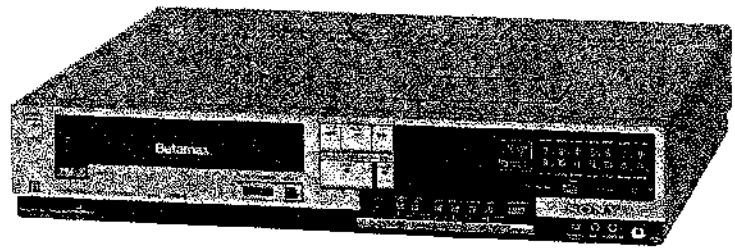
SL-2400
RMT-314

SERVICE MANUAL

US Model
E Model
PX Model

REVISED



August, 1983

711B CHASSIS

Refer to separate adjustment manual, Part number 9-972-230-11

SPECIFICATIONS

System

Video recording system	Rotary two-head helical scanning
Video signal	EIA standards, NTSC color
Channel coverage	VHF channels 2 – 13 UHF channels 14 – 83
VHF output signal	Channel 3 or 4 (selectable) 75 ohms, unbalanced
Antenna	75-ohm external antenna terminal for VHF 300-ohm external antenna terminals for UHF

Video

Input	VIDEO IN : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Output	VIDEO OUT : phono-type connector 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Signal-to-noise ratio	Better than 45 dB

Audio

Input	AUDIO IN : *mini* jack 100 k ohms, −10 dBs (0 dBs = 0.775 V rms) MIC : *mini* jack −60 dBs, suitable for microphone with 600-ohm impedance
Output	AUDIO OUT : mini jack Less than 10 k ohms, −5 dBs (100 k ohms load), unbalanced
Frequency response	Ⅱ: 50 – 12,000 Hz Ⅲ: 50 – 9,000 Hz
Signal-to-noise ratio	Better than 40 dB

Tape transport

Tape speed	Ⅰ: 4.0 cm/sec. (playback only) Ⅱ: 2.0 cm/sec. Ⅲ: 1.33 cm/sec.
Maximum recording time	Ⅱ: 3 hours 20 min. Ⅲ: 5 hours (with Sony L-830 cassette)
Fast forward time	Under 4 min. (L-500)
Rewind time	Under 4 min. (L-500)

Timer

Clock	Synchronized with the power frequency
Time indication	12-hour cycle
Timer setting	Only for recording 1 event/ 3 days

General

Power requirements	Type 1 : 120 V ac ±10%, 60 Hz ±0.5% Type 2 : 120 V ac ±10%, 50/60 Hz ±0.5% Type 3 \ 120/220 V ac ±10%, 50/60 Hz Type 4 / ±0.5%
Power consumption	39.5 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	−20°C to +65°C (−4°F to +149°F)
Dimensions	Approx. 430 × 80 × 385 mm (w/h/d) (17 × 3¼ × 15¼ inches) incl. projecting parts and controls
Weight	Approx. 9.6 kg (21 lb 3 oz)

— Continued on next page —

Beta Ⅱ Ⅲ VIDEO CASSETTE RECORDER

SONY®

MICROFILM

Remote Commander

Remote control system	Infrared control
Power requirements	3 V dc, 2 size AA batteries (IEC designation R6)
Dimensions	Approx. 65 × 20 × 153 mm (w/h/d) ($2^5/_8 \times {}^{13}/_{16} \times 6^1/_8$ inches)
Weight	Approx. 140 g (5 oz) incl. batteries

Accessories supplied

Betamax video cassette tape (1)
EAC-24 external antenna connector (75-ohm to 300-ohm matching transformer) (1)
EAC-25 external antenna connector (300-ohm to 75-ohm matching transformer) (1)
75-ohm coaxial cable with F-type connectors 2 m (6 feet) long (1)
300-ohm twin lead 2 m (6 feet) long (1)
Remote Commander RMT-314 with two size AA batteries (1)
Channel indicating segments (1 set)
AC plug adaptor (1) (for the type 3 model)

Optional accessories

Betamax video cassette tape L-250, L-500, L-750, L-830, etc.
Video head cleaning cassette L-25CL
Color video camera HVC-2000, HVC-2200, HVC-2400, HVC-2500, HVC-2800
AC adaptor for the camera HVA-200

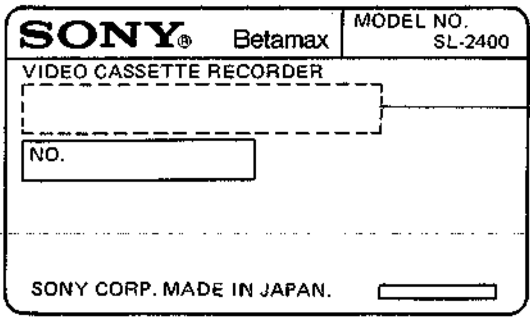
Design and specifications subject to change without notice.

Type	Area where the model is available	Voltage	Frequency
1	USA	120 V	60 Hz
2	Central/South America (except for chile)	120 V	50/60 Hz
3	PX	120/220 V	50/60 Hz
4	Other countries	120/220 V	50/60 Hz

☆☆

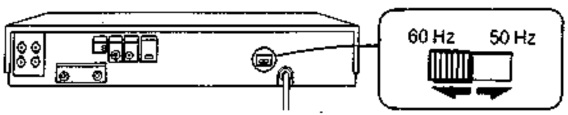
MODEL IDENTIFICATION

— Specification Label —



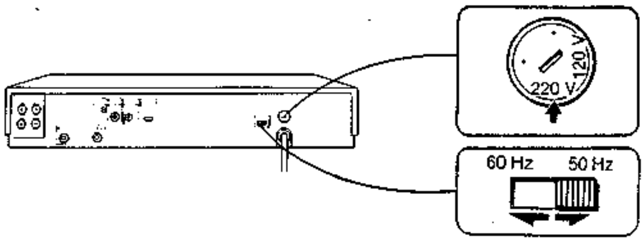
AC 120V 60 Hz 39.5W .... US model (TYPE 1)
AC 120V 50/60 Hz 39.5W .... E2 and PX2 models **(TYPE 2)**
AC 120V/220V 50/60 Hz 39.5W ...... E1 and PX1 models **(TYPE 3, 4)**

- US model (TYPE 1) operate on 120 V ac, 60 Hz.
- E2 and PX2 models **(TYPE 2)** operate on 120 V ac, 50/60 Hz. Before connecting the unit to the power source, set the frequency select switch at the rear to the appropriate position, as indicated below.



● E1, PX1 Model (TYPE 3, 4)

Before connecting the unit to the power source, **be sure to check that the voltage selector at the rear is set to 220 V when using the unit in the 220 V area.**



SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION AU COMPOSANT AYANT RAPPORT A LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DU CIRCUIT QUI SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNMENT SONT IDENTIFIÉS DANS CE MANUEL. SUIVRE LES PROCÉDURES QUAND LES COMPOSANTS CRITIQUES SONT REMPLACÉS OU LE FONCTIONNEMENT IMPROPRE EST SUSPECTÉ.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

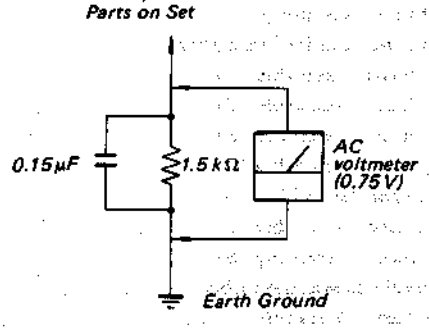


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

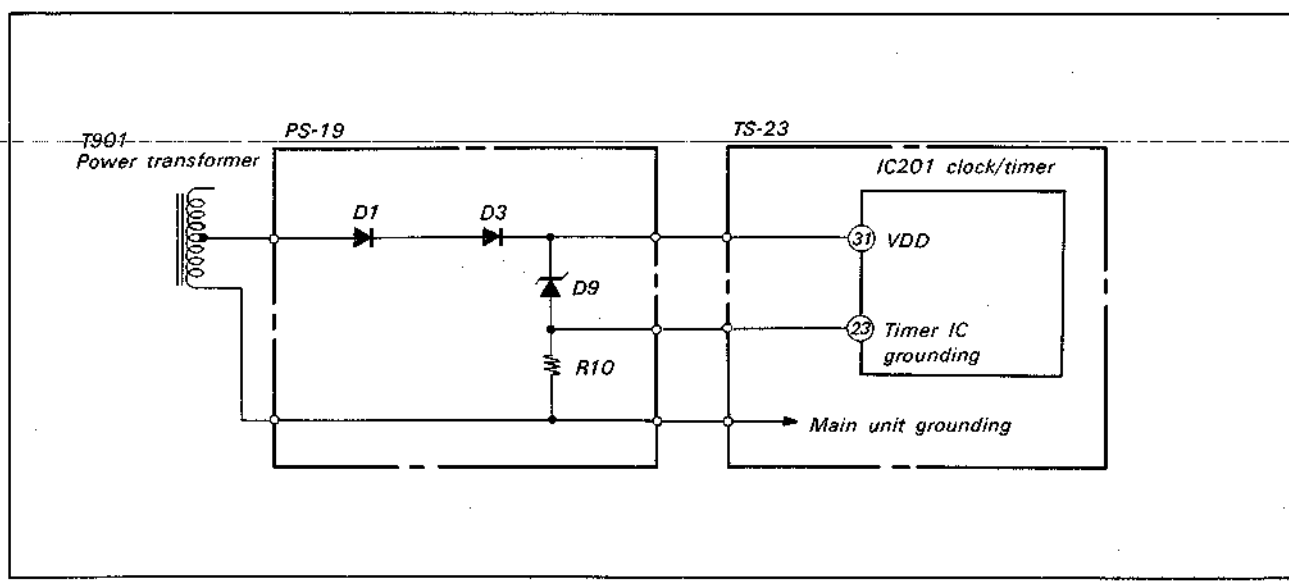
TABLE OF CONTENTS

OUTLINE

- Slim, easy-to-handle videocassette recorder, with a thickness of 8 cm
- Front loading
  Can be set at any place.
- Automatic rewind
  Automatically rewound at tape end in the REC and PB modes.
- Batascan/Bata SkipScan
  Can be quickly picture-searched during PB, FF and REW.
- Can be operated using a wireless remote controller.
- When the unit enters the REC mode with the broken safety tab of a cassette, the cassette is automatically unloaded.

[Precautions on repairing]

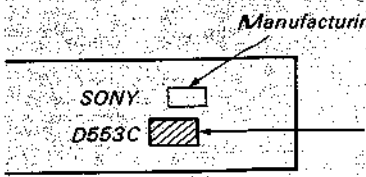
Be careful not to short-circuit between the timer IC grounding and main unit grounding (chassis).
The timer B + power supply (5V DC) are obtained at both ends of a Zener diode D9, and there is a potential difference of approx. 14.5V DC between the timer IC grounding and main unit grounding. Shorting-circuit between them may damage the timer IC (IC201).



:autions on replacement of IC401 and IC402]

ystem control ICs (IC401 and IC402 on the SS-13 board) two sorts of (new and former) parts for repairing. For parts, new parts are supplied the moment the former parts chausted.

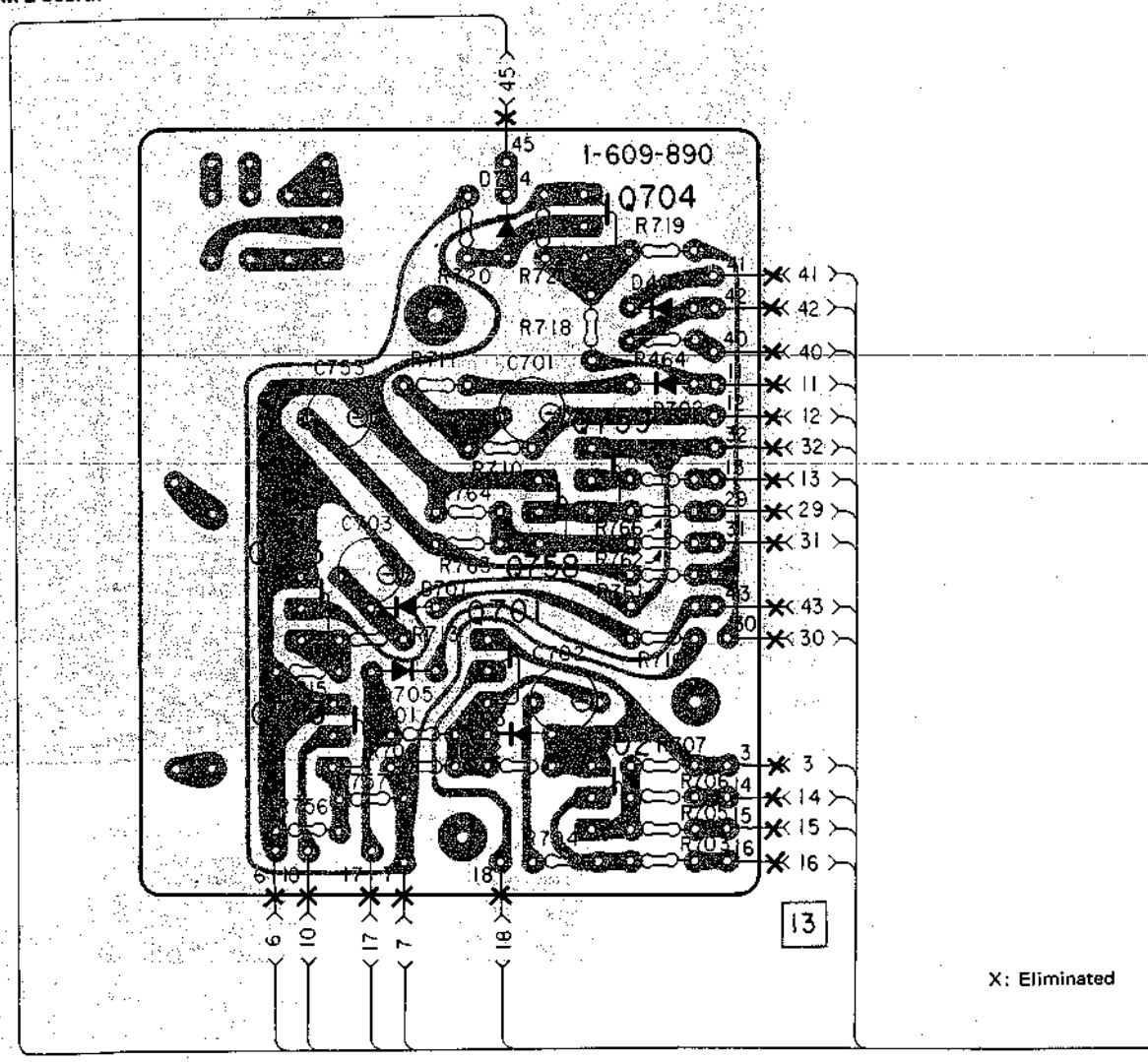
replacing with new parts, IC401 and IC402 should be ed together. Also, a part of the circuit should be modified own below.



	FORMER	NEW
IC401	μPD553C-261	μPD553C-276
IC402	μPD553C-262	μPD553C-287

fied points:

iminate the GM-2 board.

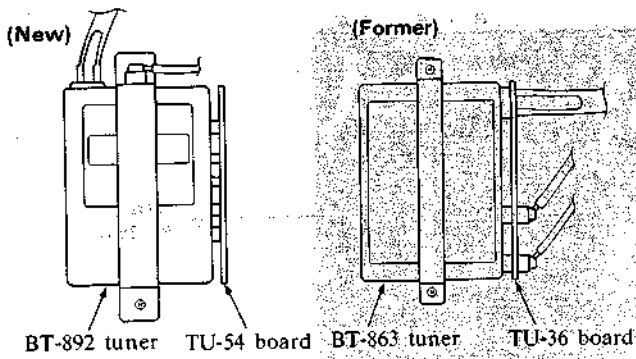


X: Eliminated

[Note on Replacement of Tuners (BT846 and BT892)]

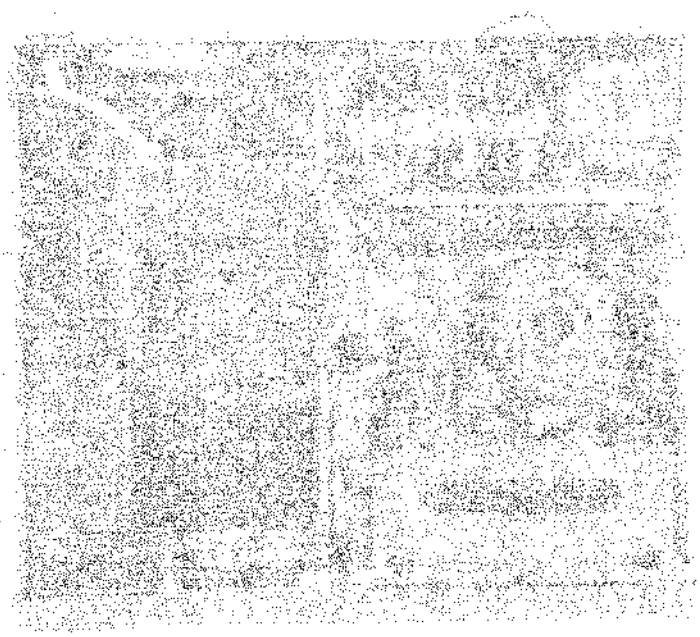
There are new and former types in the tuners. The single parts of the tuner have no compatibility between the new and former parts. For the single parts of the tuner, the new and former parts should be provided.

New and former tuners:



New	Former
Tuner (BT-892)	Tuner (BT-864)
TA-20 board	TA-12 board
TU-54 board	TU-36 board

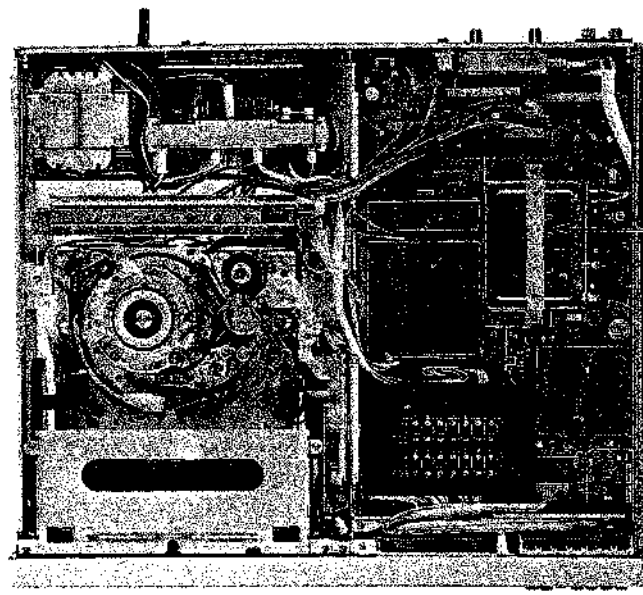
Note:
The single parts of a tuner have no compatibility between the new and former tuners.
(For the single parts of a tuner, new and former parts are required.)



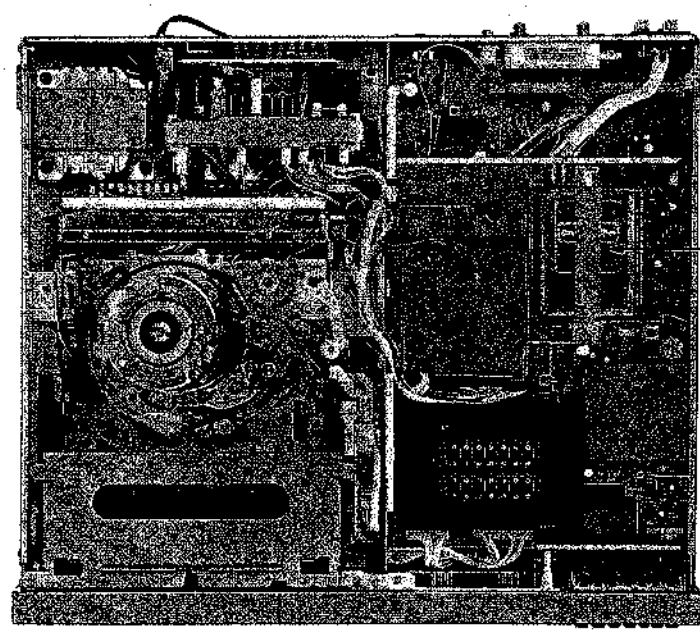
INTERNAL VIEWS

– TOP SIDE –

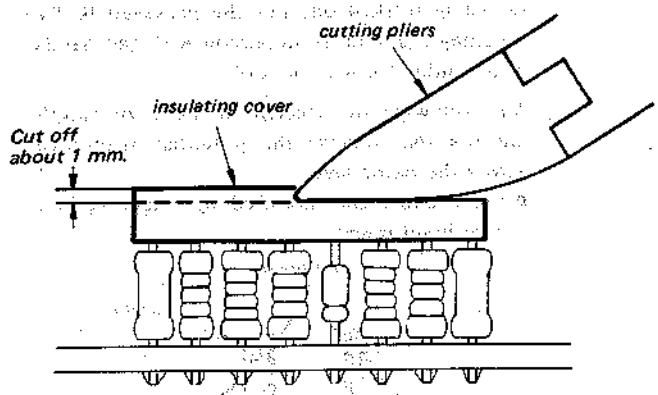
FORMER



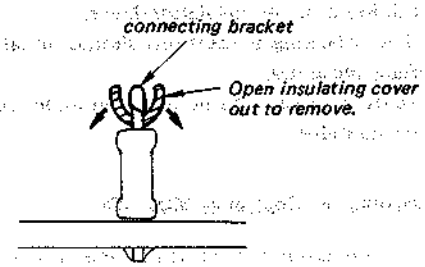
NEW

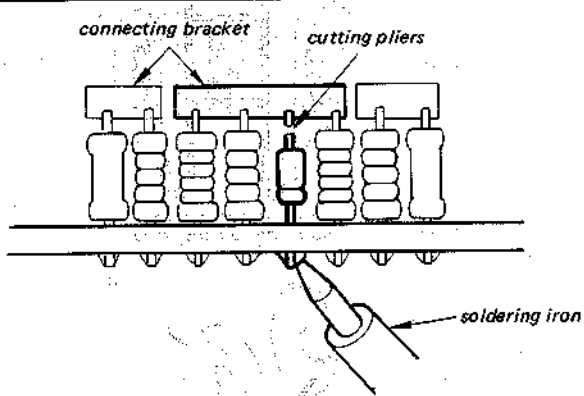


REPAIR METHOD FOR HYBRID CIRCUIT BLOCK

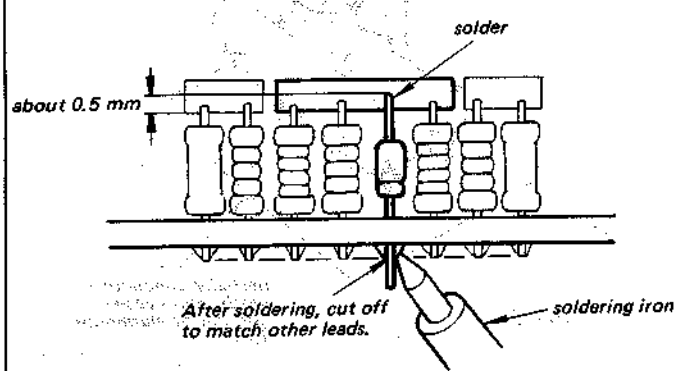


Using a cutting pliers, cut off the upper portion of the insulating cover about 1 mm, exposing the top of the connecting brackets.

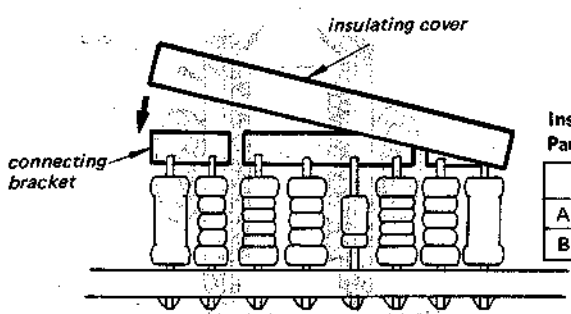




Cut off the lead of the defective part with cutting pliers. Remove solder and take out the defective part.



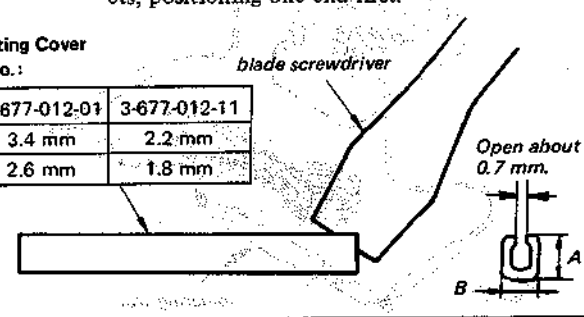
Insert the new part on the board and solder the lead to the board. Cut off the lead on the connecting bracket side so that it overlaps by about 0.5 mm, and solder to the connecting bracket.



Open the insulating cover groove about 0.7 mm and place over the connecting brackets, positioning one end first.

Insulating Cover Part No.:

	3-677-012-01	3-677-012-11
A	3.4 mm	2.2 mm
B	2.6 mm	1.8 mm



Handling Precautions for MOS ICs

Generally, the insulation resistance of the oxide layer in MOS IC structures is very high, and the oxide layer is very thin. Because of this, it is possible that the static voltages usually present on clothes and the human body will be enough to generate a potential difference across the insulator, high enough to cause a breakdown of the insulating layer.

The following precautions should be taken while handling these ICs.

(Particular care should be taken under conditions of low humidity.)

Precautions in Replacing MOS ICs

1. Store new ICs by inserting them into a urethane-polyester cushion (which is somewhat conductive), or wrapping it in aluminum foil, so that all the pins are at the same potential.
   (The ICs should be stored in that manner until mounted on the circuit board.)

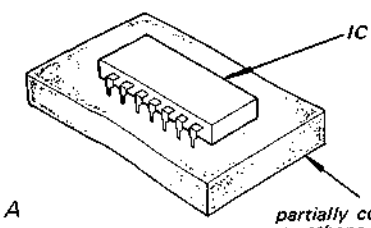


Fig. A

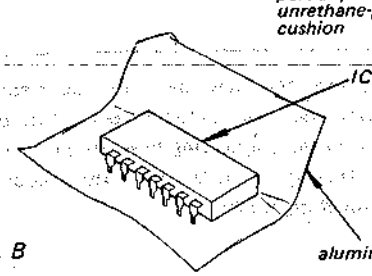


Fig. B

2. Check the soldering iron for possible power-line leakage current. Make sure that there is no leakage path by connecting an ohmmeter to the tip of the soldering iron and the plug as shown in Fig. C. If there is a leakage path, use some other soldering iron.

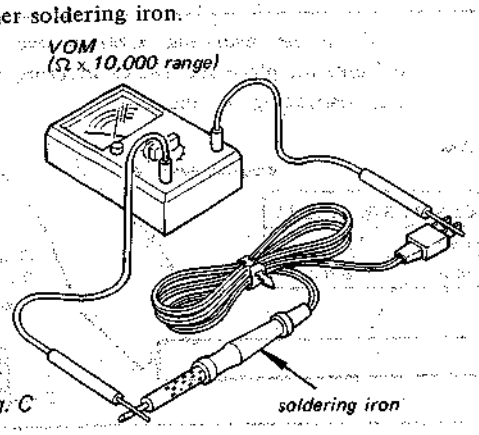


Fig. C

3. Equalize any potential difference between the clothes, the tools in use, the work bench, the set being worked on, and the packaged IC by touching them all in succession with the hands or a conductive wire or tool.
4. The following are effective methods for handling ICs that remove the potential difference across the oxide layer.
   - Use a paper clip modified by soldering in a wire braid insert.

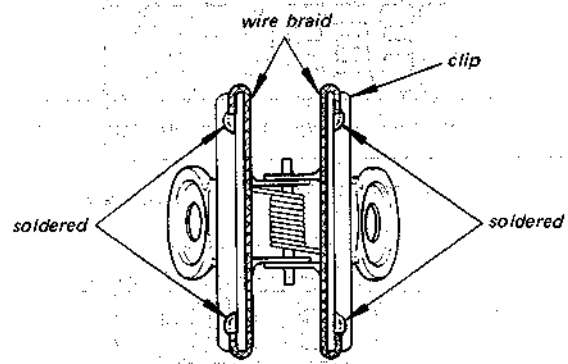


Fig. D

Make sure that there is no solder on the inside.

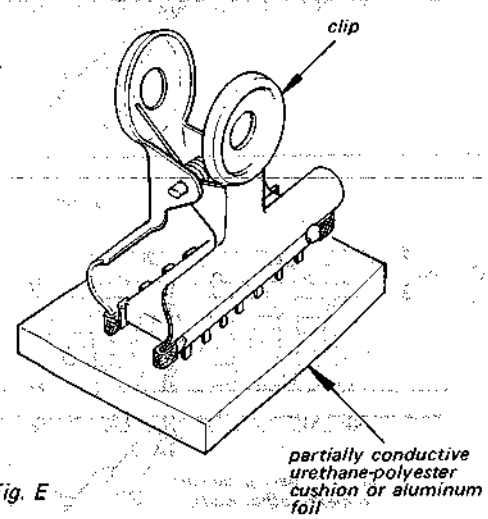
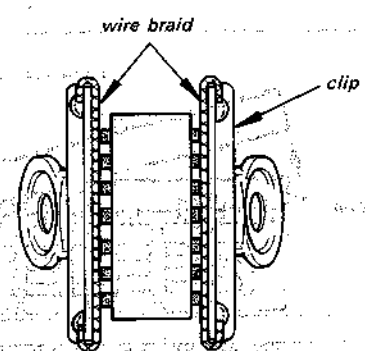


Fig. E



Make sure that all the pins are in contact with the wire braid (all the pins will then be at the same potential.).

Fig. F

- Take a short length of fine bare wire and wind it around the IC so that it shorts all the pins of the IC, while it is still in the urethane-polyester cushion or aluminum foil. This ensures that all the pins are at the same potential.

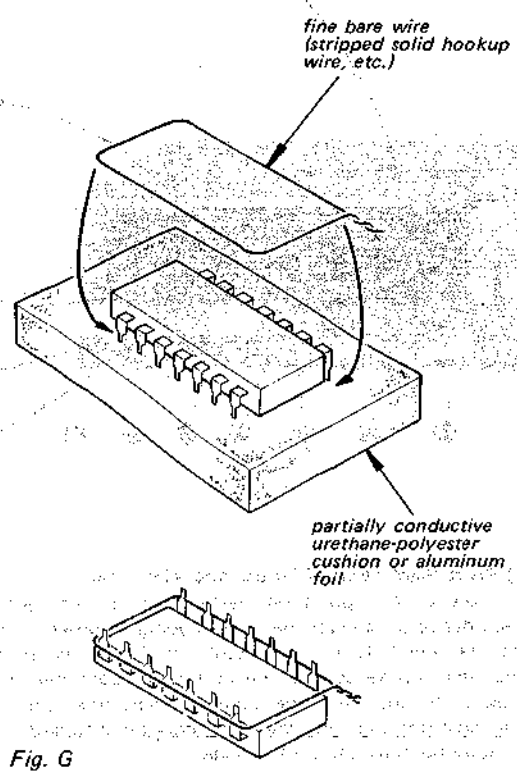


Fig. G

- When it is necessary to handle the IC with the fingers, do not touch any pin, and hold the IC at the ends of its plastic-package case as shown in Fig. H.

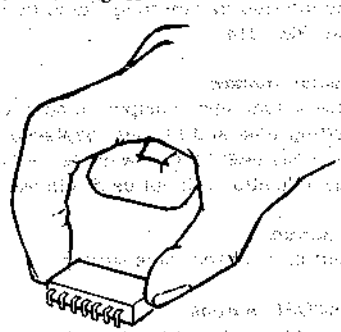


Fig. H

5. Method of Mounting
Insert the IC while holding it with the modified clip, and solder all the pins with the clip still shorting the pins. (Similarly, solder all the pins while the bare shorting wire is still wound around them.). Remove the clip or the bare shorting wire only after all the pins have been soldered.

Precaution while Checking C-MOS ICs

The C-MOS ICs (Complementary MOS) are MOS ICs that have their output sections made up of N-channel and P-channel push-pull stages to increase their speed of operation. If the output terminal of these ICs comes into contact with B+ or B- voltage, then the FET which is ON at that time will either become shorted or open.

This is valid for all the output sections that are connected together by the interconnections. Even the circuits that are physically separated (and not on the same board) can be destroyed simultaneously.

Example:

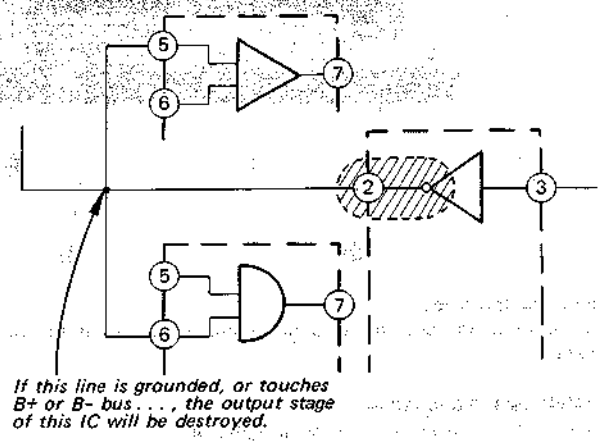
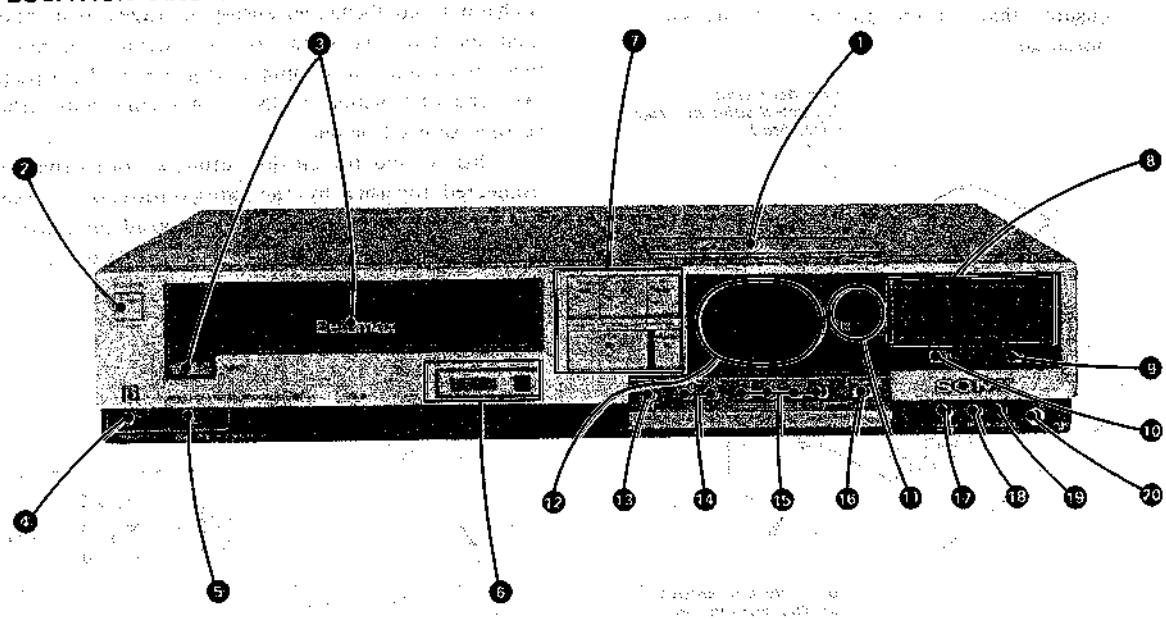


Fig. I

SECTION 1
GENERAL

1-1. LOCATION AND FUNCTION OF CONTROLS



❶ Tuning compartment
All the switches and buttons for channel presetting are in this compartment.

❷ POWER switch and lamp
Press to turn the power on. The lamp lights up.
To turn the unit off, press the switch again.
The timer section will continue to operate and the time will be displayed even if the power switch is off, as long as the ac power cord is plugged into a working outlet.

❸ Cassette compartment and ⏏ EJECT button
After turning on the recorder, insert a cassette to be recorded or played back. To remove the cassette, press the ⏏ EJECT button.

❹ TRACKING control
The center detent position provides the correct tracking for the cassettes recorded on this recorder.
If streaks or snow appears in the playback of a cassette which has been recorded on another video cassette recorder, turn this knob to obtain the best possible picture.

❺ RECORD MODE selector
Select either SP or LP to set the recording speed. In playback, SP, SP or LP mode is automatically selected.

❻ TAPE COUNTER and RESET button
The TAPE COUNTER provides a numerical reference point while recording, which can be used to index a recorded cassette.
To reset the counter to zero, press the RESET button.

❼ Function buttons
Control tape transport.

❽ Channel select buttons and indicators
Select the channel to be recorded or to be viewed with these buttons. The selected channel number will light.

❾ PROGRAM SELECT button and VTR lamp
To view a TV program selected by a channel select button on the recorder or to monitor the picture being recorded, press this button so that the VTR indicator lights up. When the ▶ button on the recorder is pressed, the unit is automatically set in this mode. To view a TV program in the usual manner, press this switch so that the indicator goes off. When the recorder is turned off, the recorder is automatically set in this mode.

❿ RECORD switch and lamp
Slide to the right to start recording. While a recording is being made, the lamp lights up.

⓫ Remote control detector
Detects the infrared transmitting signal from the supplied Remote Commander RMT-314.

⓬ Time display window
Normally the actual time is displayed here. While the timer is being set, the setting time and day are displayed. Tomorrow is the "2nd Day" and the day after tomorrow is the "3rd Day". For today's timer setting, day indication will not be displayed.

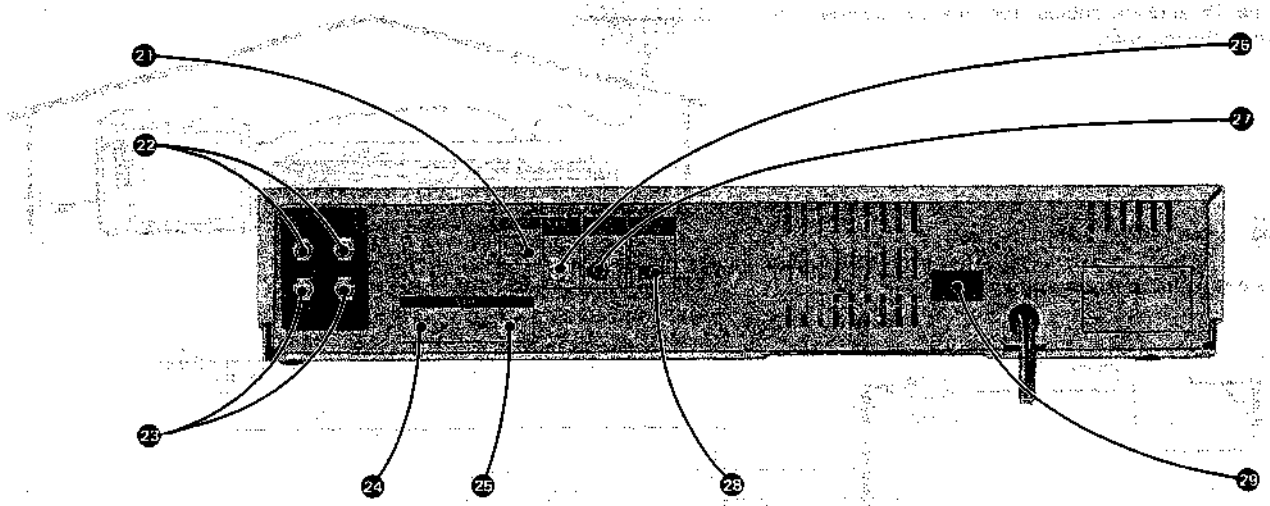
⓭ CLOCK button
Use this button in present time setting.

⓮ TURN ON/OFF buttons
Use these buttons in turn-on or turn-off time setting.

⓯ DAY, HOUR, 10 MIN, MIN buttons
Use these buttons in turn-on day and time or turn-off time settings while pressing the TURN ON or OFF button.

⓰ TIMER REC button and indicator
Press for timer-activated recording. While the timer is in operation, the indicator lights.

Rear (Photo of the US model)



⑰ CAMERA PAUSE jack (special mini type)
To start or stop the tape on the camera, connect the Sony HVA-200 ac adaptor to this jack.

⑱ MIC (microphone) jack (mini type)
Connect a microphone or the MIC OUT plug of the ac adaptor here for audio recording. When a microphone is connected, neither the sound from the AUDIO IN jack nor the sound of a TV program can be recorded.

⑲ AUDIO IN jack (mini type)
This jack accepts audio signals. Connect it to the line output of a piece of audio equipment, such as an amplifier, tape recorder, etc., or to the audio output of another video recorder or a camera. When the plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

⑳ VIDEO IN jack (phono type)
This jack accepts video signals from a camera, another video recorder etc. When the plug is inserted in this jack, the signal from the TV tuner cannot be recorded.

㉑ RF UNIT selector
Select the output channel at the VHF OUT terminal. Set the switch to 3ch or 4ch, whichever is not active in your area.

㉒ UHF IN terminals
Connect a UHF TV antenna here.

㉓ UHF OUT terminals
Connect to the UHF antenna terminals of the TV receiver to be able to view UHF TV programs even when the recorder is turned off.

㉔ VHF IN terminal
Connect a VHF TV antenna here.

㉕ VHF OUT terminal
Connect to the VHF antenna terminal of the TV receiver. The signal of a VTR program (converted to channel 3 or 4) and the VHF TV signal will be supplied to the TV receiver.

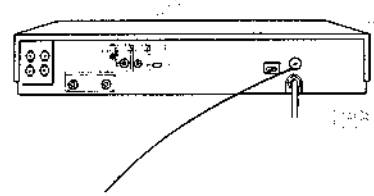
㉖ VIDEO OUT jack (phono type)
This jack provides the video signal from this recorder.
Connect it to the video input of another video recorder or a video monitor.

㉗ AUDIO OUT jack (mini type)
This jack provides the audio signals from this recorder.
Connect it to the line input of an audio equipment, such as an amplifier, tape recorder, etc., or to the audio input of another video recorder or a video monitor.

㉘ CAPTIONS/PCM switch
Normally set to the right position. For receiving captioned TV programs or for PCM recording and playback, set this switch to the left position.

㉙ Frequency select switch (capped on the US model: TYPE 1)
Set to either 50 Hz or 60 Hz in order to match the local power supply.

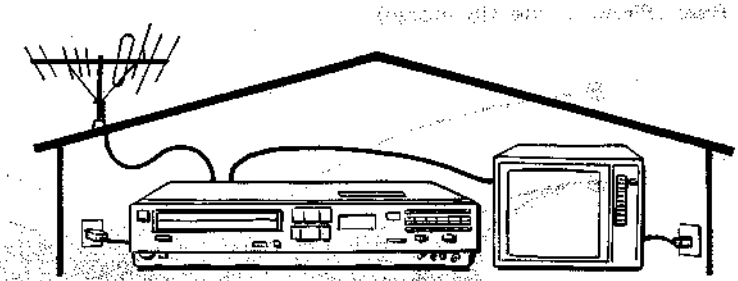
E1, PX1 Model (TYPE 3, 4)



Voltage selector
This selector is preset at the factory to 220 V.
When you use this recorder in a 120 V area, set the selector to 120 V.

I-2. ANTENNA CONNECTIONS

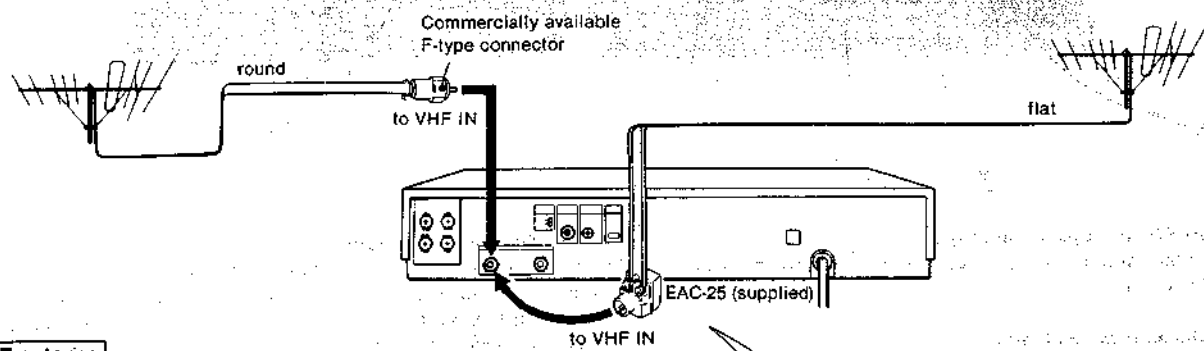
Disconnect the TV antenna cables from the TV receiver and connect them to the recorder.



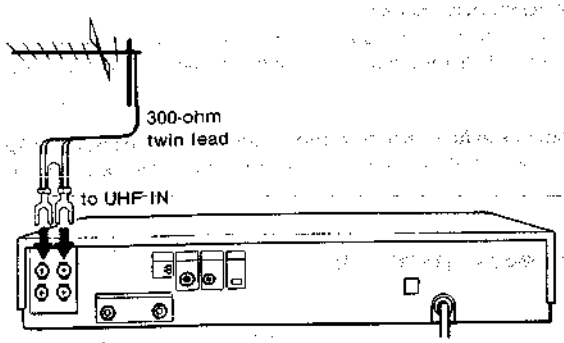
VHF antenna

If the cable is a round 75-ohm coaxial cable

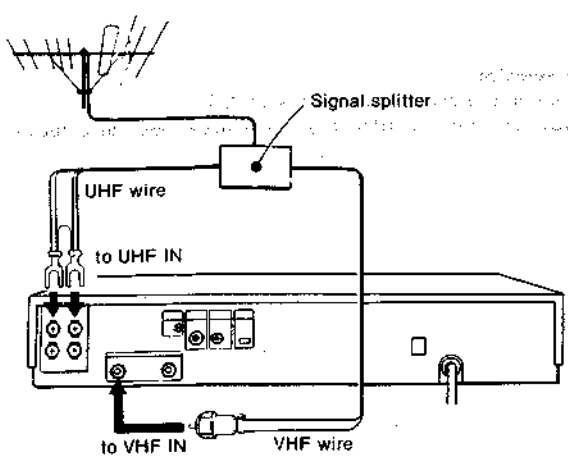
If the cable is a flat 300-ohm twin lead



UHF antenna

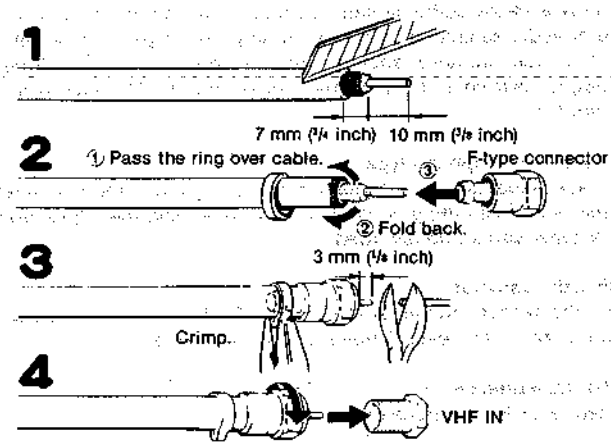


Combination VHF/UHF antenna

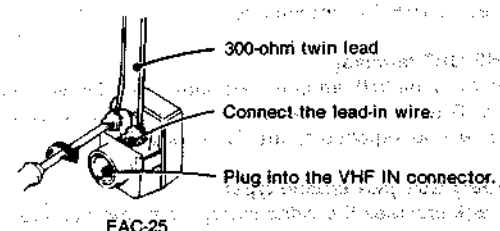


Most combination antennas are equipped with a signal splitter. If you need a splitter or a complete antenna system, see your Sony dealer or a qualified technician.

How to attach an F-type connector



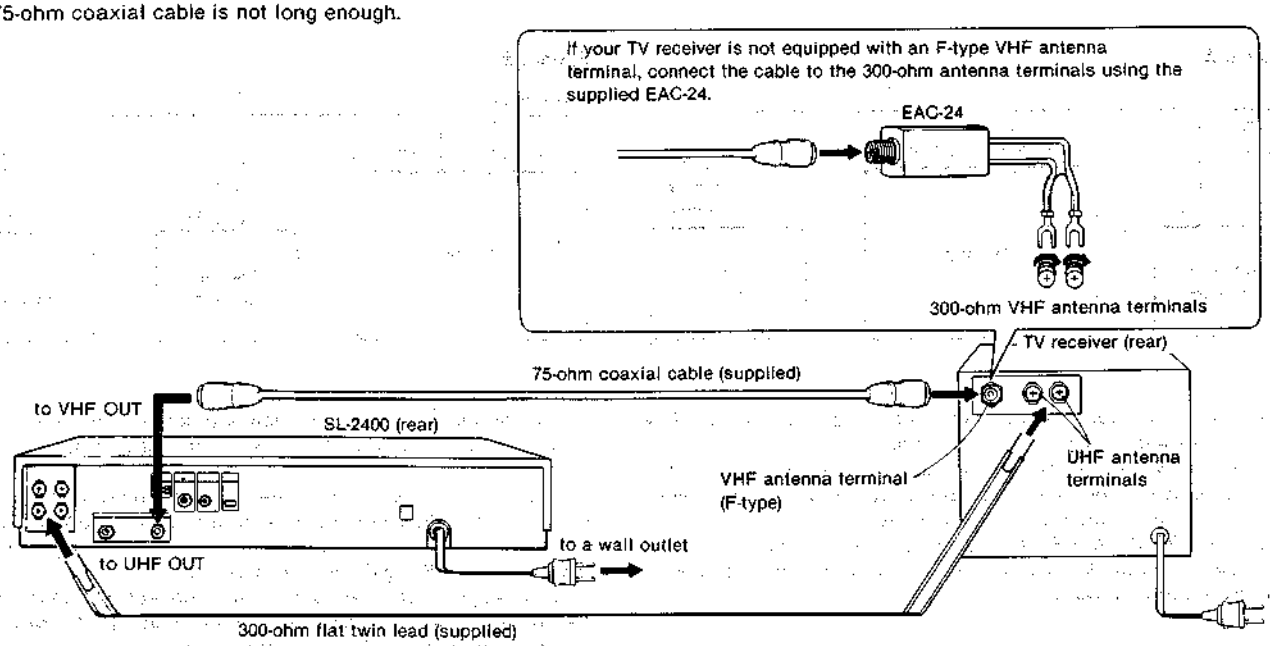
How to attach an EAC-25 external antenna connector



1-3. CONNECTING THE TV RECEIVER

Connecting a conventional TV receiver
Once the connections shown below have been made, the TV antenna signals, as well as the signal from the recorder, will be fed to the TV and you can view TV programs in the usual way.

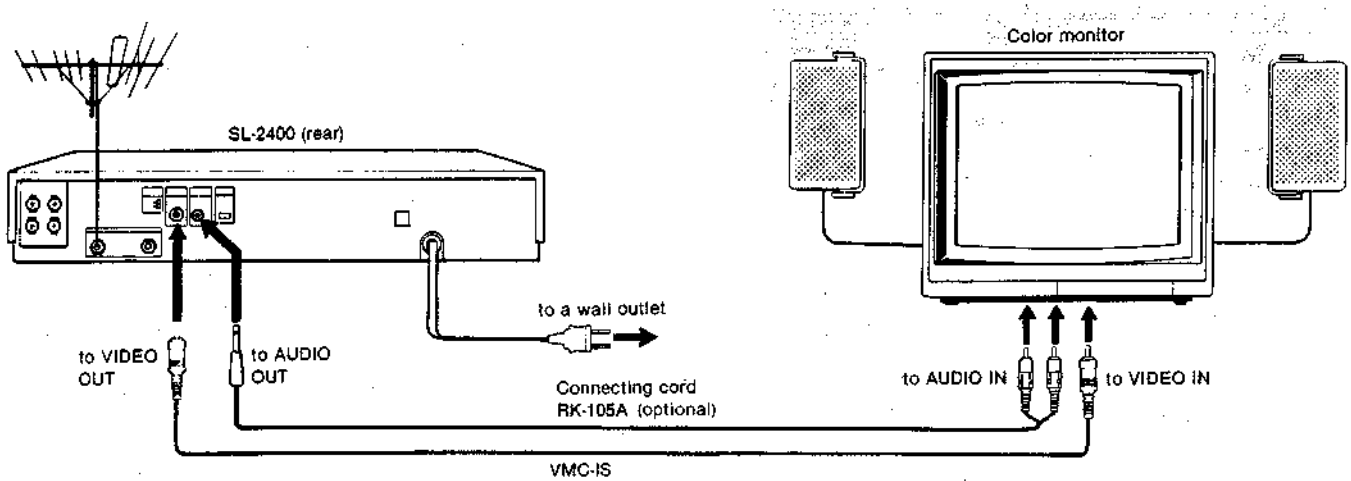
●Use an optional RFC-8 extension cable, 8 m (25 ft) long, if the supplied 75-ohm coaxial cable is not long enough.



Caution
Connections between the recorder VHF OUT connector and the antenna terminals of a TV receiver should be made only as shown in these instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of rf devices.
Never connect the output of the recorder to an antenna or make simultaneous (parallel) antenna and recorder connections at the antenna terminals of your receiver.

Connecting a color monitor
To obtain a better-quality picture, connect a color monitor, such as the Sony Profeel Trinitron Component TV, instead of a conventional TV receiver.

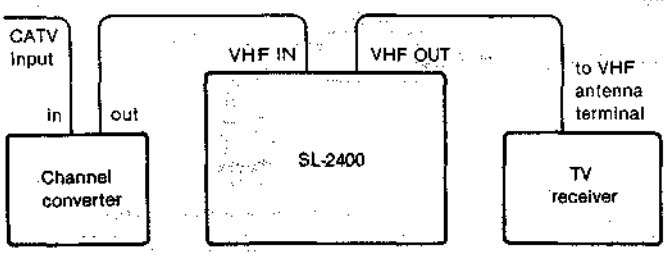
If you use a component TV tuner together with the monitor, connect the recorder and the TV tuner in the same way as in the case of the recorder and the conventional TV receiver described above.
For details on the connection of the TV tuner and the monitor, refer to the instruction manual of the TV tuner.



I-4. CONNECTIONS TO A CABLE TV (CATV) SYSTEM

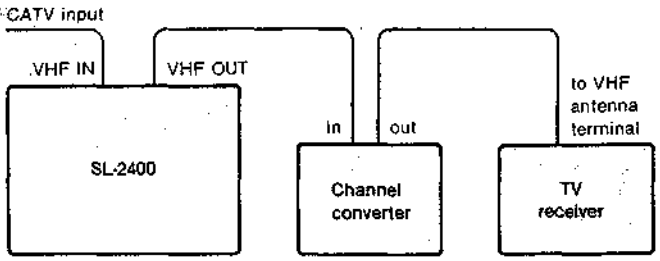
●We recommend that you consult with your cable television company for proper connection of your Betamax unit to your cable TV system.
●Before operating the recorder with a cable TV system, set the RF UNIT channel selector on the recorder to channel 3 or 4, whichever is not active in your area.
If both channels are viewable, check which gives better results by switching between channels 3 and 4.

System A



In the above configuration, you can record programs from all CATV channels as well as VHF channels 2 through 13.
Set the TV channel selector to the same channel as the RF UNIT channel selector. Set the channel select button on the recorder to receive the output channel of the converter.
Press the PROGRAM SELECT button on the recorder to turn the VTR lamp on. Now the channel to be viewed or to be recorded is selected on the converter.

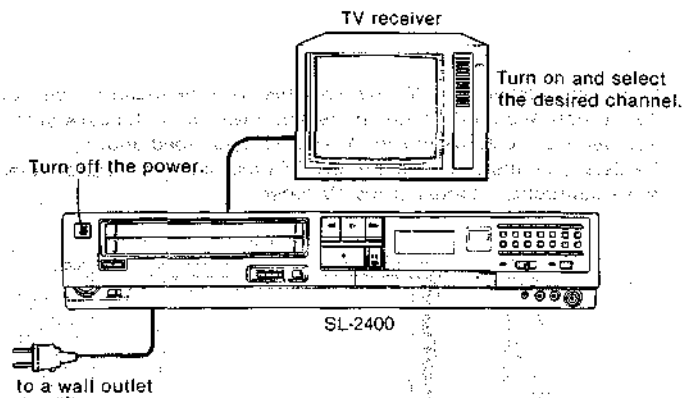
System B



In this configuration, you can view a program from the converter while recording a program from VHF channels 2 through 13 via the recorder.
Set the TV channel selector to the output channel of the converter and press the PROGRAM SELECT button to turn the VTR lamp off. For playback, set the channel selector on the converter to the same channel as the RF UNIT channel selector.
When a channel converter is not used, connect the CATV input to the recorder, then connect the recorder and the TV receiver as shown in the previous TV connection diagrams.

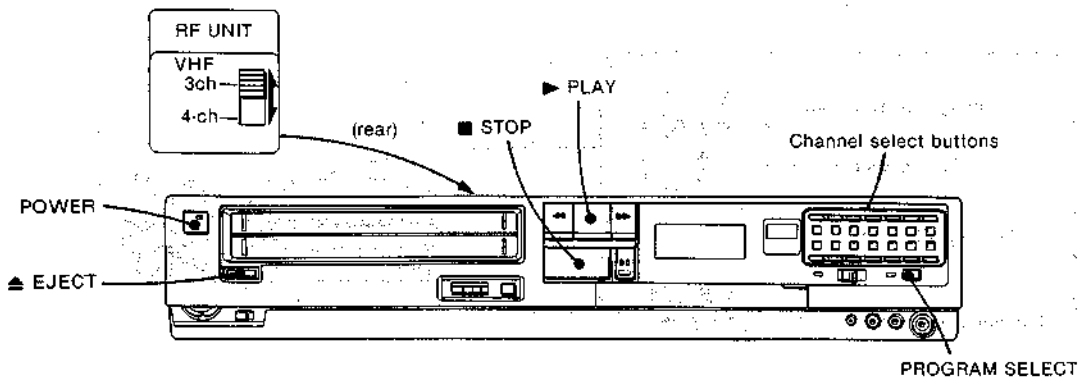
1-5. WATCHING TELEVISION

You can watch television in the usual way with the recorder connected.



1-6. ADJUSTING THE TV

Adjust your TV receiver to receive the signal from your recorder. When you have connected a color monitor, the following adjustment is not necessary.



If you do not have a recorded video cassette tape

❶ Set the RF UNIT channel selector located at the rear of the recorder to 3CH or 4CH whichever channel is not active in your area.
❷ Push in the POWER switch. The lamp lights.

❸ Press the PROGRAM SELECT button to turn the VTR lamp on.
❹ Select an active channel in your area with a channel select button on the recorder.

If you have a recorded video cassette tape

❸ Insert the cassette with the round window to the left.
❹ Press the ► button.

❺ Turn on the TV.
❻ Set the TV receiver to either VHF channel 3 or 4 to agree with the setting of the RF UNIT channel selector.
The TV program selected on the recorder or the tape program will be displayed on the TV screen. If a picture does not appear on the TV screen or if the display is not clear, fine-tune the channel on the TV.
●For details about TV channel adjustment, see the instruction manual of the TV receiver.

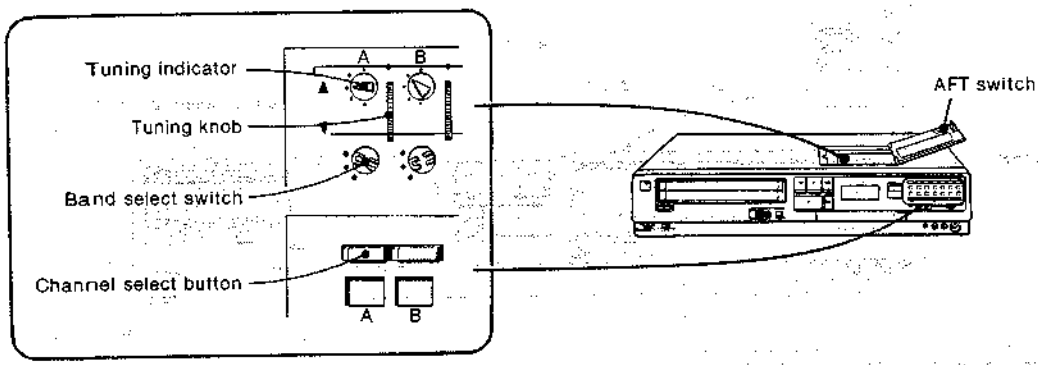
Check!
Check that the program displayed on the screen changes when a different channel select button on the recorder is selected.
If the program does not change, repeat the preceding steps.

Check!
Check that the display on the screen changes when you stop the tape by pressing the ■ button on the recorder. (To eject the cassette, press the ▲ button.)
If the program does not change, repeat the preceding steps.

Now your TV receiver is tuned to the recorder. Whenever you use the video recorder, you should set the TV to the channel which you have chosen above.

-7. TO SET UP AND FINE-TUNE THE VHF AND UHF CHANNELS IN YOUR AREA

The channel select buttons are pre-adjusted at the factory to VHF channels 2 through 13 and to two UHF channels. These pre-adjusted channels may be set up to receive any available VHF/UHF station in your area. To set up and fine-tune channels, open the tuning compartment on the top of the recorder and proceed as follows :



❶ Turn the recorder and the TV receiver on.
❷ Make sure that the TV receiver is set to the correct channel for the video recorder.
❸ Press the PROGRAM SELECT button to turn the VTR lamp on.
❹ Push the recorder channel select button to be preset. The associated channel indicator will light.
❺ Set the band select switch associated with the pushed button to one of these positions : VL (VHF Low), VH (VHF High), or U (UHF). Use a screwdriver if necessary.

To tune in channels 14 through 83 — U
To tune in channels 7 through 13 — VH
To tune in channels 2 through 6 — VL

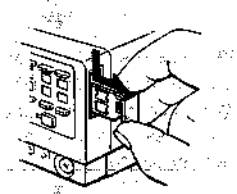
❻ Tune by turning the corresponding tuning knob, watching the TV screen until the picture of the desired channel is clearly displayed and the sound is clear.

❼ Repeat steps ❹, ❺ and ❻ for the other channel select buttons.
❽ When all stations have been set up as desired, check that the AFT switch is set to ON.

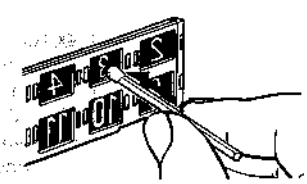
To replace the channel indicating segments

Channel indicating segments are supplied for identification of the preset channels. Insert the segments as follows :

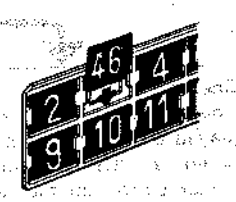
❶ Pull out the channel indication plate.



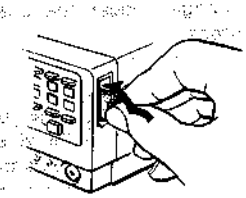
❷ Press the segment out from the rear.



❸ Pick out the appropriate segments for the channels preset and insert them into the plate.

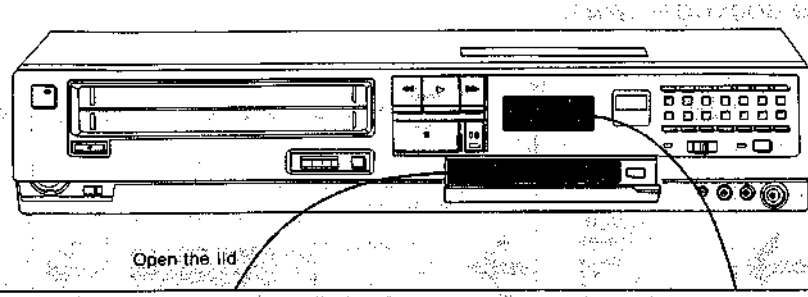


❹ Replace the plate.



1-8. SETTING THE CLOCK

When you connect the ac power cord to a wall outlet, the clock indicates, 12:00 a.m. and blinks to show that it must be set.
To set the clock to **8:35 a.m.** for example, proceed as follows :



1 CLOCK

Keep depressed until step **4**.

AM 12:00

Stops blinking.

2 CLOCK HOUR

Set the hours digit(s).

AM 8:00

PM 12 : 00 ... noon
AM 12 : 00 ... midnight

3 CLOCK 10 MIN

Set the tens of minutes digit.

AM 8:30

4 CLOCK MIN

Set the minutes digit.

AM 8:35

5 With the time signal CLOCK

Release.

AM 8:35

The clock now starts operating, showing the correct time.

Setting the hours and minutes digits
The HOUR, 10 MIN and MIN buttons can be pressed in two ways :

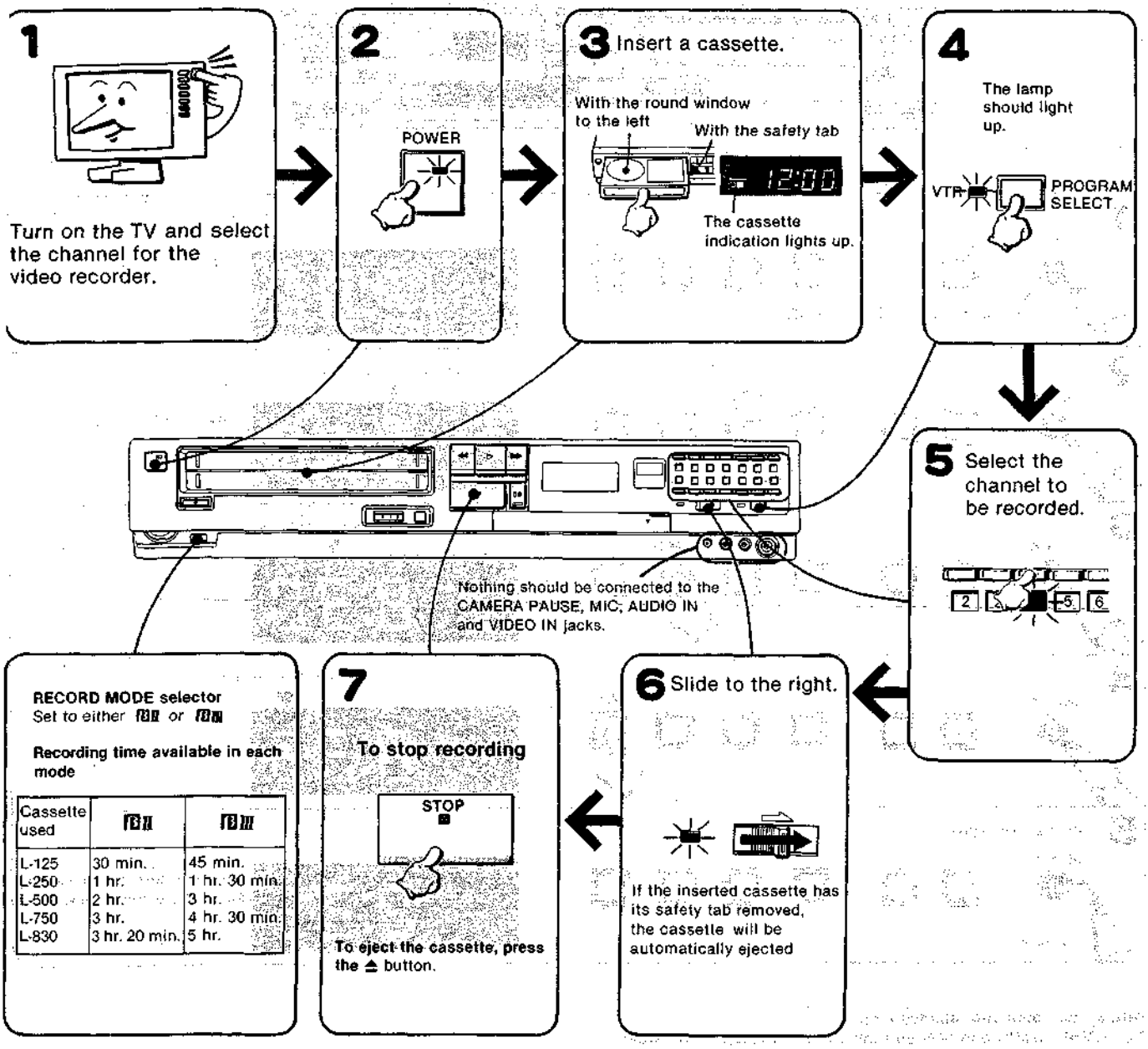
When you hold a button down, the digits will advance continuously until the button is released.

When you press and immediately release a button, the digits will advance by one.

9. HOW TO RECORD TV PROGRAMS

Caution

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.



Cassette used	▯▯II	▯▯III
L-125	30 min.	45 min.
L-250	1 hr.	1 hr. 30 min.
L-500	2 hr.	3 hr.
L-750	3 hr.	4 hr. 30 min.
L-830	3 hr. 20 min.	5 hr.

To stop the tape momentarily

Press the ▮▮ PAUSE button. The lamp on the button will blink. The TV program can be seen on the TV, but the picture will not be recorded.

To resume recording, press the button again.

To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will resume.

RECORDING ONE TV PROGRAM WHILE VIEWING ANOTHER

You can record a TV program selected on the recorder while viewing another TV program.

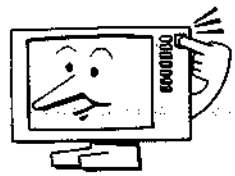
❶ Start recording the desired TV program following the above procedures.

❷ Press the PROGRAM SELECT button so that the VTR lamp goes off.

❸ Select the channel you want to view on the TV.

1-10. HOW TO PLAYBACK A RECORDED TAPE

1 Turn on the TV and select the channel for the video recorder.

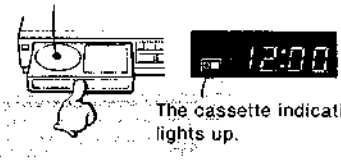


2

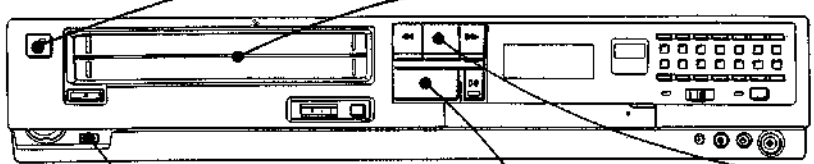
POWER

3 Insert a cassette.

With the round window to the left

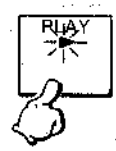


The cassette indication lights up.

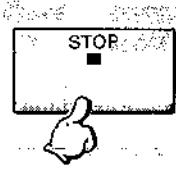


During playback, the ▯I , ▯II or ▯III mode is automatically selected depending on which mode the tape to be played back was recorded in.

4



To stop playing

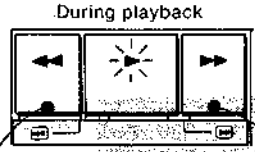


To eject the cassette, press the ⏏ button.

BETASCAN ... To search for a particular point while viewing the picture

Betascan operation during playback

During playback

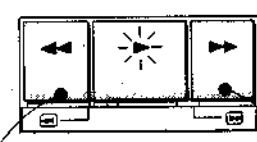


Press this for backward movement.

Press this for forward movement.

At the desired point, release the button. The normal playback will resume.

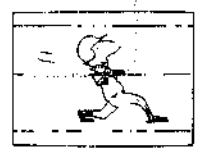
Beta SkipScan operation during rewind or fast forward mode.



When rewinding the tape, keep depressed for backward movement.

When rapidly advancing the tape, keep depressed for forward movement.

At the desired point, release the button. The normal rewind/fast forward mode will resume..

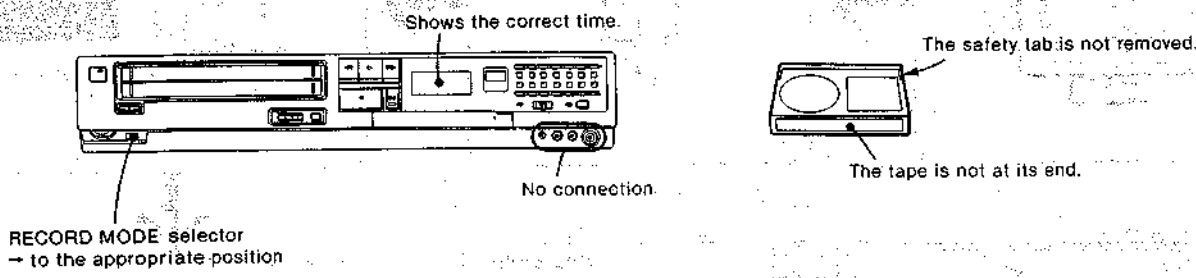


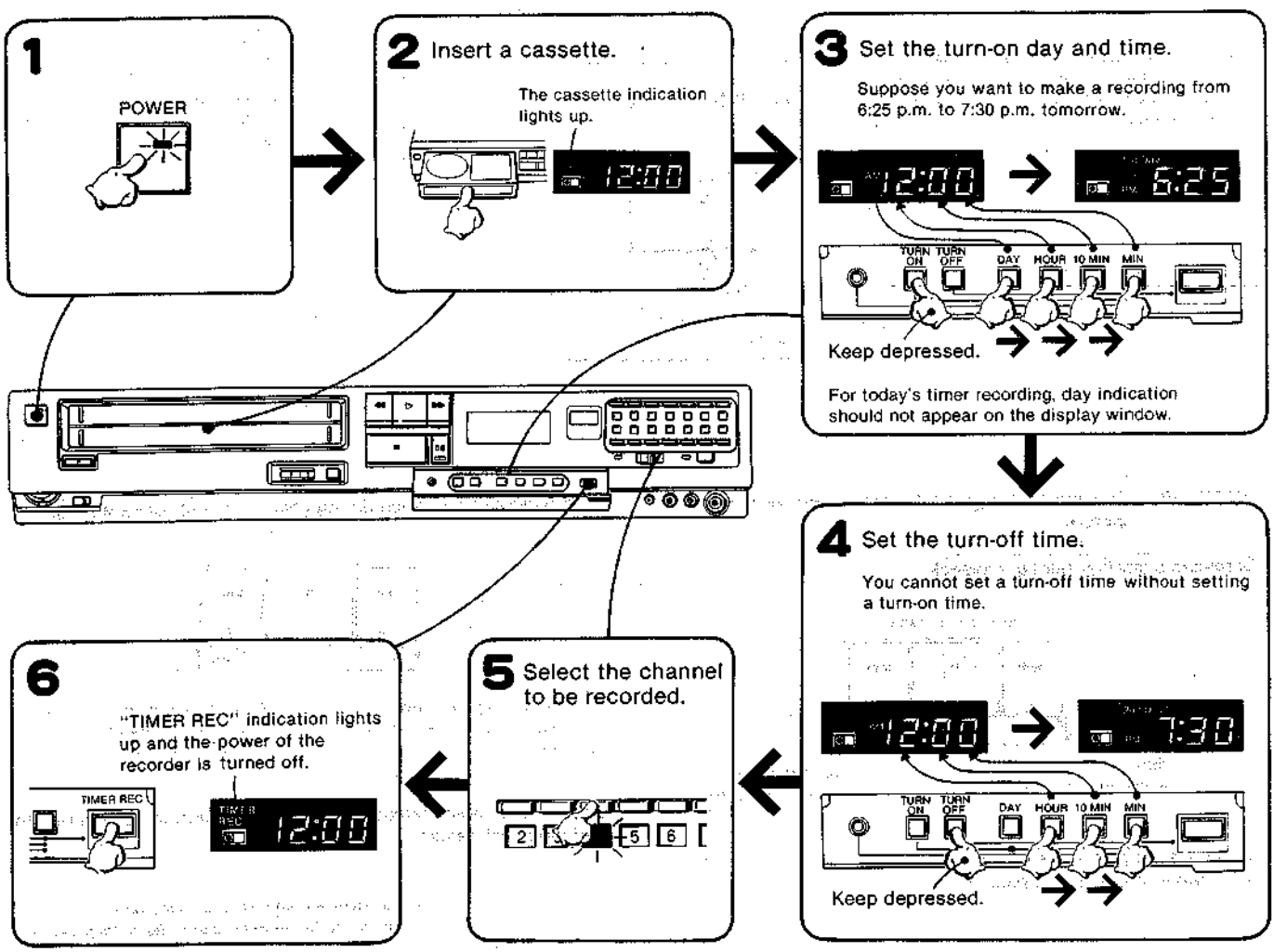
Streaks will appear and sound cannot be heard in the Betascan or Beta SkipScan picture.

1-11. TIMER-ACTIVATED RECORDING

This timer can only be used to start and stop recording. You can set one turn-on time and one turn-off time for recording within the next 3 days.
The clock time must first be set to the correct time. To set the clock.

Check before operation!





At the preset turn-on time, recording will start automatically and will continue to the preset turn-off time or to the end of the tape, at which time the recorder will be automatically turned off.

To check the timer setting
Press the TURN ON button to check the turn-on day/time and the TURN OFF button to check the turn-off time. You can reset the turn-on day/time and turn-off time separately, if necessary.

When the timer-activated recording is finished,
press the TIMER REC button to release it.
If you leave the TIMER REC button depressed, the timer recording will be activated at the same time everyday as long as the tape remains.

If the "TIMER REC" and "⊙■" indications blink and power is not turned off when you have pressed the TIMER REC button, check if a cassette is inserted.

If the inserted cassette is automatically ejected when you have pressed the TIMER REC button, check that the cassette's safety tab is not removed.

> **NOTICE:** ONCE THE TIMER REC LAMP HAS LIT UP, no function of the recorder can be activated, except the timer section settings. To operate the recorder after setting the timer, depress the TIMER REC button to release it.

To record to the end of the tape
Set the turn-off time a little after the time the tape would normally run out.

To interrupt a timer-activated recording
Press the ■ STOP button and the recorder will be turned off, then press the TIMER REC button to release it.
To set the unit to make the next timer recording on the same cassette, eject and insert the cassette again.

WHEN A POWER INTERRUPTION OCCURS

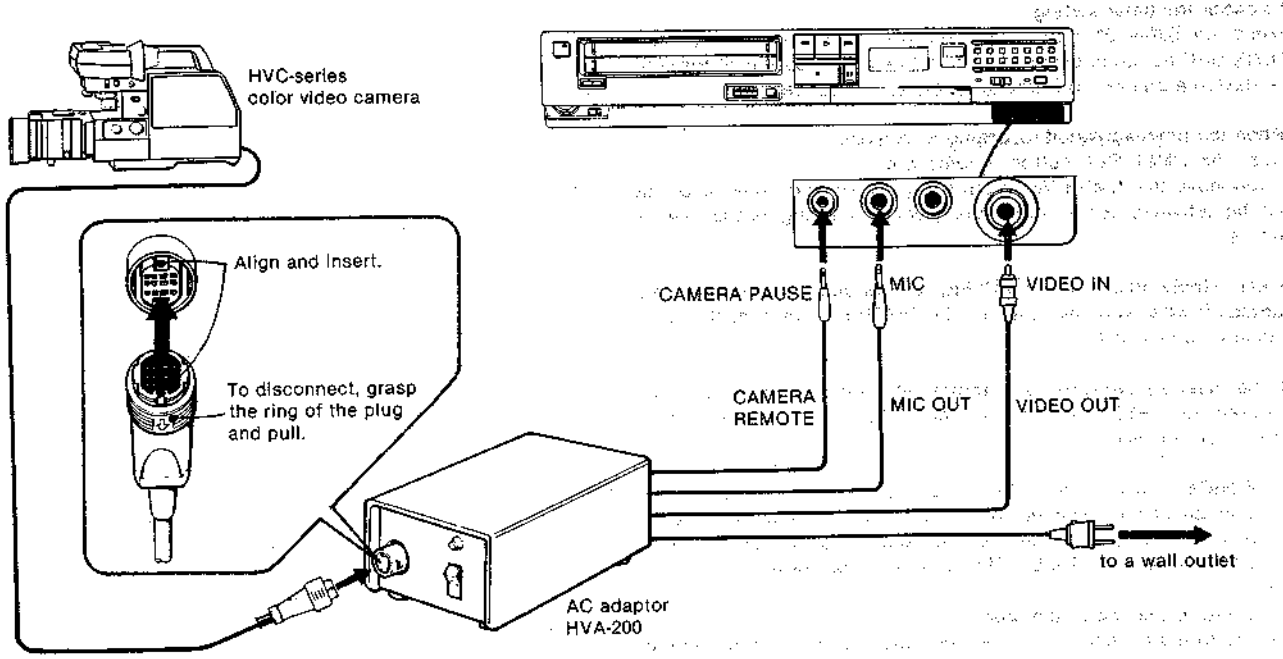
If the clock shows "AM 12:00" and blinks, all the timer settings have been erased. Reset the clock time and the timer settings.

If the clock still shows the correct time, the power has been interrupted for less than 10 seconds, and the timer programs are retained in the memory.

1-12. CAMERA RECORDING ... For producing your own programs

CONNECTIONS

- The camera must conform to American TV (EIA) standards.
- The use of a Sony HVA-200 ac adaptor is required.



To record the sound from a microphone

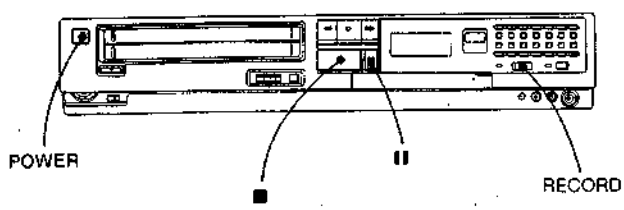
Plug a microphone into the MIC jack. If the microphone has a phone type plug, use a Sony PC-1A plug adaptor.

- When both the MIC and AUDIO IN jacks are connected, the sound from the microphone will be recorded.

To record the sound from other audio sources

Connect an audio source, such as a tape recorder, into the AUDIO IN jack.

OPERATION



❶ Press the POWER switch to turn on the recorder and insert a cassette.
❷ Turn on the power switch on the ac adaptor.
❸ Make the necessary adjustments on the camera. See the instruction manual furnished with the camera.
❹ Slide the RECORD switch to the right. Recording will begin.

- If a camera with a tape run/stop button is used, you can momentarily stop recording and restart it using that button.
- If any other camera is used, use the II button on the recorder or the PAUSE button on the remote control unit to stop the recording momentarily and restart it.

To stop recording, press the ■ button.

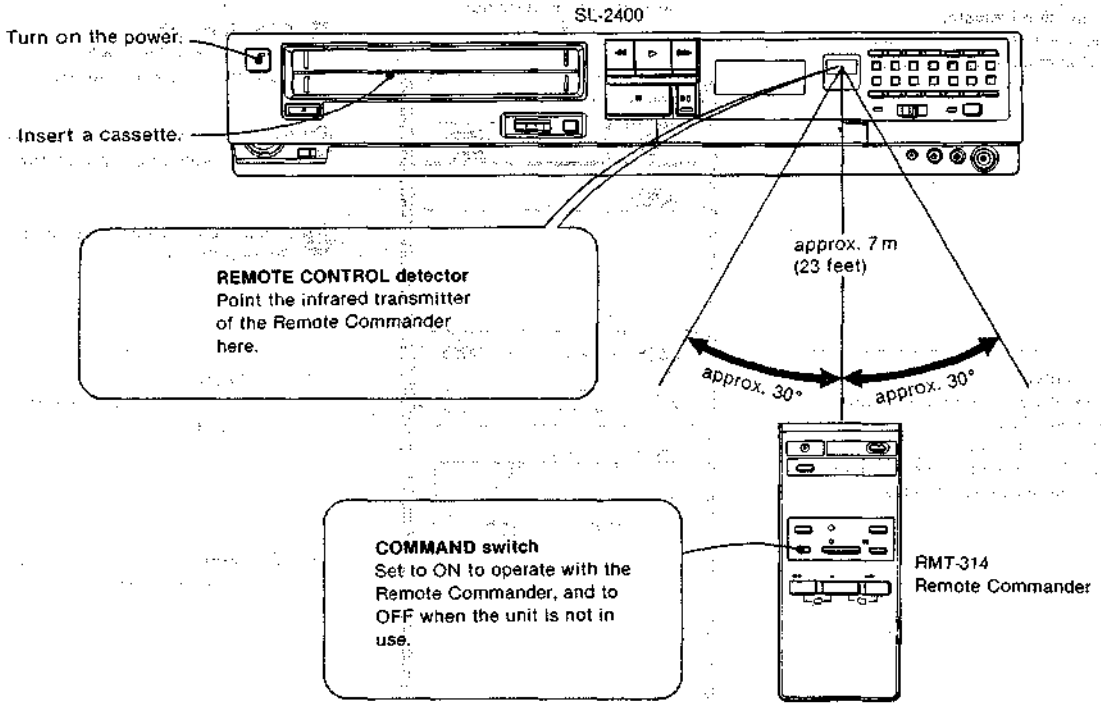
To view the picture being recorded on the TV screen

❶ Turn the connected TV on.
❷ Select the channel for the video recorder on the TV.
❸ Press the PROGRAM SELECT button so that the VTR lamp lights up.
The picture being recorded will appear on the TV screen.

- If acoustic feedback (a whistle-like sound) is heard when the microphone sound is recorded, turn the microphone (or the camera, if the microphone is built into the camera) away from the TV or turn down the TV volume.

1-13. REMOTE CONTROL OPERATION

You can control almost all of the functions of the video cassette recorder from your armchair using the supplied RMT-314 Remote Commander.

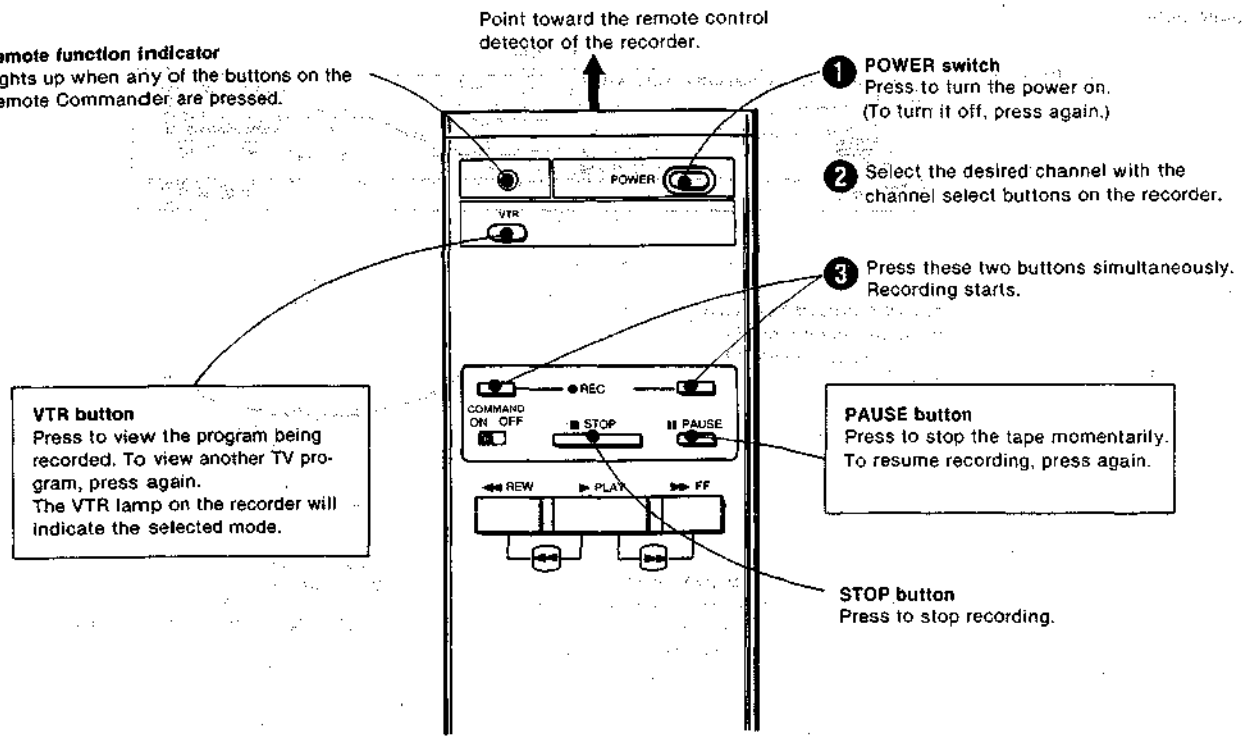


- There should be no obstacles between the Remote Commander and the remote control detector of the recorder.
- The shorter the distance between the Remote Commander, the wider the angle within which the recorder can be controlled.

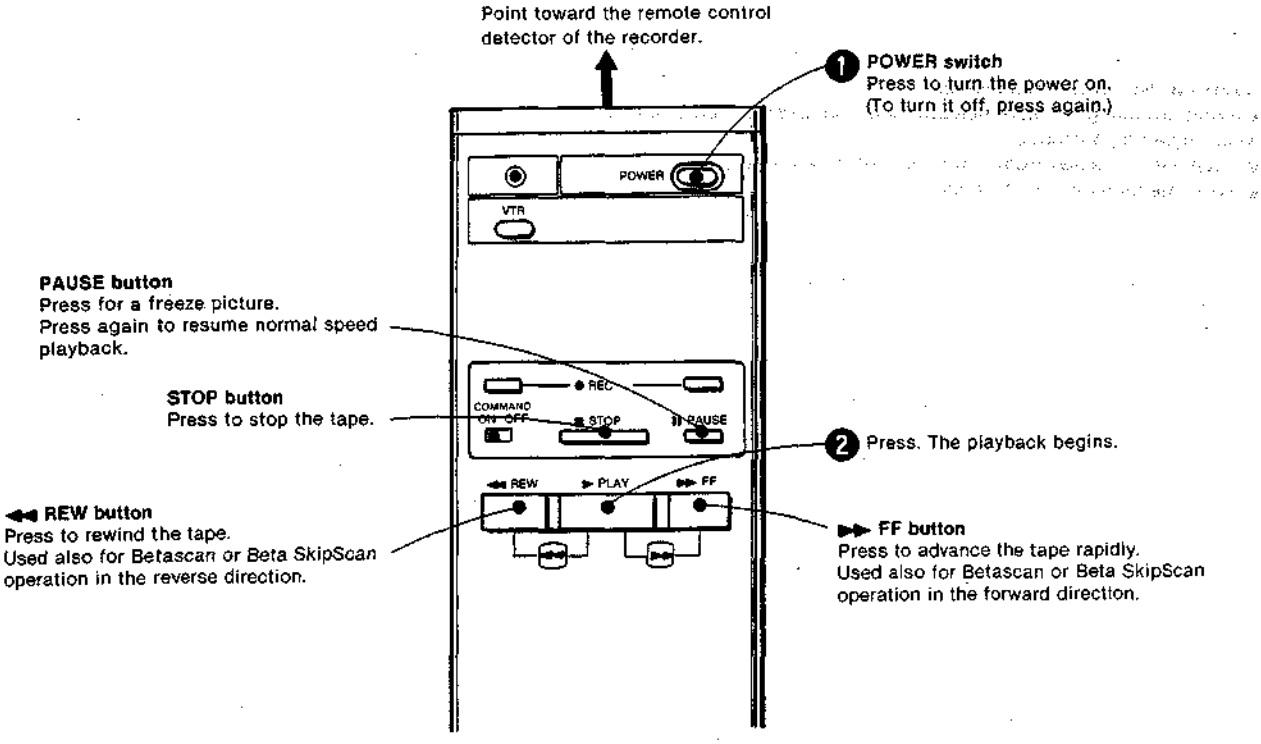
Notes on the Remote Commander

- Avoid dropping foreign objects into the cabinet, particularly when replacing batteries.
- Keep the unit away from extremely hot or humid places.
- Avoid mechanical shock to the unit.

RECORDING



PLAYBACK



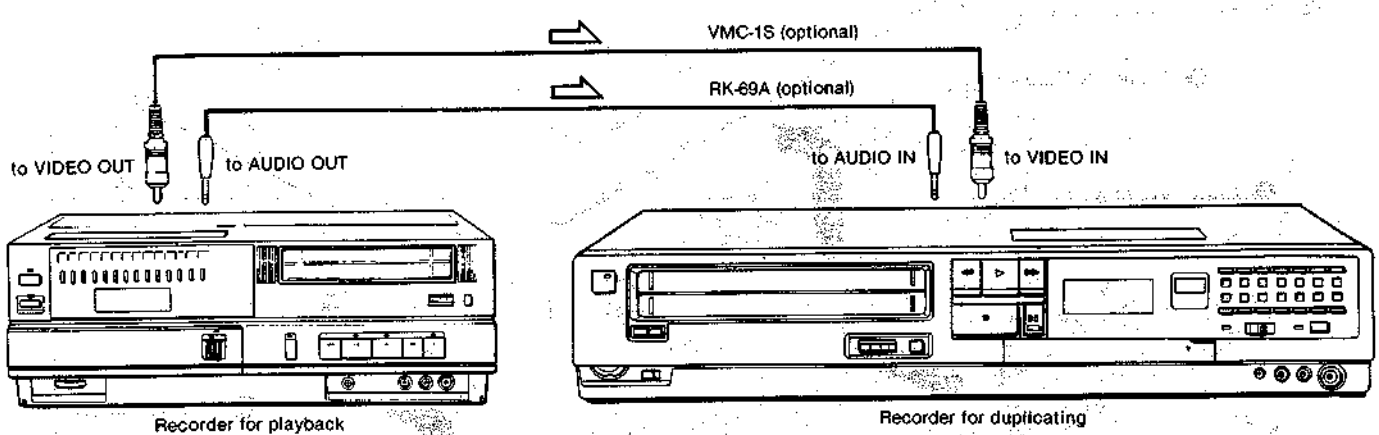
1-14. CLOSED CAPTION RECORDING AND PLAYBACK

This video cassette recorder has the capability of recording and playing back closed caption television programs for the hearing-impaired, when connected to a decoder unit or TV receiver designed to receive closed caption signals.
To play back, the CAPTIONS/PCM switch located at the rear of the recorder must be set to the left position.
Connection between the recorder and the decoder unit will depend on the unit you purchase. See the instruction manual supplied with the decoder.

1-15. TAPE COPY

CAUTION
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provisions of the copyright laws.

To duplicate a tape you will need two video recorders ; one is to play back the original tape and the other is to duplicate.



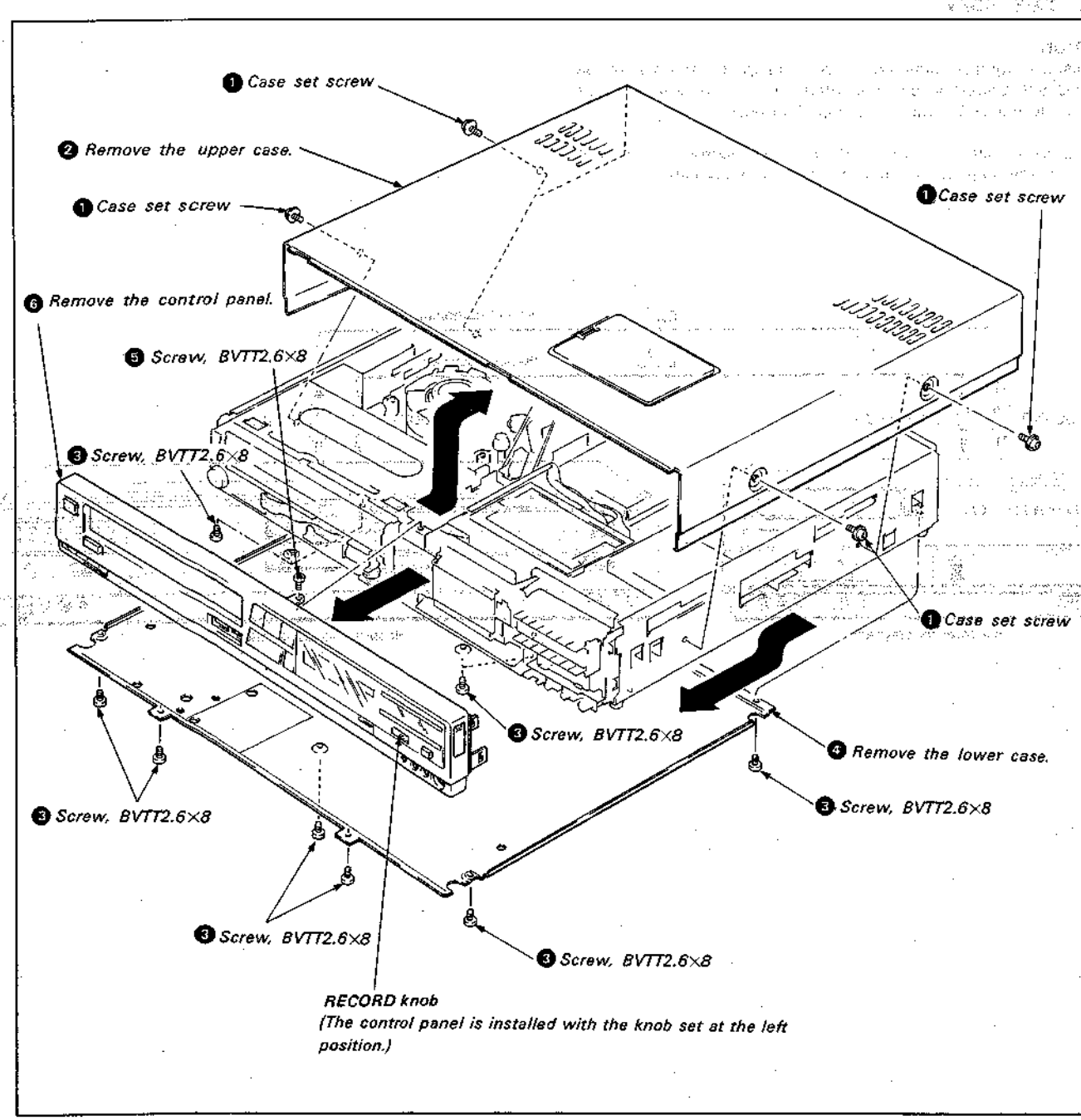
1-16. PCM RECORDING AND PLAYBACK

By connecting a PCM digital audio processor (Sony PCM-F1, etc.) you can enjoy hi-fi sound reproduction with a wide dynamic range, minimal distortion and a flat frequency response.
To play back, the CAPTIONS/PCM switch at the rear of the recorder must be set to the left position.
Connection between the recorder and the PCM digital audio processor will depend on the unit used. Follow the instruction manual of the digital audio processor.

1-17. DISASSEMBLY

1-17-1. Removal of Cabinet

1. Remove the four case set screws.
2. Remove the upper case in the direction indicated by the arrow.
3. Remove the nine screws (BVTT2.6×8).
4. Remove the lower case.
5. Remove the screw (BVTT2.6×8).
6. Remove the control panel Ass'y in the direction indicate by the arrow.



1-17-2. Assembly of Timer Door Ass'y

❶ As shown in Fig. 1, insert the springs into the protrusions of the timer door Ass'y.
❷ Insert the timer door Ass'y into portion A and mount it on the front panel.
❸ Intrude the timer door Ass'y in the direction indicated by the arrow, as shown in Fig. 2.
❹ Intrude the springs.

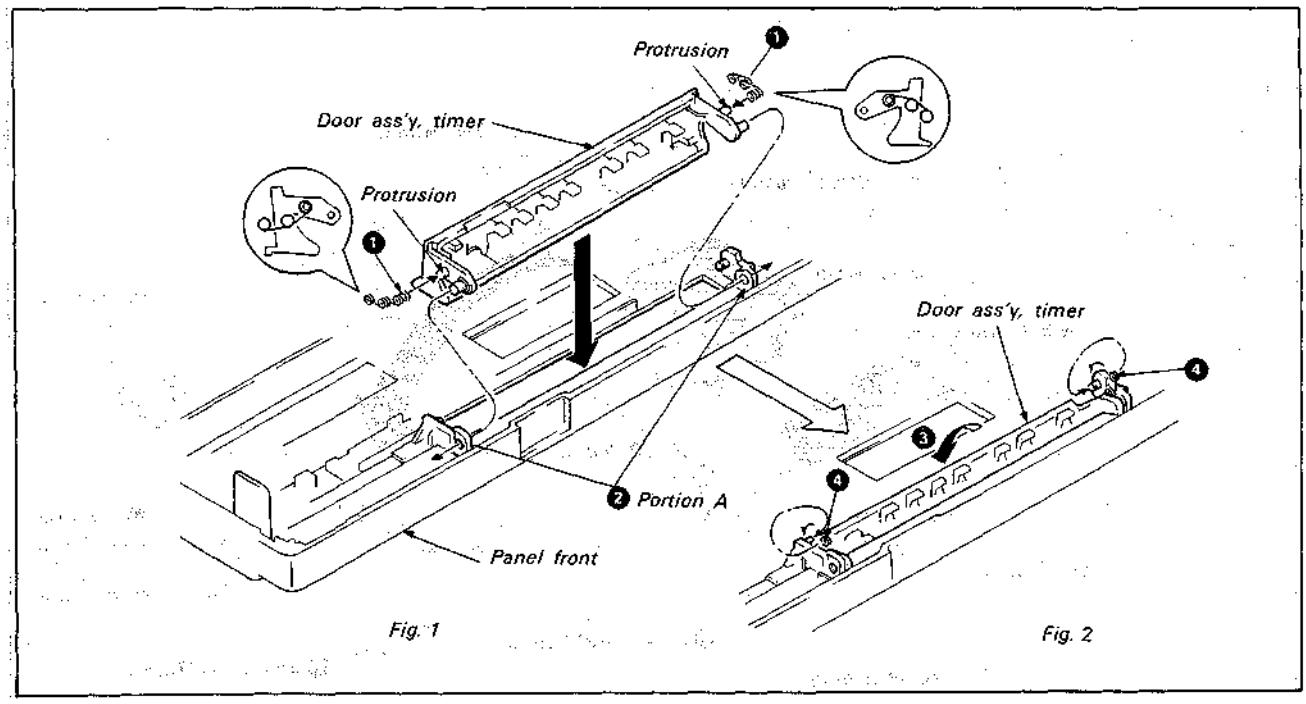
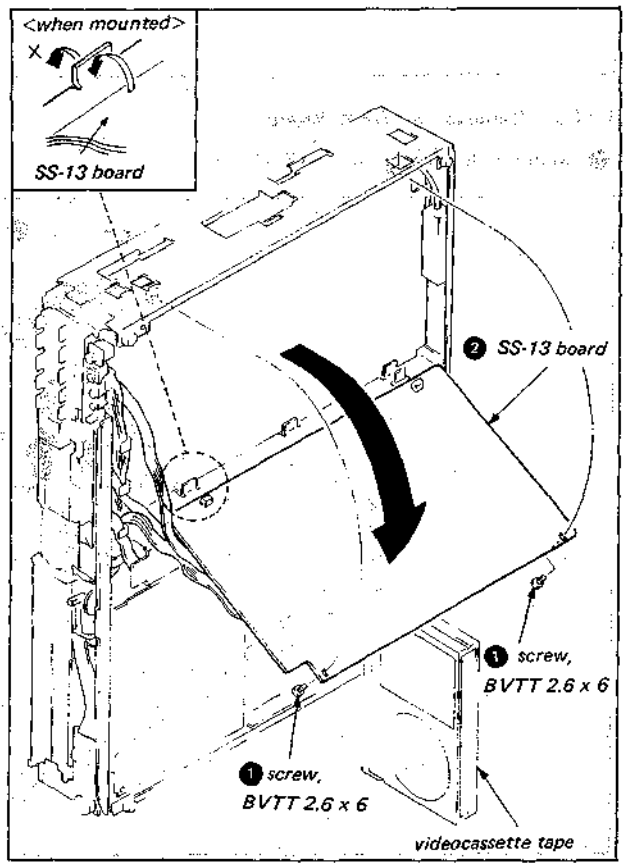


Fig. 1 Fig. 2

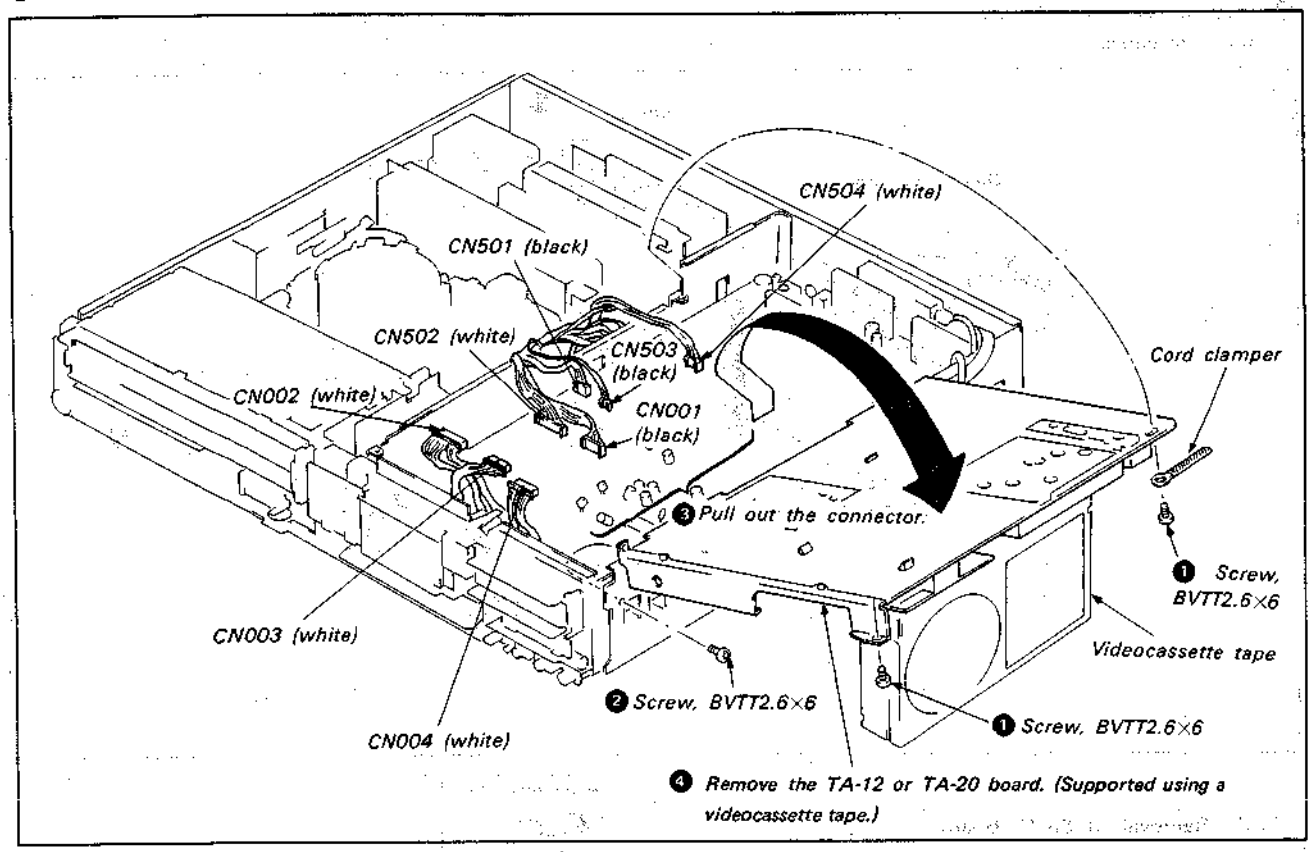
1-17-3. Removal of SS-13 Board

❶ Remove the two screws (BVTT2.6×6).
❷ Remove the SS-3 board. (Supported using a videocassette tape).



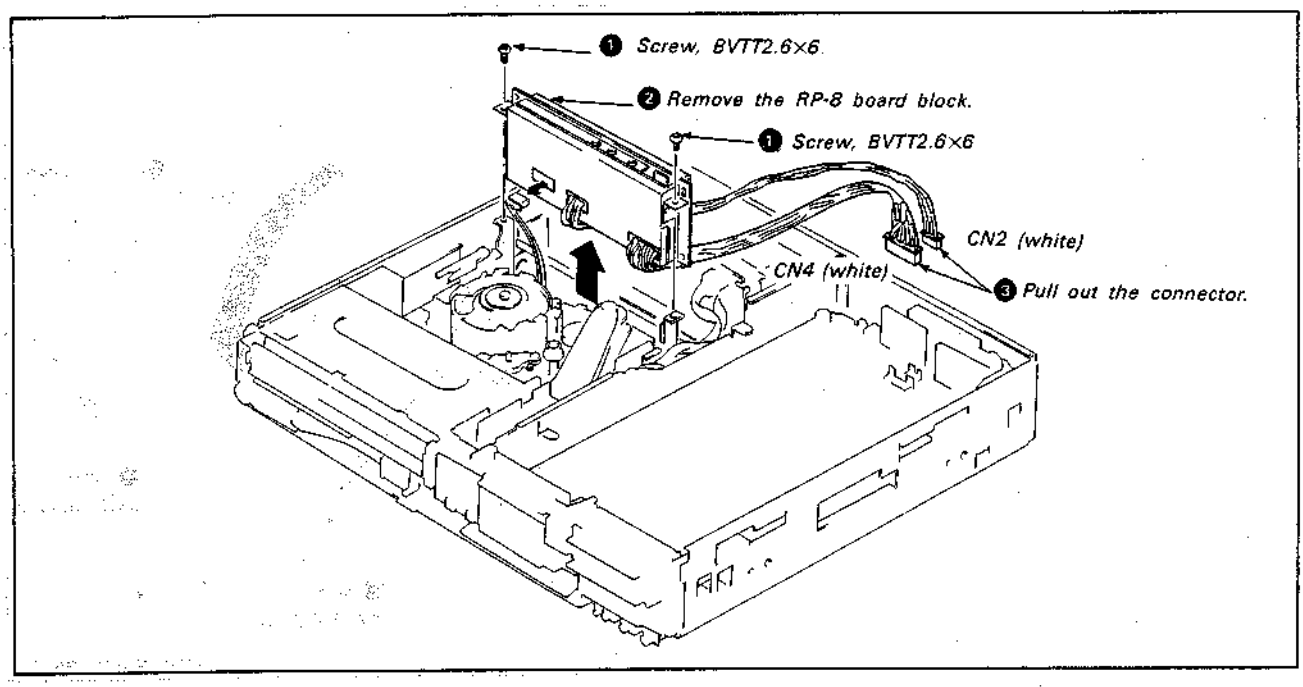
1-17-4. Removal of TA-12 or TA-20 Board

❶ Remove the two screws (BVTT2.6×6).
❷ Remove the screw (BVTT2.6×6).
❸ Pull out the eight connectors.
❹ Remove the TA-12 or TA-20 board. (Supported using a videocassette tape).



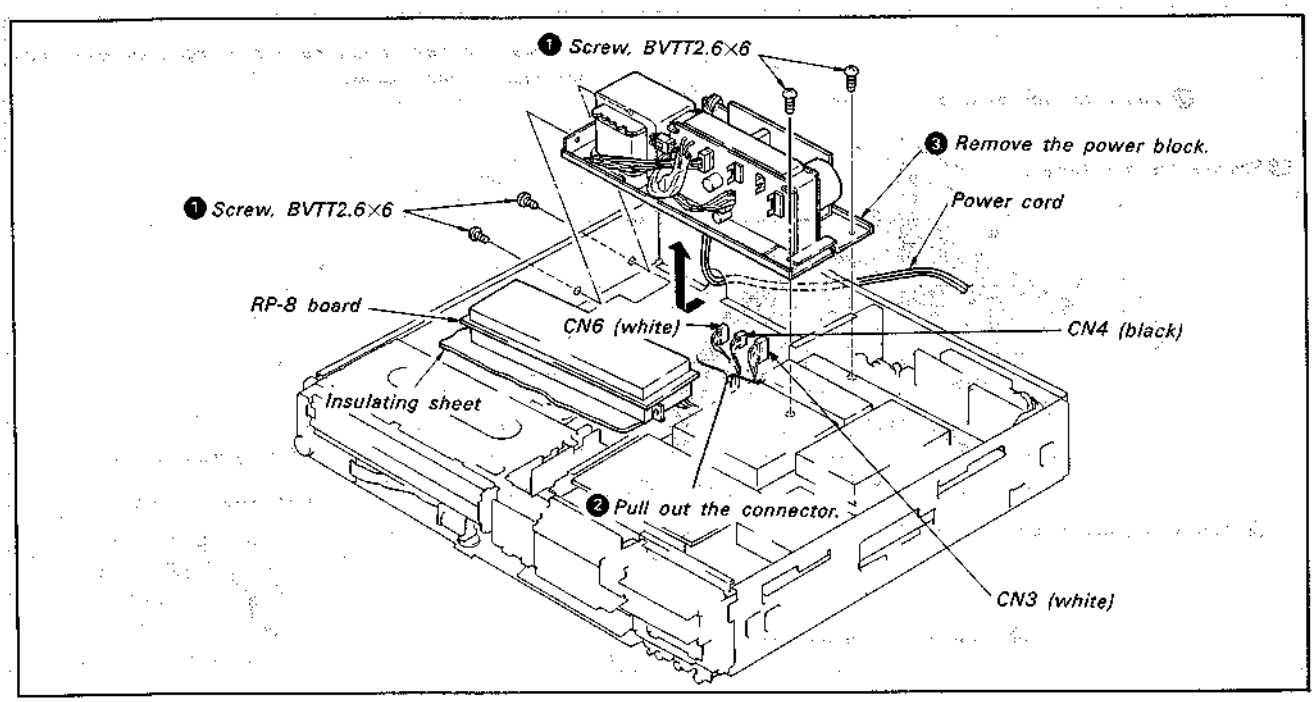
1-17-5. Removal of RP-8 Board

❶ Remove the two screws (BVTT2.6×6).
❷ Remove the RP-8 board block.
❸ Pull out the connectors CN2 (white) and CN4 (white).



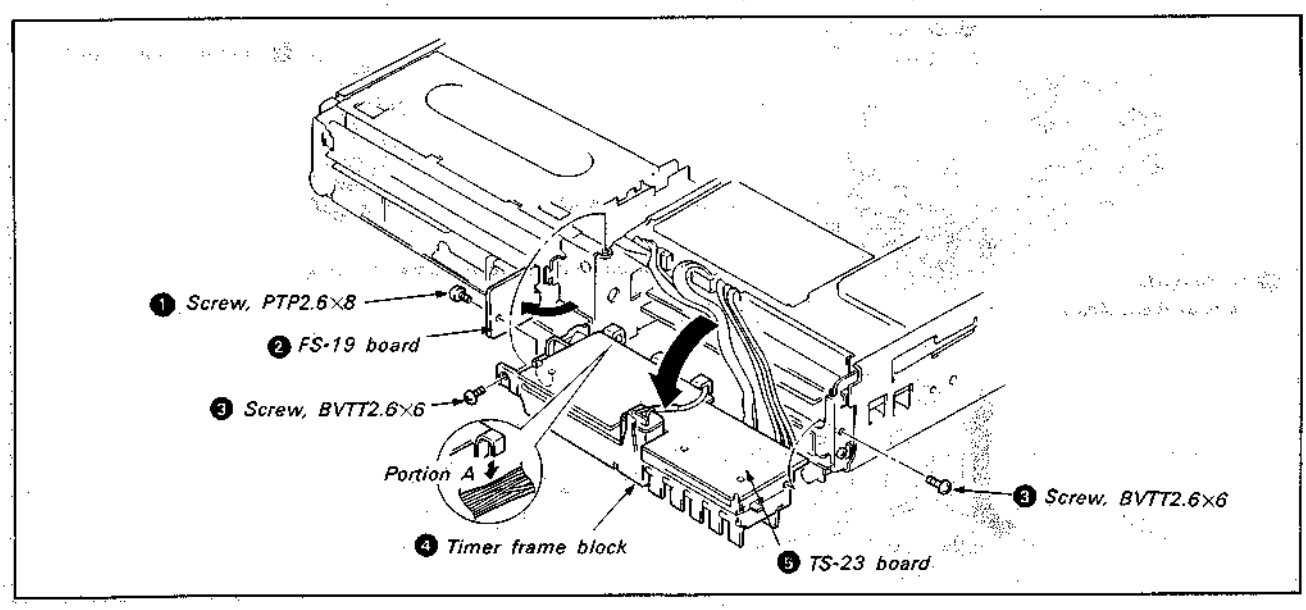
1-17-6. Removal of Power Block (PS-19, PS-20)

❶ Remove the four screws (BVTT2.6×6).
❷ Pull out the three connectors CN3 (white), CN4 (black) and CN6 (white).
❸ Remove the power block.



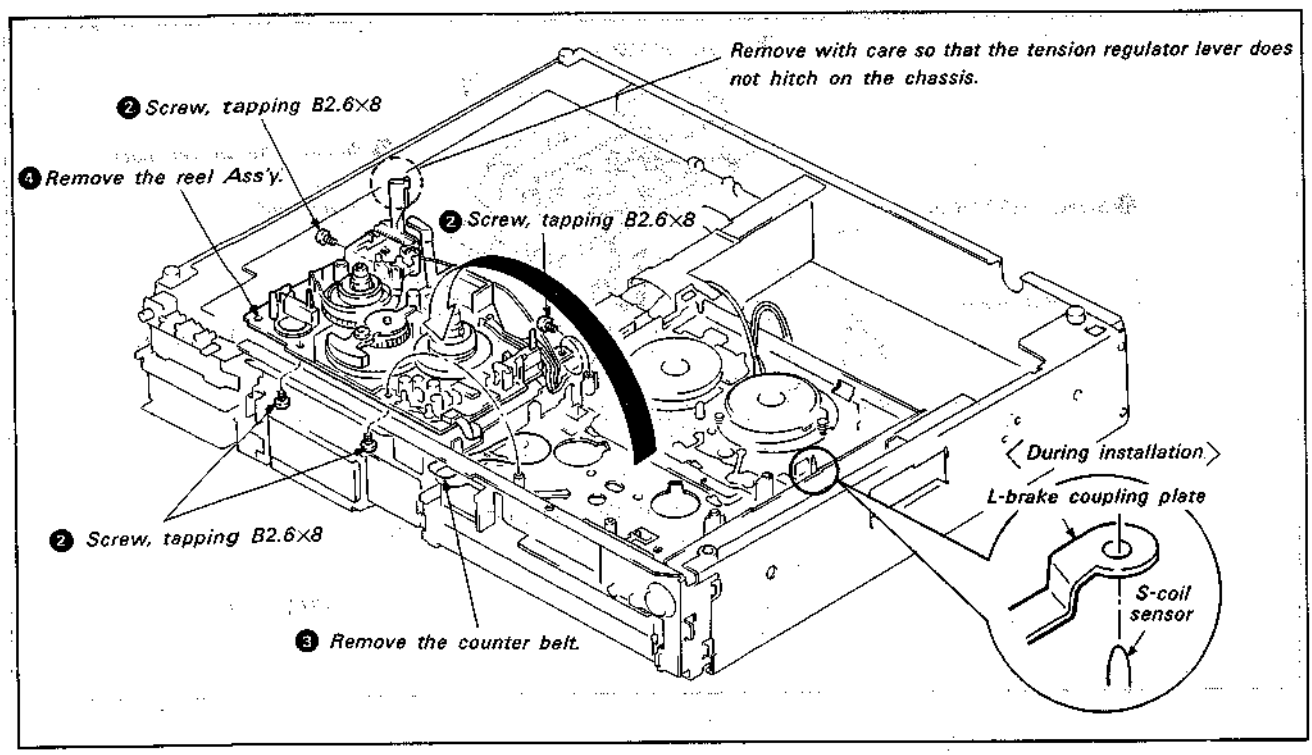
1-17-7. Removal of TS-23 Board

❶ Remove the screw (PTP2.6×8).
❷ Remove the FS-19 board.
❸ Remove the two screws (BVTT2.6×6).
❹ Lay the timer frame block in the direction indicated by the arrow. (Performed after removal of three lead wires at portion A.)
❺ Remove the TS-23 board.



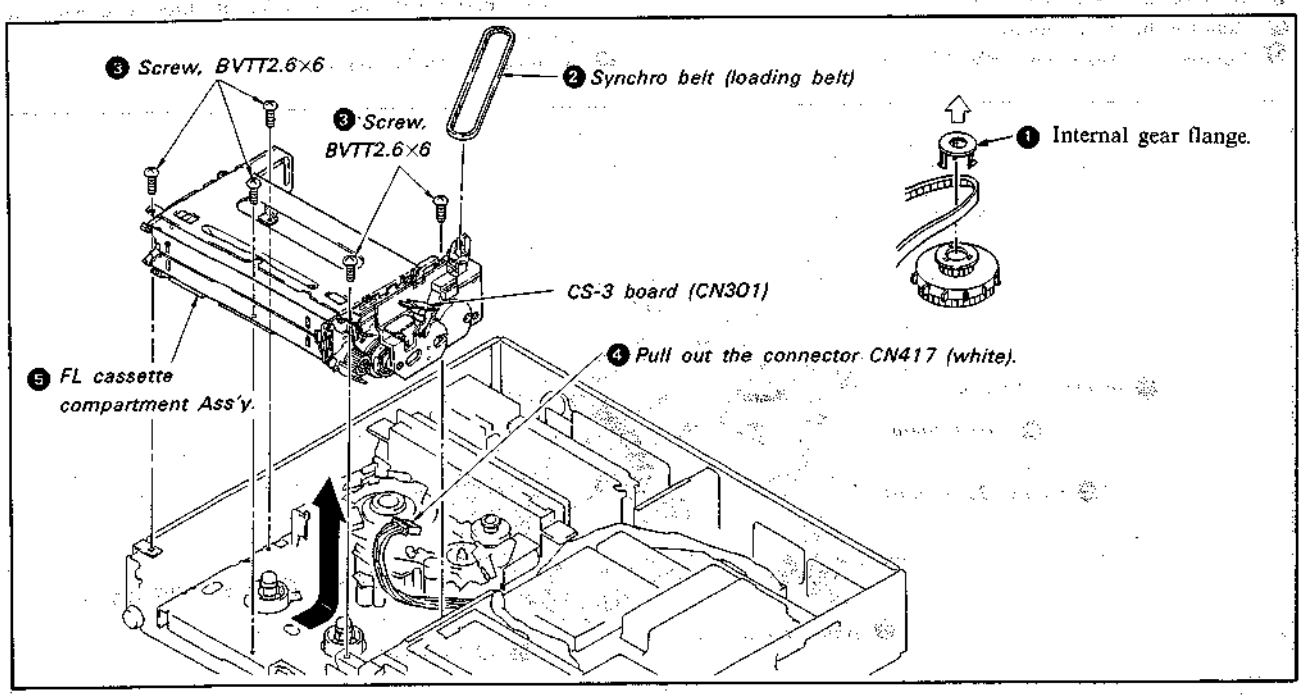
1-17-8. Removal of Reel Ass'y

❶ Turn the upper panel upside down.
❷ Remove the four screws (tapping B2.6×8).
❸ Remove the counter belt.
❹ Remove the reel Ass'y.



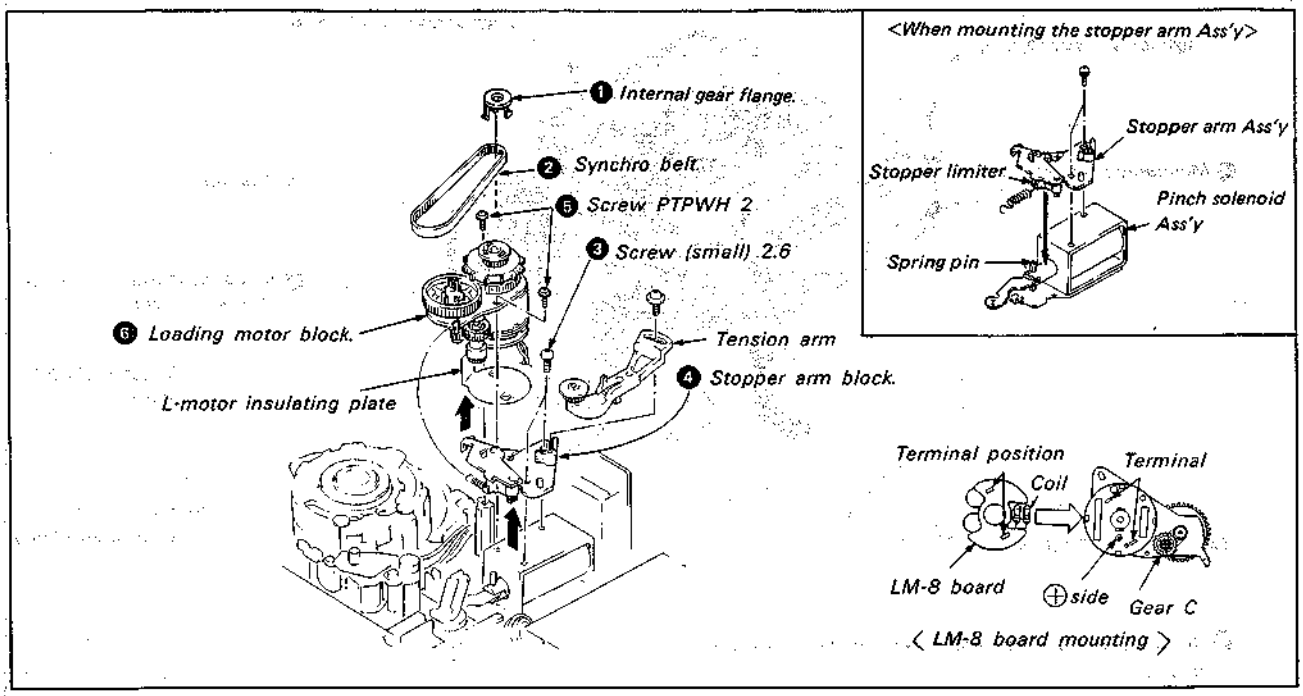
1-17-9. Removal of FL Cassette Compartment Ass'y

❶ Remove the internal gear flange.
❷ Remove the synchro belt.
❸ Remove the five screws (BVTT2.6×6).
❹ Pull out the connector CN417 (white).
❺ Remove the FL cassette compartment Ass'y in the direction indicated by the arrow (A).



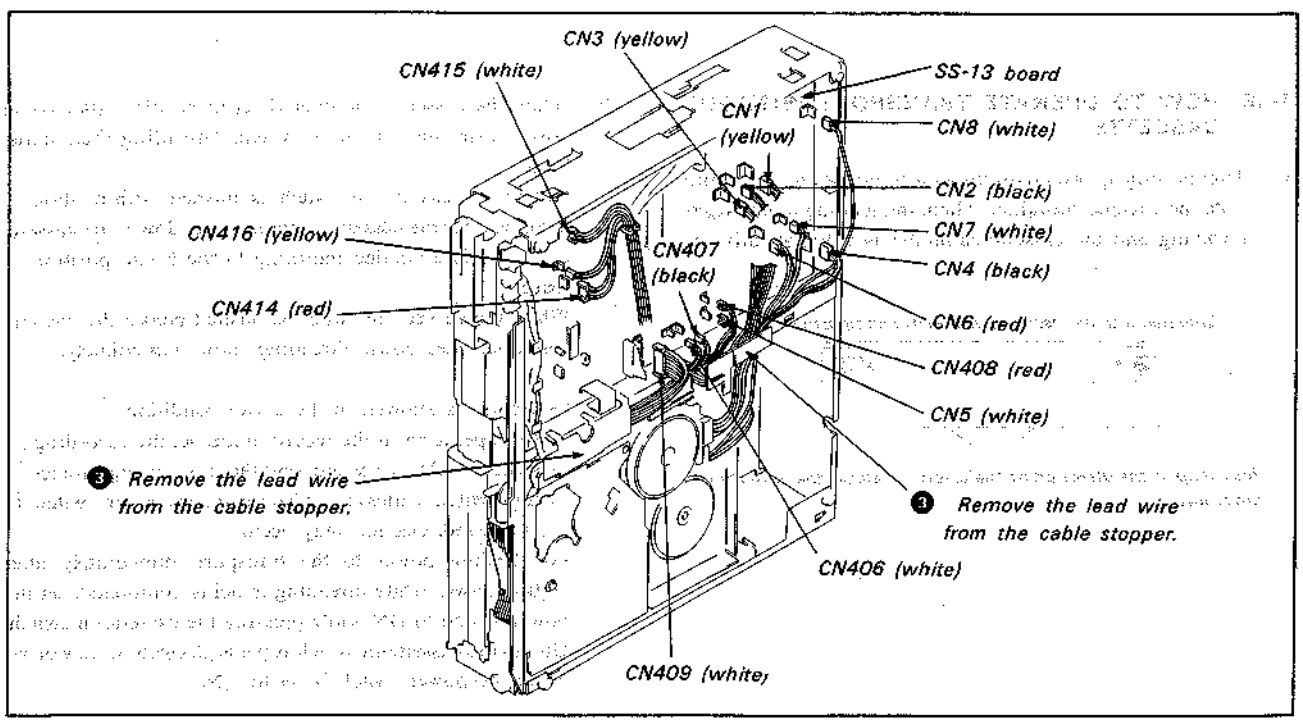
1-17-10. Removal of Loading and Threading Motors (M904)

❶ Remove the internal gear flange.
❷ Remove the synchro belt.
❸ Remove the two screws (small 2.6).
❹ Remove the stopper arm block.
❺ Remove the two screws (PTPWH 2).
❻ Remove the loading motor block.



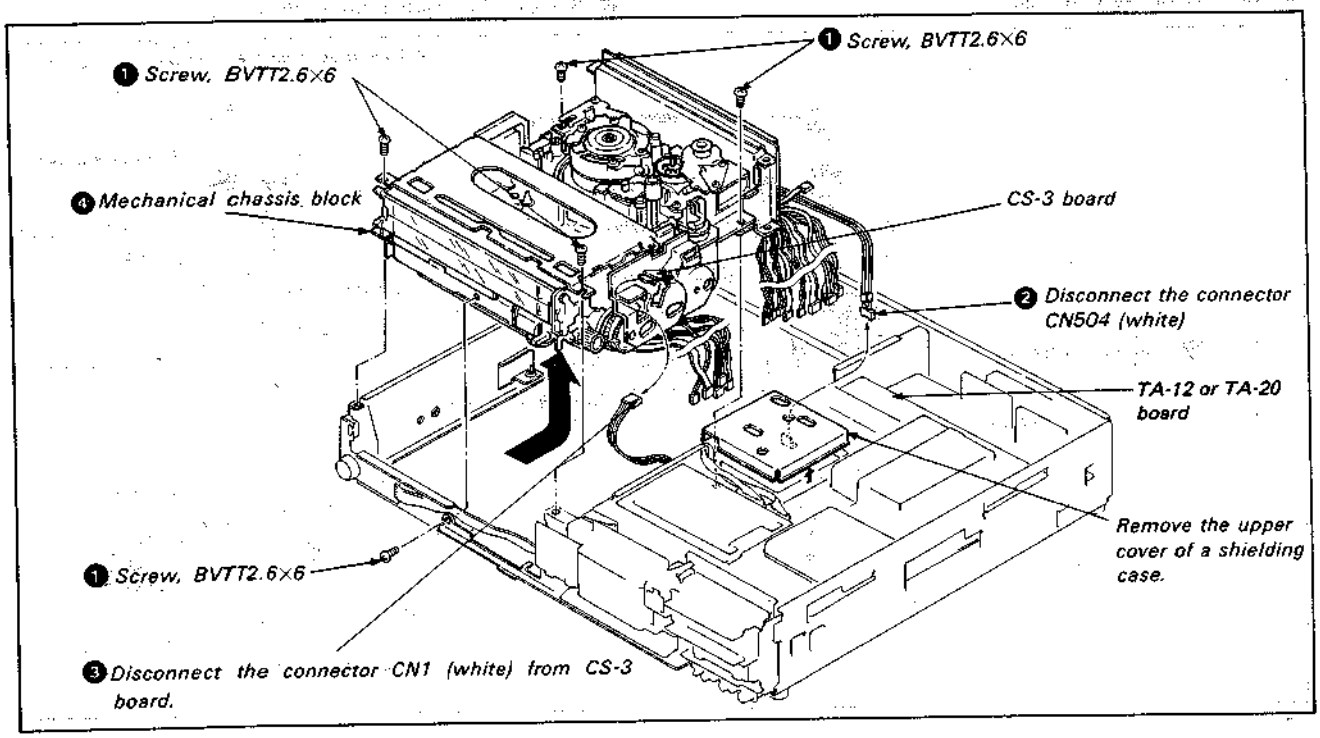
1-17-11. Removal of Mechanical Chassis Block

(1)
❶ Place the main unit with a left side panel on the bottom.
❷ Disconnect the connector from SS-13 board.
❸ Remove the connector, and then remove the lead wires from the cable stopper or harness stopper.



(2)

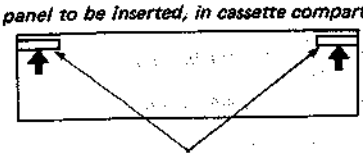
❶ Remove the five screws (BVTT2.6×6).
❷ Remove the upper cover of a shielding case on the TA-12 or TA-20 board and pull out the connector CN504 (white).
❸ Disconnect the connector CN1 (white) from CS-3 board.
❹ Pull out the mechanical chassis block in the direction indicated by the arrow.



1-18. HOW TO OPERATE TRANSPORT WITHOUT CASSETTE

1) After pulling up two mis-setting protection levers, push and slide the cassette container. Then, the loading motor starts revolving and the cassette container is automatically set.

(Side panel to be inserted, in cassette compartment)



Push it up in the direction of the arrow to release the cassette-in proof lever.

2) When the cassette container is set in position after going down, push the cassette-in switch. Threading then starts.

Note:

Unless the cassette-in switch is pushed within about 5 seconds after the cassette container goes down, the cassette container is unloaded returning to the home position.

Note:

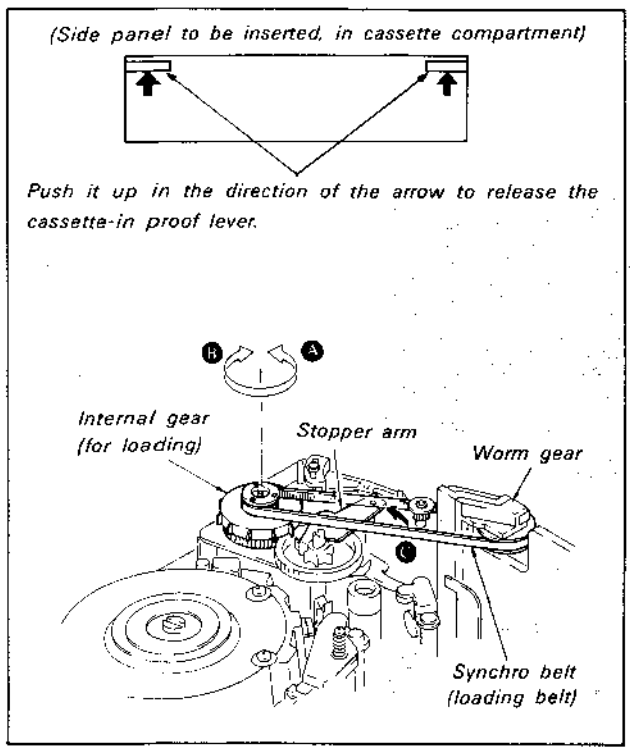
When the cassette-in switch is pushed before the cassette container goes down, threading starts immediately.

3) Operation is allowed in the above condition.

(For operation in the record mode, set the recording switch to ON while pressing the mis-erasing protection switch. Unless the mis-erasing protection switch is pressed, ejection may occur.)

For feeding power to the transport immediately after cutting power while threading is being completed, set the power switch to ON while pressing the cassette-in switch. Unless the cassette-in switch is pressed, ejection may occur when the power switch is set to ON.

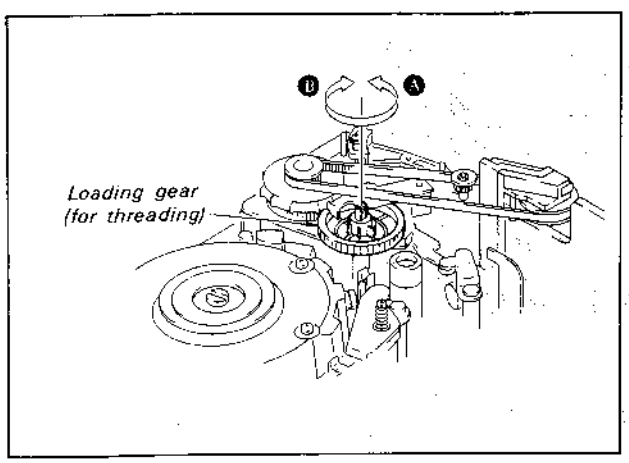
1-19. LOADING AND UNLOADING DURING POWER OFF



1) Release the two (left and right) cassette-in proof levers in a cassette compartment. push the stopper arm in the direction indicated by the arrow Ⓒ and release stop of the internal gear.
2) Rotate the internal gear in the direction of the arrow Ⓐ with your fingers until loading is completed.
3) During unloading, rotate the internal gear in the direction indicated by the arrow Ⓑ.

Note: When the loading belt is being removed, perform loading and unloading by rotating a worm gear. (Be sure to rotate the worm gear with your fingers.)

1-20. THREADING AND UNTHREADING DURING POWER OFF

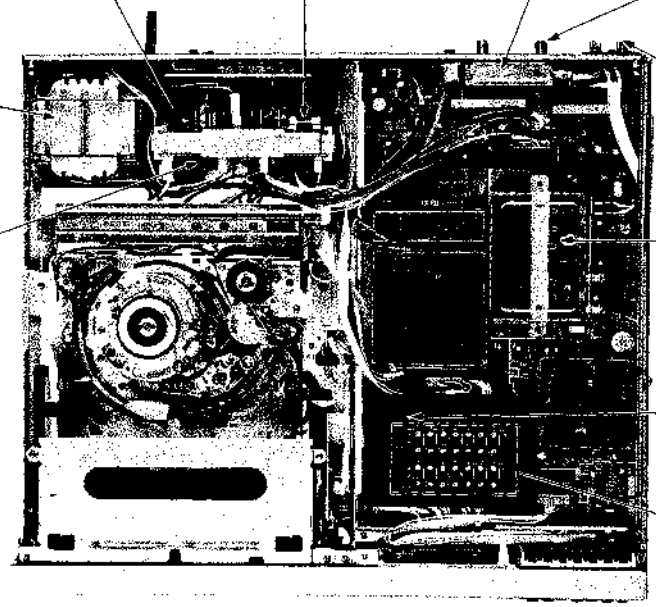


1) Rotate the loading gear in the direction of the arrow Ⓐ until threading is completed.
2) During unthreading, rotate the loading gear in the direction indicated by the arrow Ⓑ.

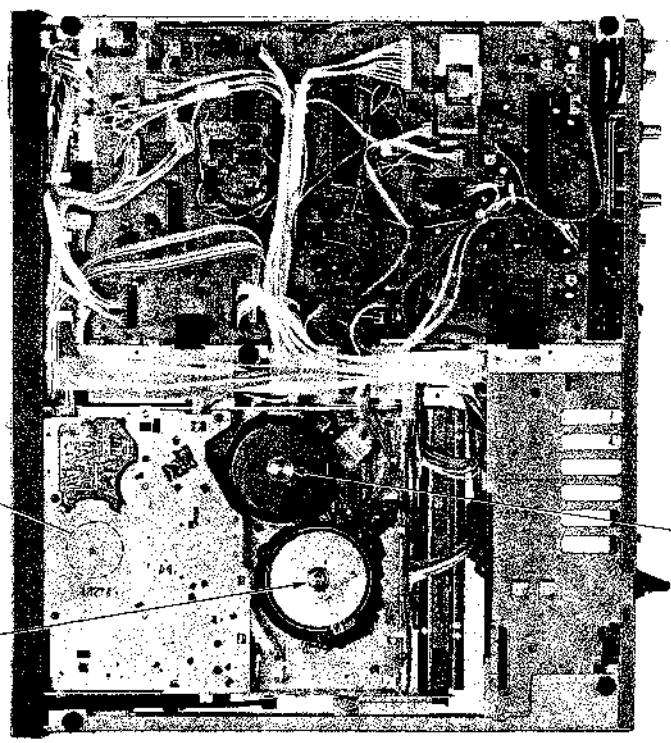
Note: Be sure to rotate the loading gear with your fingers without using a screwdriver.

1-21. INTERNAL VIEWS

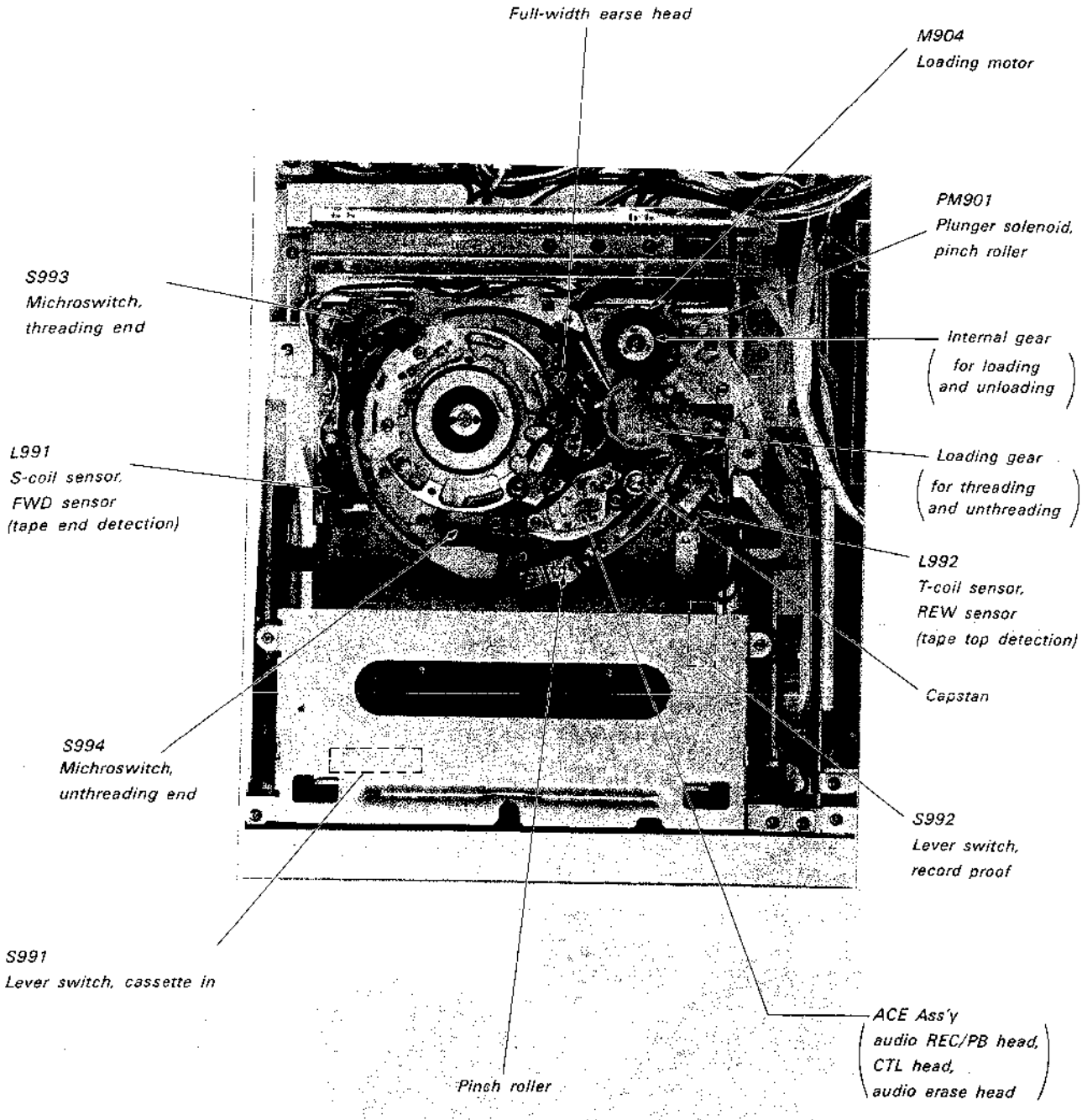
—Top side—



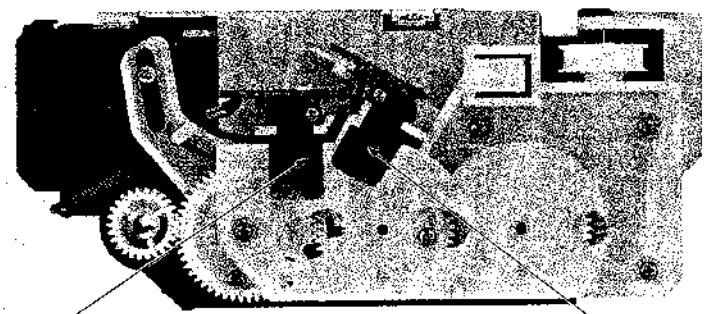
—Bottom side—



—Mechanical block—



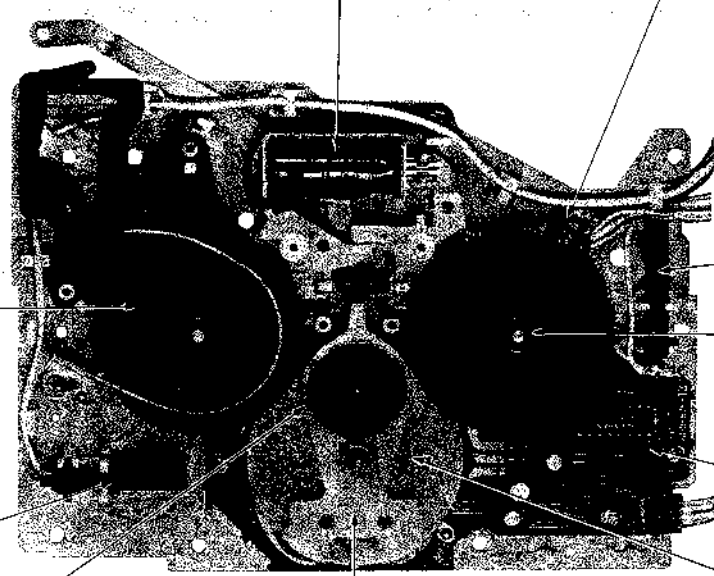
—FL (Front Loading) cassette compartment Ass'y—



S302
Lever switch, cassette ON

S301
Lever switch, cassette OFF

—Reel driving block—



PM902
plunger solenoid, brake

RD-5 board
(Take-up reel rotating detection)

S992
Lever switch, record proof

Table, Supply reel

Table, take-up reel

Reel motor board

M903

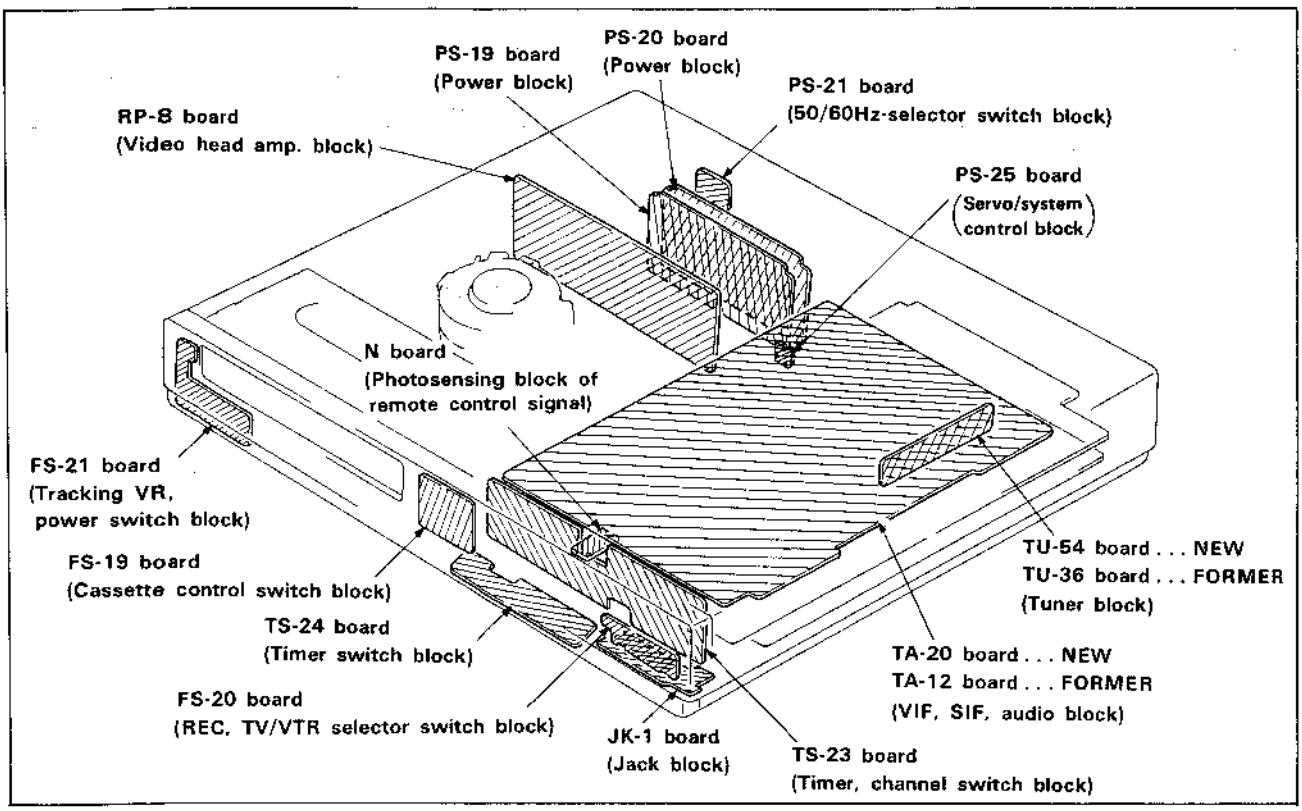
S991
Lever switch, cassette in

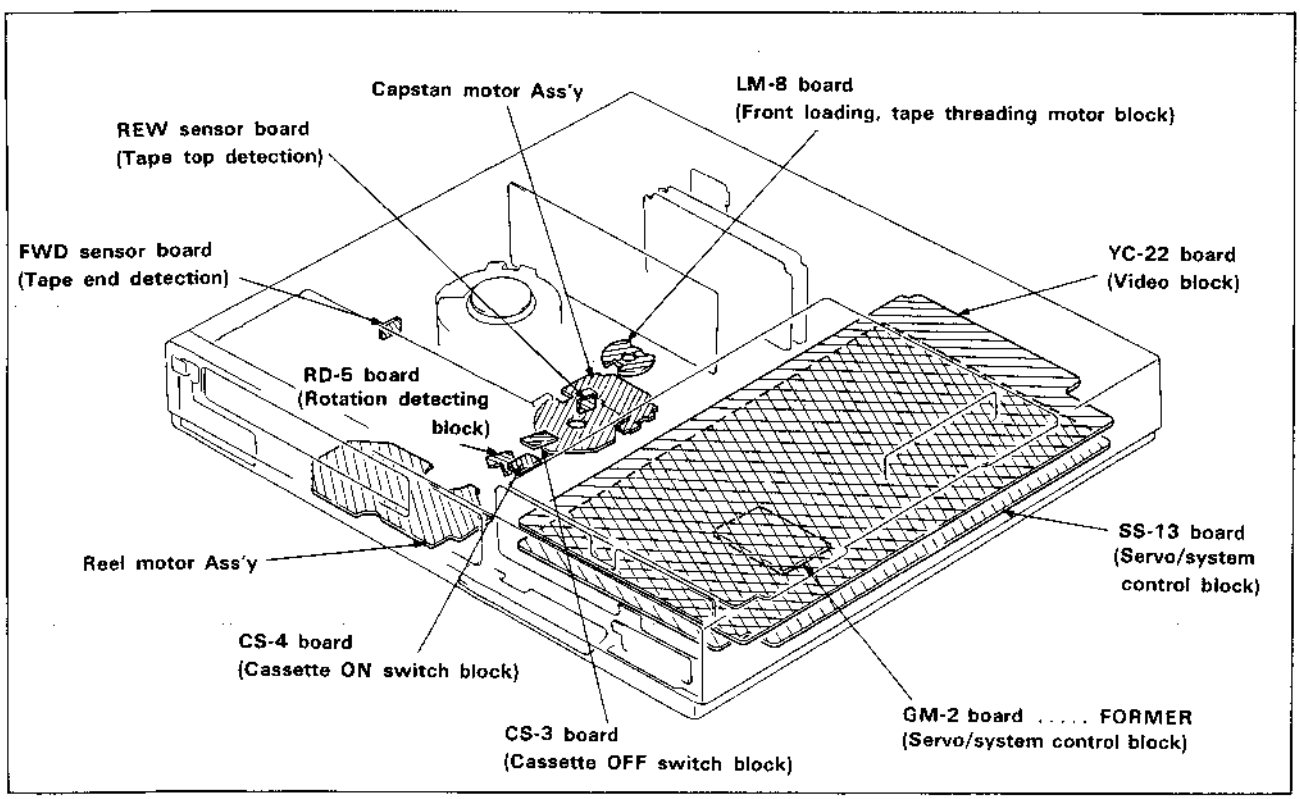
Reel motor Ass'y

Pendulum gear

Pendulum arm

1-22. BOARD ARRANGEMENT





1-23. CONFIGURATION OF MAIN BOARDS AND APPLICATION OF ICs

· **Main boards**

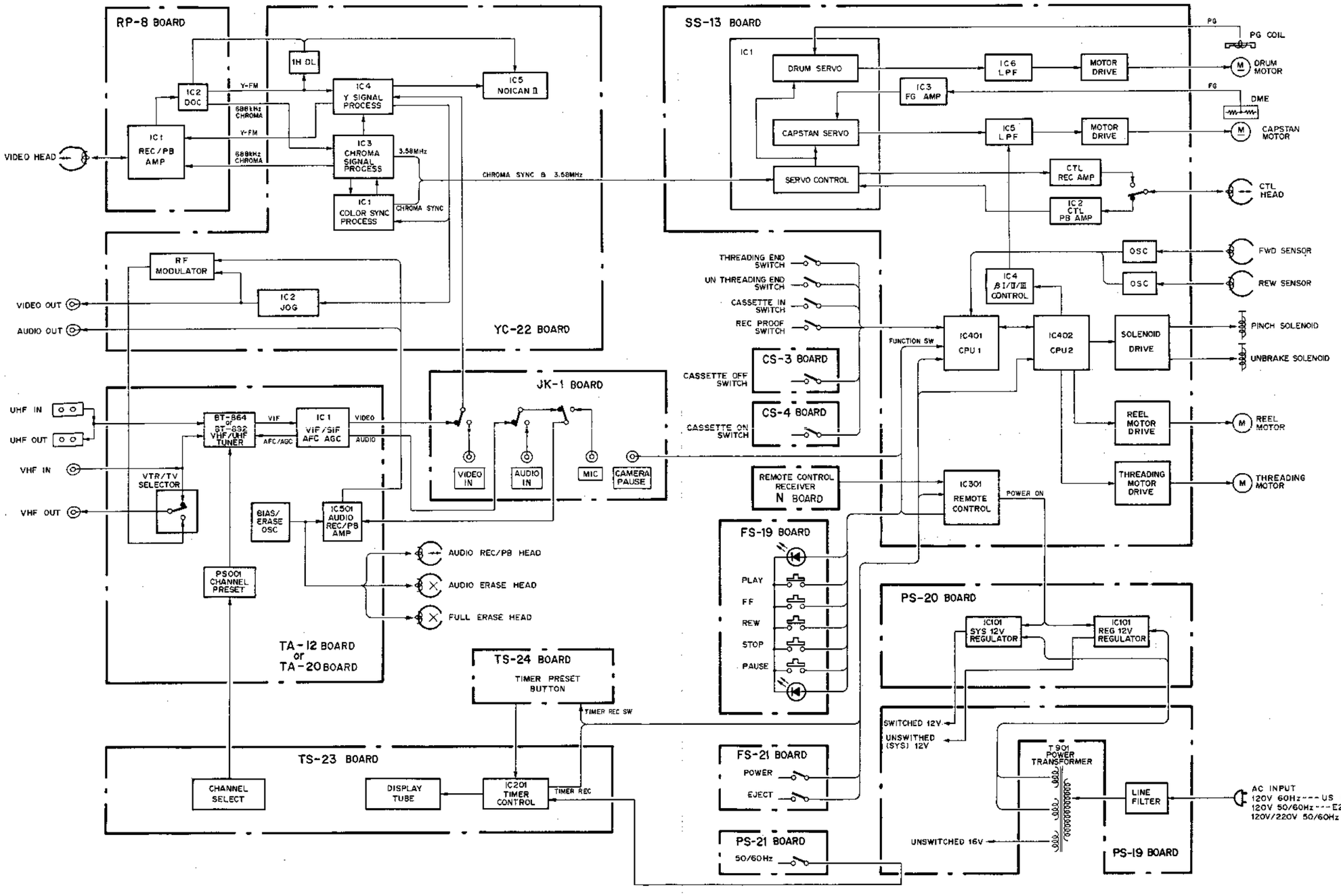
Board	Application
TA-12 or TA-20	Tuner and tuner control circuit. VIF, SIF, AGC and AFT circuits. Audio REC/PB circuit.
YC-22	Luminance and color signal REC/PB processing circuit. RF modulator.
RP-8	Low-band conversion color signal and luminance-FM signal. REC/PB circuit.
SS-13	System control circuit. Servo control circuit. FWD and REW sensor circuits. Driving circuit for drum motor, capstan motor, reel motor and loading motor. Driving circuit for pinch roller plunger solenoid, brake plunger and solenoid. Remote control circuit.
N	Remote control photosensor circuit.
FS-19, FS-20, FS-21	Function switch. Mode display.
TS-23	Clock/timer circuit. Channel switch.
TS-24	Clock/timer switch. REC switch.
PS-19, PS-20	DC stabilizing power circuit. Power control circuit. Timer power circuit.
PS-21	Timer selector switch.

• Application of ICs

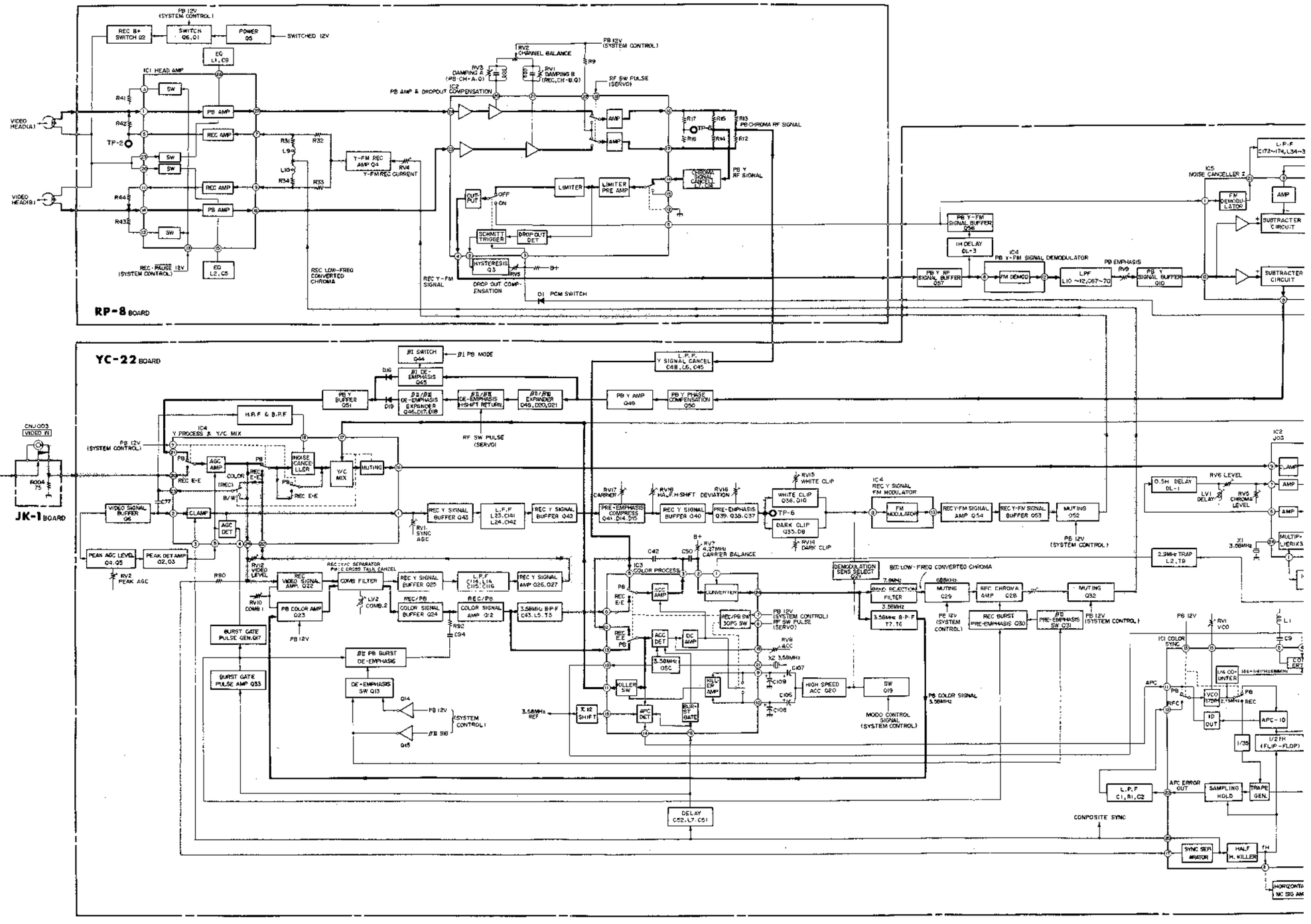
Board	Name	Application
TA-12 or TA-20		
IC001	CX-885B	VIF, SIF, AFT and AGC circuits.
IC501	LA7046	Audio REC/PB circuit.
YC-22		
IC1	CX-196	Color SYNC circuit.
IC2	CX-822	0.5H-jumping detection and compensation circuits. False-vertical SYNC signal inserting circuit.
IC3	CX-188	Color processing circuit.
IC4	CX-187	Luminance processing circuit. Luminance and color signal mixing circuit.
IC5	CX-135	Noise canceler II (luminance).
RP-8		
IC1	CX-862	Video REC/PB circuit.
IC2	CX-134A	RF switcher and drop-out compensating circuit.
SS-13		
IC1	CX-194B	Drum and capstan servo circuits.
IC2	μPC358C	CTL signal amp.
IC3	μPC4558C	FG signal amp.
IC4	TC4053BP	Capstan speed selecting and drum phase selecting (fH), in βI, II and III modes.
IC5	μPC324C	Capstan servo amp.
IC6	μPC324C	Drum servo amp.
IC301	M32080SL	Remote control circuit.
IC401	μPD553C-261	System control circuit (input). } .... FORMER
IC402	μPD553C-262	System control circuit (output). } .... FORMER
IC401	μPD553C-276	System control circuit (input). } .... NEW
IC402	μPD553C-287	System control circuit (output). } .... NEW
TS-23		
IC201	LR3466	Clock/timer control circuit.
PS-20		
IC101	STK-5324	Constant voltage/power control.

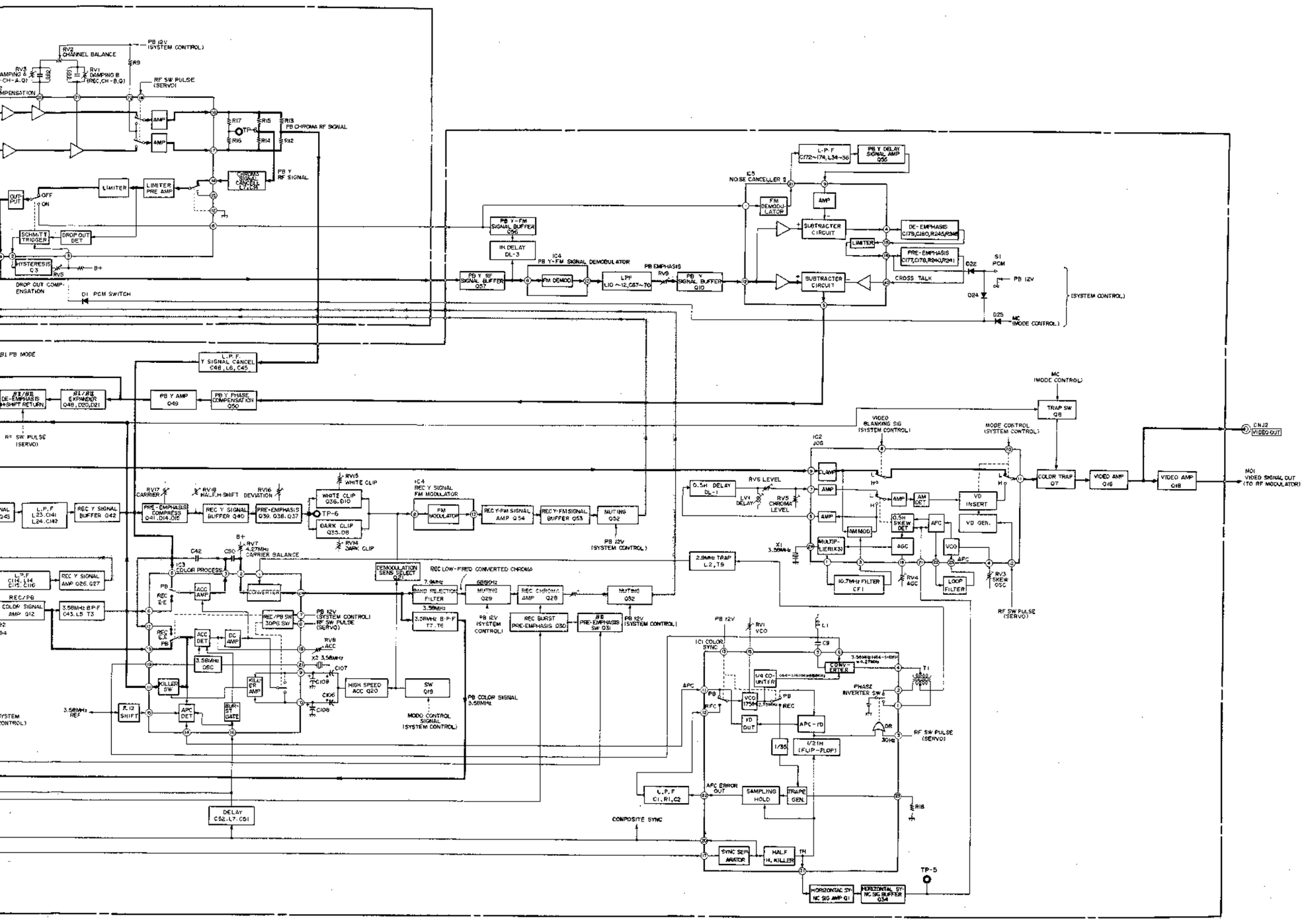
SECTION 2
BLOCK DIAGRAM

OVERALL BLOCK DIAGRAM



VIDEO BLOCK DIAGRAM



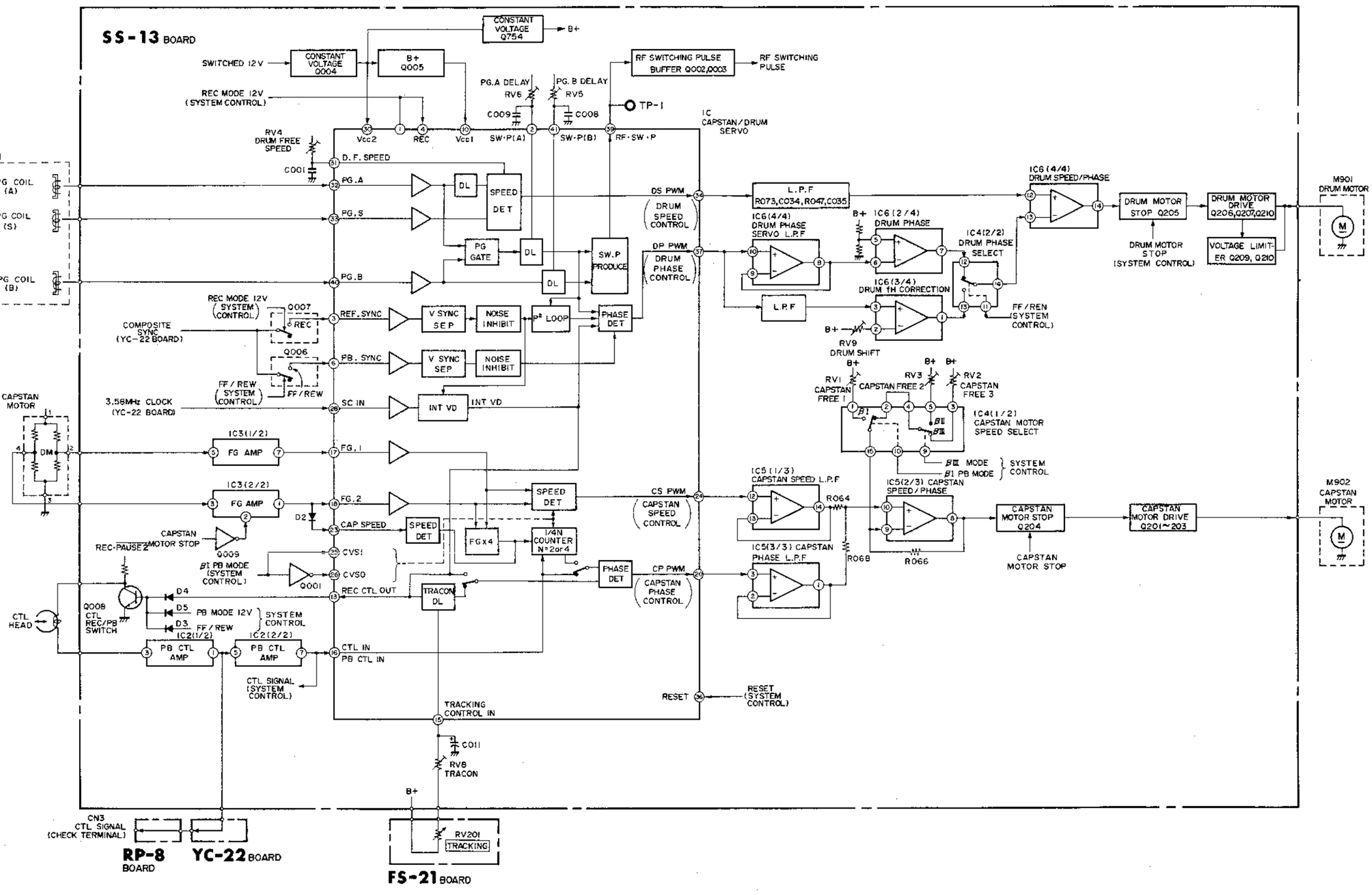


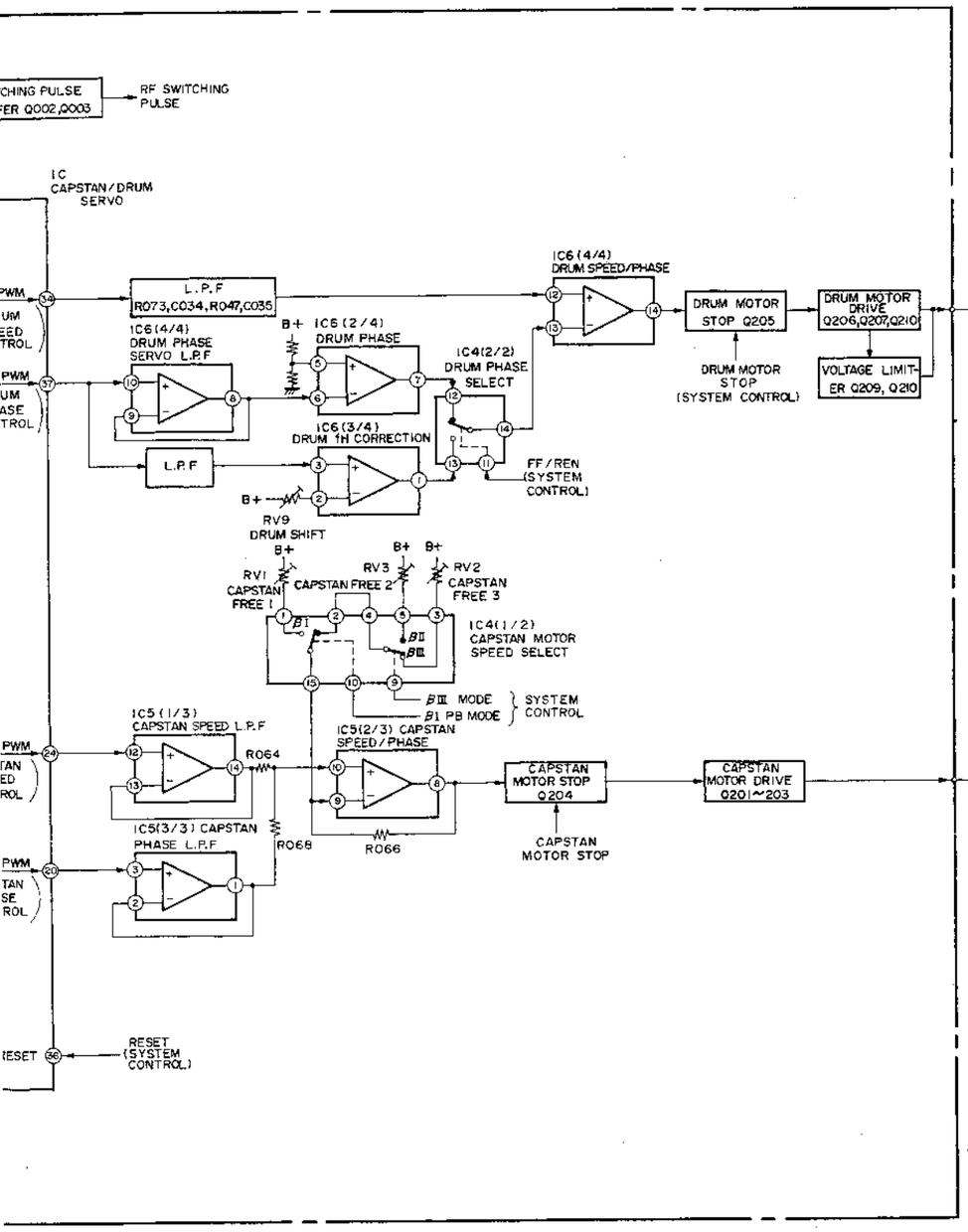
· Main signal channel

PLAYBACK

RECORD

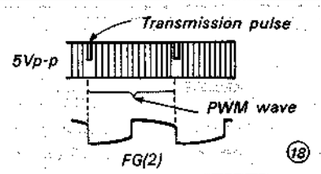
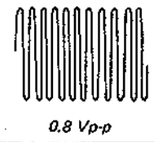
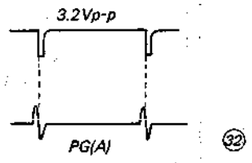
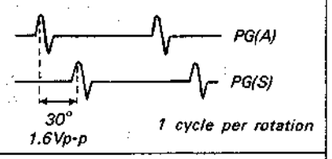
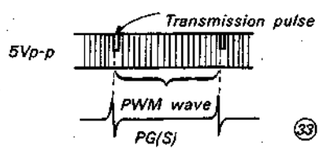
SERVO BLOCK DIAGRAM

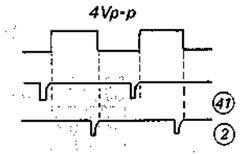
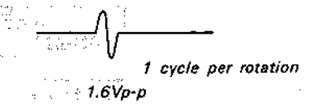
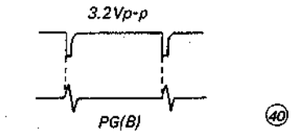




IC 1 Digital servo IC

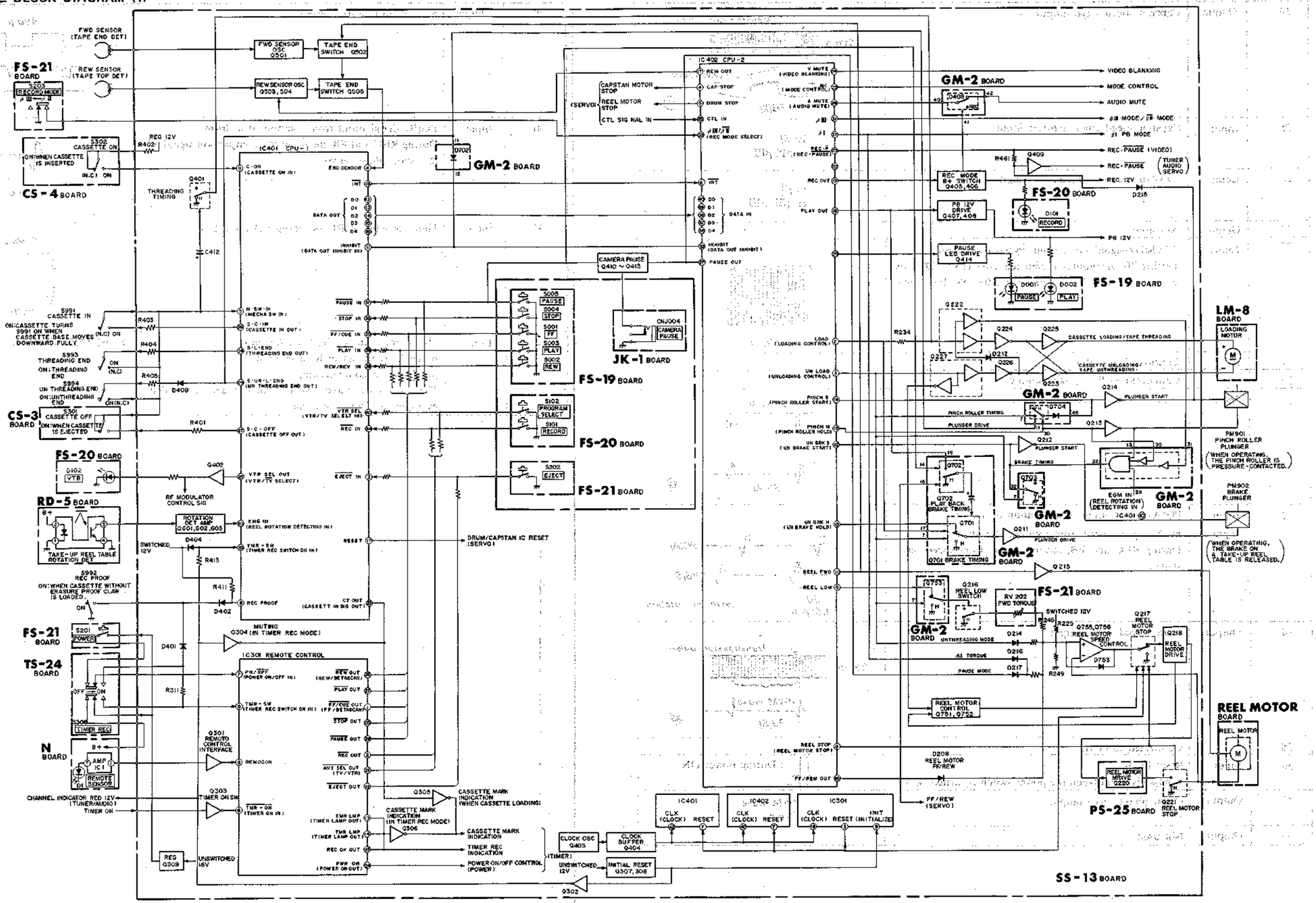
Terminal No.	I/O	Function and operation	Signal
1	Input	Changing-over signal in the REC mode	H: REC mode
2	Input	Time constant of RF switching pulse position	3.2Vp-p PG(A) (32)
3	Input	Composite signal input from the input video signal in the BETASCAN mode. In the BETASCAN mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the BETASCAN.	5Vp-p
4	Input	Input signal in the REC mode	H: REC mode
5	Input	Connected to GND.	
6	Input	Composite signal input from the PB video signal in the picture search mode. In the picture search mode (42-pin terminal "H") inside IC, the input controls the drum phase output to obtain the picture search.	5Vp-p
7	Input	Connected to B + power supply.	
8	Input	Connected to GND.	
9	Input	Connected to GND.	
10		Connected to B + power supply.	
11		Connected to GND.	
12	Output	Not used.	
13	Output	During REC, a composite signal from the input video signal is fed to a 3-pin terminal, and an REC CTL signal is generated and output using the vertical SYNC signal inside IC.	2.6Vp-p
14	Input	Connected to GND.	
15	Input	Tracking control time constant. During PB inside IC, the tracking control mono-multi output is a reference signal of the capstan phase servo.	2.6Vp-p
16	Input	PB CTL signal input in the PB mode. During PB, the input is a comparison signal of the capstan phase servo.	3Vp-p
17 18	Input Input	FG signal input from a capstan. During REC, the input is a comparison signal of the capstan phase servo. During REC and PB, the input is a capstan speed servo signal.	90° 3.4Vp-p
19	Output	Not used.	
20	Output	Capstan phase servo output	PWM wave 5Vp-p
21	Output	Not used.	
22	Output	Not used.	
23	Output	Capstan speed detecting	Goes "H" when a capstan motor starts rotating.

24	Output	Capstan speed servo output	
25	Input	Capstan speed changing-over input	H: βI L: βII, βIII
26	Input	Capstan speed changing-over input	L: βI H: βII, βIII
27	Output	Not used.	
28	Input	3.58 MHz-signal input from crystal oscillation. During PB, the input is a reference signal (INT VD) of the drum phase servo by counting down the 3.58 MHz-signal.	
29		Connected to GND	
30		Connected to B + power supply	
31	Input	Drum speed PG (A) time constant	
32 33	Input Input	PG(A) signal input from rotation of a drum PG(S) signal input from rotation of a drum During REC and PB, the input is a drum speed servo signal.	
34	Output	Drum speed servo output	
35		Connected to GND.	
36	Input	Reset input A pulse is input when the power switch is turned "ON".	 : During power ON
37	Output	Drum phase servo output	PWM wave 5Vp-p
38	Output	Not used.	

39	Output	RF switching pulse output	
40	Input	PG(B) signal input from rotation of a drum During REC and PB, the input is a comparison signal of the drum phase servo.	
41	Input	Time constant of RF switching pulse position	
42	Input	"H" is input in the BETASCAN mode. A AFC circuit inside IC goes high. (f_H deviation compensating) The drum phase output from a 37-pin terminal is controlled by input of a 6-pin terminal.	H: BETASCAN mode

FORMER

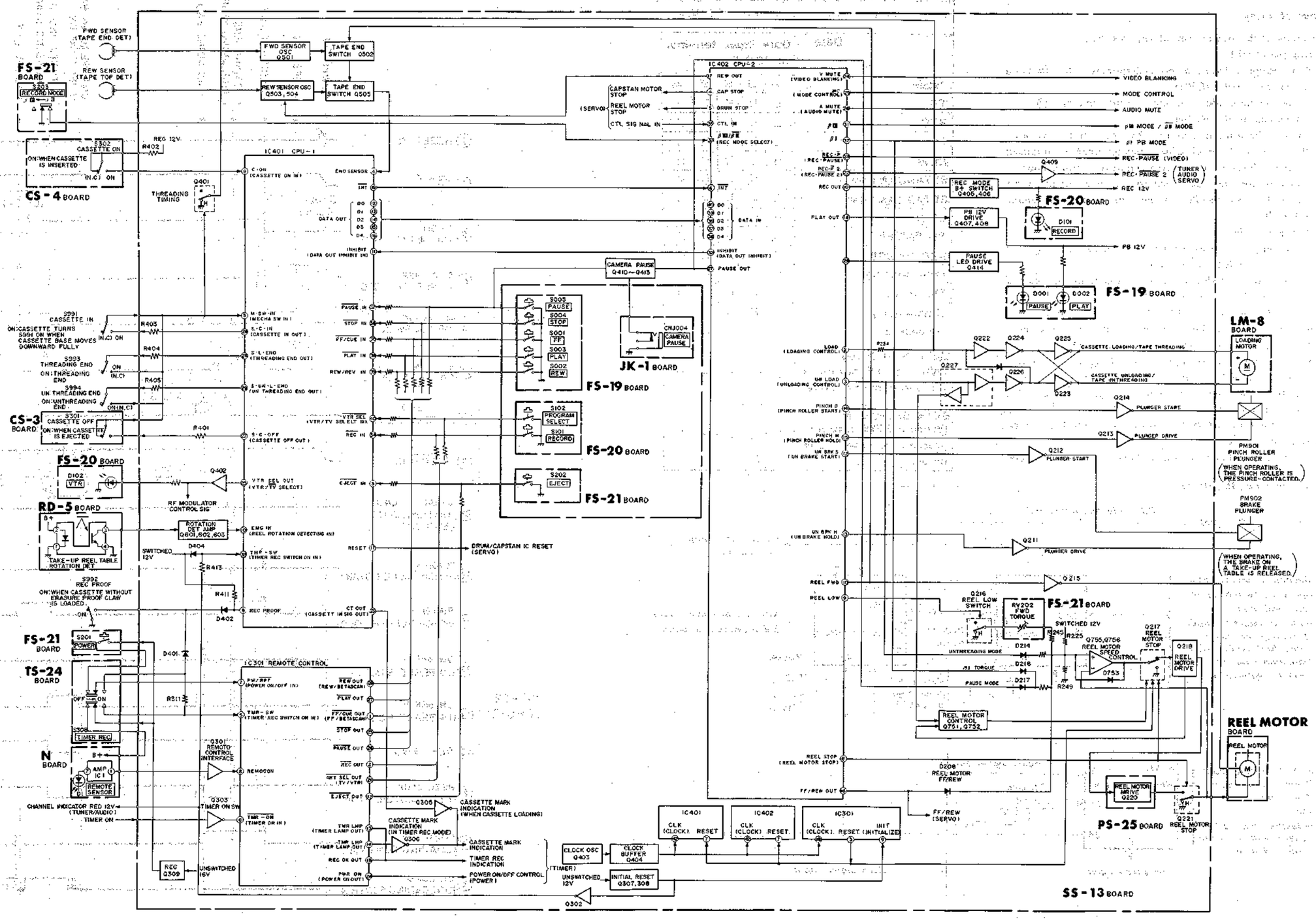
SYSTEM CONTROL BLOCK DIAGRAM (1)



NEW

NEW

SYSTEM CONTROL BLOCK DIAGRAM (1)



SYSTEM CONTROL BLOCK DIAGRAM (2)

Flow of signal

Operation of the system control requires that.

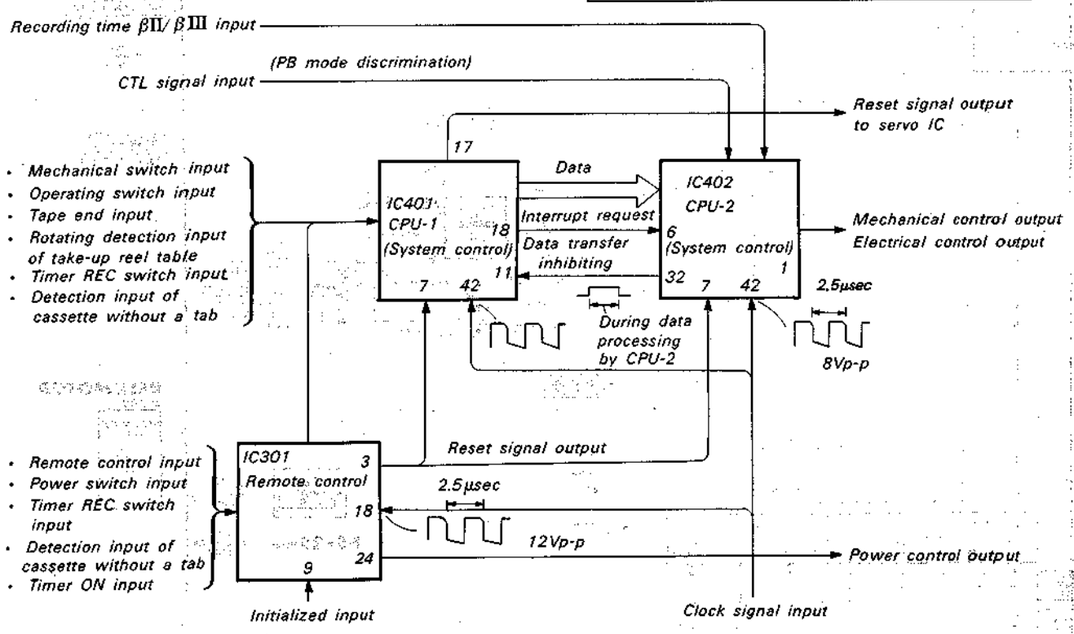
During power OFF

- Power supply is fed to the power terminals (⑲ , ⑳) of a remote control IC (IC301).
- A clock signal is added to the clock input terminal (⑱) of a remote control IC (IC301).
- The initialized input terminal (⑨) of a remote control IC (IC301) is "L" in level. (The input terminal is initialized using a pulse ⌐¬ during connection of a power code.)
- Under the condition described above, power supply, IC401 and IC402 are controlled by the input signal of a remote control IC.

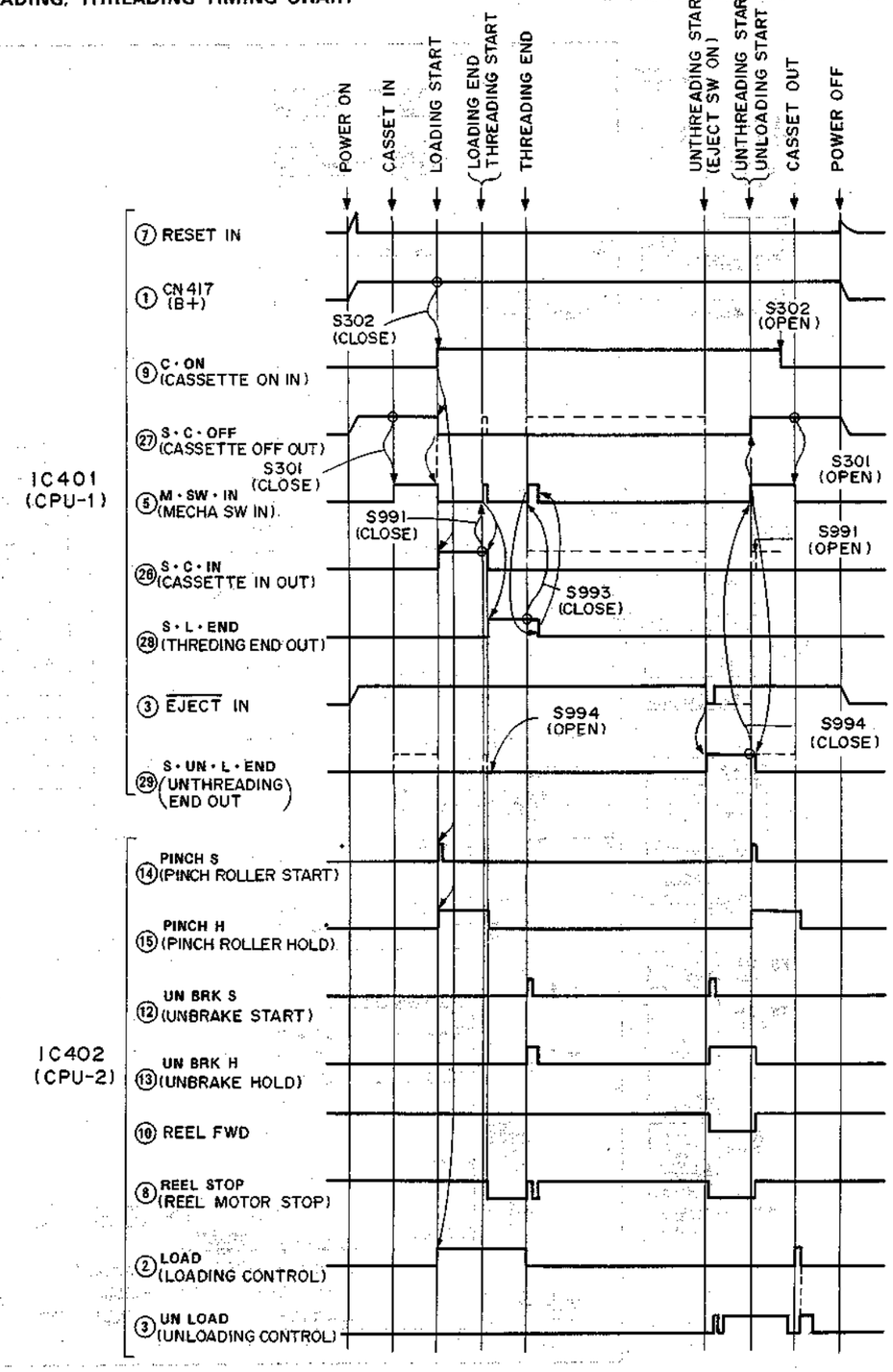
During power ON

- Power supply is fed to the power terminals (⑳ , ㉑) of system control ICs (IC401, IC402).
- A clock signal is added to the clock input terminal (㊷) of system control ICs (IC401, IC402).
- The reset input terminal (⑦) of system control ICs (IC401, IC402) is "L" in level. (The input terminal is reset using a pulse ⌐¬ through IC301 during power ON.)
- The interrupt request input terminal (⑥) of a system control IC (IC402) is high in level and each pressing of an operating switch causes the input of a negative pulse (⊤).
- The data transfer inhibiting output terminal (㉜) of a system control IC (IC402) is low in level and IC401 is in the data output mode.
- Under the condition described above, an interrupt request pulse and data are fed from IC401 to IC402 according to each input, and then each control output is fed from IC402.
- Data transmission of CPU-1 (IC401) to CPU-2 (IC402)

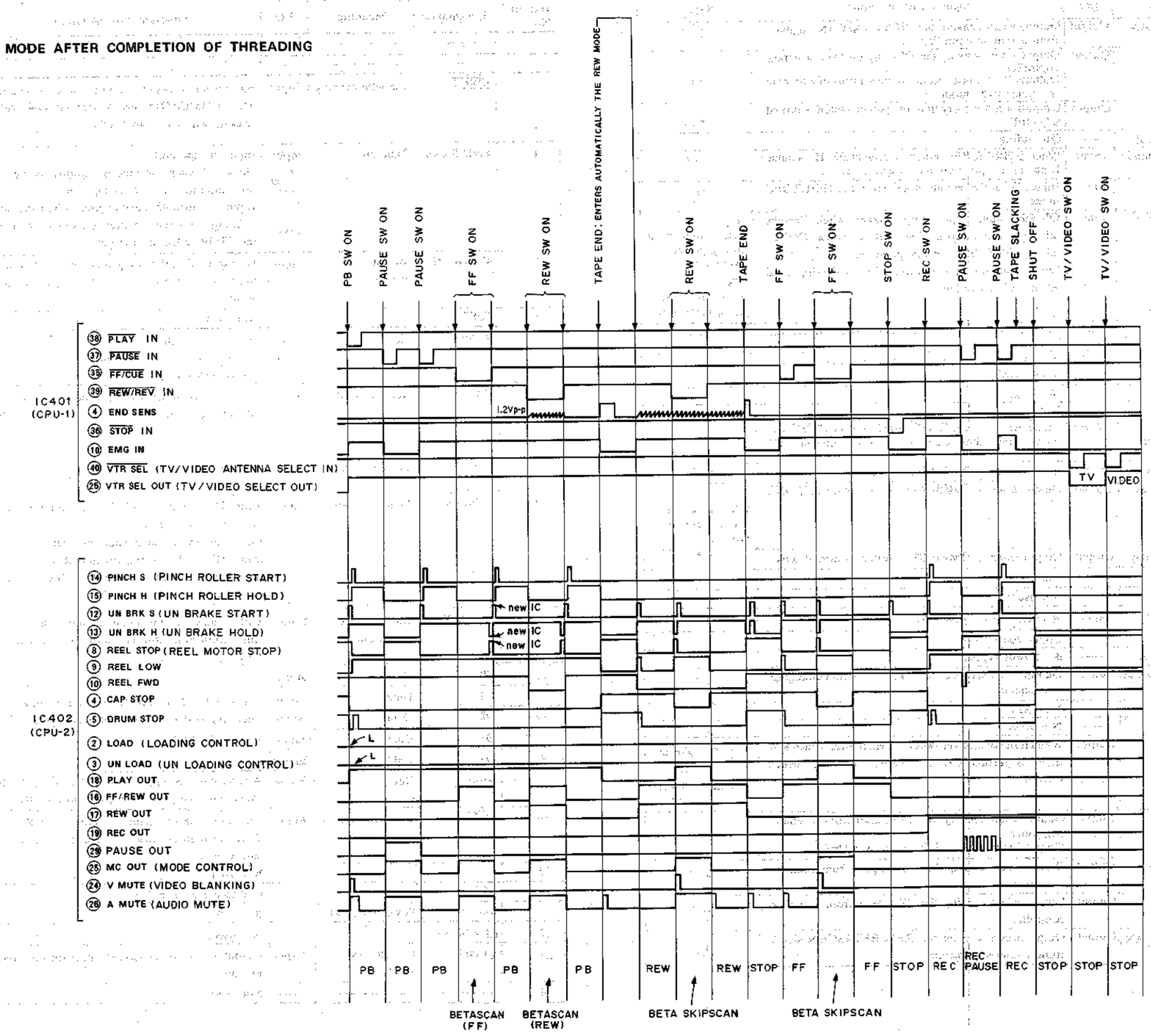
Mode \ Data	Data input terminal of IC402				
	㊵	㊴	㊳	㊲	㊱
PB	L	H	H	H	H
REC	L	L	L	H	H
FF	L	L	H	H	H
REW	H	L	H	H	H
BETASCAN (▶▶)	L	H	L	H	H
BETASCAN (◀◀)	H	H	L	H	H
STOP	H	H	L	L	H
PB PAUSE	H	H	H	H	H
REC PAUSE	H	L	L	H	H
Front loading	L	L	H	L	H
Threading	H	L	H	L	H
Unthreading	H	H	H	L	H
Unloading	L	H	H	L	H
BETA SKIPSCAN (When an FF button is pressed in the FF mode)	L	H	L	H	H
BETA SKIPSCAN (When a REW button is pressed in the REW mode)	H	H	L	H	H



LOADING, THREADING TIMING CHART



TIMING CHART IN EACH MODE AFTER COMPLETION OF THREADING

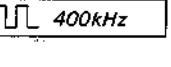


· Input/output terminal of remote control IC (IC301)

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	FF/CUE	FF/BETASCAN mode	Output	Output when sensing the FF/BETASCAN signal from a remote controller.	
2	REC	REC mode	Output	Output when sensing the REC signal from a remote controller. Outputs "L" for one second at the set time of a timer in the timer REC mode.	
3	RESET	Reset	Output	Outputs a pulse every time the power switch is turned ON/OFF.	
4	Vdd	Power terminal	—	Grounding	
5	TMR-SW	Timer REC mode	Input	When a TIMER REC switch is turned ON, "H" is input. Input of a 7-pin terminal is active-low.	
6	TMR-ON	Timer ON	Input	Inputs "L" at the set time of a timer in the TIMER REC mode.	
7	PWR/RPF	Power ON/OFF	Input	ON/OFF signal input using a power switch. Cassette tab signal input during TIMER REC switch ON ("L": tab provided, "H": tab not provided). When input of a 5-pin terminal is "L", active-high, and when "H", active-low.	: Active-high input during power switch ON. : Active-low input during TIMER REC.
8	REMOCON	Remote control	Input	Remote control serial data input from the sensing block	Serial data
9	INIT	Initializing	Input	Initializes the inside of IC during connection of a power cord.	
10	N·C	———	—	Not used.	
11	———	———	—	Not used.	
12	EJECT	Unloading of cassette without a tab	Output	Output when a TIMER REC switch is turned "ON" with the cassette without a tab loaded (7-pin terminal "H").	
13	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	
14	TMR-LMP	Cassette display	Output	Output when a TIMER REC switch is turned "ON".	: When a cassette and tab are not provided
15	REC OK	REC OK display	Output	Output when a TIMER REC switch is turned "ON".	
16	———	———	—	Not used.	
17	———	———	—	Not used.	
18	CLK IN	External clock	Input	400 kHz-clock signal input	
19	———	———	—	Connected to Vss.	
20	Vss	Power terminal	—	B + power supply 12V	
21	ANT SEL	Video/TV antenna selecting	Output	Output when sensing the VTR/TV antenna changing-over signal.	
22	———	———	—	Not used.	
23	———	———	—	Not used.	
24	PWR ON	Power ON	Output	When input of a power switch, TIMER REC switch and timer is turned ON, the power output is turned ON/OFF.	: Power ON : Power OFF
25	STOP	STOP mode	Output	Output when sensing the stop signal from a remote controller. Output for one second during power OFF.	
26	PAUSE	PAUSE mode	Output	Output when sensing the pause signal from a remote controller.	
27	PLAY	PB mode	Output	Output when sensing the PB signal from a remote controller.	
28	REW/REV	REW/BETASCAN mode	Output	Output when sensing the REW/BETASCAN signal from a remote controller.	

· Input/output terminal of system control IC (IC401)

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	———	———	—	Not used.	
2	———	———	—		
3	EJECT	Cassette ejecting	Input	Input when a cassette eject button is pressed. Input when a TIMER REC switch is turned "ON" with the cassette without a tab loaded.	
4	END SENS	Tape end	Input "H" =MORE THAN 8.5V "L" =LESS THAN 4.0V	Input at tape end. Goes "L" when the tape is running in the FWD directionand goes "H" at tape end. Inputs a sawtooth wave (5 μsec) when the tape is running in the reverse direction. Goes "H" to enter the STOP mode at tape top.	: Tape end : Tape top 5μsec 1.2Vp-p
5	M·SW IN	Mechanical switch	Input	During loading, threading, unloading and unthreading, CPU-1 enters each mode by using a mechanical switch.	
6	TEST			Not used.	
7	RESET	Reset	Input	Inputs to initialize CPU-1. A pulse is input every time the power switch is turned ON/OFF.	
8	REC PROOF	Record proof	Input	Goes "H" when the cassette without a tab is loaded. At that time, the cassette is ejected when a REC switch is turned ON.	H: cassette without a tab L: cassette with a tab
9	C·ON	Cassette ON	Input	Cassette ON is input to CPU-1 during insertion of a cassette.	
10	EMG IN	T-reel rotation	Input	EMG IN is input to CPU-1 during rotation of a T-reel (take-up reel) table. Enters the STOP mode when the EMG input goes from "H" to "L" during PB and REC. At that time, no switch except the EJECT switch is put to use.	H: when rotating L: when not rotating
11	INHIBIT	Data output inhibiting	Input	CPU-2 goes "H" during processing of data. At that time, input to inhibit output of the new data from CPU-1.	H: new data output inhibiting
12	D0	Data	Output	Fed to CPU-2, as data, according to input of an operating switch, mechanical switch, tape end, and defect detection.	Parallel data
13	D1	Data	Output		
14	D2	Data	Output		
15	D3	Data	Output		
16	D4	Data	Output		
17	RESET	Reset	Output	A reset pulse is output to reset the servo IC (IC1) every time the power switch is turned ON.	
18	INT	Interrupt request	Output	The moment the data is output to CPU-2, an interrupt request pulse is output to store the data into CPU-2.	
19	———	———	—	Not used.	
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	KEY SENSE			Not used.	
23	CI-OUT	Cassette IN display	Output	Output to display the cassette mark during cassette loading.	H: during cassette loading
24	———	———	—	Not used.	

25	VTR SEL OUT	TV/video selecting	Output	Output to change-over the antenna of an RF modulator to TV side or video side. "H" is automatically output in the PB mode. Output is inverted every time a TV/VTR switch or commander switch is pressed.	H: VTR side L: TV side
26	S·C·IN	Output for Cassette IN reading	Output	Output to inform CPU-1 that loading is completed. When loading is completed, a cassette IN switch (S991) is pressed by the cassette to store into a 5-pin terminal.	
27	S·C·OFF	Output for Cassette OFF reading	Output	Output to inform CPU-1 that unloading is completed and the cassette is unthreaded. During unthreading, a cassette OFF switch (S301) is turned ON by the cam to store into a 5-pin terminal.	
28	S·L·END	Output for threading end reading	Output	Output to inform CPU-1 that threading is completed. During end of threading, a threading end switch (S993) is turned ON to store into a 5-pin terminal.	
29	S·UN·L·END	Output for unthreading end reading	Output	Output to inform CPU-1 that unthreading is completed. During end of unthreading, an unthreading end switch (S994) is turned ON to store into a 5-pin terminal.	
30	———	———	——	Not used.	
31	———	———	——	Not used.	
32	———	———	——	Not used.	
33	TMR·SW	TIMER REC mode	Input	Goes "H" when a TIMER REC switch is turned ON. Input to inform CPU-1 that the unit is in the TIMER REC mode.	L: when not in the TIMER REC mode H: when in the TIMER REC mode
34	$\overline{\text{REC}}$	REC mode	Input	Input when pressing a REC switch and sensing the REC signal from a remote controller.	
35	$\overline{\text{FF/CUE}}$	FF/BETASCAN mode	Input	Input when pressing a FF/BETASCAN switch and sensing the FF/BETASCAN signal from a remote controller.	
36	$\overline{\text{STOP}}$	STOP mode	Input	Input when pressing a stop switch and sensing the stop signal from a remote controller.	
37	$\overline{\text{PAUSE}}$	PAUSE mode	Input	Input when pressing a pause switch and sensing the pause signal from a remote controller.	
38	$\overline{\text{PLAY}}$	PB mode	Input	Input when pressing a PB switch and sensing the PB signal from a remote controller.	
39	$\overline{\text{REW/REV}}$	REW/BETASCAN mode	Input	Input when pressing REW/BETASCAN switch and sensing the REW/BETASCAN signal from a remote controller.	
40	$\overline{\text{VTR SEL}}$	VTR/TV antenna selecting	Input	Input when pressing a VTR/TV switch and sensing the VTR/TV signal from a remote controller.	
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	 400kHz

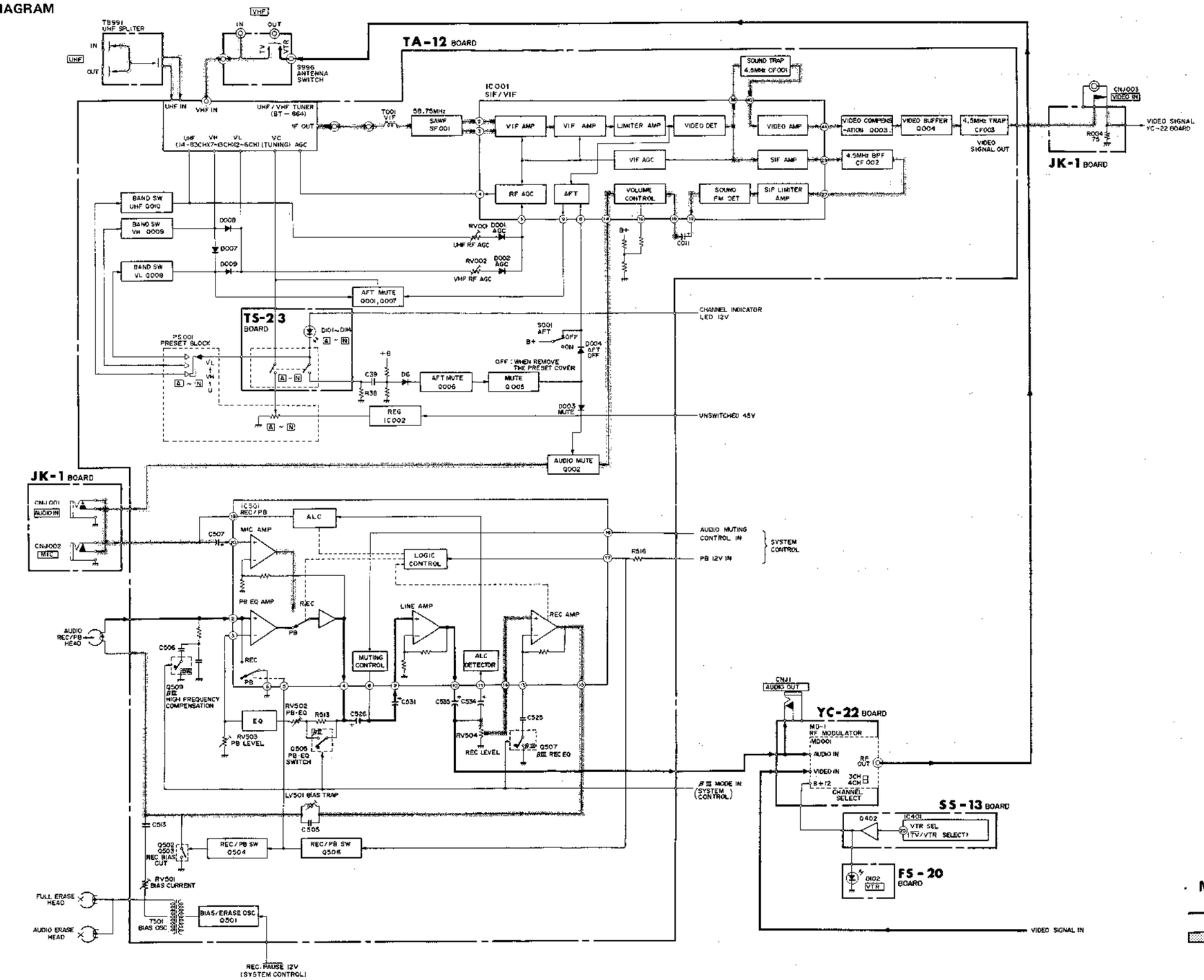
Input/output terminal of system control IC (IC402)

Terminal No.	Designation	Meaning	I/O	Function and operation	Signal
1	———	———	——	Not used.	
2	LOAD	Loading	Output	Output to perform loading and threading.	
3	UN LOAD	Unloading	Output	Output to perform unloading and unthreading.	
4	CAP STOP	Capstan motor stop	Output	Output to stop the capstan motor.	
5	DRUM STOP	Drum motor stop	Output	Output to stop the drum motor.	
6	$\overline{INT}$	Interrupt request	Input	An interrupt request pulse is input the moment the data is fed from CPU-1. The data from CPU-1 is stored into CPU-2.	
7	RESET	Reset	Input	Input to initialize CPU-2. A pulse is input every time the power switch is turned ON/OFF.	
8	REEL STOP	Reel motor stop	Output	Output to stop the reel motor.	
9	REEL LOW	Reel Low	Output	Output to speed down the reel motor.	
10	REEL FWD	Reel rotation in the FWD direction	Output	Output to change over the rotational direction of a reel.	H: FWD direction L: Reverse direction
11	———	———	——	Not used.	
12	UN BRK S	Brake canceling and plunger starting	Output	Output to start the plunger to release the brake of a take-up reel.	
13	UN BRK H	Brake canceling and plunger holding	Output	Output to hold the brake plunger.	
14	PINCH S	Pinch roller plunger starting	Output	During loading (unloading) and threading (unthreading), changes over the drive of a loading motor. Output to start the plunger to pressure-contact a pinch roller.	
15	PINCH H	Pinch roller plunger	Output	Output to hold the pinch roller plunger.	
16	FF/REW OUT	FF/REW mode	Output	Output when entering the FF, REW, BETASCAN, and BETA SKIPSCAN modes.	
17	REW OUT	REW mode	Output	Output when entering the REW and BETASCAN (REW) modes.	
18	PLAY OUT	PB mode	Output	Output when entering the PB, BETASCAN, BETA SKIPSCAN and PB PAUSE modes.	
19	REC OUT	REC mode	Output	Output when entering the REC and REC PAUSE modes.	
20	TEST			Connected to B + 12V.	
21	Vss	Power terminal		B + 12V	
22	——— REC • $\overline{P}$ 2	——— REC • PAUSE 2	—— Output	Not used.... FORMER Output when entering the REC • PAUSE mode.... NEW	——— H: REC mode L: REC • PAUSE mode

23	REC・$\overline{P}$	REC・PAUSE	Output	Output when entering the REC・PAUSE mode.	H: REC mode L: REC・PAUSE mode
24	V MUTE	Video muting	Output	Video signal muting output	⌐¬
25	MC	Mode control	Output	Output when entering the BETASCAN, PB・PAUSE and BETA SKIPSCAN modes.	⌐¬
26	A MUTE	Audio muting	Output	Audio signal muting output	⌐¬
27	PAUSE OUT	PAUSE	Output	Output when entering the PUASE mode.	⌐¬
28	N.C				
29	PAUSE LMP	PAUSE display	Output	Display-output when entering the PAUSE mode.	⌐¬: PB・PAUSE ⎍⎍⎍: REC・PAUSE
30	βI	βI PB mode	Output	Output when playing back the βI tape.	⌐¬
31	βIII	βIII mode	Output	βIII/βII mode selecting output	H: βIII mode L: βII mode
32	INHIBIT	Data transfer inhibiting	Output	Output to inhibit the data transfer by informing CPU-1 that CPU-2 is in data processing.	⎍⎍
33	βIII/$\overline{\beta II}$	REC time changing-over	Input	Input to change over the REC time	H: REC in the βIII mode L: REC in the βII mode
34	βI CANCEL	βI PB inhibiting	Input	Input to inhibit PB in the βI mode.	H: βI PB inhibiting L: Inhibit canceling
35	CTL IN	CTL signal	Input	A CTL signal is input in the PB mode. The video muting (V MUTE) output goes "H" when no CTL signal is input. PB mode discrimination.	⎍⎍⎍
36	D4	Data	Input	Data input from CPU-1	Parallel data
37	D3	Data	Input		
38	D2	Data	Input		
39	D1	Data	Input		
40	D0	Data	Input		
41	Vcc	Power terminal		Grounding side	
42	CLK	Clock	Input	External clock signal input	⎍⎍⎍ 400kHz

FORMER

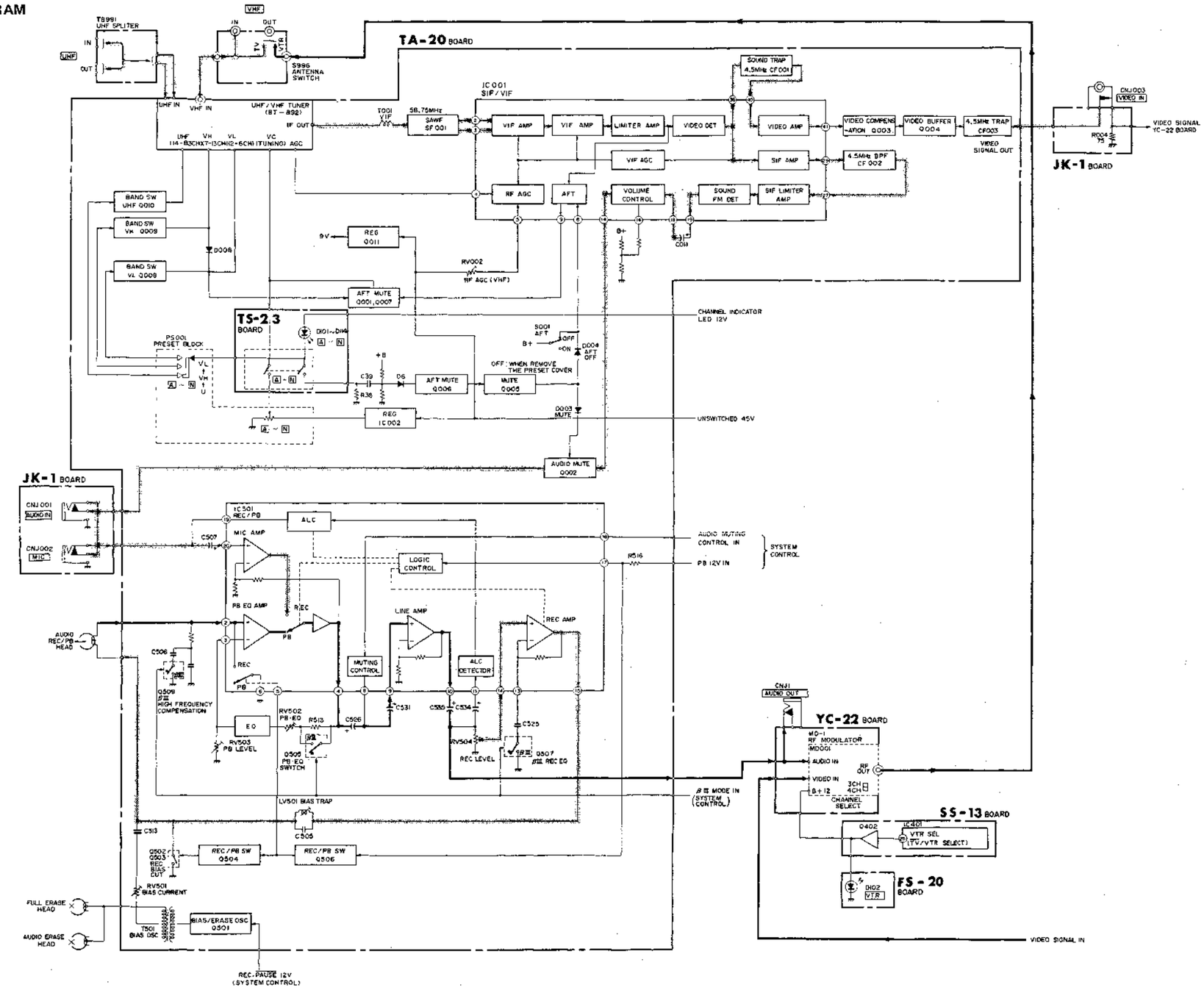
TUNER/AUDIO BLOCK DIAGRAM



NEW

NEW

TUNER/AUDIO BLOCK DIAGRAM

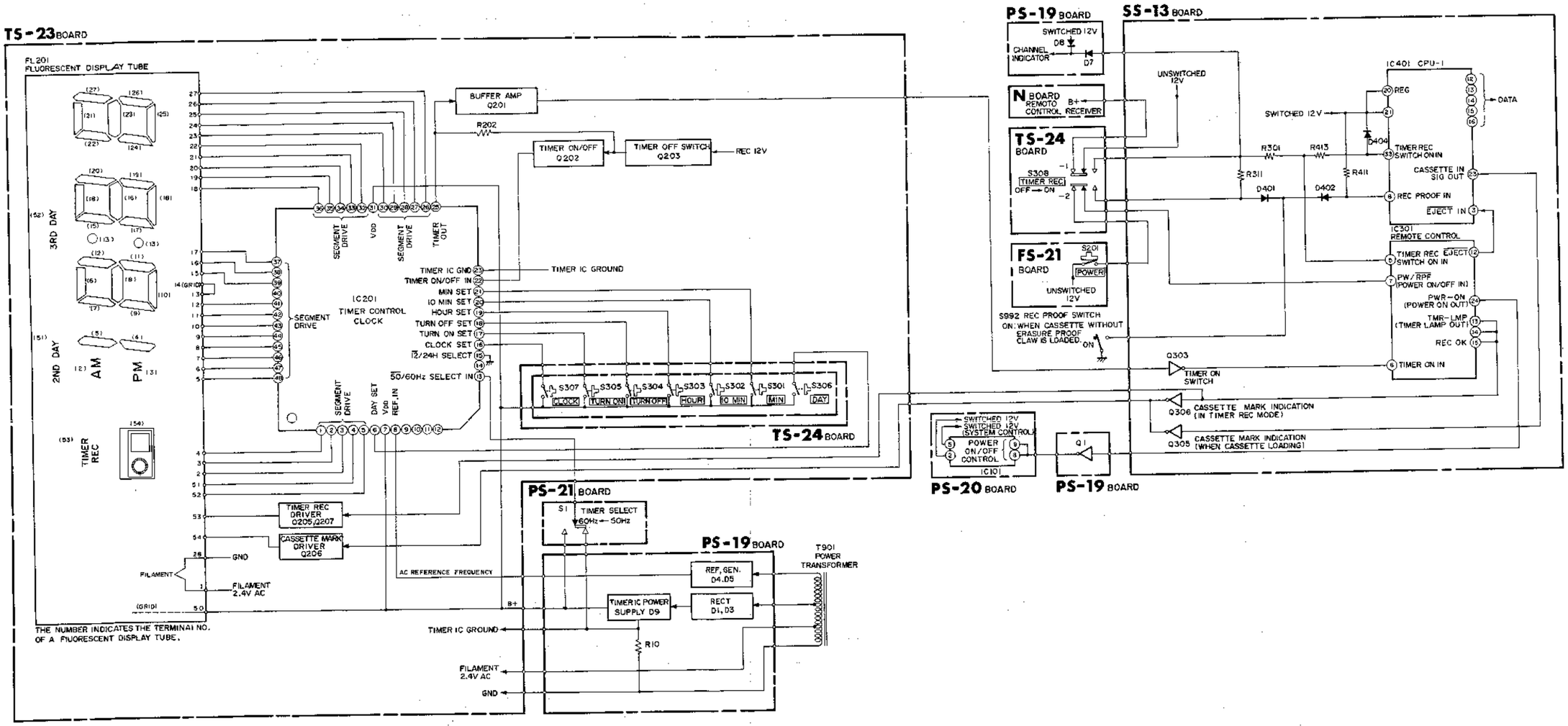


· Main signal channel

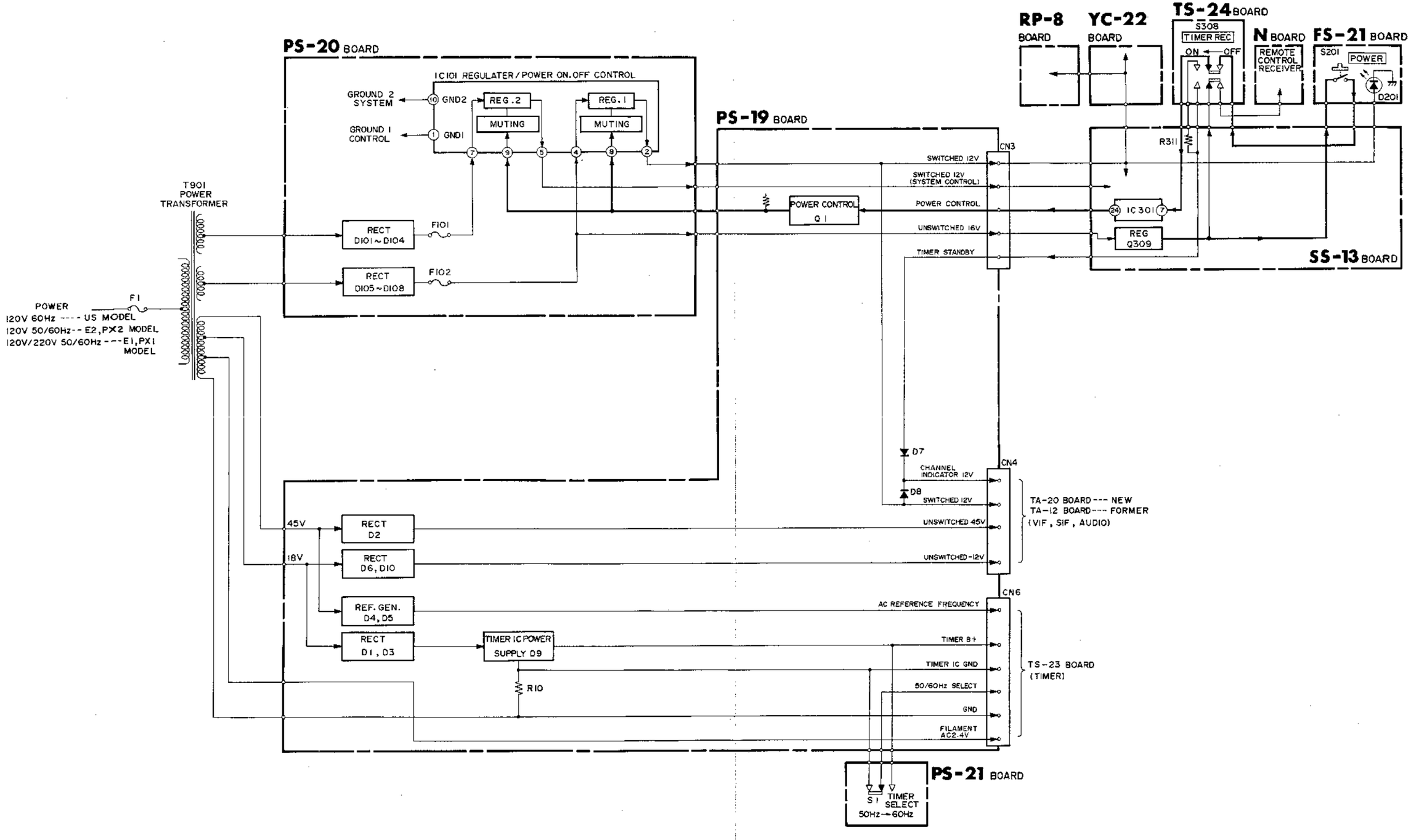
PLAYBACK

RECORD

TIMER BLOCK DIAGRAM



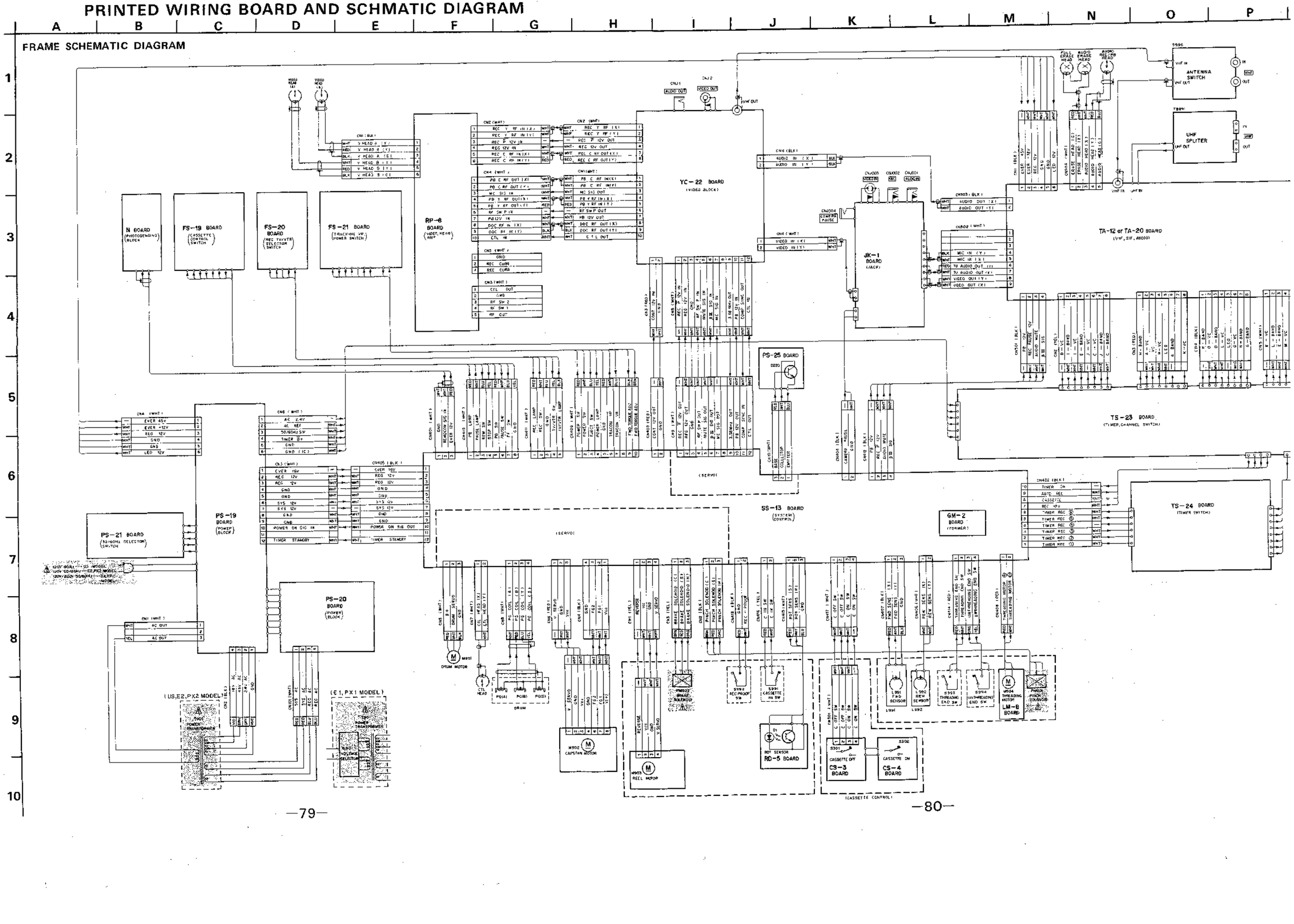
POWER SUPPLY BLOCK DIAGRAM



SECTION 3

PRINTED WIRING BOARD AND SCHMATIC DIAGRAM

FRAME SCHEMATIC DIAGRAM



P Q

ANTENNA SWITCH
VHF IN
VHF OUT
UHF SPLITER
UHF IN
UHF OUT

-24 BOARD
TIMER SWITCH)

YC-22 BOARD

1 IC1 ① REC/PB	10 IC2 ⑫ PB	19 IC3 ㉔ REC	28 IC4 ⑯ REC	37 IC5 ② PB	46 Q18 Ⓑ βIII REC/PB
2 IC2 ② REC/PB	11 IC3 ① REC/PB 4.27MHz CARRIER	20 IC3 ㉔ PB	29 IC4 ⑯ PB	38 TP-2 REC/PB	47 Q33 Ⓒ REC/PB
3 IC1 ③ REC/PB RF SWITCHING PULSE	12 IC3 ③ PB	21 IC4 ① REC	30 IC4 ㉑ PB	39 Q25 Ⓔ REC	48 Q33 Ⓔ REC/PB
4 IC1 ④ REC/PB	13 IC3 ⑤ PB	22 IC4 ① PB	31 IC4 ㉒ REC	40 TP-3 PB	49 Q54 Ⓔ REC
5 IC1 ⑰ REC/PB	14 IC3 ⑥ REC	23 IC4 ② REC	32 IC4 ㉔ REC	41 TP-5 REC/PB	50 Q55 Ⓒ PB
6 IC1 ⑳ REC/PB	15 IC3 ⑧ REC	24 IC4 ② PB	33 IC4 ① PB	42 TP-6 REC	51 Q57 Ⓔ PB
7 IC1 ㉑ REC/PB	16 IC3 ⑪ REC	25 IC4 ④ REC/PB	34 IC5 ⑤ PB	43 TP-10 REC	52 Q11 Ⓑ βIII PB
8 IC2 ① PB	17 IC3 ⑪ PB	26 IC4 ⑥ PB	35 IC5 ⑩ PB	44 TP-11 REC/PB	53 Q11 Ⓒ PB
9 IC2 ⑪ PB	18 IC3 ⑯ REC/PB	27 IC4 ⑫ PB	36 IC2 ⑫ PB	45 TP-12 PB	54 Q24 Ⓔ PB
					55 Q24 Ⓔ REC

RP-8 BOARD

1 IC1 ⑪ ,TP-2 REC	
2 TP-5 PB RF SWITCHING PULSE	
3 TP-6 PB	
4 CN2 ⑤ REC	
5 CN4 ① PB	
6 CN4 ④ PB	

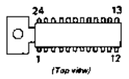
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

YC-22 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS)

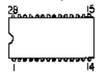
RP-8 (PB CHROMA RF SIGNAL, Y-FM SIGNAL, RECORD/PLAYBACK)

— Ref. No. YC-22 BOARD: 1000 series, RP-8 BOARD: 2000 series —

CX134A
CX135
CX187
CX188
CX196A
CX822



CX862



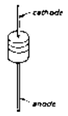
2SA733
2SA844
2SA925
2SC1815

2SA1048
2SA1115
2SC2458
2SC2603
2SC403SP

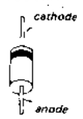
2SA1175
2SC2785

2SC403C

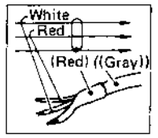
1SS119
1SS148



1SS133



- Color code of sleeving over the end of the jacket.

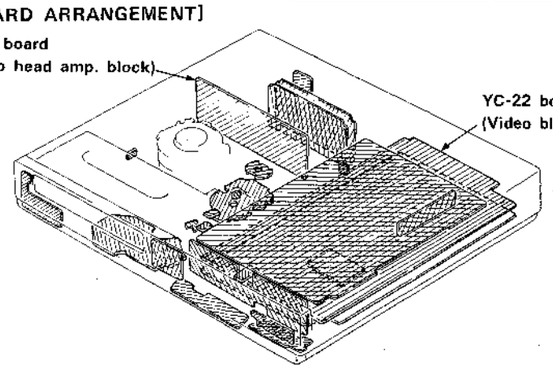


- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- Through hole
- Soldering side
- B + pattern
- [ ]— indicates side identified with part number.

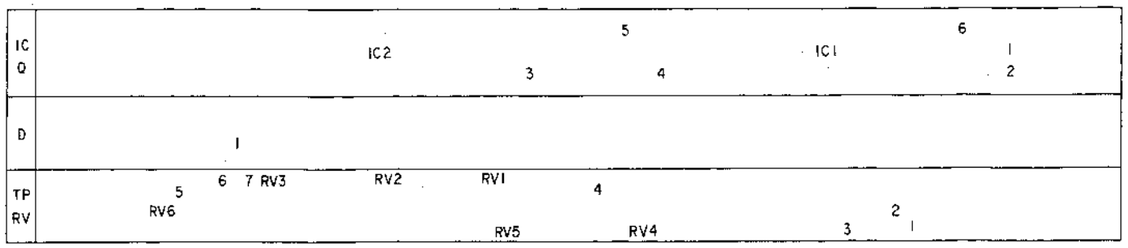
[BOARD ARRANGEMENT]

RP-8 board
(Video head amp. block)

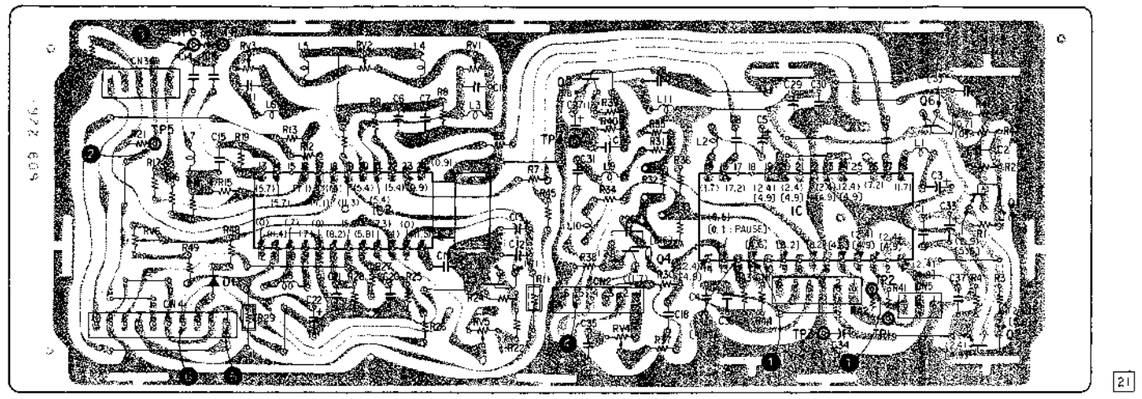
YC-22 board
(Video block)

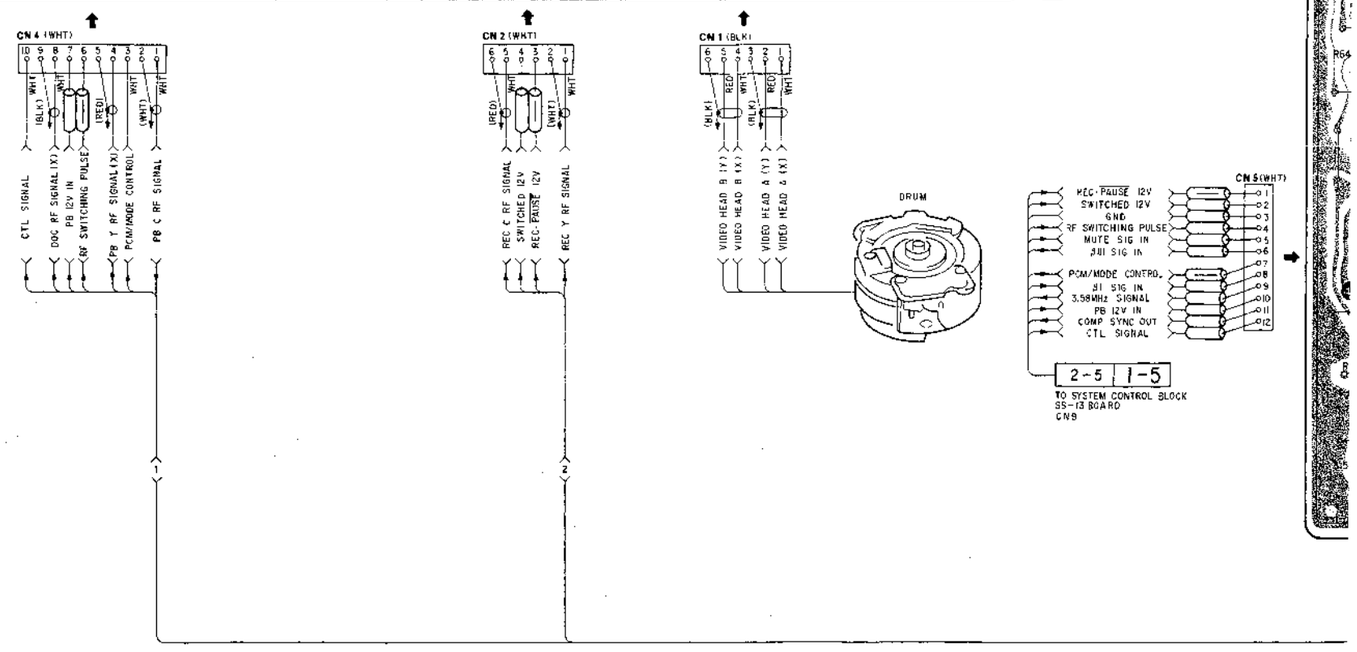


(1)

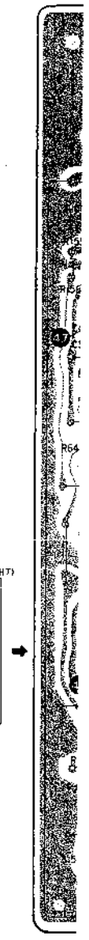


[RP-8 BOARD]





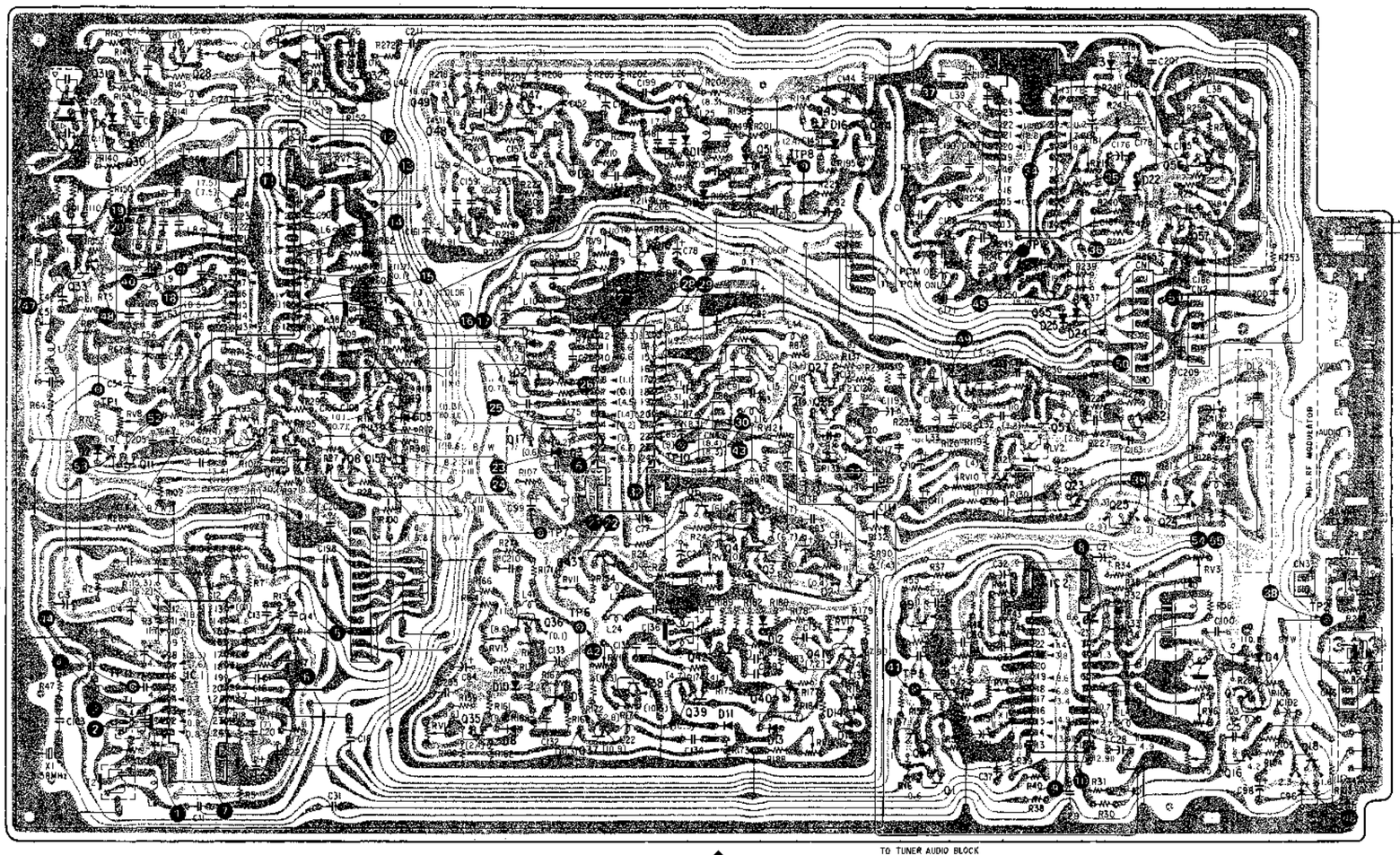
[YC-



J K L M N O P Q R S T U V W X Y

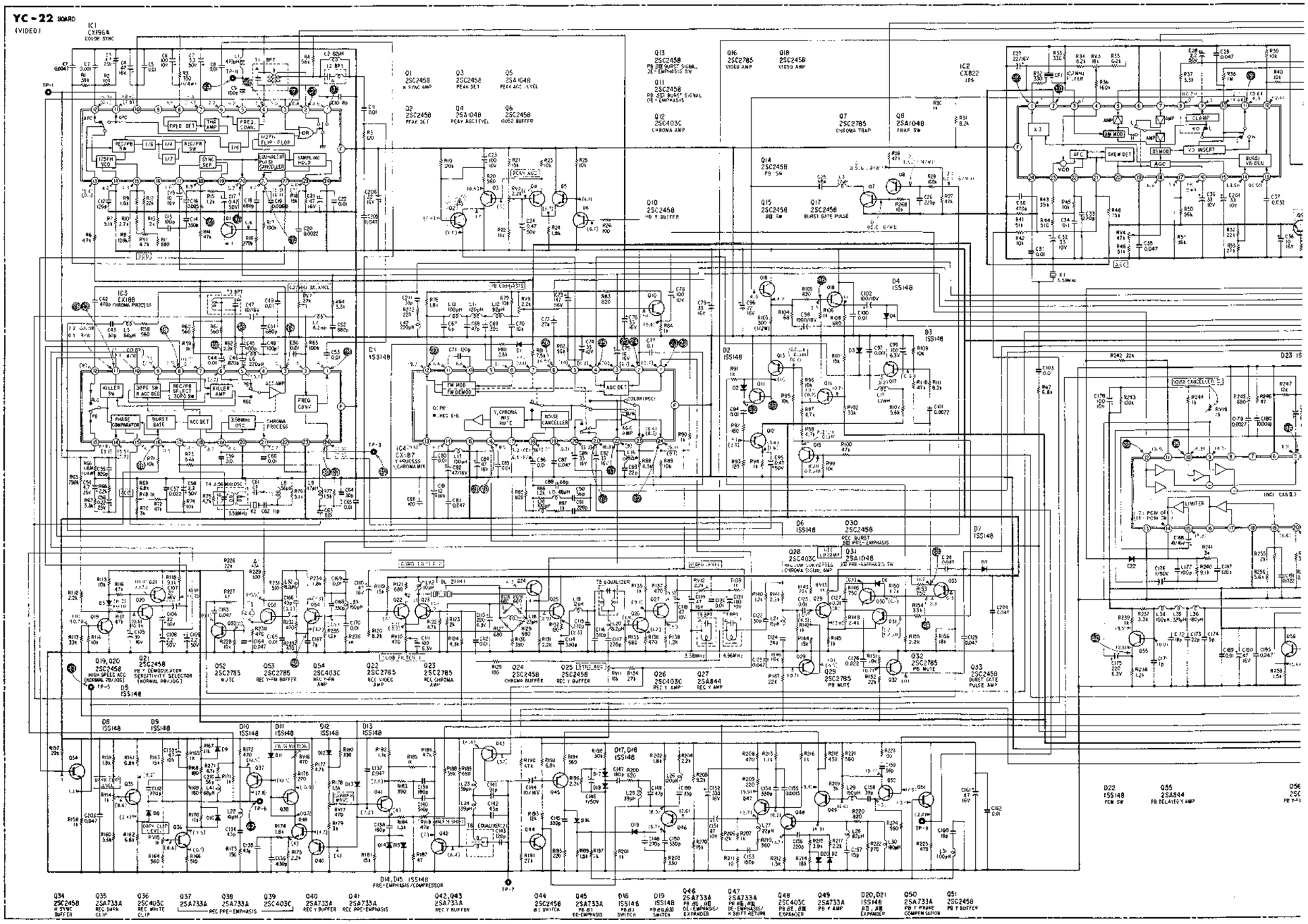
IC Q	IC1 IC2 IC3 IC4 IC5
D	
TP RV	RV1 RV2 RV3 RV4 RV5 RV6 RV7 RV8 RV9 RV10 RV11 RV12 RV13 RV14 RV15 RV16 RV17 RV18 RV19 LV1 LV2

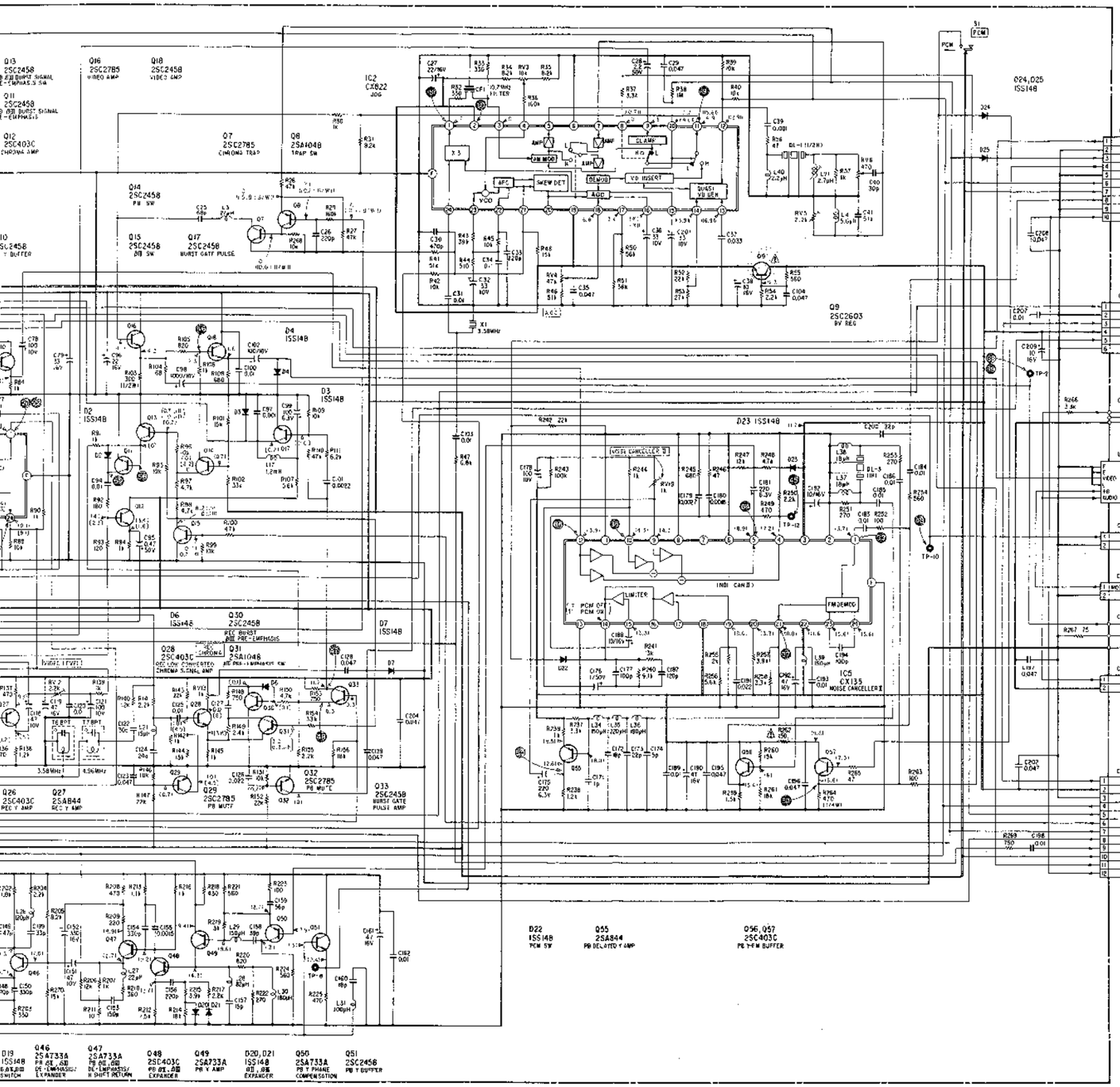
[YC-22 BOARD]



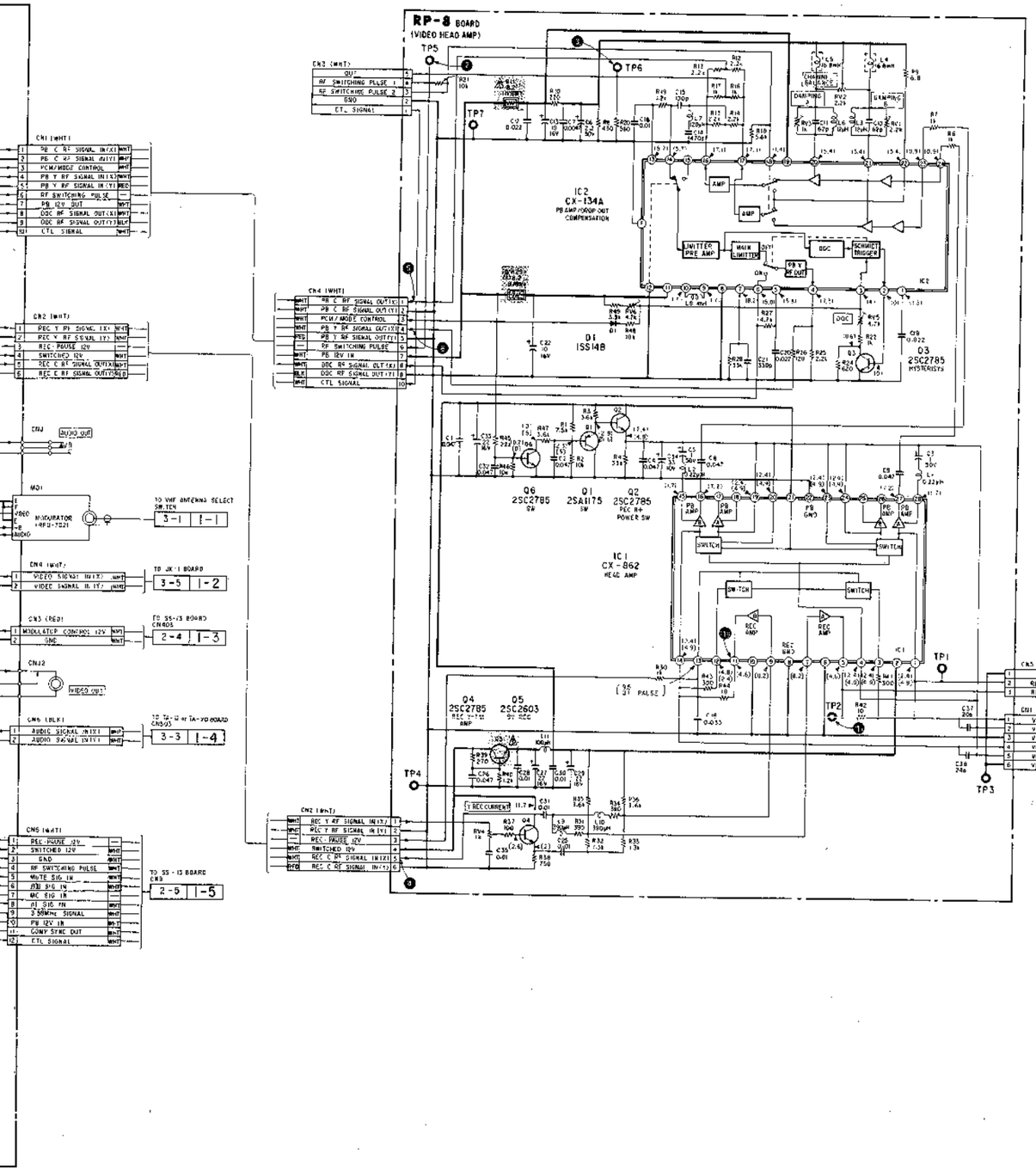
YC-22 (Y & CHROMA SIGNALS RECORD/PLAYBACK PROCESS) **RP-8** (PB CHROMA RF SIGNAL, Y-FM SIGNAL, RECORD/PLAYBACK) – Ref. No. YC-22 BOARD: 1000 series, RP-8 BOARD: 2000 series –

(1)





YC-22 BOARD: 1000 series, RP-8 BOARD: 2000 series –



NOTES:

- Connection display

(2) Indicates the connection to 1 in Fig. 3.
(1) Indicates No.1 in Fig. 1.

Fig. 1 . . . . . . Video block
Fig. 2 . . . . . . Servo/system control block
Fig. 3 . . . . . . Tuner/audio block
Fig. 4 . . . . . . Power/timer block

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- : B + bus.
  (: Unswitched)
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

  ⓫ : The number indicates No. of a waveform diagram.
  For the waveform diagram, refer to pages 73 and 74.
  * : Not measurable

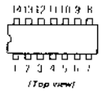
The voltage value is measured using a digital tester (10MΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

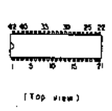
μPC1373H

μPC324C



μPC358C
μPC4558C

CX194B-0
CX194B-1
μPD553C-261
μPD553C-262



M32080SL

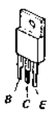
CX877
CX879
TC4053BP

2SA1048
2SA1115
2SC2458
2SC2603

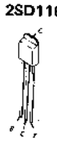
2SA1175
2SC2785

2SA772 2SC1475
2SB739 2SD788
2SB740 2SD789
2SC1474

2SC1061
2SD313HP



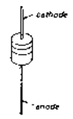
2SD1164

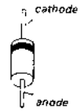


2SD773
2SD774

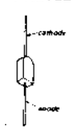
1N4148TP RD7.5EB1
1SS133 RD8.2EL2
RD5.1EL1 RD10EB2
RD5.1EL2 RD10EL3
RD5.1EL3 RD12EB3

1SS119
1SS148

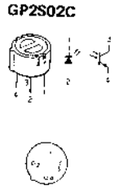




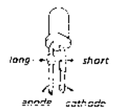
PH302B



GP2S02A
GP2S02B
GP2S02C

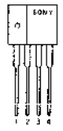


TLG123A
TLR123
TLY123

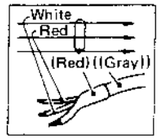


THS103

DM211

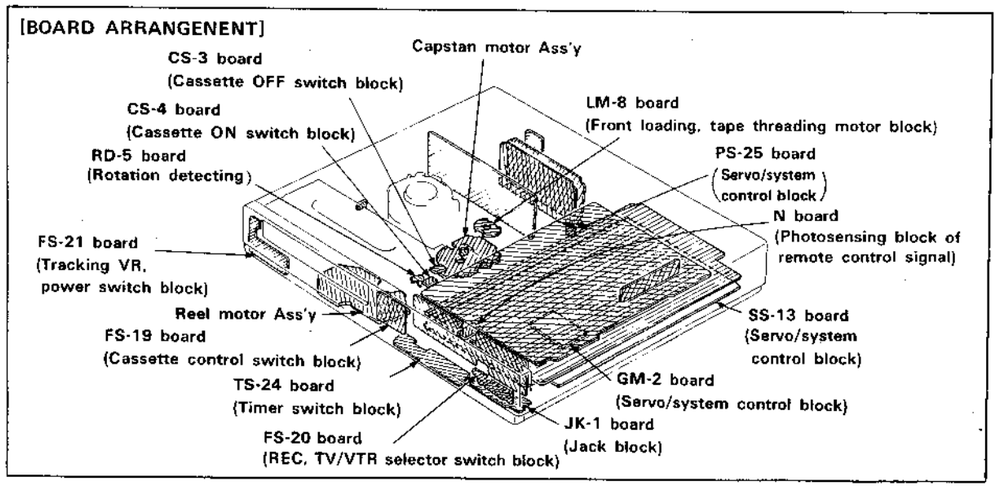


- Color code of sleeving over the end of the jacket.



- ○— indicates a lead wire mounted on the component side.
- —● indicates a lead wire mounted on the printed side.
- Through hole
- Soldering side
- Shielded wire side
- B + pattern

[BOARD ARRANGENENT]

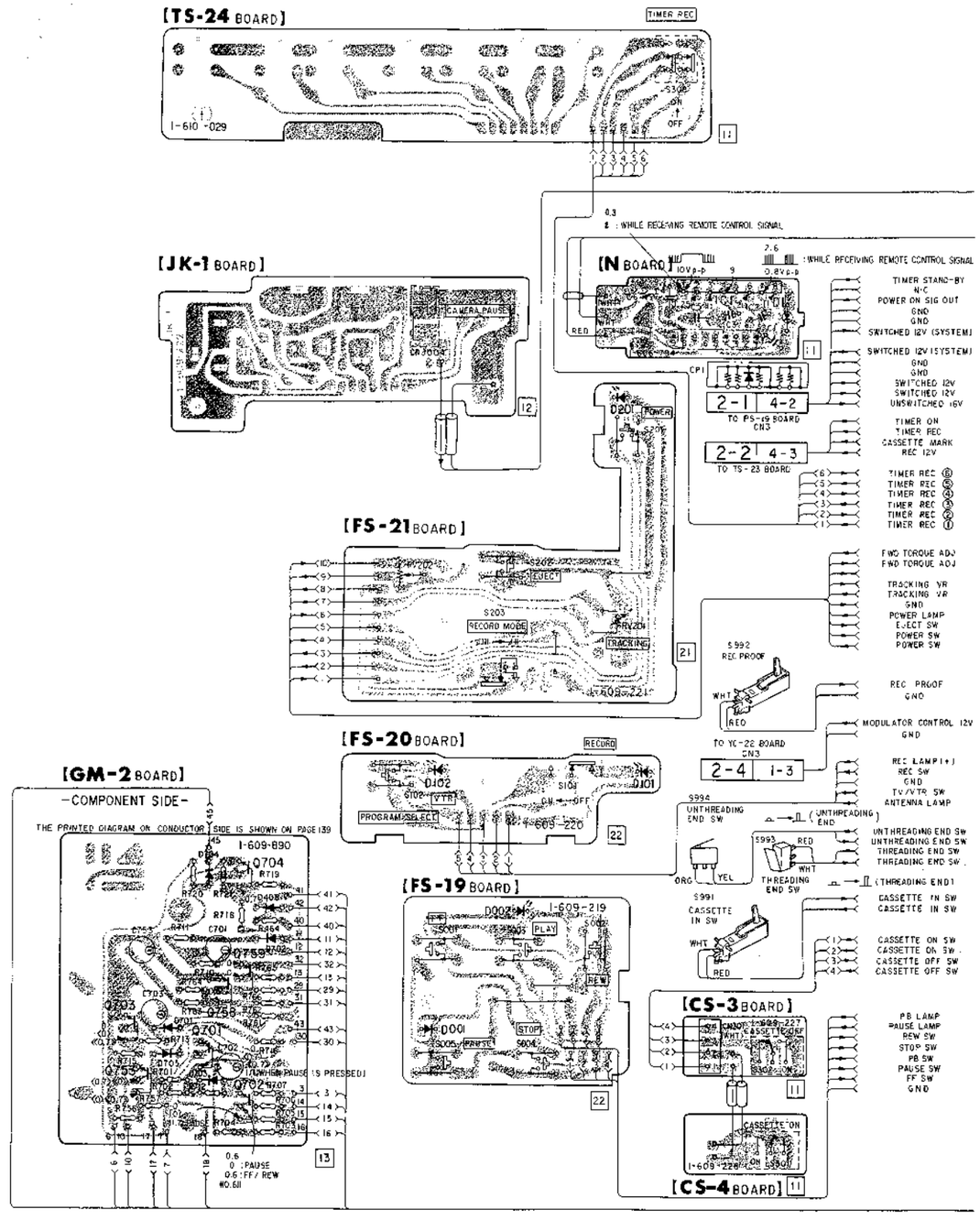


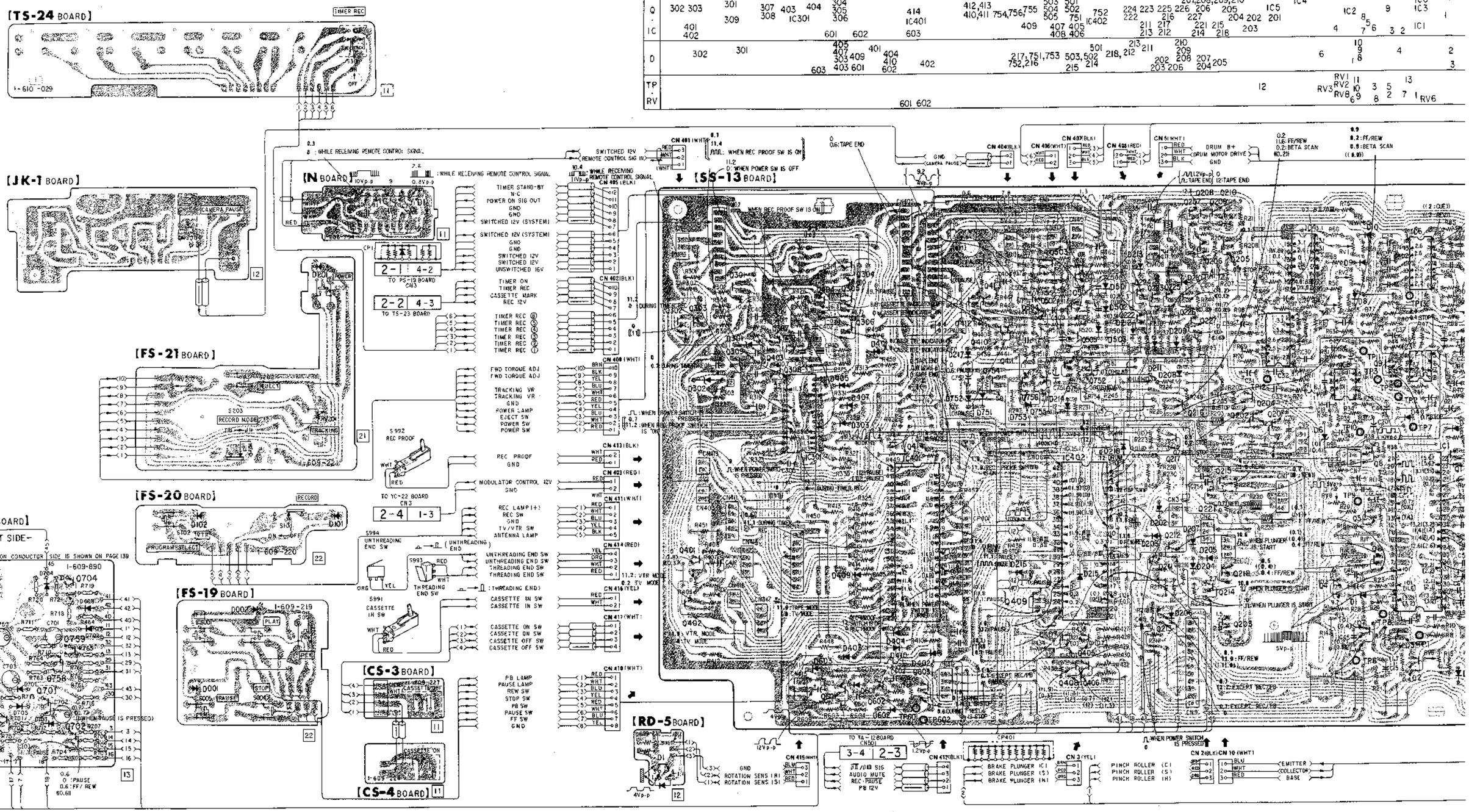
A B C D E F G H

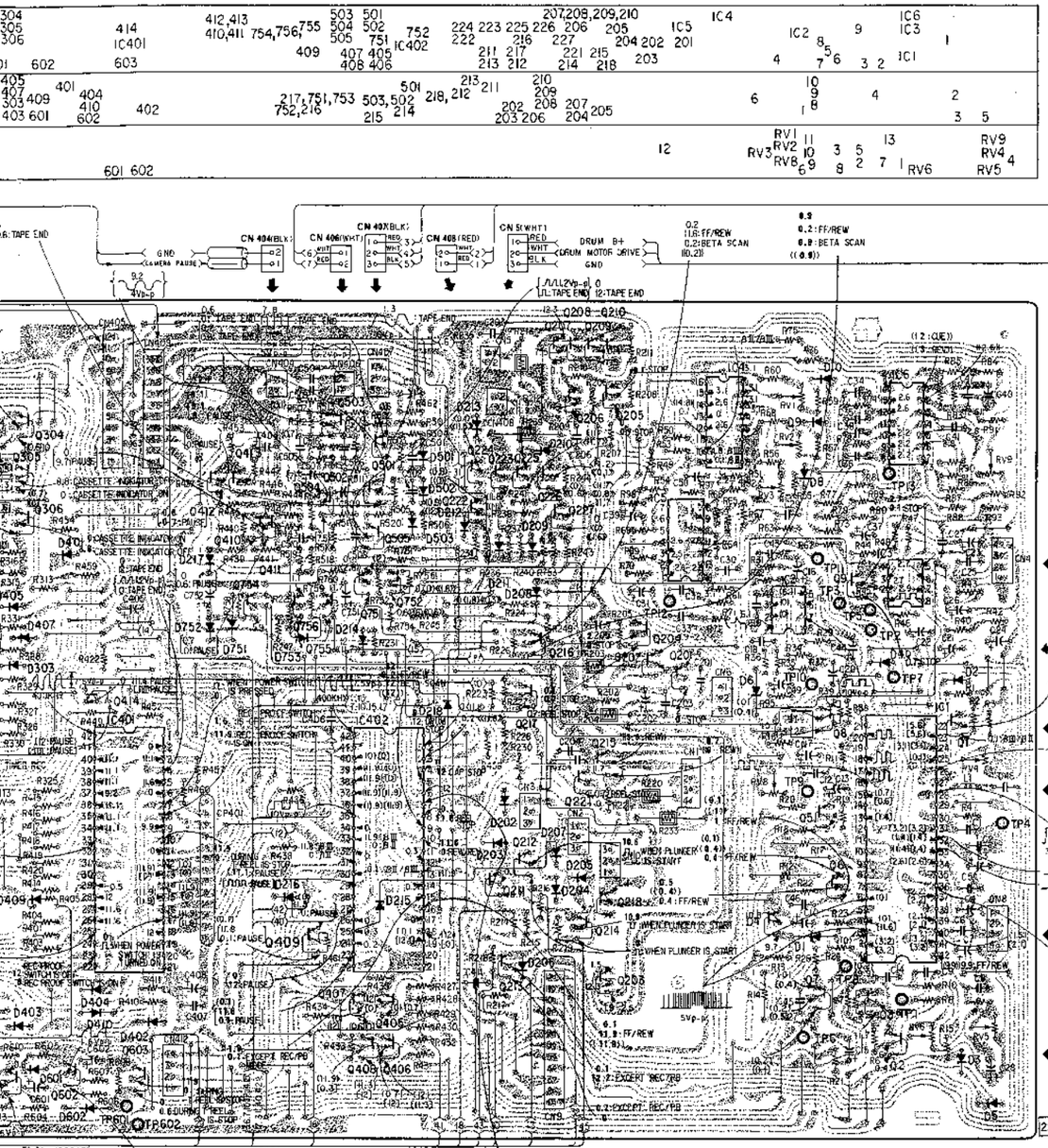
1 2 3 4 5 6 7 8 9 10

– Ref. No. SS-13 BOARD: 3000 series, GM-2 BOARD: 10000 series, FS-19 BOARD: 4000 series, FS-20 BOARD: 4100 series, FS-21 BOARD: 4200 series, REEL M

(2)




[TS-24 BOARD]
[JK-1 BOARD]
[FS-21 BOARD]
[FS-20 BOARD]
[FS-19 BOARD]
[CS-3 BOARD]
[CS-4 BOARD]
[N BOARD]
[SS-13 BOARD]
[RD-5 BOARD]
2-1 4-2 TO PS-19 BOARD CN3
2-2 4-3 TO TS-23 BOARD
2-4 1-3 TO YC-22 BOARD CN3
3-4 2-3 TO YA-12 BOARD CN501
TIMER STAND-BY
POWER ON SIG OUT
SWITCHED 12V (SYSTEM)
SWITCHED 12V
SWITCHED 16V UNSWITCHED
TIMER ON
CASSETTE MARK
REC 12V
FWD TORQUE ADJ
TRACKING VR
POWER LAMP
EJECT SW
POWER SW
PAUSE SW
FF SW
REC PROOF
MODULATOR CONTROL 12V
REC LAMP(+)
REC SW
TV/VTR SW
ANTENNA LAMP
UNTHREADING END SW
THREADING END SW
CASSETTE IN SW
CASSETTE ON SW
CASSETTE OFF SW
PB LAMP
PAUSE LAMP
REW SW
STOP SW
PB SW
FF SW
DRUM B+
DRUM MOTOR DRIVE
PINCH ROLLER (C)
PINCH ROLLER (S)
PINCH ROLLER (H)
BRAKE PLUNGER (C)
BRAKE PLUNGER (S)
BRAKE PLUNGER (H)
EMITTER
COLLECTOR
BASE



AN MOTOR) **TS-24** (TIMER SWITCH) **LM-8** (NOISE FILTER) **JK-1** (JACK) **RD-5** (ROTATION DETECTOR) **CS-3** (CASSETTE ON SWITCH) **CS-4** (CASSETTE OFF SWITCH) **N** (REMOCON SIGNAL SENSOR)

L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A1

0 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 series, JK-1 BOARD: 9100 series, RD-5 BOARD: 9200 series, CS-3·CS-4 BOARD: 9300 series, N BOARD: 9600 series —

304 305 306 1 602 414 IC401 603 412,413 410,411 754,756,755 409 503 504 505 501 502 751 407 405 408 406 752 IC402 224 223 225 226 222 211 217 213 212 216 207,208,209,210 206 227 221 215 214 218 205 204 202 203 IC5 201 IC4 4 IC2 8 5 7 6 9 3 2 IC6 IC3 IC1 1

405 407 409 303 403 601 401 404 410 602 402 217,751,753 752,216 503,502 215 501 214 218, 212 213 211 202 203 206 210 209 208 207 204 205 6 10 9 1 8 4 2 3 5

601 602 12 RV3 RV1 RV2 RV8 11 10 6 9 3 8 5 2 13 7 1 RV6 RV9 RV4 RV5 4

FORMER

SERVO, SYSTEM CONTROL SERVO, SYSTEM CONTROL

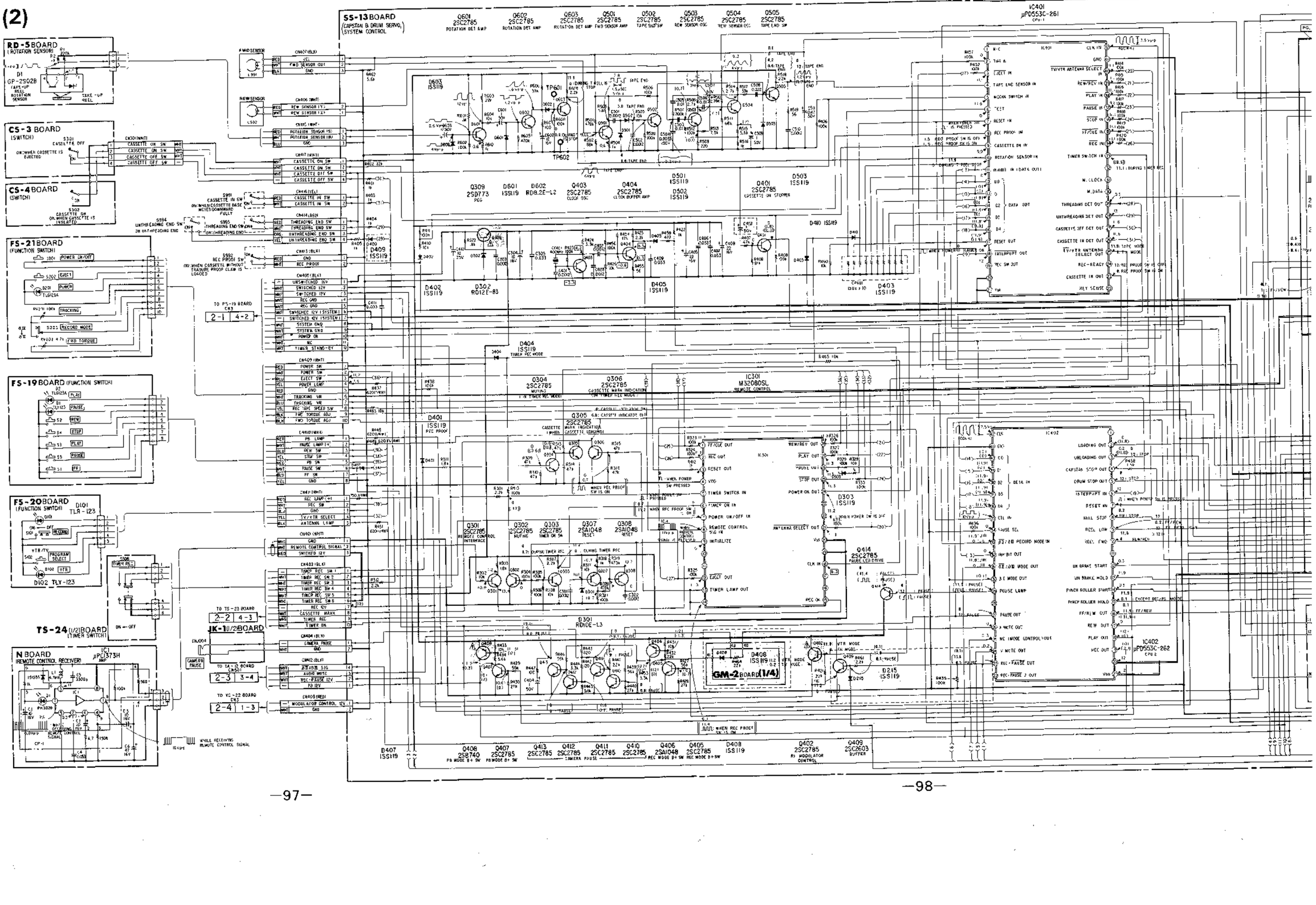
FORMER

SS-13 **GM-2** (SERVO/SYSTEM CONTROL) **FS-19** (CASSETTE CONTROL SWITCH) **FS-20** (REC, TV/VTR SELECT SWITCH) **FS-21** (TRACKING VOLUME POWER SWITCH) **PS-25** (REEL MOTOR DRIVE) **REEL MOTOR** (REEL MOTOR)

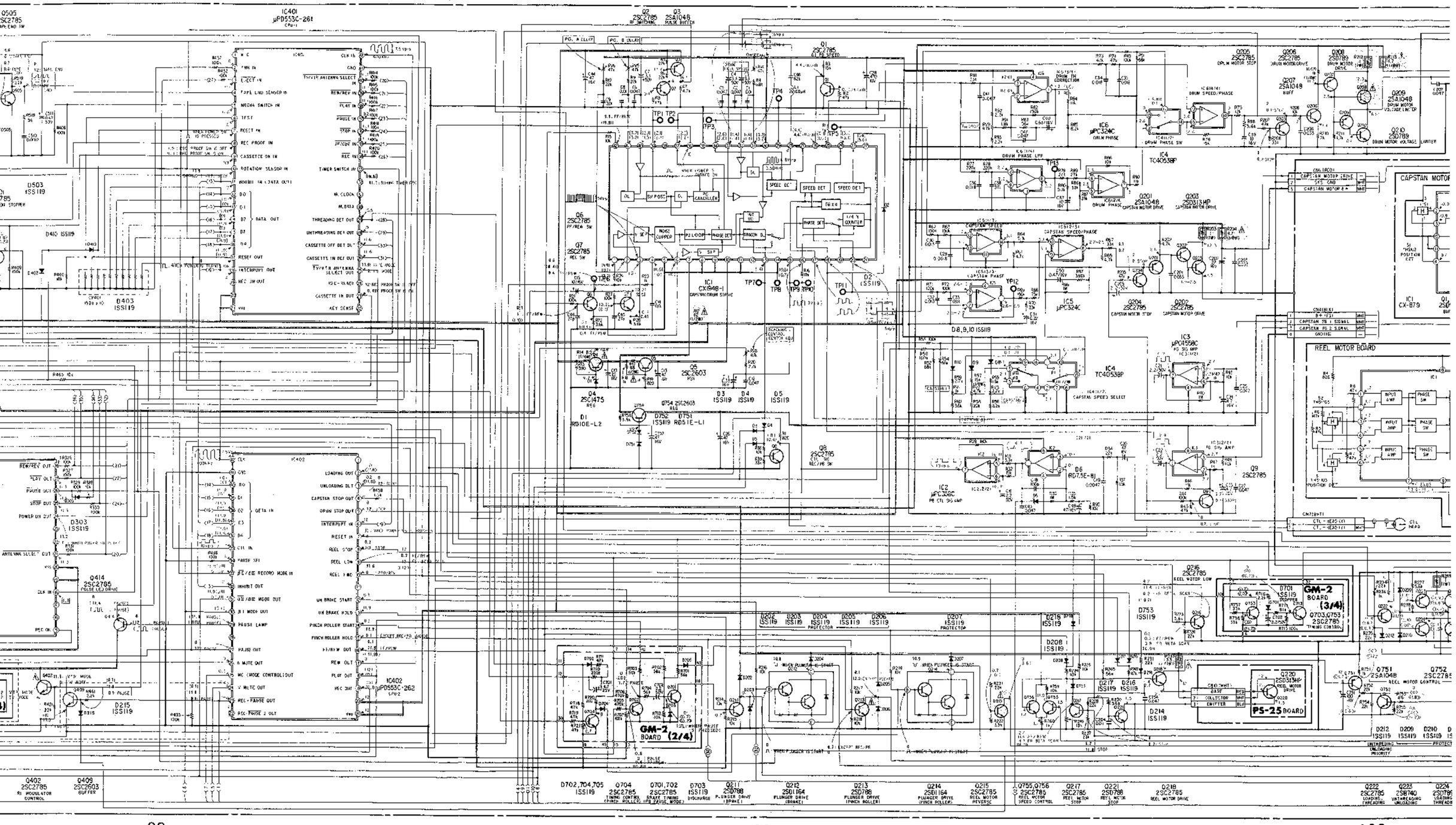
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

– Ref. No. SS-13 BOARD: 3000 series, GM-2 BOARD: 10000 series, FS-19 BOARD: 4000 series, FS-20 BOARD: 4100 series, FS-21 BOARD: 4200 series, REEL MOTOR BOARD: 5000 series, CAPSTAN MOTOR BOARD: 5100 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 se

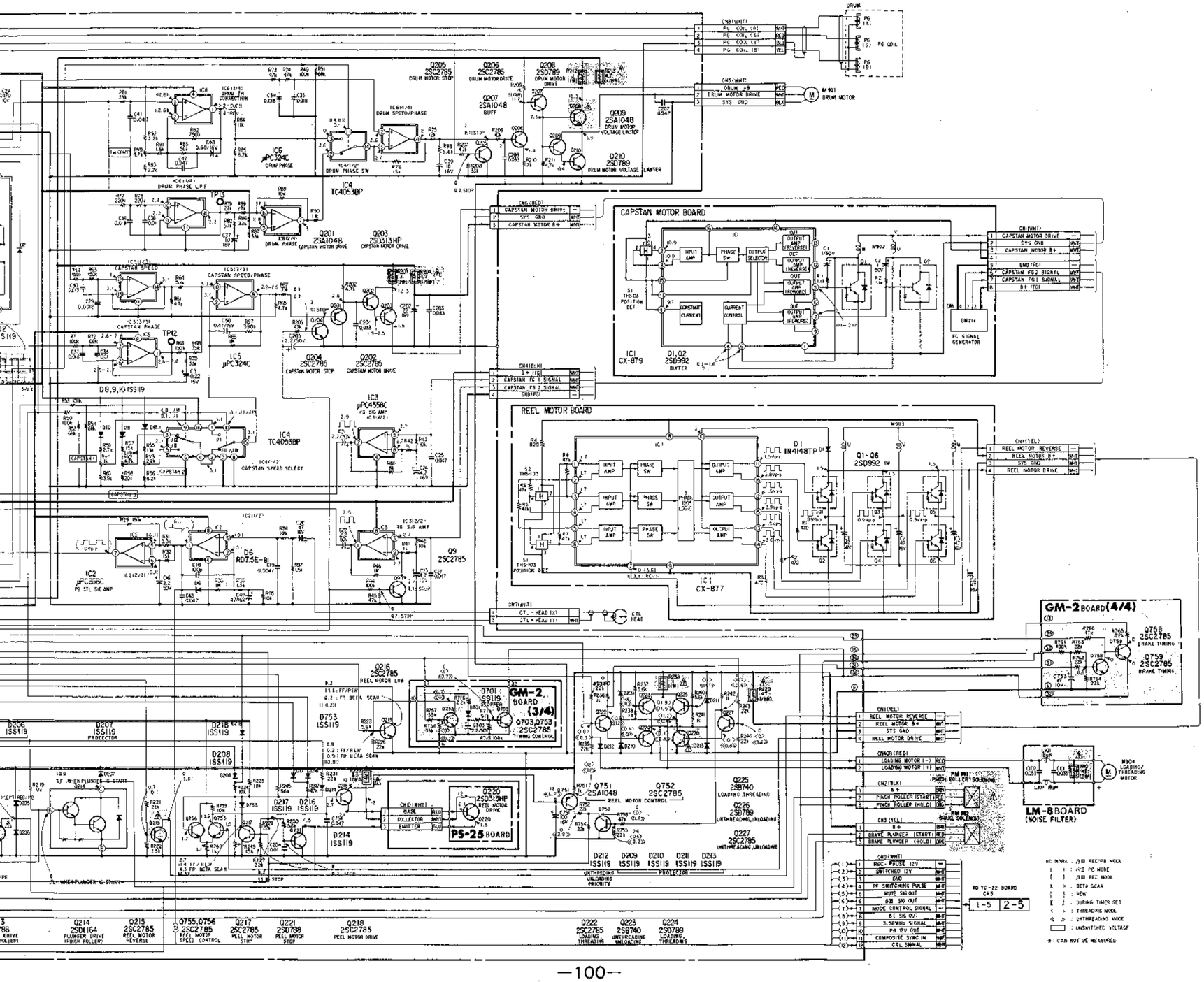
(2)



00 series, CAPSTAN MOTOR BOARD: 5100 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 series, JK-1 BOARD: 9100 series, RD-5 BOARD: 9200 series. CS-3·CS-4 BOARD: 9300 series. N BOARD: 9600 series —



CS-4 BOARD: 9300 series, N BOARD: 9600 series –



NOTES:

[ ] :When a former CPU is put to use.

- Connection display

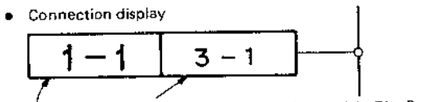


Fig. 1 . . . . . Video block
Fig. 2 . . . . . Servo/system control block
Fig. 3 . . . . . Tuner/audio block
Fig. 4 . . . . . Power/timer block

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- : B + bus.
- ( ) : Unswitched

- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

The voltage value is measured using a digital tester (10MΩ/V).

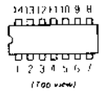
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SS-13 (SERVO/SYSTEM CONTROL)

μPC1373H

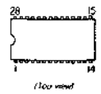
μPC324C



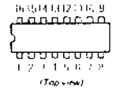
μPC358C
μPC4558C

CX194B-0 μPD553C-276
CX194B-1 μPD553C-287

M32080SL



CX877
CX879
TC4053BP



2SA1048
2SA1115
2SC2458
2SC2603

2SA1175
2SC2785

2SA772 2SC1475
2SB739 2SD788
2SB740 2SD789
2SC1474

2SC1061
2SD313HP

2SD1164

2SD773
2SD774

1SS119
1SS148

1N4148TP RD7.5EB1
1SS133 RD8.2EL2
RD5.1EL1 RD10EB2
RD5.1EL2 RD10EL3
RD5.1EL3 RD12EB3

PH302B

GP2S02A
GP2S02B
GP2S02C

TLG123A
TLR123
TLY123

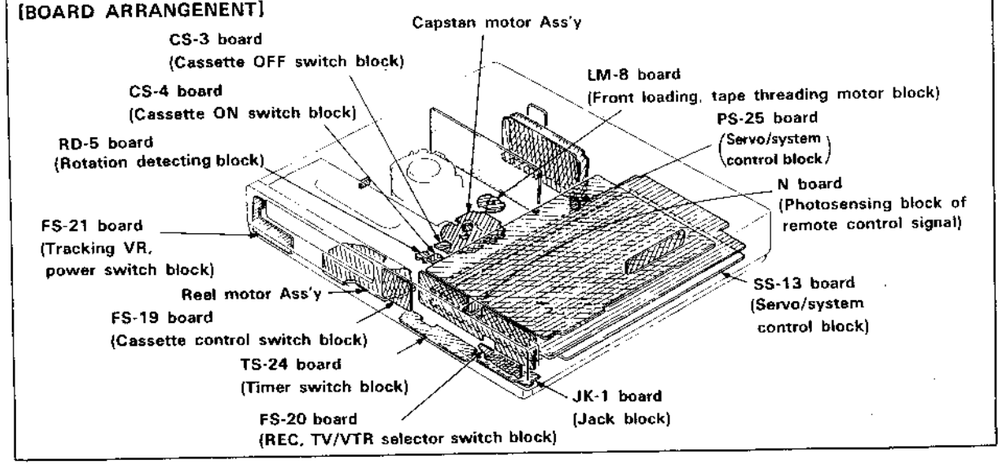
THS103

DM211

- Color code of sleeving over the end of the jacket.

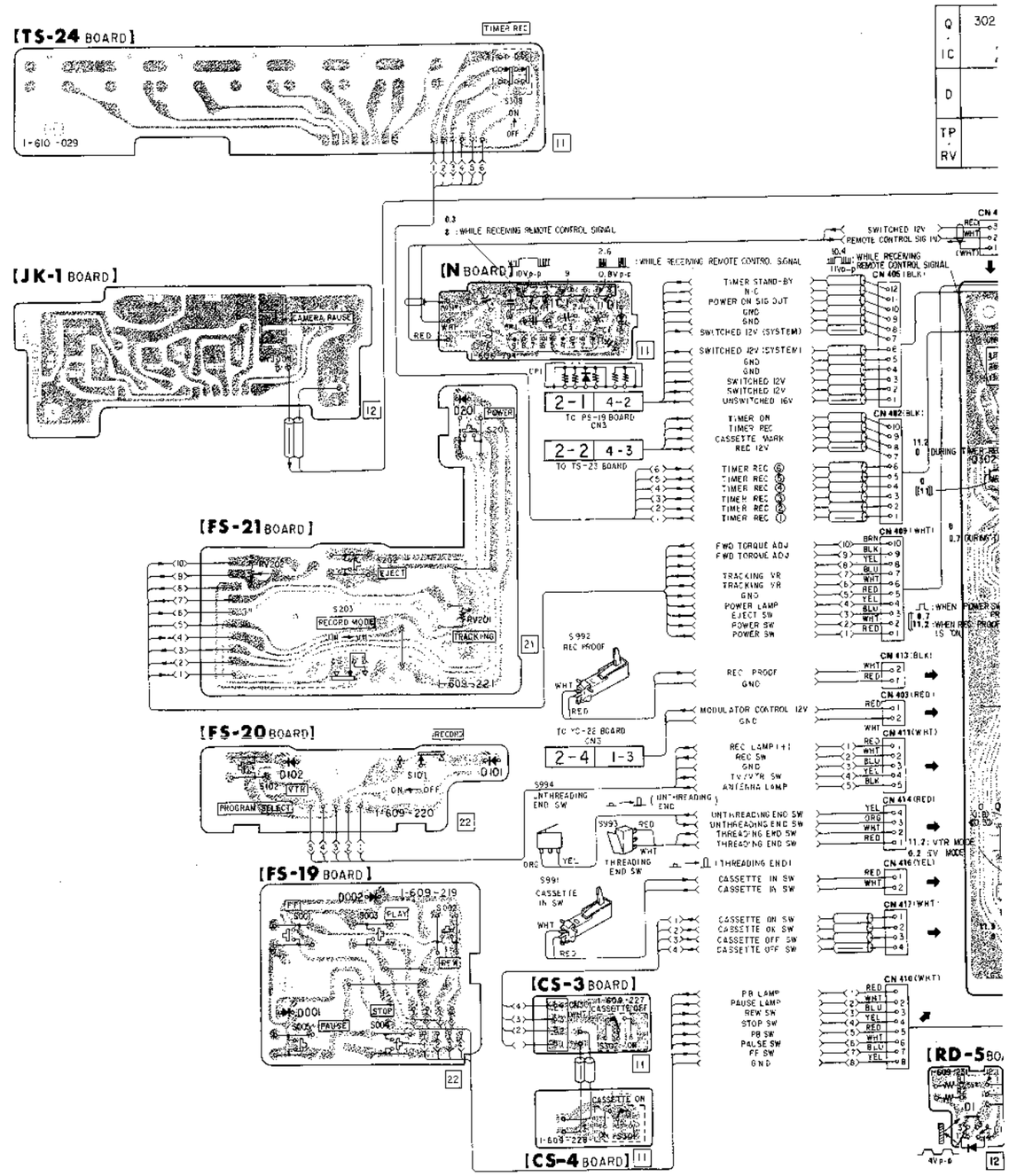
- o— indicates a lead wire mounted on the component side.
  — indicates a lead wire mounted on the printed side.
- Through hole
- Soldering side
- Component side
- B + pattern

[BOARD ARRANGENENT]

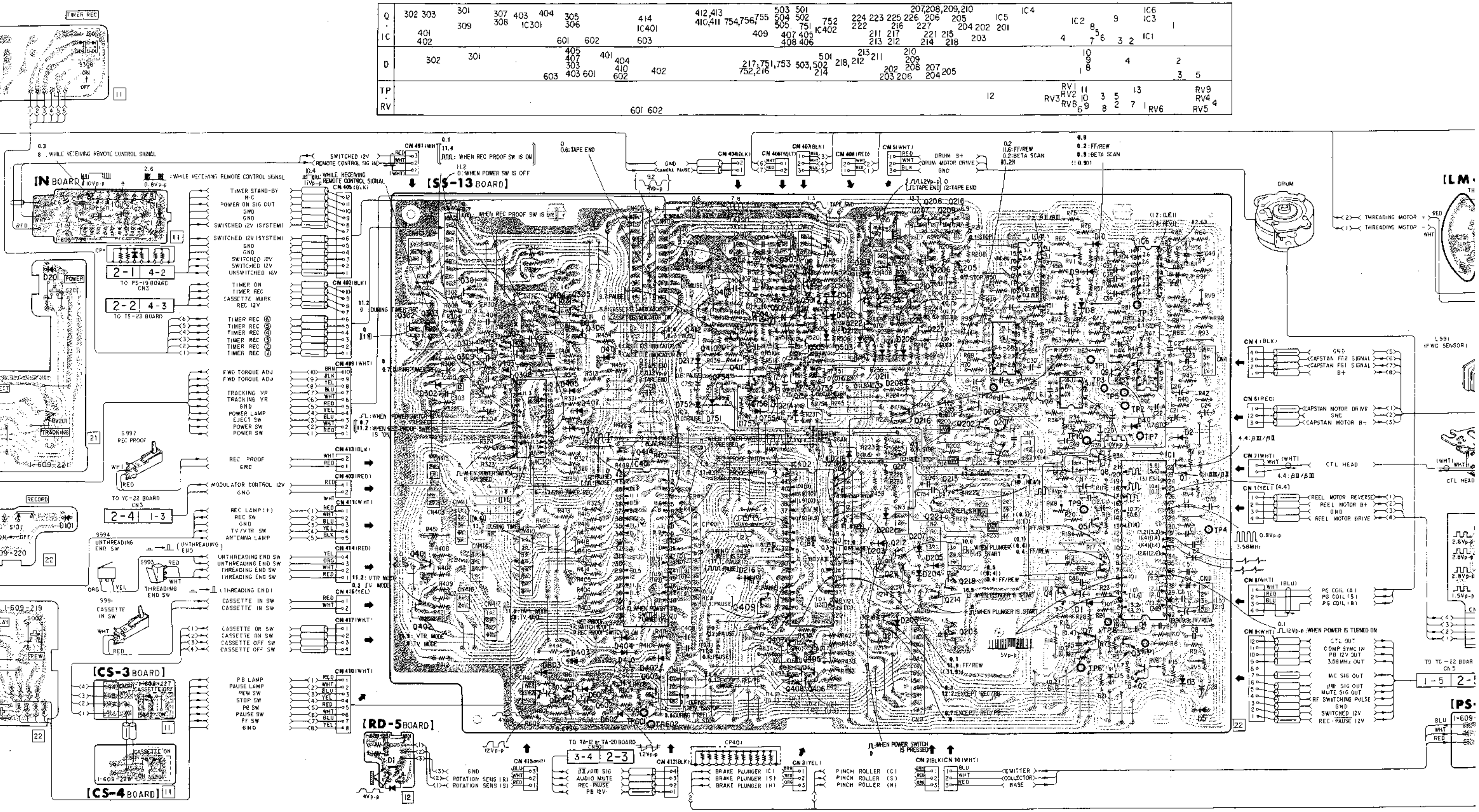


– Ref. No. SS-13 BOARD: 3000 series, GM-2 BOARD: 10000 series, FS-19 BOARD: 4000 series, FS-20 BOARD: 4100 series, FS-21 BOARD: 4200 series, REEL M

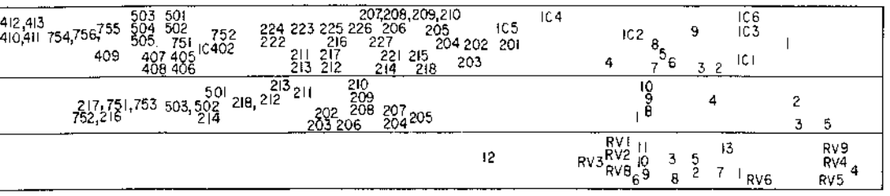
(2)

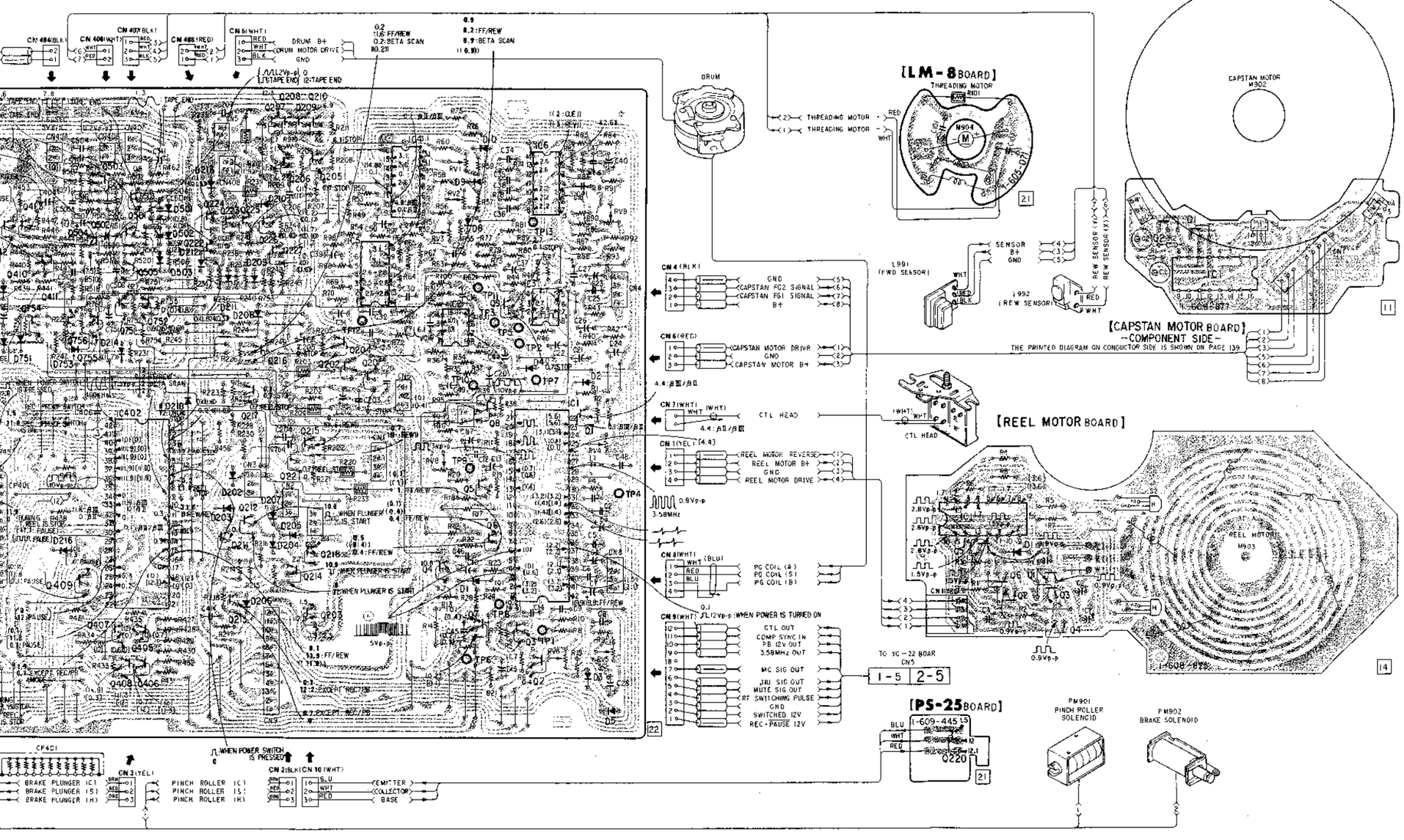


FS-19 BOARD: 4000 series, FS-20 BOARD: 4100 series, FS-21 BOARD: 4200 series, REEL MOTOR BOARD: 5000 series, CAPSTAN MOTOR BOARD: 5100 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 series, JK-1 BOARD: 9100 series, RD-5 BOARD: 9200 series, CS-3·CS-4 BOARD: 9300 s



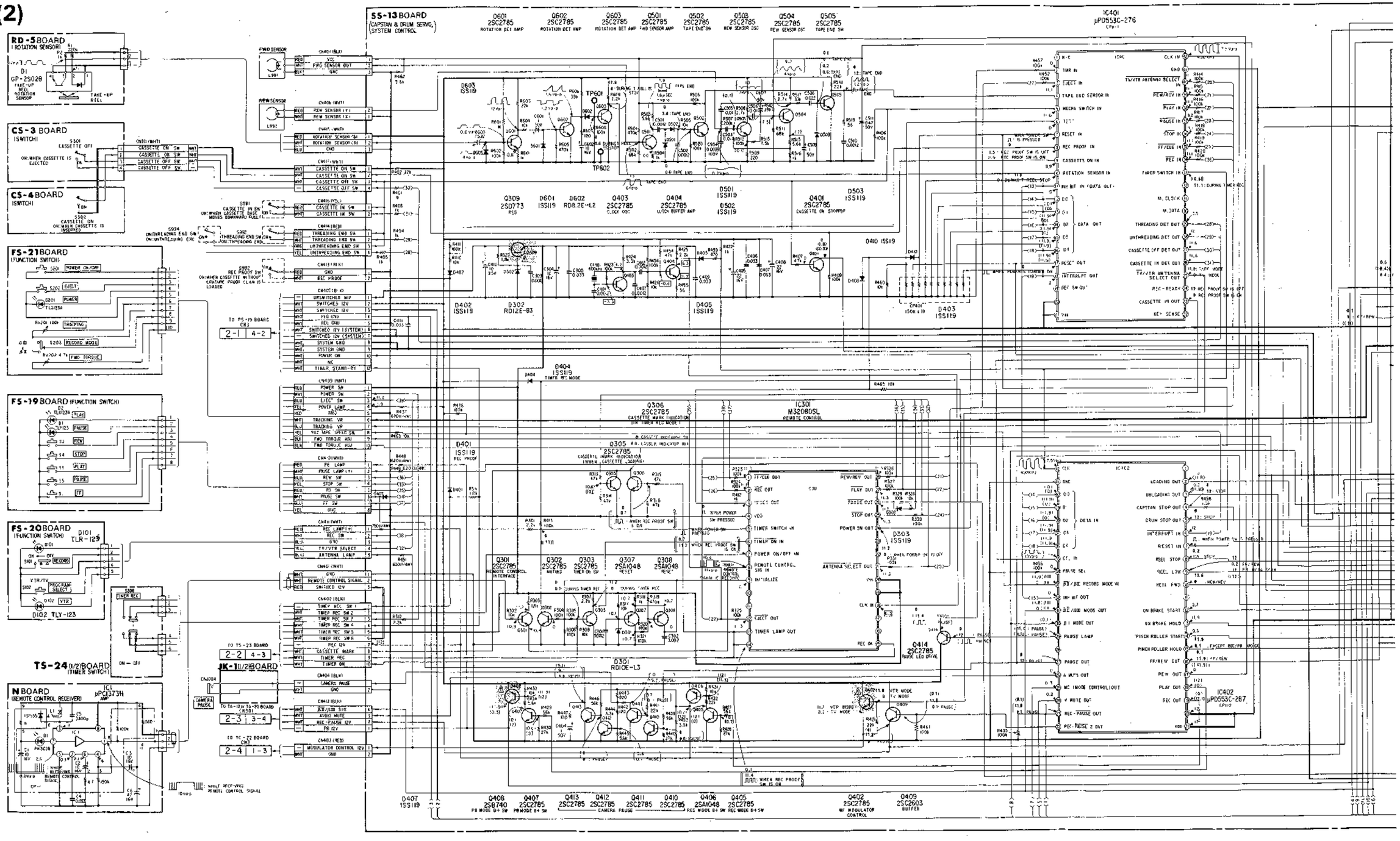
00 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 series, JK-1 BOARD: 9100 series, RD-5 BOARD: 9200 series, CS-3·CS-4 BOARD: 9300 series, N BOARD: 9600 series —





– Ref. No. SS-13 BOARD: 3000 series, GM-2 BOARD: 10000 series, FS-19 BOARD: 4000 series, FS-20 BOARD: 4100 series, FS-21 BOARD: 4200 series, REEL MOTOR BOARD: 5000 series, CAPSTAN MOTOR BOARD: 5100 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 s

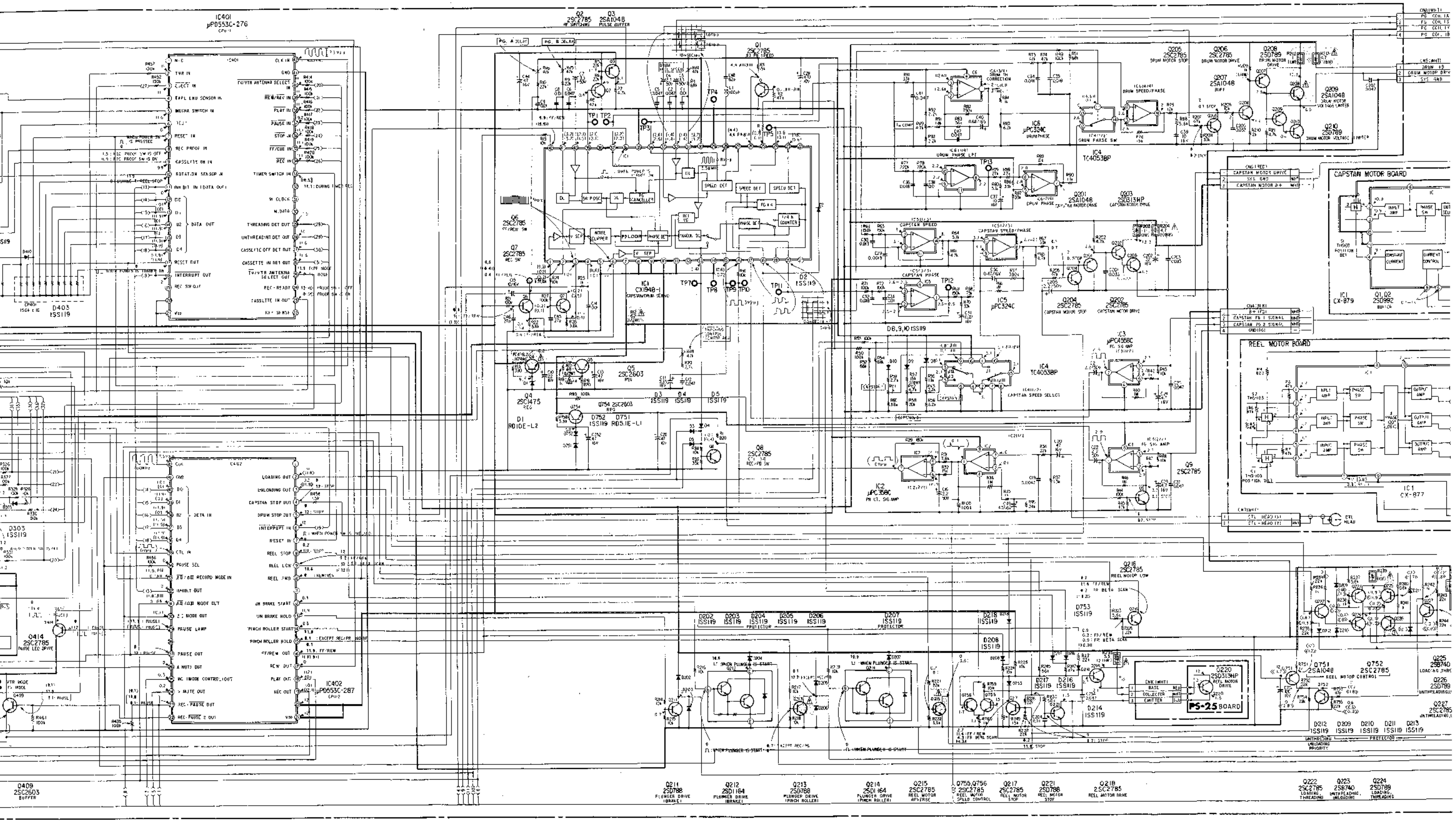
(2)



(REEL MOTOR DRIVE) **REEL MOTOR** (REEL MOTOR) **CAPSTAN MOTOR** (CAPSTAN MOTOR) **TS-24** (TIMER SWITCH) **LM-8** (NOISE FILTER) **JK-1** (JACK) **RD-5** (ROTATION DETECTOR) **CS-3** (CASSETTE ON SWITCH)

K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A1

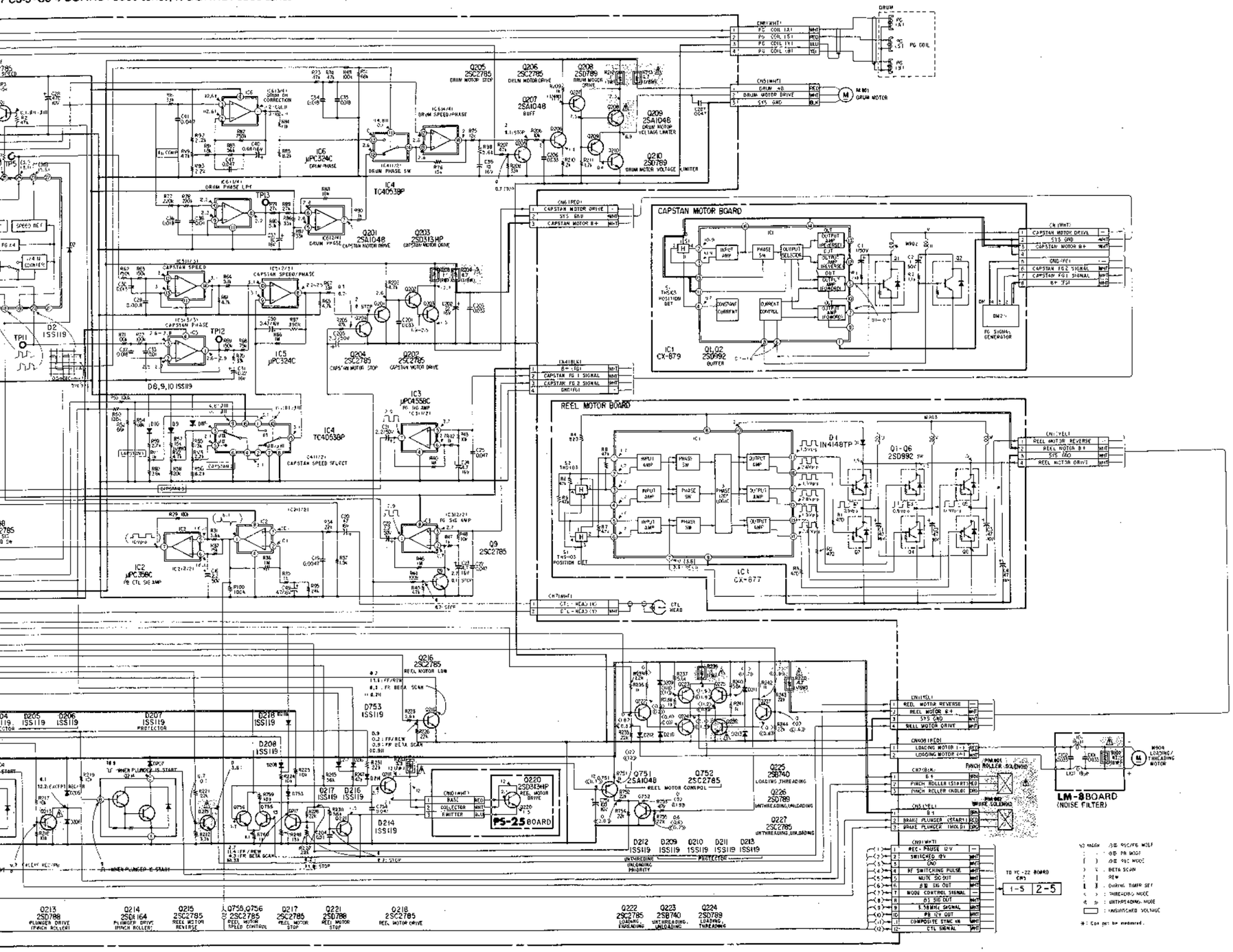
AN MOTOR BOARD: 5100 series, PS-25 BOARD: 7200 series, TS-24 BOARD: 8300 series, LM-8 BOARD: 9000 series, JK-1 BOARD: 9100 series, RD-5 BOARD: 9200 series, CS-3·CS-4 BOARD: 9300 series, N BOARD: 9600 series –



TIMER SWITCH) **LM-8** (NOISE FILTER) **JK-1** (JACK) **RD-5** (ROTATION DETECTOR) **CS-3** (CASSETTE ON SWITCH) **CS-4** (CASSETTE OFF SWITCH) **N** (REMOCON SIGNAL SENSOR)

T | U | V | W | X | Y | Z | A1 | B1 | C1 | D1 | E1

, CS-3·CS-4 BOARD: 9300 series, N BOARD: 9600 series —



NOTES:

- Connection display

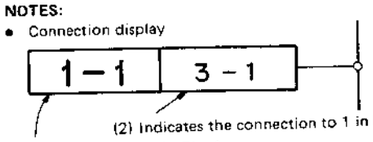


Fig. 1 . . . . . Video block
Fig. 2 . . . . . Servo/system control block
Fig. 3 . . . . . Tuner/audio block
Fig. 4 . . . . . Power/timer block

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- : B + bus.
  (: Unswitched)
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

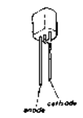
The voltage value is measured using a digital tester (10MΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

TA-12 (VIF, SIF, AFT, AGC) **TU-36** (TUNER) **TS-23** (TIMER, CHANNEL SWITCH) **JK-1** (JACK SWITCH)

μPC574J



CX885B

LA7046

2SA1048
2SA1115
2SC2458
2SC2603

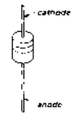
2SA1175
2SC2785

2SC945

2SD773
2SD774

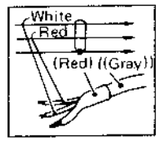
2SK43

1SS119
1SS148



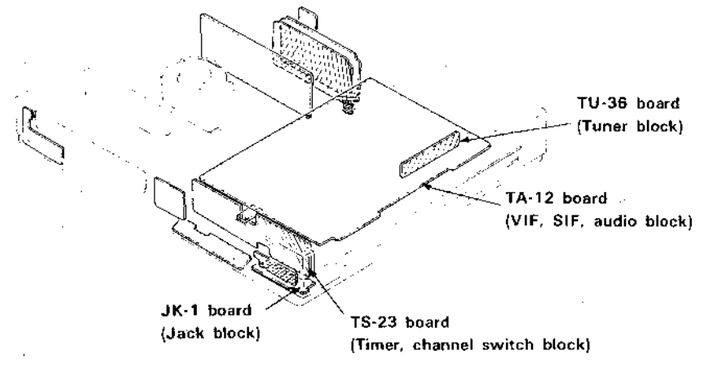
1SS133

- Color code of sleeving over the end of the jacket.



- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- Soldering side
- B + pattern
- [ ]— indicates side identified with part number.
- Ⓕ : fusible resistor.
- ▲ : nonflammable resistor.

[BOARD ARRANGENENT]

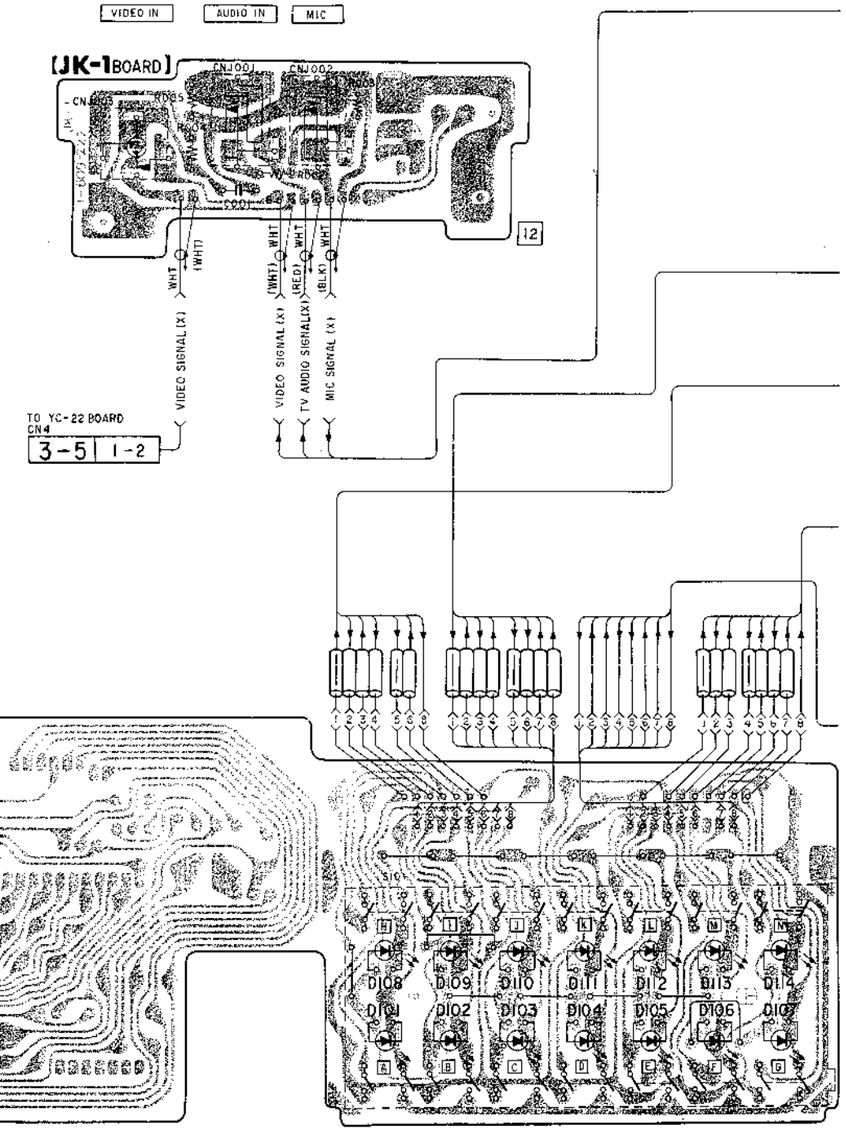


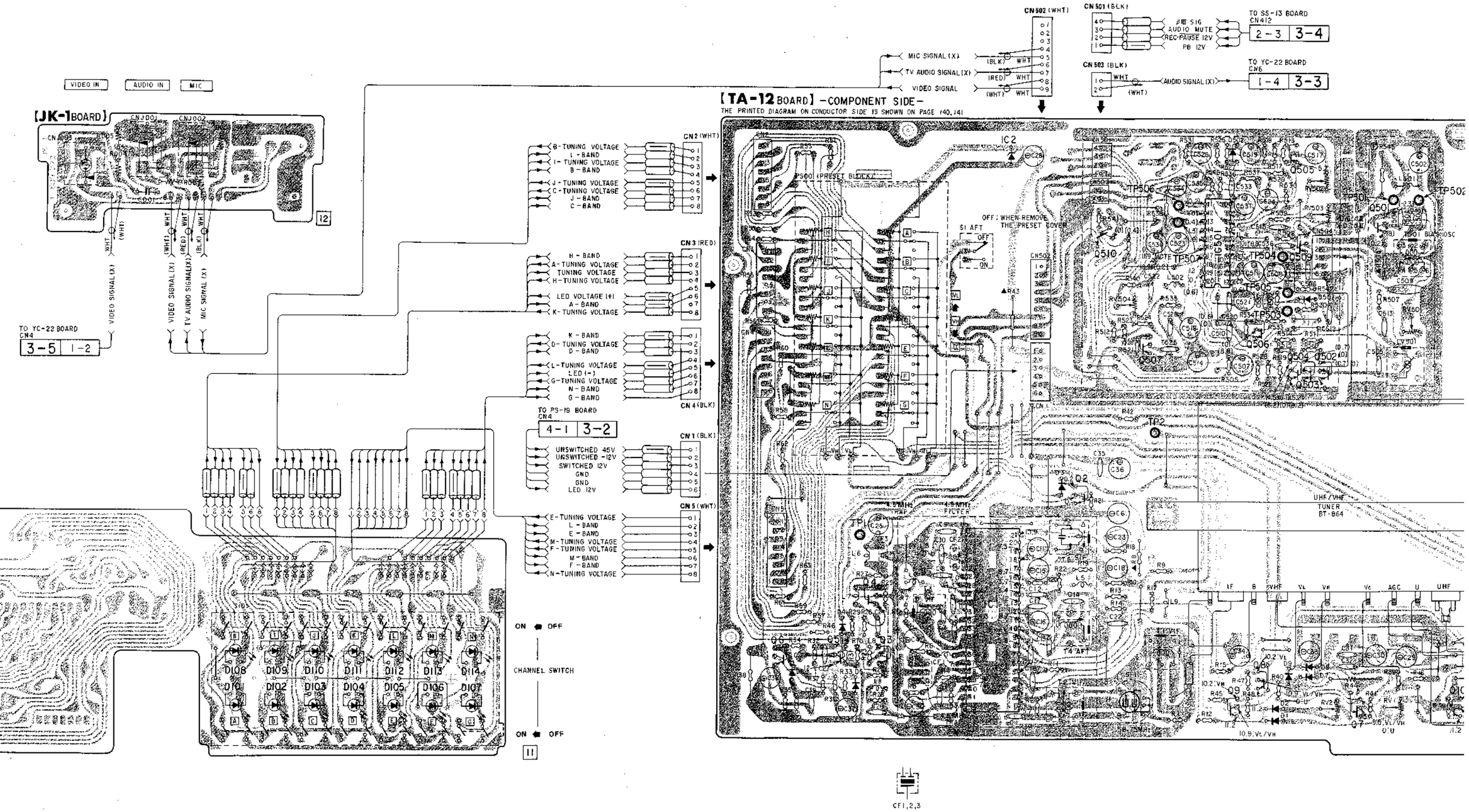
– Ref. No. TA-12 BOARD: 6000 series, TS-23 BOARD: 8000 series, JK-1 BOARD: 9000 series –

A B C D E F G H

(3)

1 2 3 4 5 6 7 8 9 10




VIDEO IN
AUDIO IN
MIC
[JK-1 BOARD]
CNJ001
CNJ002
CNJ003
VIDEO SIGNAL (X)
VIDEO SIGNAL (X)
TV AUDIO SIGNAL (X)
MIC SIGNAL (X)
TO YC-22 BOARD CN4
3-5 1-2
TO PS-19 BOARD CN4
4-1 3-2
CN 502 (WHT)
MIC SIGNAL (X)
TV AUDIO SIGNAL (X)
VIDEO SIGNAL
CN 501 (BLK)
AUDIO MUTE
REC-PAUSE 12V
PB 12V
TO SS-13 BOARD CN412
2-3 3-4
CN 503 (BLK)
AUDIO SIGNAL (X)
TO YC-22 BOARD CN6
1-4 3-3
[TA-12 BOARD] –COMPONENT SIDE–
THE PRINTED DIAGRAM ON CONDUCTOR SIDE IS SHOWN ON PAGE 140, 141
CN2 (WHT)
B-TUNING VOLTAGE
L-BAND
I-TUNING VOLTAGE
B-BAND
J-TUNING VOLTAGE
C-TUNING VOLTAGE
J-BAND
C-BAND
CN3 (RED)
H-BAND
A-TUNING VOLTAGE
TUNING VOLTAGE
H-TUNING VOLTAGE
LED VOLTAGE (+)
A-BAND
K-TUNING VOLTAGE
K-BAND
D-TUNING VOLTAGE
D-BAND
L-TUNING VOLTAGE
LED (–)
G-TUNING VOLTAGE
N-BAND
G-BAND
CN4 (BLK)
CN1 (BLK)
UNSWITCHED 45V
UNSWITCHED –12V
SWITCHED 12V
GND
GND
LED 12V
CN5 (WHT)
E-TUNING VOLTAGE
L-BAND
E-BAND
M-TUNING VOLTAGE
F-TUNING VOLTAGE
M-BAND
F-BAND
N-TUNING VOLTAGE
ON OFF
CHANNEL SWITCH
ON OFF
DI08 DI09 DI10 DI11 DI12 DI13 DI14
DI01 DI02 DI03 DI04 DI05 DI06 DI07
IC2
PS00 (PRESET BLOCK)
OFF; WHEN REMOVE THE PRESET COVER
SI AFT
MUTE
TP501
TP502
TP503
TP504
TP505
TP506
TP1
TP2
4.5MHz TRAP
4.5MHz FILTER
T4 AFT
UHF/VHF TUNER BT-864
LF B VHF VL VH Vc AGC U UHF
CF1,2,3

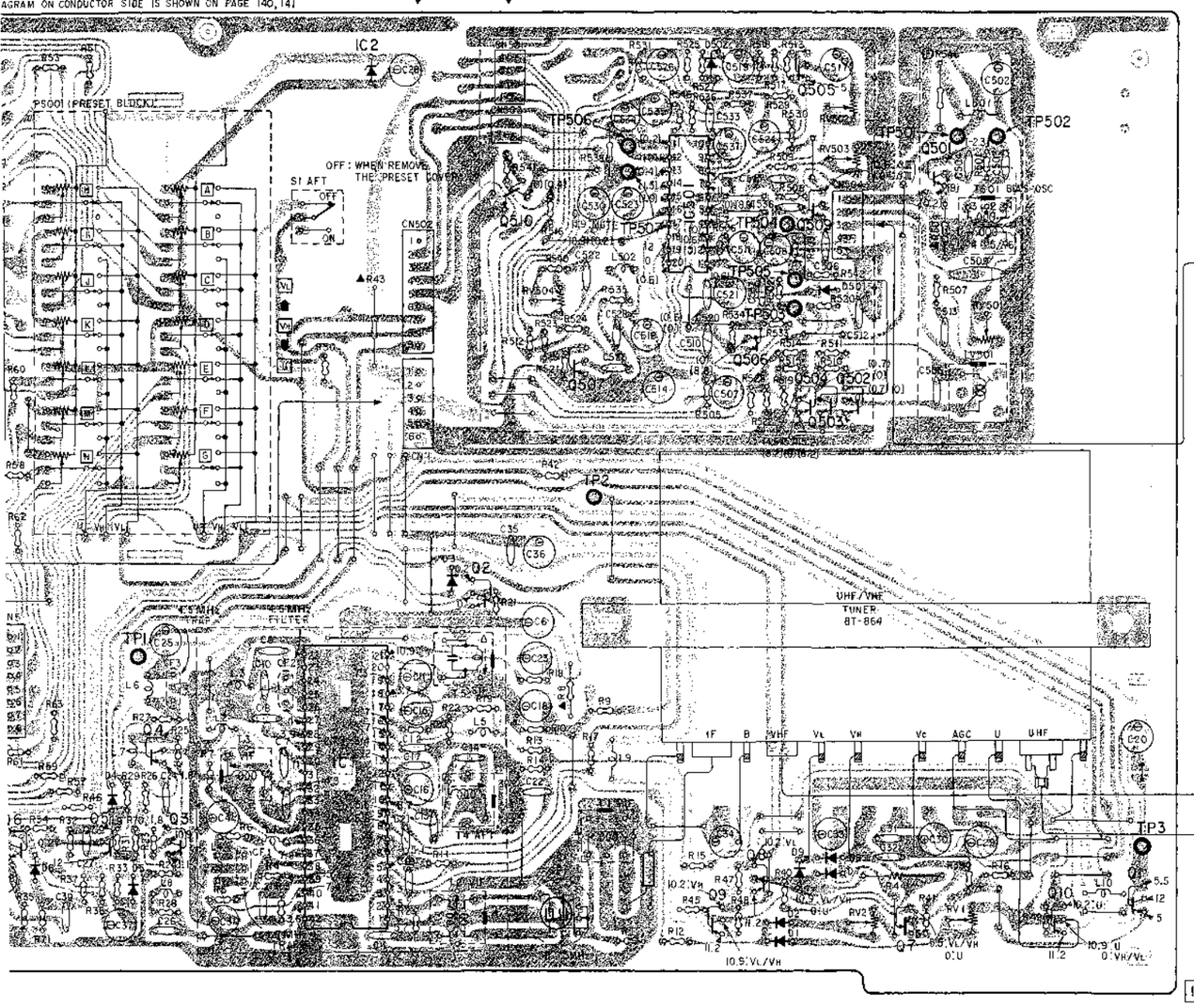
L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A1

CN502 (WHT)
MIC SIGNAL (X) (BLK) WHT
TV AUDIO SIGNAL (X) (RED) WHT
VIDEO SIGNAL (WHT) WHT

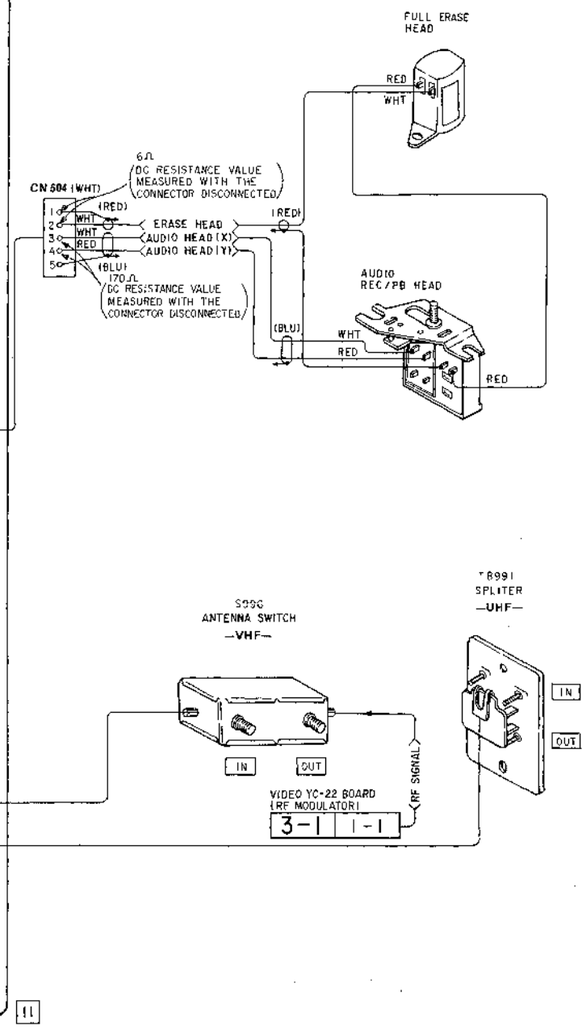
CN501 (BLK)
AUDIO SIG
AUDIO MUTE
REC-PAUSE 12V
PB 12V
TO SS-13 BOARD CN412
2-3 | 3-4

CN503 (BLK)
WHT (AUDIO SIGNAL (X)) (WHT)
TO YC-22 BOARD CN6
1-4 | 3-3

BOARD] -COMPONENT SIDE-
AGRAM ON CONDUCTOR SIDE IS SHOWN ON PAGE 140, 141



CF1,2,3



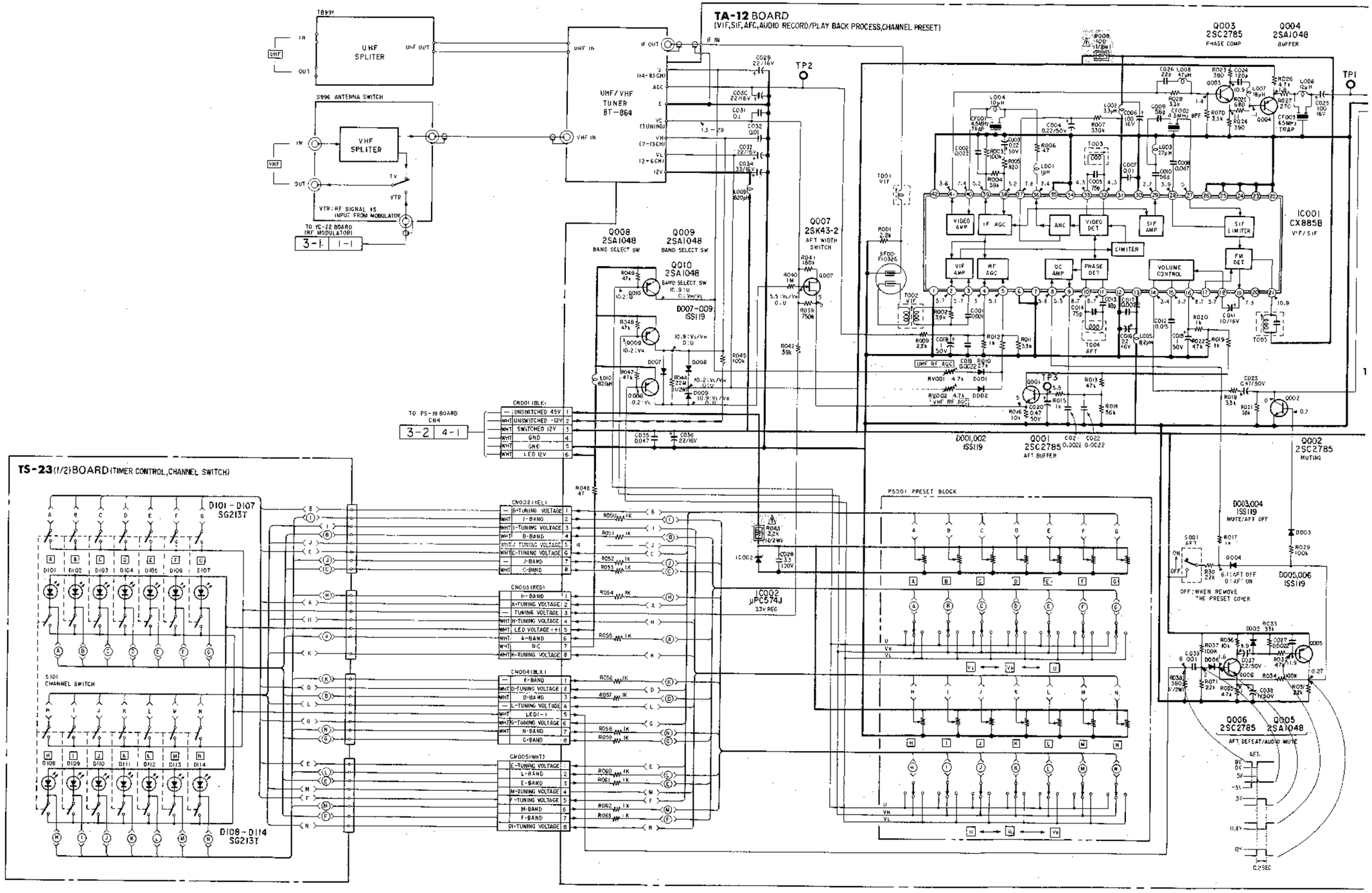
Q,IC	D	TP,RV
IC2 508 505	502	RV502
		501,502 506 507 RV503
501 IC501 510 509		504
	501	505 RV504 503 RV501
506 507		
504,503,502		LV501
		2
2	3	1
4 IC1		
6 5,3 8 1 9,7,10	4 6 9 8 7 5 2 1	3 RV2,1

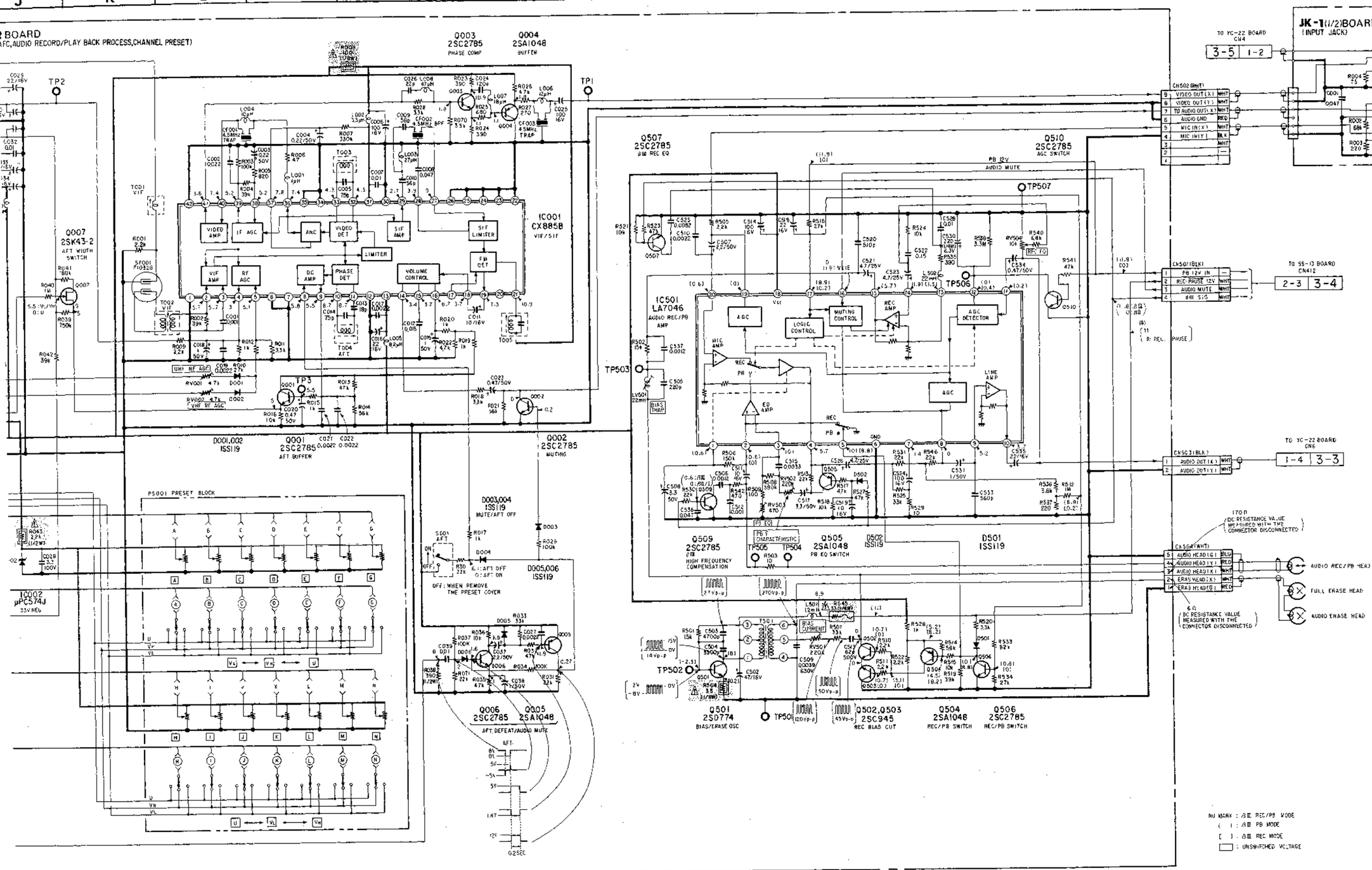
TA-12 (VIF, SIF, AFT, AGC) **TU-36** (TUNER) **TS-23** (TIMER, CHANNEL SWITCH) **JK-1** (JACK SWITCH) — Ref. No. TA-12 BOARD: 6000 series, TS-23 BOARD: 8000 series, JK-1 BOARD: 9000 series —

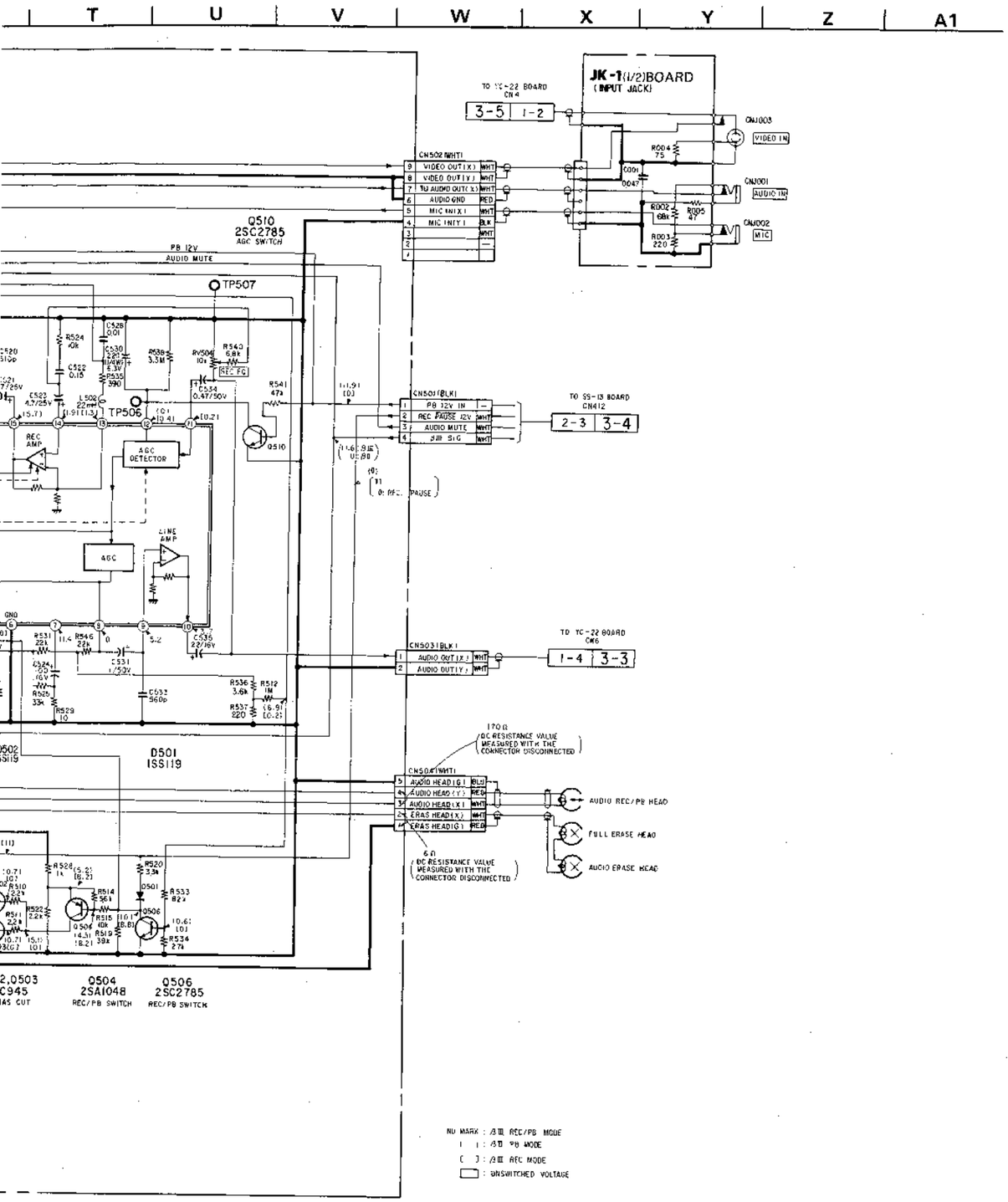
A B C D E F G H I J K L M N O P

1 2 3 4 5 6 7 8 9 10

(3)




2 BOARD
AFC,AUDIO RECORD/PLAY BACK PROCESS,CHANNEL PRESET)
Q003 2SC2785 PHASE COMP
Q004 2SA1048 BUFFER
IC001 CX8858 VIF/SIF
Q007 2SK43-2 AFT WIDTH SWITCH
PS001 PRESET BLOCK
IC002 μPC574J 33V REG
D001,002 ISS119
Q001 2SC2785 AFT BUFFER
Q002 2SC2785 MUTING
D003,004 ISS119 MUTE/AFT OFF
D005,006 ISS119
OFF: WHEN REMOVE THE PRESET COVER
Q006 2SC2785 Q005 2SA1048 AFT DEFEAT/AUDIO MUTE
Q507 2SC2785 PB REC EQ
Q510 2SC2785 AGC SWITCH
IC501 LA7046 AUDIO REC/PB AMP
Q509 2SC2785 HIGH FREQUENCY COMPENSATION
Q505 2SA1048 PB EQ SWITCH
D502 ISS119
D501 ISS119
Q501 2SD774 BIAS/ERASE OSC
Q502,Q503 2SC945 REC BIAS CUT
Q504 2SA1048 REC/PB SWITCH
Q506 2SC2785 REC/PB SWITCH
JK-1 (1/2) BOARD (INPUT JACK)
TO YC-22 BOARD CN4
TO SS-10 BOARD CN412
TO YC-22 BOARD CN6
AUDIO REC/PB HEAD
FULL ERASE HEAD
AUDIO ERASE HEAD
NO MARK : AIII REC/PB MODE
( ) : AIII PB MODE
[ ] : AIII REC MODE
: UNSWITCHED VOLTAGE



NOTES:

- Connection display

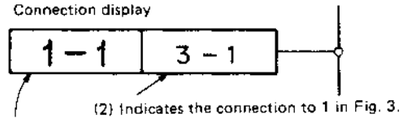


Fig. 1 . . . . . Video block
Fig. 2 . . . . . Servo/system control block
Fig. 3 . . . . . Tuner/audio block
Fig. 4 . . . . . Power/timer block

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- : B + bus.
- : B − bus.
- (□ : Unswitched)
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

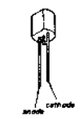
The voltage value is measured using a digital tester (10MΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

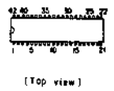
When indicating parts by reference number, please include the board name.

TA-20 (VIF, SIF, AFT, AGC) **TU-54** (TUNER) **TS-23** (TIMER, CHANNEL SWITCH)

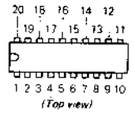
μPC574J



CX885B

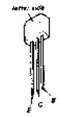


LA7046



2SA1048-GR
2SA1115
2SC2458
2SC2603

2SA1175
2SC2785

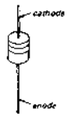


2SC945

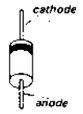
2SD773
2SD774

2SK108

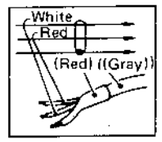
1SS119
1SS148



1SS133
RD9.1EB1

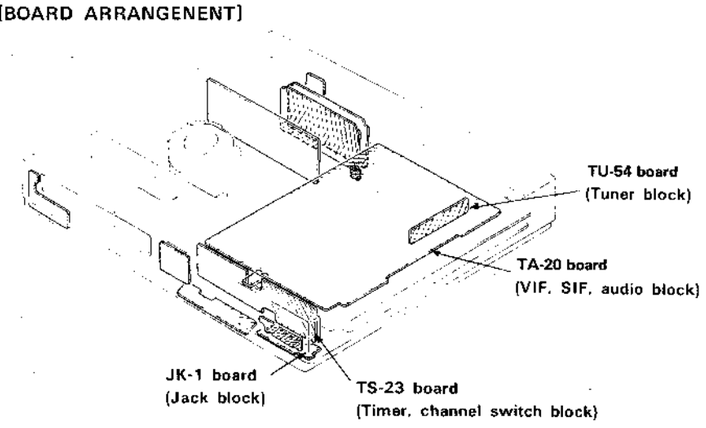


- Color code of sleeving over the end of the jacket.



- o— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- Soldering side
- B + pattern
- [ ]— indicates side identified with part number.
- Ⓕ : fusible resistor
- ▲ : nonflammble resistor

[BOARD ARRANGENENT]



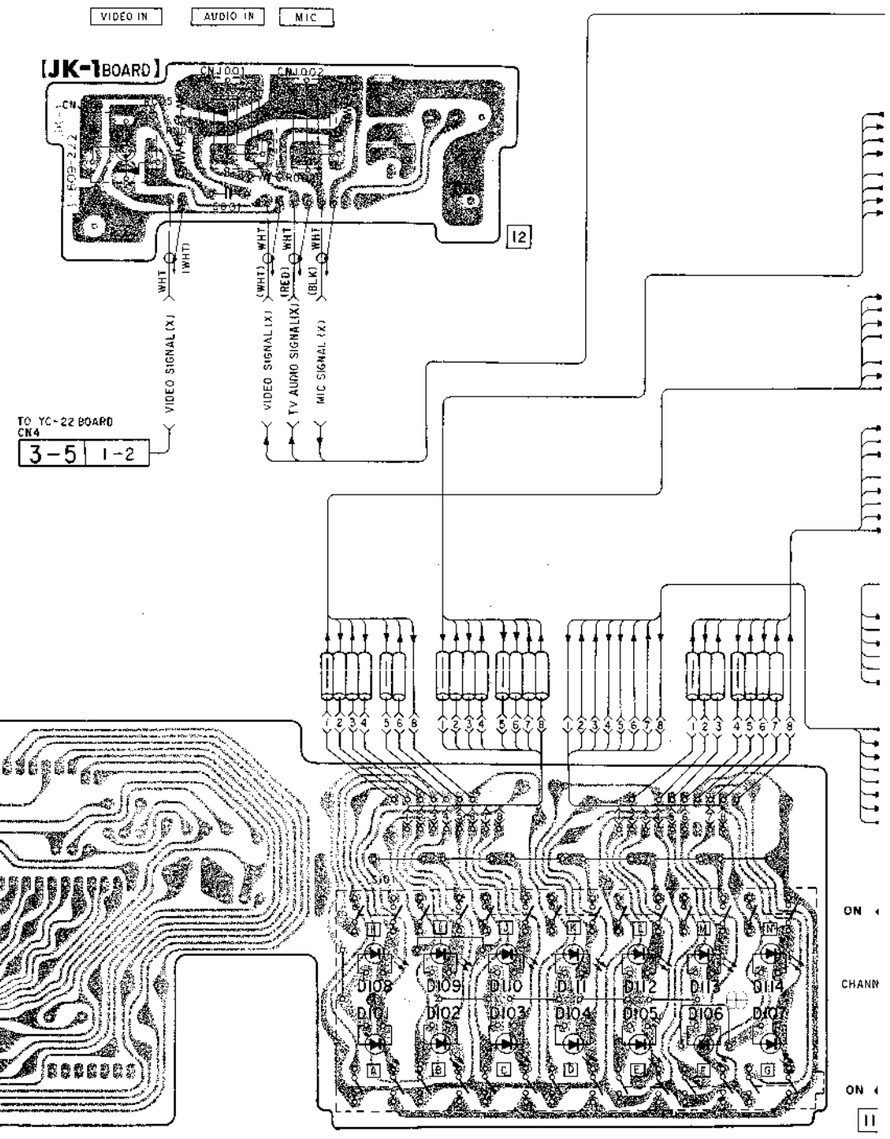
JK-1 (JACK SWITCH)

— Ref. No. TA-12 BOARD: 6000 series, TS-23 BOARD: 8000 series, JK-1 BOARD: 9000 series —

A B C D E F G H I

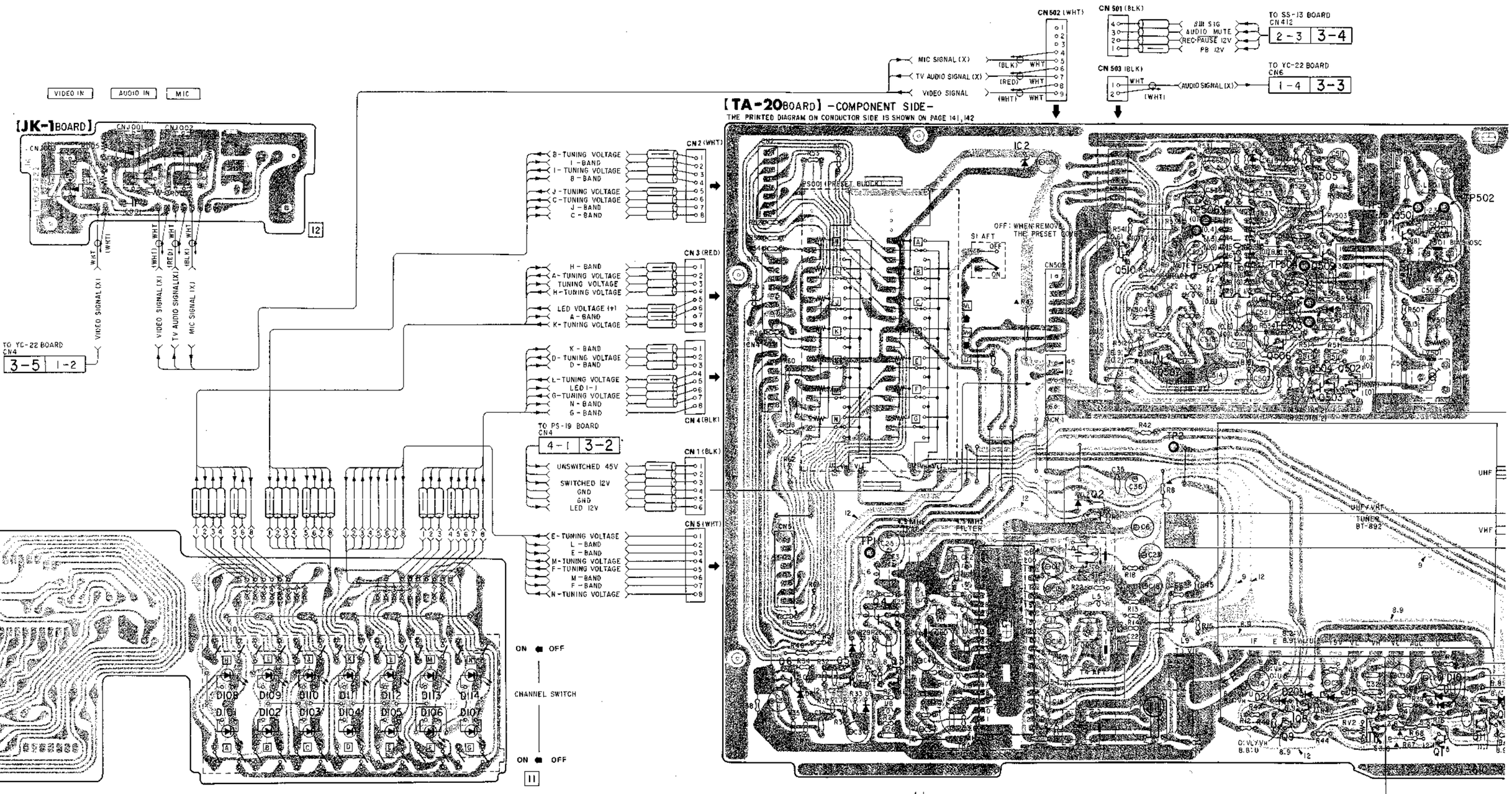
1 2 3 4 5 6 7 8 9 10

(3)



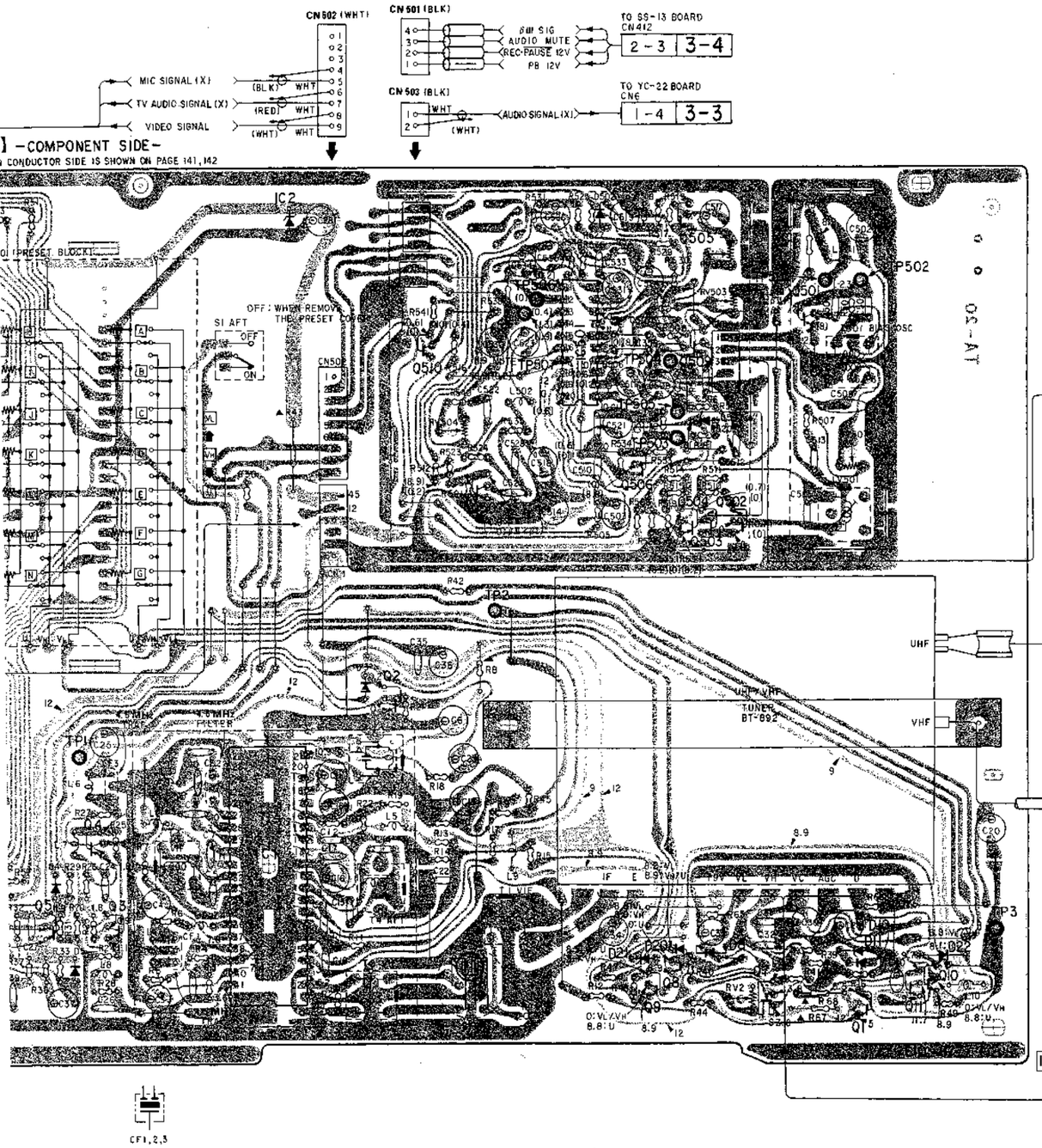
ARD: 6000 series, TS-23 BOARD: 8000 series, JK-1 BOARD: 9000 series —

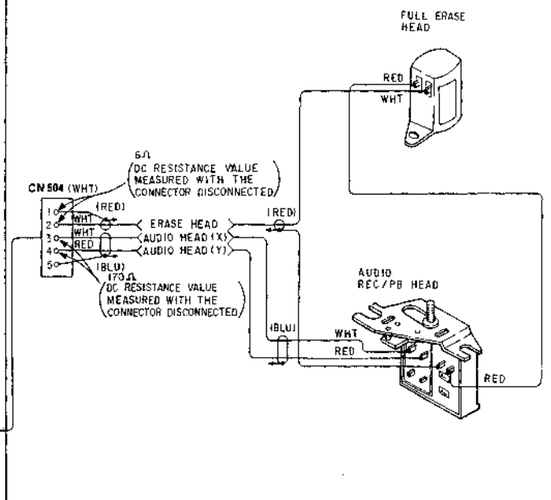
D E F G H I J K L M N O P Q R S T

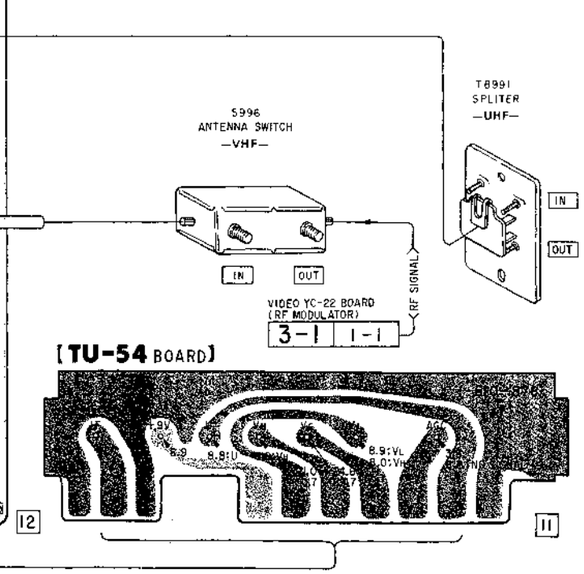


CF1,2,3

M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | A1 | B1







Q, IC	D	TP, RV
IC2 508 505	502	
		RV502
		501,502
		506
501		507 RV503
IC501		
509		
510		504
	501	505
		RV504
		503
		RV501
506		
507		
504,503,502		LV501
		2
2	3	
		1
4		
IC1		
	4	
6 5,3	6 21 20 8	3
	11 22	
	5 10	
8 11 10		
9,7		RV2
1		

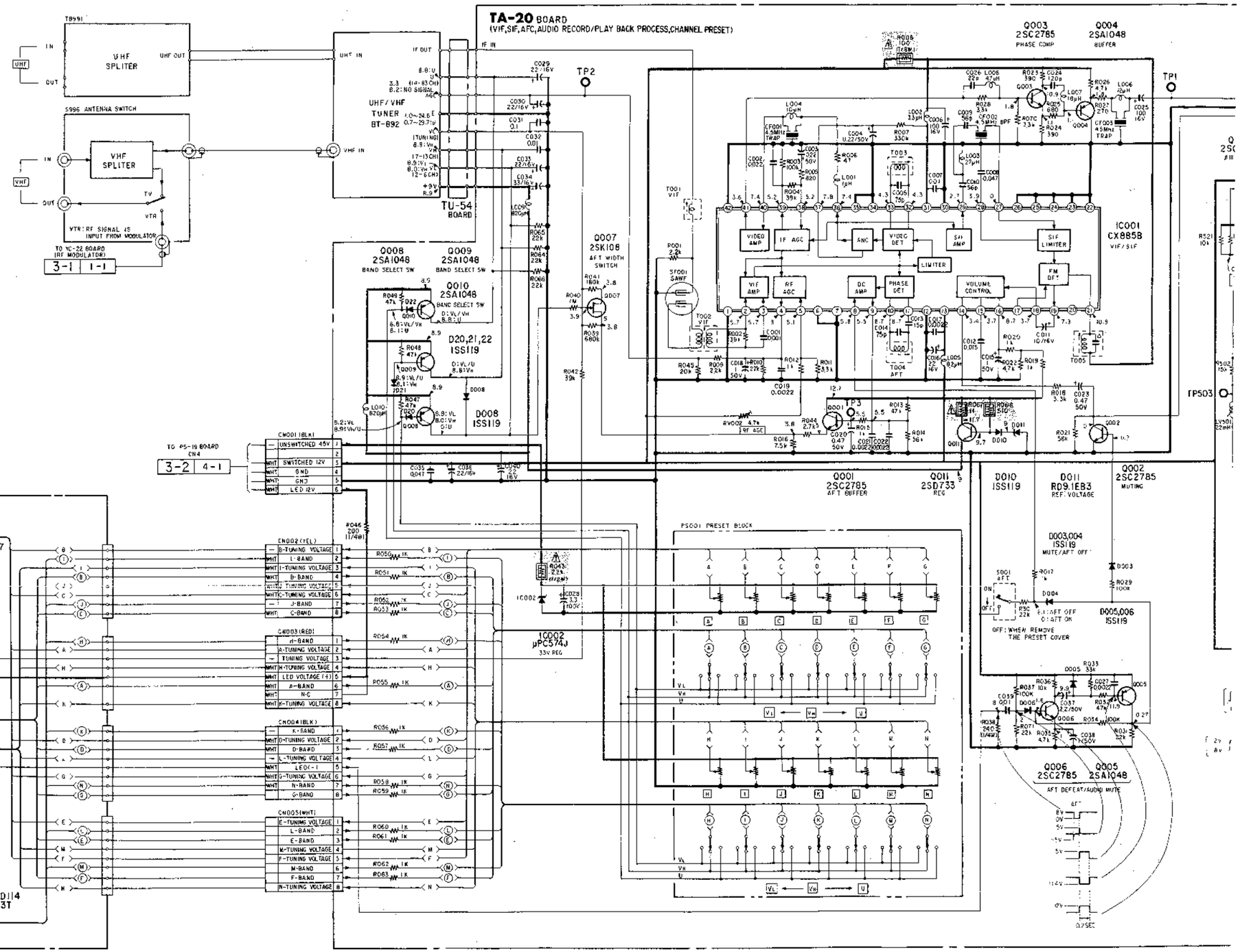
NEW

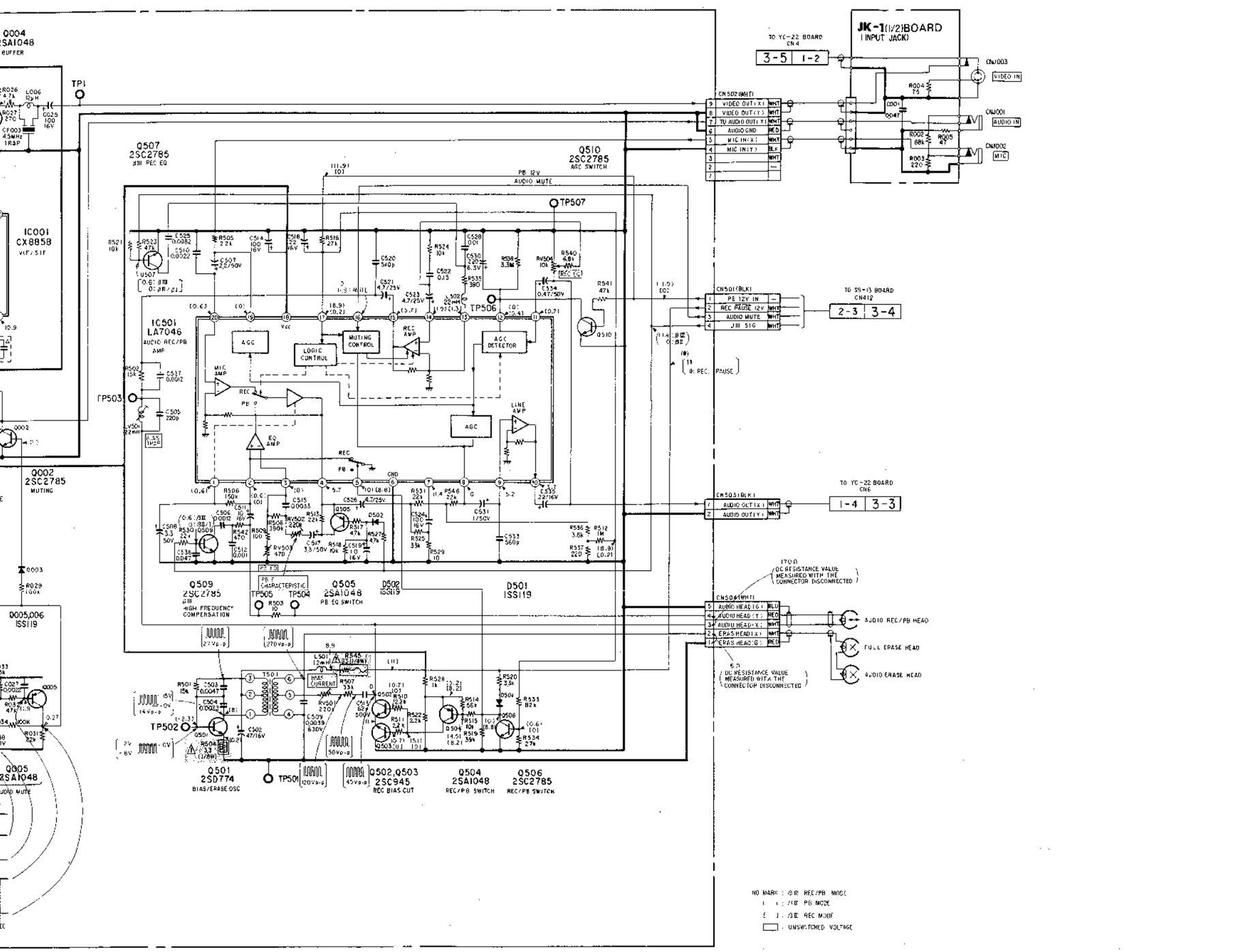
TUNER, AUDIO TUNER, AUDIO

NEW

TA-20 (VIF, SIF, AFT, AGC) **TU-54** (TUNER) **TS-23** (TIMER, CHANNEL SWITCH) **JK-1** (JACK SWITCH) – Ref. No. TA-12 BOARD: 6000 series, TS-23 BOARD: 8000 series, JK-1 BOARD: 9000 series –

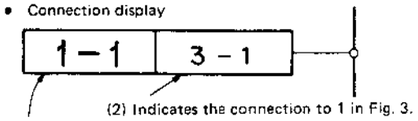
(3)





NOTES:

- Connection display



- Fig. 1 . . . . . Video block
  Fig. 2 . . . . . Servo/system control block
  Fig. 3 . . . . . Tuner/audio block
  Fig. 4 . . . . . Power/timer block
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- △ : internal component
- : B + bus.
- (▭ : Unswitched)
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.

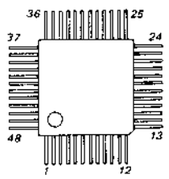
The voltage value is measured using a digital tester (10MΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

PS-19 (LINE FILTER)

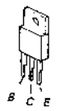
LR3466



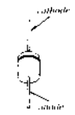
STK5324

2SB733

2SC1061
2SD313HP

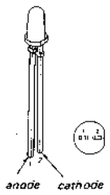


ERC01-02FL

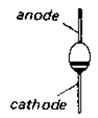


SIB01-02

SG213T



V06C



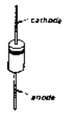
PS-20 (POWER SUPPLY)

2SA1048
2SA1115
2SC2458
2SC2603

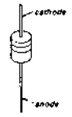
2SA1175
2SC2785

2SA772
2SB739

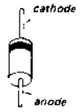
10E1
10E2
ERB12-02RK
GP08D
S3V40
S3V10F



1SS119
1SS148



1SS133
RD5.1EB2
RD11EB2
RD11EB3

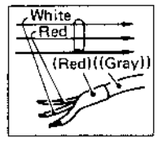


PS-21 (50 Hz/60 Hz TIMER SELECT SWITCH)

TS-23 (TIMER, CHANNEL SWITCH)

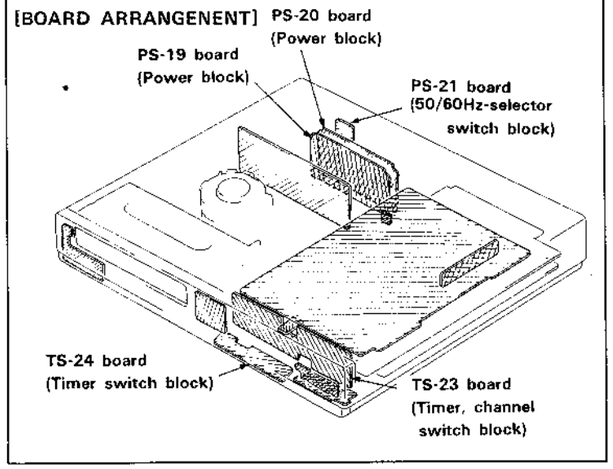
TS-24 (TIMER SWITCH)

- Color code of sleeving over the end of the jacket.



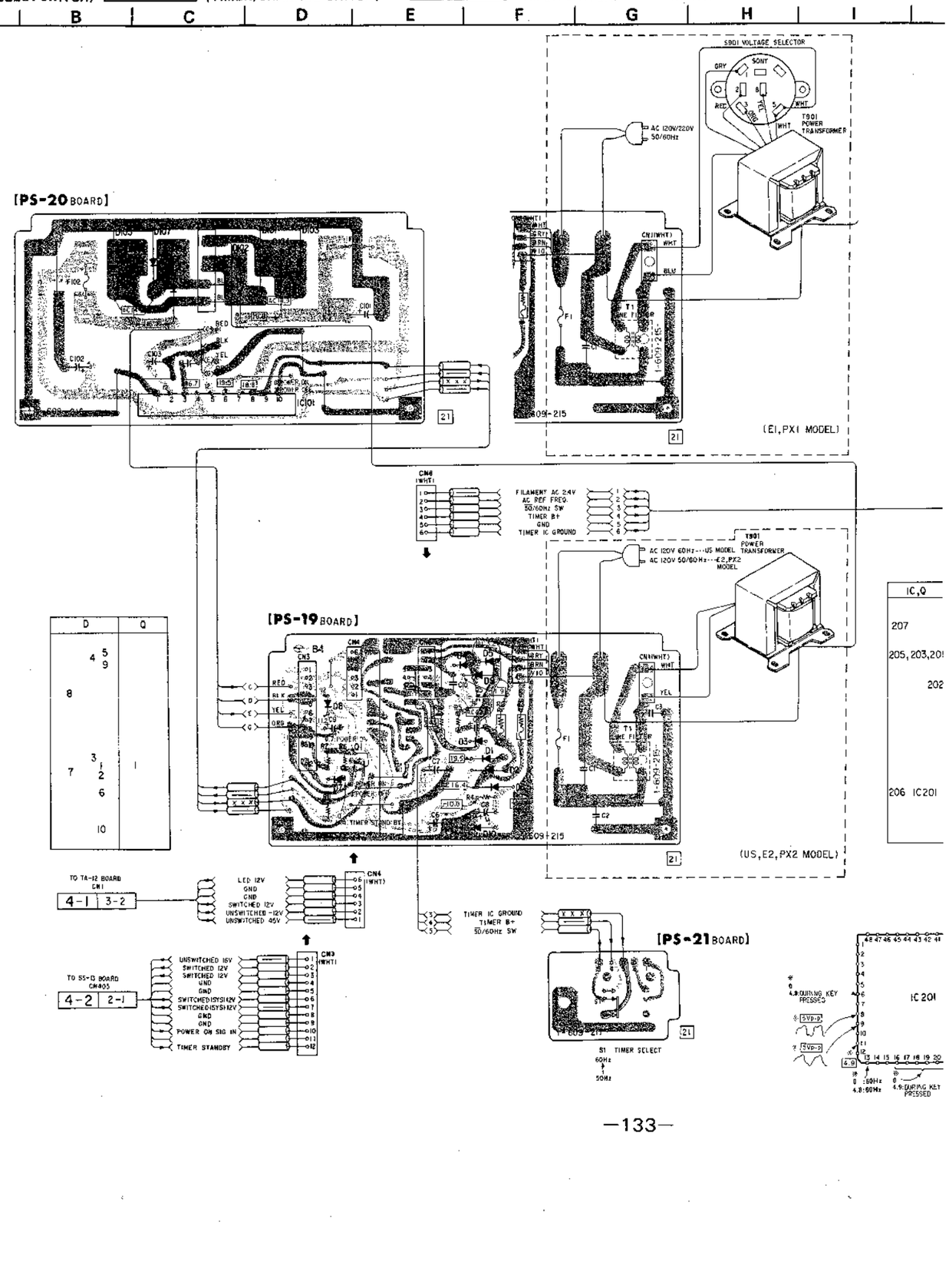
- ○— indicates a lead wire mounted on the component side.
- —● indicates a lead wire mounted on the printed side.
- Soldering side
- B + pattern
- B − pattern
- Timer IC ground

[BOARD ARRANGENENT]



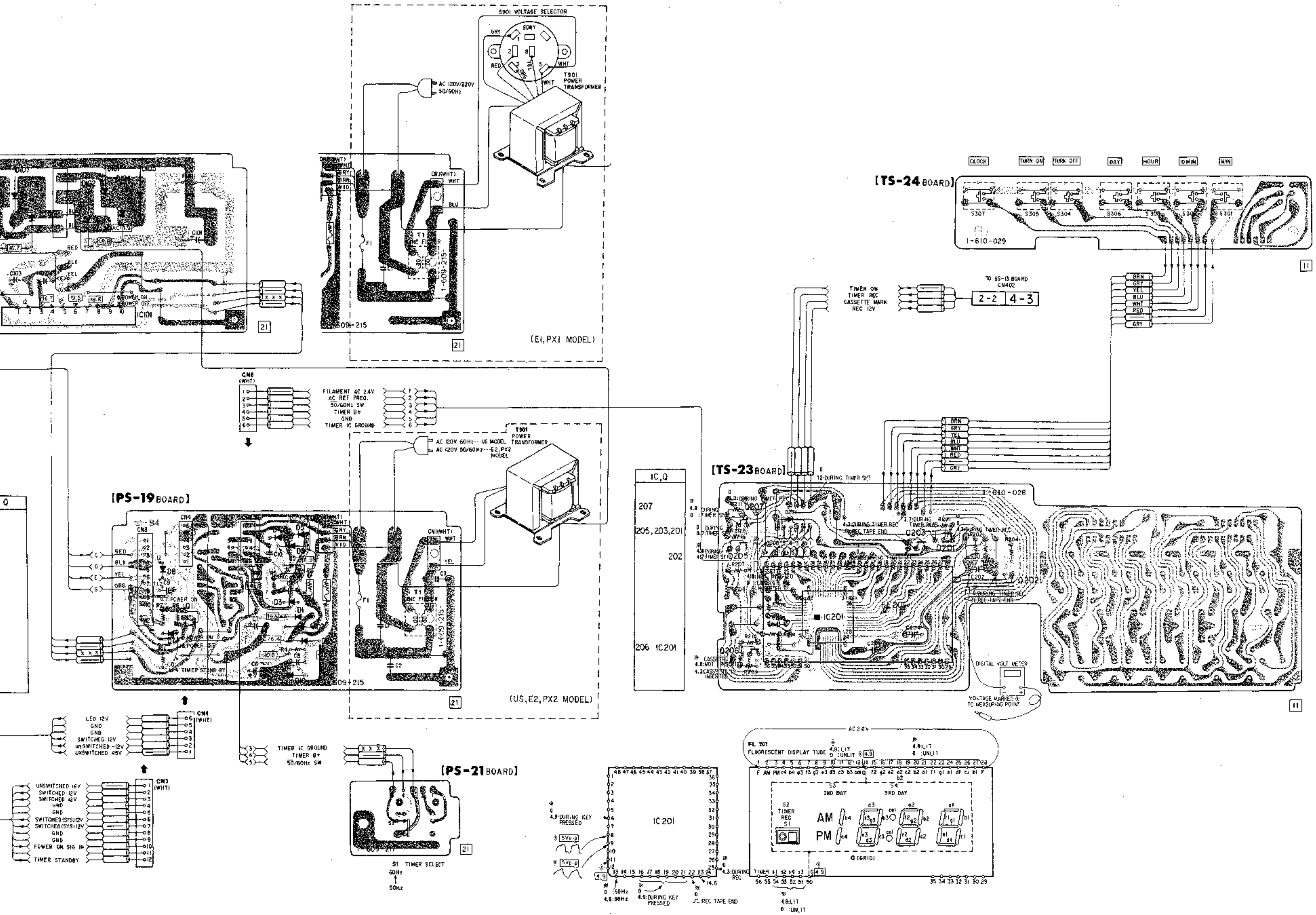
— Ref. No. PS-19 BOARD: 7000 series, PS-20 BOAF

(4)



S-23 (TIMER, CHANNEL SWITCH) TS-24 (TIMER SWITCH) – Ref. No. PS-19 BOARD: 7000 series, PS-20 BOARD: 7100 series, PS-21 BOARD: 7300 series, TS-23 BOARD: 8000 series, TS-24 BOARD: 8300 series –

C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R



PS-19 (LINE FILTER) PS-20 (POWER SUPPLY) PS-21 (50 Hz/60 Hz TIMER SELECT SWITCH) TS-23 (TIMER, CHANNEL SWITCH) TS-24 (TIMER SWITCH) – Ref No. PS-19 BOARD: 7000 series, PS-20 BOARD: 7100 series, PS-21 B(

A B C D E F G H I J K L M N O O

(4)

(E1, PX1 MODEL)

PS-19 (1/2) BOARD
(POWER SUPPLY (LINE FILTER))

AC 120V 220V 50/60Hz

F1 2A 125V

T1 LFT

C1 0.22 300V

R1 2.2M (1/2W)

CN1 (WHT)

1	AC	WHT
2	NC	
3	AC	BLU

T901 POWER TRANSFORMER

S901 VOLTAGE SELECTOR

WHT 120V 0V
ORG 127V
GRY 100V
YEL 117V
BLU 220V

F901 0.25A 250V

※=NOT REPLACEABLE, BUILT IN TRANSFORMER

(US, E2, PX2 MODEL)

PS-19 (1/2) BOARD
(POWER SUPPLY (LINE FILTER))

AC 120V 60Hz US MODEL
AC 120V, 50/60Hz E2, PX2 MODELS

F1 2A 125V

T1 LFT

C1 0.022 300V

R1 2.2M (1/2W)

C2 2200p 125V

C3 2200p 125V

CN1 (WHT)

1	AC 120V	WHT
2	NC	
3	AC 120V	YEL

T901 POWER TRANSFORMER

※=NOT REPLACEABLE, BUILT IN TRANSFORMER

PS-21 BOARD
(POWER SUPPLY (SWITCH))

S1 TIMER SELECT

60Hz 50Hz

PS-19 (1/2) BOARD
(POWER SUPPLY) REGULATOR

D3 ISS119

D4, D5 ISS119 REF GEN

CN2 (BLK)

VIO	18V AC	4
BRN	45V AC	3
GRY	24V AC	2
WHT	GND	1

R3 100 1/4W

R2 10 1/4W

D1 19.5

AC 6.4

C4 50V 100k

R5 100k

D9 RD5.1E-B2

D3

C5 330 6.3V

D4

D5 AC 3.2

4.9

C10 0.01

AC 42.6

C7 470 35V

14.5

R10 2.2k

CN6 (WHT)

1	FILAMENT AC 2.4V	—
2	AC REF FREQ	WHT
3	50/60Hz SW	WHT
4	TIMER B+	WHT
5	GND	WHT
6	TIMER IC GND	WHT

FL201 FLUORESCENT DISPLAY TUBE

F AM PM c4 b4 a3 f3 g3 e3 c

1 2 3 4 5 6 7 8 9

D201

4.9 LIT 0.8 UNLIT

PS-20 BOARD
(POWER SUPPLY (REGULATOR))

D101 – D108 S3V10F RECT

IC101 STK5324 REGULATOR / POWER ON, OFF CONTROL

IC101

REG2 REG1 MUTE2 MUTE1

GND2 B+ FILTER GND1

10 9 8 7 6 5 4 3 2 1

19.5 12

C104 100 25V

C103 47 16V

0: POWER ON
3: POWER OFF

18.8

D101 D102 D103 D104

AC 14.8

F101 3.15A 125V

C101 10000/25V (US MODEL) 4700/25V (E, PX MODEL)

D105 D106 D107 D108

AC 14.8

F102 2A 125V

C102 6800 25V

16.7

CN101 (WHT)

RED	SYS AC	1
RED	SYS AC	2
BLU	REG AC	3
BLU	REG AC	4

D1, D2, D6 10E1 RECT

D2

C6 33 100V

D6

-16.9

R4 1k

-10.8

C8 10 25V

D10

D10 RD11E-B2 REGULATOR

TO TA-12 or TA-20 BOARD CN1

4-1 3-2

CN4 (WHT)

1	UNSWITCHED 45V	—
2	UNSWITCHED -12V	WHT
3	SWITCHED 12V	WHT
4	GND	WHT
5	GND	WHT
6	I FD 12V	WHT

11.2

D8

12

D8 ISS119 REVERSE CURRENT STOPPER

TO SS-13 BOARD CN405

4-2 2-1

CN3 (WHT)

1	UNSWITCHED 16V	—
2	SWITCHED 12V	WHT
3	SWITCHED 12V	WHT
4	GND	WHT
5	GND	WHT
6	SWITCHED (SYS) 12V	WHT
7	SWITCHED (SYS) 12V	—
8	GND	WHT
9	GND	WHT
10	POWER ON SIG IN	WHT
11		WHT
12	TIMER STAND BY	WHT

C9 47/16V

12

R11 6.8k 0: POWER ON 3: POWER OFF

Q1 2SC2785 POWER ON/OFF CONTROL

R7 10k W

R6 10k 0.7: POWER ON

D7 ISS119 REVERSE CURRENT STOPPER

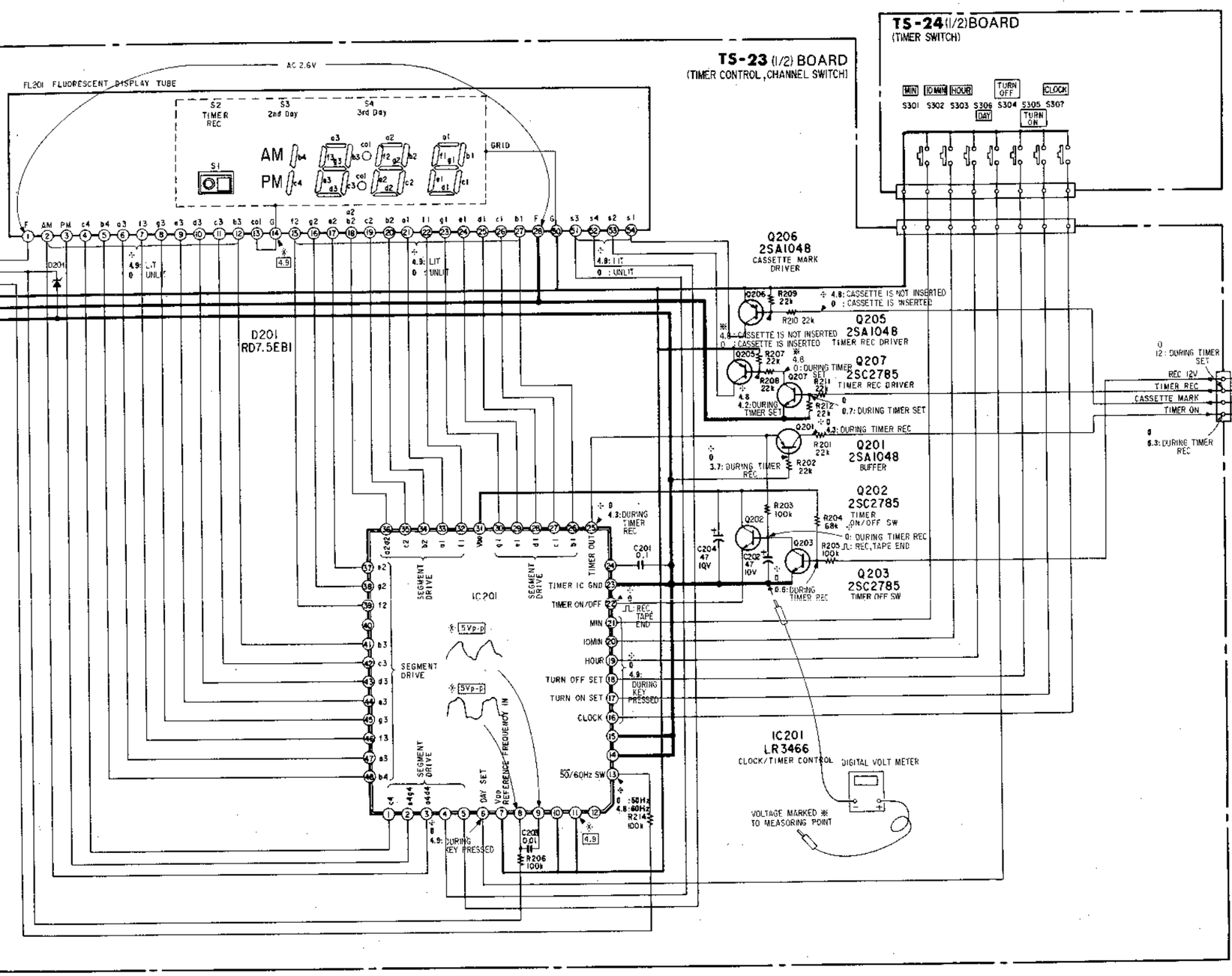
D7

0 11.4: TIMER STAND BY

1 2 3 4 5 6 7 8 9 10

PS-20 BOARD: 7100 series, PS-21 BOARD: 7300 series, TS-23 BOARD: 8000 series, TS-24 BOARD: 8300 series –

O | P | Q | R | S | T | U | V | W | X | Y | Z | A1



NO MARK : E-E MODE
□ : UNSWITCHED VOLTAGE

NOTES:

- Connection display

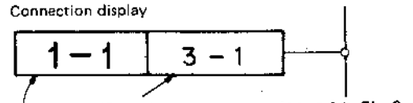


Fig. 1 . . . . . Video block
Fig. 2 . . . . . Servo/system control block
Fig. 3 . . . . . Tuner/audio block
Fig. 4 . . . . . Power/timer block

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- : Nonflammable resistor
- : Fusible resistor
- : B + bus.
- : B – bus.
- (□ : Unswitched)
- The voltage value is a reference value between the grounding when the color bar signal is received from a color bar generator.
  ※ : Reference value between timer IC and grounding

The voltage value is measured using a digital tester (10MΩ/V).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

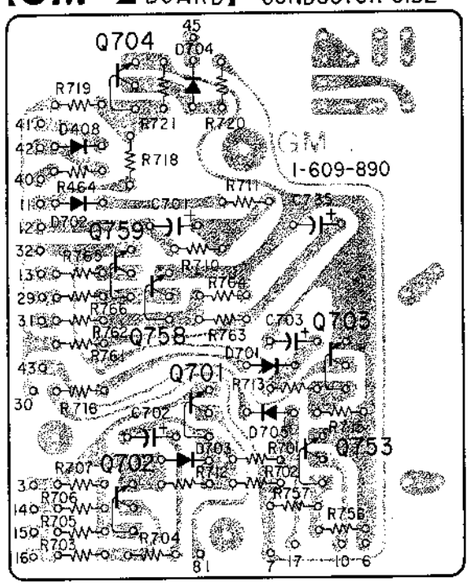
GM-2 (SYSTEM CONTROL) CAPSTAN MOTOR (CAPSTAN MOTOR) TA-12 (VIF, SIF, AFT, AGC)

– Ref. No. GM-2 BOARD: 10000 series, CAPSTAN MOTOR BOARD: 5100 series –

– Ref. No. TA-12 BOARD: 6000 series –

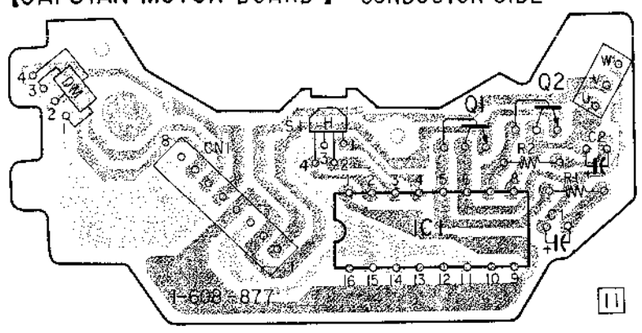
The printed diagram on component side is shown in servo and system control blocks (on pages 92 to 96).

[GM-2 BOARD] – CONDUCTOR SIDE –



13

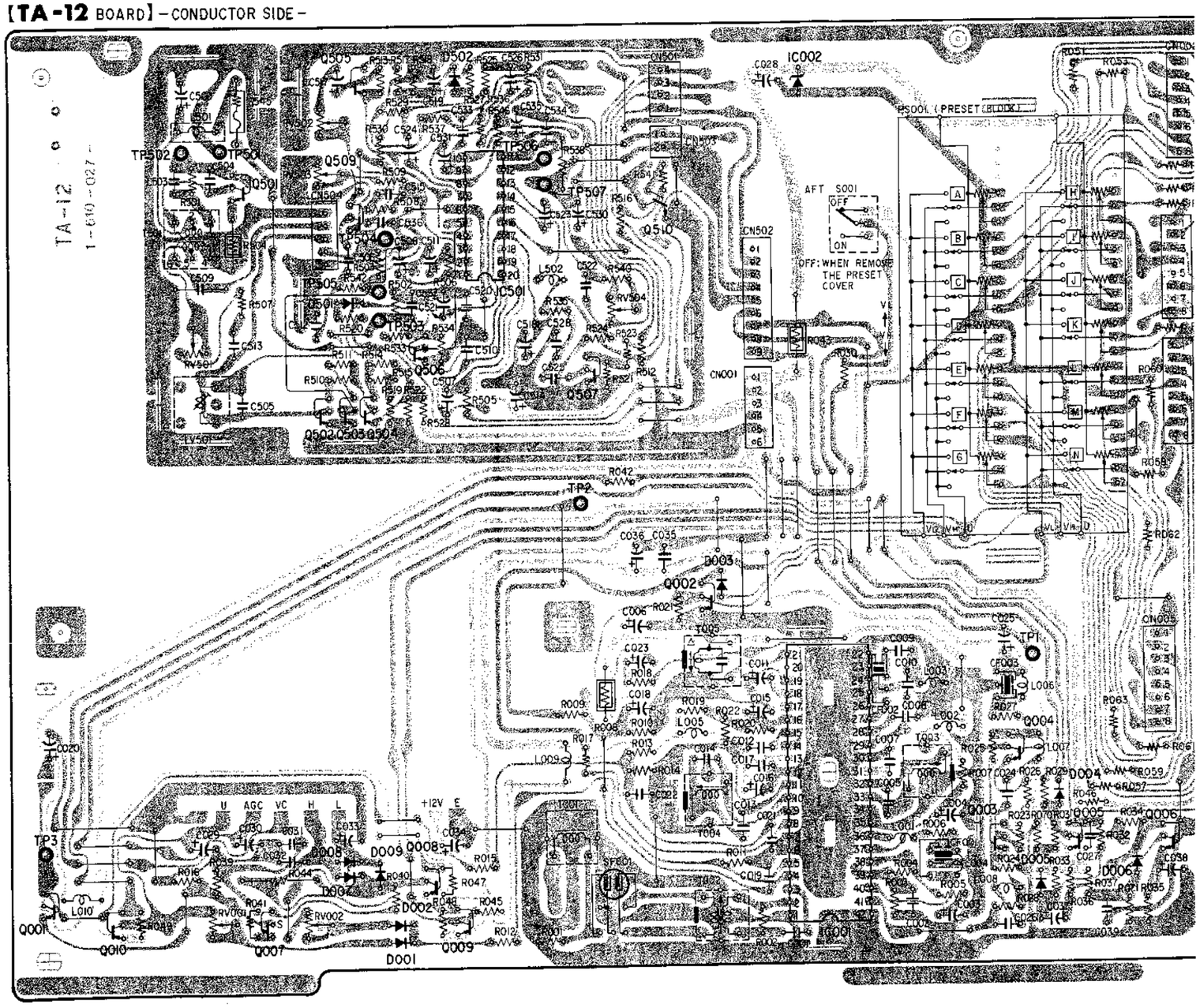
[CAPSTAN MOTOR BOARD] – CONDUCTOR SIDE –



11

The printed diagram on component side is shown in tuner and audio blocks (on pages 112 to 116).

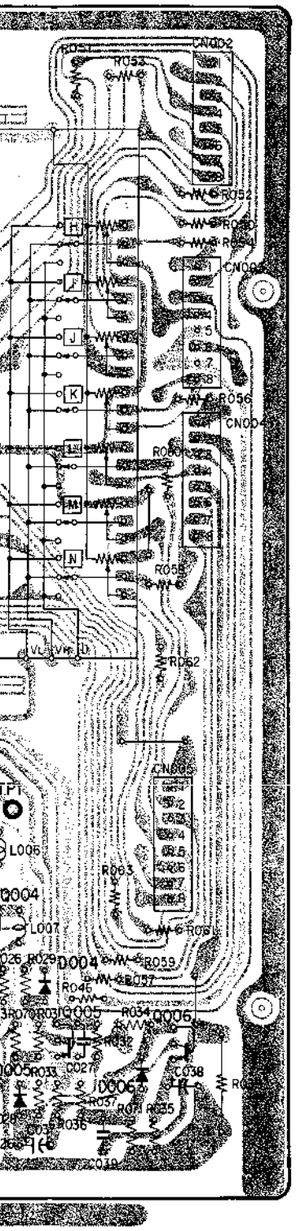
[TA-12 BOARD] – CONDUCTOR SIDE –



• ⬚ indicates side identified with part number.

• ▨ Soldering side

J K L M



11

indicates side identified with part number.

Soldering side

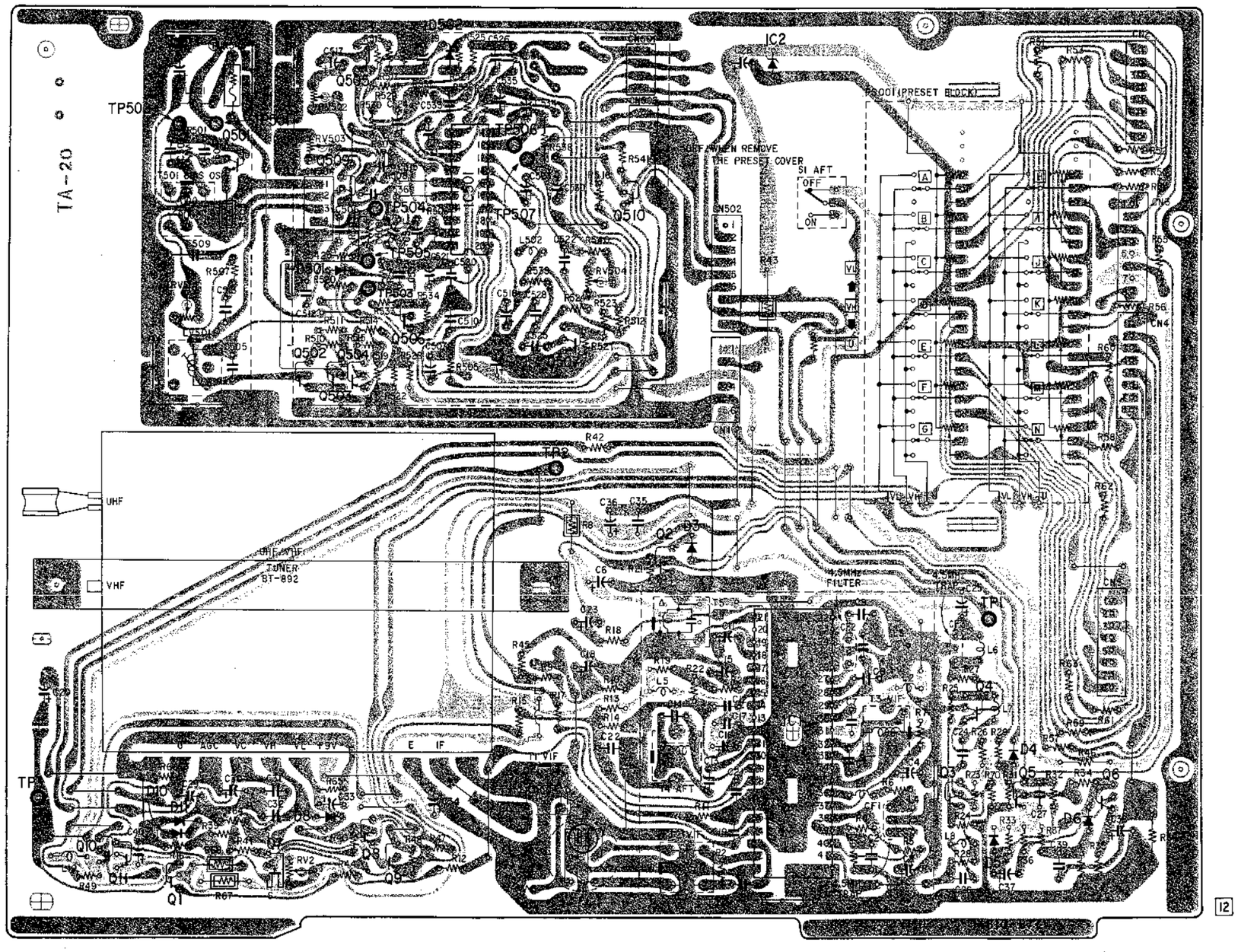
B + pattern

The printed diagram on component side is shown in tuner and audio blocks (on pages 122 to 126)

【TA-20 BOARD】— CONDUCTOR SIDE —

A B C D E F G H I J K L

1 2 3 4 5 6 7 8 9 10



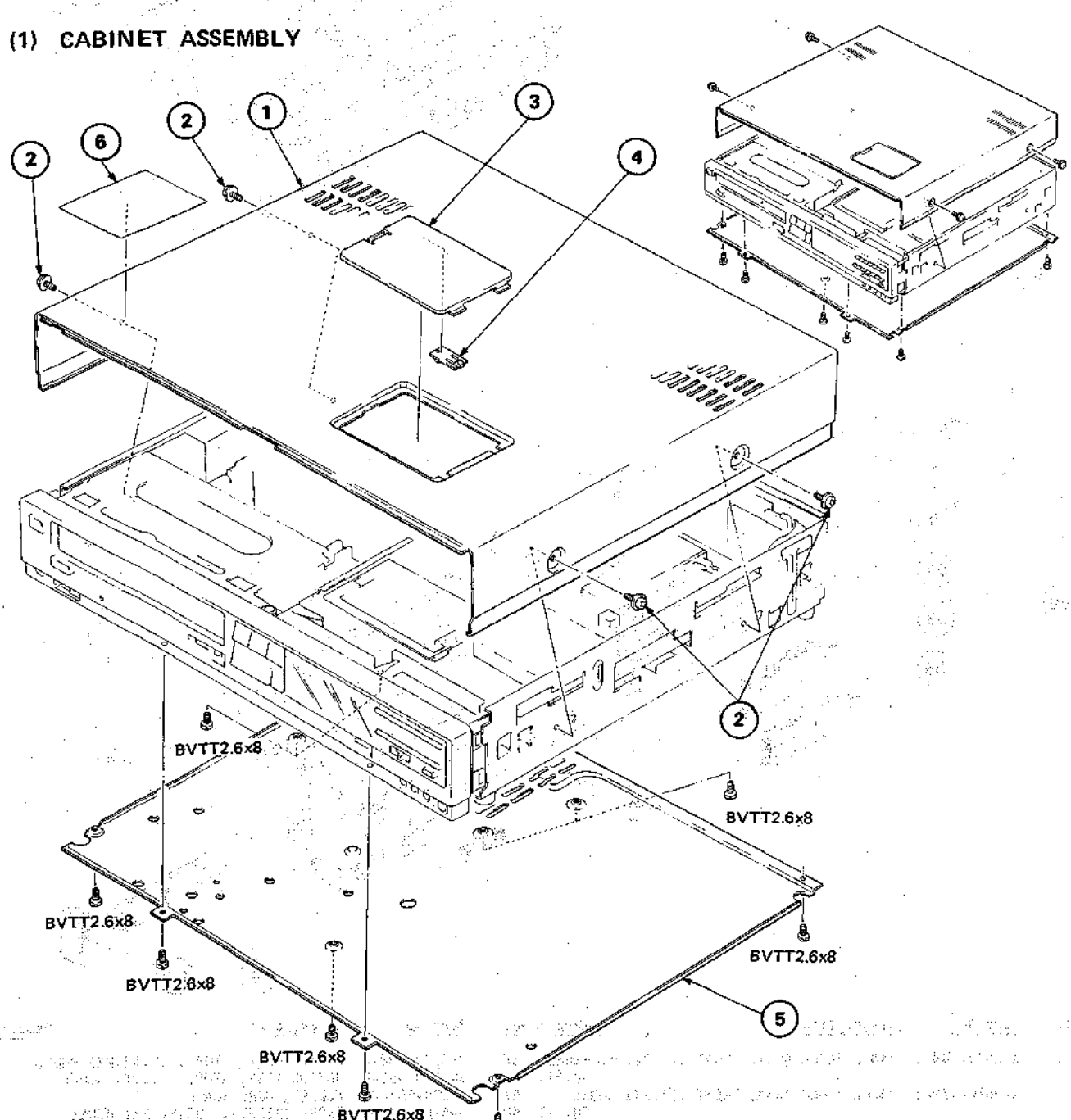
CF1,2,3

SECTION 4
EXPLODED VIEW

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

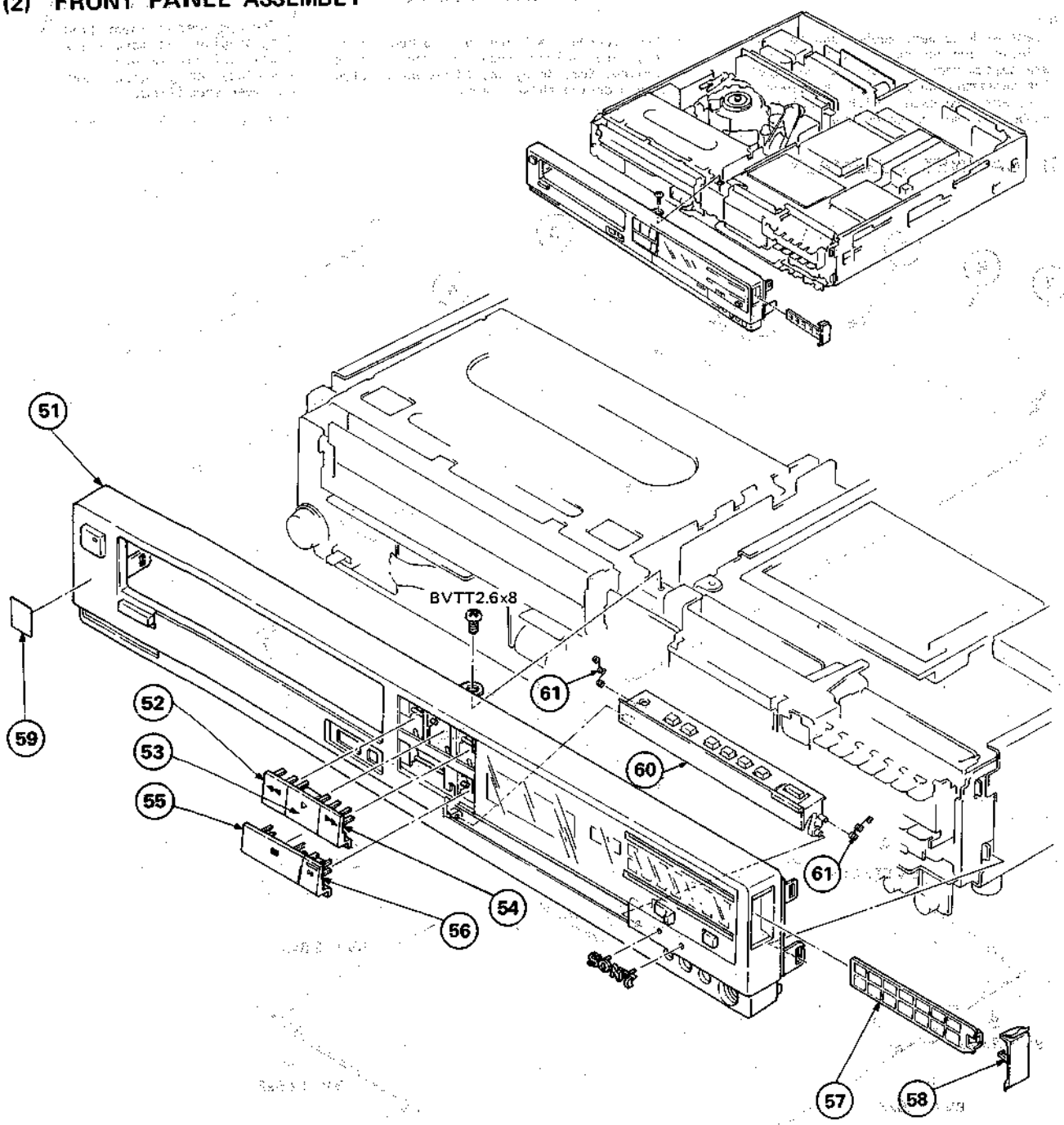
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1) CABINET ASSEMBLY



No.	Part No.	Description	Remark
1	3-679-273-41	CASE...US,E2,PX2 MODEL	
	3-679-273-00	CASE...E1,PX1 MODEL	
	3-679-273-31	CASE (RED)...E1 MODEL	
2	4-847-802-11	SCREW, CASE STOPPER	
3	X-3679-140-0	LID ASSY, PRESET...US,E2,PX2 MODEL	
	X-3679-171-0	LID ASSY, PRESET...E1,PX1 MODEL	
	X-3679-232-0	LID ASSY, PRESET(RED)...E1 MODEL	
4	3-679-148-31	BUTTON, SELECTION, AFT	
5	X-3679-131-0	PLATE ASSY, BOTTOM	
6	3-703-703-00	STICKER, SONY SYMBOL (50)	

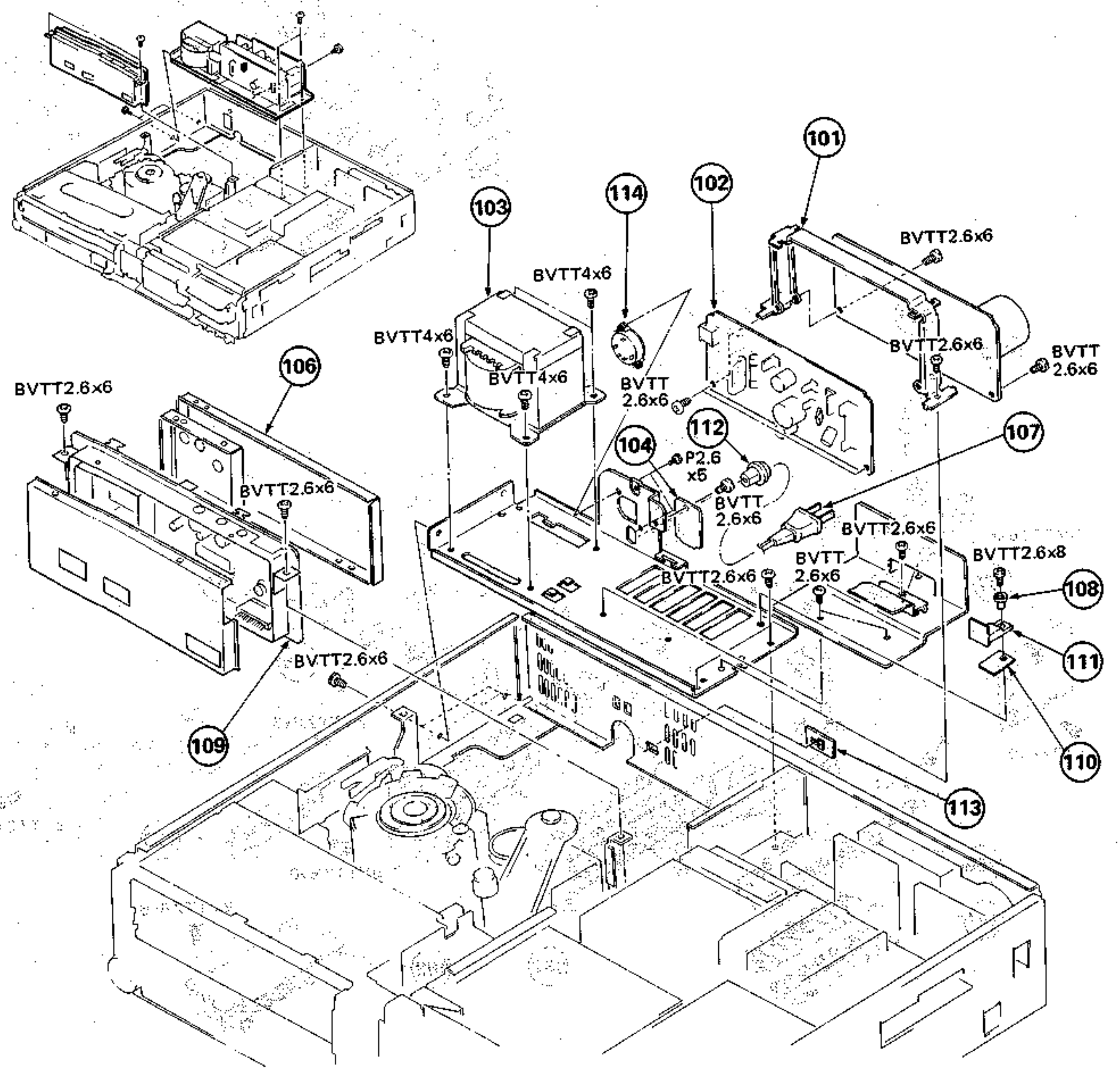
(2) FRONT PANEL ASSEMBLY



No.	Part No.	Description	Remark
51	X-3679-144-0	PANEL BLOCK ASSY, FRONT..US,E2,PX2 MODEL	60,61
	X-3679-178-0	PANEL BLOCK ASSY, FRONT..E1,PX1 MODEL	60,61
	X-3679-233-0	PANEL BLOCK ASSY, FRONT(RED)...E1 MODEL	60,61
52	3-679-296-00	BUTTON, REWIND...US,E2,PX2 MODEL	
	3-679-296-21	BUTTON, REWIND...E1,PX1 MODEL	
53	X-3679-139-0	BUTTON ASSY, PLAYBACK...US,E2,PX2 MODEL	
	X-3679-156-0	BUTTON ASSY, PLAYBACK...E1,PX1 MODEL	
54	3-679-298-00	BUTTON, FAST FORWARD...US,E2,PX2 MODEL	
	3-679-298-21	BUTTON, FAST FORWARD...E1,PX1 MODEL	
55	3-679-299-00	BUTTON, STOP...US,E2,PX2 MODEL	
	3-679-299-21	BUTTON, STOP...E1,PX1 MODEL	

No.	Part No.	Description	Remark
56	X-3679-138-0	BUTTON ASSY, STOP...US,E2,PX2 MODEL	
	X-3679-155-0	BUTTON ASSY, STOP...E1,PX1 MODEL	
57	3-679-301-00	HOLDER, DIAL SCALE	
58	3-670-087-61	FRONT (RIGHT)...US,E2,PX2 MODEL	
	3-670-087-00	FRONT (RIGHT)...E1,PX1 MODEL	
	3-670-087-51	FRONT (RIGHT)(RED)...E1 MODEL	
59	3-703-709-00	STICKER, SONY SYMBOL (15)	
60	X-3679-154-0	DOOR ASSY, TIMER...US,E2,PX2 MODEL	
	X-3679-159-0	DOOR ASSY, TIMER...E1,PX1 MODEL	
	X-3679-234-0	DOOR ASSY, TIMER(RED)...E1 MODEL	
61	3-679-306-00	SPRING	

(3) POWER BLOCK ASSEMBLY

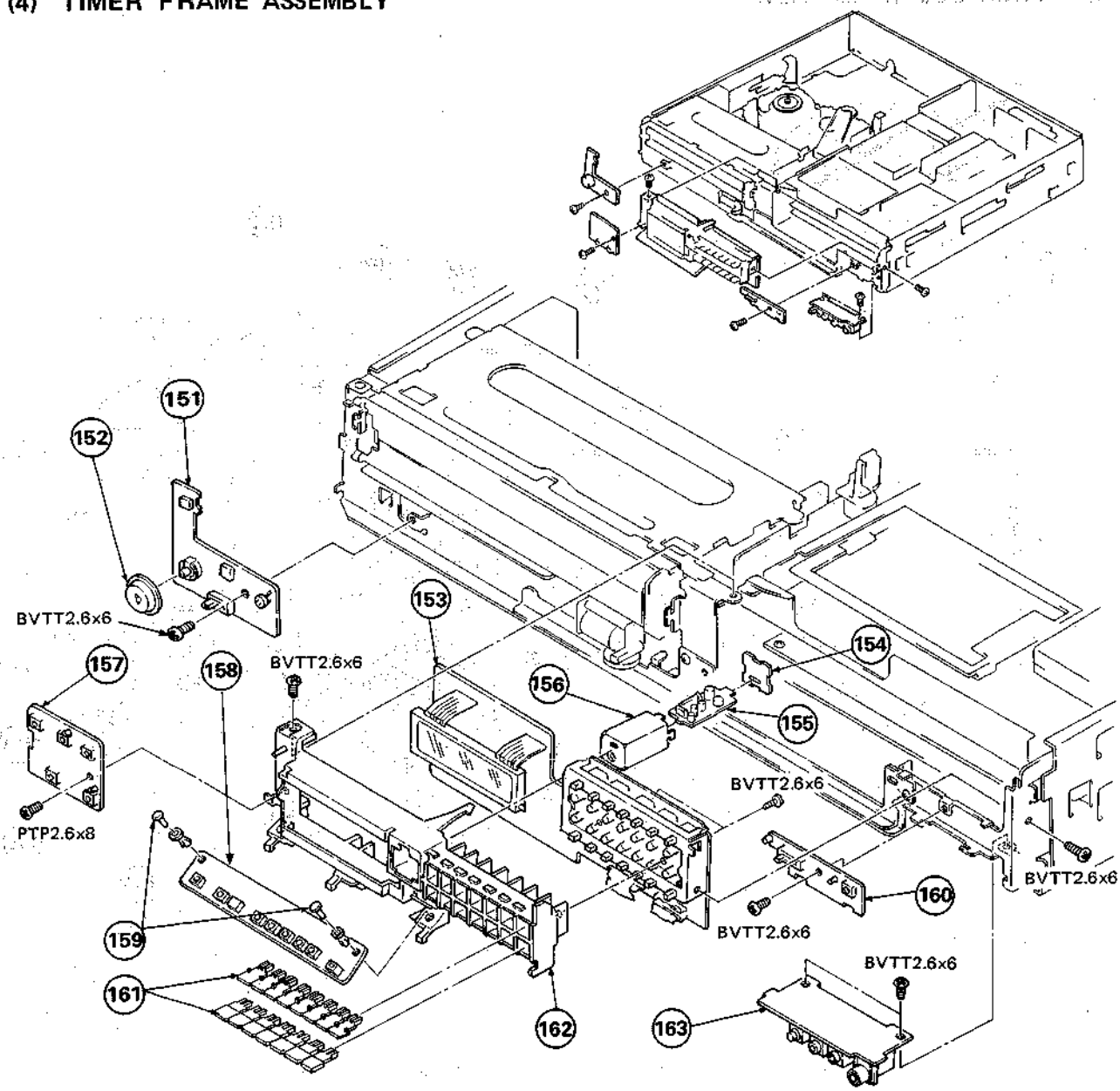


No.	Part No.	Description	Remark
101	♠:1-609-216-00	PS-20 BOARD	
102	♠:A-6728-711-A	PS-19 BOARD, COMPLETE	
103	⚠ 1-447-677-00	TRANSFORMER, POWER T901 ...US,E2,PX2 MODEL	
	⚠ 1-447-693-00	TRANSFORMER, POWER ...E1,PX1 MODEL	
104	♠:1-609-217-21	PS-21 BOARD	
106	♠:3-679-241-00	CASE (LOWER), SHIELD, RP-55	
107	⚠ 1-551-964-00	CORD, POWER ...US,E2,PX2 MODEL	
	⚠ 1-551-331-21	CORD, POWER ...E1,PX1 MODEL	

No.	Part No.	Description	Remark
108	2-832-007-00	BUSHING (K), INSULATING	
109	♠:A-6730-613-A	RP-8 BOARD, COMPLETE (PB BLOCK ASSY)	
110	3-701-754-00	PLATE, INSULATING	
111	♠:1-609-445-21	PS-25 BOARD	
112	2-231-019-00	CLAMPER, CORD	
113	3-679-292-00	COVER, SELECTION, FREQUENCY...US MODEL	
114	⚠ 1-552-304-00	SWITCH, POWER VOLTAGE CHANGE S901 ...E1,PX1 MODEL	

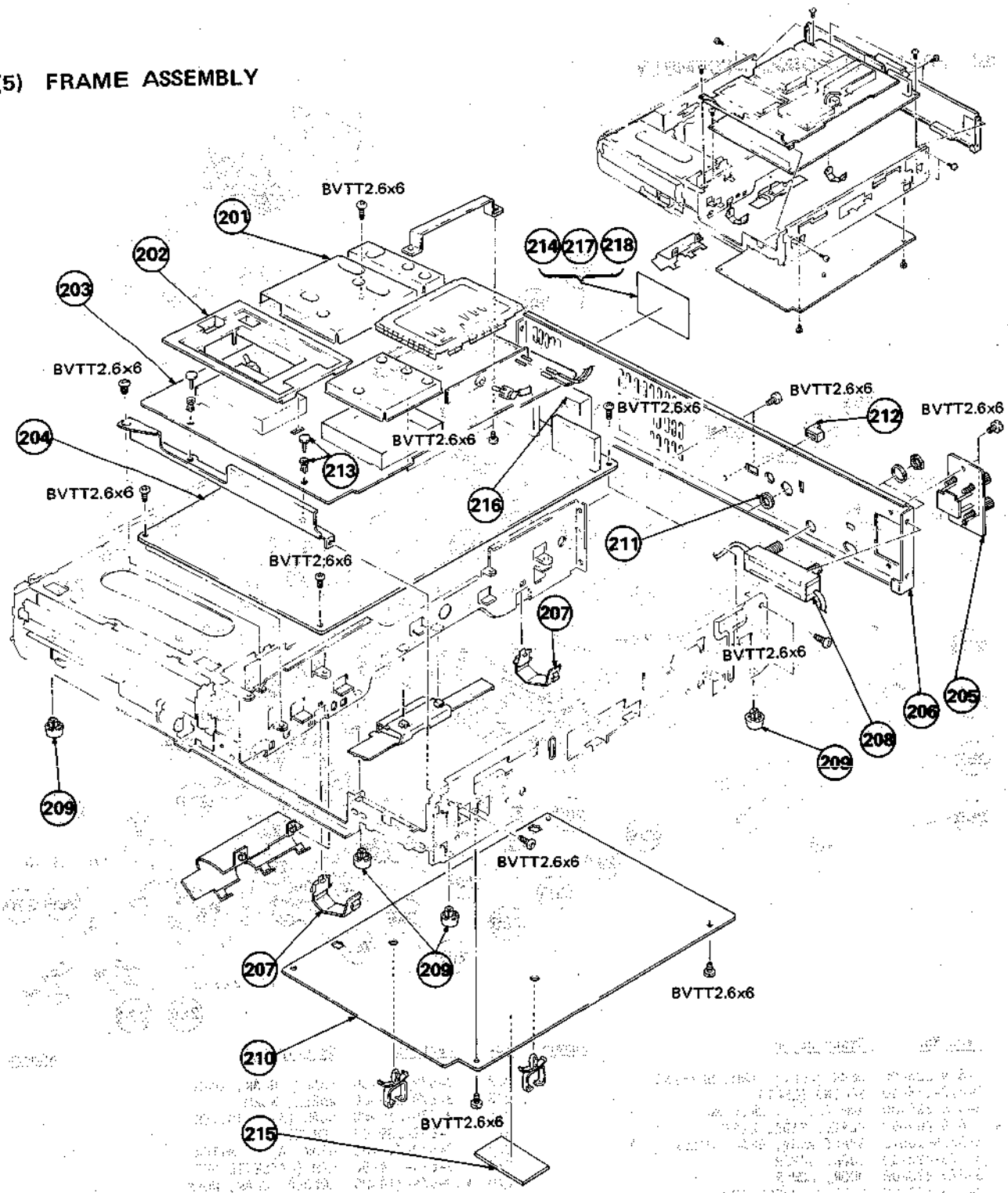
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(4) TIMER FRAME ASSEMBLY



No.	Part No.	Description	Remark
151	♦:1-609-221-00	FS-21 BOARD	
152	3-679-207-00	KNOB, TRACK CONTROL	
153	♦:1-610-028-00	TS-23 BOARD	
154	♦:4-342-118-00	LID SHIELD CASE R	
155	♦:1-606-794-00	N BOARD	
156	♦:4-342-117-00	CASE SHIELD (MAIN) R	
157	♦:1-609-219-00	FS-19 BOARD	
158	♦:1-610-029-00	TS-24 BOARD	
159	4-812-134-11	RIVET NYLON, 3.5	
160	♦:1-609-220-00	FS-20 BOARD	
161	3-679-167-00	KNOB, TUNING	
162	♦:3-679-303-00	FRAME, T.T	
163	♦:1-609-222-00	JK-1 BOARD	

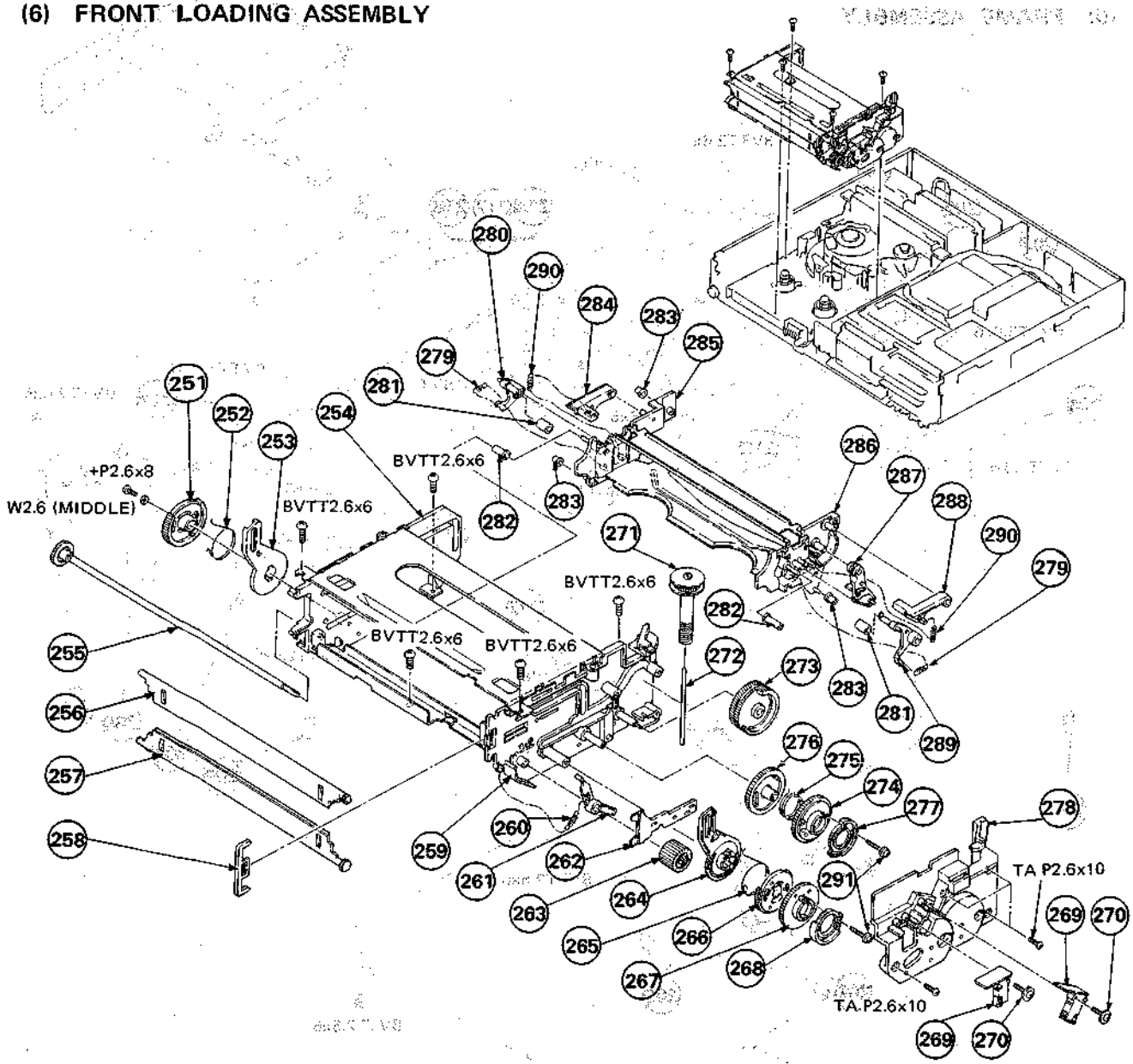
(5) FRAME ASSEMBLY



No.	Part No.	Description	Remark
201	♣:3-679-238-00	CASE (UPPER), SHIELD, AU-44	
202	3-679-302-00	COVER, PRESET	
203	♣:A-6721-166-A	TA-12 BOARD, COMPLETE...FORMER	
	♣:A-6721-186-A	TA-20 BOARD, COMPLETE...NEW	
204	♣:A-6711-433-A	YC-22 BOARD, COMPLETE	
205	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF); TB991	
206	3-679-267-11	PLATE, JACK...US,E2,PX2 MODEL	
	3-679-267-31	PLATE, JACK...E1,PX1 MODEL	
207	♣:3-679-229-00	HINGE, SS	
208	1-554-372-00	SWITCH, ANTENNA CHANGE; S996	
209	3-670-155-00	LEG	
210	♣:A-6717-320-A	SS-13 (B-299) BOARD, COMPLETE	

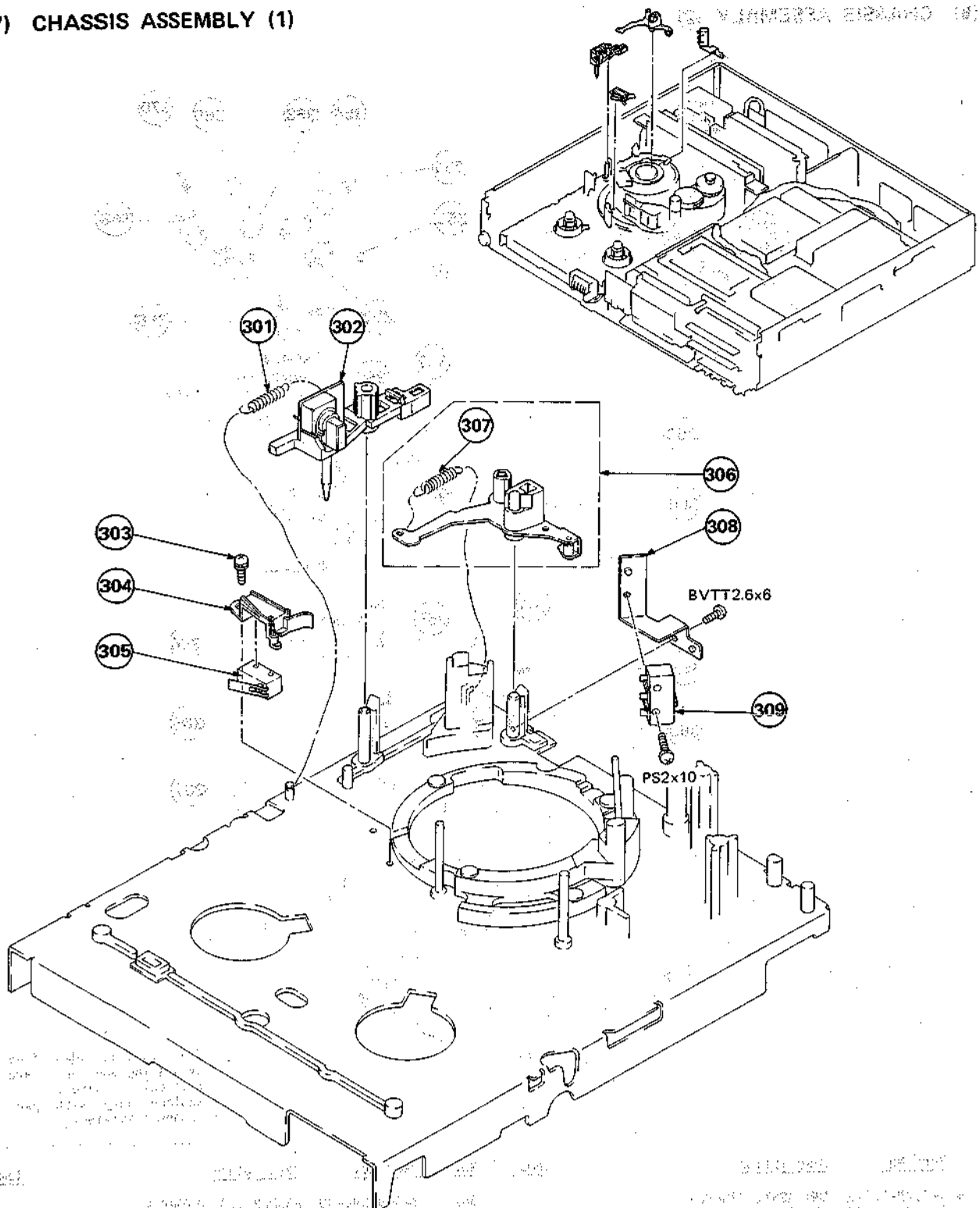
No.	Part No.	Description	Remark
211	♣:3-679-180-00	PLATE (R), ORNAMENTAL, JACK	
212	3-679-289-00	COVER, PCM	
213	4-812-134-11	RIVET NYLON, 3.5	
214	♣:3-679-295-00	LABEL, MODEL NUMBER...US MODEL	
215	♣:1-609-890-13	GM-2 BOARD...FORMER	
216	1-464-266-00	RF UNIT, COLOR (RFU-702); MD001	
217	♣:3-679-337-00	LABEL, MODEL NUMBER...E2,PX2 MODEL	
218	♣:3-679-374-00	LABEL, MODEL NUMBER...E1,PX1 MODEL	

(6) FRONT LOADING ASSEMBLY



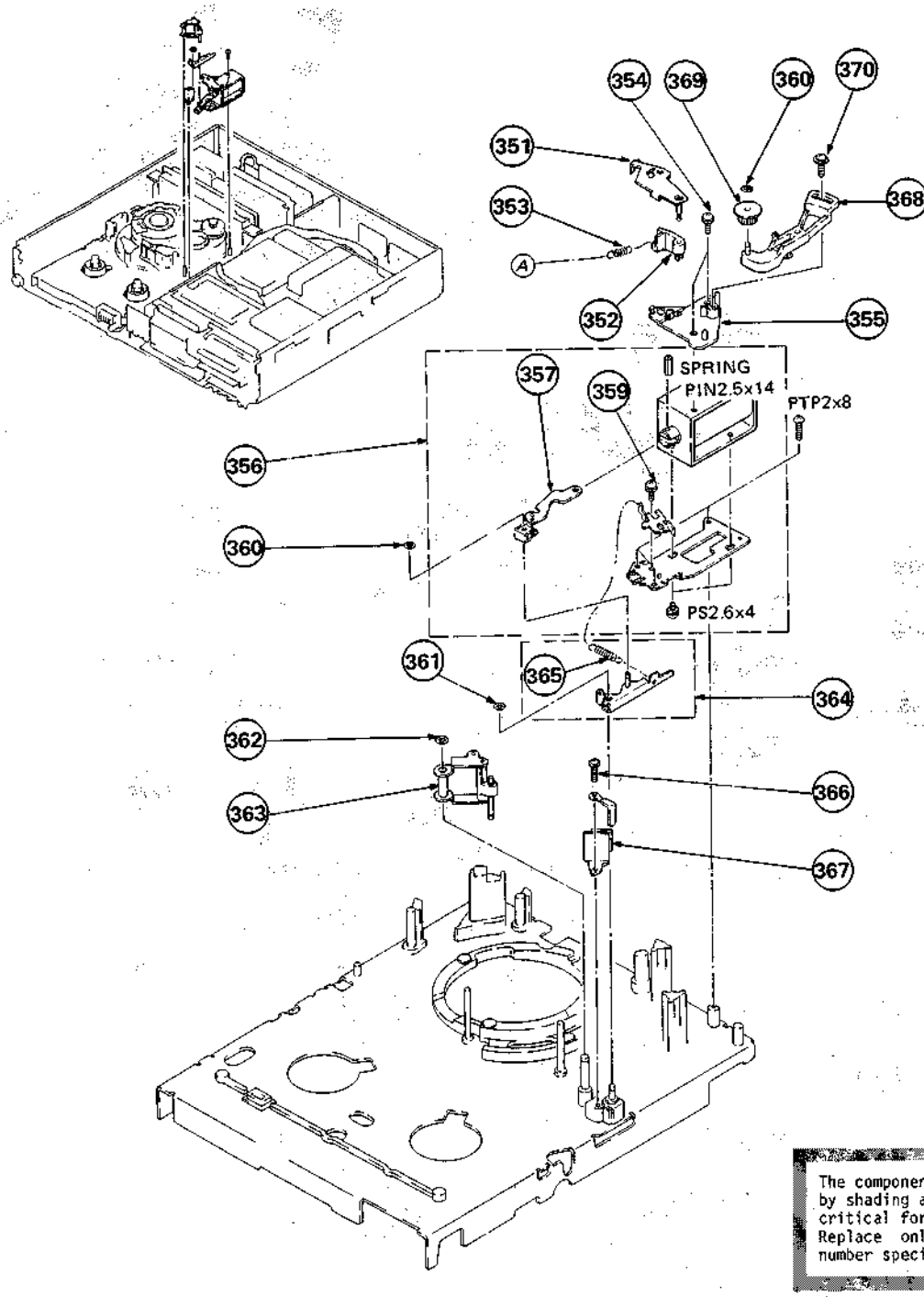
No.	Part No.	Description	Remark
251	3-679-226-00	GEAR (LEFT), ARM, DRIVING	
252	3-679-145-00	SPRING (LEFT)	
253	3-679-220-00	ARM (LEFT), DRIVING	
254	♦:3-679-266-00	PLATE, SIDE, LEFT	
255	X-3679-105-0	SHAFT ASSY, GEAR, MIDWAY	
256	3-679-222-00	DOOR, UPPER	
257	3-679-223-00	DOOR, LOWER	
258	3-679-137-00	HOLDER, OUTER DOOR	
259	♦:3-679-265-00	PLATE, SIDE, RIGHT	
260	3-679-189-00	SPRING, TENSION	
261	3-679-134-00	ARM, SWITCHING, DOOR	
262	3-679-221-00	PLATE, RACK, SWITCHING, DOOR	
263	3-679-126-00	GEAR (RIGHT), MIDWAY	
264	3-679-219-00	ARM (RIGHT), DRIVING	
265	3-679-144-00	SPRING (RIGHT)	
266	3-679-225-00	GEAR (RIGHT), ARM, DRIVING	
267	3-679-125-00	GEAR, DRIVING	
268	3-679-138-00	CAM (CASSETTE ON)	
269	1-554-241-00	SWITCH, LEVER; S301, S302	
270	3-669-480-11	+ PTPWH 2	
271	3-679-215-00	GEAR, WORM	
272	3-679-123-00	SHAFT, GEAR, WORM	
273	3-679-216-00	WHEEL, WORM	
274	3-679-218-00	GEAR (B), LIMITER	
275	3-679-139-00	SPRING	
276	3-679-217-00	GEAR (A), LIMITER	
277	3-679-124-00	CAM (CASSETTE OFF)	
278	♦:3-679-214-00	HOLDER, GEAR, WORM	
279	3-679-288-00	SPRING, TENSION	
280	3-679-130-00	LEVER (LEFT), RETAINER, CASSETTE	
281	3-679-135-00	RUBBER, RETAINER, CASSETTE	
282	3-679-128-00	ROLLER (RIGHT), DRIVING	
283	3-679-143-00	ROLLER	
284	3-679-132-00	LEVER (LEFT), PREVENTION	
285	♦:X-3679-107-0	PLATE ASSY, SIDE, BASE LEFT	
286	♦:X-3679-106-0	PLATE ASSY, SIDE, BASE RIGHT	
287	3-679-133-00	ARM, LID OPEN	
288	3-679-131-00	LEVER (RIGHT), PREVENTION	
289	3-679-129-00	LEVER(RIGHT), RETAINER, CASSETTE	
290	3-679-188-00	SPRING, TENSION	
291	3-669-480-21	+ PTPWH 2	

(7) CHASSIS ASSEMBLY (1)



No.	Part No.	Description	Remark
301	3-679-164-00	SPRING, TENSION	
302	1-464-249-00	SENSOR, S COIL; L991	
303	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
304	♦:3-669-355-00	HOLDER, SWITCH, ULE	
305	1-553-718-00	SWITCH, MICRO; S994	
306	X-3679-149-0	ARM (B) ASSY, LOCK	
307	3-679-323-00	SPRING, TENSION	307
308	♦:3-672-542-00	BRACKET, SWITCH, LE	
309	1-553-539-00	SWITCH, MICRO; S993	

(8) CHASSIS ASSEMBLY (2)

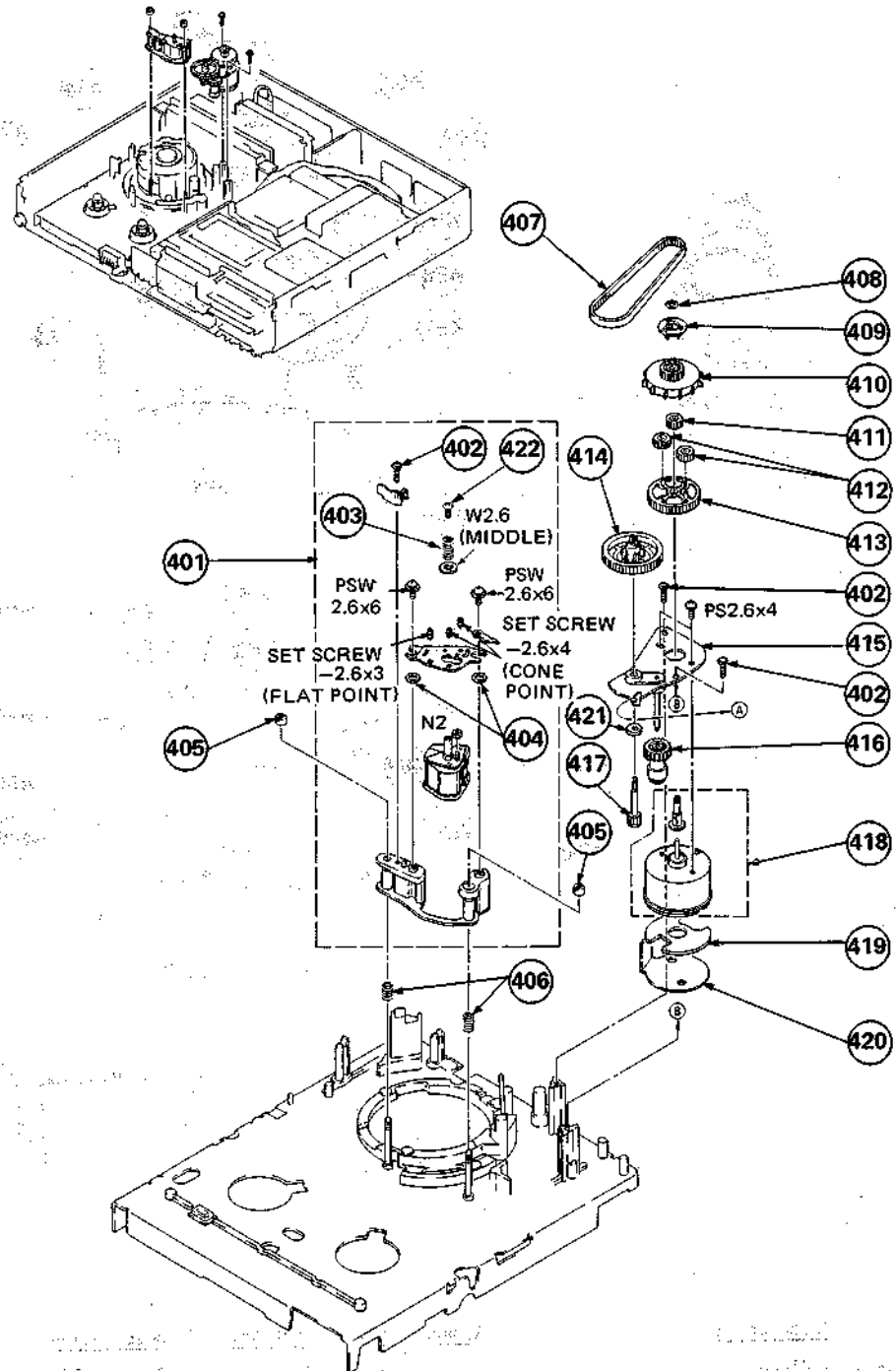


The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
351	♦:X-3679-123-0	ARM ASSY, STOPPER	
352	♦:3-679-251-00	LIMITER, STOPPER	
353	3-661-382-00	SPRING, TENSION	
355	♦:3-679-117-00	CHASSIS, ARM, STOPPER	
356	[illegible]	[illegible]	
357	X-3679-152-0	ARM (B) ASSY, PINCH SOLENOID	
359	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
360	3-669-465-00	WASHER (1.5), STOPPER	

No.	Part No.	Description	Remark
361	3-669-595-00	WASHER (2), STOPPER	
362	3-669-596-00	WASHER (2.3), STOPPER	
363	♦:X-3679-108-0	ARM ASSY, PRESS, PINCH	
364	♦:X-3669-379-0	ARM (P) ASSY, PINCH LIMITER	365
365	3-465-159-XX	SPRING, TENSION	
366	3-669-480-11	+ PTPWH 2	
367	1-464-250-00	SENSOR, T COIL; L992	
368	♦:X-3679-145-0	ARM ASSY, CAR, TENSION	
369	3-679-307-00	GEAR, TENSION	
370	3-681-231-00	PW 2.6X8	

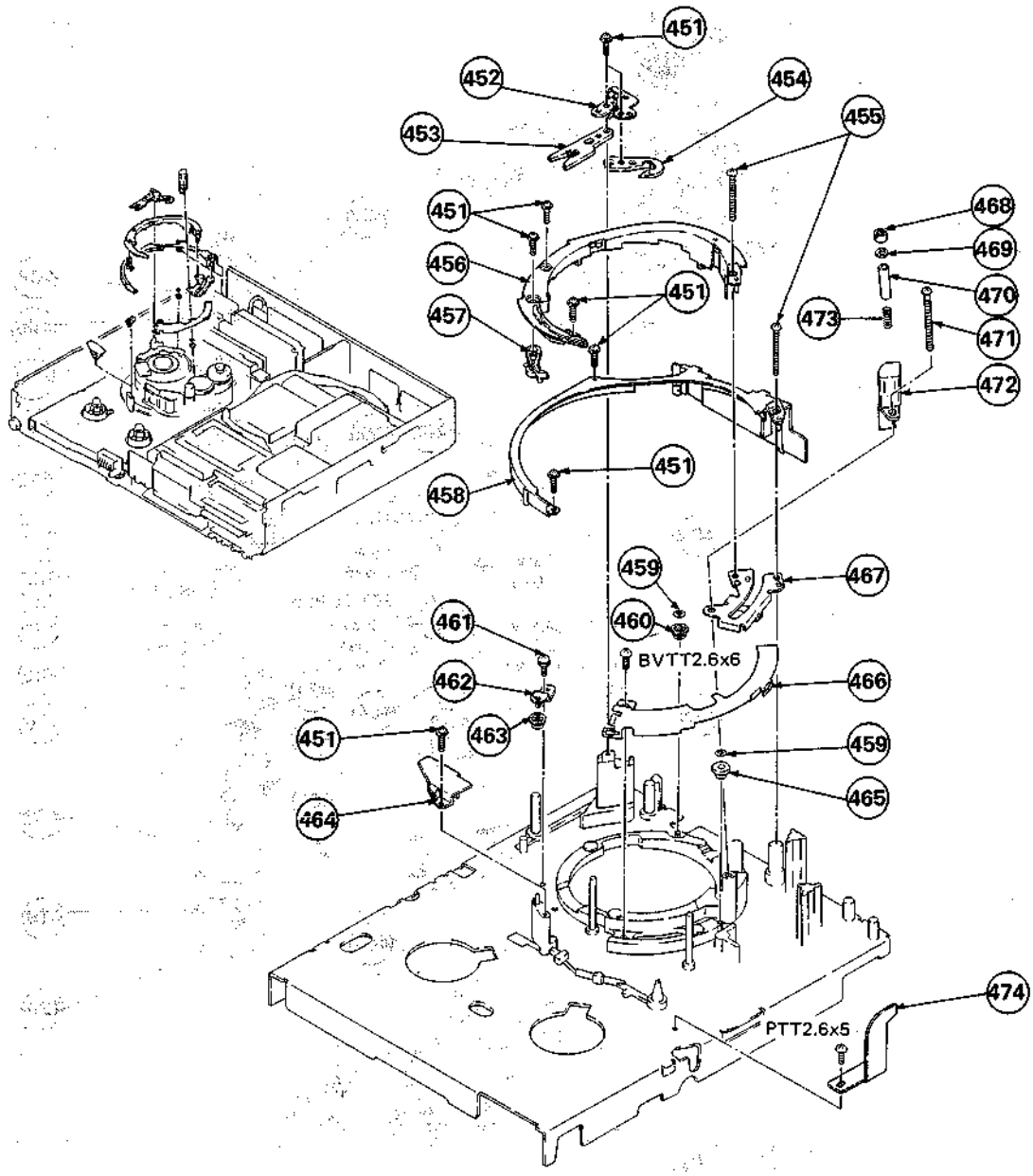
(9) CHASSIS ASSEMBLY (3)



No.	Part No.	Description	Remark
401	A-6761-056-A	ACE ASSY	402,403,404
402	3-669-480-11	+ PTPWH 2	
403	♦:3-669-316-00	SPRING, COMPRESSION	
404	3-669-598-00	WASHER, CTL	
405	3-669-318-00	NUT, ADJUSTMENT, GUIDE	
406	3-669-317-00	SPRING, COMPRESSION	
407	3-679-119-00	BELT, SYNCHRO	
408	3-669-596-00	WASHER (2.3), STOPPER	
409	3-679-140-00	FLANGE, GEAR, INTERNAL	
410	3-679-101-00	GEAR, INTERNAL	

No.	Part No.	Description	Remark
411	3-679-104-00	GEAR	
412	X-3679-124-0	GEAR ASSY, PLANET	
413	X-3679-111-0	CARRIER ASSY	
414	3-679-115-00	GEAR (LARGE), LOADING	
415	♦:X-3679-112-0	CHASSIS ASSY, GEAR, PLANET	
416	X-3669-321-0	GEAR (C) ASSY	
417	3-679-114-00	GEAR (SMALL), LOADING	
418	A-6737-118-A	MOTOR ASSY, L; M904	
419	♦:1-605-071-00	LM-8 BOARD	
420	♦:3-669-613-00	INSULATOR, L MOTOR	
421	3-701-439-11	WASHER (3)	
422	3-679-362-00	PWH 2x4	

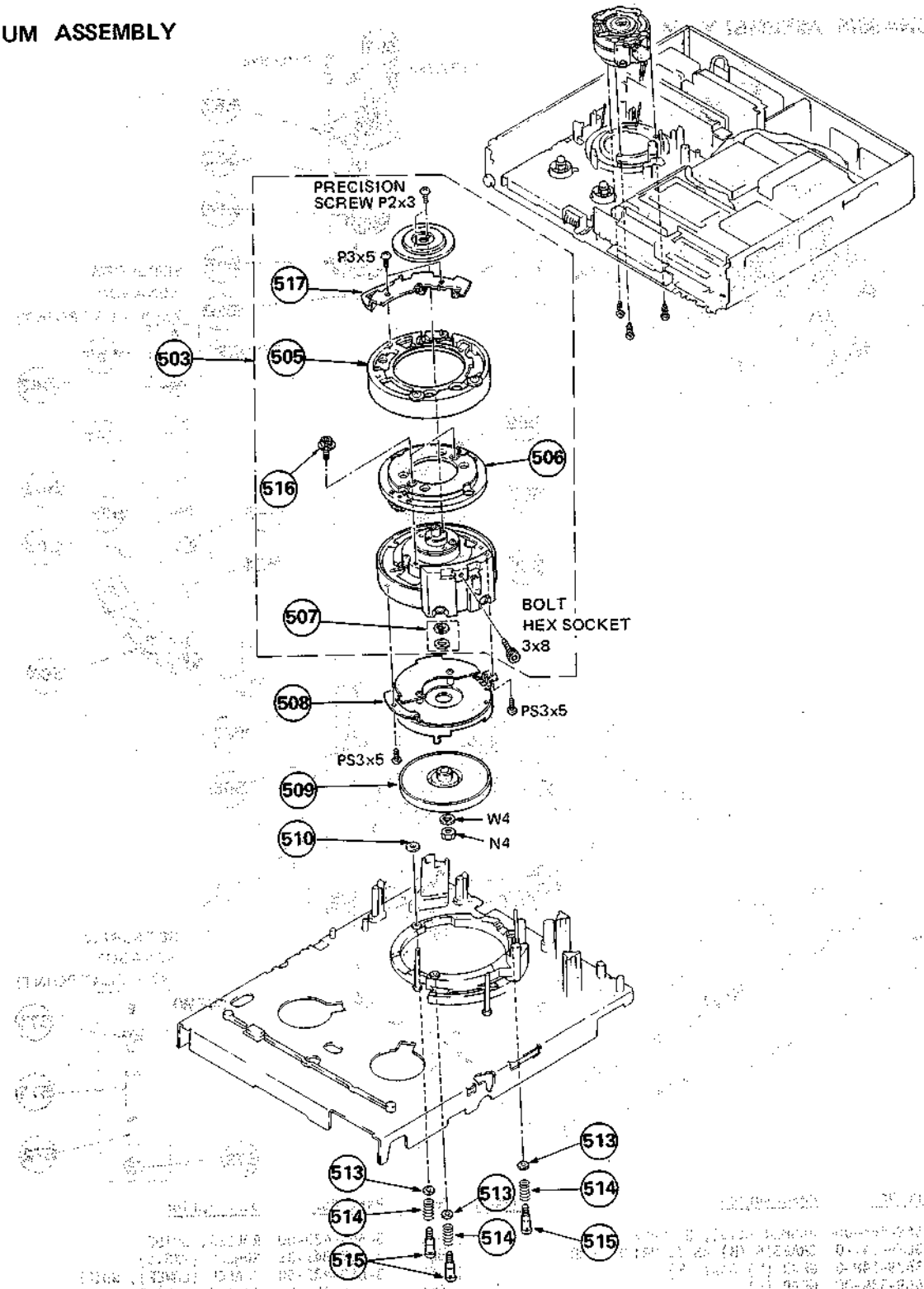
(10) CHASSIS ASSEMBLY (4)



No.	Part No.	Description	Remark
451	3-669-480-11	+ PTPWH 2	
452	♣:3-672-540-00	PLATE, GROUND, TAPE GUIDE	
453	♣:3-669-618-00	PLATE (2), ADJUST	
454	♣:3-672-507-00	PLATE (3-1), ADJUSTMENT	
455	3-669-466-00	SCREW (M 2.6)	
456	3-679-290-00	GUIDE (1-YA), SHUTTLE	
457	X-3669-383-0	ARM(S) ASSY, ULE SWITCH	
458	♣:3-669-585-00	GUIDE (2), SHUTTLE	
459	3-669-465-00	WASHER (1.5), STOPPER	
460	3-669-630-00	ROLLER (C), RING	
461	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
462	♣:X-3669-329-0	PLATE ASSY, ADJUSTMENT	

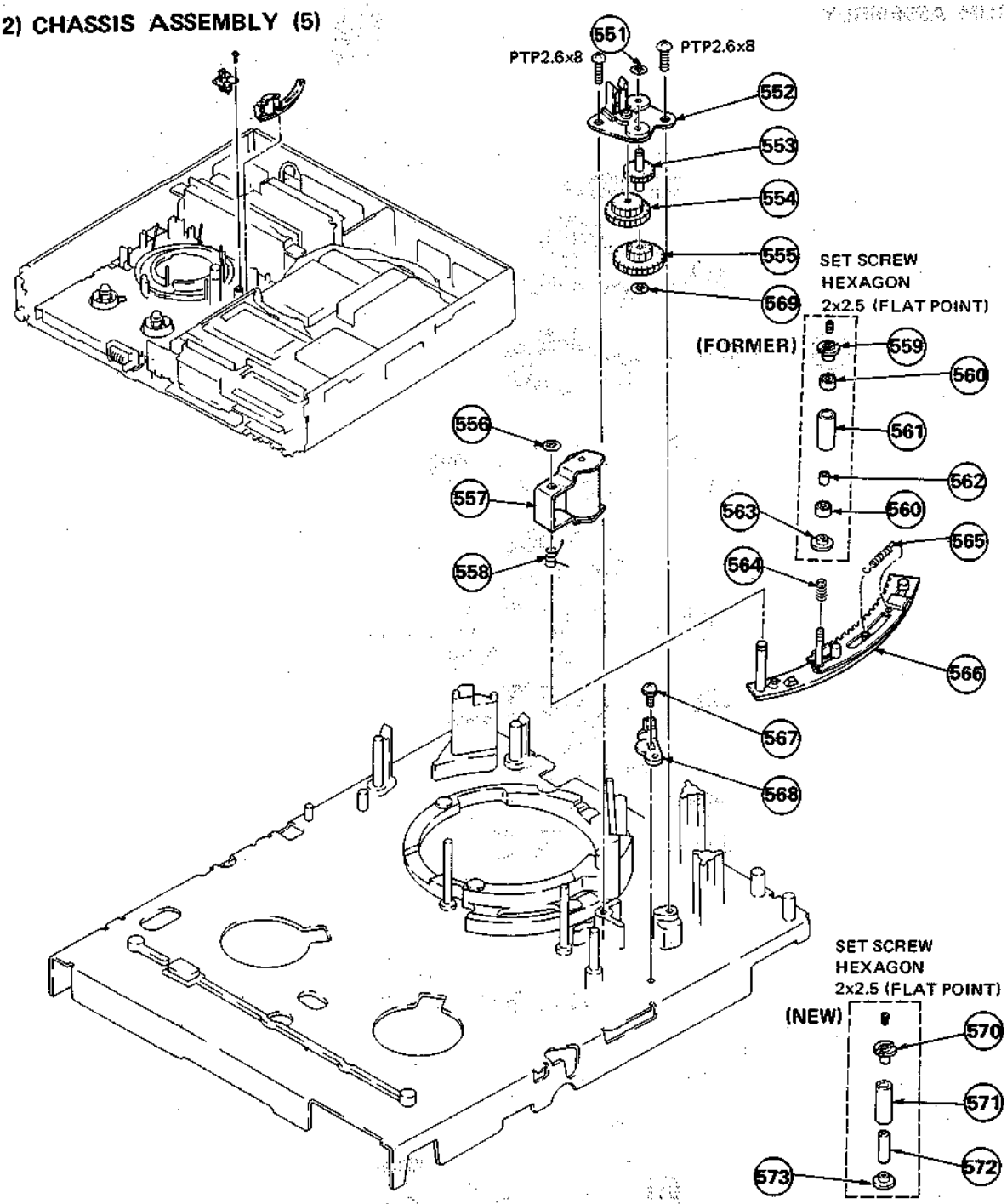
No.	Part No.	Description	Remark
463	3-669-360-00	ROLLER, RING	
464	♣:3-669-476-00	PLATE, GUIDE	
465	3-669-597-00	ROLLER (B), RING	
466	♣:3-669-477-00	LINER, LINK, PIN	
467	♣:X-3669-313-0	BASE ASSY, SLANT	
468	3-669-446-00	NUT, GUIDE	
469	3-669-447-00	FLANGE, GUIDE	
470	3-669-445-00	SPACER, GUIDE	
471	3-669-606-00	SCREW (2.6)	
472	8-825-508-10	HEAD, FE	
473	3-669-615-00	SPRING, COMPRESSION	
474	♣:3-679-163-00	PLATE, LID OPEN	

(11) DRUM ASSEMBLY



No.	Part No.	Description	Remark
503	A-6050-176-A	DRUM ASSY,(DSH-33B-R)505,506,507,516,517	
505	A-6760-123-B	DRUM UPPER ASSY	
506	A-6762-115-A	DISK ASSY	
507	X-3669-105-0	SPACER BLOCK ASSY	
508	X-2621-204-2	STATOR ASSY, D	
509	X-2621-202-0	ROTOR ASSY, D	
510	♦:3-669-646-00	SPACER, DRUM (T0.05)	
	♦:3-669-646-11	SPACER, DRUM (T0.075)	
513	3-669-600-11	WASHER, FLAT (3.5)	
514	3-429-123-00	SPRING	
515	3-669-302-00	SCREW, FITTING	
516	3-669-157-00	BOLT (WASHER) (2.6X8)	
517	A-6760-066-B	SPRING ASSY, TAPE RETAINER	

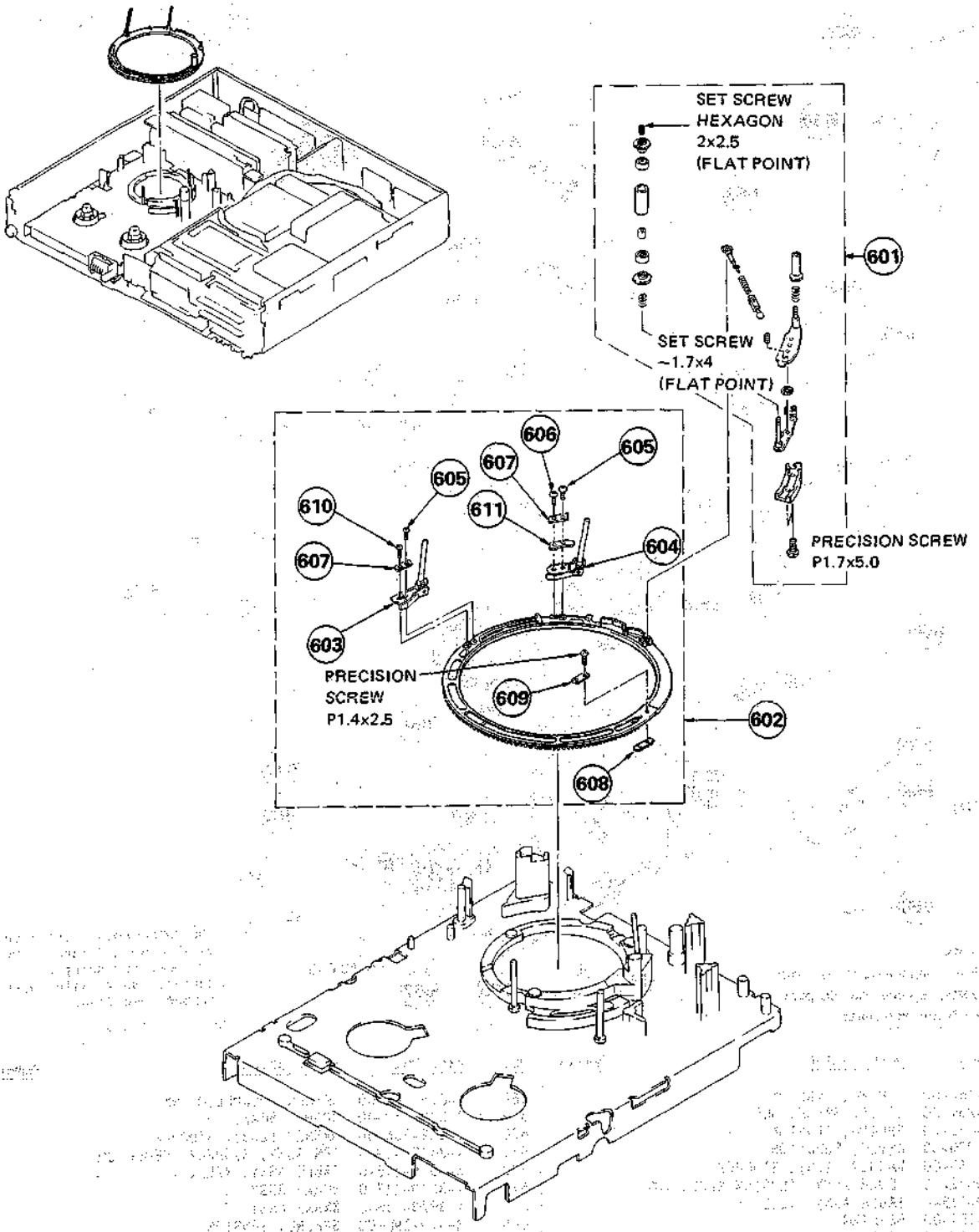
(12) CHASSIS ASSEMBLY (5)



No.	Part No.	Description	Remark
551	3-669-465-00	WASHER (1.5), STOPPER	
552	X-3679-147-0	CHASSIS (B) ASSY, DRIVE GEAR	
553	X-3679-148-0	GEAR (F) ASSY (B)	
554	3-669-338-00	GEAR (E)	
555	3-669-337-00	GEAR (D)	
556	3-669-596-00	WASHER (2.3), STOPPER	
557	X-3669-307-0	ARM ASSY, PINCH ROLLER	
558	3-669-444-00	SPRING, TORSION	
559	3-669-431-00	FLANGE (UPPER), GUIDE	
560	3-669-443-00	BEARING, BALL (NO FLANGE)	

No.	Part No.	Description	Remark
561	3-669-438-00	ROLLER, GUIDE	
562	3-657-841-31	SPACER (2X2.5)	
563	3-669-432-00	FLANGE (LOWER), GUIDE	
564	3-669-452-00	SPRING, COMPRESSION	
565	3-549-014-00	SPRING, TENSION	
566	X-3679-125-0	GEAR ASSY, SLIDER	
567	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
568	◆3-679-165-00	STOPPER, SLIDER	
569	3-669-595-00	WASHER (2), STOPPER	
570	3-676-650-00	FLANGE (UPPER) #9, GUIDE	
571	3-676-649-00	ROLLER #9, GUIDE	
572	3-672-559-00	SLEEVE, GUIDE	
573	3-672-558-00	FLANGE (LOWER) #9, GUIDE	

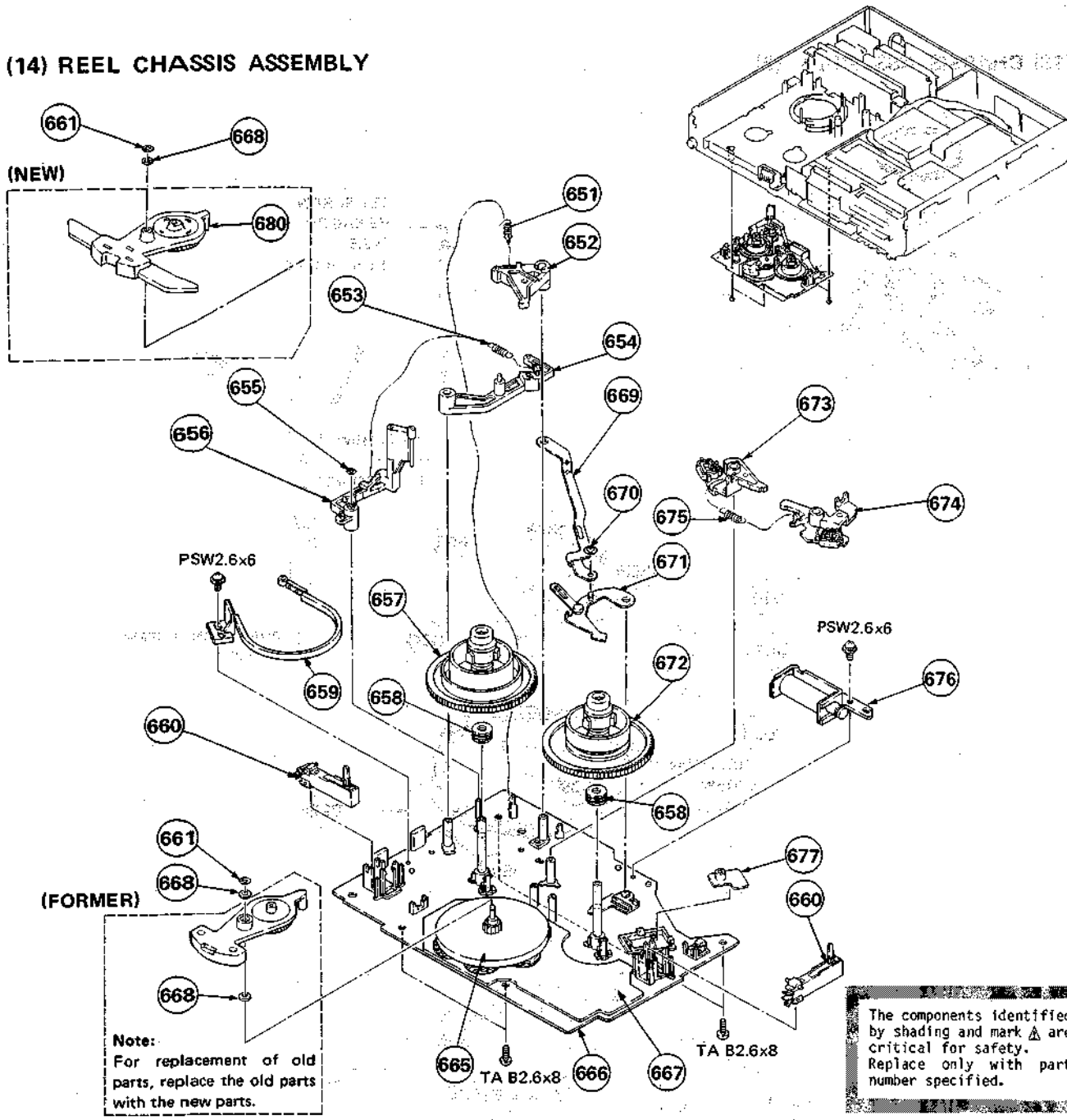
(13) CHASSIS ASSEMBLY (6)



No.	Part No.	Description	Remark
601	A-6750-108-B	SHUTTLE BLOCK ASSY, THREADING	
602	X-3679-150-0	RING (YA) ASSY, S LOADING	603,604,605 606,607,608 609,610,611
603	X-3669-429-0	GUIDE ASSY, NO.2	
604	X-3669-430-0	GUIDE ASSY, NO.3	
605	3-669-478-00	SCREW (1X3), TAPPING	

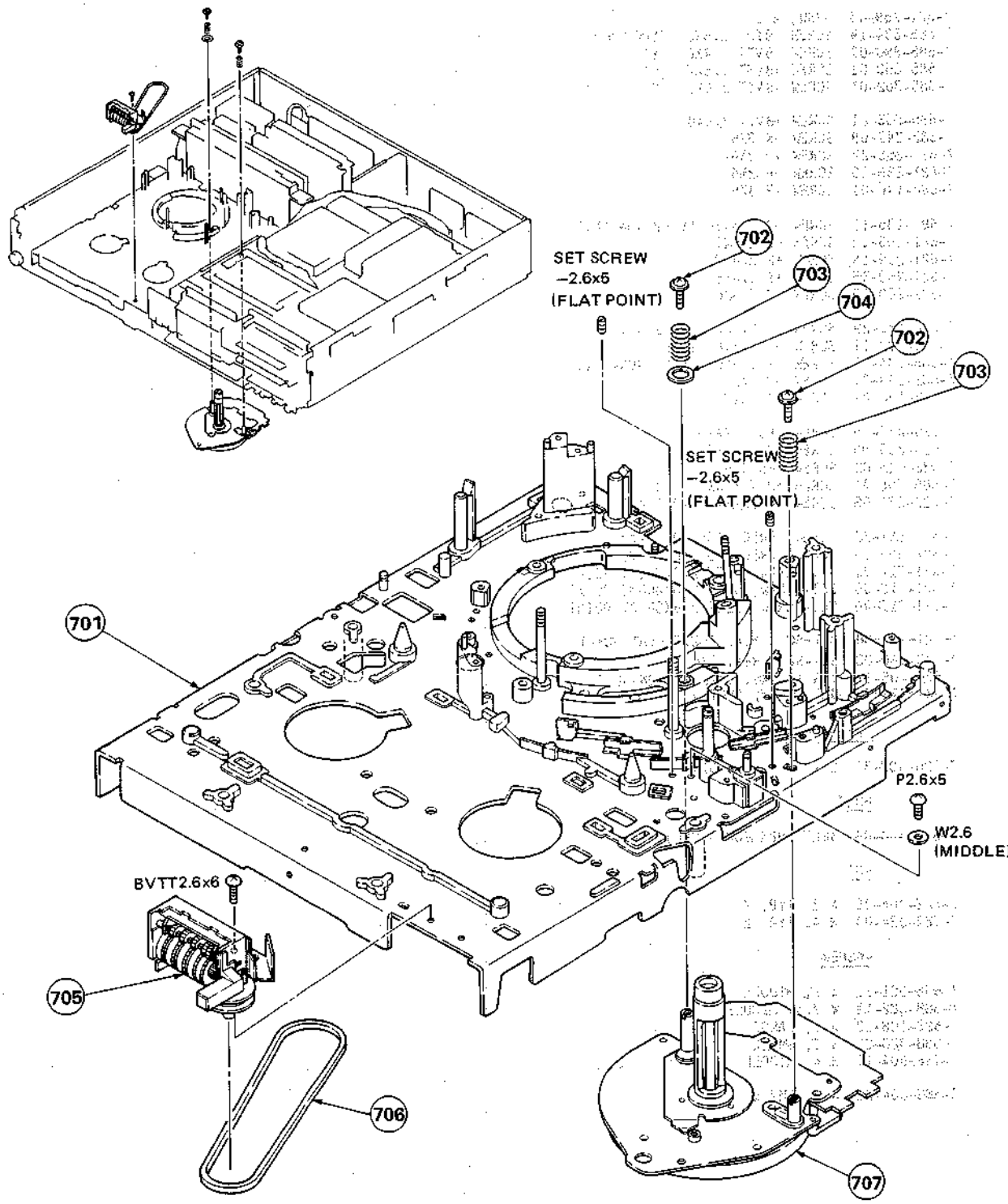
No.	Part No.	Description	Remark
606	3-669-479-00	SCREW (1.4X3.5), TAPPING	
607	♣:3-669-472-00	RETAINER, SPRING, LEAF	
608	♦:3-669-617-00	RING, GEAR	
609	♣:3-669-616-00	RETAINER	
610	3-672-586-00	SCREW (1.4X3), TAPPING	
611	3-672-583-00	SPRING, LIMITER	

(14) REEL CHASSIS ASSEMBLY



No.	Part No.	Description	Remark
651	3-679-156-00	SPRING, TENSION	
652	♣:3-679-231-00	LEVER, BRAKE, SOFT	
653	3-679-151-00	SPRING, TENSION	
654	♣:3-679-230-00	LEVER, FUNCTION	
655	3-669-465-00	WASHER (1.5), STOPPER	
656	X-3679-122-0	LEVER ASSY, TENSION REGULATOR	
657	X-3679-115-0	TABLE ASSY, REEL, S	
658	3-646-185-00	BEARING	
659	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
660	1-554-374-00	SWITCH, LEVER, S991, S992	
661	3-669-595-00	WASHER (2), STOPPER	
665	X-2622-201-0	ROTOR ASSY, R	
666	♣:X-3679-130-0	CHASSIS ASSY, SUB	
667	♣:A-4910-021-A	R STATOR BOARD, COMPLETE	
668	3-679-318-00	WASHER, PENDULUM ARM	
669	♣:3-679-168-00	JOINT, BRAKE, L	
670	3-669-596-00	WASHER (2.3), STOPPER	
671	X-3679-119-0	ARM ASSY, STOPPER, PENDULUM	
672	X-3679-116-0	TABLE ASSY, REEL, T	
673	X-3679-117-0	BRAKE ASSY, S	
674	X-3679-118-0	BRAKE ASSY, T	
675	3-679-190-00	SPRING, TENSION	
677	♣:1-609-231-00	RD-5 BOARD	
680	A-6759-074-H	ARM BLOCK ASSY, PENDULUM	

(15) CHASSIS ASSEMBLY (7)



No.	Part No.	Description	Remark
701	♦:X-3679-132-0	CHASSIS ASSY, MECHANICAL	
702	3-669-633-00	SCREW, + PW2	
703	3-679-359-00	SPRING, COMPRESSION	
704	3-669-697-00	SPACER, CAPSTAN	
705	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
706	3-679-171-00	BELT, COUNTER	
707	8-838-042-01	MOTOR, DC (BHF-1907A); M902	

SCREW

7-621-759-45	+PSW, 2.6X6
7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S
7-685-880-01	SCREW +BVTT 4X6 (S)
7-685-860-01	SCREW +BVTT 2.6X4 (S)
7-685-862-01	SCREW +BVTT 2.6X6 (S)
7-685-863-01	SCREW +BVTT 2.6X8 (S)
7-682-247-09	SCREW +K 3X6
7-621-255-22	SCREW +P 2X4
7-621-255-55	SCREW +P 2X4
7-682-146-01	SCREW +P 3X5
7-685-135-11	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-621-259-12	SCREW +P 2.6X3
7-621-259-15	SCREW +P 2.6X3
7-621-259-35	SCREW +P 2.6X5
7-621-259-45	SCREW +P 2.6X6
7-685-132-29	SCREW +P 2.6X5 TYPE2 SLIT
7-685-133-11	SCREW +P 2.6X6 TYPE1
7-685-134-11	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-682-148-01	SCREW +P 3X8
7-682-149-01	SCREW +P 3X10
7-628-253-45	SCREW +PS 2X10
7-628-253-95	SCREW +PS 2.6X4
7-682-646-01	SCREW +PS 3X5
7-685-791-01	SCREW +PTT 2.6X5 (S)
7-627-551-08	SCREW, PRECISION +P 1.4X1.6
7-627-551-28	SCREW, PRECISION +P 1.4X2.5
7-627-553-38	SCREW, PRECISION +P 2X3
7-621-712-26	SET-SCREW, SLOT 2.6X3FLAT POINT
7-621-712-35	SET-SCREW, SLOT 2.6X4CONE POINT
7-621-712-46	SET-SCREW, SLOT 2.6X5FLAT POINT
7-621-731-08	SET-SCT, HEX. 2x2.5 FLAT POINT
7-683-240-08	SET-SCT, HEX. 3X6
7-685-105-11	TPG +P 2X8, TYPE 2, NON-SLIT
7-621-714-26	SET SCREW, SLOT 1.7x4 FLAT POINT

SPRING PIN

7-626-302-31	SPRING PIN, 2.5X14

BOLT

7-683-404-04	BOLT, HEXAGON SOCKET 3X8

NUT

7-622-205-05	N 2, TYPE 2
7-684-024-04	N 4, TYPE 2

WASHER

7-688-001-11	W 2, MIDDLE
7-688-002-11	W 2.6, MIDDLE
7-623-108-22	W 3, LARGE
7-688-003-03	W 3, SMALL
7-688-004-11	W 4, MIDDLE
7-688-004-01	W 4, SMALL

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Items marked " ♣ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : μF, PF : μμF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : μH

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description			Remark
	♣A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR BOARD) **********			
	♣1-560-460-00	PIN, CONNECTOR 4P			
		CAPACITOR			
C1	1-123-821-00	ELECT	47MF	20%	16V
C2	1-123-821-00	ELECT	47MF	20%	16V
C3	1-123-821-00	ELECT	47MF	20%	16V
C4	1-123-821-00	ELECT	47MF	20%	16V
		DIODE			
D1	8-719-941-48	DIODE 1N4148TP			
		IC			
IC1	8-759-108-77	IC CX-877			
		TRANSISTOR			
Q1	8-729-100-01	TRANSISTOR 2SD992			
Q2	8-729-100-01	TRANSISTOR 2SD992			
Q3	8-729-100-01	TRANSISTOR 2SD992			
Q4	8-729-100-01	TRANSISTOR 2SD992			
Q5	8-729-100-01	TRANSISTOR 2SD992			
Q6	8-729-100-01	TRANSISTOR 2SD992			
		RESISTOR			
R1	1-247-823-00	CARBON	470	5%	1/6W
R2	1-247-823-00	CARBON	470	5%	1/6W
R3	1-247-823-00	CARBON	470	5%	1/6W
R4	1-247-829-00	CARBON	820	5%	1/6W
R5	1-247-871-00	CARBON	47K	5%	1/6W
R6	1-247-871-00	CARBON	47K	5%	1/6W
R7	1-247-871-00	CARBON	47K	5%	1/6W
R8	1-247-871-00	CARBON	47K	5%	1/6W
		DIODE			
S1	8-719-810-31	DIODE THS103-1			
S2	8-719-810-31	DIODE THS103-1			

Ref.No.	Part No.	Description			Remark
	♣A-6711-433-A	YC-22 BOARD, COMPLETE **********			
	3-655-214-00	CLIP, CABLE			
	♣3-661-659-00	CASE (MAIN), SHIELD			
	♣3-671-251-00	CASE (REAR PLATE), SHIELD			
	♣3-679-319-00	INSULATOR			
		CAPACITOR			
C001	1-161-068-00	CERAMIC	0.0047MF	20%	50V
C002	1-102-074-00	CERAMIC	0.001MF	10%	50V
C003	1-123-328-00	ELECT	4.7MF	20%	25V
C004	1-123-332-00	ELECT	47MF	20%	16V
C005	1-161-070-00	CERAMIC	0.01MF	20%	50V
C006	1-123-307-00	ELECT	100MF	20%	10V
C007	1-123-382-00	ELECT	3.3MF	20%	50V
C008	1-161-070-00	CERAMIC	0.01MF	20%	50V
C009	1-102-973-00	CERAMIC	100PF	5%	50V
C010	1-102-945-00	CERAMIC	8PF	1PF	50V
C011	1-161-070-00	CERAMIC	0.01MF	20%	50V
C012	1-102-499-00	CERAMIC	120PF	5%	50V
C013	1-102-973-00	CERAMIC	100PF	5%	50V
C014	1-102-820-00	CERAMIC	330PF	5%	50V
C015	1-123-356-00	ELECT	10MF	20%	16V
C016	1-161-010-00	CERAMIC	0.0056MF	10%	25V
C017	1-123-379-00	ELECT	0.47MF	20%	50V
C018	1-102-116-00	CERAMIC	680PF	10%	50V
C019	1-130-514-00	MYLAR	0.0068MF	10%	50V
C020	1-130-508-00	MYLAR	0.0022MF	10%	50V
C021	1-123-332-00	ELECT	47MF	20%	16V
C022	1-161-013-00	CERAMIC	0.01MF	10%	25V
C023	1-123-307-00	ELECT	100MF	20%	10V
C024	1-123-379-00	ELECT	0.47MF	20%	50V
C025	1-101-888-00	CERAMIC	68PF	5%	50V
C026	1-102-110-00	CERAMIC	220PF	10%	50V
C027	1-123-330-00	ELECT	22MF	20%	16V
C028	1-123-381-00	ELECT	2.2MF	20%	50V
C029	1-161-021-00	CERAMIC	0.047MF	10%	25V
C030	1-102-114-00	CERAMIC	470PF	10%	50V
C031	1-161-013-00	CERAMIC	0.01MF	10%	25V
C032	1-123-305-00	ELECT	33MF	20%	10V
C033	1-102-978-00	CERAMIC	220PF	5%	50V
C034	1-130-495-00	MYLAR	0.1MF	5%	50V
C035	1-161-021-00	CERAMIC	0.047MF	10%	25V
C036	1-123-305-00	ELECT	33MF	20%	10V
C037	1-130-489-00	MYLAR	0.033MF	5%	50V
C038	1-123-356-00	ELECT	10MF	20%	16V
C039	1-102-074-00	CERAMIC	0.001MF	10%	50V
C040	1-102-962-00	CERAMIC	30PF	5%	50V
C041	1-101-882-00	CERAMIC	51PF	5%	50V
C042	1-102-114-00	CERAMIC	470PF	10%	50V
C043	1-102-962-00	CERAMIC	30PF	5%	50V
C044	1-161-013-00	CERAMIC	0.01MF	10%	25V
C045	1-102-973-00	CERAMIC	100PF	5%	50V

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Ref.No.	Part No.	Description				Remark
C046	1-102-117-00	CERAMIC	820PF	10%	50V	
C047	1-123-356-00	ELECT	10MF	20%	16V	
C048	1-102-973-00	CERAMIC	100PF	5%	50V	
C049	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C050	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C051	1-102-116-00	CERAMIC	680PF	10%	50V	
C052	1-102-116-00	CERAMIC	680PF	10%	50V	
C053	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C054	1-123-328-00	ELECT	4.7MF	20%	25V	
C055	1-102-117-00	CERAMIC	820PF	10%	50V	
C056	1-131-404-00	ELECT(SOLID)	0.22MF	10%	25V	
C057	1-161-072-00	CERAMIC	0.022MF	20%	50V	
C058	1-123-381-00	ELECT	2.2MF	20%	50V	
C059	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C060	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C061	1-102-935-00	CERAMIC	2PF	0.25PF	50V	
C062	1-102-748-00	CERAMIC	11PF	5%	50V	
C063	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C064	1-102-962-00	CERAMIC	30PF	5%	50V	
C065	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C066	1-123-333-00	ELECT	100MF	20%	16V	
C067	1-102-808-00	CERAMIC	6PF	1PF	50V	
C068	1-101-880-00	CERAMIC	47PF	5%	50V	
C069	1-102-965-00	CERAMIC	39PF	5%	50V	
C070	1-102-947-00	CERAMIC	10PF	5%	50V	
C071	1-102-530-00	CERAMIC	120PF	5%	50V	
C072	1-102-961-00	CERAMIC	27PF	5%	50V	
C073	1-123-332-00	ELECT	47MF	20%	16V	
C074	1-123-305-00	ELECT	33MF	20%	10V	
C075	1-123-356-00	ELECT	10MF	20%	16V	
C076	1-123-318-00	ELECT	33MF	20%	16V	
C077	1-161-025-00	CERAMIC	0.1MF	10%	25V	
C078	1-123-307-00	ELECT	100MF	20%	10V	
C079	1-123-318-00	ELECT	33MF	20%	16V	
C080	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C081	1-123-356-00	ELECT	10MF	20%	16V	
C082	1-123-332-00	ELECT	47MF	20%	16V	
C083	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C084	1-123-332-00	ELECT	47MF	20%	16V	
C085	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C086	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C087	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C088	1-101-888-00	CERAMIC	68PF	5%	50V	
C089	1-123-318-00	ELECT	33MF	20%	16V	
C090	1-101-884-00	CERAMIC	56PF	5%	50V	
C091	1-102-110-00	CERAMIC	220PF	10%	50V	
C092	1-123-318-00	ELECT	33MF	20%	16V	
C093	1-102-959-00	CERAMIC	22PF	5%	50V	
C094	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C095	1-123-379-00	ELECT	0.47MF	20%	50V	
C096	1-123-330-00	ELECT	22MF	20%	16V	
C097	1-161-039-00	CERAMIC	0.001MF	10%	25V	
C098	1-123-656-00	ELECT	1000MF	20%	10V	
C099	1-123-295-00	ELECT	100MF	20%	6.3V	
C100	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C101	1-161-005-00	CERAMIC	0.0022MF	10%	25V	
C102	1-123-307-00	ELECT	100MF	20%	10V	
C103	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C104	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C105	1-123-356-00	ELECT	10MF	20%	16V	
C106	1-123-330-00	ELECT	22MF	20%	16V	
C107	1-123-330-00	ELECT	22MF	20%	16V	
C108	1-123-381-00	ELECT	2.2MF	20%	50V	
C109	1-123-381-00	ELECT	2.2MF	20%	50V	
C110	1-123-332-00	ELECT	47MF	20%	16V	
C111	1-123-295-00	ELECT	100MF	20%	6.3V	
C112	1-161-070-00	CERAMIC	0.01MF	20%	50V	
C113	1-123-296-00	ELECT	220MF	20%	6.3V	
C114	1-102-820-00	CERAMIC	330PF	5%	50V	
C115	1-102-980-00	CERAMIC	270PF	5%	50V	
C116	1-101-059-00	CERAMIC	510PF	5%	50V	
C117	1-102-980-00	CERAMIC	270PF	5%	50V	
C118	1-123-306-00	ELECT	47MF	20%	10V	
C119	1-123-332-00	ELECT	47MF	20%	16V	
C120	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C121	1-123-307-00	ELECT	100MF	20%	10V	
C122	1-102-962-00	CERAMIC	30PF	5%	50V	
C123	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C124	1-102-960-00	CERAMIC	24PF	5%	50V	
C125	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C126	1-161-072-00	CERAMIC	0.022MF	20%	50V	
C127	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C128	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C129	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C132	1-102-980-00	CERAMIC	270PF	5%	50V	
C133	1-123-306-00	ELECT	47MF	20%	10V	
C135	1-102-823-00	CERAMIC	43PF	5%	50V	
C136	1-102-824-00	CERAMIC	470PF	5%	50V	
C137	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C138	1-102-976-00	CERAMIC	180PF	5%	50V	
C139	1-102-976-00	CERAMIC	180PF	5%	50V	
C140	1-101-059-00	CERAMIC	510PF	5%	50V	
C141	1-102-972-00	CERAMIC	91PF	5%	50V	
C142	1-102-966-00	CERAMIC	43PF	5%	50V	
C143	1-102-816-00	CERAMIC	120PF	5%	50V	
C144	1-123-356-00	ELECT	10MF	20%	16V	
C145	1-102-112-00	CERAMIC	330PF	10%	50V	
C146	1-123-380-00	ELECT	1MF	20%	50V	
C147	1-102-976-00	CERAMIC	180PF	5%	50V	
C148	1-102-980-00	CERAMIC	270PF	5%	50V	
C149	1-101-880-00	CERAMIC	47PF	5%	50V	
C150	1-102-820-00	CERAMIC	330PF	5%	50V	
C151	1-123-306-00	ELECT	47MF	20%	10V	
C152	1-124-145-00	ELECT	330MF	20%	16V	
C153	1-101-361-00	CERAMIC	150PF	5%	50V	
C154	1-102-820-00	CERAMIC	330PF	5%	50V	

When indicating parts by reference number, please include the board name.

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Ref No.	Part No.	Description			Remark
C155	1-130-473-00	MYLAR	0.0015MF	5%	50V
C156	1-102-978-00	CERAMIC	220PF	5%	50V
C157	1-102-951-00	CERAMIC	15PF	5%	50V
C158	1-102-965-00	CERAMIC	39PF	5%	50V
C159	1-101-884-00	CERAMIC	56PF	5%	50V
C160	1-102-953-00	CERAMIC	18PF	5%	50V
C161	1-123-332-00	ELECT	47MF	20%	16V
C162	1-161-070-00	CERAMIC	0.01MF	20%	50V
C163	1-161-036-00	CERAMIC	0.047MF	20%	25V
C164	1-161-036-00	CERAMIC	0.047MF	20%	25V
C165	1-161-070-00	CERAMIC	0.01MF	20%	50V
C166	1-102-966-00	CERAMIC	43PF	5%	50V
C167	1-102-809-00	CERAMIC	7PF	1PF	50V
C168	1-102-112-00	CERAMIC	330PF	10%	50V
C169	1-161-013-00	CERAMIC	0.01MF	10%	25V
C170	1-161-013-00	CERAMIC	0.01MF	10%	25V
C171	1-102-934-00	CERAMIC	1PF	0.25PF	50V
C172	1-102-953-00	CERAMIC	18PF	5%	50V
C173	1-102-959-00	CERAMIC	22PF	5%	50V
C174	1-102-807-00	CERAMIC	5PF	1PF	50V
C175	1-123-296-00	ELECT	220MF	20%	6.3V
C176	1-123-380-00	ELECT	1MF	20%	50V
C177	1-102-973-00	CERAMIC	100PF	5%	50V
C178	1-123-307-00	ELECT	100MF	20%	10V
C179	1-161-006-00	CERAMIC	0.0027MF	10%	25V
C180	1-161-004-00	CERAMIC	0.0018MF	10%	25V
C181	1-123-296-00	ELECT	220MF	20%	6.3V
C182	1-123-356-00	ELECT	10MF	20%	16V
C183	1-161-013-00	CERAMIC	0.01MF	10%	25V
C184	1-161-013-00	CERAMIC	0.01MF	10%	25V
C185	1-161-013-00	CERAMIC	0.01MF	10%	25V
C186	1-161-013-00	CERAMIC	0.01MF	10%	25V
C187	1-102-816-00	CERAMIC	120PF	5%	50V
C188	1-123-356-00	ELECT	10MF	20%	16V
C189	1-161-070-00	CERAMIC	0.01MF	20%	50V
C190	1-123-332-00	ELECT	47MF	20%	16V
C191	1-161-072-00	CERAMIC	0.022MF	20%	50V
C192	1-123-332-00	ELECT	47MF	20%	16V
C193	1-161-070-00	CERAMIC	0.01MF	20%	50V
C194	1-102-529-00	CERAMIC	100PF	5%	50V
C195	1-161-036-00	CERAMIC	0.047MF	20%	25V
C196	1-161-036-00	CERAMIC	0.047MF	20%	25V
C197	1-161-036-00	CERAMIC	0.047MF	20%	25V
C198	1-161-070-00	CERAMIC	0.01MF	20%	50V
C199	1-102-963-00	CERAMIC	33PF	5%	50V
C200	1-102-959-00	CERAMIC	22PF	5%	50V
C201	1-123-305-00	ELECT	33MF	20%	10V
C202	1-161-021-00	CERAMIC	0.047MF	10%	25V
C203	1-161-021-00	CERAMIC	0.047MF	10%	25V
C204	1-161-021-00	CERAMIC	0.047MF	10%	25V
C205	1-161-021-00	CERAMIC	0.047MF	10%	25V
C206	1-123-330-00	ELECT	22MF	20%	16V
C207	1-161-013-00	CERAMIC	0.01MF	10%	25V
C208	1-161-021-00	CERAMIC	0.047MF	10%	25V
C209	1-123-356-00	ELECT	10MF	20%	16V
C210	1-101-884-00	CERAMIC	56PF	5%	50V
C211	1-102-963-00	CERAMIC	33PF	5%	50V
C0134	1-102-823-00	CERAMIC	43PF	5%	50V

FILTER

CF001	1-527-823-00	FILTER, CERAMIC (10.7MHZ)

CONNECTOR

CN001	1-560-898-00	PIN, CONNECTOR 10P
CN002	1-560-894-00	PIN, CONNECTOR 6P
CN003	1-560-890-31	PIN, CONNECTOR 2P
CN004	1-560-890-00	PIN, CONNECTOR 2P
CN005	1-560-900-00	PIN, CONNECTOR 12P
CN006	1-560-890-21	PIN, CONNECTOR 2P

JACK

CNJ001	1-507-678-21	JACK (AUDIO OUT)
CNJ002	1-507-588-32	PIN JACK, 1P (VIDEO OUT)

DIODE

D001	8-719-911-19	DIODE 1SS119
D002	8-719-911-19	DIODE 1SS119
D003	8-719-911-19	DIODE 1SS119
D004	8-719-911-19	DIODE 1SS119
D005	8-719-911-19	DIODE 1SS119
D006	8-719-911-19	DIODE 1SS119
D007	8-719-911-19	DIODE 1SS119
D008	8-719-911-19	DIODE 1SS119
D009	8-719-911-19	DIODE 1SS119
D010	8-719-911-19	DIODE 1SS119
D011	8-719-911-19	DIODE 1SS119
D012	8-719-911-19	DIODE 1SS119
D013	8-719-911-19	DIODE 1SS119
D014	8-719-911-19	DIODE 1SS119
D015	8-719-911-19	DIODE 1SS119
D016	8-719-911-19	DIODE 1SS119
D017	8-719-911-19	DIODE 1SS119
D018	8-719-911-19	DIODE 1SS119
D019	8-719-911-19	DIODE 1SS119
D020	8-719-911-19	DIODE 1SS119
D021	8-719-911-19	DIODE 1SS119
D022	8-719-911-19	DIODE 1SS119
D023	8-719-911-19	DIODE 1SS119
D024	8-719-911-19	DIODE 1SS119
D025	8-719-911-19	DIODE 1SS119

DELAY LINE

DL001	1-415-283-00	DELAY LINE (1/2H)
DL002	1-415-065-00	DELAY LINE (1H)
DL003	1-415-159-00	DELAY LINE (1H)

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark
		IC	
IC001	8-751-960-00	IC CX-196A	
IC002	8-758-220-00	IC CX-822	
IC003	8-751-880-00	IC CX-188	
IC004	8-759-601-87	IC CX-187	
IC005	8-751-350-00	IC CX-135	
		COIL	
L001	1-408-623-00	MICRO INDUCTOR 470UH	
L002	1-408-614-00	MICRO INDUCTOR 82UH	
L003	1-408-608-00	MICRO INDUCTOR 27UH	
L004	1-408-600-00	MICRO INDUCTOR 5.6UH	
L005	1-408-613-00	MICRO INDUCTOR 68UH	
L006	1-408-619-00	MICRO INDUCTOR 220UH	
L007	1-407-503-00	MICRO INDUCTOR 8.2MMH	
L008	1-407-747-00	MICRO INDUCTOR 56UH	
L009	1-408-611-00	MICRO INDUCTOR 47UH	
L010	1-408-615-00	MICRO INDUCTOR 100UH	
L011	1-408-616-00	MICRO INDUCTOR 120UH	
L012	1-408-614-00	MICRO INDUCTOR 82UH	
L013	1-408-617-00	MICRO INDUCTOR 150UH	
L014	1-408-615-00	MICRO INDUCTOR 100UH	
L015	1-408-613-00	MICRO INDUCTOR 68UH	
L016	1-408-614-00	MICRO INDUCTOR 82UH	
L017	1-407-718-00	MICRO INDUCTOR 1.2MMH	
L018	1-408-608-00	MICRO INDUCTOR 27UH	
L019	1-408-604-00	MICRO INDUCTOR 12UH	
L020	1-408-602-00	MICRO INDUCTOR 8.2UH	
L021	1-408-605-00	MICRO INDUCTOR 15UH	
L022	1-408-603-00	MICRO INDUCTOR 10UH	
L023	1-408-610-00	MICRO INDUCTOR 39UH	
L024	1-408-610-00	MICRO INDUCTOR 39UH	
L025	1-408-610-00	MICRO INDUCTOR 39UH	
L026	1-408-616-00	MICRO INDUCTOR 120UH	
L027	1-408-607-00	MICRO INDUCTOR 22UH	
L028	1-408-614-00	MICRO INDUCTOR 82UH	
L029	1-408-617-00	MICRO INDUCTOR 150UH	
L030	1-408-618-00	MICRO INDUCTOR 180UH	
L031	1-408-615-00	MICRO INDUCTOR 100UH	
L032	1-408-602-00	MICRO INDUCTOR 8.2UH	
L033	1-408-617-00	MICRO INDUCTOR 150UH	
L034	1-408-617-00	MICRO INDUCTOR 150UH	
L035	1-408-619-00	MICRO INDUCTOR 220UH	
L036	1-408-618-00	MICRO INDUCTOR 180UH	
L037	1-408-606-00	MICRO INDUCTOR 18UH	
L038	1-408-606-00	MICRO INDUCTOR 18UH	
L039	1-408-617-00	MICRO INDUCTOR 150UH	
L040	1-408-401-00	MICRO INDUCTOR 2.2UH	
L041	1-408-613-00	MICRO INDUCTOR 68UH	
L042	1-408-619-00	MICRO INDUCTOR 220UH	

Ref.No.	Part No.	Description	Remark
		VARIABLE COIL	
LV001	1-408-522-00	COIL, VARIABLE	
LV002	1-408-512-00	COIL, VARIABLE	
		RF UNIT	
MD001	1-464-266-00	RF UNIT, COLOR (RFU-702)	
		TRANSISTOR	
Q001	8-729-245-83	TRANSISTOR 2SC2458	
Q002	8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-245-83	TRANSISTOR 2SC2458	
Q004	8-729-117-54	TRANSISTOR 2SA1175	
Q005	8-729-117-54	TRANSISTOR 2SA1175	
Q006	8-729-245-83	TRANSISTOR 2SC2458	
Q007	8-729-178-54	TRANSISTOR 2SC2785	
Q008	8-729-117-54	TRANSISTOR 2SA1175	
Q009	8-729-178-54	TRANSISTOR 2SC2785	
Q010	8-729-245-83	TRANSISTOR 2SC2458	
Q011	8-729-245-83	TRANSISTOR 2SC2458	
Q012	8-729-603-50	TRANSISTOR 2SC403SP	
Q013	8-729-245-83	TRANSISTOR 2SC2458	
Q014	8-729-245-83	TRANSISTOR 2SC2458	
Q015	8-729-245-83	TRANSISTOR 2SC2458	
Q016	8-729-178-54	TRANSISTOR 2SC2785	
Q017	8-729-245-83	TRANSISTOR 2SC2458	
Q018	8-729-245-83	TRANSISTOR 2SC2458	
Q019	8-729-245-83	TRANSISTOR 2SC2458	
Q020	8-729-245-83	TRANSISTOR 2SC2458	
Q021	8-729-245-83	TRANSISTOR 2SC2458	
Q022	8-729-178-54	TRANSISTOR 2SC2785	
Q023	8-729-178-54	TRANSISTOR 2SC2785	
Q024	8-729-245-83	TRANSISTOR 2SC2458	
Q025	8-729-245-83	TRANSISTOR 2SC2458	
Q026	8-729-603-50	TRANSISTOR 2SC403SP	
Q027	8-729-384-48	TRANSISTOR 2SA844	
Q028	8-729-603-50	TRANSISTOR 2SC403SP	
Q029	8-729-178-54	TRANSISTOR 2SC2785	
Q030	8-729-245-83	TRANSISTOR 2SC2458	
Q031	8-729-117-54	TRANSISTOR 2SA1175	
Q032	8-729-178-54	TRANSISTOR 2SC2785	
Q033	8-729-245-83	TRANSISTOR 2SC2458	
Q034	8-729-245-83	TRANSISTOR 2SC2458	
Q035	8-729-117-54	TRANSISTOR 2SA1175	
Q036	8-729-603-50	TRANSISTOR 2SC403SP	
Q037	8-729-612-77	TRANSISTOR 2SA1027R	
Q038	8-729-612-77	TRANSISTOR 2SA1027R	
Q039	8-729-603-50	TRANSISTOR 2SC403SP	
Q040	8-729-612-77	TRANSISTOR 2SA1027R	
Q041	8-729-612-77	TRANSISTOR 2SA1027R	
Q042	8-729-612-77	TRANSISTOR 2SA1027R	
Q043	8-729-612-77	TRANSISTOR 2SA1027R	
Q044	8-729-245-83	TRANSISTOR 2SC2458	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description	Remark
Q045	8-729-612-77	TRANSISTOR 2SA1027R	
Q046	8-729-612-77	TRANSISTOR 2SA1027R	
Q047	8-729-612-77	TRANSISTOR 2SA1027R	
Q048	8-729-603-50	TRANSISTOR 2SC403SP	
Q049	8-729-612-77	TRANSISTOR 2SA1027R	
Q050	8-729-612-77	TRANSISTOR 2SA1027R	
Q051	8-729-245-83	TRANSISTOR 2SC2458	
Q052	8-729-178-54	TRANSISTOR 2SC2785	
Q053	8-729-178-54	TRANSISTOR 2SC2785	
Q054	8-729-603-50	TRANSISTOR 2SC403SP	
Q055	8-729-384-48	TRANSISTOR 2SA844	
Q056	8-729-603-50	TRANSISTOR 2SC403SP	
Q057	8-729-603-50	TRANSISTOR 2SC403SP	

RESISTOR

Ref.No.	Part No.	Description			Remark
R001	1-247-869-00	CARBON	39K	5% 1/6W	
R002	1-247-855-00	CARBON	10K	5% 1/6W	
R003	1-246-461-00	CARBON	330	5% 1/4W	
R004	1-247-849-00	CARBON	5.6K	5% 1/6W	
R005	1-247-809-00	CARBON	120	5% 1/6W	
R006	1-247-847-00	CARBON	4.7K	5% 1/6W	
R007	1-247-848-00	CARBON	5.1K	5% 1/6W	
R008	1-247-881-00	CARBON	120K	5% 1/6W	
R009	1-247-836-00	CARBON	1.6K	5% 1/6W	
R010	1-247-841-00	CARBON	2.7K	5% 1/6W	
R011	1-247-827-00	CARBON	680	5% 1/6W	
R012	1-247-863-00	CARBON	22K	5% 1/6W	
R013	1-247-838-00	CARBON	2K	5% 1/6W	
R014	1-247-871-00	CARBON	47K	5% 1/6W	
R015	1-247-833-00	CARBON	1.2K	5% 1/6W	
R016	1-247-889-00	CARBON	270K	5% 1/6W	
R017	1-247-879-00	CARBON	100K	5% 1/6W	
R018	1-247-859-00	CARBON	15K	5% 1/6W	
R019	1-247-881-00	CARBON	120K	5% 1/6W	
R020	1-247-825-00	CARBON	560	5% 1/6W	
R021	1-247-859-00	CARBON	15K	5% 1/6W	
R022	1-247-856-00	CARBON	11K	5% 1/6W	
R023	1-247-855-00	CARBON	10K	5% 1/6W	
R024	1-247-837-00	CARBON	1.8K	5% 1/6W	
R025	1-247-855-00	CARBON	10K	5% 1/6W	
R026	1-247-807-00	CARBON	100	5% 1/6W	
R027	1-247-871-00	CARBON	47K	5% 1/6W	
R028	1-247-871-00	CARBON	47K	5% 1/6W	
R029	1-247-884-00	CARBON	160K	5% 1/6W	
R030	1-247-831-00	CARBON	1K	5% 1/6W	
R031	1-247-853-00	CARBON	8.2K	5% 1/6W	
R032	1-247-819-00	CARBON	330	5% 1/6W	
R033	1-247-819-00	CARBON	330	5% 1/6W	
R034	1-247-853-00	CARBON	8.2K	5% 1/6W	
R035	1-247-853-00	CARBON	8.2K	5% 1/6W	
R036	1-247-884-00	CARBON	160K	5% 1/6W	
R037	1-247-843-00	CARBON	3.3K	5% 1/6W	
R038	1-247-903-00	CARBON	1M	5% 1/6W	
R039	1-247-855-00	CARBON	10K	5% 1/6W	
R040	1-247-855-00	CARBON	10K	5% 1/6W	
R041	1-247-872-00	CARBON	51K	5% 1/6W	
R042	1-247-855-00	CARBON	10K	5% 1/6W	
R043	1-247-869-00	CARBON	39K	5% 1/6W	
R044	1-247-824-00	CARBON	510	5% 1/6W	
R045	1-247-855-00	CARBON	10K	5% 1/6W	
R046	1-247-872-00	CARBON	51K	5% 1/6W	
R047	1-247-851-00	CARBON	6.8K	5% 1/6W	
R048	1-247-859-00	CARBON	15K	5% 1/6W	
R050	1-247-873-00	CARBON	56K	5% 1/6W	
R051	1-247-868-00	CARBON	36K	5% 1/6W	
R052	1-247-863-00	CARBON	22K	5% 1/6W	
R053	1-247-865-00	CARBON	27K	5% 1/6W	
R054	1-247-839-00	CARBON	2.2K	5% 1/6W	
R055	1-247-825-00	CARBON	560	5% 1/6W	
R056	1-247-799-00	CARBON	47	5% 1/6W	
R057	1-247-831-00	CARBON	1K	5% 1/6W	
R058	1-247-825-00	CARBON	560	5% 1/6W	
R059	1-247-831-00	CARBON	1K	5% 1/6W	
R060	1-247-825-00	CARBON	560	5% 1/6W	
R061	1-247-825-00	CARBON	560	5% 1/6W	
R062	1-247-839-00	CARBON	2.2K	5% 1/6W	
R063	1-247-879-00	CARBON	100K	5% 1/6W	
R064	1-247-843-00	CARBON	3.3K	5% 1/6W	
R065	1-247-900-00	CARBON	750K	5% 1/6W	
R066	1-210-819-00	SOLID	1.8M	5% 1/4W	
R067	1-247-843-00	CARBON	3.3K	5% 1/6W	
R068	1-247-839-00	CARBON	2.2K	5% 1/6W	
R069	1-247-851-00	CARBON	6.8K	5% 1/6W	
R070	1-247-842-00	CARBON	3K	5% 1/6W	
R071	1-247-855-00	CARBON	10K	5% 1/6W	
R072	1-247-871-00	CARBON	47K	5% 1/6W	
R073	1-247-849-00	CARBON	5.6K	5% 1/6W	
R074	1-247-855-00	CARBON	10K	5% 1/6W	
R075	1-247-847-00	CARBON	4.7K	5% 1/6W	
R076	1-247-848-00	CARBON	5.1K	5% 1/6W	
R077	1-247-835-00	CARBON	1.5K	5% 1/6W	
R078	1-247-837-00	CARBON	1.8K	5% 1/6W	
R079	1-247-855-00	CARBON	10K	5% 1/6W	
R080	1-247-849-00	CARBON	5.6K	5% 1/6W	
R081	1-247-852-00	CARBON	7.5K	5% 1/6W	
R082	1-247-873-00	CARBON	56K	5% 1/6W	
R083	1-247-829-00	CARBON	820	5% 1/6W	
R084	1-247-831-00	CARBON	1K	5% 1/6W	
R085	1-247-829-00	CARBON	820	5% 1/6W	
R086	1-247-833-00	CARBON	1.2K	5% 1/6W	
R087	1-247-831-00	CARBON	1K	5% 1/6W	
R088	1-247-846-00	CARBON	4.3K	5% 1/6W	
R089	1-247-855-00	CARBON	10K	5% 1/6W	
R090	1-247-831-00	CARBON	1K	5% 1/6W	
R091	1-247-831-00	CARBON	1K	5% 1/6W	
R092	1-247-813-00	CARBON	180	5% 1/6W	

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description				Remark
R093	1-247-809-00	CARBON	120	5%	1/6W	
R094	1-247-831-00	CARBON	1K	5%	1/6W	
R095	1-247-855-00	CARBON	10K	5%	1/6W	
R096	1-247-855-00	CARBON	10K	5%	1/6W	
R097	1-247-847-00	CARBON	4.7K	5%	1/6W	
R098	1-247-847-00	CARBON	4.7K	5%	1/6W	
R099	1-247-855-00	CARBON	10K	5%	1/6W	
R100	1-247-871-00	CARBON	47K	5%	1/6W	
R101	1-247-859-00	CARBON	15K	5%	1/6W	
R102	1-247-867-00	CARBON	33K	5%	1/6W	
R103	1-244-860-51	CARBON	300	5%	1/2W	
R104	1-247-803-00	CARBON	68	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-247-831-00	CARBON	1K	5%	1/6W	
R107	1-247-849-00	CARBON	5.6K	5%	1/6W	
R108	1-247-827-00	CARBON	680	5%	1/6W	
R109	1-247-855-00	CARBON	10K	5%	1/6W	
R110	1-247-871-00	CARBON	47K	5%	1/6W	
R111	1-247-853-00	CARBON	8.2K	5%	1/6W	
R112	1-247-839-00	CARBON	2.2K	5%	1/6W	
R113	1-247-867-00	CARBON	33K	5%	1/6W	
R114	1-247-855-00	CARBON	10K	5%	1/6W	
R115	1-247-855-00	CARBON	10K	5%	1/6W	
R116	1-247-871-00	CARBON	47K	5%	1/6W	
R117	1-247-871-00	CARBON	47K	5%	1/6W	
R118	1-247-854-00	CARBON	9.1K	5%	1/6W	
R119	1-247-859-00	CARBON	15K	5%	1/6W	
R120	1-247-853-00	CARBON	8.2K	5%	1/6W	
R121	1-247-827-00	CARBON	680	5%	1/6W	
R122	1-247-847-00	CARBON	4.7K	5%	1/6W	
R123	1-247-838-00	CARBON	2K	5%	1/6W	
R124	1-247-846-00	CARBON	4.3K	5%	1/6W	
R125	1-247-807-00	CARBON	100	5%	1/6W	
R126	1-247-827-00	CARBON	680	5%	1/6W	
R127	1-247-827-00	CARBON	680	5%	1/6W	
R128	1-247-827-00	CARBON	680	5%	1/6W	
R129	1-247-827-00	CARBON	680	5%	1/6W	
R130	1-247-821-00	CARBON	390	5%	1/6W	
R131	1-247-839-00	CARBON	2.2K	5%	1/6W	
R132	1-247-809-00	CARBON	120	5%	1/6W	
R133	1-247-827-00	CARBON	680	5%	1/6W	
R134	1-247-865-00	CARBON	27K	5%	1/6W	
R135	1-247-831-00	CARBON	1K	5%	1/6W	
R136	1-247-823-00	CARBON	470	5%	1/6W	
R137	1-247-823-00	CARBON	470	5%	1/6W	
R138	1-247-833-00	CARBON	1.2K	5%	1/6W	
R139	1-247-831-00	CARBON	1K	5%	1/6W	
R140	1-247-833-00	CARBON	1.2K	5%	1/6W	
R141	1-247-839-00	CARBON	2.2K	5%	1/6W	
R142	1-247-831-00	CARBON	1K	5%	1/6W	
R143	1-247-863-00	CARBON	22K	5%	1/6W	
R144	1-247-859-00	CARBON	15K	5%	1/6W	
R145	1-247-831-00	CARBON	1K	5%	1/6W	
R146	1-247-855-00	CARBON	10K	5%	1/6W	
R147	1-247-863-00	CARBON	22K	5%	1/6W	
R148	1-247-828-00	CARBON	750	5%	1/6W	
R149	1-247-840-00	CARBON	2.4K	5%	1/6W	
R150	1-247-847-00	CARBON	4.7K	5%	1/6W	
R151	1-247-855-00	CARBON	10K	5%	1/6W	
R152	1-247-863-00	CARBON	22K	5%	1/6W	
R153	1-247-828-00	CARBON	750	5%	1/6W	
R154	1-247-867-00	CARBON	33K	5%	1/6W	
R155	1-247-839-00	CARBON	2.2K	5%	1/6W	
R156	1-247-861-00	CARBON	18K	5%	1/6W	
R157	1-247-863-00	CARBON	22K	5%	1/6W	
R158	1-247-831-00	CARBON	1K	5%	1/6W	
R159	1-247-837-00	CARBON	1.8K	5%	1/6W	
R160	1-247-849-00	CARBON	5.6K	5%	1/6W	
R161	1-247-851-00	CARBON	6.8K	5%	1/6W	
R162	1-247-851-00	CARBON	6.8K	5%	1/6W	
R163	1-247-859-00	CARBON	15K	5%	1/6W	
R164	1-247-825-00	CARBON	560	5%	1/6W	
R165	1-247-831-00	CARBON	1K	5%	1/6W	
R166	1-247-824-00	CARBON	510	5%	1/6W	
R167	1-247-856-00	CARBON	11K	5%	1/6W	
R168	1-247-813-00	CARBON	180	5%	1/6W	
R169	1-247-813-00	CARBON	180	5%	1/6W	
R170	1-247-856-00	CARBON	11K	5%	1/6W	
R171	1-247-831-00	CARBON	1K	5%	1/6W	
R172	1-247-823-00	CARBON	470	5%	1/6W	
R173	1-247-811-00	CARBON	150	5%	1/6W	
R174	1-247-837-00	CARBON	1.8K	5%	1/6W	
R175	1-247-839-00	CARBON	2.2K	5%	1/6W	
R176	1-247-817-00	CARBON	270	5%	1/6W	
R177	1-247-847-00	CARBON	4.7K	5%	1/6W	
R178	1-247-835-00	CARBON	1.5K	5%	1/6W	
R179	1-247-842-00	CARBON	3K	5%	1/6W	
R180	1-247-819-00	CARBON	330	5%	1/6W	
R181	1-247-859-00	CARBON	15K	5%	1/6W	
R182	1-247-832-00	CARBON	1.1K	5%	1/6W	
R183	1-247-821-00	CARBON	390	5%	1/6W	
R184	1-247-835-00	CARBON	1.5K	5%	1/6W	
R185	1-247-831-00	CARBON	1K	5%	1/6W	
R186	1-247-847-00	CARBON	4.7K	5%	1/6W	
R187	1-247-799-00	CARBON	47	5%	1/6W	
R188	1-247-869-00	CARBON	39K	5%	1/6W	
R189	1-247-827-00	CARBON	680	5%	1/6W	
R190	1-247-871-00	CARBON	47K	5%	1/6W	
R191	1-247-865-00	CARBON	27K	5%	1/6W	
R192	1-247-851-00	CARBON	6.8K	5%	1/6W	
R193	1-247-857-00	CARBON	12K	5%	1/6W	
R194	1-247-820-00	CARBON	360	5%	1/6W	
R195	1-247-815-00	CARBON	220	5%	1/6W	
R196	1-247-839-00	CARBON	2.2K	5%	1/6W	
R197	1-247-831-00	CARBON	1K	5%	1/6W	
R198	1-247-866-00	CARBON	30K	5%	1/6W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No	Description				Remark
R199	1-247-835-00	CARBON	1.5K	5%	1/6W	
R200	1-247-826-00	CARBON	620	5%	1/6W	
R201	1-247-831-00	CARBON	1K	5%	1/6W	
R202	1-247-837-00	CARBON	1.8K	5%	1/6W	
R203	1-247-819-00	CARBON	330	5%	1/6W	
R204	1-247-839-00	CARBON	2.2K	5%	1/6W	
R205	1-247-853-00	CARBON	8.2K	5%	1/6W	
R206	1-247-857-00	CARBON	12K	5%	1/6W	
R207	1-247-831-00	CARBON	1K	5%	1/6W	
R208	1-247-823-00	CARBON	470	5%	1/6W	
R209	1-247-815-00	CARBON	220	5%	1/6W	
R210	1-247-820-00	CARBON	360	5%	1/6W	
R211	1-247-783-00	CARBON	10	5%	1/6W	
R212	1-247-835-00	CARBON	1.5K	5%	1/6W	
R213	1-247-832-00	CARBON	1.1K	5%	1/6W	
R214	1-247-861-00	CARBON	18K	5%	1/6W	
R215	1-247-845-00	CARBON	3.9K	5%	1/6W	
R216	1-247-831-00	CARBON	1K	5%	1/6W	
R217	1-247-839-00	CARBON	2.2K	5%	1/6W	
R218	1-247-822-00	CARBON	430	5%	1/6W	
R219	1-247-842-00	CARBON	3K	5%	1/6W	
R220	1-247-829-00	CARBON	820	5%	1/6W	
R221	1-247-825-00	CARBON	560	5%	1/6W	
R222	1-247-817-00	CARBON	270	5%	1/6W	
R223	1-247-807-00	CARBON	100	5%	1/6W	
R224	1-247-825-00	CARBON	560	5%	1/6W	
R225	1-247-823-00	CARBON	470	5%	1/6W	
R226	1-247-863-00	CARBON	22K	5%	1/6W	
R227	1-247-799-00	CARBON	47	5%	1/6W	
R228	1-247-855-00	CARBON	10K	5%	1/6W	
R229	1-247-807-00	CARBON	100	5%	1/6W	
R230	1-247-823-00	CARBON	470	5%	1/6W	
R231	1-247-824-00	CARBON	510	5%	1/6W	
R232	1-247-823-00	CARBON	470	5%	1/6W	
R233	1-247-823-00	CARBON	470	5%	1/6W	
R234	1-247-837-00	CARBON	1.8K	5%	1/6W	
R235	1-247-833-00	CARBON	1.2K	5%	1/6W	
R236	1-247-831-00	CARBON	1K	5%	1/6W	
R237	1-247-843-00	CARBON	3.3K	5%	1/6W	
R238	1-247-833-00	CARBON	1.2K	5%	1/6W	
R239	1-247-831-00	CARBON	1K	5%	1/6W	
R240	1-247-854-00	CARBON	9.1K	5%	1/6W	
R241	1-247-858-00	CARBON	13K	5%	1/6W	
R242	1-247-863-00	CARBON	22K	5%	1/6W	
R243	1-247-879-00	CARBON	100K	5%	1/6W	
R244	1-247-831-00	CARBON	1K	5%	1/6W	
R245	1-247-827-00	CARBON	680	5%	1/6W	
R246	1-247-799-00	CARBON	47	5%	1/6W	
R247	1-247-857-00	CARBON	12K	5%	1/6W	
R248	1-247-847-00	CARBON	4.7K	5%	1/6W	
R249	1-247-823-00	CARBON	470	5%	1/6W	
R250	1-247-839-00	CARBON	2.2K	5%	1/6W	
R251	1-247-817-00	CARBON	270	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R252	1-247-807-00	CARBON	100	5%	1/6W	
R253	1-247-817-00	CARBON	270	5%	1/6W	
R254	1-247-825-00	CARBON	560	5%	1/6W	
R255	1-247-838-00	CARBON	2K	5%	1/6W	
R256	1-247-849-00	CARBON	5.6K	5%	1/6W	
R257	1-247-845-00	CARBON	3.9K	5%	1/6W	
R258	1-247-843-00	CARBON	3.3K	5%	1/6W	
R259	1-247-835-00	CARBON	1.5K	5%	1/6W	
R260	1-247-859-00	CARBON	15K	5%	1/6W	
R261	1-247-861-00	CARBON	18K	5%	1/6W	
R262	1-247-815-00	CARBON	150	5%	1/6W	
R263	1-247-807-00	CARBON	100	5%	1/6W	
R264	1-246-465-00	CARBON	470	5%	1/4W	
R265	1-247-799-00	CARBON	47	5%	1/6W	
R266	1-247-843-00	CARBON	3.3K	5%	1/6W	
R267	1-247-804-00	CARBON	75	5%	1/6W	
R268	1-247-855-00	CARBON	10K	5%	1/6W	
R269	1-247-828-00	CARBON	750	5%	1/6W	
R270	1-247-859-00	CARBON	15K	5%	1/6W	
R271	1-247-847-00	CARBON	4.7K	5%	1/6W	
R272	1-247-815-00	CARBON	220	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON	4.7K
RV002	1-228-746-00	RES, ADJ, CARBON	2.2K
RV003	1-228-748-00	RES, ADJ, CARBON	10K
RV004	1-228-750-00	RES, ADJ, CARBON	47K
RV005	1-228-746-00	RES, ADJ, CARBON	2.2K
RV006	1-228-744-00	RES, ADJ, CARBON	470
RV007	1-228-749-00	RES, ADJ, CARBON	22K
RV008	1-228-745-00	RES, ADJ, CARBON	1K
RV009	1-228-746-00	RES, ADJ, CARBON	2.2K
RV010	1-228-744-00	RES, ADJ, CARBON	470
RV011	1-228-748-00	RES, ADJ, CARBON	10K
RV012	1-228-746-00	RES, ADJ, CARBON	2.2K
RV013	1-228-745-00	RES, ADJ, CARBON	1K
RV014	1-228-745-00	RES, ADJ, CARBON	1K
RV015	1-228-745-00	RES, ADJ, CARBON	1K
RV016	1-228-744-00	RES, ADJ, CARBON	470
RV017	1-228-744-00	RES, ADJ, CARBON	470
RV018	1-228-750-00	RES, ADJ, CARBON	47K
RV019	1-228-745-00	RES, ADJ, CARBON	1K

SWITCH

S001	1-553-725-21	SWITCH, SLIDE (PCM)	

TRANSFORMER

T001	1-426-083-00	TRANSFORMER, BAND PASS	
T002	1-426-082-00	TRANSFORMER, BAND PASS	
T003	1-426-081-00	TRANSFORMER, BAND PASS	
T004	1-426-078-00	TRANSFORME, VAST AMP	
T005	1-426-076-00	TRANSFORMER, EQUALIZER (1)	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

YC-22 RP-8

Ref No	Part No	Description	Remark
T006	1-426-080-00	TRANSFORMER, BAND PASS	
T007	1-426-079-00	TRANSFORMER, BAND PASS	
T008	1-426-077-00	TRANSFORMER, EQUALIZER (2)	
		CRYSTAL	
X001	1-527-396-00	CRYSTAL, OSC (3.58MHZ)	
X002	1-567-126-00	CRYSTAL, OSC (3.58MHZ)	
**********			
⚠	A-6730-613-A	RP-8 BOARD, COMPLETE (RP BLOCK ASSY) **********	
⚠	3-679-178-00	CASE (INNER) SHIELD, RP-66	
⚠	3-679-179-00	CASE (LOWER), SHIELD, RP-66	
⚠	3-679-240-00	CASE (UPPER), SHIELD, RP-55	
⚠	3-679-272-00	CASE (INNER), SHIELD, RP-55	
		CAPACITOR	
C001	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C002	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C003	1-123-380-00	ELECT 1MF 20% 50V	
C004	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C005	1-123-380-00	ELECT 1MF 20% 50V	
C006	1-123-381-00	ELECT 2.2MF 20% 50V	
C007	1-161-009-00	CERAMIC 0.0047MF 10% 25V	
C008	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C009	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C010	1-101-886-00	CERAMIC 62PF 5% 50V	
C011	1-101-886-00	CERAMIC 62PF 5% 50V	
C012	1-161-017-00	CERAMIC 0.022MF 10% 25V	
C013	1-123-356-00	ELECT 10MF 20% 16V	
C014	1-102-114-00	CERAMIC 470PF 10% 50V	
C015	1-102-973-00	CERAMIC 100PF 5% 50V	
C016	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C018	1-161-019-00	CERAMIC 0.033MF 10% 25V	
C019	1-161-017-00	CERAMIC 0.022MF 10% 25V	
C020	1-161-017-00	CERAMIC 0.022MF 10% 25V	
C021	1-102-112-00	CERAMIC 330PF 10% 50V	
C022	1-131-371-00	TANTALUM 10MF 20% 16V	
C025	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C026	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C027	1-123-330-00	ELECT 22MF 20% 16V	
C028	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C029	1-123-330-00	ELECT 22MF 20% 16V	
C030	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C031	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C032	1-161-021-00	CERAMIC 0.047MF 10% 25V	
C033	1-123-330-00	ELECT 22MF 20% 16V	
C034	1-123-305-00	ELECT 33MF 20% 10V	
C035	1-161-013-00	CERAMIC 0.01MF 10% 25V	
C037	1-102-958-00	CERAMIC 20PF 5% 50V	
C038	1-102-960-00	CERAMIC 24PF 5% 50V	

Ref.No.	Part No.	Description	Remark
		CONNECTOR	
CN001	⚠ 1-508-845-00	PIN, CONNECTOR 6P	
CN002	⚠ 1-508-845-00	PIN, CONNECTOR 6P	
CN003	⚠ 1-564-030-00	PIN, CONNECTOR 5P	
CN004	⚠ 1-508-744-00	PIN, CONNECTOR 10P	
CN005	⚠ 1-564-028-00	PIN, CONNECTOR 3P	
		DIODE	
D001	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-758-620-00	IC CX-862	
IC002	8-751-340-00	IC CX-134A	
		COIL	
L001	1-408-877-00	MICRO INDUCTOR 0.22UH	
L002	1-408-877-00	MICRO INDUCTOR 0.22UH	
L003	1-408-604-00	MICRO INDUCTOR 12UH	
L004	1-408-158-00	MICRO INDUCTOR 6.8MMH	
L005	1-408-158-00	MICRO INDUCTOR 6.8MMH	
L006	1-408-604-00	MICRO INDUCTOR 12UH	
L007	1-408-616-00	MICRO INDUCTOR 120UH	
L008	1-407-717-00	MICRO INDUCTOR 1MMH	
L009	1-408-622-00	MICRO INDUCTOR 390UH	
L010	1-408-622-00	MICRO INDUCTOR 390UH	
L011	1-408-615-00	MICRO INDUCTOR 100UH	
		TRANSISTOR	
Q001	8-729-117-54	TRANSISTOR 2SA1175	
Q002	8-729-178-54	TRANSISTOR 2SC2785	
Q003	8-729-178-54	TRANSISTOR 2SC2785	
Q004	8-729-178-54	TRANSISTOR 2SC2785	
Q005	⚠ 8-729-606-22	TRANSISTOR 2SC496	
Q006	8-729-178-54	TRANSISTOR 2SC2785	
		RESISTOR	
R001	1-247-852-00	CARBON 7.5K 5% 1/6W	
R002	1-247-855-00	CARBON 10K 5% 1/6W	
R003	1-247-844-00	CARBON 3.6K 5% 1/6W	
R004	1-247-867-00	CARBON 33K 5% 1/6W	
R006	1-247-831-00	CARBON 1K 5% 1/6W	
R007	1-247-831-00	CARBON 1K 5% 1/6W	
R008	1-247-822-00	CARBON 430 5% 1/6W	
R009	1-247-779-00	CARBON 6.8 5% 1/6W	
R010	1-247-815-00	CARBON 220 5% 1/6W	
R011	1-247-839-00	CARBON 2.2K 5% 1/6W	
R012	1-247-839-00	CARBON 2.2K 5% 1/6W	
R013	1-247-839-00	CARBON 2.2K 5% 1/6W	
R014	1-247-839-00	CARBON 2.2K 5% 1/6W	
R015	1-247-839-00	CARBON 2.2K 5% 1/6W	
R016	1-247-831-00	CARBON 1K 5% 1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No	Description				Remark
R017	1-247-831-00	CARBON	1K	5%	1/6W	
R018	1-247-849-00	CARBON	5.6K	5%	1/6W	
R019	1-247-833-00	CARBON	1.2K	5%	1/6W	
R020	1-247-825-00	CARBON	560	5%	1/6W	
R021	1-247-855-00	CARBON	10K	5%	1/6W	
R022	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-826-00	CARBON	620	5%	1/6W	
R025	1-247-839-00	CARBON	2.2K	5%	1/6W	
R026	1-247-809-00	CARBON	120	5%	1/6W	
R027	1-247-847-00	CARBON	4.7K	5%	1/6W	
R028	1-247-867-00	CARBON	33K	5%	1/6W	
R029	1-247-823-00	CARBON	560	5%	1/6W	
R030	1-247-831-00	CARBON	1K	5%	1/6W	
R031	1-247-821-00	CARBON	390	5%	1/6W	
R032	1-247-834-00	CARBON	1.3K	5%	1/6W	
R033	1-247-834-00	CARBON	1.3K	5%	1/6W	
R034	1-247-821-00	CARBON	390	5%	1/6W	
R035	1-247-844-00	CARBON	3.6K	5%	1/6W	
R036	1-247-844-00	CARBON	3.6K	5%	1/6W	
R037	1-247-807-00	CARBON	100	5%	1/6W	
R038	1-247-828-00	CARBON	750	5%	1/6W	
R039	1-247-817-00	CARBON	270	5%	1/6W	
R040	1-247-833-00	CARBON	1.2K	5%	1/6W	
R041	1-247-818-00	CARBON	300	5%	1/6W	
R042	1-247-783-00	CARBON	10	5%	1/6W	
R043	1-247-818-00	CARBON	300	5%	1/6W	
R044	1-247-783-00	CARBON	10	5%	1/6W	
R045	1-247-863-00	CARBON	22K	5%	1/6W	
R046	1-247-855-00	CARBON	10K	5%	1/6W	
R047	1-247-844-00	CARBON	3.6K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-845-00	CARBON	3.9K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-920-00	RES, ADJ, CARBON 2.2K
RV002	1-228-920-00	RES, ADJ, CARBON 2.2K
RV003	1-228-919-00	RES, ADJ, CARBON 1K
RV004	1-228-919-00	RES, ADJ, CARBON 1K
RV005	1-228-921-00	RES, ADJ, CARBON 4.7K
RV006	1-228-747-00	RES, ADJ, CARBON 4.7K

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★:A-6721-166-A	TA-12 BOARD, COMPLETE	
	**********	
1-463-377-00	TUNER (BT-864)	
★:1-556-685-00	CABLE, PIN	
★:3-679-120-00	CASE (UPPER), SHIELD, T	
★:3-679-121-00	CASE (INNER), SHIELD, T	
★:3-679-122-00	CASE (LOWER), SHIELD, T	
★:3-679-174-00	CASE (UPPER), SHIELD, AU-33	
★:3-679-175-00	CASE (INNER), SHIELD, AU-33	
★:3-679-176-00	CASE (LOWER), SHIELD, AU-33	
★:3-679-177-00	CASE (LOWER), SHIELD, AU-44	
★:3-679-239-00	CASE (INNER), SHIELD, AU-44	
4-812-134-11	RIVET NYLON, 3.5	

CAPACITOR

Ref.No	Part No.	Description				Remark
C001	1-102-074-00	CERAMIC	0.001MF	10%	50V	
C002	1-130-487-00	MYLAR	0.022MF	5%	50V	
C003	1-123-608-00	ELECT	0.22MF	20%	50V	
C004	1-123-608-00	ELECT	0.22MF	20%	50V	
C005	1-102-526-00	CERAMIC	75PF	5%	50V	
C006	1-123-333-00	ELECT	100MF	20%	16V	
C007	1-101-004-00	CERAMIC	0.01MF		50V	
C008	1-101-006-00	CERAMIC	0.047MF		50V	
C009	1-101-884-00	CERAMIC	56PF	5%	50V	
C010	1-101-884-00	CERAMIC	56PF	5%	50V	
C011	1-123-356-00	ELECT	10MF	20%	16V	
C012	1-130-485-00	MYLAR	0.015MF	5%	50V	
C013	1-102-513-00	CERAMIC	18PF	5%	50V	
C014	1-102-495-00	CERAMIC	75PF	5%	50V	
C015	1-123-380-00	ELECT	1MF	20%	50V	
C016	1-123-330-00	ELECT	22MF	20%	16V	
C017	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C018	1-123-380-00	ELECT	1MF	20%	50V	
C019	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C020	1-123-379-00	ELECT	0.47MF	20%	50V	
C021	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C022	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C023	1-123-379-00	ELECT	0.47MF	20%	50V	
C024	1-102-816-00	CERAMIC	120PF	5%	50V	
C025	1-123-333-00	ELECT	100MF	20%	16V	
C026	1-102-514-00	CERAMIC	22PF	5%	50V	
C027	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C028	1-123-382-00	ELECT	3.3MF	20%	100V	
C029	1-123-330-00	ELECT	22MF	20%	16V	
C030	1-123-330-00	ELECT	22MF	20%	16V	
C031	1-130-632-00	MYLAR	0.1MF	10%	50V	
C032	1-130-620-00	MYLAR	0.01MF	10%	50V	
C033	1-123-330-00	ELECT	22MF	20%	16V	
C034	1-123-318-00	ELECT	33MF	20%	16V	
C035	1-161-036-00	CERAMIC	0.047MF	20%	25V	
C036	1-123-330-00	ELECT	22MF	20%	16V	
C037	1-123-381-00	ELECT	2.2MF	20%	50V	
C038	1-123-380-00	ELECT	1MF	20%	50V	
C039	1-130-620-00	MYLAR	0.01MF	10%	50V	
C502	1-123-332-00	ELECT	47MF	20%	16V	
C503	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C504	1-130-477-00	MYLAR	0.0033MF	5%	50V	
C505	1-102-110-00	CERAMIC	220PF	10%	50V	
C506	1-130-472-00	MYLAR	0.0012MF	5%	50V	
C507	1-123-381-00	ELECT	2.2MF	20%	50V	
C508	1-123-382-00	ELECT	3.3MF	20%	50V	
C509	1-136-051-00	FILM	0.0039MF	10%	630V	
C510	1-130-475-00	MYLAR	0.0022MF	5%	50V	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

TA-12

Ref.No	Part No	Description			Remark
C511	1-123-356-00	ELECT	10MF	20%	16V
C512	1-130-471-00	MYLAR	0.001MF	5%	50V
C513	1-107-166-00	MICA	62PF	5%	500V
C514	1-123-333-00	ELECT	100MF	20%	16V
C515	1-130-477-00	MYLAR	0.0033MF	5%	50V
C517	1-123-382-00	ELECT	3.3MF	20%	50V
C518	1-123-330-00	ELECT	22MF	20%	16V
C519	1-123-356-00	ELECT	10MF	20%	16V
C520	1-101-059-00	CERAMIC	510PF	5%	50V
C521	1-123-328-00	ELECT	4.7MF	20%	25V
C522	1-130-497-00	MYLAR	0.15MF	5%	50V
C523	1-123-328-00	ELECT	4.7MF	20%	25V
C524	1-123-333-00	ELECT	100MF	20%	16V
C525	1-130-482-00	MYLAR	0.0082MF	5%	50V
C526	1-123-328-00	ELECT	4.7MF	20%	25V
C528	1-130-483-00	MYLAR	0.01MF	5%	50V
C530	1-123-296-00	ELECT	220MF	20%	6.3V
C531	1-123-380-00	ELECT	1MF	20%	50V
C533	1-130-468-00	MYLAR	560PF	5%	50V
C534	1-123-379-00	ELECT	0.47MF	20%	50V
C535	1-123-330-00	ELECT	22MF	20%	16V
C536	1-161-021-00	CERAMIC	0.047MF	10%	25V
C537	1-130-472-00	MYLAR	0.0012MF	5%	50V

FILTER

CF001	1-409-332-00	CERAMIC TRAP (4.5MHZ)
CF002	1-527-260-00	FILTER, CERAMIC (4.5MHZ)
CF003	1-409-332-00	CERAMIC TRAP (4.5MHZ)

CONNECTOR

CN001	1-560-894-00	PIN, CONNECTOR 6P
CN002	1-560-896-00	PIN, CONNECTOR 8P
CN003	1-560-896-00	PIN, CONNECTOR 8P
CN004	1-560-896-00	PIN, CONNECTOR 8P
CN005	1-560-896-00	PIN, CONNECTOR 8P
CN501	1-560-892-21	PIN, CONNECTOR 4P
CN502	1-560-897-00	PIN, CONNECTOR 9P
CN503	1-560-890-21	PIN, CONNECTOR 2P
CN504	1-560-893-00	PIN, CONNECTOR 5P

DIODE

D001	8-719-911-19	DIODE 1SS119
D002	8-719-911-19	DIODE 1SS119
D003	8-719-911-19	DIODE 1SS119
D004	8-719-911-19	DIODE 1SS119
D005	8-719-911-19	DIODE 1SS119
D006	8-719-911-19	DIODE 1SS119
D007	8-719-911-19	DIODE 1SS119
D008	8-719-911-19	DIODE 1SS119
D009	8-719-911-19	DIODE 1SS119
D501	8-719-911-19	DIODE 1SS119
D502	8-719-911-19	DIODE 1SS119

Ref.No.	Part No.	Description	Remark

IC

IC001	8-758-852-00	IC CX-885B
IC002	8-759-157-40	IC UPC574J
IC501	8-759-800-46	IC LA7046

COIL

L001	1-408-591-31	MICRO INDUCTOR 1UH
L002	1-408-597-00	MICRO INDUCTOR 3.3UH
L003	1-408-608-00	MICRO INDUCTOR 27UH
L004	1-408-603-00	MICRO INDUCTOR 10UH
L005	1-408-602-00	MICRO INDUCTOR 8.2UH
L006	1-408-604-00	MICRO INDUCTOR 12UH
L007	1-408-606-00	MICRO INDUCTOR 18UH
L008	1-408-611-00	MICRO INDUCTOR 47UH
L009	1-407-716-00	MICRO INDUCTOR 820UH
L010	1-407-716-00	MICRO INDUCTOR 820UH
L501	1-407-718-00	MICRO INDUCTOR 1.2MMH
L502	1-407-508-00	MICRO INDUCTOR 22UH

VARIABLE COIL

LV501	1-408-523-00	COIL, VARIABLE

VOLUME BLOCK

PS001	1-230-074-00	VOLUME BLOCK, PRESET

TRANSISTOR

Q001	8-729-178-54	TRANSISTOR 2SC2785
Q002	8-729-178-54	TRANSISTOR 2SC2785
Q003	8-729-178-54	TRANSISTOR 2SC2785
Q004	8-729-117-54	TRANSISTOR 2SA1175
Q005	8-729-117-54	TRANSISTOR 2SA1175
Q006	8-729-178-54	TRANSISTOR 2SC2785
Q007	8-769-193-09	TRANSISTOR 2SK43-3
Q008	8-729-117-54	TRANSISTOR 2SA1175
Q009	8-729-117-54	TRANSISTOR 2SA1175
Q010	8-729-117-54	TRANSISTOR 2SA1175
Q501	8-729-177-43	TRANSISTOR 2SD774
Q502	8-729-194-57	TRANSISTOR 2SC945-P
Q503	8-729-194-57	TRANSISTOR 2SC945-P
Q504	8-729-117-54	TRANSISTOR 2SA1175
Q505	8-729-117-54	TRANSISTOR 2SA1175
Q506	8-729-178-54	TRANSISTOR 2SC2785
Q507	8-729-178-54	TRANSISTOR 2SC2785
Q509	8-729-178-54	TRANSISTOR 2SC2785
Q510	8-729-178-54	TRANSISTOR 2SC2785

RESISTOR

R001	1-247-839-00	CARBON	2.2K	5%	1/6W
R002	1-247-845-00	CARBON	3.9K	5%	1/6W
R003	1-247-879-00	CARBON	100K	5%	1/6W
R004	1-247-869-00	CARBON	39K	5%	1/6W
R005	1-247-829-00	CARBON	820	5%	1/6W

When indicating parts by reference number, please include the board name.

Ref No	Part No	Description				Remark
R006	1-247-799-00	CARBON	47	5%	1/6W	
R007	1-247-891-00	CARBON	330K	5%	1/6W	
R008	1-247-853-00	CARBON	100	5%	1/6W	
R009	1-247-839-00	CARBON	2.2K	5%	1/6W	
R010	1-247-865-00	CARBON	27K	5%	1/6W	
R011	1-247-843-00	CARBON	3.3K	5%	1/6W	
R012	1-247-831-00	CARBON	1K	5%	1/6W	
R013	1-247-871-00	CARBON	47K	5%	1/6W	
R014	1-247-873-00	CARBON	56K	5%	1/6W	
R015	1-247-831-00	CARBON	1K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-247-831-00	CARBON	1K	5%	1/6W	
R018	1-247-843-00	CARBON	3.3K	5%	1/6W	
R019	1-247-831-00	CARBON	1K	5%	1/6W	
R020	1-247-831-00	CARBON	1K	5%	1/6W	
R021	1-247-873-00	CARBON	56K	5%	1/6W	
R022	1-247-847-00	CARBON	4.7K	5%	1/6W	
R023	1-247-821-00	CARBON	390	5%	1/6W	
R024	1-247-821-00	CARBON	390	5%	1/6W	
R025	1-247-827-00	CARBON	680	5%	1/6W	
R026	1-247-847-00	CARBON	4.7K	5%	1/6W	
R027	1-247-817-00	CARBON	270	5%	1/6W	
R028	1-247-843-00	CARBON	3.3K	5%	1/6W	
R029	1-247-879-00	CARBON	100K	5%	1/6W	
R030	1-247-863-00	CARBON	22K	5%	1/6W	
R031	1-247-863-00	CARBON	22K	5%	1/6W	
R032	1-247-871-00	CARBON	47K	5%	1/6W	
R033	1-247-867-00	CARBON	33K	5%	1/6W	
R034	1-247-879-00	CARBON	100K	5%	1/6W	
R035	1-247-847-00	CARBON	4.7K	5%	1/6W	
R036	1-247-855-00	CARBON	10K	5%	1/6W	
R037	1-247-879-00	CARBON	100K	5%	1/6W	
R038	1-244-863-00	CARBON	390	5%	1/2W	
R039	1-247-900-00	CARBON	750K	5%	1/6W	
R040	1-247-903-00	CARBON	1M	5%	1/6W	
R041	1-247-885-00	CARBON	180K	5%	1/6W	
R042	1-247-869-00	CARBON	39K	5%	1/6W	
R043	1-247-845-00	CARBON	4.7K	5%	1/6W	
R044	1-202-735-00	SOLID	22M	10%	1/2W	
R045	1-247-879-00	CARBON	100K	5%	1/6W	
R046	1-247-799-00	CARBON	47	5%	1/6W	
R047	1-247-871-00	CARBON	47K	5%	1/6W	
R048	1-247-871-00	CARBON	47K	5%	1/6W	
R049	1-247-871-00	CARBON	47K	5%	1/6W	
R050	1-247-831-00	CARBON	1K	5%	1/6W	
R051	1-247-831-00	CARBON	1K	5%	1/6W	
R052	1-247-831-00	CARBON	1K	5%	1/6W	
R053	1-247-831-00	CARBON	1K	5%	1/6W	
R054	1-247-831-00	CARBON	1K	5%	1/6W	
R055	1-247-831-00	CARBON	1K	5%	1/6W	
R056	1-247-831-00	CARBON	1K	5%	1/6W	
R057	1-247-831-00	CARBON	1K	5%	1/6W	
R058	1-247-831-00	CARBON	1K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R059	1-247-831-00	CARBON	1K	5%	1/6W	
R060	1-247-831-00	CARBON	1K	5%	1/6W	
R061	1-247-831-00	CARBON	1K	5%	1/6W	
R062	1-247-831-00	CARBON	1K	5%	1/6W	
R063	1-247-831-00	CARBON	1K	5%	1/6W	
R070	1-247-843-00	CARBON	3.3K	5%	1/6W	
R071	1-247-863-00	CARBON	22K	5%	1/6W	
R072	1-246-497-00	CARBON	10K	1%	1/4W	
R501	1-247-859-00	CARBON	15K	5%	1/6W	
R502	1-247-859-00	CARBON	15K	5%	1/6W	
R503	1-247-783-00	CARBON	10	5%	1/6W	
R504	1-246-980-00	CARBON	33	5%	1/6W	
R505	1-247-839-00	CARBON	2.2K	5%	1/6W	
R506	1-247-883-00	CARBON	150K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R508	1-247-893-00	CARBON	390K	5%	1/6W	
R509	1-247-807-00	CARBON	100	5%	1/6W	
R510	1-247-839-00	CARBON	2.2K	5%	1/6W	
R511	1-247-839-00	CARBON	2.2K	5%	1/6W	
R512	1-247-903-00	CARBON	1M	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-849-00	CARBON	5.6K	5%	1/6W	
R515	1-247-855-00	CARBON	10K	5%	1/6W	
R516	1-247-865-00	CARBON	27K	5%	1/6W	
R517	1-247-847-00	CARBON	4.7K	5%	1/6W	
R518	1-247-855-00	CARBON	10K	5%	1/6W	
R519	1-247-869-00	CARBON	39K	5%	1/6W	
R520	1-247-843-00	CARBON	3.3K	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R523	1-247-871-00	CARBON	47K	5%	1/6W	
R524	1-247-855-00	CARBON	10K	5%	1/6W	
R525	1-247-867-00	CARBON	33K	5%	1/6W	
R527	1-247-847-00	CARBON	4.7K	5%	1/6W	
R528	1-247-831-00	CARBON	1K	5%	1/6W	
R529	1-247-783-00	CARBON	10	5%	1/6W	
R530	1-247-863-00	CARBON	22K	5%	1/6W	
R531	1-247-863-00	CARBON	22K	5%	1/6W	
R533	1-247-877-00	CARBON	82K	5%	1/6W	
R534	1-247-865-00	CARBON	27K	5%	1/6W	
R535	1-247-821-00	CARBON	390	5%	1/6W	
R536	1-247-844-00	CARBON	3.6K	5%	1/6W	
R537	1-247-815-00	CARBON	220	5%	1/6W	
R538	1-210-825-00	SOLID	3.3M	5%	1/4W	
R540	1-247-851-00	CARBON	6.8K	5%	1/6W	
R541	1-247-871-00	CARBON	47K	5%	1/6W	
R542	1-247-823-00	CARBON	470	5%	1/6W	
R545	1-247-593-00	FUSIBLE	33	5%	1/4W	
R546	1-247-863-00	CARBON	22K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-747-00	RES, ADJ, CARBON	4.7K
RV002	1-228-747-00	RES, ADJ, CARBON	4.7K

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

TA-12 N TS-23

Ref.No	Part No.	Description			Remark
RV501	1-224-256-XX	RES, ADJ, METAL GLAZE 220K			
RV502	1-228-752-00	RES, ADJ, CARBON 220K			
RV503	1-228-744-00	RES, ADJ, CARBON 470			
RV504	1-228-748-00	RES, ADJ, CARBON 10K			
		SWITCH			
S001	1-554-373-00	SWITCH, LEVER (AFT)			
		FILTER			
SF001	1-404-227-51	SAWF			
		TRANSFORMER			
T001	1-404-153-00	VIFT			
T002	1-404-321-00	VIFT			
T003	1-404-352-00	COIL, VIF			
T004	1-404-352-00	COIL, VIF			
T005	1-404-411-00	COIL, SIF			
T501	1-433-237-00	TRANSFORMER, OSCILLATOR			
**********					
▲	1-606-794-00	N BOARD			
		*******			
▲	4-342-117-00	CASE, SHIELD (MAIN), R			
▲	4-342-118-00	LID, SHIELD CASE, R			
		CAPACITOR			
C001	1-123-617-00	ELECT	10MF	20% 16V	
C002	1-123-617-00	ELECT	10MF	20% 16V	
C003	1-123-617-00	ELECT	10MF	20% 16V	
C004	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C005	1-108-567-00	MYLAR	0.0033MF	5% 50V	
C006	1-123-821-00	ELECT	47MF	20% 16V	
		DIODE			
D001	8-719-110-32	DIODE PH302B			
		IC			
IC001	8-759-113-73	IC UPC1373H			
		COIL			
L001	1-404-310-00	COIL			
**********					
▲	1-610-028-00	TS-23 BOARD			
		**********			
		CAPACITOR			
C201	1-161-025-00	CERAMIC	0.1MF	10% 25V	
C202	1-123-306-00	ELECT	47MF	20% 10V	
C203	1-101-004-00	CERAMIC	0.01MF	50V	

Ref.No	Part No.	Description			Remark
C204	1-123-306-00	ELECT	47MF	20% 10V	
		DIODE			
D101	8-719-104-45	DIODE SG213T			
D102	8-719-104-45	DIODE SG213T			
D103	8-719-104-45	DIODE SG213T			
D104	8-719-104-45	DIODE SG213T			
D105	8-719-104-45	DIODE SG213T			
D106	8-719-104-45	DIODE SG213T			
D107	8-719-104-45	DIODE SG213T			
D108	8-719-104-45	DIODE SG213T			
D109	8-719-104-45	DIODE SG213T			
D110	8-719-104-45	DIODE SG213T			
D111	8-719-104-45	DIODE SG213T			
D112	8-719-104-45	DIODE SG213T			
D113	8-719-104-45	DIODE SG213T			
D114	8-719-104-45	DIODE SG213T			
D201	8-719-100-43	DIODE RD7.5EB1			
		INDICATOR TUBE			
FL201	1-519-289-00	INDICATOR TUBE, FLUORESCENT			
		IC			
IC201	8-759-905-28	IC LR3466			
		TRANSISTOR			
Q201	8-729-117-54	TRANSISTOR 2SA1175			
Q202	8-729-178-54	TRANSISTOR 2SC2785			
Q203	8-729-178-54	TRANSISTOR 2SC2785			
Q205	8-729-117-54	TRANSISTOR 2SA1175			
Q206	8-729-117-54	TRANSISTOR 2SA1175			
Q207	8-729-178-54	TRANSISTOR 2SC2785			
		RESISTOR			
R201	1-247-863-00	CARBON	22K	5% 1/6W	
R202	1-247-863-00	CARBON	22K	5% 1/6W	
R203	1-247-879-00	CARBON	100K	5% 1/6W	
R204	1-247-875-00	CARBON	68K	5% 1/6W	
R205	1-247-879-00	CARBON	100K	5% 1/6W	
R206	1-247-879-00	CARBON	100K	5% 1/6W	
R207	1-247-863-00	CARBON	22K	5% 1/6W	
R208	1-247-863-00	CARBON	22K	5% 1/6W	
R209	1-247-863-00	CARBON	22K	5% 1/6W	
R210	1-247-863-00	CARBON	22K	5% 1/6W	
R211	1-247-863-00	CARBON	22K	5% 1/6W	
R212	1-247-863-00	CARBON	22K	5% 1/6W	
R214	1-247-879-00	CARBON	100K	5% 1/6W	
		SWITCH			
S101	1-554-485-00	SWITCH, PUSH (14 KEY)			

When indicating parts by reference number, please include the board name.

TS-24 | CS-3 | CS-4 | LM-8 | RD-5 | SS-13

Ref.No	Part No	Description			Remark
	▲:1-610-029-00	TS-24 BOARD			
		**********			
		SWITCH			
S301	1-553-766-00	SWITCH, KEY BOARD			
S302	1-553-766-00	SWITCH, KEY BOARD			
S303	1-553-766-00	SWITCH, KEY BOARD			
S304	1-553-766-00	SWITCH, KEY BOARD			
S305	1-553-766-00	SWITCH, KEY BOARD			
S306	1-553-766-00	SWITCH, KEY BOARD			
S307	1-553-766-00	SWITCH, KEY BOARD			
S308	1-554-375-00	SWITCH, PUSH (TIMER REC)			
**********					
	▲:1-609-227-00	CS-3 BOARD			
		**********			
		CONNECTOR			
CN301	▲:1-564-029-00	PIN, CONNECTOR 4P			
		SWITCH			
S301	1-554-241-00	SWITCH, LEVER (CASSETTE OFF)			
**********					
	▲:1-609-228-00	CS-4 BOARD			
		**********			
		SWITCH			
S302	1-554-241-00	SWITCH, LEVER (CASSETTE IN)			
**********					
	▲:1-605-071-00	LM-8 BOARD			
		**********			
		CAPACITOR			
C101	1-161-057-00	CERAMIC	0.033MF	10%	50V
C102	1-161-057-00	CERAMIC	0.033MF	10%	50V
		COIL			
L101	1-408-120-00	MICRO INDUCTOR 18UH			
L102	1-408-120-00	MICRO INDUCTOR 18UH			
		RESISTOR			
[illegible]					
**********					
	▲:1-609-231-00	RD-5 BOARD			
		**********			
		DIODE			
D001	8-719-921-03	DIODE GP-2S02B			
		RESISTOR			
R001	1-247-887-00	CARBON	220K	5%	1/6W

Ref.No.	Part No.	Description			Remark
R002	1-247-831-00	CARBON	1K	5% 1/6W	
**********					
	▲:A-6717-320-A	SS-13 (B-299) BOARD, COMPLETE			
		**********			
	▲:1-594-130-00	SS-13 (B-368) COMBINED BOARD			
	1-131-413-00	ELECT(SOLID) 1MF		10% 16V	
	1-246-867-00	CARBON	91K	5% 1/8W	
	▲:3-655-214-00	CLIP, CABLE			
	▲:3-679-172-00	HEAT SINK, SS			
		APACITOR			
C001	1-130-483-00	MYLAR	0.01MF	5%	50V
C002	1-161-021-00	CERAMIC	0.047MF	10%	25V
C003	1-123-382-00	ELECT	3.3MF	20%	50V
C004	1-123-382-00	ELECT	3.3MF	20%	50V
C005	1-161-021-00	CERAMIC	0.047MF	10%	25V
C006	1-161-021-00	CERAMIC	0.047MF	10%	25V
C007	1-123-382-00	ELECT	3.3MF	20%	50V
C008	1-130-483-00	MYLAR	0.01MF	5%	50V
C009	1-130-483-00	MYLAR	0.01MF	5%	50V
C010	1-123-330-00	ELECT	22MF	20%	16V
C011	1-127-469-00	ELECT(SOLID)	0.33MF	5%	16V
C012	1-130-491-51	MYLAR	0.047MF	5%	50V
C013	1-123-332-00	ELECT	47MF	20%	16V
C014	1-161-013-00	CERAMIC	0.01MF	10%	25V
C015	1-123-356-00	ELECT	10MF	20%	16V
C016	1-123-381-00	ELECT	2.2MF	20%	50V
C018	1-102-106-00	CERAMIC	100PF	10%	50V
C019	1-130-479-00	MYLAR	0.0047MF	5%	50V
C020	1-123-332-00	ELECT	47MF	20%	16V
C021	1-123-381-00	ELECT	2.2MF	20%	50V
C022	1-123-381-00	ELECT	2.2MF	20%	50V
C023	1-123-369-00	ELECT(SOLID)	4.7MF	10%	16V
C024	1-123-369-00	ELECT(SOLID)	4.7MF	10%	16V
C025	1-161-021-00	CERAMIC	0.047MF	10%	25V
C026	1-123-332-00	ELECT	47MF	20%	16V
C027	1-161-021-00	CERAMIC	0.047MF	10%	25V
C028	1-123-310-00	ELECT	470MF	20%	10V
C029	1-161-004-00	CERAMIC	0.0018MF	10%	25V
C030	1-108-582-00	MYLAR	0.013MF	5%	50V
C031	1-131-398-00	ELECT(SOLID)	0.22MF	10%	16V
C032	1-161-016-00	CERAMIC	0.018MF	10%	25V
C033	1-161-013-00	CERAMIC	0.01MF	10%	25V
C034	1-161-016-00	CERAMIC	0.018MF	10%	25V
C035	1-161-016-00	CERAMIC	0.018MF	10%	25V
C036	1-161-016-00	CERAMIC	0.018MF	10%	25V
C037	1-123-356-00	ELECT	10MF	20%	16V
C038	1-161-013-00	CERAMIC	0.01MF	10%	25V
C039	1-123-356-00	ELECT	10MF	20%	16V
C040	1-124-429-00	ELECT(NON-POLAR)	0.68MF	10%	20V
C041	1-161-021-00	CERAMIC	0.047MF	10%	25V

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SS-13

Ref.No.	Part No.	Description			Remark
C043	1-161-021-00	CERAMIC	0.047MF	10% 25V	
C044	1-123-332-00	ELECT	47MF	20% 16V	
C045	1-102-961-00	CERAMIC	27PF	5% 50V	
C046	1-102-961-00	CERAMIC	27PF	5% 50V	
C047	1-161-021-00	CERAMIC	0.047MF	10% 25V	
C048	1-101-886-00	CERAMIC	62PF	5% 50V	
C049	1-123-332-00	ELECT	47MF	20% 16V	
C050	1-127-437-00	ELECT(SOLID)	0.47MF	10% 16V	
C201	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C202	1-123-330-00	ELECT	22MF	20% 16V	
C203	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C204	1-161-013-00	CERAMIC	0.01MF	10% 25V	
C205	1-123-381-00	ELECT	2.2MF	20% 50V	
C206	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C207	1-161-021-00	CERAMIC	0.047MF	10% 25V	
C301	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C302	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C303	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C304	1-123-356-00	ELECT	10MF	20% 16V	
C305	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C401	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C402	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C403	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C404	1-123-380-00	ELECT	1MF	20% 50V	
C405	1-123-330-00	ELECT	22MF	20% 16V	
C406	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C407	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C408	1-123-330-00	ELECT	22MF	20% 16V	
C409	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C410	1-123-356-00	ELECT	10MF	20% 25V	
C411	1-161-019-00	CERAMIC	0.033MF	10% 25V	
C412	1-123-380-00	ELECT	1MF	20% 50V	(FORMER)
C501	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C502	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C503	1-161-013-00	CERAMIC	0.01MF	10% 25V	
C504	1-129-794-00	FILM	0.0033MF	5% 100V	
C505	1-161-013-00	CERAMIC	0.01MF	10% 25V	
C506	1-161-013-00	CERAMIC	0.01MF	10% 25V	
C507	1-123-380-00	ELECT	1MF	20% 50V	
C508	1-161-017-00	CERAMIC	0.022MF	10% 25V	
C509	1-123-380-00	ELECT	1MF	20% 50V	
C510	1-161-002-00	CERAMIC	0.0012MF	10% 25V	
C511	1-123-379-00	ELECT	0.47MF	20% 50V	
C601	1-123-380-00	ELECT	1MF	20% 50V	
C602	1-123-356-00	ELECT	10MF	20% 16V	
C603	1-123-380-00	ELECT	1MF	20% 50V	
C751	1-123-333-00	ELECT	100MF	20% 16V	
C752	1-123-332-00	ELECT	47MF	20% 16V	
C754	1-161-021-00	CERAMIC	0.047MF	10% 25V	
		FILTER			
CF401	1-527-532-00	OSCILLATOR, CERAMIC (400KHz)			

Ref.No.	Part No.	Description	Remark
		CONNECTOR	
CN001	★1-560-892-41	PIN, CONNECTOR 4P	
CN002	★1-560-891-21	PIN, CONNECTOR 3P	
CN003	★1-560-891-41	PIN, CONNECTOR 3P	
CN004	★1-560-892-21	PIN, CONNECTOR 4P	
CN005	★1-560-466-00	PIN, CONNECTOR 3P	
CN006	★1-560-891-31	PIN, CONNECTOR 3P	
CN007	★1-560-890-00	PIN, CONNECTOR 2P	
CN008	★1-560-892-00	PIN, CONNECTOR 4P	
CN009	★1-560-900-00	PIN, CONNECTOR 12P	
CN010	★1-560-891-00	PIN, CONNECTOR 3P	
CN401	★1-560-891-00	PIN, CONNECTOR 3P	
CN402	★1-560-898-21	PIN, CONNECTOR 10P	
CN403	★1-560-890-31	PIN, CONNECTOR 2P	
CN404	★1-560-890-21	PIN, CONNECTOR 2P	
CN405	★1-560-900-00	PIN, CONNECTOR 12P	
CN406	★1-560-890-00	PIN, CONNECTOR 2P	
CN407	★1-560-891-21	PIN, CONNECTOR 3P	
CN408	★1-560-890-31	PIN, CONNECTOR 2P	
CN409	★1-560-898-00	PIN, CONNECTOR 10P	
CN410	★1-560-896-00	PIN, CONNECTOR 8P	
CN411	★1-560-893-00	PIN, CONNECTOR 5P	
CN412	★1-560-892-21	PIN, CONNECTOR 4P	
CN413	★1-560-890-21	PIN, CONNECTOR 2P	
CN414	★1-560-892-31	PIN, CONNECTOR 4P	
CN415	★1-560-891-00	PIN, CONNECTOR 3P	
CN416	★1-560-890-41	PIN, CONNECTOR 2P	
CN417	★1-560-892-00	PIN, CONNECTOR 4P	
		DIODE	
D001	8-719-101-76	DIODE RD10EL2	
D002	8-719-911-19	DIODE 1SS119	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D006	8-719-100-43	DIODE RD7.5EB1	
D008	8-719-911-19	DIODE 1SS119	
D009	8-719-911-19	DIODE 1SS119	
D010	8-719-911-19	DIODE 1SS119	
D202	8-719-911-19	DIODE 1SS119	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-911-19	DIODE 1SS119	
D206	8-719-911-19	DIODE 1SS119	
D207	8-719-911-19	DIODE 1SS119	
D208	8-719-911-19	DIODE 1SS119	
D209	8-719-911-19	DIODE 1SS119	
D210	8-719-911-19	DIODE 1SS119	
D211	8-719-911-19	DIODE 1SS119	
D212	8-719-911-19	DIODE 1SS119	
D213	8-719-911-19	DIODE 1SS119	
D214	8-719-911-19	DIODE 1SS119	

Notes:

(Former) : Model with IC401 (μPD553C-261) and IC402 (μPD553C-262)

(New) : Model with IC401 (μPD553C-276) and IC402 (μPD553C-287)

When indicating parts by reference number, please include the board name.

Ref No	Part No	Description	Remark
D215	8-719-911-19	DIODE 1SS119 (FORMER)	
D216	8-719-911-19	DIODE 1SS119	
D217	8-719-911-19	DIODE 1SS119	
D301	8-719-101-77	DIODE RD10EL3	
D302	8-719-100-66	DIODE RD12EB3	
D303	8-719-911-19	DIODE 1SS119	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-911-19	DIODE 1SS119	
D403	8-719-911-19	DIODE 1SS119	
D404	8-719-911-19	DIODE 1SS119	
D405	8-719-911-19	DIODE 1SS119	
D407	8-719-911-19	DIODE 1SS119	
D409	8-719-911-19	DIODE 1SS119 (FORMER)	
D410	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
D503	8-719-911-19	DIODE 1SS119	
D601	8-719-911-19	DIODE 1SS119	
D602	8-719-101-70	DIODE RD8.2EL2	
D603	8-719-911-19	DIODE 1SS119	
D751	8-719-101-50	DIODE RD5.1EL2	
D752	8-719-911-19	DIODE 1SS119	
D753	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-751-941-00	IC CX-194B-0	
IC002	8-759-135-80	IC UPC358C	
IC003	8-759-145-58	IC UPC4558C	
IC004	8-759-240-53	IC TC4053BP	
IC005	8-759-132-40	IC UPC324C	
IC006	8-759-132-40	IC UPC324C	
IC301	8-759-907-28	IC M32080SL	
IC401	8-759-101-38	IC UPD553C-261 (FORMER)	
	8-759-101-66	IC UPD553C-276 (NEW)	
IC402	8-759-101-39	IC UPD553C-262 (FORMER)	
	8-759-101-68	IC UPD553C-287 (NEW)	
		COIL	
L001	1-408-615-00	MICRO INDUCTOR 100UH	
		TRANSISTOR	
Q001	8-729-178-54	TRANSISTOR 2SC2785	
Q002	8-729-178-54	TRANSISTOR 2SC2785	
Q003	8-729-117-54	TRANSISTOR 2SA1175	
Q004	8-729-177-43	TRANSISTOR 2SD774	
Q005	8-729-606-32	TRANSISTOR 2SC2603	
Q006	8-729-178-54	TRANSISTOR 2SC2785	
Q007	8-729-178-54	TRANSISTOR 2SC2785	
Q008	8-729-178-54	TRANSISTOR 2SC2785	
Q009	8-729-178-54	TRANSISTOR 2SC2785	
Q201	8-729-117-54	TRANSISTOR 2SA1175	
Q202	8-729-178-54	TRANSISTOR 2SC2785	
Q203	8-729-316-16	TRANSISTOR 2SC1061	
Q204	8-729-178-54	TRANSISTOR 2SC2785	
Q205	8-729-178-54	TRANSISTOR 2SC2785	

Ref.No.	Part No.	Description	Remark
Q206	8-729-178-54	TRANSISTOR 2SC2785	
Q207	8-729-117-54	TRANSISTOR 2SA1175	
Q208	8-729-177-43	TRANSISTOR 2SD774	
Q209	8-729-117-54	TRANSISTOR 2SA1175	
Q210	8-729-177-43	TRANSISTOR 2SD774	
Q211	8-729-177-32	TRANSISTOR 2SD773	
Q212	8-729-116-42	TRANSISTOR 2SD1164	
Q213	8-729-177-43	TRANSISTOR 2SD774	
Q214	8-729-116-42	TRANSISTOR 2SD1164	
Q215	8-729-178-54	TRANSISTOR 2SC2785	
Q216	8-729-178-54	TRANSISTOR 2SC2785	
Q217	8-729-178-54	TRANSISTOR 2SC2785	
Q218	8-729-178-54	TRANSISTOR 2SC2785	
Q221	8-729-177-32	TRANSISTOR 2SD773	
Q222	8-729-178-54	TRANSISTOR 2SC2785	
Q223	8-729-374-02	TRANSISTOR 2SB740	
Q224	8-729-177-43	TRANSISTOR 2SD774	
Q225	8-729-374-02	TRANSISTOR 2SB740	
Q226	8-729-177-43	TRANSISTOR 2SD774	
Q227	8-729-178-54	TRANSISTOR 2SC2785	
Q301	8-729-178-54	TRANSISTOR 2SC2785	
Q302	8-729-178-54	TRANSISTOR 2SC2785	
Q303	8-729-178-54	TRANSISTOR 2SC2785	
Q305	8-729-178-54	TRANSISTOR 2SC2785	
Q306	8-729-178-54	TRANSISTOR 2SC2785	
Q307	8-729-117-54	TRANSISTOR 2SA1175	
Q308	8-729-117-54	TRANSISTOR 2SA1175	
Q309	8-729-177-43	TRANSISTOR 2SD774	
Q401	8-729-178-54	TRANSISTOR 2SC2785	
Q402	8-729-178-54	TRANSISTOR 2SC2785	
Q403	8-729-178-54	TRANSISTOR 2SC2785	
Q404	8-729-178-54	TRANSISTOR 2SC2785	
Q405	8-729-178-54	TRANSISTOR 2SC2785	
Q406	8-729-117-54	TRANSISTOR 2SA1175	
Q407	8-729-178-54	TRANSISTOR 2SC2785	
Q408	8-729-178-54	TRANSISTOR 2SC2785	
Q409	8-729-606-32	TRANSISTOR 2SC2603	
Q410	8-729-178-54	TRANSISTOR 2SC2785	
Q411	8-729-178-54	TRANSISTOR 2SC2785	
Q412	8-729-178-54	TRANSISTOR 2SC2785	
Q413	8-729-178-54	TRANSISTOR 2SC2785	
Q414	8-729-178-54	TRANSISTOR 2SC2785	
Q501	8-729-178-54	TRANSISTOR 2SC2785	
Q502	8-729-178-54	TRANSISTOR 2SC2785	
Q503	8-729-178-54	TRANSISTOR 2SC2785	
Q504	8-729-178-54	TRANSISTOR 2SC2785	
Q505	8-729-178-54	TRANSISTOR 2SC2785	
Q601	8-729-178-54	TRANSISTOR 2SC2785	
Q602	8-729-178-54	TRANSISTOR 2SC2785	
Q603	8-729-178-54	TRANSISTOR 2SC2785	
Q751	8-729-117-54	TRANSISTOR 2SA1175	
Q752	8-729-178-54	TRANSISTOR 2SC2785	

Notes:

(Former) : Model with IC401 (μPD553C-261) and IC402 (μPD553C-262)

(New) : Model with IC401 (μPD553C-276) and IC402 (μPD553C-287)

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No	Part No	Description				Remark
Q754	8-729-606-32	TRANSISTOR 2SC2603				
Q755	8-729-178-54	TRANSISTOR 2SC2785				
Q756	8-729-178-54	TRANSISTOR 2SC2785				
		RESISTOR				
R001	1-247-831-00	CARBON	1K	5%	1/6W	
R002	1-247-871-00	CARBON	47K	5%	1/6W	
R003	1-247-859-00	CARBON	15K	5%	1/6W	
R004	1-247-851-00	CARBON	6.8K	5%	1/6W	
R005	1-247-863-00	CARBON	22K	5%	1/6W	
R006	1-247-863-00	CARBON	22K	5%	1/6W	
R007	1-247-847-00	CARBON	4.7K	5%	1/6W	
R008	1-247-871-00	CARBON	47K	5%	1/6W	
R009	1-247-863-00	CARBON	22K	5%	1/6W	
R010	1-247-863-00	CARBON	22K	5%	1/6W	
R011	1-247-829-00	CARBON	820	5%	1/6W	
R012	1-244-845-00	CARBON	62	5%	1/2W	
R013	1-247-821-00	CARBON	390	5%	1/6W	
R014	1-246-923-00	CARBON	8.2	5%	1/4W	
R015	1-247-855-00	CARBON	10K	5%	1/6W	
R016	1-247-855-00	CARBON	10K	5%	1/6W	
R017	1-244-845-51	CARBON	68	5%	1/2W	
R018	1-247-831-00	CARBON	1K	5%	1/6W	
R019	1-247-829-00	CARBON	820	5%	1/6W	
R020	1-247-841-00	CARBON	2.7K	5%	1/6W	
R021	1-247-879-00	CARBON	100K	5%	1/6W	
R022	1-247-844-00	CARBON	3.6K	5%	1/6W	
R023	1-247-831-00	CARBON	1K	5%	1/6W	
R024	1-247-855-00	CARBON	10K	5%	1/6W	
R027	1-247-879-00	CARBON	100K	5%	1/6W	
R028	1-247-844-00	CARBON	3.6K	5%	1/6W	
R029	1-247-885-00	CARBON	180K	5%	1/6W	
R031	1-247-844-00	CARBON	3.6K	5%	1/6W	
R032	1-247-859-00	CARBON	15K	5%	1/6W	
R034	1-247-863-00	CARBON	22K	5%	1/6W	
R035	1-247-831-00	CARBON	1K	5%	1/6W	
R036	1-247-903-00	CARBON	1M	5%	1/6W	
R037	1-247-835-00	CARBON	1.5K	5%	1/6W	
R038	1-247-855-00	CARBON	10K	5%	1/6W	
R039	1-247-867-00	CARBON	33K	5%	1/6W	
R040	1-247-903-00	CARBON	1M	5%	1/6W	
R042	1-247-831-00	CARBON	1K	5%	1/6W	
R043	1-247-855-00	CARBON	10K	5%	1/6W	
R044	1-247-879-00	CARBON	100K	5%	1/6W	
R045	1-247-871-00	CARBON	47K	5%	1/6W	
R046	1-247-903-00	CARBON	1M	5%	1/6W	
R047	1-247-831-00	CARBON	1K	5%	1/6W	
R048	1-247-855-00	CARBON	10K	5%	1/6W	
R049	1-247-879-00	CARBON	100K	5%	1/6W	
R050	1-247-879-00	CARBON	100K	5%	1/6W	
R051	1-247-875-00	CARBON	68K	5%	1/6W	
R052	1-247-875-00	CARBON	68K	5%	1/6W	
R053	1-247-879-00	CARBON	100K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R054	1-247-875-00	CARBON	68K	5%	1/6W	
R055	1-247-858-00	CARBON	13K	5%	1/6W	
R056	1-247-853-00	CARBON	8.2K	5%	1/6W	
R056	1-247-853-00	CARBON	8.2K	5%	1/6W	
R057	1-214-160-00	METAL	15K	1%	1/4W	
R058	1-247-862-00	CARBON	20K	5%	1/6W	
R059	1-247-841-00	CARBON	2.7K	5%	1/6W	
R060	1-247-844-00	CARBON	3.6K	5%	1/6W	
R061	1-247-847-00	CARBON	4.7K	5%	1/6W	
R062	1-247-883-00	CARBON	150K	5%	1/6W	
R063	1-247-883-00	CARBON	150K	5%	1/6W	
R064	1-247-848-00	CARBON	5.1K	5%	1/6W	
R065	1-247-847-00	CARBON	4.7K	5%	1/6W	
R066	1-247-903-00	CARBON	1M	5%	1/6W	
R067	1-247-867-00	CARBON	33K	5%	1/6W	
R068	1-247-876-00	CARBON	75K	5%	1/6W	
R069	1-247-883-00	CARBON	150K	5%	1/6W	
R070	1-247-867-00	CARBON	33K	5%	1/6W	
R071	1-247-879-00	CARBON	100K	5%	1/6W	
R072	1-247-879-00	CARBON	100K	5%	1/6W	
R073	1-247-871-00	CARBON	47K	5%	1/6W	
R074	1-247-871-00	CARBON	47K	5%	1/6W	
R075	1-247-857-00	CARBON	12K	5%	1/6W	
R076	1-247-859-00	CARBON	15K	5%	1/6W	
R077	1-247-887-00	CARBON	220K	5%	1/6W	
R078	1-247-887-00	CARBON	220K	5%	1/6W	
R079	1-247-865-00	CARBON	27K	5%	1/6W	
R080	1-247-848-00	CARBON	5.1K	5%	1/6W	
R081	1-247-867-00	CARBON	33K	5%	1/6W	
R082	1-247-900-00	CARBON	750K	5%	1/6W	
R083	1-247-873-00	CARBON	56K	5%	1/6W	
R084	1-247-856-00	CARBON	11K	5%	1/6W	
R085	1-247-853-00	CARBON	8.2K	5%	1/6W	
R086	1-247-867-00	CARBON	33K	5%	1/6W	
R087	1-247-867-00	CARBON	33K	5%	1/6W	
R088	1-247-855-00	CARBON	10K	5%	1/6W	
R089	1-247-865-00	CARBON	27K	5%	1/6W	
R090	1-247-856-00	CARBON	11K	5%	1/6W	
R091	1-247-837-00	CARBON	1.8K	5%	1/6W	
R092	1-247-839-00	CARBON	2.2K	5%	1/6W	
R093	1-247-839-00	CARBON	2.2K	5%	1/6W	
R095	1-247-864-00	CARBON	24K	5%	1/6W	
R097	1-247-893-00	CARBON	390K	5%	1/6W	
R098	1-247-849-00	CARBON	5.6K	5%	1/6W	
R099	1-247-879-00	CARBON	100K	5%	1/6W	
R100	1-247-879-00	CARBON	100K	5%	1/6W	
R202	1-247-847-00	CARBON	4.7K	5%	1/6W	
R203	1-214-360-00	METAL OXIDE	1	5%	1W	F
R204	1-246-961-00	CARBON	4.7	5%	1/6W	F
R205	1-247-871-00	CARBON	47K	5%	1/6W	
R206	1-247-855-00	CARBON	10K	5%	1/6W	
R207	1-247-871-00	CARBON	47K	5%	1/6W	
R208	1-247-867-00	CARBON	33K	5%	1/6W	
R209	1-214-132-00	METAL	1K	1%	1/4W	
R210	1-247-838-00	CARBON	2K	5%	1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description			Remark
R211	1-247-847-00	CARBON	4.7K	5% 1/6W	
R212	1-212-360-00	METAL OXIDE	1K	5% 1W	F
R213	1-246-981-00	CARBON	0.1	5% 1/6W	F
R214	1-247-855-00	CARBON	10K	5% 1/6W	
R215	1-247-855-00	CARBON	10K	5% 1/6W	
R216	1-247-855-00	CARBON	10K	5% 1/6W	
R217	1-247-855-00	CARBON	10K	5% 1/6W	
R218	1-247-855-00	CARBON	10K	5% 1/6W	
R219	1-247-855-00	CARBON	10K	5% 1/6W	
R220	1-246-981-00	CARBON	0.1	5% 1/6W	F
R221	1-247-863-00	CARBON	22K	5% 1/6W	
R222	1-247-843-00	CARBON	3.3K	5% 1/6W	
R223	1-247-849-00	CARBON	5.6K	5% 1/6W	
R224	1-247-855-00	CARBON	10K	5% 1/6W	
R225	1-247-855-00	CARBON	10K	5% 1/6W	
R226	1-247-863-00	CARBON	22K	5% 1/6W	
R227	1-247-863-00	CARBON	22K	5% 1/6W	
R228	1-247-863-00	CARBON	22K	5% 1/6W	
R230	1-247-849-00	CARBON	5.6K	5% 1/6W	
R231	1-247-863-00	CARBON	22K	5% 1/6W	
R232	1-212-366-00	METAL OXIDE	3.3	5% 1W	F
R234	1-247-863-00	CARBON	22K	5% 1/6W	
R235	1-247-863-00	CARBON	22K	5% 1/6W	
R236	1-247-831-00	CARBON	1K	5% 1/6W	
R237	1-247-849-00	CARBON	5.6K	5% 1/6W	
R238	1-247-831-00	CARBON	1K	5% 1/6W	
R239	1-212-360-00	METAL OXIDE	1K	5% 1W	F
R240	1-247-849-00	CARBON	5.6K	5% 1/6W	
R241	1-247-831-00	CARBON	1K	5% 1/6W	
R242	1-247-831-00	CARBON	1K	5% 1/6W	
R243	1-247-863-00	CARBON	22K	5% 1/6W	
R244	1-247-863-00	CARBON	22K	5% 1/6W	
R245	1-247-801-00	CARBON	56	5% 1/6W	
R247	1-247-871-00	CARBON	47K	5% 1/6W	
R249	1-247-858-00	CARBON	13K	5% 1/6W	
R250	1-247-855-00	CARBON	10K	5% 1/6W	(FORMER)
R301	1-247-839-00	CARBON	2.2K	5% 1/6W	
R302	1-247-855-00	CARBON	10K	5% 1/6W	
R303	1-247-837-00	CARBON	1.8K	5% 1/6W	
R304	1-247-879-00	CARBON	100K	5% 1/6W	
R305	1-247-879-00	CARBON	100K	5% 1/6W	
R306	1-247-879-00	CARBON	100K	5% 1/6W	
R307	1-247-839-00	CARBON	2.2K	5% 1/6W	
R308	1-247-855-00	CARBON	10K	5% 1/6W	
R311	1-247-837-00	CARBON	1.8K	5% 1/6W	
R312	1-247-839-00	CARBON	2.2K	5% 1/6W	
R313	1-247-871-00	CARBON	47K	5% 1/6W	
R314	1-247-871-00	CARBON	47K	5% 1/6W	
R315	1-247-871-00	CARBON	47K	5% 1/6W	
R316	1-247-871-00	CARBON	47K	5% 1/6W	
R317	1-247-855-00	CARBON	10K	5% 1/6W	

Ref.No.	Part No.	Description			Remark
R318	1-247-831-00	CARBON	1K	5% 1/6W	
R319	1-247-895-00	CARBON	470K	5% 1/6W	
R320	1-247-895-00	CARBON	470K	5% 1/6W	
R321	1-247-879-00	CARBON	100K	5% 1/6W	
R322	1-247-837-00	CARBON	1.8K	5% 1/6W	
R323	1-247-879-00	CARBON	100K	5% 1/6W	
R324	1-247-879-00	CARBON	100K	5% 1/6W	
R325	1-247-879-00	CARBON	100K	5% 1/6W	
R326	1-247-879-00	CARBON	100K	5% 1/6W	
R327	1-247-879-00	CARBON	100K	5% 1/6W	
R328	1-247-855-00	CARBON	10K	5% 1/6W	
R329	1-247-879-00	CARBON	100K	5% 1/6W	
R330	1-247-879-00	CARBON	100K	5% 1/6W	
R331	1-247-879-00	CARBON	100K	5% 1/6W	
R401	1-247-831-00	CARBON	1K	5% 1/6W	
R402	1-247-863-00	CARBON	22K	5% 1/6W	
R403	1-247-831-00	CARBON	1K	5% 1/6W	
R404	1-247-831-00	CARBON	1K	5% 1/6W	
R406	1-247-879-00	CARBON	100K	5% 1/6W	
R407	1-247-871-00	CARBON	47K	5% 1/6W	
R408	1-247-878-00	CARBON	91K	5% 1/6W	(FORMER)
R409	1-247-879-00	CARBON	100K	5% 1/6W	
R410	1-247-855-00	CARBON	10K	5% 1/6W	
R411	1-247-879-00	CARBON	100K	5% 1/6W	
R412	1-247-831-00	CARBON	1K	5% 1/6W	
R413	1-247-879-00	CARBON	100K	5% 1/6W	
R414	1-247-879-00	CARBON	100K	5% 1/6W	
R415	1-247-879-00	CARBON	100K	5% 1/6W	
R416	1-247-879-00	CARBON	100K	5% 1/6W	
R417	1-247-879-00	CARBON	100K	5% 1/6W	
R418	1-247-879-00	CARBON	100K	5% 1/6W	
R419	1-247-879-00	CARBON	100K	5% 1/6W	
R420	1-247-879-00	CARBON	100K	5% 1/6W	
R421	1-247-863-00	CARBON	22K	5% 1/6W	
R422	1-247-831-00	CARBON	1K	5% 1/6W	
R423	1-247-879-00	CARBON	100K	5% 1/6W	
R424	1-247-843-00	CARBON	3.3K	5% 1/6W	
R425	1-247-839-00	CARBON	2.2K	5% 1/6W	
R426	1-247-855-00	CARBON	10K	5% 1/6W	
R427	1-247-873-00	CARBON	56K	5% 1/6W	
R428	1-247-865-00	CARBON	27K	5% 1/6W	
R429	1-247-873-00	CARBON	56K	5% 1/6W	
R430	1-247-865-00	CARBON	27K	5% 1/6W	
R431	1-247-855-00	CARBON	10K	5% 1/6W	
R432	1-247-863-00	CARBON	22K	5% 1/6W	
R433	1-247-855-00	CARBON	10K	5% 1/6W	
R434	1-247-849-00	CARBON	5.6K	5% 1/6W	
R435	1-247-879-00	CARBON	100K	5% 1/6W	
R436	1-247-879-00	CARBON	100K	5% 1/6W	
R437	1-246-468-00	CARBON	620	5% 1/4W	
R438	1-247-879-00	CARBON	100K	5% 1/6W	
R439	1-247-873-00	CARBON	56K	5% 1/6W	
R440	1-247-865-00	CARBON	27K	5% 1/6W	

Notes:

(Former) : Model with IC401 (μPD553C-261) and IC402 (μPD553C-262)

(New) : Model with IC401 (μPD553C-276) and IC402 (μPD553C-287)

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SS-13 GM-2
(FORMER)

Ref No	Part No	Description				Remark
R441	1-247-863-00	CARBON	22K	5%	1/6W	
R442	1-247-809-00	CARBON	120	5%	1/6W	
R443	1-247-829-00	CARBON	820	5%	1/6W	
R444	1-247-843-00	CARBON	3.3K	5%	1/6W	
R445	1-247-849-00	CARBON	5.6K	5%	1/6W	
R446	1-247-873-00	CARBON	56K	5%	1/6W	
R447	1-247-807-00	CARBON	100	5%	1/6W	
R448	1-246-468-00	CARBON	620	5%	1/4W	
R449	1-246-468-00	CARBON	620	5%	1/4W	
R450	1-246-470-00	CARBON	750	5%	1/4W	
R451	1-246-468-00	CARBON	620	5%	1/4W	
R452	1-247-879-00	CARBON	100K	5%	1/6W	
R453	1-247-843-00	CARBON	3.3K	5%	1/6W	
R454	1-247-871-00	CARBON	47K	5%	1/6W	
R455	1-247-801-00	CARBON	56	5%	1/6W	
R456	1-247-879-00	CARBON	100K	5%	1/6W	
R457	1-247-879-00	CARBON	100K	5%	1/6W	
R458	1-247-835-00	CARBON	1.5K	5%	1/6W	
R459	1-247-823-00	CARBON	470	5%	1/6W	
R460	1-247-855-00	CARBON	10K	5%	1/6W	
R461	1-247-839-00	CARBON	2.2K	5%	1/6W	(FORMER)
	1-247-879-00	CARBON	100K	5%	1/6W	(NEW)
R462	1-247-849-00	CARBON	5.6K	5%	1/6W	
R463	1-247-855-00	CARBON	10K	5%	1/6W	
R465	1-247-855-00	CARBON	10K	5%	1/6W	
R501	1-247-895-00	CARBON	470K	5%	1/6W	
R502	1-247-875-00	CARBON	68K	5%	1/6W	
R503	1-247-849-00	CARBON	5.6K	5%	1/6W	
R504	1-247-831-00	CARBON	1K	5%	1/6W	
R505	1-247-855-00	CARBON	10K	5%	1/6W	
R506	1-247-879-00	CARBON	100K	5%	1/6W	
R507	1-247-886-00	CARBON	200K	5%	1/6W	
R508	1-247-841-00	CARBON	2.7K	5%	1/6W	
R509	1-247-815-00	CARBON	220	5%	1/6W	
R510	1-247-869-00	CARBON	39K	5%	1/6W	
R511	1-247-875-00	CARBON	68K	5%	1/6W	
R512	1-247-879-00	CARBON	100K	5%	1/6W	
R513	1-247-852-00	CARBON	7.5K	5%	1/6W	
R514	1-247-841-00	CARBON	2.7K	5%	1/6W	
R515	1-247-849-00	CARBON	5.6K	5%	1/6W	
R516	1-247-831-00	CARBON	1K	5%	1/6W	
R517	1-247-867-00	CARBON	33K	5%	1/6W	
R518	1-247-863-00	CARBON	22K	5%	1/6W	
R519	1-247-801-00	CARBON	56	5%	1/6W	
R520	1-247-879-00	CARBON	100K	5%	1/6W	
R601	1-247-903-00	CARBON	1M	5%	1/6W	
R602	1-247-879-00	CARBON	100K	5%	1/6W	
R603	1-247-863-00	CARBON	22K	5%	1/6W	
R604	1-247-855-00	CARBON	10K	5%	1/6W	
R605	1-247-895-00	CARBON	470K	5%	1/6W	
R606	1-247-869-00	CARBON	39K	5%	1/6W	
R607	1-247-807-00	CARBON	100	5%	1/6W	
R608	1-247-879-00	CARBON	100K	5%	1/6W	

Ref.No.	Part No.	Description				Remark
R609	1-247-839-00	CARBON	2.2K	5%	1/6W	
R610	1-247-831-00	CARBON	1K	5%	1/6W	
R751	1-247-831-00	CARBON	1K	5%	1/6W	
R752	1-247-863-00	CARBON	22K	5%	1/6W	
R753	1-247-871-00	CARBON	47K	5%	1/6W	
R754	1-247-863-00	CARBON	22K	5%	1/6W	
R755	1-247-863-00	CARBON	22K	5%	1/6W	
R758	1-247-845-00	CARBON	3.9K	5%	1/6W	
R759	1-247-855-00	CARBON	10K	5%	1/6W	
R760	1-247-831-00	CARBON	1K	5%	1/6W	
R766	1-247-871-00	CARBON	47K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-990-00	RES, ADJ, METAL GLAZE	1K
RV002	1-228-993-00	RES, ADJ, METAL GLAZE	4.7K
RV003	1-228-991-00	RES, ADJ, METAL GLAZE	2.2K
RV004	1-228-996-00	RES, ADJ, METAL GLAZE	47K
RV005	1-228-750-00	RES, ADJ, CARBON	47K
RV006	1-228-750-00	RES, ADJ, CARBON	47K
RV008	1-228-750-00	RES, ADJ, CARBON	47K
RV009	1-228-747-00	RES, ADJ, CARBON	4.7K

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★1-609-890-13 GM-2 BOARD.....FORMER
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CAPACITOR

C701	1-123-328-00	ELECT	4.7MF	20%	25V
C702	1-123-381-00	ELECT	2.2MF	20%	50V
C703	1-123-381-00	ELECT	2.2MF	20%	50V
C753	1-131-381-00	ELECT(SOLID)	47MF	10%	10V

DIODE

D408	8-719-911-19	DIODE 1SS119
D701	8-719-911-19	DIODE 1SS119
D702	8-719-911-19	DIODE 1SS119
D703	8-719-911-19	DIODE 1SS119
D704	8-719-911-19	DIODE 1SS119
D705	8-719-911-19	DIODE 1SS119

TRANSISTOR

Q701	8-729-178-54	TRANSISTOR 2SC2785
Q702	8-729-178-54	TRANSISTOR 2SC2785
Q703	8-729-178-54	TRANSISTOR 2SC2785
Q704	8-729-178-54	TRANSISTOR 2SC2785
Q753	8-729-178-54	TRANSISTOR 2SC2785
Q758	8-729-178-54	TRANSISTOR 2SC2785
Q759	8-729-178-54	TRANSISTOR 2SC2785

RESISTOR

R701	1-247-873-00	CARBON	56K	5%	1/6W
R702	1-247-873-00	CARBON	56K	5%	1/6W

Notes:
(Former) : Model with IC401 (μPD553C-261) and IC402 (μPD553C-262)
(New) : Model with IC401 (μPD553C-276) and IC402 (μPD553C-287)

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description				Remark
R703	1-247-873-00	CARBON	56K	5%	1/6W	
R704	1-247-873-00	CARBON	56K	5%	1/6W	
R705	1-247-895-00	CARBON	470K	5%	1/6W	
R706	1-247-895-00	CARBON	470K	5%	1/6W	
R707	1-247-877-00	CARBON	82K	5%	1/6W	
R710	1-247-887-00	CARBON	220K	5%	1/6W	
R711	1-247-871-00	CARBON	47K	5%	1/6W	
R712	1-247-862-00	CARBON	20K	5%	1/6W	
R713	1-247-879-00	CARBON	100K	5%	1/6W	
R715	1-247-879-00	CARBON	100K	5%	1/6W	
R716	1-247-839-00	CARBON	2.2K	5%	1/6W	
R718	1-247-871-00	CARBON	47K	5%	1/6W	
R719	1-247-871-00	CARBON	47K	5%	1/6W	
R720	1-247-855-00	CARBON	10K	5%	1/6W	
R721	1-247-871-00	CARBON	47K	5%	1/6W	
R756	1-247-867-00	CARBON	33K	5%	1/6W	
R757	1-247-867-00	CARBON	33K	5%	1/6W	
R761	1-247-879-00	CARBON	100K	5%	1/6W	
R762	1-247-863-00	CARBON	22K	5%	1/6W	
R763	1-247-863-00	CARBON	22K	5%	1/6W	
R764	1-247-863-00	CARBON	22K	5%	1/6W	
R765	1-247-863-00	CARBON	22K	5%	1/6W	

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♣:1-609-219-00 FS-19 BOARD
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DIODE

D001	8-719-812-32	DIODE TLY123
D002	8-719-812-33	DIODE TLG123A

SWITCH

S001	1-553-766-00	SWITCH, KEY BOARD (FF)
S002	1-553-766-00	SWITCH, KEY BOARD (REW)
S003	1-553-766-00	SWITCH, KEY BOARD (PLAY)
S004	1-553-766-00	SWITCH, KEY BOARD (STOP)
S005	1-553-766-00	SWITCH, KEY BOARD (PAUSE)

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♣:1-609-220-00 FS-20 BOARD
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DIODE

D101	8-719-812-31	DIODE TLR123
D102	8-719-812-32	DIODE TLY123

SWITCH

S101	1-554-378-00	SWITCH, SLIDE (RECORD)
S102	1-553-766-00	SWITCH, KEY BOARD (VTR/TV)

Ref.No.	Part No.	Description				Remark
	♣:1-609-221-00	FS-21 BOARD **********				

DIODE

D201	8-719-812-33	DIODE TLG123A

VARIABLE RESISTOR

RV201	1-228-918-00	RES, VAR, CARBON 100K
RV202	1-230-066-00	RES, ADJ, CARBON 4.7K

SWITCH

S201	1-553-766-00	SWITCH, KEY BOARD (POWER ON/OFF)
S202	1-553-766-00	SWITCH, KEY BOARD (EJECT)
S203	1-554-377-00	SWITCH, SLIDE (RECORD MODE)

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♣:1-609-222-00 JK-1 BOARD
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♣:3-679-319-00 INSULATOR

CAPACITOR

C001	1-161-021-00	CERAMIC	0.047MF	10%	25V

JACK

CNJ001	1-507-841-00	JACK, MINIATURE (AUDIO IN)
CNJ002	1-507-841-00	JACK, MINIATURE (MIC)
CNJ003	1-507-588-32	JACK, PIN, 1P (VIDEO IN)
CNJ004	1-507-840-00	JACK, MINIATURE (CAMERA PAUSE)

RESISTOR

R002	1-247-875-00	CARBON	68K	5%	1/6W
R003	1-247-815-00	CARBON	220	5%	1/6W
R004	1-247-804-00	CARBON	75	5%	1/6W
R005	1-247-799-00	CARBON	47	5%	1/6W

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♣:A-6728-711-A PS-19 BOARD, COMPLETE
****

CAPACITOR

C001	1-130-603-00	FILM	0.1MF	20%	125V
C002	1-161-747-00	CERAMIC	0.0022MF	20%	125V ...US,E2,PX2 MODEL
C003	1-161-747-00	CERAMIC	0.0022MF	20%	125V ...US,E2,PX2 MODEL

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

PS-19 PS-20 PS-21 PS-25 CAPSTAN MOTOR

Ref.No.	Part No.	Description			Remark
C004	1-123-380-00	ELECT	1MF	20%	100V
C005	1-123-297-00	ELECT	330MF	20%	6.3V
C006	1-123-386-00	ELECT	33MF	20%	100V
C007	1-124-316-00	ELECT	470MF	20%	35V
C008	1-123-341-00	ELECT	10MF	20%	35V
C009	1-123-332-00	ELECT	47MF	20%	16V
C010	1-161-013-00	CERAMIC	0.01MF	10%	25V

CONNECTOR

CN001	♣:1-564-104-00	PIN, CONNECTOR 3P	
CN002	♣:1-560-892-00	PIN, CONNECTOR 4P	
CN003	♣:1-560-900-00	PIN, CONNECTOR 12P	
CN004	♣:1-560-894-00	PIN, CONNECTOR 6P	
CN006	♣:1-560-894-00	PIN, CONNECTOR 6P	

DIODE

D001	8-719-200-02	DIODE 10E2	
D002	8-719-200-02	DIODE 10E2	
D003	⚠:8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D006	8-719-200-02	DIODE 10E2	
D007	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
D009	8-719-100-30	DIODE RD5.1EB2	
D010	8-719-100-61	DIODE RD11EB2	

FUSE

F001	⚠:1-532-581-00	FUSE, GLASS TUBE 2A 125V	

TRANSISTOR

Q001	8-729-173-54	TRANSISTOR 2SD738	

RESISTOR

R001	1-202-723-00	SOLID	2.2M	10%	1/2W
R002	⚠:1-212-865-00	FUSIBLE	1Ω	5%	1/4W
R003	⚠:1-249-881-00	FUSIBLE	1Ω	5%	1/4W
R004	1-247-831-00	CARBON	1K	5%	1/6W
R005	1-247-879-00	CARBON	100K	5%	1/6W
R006	1-247-855-00	CARBON	10K	5%	1/6W
R007	1-247-855-00	CARBON	10K	5%	1/6W
R010	1-247-839-00	CARBON	2.2K	5%	1/6W
R011	1-247-851-00	CARBON	6.8K	5%	1/6W

TRANSFORMER

T001	⚠:1-429-357-31	TRANSFORMER, DRIVE	

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♣:1-609-216-00 PS-20 BOARD
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1-533-162-00 HOLDER, FUSE

Ref.No.	Part No.	Description			Remark
		CAPACITOR			
C101	1-125-298-00	ELECT(BLOCK)	10000MF	20%	25V ...US MODEL
	1-123-314-00	ELECT	4700MF	20%	25V ...E,PX MODEL
C102	1-125-349-00	ELECT	6800MF	20%	25V
C103	1-123-332-00	ELECT	47MF	20%	16V
C104	1-123-333-00	ELECT	100MF	20%	25V

CONNECTOR

CN101	♣:1-560-136-00	PLUG, CONNECTOR 4P	

DIODE

D101	⚠:8-719-503-40	DIODE 30V40E	
D102	⚠:8-719-503-40	DIODE 30V40E	
D103	⚠:8-719-503-40	DIODE 30V40E	
D104	⚠:8-719-503-40	DIODE 30V40E	
D105	⚠:8-719-503-40	DIODE 30V40E	
D106	⚠:8-719-503-40	DIODE 30V40E	
D107	⚠:8-719-503-40	DIODE 30V40E	
D108	⚠:8-719-503-40	DIODE 30V40E	

FUSE

F101	⚠:1-532-584-00	FUSE, GLASS TUBE 4A 125V	
F102	⚠:1-532-584-00	FUSE, GLASS TUBE 4A 125V	

IC

IC101	⚠:8-749-953-24	IC STK-5241	

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♣:1-609-217-21 PS-21 BOARD
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SWITCH

S001	1-554-377-00	SWITCH, SLIDE (TIMER SELECT)	

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♣:1-609-445-21 PS-25 BOARD
****

TRANSISTOR

Q220	8-729-831-33	TRANSISTOR 2SD313HP	

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CAPSTAN MOTOR BOARD
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CAPACITOR

C1	1-123-611-00	ELECT	1.0MF	50V
C2	1-123-611-00	ELECT	1.0MF	50V

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

CAPSTAN MOTOR TA-20

Ref.No.	Part No.	Description				Remark
		DEVICE MAGNET ELEMENT				
DM	8-745-211-00	DM-211				
		IC				
IC1	8-759-808-79	IC CX-879				
		TRANSISTOR				
Q1	8-729-100-01	TRANSISTOR 2SD992				
Q2	8-729-100-01	TRANSISTOR 2SD992				
		RESISTOR				
R1	1-247-832-00	CARBON	1.1K	5%	1/6W	
R2	1-247-832-00	CARBON	1.1K	5%	1/6W	
**********						
♣	A-6721-186-A	TA-20 BOARD, COMPLETE				
		**********				
	1-463-445-00	TUNER, ET (BT-892)				
♣	3-679-120-00	CASE (UPPER), SHIELD, T				
♣	3-679-121-00	CASE (INNER), SHIELD, T				
♣	3-679-122-00	CASE (LOWER), SHIELD, T				
♣	3-679-174-00	CASE (UPPER), SHIELD, AU-33				
♣	3-679-175-00	CASE (INNER), SHIELD, AU-33				
♣	3-679-176-00	CASE (LOWER), SHIELD, AU-33				
♣	3-679-177-00	CASE (LOWER), SHIELD, AU-44				
♣	3-679-239-00	CASE (INNER), SHIELD, AU-44				
♣	3-679-333-00	REINFORCEMENT, TUNER				
♣	4-812-134-11	RIVET NYLON, 3.5				
	7-621-259-25	SCREW +P 2.6X4				
		CAPACITOR				
C001	1-102-074-00	CERAMIC	0.001MF	10%	50V	
C002	1-130-487-00	MYLAR	0.022MF	5%	50V	
C003	1-123-608-00	ELECT	0.22MF	20%	50V	
C004	1-123-608-00	ELECT	0.22MF	20%	50V	
C005	1-102-526-00	CERAMIC	75PF	5%	50V	
C006	1-123-333-00	ELECT	100MF	20%	16V	
C007	1-101-004-00	CERAMIC	0.01MF		50V	
C008	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C009	1-101-884-00	CERAMIC	56PF	5%	50V	
C010	1-101-884-00	CERAMIC	56PF	5%	50V	
C011	1-123-356-00	ELECT	10MF	20%	16V	
C012	1-130-486-00	MYLAR	0.015MF	5%	50V	
C013	1-102-851-00	CERAMIC	15PF	5%	50V	
C014	1-102-495-00	CERAMIC	75PF	5%	50V	
C015	1-123-380-00	ELECT	1MF	20%	50V	
C016	1-123-330-00	ELECT	22MF	20%	16V	
C017	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C018	1-123-380-00	ELECT	1MF	20%	50V	
C019	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C020	1-123-379-00	ELECT	0.47MF	20%	50V	
C021	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C022	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C023	1-123-379-00	ELECT	0.47MF	20%	50V	
C024	1-102-816-00	CERAMIC	120PF	5%	50V	
C025	1-123-333-00	ELECT	100MF	20%	16V	
C026	1-102-514-00	CERAMIC	22PF	5%	50V	
C027	1-102-121-00	CERAMIC	0.0022MF	10%	50V	
C028	1-123-382-00	ELECT	3.3MF	20%	100V	
C029	1-123-330-00	ELECT	22MF	20%	16V	
C030	1-123-330-00	ELECT	22MF	20%	16V	

Ref.No.	Part No.	Description				Remark
C031	1-130-632-00	MYLAR	0.1MF	10%	50V	
C032	1-130-620-00	MYLAR	0.01MF	10%	50V	
C033	1-123-330-00	ELECT	22MF	20%	16V	
C034	1-123-318-00	ELECT	33MF	20%	16V	
C035	1-161-036-00	CERAMIC	0.047MF	20%	25V	
C036	1-123-330-00	ELECT	22MF	20%	16V	
C037	1-123-381-00	ELECT	2.2MF	20%	50V	
C038	1-123-380-00	ELECT	1MF	20%	50V	
C039	1-130-620-00	MYLAR	0.01MF	10%	50V	
C040	1-123-330-00	ELECT	22MF	20%	16V	
C502	1-123-332-00	ELECT	47MF	20%	16V	
C503	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C504	1-130-477-00	MYLAR	0.0033MF	5%	50V	
C505	1-102-110-00	CERAMIC	220PF	10%	50V	
C506	1-130-472-00	MYLAR	0.0012MF	5%	50V	
C507	1-123-381-00	ELECT	2.2MF	20%	50V	
C508	1-123-354-00	ELECT	3.3MF	20%	50V	
C509	1-136-051-00	FILM	0.0039MF	10%	630V	
C510	1-130-475-00	MYLAR	0.0022MF	5%	50V	
C511	1-123-356-00	ELECT	10MF	20%	16V	
C512	1-130-471-00	MYLAR	0.001MF	5%	50V	
C513	1-107-166-00	MICA	62PF	5%	500V	
C514	1-123-333-00	ELECT	100MF	20%	16V	
C515	1-130-477-00	MYLAR	0.0033MF	5%	50V	
C517	1-123-354-00	ELECT	3.3MF	20%	50V	
C518	1-123-330-00	ELECT	22MF	20%	16V	
C519	1-123-356-00	ELECT	10MF	20%	16V	
C520	1-101-059-00	CERAMIC	510PF	5%	50V	
C521	1-123-328-00	ELECT	4.7MF	20%	25V	
C522	1-130-497-00	MYLAR	0.15MF	5%	50V	
C523	1-123-328-00	ELECT	4.7MF	20%	25V	
C524	1-123-333-00	ELECT	100MF	20%	16V	
C525	1-130-482-00	MYLAR	0.0082MF	5%	50V	
C526	1-123-328-00	ELECT	4.7MF	20%	25V	
C528	1-130-483-00	MYLAR	0.01MF	5%	50V	
C530	1-123-296-00	ELECT	220MF	20%	6.3V	
C531	1-123-380-00	ELECT	1MF	20%	50V	
C533	1-130-468-00	MYLAR	560PF	5%	50V	
C534	1-123-379-00	ELECT	0.47MF	20%	50V	
C535	1-123-330-00	ELECT	22MF	20%	16V	
C536	1-161-021-00	CERAMIC	0.047MF	10%	25V	
C537	1-130-472-00	MYLAR	0.0012MF	5%	50V	
		FILTER				
CF001	1-409-332-00	CERAMIC TRAP (4.5MHZ)				
CF002	1-527-260-00	FILTER, CERAMIC (4.5MHZ)				
CF003	1-409-332-00	CERAMIC TRAP (4.5MHZ)				
		CONNECTOR				
CN001	♣1-560-894-00	PIN, CONNECTOR 6P				
CN002	♣1-560-896-00	PIN, CONNECTOR 8P				
CN003	♣1-560-896-00	PIN, CONNECTOR 8P				
CN004	♣1-560-896-00	PIN, CONNECTOR 8P				
CN005	♣1-560-896-00	PIN, CONNECTOR 8P				
CN501	♣1-560-892-00	PIN, CONNECTOR 4P				
CN502	♣1-560-897-00	PIN, CONNECTOR 9P				
CN503	♣1-560-890-00	PIN, CONNECTOR 2P				
CN504	♣1-560-893-00	PIN, CONNECTOR 5P				

When indicating parts by reference number, please include the board name.

TA-20

Ref.No.	Part No.	Description	Remark
		DIODE	
D003	8-719-911-19	DIODE 1SS119	
D004	8-719-911-19	DIODE 1SS119	
D005	8-719-911-19	DIODE 1SS119	
D006	8-719-911-19	DIODE 1SS119	
D008	8-719-911-19	DIODE 1SS119	
D010	8-719-911-19	DIODE 1SS119	
D011	8-719-100-55	DIODE RD9.1EB3	
D020	8-719-911-19	DIODE 1SS119	
D021	8-719-911-19	DIODE 1SS119	
D022	8-719-911-19	DIODE 1SS119	
D501	8-719-911-19	DIODE 1SS119	
D502	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-758-852-00	IC CX-885B	
IC002	8-759-157-40	IC UPC574J	
IC501	8-759-800-46	IC LA7046	
		COIL	
L001	1-408-591-00	MICRO INDUCTOR 1UH	
L002	1-408-597-00	MICRO INDUCTOR 3.3UH	
L003	1-408-608-00	MICRO INDUCTOR 27UH	
L004	1-408-603-00	MICRO INDUCTOR 10UH	
L005	1-408-602-00	MICRO INDUCTOR 8.2UH	
L006	1-408-604-00	MICRO INDUCTOR 12UH	
L007	1-408-606-00	MICRO INDUCTOR 18UH	
L008	1-408-611-00	MICRO INDUCTOR 47UH	
L009	1-407-716-00	MICRO INDUCTOR 820UH	
L010	1-407-716-00	MICRO INDUCTOR 820UH	
L501	1-407-718-00	MICRO INDUCTOR 1.2MMH	
L502	1-407-508-00	MICRO INDUCTOR 22MMH	
		VARIABLE COIL	
LV501	1-408-523-00	COIL, VARIABLE	
		VOLUME BLOCK	
PS001	1-230-074-00	VOLUME BLOCK, PRESET	
		TRANSISTOR	
Q001	8-729-178-54	TRANSISTOR 2SC2785	
Q002	8-729-178-54	TRANSISTOR 2SC2785	
Q003	8-729-178-54	TRANSISTOR 2SC2785	
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q005	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q006	8-729-178-54	TRANSISTOR 2SC2785	
Q007	8-729-600-12	TRANSISTOR 2SK108-D	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q009	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q010	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q501	8-729-177-43	TRANSISTOR 2SD774	
Q502	8-729-194-47	TRANSISTOR 2SC945-P	
Q503	8-729-194-47	TRANSISTOR 2SC945-P	
Q504	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q505	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q506	8-729-178-54	TRANSISTOR 2SC2785	
Q507	8-729-178-54	TRANSISTOR 2SC2785	
Q509	8-729-178-54	TRANSISTOR 2SC2785	
Q510	8-729-178-54	TRANSISTOR 2SC2785	
		RESISTOR	
R001	1-247-839-00	CARBON 2.2K 5% 1/6W	
R002	1-247-845-00	CARBON 3.9K 5% 1/6W	
R003	1-247-879-00	CARBON 100K 5% 1/6W	
R004	1-247-869-00	CARBON 39K 5% 1/6W	
R005	1-247-829-00	CARBON 820 5% 1/6W	
R006	1-247-799-00	CARBON 47 5% 1/6W	
R007	1-247-891-00	CARBON 330K 5% 1/6W	
R008	1-247-807-00	CARBON 100 5% 1/6W	
R009	1-247-839-00	CARBON 2.2K 5% 1/6W	
R010	1-247-865-00	CARBON 27K 5% 1/6W	
R011	1-247-843-00	CARBON 3.3K 5% 1/6W	
R012	1-247-831-00	CARBON 1K 5% 1/6W	
R013	1-247-871-00	CARBON 47K 5% 1/6W	
R014	1-247-873-00	CARBON 56K 5% 1/6W	
R015	1-247-831-00	CARBON 1K 5% 1/6W	
R016	1-247-852-00	CARBON 7.5K 5% 1/6W	
R017	1-247-831-00	CARBON 1K 5% 1/6W	
R018	1-247-843-00	CARBON 3.3K 5% 1/6W	
R019	1-247-831-00	CARBON 1K 5% 1/6W	
R020	1-247-831-00	CARBON 1K 5% 1/6W	
R021	1-247-873-00	CARBON 56K 5% 1/6W	
R022	1-247-847-00	CARBON 4.7K 5% 1/6W	
R023	1-247-821-00	CARBON 390 5% 1/6W	
R024	1-247-821-00	CARBON 390 5% 1/6W	
R025	1-247-827-00	CARBON 680 5% 1/6W	
R026	1-247-847-00	CARBON 4.7K 5% 1/6W	
R027	1-247-817-00	CARBON 270 5% 1/6W	
R028	1-247-843-00	CARBON 3.3K 5% 1/6W	
R029	1-247-879-00	CARBON 100K 5% 1/6W	
R030	1-247-863-00	CARBON 22K 5% 1/6W	
R031	1-247-863-00	CARBON 22K 5% 1/6W	
R032	1-247-871-00	CARBON 47K 5% 1/6W	
R033	1-247-867-00	CARBON 33K 5% 1/6W	
R034	1-247-879-00	CARBON 100K 5% 1/6W	
R035	1-247-847-00	CARBON 4.7K 5% 1/6W	
R036	1-247-855-00	CARBON 10K 5% 1/6W	
R037	1-247-879-00	CARBON 100K 5% 1/6W	
R038	1-246-458-00	CARBON 240 5% 1/4W	
R039	1-247-899-00	CARBON 680K 5% 1/6W	
R040	1-247-903-00	CARBON 1M 5% 1/6W	
R041	1-247-885-00	CARBON 180K 5% 1/6W	
R042	1-247-869-00	CARBON 39K 5% 1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No.	Part No.	Description				Remark
R043	⚠ 1-247-248-00	CARBON	2.2K	5%	1/2W	F
R044	1-247-841-00	CARBON	2.7K	5%	1/6W	
R045	1-247-862-00	CARBON	20K	5%	1/6W	
R046	1-246-456-00	CARBON	200	5%	1/4W	
R047	1-247-871-00	CARBON	47K	5%	1/6W	
R048	1-247-871-00	CARBON	47K	5%	1/6W	
R049	1-247-871-00	CARBON	47K	5%	1/6W	
R050	1-247-831-00	CARBON	1K	5%	1/6W	
R051	1-247-831-00	CARBON	1K	5%	1/6W	
R052	1-247-831-00	CARBON	1K	5%	1/6W	
R053	1-247-831-00	CARBON	1K	5%	1/6W	
R054	1-247-831-00	CARBON	1K	5%	1/6W	
R055	1-247-831-00	CARBON	1K	5%	1/6W	
R056	1-247-831-00	CARBON	1K	5%	1/6W	
R057	1-247-831-00	CARBON	1K	5%	1/6W	
R058	1-247-831-00	CARBON	1K	5%	1/6W	
R059	1-247-831-00	CARBON	1K	5%	1/6W	
R060	1-247-831-00	CARBON	1K	5%	1/6W	
R061	1-247-831-00	CARBON	1K	5%	1/6W	
R062	1-247-831-00	CARBON	1K	5%	1/6W	
R063	1-247-831-00	CARBON	1K	5%	1/6W	
R064	1-247-863-00	CARBON	22K	5%	1/6W	
R065	1-247-863-00	CARBON	22K	5%	1/6W	
R066	1-247-863-00	CARBON	22K	5%	1/6W	
R067	⚠ 1-247-084-00	CARBON	11	5%	1/4W	F
R068	⚠ 1-247-124-00	CARBON	510	5%	1/4W	F
R070	1-247-843-00	CARBON	3.3K	5%	1/6W	
R071	1-247-863-00	CARBON	22K	5%	1/6W	
R501	1-247-859-00	CARBON	15K	5%	1/6W	
R502	1-247-859-00	CARBON	15K	5%	1/6W	
R503	1-247-783-00	CARBON	10	5%	1/6W	
R504	⚠ 1-246-980-00	CARBON	3.3	5%	1/8W	F
R505	1-247-839-00	CARBON	2.2K	5%	1/6W	
R506	1-247-883-00	CARBON	150K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R508	1-247-893-00	CARBON	390K	5%	1/6W	
R509	1-247-807-00	CARBON	100	5%	1/6W	
R510	1-247-839-00	CARBON	2.2K	5%	1/6W	
R511	1-247-839-00	CARBON	2.2K	5%	1/6W	
R512	1-247-903-00	CARBON	1M	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-849-00	CARBON	5.6K	5%	1/6W	
R515	1-247-855-00	CARBON	10K	5%	1/6W	
R516	1-247-865-00	CARBON	27K	5%	1/6W	
R517	1-247-847-00	CARBON	4.7K	5%	1/6W	
R518	1-247-855-00	CARBON	10K	5%	1/6W	
R519	1-247-869-00	CARBON	39K	5%	1/6W	
R520	1-247-843-00	CARBON	3.3K	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R523	1-247-871-00	CARBON	47K	5%	1/6W	
R524	1-247-855-00	CARBON	10K	5%	1/6W	
R525	1-247-867-00	CARBON	33K	5%	1/6W	
R527	1-247-847-00	CARBON	4.7K	5%	1/6W	
R528	1-247-831-00	CARBON	1K	5%	1/6W	
R529	1-247-783-00	CARBON	10	5%	1/6W	
R530	1-247-863-00	CARBON	22K	5%	1/6W	
R531	1-247-863-00	CARBON	22K	5%	1/6W	
R533	1-247-877-00	CARBON	82K	5%	1/6W	
R534	1-247-865-00	CARBON	27K	5%	1/6W	
R535	1-247-821-00	CARBON	390	5%	1/6W	
R536	1-247-844-00	CARBON	3.6K	5%	1/6W	
R537	1-247-815-00	CARBON	220	5%	1/6W	
R538	1-210-825-00	SOLID	3.3M	5%	1/4W	
R540	1-247-851-00	CARBON	6.8K	5%	1/6W	
R541	1-247-871-00	CARBON	47K	5%	1/6W	
R542	1-247-823-00	CARBON	470	5%	1/6W	
R545	⚠ 1-212-869-00	FUSIBLE	33	5%	1/4W	F
R546	1-247-863-00	CARBON	22K	5%	1/6W	

VARIABLE RESISTOR

RV002	1-228-747-00	RES, ADJ, CARBON 4.7K	
RV501	1-224-256-XX	RES, ADJ, METAL GLAZE 220K	
RV502	1-228-752-00	RES, ADJ, CARBON 220K	
RV503	1-228-744-00	RES, ADJ, CARBON 470	
RV504	1-228-748-00	RES, ADJ, CARBON 10K	

SWITCH

S001	1-554-373-00	SWITCH, LEVER (AFT)

FILTER

SF001	1-404-227-51	SAWF

TRANSFORMER

T001	1-404-153-00	VIFT
T002	1-404-321-00	VIFT
T003	1-404-352-00	COIL, VIF
T004	1-404-352-00	COIL, VIF
T005	1-404-411-00	COIL, SIF
T501	1-433-237-00	TRANSFORMER, OSCILLATOR

POST PIN

TP002▲	3-846-049-11	PIN, LEAD
TP003▲	3-846-049-11	PIN, LEAD
TP502▲	3-846-049-11	PIN, LEAD
TP503▲	3-846-049-11	PIN, LEAD
TP504▲	3-846-049-11	PIN, LEAD
TP505▲	3-846-049-11	PIN, LEAD
TP506▲	3-846-049-11	PIN, LEAD

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description	Remark
		MISCELLANEOUS **********	
	A-6761-056-A	ACE ASSY (AUDIO, AUDIO ERASE, CTL)	
	1-417-063-00	TRANSFORMER, ANTENNA (EAC-24)	
	1-513-379-00	CONVERTER (EAC-25)	
	1-548-571-00	COUNTER, TAPE (MIDDLE TYPE)	
	1-551-139-00	CORD, CONNECTION	
	1-551-644-41	CORD, CONNECTION	
	1-551-[illegible]	CORD, POWER (US,E2,PX2 MODEL)	
	1-551-[illegible]	CORD, POWER (E1,PX1 MODEL)	
	1-[illegible]	CRIMEER CORD	
	8-825-508-10	HEAD, FE (FULL ERASE)	
L991	1-464-249-00	SENSOR, S COIL	
L992	1-464-250-00	SENSOR, T COIL	
M901	X-2621-202-0	ROTOR ASSY, D (DRUM MOTOR)	
	X-2621-204-2	STATOR ASSY, D (DRUM MOTOR)	
M902	8-838-042-01	MOTOR, DC (BHF-1907A) (CAPSTAN MOTOR)	
M903	♦:A-4910-021-A	R STATOR BOARD, COMPLETE (REEL MOTOR)	
	X-2622-201-0	ROTOR ASSY, R (REEL MOTOR)	
M904	A-6737-118-A	MOTOR ASSY, L (LOADING MOTOR)	
MD001	1-464-266-00	RF UNIT, COLOR (RFU-702)	
PM901	A-6749-[illegible]	SOLENOID BLOCK ASS'Y, PINCH	
PM902	A-[illegible]	SOLENOID, BRAKE PLUNGER	
S901	1-552-[illegible]	SWITCH, POWER VOLTAGE CHANGE (US,E1,PX1 MODEL)	
S991	1-554-374-00	SWITCH, LEVER (CASSETTE IN)	
S992	1-554-374-00	SWITCH, LEVER (REC PROOF)	
S993	1-553-539-00	SWITCH, MICRO (THREADING END)	
S994	1-553-718-00	SWITCH, MICRO (UNTHREADING END)	
S996	1-554-372-00	SWITCH, ANTENNA CHANGE	
T901	1-[illegible]	TRANSFORMER, POWER (US,E2,PX2 MODEL)	
	1-[illegible]	TRANSFORMER, POWER (E1,PX1 MODEL)	
TB991	1-417-092-00	DISTRIBUTOR, ANTENNA (UHF)	

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
1-417-063-00	TRANSFORMER, ANTENNA (EAC-24)	
1-506-444-00	ADAPTOR PLUG...PX1 MODEL	
1-513-379-00	CONVERTER (EAC-25)	
1-556-971-00	WIRE ASSY, FEEDER	
1-551-644-41	CORD, CONNECTION	
3-671-402-00	INDICATOR, ACCESSORY	
3-671-873-00	CASE, ACCESSORY	
3-674-317-00	LID, ACCESSORY CASE	
3-677-503-00	SHEET, PROTECTION	
3-679-326-00	CUSHION (UPPER)	
3-679-327-00	CUSHION (LOWER)	
3-679-328-00	INDIVIDUAL CARTON ...US MODEL	
3-679-356-00	INDIVIDUAL CARTON ...E1 MODEL	
3-679-339-00	INDIVIDUAL CARTON ...E2 MODEL	
3-679-340-00	INDIVIDUAL CARTON ...PX1,PX2 MODEL	
3-682-661-00	CARD, CAUTION...E1,PX1 MODEL	
3-701-630-00	BAG, POLYETHYLENE	
3-773-431-21	MANUAL, INSTRUCTION	
3-773-431-41	MANUAL, INSTRUCTION ...E1,E2 MODEL	
3-795-581-21	INSTRUCTION ...US,PX2 MODEL	
3-701-311-00	LABEL, COLOR (RED) ...E1 MODEL	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 5
ADJUSTMENT

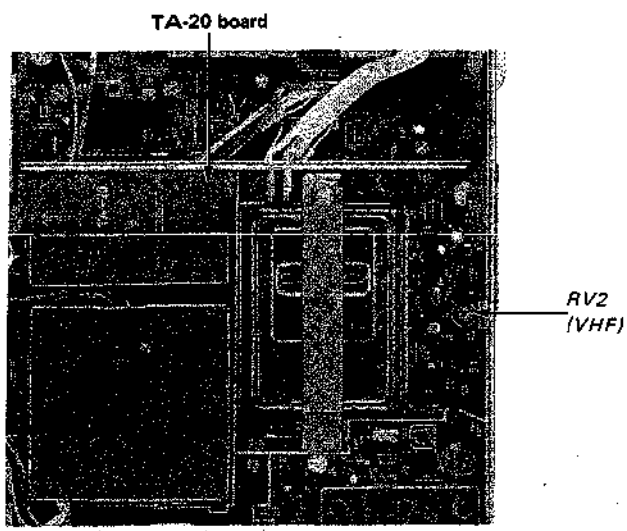
For adjustment, the TA-12 board is partly different from the TA-20 board.
Use together with the adjustment manual of the SL-2400 which has been already published.

5-6. TUNER BLOCK SYSTEM ADJUSTMENTS

1. Tuner AGC Adjustment

1) At maximum contrast, receive any VHF TV broadcast signal.
2) Turn RV2 clockwise until snow noise can be seen on the TV monitor screen.
3) Turn RV2 counterclockwise slowly and leave the adjustment at the point where the snow noise just disappears.
4) Receive telecast signals on all of the channels in succession and confirm that there is no beat due to cross-modulation, breakdown of the picture or snow noise.

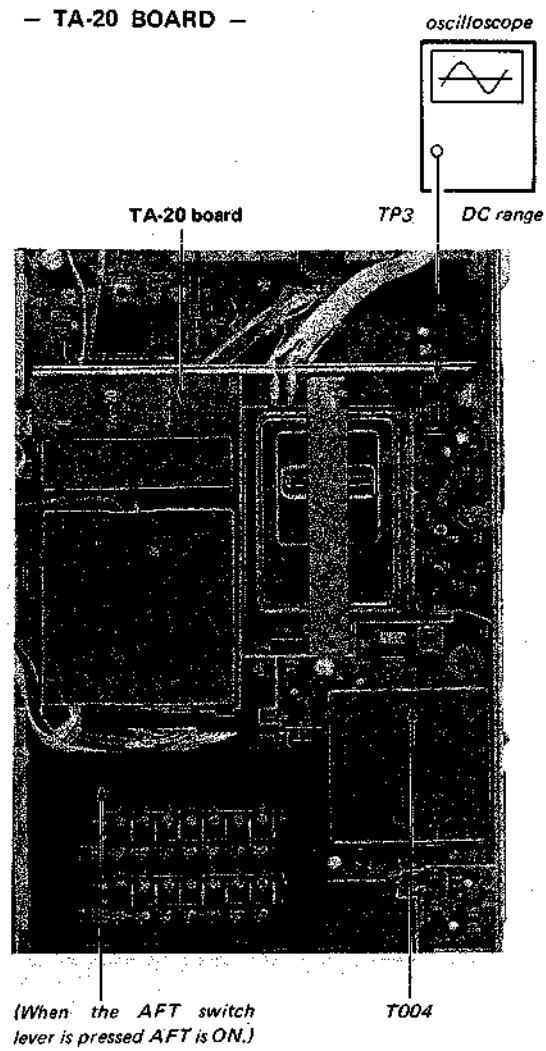
– TA-20 BOARD –



2. AFT Adjustment

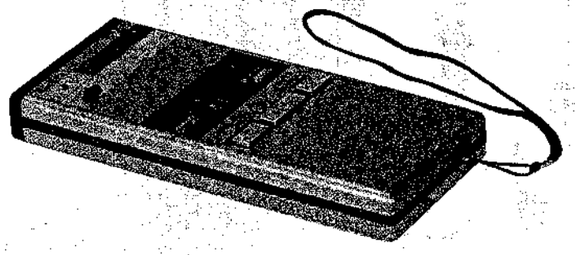
1) Receive any TV broadcast signal.
2) Turn the AFT switch OFF (with the preset cover removed).
3) Turn the preset potentiometer until a 920 kHz beat can be seen, then turn it counterclockwise slowly and leave it set at the point where the 920 kHz beat just disappears.
4) Turn the AFT switch ON (press the AFT switch lever).
5) Connect an oscilloscope to TP3 and adjust T004 so that the DC level becomes 6.0V. Confirm that there is no disappearance of color or 920 kHz beat.
6) Next, turn the AFT switch back OFF (with the preset cover removed) and turn the preset potentiometer until the picture quality just starts to deteriorate. Leave it set at that point.
7) Turn the AFT switch ON and OFF repeatedly to check the AFT operation.
8) Return the preset potentiometer to the position where it was set in step 3).

– TA-20 BOARD –



RMT-314

SERVICE MANUAL



REMOTE CONTROL UNIT

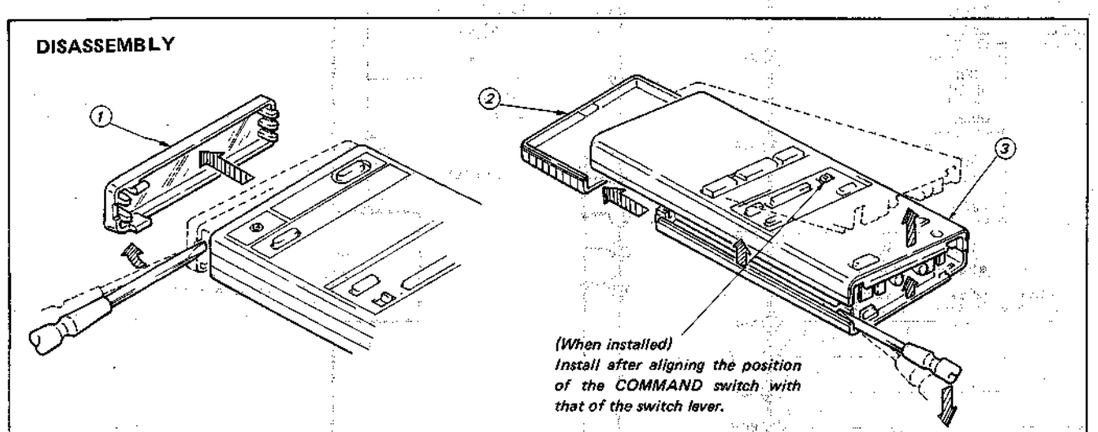
SONY®

ACC

SPECIFICATIONS

Remote control system	Infrared control
Power requirements	3 V dc, 2 size AA batteries (IEC designation R6)
Dimensions	Approx. 65 × 20 × 153 mm (w/h/d) (2⅝ × 13/16 × 6⅛ inches)
Weight	Approx. 140 g (5 oz) incl. batteries

DISASSEMBLY



The RMT-314 Wireless Remote Commander attached to SL-2400 has two types (new and former) of pc boards.

The modified points are mainly as follows:

New	Former
IR-17 board	IR-9 board
IC CX-7947	IC CX-786

1. OUTLINE

1-1. FEATURE

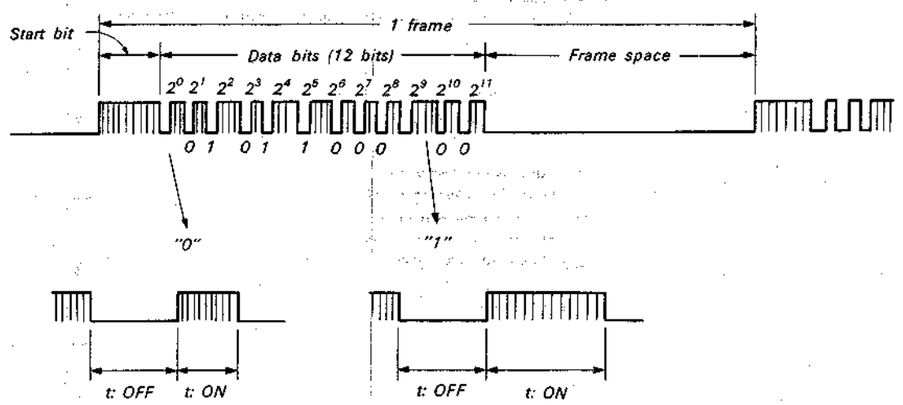
This unit is a wireless remote control commander used for operating Sony's VCR SL-2400 freely at a distant place.

1-2. REMOTE CONTROL SIGNAL

As shown in the figure below, one frame of the signal consists of a start bit and data bits (12 bits), which are periodically repeated.
"0" and "1" of each data bit are discriminated by a length of t: ON time.
The example shown below gives 001011000100 if read from the position of a bit 2^0.

The time definition is shown in the table below.

		Time	Deviation
Start bit		2.4 ms	± 0.1 ms
Data "0"	t: OFF	0.6 ms	± 0.1 ms
	t: ON	0.6 ms	± 0.1 ms
Data "1"	t: OFF	0.6 ms	± 0.1 ms
	t: ON	1.2 ms	± 0.1 ms
1 frame		45 ms	± 0.1 ms
Carrier		40 kHz	± 200 Hz



2. DIAGRAM (NEW)

Assignment table of remote control code

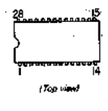
No.	Input signal	Data code							Category code				
		2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9	2^{10}	2^{11}
22	POWER	1	0	1	0	1	0	0	0	1	0	0	0
25	STOP ■	0	0	0	1	1	0	0	0	1	0	0	0
26	PAUSE ⏸	1	0	0	1	1	0	0	0	1	0	0	0
27	PB ▶	0	1	0	1	1	0	0	0	1	0	0	0
28	REW ◀◀	1	1	0	1	1	0	0	0	1	0	0	0
29	FF ▶▶	0	0	1	1	1	0	0	0	1	0	0	0
30	REC ●	1	0	1	1	1	0	0	0	1	0	0	0
43	TV/VTR	0	1	0	1	0	1	0	0	1	0	0	0

Voltage value of IC1 Unit: V

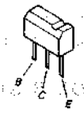
Mode \ Pin	5	4	3	2	1	27
POWER						0.13
STOP ■	0.13					
PAUSE ⏸		0.13				
PLAY ▶			0.13			
REW ◀◀				0.13		
FF ▶▶					0.13	
REC ●						0.13
TV/VTR			0.13			

(The voltage value is 0V, unless otherwise specified.)

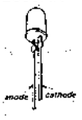
CX7947



2SC2673



SE303AX

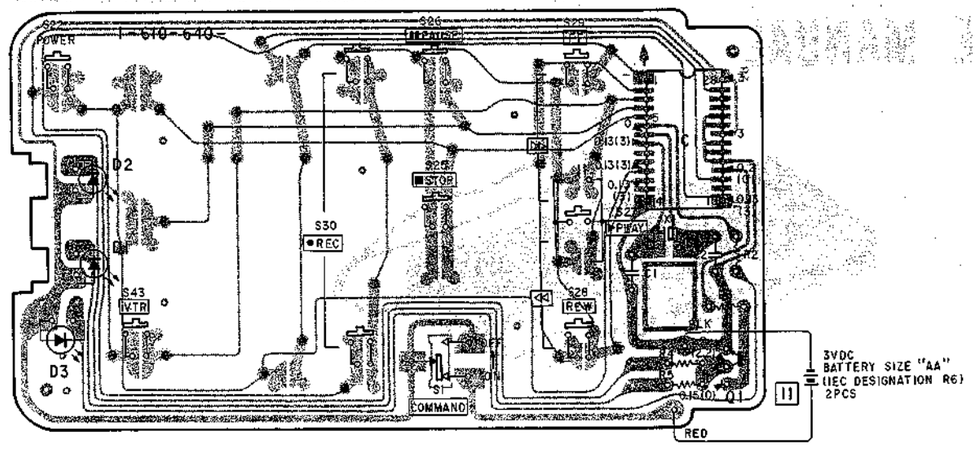


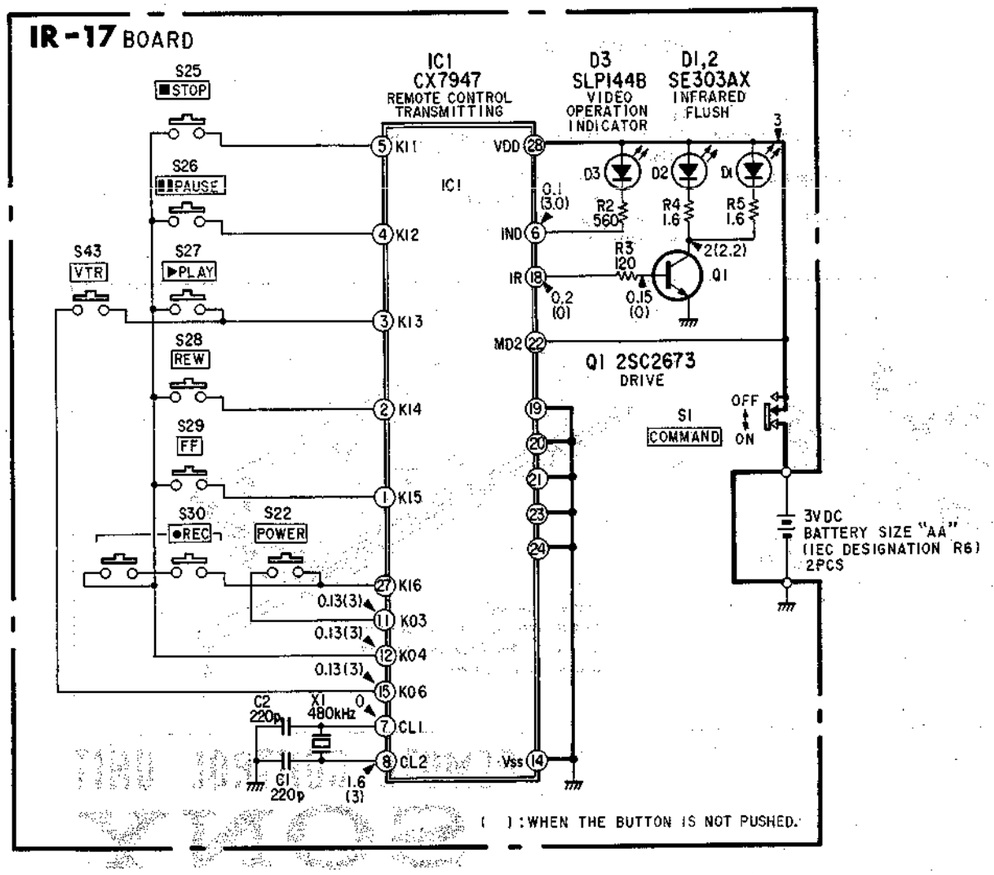
SLP144B

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ——— : B + bus.

The voltage value is measured using a digital tester (10MΩ/V).

- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- Conductor side (inner)
- Conductor side
- B + pattern





Assignment table of remote control code

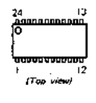
No.	Input signal	Data code 2^0	2^1	2^2	2^3	2^4	2^5	2^6	Category code 2^7	2^8	2^9	2^{10}	2^{11}
22	POWER	1	0	1	0	1	0	0	0	1	0	0	0
25	STOP ■	0	0	0	1	1	0	0	0	1	0	0	0
26	PAUSE ▮▮	1	0	0	1	1	0	0	0	1	0	0	0
27	PB ▶	0	1	0	1	1	0	0	0	1	0	0	0
28	REW ◀◀	1	1	0	1	1	0	0	0	1	0	0	0
29	FF ▶▶	0	0	1	1	1	0	0	0	1	0	0	0
30	REC ●	1	0	1	1	1	0	0	0	1	0	0	0
43	TV/VTR	0	1	0	1	0	1	0	0	1	0	0	0

Voltage value of IC1 Unit: V

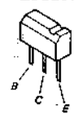
Mode \ Pin	4	5	6	7	8	9
POWER						0.13
STOP ■	0.13					
PAUSE ▮▮		0.13				
PB ▶			0.13			
REW ◀◀				0.13		
FF ▶▶					0.13	
REC ●						0.13
TV/VTR			0.13			

(The voltage value is 0V, unless otherwise specified.)

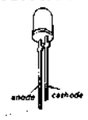
CX786



2SC2673



SE303AX



SLP144B

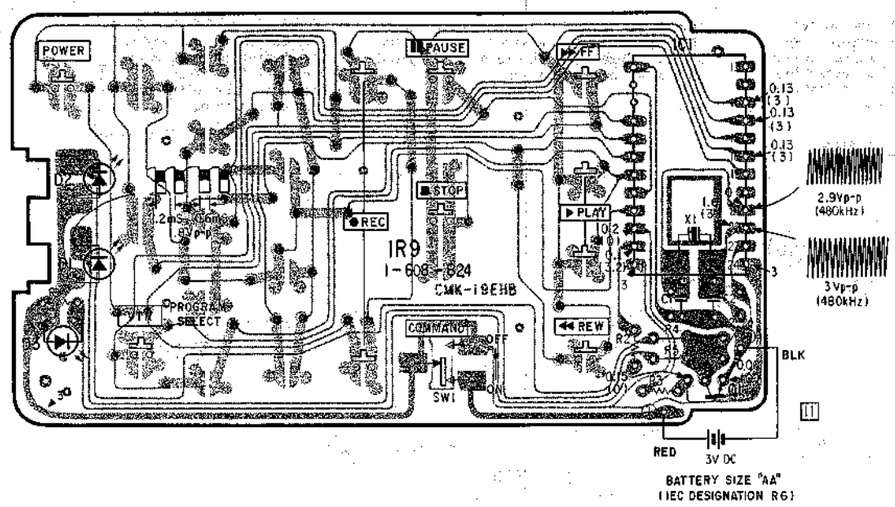
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ——— : B + bus.

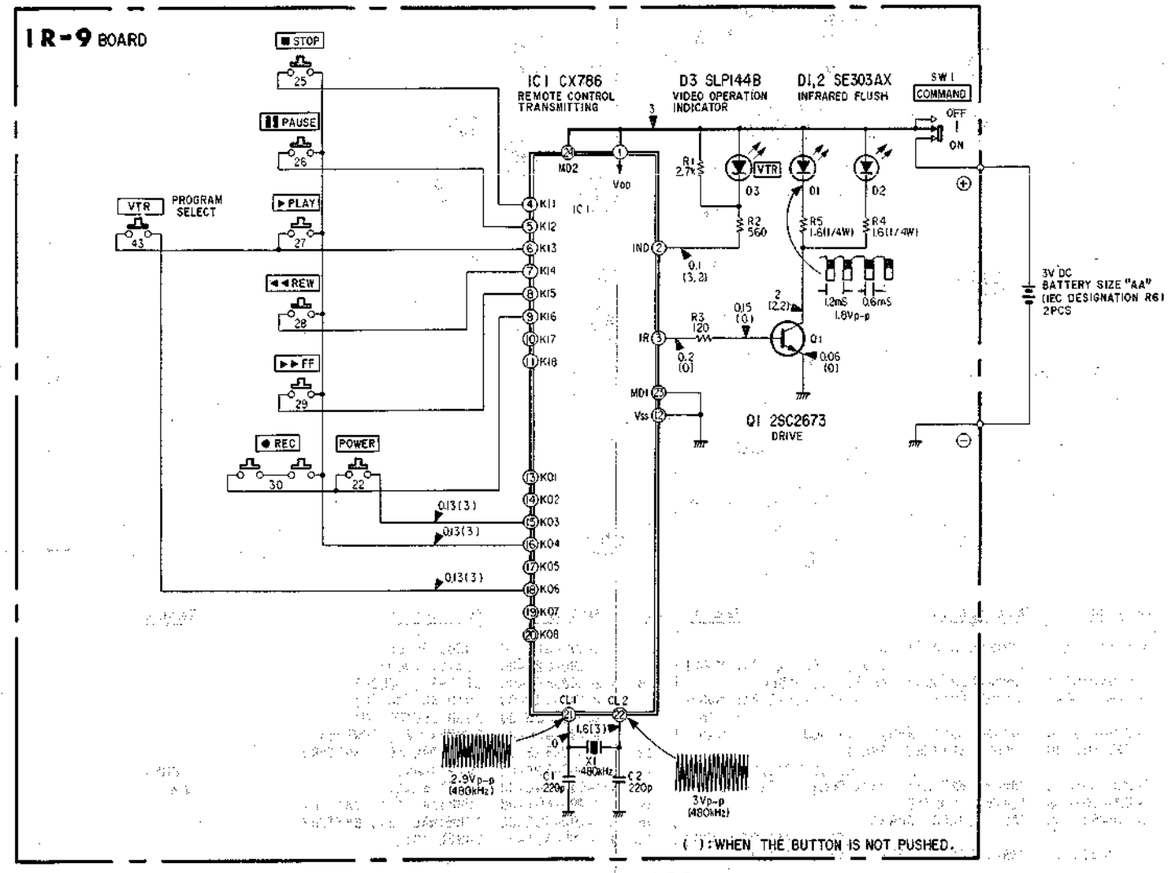
The voltage value is measured using a digital tester (10MΩ/V).

When indicating parts by reference number, please include the board name.

- ○— indicates a lead wire mounted on the component side.
- ●— indicates a lead wire mounted on the printed side.
- Conductor side (inner)
- Conductor side
- B + pattern

2. DIAGRAM (FORMER)





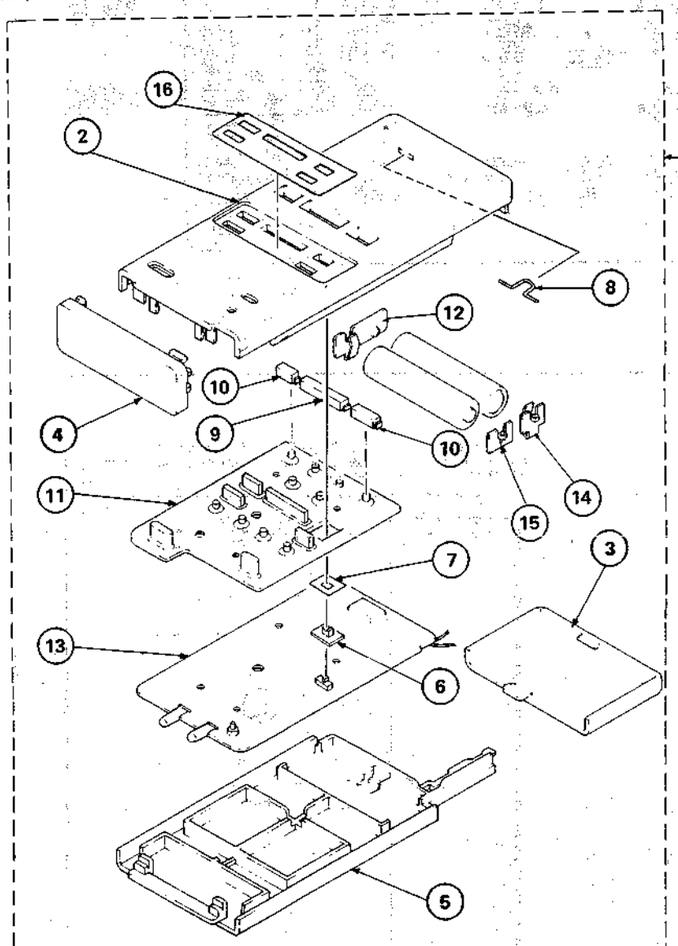
3. EXPLODED VIEW

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REMOTE CONTROL UNIT



No.	Part No.	Description	Remark
1	A-6765-126-A	COMMANDER ASSY (C) ...US,E1,E2,PX1,PX2 MODEL	
	A-6765-380-A	COMMANDER ASSY (RED)...E1 MODEL	
2	X-2290-610-0	CASING ASSY (C)...US,E1,E2,PX1,PX2 MODEL 12,16	
	X-2290-637-0	CASING ASSY (RED)...E1 MODEL 12,16	
3	2-290-606-00	COVER, BATTERY (GRAY) ...US,E1,E2,PX1,PX2 MODEL	
	2-290-606-11	COVER, BATTERY (DARK GRAY)...E1 MODEL	
4	2-290-608-00	PLATE, FROSTED	
5	2-290-611-00	CASE, LOWER (GRAY) ...US,E1,E2,PX1,PX2 MODEL	
	2-290-611-11	CASE, LOWER (DARK GRAY)...E1 MODEL	
6	2-290-628-00	KNOB, SLIDE	
7	2-290-629-00	PLATE, COLOR	
8	♦:2-290-630-00	STOPPER, HOLDER	
9	2-290-632-00	PUSH BUTTON (L)	
10	2-290-633-00	PUSH BUTTON (M)	
11	2-290-650-00	RUBBER (B), CONTACT	
12	4-350-925-00	TERMINAL (C), BATTERY	
13	♦:1-608-824-00	IR-9 BOARD	FORMER
	♦:1-610-640-00	IR-17 BOARD	NEW
14	2-290-601-00	TERMINAL (A), BATTERY	
15	2-290-602-00	TERMINAL (B), BATTERY	
16	♦:2-290-627-11	LABEL (B)	

4. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

When indicating parts by reference number, please include the board name.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

CAPACITORS
- MF : μF, PF : μμF

RESISTORS
- All resistors are in ohms
- F : nonflammable

COILS
- MMH : mH, UH : μH

Ref.No.	Part No.	Description				Remark
	♦:1-610-640-00	IR-17 BOARD **********				NEW
	♦:1-608-824-00	IR-9 BOARD **********				FORMER
	2-290-601-00	TERMINAL (A), BATTERY				
	2-290-602-00	TERMINAL (B), BATTERY				
		CAPACITOR				
C1	1-102-110-00	CERAMIC	220PF	10%	50V	
C2	1-102-110-00	CERAMIC	220PF	10%	50V	
		DIODE				
D1	8-719-193-03	DIODE SE303AX				
D2	8-719-193-03	DIODE SE303AX				
D3	8-719-901-44	DIODE SLP144B				
		IC				
IC1	8-759-902-22	IC CX-7947				NEW
IC1	8-759-907-86	IC CX-786				FORMER
		TRANSISTOR				
Q1	8-729-967-32	TRANSISTOR 2SC2673-Q				
		RESISTOR				
R1	1-247-841-00	CARBON	2.7K	5%	1/6W	FORMER
R2	1-247-825-00	CARBON	560	5%	1/6W	
R3	1-247-809-00	CARBON	120	5%	1/6W	
R4	1-246-406-00	CARBON	1.6	5%	1/4W	
R5	1-246-406-00	CARBON	1.6	5%	1/4W	
		SWITCH				
SW1	1-553-977-31	SWITCH, SLIDE				
		CRISTAL				
X1	1-527-476-00	OSCILLATOR, CERAMIC				

****

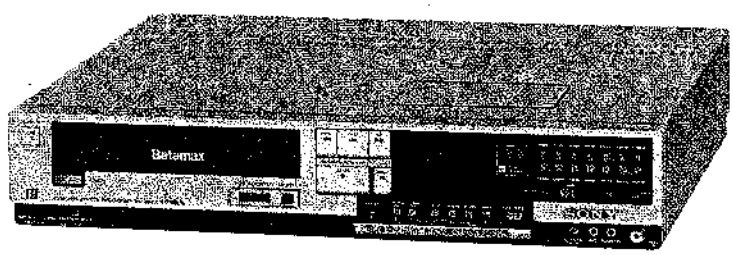
ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
3-701-620-00	BAG, POLYETHILENE	
4-352-958-00	STRAP, HAND	

SL-2400

ADJUSTMENT MANUAL

US Model
E Model
PX Model



June, 1983

711B CHASSIS

Also refer to SERVICE MANUAL.

Beta
VIDEO
CASSETTE RECORDER
SONY®

MICROFILM

Consumer

TABLE OF CONTENTS

SECTION 1
PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. DISASSEMBLY OF CABINET

Removal of the Upper/Lower Case and the Front Panel

1. Remove the four case set screws.
2. Remove the upper case in the direction indicated by the arrow.
3. Remove the nine screws (BVTT2.6×8).
4. Remove the lower case.
5. Remove a screw (BVTT2.6×8).
6. Remove the front panel in the direction indicated by the arrow.

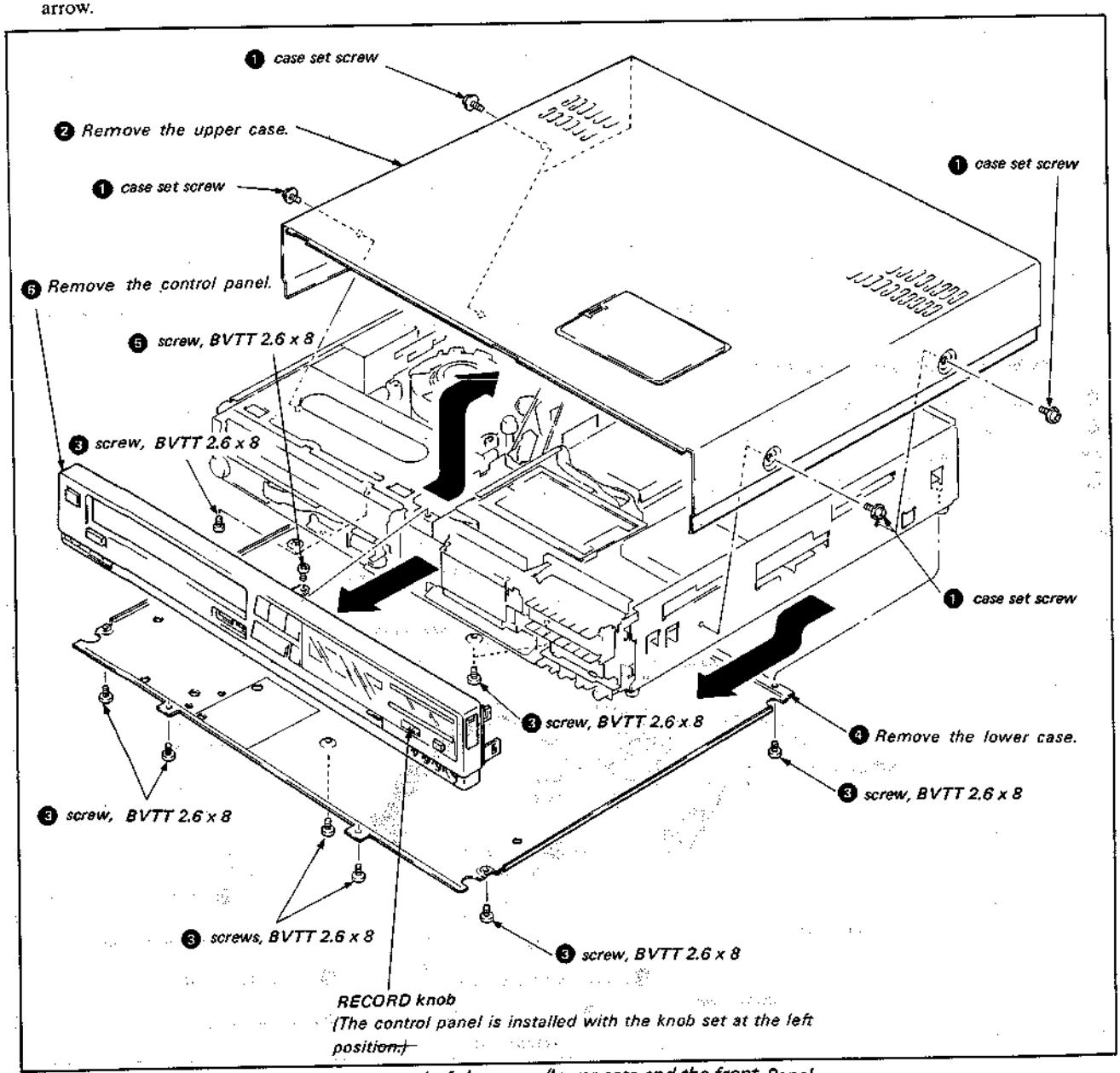


Fig. 1-1. Removal of the upper/lower case and the front Panel

1-2. REMOVAL OF RP-8 BOARD

❶ Remove the two screws (BVTT2.6×6).
❷ Remove the RP-8 board block.
❸ Pull out the connectors CN2 (white) and CN4 (white).

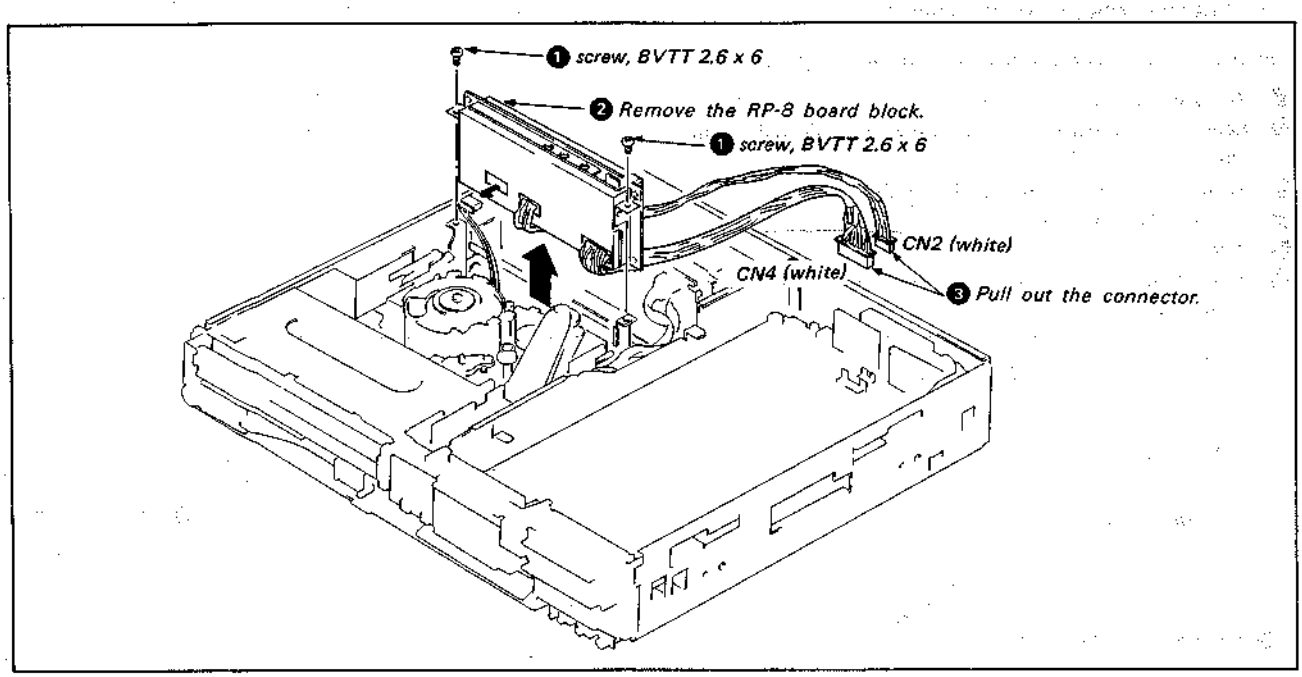


Fig. 1-2. Removal of RP-8 board

1-3. REMOVAL OF TA-12 BOARD

❶ Remove the two screws (BVTT2.6×6).
❷ Remove a screw (BVTT2.6×6).
❸ Pull out the eight connectors.
❹ Remove the TA-12 board. (Supported using a videocassette tape.)

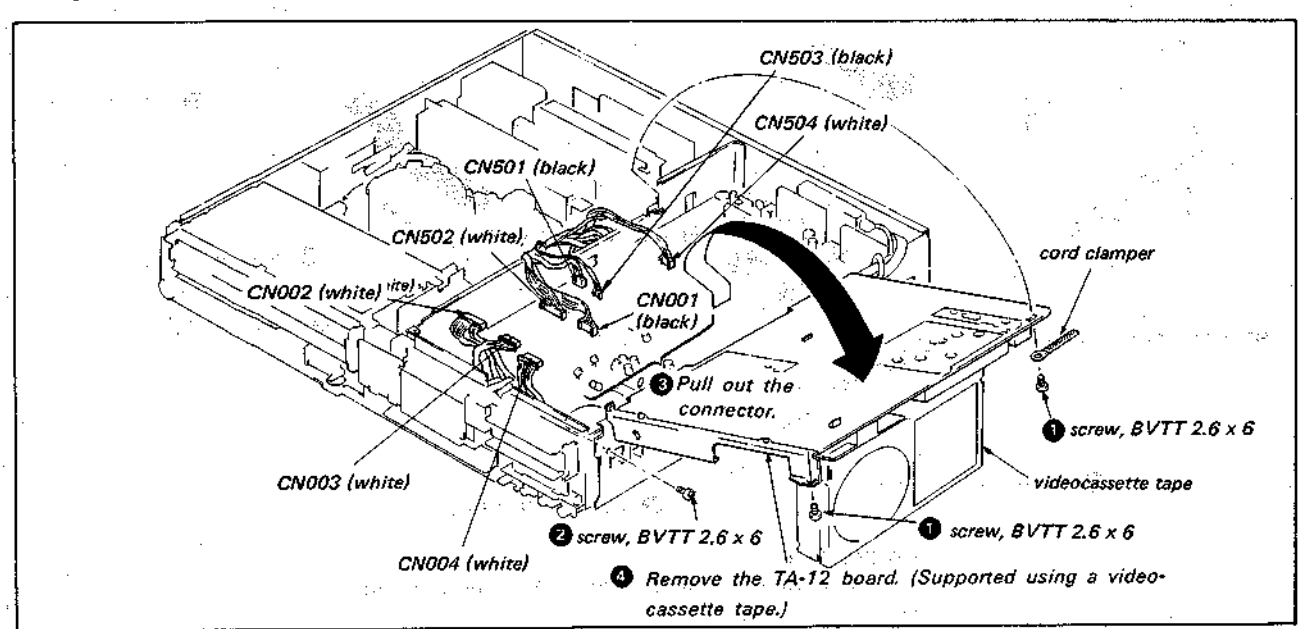


Fig. 1-3. Removal of TA-12 board

1-4. OPENING OF SS-13 BOARD

❶ Remove the two screws (BVTT2.6×6).
❷ Remove the SS-13 board. (Supported using a videocassette tape.)

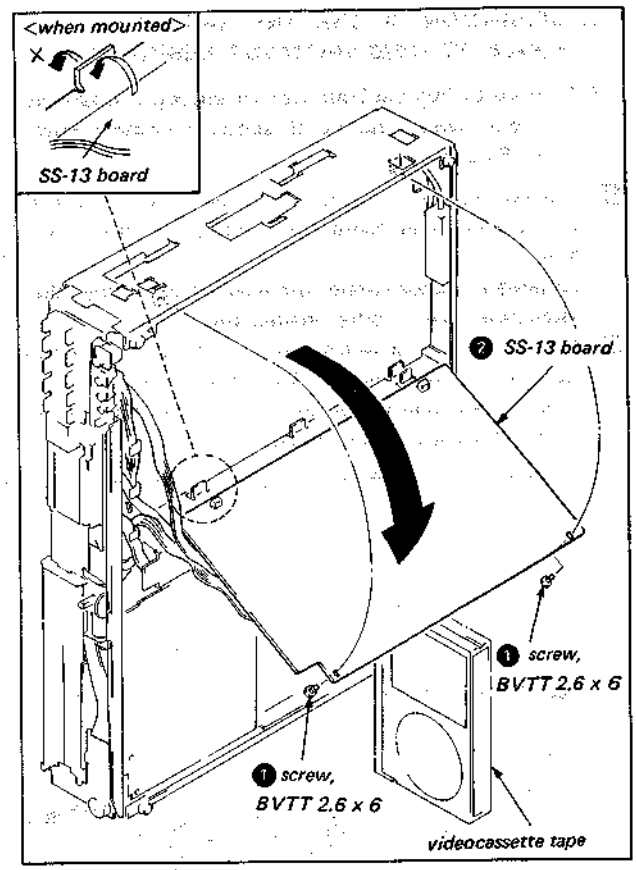


Fig. 1-4. Opening of SS-13 board

1-5. REMOVAL OF POWER BLOCK

❶ Remove the four screws (BVTT2.6×6).
❷ Pull out the three connectors CN3 (white), CN4 (black) and CN6 (white).
❸ Remove the power block.

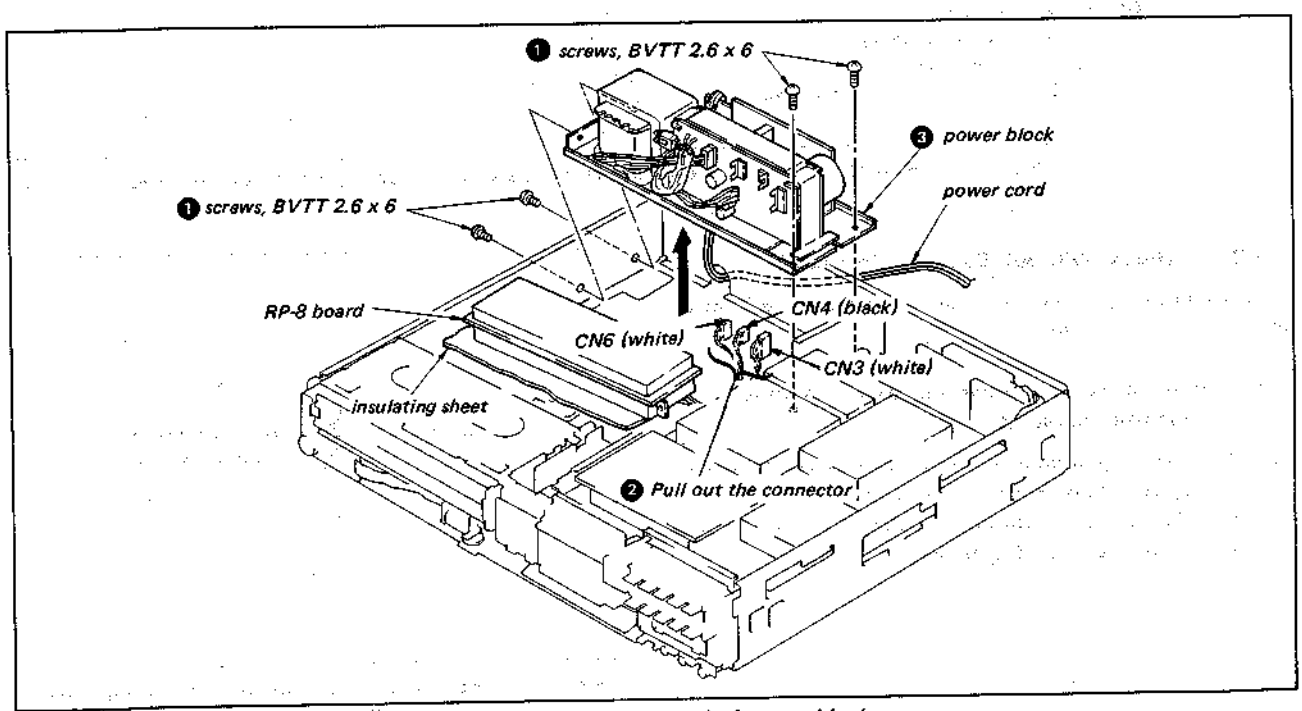


Fig. 1-5. Removal of power block

1-6. OPERATION OF THE UNIT WITH THE FL CASSETTE COMPARTMENT REMOVED

1-6-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed

❶ Connect jumper wires to short pin 1 of the CN301 connector on circuit board CS-3 to pin 2, and pin 3 to pin 4.
Note:
Be careful that the jumper wires do not touch any other parts (use tape or other insulation).

❷ Press the cassette-in switch and leave it pressed in. When the power button is turned ON, threading starts.
* Refer to section 3-6 for instructions on how to remove the FL cassette compartment.

[How to EJECT in this condition]

- Press the EJECT button. When unthreading is completed and the internal gear starts to turn, turn the power OFF.

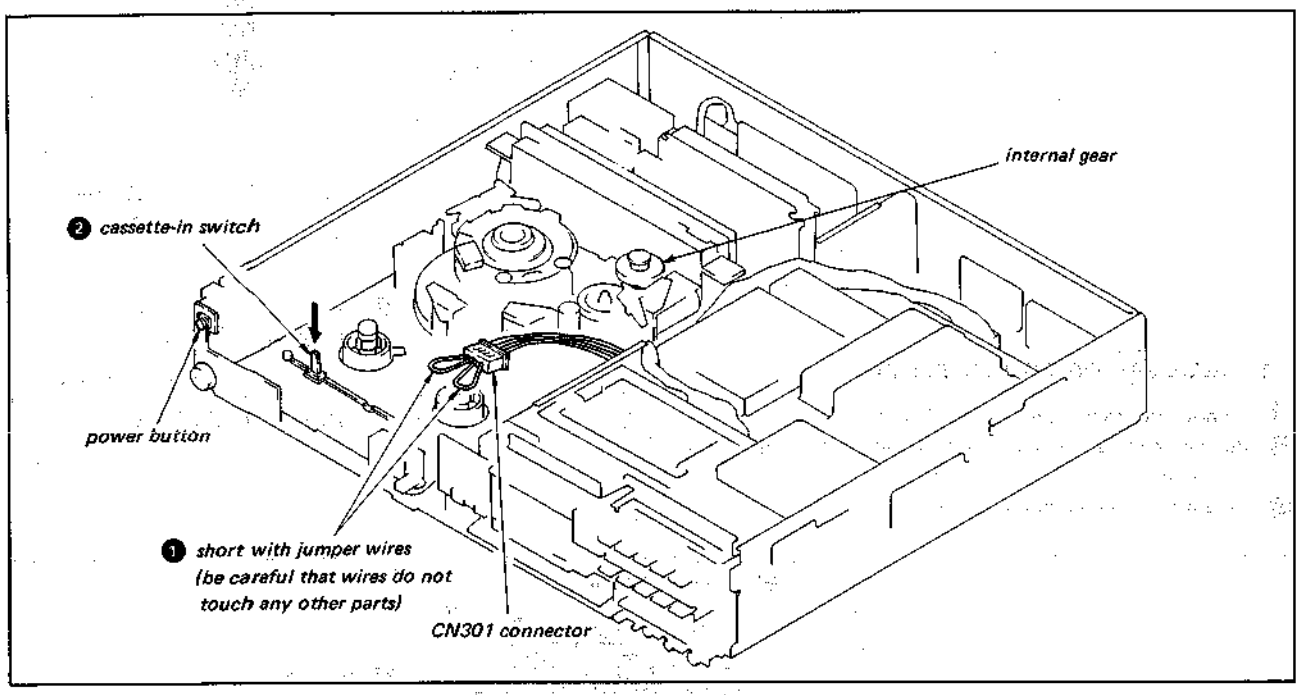


Fig. 1-6. How to thread the tape when the FL cassette compartment has been removed

1-6-2. Playback Without Cassette Installed

Complete threading by the procedure described in 1-6-1, then press the playback button.

1-6-3. How to Put in Recording Mode Without Cassette Installed

1. Thread by the procedure in 1-6-1, then press the accidental erasure prevention switch shown in Fig. 1-7.
2. With the accidental erasure prevention switch pressed down, press the recording button.

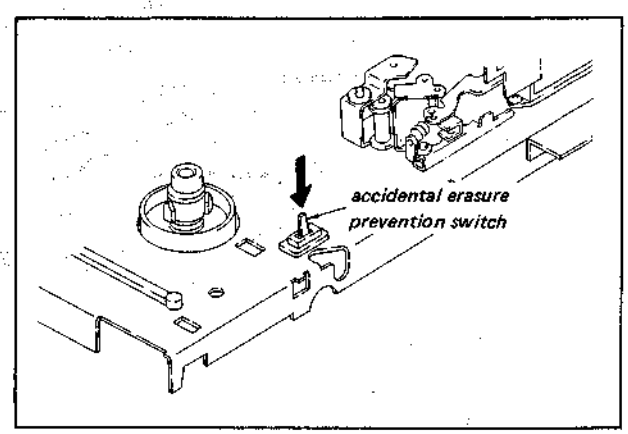


Fig. 1-7. How to put the recorder in recording mode with the FL cassette compartment removed

1-7. HOW TO LOAD, THREAD, UNLOAD AND UNTHREAD WITH THE POWER OFF

1-7-1. Manual Loading and Unloading

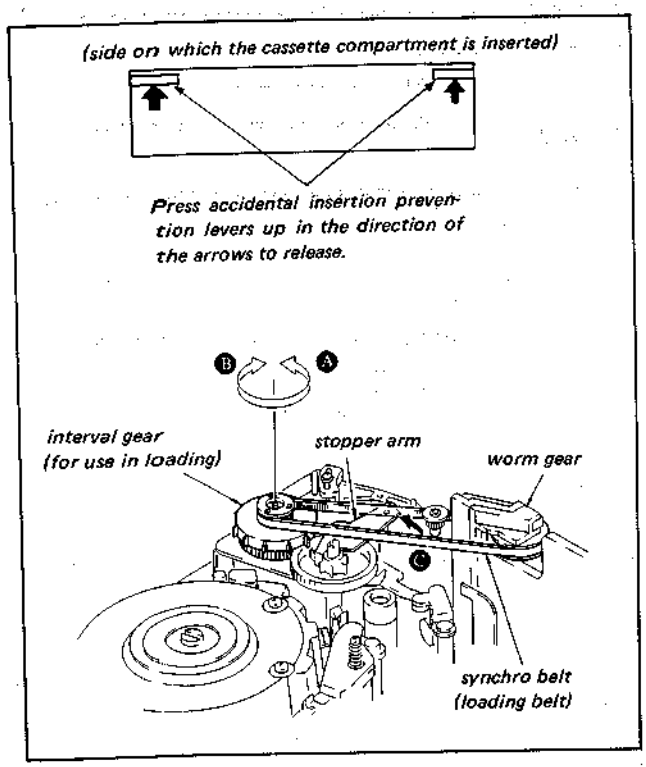


Fig. 1-8. Manual loading and unloading

1) Release the right and left accidental insertion prevention levers inside the cassette compartment, then press the stopper arm in the direction of arrow Ⓒ and release the internal gear stop.
2) Turn the internal gear manually in the direction of arrow Ⓐ until loading is completed.
3) To unload, turn the internal gear in the direction of arrow Ⓑ.

Note:
When the loading belt has been removed, load and unload by turning the worm gear manually.

1-7-2. Manual Threading and Unthreading

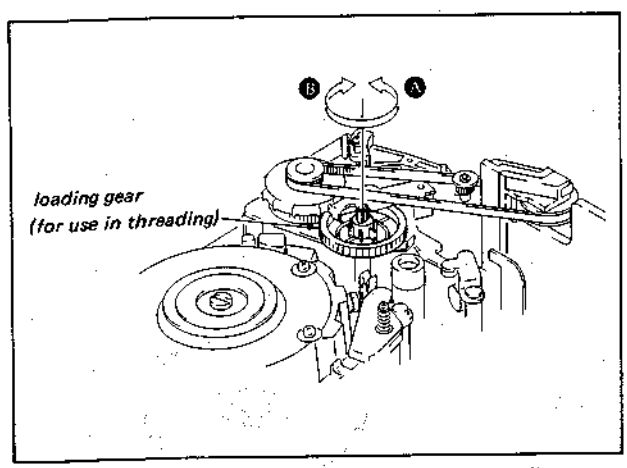


Fig. 1-9. Manual threading and unthreading

1) Turn the loading gear in the direction of arrow Ⓐ until loading is completed.
2) To unthread, turn the loading gear in the direction of arrow Ⓑ.

Note:
Always turn the loading gear sideways by hand. Never use a screwdriver or other tool.

1-8. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref.No.	Name	Part Code	Carved Jig No.	Use and Remarks
J-1	Torque Measurement Tape	J-6080-003-C	SL-0003C	forward torque and back tension measurement
J-2	Parallel Plate	J-6086-750-A	SL-0657	audio/CTL head lateral adjustment capstan shaft vertical adjustment
J-3	Dental Mirror (handle) Dental Mirror (mirror)	J-6080-029-A J-6080-030-1	SL-5052	tape path and tape traveling adjustment check
J-4	Alignment Tape (KR5-1M)	8-969-995-82	—	tracking, overall adjustment of picture quality, etc.
J-5	Cleaning Fluid	Y-2031-001-0	—	
J-6	Thickness Gauge	9-911-053-00		
J-7	Chamois Cloth	2-034-697-00	—	cleaning
J-8	Head Demagnetizer	widely available	—	demagnetization of video head and audio head
J-9	Cleaning Cassette Tape	8-888-004-00	—	video head cleaning
J-10	Dihedral Adjustment Screw	J-6080-013-1	SL-0013	video dihedral adjustment
J-11	Sector Type Gauge (50g)	7-732-050-20		soft braking measurement
J-12	Reel Table Tension Gauge	J-6080-011-A	SL-0011	torque measurement

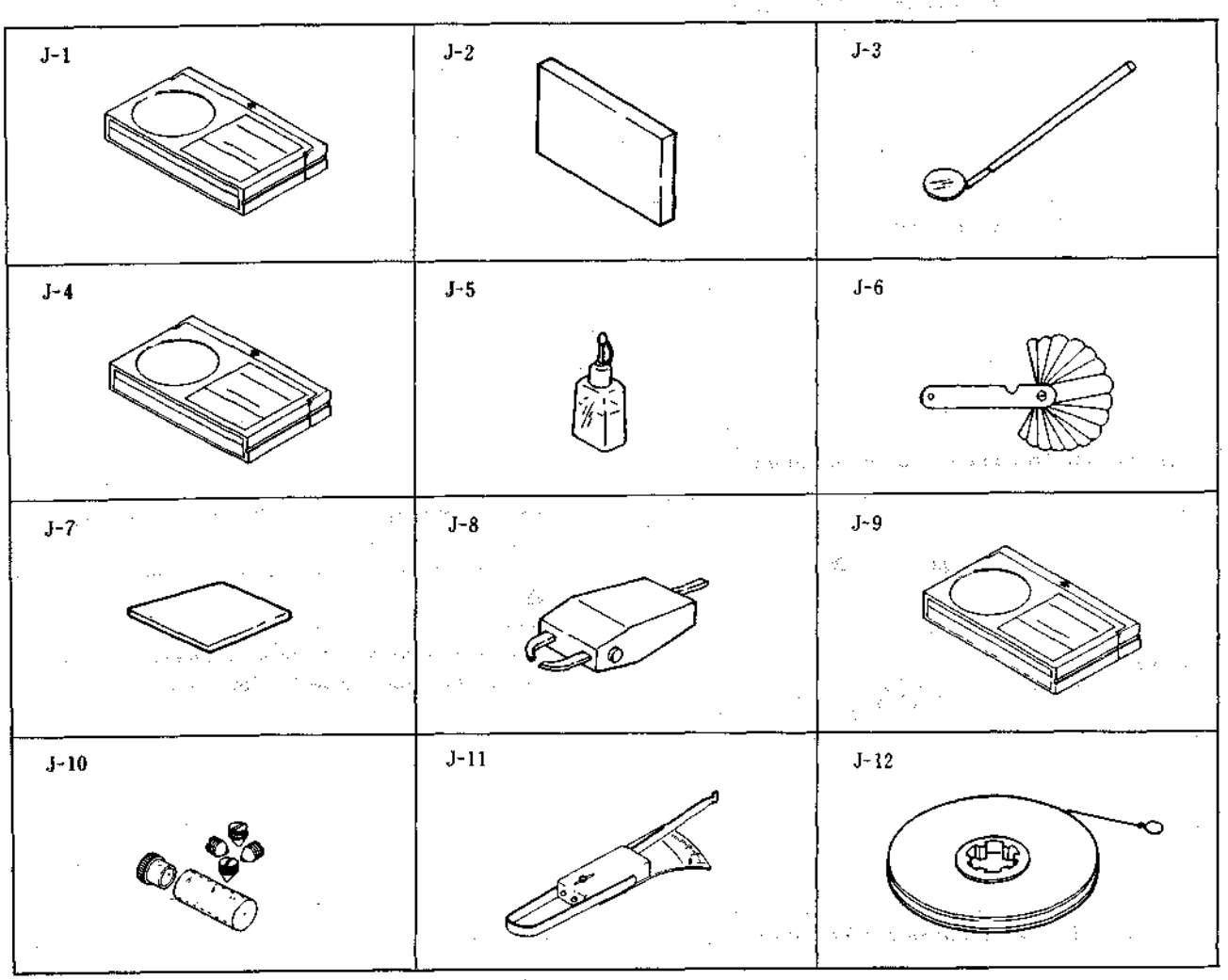


Fig. 1-10. Tools and fixtures required for servicing

SECTION 2
PERIODIC CHECK AND MAINTENANCE

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

2-1. POST-REPAIR MAINTENANCE

The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1-1. Cleaning of Rotating Head Disk Assembly

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a right angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-1-2. Cleaning of the Tape Movement System

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in in cleaning fluid.

2-1-3. Cleaning the Drive System

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

parts requiring cleaning

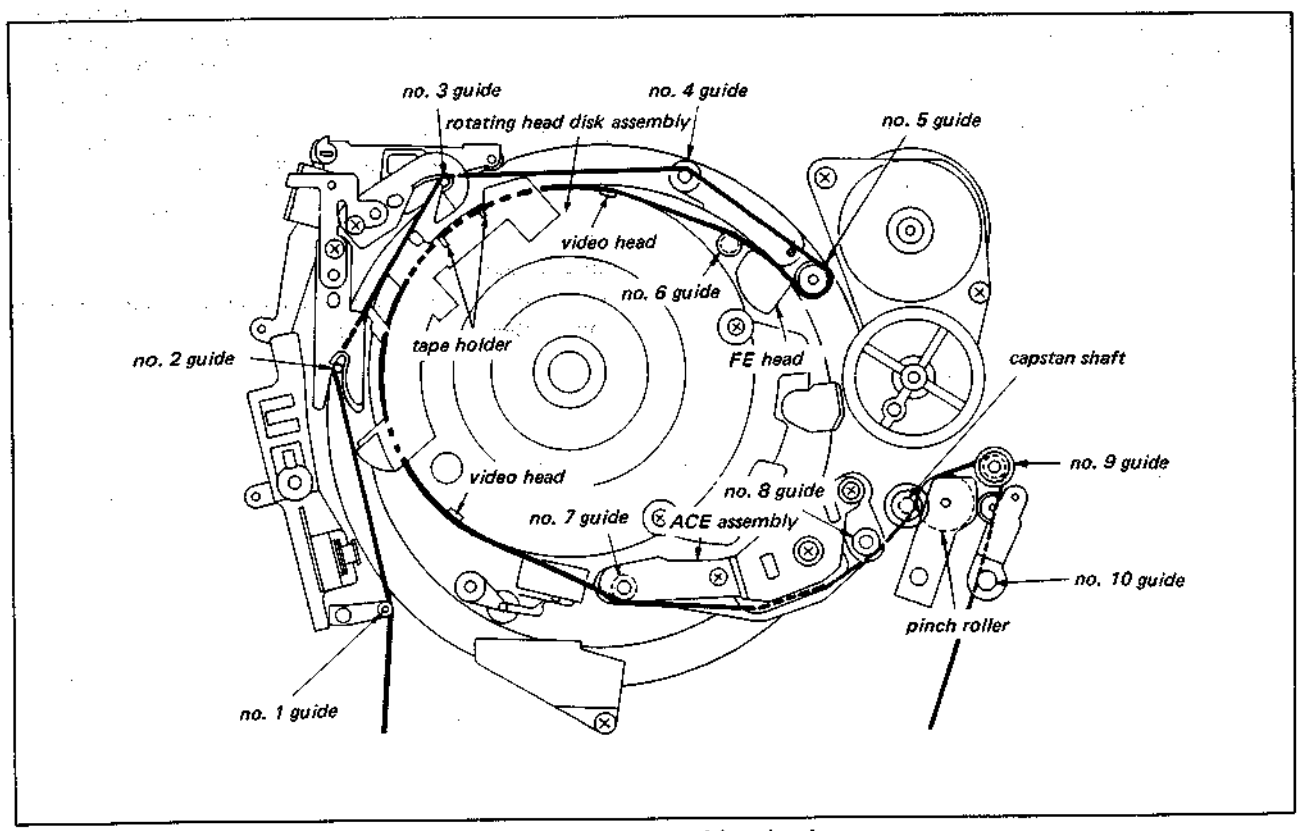


Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, accoring to user's operating hours.

	Maintenance & Check	Operating Hours (H) / Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	——	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	——	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y	——	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Loading belt (synchro belt)	3-679-119-00	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	• This cleaning must be done whenever a repair is made.
	Cleaning of iron core and opening of solenoid	——	–	–	–	○	–	–	–	○	–	–	Wipe iron core and opening of solenoid with dry cloth.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section Specified value: adjust to 30 ± 5 g•cm (When measured with torque cassette tape)
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70 ± 5 g•cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

Note:
On overhaul
When overhauling the unit, replace parts as indicated in the above table.

SECTION 3
CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REPLACEMENT OF ROTATING HEAD DISK ASSEMBLY

3-1-1. Removal of the Rotating Head Disk Assembly (Fig. 3-1)

❶ Remove the two screws that hold the damper assembly in place, then remove the damper assembly.

❷ Use a hexagonal wrench to remove the hexagonal socket bolt that holds the upper drum assembly in place, then remove the upper drum assembly.

Note:

Turn the upper drum to remove, being careful not to move the adjusting plate. Movement of the adjusting plate will have a great effect on the tape path, so caution is required.

❸ Unsolder the rotating head disk relay plate (4 red and white leads).

❹ Remove the two hexagonal socket bolts holding rotating head disk assembly ❺ in place, then remove the rotating head disk assembly.

Note:

Be careful not to touch the head tip with the hand or bang anything against it.

3-1-2. Mounting of the Rotating Head Disk Assembly (Fig. 3-1)

1) Insert rotating head disk ❺ in place, being careful of the direction so that the red and white leads are in the right places.

2) Tighten hexagonal socket bolt ❹ and solder the lead wires.

Note:

Be careful to solder the lead wires correctly and not to break any wires.

3) Attach the upper drum, being careful (as during removal) not to move the adjusting plate. While pressing the two points that determine the height, tighten hexagonal socket bolt ❷.

Note:

When inserting the upper drum, be careful that it does not touch the head tip.

Note:

When replacing the rotating drum head, it can happen that the rotating head disk assembly will be hard to remove. In such a case, remove it using the method explained below (Fig. 3-2).

❶ Remove the hexagonal socket bolts that hold the rotating head disk assembly in place.

❷ When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step ❶ into the threaded holes removed from the original holes by 90°. Tighten them a little at a time.

The head disk will be lifted up by the two screws and will come off easily.

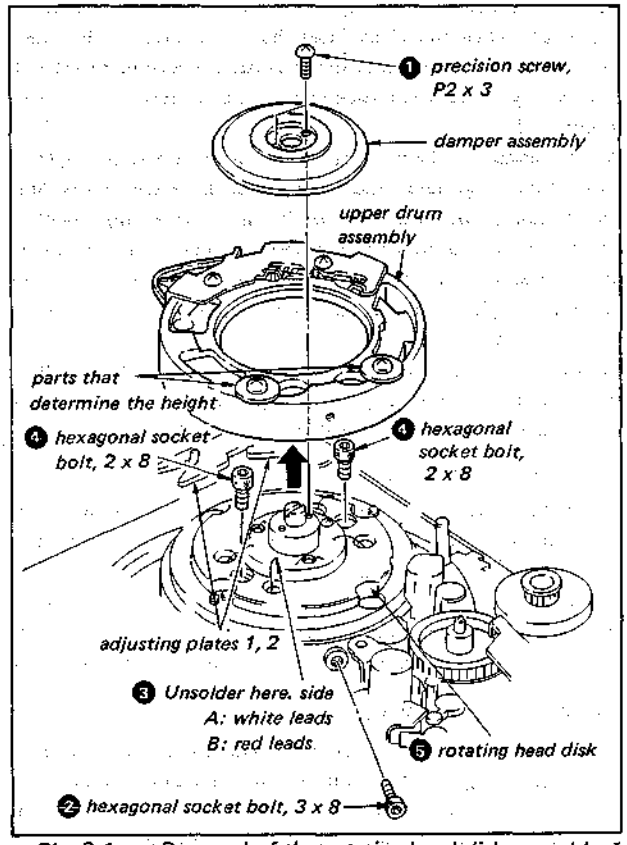


Fig. 3-1. Removal of the rotating head disk assembly I

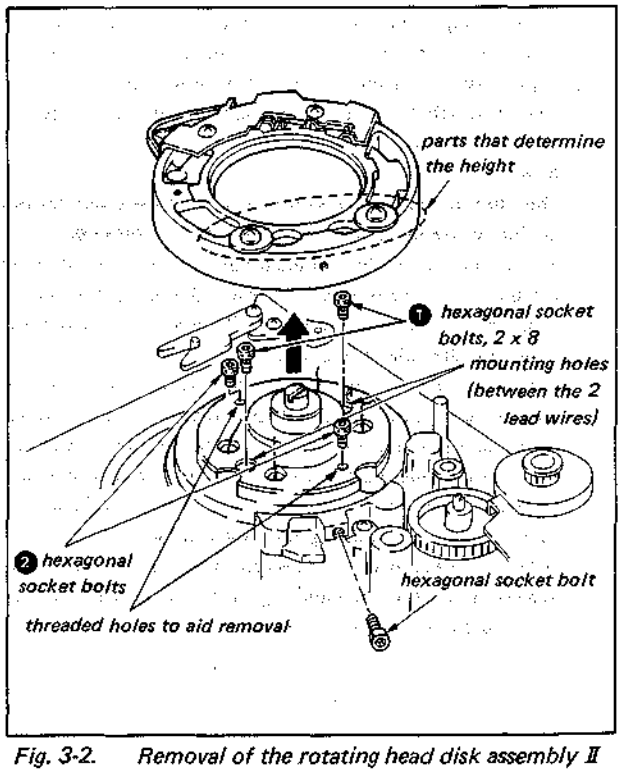


Fig. 3-2. Removal of the rotating head disk assembly II

3-2. VIDEO HEAD DIHEDRAL CHECK AND ADJUSTMENT

This adjustment is generally unnecessary, but it is sometimes necessary when the video head disk is replaced. (The video head disk used for maintenance has been precision adjusted at the factory using a microscope and almost never needs to be readjusted.)

When judging whether the video head dihedral angle is correct, the alignment tape is played back. When this is done the tracking control knob must be in the centering position. If the check is done with this knob in other than the center click position (if the tracking is off-center), even if the dihedral angle is correct the picture will be reproduced as if it were off.

Before this adjustment is performed, the ACE assembly position adjustment (refer to the section where the tape path adjustment is described) must be completed.

[Method of checking]

With the tracking control knob set to the center click position, play back the βII monoscope section of the alignment tape. Check to see if any of the vertical monoscope lines immediately below the switching pulse are reproduced double. If not, the dihedral angle is correct and does not have to be adjustment. If so, perform the adjustment as explained below.

[Method of adjustment]

1) As shown in Fig. 3-3, screw two dihedral angle adjustment screws (Jig Ref. No. J-10) into the adjustment screw holes on the side on which the red lead wires from the video head are connected, until the top of the screw is level with the video head disk. (If they are not screwed in far enough, the video head disk will not turn past the point where the top of the adjustment screw strikes the upper drum. Conversely, if it is screwed in too far, the head base will be moved, throwing the video head dihedral angle way off.)

   Note:

   The side on which the white lead wires are connected is the reference side and must not be moved.

2) Screw one of the two adjustment screws in a little bit farther until resistance is felt. Beyond this point, turning the screw still farther will move the video head, adjusting the dihedral angle.
3) With the adjustment screws in place, play the βII monoscope signal section of the alignment tape and see how the lines are reproduced. If the vertical lines are split apart more than before, turn the screw which was screwed in more tightly counterclockwise to loosen it, then adjust by tightening the other screw.
4) After the adjustment is completed, remove the adjustment screws and play the tape again to reconfirm that the adjustment is correct.

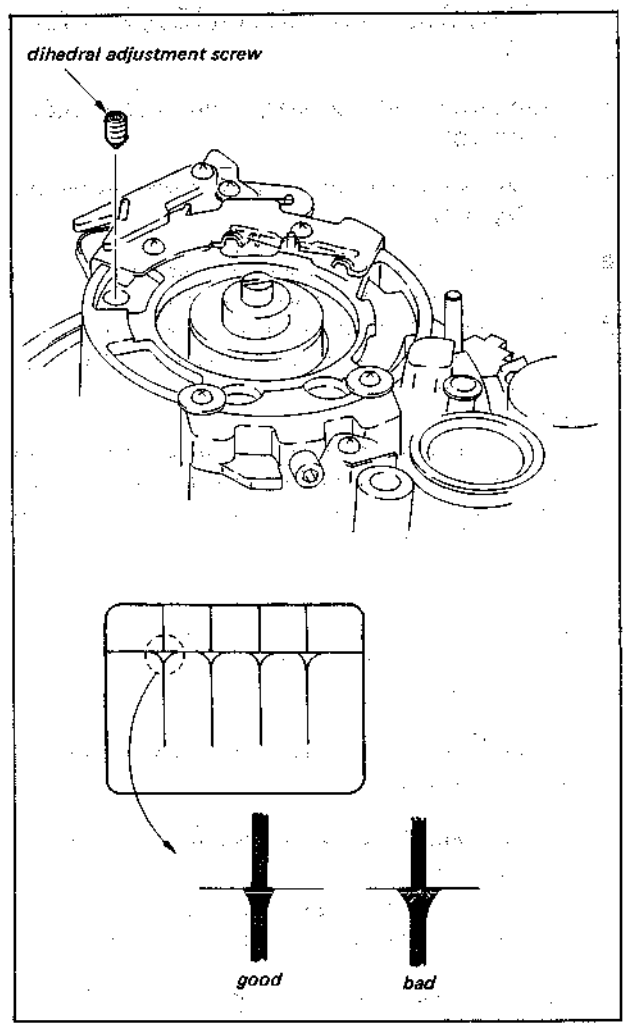


Fig. 3-3. Video head dihedral adjustment

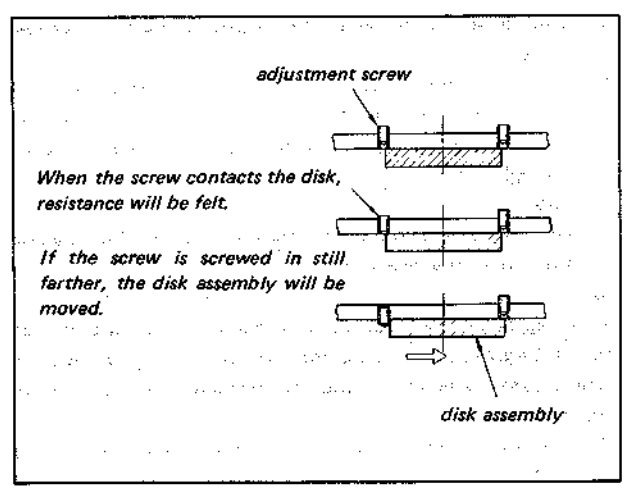


Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

❶ Measure gap Ⓐ between adjusting plate 1 and the upper drum holder section, and record the measurement.

Note:

The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.

❷ Measure gap Ⓑ between adjusting plate 2 and the upper drum holder section, and record the measurement.

Note:

The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.

❸ Remove the screws shown in Fig. 3-5, then remove the tape guide ground plate and adjusting plates 1 and 2.

❹ Remove the 3 connectors from the rear of the chassis as shown in Fig. 3-6.

❺ Remove the 3 drum mounting screws from the rear of the chassis, then remove the main body of the drum assembly. After the replacement has been completed, adjust the drum path.

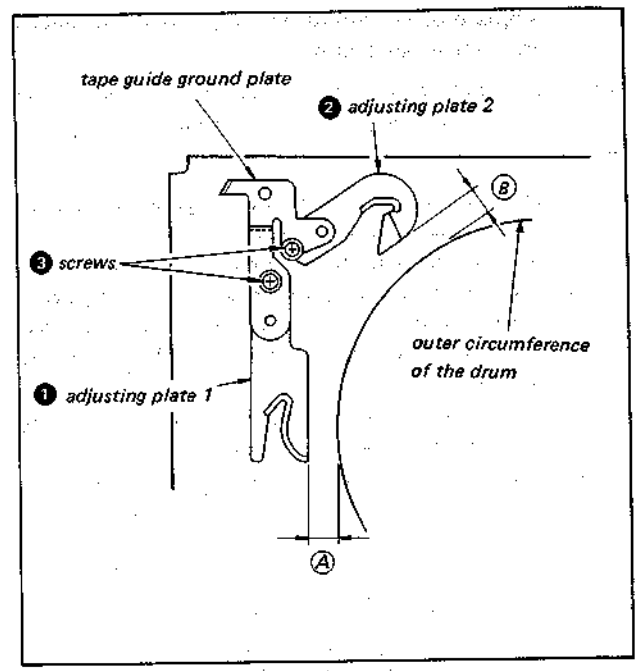


Fig. 3-5. Measurement of the position of adjusting plates 1 and 2

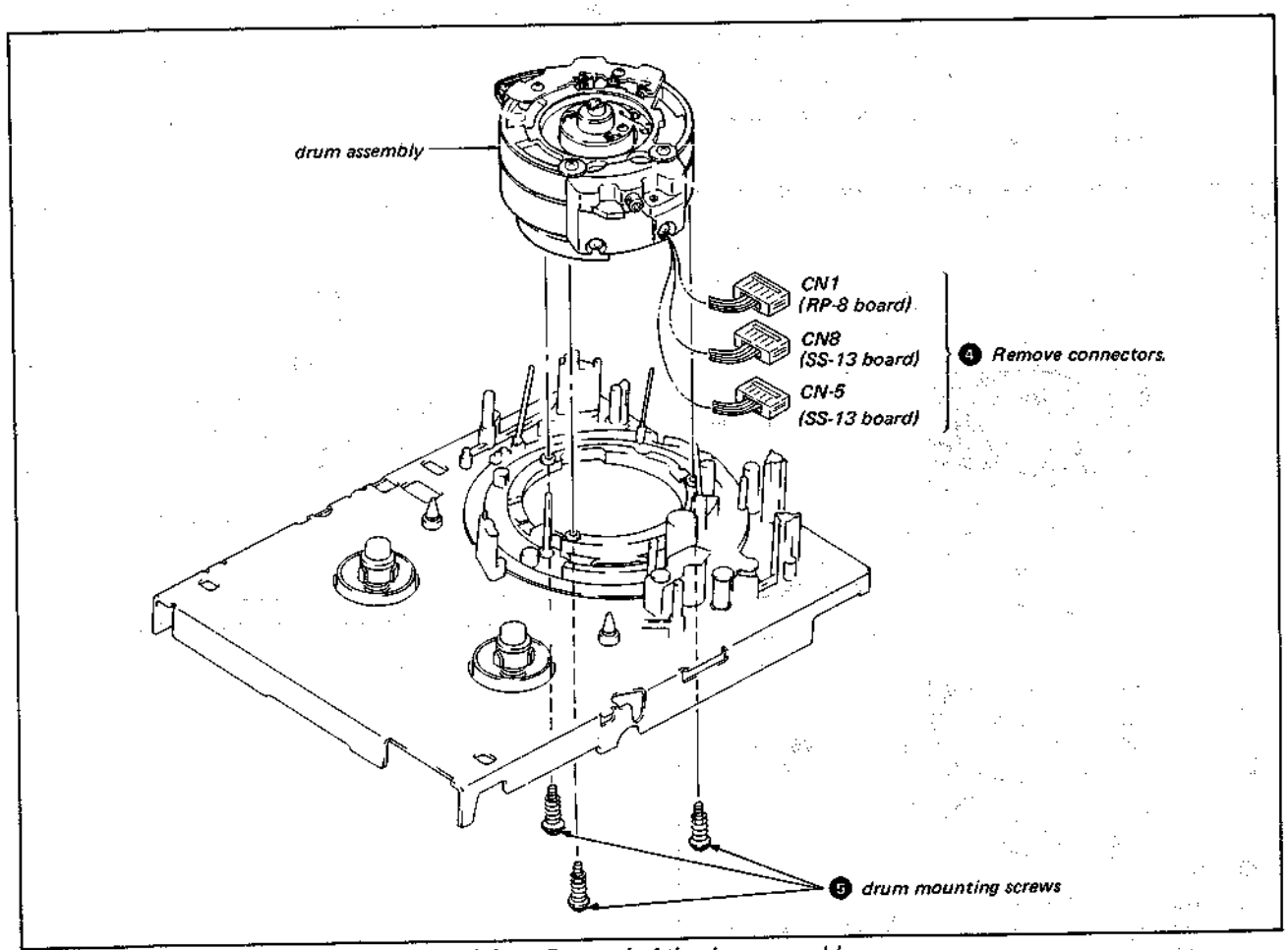


Fig. 3-6. Removal of the drum assembly

3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly

After replacing the drum assembly, adjust the gap between the motor rotor and the coil to 0.3 mm to 0.6 mm (Fig. 3-7).

[Procedure]

1) When re-assembling the drum, use the spacers which were removed to produce a gap of between 0.3 mm and 0.6 mm. Measure the gap using the gauge that comes with the drum for assembly and maintenance use. One side of the gauge is 0.3 mm and the other side is 0.6 mm. If the gap is adjusted correctly, the 0.3 mm side should fit in and the 0.6 mm side should not.
2) If this fails to give the correct gap width, do not use the spacers which were removed; instead, use a combination of the 4 0.3 mm accessory spacers to obtain the correct width.

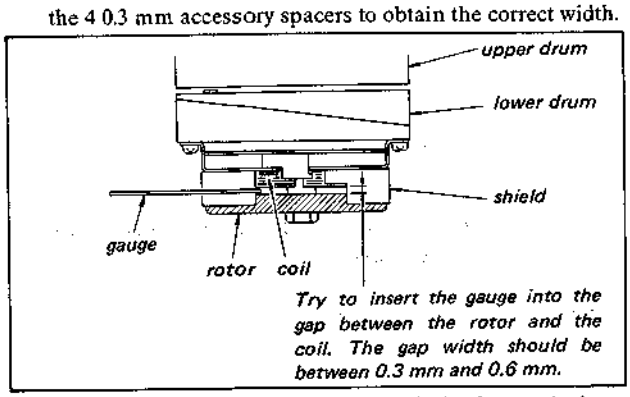


Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

❶ Remove the nut and washer.
❷ Remove the rotor from the stator.
❸ Remove the 2 screws, then remove the stator from the main body of the drum.

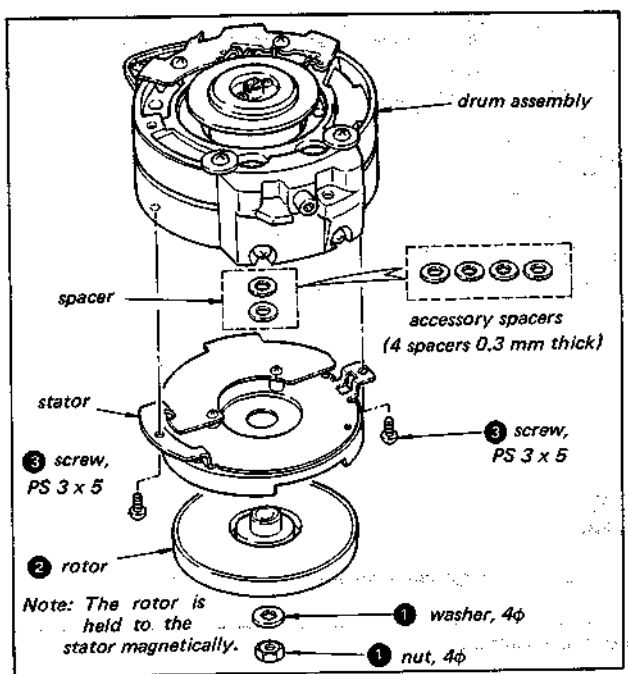


Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

3-4-1. Removal of the Capstan Motor (Fig. 3-9)

- Remove screws ❶, ❷ and ❸, then remove the capstan motor from the rear of the mechanical chassis.

Note:
After replacing the capstan motor, adjust the tape path as explained in section 4-3.

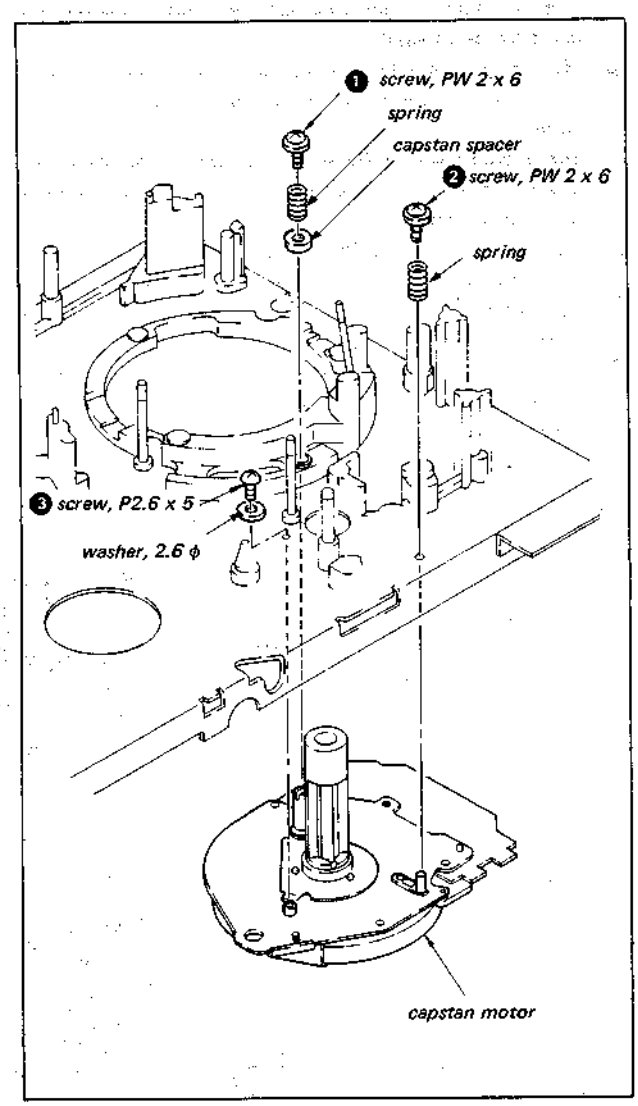


Fig. 3-9 Removal of the capstan motor

3-5. REMOVAL OF THE S COIL SENSOR (Fig. 3-10)

❶ Remove the spring.
❷ Remove the claw in the direction of arrow Ⓐ, then pull the S coil sensor out.
❸ Unplug the connector from CN407 on SS-13 board.

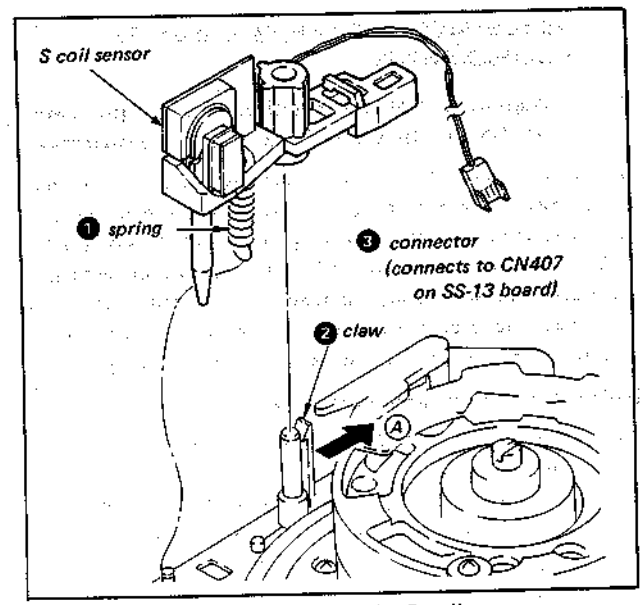


Fig. 3-10. Removal of the S coil sensor

3-6. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 3-11)

❶ Pull the internal gear flange out.
❷ Remove the synchro belt.
❸ Remove the 5 screws (BVTT2.6×6).
❹ Pull connector CN417 (white) out.
❺ Remove the FL cassette compartment section in the direction of arrow Ⓐ.

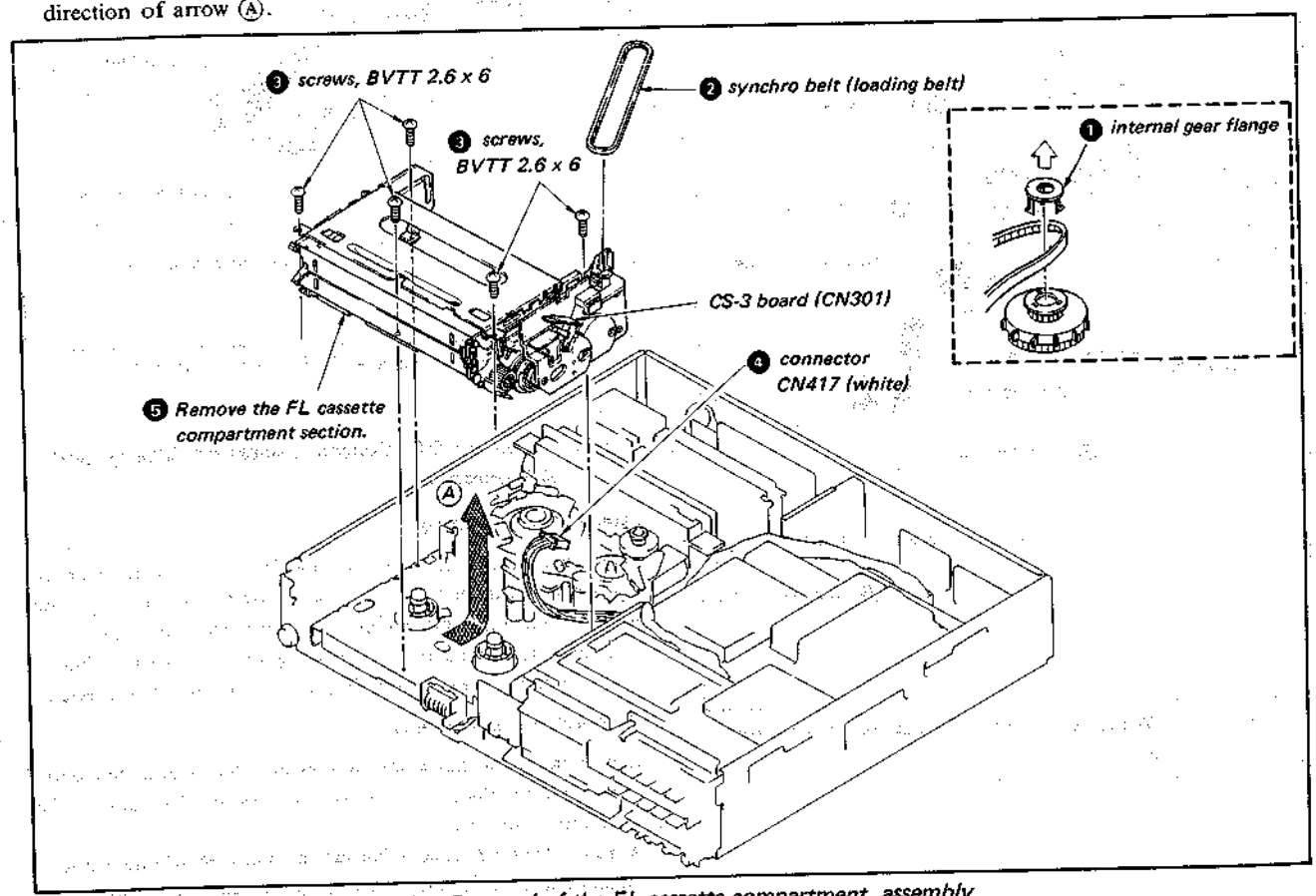


Fig. 3-11. Removal of the FL cassette compartment assembly

3-7. ADJUSTMENT OF THE FL CASSETTE COMPARTMENT

3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly

In the FL cassette compartment assembly, the cassette holder must always move parallel to the mechanical chassis. The gear system is used to control the amount by which the cassette holder advances so that this will be the case. Consequently, if the gears in this section slip out of mesh, the next time the unit is assembled the gear mesh must be adjusted to the correct position; otherwise the cassette will not feed properly.

[Adjustment of the gear positions]

1. Get a positioning rod about 200 mm long and 1.5 mm in diameter ready.
2. While passing the positioning rod through the combination of the drive arm right and cassette ON cam, fit the latter on the right side plate. Similarly, fit the drive arm left onto the left side plate.
3. Similarly, while passing the positioning rod through the worm wheel, fit the latter onto the right side plate.
4. Similarly, while passing the positioning rod through the combination of the limiter gear and cassette OFF cam, fit the latter onto the right side plate.

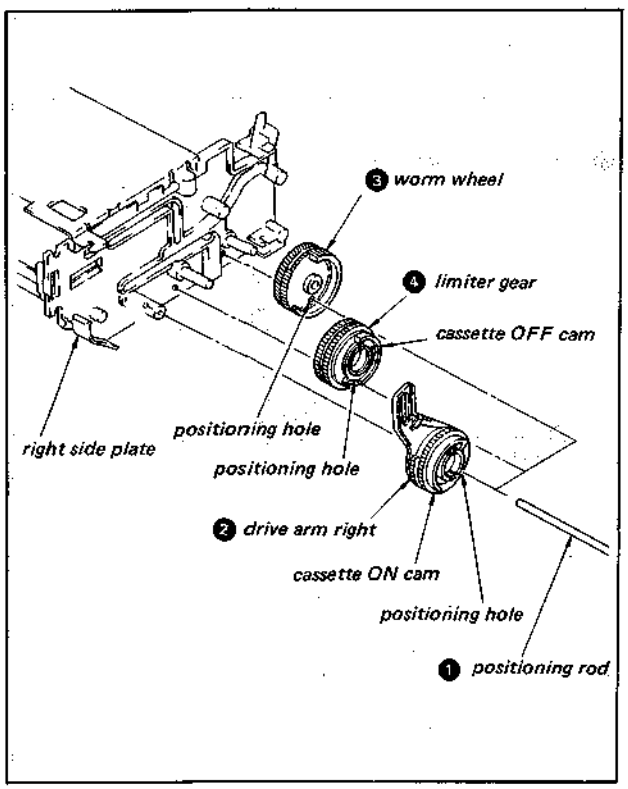


Fig. 3-12. Positioning of the FL cassette compartment gears

3-7-2. Cassette OFF Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the microswitch comes ON when the center of the drive roller is 0 to 5 mm from the end of the guide groove, as shown in Fig. 3-13. (The switch lever will be restored to tis original position, making a clicking sound.)

[Method of adjustment]

Loosen the screw that holds the cassette OFF cam attached to limiter gear A in place, move the cassette OFF cam in the direction of the arrow, adjust so that the cassette OFF switch comes ON when the above distance is 0 to 5 mm, and finally tighten the screw.

* When the cassette ON switch and cassette OFF switch operate, the threading motor comes ON.

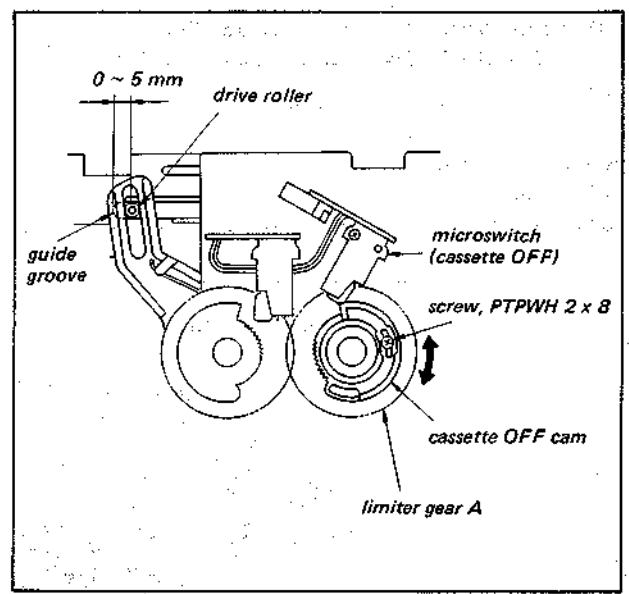


Fig. 3-13. Cassette OFF switch opration

3-7-3. Cassette ON Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the microswitch comes ON when the center of the drive roller is 10 to 15 mm from the end of the guide groove, as shown in Fig. 3-14. (A clicking sound can be heard after the switch is pressed.)

[Method of adjustment]

Loosen the screw that holds the cassette ON cam attached to the drive gear in place, then move the cassette ON cam in the direction of the arrow.

Adjust so that the cassette ON switch comes ON when the above distance is 10 to 15 mm, and finally tighten the screw.

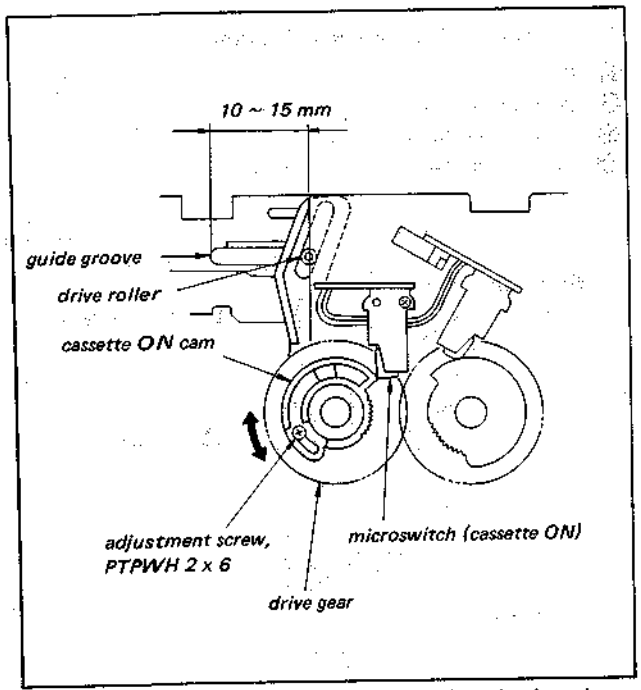


Fig. 3-14. Cassette ON switch operation check and adjustment

3-7-4. Checking and Adjustment of the Cassette Door Assembly

[Method of checking]

With the door opening and closing arm returned all the way in the direction of arrow Ⓐ, check to make sure that the upper and lower doors are vertical.

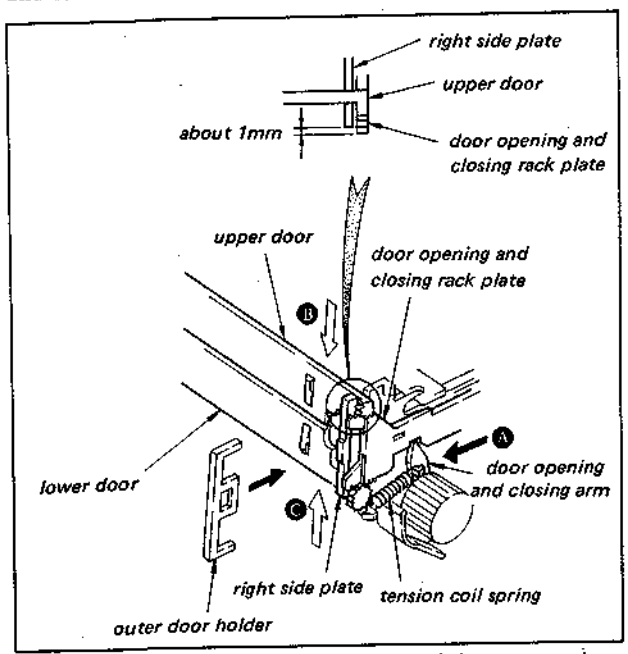


Fig. 3-15. Adjustment of the position of the cassette door assembly

[Method of adjustment]

Check to make sure that the door opening and closing rack plate has returned all the way. Then, with the tip of the door opening and closing rack plate and the tip of the right side plate about 1 mm apart, close the upper and lower doors together in the directions of arrows Ⓑ and Ⓒ so that they are vertical, and mesh the gears. Fit the outer door holder onto the right side plate, and fix the upper and lower doors in place.

3-7-5. Mounting the FL Cassette Compartment Assembly (Fig. 3-16)

❶ Hook the two claws of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.

❷ Loosely tighten the 5 mounting screws of the FL cassette compartment assembly. Move the FL cassette compartment assembly forward and backward with respect to the mechanical chassis, set it in the correct position, then tighten the mounting screws all the way.

❸ Connect the synchro belt (loading belt) between the threading motor and the worm gear, then hold it in place with the internal gear flange.

❹ Press the tension roller arm in the direction of the arrow to adjust the tension of the synchro belt (loading belt), then fix it in place with the arm fixing screw.

❺ Insert the harness sticking out from the main body into connector CN301 on CS-3 board.

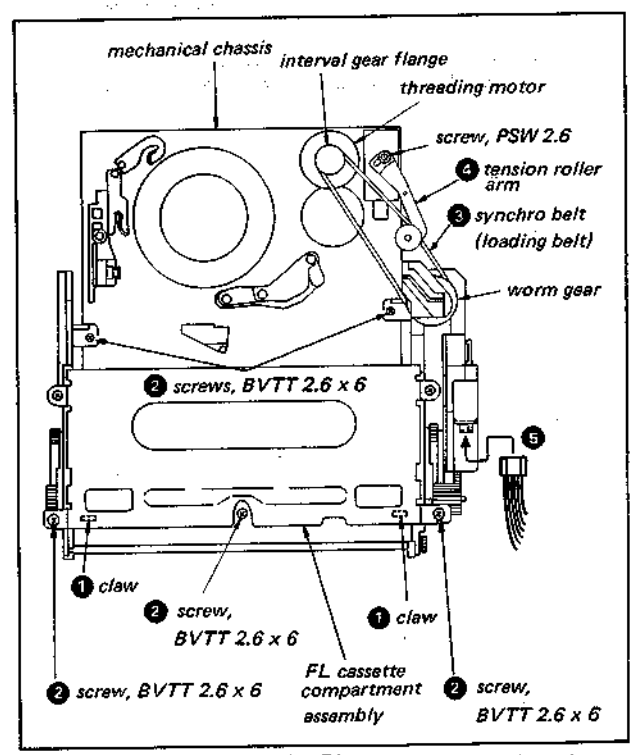


Fig. 3-16. Mounting the FL cassette compartment assembly

3-8. REMOVAL OF THE No. 2 AND No. 3 GUIDES

3-8-1. Removal of the No. 2 Guide

❶ Remove the 1×3 tap-in screw.
❷ Remove the 1.4×3.5 tap-in screw.
❸ Remove the No. 2 guide assembly.

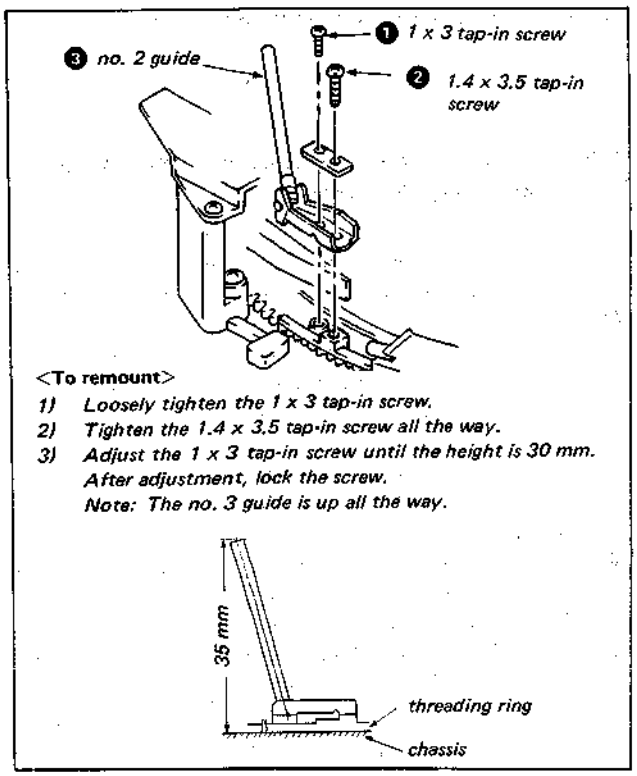


Fig. 3-17. Removal of the no. 2 guide

3-8-2. Removal of the No. 3 Guide

❶ Remove the 1×3 tap-in screw.
❷ Remove the 1.4×3.5 tap-in screw.
❸ Remove the limiter spring.
❹ Remove the No. 3 guide assembly.

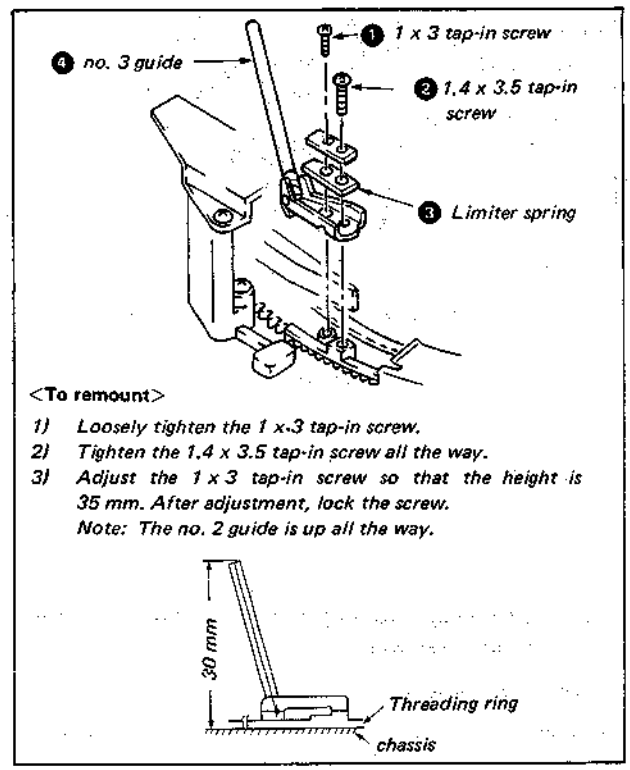


Fig. 3-18. Removal of the no. 3 guide

3-9. REPLACEMENT AND ADJUSTMENT OF THE S THREADING RING

3-9-1. Preparation to Remove the S Threading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-19)

1. Remove the cross-recessed head screw.
2. Remove the No. 6 guide nut.
3. Remove the No. 6 washer.
4. Remove the No. 6 guide spacer.
5. Remove the compression coil spring.
6. Remove the 2 guide adjustment nuts, then remove the ACE assembly and the FE head.

Note:
Since the ACE assembly and the FE head are connected by a lead wire, be careful when removing them. It is not necessary to remove the compression coil spring below the ACE assembly, but be careful not to use it.

7. Remove the 2 PSW2.6 screws, then remove the stopper arm section.
8. Remove the 2 screws, then remove the threading motor assembly by pulling it up and out.

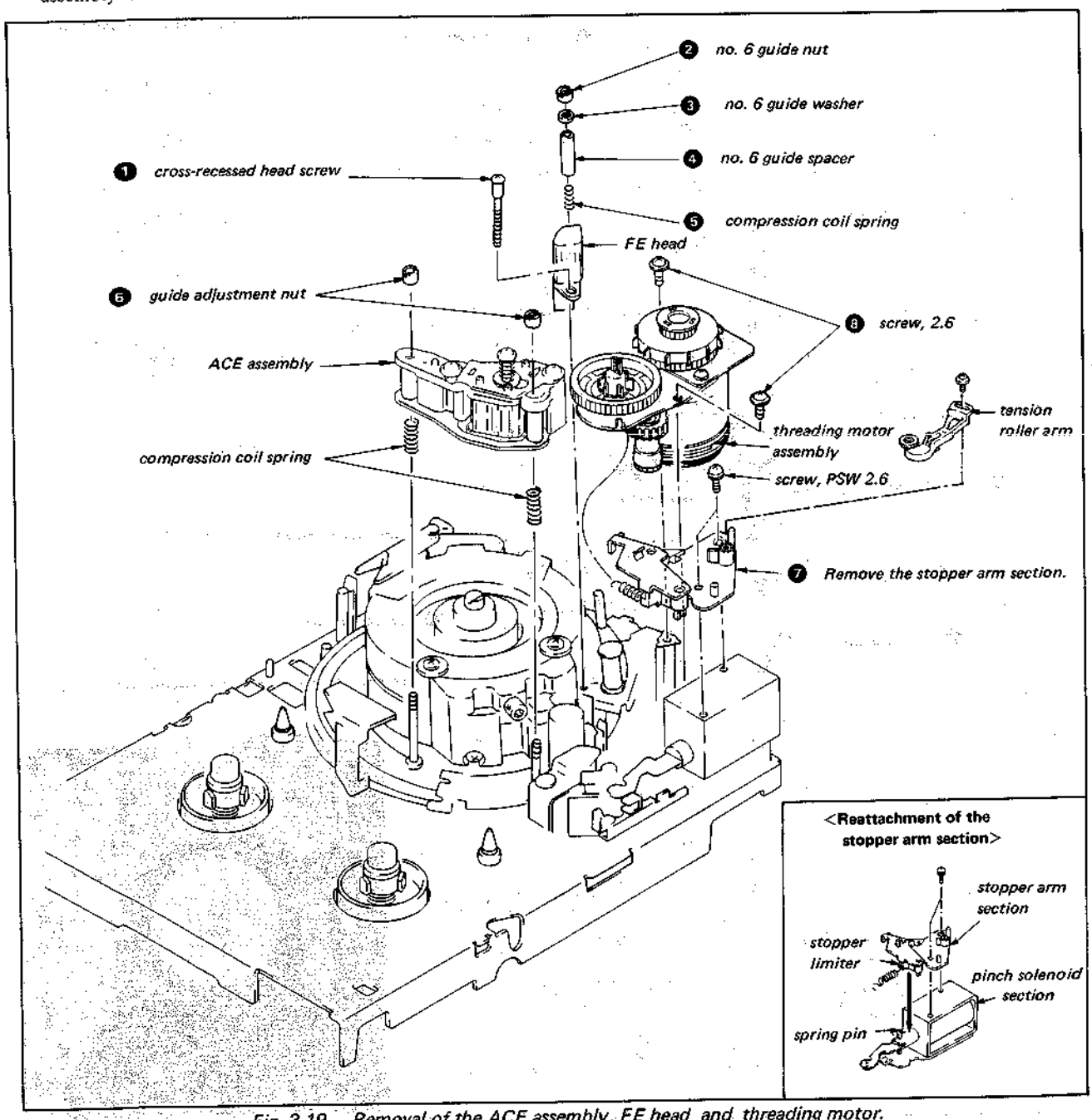


Fig. 3-19. Removal of the ACE assembly, FE head and threading motor.

Removal of Miscellaneous Parts (Fig. 3-20)

Proceeding in the same manner as in replacement of the drum assembly, measure the width of the gap between the upper drum and the adjusting plates (Fig. 3-5).

❶ Remove the screw, then remove the tape guide ground plate and adjusting plates 1 and 2.
❷ Remove the two screws, then remove the tape holder assembly.
❸ Remove the screw, then remove the guide plate.
❹ Remove the 2 PTPWH2×8 screws and the 2.6×24 screw, then remove shuttle guide II.
❺ Remove the 3 PTPWH2×8 screws and the 2.6×24 screw. Then remove the 2 claws holding shuttle guide I in place, and finally remove shuttle guide I.
❻ Remove the slant base assembly.
❼ Remove the BVTT2.6×6 screw, then remove the pinch liner link.

Note:
After removing the guide plate, do not thread or unthread a tape with the shuttle guide mounted.

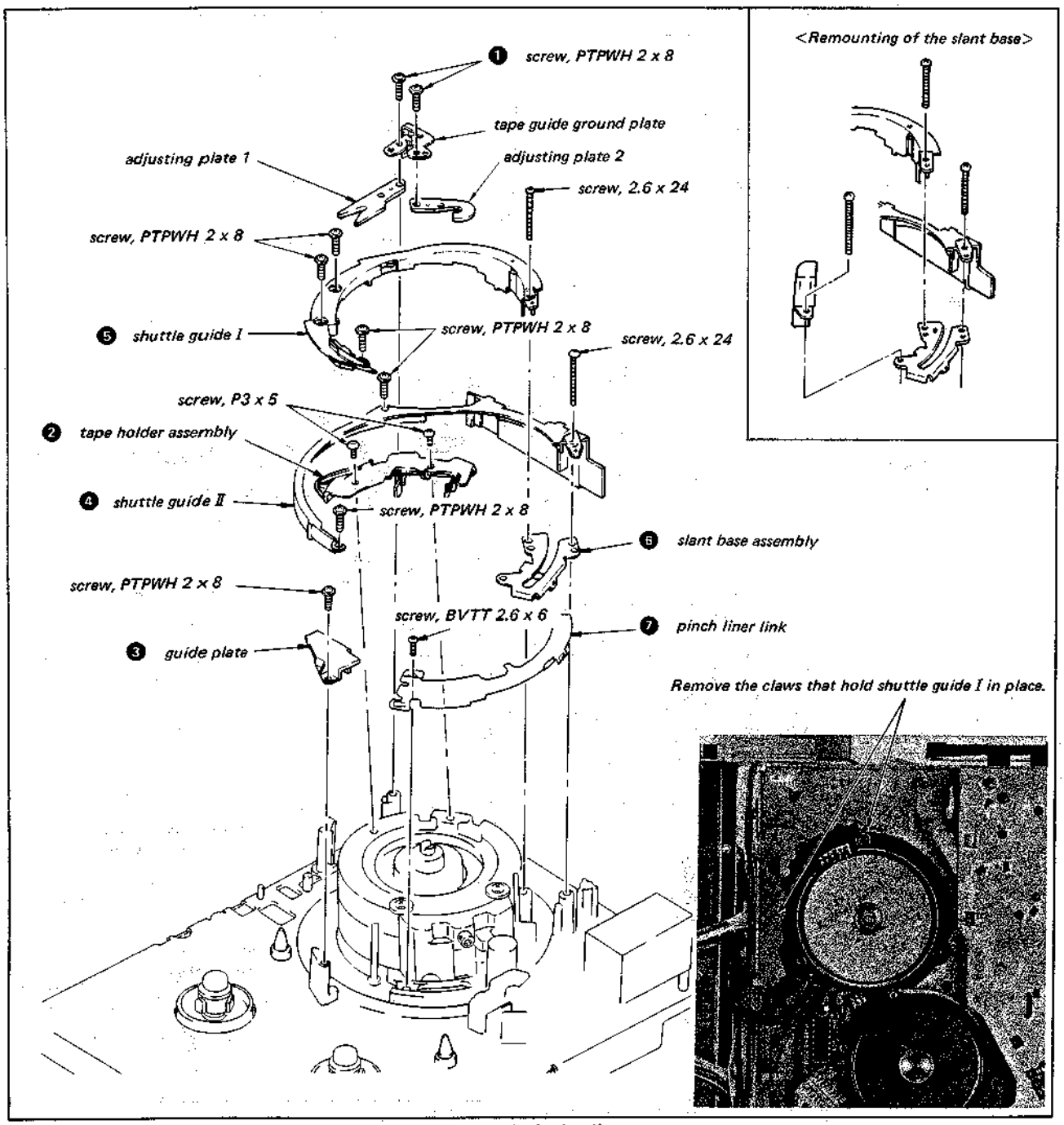


Fig. 3-20. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-21)

❶ Remove the tension coil spring from the lock arm assembly (refer to Fig. 3-26 in section 3-11-1).
❷ Turn the stop washer and remove the ring roller (B).
❸ Remove the group of parts in the unthreading end switch (for instructions on assembly and disassembly, refer to section 3-11-2 and Fig. 3-30).
❹ Remove the screw, then remove the ring roller adjustment plate.
❺ Remove the S threading ring.

Note:
Once a stop washer has been removed, do not use it again.

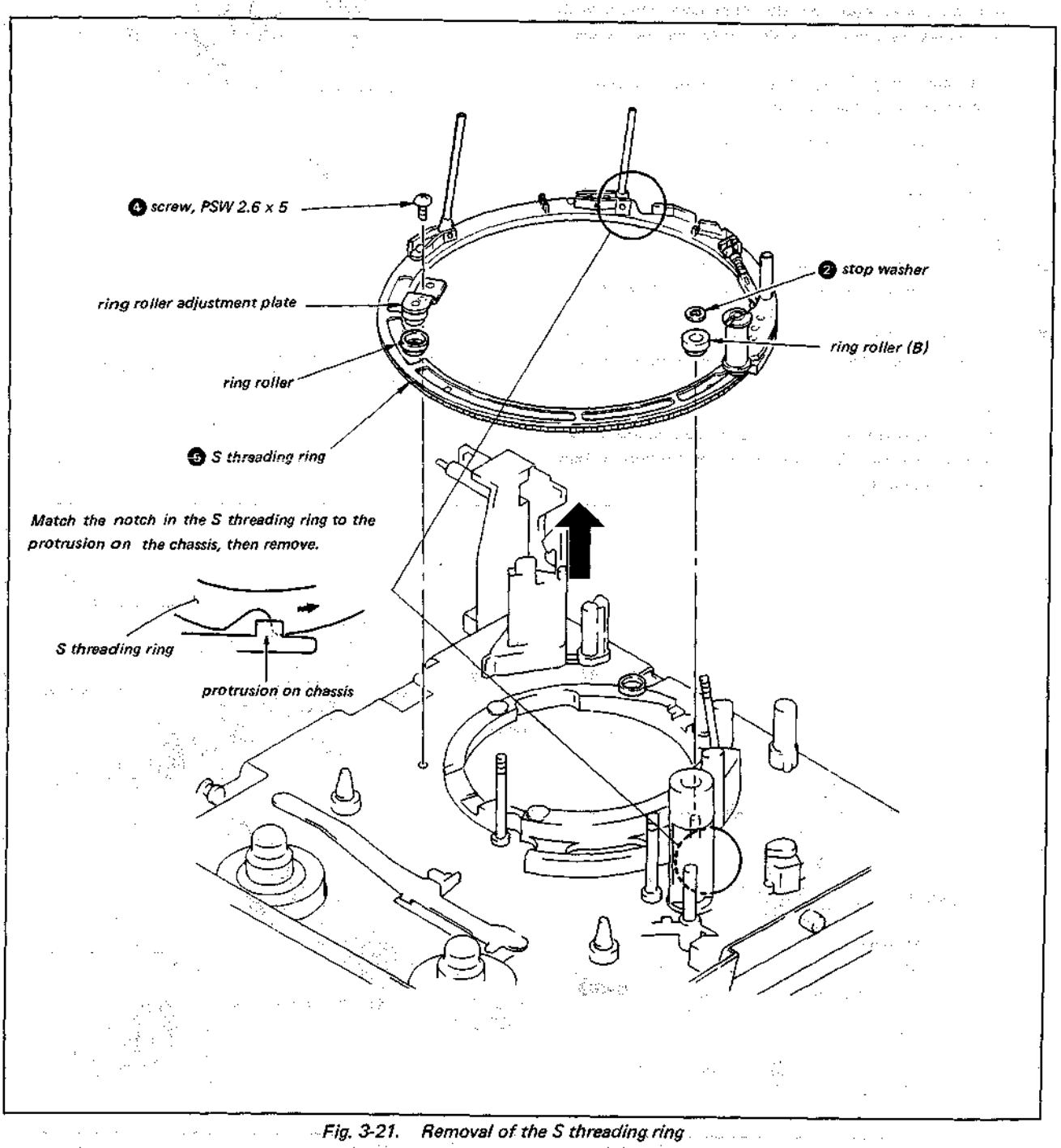


Fig. 3-21. Removal of the S threading ring

3-9-3. Slider-Stopper Mounting Check (Fig. 3-22)

❶ Confirm that the parts of the drive gear are fixed in place.

❷ Loosen the screw, insert a spacer of thickness 0.2 mm between the slider gear assembly and the slider stopper, and tighten the screw while pressing down in the direction of both arrows Ⓐ and Ⓑ.

Note:

It is absolutely necessary to press down in the direction of arrow (A) in order to eliminate play. When the screw is tightened, the slide stopper tends to turn in the direction of arrow (a), so it should be held in place with an ordinary screwdriver while tightening the screw.

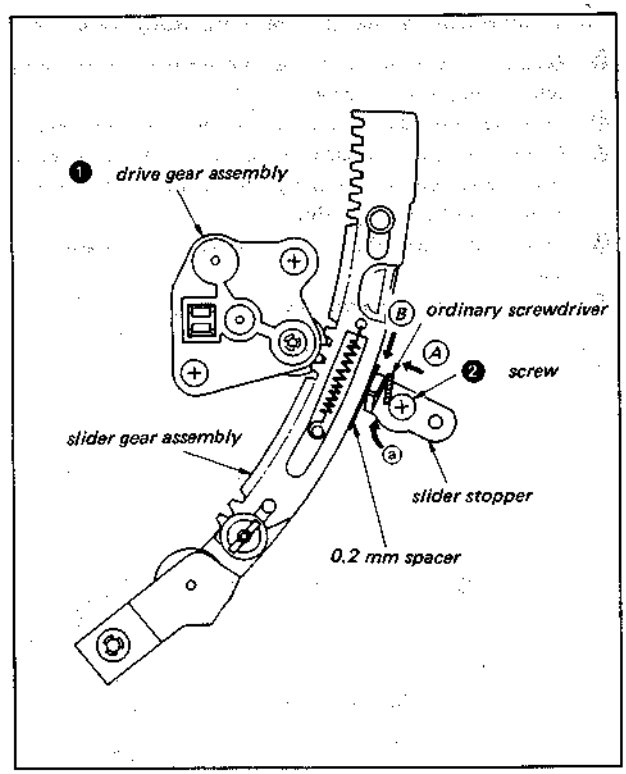


Fig. 3-22. Mounting the slider-stopper

3-9-4. S Threading Ring Mounting and Position Adjustment (Fig. 3-23)

❶ Set the slider gear assembly in the unthreading completed position.
(Insert a spacer of thickness 0.5 mm between the slider stopper and slider gear, and set so that it is up against part Ⓐ.)

❷ In this condition, fit the threading ring into place, match the chassis hole (3φ) of part Ⓑ with the S threading ring hole (1.5φ), and mesh with the drive gear teeth.

❸ Attach ring roller (B) and fix in place with a stop washer.

❹ Attach the ring roller, and fix in place with the adjustment plate.

Note:

After replacement and mounting are completed, adjust the ACE assembly as explained in the section on tape path adjustment.

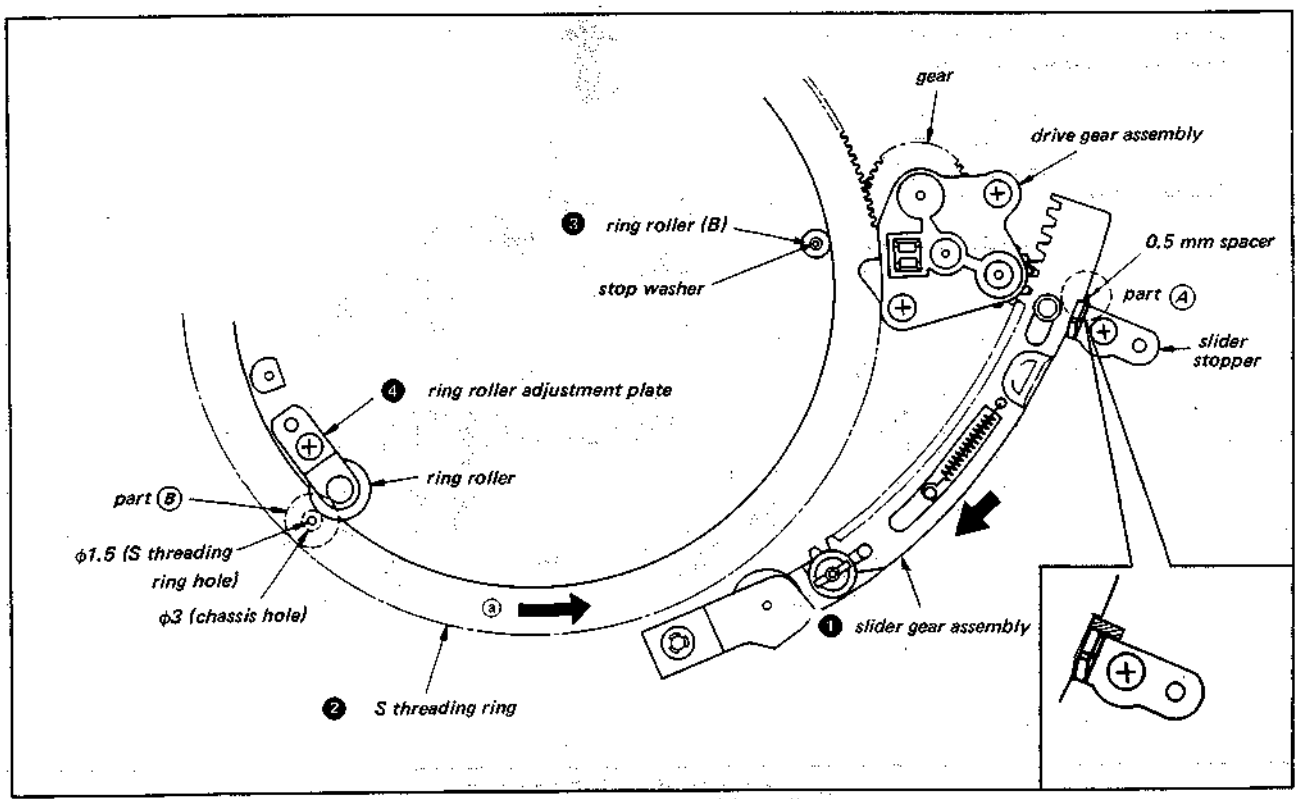


Fig. 3-23. S threading ring position adjustment

3-10. PINCH SNAP-FIT LIMITER GAP CHECK AND ADJUSTMENT

[Method of checking]

1) Set in the threading completed condition.
2) With the plunger pushed in all the way, confirm that the thickness of the pinch snap-fit limiter gap is 0.4 mm to 0.6 mm. If it is not, adjust as explained under [method of adjustment] below.

[Method of adjustment]

❶ With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way), loosen the adjustment screw.

❷ Press the pinch limiter adjustment plate in the direction of arrow ⓐ with an ordinary screwdriver, as in section Ⓐ in the diagram, and adjust until the thickness of the gap in 0.4 mm to 0.6 mm.
Tighten the adjustment screw and then lock it to fix everything in place.

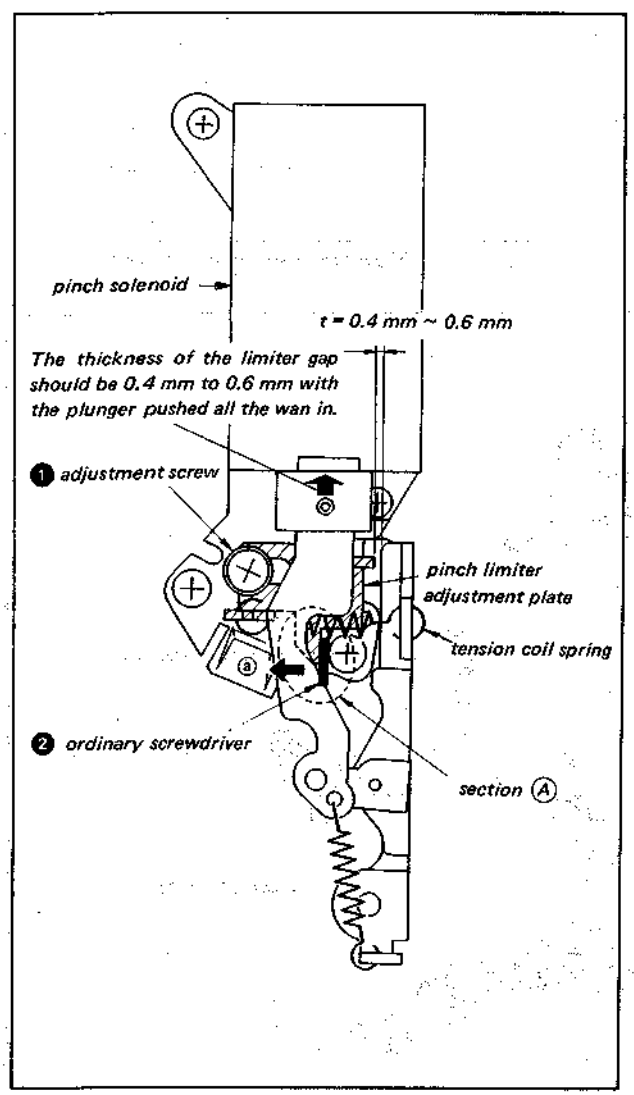


Fig. 3-24. Pinch snap-fit limiter gap adjustment plate

3-11. MICROSWITCH POSITION CHECK AND ADJUSTMENT

3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually. Check to make sure that, when the lock roller moves from above the straight line part of the notch in the ring (Fig. 3-25 section Ⓐ) to 2/3 of the way down it and back, the TE switch turns ON and OFF. This can be confirmed from the clicking sound.
If the lock roller has to move outside of this range before the switch will turn ON and OFF, adjust as explained below.

[Method of adjustment]

1) Set the lock roller between the top of the notch in the S threading ring and 2/3 of the way down it, turn the cam shaft in the direction of the arrow with an ordinary screwdriver and, when the switch turns ON (with a clicking sound), fix the cam shaft in place.
2) When the adjustment is completed, repeat the check as described under [method of checking].

[Removal]

❶ Remove the tension coil spring that is attached to the lock arm assembly.
❷ Remove the screw, then remove the TE switch assembly.
❸ Press the claws holding the main chassis assembly in place in the direction of arrow Ⓐ to release the lock, then remove the lock arm assembly.

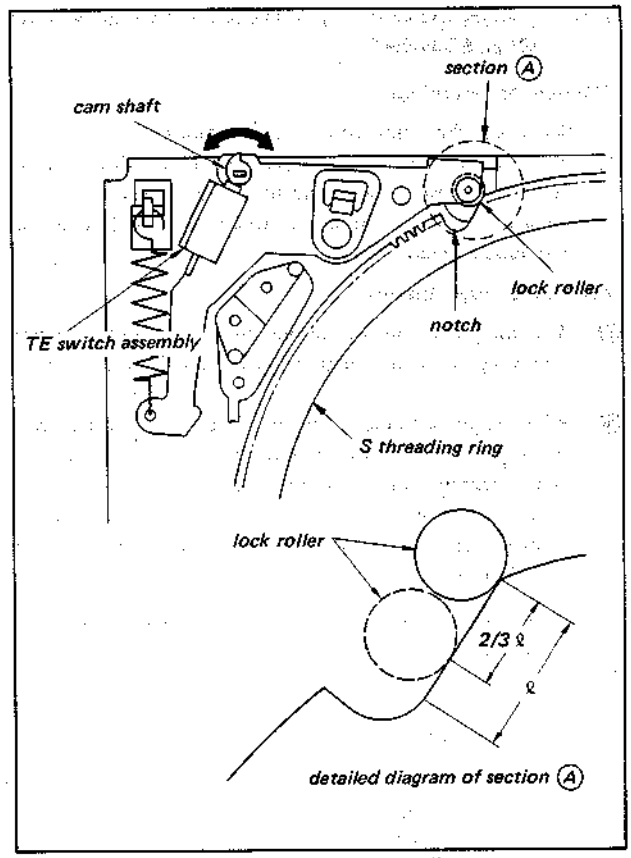


Fig. 3-25. TE switch position adjustment

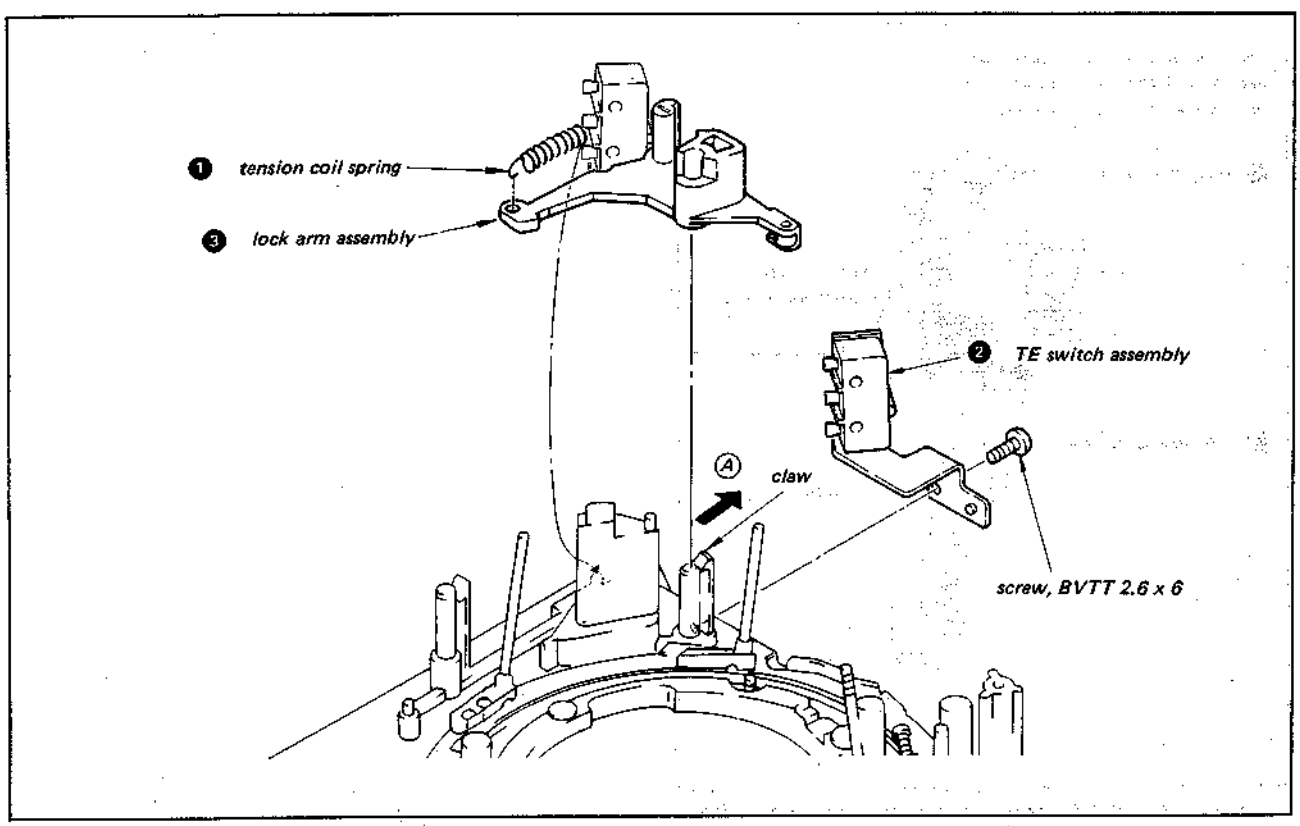


Fig. 3-26. Removal of the TE switch assembly and lock arm assembly

3-11-2. Unthreading End Switch (UTE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually until the UTE switch roller of the UTE switch arm assembly drops into the UTE switch arm groove. Confirm that when a ϕ1.2 pin is inserted into section Ⓐ in Fig. 3-27, the switch comes ON, and that when a ϕ0.6 pin is inserted the switch does not come ON.

[Method of adjustment]

1) If the switch fails to come ON when a ϕ1.2 pin is inserted, loosen small screw ❶ and adjust by turning a little at a time in the direction of arrow Ⓑ.
2) If the switch comes ON when a ϕ0.6 pin is serted, it is possible that the actuator is bent as shown Fig. 3-28. Check it and straighten it out if necessary.

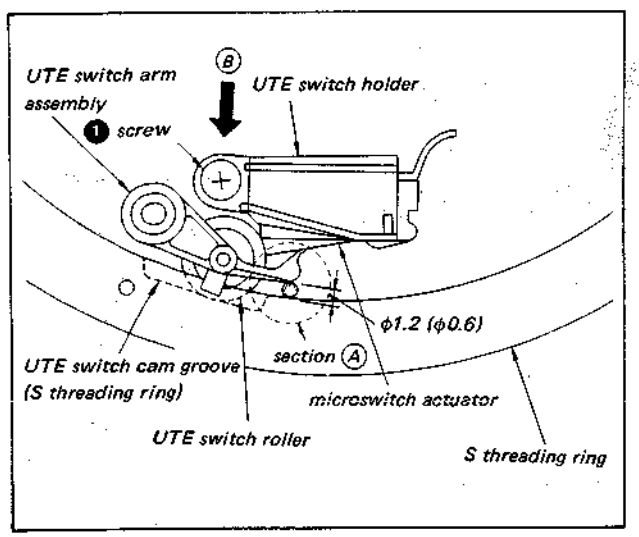


Fig. 3-27. UTE switch position adjustment

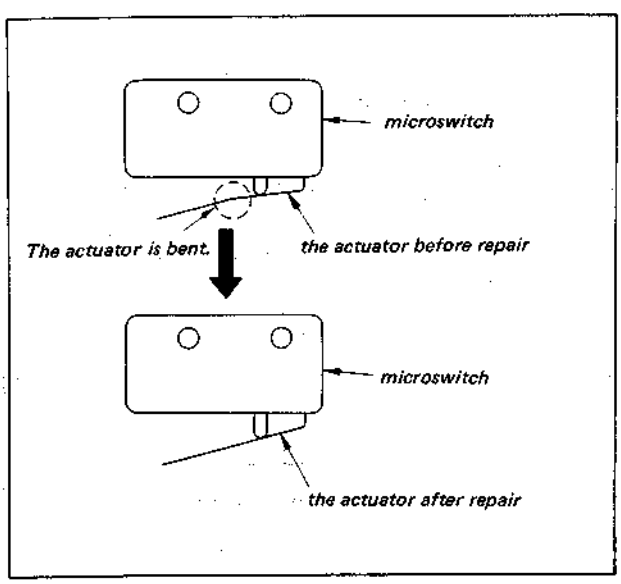


Fig. 3-28. Repair of the actuator

Note:

The ϕ1.2 and ϕ0.6 pins must be inserted in the right place, as shown in Fig. 3-29 (as shown in Fig. 3-29, depending on where the pin is inserted, because of the structure of the assembly even if it enters at 1.2 mm the gap can be less than 1.2 mm farther in).

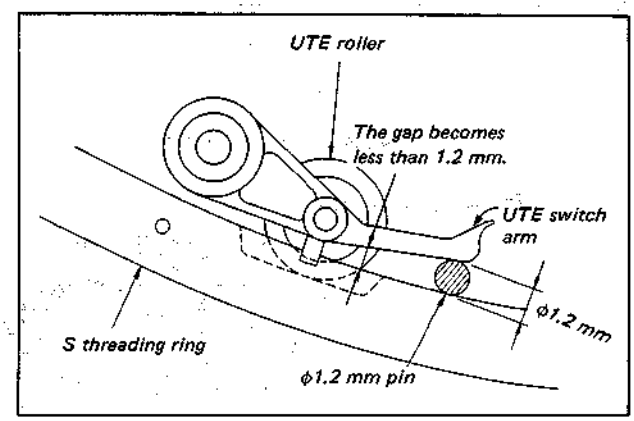


Fig. 3-29. Position of the pin when checking

[How to remove]

❶ Remove the screw, as shown in Fig. 3-30.
❷ Remove the claw of the switch from the chassis, and then remove the main body of the switch while holding the actuator in the ON position.

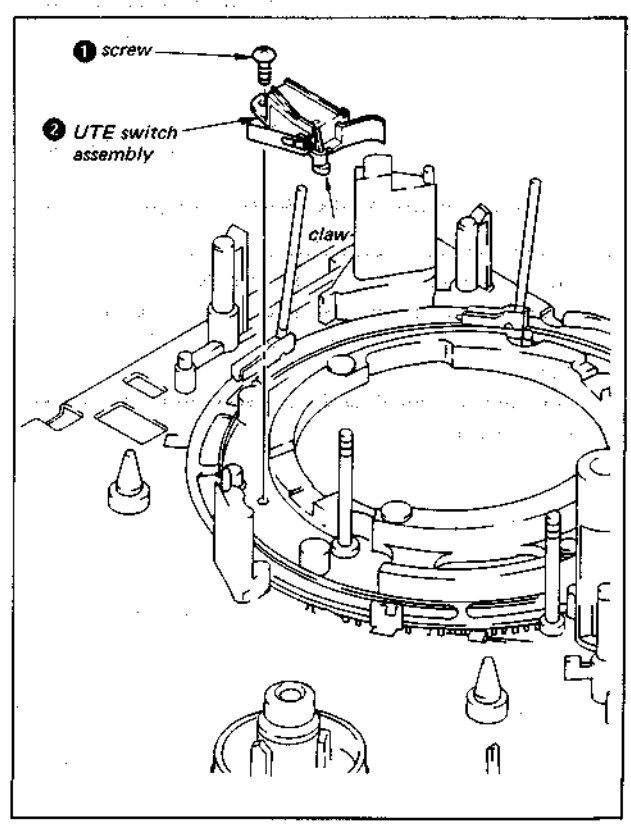


Fig. 3-30. Removal of the UTE switch

3-12. REMOVAL AND ADJUSTMENT OF THE REEL MOTOR SECTION

3-12-1. Removal of the Reel Motor Section

❶ Turn the unit so that the top surface of the main body faces down.
❷ Remove the 4 B2.6×8 tap-in screws.
❸ Remove the counter belt.
❹ Remove the reel block.

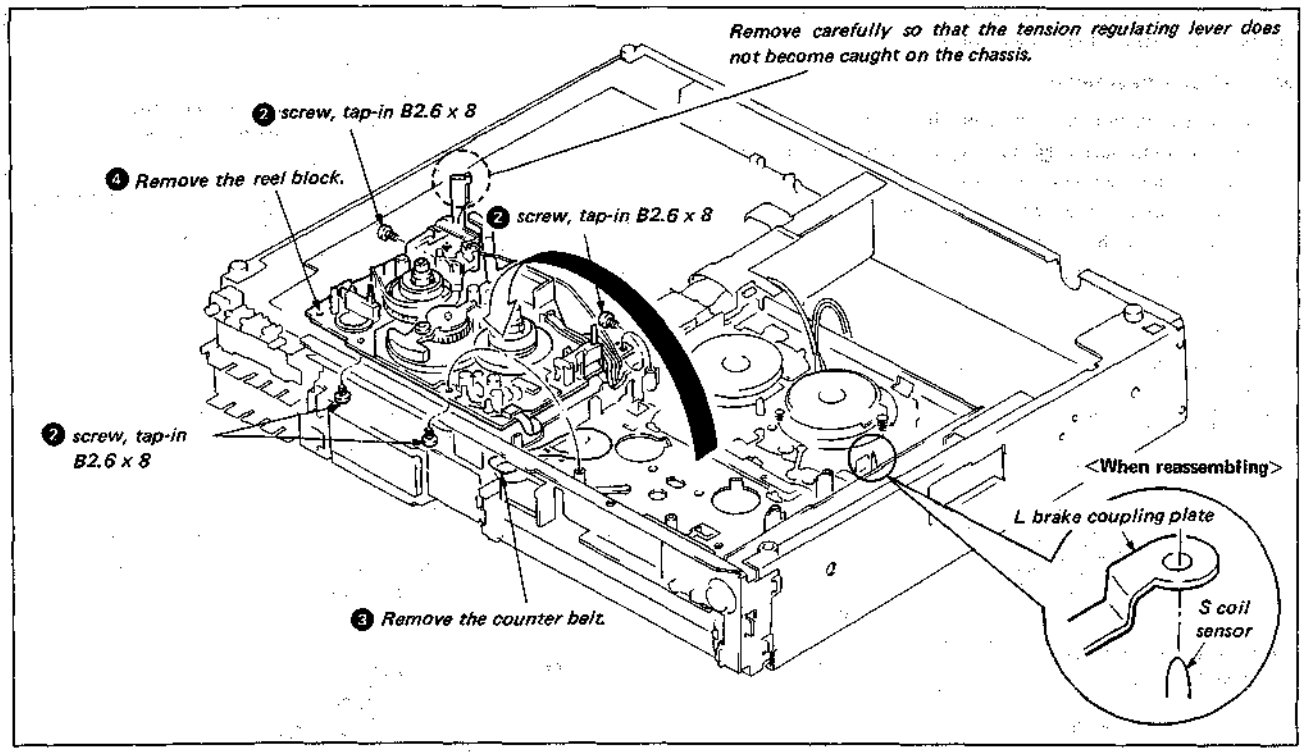


Fig. 3-31. Removal of the reel motor section

3-12-2. Adjustment of the Brake Plunger

1) Loosen the brake plunger fixing screw.
2) More the brake plunger in the direction of the arrow, and tighten the fixing screw just enough so that the plunger can move through a stroke of 2 mm.

Note:
The plunger should be 2 mm away from contact with the T brake.

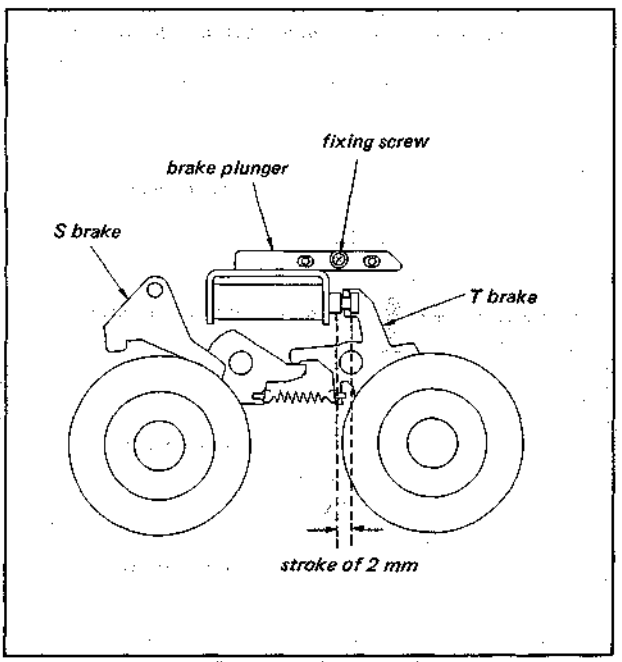


Fig. 3-32. Adjustment of the position of the brake plunger

3-12-3. Adjustment of the Soft Brake

[Method of checking]

1) Remove the cassette compartment section, and put the unit in the threaded state without a cassette.
2) As shown in Fig. 3-33, set a tension gauge (SL-0011) on the S reel platform.
3) Set the unit in fast forward mode (put the S reel platform in the free condition), and pull the sector type gauge slowly.
4) Confirm that the reading of the sector type gauge is 8g.

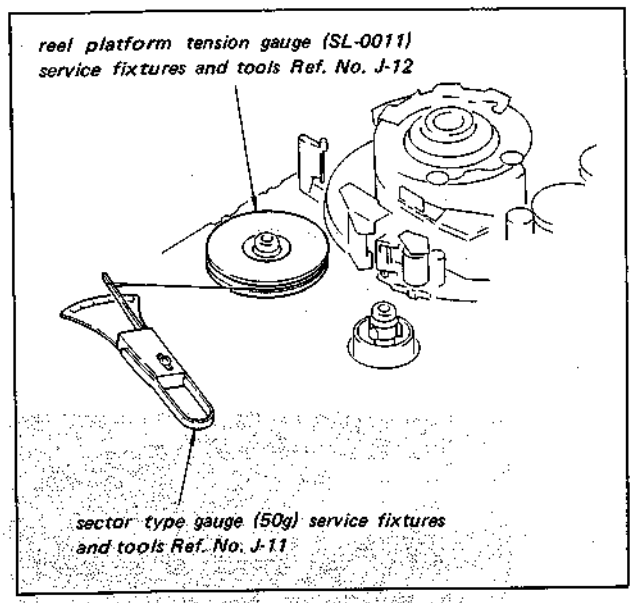


Fig. 3-33. How to check the soft brake

[Method of adjustment]

1) Adjust the position of the soft brake lever tension coil spring.

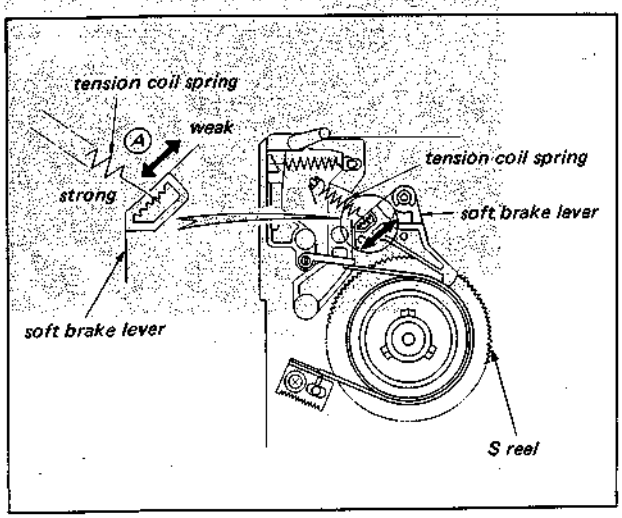


Fig. 3-34. Adjustment of the soft brake

3-12-4. Adjustment of the Position of the Tension Regulating Lever

[Method of adjustment]

1) Put the unit in playback mode.
2) Loosen the adjustment spring until the tape guide pin of the tension regulating lever assembly is positioned to the outside of the outer circumference of shuttle guide 2, as shown in Fig. 3-35. Then adjust by moving the tension regulating band assembly in the direction of arrow Ⓐ .
3) After adjustment, tighten the adjustment screw, being careful that the tension regulating band assembly does not move.

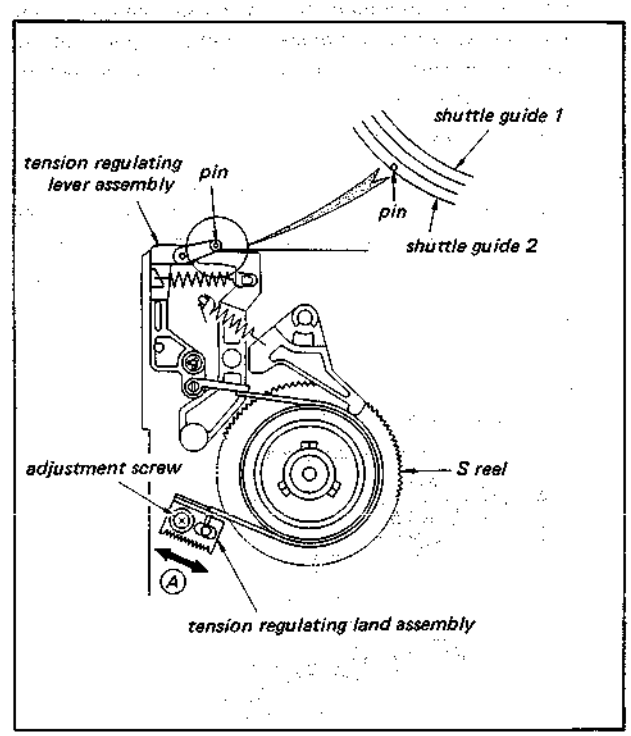


Fig. 3-35. Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD AND BACK TENSION

[Method of measurement]

1) Connect TP601 and TP602 to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
3) Read the value on the meter on the S reel side after the needle has gone around about once.
   The correct value is 30 g · cm ± 5 g · cm.

Notes:

i) The set must be perfectly level during this measurement.

ii) After the measurement, the tape can become slack when the stop button is pressed. If this happens set the unit is forward mode to take up the slack before removing the tape.

[Method of adjustment]

Move the position of the tension coil spring that is hooked on the tension regulating lever assembly in the direction of arrow Ⓐ until the measured value falls within the correct range.

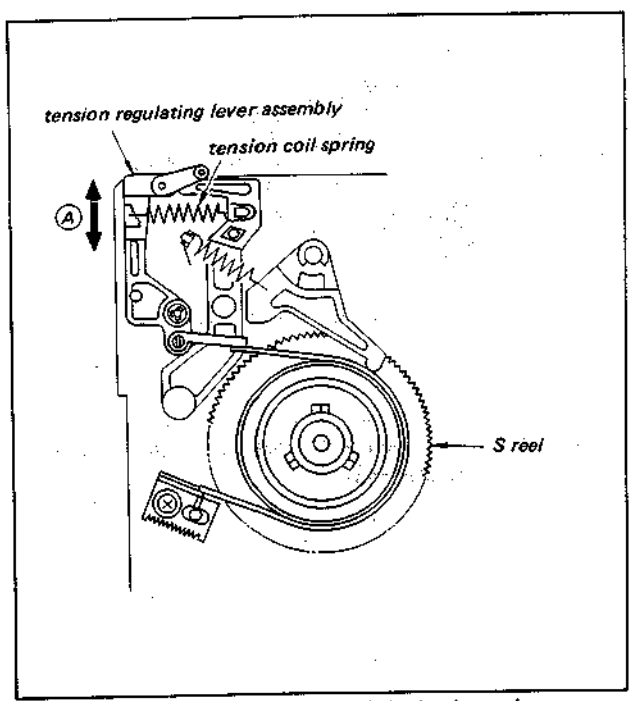


Fig. 3-36. Adjustment of the back tension

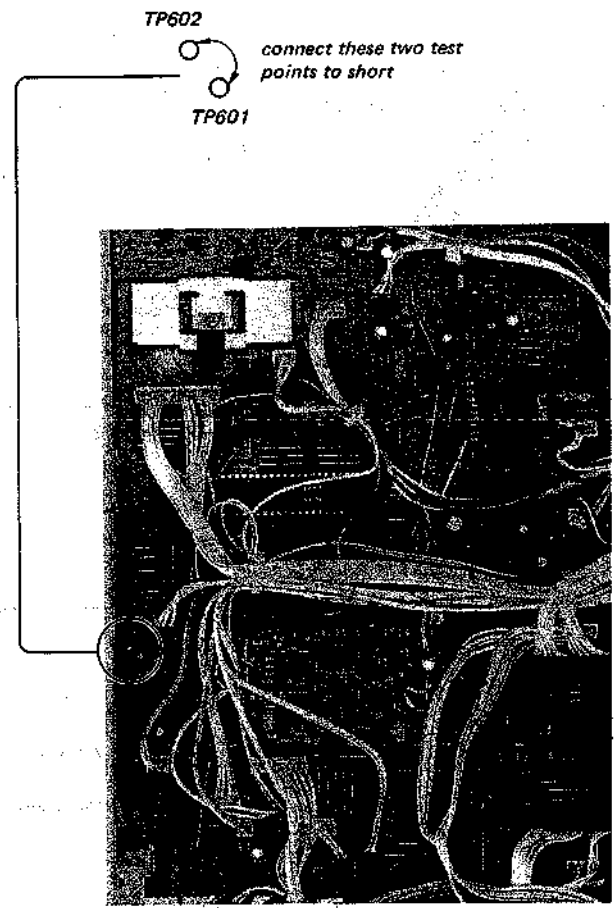


Fig. 3-37.

3-14. ADJUSTMENT OF THE FORWARD TORQUE

[Method of measurement]

1) Connect TP601 and TP602, on both ends of R608, to short them and stop the rotation detection.
2) Insert the torque cassette (SL-0003C) and start to record a telecast in βII mode.
3) Read the value on the meter on the T reel side after the needle has gone around about once. The correct range is 70 g · cm ± 5 g · cm.

[Method of adjustment]

1) Remove the front panel.
2) Turn potentiometer RV202 on FS-21 board to adjust the torque until its value falls within the correct range.

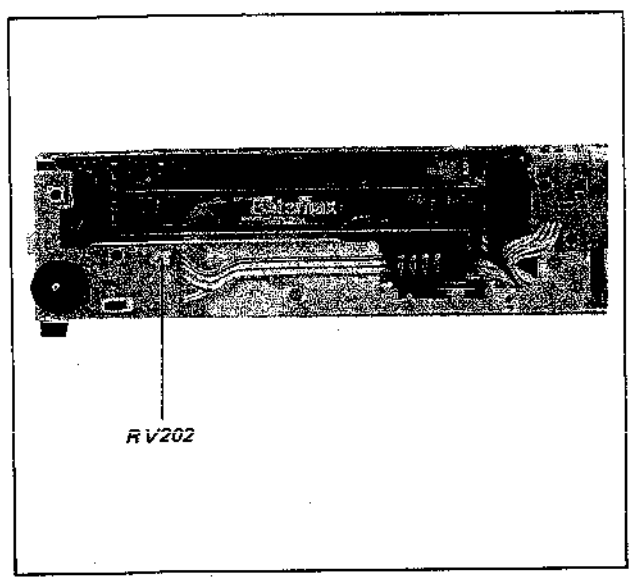


Fig. 3-38.

Note:
When the forward torque is weakened during the measurement the tape can become slack, in which case the set will go into emergency stop mode. In such a case, the only switches that will work are the cassette eject switch and the power switch. It is necessary to temporarily remove the cassette, or to turn the power OFF and back ON.

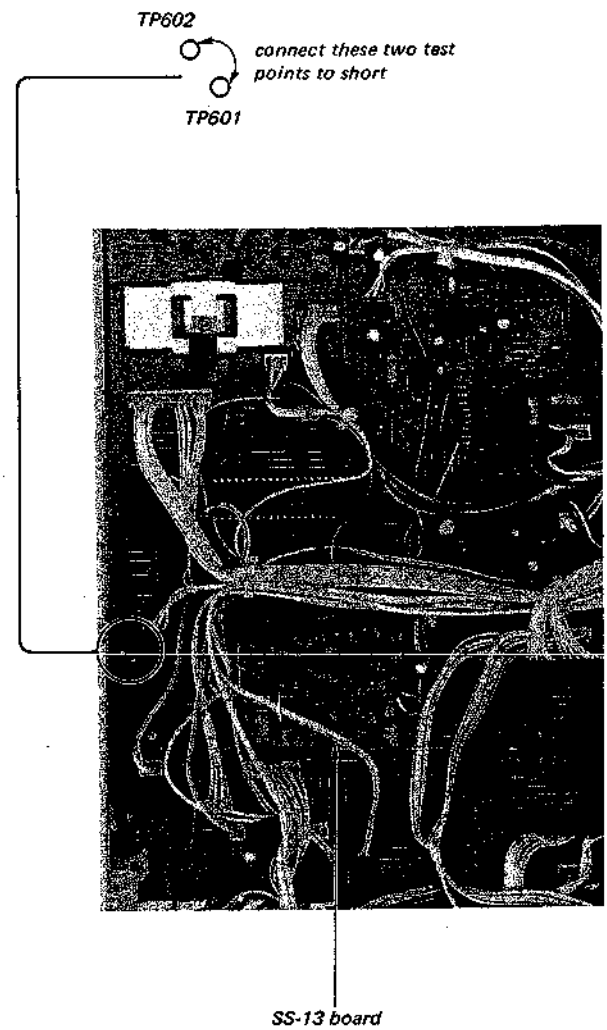
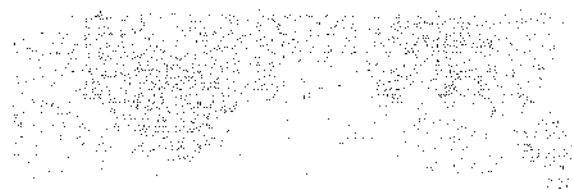


Fig. 3-39.



SECTION 4
TAPE PATH ADJUSTMENT

4-1. TRACKING ADJUSTMENT

This adjustment has a large effect on the picture quality in each mode and on the interchangeability of tapes, so it should be done carefully.

4-1-1. Preparation for adjustment
4-1-2. Adjustment on the entrance side
4-1-3. Adjustment on the exit side

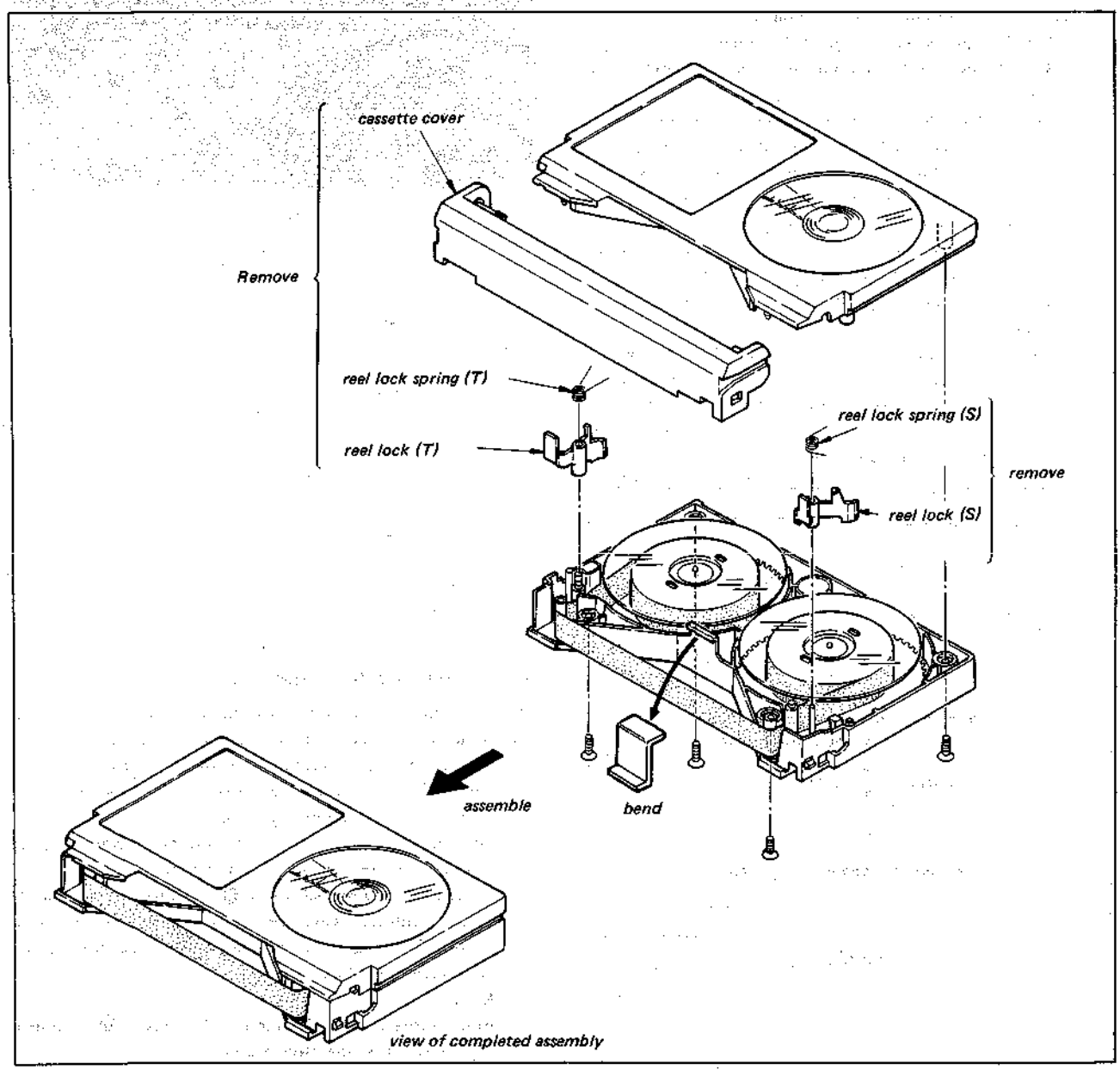


Fig. 4-1.

4-1-1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surfaces contacted by the traveling tape (tape guide, drum tape traveling surface, capstan shaft, pich roller, ACE.FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   channel 1: CN3-pin ⑤ (RP-8 board)
   external trigger: CN3-pin ③ (RP-8 board)
4) Play back the 1 kHz signal on the tracking section of the alignment tape.
5) Confirm that the oscilloscope radio frequency output waveform is flat and that the amplitude is a maximum. (Turn the tracking knob right and left to increase and decrease the amplitude while the waveform remains flat. When the amplitude of the waveform is a maximum, confirm that the fluctuations and contact of the radio frequency output waveform meet the standards given in Fig. 4-2. If they do not, go through the procedure given in step 6).
6) If the entrance waveform cannot be made flat, as shown in Fig. 4-3 (a), by turning the tracking knob, go through the "entrance side adjustment" described in 4-1-2; if the exit waveform shown in Fig. 4-3 (b) cannot be made flat, go through the "exit side adjustment" in 4-1-3.

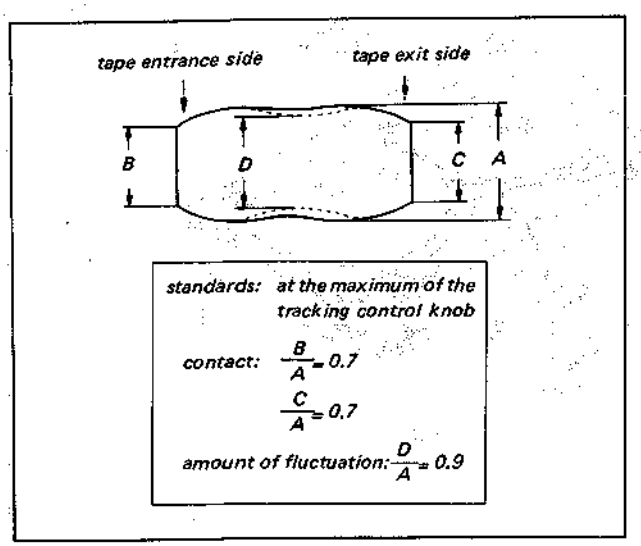
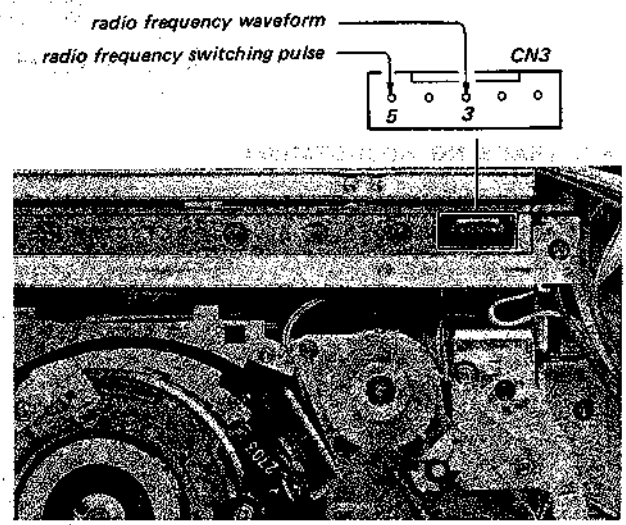


Fig. 4-2.



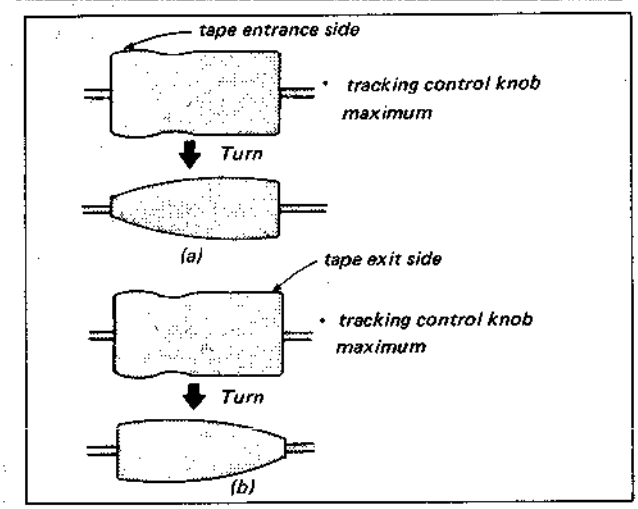


Fig. 4-3.

4-1-2. Entrance Side Adjustment

Whenever the entrance side adjustment is performed, the exit side adjustment must also be performed. The various tape guides and adjustment positions are shown in Fig. 4-5.

1) Turn the No. 6 guide counterclockwise to free the movement of the tape as it enters the drum.
2) Turn the tracking control knob until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No. 5 guide lock screw ❶ and turn the No. 5 guide until the entrance waveform sticks up a little above falt, as shown in the figure below. Then tighten the No. 5 guide lock screw (Fig. 4-6).

Note:
After tightening No.5 guide lock screw ❶, confirm that it is as in the figure below.

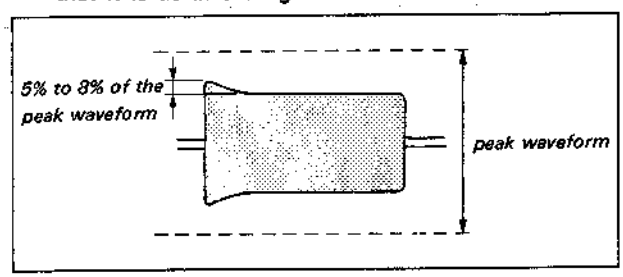


Fig. 4-4.

4) Next, lower the No. 6 guide until the waveform is flat.
5) Press the tape down between the No. 4 and No. 5 guide with a finger to lower the entrance side radio frequency waveform, then let go and confirm that the waveform returns to what it was before.
6) In this condition, check the clearance and curl of the No. 5 guide. If there are clearance and curl, adjust as explained in subsequent sections.

Note:

The tape tension between the No. 3, No. 4 and No. 5 guides must be balanced. If it is not, adjust the tilt of the No. 3 and No. 5 guides.

If the waveform cannot be made to look as shown in Fig. 4-4, or if when the tape is pressed and released on the entrance side it takes time for the waveform to return to what it was before, or if it does not return to what it was before, adjust according to the instructions given below.

[What to do when the waveform entrance output will not rise]

1) Check to see if the up-down tension between the No. 3, No. 4 and No. 5 guides is uniform. If it is not, adjust the tilt of the No. 3 and No. 5 guides.
   Note:
   The lower flange of the No. 4 guide must not protrude.
2) Raise the lower flange of the No. 4 guide to raise the entrance output.
   Note:
   It is sufficient to raise the lower flange of the No. 4 guide to 0.4 mm from its lowest position (within a rotation angle of 360°).
3) If the operation performed in step 2) fails to raise the waveform output, turn the No. 5 guide tilt adjustment screw slightly to the left, and the entrance output should rise.

[What to do when the waveform entrance output will not drop]

1) Remove the adjusting plate of the No. 3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ❷.
2) If the tape is in contact with the lower flange of the No. 4 guide, lower the flange. If the tape is sticking up from the lower flange, adjust the tilt of the No. 5 guide so that the tape does not stick up from the lower flange of the No. 4 guide.

[What to do when there is a clearance in the No. 5 guide]

Turn the No. 4 guide counterclockwise to run the tape upward and eliminate the clearance in the No. 5 guide.

Note:

At this time make sure that a large curl is not produced below the No. 4 guide.

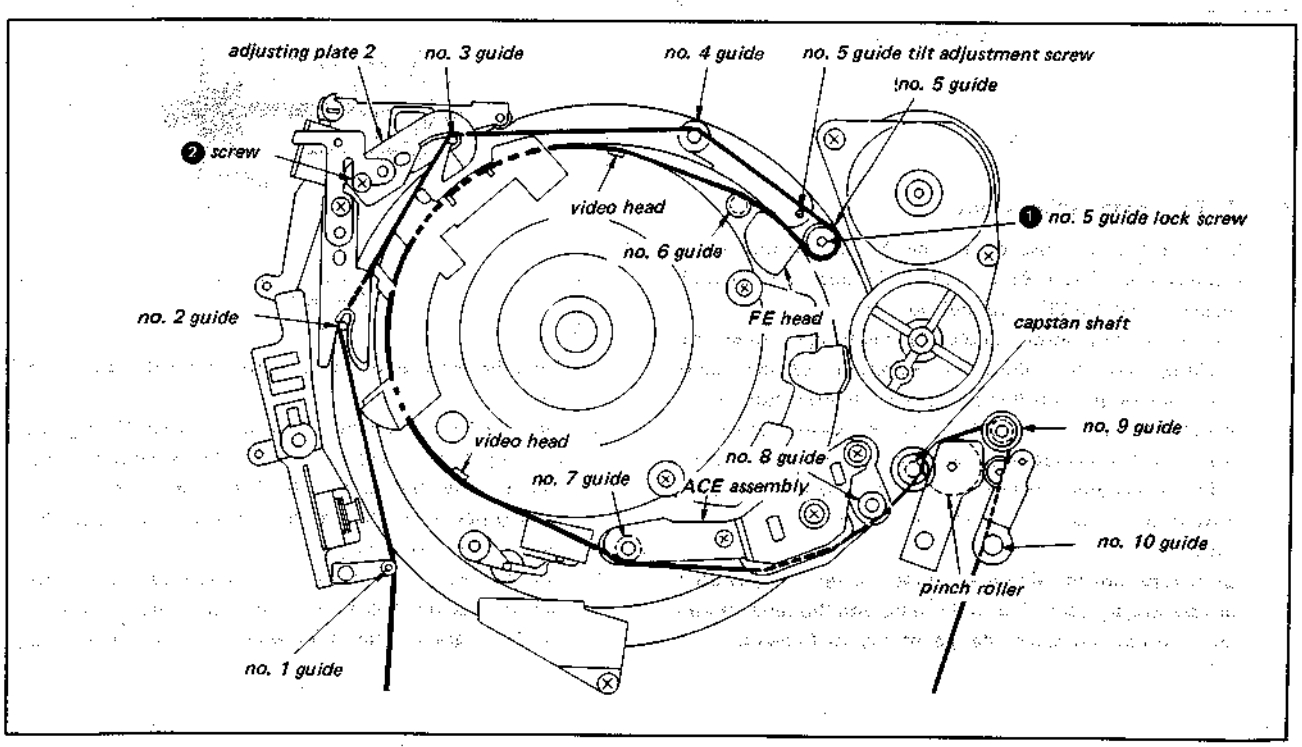


Fig. 4-5. Tape guide layout diagram

[What to do when there is a curl]

1) When there is a gap below the No. 4 guide: Just before the lower tension on the tape becomes slack, move adjusting plate 2 of the No. 3 guide to the outside.
2) When there is not a gap below the No. 4 guide (when there is a curl below the No. 4 guide):
   i) Check to see if the No. 4 guide has been raised up too high. If it has been raised up too high, turn the adjusting plate clockwise to lower the No. 4 guide.
   ii) If the curl still has not been removed after i), tighten the No. 5 guide tilt adjustment screw in the clockwise direction until the curl is removed.

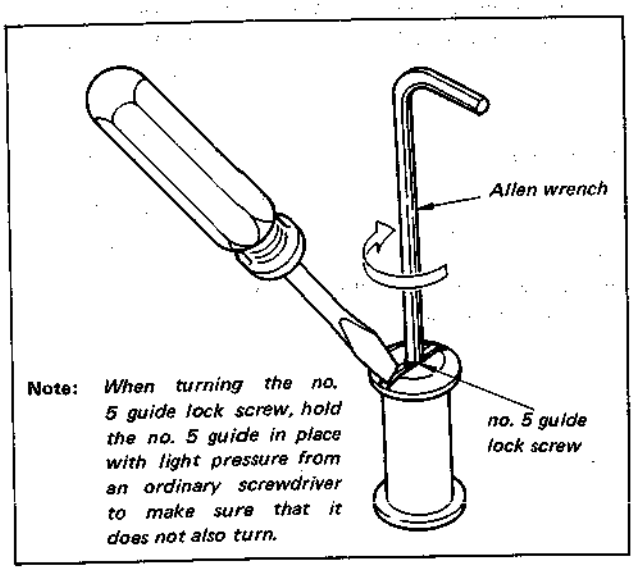


Fig. 4-6.

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to the No. ⑤ terminal on connector CN3 (on RP-8 board). Connect the external trigger to the No. ③ terminal on CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the radio frequency output waveform to 60% of its maximum level.
3) Watch the radio frequency output waveform when the No. 7 and No. 8 guides are raised (by turning the respective guide nuts counterclockwise) to let the tape run free. This waveform is called to exit free waveform.

   Note:

   Be careful not to raise the guides too far. They should be raised only about 0.3 to 0.5 mm, and the tape should not contact the lower flange of the ACE head.

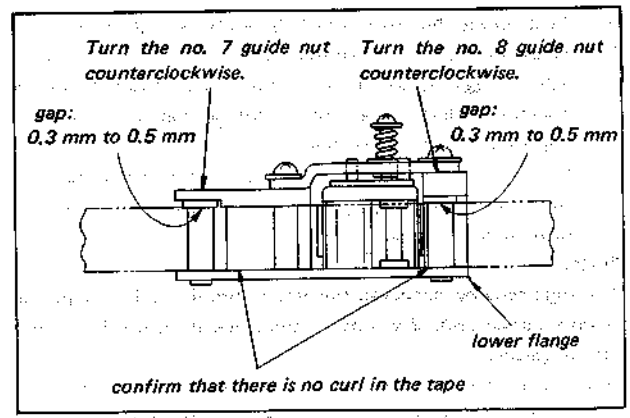


Fig. 4-7.

4) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-8(a) and (b).
   • If it is outside of this range, adjust according to the procedure in 4-3.

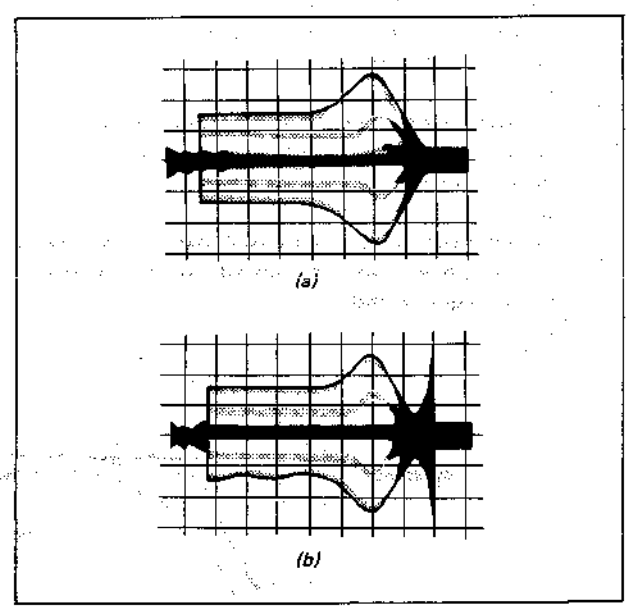


Fig. 4-8.

5) Turn the No. 7 guide nut clockwise until the waveform is flat.
6) Turn the No. 8 guide nut clockwise until the No. 8 guide is lined up with the tape (just before the waveform starts to change lower the guide until there is no curl).
7) During playback, confirm that no curl occurs in the No. 7 guide or the No. 8 guide.
8) During rewind, confirm that no curl or clearance occurs in the No. 8 guide. If there is a curl or clearance, adjust using the No. 9 guide. After adjustment, lock the guide nut.

4-2. ADJUSTMENTS AFTER REPLACEMENT OF THE ACE ASSEMBLY

After removal or replacement of the ACE assembly, perform the adjustments listed below.

4-2-1. Exit side tracking adjustment
4-2-2. CTL head (ACE assembly) position adjustment
4-2-3. Audio head (ACE assembly) azimuth adjustment
4-2-4. Audio head (ACE assembly) height adjustment

4-2-1. Exit Side Tracking Adjustment

1) Set the parallel plate (SL-0657 in the list of fixtures and tools) up against the unit as shown in Fig. 4-9. and turn the tilt adjustment screw to adjust the audio head vertically.

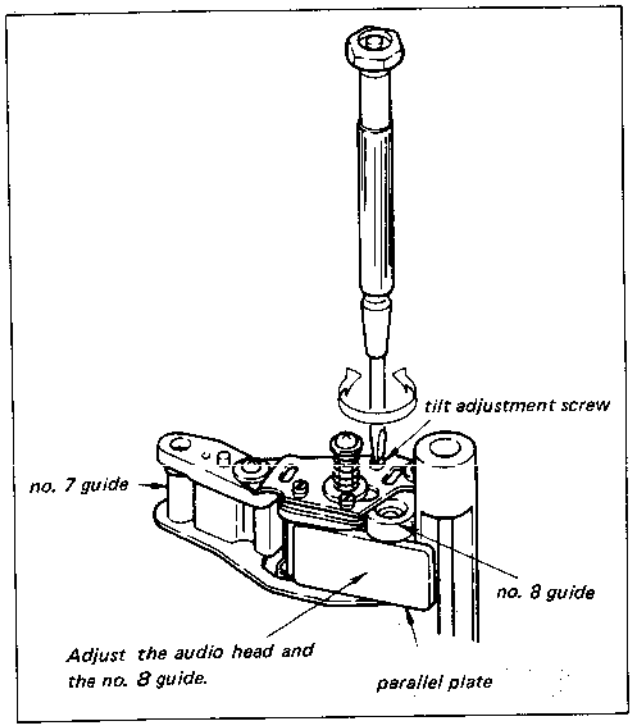


Fig. 4-9.

2) Connect the oscilloscope to terminal ⑤ of connector CN3 (on RP-8 board). Connect the external trigger to terminal ③ of CN3.

3) Play the tracking section of the alignment tape. Adjust the tracking knob until the radio frequency output waveform amplitude is reduced to about 60% of its maximum level. maximum level.

4) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) and observe the radio frequency exit free waveform when the tape runs free.

Note:
Be careful not to raise the guide too far. Raise it about 0.3 to 0.5 mm, and be careful that the tape does not contact the lower flange of the ACE head.

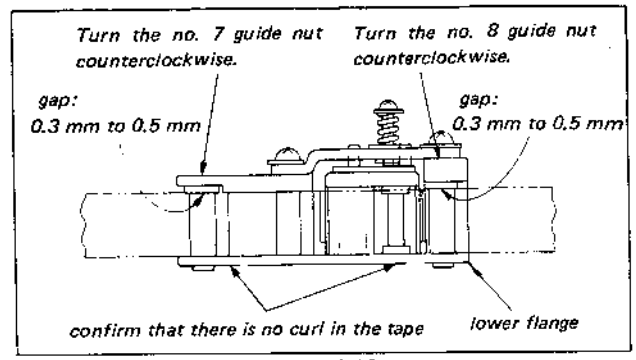


Fig. 4-10.

5) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-11(a) and (b).

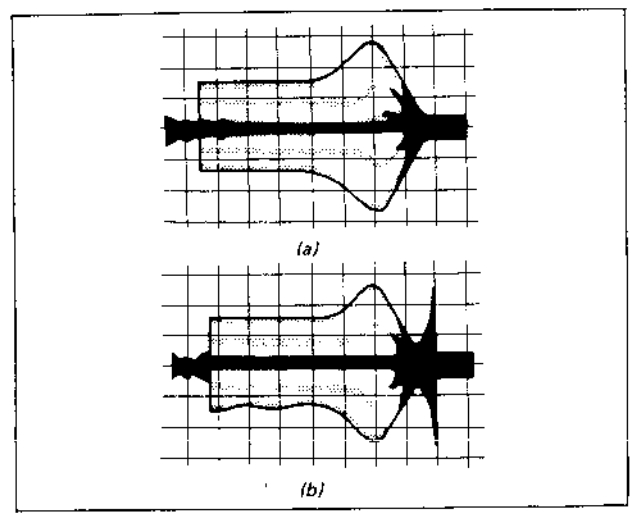


Fig. 4-11.

[When the waveform is outside this range]

- When the waveform is outside this range and has the form shown in Fig. 4-12, turn the tilt adjustment screw counterclockwise to adjust until the waveform is within the required range.

Note:
Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

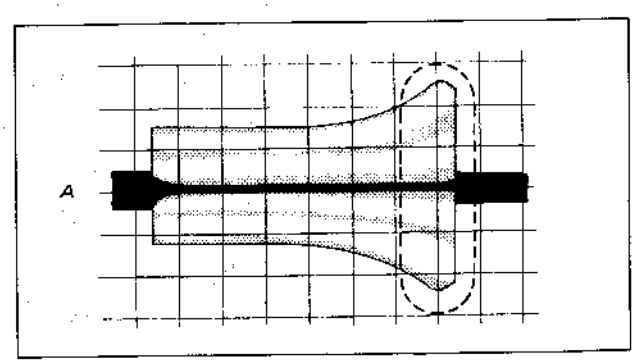


Fig. 4-12.

- When the exit free waveform is outside of the required range and has the form shown in Fig. 4-13, turn the tilt adjustment screw counterclockwise to produce waveform A (Fig. 4-12), then turn it clockwise to bring the waveform within the required range.

  Note:

  Finish the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

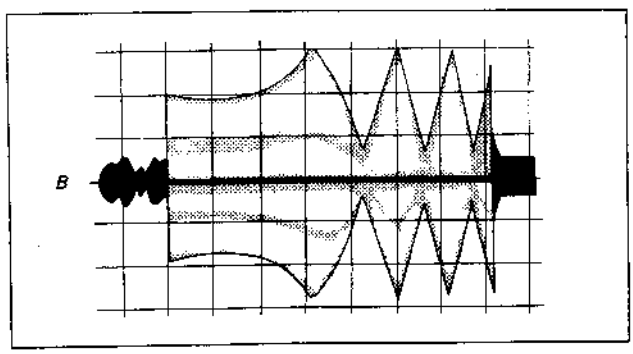
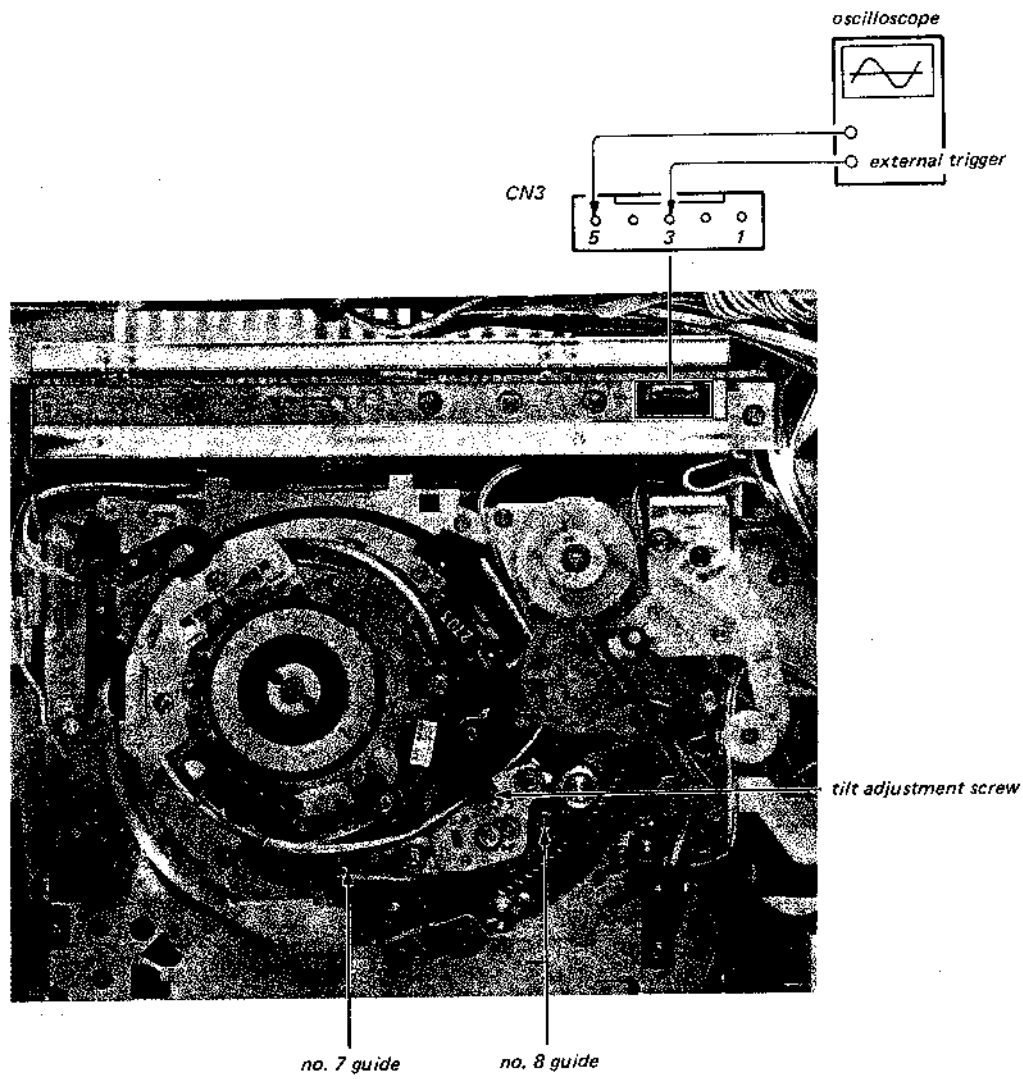


Fig. 4-13.

6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape (lower it so that there is no curl just before the waveform starts to change).
8) If the radio frequency waveform is as shown in Fig. 4-12 on the exit side, repeat the adjustment.

[Adjustment point]

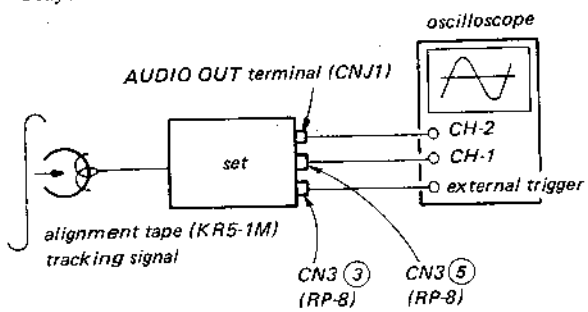


4-2-2. CTL Head (ACE Assembly) Position Adjustment

This adjustment includes the mechanical CTL head mounting position adjustment and the electrical tracking control center adjustment. The tracking control center adjustment is to be performed first, followed by the mechanical adjustment of the head mounting position.

[Connections]

1) Playback



[Method of adjustment]

1) Play the tracking signal section of the alignment tape.
2) Turn the tracking control knob clockwise or counterclockwise to the center click position. Confirm that the amplitude of the radio frequency output signal is at its maximum level. Also confirm that the audio signal 0 level position occurs at the location of the channel B waveform. If the necessary standards are not met follow the procedure in 3).

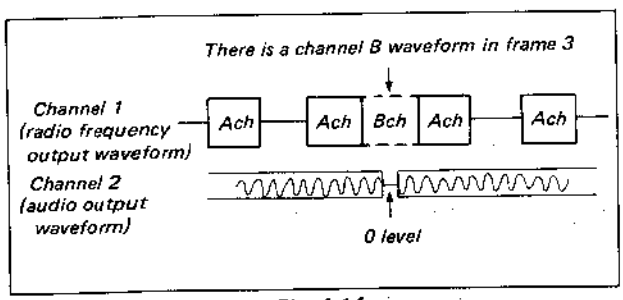


Fig. 4-14.

3) Tracking center adjustment
   Refer to electrical adjustment 2 in section 5-3-2.
4) CTL head position adjustment
   a. Set the tracking control knob at the center click position.
   b. Loosen the 2 ACE assembly position adjustment screws, then use a tool such as an ordinary screwdriver to slide the ACE assembly to where the radio frequency output waveform amplitude becomes a maximum.
   c. Play the color bar signal on the alignment tape and check the picture quality.
   d. Tighten the position adjustment screws, then lock them.

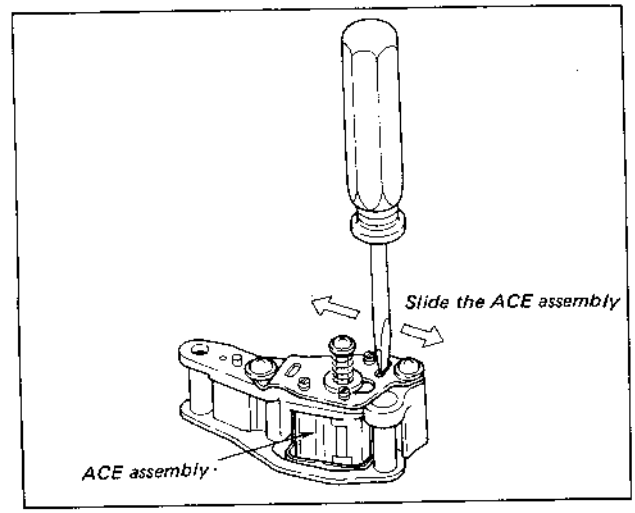
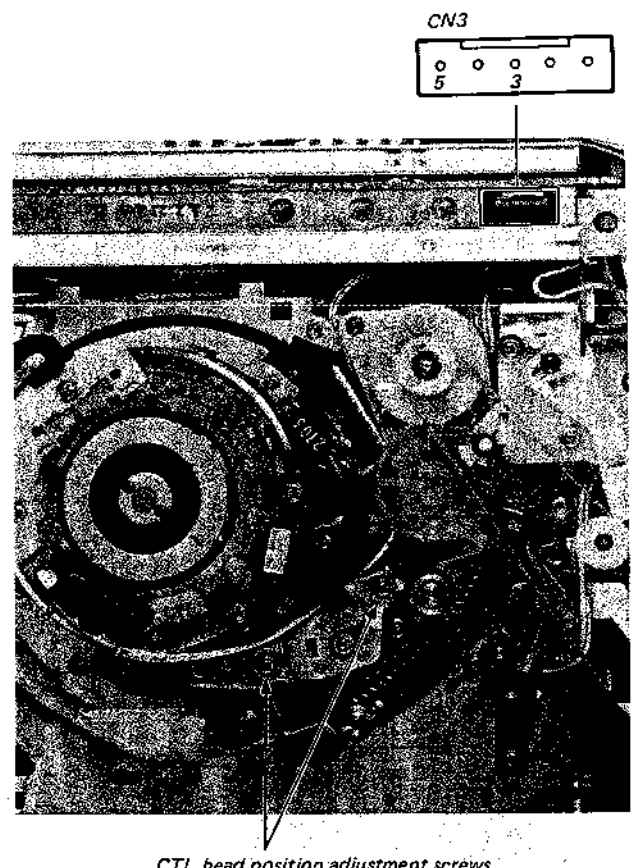


Fig. 4-15.

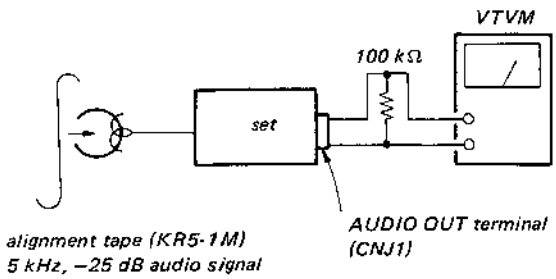
[Adjustment point]



4-2-3. Audio Head (ACE Assembly) Azimuth Adjustment

[Connections]

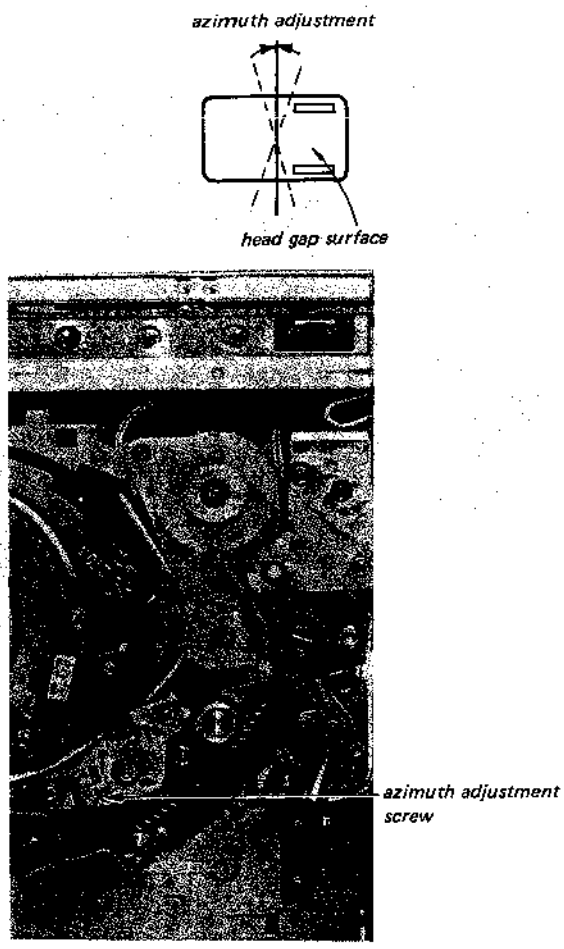
1) Playback



[Method of adjustment]

1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is a maximum.
   Note:
   Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).
3) After adjustment, lock the adjustment screw.

[Adjustment point]



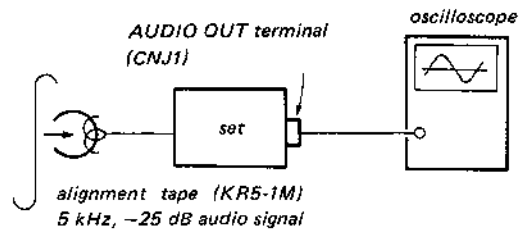
4-2-4. Audio Head (ACE Assembly) Height Adjustment

[Condition]

This adjustment must only be performed after the exit side tracking adjustment has been completed.

[Connections]

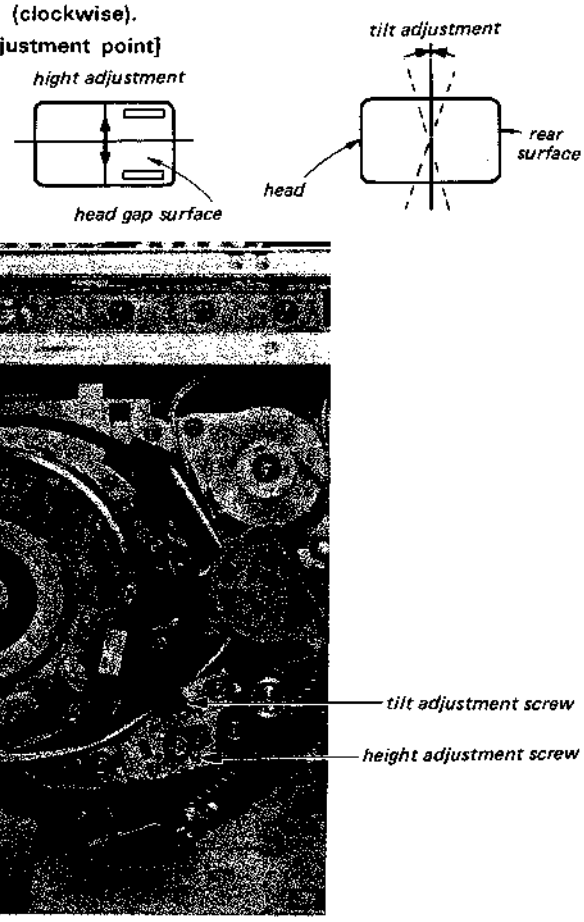
1) Playback



[Method of adjustment]

1) Play the 5 kHz, −25 dB audio signal section of the alignment tape.
2) Adjust the height adjustment screw and the tilt adjustment screw so that the amplitude of the audio line output waveform (5 kHz) becomes a maximum.
   Note:
   Both of these adjustment screws must be turned in the same direction and through the same angle, and not more than ±30°. Complete the adjustment by turning the adjustment screws in the direction of tightening (clockwise).

[Adjustment point]



4-3. ADJUSTMENTS AFTER REPLACEMENT OF THE CAPSTAN MOTOR

When the capstan motor has been removed or replaced, perform the following adjustments.

4-3-1. Capstan shaft vertical adjustment

4-3-2. Exit side tracking adjustment

4-3-1. Capstan Shaft Vertical Adjustment

1) Set the parallel plate (SL-0657 in the list of fixtures and tools) up against the No. 10 guide vertically, as shown in Fig. 4-16.
2) Loosen the mounting screw, then turn adjustment screw until the capstan motor shaft is vertical.
3) After the adjustment, tighten the mounting screw.

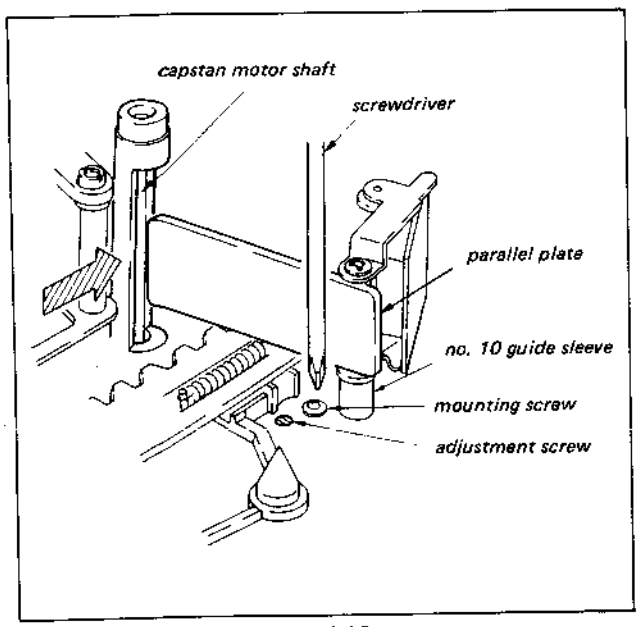


Fig. 4-16.

4-3-2. Exit Side Tracking Adjustment

1) Connect an oscilloscope to terminal No.⑤of connector CN3 on RP-8 board. Then connect the external trigger to terminal ③ of CN3.
2) Play the tracking section of the alignment tape. Adjust the tracking knob until the amplitude of the radio frequency output waveform is reduced to about 60% of its maximum level.
3) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) to free the running of the tape, and observe the radio frequency exit free waveform.

Note:

Be careful not to raise the guides too far. Raise them about 0.3 to 0.5mm. Make sure that the tape does not touch the lower flange of the ACE head.

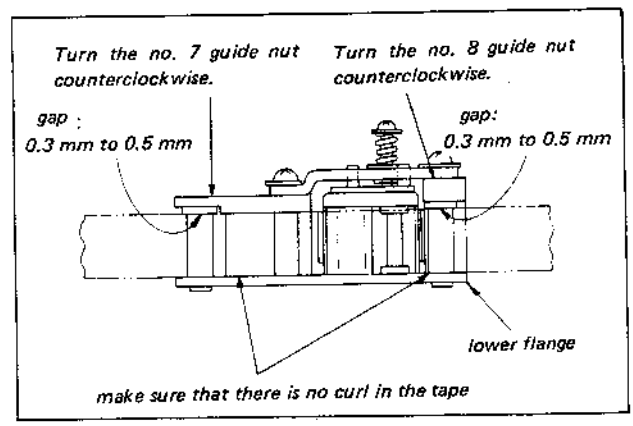


Fig. 4-17.

4) At this time, confirm that the exit free waveform is within the range shown Fig. 4-18(a) and (b).

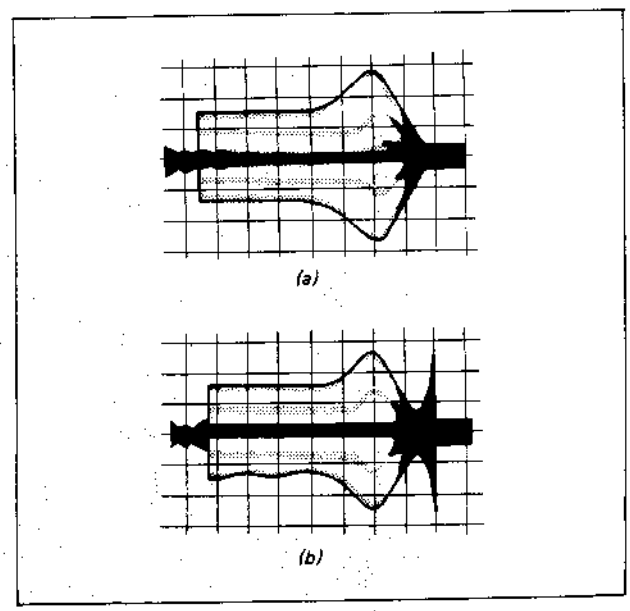


Fig. 4-18.

[When the waveform is out of range]

- When the exit free waveform is out of the correct range, and is in the form shown in Fig. 4-19, adjust as follows.
  Loosen the capstan mounting screw, then turn the adjustment screw counterclockwise until the waveform falls within the range shown in Fig. 4-18(a) and (b).
  Note:
  When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further.
  Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

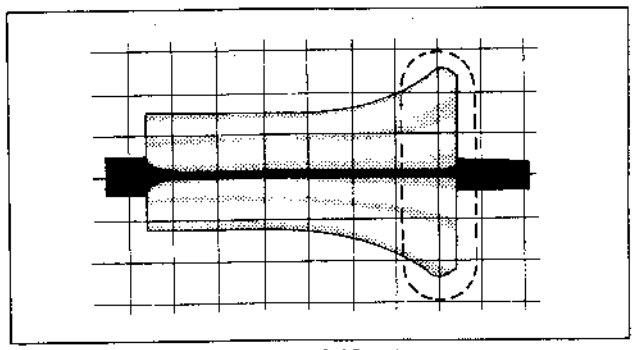


Fig. 4-19.

- If the exit waveform is outside of its correct range and has the form shown in Fig. 4-20, adjust as follows. Loosen the capstan mounting screw, then turn the adjustment screw clockwise until the waveform is brought within the range shown in Fig. 4-18(a) and (b).

[Adjustment point]

Note:
When turning the adjustment screw, wait (10 to 15 seconds) until the waveform becomes stable before adjusting further. Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

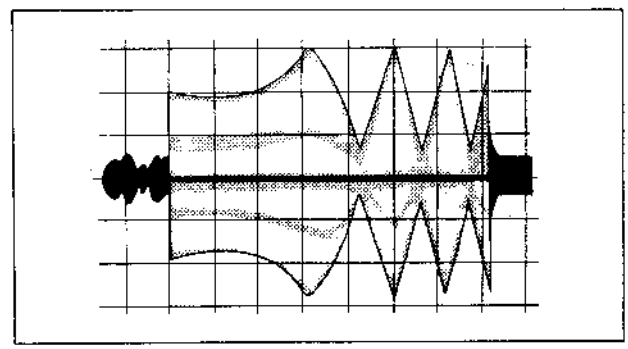
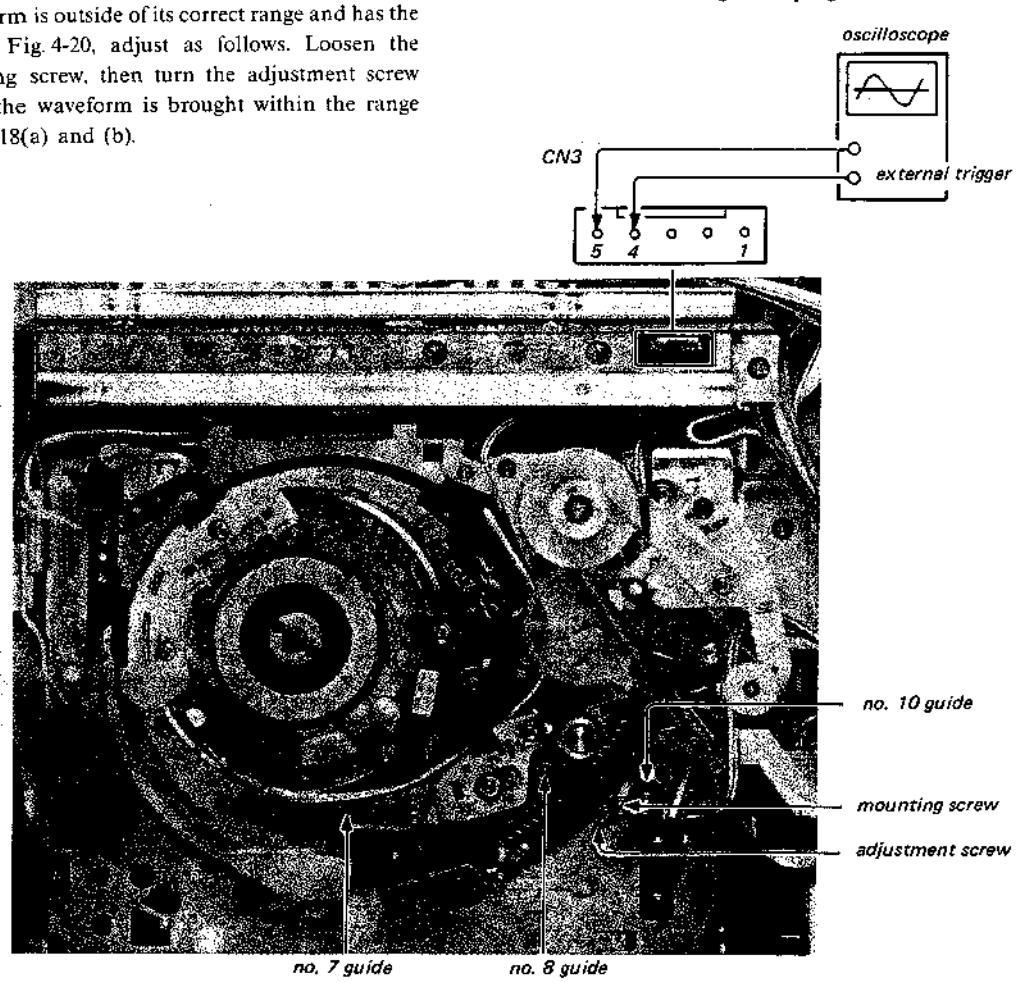


Fig. 4-20.

5) Tighten the mounting screw.
6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape. (Lower it until there is no curl just before the waveform changes.)
8) If the exit waveform rises, use the No. 7 guide to flatten it and then line the No. 8 guide up again.



4-4. HOW TO INSPECT THE TAPE TRAVELING WHEN ADJUSTING THE TAPE PATH

Adjust and check the tape path using the alignment tape following the adjustment guide, then check the tape travel using the procedure below.

1) Get one L-830 reel ready (these are widely available commercially). Remove the cassettte cover referring to Fig. 4-1 of the adjustment guide.
2) Run the L-830 tape in playback mode and check the following points.
   i) Entrance side
   Confirm that the tape does not contact the upper flange of the No. 4 guide or the No. 6 guide, and is not damaged. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-21)
   ii) Exit side
   Confirm that the tape does not contact the upper flange of the No. 7 guide or the No. 8 guide, or the upper or lower flange of the No. 10 guide, and is not scratched. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-22)
   iii) If the tape was found to not be running correctly in step ii), readjust the tape path using the alignment tape, following the adjustment guide.
   If the tape is not running correctly on the entrance side, refer to section 4-1-2 of the adjustment guide.
   If the tape is not running correctly on the exit side, refer to section 4-1-3 of the adjustment guide.

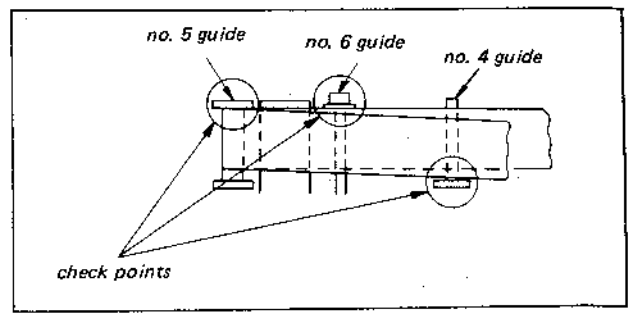


Fig. 4-21.

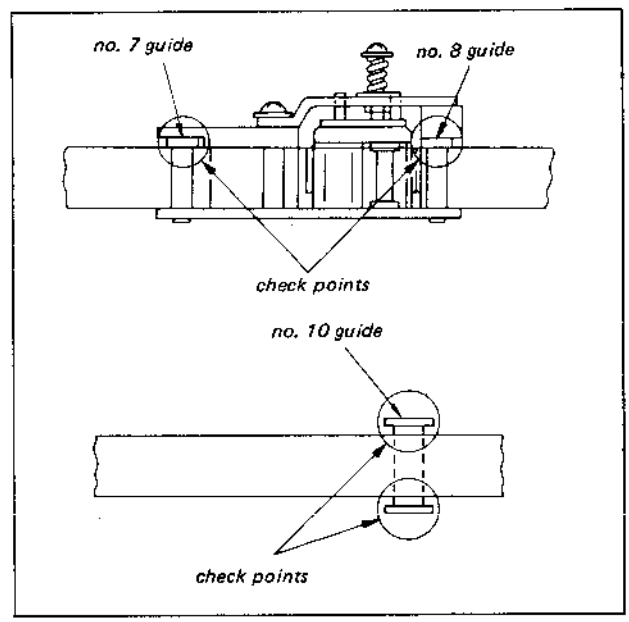


Fig. 4-22.

SECTION 5
ELECTRICAL ADJUSTMENTS

All of the instructions needed to adjust the electrical circuits in this set are given in this section.

[Instruments and tools needed]

(1) Color TV
(2) Single or double-trace oscilloscope, 15 MHz band or above, with delay mode
(3) Frequency counter (4 digits or more)
(4) NTSC pattern generator
(5) Digital voltmeter
(6) Multitester (20 kΩ/V)
(7) Audio generator
(8) Attenuator
(9) Distortion meter
(10) Alignment tape (KR5-1M) Part code: (8-969-995-82)
(11) Adjustment screwdriver (for use in adjusting semi-fixed resistors and coils) Part code: 7-700-733-01

[Setup for adjustments]

For these adjustments connect the NTSC pattern generator to the SL-2400 VHF antenna terminal, and use the output of the pattern generator as the radio frequency input signal. This radio frequency signal is processed by the internal tuner in the VTR and the intermediate frequency circuit. The video output signal from the intermediate frequency circuit must satisfy the specifications shown in the diagram below. Connect the oscilloscope to TP2 on YC-22 board to check the video output signal.

The items to be checked are the following:

(1) The amplitude of the horizontal synchronization signal must be about 0.3 Vp-p.
(2) The amplitude of the video signal must be about 0.7 Vp-p.
(3) The amplitude of the burst signal must be about 0.3 Vp-p.

The video (color bar) signal used in the adjustments is shown in Fig. 5-1.

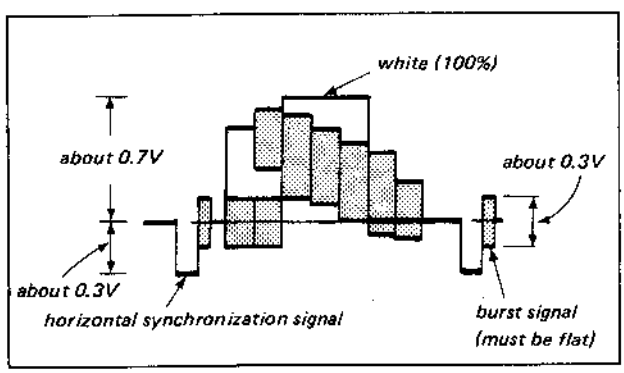
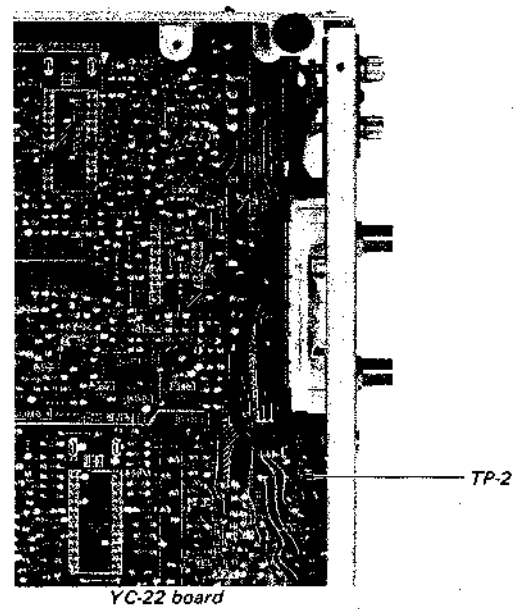


Fig. 5-1. Pattern generator color bar signal



[Method of terminating in 75Ω]

To terminate the video output terminal (CNJ2), do it as shown in Fig. 5-2.

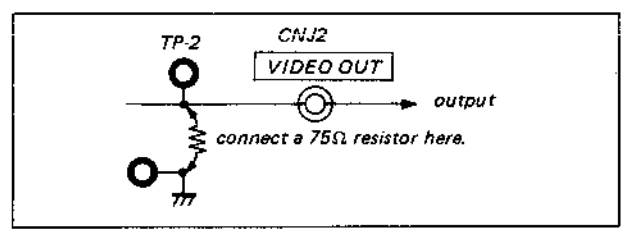


Fig. 5-2. 75Ω termination

(contents of the KR5-1M alignment tape)

	mode	video signal	audio signal	time
1	βII	Color Bar	3kHz −5dB	4 minutes each
2		Monoscope	333Hz −25dB	
3		RF sweep	5kHz −25dB	
4		Tracking	1kHz −5dB	
5	βIII	Color Bar	3kHz −5dB	
6		Monoscope	5kHz −25dB	
7		Color Bars/ Beta hi-fi: 400Hz ± 25kHz DEV.	----------	

[On the color bar signal]

The 75% color bar signal recorded on the alignment tape is shown in Fig. 5-3.

Note:

Observed at TP2 on YC-22 board.

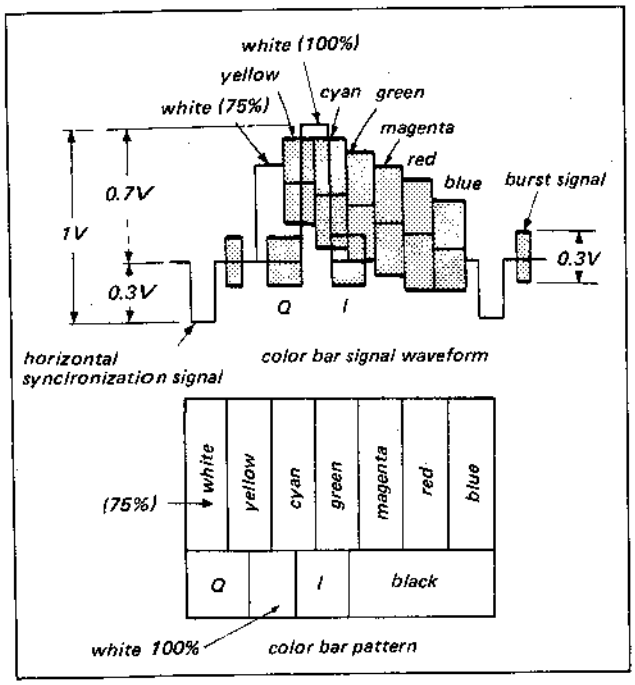


Fig. 5-3. Color bar signal an the alignment tape

[Standard input/output levels and impedances]

Input and output terminals

Video input: pin jack
input signal: 1 Vp-p, 75Ω non-equilibrium, synchronization negative

Video output: pin jack
output signal: 1 Vp-p, 75Ω non-equilibrium, sychronization negative

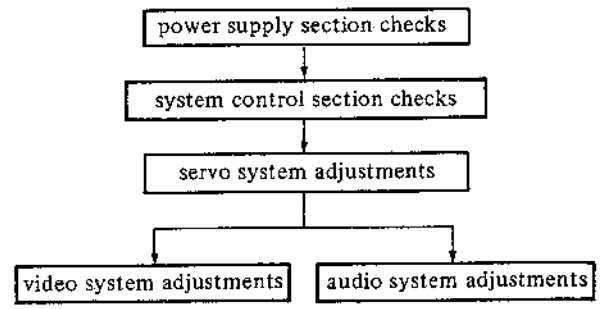
Audio input: mini jack
input level: −10 dBs (0 dBs = 0.775 Vrms)
input impedance: 47 kΩ or higher

Line audio output: mini jack
standard output: −5 dBs (440 mV) at 100 kΩ negative load
load impedance: 10 kΩ or higher

Microphone input: mini jack
−60 dBs, for low impedance use

[Adjustment procedure]

Adjust according to the procedure described below.



5-1. POWER SUPPLY SECTION CHECKS

Perform thes measurements in E-E mode (power switch ON mode).

1. Unregulated Switch 16V Check (PS-19 Board)

The voltage between terminal No. ① of CN3 and terminal No. ⑤ on the ground side should be 19V ± 3V.

2. Unregulated Switch 45V Check (PS-19 Board)

The voltage between terminal No. ① of CN4 and terminal No. ④ on the ground side should be 48V ± 5V.

3. Unregulated Switch −12V Check (PS-19 Board)

The voltage between terminal No. ② of CN4 and terminal No. ④ on the ground side should be −10.5V ± 1.5V.

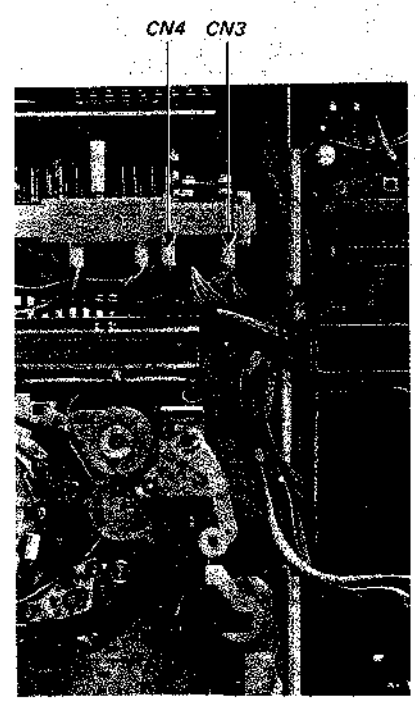
4. Switched (REG) 12V (PS-19 Board)

The voltage between terminal No. ② of CN3 and terminal No. ⑤ on the ground side should be 12V ± 0.15V.

5. Switched (System) 12V (PS-19 Board)

The voltage between terminal No. ⑥ of CN3 and terminal No. ⑨ on the ground side should be 12V ± 0.3V.

[Adjustment point (PS-19 board)]

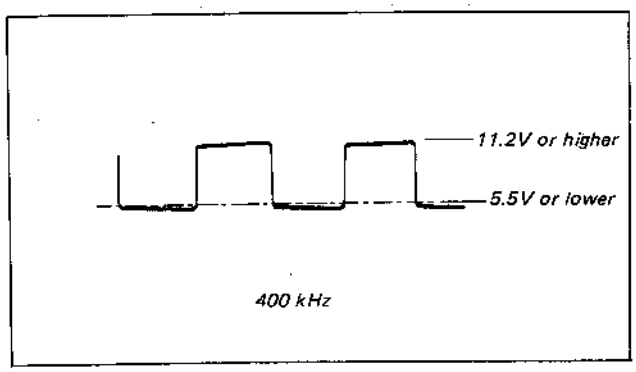


5-2. SYSTEM CONTROL SECTION CHECKS

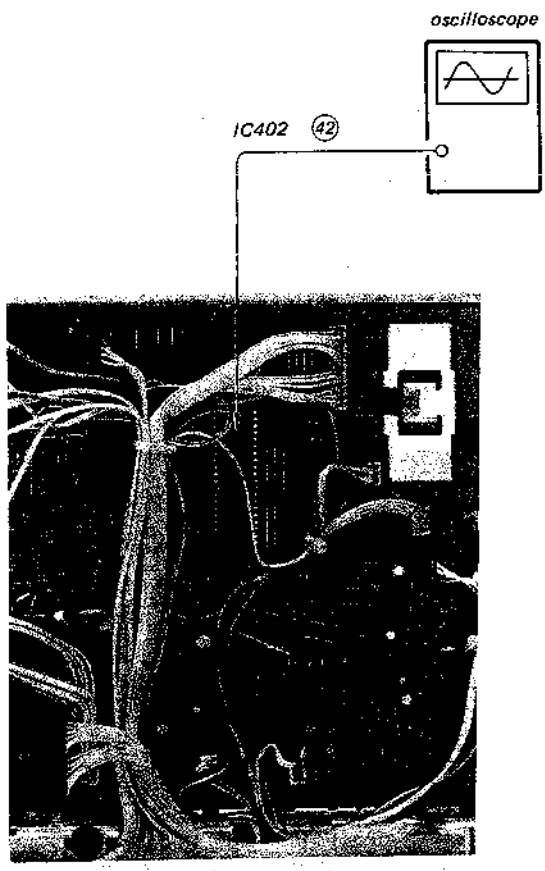
Perform these measurements in E-E mode (power switch ON mode).

1. Clock Oscillator Frequency Check

Measure at the external clock input terminal of the system control IC (terminal No. ㊷ of ICs 401 and 402) on SS-13 board.



[Measurement point (SS-13 board)]



5-3. SERVO SYSTEM ADJUSTMENTS

[Adjustment procedure]

5-3-1. Drum Servo System

1. Voltage checks
2. Clock check
3. Drum free speed adjustment
4. Radio frequency switching position adjustment
5. Drum f_H correction adjustment

5-3-2. Capstan Servo System

1. Capstan free speed adjustment
2. Tracking center adjustment

5-3-1. Drum Servo System Adjustments

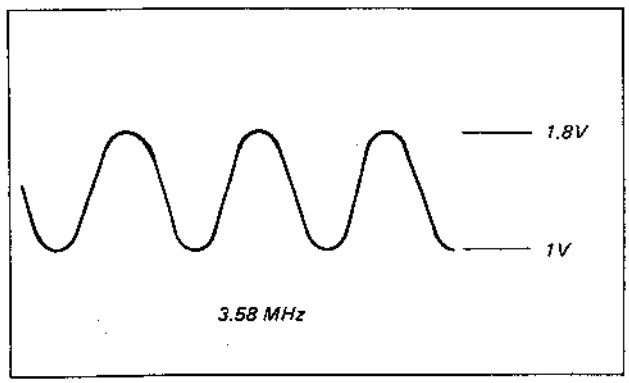
1. Voltage checks

Measure the voltage at terminals No. ㉚, No.⑦ and No.⑩ of the servo IC (IC1).

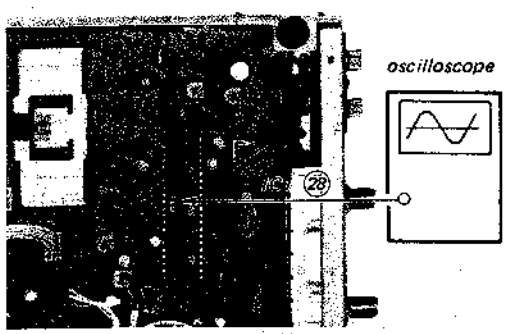
terminal No. ㉚ ..... 5.7V ± 0.3V
terminal No. ⑦ ..... 8.95V ± 0.3V
terminal No. ⑩ ..... 3.4V ± 0.3V

2. Clock check

Measure the waveform at terminal No. ㉘ of the servo IC (IC1).



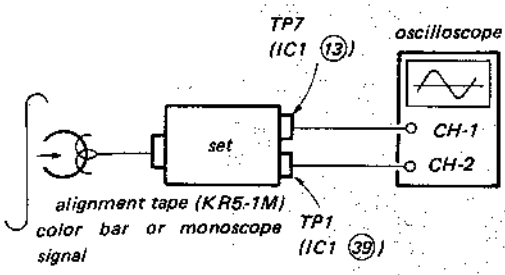
[Measurement point (SS-13 board)]



3. Drum free speed adjustment

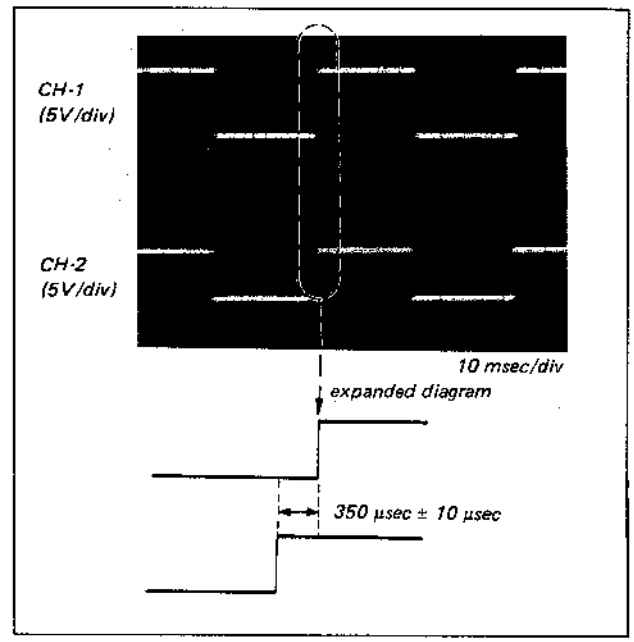
[Connections]

1) Playback

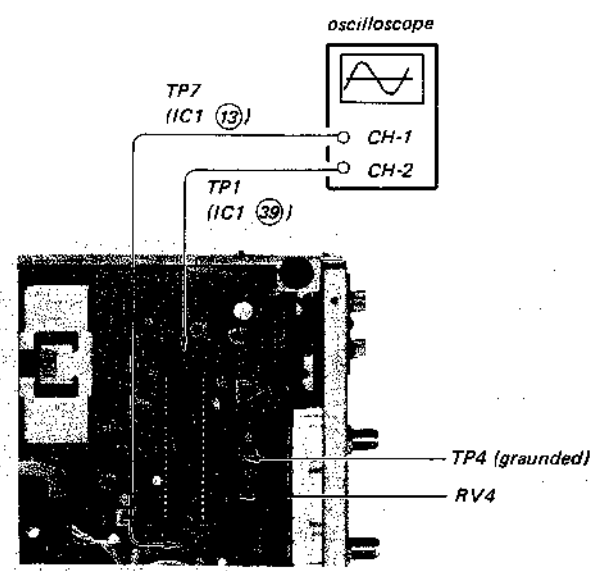


[Method of adjustment]

1) Play the color bar signal or the monoscope signal on the alignment tape.
2) Adjust to 350 μsec ± 10 μsec using RV4.



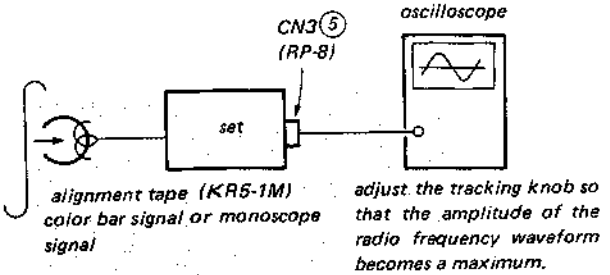
[Adjustment point: servo section (SS-13 board)]



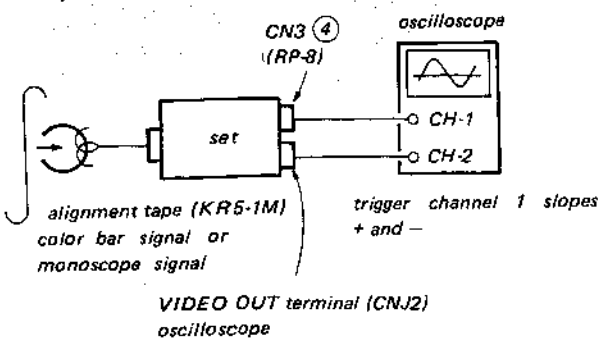
4. Radio frequency switching position adjustment

[Connections]

1) Playback

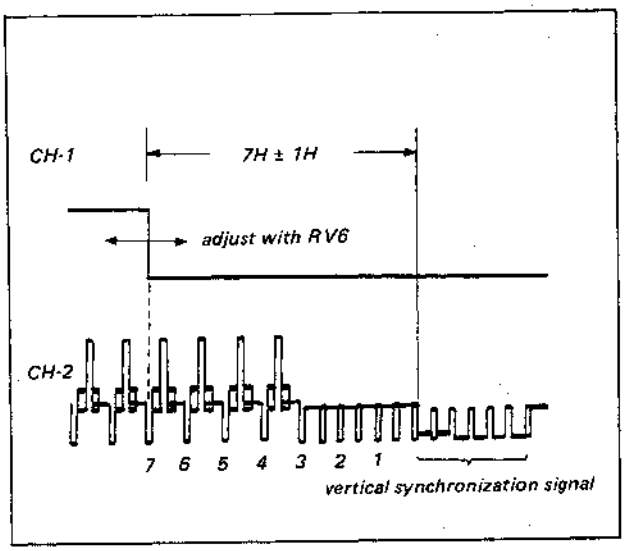


2) Playback

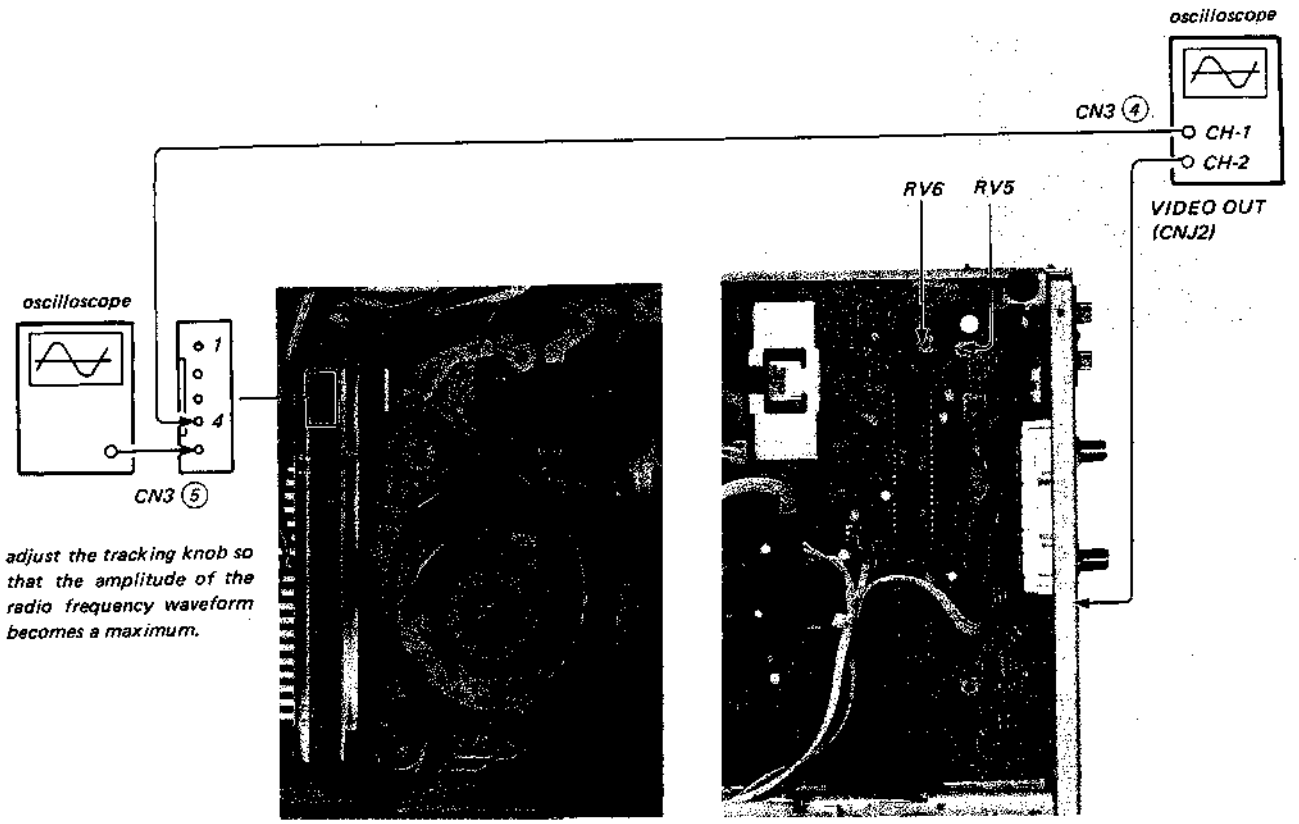


[Method of adjustment]

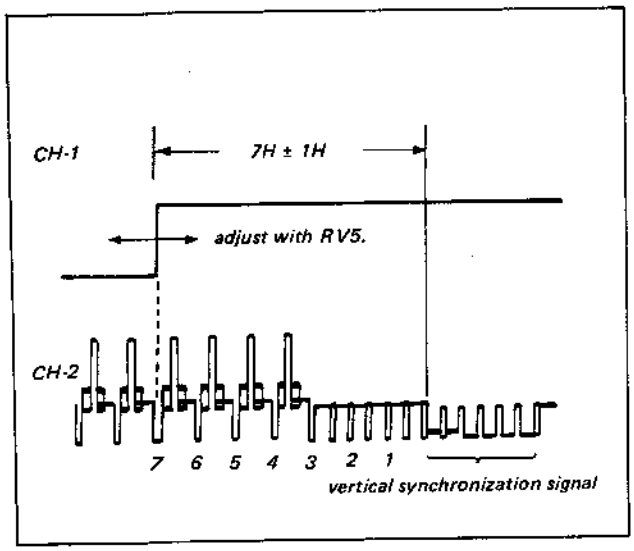
1) Play the color bar signal or the monoscope signal on the alignment tape and adjust the tracking knob so that the amplitude of the radio frequency waveform at terminal No. (5) of CN3 becomes a maximum.
2) Set the trigger slope of the oscilloscope to +.
3) Adjust RV6 (PG.A) so that the time from the falling edge of the channel 1 waveform and the vertical synchronization signal on channel 2 becomes $7_H \pm 1_H$ lines.



[Adjustment point: servo section (SS-13 board)]



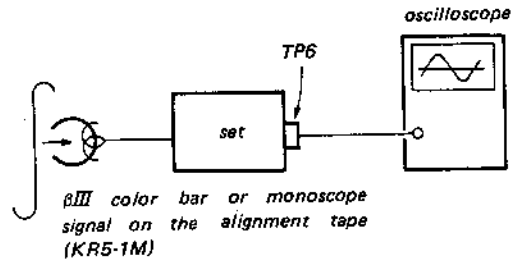
4) Set the oscilloscope trigger slope to −.
5) Adjust RV5 (PG.B) so that the time between the rising edge of the channel 1 waveform and the vertical synchronization signal on channel 2 becomes $7_H \pm 1_H$ lines.



5. Drum f_H correction adjustment

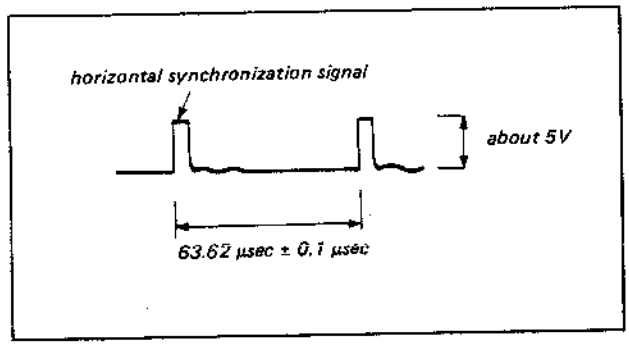
[Connections]

1) Picture search

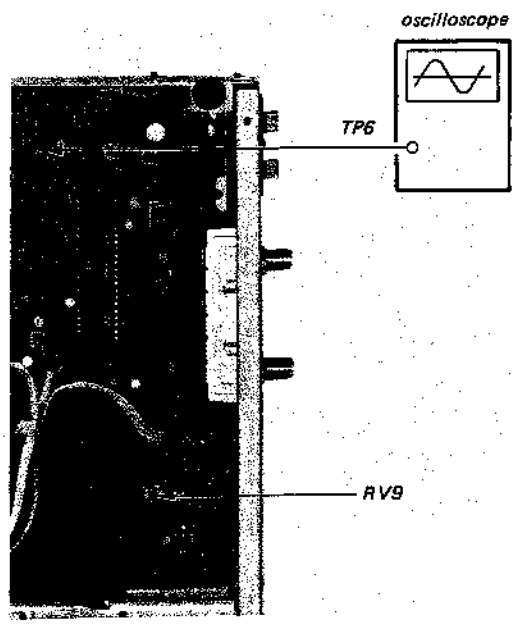


[Method of adjustment]

1) Run the set in picture search mode over the βIII color bar signal or the monoscope signal section of the alignment tape.
2) While running the picture search (◀◀: REVIEW), adjust RV9 so that the interval shown in the diagram below becomes 63.62 μsec ± 0.1 μsec.



[Adjustment point: servo section (SS-13 board)]

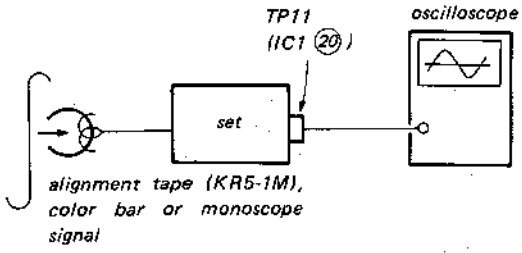


5-3-2. Capstan Servo System Adjustment

1. Capstan free speed adjustment

[Connections]

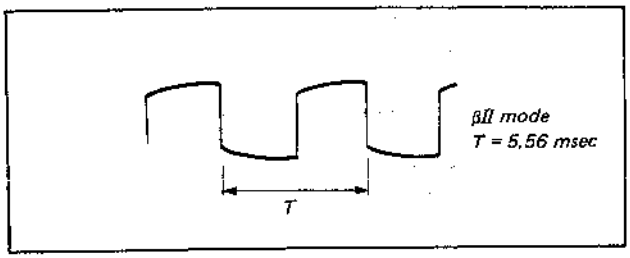
1) Playback



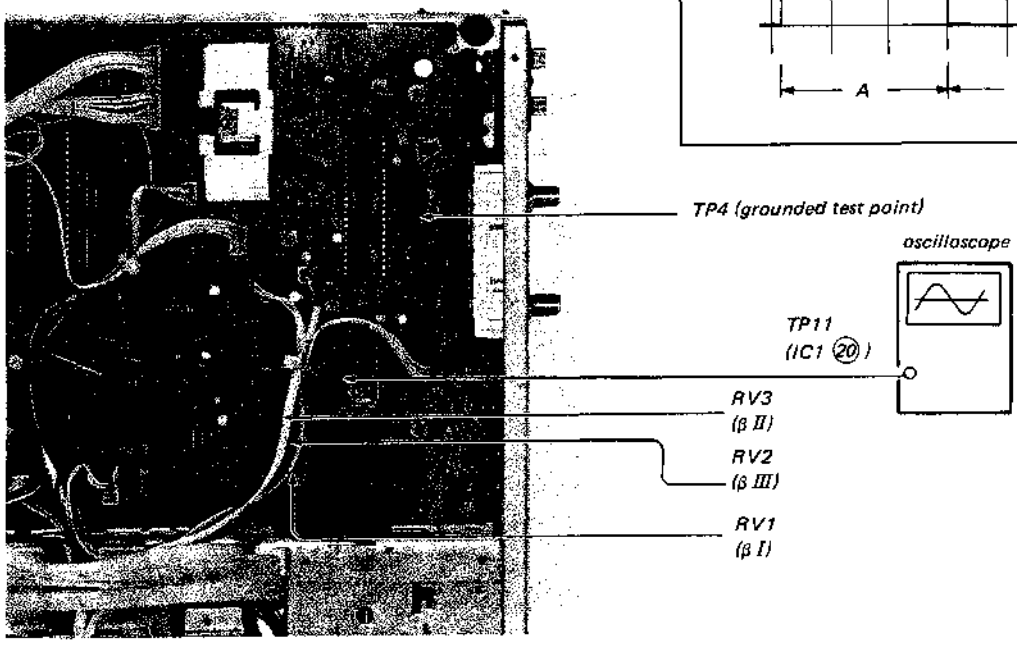
[Method of adjustment]

• βII

1) Play the βII color bar signal or the monoscope signal on the alignment tape.
2) Adjust RV3 so that the duty cycle of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at terminal No. ⑰ of IC1.

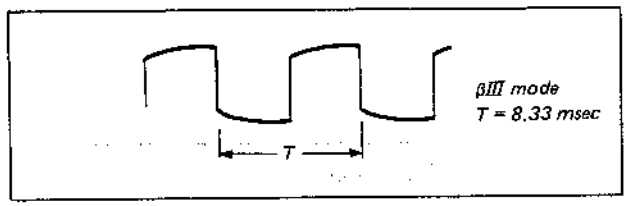


[Adjustment point: servo section (SS-13 board)]



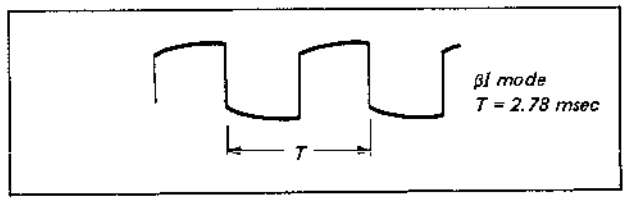
• βIII

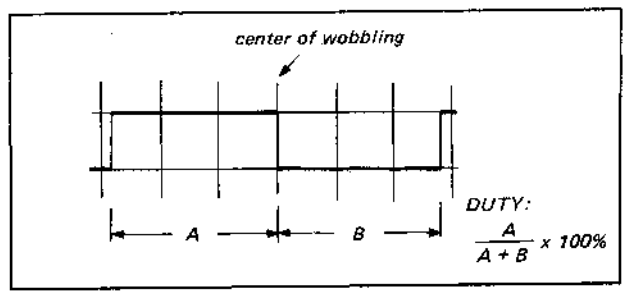
3) Play the βIII color bar signal or monoscope signal on the alignment tape.
4) Adjust RV2 so that the duty cycle of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at terminal No. ⑰ of IC1.



• βI

5) Thread the blank tape and set the unit to the REC mode. Make a connection between the 21-pin terminal (12V) and 30-pin terminal (βI MODE OUT), of IC402, and set the unit to the βI REC mode.
6) Adjust RV1 so that the duty cycle of the waveform on the oscilloscope becomes 50%.
   After adjustment, check the FG signal period at terminal No. ⑰ of IC1.





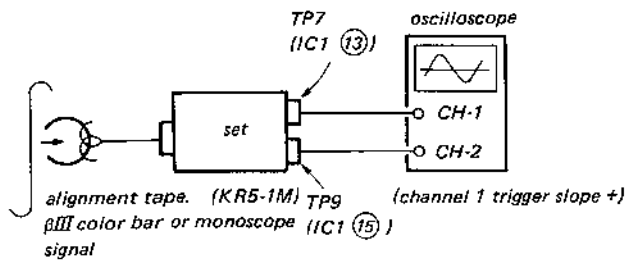
2. Tracking center adjustment

[Condition]

The tracking knob must be set to the center click position.

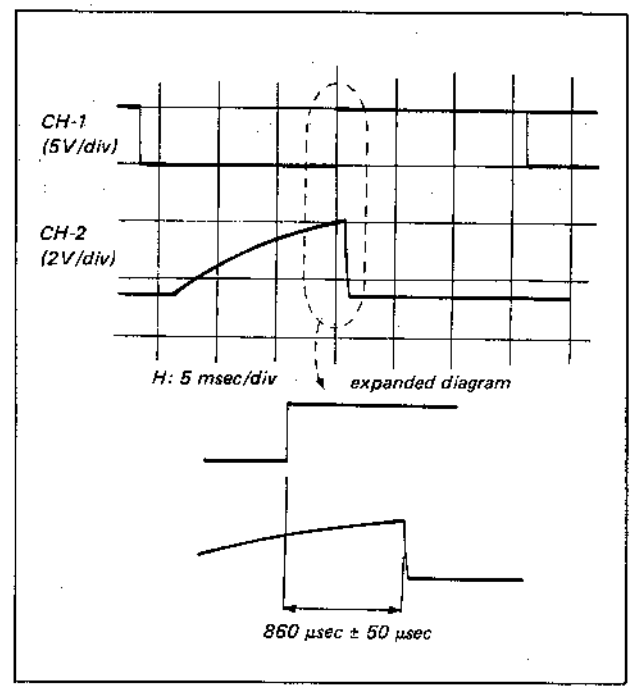
[Connections]

1) Playback

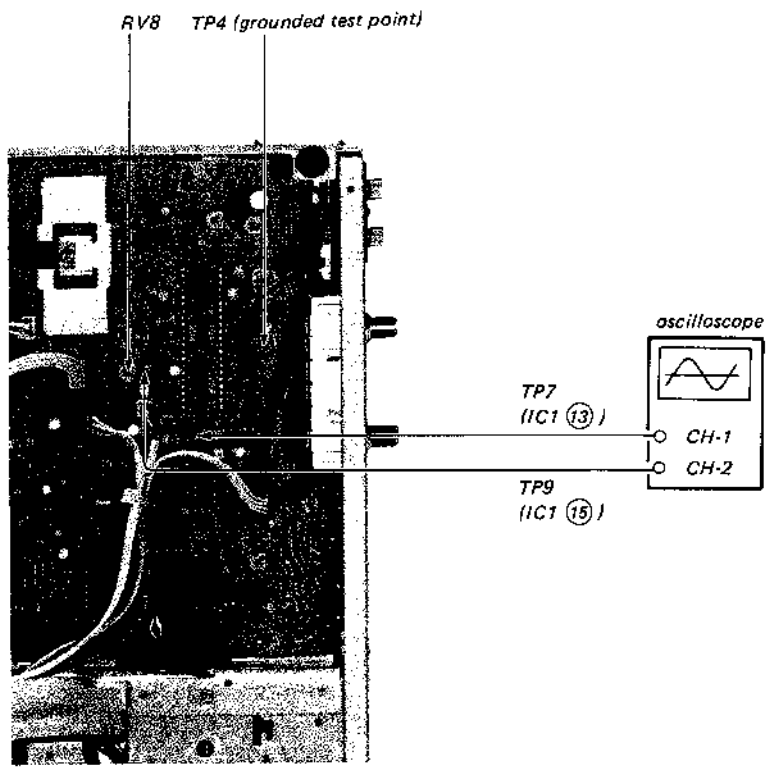


[Method of adjustment]

1) Play the βIII color bar signal or monoscope signal on the alignment tape.
2) Adjust RV8 until the interval shown in the diagram below becomes 860 μsec ± 50 μsec.



[Adjustment point: servo section (SS-13 board)]



5-4. VIDEO SYSTEM ADJUSTMENTS

As a rule the playback system is adjusted using the alignment tape. When it has been confirmed that the playback system is normal, the recording system is adjusted.
The order in which the adjustments are performed is given below. Both Y signal system adjustments and chrominance signal system adjustments are necessary for both the playback system and the recording system.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Confirm that the synchronization signal and the color burst signal meet the standards specified under "setup at the time of adjustment".

Playback system

1. Playback frequency characteristics adjustment
2. Dropout compensation sensitivity adjustment
3. Playback emphasis adjustment
4. Noise canceler II adjustment
5. 3.58 MHz oscillation frequency adjustment
6. VCO free frequency adjustment (AFC circuit)
7. Skew oscillation adjustment (0.5_H compensation circuit)
8. AGC adjustment (0.5_H compensation circuit)
9. Delay level adjustment (0.5_H compensation circuit)
10. Delay phase adjustment (0.5_H compensation circuit)
11. Delay color signal level adjustment (0.5_H compensation circuit)

Recording system

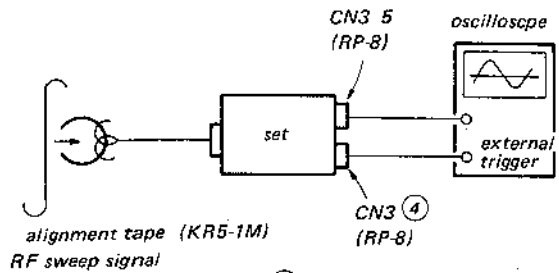
12. Peak AGC and sync AGC adjustments
13. Comb filter adjustment
14. Sync tip carrier frequency setting and FM deviation adjustment
15. 1/2 f_H shift adjustment
16. 4.27 MHz balance adjustment
17. ACC adjustment (automatic color amplitude)
18. White clip adjustment
19. Black clip adjustment
20. Brightness FM recording current adjustment
21. Color recording current adjustment

[Playback system]

1. Playback Frequency Characteristics Adjustment

[Connections]

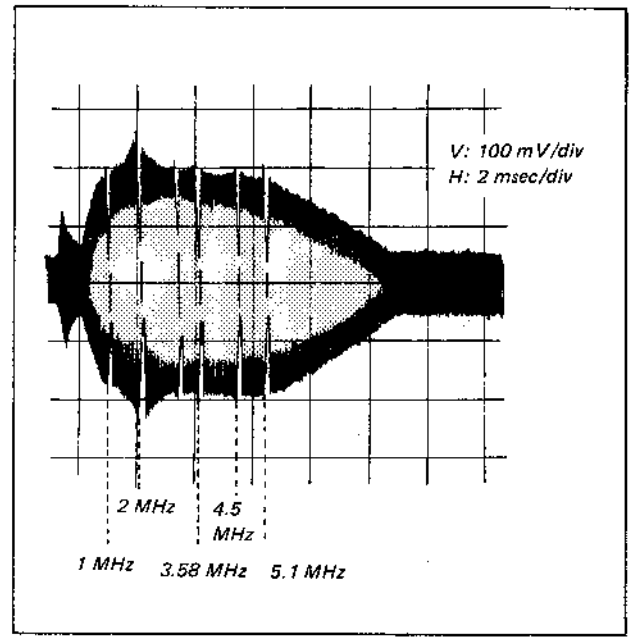
1) Playback



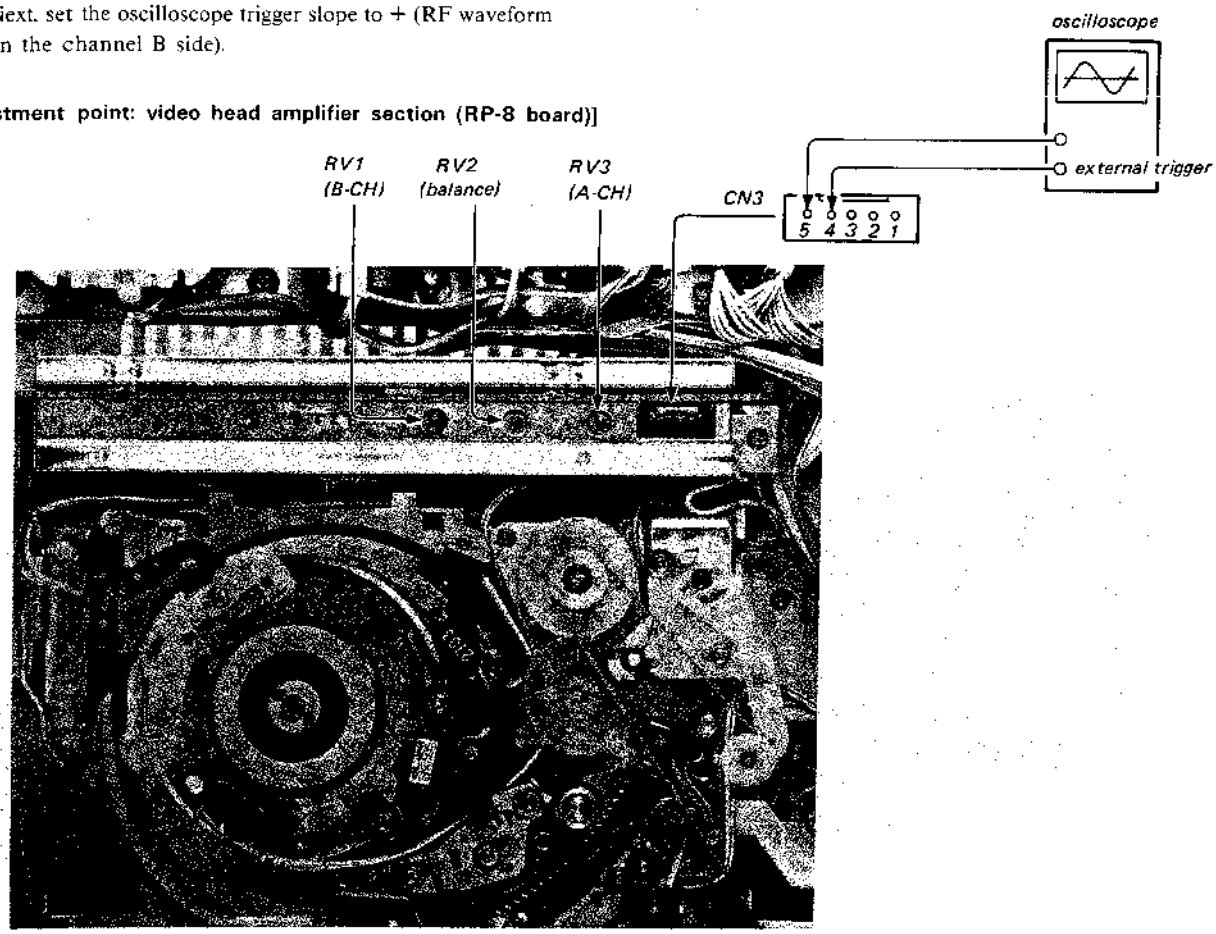
CN3 ⑤ : RF signal output
CN3 ④ : RF switching pulse

[Method of adjustment]

1) Play the RF sweep signal on the alignment tape. Adjust the tracking knob until the RF signal output waveform level becomes a maximum.
2) Set the oscilloscope trigger slope to − (RF waveform on the channel A side).
3) Adjust RV3 until the RF waveform is flat in the range of 2 MHz to 4.5 MHz, and at 5.1 MHz it is only slightly below the level at 3.5 MHz.
4) Next, set the oscilloscope trigger slope to + (RF waveform on the channel B side).
5) Adjust RV1 until the RF waveform is flat from 2 MHz to 4.5 MHz, and the level at 5.1 MHz is just slightly below that at 3.58 MHz.
6) Adjust the balance using RV2 until the levels at 4.5 MHz are equal on channel A and channel B.



[Adjustment point: video head amplifier section (RP-8 board)]



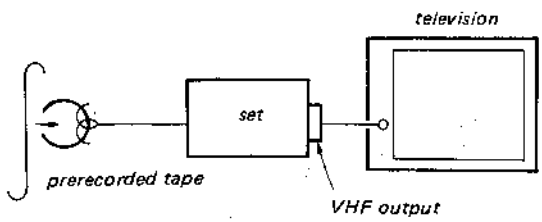
2. Dropout Compensation Sensitivity Adjustment

[Condition]

The PCM switch must be OFF.

[Connections]

1) Playback



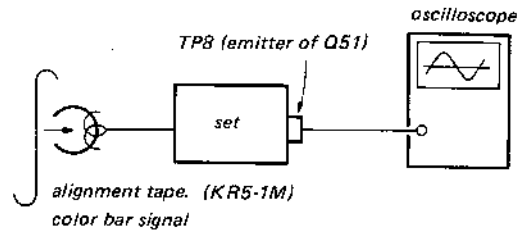
[Method of adjustment]

1) Play a section of the prerecorded tape on which there are many dropouts.
2) Turn RV5 clockwise (many dropouts will appear).
3) Turn RV5 clockwise slowly and set it at the point at which the dropouts can no longer be seen (if it is turned too far counterclockwise the picture will disappear.
4) Rewind the tape and play it again. Confirm that the dropouts are being compensated for on the section on which many dropouts were seen in step 2).
5) Turn the PCM switch ON and confirm that this removes the compensation.

3. Playback Emphasis Adjustment

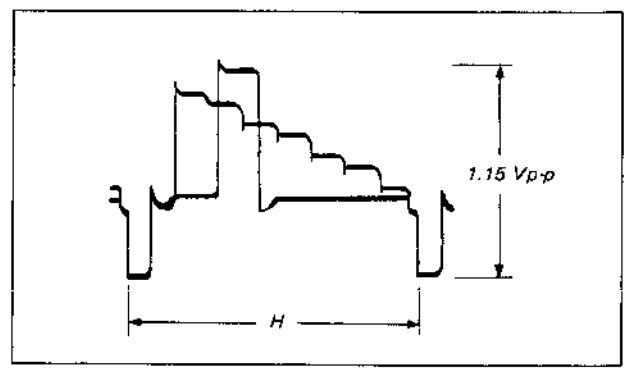
[Connections]

1) Playback

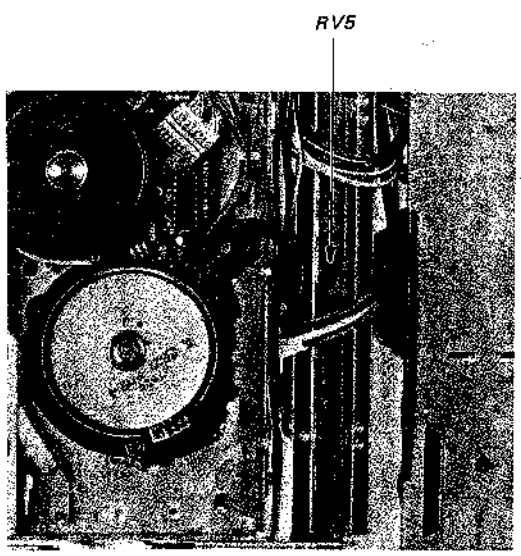


[Method of adjustment]

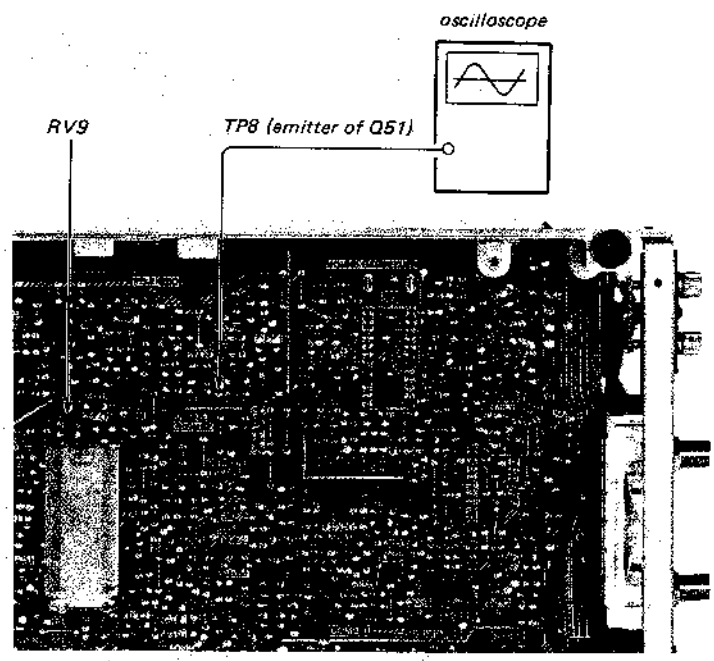
1) Play the color bar signal on the alignment tape.
2) Adjust the tracking knob to the position at which the tracking is best.
3) Adjust RV9 until the amplitude shown in the diagram below is 1.15 Vp-p.



[Adjustment point: video head amplifier section(RP-8 board)]



[Adjustment point: video section (YC-22 board)]



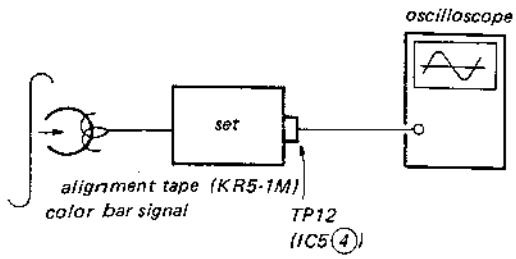
4. Noise Canceler II Adjustment

[Condition]

After this adjustment is completed, do the "playback emphasis adjustment" in section 3, then repeat the noise canceler II adjustment.

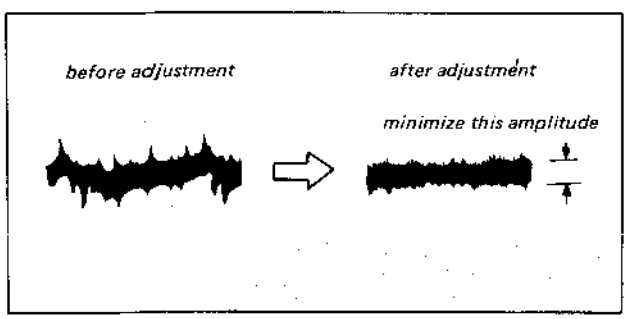
[Connections]

1) Playback

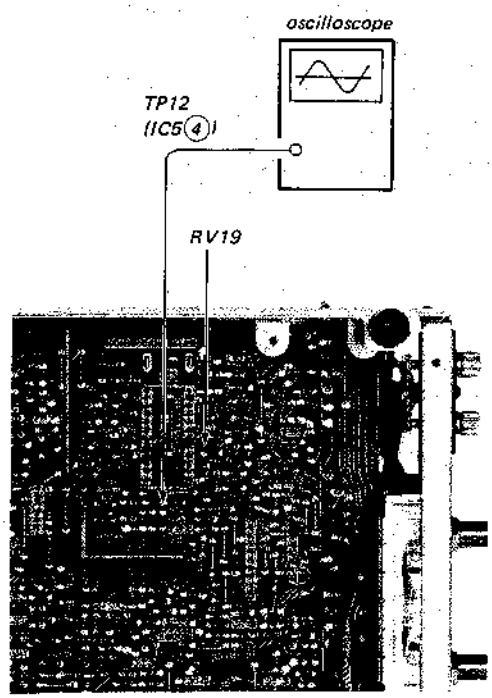


[Method of adjustment]

1) Play the color bar signal on the alignment tape.
2) Adjust RV19 until the output becomes a maximum.



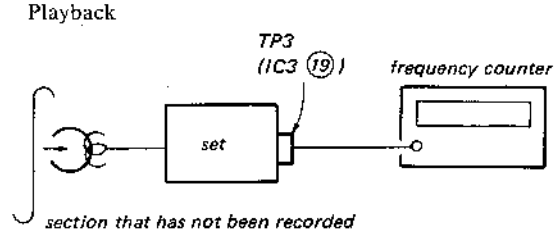
[Adjustment point: video section (YC-22 board)]



5. 3.58 MHz Oscillation Frequency Adjustment

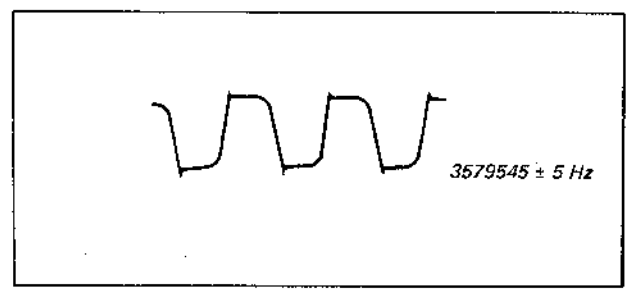
[Connections]

1) Playback

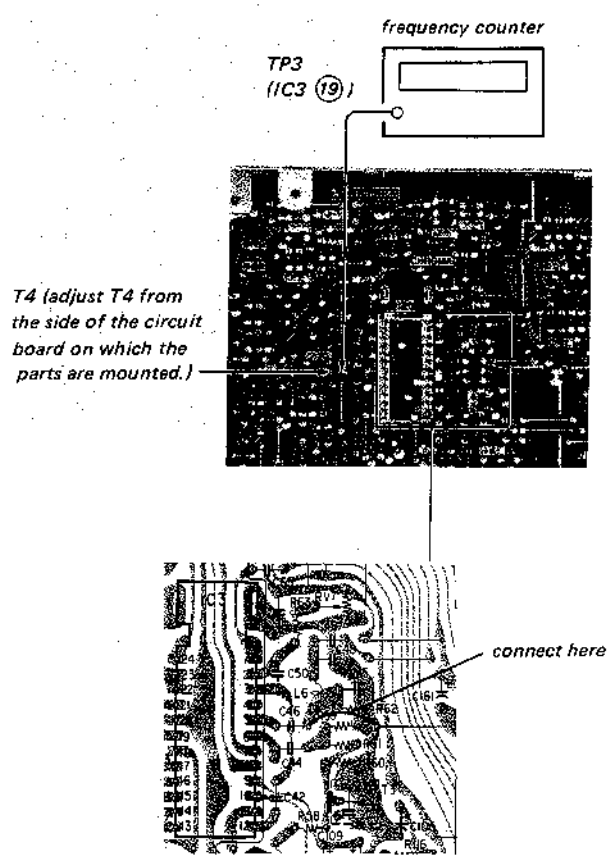


[Method of adjustment]

1) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the color signal out).
2) Adjust T4 until the frequency becomes 3579545 Hz ± 5 Hz.



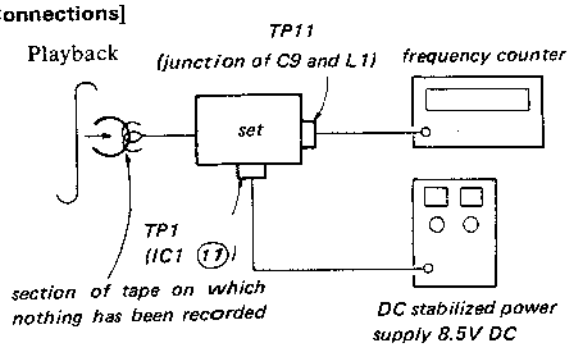
[Adjustment point: video section (YC-22 board)]



6. VCO Free Frequency Adjustment (AFC Circuit)

[Connections]

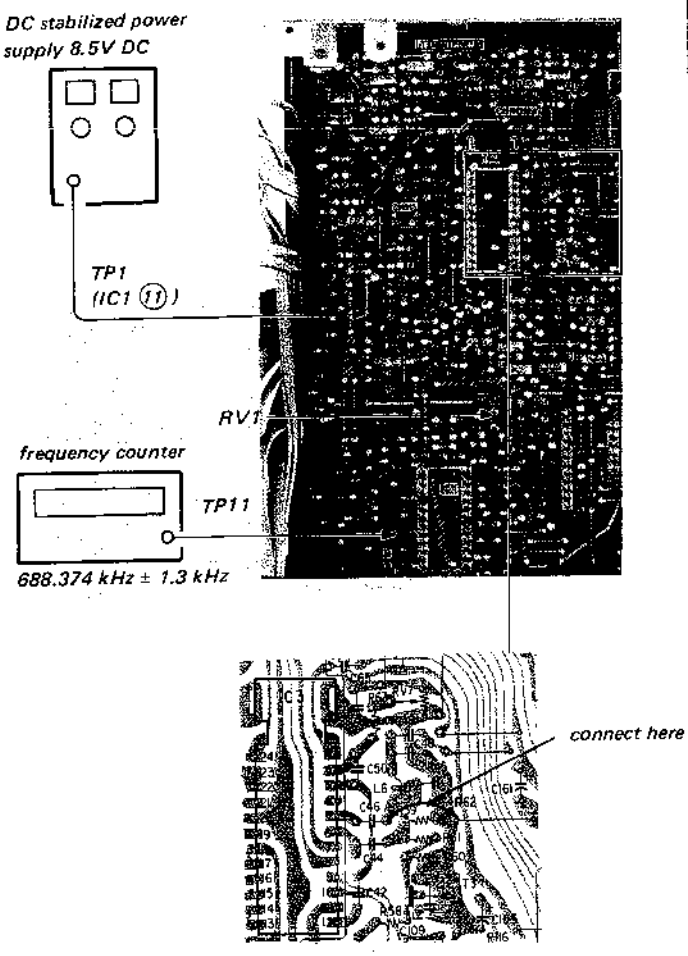
1) Playback



[Method of adjustment]

1) Apply 8.5V to TP1 (terminal No.⑪ of IC1) from the DC stabilized power supply.
2) Play a tape on which nothing has been recorded (or alternatively ground the junction of C45 and C46 to cut the reproduced color signal out).
3) Adjust RV1 until the frequency becomes 688.374 kHz ± 1.3 kHz.

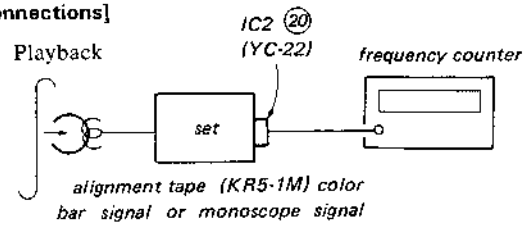
[Adjustment point: video section (YC-22 board)]



7. Skew Oscillation Adjustment (0.5_H Compensation Circuit)

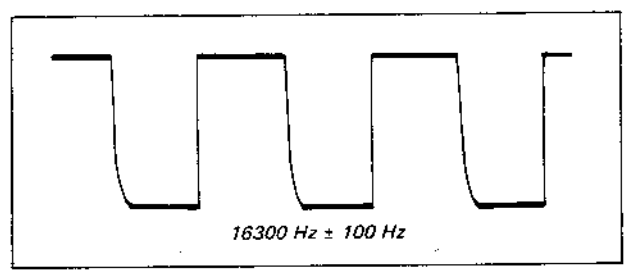
[Connections]

1) Playback

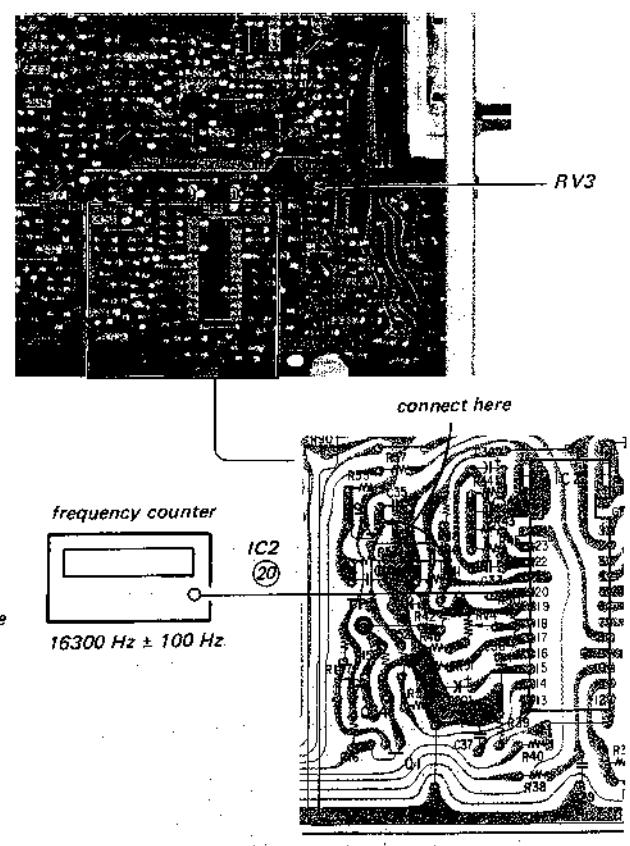


[Method adjustment]

1) Connect a lead wire between the emitter of Q9 (the 9V power supply line) and terminal No. ㉑ of IC2.
2) Play the color bar signal or the monoscope signal on the alignment tape.
3) Adjust RV3 until the reading on the frequency counter becomes 16.3 kHz ± 100 Hz.



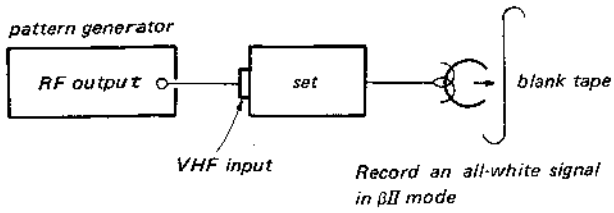
[Adjustment point: video section (YC-22 board)]



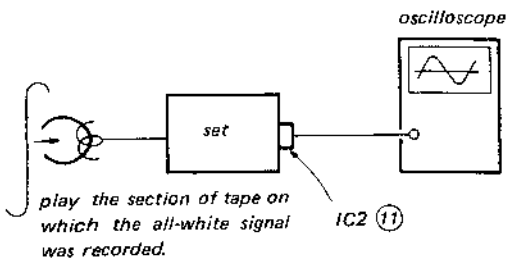
8. AGC Adjustment (0.5_H Compensation Circuit)

[Connections]

1) Recording

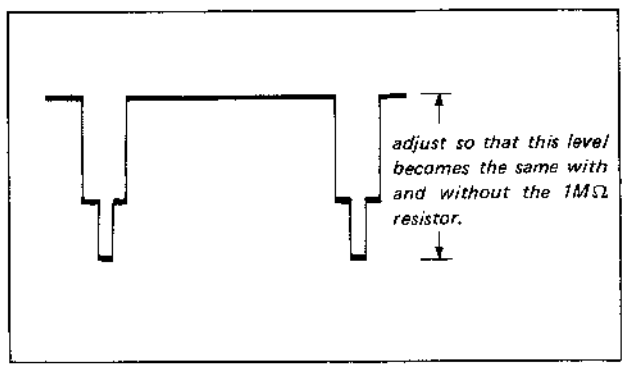


2) Playback

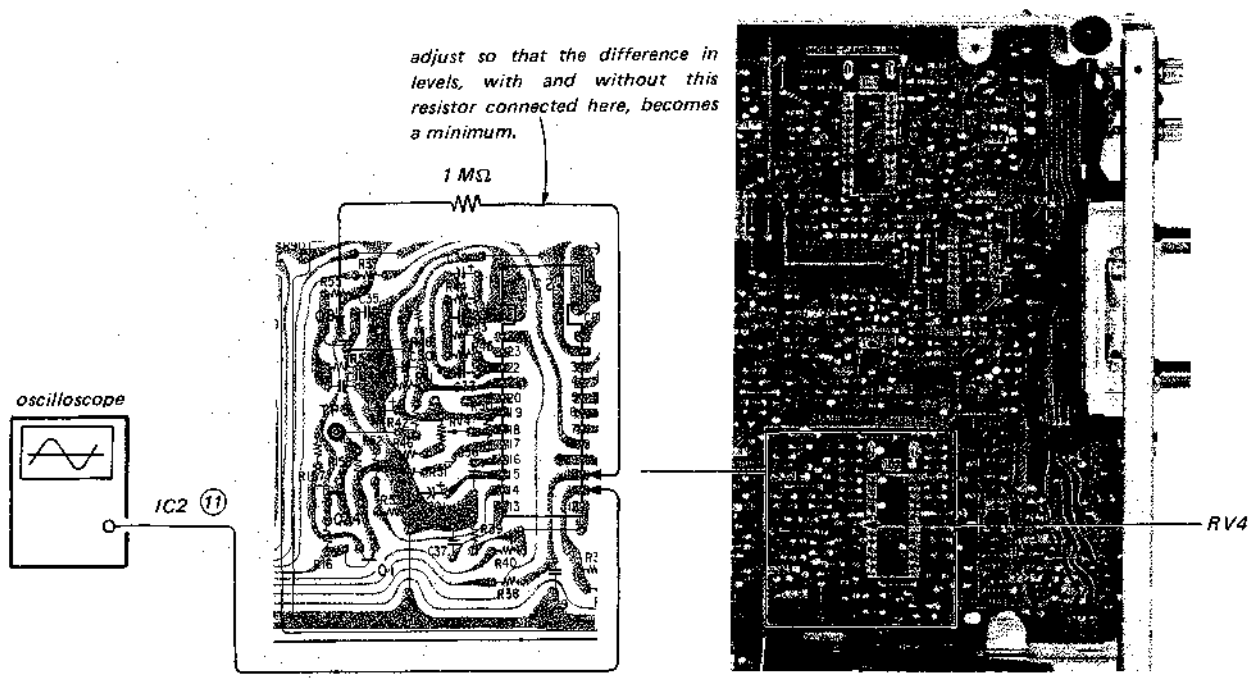


[Method of adjustment]

1) Record an all-white signal in βII mode to produce a tape with all white recorded on it.
2) Play back the section of tape on which the all-white signal was recorded.
3) Adjust RV4 until the difference in levels of the amplitude shown in the diagram below, with and without a 1 MΩ resistor connected between the collector of Q9 (the 12V power supply line) and terminal No. ⑩ of IC2 becomes a minimum (0.02V or less).



[Adjustment point: video section (YC-22 board)]



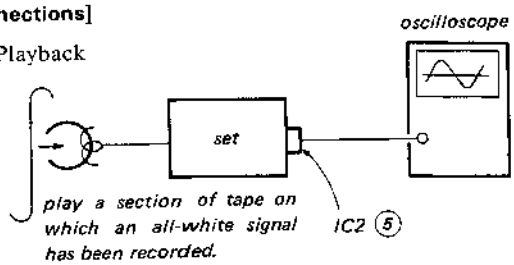
9. Delay Level Adjustment (0.5_H Compensation Circuit)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

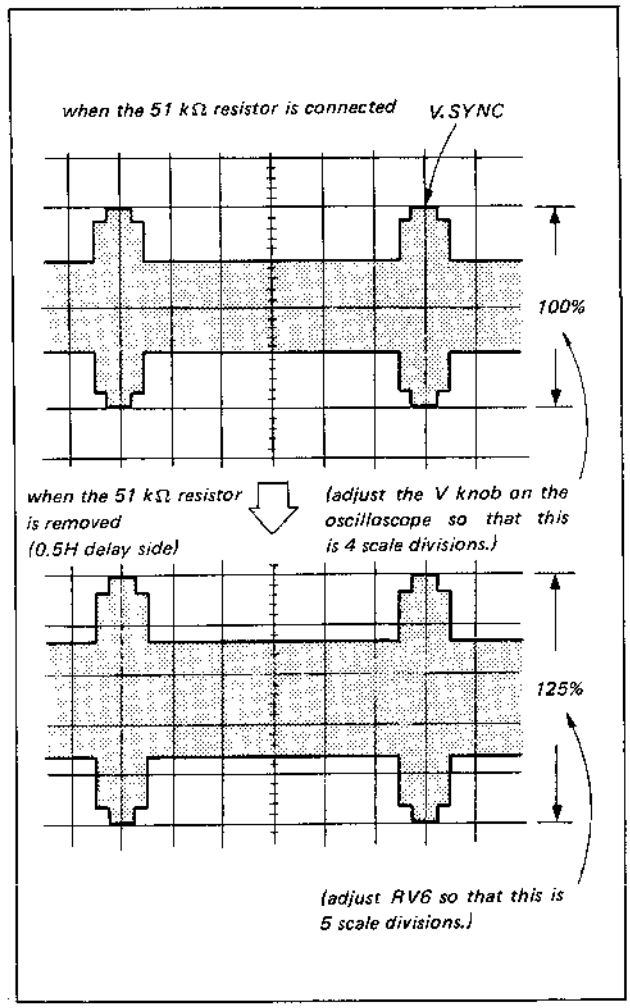
[Connections]

1) Playback

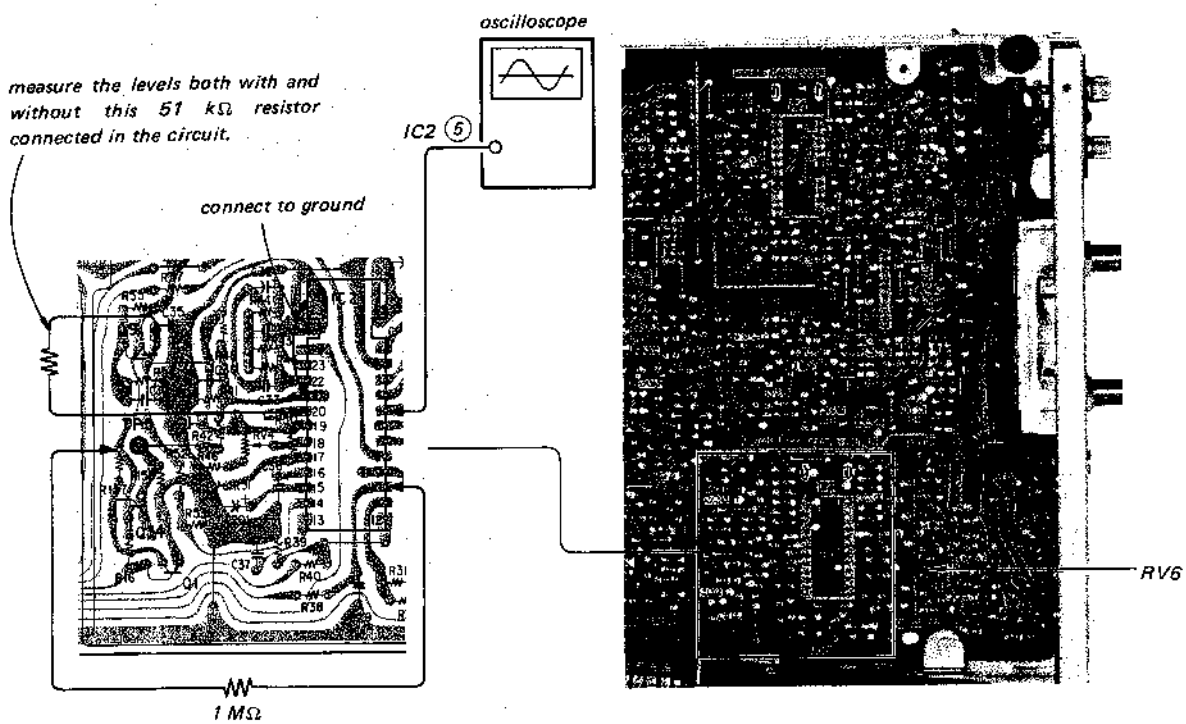


[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and terminal No. ⑩ of IC2.
2) Connect terminal No. ㉑ of IC2 to ground.
3) Play a section of tape on which an all-white signal has been recorded.
4) Measure the peak-to-peak amplitudes (see diagram at right) both with and without a 51 kΩ resistor connected between the emitter of Q9 (the 9V power supply line) and terminal No. ⑳ of IC2.
5) Adjust RV6 so that the amplitude measured without the 51 kΩ resistor in the circuit is 1.25 times that measured with the resistor in the circuit. A convenient way to do this is by adjusting the V knob on the oscilloscope so that the peak value at the V. SYNC position is 4 scale divisions; then with the resistor removed it should be 5 scale divisions.



[Adjustment point: video section (YC-22 board)]



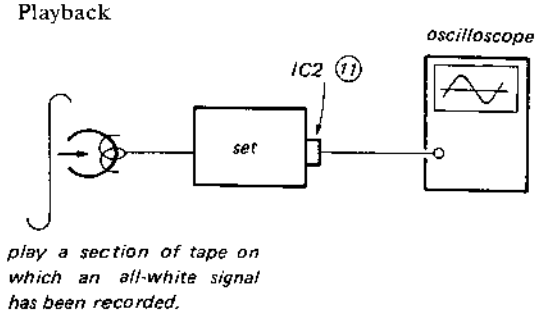
10. Delay Phase Adjustment (0.5_H Compensation Circuit)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

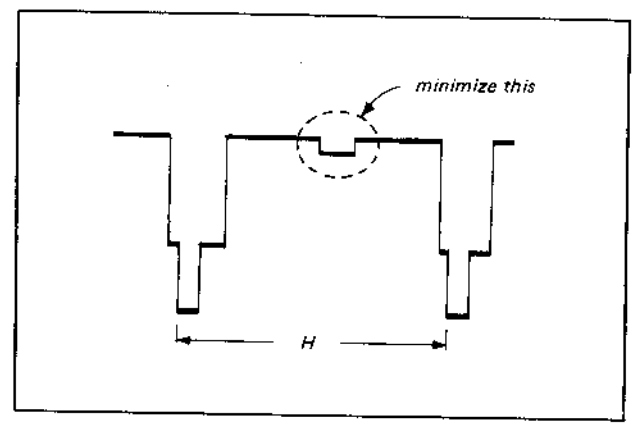
[Connections]

1) Playback

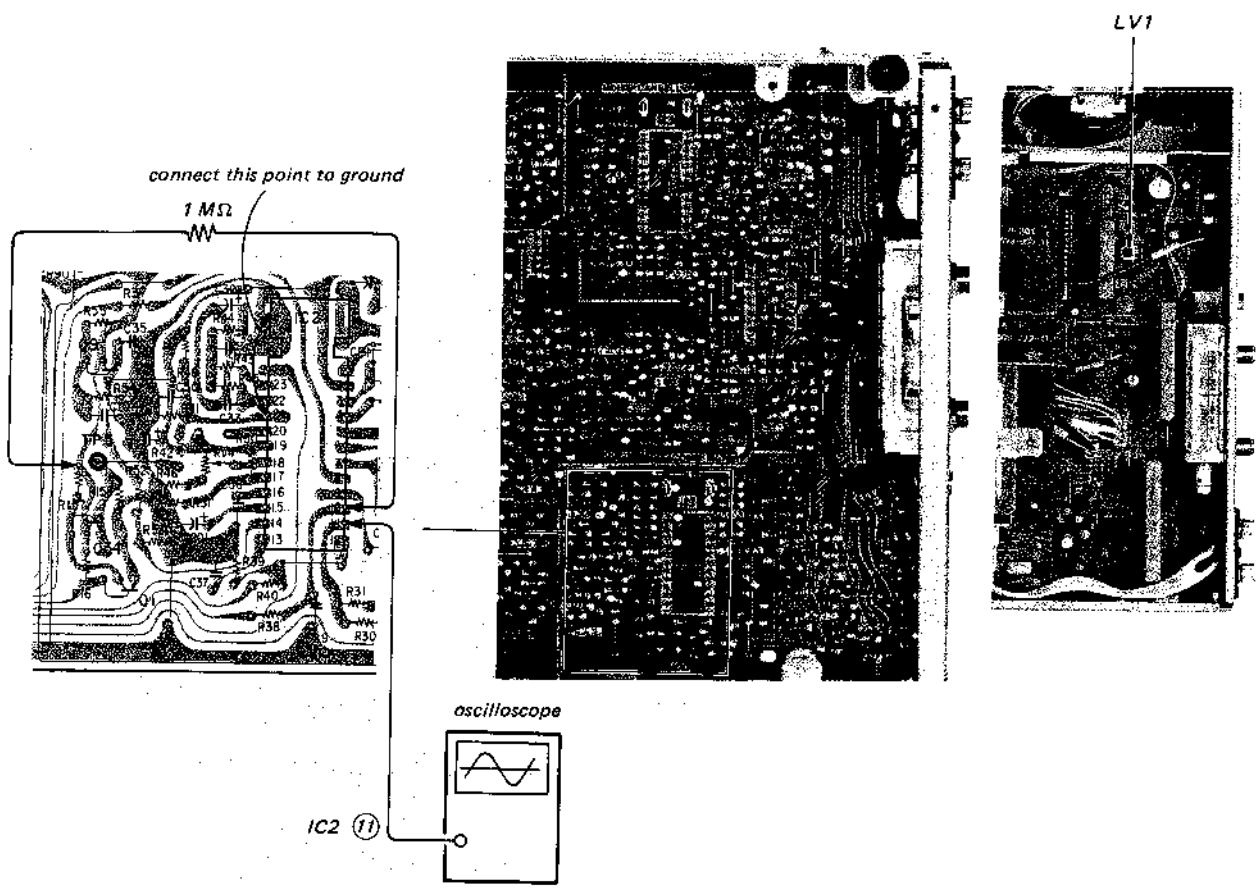


[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (12V power supply line) and terminal No. (10) of IC2.
2) Connect terminal No. (21) of IC2 to ground.
3) Play a section of tape on which an all-white signal has been recorded.
4) Adjust LV1 so that the fuzziness due to the horizontal synchronization signal that appears in the central part of the waveform becomes a minimum.



[Adjustment point: video section (YC-22 board)]



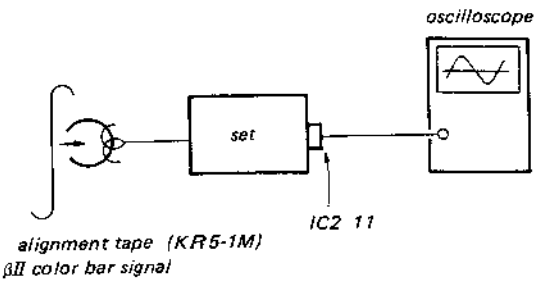
11. Delay Color Signal Level Adjustment (0.5_H Compensation Circuit)

[Condition]

Adjustments 9 through 11 must be done twice, in the order 9 — 10 — 11 — 9 — 10 — 11.

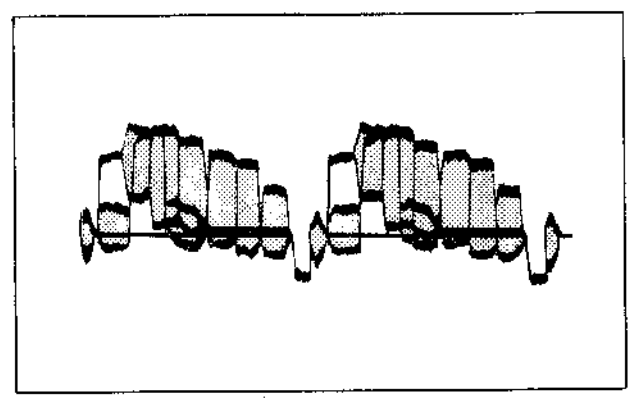
[Connections]

1) Playback

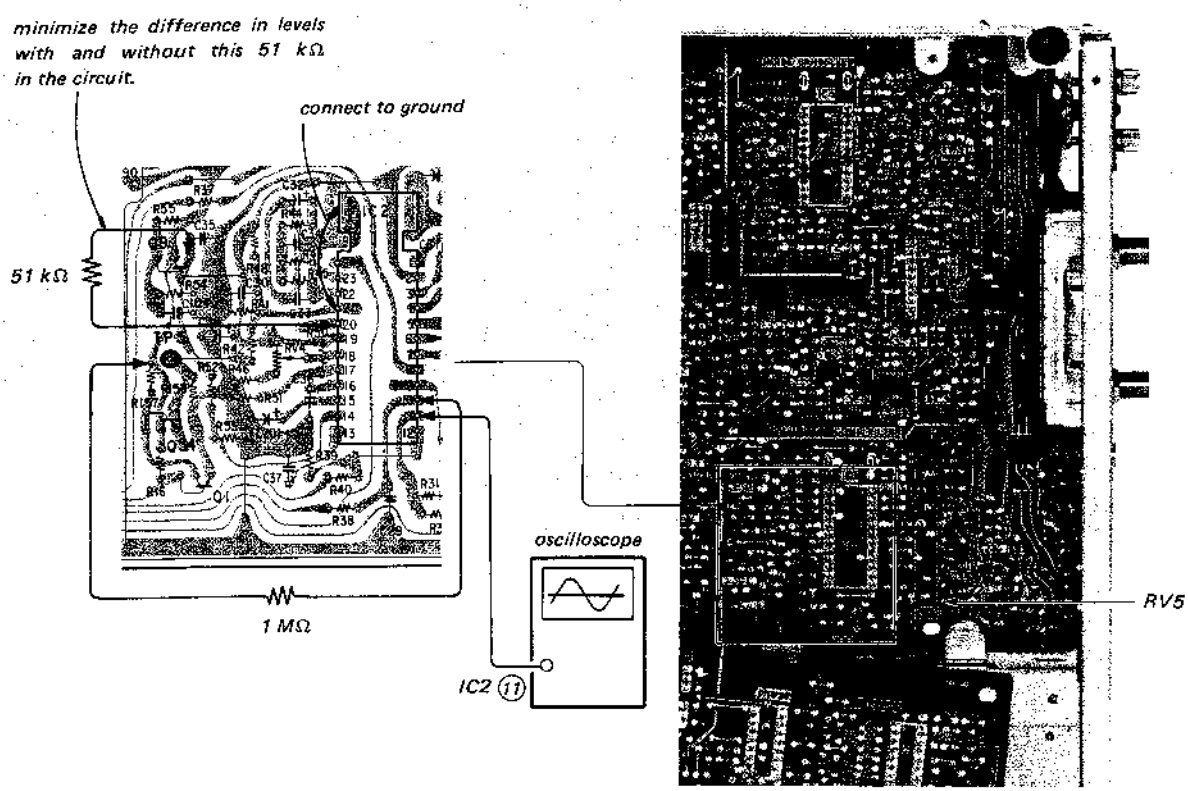


[Method of adjustment]

1) Connect a 1 MΩ resistor between the collector of Q9 (the 12V power supply line) and terminal No. ⑩ of IC2.
2) Connect terminal No. ㉑ of IC2 to ground.
3) Play the βII color bar signal on the alignment tape.
4) Connect a 51 kΩ resistor between the emitter of Q9 (the 9V power supply line) and terminal No. ⑳ of IC2, and measure the amplitudes of the color signal with and without this resistor in the circuit. Then adjust RV5 so that the difference between the two amplitudes becomes a minimum.



[Adjustment point: video section (YC-22 board)]

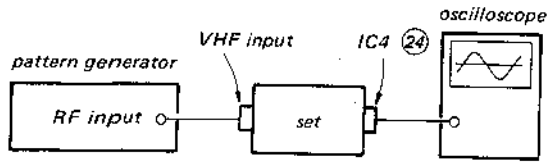


[Recording system]

12. Peak AGC and Sync AGC Adjustments

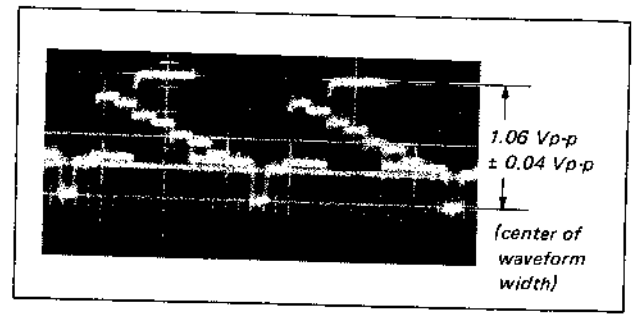
[Connections]

1) E-E mode

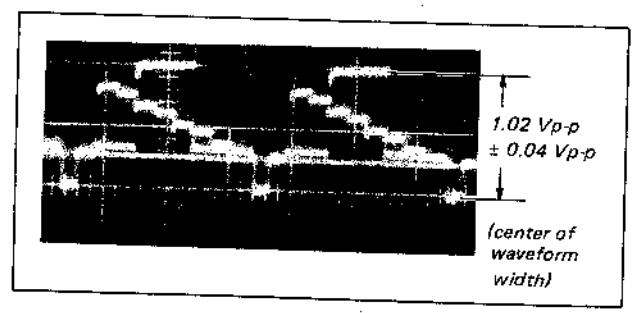


[Method of adjustment]

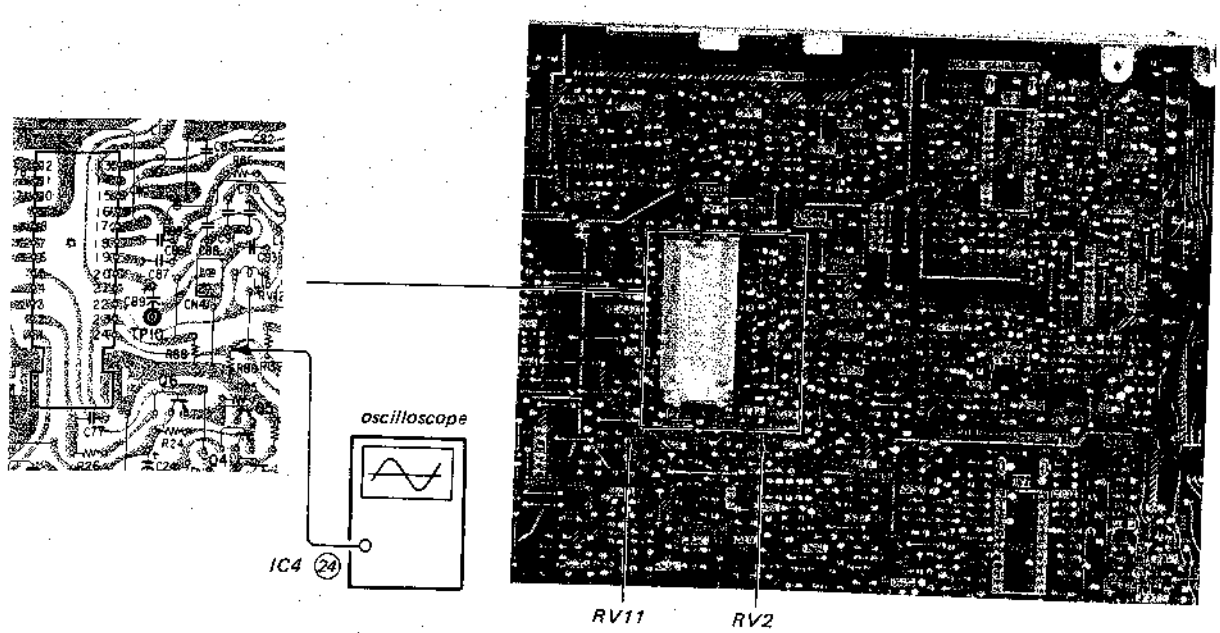
1) Supply a color bar signal with the chrominance signal removed (in other words a black-and-white signal) from the pattern generator.
2) Turn RV11 counterclockwise until the level shown in the figure at the right is a maximum.
3) Adjust RV2 (the peak AGC) until the level becomes 1.06 Vp-p ± 0.04 Vp-p.



4) Adjust RV11 (the sync AGC) until the level becomes 1.02 Vp-p ± 0.04 Vp-p.



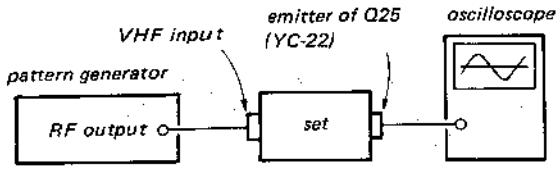
[Adjustment point: video section (YC-22 board)]



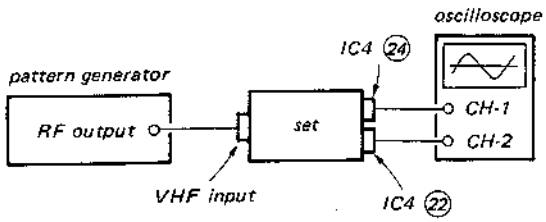
13. Comb Filter Adjustment

[Connections]

1) Recording

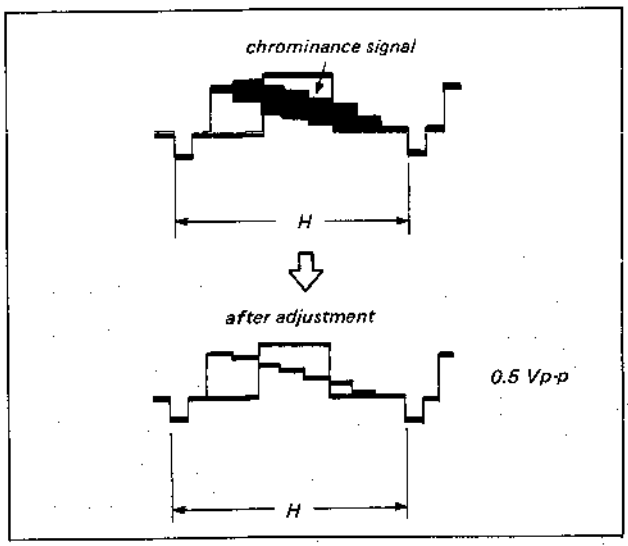


2) Recording

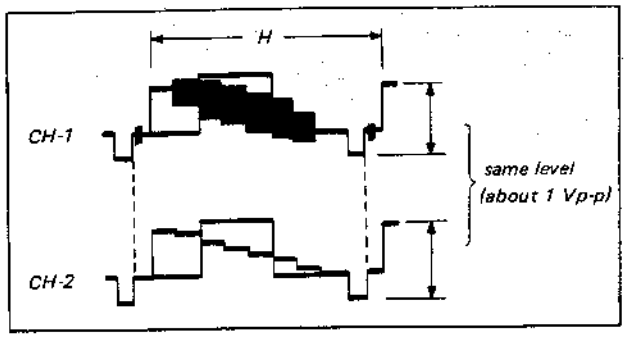


[Method of adjustment]

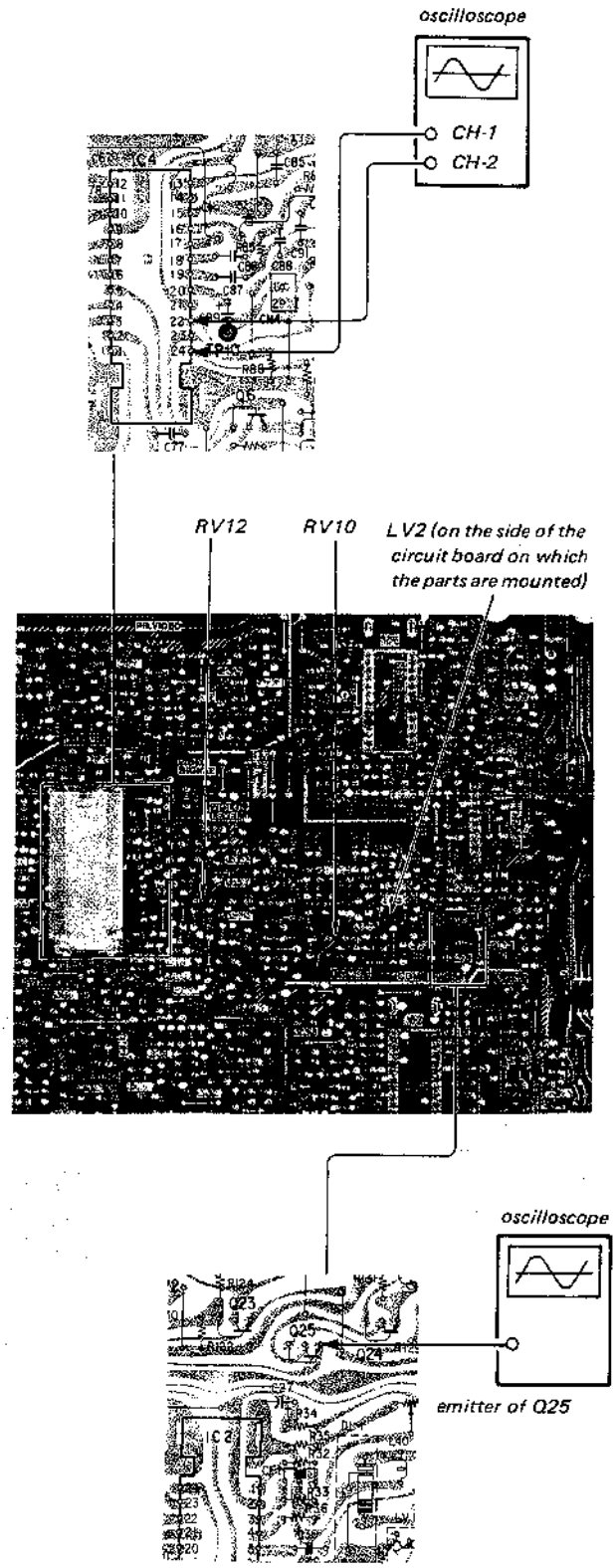
1) Input a color bar signal and put the set in recording mode.
2) Connect the oscilloscope to the emitter of Q25 and then adjust LV2 and RV10 alternately until the chrominance signal is a minimum.



3) Adjust RV12 until the video signal levels at terminal No. (24) of IC4 and terminal No. (22) of IC4 are equal (video amplitude adjustment).



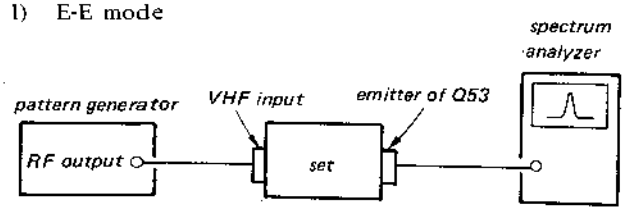
[Adjustment point: video section (YC-22 board)]



14. Sync Tip Carrier Frequency Setting and FM Deviation Adjustment

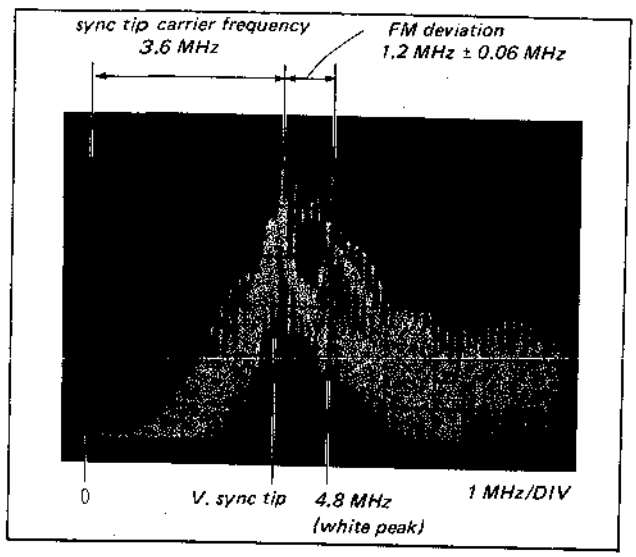
[Connections]

1) E-E mode

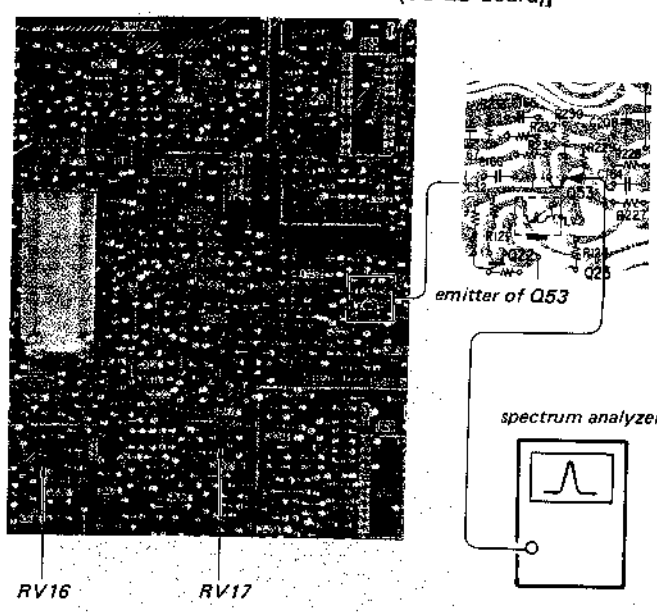


[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Observe the frequency distribution, and adjust RV17 and RV16 alternately until the sync tip carrier frequency and FM deviation fall within their respective standard ranges.



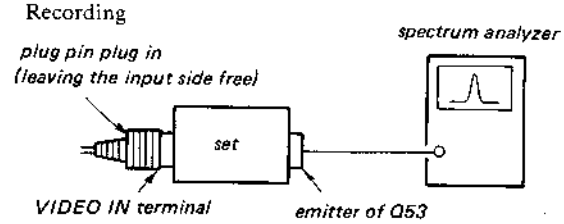
[Adjustment point: video section (YC-22 board)]



15. 1/2 f_H Shift Adjustment

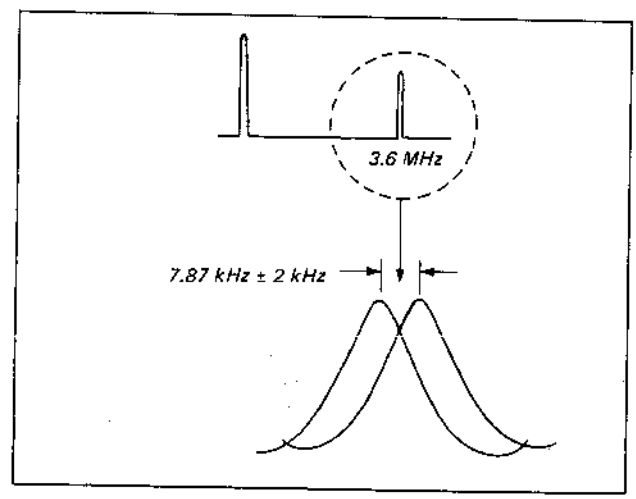
[Connections]

1) Recording

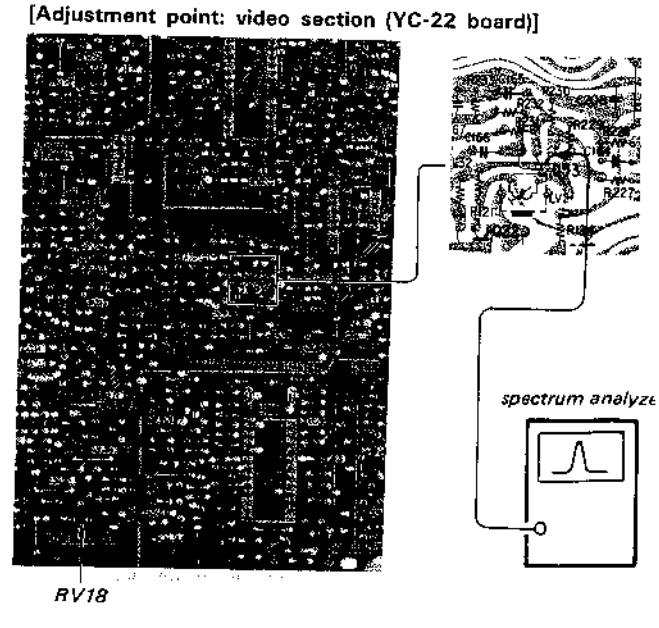


[Method of adjustment]

1) Plug a pin plug into the video input terminal (leaving the input side of the plug free), and put the set into recording mode without any signal input.
2) Adjust RV18 until the shift of the FM wave comes to 7.87 kHz ± 2 kHz.



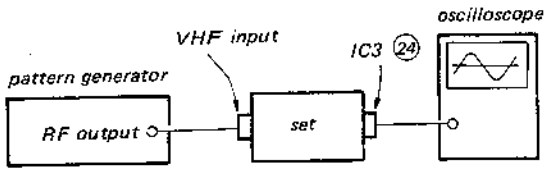
[Adjustment point: video section (YC-22 board)]



16. 4.27 MHz Balance Adjustment

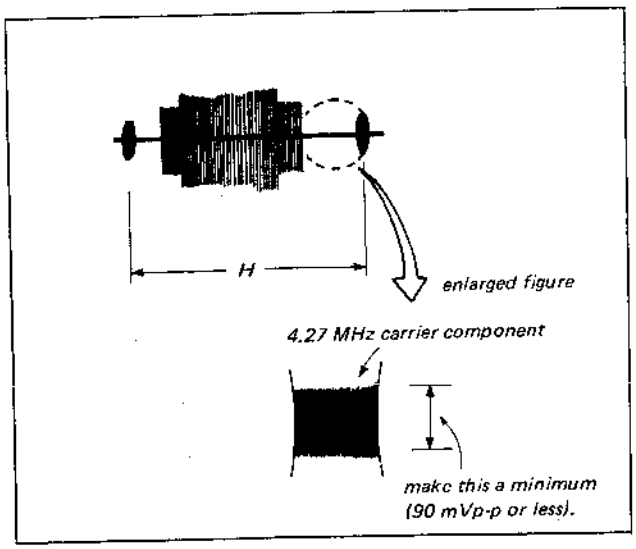
[Connections]

1) E-E mode

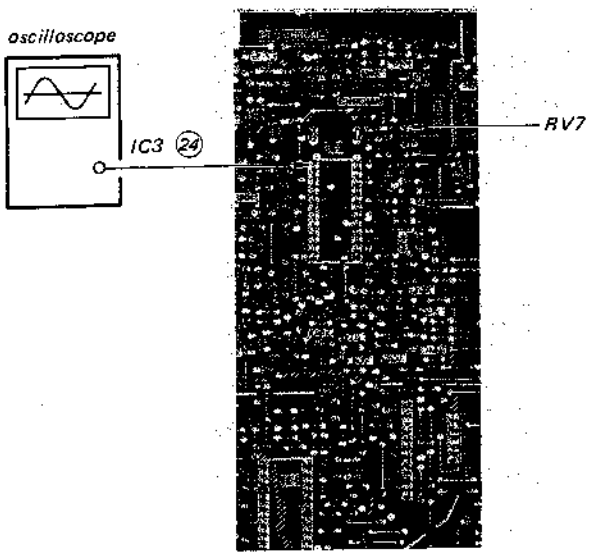


[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV7 until the amplitude of the 4.27 MHz component is a minimum.



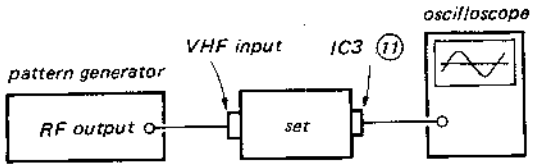
[Adjustment point: video section (YC-22 board)]



17. ACC Adjustment

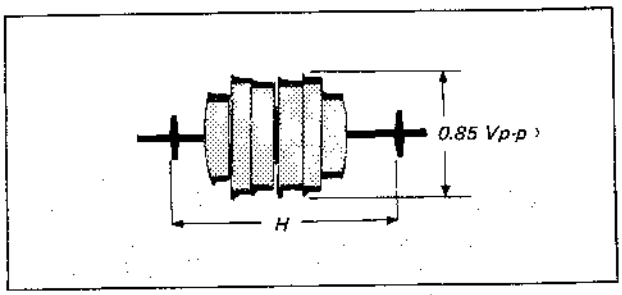
[Connections]

1) E-E mode

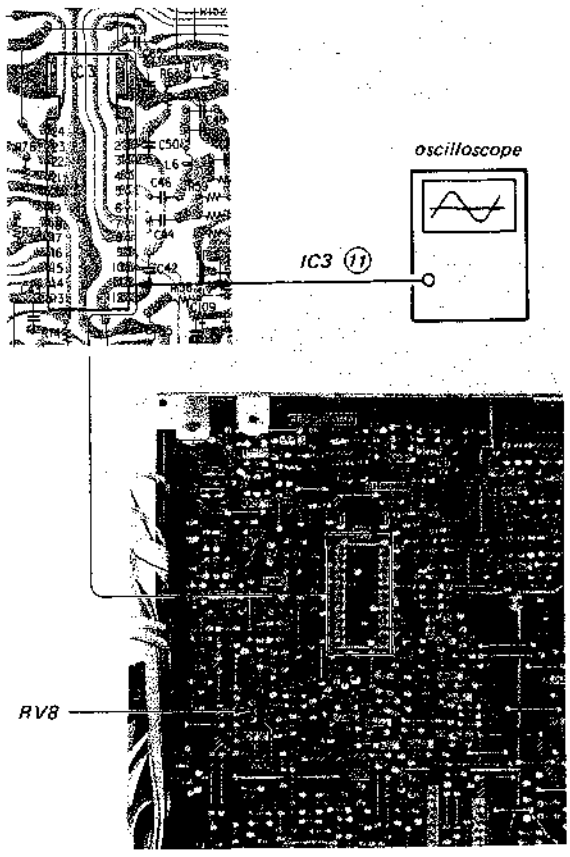


[Method of adjustment]

1) Supply a color bar signal, and put the set into E-E (direct picture) mode.
2) Adjust RV8 until the chrominance level is 0.85 Vp-p ± 0.05 Vp-p.



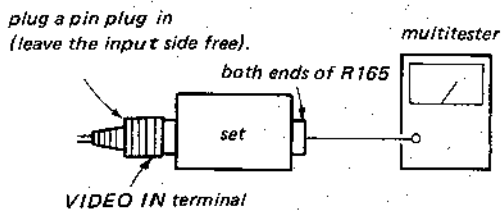
[Adjustment point: video section (YC-22 board)]



18. White Clip Adjustment

[Connections]

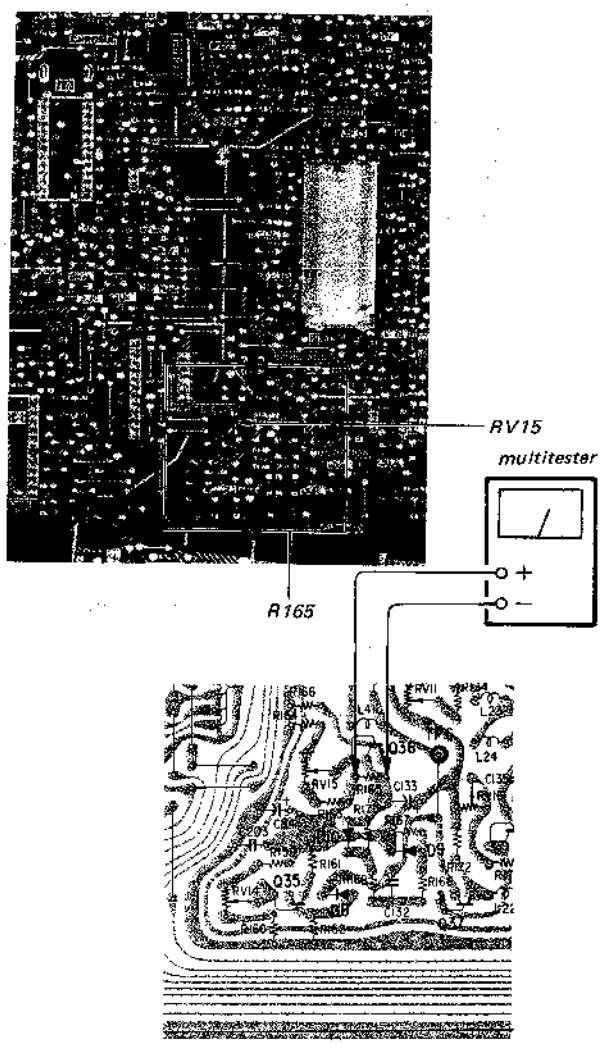
1) E-E mode



[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leave the input side of the plug free), so that there is no signal input.
2) Adjust RV15 so that the voltage at both ends of R165 is 0.20V ± 0.05V.

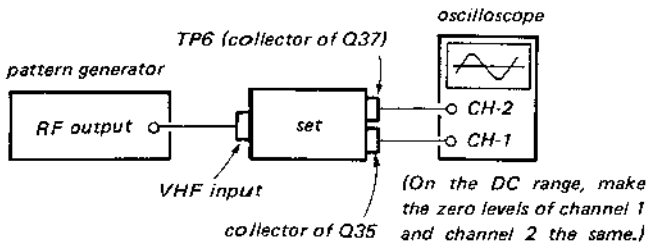
[Adjustment point: video section (YC-22 board)]

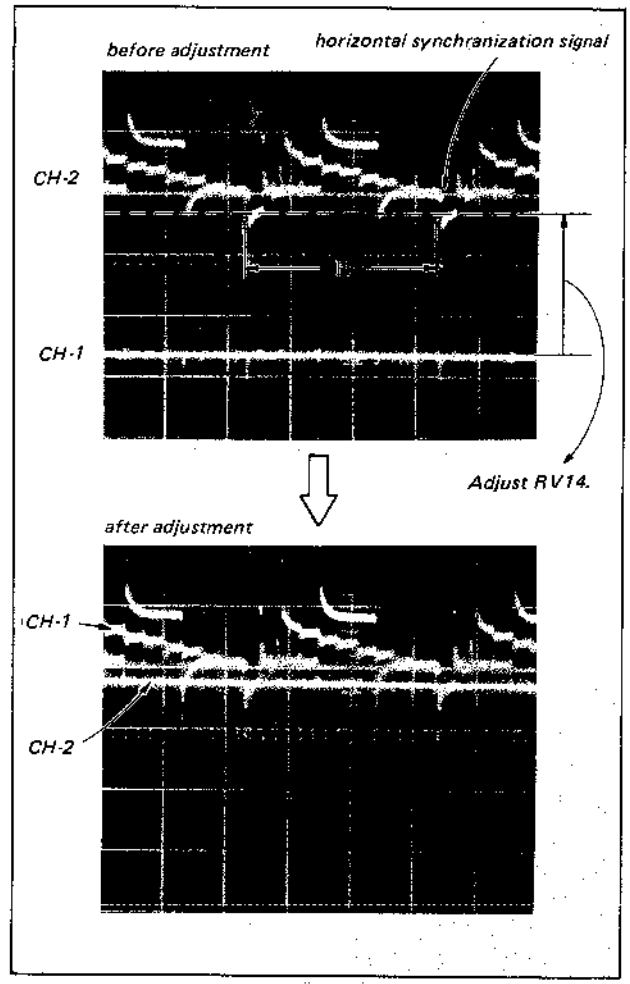


19. Black Clip Adjustment

[Connections]

1) E-E mode

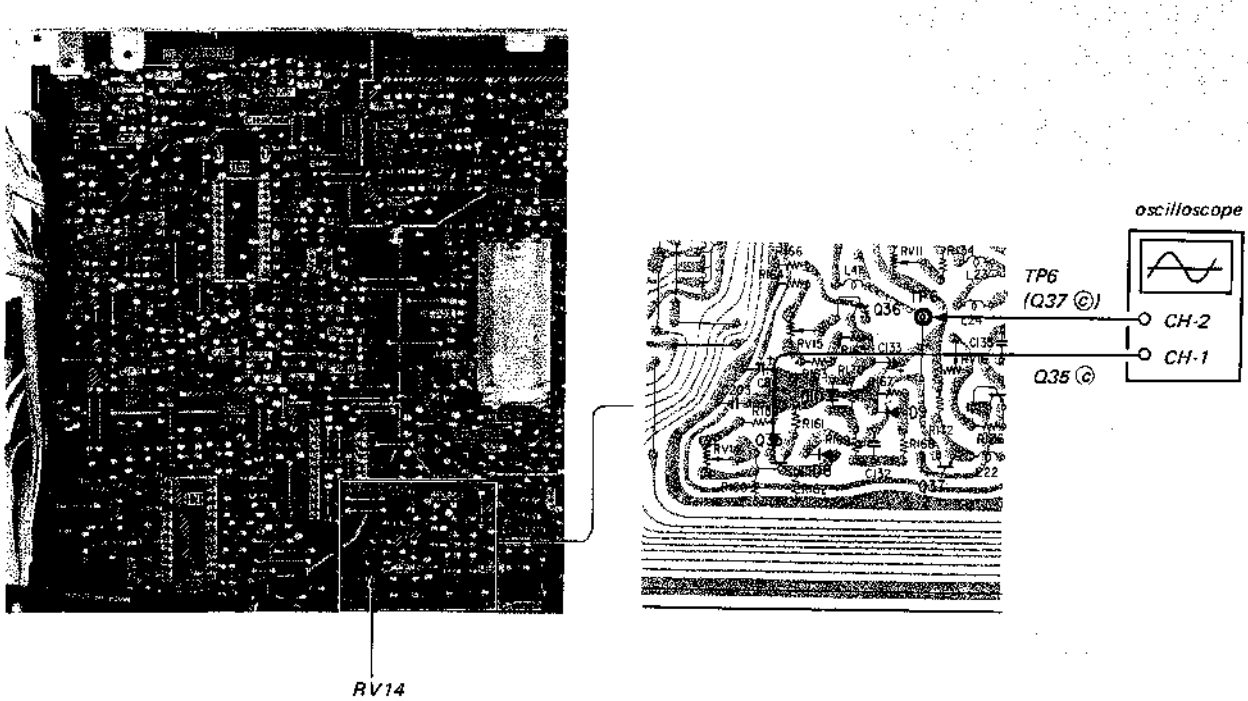




[Method of adjustment]

1) Put the oscilloscope on the DC range, and make zero levels of channel 1 and channel 2 equal to each other.
2) Supply a color bar signal, and put the set into E-E (direct picture) mode.
3) Adjust RV14 so that the voltage at the tip of the horizontal synchronization signal in the waveform on channel 2 equals the DC voltage on channel 1 (the tip of the synchronization signal should be within ±50 mV).

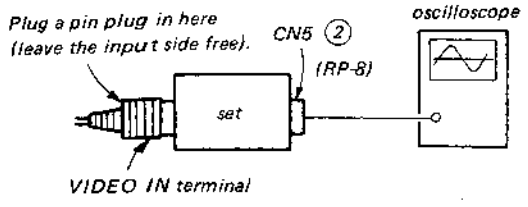
[Adjustment point: video section (YC-22 board)]



20. Brightness FM Recording Current Adjustment

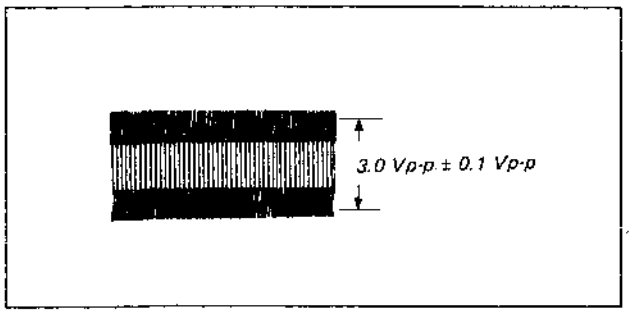
[Connections]

1) Recording

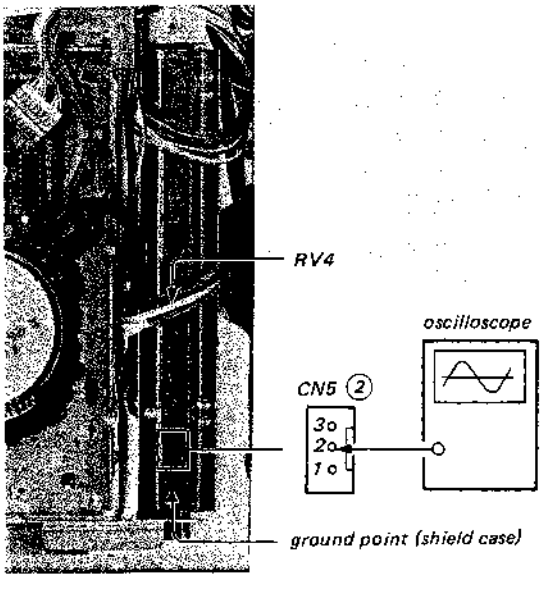


[Method of adjustment]

1) Plug a pin plug in to the video input terminal (leaving the input side of the plug free) so that there is no input signal, and put the set into recording mode.
2) Adjust RV4 until the amplitude shown in the diagram below is 3.0 Vp-p ± 0.1 Vp-p.



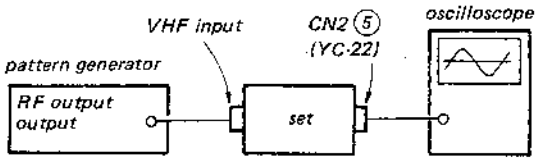
[Adjustment point: video head amplifier section (RP-8 board)]



21. Color Recording Current Adjustment

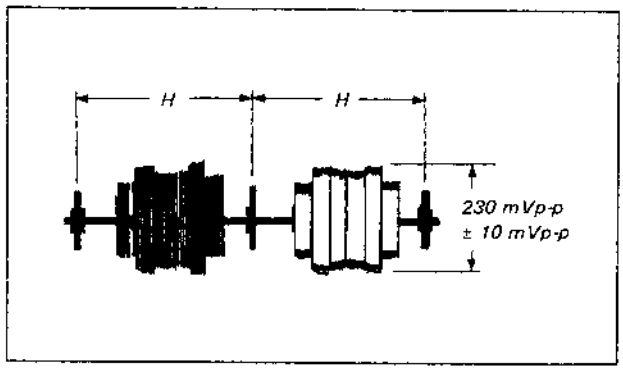
[Connections]

1) E-E mode

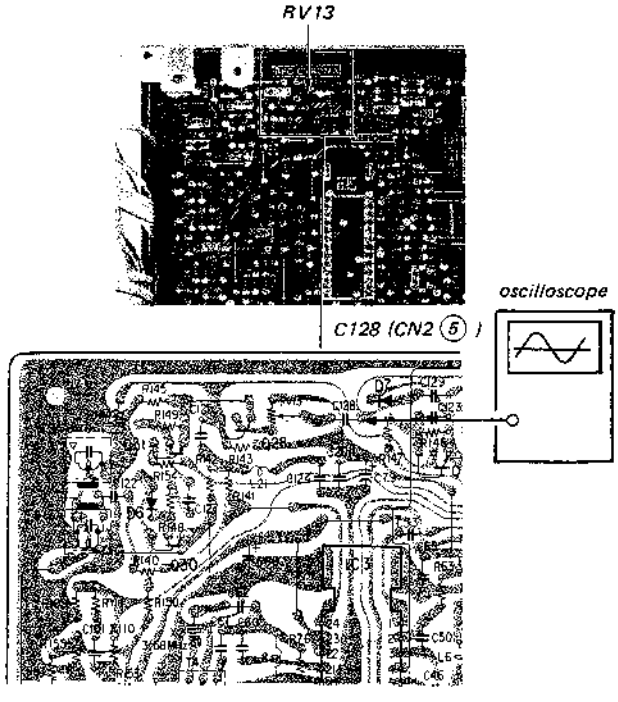


[Method of adjustment]

1) Supply a color bar signal and put the set in E-E (direct picture) mode.
2) Adjust RV13 until the amplitude shown in the diagram below is 230 mVp-p ± 10 mVp-p.



[Adjustment point: video section (YC-22 board)]



5-5. AUDIO SYSTEM ADJUSTMENTS

Use a dynamicron tape to perform these adjustments.

Sequence of adjustments

1. ACE head adjustment... refer to the description of mechanical section adjustments.
2. Playback frequency characteristics adjustments
3. Playback output level adjustment
4. Bias trap adjustment
5. Sound recording bias adjustment
6. Sound recording level adjustment
7. Overall level check
8. Overall distortion rate check
9. Overall signal-to-noise ratio check

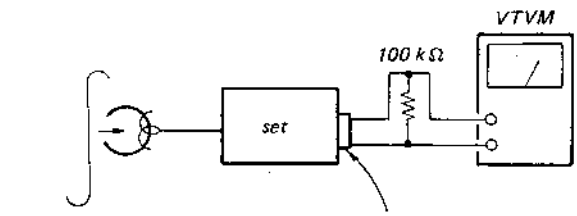
1. ACE Head Adjustment

Refer to the description of mechanical section adjustments.

2. Playback Frequency Characteristics Adjustment

[Connections]

1) Playback



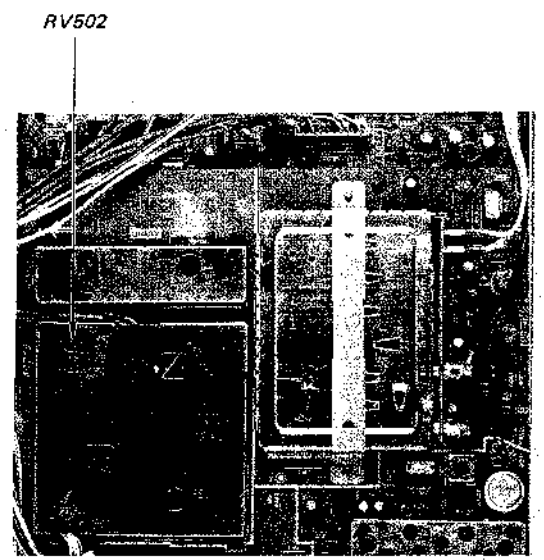
alignment tape (KR5-1M)
βII 333Hz, −25dB
5kHz, −25dB

AUDIO OUT terminal

[Method of adjustment]

1) Play the 333 Hz and 5 kHz βII audio signal sections on the alignment tape and measure the respective output levels.
2) Adjust RV502 so that the output level at 5 kHz is within 0 ± 1 dB of the output level at 333 Hz.

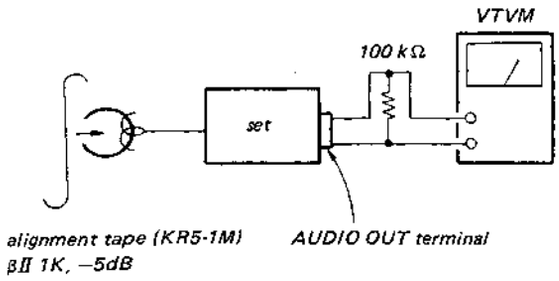
[Adjustment point: audio section (TA-12 board)]



3. Playback Output Level Adjustment

[Connections]

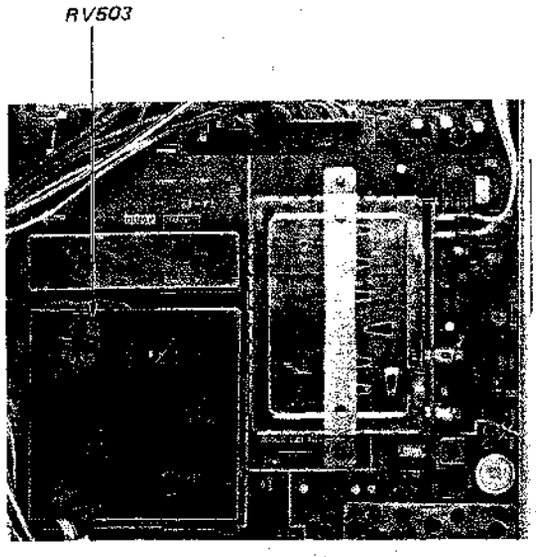
1) Playback



[Method of adjustment]

1) Play the βII 1 kHz audio signal section on the alignment tape and measure the output level.
2) Adjust RV503 until the output level becomes −5 dB (0.44V) $^{+2}_{-4}$ dB.

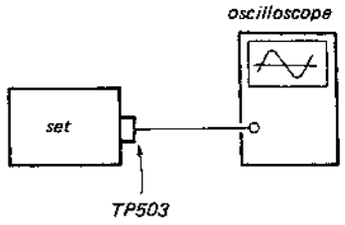
[Adjustment point: audio section (TA-12 board)]



4. Bias Trap Adjustment

[Connections]

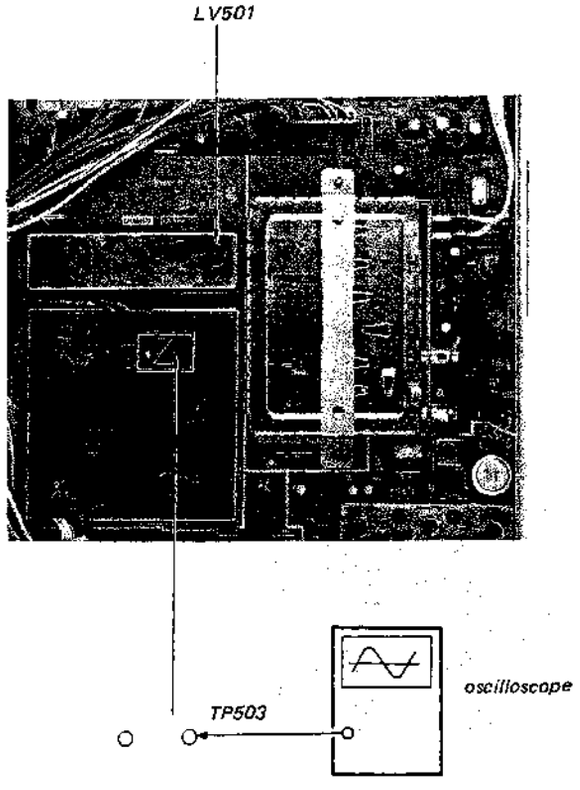
1) Recording



[Method of adjustment]

1) Put the set in recording mode with no signal input.
2) Adjust LV501 until the amplitude of the bias leak waveform becomes a minimum, 1.2 Vp-p or less.

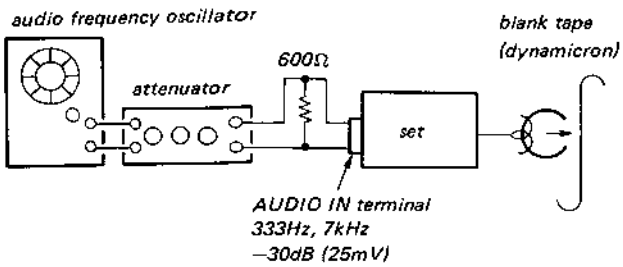
[Adjustment point: audio section (TA-12 board)]



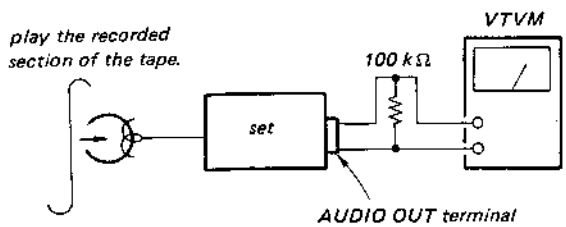
5. Sound Recording Bias Adjustment

[Connections]

1) Recording (βIII mode)



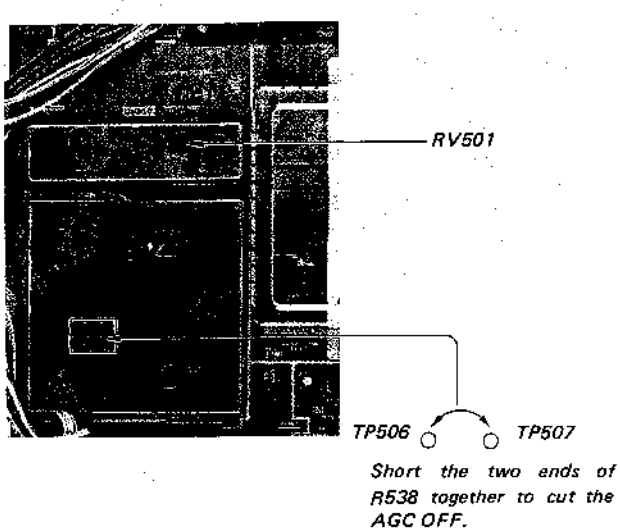
2) Playback



[Method of adjustment]

1) Short the two ends of R538 (TP506 and TP507) together to cut the AGC operation OFF.
2) Apply 333 Hz and 7 kHz, −30 dB (25 mV) signals to the audio input terminal and record them in βIII mode.
3) Play back the recorded section of tape and measure the respective output levels at 333 Hz and 7 kHz.
4) Confirm that the output level at 7 kHz is within ±1.5 dB of the output level at 333 Hz.
5) If the condition is step 4) is not satisfied, repeat steps 2) through 4). If the output level at 7 kHz is too high, turn RV501 clockwise. If the output level at 7 kHz is too low, turn RV501 counterclockwise.

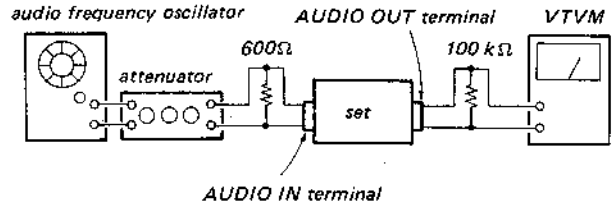
[Adjustment point: audio section (TA-12 board)]



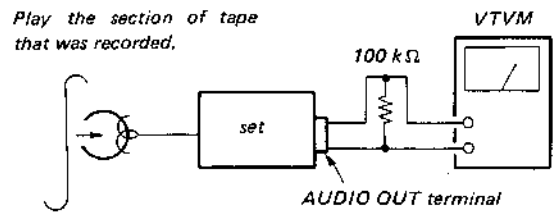
6. Sound Recording Level Adjustment

[Connections]

1) Recording



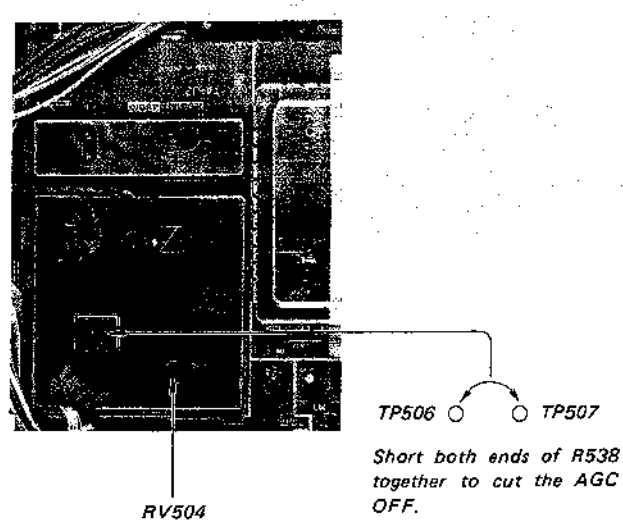
2) Playback



[Method of adjustment]

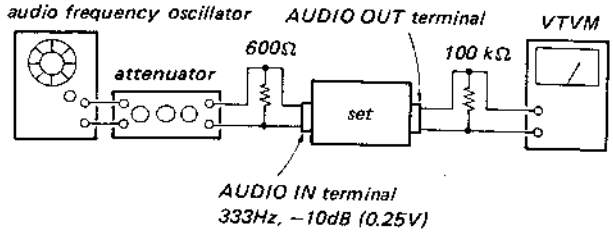
1) Short both ends of R538 (TP506 and TP507) together to cut the AGC OFF.
2) Input a 333 Hz signal, and adjust the attenuator so that the output level at the audio line output terminal in E-E mode becomes −5 dB (0.44V).
3) Record the 333 Hz signal.
4) Play the recorded section of tape back, and measure the level at the audio line output. It should be −5 dB (0.44V) ± 1 dB.
5) If the level measured in step 4) is outside of the correct ragne, repeat steps 2) through 4). If the output level is too high, turn RV504 clockwise. If the output level is too low, turn RV504 counterclockwise.

[Adjustment point: audio section (TA-12 board)]



7. Overall Level Check

[Connections]



[Method of measurement]

1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the output level at the audio line output.
3) Confirm that the output level is −5 dB (0.44V) $^{+2}_{-4}$ dB.

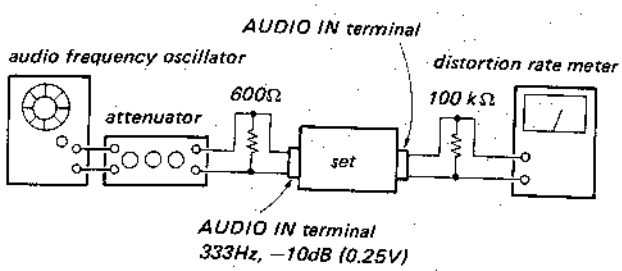
8. Overall Distortion Rate Check

[Condition]

Set the sound quality switch on high.

[Connections]

1) Recording/playback



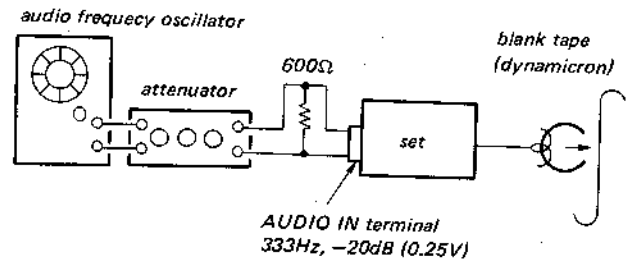
[Method of measurement]

1) Apply a 333 Hz, −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Play the recorded section of tape back and measure the distortion rate at the audio line output terminal.
3) Confirm that the distortion rate is 4% or less.

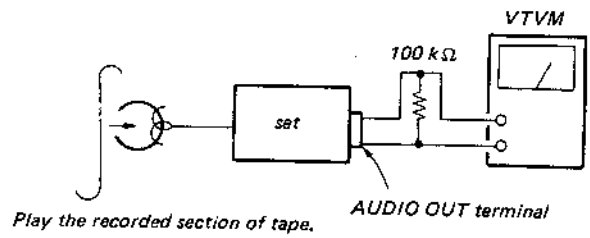
9. Overall Signal-to-noise Ratio Check

[Connections]

1) Recording (βIII mode)



2) Playback



[Method of adjustment]

1) Apply a 333 Hz −10 dB (0.25V) signal to the audio input terminal and record it in βIII mode.
2) Next, connect a mini jack to the audio input terminal, leaving the input side of the mini jack open. That is to say, the recording is now done with no input signal.
3) Play the sections of tape recorded in steps 1) and 2) back and measure the respective output levels.
   Confirm that the difference between the signal level obtained from the section recorded in step 1) and the noise level obtained from the section recorded in step 2) is 33 dB or more.

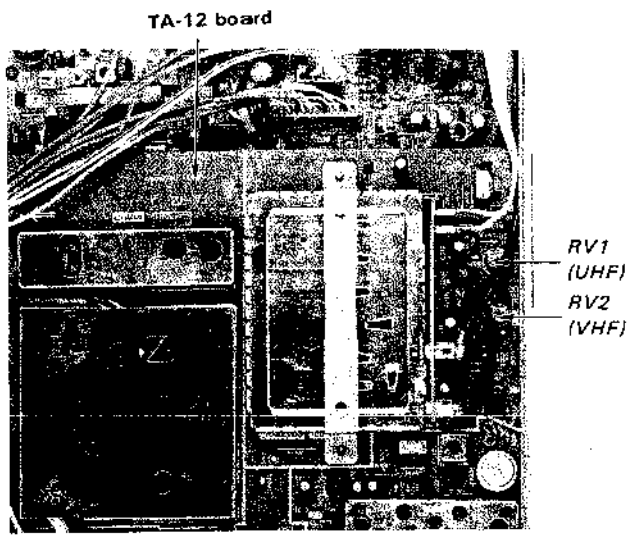
5-6. TUNER BLOCK SYSTEM ADJUSTMENTS

1. Tuner AGC Adjustment

Note:

The UHF adjustment locations are given in parentheses.

1) At maximum contrast, receive any TV broadcast signal.
2) Turn RV2 (RV1) clockwise until snow noise can be seen on the TV monitor screen.
3) Turn RV2 (RV1) counterclockwise slowly and leave the adjustment at the point where the snow noise just disappears.
4) Receive telecast signals on all of the channels in succession and confirm that there is no beat due to corss-modulation, breakdown of the picture or snow noise.



2. AFT Adjustment

1) Receive any TV broadcast signal.
2) Turn the AFT switch OFF (with the preset cover removed).
3) Turn the preset potentiometer until a 920 kHz beat can be seen, then turn it counterclockwise slowly and leave it set at the point where the 920 kHz beat just disappears.
4) Turn the AFT switch ON (press the AFT switch lever).
5) Connect an oscilloscope to TP3 and adjust T004 so that the DC level becomes 5.0V. Confirm that there is no disappearance of color or 920 kHz beat.
6) Next, turn the AFT switch back OFF (with the preset cover removed) and turn the preset potentiometer until the picture quality just starts to deteriorate. Leave it set at that point.
7) Turn the AFT switch ON and OFF repeatedly to check the AFT operation.
8) Return the preset potentiometer to the position where it was set in step 3).