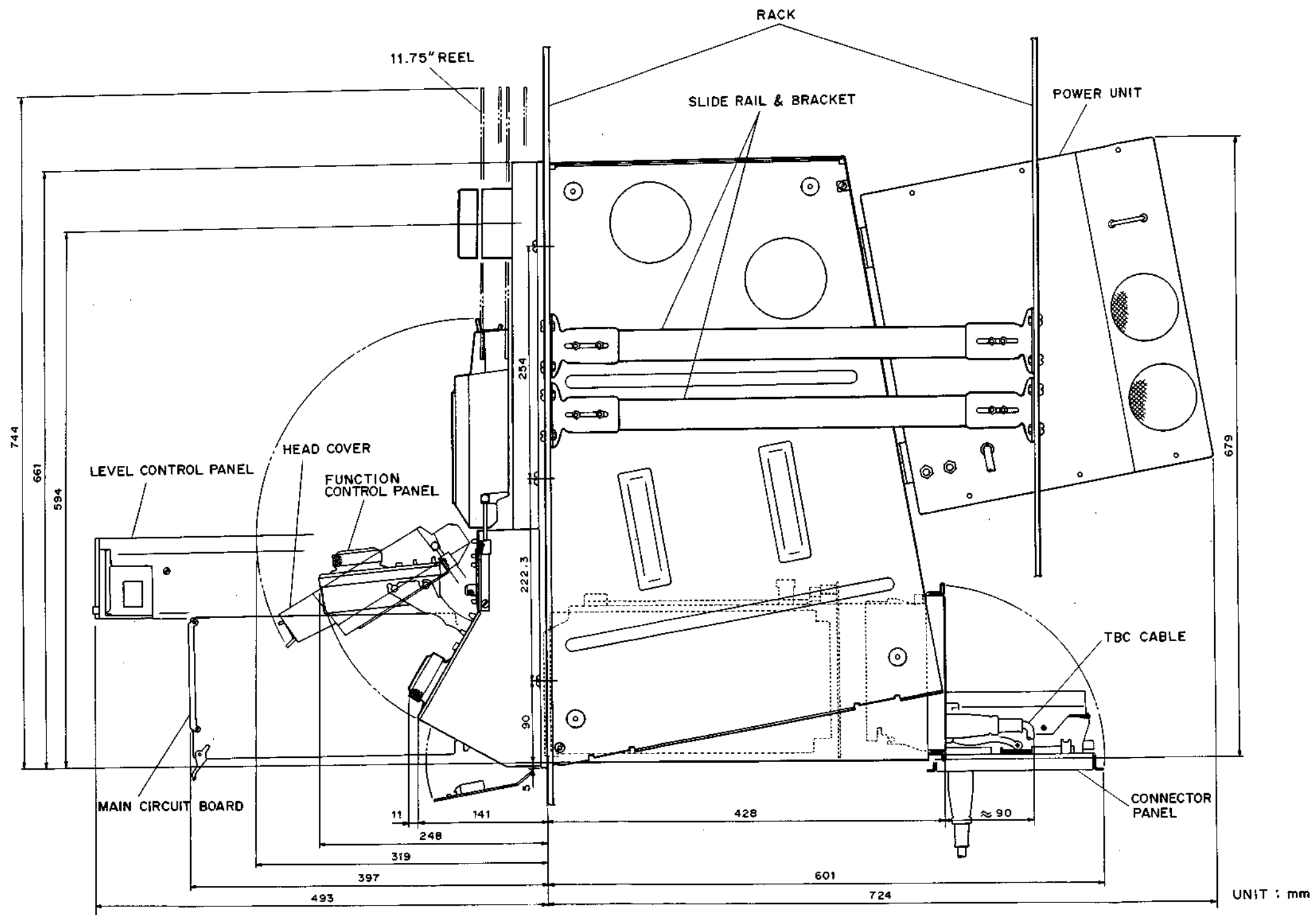
2-12(2/3)



2-12(3/3)

BVH-2000(U/C)/PS/PM
BVH-2500(U/C)/P

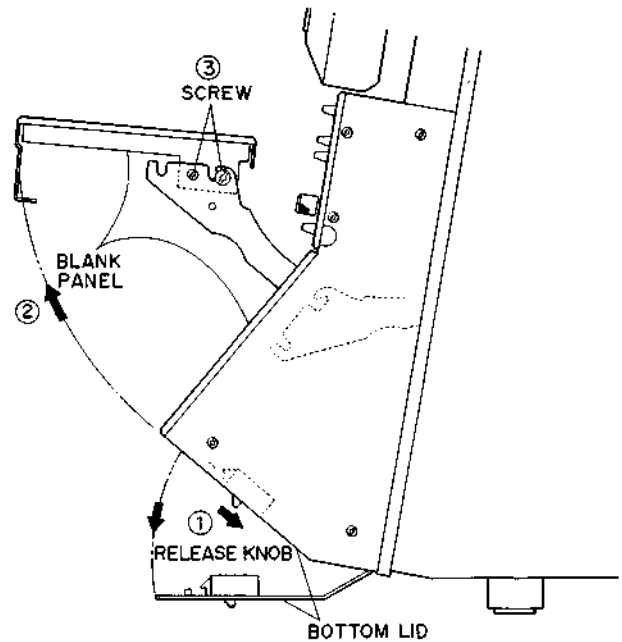
External Dimensions/Working Space: When rack-mounting



2-7. MOUNTING FUNCTION CONTROL PANEL BKH-2011/2012/2013

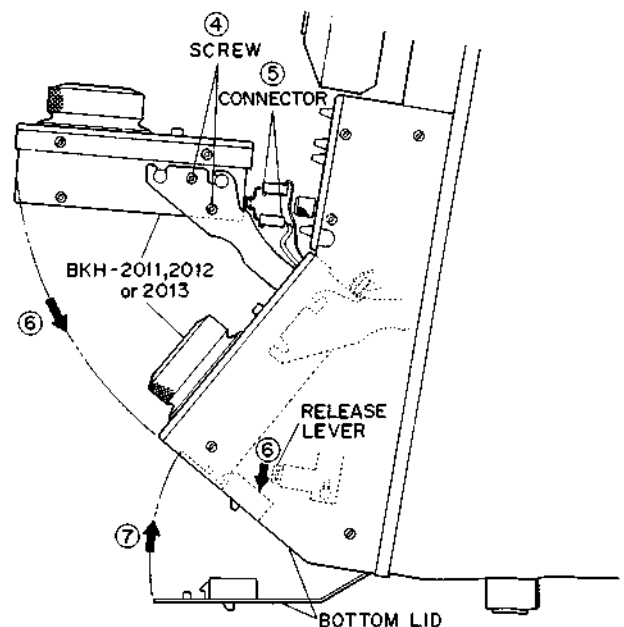
Removing Blank Panel

- ① Slide the release knobs (on the right and left) in the direction indicated by the arrow to open the bottom lid.
- ② Pull the blank panel up.
- ③ Remove the screws PSW3x8 and B4x8 (right and left) to remove the blank panel from its brackets.



MOUNTING BKH-2011/2012/2013

- ④ Mount the BKH-2011, 2012, or 2013 on the brackets. Fixing screws (PSW3x8 each two, right and left) are supplied with the BKH.
- ⑤ Connect the two connectors, CN701 (10 pins) and CN702 (26 pins), mounted in the VTR to the BKH. Be sure to lock using the BKH connector levers.
- ⑥ Push the BKH down while depressing the release lever, that is inside the left side panel of the VTR.
- ⑦ Close the bottom lid.



2-8. MOUNTING ON THE CONSOLE UNIT

Refer to the installation manual for the console unit.

(4) Picture Quality in DT Mode

Applicable to BVT-2000P #10001 to #52899

When the VTR plays back a PAL signal by the DT head, several lines on the monitor screen become dark. This modification improves the operation of ODD/EVEN detection in the DT mode.

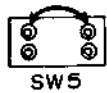
(Note) Perform the "(2) Picture Quality in DT Mode" modification before starting this modification.

Modification Procedure

BD-2 board (PWB No. 1-588-054-11, 12, 13 or 14): Modify the BD-2 board as follows.

Mount an IC SN74LS00N (8-759-900-00) on IC62 located in the right bottom corner of the BD-2 board.

Short-circuit the SW5 located in the right bottom corner of the BD-2 board as follows.

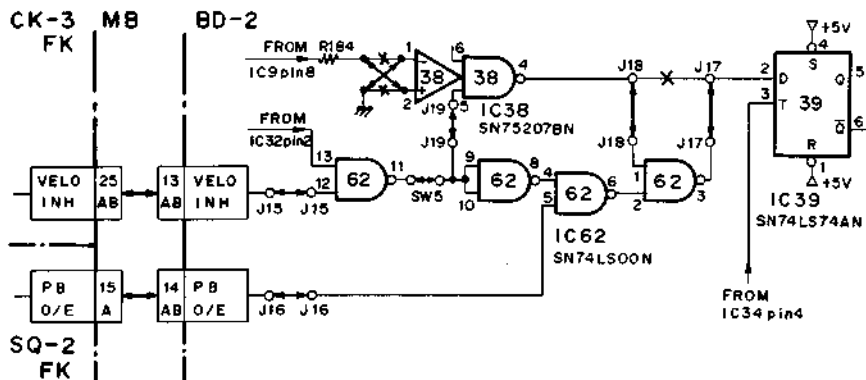


- IC38 pin 1 — Break the foil (component side) — R184
- Remove the jumper.
- jumper terminal J18 (IC38 pin 4) — Add a jumper. — jumper terminal J17 (IC39 pin 2)
- jumper terminal J15 (IC62 pin 12) — Add a jumper. — J15 (edge connector 13AB)
- jumper terminal J16 (IC62 pin 5) — Add a jumper. — J16 (edge connector 14AB)

- jumper terminal J17 (IC62 pin 3) — Add a jumper. — J17
- jumper terminal J18 (IC62 pin 1) — Add a jumper. — J18 (IC39 pin 2)
- jumper terminal J19 (IC62 pin 9, 10) — Add a jumper. — J19 (IC38 pin 4)
- IC38 pin 2 — Break the foil (solder side) — IC38 pin 7 (GND)
- IC38 pin 2 — Add a jumper (solder side) — R184
- IC38 pin 1 — Add a jumper (solder side) — IC38 pin 7 (GND)

Mother board: Add two jumpers as follows.

- CN2 pins 13A, 13B — Add a jumper. — CN12 pins 25A, 25B (BD-2) (CK-3FK)
- CN2 pins 14A, 14B — Add a jumper. — CN7 pin 15A (BD-2) (SQ-2FK)



(5) Vertical Shift in Edit Preset Mode

Applicable to BVT-2000P #10001 to #52899
 BVT-2000S #10001 to #50799

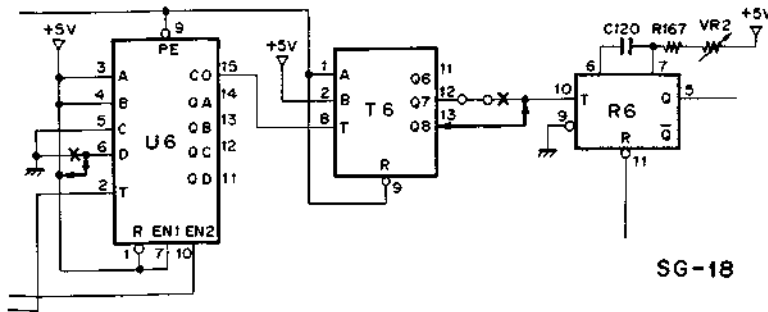
In the Edit Preset mode, the VTR can play back a picture just before editing without noise by the DT head. But when the tape speed is +2 times or more, the time base error of the playback signal may overflow the window of the TBC and it results in the vertical shift of the picture on the monitor screen.

This modification delays the window center of the TBC in the confidence mode by 8 lines compared with the unmodification.

Modification Procedure A

SG-18 board* (PWB No. 1-588-049-11, 12, 13 or 14)
 *: The SG-18 board does not have a small board SG-69 on it.

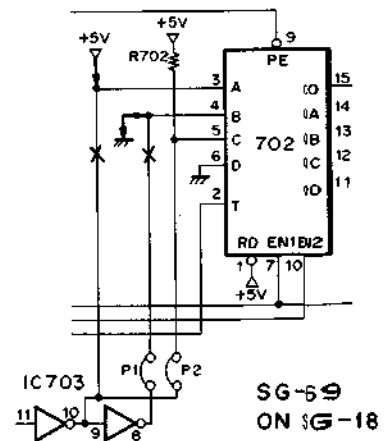
- IC-R6 pin 10 \times Break the foil. (component side) IC-T6 pin 12
- IC-U6 pin 6 \times Break the foil. (solder side) IC-U6 pin 5, 8 (GND)
- IC-R6 pin 10 \leftarrow Add a jumper. \rightarrow IC-T6 pin 13
- IC-U6 pin 6 \leftarrow Add a jumper. \rightarrow IC-U6 pin 4 (+5V)



Modification Procedure B

SG-18 board* (PWB No. 1-588-049-14 and above)
 *: The SG-18 board has a small board SG-69 on it. Modify the SG-69 board with PWB No. 1-607-436-11 as follows.

- IC702 pin 3 \times Break the foil. (component side) IC703 pin 9, 10
- IC702 pin 4 \times Break the foil. (component side) IC703 pin 8
- IC702 pin 3 \leftarrow Add a jumper. \rightarrow IC702 pin 1 (+5V)
- IC702 pin 4 \leftarrow Add a jumper. \rightarrow IC702 pin 8 (GND)



Modification Procedure C

Replace the SG-18 board as follows.

- PWA No. A-6259-058-A or -B (BVT-2000P)
- PWA No. A-6259-064-A or -B (BVT-2000S)
- (PWB No. 1-588-049-11, 12, 13, 14 or 15)

(Note) There are two kinds of SG-18 boards, one is the board with SG-69 small board, the other is the SG-18 board by itself.

- PWA No. A-6259-058-C (BVT-2000P)
- PWA No. A-6259-064-C (BVT-2000S)
- (PWB No. 1-588-049-15 & above)

(Note) This is the SG-18 board with SG-69 small board.

(6) PB V Signal Detection

Applicable to BVT-2000P #10001 to #52899
BVT-2000S #10001 to #50799

BVT-2000 has the following two circuits to detect a PB V signal.

Circuit 1: V sync pulse separator

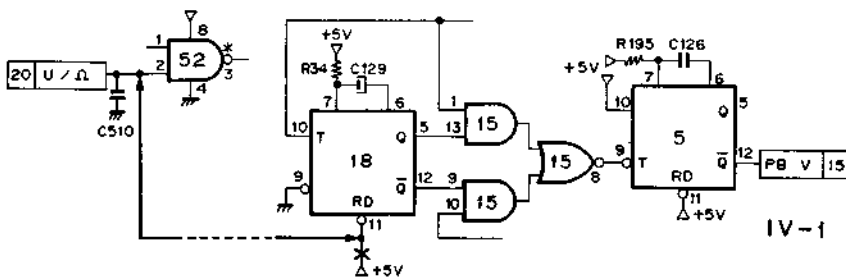
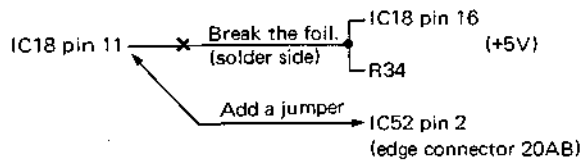
Circuit 2: first equalizing pulse separator

When a V sync pulse exists in the playback video signal of the VTR, the circuit 1 has a priority. But, when the phase difference between the SYNC head output and the VIDEO head output is too large, the circuit 1 cannot detect a PB V signal with correct phase.

By this modification, the circuit 2 operates for BVH VTRs whether a V sync pulse exists or not in the playback signal.

Modification Procedure

IV-1 board: Modify the IV-1 board as follows.



(7) Video Level Control in Bidirex Mode

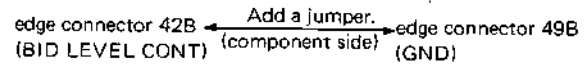
Applicable to BVT-2000P #10001 to #53299
BVT-2000S #10001 to #51099

BVT-2000 compensates the video level change caused by the tape speed variation. Overcompensation, however, is caused by using BVT-2000 with BVH-2000/2180 because BVH-2000/2180 have the same function in themselves, therefore the compensator in the TBC should be killed.

(Note) Don't apply this modification when using BVT-2000 together with the BVH VTRs except BVH-2000/2180.

Modification Procedure

IV-1 board: Add a jumper as follows.



(8) Y ADD ON/OFF Switch

Applicable to BVT-2000P #10001 to 65299
 BVT-2000S #10001 to 61199

The Y ADD ON/OFF switch determines the Y signal addition in the DT or Bidirex mode.

In the normal play mode, the Y ADD ON/OFF switch does not affect the operation of the TBC.

Since the picture characteristics of the TBC output are different between Y ADD ON and OFF in the DT or Bidirex mode as follows, select the appropriate position according to the tape speed and/or the contents of the picture.

When the VTR is in the DT or Bidirex mode, the following two status appears alternately in the short period if the tape speed is ± 1.5 times and above or ± 0.5 times and below or in the long period if the tape speed is near to ± 1 times.

Status A: The field of the VTR playback signal coincides with that of the TBC reference signal. In this case, Y ADD function does not work regardless of the Y ADD switch position.

Status B: The field of the VTR playback signal does not coincide with that of the TBC reference signal. In this case, if the Y ADD switch is set to ON, the VTR playback signal is processed by the Y ADD function and the vertical resolution of the TBC output signal is reduced by half. It results in an indistinct picture.

Y ADD ON

When the tape speed is approximately ± 1.5 times and above or ± 0.5 times and below, the vertical movement of the lines is smoothed and the TBC output picture feels natural.

When the tape speed is near to ± 1 times, distinct and indistinct pictures may appear alternately in the long period even though the original picture is distinct.

Y ADD OFF

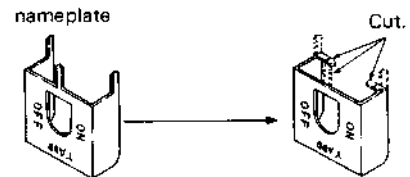
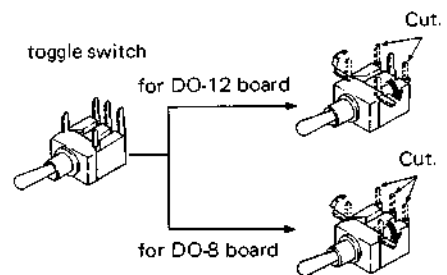
When the tape speed is approximately ± 1.5 times and above or ± 0.5 times and below, the picture on the monitor screen moves vertically by one line in the short period and it may seem flicker.

When the tape speed is near to ± 1 times, the picture moves vertically by one line in the long period but the picture does not become indistinct.

Modification Procedure

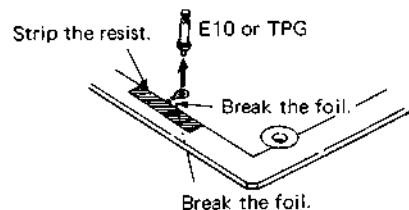
Prepare the following parts and modify them as follows.

- 1pc 1-553-439-00 toggle switch
- 1pc 3-659-859-00 nameplate "16"



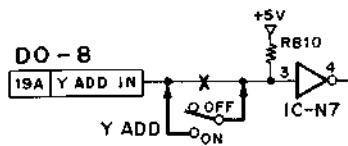
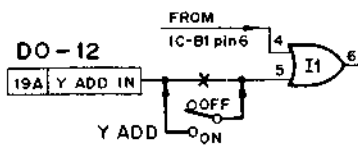
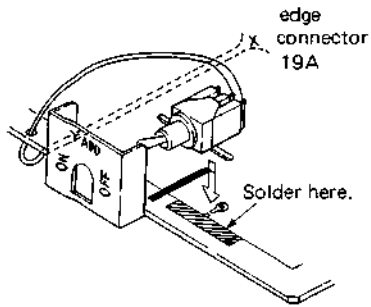
DO-12 or DO-8 board: Modify them as follows.

Remove the GND terminal E10 or TPG located in A-12 on the DO board and then break the foils of the GND terminal on both side (component/solder side). Strip the resist from the board as shown below.



Insert the mid lead of the switch into the hole for E10 of DO-12 board. Don't use the TPG hole of DO-8 board because it is connected to GND by inside foil. Solder the switch and nameplate to the DO board.

Break the foil (or remove the jumper) from the edge connector 19A (solder side) and then solder the jumpers as shown below.



2-11. FUNCTION OF SWITCHES AND JUMPERS

2-11-1. Index of Switches and Jumpers

AE-03 Board	Section	SY-79 Board	Section
S1: A-3 SEL:MIC/LINE /TC Sel.....	2-11-2, 1-6-3	S1: REACTION TIME.....	2-11-7, 1-6-3, 4-12-1, 4-13-8, 4-13-10(A203H)
S2: A-3 SEL:INT/EKT-1/EKT-2 Sel.....	2-11-2, 1-6-3	S2: PREROLL TIME.....	2-11-7, 1-6-3, 4-12-1, 4-13-8, 4-13-10(A203H)
BQ-02 Board		S3: Test.....	2-11-7, 4-13-1, 4-13-8
S1: VIDEO EQUALIZER:AUTO/MANU.....	2-11-3, 1-6-3	S4: PARA RUN:ON/OFF.....	2-11-7, 1-6-3
JP1,2:DROPOUT Signal Sel Jumper.....	2-11-3, 13-33	S5: VAR:P JOG/P PLAY.....	2-11-7, 1-4-3, 1-4-4, 1-4-5, 1-6-3, 1-9-4, 1-9-5,
JP3: DROPOUT Test Jumper.....	2-11-3, 13-32	S6: REMOTE-1/2/3.....	2-11-7, 1-4-1, 1-6-3
DM-25 Board		S7: Not used.	
SW1: WHITE REFERENCE ON/OFF.....	2-11-4	S8: Not used.	
SW2A: INSERTION LINE Sel.....	2-11-4	S9-1: Not used.	
MD-14 Board		S9-2: Free Run Test.....	2-11-7, 4-13-6
S1: RF(V)/INPUT/RF(S) METER Sel.....	2-11-5, 1-6-3	S9-3: Not used.	
JP1,2:Cable Compensation Jumper.....	2-11-5, 13-12	S9-4: Function Key Enable.....	2-11-7, 1-4-1, 4-13-10(A202H)
JP3,4: Meter Select Jumper.....	2-11-5	S9-5: Function Stop Enable.....	2-11-7, 1-4-1, 4-13-10(A202H)
JP5,6: 00/02/04 Model Sel Jumper.....	2-11-5	S9-6: Still Off Enable.....	2-11-7, 4-13-10(A202H)
LG-02(A) Board		S9-7: Tension Off Enable.....	2-11-7, 4-13-10(A202H)
S1-1: VIDEO/SYNC SIMUL.....	2-11-6	S9-8: Standby Off Enable.....	2-11-7, 4-13-10(A202H)
S1-2: TC INSERT INHIBIT.....	2-11-6	S10: Not used.	
S1-3: TENSION RELEASE.....	2-11-6	S11: Not used.	
S1-4: Not used.		S12: REC TEST (For 00 Model).....	2-11-7, 1-6-3
S2-1: REEL MODE SHUTTLE.....	2-11-6	J1: Audio-3 REC Control Jumper.....	2-11-7, 2-11-6(S2-5)
S2-2: DELAY ENABLE.....	2-11-6, 4-13-10(A292H)	J2: Always set to B.	
S2-3: PLAY/REC EOT INHIBIT.....	2-11-6, 4-13-10(A292H)	J3: Audio-1 REC Control Jumper.....	2-11-7, 2-11-6(S2-5)
S2-4: LEVER SW ENABLE.....	2-11-6, 4-13-10(A292H)	J4: Audio-2 REC Control Jumper.....	2-11-7, 2-11-6(S2-5)
S2-5: AUDIO REC ENABLE.....	2-11-6, 4-13-10(A200H)	JP1: Always open.	
S2-6: TC SENSE MODE SEL.....	2-11-6, 4-13-10(A292H)	JP2: Always short.	
S2-7: Not used.		JP3: Always open.	
S2-8: MODEL SELECT.....	2-11-6, 4-13-10(A292H)	JP4: Always short.	
S3: PLAY MODE (VISC,PAL-M).....	2-11-6, 1-6-3	JP5: Always open.	
MODE SEL (PAL,SECAM).....	2-11-6, 1-6-3	JP6: Always short.	
S4: REC INHIBIT.....	2-11-6, 1-6-3	JP7: VIDEO TEST Jumper.....	2-11-6
JP1: CONF TEST Jumper.....	2-11-6		
JP2: OSC CONF TEST Jumper.....	2-11-6		
JP3: Always open.			
JP4: Always open.			
JP5: NORMAL FWD TEST Jumper.....	2-11-6		
JP6: VIDEO REC OFF TEST Jumper.....	2-11-6		
JP7: VIDEO TEST Jumper.....	2-11-6		

(2-11-1. Index of Switches & Jumpers)

SY-80 Board	Section
S1: Test/Upper.....	2-11-8, 4-12-1, 4-13-8
S2: Test/Lower.....	2-11-8, 4-12-1, 4-13-8
S3: Reset.....	2-11-8, 4-13-1, 4-14-1
S4: Test.....	2-11-8, 4-12-1, 4-13-8
S5: EOT STOP: ON/OFF.....	2-11-8, 1-6-3, 4-13-10 (A028H)
S6: EDIT: P2,P2/F1,F1.....	2-11-8, 1-6-3, 4-13-10 (A028H)
S7: DF: ON/OFF.....	2-11-8, 1-6-3, 4-13-10 (A028H)
S8-1: Free Run Test.....	2-11-8, 4-13-6
S8-2: Not used.	
S8-3: Not used.	
S8-4: Not used.	
S8-5: EVB.....	2-11-8, 4-13-10 (A028H)
S8-6: Not used.	
S8-7: Ext DF/CF Control Enable.....	2-11-8, 4-13-10 (A028H)
S8-8: Operation Guide.....	2-11-8, 1-11-5
S9-1: Rec Confi Off.....	2-11-8, 4-13-10 (A283H)
S9-2: Audio Edit.....	2-11-8, 4-13-10 (A283H)
S9-3: EE Mode Sel.....	2-11-8, 1-4-3, 1-4-4, 1-4-5
S9-4: Preroll Mode.....	2-11-8, 4-13-10 (A283H)
S9-5: Display Mode.....	2-11-8, 4-13-10 (A283H)
S9-6: IN Point Synchro.....	2-11-8, 4-13-10 (A283H)
S9-7: Synchro Off.....	2-11-8, 4-13-10 (A283H)
S9-8: Test Display.....	2-11-8, 4-13-9

SV-43 Board

S1-1: Free Run Test.....	2-11-9, 4-13-6
S1-2: HARD CPU Access Inhibit.....	2-11-9
S1-3: Always set to off.	
S1-4: Always set to off.	
S2: TAPE RUN: NORM/STOP.....	2-11-9, 1-6-3

RL-12 Board

S1: SKEW: AUTO/MANU.....	2-11-10, 1-6-3
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CD-17 Board

S1: ADV: BVT/OFF/BKH.....	2-11-11, 1-6-3
S2: CAP LOCK: 4F/2F (NTSC).....	2-11-11, 1-6-3
CAP LOCK: 8F/4F/2F (PS/PM).....	2-11-11, 1-6-3
S3-1: CF Lock Mode.....	2-11-11
S3-2: Auto PG ON/OFF.....	2-11-11, 3-24-7
S3-3: Always set to on.	
S3-4: Time Compen ON/OFF.....	2-11-11
S3-5: PG Phase Preset.....	2-11-11, 3-24-7
S3-6: PG Phase Preset.....	2-11-11, 3-24-7
S3-7: Auto Skew ON/OFF.....	2-11-11, 2-11-10
S3-8: Tracking Shift.....	2-11-11

(CD-17)

	Section
S4: Test-1.....	2-11-11, 4-14-1, 4-14-2
S5: Test-2.....	2-11-11, 4-14-1, 4-14-2 (Test-1 "5"), 4-14-3
S6: Test-3.....	2-11-11, 4-14-4
S7: Entry.....	2-11-11, 4-14-1
S8: Advance Preset.....	2-11-11, 1-6-3

SR-15 Board

S1: SC ADJ: MANU/FIX/EXT.....	2-11-12, 1-6-3
S2: PULSE OUT: REF2/4/PB CF (NTSC)...	2-11-12, 1-6-3
PULSE OUT: REF2/8/PB CF (PS/PM)...	2-11-12, 1-6-3

DF-04 Board

DF-05 Board

S1-1: Always set to off.	
S1-2: Always set to on.	
S1-3: Always set to on.	
S1-4: NTSC,PAL-M: Always set to off.	
PAL,SECAM: Always set to on.	
S2: REM/FIELD/FRAME.....	2-11-13, 1-6-3
S3: Always set to on.	
S4: Always set to off.	

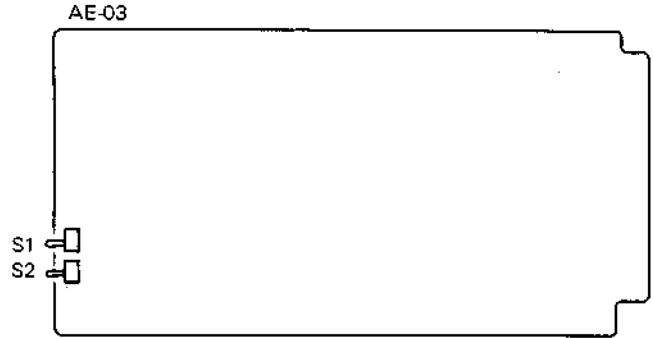
(2-11-1. Index of Switches & Jumpers)

LA-02 Board	Section
A,B,C,D,E,F,G,H,I:	
Audio Output Impedance Sel.....	2-11-14
JP101,102:	
Audio-1 Input Impedance Sel.....	2-11-14
JP201,202:	
Audio-2 Input Impedance Sel.....	2-11-14
JP301,302:	
Audio-3 Input Impedance Sel.....	2-11-14
JP401,402:	
Audio-4 Input Impedance Sel.....	2-11-14
K: Audio-1/2/3/4 Input Impedance Sel..	2-11-14
JP103,104,105,106:	
Audio-1 Input Level Sel.....	2-11-14
JP203,204,205,206:	
Audio-2 Input Level Sel.....	2-11-14
JP303,304,305,306:	
Audio-3 Input Level Sel.....	2-11-14
JP403,404,405,406:	
Audio-4 Input Level Sel.....	2-11-14

VM-01 Board

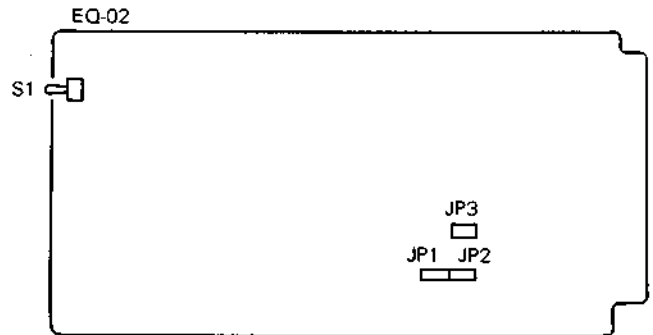
S1: MONITOR:HT (TBC)/SPARE.....	2-11-15
S2: VIDEO OUT-3:DEMOD/BKH.....	2-11-15
S3: VIDEO OUT-1/2:DEMOD/BKH (HT).....	2-11-15

2-11-2. AE-03 Board



S1: A-3 SEL: MIC/LINE/TC Select Switch
 S2: A-3 SEL: INT/EXT-1/EXT-2 Select Switch
 Refer to section 1 AE-03 board.

2-11-3. EQ-02 Board



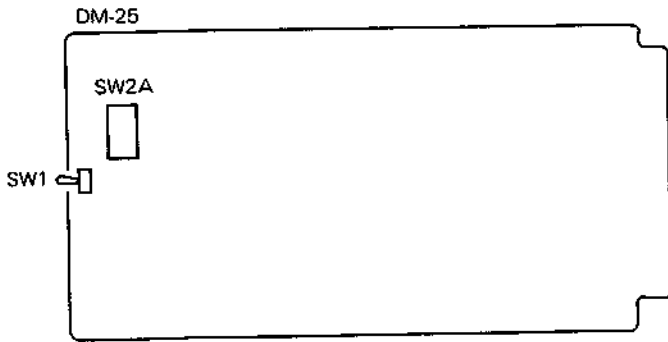
S1: VIDEO EQUALIZER: AUTO/MANU Switch
 Refer to section 1 EQ-02 board.

JP1/JP2: DROPOUT SIGNAL SELECT Jumper
 Select either the RF signal or TTL pulse as the DROPOUT signal outputted from the DO SIG OUTPUT connector on the connector panel.

JP1	JP2	DO SIG OUTPUT
Short	Open	RF Signal
Open	Short	TTL Pulse (DO:Low)

JP3: DROPOUT TEST Jumper
 Normally, short JP3, and open it when performing the dropout detector sensitivity adjustment.
 Refer to section 13-32 for adjustment procedure.

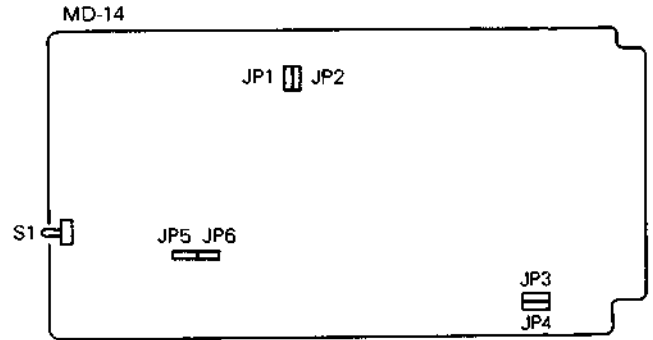
2-11-4. DM-25 Board



SW1: WHITE REFERENCE ON/OFF Switch
SW2A: INSERTION LINE Select Switch
 SW1 and SW2A are used for adjusting the deviation of the FM modulator.
 When SW1 is set to ON, a carrier equivalent to a 100% WHITE is inserted into the EE signal.
 Insertion line can be selected by the SW2A as follows.
 Normally, set SW1 to OFF.

SW1	ON CHANNEL OF SW2A	INSERTION LINE		
		NTSC	PAL/SECAM	PAL-M
ON	1	10,11	6, 7, 319, 320	7, 8, 270, 271
	2	12, 13	8, 9, 321, 322	9, 10, 272, 273
	3	14, 15	10, 11, 323, 324	11, 12, 274, 275
	4	16, 17	12, 13, 325, 326	13, 14, 276, 277
	5	18, 19	14, 15, 327, 328	15, 16, 278, 279
	6	20, 21	16, 17, 329, 330	17, 18, 280, 281
	7	22, 23	18, 19, 331, 332	19, 20, 282, 283
	8	24, 25	20, 21, 333, 334	21, 22, 284, 285
OFF	X	Not Inserted		

2-11-5. MD-14 Board



S1: RF(V)/INPUT/RF(S) METER SELECT Switch
 Refer to section 1 MD-14 board.

JP1/JP2: CABLE COMPENSATION Jumper
 Normally, short JP2 and open JP1. When JP1 is shorted and JP2 is opened, the frequency response of the signal inputted to the VIDEO INPUT connector can be compensated by the CV1 and RV5.
 Refer to section 13-12 for alignment procedure.

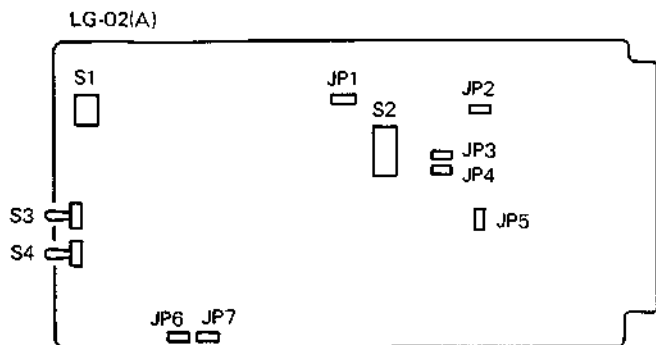
JP3/JP4: METER SELECT Jumper
 When RF(V)/INPUT/RF(S) METER select switch S1 is set to INPUT position, the VIDEO/RF meter shows a input video level, and indication can be selected by the setting of JP3/JP4 as follows. Short JP4 and open JP3 for standard setting.

JP3	JP4	METER INDICATION
Short	Open	Pedestal to Video Peak
Open	Short	Pedestal to Sync tip

JP5/JP6: 00/10/02/12/04/14 MODEL SELECT Jumper
 Set the jumpers in accordance with the model as follows.

MODEL	JP5	JP6
BVH-2000	02/12	Short
BVH-2180	or	Open
	04/14	
	00/10	Open
		Short

2-11-6. LG-02(A) Board



S1-1: VIDEO/SYNC SIMUL Switch

Video and sync channels can be preset by the combination of S1-1 and S3 position. (Refer to the applicable table below.)

NTSC, PAL-M (00) (02) (04) Models

S1-1 V/S SIMUL	S3 PLAY MODE	EDIT PRST KEY		PRESET CHANNEL
		VIDEO	A4/SYNC	
ON	1.5 Head	ON	----	VIDEO/SYNC
ON	1.5	----	ON	VIDEO/SYNC
ON	1	ON	----	VIDEO
ON	1	----	ON	VIDEO
OFF	1.5	ON	----	VIDEO
OFF	1.5	----	ON	SYNC
OFF	1	ON	----	VIDEO
OFF	1	----	ON	None

NTSC, PAL-M (10) (12) (14) Models

S1-1 V/S SIMUL	EDIT PRST KEY		PRESET CHANNEL
	VIDEO	A4/SYNC	
ON	ON	----	VIDEO
ON	----	ON	VIDEO
OFF	ON	----	VIDEO
OFF	----	ON	None

PAL, SECAM (00) (02) (04) Models

S1-1 V/S SIMUL	S3 MODE SEL	EDIT PRST KEY		PRESET CHANNEL
		VIDEO	A4/SYNC	
ON	SYNC	ON	----	VIDEO/SYNC
ON	SYNC	----	ON	VIDEO/SYNC
ON	OFF	ON	----	VIDEO
ON	OFF	----	ON	VIDEO
ON	*A4	ON	----	VIDEO/A4
ON	*A4	----	ON	VIDEO/A4
OFF	SYNC	ON	----	VIDEO
OFF	SYNC	----	ON	SYNC
OFF	OFF	ON	----	VIDEO
OFF	OFF	----	ON	None
OFF	*A4	ON	----	None
OFF	*A4	----	ON	A4

* When the machine is 00 or 02 model, do not set to position A4.

PAL, SECAM (10) (12) (14) Models

S1-1 V/S SIMUL	S3 MODE SEL	EDIT PRST KEY		PRESET CHANNEL
		VIDEO	A4/SYNC	
ON	1HD	ON	----	VIDEO
ON	1HD	----	ON	VIDEO
ON	*A4	ON	----	VIDEO/A4
ON	*A4	----	ON	VIDEO/A4
OFF	1HD	ON	----	VIDEO
OFF	1HD	----	ON	None
OFF	*A4	ON	----	None
OFF	*A4	----	ON	A4

*When the machine is 10 or 12 model, do not set to position A4.

S1-2: TC INSERT INHIBIT Switch

It functions when the MIC/LINE/TC select switch S1 on the AE-03 board is set to TC.

Normally, S1-2 is set to OFF, in this case, the time code can be recorded on the audio-3 track.

When S1-2 is set to ON, channel preset of the audio-3 in the insert edit mode is inhibited, therefore rewriting of the time code will not be performed.

Note: When S1-2 is set to ON, and performing the assemble edit, the channel preset of the audio-3 becomes possible and rewriting of the time code can be performed.

S1-3: TENSION RELEASE Switch

It functions when S9-7 on the SY-79 board is set to ON. Normally, S1-3 is set to OFF and when the STANDBY ON condition continues for 30 seconds, the tape will slacken.

When the BVH-2000 or BVH-2180 is used as a player for on air etc, S1-3 must be set to ON. In this case, when the STANDBY ON condition continues for 2 seconds, the tape will slacken and the DT mode will go OFF.

S1-4: Not used.

S2-1: REEL MODE SHUTTLE Switch

When performing the edit by combining the BVH-2000/2180 with the other VTRs except the BVH-2000/2180, if the BVH-2000/2180 is not used as a local machine, the synchronization and preroll is performed by the speed command from the editor, and the pinch roller is changed from ON and OFF when the tape speed is over 3 times SHUTTLE mode, in result, a malfunction of the edit may occur. In this case, set S2-1 to ON. Normally, S2-1 is set to OFF and the tape will be driven by the capstan in 3 times or less SHUTTLE mode.

When S2-1 is set to ON, the tape will not be driven by the capstan but only by the reel in 3 times or less SHUTTLE mode. When the tape speed displayed on the SEARCH indicator is 1/4 or less speed, the tape will stop and the VTR will be put in the STILL mode.

S2-2: DELAY ENABLE Switch

S2-3: PLAY/REC EOT INHIBIT Switch

S2-4: LEVER SW ENABLE Switch

Refer to address A292H Bit-1, 2 and 3 of section 4-13-10.

S2-5: AUDIO REC ENABLE Switch

Refer to address A200H/A201H of section 4-13-10.

S2-6: TC SENSE MODE SEL Switch

Refer to address A292H Bit-5 of section 4-13-10.

S2-7: Not used.

S2-8: MODEL SELECT Switch

Refer to address A292H Bit-7 of section 4-13-10.

S3: PLAY MODE Switch (NTSC, PAL-M)

MODE SEL Switch (PAL, SECAM)

Refer to section 1 LG-02 board

(2-11-6. LG-02(A) Board)

S4: REC INHIBIT Switch

Refer to section 1 LG-02(A) board.

JP1: CONF1 TEST Jumper

Used for checking the audio monitor head for the 02 or 04 model.

Short the JP1, and set the TAPE/EE selector on the front panel to "TAPE" then place the VTR into the PLAY mode.

The playback (confidence) signal from the audio monitor head will be outputted from the AUDIO MONITOR R/L connectors.

Note: When the JP1 is opened, the playback (confidence) signal is outputted only in the REC or the EDIT REC mode.

JP2: OSC CONT TEST Jumper

When JP2 is shorted, the audio bias/erase oscillator will work and the recording system of the audio circuitry can be checked without threading a tape.

JP3: Always open.

JP4: Always open.

JP5: NORMAL FWD TEST Jumper

When JP5 is shorted, the "NORMAL FWD + EE" signal goes active, and the confirmation and adjustment of the burst suppressor on the DM-25 board and the time code system on the AE-03 board can be performed by the STOP mode or without threading a tape.

JP6: VIDEO REC OFF TEST Jumper

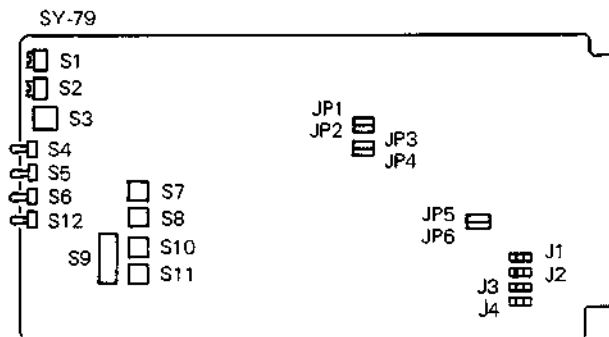
When JP6 and JP7 are shorted, only the video/sync rotary erase amplifier will work and the REC mode is inhibited.

In this way, confirmation and adjustment of the rotary video and sync erase heads can be performed in the STOP mode.

JP7: VIDEO TEST Jumper

When JP7 is shorted, the PLAY VIDEO and the PLAY SYNC amplifiers on the DR-13 board inside the upper drum assembly can be checked without rotating the drum.

2-11-7. SY-79 Board



S1: REACTION TIME Switch

Functions of S1 are a selection of reaction time and designation of common memory address in the test mode.

Refer to following sections for details.

REACTION TIME

1 SY-79 board

4-13-10 Address A203H Bit-7, 6, 5, 4

TEST MODE

4-12-1

4-13-8

S2: PREROLL TIME Switch

Functions of S2 are a selection of preroll time and designation of common memory address in the test mode.

Refer to following sections for details.

PREROLL TIME

1 SY-79 board

4-13-10 Address A203H Bit-3, 2, 1, 0

TEST MODE

4-12-1

4-13-8

S3: TEST Switch

Used for testing the system control. Refer to sections 4-12-1, 4-13-1 and 4-13-8 for detail.

S4: PARA RUN: ON/OFF Switch

Refer to section 1 SY-79 board.

S5: VAR: P JOG/P PLAY Switch

Refer to section 1.

S6: REMOTE-1/2/3 Switch

Refer to section 1.

S7 : Not used.

S8 : Not used.

INSTALLATION

(2-11-7. SY-79 Board)

S9-1: Not used.

S9-2: FREE RUN TEST Switch

Refer to section 4-13-6.

S9-3: Not used.

S9-4: FUNCTION KEY ENABLE Switch

S9-5: FUNCTION STOP ENABLE Switch

Refer to sections 1② and 4-13-10 Address A202H Bit-4 and 3.

S9-6: STILL OFF ENABLE Switch

Refer to section 4-13-10 Address A202H Bit-2.

S9-7: TENSION OFF ENABLE Switch

Refer to section 4-13-10 Address A202H Bit-1.

S9-8: STANDBY OFF ENABLE Switch

Refer to section 4-13-10 Address A202H Bit-0.

S10: Not used.

S11: Not used.

S12: REC TEST Switch (For 00 Model)

Refer to section 1 SY-79 board.

J1: AUDIO-3 REC CONTROL Solder Jumper

J2: Always short B.

J3: AUDIO-1 REC CONTROL Solder Jumper

J4: AUDIO-2 REC CONTROL Solder Jumper

Effective when the system control ROM is version 3 and up.

Refer to section 4-13-10 Address A200H/A201H.

JP1: Always open.

JP2: Always short.

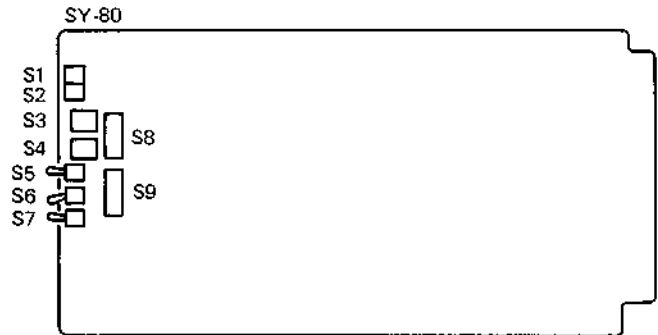
JP3: Always open.

JP4: Always short.

JP5: Always open.

JP6: Always short.

2-11-8. SY-80 Board



S1: TEST/UPPER Switch

S2: TEST/LOWER Switch

Used for testing the system control.

Refer to sections 4-12-1 and 4-13-8.

S3: RESET Switch

Used for testing the system control.

Refer to sections 4-13-1 and 4-14-1.

S4: TEST Switch

Used for testing the system control.

Refer to sections 4-12-1 and 4-13-8.

S5: EOT STOP: ON/OFF Switch

Refer to sections 1 SY-80 board and 4-13-10 Address A028H Bit-2 and 0.

S6: EDIT: F2, F2/F1, F1 Switch

Refer to sections 1 SY-80 board and 4-13-10 Address A282H Bit-1 and 0.

S7: DF: ON/OFF Switch

Refer to sections 1 SY-80 board and 4-13-10 Address A282H Bit-5.

S8-1: FREE RUN TEST Switch

Refer to section 4-13-6.

S8-2: Not used.

S8-3: Not used.

S8-4: Not used.

S8-5: BVB Switch

Refer to section 4-13-10 Address A282H Bit-6.

S8-6: Not used.

S8-7: EXT DF/CF CONTROL EN Switch

Refer to section 4-13-10 Address A282H Bit-4.

(2-11-8. SY-80 Board)

S8-8: OPERATION GUIDE Switch
Refer to section 1.

S9-1: REC CONF1 OFF Switch
Refer to section 4-13-10 Address A283H Bit-0.

S9-2: AUDIO EDIT Switch
Refer to section 4-13-10 Address A283H Bit-1.

S9-3: EE MODE SEL Switch
Refer to section 1.

S9-4: PREROLL MODE Switch
Refer to section 4-13-10 Address A283H Bit-3.

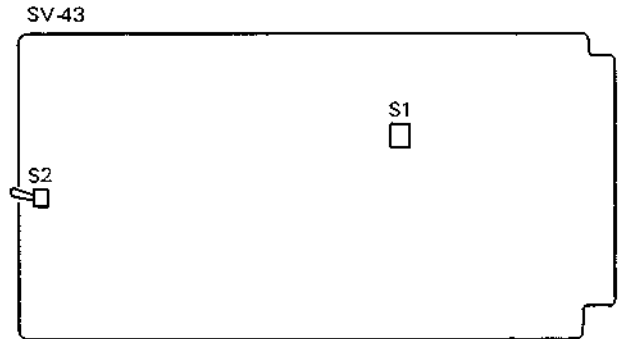
S9-5: DISPLSY MODE Switch
Refer to section 4-13-10 Address A283H Bit-4.

S9-6: IN POINT SYNCHRO Switch
Refer to section 4-13-10 Address A283H Bit-5.

S9-7: SYNCHRO OFF Switch
Refer to section 4-13-10 Address A283H Bit-6.

S9-8: TEST DISPLAY Switch
Refer to section 4-13-9.

2-11-9. SV-43 Board



S1-1: FREE RUN TEST Switch
Refer to section 4-13-6.

S1-2: HARD CPU ACCESS INHIBIT Switch
OFF: Normal set position.

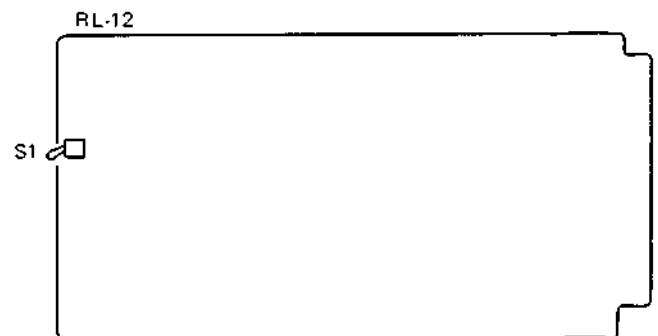
ON: The communication of the HOST CPU and HARD CPU will be separated and the judgement of the defective part can be checked easily in the free run test mode.

S1-3: Always set to OFF.

S1-4: Always set to OFF.

S2: TAPE RUN: NORM/STOP Switch
Refer to section 1 SV-43 board.

2-11-10. RL-12 Board

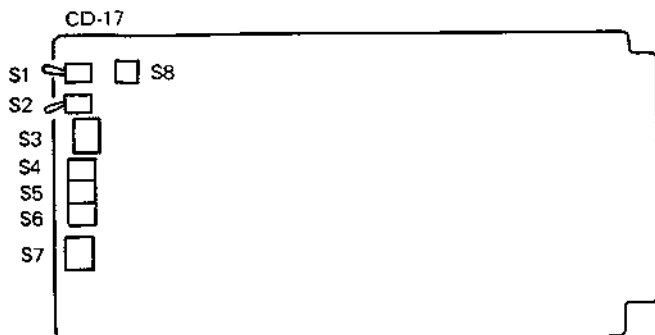


S1: SKEW: AUTO/MANU Switch
Refer to section 1 RL-12 board.

The skew operation will be changed in accordance with the AUTO SKEW ON/OFF switch S3-7 setting on the CD-17 board as follows.

S1/RL-12	S3-7/CD-17	SKEW CONTROL
AUTO	ON	AUTO
AUTO	OFF	CONSTANT (Same as in REC mode.)
MANU	ON/OFF	MANUAL (RV14/RL-12)

2-11-11. CD-17 Board



S1: ADV: BVT/OFF/BKH Switch
Refer to section 1 CD-17 board.

S2: CAP LOCK: 4F/2F (NTSC) Switch
CAP LOCK: 8F/4F/2F (PS/PM) Switch
Refer to section 1 CD-17 board.

S3-1: CF LOCK MODE Switch
It is effective when the servo ROM is Version 3 or higher.
Normally set to OFF.
OFF: The color framing in the PLAY mode will lock by following the CF pulse played back from the tape.
ON: Once the color framing locks to the CF pulse played back from the tape, even if the intervals of the CF pulse played back after locking are changed or the CF pulse is dropped out, the color framing will continue.

S3-2: AUTO PG ON/OFF Switch
Used for adjusting the PG phase of the R/P head and the PLAY head. Refer to section 3-24-7.

S3-3: Always set to ON.

S3-4: TIMER COMPEN. ON/OFF Switch
When compensating the timer data from the timer roller with the CTL signal which has been recorded in the tape, set to ON. When not compensating, set to OFF.

S3-5: PG PHASE PRESET Switch

S3-6: PG PHASE PRESET Switch
Used for adjusting the PG phase of the R/P head and the PLAY head. Refer to section 3-24-7.

S3-7: AUTO SKEW ON/OFF Switch
Refer to section 2-11-10.

S3-8: TRACKING SHIFT Switch

When the S3-8 is set to ON during the playback mode with the R/P head, each phase of the audio, time code and CTL will advance in accordance with the compensation amount of the TRACKING control.
Normally set to OFF.

S4: TEST-1 Switch
Refer to sections 4-14-1 and 4-14-2.

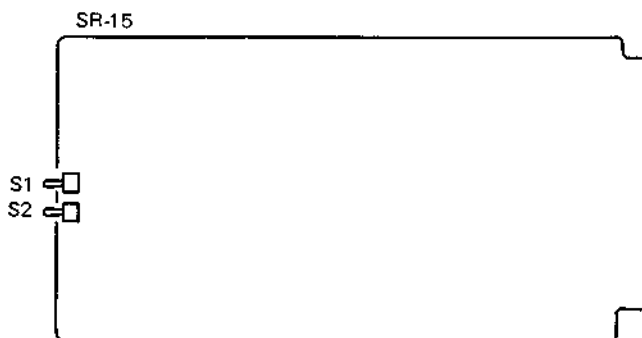
S5: TEST-2 Switch
Refer to sections 4-14-1, 4-14-2 TEST-1 "5" and 4-14-3.

S6: TEST-3 Switch
Refer to section 4-14-4.

S7: ENTRY Switch
Refer to section 4-14-1.

S8: ADVANCE PRESET Switch
Refer to section 1 CD-17 board.
In case of 10, 12 or 14 model, there is no S8.

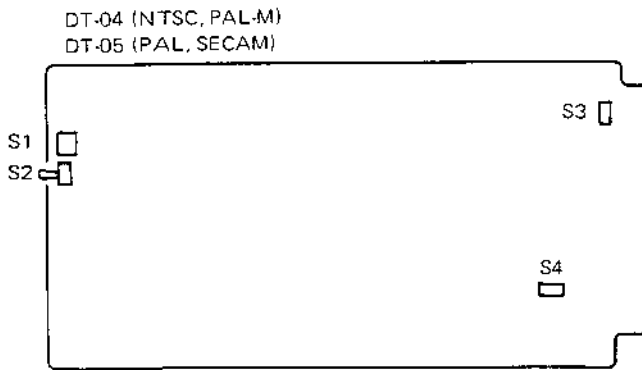
2-11-12. SR-15 Board



S1: SC ADJ: MANU/FLX/EXT Switch
Refer to section 1 SR-15 board.

S2: PULSE OUT: REF2/REF4/PB CF (NTSC) Switch
PULSE OUT: REF2/REF8/PB CF (PS/PM) Switch
Refer to section 1 SR-15 board.

**2-11-13. DT-04 Board (NTSC, PAL-M)
DT-05 Board (PAL, SECAM)**



S1-1: Always set to OFF.

S1-2: Always set to ON.

S1-3: Always set to ON.

S1-4: NTSC, PAL-M: Always set to OFF.

PAL, SECAM: Always set to ON.

S2: REM/FIELD/FRAME Switch

Refer to section 1 DT-04 board (DT-05 for PS model).

S3: Set to ON for the BVH-2000 and BVH-2180.

Set to OFF for the BVH-2500.

S4: Always set to OFF for the BVH-2000 and BVH-2180.

Used when adjusting for the BVH-2500.

(2-11-14. LA-02 Board)

The line input impedance of audio CH-1, 2, 3 and 4 is set to 600Ω when shipped. However, the LA-02 board remodeled as shown below makes 10 kΩ or 150Ω impedance possible.

Input impedance	Jumper plug				Pattern
	CH-1	CH-2	CH-3	CH-4	Each CH
	JP101/102	JP201/202	JP301/302	JP401/402	K
10kΩ	JP101	JP201	JP301	JP401	X
600Ω	JP102	JP202	JP302	JP402	□□
150Ω	JP102	JP202	JP302	JP402	⊕⊕

X : Don't care.
 □□ : Leave open.
 ⊕⊕ : Short (Solder).

JP103, 104, 105, 106: Audio-1

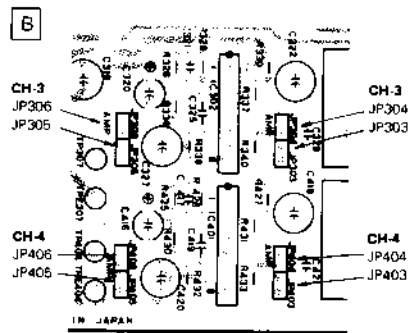
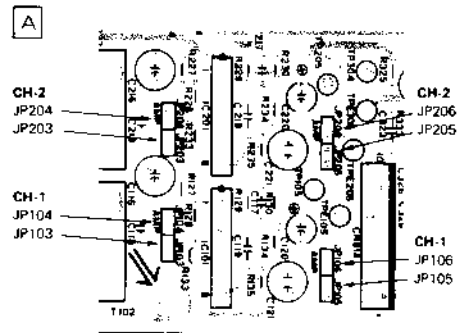
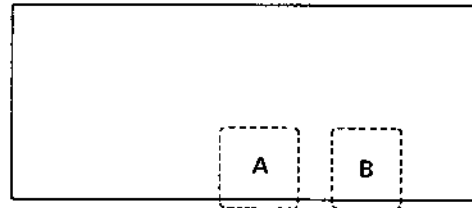
JP203, 204, 205, 206: Audio-2

JP303, 304, 305, 306: Audio-3

JP403, 404, 405, 406: Audio-4

Audio Input Level Select Jumpers

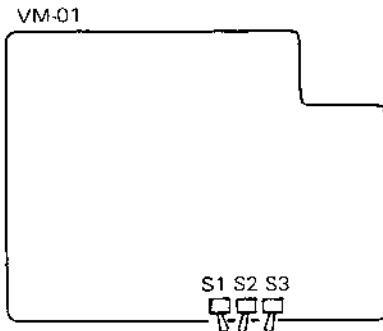
LA-02 BOARD : COMPONENT SIDE



Altering the jumper plug settings on the LA-02 board makes it possible to change the audio CH-1, 2, 3 and 4 line input reference level from +8 dB to -12 dB.

Reference input level	Jumper plug							
	CH-1		CH-2		CH-3		CH-4	
	JP103 104	JP105 106	JP203 204	JP205 206	JP303 304	JP305 306	JP403 404	JP405 406
+8dB	JP103	JP105	JP203	JP205	JP303	JP305	JP403	JP405
-12dB	JP104	JP106	JP204	JP206	JP304	JP306	JP404	JP406

2-11-15. VM-O1 Board



S1: MONITOR: HT (TBC)/SPARE Switch

HT (TBC): Be sure to set S1 to "HT (TBC)" position when using the plug-in TBC or plug-in heterodyne color board (NTSC only). In this way, when the PICTURE MONITOR select button is set to SPARE, the TBC or heterodyne color signal can be outputted from the VIDEO MONITOR OUTPUT connector. Also, when the WAVEFORM MONITOR select button is set to the "SELECT VIDEO", the TBC or heterodyne color signal can be outputted from the WFM MONITOR OUTPUT connector.

SPARE: When the PICTURE MONITOR select button is set to "SPARE", the signal supplied to the SPARE MONITOR INPUT connector can be outputted from the VIDEO MONITOR OUTPUT connector. Also, when the WAVEFORM MONITOR select button is set to "SELECT VIDEO", the signal supplied to the SPARE MONITOR INPUT connector can be outputted from the WFM MONITOR OUTPUT connector.

S2: VIDEO OUT-3: DEMOD/BKH Switch

DEMOD: Set S2 to "DEMOD" position when outputting the signal from the VIDEO INPUT connector or the signal reproduced from the tape to the VIDEO-3 OUTPUT connector.

BKH: Set S2 to "BKH" position when outputting the composite or non-composite video signal selected by the S2 on the PR board of the plug-in TBC to the VIDEO-3 OUTPUT connector.

S3: VIDEO OUT-1/2: DEMOD/BKH (HT) Switch

DEMOD: Set S3 to "DEMOD" position when outputting the signal from the VIDEO INPUT connector or the signal reproduced from the tape to the VIDEO-1 and VIDEO-2 OUTPUT connectors.

BKH (HT): Set S3 to "BKH (HT)" position when outputting the video signal from the plug-in TBC or the heterodyne color board to the VIDEO-1 and VIDEO-2 OUTPUT connectors.

2-12. NOTES ON BVE-5000/P, BVE-3000/P OPERATION

2-12-1. BVE-5000/P Setting

When installing the BK-5005 (VIO-5 board) in the BVE-5000/P and using in combination with the BVH-2000/2180, set the BK-5005 SW2, 3, 4 and 5 as follows.

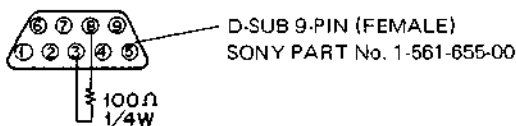
BK-5005	BVH-2000/2180	
	NTSC/PM	P/S
SW2&4 1	OFF	OFF
2	OFF	OFF
3	ON	ON
4	OFF	OFF
5	OFF	OFF
6	ON	OFF
7	ON	OFF
8	OFF	ON
SW3&5 1	OFF (or ON*1)	OFF (or ON*1)
2	OFF	OFF
3	ON	ON
4	OFF	OFF
5	ON	ON
6	OFF	OFF
7	ON	ON
8	OFF	OFF

- *1. When placing the 11.75-inch or 14-inch reel onto both the S and T reel tables, set SW3-1 and SW5-1 to ON. When using the other size of reel and if both switches are set to ON, the preroll time becomes longer.

2-12-2. Termination of REMOTE-2 OUT

When installing the BK-5005 (VIO-5 board) in the BVE-5000/P and using in combination with the BVH-2000/PS/PM, terminate the BVH-2000/2180 REMOTE-2 OUT connector as follows.

REMOTE-2 OUT



2-12-3. REMOTE Mode of BVH-2000/2180

When operating the BVH-2000/2180 in the REMOTE mode, all the switches on the control panel become inoperative and they are controlled from the external equipment. However, when using the BVE-5000/P or BVE-3000/P, the following switches can be set from the BVH-2000/2180.

- TAPE/EE Select Switch
- SERVO REF Select Switch
- HEAD Select Switch

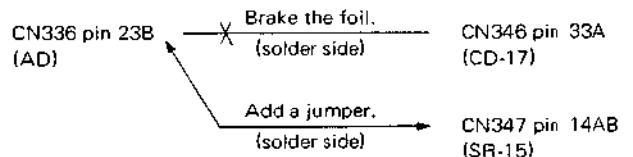
When performing the switches settings, make a setting with LOCAL mode and then return to REMOTE mode, or make a setting with power off and then turn on the power again.

2-12-4. Color Frame Editing using Plug-in TBC

When installing the Sony plug-in TBC in the BVH-2000/2180 and performing the color frame editing by using the BVE-5000/P or BVE-3000/P, modify the BVH-2000/2180 as follows because the plug-in TBC does not have a CF pulse input terminal from the BVE-5000/P or BVE-3000/P.

Modification Procedure

Modify the MOTHER board MB-14A as follows.



After the modification, set the SC ADJ switch (S1/SR-15) on the BVH-2000/2180 to FIX or MANU.

Note: When installing Sony Plug-in TBC in the modified BVH-2000/2180 and perform the color frame editing without the BVE-5000/P or BVE-3000/P, perform the following settings.

- SC ADJ switch (S1/SR-15) → FIX or MANU
- PULSE OUT switch (S2/SR-15) → PB CF
- Connect between FRAME PULSE OUT and CF PULSE IN connectors.

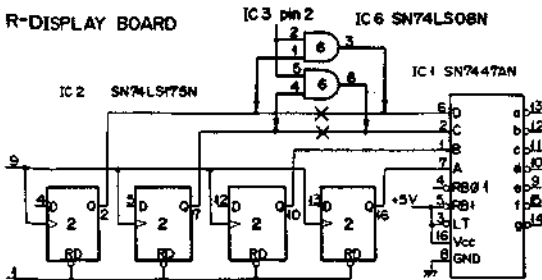
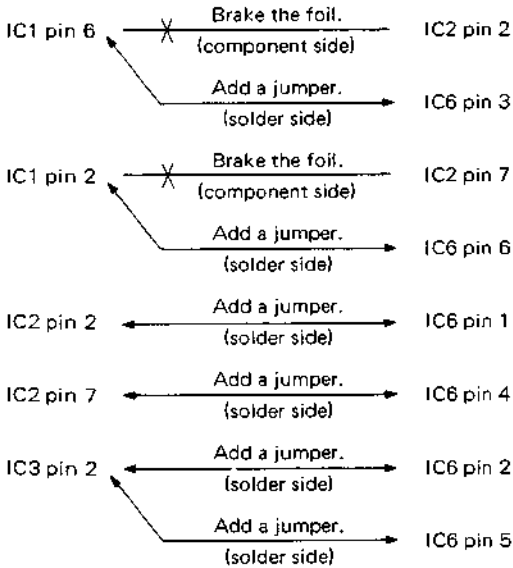
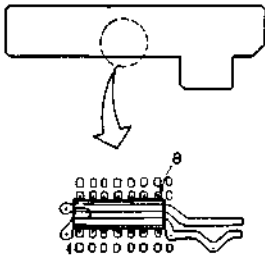
2-13. NOTES ON BVR-1000 OPERATION

When controlling the BVH-2000/2180 via the BKH-2016 by the BVR-1000, and if the timer display at the 10 FRAME on the BVR-1000 shows "3" "4" "5" or "6" by mistake, modify the BVR-1000 as follows.

Modification Procedure

Mount the SN74LS08N (IC6) in the following location on the R-DISPLAY board.

R-DISPLAY board
— Component Side —



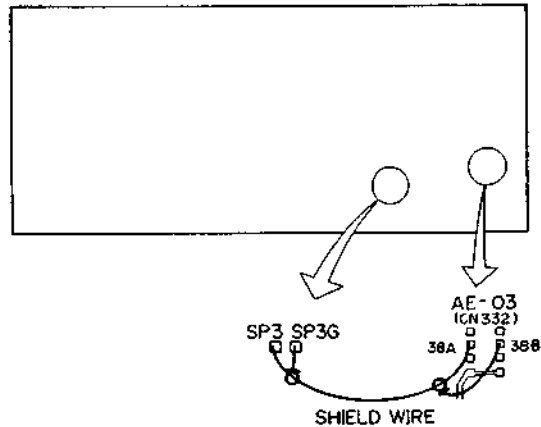
2-14. OUTPUT OF AUDIO-3 MONITOR SIGNAL FROM WFM OUTPUT

Perform the following modifications.
When the WAVEFORM MONITOR select switch is set to SPARE, the AUDIO-3 monitor signal is outputted from the WFM OUTPUT connector.

Modification Procedure

1. Modify the MOTHER board MB-14A as follow.
Connect the shield wire between AE-03/CN332 pin-38A and SP3 (CN314 pin-9B).

MOTHER (MB-14A) board
— Solder Side —



2. Modify the VM-01 board as follows.

R106	100Ω	→	OPEN
R107	51Ω	→	SHORT
R108	51Ω	→	Change to 1K (1-246-783-00).
C58	47μF 16V	→	SHORT

2-15. SELECTION OF TIME CODE OUTPUT BY TAPE/EE SELECT SWITCH

When the BKH-2015A (TC-14A board) is installed in the BVH-2000/2180 and S4 on the TC-14A board is set to REGEN, the slave-locked time code signal is only outputted to the TIME CODE OUT connector. When set the jumper plug on board AE-03 to JP2 (PB/EE) from JP1 (REGEN), the output of the TIME CODE OUT connector can be selected only in the playback mode by the TAPE/EE select switch as follows.

TAPE/EE select switch	TIME CODE OUTPUT signal
TAPE:	Time code read from the tape
TAPE/EE:	Slave-Locked Time Code
INPUT:	Slave-Locked Time Code

Modification Procedure

AE-03 board

Change the jumper plug from JP1 (REGEN) to JP2 (PB/EE).

SECTION 3 PERIODIC CHECK AND MAINTENANCE

3-1. PERIODIC CHECK ITEM AND PERIOD

A. Following table shows standard period of cleaning, confirmation, adjustment and replacement of the principal parts.

B. If you cannot find the part, see the page of section-D in the manual of Vol. 3 for NTSC, PM/VOL. 4 for PS.

C. The part marked with † is not required to replace as a single part because it is included in the assembly above of the arrow mark †.

Note 1: The "time" described here is the integrated time of the head hours meter. When the machine is used as table-top type, sum up time indicated by the head hours meter every replacement of the upper drum or the head drum assembly.

Note 2: Only the latest part number is described here. When ordering a part, see the page of section D in volume 3 (for NTSC/PM) /volume 4 (for PS), referring to the section of the replacement procedure that corresponds to the part.


BLOCK NAME OR PART NAME		PARTNUMBER	PAGE OF SECTION D	DAILY	2500 HOURS	5000 HOURS	7500 HOURS	10000 HOURS	12500 HOURS	15000 HOURS	REMARKS
TAPE PATH BLOCK				CLN	ADJ	ADJ	ADJ	ADJ	ADJ	ADJ	Refer to section 3-2 for cleaning and section 3-24-2 for adjustment.
BEARINGS OF GUIDE ROLLER 1, 2		3-656-948-00	D-21—D22		RPL	RPL	RPL	RPL	RPL	RPL	After replacement, refer to section 3-24-2 for the tape running adjustment.
MOVABLE GUIDE ASSY		A-6046-034-B	D-27, D-28	CLN				RPL			Refer to section 3-6 for replacement and to section 3-24-1 for adjustment.
ENTRANCE SLANT GUIDE ASSY		A-6046-037-C	D-27, D-28	CLN		RPL		†		RPL	Replace in accordance with section 3-8.
EXIT SLANT GUIDE ASSY		A-6046-035-A	D-27, D-28	CLN		RPL		†		RPL	Replace in accordance with section 3-8.
REED SWITCH ON THE TH-03 BOARD		1-552-180-00	D-27, D-28		RPL	RPL	RPL	†	RPL	RPL	Refer to section 3-23-2 for replacement.
TAPERED GUIDE		3-673-725-00	D-27, D-28	CLN	RPL	RPL	RPL	†	RPL	RPL	After replacement, verify RF waveform in accordance with section 3-4.
IP ROLLER SHAFT ASSY		A-6046-027-E	D-27, D-28	CLN		RPL		RPL		RPL	
BEARINGS OF IP ROLLER SHAFT ASSY		3-659-213-00	D-31, D-32		RPL	†	RPL	†	RPL	†	
IP DRIVING ASSY		A-6037-022-A	D-35, D-36				RPL			RPL	
DRUM BLOCK				CLN							Refer to section 3-2.
DEMAGNETIZING OF HEADS											When required, demagnetize the heads referring to section 3-3.
TRACKING CHECK											Every 250 hours, verify that the RF waveform satisfies the specified value referring to section 3-4. If not, perform the adjustment in accordance with section 3-24-5.
HEAD DRUM ASSY	(NTSC 02, PM 02)	A-6050-147-A	D-23—D-24	CLN		RPL		RPL		RPL	Replace in accordance with section 3-6. After replacement, perform the adjustment in accordance with the flowchart shown in section 3-24-1.
	(PS 02, 04)	A-6050-148-A									
	(NTSC 00, PM 00)	A-6050-158-A									
	(PS 00)	A-6050-160-A									
UPPER DRUM ASSY	(NTSC 02, PM 02)	A-6052-046-A	D-23—D-24	CLN							Check the head projection every 500 hours. If necessary, replace the upper drum.
	(PS 02, PS 04)	A-6052-047-A									
	(NTSC 00, PM 00)	A-6052-054-A									
	(PS 00)	A-6052-055-A									
SLIP RING and BRUSH		A-6709-428-A A-6709-429-B	D-23—D-24		RPL	†	RPL	†	RPL	†	Only 02, 04 models. Clean them when required. And perform cleaning and replacement in accordance with section 3-7.
REEL TABLE BLOCK											
REEL STOPPER PIN		3-673-680-00	D-17—D-18			RPL		RPL		RPL	After replacement, verify the height of the reel table in accordance with section 3-24-2.
REEL CLAW ASSY		X-3651-315-0	D-17—D-18			RPL		RPL		RPL	If reel table has been removed when the reel claw assy is replaced, verify the height of the reel table in accordance with section 3-24-2.
BRAKE BAND		X-3673-601-0	D-17—D-18		RPL	RPL	RPL	RPL	RPL	RPL	Replace in accordance with section 3-10.
BRAKE SOLENOID		1-454-304-00	D-17—D-18				RPL			RPL	Replace in accordance with section 3-11.
S REEL MOTOR		8-838-028-01	D-17—D-18				RPL			RPL	Replace in accordance with section 3-9-1.
T REEL MOTOR		8-838-028-11	D-17—D-18				RPL			RPL	Replace in accordance with section 3-9-2.
MECHANICAL BRAKE					ADJ	ADJ	ADJ	ADJ	ADJ	ADJ	Refer to section 3-9 for the brake torque adjustment.

CLN: cleaning, CFM: confirmation, ADJ: adjustment, RPL: replacement

BLOCK NAME OR PART NAME	PART NUMBER	PAGE OF SECTION D	DAILY	2500 HOURS	5000 HOURS	7500 HOURS	10000 HOURS	12500 HOURS	15000 HOURS	REMARKS
TENSION ARM BLOCK										
S-TENSION ARM ASSY	A-6042-018-B	D-21—D-22	CLN			RPL			RPL	Replace in accordance with section 3-12.
T-TENSION ARM ASSY	A-6042-019-A	D-21—D-22	CLN			RPL			RPL	Replace in accordance with section 3-13.
BEARINGS OF T-TENSION ARM	3-659-213-00	D-21—D-22		RPL	RPL	1	RPL	RPL	1	
AIR DAMPER	3-673-614-00	D-21—D-22		ADJ	ADJ	1	ADJ	ADJ	1	
CAPSTAN BLOCK										
PINCH ROLLER	3-656-909-02	D-29, D-30	CLN	RPL	RPL	RPL	RPL	RPL	RPL	Replace in accordance with section 3-18.
BEARINGS OF PINCH ROLLER	3-656-913-00	D-29, D-30		RPL	RPL	RPL	RPL	RPL	RPL	Replace referring to section 3-18.
SOLENOID OF PINCH ROLLER	1-454-305-00	D-29, D-30			ADJ	RPL		ADJ	RPL	Replace in accordance with section 3-19.
JOINT PIN OF PLUNGER	3-673-748-00	D-29, D-30			RPL		RPL		RPL	Replace referring to section 3-19.
CAPSTAN MOTOR	8-838-029-01	D-29, D-30	CLN		RPL		RPL		RPL	Replace in accordance with section 3-17.
MINI TENSION ARM ASSY	X-3673-669-0	D-29, D-30	CLN							When required, replace in accordance with section 3-15.
SOLENOID OF MINI TENSION ARM	1-454-263-21	D-29, D-30				RPL			RPL	Replace in accordance with section 3-16.
STATIONARY HEAD BLOCK										
DEMAGNETIZING OF HEADS			CLN							When required, demagnetize the head referring to section 3-3.
AUDIO R/P HEAD (FOR 00, 02)	8-825-737-10	D-31, D-32	CLN	RPL	RPL	RPL	RPL	RPL	RPL	Replace in accordance with section 3-20. After replacement, perform the adjustment in accordance with the flowchart in section 3-24-1.
(FOR PS 04)	8-825-737-60									
AUDIO MONITOR HEAD (FOR 02)	8-825-737-20	D-31, D-32	CLN	RPL	RPL	RPL	RPL	RPL	RPL	Replace in accordance with section 3-21. After replacement, perform the adjustment in accordance with the flowchart in section 3-24-1.
(FOR PS 04)	8-825-737-70									
AUDIO ERASE HEAD (FOR 00, 02)	8-825-725-50	D-31, D-32	CLN							When required, replace in accordance with section 3-22.
(FOR PS 04)	8-825-725-70									
HD-07 BOARD (FOR 00, 02)	1-606-680-00	D-31, D-32		RPL	RPL	RPL	RPL	RPL	RPL	
(FOR PS 04)	1-606-681-00									
DUMMY GUIDE (FOR 00)	3-674-665-00	D-31, D-32	CLN	RPL	RPL	RPL	RPL	RPL	RPL	
TIMER ROLLER BLOCK										
ROLLER ASSY (FOR NTSC, PM)	A-6045-018-C	D-21, D-22	CLN	RPL	RPL	RPL	RPL	RPL	RPL	Replace in accordance with section 3-23-1.
(FOR PS)	A-6045-019-C									
BEARINGS OF TIMER ROLLER	3-651-607-00	D-21, D-22		RPL	RPL	RPL	RPL	RPL	RPL	Refer to section 3-23-1 for replacement.
FAN MOTOR (POWER BLOCK)	1-541-203-00	D-5—D-6				RPL			RPL	
FAN MOTOR (POWER BLOCK)	1-541-170-21	D-5—D-6				RPL			RPL	
FAN MOTOR (UPPER SIDE AND MIDDLE)	1-541-170-21	D-35, D-36			RPL		RPL		RPL	
POWER SWITCH	1-554-066-00	D-15—D-16				RPL			RPL	

CLN: cleaning, CFM: confirmation, ADJ: adjustment, RPL: replacement

3-2. CLEANING

1. Clean the surface of the parts shown with  in Fig. 3-1 with cleaning piece or cotton swab moistened with cleaning fluid (for example, FREON 113).

NOTE 1: Open the movable guide, and clean the guide posts and guide flanges sufficiently. If tape chips or back coating material of tape stick to the guide pins of the entrance or exit slant guides, the tape may be cut during operation.

NOTE 2: BVH-2000/PS 00 and 10 models have the guide post 2 instead of the audio/CTL monitor head but if has not the mini tension arm.

NOTE 3: With the power off, clean the rotary heads.

NOTE 4: Clean the rotary heads in the direction of their rotation and never clean them vertically. Do not use a cotton swab for head cleaning.

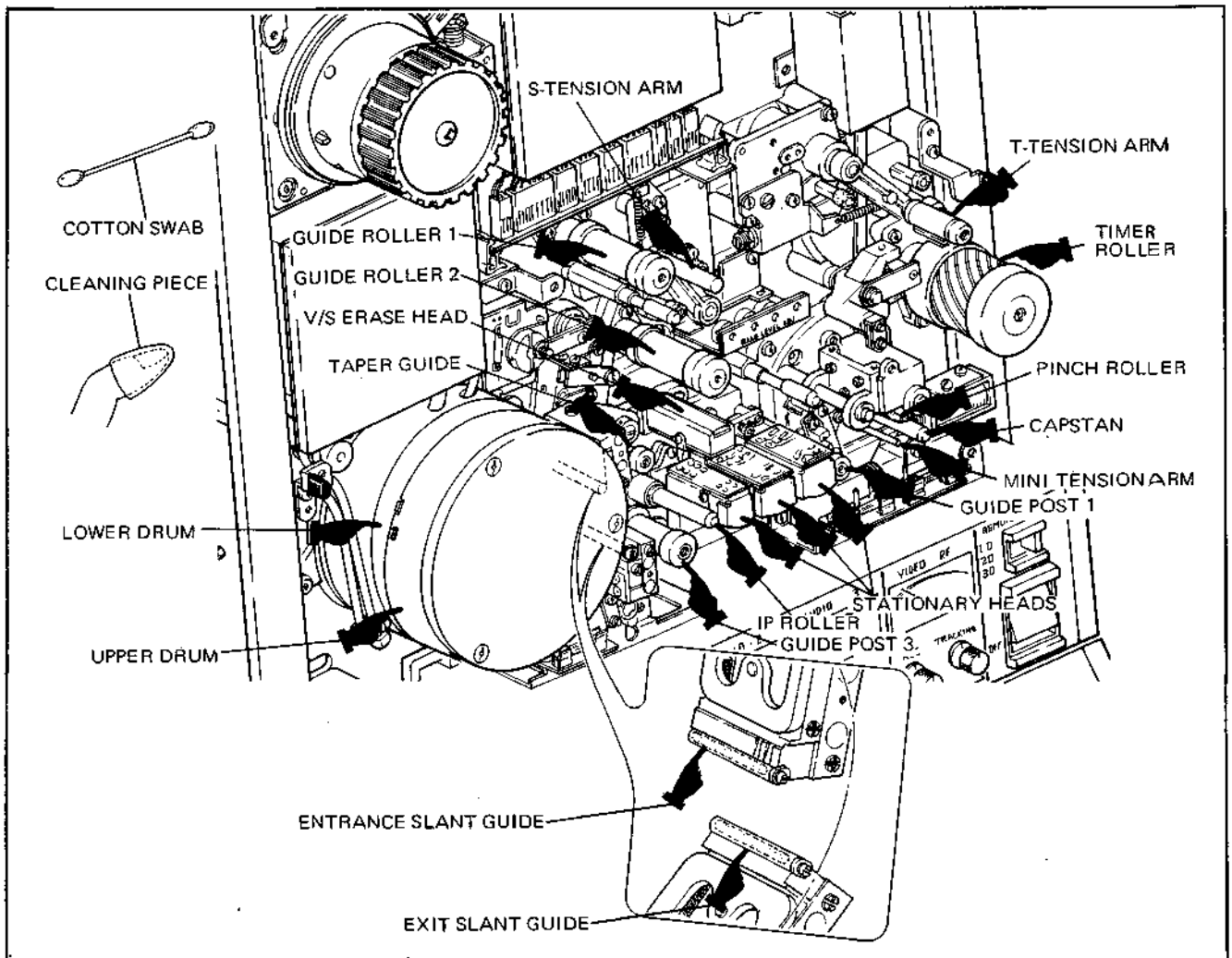


Fig. 3-1. Cleaning of the Surfaces of Guides and Heads on the Tape Path

3-3. DEMAGNETIZING OF HEADS

If the moiré of video signal or the audio signal distortion exceeds the allowable limit, demagnetize the rotary heads or stationary heads shown in Fig. 3-2 with the demagnetizer (SONY HE-4).

Bring the tip of the demagnetizer as close as possible to the head without contacting it. Withdraw the demagnetizer slowly and turn off the demagnetizer when it is at least one meter away from the head.

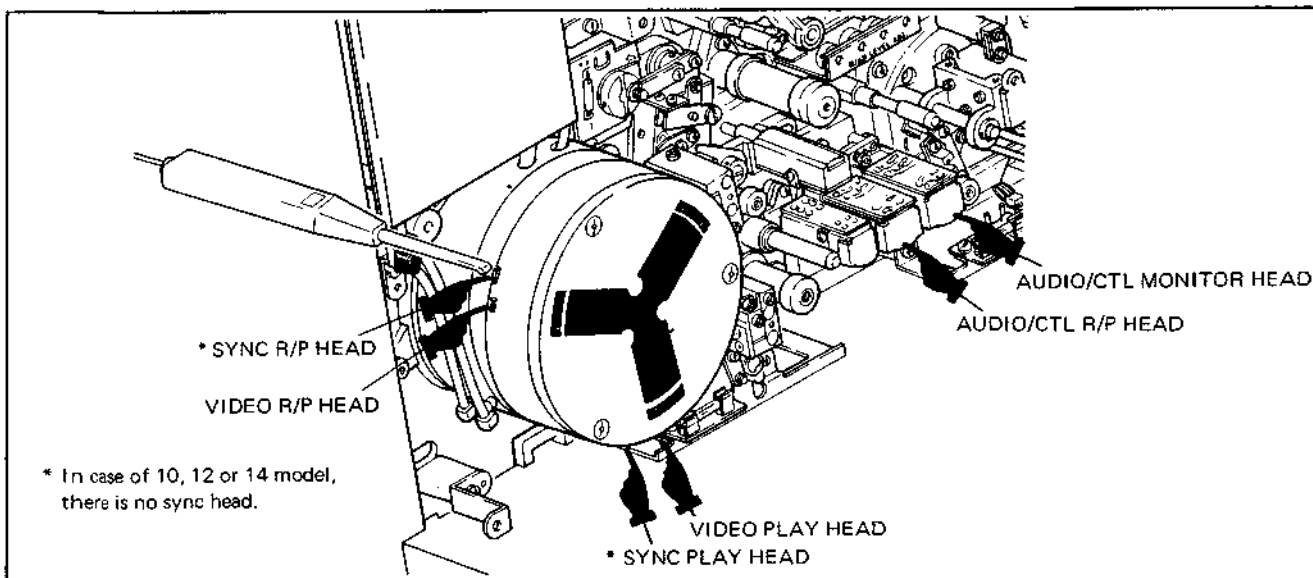


Fig. 3-2. Demagnetizing of Heads

3-4. TRACKING CHECK

1. Set the HEAD selector to R/P.
2. Connect the oscilloscope to TP1 and TP2 on EQ-02 board. (In case of 10 or 12 model, only TP1 is checked.)
3. Play back the "WHITE" segment of the alignment tape, and check that the RF envelope is within the specified values shown in Fig. 3-3. If not, perform the tracking adjustment.
4. Pull and turn the TRACKING control in both directions and check that the RF waveform maintains almost flat envelope while the amplitude increases and decreases. If necessary, perform the tracking adjustment.
5. Turn the TRACKING control for the maximum RF amplitude. Push the knob and check that the RF waveform does not change. If it changes, perform the CTL head position adjustment.

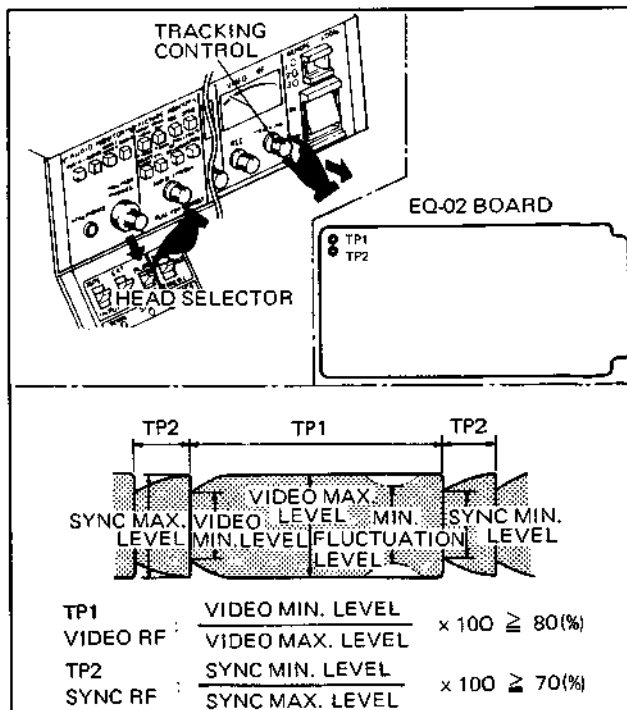


Fig. 3-3. Tracking Check

3-5. HEAD PROJECTION CHECK AND UPPER DRUM REPLACEMENT

- A. The normal operating time of the rotary heads mounted on the upper drum is guaranteed for 500 hours.
- B. If the head projection is less than $50\ \mu\text{m}$, we recommend to replace the upper drum.
- C. The drum eccentricity gauge is used for measuring the head projection.
Sony Part No. J-6250-800-A
- D. Before measuring the head projection or before adjusting the eccentricity of the upper drum, clean the cylindrical surface and the tip of the white pin inserted in measurement arm of the gauge for keeping the heads from damage.

CHECK

1. Remove the drum panel.
2. Confirm that the tip of the dial gauge probe is at the center of the white plastic pin inserted in the measurement arm. If it is not at the center, adjust the dial gauge probe by moving it as shown in Fig. 3-4.
3. Turn the zero adjustment knob full counterclockwise.
4. Press the stopper of the gauge against the lower drum and tighten the fixing knob.
5. To measure the projection of video head, move the gauge in A direction shown in Fig. 3-5 and move it in B or C direction so that half of the dot is hidden. Then turn the gauge slowly back toward the drum.
6. Turn the upper drum by hand so as to bring the video head close to the white pin of the gauge. Never touch the head to the pin.
7. Adjust the zero adjustment knob so that the gauge indicates zero.
8. Confirm that the projection of video R/P head and video PLAY head is more than $50\ \mu\text{m}$. If the projection of either head is less than $50\ \mu\text{m}$, we recommend to replace the upper drum.
9. (Except for 10, 12 and 14 models)
To measure the projection of sync head, move the gauge in A direction shown in Fig. 3-5 and move it in B direction until it stops. Then turn the gauge slowly back toward the drum. Measure the head projection as steps 6 to 8.
If the projection of either head is less than $50\ \mu\text{m}$, we recommend to replace the upper drum.

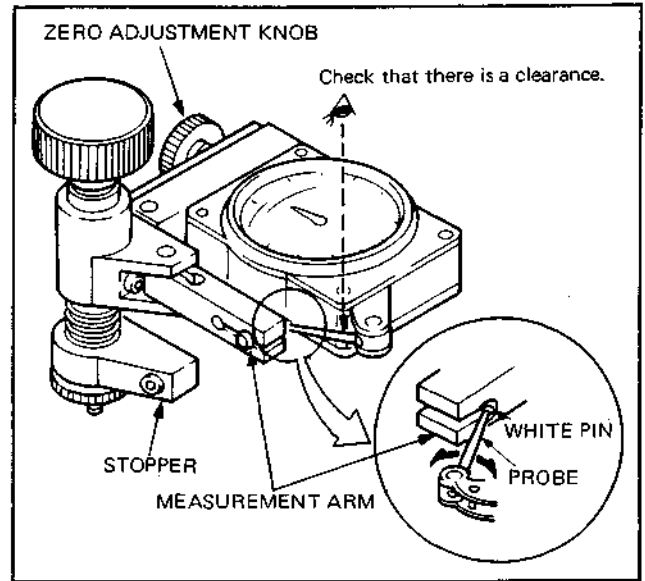


Fig. 3-4. Upper Drum Eccentricity Adj. Gauge

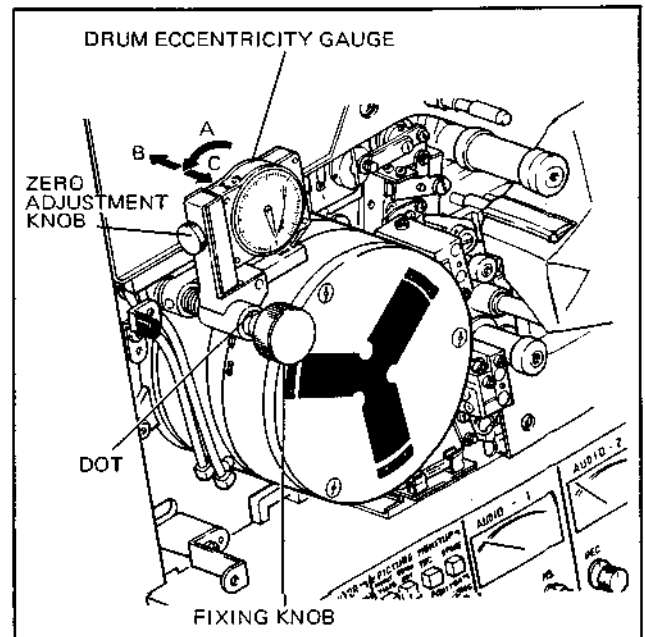


Fig. 3-5. Head Projection Measurement

10. Turn the zero adjustment screw full counterclockwise and remove the gauge.
11. If it is not necessary to replace the upper drum, mount the drum panel.
If necessary, perform the following procedures.

UPPER DRUM REPLACEMENT

1. Remove the three screws securing the upper drum lid.
2. Remove the three screws securing DR-13 board (except for 00 and 10 models) or DR-20 board (for 00 and 10 models).
3. Remove the two screws securing the upper drum.
4. Clean the following parts with cloth moistened with cleaning fluid. Refer to Fig. 3-6.
 - a. Lower drum flange
 - b. Surface of lower drum come in contact with tape on the lower drum
 - c. Entrance and exit slant guides and guide flanges
 - d. Bottom of the upper drum

5. Match the head mark of DR-14 board on the upper drum to the mark of DR-15 board on the lower drum flange. Mount the upper drum by tightening two tapered shaft screws alternately.

**NOTE: tapered shaft screw
SONY Part No. J-6040-460-A**

6. Remove the tapered shaft screw near the video head and fix the upper drum with a C4x14 screw, a flat washer and a spring washer and also replace the other tapered shaft screw with a C4x14 screw, a flat washer and a spring washer.
7. Loosen two screws tightened in step 6 1/2 or 1 turn.
8. Check that the tip of the dial gauge probe is at the center of the white plastic pin inserted in the measurement arm as shown in Fig. 3-4.
9. Turn the zero adjustment knob full counterclockwise.
10. Press the stopper of the gauge against the lower drum and tighten the fixing knob on the position shown in Fig. 3-7.

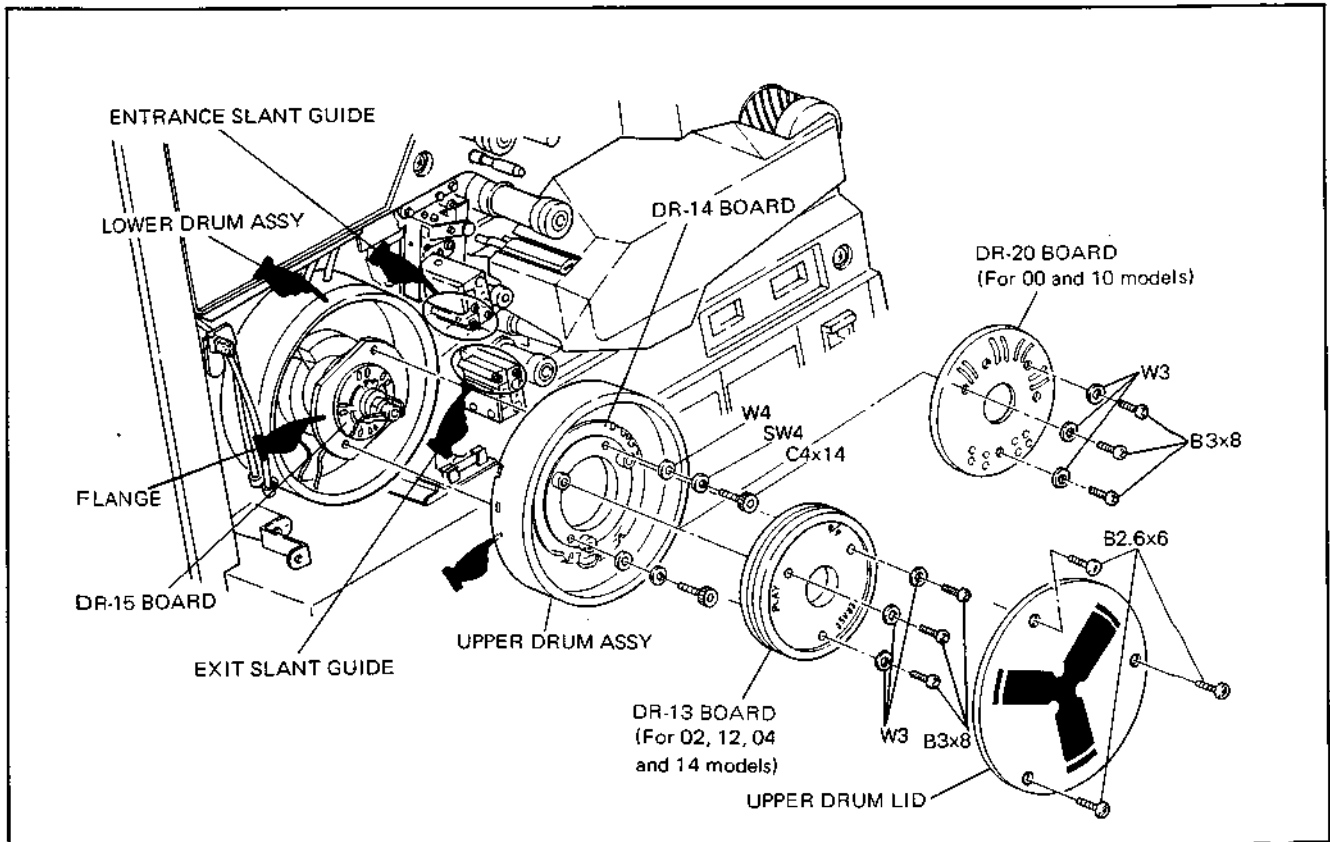


Fig. 3-6. Replacement of Upper Drum Assembly

11. Turn the gauge in A direction as shown in Fig. 3-7 and move it in B direction until it stops. Then turn the gauge slowly back toward the drum.
12. Adjust the zero adjustment knob so that the gauge indicates zero.
13. Slowly rotate the upper drum clockwise and confirm that the swing of the needle is within $3\ \mu\text{m}$. If the swing of the needle is over $3\ \mu\text{m}$, adjust as follows.
 - a. Rotate the upper drum slowly by hand and stop at the position where the gauge shows the maximum value.
 - b. With a screwdriver handle or nylon hammer, lightly tap the inside of the upper drum opposite to the gauge until the gauge reading is about $1/3$ of the maximum value.

CAUTION: Do not tap the outside of the upper drum.

 - c. Rotate the upper drum slowly by hand. Confirm that the swing of the needle is within $3\ \mu\text{m}$. If the swing of the needle is over $3\ \mu\text{m}$, repeat steps a, b and c, until the swing of the needle is within $3\ \mu\text{m}$.

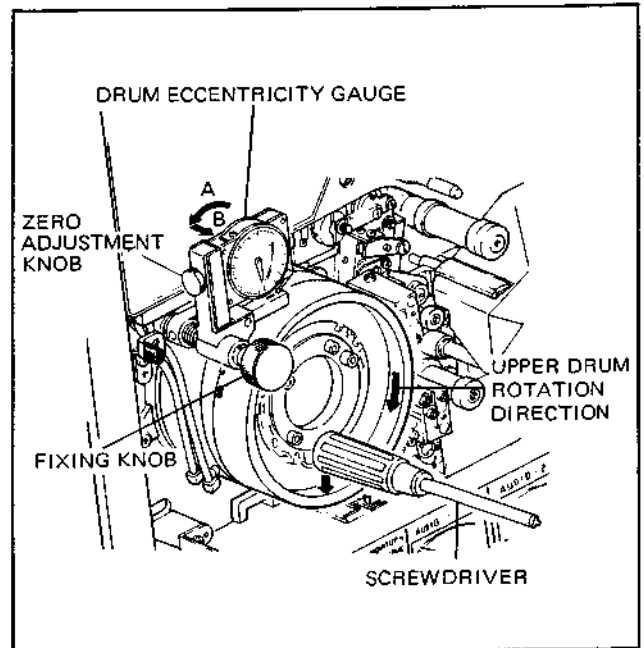


Fig. 3-7. Upper Drum Eccentricity Adjustment

14. Tighten the two screws securing the upper drum alternately. Turning the upper drum by hand, confirm that the swing of the needle is always within $3\ \mu\text{m}$.
15. Turn the zero adjustment knob full counterclockwise, and remove the gauge.
16. Clean the contacts of each boards of DR-14, DR-15 and DR-13 or DR-20 with clean and dry cloth.
17. For 00 and 10 models, fix DR-20 board with three screws so that the head names of DR-20 board correspond to that of DR-15 board.
18. For 02, 12, 04 and 14 models, place DR-13 board so that the head name of DR-13 board correspond to that of DR-15 board, And after confirming that the brassy ring of the DR-14 board is put on the lower drum flange steadily, fix DR-13 board with the three screws securely.
19. Place the upper drum lid so that the head marks of the drum lid are directly over that of DR-13 or DR-20 boards.
20. Replace the head hours meter with new one which is supplied with the upper drum assembly.
21. Install the drum panel.
22. Perform the adjustments of the flowchart in Section 3-24-1.

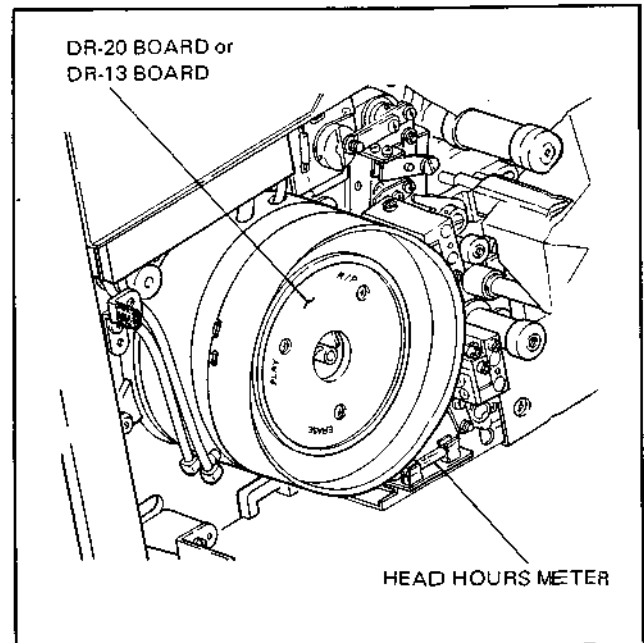


Fig. 3-8. Installation of DR-13 Board

3-6. REPLACEMENT OF THE HEAD DRUM ASSEMBLY

Preliminary Information

- A. Replacement of the head drum assembly is required in the following cases.
- ① When a correct RF waveform can not be obtained by tracking adjustment because of wear or damage of the tape guide.
 - ② When the deterioration of the video signal or the audio signal because of wear of the bearing of the rotor no longer can be tolerated.
- B. When it is not long since the upper drum assembly was replaced, if the life of the video heads still remains, only the lower drum assembly can be replaced (refer to section 6-4).
- C. After replacing the head drum assembly, keep the movable guide closing and confirm that the clearance between the upper drum and the movable guide is 50 μ m or more.
- D. After confirming the above item C, adjust the rotating speed of the head drum when the drum is controlled only by the analog velocity loop of the drum servo system.
- E. After performing the above items C and D, adjust each item according to the flowchart in section 3-24-1.
- F. The power must be OFF during the replacement.

Removal

1. Remove the stationary head cover, the drum panel, and the reel panel.
2. Move to the rear of the machine, pull the connectors CN117, CN114, and CN112 from the DA-07 board, and pull out the connectors CN291 (except for 00/10 models) and CN292 from the drum motor.
3. Go to the front, remove the shield cover of the RP-09 board, and pull out the connectors CN263, CN265, (for 00/02/04 models) CN267, and CN269.
4. For 02/04/12/14 models or BVH-2500/P, pull out the connectors CN271 and CN272 (except for 10, 12 and 14 models) from the head drum assembly.
5. When the entrance and exit slant guides are closed, turn the threading motor with a flat-blade screwdriver to open the slant guides.
6. Slightly loosen the four screws securing the movable guide assembly, and push the assembly in the direction opposite to the head drum assembly, and keep the drum stopper pin apart from the head drum assembly.
7. Remove the three screws securing the drum lid.
8. While holding the head drum assembly securely, remove the three screws and pull out the head drum assembly not to hit against the slant guide.
9. Place the removed head drum assembly with the upper drum down, and remove the three screws securing the drum slant base.

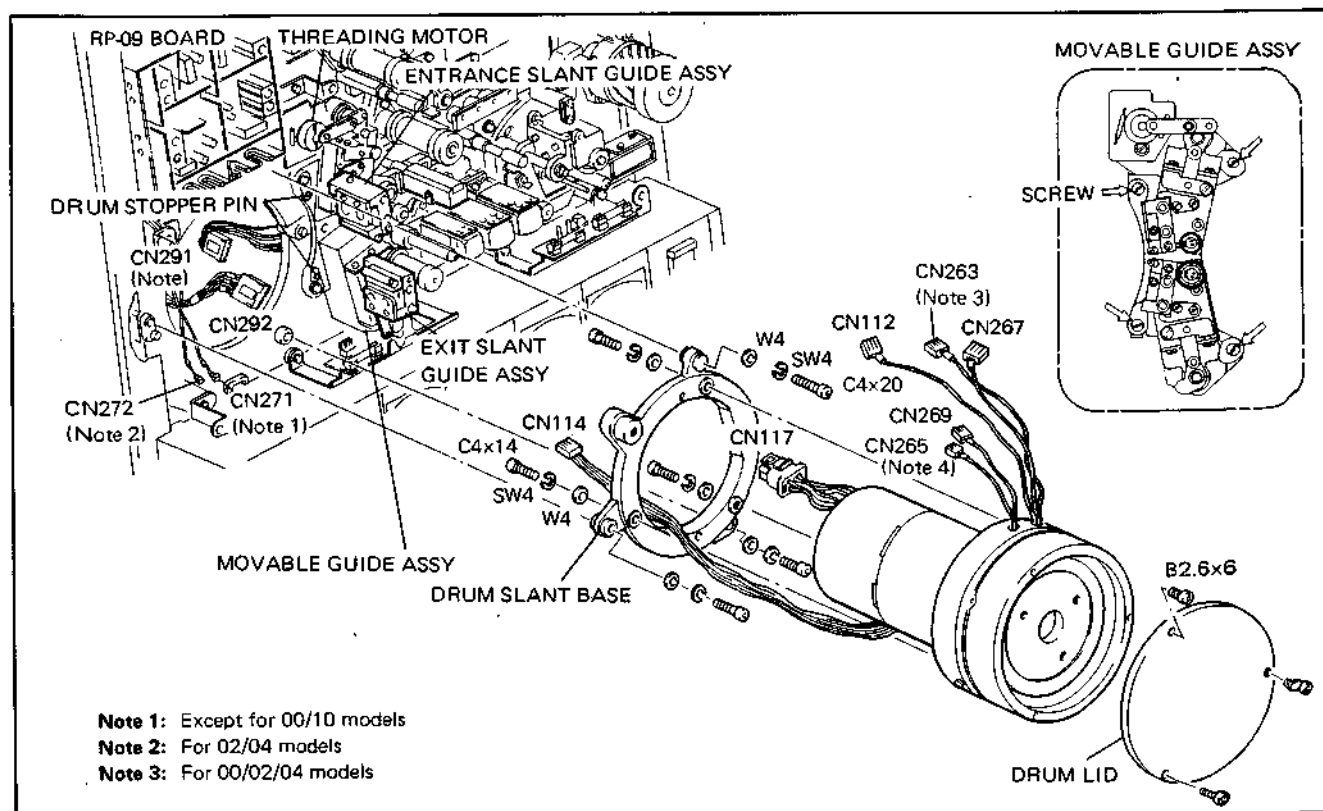


Fig. 3-9. Removal of the Head Drum Assembly

Cleaning

10. Wipe the following parts with a clean cloth moistened with cleaning fluid.
 - a. The parts of the entrance and exit slant guides facing the drum.
 - b. The upper surface of the boss on which the head drum assembly was installed.
 - c. The surface of the new head drum coming in contact with the tape.

Note: If alcohol was used as cleaning fluid, after cleaning, wipe the parts with a soft and dry cloth again.

Installation

11. Place the new head drum assembly on a soft cloth so that the upper drum side of the assembly is down.
12. Refer to Fig. 3-9, and fix the drum slant base removed from the old head drum assembly with the three screws (C4×14) via the washers (W4) and the spring washers (SW4) to the new head drum assembly.
13. Pass the connectors CN114 and CN117 through the hole in the base plate to the rear. Hold the head drum assembly securely as shown in Fig. 3-10, match the guide hole of the drum slant base with the pin (A), and then push the part B of the drum slant base against the pin (B). Confirming that the slant base and the bosses on the base plate fit perfectly and fix with the three screws (C4×20) via the washers (W4), and the spring washers (SW4).

Note: Take sufficient care that the head drum assembly does not hit against the slant guide assembly.

14. Plug the connectors CN263, CN265, CN267 and CN269 at their specified positions on the RP-09 board.
15. Plug the connectors CN271 and CN272 at the positions shown in Fig. 3-10.
16. Pass the connector CN112 through the hole shown in Fig. 3-10 to the rear of the base plate.
17. Go to the rear of the machine, and plug the connectors CN117, CN114 and CN112 at their specified positions on the DA-07 board.
18. Plug the connectors CN291 and CN292 at their specified positions at the rear of the drum.
19. Place the drum lid so that the head name written on the drum lid are directly over the same head name on the board cover inside the upper drum. Confirm that the drum lid fits in the upper drum firmly, and fix it with the three screws (B2.6×6).
20. While pushing the movable guide assembly in both directions of the head drum assembly and the eccentric stopper shown in Fig. 3-10 simultaneously, tighten the four screws securely.
21. Replace the head hours meter with new one.

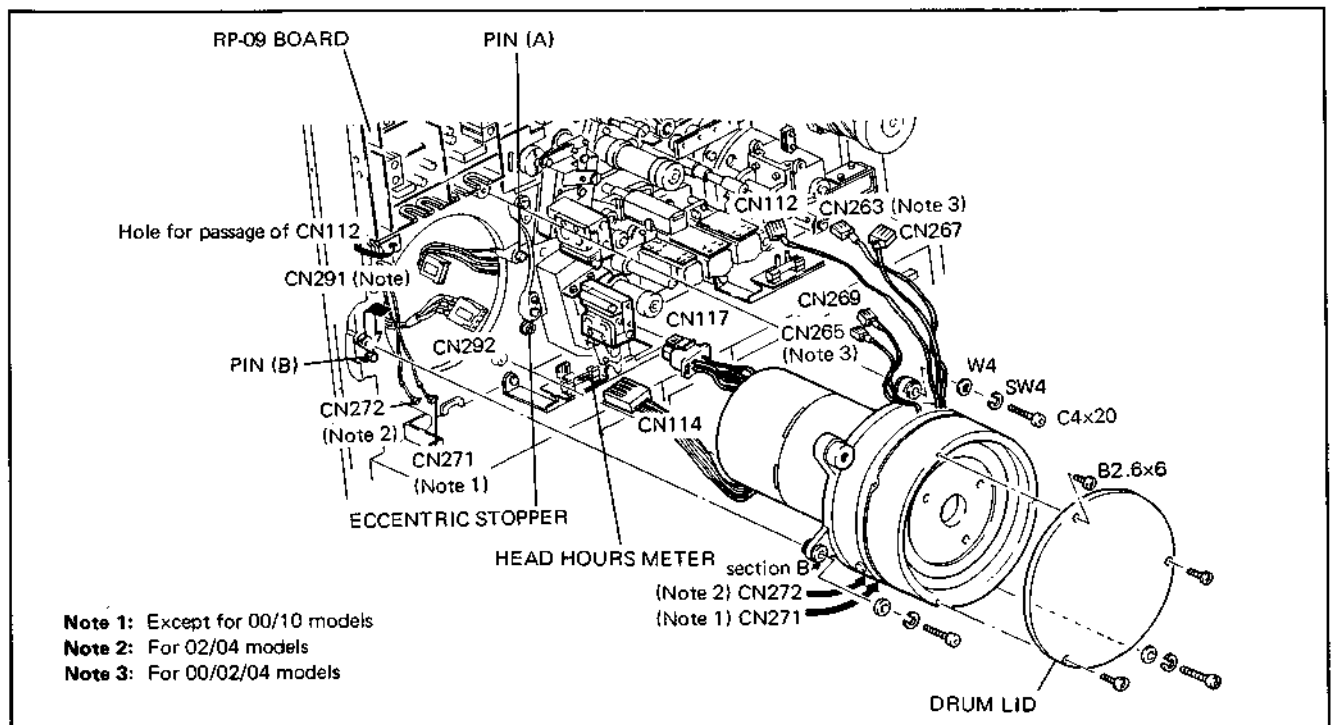


Fig. 3-10. Installation of the Head Drum Assembly

Clearance Confirmation

22. Insert a 50- μ m-thick paper (or video tape folded in two) between the upper drum and movable guide including the guide flanges.
23. Turn the threading motor with a flat-blade screwdriver to close the movable guide.
24. Confirm smooth movement of the paper.

Drum Speed Adjustment

25. Turn on the power.
26. Set S4 (TEST 1) switch on the CD-17 board to position "D", and depress S7 (ENTRY) switch for at least 0.5 sec.
Note: By this procedure, the drum motor will be controlled by the analog velocity loop. To release this test condition, carry out one of the following operations.
 - a. Turn off the power.
 - b. Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec.
 - c. Depress the switch S3 (TEST) on the SY-79 board.
27. Set the machine in STANDBY mode, and confirm that either of the following is displayed or they are displayed alternately on the display element ND1 on the SV-43 board. If different numbers are displayed, adjust RV4 on the CD-17 board.

FD, FE, FF, 00, 01, 02

28. Turn off the power to release the test mode.
29. Mount the reel panel, the stationary head cover, and the drum panel.
30. Perform the tape path adjustment in accordance with the flowchart shown in section 3-24-1.

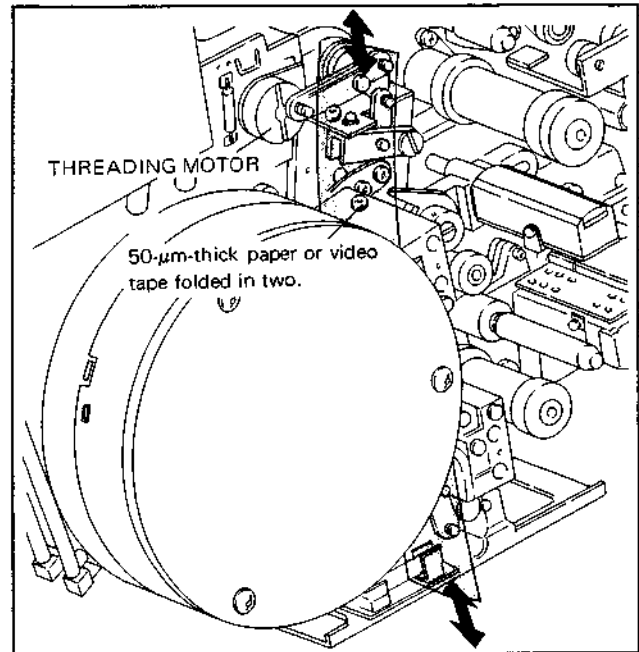


Fig. 3-11. Gap Confirmation

PERIODIC CHECK & MAINTENANCE

3-7. SLIP RING AND BRUSH CLEANING AND REPLACEMENT (Except for 00 and 10 models)

Preliminary Information

- A. The slip ring and the brush of the head drum assembly do not require periodic cleaning. However, cleaning should be carried out when slip ring noise or white dots appear on the monitor.
- B. For the cleaning, prepare a soft short-haired brush. If no such brush should be available, prepare a cotton swab which the tip are squashed with a hammer etc.
- C. Cleaning liquid is not especially required, but FREON etc. should be used when cleaning is difficult.
- D. When the slip ring noise does not disappear even after cleaning, it is desirable to replace the slip ring and the brush at the same time.
- E. Do not apply conductive grease to the contact parts of slip ring and brush.
- F. As the brush bends very easily, it must be handled with sufficient care.

3-7-1. Cleaning of Slip Ring and Brush

Cleaning

1. Go to the rear of the machine and open the power supply block. Pull out the connector CN291 connected to the head drum assembly.
2. Loosen the three screws securing the rear cover to the head drum assembly sufficiently and remove the rear cover.
3. Loosen the screw securing the brush mounting block by 2 turns.
4. Turn the brush mounting block clockwise, until the brush comes completely out of the slip ring grooves and then pull out it.
5. Bring the prepared cleaning brush into contact with the slip ring grooves as shown in the following figure and clean while turning the rotor of the drum.
6. Use the cleaning brush to clean from the brush root on the SL-09 board to the tip.

Note: Do not move the cleaning brush in the opposite direction.

Brush Remounting and Pressure Adjustment

7. Mount the brush mounting block on the head drum assembly in the reverse order of step 4 and tighten the fixing screw so that the brush mounting block can be moved lightly.

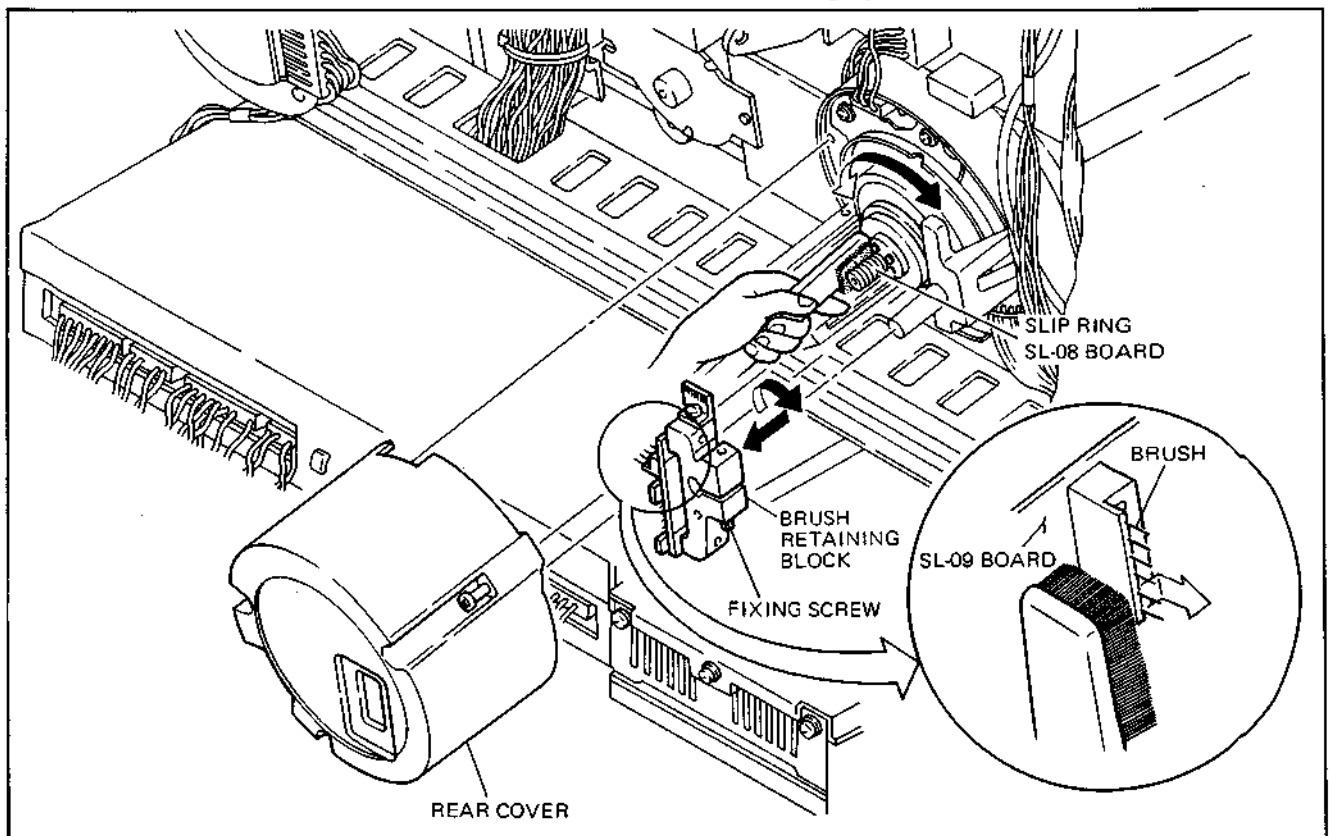


Fig. 3-12. Cleaning of Slip Ring and Brush

8. Turn the height adjustment screw shown in Fig. 3-14 so that the each brush comes to the center of each slip ring groove. And adjust the brush mounting block so that all brushes up to the last one contact the center of the slip ring grooves. At this time, Δ shows the point where the line marked on the brush base intersects the scale plate, move the brush retaining block to the position \blacktriangle next to Δ , and then tighten the screw.

Noise Check

9. Mount the rear cover, and plug the connector CN291 at the specified position.
10. Play back a recorded tape by the video PLAY head (for BVH-2000/2180/PS/PM) or by the DT head (for BVH-2500/P). And confirm that no slip ring noise appears on the monitor. If the noise still should appear, replace the SL-08 board (slip ring) and the SL-09 board (brush).

3-7-2. Slip Ring and Brush Replacement

Removal

1. Pull out the connector CN291 connected to the head drum assembly.
2. Sufficiently loosen the three screws securing the rear cover to the head drum assembly, and remove the rear cover.
3. Loosen the screw securing the brush mounting block by two turns. Turn the brush mounting block until the brush comes completely out of the grooves of the slip ring, and then pull out it.
4. Remove the SL-09 board from the brush mounting block and the SL-08 board from the head drum assembly.

Mounting and Pressure Adjustment

5. Mount the new SL-08 board with three screws (PS3x12) on the head drum assembly and mount the new SL-09 board with two screws (PS3x8) on the brush mounting block.
6. Mount the brush mounting block on the head drum assembly in the reverse order of step 3, and tighten the fixing screw so that the brush mounting block can be moved lightly.

Note: Take sufficient care not to hit the brush against the slip ring etc.

7. Turn the height adjustment screw shown in Fig. 3-14 so that the each brush comes to the center of each slip ring groove. And adjust the brush mounting block so that all brushes up to the last one contact the center of the slip ring grooves. At this time, Δ show the point where the line marked on the brush base intersects the scale shown in Fig. 3-13, move the brush mounting block to the position \blacktriangle next to Δ , and then tighten the screw.
8. Mount the rear cover, and plug the connector CN291 at the specified position.

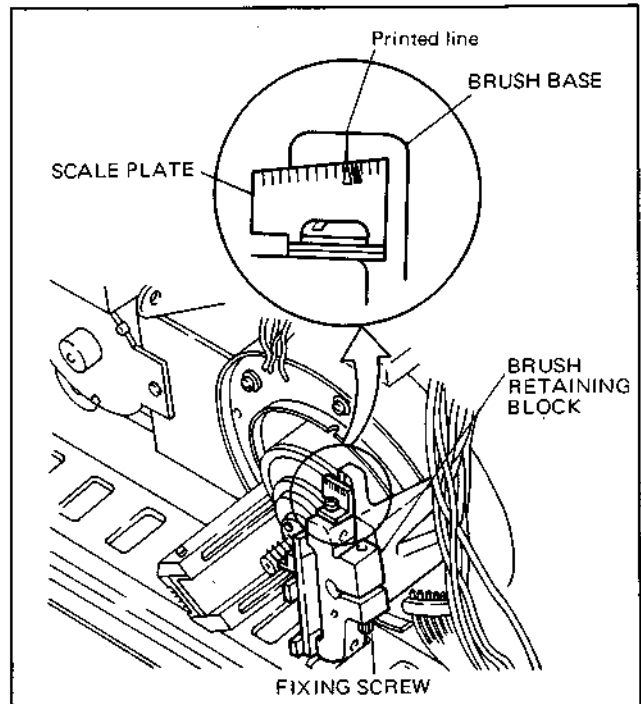


Fig. 3-13. Brush Pressure Adjustment

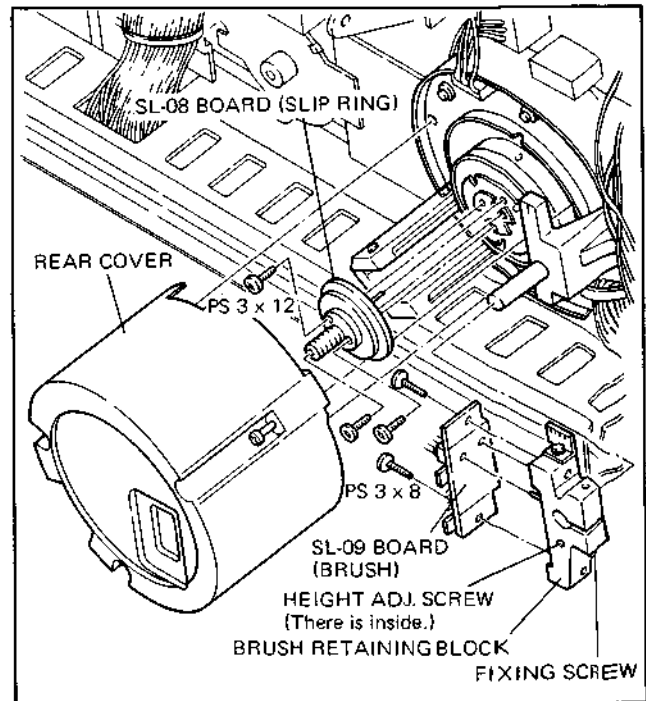


Fig. 3-14. Replacement of Slip Ring and Brush

3-8. REPLACEMENT OF THE SLANT GUIDE ASSEMBLY

Preliminary Information

- A. When the guide post of the entrance or exit slant guide assembly has worn out, only the guide post can be replaced (see section 6-6), but the special mounting fixture for replacement is required.
- B. For prevention of damage to the rotary heads on the upper drum, and in order to hold the overlap for the RF waveform at the time of mounting, mount so that the clearance between the upper drum and the entrance (or exit) slant guide assembly becomes the specified value.
- C. After replacement, perform the tape path alignment, according to the flowchart in section 3-24-1.

3-8-1. Replacement of Entrance Slant Guide Assembly

Removal

1. Turn off power. When the slant guide is closed, turn the threading motor with a flat-blade screwdriver to open the slant guide.
2. Remove the two screws holding the entrance slant guide assembly, and remove the fence.
3. Clean the surface on the slide base, on which the slant guide assembly was mounted, and the part of the tape contact surface of the lower drum, which was covered by this assembly.

Installation

4. Loosen the setscrew driven into the lower of the taper guide about three turns.
5. Lightly fix the new entrance slant guide assembly with two screws (C3×12) via washers (W3) and spring washers (SW3) as far as possible away from the upper drum.

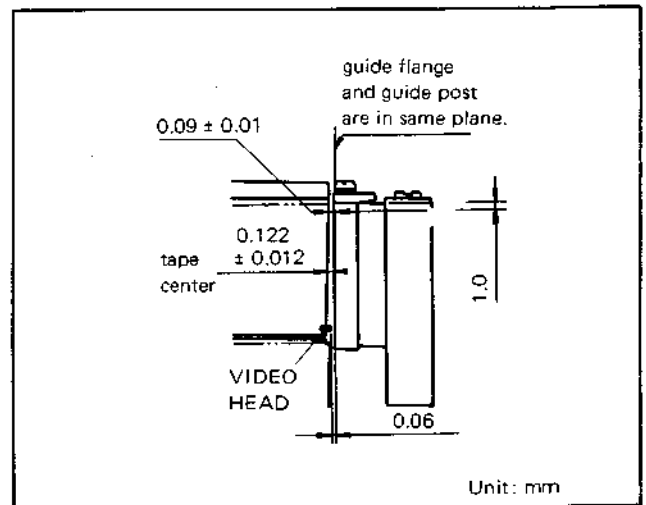


Fig. 3-15-1. Measurements near to Exit Slant Guide Assembly

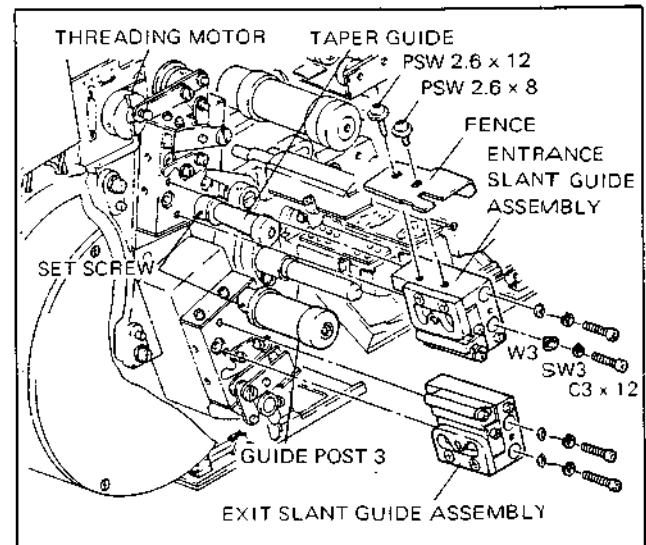


Fig. 3-15-2. Replacement of the Slant Guide Assembly

6. Turn the rotary head of the upper drum to move it away from the slant guides, and stop it. Turn the threading motor with a flat-blade screwdriver to close the slant guides.

Note: Close the slant guides positively, taking sufficient care that the guide bracket (or the guide post) does not come into contact with the upper drum.
7. Insert the thickness gauge of 0.1 mm in thickness between the guide bracket of entrance slant guide assembly and the upper drum.

While holding the entrance slant guide assembly so that the assembly contacts with three points marked with ▲ in Fig. 3-16-1, tighten the two screws securely.
8. Reinstall the fence and adjust the position as follows.
 - ① While pushing the fence in the direction shown by arrow in Fig. 3-16-1 and also pushing it toward the lower drum so that the lower of the fence touches the cylinder of lower drum, and lightly fix the fence with two screws PSW 2.6 × 12 and PSW 2.6 × 8.
 - ② Adjust the setscrew so that the clearance between the upper drum and the fence is 0.15 ± 0.05 mm. After adjustment, securely tighten the screws which were tightened loosely in the former step.
 - ③ Confirm that the tip of the setscrew touches the entrance slant guide block, and glue the setscrew tightened in step 2 with adhesive like a retaining compound.
9. Open the slant guides, insert a 1 inch video tape folded to double thickness between the slant guides (including the guide flanges) and the upper drum, and confirm that the tape moves smoothly after closing the slant guides.
10. Perform the tape path adjustment according to the flowchart of section 3-24-1.

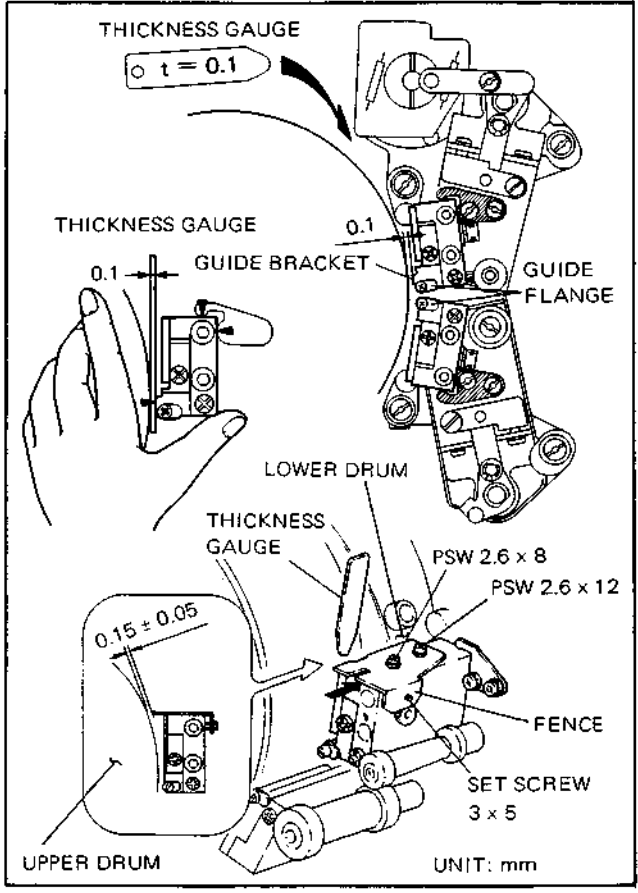


Fig. 3-16-1. Entrance Slant Guide Assy Position Adj.

3-8-2. Replacement of Exit Slant Guide Assembly

Removal

1. Turn off power. When the slant guide is closed, turn the threading motor with a flat-blade screwdriver to open the slant guide.
2. Remove the two screws holding the exit slant guide assembly.
3. Clean the surface on the slide base, on which the slant guide assembly was mounted, and the part of the tape contact surface of the lower drum, which was covered by this assembly.

Installation

4. Loosen the setscrew driven into the lower of the guide post 3 about three turns.
5. Lightly fix the new exit slant guide assembly with two screws (C3 × 12) via washers (W3) and spring washers (SW3) as far as possible away from the upper drum.
6. Turn the rotary head of the upper drum to move it away from the slant guides, and stop it. Turn the threading motor with a flat-blade screwdriver to close the slant guides.

Note: Close the slant guides positively, taking sufficient care that the guide post does not come into contact with the upper drum.

7. Insert the thickness gauge of 0.09 mm in thickness between upper drum and guide post as shown in the detail of Fig. 3-16-2.

While holding the exit slant guide assembly so that the assembly contacts with three points marked with ▲ in the figure, tighten the two screws securely.

8. Check that the thickness gauge of 0.08 mm in thickness passes through the position shown in the detail of Fig. 3-16-2, and also check that the thickness gauge of 0.10 mm in thickness does not pass.
9. Perform the tape path adjustment according to the folwchart of section 3-24-1.

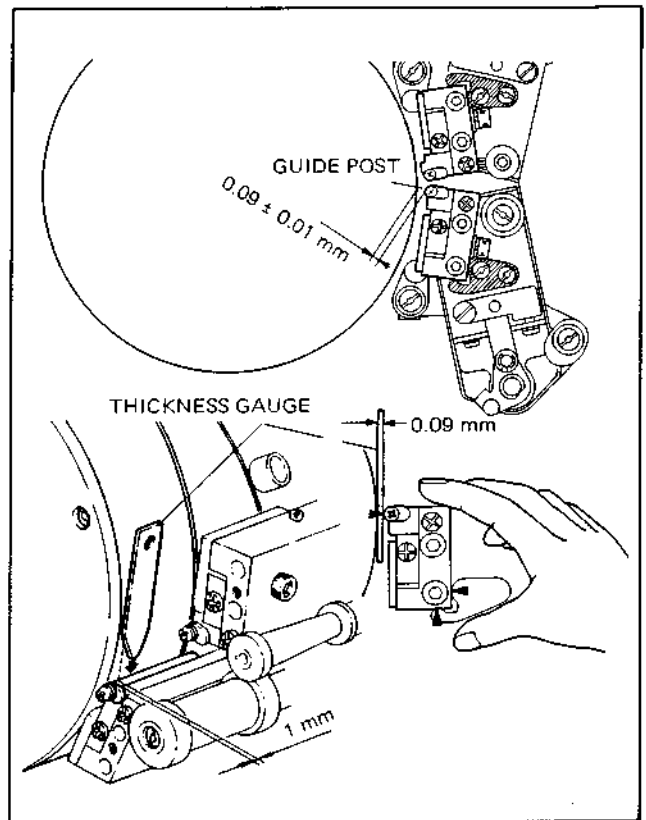
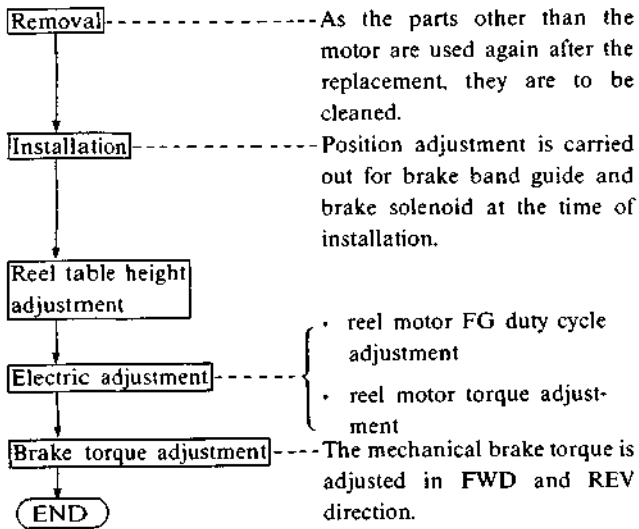


Fig. 3-16-2. Exit Slant Guide Assy Position Adj.

3-9. REEL MOTOR REPLACEMENT

A. Replacement and the subsequent adjustment are carried out as follows.



E. Prepare the following parts for the adjustment.

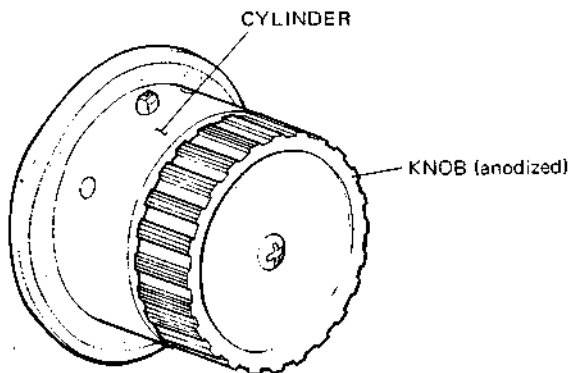
- ① Brake adjustment fixture: Sony part No. J-6043-720-A
For the brake band guide, brake solenoid and link stopper position adjustment.
- ② Thickness gauge: Sony part No. J-6041-670-A
For the link stopper adjustment.
- ③ Tape fully wound on to a 9-inch reel.
For the motor torque adjustment.

F. The T reel motor must not be used instead of the S reel motor.

B. The mechanical brake operates when the power has turned off during tape running or when no tape has been detected by tape sensor. Then the brake operate together with electro-magnetic brake. The synthesized brake force is displayed at ND1 on SV-43 board by setting the machine in test mode. The value indicates the deceleration of the reel rotation speed every unit time. The value shows that the higher the value is, the stronger the brake force is.

C. The reel table whose cylinder is made of nickel plated brass is installed originally. However the reel table has also another type, that is, the cylinder is made of aluminum alloy. Since each reel table differs in adjustment value, check the material of the cylinder before adjustment.

D. Distinction of reel-table knobs



- When the color of the knob and the cylinder is the same: the cylinder is anodized.
- When the color of the cylinder is different from that of the knob: The cylinder is nickel-plated.

3-9-1. S Reel Motor Replacement

Removal

1. Turn off the power, and remove the front panels. And then pull out the connector CN001 from TT-01 board.
2. Go to the rear of the machine, open the power supply block, and pull out the connectors CN209, CN206, and CN204 from the RA-05 board. As for CN209, remove the clamp holding its harness.
3. Loosen the two set screws ① shown in Fig. 3-17. While pushing the solenoid plunger by hand, pull out the reel table.
4. Remove the two E rings ②, and remove the brake band.
5. Remove the screw ③, and remove the brake solenoid assembly.
6. Remove each one end of the two springs applied between link stopper and brake links. Remove the E ring ④, and remove the brake links.
7. Remove the three screws ⑤, and remove the brake band guide.
8. Remove the three brake band posts ⑥.
9. Remove the set screw ⑦ and the brake post ⑧ securing the link stopper.
10. Remove the four screws ⑨, and remove the S reel motor.
11. Clean the surfaces of the bosses from which the motor has been removed and the removed parts.

Note: Take sufficient care not to bend the brake band.

Installation

12. Pass the three harnesses of the new reel motor through the hole in the base plate to the rear, and fix the reel motor with the four screws ⑨ (PSW4×16). Go to the rear of the machine, and plug the connectors CN204, CN206, and CN209 at their specified positions on the RA-05 board. Fix the harness of CN209 at the specified position.
13. Fix the link stopper with the brake post ⑧, and then tighten the screw ⑦ (PSW3×8).
14. Install the three brake band posts ⑥.

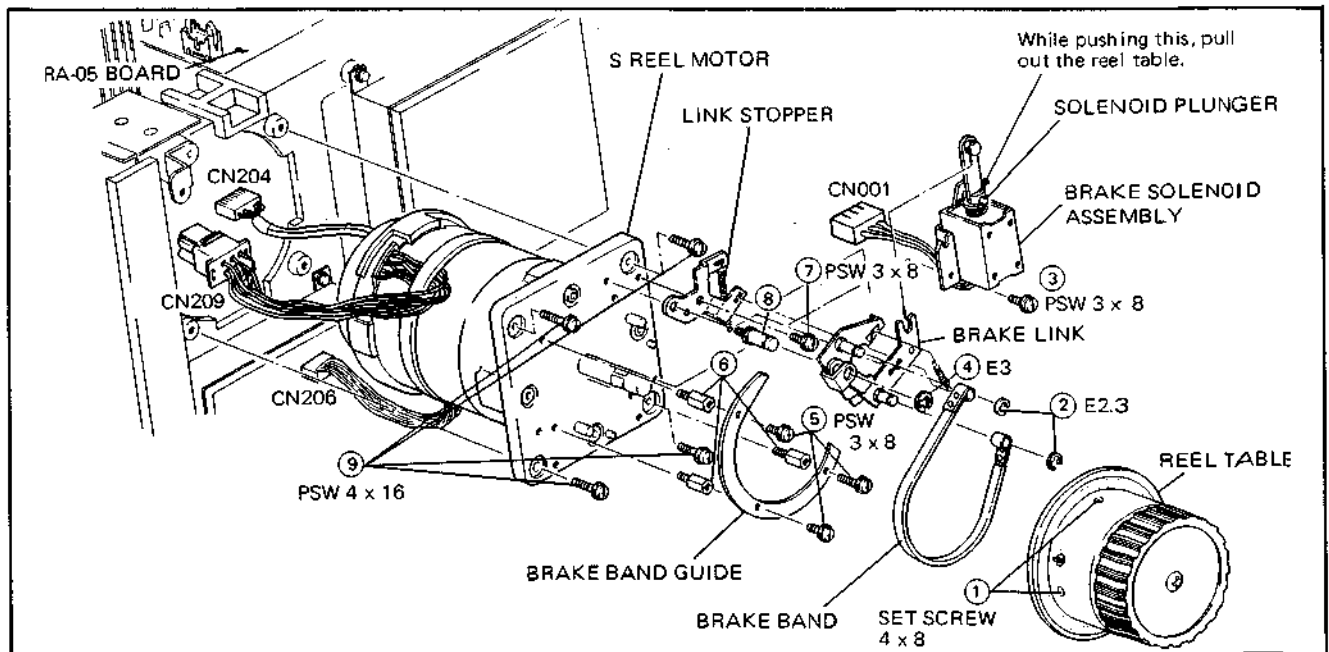


Fig. 3-17. Replacement of the S Reel Motor

Brake Band Guide Position Adjustment

15. Turn the side marked "A, JB-372" of the brake adjustment fixture in front and place it onto the reel motor shaft (see Fig. 3-18).
16. While pressing the brake band guide lightly against the brake adjustment fixture, fix the brake band guide with the three PSW3x8 screws.
17. Remove the brake adjustment fixture.

Link Stopper Position Adjustment

18. Place the brake link onto the brake post and fix it with E-3 ring ④ (see Fig. 3-17).
19. Place the spring between the link stopper and the brake link.
20. Lightly fix the brake solenoid assembly with the screw ③.
21. While pressing the plunger by hand, turn the side "B" of the brake adjustment fixture in front and place it onto the reel motor shaft.
22. Do not push the plunger and adjust the position of the link stopper so that the clearance between the link stopper and the brake link (top) is the value shown in Fig. 3-19.

Brake Solenoid Position Adjustment

23. When the plunger has been pressed, adjust the position of the brake solenoid so that the brake band is not transformed at the "X" and "Y" locations shown in Fig. 3-19, and the clearance between the brake adjustment fixture and the brake band is 0.2 mm or more all along the "Z" location. After the adjustment, fix the brake solenoid with a PSW3x8 screw.
24. While pressing the plunger, remove the brake adjustment fixture.
25. Clean the lower cylinder of the reel table (the surface coming in contact with the brake band) and while pressing the plunger by hand, place the reel table onto the reel motor shaft.
26. While pushing reel table lightly to the reel motor, fix it with two set screws.

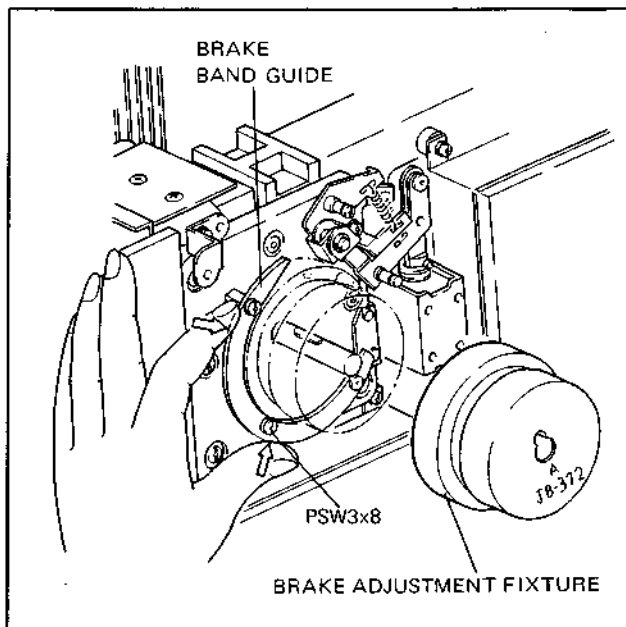


Fig. 3-18. Brake Band Guide Position Adjustment

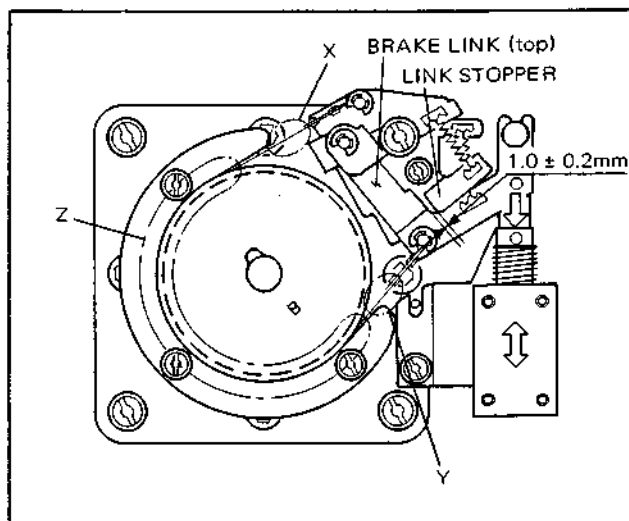


Fig. 3-19. Link Stopper/Brake Solenoid Position Adjustment

Reel Table Height Adjustment

27. Thread a recorded tape free of wrinkles and damages. Confirm that the tape has no strong contact with the reel flange in F.FWD mode. Confirm the same thing also in REW mode. If there should be strong contact, adjust according to the following steps. When the tape curls at a position other than the reel flange, adjust according to section 3-24-2.
28. Adjust the height according to the following sequence.
 - a. Remove the tape, cover, and reel washer.
 - b. Loosen the two set screws ① securing the reel table, and turn the height adjustment screw shown in Fig. 3-20.

Note 1: One turn of the adjustment screw changes the height by 0.7 mm.

Note 2: Turn the adjustment screw as follows.

- If the tape contacts the upper reel flange, turn the screw clockwise.
 - If the tape contacts the lower reel flange, turn the screw counterclockwise.
- c. While pushing the reel table lightly against the motor, tighten the two set screws ①. Again confirm the height of the reel table according to step 27, and then install the reel washer and the cover.

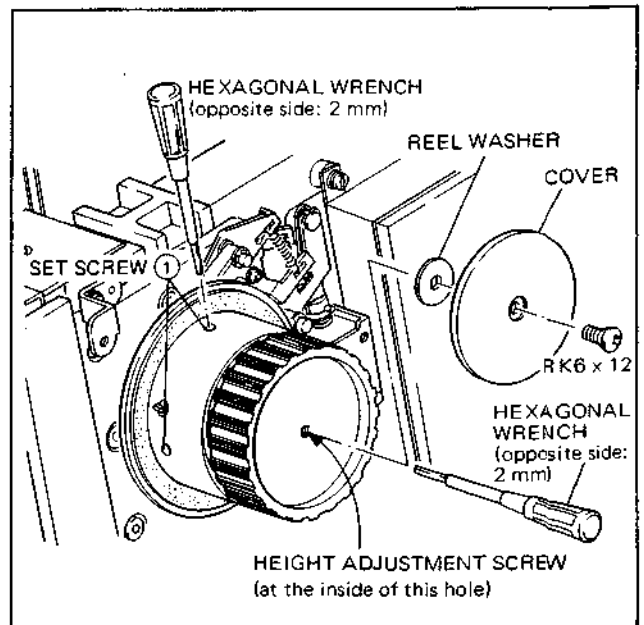


Fig. 3-20. S Reel Table Height Adjustment

FG Duty Cycle Adjustment

29. Adjust as follows so that the motor FG duty cycle in FWD 3 times normal speed is 50%.
 - ① Thread a recorded tape.
 - ② Turn on the power. Set S4 (TEST-1) switch on the CD-17 board to "1", and depress S7 (ENTRY) switch for at least 0.5 sec.
 - ③ Connect an oscilloscope to TP3 on the RL-12 board, and set the machine in FWD 3 times normal speed mode.
 - ④ Confirm that the duty cycle of the waveform at TP3 is 50%. If necessary, adjust RV2.
 - ⑤ Connect the oscilloscope in the same way to TP14 of the RL-12 board, and confirm that the duty cycle in FWD 3 times normal speed mode is 50%. If necessary, adjust RV4.
 - ⑥ Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec. (This cancels the test mode.)
 - ⑦ Remove the tape.

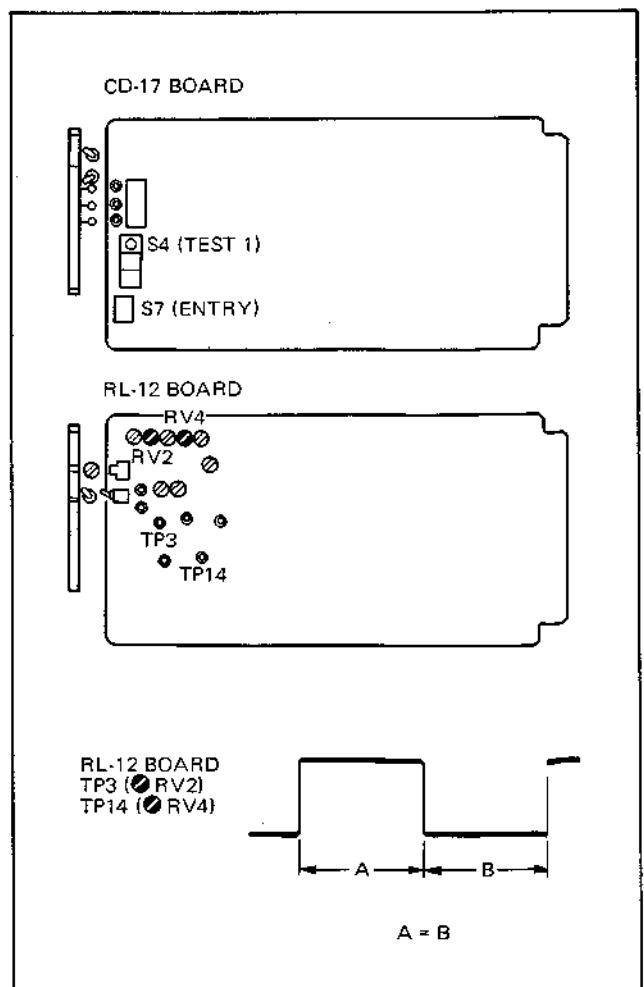


Fig. 3-21. S Reel Motor FG Duty Cycle Adjustment

S Reel Motor Torque Adjustment

30. Adjust the drive torque of the reel motor according to the following sequence.

Note: As one of the test functions of the machine, the motor output torque can be calculated from the acceleration and deceleration time by activating or stopping a predetermined inertia load, and the results can be indicated. Then adjustment is carried out so that the display shows the specified value.

a. Install a 9" reel with tape fully wound and the tape end fixed with adhesive tape on the S reel table.

CAUTION: As this reel is the reference inertia load, a reel with only little tape wound onto it or a reel with a different diameter must not be used.

b. Turn on the power. And set S4 (TEST 1) switch on the CD-17 board to "2".

c. Depress S7 (ENTRY) switch on the CD-17 board until the S reel starts to rotate. (By this operation, the S reel motor automatically executes the sequence of forward, reverse and stop.)

d. After motor stops, confirm that the number shown in Fig. 3-22 is indicated by the display element ND1 on the SV-43 board. If necessary, adjust RV1 on the RA-05 board.

After the adjustment, again carry out step c, and then confirm step d. Repeat this sequence until the specified value is obtained.

Note: When RV1 is turned clockwise by one division, the figure of the upper digit displayed on ND1 decreases one and when RV1 is turned counter-clockwise by one division, the figure increases one.

e. Remove the inertia load reel.

Note: When this reel is to be used for general recording, carefully remove the adhesive where the tape was fixed with adhesive tape, or cut off about 80 cm of the tape from the tape end. If the tape is used with adhesive on it, the head may be clogged, or the tape may be wound around the guide.

f. Set the switch S4 on the CD-17 board to "0", and depress the switch S3 (RESET) on the SY-80 board.

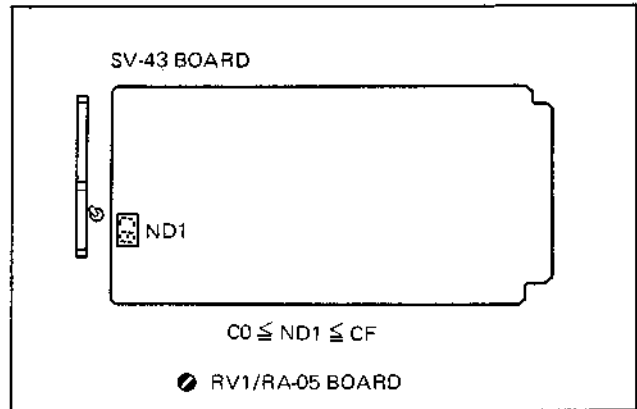


Fig. 3-22. Motor Torque Adjustment Value

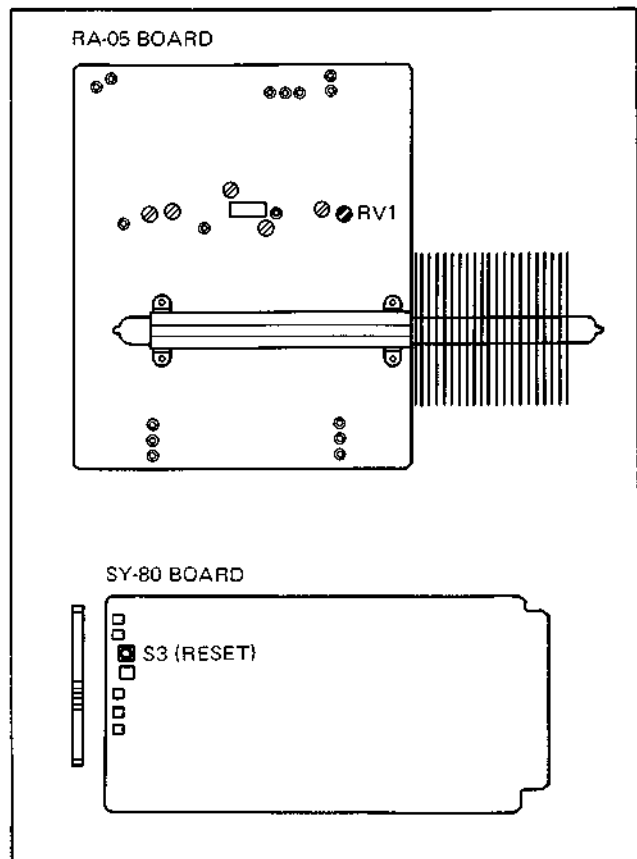


Fig. 3-23. S Reel Motor Torque Adjustment

Mechanical Brake Torque Adjustment

31. Adjust the mechanical brake torque as follows.

- ① Set the 9-inch empty reel onto the S reel table.
- ② Turn on the power.
- ③ Set S4 (TEST-1) switch on the CD-17 board to "4", and measure the REV and FWD brake torque as follows.

Note: The characteristic of the brake is different in the material of the reel-table cylinder and the material can be distinguished by its surface treatment. Before performing the adjustment, check the material of the cylinder. (See item D in the Preliminary Information.)

- (i) **FWD (CCW) brake torque:**
Set S5 (TEST-2) switch on the CD-17 board to "A" and depress S7 (ENTRY) switch for at least 0.5 sec. When the rotation of the reel has stopped, check that the ND1 on the SV-43 board indicates the value shown in Fig. 3-24. If necessary, change the mounting position of the adjustment spring (FWD/CCW).
- (ii) **REV(CW) brake torque:**
Set S5 (TEST-2) switch on the CD-17 board to "B" and depress S7 (ENTRY) switch for at least 0.5 sec. When the rotation of the reel has stopped, check that the ND1 on the SV-43 board indicates the value shown in Fig. 3-24. If necessary, change the mounting position of the adjustment spring (REV/CW).

- ④ Set the switches S4 and S5 to "0" and release the test mode by pushing S7 for at least 0.5 sec.

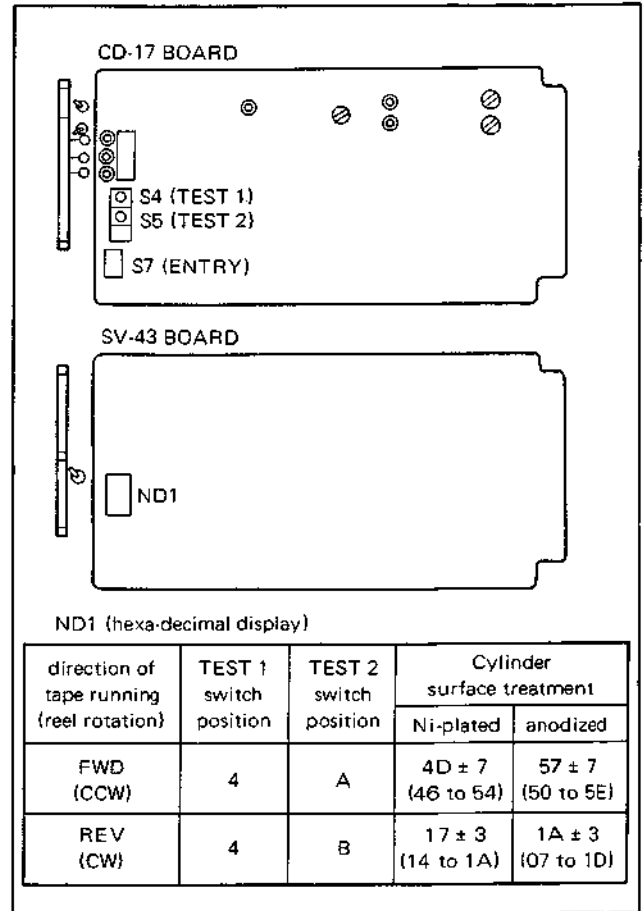


Fig. 3-24. Brake Torque

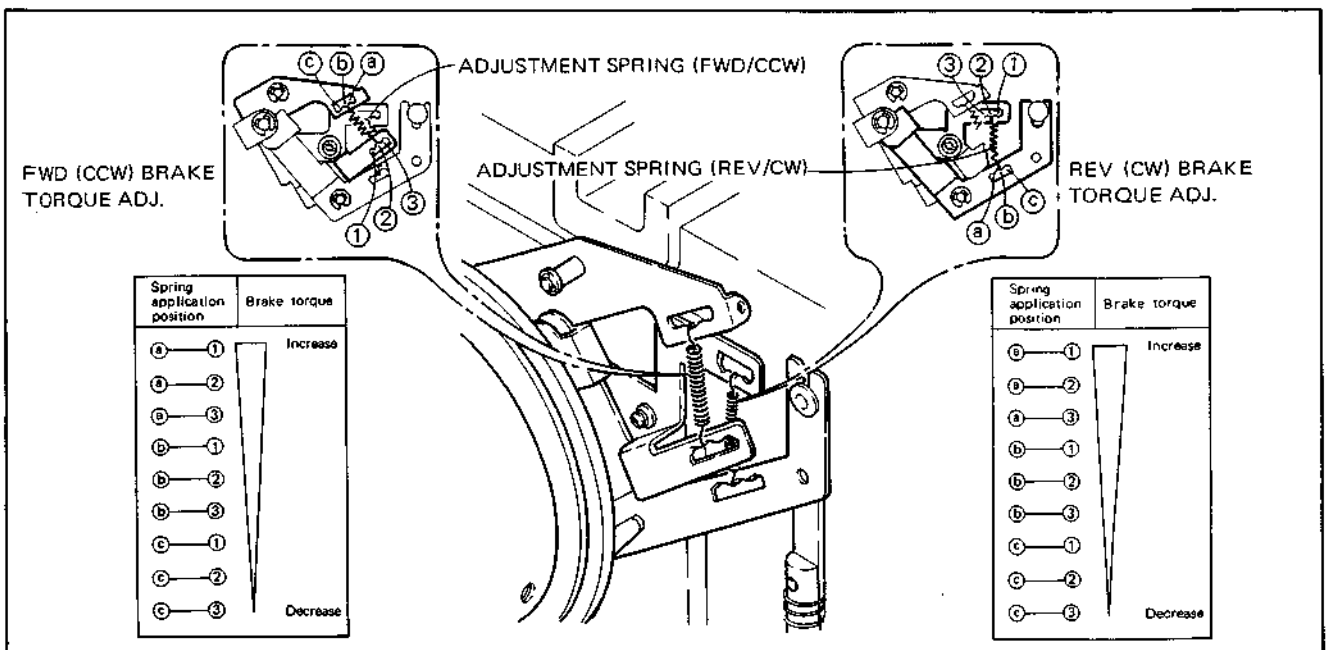


Fig. 3-25. S Reel Brake Torque Adjustment

3-9-2. T Reel Motor Replacement

Removal

1. Turn off the power, and remove the front panels. And then pull out the connector CN002 from TT-01 board.
2. Go to the rear of the machine, and open the power supply block. Pull out the connectors CN207, CN205, and CN202 from the RA-05 board. As for CN207, remove the clamp holding its harness.
3. Loosen the two set screws ① shown in Fig. 3-26. While pushing the solenoid plunger by hand, pull out the reel table.
4. Remove the two E rings ②, and remove the brake band.
5. Remove the screw ③, and remove the brake solenoid assembly.
6. Remove each one end of the two springs installed between link stopper and brake links. Remove the E ring ④, and remove the brake links.
7. Remove the three screws ⑤, and remove the brake band guide.
8. Remove the three brake band posts ⑥.
9. Remove the screw ⑦ and the brake post ⑧ which secure the link stopper.
10. Remove the four screws ⑨, and remove the T reel motor.
11. Clean the surface of the bosses on which the motor was installed and the removed parts.

Note: Take sufficient care not to bend the brake band.

Installation

12. Pass the three harnesses of the new reel motor through the hole in the base plate to the rear, and fix the reel motor with the four screws ⑨ (PSW4×16). Go to the rear of the machine, and plug the connectors CN202, CN205, and CN207 at their specified positions on the RA-05 board. Fix the harness of the connector CN207 at the specified position.
13. Fix the link stopper with the brake post ⑧, and then tighten the screw ⑦ (PSW3×8).
14. Install the three brake band posts ⑥.

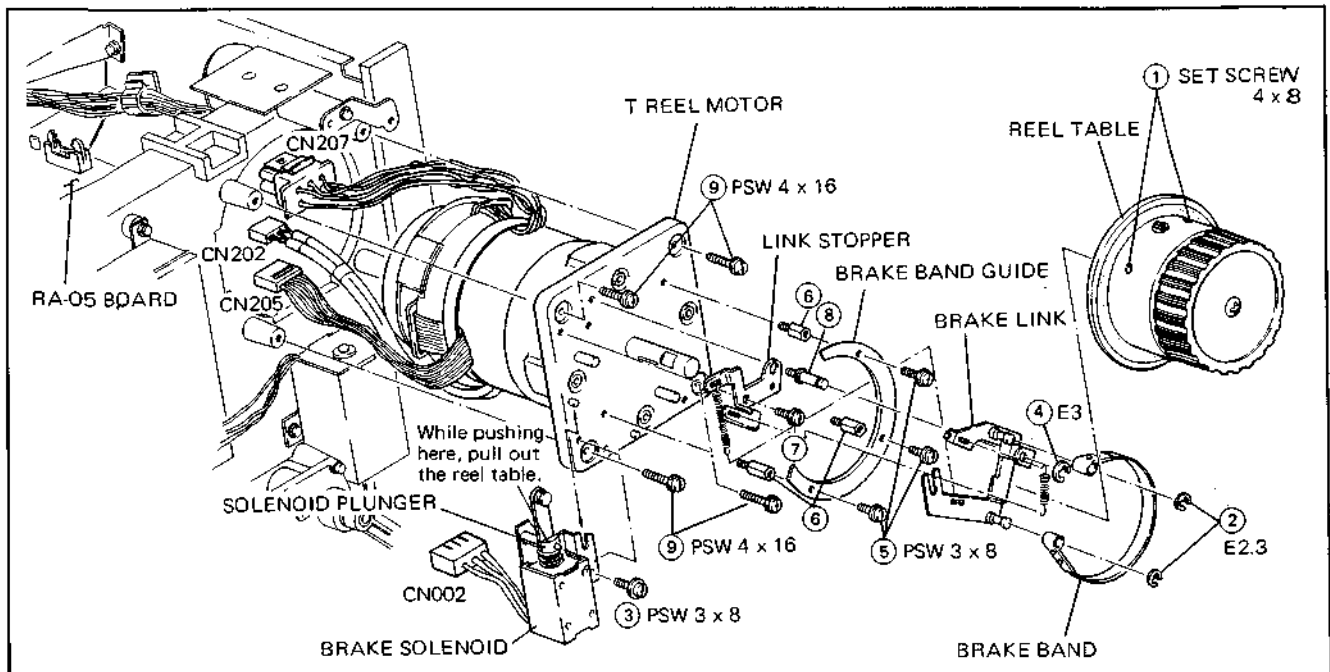


Fig. 3-26. T reel Motor Replacement

Brake Band Guide Position Adjustment

15. Turn the side marked "A, JB-372" of the brake adjustment fixture in front and place it onto the reel motor shaft (see Fig. 3-27).
16. While pressing the brake band guide lightly against the brake adjustment fixture, fix the brake band guide with the three PSW3×8 screws.
17. Remove the brake adjustment fixture.

Link Stopper Position Adjustment

18. Place the brake link onto the brake post and fix it with E ring ④ (see Fig. 3-26).
19. Place the spring between the link stopper and the brake link.
20. Lightly fix the brake solenoid assembly with the screw ③.
21. While pressing the plunger by hand, turn the side "B" of the brake adjustment fixture in front and place it onto the reel motor shaft.
22. Do not push the plunger and adjust the position of the link stopper so that the clearance between the link stopper and the brake link (top) is the value shown in Fig. 3-28.

Brake Solenoid Position Adjustment

23. When the plunger has been pressed, adjust the position of the brake solenoid so that the brake band is not transformed at the "X" and "Y" locations shown in Fig. 3-28, and the clearance between the brake adjustment fixture and the brake band is 0.2 mm or more all along the "Z" location. After the adjustment, fix the brake solenoid with a PSW3×8 screw.
24. While pressing the plunger, remove the brake adjustment fixture.
25. Clean the lower cylinder of the reel table (the surface coming in contact with the brake band) and while pressing the plunger by hand, place the reel table onto the reel motor shaft.
26. While pushing reel table lightly to the reel motor, fix it with two set screws.

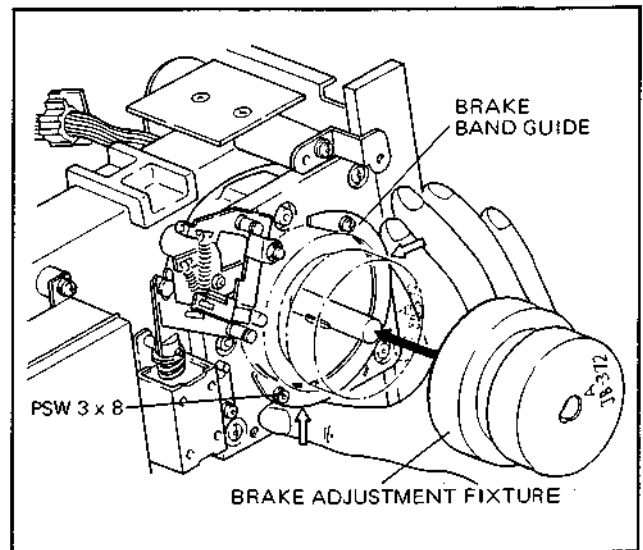


Fig. 3-27. Brake Band Guide Position Adjustment

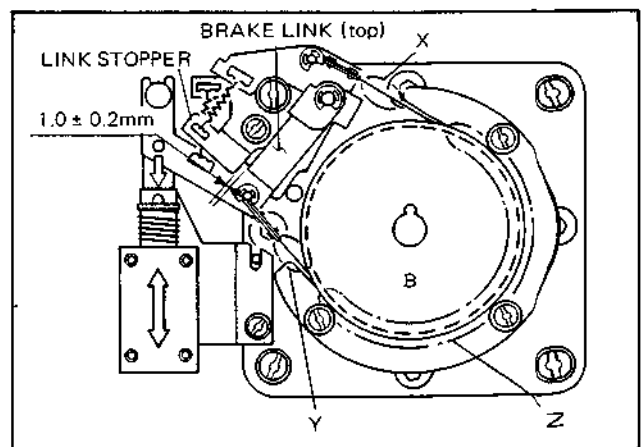


Fig. 3-28. Link Stopper/Brake Solenoid Position Adjustment

Reel Table Height Adjustment

27. Thread a recorded tape free of wrinkles and damages. Confirm that the tape has no strong contact with the reel flange in FWD mode. Confirm the same thing also in REW mode. If there should be strong contact, adjust according to the following steps. When the tape curls at a position other than the reel flange, adjust according to section 3-24-2.
28. Adjust the height according to the following sequence.
 - a. Remove the tape, cover, and reel washer.
 - b. Loosen the two set screws ① securing the reel table, and turn the height adjustment screw shown in Fig. 3-29.

Note 1: One turn of the adjustment screw changes the height by 0.7 mm.

Note 2: Turn the adjustment screw as follows.

 - If the tape contacts the upper reel flange, turn the screw clockwise.
 - If the tape contacts the lower reel flange, turn the screw counterclockwise.
 - c. While pushing the reel table lightly against the motor, tighten the two set screws ①. Again confirm the height of the reel table according to step 27, and then install the reel washer and the cover.

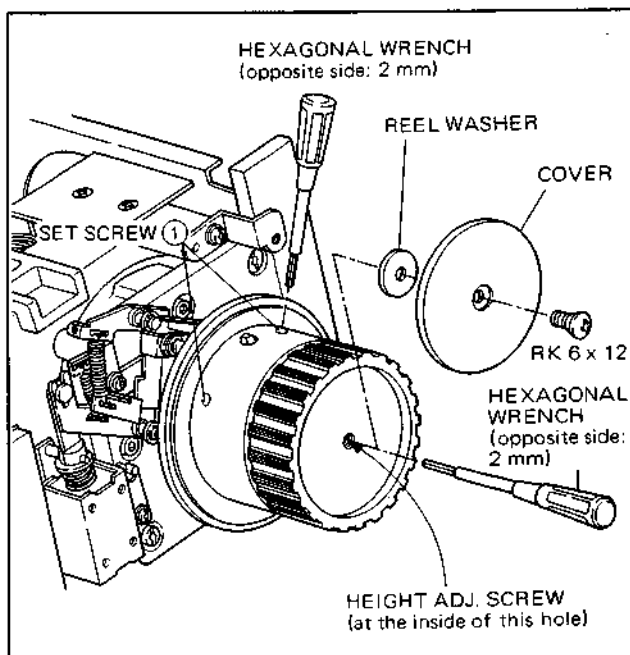


Fig. 3-29. T Reel Table Height Adjustment

FG Duty Cycle Adjustment

29. Adjust as follows so that the motor FG duty cycle in FWD 3 times normal speed is 50%.
 - a. Thread a recorded tape.
 - b. Turn on the power. Set S4 (TEST-1) switch on the CD-17 board to "1", and depress S7 (ENTRY) switch for at least 0.5 sec.
 - c. Connect an oscilloscope to TP1 on the RL-12 board and set the unit to FWD 3 times normal speed mode.
 - d. Confirm that the duty cycle of the waveform at TP1 is 50%. If necessary, adjust RV6.
 - e. Connect the oscilloscope in the same way to TP2 of the RL-12 board, and confirm that the duty cycle in FWD 3 times normal speed mode is 50%. If necessary, adjust RV5.
 - f. Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec. (This cancels the test mode.)
 - g. Remove the tape.

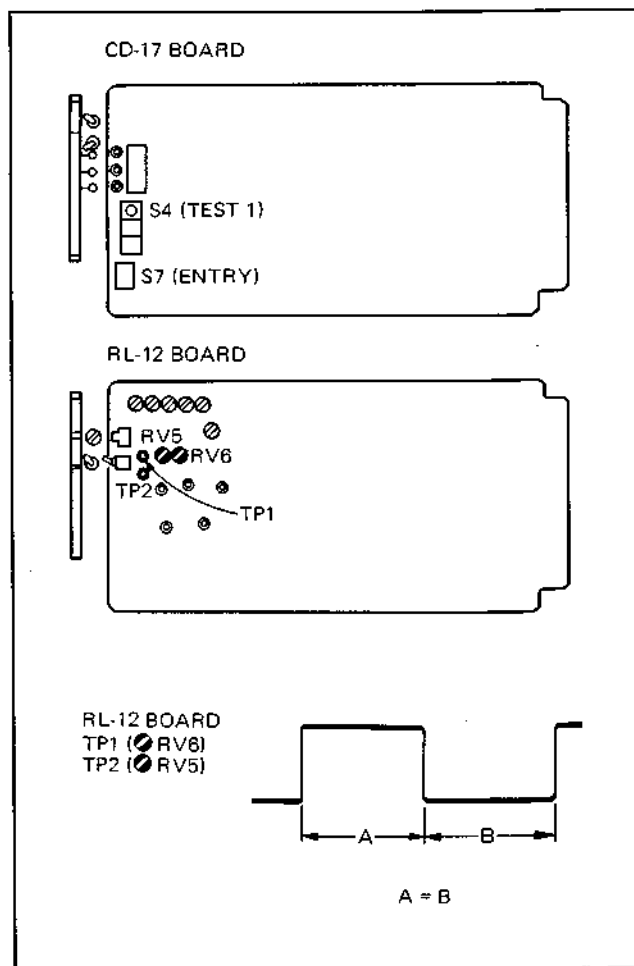


Fig. 3-30. T Reel Motor FG Duty Cycle Adjustment

T Reel Motor Torque Adjustment

30. Adjust the drive torque of the reel motor according to the following sequence.

Note: As one of the test functions of the machine, the motor output torque can be calculated from the acceleration and deceleration time by starting and stopping predetermined inertia load, and the results can be indicated. Then adjustment is carried out so that the display shows the specified value.

a. Install a 9 inch reel with tape fully wound and the tape end fixed with adhesive tape on the T reel table.

CAUTION: As this reel is the reference inertia load, a reel with only little tape wound onto it or a reel with a different diameter must not be used.

b. Turn on the power, and set S4 (TEST 1) switch on the CD-17 board to "3".

c. Depress S7 (ENTRY) switch on the CD-17 board until the T reel starts to rotate. (By this operation, the T reel motor automatically executes the sequence of forward, reverse, and stop.)

d. After motor stop, confirm that the number shown in Fig. 3-31 is indicated by the display element ND1 on the SV-43 board. If necessary, adjust RV6 on the RA-05 board.

After the adjustment, again carry out step c. and then confirm step d. Repeat this sequence until the specified value is obtained.

Note: When RV6 is turned clockwise by one division, the figure of the upper digit displayed on ND1 decreases one and when RV6 is turned counter-clockwise by one division, the figure increases one.

e. Remove the inertia load reel.

Note: When this reel is to be used for general recording, carefully remove the adhesive where the tape was fixed with adhesive tape, or cut off about 80 cm of the tape from the tape end. If the tape is used with adhesive on it, the head may be clogged, or the tape may be wound around the guides.

f. Set the switch S4 on the CD-17 board to "0", and depress the switch S3 (RESET) on the SY-80 board.

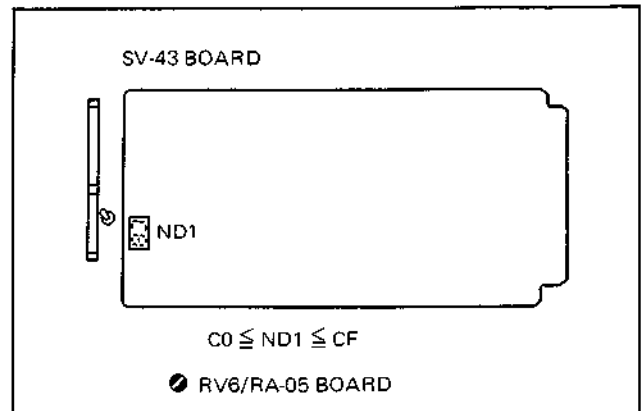


Fig. 3-31. Motor Torque Adjustment Value

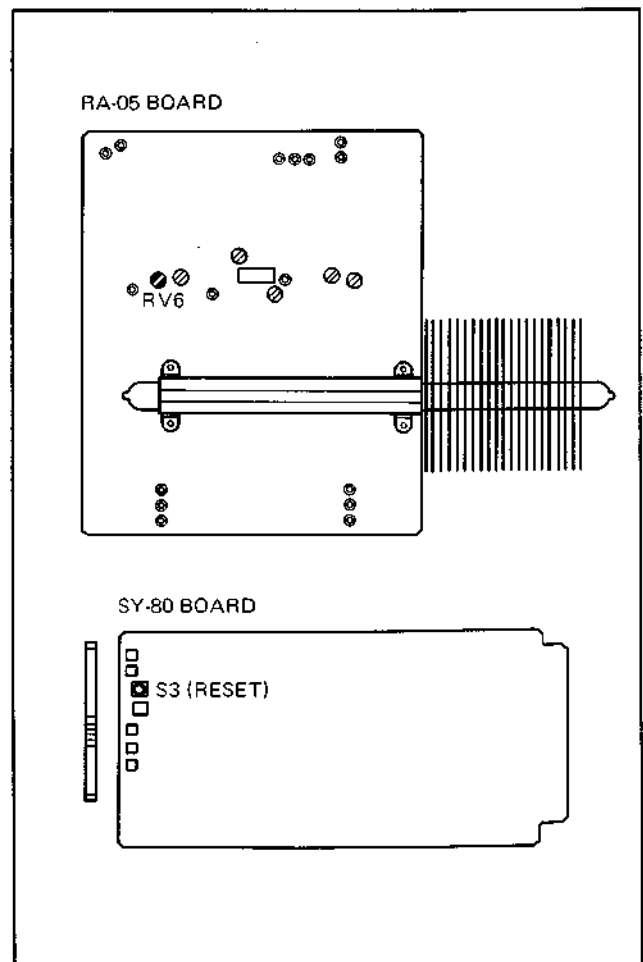


Fig. 3-32. T Reel Motor Torque Adjustment

Mechanical Brake Torque Adjustment

31. Adjust the mechanical brake as follows.

- ① Set the 9-inch empty reel onto the T reel table.
- ② Turn on the power.
- ③ Set S4 (TEST-1) switch on the CD-17 board to "4", and measure the REV and FWD brake torque as follows.

Note: The characteristic of the brake is different in the material of the reel-table cylinder and the material can be distinguished by its surface treatment. Before performing the adjustment, check the material of the cylinder. (See item D in the Preliminary Information.)

(i) REV(CW) brake torque:

Set S5 (TEST-2) switch on the CD-17 board to "C" and depress S7 (ENTRY) switch for at least 0.5 sec. When the rotation of the reel has stopped, check that the ND1 on the SV-43 board indicates the value shown in Fig. 3-33. If necessary, change the mounting position of the adjustment spring (REV/CW).

(ii) FWD(CCW) brake torque:

Set S5 (TEST-2) switch on the CD-17 board to "D" and depress S7 (ENTRY) switch for at least 0.5 sec. When the rotation of the reel has stopped, check that the ND1 on the SV-43 board indicates the value shown in Fig. 3-33. If necessary, change the mounting position of the adjustment spring (FWD/CCW).

- ④ Set the switches S4 and S5 to "0" and release the test mode by pushing the switch S7 for at least 0.5 sec.

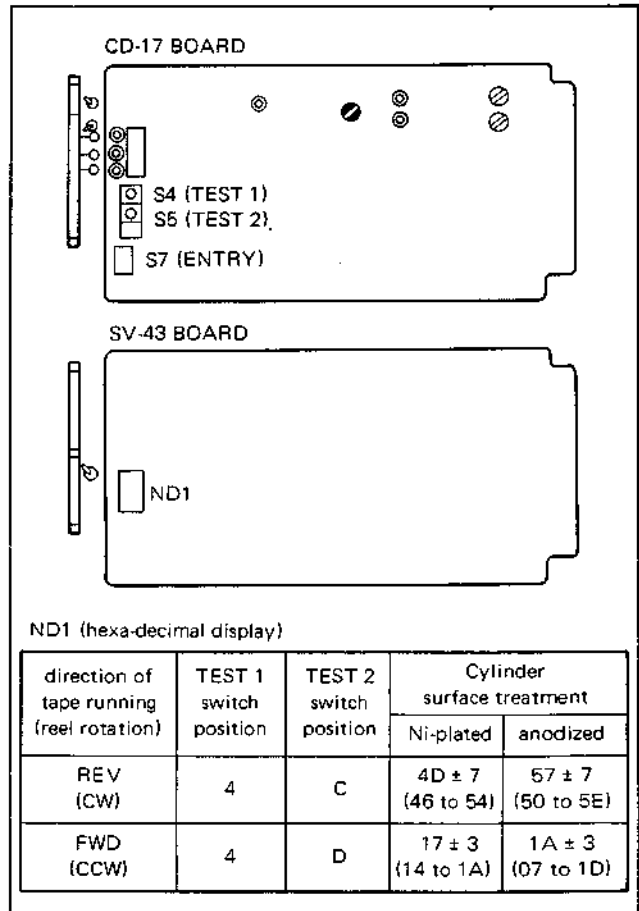


Fig. 3-33. Brake Torque

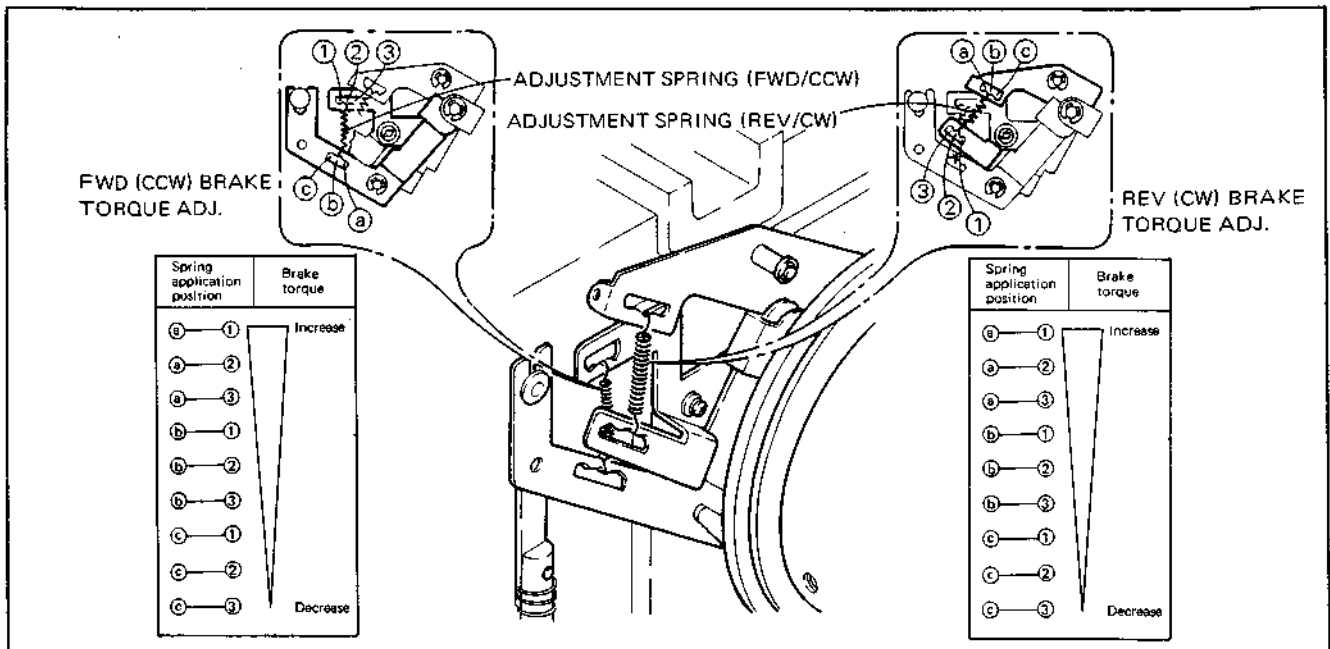
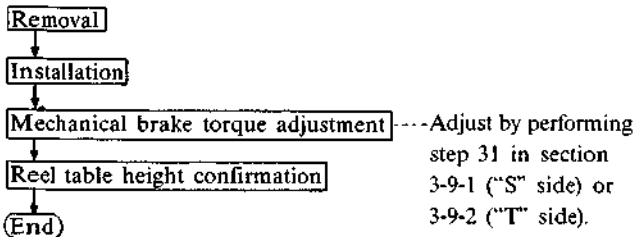


Fig. 3-34. T Reel Brake Torque Adjustment

3-10. BRAKE BAND REPLACEMENT

Preliminary Information

- A. The mechanical brake works when the power is off or the tape is not threaded. When the brake torque is adjusted correctly, the reel may be stopped without damage to the tape even if the power is turned off during tape running.
- B. When the mechanical brake torque can not be adjusted with any application position of the adjustment spring, the brake band must be replaced.
- C. Brake band replacement and the subsequent adjustment after the replacement are carried out according to the following sequence.



Removal

1. Loosen the two set screws shown in Fig. 3-35. While attracting the solenoid plunger, remove the reel table. Clean the cylindrical part at the lower part of the reel table, which has been in contact with the brake band.
2. Remove the two E rings, and remove the brake band.

Installation

3. Install the new brake band in the position shown in Fig. 3-35 (a), and fasten it with the two E rings (E2.3).
4. While pressing the plunger, place the brake adjustment fixture ("B" mark faces the front) onto the reel motor shaft as shown in Fig. 3-35 (b).
5. While not pressing the plunger, check that the clearance between the link stopper and the brake link (top) is 1.0 ± 0.2 mm. If it is not within specifications, adjust the position of the link stopper.
6. While pressing the plunger, remove the brake adjustment fixture and place the reel table. While pushing the reel table to the reel motor, tighten the two set screws.

Mechanical Brake Torque Adjustment

7. Adjust the mechanical brake torque according to the instructions of "Preliminary Information".

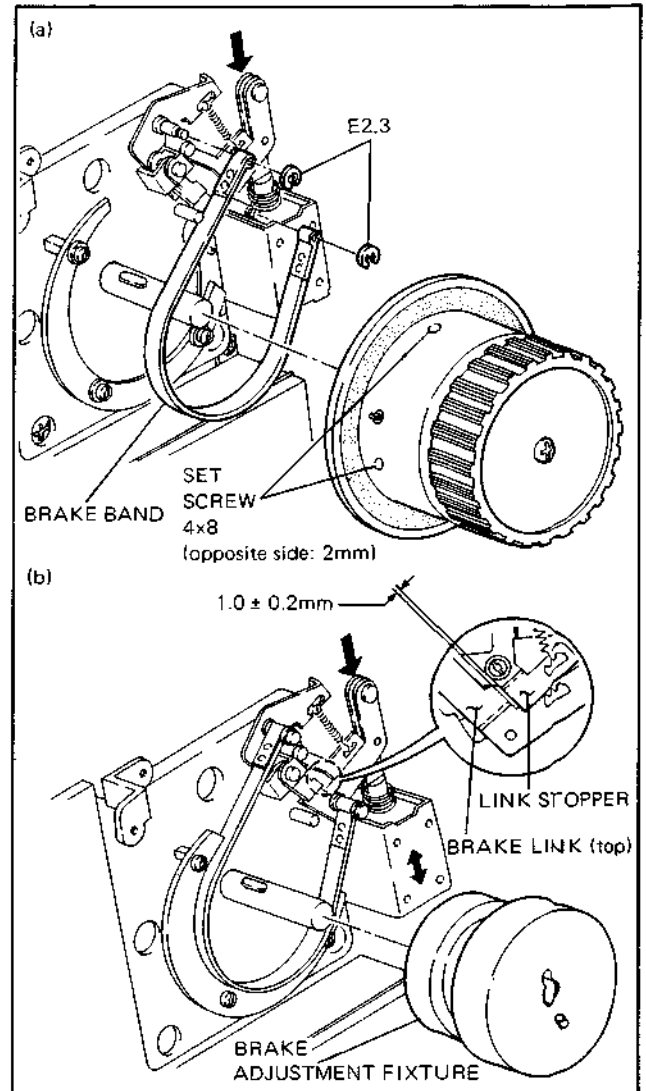


Fig. 3-35. Brake Band Replacement

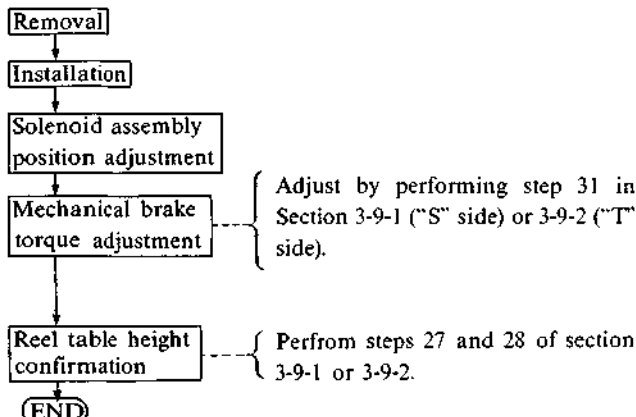
Reel Table Height Confirmation

8. Thread a recorded tape free of wrinkles and damages. Confirm that the tape has no strong contact with the reel flange in F.FWD mode. Confirm the same thing also in REW mode. If there should be strong contact, adjust according to section 3-24-2.

3-11. BRAKE SOLENOID REPLACEMENT

Preliminary Information

Brake solenoid replacement is carried out in the following sequence.



Removal

1. Loosen the two set screws securing the reel table. Next, while attracting the solenoid plunger by hand, pull the reel table.
2. Remove one screw (PSW3×8) shown in Fig. 3-36, and remove the brake solenoid assembly.
3. Disassemble the brake solenoid assembly under reference to Fig. 3-36.

Installation

4. Replace the solenoid for a new one and reassemble. At this time, install the bracket so that it can be moved lightly.
5. Adjust so that the distance between the solenoid pin and the end of the longitudinal hole of the bracket becomes 5.0 mm ± 0.5 mm as shown in Fig. 3-37, and then fix the bracket securely.
6. Lightly fix the solenoid assembly with one screw (PSW3×8) in the position shown in Fig. 3-36.

Solenoid Assembly Position Adjustment

7. While pressing the plunger, place the brake adjustment fixture ("B" mark faces the front) onto the reel motor shaft.
8. When the plunger has been pressed, adjust the position of the brake solenoid so that the brake band is not transformed at the "X" and "Y" shown in Fig. 3-38, and the clearance between the brake band and the brake adjustment fixture is 0.2 mm or more along the "Z". After the adjustment, fix the brake solenoid firmly with a PSW3×8 screw.
9. While pressing the plunger, remove the brake adjustment fixture and place the reel table onto the reel motor shaft.
10. While pushing the reel table to the reel motor, tighten two set screws.
11. Check the mechanical brake torque and the reel table height in accordance with the instructions of the above "Preliminary Information".

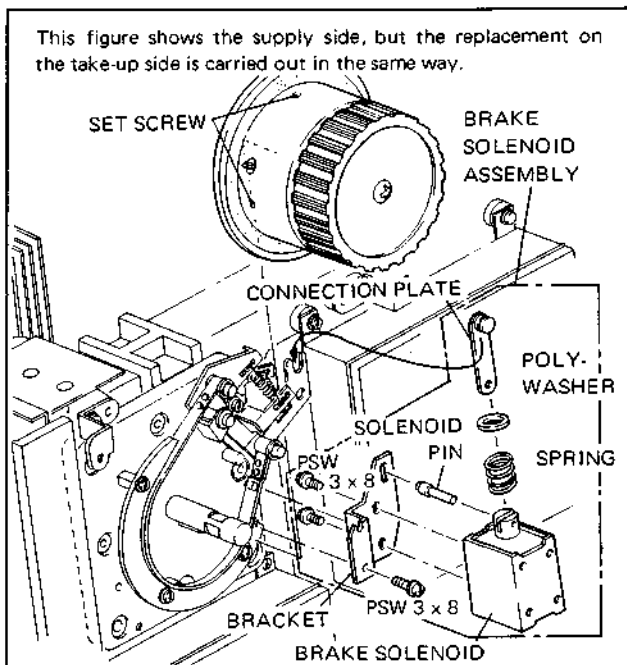


Fig. 3-36. Brake Solenoid Replacement

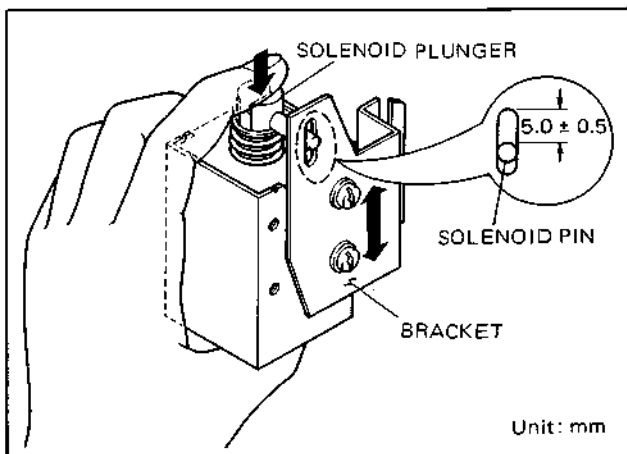


Fig. 3-37. Bracket Position Adjustment

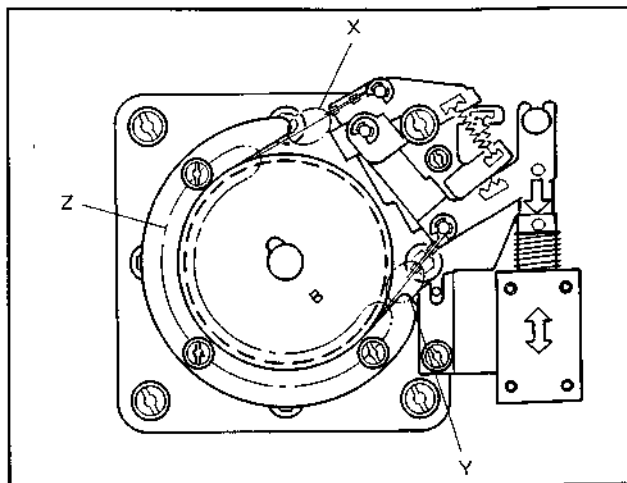


Fig. 3-38. Solenoid Assembly Position Adjustment

3-12. REPLACEMENT OF THE S-TENSION ARM ASSEMBLY

Preliminary Information

- If the tape tension (FWD back tension) may not be adjusted correctly, the S-tension arm assembly should be replaced. When the wear of the guide shaft is the cause that the correct tape tension is not obtained, replace the guide shaft or turn the worn surface (see section 6-5).
- As the tension spring used for the S-tension arm assembly has a large influence onto the tape tension, the hook part must not be bent, and only the specified spring must be used for replacement.
- After replacement of the S-tension arm assembly, adjust the tape tension and confirm the tape path condition.
- Take care that no excessive force acts onto the potentiometer.
- For the tape tension adjustment, prepare a tension adjustment tool (part No. J-6043-120-A) and a digital volt meter.

Replacement

- Pull out the connector CN003 from the TT-01 board.
- For PS or P model, remove the screw B3×6 and remove the balance weight.
- Remove the two screws (PS3×16) shown in Fig. 3-39. Remove the S-tension arm assembly, and install a new one.
- For PS or P model, mount the balance weight with the screw (B3×6).

Tape Tension Adjustment

- Put the S-arm adjustment weight (marked S85) of the tension adjustment tool onto the guide shaft of the tension arm. Raise the arm slightly by hand, and then release it quietly. Bring the arm into free vibration, and wait until it stops.
 - Connect a digital voltmeter to TP12 on the RL-12 board. And turn on the power of VTR.
 - Confirm that the voltage at TP12 is $0V \pm 30mV$. If necessary, adjust RV12 on the RL-12 board.
 - Confirm that the voltage at TP12 is $-2.6V \pm 0.15V$ when the weight is removed from the S-tension arm. If necessary, adjust RV1 on the TT-01 board.
- Attach the weight again and perform steps 5 and 7. Repeat steps 5, 7 and 8 until both the specifications are satisfied without any adjustment.

Tape Path Confirmation

- Remove the weight, thread a tape, and set the machine in REC mode. Confirm that the tape does not curl near the guide rollers 1 and 2. If the tape should curl, adjust according to section 3-24-2. Confirm in the same way for the modes F.FWD, REV ×1 program JOG, and REW.

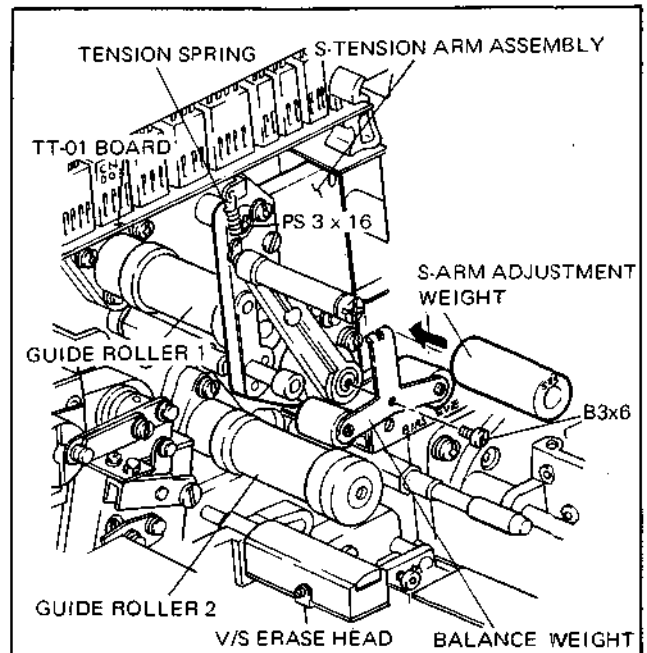


Fig. 3-39. S Tension Arm Replacement

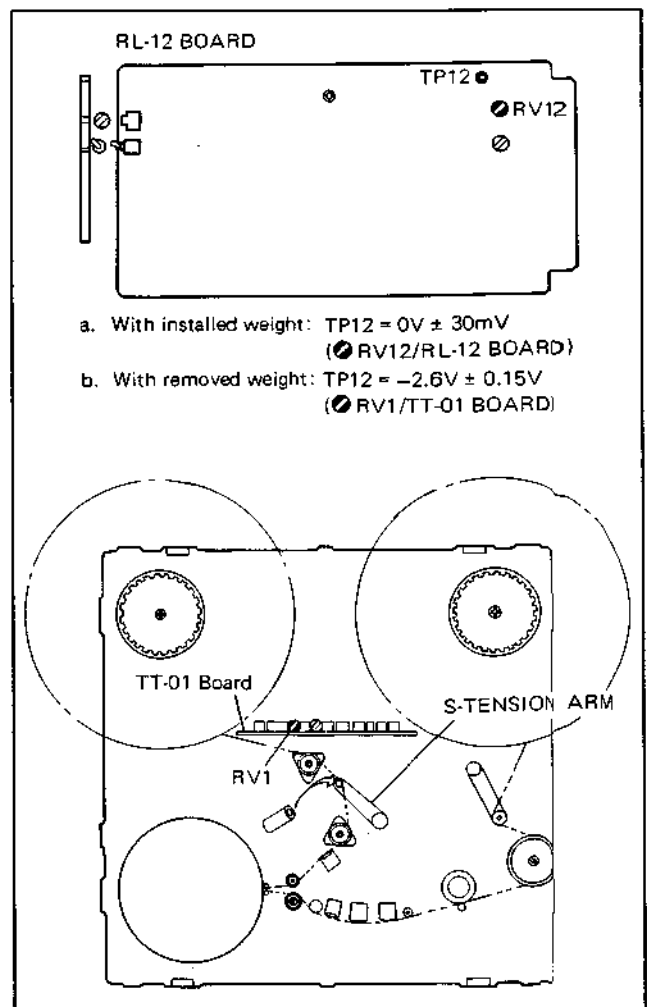


Fig. 3-40. Tape Tension Adjustment

3-13. REPLACEMENT OF THE T-TENSION ARM ASSEMBLY

Preliminary Information

- A. When the tape becomes abnormally tight or loose near the T-tension arm assembly, first the damping speed of the air damper is adjusted (refer to section 3-14). Next, the tension of the T-tension arm is adjusted (steps 3 to 7 of this section). If the tension arm may not be adjusted, replace the tension arm assembly.
 - B. When the parts (bearing etc.) composing the T-tension roller shown in Fig 3-41 have been replaced, confirm the tape path according to section 3-24-2.
- Note: As the sequence for replacement of the tension roller components is not especially shown, refer to the exploded view in section D when replacement is required.
- C. Take care that no excessive force acts on the potentiometer.
 - D. For the tension adjustment, prepare a tension adjustment tool (part No. J-6043-120-A) and a digital voltmeter.

Replacement

1. Pull out the connector CN004 from TT-01 board.
2. Remove the two screws (PS3x16) shown in Fig. 3-41, and remove the T-tension arm assembly. Install the new T-tension arm assembly, and insert the connector CN004 at its original position.

Tension Adjustment

3. Install the T-tension post (the part of the prepared adjustment tool in the position shown in the right of Fig. 3-41. Apply the weight marked T135 as shown in the figure.
4. Connect the digital voltmeter to TP13 on the RL-12 board. And turn on the power of VTR.
5. Confirm that the indication of the digital voltmeter is $0V \pm 0.03V$. If necessary, adjust RV13 on the RL-12 board.
6. Replace the weight by the one marked T240.
7. Confirm that the indication of the digital voltmeter is $1.4V \pm 0.15V$. If necessary, adjust RV2 on the TT-01 board.
8. Replace the weight by T135 weight and perform the confirmation in step 5 again. Repeat steps 5 to 8 until both the specifications are satisfied without any adjustment.
9. Remove the weight and the T-tension post.

Tape Path Confirmation

10. Thread a tape, and confirm that the tape does not curl near the tension roller and near the timer roller in REC mode. If it should curl, adjust according to section 3-24-2. Carry out the same confirmation also for F.FWD, REV x1 program JOG, and REW mode.

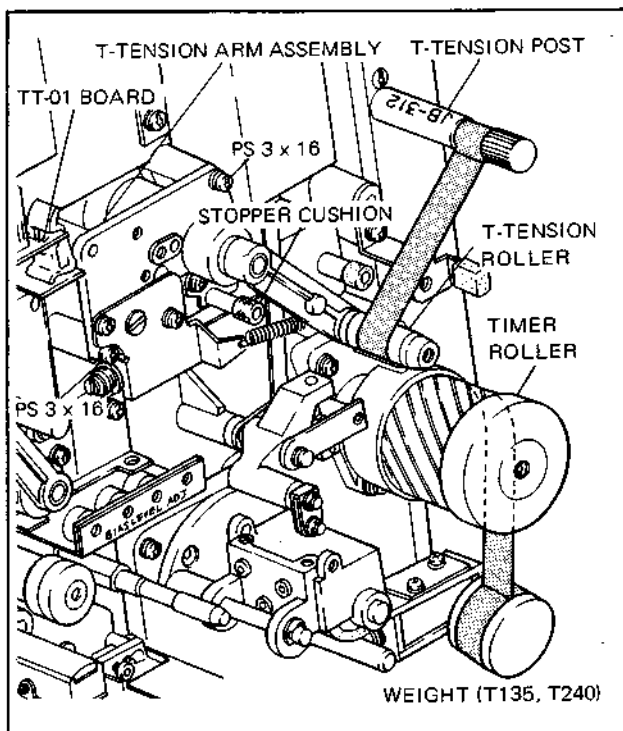


Fig. 3-41. T-Tension Arm Replacement

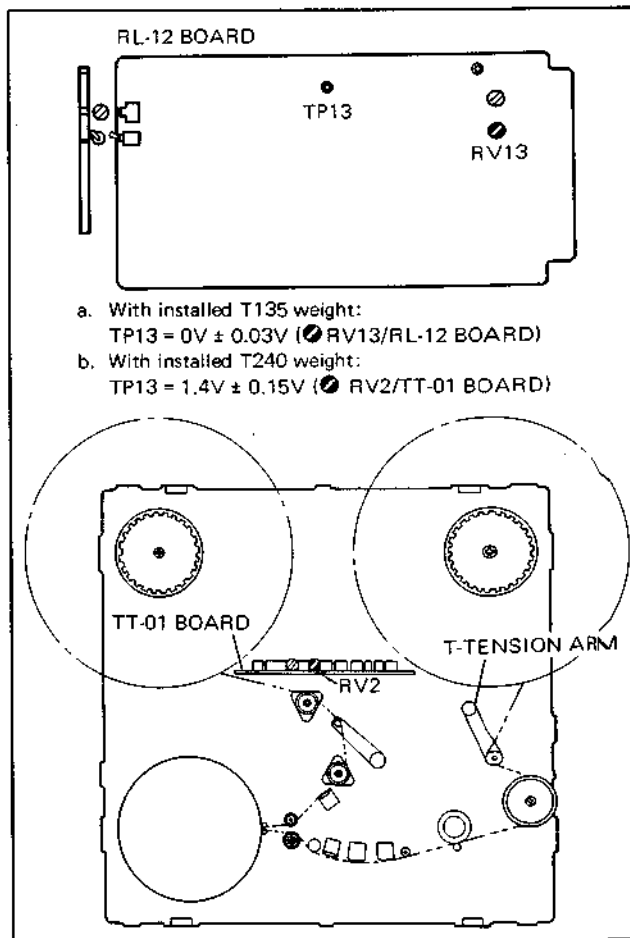


Fig. 3-42. Tension Adjustment

3-14. AIR DAMPER ADJUSTMENT

Preliminary Information

- A. When the tape becomes abnormally tight or loose near the T-tension arm assembly, the damping speed of the air damper should be confirmed.
- B. As the spring applied to the tension arm has a large influence onto the tape tension, the hook shape must not be changed, and the air damper rod must not be bent.
- C. One of the drum start conditions is that the tape tension is above a certain value, so that drum start in STANDBY mode should be confirmed after air damper adjustment.
- D. Take care that no excessive force acts on the potentiometer.

Removal

1. Pull out the connector CN004 from the TT-01 board.
2. Remove the two screws securing the T-tension arm assembly.
3. Remove one end of the tension spring installed between the T-tension arm and the spring holder.
4. Remove the nut at the tip of the connection rod, and remove the air pot holder of the tension arm from the connection rod.

Damping Speed Adjustment

5. Apply a 40 grams weight as shown in Fig. 3-44 to the tip of the connection rod, push the piston against the end of the cylinder, and release it quietly. Confirm that the time required for free dropping of the cylinder over the distance shown in the figure is 10 sec \pm 1 sec. If necessary, adjust with the adjustment screw at the end of the cylinder.

Installation

6. Place the air pot holder of the tension arm onto the tip of the connection rod, and tighten the nut.
 7. Apply the tension spring of the tension arm to the spring holder.
- Note:** Do not bend or transform the hook part after application of the spring.
8. Install the tension arm at the specified position with two screws (PS3 \times 16).

Drum Start Confirmation

9. Thread a tape, and loosen the tape slightly near the take-up and supply reel. Confirm that the drum starts to rotate when the unit is set in STANDBY mode.

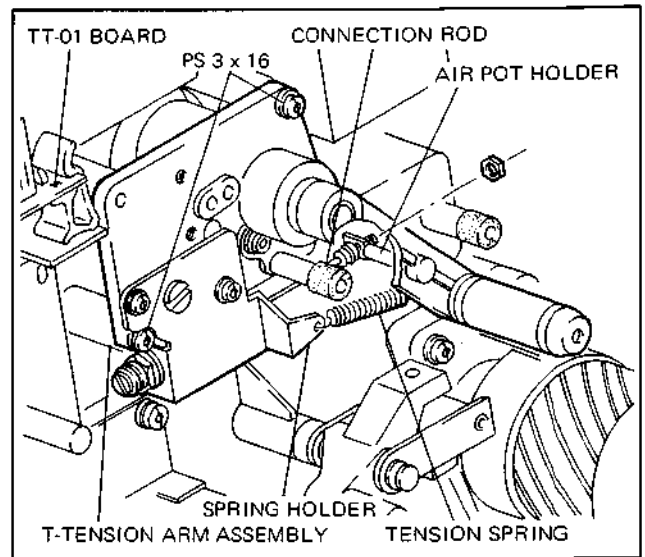


Fig. 3-43. T-Tension Arm Assembly

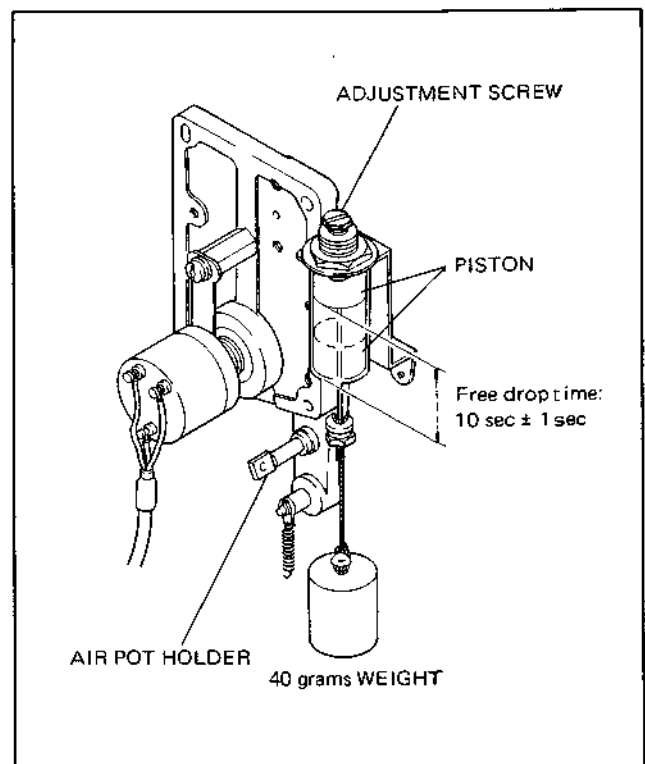


Fig. 3-44. Damping Speed Adjustment

3-15. MINI TENSION ARM REPLACEMENT (Except for BVH-2000/2180 00 and 10 models)

Preliminary Information

- A. The mini tension arm serves to keep the tape tension constant even with rapid change of the tape speed, for example with a playback mode with variable tape speed like JOG mode. If the mini tension arm does not operate normally, the tape momentarily will become slack when the tape speed is reduced rapidly or when the tape direction is reversed, so that the tape will be incorrect contact with the video head and the video signal will be lost.
- B. After replacing of the mini tension arm, it must be confirmed that the shaft of the mini tension arm and the capstan are parallel. When the parallelism is bad, the tape edge may be damaged.
- C. For confirmation of the parallelism of the shaft of the mini tension arm, prepare a flat plate (part No. J-6040-160-A).

Removal

1. Remove the two screws fixing the TD-05 board.
2. Remove the E ring holding the mini tension arm and remove the one end of the spring shown in Fig. 3-45. Replace for the new mini tension arm, apply the spring and reinstall the E ring.

Parallelism Confirmation

3. Remove the two E rings shown in Fig. 3-46, and remove the pinch roller assembly.
4. Place the flat plate into the position shown by the hatching in detail a of Fig. 3-46, bring the flat plate into close contact with the capstan, and confirm that the clearance between the flat plate and the shaft of the tension arm is 0.05 mm or less as shown in detail b.

Next, move the mini tension arm in the direction shown by the arrow in detail a, bring the flat plate to the position indicated by the dot-and-dash line, and confirm the clearance in the same way as before. When the clearance is outside of the specified value, adjust by bending the part of the arm plate hatched in detail a.

CAUTION: For bending of the arm plate, take care that no excessive force acts onto the arm post.

5. Install the pinch roller assembly in the reverse order of the removal.
6. Install the TD-05 board with the two screws (PS2.6×6).
7. Thread a tape, set the machine in REC mode, and confirm that there is a clearance of 0.3 to 0.8 mm between the mini tension arm and the tape. If necessary, adjust by bending the claw in detail a of Fig. 3-46.

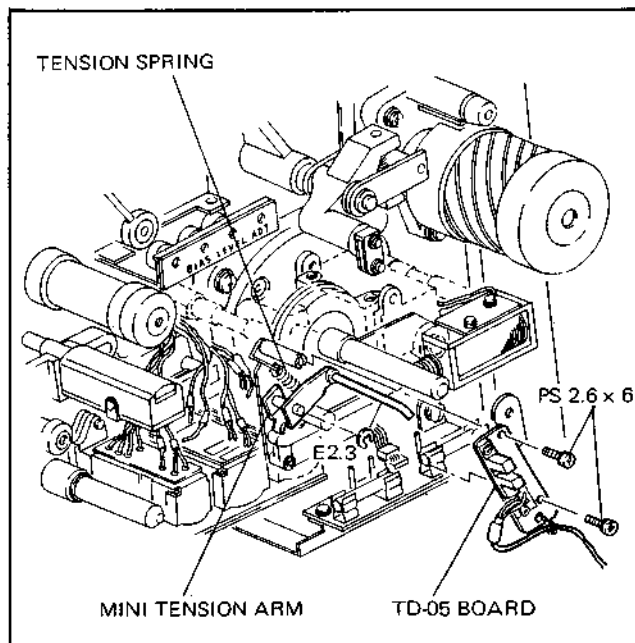


Fig. 3-45. Mini Tension Arm Replacement

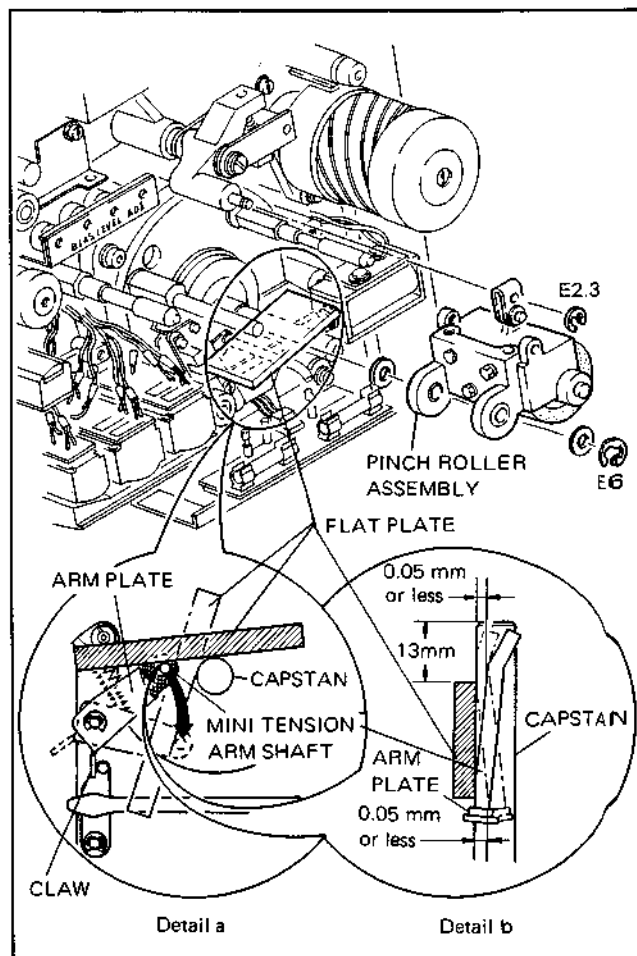


Fig. 3-46. Parallelism Confirmation for the Mini Tension Arm Shaft

BVH-2000(U/C)/PS/PM
BVH-2180(U/C)/PS/PM
BVH-2500(U/C)/P
BVH-2700(U/C)

3-16. MINI TENSION ARM SOLENOID REPLACEMENT (Except for BVH-2000/2180 00 and 10 models)

Preliminary Information

After the replacement, the solenoid installation position must be adjusted. When the solenoid is not installed in the correct position, the mini tension arm will not operate correctly, and the contact between tape and video head may become incorrect when the tape speed is changed rapidly in JOG mode, so that the video signal may be lost.

Removal

1. Pull out the connector CN007 from the TT-01 board. If the harness is held by a clamp, remove the clamp.
2. Remove the two screws securing the TD-05 board.
3. Remove the two screws (PSW3×8) and the post shown in Fig. 3-47, and remove the mini tension arm assembly.
4. Remove the two screws securing the solenoid, and remove the solenoid and the compression spring (This spring will be used again later.)

Installation

5. Pass the previously removed compression spring through the plunger of the new solenoid, and fix the solenoid tightly with the two screws (PS2.6×6) to the mini tension arm assembly so that it can be moved by hand.
6. Adjust the position of solenoid so that the stopper and the rod become in contact each other as shown in the detail of Fig. 3-47 when the solenoid plunger is attracted by hand, and then fix the solenoid by tightening the two screws.
7. Fix the mini tension arm assembly with the two screws (PSW3×8) and the post to the flange of the capstan motor.
8. Fix the TD-05 board with the two screws (PS2.6×6).
9. Plug the connector CN007 from the solenoid at the specified position on the TT-01 board, and if the harness had been fixed by a clamp, also apply the clamp again.
10. Thread a tape, set the machine in REC mode and confirm that the clearance between the mini tension arm shaft and the tape is 0.3 to 0.8 mm. If necessary, adjust by bending the claw shown in Fig. 3-47.

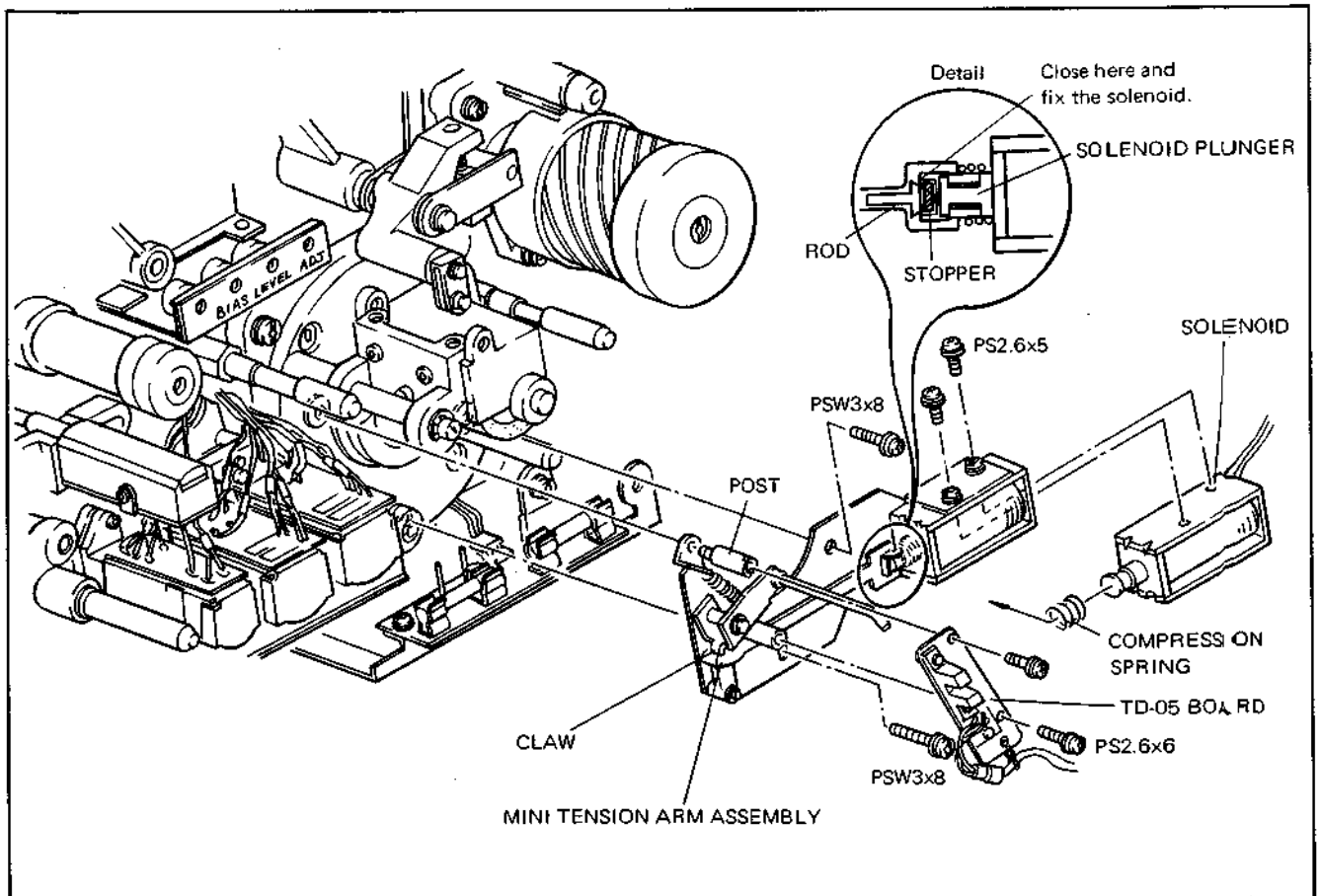
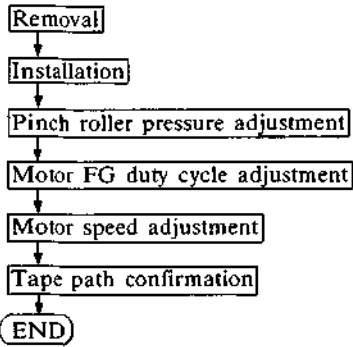


Fig. 3-47. Mini Tension Arm Solenoid Replacement

3-17. CAPSTAN MOTOR REPLACEMENT

Preliminary Information

- A. The capstan motor is replaced according to the following flowchart.



- B. For pinch roller pressure adjustment, prepare a tension scale with a full scale of 5 kg (part No. J-6041-640-A) and a 20 cm long string.
- C. As the indication value of a tension scale differs somewhat according to the pulling direction, adjust the zero point of the tension scale in advance in the use direction.

Removal

1. Go to the rear of the machine, open the power supply unit, and pull out the connector CN106 from the capstan motor. Further, pull out the connectors CN102 and CN103 from the CA-09 board.
2. Return to the front of the machine, and pull out the connector CN007 from the TT-01 board.
3. Remove the two screws ① (PS2.6×6) securing the TD-05 board.
4. Remove the two screws ② (PSW3×8) and the post ③ shown in Fig. 3-48, and remove the mini tension arm assembly.
5. Remove the two E rings ④ and ⑤, and remove the pinch roller assembly and the poly-washer.
6. Remove the pinch roller post ⑥ and the cover post ⑦.
7. Remove the 4 screws ⑧ (C4×20), and remove the capstan motor.

Installation

8. Fix the new capstan motor with the four screws ⑧ (C4×20) via washers and spring washers.
9. Reinstall the removed parts in reverse order from step 6 to step 1.

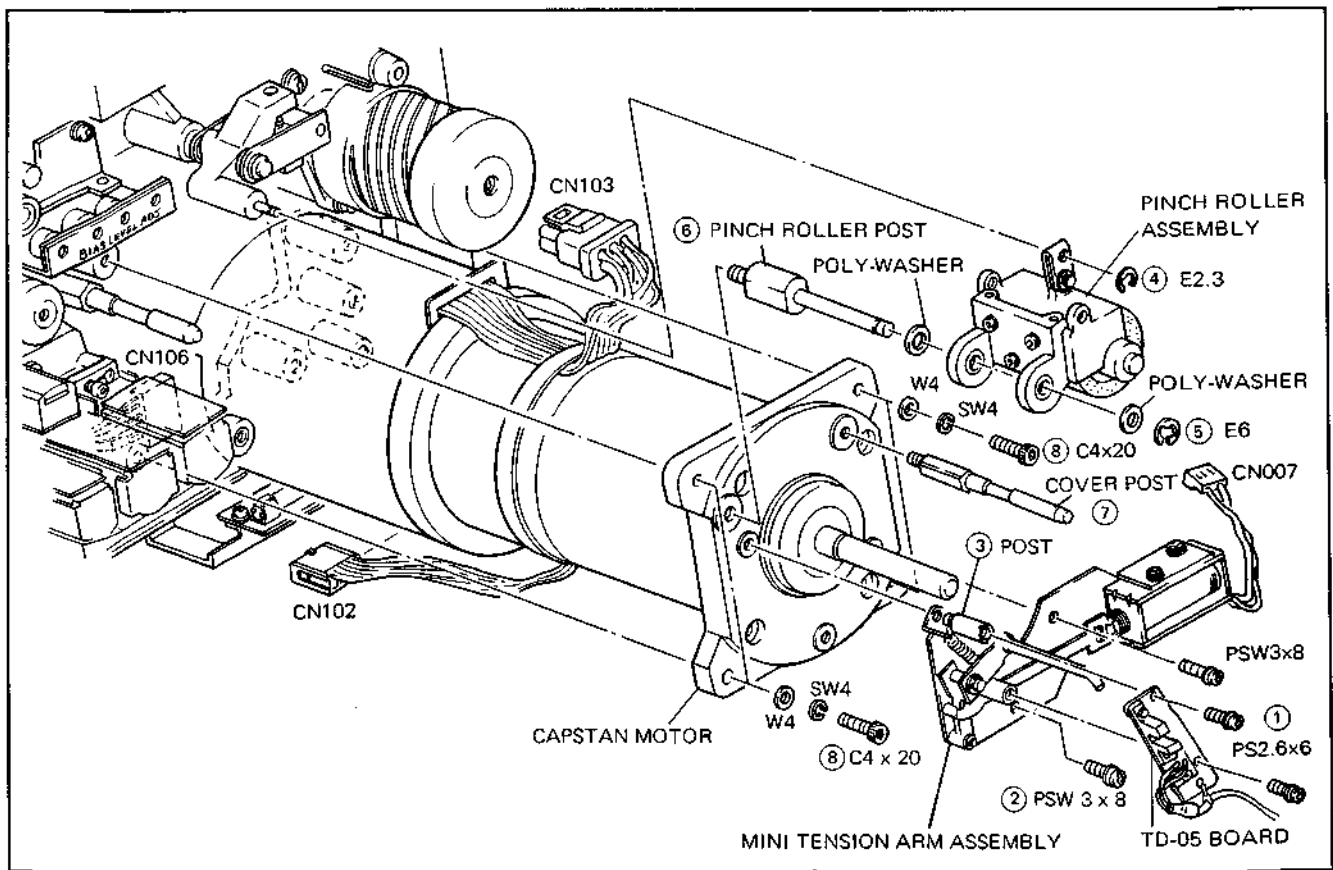


Fig. 3-48. Capstan Motor Replacement

3. PERIODIC CHECK & MAINTENANCE

Pinch Roller Pressure Adjustment

10. Set S4 (TEST 1) and S5 (TEST 2) switches to "5" and "1" respectively, and depress S7 (ENTRY) switch for at least 0.5 sec.
11. Apply the 5 kg tension scale as shown in Fig. 3-49 to the pinch roller arm. Pull the tension scale in the direction connecting the capstan and the pinch roller as shown by the arrow in detail a, separate the pinch roller once from the capstan, and wait until the rotation of the pinch roller stops. Return the tension scale in direction of the capstan, and confirm that the indication value of the tension scale is 3.7 to 4.0 kg when the pinch roller starts to rotate again. If necessary, adjust according to the following step.
12. Turn the adjustment screw shown in detail b according to the condition.
13. When the pinch roller pressing against the capstan, confirm that the clearance between the pinch lever and the stopper is 0.3 ± 0.1 mm as shown in detail b. If necessary, adjust the stopper position. Apply the locking compound to the threaded part of the adjustment screw.
14. Press S3 (RESET) on the SY-80 board.

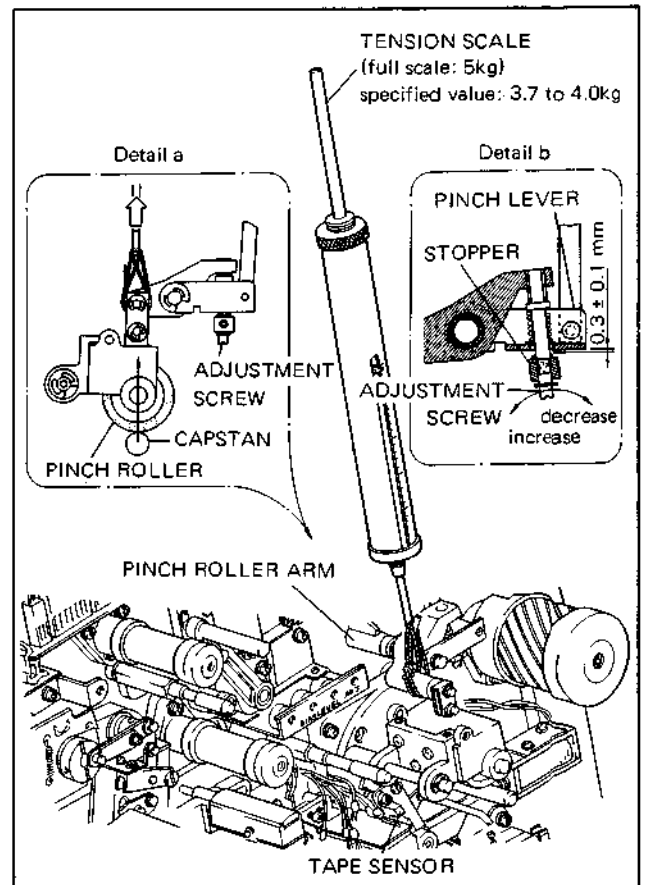


Fig. 3-49. Pinch Roller Pressure Adjustment

Motor FG Duty Cycle Adjustment

15. Insert a piece of opaque paper or a piece of video tape into the slit of the tape sensor, and fix it.
16. Set S4 (TEST 1) on the CD-17 board to "1", and press S7 (ENTRY) for at least 0.5 sec.
17. Set the machine in the following mode.
for NTSC, PM: 10/30 FWD PROGRAM JOG mode
for PS, P: 8/25 FWD PROGRAM JOG mode
18. Confirm that the duty cycle of the waveform at TP6 of the CD-17 board is 50% as shown in Fig. 3-50. If necessary, adjust RV2.
19. In the same way, confirm that the duty cycle of the waveform at TP7 of the CD-17 board also is 50%. If necessary, adjust RV3.
20. Press the STOP button and then press S3 (RESET) on the SY-80 board. Remove the shade from the tape sensor.

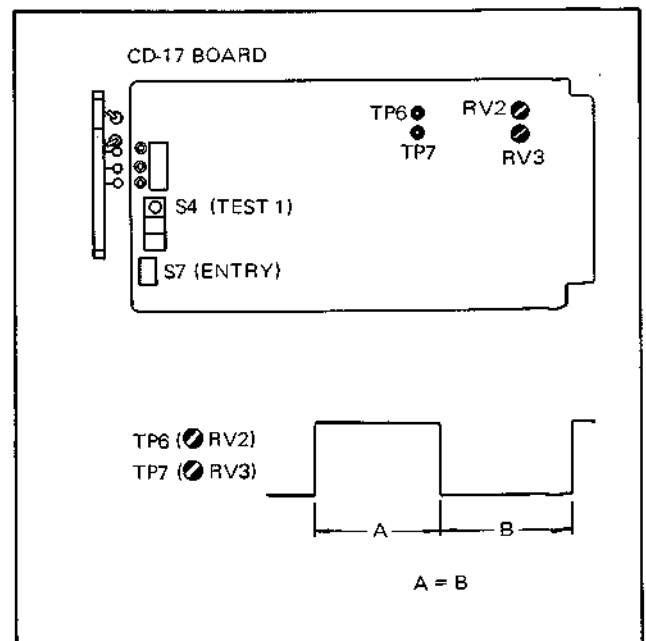


Fig. 3-50. Motor FG Duty Cycle Adjustment

Motor Speed Adjustment

21. Thread an alignment tape, and play back the "WHITE" segment of the tape.
22. Set S4 (TEST 1) switch on the CD-17 board to "B", and depress S7 (ENTRY) switch for at least 0.5 sec.
23. Confirm that the voltage at TP1 on the CD-17 board is $0V \pm 0.1V$ after passing five seconds or more in the test "B" mode. If not, adjust RV1 on the CD-17 board.
24. Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec. Test mode is released.
25. Confirm that the voltage at TP1 is $0V \pm 0.2V$ after test mode is released and passing approx. five seconds. If not, readjust steps 22 through 25.
26. Set the machine in STOP mode.

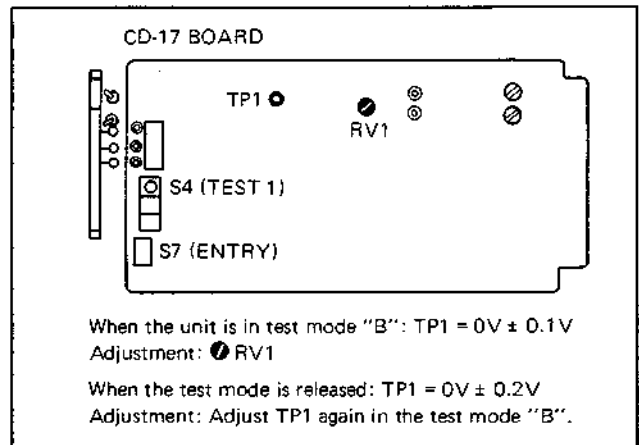
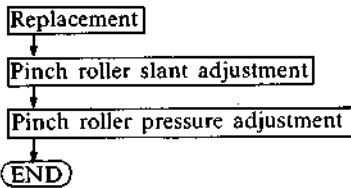


Fig. 3-51. Motor Speed Adjustment

3-18. PINCH ROLLER REPLACEMENT

Preliminary Information

- A. When the pinch roller has been replaced, the slant of the pinch roller against the capstan must be adjusted. When this adjustment is not sufficient, the pinch roller may be deformed, thus causing wow, and the tape may be damaged.
- B. The pinch roller is replaced according to the following procedures.



- C. Prepare the following instruments for adjustment and confirmation.
 - (1) Thickness gauge: J-6041-670-A
 - (2) Tension scale (5 kg): J-6041-640-A

Replacement

1. Remove the two E rings shown in Fig. 3-52, and remove the pinch roller assembly.
2. Remove the two set screws securing the pinch roller shaft from the pinch roller assembly, and remove the pinch roller.
3. Replace the pinch roller for a new one, and reinstall the parts in the reverse order of the above steps 1 and 2.

Pinch Roller Slant Adjustment

4. Lightly push the pinch roller towards the capstan as shown in Fig. 3-53, and confirm that there is close contact or that the clearance at the bottom is 0.03 mm or less when the pinch roller just comes into contact with the capstan. If the clearance is larger, or if there is a clearance at the top, loosen the locking screw, and adjust the slant of the pinch roller.

Pinch Roller Pressure Adjustment

5. Set S4 (TEST 1) and S5 (TEST 2) switches on the CD-17 board to "5" and "1" respectively, and depress S7 (ENTRY) switch for at least 0.5 sec.
6. Use the string to attach the 5 kg tension scale to the pinch roller arm, pull in the direction connecting the capstan and the pinch roller, and separate the pinch roller from the capstan. Wait until the rotation of the pinch roller stops, return the pinch roller slowly towards the capstan, and confirm an indication value of 3.7 to 4.0 kg for the tension scale when the pinch roller again starts to rotate. If not, adjust with the pressure adjustment screw.

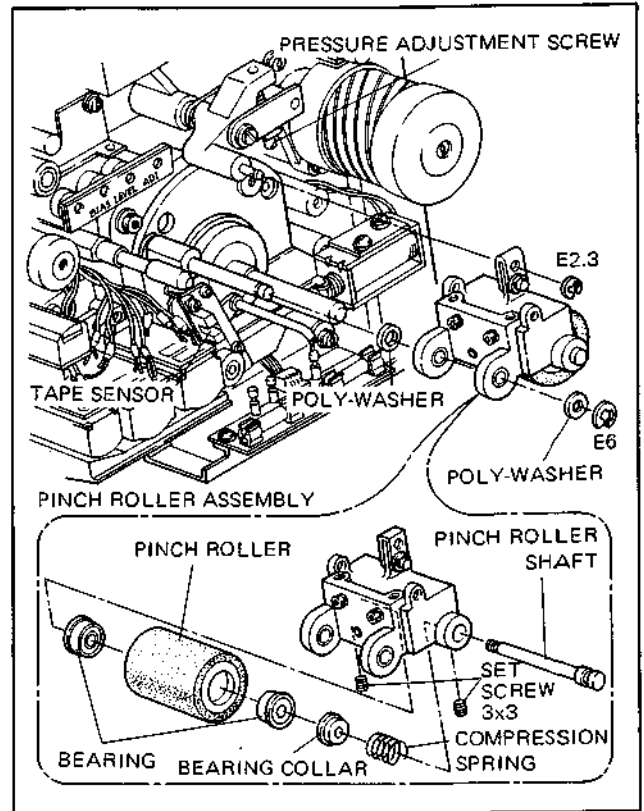


Fig. 3-52. Pinch Roller Replacement

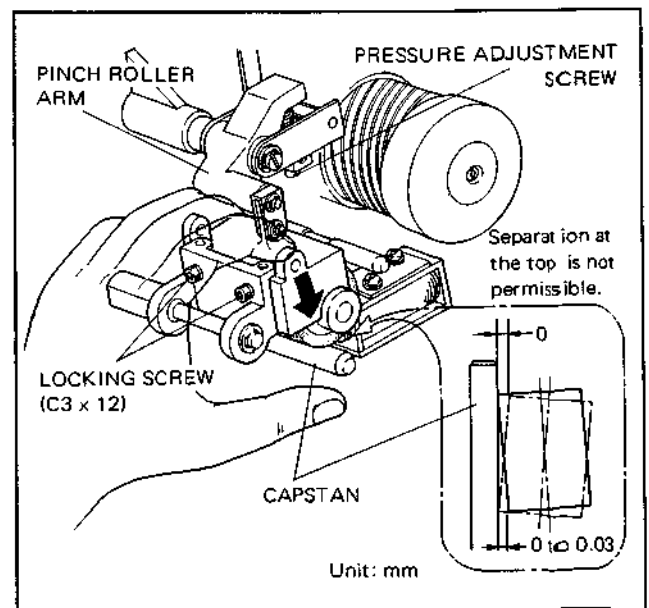


Fig. 3-53. Pinch Roller Slant Adjustment

7. When the pressure has been adjusted, apply adhesive (for example locking compound) to the threaded part of the adjustment screw. Next, when the pinch roller pressing against the capstan, confirm that the clearance between the pinch lever and the stopper is 0.3 ± 0.1 mm.
8. Press S3 (RESET) on the SY-80 board.

3-19. PINCH ROLLER SOLENOID REPLACEMENT

Preliminary Information

- A. With installation of the solenoid on the bracket, the solenoid installation position must be adjusted. When this adjustment is not correct, it may not be possible to adjust the pressure of the pinch roller against the capstan correctly, the clearance between the capstan and the pinch roller may not be correct, and tape threading may become difficult.
- B. When the solenoid has been replaced, the pinch roller pressure must be adjusted. Refer to Fig. 3-49.

Replacement

1. Pull out the connector CN008 from the TT-01 board. If the harness of CN008 clamped, remove it also.
2. Remove the E ring (E2.3) and the three screws (PS4×10) shown in Fig. 3-54, and then turn the post screw to remove the pinch roller solenoid assembly.
3. Replace the solenoid for a new one and reassemble, referring to Fig. 3-54. Tighten the solenoid lightly, so that it can be moved by hand.

Pinch Roller Solenoid Position Adjustment

4. As shown in Fig. 3-55, adjust the position of the pinch roller solenoid so that the clearance between the connection rod and the cushion becomes 7.0 ± 0.2 mm when the solenoid plunger is attracted. After the adjustment, tighten the three screws securely.
5. Install the pinch roller solenoid assembly in the reverse order of the steps 2 to 1.

Pinch Roller Pressure Adjustment

6. Set S4 (TEST 1) and S5 (TEST 2) switches on the CD-17 board to "5" and "1" respectively, and depress S7 (ENTRY) switch for at least 0.5 sec.
7. Use the string to attach the 5 kg tension scale to the pinch roller arm (refer to Fig. 3-49), pull in the direction connecting the capstan and the pinch roller, and separate the pinch roller from the capstan. Wait until the rotation of the pinch roller stops, return the pinch roller slowly towards the capstan, and confirm an indication value of 3.7 to 4.0 kg for the tension scale when the pinch roller again starts to rotate. If not, adjust the pressure adjustment screw.
8. When the pressure has been adjusted, apply locking compound to the threaded part of the adjustment screw. Next, when the pinch roller pressing against the capstan, confirm that the clearance between the pinch lever and the stopper is 0.3 ± 0.1 mm as shown in Fig. 3-49.
9. Press S3 (RESET) on the SY-80 board.

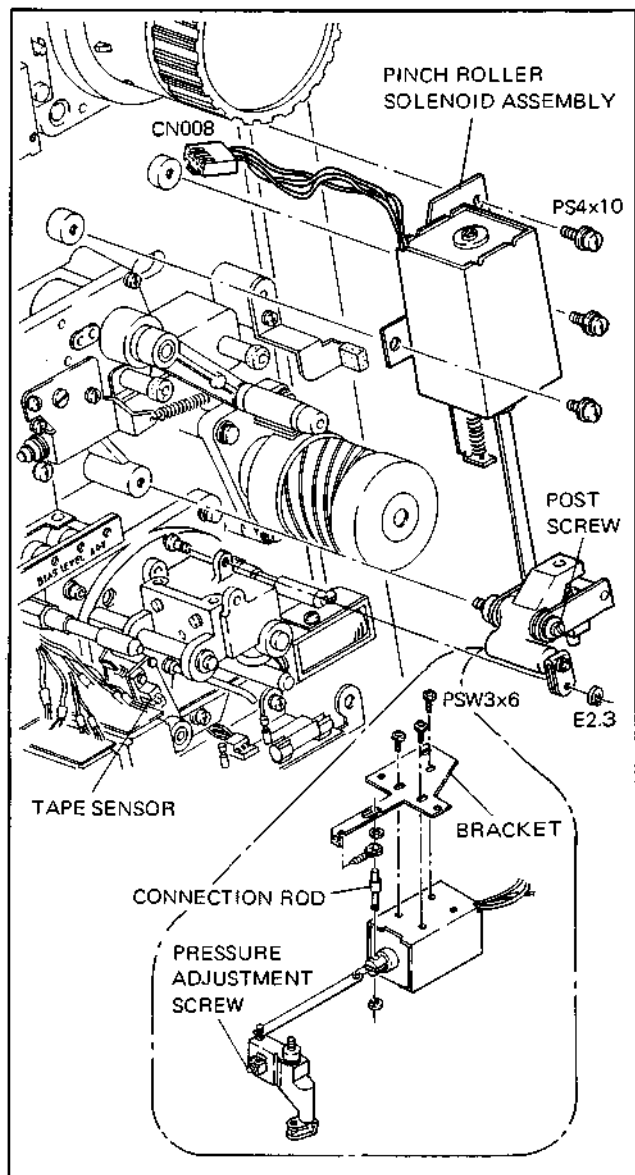


Fig. 3-54. Pinch Roller Solenoid Replacement

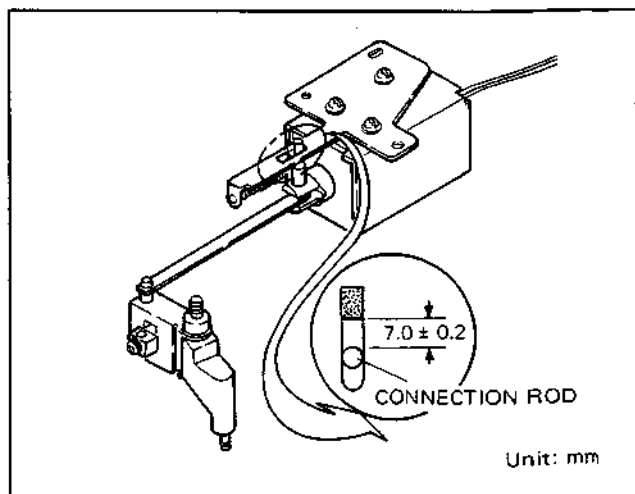


Fig. 3-55. Pinch Roller Solenoid Position Adjustment

3-20. AUDIO/CTL R/P HEAD REPLACEMENT

When the audio/CTL R/P head (in the following abbreviated as head) is replaced, it is possible that head azimuth, height, position, etc. differ from those before the replacement, so that adjustment according to the flowchart of section 3-24-1 must be carried out after the replacement.

Removal

1. Remove the R/P shielding case cover.
2. Remove the leads from the head.
 - Note:** Take care not to touch the drum cover with the soldering iron.
3. Remove the two screws (C3×16 and C3×10) shown in Fig. 3-56-A, and remove the head assembly.
 - Note:** Do not turn any other screws than these two screws.
4. Remove the HD-07 (except for PS 04/14 models) or HD-08 (for PS 04/14 models) boards from the head assembly.
5. Remove the two screws securing the head.
 - Note:** The head can be replaced even if the shielding case is joined together.

Installation

6. Pushing the new head towards the shielding case, fix it with two screws (PS2.6×6).
 - Note:** When the shielding case had been removed, fix shielding case to the head base lightly and place the head assembly as shown in Fig. 3-56-C onto a flat table, insert a thickness gauge with a thickness of 0.4 mm between the head and the flat table, depress the shielding case lightly, and tighten the previously lightly tightened screws securely.
7. Solder the HD-07 or HD-08 boards to the head assembly.

Head Assembly Installation

8. Install the head assembly so that the hole shown in Fig. 3-56-B is placed onto the pin on the head table.
 - Note 1:** Tighten the two screws so that the head assembly will be parallel to the neighboring audio/CTL erase head.
 - Note 2:** Tighten the two screws finally with a torque of 6 to 8 kg-cm. Please note that excessive tightening of the screws may cause change of Zenith.
9. Solder the leads to the head referring to Fig. 3-56-D.
10. Reinstall the R/P shielding case cover.
11. Adjust the tape path system and the audio signal system according to the flowchart of section 3-24-1.

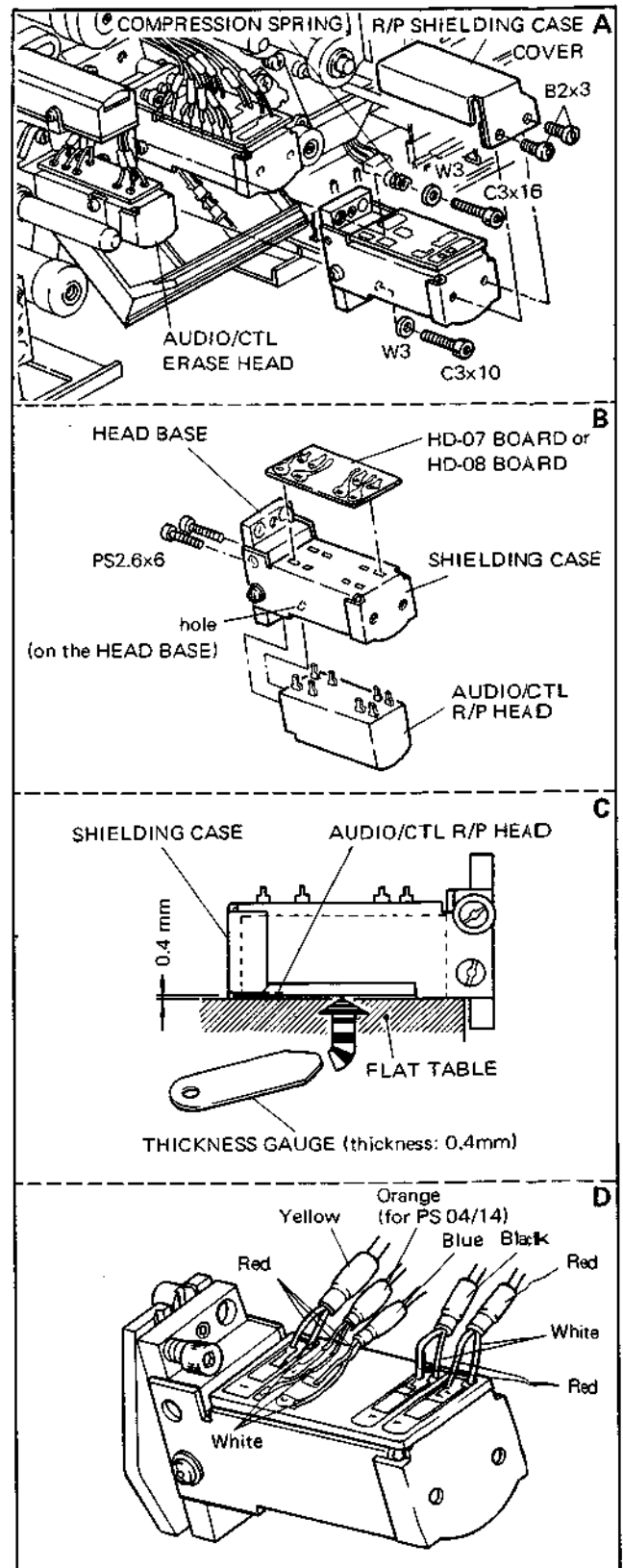


Fig. 3-56. Audio/CTL R/P Head Replacement

3-21. AUDIO/CTL MONITOR HEAD REPLACEMENT (Except for 00 and 10 models)

When the audio/CTL monitor head (in the following abbreviated to monitor head) has been replaced, azimuth, height, etc. may be different from before the replacement, so that adjustment according to the flowchart of section 3-24-1 must be carried out after the replacement.

Removal

1. Remove the leads from the monitor head.
Note: Do not touch the drum cover with the soldering iron.
2. Remove the two screws shown in Fig. 3-57-A, and remove the monitor head assembly.
Note: Do not turn any other screws than these two screws.
3. Remove the HD-07 (except for PS 04 and 14 models) or HD-08 (for PS 04 and 14 models) boards from the monitor head assembly.
4. Remove the two screws securing the monitor head to the head base.
Note: The head can be replaced even if the shielding case is joined together.
5. Pushing the new head towards the shielding case, fix it with two screws (PS2.6×6).
Note: When the shielding case has been removed, fix the shielding case to the head base lightly and place the monitor head assembly as shown in Fig. 3-57-C onto a flat table, insert a thickness gauge with a thickness of 0.4 mm between the head and the flat table, depress the shielding case lightly, and tighten the previously lightly tightened screws securely.
6. Solder the HD-07 or HD-08 boards to the monitor head assembly.

Head Assembly Installation

7. Install the monitor head assembly so that the hole shown in Fig. 3-57-B is placed onto the pin on the head table.
Note 1: Tighten the two screws so that the head assembly will be parallel to the neighboring audio/CTL R/P head.
Note 2: Tighten the two screws finally with a torque of 6 to 8 kg-cm. Please note that excessive tightening of the screws may cause change of Zenith.
8. Solder the leads to the head referring to Fig. 3-57-D.
9. Adjust the tape path system and the audio signal system according to the flowchart of section 3-24-1.

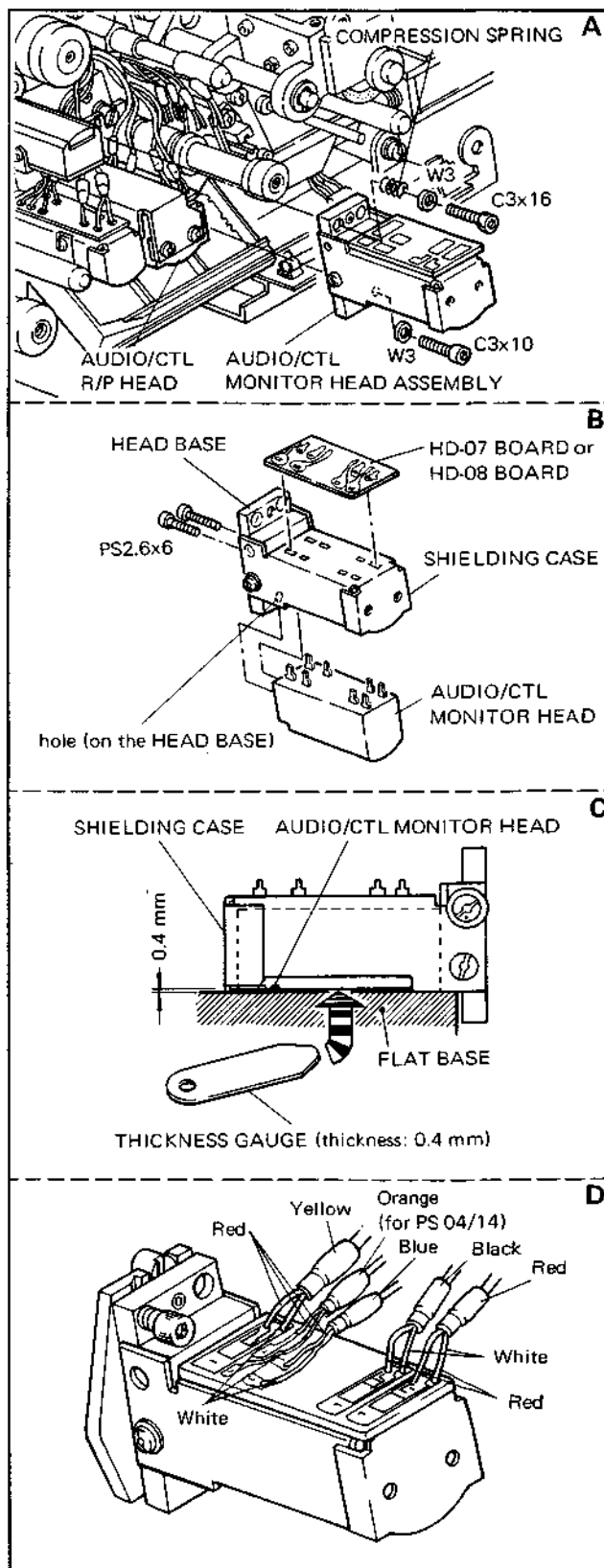


Fig. 3-57. Audio/CTL Monitor Head Replacement

3-22. AUDIO/CTL ERASE HEAD REPLACEMENT

After replacement of the audio/CTL erase head (in the following abbreviated to erase head), confirm the head height according to section 3-24-11, and then adjust the required items for the audio signal system according to section 12.

Removal

1. Remove the leads from the erase head.
2. Remove the two screws shown in Fig. 3-58-A, and remove the erase head.
Note: Do not turn any other screws than these two screws.
3. Remove the CEH-2 board from the erase head.
4. Remove the two screws securing the shielding case to the erase head.
5. Remove the two screws securing the erase head to the head base.

Installation

6. Fix the new erase head with the two screws (PS2.6x6) lightly to the head base, so that the head still can be moved lightly.
7. Place the erase head as shown in Fig. 3-58-C onto a flat table, depress it lightly from above, and tighten the two screws securely.
8. Place the shielding case over the erase head, and fix it with the two screws (B2x3).
9. Attach the CEH-2 board by soldering so that it is in close contact with the rear of the shielding case.

Head Assembly Installation

10. Fix the erase head assembly with the two screws (PS3x8).
11. Solder the leads to the head referring to Fig. 3-58-D.
12. Confirm the height of the erase head according to section 3-24-11.
13. Adjust the erase current and the erase frequency according to section 12.

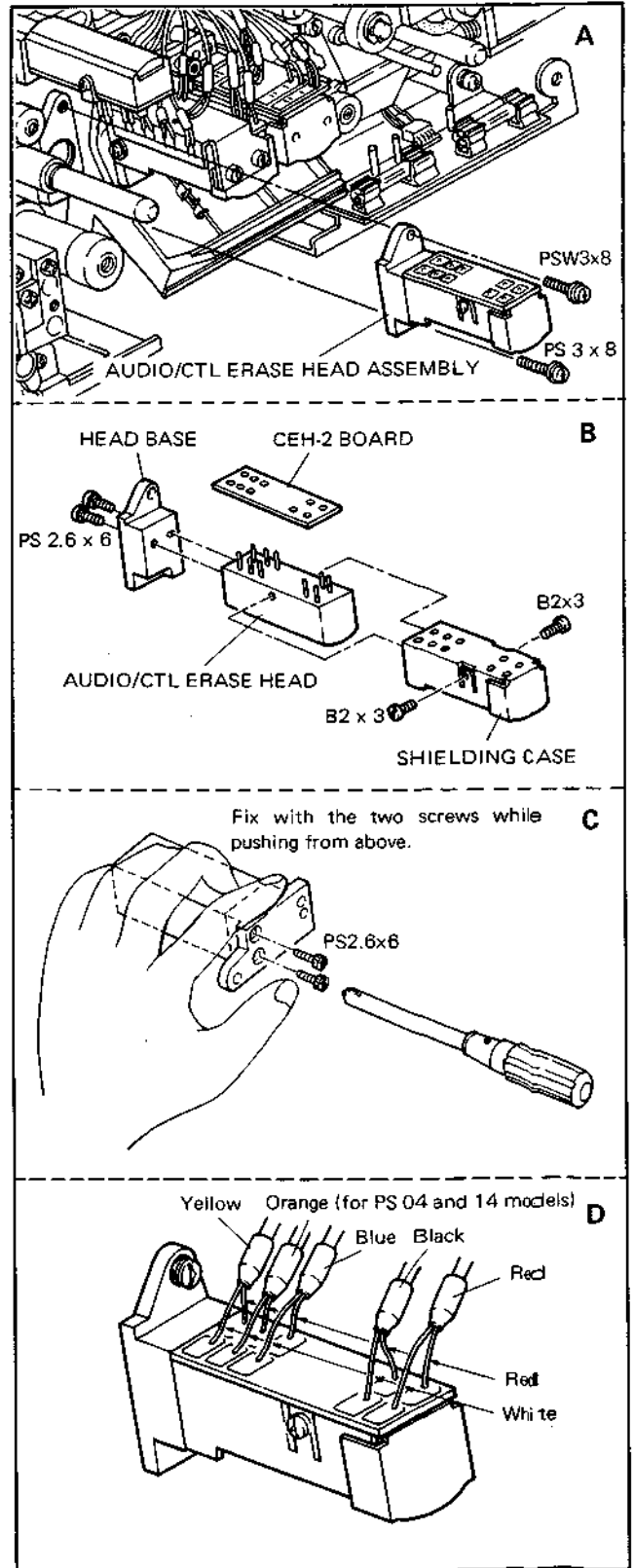


Fig. 3-58. Audio/CTL Erase Head

3-23. OTHER PARTS REPLACEMENT

3-23-1. Roller Assembly Replacement

Preliminary Information

- A. Bearing replacement also is carried out in the sequence described here, and the tape path is confirmed. However FG duty cycle adjustment is not required in this case.
- B. The magnet ring and the timer roller, which are components of the roller assembly, are glued to each other by adhesive, so that they should be replaced as an assembly.

Replacement

1. Disassemble the timer roller as shown in Fig. 3-59, replace the required parts, and reassemble.

Confirmation of the Tape Path

2. Thread a tape, and set the machine in REC mode. Confirm that the tape is in light contact with the upper flange of the timer roller assembly and that the tape does not curl. Also confirm that the tape does not curl near the T-tension arm. If necessary, adjust the height of the upper flange, referring to section 3-24-2. Confirm the tape path in F.FWD and REW mode in the same way.

FG Duty Cycle Adjustment

3. Turn on the power, set S4 (TEST 1) switch on the CD-17 board to "1", and depress S7 (ENTRY) switch for at least 0.5 sec.
4. Confirm that the duty cycle of the waveform of TP6 on the RL-12 board is 50% when the machine is in FWD 3 times speed mode. If necessary, adjust RV3 on RL-12 board.
5. In the same way, confirm a duty cycle of 50% for the waveform of TP15.
6. Set the machine in STANDBY mode and remove the tape.
7. For cancellation of the test mode, set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec.

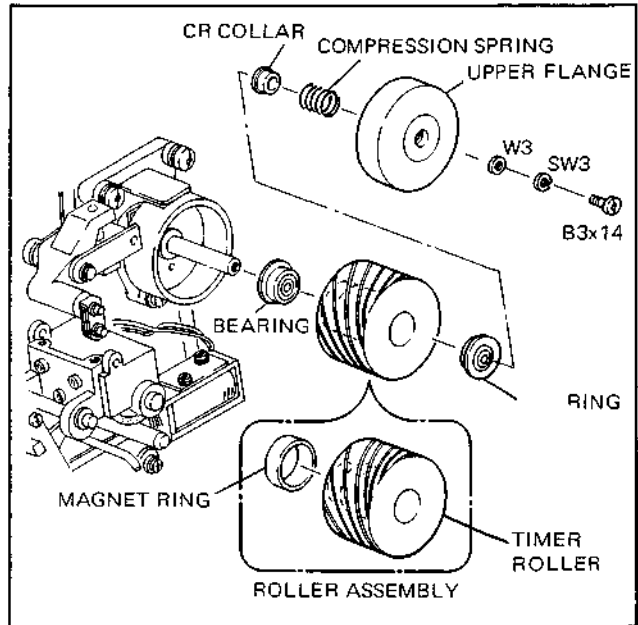


Fig. 3-59. Roller Assembly Replacement

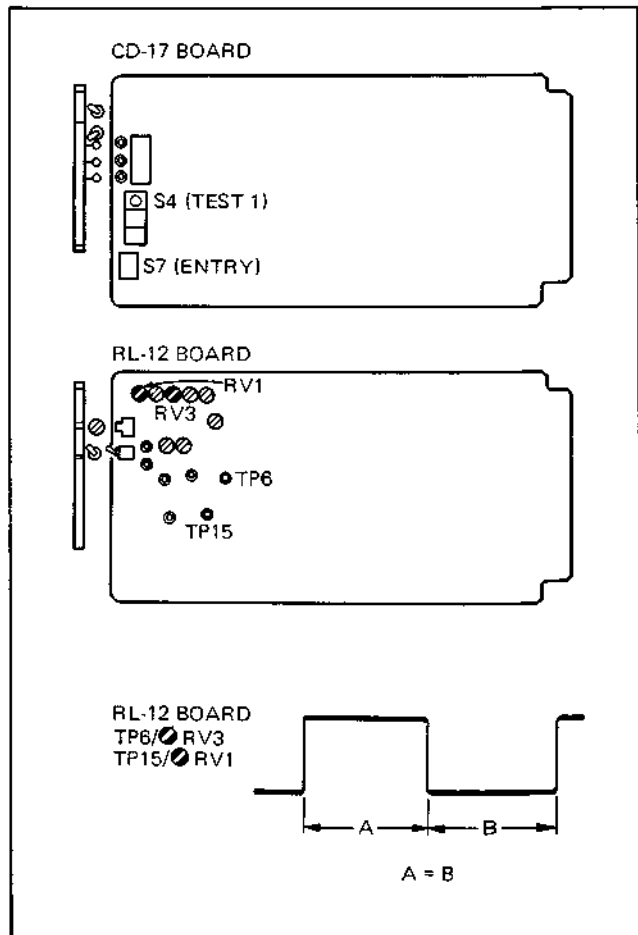


Fig. 3-60. FG Duty Cycle Adjustment

3-23-2. Reed Switch Replacement (Component of Movable Guide Assembly)

Preliminary Information

- A. The reed switch on the TH-03 board is used to detect the stop position of the entrance and exit slant guides.
- B. If the reed switch is not mounted in the correct position, the slant guides may not perform an open and close operation correctly.
- C. The relief plate mounted on the straight link protects the fingers from injury when threading a tape. Once this mechanism operates by pinching the fingers, the slant guides will not be set in the correct position from the next threading.
In this case, fix the relief plate so that the both sides of the relief plate and the straight link are on the same plane.

Replacement

1. Remove the E ring (E3) securing the straight link.
2. Loosen the screw ③ securing the relief plate and remove the straight link.
3. Loosen the setscrew, remove the rotary link.
4. Remove the used reed switch.
5. Cut off the leads of a new reed switch in the specified length shown in Fig. 3-61 detail a.
6. Put the part marked ● of the reed switch in the direction shown in detail a and solder the leads.
7. Put the rotary link on the shaft of the motor and tighten the setscrews.

8. Secure the straight link with the E ring (E3). Move the relief plate in the direction shown in detail b and put the relief plate so that the both sides of the relief plate and the straight link are on the same plane and tighten screw ③.
Note: The screw ③ must be tightened with the torque of approx. 10kg-cm.

Confirmation

9. Thread a tape and set the machine in the STANDBY mode and make sure that the slant guides close at the proper position.
10. When the tape has been pulled out from the end-of-tape sensor, make sure that the slant guides open and then make sure that the guides are closed when the tape is threaded into the end-of-tape sensor. Perform this procedure three times.

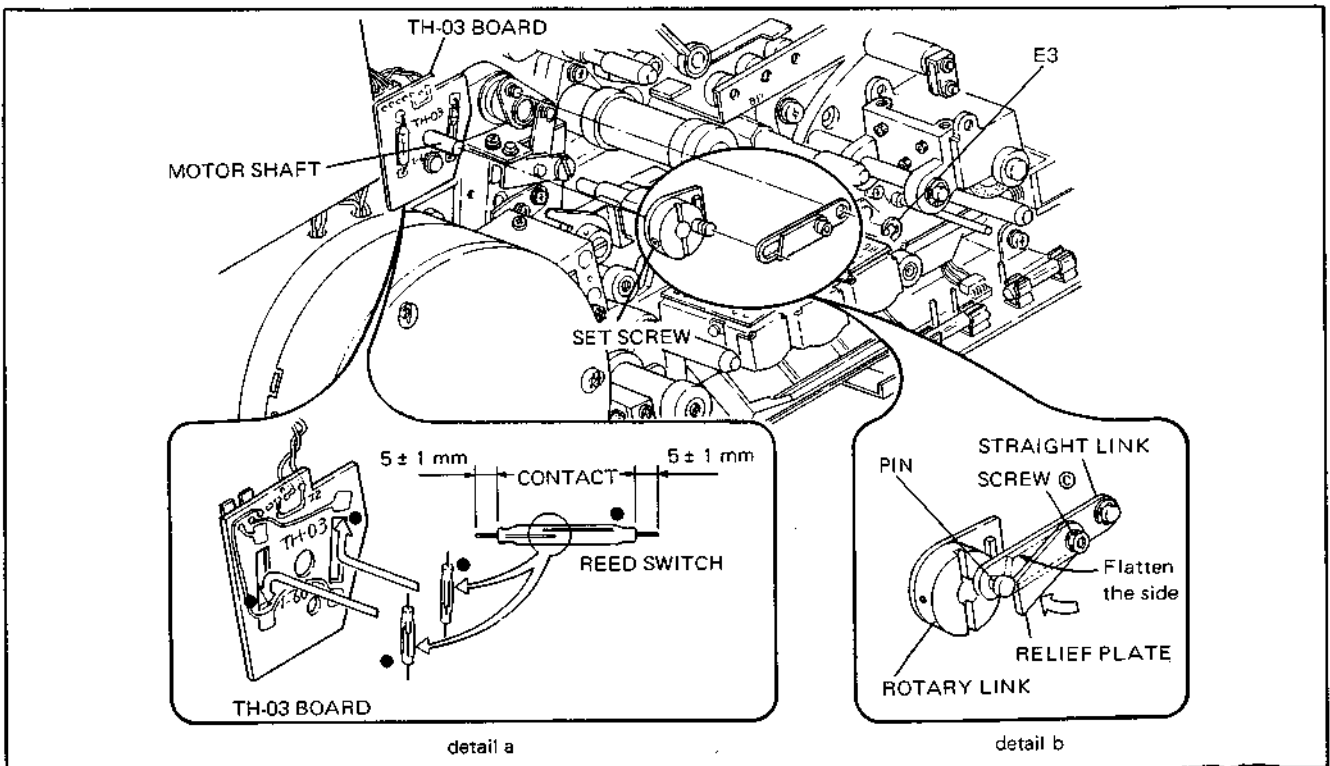


Fig. 3-61. Replacement of Reed Switch

3-24. TAPE PATH ADJUSTMENT AFTER REPLACING THE PARTS

3-24-1. Adjustment Flowchart

Replacement of Head Drum Assy, Lower Drum Assy, Movable Guide, Entrance and Exit Slant Guides, and component of Slant Guide Assy.

When the S-reel table, guide roller 1, guide roller 2, fixed guide 1, timer roller, T-tension arm or T-reel table is replaced, however the height adjustment is not required, the tracking check and the subsequent adjustments of the flowchart may be skipped.

Upper Drum Assy Replacement

When the upper drum assembly is replaced, however the tracking and CTL head position adjustments are not required, the following may be skipped.

3-24-9. Audio/CTL R/P Head Adjustment

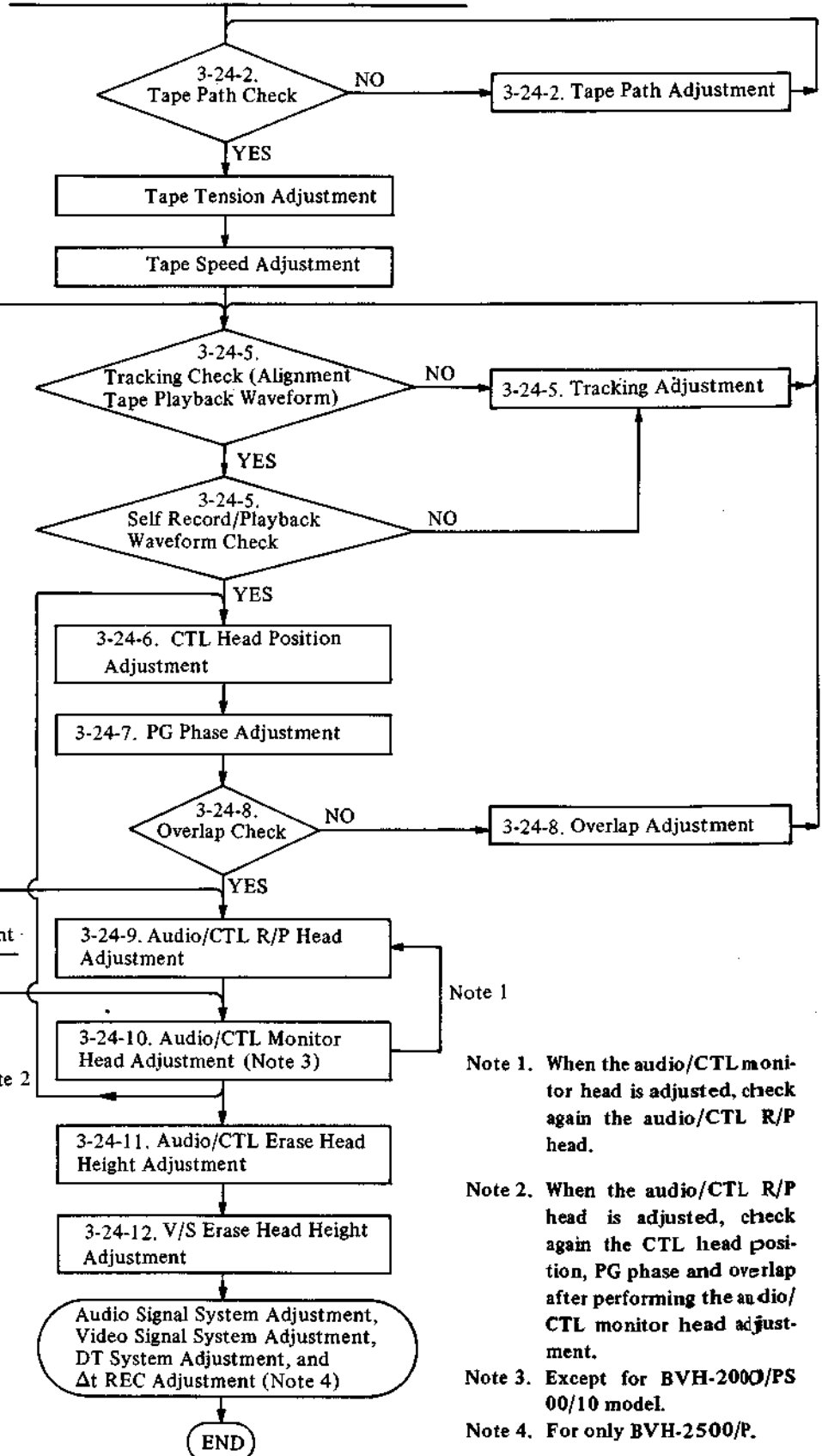
3-24-10. Audio/CTL Monitor Head Adjustment

3-24-11. Audio/CTL Erase Head Adjustment

Audio/CTL R/P Head Replacement

Audio/CTL Monitor Head Replacement

When the audio/CTL R/P head or audio/CTL monitor head is replaced, however the tracking adjustment is not required, the V/S erase head height adjustment may be skipped.



Note 2

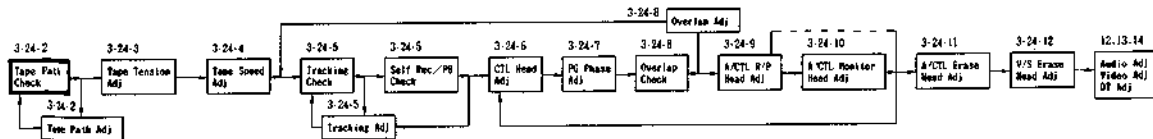
Note 1

Note 1. When the audio/CTL monitor head is adjusted, check again the audio/CTL R/P head.

Note 2. When the audio/CTL R/P head is adjusted, check again the CTL head position, PG phase and overlap after performing the audio/CTL monitor head adjustment.

Note 3. Except for BVH-2000/PS 00/10 model.

Note 4. For only BVH-2500/P.



3-24-2. Tape Path Check & Adjustment

Check that the tape does not touch the reel flange strongly and there is no tape curl nor abnormal tape running in each mode of REC, F.FWD, REV x1 SHUTTLE and REW.

Tape Path Check

1. Place a reel whose flanges have little shake on the reel table and tape must be free from scratches and wrinkles on both edges.
2. Set in the REC mode and check the following points.
 - ① Supply reel:
Tape touches the reel flange little.
 - ② Guide roller 1:
Tape curls little, though the upper edge of the tape touches the guide flange.
 - ③ Guide roller 2:
Tape curls little, though the lower edge of the tape touches the guide flange.
 - ④ Taper guide:
Tape does not curl.
 - ⑤ Entrance and Exit Slant Guides:
Tape does not curl along the guide flange.
 - ⑥ Guide post 3:
Tape does not curl.
 - ⑦ Guide post 1:
Tape does not curl, though the lower edge of the tape touches the guide flange.
 - ⑧ Timer roller:
Tape curls little, though the upper edge of the tape touches the flange.
 - ⑨ T-tension arm
Tape curls little, though the lower edge of the tape touches the flange.
 - ⑩ Take-up reel:
Tape touches the reel flange little.
3. If the tape does not run in accordance with the above items, adjust the height of the reel tables or guides.
4. Check Step 2 in the order of the F.FWD, REV x1 SHUTTLE and REW mode. If necessary, adjust the height of the reel tables or the guides.

Note: If the height of the tape path on the timer roller varies in the REC, F.FWD or REW mode, adjust the slant of the timer roller so that the tape runs at the same height in the REC mode.

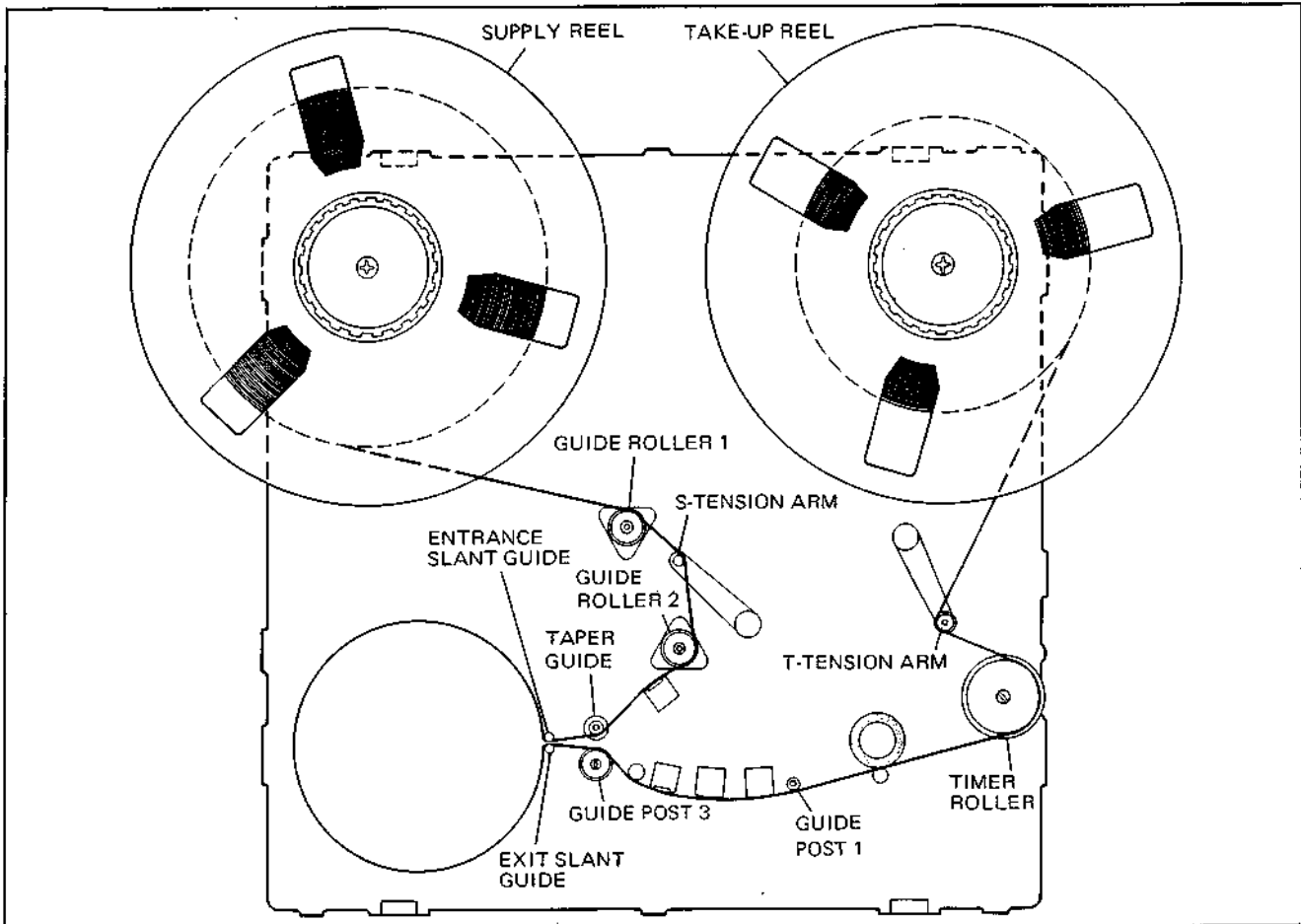
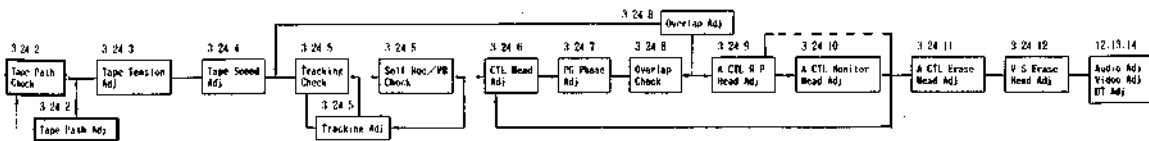


Fig. 3-62 Tape Path Check

Guide Height Adjustment

The height of the guides is shown in Fig. 3-63.

When the part is replaced, mount it after adjusting the height of the guides to the value shown below.

Note 1: Do not adjust the guides, especially guide roller 2, taper guide, entrance slant guide, exit slant guide, guide post 3 and guide post 1 unless absolutely necessary. When these guides have been adjusted, check the tracking and the height of the stationary heads.

Note 2: The entrance and exit slant guide should not be adjusted in this section.

Note 3: For the V/S erase head, audio/CTL erase head, audio/CTL R/P head and audio/CTL monitor head, the adjustment is not required in this section.

Illustration 3. PERIODIC CHECK & MAINTENANCE

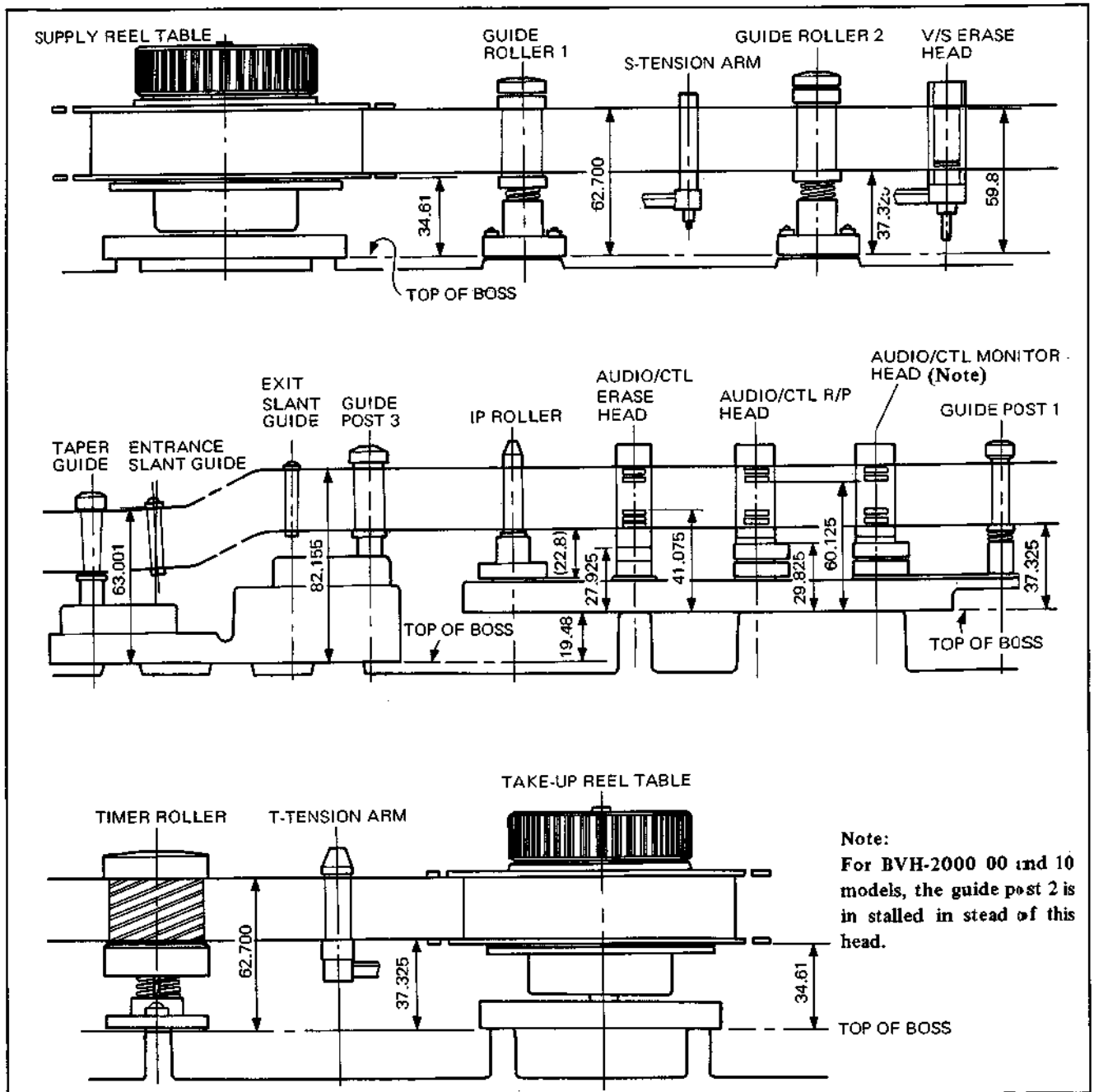
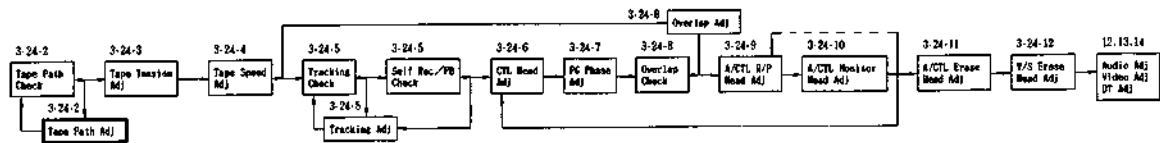
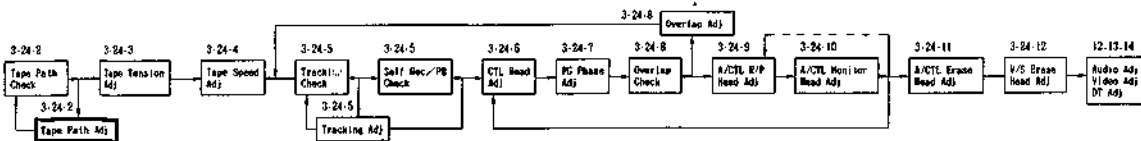


Fig. 3-63. Guide Height



Supply and Take-up Reel Table Height Adjustment

1. Remove the cover and reel washer.
 2. Loosen setscrews A and B.
 3. While pushing the reel table lightly in the direction of the arrow, adjust the height of the reel table by turning setscrew C.
- Note 1.** Adjust the height of the reel table so that the tape runs without touching the flange of the reel.
- Note 2.** For the height to the top of the reel sheet from the top of the boss, see Fig. 3-63.
4. Tighten setscrews A and B and mount the reel washer and cover.

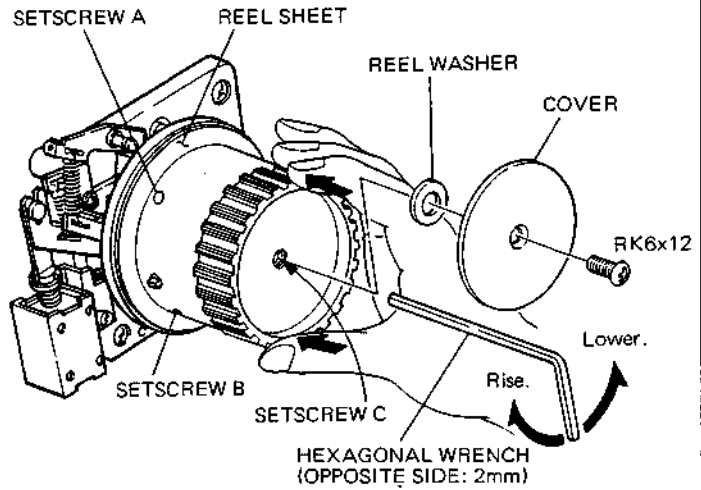


Fig. 3-64-1.

Guide Roller 1 & 2 Height Adjustment

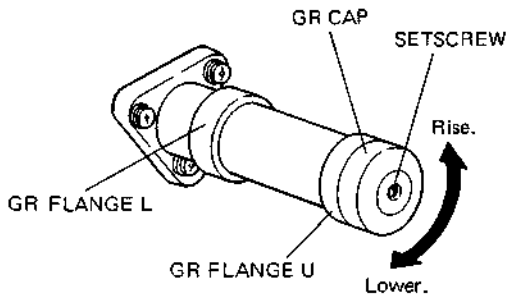


Fig. 3-64-2.

- Caution 1.** Do not adjust guide roller 1 & 2 unless absolutely necessary. If the curl remains by any means, finely adjust guide roller 1.
- Caution 2.** When guide roller 1 or 2 is replaced, mount the roller after adjusting the height to the value shown in Fig. 3-63.
1. Loosen the setscrew.
 2. Adjust the height of the guide roller by turning GR cap.
- Note 1.** Adjust guide roller 1 so that the tape touches GR flange U lightly without curl.
- Note 2.** Adjust guide roller 2 so that the tape touches GR flange L lightly without curl.
3. Tighten the setscrew.

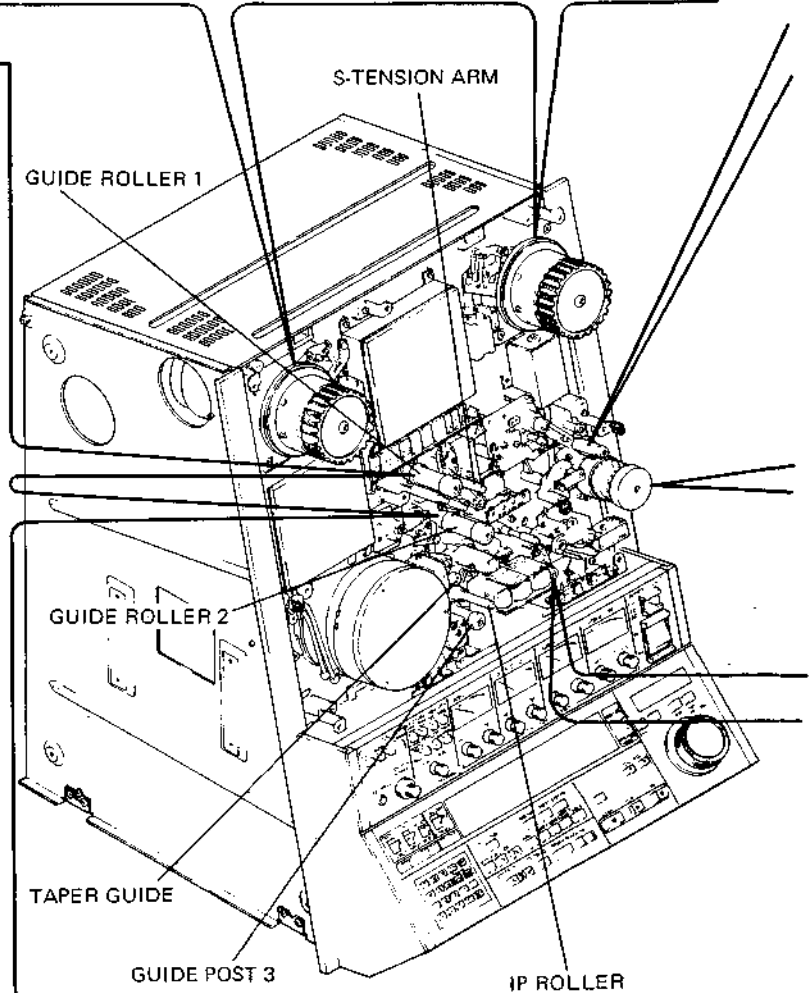


Fig. 3-64-3.

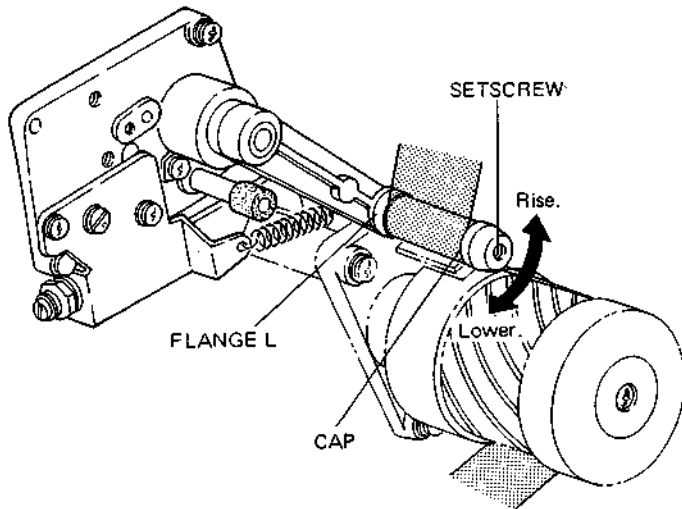
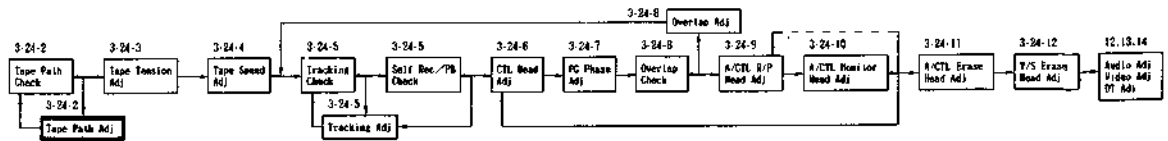


Fig. 3-64-4.

T-Tension Arm Height Adjustment

1. Loosen the setscrew.
2. Set the machine in the REC mode. While checking that the tape does not curl along the timer roller, adjust the height of T-tension arm by turning the cap so that the tape touches flange L.
3. Set the machine in the REV $\times 1$ SHUTTLE mode. Adjust again that there is no tape curl along the timer roller and the curl becomes as small as possible along T-tension arm.
4. When the mode is changed from F.FWD to REV $\times 1$ SHUTTLE, check that the curl does not change along the timer roller and T-tension arm. If changed, perform Step 2 through 4 again.
5. Tighten the setscrew.

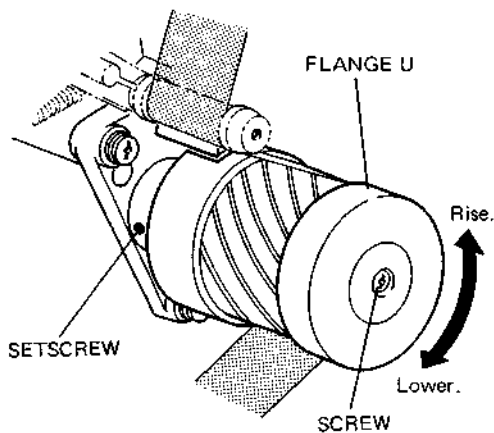


Fig. 3-64-5.

Timer Roller Height Adjustment

Note: The height of the timer roller and T-tension arm influences each other.

If necessary, adjust the height of T-tension arm also.

1. Check that the screw of flange U is tightened.
2. Loosen the setscrew.
3. Set the machine in the REC mode. Adjust the height of the timer roller by turning the flange U so that the tape touches flange U lightly without curl.
4. Tighten the setscrew and check that the screw of flange U is tightened.

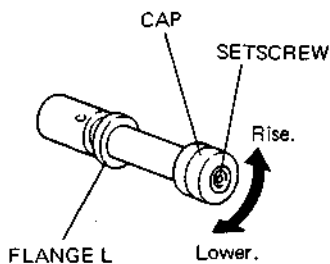


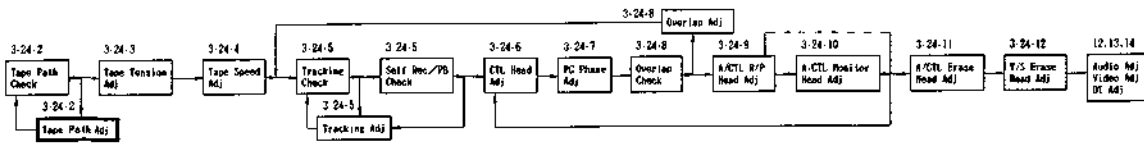
Fig. 3-64-6.

Guide Post 1 Height Adjustment

1. Loosen the setscrew.
2. Set the machine in the REC mode. Adjust the height of the guide by turning the cap so that the tape touches flange L lightly without curl.
3. Tighten the setscrew.

Note 1. Do not adjust the guide post 1 unless absolutely necessary.

Note 2. When the guide post 1 is replaced, mount it after adjusting the height to the values shown in Fig. 3-63.



Taper Guide Height Adjustment

Note: In this section, the height will need not to be adjusted especially unless no tape curls along the guide flange.

1. Loosen the set screw on the top of the taper guide.
2. Turn the cap of the taper guide so that the tape does not curl in REC mode.
3. Fix the cap by tightening the set screw loosened in step 1 with a torque 7 to 8 kg-cm.

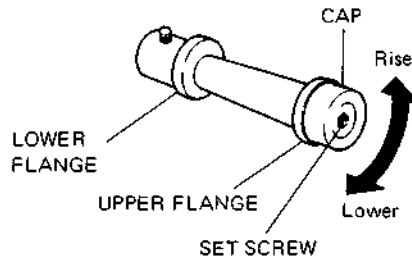


Fig. 3-64-7.

Guide Post 3 Height Adjustment

Note: In this section, the height will need not to be adjusted especially unless no tape curls along the guide flange.

1. Loosen the set screw driven in the upper flange.
2. Turn the height adjustment screw on the top of the upper flange so that the tape does not curl in REC mode.
3. While facing the set screw fastening the upper flange downward, tighten it securely.

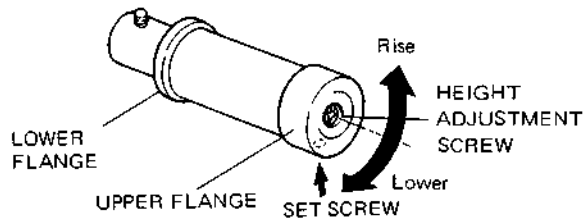


Fig. 3-64-8.

Timer Roller Slant Adjustment

If the height of the tape path along the timer roller varies in each of the REC, F.FWD or REW mode, this adjustment must be performed.

1. Prepare the spacers.

Thickness (mm)	Part No.
0.02	3-651-334-01
0.05	3-651-334-11
0.1	3-651-334-21
2. Insert the spacer into the position shown in Fig. 3-65 so that the height of the tape path in the F.FWD or REW mode is the same as that in the REC mode.

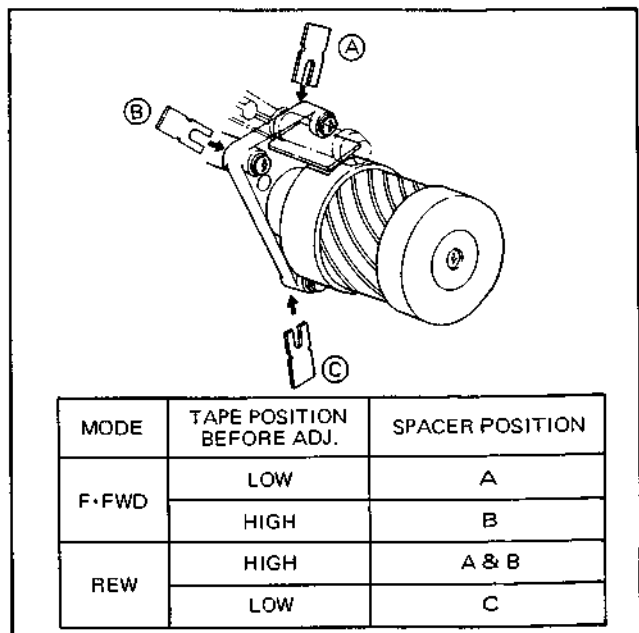
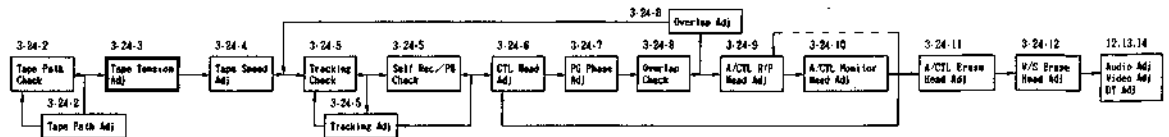


Fig. 3-65. Timer Roller Slant Adjustment

BVH-2000(U/C)/PS/PM
 BVH-2180(U/C)/PS/PM
 BVH-2500(U/C)/P



3-24-3. Tape Tension Adjustment

Preliminary Information

- A. This is the tape tension (FWD back tension) adjustment in the REC mode.
- B. Prepare the tension adjustment tool.
Part No. J-6043-120-A
- C. If the specific tape tension is not obtained when the following adjustment has been performed and when it is supposed that the cause is the malfunction of the potentiometer built in the S-tension arm assembly, replace the S-tension arm assembly, referring to section 3-12. The whole assembly should be replaced even if any component of the assembly is worn out or damaged except the guide shaft. If the guide shaft is worn out, replace it referring to section 6-5 or shift the worn surface of the shaft.

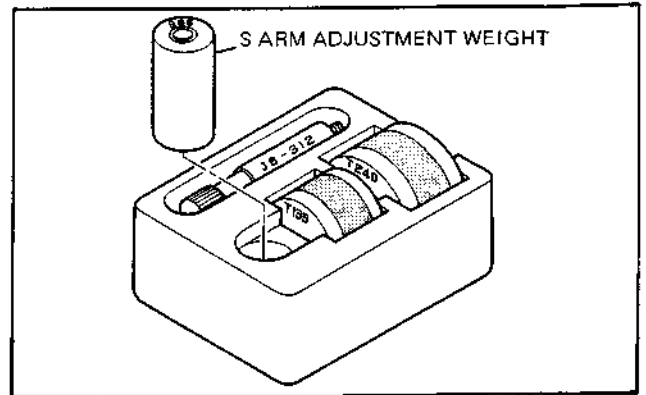


Fig. 3-66. Tension Adjustment Tool

Check and Adjustment

1. Put the S arm adjustment weight on the guide shaft of the S-tension arm. Lift the arm by hand and then take the hand off slowly so that the arm vibrates freely. Wait until the arm stops naturally.
2. Connect the digital voltmeter to TP12 on RL-12 board. And turn on the power of VTR.
3. Check that the voltage at TP12 is $0V \pm 0.03V$. If necessary, adjust RV12 on RL-12 board.
4. Remove the weight from the S-tension arm and check that the voltage at TP12 (or TP IN) is $-2.6 \pm 0.15V$. If necessary, adjust RV1 on TT-01 board.
5. Put the adjustment weight again, and vibrate the arm freely and wait until the arm stops naturally. After the arm was stopped, confirm that the voltage at TP12 is 0 ± 0.03 volt. If not, adjust RV12 again, and then perform step 4. And if RV1 has been adjusted in step 4, perform this step 5 again.

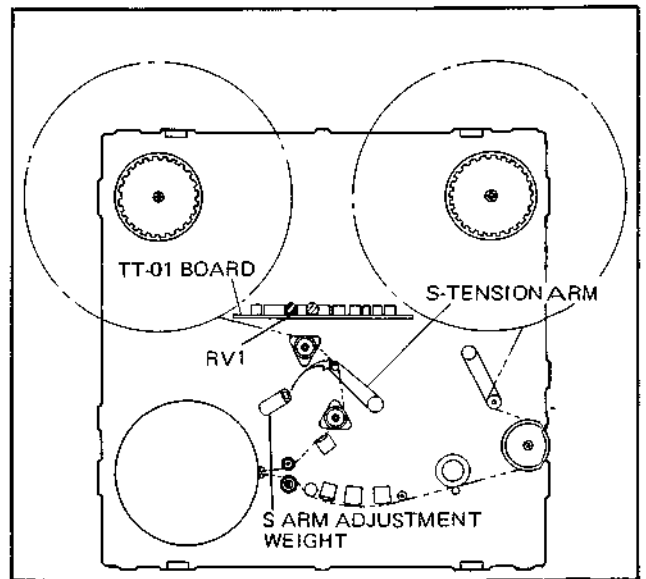


Fig. 3-67. Tape Tension Adjustment

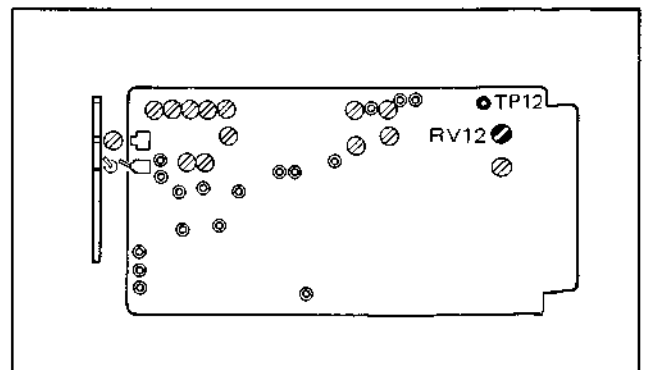
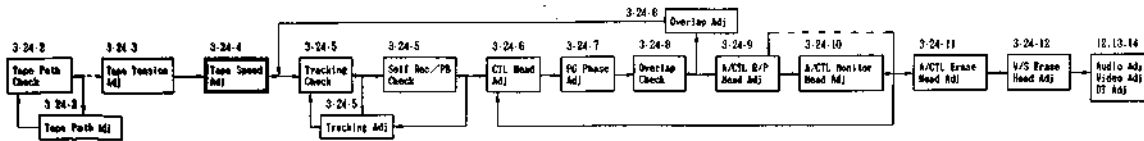


Fig. 3-68. RL-12 Board



3-24-4. Tape Speed Adjustment

Preliminary Information

- A. This is the tape speed adjustment in the REC mode.
- B. This adjustment is required when RV9 on the CD-17 board has been adjusted by mistake, RV9 or the capstan motor has been replaced.
- C. This adjustment is to set the FG pulse of the capstan motor to the specified frequency.

Note: There is another way of performing the tape speed adjustment by playing back the alignment tape in the test mode B, but this adjustment should not be used because the alignment tape may be transformed with use.

Check and Adjustment

1. Connect the frequency counter to TP6.
2. Thread a tape and record a video signal.
3. While recording, check that the counter reads:
 - 839.4 Hz \pm 0.3 Hz; for NTSC/PAL-M
 - 825.0 Hz \pm 0.3 Hz; for PAL/SECAM
 If necessary, adjust RV9 on the CD-17 board.

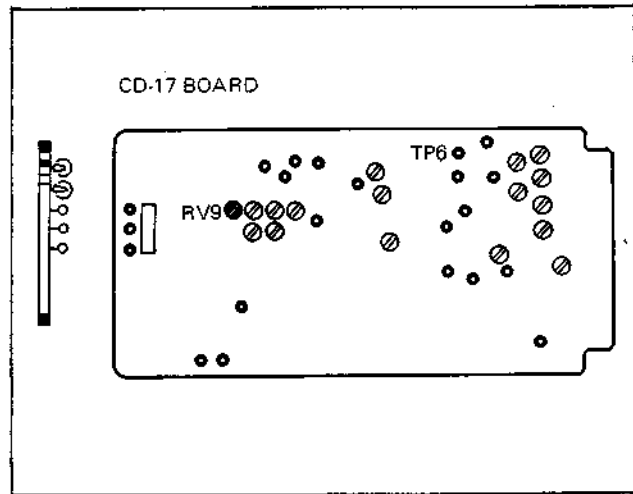
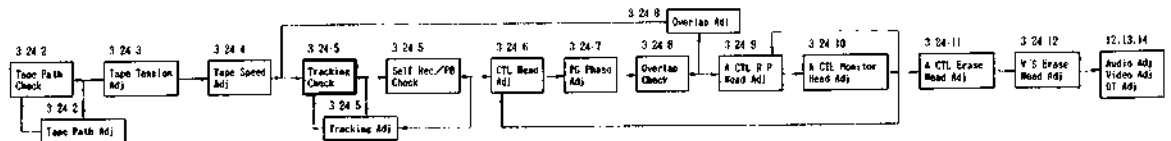


Fig. 3-69. Tape Speed Adjustment



3-24-5. Tracking Adjustment

A. Tracking Check (Alignment Tape Playback Waveform Check)

Note 1: If the upper drum has been replaced, run a tape in the PLAY or REC mode for about 20 minutes to break in the new upper drum before performing the tracking check.

Note 2: In case of 10, 12 or 14 model, there is no sync head.

1. Set the HEAD selector to R/P and set the ADV switch on the CD-17 board to OFF.
2. Connect CH-1 of the oscilloscope to TP1 on EQ-02 board and connect CH-2 to TP2. (In case of 10, 12 or 14 model, only TP1 is checked.)
3. Play back an alignment tape.
4. Check that the tape touches the upper flange of the taper guide lightly and the tape does not curl along the flange.
If not, perform the adjustment procedures.
5. Check that the tape touches the lower flange of guide post 3 lightly and the tape does not curl along the flange. If not, perform the adjustment procedures.
6. Play back the WHITE segment of the alignment tape and maximize the RF amplitude by turning TRACKING knob.
7. Check that the VIDEO and SYNC RF waveform show the specified value in Fig. 3-70-1.
8. Push TRACKING knob and check that the RF waveform does not vary. If the waveform varies, the CTL head position adjustment is required.
9. By performing the following two steps, check the gap between the upper drum and the guide post where is 1 mm apart from the guide flange as shown in Fig. 3-70-2.
 - ① 0.08-mm-gauge can be passed.
 - ② 0.10-mm-gauge cannot be passed.

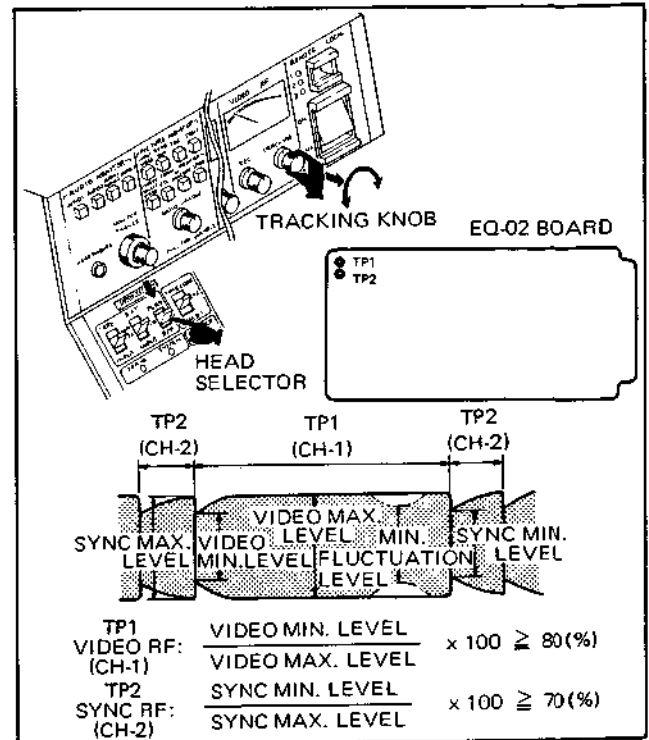


Fig. 3-70-1. Alignment Tape Playback Check

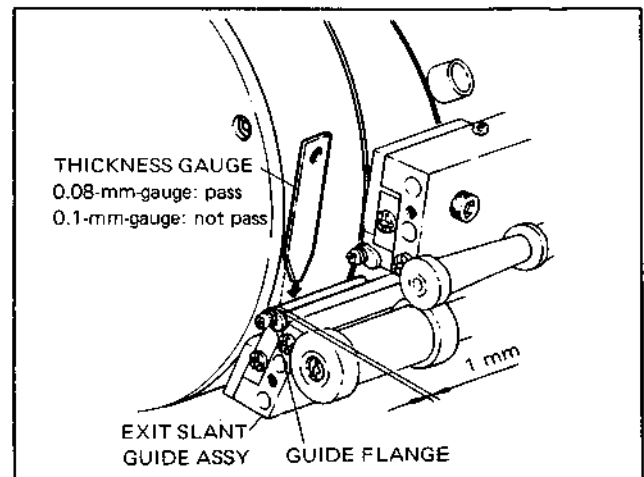
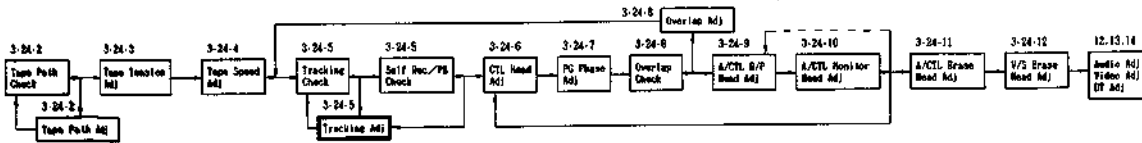


Fig. 3-70-2. Checking Gap near to Exit Slant Guide Assy



B. Tracking Adjustment

Preliminary Information

A. This adjustment is to make the heads trace the record pattern of the alignment tape correctly and to make the heads come into contact with the tape properly so that the tape interchangeability is maintained.

B. Adjustment points

- ① The height or slant of the taper guide, slant guides (entrance and exit) and guide post 3 must be adjusted.
 - ② The RF waveform of the tape entrance side must be adjusted first, and then that of the tape exit side must be adjusted.
 - ③ Each height of the taper guide and entrance slant guide should be adjusted alternately while checking the RF waveform.
 - ④ Before turning the slant guide adjustment screw, push the tape lightly and check the direction in which the slant guide must be moved.
 - ⑤ For the relation between the turning direction of the adjustment screw and moving direction of the slant guide, see Fig. 3-72.
 - ⑥ Make as much of the tracking adjustment as possible by adjusting the slant of the slant guide. Be careful that the guide flange does not press the tape excessively when turning the height adjustment screw.
 - ⑦ Each height of the guide post 3 and exit slant guide should be adjusted while checking the RF waveform.
- C. To adjust the height and slant, use phillips screwdriver for M2.6.

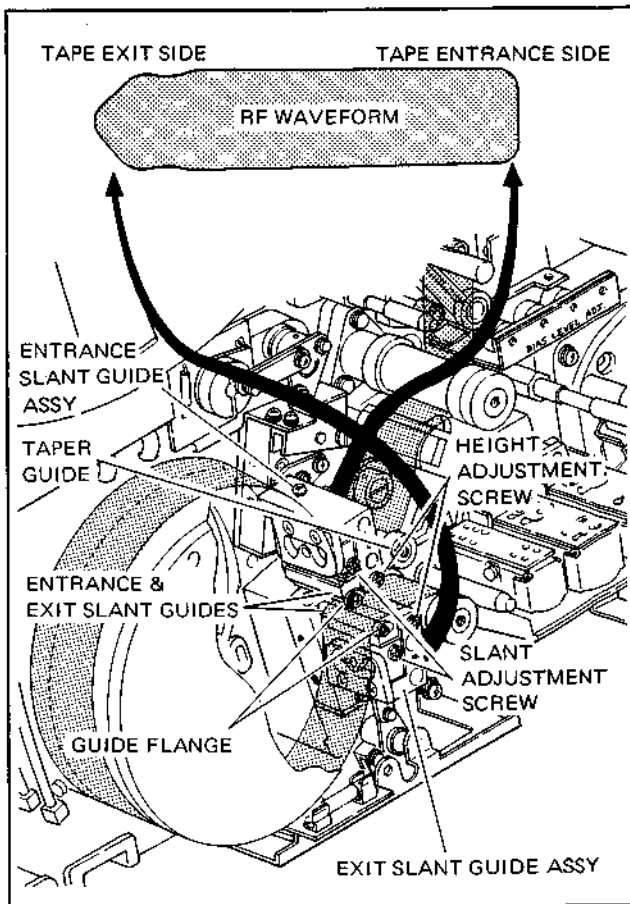


Fig. 3-71. Tracking Adjustment

- D. If the tracking cannot be adjusted correctly owing to the wear of the entrance slant guide, exit slant guide or the tape guide section of the head drum assembly, replace the part in accordance with the following section.
- Head drum assembly: Section 3-6
 - Entrance slant guides assembly: Section 3-8
 - Exit slant guide assembly: Section 3-8
 - Components of the slant guide assembly: Section 6-6

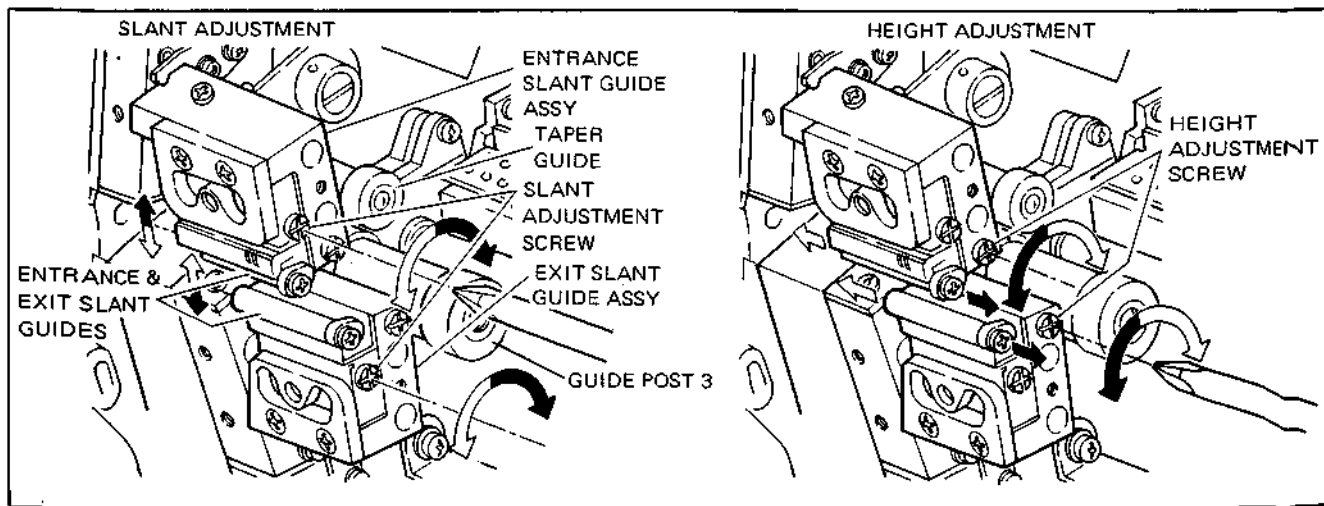
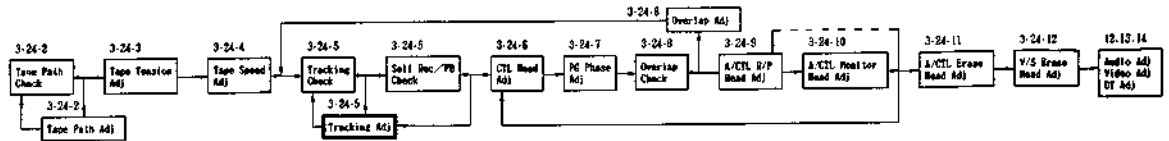


Fig. 3-72. Movement of Adjustment Screws and Slant Guides



Preparation before Adjustment

1. Check that HEAD selector is set to R/P and ADV switch on CD-17 board is set to off. Connect the oscilloscope CH-1 to TP1 on EQ-02 board and connect CH-2 to TP-2.
2. Play back the WHITE segment of the alignment tape.
3. Adjust by turning the TRACKING knob so that the RF amplitude is 3/4 of its maximum.

Height Adjustment of Taper Guide

4. Loosen the set screw on the top of the taper guide, and then turn the cap so that the tape is positioned in the middle of the guide.
5. Loosen the locking screw of the entrance slant guide assembly 1/8 to 1/4 turn.
6. Turn the height adjustment screw of the entrance slant guide about 90 degrees counterclockwise, and confirm that the RF amplitude at the tape entrance side decreases 10 to 20 percent. If not, adjust the slant of the slant guide as follows.
 - a By pushing U or L point of the running tape as shown in Fig. 3-73-2, find out the side whose RF waveform is similar to (a) of Fig. 3-73-1.
 - b If the waveform is similar to (a) of Fig. 3-73-1 by pushing L , turn the slant adjustment screw counterclockwise. If the waveform is similar to (a), by pushing U , turn the screw clockwise.
7. Turn the cap of the taper guide clockwise slowly so that the RF waveform is as flat as possible. See (b) of Fig. 3-73-1.
8. Fix the cap by tightening the set screw on the top of the cap with a torque of 7 to 8 kg-cm.
9. Confirm that the tape touches the upper flange of the taper guide but the tape does not curl along the flange.
10. Proceed to step 14 (height adjustment of entrance slant guide).

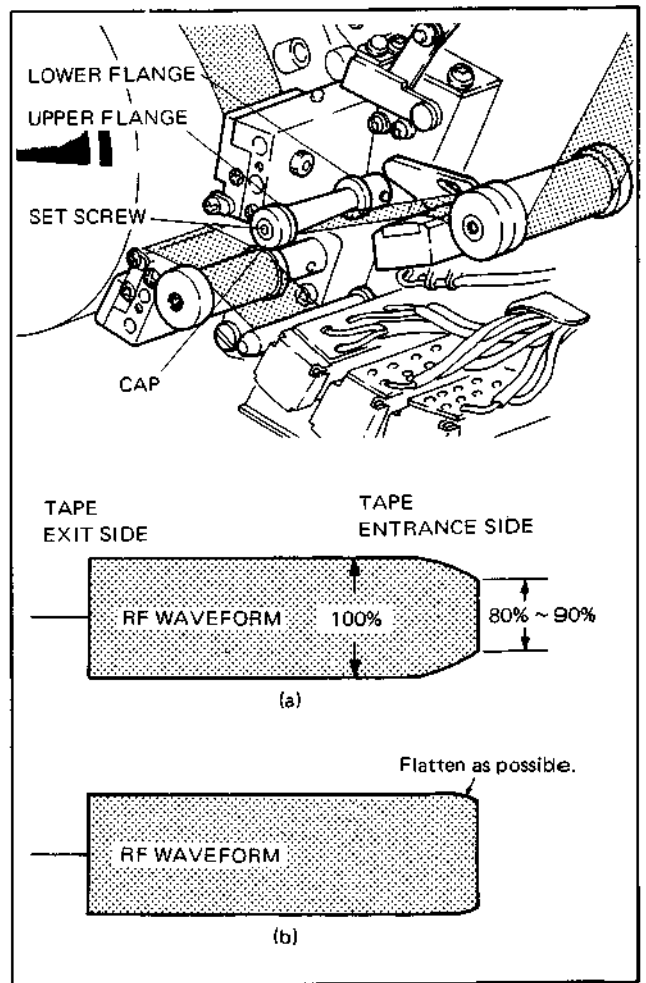
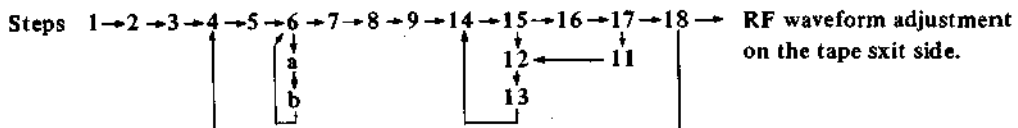
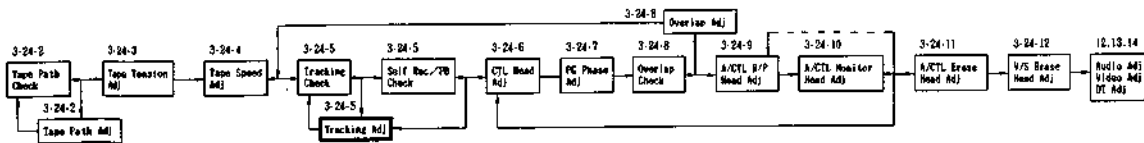


Fig. 3-73-1. Height Adjustment of Taper Guide

Note: The adjustment order of the RF waveform on the tape entrance side is as follows;





Slant Adjustment of Entrance Slant Guide

11. Loosen the locking screw of the entrance slant guide assembly 1/8 to 1/4 turn.
12. Lightly push **U** or **L** side of the tape shown in Fig. 3-73-2 and find out the side whose RF waveform on the tape entrance side becomes flat.
13. If the RF waveform flattens when the **L** side of the tape is pushed, turn the slant adjustment screw counterclockwise and if the waveform flattens when the **U** side of the tape is pushed, turn the adjustment screw clockwise.

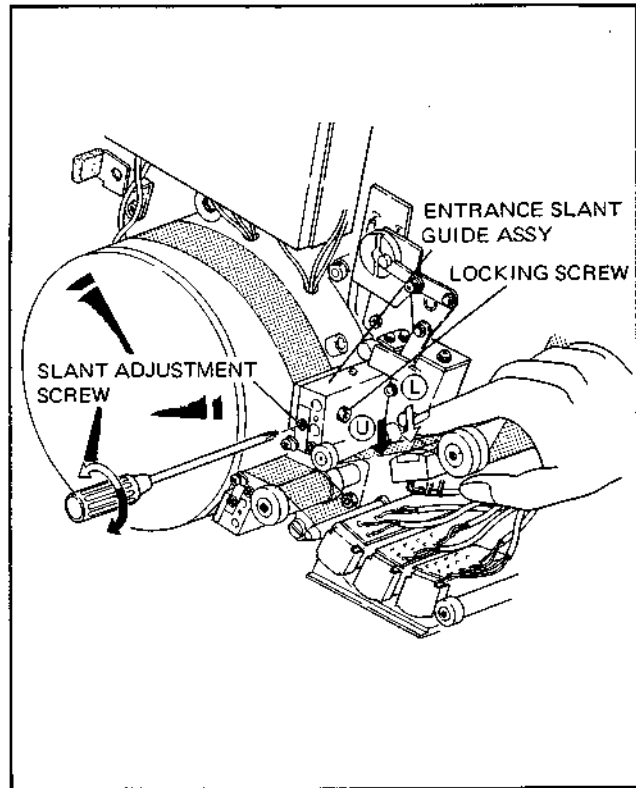


Fig. 3-73-2. Slant Adjustment of Entrance Slant Guide

Height Adjustment of Entrance Slant Guide

14. Check that the tape does not curl along the guide flange of the entrance slant guide. If the tape curls, turn the height adjustment screw counterclockwise.
15. Check that the RF waveform is flat. If it is not, return to step 12 and adjust the slant of the entrance slant guide again.
Repeat steps 12 to 15 until the RF waveform becomes as flat as possible and the tape does not curl along the guide flange.
16. Finally adjust again by turning the height adjustment screw so that the tape does not curl along the guide flange and the RF waveform is flat.
17. Tighten the locking screw of the entrance slant guide assembly and check that the RF waveform remains flat. If the RF waveform is varied, proceed to step 11 again.
18. If the taper guide is a height adjustable type, confirm that the tape touches to the upper flange of the taper guide and the tape does not curl. If not, proceed to step 4 again.

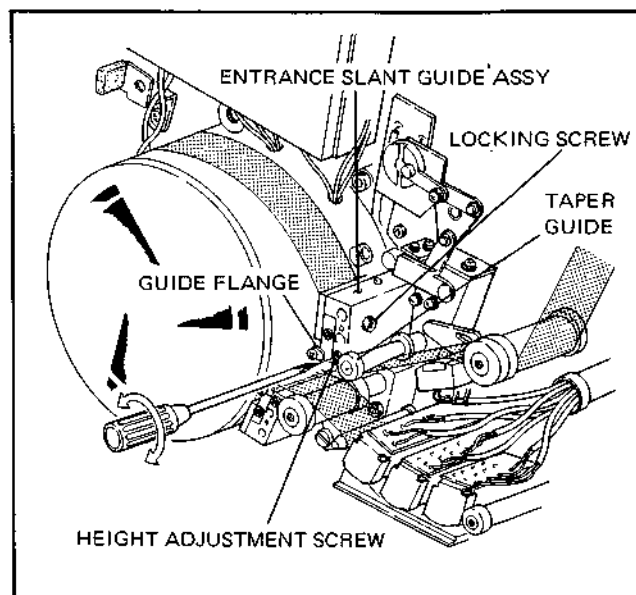
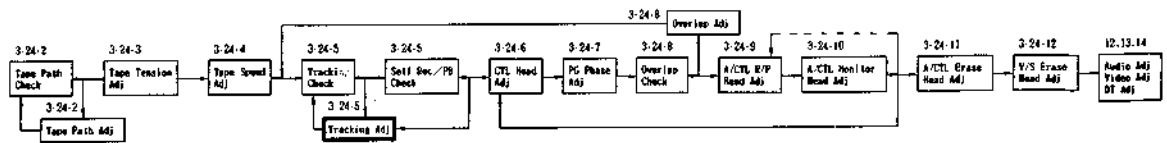


Fig. 3-74. Height Adjustment of Entrance Slant Guide



Height Adjustment of Guide Post 3

19. Loosen the set screw driven into the guide post 3.
20. Turn the height adjustment screw on the top of the guide post 3 so that the tape is positioned in the middle of the upper and lower flanges.

Slant Adjustment of Exit Slant Guide

21. Loosen the locking screw of the exit slant guide assembly 1/8 to 1/4 turn.
22. Lightly push the $\text{\textcircled{U}}$ or $\text{\textcircled{L}}$ side of the tape shown in Fig. 3-75 and find out the side whose RF waveform on the tape exit side becomes flat.

If the RF waveform flattens when the $\text{\textcircled{L}}$ side of the tape is pushed, turn the slant adjustment screw counterclockwise and if the waveform flattens when the $\text{\textcircled{U}}$ side is pushed, turn the adjustment screw clockwise.

Height Adjustment of Exit Slant Guide

23. Check that the tape does not curl along the guide flange of the exit slant guide. If the tape curls, turn the height adjustment screw counterclockwise.
24. Check that the RF waveform is flat. If it is not, return to step 22 and adjust the slant again.

Repeat steps 22 to 24 until the RF waveform becomes as flat as possible and the tape does not curl along the guide flange.
25. Finally adjust again by turning the height adjustment screw so that the tape does not curl along the guide flange and the RF waveform is flat.
26. Tighten the locking screw of the exit slant guide assy and check that the RF waveform remains flat. If the waveform is varied, proceed to step 21 again.
27. Check the gap between the upper drum and guide post by performing step 9 in item A (Tracking Check).
28. While confirming that the RF waveform does not vary, turn the height adjustment screw of the guide post 3 so that the tape touches the lower flange of the guide post 3.
29. Tighten the set screw which was loosened in step 19.

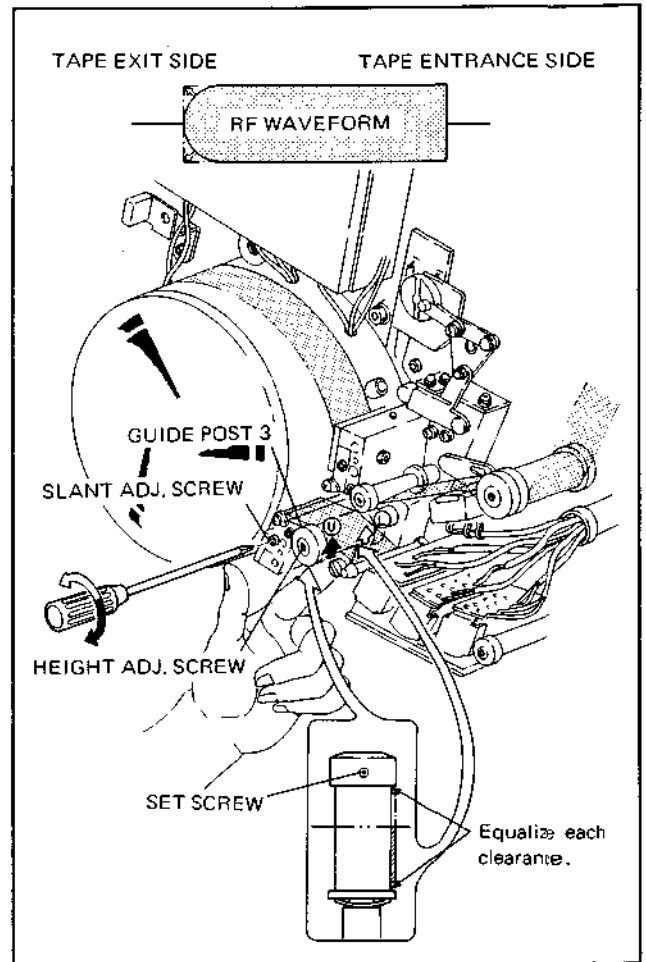


Fig. 3-75. Height Adjustment of Guide Post 3 and Slant Adjustment of Exit slant Guide.

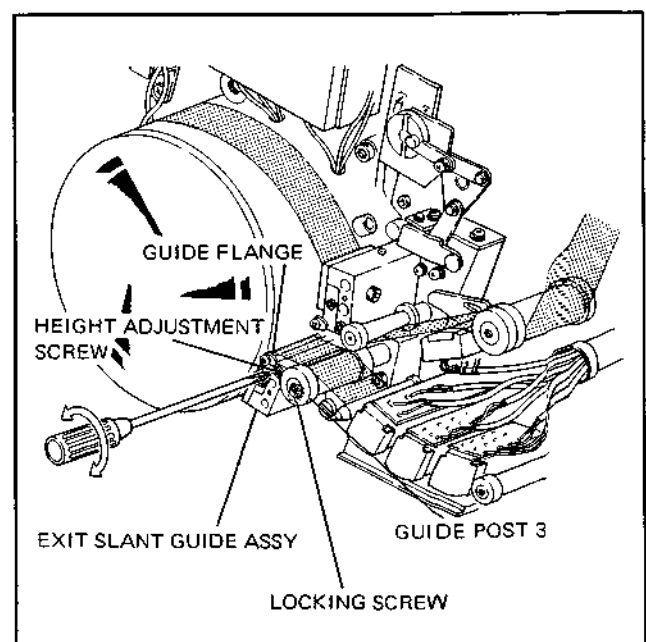
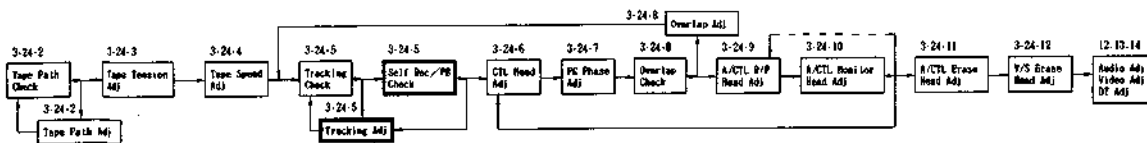


Fig. 3-76. Height Adjustment of Exit Slant Guide



Check after Adjustment

30. Thread a recorded tape.
 - Note:** Use the worn-out tape since the tape may be damaged.
31. Set the machine in the STANDBY mode.
32. Set the tape running onto the guide flange of the exit slant guide about 1 mm and tighten the tape by turning the take-up reel by hand.
33. Set the machine in the PLAY mode and check that the tape forced to run onto the guide flange is restored in the normal tape running. If the tape is not restored in the normal tape running, check the following;
 - (1) Is the tape tension correct?
 - (2) Does the guide flange press too strongly against the tape?
 - (3) Is the slant of the guide correct?

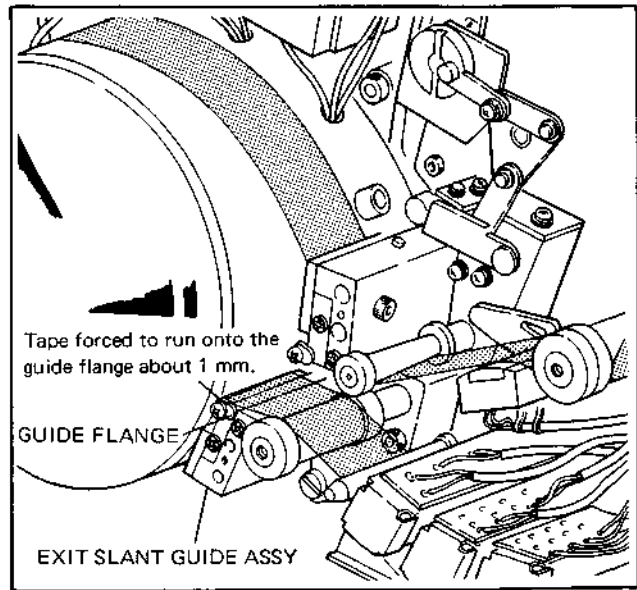
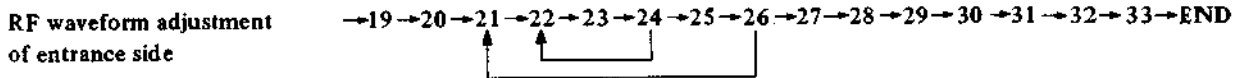


Fig. 3-77. Check of Tape running onto Guide Flange

Note: The adjustment order of the RF waveform on the tape exit side is as follows;



C. Self Record/Playback RF Waveform Check

The contact of the tape with the rotary heads is checked by observing the self record/playback RF waveform.

1. Connect the oscilloscope to TP1 on EQ-02 board.
2. Set HEAD selector to R/P.
3. Thread a tape and record a video signal.
4. Play back the recorded segment and confirm that the RF waveform shows the value in Fig. 3-78.

If not, perform the tracking adjustment again. Tracking adjustment should be performed so that the playback waveform of an alignment tape and self recording tape satisfies the specified value at the same time.

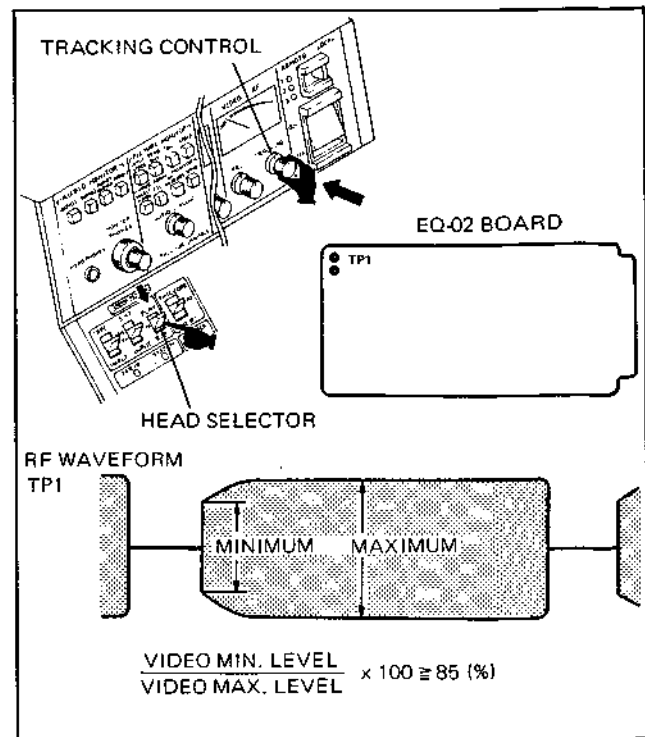
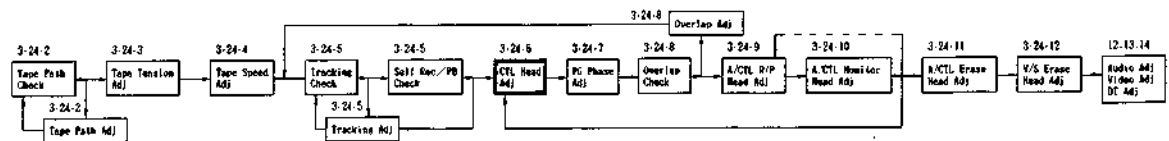


Fig. 3-78. Self Record/Playback RF Waveform Check



3-24-6. CTL Head Position Adjustment

- A. If CTL head has been mounted on the incorrect position, the tape recorded by any other machine can not be played back correctly on this machine.
- B. Since the PG phase deviates a great deal when CTL head is moved, the PG phase must be always adjusted after performing the adjustment of CTL head.

Check

1. Confirm that ADV switch on CD-17 board is set to off and connect the oscilloscope to TP1 on EQ-02 board.
2. Play back the WHITE segment of the alignment tape.
3. Adjust by turning TRACKING knob so that the RF waveform shows maximum and check that the RF waveform remains unchanged when the TRACKING knob is pushed at the maximum RF amplitude. If the RF waveform changes, perform the following adjustment.

Adjustment

4. Remove the head shield cover.
5. Loosen the four screws fixing the head base 1/4 to 1/2 turn.
6. Check that TRACKING knob has been pushed and playback the WHITE segment of the alignment tape.
7. Insert the hexagonal screwdriver (2.5 mm to the opposite side) into the hole shown in Fig. 3-80. Pushing the head base in the direction of the arrow by hand, move the screwdriver right or left so that the RF waveform shows maximum.
8. Tighten the four screws loosened at Step 5.
9. Check that there is no clearance between pins and the head base shown in Fig. 3-80.
10. Check by turning TRACKING knob that the RF waveform does not change when the knob is pushed at the maximum RF amplitude.
If it changes, repeat Steps 5 to 10.
11. Mount the head shield cover.

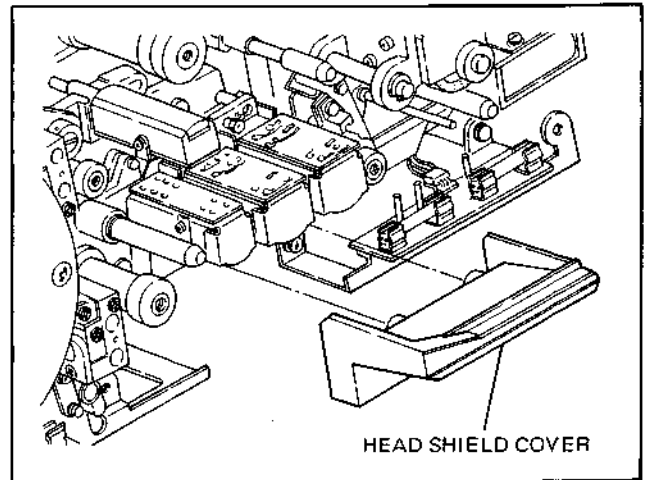


Fig. 3-79. Head Shield Cover Removal

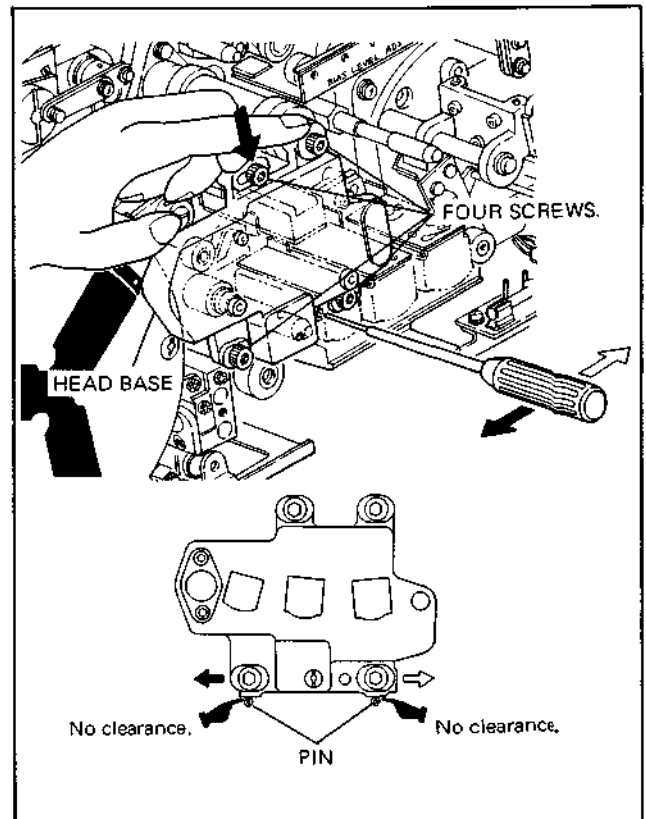
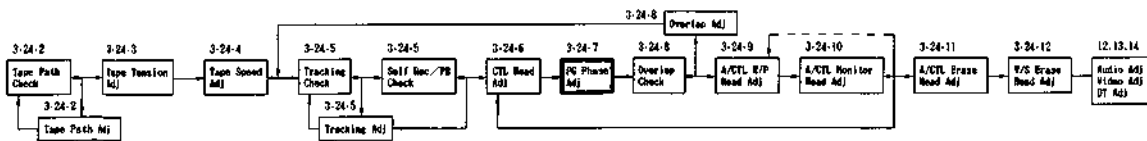


Fig. 3-80. CTL Head Position Adjustment



3-24-7. PG Phase Adjustment

The PG phase adjustment is required in each playback mode with R/P head and PLAY head.

A. Playback with R/P Head

Check

1. Connect the oscilloscope to VIDEO INPUT connector and VIDEO OUTPUT connector.
2. Set ADV switch on CD-17 board to OFF and set #2 of S3 to OFF (The AUTO PG does not operate.) and check that #3 of S3 is set to ON.
3. Thread the alignment tape.
4. Set HEAD selector to R/P and play back the alignment tape.
5. Check that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$, as shown in Fig. 3-81.

If the specified value is not obtained, perform the following adjustment.

If the specified value is obtained, proceed to Step 11 "Phase check in the playback mode with PLAY head".

Adjustment

6. Adjust RV8 on CD-17 board so that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$.
If the adjustment can not be made within the variable range of RV8, proceed to next step.
7. Set RV8 in the middle of the variable range.
8. Adjust RV5 so that the phase difference between VIDEO IN and VIDEO OUT is within $\pm 0.75H$, as shown in Fig. 3-82.

If the specified value is not obtained, set #5 and #6 of S3 as follows and adjust RV5 again so that the phase difference is within $\pm 0.75H$.

- a) When VIDEO OUT is in advance of VIDEO IN;
#5 → ON, #6 → ON
- b) When VIDEO IN is in advance of VIDEO OUT;
#5 → OFF, #6 → OFF

9. Set RV5 in the middle of positions A and B as shown in Fig. 3-82.

A shows the position of RV5 when the VIDEO OUT waveform is shifted by turning RV5 clockwise. B shows the position of RV5 when the VIDEO OUT waveform is shifted by turning RV5 counterclockwise. Connect the oscilloscope to TP15 and TP13 on CD-17 board.

Adjust RV5 so that the positive-going edge at TP15 coincides with the nearest leading edge at TP13.

10. Adjust RV8 again so that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$.

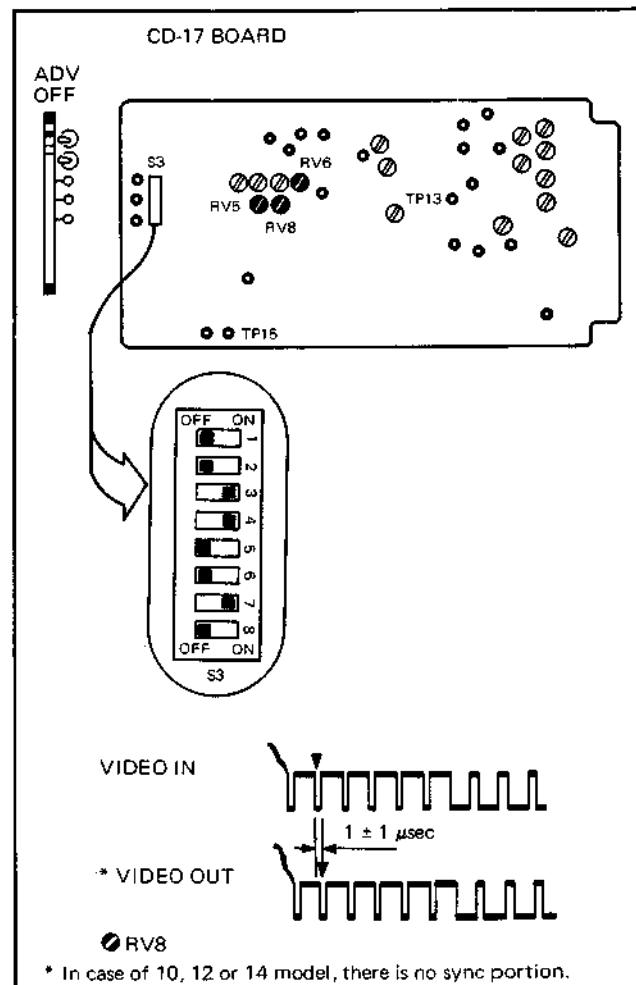


Fig. 3-81. PG Phase Adjustment in the Playback Mode with R/P Head

MINIMUM 3. PERIODIC CHECK & MAINTENANCE

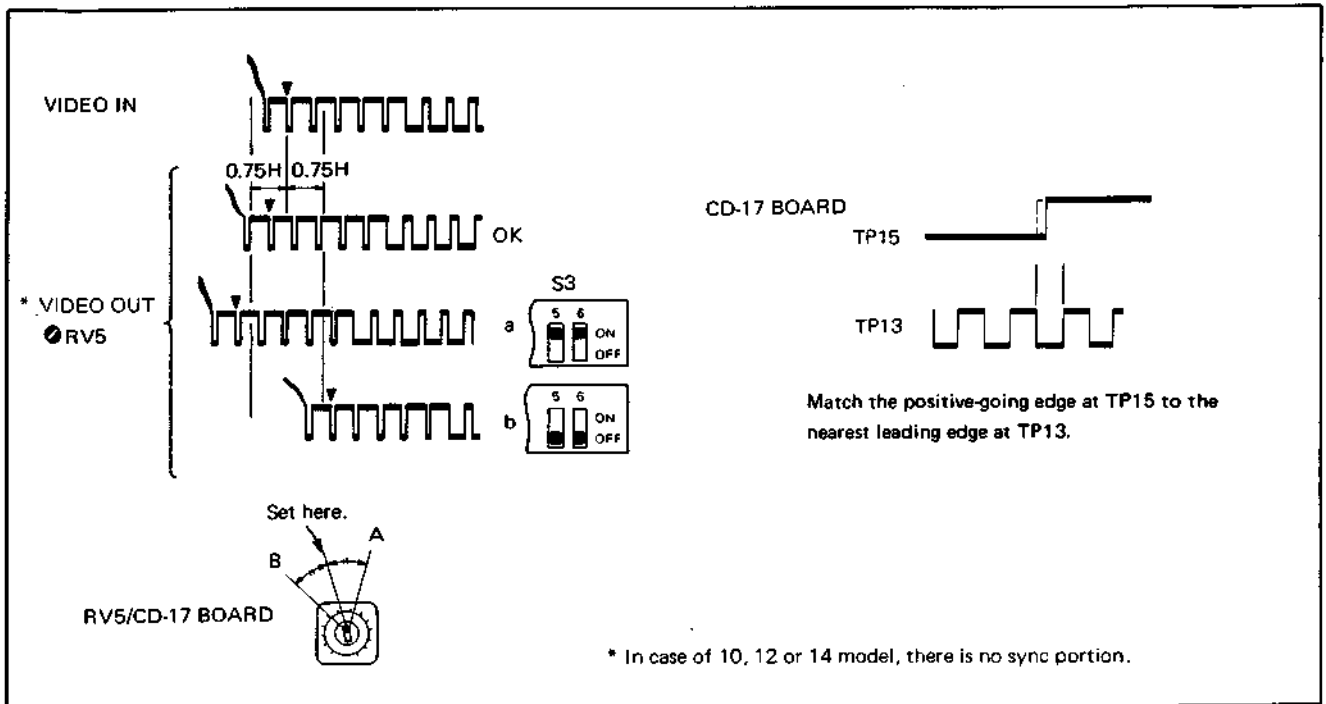
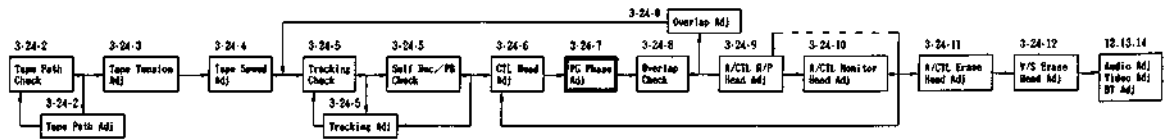


Fig. 3-82. PG Phase Adjustment in the Playback Mode with R/P Head

B. Playback with PLAY Head

Check

11. Set HEAD selector to PLAY and play back the alignment tape.
12. Check that the phase difference between VIDEO IN (CH-1) and VIDEO OUT (CH-2) is within $1 \pm 1 \mu\text{sec}$. If the specified value is not obtained, perform the following adjustment. If the specified value is obtained, proceed to step 14.

Adjustment

13. Adjust RV6 on CD-17 board so that the phase difference between VIDEO IN (CH-1) and VIDEO OUT (CH-2) is within $1 \pm 1 \mu\text{sec}$.
14. Reset #2 of S3 on CD-17 board (The AUTO PG operates.), keeping #3 of S3 ON.

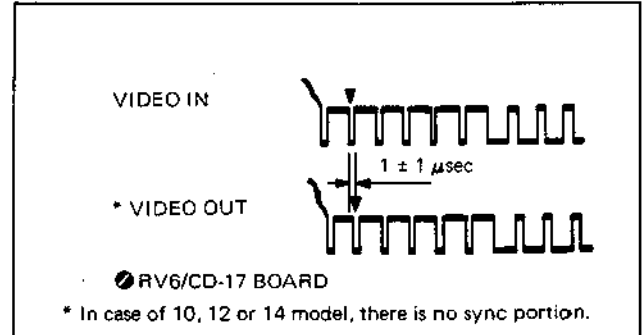
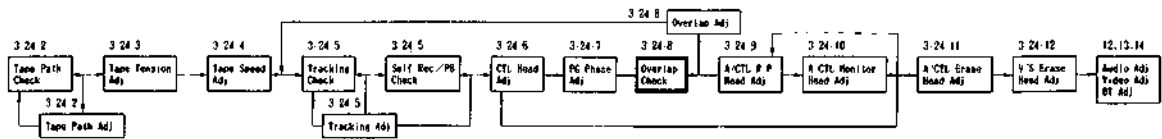


Fig. 3-83. PG Phase Adjustment in the Playback Mode with PLAY Head



3-24-8. Overlap Adjustment

Preliminary Information

1. Overlap means the segment of the playback RF waveform cut off by PB switching.
2. When overlap B and C in the odd field are adjusted, it is not necessary to adjust dropout A and overlap on the tape exit side in the even field.
3. After performing the overlap adjustment, the following clearance must be checked.

- ① Clearance between the guide bracket and upper drum is 0.09 mm or more.
- ② Clearance between the fence (entrance side) and upper drum is 0.15 +/- 0.05 mm. See Fig. 3-86-2.
- ③ Clearance between the exit slant guide and upper drum is 0.09 ± 0.01 mm. See Fig. 3-86-2.

Note: With power off, turn the threading motor of the movable guide with a flat-brade screwdriver so that the movable guide is closed, and check the clearance.

4. Adjustment Points

- ① When adjusting overlap C on the tape entrance side, loosen screw N so that the slant guide assy turns around screw M, and adjust the clearance between the guide bracket and upper drum.
- ② The clearance between the guide bracket and upper drum can be adjusted by turning the set-screw driven into the taper guide.
- ③ When adjusting overlap B on the tape exit side, loosen screw P so that the exit slant guide assy turns around screw Q, and adjust the clearance between the exit slant guide and upper drum.
- ④ The clearance between the exit slant guide and upper drum can be adjusted by turning the set-screw driven into the guide post 3.
5. The thickness gauge is required for this adjustment. Sony Part No. J-6041-670-A
6. After performing the overlap adjustment, be sure to check the tracking waveform in section 3-24-5.

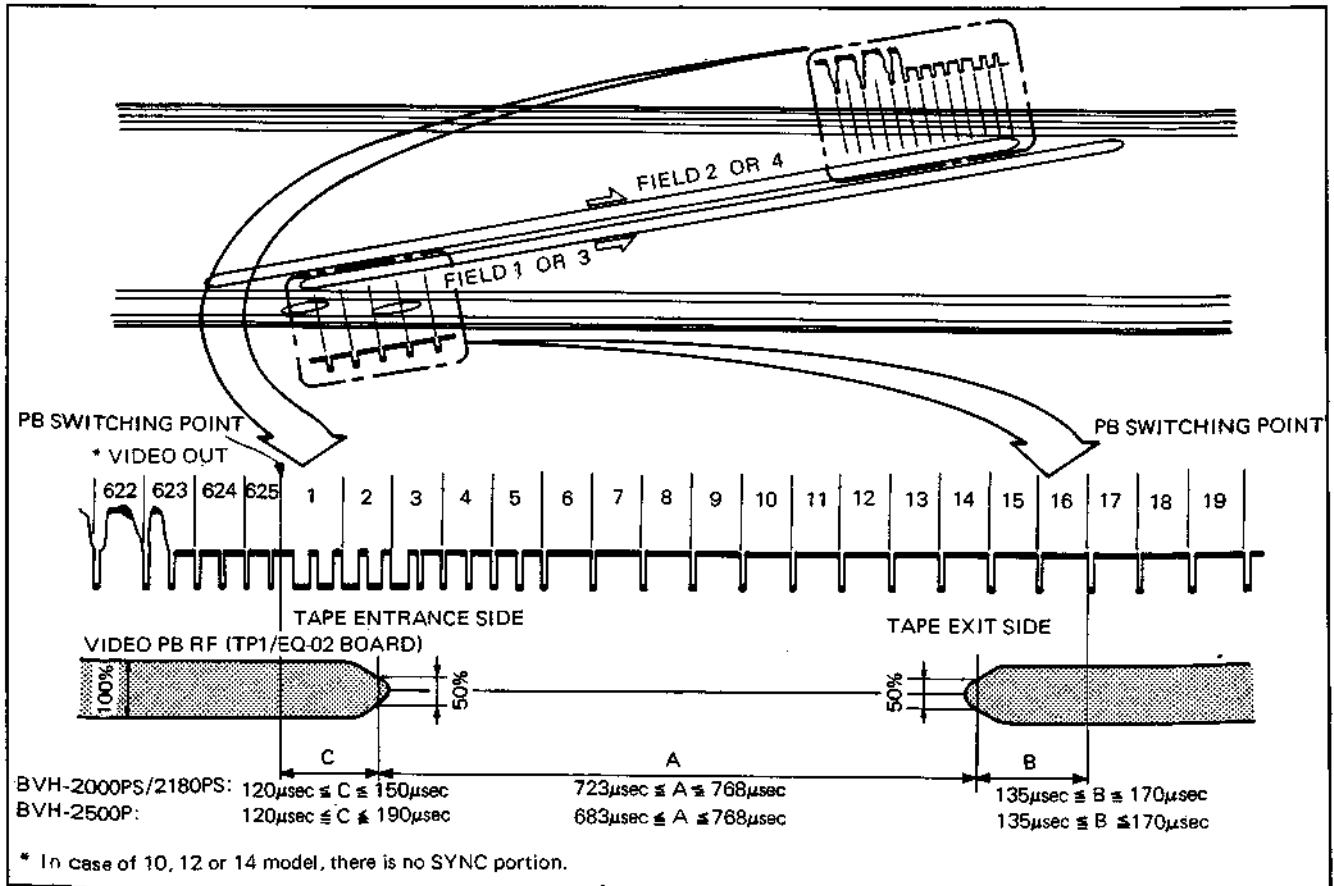


Fig. 3-84. Overlap Adjustment

3. PERIODIC CHECK & MAINTENANCE

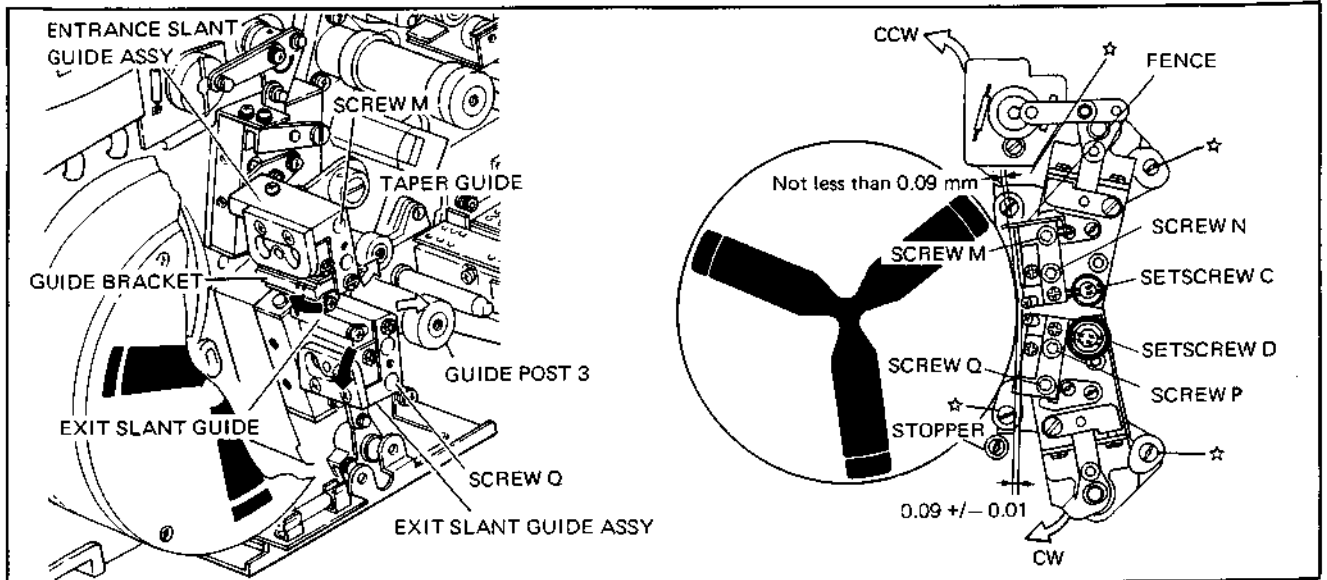


Fig. 3-85. Overlap Adjustment

Check

1. Connect the oscilloscope to TP1 on EQ-02 board and VIDEO OUTPUT connector. Set ADV switch on CD-17 board to OFF.
2. Thread a tape.
3. Set HEAD selector to R/P.
4. Record a video signal.
5. Play back the recorded segment and check that overlap B and C is within the range shown in Fig. 3-84.
6. After check, reset the ADV switch to ON.

Adjustment

Note 1: If the entrance slant guide assembly or the whole assembly of the movable guide has been moved, check that the clearance between upper drum and fence, referring to Fig. 3-68-2. For the adjustment, refer to section 3-8-1.

Note 2: If the exit slant guide assembly or the whole assembly of the movable guide has been moved, check that the clearance between upper drum and guide post, referring to Fig. 3-68-2.

I When the sum of the overlaps B and C is the following value and either overlap is less than the specified value.
 for NTSC, PM: 217 μ sec or more
 for PS: 287 μ sec or more

1. When the overlap B is less than the specified value (See Fig. 3-85).
 - a. Loosen four screws marked ☆.
 - b. While pushing the movable guide assembly lightly to the head drum assembly, move it in the direction of the arrow CCW.
 - c. Tighten four screws marked ☆ and check the overlap again.
 - d. After performing the adjustment, turn the stopper clockwise, press it against the movable guide assembly and tighten the screw.

Note: When move the movable guide assembly 1 mm along the circumference of the drum, the overlap changes approx. 40 μ sec.

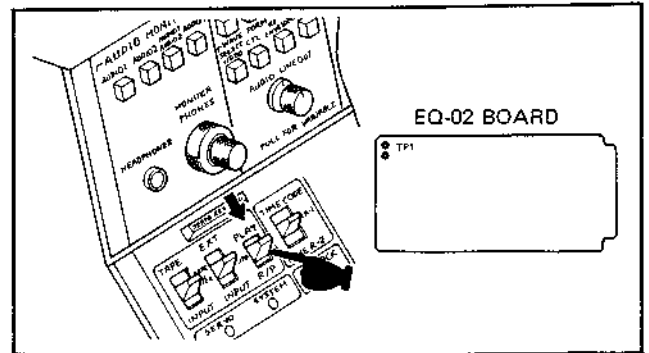


Fig. 3-86-1. Overlap Check

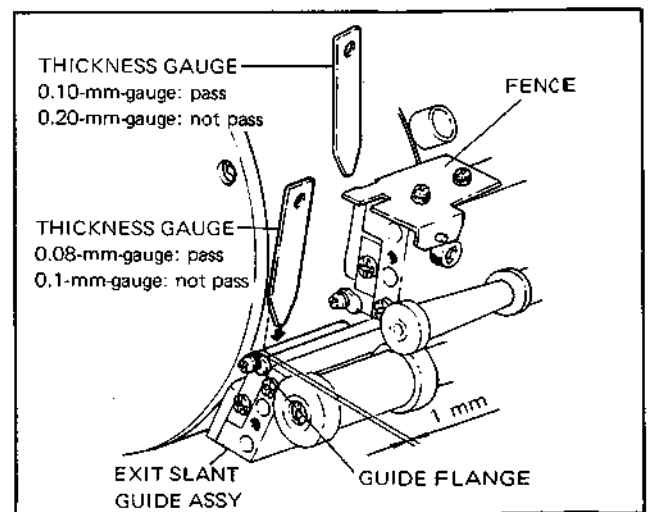
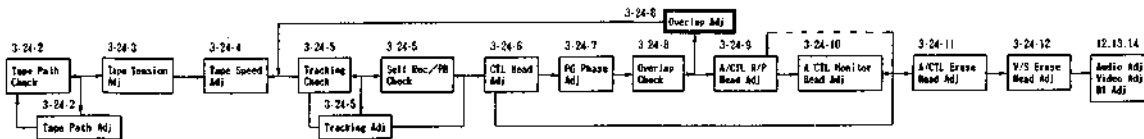


Fig. 3-86-2. Checking Gap near to Slant Guide Assy



2. When the overlap C is less than the specified value (See Fig. 3-85).

- a. Loosen the stopper, then loosen four screws marked ☆.
- b. While pushing the movable guide assembly against the head drum assembly, move it in the direction of the arrow CW.
- c. Tighten four screws marked ☆ and check the overlap again.
- d. After performing the adjustment, turn the stopper clockwise, press it against the movable guide assembly and tighten the screw.

• When overlap C is out of the specified value;

1. Loosen screw N shown in Fig. 3-87. 1/2 to 1 turn.
Note: Do not loosen screw M.
2. Adjust by turning the setscrew driven into the taper guide.

Note: When the setscrew is turned 10 degrees, the overlap changes approx. 27 μsec. When the overlap must be increased, turn the setscrew clockwise.

When the overlap must be decreased, turn the setscrew counterclockwise and then push the entrance slant guide assy against the tip of the setscrew by hand.

Note: When pushing the entrance slant guide, do not use a screwdriver.

3. Tighten screws N and M fixing the entrance slant guide assy.
4. Turn the upper drum by hand and keep the head away from the entrance slant guide assy. Check by using the thickness gauge that the clearance between the guide bracket and upper drum is 0.09 mm or more.
5. Check the overlap again by performing Steps 4 and 5 in Check procedure. Repeat Steps 1 to 5 until the specified value is obtained.

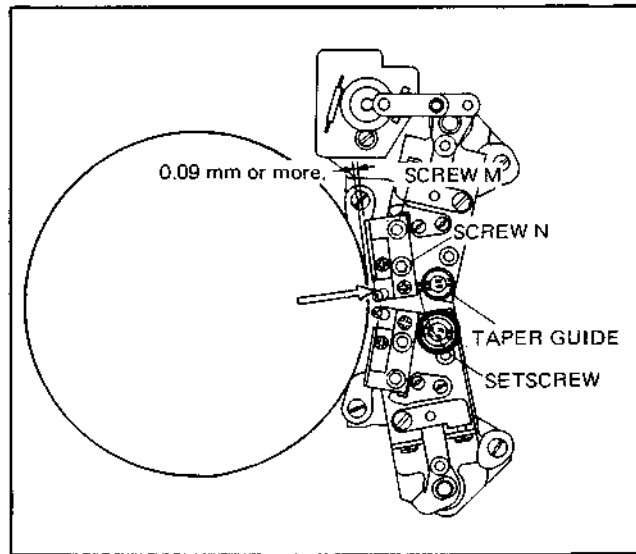


Fig. 3-87. Overlap C Adjustment

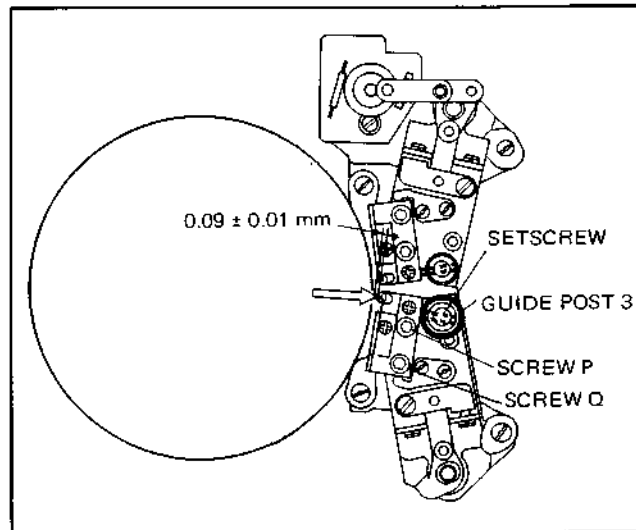


Fig. 3-88. Overlap B Adjustment

• When overlap B is out of the specified value;

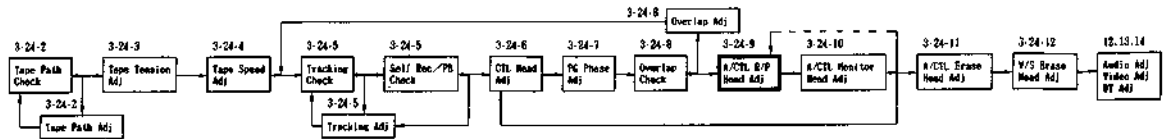
1. Loosen screw P shown in Fig. 3-88 1/2 to 1 turn.
Note: Do not loosen screw Q.
2. Adjust by turning the setscrew driven into guide post 3.

Note: When the screw is turned 10 degrees, the overlap changes approx. 55 μsec. When the overlap must be increased, turn the setscrew clockwise.

When the overlap must be decreased, turn the setscrew counterclockwise and then push the exit slant guide assy against the tip of the setscrew by hand.

Note: When pushing the exit slant guide, do not use a screwdriver.

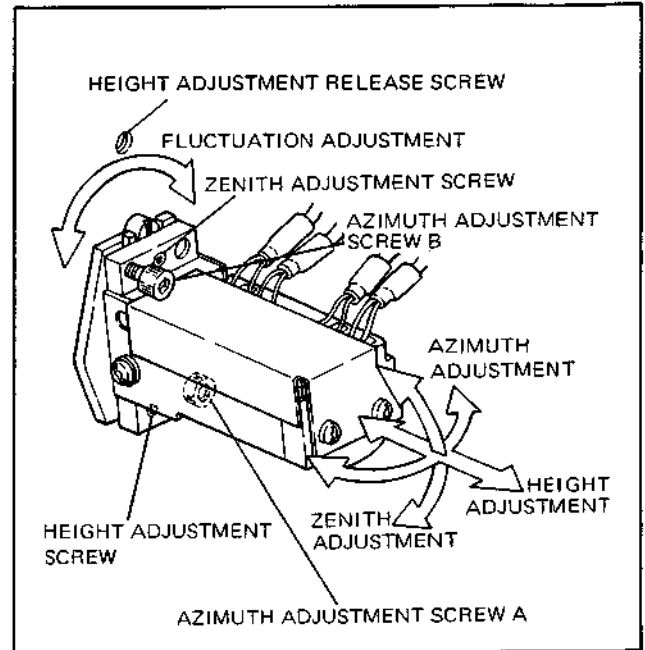
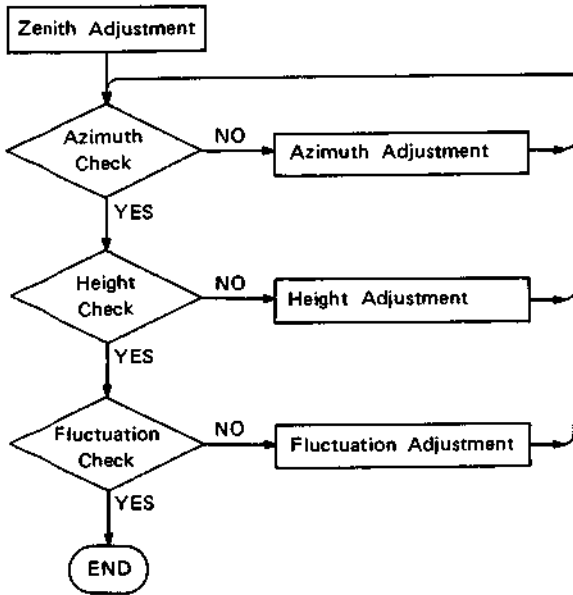
3. Tighten screws P and Q fixing the exit slant guide assy.
4. Turn the upper drum by hand and keep the head away from the exit slant guide assy. Check by using the thickness gauge that the clearance between the exit slant guide and upper drum is 0.09 ± 0.01 mm.
5. Check the overlap again by performing Steps 4 and 5 in check procedure. Repeat Steps 1 to 5 until the specified value is obtained.



3-24-9. Audio/CTL R/P Head Adjustment

Preliminary Information

A. Perform the adjustment, following the flowchart below.



- B. When the guides on the tape path have been adjusted, be sure to check the audio/CTL R/P head, following the above flowchart.
- C. Prepare the following flat plate for zenith adjustment. Part No. J-6040-160-A
- D. The zenith adjustment is not necessary except when the zenith adjustment screw has been made to turn or the azimuth adjustment screw has been tightened excessively.

Zenith Adjustment

1. Put the flat plate on both audio/CTL erase head and audio/CTL R/P head as shown in Fig. 3-89. Check that there is no space between the audio/CTL R/P head and the flat plate when the plate is put on the audio/CTL erase head without any space and also check that there is no space between the audio/CTL R/P head and the flat plate when the plate is put on the audio/CTL monitor head (except for 00 and 10 models) or the guide post 2 (for 00 and 10 models) without any space.
2. If there is a space, eliminate the space by turning the zenith adjustment screw.

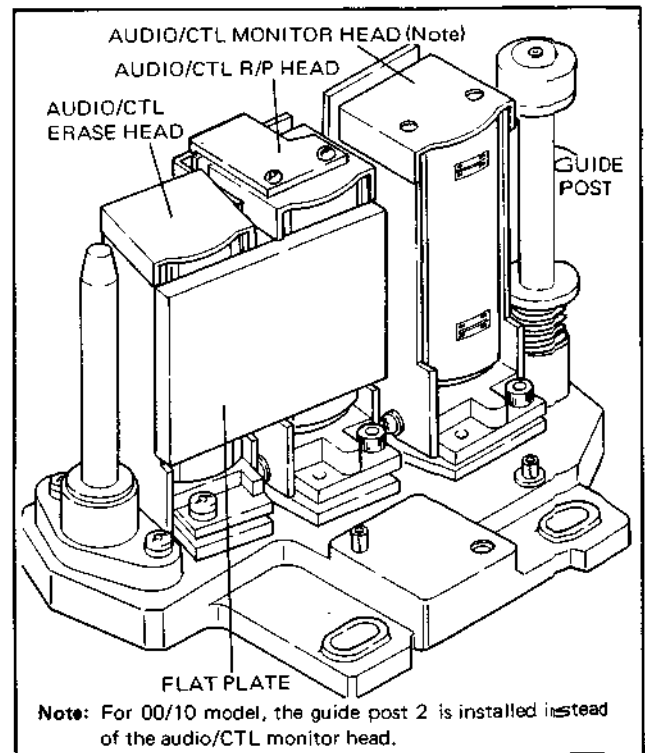
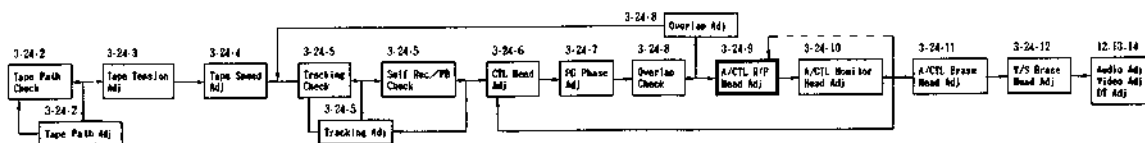


Fig. 3-89. Audio/CTL R/P Head Zenith Adjustment



Azimuth Adjustment

Check

1. Connect the oscilloscope to AUDIO-1 OUT and AUDIO-2 OUT.
Set the oscilloscope in the EXT. HORIZONTAL mode so that the Lissajous figures can be seen on the scope.
2. Play back the audio 3 kHz segment of the alignment tape and adjust by turning AUDIO-1, 2 PB level controls so that AUDIO-1, 2 meters show 0 VU. Adjust the scope so that the amplitude of AUDIO-1 and AUDIO-2 is 6 cm.
3. Check that the phase difference between AUDIO-1 and AUDIO-2 is within 5 degrees. See Fig. 3-90. If the specified value is not obtained, perform the following adjustment.

Adjustment

4. Loosen the azimuth adjustment screw B and adjust by turning screw A so that the specified phase difference is obtained. Slightly turn screw B clockwise and then adjust by turning screw A so that the specified phase difference is obtained.
Repeat the same procedure until both screws are tightened completely and finally check that the specified value is obtained.
Note: The screws should be tightened with 6 to 8 kg-cm torque.
5. Play back the audio 15 kHz segment of the alignment tape and adjust the scope so that the amplitude of AUDIO-1 and AUDIO-2 is 6 cm.
6. Check that the phase difference between AUDIO-1 and AUDIO-2 is within 30 degrees. See Fig. 3-91.
If the specified value is not obtained, repeat Step 4 again.

Height Adjustment

Check

1. Connect the oscilloscope to AUDIO-1 OUT and AUDIO-2 OUT.
2. Play back the audio 3 kHz segment of the alignment tape. Adjust the oscilloscope so that the amplitude of both channels increases and it is equal. Observe "G" shown in Fig. 3-92.
3. Check that clearance "G" becomes wide when the tape edge near the audio/CTL R/P head is pushed up or down, as shown in Fig. 3-93.
If "G" becomes narrow, perform the following adjustment.

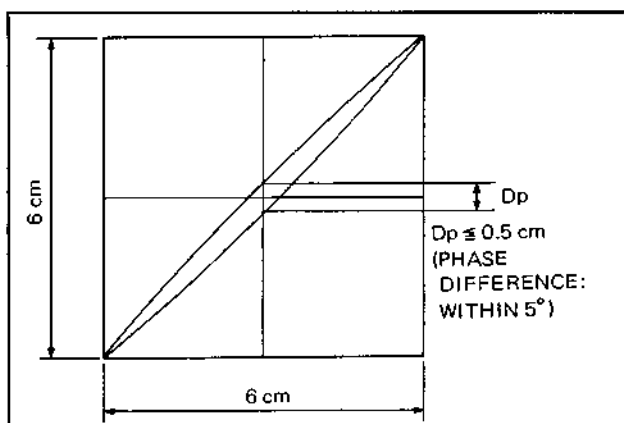


Fig. 3-90. Audio/CTL R/P Head Azimuth Adjustment of Audio 3 kHz Playback

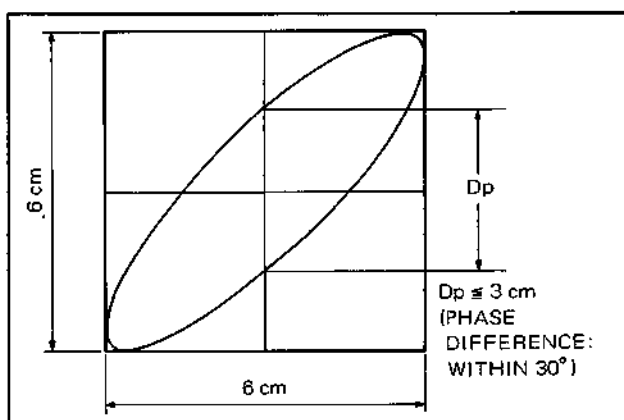


Fig. 3-91. Audio/CTL R/P Head Azimuth Adjustment of Audio 15 kHz Playback

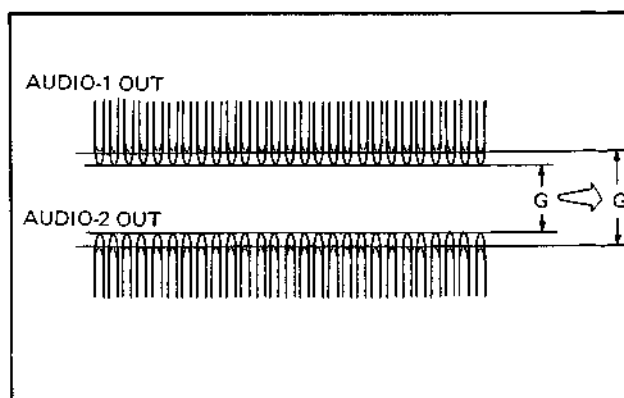
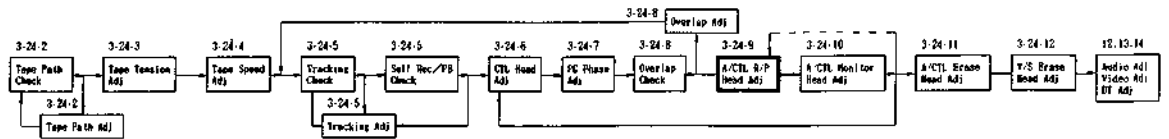


Fig. 3-92. Audio/CTL R/P Head Height Check



Adjustment

4. Loosen the height adjustment release screw 1/2 to 1 turn.
5. Turn the height adjustment screw as follows.
 - a. If "G" becomes narrow when the tape is pushed down, turn the height adjustment screw clockwise.
 - b. If "G" becomes narrow when the tape is pushed up, turn the height adjustment screw counterclockwise.
6. Tighten the height adjustment release screw and check the height again by performing Step 3.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

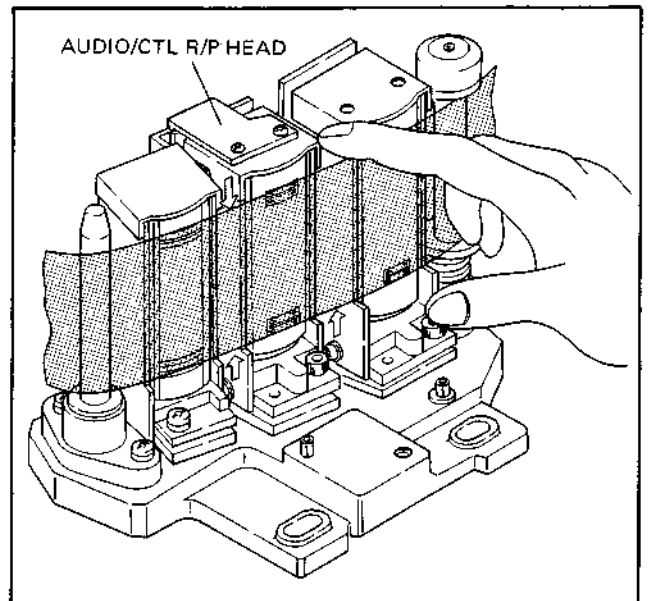


Fig. 3-93. Audio/CTL R/P Head Height Check

Fluctuation Adjustment Check

1. Connect the oscilloscope to AUDIO-1 OUT.
 2. Check that SKEW switch on RL-12 board is set to AUTO.
 3. Play back the audio 15 kHz segment of the alignment tape, and adjust the scope so that the amplitude "A" becomes as wide as possible as shown in Fig. 3-94.
 4. Set SKEW switch to MANU and turn SKEW knob full counterclockwise, and then suppose that the amplitude shown on the scope is "B".
- Check that the ratio of "A" to "B" is the specified value shown in Fig. 3-94. If the specified value is obtained, set SKEW switch to AUTO. If the specified value is not obtained, perform the following adjustment.

Adjustment

5. Check that the height adjustment screw is not being loose.
6. Loosen the height adjustment release screw 1/2 to 1 turn.
7. When the fluctuation adjustment screw is turned clockwise or counterclockwise a little and check whether the specified value shown in Fig. 3-94 is obtained. Repeat the adjustment and check procedures until the specified value is obtained.
8. Tighten the height adjustment release screw and check that the specified value is obtained by performing Step 4 again.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

9. Return to the beginning of the flowchart and check the azimuth and height.

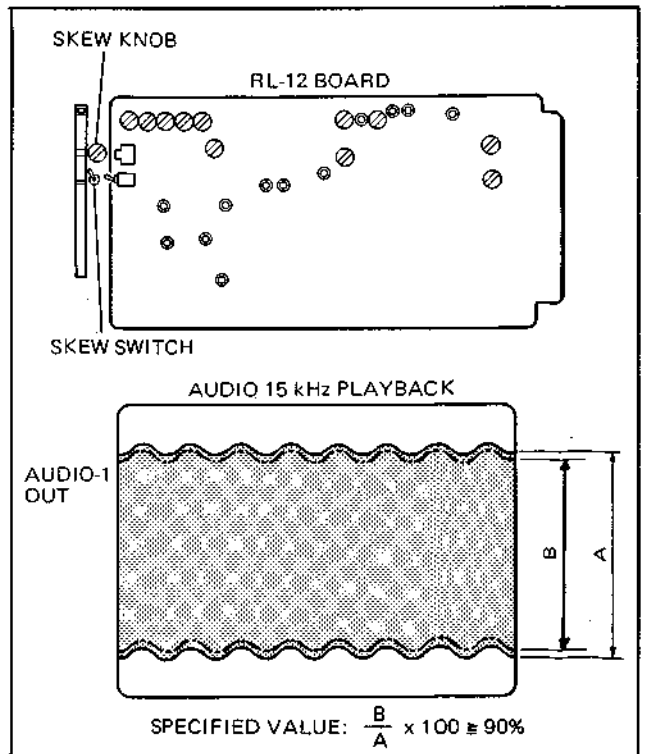
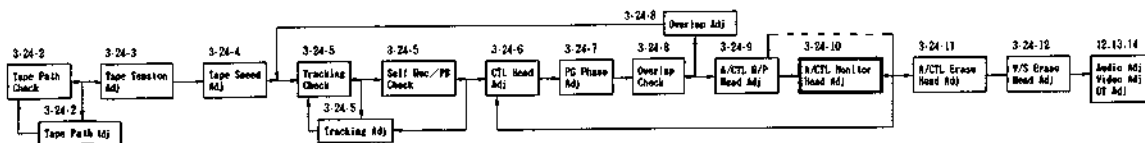


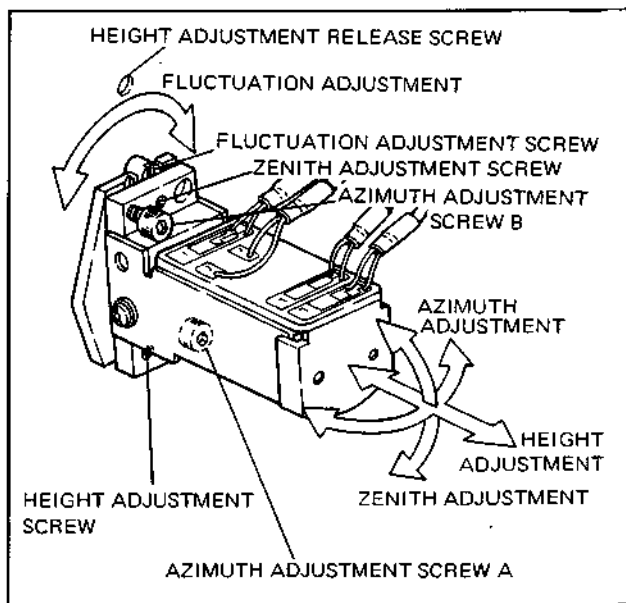
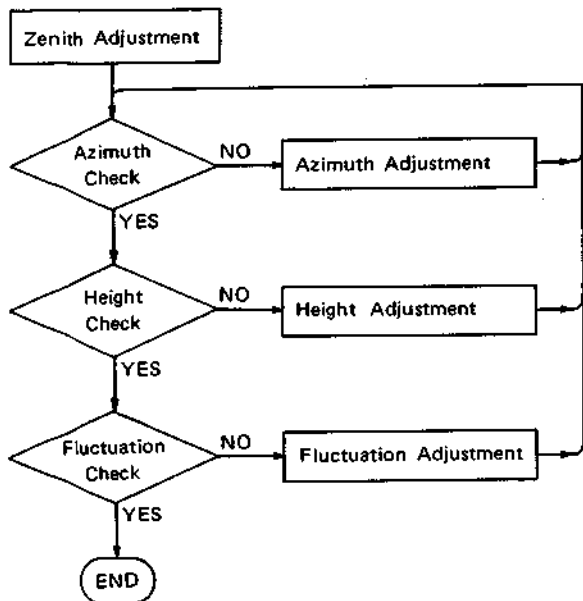
Fig. 3-94. Audio/CTL R/P Head Fluctuation Adjustment



3-24-10. Audio/CTL Monitor Head Adjustment (Except for 00/10 model)

Preliminary Information

A. Perform the adjustment, following the flowchart below.



- B. When the guides on the tape path have been adjusted, be sure to check the audio/CTL monitor head, following the above flowchart.
- C. Prepare the following flat plate for zenith adjustment. Part No. J-6040-160-A
- D. The zenith adjustment is not necessary except when the zenith adjustment screw has been made to turn or the azimuth adjustment screw has been tightened excessively.

Zenith Adjustment

1. Put the flat plate on both audio/CTL R/P head and audio/CTL monitor head as shown in Fig. 3-95. Check that there is no space between the audio/CTL monitor head and the flat plate when the plate is put on the audio/CTL R/P head without any space and also check that there is no space between the audio/CTL monitor head and that plate when the plate is put on the guide post 1 without any space.
2. If there is a space, equalize and minimize each space by turning the zenith adjustment screw of the audio/CTL monitor head.

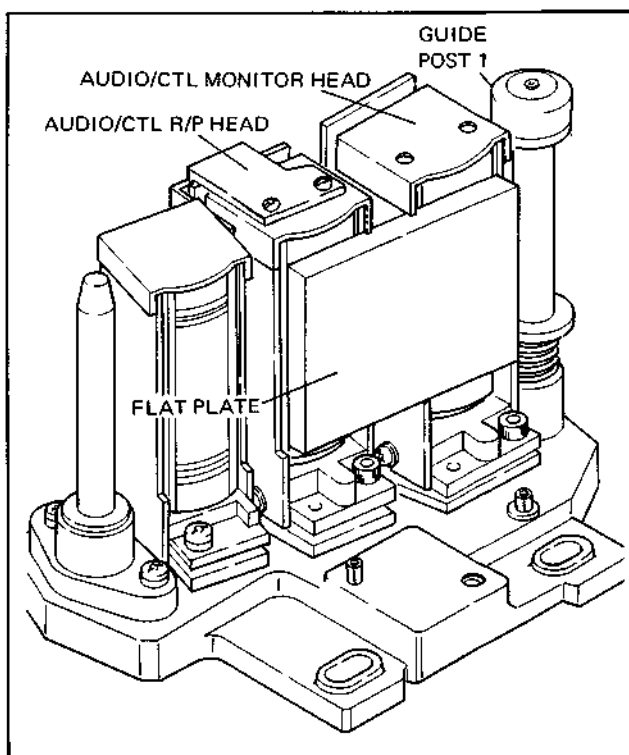
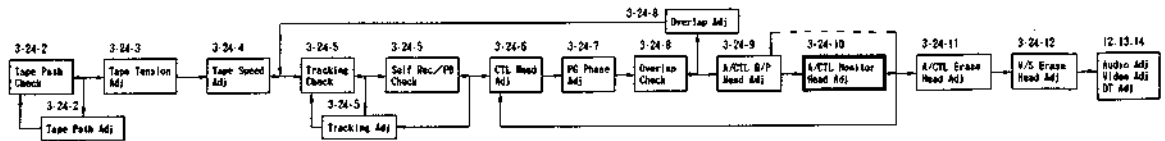


Fig. 3-95. Audio/CTL Monitor Head Zenith Adjustment

IIIIIIIIII 3. PERIODIC CHECK & MAINTENANCE



Azimuth Adjustment Check

1. Set AUDIO MONITOR select button to **AUDIO-1** and short-circuit JP1 on LG board.
2. Connect the oscilloscope to MONITOR OUTPUT L and MONITOR OUTPUT R.
Set the oscilloscope in the EXT. HORIZONTAL mode so that the Lissajous figures can be seen on the scope.
3. Play back the audio 3 kHz segment of the alignment tape and adjust by turning RV106 and RV206 on the AU-27 board so that AUDIO-1, 2 meters show 0 VU. Adjust the scope so that the amplitude of the audio-1 channel and the audio-2 channel is 6 cm.
4. Check that the phase difference between the audio-1 channel and the audio-2 channel is within 5 degrees. See Fig. 3-96.
If the specified value is not obtained, perform the following adjustment.

Adjustment

5. Loosen the azimuth adjustment screw B and adjust by turning screw A so that the specified phase difference is obtained. Slightly turn screw B clockwise and then adjust by turning screw A so that the specified phase difference is obtained. Repeat the same procedure until both screws are tightened completely and finally check that the specified value is obtained.
Note: The screws should be tightened with a torque of 6 to 8 kg-cm.
6. Play back the audio 15 kHz segment of the alignment tape and adjust the scope so that the amplitude of the audio-1 channel and the audio-2 channel is 6 cm.
7. Check that the phase difference between the audio-1 channel and the audio-2 channel is within 30 degrees. See Fig. 3-97.
If the specified value is not obtained, repeat Step 5 again.

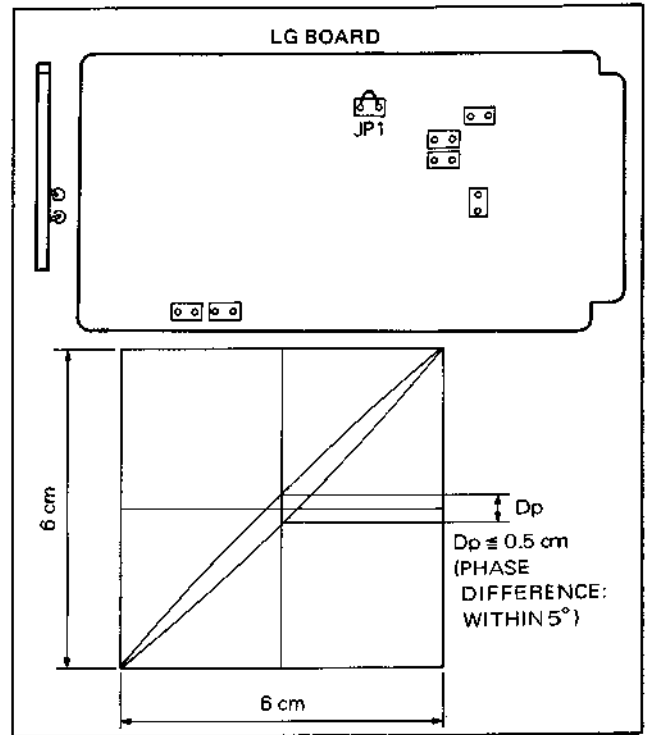


Fig. 3-96. Audio/CTL Monitor Head Azimuth Adjustment of Audio 3 kHz Playback

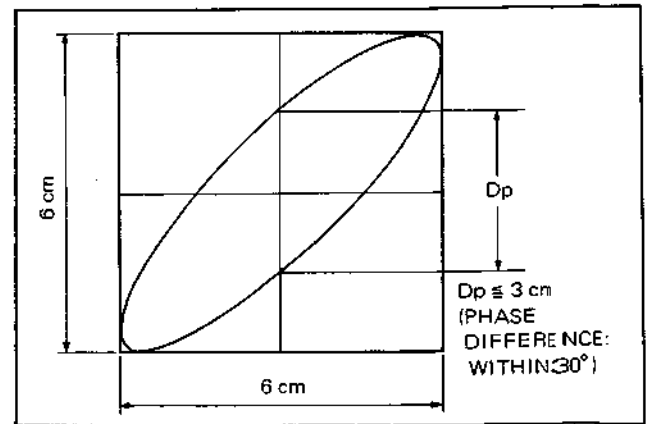
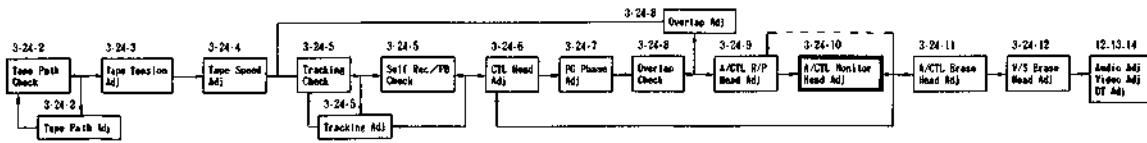


Fig. 3-97. Audio/CTL Monitor Head Azimuth Adjustment of Audio 15 kHz Playback



Height Adjustment

Check

1. Check that the setting performed in Step 1 of azimuth adjustment has been maintained. Connect the oscilloscope to MONITOR OUT L and MONITOR OUT R.
2. Play back the audio 3 kHz segment of the alignment tape. Adjust the oscilloscope so that the amplitude of both channels increases and it is equal. Observe "G" shown in Fig. 3-98.
3. Check that clearance "G" becomes wide when the tape edge near the audio/CTL monitor head is pushed up or down, as shown in Fig. 3-98. If "G" becomes narrow, perform the following adjustment.

Adjustment

4. Loosen the height adjustment release screw 1/2 to 1 turn.
5. Turn the height adjustment screw as follows.
 - a. If "G" becomes narrow when the tape is pushed down, turn the height adjustment screw clockwise.
 - b. If "G" becomes narrow when the tape is pushed up, turn the height adjustment screw counterclockwise.
6. Tighten the height adjustment release screw and check the height again by performing Step 3.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

Fluctuation Adjustment

Check

1. Check that the setting performed in step 1 of azimuth adjustment has been maintained. Connect the oscilloscope to MONITOR OUT L.
2. Check that SKEW switch on RL-12 board is set to AUTO.
3. Play back the audio 15 kHz segment of the alignment tape, and adjust the scope so that the amplitude "A" becomes as wide as possible. See Fig. 3-99.
4. Set SKEW switch to MANU and turn SKEW knob full counterclockwise, and then suppose that the amplitude shown on the scope is "B". Check that the ratio of "A" to "B" is within the specified value. If the specified value is obtained, set SKEW switch to AUTO. If the specified value is not obtained, perform the following adjustment.

Adjustment

5. Check that the height adjustment screw is not being loose.
6. Loosen the height adjustment release screw 1/2 to 1 turn.
7. Turn the fluctuation adjustment screw clockwise or counterclockwise a little and check that the specified value shown in Fig. 3-99 is obtained. Repeat the adjustment and check procedures until the specified value is obtained.
8. Tighten the height adjustment release screw and check that the specified value is obtained by performing Step 4 again.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

9. Return to the beginning of the flowchart and check the azimuth and height.
10. Remove the jumper connected in Step 1 of the azimuth adjustment.

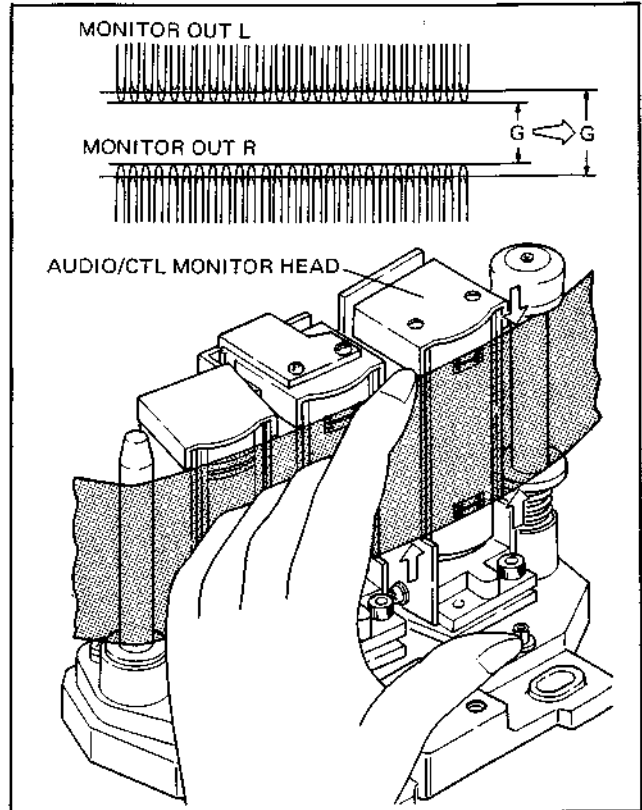


Fig. 3-98. Audio/CTL Monitor Head Height Check

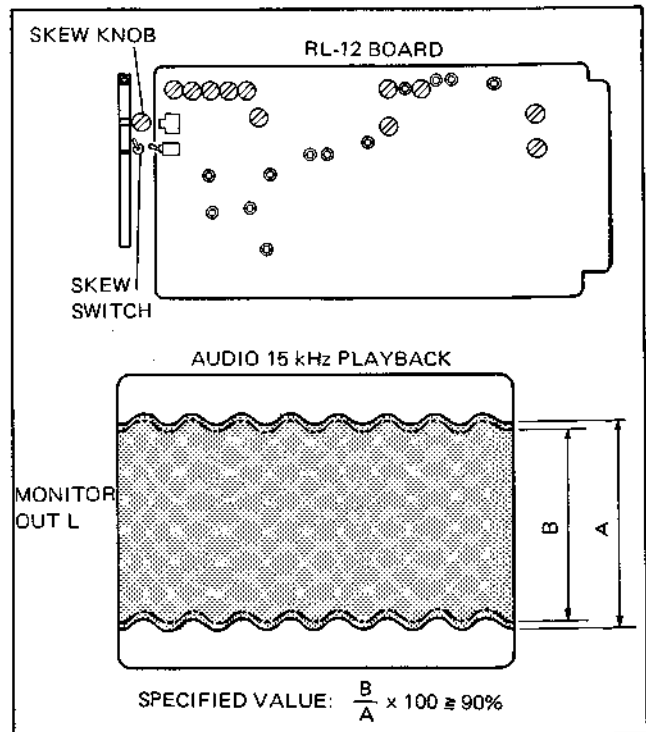
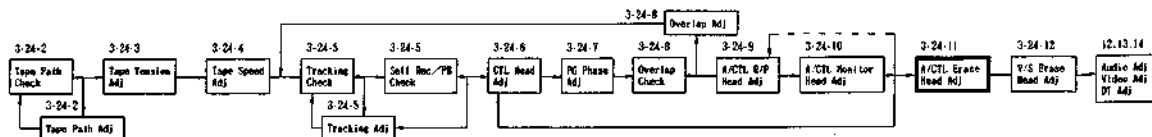


Fig. 3-99. Audio/CTL Monitor Head Fluctuation Adjustment



3-24-11. Audio/CTL Erase Head Height Adjustment

When the audio/CTL erase head is replaced or when the height adjustment of the guides has been performed after replacing the head drum assy, check the height of the audio/CTL erase head.

Check

1. Set AUDIO MONITOR select button to AUDIO-1
AUDIO-2
2. Record 1 kHz signal on the audio-1 and audio-2 channels.
3. Rewind the segment recorded in Step 2 and record no signal on the audio-1 and audio-2 channels.
4. Connect the headphones and play back the segment of no signal recorded in Step 3.
Check that 1 kHz signal is not heard even if MONITOR/PHONES level control is set to maximum. If the signal is heard, adjust as follows.

Adjustment

5. Loosen the adjustment release screw 1/2 to 1 turn.
6. Change the head height by turning the height adjustment screw a little. After tightening the adjustment release screw, check the height of the head by performing Steps 2 to 4 again.

Note: The adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

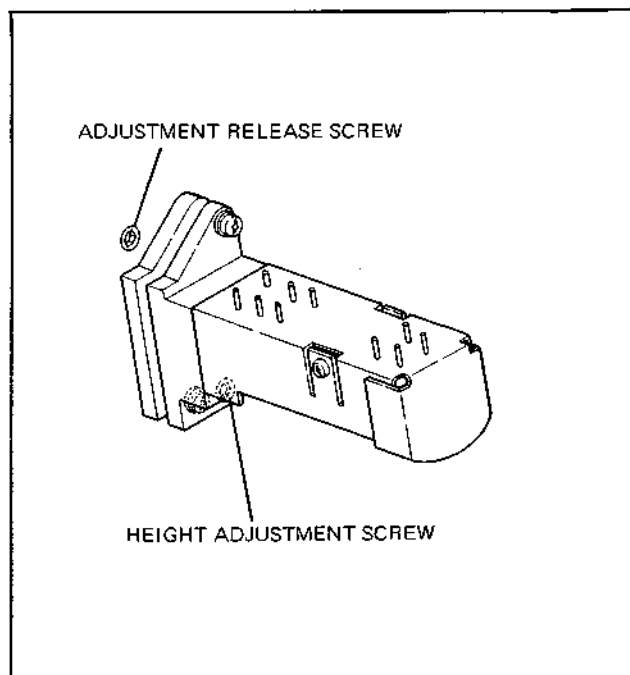
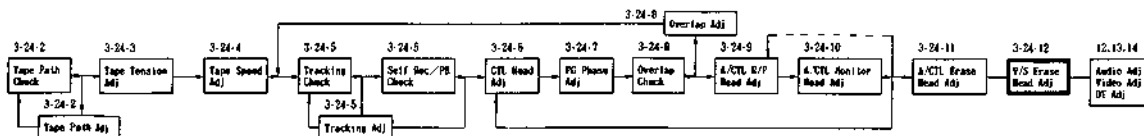


Fig. 3-100. Audio/CTL Erase Head Height Adjustment



3-24-12. V/S Erase Head Height Adjustment

- A. When the taper guide is replaced or guide roller 2 is adjusted, it is necessary to adjust the height of V/S erase head.
- B. If the audio-1 and audio-3 channels are not influenced by V/S erase head when a video signal is recorded in the ASSEMBLE mode, the height of V/S erase head is regarded as correct.

Check

1. Record 3 kHz signal on the audio-1 and -3 channels.
2. Rewind half of the segment recorded in Step 1, and record a video signal on the video and sync channels in the ASSEMBLE mode.
3. Connect the oscilloscope to AUDIO-1 and AUDIO-3 LINE OUTPUTS.
4. Playing back the segment recorded in Steps 1 and 2, check that the waveform does not change at the IN point. If the waveform changes, perform the following adjustment.

Adjustment

5. Take off V/S erase head assy by removing V/S screw.
6. Change the thickness of the spacer.
 - a. If the audio-1 waveform changes, decrease the thickness of the spacer.
 - b. If the audio-3 waveform changes, increase the thickness of the spacer.

Thickness (mm)	Part No.
0.05	3-651-419-01
0.1	3-651-419-21

7. Mount V/S erase head assy referring to Fig. 3-101, and check the height of V/S erase head by performing Steps 1 to 4 again.

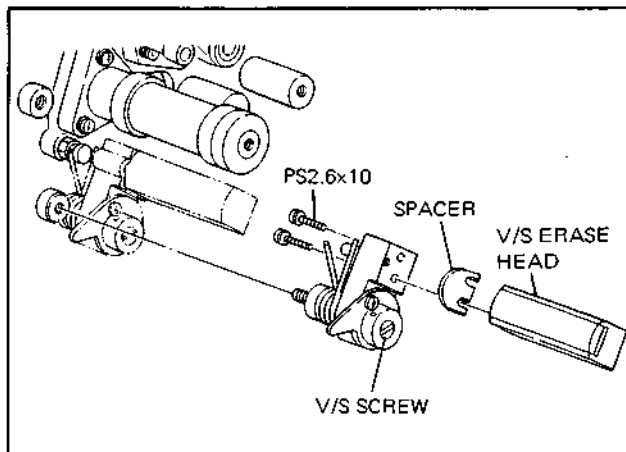


Fig. 3-101. V/S Erase Head Height Adjustment

SECTION 4 SERVICE INFORMATION

4-1. PRINCIPAL COMPONENTS LOCATION

TAPE TRANSPORT: HEAD, MOTOR, SOLENOID etc.

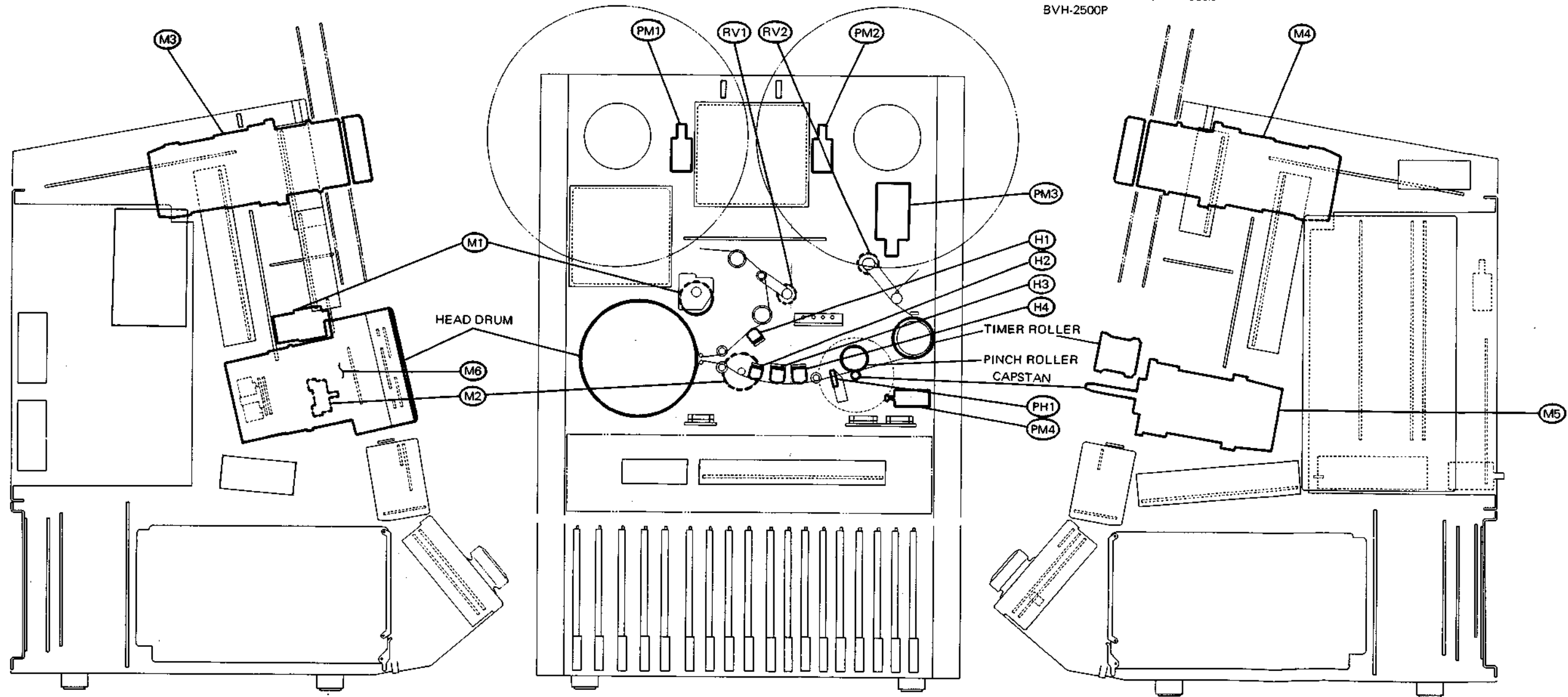
H1 HEAD, V/S ERASE
 H2 HEAD, AUDIO/CTL ERASE
 H3 HEAD, AUDIO/CTL R/P
 H4 HEAD, AUDIO/CTL MONITOR: BVH-2000PS 02, 12, 04 and 14 models
 BVH-2180PS 02, 12, 04 and 14 models
 BVH-2500P

M1 MOTOR, THREADING
 M2 MOTOR, IP (IMPEDANCE ROLLER)
 M3 MOTOR, SUPPLY REEL
 M4 MOTOR, TAKE-UP REEL
 M5 MOTOR, CAPSTAN
 M6 MOTOR, DRUM

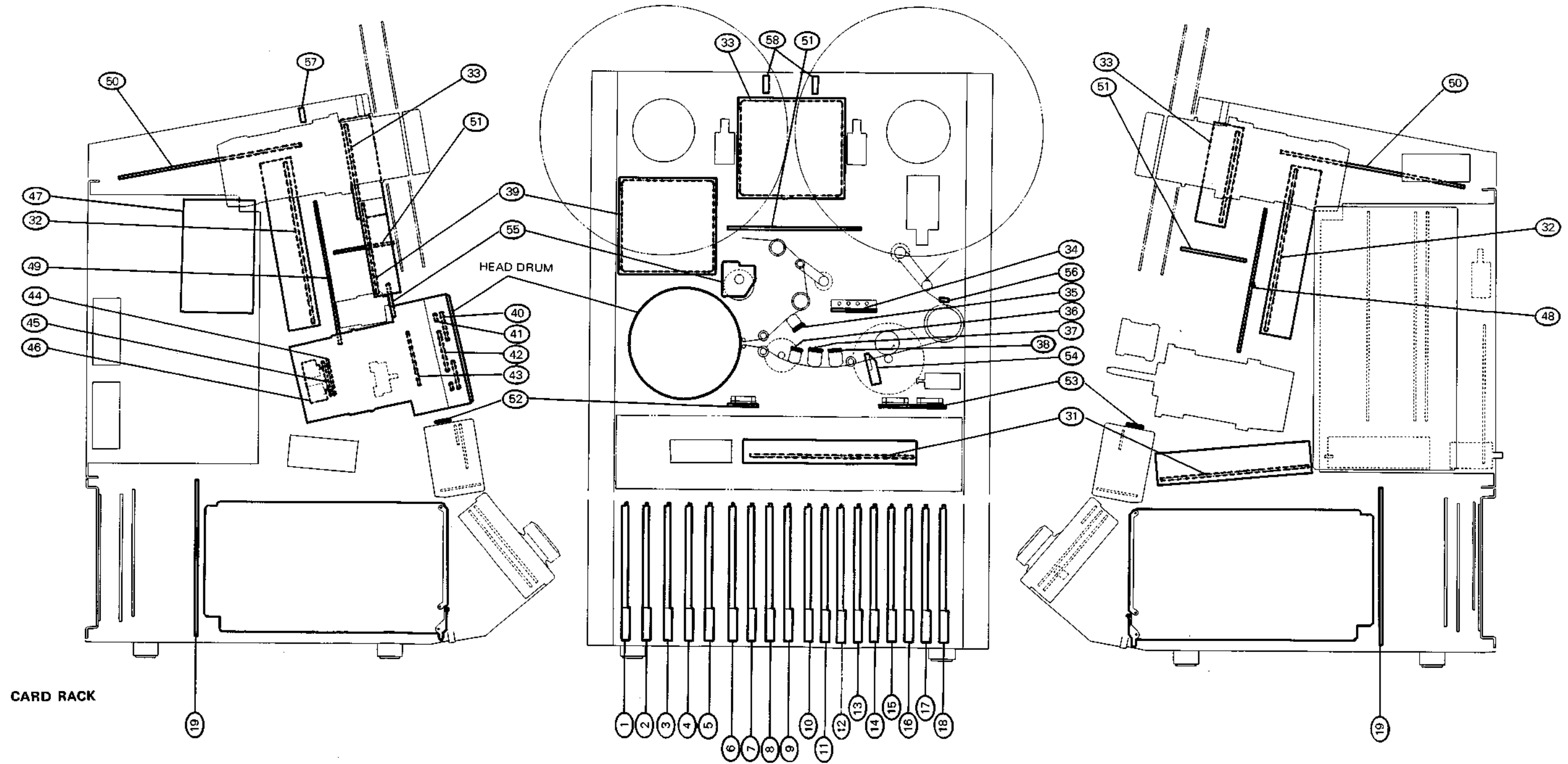
PH1 PHOTOINTERRUPTER, TAPE SENSOR

PM1 SOLENOID, SUPPLY REEL BRAKE
 PM2 SOLENOID, TAKE-UP REEL BRAKE
 PM3 SOLENOID, PINCH ROLLER
 PM4 SOLENOID, MINI TENSION ARM: BVH-2000PS 02, 12, 04 and 14 models
 BVH-2180PS 02 and 04 models
 BVH-2500P

RV1 POTENTIOMETER, SUPPLY TENSION
 RV2 POTENTIOMETER, TAKE-UP TENSION



TAPE TRANSPORT: PRINTED CIRCUIT BOARD



TAPE TRANSPORT: PRINTED CIRCUIT BOARD

- 31 AP-12 BOARD: AUDIO/CTL REC/PB PREAMPLIFIER
- 32 BE-02 BOARD: AUDIO BIAS/ERASE OSCILLATOR
- 33 BE-03 BOARD: AUDIO BIAS AMPLIFIER
- 34 BE-04 BOARD: AUDIO BIAS LEVEL ADJ.

- 35 HD-06 BOARD: V/S ERASE HEAD
- 36 CEH-2 BOARD: AUDIO/CTL ERASE HEAD
- 37 HD-07 BOARD: AUDIO/CTL R/P HEAD: 02, 12, 00 and 10 models
- HD-08 BOARD: AUDIO/CTL R/P HEAD: 04 and 14 models
- 38 HD-07 BOARD: AUDIO/CTL MONITOR HEAD: 02 model
- HD-08 BOARD: AUDIO/CTL MONITOR HEAD: 04 and 14 models

- 39 BP-09 BOARD: VIDEO/SYNC R/P AMP (for R/P HEAD)

- 40 DR-13 BOARD: VIDEO/SYNC PB AMP (for PLAY HEAD):
02, 12, 04 and 14 models

- DR-20 BOARD: ROTARY HEAD RELAYING: 00 and 10 models

- 41 DR-14 BOARD: } ROTARY HEAD RELAYING
- 42 DR-15 BOARD: } ROTARY HEAD RELAYING
- 43 DR-16 BOARD: } ROTARY HEAD RELAYING
- 44 SL-07 BOARD: } SLIP RING RELAYING
- 45 SL-08 BOARD: } SLIP RING RELAYING
- 46 SL-09 BOARD: } SLIP RING RELAYING

- 47 DD-03 BOARD: DT DRIVER
- 48 CA-09 BOARD: CAPSTAN MOTOR DRIVER
- 49 DA-07 BOARD: DRUM MOTOR DRIVER
- 50 RA-05 BOARD: REEL MOTOR DRIVER

- 51 TT-01 BOARD: TTP AUX
(SOLENOID, MOTOR DRIVER etc.)
- 52 HM-05 BOARD: HEAD HOURS METER
- 53 TM-16 BOARD: TAPE RUNNING/OPERATION HOURS
METER

- 54 TD-05 BOARD: TAPE DETECTOR
- 55 TH-03 BOARD: THREADING MOTOR
- 56 TR-07 BOARD: TIMER ROLLER SENSOR
- 57 RS-17 BOARD: REEL SENSE AMP (BVH-2180PS ONLY)
- 58 RS-18 BOARD: REEL SENSOR (BVH-2180PS ONLY)

CARD RACK

- 1 AU-27 BOARD: AUDIO-1, 2 REC EQ/PB AMPLIFIER
- 2 AE-03 BOARD: AUDIO-3, 4 REC EQ/PB AMPLIFIER
- 3 EQ-02 BOARD: VIDEO/SYNC PB EQUALIZER
- 4 DM-25 BOARD: VIDEO DEMODULATOR
- 5 MD-14 BOARD: VIDEO MODULATOR

- 6 AD BOARD: A/D CONVERTER } OPTION
- 7 MY BOARD: MEMORY } OPTION
- 8 SG BOARD: SYNC GENERATOR } OPTION
- 9 PR BOARD: PROCESSOR } OPTION

- 10 LG-02(A) BOARD: LOGIC
- 11 TC-14A BOARD: TIME CODE READER/GENERATOR:
OPTION BKH-2015A
- 12 SY-79 BOARD: SYSTEM CONTROL CPU-1
- 13 SY-80 BOARD: SYSTEM CONTROL CPU-2
- 14 SV-43 BOARD: SERVO CPU
- 15 RL-12 BOARD: REEL SERVO
- 16 CD-17 BOARD: CAPSTAN/DRUM SERVO
- 17 SR-15 BOARD: SERVO REF. SIGNAL GENERATOR
- 18 DT-05 BOARD: DT CONTROL: 02, 12, 04 and 14 models

- 19 MB-14A BOARD: MOTHER BOARD

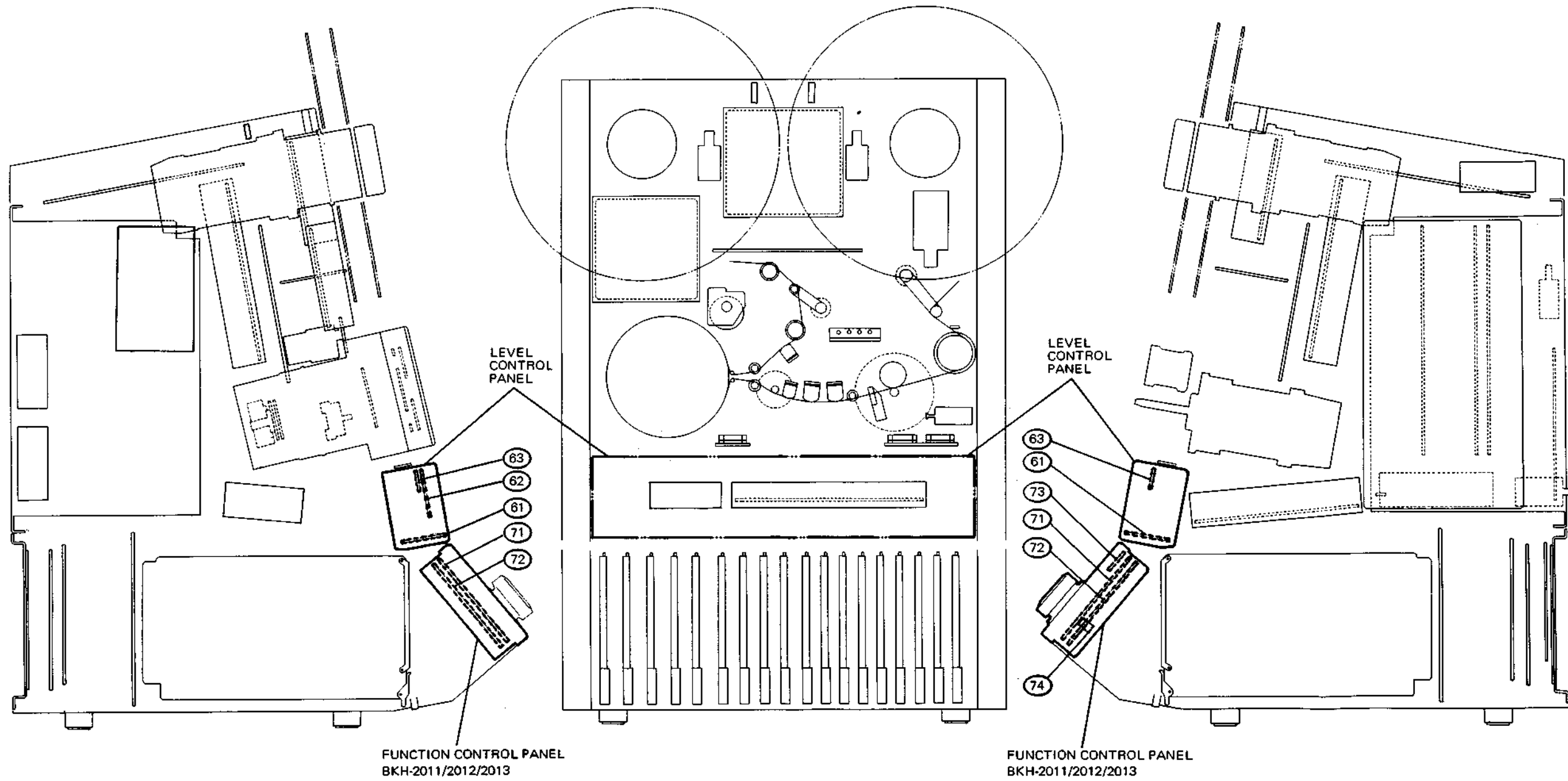
LEVEL CONTROL PANEL

- 61 VR-05 BOARD: LEVEL CONTROL/INDICATOR: 02, 00 model
- VR-07 BOARD: LEVEL CONTROL/INDICATOR: 04 model
- 62 MS-07 BOARD: MONITOR SELECT: 02, 00 model
- MS-08 BOARD: MONITOR SELECT: 04 model
- 63 ML-02 BOARD: METER LAMP: 02, 00 model
- ML-03 BOARD: METER LAMP: 04 model

FUNCTION CONTROL PANEL

- 71 SA-11/12/13 BOARD
- 72 DY-01/02/03 BOARD
- 73 LE-16 BOARD
- 74 DE-08 BOARD

OPTION
BKH-2011/2012/2013



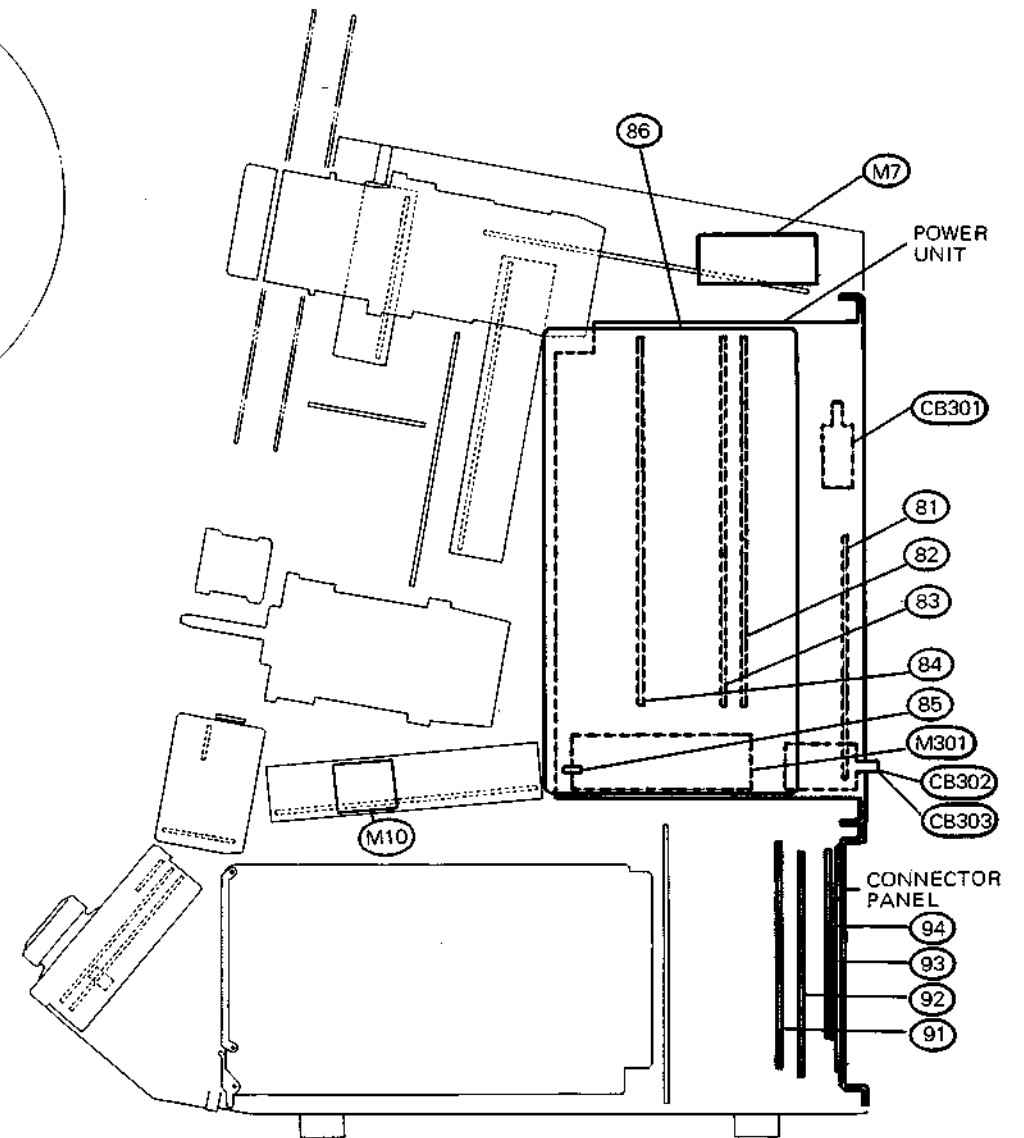
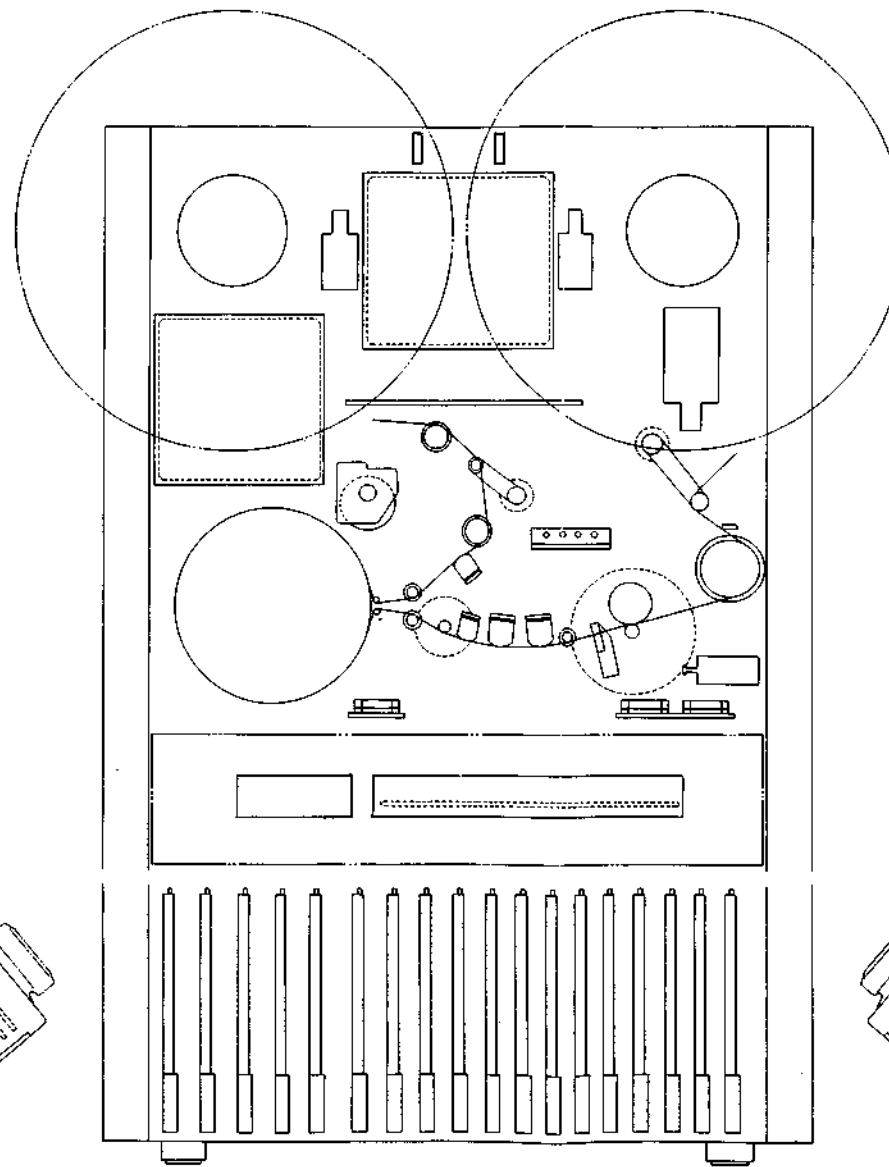
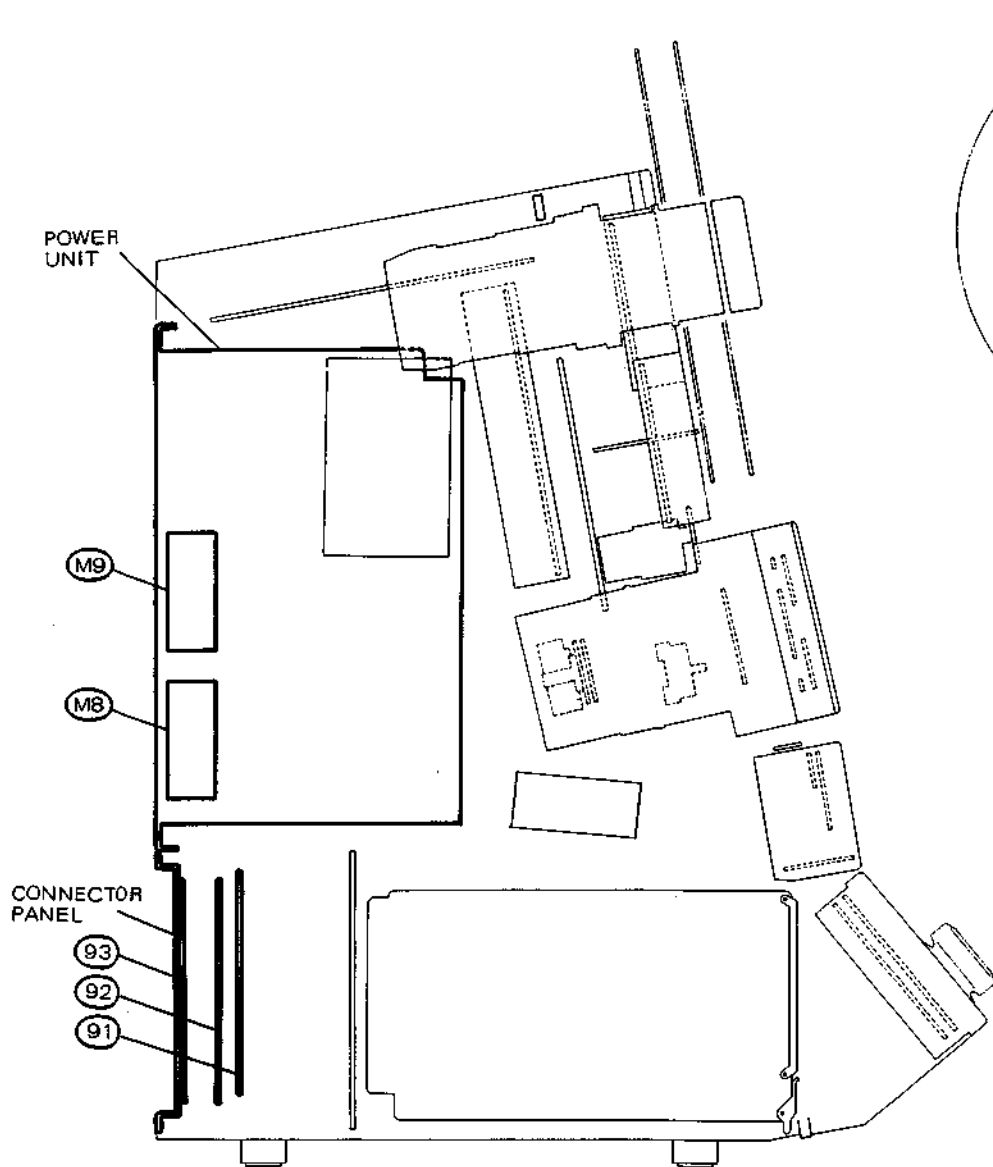
POWER SUPPLY

- 81 AC-39 BOARD: PRIMARY RECTIFIER
- 82 FV-02 BOARD: } SWITCHING REGULATOR
- 83 VV-01 BOARD: } SWITCHING REGULATOR
- 84 FV-01 BOARD: } SWITCHING REGULATOR
- 85 CN-54 BOARD: FAN MOTOR RELAYING
- 86 PS-14 BOARD: SERIES REGULATOR: BVH-2000/2180/2500
- PS-80 BOARD: SERIES REGULATOR: BVH-2700

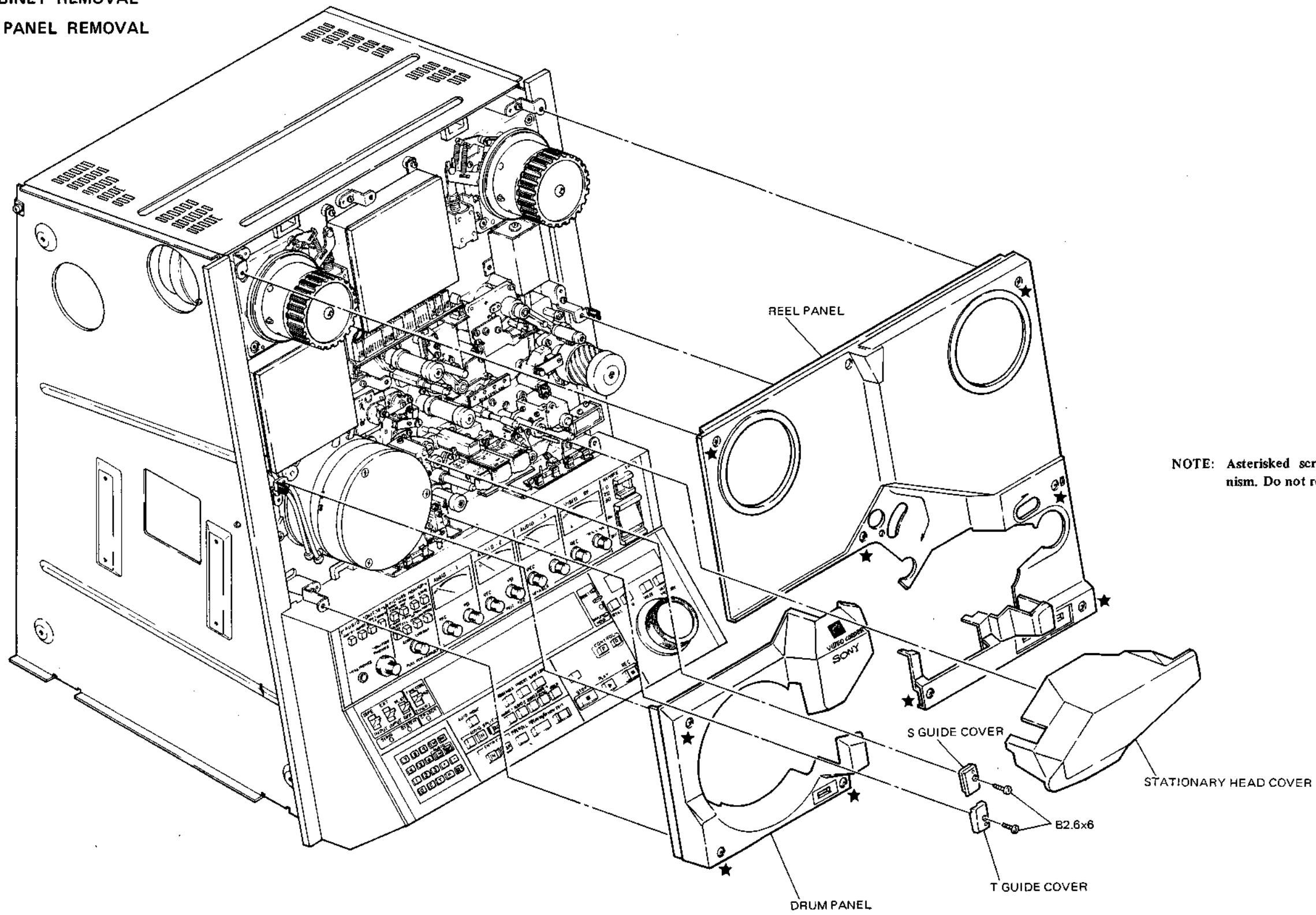
- CB301 PROTECTOR
- CB302 BREAKER, 6A
- CB303 BREAKER, 10A
- M7 MOTOR, FAN
- M8 MOTOR, FAN (Except for BVH-2000(10), (12), (14) model)
- M9 MOTOR, FAN
- M301 MOTOR, FAN
- M10 MOTOR, FAN

CONNECTOR PANEL

- 91 LA-02 BOARD: AUDIO LINE IN/OUT AMPLIFIER
- 92 VM-01 BOARD: VIDEO BUFFER/MONITOR SELECT
- 93 CN-37 BOARD: VIDEO CONNECTOR PANEL
- 94 CN-49 BOARD: REMOTE CONNECTOR PANEL

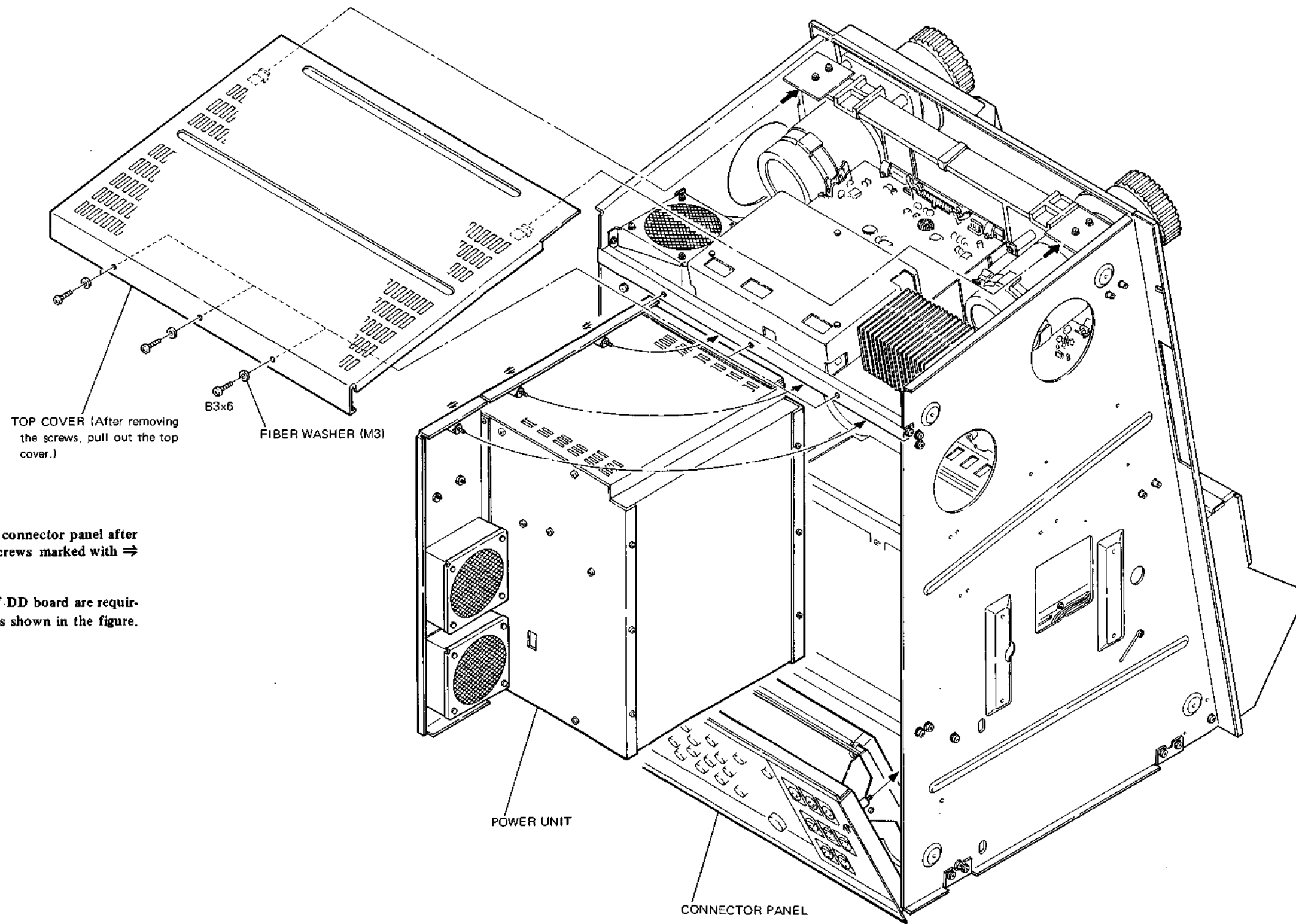


4-2. CABINET REMOVAL
FRONT PANEL REMOVAL



NOTE: Asterisked screws have drop prevention mechanism. Do not remove forcibly.

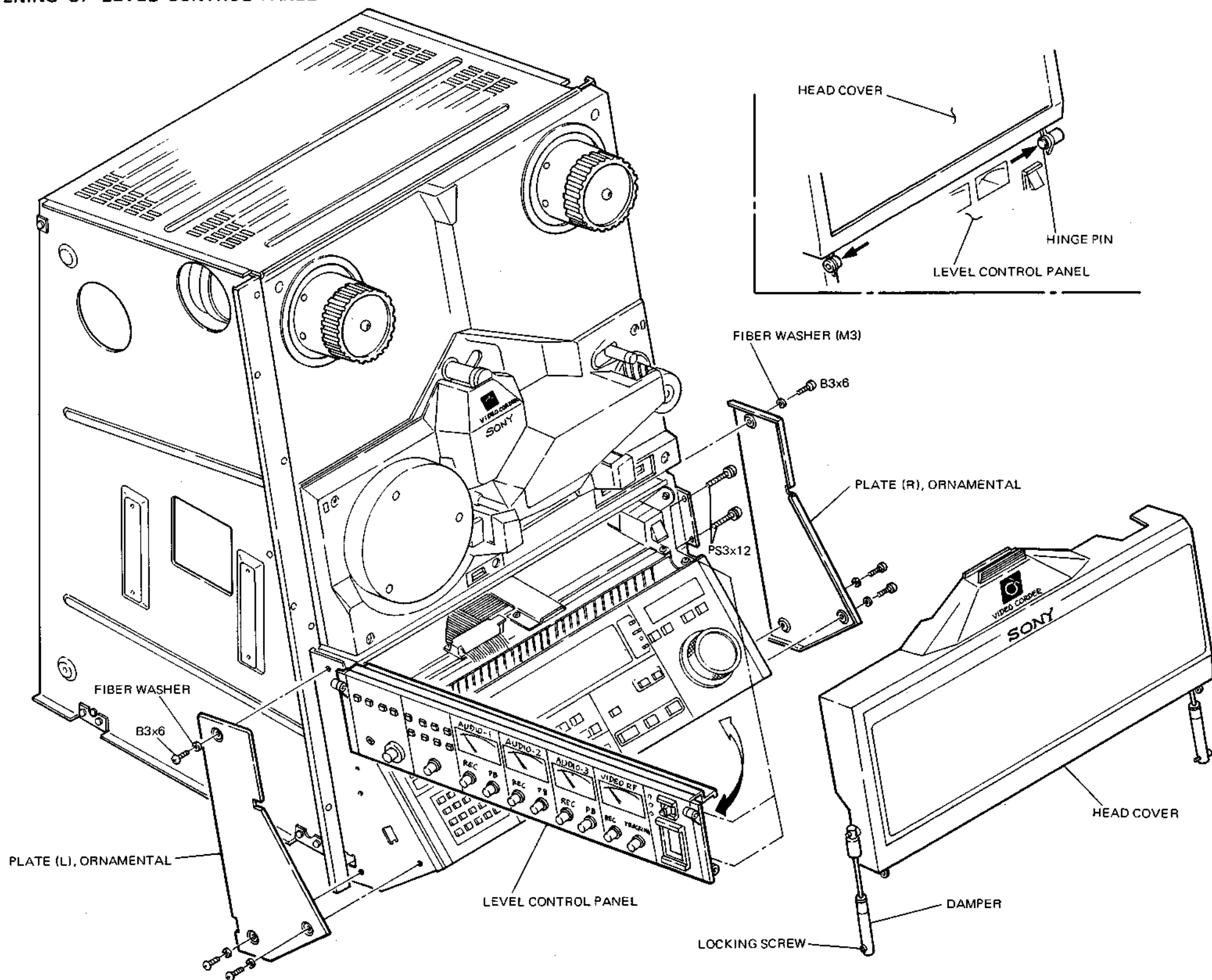
OPENING OF THE REAR PANELS AND TOP COVER



NOTE 1: Open the power unit and connector panel after sufficiently loosening the screws marked with ⇒ on the panel.

NOTE 2: If the check/adjustment of DD board are required, open the power unit as shown in the figure.

OPENING OF LEVEL CONTROL PANEL

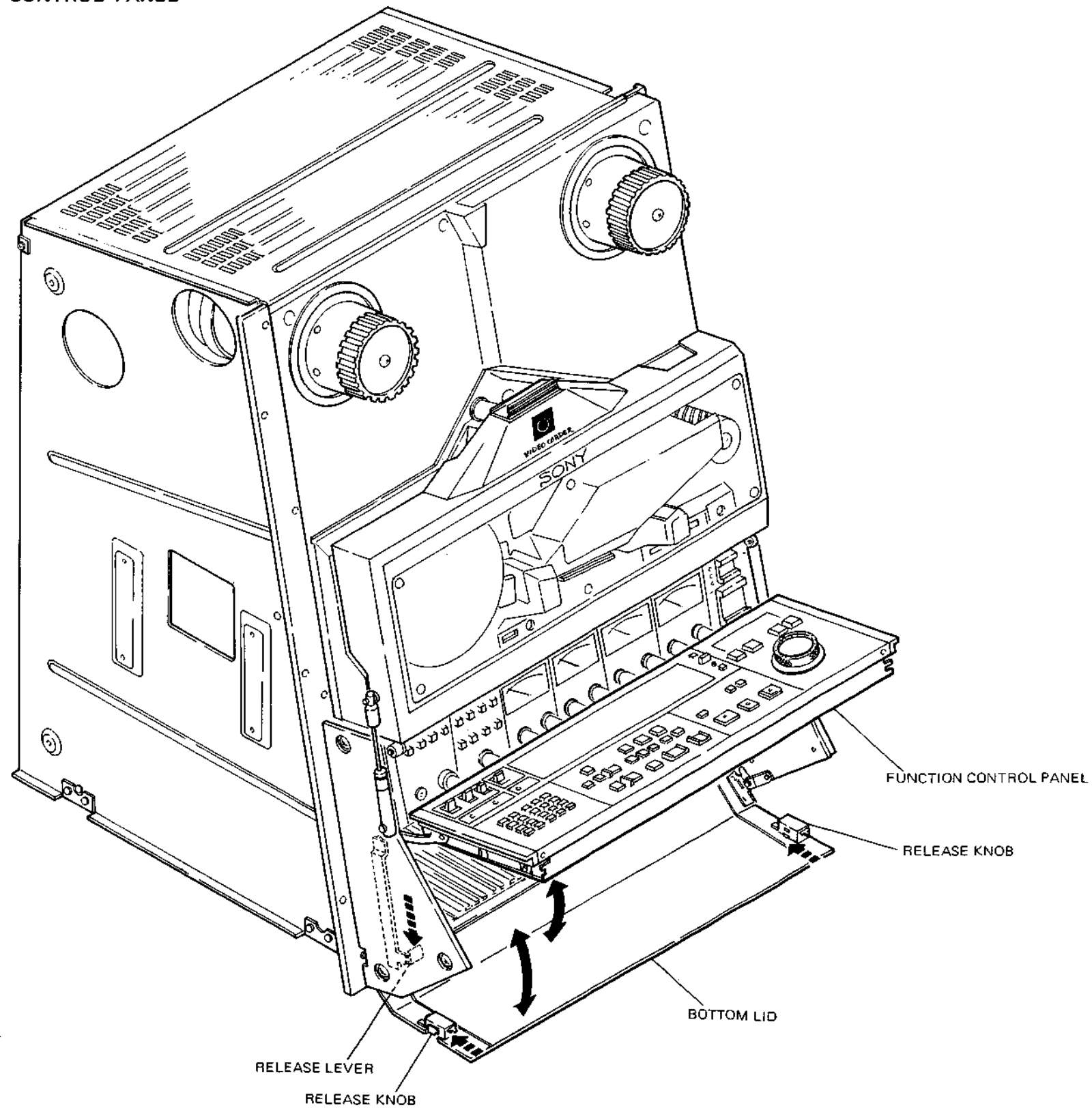


If the check/adjustment of AP board are required, open the level control panel as follows.

1. Remove the each side of dampers by turning the locking screw of dampers as shown in the figure.
2. Remove the head cover, while pushing the hinge pins on the level control panel.
3. Remove the right and left ornamental panels.
4. Remove the two screws which fix the right end of the level control panel.

NOTE: To close the level control panel, perform the reverse order of opening.

OPENING OF FUNCTION CONTROL PANEL



When the adjustment/check of the printed circuit boards in the card rack are required, open and close the function control panel as follows.

To open the panel

1. Open the bottom lid, while pulling the two release knobs on the lower side of the bottom lid.
2. Pull the function control panel up as shown in the figure.

To close the panel

3. Close the function control panel, while pushing down the release lever shown in the figure.
4. Close the bottom lid.

4-3. NOTES ON POWER UNIT

4-3-1. Capacity of AC Power Source

The AC (50/60 Hz) power supply voltage of the BVH-2000PS/2500P is 90 to 132V or 180 to 265V and the power consumption of the BVH-2000PS/2500P is 550W max and the power consumption of the BVH-2180PS is 600W max.

However, in the worst case, approx. 10A for AC90-132V or 6A for AC180-265V input current may flow and the surge currents will be three or four times as much. If the capacity of the power source is inadequate, the circuit breaker may operate unexpectedly or the internal protector of the BVH-2000PS/2180PS/2500P may operate so as not to output a DC voltage.

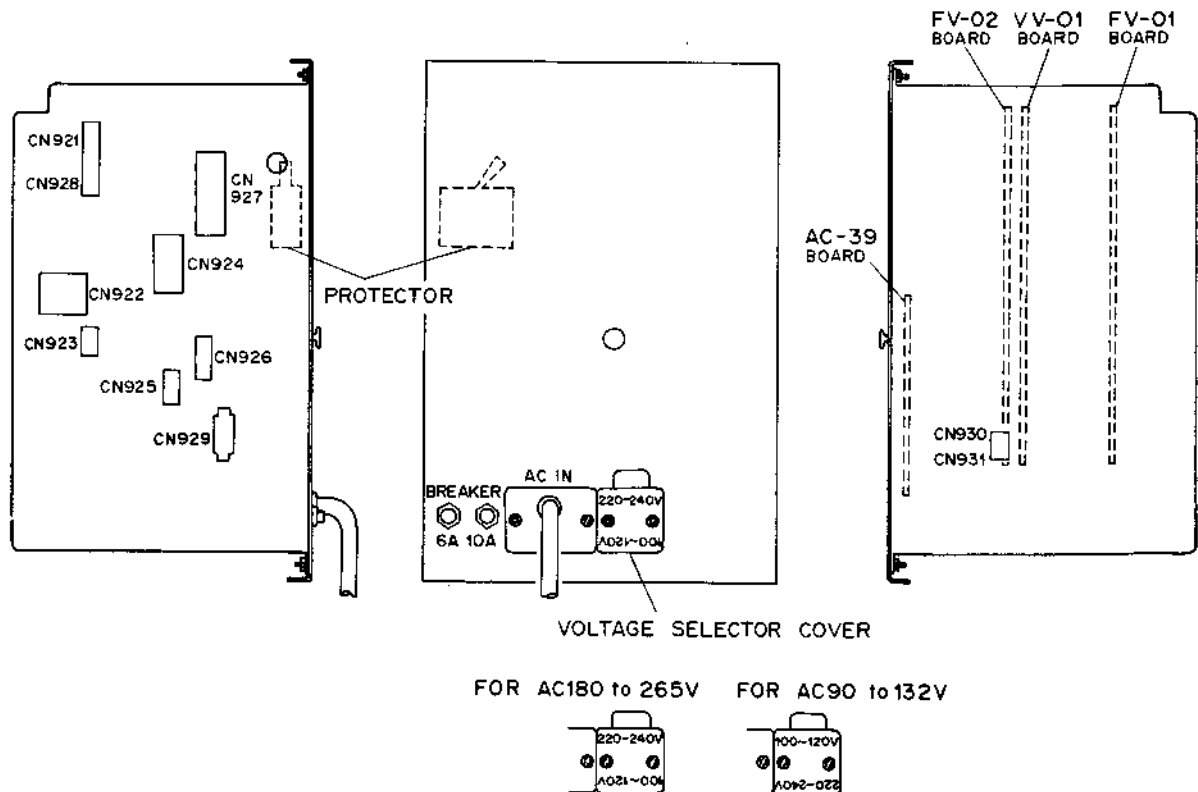
4-3-3. Ventilation/Heat Sink

The four fans are for cooling the BVH-2000PS/2180PS/2500P. If either the intake or exhaust should become clogged or the fans stop, damage may result to the power unit etc.

The heat sinks provided on each board are rated on the assumption that cooling will be provided by the fans. Consequently, the unit should not be operated too long without fan cooling (such as when the unit is opened for checks etc.).

4-3-2. Voltage Selector Cover

The voltage selector cover should be correctly attached to the rear panel of the power unit in accordance with the power line voltage to be used as shown below. To attach the cover sets the power unit to operate with the voltage range between AC90-132V or AC180-265V.



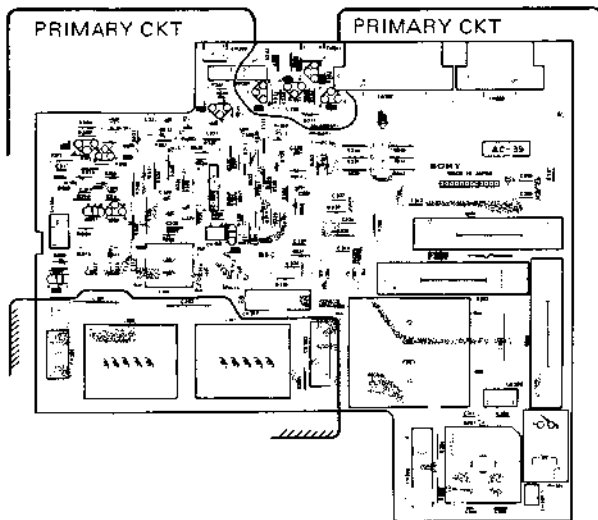
4-3-4. Primary Circuit & Electric Shock

The power supply comprises a switching regulator and the PS-14 series regulator board; the switching regulator comprises the AC-39, FV-02, VV-01 and FV-01 boards and the primary circuit associated parts. The entire switching regulator is mounted on the same chassis as the power unit.

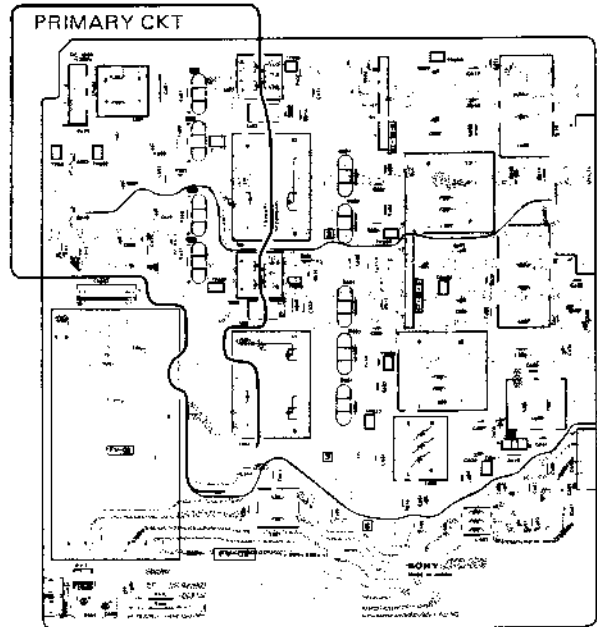
Since the switching regulator is mainly on the primary side, it is important to beware of electric shock. The figure below shows the primary side of each board. The heat sinks on the primary zone of the FV-02, VV-01 and FV-01 are also connected to the primary.

Note that the parts indicated by diagonal bars on the AC-39 board are active even when the power switch is off.

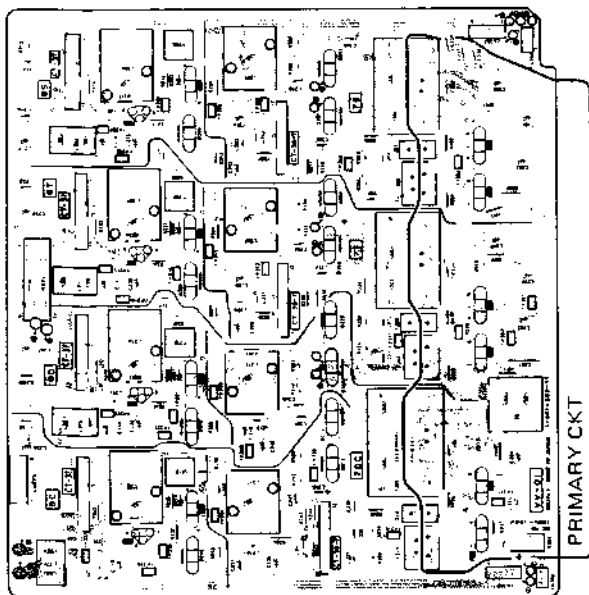
AC-39 BOARD (solder side)



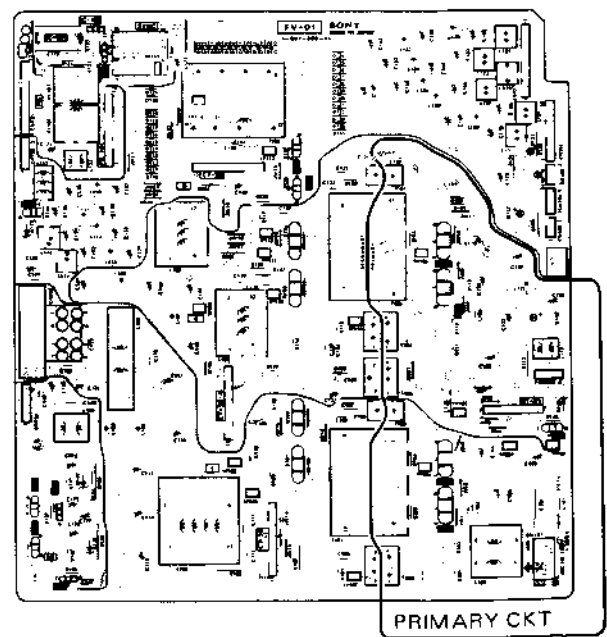
FV-02 BOARD (solder side)



VV-01 BOARD (solder side)



FV-01 BOARD (solder side)



Note that even after the power switch is turned off, a high voltage remains in the two electrolytic capacitors in the power unit and it is dangerous to discharge them rapidly.

On the FV-02, VV-01 and FV-01 boards, even after disconnecting the CN601, 201 and 101 input connectors, a high voltage still remains in the following capacitors:

FV-02 board (CN601)	VV-01 board (CN201)	FV-01 board (CN101)
C602	C202	C102
C603	C203	C103
C604	C204	C104
C618	C205	C122
C620	C219	C123
	C220	C124
	C234	
	C235	

CN924 on the VV-01 board (connected to CN104/CA-09 board and CN208/RA-05 board) and CN926 on the FV-02 board (connected to CN281/DD board) both output high voltages. Beware of electric shock!

4-3-5. Check of AC-39 Board

The checking the AC-39 board, note the following:

- 1) It is easier to perform the check after removing the ornamental panel of the power unit (remove the nuts using a nut driver).
- 2) Most of the AC-39 board is on the primary side and the AC-39 board has a live section even after the power switch is turned off. Beware of electric shock!
- 3) The heat sink of rectifier diode D31 on the AC-39 board is secured on the power unit chassis with a screw which improves the radiation effect. Do not operate too long with the screw removed from the chassis.
- 4) As the main rectifier circuit, sub rectifier circuit and secondary circuits all have different potentials, do not use the same "cold (GND)" for all of them.
- 5) The CN303 and CN304 2-pin connectors are necessary for the operation of the protector circuit and should be left connected when servicing or checking.
- 6) Do not load with the CN305 4-pin connector and CN309 and CN310 3-pin connectors disconnected.

4-3-6. LEDs for DC Output Check

Green LEDs are provided on the FV-02 and FV-01 boards for the following output checks:

FV-02 board	FV-01 board
D603: +13.8V (for +12V)	D146: +6.8V (for +5V)
D606: -13.8V (for -12V)	D147: +13V (for the fans)
	D148: +13V (for primary ckt CTL)
	D151: +17V (for secondary ckt CTL)

4-3-7. DC Output Terminals

The cold side (GND pins) of the switching regulator DC output circuit is divided according to the voltage system and each output voltage is determined by an each GND pin.

Output system	Respective pin HOT-COLD (GND)
FIXED OUTPUTS	
+6.8V (for +5V)	CN922, 1-6
-8.6V (for -5V)	CN927, 9-17
+13.8V (for +12V)	CN927, 5-7
-13.8V (for -12V)	CN927, 4-10
+19V (for +12V pre-drive)	CN928, 1-3
-19V (for -12V pre-drive)	CN928, 5-3
+250V (for DT)	CN926, 10-8
-250V (for DT)	CN926, 6-8
+13V (for solenoids)	CN923, 1-3
+13V (for fans)	CN930, 1-3
-48V (for fluorescent display)	CN926, 1-3
VARIABLE OUTPUTS	
SR VH (for S-reel motor)	CN924, 1-7
TR VH (for T-reel motor)	CN924, 2-8
DR VH (for drum motor)	CN924, 5-10
CP VH (for capstan motor)	CN924, 6-11

4-3-8. PDS (Power Dead Sense) Function

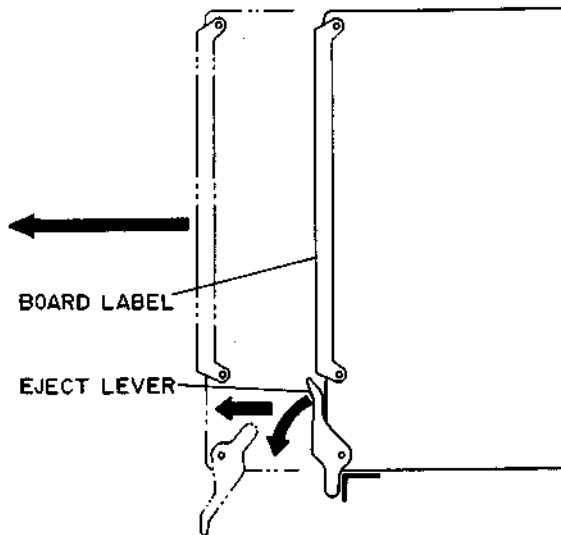
If a malfunction occurs in one of the switching regulator outputs +/-19V, +/-13.8V, +6.8V and -8.6V, all the outputs will be interrupted. This function is designated as PDS (Power Dead Sense).

The PDS will not operate, even though a malfunction occurs in the variable outputs (SR VH, TR VH, DR VH, CP VH), or DT drive (+/-250V), fluorescent display drive (-48V) and fan/solenoid drive (+13V) in the fixed outputs.

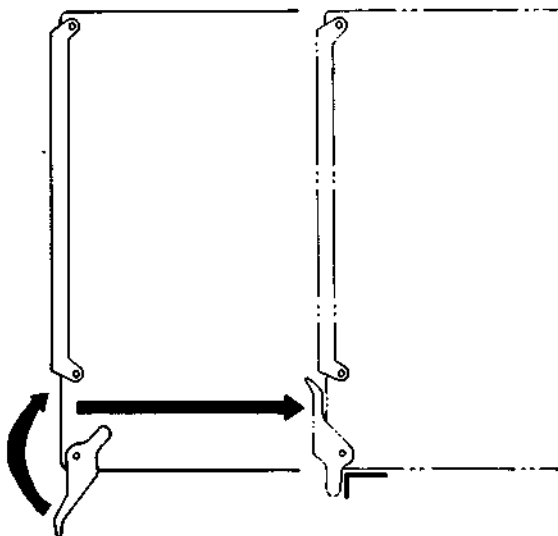
4-4. EXTRACTING/INSERTING PLUG-IN BOARDS

Wait two seconds or more after switching off the power before extracting or inserting any of the plug-in boards.

Extract the board from the connector using the eject lever. Do not start by pulling on the board label.



Set the eject lever in the position shown and then insert the board.



4-5. NOTES ON REPAIR PARTS

(1) Safety Related Components Warning

Components identified by shading marked with Δ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.

(2) Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical spare parts list are indicating the part numbers of "the standardized genuine parts at present".

(3) Change of Parts

Regarding engineering parts changes, refer to Section E. "CHANGED PARTS".

(4) Stock of Parts

Parts marked with () on the spare parts list are not normally required for routine service work. Orders for parts marked with () will be processed, but allow for additional delivery time.

(5) Units for Capacitors, Inductors and Resistors

The following units are assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified:

Capacitors; μF
Inductors; μH
Resistors; ohm

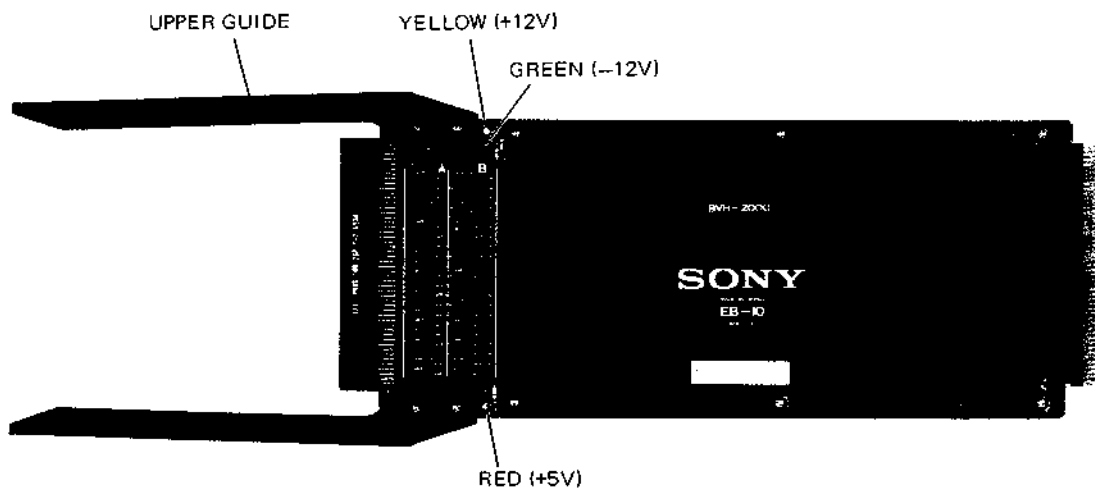
4-6. MAINTENANCE TOOLS/FIXTURES

Extender, EB-10 Sony Part No. A-6001-005-A

Used for checking and repairing the plug-in circuit board in the card rack. The VTR has 1 pc as an accessory.

If the EB-10 extender is inserted into the card rack, it is possible to check that +12V, -12V and +5V DC is being supplied by checking the illumination of the LEDs on the extender.

When the VTR is mounted in a rack, remove the upper guide on the extender for use.

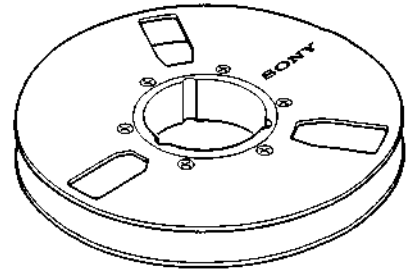
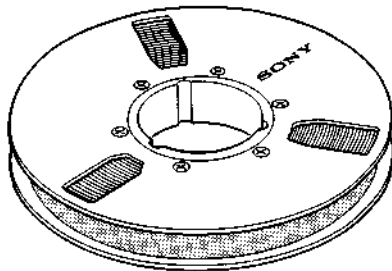


Alignment Tape, BR5-2PS-A4 Sony Part No. 8-944-005-63

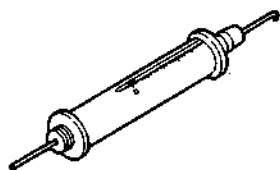
An alignment tape for the BVH series PAL/SECAM VTR. The contents are shown on the section 4-7.

SONY 9 inches Empty Reel

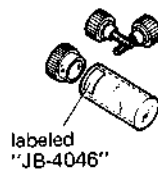
Used for reel brake torque adjustment.



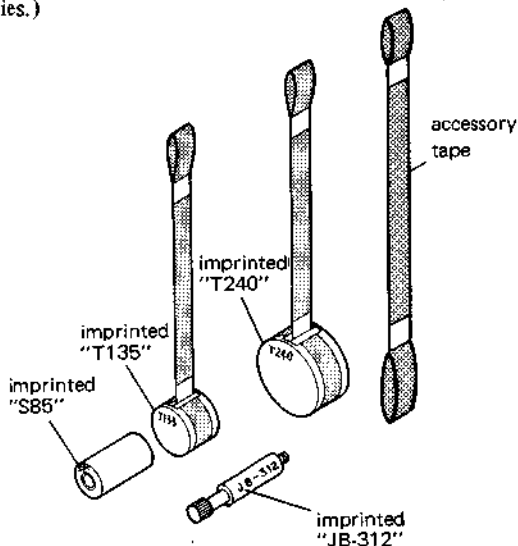
Tension Scale, 5 k grams Sony Part No. J-6041-640-A
 The 5 k grams tension scale is used for pinch roller pressure adjustment.



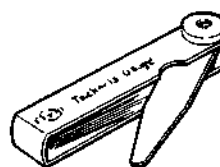
Tapered Screw Sony Part No. J-6040-460-A
 Consists of two tapered screws and used for upper drum position adjustment.



Tension Adjustment Tool Sony Part No. J-6043-120-B
 Used for tape tension adjustment.
 (The accessory tape is used for only BVH-2180 series.)

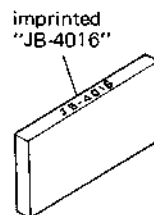


Thickness Gauge Sony Part No. J-6041-670-A
 Used for mechanical parts position adjustment.

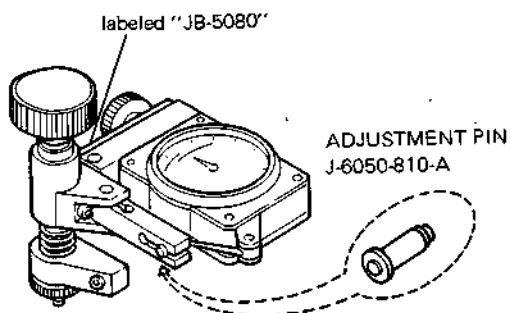


thickness (mm)		
0.03	0.04	0.08
0.09	0.10	0.11
0.12	0.13	0.14
0.15	0.20	0.25
0.30	0.35	0.40
0.45	0.50	0.60
0.75	0.80	0.90
1.00		

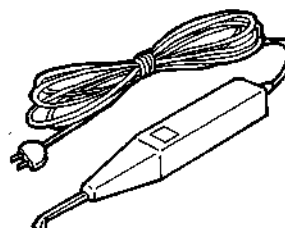
Flat Plate Sony Part No. J-6040-160-A
 Used for stationary head zenith check and adjustment.



Drum Eccentricity Adj. Gauge Sony Part No. J-6250-800-A
 Used for drum eccentricity adjustment and for rotary head tip projection check.



Demagnetizer, Sony HE-4 Commercially Available
 Used to demagnetize heads.



BVH-2000(U/C)/PS/PM
 BVH-2180(U/C)/PS/PM
 BVH-2500(U/C)/P
 BVH-2700(U/C)

IC Test Clip, TC-16 Sony Part No. J-6041-770-A

IC Test Clip, TC-20 Sony Part No. J-6041-780-A

Manufactured by:

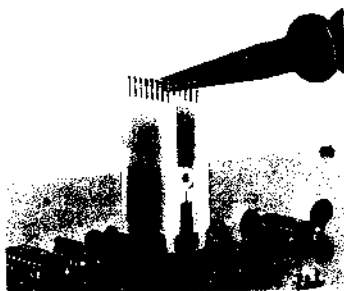
AP PRODUCTS INCORPORATED

P.O. Box 697, 72 Corwin Drive,

Painesville, Ohio 44077, U.S.A.

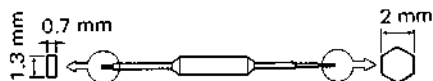
Phone: (216) 354-2101

When connecting the test probe to the terminal of DIP integrated circuit, these clips are convenient. Type TC-16 is for DIP 14-pin or 16-pin IC and Type TC-20 is for 18-pin or 20-pin IC.



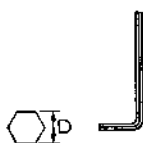
Alignment Screwdriver Sony Part No. 7-700-733-01

Used to adjust variable resistors and variable inductors etc.



L-shaped Hexagonal Wrench Set

Sony Part No. 7-700-736-00
or J-6041-700-A



D (mm)	7-700-736-00	J-6041-700-A
1.27	○	
1.4	○	
1.5	○	○
1.58	○	
2.0	○	○
2.5	○	○
3.0	○	○
4.0	○	○
5.0	○	
6.0	○	
8.0	○	
10	○	

Hexagonal Screw Driver, 1.4 mm

Sony Part No. 7-700-766-02

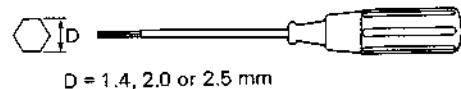
Hexagonal Screw Driver, 2 mm

Sony Part No. 7-700-766-03

Hexagonal Screw Driver, 2.5 mm

Sony Part No. 7-700-766-04

Used for stationary head replacement.



Nut Driver, 5.5 mm Sony Part No. 7-700-751-02

Used to open the ornamental panel of the power unit for checking and repairing AC-39 board.



TOTSU Screwdriver 2 mm Sony Part No. 7-721-050-61

TOTSU Screwdriver 2.6 mm Sony Part No. 7-721-050-62

TOTSU Screwdriver 3 mm Sony Part No. 7-721-050-63

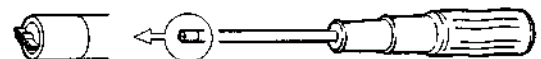
TOTSU Screwdriver 4 mm Sony Part No. 7-721-050-64

Screwdriver for "TOTSU" type screws shown below. Almost all the screws that are used in this machine are TOTSU type.



A flat blade screwdriver can be used for TOTSU screw but TOTSU screwdriver has the following merits.

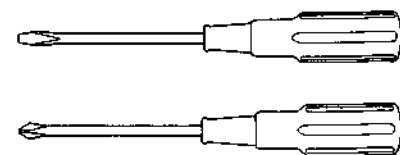
- TOTSU screwdriver can catch a TOTSU screw. It is convenient when mounting or removing the TOTSU screw which is out of reach.
- The pin on the blade head prevents slipping off a TOTSU screw head.



Flat Blade Screwdriver

Phillips Screwdriver

These screwdrivers also are necessary for sewing.

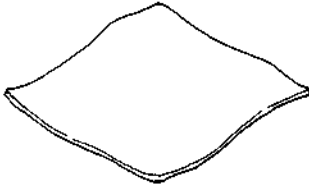


Cleaning Fluid

"FREON" is recommended for cleaning. When it is not available, ethanol (Sony cleaning fluid, part number Y-2031-001-0) can be used for cleaning the surfaces of the components on the tape path. To clean the slip ring, use "FREON" or rub it with dry cloth.

Cleaning Piece Sony Part No. 2-034-697-00

Clean the surface of parts with this cleaning piece moistened with cleaning fluid.



Erase Head Spacer "B" (Except for BVH-2700)

Thickness 0.05 mm Sony Part No. 3-651-419-01

Thickness 0.1 mm Sony Part No. 3-651-419-21

These may be necessary for the height adjustment of V/S erase head when replacing it.



Timer Roller Spacer

Thickness 0.02 mm Sony Part No. 3-651-334-01

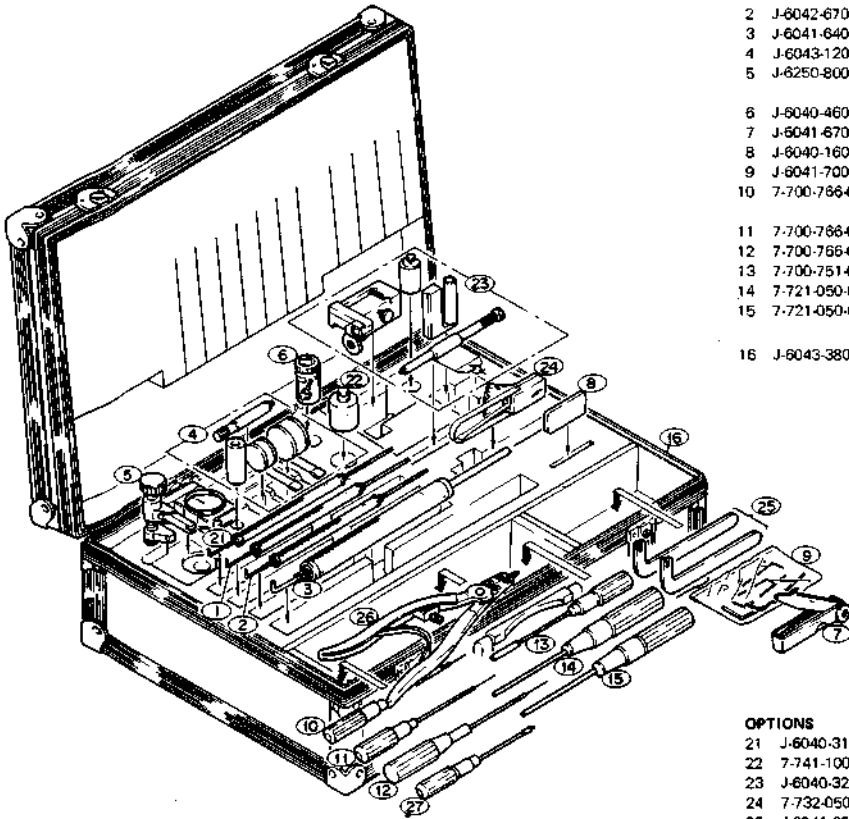
Thickness 0.05 mm Sony Part No. 3-651-334-11

Thickness 0.1 mm Sony Part No. 3-651-334-21

These may be necessary for the slant adjustment of the timer roller when replacing it and when adjusting tape path.



BVH-2000 TOOL KIT Sony Part No. J-6043-230-C



USED FOR				
BVH-2000	BVH-2180	BVH-1000A	BVH-500	BVH-500A
2180	1100A	1100	500A	
2500				
2700				

INCLUDED

1	J-6041-630-A	Tension Scale, 200 grams	-	o	o	o
2	J-6042-670-A	Tension Scale, 1 kilograms	-	o	-	-
3	J-6041-640-A	Tension Scale, 5 kilograms	o	o	o	o
4	J-6043-120-B	Tension Adjustment Tool	o	-	-	-
5	J-6250-800-A	Drum Eccentricity Adj. Gauge	o	o	o	o
6	J-6040-460-A	Tapered Screws	o	o	o	o
7	J-6041-670-A	Thickness Gauge	o	o	o	o
8	J-6040-160-A	Flat Plate	o	o	o	o
9	J-6041-700-A	L-shaped Hex. Wrench Set	o	o	o	o
10	7-700-766-02	Hex. Screw Driver, 1.4 mm	o	-	-	-
11	7-700-766-03	Hex. Screw Driver, 2 mm	o	-	-	-
12	7-700-766-04	Hex. Screw Driver, 2.5 mm	o	-	-	-
13	7-700-751-02	Nut Driver, 5.5 mm	o	-	-	-
14	7-721-050-63	TOTSU Screw Driver, 3 mm	o	o	o	o
15	7-721-050-64	TOTSU Screw Driver, 4 mm	o	o	o	o
16	J-6043-380-A	Carrying Case	o			

OPTIONS

21	J-6040-310-A	Tension Scale, 500 grams	-	o	o	-
22	7-741-100-01	Weight, 200 grams	-	o	-	-
23	J-6040-320-A	Tension Adjustment Tool	-	o	o	-
24	7-732-050-10	Sector Gauge, 20 grams	-	o	-	-
25	J-6041-650-A	Tension Arm Bending Tools	-	o	o	o
26	J-6041-660-A	Stop-ring Plier	-	-	-	o
27	J-6040-070-A	Eccentric Screw Driver	-	o	o	-

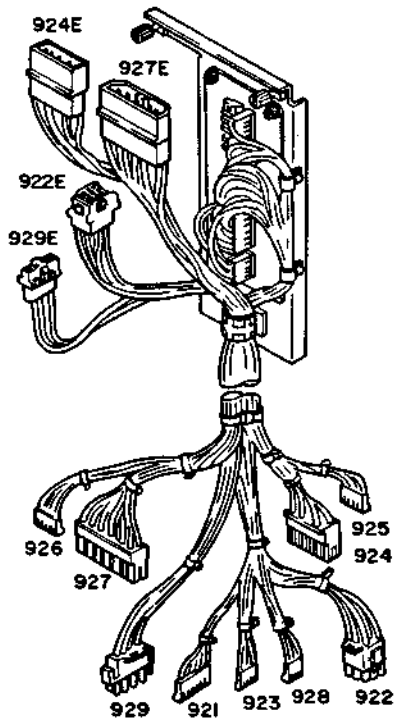
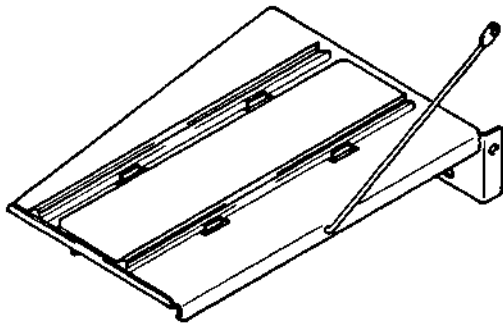
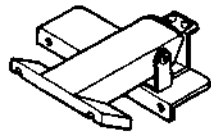
BVH-2000(U/C)/PS/PM
 BVH-2180(U/C)/PS/PM
 BVH-2500(U/C)/P
 BVH-2700(U/C)

SERVICES INFORMATION

Switching Regulator Adjustment Fixture

Sony Part No. J-6043-640-A

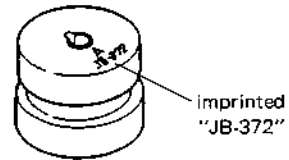
Used for check and adjustment the switching regulator board inside the power unit.



Brake Adjustment Fixture

Sony Part No. J-6043-720-A

Used when replacing the reel motor, brake band or brake solenoid.

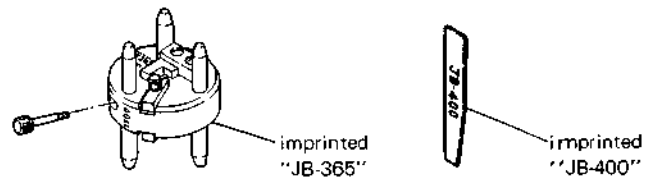


Guide Flange Fixture

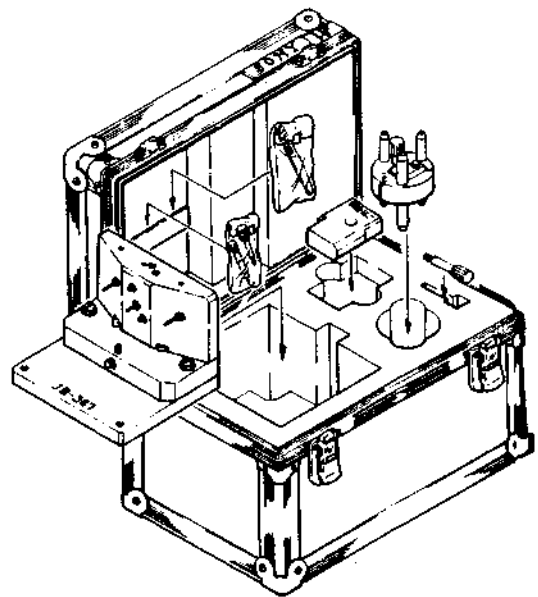
Sony Part No. J-6043-870-A

Used when fixing the guide flange of the entrance or exit slant guide assembly on the guide post.

The spacer (Sony Part No. J-6044-000-A) is included in this fixture. For replacement of the guide flange, contact your sony service office.



The guide flange fixture is also included in the following guide replacement fixture kit (Sony Part No. J-6043-730-A) for the BVH-100C/1100/1100A/1180.



4-7. ALIGNMENT TAPE BR5-2PS-A4

The BR5-2PS-A4 alignment tape is for Sony BVH series PAL/SECAM VTR.
The following signals are recorded on it.

TIMER min. sec	AUDIO				VIDEO	
	USE	CONTENTS (CH1 , CH2 , CH3 , CH4)	SYNC	VIDEO CONTENTS	USE	
0.00	PHASE	3 kHz, +8 dBm	*3	100% WHITE	TRACKING	
4.00	PHASE	15 kHz, +8 dBm				
8.30	NIL	BLANK	*3	LINEARITY	DG, DP	
9.00						
14.00	OUTPUT LEVEL	1 kHz + 8 dBm	*1	MULTIBURST	FREQUENCY RESPONSE	
14.30						
16.30	↑	1 kHz	← REFERENCE →	LINE 17 SIGNAL	K FACTOR etc.	
17.00						
18.30	↑ FREQUENCY RESPONSE ↓	50 Hz ()	*2	100/0/75/0 PAL COLOUR BARS	GENERAL PERFORMANCE CHECK	
19.00		100 Hz ()				
		200 Hz ()				
		300 Hz ()				
		500 Hz ()				
		3 kHz ()				
		5 kHz ()				
		7.5 kHz ()				
	10 kHz ()					
	15 kHz ()					
24.00	NIL	BLANK	*3	100/0/100/0 PAL COLOUR BARS	GENERAL PERFORMANCE CHECK	
24.30						
26.30	NIL	BLANK	BLACK BURST	SECAM COLOUR BARS	GENERAL PERFORMANCE CHECK	
27.00						
29.00						

*1. When playing back this tape, check/adjust the machine so that its audio output level is the nominal level (+8 dBm) plus the calibration level (dB) as follows.

ex. calibration level = -0.5 dB
actual output level = +8 - 0.5 = +7.5 dBm

*2. When playing back this tape, check/adjust the machine so that its output level at each frequency is the reference level at 1 kHz plus the calibration level (dB).

*3. The VITS is recorded.

SYNC CHANNEL	LINE 14/327	MULTIBURST
	LINE 15/328	LINE 17 SIGNAL
VIDEO CHANNEL	LINE 19/332	LINE 17 SIGNAL
	LINE 20/333	MULTIBURST

WARNING

TAPE MUST BE STOPPED IN THE BLACK SEGMENTS ONLY. STOPPING FROM REWIND OR FAST FORWARD, AND STARTING THE REWIND OR FAST FORWARD MUST BE MADE IN THE BLACK SEGMENTS ONLY.

NEVER PUT THE MACHINE INTO JOG OR STILL MODE WHILE ALIGNMENT TAPE IS THREADED. ABOVE CONDITION MUST BE MET TO AVOID A POSSIBLE DAMAGE TO THE TAPE AND TO PROLONG THE LIFE EXPECTANCY OF THE HIGHLY CALIBRATED ALIGNMENT TAPE.

CAUTION

- 1. KEEP THIS TAPE AWAY FROM STRONG MAGNETIC FIELDS.*
- 2. AVOID STORAGE AT HIGH TEMPERATURES. MAXIMUM STORAGE TEMPERATURE IS 40 °C (100 °F)*

4-8. MOUNTING OF REC INHIBIT SWITCH ON FRONT PANEL

Applicable to BVH-2000 # 10001 to # 11399

Applicable to BVH-2000PS # 10001 to # 11199

Applicable to BVH-2000PM # 10001 to # 10199

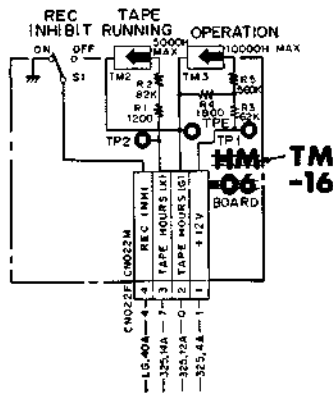
The machines with serial numbers higher than above and all BVH-2180/2500 series VTRs have been modified at the factory.

When mounting the REC INHIBIT switch on the front panel of the BVH-2000/PS/PM with serial No. as shown above, use the optional BVH-KIT3 parts kit. For the modification procedure, refer to the BVH-2000/PS/PM SUPPLEMENT-4 (BVH-KIT3). Another REC INHIBIT switch is mounted on the LG-02 board and relationship between them are as follows.

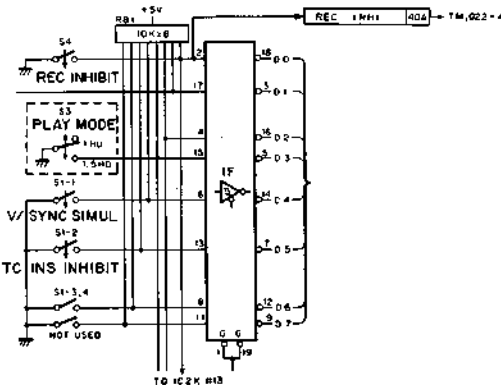
REC INHIBIT Switch		REC INHIBIT State
Front Panel	LG-02 Board	
ON	ON	ON
ON	OFF	ON
OFF	ON	ON
OFF	OFF	OFF

Circuit after modification

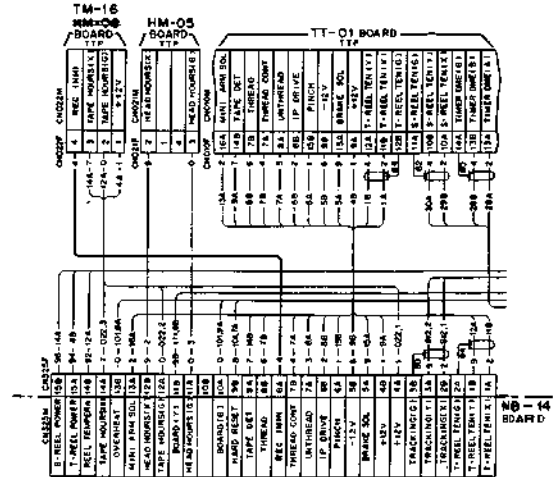
FRAME WIRING (1/2) TAPE TRANSPORT



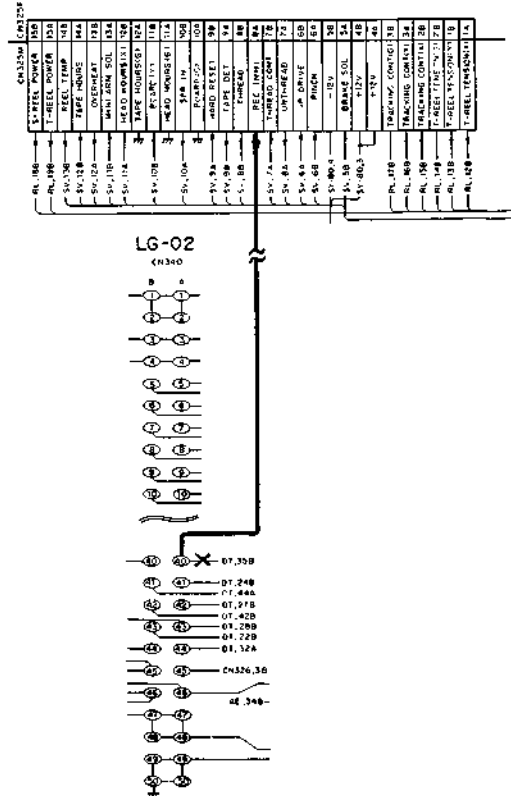
LG-02 board



FRAME WIRING CARD RACK

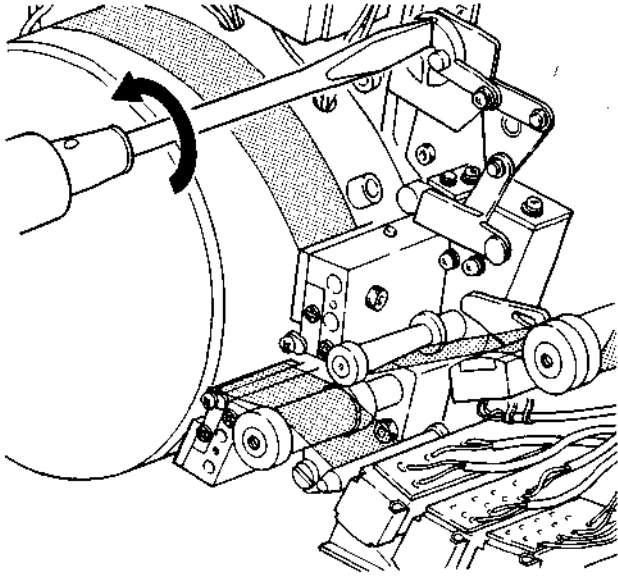


Mother (MB-14) board



4-9. MANUAL OPEN/CLOSE OF MOVABLE GUIDE

The movable guide can be opened and closed manually using the flat blade screwdriver.



||||||| 4. SERVICE INFORMATION

4-10. ERROR MESSAGES

An error message will be displayed on the type 2 or 3 control panel if an error occurs after the power-on or during operation.

"SYS ERR" (System Error)

1. This message will be displayed when a key short-circuit error is detected during the power-on initial check (see section 4-11). Also, the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound. If such an error occurs, the "11" will be displayed on the ND1 of the SY-79 board.
2. This message will be displayed when the CPU on the SY-79 board detects an error in the normal operating mode.

"SRV ERR" (Servo Error)

This message will be displayed when the ROM for the system control is version 3 and higher and the interface between the SY-80 and SV-43 boards become impossible owing to the error of the servo system. For details, see the explanation of D7 on the section 4-12-3.

"SY80 ERR" (SY-80 Board Error)

This message will be displayed when the program on the SY-80 board stops and the interface with the SY-79 board becomes impossible.

"OVERHEAT" (Power Overheat)

This message will be displayed when the power supply overheats. Also, the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound, however the operation in progress will continue. When the STOP button is pressed, the buzzer will stop.

"LINE ERR" (Line Error)

This message will be displayed if the "P" or "R" button on the local machine is pressed when the master machine is connected to one of the REMOTE-1/2/3 connectors on the connector panel.

When one of the function buttons is pressed, the message will disappear.

"ABORT" (Abort in Edit or Preroll)

This message will be displayed in the following case, and the VTR will be placed into the STOP mode forcibly. When one of the function buttons is pressed, the message will disappear.

1. When the machine is in the AUTO EDIT or PREVIEW mode, and if the synchronization is not finished or the servo lock is out six frames before the VIDEO IN or AUDIO IN point.
2. If the PREROLL is completed without the CUE-UP status being set, though the PREROLL command has been outputted to the other machine, when two VTRs are being operated in the AUTO EDIT or PREVIEW mode.

"LOST LCK" (Lost Lock)

This message will be displayed when the drum or capstan servo lock is instantly lost during the RECORD or EDIT, however the operation in progress will continue.

When one of the function buttons is pressed in the LOCAL mode or remote function command or LOST LOCK RESET command is received in the REMOTE mode, the message will disappear.

"NEGATIVE"

This message will be displayed when the VIDEO IN/OUT points or the AUDIO IN/OUT points are set as follows.

IN POINT \geq OUT POINT

In this case, set the IN and OUT points again.

"DATA ERR" (Operation or Receive CMD Error)

This message will be displayed in the following case, and it will disappear when one of the function buttons or the C (CLEAR) key is pressed.

1. When erroneous time code or timer data is set as an edit point by the 20-key.
2. When an indefinable command is received from the REMOTE machine.

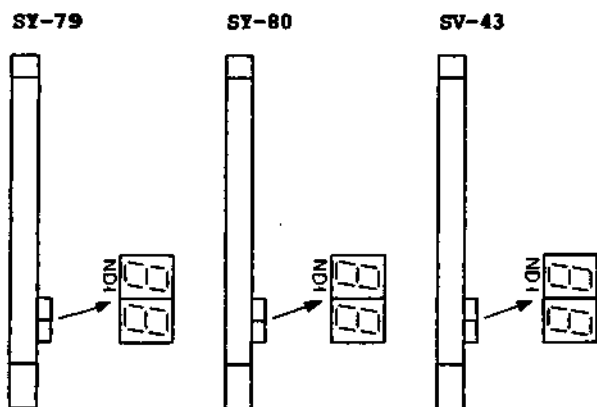
"TAPE OUT"

This message will be displayed when the tape is completely wound up on the S or T reel, or the tape is not correctly threaded through the tape sensor. Also, the VTR will be forcibly placed into the STOP mode.

4-11. SELF-DIAGNOSIS FUNCTION WITH POWER-ON

The BVH-2000/2180 has a self-diagnosis function which may be used to troubleshoot the system. When the power is turned on, the CPUs on the SY-79, SY-80 and SV-43 boards will check the CPU, ROM, RAM and the interface between the system control and servo according to the previously set procedure. During this check, the message "INITIAL" will be displayed on the control panel.

If there is no malfunction, the display will disappear and the timer display will appear instead. When the malfunction is detected, the self-diagnosis stop, and the "INITIAL" display will continue. (The "SYS ERR" will be displayed when the CTC or one of the keys or switches on the control panel is defective.) If the malfunction is detected by the self-diagnosis function the defective point can be known by the data displayed on the NDI (2-digit 7-segment LED) of the SY-79, SY-80 and SV-43 boards.



SY-79 POWER-ON INITIAL CHECK

SY-79 NDI	FAULTY PART	ERROR
00	IC-1H(CPU)	CPU doesn't work.
01	IC-2E(RAM)	RAM Data Read/Write Error
02	IC-2D(RAM)	RAM Data Read/Write Error
05	IC-1K(ROM)	ROM Checksum Error
06	IC-1I(ROM)	ROM Checksum Error
07	IC-1H(ROM)	ROM Checksum Error
08	IC-1G(ROM)	ROM Checksum Error
09	IC-1E(ROM)	ROM Checksum Error
0A	IC-1D(ROM)	ROM Checksum Error
0B	IC-1C(ROM)	ROM Checksum Error
0F	SY-80 BRD	Error occurs on SY-80 board. *1
10	IC-2H(CTC)	CTC Vertical Interrupt Error
11	Key/Switch	Key/Switch on SY-79 may be shorted.

*1: When the display on the NDI of the SY-79 board stops at "0F", check the display on the NDI of the SY-80 board, and repair.

SY-80 POWER-ON INITIAL CHECK

SY-80 NDI	FAULTY PART	ERROR
00	IC-2T(CPU)	CPU doesn't work.
01	IC-1B(RAM)	RAM Data Read/Write Error
05	IC-1F(ROM)	ROM Checksum Error
06	IC-1D(ROM)	ROM Checksum Error
07	IC-1C(ROM)	ROM Checksum Error
0D	IC-1J(RAM)	Error occurs at Common Memory
0E	SV-43 BRD	Error occurs on SV-43 board. *2
0F	SY-79 BRD	Error occurs on SY-79 board. *3
10	IC-3K(CTC)	CTC Vertical Interrupt Error
11	IG-02 BRD	IG-02 board is not installed.

*2: When the display on the NDI of the SY-80 board stops at "0E", check the display on the NDI of the SV-43 board, and repair.

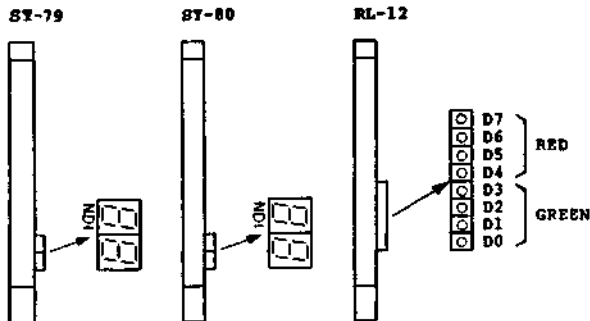
*3: When the display on the NDI of the SY-80 board stops at "0F", check the display on the NDI of the SY-79 board, and repair.

SV-43 POWER-ON INITIAL CHECK

SV-43 NDI	FAULTY PART	DETECTION
00	IC-1N(RAM) IC-6M(RAM) Data Bus Address Bus Control Bus	RAM Data Read/Write Check
01	IC-1N, IC-2N	Host CPU Program Error Detector Check
02	IC-1N, IC-2N	Hard CPU Program Error Detector Check
03	IC-3B IC-4K IC-3K IC-3J IC-3L(Hard CPU)	Memory & I/O (Hard CPU) Access Check
04	IC-6M(RAM) IC-4G IC-5H IC-5G IC-5M	Host/Hard Data Transfer Check
11	IC-1E(ROM)	Checksum Error
12	IC-1F(ROM)	Checksum Error
13	IC-1H(ROM)	Checksum Error
14	IC-1I(ROM)	Checksum Error
15	IC-6I(ROM)	Checksum Error
16	IC-6K(ROM)	Checksum Error
17	Vicinity of Hard CPU	Hard CPU Ready State Check

4-12. SELF-DIAGNOSIS DURING NORMAL OPERATION

When the VTR is being operated in the normal mode and an error occurs, an error message will be displayed on the control panel (see section 4-10), and the content of the malfunction can be checked by the ND1 display on the SY-79 board or SY-80 board, or the 8-LED display on the RL-12 board.



1. When the program error occurs on the SY-79 board, "E" will be displayed at the low order byte (LSD) on the ND1 of the SY-80 board, then "0" through "F" will be displayed successively at the high order byte (MSD) in steps of about 150 msec.



2. When the error is detected on the SY-80 board, "E" will be displayed at the low order byte (LSD) on the ND1 of the SY-79 board, then "0" through "F" will be displayed successively at the high order byte (MSD) in steps of about 150 msec. When the address "A081H" of the common memory is assigned in accordance with the following sequence, the content of the error can be checked by the display on the ND1.

4-12-1. When VTR Stops with "SYS ERR" Display

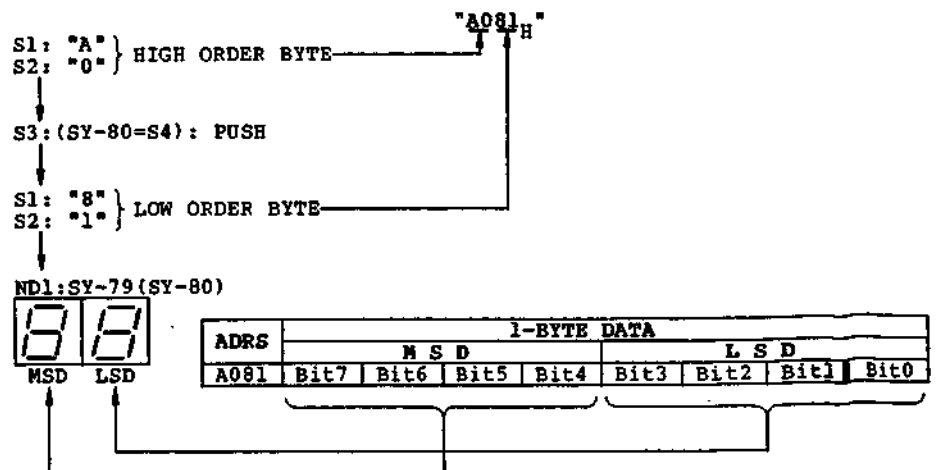
When the following error is detected, the VTR will be forcibly placed into the STOP mode, and the message "SYS ERR" will be displayed on the control panel, and then the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound. When the VTR goes into the STOP mode without "SYS ERR" being displayed, refer to section "4-12-3".

Step 1.

Set the high order byte of address "A081H" as follows. Set S1 to "A" and S2 to "0", then press S3 on the SY-79 board, or set S1 to "A" and S2 to "0", then press S4 on the SY-80 board.

Step 2.

Set the low order byte of address "A081H" as follows. Set S1 to "8" and S2 to "1" on the SY-79 or SY-80 board. As a result, the content of the 1-byte data of address "A081H" will be displayed in hexadecimal notation on the ND1 of the SY-79 or SY-80 board.



4-12-3. Error/Mode Display by LEDs on RL-12 Board

The respective bits will be set to "1" in accordance with the kind of error.

BIT 7: Not used.

BIT 6: Not used.

BIT 5: When a hard error, such as a bus short, occurs on the SY-80 board. In this case, the message "SY80 ERR" will be displayed.

BIT 4: When the V synchronous interruption processed by the CPU on the SY-80 board becomes impossible. In this case, only the timer display just before the occurrence of the error is held, and the VTR does not work, however, only the display can be switched over by operating the function buttons or keys.

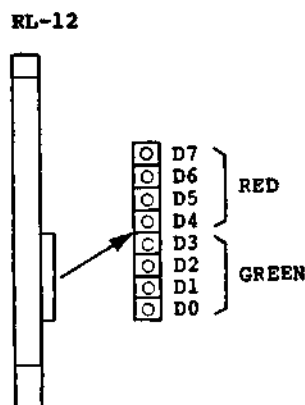
BIT 3: When the CPU on the SV-43 board becomes impossible. In this case, only the display can be switched over by operating the function buttons or keys, however, the VTR does not work and the message "SRV ERR" will be displayed.

BIT 2: When the interface from the SY-80 to SV-43 board becomes impossible.

BIT 1: When the interface from the SV-43 to SY-80 board becomes impossible.

BIT 0: When the interface between the SY-79 and SY-80 boards becomes impossible.

The content of the error which occurs in the normal mode operation can be checked by the LEDs light on the RL-12 board. In particular, if the VTR is forcibly placed into the STOP mode without the display of error message or error display by a flashing light of the function button, it is necessary to check the LEDs light on the RL-12 board.



D7: Servo/System Control Interface Error

If the following errors occur in the communication data of the servo and system control, LED D7 will light up for about 0.5 seconds. Even if this error occurs, the VTR will continue operating in the current mode.

1. When the command data from the system control is not normal.
2. When an undefined command is received from the system control.
3. When the communication data between the servo and system control interrupts more than 0.2 seconds.

D6: Drum Servo Error

When the error described in section "4-12-2".

D5: Tape Transport Error

When the error is detected, both D5 and D4 will light up, and in addition the kind of error can be distinguished by the lighting condition of D3, D2, D1 and D0. If one of the following errors occurs, the mode being executed will be released and, the VTR will be forcibly placed into the STOP mode. Also, the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. For details of the error, refer to the items D3, D2, D1 and D0.

It can be released from the error condition by the tension of the S and T tension arms slackening.

RL-12 Board

D5	D4	D3	D2	D1	D0	ERROR
1	1	1	0	0	0	T-Reel Tension
1	1	0	1	0	0	S-Reel Tension
1	1	0	0	1	0	Capstan FG
1	1	0	0	0	1	Reel FG

1: LAMP ON
0: LAMP OFF

4-12-2. When VTR Stops with STANDBY Button Blinking

When one of the following errors is detected, the VTR will be forcibly placed into the STOP mode and the STANDBY button will blink. Also, LED D6 (red) on the RL-12 board and the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. When the VTR is placed into the STANDBY ON mode, it can be released from the error condition.

1. When the tape is stuck around the drum by the condensation, etc., and if the VTR is placed into the STANDBY ON mode (SERVO alarm lamp will light up), the drum motor will perform drive/release operation 3 times at intervals of about 1 second, and if the tape does not become unstuck, the VTR will go into the error mode.
2. When the drum servo lock is lost continuously for about 16 seconds.
3. When the drum rotation decreases less than 80% of normal speed after the drum servo locks.

(4-12-3. Error/Mode Display by LEDs on RL-12 Board)

D4: Servo System Error

If the following error is detected, LED D4 and the SYSTEM alarm lamp on the front panel will light up, the buzzer will sound, the mode being executed will be released, and the VTR will be forcibly placed into the STOP mode.

1. If the SV/RL/CD/SR board is not correctly inserted into the card rack or the connection or contact between the CA/RA/DA/TT boards in the tape transport and the harness connectors is defective, the SYSTEM alarm lamp will light up and the buzzer will sound until repair of the defective part is completed.
2. When the drum, capstan, S reel and T reel motors overheat
When the temperature inside the motor falls to 90°C or below, the VTR will return to normal.
3. When the previously explained D5 Tape Transport Error occurs

D3: Servo Mode/T Tension Error

- If the tape becomes abnormally tensed or slackens in the vicinity of the T side tension arm, LEDs D5, D4 and D3 will light up, the mode being executed will be cancelled, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. The error condition can be released by slackening the tension of the S and T tension arms.
- If LED D3 lights up while D5 and D4 are out, the servo system is normal. If D3 is out, however, one of the following errors has occurred. Even if an error occurs, the mode being executed will continue.
 1. If the speed during operation deviates at least ± 0.1 normal speed against the designated speed during the pinch drive mode (PLAY, REC, VAR, JOG, or less than $\pm 3 \times$ normal SHUTTLE).
 2. If the PB V phase deviates at least $\pm 20 \mu\text{sec}$ against the REF V during the $1 \times$ normal playback.

D2: Color Framing/S Tension Error

- If the tape becomes abnormally tensed or slackens in the vicinity of the S side tension arm, LEDs D5, D4 and D2 will light up, the mode being executed will be cancelled, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. The error condition can be released by slackening the tension of the S and T tension arms.
- If LED D2 lights up while D5 and D4 are out during playback or recording in the color framing mode, the color framing is normal, and the CF LOCK lamp on the front panel will also light up.
If the color framing is not locked, both D2 and the CF LOCK lamp on the front panel will be out. In such a case, check the setting of the SC ADJ switch on the SR-15 board. Also, in the case of the playback mode, confirm that the setting of the CAP LOCK switch on the CD-17 board is "4F" (PS/PM is "8F").

SC ADJ Switch (S1/SR-15)

MANU: If the SC phase against the H of the signal inputted to the VIDEO INPUT or the REF VIDEO INPUT is adjusted within $\pm 70^\circ$ by the SC ADJ control (\odot RV5/SR-15), D2 and the CF LOCK lamp will light up, and the VTR will be placed into the color framing mode.

FIX: If the SC phase against the H of the signal inputted to the VIDEO INPUT or the REF VIDEO INPUT is within $\pm 70^\circ$, D2 and the CF LOCK lamp will light up, and the VTR will be placed into the color framing mode.

EXT: If the system is locked to the color framing pulse inputted to the CF PULSE INPUT connector on the connector panel, D2 and the CF LOCK lamp will light up.

(4-12-3. Error/Mode Display LEDs on RL-12 Board)

D1: Drum Lock/Capstan FG Error

- If the capstan DME is damaged or the tape slips on account of insufficient pressure of the pinch roller, LEDs D5, D4 and D1 will light up, the mode being executed will be released, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. The error condition can be released by slackening the tension on the S and T tension arms.
- If LED D1 lights up while D5 and D4 are out, the drum lock is normal. If, D1 is out, the drum lock is lost.

If drum lock is momentarily lost during operation, D1 will go out momentarily but the VTR will continue to operate. If drum lock is lost continuously for at least 16 seconds, or more, a drum servo error will result, and the LED D6 will light up (see previous explained of D6). If the drum lock will be momentarily lost during recording or editing, the message "LOST LCK" will be displayed on the control panel of the type 2 or 3. When one of the function button is pressed, the display will disappear.

D0: Capstan Lock

- If the DME of the S and/or T reel is damaged or the reel turns freely because the tape is not completely wound on the T side reel when loading the tape, LEDs D5, D4 and D0 will light up, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up, and the buzzer will sound. The error condition can be released by slackening the tension of the S and T tension arms.
- If LED D0 lights up while D5 and D4 are out, the capstan lock is normal. If D0 is out, however, one of the following errors has occurred. Even if an error occurs, the mode being executed will continue.
 1. When the phase lock of the capstan is lost during normal playback.
 2. When the speed lock of the capstan is lost during recording.
 3. When the speed lock of the capstan is lost during the program play mode.

If the capstan lock is lost during recording or editing, the message "LOST LCK" will be displayed on the control panel of the type 2 or 3. When the one of the function button is pressed, the display will disappear.

4-13. TEST FUNCTIONS OF SYSTEM CONTROL SYSTEM

The following tests can be carried out under the test functions of the system control system.

BVH-2000/2180

Software version (see section 4-13-2)

Address bus/bus buffer (see section 4-13-6)

Memory data (see section 4-13-10)

Control panel

Lamp/buzzer (see section 4-13-3)

Display/character (see section 4-13-4)

Key/switch/dial (see section 4-13-5)

4-13-1. Test Mode setting/canceling

The system control system will go into the test mode by one of the following operations.

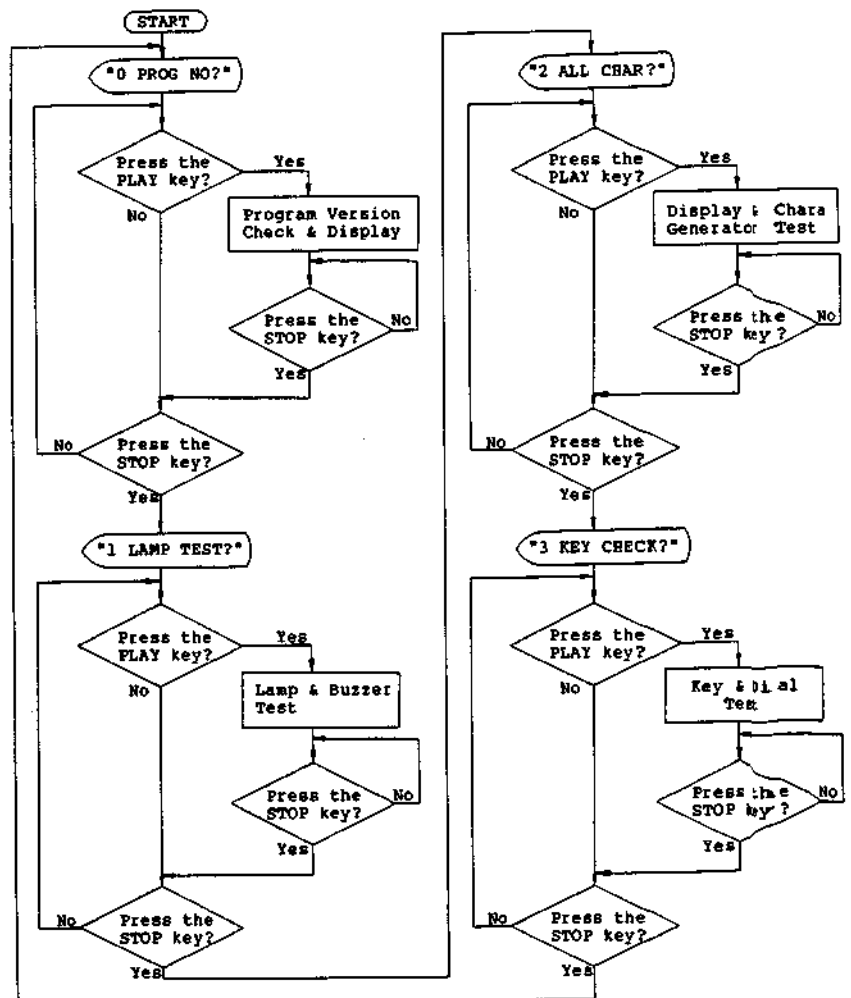
1. Press the RESET switch S3/SY-80 while pressing the TEST switch S3/SY-79.
2. Turn on the power while pressing the TEST switch S3/SY-79.

The test mode menu will be successively displayed as shown in the following flowchart.

When the PLAY key is pressed, each block will be put into the particular condition described below, in order to execute the test displayed on the menu. Also, when the STOP key is pressed, the next menu will be displayed.

To release the test mode, either press the RESET switch S3/SY-80 or turn on the power again.

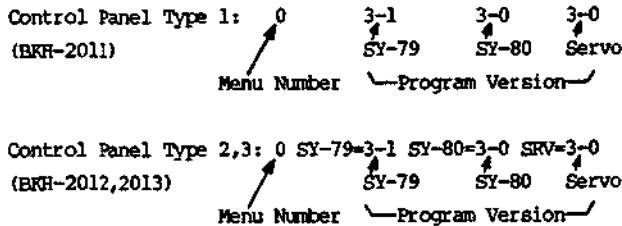
Test Mode Flowchart



Note: When the BKH-2011 is installed, only the number of the menu will be displayed.

4-13-2. Software Version Check ("0 PROG NO?")

When the first menu is selected, the software version will be displayed.



4-13-4. Display and Character Generator Test ("2 ALL CHAR?")

In this test, the display and the character generator in the control panel can be checked by confirming that the following characters appear successively on the control panel display at about one second intervals.

Control Panel Type 1 (BKH-2011)

When the PLAY button is pressed, the characters from ";" through "0" as shown in the figure 1 will be displayed about 1 second, and then each segment will light up successively. In this case, all digits will light up simultaneously.

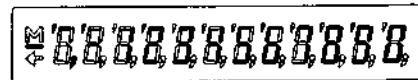


Fig. 1.

Next, as shown in the figure 2, all digits will simultaneously become "0", then "1", ... and finally "9". After "9", the display will return to "0" and the above cycle will be repeated.

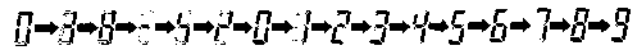
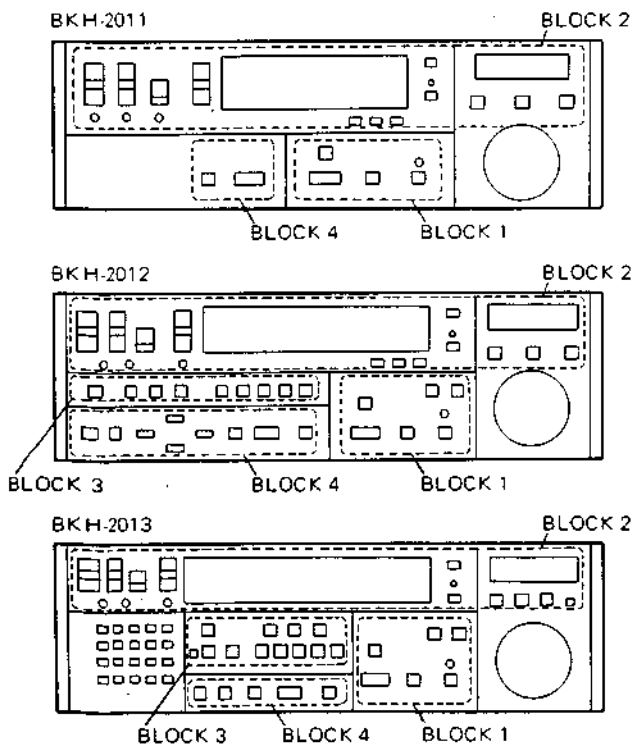


Fig. 2.

4-13-3. Lamp and Buzzer Test ("1 LAMP TEST?")

In this test, the lamps and buzzer on the control panel can be tested.

1. The lamps will light up at about one second intervals in each of the blocks shown below.
2. The buzzer continues sounding while block 1 is lit, and at the instant block 3 lights up, the buzzer sounds.



If the PLAY key is pressed during execution of this menu, the characters as shown in the figure 1 will appear while the key is pressed.

Control Panel Types 2, 3 (BKH-2012, 2013)

When the PLAY button is pressed, 40 characters "*" through "/" as shown in the figure 1 are displayed simultaneously in a row in case of BKH-2012 and two rows in case of BKH-2013. Then the respective characters from "!" through "Z" are displayed simultaneously on all digits. After "Z", the display will return to "*" and the above cycle will be repeated.

BKH-2012

*-0123456789:ABCDEFGHIJKLMNPOQRSTUVWXYZ/

BKH-2013

*-0123456789:ABCDEFGHIJKLMNPOQRSTUVWXYZ/
 *-0123456789:ABCDEFGHIJKLMNPOQRSTUVWXYZ/

Fig. 1.

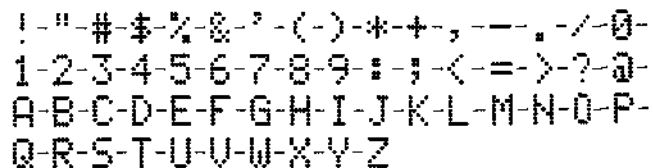


Fig. 2.

If the PLAY key is pressed during execution of this menu, the 40 characters from "*" through "/" as shown in the figure 1 will be displayed while the key is pressed.

4-13-5. Key and Dial Test ("3 KEY CHECK?")

In this test, it is possible to check the keys, switches and dial on the control panel.

1. Key & switch check

Press the key or operate the switch on the control panel, and confirm that a number corresponding to the key or switch is displayed, as shown in the table below.

No.	KEY/SWITCH	CONTROL PANEL		
		2011	2012	2013
01	PLAY	o	o	o
02	REC	b	o	o
03	VAR	o	o	o
04	JOG	o	o	o
05	SHUTTLE	o	o	o
06	STANDBY	o	o	o
07	EDIT	o	o	o
08	PREROLL	o	o	o
09	PREVIEW/REVIEW	o	o	o
0A	SPOT ERASE	o	o	o
0B	RESET	o	o	o
0C	DISPLAY HOLD	o	o	o
0D	SHIFT	o	o	o
0E	ADVANCE	o	o	o
0F	VAR MEMORY	o	o	o
10	PRESET	o	o	o
11	ENTRY IN	o	o	o
12	ENTRY OUT	o	o	o
13	AUDIO SPLIT IN	o	o	o
14	AUDIO SPLIT OUT	o	o	o
15	AUDIO SPLIT	o	o	o
17	AUTO MODE	o	o	o
18	AUDIO-1	o	o	o
19	AUDIO-2	o	o	o
1A	AUDIO-3	o	o	o
1B	AUDIO-4/SYNC	o	o	o
1C	VIDEO	o	o	o
1D	ASSEMBLE	o	o	o
1E	INSERT	o	o	o
20	TAPE/EE	INPUT	o	o
21	SEL	TAPE	o	o
22	SERVO	EXT	o	o
23	REF SEL	INPUT	o	o
24	HEAD SEL	R/P	o	o
25	TC/TIMER	TM-2	o	o
26	SEL	TC	o	o
28	0	(20key)	o	o
29	1	(20key)	o	o
2A	2	(20key)	o	o
2B	3	(20key)	o	o
2C	4	(20key)	o	o
2D	5	(20key)	o	o
2E	6	(20key)	o	o
2F	7	(20key)	o	o
30	8	(20key)	o	o
31	9	(20key)	o	o
32	C	(20key)	o	o
33	T	(20key)	o	o
34	F	(20key)	o	o
35	+	(20key)	o	o
36	-	(20key)	o	o
37	SET	(20key)	o	o
38	IN	(20key)	o	o
39	AUDIO IN	(20key)	o	o
3A	OUT	(20key)	o	o
3B	AUDIO OUT	(20key)	o	o
3C	CONTROL P		o	o
3D	CONTROL R		o	o
3F	DIAL		o	o
53	TRIM IN		o	o
54	TRIM OUT		o	o
55	TRIM +		o	o
56	TRIM -		o	o

2. Search dial check

Turn the dial fully CW and CCW, and confirm that the display changes between -3D and +5D, and also that the clutch engages at the -3D, 00, +3C and +5D positions.

4-13-6. Free Run Test

The free run test is a useful function for detecting a defective address bus or bus buffer.

1. SY-79 Board

When the FREE RUN switch S9-2 on the SY-79 board is set to ON, the CPU will go into a free run condition (condition in which a specific command is repeatedly executed), and the data bus buffer will separate the CPU from the data bus on the board. Since the address which increases every four clocks is outputted from the CPU to the address bus, it is possible to easily detect the defective points on the address bus and bus buffer, etc., by observing this address at each point.

2. SY-80 Board

When the FREE RUN switch S8-1 on the SY-80 board is set to ON, it is possible to check the address bus and bus buffer on the SY-80 board in a similar manner to 1 above.

3. SV-43 Board

When the FREE RUN switch S1-1 on the SV-43 board is set to ON, it is possible to check the address bus and bus buffer on the SV-43 board in a similar manner to 1 above.

4-13-7. Test by Memory Readout

In the system control, it is possible to display error data written in the common memory (IC-1J) installed on the SY-80 board, and also status data which indicates the operating condition of the VTR, on the ND1 of the SY-79 and SY-80 boards. By comparing this displayed data with the contents of the table shown later, it is possible to locate defective points more easily.

If the BKH-2015A time code reader/generator is installed, it is possible to make a superimposed display of a total of 16 bytes between the address of the common memory designated by the SY-79 or SY-80 board and the 15th address after the above address, on the monitor. (For details, see section "4.13-9".)

4-13-8. Designation and Test of Memory Address

Example: When checking address "A010_H" using the SY-79 board

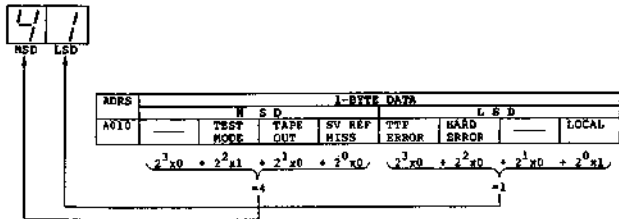
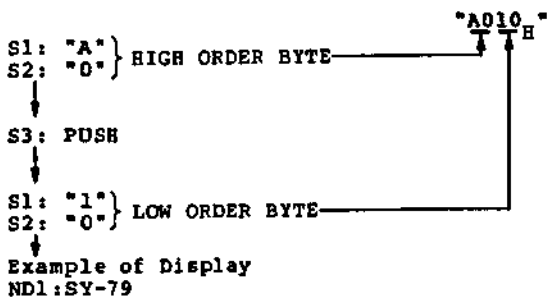
Step 1.

Set S1 (REACTION TIME switch) to "A", S2 (PREROLL TIME switch) to "0" and press S3 (TEST switch) on the SY-79 board.

Step 2.

Set S1 to "1" and S2 to "0" on the SY-79 board.

In the above way, it is possible to display the contents of 1 byte of address "A010_H" on the ND1 in hexadecimal notation.



The above example indicates that the machine is in the following condition.

- TEST MODE? Yes
- TAPE OUT? No
- SERVO REF MISS? No
- TTP ERROR? No
- HARD ERROR? No
- LOCAL? Yes

Example: When checking address "XXXX_H" using the SY-80 board

Step 1.

Set S1 (TEST/UPPER switch) and S2 (TEST/LOWER switch) to the hexadecimal number of the high order byte, then press S4 (TEST switch) on the SY-80 board.

Step 2.

Set S1 and S2 on the SY-80 board to the hexadecimal number of the low order byte. In this way, the content of 1 byte of address "XXXX_H" will be displayed on the ND1 of the SY-80 board in hexadecimal notation.

4-13-9. Monitor Display of Common Memory

When making a superimposed display of the contents of the common memory on the monitor, set the switches on the SY-80 and TC-14A (BKH-2015A) boards as shown below.

SY-80 Board

TEST DISPLAY switch S9-8 ON

TC-14A Board

CHAR switch S7 ON

CHAR mode switch S13 "A"

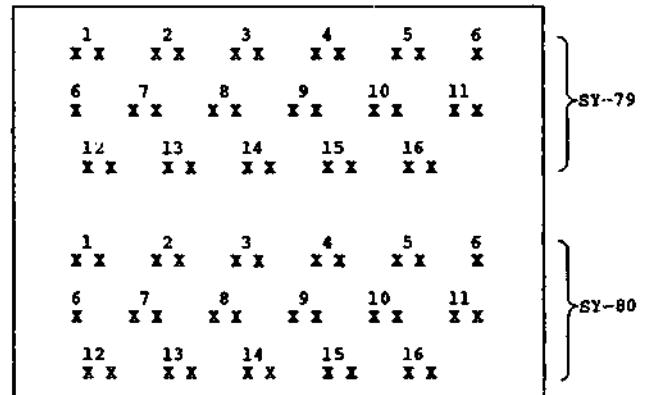
CHAR SIZE switch S11 "1"

CHAR V POSITION switch S12 "1"

Adjust the horizontal position of the displayed characters using \odot RV1, and the character size using \odot RV2.

Using the method of "4-13-8" above, the contents of the common memory consisting of 16 bytes from the address designated by the SY-79 board to the 15th address after the above address will be superimposed on the top half of the monitor, and the contents of the 16 bytes designated by the SY-80 board will be superimposed on the bottom half of the monitor.

Display on the Monitor



4-13-10. Contents of Common Memory Data

When the table below is used and the common memory address equivalent to the desired check item is designated according to section "4-13-8", the operating condition or the error condition of the VTR can be checked by the display of the NDI on the SY-79 or SY-80 board, or the monitor. The description of status, mode command, and address whose bit is not assigned has been omitted because these are unnecessary for servicing.

ADDRESS	1-BYTE DATA							
	MSD				LSD			
	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
A010		TEST MODE	TAPE OUT	SRV REF MISSING	TTP ERROR	HARD ERROR		LOCAL
A018	BUZZER	SRV LOST LOCK	NEAR EOT	EOT	CF LOCK	SERVO ALARM	SYSTEM ALARM	REC INHIBIT
A019	FUNCTION ABORT			VIDEO LACK	SYNC LACK			
A028						TAKE-UP END	TM2 STOP MODE	SUPPLY END
A02E	VIDEO SIGNAL FORMAT							
A02F	MODEL VARIATION (00/02/04)							
A200	STANDBY			PARALLEL INPUTS		PARALLEL INPUTS		
A201	0	0	0	0	FF	REC	PLAY	STOP
A202	REMOTE -3	PARA RUN ON	PROG JOG	COMMON KEY EN	REM STOP EN	STILL OFF EN	TENSION OFF EN	STBY OFF EN
A203	REACTION TIME			PREROLL TIME				
A206	8	4	2	1	8	4	2	1
A208	TEST SW	CCJ REMOTE	9-PIN REMOTE	REMOTE	REF2		REC TEST	
A209	ALM TALLY			PARALLEL OUTPUTS		PARALLEL OUTPUTS		
A280	TEST SW	OVERHEAT	REF 4	REF 2	TIMER DIR			SV READY
A282		BVB ON	DF ON	DF/CF CONT EN	EOT EN	OP GUIDE ON	F1	F2
A283	TEST DISPLAY	SYNC OFF	IN POINT SYNC	12H/24H TM MODE	PREROLL MODE	EE MODE SEL	AUDIO EDIT	REC CONF OFF
A288	REC TEST + TAPE	FIELD JOG	SOFT RESET					SYS-CON READY
A28A	EDIT LAMP			REMO-3 OUTPUT		REMO-3 OUTPUT		
A28B	REC	PLAY	STOP	ENTER	REF ERROR	CF LOCK	DRUM LOCK	CAP LOCK
A290	0		TC INS INH	VID/SYNC SIMUL	SYNC EN	A4 EN	A3/TC SEL	REC INH
A291	CONFI TEST	JUMPER ON	0	VIDEO LACK	SYNC LACK	DT ON	DT MODE	DT EXIST
A292	MODEL "00"		TC RETURN-1	AUDIO REC	LEVER SW EN	PLAY EOT INH	SLAVE DELAY	REEL ONLY SHUTTLE
A298	OSC CONT	FULL VID CTL ERS			A4/SYNC ERASE	A3 ERASE	A2 ERASE	A1 ERASE
A299			CTL REC	VIDEO REC	A4/SYNC REC	A3 REC	A2 REC	A1 REC
A29A			OFF TAPE + CONFI	VIDEO TAPE	A4 TAPE	A3 TAPE	A2 TAPE	A1 TAPE
A29B				VIDEO CONFI	A4 CONFI	A3 CONFI	A2 CONFI	A1 CONFI
A29C					A4 MUTE	A3 MUTE	A2 MUTE	A1 MUTE
A29D			1-HEAD MODE	NORM FWD + EE	Y/C SEP ON		VID+SYNC REC	ROTARY ERASE
A29E	INTERNAL TBC		INPUT CHECK	ATT	PB H SEL	DT REG ON	PB HEAD SEL	DT HEAD SEL

0:LOW ALWAYS

Address A010H

BIT6: TEST MODE

When the VTR is set in the test mode, bit 6 will become "1".

BIT5: TAPE OUT

When either the tape is not correctly threaded through the tape sensor or the tape is completely wound up on the S or T reel, bit 5 is set to "1". In such a case, the VTR will be forcibly placed into the STOP mode, and the message "TAPE OUT" will be displayed on the type 2 or 3 control panel.

BIT4: SERVO REF MISSING

If the signal corresponding to the setting of the SERVO REF selector on the front panel is not inputted to the connector panel, bit 4 will be set to "1". In such a case, the STOP button will blink, however it is possible to carry out the normal operation.

BIT3: TTP ERROR

When one of the following errors occurs, bit 3 will be set to "1". In such a case, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound.

1. When the tape tension becomes abnormally high or low in the vicinity of the S or T tension arm.
2. When either the capstan DME is damaged or the tape slips owing to insufficient pressure of the pinch roller.
3. If the T reel turns freely because of incomplete tape winding on the T reel, or if the S or T reel DME is damaged.
4. When the timer roller DME is damaged.

In case of the above errors, it is possible to find out the cause by the 8-LED display on the RL-12 board.

RL-12 Board

D5	D4	D3	D2	D1	D0	ERROR
1	1	1	0	0	0	T-Reel Tension
1	1	0	1	0	0	S-Reel Tension
1	1	0	0	1	0	Capstan FG
1	1	0	0	0	1	Reel FG

1: LAMP ON
0: LAMP OFF

BIT2: HARD ERROR

When one of the following errors occurs, bit 2 will be set to "1". In such a case, the VTR will be forcibly placed into the STOP mode, the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound.

1. When the power supply overheats.
2. When the interface between the servo and the system control is abnormal.

BIT0: LOCAL

When either the REMOTE/LOCAL switch on the front panel is set to the LOCAL or the REMOTE-1/2/3 switch on the SY-79 board is set to REMOTE-3 position, bit 0 will become "1".

Address A018H

BIT7: BUZZER

In the following cases, bit 7 will be set to "1" and the buzzer will sound once.

For BKH-2011

When the ENTRY or timer RESET button is pressed.

For BKH-2012

When the ENTRY IN, ENTRY OUT or timer RESET button is pressed, or the TRIM + or - key is pressed while the TRIM IN or OUT key is pressed.

For BKH-2013

When the ENTRY IN, ENTRY OUT, AUDIO SPLIT or timer RESET button is pressed, or the IN, OUT, AUDIO IN or AUDIO OUT key is pressed.

When the VTR will be forcibly placed into the STOP mode due to an error, the buzzer will sound continuously.

BIT6: SERVO LOST LOCK

When the capstan or drum servo lock is momentarily lost during playback, recording or editing, bit 6 will be set to "1". If this error is detected, the operation taking place will continue, and in the case of recording or editing, the message "LOST LCK" will be displayed. When the function button is pressed in the LOCAL mode, or the remote function command or LOST LOCK RESET command is received in the REMOTE mode, bit 6 will be reset to "0" and the "LOST LCK" display will disappear.

BIT5: NEAR END-OF-TAPE

If the tape is traveling in the take-up direction or the value which was previously reserved in the VAR or PROGRAM JOG mode when the VTR was stopped has been designated in the take-up direction, and the amount of tape on the S or T reel comes about 150 seconds or less before the end of the tape, bit 5 will be set to "1", and the tape speed will decelerate to x10 speed. The SEARCH LED on the control panel will blink.

(4-13-10, Contents of Common Memory Data)
(Address A018H)

BIT4: END-OF-TAPE

If the amount of tape on the S or T reel becomes approximately 30 seconds or less before the end of the tape, bit 4 will be set to "1", and the VTR will operate as follows in accordance with the setting of the EOT STOP switch on the SY-80 board. Refer to address A292H BIT2.

EOT STOP Switch S5/SY-80

ON: VTR goes into the STOP mode.

OFF: Movable guide opens and tape is taken up. In the case of the FWD direction, the movable guide will open after the tape is taken up.

BIT3: COLOR FRAMING LOCK

When the system is locked to the color framing during playback, recording or editing, bit 3 will be set to "1" and the CF LOCK lamp on the front panel will light up.

BIT2: SERVO ALARM

In either of the following cases, bit 2 will be set to "1" and the SERVO alarm lamp on the front panel will light up.

1. From when the drum starts until the drum servo locks.
2. When the tape is stuck around the drum by the condensation, etc., and the VTR is placed into the STANDBY ON mode, the drum motor is repeating drive/cancel operation 3 times in order to release the sticking.

BIT1: SYSTEM ALARM

In any of the following cases, bit 1 will be set to "1" and the SYSTEM alarm lamp on the front panel will light up.

1. When the "SYS ERR" or "PROG ERR" message is displayed. See section 4-12-1.
2. When the STANDBY button is blinking and the VTR is forcibly stopped. See section 4-12-2.
3. When a servo error occurs. See the explanation of D5, D4, D3, D2, D1 and D0 in section 4-12-3.

BIT0: REC INHIBIT

When either the REC INHIBIT switch on the front panel or the LG-02 board is set to ON, bit 0 will be set to "1".

Address A019H

BIT7: FUNCTION ABORT

If the message "ABORT" is displayed on the control panel, and the VTR is forcibly placed into the STOP mode (see the explanation of "ABORT", section 4-10), bit 7 will be set to "1".

BIT4: VIDEO LACK

If the playback output of the video channel drops out for at least 400 μ sec, and this condition continues for at least 6 fields, bit 4 will be set to "1".

BIT3: SYNC LACK

If the playback output of the sync channel drops out for at least 400 μ sec, and this condition continues for at least 6 fields, bit 3 will be set to "1".

Address A028H

BIT2: TAKE-UP END

If the amount of tape on the T reel becomes approximately 30 seconds or less when the tape is being taken up on the S reel, bit 2 will be set to "1", and the operation of the VTR will be changed in accordance with the setting of the EOT STOP switch on the SY-80 board as follows.

EOT STOP Switch S5/SY-80

ON: The VTR will go into the STOP mode.

OFF: The movable guide will open and tape will be taken up.

BIT1: TIMER-2 STOP MODE

If the VTR stops when the value of timer-2 is "00:00:00:00", bit 1 will be set to "1".

BIT0: SUPPLY END

If the amount of tape on the S reel becomes approximately 30 seconds or less before the end of the tape, bit 0 will be set to "1", and the operation of the VTR will be changed in accordance with the EOT STOP switch on the SY-80 board. Refer to address A292H BIT2.

EOT STOP Switch S5/SY-80

ON: The VTR will go into the STOP mode.

OFF: The movable guide will open and tape will be taken up.

(4-13-10. Contents of Common Memory Data)

Address A02EH

This address will be set as shown below, in accordance with the video signal format.

	BIT7	BIT0
NTSC/PAL-M:	0000	0000 (00H)
PAL/SECAM:	0000	0001 (01H)

Address A02FH

This address will be set as shown below, in accordance with the difference between models 00/02/04/10/12/14.

BVH-2000/PS/PM	BIT7	BIT0
NTSC-02/12 or PS-02/12/04/14:	0001	0000 (10H)
NTSC/PS-00/10:	0001	0001 (11H)
PM-02:	0001	0100 (14H)
PM-00:	0001	0101 (15H)

BVH-2180/PS/PM	BIT7	BIT0
NTSC-02 or PS-02/04:	0001	1000 (18H)
NTSC/PS-00:	0001	1001 (19H)
PM-02:	0001	1100 (1CH)
PM-00:	0001	1101 (1DH)

Address A200H

Address A201H

When parallel remote control is being performed using the REMOTE-3 connector on the connector panel, the mode command will be displayed in each bit as shown in the previous table.

If the following change is made, it is possible to perform the REC control of AUDIO 1, 2 and 3 using the spare terminal of the REMOTE-3 connector, and the mode status will be displayed in bits 1, 2 and 3 of address A201H.

SY-79 Board

Jumpers J1, 3 and 4: Change A → B

LG-02 (A) Board

S2-5: Change OFF → ON

REMOTE-3 Connector

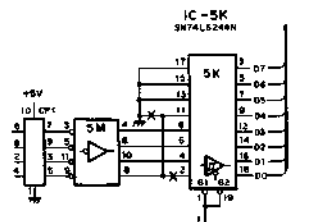
Address A201H

Pin-23: A3 REC (SPARE-3) → BIT3

Pin-40: A2 REC (SPARE-4) → BIT2

Pin-37: A1 REC (SPARE-1) → BIT1

In case of the BVH-2000PS (04/14 Model) and when performing the REC control of AUDIO-4, modify the SY-79 board as follows.



REC control of AUDIO-4 can be performed using a pin-22 (spare-2) of the REMOTE-3 connector.

Address A202H

The set position of the switches (S6, 4, 5, 9-4 to 9-8) on the SY-79 board will be displayed in each bit.

BIT7: REMOTE-1/2/3 Switch S6

When S6 is in the REMOTE-3 position, bit 7 will be set to "1".

BIT6: PARALLEL RUN Switch S4

When S4 is on, bit 6 will be set to "1".

BIT5: VAR Switch S5

When S5 is PJOG, bit 5 will be set to "1".

BIT4: FUNCTION KEY ENABLE Switch S9-4

BIT3: FUNCTION STOP ENABLE Switch S9-5

Even when the VTR is in the REMOTE mode (slave machine), it is possible to locally control the modes shown in the table below, in accordance with the setting of S9-4 and S9-5.

S9-4	S9-5	BIT		Possible Operation in Remote Mode
		4	3	
OFF	OFF	0	0	None
OFF	ON	0	1	STOP
ON	OFF	1	0	STOP, REC, PLAY, VAR, JOG, SHUTTLE
ON	ON	1	1	Modes other than P(player) & R(recorder)

BIT2: STILL OFF ENABLE Switch S9-6

Bit 2 is set to "1" when S9-6 is on, and the STILL condition continues for about 3 minutes, the mode will change over to the STANDBY ON (STOP) mode.

BIT1: TENSION OFF ENABLE Switch S9-7

Bit 1 is set to "1" when S9-7 is on, and the tape will slacken when the STANDBY ON condition continues for 2 or 30 seconds according to the setting of S1-3 TENSION RELEASE switch on the LG-02(A) board.

S1-3/LG-02(A) board

ON: 2 seconds

OFF: 30 seconds

BIT0: STANDBY OFF ENABLE Switch S9-8

Bit 0 is set to "1" when S9-8 is on, and the STANDBY ON condition continues for about 9 minutes, the mode will change over to the STANDBY OFF (STOP) mode.

(4-13-10. Contents of Common Memory Data)
Address A203H

BITS 7, 6, 5, 4

REACTION TIME Switch S1

Each bit will be set as shown in the table below, in accordance with the set position of REACTION TIME switch S1 (hexadecimal rotary switch) on the SY-79 board.

S1	REACTION TIME		BIT			
	NTSC/PAL-M 0-FRAME	PAL/SECAM 0-FRAME	7	6	5	4
0	0	2	0	0	0	0
1	2	4	0	0	0	1
2	4	6	0	0	1	0
3	6	8	0	0	1	1
4	8	10	0	1	0	0
5	10	12	0	1	0	1
6	12	14	0	1	1	0
7	14	16	0	1	1	1
8	16	18	1	0	0	0
9	18	20	1	0	0	1
A	20	22	1	0	1	0
B	22	24	1	0	1	1
C	24	25	1	1	0	0
D	26	25	1	1	0	1
E	28	25	1	1	1	0
F	30	25	1	1	1	1

BITS 3, 2, 1, 0

PREROLL TIME Switch S2

Each bit will be set as shown in the table below, in accordance with the set position of the PREROLL TIME switch S2 (hexadecimal rotary switch) on the SY-79 board.

S2	PREROLL TIME	BIT			
		3	2	1	0
0	0-SEC	0	0	0	0
1	1	0	0	0	1
2	2	0	0	1	0
3	3	0	0	1	1
4	4	0	1	0	0
5	5	0	1	0	1
6	6	0	1	1	0
7	7	0	1	1	1
8	8	1	0	0	0
9	9	1	0	0	1
A	10	1	0	1	0
B	11	1	0	1	1
C	12	1	1	0	0
D	13	1	1	0	1
E	14	1	1	1	0
F	15	1	1	1	1

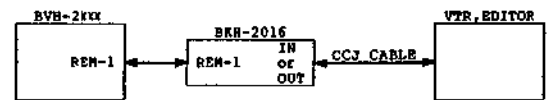
Address A206H

BIT7: TEST SWITCH

While TEST switch S3 is pressed when performing a test using the SY-79 board, bit 7 will be set to "1".

BIT6: CCJ REMOTE

When the REMOTE-1 connector on the connector panel is used to connect the VTR or editor as shown in the figure below, and the REMOTE-1/2/3 switch S6 on the SY-79 board is set to REMOTE-1, bit 6 will be set to "1" and the REMOTE-1 lamp on the front panel will light up.



BIT5: 9-PIN REMOTE

When the REMOTE-2 IN/OUT connector on the connector panel is used to connect the VTR, etc., and REMOTE-1/2/3 switch S6 on the SY-79 board is set to REMOTE-2, bit 5 will be set to "1" and the REMOTE-2 lamp on the front panel will light up.

BIT4: REMOTE

Bit 4 will be set to "1", when the REMOTE/LOCAL switch on the front panel is set to REMOTE.

BIT3: REF 2

While the REF 2 signal inputted to the SY-79 board from the RL-12 board is in the field 2 or 4 for NTSC/PAL-M, in the field 2, 4, 6 or 8 for PAL/SECAM, bit 3 will be set to "1".

BIT1: REC TEST (BVH-2000/2180 only)

The REC TEST mode is a function designed specifically for "00 or 10 model". When the REC TEST switch S12 on the SY-79 board is pressed, bit 1 will be set to "1" and the VTR will go into the REC TEST mode.

(4-13-10. Contents of Common Memory Data)

Address A208H

Address A209H

When parallel remote control is being performed using the REMOTE-3 connector on the connector panel, the condition of the mode status and error data will be displayed in each bit. See the previous ADDRESS/BIT table.

A209H BIT4: VID 6 (VIDEO LACK)

When the playback output of the video channel drops out for at least 400 μ sec, and this condition continues for at least 6 fields, bit 4 will be set to "1", and the output level of pin 25 of the REMOTE-3 connector on the connector panel will become LOW.

A209H BIT3: SYNC 6 (SYNC LACK)

When the playback output of the sync channel drops out for at least 400 μ sec, and this condition continues for at least 6 fields, bit 3 will be set to "1", and the output level of pin 23 of the REMOTE-3 connector on the connector panel will become LOW. See note.

A209H BIT2: FWD LAMP

When the tape is traveling in the FWD direction, bit 2 will be set to "1", and the output level of pin 40 of the REMOTE-3 connector on the connector panel will become LOW. See note.

A209H BIT1: REV LAMP

When the tape is traveling in the REV direction, bit 1 will be set to "1", and the output level of pin 37 of the REMOTE-3 connector on the connector panel will become LOW. See note.

Note: If the change mentioned in the item of address A201H is made in order to perform REC control of audio 1, 2 and 3, the signal corresponding to bits 3, 2 and 1 in address "A209H" will not be outputted.

Address A280H

BIT7: TEST SWITCH

While TEST switch S4 is pressed when performing a test using the SY-80 board, bit 7 will be set to "1".

BIT6: OVERHEAT

When the power supply overheats, bit 6 will be set to "1", and the message "OVERHEAT" will be displayed on the control panel. Also, the SYSTEM alarm lamp on the front panel will light up and the buzzer will sound, however the operation taking place will continue.

BIT5: REF 4

While the REF 4 signal inputted from the SR-15 board to the SY-80 board is in the field 3 or 4, bit 5 will be set to "1".

BIT4: REF 2

While the REF 2 signal inputted from the SR-15 board to the SY-80 board is in field 2 or 4, bit 4 will be set to "1".

BIT3: TIMER DIRECTION

When the timer roller rotates in the FWD (CCW) direction, bit 3 will be set to "1".

BIT0: SERVO READY

When an abnormality is not found in the servo system as a result of initial check with power-on, bit 0 will be set to "1", and will be held at "1" after the check.

Address A282H

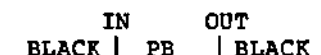
BIT6: BLACK-VIDEO-BLACK ON

When BKH-2015A (TC-14A board) is installed, and the monitor picture is black-controlled during preview, as shown below, set the BVB switch S8-5 on the SY-80 board to ON (bit 6 will be set to "1"), and set the CHAR switch S7 on the TC-14A board to ON.

When the VIDEO is preset.



When the VIDEO is not preset.



BIT5: DROP FRAME ON

When the DF switch S7 on the SY-80 board is set to ON, bit 5 will be set to "1", and the timer and time code will go into the drop frame mode.

BIT4: EXT DF/CF CONTROL ENABLE

When the EXT DF/CF CONT EN switch S8-7 on the SY-80 board is set to ON, bit 4 will be set to "1" and the drop frame of the timer and time code, and color framing of the time code, will be controlled by the DF and CF bits data in the TCG PRESET command from the REMOTE-2.

BIT3: END-OF-TAPE STOP ENABLE

When the EOT STOP switch S5 on the SY-80 board is set to ON, bit 3 will be set to "1" and the EOT STOP operation will take place.

BIT2: OPERATION GUIDE ON

When the OPERATION GUIDE switch S8-8 on the SY-80 board is set to ON, bit 2 will be set to "1" and the operation sequence for the AUTO EDIT mode editing can be guided by means of the blinking of the buttons. For details, see section 1.

(4-13-10. Contents of Common Memory Data)
(Address A282H)

BIT1: EDIT F1

BIT0: EDIT F2

Bits 1 and 0 will be set as shown in the following table, in accordance with the set position of EDIT switch S6 on the SY-80 board and the video IN/OUT points during the editing can be set as shown in the following table.

EDIT SW S6	IN POINT	OUT POINT	BIT	
			1	0
F2	Field 2	Field 1	0	1
F2/F1	Depends on ENTRY IN key	Depends on ENTRY OUT key	0	0
F1	Field 1	Field 2	1	0

In the case of the AUTO EDIT mode, however, the IN point will be in field 1 and the OUT point will go into field 2 regardless of the set position of switch S6.

Address A283H

BIT7: TEST DISPLAY

When the BKH-2015A (TC-14A board) is installed and the content of the common memory in the system control is displayed on the monitor, the switches on the SY-80 and TC-14A board are set as shown below, bit 7 will be set to "1".

SY-80 Board

TEST DISPLAY Switch S9-8 ... ON

TC-14A Board

CHAR Switch S7 ON

CHAR Mode Switch S13 "A"

BIT6: SYNCHRONIZING OFF

When the SYNCHRO OFF switch S9-7 on the SY-80 board is set to ON, bit 6 will be set to "1", and in the case of the edit with two VTRs or DT playback, synchronizing operation will not take place.

BIT5: IN POINT SYNCHRONIZING

When the IN POINT SYNCHRO switch S9-6 on the SY-80 board is set to ON, bit 5 will be set to "1" and the VTR will perform synchronizing operation from the ENTRY IN point in synchronization with the absolute time of the timer or time code.

BIT4: 12H/24H TIMER MODE

When the 12H/24H TIMER MODE switch S9-5 on the SY-80 board is set to ON, bit 4 will be set to "1" and a 12-hour display with +/- sign will appear in the timers 1 and 2 of block 1 on the control panel. When S9-5 is set to OFF, bit 4 will be set to "0", and the 24-hour time display will appear.

BIT3: PREROLL MODE

When the PREROLL MODE switch S9-4 on the SY-80 board is set to ON, bit 3 will be set to "1". In such a case, when prerolling from the present tape position to a cue-up point at least 12 hours ahead using tape on which a time code is continuous recorded through an interval of several hours due to editing, etc., if the time corresponding to the entered cue-up point is greater than the time corresponding to the present tape position, preroll will take place in the forward direction. Conversely if the cue-up point is less, preroll will take place in the reverse direction. When S9-4 is set to OFF, bit 3 will be set to "0". In such a case, if the difference between the time corresponding to the present tape position and the time corresponding to the cue-up point is 12 hours or more, the time direction will reverse, enabling preroll to take place correctly towards the cue-up point. Conversely, if the time difference is less than 12 hours, the time direction will not reverse.

BIT2: EE MODE SEL

When the EE MODE SEL switch S9-3 on the SY-80 board is set to ON, bit 2 will be set to "1". For details, see the discription about TAPE/EE selector of section 1.

BIT1: AUDIO EDIT

When the AUDIO EDIT switch S9-2 on the SY-80 board is set to ON, bit 1 will be set to "1", and when the audio editing alone takes place, the conditions of the capstan servo lock during CUT IN will be ignored.

BIT0: REC CONFIDENCE OFF

When the CONFIDENCE OFF switch S9-1 on the SY-80 board is set to ON, bit 0 will be set to "1". In the case of the REC or EDIT REC mode, the EE signal will be outputted to the VIDEO OUTPUT and VIDEO MONITOR OUTPUT connectors, even if the TAPE/EE selector is in the TAPE position.

Address A288H

BIT7: REC TEST + TAPE (BVH-2000/2180 only)
The REC TEST function is provided only on 00 and 01 models, and bit 7 is set to "1" when either reserving or executing the REC TEST mode.

BIT6: FIELD JOG
When switch S2 on the DT-04 board (DT-05 for the PAL/SECAM model) is set to REM, bit 6 will be set as shown below, in accordance with the condition of the DT FLD/FR SEL command (CMD1=41, CDM2=38) inputted from the REMOTE-2 connector on the connector panel.

FIELD JOG: BIT6 = "1"

FRAME JOG: BIT6 = "0"

During the initial check with power-on, bit 6 will be set to "1".

BIT5: SOFTWARE RESET
In the case where an error occurs and the VTR is forcibly placed into the STOP mode, bit 5 will be set to "1", the latches of the entire CTC output port except the CPU will be reset.

BIT0: SYSTEM CONTROL READY
When no abnormality is found in the system control as a result of the initial check with power-on, bit 0 will be set to "1" and will remain "1" after the check.

Address A28AH

When the REMOTE-3 connector on the connector panel is used and parallel remote control is being performed, the condition of EDIT PRESET will be displayed in the respective bits shown in the previous table.

When the REC control of the AUDIO 1, 2, 3 is carried out (refer to the explanation of address A200H/A201H), the content of bit 6 through bit 0 will change as shown below.

BIT7: EDIT LAMP (does not change)

BIT6: INSERT LAMP → SYNC LACK
See explanation of bit 3 of address A019H

BIT5: ASSEMBLE LAMP → FWD LAMP
When the VTR is designated in the mode in which tape travels in FWD direction, bit 5 becomes "1".

BIT4: VIDEO PRESET → REV LAMP
When the VTR is designated in the mode in which tape travels in REV direction, bit 4 becomes "1".

BIT3: SYNC PRESET → A4 REC CONT
For model PS-04/14, bit 3 becomes "1" during recording of AUDIO-4 channel.

BIT2: A3 PRESET → A3 REC CONT
Bit 2 becomes "1" during recording of AUDIO-3 channel.

BIT1: A2 PRESET → A2 REC CONT
Bit 1 becomes "1" during recording of AUDIO-2 channel.

BIT0: A1 PRESET → A1 REC CONT
Bit 0 becomes "1" during recording of AUDIO-1 channel.

Address A28BH

When the REMOTE-3 connector on the connector panel is used and parallel remote control is being performed, the condition of the function mode and servo lock mode will be displayed in the respective bits shown in the previous table.

BIT7: REC
While the REC button on the LOCAL machine is pressed, bit 7 will be set to "1".

BIT6: PLAY
While the PLAY button on the LOCAL machine is pressed, bit 6 will be set to "1".

BIT5: STOP
While the STOP button on the LOCAL machine is pressed, bit 5 will be set to "1".

BIT4: ENTER
While the ENTRY button on the LOCAL machine is pressed, bit 4 will be set to "1".

BIT3: REFERENCE ERROR
If the signal corresponding to the setting of the SERVO REF selector on the front panel is not inputted into the connector panel, bit 3 will be set to "1", and the STOP button will blink. In such a case, normal operation will be possible.

BIT2: COLOR FRAMING LOCK
If the VTR is operating in the color framing mode, bit 2 will be set to "1" and the CF LOCK lamp on the front panel will be light up.

BIT1: DRUM LOCK
When the drum servo is operating normally, bit 1 will be set to "1".

BIT0: CAPSTAN LOCK
When the capstan servo is operating normally, bit 0 will be set to "1".

4. SERVICE INFORMATION

Address A290H

The setting condition of each switch on the LG-02 (A) board will be displayed in the respective bits.

BIT6: TENSION RELEASE Switch S1-3
 When S1-3 is set to ON, Bit 6 will be set to "1", and the tape will slacken when the STANDBY ON condition continues for 2 seconds.

When S1-3 is set to OFF, Bit 6 will be set to "0", and the tape will be slacken when the STANDBY ON condition continues for 30 seconds.

BIT5: TC INSERT INHIBIT Switch S1-2 (Except for 10, 12 and 14 models)
 and when S1 on the AE-03 board is set to TC, the INSERT edit of audio 3 will be inhibited. It is possible, however, to perform the ASSEMBLE edit and normal recording of audio 3.

BIT4: VIDEO/SYNC SIMUL Switch S1-1 (Except for 10, 12 and 14 models)
 Bit 4 will be set to "1" when this switch is set to ON, and by pressing either the VIDEO or AUDIO-4 /SYNC preset button, it is possible to simultaneously select (ON/OFF) both the VIDEO and SYNC channels.

BIT3: PLAY MODE switch S3 (NTSC/PM) MODE SEL Switch S3 (PS)

- NTSC/PM (Except for 10 and 12 models)
 When S3 is set to 1.5HD, bit 3 will be set to "1", and the VTR will go into the 1.5 head mode.
- PS (Except for 10, 12 and 14 models)
 When S3 is set to SYNC, bit 3 will be set to "1", and the AUDIO-4 channel will switch over to the SYNC channel.

BIT2: A4 ENABLE
 In the case of the PS model, when MODE switch S3 is set to A4, bit 2 will be set to "1" and the SYNC channel will switch over to the AUDIO-4 channel.

BIT1: A3/TC SEL S1/AE-03
 The setting condition of the A3 SEL switch on the AE-03 board is displayed in bit 1.

A3 SEL	BIT1
MIC	1
LINE	1
TC	0

BIT0: REC INHI Switch S4
 When either the REC INHIBIT switch on the front panel or S4 on the LG-02 (A) board is set to ON, the REC and EDIT REC operations will be inhibited, and bit 0 will be set to "1".

REC INHIBIT Switch		REC INHIBIT STATUS	BIT 0
Front Panel	LG-02 Board		
ON	ON	ON	1
ON	OFF	ON	1
OFF	ON	ON	1
OFF	OFF	OFF	0

Address A291H

BIT7: CONFI TEST
 When the jumper pin JP1 on the LG-02 (A) board is shorted, pin 7 will be set to "1". If then the TAPE/EE selector on the front panel is set to TAPE and the VTR is placed into the PLAY mode, a playback signal from the audio monitor head will be outputted from the AUDIO MONITOR R/L connectors. In this way, it is possible to check the audio monitor head.

BIT6: JUMPER ON
 Seven test jumper pins (JP1 to JP7) are used on the LG-02 (A) board. If any one of these jumper pins is shorted, bit 6 will be set to "1". If the VTR is operated in a normal condition, all the jumper pins must be opened.

BIT5: Not Used.
 Always set to "0".

BIT4: VIDEO LACK
 If the playback output from the video channel drops out for at least 400 μsec, and this condition continues for at least 6 fields, bit 4 will be set to "1".

BIT3: SYNC LACK
 If the playback output from the sync channel drops out for at least 400 μsec, and this condition continues for at least 6 fields, bit 3 will be set to "1".

BIT2: DT ON
 When the VTR is placed into the DT playback mode, and the drum servo is locked, bit 2 will be set to "1".

BIT1: DT MODE
 When the VTR is operated in the DT playback range from -1 to +3 times normal speed, bit 1 will be set to "0".

BIT0: DT EXIST
 When the DT-04 (DT-05: PS model) board is correctly inserted on the card rack, bit 0 will be set to "1".

(4-13-10. Contents of Common Memory Data)

Address A292H

The set positions of switches S2-8 to S2-1 on the LG-02 (A) board will be displayed on each bit.

BIT7: MODEL 00 or 10 (S2-8)

In case 00 or 10 model, S2-8 should be set to ON (bit 7 = "1"), or in case 02, 12, 04 or 14 model, S2-7 should be set to OFF (bit 7 = "0").

BIT5: TC SENSE MODE SEL (S2-6)

If S2-6 is ON, bit 5 will be "1", and if S2-6 is OFF, bit 5 will be "0".

The return data against the CURRENT TIME SENSE command (CMD-1 = 61, CMD-2 = 0C, DATA-1 = 03) via the REMOTE-2 IN/OUT connector on the connector panel is as shown in the table below.

READ OUT		S2-6	RETURN DATA	RETURN CODE
LTC	VITC			
NO	YES	ON	VITC	74 06 XX XX XX XX
NO	YES	OFF	LTC CORRECTED BY CTL	74 14 XX XX XX XX
YES	NO	x	LTC	74 04 XX XX XX XX
YES	YES	x	LTC	74 04 XX XX XX XX
NO	NO	x	LTC CORRECTED BY CTL	74 14 XX XX XX XX

x: Don't care.

BIT4: AUDIO REC ENABLE (S2-5)

When S2-5 is ON, bit 4 will be set to "1". When S2-5 is set to ON, and the change of the SY-79 board described in the section of address A201H is carried out, it is possible to perform the REC control of AUDIO 1, 2 and 3 from the spare terminal of the REMOTE-3 connector on the connector panel during the PLAY mode.

BIT3: LEVER SW ENABLE (S2-4)

When S2-4 is ON, bit 3 will be set to "1". When S2-4 is set to ON, the operation of the following switches will be effective even from the master machine.

SERVO REF selector

HEAD selector

TIME CODE/TIMER selector

BIT2: PLAY/REC EOT INHIBIT switch (S2-3)

When S2-3 is set to ON, bit 2 will be set to "1". In this condition, the tape will be taken up entirely without undergoing the EOT stop in either the PLAY or REC mode even if the EOT STOP switch S5 on the SY-80 board is set to ON.

BIT1: DELAY ENABLE (S2-2)

When S2-2 is set to ON, bit 1 will be set to "1". When synchronizing the BVH-2000/2180 with a slave VTR having a faster access time, it is possible to delay the timing of the PLAY command sent to the slave machine by setting in the ON position S2-2. The amount of delay can be set from 0 to 15 frames by the TEST/UPPER switch S1 on the SY-80 board.

BIT0: REEL MODE SHUTTLE (S2-1)

When S2-1 is set to ON, bit 0 will be set to "1". Normally, S2-1 is set to OFF and the tape will be driven by the capstan in 3x or less SHUTTLE mode. When S2-1 is set to ON, the tape will not be driven by the capstan but only by the reel in 3x or less SHUTTLE mode.

4. SERVICE INFORMATION

Address A298H

- BIT7: OSC CONT**
When bit 7 is set to "1", the audio bias/erase oscillator will operate, and when bit 7 is set to "0", the oscillator will stop.
- BIT6: FULL VIDEO/CTL ERASE**
When bit 6 is set to "1", the VIDEO channel of the V/S erase head and also the CTL channel of the AUDIO/CTL erase head will operate.
- BIT3: A4/SYNC ERASE**
When bit 3 is set to "1", the SYNC channel of the V/S erase head or, in the case of the PS-04 model, the A4 channel of the AUDIO/CTL erase head, will operate.
- BIT2: A3 ERASE**
When bit 2 is set to "1", A3 channel of the AUDIO/CTL erase head will operate.
- BIT1: A2 ERASE**
When bit 1 is set to "1", A2 channel of the AUDIO/CTL erase head will operate.
- BIT0: A1 ERASE**
When bit 0 is set to "1", A1 channel of the AUDIO/CTL erase head will operate.

Address A299H

- BIT5: CTL REC**
When bit 5 is set to "1", CTL will go into the record mode.
- BIT4: VIDEO REC**
When bit 4 is set to "1", VIDEO will go into the record mode.
- BIT3: A4/SYNC REC (Except for 10 and 12 models)**
When bit 3 is set to "1", SYNC or, in the case of 04 or 14 model, AUDIO-4, will go into the record mode.
- BIT2: A3 REC**
When bit 2 is set to "1", AUDIO-3 will go into the record mode.
- BIT1: A2 REC**
When bit 1 is set to "1", AUDIO-2 will go into the record mode.
- BIT0: A1 REC**
When bit 0 is set to "1", AUDIO-1 will go into the record mode.

Address A29AH

- BIT5: OFF TAPE + CONF1**
When the DEMOD output for the external TBC is the playback signal from the tape, bit 5 will be set to "1".
- BIT4: VIDEO TAPE**
When the video system is in the PB mode, bit 4 will be set to "1", and in the case of the EE, it will be set to "0".
- BIT3: A4 TAPE (PS-04 and 14 models only)**
- BIT2: A3 TAPE**
- BIT1: A2 TAPE**
- BIT0: A1 TAPE**
When bit 3, 2, 1 or 0 is set to "1", the playback signal from the tape will be outputted from each LINE OUTPUT of the AUDIO-4, 3, 2 or 1 respectively, and when it will be set to "0", the EE signal will be outputted.

Address A29BH

- BIT4: VIDEO CONF1**
When the DEMOD output for the external TBC is the CONF1 playback signal, bit 4 will be set to "1".
- BIT3: A4 CONF1 (PS-04 and 14 models only)**
- BIT2: A3 CONF1**
- BIT1: A2 CONF1**
- BIT0: A1 CONF1**
When bit 3, 2, 1 or 0 is set to "1", the CONF1 playback signal of the channel selected by the AUDIO MONITOR select button will be outputted from the AUDIO MONITOR OUTPUT.

Address A29CH

- BIT3: A4 MUTE (PS-04 and 14 models only)**
- BIT2: A3 MUTE**
- BIT1: A2 MUTE**
- BIT0: A1 MUTE**
When bit 3, 2, 1 or 0 is set to "1", each playback signal of the AUDIO-4, 3, 2 or 1 will be muted.

(4-13-10. Contents of Common Memory Data)

Address A29DH

BIT5: 1-HEAD MODE

When the PLAY MODE switch S3 on the LG-02 board is set to 1-HEAD mode, bit 5 will be set to "1", and a 1-HEAD MODE signal will be sent to the DT system.

BIT4: NOR FWD + EE

When the VTR is operated in 1× normal playback or the EE mode, bit 4 will be set to "1", and each LPF in the AUDIO-3 and CTL playback system and the burst level suppressor will be switched over.

BIT3: Y/C SEP ON

During PLAY, REC or 1× normal playback in a mode other than PLAY or REC, bit 3 will be set to "0", and Y/C separation at TBC will not take place. During playback at a speed other than the above, bit 3 will be set to "1", and Y/C separation at TBC will take place.

BIT1: VIDEO + SYNC REC

When the record mode of the VIDEO or SYNC channel is designated, bit 1 will be set to "1", then the logic system will receive this signal and generate an actual control signal.

BIT0: ROTARY ERASE

When a mode which erases a VIDEO or SYNC channel with a rotary erase head is designated, bit 0 will be set to "1", then the logic system will receive this signal and generate an actual control signal.

Address A29EH

BIT7: INTERNAL TBC

When the ADV switch S1 on the CD-17 board is set to BKH, bit 7 will be set to "1".

BIT5: INPUT CHECK

When the TAPE/EE selector is set to INPUT, bit 5 will be set to "1", and the video and audio input signals will be outputted from the VIDEO MONITOR OUTPUT and AUDIO MONITOR OUTPUT connectors.

BIT4: ATT

When the tape speed becomes at least 5 times normal speed, bit 4 will be set to "1", and the A1 and A2 output levels will be attenuated about 20 dB.

BIT3: PB H SEL

When the HEAD selector is set to R/P and the VTR is operated in the normal playback (capstan lock) and edit condition is not preset, bit 3 will be set to "1", and the timing of the logic system will be synchronized with the PB H. If the VTR is in a mode other than normal playback (capstan lock), bit 3 will be set to "0", and the timing will be synchronized with the REF H.

BIT2: DT REG ON

When the VTR is placed into the DT playback mode, bit 2 will be set to "1", and the +12V regulator for the DT driver will operate.

BIT1: PB HEAD SEL

When the HEAD selector is set to PLAY, bit 1 will be set to "1", and if it is set to R/P, bit 1 will be set to "0".

BIT0: DT HEAD SEL

When the VTR is operated in -1× through +3× DT playback, bit 0 will be set to "1".

iiiiiiii 4. SERVICE INFORMATION

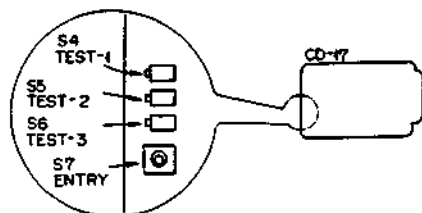
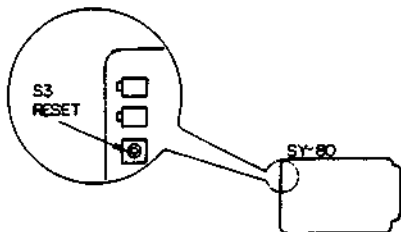
4-14. SERVO TEST FUNCTIONS

4-14-1. Test Mode Setting/Canceling

Set the TEST-1 switch S4 (hexadecimal rotary switch) on the CD-17 board to the desired position of "1" to "F", then press the ENTRY switch S7 on the CD-17 board for at least 0.5 seconds.

There are three ways of canceling the test mode as follows.

1. Turn the power off and then on.
2. Press the RESET switch S3 on the SY-80 board.
3. Set the TEST-1 switch S4 and TEST-2 switch S5 on the CD-17 board to "0", and press the ENTRY switch S7 on the CD-17 board.



4-14-2. Function of TEST-1 Switch (S4/CD-17)

TEST-1 "0": Test Mode Off

Set the switch to this position when not performing the test. When cancellation of TEST-1 "1" to "F" is performed by method 1 or 2 of section 4-14-1, the machine will be automatically reset to "0" regardless of the position of the TEST-1 switch.

TEST-1 "1": Mechanism Operation Check

When the switch is set to this position and paper, etc., is inserted in the tape sensor, error detection of S and T tension, capstan FG, S and T reel FG and timer roller FG will be inhibited, permitting the VTR to be operated normally without threading a tape.

Note: When the TEST-1 switch is set to position "1", the operation of the error detector will be inhibited, hence it is dangerous to thread a tape. When performing normal operation by threading a tape, be sure to first cancel the TEST-1 "1" mode.

TEST-1 "2": S-Reel Torque Check

TEST-1 "3": T-Reel Torque Check

In this test, it is possible to check the average value of the acceleration and deceleration torque of the S or T reel, during forward and reverse rotation, from the NDI display on the SV-43 board.

Step 1.

Place a 9-inch reel of full-wound tape on the S reel table (T reel table in the case of TEST-1 "3") and fix the end of the tape with adhesive tape.

Step 2.

Set the TEST-1 switch to position "2" (or "3"), and press the ENTRY switch S7/CD-17 until the reel starts to rotate.

Step 3.

After about 12 seconds the reel will stop. If the NDI display on the SV-43 board is within "C0" to "CF", the torque is within the specifications. If the display shows other value, turn RV1 (RV6 in the case of TEST-1 "3") on the RA-05 board slightly, and repeat steps 2 and 3.

TEST-1 "4": Reel Brake Check

It is possible to check and adjust the S and T reel brake torque by the setting of the TEST-2 switch S5. For details, refer to section 3.

(4-14-2. Function of TEST-1 Switch S4/CD-17)

TEST-1 "5": Solenoid/Motor Check

It is possible to check the solenoid and motor in accordance with the setting of the TEST-2 switch S5.

TEST-1 "5" & TEST-2 "0": Test Mode Off

Set the switch to this position when not performing the test.

TEST-1 "5" & TEST-2 "1": Pinch Roller Pressure

In the case of TEST-1 "1", the drum, capstan and S and T reel motors will rotate, however for this test mode, only the capstan motor will rotate, and the pinch roller will be pressed against the capstan.

Refer to section 3 for adjustment procedure.

TEST-1 "5" & TEST-2 "2": Pinch Solenoid

The pinch solenoid turns on and off every one second, or so.

TEST-1 "5" & TEST-2 "3": Brake Solenoid

The S and T reel brake solenoid turns on and off every one second, or so.

TEST-1 "5" & TEST-2 "4": Mini Arm Solenoid

The mini tension arm solenoid turns on and off every one second, or so.

TEST-1 "5" & TEST-2 "5": IP Roller Motor

The IP roller motor turns on and off every one second, or so.

TEST-1 "5" & TEST-2 "6": Not used.

TEST-1 "5" & TEST-2 "7": Threading Motor

The movable guide opens and closes every four seconds, or so.

TEST-1 "5" & TEST-2 "8": Not used.

TEST-1 "5" & TEST-2 "9": Not used.

TEST-1 "5" & TEST-2 "A": Not used.

TEST-1 "5" & TEST-2 "B": Capstan Motor

The capstan rotates.

TEST-1 "5" & TEST-2 "C": Not used.

TEST-1 "5" & TEST-2 "D": Drum Motor

The drum rotates.

TEST-1 "5" & TEST-2 "E": Not used.

TEST-1 "5" & TEST-2 "F": Not used.

TEST-1 "6": Not used.

TEST-1 "7": Not used.

TEST-1 "8": Not used.

TEST-1 "9": Not used.

TEST-1 "A": Not used.

TEST-1 "B"

TEST-1 "C": Tape Speed Check

This test permits the following checks to establish whether or not the tape speed (rotating speed of capstan) in the PLAY mode is the same as that in the RECORD mode.

Step 1.

Thread the alignment tape. Set the TEST-1 switch to "B" and press the ENTRY switch. (The capstan phase lock loop will go open, and the capstan speed will be the same as that in the RECORD mode.)

Step 2.

Place the machine in the PLAY mode, and memorize the ND1 display on the SV-43 board.

Step 3.

Set the TEST-1 switch to "C", and press the ENTRY switch. (The capstan is driven only by the analog velocity loop consisting of hardware.)

Step 4.

Place the machine in the PLAY mode, and check to see if the value displayed on the ND1 is the same as the value memorized in step 2. If it is not, adjust RV1 on the CD-17 board in the TEST-1 "C" mode.

TEST-1 "D": Drum Speed Check

In this test, the drum speed can be checked by the ND1 display on the SV-43 board as follows.

Set the TEST-1 switch to "D", press the ENTRY switch, and place the machine in the STANDBY ON mode. (The drum will be driven only by the analog velocity loop consisting of hardware.) If the ND1 display on the SV-43 board shows "02", "01", "00", "FF", "FE" or "FD", the drum speed is within the specifications.

If the display is different to the above, adjust RV4 on the CD-17 board.

TEST-1 "E": Real Time Display of Status

This test enables the servo status flag, and so on, of the servo operating in the normal mode to be displayed in real time, on ND1 on the SV-43 board for the TEST-2 switch setting, or on the 8 LEDs display on the RL-12 board for the TEST-3 switch setting. For details, refer to the item on the TEST-2 switch and the TEST-3 switch.

TEST-1 "F": Not used.

4-14-3. Function of TEST-2 Switch (S5/CD-17)

The TEST-2 switch goes active when the TEST-1 switch is either "5" or "E".

When the TEST-1 switch is "5", refer to "4-14-2 Function of TEST-1 switch".

TEST-1 "E" & TEST-2 "0"	TEST-1 "E" & TEST-2 "8"
TEST-1 "E" & TEST-2 "1"	TEST-1 "E" & TEST-2 "9"
TEST-1 "E" & TEST-2 "2"	TEST-1 "E" & TEST-2 "A"
TEST-1 "E" & TEST-2 "3"	TEST-1 "E" & TEST-2 "B"
TEST-1 "E" & TEST-2 "4"	TEST-1 "E" & TEST-2 "C"
TEST-1 "E" & TEST-2 "5"	TEST-1 "E" & TEST-2 "D"
TEST-1 "E" & TEST-2 "6"	TEST-1 "E" & TEST-2 "E"
TEST-1 "E" & TEST-2 "7"	TEST-1 "E" & TEST-2 "F"

These are not used.

4-14-4. Function of TEST-3 Switch (S6/CD-17)

The TEST-3 switch goes active when the TEST-1 switch is "E".

As shown below, it is possible to display the servo status as well as error data during operation in the normal mode in accordance with the setting of the TEST-3 switch, on the 8 LEDs display on the RL-12 board.

The following table shows the assignment of functions of the 8 LEDs display for the positions of the TEST-3 switch.

TEST 1	TEST 3	RL-12 LEDs							
		D7	D6	D5	D4	D3	D2	D1	D0
E	0	CAPSTAN 1:FWD(CW) 0:REV(CCW)	----	TAPE TIMER 1:FWD(CCW) 0:REV(CW)	T-REEL 1:FWD(CCW) 0:REV(CW)	S-REEL 1:FWD(CCW) 0:REV(CW)	----	----	----
E	5	SRV BOARD CONNECT 1:NG 0:OK	MOTOR OVERHEAT 1:OH 0:NORM	HARD RESET 1:INH 0:NORM	----	REEL TEMP 1:NORM 0:WARM	UNTHREAD END 0:END	THREAD END 0:END	TAPE DET 1:OUT 0:DET
E	6	----	----	MINI ARM 1:OUT 0:ON	THREAD CONT 1:OFF 0:ON	PINCH ROLLER 1:OFF 0:ON	REEL BRAKE 1:BRAKE 0:OFF	IP ROLLER MOTOR 1:FREE 0:DRIVE	HEAD HM 1:STOP 0:ROTATE
E	7	SYS FRAME MODE 00:CD-17 CAP LOCK SW 01:2FL 10:4FL 11:8FL		----	----	ADV 1:SEL 0:OFF	HEAD MODE 1:1HEAD 0:1.5HEAD	HEAD SEL 1:R/P 0:PLAY	SERVO REP SEL 1:EXT 0:INPUT
E	8	----	----	----	PLAY HEAD VIDEO 1:YES 0:NO	INSERT PRESET 1:ON 0:OFF	ASSEMBLE PRESET 1:ON 0:OFF	VIDEO REC 1:REC 0:REC	VIDEO EE 1:EE 0:PE
E	9	----	TAPE DET 1:DET 0:OUT	----	----	----	S-REEL NEAR END 1:NEAR END	T-REEL NEAR END 1:NEAR END	E.O.T. 1:BOT
E	A	THREAD 1:CLOSE 0:OTHERS	PINCH 1:ON 0:OFF	OFF TAPE CTL 00:NO CTL 01:2FL 10:4FL 11:8FL	----	----	----	----	----
E	B	BVT ADV 1:ADV MODE	BEH ADV 1:ADV MODE	SERVO LOCK MODE 00:NO CTL 01:2FL 10:4FL 11:8FL	REF SIG 00:NO REF 01:B/W 10:SECAM 11:PAL/NTSC/PM	----	----	COLOR FRAME DET 00:UNLOCK 11:LOCK	----

1 = LAMP ON
0 = LAMP OFF

(4-14-4. Function of TEST-3 Switch S6/CD-17)

TEST-1 "E" & TEST-3 "0": Rotating Direction Display

- D7:** Direction of capstan rotation
ON: FWD (CW)
OFF: REV (CCW)
- D6:** Not used.
- D5:** Direction of timer roller rotation
ON: FWD (CCW)
OFF: REV (CW)
- D4:** Direction of T reel rotation
ON: FWD (CCW)
OFF: REV (CW)
- D3:** Direction of S reel rotation
ON: FWD (CCW)
OFF: REV (CW)
- D2:** Not used.
- D1:** Not used.
- D0:** Not used.

- TEST-1 "E" & TEST-3 "1":** Not used.
- TEST-1 "E" & TEST-3 "2":** Not used.
- TEST-1 "E" & TEST-3 "3":** Not used.
- TEST-1 "E" & TEST-3 "4":** Not used.

TEST-1 "E" & TEST-3 "5": Alarm Display

- D7:** Servo board insertion error
D7 will light up if the SV/RL/CD/RL board in the card rack is not correctly inserted, or if the connection or contact between the CA/RA/DA/TT board in the tape transport and the harness connector is defective, and the VTR will be forcibly goes into the stop mode.
- D6:** Motor overheat
D6 lights up when the drum, capstan, S reel and T reel motors overheat (temperature inside motor rises to approx. 110°C), and the VTR will be forcibly goes into the stop mode.
- D5:** Hardware error
D5 will light up if one of the following errors is detected, and the VTR will be forcibly goes into the stop mode.
 1. Servo board installation error (see explanation of D7)
 2. Motor overheat (see explanation of D6)
 3. Power supply voltages (+12V, +5V, -12V) used in servo system are abnormal.
 4. Abnormal S or T tension
 5. Drum, capstan, S reel or T reel motor FG is abnormal.
- D4:** Not used.
- D3:** Reel motor temperature rise alarm
D3 lights up when the temperature inside the S or T side reel motor increases approx. 90°C, and the acceleration and deceleration time of the reel will become about twice the normal.

- D2:** Movable guide motion display
- D1:**

D2	D1	STATE OF MOVABLE GUIDE
ON	ON	UNDER OPEN or CLOSE
ON	OFF	CLOSE
OFF	ON	OPEN

- D0:** Tape sensor operation display
D0 lights up when the tape is completely wound up on the S or T reel, or when the tape is not correctly threaded through the tape sensor. In this case, the VTR will be forcibly placed into the STOP mode, and the error message "TAPE OUT" will be displayed on the control panel type 2 or 3.

TEST-1 "E" & TEST-3 "6"

- D7:** Not used.
- D6:** Not used.
- D5:** Mini tension arm operation display
ON: When the arm does not operate
The arm will not operate in the PLAY, REC or more than $\pm 3 \times$ normal SHUTTLE.
OFF: When arm operates
The arm will operate in the VAR, JOG or less than $\pm 3 \times$ normal SHUTTLE, and the tape tension will be maintained constant.
- D4:** Threading motor operation display
OFF: When the motor operates
D4 will turn off when the threading motor is driven and movable guide is opening and closing.
ON: When the motor does not operate
- D3:** Pinch roller operation display
OFF: D3 will turn off after the pinch solenoid is driven and the pinch roller is pressed against the capstan.
ON: D3 lights up when the pinch roller is released.
- D2:** Reel brake operation display
ON: Reel brake drive (drum stopping)
The reel brake will be driven when the drum stops. Also, if the power is carelessly turned off during operation, the brake solenoid will be reset, and the reel brake will be applied to protect the tape.
OFF: Reel brake release (drum rotating)
- D1:** IP roller motor operation display
OFF: When the motor operates
The IP roller will become free after the pinch roller is pressed against the capstan in the PLAY mode, and will be driven when the machine runs more than $\pm 1/2$ normal speed.
ON: When IP roller is free
The IP roller will be free.
- D0:** Head hours meter operation display
ON: When the drum is stopping
OFF: When the drum is rotating

TEST-1 "E" & TEST-3 "7"

The condition of each command supplied from the system control to the servo system will be displayed.

- D7:** Servo lock mode display
- D6:**

This is a servo lock mode execution command which is inputted from a local machine via the system control when this machine is operated remotely.

D7	D6	MODE COMMAND FROM LOCAL MACHINE
ON	ON	8-FIELD LOCK
ON	OFF	4-FIELD LOCK
OFF	ON	2-FIELD LOCK
OFF	OFF	*

* Depends on setting of the CAP LOCK switch S2 on the CD-17 board.

- D5:** Not used.
- D4:** Not used.
- D3:** ADVANCE ON/OFF display
 - OFF:** When the machine is in the edit preset mode, ADVANCE OFF will be forcibly executed from the system control, and the ADV switch S1 and ADV PRESET switch S8 on the CD-17 board will become ineffective.
 - ON:** When the machine is in the PLAY mode, the setting of the ADV switch S1 and ADV PRESET switch S8 on the CD-17 board will be effective.
- D2:** PLAY MODE switch S3/LG-02 (A) mode display
 - OFF:** 1.5 head mode
 - ON:** 1 head mode
 - In case of 10, 12 or 14 model, there is only 1 head mode.
- D1:** HEAD selector mode display
 - OFF:** PLAY head
 - ON:** R/P head
- D0:** SERVO REF selector mode display
 - OFF:** INPUT mode
 - ON:** EXT mode

TEST-1 "E" & TEST-3 "8"

The condition of each command supplied from the system control to the servo system is displayed.

- D7:** Not used.
- D6:** Not used.
- D5:** Not used.
- D4:** Playback status of PLAY head display
 - ON:** PLAY head playback
 - OFF:** For all conditions other than above
- D3:** Insert preset display
 - ON:** When performing the insert preset
 - OFF:** For all conditions other than above
- D2:** Assemble preset display
 - ON:** When performing the assembly preset
 - OFF:** For all conditions other than above
- D1:** CTL recording mode display
 - ON:** When the CTL is in the RECORD mode
 - OFF:** For all conditions other than above

- D0:** VIDEO EE mode display
 - ON:** When the VIDEO is EE mode
 - OFF:** For all conditions other than above

TEST-1 "E" & TEST-3 "9"

The condition of each status supplied from the servo system to the system control is displayed.

- D7:** Not used.
- D6:** Tape sensor operation display
 - D6 turns off when the tape sensor is in an operating condition (when the tape is wound up on the S or T reel, or the tape is not correctly threaded through the tape sensor), and this status signal is transmitted to the system control to forcibly stop the VTR.

- D5:** Not used.
- D4:** Not used.
- D3:** Not used.
- D2:**
- D1:** NEAR EOT display

D2 and D1 light up about 150 seconds before the tape is completely taken up onto the S or T reel by the tape winding diameter detector and reduces the tape speed to 10 times normal speed.

- D0:** EOT (End-of-Tape) stop display
 - D0 lights up about 30 seconds before the tape is completely taken up onto the S or T reel, and the status signal is transmitted to the system control to stop the VTR forcibly. However, when the EOT STOP switch on the SY-80 board is off, the tape will not stop, and the tape will be completely taken up onto the reel.

TEST-1 "E" & TEST-3 "A"

The condition of each status supplied from the servo system to the system control is displayed.

- D7:** Movable guide operation display
 - OFF:** When the movable guide is open or while it is opening or closing
 - ON:** When the movable guide is closed
- D6:** Pinch roller operation display
 - OFF:** When the pinch roller is released
 - ON:** When the pinch roller is pressed against the capstan

- D5:**
- D4:** PB CTL field lock display

D5 and D4 become effective in the PLAY or PROGRAM PLAY mode and show the PB CTL field lock mode as a two-bit.

D5	D4	STATE OF PB CTL
OFF	OFF	CTL is not reproduced.
OFF	ON	2-FIELD
ON	OFF	4-FIELD
ON	ON	8-FIELD

- D3:** Not used.
- D2:** Not used.
- D1:** Not used.
- D0:** Not used.

(4-14.4. Function of TEST-3 Switch S6/CD-17)

TEST-1 "E" & TEST-3 "B"

The condition of each status supplied from the servo system to the system control is displayed.

D7: BVT mode display

D7 lights up when the ADV switch S1 on the CD-17 board is set to the BVT position. The amount of ADVANCE between 0 through 15H can be selected by the ADV PRESET switch S8 on the CD-17 board.

In case of 10, 12 or 14 model, there is no BVT mode.

D6: BKH mode display

D6 lights up when the ADV switch S1 on the CD-17 board is set to the BVT position. The amount of ADVANCE will become 108 μS.

D5: Servo lock mode display
D4: Servo lock mode display

D5 and D4 indicate the setting of the CAP LOCK switch S2 on the CD-17 board and also the servo lock mode determined by the PB CTL.

D5	D4	STATE OF SERVO LOCK
OFF	OFF	CTL is not reproduced.
OFF	ON	2-FIELD LOCK
ON	OFF	4-FIELD LOCK
ON	ON	8-FIELD LOCK

D3: REF VIDEO signal system display
D2: REF VIDEO signal system display

D3	D2	REF VIDEO INPUT
OFF	OFF	NO INPUT (STOP button blinks.)
OFF	ON	B/W SIGNAL
ON	OFF	SECAM SIGNAL
ON	ON	NTSC/PAL/PAL-M SIGNALS

D1: Color frame pulse detection display
D0: Color frame pulse detection display

The meaning of the LED indication will change depending upon the set position of the SC ADJ switch S1 on the SR-15 board as shown below.

1. SC ADJ switch = EXT

Indicates the input of the CF PULSE input terminal on the connector panel.

D1	D2	CF PULSE INPUT
OFF	OFF	NOT SUPPLIED
ON	ON	SUPPLIED

2. SC ADJ switch = FIX/MANU

Detects the phase relationship between the subcarrier and sync, and indicates the status of color framing lock/unlock.

D1	D0	SC PHASE
OFF	OFF	UNLOCK
OFF	ON	*DELAY
ON	OFF	*ADVANCE
ON	ON	LOCK

* is a transient condition when going into the unlock condition. Finally, the LED settles into the unlock condition. In the case of unlock, adjust the SC PHASE of the signal source. If not, set the SC ADJ switch to MANU, then temporarily perform the adjustment using the SC ADJ potentiometer ⓄRV5.

TEST-1 "E" & TEST-3 "C": Not used.

TEST-1 "E" & TEST-3 "D": Not used.

TEST-1 "E" & TEST-3 "E": Not used.

TEST-1 "E" & TEST-3 "F": Not used.

SECTION 5 THEORY OF OPERATION

5-1. GENERAL DESCRIPTION

This machine is a 1-inch helical scanning VTR whose design is based on the EBU Type C format with direct high-band FM recording.

For the Video signal, the VIDEO/SYNC PLAY heads are provided in addition to the R/P head, also a AUDIO/CTL MONITOR head is provided for the AUDIO signal as an option at the factory, and confidence operation (simultaneous recording and playback) made to be possible. The VIDEO PLAY head is a DT (Dynamic Tracking) head. When the VIDEO/SYNC R/P head becomes inoperative because of some reasons, the VIDEO/SYNC PLAY heads can be used as a spare head as well as confidence operation. Noiseless playback is possible up to -1 to +3 times normal speed by the Dynamic Tracking function. When the BKH-2013 Control Panel Type-3 is used, the playback speed ranging from -1 to +3 times normal speed can be freely controlled by the Variable Memory function.

The brushless DC motors are used at the supply reel, take-up reel, capstan and drum motors, and those motors are controlled by the CPU in order to realize high-speed access and reduce servo lock time, and any size of reels can be used without considering combinations.

A SERVO/SYSTEM alarm lamps (RED) on the function control panel are lit when

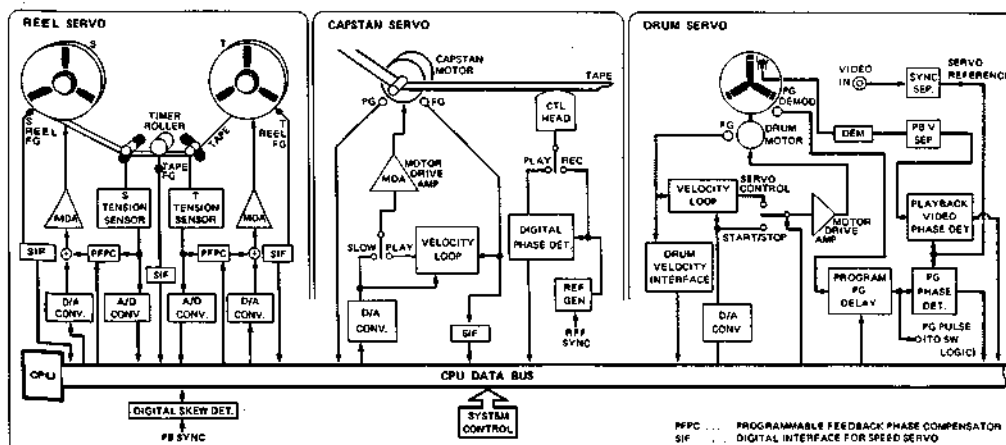
- * The data transmission between the system control and servo CPUs are disturbed.
- * The motor drive circuits become overheat.
- * The tape threading is incorrected.
- * The head drum does not rotate at the STANDBY mode.
- * The servo CPU becomes defective.
- * The data of the servo CPU becomes abnormal.
- * The capstan servo is not locked in the record or the playback modes.

When the Control Panel BKH-2012 or the BKH-2013 is used, error messages related with the editing operation as well as aforesaid alarms can be displayed at the fluorescent display.

When performing the tape threading or cleaning around the tape path, entrance and exit guides of the rotary head drum, VIDEO/SYNC erase head and audio head cover can be moved automatically by the Movable Guide System.

A built-in switching regulator generates the 11 fixed voltages for curcuitry and 4 variable voltages for driving the S-reel, T-reel, Capstan and Drum motors. AC input voltage can be selected by using the voltage selector. High and low voltage protectors are furnished under consideration of incorrect setting of the voltage selector. Moreover, the DC output detector and the overheat protector are also composed.

Optional accessory BKH-2015A is a Time Code Generator/Reader consisted of one board. The LTC (Longitudinal Time Code) or the VITC generation/reading as well as character generator are composed. An mechanical tape timer or CTL-corrected tape timer signals can generate and/or read according to the switch (S3-4) setting on board CD-17 inside the machine.



5-2. TAPE FORMAT

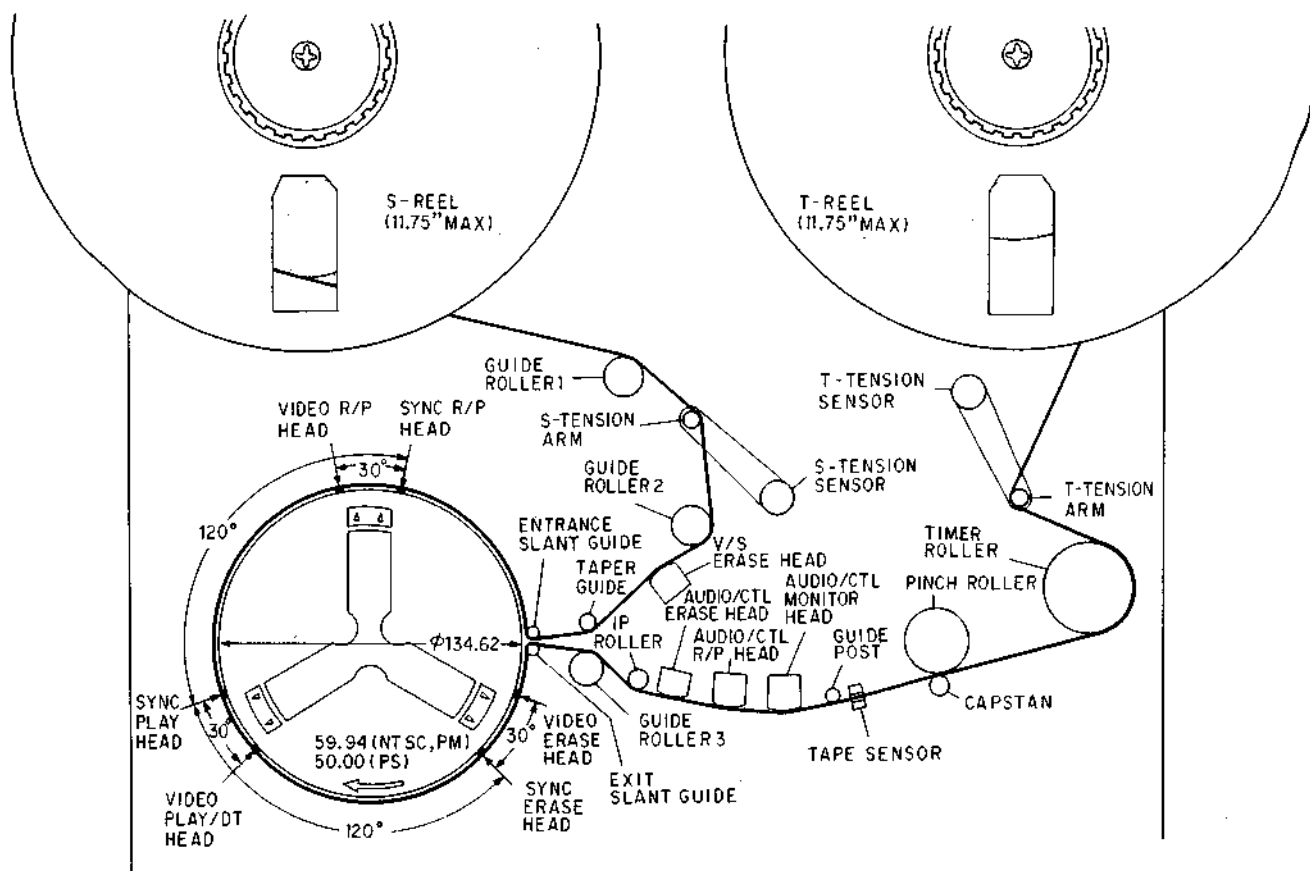
The Type C format is the standard of 1-inch helical scan VTRs for broadcasting applications, and is characterized by the following two features.

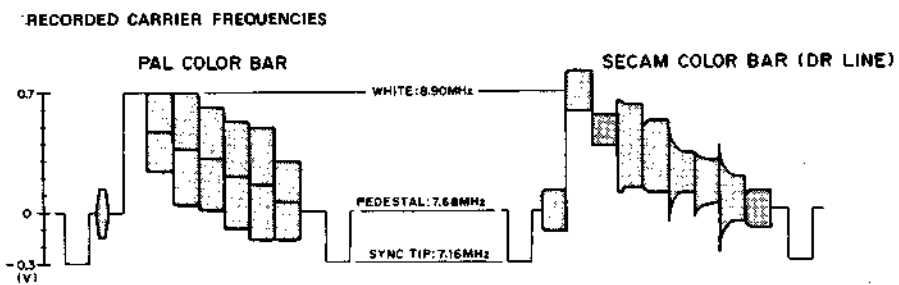
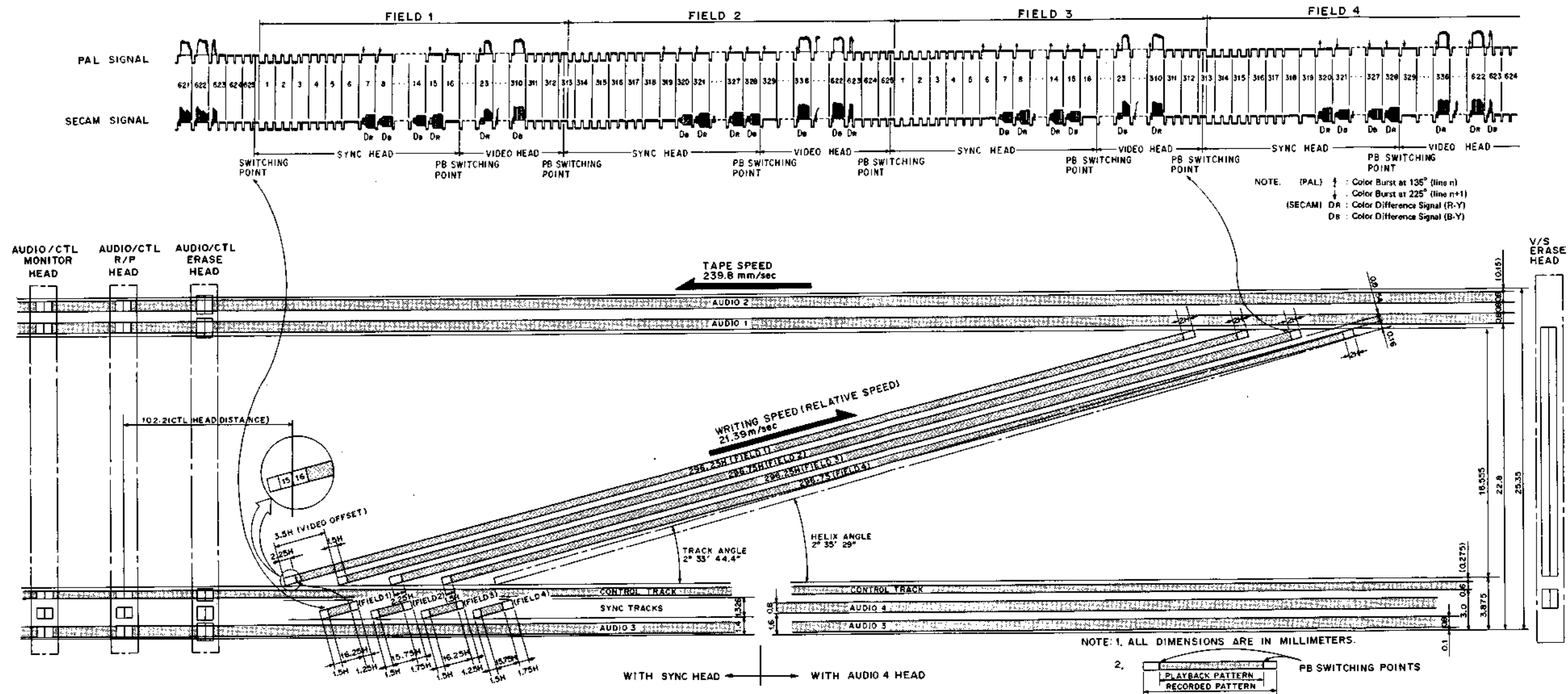
One is the non-segment recording system where the video signal is continuously recorded by one head without occurring the banding noise and flicker like a QUAD VTR, moreover, deterioration in the picture quality is minimal under multi-generation dubbing condition.

The other important feature is "omega wrap". Another 360-degree wrapping system is "alfa wrap", but its main defect consists in the fact that the audio and CTL tracks are duplicated on to the video track. The wrap angle of "omega wrap" is made 344-degree under the Type C format and the audio and CTL tracks are provided separately from the video track. Since the wrap angle is 344-degree, part of the V-blanking is lost with only one head so additional SYNC head prevents this loss.

Both VIDEO and SYNC head are provided on SONY machine as a standard, however VIDEO head only machine is also available from SONY.

THEORY OF OPERATION





5-3. AUDIO SIGNAL SYSTEM

5-3-1. Outline of Audio Signal System

The audio system circuitry is configured on the following boards. An asterisk (*) indicates that the board or audio channel is featured only in the PS-04 and 14 models.

CARD RACK

- AU-27 Board: AUDIO-1/2 REC & PB EQ Amplifier
- AE-03 Board: AUDIO-3/*4 REC & PB EQ Amplifier
AUDIO-3/CTL Cancellor
*AUDIO-4/CTL Cancellor

TAPE TRANSPORT

- AP-06/12 Board: AUDIO-1/2/3/*4 REC/PB Amplifier
- BE-02 Board: Bias/Erase Oscillator
AUDIO-1/2/3/*4 Erase Amplifier
- BE-03 Board: AUDIO-1/2/3/*4 REC Bias Amplifier
- BE-04 Board: AUDIO-1/2/3/*4 Bias Level Controller

LEVEL CONTROL PANEL

- VR-05(*VR-07) Board:
AUDIO-1/2/3/*4 REC/PB Control Amp.
- MS-07(*MS-08) Board:
AUDIO-1/2/3/*4 Monitor Selector

CONNECTOR PANEL

- LA-02 Board: AUDIO-1/2/3/4 Input/Output Amplifier

Refer to section A for the block diagram of the audio system.

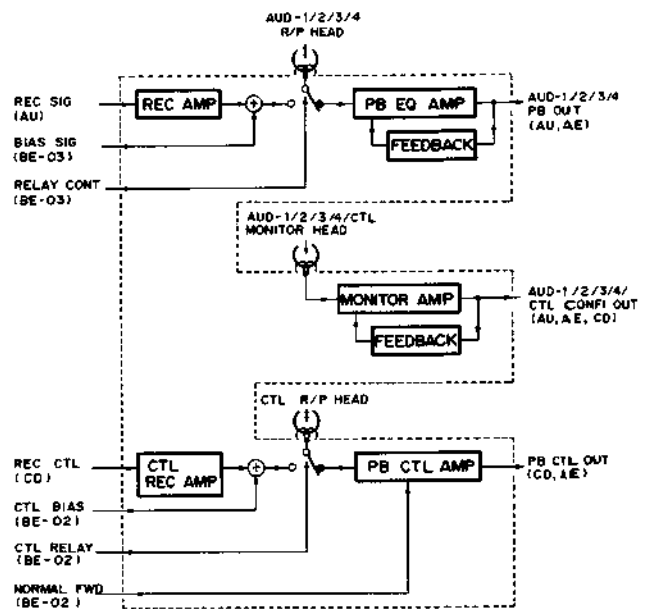
5-3-2. AP-06/12 Board

1. Outline

Following the changes made in the board dimensions, the AP-06 board has been replaced by the AP-12 board starting with models BVH-2000 having serial numbers in the 30,000 range and with models BVH-2180 having serial numbers in the 10000 range. However, in terms of the actual circuitry there is no difference between the two boards. Furthermore, the circuit configuration for the AUDIO-1/2/4 channels is the same so that the description below is confined to the AUDIO-1 and AUDIO-3 channels. AUDIO-4 is a function provided only with the PS-04 and 14 models.

This board houses the monitor amplifiers and the REC/PB amplifiers of the AUDIO-1/2/3/4/CTL channels.

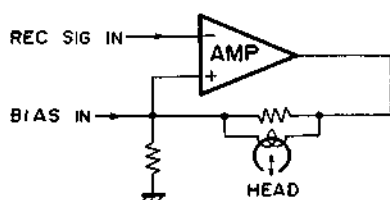
AP-06/12 BOARD BLOCK DIAGRAM



2. REC Amplifier

In order to reduce the variations in the recording current, which are generated by fluctuations in the R/P head's impedance, the R/P head is inserted into the feedback loop of the REC amplifier and a constant-current circuit is configured. The signals entering the AUDIO LINE IN connector are impedance-matched by the LA board, their recording level is adjusted by the VR board, and they are input to the REC amplifier on the AP board through the REC amplifier on the AU board. A bias signal (198.9 kHz) from the BE-02 board is added to the recording signal and supplied to the R/P head.

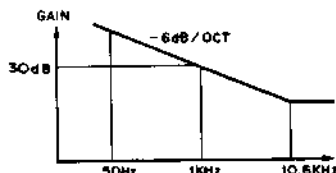
REC AMP



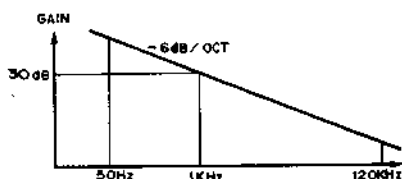
3. PB EQ Amplifier

This circuit configures a feedback type of equalizer amplifier based on a 2-stage differential amplifier. In order for the time code signal to be played back at high speed, the AUDIO-3 channel frequency response is linearly extended up to a higher range than that of the other channels.

FREQUENCY RESPONSE OF AUDIO CH-1/2/4



FREQUENCY RESPONSE OF AUDIO CH-3



4. Audio Monitor Amplifier

The AUDIO-1/2/4 amplifier gain is 48 dB at 1 kHz, but since the playback sensitivity of the AUDIO-3 channel head is 6 dB lower than that of the other channels, the amplifier gain of this channel is 54 dB. In order to suppress the power line noise, a ripple filter is used in each of the channels.

5. CTL REC Amplifier

The REC CTL signal is produced by the CD board based on the REF 4F signal of the SR board and on the REF 2F signal of the RL board, and it is supplied to the AP board. The supplied CTL signal is amplified to the prescribed level, bias (198.9 kHz) is applied to the signal in order to reduce the recording current, and the signal is passed through the CTL R/P head for saturated recording on the tape. By applying bias to the REC CTL signal, it is possible to reduce the effects of the CTL on the AUDIO-3 channel.

6. CTL PB Amplifier

The PB CTL signal, which has been played back by the CTL R/P head, is supplied to the CD board and the color frame is detected from its phase relationship with the capstan FG. Furthermore, the supplied PB CTL signal is first amplified by the CD board and then, in order to correct the tape timer by CTL, it is output to the RL board.

Q701 is a switcher which switches the frequency response to the value with 1x normal speed playback and to the value with any other speed. In order to reduce bias leak from the AUDIO-3 channel, bias trap Q502 is activated when a tape is played back at 1x normal speed.

Since the level of the CTL signal played back in the PAL/SECAM model is low, the fluctuations in the DC level must be suppressed. To do so, Q503 is switched on by the NORMAL FWD signal during 1x normal speed playback and the low-range frequency response is reduced.

CHAPTER 5. THEORY OF OPERATION

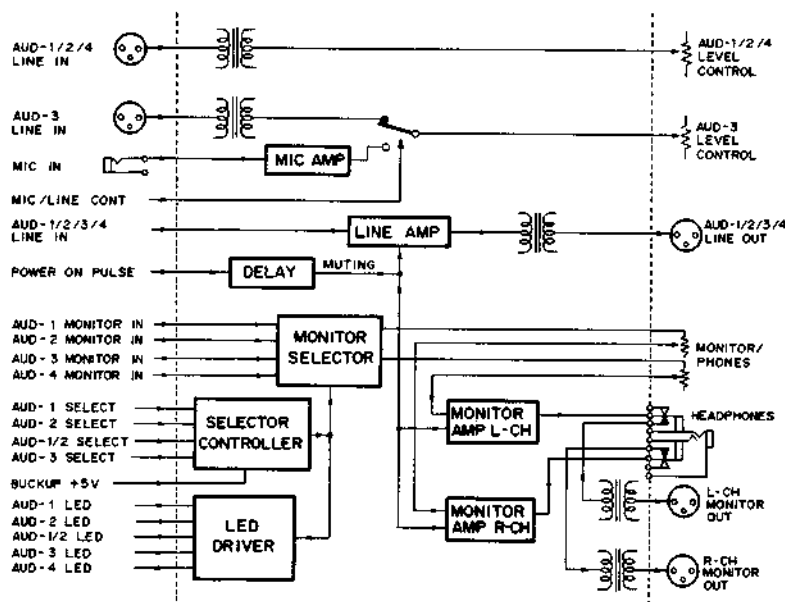
5-3-3. LA-02 Board

1. Outline

This board contains the following circuits:

- Audio Line Input Impedance Matching Circuit
- Audio Line Output Amplifier
- Monitor Selector
- Monitor R/L Output Amplifier
- Mic Amplifier

LA-02 BOARD BLOCK DIAGRAM



2. Line Input Amplifier

Normally, the line input amplifier's output is set "off" by the short plug and the signal, supplied to the LINE IN connector, is output directly to the VR board without passing through the line input amplifier.

When the short plug is switched "on", the line input amplifier is inserted between the LINE IN connector and the VR board and the input signal can be amplified by 20 dB.

There is a choice of three input impedance values: 10K-ohm, 600-ohm and 150-ohm.

3. Line Amplifier/Monitor Amplifier

The AUDIO-1/2/3/4 line amplifiers and monitor R/L amplifiers are configured with the same circuitry, and they form a push-pull output.

The output impedance may be set to 600-ohm, 150-ohm or 37.5-ohm, and a muting circuit is used to prevent click noise when the power is switched on and off.

4. Monitor Selector

This circuit decodes the monitor select signals from the MS board and it selects the monitor signals of the channels supplied from the AU board and AE board. In order to light the LED inside the monitor select button on the MS board, the decoded signals are encoded and output.

5. Microphone Amplifier

The AUDIO-3 channel can be switched to the microphone input by the MIC/LINE CONT signal from the AE board. The allowable MIC IN input level is -67 dB to -36 dB, and the microphone amplifier gain is 47 dB.

5-3-4. AU-27 Board

1. Outline

This board is configured with the AUDIO-1/2 channel recording amplifier, playback amplifier, monitor amplifier and meter driver. Both the recording and playback amplifiers are provided with a crosstalk canceller.

The circuit configuration for the AUDIO-1 and -2 channels is the same and so the description below concerns mainly the AUDIO-1 circuitry.

Refer to AUDIO-1 & 2 SIGNAL SYSTEM in section A for a block diagram of the AU-27 board.

2. Recording Amplifier

The signal supplied to the AUDIO-1 LINE IN connector is impedance-matched on the LA board, its recording level is adjusted by the VR board and it is supplied to the recording amplifier. A bias signal is added by the AP board to the input signal, which has now been amplified by the recording amplifier, and the signal is recorded onto the tape through the R/P head. In order to cancel out the crosstalk from the AUDIO-1 to the AUDIO-2 channel, part of the signal amplified by the recording amplifier is supplied to the AUDIO-2 recording amplifier and playback amplifier. When the VTR is placed in the recording mode, part of the recording signal is amplified by IC109 and supplied to the AUDIO-2 recording amplifier. This process serves to cancel out the crosstalk components generated between the heads during recording. When AUDIO-1 is set to the insert mode, the A1 CANCEL signal from the BE-03 board is set high and the muting circuit IC111 goes off. When IC111 goes off, part of the recording signal, which has been amplified by IC109 and whose frequency response has been compensated for, is supplied to the AUDIO-2 playback amplifier and the AUDIO-1 components leaking into the AUDIO-2 channel are cancelled out.

3. Playback Amplifier

The playback amplifier is composed of the flat amplifier IC101 with an amplifier gain of approximately 29 dB and the bandpass filter IC102 which is based on an active filter. The attenuation of the bandpass filter is -12 dB/OCT and its bandpass response referenced to 1 kHz is -3 dB at 30 Hz and -3 dB at 27 kHz.

The level of the signal output from the playback amplifier is adjusted by the VR board, and the signal itself is returned to the AU board. The playback signal returned from the VR board is output from the AUDIO LINE OUT connector through the switcher IC111 and LA board. Furthermore, part of the signal returned from the VR board is full-wave-rectified by the meter

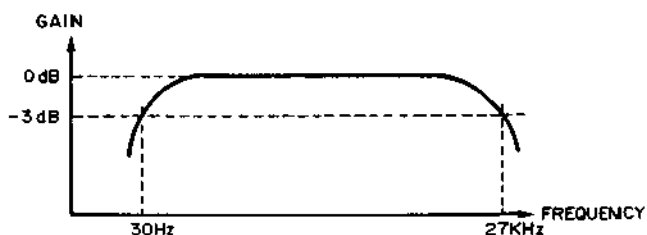
drive circuit, and it is supplied to the audio meter through the LA board and VR board. The signal returned from the VR board passes through the buffer amplifier and then through the LA board and VR board, and it is output from the MONITOR OUT connector and HEADPHONES jack.

Part of the AUDIO-2 channel playback signal is supplied to the AUDIO-1 flat amplifier (IC101-7), and crosstalk from the AUDIO-2 channel to the AUDIO-1 channel during playback is cancelled out. The signal output from the AUDIO-2 crosstalk canceller IC209 is supplied to pin 6 of the flat amplifier IC101, and crosstalk from the AUDIO-2 channel to the AUDIO-1 channel, when the AUDIO-2 channel is set to the insert mode, is cancelled out.

When the VTR is placed in the SEARCH mode at the 5x speed or above, the ATT signal from the LG board is set low and the playback output is attenuated by approximately 20 dB.

For about 5 seconds after the power has been switched on, muting is applied in order to prevent popping noise from being generated.

BANDPASS RESPONSE



4. Monitor Amplifier

As with the playback amplifier, the monitor amplifier IC104 is an active filter type of bandpass filter and its bandpass response is the same.

When the front panel TAPE/EE selector is set to the TAPE position, the VTR enters the simultaneous recording/playback (CONFIDENCE) mode, the signals recorded by the R/P head are played back instantly by the monitor head, and the signal being recorded can be monitored at the MONITOR OUT connector on the connector panel or at the HEADPHONES jack.

5. Meter Amplifier

The AUDIO LINE IN connector input signal, the playback signal from the R/P head or the playback signal from the monitor head is supplied to the meter amplifier. The supplied signal is full-wave-rectified and the audio meter is driven.

5-3-5. AE-03 Board

1. Outline

This board is configured with the AUDIO-3 recording, playback and monitoring amplifiers, and the meter driver as well as the time code recording and playback amplifiers. The PS-04 and 14 models are also provided with the AUDIO-4 channel circuitry.

Refer to AUDIO-3 SIGNAL SYSTEM in section A for a block diagram of the AE-03 board. Refer to AUDIO-3 & AUDIO-4 SIGNAL SYSTEM in section A for the block diagram of the pertinent circuitry in the PS-04 and 14 models.

2. Recording Amplifier

The circuitry configuring the AUDIO-3/4 recording amplifier is the same as that for the AUDIO-1/2 recording amplifier on the AU board. With any model other than the PS-04 or 14, the crosstalk generated between AUDIO-3 and CTL is cancelled out; with the PS-04 or 14 model, the crosstalk between AUDIO-3 and AUDIO-4 is cancelled out.

When the A3 SEL switch on the AE board is set to TC, the switcher IC4 is switched to the time code side, and the AUDIO-3 recording amplifier functions as the time code recording amplifier.

3. Playback Amplifier

AUDIO-3 Playback Amplifier

This amplifier is composed of the 20 dB flat amplifier IC1, bandpass filter based on the active filter IC2, and the 14dB flat amplifier IC33. The bandpass response of the bandpass filter is 40 Hz to 25 kHz.

When the A3 SEL switch on the AE board is set to TC, the time code signals can be played back. In order to read out the time code signals from the 1/10x speed to the maximum speed, the switcher IC3 is switched by the NORMAL FWD+EE signal from the LG board; with the 1x normal speed, the signals which have passed through the filter are output as the playback signals, while with any other speed, the signals prior to passing through the filter are output as the playback signals.

Q9/Q15 is a muting circuit which serves to prevent the transient noise from being generated when the VTR is switched from the recording mode to the playback mode during editing. The muting signal (A3 MUTE) is supplied to the 31A pin at a timing delayed by 8msec from the A3 TAPE/EE signal which is supplied to the 30A pin.

Q1 is a bias trap which is set on during 1x speed to reduce the bias leak (198.9 kHz).

AUDIO-4 Playback Amplifier

The circuitry is the same as that of the AUDIO-1/2 on the AU board.

BV H-2000(U/C)/PS/PM

BV H-2180(U/C)/PS/PM

BV H-2500(U/C)/P/PM

4. Monitor Amplifier

The circuitry is the same as that of the AUDIO-1/2 on the AU board.

5. Meter Amplifier

The circuitry is the same as that of the AUDIO-1/2 on the AU board.

6. AUD-3/CTL Crosstalk Canceller (00, 10, 02 and 12 Models)

Since the AUDIO-3 track and CTL track are close to each other, crosstalk arises between the two tracks. Depending on the VTR mode, this crosstalk is reduced by three types of cancellers.

(1) PB Mode (PB CTL to PB AUD-3)

Part of the PB CTL signal of the AP board is supplied to the AUDIO-3 playback amplifier on the AE board to reduce the crosstalk.

(2) VIDEO ASSEMBLE Mode (REC CTL to PB AUD-3)

In the video assemble editing mode, both the video and CTL channels are open for recording and so part of the REC CTL signal, produced by the CD board, is supplied to the AUDIO-3 playback amplifier to reduce the crosstalk.

(3) AUD-3 INSERT Mode (REC AUD-3 to PB CTL)

This canceller functions in the AUDIO-3 insert mode to prevent the servo lock from being disengaged and the PB CTL from being disturbed by the effects of AUDIO-3.

7. AUD-4/CTL Crosstalk Canceller (PS-04/14 Model)

Whereas in the 00/10/02/12 model the crosstalk between the AUDIO-3 and CTL tracks is cancelled, in the PS-04/14 model the crosstalk between the AUDIO-4 and CTL tracks is cancelled.

- (1) **PB Mode (PB CTL to PB AUD-4)**
Part of the PB CTL signal from the AP board is supplied to the AUDIO-4 playback amplifier on the AE board to reduce the crosstalk.
- (2) **VIDEO ASSEMBLE Mode (REC CTL to PB AUD-4)**
In the video assemble editing mode, both the video and CTL channels are open for recording and so part of the REC CTL signal, produced by the CD board, is supplied to the AUDIO-4 playback amplifier to reduce the crosstalk. However, in the 04/14 model, the mechanical distance between the AUDIO-4 and CTL tracks on the R/P head differs from that in the 00/10/02/12 model and so the frequency components of the crosstalk which is generated also differ.
- (3) **AUD-4 INSERT Mode (REC AUD-4 to PB CTL)**
This canceller functions in the AUDIO-4 insert mode. In order to lock the servo stably, the recording amplifier is muted by the timing of the rise and fall of the A4 CANCEL signal supplied from the BE-02 board, and this prevents PB CTL from being affected.

8. AUD-3/AUD-4 Crosstalk Canceller (PS-04/14 Model)

In the PS-04/14 model, crosstalk between AUDIO-3 and AUDIO-4 is cancelled out.

- (1) **AUDIO-3 INSERT Mode (REC AUD-3 to PB AUD-4)**
This canceller functions in the AUDIO-3 insert mode.
- (2) **AUDIO-4 INSERT mode (REC AUD-4 to PB AUD-3)**
This canceller functions in the AUDIO-4 insert mode.
- (3) **PB mode (PB AUD-3 to PB AUD-4)**
Part of the AUDIO-3 playback signal is supplied to the AUDIO-4 playback amplifier to reduce the crosstalk.
- (4) **PB mode (PB AUD-4 to PB AUD-3)**
Part of the AUDIO-4 playback signal is supplied to the AUDIO-3 playback amplifier to reduce the crosstalk.
- (5) **REC mode (REC AUD-3 to REC AUD-4)**
Part of the AUDIO-3 recording signal is supplied to the AUDIO-4 recording amplifier to reduce the crosstalk.
- (6) **REC mode (REC AUD-4 to REC AUD-3)**
Part of the AUDIO-4 recording signal is supplied to the AUDIO-3 recording amplifier to reduce the crosstalk.

9. Time Code System

When the A-3 SEL switch S1 is set to TC, the time code signal can be recorded or played back by the AUDIO-3 channel.

(1) Time Code Recording System

When the A-3 SEL switch S1 is set to TC, the time code signal which executes recording can be selected in accordance with the setting of the INT/EXT1/EXT2 switch S2.

- INT: Time code signal from TC-14A Board
- EXT1: Time code signal supplied to connector panel's TIME CODE IN connector(BNC)
- EXT2: Time code signal supplied to AUDIO-3 LINE INPUT connector

The time code signal selected by IC15 is converted to the TTL level by the hysteresis comparator configured by IC17 and IC21.

The time code signal for recording, which has been converted to the TTL level, passes through switcher IC18/19, is waveform-shaped by IC14, it passes through the AUDIO-3 recording amplifier and is recorded onto the AUDIO-3 track. Furthermore, part of the time code signal which has passed through switcher IC18/19 is waveform-shaped by IC16, it passes through the LA board, and it is output from the rear panel TIME CODE OUT and AUDIO-3 LINE OUT connectors.

(2) Time Code Playback System

When the A-3 SEL switch S1 is set to TC and the VTR is placed in the playback mode, the time code signals recorded on the AUDIO-3 track are played back.

5-3-6. BE-02 Board

1. Outline

The BE-02 board is configured with the following circuitry:

- Audio Bias/Erase Oscillator
- Video/CTL Erase Oscillator (Stationary Head)
- Audio Erase Amplifier
- CTL Bias Amplifier
- Crosstalk Canceller Controller
- Bias Timing Controller

2. Audio Bias/Erase Oscillator

The master oscillation frequency is 14.31818 MHz, and the frequency of 198.9 kHz, produced by dividing the master frequency by 72, is used as the bias and erase signals. Also, in order to prevent accidental erasure when the power is switched on, the timing of the oscillation start is controlled by the POWER ON RESET signal from the PS board. The generated erase signal is supplied to the audio erase head through the erase amplifiers of the various channels on the BE-02 board. Furthermore, the bias signal is added onto the recording signals of the various channels by the BE-03 board, and it is supplied to the R/P head.

3. Video/CTL Erase Oscillator (Stationary Head)

This circuit is composed of an astable multivibrator with an oscillation frequency of 118 kHz. When the VTR is placed in the video assemble mode, the video and CTL tracks are erased. As with the audio bias/erase oscillator, the timing of the oscillation start is controlled by the POWER ON RESET signal from the PS board.

4. Audio Erase Amplifier

The circuit configuration is the same for all channels and so the description here is confined to the AUDIO-1 channel.

IC101 is a Miller Integrator which controls the slope of the erase signal's rise and fall. The erase signal is supplied to IC3-13 as a square wave which becomes a sine wave in the resonance circuit configured by LV4/C108, and it is supplied to the erase head through buffer Q101 to Q104.

Muting IC8 is controlled by IC101-7, the muting is switched off before the power reset rises and it comes on when it falls, and malfunctioning in the erase amplifier is prevented.

5. CTL Bias Amplifier

The circuitry of this amplifier is configured in the same way as that of the audio erase amplifier although the time of the rise and fall of the ramp waves generated by Miller Integrator IC9 differs.

6. Crosstalk Canceller Controller

The Ax CANCEL signal, which serves as the control signal of the crosstalk canceller, is produced by inverting the logic of the Ax REC signal from the LG board. The timing at which the crosstalk canceller is set off is delayed by an amount of time equivalent to the fall of the audio bias.

7. Bias Timing Controller

The BE-03 board recording bias amplifier is controlled by the Ax REC signal from the LG board.

5-3-7. BE-03/BE-04 Board

1. Outline

The BE-03 board is configured with bias amplifiers for each channel and with a relay timing controller for switching the R/P head to recording or playback. A control for adjusting the bias level is mounted on the BE-04 board.

2. Bias Amplifier

The bias amplifier features a push-pull configuration. It amplifies the bias signal (198.9 kHz) from the BE-02 board and outputs it to the AP board. This bias signal and audio signal are added by the AP board and recorded onto the tape through the R/P head.

3. Relay Timing Controller

The circuitry configuration is the same for each channel and so the description here is confined to the AUDIO-1 channel.

IC2 is a Miller Integrator which controls the slope of the bias signal's rise and fall.

Q101 and Q102 convert the signal, which has been varied to between $-12V$ and $+8V$ and which has been output by IC2, into a logic level.

5-4. VIDEO SIGNAL SYSTEM

The circuitry of the video signal system is housed on seven circuit boards whose principal functions are given below:

1. MD-14 board: Modulator
2. EQ-02 board: Equalizer
3. DM-25 board: Demodulator
4. RP-09 board: REC/PB amplifiers
5. VM-01 board: Video buffers and monitor amplifiers
6. VR-05 board: REC/PB level control
7. DR-13 board: PLAY head and ST GAUGE amplifiers

- Dynamic tracking is processed by the DT-04 (or DT-05 for PS) and DD boards. For details, refer to "Section 5-5 DYNAMIC TRACKING SYSTEM".
- In case of 10, 12 or 14 model, there is no sync head.

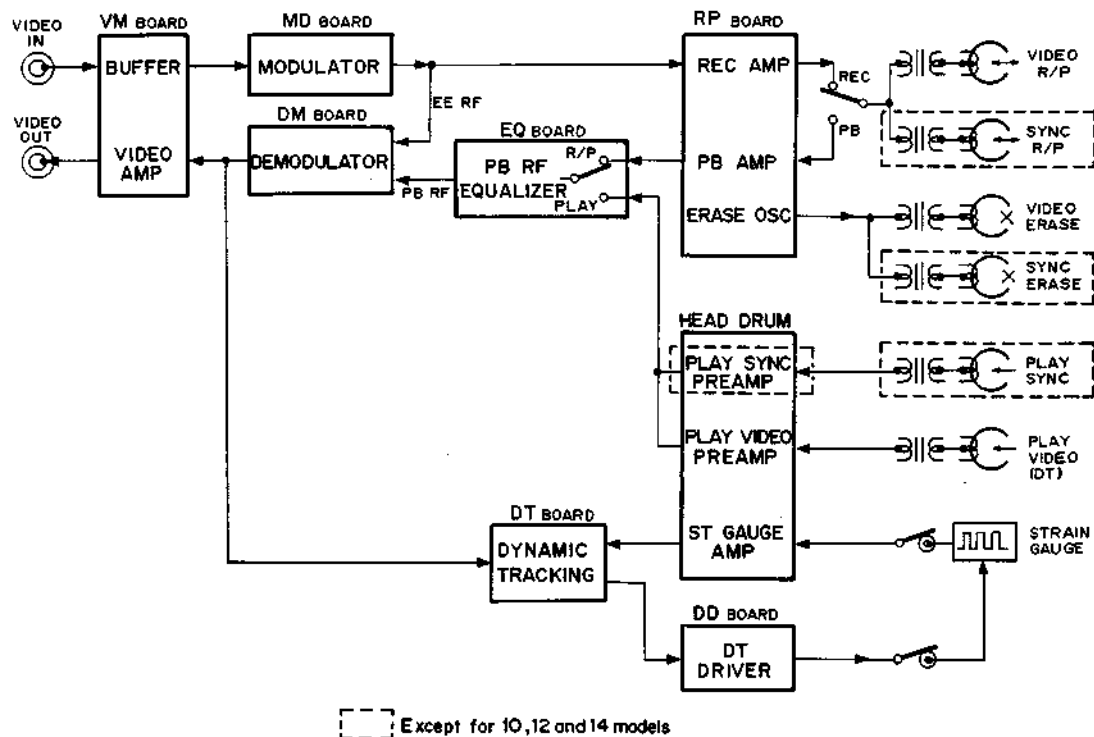
5-4-1. Outline of Video Signal System

The video signal supplied to the VIDEO INPUT connector is passed through the buffer (VM-01 board) to the MD-14 board. The video signal level is controlled on the MD-14 board by a voltage corresponding to the setting of the REC level control on the front panel, and after this the signal is frequency modulated. The frequency modulated RF signal is then amplified by the RP-09 board, supplied to the R/P heads and recorded onto the tape.

During playback the signals recorded on the tape are played back by the R/P heads or PLAY heads. The PB RF signals from the R/P heads are supplied to the EQ-02 board through the RP-09 board while the PB RF signals from the PLAY heads are supplied to the EQ-02 board through the DR-13 board inside the upper drum.

The EQ-02 board functions to compensate for the differential gain (DG), differential phase (DP) and frequency response of the signal and also to detect dropouts, and the signal is then supplied to the DM-25 board. The DM-25 board serves to demodulate the EE RF signal from the MD-14 board or the PB RF signal from the EQ-02 board. The demodulated signal is then output through the VM-01 board from the VIDEO OUTPUT connector.

VIDEO SIGNAL SYSTEM



5-4-2. MD-14 Board

1. Outline

The video signal supplied to the VIDEO INPUT connector is further supplied to the MD board through the buffer on the VM board, and their level is adjusted by the VIDEO level control on the front panel. The adjusted video signal is sent to the burst doubler so that the signal-to-noise ratio of the burst level during playback is enhanced. This circuit functions to double the burst level (except the SECAM system), the signal pass through the VITC/VIDEO switcher and is supplied to the FM modulator by way of the 7.5 MHz/-3 dB low-pass filter that serves to reduce the switching noise caused by the burst doubler.

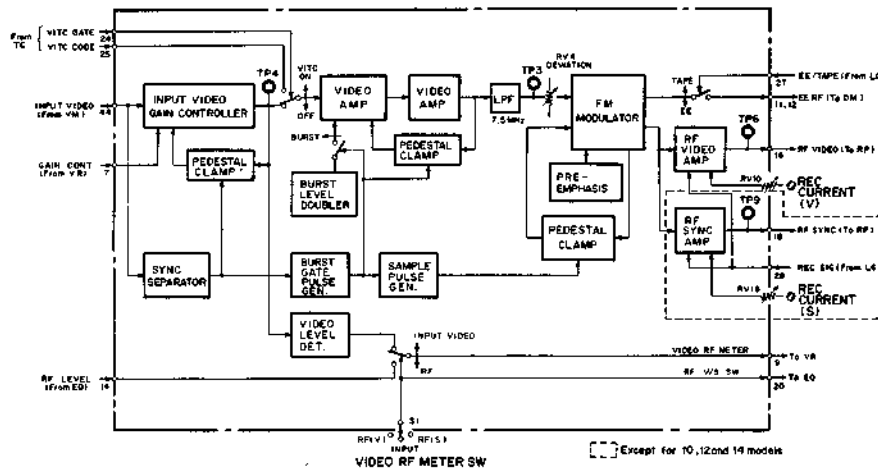
The deviation of the FM modulator is as follows:

- NTSC/PAL-M = 7.06 to 10.00 MHz
- PAL/SECAM = 7.16 to 8.90 MHz

In order to stabilize the oscillation frequency of the FM modulator, it is clamped at the frequency (7.9 MHz for NTSC/PAL-M, 7.682 MHz for PAL/SECAM) corresponding to the pedestal level by the pedestal clumper.

The frequency response of the RF (FM modulator output) signal is compensated for in a subsequent stage--an operation which is performed separately for the video and sync channels--and the signals are then supplied to the R/P heads by way of the RP-09 board and recorded onto the tape.

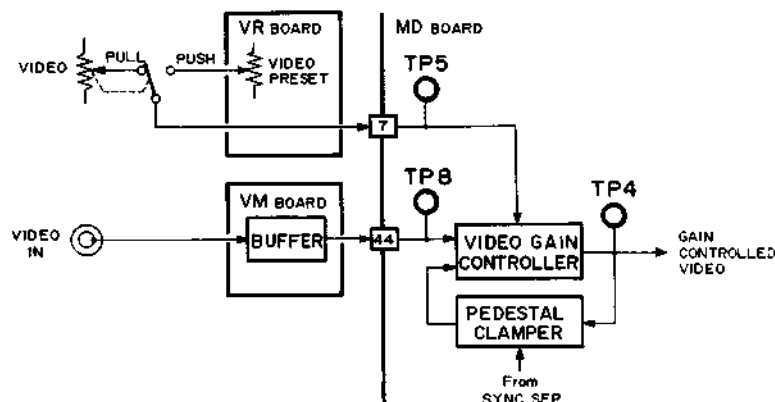
Besides the above circuitry the MD-14 board is also provided with a VIDEO/RF meter driver.



2. Input Video Gain Controller (IC10, Q9-Q13) Pedestal Clumper (IC38, Q18-Q20)

In order to stabilize operation with the video input signal whose APL fluctuates, negative feedback is applied so that the back porch level of the video signal is set to 0V at the base of Q12 with pulse from the pedestal clumper.

The gain of the video amplifier can be varied 6 dB or more when the voltage at the gain control terminal (pin-7 of the edge connector) varies $\pm 2.5V$.



(5-4-2, MD-14 Board)

3. VIDEO/RF Meter Driver (IC38)

There are two methods of detecting the video level when driving the VIDEO/RF meter: one method involves detecting the peak level of the video signal and the other involves the detection of the sync level. The peak level is held when jumper plug JP3 on the board is shorted; the sync level is held when jumper plug JP4 is shorted.

4. VITC Inserter (IC6,7,16,21,Q16)

The VITC can be inserted into any 2 lines in the vertical blanking period when the optional BKH-2015A (TC-14A board) time code generator/reader is installed to the VTR.

The insertion line can be designated with switches S9 and S10 on the TC-14A board.

5. Sync Separator (IC18,19,20,21,30,36,37)

This circuit is configured with an operational amplifier and diode. It serves to reproduce the DC component into video signals in which this component has been lost and in which fluctuations have been caused by noise. This enables sync separation with a high degree of stability and tracking ease.

6. Burst Gate Pulse Generator (IC30,31,33 to 37) Burst Level Doubler (IC8,9)

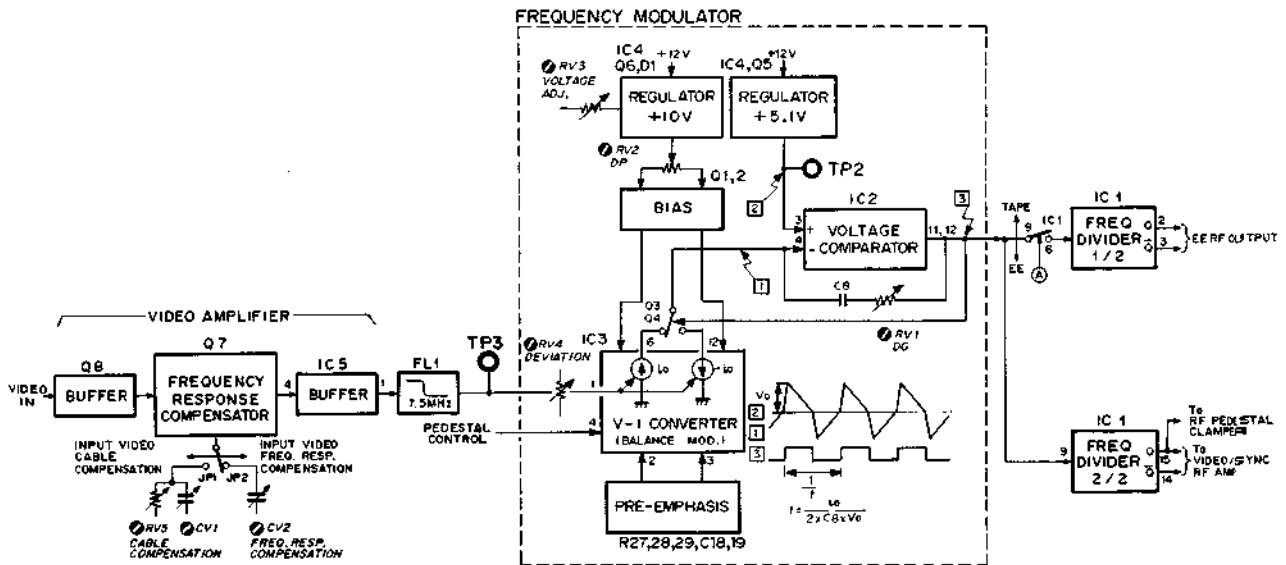
The burst level doubler amplifies the recording level of the burst and doubles its original level in order to improve the S/N ratio of the burst during playback.

The gain of the video amplifier IC7 is switched by the burst gate pulse.

7. FM Modulator (IC1 to 4, Q1 to 6)

The video signal whose frequency response has been compensated for by the video amplifier (Q8,Q7,IC5) is supplied to the FM modulator by way of the low-pass filter.

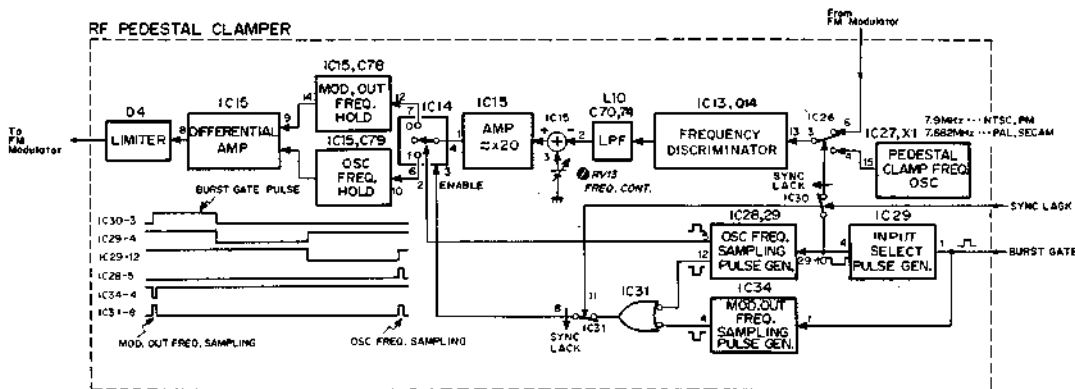
R27,R28,R29,C18 and C19 on the gain terminal of IC3 provide the pre-emphasis constant and a current corresponding to the level of the video signal is output to -OUT/+OUT of IC3. This current is switched by Q3 and Q4, C8 is charged and discharged and the modulator oscillates at double the frequency of the carrier. The modulator output, which is now oscillating at double the frequency, has its frequency halved by IC1.



(5-4-2. MD-14 Board)

8. RF Pedestal Clamper (IC13,14,15,28,29,34,Q14)

The FM modulator output is supplied to the RF pedestal clamper by way of frequency divider IC1. It further passes through switcher IC26 to the discriminator composed of IC13 and Q14. Here a voltage corresponding to the frequency of the pedestal is held in C78. Meanwhile, the oscillator composed of X1 and IC27 is oscillating at the frequency (7.9 MHz for NTSC/PAL-M or 7.682 MHz for PAL/SECAM) corresponding to the pedestal, a voltage passes through switcher IC26 and discriminator as with the modulator output and it is held in C79. The RF pedestal clamper serves to feed back the signal to the FM modulator so that the two held voltages tally and thus the frequency is stabilized.



9. Video/Sync RF Amplifier (Q17,Q21 to 25,IC1,12,25,33)

The frequency of the RF signal from the FM modulator is halved by IC1, and is switched respectively for the video and sync channels by the "REC SIG" signal supplied to pin-28 on the MD-14 board, then the both signals are output to the RP board.

(In case of 10, 12 or 14 model, there is no sync channels.)

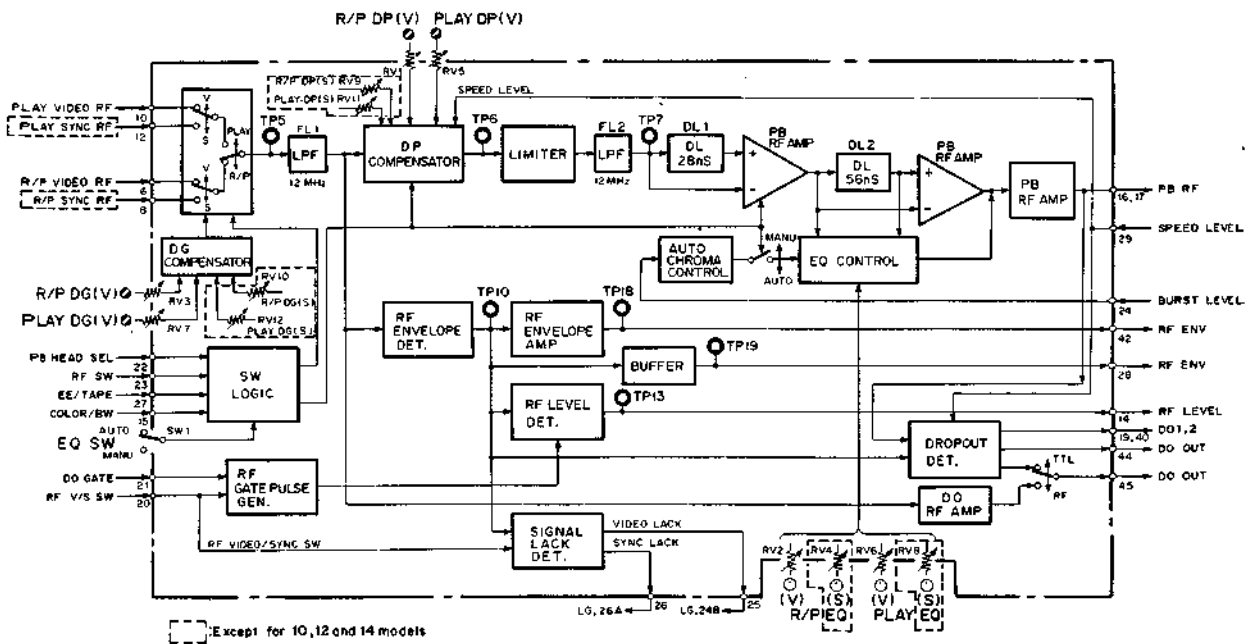
5-4-3. EQ-02 Board

The following description applies to the EQ-02 board with board number 1-606-659-12 or following.

1. Outline

The playback RF signal from the tape is supplied to the EQ-02 board by way of the playback amplifier on the RP-09 board. The differential gain (DG), differential phase (DP) and frequency response of this signal is compensated for on the EQ-02 board. On this board also houses an RF envelope detector and a dropout detector.

The playback RF signals from the R/P head and the PLAY head are supplied to this board, compensation for the DG gain of these signals are provided separately for each channel, and the signals are combined into a single signal after passing through the switcher. Next, the DP and frequency response of the signal is compensated for. After compensation, conversion is made to the emitter-coupled logic (ECL) level by the PB RF limiter and the signal is then output to the DM-25 board.



(5-4-3. EQ-02 Board)

2. DG Compensator (Q2,5,9,12) RF Switcher (Q1,4,8,11)

The frequency response near the RF carrier is changed and the DG of the signal compensated for by varying the Q of the emitter's resonance circuit.

During playback, the RF switcher is switched by the RF SW signal from the LG board and either of the channels (heads) is thereby selected.

3. PB RF Equalizer (Q22-24, 27, 29-32) DP Compensator (Q3,6,7,10,19 to 21,28,IC9)

This circuit compensates for the frequency response of the playback RF signals of the R/P video and R/P sync heads and of the PLAY video and PLAY sync heads.

The DP is compensated for simply by varying the phase characteristics without inducing any change in the RF amplitude characteristics.

4. Equalizer Controller (Q14 to 18,41,IC3,4,9)

A cosine equalizer is used to control the frequency response and only the amplitude characteristics is controlled without inducing any change in the phase characteristics.

When the AUTO/MANUAL switch S1 on the EQ-02 board is set to MANUAL, the frequency response of the equalizer is controlled by the DC voltage corresponding to the settings of the EQ controls on the board. When the same switch is set to AUTO, the burst level is made constant by the DC voltage corresponding to the level of the burst level signal supplied from the DM-25 board.

5. RF Envelope Detector (Q34,35,36,IC5,6,7,9,10)

Envelope detection for the RF signal is executed by IC6 and the detected RF envelope signal is output to the DT, MD and VM boards. The DT board is used for detecting the tracking error. The MD board is used for driving the VIDEO/RF meter. When the meter switch S1 on the front of the MD board has been set to RF(V), the envelope signal sampled by the timing of the video channel is output; when the same switch has been set to RF(S), (Except for 10, 12 and 14 models) the envelope signal sampled by the timing of the sync channel is output.

The VM board first amplifies the envelope signal and then outputs it to the WFM MONITOR OUTPUT connector on the connector panel.

6. Dropout Detector (Q37 to 40,IC8,14,21-26)

There are two types of dropout detector; one detects the level changes in the RF envelope; the other detects the dropouts from the RF frequency.

Detection with shallow dips in the RF envelope takes place at pin-4 of comparator IC8 and errors in the clamping of the sync separation on the DM board is prevented.

Detection with deep dips in the RF envelope takes place at Pin-9 of comparator IC8 and the signal is output to the time base corrector.

The RF envelope signal is supplied to the inverting input of comparator IC8 while a voltage smoothed by RC network is supplied to the non-inverting input of IC8. When the level of the RF envelope signal at the inverting input side drops even below the reference level of the non-inverting input side, this is detected in the form of a dropout.

The dropouts from the RF frequency is detected by retriggerable monostable multivibrator IC21. When this is triggered across the normal frequency range, its output is active but when triggered at a lower frequency than normal, an inactive interval is caused and this is detected as a dropout.

Furthermore, the RF frequency varies in the shuttle mode and so the time constant of the retriggerable monostable multivibrator is varied by the speed level signal from the DM board and in this way the detection level is compensated for.

When dropouts in the video or sync channel arising continuously for 400-micro seconds or more are detected, the video lack or sync lack signal is output to the LG board.

5-4-4. DM-25 Board

1. Outline

The PB RF signal from the EQ board and the EE RF signal from the MD board are supplied to the demodulator on this board, and one of these signals is selected by the EE/TAPE signal from the LG board.

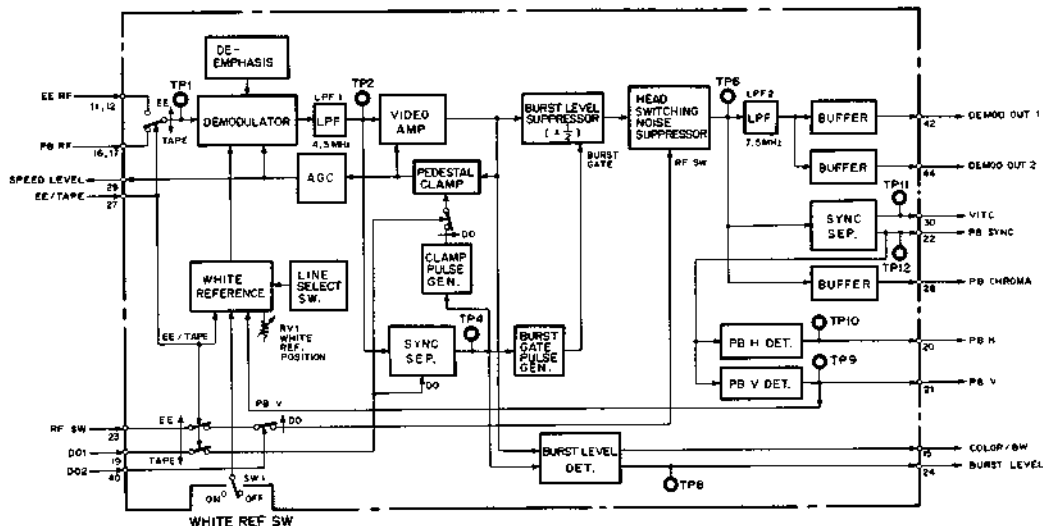
When the WHITE REF switch SW1 on the DM board has been set to ON and the VTR is in the EE mode, a frequency (10 MHz for NTSC/PAL, 8.9 MHz for PAL/SECAM) corresponding to the white peak is inserted into 2 lines of the vertical blanking period in accordance with the setting of the insertion line selector switch SW2A.

The demodulator operates with the pulse count system.

After the demodulation, the signal is supplied to the burst level suppressor by way of the de-emphasis circuit and video amplifier, and the burst level, amplified to double what it was during modulation, is returned to its proper level.

The head switching noise in the output is reduced by the suppressor and the output signal itself passes through the low-pass filter after which it is output to the VM board and to the AD board on the plug-in time base corrector.

In addition to the above circuits, the DM board is configured with a white reference marker generator, a pedestal clamber, an AGC circuit for keeping the video level constant in the shuttle mode, and PB V, PB H and burst level detector.



2. FM Demodulator (Q3 to 6, I5, IC1 to 6)

The PB RF or the EE RF signal, supplied at the ECL level, is converted to a TTL level by IC6 and, after selection by selector IC5, it is input to the pulse count system FM demodulator. The demodulator output is de-emphasized by R66 and C60, it passes through the buffer IC1 and low-pass filter LPF1 (4.5 MHz for NTSC/PAL-M, 5.5 MHz for PAL/SECAM) and it is supplied to the video amplifier and sync separator. The fluctuations in the video level which occur because the RF frequency varies due to speed changes in the shuttle mode is prevented by detecting the changes in the DC voltage of the pedestal after demodulation and by feeding back these changes with AGC circuit IC3.

3. Pedestal Clamber (Q10 to 12, IC11, 1A, 3C, 3D, 5D)

Feedback is applied to video amplifier IC12 and IC13 so that the back porch DC level of the demodulated video signals is made 0V and the pedestal of the IC13 video output is kept constant. The monostable multivibrator IC5D generates sampling pulses at the timing of the horizontal sync signal from the sync separator which will be described below. Q9, 10 and 11 configure a switch driver and switcher and the back porch of the demodulated video signal is sampled.

(5-4-4. DM-25 Board)

4. Sync Separator (IC1E,2F,3F)

The demodulated video signal is amplified approximately 3-times by the initial-stage operational amplifier IC3F.

In order to ensure accurate sync separation, any level below the sync tip produced in the single-head playback mode is DC-shifted by the next-stage operational amplifier IC3F using the dropout-1 signal from the EQ board, thus resulting in the elimination of any level below the sync tip.

D2 to 5 are analog switcher. The sync tip is sampled, its voltage is held in C24, this voltage is fed back to the drive voltage of the analog switcher with video signal whose pedestal level is fluctuating, and fluctuation is tracked.

Video signal in which the sync tip is clamped at 0V is produced at TP3, and it is only the sync portion of the video signal which is converted to the TTL level by the next-stage comparator IC1E and output

5. Burst Level Suppressor (IC4E,5E,Q12)

The burst level which was amplified 2-times by the MD board during recording is now returned to its regular level in the playback mode by this circuit.

6. RF Switching Noise Suppressor (Q13,14,IC1B,3B,14)

This circuit reduces the dropouts contained in the video signals which is played back from the tape and also the switching noise which is generated when the video/sync heads are switched.

7. White Marker Generator (IC2B,2D,2E,3A,3B,3C,4B)

When the WHITE REF switch SW1 on the DM board has been set to ON and the VTR enters the EE mode, one of the frequencies below corresponding to the white peak in the RF signal can be inserted into 2 lines of the vertical blanking period.

10 MHz for NTSC/PAL-M

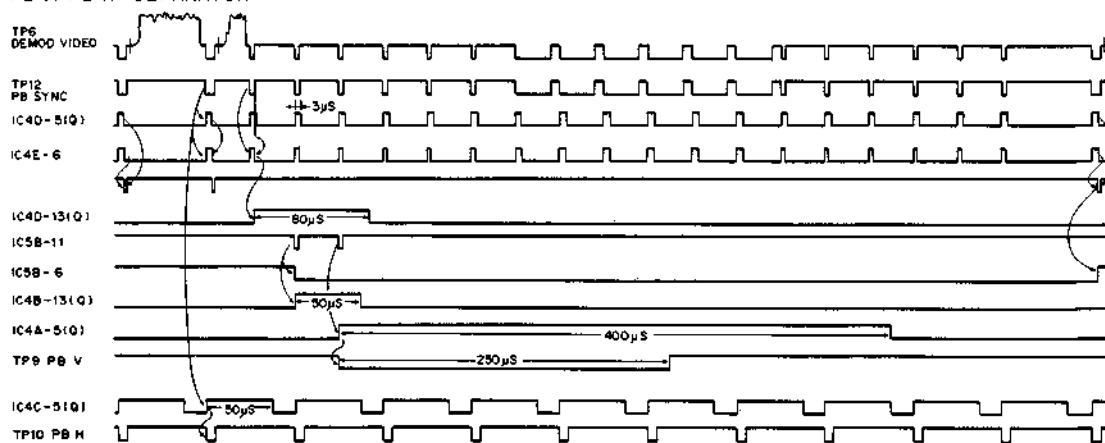
8.9 MHz for PAL/SECAM

The insertion line can be designated using insertion line selector switch SW2A.

8. PB H, PB V Detector (IC1A,1D,3B,3C,4A,4B,4C,4D,5A,5B)

The PB H and PB V signals are detected from the EE RF or PB RF demodulated video signals. The PB V signal is output with a width of 250 μ sec from the position of the third equalizing pulse.

PB V/PB H SEPARATOR



9. Burst Level Detector (Q7,8,IC7,8,9,3D,5C,5D)

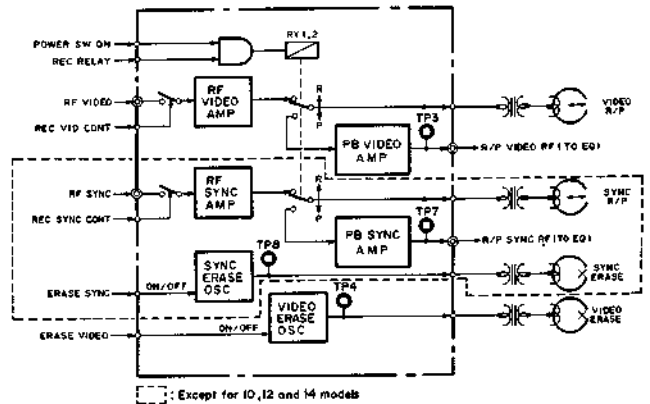
This circuit detects the envelope of the demodulated video signal's subcarrier component and samples the portion corresponding to its burst level. The sampling pulse is provided from the H SYNC signal produced from the PB SYNC signal.

The sampled voltage is held in C95 and is output as the burst level signal to the auto chroma equalizer on the EQ board. The playback RF characteristics is controlled here so that the burst level during playback is constant.

5-4-5. RP-09 Board

This board is composed of the PB RF and REC RF amplifiers for the R/P heads and the erase oscillators for the VIDEO/SYNC erase heads.

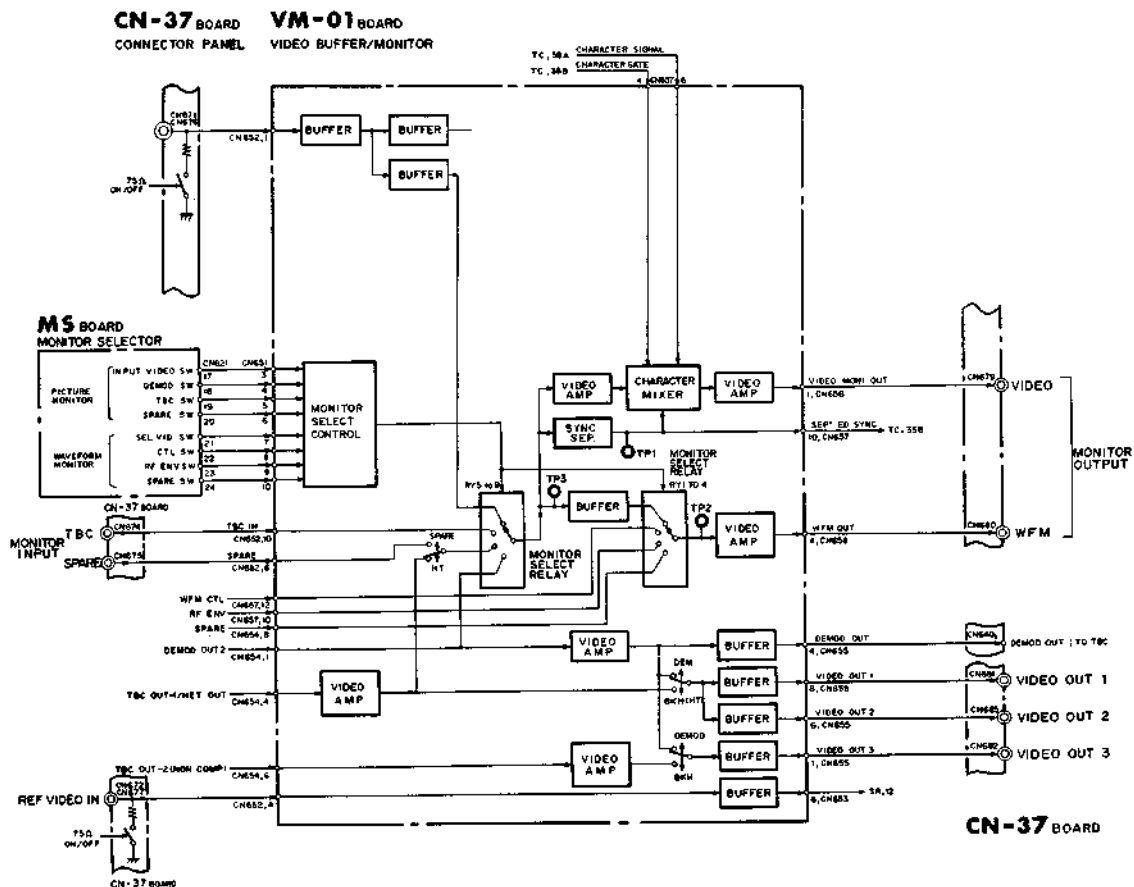
In the recording mode the RF VIDEO/SYNC signal from the MD board is amplified and supplied to the R/P head. Simultaneously, the VIDEO/SYNC erase oscillators are activated to drive the rotary erase heads. In the playback mode, the PB RF signals from the VIDEO/SYNC heads are amplified and output to the EQ board.



5-4-6. VM-01 Board

1. Outline

This board is configured with video input/output amplifiers and buffers. It also functions to select the signals which are output to the WFM MONITOR OUTPUT and the VIDEO MONITOR OUTPUT connectors and to superimpose characters from the time code generator/reader onto the VIDEO MONITOR OUTPUT signal.



(5-4-6. VM-01 Board)

2. Monitor Selector (IC1-8)

This switch circuit functions to output the signals designated by the front panel PICTURE MONITOR and WAVEFORM MONITOR selector switches from the VIDEO MONITOR and WFM MONITOR OUTPUT connectors.

3. Sync Separator (IC15,16)

As with the sync separator circuit on the MD board, this circuit reproduces the DC component of the video signal in which this component has been lost or in which there are fluctuations caused by noise.

4. Pedestal Clamper (IC14,17,18,19,Q3,5,6)

This circuit holds the pedestal level of the VIDEO MONITOR OUTPUT signal to 0V.

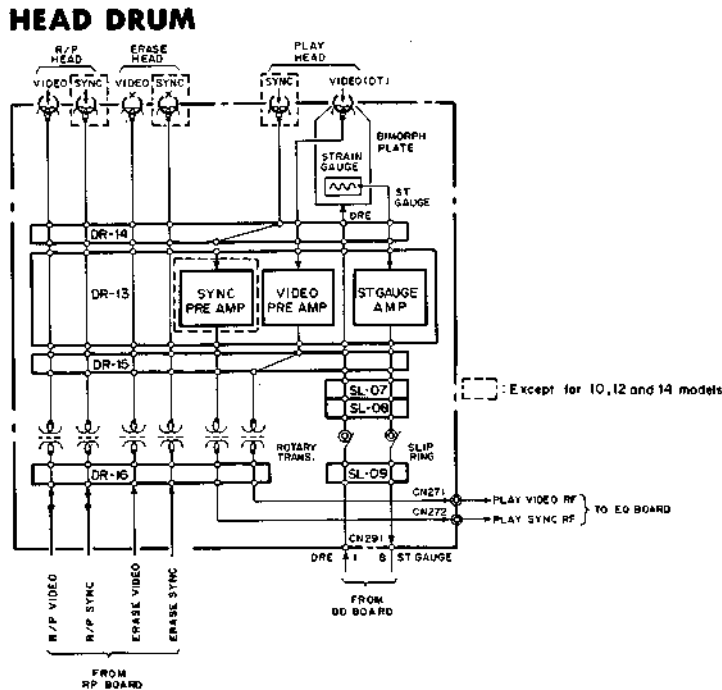
5. Character Inserter (IC9,10,19,20,Q1,2,4)

When the "CHARACTER GATE" signal from CN657-4 is set low, the "CHARACTER SIG" signal from CN657-6 can be inserted into the VIDEO MONITOR OUTPUT signal.

5-4-7. DR-13 Board

This board is housed inside the upper drum and it is configured by the amplifiers for the PLAY heads and by the STRAIN GAUGE amplifier for the DT head. It also functions to relay signals from the R/P heads and erase heads to the RP board.

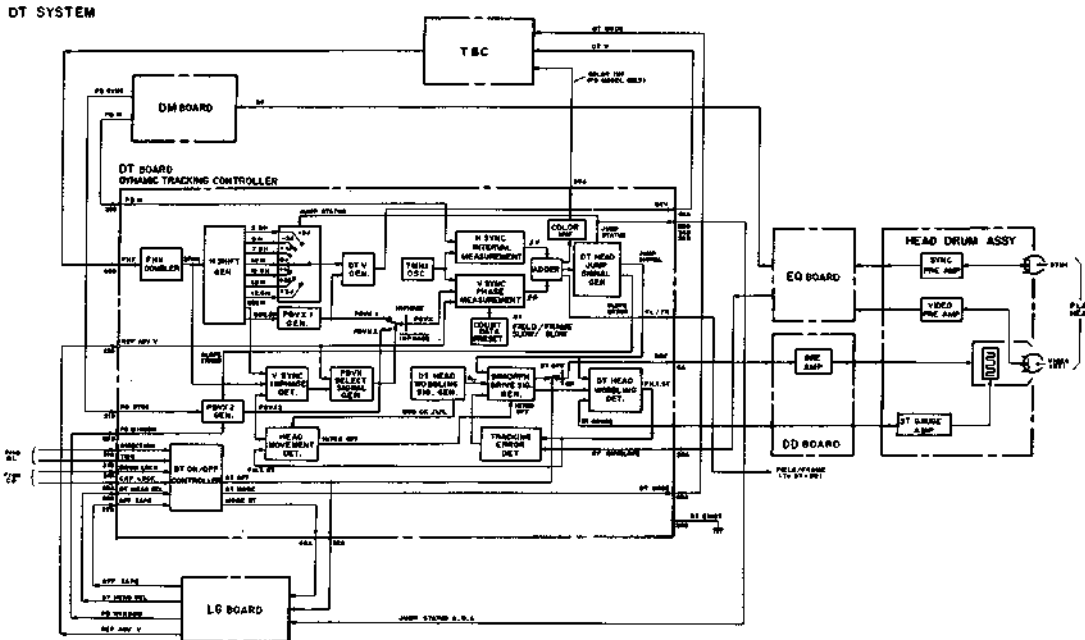
In addition to the DR-13 board, the head drum contains the DR-14/15/16 boards and SL-07/08/09 boards which are all used for relay purposes.



5-5. DYNAMIC TRACKING (DT) SYSTEM

5-5-1. Outline of DT System

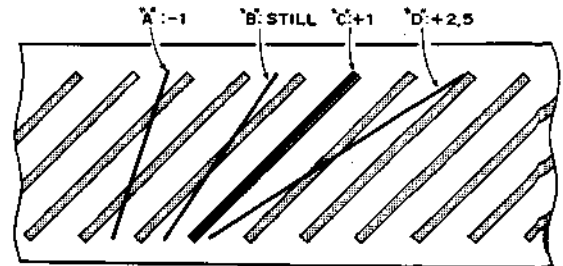
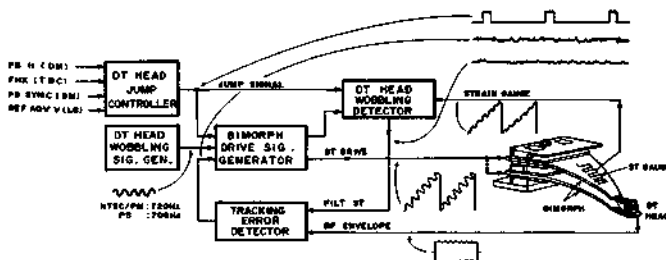
The DT system circuitry is composed of the DT board inside the card rack, the DD board of the tape transport block and the DR board inside the upper drum, and it serves to control the DT head and TBC sync system.



5-5-2. Principle of Arbitrary Playback

Among the informations required for optimum arbitrary playback are the jump amount information, the slant error information and the tracking error information. These signals are added together, the wobbling signal is further superimposed onto these signals, and they are used as the bimorph drive signal.

In the figure, "A" represents the head path with $-1x$ speed, "B" with STILL, "C" with $+1x$ speed and "D" at $+2.5x$ speed, respectively. This occurs since the writing speed (relative speed) of the head with respect to the tape speed relies on the tape speed and the rotation speed of the drum. The writing speed is thus detected and the slant is compensated for so that the head moves in parallel with the track path.



1. Slant Compensation

The angle at which the head traces the surface of the tape during playback at $1x$ normal speed is the same as the angle of the video track which has been recorded onto the tape. However, when the tape is played back at a different speed, the angle at which the head traces and the recording track angle do not coincide. As a result, a tracking error (slant error) is caused, resulting in guard band noise visible on the playback picture.

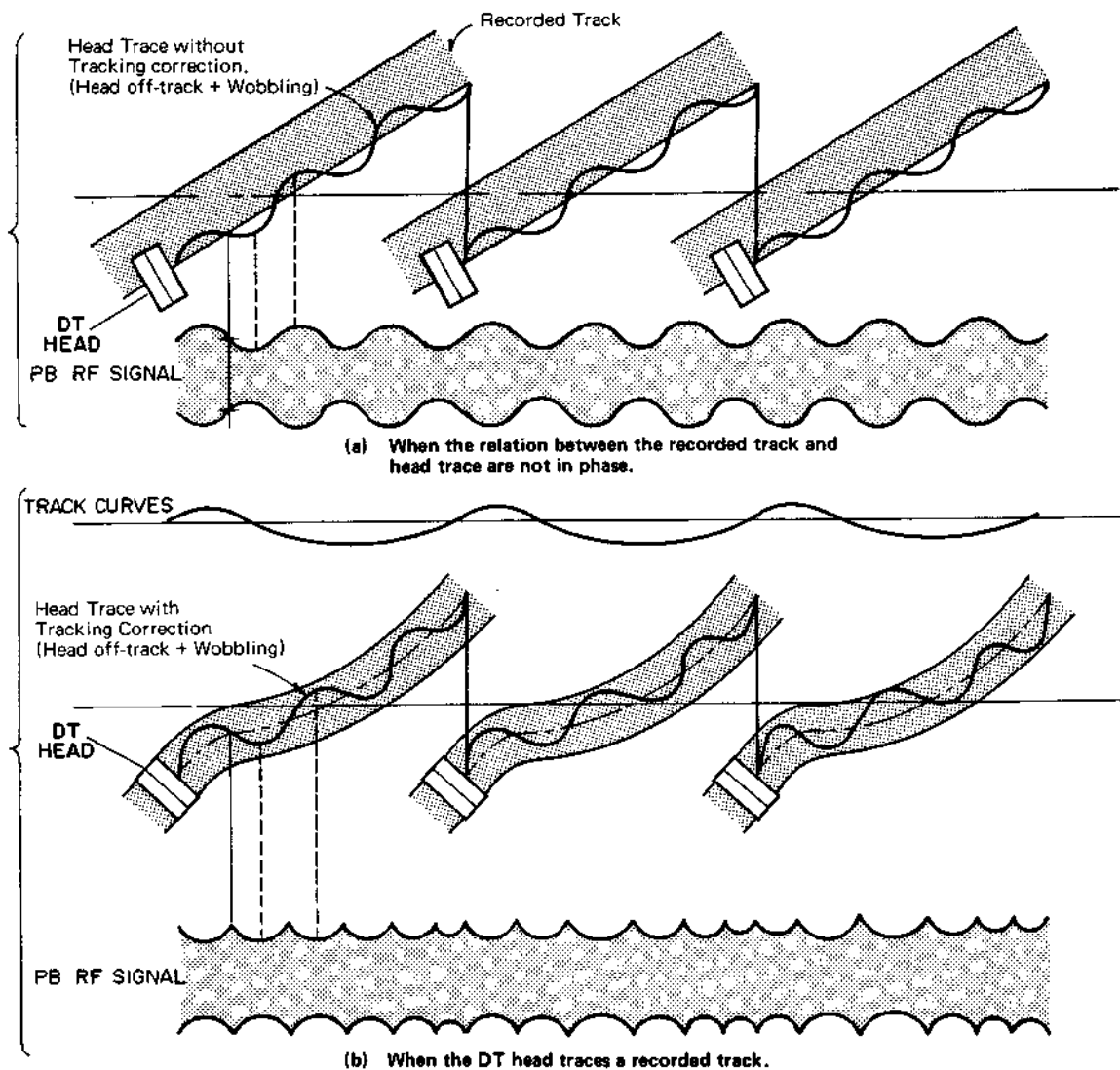
For the phase error to be compensated for by the DT function, the DT head must have a maximum $\pm 1/2$ track pitch displacement. For instance, when the DT head is in the center of adjoining tracks, it must be displaced $1/2$ pitch either up or down in accordance with the playback speed. Furthermore, when the DT head has started tracing a specific track, the slant error must be compensated for until the tracing of the track has been completed.

2. Tracking Control

A tracking error will occur if the DT head is simply displaced at the angle of the video track at the arbitrary playback. This is due to a phase shift of the track or the linearity of the DT head path and video track.

In order to safeguard against this tracking error, the bimorph, onto which the DT head is mounted, is wobbled at a constant frequency (720 Hz with NTSC/PAL, 700 Hz with PAL/SECAM) in the direction parallel to the recording head gap, and the tracking error is detected from the amplitude-modulated playback RF signal.

A strain gauge is adhered to the bimorph leaf to indicate the DT head movement but, since sawtooth waves for driving the bimorph indicating the head jump are also included along with the wobbling signal, the undesirable components are removed and filtered out by a subtractor and high-pass filter, and only the wobbling components are taken out. The wobbling signal which indicates the head movement is multiplied by the amplitude modulated RF envelope signal, it passes through the low-pass and notch filters, and it is detected as the tracking error information. The detected tracking error information is returned to the drive signal and the track is traced.



5. THEORY OF OPERATION

3. Track Jump Control

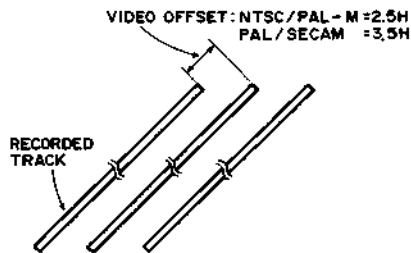
The video offset of the video tracks, as defined by the type C format, is $2.5H$ for NTSC/PAL-M systems and $3.5H$ for PAL/SECAM systems. When the head has jumped to the adjacent track, the phase of the playback video signal shifts $2.5H$ ($3.5H$). Consequently, in order to make effective use of the TBC window or secure an overlap, controlled must be exercised, no matter what the speed, so that the phase of the playback video signal does not shift excessively.

The PBVX2 signal (see Section 5-5-3. Item 6), which is detected from the equalizing pulse indicating the phase of the video signal, serves to judge which track is being traced. Normally, however, the PBVX1 signal, which operates stably, is used as the V reference although, when something goes wrong with the FHX signal from the TBC, this signal is automatically switched to the PBVX2 signal. When the phases of the PBVX1 and PBVX2 signals shift for more than 4 fields in succession, the phase of the PBVX1 signal is compensated for using the IN PHASE generator by the timing of the PBVX2 signal.

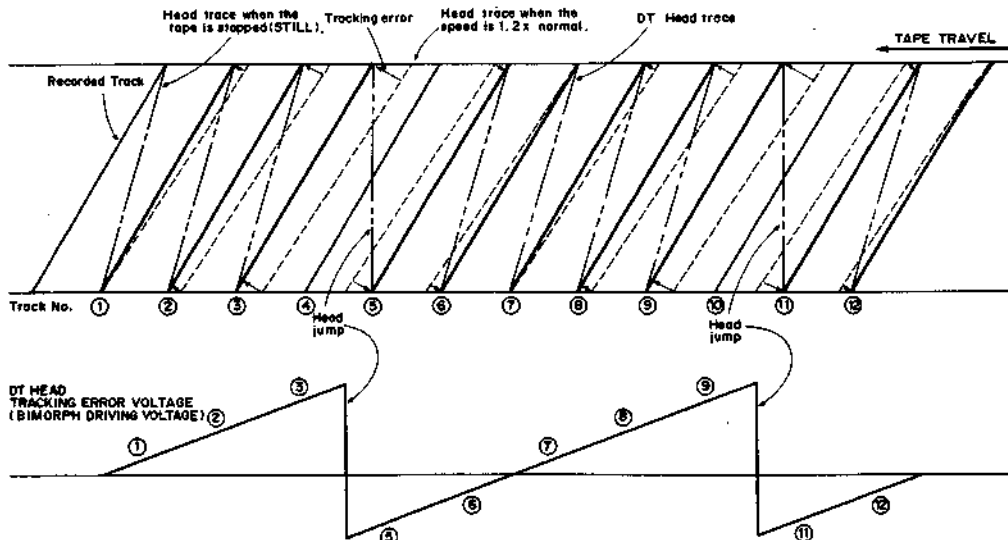
Overlap tracing is required for the video tracks for slow playback, while interval tracking is required for playback at a different speed above the $1x$ normal speed.

DT playback at a $1.2x$ speed is used below as an example.

The path of the DT head, which is fixed with respect to the recording tracks (solid lines) on the tape, is shown as dotted lines. In order for tracking to be conducted properly, the DT head must be displaced from the dotted lines to the thick lines. In the example below, the 4th and 10th tracks are skipped. The position and size of the head jump are controlled by the head's writing speed information relative to the tape, which is detected from the DT playback signal and phase difference information, which in turn is detected from the relationship between the DT playback signal and reference signal, which in turn is detected from the input video signal.



TRACKING AND HEAD JUMP IN ARBITRARY PLAYBACK



5-5-3. DT-04 Board (DT-05 Board in PS model)

1. Outline of Digital Trace Circuit

While the arbitrary playback, the DT head either skips the video recording tracks (interval tracing) or traces the tracks by overlapping (overlap tracing), and every time the tracing of one track is completed, the judgment as to which track should be traced next is controlled by the digital tracing control section. The digital tracing control section is composed as follows.

H SYNC INTERVAL COUNTER

V SYNC PHASE DETECTOR

ADDER

The tracing of the DT head with respect to the recording tracks is selected by the data (Δf , $\Delta\phi$) from these circuits.

As a result, a signal is output to the H shift selector as the "JUMP STATUS" signal and the DT V phase, as the V information of the playback picture, is controlled.

Furthermore, the "JUMP STATUS" signal is D/A converted and superimposed onto the bimorph drive signal (DRE) so that the head will jump the tracks.

In the case of the PS model, the "JUMP STATUS" signal is encoded and output as the "COLOR INFORMATION" signal to the TBC in order to maintain the continuity of the burst phase of the playback signal after the head has jumped tracks.

H SYNC INTERVAL COUNTER

This detects the writing speed (Δf) of the recording tracks and head during arbitrary playback.

The PB H signal from the DM board is waveform-shaped and then its frequency is halved (divided by 3 for the PS model). The divided PB H signal cycle is measured by the 7 MHz clock signal.

V SYNC PHASE DETECTOR

The time difference between the REF ADV V signal from the LG board and the PBVX signals obtained from the playback signal is sampled by the 7 MHz clock signal, and the phase difference ($\Delta\phi$) of the video signal is detected.

ADDER

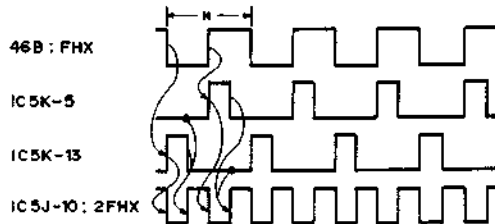
This processes the tape speed data (Δf) and the phase data ($\Delta\phi$), and it determines the amount of track jump in accordance with the results obtained.

2. FHX Doubler

Input into pin 46B on the DT board is the H period FHX signal with a duty cycle of 50%. This signal is in-phase with the playback video signal, which has been stabilized to a high degree by the AFC circuit and which has been sync-separated from the playback video signal at the TBC.

One-shot IC5K-5 is triggered at the positive going edge of the FHX signal and IC5K-13 is triggered at the negative going edge, respectively, and the 2FHX signal, produced by doubling the FHX signal, is output from the NOR gate IC5J-10.

FHX DOUBLER



3. H Shift Generator

The highly stable horizontal sync signal (FHX), produced by separating it from the playback video signal in the TBC, is input this circuit. It is used to detect the V signals (PBVX1, DT V) during arbitrary playback. Furthermore, it is reset by the V signal (PBVX2) detected from the playback signal and its phase is also aligned. When the DT head jumps a track, a 2.5H (or 3.5H with the PS model) phase shift results per track. Consequently, one field interval is counted by the counter IC5L5H with the 2FHX signal from the FHX doubler, and this is divided into the interval during which the DT head traces the track and the into interval during which the DT head jumps the track upon completion of the tracing.

During the interval when the DT head is tracing the tracks, the 2FHX signal is counted up to 505, which is equivalent to 252.5H (or 602, equivalent to 301H, with the PS model), by the counter IC5L5H, and while the count is taking place, the H shift selector IC5F is prevented from operating. When the 505 count is completed and it is the turn of the head jump interval, the output (H shift amount) of the H shift selector IC5F is selected by the JUMP STATUS A, B and C signals in 2.5H steps from 2.5H to 17.5H (3.5H steps from 1H to 22H with the PS model).

JUMP STATUS			HEAD JUMP/H SHIFT	
C	B	A	NTSC/PAL-M	PAL/SECAM
0	0	0	+3 TRACK/17.5H	—
0	0	1	—	-3 TRACK/1H
0	1	0	-3 TRACK/2.5H	-2 TRACK/4.5H
0	1	1	-2 TRACK/5H	-1 TRACK/8H
1	0	0	-1 TRACK/7.5H	0 TRACK/11.5H
1	0	1	0 TRACK/10H	+1 TRACK/15H
1	1	0	+1 TRACK/12.5H	+2 TRACK/18.5H
1	1	1	+2 TRACK/15H	+3 TRACK/22H

4. PBVX1 Detector

This detector is composed of IC4G-9 and IC4O-4, and the V sync signal is for checking the video phase at the tail of the tracks which have performed DT playback. The PBVX1 signal is in-phase with the PBVX2 signal, which has been detected from the playback signal mentioned later, but when the PBVX1 signal phase has shifted, it is locked by the PBVX2 signal.

5. DT V Generator

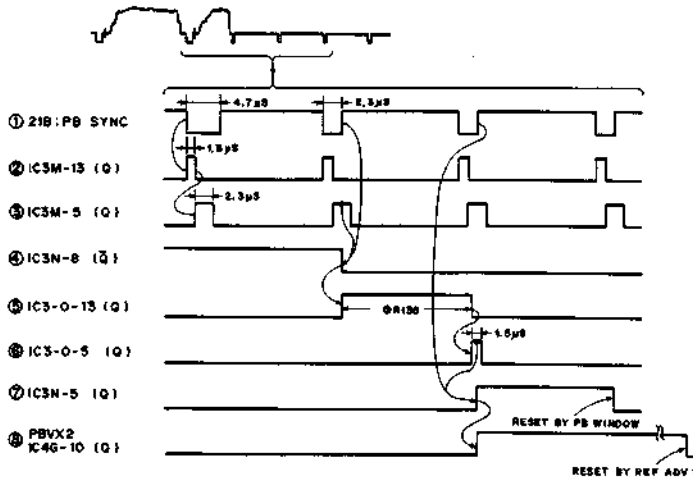
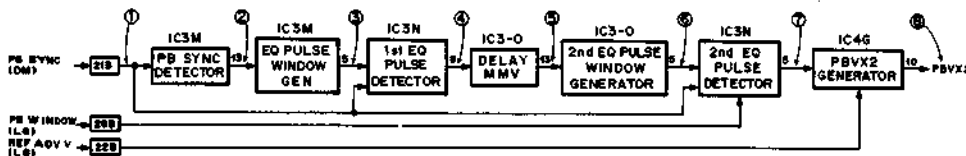
The DT V generator IC5N is triggered by the reset pulses from the H shift generator, it provides a 1.75H (0.25H for the PS model) shift, and its signal is used as the TBC's V sync signal. The DT V signal is output at the starting part of the video track which is now to be traced and it is equivalent to 13th line (10th line with the PS model) of the video signal. Furthermore, the pulses, which are output after 2H from the timing at which the DT V signal is output, are supplied to the DT ON/OFF controller IC5O, and they are used to switch the TBC's video processing (DT mode switching).

6. PBVX2 Detector

This detector's signal is used to judge the track jumping with DT playback and it is also used as a reference for the TBC's V sync signal.

As can be seen in the figure below, the PBVX2 signal is detected at the timing of the rise in the equalizing pulse of the PB SYNC signal supplied from the DM board, and output it from IC4G-10.

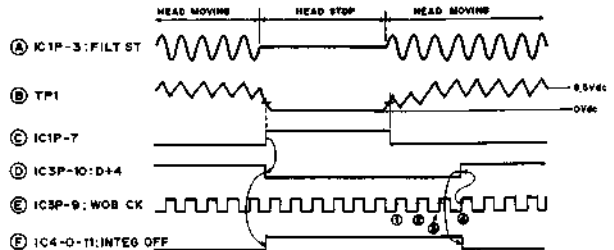
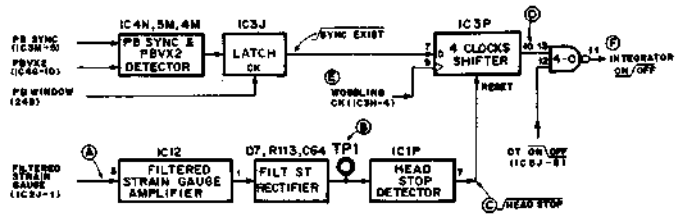
PBVX2 DETECTOR



7. Head Movement Detector

This detector monitors the FILT ST (Filtered Strain Gauge) signal indicating the DT head movement and, when the DT head has stopped moving, the "INTEG OFF" signal is output and the head operation is reset. This "INTEG OFF" signal is also output even when the PB sync signal and PBVX2 signal are not detected and when the VTR is not placed in the DT mode.

HEAD MOVEMENT DETECTOR

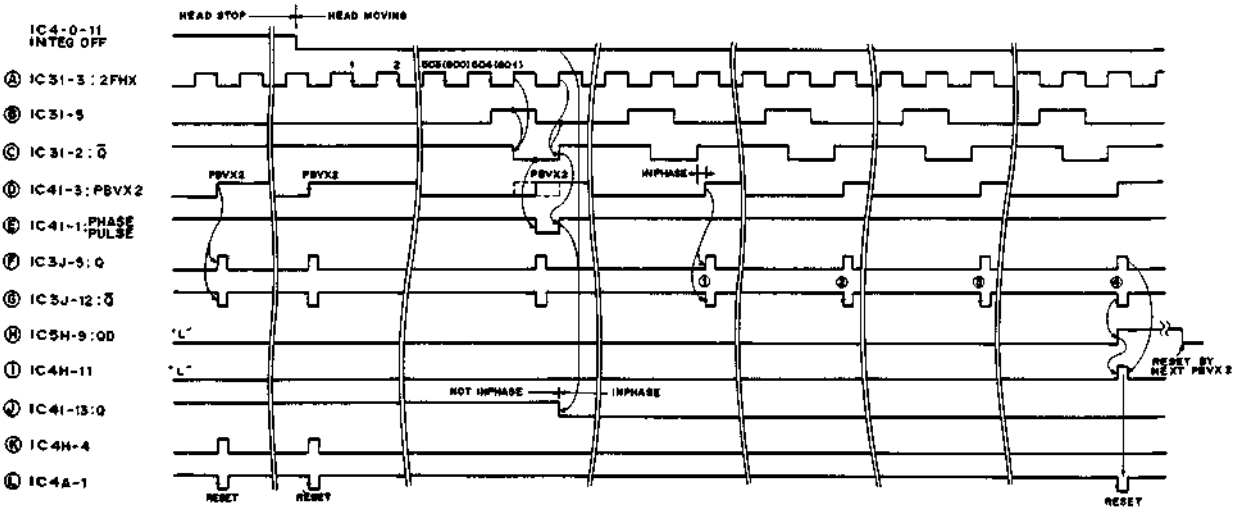
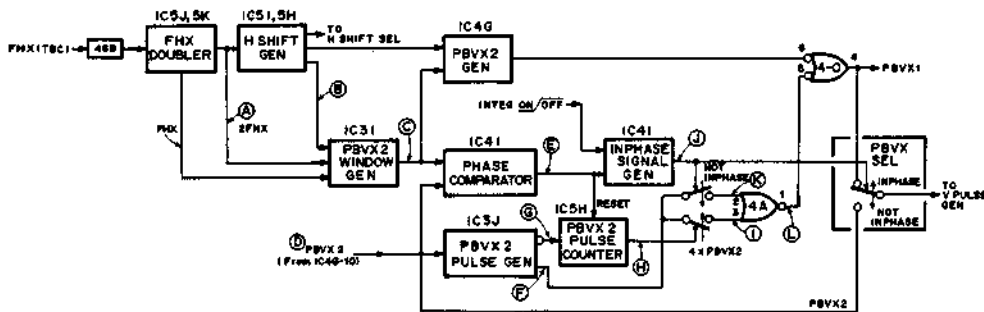


8. V Sync In-phase Detector

In the DT playback mode, the FHX signal supplied from the TBC is counted and the PBVX1 and DT V signals are produced. However, when, for instance, the FHX signal fluctuates due to an excessively high skew error or noise, this causes the head jump amount to deviate and also the phase with respect to the reference signal of the video signal which is output from the TBC to shift.

This circuit functions to compare the phases of the PBVX2 signal detected from the PB sync signal and of the PBVX1 signal detected from the FHX signal. When the phases do not coincide for 4 fields in succession, the H shift generator and DT V generator are reset at the timing of the PBVX2 signal, and the phases are brought back into synchronization.

V SYNC INPHASE DETECTOR

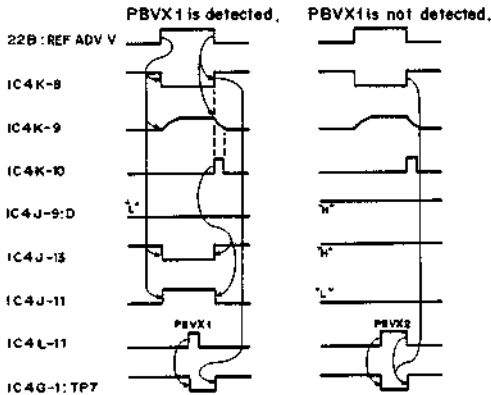
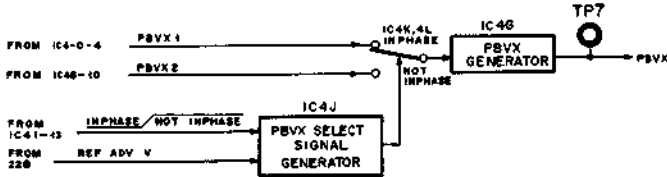


5. THEORY OF OPERATION

9. PBVX Selector

This serves to check the operating status of the V sync in-phase detector at the timing of the REF ADV V signal from the LG board. When the FHX signal from the TBC is not input or when the DT system stops operating and the INTEG OFF signal is output from the head movement detector, the PBVX2 signal is automatically selected. Furthermore, the PBVX1 signal is selected when the DT system's operation is returned to normal.

PBVX SELECTOR



10. DT ON/OFF Controller

This circuit controls the ON/OFF of the DT function and outputs the "DT MODE" signal which expedites the processing of the video signal to the TBC.

The DT system functions under the following conditions:

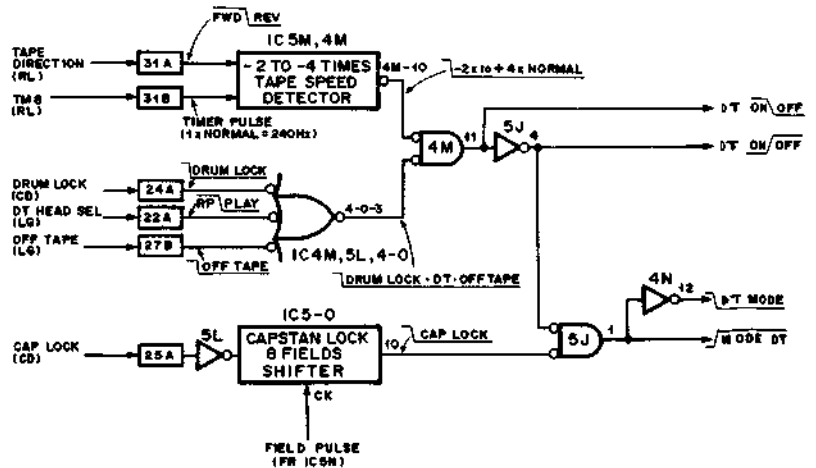
- HEAD Selector PLAY (22A:DT HEAD SEL=low)
- Drum servo Locked (24A:DRUM LOCK=low)
- VTR PB Mode (27B:OFF TAPE=low)
- Tape speed -1x to +3x speed

When the VTR is in the shuttle mode, the tape speed is limited to the -1x to +3x range by the pin 22A DT HEAD SEL signal (low).

The tape speed is detected by measuring, using one-shot IC5M, the period of the timer pulses (240 Hz at 1x normal speed) input into pin 31B. IC4M-10 is set low when the tape speed is in the -2x to +4x speed range.

The "CAP LOCK" signal, which has been input into pin 25A, indicates the operation of the capstan servo. When the capstan servo is locked, this signal is set low, the field interval pulses which are input into shift register IC5-O from the DT V generator are counted, and when the capstan servo is locked for 8 or more fields in succession, the IC5-O Q output is set high and the TBC's DT processing is released. When pin 25A has been set high, the IC5-O Q output is immediately set low and, before the head starts jumping or, in other words, while the subcarrier's continuity is still in tact, the VTR moves into the DT mode.

DT ON/OFF CONTROLLER

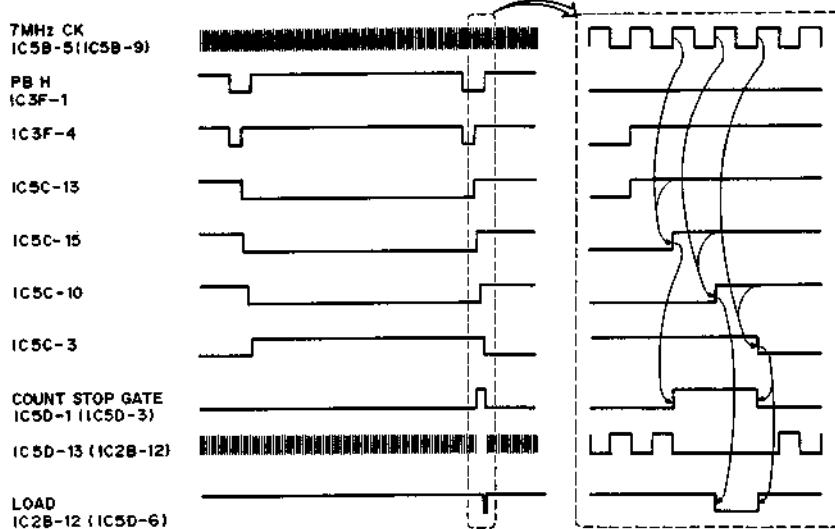


(5-5-3, DT-04/05 Board)

11. Trigger Pulse Generator

The clock generator oscillates at a frequency of 14.31818 MHz. The 7 MHz clock pulses, produced by halving the oscillation frequency, are synchronized by the PB H signal from the DM board, and they are used as the H sync interval counter's clock pulses and load pulses. The 7 MHz clock pulses, which have not been synchronized, are used for the V sync phase detector and V pulse generator.

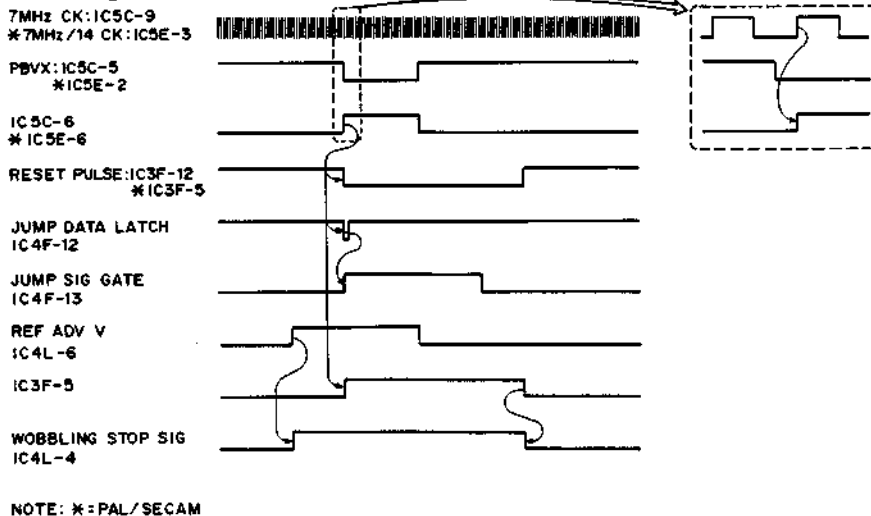
TRIGGER PULSE GENERATOR



12. V Pulse Generator

This generator produces the various control signals at the timing of the REF ADV V signal and PBVX signal synchronized by the 7 MHz clock pulses in the NTSC/PAL-M model or synchronized by the 7 MHz clock pulses, which have been divided by 14, in the PAL/SECAM model.

V PULSE GENERATOR



13. H Sync Interval Counter

The 7MHz clock pulses, which have been gated by the trigger pulse generator, are input into this circuit. In the NTSC/PAL-M model, 2H interval clock pulses (3H interval clock pulses in the PAL/SECAM model) are counted, and the change (Δf) in the time base of the horizontal sync signal during arbitrary playback is measured. The results of this measurement are added to the output ($\Delta\phi$) of the V sync phase detector, which will be described later, and the jump signal is produced. The 7MHz clock signal is produced by halving the 14.31818 MHz frequency. Consequently, the two horizontal sync (3 horizontal sync with the PS model) time at 1x normal speed is 127.1 μ sec (192 μ sec with the PS model).

This means that the H sync interval counter counts 910 (1377 with the PAL/SECAM model) but, in actual fact, the 7 MHz clock pulses entering the counter stop in a time equivalent to 2 clock pulses and so the counter counts 908 (1375 in the PAL/SECAM model) instead.

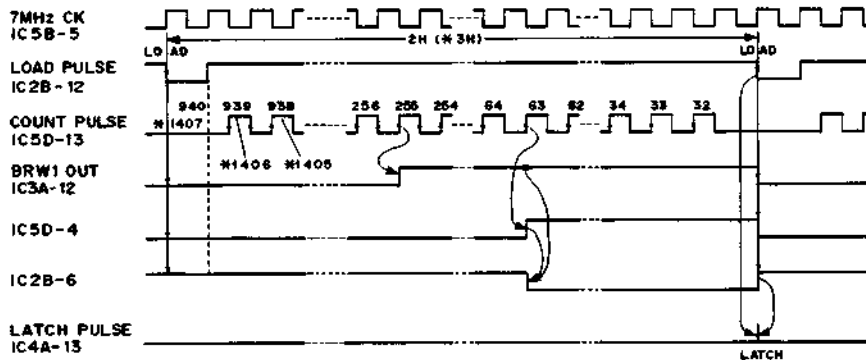
The interval counter is preset to a count of 940 (1407 in the PAL/SECAM model) and when the count stop period arrives, it is loaded with the load pulses from the trigger pulse generator, and it starts counting down.

With a 1x normal speed, the counter data output is latched to IC1C by the load pulses from the trigger pulse generator at the 32 count timing, and it is simultaneously loaded into the preset value.

With arbitrary playback, the timing of the load pulses differs from that with 1x normal speed and so the value of the counter's data output is incremented or decremented, and the count is changed from 14 to 49 (10 to 52 in the PS model) across a -1x to +3x speed range.

H SYNC INTERVAL COUNTER

EX. TAPE SPEED = 1X NORMAL



NOTE: * = PAL/SECAM

14. H Sync Interval Comparator

This circuit is a protection circuit which assesses whether the data latched by the H sync interval counter are normal.

The H sync interval counter in the previous stage is loaded every 2H (every 3H with the PS model) and its data are latched into IC1C. The data, prior to being latched again into IC1C, are latched into data latch IC2D. The comparator IC2C supplies the high-order 4 bits among the 6-bit data latched into IC1C and IC2D to the A0, A1, A2, A3 and B0, B1, B2, B3 inputs, and the A=B output is set high when these two sets of data tally. When the "A=B" pin of comparator IC2C-6 is kept high for 3 intervals in succession, the data are judged to be normal and IC2B-8 is set low, and the data are latched into IC1D as the " Δf " data.

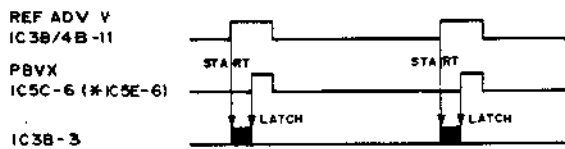
(5-5-3. DT-04/05 Board)

15. V Sync Phase Detector

This circuit detects the difference ($\Delta\phi$) between the phase of the REF ADV V signal, which is input from the LG board, and the phase of the PBVX signal which has been synchronized with the 7 MHz clock signal by the V pulse generator. Along with the Δf data from the H sync interval comparator, it is used to judge the head jump amount.

IC4E and IC5E are preset to 37 and the 7 MHz clock frequency is divided by 37 (or 56 by the V pulse generator in the PAL/SECAM model). In accordance with the FIELD/FRAME switch S2 setting, IC3B and IC4B are preset to 186 (or 161 in the PAL/SECAM model) in the FIELD SLOW mode and to 202 (or 177) in the FRAME SLOW mode. The preset value can be finely adjusted by switch S1. IC3B and IC4B count down while the REF ADV V signal is high, and the pulses are latched as the Δf signal into IC3C (IC4C in the PAL/SECAM model) at the positive going edge of the PBVX signal.

V SYNC PHASE DETECTOR



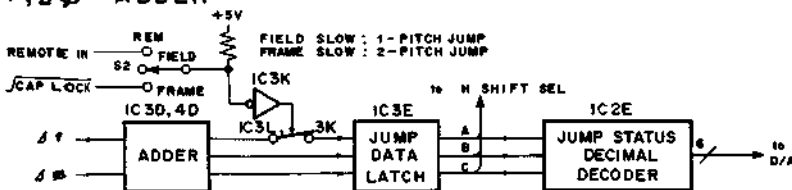
16. Δf , $\Delta\phi$ Adder

This circuit calculates the head jump amount required during arbitrary playback from the Δf and $\Delta\phi$ data detected by the V sync phase detector and H sync interval comparator. The results of this operation are output as 8-bit data but only the high-order 3 bits are used as the actual jump data.

The high-order 3 bits data (JUMP STATUS A, B, C) are supplied to the H shift selector and the H shift amount is controlled. Furthermore, these data are decoded into a decimal value by IC2E, D/A converted by jump signal generator IC1P and IC2F, the slope error signal, detected by IC1E, is superimposed onto these data, and they are output to the integrator.

Reference should be made to the H shift generator in subsection 2 for details on the head jump amount as it relates to the changes in the JUMP STATUS A, B and C data.

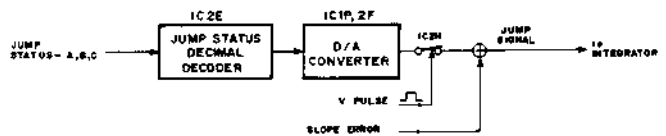
Δf , $\Delta\phi$ ADDER



17. Jump Signal Generator

This circuit converts the 3-bit data (JUMP STATUS A, B, C), which have been supplied from the adder and which have been decoded into a decimal value, into an analog voltage, and it generates the head jump information. The head must jump during the vertical blanking period and so, only when the V pulse from the V pulse generator IC4F-13 is high, the jump signal is added to the slope error signal and output to integrator IC1N-2.

JUMP SIGNAL GENERATOR



18. Slope Error Generator

This circuit converts the digital 6-bit data from the H sync interval counter into an analog signal. The analog signal, which has been D/A converted by IC1E and IC1F, is supplied to the one-shot IC3-O time constant circuit in the PBVX2 detector where it is pulse-width-modulated (PWM).

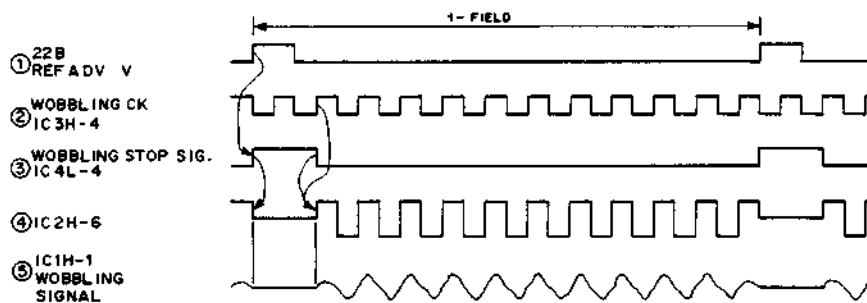
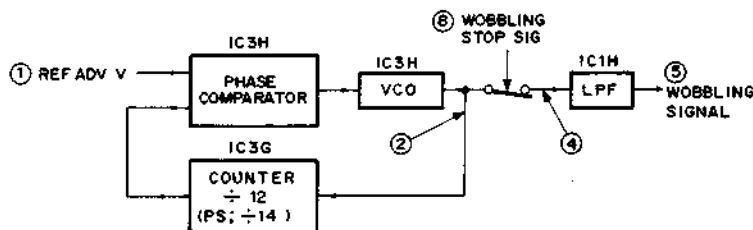
The PBVX2 signal is detected by this modulation at the positive going edge of the PB SYNC signal input into pin 21B. In addition, the D/A converted analog signal is added to the output of the jump signal generator and supplied to integrator IC1N-2, and the slope voltage for driving the bimorph is generated.

19. Wobbling Signal Generator

This circuit serves to wobble the bimorph leaf, on which the DT head is mounted, at a fixed frequency (720 Hz for the NTSC/PAL-M system; 700 Hz for the PAL/SECAM system) in a direction perpendicular to the recording track. The tracking error is detected from the movement of the strain gauge mounted on the bimorph leaf.

IC3H and 2H form a phase-locked loop circuit for generating the wobbling signal, and they output a frequency which is 12 times (14 times for the PAL/SECAM system) the field frequency. While the head is jumping, the output of the wobbling signal is inhibited by the wobbling stop signal from the V pulse generator IC4L-4. Moreover, a low-pass filter, which is composed of IC1H, is inserted into the circuit so that the wobbling starts smoothly and so that wobbling is not added to the ringing which occurs after the head has jumped.

WOBBLING SIGNAL GENERATOR



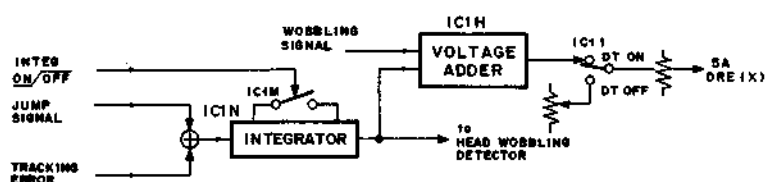
20. Bimorph Drive Signal Generator

The bimorph drive signal is produced by the following three signals:

1. Jump signal detected from Δf , $\Delta \phi$ slope error
2. Tracking error signal
3. Wobbling signal

When the "INTEG OFF" signal from the head movement detector is input, the integrator IC1N-2 is reset and only the wobbling signal is supplied to the bimorph.

BIMORPH DRIVE SIGNAL GENERATOR

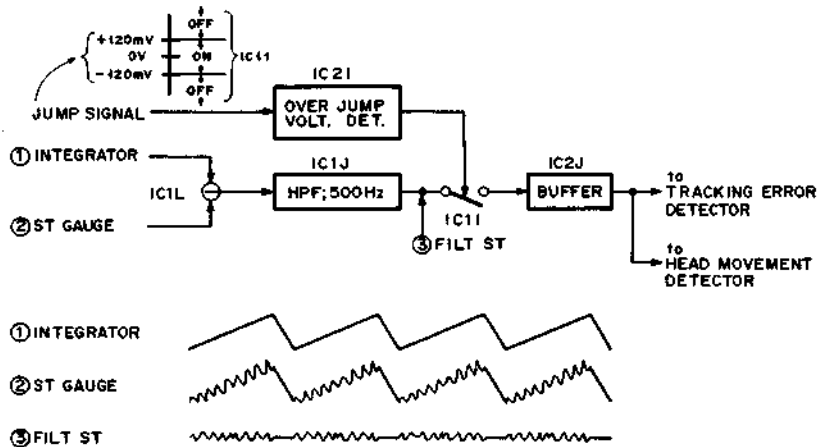


21. Head Wobbling Detector

In addition to the wobbling components, the PB RF signal during DT playback also contains resonance frequency and other components as well as delay and mechanical distortion created by wobbling the bimorph leaf. Therefore, the status of the actual DT head tracing is detected from the output of the strain gauge which is mounted on the bimorph leaf. The strain gauge signal from the head drum is supplied to IC1L-3 while the output of the integrator IC1N-1 is supplied to IC1L-2. The two signals are subtracted, the slope waves are removed,

the undesirable components are filtered out by the high-pass filter IC1J-1, and the remaining signal is input into the multiplexer IC2K of the tracking error detector as the FILT ST (Filtered Strain Gauge) signal. In order to safeguard against incorrect operation of the DT head, the current rushing into the integrator is detected by IC2I. When it exceeds ± 120 mV, IC1I is turned off and the FILT ST signal output is inhibited.

HEAD WOBBLING DETECTOR

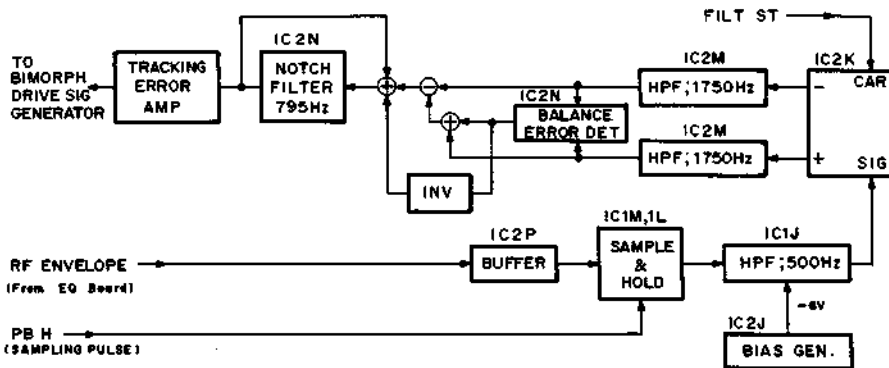


22. Tracking Error Detector

This circuit serves to multiply the RF envelope signal from the EQ board and the FILT ST signal from the head wobbling detector using IC2K and to detect the tracking error. The RF envelope signal from the EQ board is sampled by IC1M-15 at the timing of the PB H signal, it is further amplified by approximately 30dB by IC1L-7 and it is supplied to multiplier IC2K through the high-pass filter IC1J. The tracking error signal is sent to the output of the multiplier IC2K. In fact,

the neighboring double frequencies of the wobbling are filtered out by the high-pass filters IC2M. the frequencies mainly generated by imbalance in the circuitry are filtered out by the notch filter IC2N, and the remaining signal is output to the bimorph drive signal generator.

TRACKING ERROR DETECTOR



(5-5.3. DT-04/-05 Board)

23. Color Information Signal Generator (PS model only)

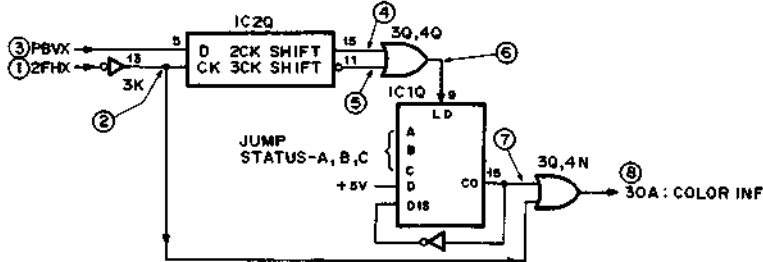
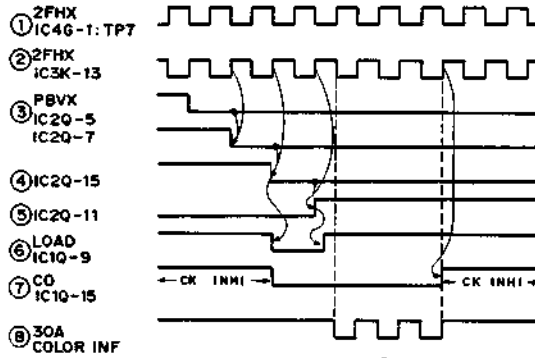
When the head jumps across neighboring tracks, the subcarrier continuity is lost because of the EBU type C format's video offset (3.5H) and PAL system. Therefore, pulses corresponding to the head jump amount are supplied to the TBC as the color information signal and these are controlled so that the burst detected by the TBC can be predicted.

HEAD JUMP (TRACK)	-3	-2	-1	0	+1	+2	+3
NUMBER OF PULSE	4	3	2	1	4	3	2

The JUMP STATUS signal is input into the preset pin of the presettable up counter IC1Q, and the preset value changes in accordance with the head jump amount.

When, for instance, the head has jumped ± 2 tracks, pins D, C, B and A of IC1Q are set to "1100 (12_{10})", and when the counter counts 3, the carry out (CO) signal is set high and the IC3Q-1 output is inhibited. Consequently, three negative polarity pulses are output to the color information signal of pin 30A.

COLOR INFORMATION SIGNAL GENERATOR EX. ± 2 TRACK JUMP



5-6. SYSTEM CONTROL SYSTEM

5-6-1. Outline of System Control System

The circuitry of the system control system is composed of the three circuit boards (SY-79, SY-80 and LG-02) in the card rack and the two circuit boards (SA and DY) inside the optional function control panel (hereafter called the "control panel") BKH-2011/2012/2013.

There are three kinds of control panels: Type I (BKH-2011), Type II (BKH-2012) and Type III (BKH-2013). By replacing the control panels, it is possible to use the VTR system at different levels.

CARD RACK BLOCK

SY-79 Board: A CPU is mounted on this board. It generates the commands for communicating between the external equipment which is connected to the control panel and remote connectors, decoding the statuses and for controlling the VTR hardware.

SY-80 Board: A CPU is mounted on this board. While exchanging information between the servo system and optional time code reader/generator (BKH-2015A: TC-14A board), it controls the audio and video recording/playback timing signals which are output from the LG-02 board in accordance with the commands supplied from the SY-79 board.

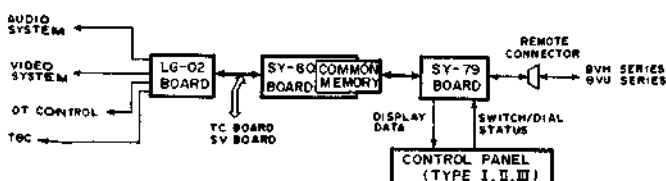
LG-02 Board: This outputs the control signals, corresponding to the command signals from the SY-80 board, to the various boards. Some of the output signals are output after having been synchronized with the sync signal.

CONTROL PANEL BLOCK

SA Board: This relays the data indicating the settings of the switches on the control panel to the SY-79 board and, in accordance with the data from the SY-79 board, it controls the lighting/extinguishing of the LEDs inside the switches.

DY Board: This generates the signals which indicate the SEARCH dial's rotational angle and direction, and it outputs the signals to the SY-79 and SY-80 boards. Furthermore, it displays the characters, which correspond to the display data supplied from the SY-79 board, on the fluorescent display.

SYSTEM CONTROL BLOCK DIAGRAM



5-6-2. Outline of SY-79 Board

This board generates the VTR control signals, based on the signals from the equipment which has been connected to the remote connectors and control panel, and it writes these signals into the common memory of the SY-80 board. In addition, it generates the remote control signals and outputs them to the remote connectors.

1. CPU

The CPU (Central Processing Unit) is operated by the 2.4576 MHz clock signal in accordance with the program written into the 28K-byte ROM. Major control over the VTR is carried out by interruption handling with each field and control, which involves a leeway in terms of time, is carried out in the programmed sequence by non-interruption handling (steady level handling).

A brief description of the I/O signals connected to the CPU is given below.

φ: This is the CPU clock input signal. It is generated by halving the output of the 4.9152 MHz crystal oscillator to 2.4576 MHz and by shaping its waveform. It is input as the clock signal of the CPU.

RESET: The CPU is reset by the following two commands:

- When the CPU RESET switch S3 on the SY-80 board is pressed.
- When the power is switched on and the POWER ON RESET pulse is supplied.

WAIT: The CPU ceases to operate while the "SY WAIT" signal from the SY-80 board is low. When the common memory IC1J (1K RAM) on the SY-80 board has already been accessed by the CPU on the SY-80, the "SY WAIT" signal is input in cases where an attempt has been made to access the common memory from the SY-79 board CPU.

INT (INTERRUPT):

NMI (NON-MASKABLE INTERRUPT):

There are two CPU interruption handling signals: INT and NMI. INT denotes interruption which can be enabled or disabled by the software program; NMI denotes interruption which cannot be disabled by the software program.

WR (WRITE OUT):

RD (READ OUT):

The software program relating to cases where WRITE or READ is output contains commands for the I/O port and commands for the memory.

MREQ (MEMORY REQUEST):

When a WRITE is requested to the memory, both the WR and MREQ become active.

(5-6-2. Outline of SY-79 Board)

IOREQ (INPUT/OUTPUT REQUEST)

On the SY-79 board the serial input/output (SIO) and CTC (Counter/Timer Circuit) are used as the I/O ports. When these are accessed, IOREQ becomes active and in all other cases the MREQ is used.

2. CTC

The CTC (Counter/Timer Circuit) has separate counter/timers for each of the four channels although only three channels are used with the SY-79 board.

When the REF V signal from the RL board of the servo system is input into the first channel CTC (IC2H), the CPU is interrupted field by field, and the VTR's operating status is monitored and controlled by the system control program.

The second channel CTC counts the dial pulses from the control panel and the count value is read into the CPU through the data bus.

The third channel CTC is used to control the REMOTE-2 (9-pin) port communication. It is used to judge whether the line has been interrupted for 10msec or more.

3. SIO

The SIO (Serial Input/Output) is used for inputting and outputting the remote control data. It conducts full duplex communication at a data signaling rate of 38.4 kbits/sec, which is produced by dividing the 2.4576 MHz clock signal frequency

by 64, and it conforms to the RS-422-A standard. The CPU is interrupted every time data sending or receiving has been concluded either when a response to the transmission is being awaited or in order to analyze the receive data.

4. ROMs

Written into these ROMs are the 28K-byte program data for controlling the various systems in accordance with the commands from the control panel or the equipment which is connected to the remote connectors. One ROM has a capacity of 4K-byte, and the ROMs are accessed by the addresses below with the address decoder IC4F.

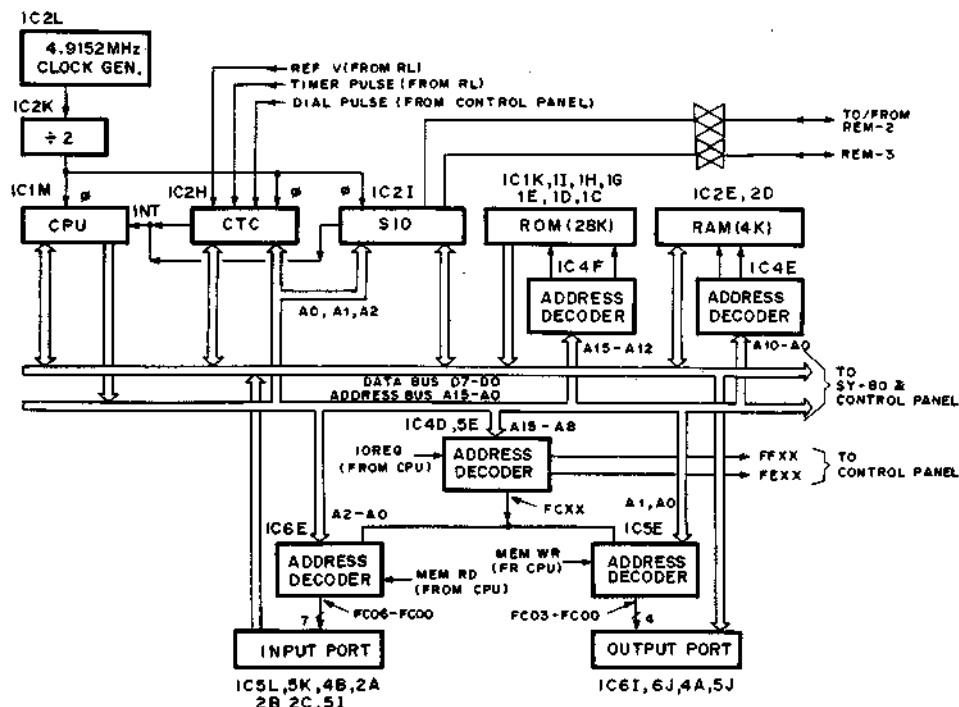
- IC1K: 0000H - 0FFFH
- IC1I: 1000H - 1FFFH
- IC1H: 2000H - 2FFFH
- IC1G: 3000H - 3FFFH
- IC1E: 4000H - 4FFFH
- IC1D: 5000H - 5FFFH
- IC1C: 6000H - 6FFFH

5. RAMs

The RAMs transfer the data to and from the CPU on the SY-79 board. One RAM has a 2K-byte capacity. The RAMs are accessed by the addresses below with the address decoder IC4E.

- IC2E: 8000H-87FFH
- IC2D: 8800H-8FFFH

SY-79 BOARD BLOCK DIAGRAM



5. THEORY OF OPERATION

5-6-3. Outline of SY-80 Board

This board converts the control commands supplied from the SY-79 board into control data and controls the audio and video timing signals which are output from the LG board. Moreover, it transfers the status data and control data to and from the time code generator/reader and the servo system.

The commands from the SY-79 board are read into the CPU through the SY-80 board common memory. The common memory is composed of a 1K-byte RAM, it can handle data reading and writing from the CPUs of both the SY-79 and SY-80 boards, and data are transferred to and from the CPUs by reading out at one end the data written at the other end.

1. CPU

The CPU (Central Processing Unit) is operated by the 2.4576 MHz clock signal in accordance with the program written into the 12K-byte ROM. As with the SY-79 board, major control over the VTR is carried out by interruption handling with each field and control, which involves a leeway in terms of time, is carried out in the programmed sequence by non-interruption handling (steady level handling).

2. CTC

When the REF V signal is input into the first channel CTC, the CPU is interrupted field by field, as with the SY-79 board, and the VTR's operating status is monitored and controlled by the system control program.

The dial pulses are input into the second channel CTC which counts them, as with the SY-79 board. The pulses are counted in the SHUTTLE mode by the SY-79 board and in the JOG mode by the SY-80 board.

The third and fourth channel CTCs count the pulses when the timer roller is rotating in the forward or reverse direction.

3. ROMs

Written into these SY-80 board ROMs are the 12K-byte program data for directly driving the hardware. One ROM has a capacity of 4K-byte, and the ROMs are accessed by the addresses below with the address decoder IC2D.

IC1F: 0000H - 0FFFH

IC1D: 1000H - 1FFFH

IC1C: 2000H - 2FFFH

4. RAM

The RAM transfers the data to and from the CPU on the SY-80 board. It has a 2K-byte capacity and it is accessed by the 8000H-87FFH addresses with the address decoder IC2E.

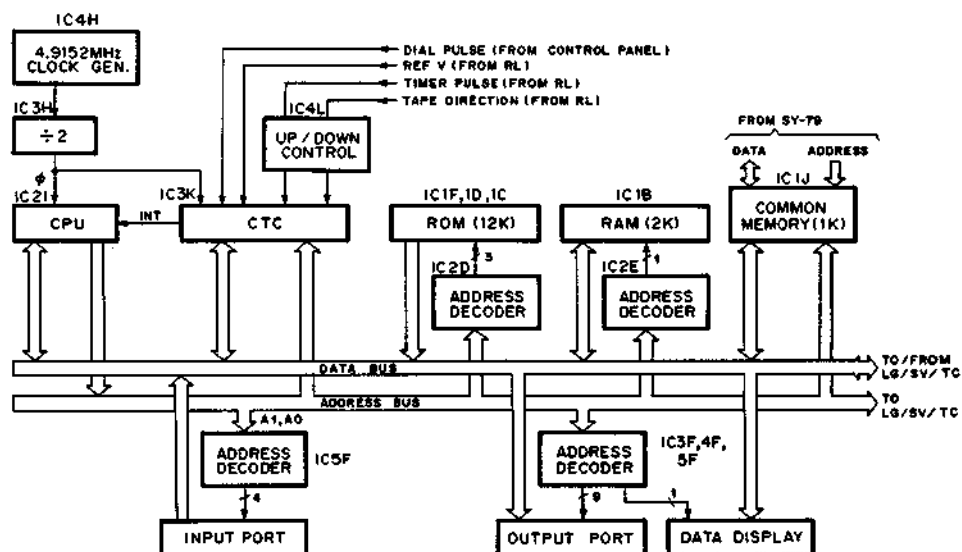
5. Common Memory

IC1J (RAM) is a common memory which intermediates in the communication between the respective CPUs on the SY-79 and SY-80 boards.

The capacity of the IC1J is 2K-byte. Half this capacity, or 1K-byte, is used as the common memory and it is accessed by the A000H to A3FFH addresses while the remaining capacity, or 1K-byte, is used as the system memory and is accessed by the A400H to A7FFH addresses.

The operating commands from the control panel and remote connectors are converted into command data on the SY-79 board, they are written into the common memory, the data, which have been written by the SY-80 board, are read out and the hardware is controlled. The hardware status data are written by the SY-80 board, the data thus written are read out by the SY-79 board, and the operating statuses of the various sections are checked.

SY-80BOARD BLOCK DIAGRAM

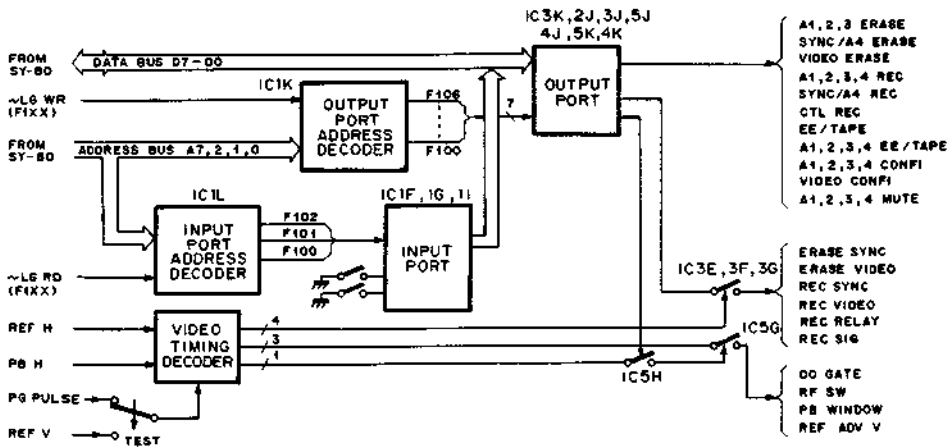


5-6-4. Outline of LG Board

The SY-80 board data bus and the decoded address bus signals are input into the LG board which is used as an input/output port of the SY-80 board. Moreover, this board generates the recording and playback switching signals for audio and video signals.

The audio system is controlled by command signals input from the SY-80 board CPU, and erase, recording, simultaneous recording/playback (CONFIDENCE) and muting are controlled. The switching signals of the video and sync heads for recording/playback are generated from the vertical and horizontal sync signals input from the servo system.

LG BOARD BLOCK DIAGRAM



5-6-5. Control Panels (BKH-2011, 2012, 2013)

1. Outline

Since the operations and circuit configuration of the three function control panels are identical, the description below is confined to the BKH-2013 panel which has the most functions. When the switches on the control panel are pressed or when they are set and a mode is specified, the corresponding data are input to the CPU on the SY-79 board. When the SY-79 CPU receives the mode command from the control panel, it sends back to the control panel the control data for lighting the LEDs inside the switches and the display on the control panel.

2. Input Control Block

The switches and keys on the control panel are configured in the form of a matrix. The row of this key matrix are connected to the address bus via the address decoder while the column are connected to the data bus via the port.

When viewed from the SY-79 CPU, these switches and keys are arrayed from the FE00H address to the FE07H address.

When the SY-79 key scan program is started, the statuses of the switches corresponding to the address data output by the CPU are read into the CPU.

Connected to address FE07H on the key matrix are diodes which indicate the type of control panel. The type of panel used with the VTR is detected by the bit-7 and bit-6 logic.

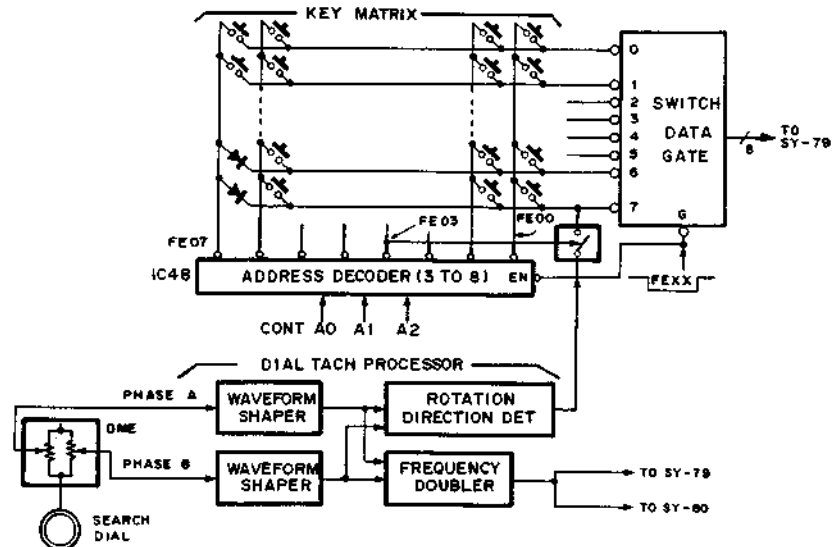
ADDRESS FE00H

Bit-7	Bit-6	TYPE
0	0	BKH-2011
0	1	BKH-2012
1	0	BKH-2013

On the SEARCH dial a multi-polar magnet is mounted in the form of a disc. When the dial is rotated, a signal with a 90° phase difference is produced from the divided magnetic element (DME) mounted adjacently. This signal is waveform-shaped by the DY board, and both the signal indicating the rotational direction of the SEARCH dial and the dial pulse signal proportionate to the dial's rotational angle are generated. The angular resolution of the dial pulses is 2.5°.

The signal (data) indicating the rotational direction of the dial is assigned to bit-7 of address FE03H while the dial pulse signal is output to the respective CTCs of the SY-79 and SY-80 boards.

INPUT CONTROL BLOCK



(5-6-5. Control Panel)

CONFIGURATION OF KEY MATRIX

ADDRESS	TYPE	Bit-7	Bit-6	Bit-5	Bit-4	Bit-3	Bit-2	Bit-1	Bit-0
FE00 _H	I	----	STANDBY	SHUTTLE	JOG	VAR	REC	PLAY	STOP
	II	EDIT	STANDBY	SHUTTLE	JOG	VAR	REC	PLAY	STOP
	III	EDIT	STANDBY	SHUTTLE	JOG	VAR	REC	PLAY	STOP
FE01 _H	I	----	ADV	SHIFT	HOLD	RESET	----	----	PREROLL
	II	----	ADV	SHIFT	HOLD	RESET	SPOT ERS	PREVIEW	PREROLL
	III	VAR MEM	----	----	HOLD	RESET	SPOT ERS	PREVIEW	PREROLL
FE02 _H	I	----	----	----	----	----	----	ENTRY	PRESET
	II	AUTO	-	+	TRIM OUT	TRIM IN	OUT	IN	PRESET
	III	AUTO	----	A SPLIT	A OUT	A IN	OUT	IN	----
FE03 _H	I	DIAL DIR	----	----	----	----	----	----	----
	II	DIAL DIR	INSERT	ASMBL	VIDEO	SYNC/A4	A3	A2	A1
	III	DIAL DIR	INSERT	ASMBL	VIDEO	SYNC/A4	A3	A2	A1
FE04 _H	I	----	TC	TM2	PB H	INPUT	EXT	TAPE	IN CHK
	II	----	TC	TM2	PB H	INPUT	EXT	TAPE	IN CHK
	III	----	TC	TM2	PB H	INPUT	EXT	TAPE	IN CHK
FE05 _H	I	----	----	----	----	----	----	----	----
	II	----	----	----	----	----	----	----	----
	III	7	6	5	4	3	2	1	0
FE06 _H	I	----	----	----	----	----	----	----	----
	II	----	----	----	----	----	----	----	----
	III	SET	-	+	F	T	C	9	8
FE07 _H	I	LOW	LOW	----	----	----	----	----	----
	II	LOW	HIGH	R	P	----	----	----	----
	III	HIGH	LOW	R	P	A OUT	V OUT	A IN	V IN

Reading the Key Data using the Matrix

The method described below relates to when the PLAY switch on the BKH-2013 has been pressed.

The address decoder IC48 is enabled by the "~FEXX" signal from the SY-79 board, it decodes the "CONT A0,A1,A2" signals from the SY-79 board, and it scans addresses FE00H to FE07H on the matrix. When the PLAY switch is pressed, bit-1 of address FE00H is set high and this is read into the CPU on the SY-79 board through the data bus buffer IC34. The FE00H address data, which have been read into the CPU on the SY-79 board, are read into the CPU on the SY-80 board through the transport memory in the SY-80 board common memory, in order to control the local machine, and the LG and SV boards are controlled. The equipment connected to the REMOTE-2/-3 connectors on the rear panel is controlled by the CPU on the SY-79 board.

3. Display Control Block

The LEDs inside the switch, SEARCH LED, buzzer and fluorescent display are controlled by the display control section.

The LEDs inside the switches are arrayed in addresses FE00H, FE01H, FE02H, FE03H, FE05H and FE07H, and the SEARCH LED is arrayed in address FE04H.

When the CPU is writing data, the switch and SEARCH LEDs are selected; when it is reading data, the key matrix is selected. The data, input from the CPU on the SY-79 board through the data bus, are first latched, and the ON/OFF operations of the LEDs inside the switches and SEARCH LED are controlled in accordance with the data.

The buzzer control port is arrayed in addresses FE05H and FE06H. When the VTR malfunctions and the buzzer sounds continuously, it is controlled by bit-7 of the FE05H address. It is controlled by bit-0 of the FE06H address when the buzzer is sounded once for confirmation when a switch has been pressed. The SEARCH dial clutch is controlled by bit-2 and bit-1 of address FE06H. For example, when the VTR is in the PROGRAM JOG mode, a click is added to the SEARCH dial at the STILL, ±1x and ±3x speed positions.

The time code, timer, tape speed, alarm message and edit point can be displayed on the fluorescent display. The type and number of characters which are displayed on the fluorescent display differ according to the type of control panel which is being used.

- BKH-2011: 7-segment numerical/12-digit display
- BKH-2012: 5x7-dot/40-character, single-row display
- BKH-2013: 5x7-dot/40-character, double-row display

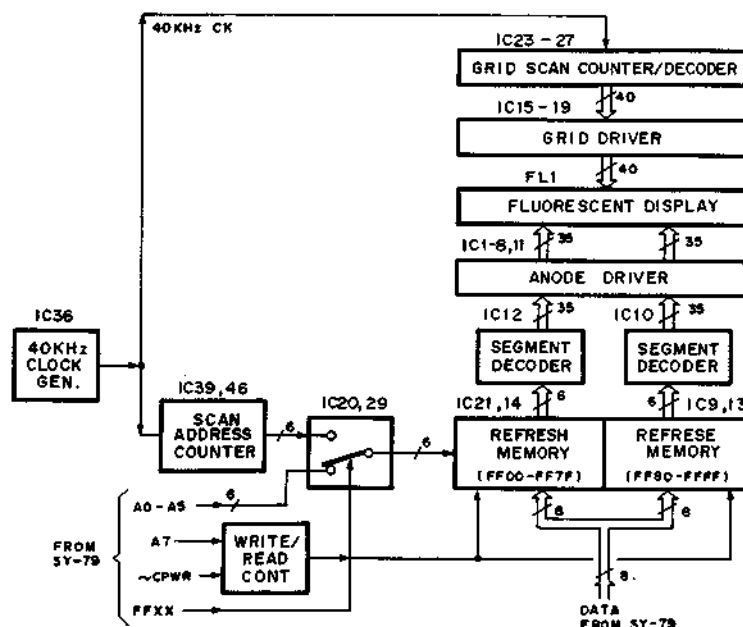
The following description is confined to the BKH-2013.

The display data from the SY-79 CPU for the top row of the fluorescent display are input into refresh memory IC21 and IC14 (RAMs) while the display data for the bottom row are input into IC9 and IC13 (RAMs). In accordance with addresses "A5 to A0," the data are stored one character at a time in the refresh memory and they are read out in sequence by the scan address counter, which will be described later. The top row display data are written into addresses FF00H to FF7FH; the bottom row display data are written into addresses FF80H to FFFFH.

The stored display data are read out as follows.

The clock generator IC36 oscillates a 40kHz. This frequency is divided down by 8 at IC39 to 5kHz and the resulting clock pulses are counted by address counter IC39 and IC46. The address counter output passes through the multiplexer IC20 and IC29, it simultaneously accesses the address inputs of the refresh memories for the top and bottom rows, and the stored display data are read out in sequence one character at a time. The display data, which are now read out, are converted into 35-bit pattern data by segment decoders IC12 and IC10, the data pass through the anode driver and are input into the fluorescent display. The grid pins (G1 to G40) of the fluorescent display are driven through the grid driver IC15 to IC19 by the grid scan counter/decoder IC23 to IC27. This has the effect of driving grid pins G1 to G40 in sequence and in displaying the pattern, which has been input into the common anode, at the designated position.

DISPLAY CONTROL BLOCK FOR BKH-2013



5-6-6. Outline of Remote Control

When the REMOTE/LOCAL switch on the level control panel is set to the REMOTE position, remote control can be carried out from an external VTR or editor. The switch is set to the LOCAL position when the local machine is used as the master machine when editing.

When the switch has been set to REMOTE, it is no longer possible to perform any operation using the controls on the control panel although the following operations are possible with the settings of the switches on the SY-79 board.

S9-4	S9-5	POSSIBLE OPERATION
OFF	OFF	None
OFF	ON	STOP
ON	OFF	TOP.REC.PLAY.VAR.JOG.SHUTTLE
ON	ON	Mode other than P(Player) & R(Recorder)

There are three remote control connectors: REMOTE-1, REMOTE-2 and REMOTE-3. These can be selected in accordance with the controller using the REMOTE switch S6 on the SY-79 board. The D-SUB 15-pin connector and D-SUB 9-pin connector are used respectively for the REMOTE-1 and REMOTE-2 connectors. The control signals handled are the same.

- REMOTE-1: Used when performing remote control through the CCJ converter.
- REMOTE-2: Used when performing remote control by RS-422-A serial signals.
- REMOTE 3: Used when performing remote control by the parallel I/O signals.

(In case of 10, 12 or 14 model, there is no REMOTE-1.)

1. REMOTE-1 Connector

The REMOTE-1 connector is a D-SUB 15-pin connector which is used to connect equipment with a CCJ (10-pin) type round REMOTE I/O connector through the BKH-2016 CCJ converter. When the REMOTE switch on the SY-79 board is set to REMOTE-1, the multiplexer IC4M-9 and IC4M-10 goes low, and the SIO (IC2I-15) TXDA output is converted into a balanced serial signal by line driver IC4-O-2. This serial signal is output from pin 32B/32A to the REMOTE-1 connector on the connector panel as the CCJ OUT +/- signal. Furthermore, the CCJ IN +/- signal, which is input from the REMOTE-1 connector to pin 30B/30A, is input into SIO through line receiver IC4Q-13.

The signals below are allotted to the various pins of the REMOTE-1 connector.

TIMER PULSE	①	⑨	GND
CCJ IN (-)	②	⑩	CCJ IN (+)
CCJ OUT (-)	③	⑪	CCJ OUT (+)
TAPE DIRECTION	④	⑫	+12V OUT
-12V OUT	⑤	⑬	GND(±12V)
+5V OUT	⑥	⑭	GND(+5V)
CTL OUT (X)	⑦	⑮	CTL OUT (G)
REMOTE OUT	⑧		

Pin-1: TIMER PULSE

This is a negative timer pulse with a pulse width of 8μsec which has been CTL-corrected by the RL board. It is used to count the frames.

Pin-2,10,3,11: CCJ IN/OUT

These signals are serial data which are input from and output to the SY-79 board. The signal system is based on the RS-422-A standard.

Pin-4: TAPE DIRECTION

This signal indicates the tape direction: a high signal is output when the tape travels in the forward direction and a low signal is output when it travels in the reverse direction.

Pin-5,6,12,13,14: +5V,±12V,GND

These power supply pins supply power to the BKH-2016 CCJ converter.

Pin-7,15: CTL OUT

These are the differential pulses of the CTL pulse rise. REF CTL is output in the recording mode; PB CTL is output in the playback mode.

Pin-8: REMOTE OUT

When the REMOTE/LOCAL switch on the front panel is set to the REMOTE position, a low signal is output; when it is set to LOCAL, a high signal is output.

2. REMOTE-2 connectors

The REMOTE-2 input and REMOTE-2 output connectors are D-SUB 9-pin connectors which are used when RS-422-A serial signal system equipment is connected. For details on the REMOTE-2 connectors, refer to "PROTOCOL OF REMOTE-2 (9PIN) CONNECTOR" in the separate manual.

When the REMOTE switch S6 on the SY-79 board is set to REMOTE-2, the multiplexer IC4M-9 is set high and the SIO (IC2I-15) TXDA output is converted to a serial signal by line drivers IC4P-2 and IC4P-7. When the "TRANSMIT ENABLE" signal output from bit-1 (IC5J-5) of address FC03H as the port data is high at this time, the MASTER OUT +/- signal output of pin 33A/34A and the MASTER IN +/- signal input from pin 34B/35B are enabled.

When the machine is being used as the recorder (master), both the "MASTER REQUEST" signal output from bit-0 (IC5J-2) of address FC03H and the "PRIORITY IN" signal input into pin-35A are set high, and the "~MASTER STATUS" signal output from IC4N-6 is set low. As a result, line driver IC4P-2 is enabled and line driver IC4P-7 is inhibited, the MASTER OUT +/- signal is output from pin 33A/34A, and the REMOTE IN +/- signal from the external machine is input from pin 34B/35B through IC4Q-5, IC4M-14 and IC4M-15 into the SIO (IC2I) RXDA pin. Furthermore, when the REMOTE switch S6 is set to REMOTE-2, IC4N-3 is set low, the driver IC4O-6 is enabled and the PRIORITY OUT signal is output from pin-33B.

3. REMOTE-3 Connector

This is a D-SUB 50-pin connector which is used when equipment, which inputs or outputs parallel remote control signals, is connected.

When the REMOTE switch S6 on the SY-79 board is set to REMOTE-3, IC4B-17 (bit-7 of address FC02H) is set low and the data are read into the SY-79 board CPU. When this CPU detects this status, IC5L (bit-7 to bit-0 of address FC00H) and IC5K (bit-0 of address FC01H) become active, and the data from the ports are received. Moreover, the status signals are output all the time from output port IC6I (bit-7 to bit-0 of address FC00H), regardless of the REMOTE switch setting.

The following signals are allocated to the various pins of the REMOTE-3 connector:

- Pin-1: FF IN
FAST FORWARD command input: Low active
- Pin-2: OUT 7 (REC SW OUT)
Low while REC button is depressed
- Pin-3: OUT 6 (PLAY SW OUT)
Low while PLAY button is depressed
- Pin-4: OUT 5 (STOP SW OUT)
Low while STOP button is depressed

- Pin-5: OUT 4 (ENTRY SW)
Low while ENTRY button is depressed
- Pin-6: OUT 3 (REF ERROR OUT)
Low when SERVO REF selector switch on the control panel has been set incorrectly
- Pin-7: OUT 2 (CF LOCK OUT)
Low while the VTR is locked by color framing
- Pin-8: OUT 1 (DRUM LOCK OUT)
Low while drum is servo-locked
- Pin-9: OUT 0 (CAPSTAN LOCK OUT)
Low while capstan is servo-locked
- Pin-10: SP2: Not used
- Pin-11: SP 1: Not used
- Pin-12: DVT: Gate pulse of VITC data
- Pin-13: DRD: Gate pulse of time code reader
- Pin-14: CK
Clock pulse (447kHz; NTSC/PAL-M, 453kHz; PAL/SECAM)
- Pin-15: DATA-1(LSB)
- Pin-32: DATA-2
- Pin-16: DATA-4
- Pin-17: DATA-8(MSB)
TCR, TM1, TCR user bit, TM2, VITC, TCG, VITC user bit and TCG user bit denote the timer code bits, respectively, and 4 bits make up 1 word. 8 words form a time data.
- Pin-18: PREROLL command input: Low active
- Pin-19: STANDBY ON command input: Low active
- Pin-20: REWIND IN command input: Low active
- Pin-21: ENTRY IN command input: Low active
- Pin-22: SPARE 2 (STANDBY OFF command input): Low active
(AUDIO-4 REC control input): Low active
This is normally the input pin for the STANDBY OFF command. However, in the case of the PS-04 model, when reference is made to "Address A201H" in Section 4-13-10 and the SY-79 board is remodeled, it serves as the AUDIO-4 REC control input pin.
- Pin-23: SPARE 3 (SYNC 6 LACK output): Low active
(AUDIO-3 REC control input): Low active
Normally, the SYNC 6 LACK signal, which indicates that the PB output of the sync channel has dropped 400µsec or more and, moreover, that this has been continuous for 6 or more fields, is output from this pin. However, when S2-5 on the LG board is set to ON and the SY-79 board jumper J3 is changed from A to B, this pin serves as the AUDIO-3 REC control input pin.
- Pin-24: REC status output: Low active
- Pin-25: VIDEO 6 LACK OUT: Low active
This is the alarm signal which indicates that the PB output of the video channel has dropped 400µsec or more and, moreover, that this has been continuous for 6 or more fields.

(5-6-6. Outline of Remote Control)

Pin-26: OUT 15 (ASSEMBLY PRESET STATUS output): Low active
(FWD STATUS output): Low active

Normally, this is the ASSEMBLY PRESET STATUS output but when S2-5 on the LG board is set to ON, it serves as the FWD STATUS output pin.

Pin-27: OUT 17 (EDIT STATUS output): Low active

Pin-28: DTM: Timer data gate pulse

Pin-29: DGN: Time code generator gate pulse

Pin-30: MP

Timing pulses which read DATA 1, 2, 4 and 8 supplied to pins 15, 32, 16 and 17.

Pin-31: K4

Clock signal which is produced by dividing the clock pulse supplied to pin-14 down to 128.

(Pin-32: DATA-2: See pin-15)

Pin-33: GND

Pin-34: PLAY command input: Low active

Pin-35: STOP command input: Low active

Pin-36: REC command input: Low active

Pin-37: SPARE 1 (REW command output): Low active

(AUDIO-1 REC control input): Low active

This is normally the REW command output pin but when S2-5 on the LG board is set to ON and the SY-79 board jumper J2 is changed from A to B, this pin serves as the AUDIO-1 REC control input pin.

Pin-38: OUT 11 (AUDIO-2 PRESET STATUS output): Low active

(AUDIO-2 REC OUT STATUS output): Low active

This is normally the AUDIO-2 PRESET STATUS output pin but when S2-5 on the LG board is set to ON, this pin serves as the AUDIO-2 REC OUT STATUS output pin.

Pin-39: OUT 10 (AUDIO-1 PRESET STATUS output): Low active

(AUDIO-1 REC OUT STATUS output): Low active

This is normally the AUDIO-1 PRESET STATUS output pin but when S2-5 on the LG board is set to ON, this pin serves as the AUDIO-1 REC OUT STATUS output pin.

Pin-40: SPARE 4 (FF command output): Low active

(AUDIO-2 REC control input): Low active

This is normally the FF command output pin but when S2-5 on the LG board is set to ON and the SY-79 board jumper J4 is changed from A to B, this pin serves as the AUDIO-2 REC control input pin.

Pin-41: OUT 13 (SYNC PRESET STATUS output): Low active

(AUD-4 REC MODE STATUS output): Low active

This is normally the SYNC PRESET STATUS output pin but when S2-5 on the LG board is set to ON, this pin serves as the AUDIO-4 REC MODE STATUS output pin.

Pin-42: OUT 12 (AUDIO-3 PRESET STATUS output): Low active

(AUD-3 REC MODE STATUS output): Low active

This is normally the AUDIO-3 PRESET STATUS output pin but when S2-5 on the LG board is set to ON, this pin serves as the AUDIO-3 REC MODE STATUS output pin.

Pin-43: STOP STATUS output: Low active

Pin-44: OUT 14 (VIDEO PRESET STATUS output): Low active

(REVERSE STATUS command output): Low active

This is normally the VIDEO PRESET STATUS output pin but when S2-5 on the LG board is set to ON, the status command indicating reverse tape travel is output.

Pin-45: OUT 16 (INSERT PRESET STATUS output): Low active

(SYNC 6 LACK output): Low active

Normally, this is the INSERT PRESET STATUS output pin but when S2-5 on the LG board is set to ON, the SYNC 6 LACK signal, which indicates that the PB output of the sync channel has dropped 400µsec or more and, moreover, that this has been continuous for 6 or more fields, is output from this pin.

Pin-46: STANDBY ON status output: Low active

Pin-47: PLAY status output: Low active

Pin-48: REMOTE OUT

This signal is low when the REMOTE/LOCAL switch is set to REMOTE but high when the switch is set to LOCAL.

Pin-49: ALARM OUT

A low signal is output when the VTR is in the alarm condition.

Pin-50: PREROLL status output: Low active

||||| 5. THEORY OF OPERATION

5-6-7. Common Memory

1. Outline

The common memory IC1J (1K-byte) on the SY-80 board switches the address bus and data bus so that it is accessed from the two CPUs on the SY-79 and SY-80 boards and it exercises the forms of control below so that it is not accessed from the two CPUs simultaneously.

- When it is accessed virtually simultaneously, it supplies a WAIT signal to the CPU which was delayed in accessing until the preceding CPU has completed its access.
- There is no order of priority between the two CPUs.
- Access by one CPU cannot be cancelled during actual access.

The status data indicating the operating status of the VTR and the error data accompanying the occurrence of a malfunction after the power has been switched on or during normal operation are written into the common memory, and its contents can be checked using the test function (see Section 4-13).

Addresses A000H through A2FFH in the common memory are divided into six data areas of 128 bytes each, as indicated below, and the 256 bytes from addresses A300H to A3FFH are used as 64 counters of 4 bytes each.

1. A000H-A07FH: MAIN COMMUNICATION (SY-79 to SY-80)
2. A080H-A0FFH: MAIN COMMUNICATION (SY-80 to SY-79)
3. A100H-A17FH: SUPERIMPOSE (SY-79 to SY-80)
4. A180H-A1FFH: Not used.
5. A200H-A27FH: HARD PORT MONITOR (SY-79 to SY-80)
6. A280H-A2FFH: HARD PORT MONITOR (SY-80 to SY-79)

2. Main Communication Data Area (A000H to A0FFH)

The main area is assigned as shown below.

MEMORY MAP

A000	TRANSPORT CONTROL	... Tape Run Status Control Commands
A008	TIMER CONTROL	... TC GEN. Control Commands
A010	SELF STATUS	... Local Machine (self) Control Data
A020	VIDEO/AUDIO EDIT CONT	... Editing Operation Commands
A028	EOT STATUS etc	... EOT Status Data, etc.
A030	PLAYER STATUS	... Player Status Data
A040	PLAYER MODE	... Player Timer Display Data
A050	Not assigned.	
A070	SY-79 to SY-80 TEST	... SY-79/80 Read/Write Test
A080	SY-80 STATUS	... SY-80 Status Data
A090	TIMER DISPLAY	... TC/Timer Display Data
A0A0	BLOCK 2 DISPLAY	... Block 2 Fluorescent Display Data
A0B0	Not assigned.	
A0F0	SY-80 to SY-79 TEST	... SY-80/79 Read/Write Test
A0F2	ROM CHECKSUM	... ROM Checksum Results
A0FF		

3. Superimpose Data Area (A100H to A1FFH)

When the ALL DISPLAY switch S13-3 on the TC-14A board is set to ON, the display data with 128 characters superimposed on the monitor screen are read into the common memory in ASCII code in the order in which they are displayed.

The SY-79 board CPU writes the display data, they are read out by the SY-80 board CPU, and they are transferred to the TC-14A board.

MEMORY MAP

A100	SUPERIMPOSE DATA
A180	Not assigned.
A1FF	

4. Hard Port Monitor Area (A200H to A2FFH)

The LG board, control panel, servo system, time code reader/generator and REMOTE-3 input/output data are copied and stored in this area. Addresses A200H through A27FH are used as the port data area of the SY-79 board while addresses A280H through A2FFH are used as the port data area of the SY-80 board.

MEMORY MAP

A200	PARALLEL I/O	... Parallel I/O Data
A210	KEY MATRIX	... Key, Switch Setting Data
A218	LED/LAMP/CLUTCH	... LED, Lamp, Clutch ON/OFF
A220	DISPLAY DATA	... Fluorescent Display Character Data
A270	Not assigned.	
A280	80 MISCELLANEOUS I/O	... SY-80 Miscellaneous I/O
A290	LOGIC I/O	... I/O Data to/from LG Board
A2A0	TIMER I/O	... I/O Data to/from TC Board
A2B0	SERVO I/O	... CMD/SENSE transfer to/from SV Board
A2C0	SERVO STATUS	... Servo System Status Data
A2D0	SV CONT CMD BUFFER	... Servo Command Buffer
A2E0	SY-80 PROG No.	... SY-80 Software Program Version
A2F0	SERVO PROG No.	... Servo Software Program Version
A2FF		

5. Counter Area (A300H to A3FFH)

This area is composed of 64 counters. Four bytes are allocated to each counter and these are used mainly to handle the time data.

6. Common Memory Control

In order to be accessed from two CPUs, the common memory exercises control by supplying a WAIT signal to one CPU while the other is accessing.

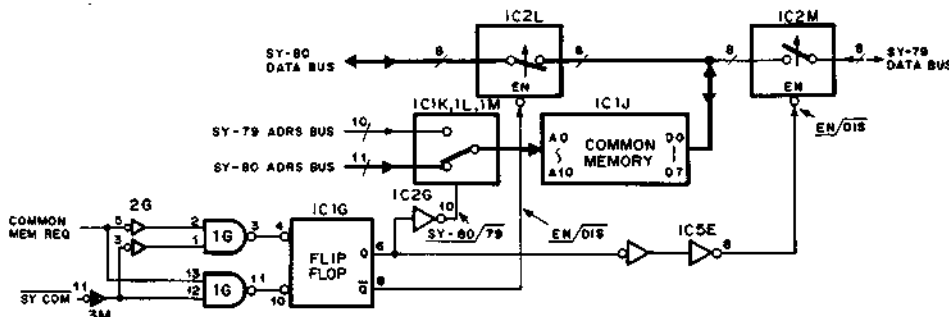
For instance, when the SY-80 board CPU is accessing the common memory, the gate IC1G-2 is set high by the "COMMON MEMORY REQUEST" signal from the address decoder IC2E-11. The common memory is not accessed from the SY-79 board CPU and so the pin-37B "SY COM" signal is made inactive (high) and IC1G-1 is set high. Consequently, the flip-flop IC1G-6 is set high and IC1G-8 is set low.

The high-level output of the flip-flop IC1G-6 is input through the inverter IC2G-10 into the common memory address selector IC1K, 1L and 1M, and the SY-80 board address bus is selected. Furthermore, the IC1G-6 output disables the bus buffer IC2M through the inverter IC5E-8, and the SY-79 board data bus is isolated from the data bus of the common memory.

In addition, the low-level output of the flip-flop IC1G-8 enables the bus buffer IC2L and it connects the SY-80 board data bus to the common memory.

When the SY-80 board CPU is accessing the common memory, the "SY COM" signal is input from the SY-79 board to pin-37B in cases where the SY-79 board CPU has attempted to access the common memory. The "SY COM" signal sets IC3G-12 high through the inverter IC3M-10 but since the flip-flop IC1G-6 is set high, IC3G-11 is set low, the signal is returned from pin-25A to the SY-79 board as the "SY WAIT" signal, and the CPU on the SY-79 board is set to the wait condition. When the SY-80 CPU has finished accessing the common memory, the "COMMON MEMORY REQUEST" signal of the address decoder IC2E-11 is set high and the status of the flip-flop IC1G is inverted. When the "SY COM" signal from the SY-79 board is active at this time, the common memory is accessed by the SY-79 board CPU.

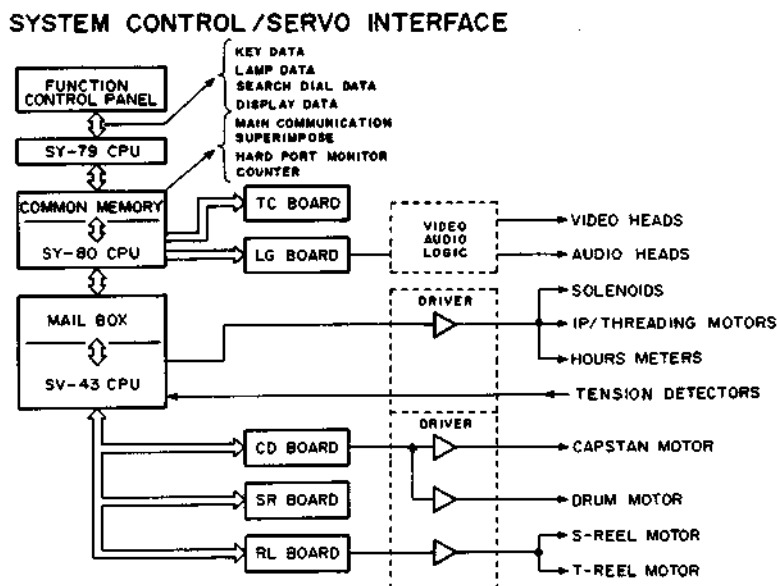
COMMON MEMORY



5. THEORY OF OPERATION

5-6-8. System Control/Servo Interface

The data communication between the system control and servo systems is undertaken as shown in the figure below.



1. Control Panel/SY-79 Interface

The description below is based on an example of when the PLAY switch on the control panel has been pressed. When viewed from the CPU of the SY-79, the PLAY switch is arrayed at bit-1 of address FE00H (refer to key matrix list in Section 5-6-5), and when the PLAY switch is pressed, bit-1 is read at high and read into the CPU on the SY-79 board.

2. SY-79/Common Memory Interface

The PLAY data, which has now been read, is transmitted to the common memory as the "12H" data (see table), produced by coding the NORMAL PLAY command on the SY-79 board CPU, and it is read into address A000H of the main communication area. The transport control data besides the PLAY data is read into the A000H address of the common memory. Addresses A000H, A001H and A002H of the common memory form the transport control area (3 bytes). The transport control data is read into address A000H, which is the 1st byte, and the speed data are read into addresses A001H and A002H, which are the 2nd and 3rd bytes.

For instance, when the VTR is played back in the PLAY mode, "12H" denoting NORMAL PLAY is read into the 1st byte A000H address, and since the tape speed is 1x normal speed, DATA-1 (addresses A001H/A002H) is not used. Furthermore, when the VTR is forwarded in the SHUTTLE mode, "04H" indicating forward transport is read into the 1st byte address A000H and the speed data in the SHUTTLE mode is read into the DATA-1 A001H address. Furthermore, the data for interpolating the interim speed of the speed data, which has been read into address A001H, is read into the DATA-1 A002H address.

The tape speed of the command to which DATA-1 is added is based on the following formula.

$$SPEED = 10^{(N/32 - 2)} + M/256 \{ 10^{(N+1/32 - 2)} - 10^{(N/32 - 2)} \}$$

N: SPEED DATA OF A001H
M: SPEED DATA OF A002H

The tape speed covering a ±25.5% range in 0.1% steps with respect to 1x normal speed is read into DATA-2 (A001H). DATA-2 is "01H" at 0.1% and "FFH" at 25.5%. The "+" and "-" are determined by the transport direction of the command issued.

(5-6-8. System Control/Servo Interface)

COMMAND NAME	A000 _H	A001 _H	A002 _H
STANDBY OFF	00 _H	.....	.....
TENSION OFF	01 _H	.....	.....
MANUAL JOG	02 _H	.....	.....
FORWARD	04 _H	DATA-1	
REVERSE	0C _H	DATA-1	
NORMAL PLAY	12 _H	.....	.....
PROG PLAY FWD	15 _H	DATA-2	.....
PROG PLAY REV	1D _H	DATA-2	.....
PREROLL	20 _H	33 _H	.....

3. SY-80/ Servo Interface

Interfacing between the SY-80 and servo system is undertaken by the interface memory (MAIL BOX) IC3P,3Q,4P and 4Q, which has a capacity of 8 bytes, on the SV board. Whether seen from the SY-80 side or servo system side, the same addresses of the interface memory are allocated, and both reading and writing are undertaken simultaneously. Four of the 8 bytes are used for interfacing with the servo system from the SY-80 and the remaining 4 bytes are used for interfacing with the SY-80 from the servo system.

The data stored in the common memory have their format converted by the CPU on the SY-80 board, and they are read into the interface memory on the SV board.

SY-80 TO SV-43 INTERFACE DATA FORMAT

ADRS	BITS							
	D7	D6	D5	D4	D3	D2	D1	D0
F400 _H	CS	COMMAND CODE					SENSE CMD	
F401 _H	COMMAND DATA-0							
F402 _H	COMMAND DATA-1							
F403 _H	CHECKSUM							

F400H Bit-7: CS (Command Set)
This flag serves to advise that the command data have been transmitted to the servo side: a "high" signal is transmitted.

F400H Bit-6 to Bit-2: COMMAND CODE
These bits specify a total of 13 operating modes for the servo system. When the CPU on the SV board receives an undefined command not included in the COMMAND CODE, this is treated in exactly the same way as the STANDBY OFF command.

COMMAND NAME	COMMAND CODE				
	D6	D5	D4	D3	D2
*1STANDBY OFF	0	0	0	0	0
*1STANDBY ON	0	0	0	1	0
*1MANUAL JOG	0	0	1	0	0
*2REEL REV	0	0	1	0	1
*2REEL FWD	0	0	1	1	1
*2PINCH REV	0	1	0	0	1
*1PINCH STILL	0	1	0	1	0
*2PINCH FWD	0	1	0	1	1
*1TRANSIENTLESS PLAY	0	1	1	0	0
*1NORMAL FWD	0	1	1	1	0
*3PROG SPEED PLAY	0	1	1	1	1
*1PRESET-0/1	1	0	0	0	0
UNIVERSAL DATA CALL	1	0	0	1	0

- *1: The 2-byte preset data indicating the preset mode of the servo system are added to DATA-0 and DATA-1.
- *2: The 2-byte speed data are added to COMMAND DATA-1 and DATA-0.
- *3: The 1-byte speed data is added to COMMAND DATA-0.

F400H Bit-1:0: SENSE COMMAND
These bits request the status of the servo system required when controlling the system control system, and the servo status data corresponding to the SENSE COMMAND are read out from the servo system by the CPU on the SY-80 board.
The "ACK+STATUS-0," read out from the servo system, is stored in address F400H of the interface memory (MAIL BOX) while "STATUS-1" through "STATUS-7" are stored in addresses F401H and F402H as SENSE DATA-0 and SENSE DATA-1, and CHECKSUM is stored in address F403H, respectively. Furthermore, the servo status data, which have been stored in the interface memory, are stored in addresses A2C0H through A2C7H of the common memory.

SENSE COMMAND

SENSE COMMAND		REQUESTED STATUS	
D1	D0		
0	0	STATUS-1	STATUS-2
0	1	STATUS-3	STATUS-4
1	0	STATUS-5	STATUS-6
1	1	STATUS-7	.....

IIIIIIII 5. THEORY OF OPERATION

(5-6-8. System Control/Servo interface)
 SV-43 TO SY-80 INTERFACE DATA FORMAT

ADDRESS	BITS								
	D7	D6	D5	D4	D3	D2	D1	D0	
F400H	ACK			STATUS-0					
F401H				SENSE DATA-0					
F402H				SENSE DATA-1					
F403H				CHECKSUM					

ASSIGNMENT OF STATUS DATA IN COMMON MEMORY

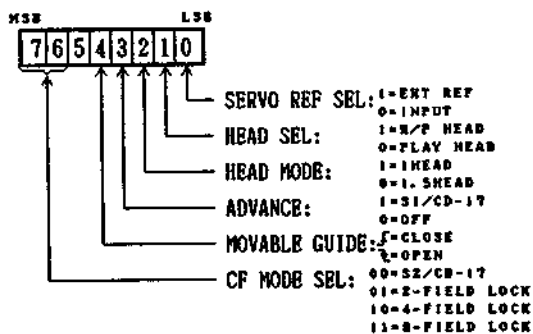
ADDRESS	LABEL	D7	D6	D5	D4	D3	D2	D1	D0
A2C0H	STATUS-0	(ACK)	DRUM ALARM	TTP ALARM	SYSTEM 1	SYSTEM 0	CF LOCK	DRUM LOCK	CAP LOCK
A2C1H	STATUS-1	IF ERROR	TAPE DIR	TAPE TENSION	TAPE SPEED ERROR		TAPE HEAR EOT TAKE-UP	END OF TAPE	
A2C2H	STATUS-2	TTHREAD ON	FINCH ON	TAPE (CTL) MODE		FRAME ERROR			
A2C3H	STATUS-3	EVT ADV	RKH ADV	FRAME LOCK MODE	REF SIG		COLOR FRAME DET		
A2C4H	STATUS-4	TAPE SPEED (L)							
A2C5H	STATUS-5	SIGN (FWD=0)	TAPE SPEED (H)						
A2C6H	STATUS-6	REEL ACCELERATION ABILITY							
A2C7H	STATUS-7	REEL ACCELERATION ABILITY							

F401H: COMMAND DATA-1

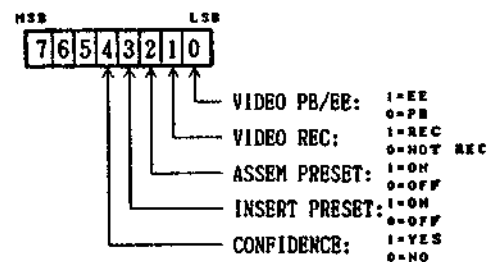
F402H: COMMAND DATA-1

These are the preset data or 2-byte speed data ("10·00H" with 1x normal speed) which are added in accordance with the operating mode. When the data added are the preset data, PRESET-0 is read into address F401H and PRESET-1 is read into address F402H.

PRESET-0 (F401H)



PRESET-1 (F402H)



F403H: CHECKSUM

This is the 3-byte (F400H, F401H and F402H) checksum data.

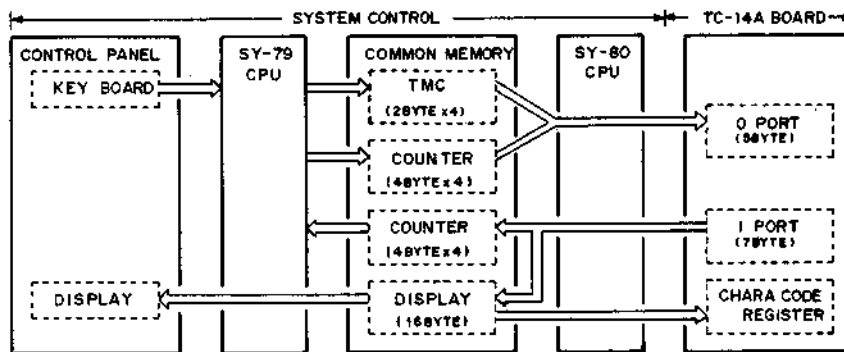
5-6-9. System Control/TC Board Interface

The system control system controls the read out and presetting of the timer-1, timer-2, user's bit and time code data.

The preset data, specified by the keys on the control panel, are stored in addresses A008H through A00FH of the common memory by the SY-79 CPU. The stored data are read out by the SY-80 CPU and controls the time code board.

The SY-80 CPU reads out the various data from the time code board field by field and stores it in the common memory. Furthermore, the SY-80 CPU generates the control panel's display data and superimpose data.

SYSTEM CONTROL TO TIME CODE READER/GENERATOR INTERFACE



1. Data Presetting

The preset data, specified by the keyboard on the control panel, are stored by the SY-79 CPU in the 8-byte area spanning addresses A008H through A00FH of the common memory as the timer control data (TMC).

There are four types of TMC data: TMC0, 1, 2 and 3. They are allotted as follows:

- TMC0: Timer-1
- TMC1: Timer-2
- TMC2: User's Bit
- TMC3: Time Code

The TMC data are configured by counter numbers which have stored the values for presetting and by the 1-bit preset command.

TIMER CONTROL DATA IN COMMON MEMORY

ADDRESS	LABEL	BITS							
		D7	D6	D5	D4	D3	D2	D1	D0
A008 _H	TMC0						TMC1 PRST		
A009 _H	TMC0+1	COUNTER NUMBER (24 _H)							
A00A _H	TMC1						TMC2 PRST		
A00B _H	TMC1+1	COUNTER NUMBER (25 _H)							
A00C _H	TMC2						USG PRST		
A00D _H	TMC2+1	COUNTER NUMBER (27 _H)							
A00E _H	TMC3						TCC PRST	TCC RUN	TCC HOLD
A00F _H	TMC3+1	COUNTER NUMBER (26 _H)							

REVISION B. THEORY OF OPERATION

(5-6-9. System Control/TC Board Interface)

The common memory counter area (addresses A300H through A3FFH) is composed of 64 counters, and to each counter is allotted a number from 00H to 3FH. Four bytes are allotted to each counter.

Counter numbers are allotted corresponding to the data used, and 24H through 27H are used for the TMC data.

TMC0 through TMC3 are bits which command the presetting. When bit-2 is set high, the preset values are read into the counter area below in the common memory, and the counter numbers which have read the preset values are stored in TMC0+1 through TMC3+1.

The timing of the presetting using the CPU on the SY-80 board is started after 8msec. have elapsed from the vertical sync, and it is performed in an interval of several milliseconds in the order of TIME CODE, USER'S BIT, TIMER-1 and TIMER-2.

- A390H-A393H: TIMER-1 PRESET DATA (24H)
- A394H-A397H: TIMER-2 PRESET DATA (25H)
- A398H-A39BH: TIME CODE PRESET DATA (26H)
- A39CH-A39FH: USER'S BIT PRESET DATA (27H)

The preset data read into the common memory are read out by the SY-80 CPU and written into the time code board with the addresses below.

TC WRITE HARD PORT DATA

ADDRESS	BITS							
	D7	D6	D5	D4	D3	D2	D1	D0
F300 _H	CF	DF	10 ¹ FRAMES		10 ⁰ FRAMES			
F301 _H			10 ¹ SECONDS		10 ⁰ SECONDS			
F302 _H			10 ¹ MINUTES		10 ⁰ MINUTES			
F303 _H			10 ¹ HOURS		10 ⁰ HOURS			
F304 _H	CG BLK	PRE-SET	CF ON	DF ON	RUN	TIMER SELECT		

The main signals in the table above are as follows:

CF ON: This specifies color framing lock.

DF ON: This specifies the drop frame.

CG BLK (Character Generator Black):

This specifies black for the whole screen.

TIMER SELECT:

- 000: TC READER
- 001: TIMER-1
- 010: TC USER'S BIT READER
- 011: TIMER-2
- 100: VITC READER
- 101: TC GENERATOR
- 110: VITC USER'S BIT READER
- 111: USER'S BIT GENERATOR

2. Time Code/Timer Data Read Out

The TIMER-1, TIMER-2, USER'S BIT, TIME CODE and switch setting data are read out from the hard port (F300H through F306H) on the time code board with addresses F300H through F306H of the SY-80 CPU, and they are stored in the counter area (A300H through A3FFH) of the common memory. The timing of the read out, based on the SY-80 CPU, is started after 1.27msec. have elapsed from the vertical sync. Furthermore, the data, which have been read out, are converted into display data by the SY-80 CPU and stored in the timer display area (A090H through A09FH) of the common memory.

Read into addresses A090H through A092H (3 bytes) of the timer display area are the 3-character codes (TM1, TM2, TCR, UBR, TCR., UBR., TCG, UBG) of the eight types of data indicated as titles on the control panel and monitor screen. Moreover, since data are read out from VITC to TC and UB, the VITC mark (.) assigned to address A093H is added to the fourth character of the title for differentiation.

TIMER DISPLAY AREA

ADDRESS	BITS							
	D7	D6	D5	D4	D3	D2	D1	D0
A090 _H	TITLE							
A091 _H	TITLE							
A092 _H	TITLE							
A093 _H	TITLE:VITC MARK(.)							
A094 _H	TENS OF HOURS							
A095 _H	UNITS OF HOURS							
A096 _H	COLON (BLANK IN UB)							
A097 _H	TENS OF MINUTES							
A098 _H	UNITS OF MINUTES							
A099 _H	*1	COLON						
A09A _H	TENS OF SECONDS							
A09B _H	UNITS OF SECONDS							
A09C _H	*2	COLON						
A09D _H	TENS OF FIELDS							
A09E _H	UNITS OF FIELDS							
A09F _H	FIELD MARK(*)							

- *1:DF TAPE MARK
- *2:DF CTL MARK

The display data stored in the common memory are returned to the time code board and are written in 8-bit ASCII code into the character code memory on the time code board.

5-7. SERVO SYSTEM

5-7-1. Outline of Servo System

The servo system circuitry is housed on four boards in the card rack and eight boards in the tape transport block. The principal functions of the boards are as follows:

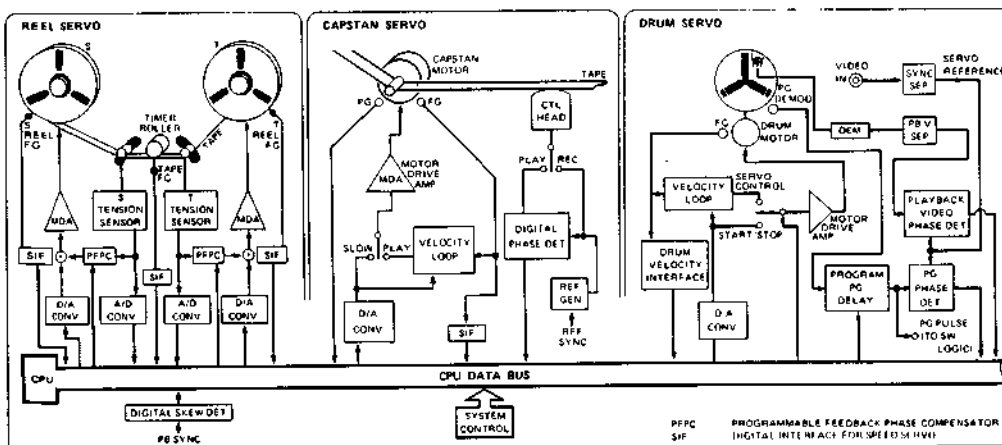
CARD RACK

- CD-17 Board: Capstan/Drum Servo
- RL-12 Board: Reel Servo
- SR-15 Board: Servo Reference Signal Gen.
- SV-43 Board: Servo Processor

TAPE TRANSPORT BLOCK:

- TT-01 Board: Tape Transport Control
- CA-09 Board: Capstan Motor Driver
- DA-07 Board: Drum Motor Driver
- RA-05 Board: Reel Motor Driver
- HM-05 Board: Head Hours Meter
- TM-16 Board: Running/Operation Hours Meter
- TD-05 Board: Tape Detector
- TR-07 Board: Timer Roller Rotation Detection

There are three servo systems: the drum servo, capstan servo and reel servo. Each servo system is coupled with two CPUs (HOST and HARD) on the SV board. All the data required to control the servo systems are centralized by the software for optimum control.



(5-7-1. Outline of Servo System)

The HOST CPU is responsible for processing the control data, providing interface with the system control system and carrying out self-diagnosis. The HARD CPU is responsible for handling the data between the various boards which are used for the servo systems.

The HOST CPU and HARD CPU function independently and even if either should CPU fail, the motors can be stopped without the tape sustaining any damage.

The servo system processing must be conducted in synchronization with the video signal, and a series of processing operations are conducted with interrupts being applied in V/2 units for the HOST CPU and in V/8 units for the HARD CPU.

The main data processed by the CPUs are as follows:

DRUM SERVO SYSTEM

- PG Drum rotational phase data
- FG Drum rotational speed data
- PB V Tape recording data, Head/PG relative phase data

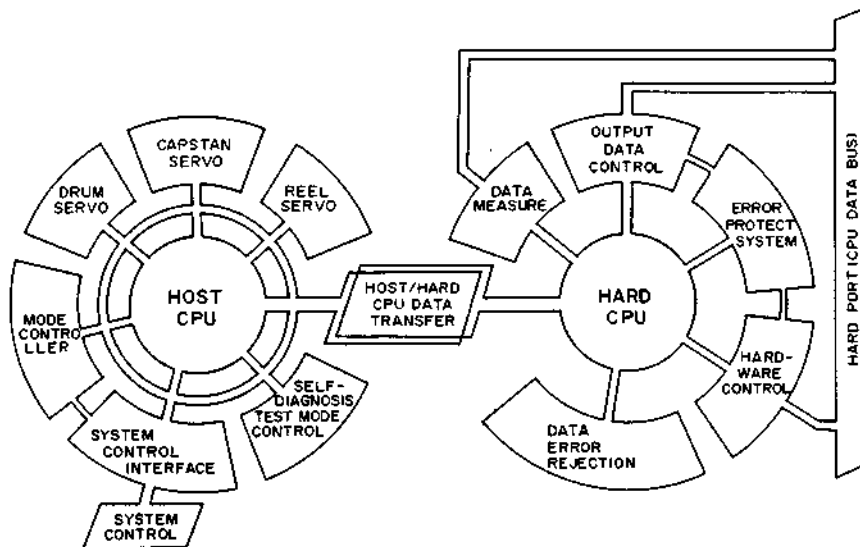
CAPSTAN SERVO SYSTEM

- FG Capstan rotational speed data, Capstan rotation direction data
- CTL Tracking data

REEL SERVO SYSTEM

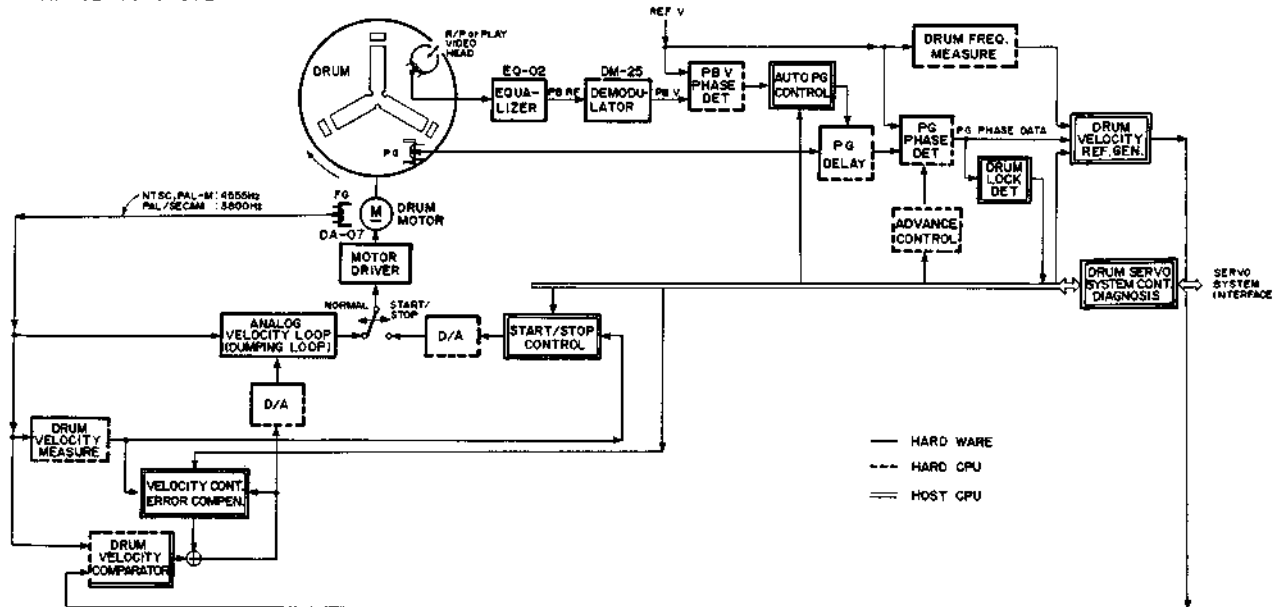
- TENSION SENSOR Supply/Take-up tape tension data
- REEL FG Supply/Take-up reel rotational speed data, rotation direction data
- TIMER FG Tape speed data, tape direction data
- PB H Skew error data

In response to the commands from the system control system, the optimum data are output to the motors, solenoids and other drive systems.



5-7-2. Outline of Drum Servo System

DRUM SERVO SYSTEM



The R/P and the PLAY heads are positioned 120 degrees apart on the head drum. The drum PG phase is delayed by the HARD CPU in accordance with the R/P or PLAY head and made identical to the REF V.

The drum FG rotates at 76 cycles per rotation and with normal rotation its frequency is:

4555 Hz for NTSC, PAL-M (59.94×76)

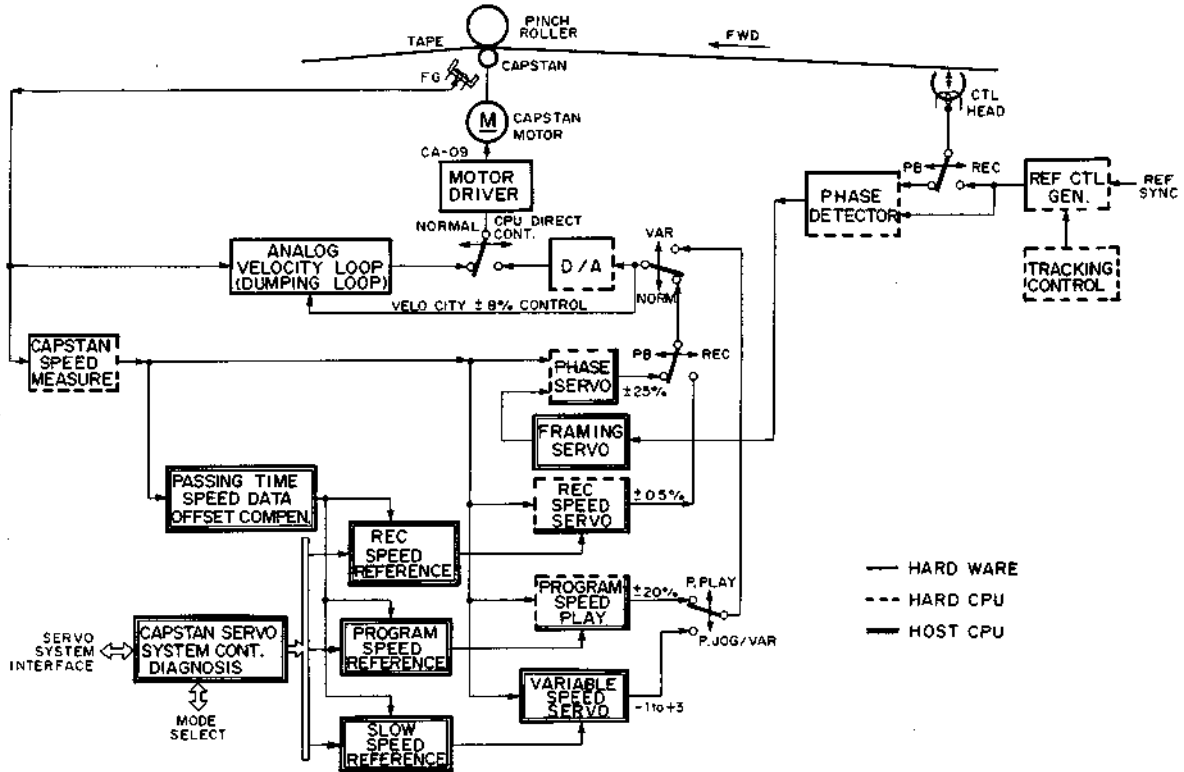
3800 Hz for PAL/SECAM (50×76)

The rotational speed of the drum under normal rotation conditions is controlled by the analog velocity loop configured by the hardware. Furthermore, to cope with variations in the load and drift in the devices configuring the drum servo, the CPUs provide digital compensation and the drum servo's phase and speed under transient conditions are controlled by the drum PG's phase data.

The drum motor is directly driven by the data from the HARD CPU on the SV board, sent via the D/A converter on the RL board, across those ranges requiring quick access such as from start to near drum lock and from drum lock to stop.

5-7-3. Outline of Capstan Servo System

CAPSTAN SERVO SYSTEM



The capstan FG rotates at 96 cycles per rotation and the frequency under 1x speed running conditions is:

839.2 Hz for NTSC, PAL-M

825.0 Hz for PAL/SECAM

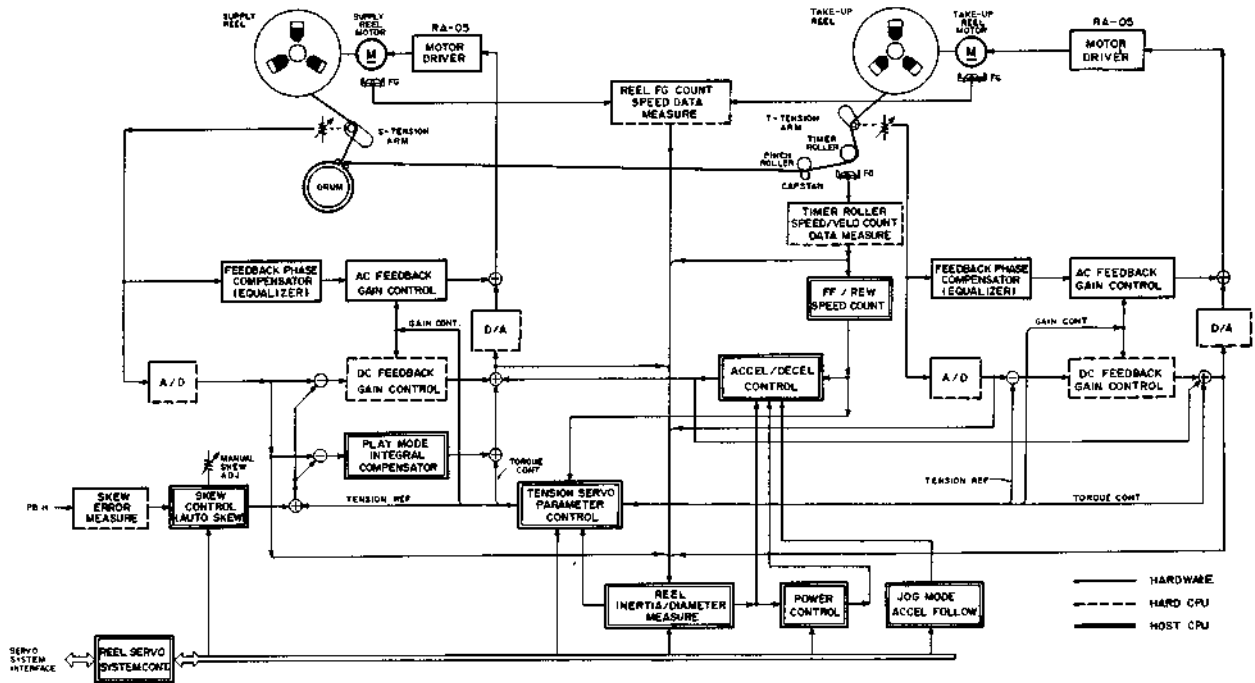
The analog velocity loop configured by the hardware is used as a damping loop in the 1x speed PLAY mode or REC mode and the speed can be compensated for up to $\pm 5\%$ by the CPU.

The capstan rotation in the REC mode has a stability of $\pm 0.05\%$ while the phase is controlled by the PB CTL in the 1x speed PLAY mode.

The tape speed range in the JOG mode is -3 to $+3$ times the normal speed and the tape is directly driven by the capstan. The difference between the rotational speed data of the search dial and capstan FG speed is measured by the CPU and in order to keep the rotational speed of the capstan tracking the rotational speed of the search dial, the capstan motor is directly driven. Even in the PROGRAM PLAY, PROGRAM JOG and VAR MEMORY modes, the capstan motor is directly driven by the CPU.

5-7-4. Outline of Reel Servo System

REEL SERVO SYSTEM



The reel servo is responsible for controlling the tape tension at the S (Supply) and the T (Take-up) sides and for controlling the S and T reel acceleration or deceleration.

The tape tension is detected by the S and T tension arms and, in accordance with the mode, the tension is controlled by the hardware and CPU so that its value is optimum. The tape tension is made even stabler by detecting the winding diameter of the tape by the S and T reel FG data.

During acceleration or deceleration, the transitional motor torque necessary for control is calculated by the HOST CPU, based on the command, reel inertia and tape winding diameter data, and applied via the tension feedback system.

The timer roller FG signals are output in two phases (FG A and FG B) and the speed is detected by their time difference. In the 1x normal speed mode, the timer roller outputs a frequency corresponding to the V period.

In order to maintain the accuracy of the timer count and guard against the effects of timer roller slippage and variations in diameter, the timer roller FG is compensated for by REC CTL in the recording mode and by PB CTL in the playback mode, and the timer pulse obtained.

The CTL-compensated timer pulses are supplied to the system control system and used for timer display.

5-7-5. CD-17 Board

1. Outline

The CD-17 board houses the following circuits:

CAPSTAN SERVO SYSTEM

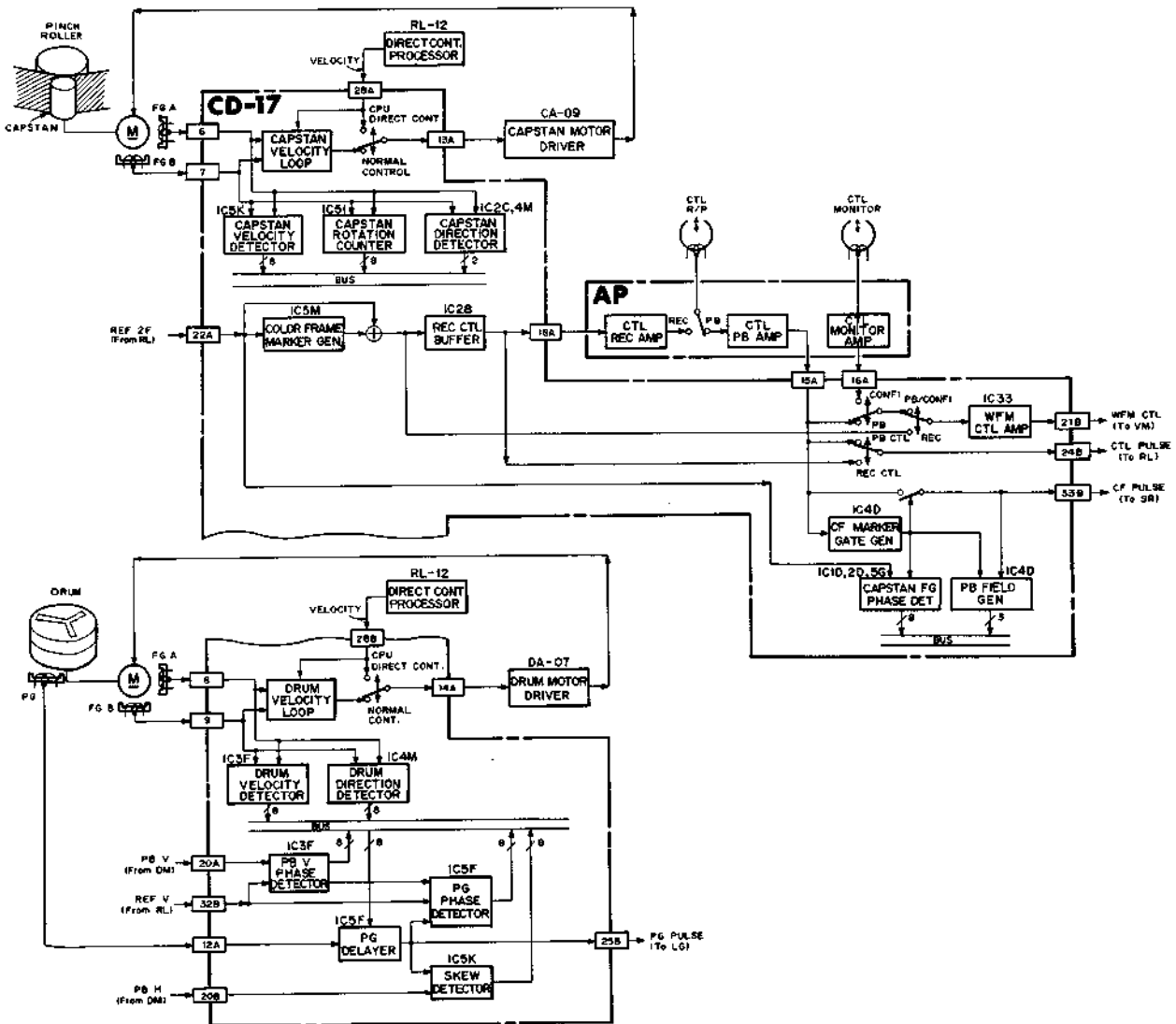
- Capstan Velocity Detector/Controller
- Capstan Rotation Detector
- Capstan Phase Comparator
- CTL REC/PB Amplifier
- Color Frame Marker Generator/Detector

DRUM SERVO SYSTEM

- Drum Velocity Detector/Controller
- Drum PG Rotation Detector
- Drum Phase Comparator
- PB V Phase Detector
- Drum PG Delayer

OTHERS

- Skew Detector
- Address Decoder
- I/O Port

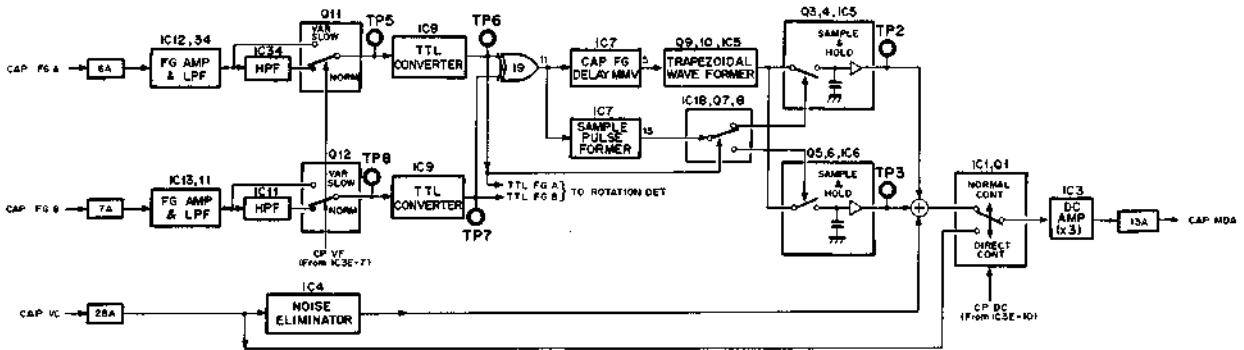


5. THEORY OF OPERATION

2. Capstan Velocity Loop

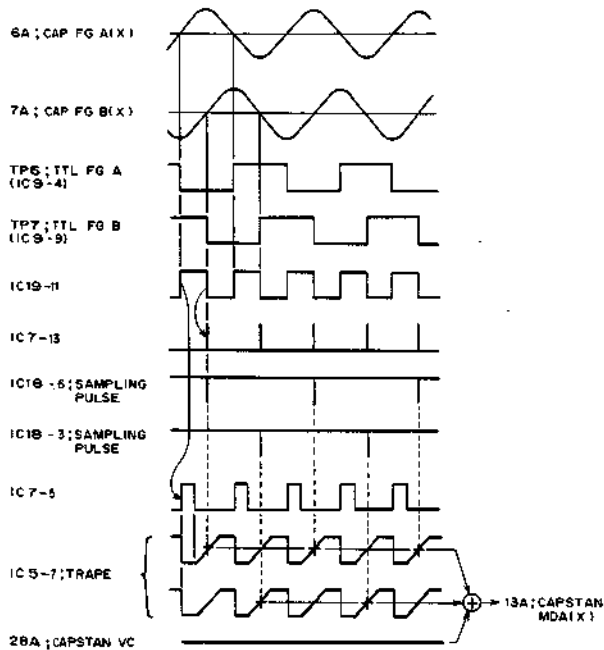
The capstan velocity loop is a damping loop for stabilizing the rotation of the capstan in the REC mode or 1x speed PLAY mode. Normally, the capstan rotation is controlled by the CPU but high-speed, high-accuracy damping is controlled by the capstan velocity loop. The capstan is directly driven by the CPU in the JOG, PROGRAM JOG, PROGRAM PLAY and VAR MEMORY modes.

CAPSTAN VELOCITY LOOP



The time difference between the capstan FG A and B is first converted into a voltage, it is compensated for by the CAPSTAN VC from the D/A converter on the RL board, the capstan's rotation control signal, CAPSTAN MDA, is produced and this is output to the capstan drive amplifier on the CA board.

CAPSTAN VELOCITY LOOP

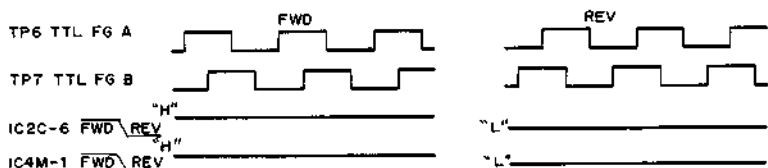


3. Capstan Rotation Detection

Based on the CAPSTAN FG A and B signals converted to the TTL level in the capstan velocity loop, the capstan's rotational direction, speed and duration are detected and these are sent to the CPU in the form of data which indicate the status of the capstan.

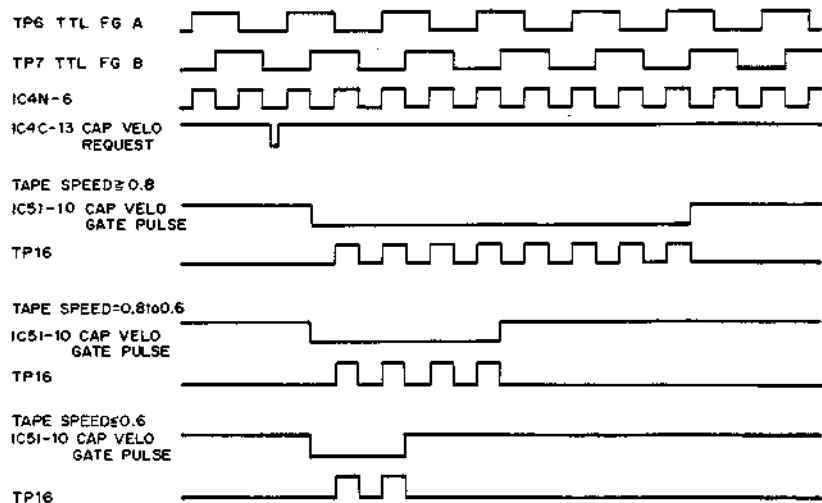
Rotational Direction Detection

The capstan's rotational direction is detected by using the fact that the CAPSTAN FG A signal phase advances in the FWD mode and the CAPSTAN FG B signal phase advances in the REV mode. In order to compensate for errors with reverse rotation, detection is made using two D-type flip-flops (IC2C-6, IC4M-1).



Rotational Speed Detection

The rotational speed of the capstan is detected by IC5K. The CAPSTAN FG A and B time difference signals from IC4N-6 are sampled by the 0.4 microseconds clock pulses from IC4S-6 and is sent to the CPU as the data which indicate the capstan's rotational speed. The FG frequency differs according to the tape speed.



Duration Detection

For compensating for the phase and mechanical position of the CAPSTAN FG A and B signals, the time equivalent to 2 FG duration with a tape speed of less than 1x speed or the time equivalent to 32 FG duration with a tape speed of over 1x speed is sampled by the 3.2 microseconds clock pulses from IC4S-4 and this information is sent as the data indicating the capstan's duration to the CPU.

5. THEORY OF OPERATION

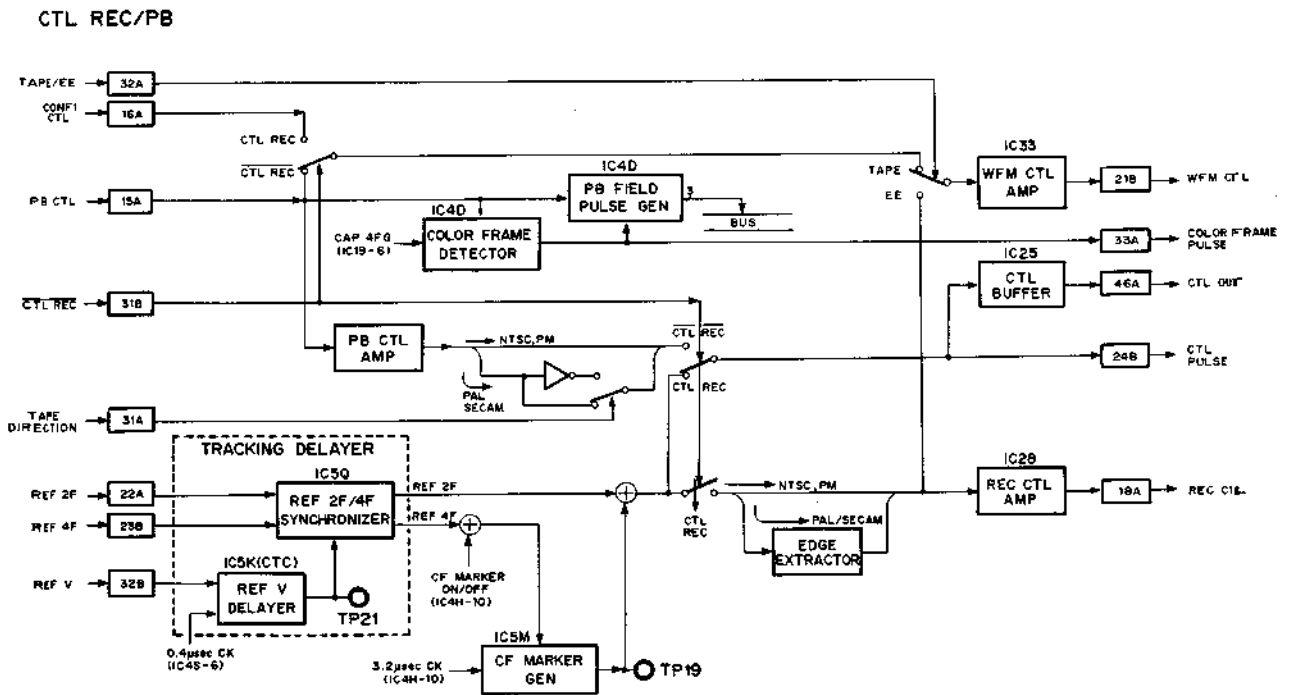
4. REC CTL and PB CTL Circuits

REC CTL Circuit

The REC CTL signal is produced by the REF 2F signal from the RL board and by the REF 4F signal from the SR board. It is passed through the AP board and supplied to the CTL R/P head. The REF 2F/4F signals (REF 2F/4F/8F with the PS model) which have been input into pins 22A, 23A, and 23B are delayed by IC5K as far as the position programmed by the CPU according to tracking information, and used for tracking reference during playback and REC CTL signal composition during recording. The color framing marker pulse (CF pulse) which indicates the first field with color framing recording is provided by dividing the 3.2 microseconds clock pulse from IC4S-4 by IC5M and it is output from IC5M-13. This pulse is added to the REF 2F signal from IC5Q-15 and made the REC CTL signal at IC4E-10, and this signal is output to the CTL R/P head through the AP board.

PB CTL Circuit

The PB CTL signal from the CTL R/P head is input into pin 15A on the CD board via the AP board and in order to compensate the tape timer with CTL, it is output from pin 24B to the RL board. The color frame is detected from the relationship between the PB CTL and capstan FG signals.

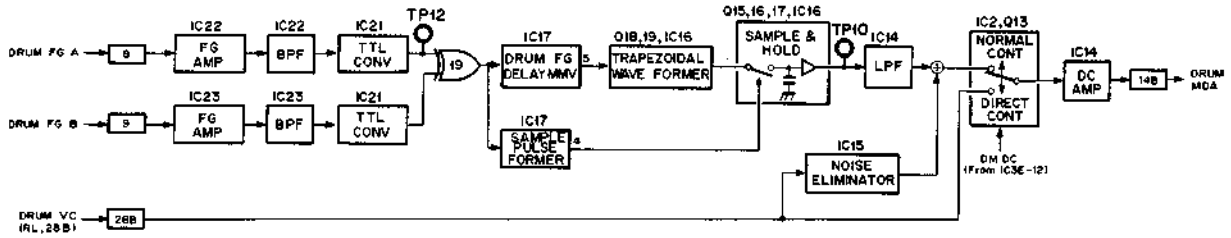


(5-7-5. CD-17 Board)

5. Drum Velocity Loop

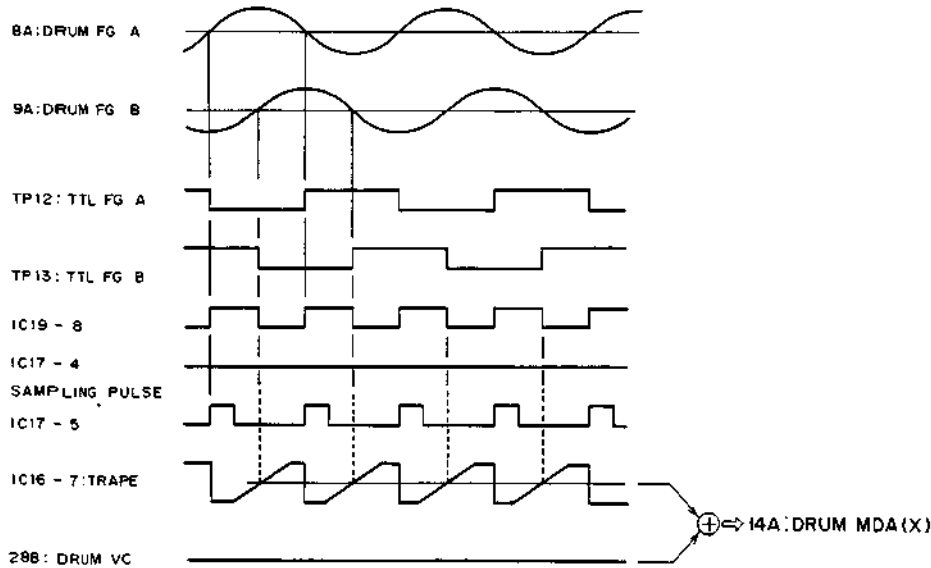
The drum velocity loop is a damping loop for stabilizing the drum rotation, and it is used only under normal rotation conditions. The drum rotation is driven directly by data from the CPU across the ranges from start to near drum lock and from drum lock to stop.

DRUM VELOCITY LOOP



The time difference between the capstan FG A and B signals is first converted into a voltage, it is compensated for by the DRUM VC from the D/A converter on the RL board, the drum's rotation control signal, DRUM MDA, is produced and this is output to the drum drive amplifier on the DA board.

DRUM VELOCITY LOOP



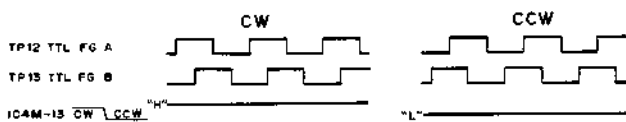
5. THEORY OF OPERATION

6. Drum Rotation Detection

Based on the DRUM FG A and B signals which are converted to the TTL level in the drum velocity loop, the drum rotational direction, speed and drum PG phase are detected, and this information is sent to the CPU in the form of data indicating the drum status.

Rotational Direction Detection (Reverse Rotation Prevention)

The drum rotational direction is detected by the D-type flip flop IC4M-13 which is set "High" when the drum is rotating in the clockwise direction and set "Low" when it is rotating in the counterclockwise direction.



Rotational Speed Detection

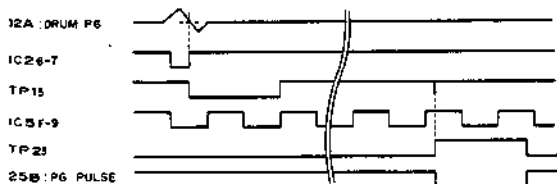
The drum rotational speed is detected by IC3F. The 0.4 microsecond clock pulse is used for counting an amount equivalent to 19 cycles of the DRUM FG B signal and this information is sent to the CPU as the data indicating the drum's rotational speed.

7. Drum PG Delay

The drum PG signal from the drum motor is output at the timing before $9.5 \pm 2H$ from the negative-going edge of the vertical equalizing pulse, and its level is 0.3 to 1.3 Vp-p.

This DRUM PG signal is input into pin 12A of the CD board via the DA board, and converted into the TTL level by IC26 with the point crossing with 0 volt serving as the reference. Since the drum phase differs by $V/3$ with playback by the PLAY head and playback by the R/P head, the drum FG signal and 0.4 microsecond clock pulses are used to delay the drum PG signal by IC5K (CTC) in accordance with whether the R/P head or PLAY head is used. The delayed drum PG signal is output from pin 25B (PG PULSE) to the LG board and it is used as a reference for the switching position. Furthermore, the delayed drum PG signal is also used for the drum phase and skew detectors.

DRUM PG DELAY



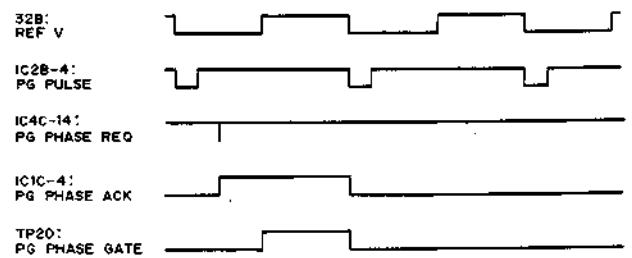
8. PG Phase Detection

The gate pulse corresponding from the positive-going edge of the REF V signal input from pin 32B to the negative-going edge of the PG pulse is generated by IC3B and at IC5F the gate time is measured by the 0.4 microsecond clock pulse.

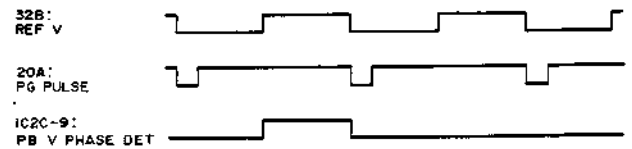
During this measurement IC1C-4 is set "High (PG PHASE ACK)" which advises the CPU that measurement is being conducted.

The gate pulse corresponding to the phase difference between the REF V signal input to pin 32B and the PB V signal input to pin 20A is generated by IC2C (PB V PHASE DET) and at IC3F the gate time is measured by the 0.4 microsecond clock pulse which is timed by IC5-0.

PG PHASE DET



PB V PHASE DET

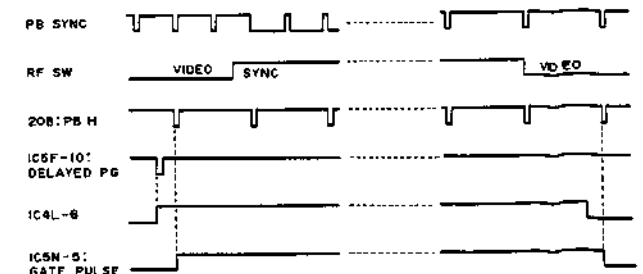


Results of PG phase measurement is used for control of drum phase. Results of PB V measurement is used for control of the AUTO PG during normal playback of the R/P head.

9. Skew Detection

The time extending from the PB H at the end of the video track to the PB H at the start of the next video track is measured and the skew is detected.

IC5K (CTC) measures the width of the gate pulse generated by IC4L and IC5N using a 0.4 microsecond clock pulse and this information is sent to the CPU as the skew data.



5-7-6. RL-12 Board

1. Outline

The RL-12 board houses the hardware required to control the reel motors. It is controlled by the data from the SV-43 board. The RL-12 board also houses a generator circuit for generating interrupt signal for the CPU on the SV-43 board.

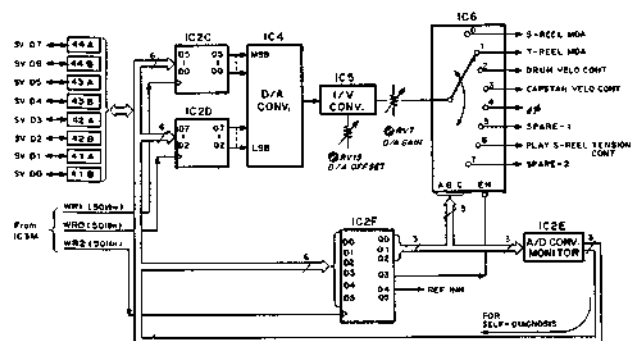
The main circuits accommodated on the RL-12 board are:

- 8-Bit A/D Converter for Analog Voltage Detection
- 12-Bit D/A Converter for Analog Voltage Control
- Supply/Take-up Reel Tension AC Feedback Loop
- Supply/Take-up Reel Rotation Detector
- Timer Roller Rotation Detector
- Interrupt Signal Generator

2. 12-Bit D/A Converter for Analog Voltage Control

The data required to control the analog voltage (motor control) are supplied from the SV board to the RL board and they are converted into analog signals by the 12-Bit D/A converter IC4.

The D/A converter IC4 serves to convert by time-sharing the signals equivalent to 8 channels whose data are supplied by the WRITE ADDRESS:5018H/Bit-2 (LSB) to Bit-7 and 5019H/Bit-0 to Bit-5 (MSB). These signals are selected by the demultiplexer IC6 in accordance with the CPU's output port IC2F (WRITE ADDRESS: 501AH/Bit-2, -1, -0) and are output to the various systems.



IC2F:WR ADDR 501AH			SELECTION OF D/A OUTPUT DATA
BIT-2	BIT-1	BIT-0	
0	0	0	S-REEL MDA
0	0	1	T-REEL MDA
0	1	0	DRUM VELO CONT
0	1	1	CAPSTAN VELO CONT
1	0	0	SPARE
1	0	1	SPARE-1
1	1	0	PLAY S-REEL TENSION CONT
1	1	1	SPARE 2

The output of IC2F is read again into the CPU via IC2F and reconfirmed.

3. Reel Tension AC Feedback Loop

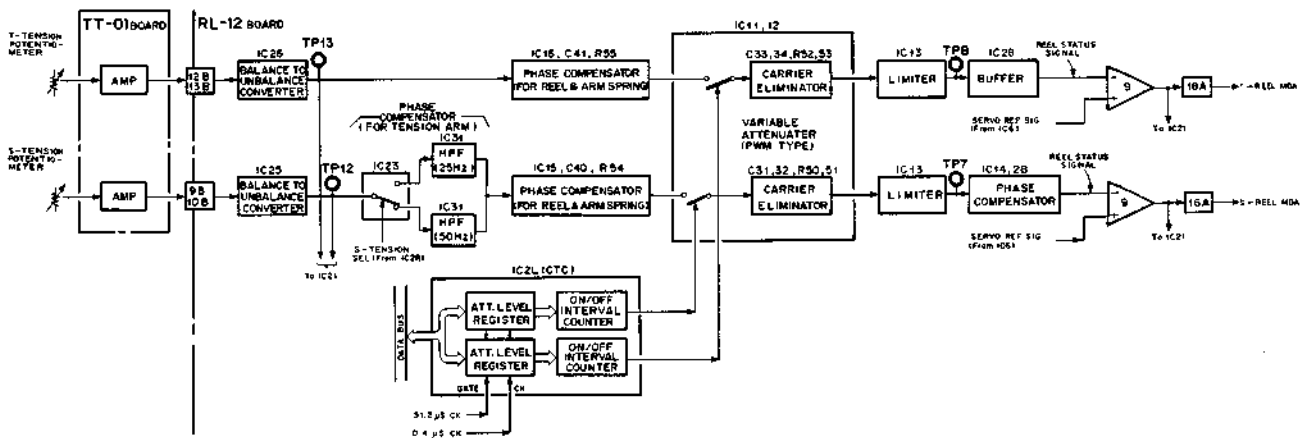
Frequencies created by resonance between the tension arms, arm springs, reels, etc. would be too much of a processing load for the CPU and are therefore handled by an AC feedback loop configured by the hardware.

The tape tension is detected by the potentiometers connected to the S and T tension arms and it is input to the RL board via the TT board. The tape tension signals are converted into unbalanced signals by the first stage operational amplifier and then input into the AC feedback loop.

The AC feedback loop is configured by the phase compensators, variable attenuators, and amplifiers. The unstable elements which the mechanical resonance of the tension arms, arm springs and reels bring to the loop are compensated by the phase compensators. The variable attenuator compensates for the fluctuation of the frequency response caused by the reel inertia and tape winding diameter, and it controls the system gain in accordance with the amplitude characteristics. This is a PWM type of variable attenuator and its on/off ratio is switched by the CPU and its attenuation level is varied

A frequency beyond the band used by the servo system is used to eliminate the on/off switching signal, which is superimposed onto the control signal as the carrier, in the low-pass filter so that the control signal is not affected.

IC2L (CTC) is triggered by the clock pulses with a frequency of approximately 20kHz, produced by dividing the frequency of the 10 MHz clock pulse input into pin-34A. IC2L counts 2.5 MHz clock pulses and when the count reaches zero, duty pulse corresponding to the value loaded into IC2L can be produced.



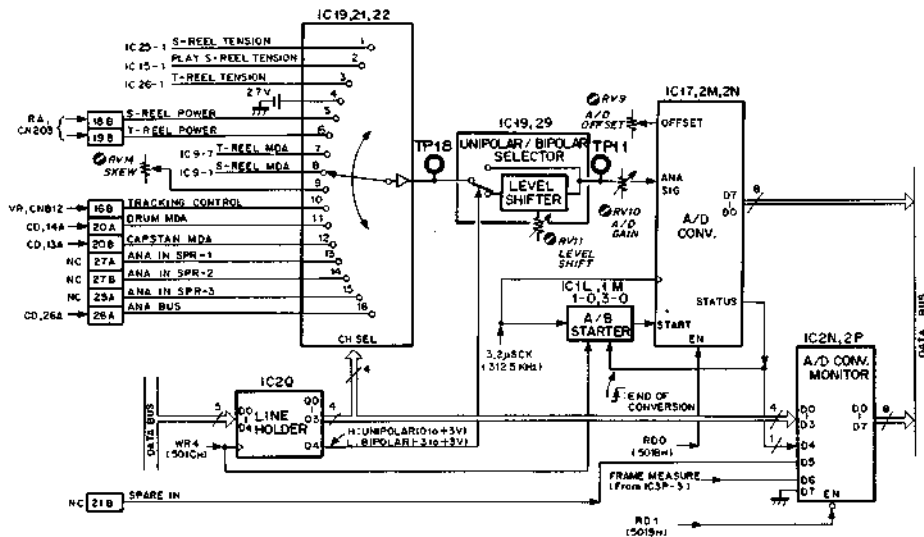
4. 8-Bit A/D Conv. for Analog Voltage Detection

Several analog signals are input into the RL board, and input into the A/D converter IC17 for processing by the CPU.

As with the D/A converter, this A/D converter is used in common by the various system.

A/D converter IC17 converts the analog signals equivalent to 16 channels (an additional 8 channels are provided on the CD board) into digital signals in accordance with the select address data given by the WRITE ADDRESS 501CH/Bit-3,-2,-1,-0. The digitally converted 8 bits data are read into the CPU by the READ ADDRESS 5018H.

Which system is to be converted by the A/D converter is determined by the output of the output port IC2Q. The output of IC2Q is again read into the CPU via the input port IC2P.



IC20: WR ADDR 501CH				SELECTION OF A/D INPUT DATA
BIT-3	BIT-2	BIT-1	BIT-0	
0	0	0	0	S REEL TENSION "B"
0	0	0	1	PLAY S-REEL TENSION "B"
0	0	1	0	T-REEL TENSION "B"
0	0	1	1	+12V POWER MONITOR "U"
0	1	0	0	S-REEL POWER "U"
0	1	0	1	T-REEL POWER "U"
0	1	1	0	T-REEL MDA "B"
0	1	1	1	S REEL MDA "B"
1	0	0	0	SKREW CONTROL "U"
1	0	0	1	TRACKING CONTROL "U"
1	0	1	0	DRUM MDA "B"
1	0	1	1	CAPSTAN MDA "B"
1	1	0	0	SPARE-1 (Not used) "B"
1	1	0	1	SPARE-2 (Not used) "B"
1	1	1	0	SPARE-3 (Not used) "B"
1	1	1	1	ANA BUS (CD-17 MPX) "U/B"

In accordance with the signals of the 16 channels for which conversion is provided by the A/D converter, the UNIPOLAR/BIPOLAR select signal is output from IC2Q-12 (Bit-4).

Signals with "B" in the table above denote BIPOLAR signals and -3 to +3V data are converted. Signals with "U" are UNIPOLAR signals and 0 to +3V data are converted.

SERVO SYSTEM 5. THEORY OF OPERATION

(5-7-6. RL-12 Board)

5. S/T Reels and Timer Roller Rotational Speed and Direction Detection

S/T reels Rotational Speed Detection

The REEL FG signals corresponding to the reel rotational speed are input into the RL board via the FG amplifier on the RA board, and they are converted into the TTL level by the first stage comparator. The converted REEL FG A and B signals are made the clock pulses with a frequency double that of the FG by IC1C (EXCLUSIVE OR) and these are counted by IC2I (CTC). Based on these count data, the rotational speed is detected by the CPU.

The S-reel FG pulses are counted by IC2I-9 while the T-reel FG pulses are counted by IC2I-15.

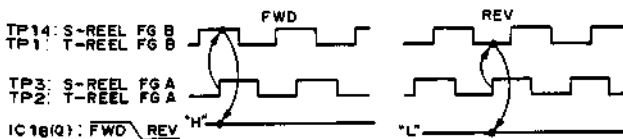
Timer Roller Rotational Speed Detection

As with the reels, the timer roller rotational speed is detected using the phase difference of the TIMER FG A and B signals. The TIMER FG A and B signals, input into the RL board via the FG amplifier on the TT board, are converted into the TTL level by the comparator IC1. The converted TIMER FG A and B signals are synchronized with 0.8 microsecs. pulses by IC1D and, along with the CTL pulses from the CD board which are synchronized by IC1D at the same time, they are input into IC1E (PROM). Pulses with double the frequency of the TIMER FG signals are output from IC1E-11 (PROM), the addressing noise of the PROM included in the output pulses is eliminated by IC1F and the pulses are counted by IC2I-18 (CTC). Based on these count data, rotational speed of timer roller is detected by the HARD CPU.

Rotation Direction Detection

The reel rotation direction is detected by IC1B using the fact that the FG B signal phase advances in the FWD mode and the FG A signal phase advances in the REV mode. As with the reels, the timer roller's rotational direction is detected using the phase difference between the FG B and A signals.

In order to detect the rotational direction with the minimum pulse change, the FG A, B signals are sampled by the 1.25 MHz (0.8 microseconds) clock pulses and the signal delayed by 0.8 microseconds (equivalent to one 1.25 MHz cycle) and these signals are input into IC1E (PROM) and detected.



6. Interrupt Signal Generator

The interrupt signals are applied to the CPU on the SV board at the timing of 1 over the integer of the vertical sync signal (V) detected from the video signal, and the operation of the servo system is synchronized with that of the video system.

The interrupt signals are provided by dividing the frequency of the V/16 signal generated from counter IC2J-17 using IC1L. These frequency-divided signals include the V/8, V/2, V and 2V signals. The V/8 and V/2 signals are used as the HARD CPU and HOST CPU interrupt signals, the V signal is used as the REF V signal, and the 2V signal is used as the REF 2F signal. The counter IC2J counts the 2.5 MHz pulses, produced by dividing the frequency of the 10 MHz clock pulses, produced by the SV board, as far as the value (set by the SV board CPU) set in the time constant register inside IC2J (CTC) and it generates pulse when the count is terminated.

The frame signal detected from the video signal supplied from the SR board or the "SEL FRAME" signal, which is the frame signal supplied from the plug-in TBC, is input into the gate of counter IC2J-16. When this gate is set "Low", the counter IC2J-17 is reset.

The output cycle of this counter is the value preset inside the counter and even when the reference signal is input while the CPU is processing, the CPU conducts PLL processing so that there is no rapid synchronization. This is performed so that the interrupt processing is not disturbed.

5-7-7. SR-15 Board

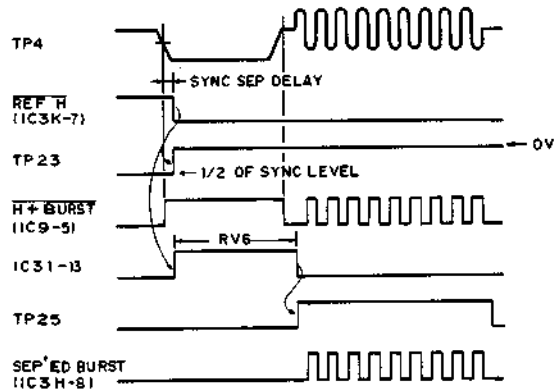
1. Outline

This board is configured with hardware in order to generate the reference signal for the servo system. The BW/COLOR, REF SYNC, REF H, REF V, and COLOR FRAMING are detected by the video signal supplied from the REF VIDEO INPUT or the VIDEO INPUT connector.

2. Burst Separator

The input video signal is amplified about 2 volts by Q14 to Q16 and the signal is then supplied to the burst separator and the sync separator. An outputs of the BURST/H separator IC9-5 and the burst flag that is generated from the REF H separator IC3K-6 by way of delay monostable multivibrator IC3I are output to the burst separator IC3H-8 so that the burst is separated at the timing of the both signals.

BURST SEPARATOR



3. BW/COLOR Detection

The burst counter IC4L and IC5K counts the number of burst. When the count during one field becomes 1024 or more, the output of IC5K-12(Q8) goes "High" and the color signal input is detected. Therefore the result of detection is latched in IC5L-13. The burst counter is reset by the reset pulse at an interval of field supplied from IC4K-10.

4. REF SYNC Separator

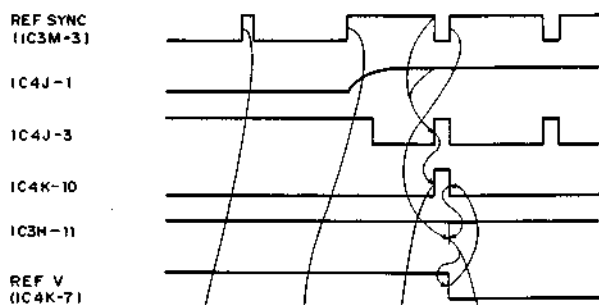
A video signal with negative sync which is clamped by D8 is supplied to the inverting input of IC16-6 and the envelope of sync portion which is detected by IC5 and IC7 is supplied to the non-inverting input of IC16-6. Based on the relationship between the both signals, the video signal without fluctuation can be obtained. This signal is converted to TTL level by the sync separator IC14-9 and output to the REF H separator and the REF V separator.

5. REF H, REF V, REF FRAME Separator

REF V separator is configured with IC4J, IC4K and IC3H. The IC3H is output the REF V pulse at the timing correspond to the trailing edge of the first equalizing pulse of V SYNC. The monostable multivibrator IC3K-6 with about 50 microseconds time constant is used as a REF H separator in order to reject the equalizing pulse.

The REF FRAME separator is configured with IC5I and IC4H. The REF FRAME is detected by the relationship between the REF V and REF H separators.

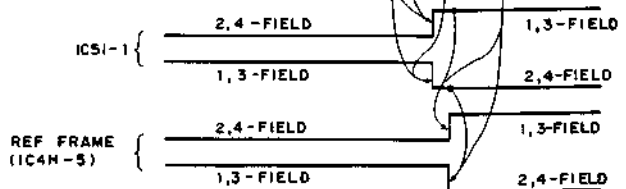
REF V SEP



REF H SEP



REF FRAME SEP



(5-7-7. SR-15 Board)

6. V SYNC Separator

The monostable multivibrator IC4K-7 with about 15 milliseconds time constant is used as a V SYNC separator. This output is output to the EXT CF synchronizer IC5L-3, and the external color framing pulse which is input to the CF PULSE IN connector is synchronized with the V SYNC.

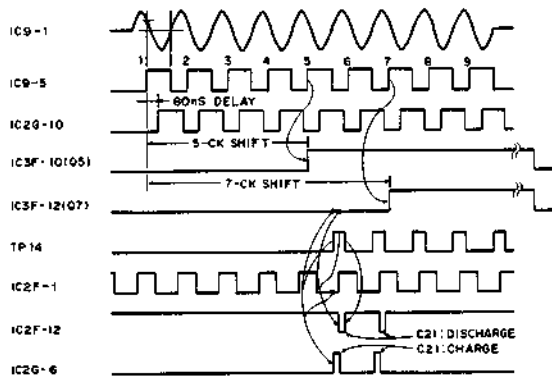
7. H/V Detector

H and V signals separated by the REF H separator IC3K-7 and the REF V separator IC4K-7 are rectified by the CR circuit so that the both signals are supplied to the H/V detector IC5M-10. When H and V are separated correctly, the output of the H/V detector goes "Low" and the result of detection is read into the CPU with address "5070H" via the input port IC4M.

8. Burst Phase Comparator

This circuit is configured with IC2F-12 and IC2G-6, and it serves to compare the output of the CF phase shifter IC3B-13 and 6th and 7th of burst signal separated from the input video signal. The compared output is output to the charge pump so that the oscillating frequency of the VXO (Voltage Controlled Crystal Oscillator) is controlled.

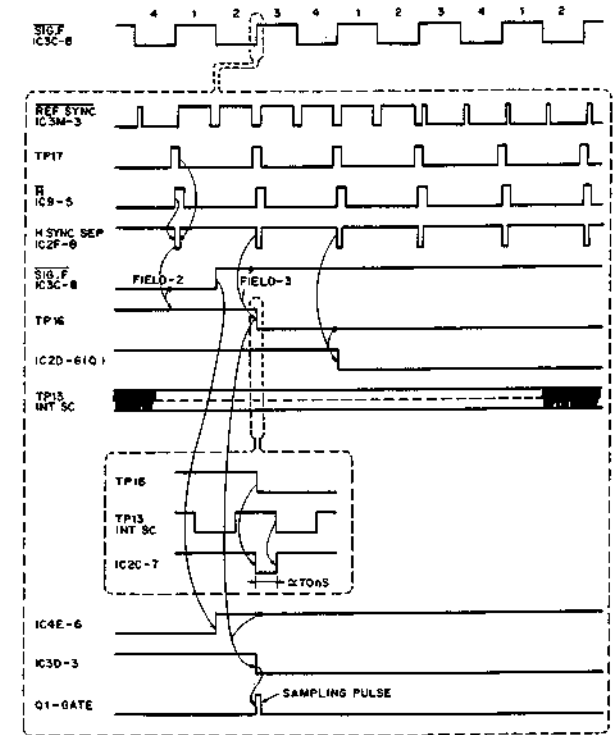
BURST PHASE COMPARATOR



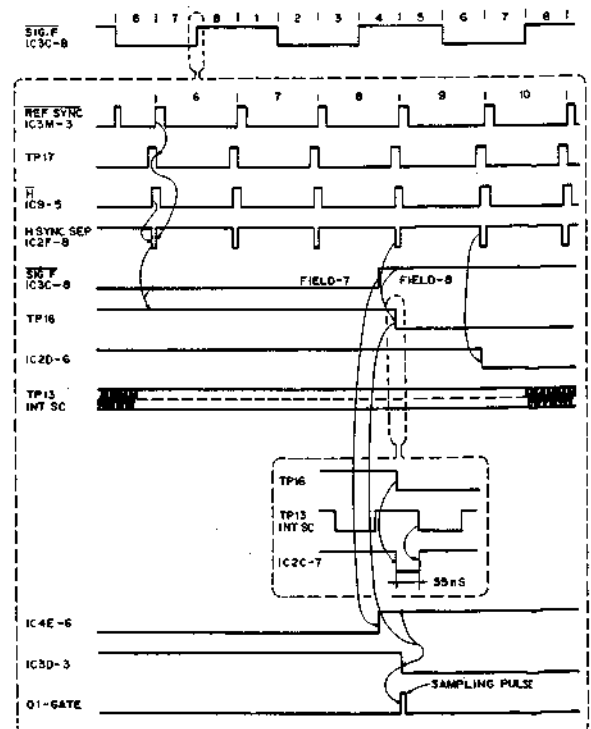
9. Color Frame Phase Detector

The Color frame phase (CF PHASE) is detected from the relationship between the burst and the REF H signals separated from the input video signal. It is output to the RL board via the analog multiplexer on the CD board, and interface to the CPU via the A/D converter.

CF PHASE DETECTOR (NTSC)



CF PHASE DETECTOR (PAL)



(5-7-7, SR-15 Board)

10. PAL/PAL-M 4-Field Detector

Detection of PAL 4-field will be judged whether the burst at 6th line of the odd field is detected.

Burst pulse from IC9-5, which is passed through the 4.55 MHz ceramic filter, is again converted to the TTL level by IC14 and is input to the burst counter IC5E. The burst counter IC5E starts counting at the timing of 6th line of odd field, and after counting 5 pulses, the carry out (CO) is output. This signal is latched by the H sync timing so that the PAL 4-field pulse is output.

Detection of PAL-M 4-field will be judged whether the burst at 8th line of the odd field is detected.

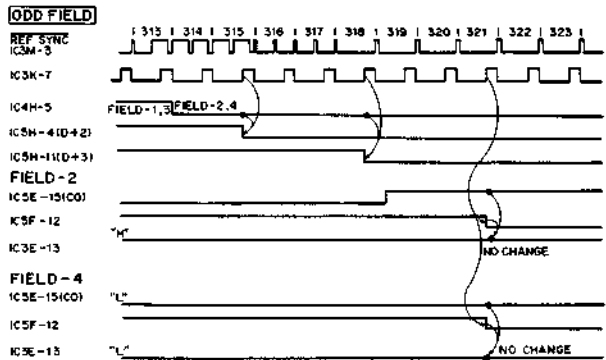
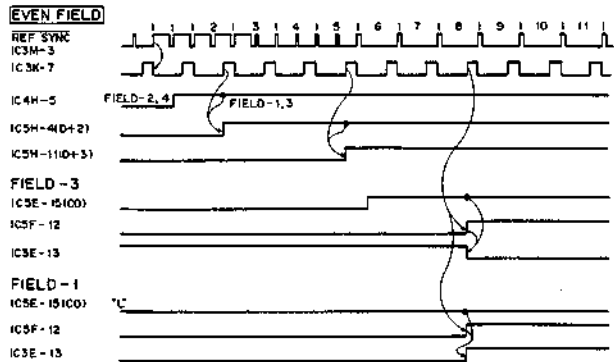
11. SECAM 4-Field Detector

Detection of SECAM 4-field will be judged whether the subcarrier DR at the 8th line of the odd field is detected.

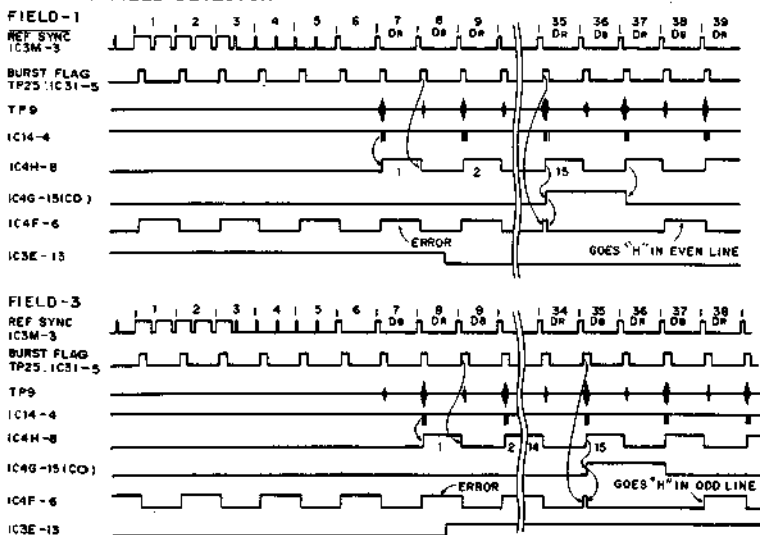
The subcarrier (DR=4.40625 MHz, DB=4.25 MHz) from IC9-5 is converted as a level signals correspond to the frequency of DR and DB by means of 4.55 MHz ceramic filter so that the only the DR is detected and converted to a TTL level by the comparator IC14. The DR pulse converted as a TTL is input to the flip-flop IC4H-8 and the "Low/High" pulses correspond to the DR and DB at an interval of H SYNC is generated.

The counter IC4G counts this pulse and the carry out (CO) is output when the counter counts 15 pulses. Flip-flop IC4F-6 is output "Low/High" pulses alternately at the timing of H SYNC and if a incorrect polarity of alternation is detected, polarity will be inverted forcibly at the timing of carry out (CO) from the counter IC4G. This output is latched by the frame rate signal from IC5F in order to perform 4-field detection.

PAL 4-FIELD DETECTOR



SECAM 4-FIELD DETECTOR



B. THEORY OF OPERATION

(5-7-7. SR-15 Board)

12. Plug-in TBC Detection

The plug-in TBC sends the "TBC FRAME" signal that has the timing of the REF 2F, and the "LALT" signal that has the "High" level at the first line of the first field and alternates its polarity at every horizontal line. When the plug-in TBC sends the "LALT" signal into the SR board, while the external reference signal is not input, the IC4J-10 becomes "High", and the servo system operates on the reference signals supplied from the plug-in TBC.

The "LALT" signal is used as the REF.H signal. The TBC FRAME signal is used as the frame signal and the 4-field signal.

13. EXT CF Detector

The EXT CF signal is input and is converted to the pulse having pulse width of longer than one field, by a monostable multivibrator IC3K-9. This signal is latched by the V. SYNC timing that is separated from the input video signal, and is used to detect if the EXT CF is existing or not.

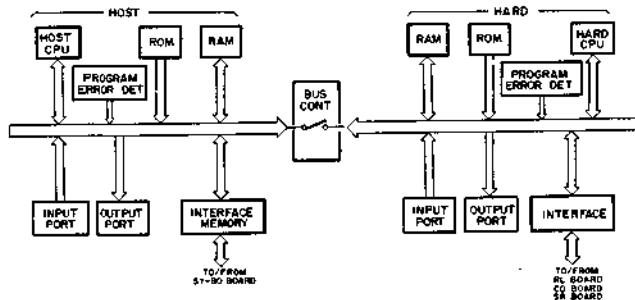
14. REF 4F/8F Generator

The "REF 2F" signal from the RL board is counted down to generate the REF 4F and the REF 8F signals. When the INT 4F or the TBC 4F pulse exists, polarity of the REF 4F or the REF 8F signals are controlled by the CPU.

5-7-8. SV-43 Board

1. General

The SV-43 board has the two CPUs that perform all the servo controls and the interface between the servo system and the system control system of the machine.



2. CPU

The SV-43 board is a multiple-CPU type controller using the two pieces of CPU. The multiple-CPU type controller has advantages such as that work load per one piece of CPU is decreased, the data sampling time becomes constant, and the circuit can be made simpler. From view point of content of control, the CPU IC2B is called as the HOST CPU while the other CPU IC3L is called as the HARD CPU. The HOST CPU takes charge of the servo-control data processing, interface with the SY-80 board, and self-diagnostics. The HARD CPU takes charge of transferring servo data with the other servo related board.

Both of the HOST CPU and the HARD CPU are operating on the 2.5 MHz clock pulse, but each CPU are operating independently. The HOST CPU has the priority to gain access to the main memory and the I/O area of the HARD CPU. This connection ensures that motors can be stopped without giving damage to tape even when either one of the two CPUs should become defective, and that the test and check of the hardware become possible.

The data processing of the servo system are synchronized with the video signal. The HOST CPU is interrupted at V/2 rate, and the HARD CPU is interrupted at V/8 rate so that the series of processing is carried out. Both CPUs are reset by the reset pulses from the system control and the power supply systems.

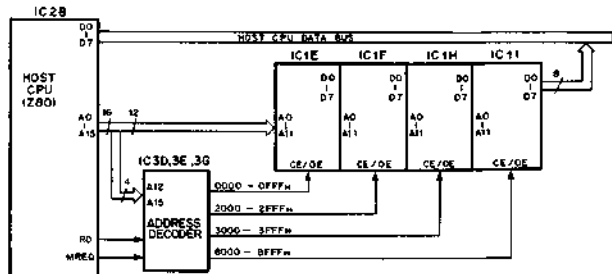
3. ROM, RAM

The HOST CPU has the ROM of 16K-byte and the RAM of 2K-byte. The HARD CPU has the ROM of 8K-byte and the RAM of 2K-byte. These memories are continuously addressed in conjunction with the HOST CPU so that the HOST CPU can access the HARD CPU's hardware directly. If these memories are addressed simply to be continuous, the HARD CPU will re-start from address 0 whenever the power is turned on or the CPU is reset.

Therefore the memory address is made so that the address decode can image the memory of every 4000H address.

HOST CPU Program Memory Address Decoder

This decoder is configured with the 4 pieces of each 4K-byte ROMs (IC1E, IC1F, IC1H, IC1I). They are addressed as shown in the following memory map.



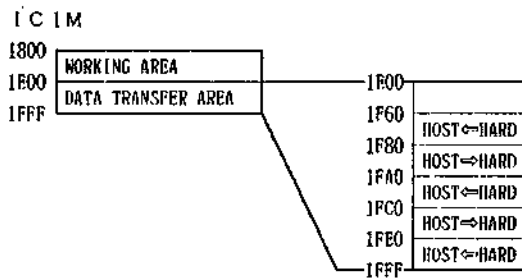
0000	MAIN PROGRAM CONTROL	IC1E
	MODE CONTROL	
0FFF	REEL SERVO	
2000	REEL DIAMETER	IC1F
	REEL TAPE/TA	
	REEL POWER CONTROL	
3000	TEST MODE	IC1H
	SYS INTERFACE	
	SERVO LOCAL COMMAND	
3FFF	DRUM SERVO	
8000	UTILITY ROUTINE	IC1I
	REEL SERVO DATA TABLE	
8FFF	MONITOR	

(5-7-8. SV-43 Board)

RAM for the HOST CPU Working Area

The 2K-byte static RAM (IC1M) is used having the address as shown in the following address map.

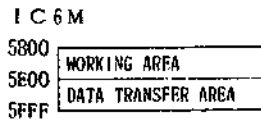
Addresses from 1800H to 1DFFH are used as the working area of the HOST CPU. The addresses from 1E00H to 1FFFH are used for data transfer between the HOST CPU and the HARD CPU.



RAM for the HARD CPU Working Area

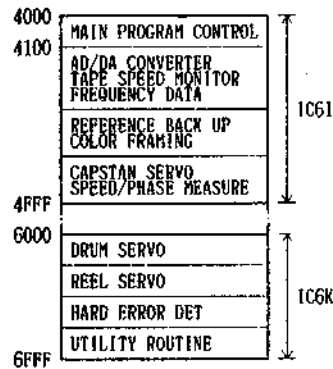
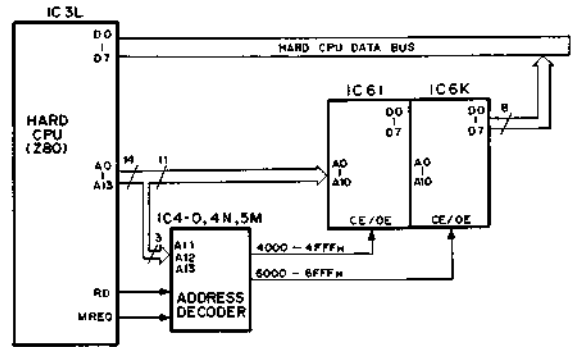
The 2K-byte static RAM (IC6M) is used having the address as shown in the following address map.

Addresses from 5800H to 5DFFH are used as the working area of the HARD CPU. The addresses from 5E00H to 5FFFH are used for data transfer.



4. Program Memory Address Decoder of HARD CPU

This decoder is configured with the 2 pieces of each 4K-byte ROMs (IC6I, IC6K), having the address as shown in the following address map.

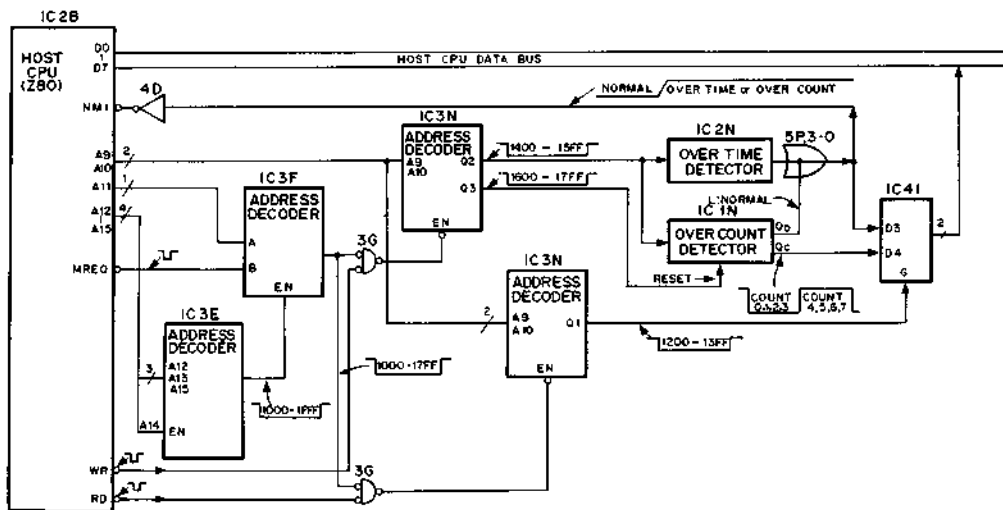


(5-7-8. SV-43 Board)

5. Program Error Detection

The CPU's runaway is detected by the two detectors, one is the overtime detector IC2N and the other is the overcount detector IC1N. Both of the HOST CPU and the HARD CPU access the overtime and the overcount detectors periodically. The software is programmed to reset the overcount detector, too.

When the CPU starts the runaway so that either the CPU's accessing interval to the overtime detector becomes longer than the normal one, or the CPU accesses the overcount detector more than eight times continuously, the CPU is interrupted. This is the NMI (Non-Maskable Interrupt) that is accepted regardless of any other conditions so that the CPU goes to Error Hold routine, and the VTR is forced to go into the STOP mode.



Note: Since the HOST side circuit configuration and that of the HARD side are equivalent, only the HOST side is explained.

(1) Overtime Detector

The overtime detector consists of the retriggerable one-shot IC2N having the approx. 5msec time constant.

In the normal operating condition, the address decoder IC3N-6 (addresses 1400H to 15FFH; Low) sends the trigger pulse to the one-shot IC2N more than once per 5msec. The one-shot IC2N-7 is kept "Low" state. When the program should malfunction, the address decoder IC3N-6 outputs trigger pulses with longer intervals so that the retriggerable one-shot IC2N-7 output becomes "High" state. This output is inverted by IC4D to "Low" that interrupts the CPU by feeding it to the HOST CPU IC2B pin-17 (NMI). The CPU goes to the error processing routine.

(2) Overcount Detector

The overcount detector consists of an up-counter IC1N. This overcounter receives the same signal of the address decoder output IC3N-6 (Q2), as the overtime counter circuit.

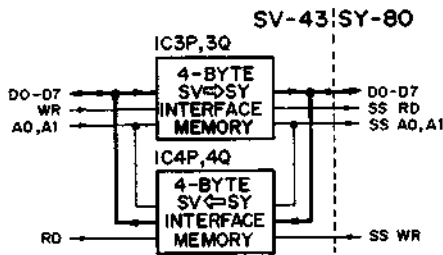
The up-counter IC1N outputs the "Low" normally by receiving constant reset pulse from IC3N-7.

If program should malfunction and incoming timing of the reset pulses will be delayed, and then the up-counter IC1N reaches more than 8 counts, the HOST CPU's NMI terminal is interrupted so that the CPU goes to the error processing routine.

(5-7-8, SV-43 Board)

6. Interface between Servo and System Control

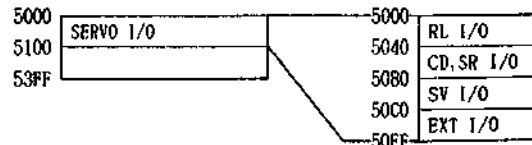
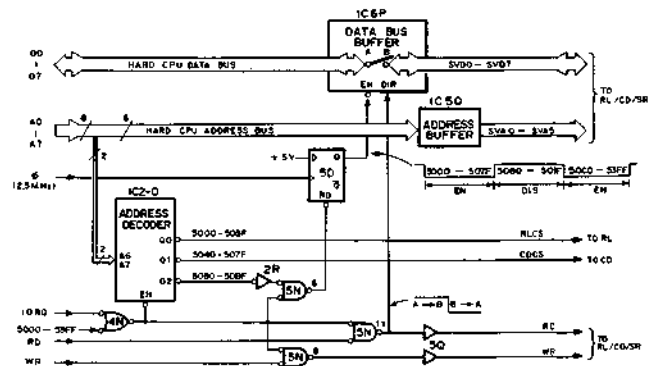
The 8-byte interface memories (IC3P,3Q,3R,4P,4Q,4R) are used between the SY-80's CPU and the SV-43's CPU so that the servo system should be controlled in accordance with the VTR's operating mode that is specified by the system control of the machine. These interface memories can be written-down and read-out simultaneously. The four bytes output of the eight bytes are used for interface from the servo to the system control (where addresses are "1000H to 1003H") while the other four bytes are used for interface from the system control to the servo (where addresses are "F400H to F403H"). The SV-43's CPU and the SY-80's CPU are judged whether they are ready to accept commands or not ready, by looking at the SV READY (pin No. 24 output) and at the SY READY (input from the pin No. 24A).



7. Interface between SV-43 and other Servo Boards

The SV-43 board controls all the rest of circuit board that are used for servo operation. Control is made from the SV-43 to other servo boards mainly through the HARD CPU's bus, but partly through the I/O port.

The servo related boards have the specific assigned addresses shown as follows. The HARD CPU's data are directed to the certain circuit board specified by the address decoder IC2-0, and are output. The IC6P is the data bus's buffer that determines direction of data flow, by receiving the IOREQ signal and the RD signal from the CPU.



8. I/O Port of the HOST CPU

INPUT PORT

The input port of the HOST CPU consists of IC2Q and IC4I, that are addressed as "1200H (RD mode)". This input port is used to read the setting position of various switches and operating status of the various circuits inside the board.

A part of the input port is connected to the output port (IC6-O-7: HARD OUT) of the HARD CPU for monitoring whether the HARD CPU is operating normally.

Address 1200H

- D7: S1-3 (always "OFF")
Reserved for spare. "1" is always read.
- D6: S1-2: HARD CPU ACCESS INHIBIT
Reading the switch's setting data and storing them into the memory.
The S1-2 is normally set to "OFF" so that the D6 is set to "1".
When S1-2 is set to "ON", the D6 will be "0" so that the HARD CPU's memory I/O cannot be accessed (inhibited) even though the HOST CPU designates the address.
- D5: HARD ABN (ABNORMAL)
When the HARD CPU's program error detector detects an error, "1" is read.
- D4: HOST ABN (ABNORMAL) Qc
When the HOST CPU's overcount detector counts "0 to 3", "0" is read. When it counts "4 to 7", "1" is read.
- D3: HOST ABN (ABNORMAL)
When the HOST CPU's program error detector detects an error, "1" is read.
- D2: SY READY
When the SY-80's CPU operates normally, "1" is read.
- D1: HARD OUT
This data is detected by the HARD CPU's program error detector. When the HARD CPU operates normally, "1" is read.
- D0: REF V
The REF V. signal having the duty 50% cycle, with negative going edge of vertical timing, is read.

OUTPUT PORT

The output port of the HOST CPU consists of IC5I, that is addressed as "1200H (WR mode)". This output port is mainly used to inform the HOST CPU's operating conditions to the HARD CPU.

Address 1200H

- D5: DATA TRANSFER ENEBLE
This is the signal enabling to transfer the HOST CPU's data to the HARD CPU. Data are transferred when the D5 is set to "1".
- D4: BUS REQUEST
When D4 is set to "1", the HARD CPU releases the buses such as data bus, address bus and control bus. The HOST CPU occupies these buses.
- D3: SV 01
This signal is output to the SY-80 board's input port, but is not used.
- D2: HARD RESET
This signal inhibits operation of the mechanism such as motor and solenoid during when the system is initializing. This signal is set to "0" during initializing.
- D1: HOST OUT
This signal informs the HOST CPU's operating conditions to the HARD CPU. As long as the HOST CPU operates normally, "1" is output.
- D0: INT (INTERRUPT) TIME
During when the HOST CPU is processing the interrupt routine, D0 is set to "1". The time required for interrupt routine can be measured at TP8.

9. I/O Port of the HARD CPU

INPUT PORT

The HARD CPU's input port consists of IC2P, IC2Q and IC6N, that are addressed as "5080H/5081H (RD mode)".

The address "5080H" is assigned to read the operating condition of various circuits of the SV-43 board. The address "5081H" is assigned to read the alarm signals of the motors, tape, etc.

Address 5080H

- D7: SY 02
Not used.
- D6: SY 01
Not used.
- D5: HOST ABN (ABNORMAL)
When the HOST CPU's program error detector detects an error, "1" is read.
- D4: HARD ABN (ABNORMAL) Qc
When the HARD CPU's overcount detector IC1N counts "0 to 3", "0" is read. When it counts "4 to 7", "1" is read.
- D3: HARD ABN (ABNORMAL)
When the HARD CPU's program error detector detects an error, "1" is read.
- D2: S1-4 (always "OFF")
Reserved for spare. "1" is always read.
- D1: HOST OUT
This signal informs the HOST CPU's operating conditions to the HARD CPU. As long as the HOST CPU operates normally, "1" is read.
- D0: REF V
The REF V. signal having the duty 50% cycle, with negative going edge of vertical timing, is read.

Address 5081H

- D7: BOARD NG
"0" is read when even one of any servo related boards is incorrectly installed, or when any one of connector has loose connection or poor contact.
- D6: OVERHEAT
"0" is read when the internal temperature of the motors such as the drum motor, capstan motor or reel motors increases until the overheat temperature detector in each motor driver boards, detects an overheat.
- D5: HARD RESET IN
"1" is read when the above mentioned D7 "BOARD NG" or D6 "OVERHEAT" takes place, or when the machine system in initialization period, or when a program error is detected. This "1" signal inhibits the operation of mechanism such as motor or solenoid.
- D4: SPR IN
Not used.
- D3: REEL TEMP
When the heat sink of the supply or take-up reel motor drive amplifier exceeds the 90-degree temperature, "0" is read so that the build-up time of the motor is made double of normal time.
- D2: UNTHREAD
When it is immediately after the power is turned on, or the movable guide is opened after the tape is taken-up, "0" is read.
- D1: THREAD
When tape is threaded, and the movable guide is closed, "0" is read.
- D0: TAPE DET
When the tape sensor detects tape even though the tape is incorrectly threaded, "0" is read so that the VTR is forced to go into the STOP mode.

(5-7-8. SV-43 Board)

OUTPUT PORT

The HARD CPU's output port consists of IC1P, IC1Q and IC6-O, that are addressed as "5080H/5081H/5082H (WR mode)".

The address "5080H" (IC6-O) outputs the signals such as the hardware reset signal, the HARD OUT signal that tells the HARD CPU's operating condition, and the READY SV signal telling the system control that the servo system is operating normally.

The address "5081H" (IC1Q) outputs the drive signals such as the mini-tension arm, threading motor, IP motor, pinch roller, brake solenoid and head hour meter. Drive signals are output to the TT board.

The address "5082H" (IC1P) outputs the servo data that are measured in the test mode to be displayed on the 7-segment LED, and the tape running meter drive signal.

Address 5080H

- D5: SPARE
Not used.
- D4: SV 02
This signal is output to the SY-80 board's input port, but is not used.
- D3: SV READY
This signal informs the HOST and HARD CPU's operating conditions to the system control system. As long as the both CPUs operate normally, "1" is output.
- D2: HARD RESET
"0" is output when the system is initializing, or when the machine is alarm conditions. This "0" signal inhibits operation of mechanism such as motor or solenoid.
- D1: HARD OUT
This signal informs the HARD CPU's operating conditions to the HOST CPU. As long as the HARD CPU operates normally, "1" is output.
- D0: INT (INTERRUPT TIME)
During when the HOST CPU is processing the interrupt routine, D0 is set to "1". The time required for interrupt routine can be measured at TP13.

Address 5081H

- D5: MINI ARM
This signal is used for controlling the mini tension arm. "1" is output when the machine operates in the VAR, JOG or less than $\pm 3x$ NORMAL SHUTTLE modes so that the shock of tension is prevented.
- D4: THREAD CONT
This signal controls the threading motor for the movable guide. When D4 goes "0", the movable guide operates.
- D3: PINCH SOL
This signal is used for driving the pinch solenoid. The pinch roller is pressed against the capstan when the "0" is output.
- D2: BRAKE SOL
This is a drive signal for the brake solenoid of the supply and the take-up reels. The brakes are released when the "0" is output.
- D1: IP MOTOR DRIVE
This is a drive signal for the impedance roller motor. The motor rotates when the "0" is output.
- D0: HEAD HOURS
This is a driving signal for the HEAD HOURS meter. During when the drum motor rotates, the "0" is output.

Address 5082H

- D5: TAPE HOURS
This is a drive signal for the TAPE RUNNIG meter so that the "0/1" ratio will be changed in accordance with the tape speed.
- D4: 7-SEG LED SEL
This is a display select signal for the 7-segment LED. The LSD is displayed when "0" is output and the MSD is displayed when "1" is output.
- D3/D2/D1/D0: LED DATA
There are decoding display data, decoded by IC5C, for the 7-segment LED.

5-8. POWER SUPPLY SYSTEM

5-8-1. Outline

The power supply system is composed of the switching regulator and the series regulator. The main functions of the various boards are detailed below.

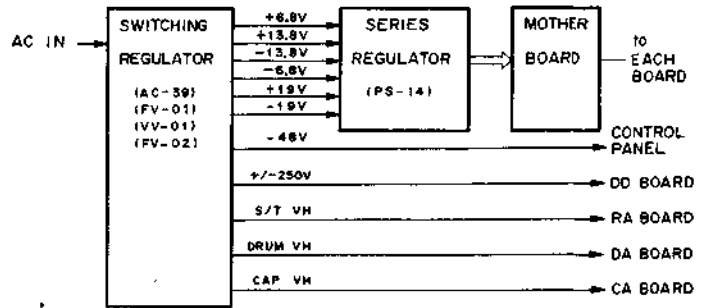
SWITCHING REGULATORS

- AC-39 Board: Surge Current Protector
Main Rectifier
High/Low AC Input Voltage Protectors
- FV-01 Board: System Starter (ST-21 Board)
System Power Supply (CT-36-4 Board)
Sync Generator
Power Controller (CT-38 Board)
Power Active Circuit (PA-19 Board)
6.8V System Power Supply (CT-36-1 Board)
Fan/Solenoid Power Supply
Overheat Detector
PDS (Power Dead Sense) Function
- VV-01 Board: Variable Voltage Power Supply for Motors
- FV-02 Board: $\pm 3.8V/-8.6V/-48V/\pm 250V$ Power Supplies

SERIES REGULATOR

PS-14 Board: $\pm 5V/\pm 12V/-6V$ Power Supplies

POWER SUPPLY SYSTEM

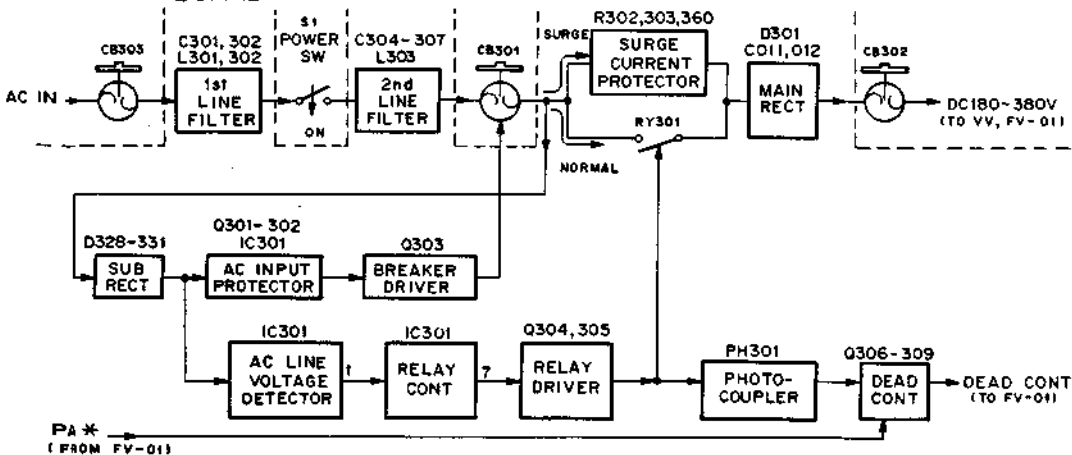


5-8-2. AC-39 Board

1. Line Filters

The AC line input is supplied first through the 10A circuit breaker CB303 to the AC-39 board and then through the first line filter (L301, L302, C301, C302), power switch S1 and the second line filter (L303, C304 to C307) to the circuit breaker CB301. The operation of CB301 is controlled by the high/low AC input voltage protectors which will be described in detail later. The two line filters serve to remove both extraneous noise and the noise which leaks from the regulators into the AC line. The AC voltage, whose noise has been removed, is supplied to the surge current protector described in the item 2.

AC-39 BOARD BLOCK DIAGRAM



2. Surge Current Protector

In order to safeguard against ripple in the various output systems, the switching regulators employ high-capacitance smoothing capacitors C011 and C012. Consequently, there is a danger that a high surge current may flow just after the power has been switched on, and the surge current protector is used in order to prevent this surge current from damaging the power switch or other parts.

This surge current protector is composed of R302,R303,R360 and RY301. Just after the power is turned on, relay RY301 remains off, and the AC input passes through the current-limiting resistors R302,R303 and R306 and fuse F301, and it is supplied to the main rectifier D301. The AC input is also supplied to the sub-rectifier D328 through D331. When the sub-rectifier rises above a constant voltage, the AC detector IC301-1 becomes high, the input passes through R323 and C321, which configure a time constant circuit of approximately 1.5 seconds, and it is output to the relay controller IC301-7. The relay controller IC301-7 becomes high after approximately 1.5 seconds from AC detector IC301-1, this causes the relay driver Q304 turns on and relay RY301 goes on. Once relay RY301 goes on, the input of the main rectifier is switched from the current-limiting resistor and fuse side to the relay side. The operating mode of relay RY301 is sent through the photocoupler PH301 to the dead control circuit Q306-309, it is combined with the PA (Power Active) signal from the FV-01 board which indicates that the rectified voltage is 180V or more, and it is supplied as the DEAD CONT signal to the power control board (CT-38) on the FV-01 board.

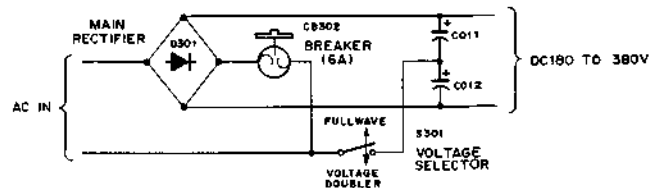
As described above, the relay RY301 is off for approximately 1.5 seconds just after the power has been turned on, and while the current is being limited by R302,R303 and R360, it is charged in smoothing capacitors C011 and C012. The relay RY301 goes on around the time when the charge current drops and it transfers to normal operation.

3. Main Rectifier (D301/C011/C012)

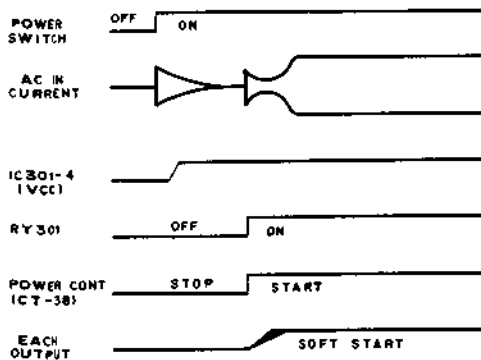
The AC line voltage, which has passed through the surge current protector, is supplied to the main rectifier. When the voltage selector S301 is set to an optimum position in accordance with the AC line voltage which is to be used by the VTR, the rectification method of the main rectifier and sub-rectifier (see item 4) is switched. When the AC line voltage ranges from 90V through 132V, the voltage-doubling rectification method is used; when it ranges from 180V through 265V, the full-wave rectification method is used.

The DC voltage rectified by the main rectifier is output to the FV-01, FV-02 and VV-01 boards, it is switched by pulse width modulation (PWM) on the boards and then converted into an AC voltage.

MAIN RECTIFIER



SURGE CURRENT PROTECTOR



CHAPTER 5. THEORY OF OPERATION

4. High/Low AC Input Voltage Protectors

This circuit is composed of a high AC input protector and a low AC input protector. It functions to detect malfunctions such as when the voltage selector has been set in error to an incorrect position.

The rectified output from the sub-rectifier D328 through D331 is output to the high/low AC input voltage protectors, and this rectified voltage serves to judge whether the AC line input voltage is normal. When the high/low AC input voltage protectors detect anything abnormal, the circuit protector CB301 is actuated, the input of the main rectifier D301 is shut off and all the power supplies used by the VTR are cut off.

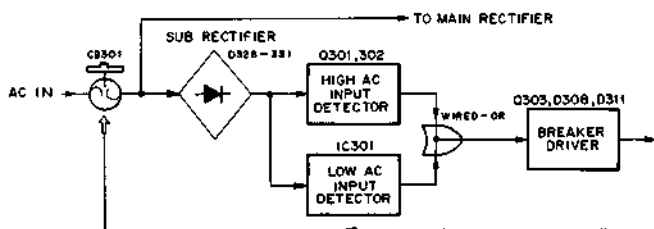
(1) High AC Input Protector (Q301/Q302/Q303)

Q301 and Q302 function as a comparator. This is set on when a high voltage is supplied and the thyristors D308 and D311, which function as the memory, are triggered. Once the thyristors have been triggered, the circuit protector CB301 is actuated and the primary circuit is shut off. Q303 serves to prevent a high voltage from being supplied across pins 3 and 4 of the circuit protector CB301.

(2) Low AC Input Protector (IC301-14/IC301-8)

When the power is turned on, the system power supply (CT-36-4 board) on the FV-01 board starts up but when the comparator IC301-14 detects that the AC line input voltage is low, the pin 14 output goes high and the voltage of comparator IC301 pin 10 (inverting input) is made to rise gradually by the delay circuit R336/C324/C330. After about 1 minute has elapsed, IC301 pin 8 goes high which causes the thyristors D308 and D311 to be triggered, the circuit protector CB301 to be actuated and the primary circuit to be shut off.

AC INPUT PROTECTOR



5-8-3. FV-01 Board

1. System Starter (ST-21 Board)

Once the power has been switched on, system starter is started promptly by the DC 180-380V voltage from the main rectifier on the AC-39 board, and the voltage (Vcc) is supplied to the system power supply (CT-36-4 board).

When the DC voltage at pin 1 on the ST-21 board reaches approximately 50V, Q351 goes on, and an even higher voltage is generated through transformer T106 at pin 3 in phase with pin 2. This voltage is returned to the Q351 and Q352 bases and positive feedback is applied. That is to say, just after the power is switched on, Q351 goes on and Q352 maintains its off status, and C125 is charged gradually through transformer T106. When T106 is saturated, the Q351 base voltage drops, Q351 goes off and, conversely, Q352 goes on, and C125 is discharged through T106. While it is discharging, the voltage is supplied to pin 10 of the CT-36-4 board through D105. In this way, self-oscillation is performed.

When Q353 detects the voltage which indicates that the system power supply (CT-36-4 board) has started up and that the system power supply which has been supplied to pin 4 of the ST-21 board through transformer T104 has started up, the operation of the system starter stops.

2. System Power Supply (CT-36-4 Board)

When the system starter (ST-21 board) is started, the voltage produced by rectifying the output of transformer T106 pin 7 is supplied as the power supply (Vcc) to pin 10 of the system power supply (CT-36-4 board). Once the system power supply (CT-36-4 board) is started up by the system starter, its operation is then sustained by the self-generating voltage. The system power supply controls all the power supplies whose power is generated by the switching regulator. It is started up just after the power has been switched on and, when the power is switched off, it keeps operating until the last moment.

3. Sync Generator (IC101, T109)

From the oscillation output of the system power supply (CT-36-4 board), the sync generator provides the "SYNC" signal (with a 70 kHz frequency and 1 μ sec pulse width) which synchronizes the switching frequencies of the various systems. It prevents beat resulting from the difference in the switching frequencies.

4. Power Controller (CT-38 Board)

The power controller adopts a push-pull DC-DC converter system and it is composed of the CT-38 board, Q105, Q106 and T108. This circuitry generates the +17V voltage (for Vcc) of the systems housed in the FV-01, FV-02 and VV-01 boards and also the ±19V voltages for the series regulator (PS-14 board). A DC voltage ranging from 180V through 380V is supplied from the AC-39 board to the 6.8V system, 13V SOL and 13V FAN switching regulators on the FV-01 board, to the ±13.8V, ±250V and -48V switching regulators on the FV-02 board as well as to the SR/TR/DR/CD switching regulators on the VV-01 board, and when the +17V voltage from the power controller rises, the respective operations are started. In other words, all the outputs are controlled by the operations of this circuitry. The power controller itself is controlled by the PDS (POWER DEAD SENSE) signal from the PS-14 board which indicates a malfunction in the power supply system, by the OVERHEAT DEAD signal from the FV-02 board or by the DEAD CONT signal from the AC-39 board.

- (1) The PDS signal indicates the state of the fixed output voltages (+6.8V, ±13.8V, ±19V, -8.6V) sent to the switching regulators from the series regulator (PS-14 board), and it is high under normal conditions.
- (2) The OHD signal indicates that the power transistors inside the switching regulators have overheated and this is detected by the temperature sensor mounted on the heatsink. Normally, the OHD signal is open but when the temperature of the heatsink exceeds 70°C, it is output to the system control system and an alarm message appears on the fluorescent display of the function control panel. When the temperature further rises to exceed 90°C, this signal is set to ground level and all the outputs are prohibited.
- (3) The DEAD CONT signal indicates the operating mode of the main rectifier voltage at the primary side and the relay which is used to safeguard against surge current. It is low when the relay is on or when the main rectifier voltage at the primary side is 180V or more.

5. Power Active Circuit (PA-19 Board)

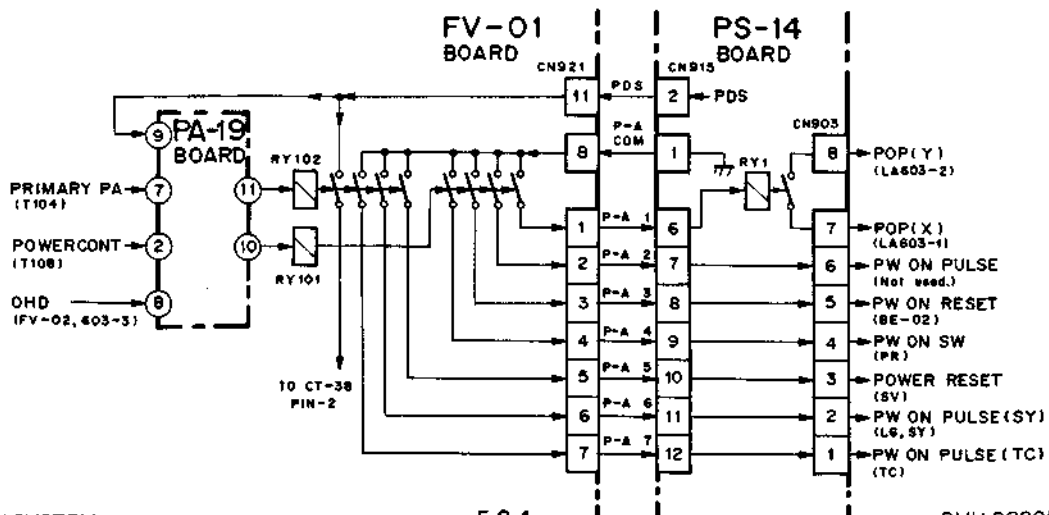
Generated on the PA-19 board are the power active signals (P-A 1 to P-A 7) which advise the various boards used by the VTR that the switching regulators are operating normally. The power active signals are generated only when the following four signals are normal.

- PA-19 pin 7: Primary PA Signal (180-380V when normal)
This signal is produced by peak-rectifying the secondary voltage of T104 on the system power supply (CT-36-4 board), and it indirectly monitors the rectified voltage of the main rectifier.
- PA-19 pin-2: Power Control Signal (17V or more when normal)
See item 4.
- PA-19 pin-9: POWER DEAD SENSE Signal (5V when normal)
See (1) in item 4.
- PA-19 pin-8: OVERHEAT DET Signal (open when normal)
See (2) in item 4.

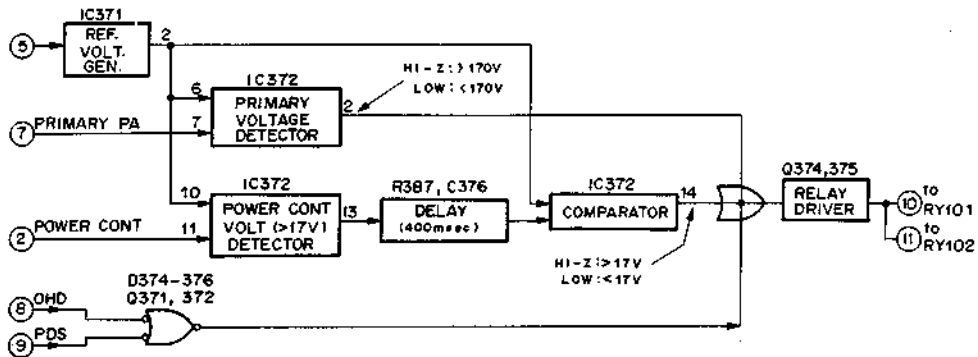
When the above four signals supplied to the PA-19 board are normal, the P-A COM signal from the series regulator PS-14 board is returned through relays RY101 and RY102 as the "P-A 1" through "P-A 7" signals to the PS-14 board, and the returned signals are distributed to the various boards.

Comparator IC372-2, IC372-14 and an output of Q372 feature a wire ORed connection. When the following conditions are present, relays RY101 and RY102 are driven through the relay driver Q375 and the "P-A 1" through "P-A 7" signals are output. IC372-1 is a hysteresis comparator for removing noise, and its output is supplied to the primary voltage detector IC372-2.

POWER ACTIVE CIRCUIT



PA-19 BOARD BLOCK DIAGRAM



When a voltage (PRIMARY PA SIG.) exceeding 180V is supplied, the secondary output voltage is detected through pin 7 of the PA-19 board by IC372. Pin 2 of IC372 is in the high-impedance state. When the input voltage is less than 180V, pin 2 is set low, and RY101 and RY102 go off even if the other three systems (POWER CONT, OHD, PDS) are normal. Hysteresis comparator IC372-13 detects the input voltage at pin 2 of the PA-19 board. When the input voltage is more than +17V and it is detected that the regulator is operating normally, pin 13 of IC372 is set high, and pin 14 of comparator IC372 is switched from low to the high-impedance state by the next stage delay circuit R387, C376 at a timing which is delayed by approximately 400 msec.

The OVERHEAT DET signal is supplied to pin 8 of the PA-19 board and the power-down signal (POWER DEAD SENSE) is supplied to pin 9. When something abnormal is detected in the regulator by both signals or by one signal, the Q372 collector goes low, and the relay drivers Q374/375 are set off. When the regulator is operating normally, the Q372 collector is set high, relay drivers Q374/375 are driven and relays RY101/102 are set on. Relay drivers Q374 and Q375 are connected in series, and Q374 goes on when the input voltage at pin 5 of the PA-19 board is 15V or more. This prevents faulty operation in the relays which is caused when the power in the PA-19 board rise or falls.

6. +6.8V System Power Supply (CT-36-1 Board)

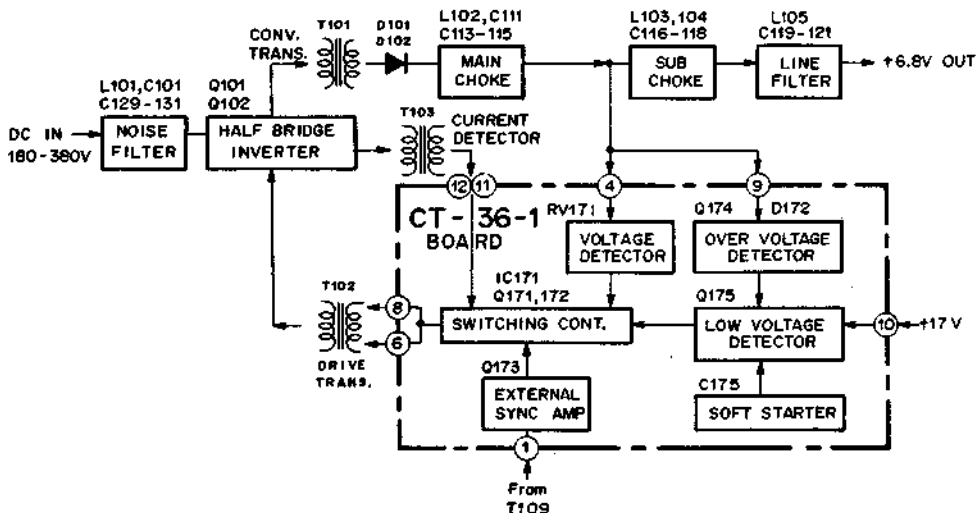
The +6.8V system power supply is a half-bridge inverter type of switching regulator. It is composed of T101, T102, T103, Q101, Q102, D101 and D102 and of the CT-36-1 board.

The "DC 180-380V" voltage input to pin 2 of the FV-01 board is supplied to the Q101 and Q102 half-bridge inverter. Q101 and Q102 are switched alternately by the switching controller, composed of IC171, Q171 and Q172 inside the CT-36-1 board, through T103, and the DC 180-380V voltage is converted into a 35 kHz AC voltage. The converted AC voltage is rectified into a +6.8V voltage by D101 and D102 through T101, and it is output to the series regulator (PS-14 board) through the main and sub choke coils and line filter.

When the +17V voltage from the power controller (CT-38 board) is supplied to pin 10 of the CT-36-1 board, the PWM switching regulator IC171 starts operating. An oscillator is contained inside IC171 and this is synchronized by the SYNC signal (70kHz) from the system power supply (CT-36-4 board) which is supplied to pin 1 of the CT-36-1 board.

In cases where the voltage from the power controller (CT-38 board) has dropped to +15V or less or where the +6.8V system is no-loaded and an overvoltage is about to be output, both Q174 and Q175 are set on and the output is prohibited.

6.8V SYSTEM POWER SUPPLY

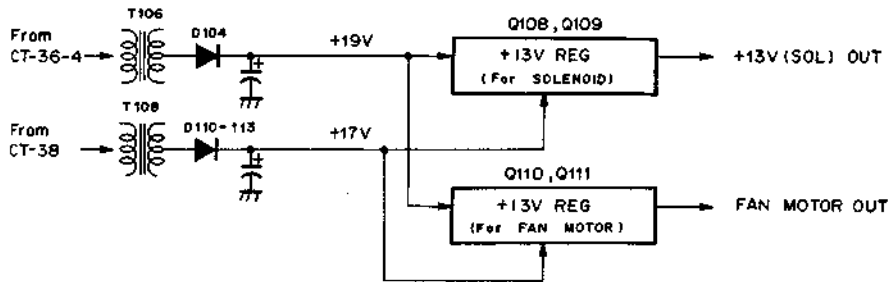


(5-8-3. FV-01 Board)

7. Fan Motor/Solenoid Power Supply (Q108-Q111)

The machine is forcibly ventilated by a fan motors and it uses a solenoid to memorize mechanically the various modes in accordance with the VTR operation. The circuitry of this power supply is configured as a series regulator. It provides 13V from the 17V and 19V provided by the switching regulator and it supplies the voltages to the fan motors and solenoids. The +19V, produced by rectifying the output of the system power supply (CT-36-4 board) by T106 and D104, is supplied to the Q108 and Q110 collectors. Furthermore, the 17V, produced by rectifying the output of the power controller (CT-38 board) by D110 through D113, is supplied through zener diodes D149 and D150 as the reference voltage to the bases of Q108 and Q110. The output current is detected by R141 and R142 and it is protected from load failures respectively by Q109 and Q111.

POWER SUPPLY FOR SOLENOID & FAN MOTOR



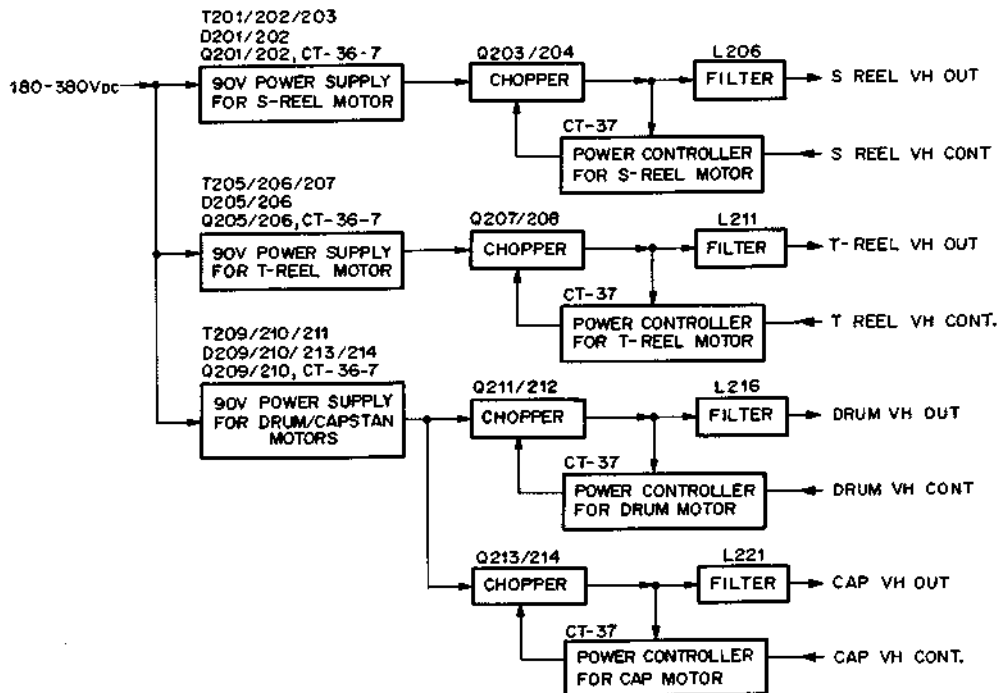
5-8-4. VV-01 Board

1. Outline

The VV-01 board is composed of the power supplies (S-REEL VH, T-REEL VH, CAP VH, DRUM VH) which are used for the variable voltage outputs to drive the supply reel, take-up reel, capstan and drum motors. These power supplies are controlled by the control signals from the motor drive boards (RA/CA/DA boards) or, in other words, in accordance with the operating mode of the VTR.

This board is composed of the three CT-36-7 boards, the four CT-37 boards and their peripheral circuitry. For details on the operation of the CT-36-7 board and its peripheral parts, refer to the description given in item 6 of section 5-8-3 "6.8V System Power Supply: CT-36-1 Board".

VV-01 BOARD BLOCK DIAGRAM



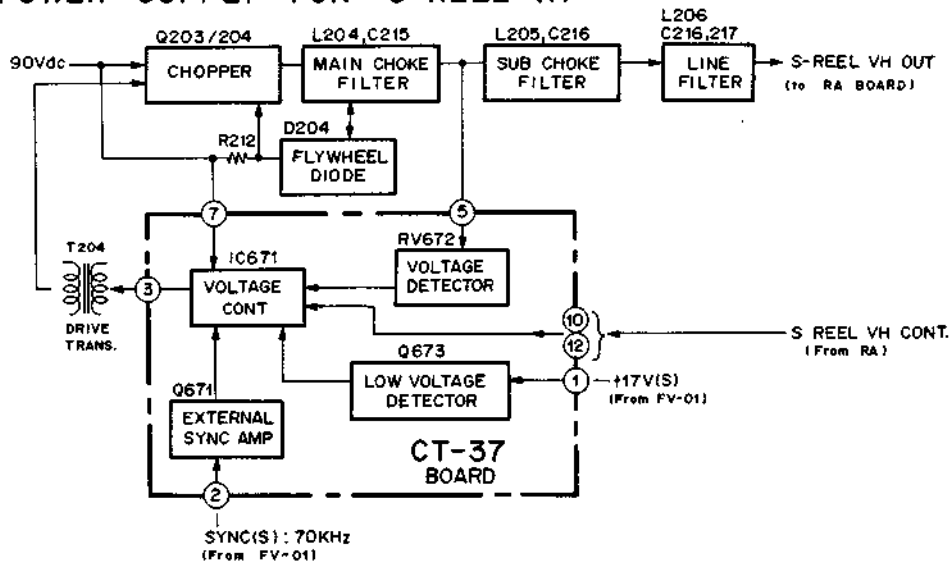
(5-8-4. VV-01 Board)

2. Variable Power Supplies for S/T Reel, Capstan and Drum Motors

The DC 180-380V voltage which is supplied to CN201-2 of the VV-01 board from the AC-39 board is first rectified to 90V by the three CT-36-7 boards and then used as the power supply to drive the supply (S) reel, take-up (T) reel and drum motors. The power supply, which is used by the drum motor system and which is rectified to approximately 47V through transformer T209, is used for the capstan motor. The CT-37 board is the control board first for varying the voltage supplied at 90V or 47V in accordance with the operating mode of the VTR and second for outputting this voltage.

Since the various systems have the same circuit configuration, the description below is confined to the variable power supply of the supply (S) reel system. The voltage which has been rectified to 90V by the CT-36-7 board and its peripheral circuits is chopped by transistors Q203 and Q204. When Q203 and Q204 are set on, the main choke coil L204 is charged and when they are off, it discharges through flywheel diode D204 and the power is sent to the load. The CT-37 board controls the Q203/Q204 "on/off" time in accordance with the "S-REEL VH CONT" signal from the RA-05 board and it varies the output voltage. The output voltage is controlled by IC671 on the CT-37 board and IC671 oscillates in synchronization with the SYNC (S) signal (70 kHz frequency) supplied to pin 2 of the CT-37 board. The current flowing to the input is detected by R212 and the output power is controlled.

POWER SUPPLY FOR S-REEL VH



5-8-5. FV-02 Board

1. Outline

This board is composed of the $-8.6V$, $\pm 13.8V$, $\pm 250V$ and $-48V$ power supplies. The $+8.6V$ and $\pm 13.8V$ voltages are supplied to the series regulator (PS-14 board) and $\pm 12V$, $-5V$ and $-6V$ voltages are produced. The $\pm 250V$ voltages are sent to the DD board (DT Driver) and are used as the power supply to drive the bimorph leaf. The $-48V$ voltage is supplied to the function control panel and used to power the fluorescent display tube.

2. $-8.6V$, $\pm 13.8V$ Power Supplies (CT-36-2, CT-36-3 Boards)

The $+13.8V$ voltage is produced by the CT-36-2 board and its peripheral hardware on the FV-02 board. The $-8.6V$ and $-13.8V$ voltages are produced by the CT-36-3 board and its

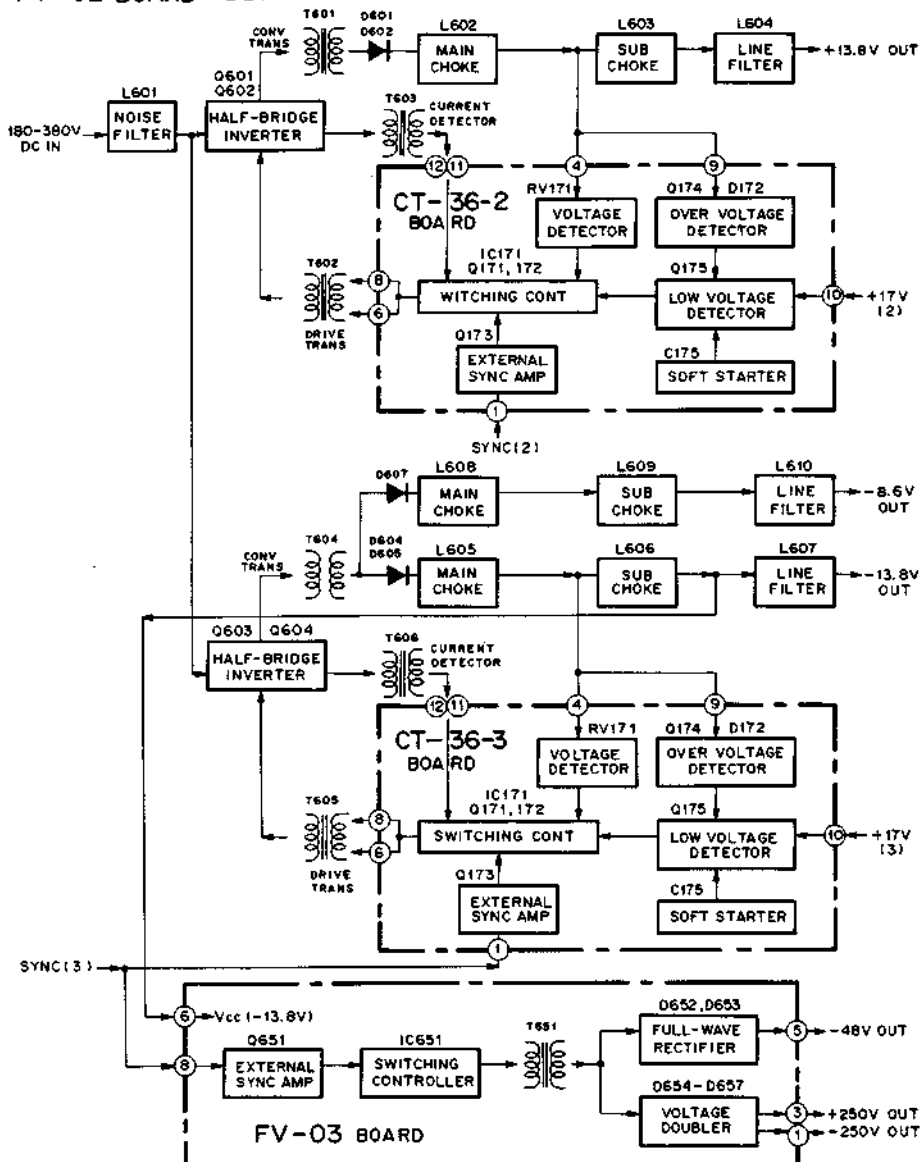
peripheral hardware. Although the voltages handled are different, the circuitry configuration is virtually identical to that of the CT-36-1 board on the FV-01 board and so reference should be made to 6 in item 5-8-3 for details of the operation.

3. $\pm 250V$, $-48V$ Power Supplies (FV-03 Board)

The $\pm 250V$ voltages are used to drive the DT head and the $-48V$ voltage is used for the fluorescent display tube on the function control panel.

The FV-03 board is a push-pull type of DC-DC converter which is synchronized with the SYNC (3) signal from the FV-01 board. The $\pm 250V$ voltages are produced by voltage-doubling rectification while the $-48V$ voltage is produced by center-tapped fullwave voltage-doubling rectification.

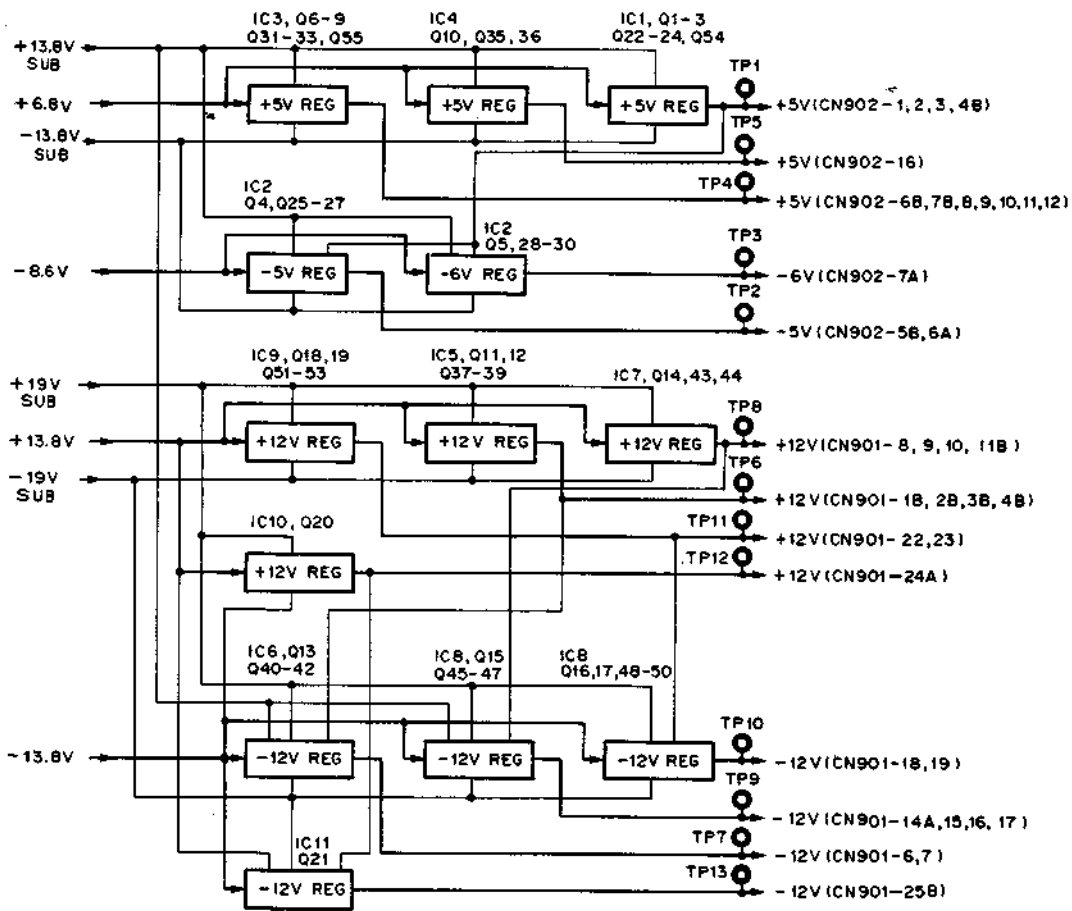
FV-02 BOARD BLOCK DIAGRAM



5-8-6. PS-14 Board

The various power supply inputs from the switching regulators are converted into stable +5V, -5V, -6V, +12V and -12V voltages by the PS-14 board, and these are output to the various boards. All the outputs from the switching regulators are floating and they are connected to a common ground on the PS-14 board. The PS-14 board contains the PDS (Power Dead Sense) circuit which judges whether the +6.8V, +13.8V, +19V, -8.6V, -13.8V and -19V voltages which are supplied from the switching regulators are normal. If anything abnormal is detected, the PDS signal is output to the FV-01 board and all the outputs of the switching regulators are shut off.

PS-14 BOARD BLOCK DIAGM



Downloaded by: b. THEORY OF OPERATION

SECTION 6 REPLACEMENT

This section provides procedures for replacement and the subsequent adjustment which require some preliminary knowledge. The parts not described here are provided in Section 3 or exploded views in Section D.

6-1. V/S ERASE HEAD REPLACEMENT

Preliminary Information

If the leads of the V/S erase head are caught on the harness holder for the audio/CTL head, the V/S erase head can not be set in the correct position and it may cause double recording in the REC mode.

Replacement

1. Go to the rear of the machine and open the power supply and remove the connector CN383 from the BE-02 board.
2. Loosen the V/S screw and remove the V/S erase head assembly.
3. Remove the harness from the V/S erase head, then remove the head. (See Fig. 6-1.)
Note: The spacer will be used again.
4. After replacing the head, assemble the parts in the reverse order of step 3.
5. Solder the harness to the head. (See Fig. 6-2.)
6. Mount the V/S erase head in the order of steps 2 and 1.
7. Connect the connector CN383 to the BE-02 board.

Adjustment

8. Turn the threading motor with a flat-blade screwdriver to close the slant guide and make sure that the leads of the V/S erase head are not caught on the harness holder.
9. Check the height of the V/S erase head, referring to Section 3-24-12.

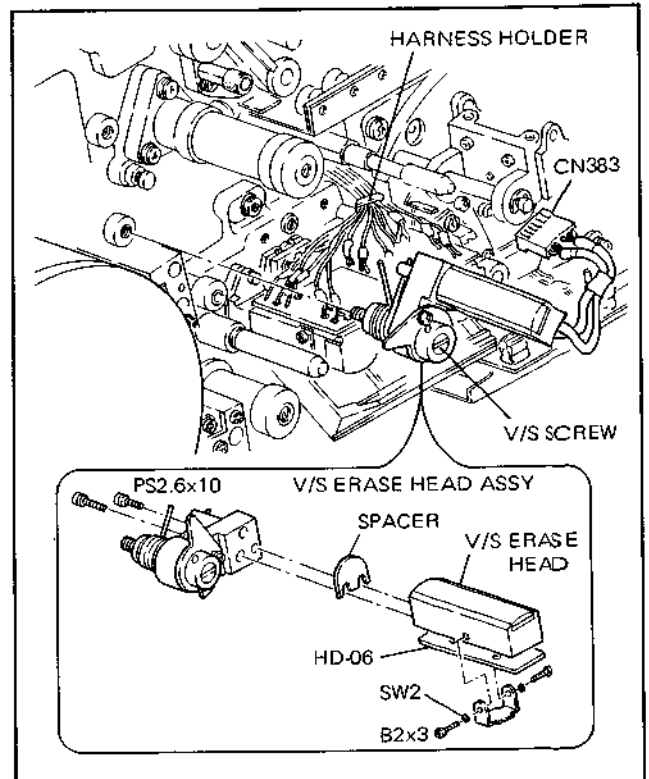


Fig. 6-1. V/S Erase Head Replacement

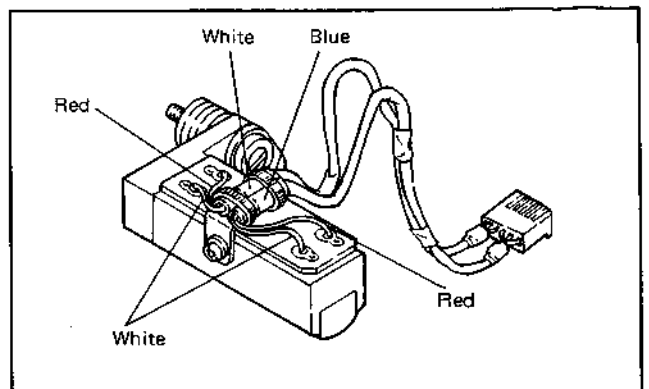


Fig. 6-2. Soldering Leads

6-2. DME REPLACEMENT

Preliminary Information

- A. Spacers may be inserted at the base of the timer roller assembly. These spacers must be reinstalled at their positions after DME replacement, and they may not be lost or installed in different positions.
- B. Installation must be carried out so that the clearance between the magnet ring inserted into the boss of the counter roller and the DME reaches the specified value. With incorrect installation, the DME may be damaged or the tape timer may cause the counting errors.
- C. When the relative position between DME and magnet has been changed, the FG duty cycle must be adjusted.

Replacement

1. Pull out the connector CN005 from the TT-01 board. When the harness is clamped, also remove it.
2. Remove the three screws (PSW4x20), and remove the timer roller assembly from the base chassis.
3. Remove the set screw from the boss part of the base of the timer roller assembly as shown in the exploded view in Fig. 6-3, and remove the piece from the screw hole. Next, turn the upper flange of the timer roller in counterclockwise, and remove the turning prevention nut and the base.
4. Remove the two screws securing the DME holder assembly, and replace the DME with a new one.
Note: During soldering, push the DME against the holder.

DME Installation Position Adjustment

5. Fix the DME holder assembly to the lower flange of the timer roller with the two screws (PSW2.6x6) so that it still can be moved lightly.
6. Insert a thickness gauge with a thickness of 0.3 mm between the DME and the magnet ring, push the DME holder assembly lightly from above, and tighten the two screws securely.

Installation

7. Insert the bent part of the turning prevention nut into the hole of the base as shown in Fig. 6-3, and tighten the screw of the timer roller shaft by 3 or 4 turns. Insert the piece into the screw hole of the base boss, and tighten the set screw (4x6) lightly.
8. Adjust the upper flange so that the dimension from the installation surface of the timer roller assembly to the bottom of the upper flange becomes 62.700 mm or as near as possible referring to section 3-24-2, and then tighten the set screw driven in the preceding step securely.

9. Fix the timer roller assembly securely with the three screws (PSW4x20) to the base chassis. When spacers had been used, reinstall them in their original positions.
10. Plug the connector CN005 to the TT-01 board, and clamp the harness again in the original position.

Tape Path Confirmation

11. Thread a tape, and set the machine in REC mode. Confirm that the tape is in light contact with the upper flange of the timer roller assembly and that the tape does not curl. Also confirm that the tape does not curl near the T-tension arm. If necessary, adjust the height of the upper flange and/or the slant of the timer roller referring to section 3-24-2. Confirm the tape path in the same way in F.FWD mode and REW mode.

FG Duty Cycle Adjustment

12. Adjust the FG duty cycle of the timer roller according to steps 3 to 7 of section 3-23-1.

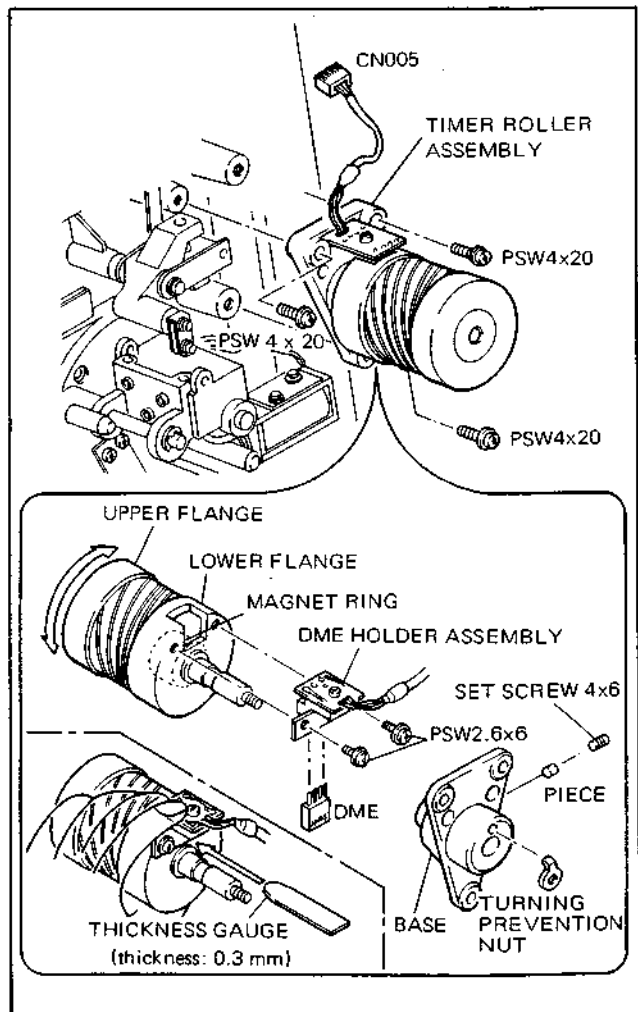
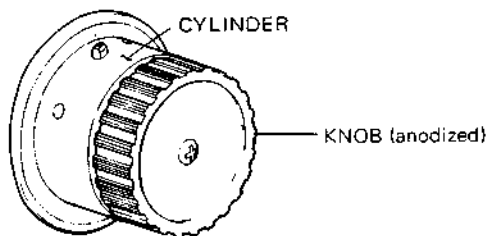


Fig. 6-3. DME Replacement

6-3. REEL MOTOR ASSY REPLACEMENT

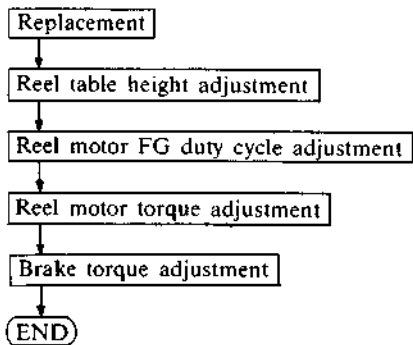
Preliminary Information

- A. The mechanical brake built in reel motor assembly operates when the power has been turned off during tape running or when no tape has been detected by tape sensor, and then the mechanical brake operates together with electromagnetic brake. The combined brake force can be displayed at ND1 on the SV-43 board by "TEST" mode. The displayed value indicates the deceleration of the reel rotation speed every unit time, and the value shows that the higher the value is, the stronger the brake force is.
- B. The cylinder of the reel table supplied as the reel motor assembly, is made of nickel-plated brass. If replacing the reel table made of nickel-plated brass with other reel table, check the material of the cylinder before adjustment, because the adjusting value of the brake torque differs in the material.
- C. Distinction of reel table



color of cylinder and knob	same	different
surface treatment of cylinder	anodized	nickel-plated

- D. Replacement and the subsequent adjustment for the reel motor assembly must be performed as follows.



6-3-1. S Reel Motor Assy Replacement

Replacement

1. Turn off the power and remove the front panels.
2. Remove the cover and reel washer shown in Fig. 6-4.
3. Remove the connector CN001 from the TT-01 board.
4. Go to the rear of the machine and open the power supply block. Remove the connectors CN204, CN206, and CN209 from the RA-05 board and remove the harness of CN209 from the clamp.
5. Remove four PSW4×16 screws securing the reel motor assembly.
6. To install the new assembly, reverse removal procedure.

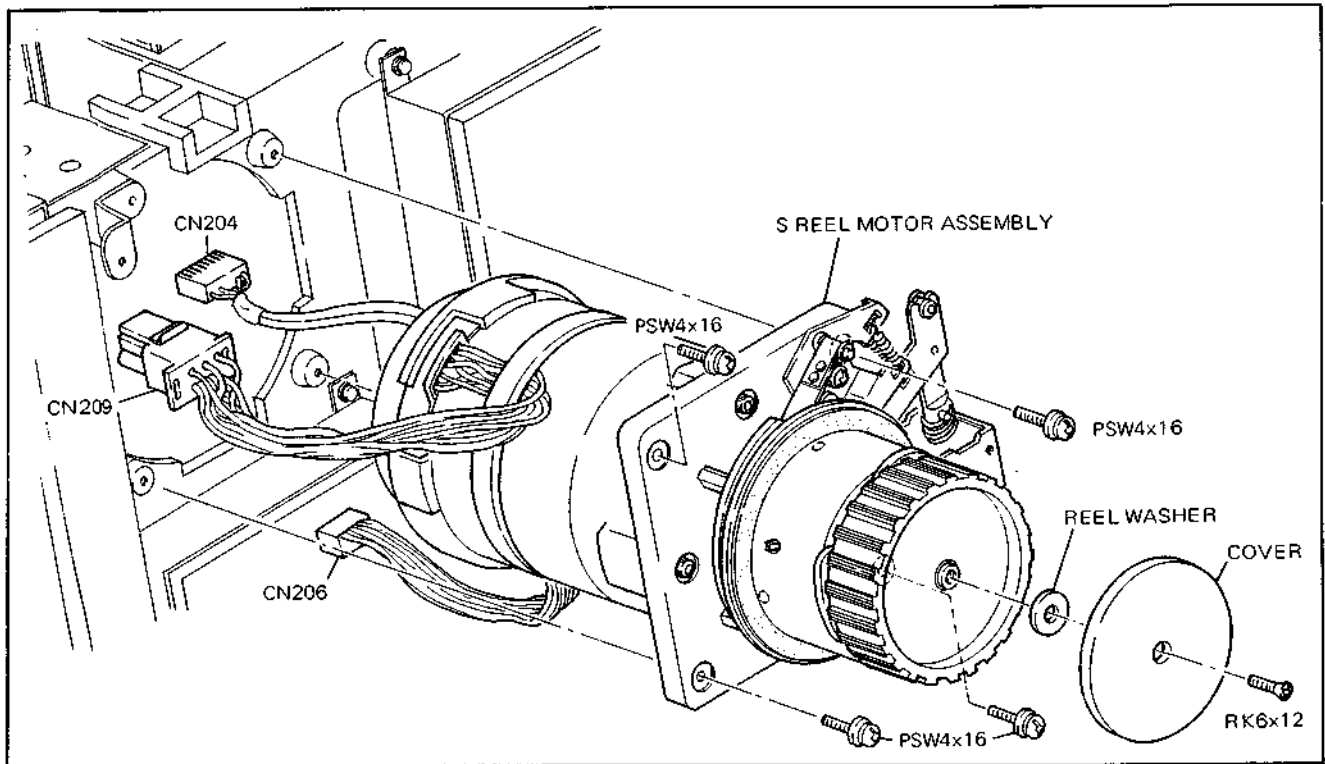


Fig. 6-4. S Reel Motor Assembly Replacement

Reel Table Height Adjustment

7. Thread a recorded tape without wrinkles and damage. Check that the tape does not come in contact with the reel flange extremely in F.FWD mode. Perform the same check in REW mode. If the tape comes in contact with the reel flange extremely, perform the following steps a, b and c. If the tape curls at the other position than the reel flange, perform the adjustments shown in section 3-24-2.

- a. Remove the tape, cover and reel washer (see Fig. 6-5).
- b. Loosen the two set screws securing the reel table, and turn the height adjustment screw.

Note 1: One turn of the screw changes the height by 0.7 mm.

Note 2: Turn the screw as follows.

- If the tape contacts the upper reel flange, turn the screw clockwise.
- If the tape contacts the lower reel flange, turn the screw counterclockwise.

c. While pushing the reel table lightly to the motor, tighten the two set screws. Check the height of the reel table again and then reinstall the reel washer and the cover.

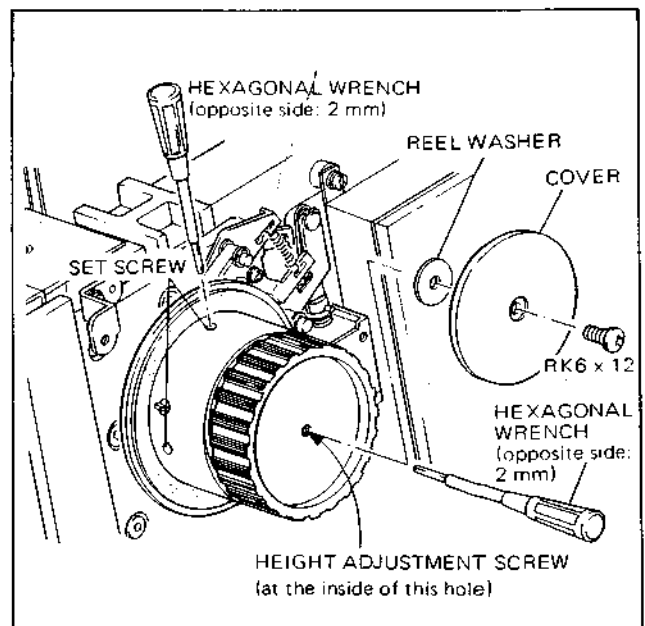


Fig. 6-5. S Reel Table Height Adjustment

FG Duty Cycle Adjustment

8. Adjust as follows so that the motor FG duty cycle in FWD 3 times normal speed is 50%.
 - ① Thread a recorded tape.
 - ② Turn on the power. Set S4 (TEST-1) switch on the CD-17 board to "1", and depress S7 (ENTRY) switch for at least 0.5 sec.
 - ③ Connect an oscilloscope to TP3 on the RL-12 board, and set the machine in FWD 3 times normal speed mode.
 - ④ Confirm that the duty cycle of the waveform at TP3 is 50%. If necessary, adjust RV2.
 - ⑤ Connect the oscilloscope in the same way to TP14 of the RL-12 board, and confirm that the duty cycle in FWD 3 times normal speed mode is 50%. If necessary, adjust RV4.
 - ⑥ Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec. (This cancels the test mode.)
 - ⑦ Remove the tape.

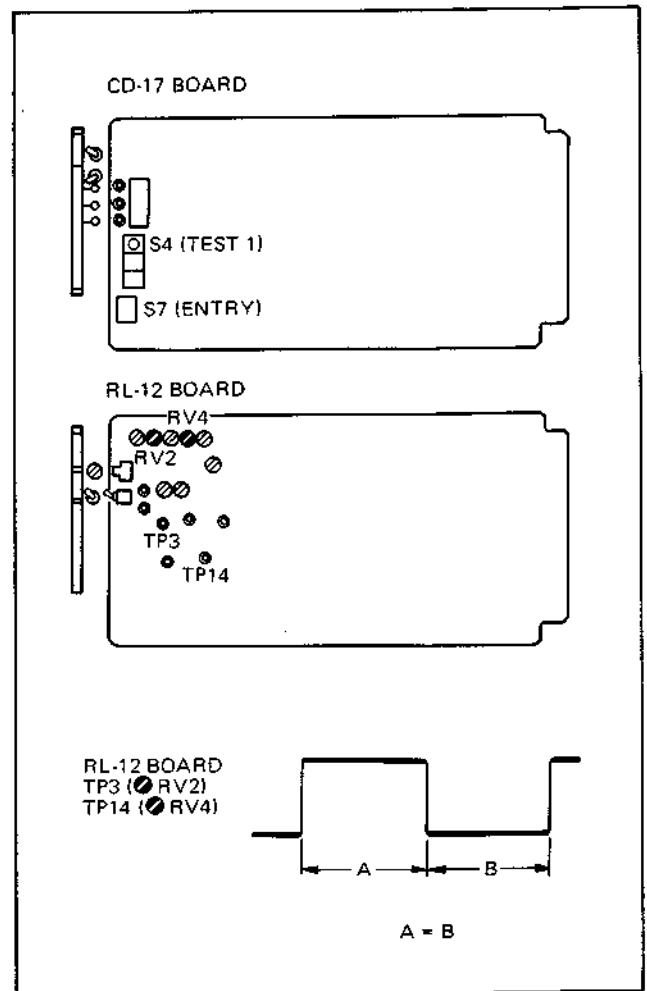


Fig. 6-6. S Reel Motor FG Duty Cycle Adjustment

S Reel Motor Torque Adjustment

9. Adjust the drive torque of the reel motor according to the following sequence.

Note: As one of the test functions of the machine, the motor output torque can be calculated from the acceleration and deceleration time by activating or stopping a predetermined inertia load, and the results can be indicated. Then adjustment is carried out so that the display shows the specified value.

- a. Install a 9" reel with tape fully wound and the tape end fixed with adhesive tape on the S reel table.

CAUTION: As this reel is the reference inertia load, a reel with only little tape wound onto it or a reel with a different diameter must not be used.

- b. Turn on the power and set S4 (TEST 1) switch on the CD-17 board to "2".
- c. Depress S7 (ENTRY) switch on the CD-17 board until the S reel starts to rotate. (By this operation, the S reel motor automatically executes the sequence of forward, reverse and stop.)
- d. After motor stops, confirm that the number shown in Fig. 6-7 is indicated by the display element ND1 on the SV-43 board. If necessary, adjust RV1 on the RA-05 board.

After the adjustment, again carry out step c, and then confirm step d. Repeat this sequence until the specified value is obtained.

Note: When RV1 is turned clockwise by one division, the figure of the upper digit displayed on ND1 decreases one and when RV1 turned counterclockwise by one division, the figure increases one.

- e. Remove the inertia load reel.

Note: When this reel is to be used for general recording, carefully remove the adhesive where the tape was fixed with adhesive tape, or cut off about 80 cm of the tape from the tape end. If the tape is used with adhesive on it, the head may be clogged, or the tape may be wound around the guide.

- f. Set the switch S4 on the CD-17 board to "0", and depress the switch S3 (RESET) on the SY-80 board.

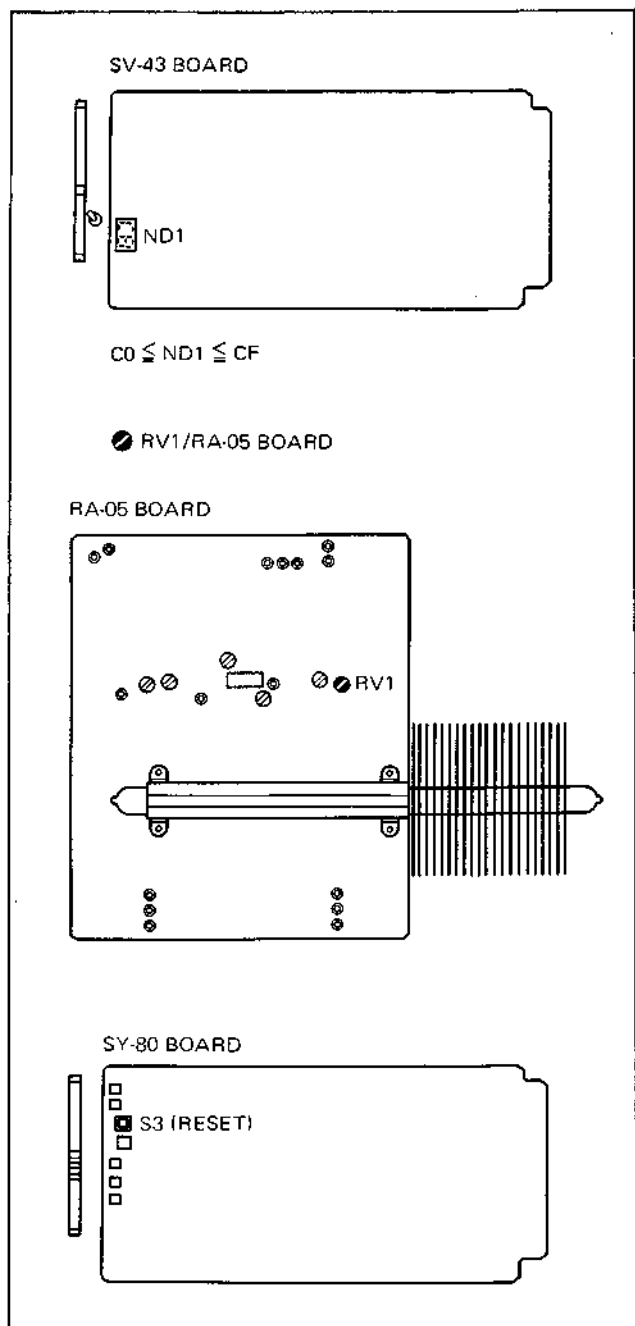


Fig. 6-7. S Reel Motor Torque Adjustment

Mechanical Brake Torque Adjustment

Note 1: When measuring the brake torque, be sure to use a 9-inch empty reel.

Note 2: The reel motor assembly supplied as a repair part includes the reel table cylinder made of nickel-plated brass. The adjusting value of the brake torque differs in the material of the reel table. When replacing the reel table with the other one, check the material of reel table referring to item C in the preliminary information.

10. Place a 9-inch empty reel on the S reel table and turn on the power.
11. Set S4 (TEST 1) on the CD-17 board to "4", and adjust the following brake torque.
 - (1) FWD(CCW) brake torque
Set S5 (TEST 2) on the CD-17 board to "A", and depress S7 (ENTRY) for at least 0.5 sec. When the rotation of the reel has stopped, confirm that the ND1 on the SV-43 board indicates the value shown in Fig. 6-8. If the value is not within specifications, change the position of the spring (FWD/CCW) as shown in Fig. 6-9.
 - (2) REV(CW) brake torque
Set S5 (TEST 2) on the CD-17 board to "B", and depress S7 (ENTRY) for at least 0.5 sec. When the rotation of the reel has stopped, confirm that the ND1 on the SV-43 board indicates the value shown in Fig. 6-8. If the value is not within specifications, change the position of the spring (REV/CW) as shown in Fig. 6-9.
12. Set both S4 and S5 to "0", and depress S7 for at least 0.5 sec to release the test mode.

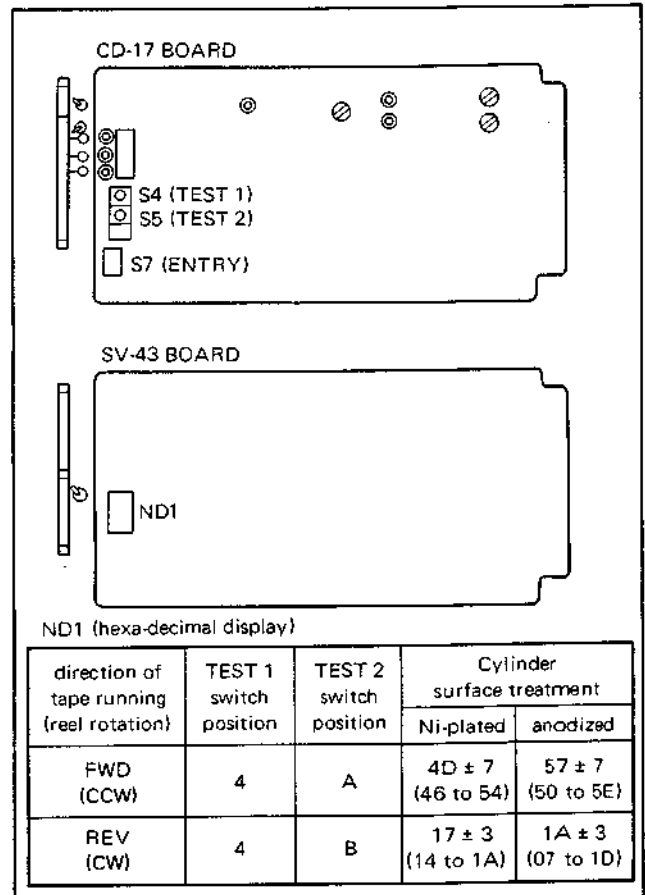


Fig. 6-8. Brake Torque

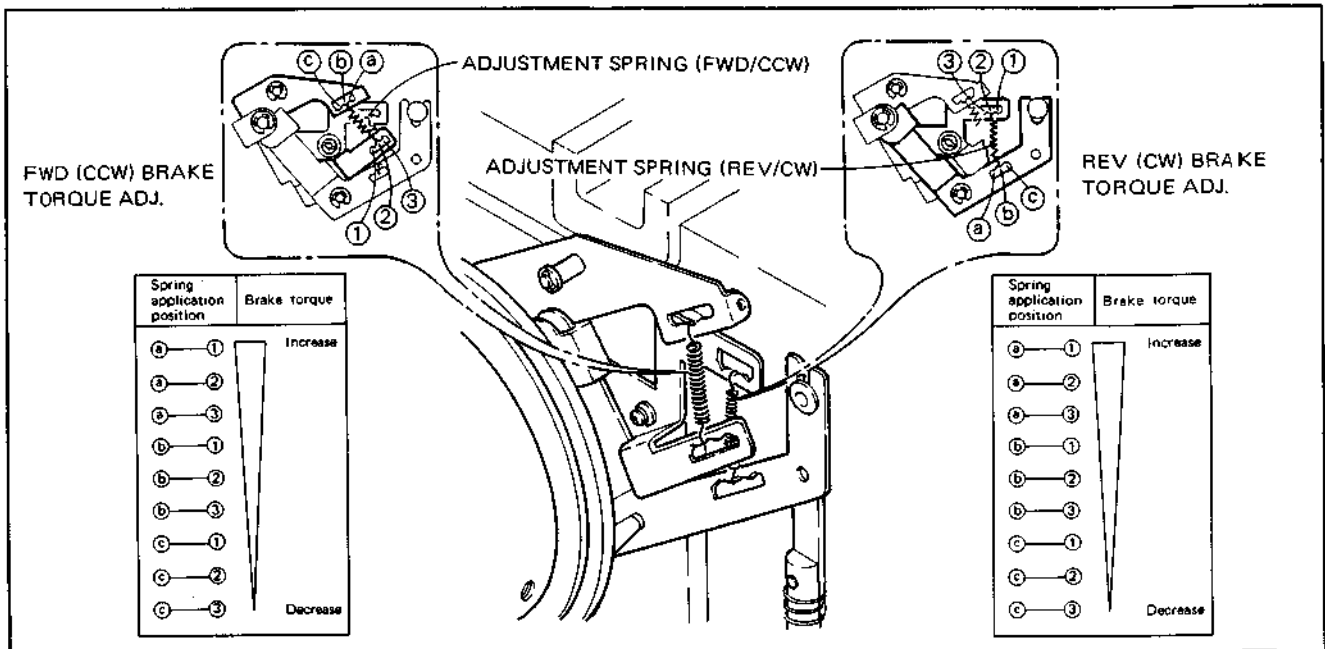


Fig. 6-9. S Reel Brake Torque Adjustment

6-3-2. T Reel Motor Assy Replacement

Replacement

1. Turn off the power and remove the front panels.
2. Remove the cover and reel washer (see Fig 6-10).
3. Remove the connector CN002 from the TT-01 board.
4. Open the power supply block. Remove the connectors CN202, CN205 and CN207 from the RA-05 board, and remove the harness of CN207 from the clamp.
5. Remove the four PSW4x6 screws securing the reel motor assembly.
6. To install the new assembly, reverse removal procedure.

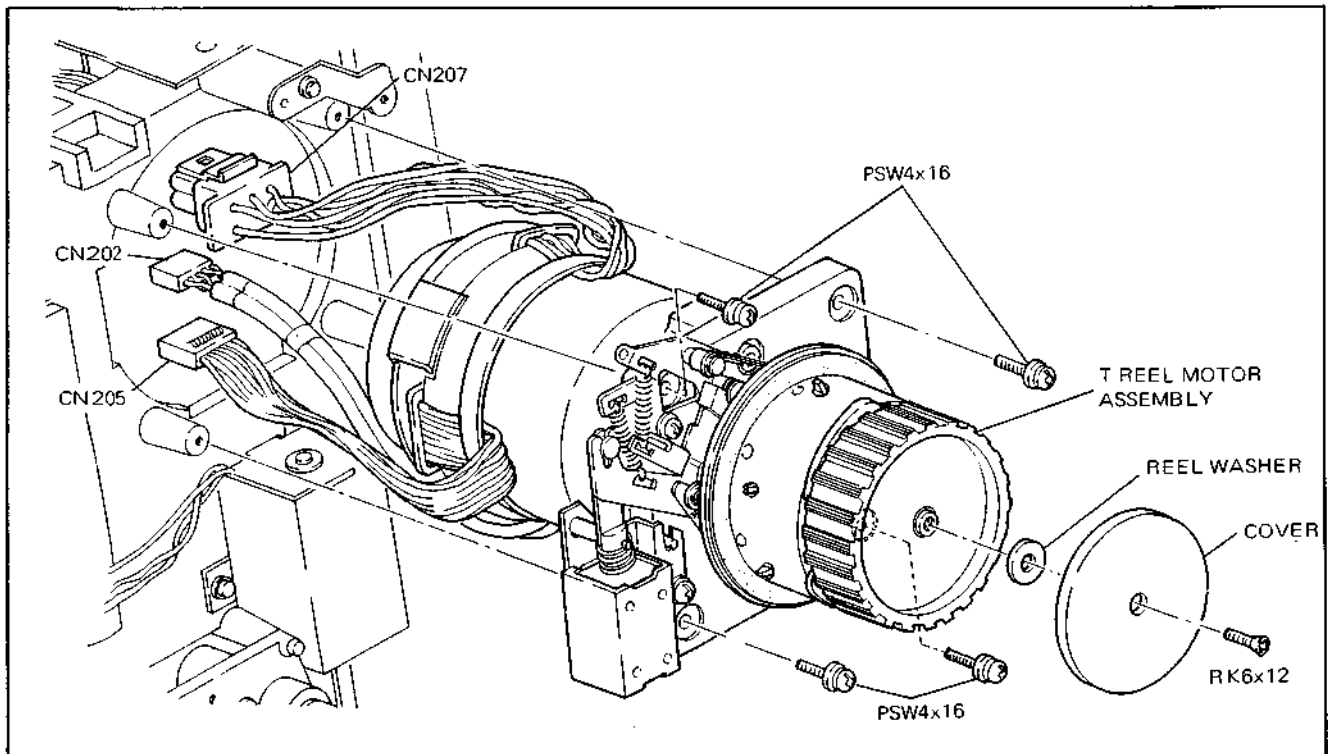


Fig. 6-10. T Reel Motor Assembly Replacement

Reel Table Height Adjustment

7. Thread a recorded tape free of wrinkles and damages. Confirm that the tape has no strong contact with the reel flange in F.FWD mode. Confirm the same thing also in REW mode. If there should be strong contact, adjust according to the following steps. When the tape curls at a position other than the reel flange, adjust according to section 3-24-2.
8. Adjust the height according to the following sequence.
 - a. Remove the tape, cover, and reel washer.
 - b. Loosen the two set screws securing the reel table, and turn the height adjustment screw shown in Fig 6-11.

Note 1: One turn of the adjustment screw changes the height by 0.7 mm.

Note 2: Turn the adjustment screw as follows.

 - If the tape contacts the upper reel flange, turn the screw clockwise.
 - If the tape contacts the lower reel flange, turn the screw counterclockwise.
 - c. While pushing the reel table lightly against the motor, tighten the two set screws. Again confirm the height of the reel table according to step 10, and then install the reel washer and the cover.

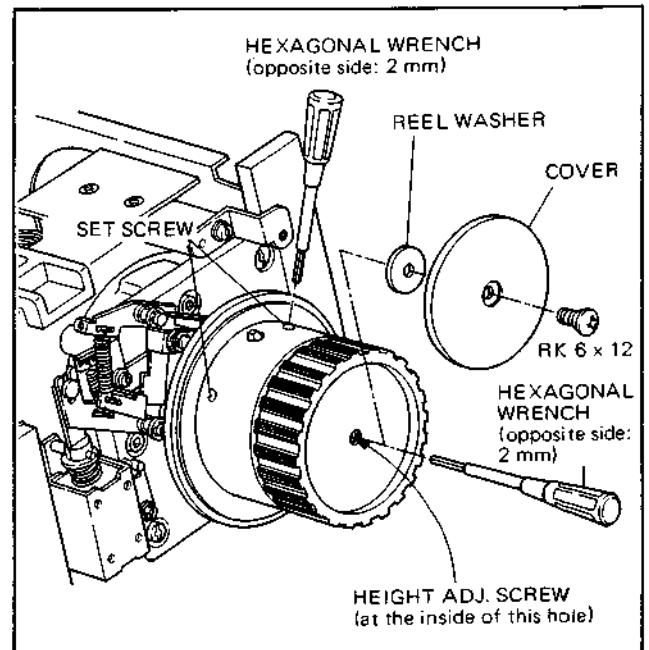


Fig. 6-11. T Reel Table Height Adjustment

FG Duty Cycle Adjustment

9. Adjust as follows so that the motor FG duty cycle in FWD 3 times normal speed is 50%.
 - a. Thread a recorded tape.
 - b. Turn on the power. Set S4 (TEST-1) switch on the CD-17 board to "1", and depress S7 (ENTRY) switch for at least 0.5 sec.
 - c. Connect an oscilloscope to TP1 on the RL-12 board and set the unit to FWD 3 times normal speed mode.
 - d. Confirm that the duty cycle of the waveform at TP1 is 50%. If necessary, adjust RV6.
 - e. Connect the oscilloscope in the same way to TP2 of the RL-12 board, and confirm that the duty cycle in FWD 3 times normal speed mode is 50%. If necessary, adjust RV5.
 - f. Set the switch S4 on the CD-17 board to "0", and depress the switch S7 for at least 0.5 sec. (This cancels the test mode.)
 - g. Remove the tape.

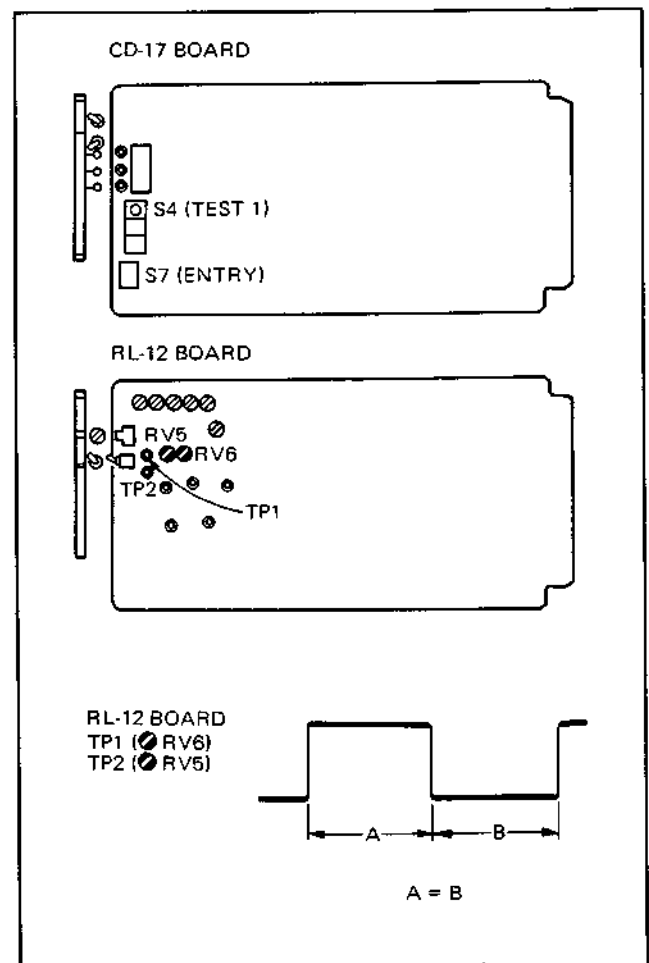


Fig. 6-12. T Reel Motor FG Duty Cycle Adjustment

T Reel Motor Torque Adjustment

10. Adjust the drive torque of the reel motor according to the following sequence.

Note: As one of the test functions of the machine, the motor output torque can be calculated from the acceleration and deceleration time by starting and stopping predetermined inertia load, and the results can be indicated. Then adjustment is carried out so that the display shows the specified value.

- a. Install a 9 inch reel with tape fully wound and the tape end fixed with adhesive tape on the T reel table.

CAUTION: As this reel is the reference inertia load, a reel with only little tape wound onto it or a reel with a different diameter must not be used.

- b. Turn on the power, and set S4 (TEST 1) switch on the CD-17 board to "3".
 c. Depress S7 (ENTRY) switch on the CD-17 board until the T reel starts to rotate. (By this operation, the T reel motor automatically executes the sequence of forward, reverse, and stop.)
 d. After motor stop, confirm that the number shown in Fig 6-13 is indicated by the display element ND1 on the SV-43 board. If necessary, adjust RV6 on the RA-05 board.

After the adjustment, again carry out step c, and then confirm step d. Repeat this sequence until the specified value is obtained.

Note: When RV6 is turned clockwise by one division, the figure of the upper digit displayed on ND1 decreases one and when RV6 is turned counter-clockwise by one division, the figure increases one.

- e. Remove the inertia load reel.

Note: When this reel is to be used for general recording, carefully remove the adhesive where the tape was fixed with adhesive tape, or cut off about 80 cm of the tape from the tape end. If the tape is used with adhesive on it, the head may be clogged, or the tape may be wound around the guides.

- f. Set the switch S4 on the CD-17 board to "0", and depress the switch S3 (RESET) on the SY-80 board.

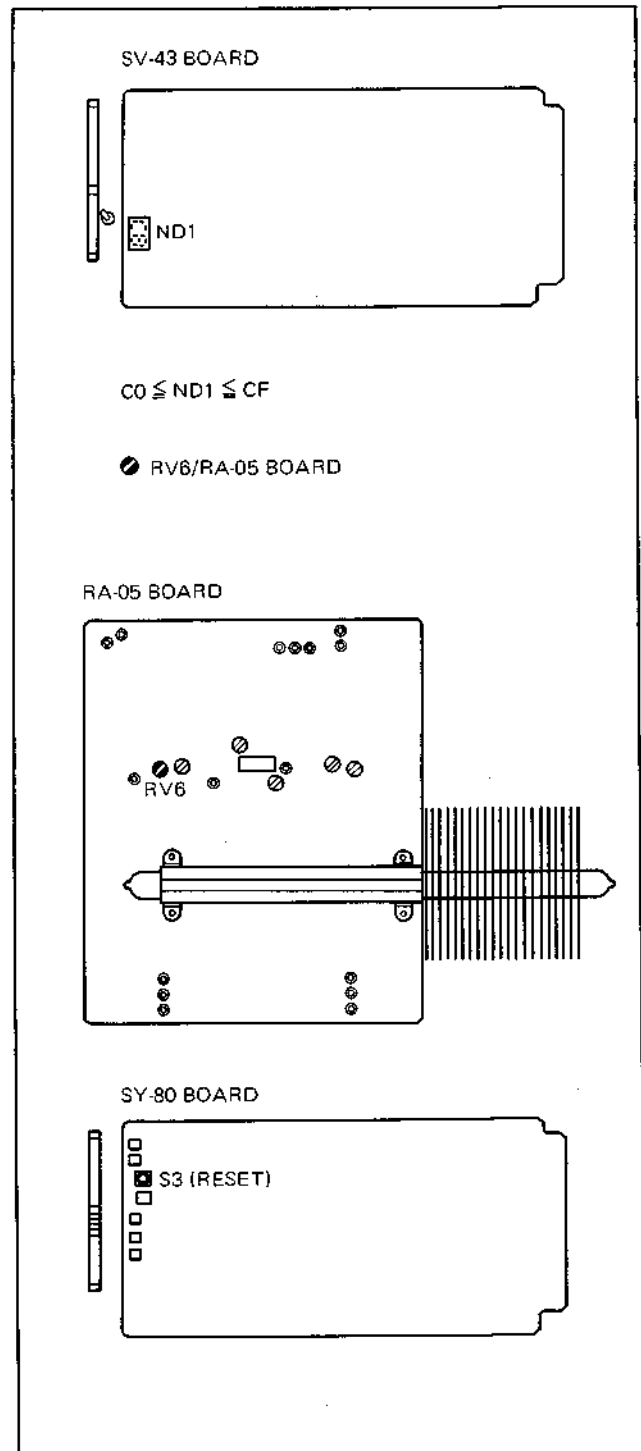


Fig. 6-13. T Reel Motor Torque Adjustment

Mechanical Brake Adjustment

Note 1: When measuring the brake torque, be sure to use a 9-inch empty reel.

Note 2: The reel motor assembly supplied as a repair part includes the reel table cylinder made of nickel-plated brass. The adjusting value of the brake torque differs in the material of the reel table. When replacing the reel table with the other one, check the material of reel table referring to item C in the preliminary information.

11. Place a 9-inch empty reel on the T reel table and turn on the power.
12. Set S4 (TEST 1) on the CD-17 board to "4", and adjust the following brake torque.
 - (1) REV(CW) brake torque
Set S5 (TEST 2) on the CD-17 board to "C", and depress S7 (ENTRY) for at least 0.5 sec. When the rotation of the reel has stopped, confirm that the ND1 on the SV-43 board indicates the value shown in Fig 6-14. If the value is not within specifications, change the position of the spring (REV/CW) as shown in Fig 6-15.
 - (2) FWD(CCW) brake torque
Set S5 (TEST 2) on the CD-17 board to "D", and depress S7 (ENTRY) for at least 0.5 sec. When the rotation of the reel has stopped, confirm that the ND1 on the SV-43 board indicates the value shown in Fig 6-14. If the value is not within specifications, change the position of the spring (FWD/CCW) as shown in Fig 6-15.
13. Set S4 and S5 to "0", and depress S7 for at least 0.5 sec to release the test mode.

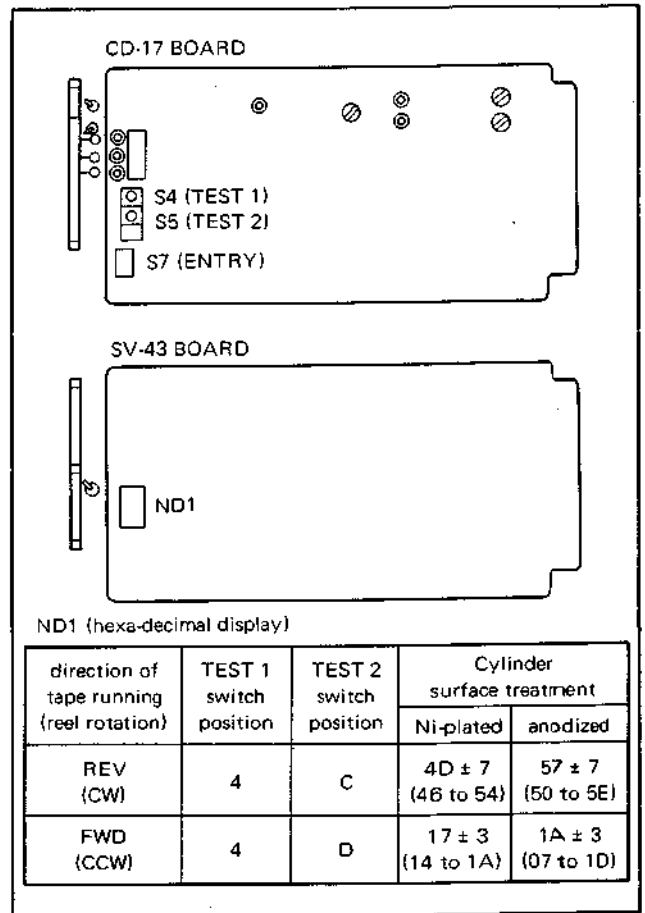


Fig. 6-14. Brake Torque

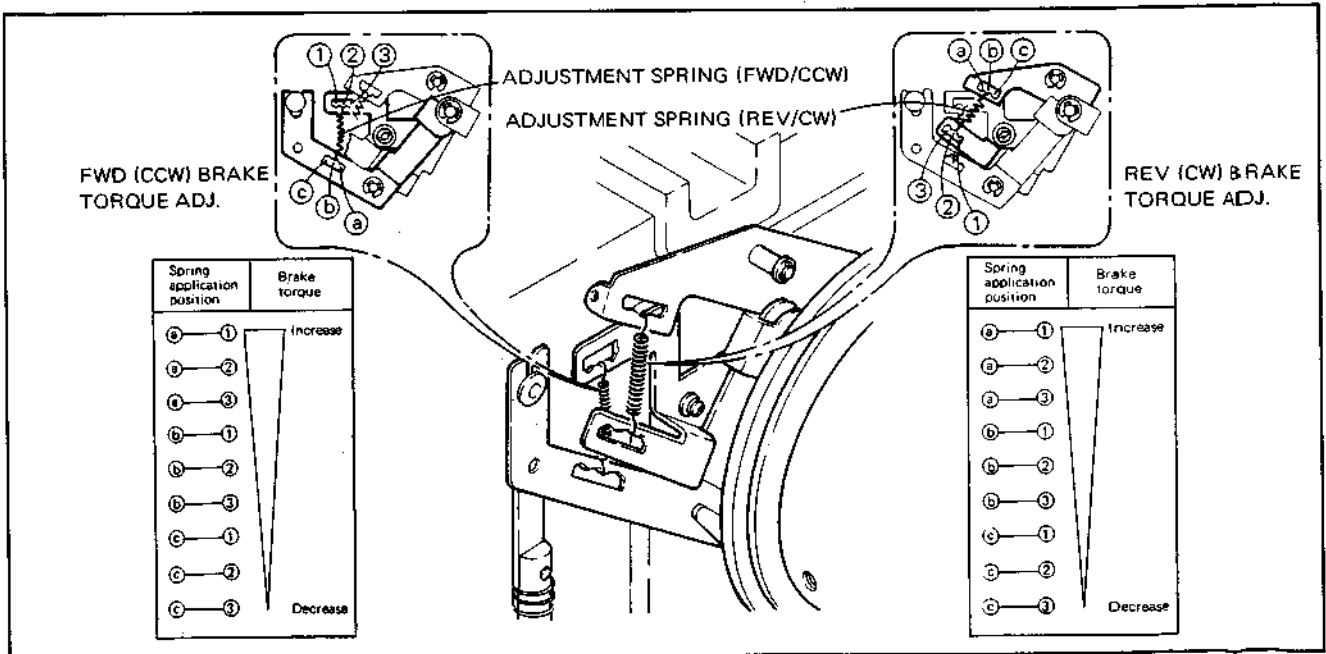
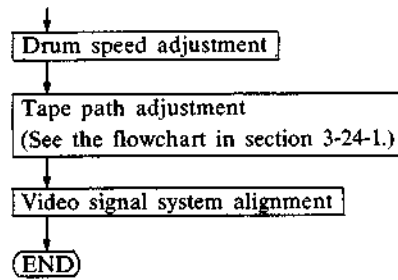
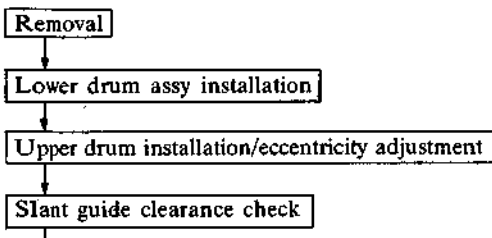


Fig. 6-15. T Reel Brake Torque Adjustment

6-4. LOWER DRUM ASSY REPLACEMENT

Preliminary Information

- A. Although the upper drum is normal and the life of the upper drum still remains enough, the lower drum assembly should be replaced in the following cases.
1. When a correct RF waveform can not be obtained by tracking adjustment because of wear or damage of the tape guide of the lower drum.
 2. When the deterioration of the video signal or the audio signal no longer can be tolerated because of wear of the bearings.
- B. Do not insert the shim between the upper drum and the flange of the lower drum except that the shim is included in the lower drum assembly supplied as a repair part. (Do not use the shim again which was used in the former drum assembly.)
- C. Replacement and the subsequent adjustment should be performed as follows.



- D. Prepare the following parts for the replacement.
Taper shaft screw: Sony part No. J-6040-460-A
Upper drum eccentricity adjustment gauge: Sony part No. J-6250-800-A.
- E. During replacement, turn off the power.

Removal

1. Remove the stationary head cover, the drum panel and the reel panel.
2. When the movable guide has been closed, turn the threading motor with a flat-blade screwdriver to open the slant guides.
3. Remove the three screws securing the drum lid.
4. Remove the three screws securing the DR-13 board (except for 00 and 10 models) or DR-20 board (for 00 and 10 models).
5. Remove the two screws securing the upper drum.

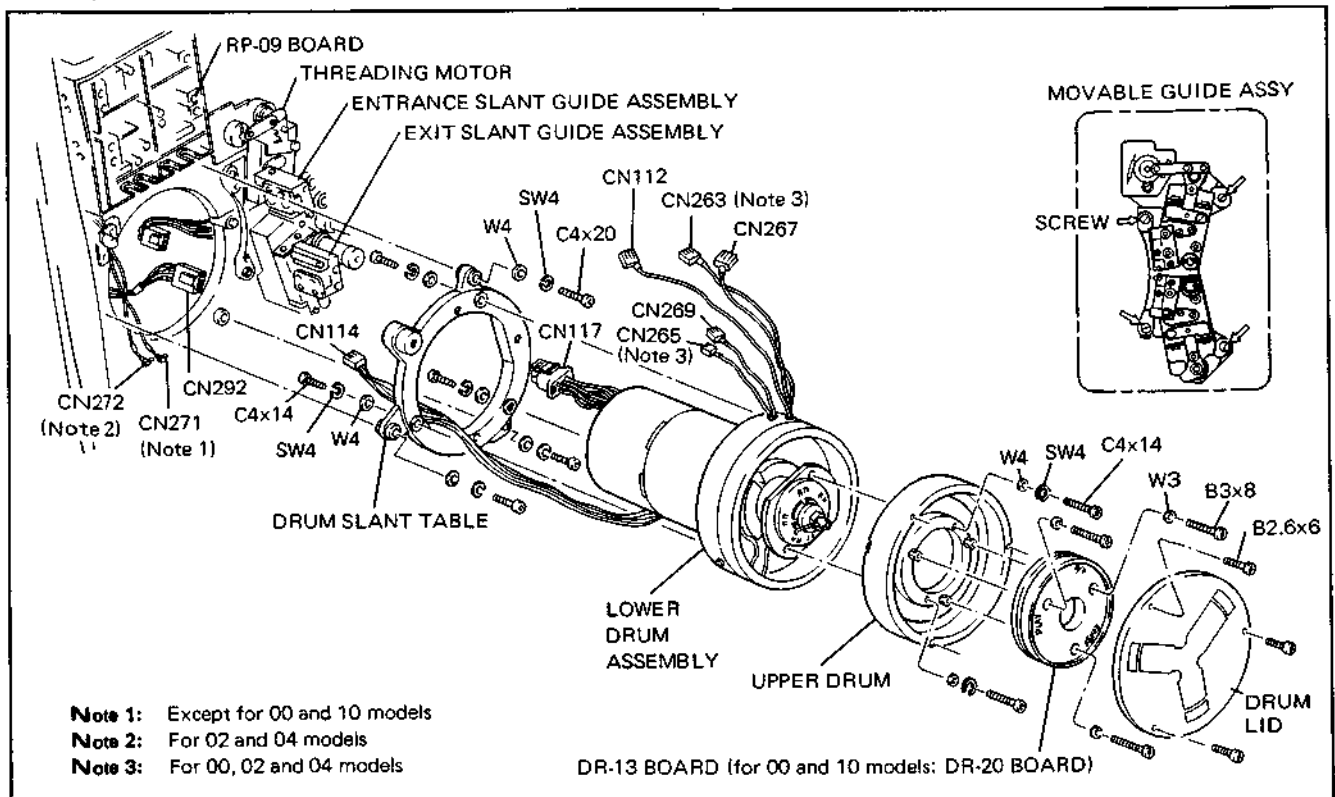


Fig. 6-16. Lower Drum Assembly Replacement

6. Go to the rear of the machine. Remove the connectors CN112, CN114 and CN117 from the DA-07 board and remove CN291 (except for 00 and 10 models) and CN292 from the motor.
7. Go to the front. Remove the shield cover for the PR-09 board, and remove the connectors CN263, CN265, CN267 and CN269.
8. For 02, 12, 04 and 14 models, remove the connectors CN271 and CN272 (Except for 12 and 14 models) connected to the side of the lower drum assembly.
9. Slightly loosen the four screws securing the movable guide, and by pushing the movable guide in the direction opposite to the head drum assembly, keep the drum stopper pin apart from the lower drum assembly.
10. While holding the lower drum assembly securely, remove the three screws and take off the lower drum assembly not to hit against the slant guide.
11. Place the lower drum assembly upside down, and remove the three screws securing the drum slant table.

Cleaning

12. Wipe the following parts with a clean cloth moistened with cleaning fluid.
 - a. The surface of the entrance and exit slant guides facing the drum.
 - b. The surface of the boss on which the lower drum assembly was installed.
 - c. The surface of the new lower drum assembly coming in contact with the tape.

Note: When alcohol is used as cleaning fluid, be sure to wipe the surface with a soft and dry cloth after cleaning as it tends to leave a persistent residue on the surface.

Lower drum assembly installation

13. Mount the drum slant table removed in step 11 on the new lower drum assembly with three C4×14 screws, W4 and SW4 washers.
14. Pass the connectors CN114 and CN117 through the hole in the base plate to the rear. Match the guide hole of the drum slant table to the pin A, and press the point B of the drum slant table against the pin B as shown in Fig. 6-17. Confirm that there is no clearance between the drum slant table and the bosses on the base plate and fix the lower drum assembly with three C4×20 screws, W4 and SW4 washers.
15. Put the connectors CN263 (Except for 12/14 model), CN265 (Except for 12/14 model), CN267 and CN269 in their designated positions on the RP-09 board.
16. For 02, 12, 04 and 14 models, put the connectors CN271 and CN272 (Except for 12 and 14 models) and in the positions shown in Fig. 6-17.
17. Pass the connector CN112 through the hole in the base plate to the rear.
18. Go to the rear of the machine, and put the connectors CN112, CN114 and CN117 in their designated positions on the DA-07 board.
19. Put the connectors CN291 (except for 00 and 10 models) and CN292 in their designated positions at the rear of the drum.

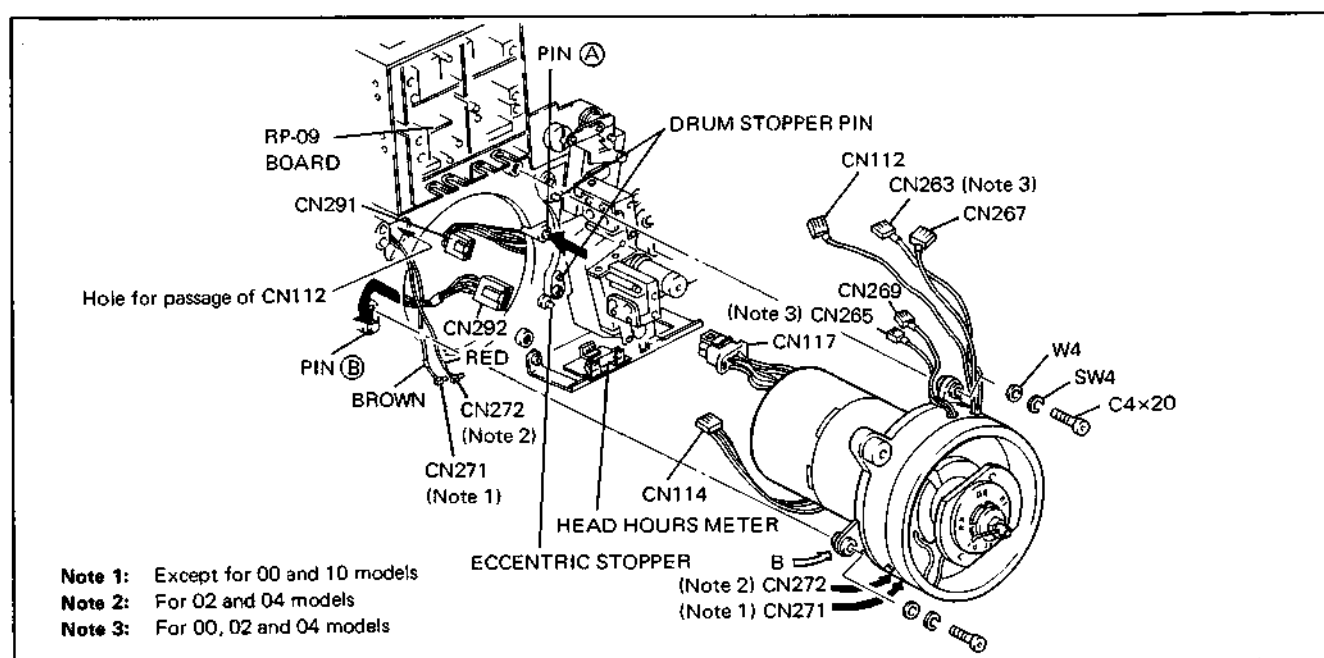


Fig. 6-17. Lower Drum Assembly Installation

Upper Drum Installation & Eccentricity Adjustment

20. Tighten two taper shaft screws securing the upper drum alternately.

CAUTION: Even if the shim has been inserted between the upper drum and the lower drum before replacing, do not use the shim again, however, if the shim is supplied with the new lower drum assembly, be sure to use it.

21. Remove the taper shaft screw near the video head and put a C4×14 screw, SW4 and W4 washers in the hole where the taper shaft screw had been mounted, and also replace the other taper shaft screw with a C4×14 screw, SW4 and W4 washers, and then loosen the two screws 1/2 or one turn.
22. Check that the tip of the dial gauge probe is at the center of the white plastic pin inserted in the measurement arm. If it is not at the center, adjust the position of the dial gauge probe.
23. Turn the zero adjustment knob fully counterclockwise, and place the stopper of the gauge on the lower side of the lower drum and tighten the fixing knob.
24. Move the gauge in the direction A shown in Fig. 6-18 and pull it fully in the direction B and then turn it slowly back toward the drum.
25. Adjust the zero adjustment knob so that the gauge indicates zero.
26. Slowly rotate the upper drum clockwise and check that the swing of the needle is within 3 μm.

If the swing of the needle is over 3 μm, adjust as follows.

- a. Rotate the upper drum slowly clockwise by hand and stop at the position where the gauge shows the maximum value.
- b. With the handle of a screwdriver or a nylon hammer, lightly tap the inside of the upper drum opposite to the gauge so that the gauge shows 1/3 of the maximum value.

CAUTION: Do not tap the outside of the upper drum.

- c. Rotate the upper drum slowly by hand again and check that the swing of the needle is within 3 μm. If the swing is over 3 μm, repeat steps a, b and c, until the swing becomes 3 μm or less.
27. Fix the upper drum firmly by tightening the two C4×14 screws alternately. Turn the upper drum slowly by hand, and check that the swing of the needle is within 3 μm.
28. Turn the zero adjustment knob fully counterclockwise, and remove the gauge.

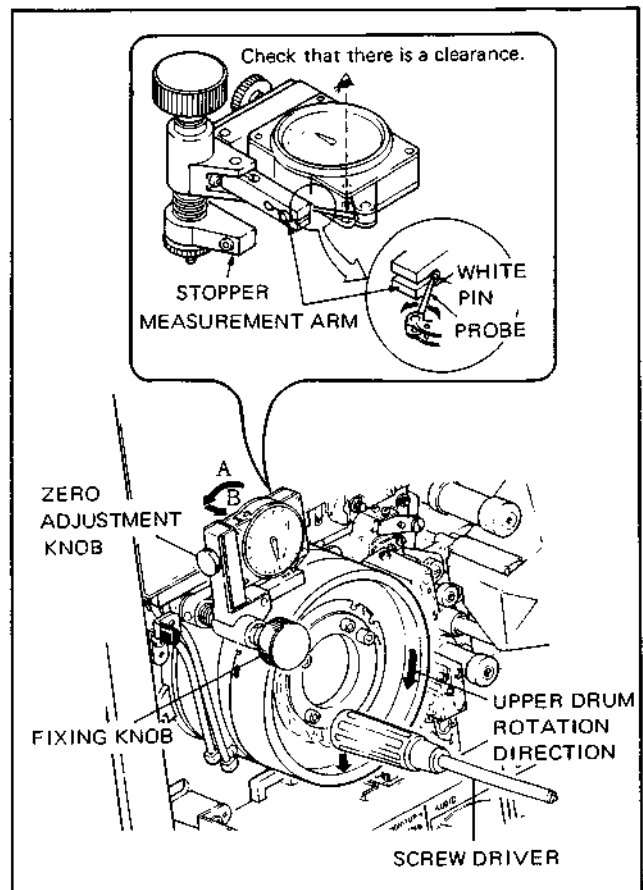


Fig. 6-18. Upper Drum Installation and Eccentricity Adjustment.

29. Clean each contacts of the DR-14, DR-15 boards, and DR-20 board (for 00 and 10 models) or DR-13 board (except for 00 and 10 models) with clean and dry cloth.
30. Match the head name of the DR-20 board or DR-13 board to that of the DR-15 board and fix them with three B3×8 screws and W3 washers.
31. Match the head name of the upper drum lid to that of the DR-20 board or DR-13 board and fix them with three B2.6×6 screws.

Gap Confirmation

32. While pushing the movable guide assembly simultaneously in both directions of the lower drum assembly and the eccentric stopper shown in Fig. 6-17, tighten the four screws securely.
33. Insert a 50- μ m-thick paper (or video tape folded in two) between the upper drum and the movable guide including the guide flanges.
34. Turn the threading motor with a flat-blade screwdriver to close the movable guide and check that the paper or video tape inserted in step 33 can move smoothly.

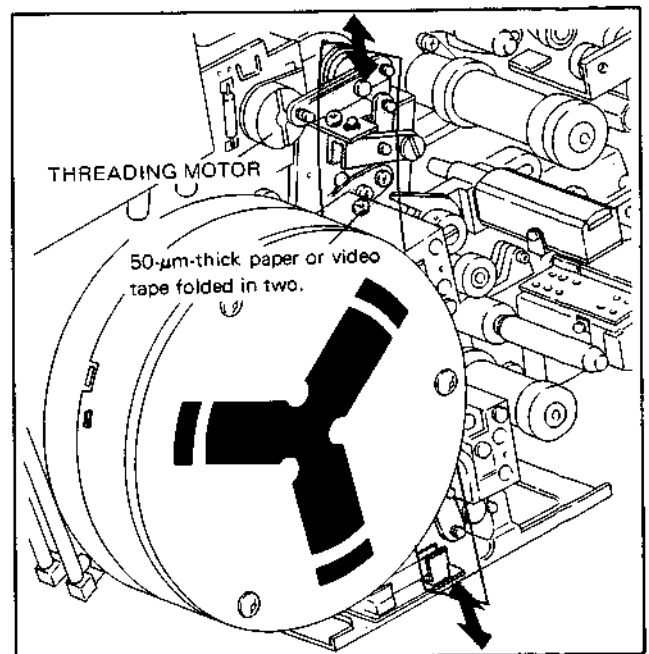


Fig. 6-19. Gap Confirmation

Drum Speed Adjustment

35. Turn on the power and set S4 (TEST 1) on the CD-17 board to "D" and press S7 (ENTRY) for at least 0.5 sec.
36. Set the machine in STANDBY mode, and check that either of the following is displayed or the following is displayed alternately on the display element ND1 on the SV-43 board. If the different numbers are displayed, adjust RV4 on the CD-17 board.
ND1 display: FD, FE, FF, 00, 01 or 02
37. Turn off the power to release the test mode.
38. Mount the reel panel, the stationary head cover and the drum panel.
39. Perform the tape path adjustment in accordance with the flowchart shown in section 3-24-1.

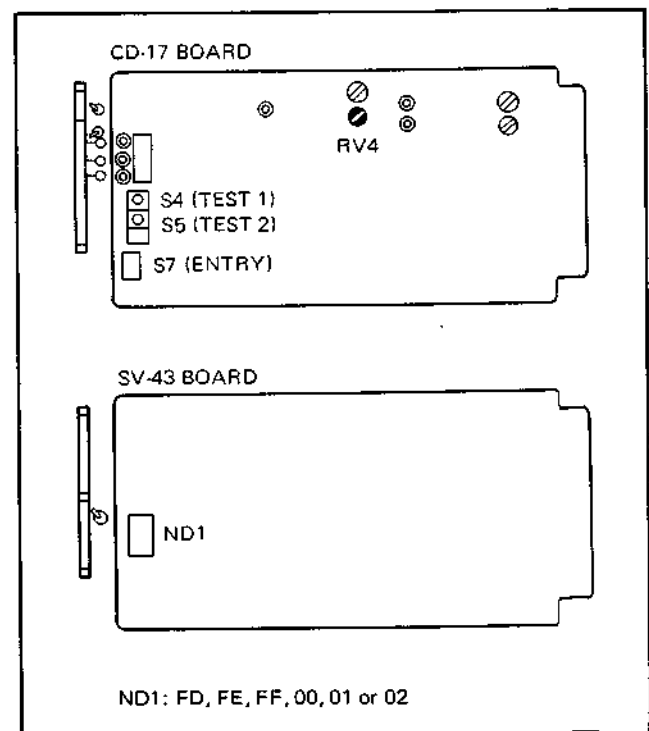


Fig. 6-20. Drum Speed Adjustment

6-5. GUIDE POST REPLACEMENT

Preliminary Information

A. The 00 and 10 models VTR have the five guide posts (02, 12, 04 and 14 models VTR have four guide posts) as shown below.

(The guide post 2 is used instead of the audio/CTL monitor head for 00 and 10 models.)

B. Since the guide post 1, 2, 3 and taper guide have a serious influence on the record and playback of the audio or video signal, the following adjustments or checks must be performed after replacement.

Guide post 1:

After checking the tape running near the guide post 1 in accordance with section 3-24-2, perform the checks or adjustments subsequent to the section 3-24-9 "audio/CTL R/P head adjustment" of the flowchart shown in section 3-24-1.

Guide post 2:

Perform the adjustments subsequent to the "audio/CTL R/P head adjustment" of the flowchart shown in section 3-24-1.

Guide post 3 and taper guide:

Perform the checks and adjustments subsequent to the "tape path adjustment" of the flowchart shown in section 3-24-1.

C. When the guide has been worn out, turn the worn surface (see the detail of Fig. 6-21) into the position not coming in contact with the tape and check each item of the above B.

Replacement

1. Replace the defective part, referring to Fig. 6-21.

Note: For the guide post 3 and taper guide, take notice of the direction of the spring.

2. Perform the adjustments of each item of the above B.

Note: For the S-tension arm, perform the tape tension adjustment shown in section 3-24-3 when the guide is worn out excessively, however no adjustment is required in other cases.

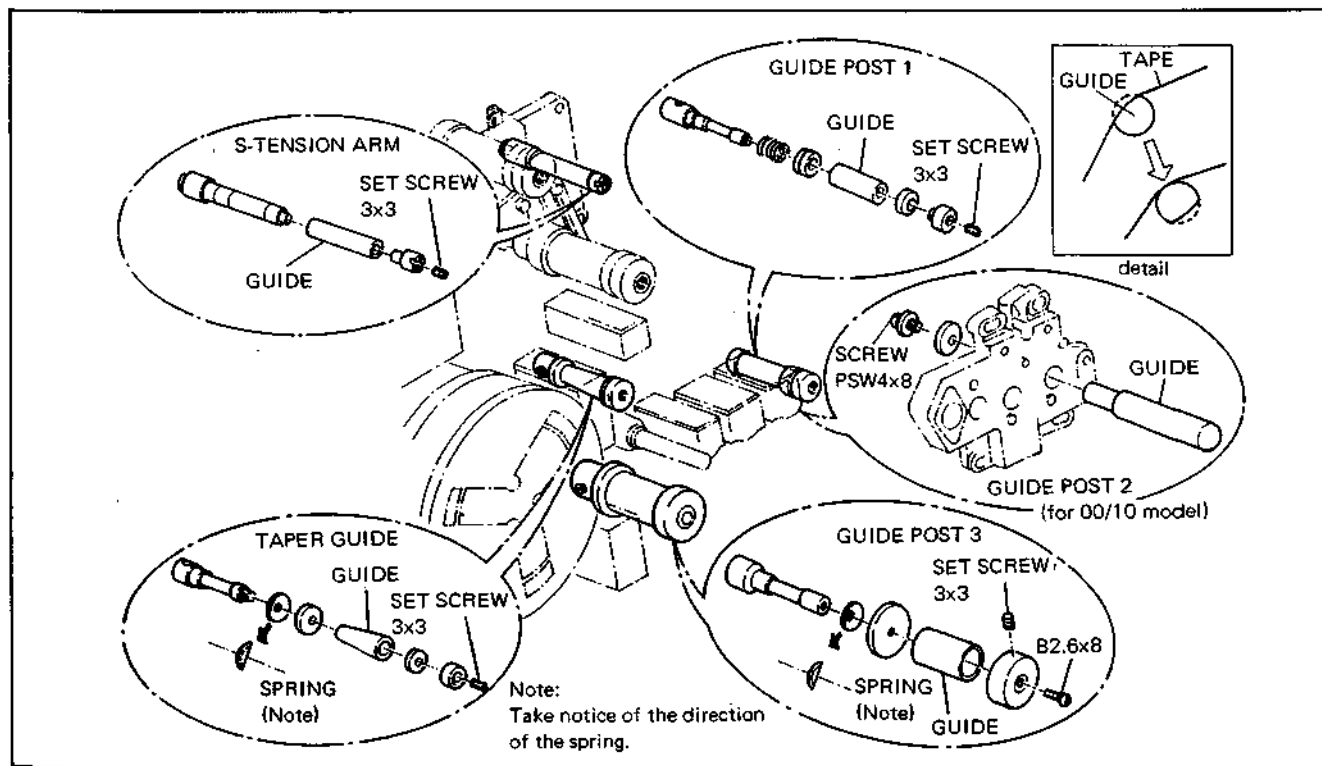


Fig. 6-21. Replacement of Guide Posts

6-6. REPLACEMENT OF SLANT GUIDE COMPONENTS

(For replacement, contact your SONY office.)

Preliminary Information

- This section provides the replacement and adjustment procedures for the guide post, guide flange and entrance guide bracket of the entrance/exit slant guide assembly (see Fig. 6-23).
- Prepare the guide flange fixture (inc. accessory screw and spacer) to replace the guide post and guide flange. Guide flange fixture: Part No. J-6043-870-A.
- After replacement, perform the tape path adjustment in accordance with the flowchart shown in section 3-24-1.

6-6-1. Replacement of Entrance Slant Guide Components

Removal

- Turn off the power. When the slant guide is closed, turn the threading motor with a flat-blade screwdriver to open the slant guide.
 - Remove the two screws securing the entrance slant guide assembly, and remove the fence.
 - Remove the following parts (see Fig. 6-24).
 - Loosen the screw ① and remove the compression spring.
 - Remove the screws ② and ③ and take off the guide bracket.
 - When replacing the guide post or guide flange, remove the flange fixing screw ④.
 - Remove the two screws ⑤ and remove the guide post from the guide bracket.
 - When replacing the guide bracket, remove the slant adjustment screw, steel ball and slant adjustment rod.
- Note:** When replacing the guide bracket only, go to step 9.

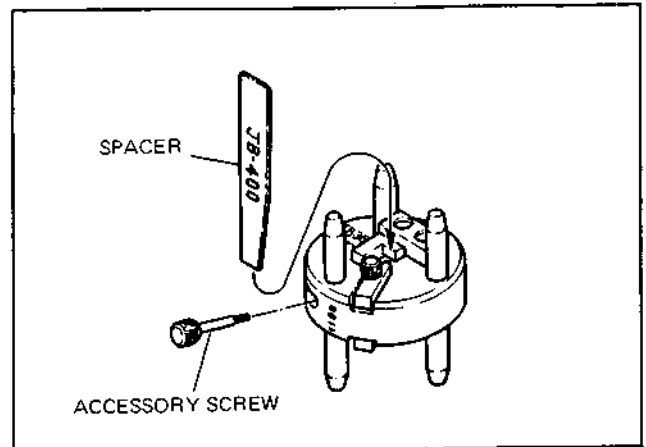


Fig. 6-22. Guide Flange Fixture

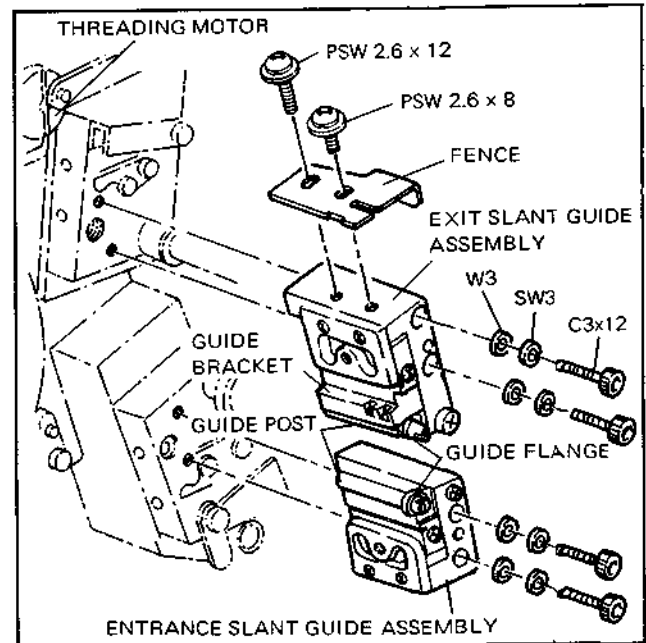


Fig. 6-23. Removal of Slant Guide Assembly

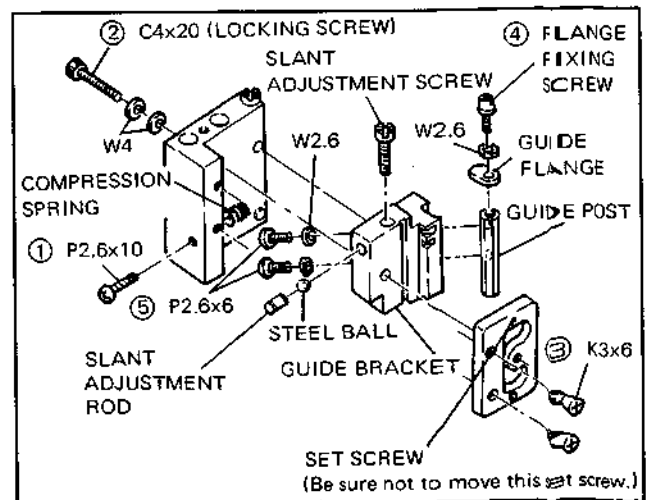


Fig. 6-24. Disassembly of Entrance Slant Guide

Assembly of Guide Flange and Guide Post (Entrance Side)

4. Set the guide post and the flange as shown in the detail "a" of Fig. 6-25, and tighten the flange fixing screw lightly so that the flange can move.
5. Place the surface marked with "S" of the guide flange fixture upward, and place the guide post as shown in the detail "b" of Fig. 6-25.
6. Drive the accessory screw into the side of the fixture and pushing it fully to the edge marked with "2000", tighten the screw.
7. Tighten the flange pushing screw lightly and then tighten the flange fixing screw firmly.
8. Remove the accessory screw and loosen the flange pushing screw and remove the guide post.

Reassembly of Guide (Entrance Side)

9. Pushing the guide post in the direction shown by the arrow (see Fig. 6-26), fix it to the guide bracket with two P2.6×6 screws applied with adhesive (such as locking compound) and W2.6 washers.
10. Check that the 0.03 mm thickness gauge cannot be inserted between the guide bracket and guide flange.
11. When the guide bracket has been replaced, drive the slant adjustment screw into the guide bracket, and put the steel ball and slant adjustment rod into the hole of the guide bracket shown in Fig. 6-26.
12. Reassemble the guide referring to Fig. 6-25, but do not tighten the C4×20 locking screw firmly.

Slant and Height Adjustment (Entrance Side)

13. Turn the slant adjustment screw so that the "B" side is in parallel with "A" side (see Fig. 6-27).
14. Turn the height adjustment screw so that the "D" side comes on the same plane with "C" side.
15. Tighten the C4×20 locking screw firmly (see Fig. 6-26).

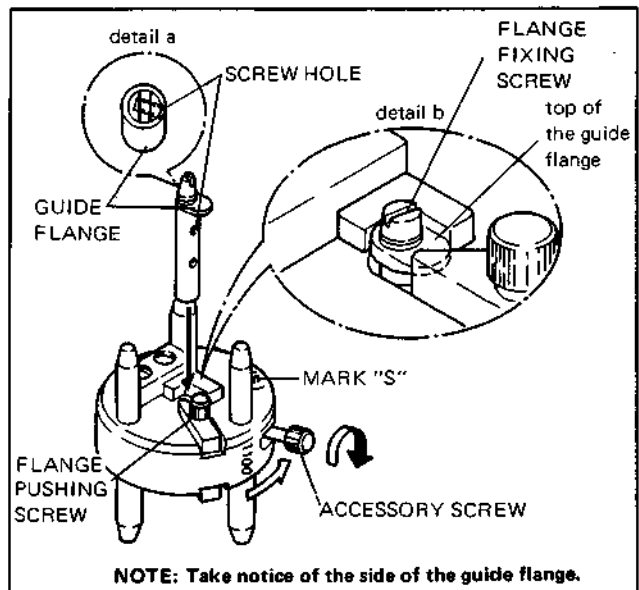


Fig. 6-25. Assembly of Entrance Guide Flange and Guide Post

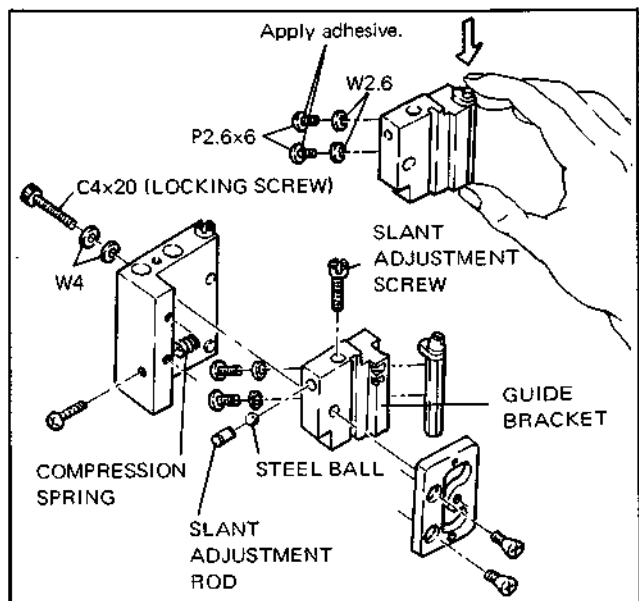


Fig. 6-26. Assembly of Entrance Slant Guide

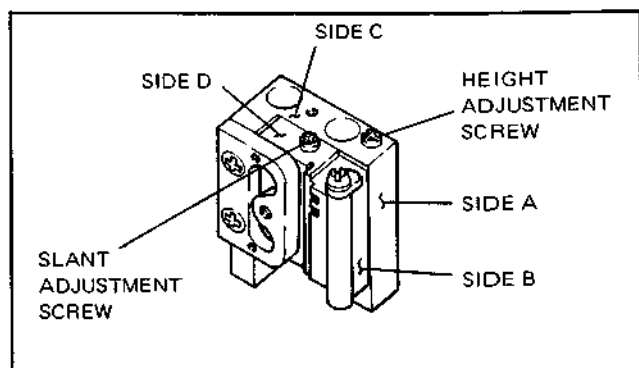


Fig. 6-27. Slant and Height Adjustment of Entrance Slant Guide

REPLACEMENT 6

Installation of Entrance Slant Guide Assy

16. Clean the surface of the slide base on which the entrance slant guide assembly has been mounted, and the part of the lower drum in contact with the tape which was hidden by this assembly.
17. Loosen the set screw driven into the lower part of the taper guide by 3 turns.
18. Lightly fix the entrance slant guide assembly with two C3×12 screws, SW3 and W3 washers as far as possible away from the upper drum.
19. Turn the rotary head of the upper drum to keep apart from the slant guide and stop it. Turn the threading motor with a flat-blade screwdriver to close the slant guide.

Note: Close the slant guide positively, checking that the guide post or guide bracket does not come into contact with the upper drum.

20. Insert a 0.1 mm thickness gauge between the guide bracket and the upper drum (see Fig. 6-28). Pressing the entrance slant guide assembly to come in contact with the three points indicated by ▲ in the figure, tighten the two C3×12 screws firmly.

21. Reinstall the fence and adjust the position as follows.

- ① While pushing the fence in the direction shown by arrow in Fig. 6-28 and also pushing it toward the lower drum so that the lower of the fence touches the cylinder of lower drum, and lightly fix the fence with two screws PSW 2.6 × 12 and PSW 2.6 × 8.
- ② Adjust the setscrew so that the clearance between the upper drum and the fence is 0.15 ± 0.05 mm. After adjustment, securely tighten the screws which were tightened loosely in the former step.
- ③ Confirm that the tip of the setscrew touches the entrance slant guide block, and glue the setscrew tightened in step 2 with adhesive like a retaining compound.

Check and Adjustment (Entrance Side)

22. Open the slant guide and insert a 1-inch video tape folded in two between the slant guide (incl. the guide flange) and the upper drum. After closing the slant guide, check that the tape moves smoothly.
23. Perform the tape path adjustment in accordance with the flowchart of section 3-24-1.

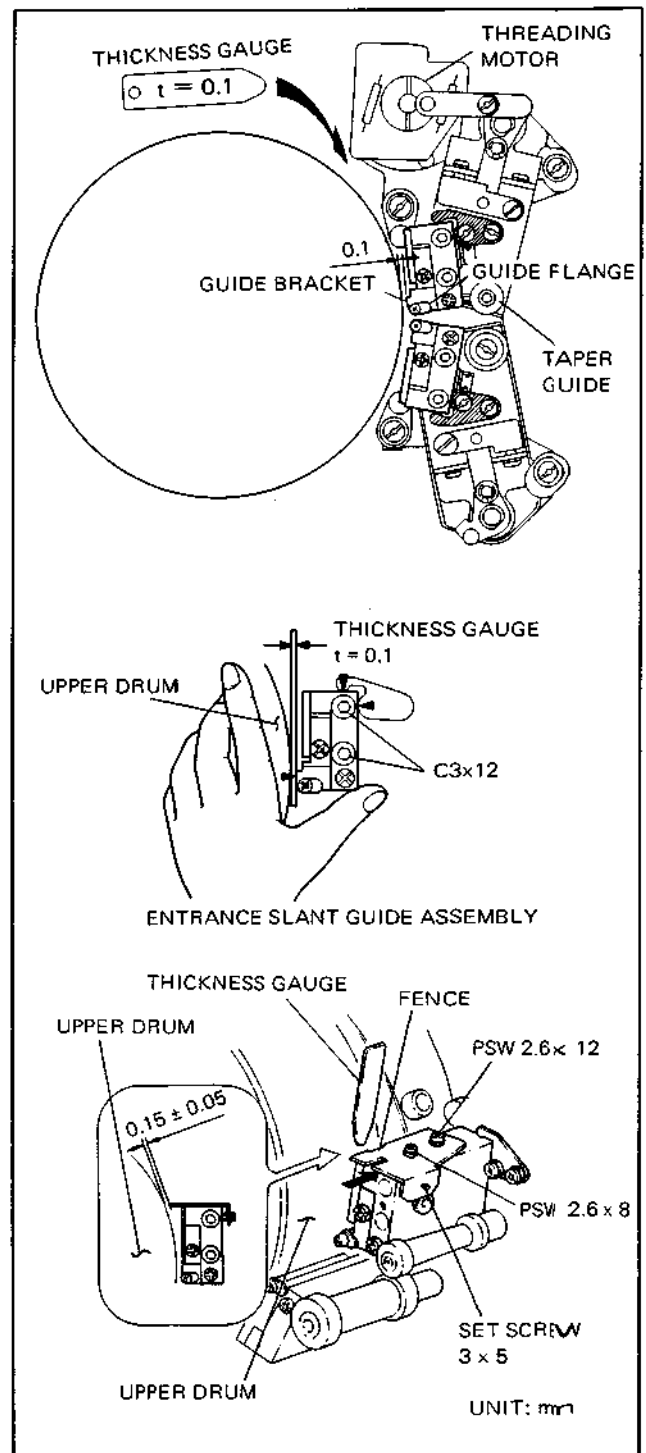


Fig. 6-28. Entrance Slant Guide Assembly Position Adjustment

6-6-2. Replacement of Exit Slant Guide Components

Removal

1. Turn off the power. When the slant guide is closed, turn the threading motor with a flat-blade screwdriver to open the slant guide.
2. Remove the two screws securing the exit slant guide assembly.
3. Remove the following parts (see Fig. 6-29).
 - a. Loosen the screw ① and remove the compression spring.
 - b. Remove the screws ② and ③ and take off the guide bracket.
 - c. Remove the flange fixing screw ④.
 - d. Remove the two screws ⑤ and remove the guide post from the guide bracket.

Assembly of Guide Flange and Guide Post (Exit Side)

4. Set the guide post and flange as shown in the detail "a" of Fig. 6-30, and tighten the flange fixing screw lightly so that the flange can move.
5. Place the surface marked with "T" of the guide flange fixture upward, and place the guide post as shown in the detail "b" of Fig. 6-30.
6. Drive the accessory screw into the side of the fixture and pushing it fully to the edge marked with "2000", tighten the screw.
7. Insert the accessory spacer between the guide flange and the stopper. Tighten the guide flange pushing screw by hand, and then tighten the flange fixing screw securely.
8. Remove the accessory screw and loosen the flange pushing screw and remove the guide post.

Reassembly of Guide (Exit Side)

9. Pushing the guide post in the direction shown by the arrow (see Fig. 6-31), fix it to the guide bracket with two P2.6×6 screws applied with adhesive (such as locking compound) and W2.6 washers.
10. Check that the 0.03 mm thickness gauge cannot be inserted between the guide bracket and guide flange.
11. Reassemble the guide referring to Fig. 6-29, but the C4×20 locking screw should not be tightened firmly.

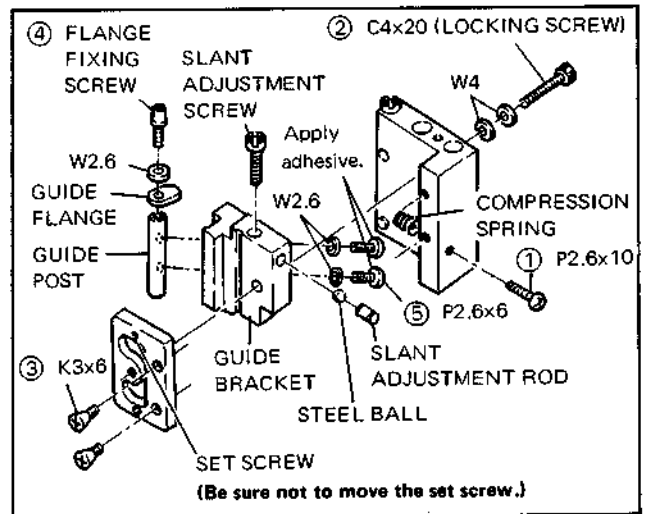


Fig. 6-29. Disassembly of Exit Slant Guide

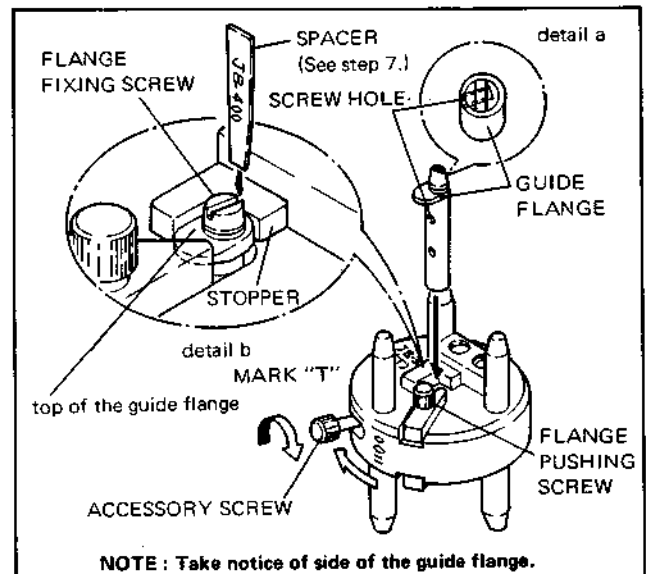


Fig. 6-30. Assembly of Exit Guide Flange and Guide Post

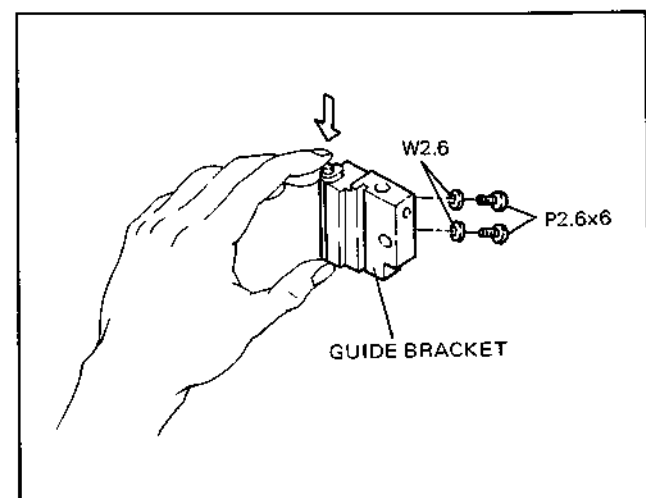


Fig. 6-31. Reassembly of Exit Guide Post and Guide Bracket

Slant and Height Adjustment (Exit Side)

12. Turn the slant adjustment screw so that the "B" side is parallel with "A" side (see Fig. 6-32).
13. Turn the height adjustment screw so that the "D" side comes on the same plane with "C" side.
14. Tighten the C4×20 locking screw firmly (see Fig. 6-29).

Installation of Exit Slant Guide Assy

15. Clean the surface of the slide base on which the exit slant guide assembly has been mounted, and the part of the lower drum in contact with the tape which was hidden by this assembly.
16. Loosen the set screw driven into the lower part of the guide post 3 by 3 turns.
17. Lightly fix the exit slant guide assembly with two C3×12 screws, SW3 and W3 washers as far as possible away from the upper drum.
18. Turn the rotary head of the upper drum to keep apart from the slant guide and stop it. Turn the threading motor with a flat-blade screwdriver to close the slant guide.
Note: Close the slant guide positively, checking that the guide post or guide bracket does not come into contact with the upper drum.
19. Insert the thickness gauge of 0.09 mm in thickness between the upper drum and the guide post as shown in Fig. 6-33. While pressing the exit slant guide assembly to come in contact with the three points indicated by ▲ in the figure, tighten the two C3X12 screws firmly.

Check and Adjustment (Exit Side)

20. Open the slant guide and insert a 1-inch video tape folded in two between the slant guide (incl. the guide flange) and the upper drum. After closing the slant guide, check that the tape moves smoothly.
21. Perform the tape path adjustment in accordance with the flowchart of section 3-24-1.

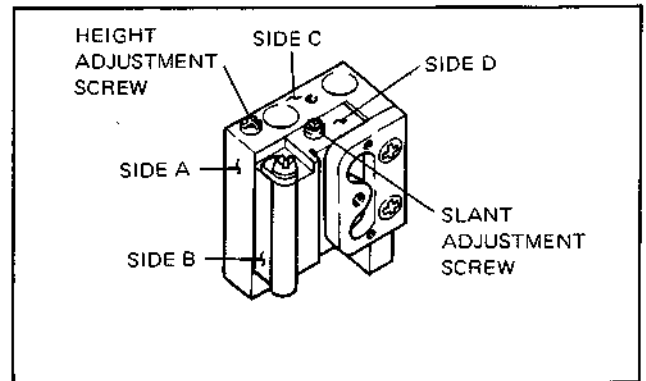


Fig. 6-32. Slant and Height Adjustment of Exit Slant

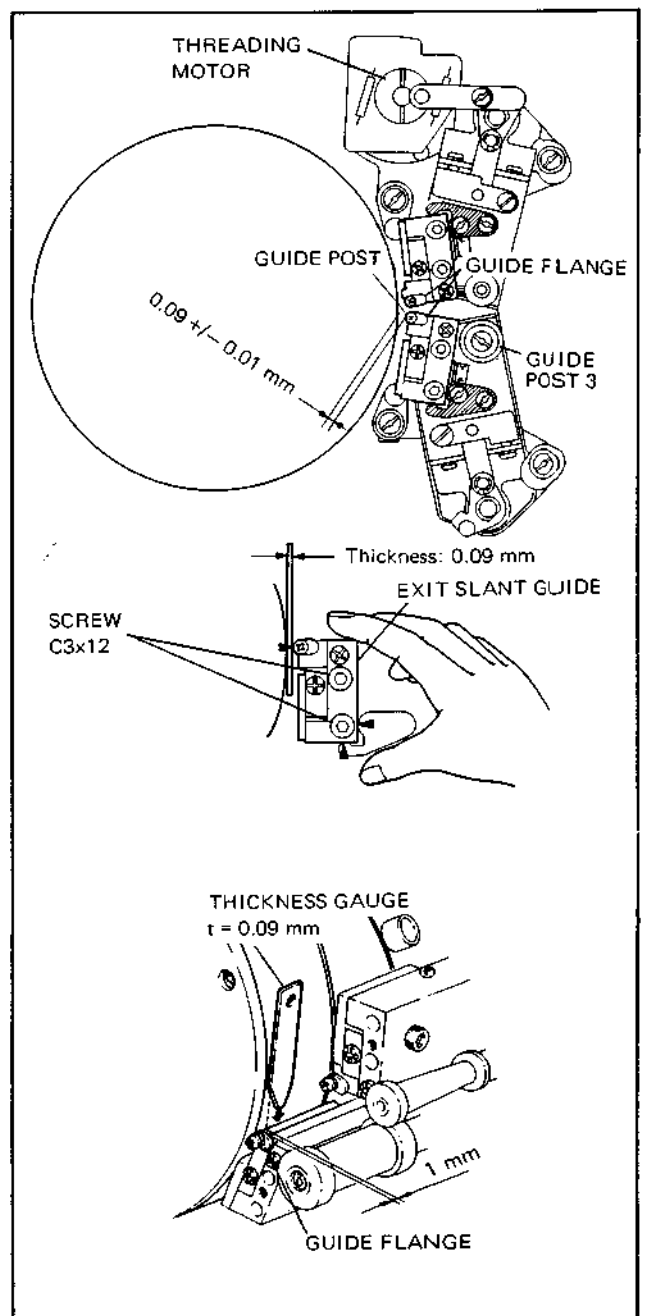


Fig. 6-33. Exit slant Guide Assembly Position Adjustment

SECTION 7 GENERAL INFORMATION FOR ALIGNMENT

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RA-05 Board

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VV-01 Board

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FV-01 Board

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SECTION 8 PREPARATION FOR ALIGNMENT

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TEKTRONIX Type 1411 or Equivalent
Test Signal Module SYNC GENERATOR SPG12
COLOR BAR GEN. TSG11
PATTERN GEN. TSP11
LINEARITY GEN. TSG13
PULSE & BAR GEN. TSG15
MULTIBURST GEN. TSG16

Refer to section 8-2 for signal details.

2. PAL Test Signal Generator

TEKTRONIX Type 148 or Equivalent

3. PAL Vectorscope

TEKTRONIX Type 521A or Equivalent

4. PAL Waveform Monitor

TEKTRONIX Type 1481 or Equivalent

5. Spectrum Analyzer

HEWLETT PACKARD Type 141T or Equivalent

6. Oscilloscope

TEKTRONIX Type 465B or Equivalent

7. Frequency Counter

8. Audio Distortion Analyzer

HEWLETT PACKARD Type 331A or Equivalent

9. Audio Oscillator

HEWLETT PACKARD Type 200CD or Equivalent

10. Digital Voltmeter

Effective digits; more than 4½ digits
Accuracy; less than 0.02% ±1 count

11. Attenuator

HEWLETT PACKARD Type 4436A or Equivalent

12. 1kHz & 15kHz Band-Pass Filter

Spec.: $Q > 5$

Attenuation = more than 12dB/OCT

S/N ratio = more than 70dB

13. Time Base corrector

SONY BVT-2000P

14. Extender; EB-10 (Supplied with the machine)

SONY Part No. A-6001-005-A

15. Tension Adjustment Tool

SONY Part No. J-6043-120-B

16. Alignment Tape; BR5-2PS-A4

SONY Part No. 8-944-005-63

17. Empty Reel

18. SONY 9" Full Wound Tape

19. IC Test Clip

Type TC-16: SONY Part No. J-6041-770-A

Type TC-20: SONY Part No. J-6041-780-A

Manufacturer;

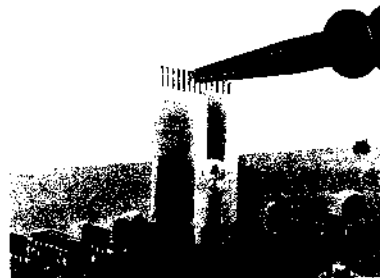
AP PRODUCTS INCORPORATED

P.O.Box 697, 72 Corwin Drive

Peinesville, Ohio 44077, U.S.A.

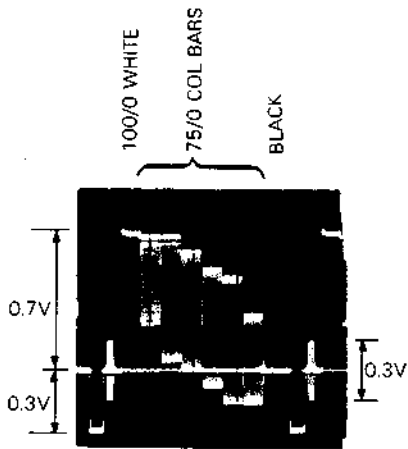
Tel: (216) 354-2101

When connecting the test probe to the terminal of DIP integrated circuit, these clips are convenient. Type TC-16 is for DIP 14-pin or 16-pin IC and Type TC-20 is for 18-pin or 20-pin IC.

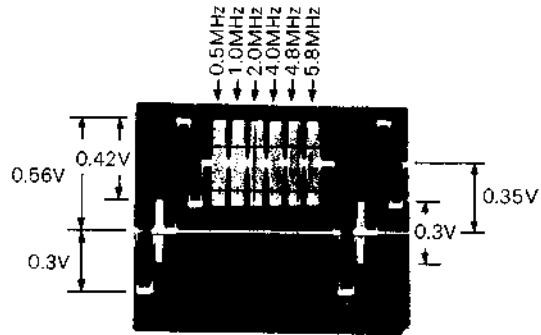


8-2. TEST SIGNALS

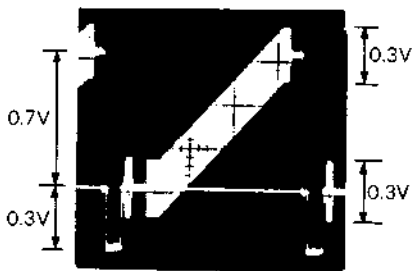
PAL COLOR BARS



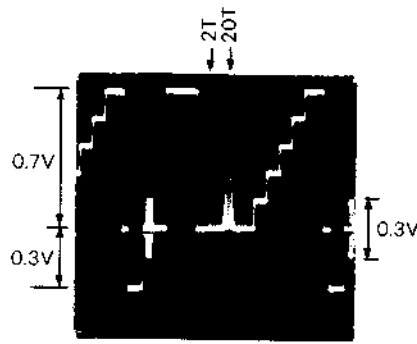
PAL MULTIBURST



PAL RAMP LINEARITY



PAL LINE 17 SIGNAL



8-3. VITS SIGNAL INSERTION

TEK. 1411

See the TSP11 manual for details.

	LINE	SIGNAL
VIDEO CH	17/330	BLANK
	18/331	BLANK
	19/332	LINE 17 SIGNAL
	20/333	MULTIBURST
	21/334	BLANK
	22/335	BLANK

TEK. 148

See the 148 manual for details.

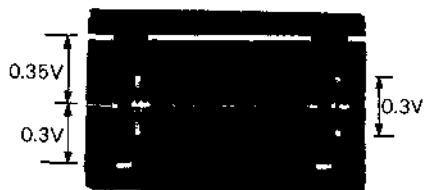
	LINE	SIGNAL
SYNC CH	11/324	BLANK
	12/325	BLANK
	13/326	BLANK
	14/327	MULTIBURST
	15/328	LINE 17 SIGNAL
	16/329	BLANK

When the 148 is used as the VITS inserter, do not make a programming on the VIDEO channel. If do so, the two signals will be added and inserted as a double amplitude VIT signal on the program line output.

PAL 100% FLAT FIELD

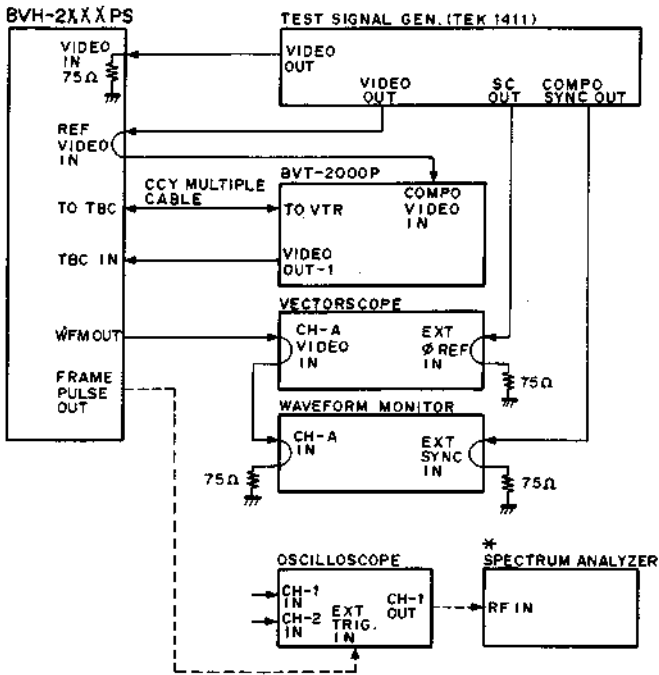


PAL 50% FLAT FIELD



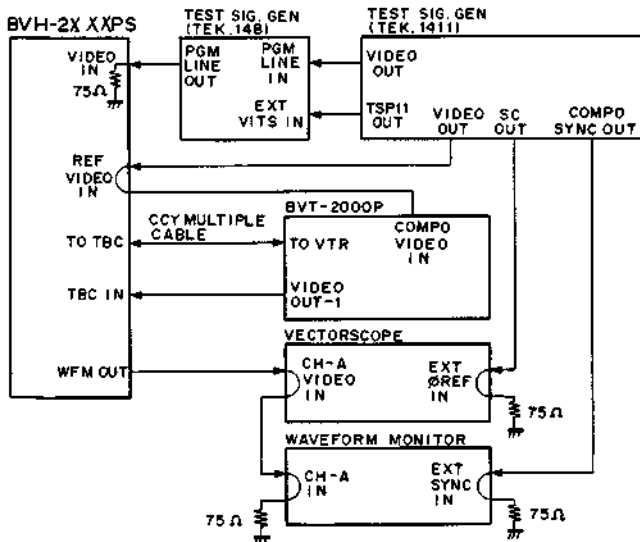
8-4. CONNECTIONS

CONNECTION 1.

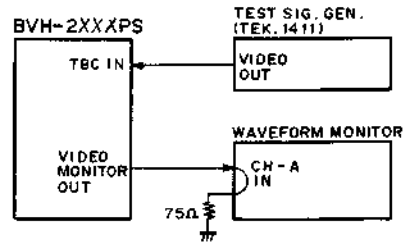


* When performing the adjustment of section 13-14, 13-30-4 and 13-30-6, prepare the Spectrum Analyzer.

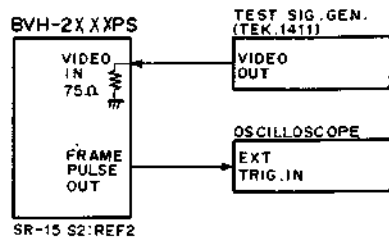
CONNECTION 2. (For sec. 13-31-3)



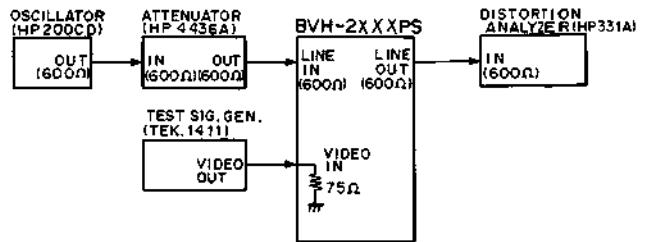
CONNECTION 3.



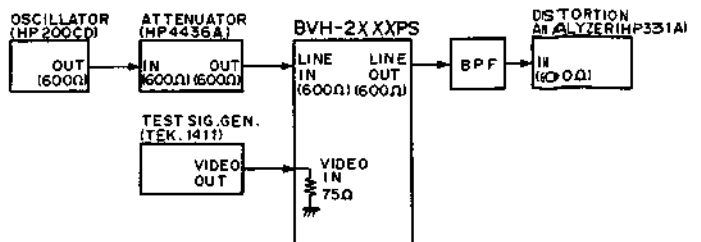
CONNECTION 4.



CONNECTION 5.



CONNECTION 6.



8-5. INITIAL SETTING OF THE BVT-2000P

8-5-1. Control Panel

NORMAL/BYPASS Sw NORMAL
 CNR ON/OFF Sw OFF
 REMOTE/LOCAL Sw LOCAL
 DIRECT COLOR/U-matic Sw DIRECT
 Each PRESET Sw PRESET

8-5-2. Connector Panel

NON COMP/COMP Sw COMP

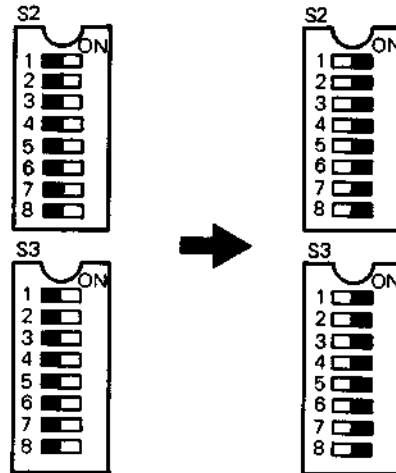
8-5-3. V. BLANKING LINE SELECT Switch (SG-19 Board) Setting

Note:

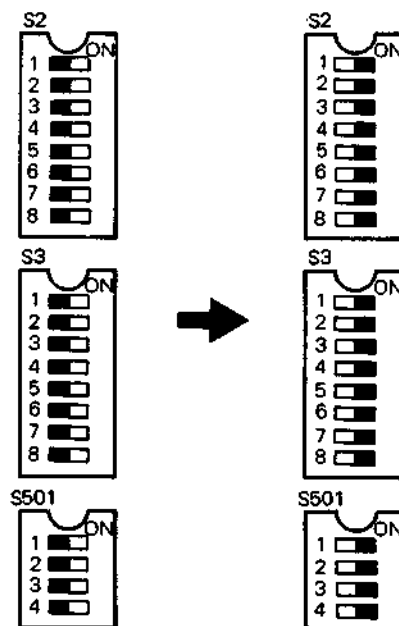
Since the board layout of the SG-19 board have been changed several times, therefore the V. BLANKING switch (S2, S3 and S501) positions under normal operating condition are differed. After completion of the electrical alignment, do not forget resetting the V. BLANKING switches correctly.

Change the programming of the V. BLANKING LINE SELECT switch as follows.

SG-19 BOARD
 BOARD NO. 1-588-045-11



SG-19 BOARD
 BOARD No. 1-588-045-12 or UP



PREPARATION FOR ALIGNMENT

8-6. Initial Setting of the BVH-2000PS/2180PS

8-6-1. Level Control Panel

For 00/02 Models

PICTURE MONITOR Sel.....DEMOD OUT
WAVEFORM MONITOR Sel.....SELECT VIDEO
REMOTE/LOCAL Sw.....LOCAL
AUDIO-1/2/3 REC Cont.....Push
AUDIO-1/2/3 PB Cont.....Push
VIDEO Level Cont.....Push
TRACKING Cont.....Push

For 04 Model

REMOTE/LOCAL Sw.....LOCAL
AUDIO-1/2/3/4 REC Cont.....Push
AUDIO-1/2/3/4 PB Cont.....Push
VIDEO Level Cont.....Push
TRACKING Cont.....Push

8-6-2. Function Control Panel

TAPE/EE Sel.....TAPE/EE
SERVO REF Sel.....INPUT
HEAD Sel.....R/P
TIME CODE/TIMER Sel.....TIMER-1

8-6-3. Card Rack Block

AE-03 Board

S1; A-3 Sel Sw.....LINE
S2; TC Input Sel Sw.....INT
SW3; REGEN/(PB/EE) Sel.....REGEN

EQ-02 Board

S1; AUTO/MANU Sw.....AUTO
JP2/1; DO TTL/RF Sel.....TTL(JP2)
JP3; DROPOUT TEST.....SHORT

DM-25 Board

SW1; WHITE REF Sw.....OFF
SW2A-1 to 8;
 INSERTION LINE Sel Sw.....ON

MD-14 Board

S1; METER Sel Sw.....INPUT
JP1/2; FREQ. COMPEN Sel.....JP2
JP3/4; PEAK/SYNC Sel.....SYNC(JP4)
JP5/6; MODEL Sel.....Depends on model

LG-02(A) Board

S1-1; V/S SIMUL Sw.....ON
S1-2; TC INS INHIBIT Sw.....OFF
S1-3; TENSION RELEASE Sw.....OFF
S2-1; REEL MODE SHUTTLE Sw.....OFF
S2-2; DELAY ENABLE Sw.....OFF
S2-3; PLAY/REC EOT INHIBIT Sw.....OFF
S2-4; LEVER SW ENABLE Sw.....OFF
S2-5; AUDIO REC ENABLE Sw.....OFF
S2-6; TC SENSE MODE SELECT Sw.....OFF
S2-8; MODEL SELECT Sw.....Depends on model
S3; PLAY MODE Sel Sw.....1.5HD
S4; REC INHIBIT Sw.....Depends on
 each sections
JP1; CONF1 TEST.....OPEN
JP2; OSC CONT TEST.....OPEN
JP3OPEN
JP4OPEN
JP5; NORMAL FWD TEST.....OPEN
JP6; VID REC OFF TEST.....OPEN
JP7; VID TEST.....OPEN

TC-14A Board (Optional BKH-2015A)

S1; READER Sw.....TC
S2; TC GEN. MODE Sw.....Free
S3; TC/UB MODE Sw.....TC
S4; PRESET/REGEN Sw.....PRESET
S5; TC/UB MODE Sw.....TC
S6; VITC Sw.....ON
S7; CHARACTER Sw.....ON
S8-1; N1 Sw.....OFF
S8-2; N2 Sw.....OFF
S8-2; SP1 Sw.....OFF
S8-4; CF Sw.....OFF
S8-5; CF BIT SW.....OFF
S8-6; LTC CORRECTION Sw.....OFF
S8-7; LTC ERROR BYPASS Sw.....OFF
S8-8; CHARACTER+VITC CONT Sw.....OFF
S9; VITC INSERT POSITION Sw...2
S10; VITC INSERT POSITION Sw...4
S11; CHARACTER SIZE Sw.....0 or 1
S12; CHARA V POSITION Sw.....Depends on usage
S13; CHARACTER MODE Sw.....Depends on usage
JP1; BINARY GROUP FLAG A.....SHORT
JP2; BINARY GROUP FLAG B.....SHORT
JP3; CHARA+VITC CONT ENABLE.....SHORT
JP4A/4B.....JP4B
JP5OPEN

SY-79 Board

S1; REACTION TIME Sw.....0
 S2; PREROLL TIME Sw.....7
 S3; TEST Sw.....Used for testing
 S4; PARA RUN Sw.....OFF
 S5; VAR Sw.....P JOG
 S6; REMOTE Sw.....2
 S9-2; FREE RUN Sw.....OFF
 S9-3;OFF
 S9-4; FUNCTION KEY ENABLE Sw....OFF
 S9-5; FUNCTION STOP ENABLE Sw...OFF
 S9-6; STILL OFF ENABLE Sw.....ON
 S9-7; TENSION OFF ENABLE Sw.....ON
 S9-8; STANDBY OFF ENABLE Sw.....ON
 S12; REC TEST Sw.....OFF
 JP1OPEN
 JP2SHORT
 JP3OPEN
 JP4SHORT
 JP5OPEN
 JP6SHORT

SY-80 Board

S1; TEST/UPPER Sw.....Free
 S2; TEST/LOWER Sw.....Free
 S3; RESET Sw.....Used for testing
 S4; TEST Sw.....Used for testing
 S5; EOT STOP Sw.....ON
 S6; EDIT TIMING Sw.....F1/F2
 S7; DROP FRAME Sw.....ON
 S8-1; FREE RUN Sw.....OFF
 S8-4OFF
 S8-5; BVB Sw.....OFF
 S8-7; EXT DF/CF CONTROL EN Sw...OFF
 S8-8; OPERATION GUIDE Sw.....OFF
 S9-1; REC CONFI OFF Sw.....OFF
 S9-2; AUDIO EDIT Sw.....OFF
 S9-3; EE MODE Sw.....OFF
 S9-4; PREROLL MODE Sw.....OFF (+/-12H)
 S9-5; DISPLAY MODE Sw.....Depends on usage
 S9-6; IN POINT SYNCHRO Sw.....OFF
 S9-7; SYNCHRO OFF Sw.....OFF
 S9-8; TEST DISPLAY Sw.....OFF

SV-43 Board

S1-1; FREE RUN Sw.....OFF
 S1-2; HARD CPU DIRECT ACCESS
 INHIBIT Sw.....OFF
 S1-3OFF
 S1-4OFF
 S2; TAPE RUN Sw.....NORM

RL-12 Board

S1; SKEW Sw.....AUTO

OD-17 Board

S1; ADV Sw.....BYT
 S2; CAP LOCK Sw.....4F
 S3-1; CF LOCK MODE.....OFF
 S3-2; AUTO PG ON/OFF Sw.....ON
 S3-3ON
 S3-4; TIMER CTL COMP Sw.....ON
 S3-5; PG PHASE PRESET Sw.....Depends on
 adjustment
 S3-6; PG PHASE PRESET Sw.....Depends on
 adjustment
 S3-7; AUTO SKEW ON/OFF Sw.....ON
 S3-8; TRAKING SHIFT Sw.....OFF
 S4; TEST-1 Sw.....0
 S5; TEST-2 Sw.....0
 S6; TEST-3 Sw.....0
 S7; ENTRY Sw.....Used for testing
 S8; ADV PRESET Sw.....12H(02/04 models)
 4H(00 model)

SR-15 Board

S1; CF SC ADJ Sw.....FIX
 S2; PULSE OUT Sw.....REF 2

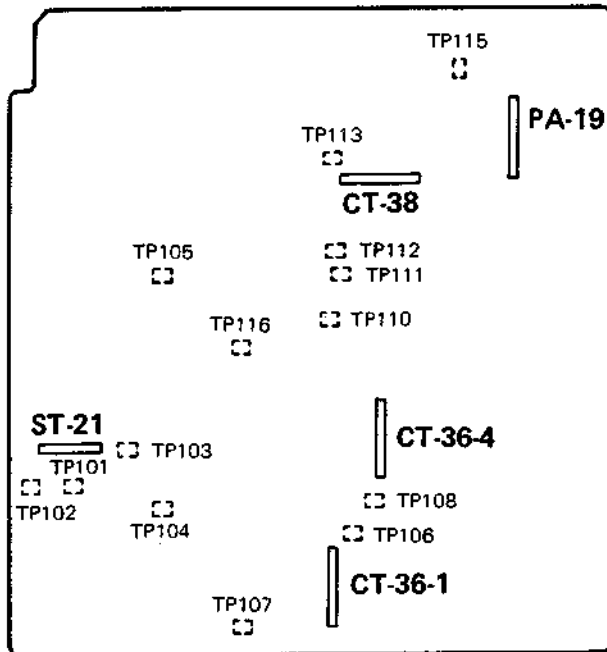
DT-05 Board

S1-1OFF
 S1-2ON
 S1-3ON
 S1-4ON
 S2; REM/FIELD/FIELD Sw.....FIELD
 S3;ON
 S4;OFF

Illustration 8. PREPARATION FOR ALIGNMENT

SECTION 9 POWER SUPPLY ALIGNMENT

FV-01 Board



PA-19 Board



CT-36-4 Board



CT-36-1 Board



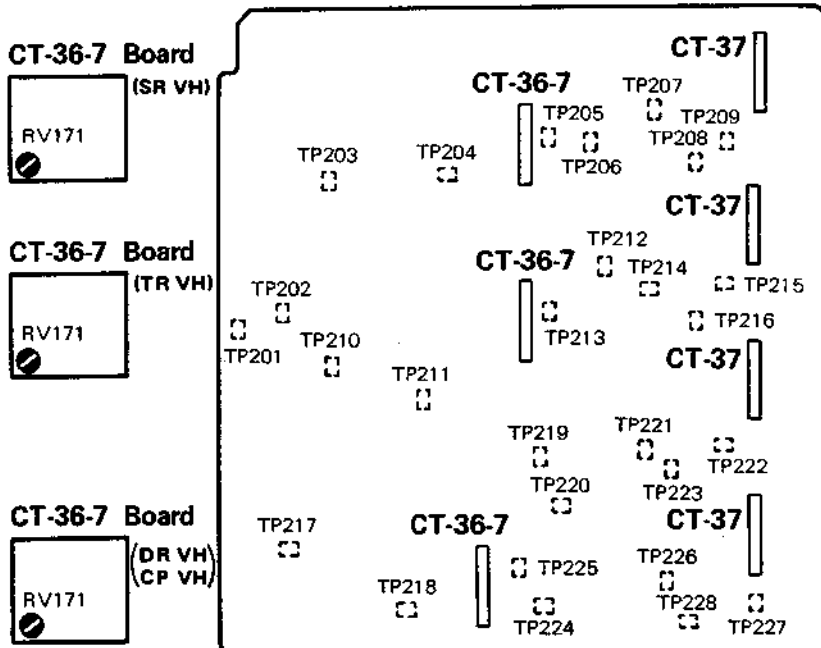
ST-21 Board



CT-38 Board



VV-01 Board



CT-36-7 Board (SR VH)



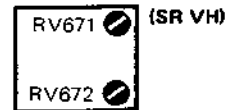
CT-36-7 Board (TR VH)



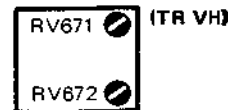
CT-36-7 Board (DR VH) (CP VH)



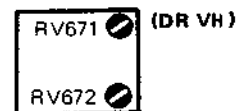
CT-37 Board



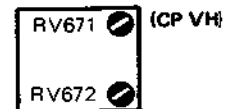
CT-37 Board (TR VH)



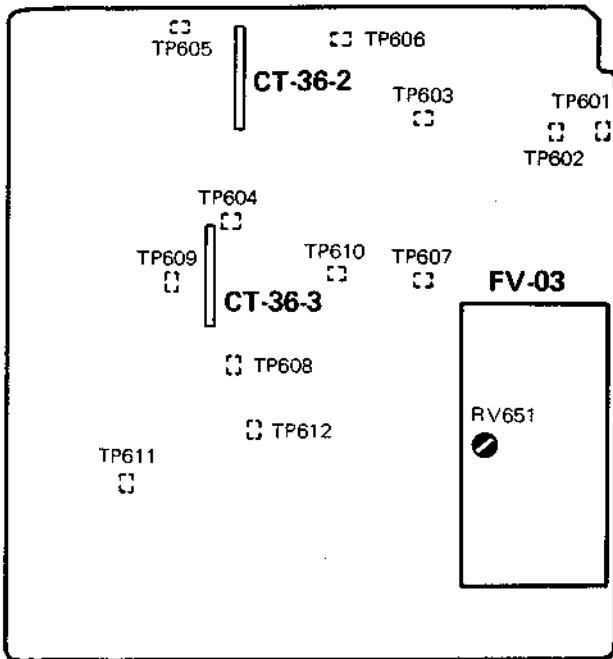
CT-37 Board (DR VH)



CT-37 Board (CP VH)



FV-02 Board



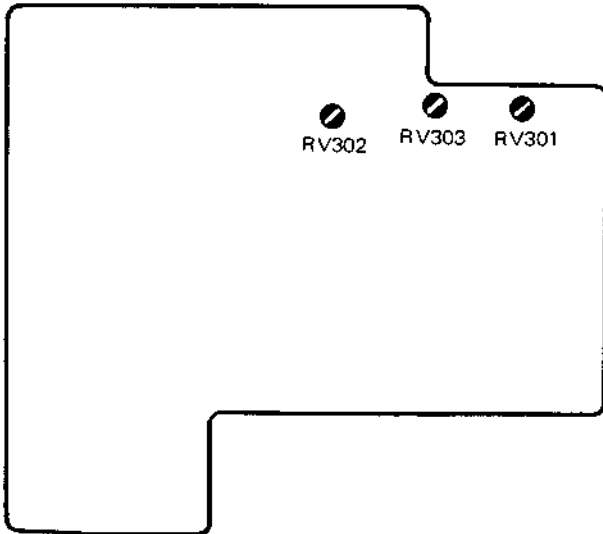
CT-36-2 Board



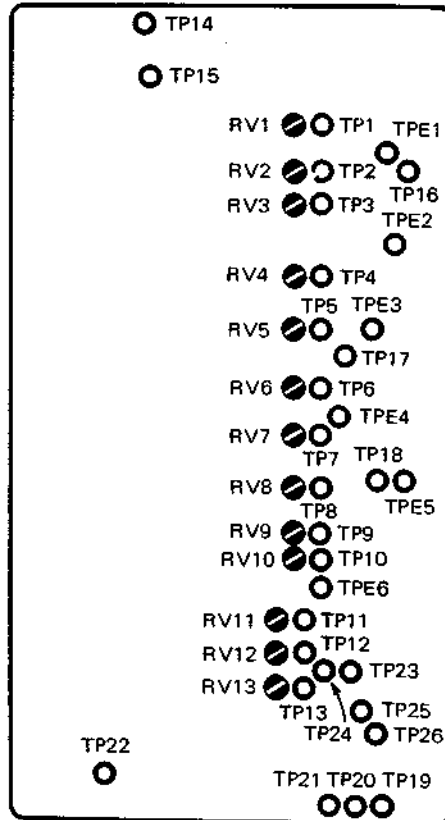
CT-36-3 Board



AC-39 Board



PS-14 Board



POWER SUPPLY ALIGNMENT

CAUTION: Before starting to perform the check and adjustment of the power supply, read section 4-3 "Notes on Power Unit".

9-1. SWITCHING REGULATOR OPERATING CHECK AND ADJUSTMENT

When performing the operating check and adjustment for the FV-01, VV-01, FV-02 and AC-39 boards, use the switching regulator adjustment fixture (Sony Part No. J-6043-640-A). Since a high voltage and "live" current still remain in some

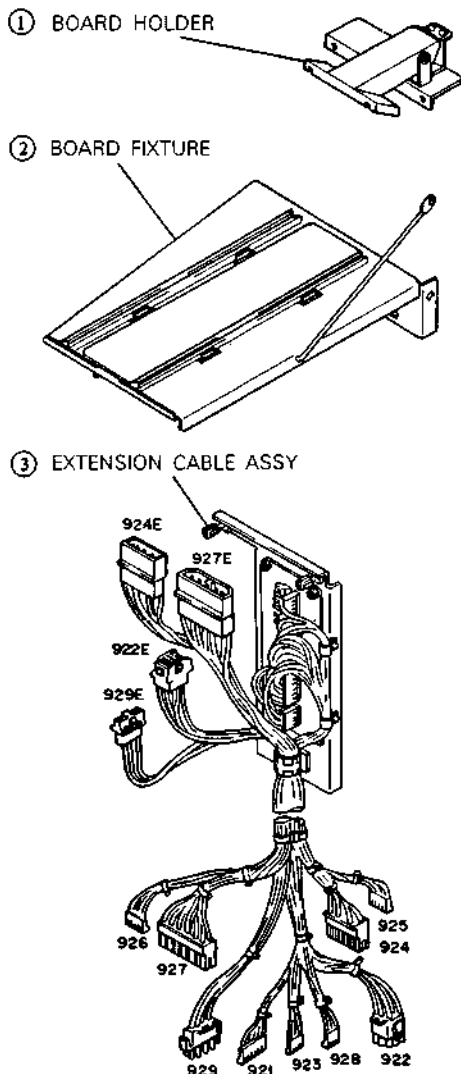
parts and circuit of the power unit after the power switch is turned off, the fixture installation and removal must be performed after removing the power cord and passing five minutes or more.

9-1-1. Switching Regulator Adjustment Fixture Installation

The switching regulator adjustment fixture is composed of the following three parts.

When performing the AC-39 board check and adjustment, use

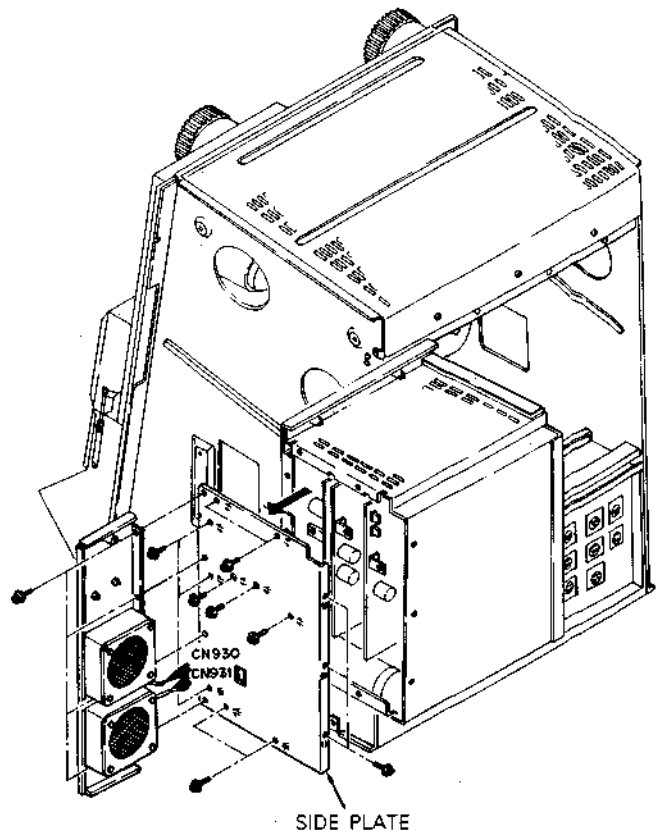
- ③ Extension Cable Assy only.



Step 1. Fan Motor and Side Plate Removal

Open the power unit by loosening the six screws on the rear panel and fix it with the stopper. See section 4-2 "Cabinet Removal". Remove the connectors CN930 and CN931 (Except for 10, 12 and 14 models) and four screws fixing the fan motors to the side plate.

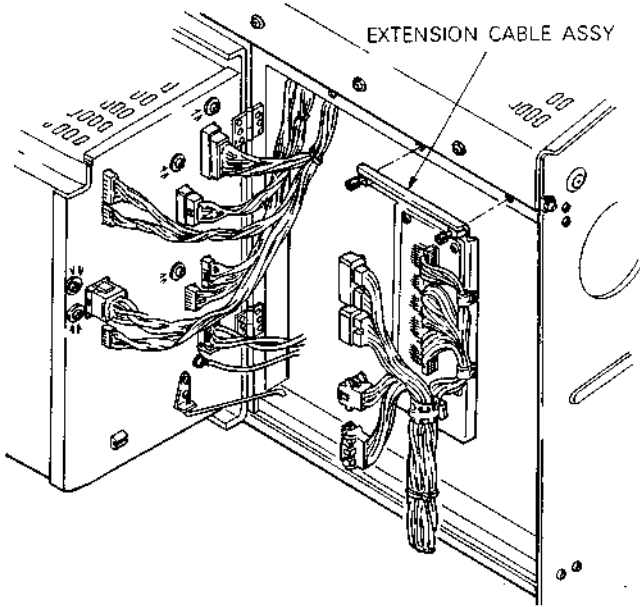
Remove the 13 screws on the side plate and remove the side plate from the power unit.



(9-1-1. Switching Regulator Adjustment Fixture)
Installation

Step 2. Extension Cable Assy Installation

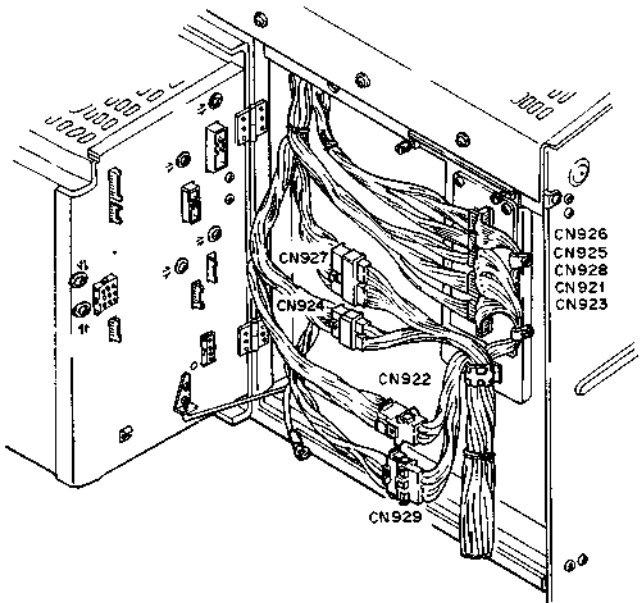
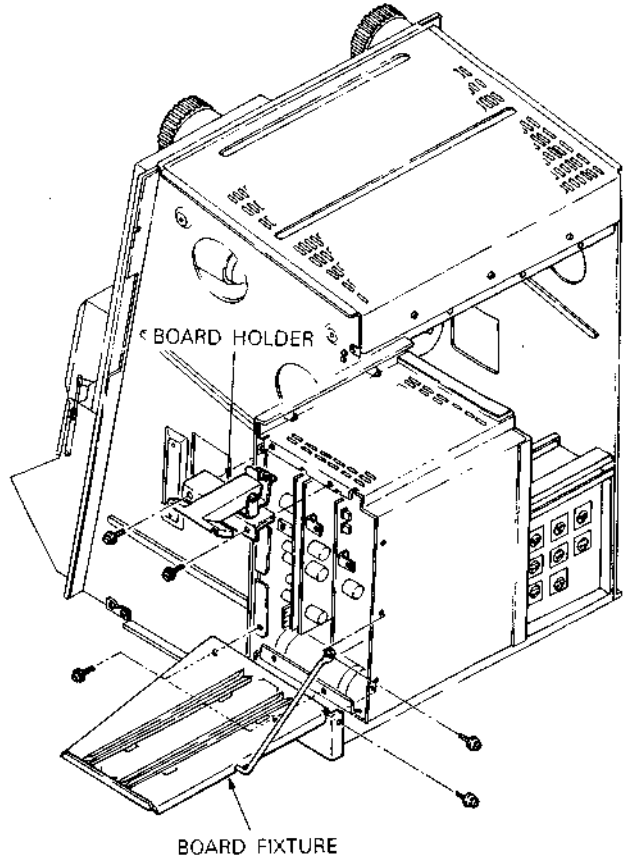
Install the extension cable assy on the VTR.



Remove the connectors CN921 to CN929 and the ground lead-wire connected between the VTR and the power unit. Connect the connectors CN921 and CN929 disconnected from the power unit to the extension cable assy, however, leave the ground lead-wire disconnected.

Step 3. Board Fixture and Board Holder Installation

Install the board fixture and board holder on the power unit with screws removed at step 1.



■■■■■■■■■■ 9. POWER SUPPLY ALIGNMENT

9-1-2. Board Settings

Caution: To prevent electric shock hazard from the primary circuit, the following procedures must be performed after disconnecting the power cord and passing five minutes or more.

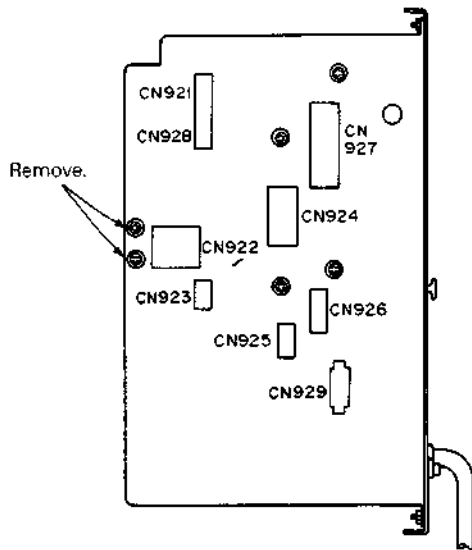
1. FV-01 Board Setting

Step 1.

Install the switching regulator adjustment fixture.
See section 9-1-1.

Step 2.

Remove the two screws securing the FV-01 board as follows.



Step 3.

Connect the connectors CN924, 925, 926, 927 and 929 of the extension cable assy to the corresponding connectors on the power unit.

Step 4.

Remove the connectors CN101 to CN107 connecting the FV-01 board and the other boards and pull out the FV-01 board from the power unit.

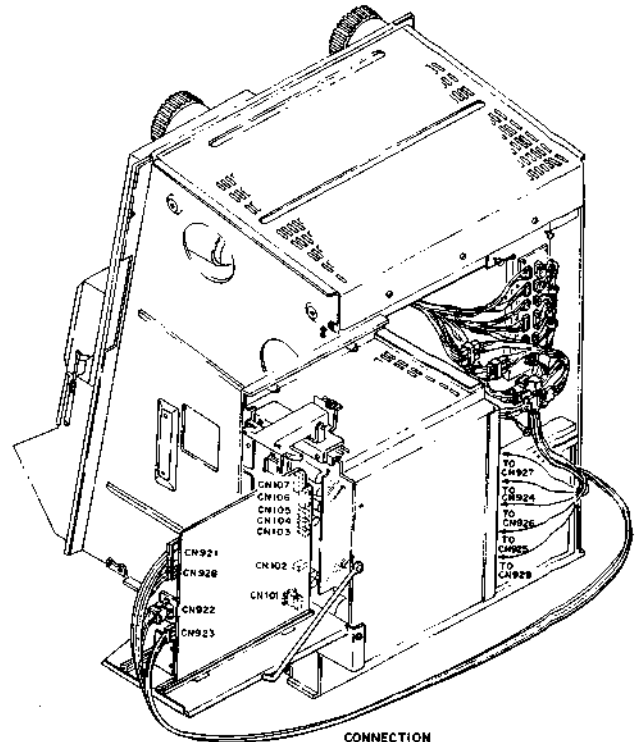
Turn the FV-01 board 180° and insert it into the guide rail of the board fixture and fix it with the board holder.

Step 5.

Connect the connectors CN101 to CN107 removed at step 4 to the proper positions on the FV-01 board.

Step 6.

Connect the connectors CN921, 922, 923 and 929 of the extension cable assy to the corresponding connectors on the FV-01 board.



CONNECTION

FV-01, CN101 → AC-39, CN307
 FV-01, CN102 → AC-39, CN305
 FV-01, CN103 → CN-54, CN470
 FV-01, CN104 → AC-39, CN311
 FV-01, CN105 → FC-02, CN605
 FV-01, CN106 → FC-02, CN602
 FV-01, CN107 → VV-01, CN202, 203

Step 7.

Turn the power on and perform the FV-01 board operating check and adjustment. The work must be performed in a short time.

Step 8.

After performing the operating check and adjustment, turn the power off and disconnect the power cord.

After passing five minutes or more, reinstall the FV-01 board to the power unit in reverse order of the above steps.

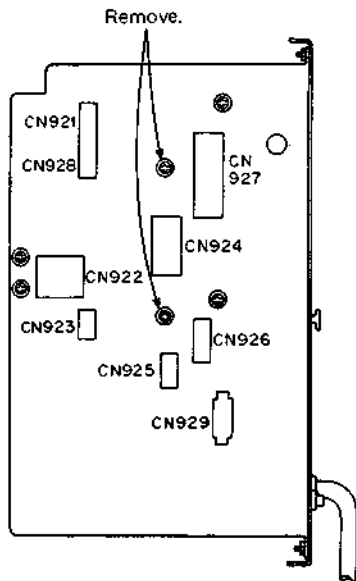
2. VV-01 Board Setting

Step 1.

Install the switching regulator adjustment fixture.
See section 9-1-1.

Step 2.

Remove the two screws securing the VV-01 board as follows.



Step 3.

Connect the connectors CN921, 922, 923, 926, 927, 928 and 929 of the extension cable assy to the connector panel of the power unit.

Step 4.

Disconnect the connectors CN201, 202 and 203 connecting the VV-01 board and the other boards and also remove the connectors CN102, 104 and 106 connecting the FV-01 board and the other boards because the leads of CN102, 104 and 106 obstruct the VV-01 board removal.

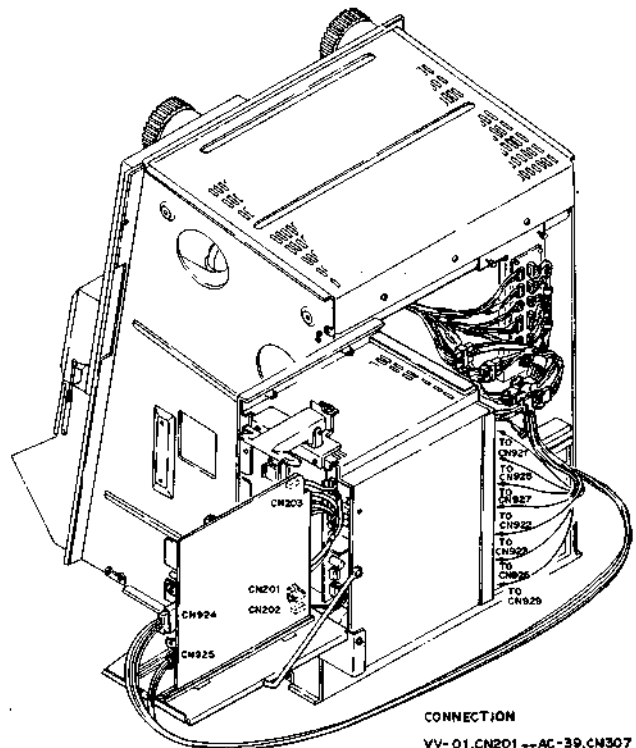
After pulling the VV-01 board from the power unit, turn the VV-01 board 180° and insert it into the guide rail of the board fixture and fix it with the board holder.

Step 5.

Connect the connectors CN102, 104, 106, 201, 202 and 203 removed at step 4 to the proper positions on the FV-01 and VV-01 boards.

Step 6.

Connect the connectors CN924 and 925 of the extension cable assy to the corresponding connectors on the VV-01 board.



CONNECTION

VV-01, CN201	→ AC-39, CN307
VV-01, CN202	→ FV-01, CN107
VV-01, CN203	→ FV-01, CN107
FV-01, CN102	→ AC-39, CN305
FV-01, CN104	→ AC-39, CN311
FV-01, CN106	→ FV-02, CN602

Step 7.

Turn on the power and perform the VV-01 board operation check and adjustment. The work must be performed in a short time.

Step 8.

After performing the operation check and adjustment, turn the power off and disconnect the power cord.

After passing five minutes or more, reinstall the VV-01 board to the power unit in reverse order of the above steps.

(9-1-2. Board Settings)

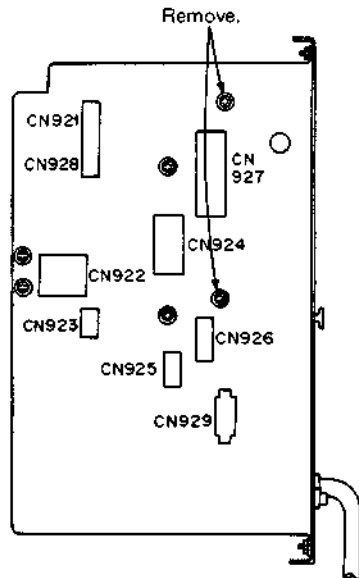
3. FV-02 Board Setting

Step 1.

Install the switching regulator adjustment fixture.
See section 9-1-1.

Step 2.

Remove two screws securing the FV-02 board as follows.



Step 3.

Connect the connectors CN921, 922, 923, 924, 925, 928 and 929 of the extension cable assy to the connector panel of the power unit.

Step 4.

Disconnect the connectors CN601, 602 and 603 connecting the FV-02 board and the other boards and pull the FV-02 board from the power unit.

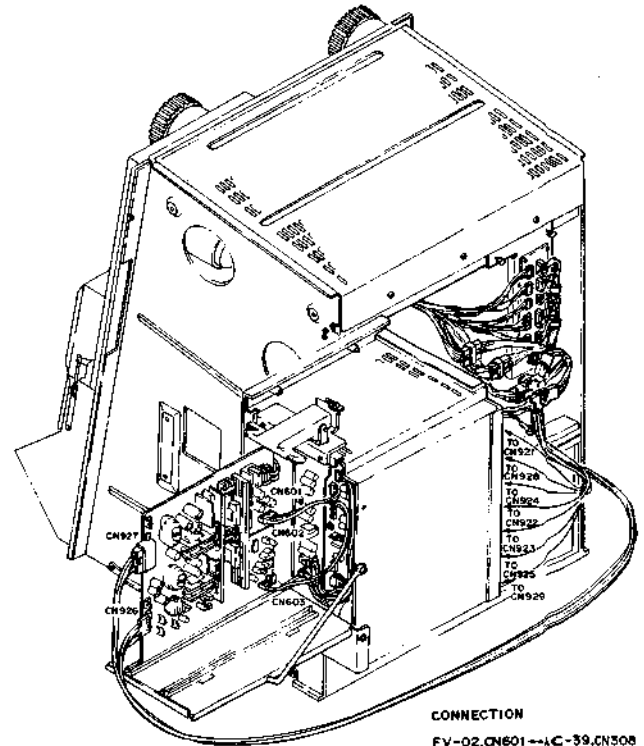
Turn the FV-02 board 180° and insert it into the guide rail of the board fixture and fix it with the board holder.

Step 5.

Connect the connectors CN601, 602 and 603 removed at step 4 to the proper positions on the FV-02 board.

Step 6.

Connect the connectors CN926 and 927 of the extension cable assy to the corresponding connectors on the FV-02 board.



Step 7.

With power on, perform the FV-02 board operation check and adjustment. The work must be performed in a short time.

Step 8.

After performing the operation check and adjustment, turn the power off and disconnect the power cord.

After passing five minutes or more, reinstall the FV-02 board to the power unit in reverse order of the above steps.

(9-1-2. Board Settings)

4. AC-39 Board Setting

Caution: When performing the AC-39 board operation check and adjustment, leave the side plate of the power unit installed.

When the switching regulator adjustment fixture is already installed to the power unit, remove the board fixture and board holder.

Step 1.

Install the extension cable assy. See step 2 of section 9-1-1.

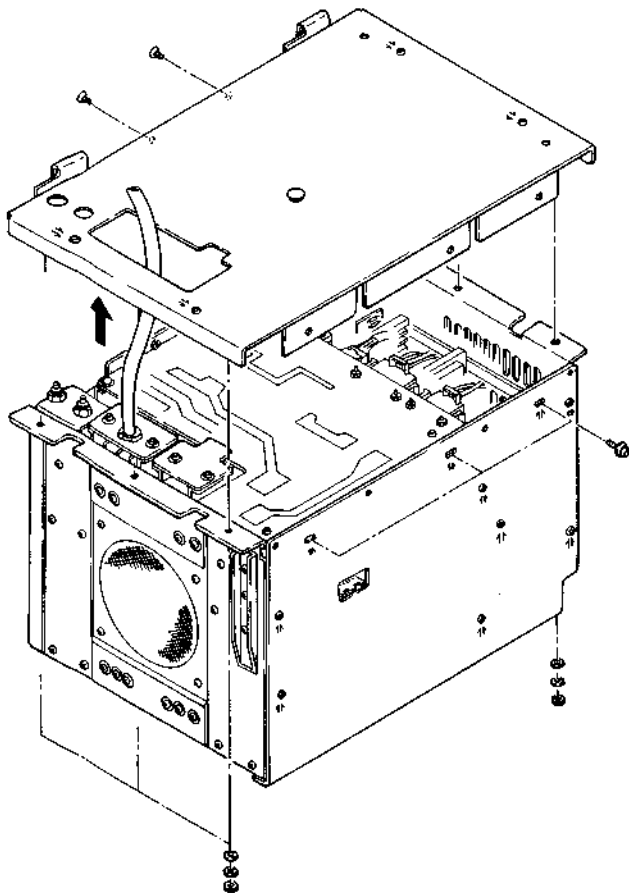
Step 2.

Lift the power unit a little and remove it from the VTR. Turn the rear panel of the power unit downward and place it on the work table.

Step 3.

Remove the six nuts, washers and spring washers with a nut driver.

Turn the rear panel upward and remove the remaining five screws to take off the rear panel.



Step 4.

Connect all the connectors CN921 to CN929 of the extension cable assy to the proper connectors on the connector panel of the power unit.

Step 5.

Turn on the power and perform the AC-39 board operation check and adjustment. The work must be performed in a short time.

Step 6.

After performing the operation check and adjustment, turn the power off and remove the power cord.

After passing five minutes or more, reinstall the rear panel to the power unit in reverse order of the above steps and install the power unit to the VTR.

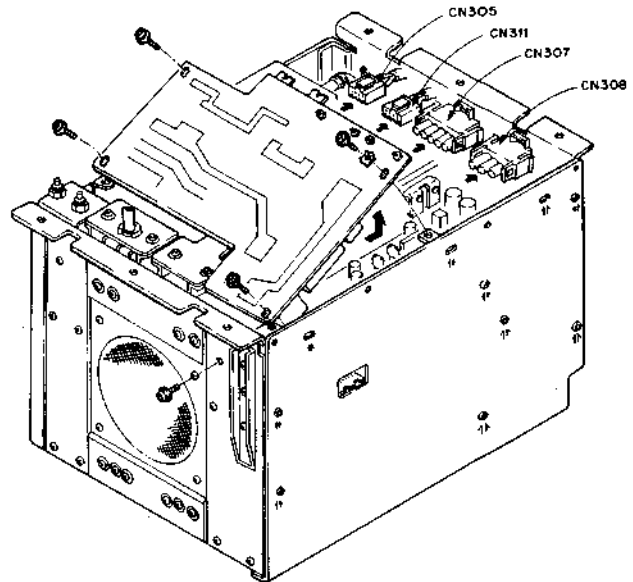
9-1-3. AC-39 Board Part Replacement

Step 1.

Remove four screws securing the AC-39 board (one with external tooth washer) and a screw securing the heatsink for diodes and the bottom of the power unit.

Step 2.

Disconnect the connector CN305, 307, 308 and 311 from the AC-39 board. Lift the board gently not to give the excessive force to the harness and replace the part.



Step 3.

If the part replacement is difficult, you may remove the connectors except CN305, 307, 308 and 311, but after replacing the parts, connect them to their original positions.

Step 4.

When reinstalling the AC-39 board to the power unit after replacing the parts, tighten the four screws securing the board temporarily and tighten the screw securing the heatsink firmly, and finally tighten the above four screws firmly.

9-1-4. Load

1. No Load

Remove the connectors CN921 to CN928 (all except CN929) on the connector panel of the power unit and CN930 and CN931 for the fan motors on the side plate. The power unit is placed in no-load state.

(CN929 is connected to the power switch of the VTR.)

2. VTR Load

When performing the output check and adjustment of the power unit, the VTR is used as a load.

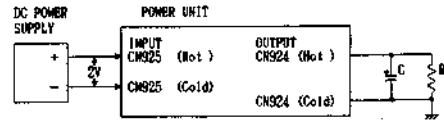
3. Standard Load

When performing the power unit operation check and adjustment, the dummy load (standard load) that is equivalent to the impedance of the VTR is connected to the power unit. The cold side of the standard load must be grounded and the load capacitor whose high frequency response is good must be used.

When performing the variable output system check, DC input voltage (2V) must be applied after the relays RY101 and 102 on the FV-01 board have been energized.

The following is the rated value of the standard load for each output.

Standard Load for Variable Output Check

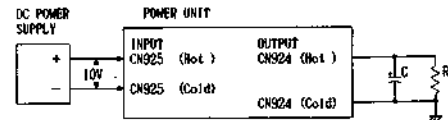


OUTPUT SYSTEM	2Vdc INPUT PIN Hot-Cold	OUTPUT PIN Hot-Cold	LOAD	
			C (μF / V)	R (Ω / W)
SR VH	CN925 8-7	CN924 1-7	100 / 100	50/8
TR VH	CN925 6-5	CN924 2-8	100 / 100	50/8
DR VH	CN925 4-3	CN924 5-10	100 / 100	50/8
CP VH	CN925 2-1	CN924 6-11	100 / 63	25/4

4. Critical Load

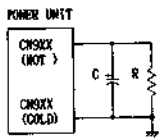
Used for power limit adjustment of the variable output system. The DC input voltage (10V) must be applied after the relays RY101 and 102 on the FV-01 board have been energized.

The following is the rated value of the critical load for each variable output.

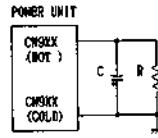


OUTPUT SYSTEM	10Vdc INPUT PIN Hot-Cold	OUTPUT PIN Hot-Cold	LOAD	
			C (μF / V)	R (Ω / W)
SR VH	CN925 8-7	CN924 1-7	100 / 100	50/90
TR VH	CN925 6-5	CN924 2-8	100 / 100	50/90
DR VH	CN925 4-3	CN924 5-10	100 / 100	50/90
CP VH	CN925 2-1	CN924 6-11	100 / 63	25/45

Standard Load for Fixed Output Check



(Fig. 1)



(Fig. 2)

OUTPUT SYSTEM	Fig. No.	REPRESENTATIVE PIN Hot-Cold	LOAD		RATED CURRENT	RATED VOLTAGE	
			C (μF / V)	* R		MIN.	MAX.
+ 19 V	1	CN928 1-3	100 / 25	43.5 Ω	400mA	+ 20 V	+ 25 V
- 19 V	2	CN928 5-3	100 / 25	143 Ω	140mA	- 25 V	- 20 V
+ 6.8V	1	CN922 1-6	100 / 25	0.46Ω	15 A	+ 6.8V	+ 8.0V
+ 13.8V	1	CN927 5-7	100 / 25	2.12Ω	6.6A	+ 13.9V	+ 15.0V
- 13.8V	2	CN927 4-10	100 / 25	3.19Ω	4.4A	- 15.0V	- 13.9V
- 8.6V	2	CN927 9-17	100 / 25	5.56Ω	1.6A	- 15 V	- 8 V
+ 250 V	1	CN926 10-8	1 / 300	23.8kΩ	10mA	+225 V	+300 V
- 250 V	2	CN926 6-8	1 / 300	23.8kΩ	10mA	-300 V	-225 V
- 48 V	2	CN926 1-3	10 / 100	825 Ω	60mA	- 65 V	- 48 V
+ 13 V	1	CN923 5-6	100 / 25	10.4 Ω	1.2A	+ 12 V	+ 15 V
+ 13 V	1	CN923 1-3	100 / 25	7.6 Ω	1.6A	+ 12 V	+ 15 V

*: Reference Value

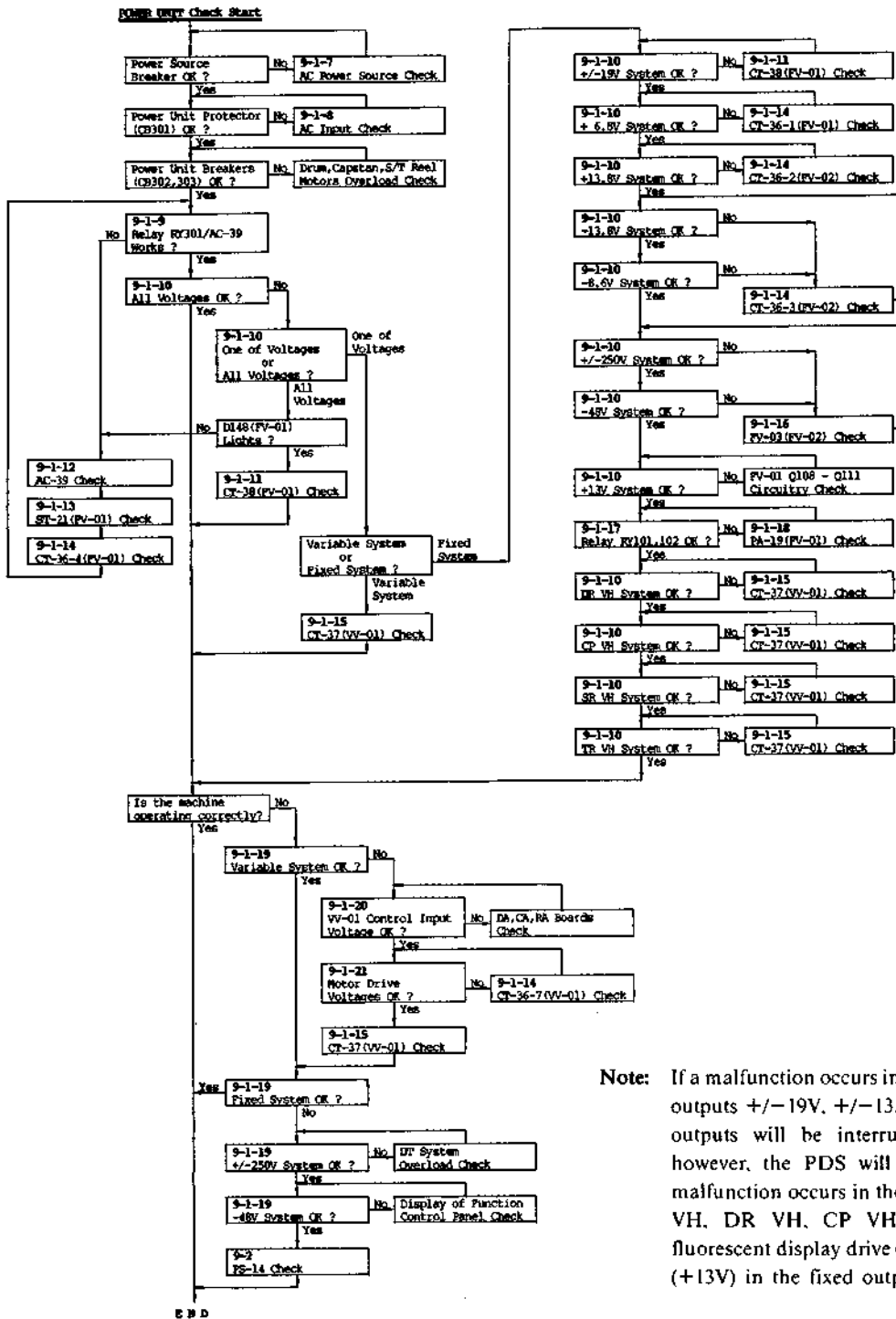
9-1-5. Preparation for Board Operation Check and Adjustment

Before performing the operation check and adjustment of each board, inspect by the eye that the foreign matter is not adhered to the board and the component is not abnormal.

Equipment Required: Oscilloscope
Digital Voltmeter
DC Ammeter
Autotransformer

9-1-6. Power Unit Check and Adjustment Procedure

When a malfunction has occurred in the power unit, perform the operation check and adjustment in accordance with the following procedures.



Note: If a malfunction occurs in one of the switching regulator outputs $\pm 19V$, $\pm 13.8V$, $+6.8V$ and $-8.6V$, all the outputs will be interrupted by the PDS function, however, the PDS will not operate, even though a malfunction occurs in the variable outputs (SR VH, TR VH, DR VH, CP VH), or DT drive ($\pm 250V$), fluorescent display drive ($-48V$) and fan/solenoid drive ($+13V$) in the fixed outputs.

E 3 D

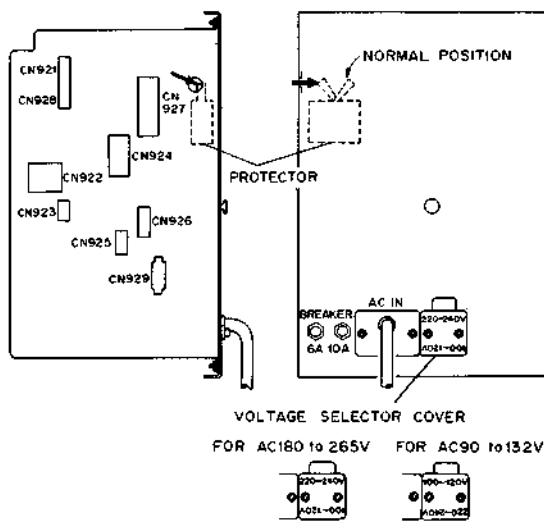
9-1-7. AC Power Capacity Check

When the breaker for the AC power source has operated owing to the inadequate AC power source, use an AC power source with a larger capacity. See section 4-3-1.

9-1-8. AC Input Voltage Check

When the power unit protector CB301 has operated, check that the AC input voltage is in the range of 90V to 132V or 220V to 240V and set the protector to the normal position.

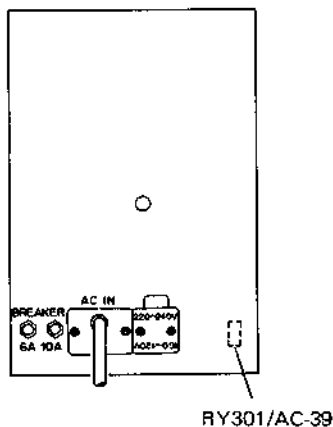
Check that the voltage selector cover has been mounted on the power unit. If the cover is off, mount it and after 30 seconds or more, set the protector to the normal position.



9-1-9. Relay Switching Click Check with Power ON/OFF

The relay RY301 for rush current limiter has been mounted on the AC-39 board in the power unit.

Approach the ear to the rear panel of the power unit, turn on the power switch and check the switching click of the relay.



9-1-10. Power Unit No-Load Voltage Check

Disconnect the connectors CN921 to 928, 930 and 931 (except CN929) which connect the power unit to the VTR and the fans, to set the power unit to the no-load condition.

Turn on the power switch and check that each output voltage is in the range shown below.

Fixed Outputs

OUTPUT SYSTEM	TEST POINT Hot-Cold	OUTPUT VOLTAGE	
		MIN.	MAX.
+ 19 V	CN928 1-3	+ 20 V	+ 25 V
- 19 V	CN928 5-3	- 25 V	- 20 V
+ 6.8V	CN922 1-6	+ 6.9V	+ 8.0V
+ 13.8V	CN927 5-7	+ 13.9V	+ 15.0V
- 13.8V	CN927 4-10	- 15.0V	- 13.9V
- 8.6V	CN927 9-17	- 15 V	- 8 V
+250 V	CN926 10-8	+225 V	+300 V
-250 V	CN926 6-8	-300 V	-225 V
- 48 V	CN926 1-3	- 65 V	- 48 V
+ 13 V	CN923 1-3	+ 12 V	+ 15 V
+ 13 V	CN930 1-3	+ 12 V	+ 15 V

Variable Outputs

OUTPUT SYSTEM	TEST POINT Hot-Cold	OUTPUT VOLTAGE	
		MIN.	MAX.
SR VH	CN924 1-7	0V	+ 30V
TR VH	CN924 2-8	0V	+ 30V
DR VH	CN924 5-10	0V	+ 30V
CP VH	CN924 6-11	0V	+ 15V

The variable outputs should be in the above range first and fall gradually to 0V.

9-1-11. CT-38 (FV-01) Board Check

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter

Oscilloscope

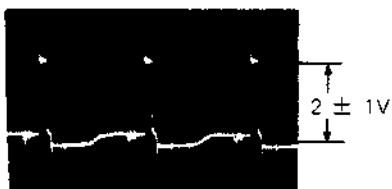
Mode of VTR: STOP (STANDBY OFF)

TEST POINT

(Hot - Cold)

CT-38 ⑥ - ⑤ : CT-38 board power supply voltage
= 20.5 ± 3.5 Vdc

CT-38 ① - ⑤ : Synchronizing pulse



CT-38 ⑧ - ⑤ : REF 5V = 5 ± 0.3 Vdc

CT-38 ③ - ⑤ : Overheat detector input = 20 ± 4 Vdc
When the overheat sensor (90°C) works, it falls to 0V.

CT-38 ② - ⑤ : PDS Input = 5 ± 0.5 Vdc
When the PDS operates, it falls to 0V.

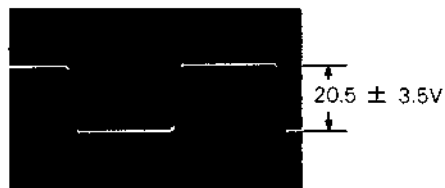
CT-38 ⑦ - ⑤ : Each board power supply voltage control
output = 0.4 ± 0.4 Vdc

CT-38 ⑨ - ⑤ : Q105 drive waveform

CT-38 ⑩ - ⑤ : Q106 drive waveform



FV-01 TP113 - CT-38 ⑤ : Converter transformer drive
waveform



9-1-12. AC-39 Board Operation Check and Adjustment

1. Operation Check

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter

Autotransformer

Mode of VTR: STOP (STANDBY OFF)

TEST POINT

(Hot - Cold)

CN301 ① - ③ : AC input voltage
NTSC/PM: AC 100 to 120V

PS: AC 100 to 120V or AC220 to 240V

It depends on voltage selector setting.

CN302 ① - ② : Voltage after passing the power switch
NTSC/PM: AC100 to 120V

PS: AC100 to 120V or AC220 or 240V

It depends on voltage selector setting.

CN308 ③ - ② : Primary rectified voltage = DC180 to 380V
When the voltage is not outputted, check the fuse F301 on the board.

If the fuse F301 is broken, replace it with a new one and perform the following check.

Step 1.

Leave the connectors (CN305 and CN102, CN311 and CN104, CN307 and CN101) connecting the AC-39 board to FV-01 board, and remove the others except CN309 and CN310 on the AC-39 board inside the power unit.

Step 2.

Turn the power switch on and check the switching click of the relay RY301. See section 9-1-9.

If the switching click is not heard, check the rush current limiter consisting of IC301 and Q304.

Both Leads of C313: Sub-rectifying voltage = DC170 to 380V

Note: The sub-rectified voltage allows the detection of the AC input voltage and switching of the relay RY301 for the rush current limiter.

(9-1-12. AC-39 Board Operation Check & Adjustment)

2. Surge Current Protector Adjustment

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter

Autotransformer

Mode of VTR: STOP (STANDBY OFF)

Step 1.

Disconnect CN921, 922, 923, 924, 925, 926, 927 and 928 from the power unit

Step 2.

Connect AC power cable to the autotransformer and turn on the power. Set the voltage across C313/AC-39 for 140 Vdc with the autotransformer.

Step 3. Adjustment AC-39 Board

RY301 = Just ON

● RV302/AC-39

3. Low AC Input Voltage Protector Adjustment

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter

Autotransformer

Mode of VTR: STOP (STANDBY OFF)

Step 1.

Disconnect CN921, 922, 923, 924, 925, 926, 927 and 928 from the connector panel of the power unit.

Step 2.

Connect AC power cable to the autotransformer and turn on the power. Set the voltage across C313/AC-39 for 170 Vdc with the autotransformer.

Step 3. Adjustment AC-39 Board

IC301 pin-14 = LOW level

(at the transition of the level)

● RV303/AC-39

Step 4.

Set the voltage across C313/AC-39 for 165 Vdc with the autotransformer, and after 1 minute or more, check the circuit protector CB301/AC-39 activates.

4. High AC Input Voltage Protector Adjustment

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter

Autotransformer

Mode of VTR: STOP (STANDBY OFF)

Step 1.

Disconnect CN921, 922, 923, 924, 925, 926, 927 and 928 from the connector panel of the power unit.

Step 2.

Connect AC power cable to the autotransformer and turn on the power. Set the voltage across C313/AC-39 for 400 Vdc with the autotransformer.

Step 3. Adjustment AC-39 Board

Turn ●RV301/AC-39 gradually clockwise and stop it where the circuit protector CB301/AC-39 just activates.

After 30 seconds or more, set the protector to the normal position.

9-1-13. ST-21 (FV-01) Board Operation Check

Load: VTR Load (See section 9-1-4.)

Equipment: Oscilloscope

Mode of VTR: STOP (STANDBY OFF)

1. Check the waveform just after the power switch is turned on.

TEST POINT

(Hot ~ Cold)

ST-21 ① — ⑤:

Charging waveform of the primary voltage

ST-21 ② — ⑤:

Switching waveform of the power starting



9-1-14. CT-36 (FV-01/FV-02/VV-01) Board Operation Check and Adjustment

The power unit has seven CT-36 boards as follows

FV-01 Board: CT-36-1

CT-36-4

FV-02 Board: CT-36-2

CT-36-3

VV-01 Board: CT-36-7 (three boards)

For the CT-36 board whose suffix number is not specified in the following, the operation check and adjustment are applied to all the CT-36 boards.

1. Operation Check

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter
Oscilloscope

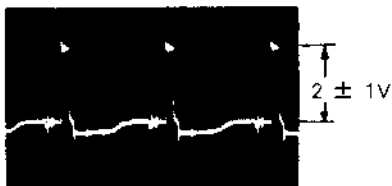
Mode of VTR: CT-36-1, 2, 3, 4 STOP (STANDBY OFF)
CT-36-7 STOP (STANDBY ON)

TEST POINT

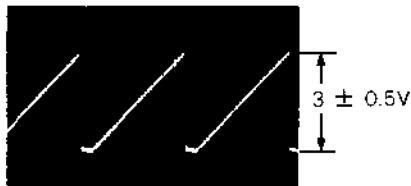
(Hot - Cold)

CT-36 ⑩ - ⑦: Power supply voltage
CT-36-1, 2, 3, 7 = 17.5 ± 1.5 Vdc
CT-36-4 = 18.5 ± 1.5 Vdc

CT-36 ① - ⑦: Synchronizing pulse
(CT-36-4/FV-01 board check is not required.)



CT-36 ② - ⑦: Sawtooth generator waveform

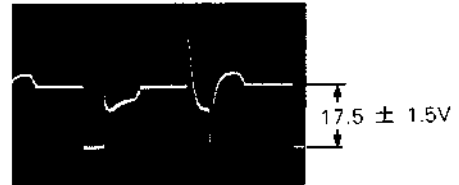


CT-36 ⑤ - ⑦: REF 5V = 5 ± 0.3 Vdc

CT-36 ③ - ⑦: DEAD CONT voltage = 0.8 ± 0.5 Vdc

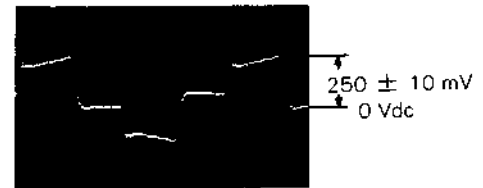
CT-36 ⑥ - ⑦: Drive transformer switching waveform

CT-36 ⑧ - ⑦: Drive transformer switching waveform



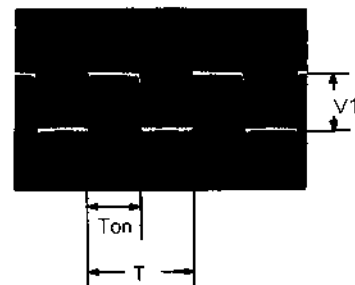
CT-36 ⑪ - ⑦: Excessive current detection input

CT-36 ⑫ - ⑦: Excessive current detection input



Converter Rectified output

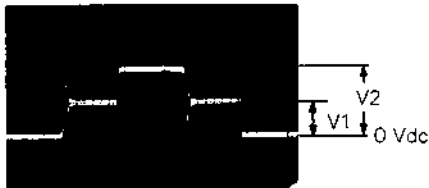
BOARD	TEST POINT Hot-Cold	Vo CHECK POINT Hot-Cold
CT-36-4	FV-01 TP110-109	FV-01 C141 ⊕-⊖
CT-36-1	FV-01 TP108-106	FV-01 CN922 1-5
CT-36-2	FV-02 TP604-605	FV-02 CN927 5-7
CT-36-3	-13.8V FV-02 TP608-609	FV-02 CN927 4-1
CT-36-3	-8.6V FV-02 TP612-611	FV-02 CN927 9-17
CT-36-7	SR VH VV-01 L202 ⑨-TP205	VV-01 TP206-205
CT-36-7	TR VH VV-01 L207 ⑩-TP213	VV-01 TP212-213
CT-36-7	DR VH VV-01 L212 ⑪-TP220	VV-01 TP219-220
CT-36-7	CP VH VV-01 L217 ⑫-TP225	VV-01 TP224-225



$$V_o = V_1 \times \frac{T_{on}}{T} \pm 20\%$$

9-1-14. CT-36 (FV-01/FV-02/VV-01) Board Operation
Check & Adjustment
Switching Voltage

BOARD	TEST POINT Hot-Cold
CT-36-4	FV-01 TP105-101
CT-36-1	FV-01 TP104-101
CT-36-2	FV-02 TP603-602
CT-36-3	FV-02 TP607-602
CT-36-7	SR VH VV-01 TP203-201
CT-36-7	TR VH VV-01 TP210-201
CT-36-7	DR VH, CP VH VV-01 TP217-201



2. Output Voltage Adjustment

When the adjustment of RV171 is required, check the CT-36 board specified in the following table.

Load: VTR Load/Standard Load (See section 9-1-4.)
Equipment: Digital Voltmeter
Mode of VTR: STOP (STANDBY OFF)

BOARD	TEST POINT Hot-Cold	SPECIFICATIONS	
		VTR LOAD	STANDARD LOAD
CT-36-4	FV-01 C141 ⊕-⊖	+19.0±0.5V	+19.0±0.5V
CT-36-1	FV-01 CN922 1-6	+7.2±0.3V	+7.1±0.1V
CT-36-2	FV-02 CN927 5-7	+14.1±0.2V	+14.0±0.1V
CT-36-3	FV-02 CN927 4-1	-14.1±0.2V	-14.0±0.1V
CT-36-7	SR VH VV-01 TP206-205	+94.0±0.5V **+90.0±1.0V	+94.0±0.5V **+90.0±1.0V
CT-36-7	TR VH VV-01 TP212-213	+94.0±0.5V **+90.0±1.0V	+94.0±0.5V **+90.0±1.0V
CT-36-7	DR VH, CP VH VV-01 TP219-220	+94.0±0.5V **+90.0±1.0V	+94.0±0.5V **+90.0±1.0V

* : POWER UNIT with Serial No. up to 902813.

9-1-15. CT-37 (VV-01) Board Operation Check and Adjustment

The four CT-37 boards are used on the VV-01 board as follows.

- CT-37 (SR VH)
- CT-37 (TR VH)
- CT-37 (DR VH)
- CT-37 (CP VH)

For the CT-37 board whose output system name is not specified in the following, the operation check and adjustment are applied to all the CT-37 boards.

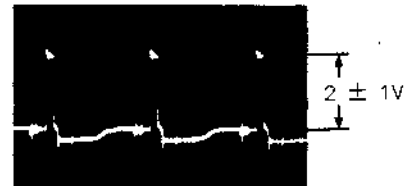
1. Operation Check

Load: VTR Load (See section 9-1-4.)
Equipment: Digital voltmeter
Oscilloscope
Mode of VTR: STOP (STANDBY OFF)

TEST POINT
(Hot - Cold)

CT-37 ① - ⑧ : CT-37 board power supply voltage
= 17.5 ± 1.5 Vdc

CT-37 ② - ⑧ : Synchronizing pulse



CT-37 ⑩ - ⑧ : Motor drive control input voltage

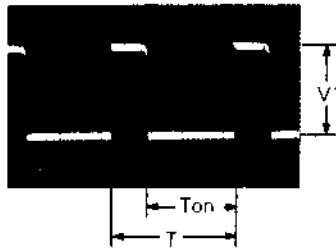
OUTPUT SYSTEM	TEST POINT		SPEC. IN : OUT	TOLERANCE
	IN Hot-Cold	OUT Hot-Cold		
SR VH	CT-37 ④-⑤	CN924 1-7	1 : 10	± 5%
TR VH	CT-37 ④-⑤	CN924 2-8	1 : 10	± 5%
DR VH	CT-37 ④-⑤	CN924 5-10	1 : 10	± 5%
CP VH	CT-37 ④-⑤	CN924 6-11	1 : 5	± 5%

CT-37 ③ - ⑧ : Switching transistor drive waveform



Motor Drive Voltage

OUTPUT SYSTEM	TEST POINT Hot-Cold	Vo CHECK POINT Hot-Cold
SR VH	VV-01 TP207-208	CN924 1-7
TR VH	VV-01 TP214-216	CN924 2-8
DR VH	VV-01 TP221-223	CN924 5-10
CP VH	VV-01 TP226-228	CN924 6-11



$$V_o = V_1 \times \frac{T_{on}}{T} \pm 20\%$$

2. Output Voltage Adjustment

Load: VTR Load (See section 9-1-4.)
 Equipment: Digital Voltmeter
 Mode of VTR: STOP (STANDBY OFF)

When the adjustment of RV672 is required, refer to the following table.

OUTPUT SYSTEM	TEST POINT		SPEC. IN : OUT	TOLERANCE
	IN Hot-Cold	OUT Hot-Cold		
SR VH	CT-37 ①-③	CN924 1-7	1 : 10	± 5%
TR VH	CT-37 ①-③	CN924 2-8	1 : 10	± 5%
DR VH	CT-37 ①-③	CN924 5-10	1 : 10	± 5%
CP VH	CT-37 ①-③	CN924 6-11	1 : 5	± 5%

3. Output Power Adjustment

Load: Critical Load (See section 9-1-4.)
 Equipment: Digital Voltmeter

When the adjustment of RV671 is required, refer to the following table.

OUTPUT SYSTEM	TEST POINT Hot-Cold	SPEC.
SR VH	CN924 1-7	+65 ± 2V
TR VH	CN924 2-8	+65 ± 2V
DR VH	CN924 5-10	+65 ± 2V
CP VH	CN924 6-11	+33 ± 2V

9-1-16. FV-03 (FV-02) Board Operation Check and Adjustment

1. Operation Check

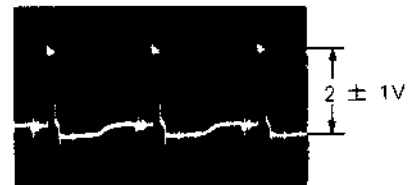
Load: VTR Load (See section 9-1-4.)
 Equipment: Digital Voltmeter
 Oscilloscope
 Mode of VTR: STOP (STANDBY OFF)

TEST POINT

(Hot - Cold)

FV-03 ⑥ - ⑦: FV-03 board power supply voltage
 = 14 ± 0.5 Vdc

FV-03 ⑧ - ⑦: Synchronizing pulse



Q652 COLLECTOR - ⑦: Converter transformer drive waveform

Q653 COLLECTOR - ⑦: Converter transformer drive waveform



2. Output Power Adjustment

When the adjustment of RV651/FV-03 board is required, perform the following steps.

Load: VTR Load (See section 9-1-4.)
 Equipment: Ammeter
 Mode of VTR: STOP (STANDBY OFF)

Step 1.

Connect the Ammeter in series to pin ⑥ on the FV-03 board.

Step 2.

Connect the jumper between CN926 pin-1 and pin-3 to short-circuit the -48V output.

Step 3. Adjustment

$$\text{Current} = 0.2 \pm 0.02A$$

RV651/FV-03

Step 4.

After the adjustment, remove the jumper.

9-1-17. RY101, 102/FV-01 Operation Check

Load: No-Load (See section 9-1-4.)

CN921 8-1 Spec.: 0Ω
 CN921 8-5 Spec.: 0Ω

If outside the specifications, perform section 9-1-18 PA-19 board operation check.

9-1-18. PA-19 (FV-01) Board Operation check and Adjustment

1. Operation Check

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter
 Oscilloscope

Mode of VTR: STOP (STANDBY OFF)

TEST POINT

(Hot — Cold)

- PA-19 ⑤ — ⑫: PA-19 board power supply voltage = 20 ± 3 Vdc
- PA-19 ⑥ — ⑫: Relay (RY101, 102) drive output voltage = 20 ± 3 Vdc
- PA-19 ⑦ — ⑫: PA-19 board voltage detector input = 11 ± 1.5 Vdc
- PA-19 ① — ⑫: P.A. (Power Active) output = 11 ± 1 Vdc
 When the primary voltage falls to 180V or less, the output becomes 0V.
- PA-19 ⑧ — ⑫: Overheat detection input = 20 ± 3 Vdc
 When the overheat sensor (90°C) is operated, the input becomes 0V.
- PA-19 ② — ⑫: 19V detection input = 22 ± 3 Vdc
- PA-19 ⑨ — ⑫: PDS input = 5 ± 0.5 Vdc
 When the PDS is operated, the input becomes 0V.
- PA-19 ⑩ — ⑫: Relay RY101 control output voltage
- PA-19 ⑪ — ⑫: Relay RY102 control output voltage = 5 ± 1 Vdc

2. Adjustment

When the adjustment of RV371/PA-19 board is required, performed the following steps.

Load: VTR Load (See section 9-1-4.)

Equipment: Digital Voltmeter
 Oscilloscope
 Autotransformer

Mode of VTR: STOP (STANDBY OFF)

Step 1.

Set the DC input voltage across CN101 pin-1 and pin-2 on the FV-01 board for +180V with the autotransformer.

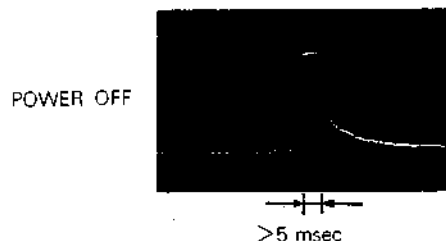
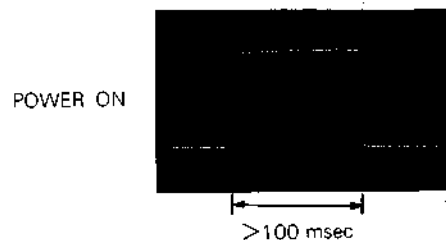
Step 2. Adjustment

Voltage of CN921 8-1 = 0 Vdc

RV371/PA-19

Step 3.

After the adjustment, check the waveform of edge connector 45B on the SV-43 board installed into the card rack.



9-1-19. Power Unit Loaded Output Voltage Check

Disconnect the connector CN921 from the connector panel of the power unit to stop the PDS function, and turn the power on. Set the VTR into the STOP (STANDBY OFF) mode and check that each output voltage is in the range shown below.

Fixed Outputs

OUTPUT SYSTEM	TEST POINT Hot-Cold	OUTPUT VOLTAGE	
		MIN.	MAX.
+ 19 V	PS-14 TP20-C84 ⊖	+ 20 V	+ 25 V
- 19 V	PS-14 TP19-C86 ⊕	- 25 V	- 20 V
+ 6.8V	PS-14 TP15-C3 ⊖	+ 6.9V	+ 8.0V
+ 13.8V	PS-14 TP21-C81 ⊖	+ 13.9V	+ 15.0V
- 13.8V	PS-14 TP22-C76 ⊕	- 15.0V	- 13.9V
- 8.6V	PS-14 TP14-C4 ⊕	- 15 V	- 8 V
+250 V	CN926 10- 8	+225 V	+300 V
-250 V	CN926 6- 8	-300 V	-225 V
- 48 V	CN926 1- 3	- 65 V	- 48 V

Variable Outputs

OUTPUT SYSTEM	TEST POINT Hot-Cold	OUTPUT VOLTAGE	
		MIN.	MAX.
SR VH	CN924 1- 7	+ 18V	+ 30V
TR VH	CN924 2- 8	+ 18V	+ 30V
DR VH	CN924 5-10	+ 18V	+ 30V
CP VH	CN924 6-11	+ 8V	+ 15V

9-1-20. VV-01 Board Control Input Voltage Check

Check that the connectors CN921 to CN929 have been connected to the proper positions on the connector panel of the power unit.

Set the VTR into the STOP (STANDBY OFF) mode and check that the reference input voltage of each variable output system is in the range shown below.

OUTPUT SYSTEM	TEST POINT Hot-Cold	REF. INPUT VOLTAGE
SR VH	CN925 8- 7	+2.5 ±0.5V
TR VH	CN925 6- 5	+2.5 ±0.5V
DR VH	CN925 4- 3	+2.5 ±0.5V
CP VH	CN925 2- 1	+2.5 ±0.5V

9-1-21. VV-01 Board Motor Drive Voltage Check

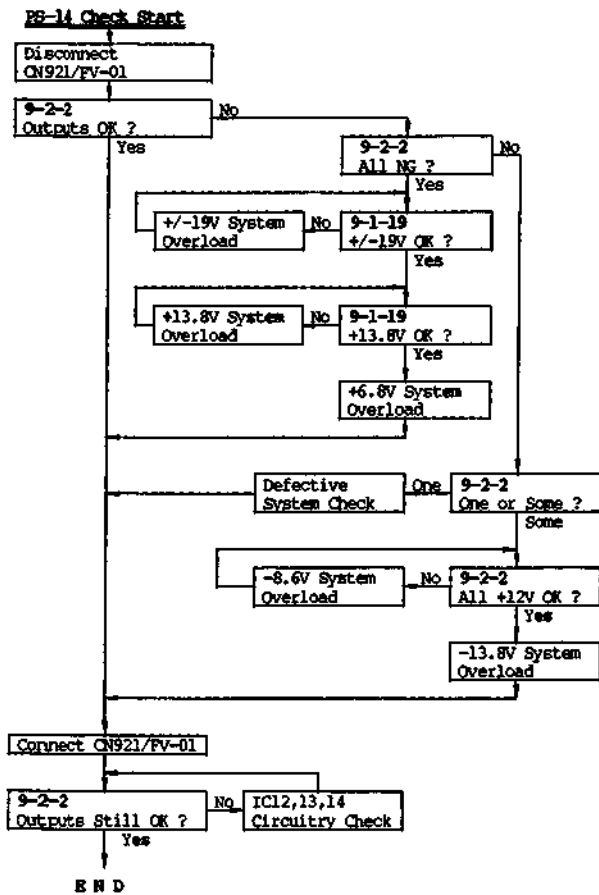
Check that the connectors CN921 to CN929 have been connected to the proper positions on the connector panel of the power unit.

Set the VTR into the STOP (STANDBY OFF) mode and check that the motor drive voltage of each variable output system is in the range shown below.

OUTPUT SYSTEM	TEST POINT Hot-Cold	MOTOR DRIVE VOLTAGE
SR VH	VV-01 TP206 -205	+90 ±4.5V
TR VH	VV-01 TP212 -213	+90 ±4.5V
DR VH	VV-01 TP219 -220	+90 ±4.5V
CP VH	VV-01 TP224 -225	+47 ±2.5V

9-2. PS-14 BOARD (SERIES REGULATOR) OPERATION CHECK

9-2-1. PS-14 Board Operation Check Procedure



9-2-2. PS-14 Board Output Check

Equipment: Digital Voltmeter
Mode of VTR: STOP (STANDBY OFF)

Proceed the check in accordance with the flowchart of section 9-2-1.

PS-14 Board

OUTPUT SYSTEM	TEST POINT Hot - Cold	RATED VOLTAGES
+12V	TP 6 - TP65	+12.0 to 12.2V
+12V	TP 8 - TP65	+12.0 to 12.2V
+12V	TP11 - TP66	+12.0 to 12.2V
+12V	TP12 - TP66	+12.0 to 12.2V
-12V	TP 7 - TP65	-12.2 to 12.0V
-12V	TP 9 - TP66	-12.2 to 12.0V
-12V	TP10 - TP66	-12.2 to 12.0V
-12V	TP13 - TP66	-12.2 to 12.0V
+5V	TP 1 - TP62	+5.0 to 5.2V
+5V	TP 4 - TP63	+5.0 to 5.2V
+5V	TP 5 - TP63	+5.0 to 5.2V
-5V	TP 2 - TP62	-5.2 to 5.0V
-6V	TP 3 - TP62	-6.2 to 6.0V

9-3. PS-14 BOARD (SERIES REGULATOR) ADJUSTMENT

9-3-1. +5V Adjustment

Equipment: Digital Voltmeter
Mode of VTR: STOP

Adjustment

For Mother board with board No. 1-606-708-11 of the BVH-2000.

- MD-14 pin-47 = +5.00 ±0.02 Vdc
 ⊗RV1/PS-14
- SR-15 pin-47 = +5.00 ±0.02 Vdc
 ⊗RV4/PS-14
- PS-14 TP5-TPE3 = +5.00 ±0.02 Vdc
 ⊗RV5/PS-14

For Mother board with board No. other than above of the BVH-2000, BVH-2500 or BVH-2180.

Insert the extender into slot No.9 (CN339) on the card rack.
The voltages can be measured at the TPs on the extender.

- Extender TP47 = +5.00 ±0.02 Vdc
 ⊗RV1/PS-14
- Extender TP8A = +5.00 ±0.02 Vdc
 ⊗RV4/PS-14
- Extender TP8B = +5.00 ±0.02 Vdc
 ⊗RV5/PS-14

9-3-2. +12V Adjustment

Equipment: Digital Voltmeter
Mode of VTR: STOP

Adjustment

For Mother board with board No. 1-606-708-11 of the BVH-2000.

- MD-14 pin-3 = +12.00 ±0.02 Vdc
 ⊗RV6/PS-14
- SR-15 pin-3 = +12.00 ±0.02 Vdc
 ⊗RV8/PS-14
- AU-27 pin-3 = +12.00 ±0.02 Vdc
 ⊗RV11/PS-14
- PS-14 TP12-TPE4 = +12.00 ±0.02 Vdc
 ⊗RV12/PS-14

For Mother board with board No. other than above of the BVH-2000, BVH-2500 or BVH-2180.

Insert the extender into slot No. 9 (CN339) on the card rack.
The voltages can be measured at the TPs on the extender.

- Extender TP3 = +12.00 ±0.02 Vdc
 ⊗RV6/PS-14
- Extender TP7A = +12.00 ±0.02 Vdc
 ⊗RV8/PS-14
- Extender TP9B = +12.00 ±0.02 Vdc
 ⊗RV11/PS-14
- Extender TP5A = +12.00 ±0.02 Vdc
 ⊗RV12/PS-14

9-3-3. -5V Adjustment

Equipment: Digital Voltmeter
Mode of VTR: STOP

Adjustment

For Mother board with board No. 1-606-708-11 of the BVH-2000.

$$\text{AD pin-46} = -5.00 \pm 0.02 \text{ Vdc}$$

⊗RV2/PS-14

For Mother board with board No. other than above of the BVH-2000, BVH-2500 or BVH-2180.

Insert the extender into slot No. 9 (CN339) on the card rack.
The voltages can be measured at the TPs on the extender.

$$\text{Extender TP46} = -5.00 \pm 0.02 \text{ Vdc}$$

⊗RV2/PS-14

9-3-4. -6V Adjustment

Equipment: Digital Voltmeter
Mode of VTR: STOP

Adjustment

For Mother board with board No. 1-606-708-11 of the BVH-2000.

$$\text{AD pin-40} = -6.00 \pm 0.02 \text{ Vdc}$$

⊗RV3/PS-14

For Mother board with board No. other than above of the BVH-2000, BVH-2500 or BVH-2180.

Insert the extender into slot No. 9 (CN339) on the card rack.
The voltages can be measured at the TPs on the extender.

$$\text{Extender TP11B} = -6.00 \pm 0.02 \text{ Vdc}$$

⊗RV3/PS-14

9-3-5. -12V Adjustment

Equipment: Digital Voltmeter
Mode of VTR: STOP

Adjustment

For Mother board with board No. 1-606-708-11 of the BVH-2000.

$$\text{MD-14 pin-4} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV7/PS-14

$$\text{SR-15 pin-4} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV9/PS-14

$$\text{AU-27 pin-4} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV10/PS-14

$$\text{PS-14 TP13-TPE4} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV13/PS-14

For Mother board with board No. other than above of the BVH-2000, BVH-2500 or BVH-2180.

Insert the extender into slot No. 9 (CN339) on the card rack.
The voltages can be measured at the TPs on the extender.

$$\text{Extender TP4} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV7/PS-14

$$\text{Extender TP6B} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV9/PS-14

$$\text{Extender TP10B} = -12.00 \pm 0.02 \text{ Vdc}$$

⊗RV10/PS-14

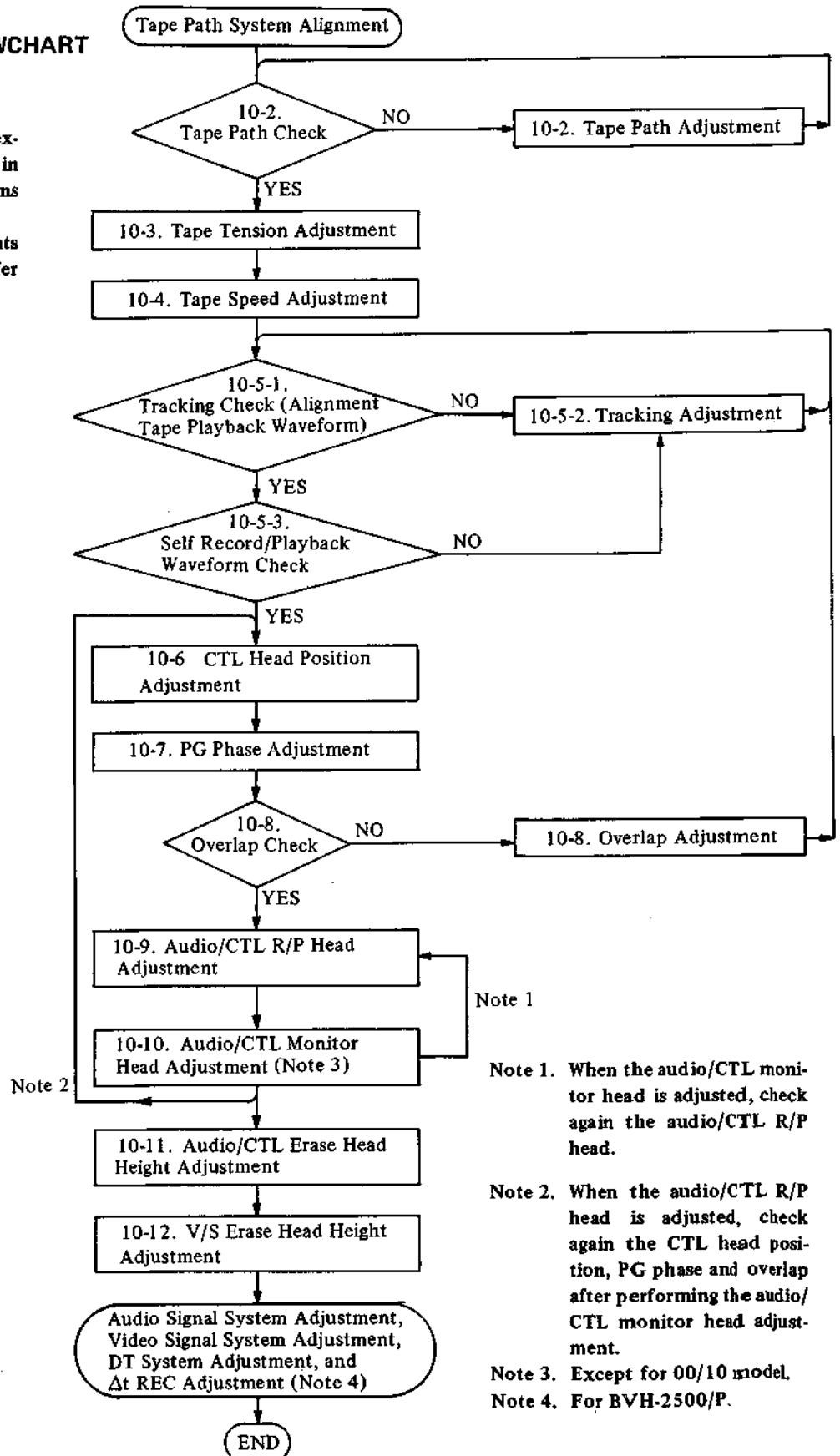
$$\text{Extender TP5B} = -12.00 \pm 0.02 \text{ Vdc}$$

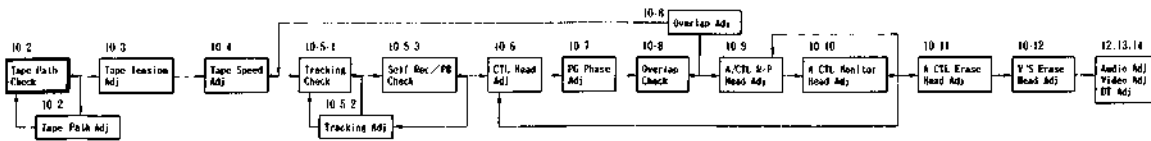
⊗RV13/PS-14

SECTION 10 TAPE PATH SYSTEM ALIGNMENT

10-1. ADJUSTMENT FLOWCHART

Note:
The following flowchart and explanation are provided for use in finding the cause of malfunctions and troubleshooting.
When performing the adjustments after replacing the parts, refer to Section 3-24.





10-2. TAPE PATH CHECK & ADJUSTMENT

It is required that the tape does not touch the reel flange strongly and there is no tape curl near each guide nor abnormal tape running in REC, F·FWD, REV x 1 PROGRAMED JOG and REW modes.

Tape Path Check

1. Place a reel whose flanges have little shake on the reel table and the tape must be free from scratches and wrinkles on both edges.
 - ① Supply reel:
Tape touches the reel flange little.
 - ② Guide roller 1:
Tape curls little, though the upper edge of the tape touches the guide flange.
 - ③ Guide roller 2:
Tape curls little, though the lower edge of the tape touches the guide flange.
 - ④ Taper guide:
Tape does not curl.
 - ⑤ Entrance and Exit Slant Guides:
Tape does not curl along the guide flange.

- ⑥ Guide post 3:
Tape does not curl.
 - ⑦ Guide post 1:
Tape does not curl, though the lower edge of the tape touches the guide flange.
 - ⑧ Timer roller:
Tape curls little, though the upper edge of the tape touches the flange.
 - ⑨ T-tension arm
Tape curls little, though the lower edge of the tape touches the flange.
 - ⑩ Take-up reel:
Tape touches the reel flange little.
3. If the tape does not run in accordance with the above items, adjust the height of the reel tables or guides.
 4. Check Step 2 in the order of the F.FWD, REV x 1 SHUTTLE and REW mode. If necessary, adjust the height of the reel tables or guides.

Note: If the height of the tape path on the timer roller varies in the REC, F.FWD or REW mode, adjust the slant of the timer roller so that the tape runs at the same height in the REC mode.

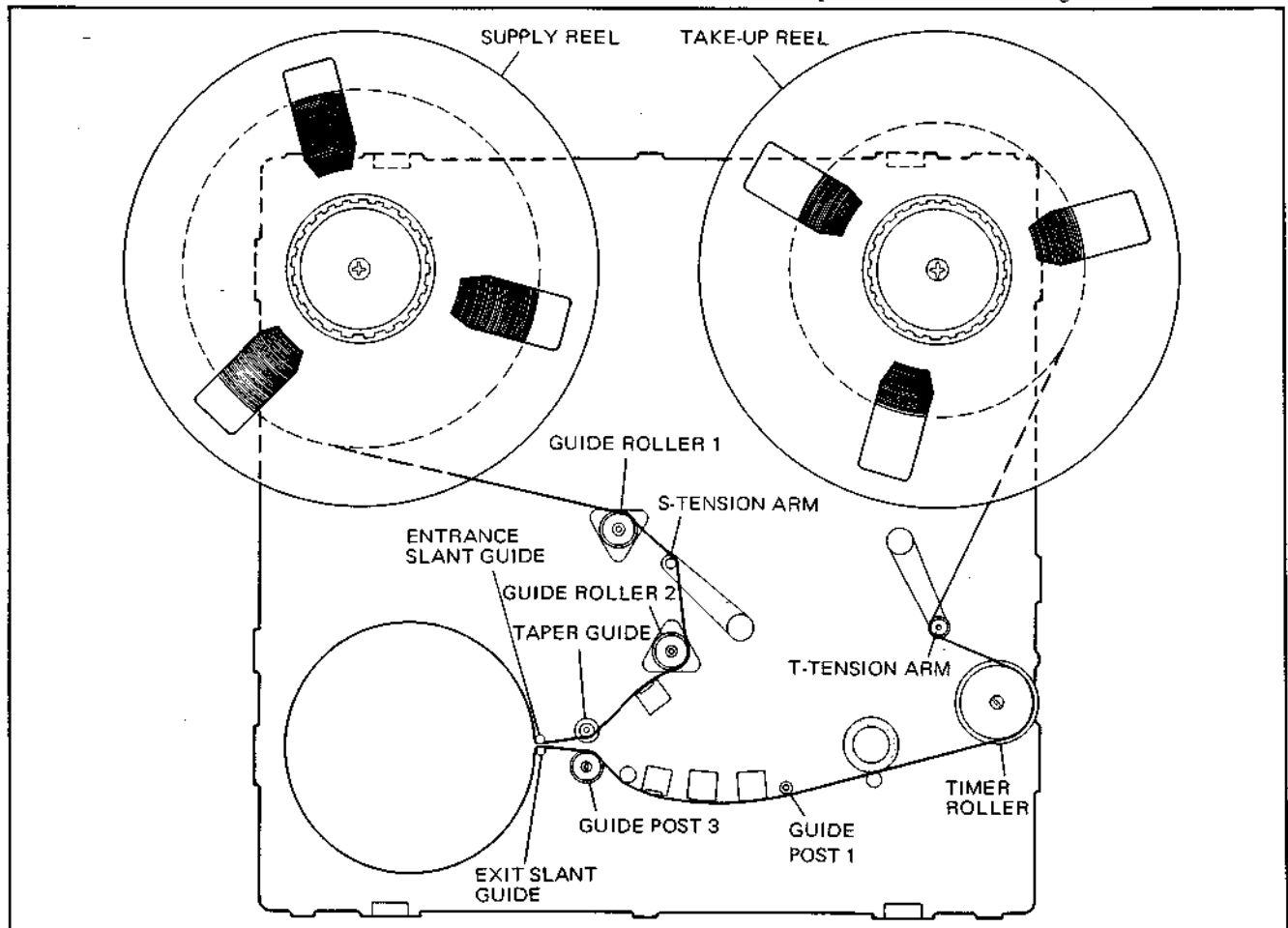
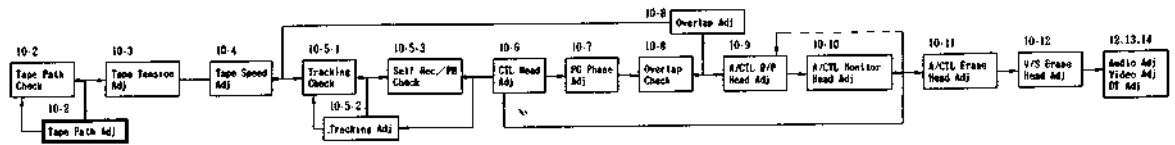


Fig. 10-1. Tape Path Check



Guide Height Adjustment

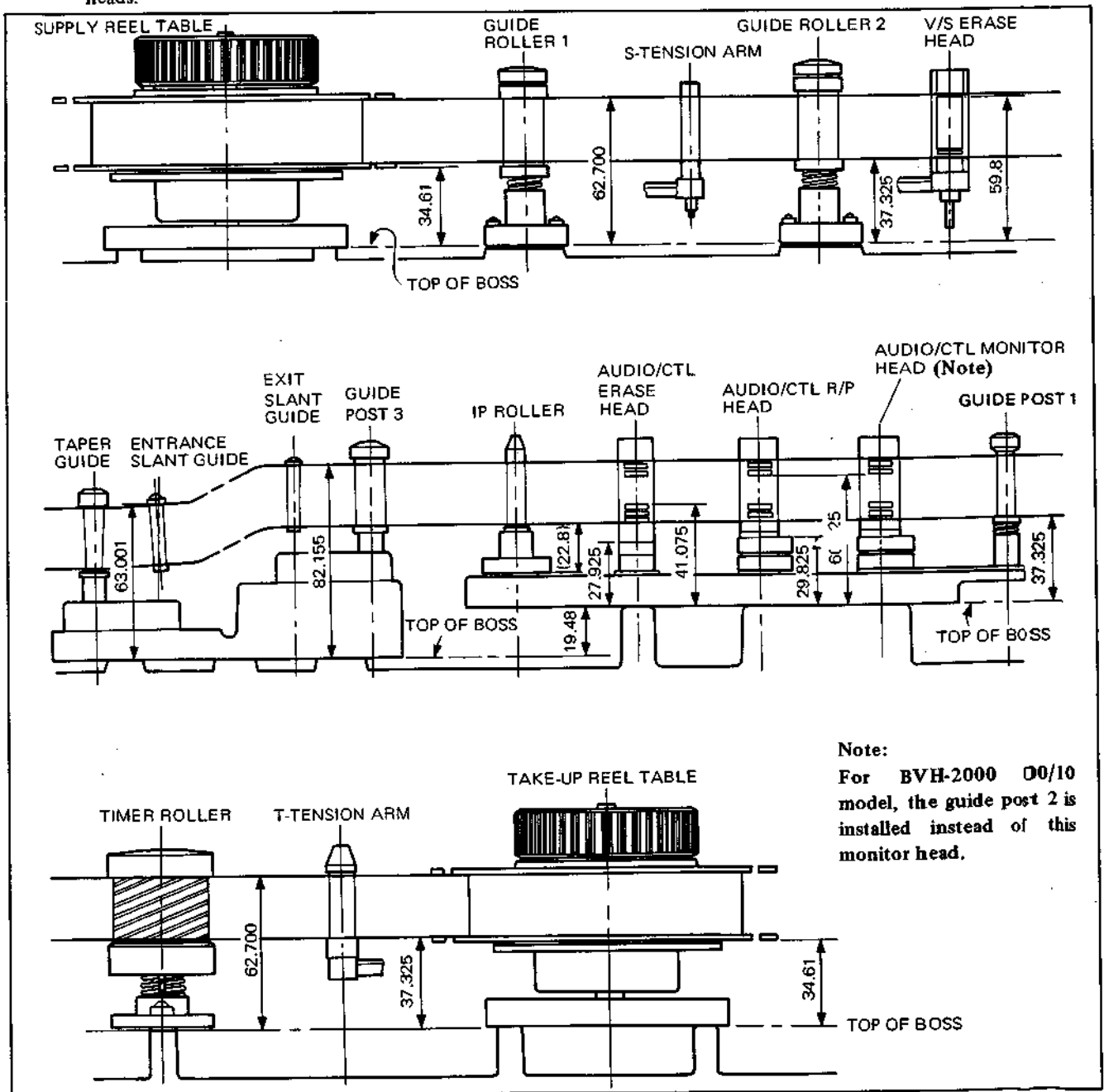
The height of the guides is shown in Fig. 10-2.

When the part is replaced or when the height of the guide has been changed excessively, mount it after adjusting the height of the guides to the value shown below.

Note 1: Do not adjust the guides, especially guide roller 2, taper guide, entrance slant guide, exit slant guide, guide post 3 and guide post 1 unless absolutely necessary. When these guides have been adjusted, check the tracking and the height of the stationary heads.

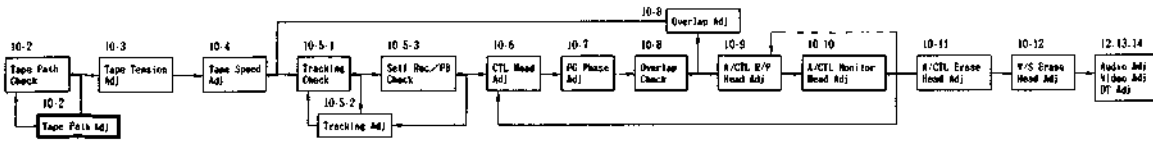
Note 2: The entrance and exit slant guide should not be adjusted in this section.

Note 3: For the V/S erase head, audio/CTL erase head, audio/CTL R/P head and audio/CTL monitor head, the adjustment is not required in this section.



Note:
For BVH-2000 00/10 model, the guide post 2 is installed instead of this monitor head.

Fig. 10-2. Guide Height



Supply and Take-up Reel Table Height Adjustment

1. Remove the cover and reel washer.
 2. Loosen setscrews A and B.
 3. While pushing the reel table lightly in the direction of the arrow, adjust the height of the reel table by turning setscrew C.
- Note: Adjust the height of the reel table so that the tape runs without touching the reel flange.
4. Tighten setscrews A and B and mount the reel washer and cover.

- Note: If the tape still touches the reel flange excessively when this adjustment has been performed, check the following.
- ① The reel flanges have been deformed.
 - ② The reel sheet has been deformed or a foreign substance is attached to the reel sheet.
 - ③ A bearing noise is generated from the reel motor. (When replacing the motor, refer to Section 3-9.)

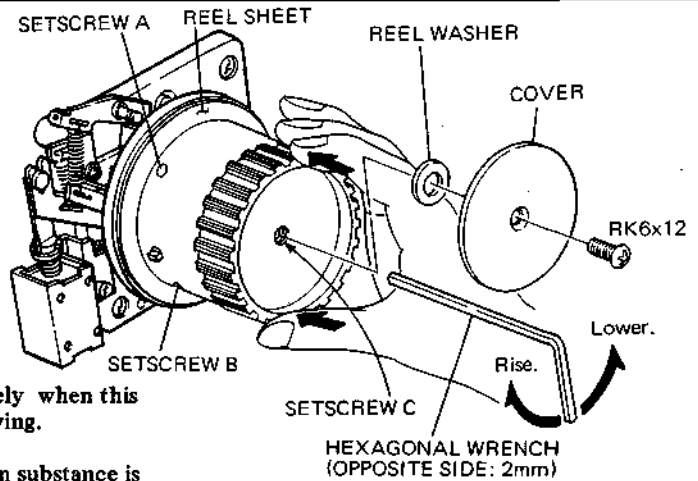


Fig. 10-3-1.

Guide Roller 1 & 2 Height Adjustment

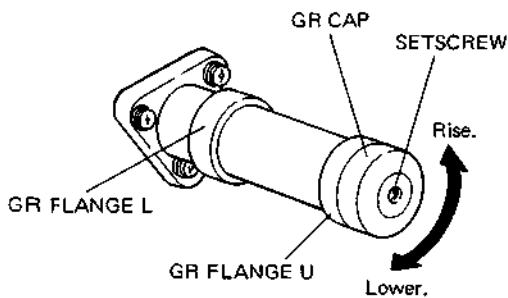


Fig. 10-3-2.

Caution: Do not adjust guide roller 1 & 2 unless absolutely necessary. If the curl remains by any means, finely adjust guide roller 1.

1. Loosen the setscrew.
2. Adjust the height of the guide roller by turning GR cap as follows.
 - ① Adjust guide roller 1 so that the tape touches GR flange U lightly without curl.
 - ② Adjust guide roller 2 so that the tape touches GR flange L lightly without curl.
3. Tighten the setscrew.

Note: If the curl still remains when the height adjustment has been performed, rotate the mounting position of the guide roller. If the curl remains by any means and the noise caused by the wear of bearing is heard, replace the defective part or assembly.

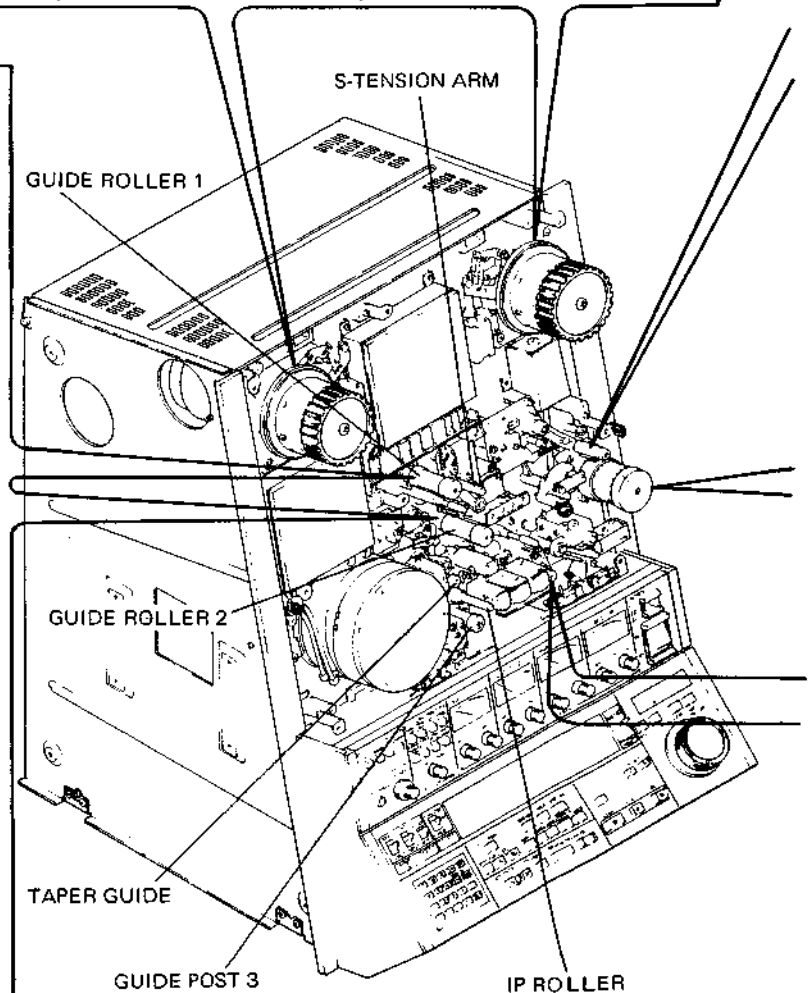


Fig. 10-3-3.

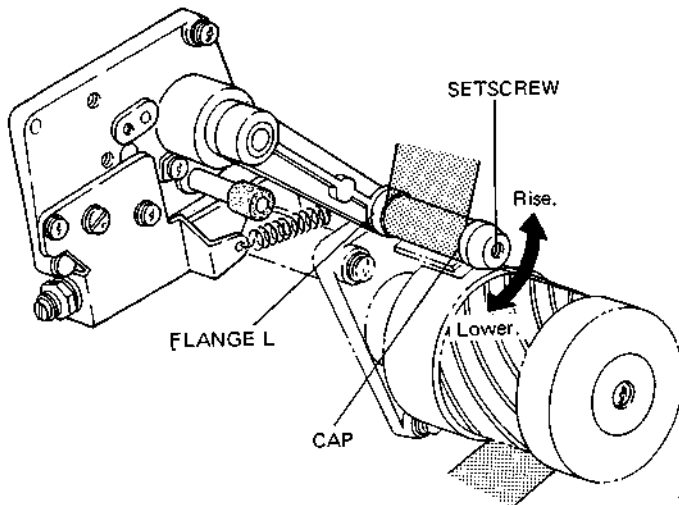
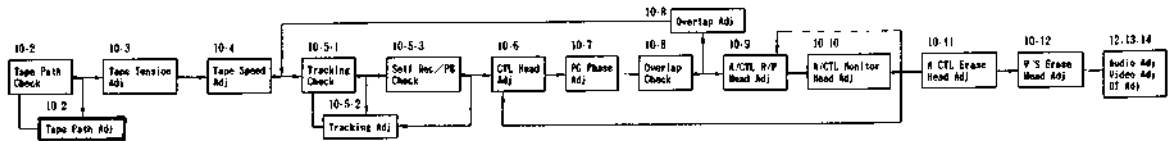


Fig. 10-3-4.

Note: When replacing the T-tension arm assembly, refer to Section 3-13.

T-Tension Arm Height Adjustment

1. Loosen the setscrew.
2. Set the machine in the REC mode. While checking that the tape does not curl along the timer roller, adjust the height of T-tension arm by turning the cap so that the tape touches flange L.
3. Set the machine in the REV x 1 SHUTTLE mode. Adjust again that there is no tape curl along the timer roller and the curl becomes as small as possible along T-tension arm.
4. When the mode is changed from F.FWD to REV x 1 SHUTTLE, check that the curl does not change along the timer roller and T-tension arm. If changed, perform Step 2 through 4 again.
5. Tighten the setscrew.

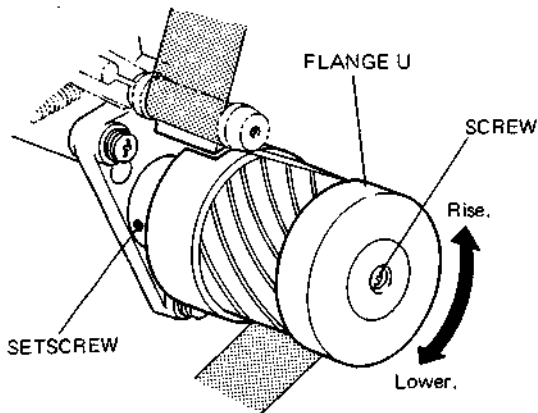


Fig. 10-3-5.

Timer Roller Height Adjustment

Note: The height of the timer roller and T-tension arm influences each other.

If necessary, adjust the height of T-tension arm also.

1. Check that the screw of flange U is tightened.
2. Loosen the setscrew.
3. Set the machine in the REC mode. Adjust the height of the timer roller by turning the flange U so that the tape touches flange U lightly without curl.
4. Tighten the setscrew and check that the screw of flange U is tightened.

Note 1: When replacing the timer roller, perform the replacement referring to pages D-21 to D-22 in section D of manual VOL.3 (for NTSC, PM) or VOL.4 (for PS). After replacement, perform the adjustment of this item, and then perform the servo adjustment in section 11-1.

Note 2: When replacing only the roller section, perform the replacement in according to section 3-23-1.

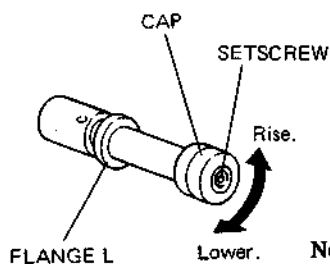


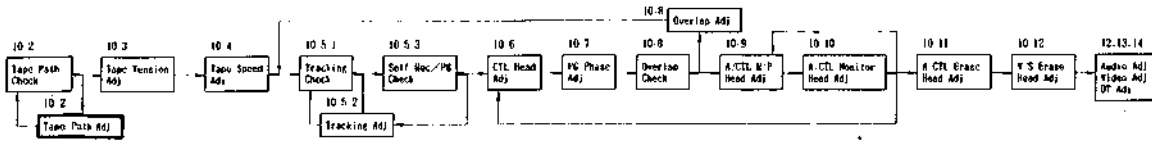
Fig. 10-3-6.

Guide Post 1 Height Adjustment

1. Loosen the setscrew.
2. Set the machine in the REC mode. Adjust the height of the guide by turning the cap so that the tape touches flange L lightly without curl.
3. Tighten the setscrew.

Note: Do not adjust the guide post 1 unless absolutely necessary.

Note: When replacing the components of this guide, refer to Section 6-5.



Taper Guide Height Adjustment

Note : In this section, the height will need not to be adjusted especially unless no tape curls along the guide flange.

1. Loosen the set screw on the top of the taper guide.
2. Turn the cap of the taper guide so that the tape does not curl in REC mode.
3. Fix the cap by tightening the set screw loosened in step 1 with a torque of 7 to 8 kg-cm.

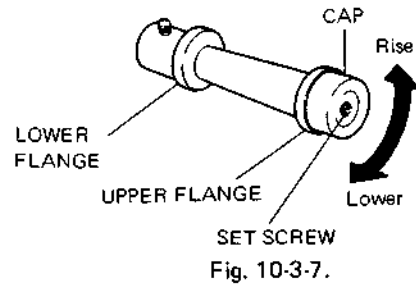


Fig. 10-3-7.

Guide Post 3 Height Adjustment

Note : In this section, the height will need not to be adjusted especially unless no tape curls along the guide flange.

1. Loosen the set screw driven in the upper flange.
2. Turn the height adjustment screw on the top of the upper flange so that the tape does not curl in REC mode.
3. While facing the set screw fastening the upper flange downward, tighten it securely.

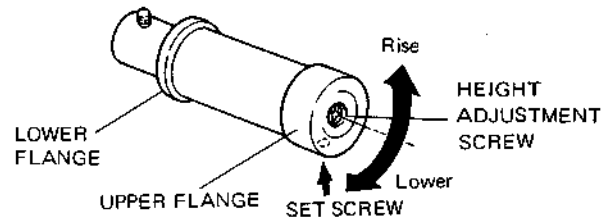


Fig. 10-3-8.

Timer Roller Slant Adjustment

If the height of the tape path along the timer roller varies in each of the REC, F.FWD or REW mode, this adjustment must be performed.

1. Prepare the spacers.

Thickness (mm)	Part No.
0.02	3-651-334-01
0.05	3-651-334-11
0.1	3-651-334-21
2. Insert the spacer into the position shown in Fig. 10-4 so that the height of the tape path in the F.FWD or REW mode is the same as that in the REC mode.

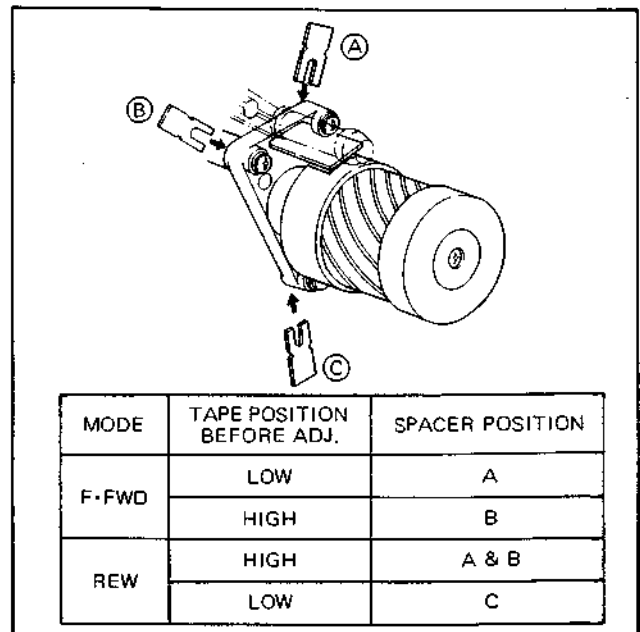
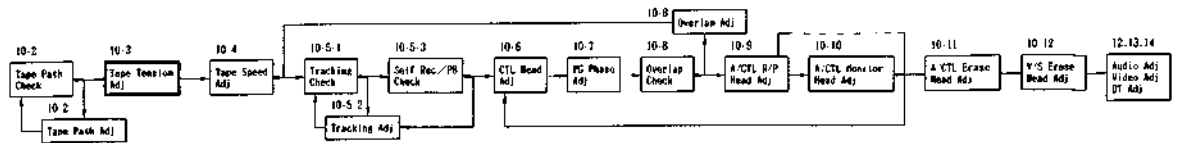


Fig. 10-4. Timer Roller Slant Adjustment

10. TAPE PATH SYSTEM ALIGNMENT



10-3. TAPE TENSION ADJUSTMENT

10-3-1. S Side Tape Tension Adjustment

Preliminary Information

- A. This is the tape tension (FWD back tension) adjustment in the REC mode.
- B. Prepare the tension adjustment tool.
Part No. J-6043-120-A
- C. If the specific tape tension is not obtained when the following adjustment has been performed and when it is supposed that the cause is the malfunction of the potentiometer built in the S-tension arm assembly, replace the S-tension arm assembly, referring to section 3-12. The whole assembly should be replaced even if any component of the assembly is worn out or damaged except the guide shaft. If the guide shaft is worn out, replace it referring to section 6-5 or shift the worn surface of the shaft.

Check and Adjustment

1. Put the S arm adjustment weight on the guide shaft of the S-tension arm. Lift the arm by hand and then take the hand off slowly so that the arm vibrates freely. Wait until the arm stops naturally.
2. Connect the oscilloscope to TP12 on RL-12 board. And turn on the power of VTR.
3. Check that the voltage at TP12 is $0V \pm 0.03V$. If necessary, adjust RV12 on RL-12 board.
4. Remove the weight from the S-tension arm and check that the voltage at TP12 is $-2.6 \pm 0.15V$. If necessary, adjust RV1 on TT-01 board.
5. Put the adjustment weight again, and vibrate the arm freely and wait until the arm stops naturally. After the arm was stopped, confirm that the voltage at TP12 is 0 ± 0.03 volt. If not, adjust RV12 again, and then perform step 4. And if RV1 has been adjusted in step 4, perform this step 5 again. Repeat steps 1, 3 and 4 until both the voltage at the time when loading and unloading the weight meet the specifications without any adjustment.

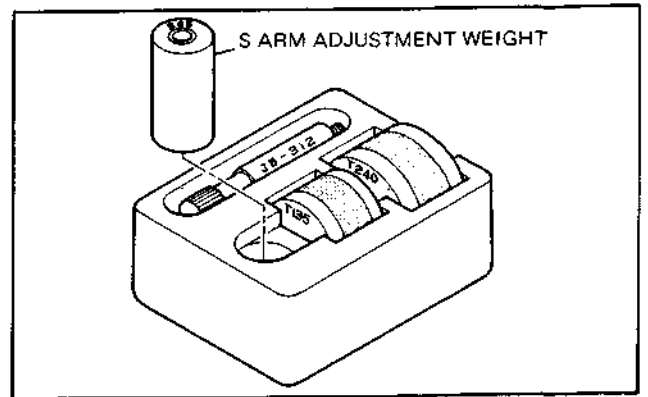


Fig. 10-5. Tension Adjustment Tool

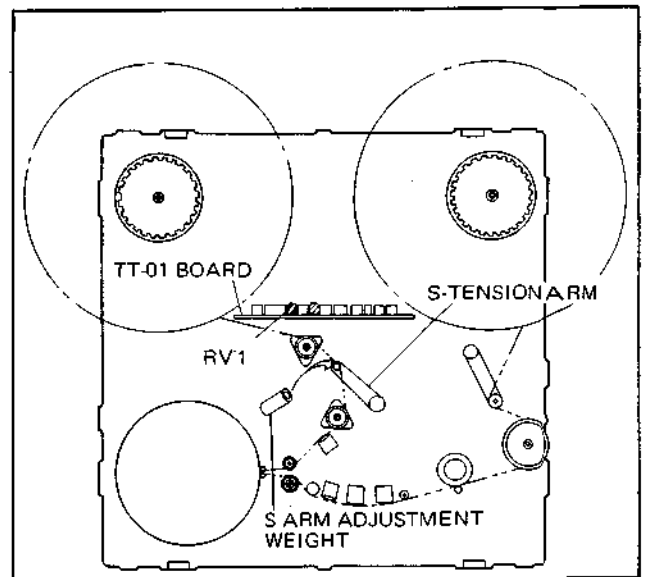


Fig. 10-6. Tape Tension Adjustment

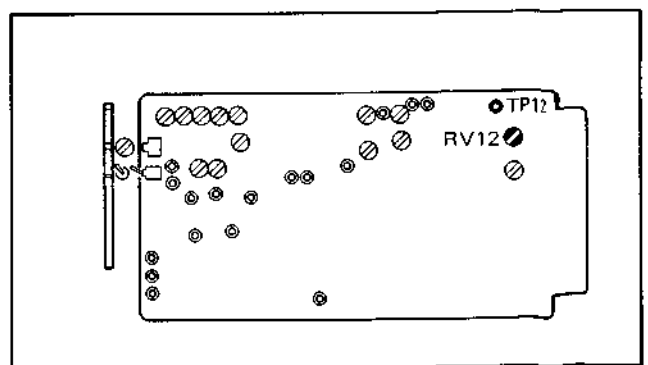
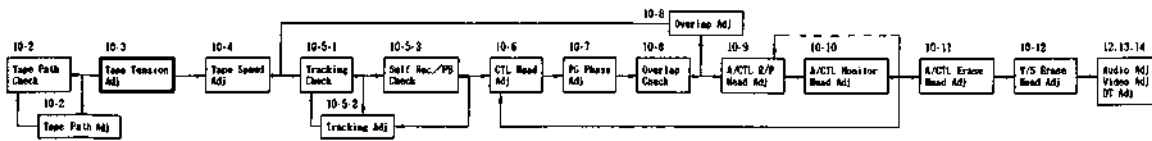


Fig. 10-7. RL-12 Board



10-3-2. T Side Tape Tension Adjustment

Preliminary Information

- A. The tape tension around the rotary heads in the record and playback mode is decided by S-reel motor, S-tension arm and capstan motor and it has no relation to the T-tension arm.
- B. The T-tension arm mainly operates as the sensor which controls the T-reel motor.
If the adjustment is not correctly performed, the tape may be wound up in disorder.
- C. If the specific tape tension is not obtained when the following adjustment has been performed and when it is supposed that the cause is the malfunction of the potentiometer built in the T-tension arm assembly, replace the whole T-tension arm assembly, referring to Section 3-13.

Check and Adjustment

1. Install the T-tension post (the part of the prepared adjustment tool) in the position shown in the right of Fig. 10-8. Apply the weight marked T135 as shown in the figure.
2. Connect the digital voltmeter to TP13 on the RL-12 board, and turn on the power of VTR.
3. Confirm that the indication of the digital voltmeter is $0V \pm 0.03V$. If necessary, adjust RV13 on the RL-12 board.
4. Replace the weight with the one marked T240.
5. Confirm that the indication of the digital voltmeter is $1.4V \pm 0.15V$. If necessary, adjust RV2 on the TT-01 board.
6. Replace the weight by T135 weight and perform the confirmation in step 3. Repeat steps 3 to 6 until both the specifications are satisfied without any adjustment.
7. Remove the weight and the T-tension post.

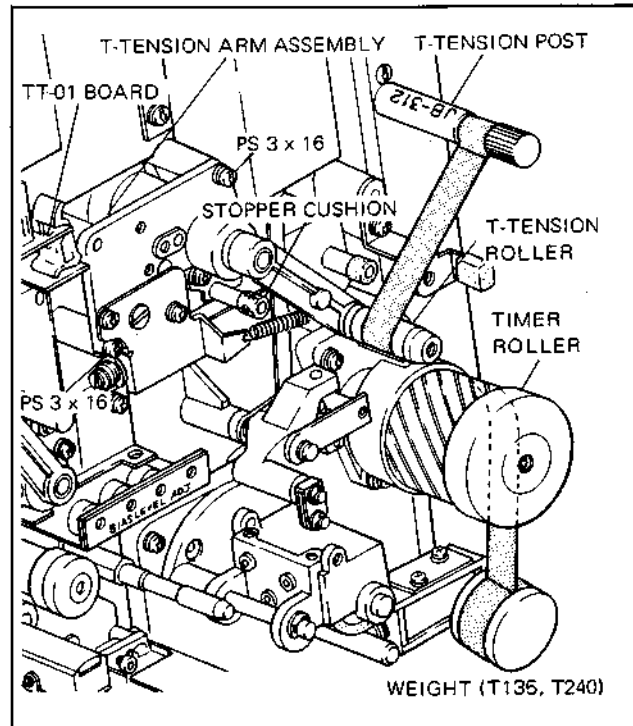


Fig. 10-8. T-Tension Arm Replacement

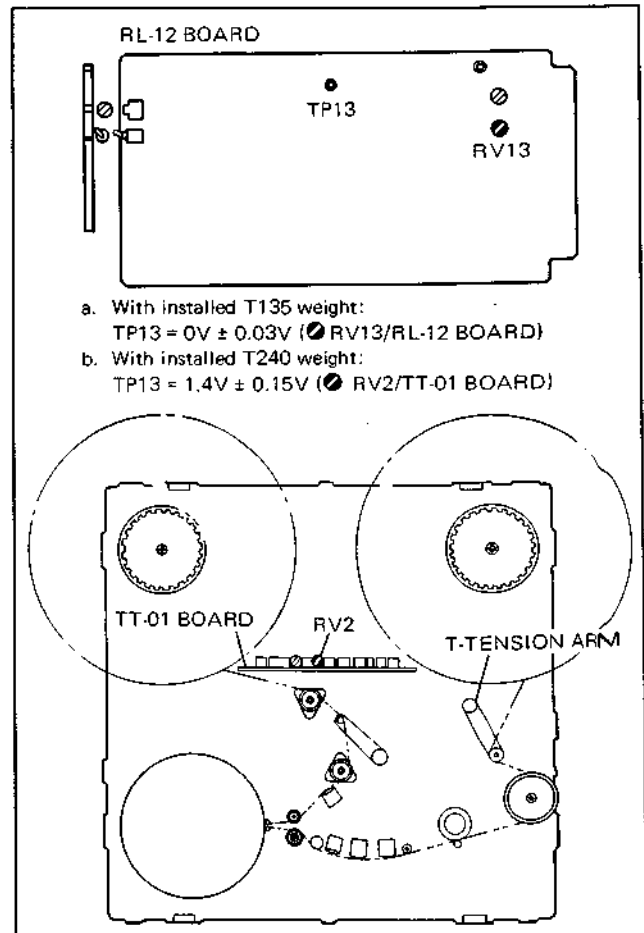
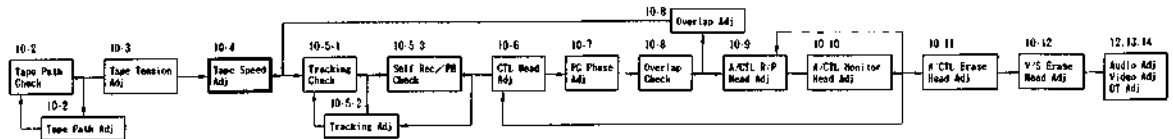


Fig. 10-9. Tension Adjustment



10.4. TAPE SPEED ADJUSTMENT

Preliminary Information

- A. This is the tape speed adjustment in the REC mode.
- B. This adjustment is required when RV9 on the CD-17 board has been adjusted by mistake, RV9 or the capstan motor has been replaced.
- C. This adjustment is to set the FG pulse of the capstan motor to the specified frequency.

Note: There is another way of performing the tape speed adjustment by playing back the alignment tape in the test mode B, but this adjustment should not be used because the alignment tape may be transformed with use.

- D. The rotating speed of the capstan could be adjusted by setting the FG pulse to the specified frequency but the tape speed is also in proportion to the diameter of the capstan. If the capstan is worn out extremely, it happens that the tape speed may not be correctly adjusted.
- E. When the servo is not locked in the PLAY mode even if this adjustment has been performed, check the pinch roller pressure using sequence established in steps 10 to 14 in Section 3-17, then perform Section 11 Servo System Alignment.
- F. For the replacement of the capstan motor, refer to Section 3-17.

Check and Adjustment

1. Connect the frequency counter to TP6.
2. Thread a tape and record a video signal.
3. While recording, check that the counter reads:
 - 839.4 Hz \pm 0.3 Hz; for NTSC/PAL-M
 - 825.0 Hz \pm 0.3 Hz; for PAL/SECAM
 If necessary, adjust RV9 on the CD-17 board.

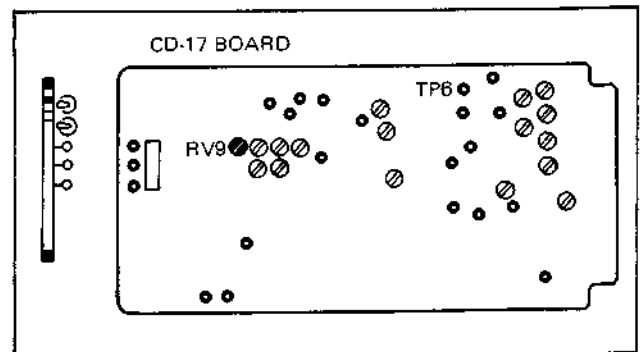
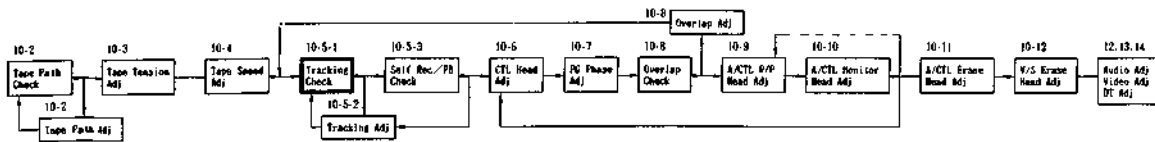


Fig. 10-10. Tape Speed Adjustment



10-5. TRACKING ADJUSTMENT

10-5-1. Tracking Check (Alignment Tape Playback Waveform Check)

Note 1: If the upper drum has been replaced, run a tape in the PLAY or REC mode for about 20 minutes to break in the new upper drum before performing the tracking check.

Note 2: For the machines of 10, 12 and 14 models, the sync head are not installed.

1. Set the HEAD selector to R/P and set the ADV switch on the CD-17 board to OFF.
2. Connect CH-1 of the oscilloscope to TP1 on EQ-02 board and connect CH-2 to TP2.

(In case of 10, 12 or 14 model, only TP1 is checked.)

3. Play back an alignment tape.
4. Check that the tape touches the upper flange of the taper guide lightly and the tape does not curl along the flange.
If not, perform the adjustment procedures.

5. Check that the tape touches the lower flange of guide post 3 lightly and the tape does not curl along the flange. If not, perform the adjustment procedures.
6. Play back the WHITE segment of the alignment tape and maximize the RF amplitude by turning TRACKING knob.
7. Check that the VIDEO and SYNC RF waveform show the specified value in Fig. 10-11-1.
8. Push TRACKING knob and check that the RF waveform does not vary. If the waveform varies, the CTL head position adjustment is required.

9. By performing the following two steps, check the gap between the upper drum and the guide post where is 1 mm apart from the guide flange as shown in Fig. 10-11-2.

- ① 0.08-mm-gauge can be passed.
- ② 0.10-mm-gauge cannot be passed.

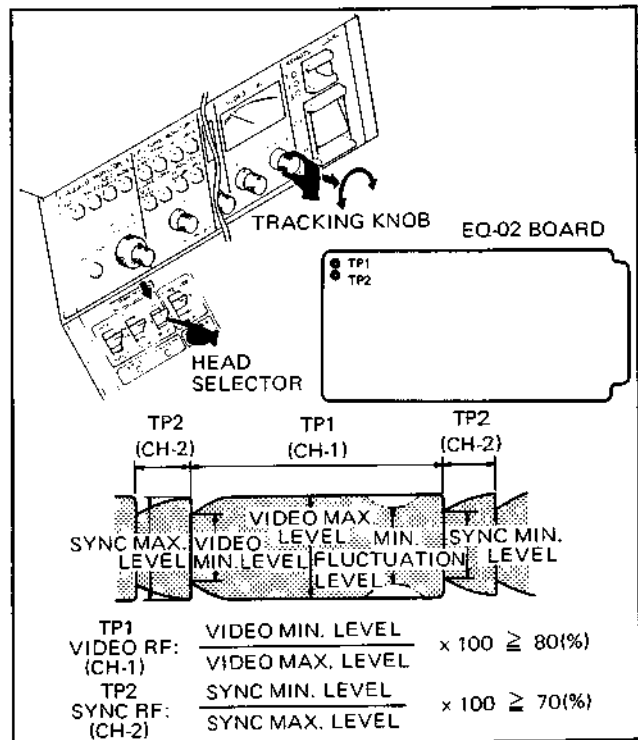


Fig. 10-11-1. Alignment Tape Playback Check

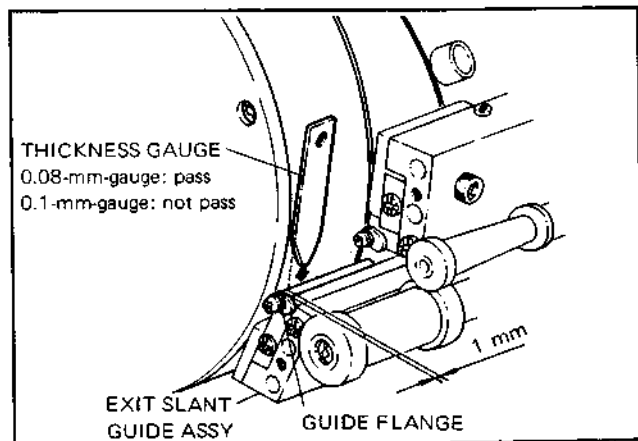
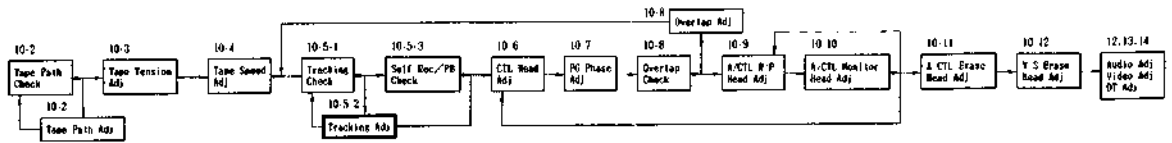


Fig. 10-11-2. Checking Gap near to Exit Slant Guide Assy



10-5-2. Tracking adjustment

Preliminary Information

A. This adjustment is to make the heads trace the record pattern of the alignment tape correctly and to make the heads come into contact with the tape properly so that the tape interchangeability is maintained.

B. Adjustment points

- ① The height or slant of the taper guide, slant guides (entrance and exit) and guide post 3 must be adjusted.
- ② The RF waveform of the tape entrance side must be adjusted first, and then that of the tape exit side must be adjusted.
- ③ Each height of the taper guide and entrance slant guide should be adjusted alternately while checking the RF waveform.
- ④ Before turning the slant guide adjustment screw, push the tape lightly and check the direction in which the slant guide must be moved.
- ⑤ For the relation between the turning direction of the adjustment screw and moving direction of the slant guide, see Fig. 10-13.
- ⑥ Make as much of the tracking adjustment as possible by adjusting the slant of the slant guide. Be careful that the guide flange does not press the tape excessively when turning the height adjustment screw.
- ⑦ Each height of the guide post 3 and exit slant guide should be adjusted while checking the RF waveform.

C. To adjust the height and slant, use phillips screwdriver for M2.6.

D. If the tracking cannot be adjusted correctly owing to the wear of the entrance slant guide, exit slant guide or the tape guide section of the head drum assembly, replace the part in accordance with the following section.

Head drum assembly: Section 3-6

Entrance slant guides assembly: Section 3-8

Exit slant guide assembly: Section 3-8

Components of the slant guide assembly: Section 6-6

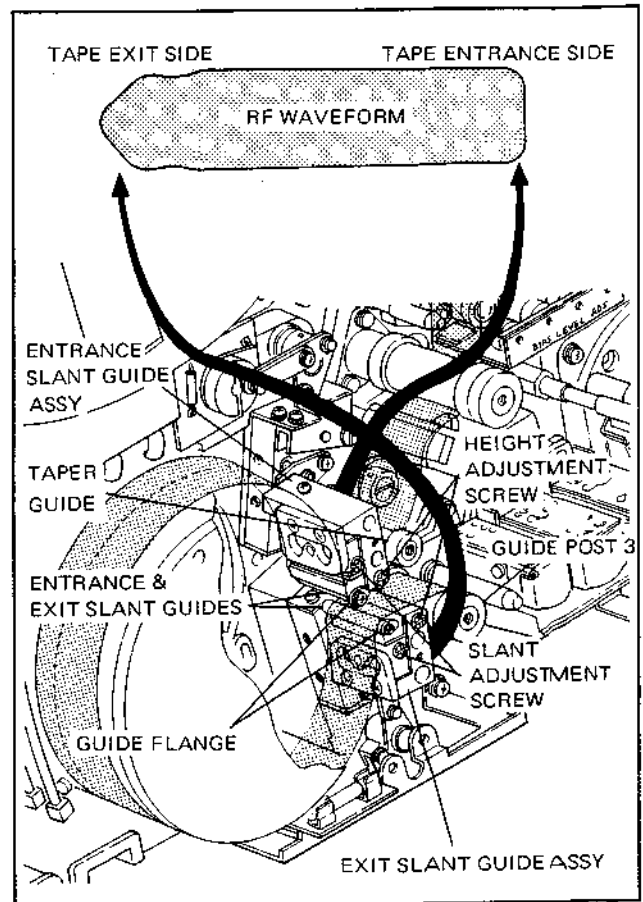


Fig. 10-12. Tracking Adjustment

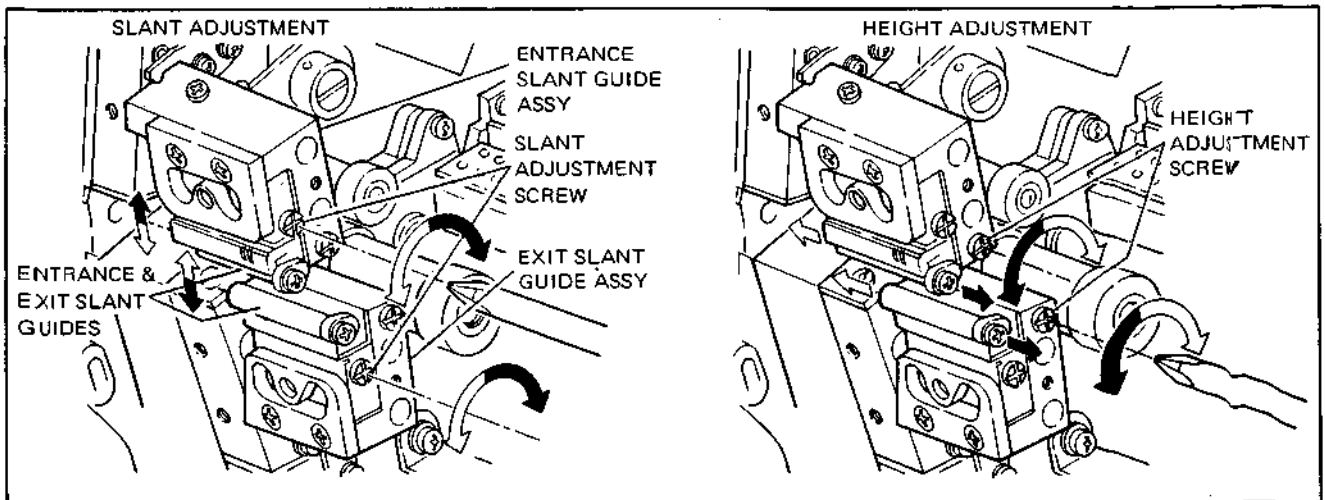
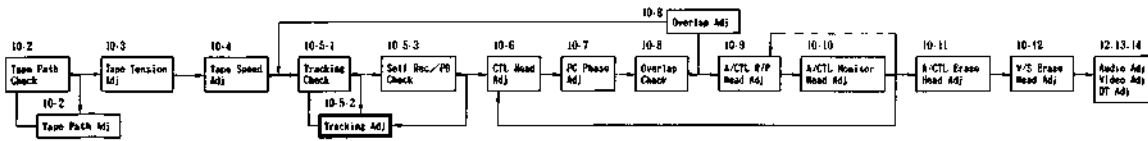


Fig. 10-13. Movement of Adjustment Screws and Slant Guides



Preparation before Adjustment

1. Check that HEAD selector is set to R/P and ADV switch on CD-17 board is set to off. Connect the oscilloscope CH-1 to TP1 on EQ-02 board and connect CH-2 to TP-2.
2. Play back the WHITE segment of the alignment tape.
3. Adjust by turning the TRACKING knob so that the RF amplitude is 3/4 of its maximum.

Height Adjustment of Taper Guide

4. Loosen the set screw on the top of the taper guide, and then turn the cap so that the tape is positioned in the middle of the guide.
5. Loosen the locking screw of the entrance slant guide assembly 1/8 to 1/4 turn.
6. Turn the height adjustment screw of the entrance slant guide about 90 degrees counterclockwise, and confirm that the RF amplitude at the tape entrance side decreases 10 to 20 percent. If not, adjust the slant of the slant guide as follows.
 - a By pushing **U** or **L** point of the running tape lightly as shown in Fig. 10-14-2, find out the side whose RF waveform is similar to (a) of Fig. 10-14-1.
 - b If the waveform is similar to (a) of Fig. 10-14-1 by pushing **L**, turn the slant adjustment screw counterclockwise. If the waveform is similar to (a), by pushing **U**, turn the screw clockwise.
7. Turn the cap of the taper guide clockwise slowly so that the RF waveform is as flat as possible. See (b) of Fig. 10-14-1.
8. Fix the cap by tightening the set screw on the top of the cap with a torque of 7 to 8 kg-cm.
9. Confirm that the tape touches the upper flange of the taper guide but the tape does not curl along the flange.
10. Proceed to step 14 (height adjustment of entrance slant guide).

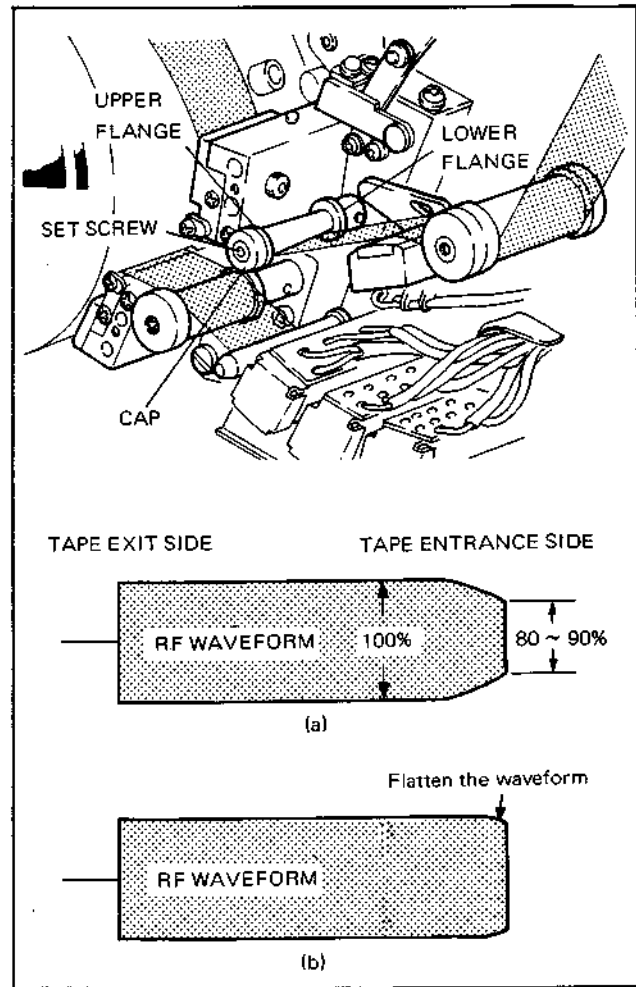
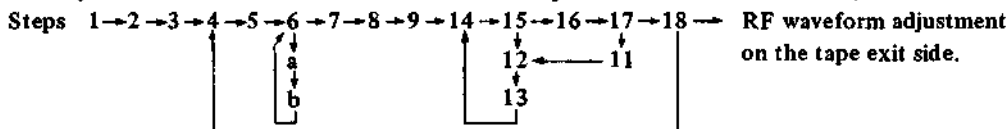
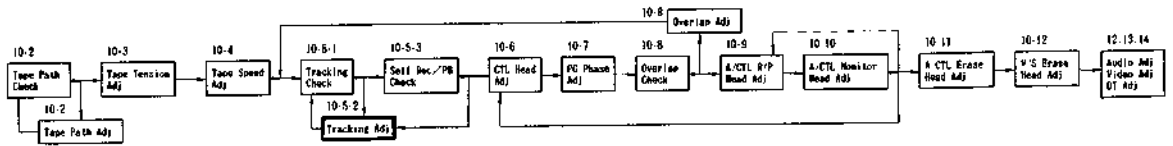


Fig. 10-14-1. Height Adjustment of Taper Guide

Note: The adjustment order of the RF waveform on the tape entrance side is as follows;





Slant Adjustment of Entrance Slant Guide

11. Loosen the locking screw of the entrance slant guide assembly 1/8 to 1/4 turn.
12. Lightly push **U** or **L** side of the tape shown in Fig. 10-14-2 and find out the side whose RF waveform on the tape entrance side becomes flat.
13. If the RF waveform flattens when the **L** side of the tape is pushed, turn the slant adjustment screw counterclockwise and if the waveform flattens when the **U** side of the tape is pushed, turn the adjustment screw clockwise.

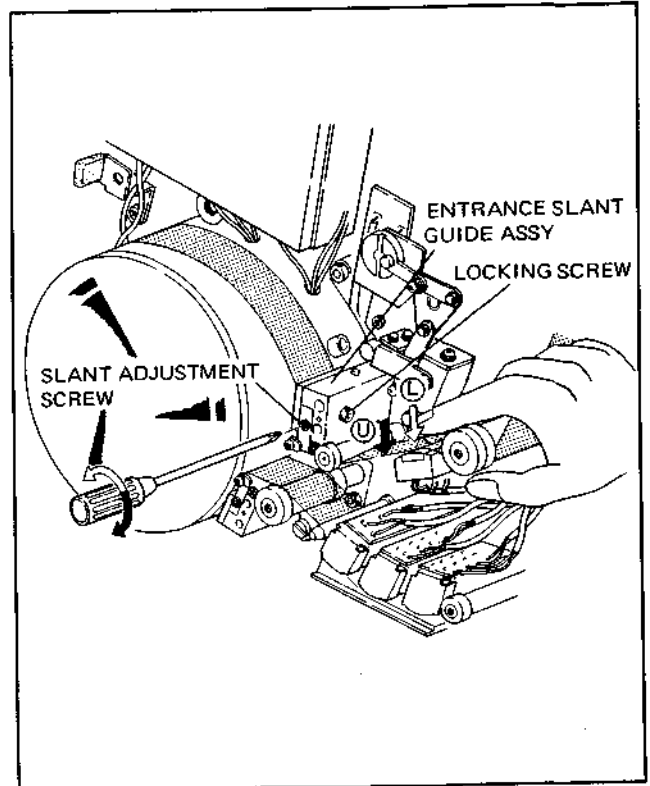


Fig. 10-14-2. Slant Adjustment of Entrance Slant Guide

Height Adjustment of Entrance Slant Guide

14. Check that the tape does not curl along the guide flange of the entrance slant guide. If the tape curls, turn the height adjustment screw counterclockwise.
15. Check that the RF waveform is flat. If it is not, return to step 12 and adjust the slant of the entrance slant guide again.
Repeat steps 12 to 15 until the RF waveform becomes as flat as possible and the tape does not curl along the guide flange.
16. Finally adjust again by turning the height adjustment screw so that the tape does not curl along the guide flange and the RF waveform is flat.
17. Tighten the locking screw of the entrance slant guide assembly and check that the RF waveform remains flat. If the RF waveform is varied, proceed to step 11 again.
18. Confirm that the tape touches the upper flange of the taper guide and the tape does not curl. If not, proceed to step 4 again.

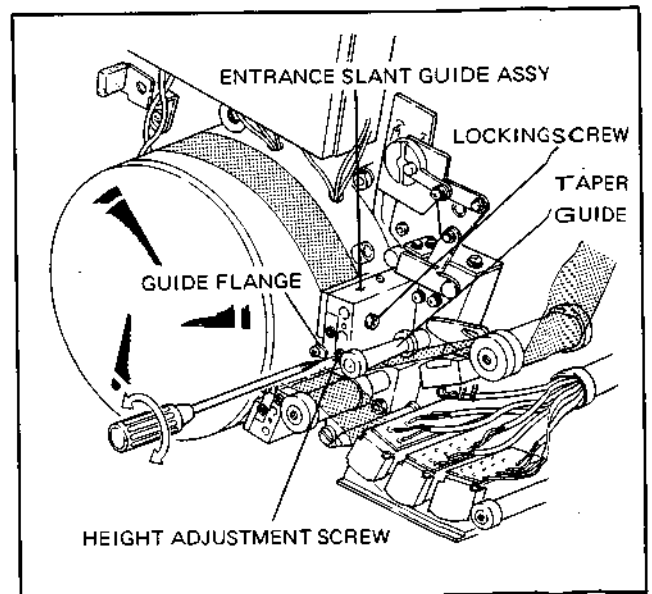
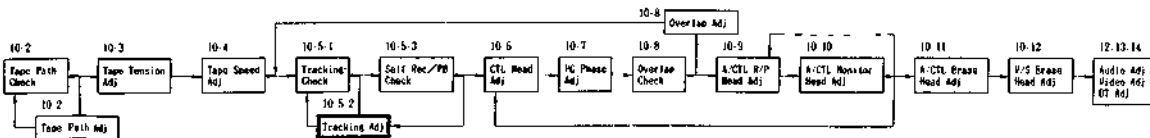


Fig. 10-15. Height Adjustment of Entrance Slant Guide



Height Adjustment of Guide Post 3

19. Loosen the set screw driven into the guide post 3.
20. Turn the height adjustment screw on the top of the guide post 3 so that the tape is positioned in the middle of the upper and lower flanges.

Slant Adjustment of Exit Slant Guide

21. Loosen the locking screw of the exit slant guide assembly 1/8 to 1/4 turn.
22. Lightly push the $\text{\textcircled{U}}$ or $\text{\textcircled{L}}$ side of the tape shown in Fig. 10-16 and find out the side whose RF waveform on the tape exit side becomes flat. If the RF waveform flattens when the $\text{\textcircled{L}}$ side of the tape is pushed, turn the slant adjustment screw counterclockwise and if the waveform flattens when the $\text{\textcircled{U}}$ side is pushed, turn the adjustment screw clockwise.

Height Adjustment of Exit Slant Guide

23. Check that the tape does not curl along the guide flange of the exit slant guide. If the tape curls, turn the height adjustment screw counterclockwise.
24. Check that the RF waveform is flat. If it is not, return to step 22 and adjust the slant again. Repeat steps 22 to 24 until the RF waveform becomes as flat as possible and the tape does not curl along the guide flange.
25. Finally adjust again by turning the height adjustment screw so that the tape does not curl along the guide flange and the RF waveform is flat.
26. Tighten the locking screw of the exit slant guide assembly and check that the RF waveform remains flat. If the waveform is varied, proceed to step 21 again.
27. Check the gap between the upper drum and the guide post by performing step 9 in Tracking Check.
28. While confirming that the RF waveform does not vary, turn the height adjustment screw of the guide post 3 so that the tape touches the lower flange of the guide post 3.
29. Tighten the set screw which was loosened in step 19.

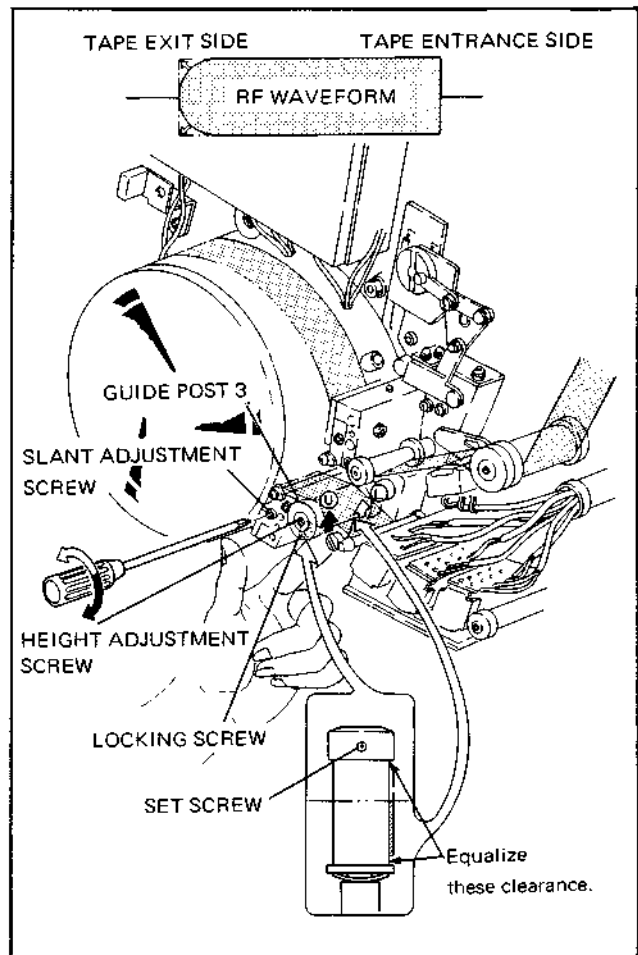


Fig. 10-16. Height Adjustment of Guide Post 3 and Slant Adjustment of Exit Slant Guide

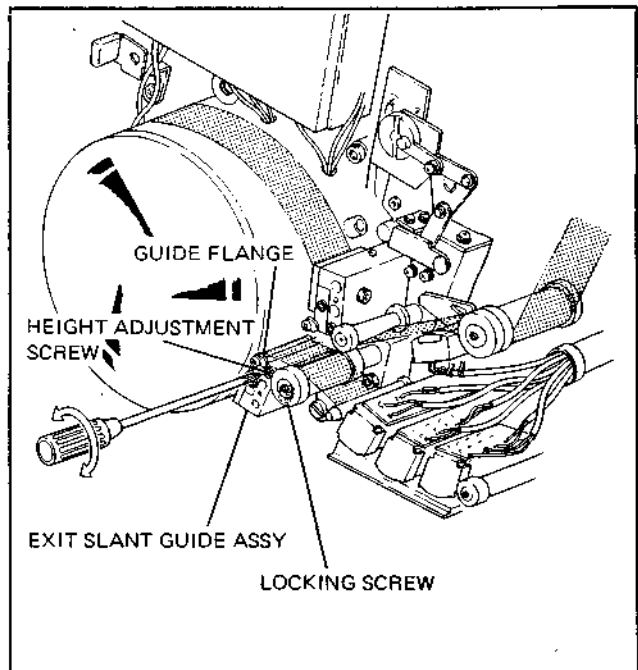
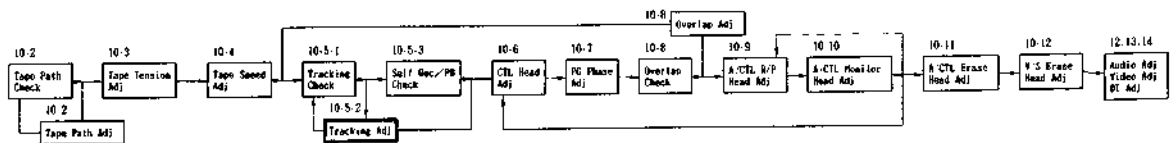


Fig. 10-17. Height Adjustment of Exit Slant Guide



Check after Adjustment

30. Thread a recorded tape.

Note: Use the worn-out tape since the tape may be damaged.

- 31. Set the machine in the STANDBY mode.
- 32. Set the tape running onto the guide flange of the exit slant guide about 1 mm and tighten the tape by turning tape take-up reel by hand.
- 33. Set the machine in the PLAY mode and check that the tape forced to run onto the guide flange is restored in the normal tape running. If the tape is not restored in the normal tape running, check the following;
 - (1) Is the tape tension correct?
 - (2) Does the guide flange press too strongly against the tape?
 - (3) Is the slant of the guide correct?

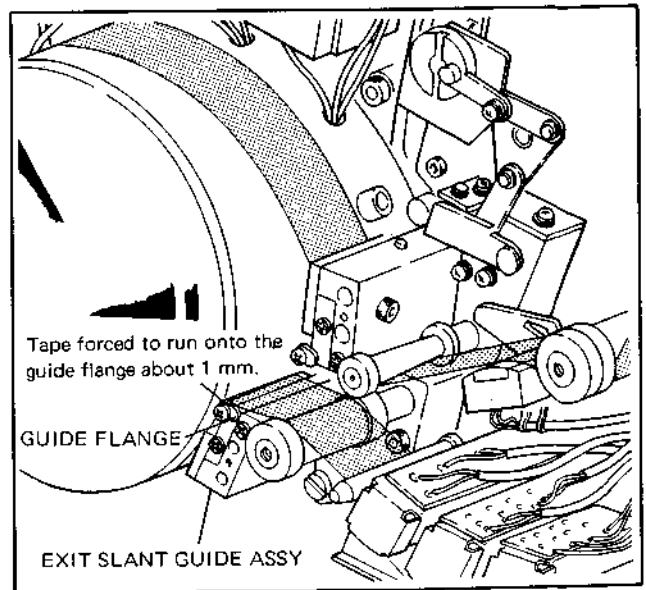
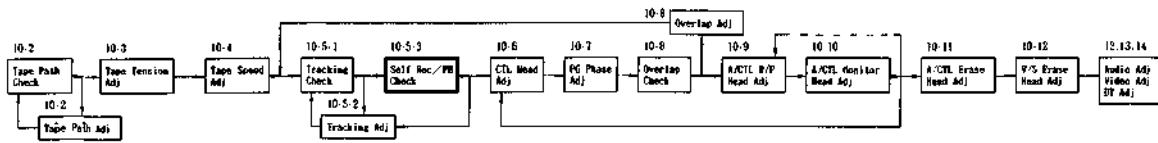


Fig. 10-18. Check of Tape running onto Guide Flange

Note: The adjustment order of the RF waveform on the tape exit side is as follows;

RF waveform adjustment →19→20→21→22→23→24→25→26→27→28→29→30→31→32→33→END
of entrance side





10-5-3. Self Record/Playback RF Waveform Check

The contact of the tape with the rotary heads is checked by observing the self record/playback RF waveform.

1. Connect the oscilloscope to TP1 on EQ-02 board.
2. Set HEAD selector to R/P.
3. Thread a tape and record a video signal.
4. Play back the recorded segment and confirm that the RF waveform show the value in Fig. 10-19.

If not, perform the tracking adjustment again.

Tracking adjustment should be performed so that the playback waveform of an alignment tape and self recording tape satisfies the specified value at the same time.

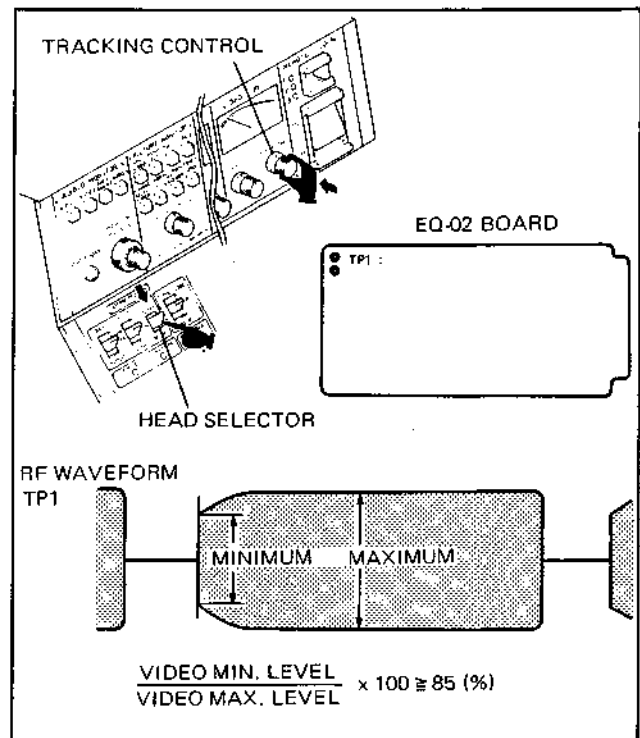
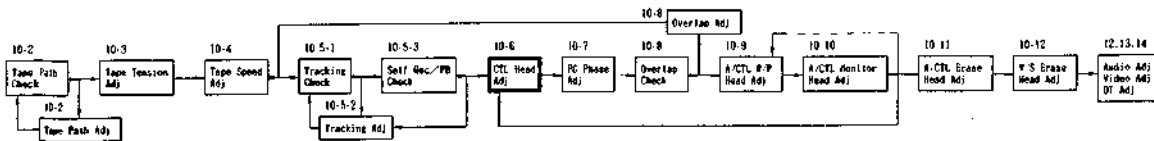


Fig. 10-19. Self Record/Playback RF Waveform Check



10-6. CTL HEAD POSITION ADJUSTMENT

- A. If CTL head has been mounted on the incorrect position, the tape recorded by any other machine can not be played back correctly on this machine.
- B. Since the PG phase deviates a great deal when CTL head is moved, the PG phase must be always adjusted after performing the adjustment of CTL head.

Check

1. Confirm that ADV switch on CD-17 board is set to off and connect the oscilloscope to TP1 on EQ-02 board.
2. Play back the WHITE segment of the alignment tape.
3. Adjust by turning TRACKING knob so that the RF waveform shows maximum and check that the RF waveform remains unchanged when the TRACKING knob is pushed at the maximum RF amplitude. If the RF waveform changes, perform the following adjustment.

Adjustment

4. Remove the head shield cover.
5. Loosen the four screws fixing the head base 1/4 to 1/2 turn.
6. Check that TRACKING knob has been pushed and playback the WHITE segment of the alignment tape.
7. Insert the hexagonal screwdriver (2.5 mm to the opposite side) into the hole shown in Fig. 10-21. Pushing the head base in the direction of the arrow by hand, move the screwdriver right or left so that the RF waveform shows maximum.
8. Tighten the four screws loosened at Step 5.
9. Check that there is no clearance between pins and the head base shown in Fig. 10-21.
10. Check by turning TRACKING knob that the RF waveform does not change when the knob is pushed at the maximum RF amplitude. If it changes, repeat Steps 5 to 10.
11. Mount the head shield cover.

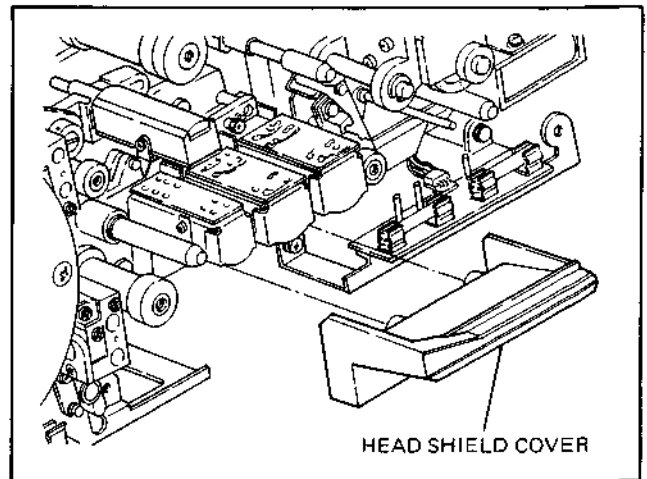


Fig. 10-20. Head Shield Cover Removal

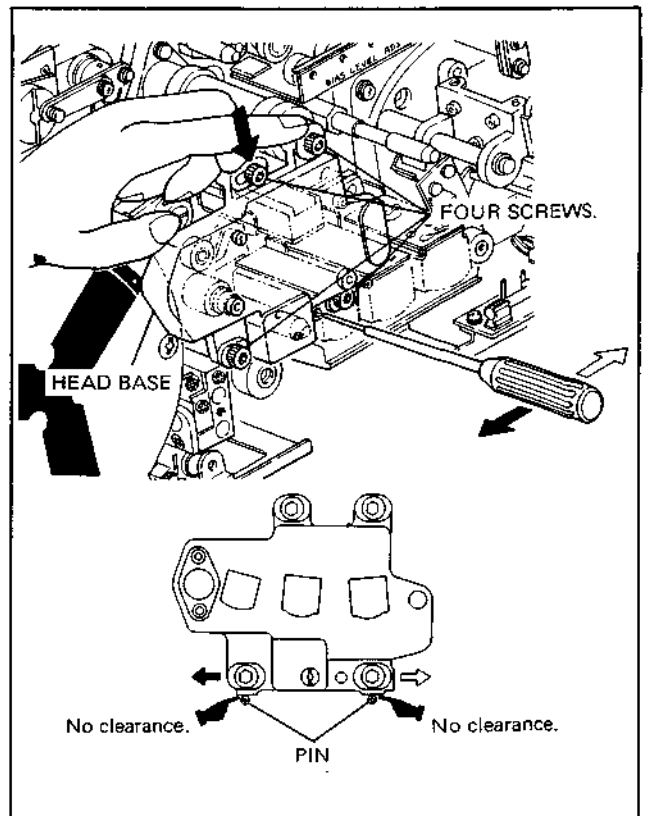
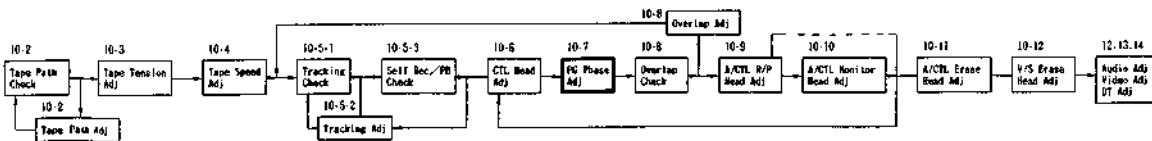


Fig. 10-21. CTL Head Position Adjustment



10-7. PG PHASE ADJUSTMENT

The PG phase adjustment is required in each playback mode with R/P head and PLAY head.

A. Playback with R/P Head

Check

1. Connect the oscilloscope to VIDEO INPUT connector and VIDEO OUTPUT connector.
2. Set ADV switch on CD-17 board to OFF and set #2 of S3 to OFF (The AUTO PG does not operate.) and check that #3 of S3 is set to ON.
3. Thread the alignment tape.
4. Set HEAD selector to R/P and play back the alignment tape.
5. Check that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$, as shown in Fig. 10-22.

If the specified value is not obtained, perform the following adjustment.

If the specified value is obtained, proceed to Step 11 "Phase check in the playback mode with PLAY head".

Adjustment

6. Adjust RV8 on CD-17 board so that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$.

If the adjustment can not be made within the variable range of RV8, proceed to next step.

7. Set RV8 in the middle of the variable range.
8. Adjust RV5 so that the phase difference between VIDEO IN and VIDEO OUT is within $\pm 0.75H$, as shown in Fig. 10-23.

If the specified value is not obtained, set #5 and #6 of S3 as follows and adjust RV5 again so that the phase difference is within $\pm 0.75H$.

- a) When VIDEO OUT is in advance of VIDEO IN; #5 → ON, #6 → ON
 - b) When VIDEO IN is in advance of VIDEO OUT; #5 → OFF, #6 → OFF
9. Set RV5 in the middle of positions A and B as shown in Fig. 10-23.
A shows the position of RV5 when the VIDEO OUT waveform is shifted by turning RV5 clockwise. B shows the position of RV5 when the VIDEO OUT waveform is shifted by turning RV5 counterclockwise. Connect the oscilloscope to TP15 and TP13 on CD-17 board.
Adjust RV5 so that the positive-going edge at TP15 coincides with the nearest leading edge at TP13.
 10. Adjust RV8 again so that the phase difference between VIDEO IN and VIDEO OUT is within $1 \pm 1 \mu\text{sec}$.

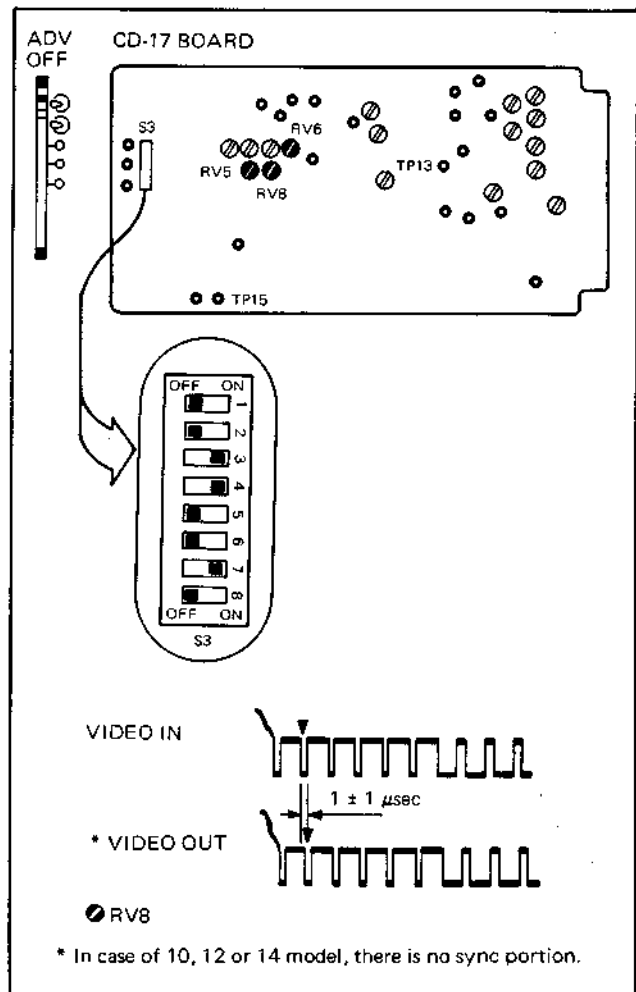


Fig. 10-22. PG Phase Adjustment in the Playback Mode with R/P Head

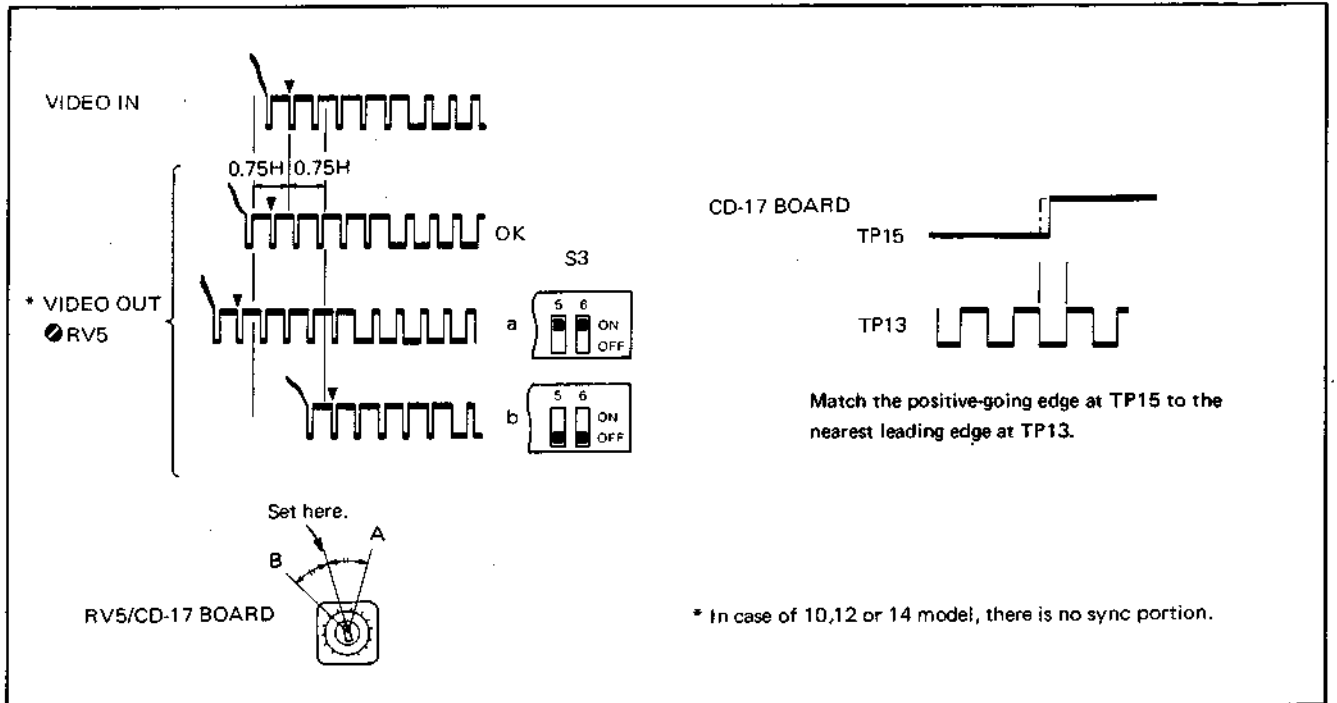
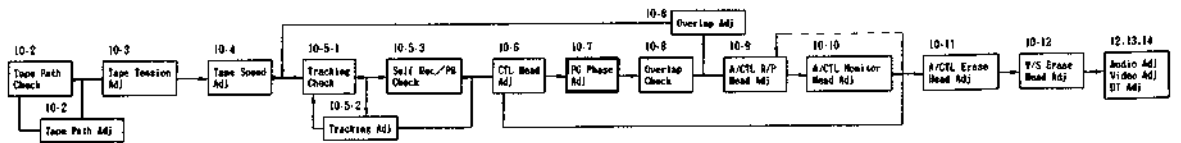


Fig. 10-23. PG Phase Adjustment in Playback Mode with R/P Head

B. Playback with PLAY Head

Check

11. Set HEAD selector to PLAY and play back the alignment tape.
12. Check that the phase difference between VIDEO IN (CH-1) and VIDEO OUT (CH-2) is within $1 \pm 1 \mu\text{sec}$. If the specified value is not obtained, perform the following adjustment.
If the specified value is obtained, proceed to step 14.

Adjustment

13. Adjust RV6 on CD-17 board so that the phase difference between VIDEO IN (CH-1) and VIDEO OUT (CH-2) is within $1 \pm 1 \mu\text{sec}$.
14. Reset #2 of S3 on CD-17 board ON (The AUTO PG operates.), keeping #3 of S3 ON.

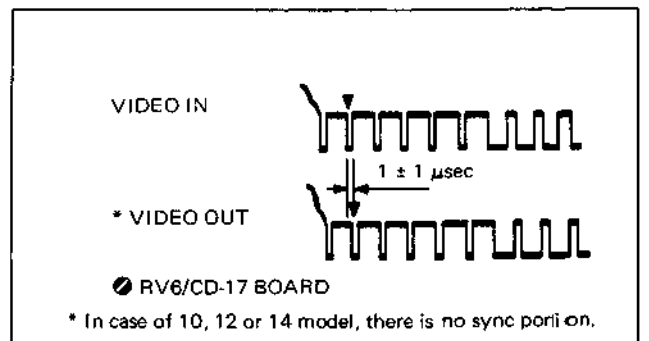
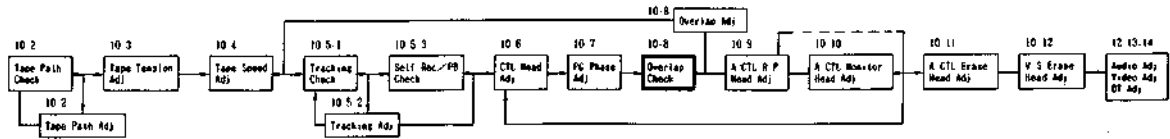


Fig. 10-24. PG Phase Adjustment in the Playback Mode with PLAY Head



10-8. OVERLAP ADJUSTMENT

Preliminary Information

1. Overlap means the segment of the playback RF waveform cut off by PB switching.
2. When overlap B and C in the odd field are adjusted, it is not necessary to adjust dropout A and overlap on the tape exit side in the even field.
3. After performing the overlap adjustment, the following clearance must be checked.
 - ① Clearance between the guide bracket and upper drum is 0.09 mm or more.
 - ② Clearance between the fence (entrance side) and upper drum is 0.15 +/- 0.05 mm. See Fig. 10-27-2.
 - ③ Clearance between the exit slant guide and upper drum is 0.09 ± 0.01 mm. See Fig. 10-27-2.

Note: With power off, turn the threading motor of the movable guide with a flat-blade screwdriver so that the movable guide is closed, and check the clearance.

4. Adjustment Points

- ① When adjusting overlap C on the tape entrance side, loosen screw N so that the slant guide assy turns around screw M, and adjust the clearance between the guide bracket and upper drum.
 - ② The clearance between the guide bracket and upper drum can be adjusted by turning the set-screw driven into the taper guide.
 - ③ When adjusting overlap B on the tape exit side, loosen screw P so that the exit slant guide assy turns around screw Q, and adjust the clearance between the exit slant guide and upper drum.
 - ④ The clearance between the exit slant guide and upper drum can be adjusted by turning the set-screw driven into the guide post 3.
5. The thickness gauge is required for this adjustment. Sony Part No. J-6041-670-A
 6. After performing the overlap adjustment, be sure to check the tracking waveform in section 10-5-1.

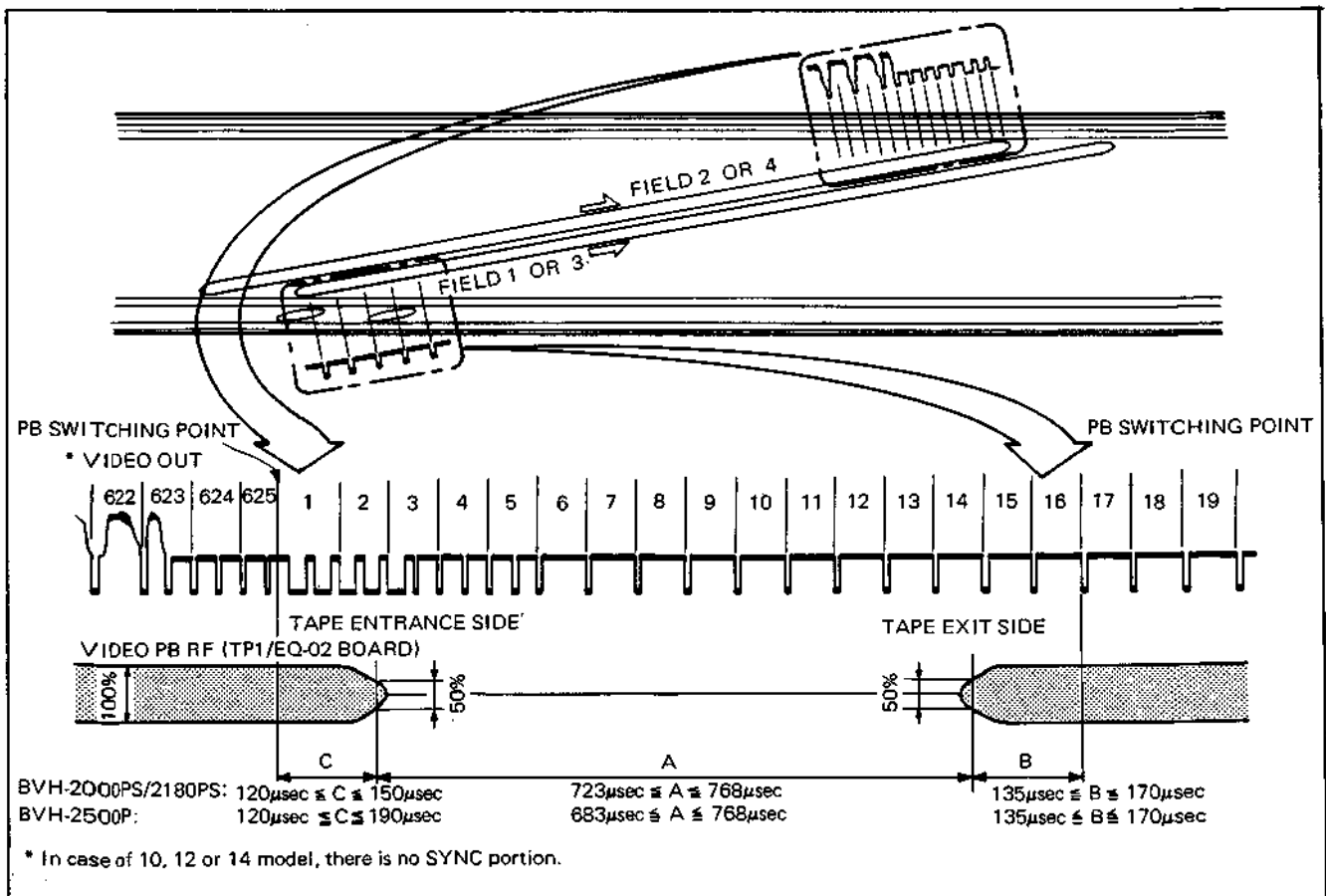


Fig. 10-25. Overlap Adjustment

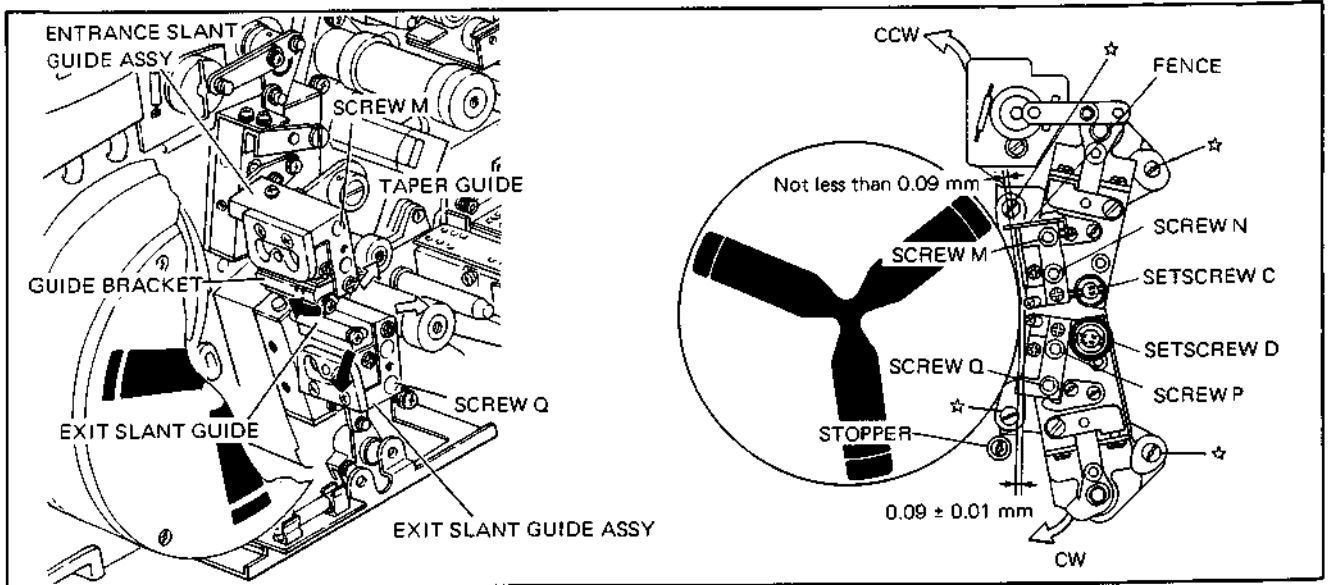


Fig. 10-26. Overlap Adjustment

Check

1. Connect the oscilloscope to TP1 on EQ-02 board and VIDEO OUTPUT connector. Set ADV switch on CD-17 board to OFF.
2. Thread a tape.
3. Set HEAD selector to R/P.
4. Record a video signal.
5. Play back the recorded segment and check that overlap B and C is within the range shown in Fig. 10-25.
6. After check, reset ADV switch to ON.

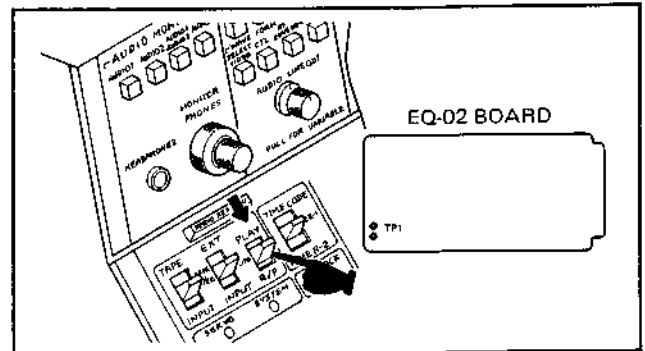


Fig. 10-27-1. Overlap Check

Adjustment

Note 1: If the entrance slant guide assembly or the whole assembly of the movable guide has been moved, check that the clearance between upper drum and fence, referring to Fig. 10-27-2. For the adjustment, refer to section 3-8-1.

Note 2: If the exit slant guide assembly or the whole assembly of the movable guide has been moved, check that the clearance between upper drum and guide post, referring to Fig. 10-27-2.

- When the sum of the overlaps B and C is the following value and either overlap is less than the specified value. For NTSC, PM: 217 μ sec or more For PS: 287 μ sec or more
1. When the overlap B is less than the specified value (see Fig. 10-26).
 - a. Loosen four screws marked ☆.
 - b. While pushing the movable guide assembly lightly to the head drum assembly, move it in the direction of the arrow CCW.
 - c. Tighten four screws marked ☆ and check the overlap again.
 - d. After performing the adjustment, turn the stopper clockwise, press it against the movable guide assembly and tighten the screw.

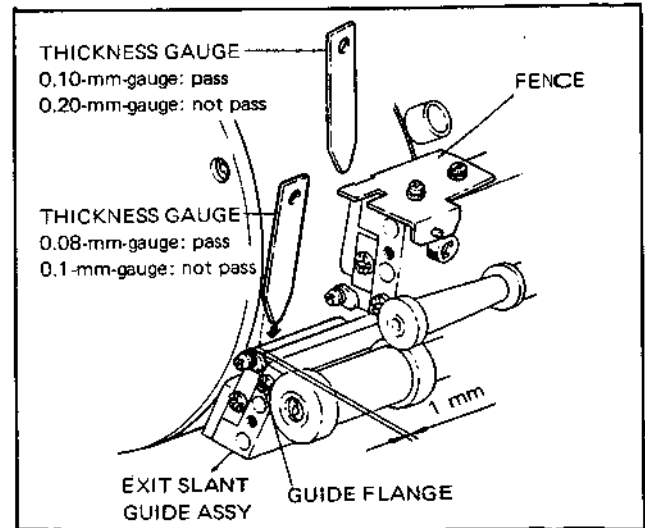
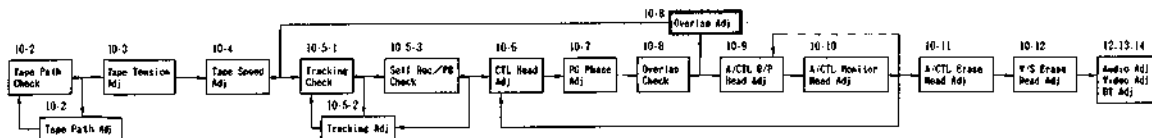


Fig. 10-27-2. Checking Gap near to Slant Guide Assy

Note: When moving the movable guide assembly 1 mm along the circumference of the head drum, the overlap changes approx. 40 μ sec.



2. When the overlap C is less than the specified value (see Fig. 10-26);
 - a. Loosen the stopper, then loosen four screws marked ☆.
 - b. While pushing the movable guide assembly against the head drum assembly, move it in the direction of the arrow CW.
 - c. Tighten four screws marked ☆ and check the overlap again.
 - d. After performing the adjustment, turn the stopper clockwise, press it against the movable guide assembly and tighten the screw.

3. Tighten screws P and Q fixing the exit slant guide assy.
4. Turn the upper drum by hand and keep the head away from the exit slant guide assy. Check by using the thickness gauge that the clearance between the exit slant guide and upper drum is 0.09 mm or more.
5. Check the overlap again by performing Steps 4 and 5 in Check procedure. Repeat Steps 1 to 5 until the specified value is obtained.

• When overlap C is out of the specified value;

1. Loosen screw N shown in Fig. 10-28 1/2 to 1 turn. **Note: Do not loosen screw M.**
2. Adjust by turning the setscrew driven into the taper guide. **Note: When the setscrew is turned 10 degrees, the overlap changes approx. 27 μsec. When the overlap must be increased, turn the setscrew clockwise. When the overlap must be decreased, turn the setscrew counterclockwise and then push the entrance slant guide assy against the tip of the setscrew by hand. Note: When pushing the entrance slant guide, do not use a screwdriver.**
3. Tighten screws N and M fixing the entrance slant guide assy.
4. Turn the upper drum by hand and keep the head away from the entrance slant guide assy. Check by using the thickness gauge that the clearance between the guide bracket and upper drum is 0.09 mm or more.
5. Check the overlap again by performing Steps 4 and 5 in Check procedure. Repeat Steps 1 to 5 until the specified value is obtained.

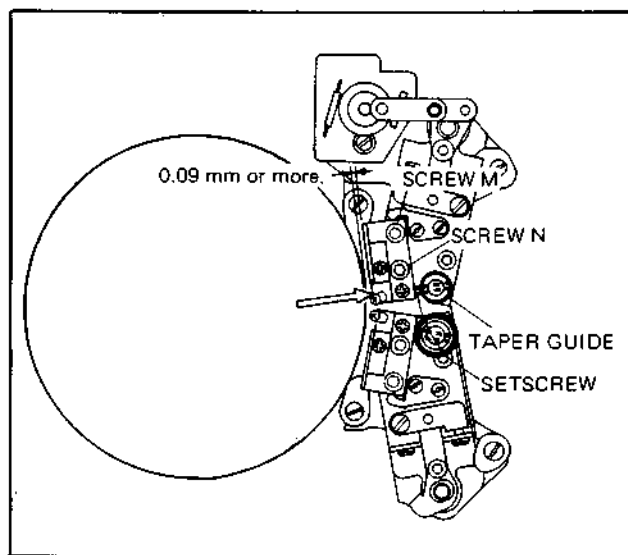


Fig. 10-28. Overlap C Adjustment

• When overlap B is out of the specified value;

1. Loosen screw P shown in Fig. 10-29 1/2 to 1 turn. **Note: Do not loosen screw Q.**
2. Adjust by turning the setscrew driven into guide post 3. **Note: When the screw is turned 10 degrees, the overlap changes approx. 55 μsec. When the overlap must be increased, turn the setscrew clockwise. When the overlap must be decreased, turn the setscrew counterclockwise and then push the exit slant guide assy against the tip of the setscrew by hand.**

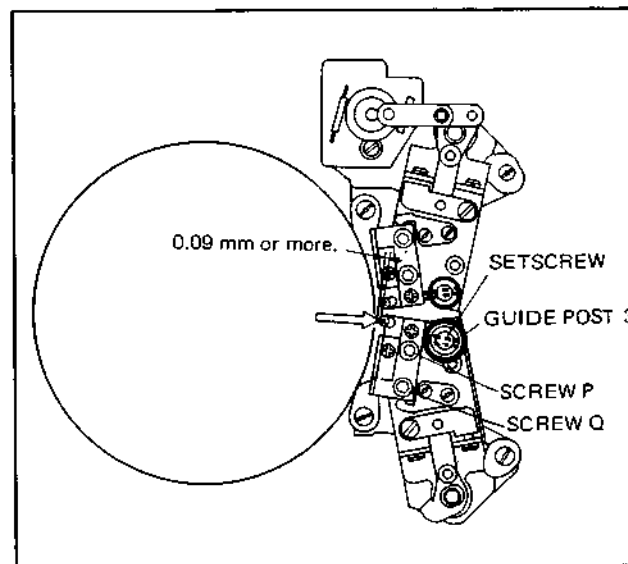
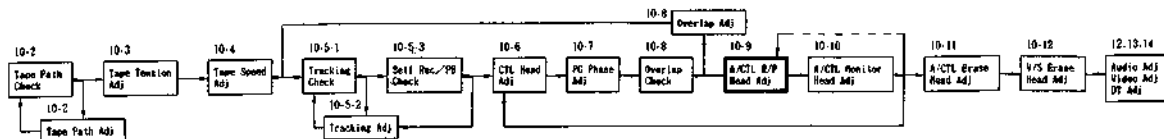


Fig. 10-29. Overlap B Adjustment

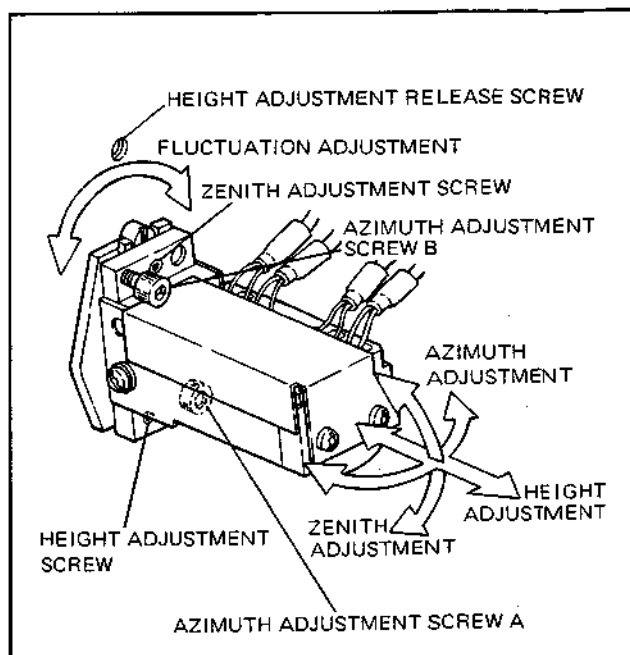
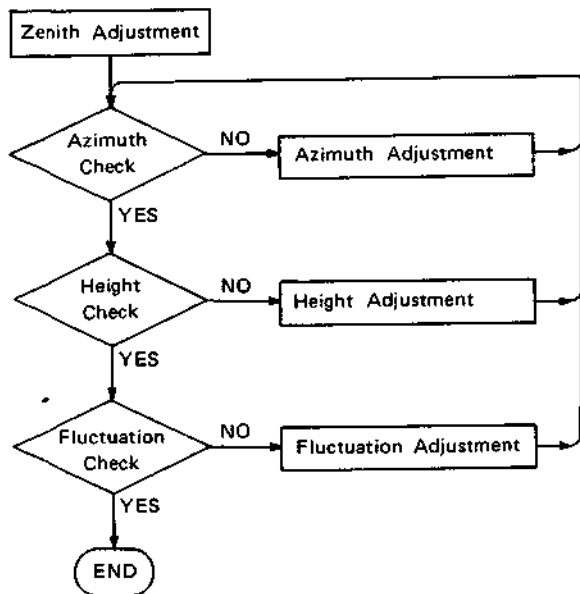
Note: When pushing the exit slant guide, do not use a screwdriver.



10-9. AUDIO/CTL R/P HEAD ADJUSTMENT

Preliminary Information

A. Perform the adjustment, following the flowchart below.



- B. When the guides on the tape path have been adjusted, be sure to check the audio/CTL R/P head, following the above flowchart.
- C. Prepare the following flat plate for zenith adjustment. Part No. J-6040-160-A
- D. The zenith adjustment is not necessary except when the zenith adjustment screw has been made to turn or the azimuth adjustment screw has been tightened excessively.
- E. When replacing the R/P head refer to Section 3-20 and when performing the adjustment after replacing the head, follow the flowchart shown in Section 3-24-1.

Zenith Adjustment

1. Put the flat plate on both audio/CTL erase head and audio/CTL R/P head as shown in Fig. 10-30. Check that there is no space between the audio/CTL R/P head and the flat plate when the plate is put on the audio/CTL erase head without any space and also check that there is no space between the audio/CTL R/P head and the flat plate when the plate is put on the audio/CTL monitor head (except for 00 and 10 models) or the guide post 2 (for 00 and 10 models) without any space.
2. If there is a space, eliminate the space by turning the zenith adjustment screw.

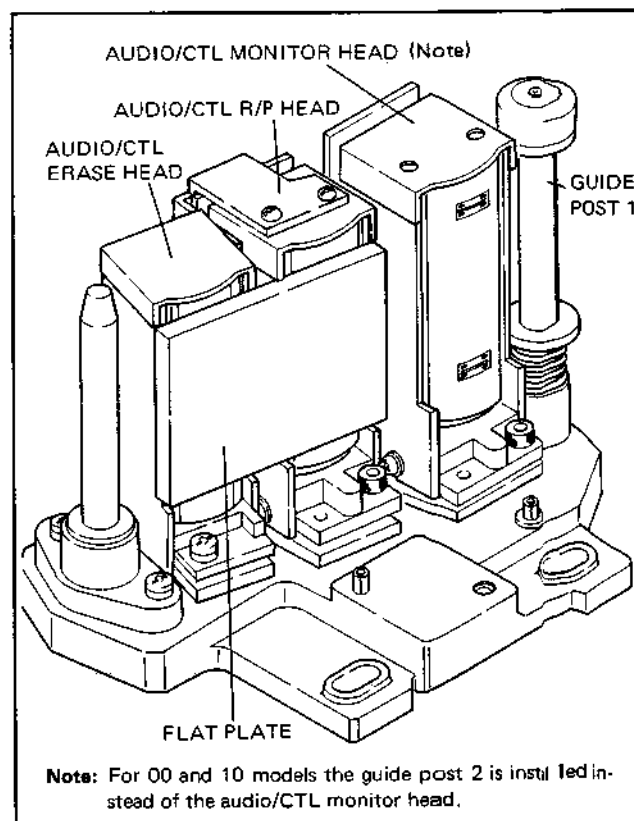
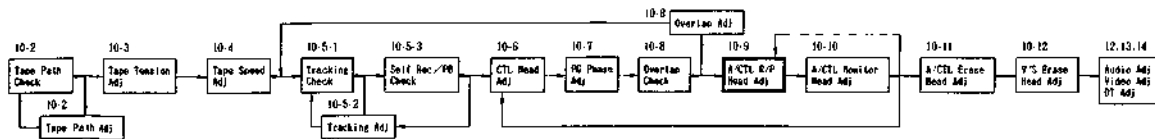


Fig. 10-30. Audio/CTL R/P Head Zenith Adjustment



Azimuth Adjustment

1. Connect the oscilloscope to AUDIO-1 OUT and AUDIO-2 OUT.
Set the oscilloscope in the EXT. HORIZONTAL mode so that the Lissajous figures can be seen on the scope.
2. Play back the audio 3 kHz segment of the alignment tape and adjust by turning AUDIO-1, 2 PB level controls so that AUDIO-1, 2 meters show 0 VU. Adjust the scope so that the amplitude of AUDIO-1 and AUDIO-2 is 6 cm.
3. Check that the phase difference between AUDIO-1 and AUDIO-2 is within 5 degrees. See Fig. 10-31. If the specified value is not obtained, perform the following adjustment.
4. Loosen the azimuth adjustment screw B and adjust by turning screw A so that the specified phase difference is obtained. Slightly turn screw B clockwise and then adjust by turning screw A so that the specified phase difference is obtained.
Repeat the same procedure until both screws are tightened completely and finally check that the specified value is obtained.
Note: The screws should be tightened with a torque of 6 to 8 kg-cm.
5. Play back the audio 15 kHz segment of the alignment tape and adjust the scope so that the amplitude of AUDIO-1 and AUDIO-2 is 6 cm.
6. Check that the phase difference between AUDIO-1 and AUDIO-2 is within 30 degrees. See Fig. 10-32.
If the specified value is not obtained, repeat Step 4 again.

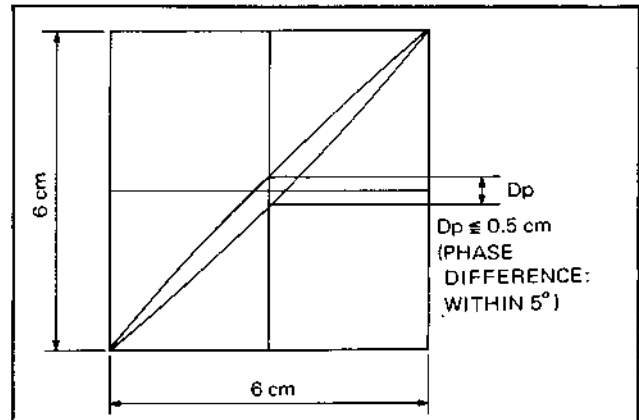


Fig. 10-31. Audio/CTL R/P Head Azimuth Adjustment of Audio 3 kHz Playback

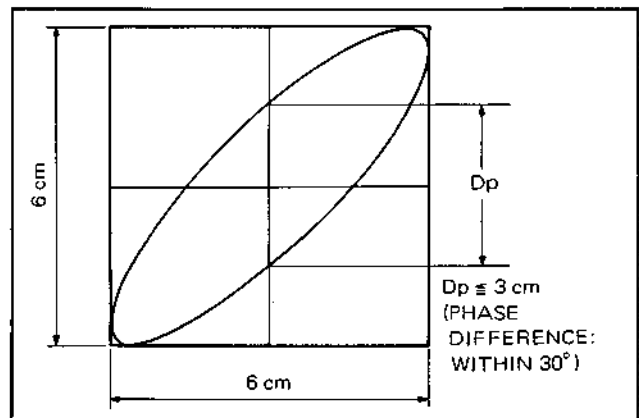


Fig. 10-32. Audio/CTL R/P Head Azimuth Adjustment of Audio 15 kHz Playback

Height Adjustment Check

1. Connect the oscilloscope to AUDIO-1 OUT and AUDIO-2 OUT.
2. Play back the audio 3 kHz segment of the alignment tape. Adjust the oscilloscope so that the amplitude of both channels increases and it is equal. Observe "G" shown in Fig. 10-33.
3. Check that clearance "G" becomes wide when the tape edge near the audio/CTL R/P head is pushed up or down, as shown in Fig. 10-34.
If "G" becomes narrow, perform the following adjustment.

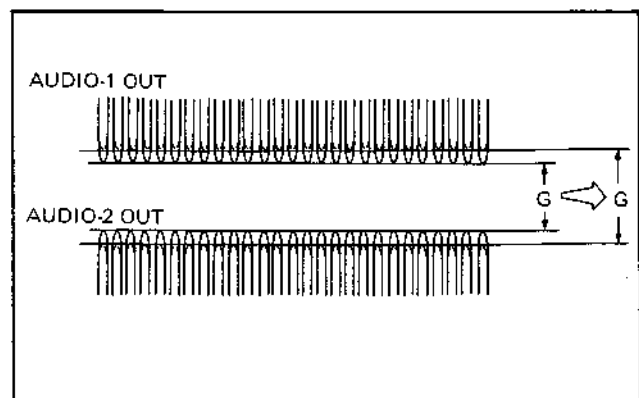
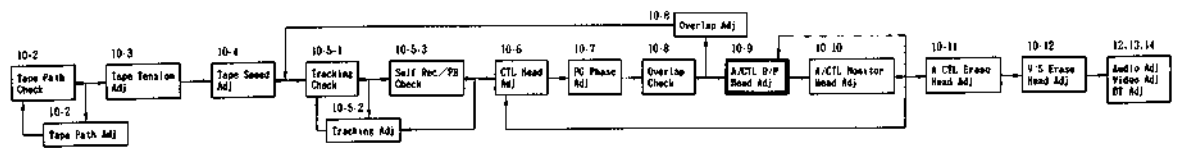


Fig. 10-33. Audio/CTL R/P Head Height Check



Adjustment

4. Loosen the height adjustment release screw 1/2 to 1 turn.
5. Turn the height adjustment screw as follows.
 - a. If "G" becomes narrow when the tape is pushed down, turn the height adjustment screw clockwise.
 - b. If "G" becomes narrow when the tape is pushed up, turn the height adjustment screw counterclockwise.
6. Tighten the height adjustment release screw and check the height again by performing Step 3.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

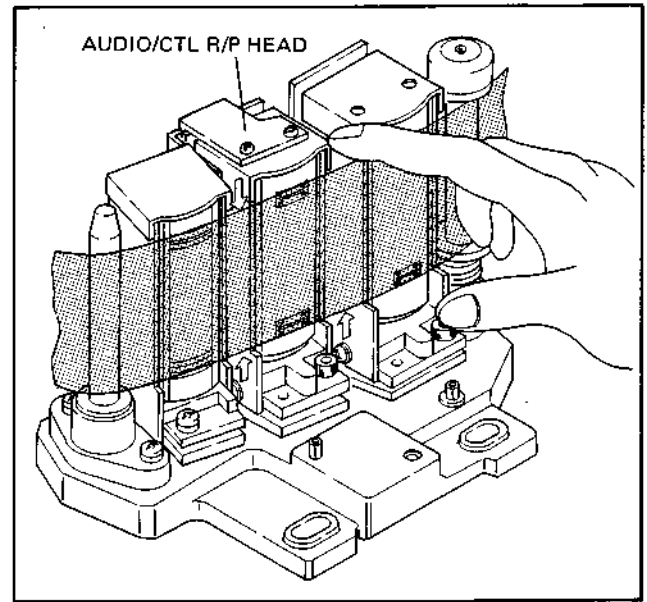


Fig. 10-34. Audio/CTL R/P Head Height Check

Fluctuation Adjustment

Check

1. Connect the oscilloscope to AUDIO-1 OUT.
2. Check that SKEW switch on RL-12 board is set to AUTO.
3. Play back the audio 15 kHz segment of the alignment tape, and adjust the scope so that the amplitude "A" becomes as wide as possible as shown in Fig. 10-35.
4. Set SKEW switch to MANU and turn SKEW knob full counterclockwise, and then suppose that the amplitude shown on the scope is "B".

Check that the ratio of "A" to "B" is the specified value shown in Fig. 10-35. If the specified value is obtained, set SKEW switch to AUTO. If the specified value is not obtained, perform the following adjustment.

Adjustment

5. Check that the height adjustment screw is not being loose.
6. Loosen the height adjustment release screw 1/2 to 1 turn.
7. When the fluctuation adjustment screw is turned clockwise or counterclockwise a little and check whether the specified value shown in Fig. 10-35 is obtained. Repeat the adjustment and check procedures until the specified value is obtained.
8. Tighten the height adjustment release screw and check that the specified value is obtained by performing Step 4 again.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

9. Return to the beginning of the flowchart and check the azimuth and height.

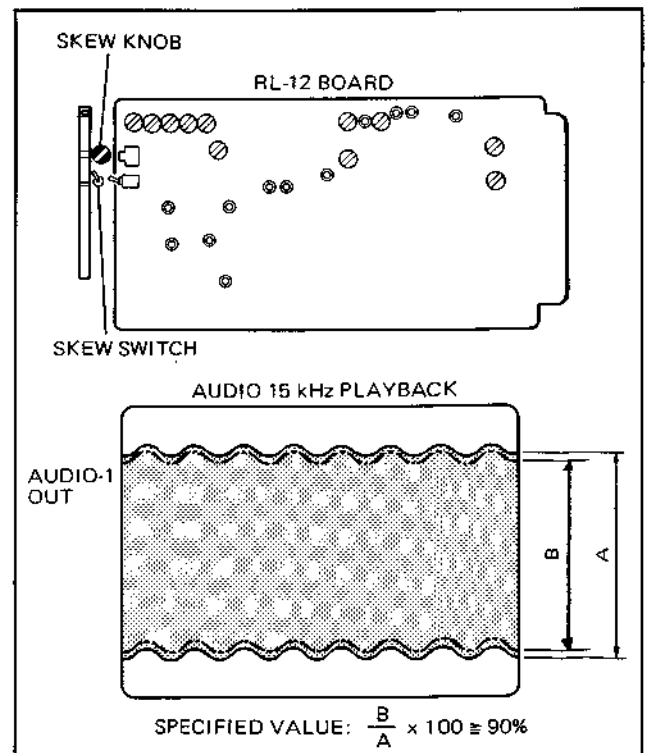
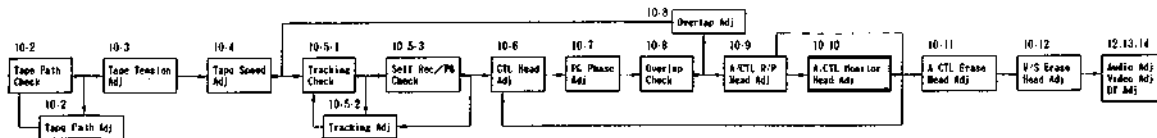


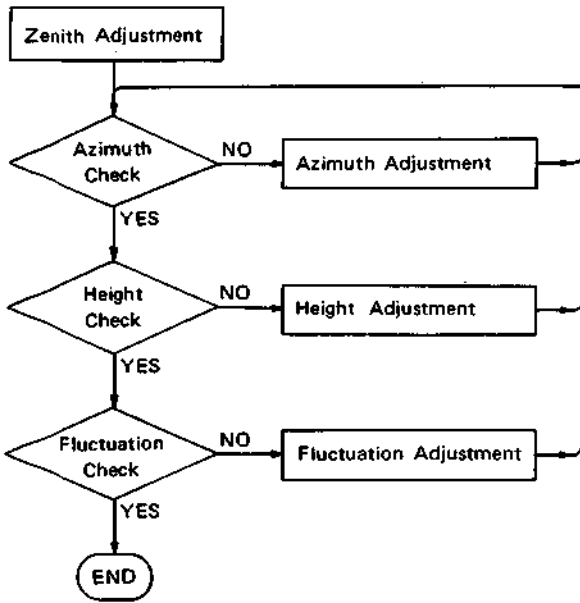
Fig. 10-35. Audio/CTL R/P Head Fluctuation Adjustment



10-10. AUDIO/CTL MONITOR HEAD ADJUSTMENT (except for 00 model)

Preliminary Information

A. Perform the adjustment, following the flow chart below.



- B. When the guides on the tape path have been adjusted, be sure to check the audio/CTL monitor head, following the above flowchart.
- C. Prepare the following flat plate for zenith adjustment. Part No. J-6040-160-A
- D. The zenith adjustment is not necessary except when the zenith adjustment screw has been made to turn or the azimuth adjustment screw has been tightened excessively.
- E. When replacing the monitor head, refer to Section 3-21 and when performing the adjustment after replacing the monitor head, follow the flowchart shown in Section 3-24-1.

Zenith Adjustment

1. Put the flat plate on both audio/CTL R/P head and audio/CTL monitor head as shown in Fig. 10-36. Check that there is no space between the audio/CTL monitor head and the flat plate when the plate is put on the audio/CTL R/P head without any space and also check that there is no space between the audio/CTL monitor head and that plate when the plate is put on the guide post 1 without any space.
2. If there is a space, equalize and minimize each space by turning the zenith adjustment screw of the audio/CTL monitor head.

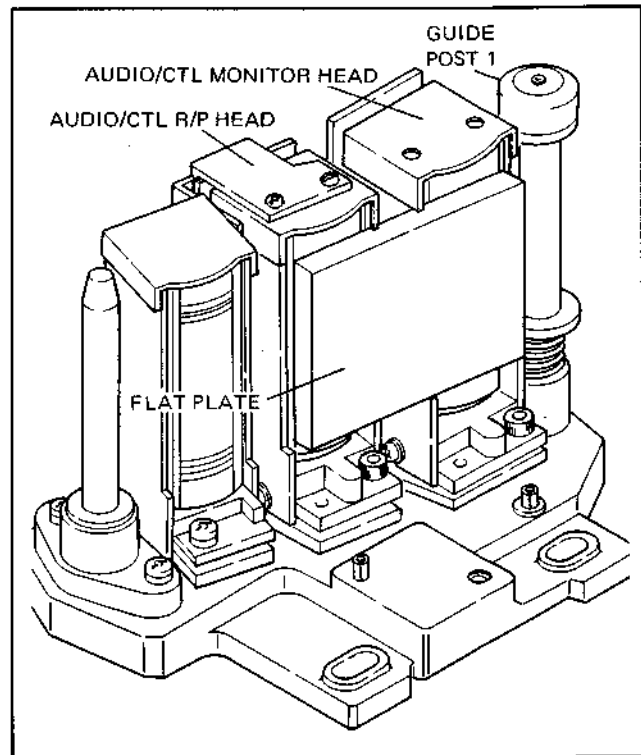
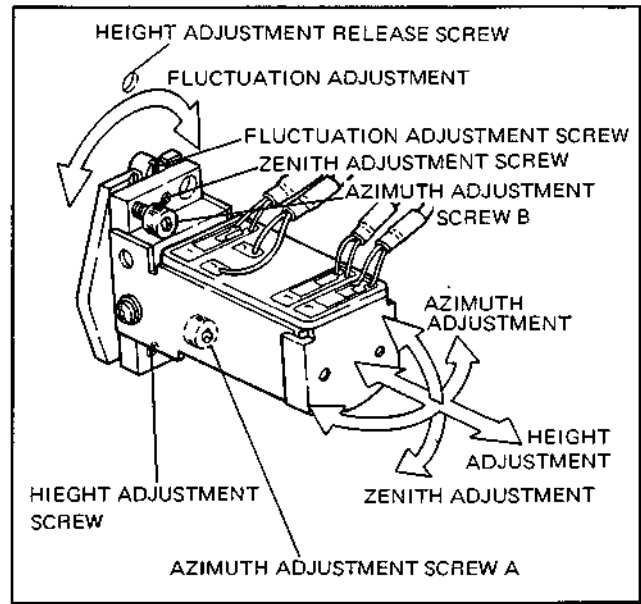
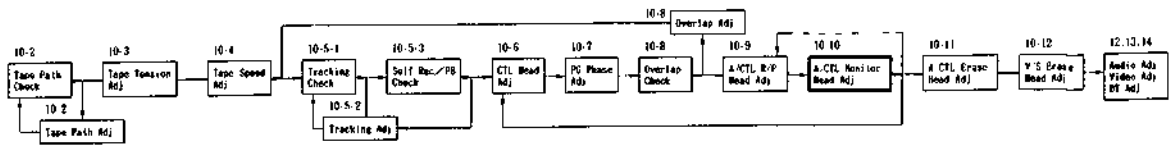


Fig. 10-36. Audio/CTL Monitor Head Zenith Adjustment



Azimuth Adjustment

1. Set AUDIO MONITOR select button to **AUDIO-1** and short-circuit JP1 on LG board.
2. Connect the oscilloscope to MONITOR OUTPUT L and MONITOR OUTPUT R.
Set the oscilloscope in the EXT. HORIZONTAL mode so that the Lissajous figures can be seen on the scope.
3. Play back the audio 3 kHz segment of the alignment tape and adjust by turning RV106 and RV206 on the AU-27 board so that AUDIO-1, 2 meters show 0 VU. Adjust the scope so that the amplitude of the audio-1 channel and the audio-2 channel is 6 cm.
4. Check that the phase difference between the audio-1 channel and the audio-2 channel is within 5 degrees. See Fig. 10-37.
If the specified value is not obtained, perform the following adjustment.
5. Loosen the azimuth adjustment screw B and adjust by turning screw A so that the specified phase difference is obtained. Slightly turn screw B clockwise and then adjust by turning screw A so that the specified phase difference is obtained. Repeat the same procedure until both screws are tightened completely and finally check that the specified value is obtained.
Note: The screws should be tightened with a torque of 6 to 8 kg·cm.
6. Play back the audio 15 kHz segment of the alignment tape and adjust the scope so that the amplitude of the audio-1 channel and the audio-2 channel is 6 cm.
7. Check that the phase difference between the audio-1 channel and the audio-2 channel is within 30 degrees. See Fig. 10-38.
If the specified value is not obtained, repeat Step 5 again.

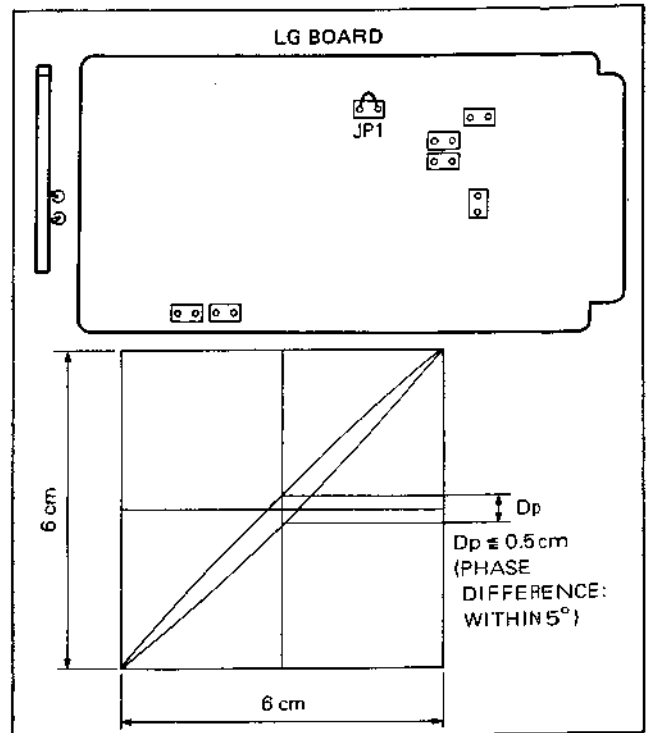


Fig. 10-37. Audio/CTL Monitor Head Azimuth Adjustment of Audio 3 kHz Playback

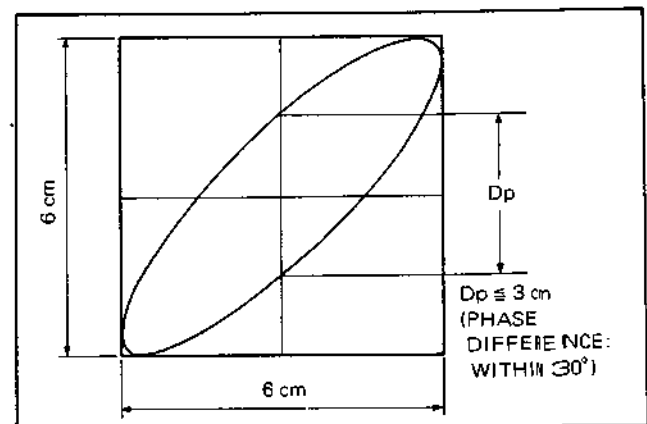


Fig. 10-38. Audio/CTL Monitor Head Azimuth Adjustment of Audio 15 kHz Playback

Height Adjustment

Check

1. Check that the setting performed in Step 1 of azimuth adjustment has been maintained.
Connect the oscilloscope to MONITOR OUT L and MONITOR OUT R.
2. Play back the audio 3 kHz segment of the alignment tape. Adjust the oscilloscope so that the amplitude of both channels increases and it is equal. Observe "G" shown in Fig. 10-39.
3. Check that clearance "G" becomes wide when the tape edge near the audio/CTL monitor head is pushed up or down, as shown in Fig. 10-39. If "G" becomes narrow, perform the following adjustment.

Adjustment

4. Loosen the height adjustment release screw 1/2 to 1 turn.
5. Turn the height adjustment screw as follows.
 - a. If "G" becomes narrow when the tape is pushed down, turn the height adjustment screw clockwise.
 - b. If "G" becomes narrow when the tape is pushed up, turn the height adjustment screw counterclockwise.
6. Tighten the height adjustment release screw and check the height again by performing Step 3.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

Fluctuation Adjustment

Check

1. Check that the setting performed in step 1 of azimuth adjustment has been maintained.
Connect the oscilloscope to MONITOR OUT L.
2. Check that SKEW switch on RL-12 board is set to AUTO.
3. Play back the audio 15 kHz segment of the alignment tape, and adjust the scope so that the amplitude "A" becomes as wide as possible. See Fig. 10-40.
4. Set SKEW switch to MANU and turn SKEW knob full counterclockwise, and then suppose that the amplitude shown on the scope is "B".
Check that the ratio of "A" to "B" is within the specified value. If the specified value is obtained, set SKEW switch to AUTO. If the specified value is not obtained, perform the following adjustment.

Adjustment

5. Check that the height adjustment screw is not being loose.
6. Loosen the height adjustment release screw 1/2 to 1 turn.
7. Turn the fluctuation adjustment screw clockwise or counterclockwise a little and check that the specified value shown in Fig. 10-40 is obtained. Repeat the adjustment and check procedures until the specified value is obtained.
8. Tighten the height adjustment release screw and check that the specified value is obtained by performing Step 4 again.

Note: The height adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

9. Return to the beginning of the flowchart and check the azimuth and height.
10. Remove the jumper connected in Step 1 of the azimuth adjustment.

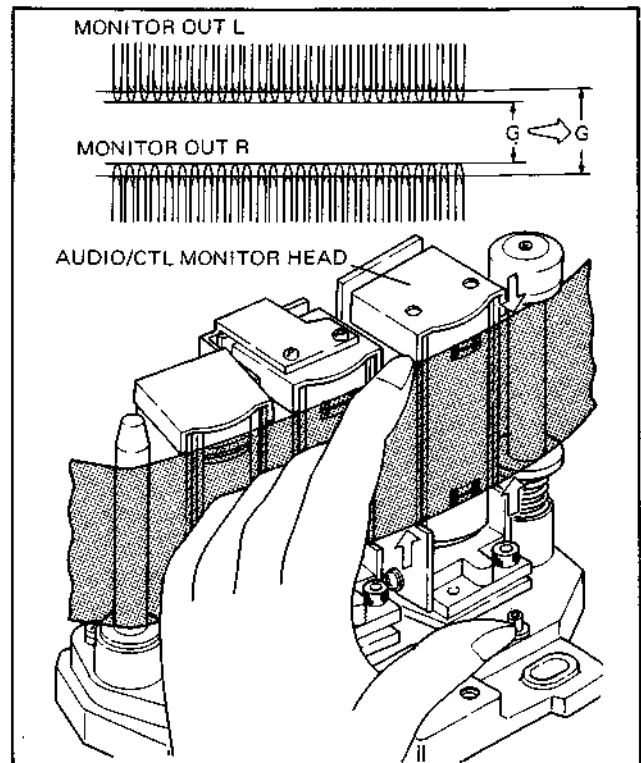


Fig. 10-39. Audio/CTL Monitor Head Height Check

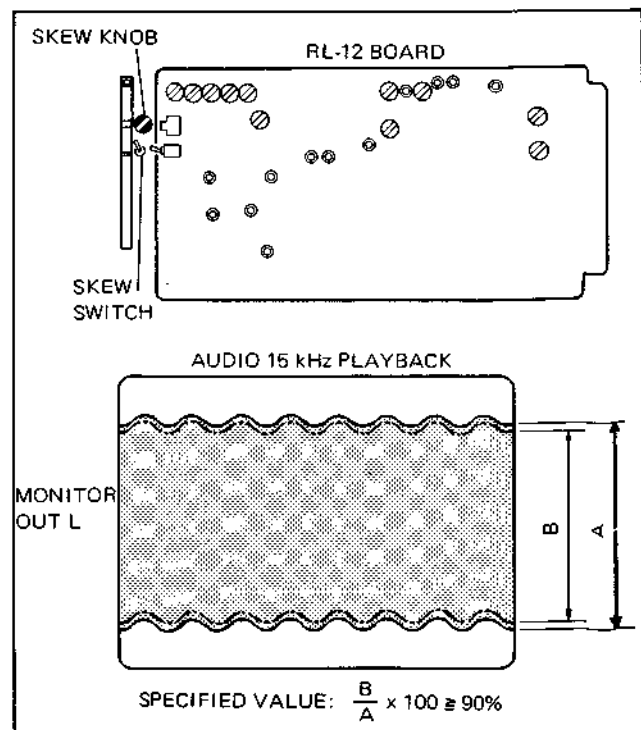
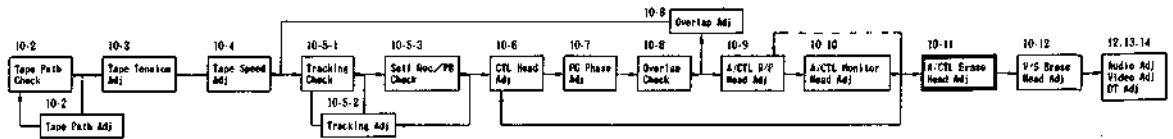


Fig. 10-40. Audio/CTL Monitor Head Fluctuation Adjustment

BVH-2000(U/C)/PS/PM
BVH-2180(U/C)/PS/PM
BVH-2500(U/C)/P



10-11. AUDIO/CTL ERASE HEAD HEIGHT ADJUSTMENT

Preliminary Information

- A. When the height of the audio/CTL erase head has been changed or when the height of the guides has been adjusted by performing the tape path adjustment, check the height of the audio/CTL erase head.
- B. When replacing the audio/CTL erase head, refer to Section 3-22. When performing the adjustment after replacing the erase head, follow the flowchart shown in Section 3-24-1 and then perform the alignment in Section 12; Audio Signal System Alignment.

Check

1. Set AUDIO MONITOR select button to **AUDIO-1** / **AUDIO-2**.
2. Record 1 kHz signal on the audio-1 and audio-2 channels.
3. Rewind the segment recorded in Step 2 and record no signal on the audio-1 and audio-2 channels.
4. Connect the headphones and play back the segment of no signal recorded in Step 3.
Check that 1 kHz signal is not heard even if MONITOR/PHONES level control is set to maximum. If the signal is heard, adjust as follows.

Adjustment

5. Loosen the adjustment release screw 1/2 to 1 turn.
6. Change the head height by turning the height adjustment screw a little. After tightening the adjustment release screw, check the height of the head by performing Steps 2 to 4 again.

Note: The adjustment release screw should be tightened with a torque of 14 to 16 kg-cm.

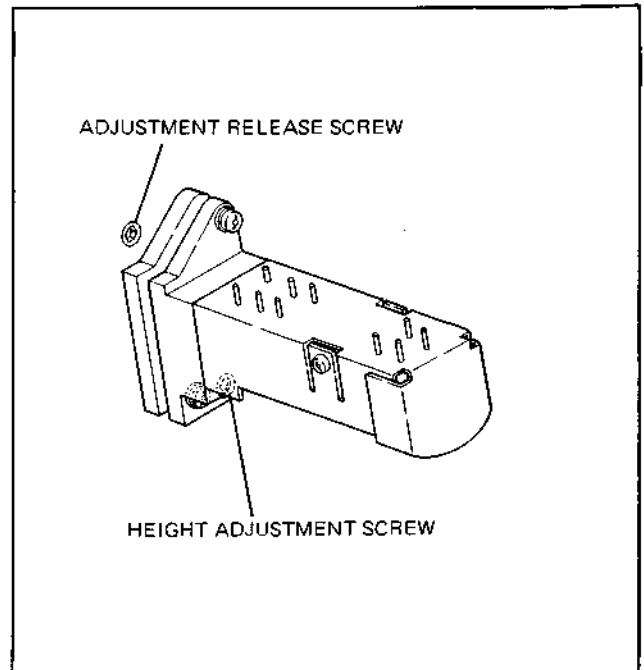
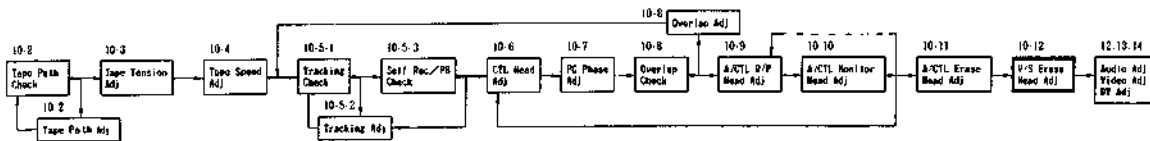


Fig. 10-41. Audio/CTL Erase Head Height Adjustment



10-12. V/S ERASE HEAD HEIGHT ADJUSTMENT

Preliminary Information

- A. When the taper guide is replaced or guide roller 2 is adjusted, it is necessary to adjust the height of V/S erase head.
- B. If the audio-1 and audio-3 channels are not influenced by V/S erase head when a video signal is recorded in the ASSEMBLE mode, the height of V/S erase head is regarded as correct.
- C. If the harness of the audio/CTL (R/P, monitor and erase) heads is not firmly clamped with a harness holder, the leads of the V/S erase head may be caught on the holder and it will prevent the V/S erase head moving. When the erasure of the video and sync signals is incomplete, close the slant guides and check that the harness holder is holding the harness of the audio/CTL heads tightly and the V/S erase head can move smoothly.

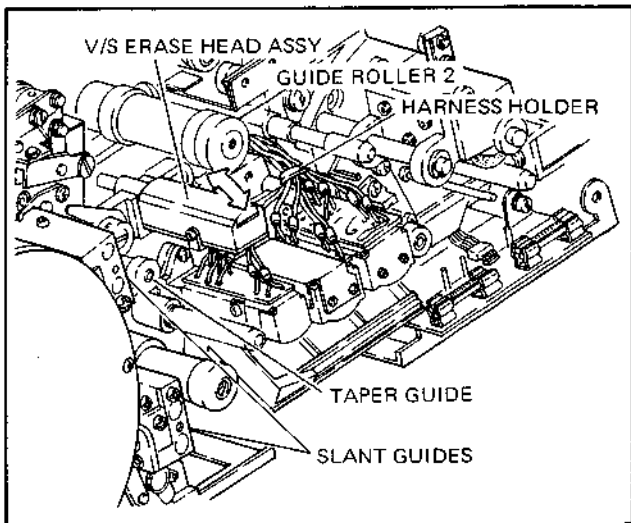


Fig. 10-42. Confirmation of Harness Clamp

Check

1. Record 3 kHz signal on the audio-1 and -3 channels.
2. Rewind half of the segment recorded in Step 1, and record a video signal on the video and sync channels in the ASSEMBLE mode.
3. Connect the oscilloscope to AUDIO-1 and AUDIO-3 LINE OUTPUTs.
4. Playing back the segment recorded in Steps 1 and 2, check that the waveform does not change at the IN point. If the waveform changes, perform the following adjustment.

Adjustment

5. Take off V/S erase head assy by removing V/S screw.
6. Change the thickness of the spacer.
 - a. If the audio-1 waveform changes, decrease the thickness of the spacer.
 - b. If the audio-3 waveform changes, increase the thickness of the spacer.

Thickness (mm)	Part No.
0.05	3-651-419-01
0.1	3-651-419-21

7. Mount V/S erase head assy referring to Fig. 10-43, and check the height of V/S erase head by performing Steps 1 to 4 again.

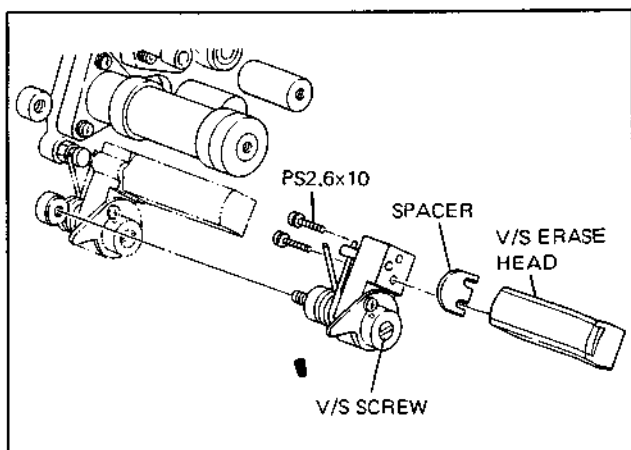
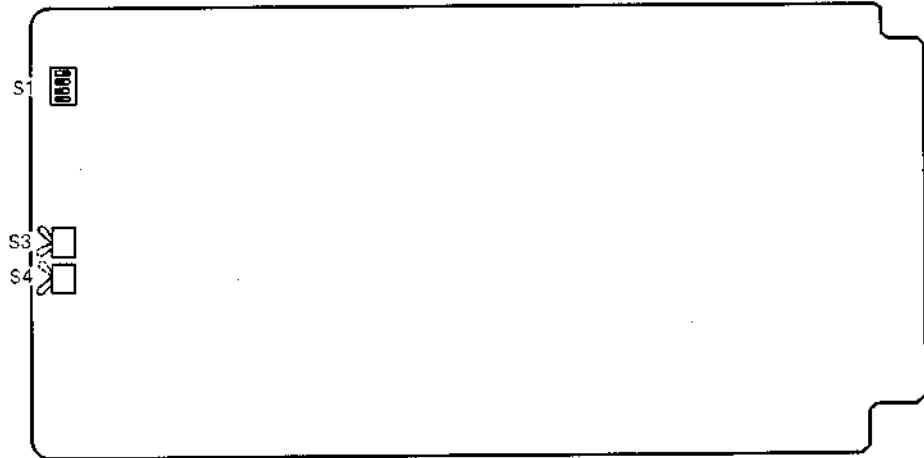


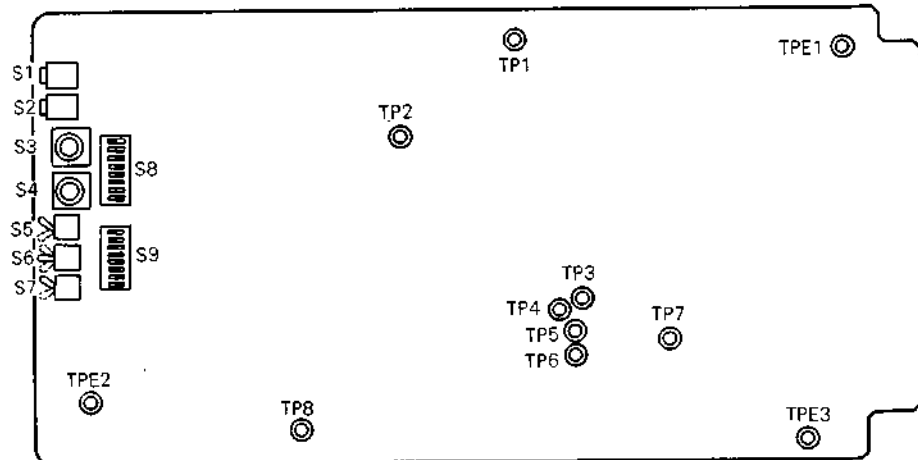
Fig. 10-43. V/S Erase Head Height Adjustment

SECTION 11 SERVO SYSTEM ALIGNMENT

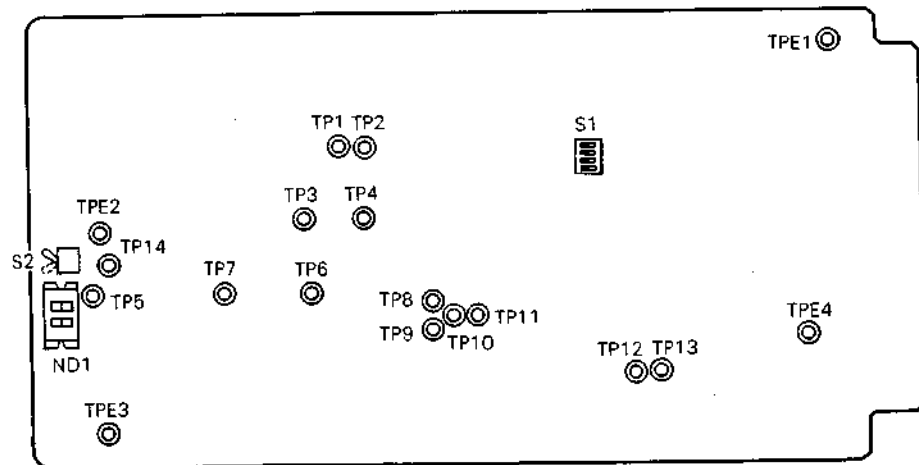
LG-02(A) Board



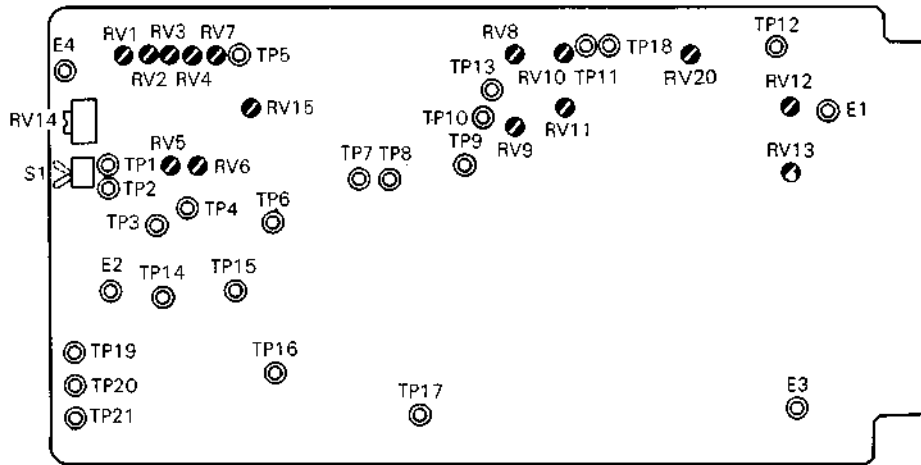
SY-80 Board



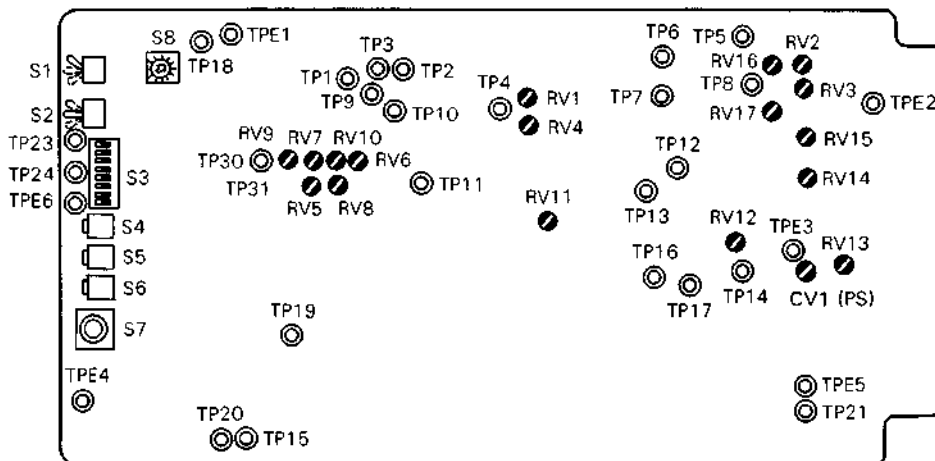
SV-43 Board



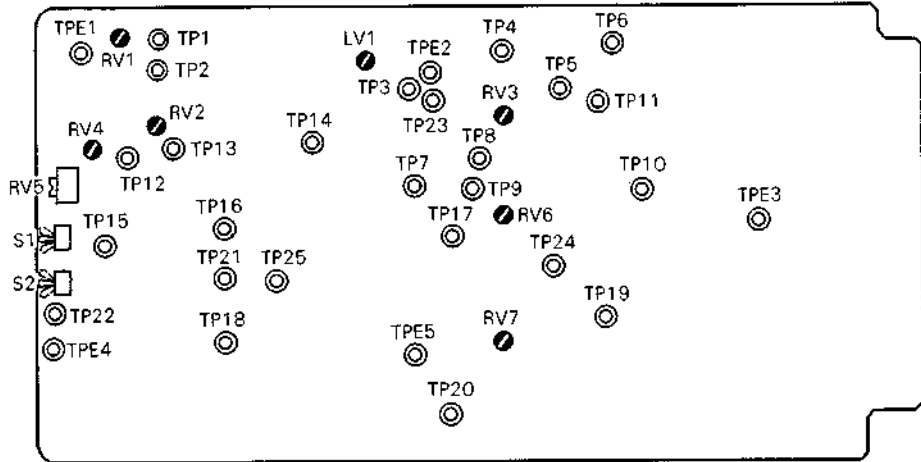
RL-12 Board



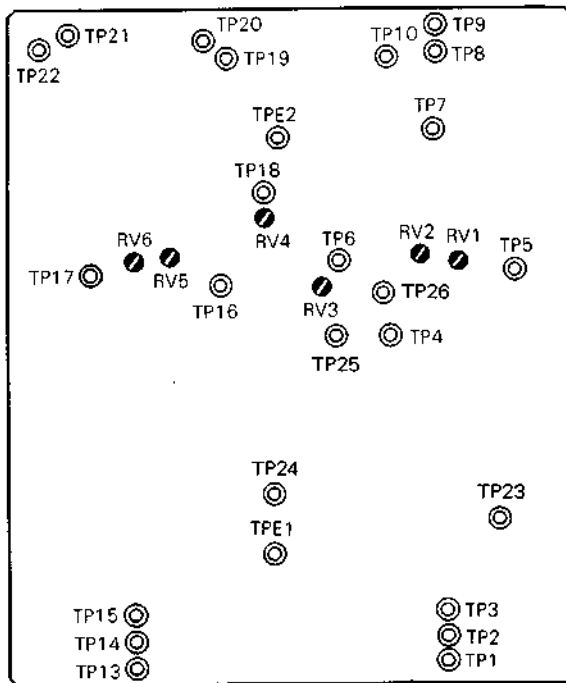
CD-17 Board



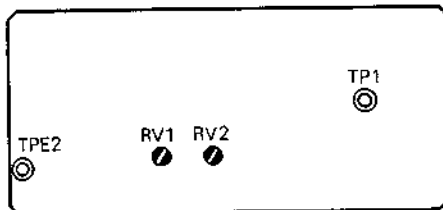
SR-15 Board



RA-05 Board



TT-01 Board



11-1. S/T-REEL AND TIMER ROLLER FG DUTY ADJUSTMENT

Connection; See section 8-4 connection 4.

Equipment; Oscilloscope

Setting of Switches & Controls;

SERVO REF Sw: INPUT

Input Signal (VIDEO IN);

COLOR BARS

Step 1.

Put a piece of paper (or equivalent) in between the tape sensor. Set the TEST switch (S4/CD-17) to position "1" and press the ENTRY switch (S7/CD-17) more than 0.5sec.

Put VTR to program Jog +3 Times Normal mode.

Step 2. Adjustment

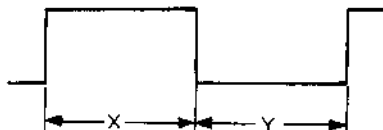
RL-12 Board

T-REEL FG (A); TP2 X = Y \odot RV5

T-REEL FG (B); TP1 X = Y \odot RV6

S-REEL FG (A); TP3 X = Y \odot RV2

S-REEL FG (B); TP14 X = Y \odot RV4



Step 3.

After adjustment, place the machine into the STOP mode.

Set the TEST-1 switch (S4/CD-17) to position "0" and press the ENTRY switch (S7/CD-17) more than 0.5sec.

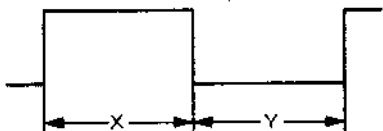
Step 4.

Playback the alignment tape.

Step 5. Adjustment

TIMER ROLLER(A); TP15 X = Y \odot RV1

TIMER ROLLER(B); TP6 X = Y \odot RV3



11-2. S-TENSION SENSOR ADJUSTMENT

Connection; See section 8-4 connection 4.

Equipment; Digital Voltmeter

Mode of VTR; STOP

Setting of Switches & Controls;

SERVO REF Sw: INPUT

Input Signal (VIDEO IN);

COLOR BARS

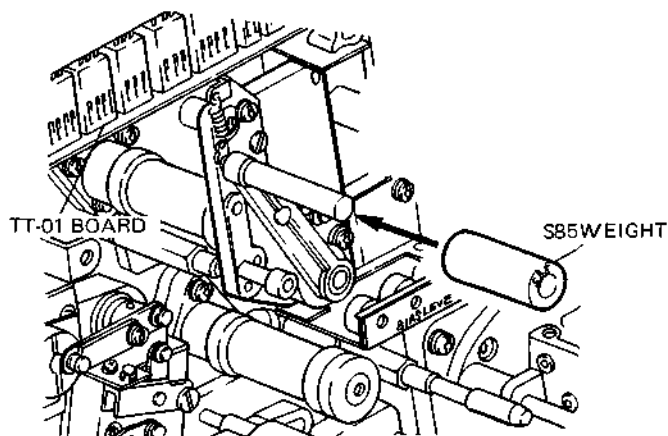
Step 1.

Prepare the Tension Adjustment Tool.

SONY Part No. J-6043-120-B

Step 2.

Put the S85 weight on the guide shaft of the S-tension arm. Hold up the S-tension arm by hand and release the hand gently.



Step 3. Adjustment RL-12 Board

TP12 = $0 \pm 30\text{mVdc}$

\odot RV12

Step 4.

Remove the S85 weight.

Step 5. Adjustment

TP12/RL-12 = $-2.6 \pm 0.15\text{Vdc}$

\odot RV1/TT-01

11-3. T-TENSION SENSOR ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Digital Voltmeter

Mode of VTR: STOP

Setting of Switches & Controls:

SERVO REF Sw: INPUT

Input Signal (VIDEO IN):

COLOR BARS

Step 1.

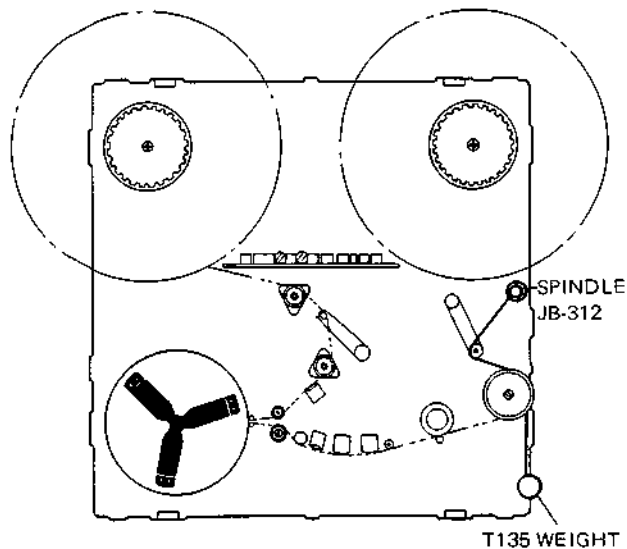
Prepare the Tension Adjustment Tool.

SONY Part No. J-6043-120-B

Step 2.

For BVH-2000, 2500

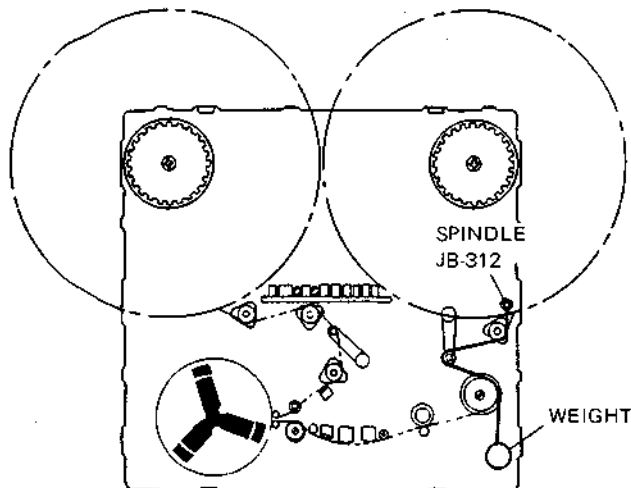
Fix the JB-312 tension adjustment spindle, and put the T135 weight on the guide shaft of the T-tension arm as shown below.



For BVH-2180

Fix the JB-312 tension adjustment spindle, and put the weight on the guide shaft of the T-tension arm as shown below.

Note. As for the weight, see section 10-3-2.



Step 3. Adjustment RL-12 Board

For BVH-2000, 2500

$$TP13 = 0 \pm 30 \text{ mVdc}$$

RV13

For BVH-2180;

$$TP13 = -0.14 \pm 0.02 \text{ Vdc}$$

RV13

Step 4

For BVH-2000, 2500

Change the weight from T135 to T240.

For BVH-2180

Remove the weight.

Step 5. Adjustment

For BVH-2000, 2500

$$TP13/RL-12 = 1.40 \pm 0.15 \text{ Vdc}$$

RV2/TT-01 Board

For BVH-2180

$$TP13/RL-12 = -1.90 \pm 0.01 \text{ Vdc}$$

RV2/TT-01 Board

Step 6.

After the adjustment, remove the tool.

11-4. A/D CONV. REFERENCE ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Digital Voltmeter

Mode of VTR: STOP

Setting of Switches & Controls:

SERVO REF Sw: INPUT

Input Signal (VIDEO IN):

COLOR BARS

Adjustment RL-12 Board

$$TP10 = 2.000 \pm 0.001 \text{ Vdc}$$

RV8

11-5. A/D CONVERTER ADJUSTMENT

Connection; See section 8-4 connection 4.

Equipment; Digital Voltmeter

Mode of VTR; STOP

Setting of Switches & Controls;

SERVO REF Sw: INPUT

Input Signal (VIDEO IN);

COLOR BARS

CAUTION:

Don't attempt to turn \odot RV9 on the RL-12 board. In case of turning, set it as shown below.

RV9/RL-12



Step 1.

Remove solder at pin-43B of the edge connector on the extender, and connect a jumper between pin-43B of edge connector and GND.

Step 2.

Connect a jumper between TP18 and GND on the RL-12 board.

Step 3. Adjustment RL-12 Board

TP11 = 2.560 ± 0.005 Vdc

\odot RV11

Step 4.

Remove the jumper from extender and solder at pin-43B.

Step 5.

Set the TEST-1 switch (S4/CD-17) to position "E" and TEST-2 switch (S5/CD-17) to position "4".

Step 6.

Press the ENTRY switch (S7/CD-17) more than 0.5 sec.

Step 7. Adjustment

7-Seg. LEDs/SV-43 = Transition from "7F" to "80"

\odot RV10/RL-12

Step 8.

After adjustment, set TEST-1/2 switches to position "0" respectively.

11-6. D/A CONVERTER ADJUSTMENT

Connection; See section 8-4 connection 4.

Equipment; Digital Voltmeter

9" Full Wound Tape

Mode of VTR; STOP

Setting of Switches & Controls;

SERVO REF Sw: INPUT

Input Signal (VIDEO IN);

COLOR BARS

Step 1.

Put a 9" full wound tape, whose end is stuck by an adhesive tape, on the S-reel table.

Do not thread the tape.

Step 2. Adjustment RL-12 Board

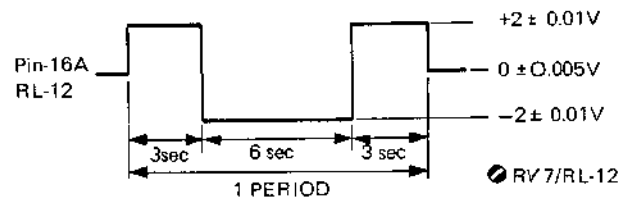
Edge connector pin-16A = 0 ± 0.005 Vdc

\odot RV15

Step 3.

Set the TEST-1 switch (S4/CD-17) to position "2", press the ENTRY switch (S7/CD-17) and confirm the level changes at pin-16A/RL-12 as shown below.

If the top and bottom levels are not satisfied the specifications, adjust \odot RV7/RL-12.



Step 4.

After adjustment, repeat step 2 and make sure step 1.

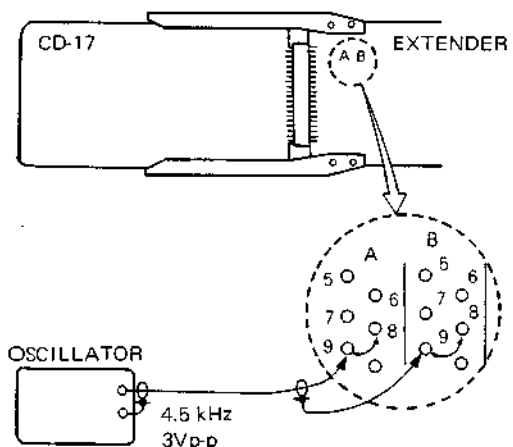
Step 5.

Set the TEST-1 switch (S4/CD-17) to position "0" and press the RESET switch (S3/SY-80).

11-7. DRUM FG AMPLIFIER ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Audio Oscillator
 Mode of VTR; STOP
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 Input Signal (VIDEO IN);
 COLOR BARS

- Step 1.**
 Disconnect a 8-pin connector CN292 from the Drum Motor Assy.
- Step 2.**
 Feed 4.5 kHz/3 Vp-p sine-wave signal at pin-8 and pin-9 on the CD-17 board through the Extender as shown below.



Step 3. Adjustment CD-17 Board
 PHASE DIFFERENCE = less than 0.3 μ sec
 BETWEEN TP12 & TP13 \bullet RV14/ \bullet RV15

Step 4.
 Connect CN292 to the Drum Motor Assembly.

11-8. DRUM VELOCITY ADJUSTMENT

Connection; See section 8-4 connection 4.
 Mode of VTR: STANDBY ON
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 Input Signal (VIDEO IN);
 COLOR BARS

- Step 1.**
 Set the TEST-1 switch (S4/CD-17) to position "D" and press the ENTRY switch (S7/CD-17) more than 0.5 sec.
- Step 2.**
 Place the machine into the STANDBY ON mode.
- Step 3. Adjustment**
 7-Seg. LEDs/SV-43 = "FD", "FE", "FF", "00", "01" or "02"
 \bullet RV4/CD-17
- Step 4.**
 After adjustment set TEST-1 switch (S4/CD-17) to position "0".

11-9. CAPSTAN FG AMPLIFIER ADJUSTMENT

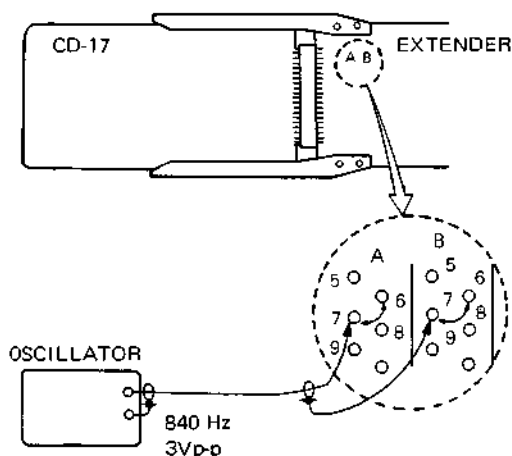
Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Audio Oscillator
 Mode of VTR; STOP
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.

Disconnect a 10-pin connector CN106 from the Capstan Motor Assy.

Step 2.

Feed 840 Hz/3 Vp-p sine-wave signal at pin-6 and pin-7 on the CD-17 board through the Extender as shown below.



Step 3. Adjustment CD-17 Board

PHASE DIFFERENCE = less than 1.5 μ sec
 BETWEEN TP6 & TP7 \odot RV16/ \odot RV17

Step 4.

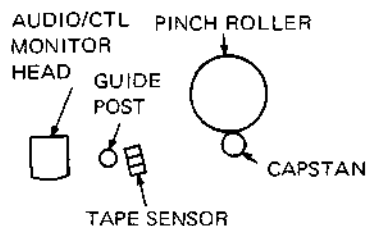
Connect CN106 to the Capstan Motor Assy.

11-10. CAPSTAN FG DUTY ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; Program Jog +10/30 Times Normal
 (NTSC and PM)
 Program Jog +8/25 Times Normal (PS)
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.

Remove the S and T reels.
 Place a piece of paper in the tape sensor.



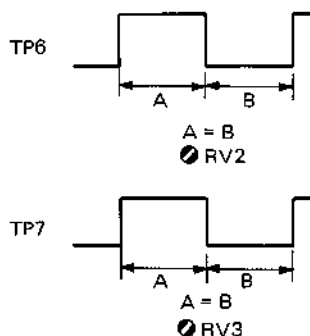
Step 2.

Set the TEST-1 switch (S4/CD-17) to position "1" and press the ENTRY switch (S7/CD-17) more than 0.5 sec.

Step 3.

Place the machine into Program Jog +10/30(+8/25 for PS) times normal mode.

Step 4. Adjustment CD-17 Board



Step 5.

After adjustment, remove a piece of paper from the tape sensor, set the TEST-1 switch (S4/CD-17) to position "0" and press the ENTRY switch (S7/CD-17) more than 0.5 sec.

11-11. CAPSTAN VELOCITY AND FG LEVEL ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; PLAY (use Alignment Tape)
 Setting of Switches & Controls;
 SERVO REF Sw :INPUT
 REC INHIBIT Sw: ON
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.
 Play back the 100% WHITE portion of alignment tape.

Step 2.
 Set the TEST-1 switch (S4/CD-17) to position "B" and press the ENTRY switch (S7/CD-17) more than 0.5 sec.
 After passing more than 5 sec, perform RV1 (CD-17) adjustment.

Step 3. Adjustment
 TP1/CD-17 = $0 \pm 0.1V_{dc}$
 RV1/CD-17

Step 4.
 Set the TEST-1 switch (S4/CD-17) to position "0" and press the ENTRY switch (S7/CD-17) more than 0.5 sec.
 After passing more than 5 sec, check that the voltage at TP1 (CD-17) for $0 \pm 0.2 V_{dc}$. If not, repeat from step 2.

Step 5.
 (For BVH-2500/P)
 TP30/CD-17 = $5.5 \pm 0.2 V_{p-p}$
 RV7
 TP31/CD-17 = $5.5 \pm 0.2 V_{p-p}$
 RV10

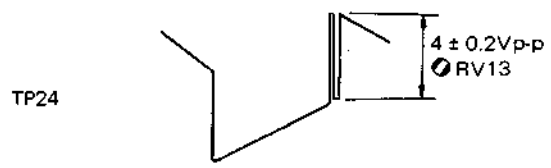
11-12. PB CTL LEVEL ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; See respective steps.
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 REC INHIBIT Sw: ON
 Input Signal (VIDEO IN);
 COLOR BARS

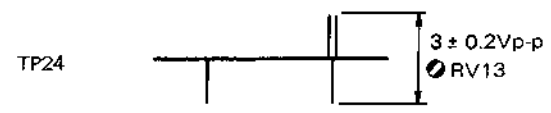
CD-17 Board

Step 1. Adjustment
 Play back the 100% WHITE portion of the alignment tape.

For NTSC/PAL-M

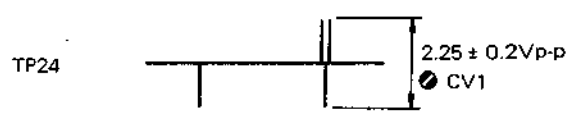


For PAL/SECAM



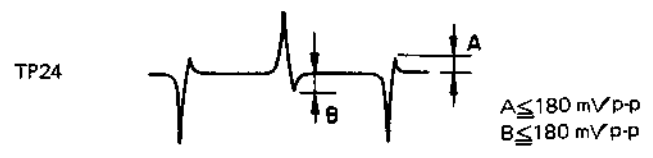
Step 2. Adjustment

Place the VTR into the SHUTTLE -50 times normal mode.



Step 3. Check

After adjustment, place the VTR into the SHUTTLE -16 times normal mode.



If the levels are out of the specifications, return to the step 2 and readjust CV1, and perform the step 3 again.

11-13. REC CTL LEVEL ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Oscilloscope

Mode of VTR: REC

Setting of Switches & Controls:

SERVO REF Sw: INPUT

REC INHIBIT Sw: OFF

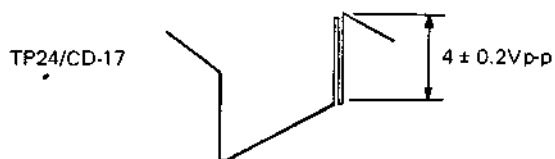
Input Signal (VIDEO IN);

COLOR BARS

Step 1.

Place the machine into the REC mode and play it back.

For NTSC/PAL-M



For PAL/SECAM



Step 2.

If it is out of specifications, place the machine into the REC mode and adjust \odot RV11/CD-17 while recording.

Play back a recorded portion and repeat the adjustment until satisfy the specifications as shown in step 1.

11-14. CONF CTL LEVEL ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Oscilloscope

Mode of VTR: REC

Setting of Switches & Controls;

TAPE/EE Sel: TAPE

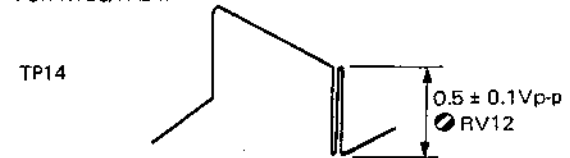
REC INHIBIT Sw: OFF

Input Signal (VIDEO IN);

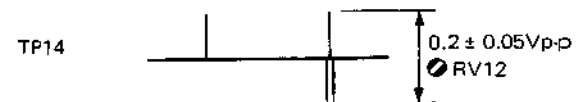
COLOR BARS

Adjustment CD-17 Board

FOR NTSC/PAL-M



For PAL/SECAM



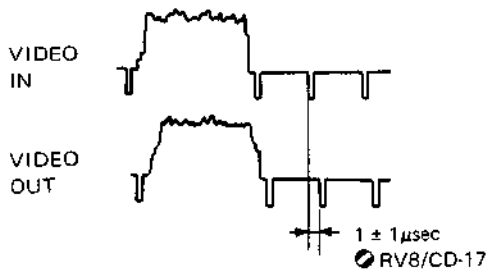
11-15. DRUM PG PHASE ADJUSTMENT

11-15-1. R/P Head

- Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; PLAY (use Alignment Tape)
 Setting of Switches & Controls;
 HEAD Sel: R/P (For BVH-2000/PS/PM and BVH-2180/PS/PM)
 R/P MODE Sel: FRM or FIELD (For BVH-2500/P)
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 TRACKING Control: OFF (push)
 REC INHIBIT Sw: ON
 ADV Sw (S1/CD-17): OFF
 S3-2 (CD-17): OFF
 S3-3 (CD-17): ON

Input Signal (VIDEO IN);
 COLOR BARS

Step 1. Adjustment



If the adjustment can not be made within the variable range of RV8, proceed to next step.

Step 2.

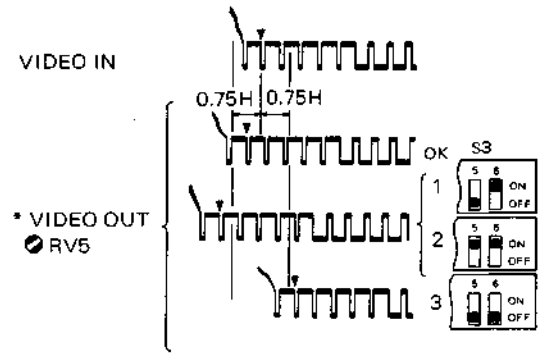
Set RV8/CD-17 to mid-way of the variable range and perform the following adjustment.

Step 3. Adjustment CD-17 Board

PHASE DIFFERENCE BETWEEN VIDEO IN & OUT = $0 \pm 0.75H$ RV5

If not, set S3-5 and S3-6 as follows, and adjust RV5 again.

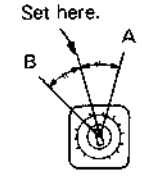
- | | | |
|-----------------------------|-------|------|
| | S3-5 | S3-6 |
| 1. OUT is in advance of IN. | → OFF | ON |
| 2. If 1 is not effected. | → ON | ON |
| 3. IN is in advance of OUT. | → OFF | OFF |



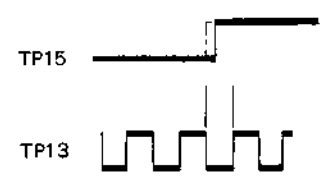
* In case of 10, 12 or 14 model, there is no sync portion.

Step 4.

Turn RV5 to CW/CCW and memorize the positions A and B of the RV5 when the VIDEO OUT phase to be shifted. Set RV5 to mid-way of the both positions.



Step 5. Adjustment CD-17 Board



Match the positive going edge at TP15 to the nearest positive or negative going edge at TP13 by RV5.

Step 6. Adjustment

Adjust RV8/CD-17 to obtain the phase difference at the VIDEO IN and VIDEO OUT for $1 \pm 1 \mu\text{sec}$.

11-15-2. PLAY Head

Connection: See section 8-4 connection 4.

Equipment: Oscilloscope

Mode of VTR; PLAY (use Alignment Tape)

Setting of Switches & Controls;

HEAD Sel: PLAY (For BVH-2000/PS/PM
and BVH-2180/PS/PM)

R/P MODE Sel: CONF HEAD
(For BVH-2500/P)

SERVO REF Sw: INPUT

TAPE/EE Sel: TAPE/EE

REC INHIBIT Sw: ON

ADV Sw (S1/CD-17): OFF

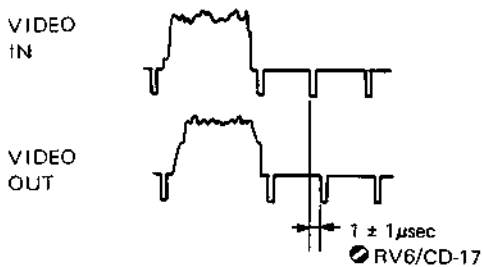
S3-2 (CD-17): OFF

S3-3 (CD-17): ON

Input Signal (VIDEO IN);

COLOR BARS

Step 1. Adjustment



Step 2.

Reset S3-2 (CD-17) to "ON" and ADV switch (S1/CD-17) to "BVT" or "BKH" position.

(In case of 10, 12 or 14 model, reset to "BKH" position.)

11-16. TAPE SPEED ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment; Frequency Counter

Mode of VTR; REC

Setting of Switches & Controls;

SERVO REF Sw: INPUT

TAPE/EE Sel: TAPE/EE

REC INHIBIT Sw: OFF

Input Signal (VIDEO IN);

COLOR BARS

Adjustment CD-17 Board

TP6 = $839.4 \pm 0.3\text{Hz}$ (NTSC/PAL-M)

$825.0 \pm 0.3\text{Hz}$ (PAL/SECAM)

RV9

11-17. PEDESTAL CLAMP ADJUSTMENT

Connection; See section 8-4 connection 4.

Equipment; Oscilloscope

Mode of VTR; STOP (Auto EE)

Setting of Switches & Controls;

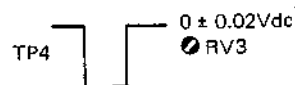
SERVO REF Sw: INPUT

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

COLOR BARS

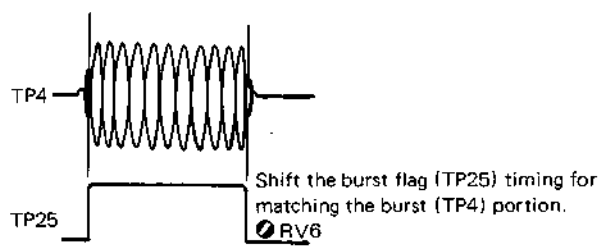
Adjustment SR-15 Board



11-18. BURST GATE ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; STOP (Auto EE)
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 COLOR BARS

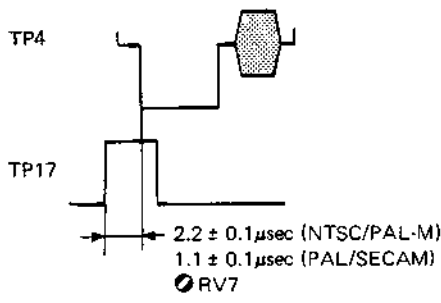
Adjustment SR-15 Board



11-19. H GATE ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; STOP (Auto EE)
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 COLOR BARS

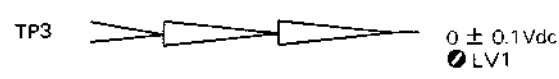
Adjustment SR-15 Board



11-20. PHASE-LOCKED-LOOP ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Oscilloscope
 Mode of VTR; STOP (Auto EE)
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 COLOR BARS

Adjustment SR-15 Board



11-21. SC PHASE ADJUSTMENT

Connection; See section 8-4 connection 4.
 Equipment; Digital Voltmeter
 Mode of VTR; STOP (Auto EE)
 Setting of Switches & Controls;
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 SC Sw (S1/SR-15): FIX → MANU
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.
 Set the SC switch (S1/SR-15) to "FIX" position.

Step 2. Adjustment SR-15 Board
 TP1 = $-1.55 \pm 0.02 \text{Vdc}$ (NTSC/PAL-M)
 $-1.10 \pm 0.02 \text{Vdc}$ (PAL/SECAM)
 Ⓞ RV4

TP2 = $0 \pm 0.1 \text{Vdc}$ (NTSC/PAL-M/PAL/SECAM)
 Ⓞ RV2

Step 3.
 Set the SC switch (S1/SR-15) to "MANU" position.

Step 4. Adjustment SR-15 Board
 TP1 = $-1.95 \pm 0.02 \text{Vdc}$ (NTSC/PAL-M)
 $-1.50 \pm 0.02 \text{Vdc}$ (PAL/SECAM)
 Ⓞ RV5

TP2 = $2.0 \pm 0.1 \text{Vdc}$ (NTSC/PAL-M/PAL/SECAM)
 Ⓞ RV1

11-22. S-REEL AMPLIFIER OFFSET ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Digital Voltmeter

Mode of VTR: STOP (Auto EE)

Setting of Switches & Controls;

SERVO REF Sw: INPUT

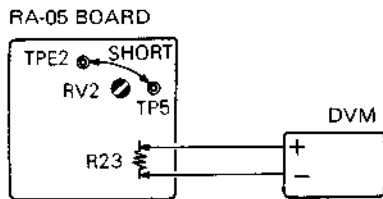
TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

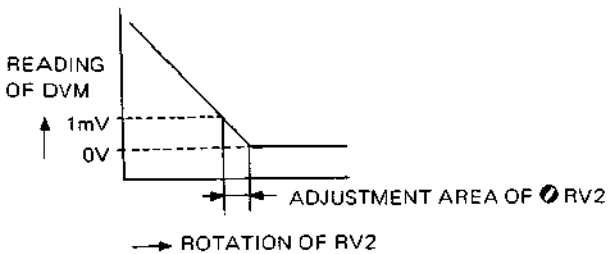
COLOR BARS

Step 1.

Connect a jumper between TP5 and GND and connect a digital voltmeter to R23 on the RA-05 board.



Step 2. Adjustment RA-05 Board



Step 3.

Remove the jumper.

11-23. S-REEL NORMAL TORQUE ADJUSTMENT

For RA-05 Board No. 1-606-694-11 and 12

Connection: See section 8-4 connection 4.

Equipment: Oscilloscope

Mode of VTR: Program Jog $\times 1$ FWD (use Alignment Tape)

Setting of Switches & Controls;

SERVO REF Sw: INPUT

TAPE/EE Sel: TAPE/EE

REC INHIBIT Sw: ON

Input Signal (VIDEO IN);

COLOR BARS

Adjustment RA-05 Board

IC5 pin-6



BVH-2000(U/C)/PS/PM

BVH-2180(U/C)/PS/PM

BVH-2500(U/C)/P

11-24. S-REEL MOTOR TORQUE ADJUSTMENT

Connection: See section 8-4 connection 4.

Equipment: Oscilloscope

9" Full Wound Tape

Mode of VTR: STOP

Setting of Switches & Controls;

SERVO REF Sw: INPUT

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

COLOR BARS

Step 1.

Load the 9" full wound tape, whose end is struck by an adhesive tape, on the S-reel table.

Do not thread the tape.

Step 2.

Set the TEST-1 switch (S4/CD-17) to position "2".

Step 3.

Keep on pressing the ENTRY switch (S7/CD-17) until the S-reel starts rotation.

Step 4.

After passing about 12 sec the S-reel stops its rotation and the 7-Seg. LEDs/SV-43 display the data.

Step 5. Adjustment

7-Seg. LEDs/SV-43 = "C0", "C1", "C2", "C3", "C4", "C5", "C6", "C7", "C8", "C9", "CA", "CB", "CC", "CD", "CE" or "CF"

●RV1/RA-05

Step 6.

After adjustment remove the 9" full wound tape.

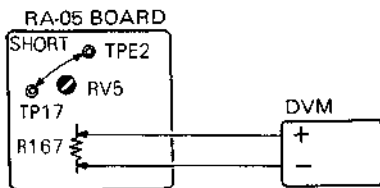
Set the TEST-1 switch (S4/CD-17) to position "0" and press the RESET switch (S3/SY-80).

11-25. T-REEL AMPLIFIER OFFSET ADJUSTMENT

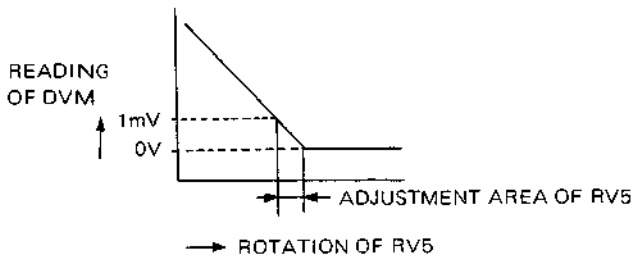
Connection: See section 8-4 connection 4.
 Equipment: Digital Voltmeter
 Mode of VTR; STOP (Auto EE)
 Setting of Switches & Controls:
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.

Connect a jumper between TP17 and GND and connect a digital voltmeter to R167 on the RA-05 board.



Step 2. Adjustment RA-05 Board



Step 3.

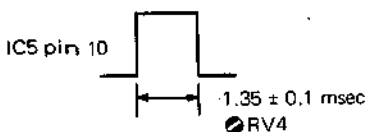
Remove the jumper.

11-26. T-REEL NORMAL TORQUE ADJUSTMENT

For RA-05 Board No. 1-606-694-11 and 12

Connection: See section 8-4 connection 4.
 Equipment: Oscilloscope
 Mode of VTR; Program Jog x1 FWD (use Alignment Tape)
 Setting of Switches & Controls:
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 REC INHIBIT Sw: ON
 Input Signal (VIDEO IN);
 COLOR BARS

Adjustment RA-05 Board



11-27. T-REEL MOTOR TORQUE ADJUSTMENT

Connection: See section 8-4 connection 4.
 Equipment: Oscilloscope
 9" Full Wound Tape
 Mode of VTR; STOP
 Setting of Switches & Controls:
 SERVO REF Sw: INPUT
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.

Load the 9" full wound tape, whose end is stuck by an adhesive tape, on the T-reel table.
 Do not thread the tape.

Step 2.

Set the TEST-1 switch (S4/CD-17) to position "3".

Step 3.

Keep on pressing the ENTRY switch (S7/CD-17) until the T-reel starts rotation.

Step 4.

After passing about 12sec the T-reel stops its rotation and the 7-Seg. LEDs/SV-43 display the data.

Step 5. Adjustment

7-Seg. LEDs/SV-43 = "C0", "C1", "C2", "C3", "C4", "C5", "C6",
 "C7", "C8", "C9", "CA", "CB", "CC",
 "CD", "CE" or "CF"
 ●RV6/RA-05

Step 6.

After adjustment remove the 9" full wound tape.
 Set the TEST-1 switch (S4/CD-17) to position "0" and press the RESET switch (S3/SY-80).

11-28. S-REEL TENSION OFFSET ADJUSTMENT

Connection: See section 8-4 connection 4.
Equipment: Digital Voltmeter
Mode of VTR: STANDBY ON
Input Signal (VIDEO IN);
Don't care.

Applicable Serial No.

BVH-2000: # 22501 & up
BVH-2000PS: # 12201 & up
BVH-2000PM: # 20201 & up
BVH-2180: # 10001 & up
BVH-2180PS: # 10001 & up
BVH-2180PM: # 10001 & up
BVH-2500: # 10101 & up
BVH-2500P: # 10001 & up

Adjustment RL-12 Board

TP7 = 0 ± 50 mV
● RV20

11-29. IP MOTOR ADJUSTMENT

Connection: See section 8-4 connection 4.
Equipment: Oscilloscope
Frequency Counter (via Oscilloscope)
Mode of VTR: SHUTTLE +1/2
Input Signal (VIDEO IN);
Don't care.

Step. 1

Open the rear panel, remove the IP Driving Moter Assy from VTR, but don't remove the CN024.

Step. 2 Adjustment MOTOR Board

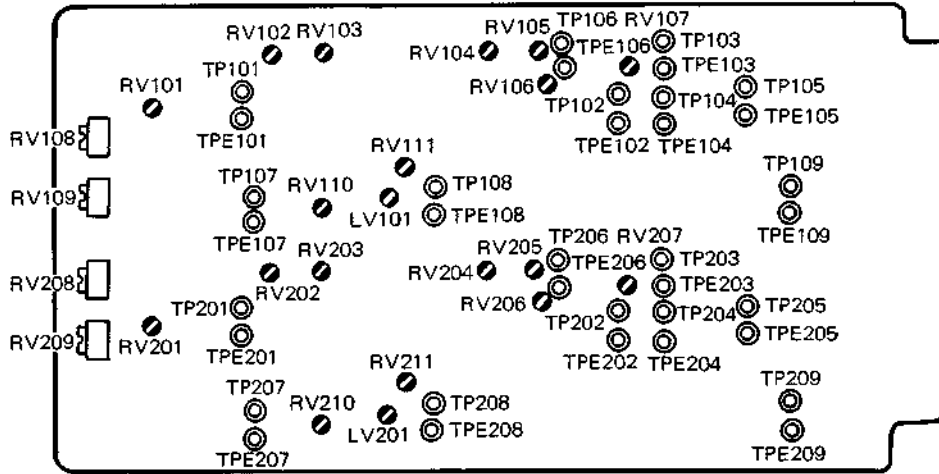


TP - φ1 = 80 ± 5 Hz
● RT301

SECTION 12

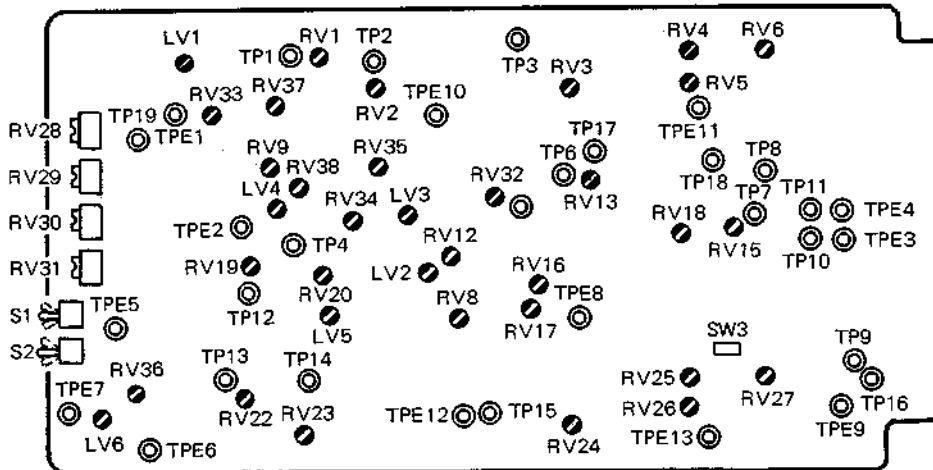
AUDIO SIGNAL SYSTEM ALIGNMENT (FOR 00, 10, 02 and 12 MODELS)

AU-27 Board

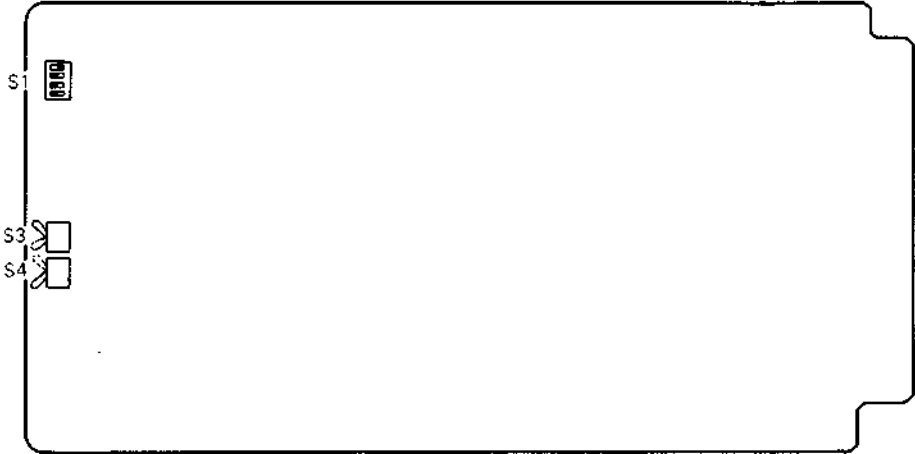


AE-03 Board

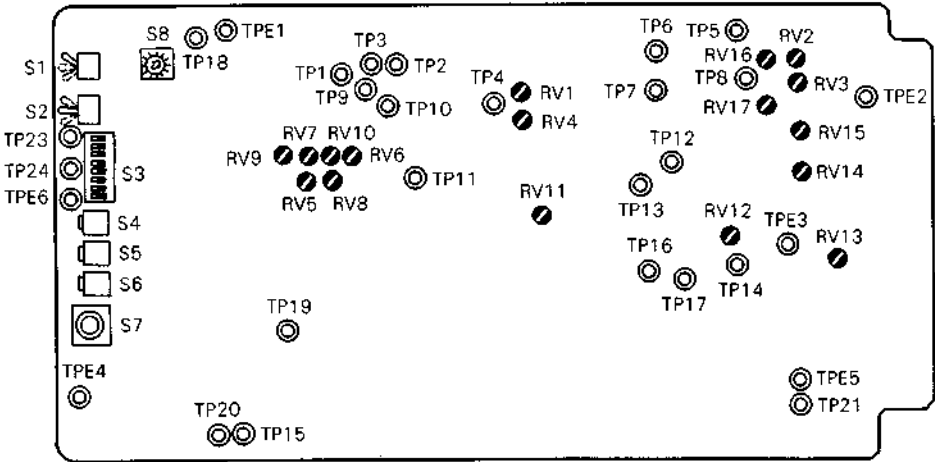
04 00/02
Model Model



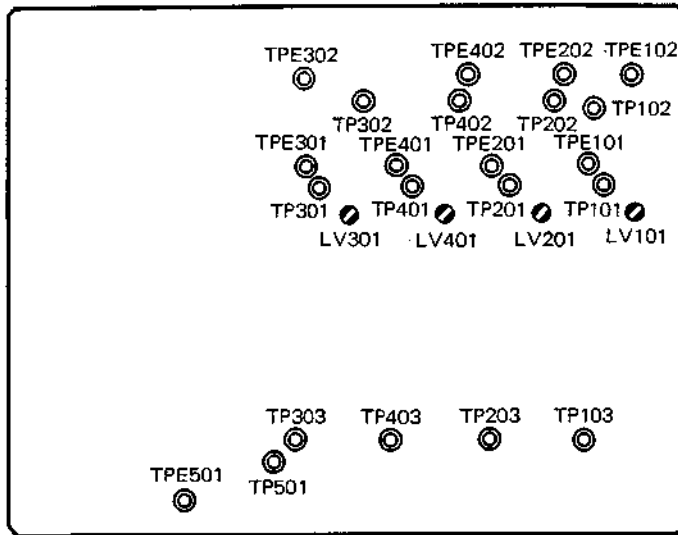
LG-02(A) Board



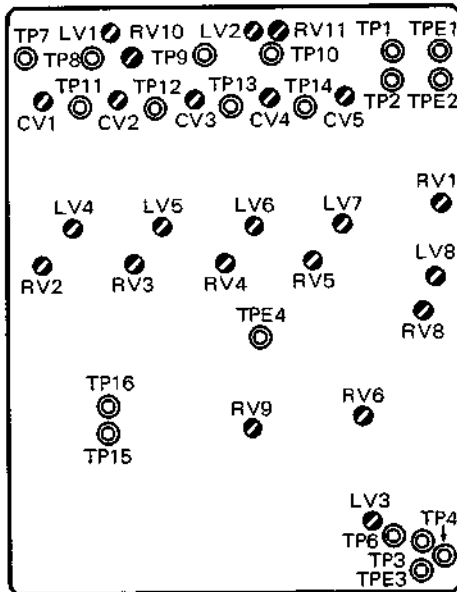
CD-17 Board



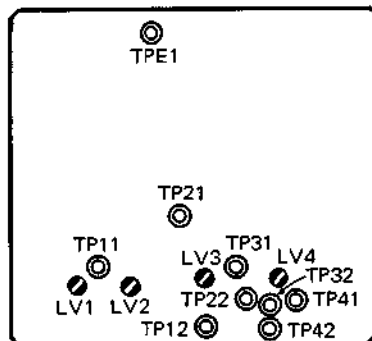
AP-12 Board



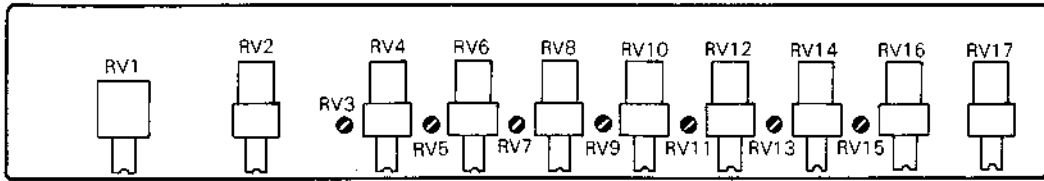
BE-02 Board



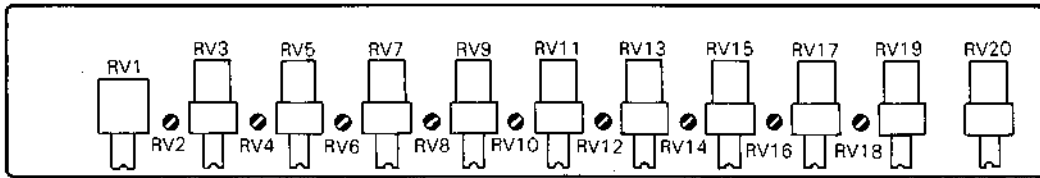
BE-03 Board



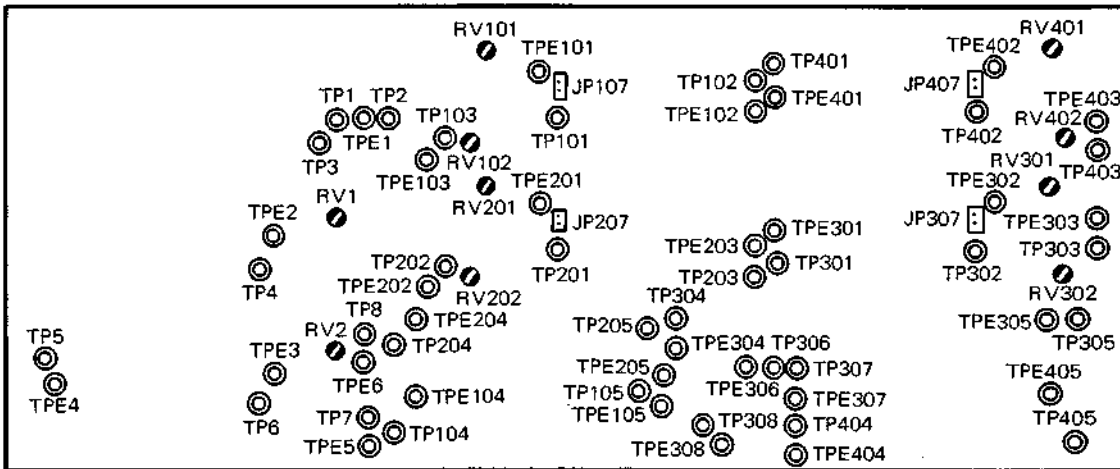
VR-05 Board



VR-07 Board ; For 04 model



LA-02 Board



12-1. LINE AMPLIFIER OFFSET AND OUTPUT LEVEL ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Digital Voltmeter
Distortion Analyzer

Mode of VTR: STOP

Setting of Switches & Controls:
TAPE/EE Sel: INPUT
AUDIO-1/2/3 REC Cont: push
A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN):
no signal → 1 kHz/+8 dBm

Step 1. Line Amplifier Offset Adjustment

Disconnect the AUDIO-1/2/3 LINE INPUT connectors.
Pull out JP107, 207, 307 and CN608 on the LA-02 board.

	LA-02 Board	DVM
AUDIO-1:	TP101-TPE101	= 0 ± 1 mVdc ⓄRV101/LA-02
AUDIO-2:	TP201-TPE201	= 0 ± 1 mVdc ⓄRV201/LA-02
AUDIO-3:	TP302-TPE302	= 0 ± 1 mVdc ⓄRV301/LA-02
R Monitor:	TP4-TPE2	= 0 ± 1 mVdc ⓄRV1/LA-02
L Monitor:	TP6-TPE3	= 0 ± 1 mVdc ⓄRV2/LA-02

Step 2. Line Output Level Adjustment

Feed +8 dBm at 1 kHz to AUDIO-1/2/3 LINE INPUT connectors and plug in JP107, 207, 307 and CN608 on the LA-02 board.

	LA-02 Board	DVM
AUDIO-1:	TP103-TPE103	= 77.46 ± 1 mV ⓄRV3/VR-05
AUDIO-2:	TP202-TPE202	= 77.46 ± 1 mV ⓄRV7/VR-05
AUDIO-3:	TP303-TPE303	= 77.46 ± 1 mV ⓄRV11/VR-05

	Distortion Analyzer
AUDIO-1 LINE OUTPUT	= $+8 \pm 0.1$ dBm ⓄRV102/LA-02
AUDIO-2 LINE OUTPUT	= $+8 \pm 0.1$ dBm ⓄRV202/LA-02
AUDIO-3 LINE OUTPUT	= $+8 \pm 0.1$ dBm ⓄRV302/LA-02

12-2. AUDIO LEVEL METER CALIBRATION

Connection: See section 8-4 connection 5.

Equipment: Unnecessary

Mode of VTR: STOP

Setting of Switches & Controls:
TAPE/EE Sel: INPUT
A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN):
1 kHz/+8 dBm

Adjustment

AUDIO LEVEL METER = 0 VU \pm 0.2 dB
AUDIO-1: ⓄRV107/AU-27
AUDIO-2: ⓄRV207/AU-27
AUDIO-3: ⓄRV3/AE-03

12-3. PB LEVEL CONTROLS CALIBRATION

Connection: See section 8-4 connection 5.

Equipment: Distortion Analyzer

Mode of VTR: PLAY (Use alignment tape.)

Setting of Switches & Controls:
AUD-1/2/3 PB Cont: push
REC INHIBIT Sw: ON
A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN):
Don't care.

Adjustment

Push AUDIO-1/2/3 PB level controls. Play back 0 VU for NTSC, +8 dBm for PAL/SECAM/PAL-M at 1 kHz of alignment tape and adjust as follows.

AUDIO LINE OUTPUT = $+8 \pm 0.1$ dBm
AUDIO-1: ⓄRV5/VR-05
AUDIO-2: ⓄRV9/VR-05
AUDIO-3: ⓄRV13/VR-05

Adjustment of ⓄRV5, RV9 and RV13 can be done by opening the function control panel (Refer to section I).

12-4. PB FREQ. RESPONSE ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Distortion Analyzer

Mode of VTR; PLAY (Use alignment tape.)

Setting of Switches & Controls:

AUDIO-1/2/3 PB Cont: pull

REC INHIBIT Sw: ON

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN):

Don't care.

Step 1.

Set A-3 SEL switch (S1/AE-03) to LINE and play back -10 VU for NTSC, -2 dBm for PAL/SECAM/PAL-M at 1 kHz of alignment tape.

Pull AUDIO-1/2/3 PB level controls and set AUDIO-1/2/3 LINE OUTPUT levels as follows.

AUDIO LINE OUTPUT = -2 dBm

AUDIO-1 PB Cont (RV6/VR-05)

AUDIO-2 PB Cont (RV10/VR-05)

AUDIO-3 PB Cont (RV14/VR-05)

Step 2.

Play back -10 VU for NTSC, -2 dBm for PAL/SECAM/PAL-M at 10 kHz of alignment tape.

AUDIO LINE OUTPUT = $-2^{+1.5}_{-3.0}$ dBm

AUDIO-1: RV102/AU-27

AUDIO-2: RV202/AU-27

AUDIO-3: RV1/AE-03

Step 3.

Play back -10 VU for NTSC, -2 dBm for PAL/SECAM/PAL-M at 50 Hz of alignment tape.

AUDIO LINE OUTPUT = $-2^{+1.5}_{-3.0}$ dBm

AUDIO-1: RV103/AU-27

AUDIO-2: RV203/AU-27

AUDIO-3: RV2/AE-03

Step 4.

Play back -10 VU for NTSC, -2 dBm for PAL/SECAM/PAL-M at 100 Hz of alignment tape and check the AUDIO-1/2/3 LINE OUTPUT levels.

AUDIO-1/2/3 LINE OUTPUT = $-2^{+1.5}_{-3.0}$ dBm

If not, repeat steps 3 and 4.

Step 5.

Play back -10 VU for NTSC, -2 dBm for PAL/SECAM/PAL-M at 50 Hz through 15 kHz of alignment tape continuously and check the frequency response.

AUDIO-1/2/3 LINE OUTPUT = $-2^{+1.5}_{-3.0}$ dBm

If not, repeat steps 1 through 5.

Step 6.

After adjustment, perform section 12-3 "PB Level Controls Calibration".

12-5. PB CTL LEVEL ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Oscilloscope

Mode of VTR: PLAY (Use alignment tape.)

Setting of Switches & Controls:

REC INHIBIT Sw: ON

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment CD-17 Board

Play back 100% WHITE of alignment tape.

For NTSC/PAL-M

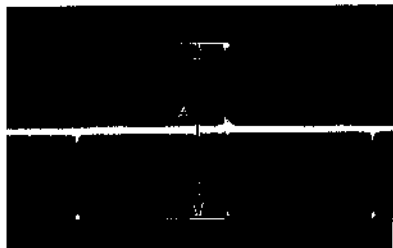
TP24



$A = 4 \pm 0.2V$
RV13

For PAL/SECAM

TP24



$A = 3 \pm 0.2Vp-p$
RV13

12-6. AUDIO ERASE OSCILLATOR FREQUENCY AND LEVEL ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Oscilloscope

Frequency Counter

Mode of VTR: REC (Don't use alignment tape.)

Setting of Switches & Controls:

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment BE-02 Board

Erase Osc Level: TP3-TPE3 = $4.0 \pm 0.2 Vp-p$
(Oscilloscope) * RV8

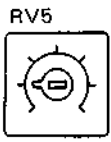
* If the level is not adjusted, turn RV8/LV8/BE-02 for maximum level and readjust RV8.

In case of turning RV8, sections 12-11 step 3 through 12-14 and 12-22 must be performed.

12-7. SYNC ERASE (V/S Head) CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 Don't care.

Step 1.
 Set \odot RV5/BE-02 as follows.

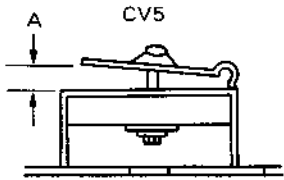


Step 2.
 Place machine in record mode.

TP1-TPE1/BE-02 = Maximum
 \odot LV7/BE-02
 \odot CV5/BE-02

If the clearance "A" of \odot CV5/BE-02 is wider than 3 mm, change the value of C5/BE-02 to 470pF/500V and repeat from the beginning of step 2.
 If the peak level is not obtained even if the clearance of \odot CV5/BE-02 is zero, change the value of C5/BE-02 to 750pF/500V and repeat from the beginning of step 2.

Part Information					Sony Part No.
Description					
CAP, MICA	470pF	500V	5%		1-109-573-00
CAP, MICA	750pF	500V	5%		1-109-578-00



Step 3.
 TP1-TPE1/BE-02 = 240 ± 10 mVp-p
 \odot RV5/BE-02

12-8. VIDEO (V/S Head)/CTL ERASE FREQUENCY AND CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Frequency Counter
 Oscilloscope
 Mode of VTR; REC (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 Don't care.

Step 1.
 Place machine in record mode and check the oscillating frequency.

TP2-TPE2/BE-02 = 118 ± 5 kHz
 (Freq. Counter)

If not, change the value of C6 as follows.
 Frequency is low.; Change to 2000pF or 2200pF/500V.
 Frequency is high.; Change to 2700pF or 3000pF/500V.

Part Information					Sony Part No.
Description					
CAP, MICA	2000pF	500V	5%		1-109-588-00
CAP, MICA	2200pF	500V	5%		1-109-589-00
CAP, MICA	2700pF	500V	5%		1-109-591-00
CAP, MICA	3000pF	500V	5%		1-109-592-00

Step 2.
 With machine still in record mode, adjust as follows.

TP2-TPE2/BE-02 = 450 ± 10 mV
 (Oscilloscope) \odot RV1/BE-02

12-9. AUDIO ERASE CURRENT ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Oscilloscope

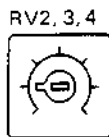
Mode of VTR: REC → PLAY & INSERT
(Don't use alignment tape.)

Setting of Switches & Controls:
REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN):
Don't care.

Step 1.

Set ⓪ RV2, RV3 and RV4 as follows.



Step 2. Adjustment BE-02 Board

Place machine in record mode and adjust as follows.

AUDIO-1: TP7-TPE3 = Maximum Level ⓪ CV1 ⓪ LV4

AUDIO-2: TP8-TPE3 = Maximum Level ⓪ CV2 ⓪ LV5

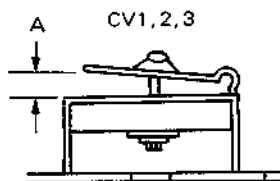
AUDIO-3: TP9-TPE3 = Maximum Level ⓪ CV3 ⓪ LV6

If the clearance "A" of ⓪ CV1(AUD-1), CV2(AUD-2) or CV3(AUD-3) is wider than 3 mm, change the value of C1(AUD-1), C2(AUD-2) or C3(AUD-3) to 150pF/500V and repeat from the beginning of step 2.

If the peak level is not obtained even if the clearance of ⓪ CV1(AUD-1), CV2(AUD-2) or CV3(AUD-3) is zero, change the value of C1(AUD-1), C2(AUD-2) or C3(AUD-3) to 470pF/500V and repeat from the beginning of step 2.

Part Information

Description	Sony Part No.
CAP, MICA 150pF 500V 5%	1-109-677-00
CAP, MICA 470pF 500V 5%	1-109-689-00



Step 3. Adjustment BE-02 Board

With machine still in record mode, adjust as follows.

AUDIO-1: TP7-TPE3 = 230 ± 10 Vp-p ⓪ RV2

AUDIO-2: TP8-TPE3 = 230 ± 10 Vp-p ⓪ RV3

AUDIO-3: TP9-TPE3 = 230 ± 10 Vp-p ⓪ RV4

Step 4.

Play back the recording, place machine in AUDIO-2 INSERT mode and adjust as follows.

TP7-TPE3/BE-02 = less than 10 Vp-p
⓪ LV1/BE-02

Still in playback mode, place machine in AUDIO-1 INSERT mode and check as follows.

TP8-TPE3/BE-02 = less than 10 Vp-p
If not, fine tune ⓪ LV1
and repeat step 4.

If the voltage at TP7 and/or TP8 does not meet the specifications, fine tune ⓪ RV10/BE-02 and repeat from the beginning of step 4.

After completion, return to step 3 and if ⓪ RV2 and/or ⓪ RV3 is readjusted, proceed to the step 4, then confirm from steps 3 and 4.

12-10. CTL (Audio/CTL Head) BIAS CURRENT ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Oscilloscope

Mode of VTR: REC (Don't use alignment tape.)

Setting of Switches & Controls:
REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN):
Don't care.

Adjustment BE-02 Board

TP6-TPE4 = Maximum
⓪ LV3

TP6-TPE4 = 150 ± 10 Vp-p
⓪ RV6

12-11. AUDIO (Audio/CTL Head) BIAS LEAK AND BIAS CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope
Distortion Analyzer

Mode of VTR; REC (Don't use alignment tape.)

Setting of Switches & Controls;

AUDIO MONITOR Sel: AUDIO-1,2, or 3

REC INHIBIT Sw: OFF

TAPE/EE Sel: BVH-2000/PS/PM 00 and 10 models INPUT

BVH-2000/PS/PM 02 and 12 models

BVH-2180/PS/PM 02 model INPUT → TAPE

A-3 SEL Sw(S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

no signal → 1 kHz/+8 dBm

Step 1.

Open the level control panel and the rear panel, remove all connectors from the AP board, and take off the AP board. Coming round to the rear, put the AP board in the VTR and connect CN351, 353 and 354 to the proper positions on the board.

Step. 2 Adjustment AP Board

Perform the following adjustments in record mode.

AUDIO-1: TP101-TPE101 = Minimum Bias Leak ⓪LV101

AUDIO-2: TP201-TPE201 = Minimum Bias Leak ⓪LV201

AUDIO-3: TP301-TPE301 = Minimum Bias Leak ⓪LV301

After the adjustments, reinsert the AP board to the proper position and connect all connectors to the board.

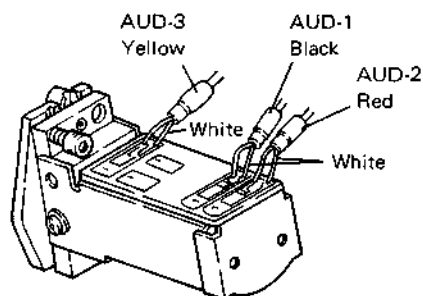
Step 3.

Disconnect AUDIO LINE INPUT and connect distortion analyzer to AUDIO MONITOR OUTPUT.

Set TAPE/EE selector to INPUT, A-3 SEL switch (S1/AE-03) to LINE and BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 to midrange.

Step 4.

Connect oscilloscope across white lead and GND on the Audio/CTL R/P head as shown below and adjust as follows.



AUDIO-1 = Maximum Level ⓪LV1/BE-03

AUDIO-2 = Maximum Level ⓪LV2/BE-03

AUDIO-3 = Maximum Level ⓪LV3/BE-03 (Oscilloscope)

Step 5.

For BVH-2000/2180/PS/PM 00 and 10 Models

Feed +8 dBm at 1 kHz to AUDIO-1(2, 3) LINE INPUT.

Turn A1(2, 3) BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 fully counterclockwise.

Place machine in record mode and turn the A1(2, 3) BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 slowly clockwise.

While playing back the recording, set AUDIO MONITOR selector to AUDIO-1(2, 3), find out 0.5 dB over the peak position and set A1(2, 3) BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 appropriately.

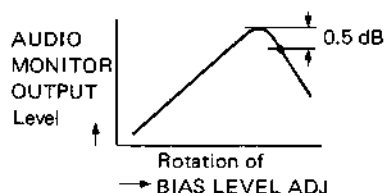
For BVH-2000/2180/PS/PM 02 and 12 Models, BVH-2500/P

Feed +8 dBm at 1kHz to AUDIO-1(2, 3) LINE INPUT.

Set TAPE/EE selector to TAPE and AUDIO MONITOR selector to AUDIO-1(2, 3).

Turn A1(2, 3) BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 fully counterclockwise and place machine in record mode.

Turn A1(2, 3) BIAS LEVEL ADJ controls (RV1, 2, 3)/BE-04 slowly clockwise and stops at the 0.5 dB position over the peak as follows.



12-12. RECORDING LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

AUDIO MONITOR Sel: AUDIO-1, 2 or 3

AUDIO-1/2/3 REC Cont: push

AUDIO-1/2/3 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: BVH-2000/PS/PM 00 and 10
models INPUT

BVH-2000/PS/PM 02 and 12
models

BVH-2180/PS/PM 02 model
INPUT → TAPE

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Step 1.

Set TAPE/EE selector to INPUT and A-3 SEL switch (S1/AE-03) to LINE.

During STOP mode, push AUDIO-1/2/3 REC controls and check the AUDIO-1/2/3 LINE OUTPUT levels as follows.

AUDIO-1/2/3 LINE OUTPUT = +8 dBm

If not, perform section 12-1 "Line Amplifier Offset & Output Level Adjustment".

Step 2.

Set REC INHIBIT switch to ON and play back 0VU for NTSC, +8 dBm for PAL/SECAM/PAL-M at 1 kHz of alignment tape. Push AUDIO-1/2/3 PB controls and check the AUDIO-1/2/3 LINE OUTPUT levels as follows.

AUDIO-1/2/3 LINE OUTPUT = +8 dBm

If not, perform section 12-3 "PB Level Controls Calibration".

Step 3.

Set REC INHIBIT switch to OFF. Using ordinary tape, make a recording of +8 dBm at 1 kHz and play back the recording. Check AUDIO-1/2/3 LINE OUTPUT levels as follows.

AUDIO-1/2/3 LINE OUTPUT = +8 ± 0.1 dBm

If not, measure the levels as against the specifications and proceed to the next step.

Step 4.

For BVH-2000/2180/PS/PM 00 and 10 Models

Connect distortion analyzer to AUDIO MONITOR OUTPUT and set AUDIO MONITOR selector to AUDIO-1, 2 or 3.

With record mode, turn following pots a little and play back the recording, and then adjust as follows.

AUDIO-1 LINE OUTPUT = +8 ± 0.1 dBm Ⓞ RV109/AU-27

AUDIO-2 LINE OUTPUT = +8 ± 0.1 dBm Ⓞ RV209/AU-27

AUDIO-3 LINE OUTPUT = +8 ± 0.1 dBm Ⓞ RV29/AE-03

For BVH-2000/2180/PS/PM 02 and 12 Models, BVH-2500/P

Connect distortion analyzer to AUDIO MONITOR OUTPUT and set TAPE/EE selector to TAPE and AUDIO MONITOR selector to AUDIO-1, 2 or 3.

Place machine in record mode and correct the recording level according to the levels measured in step 3 using following pots.

AUDIO-1: Ⓞ RV109/AU-27

AUDIO-2: Ⓞ RV209/AU-27

AUDIO-3: Ⓞ RV29/AE-03

Step 5.

Play back the recording and check whether the AUDIO-1/2/3 LINE OUTPUT levels meet the levels measured in step 3.

If not, repeat steps 4 and 5 a few times.

12-13. CONF LEVEL ADJUSTMENT

(For BVH-2000/2180 02 and 12 Models/BVH-2500)

Connection: See section 8-4 connection 5.

Equipment: Distortion Analyzer

Mode of VTR: See respective steps.

Setting of Switches & Controls:

AUDIO MONI Sel: AUD-1 → AUD-1, 2, 3

AUDIO-1/2/3 REC Cont: push

AUDIO-1/2/3 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT → TAPE

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Step 1.

Perform the same procedures in section 12-12 steps 1 and 2.

Step 2.

With machine still in playback of alignment tape, set AUDIO MONITOR selector to AUDIO-1 and adjust as follows.

AUDIO MONITOR OUTPUT = +8 dBm

MONITOR/PHONES Control
(RV1/VR-05)**Step 3.**

Set REC INHIBIT switch to OFF and TAPE/EE selector to TAPE. Using ordinary tape, make a recording of +8 dBm at 1 kHz and check and/or adjust as follows.

AUDIO MONITOR OUTPUT = +8 ± 0.1 dBm

AUDIO-1: Ⓞ RV106/AU-27

AUDIO-2: Ⓞ RV206/AU-27

AUDIO-3: Ⓞ RV4/AU-27

12-14. RECORD AMPLIFIER FREQUENCY RESPONSE ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Distortion Analyzer

Mode of VTR: See respective steps.

Setting of Switches & Controls:

AUDIO-1/2/3 REC Cont: push

AUDIO-1/2/3 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm → 1 kHz/-2 dBm

→ 10 kHz/-2 dBm

Step 1.

Perform the same procedures in section 12-12 steps 1 and 2.

Step 2.

Set REC INHIBIT switch to OFF. Using ordinary tape, make a short recording of -2 dBm at 1 kHz and 10 kHz. Play back the recording and check the level of 10kHz with reference to 1 kHz as follows.

AUDIO-1/2/3 LINE OUTPUT: 10 kHz = 0 ± 0.5 dB

(reference to 1 kHz)

If not, turn the following pots a little and repeat from the beginning of step 2.

AUDIO-1: Ⓞ RV108/AU-27

AUDIO-2: Ⓞ RV208/AU-27

AUDIO-3: Ⓞ RV28/AE-03

12-15. CROSSTALK LEVEL ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Distortion Analyzer

Mode of VTR: REC → PLAY/INSERT

(Don't use alignment tape.)

Setting of Switches & Controls:

AUDIO-1/2/3 REC Cont: push

AUDIO-1/2/3 PB Cont: push

REC INHIBIT Sw: OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

no signal → 1 kHz/+8 dBm → 15, 20, 25 kHz/
+8 dBm

Step 1. AUD-1 to AUD-2 Crosstalk Adjustment

Disconnect AUDIO-2 LINE INPUT and record a few minutes of no signal on AUDIO-2.

Feed +8 dBm at 1 kHz to AUDIO-1 LINE INPUT. Play back the recording and record over recording with AUDIO-1 INSERT mode, then adjust as follows.

AUDIO-2 LINE OUTPUT = Minimum

● RV110/AU-27

Next, change the AUDIO-1 LINE INPUT to +8 dBm at 15 kHz, 20 kHz and 25 kHz in turn and adjust as follows.

AUDIO-2 LINE OUTPUT \leq -7 dBm

● RV111/AU-27

● LV101/AU-27

Step 2. AUD-2 to AUD-1 Crosstalk Adjustment

Adjust AUDIO-2 to AUDIO-1 crosstalk level in a similar manner to step 1.

AUDIO-1 LINE OUTPUT = Minimum (1 kHz)

● RV210/AU-27

AUDIO-1 LINE OUTPUT \leq -7 dBm (15 kHz, 20 kHz, 25 kHz)

● RV211/AU-27

● LV201/AU-27

12-16. REC CTL LEVEL ADJUSTMENT

Connection: See section 8-4 connection 5.

Equipment: Oscilloscope

Mode of VTR: REC → PLAY

(Don't use alignment tape.)

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

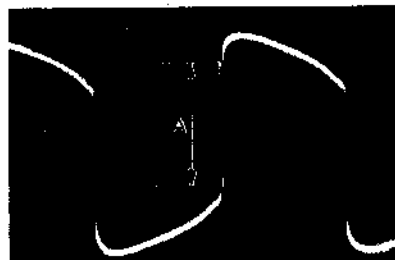
Input Signal (AUDIO LINE IN);

Don't care.

Adjustment CD-17 Board

Place machine in recorded mode and play back the recording, then confirm as follows.

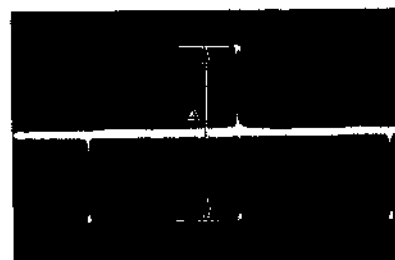
For NTSC/PAL-M



TP24

A = 4 ± 0.2V

For PAL/SECAM



TP24

A = 3 ± 0.2Vp-p

If not, place machine in record mode and turn ● RV1/CD-17 a little while recording. Play back the recording and repeat the confirmation.

12-17. CONF CTL LEVEL ADJUSTMENT

(For BVH-2000/2180 02 and 12 Models/BVH-2500)

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 TAPE/EE Sel: TAPE
 Input Signal (AUDIO LINE IN);
 Don't care.

Adjustment CD-17 Board

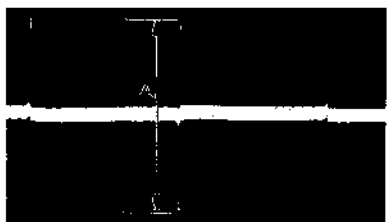
For NTSC/PAL-M



TP14/CD-17

A = $0.5 \pm 0.1V$
 Ⓢ RV12

For PAL/SECAM



TP14/CD-17

A = $0.19 \pm 0.05V_{p-p}$
 Ⓢ RV12

12-18. PB CTL TO AUDIO-3 CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC → PLAY/INSERT → PLAY
 (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 no signal

Adjustment

Disconnect AUDIO-3 LINE INPUT and record a few minutes of no signal on AUDIO-3.
 Play back the recording and record over recording with AUDIO-3 INSERT mode.
 Play back the entire recording and adjust as follows.

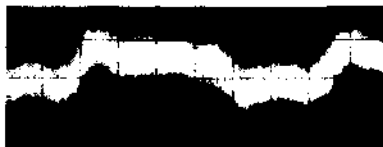
For NTSC/PAL-M

INCORRECT



AUDIO-3 LINE OUTPUT

CORRECT



Minimum Crosstalk
 Ⓢ RV32/AE-03

For PAL/SECAM

INCORRECT



AUDIO-3 LINE OUTPUT

CORRECT



Minimum Crosstalk
 Ⓢ RV32/AE-03

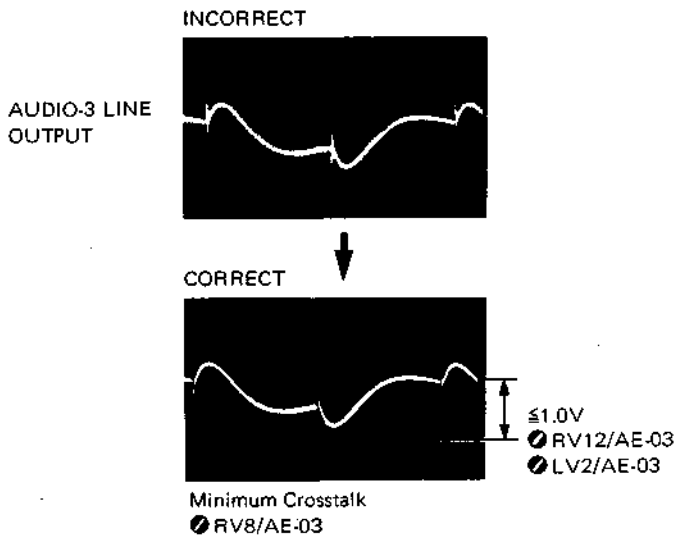
12-19. CTL TO AUD-3 CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC → PLAY/VIDEO ASSEMBLE
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 no signal

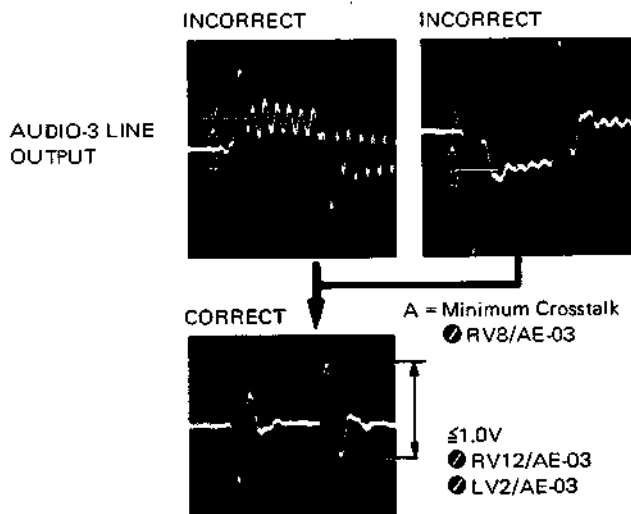
Adjustment

Disconnect AUDIO-3 LINE INPUT and record a few minutes of no signal on AUDIO-3.
 Play back the recording and record over recording with VIDEO ASSEMBLE mode, then adjust as follows.

For NTSC/PAL-M



For PAL/SECAM



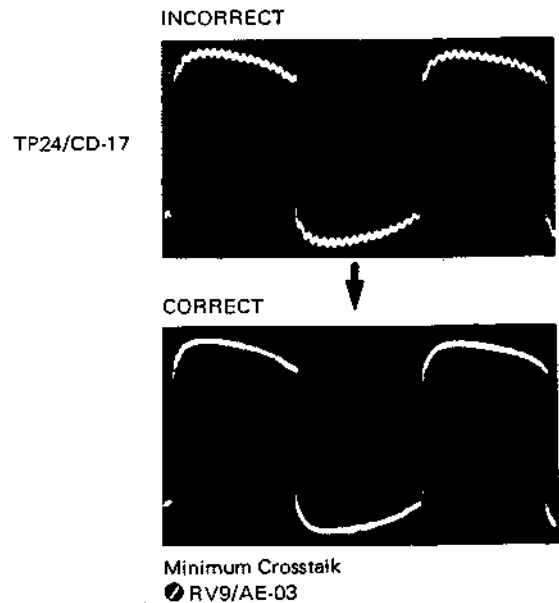
12-20. REC AUD-3 TO PB CTL CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC → PLAY/AUD-3 INSERT
 (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 no signal → 1 kHz/+18 dBm

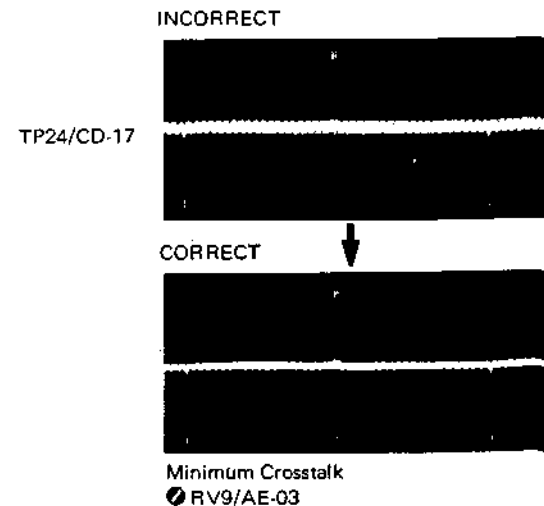
Adjustment

Disconnect AUDIO-3 LINE INPUT and record a few minutes of no signal on AUDIO-3.
 Connect AUDIO-3 LINE INPUT and feed +18 dBm at 1 kHz.
 Play back the recording and record over recording with AUDIO-3 INSERT mode, then adjust as follows.

For NTSC/PAL-M



For PAL/SECAM



12-21. PLAY MODE CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 6.
Equipment; Distortion Analyzer
Mode of VTR; See respective steps.
Setting of Switches & Controls:
AUDIO-1/2/3 REC Cont: push
AUDIO-1/2/3 PB Cont: push
REC INHIBIT Sw: ON → OFF
TAPE/EE Sel: INPUT
A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);
See respective steps.

Step 1.

Perform the same procedures in section 12-12 steps 1 and 2.

Step 2. AUD-1 to AUD-2 Crosstalk Adjustment

Set REC INHIBIT switch to OFF and disconnect AUDIO-2 LINE INPUT. Using ordinary tape, record a few minutes of no signal on AUDIO-2.

Play back the recording and record +18 dBm at 1 kHz and 15 kHz at an interval of 1 minute over recording with AUDIO-1 INSERT mode.

Play back the entire recording and check and/or adjust as follows.

AUDIO-2 LINE OUTPUT: 1 kHz \leq -65 dB
15 kHz \leq -55 dB
● RV101/AU-27

Step 3. AUD-2 to AUD-1 Crosstalk Adjustment

Adjust AUDIO-2 to AUDIO-1 crosstalk level in a similar manner to step 2.

AUDIO-1 LINE OUTPUT: 1 kHz \leq -65 dB
15 kHz \leq -55 dB
● RV201/AU-27

12-22. MONITOR AMPLIFIER FREQUENCY RESPONSE ADJUSTMENT

(For BVH-2000/2180 02 and 12 Models/BVH-2500)

Connection; See section 8-4 connection 5.
Equipment; Distortion Analyzer
Mode of VTR; See respective steps.
Setting of Switches & Controls:
AUDIO MONITOR Sel: AUD-1/2/3
AUDIO-1/2/3 REC Cont: push
AUDIO-1/2/3 PB Cont: push
REC INHIBIT Sw: ON → OFF
TAPE/EE Sel: INPUT → TAPE
A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);
See respective steps.

Step 1.

Perform the same procedures in section 12-12 steps 1 and 2.

Step 2.

With machine still in playback of alignment tape, set AUDIO MONITOR selector to AUDIO-1 and adjust MONITOR/PHONES level control (RV1/VR-05) for +8 dBm at AUDIO MONITOR OUTPUT.

Step 3.

Set REC INHIBIT switch to OFF. Using ordinary tape, record -2 dBm at 10 kHz, 50 Hz and 100 Hz in turn on AUDIO-1, 2 and 3.

Play back the recording and measure the levels at AUDIO MONITOR OUTPUT connector while selecting the AUDIO MONITOR selector to AUD-1, 2, and 3.

Step 4

Set TAPE/EE selector to TAPE. Feed -2 dBm at 10 kHz to AUDIO LINE INPUT and place machine in record mode. Check the AUDIO MONITOR OUTPUT levels while selecting the AUDIO MONITOR selector to AUD-1, 2 and 3, then compare the levels at 10 kHz measured in step 3.

If the level differences are more than ± 1 dB, adjust with following pots.

AUDIO-1: ● RV104/AU-27
AUDIO-2: ● RV204/AU-27
AUDIO-3: ● RV6/AE-03

Step 5.

Feed -2 dBm at 50 Hz and check and/or adjust the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

AUDIO-1: ● RV105/AU-27
AUDIO-2: ● RV205/AU-27
AUDIO-3: ● RV5/AE-03

Step 6.

Feed -2 dBm at 100 Hz and check the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

If the level differences are more than ± 1 dB, repeat steps 5 and 6 again.

Step 7.

Feed -2 dBm at 50 Hz, 100 Hz and 10 kHz in turn and check the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

If the level differences are more than ± 1 dB, repeat steps 4 through 7.

12-23. TIME CODE DUTY CYCLE ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; STOP → REC → PLAY
(Don't use alignment tape.)

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC → LINE → TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Step 1.

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1 kHz to AUDIO-3 LINE INPUT.

TP8-TPE8 (GND)/AE-03
(Ext Trig: TP8)
(Trig Slope: +/-)



Step 2.

Set A-3 SEL switch (S1/AE-03) to LINE and make a short recording.

Step 3.

Return A-3 SEL switch (S1/AE-03) to TC.

Play back the recording in step 2 and check and/or adjust as follows.

TP7-TPE8 (GND)/AE-03
(Ext Trig: TP7)
(Trig Slope: +/-)



12-24. TIME CODE OUTPUT LEVEL ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Distortion Analyzer

Mode of VTR; STOP

Setting of Switches & Controls;

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Adjustment

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1 kHz to AUDIO-3 LINE INPUT and connect oscilloscope and 75 ohm termination to TIME CODE OUTPUT.

TIME CODE OUTPUT = 0.5 ± 0.1 Vp-p
(Oscilloscope) RV17/AE-03

AUDIO-3 LINE OUTPUT = $+8 \pm 0.1$ dBm
(Distortion Analyzer) RV16/AE-03

12-25. TIME CODE RECORDING LEVEL ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; STOP

Setting of Switches & Controls;

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Adjustment

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1 kHz to AUDIO-3 LINE INPUT.

TP19-TPE2/AE-03 = 150 ± 5 mVp-p
RV13/AE-03

12-26. REC BIAS LEAK ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC → PLAY/INSERT

Setting of Switches & Controls;

AUDIO-1/2/3 REC Cont: Pull

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

no signal

Applicable Serial No.;	BVH-2000	# 23101 & up
	BVH-2000PS	# 22901 & up
	BVH-2000PM	# 20201 & up
	BVH-2180	# 10001 & up
	BVH-2180PS	# 10001 & up
	BVH-2180PM	# 10001 & up
	BVH-2500	# 10701 & up
	BVH-2500P	# 10001 & up

Step 1.

Pull AUDIO-1/2/3 REC Level Controls and turn fully counter-clockwise. Make a recording of no signal on AUDIO-1/2/3.

Step 2. AUD-1 to AUD-2 Bias Leak Adj.

Play back the recording of step 1 and record over recording with AUDIO-1 INSERT mode, then adjust as follows.

AUDIO-2 LINE OUTPUT = Minimum Bias Leak
● LV202/AU-27

Step 3. AUD-2 to AUD-1 Bias Leak Adj.

Play back the recording of step 1 and record over recording with AUDIO-2 INSERT mode, then adjust as follows.

AUDIO-1 LINE OUTPUT = Minimum Bias Leak
● LV102/AU-27

Step 4. AUD-1/2 to AUD-3 Bias Leak Adj.

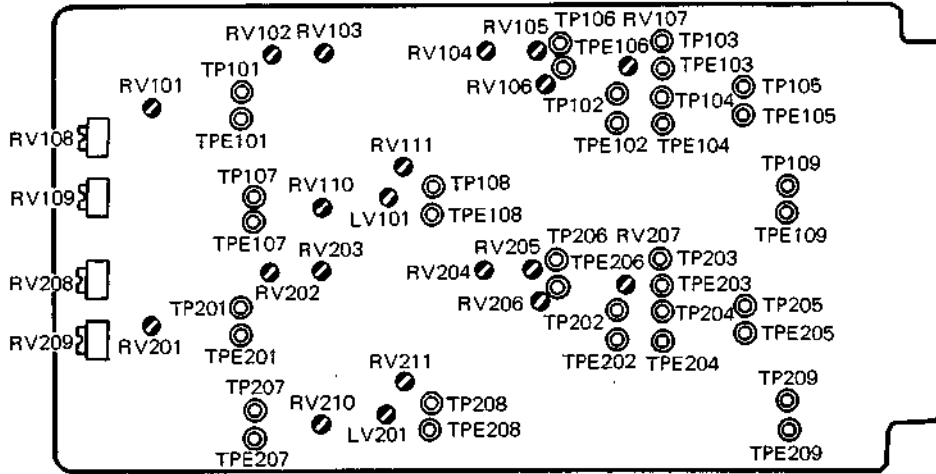
Play back the recording of step 1 and record over recording with AUDIO-1/2 INSERT mode, then adjust as follows.

AUDIO-3 LINE OUTPUT = Minimum Bias Leak
● LV1/AE-03

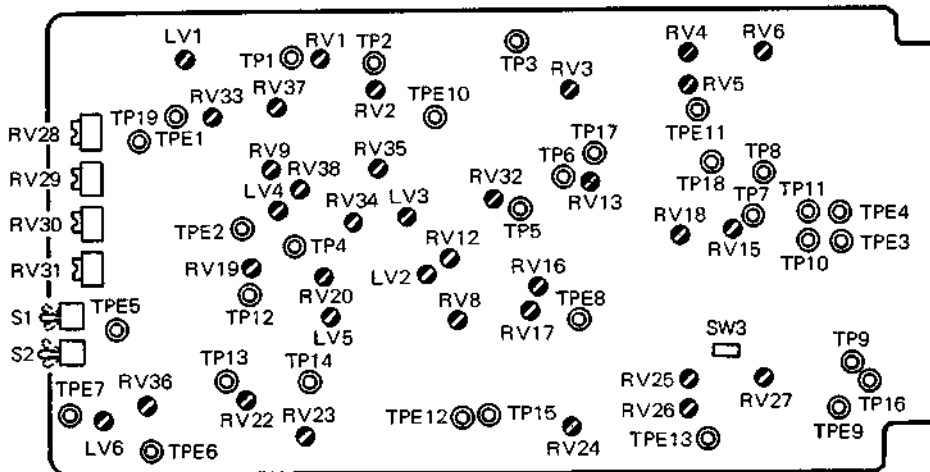
SECTION 12

AUDIO SIGNAL SYSTEM ALIGNMENT (FOR 04/14 MODEL)

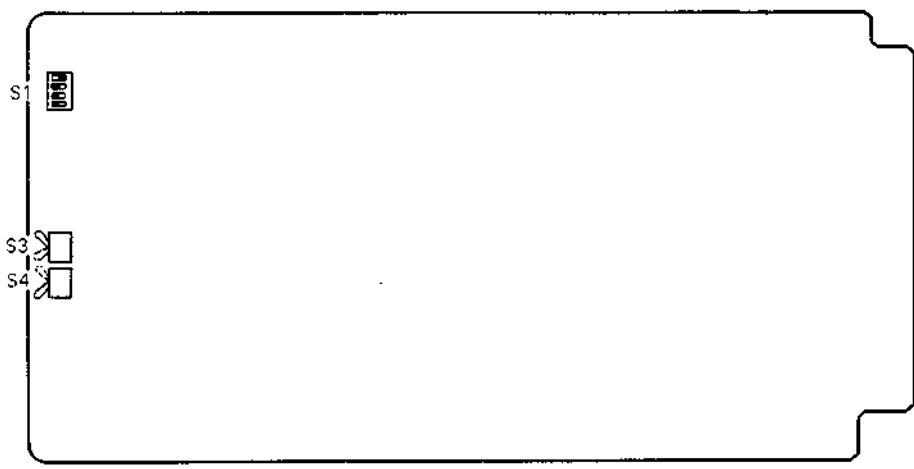
AU-27 Board



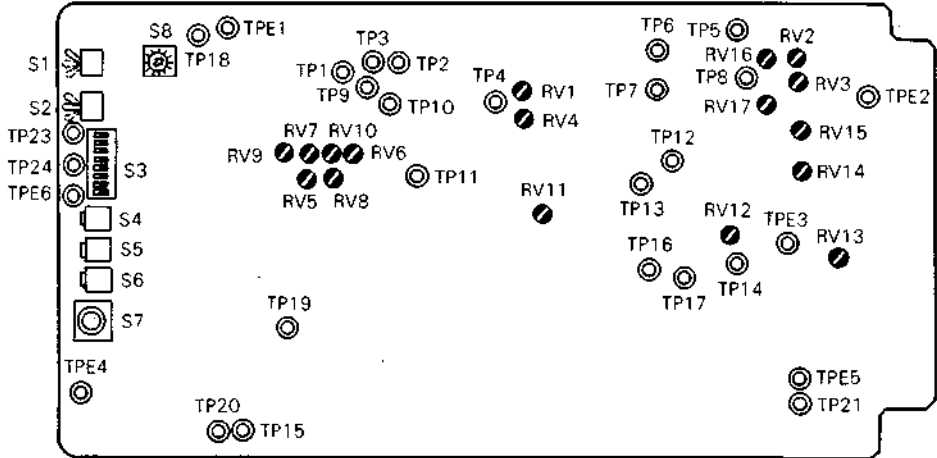
AE-03 Board



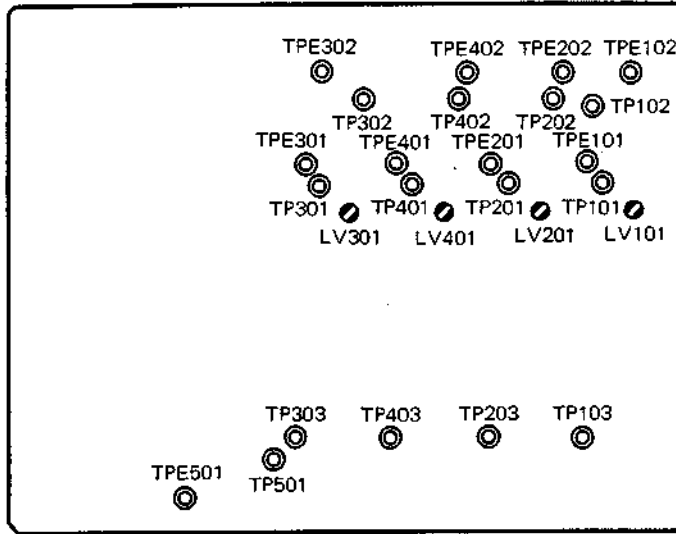
LG-02(A) Board



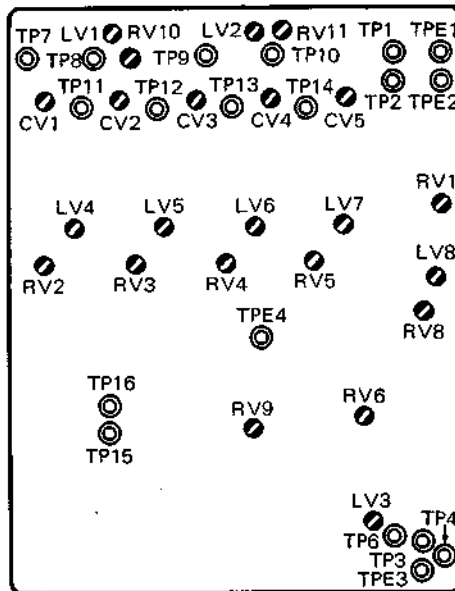
CD-17 Board



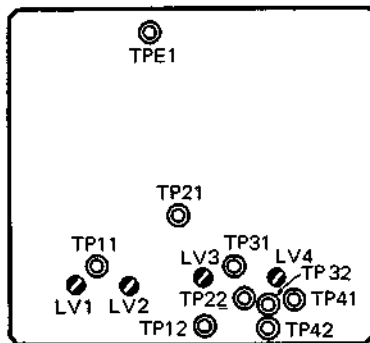
AP-12 Board



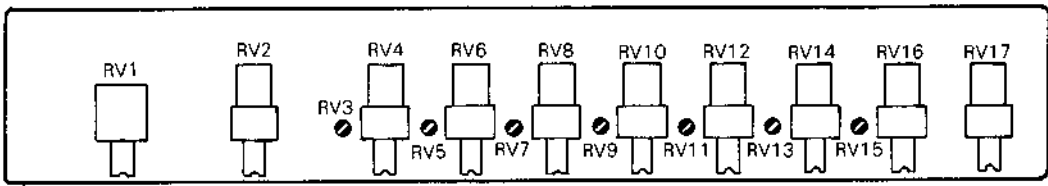
BE-02 Board



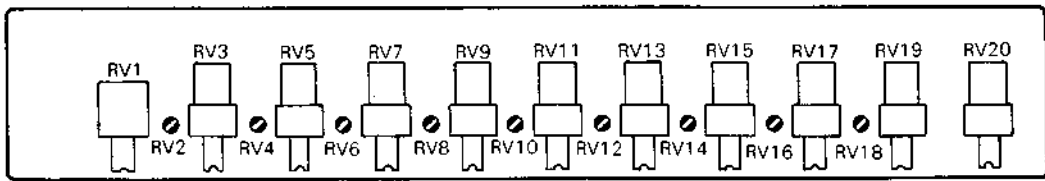
BE-03 Board



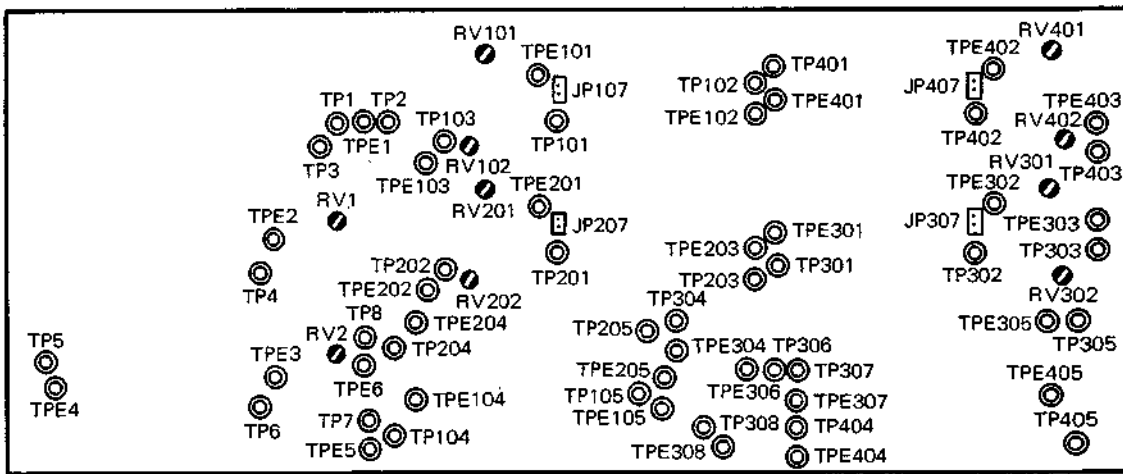
VR-05 Board



VR-07 Board ; For 04 model



LA-02 Board



12-1. LINE AMPLIFIER OFFSET AND OUTPUT LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.
Equipment; Digital Voltmeter
Distortion Analyzer
Mode of VTR; STOP
Setting of Switches & Controls;
TAPE/EE Sel: INPUT
AUDIO-1/2/3/4 REC Cont: push
A-3 SEL Sw (S1/AE-03): LINE
Input Signal (AUDIO LINE IN);
no signal → 1 kHz/+8 dBm

Step 1. Line Amplifier Offset Adjustment

Disconnect the AUDIO-1/2/3/4 LINE INPUT connectors.
Pull out JP107, 207, 307, 407 and CN608 on the LA-02 board.

	LA-02 Board	DVM
AUDIO-1:	TP101-TPE101 =	0±1 mVdc Ⓞ RV101/LA-02
AUDIO-2:	TP201-TPE201 =	0±1 mVdc Ⓞ RV201/LA-02
AUDIO-3:	TP302-TPE302 =	0±1 mVdc Ⓞ RV301/LA-02
AUDIO-4:	TP402-TPE402 =	0±1 mVdc Ⓞ RV401/LA-02
R Monitor:	TP4-TPE2 =	0±1 mVdc Ⓞ RV1/LA-02
L Monitor:	TP6-TPE3 =	0±1 mVdc Ⓞ RV2/LA-02

Step 2. Line Output Level Adjustment

Feed +8 dBm at 1 kHz to AUDIO-1/2/3/4 LINE INPUT connectors and connect JP107, 207, 307, 407 and CN608 on the LA-02 board.

	LA-02 Board	DVM
AUDIO-1:	TP103-TPE103 =	77.46±1 mV Ⓞ RV2/VR-07
AUDIO-2:	TP202-TPE202 =	77.46±1 mV Ⓞ RV6/VR-07
AUDIO-3:	TP303-TPE303 =	77.46±1 mV Ⓞ RV10/VR-07
AUDIO-4:	TP403-TPE303 =	77.46±1 mV Ⓞ RV14/VR-07

	Distortion Analyzer
AUDIO-1 LINE OUTPUT =	+8±0.1 dBm Ⓞ RV102/LA-02
AUDIO-2 LINE OUTPUT =	+8±0.1 dBm Ⓞ RV202/LA-02
AUDIO-3 LINE OUTPUT =	+8±0.1 dBm Ⓞ RV302/LA-02
AUDIO-4 LINE OUTPUT =	+8±0.1 dBm Ⓞ RV402/LA-02

12-2. AUDIO LEVEL METER CALIBRATION

Connection; See section 8-4 connection 5.
Equipment; Unnecessary
Mode of VTR; STOP
Setting of Switches & Controls;
TAPE/EE Sel: INPUT
A-3 SEL Sw (S1/AE-03): LINE
Input Signal (AUDIO LINE IN);
1 kHz/+8 dBm

Adjustment

AUDIO LEVEL METER = 0 VU ± 0.2 dB
AUDIO-1: Ⓞ RV107/AU-27
AUDIO-2: Ⓞ RV207/AU-27
AUDIO-3: Ⓞ RV3/AE-03
AUDIO-4: Ⓞ RV24/AE-03

12-3. PB LEVEL CONTROLS CALIBRATION

Connection; See section 8-4 connection 5.
Equipment; Distortion Analyzer
Mode of VTR; PLAY (Use alignment tape.)
Setting of Switches & Controls;
AUDIO-1/2/3/4 PB Cont: push
REC INHIBIT Sw: ON
A-3 SEL Sw (S1/AE-03): LINE
Input Signal (AUDIO LINE IN);
Don't care.

Adjustment

Push AUDIO-1/2/3/4 PB level controls. Play back +8 dBm at 1 kHz of alignment tape and adjust as follows.

AUDIO LINE OUTPUT =	+8 ± 0.1 dBm
AUDIO-1:	Ⓞ RV4/VR-07
AUDIO-2:	Ⓞ RV8/VR-07
AUDIO-3:	Ⓞ RV12/VR-07
AUDIO-4:	Ⓞ RV16/VR-07

Adjustment of ⓄRV4, RV8, RV12 and RV16 can be done by opening the function control panel (Refer to section 1).

12-4. PB FREQ. RESPONSE ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; PLAY (Use alignment tape.)

Setting of Switches & Controls;

AUDIO-1/2/3/4 PB Cont: pull

REC INHIBIT Sw: ON

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

Don't care.

Step 1.

Set A-3 SEL switch (S1/AE-03) to LINE and play back -2 dBm at 1 kHz of alignment tape.

Pull AUDIO-1/2/3/4 PB level controls and set AUDIO-1/2/3/4 LINE OUTPUT level as follows.

AUDIO LINE OUTPUT = -2 dBm

AUD-1 PB Cont (RV5/VR-07)

AUD-2 PB Cont (RV9/VR-07)

AUD-3 PB Cont (RV13/VR-07)

AUD-4 PB Cont (RV17/VR-07)

Step 2.

Play back -2 dBm at 10 kHz of alignment tape.

AUDIO LINE OUTPUT = $-2_{-3.0}^{+1.5}$ dBm

AUDIO-1: \odot RV102/AU-27

AUDIO-2: \odot RV202/AU-27

AUDIO-3: \odot RV1/AE-03

AUDIO-4: \odot RV22/AE-03

Step 3.

Play back -2 dBm at 50 Hz of alignment tape.

AUDIO LINE OUTPUT = $-2_{-3.0}^{+1.5}$ dBm

AUDIO-1: \odot RV103/AU-27

AUDIO-2: \odot RV203/AU-27

AUDIO-3: \odot RV2/AE-03

AUDIO-4: \odot RV23/AE-03

Step 4.

Play back -2 dBm at 100 Hz of alignment tape and check the AUDIO-1/2/3/4 LINE OUTPUT levels.

AUDIO-1/2/3/4 LINE OUTPUT = $-2_{-3.0}^{+1.5}$ dBm

If not, repeat steps 3 and 4.

Step 5.

Play back -2 dBm at 50 Hz through 15 kHz of alignment tape continuously and check the frequency response.

AUDIO-1/2/3/4 LINE OUTPUT = $-2_{-3.0}^{+1.5}$ dBm

If not, repeat steps 1 through 5.

Step 6.

After adjustment, perform section 12-3 "PB Level Controls Calibration".

12-5. PB CTL LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; PLAY (Use alignment tape.)

Setting of Switches & Controls;

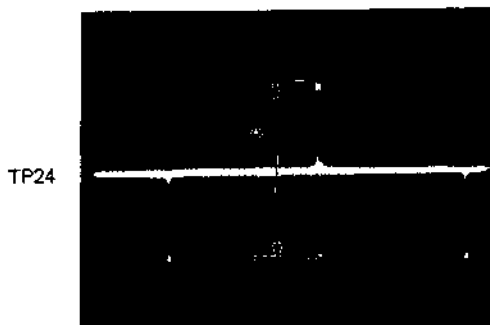
REC INHIBIT Sw: ON

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment CD-17 Board

Play back 100% WHITE of alignment tape.



$A = 3 \pm 0.2 \text{ Vp-p}$
RV13

12-6. AUDIO ERASE OSCILLATOR FREQUENCY AND LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Frequency Counter

Mode of VTR; REC (Don't use alignment tape.)

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment BE-02 Board

Erase Osc Level: TP3-TPE3 = $4.0 \pm 0.2 \text{ Vp-p}$
(Oscilloscope) * RV8

* If the erase level is not adjusted, turn RV8/BE-02 for maximum level and readjust RV8.

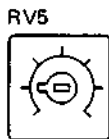
In case of turning RV8, sections 12-14 step 3 through 12-17 and 12-25 must be performed.

12-7. SYNC ERASE (V/S Head) LEVEL ADJUSTMENT (Except for 14 model)

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 MODE SEL Sw (S3/LG-02): SYNC → A4
 Input Signal (AUDIO LINE IN);
 Don't care.

Step 1.

Set MODE SEL switch (S3/LG-02) to SYNC and turn Ⓐ RV1/BE-02 fully counterclockwise, then set Ⓐ RV5/BE-02 as follows.



Step 2.

Place machine in record mode.

TP1-TPE1/BE-02 = Maximum Level

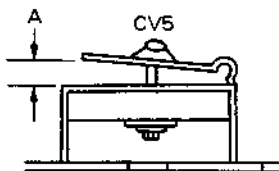
- Ⓐ LV7/BE-02
- Ⓐ CV5/BE-02

If the clearance "A" of Ⓐ CV5/BE-02 is wider than 3 mm, change the value of C5/BE-02 to 470pF/500V and repeat from the beginning of step 2.

If the peak level is not obtained even if the clearance of Ⓐ CV5/BE-02 is zero, change the value of C5/BE-02 to 750pF/500V and repeat from the beginning of step 2.

Part Information

Description	Sony Part No.
CAP, MICA 470pF 500V 5%	1-109-573-00
CAP, MICA 750pF 500V 5%	1-109-578-00



Step 3.

After adjustment, set Ⓐ RV1/BE-02 to midrange and MODE SEL switch (S3/LG-02) to A4.

12-8. VIDEO(V/S Head)/CTL ERASE FREQUENCY AND CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Frequency Counter
 Oscilloscope
 Mode of VTR; REC (Don't use alignment tape.)
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 Don't care.

Step 1.

Place machine in record mode and check the oscillating frequency.

TP2-TPE2/BE-02 = 118 ± 5 kHz
 (Freq. Counter)

If not, change the value of C6 as follows.

Frequency is low.; Change to 2000pF or 2200pF/500V.
 Frequency is high.; Change to 2700pF or 3000pF/500V.

Part information

Description	Sony Part No.
CAP, MICA 2000pF 500V 5%	1-109-588-00
CAP, MICA 2200pF 500V 5%	1-109-589-00
CAP, MICA 2700pF 500V 5%	1-109-591-00
CAP, MICA 3000pF 500V 5%	1-109-592-00

Step 2.

With machine still in record mode, adjust as follows.

TP2-TPE2/BE-02 = 450 ± 10 mV
 (Oscilloscope) Ⓐ RV1/BE-02

12-9. AUDIO-1/2 ERASE CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

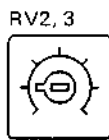
Mode of VTR; REC → PLAY & INSERT
(Don't use alignment tape.)

Setting of Switches & Controls;
REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);
Don't care.

Step 1.

Set \odot RV2 and RV3/BE-02 as follows.



Step 2. Adjustment BE-02 Board

Place machine in record mode and adjust as follows.

AUD-1: TP7-TPE3 = Maximum Level \odot CV1 \odot LV4

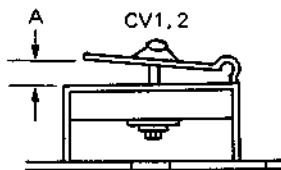
AUD-2: TP8-TPE3 = Maximum Level \odot CV2 \odot LV5

If the clearance "A" of \odot CV1(AUD-1) or CV2(AUD-2) is wider than 3 mm, change the value of C1(AUD-1) or C2(AUD-2) to 150pF/500V and repeat from the beginning of step 2.

If the peak level is not obtained even if the clearance of \odot CV1(AUD-1) or CV2(AUD-2) is zero, change the value of C1(AUD-1) or C2(AUD-2) to 470pF/500V and repeat from the beginning of step 2.

Part Information

Description	Sony Part No.
CAP, MICA 150pF 500V 5%	1-109-677-00
CAP, MICA 470pF 500V 5%	1-109-689-00



Step 3. Adjustment BE-02 Board

With machine still in record mode, adjust as follows.

AUDIO-1: TP7-TPE3/BE-02 = 230 ± 10 Vp-p \odot RV2/BE-02

AUDIO-2: TP8-TPE3/BE-02 = 230 ± 10 Vp-p \odot RV3/BE-02

Step 4.

Play back the recording and place machine in AUDIO-2 INSERT mode, and then check and/or adjust as follows.

TP7-TPE3/BE-02 = less than 10 Vp-p

\odot LV1/BE-02

Still in playback mode, place machine in AUDIO-1 INSERT mode and check as follows.

TP8-TPE3/BE-02 = less than 10 Vp-p

If not, fine tune \odot LV1
and repeat step 4.

If the voltage at TP7 and/or TP8 does not meet the specifications, fine tune \odot RV10/BE-02 and repeat from the beginning of steps 4.

After completion, return to step 3 and if \odot RV2 and/or \odot RV3 is readjusted, proceed to the step 4, then confirm from steps 3 and 4.

12-10. AUDIO-3/4 ERASE CURRENT ADJUSTMENT

Before proceeding this adjustment, be sure to adjust section 12-7 "Sync Erase (V/S Head) Level Adjustment".

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; INSERT

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

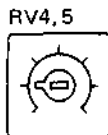
MODE SEL Sw (S3/LG-02): A4

Input Signal (AUDIO LINE IN);

Don't care.

Step 1.

Set \odot RV4 and RV5/BE-02 as follows.



Step 2.

Set MODE SEL switch (S3/LG-02) to A4 and place machine in AUDIO-3 and 4 INSERT mode and adjust as follows.

AUDIO-3: TP9-TPE3/BE-02 = Maximum Level
 \odot CV3 \odot LV6/BE-02

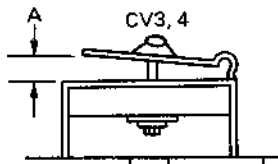
AUDIO-4: TP10-TPE3/BE-02 = Maximum Level
 \odot CV4/BE-02
 (Do not adjust LV7.)

If the clearance "A" of \odot CV3(AUD-3) or CV4(AUD-4) is wider than 3 mm, change the value of C3(AUD-3) or C4(AUD-4) to 150pF/500V and repeat from the beginning of step 2.

If the peak level is not obtained even if the clearance of \odot CV3(AUD-3) or CV4(AUD-4) is zero, change the value of C3(AUD-3) or C4(AUD-4) to 470pF/500V and repeat from the beginning of step 2.

Part Information

Description	Sony Part No.
CAP, MICA 150pF 500V 5%	1-109-677-00
CAP, MICA 470pF 500V 5%	1-109-689-00



Step 3.

With machine still in the same condition, check and/or adjust as follows.

AUDIO-3: TP9-TPE3/BE-02 = 230 ± 15 Vp-p \odot RV4/BE-02

AUDIO-4: TP10-TPE3/BE-02 = 230 ± 15 Vp-p \odot RV5/BE-02

Step 4.

Play back the recording and place machine in AUDIO-4 INSERT mode, and then check and/or adjust as follows.

TP9-TPE3/BE-02 = less than 10 Vp-p

\odot LV2/BE-02

Step 5.

Still in playback mode, place machine in AUDIO-3 INSERT mode and check as follows.

TP10-TPE3/BE-02 = less than 10 Vp-p

If not, fine tune \odot LV2/BE-02

and repeat steps 3, 4 and 5.

If the voltage at TP9 and/or TP10 does not meet the specifications, fine tune RV11/BE-02 and repeat steps 3 through 5.

After completion, return to step 3 and if \odot RV4 and/or \odot RV5 is readjusted, proceed to the steps 4 and 5, then confirm from steps 3 through 5.

12-11. SYNC ERASE (V/S Head) CURRENT ADJUSTMENT (Except for 14 model)

Before proceeding this adjustment, be sure to adjust sections 12-7 "Sync Erase (V/S Head) Level Adjustment" and 12-10 "Audio-3/4 Erase Current Adjustment".

Connection; See section 8-4 connection 5.
Equipment; Oscilloscope
Mode of VTR; REC (Don't use alignment tape.)
Setting of Switches & Controls;
REC INHIBIT Sw: OFF
MODE SEL Sw (S3/LG-02): SYNC → A4
Input Signal (AUDIO LINE IN);
Don't care.

Adjustment

Set MODE SEL switch (S3/LG-02) to SYNC, place machine in record mode and check as follows.

TP1-TPE1/BE-02 = 240 ± 10 mVp-p

If not, choose the value of R189/BE-02 out of 0 to 30 ohms (1/2W).

Do NOT adjust CV5, RV5 and LV7.

After adjustment, return MODE SEL switch (S3/LG-02) to A4.

12-12. CTL (Audio/CTL Head) BIAS CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.
Equipment; Oscilloscope
Mode of VTR; REC (Don't use alignment tape.)
Setting of Switches & Controls;
REC INHIBIT Sw: OFF
Input Signal (AUDIO LINE IN);
Don't care.

Adjustment BE-02 Board

TP6-TPE4 = Maximum Level
● LV3

TP6-TPE4 = 150 ± 10 Vp-p
● RV6

12-13. AUDIO (Audio/CTL Head) BIAS LEAK AND BIAS CURRENT ADJUSTMENT

Connection; See section 8-4 connection 5.
Equipment; Oscilloscope
Distortion Analyzer
Mode of VTR; REC (Don't use alignment tape.)
Setting of Switches & Controls;
AUDIO MONITOR Sel: AUDIO-1, 2, 3 or 4
REC INHIBIT Sw: OFF
TAPE/EE Sel: INPUT → TAPE
A-3 SEL Sw (S1/AE-03): LINE
Input Signal (AUDIO LINE IN);
no signal → 1 kHz/+8 dBm

Step 1.

Open the level control panel and the rear panel, remove all connectors from the AP-12 board, and take off the AP-12 board. Coming round to the rear, put the AP-12 board in the VTR and connect CN351, 353 and 354 to the proper positions on the board.

Step 2. Adjustment AP-12 Board

Perform the following adjustments in record mode.

AUDIO-1: TP101-TPE101 = Minimum Bias Leak ● LV101
AUDIO-2: TP201-TPE201 = Minimum Bias Leak ● LV201
AUDIO-3: TP301-TPE301 = Minimum Bias Leak ● LV301
AUDIO-4: TP401-TPE401 = Minimum Bias Leak ● LV401

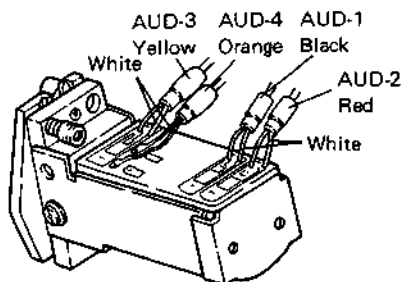
After the adjustments, reinsert the AP-12 board to the proper position and connect all connectors to the board.

Step 3.

Disconnect AUDIO LINE INPUT and connect distortion analyzer to AUDIO MONITOR OUTPUT.
Set TAPE/EE selector to INPUT. A-3 SEL switch (S1/AE-03) to LINE and BIAS LEVEL ADJ controls (RV1, 2, 3, 4)/BE-04 to midrange.

Step 4.

Connect oscilloscope across white lead and GND on the Audio/CTL R/P head as shown below and adjust as follows.



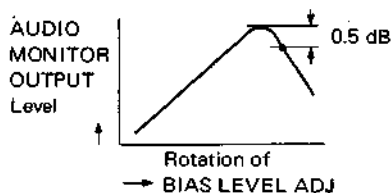
- AUDIO-1 = Maximum Level \odot LV1/BE-03
- AUDIO-2 = Maximum Level \odot LV2/BE-03
- AUDIO-3 = Maximum Level \odot LV3/BE-03
- AUDIO-4 = Maximum Level \odot LV4/BE-03 (Oscilloscope)

Step 5.

Feed +8 dBm at 1 kHz to AUDIO-1(2, 3, 4) LINE INPUT. Set TAPE/EE selector to TAPE and AUDIO MONITOR selector to AUDIO-1(2, 3, 4).

Turn A1(2, 3, 4) BIAS LEVEL ADJ controls (RV1, 2, 3, 4)/BE-04 fully counterclockwise and place machine in record mode.

Turn A1(2, 3, 4) BIAS LEVEL ADJ controls (RV1, 2, 3, 4)/BE-04 slowly clockwise and stops at the 0.5 dB position over the peak as follows.



12-14. RECORDING LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

- AUDIO MONITOR Sel: AUDIO-1, 2, 3 or 4
- AUDIO-1/2/3/4 REC Cont: push
- AUDIO-1/2/3/4 PB Cont: push
- REC INHIBIT Sw: ON \rightarrow OFF
- TAPE/EE Sel: INPUT \rightarrow TAPE
- A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Step 1.

Set TAPE/EE selector to INPUT and A-3 SEL switch (S1/AE-03) to LINE.

During STOP mode, push AUDIO-1/2/3/4 REC controls and check the AUDIO-1/2/3/4 LINE OUTPUT levels as follows.

AUDIO-1/2/3/4 LINE OUTPUT = +8 dBm

If not, perform section 12-1 "Line Amplifier Offset & Output Level Adjustment".

Step 2.

Set REC INHIBIT switch to ON and play back +8 dBm at 1 kHz of alignment tape.

Push AUDIO-1/2/3/4 PB controls and check the AUDIO-1/2/3/4 LINE OUTPUT levels as follows.

AUDIO-1/2/3/4 LINE OUTPUT = +8 dBm

If not, perform section 12-3 "PB Level Controls Calibration".

Step 3.

Set REC INHIBIT switch to OFF. Using ordinary tape, make a recording of +8 dBm at 1 kHz and play back the recording. Check AUDIO-1/2/3/4 LINE OUTPUT levels as follows.

AUDIO-1/2/3/4 LINE OUTPUT = +8 \pm 0.1 dBm

If not, measure the levels as against the specifications and proceed to the next step.

Step 4.

Connect distortion analyzer to AUDIO MONITOR OUTPUT and set TAPE/EE selector to TAPE and AUDIO MONITOR selector to AUDIO-1, 2, 3 or 4.

Place machine in record mode and correct the recording level according to the levels measured in step 3 using following controls.

- AUDIO-1: \odot RV109/AU-27
- AUDIO-2: \odot RV209/AU-27
- AUDIO-3: \odot RV29/AE-03
- AUDIO-4: \odot RV31/AE-03

Step 5.

Play back the recording and check whether the AUDIO-1/2/3/4 LINE OUTPUT levels meet the levels measured in step 3.

If not, repeat steps 4 and 5 a few times.

12-15. CONFI LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

AUDIO MONI Sel: AUD-1 → AUD-1, 2, 3 or 4

AUDIO-1/2/3/4 REC Cont: push

AUDIO-1/2/3/4 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Step 1.

Perform the same procedures in section 12-14 steps 1 and 2.

Step 2.

With machine still in playback of alignment tape, set AUDIO MONITOR selector to AUDIO-1 and adjust as follows.

AUDIO MONITOR OUTPUT = +8 dBm

MONITOR/PHONES

Control (RV1/VR-07)

Step 3.

Set REC INHIBIT switch to OFF and TAPE/EE selector to TAPE.

Using ordinary tape, make a recording of +8 dBm at 1 kHz and then check and/or adjust as follows.

AUDIO MONITOR OUTPUT = +8 ± 0.1 dBm

AUDIO-1: Ⓢ RV106/AU-27

AUDIO-2: Ⓢ RV206/AU-27

AUDIO-3: Ⓢ RV4/AE-03

AUDIO-4: Ⓢ RV25/AE-03

12-16. RECORD AMPLIFIER FREQUENCY RESPONSE ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

AUDIO-1/2/3/4 REC Cont: push

AUDIO-1/2/3/4 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm → 1 kHz/-2 dBm → 10 kHz/-2 dBm

Step 1.

Perform the same procedures in section 12-14 steps 1 and 2.

Step 2.

Set REC INHIBIT switch to OFF. Using ordinary tape, make a short recording of -2 dBm at 1 kHz and 10 kHz. Play back the recording and check the level of 10 kHz with reference to 1 kHz as follows.

AUDIO-1/2/3/4 LINE OUTPUT: 10 kHz = 0 ± 0.5 dB

(reference to 1 kHz)

If not, turn the following pots a little and repeat from the beginning of step 2.

AUDIO-1: Ⓢ RV108/AU-27

AUDIO-2: Ⓢ RV208/AU-27

AUDIO-3: Ⓢ RV28/AE-03

AUDIO-4: Ⓢ RV30/AE-03

12-17. CROSSTALK LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; REC → PLAY/INSERT

(Don't use alignment tape.)

Setting of Switches & Controls;

AUDIO-1/2/3/4 REC Cont: push

AUDIO-1/2/3/4 PB Cont: push

REC INHIBIT Sw: OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

no signal → 1 kHz/+8 dBm → 15, 20, 25 kHz/

+8 dBm

Step 1. AUD-1 to AUD-2 Crosstalk Adjustment

Disconnect AUDIO-2 LINE INPUT and record a few minutes of no signal on AUDIO-2.

Feed +8 dBm at 1 kHz to AUDIO-1 LINE INPUT. Play back the recording and record over recording with AUDIO-1 INSERT mode, then adjust as follows.

AUDIO-2 LINE OUTPUT = Minimum

⊗ RV110/AU-27

Next, change the AUDIO-1 LINE INPUT to +8 dBm at 15 kHz, 20 kHz and 25 kHz in turn and adjust as follows.

AUDIO-2 LINE OUTPUT ≤ -7 dBm

⊗ RV111/AU-27

⊗ LV101/AU-27

Step 2. AUD-2 to AUD-1 Crosstalk Adjustment

Adjust AUDIO-2 to AUDIO-1 crosstalk level in a similar manner to step 1.

AUDIO-1 LINE OUTPUT = Minimum (1 kHz)

⊗ RV210/AU-27

AUDIO-1 LINE OUTPUT ≤ -7 dBm (15 kHz, 20 kHz, 25 kHz)

⊗ RV211/AU-27

⊗ LV201/AU-27

Step 3. AUD-3 to AUD-4 Crosstalk Adjustment

Adjust AUDIO-3 to AUDIO-4 crosstalk level in a similar manner to step 1.

AUDIO-4 LINE OUTPUT = Minimum (1 kHz)

⊗ RV34/AE-03

AUDIO-4 LINE OUTPUT ≤ -7 dBm (15 kHz, 20 kHz, 25 kHz)

⊗ RV35/AE-03

⊗ LV3/AE-03

Step 4. AUD-4 to AUD-3 Crosstalk Adjustment

Adjust AUDIO-4 to AUDIO-3 crosstalk level in a similar manner to step 1.

AUDIO-3 LINE OUTPUT = Minimum (1 kHz)

⊗ RV19/AE-03

AUDIO-3 LINE OUTPUT ≤ -7 dBm (15 kHz, 20 kHz, 25 kHz)

⊗ RV20/AE-03

⊗ LV5/AE-03

12-18. REC CTL LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC → PLAY

(Don't use alignment tape.)

Setting of Switches & Controls;

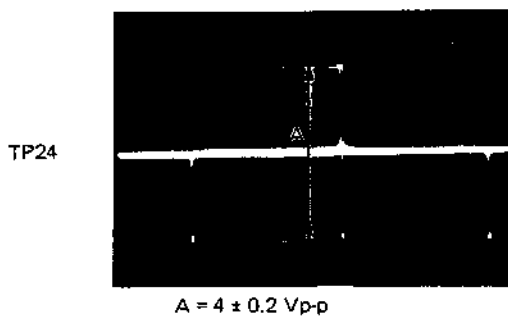
REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment CD-17 Board

Place machine in record mode and play back the recording, then confirm as follows.



If not, place machine in record mode and turn \odot RV11/CD-17 a little while recording. Play back the recording and repeat the confirmation.

12-19. CONF CTL LEVEL ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC (Don't use alignment tape.)

Setting of Switches & Controls;

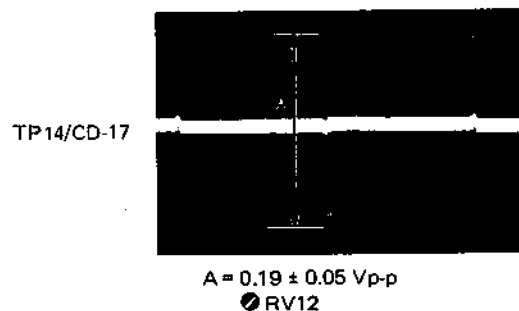
REC INHIBIT Sw: OFF

TAPE/EE Sel: TAPE

Input Signal (AUDIO LINE IN);

Don't care.

Adjustment CD-17 Board



12-20. PB CTL TO AUDIO-4 CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC → PLAY/INSERT → PLAY

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

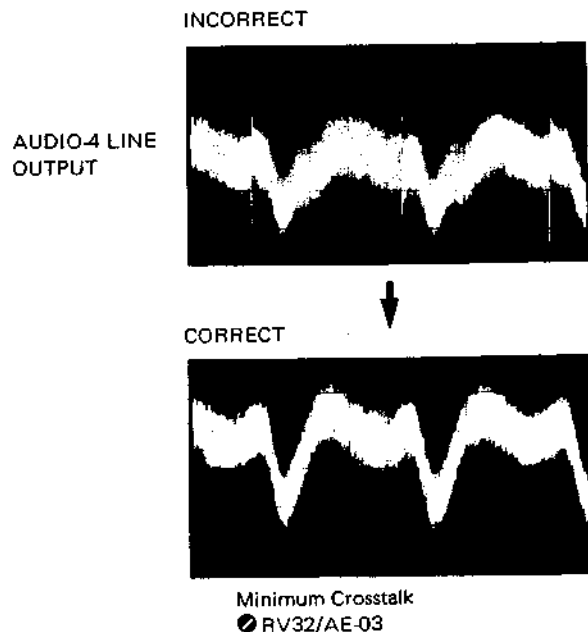
no signal

Adjustment

Disconnect AUDIO-4 LINE INPUT and record a few minutes of no signal on AUDIO-4.

Play back the recording and record over recording with AUDIO-4 INSERT mode.

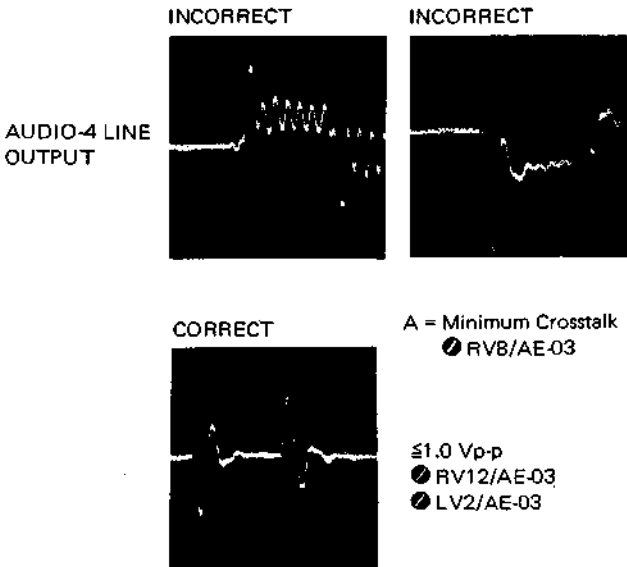
Play back the entire recording and adjust as follows.



12-21. CTL TO AUDIO-4 CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; REC → PLAY/VIDEO ASSEMBLE
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 no signal

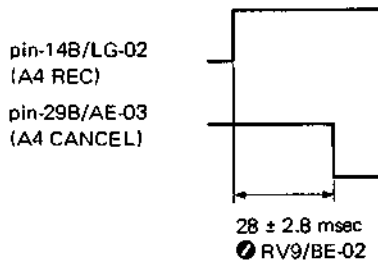
Adjustment
 Disconnect AUDIO-4 LINE INPUT and record a few minutes of no signal on AUDIO-4.
 Play back the recording and record over recording with VIDEO ASSEMBLE mode, then adjust as follows.



12-22. AUDIO-4 CANCEL TIMING ADJUSTMENT

Connection; See section 8-4 connection 5.
 Equipment; Oscilloscope
 Mode of VTR; PLAY/AUDIO-4 INSERT
 Setting of Switches & Controls;
 REC INHIBIT Sw: OFF
 Input Signal (AUDIO LINE IN);
 no signal

Adjustment
 Press AUDIO-4 INSERT button. While switching the AUDIO-4/SYNC preset button to ON or OFF, adjust as follows.



12-23. REC AUDIO-4 TO PB CTL CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC → PLAY/AUDIO-4 INSERT

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

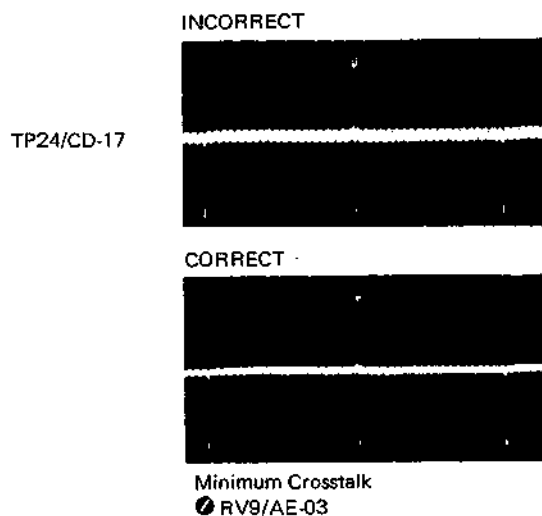
no signal → 1 kHz/+18 dBm → 15 kHz/+18 dBm

Step 1.

Disconnect AUDIO-4 LINE INPUT and record a few minutes of no signal on AUDIO-4.

Connect AUDIO-4 LINE INPUT and feed +18 dBm at 1 kHz.

Play back the recording and record over recording with AUDIO-4 INSERT mode, then adjust as follows.



Step 2.

Similar manner to step 1, change the AUDIO-4 LINE INPUT to +18 dBm at 15 kHz with machine still in AUDIO-4 INSERT mode.

TP24/CD-17 = Minimum Crosstalk

⊗ LV4/AE-03

⊗ RV38/AE-03

12-24. PLAY MODE CROSSTALK ADJUSTMENT

Connection; See section 8-4 connection 6.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

AUDIO-1/2/3/4 REC Cont: push

AUDIO-1/2/3/4 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw(S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

See respective steps.

Step 1.

Perform the same procedures in section 12-14 steps 1 and 2.

Step 2. AUD-1 to AUD-2 Crosstalk Adjustment

Set REC INHIBIT switch to OFF and disconnect AUDIO-2 LINE INPUT. Using ordinary tape, record a few minutes of no signal on AUDIO-2.

Play back the recording and record +18 dBm at 1 kHz and 15 kHz at an interval of 1 minute over recording with AUDIO-1 INSERT mode.

Play back the entire recording and check and/or adjust as follows.

AUDIO-2 LINE OUTPUT: 1 kHz ≅ -65 dB

15 kHz ≅ -55 dB

⊗ RV101/AU-27

Step 3. AUD-2 to AUD-1 Crosstalk Adjustment

Adjust AUDIO-2 to AUDIO-1 crosstalk level in a similar manner to step 2.

AUDIO-1 LINE OUTPUT: 1 kHz ≅ -65 dB

15 kHz ≅ -55 dB

⊗ RV201/AU-27

Step 4. AUD-3 to AUD-4 Crosstalk Adjustment

Adjust AUDIO-3 to AUDIO-4 crosstalk level in a similar manner to step 2.

AUDIO-4 LINE OUTPUT: 1 kHz ≅ -65 dB

15 kHz ≅ -55 dB

⊗ RV33/AE-03

Step 5. AUD-4 to AUD-3 Crosstalk Adjustment

Adjust AUDIO-4 to AUDIO-3 crosstalk level in a similar manner to step 2.

AUDIO-3 LINE OUTPUT: 1 kHz ≅ -65 dB

⊗ RV36/AE-03

15 kHz ≅ -55 dB

⊗ RV37/AE-03

12-25. MONITOR AMPLIFIER FREQUENCY RESPONSE ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Distortion Analyzer

Mode of VTR; See respective steps.

Setting of Switches & Controls;

AUDIO MONITOR Sel: AUD-1/2/3/4

AUDIO-1/2/3/4 REC Cont: push

AUDIO-1/2/3/4 PB Cont: push

REC INHIBIT Sw: ON → OFF

TAPE/EE Sel: INPUT → TAPE

A-3 SEL Sw(S1/AE-03): LINE

Input Signal (AUDIO LINE IN);

See respective steps.

Step 1.

Perform the same procedures in section 12-14 steps 1 and 2.

Step 2.

With machine still in playback of alignment tape, set AUDIO MONITOR selector to AUDIO-1 and adjust MONITOR/PHONES level control (RV1/VR-07) for +8 dBm at AUDIO MONITOR OUTPUT.

Step 3.

Set REC INHIBIT switch to OFF. Using ordinary tape, record -2 dBm at 10 kHz, 50 Hz and 100 Hz in turn on AUDIO-1, 2, 3 and 4. Play back the recording and measure the levels at AUDIO MONITOR OUTPUT connector while selecting the AUDIO MONITOR selector to AUDIO-1, 2, 3 and 4.

Step 4.

Set TAPE/EE selector to TAPE. Feed -2 dBm at 10 kHz to AUDIO LINE INPUT and place machine in record mode. Check the AUDIO MONITOR OUTPUT levels while selecting the AUDIO MONITOR selector to AUD-1, 2, 3 and 4, then compare the levels at 10 kHz measured in step 3. If the level differences are more than ± 1 dB, adjust with following pots.

AUDIO-1: Ⓞ RV104/AU-27

AUDIO-2: Ⓞ RV204/AU-27

AUDIO-3: Ⓞ RV6/AE-03

AUDIO-4: Ⓞ RV27/AE-03

Step 5.

Feed -2 dBm at 50 Hz and check and/or adjust the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

AUDIO-1: Ⓞ RV105/AU-27

AUDIO-2: Ⓞ RV205/AU-27

AUDIO-3: Ⓞ RV5/AE-03

AUDIO-4: Ⓞ RV26/AE-03

Step 6.

Feed -2 dBm at 100 Hz and check the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

If the level differences are more than ± 1 dB, repeat steps 5 and 6 again.

Step 7.

Feed -2 dBm at 50 Hz, 100 Hz and 10 kHz in turn and check the AUDIO MONITOR OUTPUT levels in a similar manner to step 4.

If the level differences are more than ± 1 dB, repeat steps 4 through 7.

12-26. TIME CODE DUTY CYCLE ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; STOP → REC → PLAY

Setting of Switches & Controls;

REC INHIBIT Sw: OFF

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC → LINE → TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

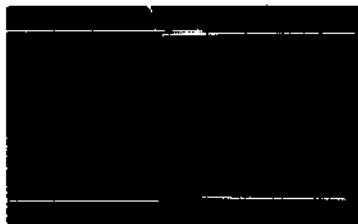
1 kHz/+8 dBm

Step 1.

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1 kHz to AUDIO-3 LINE INPUT.

TP8-TPE8 (GND/AE-03)
(Ext Trig: TP8)
(Trig Slope: +/-)



≤5 μsec
RV18/AE-03

Step 2.

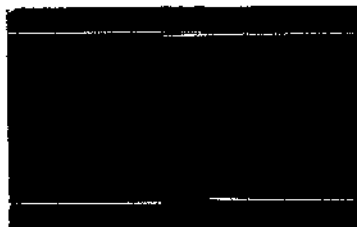
Set A-3 SEL switch (S1/AE-03) to LINE and make a short recording.

Step 3.

Return A-3 SEL switch (S1/AE-03) to TC.

Play back the recording in step 2 and check and/or adjust as follows.

TP7-TPE8 (GND) AE-03
(Ext Trig: TP7)
(Trig Slope: +/-)



≤5 μsec
RV15/AE-03

12-27. TIME CODE OUTPUT LEVEL ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Distortion Analyzer

Mode of VTR; STOP

Setting of Switches & Controls;

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Adjustment

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1kHz to AUDIO-3 LINE INPUT and connect oscilloscope and 75 ohm termination to TIME CODE OUTPUT.

TIME CODE OUTPUT = 0.5 ± 0.1 V_{p-p}
(Oscilloscope) RV17/AE-03

AUDIO-3 LINE OUTPUT = $+8 \pm 0.1$ dBm
(Distortion Analyzer) RV16/AE-03

12-28. TIME CODE RECORDING LEVEL ADJUSTMENT

This adjustment is necessary when make a recording or playing back of the time code.

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; STOP

Setting of Switches & Controls;

TAPE/EE Sel: INPUT

A-3 SEL Sw (S1/AE-03): TC

TC INT/EXT1/EXT2 Sw (S2/AE-03): EXT2

Input Signal (AUDIO LINE IN);

1 kHz/+8 dBm

Adjustment

Set A-3 SEL switch (S1/AE-03) to TC and TC INT/EXT1/EXT2 switch (S2/AE-03) to EXT2.

Feed +8 dBm at 1 kHz to AUDIO-3 LINE INPUT.

TP19-TPE2/AE-03 = 150 ± 5 mV_{p-p}
RV13/AE-03

12-29. REC BIAS LEAK ADJUSTMENT

Connection; See section 8-4 connection 5.

Equipment; Oscilloscope

Mode of VTR; REC → PLAY/INSERT

Setting of Switches and Controls;

AUDIO-1/2/3/4 REC Cont: Pull

REC INHIBIT Sw: OFF

Input Signal (AUDIO LINE IN);

no signal

Step 1.

Pull AUDIO-1/2/3/4 REC Level Controls and turn fully counterclockwise. Make a recording of no signal on AUDIO-1/2/3/4.

Step 2. AUD-1 to AUD-2 Bias Leak Adj.

Play back the recording of step 1 and record over recording with AUDIO-1 INSERT mode, then adjust as follows.

AUDIO-2 LINE OUTPUT = Minimum Bias Leak

⊗ LV202/AU-27

Step 3. AUD-2 to AUD-1 Bias Leak Adj.

Play back the recording of step 1 and record over recording with AUDIO-2 INSERT mode, then adjust as follows.

AUDIO-1 LINE OUTPUT = Minimum Bias Leak

⊗ LVI02/AU-27

Step 4. AUD-3 to AUD-4 Bias Leak Adj.

Play back the recording of step 1 and record over recording with AUDIO-3 INSERT mode, then adjust as follows.

AUDIO-4 LINE OUTPUT = Minimum Bias Leak

⊗ LV6/AE-03

Step 5. AUD-4 to AUD-3 Bias Leak Adj.

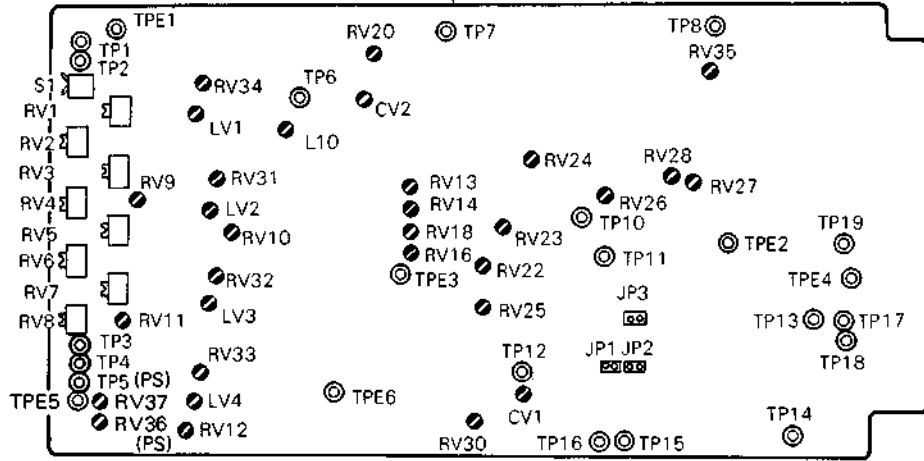
Play back the recording of step 1 and record over recording with AUDIO-4 INSERT mode, then adjust as follows.

AUDIO-3 LINE OUTPUT = Minimum Bias Leak

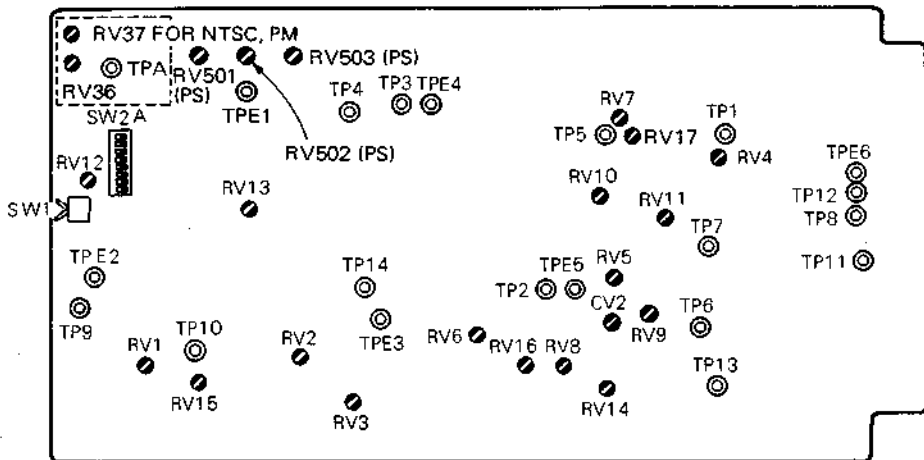
⊗ LV1/AE-03

SECTION 13 VIDEO SIGNAL SYSTEM ALIGNMENT

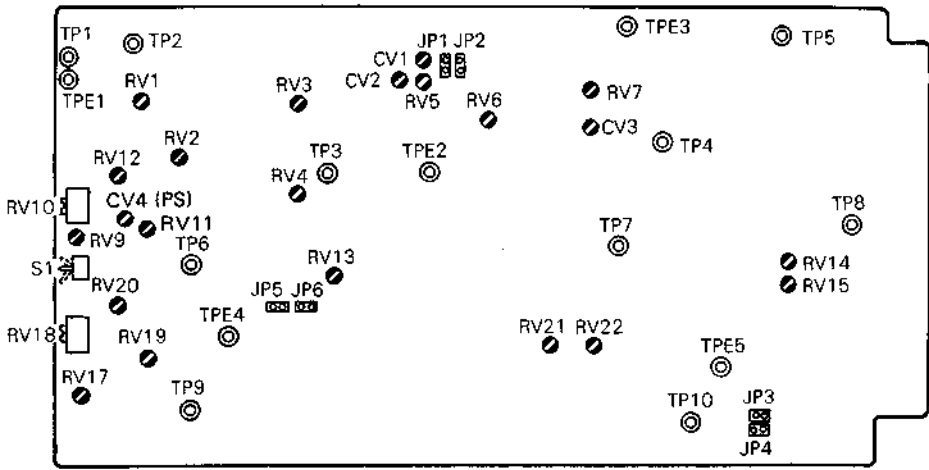
EQ-02 Board



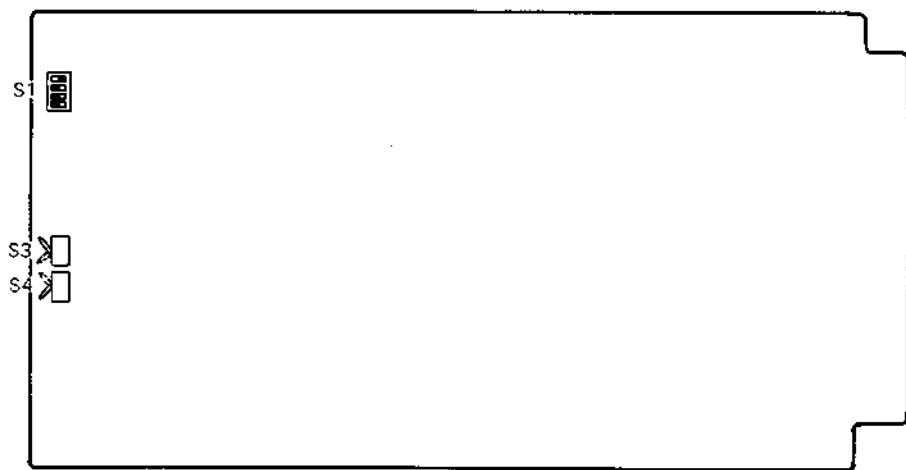
DM-25 Board



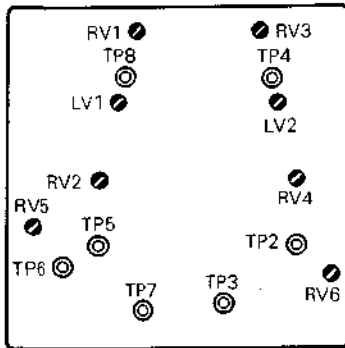
MD-14 Board



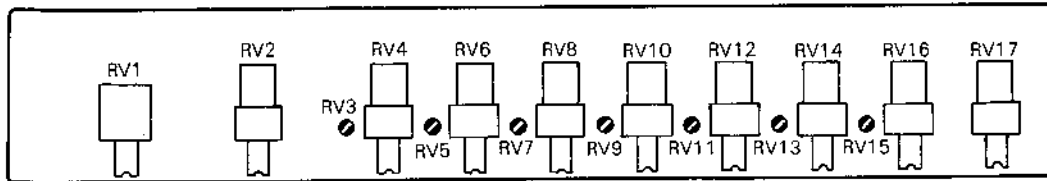
LG-02(A) Board



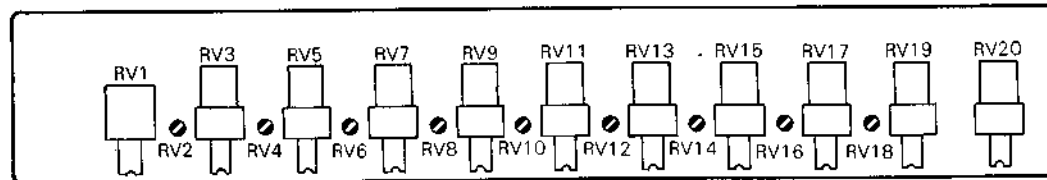
RP-09 Board



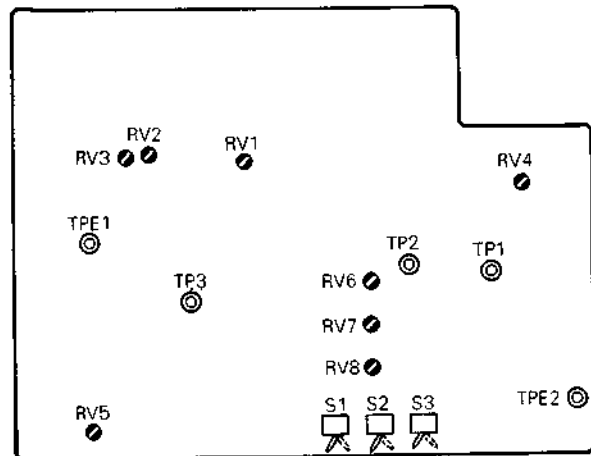
VR-05 Board



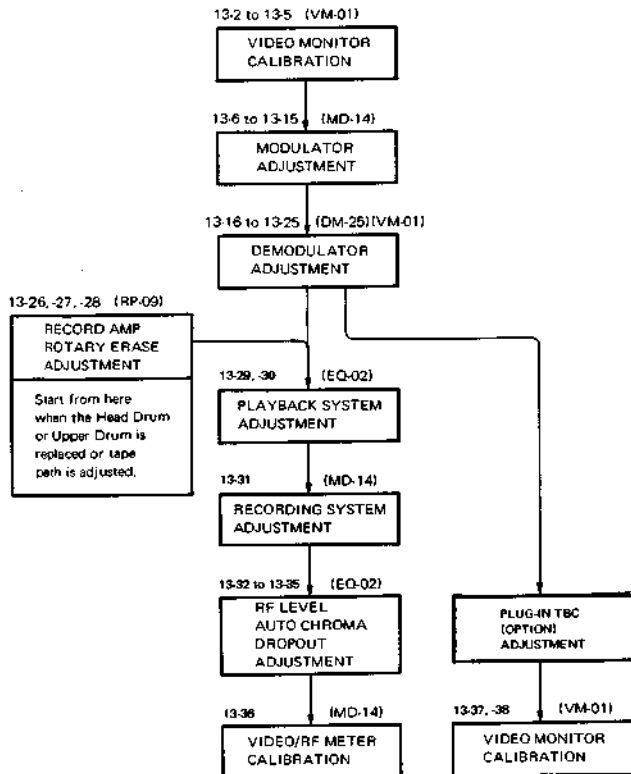
VR-07 Board ; For 04 model



VM-01 Board



13-1. VIDEO SIGNAL SYSTEM ALIGNMENT SEQUENCE



13-2. INSERT CHARACTER LEVEL ADJUSTMENT

This adjustment is necessary when the TC-14A board (Time Code Reader/Generator) is installed.

When the TC-14A board is not installed, set \odot RV1/VM-01 to mid-rotation.

Connection: See section 8-4 connection 3.

Equipment: Waveform Monitor

Mode of VTR: STOP (Auto E-E)

Setting of Switches & Controls:

PICTURE MONITOR Sel: TBC

TAPE/EE Sel: TAPE/EE

CHAR ON/OFF Sw(S7/TC-14A): ON

Input Signal (TBC MONITOR IN):

BLACK BURST

Adjustment

VIDEO MONITOR OUT



$0.57 \pm 0.01V$
 \odot RV1/VM-01

13-3. VIDEO MONITOR LEVEL AND FREQ. RESPONSE ADJUSTMENT

Connection; See section 8-4 connection 3.

Equipment; Waveform Monitor

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

PICTURE MONITOR Sel: TBC

TAPE/EE Sel: TAPE/EE

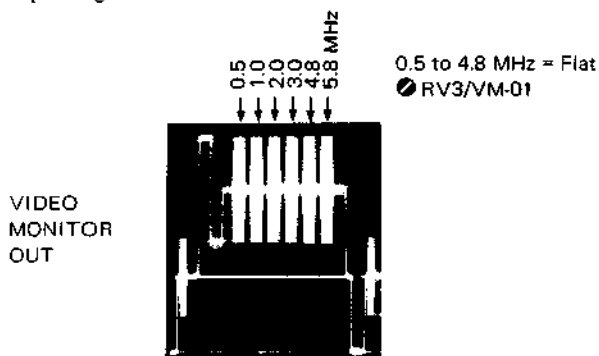
Input Signal (TBC MONITOR IN);

RAMP LINEARITY

MULTIBURST

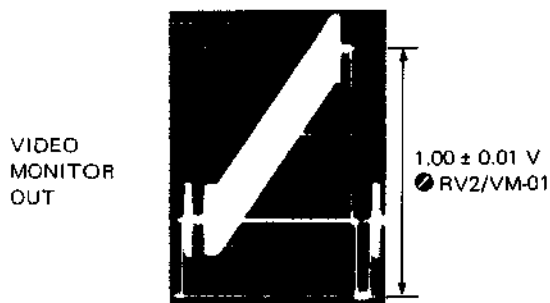
Step 1.

Input Signal: MULTIBURST



Step 2.

Input Signal: RAMP LINEARITY



Step 3.

After the adjustment, repeat from step 1 until meet the specifications.

13-4. WFM OUTPUT LEVEL ADJUSTMENT

Connection; See section 8-4 connection 3.

Equipment; Waveform Monitor

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

PICTURE MONITOR Sel: TBC

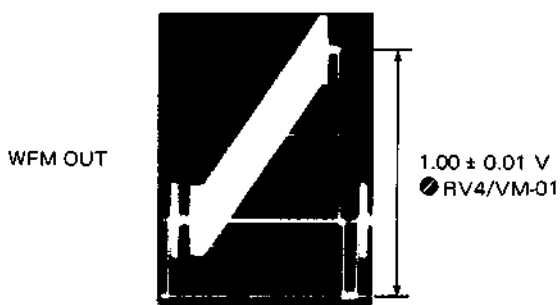
WAVEFORM MONITOR Sel: SELECT VIDEO

TAPE/EE Sel: TAPE/EE

Input Signal (TBC MONITOR IN);

RAMP LINEARITY

Adjustment



13-5. INPUT VIDEO LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Waveform Monitor

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

PICTURE MONITOR Sel: INPUT VIDEO

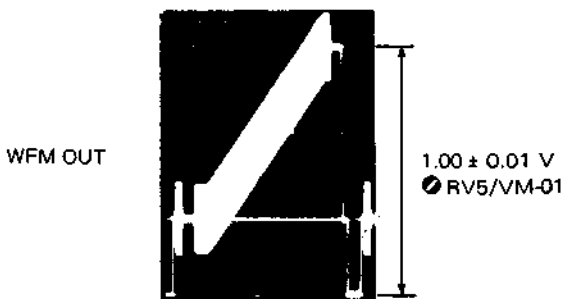
WAVEFORM MONITOR Sel: SELECT VIDEO

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

RAMP LINEARITY

Adjustment



13-6. +5.1V REGULATOR ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Digital Voltmeter

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment MD Board

TP2 = $+5.10 \pm 0.05\text{Vdc}$

⊗ RV3

13-7. VIDEO LEVEL PRESET AND VIDEO/RF LEVEL METER CALIBRATION

13-7-1. VIDEO Level Preset Adjustment

Connection; See section 8-4 connection 1.

Equipment; Digital Voltmeter

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment

TP5/MD-14 = $-0.5 \pm 0.01\text{Vdc}$

⊗ RV15/VR-05 (BVH-2000PS 00/02, BVH-2500P)
BVH-2180PS 00/02

⊗ RV18/VR-07 (BVH-2000PS/2180PS 04)

13-7-2. VIDEO/RF Level Meter Calibration

Connection; See section 8-4 connection 1.

Equipment; Unnecessary

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

PICTURE MONITOR Sel: DEMOD OUT

WAVEFORM MONITOR Sel: SELECT VIDEO

TAPE/EE Sel: TAPE/EE

METER Sw (S1/MD): INPUT

Input Signal (VIDEO IN);

RAMP LINEARITY

Adjustment

VIDEO/RF METER = 100%

⊗ RV15/MD Board

13-8. MODULATOR BURST TIMING ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Oscilloscope

Mode of VTR; STOP (Auto E-E)

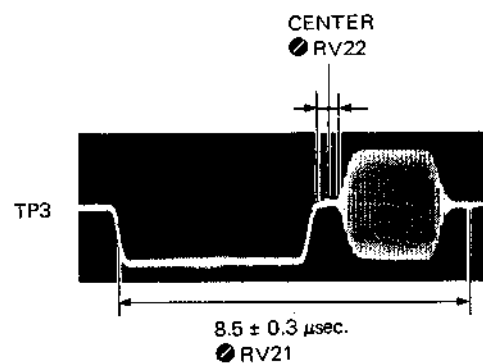
Setting of Switches & Controls;

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);

Any Signal with Burst

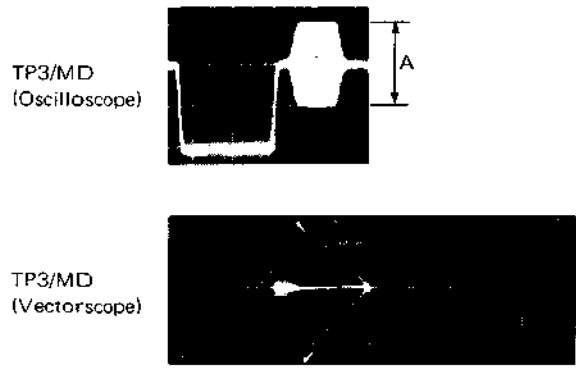
Adjustment MD Board



13-9. BURST LEVEL AND PHASE ADJUSTMENT

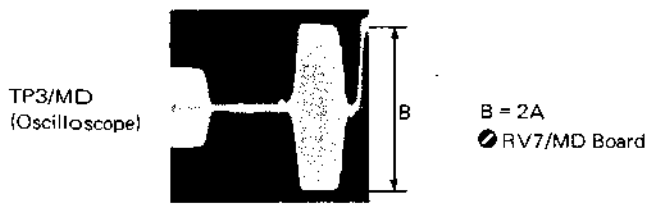
Connection: See section 8-4 connection 1.
 Equipment: Vectorscope via Oscilloscope
 Mode of VTR: STOP (Auto E-E)
 Setting of Switches & Controls:
 TAPE/EE Sel: TAPE/EE
 SERVO REF Sw (Cont. Panel): EXT→INPUT
 Disconnect EXT REF VIDEO connector.
 Input Signal (VIDEO IN):
 RAMP LINEARITY

Step 1.
 Set the SERVO REF switch to EXT position and measure the burst level (A) and phase.

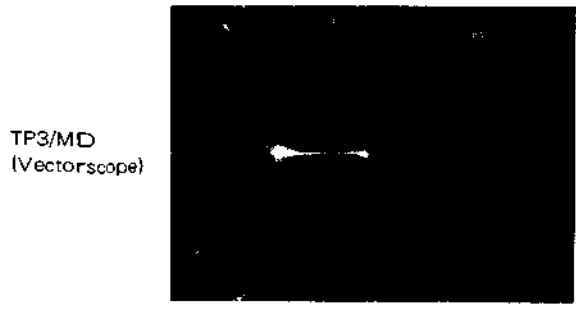


Step 2.
 Set the SERVO REF switch to INPUT position.

Step 3. Level Adjustment



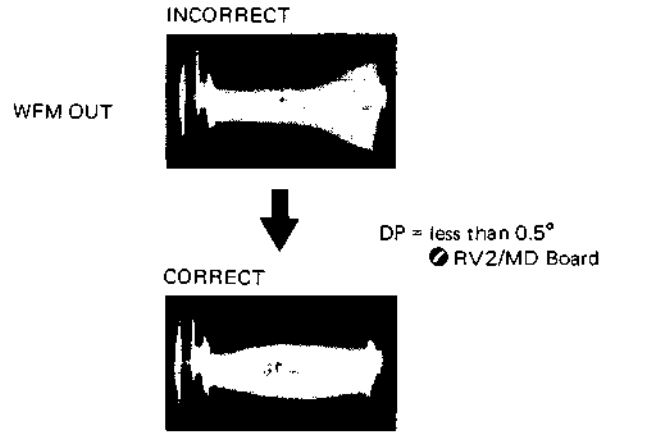
Step 4. Phase Adjustment
 Adjust \odot CV3/MD for the same relationship between chroma and burst on the vectorscope as step 1.



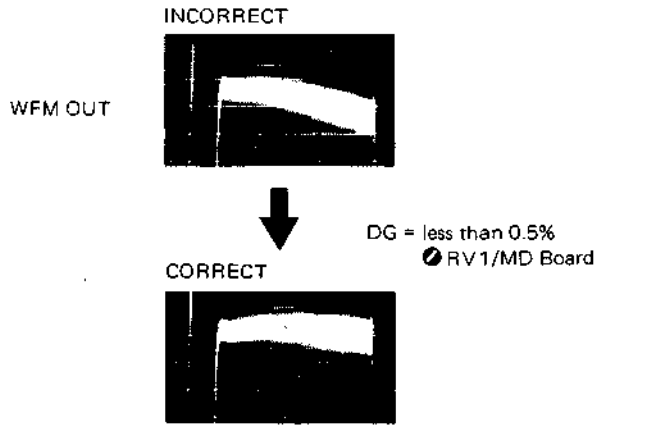
13-10. DG AND DP ADJUSTMENT

Connection: See section 8-4 connection 1.
 Equipment: Vectorscope (DP or DG mode)
 Mode of VTR: STOP (Auto E-E)
 Setting of Switches & Controls:
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN):
 RAMP LINEARITY

Step 1. DP Adjustment



Step 2. DG Adjustment

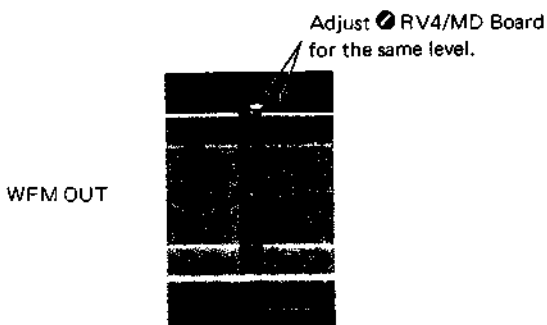


13-11. FM DEVIATION ADJUSTMENT

Connection: See section 8-4 connection 1.
 Equipment: Waveform Monitor (2-Field Mode)
 Mode of VTR: STOP (Auto E-E)
 Setting of Switches & Controls:
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 WHITE REF Sw (SW1/DM-25): ON
 Input Signal (VIDEO IN):
 RAMP LINEARITY

Step 1.
 Set the WHITE REF switch (SW1/DM-25) to ON.

Step 2. Adjustment



Step 3.
 After adjustment, set the WHITE REF switch (SW1/DM-25) to OFF.

13-12. MODULATOR FREQ. RESPONSE ADJUSTMENT

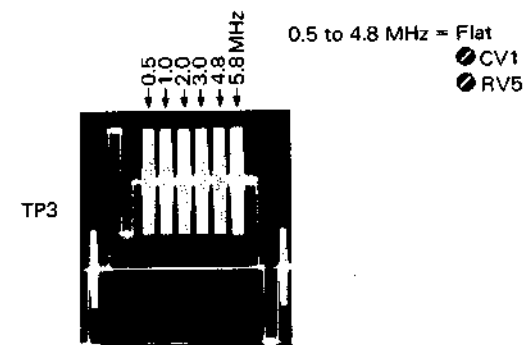
Connection: See section 8-4 connection 1.
 Equipment: Oscilloscope
 Mode of VTR: STOP (Auto E-E)
 Setting of Switches & Controls:
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN):
 MULTIBURST

MD board

Step 1.
 Set the JP1/JP2 jumper plug to JP2.

TP3: 0.5 to 4.8MHz = Flat
 CV2

Step 2.
 Set the JP1/JP2 jumper plug to JP1.



Step 3.
 After adjustment, set the jumper plug to JP2.

13-13. VITC LEVEL AND TIMING ADJUSTMENT

This adjustment is necessary when the TC-14A board (Time Code Reader/Generator) is installed.

Connection; See section 8-4 connection 1.

Equipment; Waveform Monitor (Line-19)

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls;

PICTURE MONITOR Sel: DEMOD

WAVEFORM MONITOR Sel: SELECT VIDEO

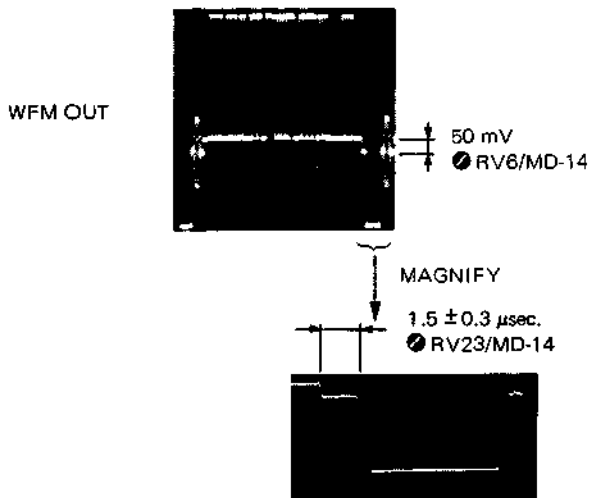
TAPE/EE Sel: TAPE/EE

VITC ON/OFF Sw (S6/TC-14A): ON

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment



13-14. MODULATOR FREE RUN FREQ. AND BALANCE ADJUSTMENT

Connection; See section 8-4 connection 1, and disconnect the video input connector.

Equipment; Spectrum Analyzer via Oscilloscope

Mode of VTR; RECORD

Setting of Switches & Controls;

SERVO REF Sel: EXT

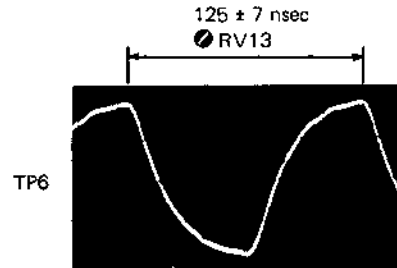
REC INHI Sw: OFF

Input Signal (VIDEO IN);

No Signal

Adjustment MD-14 Board

Set the SERVO REF Selector to EXT position.



VIDEO CH: Spectrum Analyzer

TP6: Minimize 18MHz component.

RV9

SYNC CH: Spectrum Analyzer

TP6: Minimize 18MHz component.

RV17

13-15. MODULATOR RF BALANCE ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Waveform Monitor

Spectrum Analyzer (via Oscilloscope)

Mode of VTR; STOP

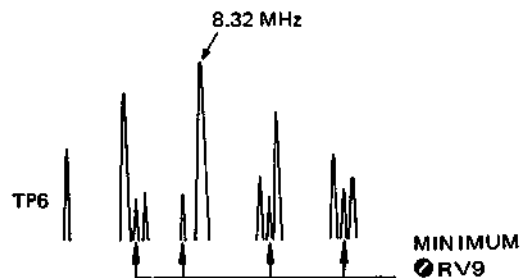
Input signal (VIDEO IN);

MOIRÉ (See section 13-30-4 step 1.)

Step 1.

Short JP7 (VIDEO TEST) on the LG-02(A) board.

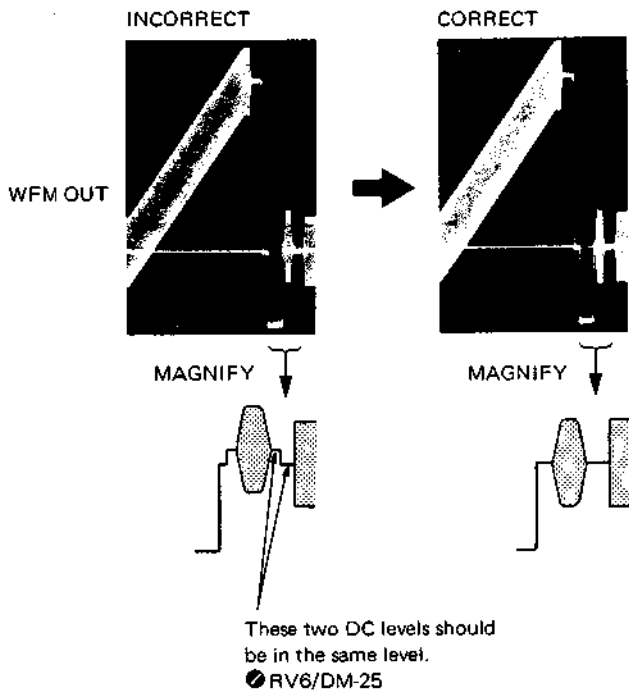
Step 2. Adjustment MD-14 board.



13-16. BURST DC LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Waveform Monitor (2-Field Mode)
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 Any Signal with Burst

Adjustment



13-17. DEMOD AGC ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Oscilloscope
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 RAMP LINEARITY

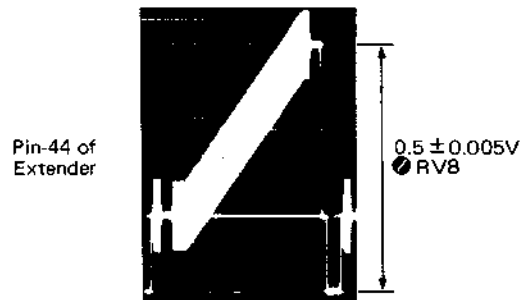
Adjustment DM-25 Board

TP5 = $0 \pm 0.2V_{dc}$
 ● RV10

13-18. DEMOD OUTPUT LEVEL ADJUSTMENT 1

Connection; See section 8-4 connection 1.
 Equipment; Oscilloscope
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 RAMP LINEARITY

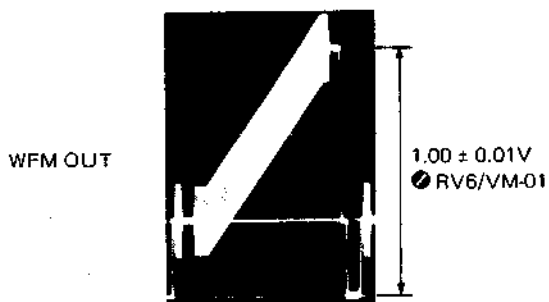
Adjustment DM-25 Board



13-19. DEMOD OUTPUT LEVEL ADJUSTMENT 2

Connection: See section 8-4 connection 1.
 Equipment: Waveform Monitor
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 RAMP LINEARITY

Adjustment

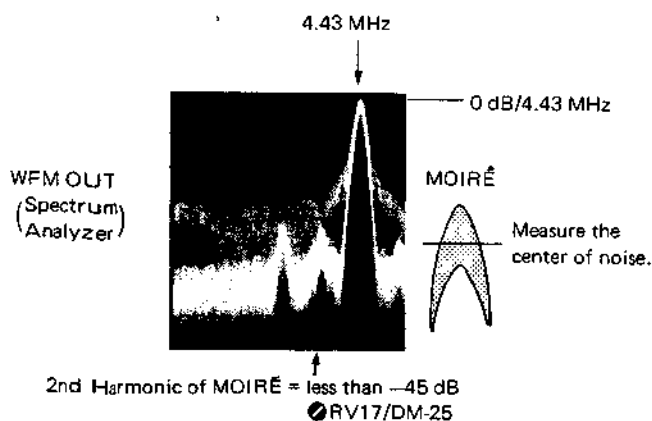


13-20. DEMOD BALANCE AND WINDOW PULSE TIMING ADJUSTMENT

13-20-1. Demod Balance Adjustment

Connection: See section 8-4 connection 1.
 Equipment: Waveform Monitor
 Spectrum Analyzer
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 MOIRÉ (See section 13-30-4 step 1.)

Adjustment



13-20-2. Window Pulse Timing Adjustment

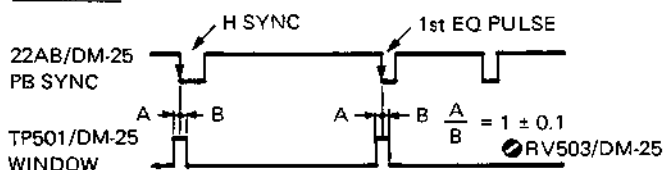
For serial No. BVH-2000PS; # 33801 & UP
 BVH-2180PS; # 10201 & UP

Connection: See Section 8-4 Connection 1
 Equipment: Oscilloscope
 Mode of VTR; STOP (Auto EE)
 Setting of Switch; TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 Any Signal with Burst

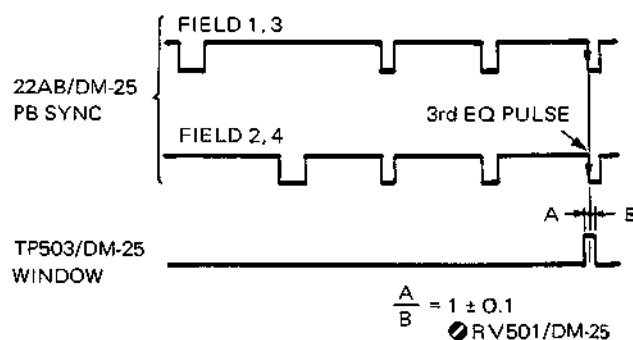
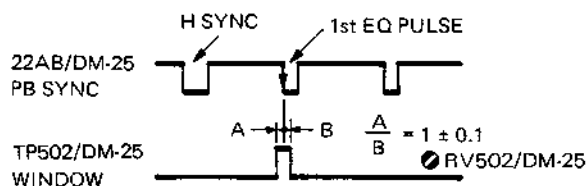
Adjustment

DM-25 Board
 Before adjustment, turn RV503 fully counterclockwise.

FIELD 1, 3



FIELD 2, 4



13-21. WHITE REFERENCE TIMING ADJUSTMENT

Connection: See section 8-4 connection 1.

Equipment: Waveform Monitor (Line-21)

Mode of VTR; STOP (Auto E-E)

Setting of Switches & Controls:

PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 TAPE/EE Sel: TAPE/EE
 WHITE REF Sw (SW1/DM-25): ON

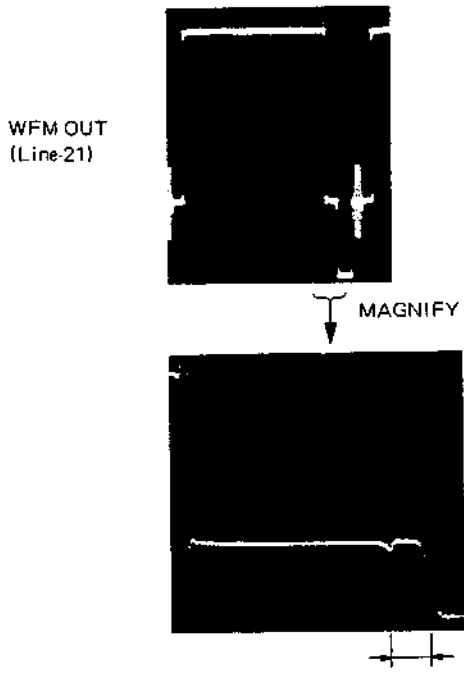
Input Signal (VIDEO IN):

RAMP LINEARITY

Step 1.

Set the WHITE REF switch (SW1/DM-25) to ON and
 ⓪ RV1/DM-25 to fully counterclockwise.

Step 2. Adjustment



Step 3.

After adjustment, set the WHITE REF switch (SW1/DM-25) to OFF.

13-22. DEMOD BURST GATE TIMING ADJUSTMENT

Connection: See section 8-4 connection 1.

Equipment: Oscilloscope

Mode of VTR; STOP (Auto E-E)

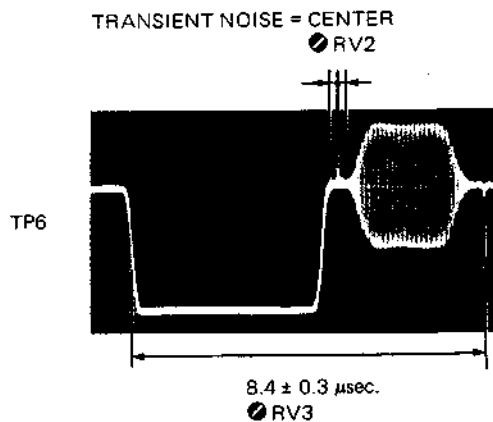
Setting of Switches & Controls:

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN):

Any Signal with Burst

Adjustment DM-25 Board



13-23. BURST LEVEL DETECTOR ADJUSTMENT

Connection: See section 8-4 connection 1.

Equipment: Oscilloscope

Mode of VTR; STOP (Auto E-E)

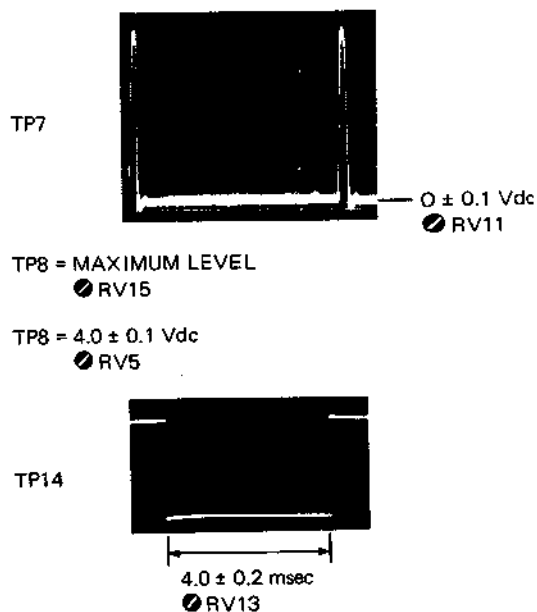
Setting of Switches & Controls:

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN):

BLACK BURST

Adjustment DM-25 Board



13-24. DEMOD FREQ. RESPONSE ADJUSTMENT

Connection: See section 8-4 connection 1.

Equipment: Waveform Monitor

Mode of VTR: STOP (Auto E-E)

Setting of Switches & Controls:

PICTURE MONITOR Sel: INPUT VIDEO →
DEMODO OUT

WAVEFORM MONITOR Sel: SELECT VIDEO

TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN):

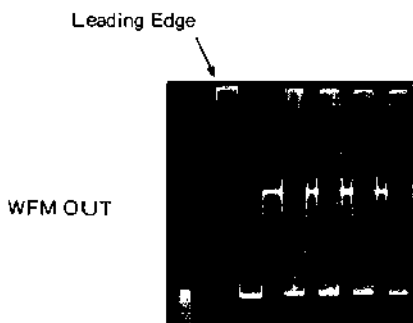
MULTIBURST

LOW BAND FREQUENCY RESPONSE

Step 1.

Set the PICTURE MONITOR Selector to INPUT VIDEO.

Observe and memorize the leading edge of the Multiburst signal as shown below.



Step 2.

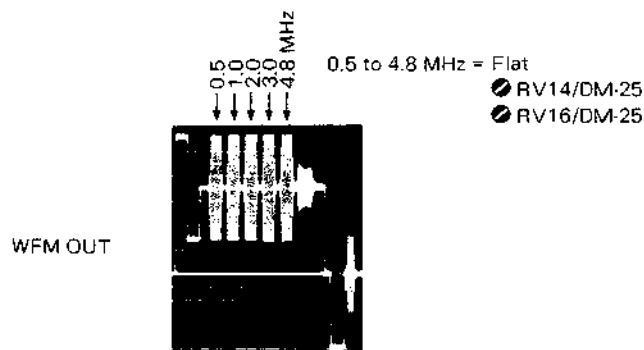
Set the PICTURE MONITOR Selector to DEMODO OUT.

Adjust RV7/DM-25 for the same wave shape as memorized in step 1.

HIGH BAND FREQUENCY RESPONSE

Step 3.

Set the PICTURE MONITOR Selector to DEMODO OUT.



13-25. BURST PHASE AND LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.
Disconnect the EXT REF VIDEO INPUT.

Equipment; Vectorscope (VECTOR Mode)

Mode of VTR; STOP (Auto E-E)

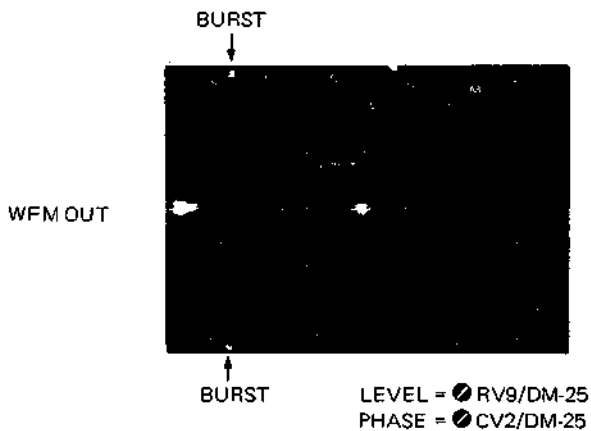
Setting of Switches & Controls;

PICTURE MONITOR Sel: DEMOD OUT
WAVEFORM MONITOR Sel: SELECT VIDEO
TAPE/EE Sel: TAPE/EE

Input Signal (VIDEO IN);
RAMP LINEARITY

Adjustment DM-25 Board

While switching the SERVO REF switch on the function control panel to INPUT or EXT alternately, adjust ● RV9 and ● CV2/DM-25 for the same level and phase.



13-26. RECORD AMPLIFIER PRESETTING

Do not turn the following potentiometers. If you should turn or make a replacement, set them as follows.

RP-09 Board

RV2 : Mid-rotation

RV4 : Mid-rotation

13-27. ROTARY ERASE LEVEL AND FREQ. ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Frequency Counter via Oscilloscope
 Mode of VTR; STOP (Auto E-E)
 Setting of Switches & Controls;
 TAPE/EE Sel: TAPE/EE
 Input Signal (VIDEO IN);
 Any Signal with Burst

Step 1.

Take the LG-02 board out from the card rack and put it in at the card rack via the Extender.
 Connect jumpers between pin-21A and GND and pin-22A and GND on the Extender respectively.

Step 2. Adjustment RP-09 Board

VIDEO CHANNEL

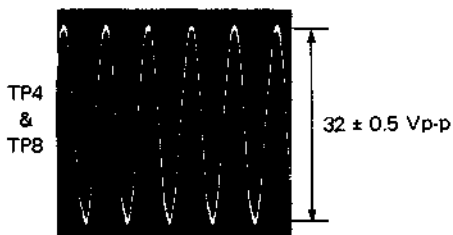
TP4 = 32 ± 0.5 Vp-p
 ● RV3

TP4 = 16 ± 0.1 MHz
 ● LV2

SYNC CHANNEL
 (Except for 10, 12 and 14 models.)

TP8 = 32 ± 0.5 Vp-p
 ● RV1

TP8 = 16 ± 0.1 MHz
 ● LV1



Step 3.

After adjustment, remove jumpers and Extender.

13-28. RECORD CURRENT AND PB RF LEVEL ADJUSTMENT

CAUTION: Before perform the section 13-28 and higher, demagnetize the rotary heads, referring to section 3-3.

For 02, 12, 04 and 14 Models

Connection; See section 8-4 connection 1.
 Equipment; Waveform Monitor
 Oscilloscope
 Mode of VTR; REC → PLAY
 Setting of Switches & Controls;
 WAVEFORM MONITOR Sel: RF ENVELOPE
 TAPE/EE Sel: TAPE
 Input Signal (VIDEO IN);
 RAMP LINEARITY

Step 1.

Set the METER Selector (S1/MD-14) to RF(V) position.
 Place the machine into the REC mode and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
 ● RV10/MD-14

Step 2. (Except for 10, 12 and 14 models)

With machine still in REC mode, set the METER Selector (S1/MD-14) to RF(S) position and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
 ● RV18/MD-14

Step 3.

Set the HAED Selector to R/P position.
 Record the ramp linearity signal for several minutes.
 Play back the recording and observe the RF envelope signal on the Waveform Monitor, and then adjust the levels as follows.

TP8/EQ-02 = 0.4 ± 0.04 Vp-p
 ● RV34/EQ-02

WFM OUT: R/P SYNC RF LEVEL = R/P VIDEO RF LEVEL
 ● RV31/EQ-02

Step 4.

Set the HEAD Selector to PLAY position.
 While playing back the portion recorded in step 3, adjust the level on the Waveform Monitor as follows.

WFM OUT: PLAY VIDEO RF LEVEL = R/P VIDEO RF LEVEL
 ● RV32/EQ-02

WFM OUT: PLAY SYNC RF LEVEL = PLAY VIDEO RF LEVEL
 (Except for 10, 12 and 14 models)
 ● RV33/EQ-02

For 00 and 10 Models

Connection: See section 8-4 connection 1.
Equipment: Waveform Monitor
Oscilloscope
Mode of VTR; REC TEST → REC → PLAY
Setting of Switches & Controls:
WAVEFORM MONITOR Sel: RF ENVELOPE
REMOTE/LOCAL Sw: LOCAL
REC INHI Sw: OFF
REC TEST Sw (S12/SY-79): ON (1)
Input signal (VIDEO IN);
RAMP LINEARITY

Step 1.

Press the REC TEST switch (S12/SY-79) downward.
Press the REC button, the machine repeats the recording and playback at an interval of 1 second.

Step 2.

With machine still in REC TEST mode, set the METER Selector (S1/MD-14) to RF (V) position and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
● RV10/MD-14

Step 3.

With machine still in REC TEST mode, set the METER Selector to RF (S) position and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
● RV18/MD-14

Step 4.

Press the STOP button so as to release the REC TEST mode.

Step 5.

Record the RAMP LINEARITY signal for several minutes.
Play back the recording, observe the RF envelope signal on the Waveform Monitor and adjust as follows.

TP8/EQ-02 = 0.4 ± 0.04 Vp-p
● RV34/EQ-02

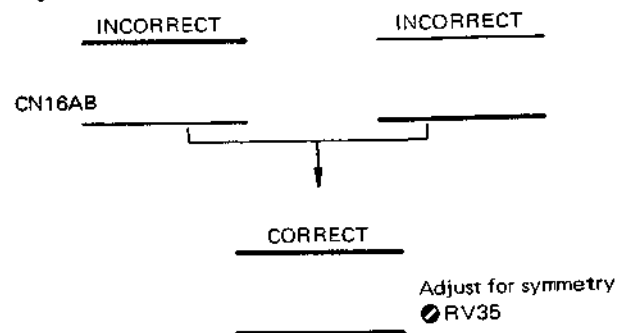
WFM OUT: SYNC RF = VIDEO RF
(Except for 10, 12 and 14 models)
● RV31/EQ-02

13-29. LIMITER BALANCE ADJUSTMENT

Connection: See section 8-4 connection 1.
Equipment: Oscilloscope
Mode of VTR; STOP
Setting of Switches & Controls:
TAPE/EE Sel: TAPE
HEAD Sel: R/P → PLAY
Input Signal (VIDEO IN);
Any Signal with Burst

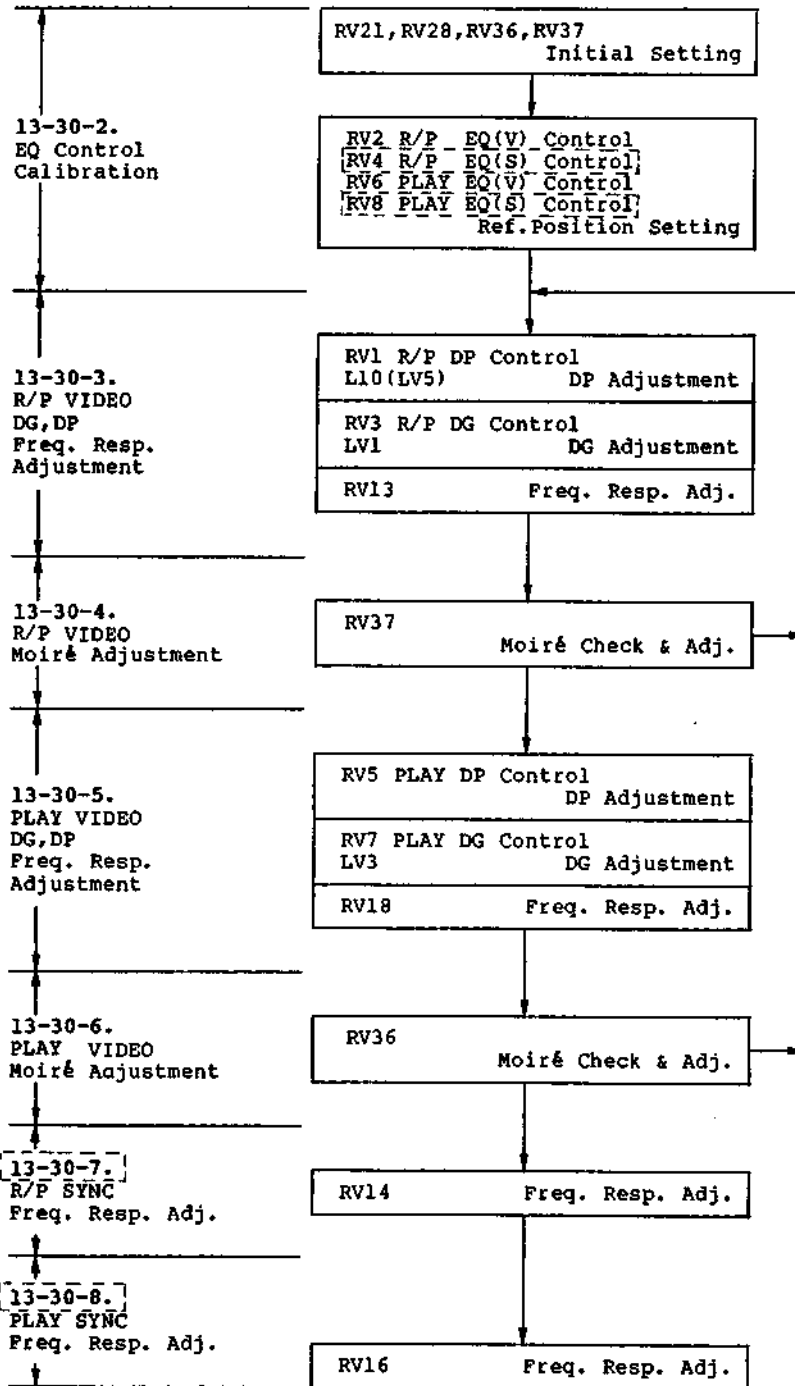
Adjustment EQ-02 Board

Switching the HEAD selector to R/P and PLAY alternately, adjust ● RV35 as follows.



13-30. PB FREQ. RESPONSE, DG AND DP ADJUSTMENT

13-30-1. EQ-02 Board Adjustment Flowchart



□: Except for 10, 12 and 14 models.

13. VIDEO SIGNAL SYSTEM ALIGNMENT (IIIIIIIIII)

13-30-2. EQ Control Calibration

Connection: Don't care.
 Equipment: Oscilloscope
 Mode of VTR: STOP
 Setting of Switches & Controls:
 Don't care.

EQ-02 Board.

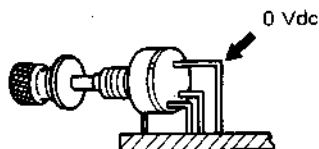
Step 1.
 Set the controls as follows.

- RV21: Mid-rotation
- RV36: Mid-rotation
- RV37: Mid-rotation
- RV28:



Step 2.
 Adjust the voltage at the center lead of following four EQ controls on the EQ-02 board for 0Vdc.

- R/P EQ (V) Control (RV2/EQ-02)
- * R/P EQ (S) Control (RV4/EQ-02)
- PLAY EQ (V) Control (RV6/EQ-02)
- * PLAY EQ (S) Control (RV8/EQ-02)



* : Except for 10, 12 and 14 models.

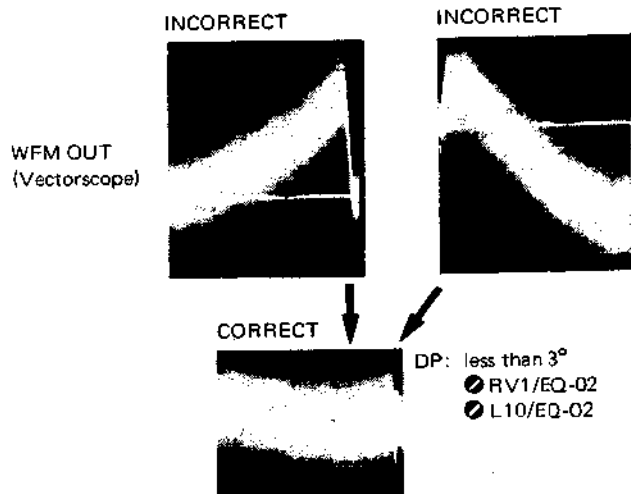
13-30-3. R/P VIDEO DG, DP and Freq. Response Adjustment

Connection: See section 8-4 connection 1.
 Equipment: Vectorscope (Full Field)
 Waveform Monitor
 Mode of VTR: PLAY (Ramp Linearity and Multiburst of Alignment Tape)
 Setting of Switches & Controls:
 HEAD Sel: R/P
 PICTURE MONITOR Sel: TBC OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 REC INHI Sw: ON
 AUTO/MANU Sw (S1/EQ-02): MANU

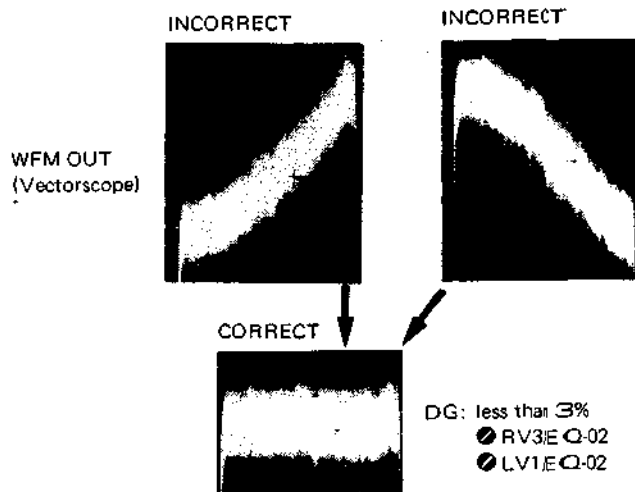
Step 1.
 Set the HEAD Selector to R/P position.

Step 2. Adjustment

DP Adjustment (Play back of Ramp Linearity)



DG Adjustment (Playback of Ramp Linearity)



Freq. Response Adjustment (Playback of Multiburst)

WFM: Freq. Resp. = Flat
 ● RV13/EQ-02

After the adjustment, repeat from the DP adjustment until satisfy the specifications.

Specifications

- DG: less than 3%
- DP: less than 3°
- FREQ. RESP.: Flat (± 0.3 dB: reference to 0.5MHz)

13-30-4. R/P VIDEO MOIRÉ Adjustment

Connection; See section 8-4 connection 1.

Equipment; Spectrum Analyzer

Mode of VTR; PLAY (Color Bar of Alignment Tape)

Setting of Switches & Controls;

HEAD Sel: R/P

PICTURE MONITOR Sel: DEMOD OUT

WAVEFORM MONITOR Sel: SELECT VIDEO

REC INHI Sw: ON

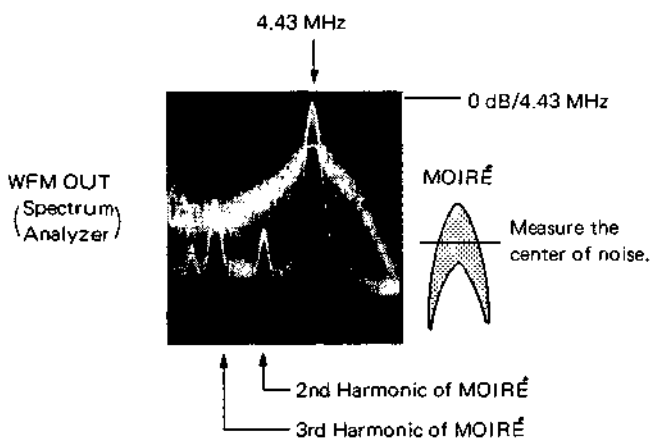
Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment

While playing back the Color Bar portion of the alignment tape, adjust the level of 2nd harmonic of MOIRÉ by \odot RV37/EQ-02, check whether the 2nd and 3rd harmonics of MOIRÉ meet the specifications.

If not, repeat from section 13-30-3.



Specifications

2nd Harmonic of MOIRÉ = less than -35dB

\odot RV37/EQ-02

3rd Harmonic of MOIRÉ = less than -35dB

13-30-5. PLAY VIDEO DG, DP and Freq. Response Adjustment

Connection; See section 8-4 connection 1.

Equipment; Vectorscope
Waveform Monitor

Mode of VTR; PLAY (Ramp Linearity and Multiburst of Alignment Tape)

Setting of Switches & Controls;
HEAD Sel: PLAY
TAPE/EE Sel: TAPE/EE
PICTURE MONITOR Sel: TBC OUT
WAVEFORM MONITOR Sel: SELECT VIDEO
REC INHI Sw: ON
AUTO/MANU Sw (S1/EQ-02): MANU

Freq. Response Adjustment (Playback of Multiburst)

WFM: Freq. Resp. = Flat

⊗ RV18/EQ-02

After the adjustment, repeat from the DP adjustment until satisfy the specifications.

Specifications

DG; less than 3%

DP; less than 3°

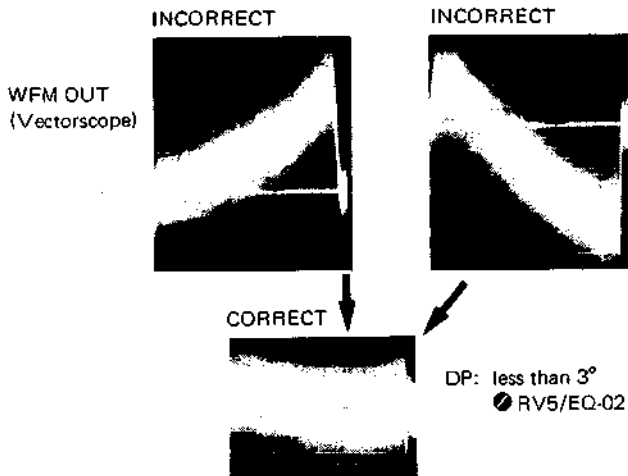
FREQ. RESP.; Flat (± 0.3 dB; reference to 0.5MHz)

Step 1.

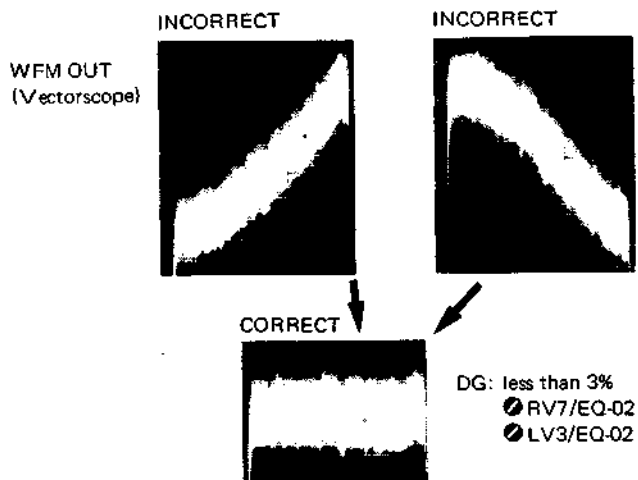
Set the HEAD Selector to PLAY position.

Step 2. Adjustment

DP Adjustment (Playback of Ramp Linearity)



DG Adjustment (Playback of Ramp Linearity)

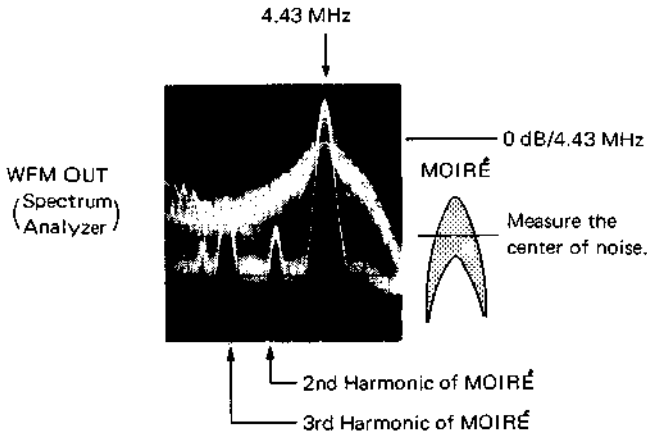


13-30-6. PLAY VIDEO MOIRÉ Adjustment

Connection; See section 8-4 connection 1.
 Equipment; Spectrum Analyzer
 Mode of VTR; PLAY (Color Bar of Alignment Tape)
 Setting of Switches & Controls;
 HEAD Sel: PLAY
 PICTURE MONITOR Sel: DEMOD OUT
 WAVEFORM MONITOR Sel: SELECT VIDEO
 REC INHI Sw: ON
 Input Signal (VIDEO IN);
 Any Signal with Burst

Adjustment

While playing back the Color Bar portion of the alignment tape, adjust the level of 2nd harmonic of MOIRÉ by ⓄRV36/EQ-02, check whether the 2nd and 3rd harmonics of MOIRÉ meet the specifications.
 If not, repeat from section 13-30-3.



Specifications

2nd Harmonic of MOIRÉ = less than -35dB
 ⓄRV36/EQ-02
 3rd Harmonic of MOIRÉ = less than -35dB

13-30-7. R/P SYNC Freq. Response Adjustment
(Except for 10, 12 and 14 models)

Connection; See section 8-4 connection 1.
Equipment; Waveform Monitor (Line-14)
Mode of VTR; PLAY (100% White of Alignment Tape)
Setting of Switches & Control;
HEAD Sel: R/P
PICTURE MONITOR Sel: TBC OUT
WAVEFORM MONITOR Sel: SELECT VIDEO
REC INHI Sw: ON
AUTO/MANU Sw (S1/EQ-02): MANU

Step 1.

Set the HEAD Selector to R/P position.

Step 2. Adjustment (Playback of 100% White)

WFM OUT:Waveform Monitor
Freq. Resp. = Flat
●RV14/EQ-02

13-30-8. PLAY SYNC Freq. Response Adjustment
(Except for 10, 12 and 14 models)

Connection; See section 8-4 connection 1.
Equipment; Waveform Monitor (Line-14)
Mode of VTR; PLAY (100% White of Alignment Tape)
Setting of Switches & Controls;
HEAD Sel: PLAY
PICTURE MONITOR Sel: TBC OUT
WAVEFORM MONITOR Sel: SELECT VIDEO
REC INHI Sw: ON
AUTO/MANU Sw (S1/EQ-02): MANU

Step 1.

Set the HEAD Selector to PLAY position.

Step 2. Adjustment (Playback of 100% White)

WFM OUT:Waveform Monitor
Freq. Resp. = Flat
●RV16/EQ-02

13-31. VIDEO/SYNC RECORD SYSTEM ADJUSTMENT

13-31-1. Video Channel Freq. Response, DG and DP Adjustment

For 02, 12, 04 and 14 Models

Connection; See section 8-4 connection 1.
Equipment; Waveform Monitor (Line-20)
Vectorscope

Mode of VTR; REC

Setting of Switches & Controls;
TAPE/EE Sel: TAPE
PICTURE MONITOR Sel: TBC
WAVEFORM MONITOR Sel: SELECT VIDEO
REC INHI Sw: OFF
METER Sel (S1/MD-14): RF(V)

Input Signal (VIDEO IN);
RAMP LINEARITY
(VITS: MULTIBURST)

Adjustment

Set the TAPE/EE Selector to TAPE and METER Selector (S1/MD-14) to RF (V) positions.
Place the machine into the REC mode and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
● REC CUR (V) Control (RV10/MD-14)

WFM OUT: Vectorscope
DP = less than 3°
DG = less than 3%
● RV11, ● CV4/MD-14

WFM OUT: Waveform Monitor (Line-20)
Freq. Resp. = Flat
● RV12/MD-14

Repeat the adjustment several times until satisfy the specifications.

For 00 and 10 Models

Connection; See section 8-4 connection 1.
Equipment; Waveform Monitor (Line-20)
Vectorscope

Mode of VTR; REC TEST → REC → PLAY

Setting of Switches & Controls;
PICTURE MONITOR Sel: TBC
WAVEFORM MONITOR Sel: SELECT VIDEO
REC INHI Sw: OFF
METER Sel (S1/MD-14): RF (V)
REC TEST Sw: (S12/SY-79): ON (↓)

Input signal (VIDEO IN);
RAMP LINEARITY
(VITS: MULTIBURST)

Step 1.

Press the REC TEST switch (S12/SY-79) downward.
Press the REC button, the machine goes into the REC TEST mode and repeats the recording and playback at an interval of 1 second.

Step 2.

With machine still in REC TEST mode, set the METER Selector (S1/MD-14) to RF (V) position and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
● REC CUR (V) Control (RV10/MD-14)

Step 3.

With machine still in REC TEST mode, adjust as follows.

Specifications

WFM OUT: Vectorscope
DG = less than 3%
● RV11, ● CV4/MD-14

WFM OUT: Waveform Monitor (Line-20)
Freq. Response = Flat
● RV12/MD-14

Step 4.

Press the STOP button so as to release the REC TEST mode.

Step 5.

Record the Ramp Linearity signal for about 1 minute.
Playback the recording and check whether the Freq. Response and DG meet the specifications on step 3. If not, turn ● RV11, CV4 and/or RV12 a little and repeat this procedure a few times.

13-31-2. R/P and PLAY VIDEO MOIRÉ Confirmation

Connection; See section 8-4 connection 1, excluding step 1.

Equipment; Waveform Monitor

Spectrum Analyzer

Mode of VTR: REC → PLAY

Setting of Switches & Controls;

HEAD Sel: R/P → PLAY

PICTURE MONITOR Sel: DEMOD OUT

WAVEFORM MONITOR Sel: SELECT VIDEO

Input Signal (VIDEO IN);

MOIRÉ (See step 1) → Any signal with Burst

Step 1. Recording of MOIRÉ signal

Refer to section 13-30-4 step 1.

Step 2.

Set the HEAD selector to R/P position.

Step 3. MOIRÉ Check

Connect the equipments referring to section 8-4 connection 1 and while playing back the recording, check whether the 2nd and 3rd harmonics MOIRÉ meet the specifications.

Step 4.

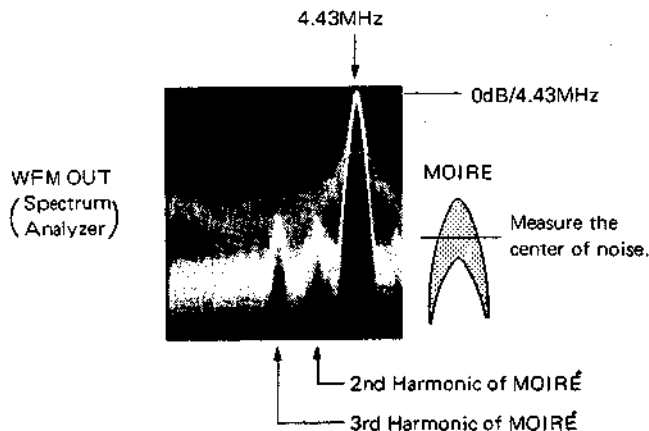
Change the HEAD selector to PLAY, and perform MOIRÉ check in a similar manner to step 3.

If not, proceed to the next step.

Step 5.

NOTE: Don't turn ⓄRV36 and ⓄRV37/EQ-02.

- 2nd Harmonic of MOIRÉ > -35dB
Adjust ⓄRV9/MD-14, however, do not improve 3dB or more.
- 3rd Harmonic of MOIRÉ > -35dB
Perform the adjustment from section 13-30-3.



Specifications

2nd Harmonic of MOIRÉ = less than -35dB

3rd Harmonic of MOIRÉ = less than -35dB

13-31-3. Sync Channel Freq. Response, DG and DP Adjustment

For 02/04 Model

Connection; See section 8-4 connection 2.
Equipment; Waveform Monitor (Line-14)
 Vectorscope (VITS FIELD, Line-13)
Mode of VTR; REC
Setting of Switches & Controls;
 TAPE/EE Sel: TAPE
 PICTURE MONITOR Sel: TBC
 WAVEFORM MONITOR Sel: SELECT VIDEO
 REC INHI Sw: OFF
 METER Sel (S1/MD-14): RF (S)
Input Signal (VIDEO IN);
 Any signal with Burst

Step 1.

Insert the Ramp Linearity (VITS) in line 13 and Multiburst (VITS) in line 14 of TEK 148.

Step 2. Adjustment

Set the TAPE/EE Selector to TAPE and METER Selector (S1/MD-14) to RF (S) position.
Place the machine into the REC mode and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
 ● REC CUR (S) Control (RV18/MD-14)

WFM OUT: Vectorscope
 DP; less than 4°
 DG; less than 4%
 ● RV19/MD-14

WFM OUT: Waveform Monitor
 Freq. Response = Flat
 ● RV20/MD-14

Repeat the adjustment several times until satisfy the specifications.

For 00 Model

Connection; See section 8-4 connection 2.
Equipment; Waveform Monitor (Line-14)
 Vectorscope (VITS FIELD, Line-13)
Mode of VTR; REC TEST → REC → PLAY
Setting of Switches & Controls;
 PICTURE MONITOR Sel: TBC
 WAVEFORM MONITOR Sel: SELECT VIDEO
 REC INHI Sw: OFF
 METER Sel (S1/MD-14): RF (S)
 REC TEST Sw (S12/SY-79): ON (I)
Input Signal (VIDEO IN);
 Any signal with Burst

Step 1.

Insert the Ramp Linearity (VITS) in line 13 and Multiburst (VITS) in line 14 of TEK 148.

Press the REC TEST switch (S12/SY-79) downward.
Press the REC button, the machine goes into the REC TEST mode and repeats the recording and playback at an interval of 1 second.

Step 2.

With machine still in REC TEST mode, set the METER Selector (S1/MD-14) to RF (S) position and adjust as follows.

VIDEO/RF Meter = Maximum Deflection
 ● REC CUR (S) Control (RV18/MD-14)

Step 3.

With machine still in REC TEST mode, adjust as follows.

Specifications

WFM OUT: Vectorscope (Line-13)
 DG = less than 4%
 ● RV19/MD-14

WFM OUT: Waveform Monitor (Line-14)
 Freq. Response = Flat
 ● RV20/MD-14

Step 4.

Press the STOP button so as to release the REC TEST mode.

Step 5.

Make a recording about 1 minute.
Playback the recording and check whether the DG and Frequency Response meet the specifications on step 3.
If not, turn ● RV19 and/or RV20 a little and repeat this procedure a few times.

13-32. DROPOUT DETECTOR SENSITIVITY ADJUSTMENT

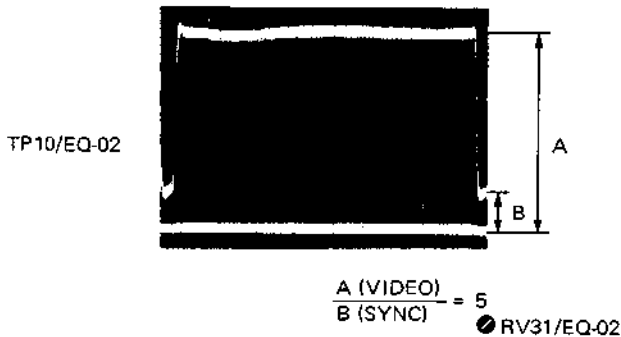
Connection; See section 8-4 connection 1.
 Equipment; Waveform Monitor
 Oscilloscope
 Mode of VTR; STOP → REC → PLAY
 Setting of Switches & Controls;
 WAVEFORM MONITOR Sel: RF ENVELOPE
 HEAD Sel: R/P
 REC INHI Sw: OFF
 AUTO/MANU Sw (S1/EQ-02): MANU
 Input Signal (VIDEO IN);
 COLOR BARS

Step 1.
 Unplug the jumper plug JP3 on the EQ-02 board.

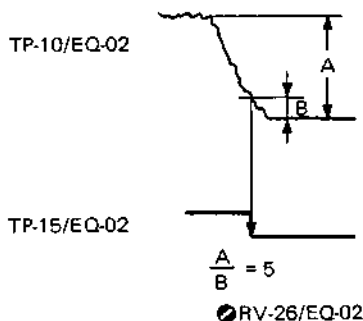
Step 2.
 Set the machine into the STOP mode and adjust as follows.



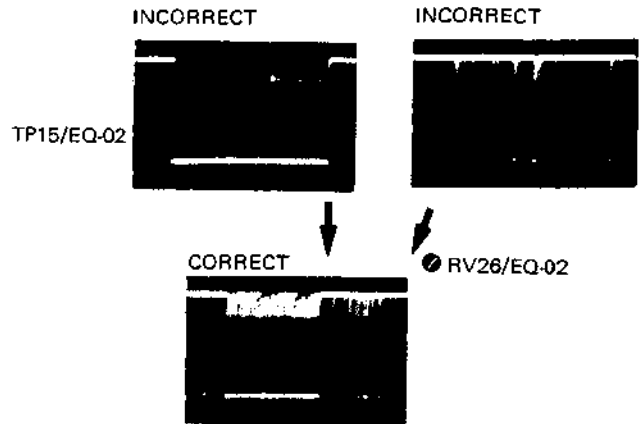
Step 3. (Only for 00, 02 and 04 models)
 Record and play back a color bars signal and set the SYNC level as follows.



Step 4. (Only for 10, 12 and 14 models)
 Record and playback color bar signal, and adjust as follows.



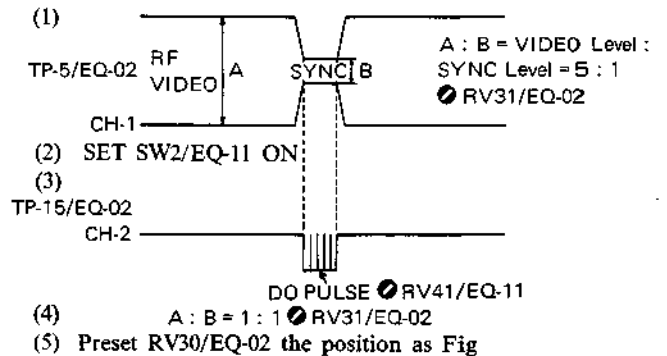
Step 5. Adjustment (Only for 00, 02 and 04 models)



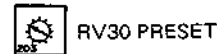
After the adjustment, set RV31/EQ-02 to obtain the SYNC level equal to VIDEO level.

Step 6. (Only for 00, 02 and 04 models)
 Plug the jumper plug JP3 on the EQ-02 board.

Step 7. Adjustment of EQ-11 BOARD
 Record and playback color bar signal, and adjust as follows.
 (Only for 00, 02 and 04 models)

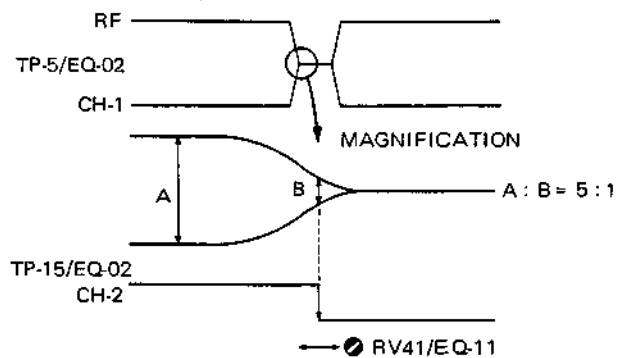


(5) Preset RV30/EQ-02 the position as Fig

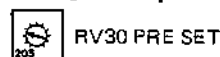


(Only for 10, 12 and 14 models)

(1) SET SW2/EQ-11 ON



(2) Preset RV30/EQ-02 the position as Fig



13-33. RF LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Waveform Monitor (Ext Sync, 2-Field Mode)
 Oscilloscope

Mode of VTR; REC → PLAY

Setting of Switches & Controls;

DO SIG OUTPUT: Terminate with 75-ohm
 WAVEFORM MONITOR Sel: RF ENVELOPE
 HEAD Sel: R/P → PLAY
 REC INHI Sw: OFF
 AUTO/MANU Sw (S1/EQ-02): MANU

Input Signal (VIDEO IN);
 50% FLAT FIELD

Step 1.

Record and play back a 50% Flat Field signal.

Step 2.

For NTSC model

TP5/EQ-02 = 0.9 ± 0.04 Vp-p ⓄRV34/EQ-02

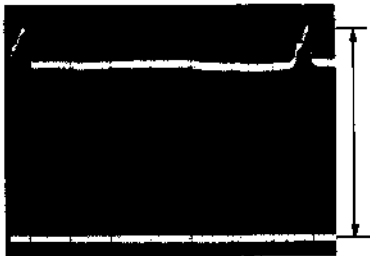
For PS model

TP8/EQ-02 = 0.4 ± 0.04 Vp-p ⓄRV34/EQ-02

TP10/EQ-02  1.0 ± 0.02 Vdc
 ⓄRV23/EQ-02

Step 3.

Set the HEAD SELECT switch to R/P position.

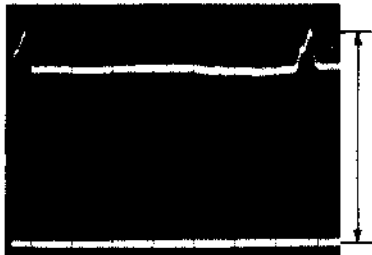
WFM OUT 

VIDEO CH = 0.35 ± 0.05 Vp-p
 ⓄRV25/EQ-02

* SYNC CH = 0.35 ± 0.05 Vp-p
 ⓄRV31/EQ-02

Step 4.

Set the HEAD SELECT Switch to PLAY position.

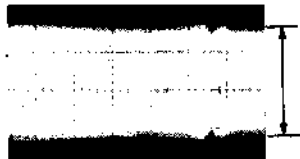
WFM OUT 

VIDEO CH = 0.35 ± 0.05 Vp-p
 ⓄRV32/EQ-02

* SYNC CH = 0.35 ± 0.05 Vp-p
 ⓄRV33/EQ-02

Step 5.

Set the jumper plug JP2/JP1 (TTL/RF) on the EQ-02 board to JP1 (RF).

TP16/EQ-02 

0.3 Vp-p
 ⓄRV22/EQ-02

Step 6.

Set the jumper plug JP2/JP1 to JP2 (TTL).

*Except for 10, 12 and 14 models.

13-34. AUTO CHROMA LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Waveform Monitor
 Mode of VTR; REC → PLAY
 Setting of Switches & Controls;
 HEAD Sel: R/P
 TAPE/EE Sel: TAPE/EE
 PICTURE MONITOR Sel: TBC
 WAVEFORM MONITOR Sel: SELECT VIDEO
 REC INHI Sw: OFF
 Input Signal (VIDEO IN);
 MULTIBURST

Step 1.

Make sure the position of R/P EQ (V) Control (RV2/EQ-02) as follows.

Center Lead = 0Vdc
 (Refer to section 13-30-2)

Step 2.

Record the Multiburst and while playing it back, adjust as follows.

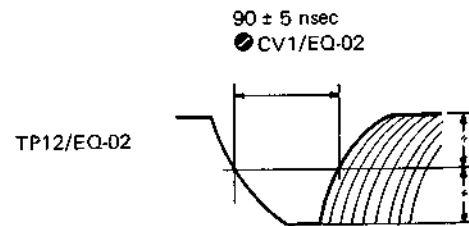
While switching the AUTO/MANU switch (S1/EQ-02) alternately, adjust the frequency response in AUTO mode as against in MANU mode as equal as possible with ●RV27/EQ-02 at the WFM OUT.

13-35. DROPOUT DETECTOR ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Oscilloscope (Trig. Slope -)
 Mode of VTR; REC → PLAY (x1) → SHUTTLE
 Setting of Switches & Controls;
 HEAD Sel: R/P
 REC INHI Sw: OFF
 AUTO/MANU Sw (S1/EQ-02): AUTO
 PLAY MODE Sw (S3/LG-02(A)): 1-HEAD
 Input Signal (VIDEO IN);
 COLOR BARS

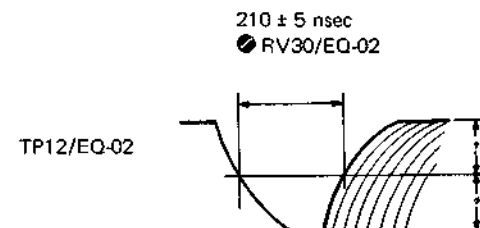
Step 1.

Record a color bars signal and while playing it back, adjust as follows.



Step 2.

Place the machine into SHUTTLE mode.
 Turn the SEARCH dial toward counterclockwise gradually and stop where the voltage at pin-29AB/EQ-02 reaches +1Vdc, then adjust as follows.



13-36. VIDEO/RF METER CALIBRATION

Connection; See section 8-4 connection 1.

Mode of VTR; STOP → REC → PLAY

Setting of Switches & Controls;

TAPE/EE Sel: TAPE/EE

HEAD Sel: R/P

REC INHI Sw: OFF

AUTO/MANU Sw (S1/EQ-02): AUTO

Input Signal (VIDEO IN);

RAMP LINEARITY

Step 1.

Place the machine into the STOP (Auto EE) mode, and set the METER Sel (S1/MD-14) to INPUT position, then adjust as follows.

VIDEO/RF METER = 100%

● RV15/MD-14

Step 2.

Set the METER Sel (S1/MD-14) to RF(V) position.

Record a Ramp Linearity signal and while playing it back, adjust as follows.

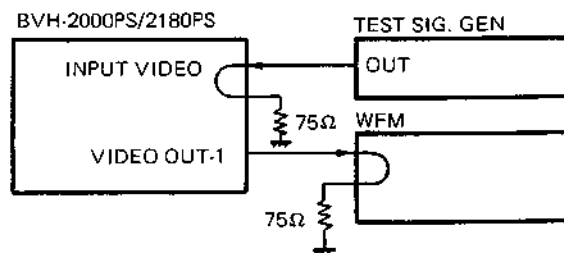
VIDEO/RF METER = 100%

● RV14/MD-14

13-37. VIDEO OUTPUT 1 LEVEL ADJUSTMENT

When the Plug-in TBC is used in combination with the BVH-2000PS/2180PS, this adjustment is required.

Connection;



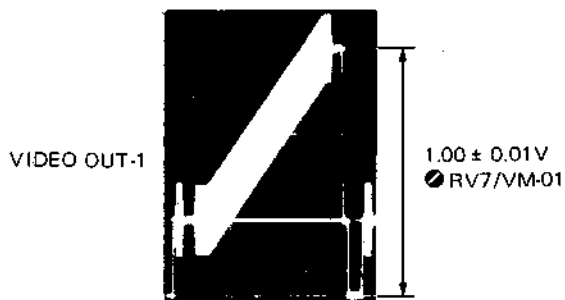
Equipment; Waveform Monitor

Mode of VTR; STOP (Auto E-E)

Input Signal (VIDEO IN);

RAMP LINEARITY

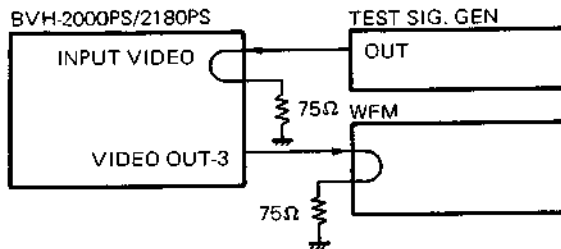
Adjustment



13-38. VIDEO OUTPUT 3 LEVEL ADJUSTMENT

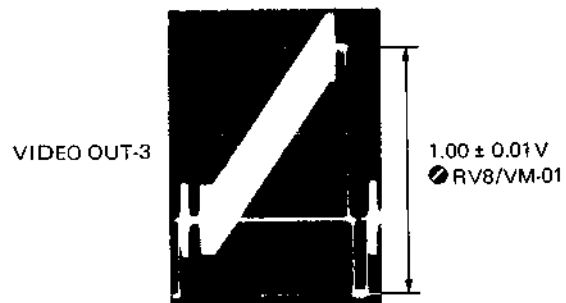
When the Plug-in TBC is used in combination with the BVH-2000PS, this adjustment is required.

Connection:



Equipment: Waveform Monitor
Mode of VTR: STOP (Auto E-E)
Input Signal (VIDEO IN):
RAMP LINEARITY

Adjustment

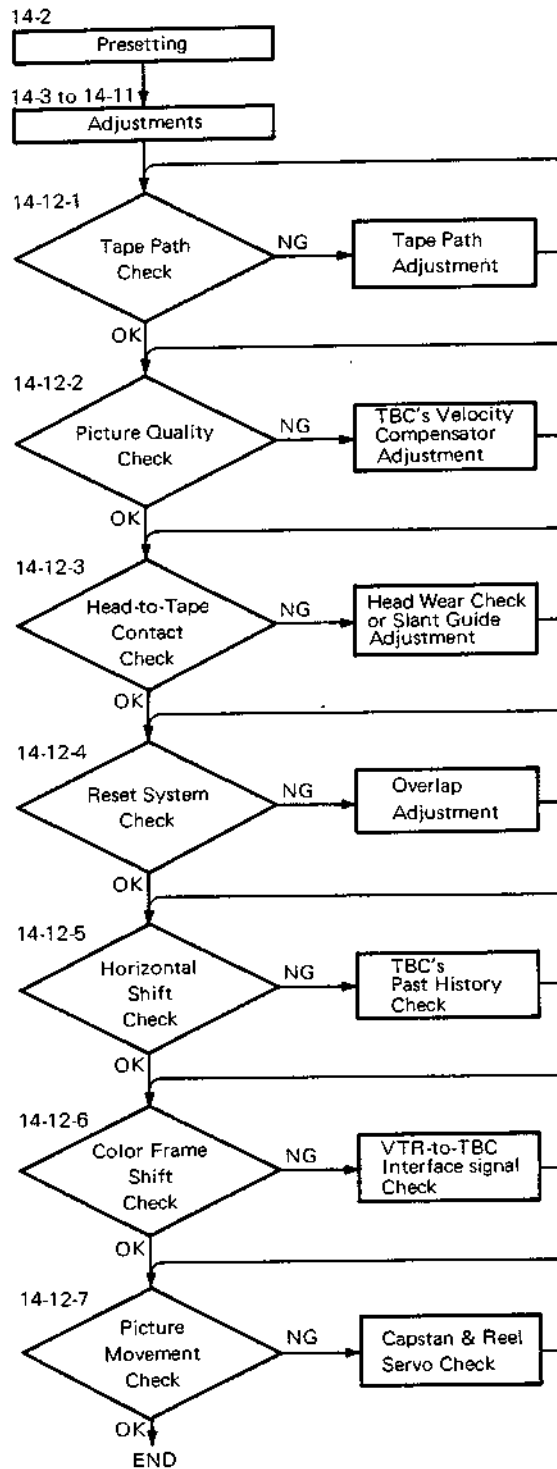


SECTION 14

DT SYSTEM ALIGNMENT

14-1. ALIGNMENT FLOWCHART

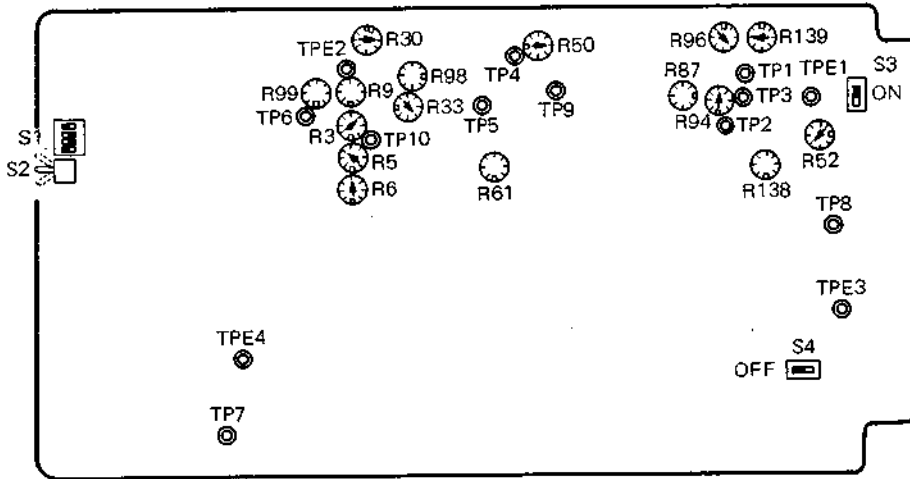
The DT system operates with various closed loops and it necessitates for the all systems to be operating correctly. In particular, it relates to the tape path, drum servo, capstan servo, reel servo, system control and video signal systems.



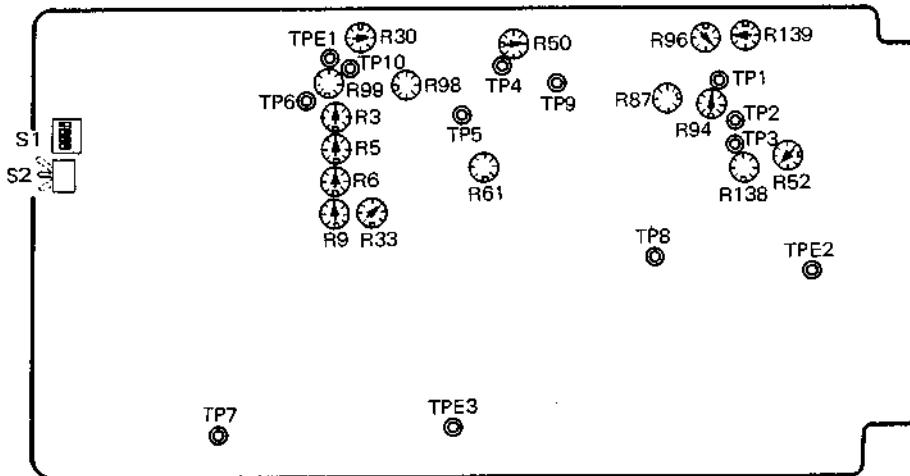
14-2. POTS AND SWITCHES PRESETTING

Note: R99 adjustment need not be performed.

DT-04 Board



DT-05 Board



14. DT SYSTEM ALIGNMENT IIIIIIIIIII

14-3. +12V ADJUSTMENT

Connection: See section 8-4 connection 1.
 Equipment: Digital Voltmeter
 Mode of VTR: STOP
 Switch & Control Settings:
 HEAD Sel: PLAY

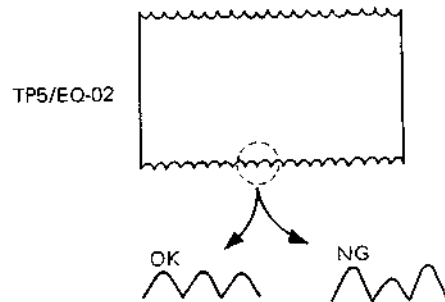
Adjustment DD-03 Board

IC1 pin-3 = 12 ± 0.01 Vdc
 ⓄRV1

14-5. RF BALANCE ADJUSTMENT

Connection: See section 8-4 connection 1.
 Equipment: Oscilloscope
 Mode of VTR: REC
 Switch & Control Settings:
 TAPE/EE Sel: TAPE
 HEAD Sel: PLAY
 REC INHI Sw: OFF
 Input Signal (VIDEO IN):
 Any Signal with Burst

Adjustment

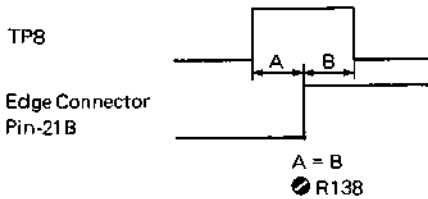


Adjust ⓄR87 and ⓄR61 (DT-04/05) for symmetry and discrepancy in size between neighboring waves of the folded-up since waves.

14-4. PB V DETECTOR ADJUSTMENT

Connection: See section 8-4 connection 1.
 Equipment: Oscilloscope (Trig. TP8: DT-04/05)
 Mode of VTR: STOP (Auto E-E)
 Switch & Control Settings:
 TAPE/EE Sel: TAPE/EE
 HEAD Sel: PLAY
 Input Signal (VIDEO IN):
 Any Signal with Burst

Adjustment DT-04/05 Board

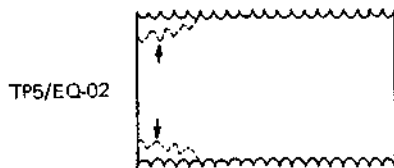


14-6. DT DRIVE AND JUMP SIGNAL D/A LEVELS ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Oscilloscope
 Mode of VTR; VAR Still → -1 → +2 → +3
 Switch & Control Settings;
 TAPE/EE Sel: TAPE
 HEAD Sel: PLAY
 REC INHI Sw: OFF
 Input Signal (VIDEO IN);
 Any Signal with Burst

Step 1.

Place machine in VAR Still mode.
 Adjust R33 for maximum and no discrepancy in size between neighboring waves of the folded-up sine waves at the beginning of the RF envelope as shown.



Step 2.

Adjust R3 in similar manner to step 1 with VAR -1 mode.

Step 3.

Adjust R5 in similar manner to step 1 with VAR +2 mode.

Step 4.

Adjust R6 in similar manner to step 1 with VAR +3 mode.

Step 5.

Note: Normally, there is not much necessity to perform step 5.

Observe the PB CTL signal at pin-15A of the edge connector on the CD-17 board. With JOG mode, turn the search dial toward counterclockwise until the PB CTL pulse width reaches -5% (-1.05 times normal) as against the -1 time normal speed and in this instant set the REMOTE/LOCAL switch to REMOTE position, so that the speed can be maintained.

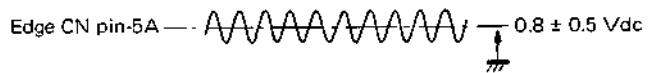
Adjust R9 in similar manner to step 1 with -1.05 JOG mode.

14-7. WOBBLING AND DT DRIVE LEVELS ADJUSTMENT

Connection; See section 8-4 connection 1.
 Equipment; Oscilloscope
 Mode of VTR; REC → STOP (Auto E-E)
 Switch & Control Settings;
 TAPE/EE Sel: TAPE
 HEAD Sel: PLAY
 REC INHI Sw: OFF
 Input Signal (VIDEO IN);
 Any Signal with Burst

Step 1. DT-04/05 Board

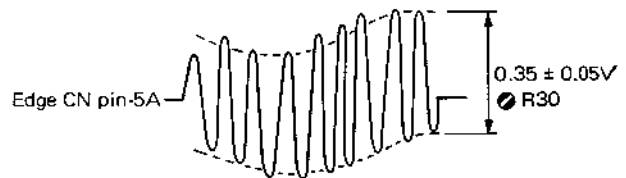
Place machine in record mode and check the average driving level as follows.



If the measured level against the specified value is abnormal, replace the upper drum assembly.

Step 2. Wobbling Level Adjustment DT-04/05 Board

With machine still in record mode, check and/or adjust as follows.



Step 3. DT Drive Level Adjustment DT-04/05 Board

Place machine in STOP (AUTO EE) mode and check and/or adjust as follows.

Edge CN pin-5A = 0.8 Vdc
 R98

14-8. RF ENVELOPE LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Oscilloscope

Mode of VTR; VAR +1

Switch & Control Settings;

TAPE/EE Sel: TAPE

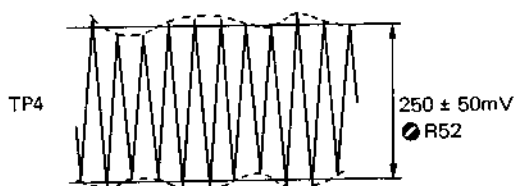
HEAD Sel: PLAY

REC INHI Sw: OFF

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment DT-04/05 Board



14-9. STRAIN GAUGE LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Oscilloscope

Mode of VTR; STILL

Switch & Control Settings;

TAPE/EE Sel: TAPE

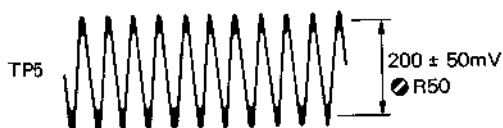
HEAD Sel: PLAY

REC INHI Sw: OFF

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment DT-04/05 Board



14-10. FEED-BACK LOOP ADJUSTMENT

Note: Normally, it is sufficient for R94 and R96 to be left at the preset position as shown in section 14-2.

Connection; See section 8-4 connection 1.

Equipment; Oscilloscope

Mode of VTR; VAR +1/30 (NTSC/PM)

VAR +1/25 (PS)

Switch & Control Settings;

TAPE/EE Sel: TAPE

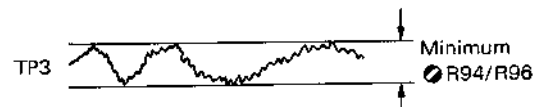
HEAD Sel: PLAY

REC INHI Sw: OFF

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment DT-04/05 Board



14-11. WOBBLING LEVEL ADJUSTMENT

Connection; See section 8-4 connection 1.

Equipment; Oscilloscope

Mode of VTR; PLAY

Switch & Control Settings;

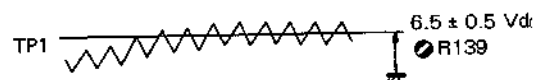
TAPE/EE Sel: TAPE

HEAD Sel: PLAY

Input Signal (VIDEO IN);

Any Signal with Burst

Adjustment DT-04/05 Board



14-12. CONFIRMATION AFTER ADJUSTMENT

Make a connection of the test equipments referring to section 8-4 connection 1.

14-12-1. Tape Path Check in Reverse Direction

Record a color bar signal a few minutes. Place machine in JOG mode and move at the beginning of the recorded portion slightly in the forward direction and stop the tape.

Set the VAR preset speed to about $-6/30$ ($-5/25$ for PAL/SECAM) with Program Jog mode.

Check that the waveforms at the beginning of the RF envelope do not change for about 5 seconds after the VAR button has been pressed and immediately after the tape has started to move in the reverse direction.

If the waveforms change about 10%, the problem may be caused by a defective S or T slant guide assembly which necessitates the tape path adjustment.

14-12-2. Picture Quality Check in Normal Speed

Play back the color bar recorded portion and while switching the tape speed with VAR +3, +2, +1, +1/5, 0, -1/5 and -1 speeds, check that the hue and brightness irregularity, white or black stripes and dropouts do not result.

Take special care at the top and bottom of the picture and a problem may be caused by insufficient velocity compensator adjustment of the TBC.

14-12-3. Head-to-Tape Contact Check at the Mode Transition

Check that there is nothing wrong with the RF envelope and picture when the machine is in transit between the reverse/STILL/+1 speed/+3 speed modes.

Also check that there are no omissions at the top of the picture during manual JOG mode.

Omissions may be caused by a head wear or a defective adjustment around the S or T slant guide assembly.

14-12-4. Reset System Check with Excessive Speeds

With manual JOG mode, rotate the reel by hand, increase the speed to more than -1 in order to disturb the DT operation, release hand immediately so as to set machine in still mode and then check that the proper DT playback picture should appear at the time.

If the DT operation cannot be returned properly, the problem may be caused by the insufficient overlap of the video track.

14-12-5. Horizontal Shift Check

While playing back the color bar with -1 through +3 speeds, check the picture on the monitor does not shift 140 nsec or 280 nsec (113 nsec or 226 nsec for PAL/SECAM) horizontally. If there is any shift, check the SKEW amount and interface signals between the VTR and TBC or past history (Refer to sec. 2-10 "BVT-2000 Modification") of the TBC used.

14-12-6. Color Frame Shift Check

Feed an any signal with stable horizontal sync/subcarrier and make a recording. Check that the color framing is locked with the SC PHASE meter on the SR-15 board.

Play back the recording with normal speed and adjust the CF pot on the BVT-2000's SQ board.

Check that the picture does not shift up and down or left and right when the VTR is changed in PLAY \rightarrow STILL \leftrightarrow PLAY modes. This kind of symptom may occur when the early BVT-2000 is used. Check the interface signals between the VTR and TBC.

14-12-7. Picture Movement Check

Record a sports program or other pictures which move quickly, and play it back. When the mode is switched from +1 speed to still, check that the tape stops in about 0.2 sec and after stopping the picture does not flow or the movements do not return.

Check the access time when the mode is switched from still to +1 speed. If there is any trouble, check the capstan and reel servo systems (in particular, motor and drive power supply system).

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