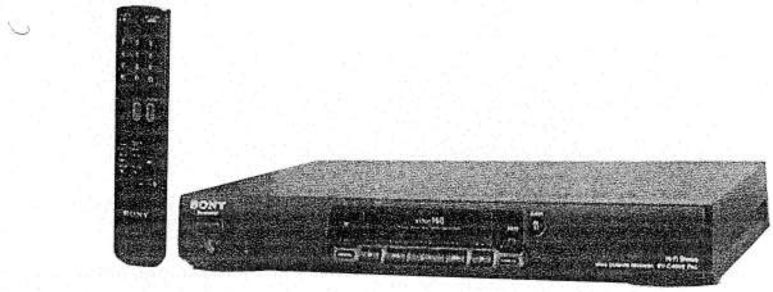
EV-C400E
RMT-V176

SERVICE MANUAL

AEP Model



video Hi8

F MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL V" (9-973-445-11).

SPECIFICATIONS

System

Format 8 mm video CCIR standard
Video signal PAL color, CCIR standards
Tape speed SP: Approx. 20.051 mm/s
LP: Approx. 10.058 mm/s
Playback time 1 hr. 30 min, in SP mode
(with E5/P5-90 tape)
3 hrs, in LP mode
(with E5/P5-90 tape)
Fast-forward and rewind time
Approx. 2 min, 15 sec.
1 min. (High speed rewind)
(with E5/P5-90)

Inputs and outputs

LINE IN S VIDEO IN, 4-pin mini DIN (1)
Luminance signal:
1 Vp-p, 75 ohms,
unbalanced, sync negative
Chrominance signal:
0.3 Vp-p, 75 ohms,
unbalanced
VIDEO IN, Phono jack (1)
Input signal:
1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO IN, Phono jack (2)
Input level:
−7.5 dBs (0 dBs=0.775 Vrms)
Input impedance:
more than 47 kilohms

LINE OUT 1 S VIDEO OUT, 4-pin mini DIN (1)
Luminance signal:
1 Vp-p, 75 ohms,
unbalanced, sync negative
Chrominance signal:
0.3 Vp-p, 75 ohms,
unbalanced
VIDEO OUT, Phono jack (1)
Output signal:
1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO OUT, Phono jack (2)
Rated output level: −7.5 dBs
Load impedance: 47 kilohms
Output impedance:
less than 10 kilohms

LINE OUT 2 VIDEO OUT, Phono jack (1)
Output signal:
1 Vp-p, 75 ohms,
unbalanced, sync negative
AUDIO OUT, Phono jack (1)
Rated output level: −7.5 dBs
Load impedance: 47 kilohms
Output impedance:
less than 10 kilohms
RFU DC OUT, Special mini-jack (1)
5 V DC

General

Power requirements
220–240 V AC, 50 Hz
Power consumption
9W
Operating temperature
5 ℃ to 40 ℃
Storage temperature
−20 ℃ to 60 ℃
Dimensions Approx. 430 × 60 × 296 mm (w/h/d)
including projecting parts and controls
Mass Approx. 3.5 kg

Supplied accessories

Remote Commander (1)
Size AA (R6) batteries (2)
Audio/video cable (3 phono to 3 phono) (1)
S video cable (1)
VMC-91 plug adaptor (EURO-AV to 3 phono) (1)

Design and specifications are subject to change without notice.

MICROFILM

Hi8 VIDEO CASSETTE RECORDER

SONY®

TABLE OF CONTENTS

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 B+ voltage to see it is at the values specified.
6. Flexible Circuit board Repairing
   - Keep the temperature of the soldering iron around 270°C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY-RELATED COMPONENT WARNING!!

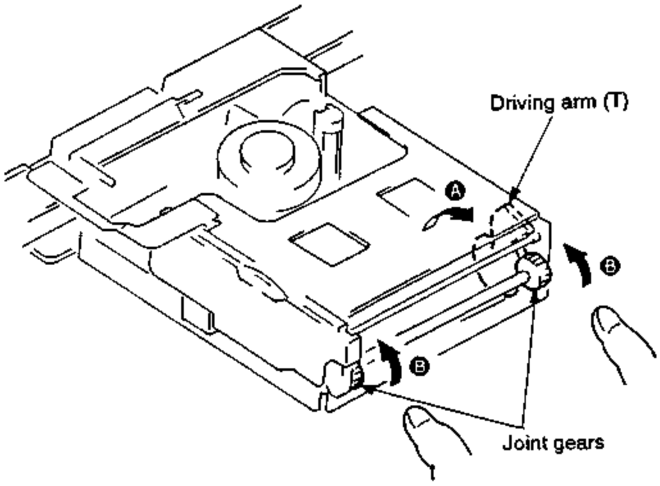
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
SERVICE NOTE

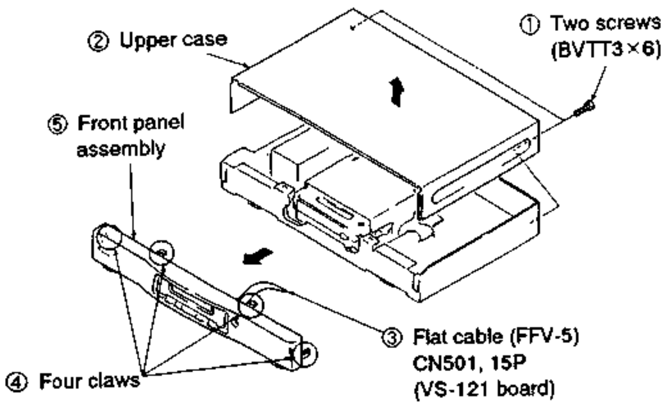
1-1. REMOVAL OF CASSETTE AT FAILURE WITH CASSETTE INSERTED

Ⓐ If tape is wounded on the drum and it cannot be removed:
Rotate the capstan motor wheel in either direction and rotate the S or R reel to house the tape. Then, perform procedure Ⓑ.

Ⓑ If tape is housed in the cassette half and cannot be removed:
① Remove the MD block. (For removal, refer to Section 3-3.)
② Release the drive arm lock from the driving arm located the both side of the cassette compartment in the arrow direction ❹.
③ Rotate the joint gears in the arrow direction ❸ with both the thumbs.

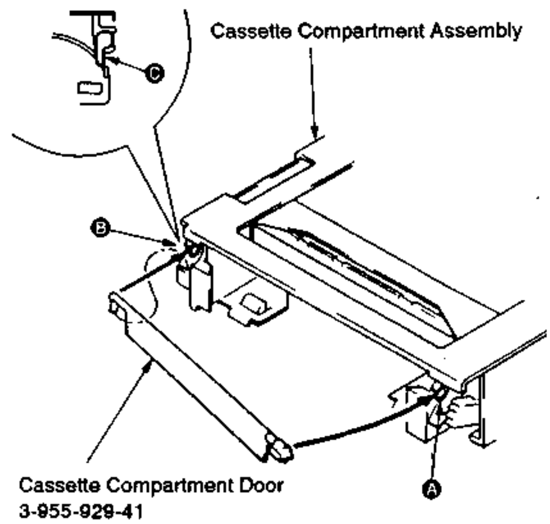


1-2. REPLACEMENT OF EXTERNAL PARTS



1-3. REPLACEMENT OF CASSETTE DOOR ASSEMBLY

1) Remove the front panel.
2) First undo ❹ portion toward you and then undo ❸.



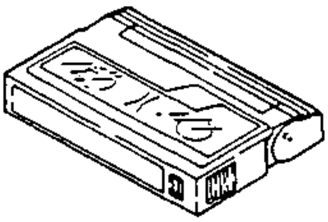
3) When installing, as shown above, first put in ❸ portion by setting the claw ❻. Then, put in ❹ portion and install so that the door hangs almost vertically.

1-4. CLEANING OF VIDEO HEAD AND TAPE PATH

Method 1

[Cleaning Method with Cleaning Tape]

- A cleaning cassette should be used. (When using, the attached manual for the cleaning cassette should be thoroughly read.)



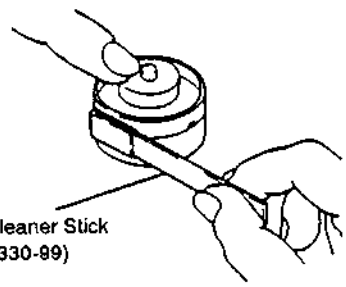
Method 2

[Cleaning Method with Cleaning Liquid]

① Remove the upper case of the video deck.

② Apply cleaning liquid to a head cleaner stick.

③ As shown in the right figure, press the head cleaner stick lightly. Turn the top of the rotary upper drum gradually and clean the video deck.



[Cleaning Method for Tape Path]

① Apply cleaning liquid to a head cleaner stick.

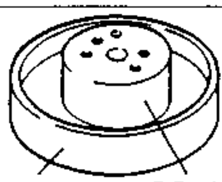
② Clean the guides which tape touches directly and the pinch roller with the head cleaner.

1-5. REPLACEMENT OF ROTARY UPPER DRUM

Method 3

Caution

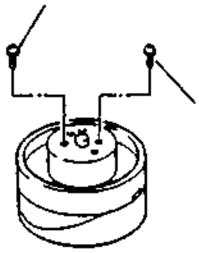
- Particular care must be taken when handling the video head and the terminals.
- When handling the rotary upper drum, do not touch the side (A portion) and hold the top (B portion) (See Fig. 1).



(Fig. 1)

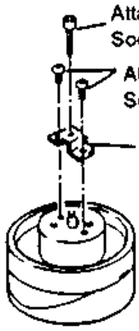
Removal of Rotary Upper Drum

① Remove two screws (2 × 5) (See Fig. 2).



(Fig. 2)

② Fix the jig (supplied with the spare rotary upper drum) with the two attached short screws. Then, put the attached long screw into the jig until the rotary upper drum may be removed (See Fig. 3).

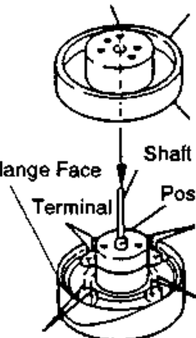


(Fig. 3)

Installation of New Rotary Upper Drum

① Clean the flange face and the bottom face of the new rotary upper drum (See Fig. 4).

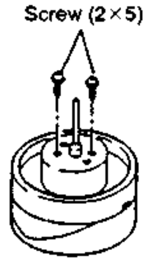
② Insert the shaft attached to the jig into the positioning hole in the lower drum. Then, put the shaft through the positioning hole in the new rotary upper drum and set the drum lightly.



(Fig. 4)

③ With the shaft inserted into the positioning hole, push into the upper drum lightly with a hand. If the drum is not allowed to be bottomed, alternately tighten two screws (2 × 5) gradually and install the drum (See Fig. 5).

④ Pull out the shaft inserted. If the shaft is not allowed to be withdrawn smoothly, go back to Step ② and redo the procedure.



(Fig. 5)

⑤ Once the drum has been replaced, clean the video head and the tape path with a head cleaner stick (See "Cleaning Method 2 for Video Head and Tape Path).

This section is extracted from instruction manual.

Welcome!

Thank you for purchasing the Sony Video Cassette Recorder (VCR).
Here are some of the features you'll enjoy with your VCR:

- Hi8 (High Eight) video system for quality playback of Hi8 tapes
- Large buttons for easy operation
- Dynamic hi-fi stereo sound

Note
- This VCR does not receive TV programmes, since it has neither aerial input nor built-in tuner.

Compatible colour systems

This VCR is designed to play back using the PAL colour system. Playback of video sources based on other colour systems cannot be guaranteed.

Compatible video systems

- This VCR uses the 8 mm video system and plays back in the SP mode (approximately 20.051 mm/s) and theLP mode (approximately 10.058 mm/s). The quality of the recorded picture in the LP mode, however, will not be as good as that in the SP mode. It can record only in the SP mode.
- This VCR plays back a tape recorded in the Hi8 or conventional 8 mm video system according to the system mode used in recording.
- PCM (Pulse Code Modulation) playback, that is, digital playback, is not possible with this unit. The PCM sound recorded on another VCR cannot be played back on this VCR.

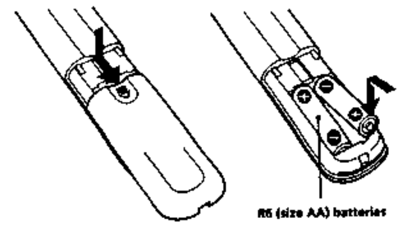
Note
- This VCR does not receive TV programmes, since it has neither antenna input terminal nor built-in tuner. It can, however, record them through the line input jacks.

Table of contents

Setting up the remote commander

Inserting the batteries

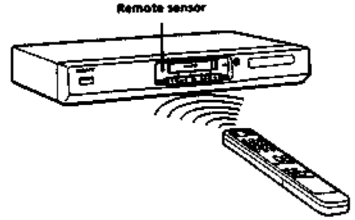
Insert two R6 (size AA) batteries (supplied) by matching the + and – on the batteries to the diagram inside the battery compartment.



Notes
- With normal use, the batteries should last for approximately three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the TV control area of the remote commander can be used to operate your TV.



Hookups

Before you can use your VCR for the first time, you need to connect it to your TV. This section explains how to hookup and set up your VCR so that you can start enjoying it right away.

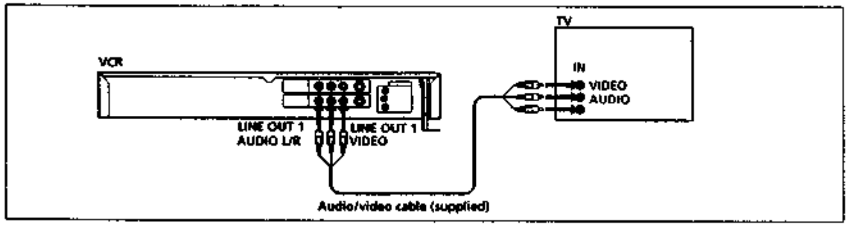
Before you get started

- Turn off the power to all equipment.
- Do not connect the mains lead until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified personnel.

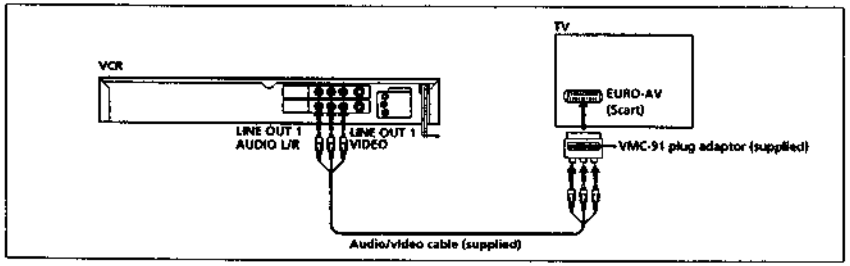
Audio/video (AV) hookup

If your TV has audio/video (A/V) input jacks, or a EURO-AV (Scart) connector, you will get a better picture and sound if you hook up your VCR using these connections (hookup examples A or B below). If your TV has an S VIDEO input connector, the picture quality will be further improved (hookup example C on the next page). If your TV doesn't have A/V inputs, see the next page for RFU DC OUT hookup.

A Use this hookup if your TV has audio/video (A/V) input jacks



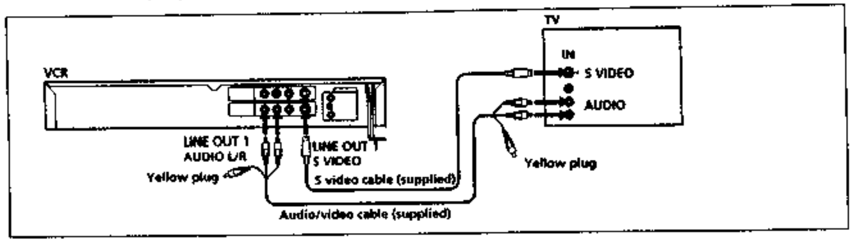
B Use this hookup if your TV has a EURO-AV (Scart) connector



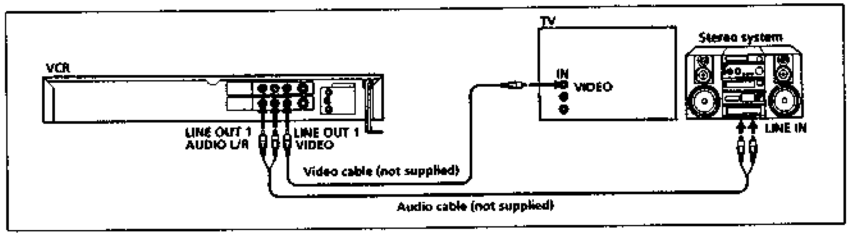
To view the playback picture through the above hookup
Select video input for this VCR on the connected TV.

Hookups (continued)

C Use this hookup if your TV has an S VIDEO input connector

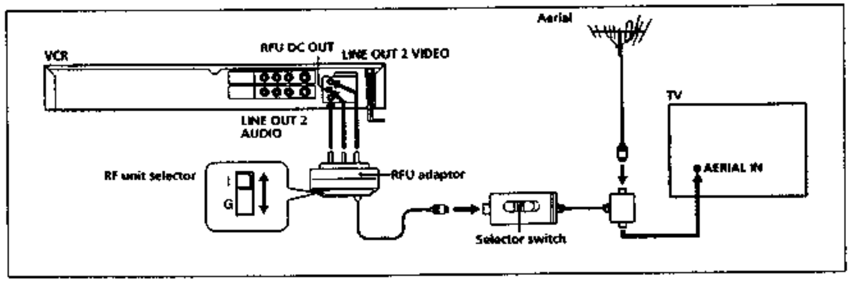


D Use this hookup if you want to connect the VCR to a stereo system



RFU DC OUT hookup

If your TV doesn't have audio/video (A/V) input jacks, or a EURO-AV connector, make an RFU DC OUT connection using an RFU kit (RFU-89EKA, not supplied). For this connection, refer to the instruction manual of the RFU kit as well.



Note

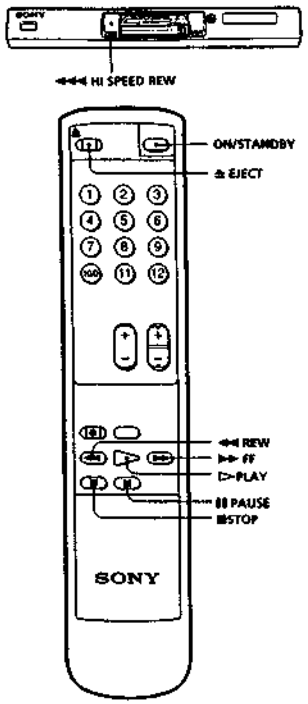
- The sound you hear will be monaural even if you play back a stereo tape.

To view the playback picture through this hookup
Set the RF unit selector of the RFU adaptor to I or G according to the TV system of your country, set the selector switch to VTR, and select a programme position on the TV that is not used to receive a TV station.

2-3

Playing a tape

This section shows you how to play back a video tape.



1 Turn on your TV and tune in to the VCR:
- If the TV is connected to the VCR using the audio/video cable or EURO-AV cable, set the TV to video input.
- If the TV is connected to the VCR using the RFU kit, set the TV to the programme position for the VCR.

2 Insert a tape.
The VCR turns on automatically.
If an Hi8 tape is inserted, the Hi8 indicator lights up.

3 Press ▷ PLAY to start playing.
When the tape reaches the end, the VCR automatically rewinds it to the beginning. (The power remains on.)

Additional tasks

To	Press	Indicator to light
Stop play	■ STOP	—
Pause play	II PAUSE	• PAUSE
Resume play after pause	II PAUSE or ▷ PLAY	• PLAY
Search forward	▶▶ FF during playback	• PLAY • FF
Search backward	◀◀ REW during playback	• REW • PLAY
Advance the tape rapidly	▶▶ FF during stop	• FF
Rewind the tape	◀◀ REW during stop	• REW
Rewind the tape at high speed	◀◀◀ HI SPEED REW on the VCR	—
Automatic playback after rewinding	▷ PLAY while pressing ◀◀ REW	• REW ✻ PLAY (• PLAY blinks)
Automatic playback after high speed rewinding	▷ PLAY while pressing ◀◀◀ HIGH SPEED REW	✻ PLAY (• PLAY blinks)
Eject the tape	≙ EJECT	(▭ disappears)
Turn off the power	ON/STANDBY	(Indicator turns from green to red)

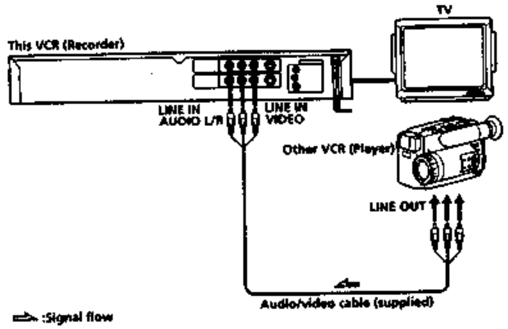
Notes
- Depending on the TV, there may be no colour in the search forward, search backward, or playback pause modes.
- If you use search forward or search backward in the LP mode, the picture may be difficult to view due to noise.

Editing with another VCR

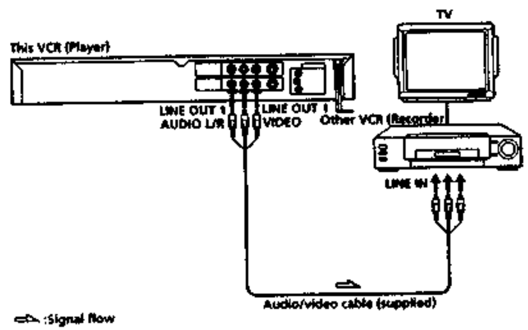
This section shows you how to edit to or from another VCR or camcorder. You can make a copy of a tape using this VCR for recording or playback.

Tips
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- If the VCR has an S VIDEO OUT connector, connect the VCR using the S video cable. Leave the yellow plugs of the supplied A/V cable unconnected.
- If the VCR has a EURO-AV (Scart) connector, connect the VCR using the supplied VMC-91 plug adaptor.

How to hook up to record on this VCR



How to hook up to record to another VCR



Note
- When connecting the VCRs, do not simultaneously connect the EURO-AV connector and LINE OUT jacks on your VCR. A humming noise may occur if you do this.

Operation (when recording on this VCR)

1 Insert a source tape with its safety tab removed into the other (playback) VCR.

2 Insert a tape into this (recording) VCR.

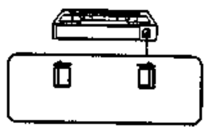
3 To start editing, start playback on the other VCR and press ● REC on this VCR simultaneously.
The recording indicator (●) on this VCR lights up.

To stop editing
Press the ■ STOP buttons on both VCRs.

Saving a recording

Video tapes have a safety tab to protect against accidental recording. To prevent accidental erasure of a recording, slide out the tab on the back of the cassette so that the red colour is visible. A tape with its red safety tab visible is ejected if you try to record on it.

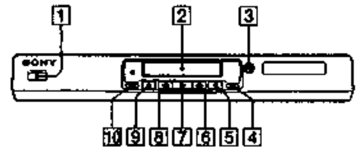
To record on the tape, slide the tab back.



Index to parts and controls

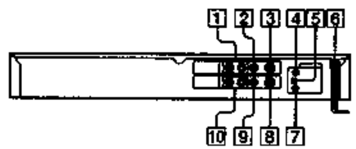
Refer to the pages indicated in ( ) for details.

Front panel



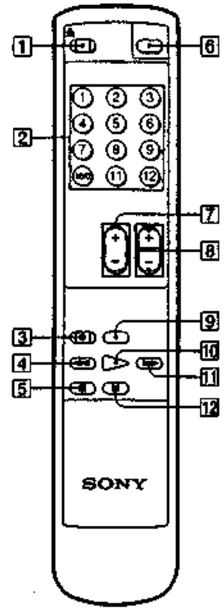
1 ON/STANDBY switch/indicator
2 Tape compartment
3 ≙ EJECT button
4 ● REC (recording) button (9)
5 ❚❚ PAUSE button
6 ▶▶ FF (fast-forward) button
7 ▷ PLAY button
8 ◀◀ REW (rewind) button
9 ■ STOP button
10 ◀◀◀HI SPEED REW (high speed rewind) button (7)

Rear panel



1 LINE IN AUDIO L/R jacks (8)
2 LINE IN VIDEO jack (8)
3 LINE IN S VIDEO connector
4 LINE OUT 2 VIDEO jack (6)
5 LINE OUT 2 RFU DC OUT jack (6)
6 Mains lead
7 LINE OUT 2 AUDIO jack (6)
8 LINE OUT 1 S VIDEO connector (6)
9 LINE OUT 1 VIDEO jack (5, 6)
10 LINE OUT 1 AUDIO L/R jacks (5, 6)

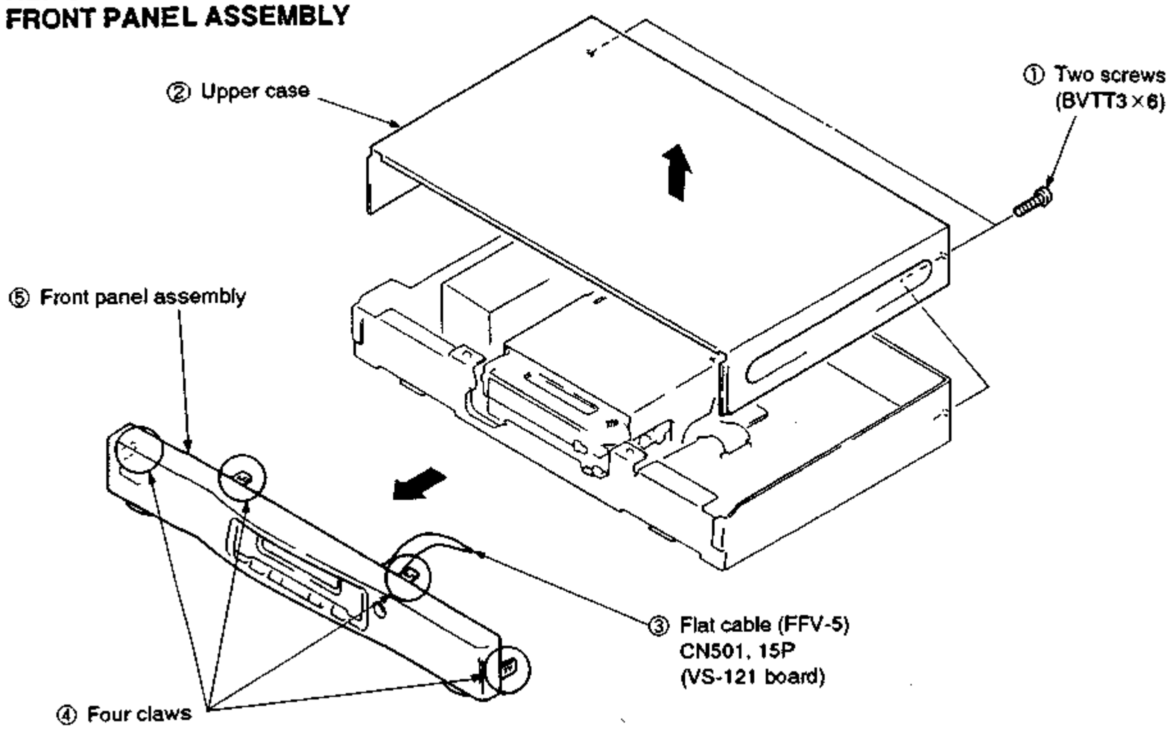
Remote commander



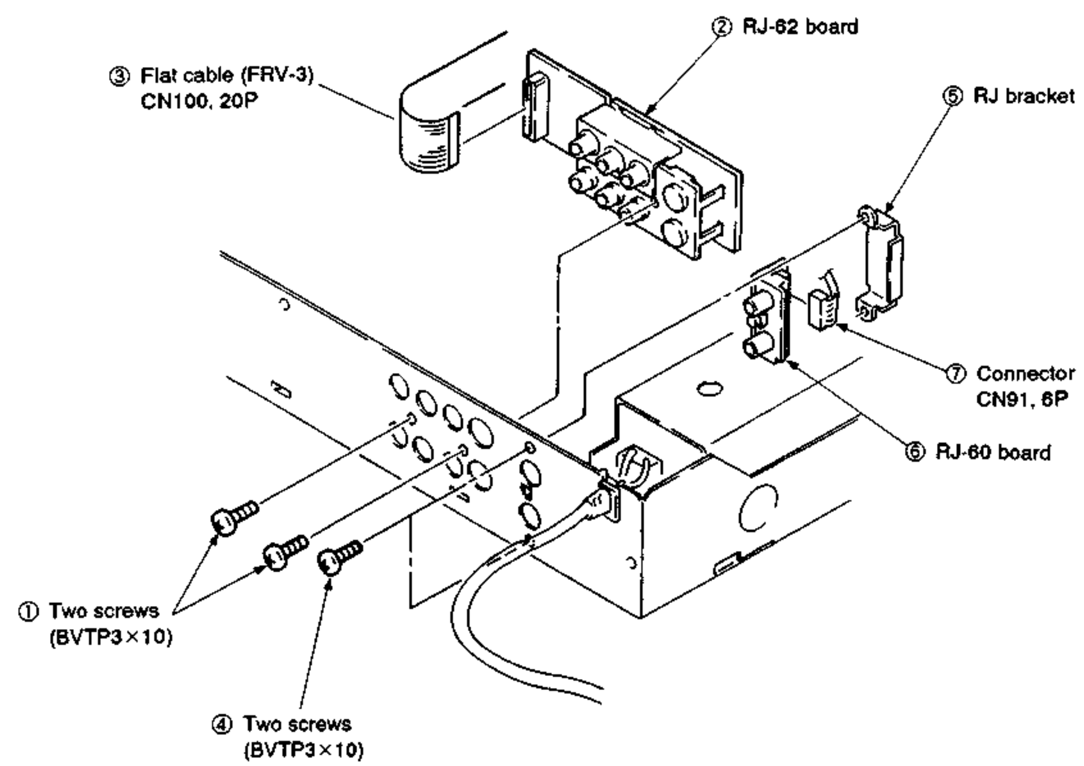
1 ≙ EJECT button (7)
2 Programme number buttons
3 ● REC (recording) button (9)
4 ◀◀ REW (rewind) button (7)
5 ■ STOP button (7)
6 ON/STANDBY button (7)
7 VOL (volume) +/– button
8 PROGR (programme) +/– button
9 COUNTER RESET button
10 ▷ PLAY button (7)
11 ▶▶ FF (fast-forward) button (7)
12 ❚❚ PAUSE button (7)

SECTION 3
DISASSEMBLY

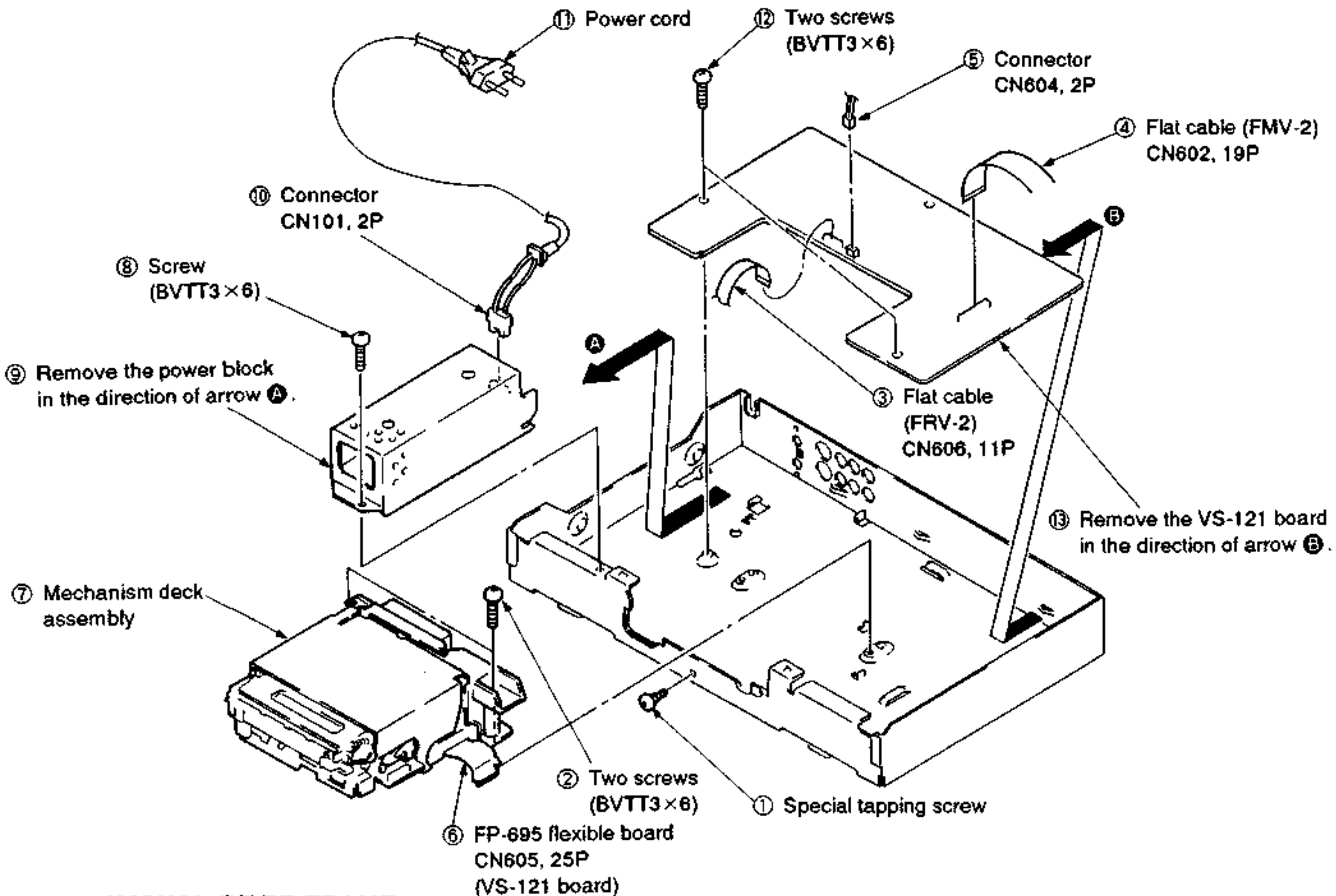
3-1. REMOVAL OF UPPER CASE AND FRONT PANEL ASSEMBLY



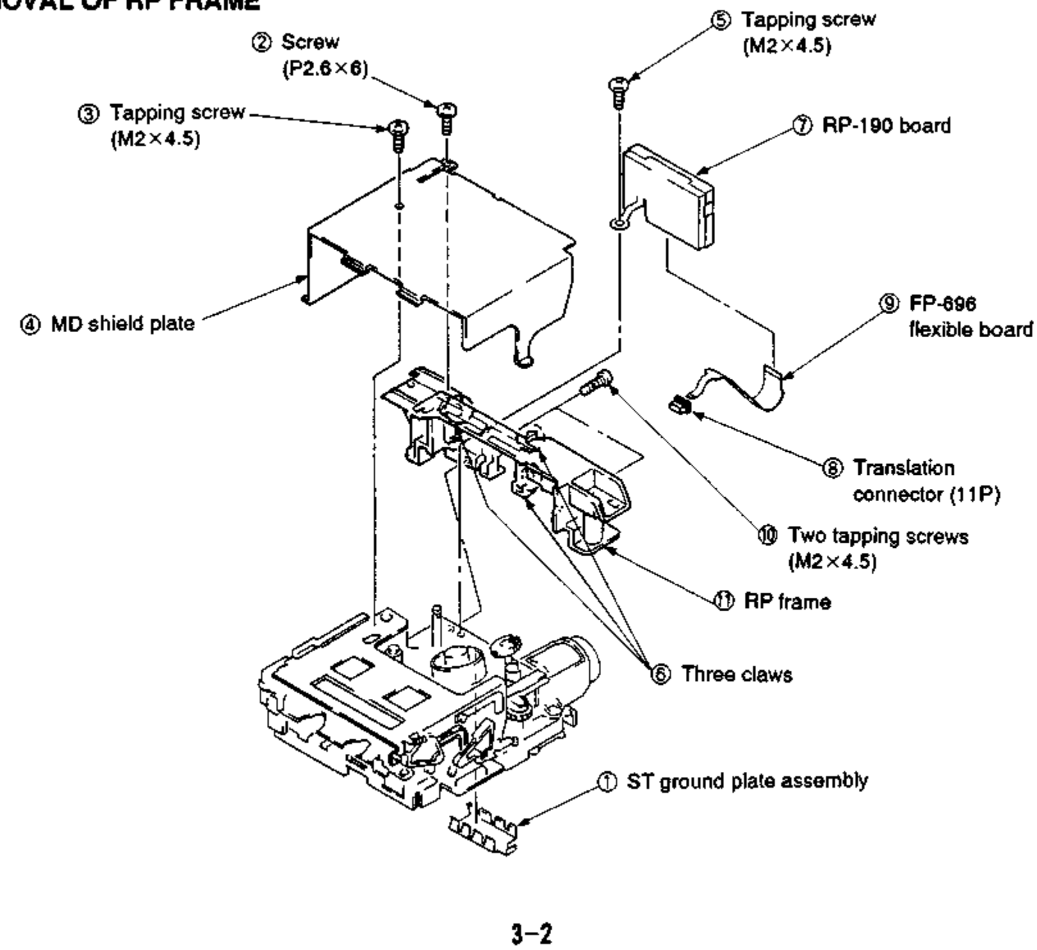
3-2. REMOVAL OF RJ-60 AND RJ-62 BOARDS



3-3. REMOVAL OF VS-121 BOARD, POWER BLOCK AND MECHANISM DECK ASSEMBLY



3-4. REMOVAL OF RP FRAME

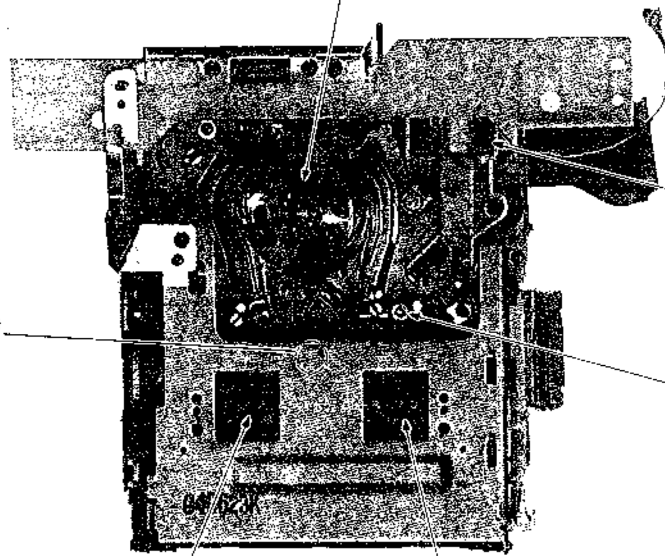


3-5. INTERNAL VIEWS

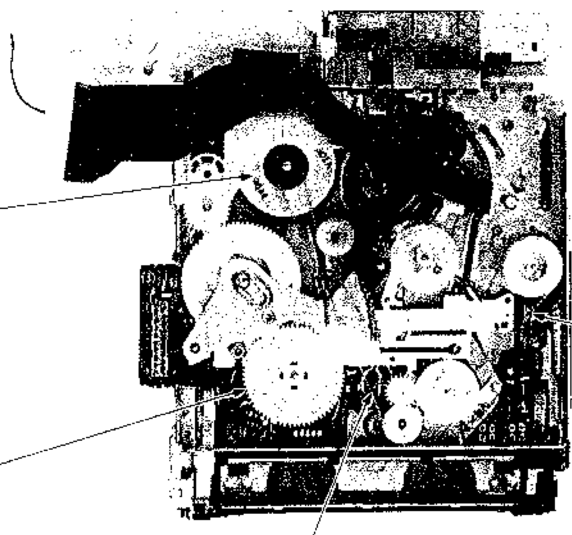
— Top Side —

M901

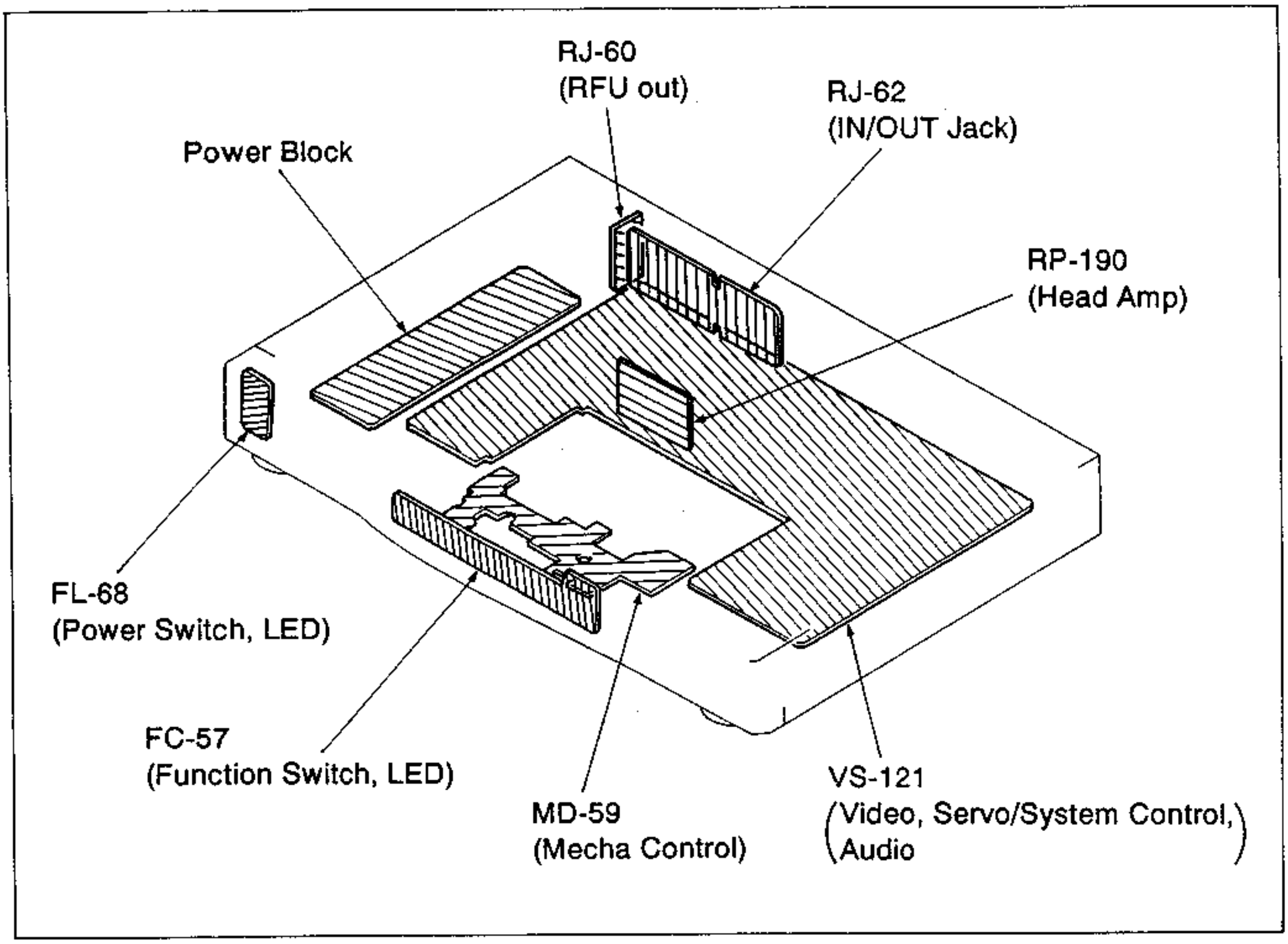
Drum assembly (DGU-0B8A-R)	A-7048-787-A
Upper drum assembly (DGR-0B8-R)	A-7049-660-A



— Bottom Side —

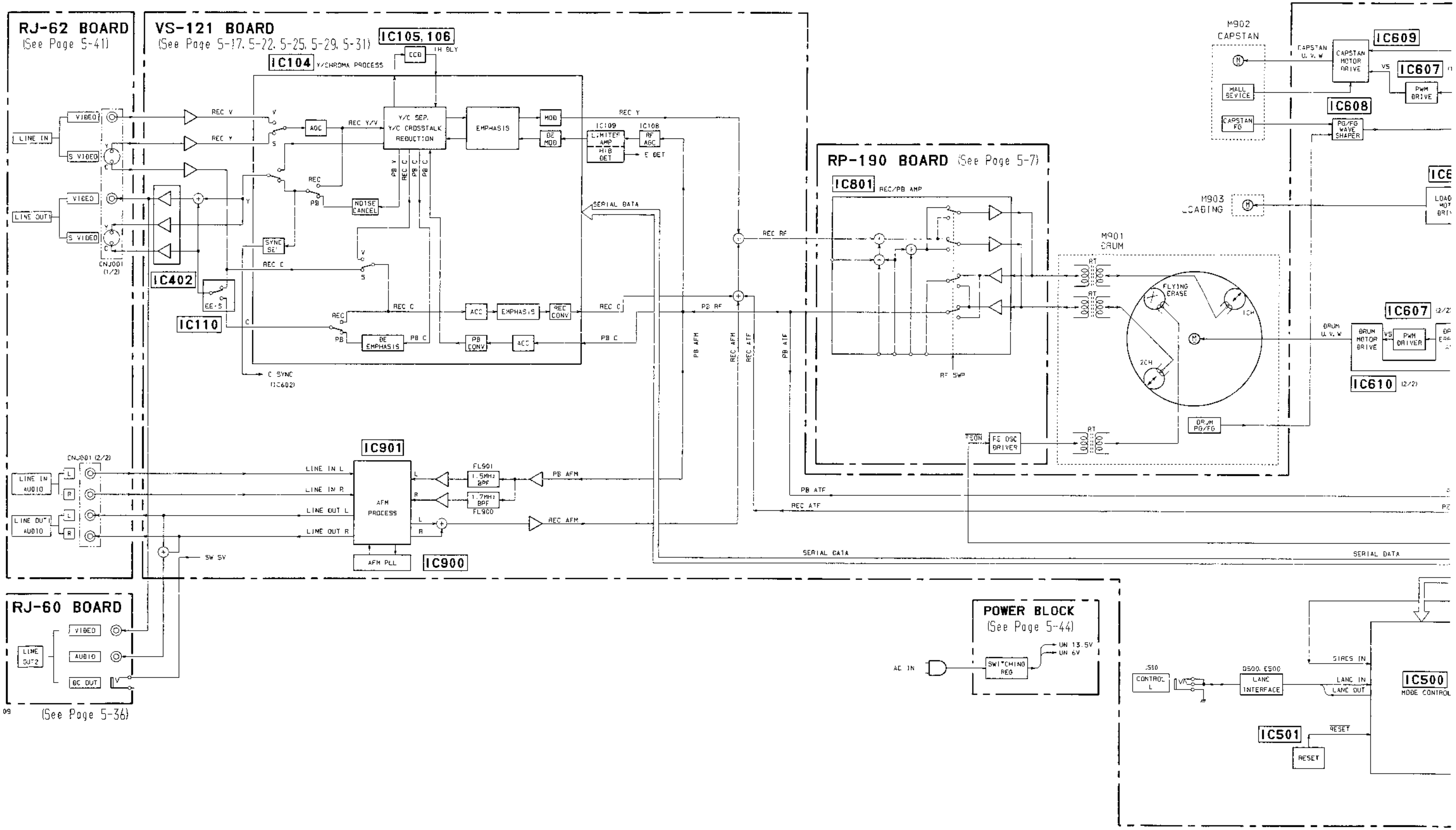


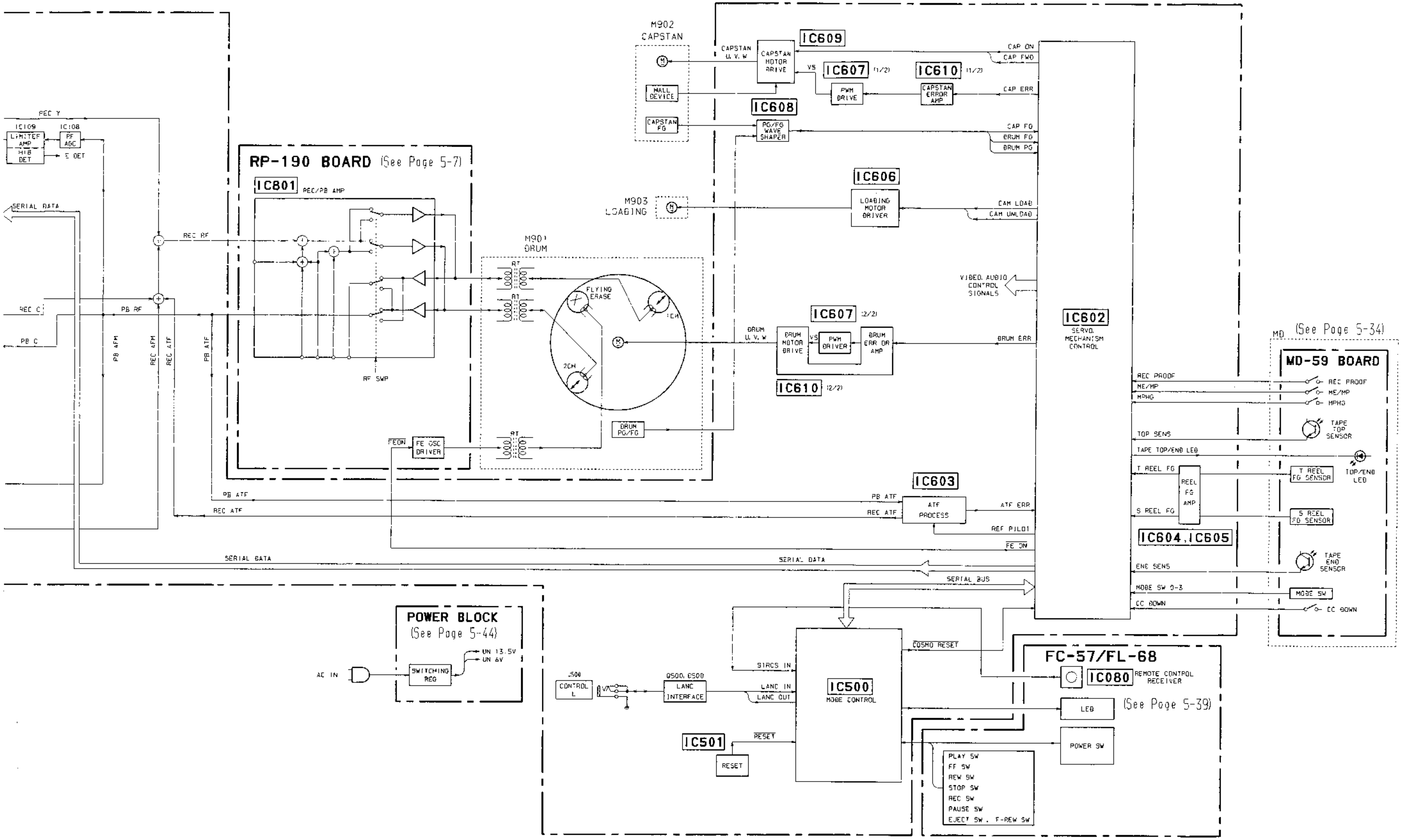
3-6. CIRCUIT BOARDS LOCATION



SECTION 4
DIAGRAMS

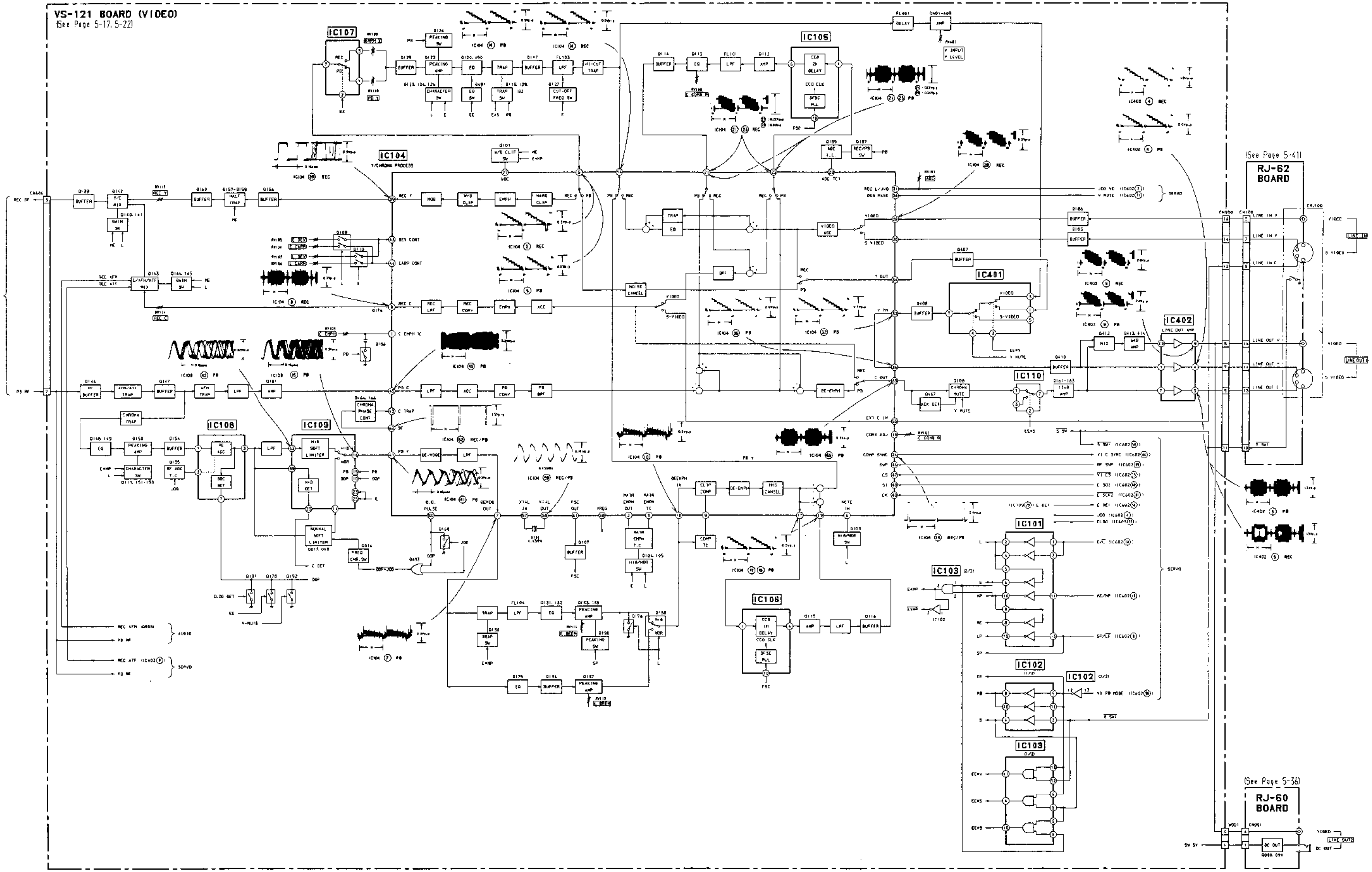
4-1. OVERALL BLOCK DIAGRAM



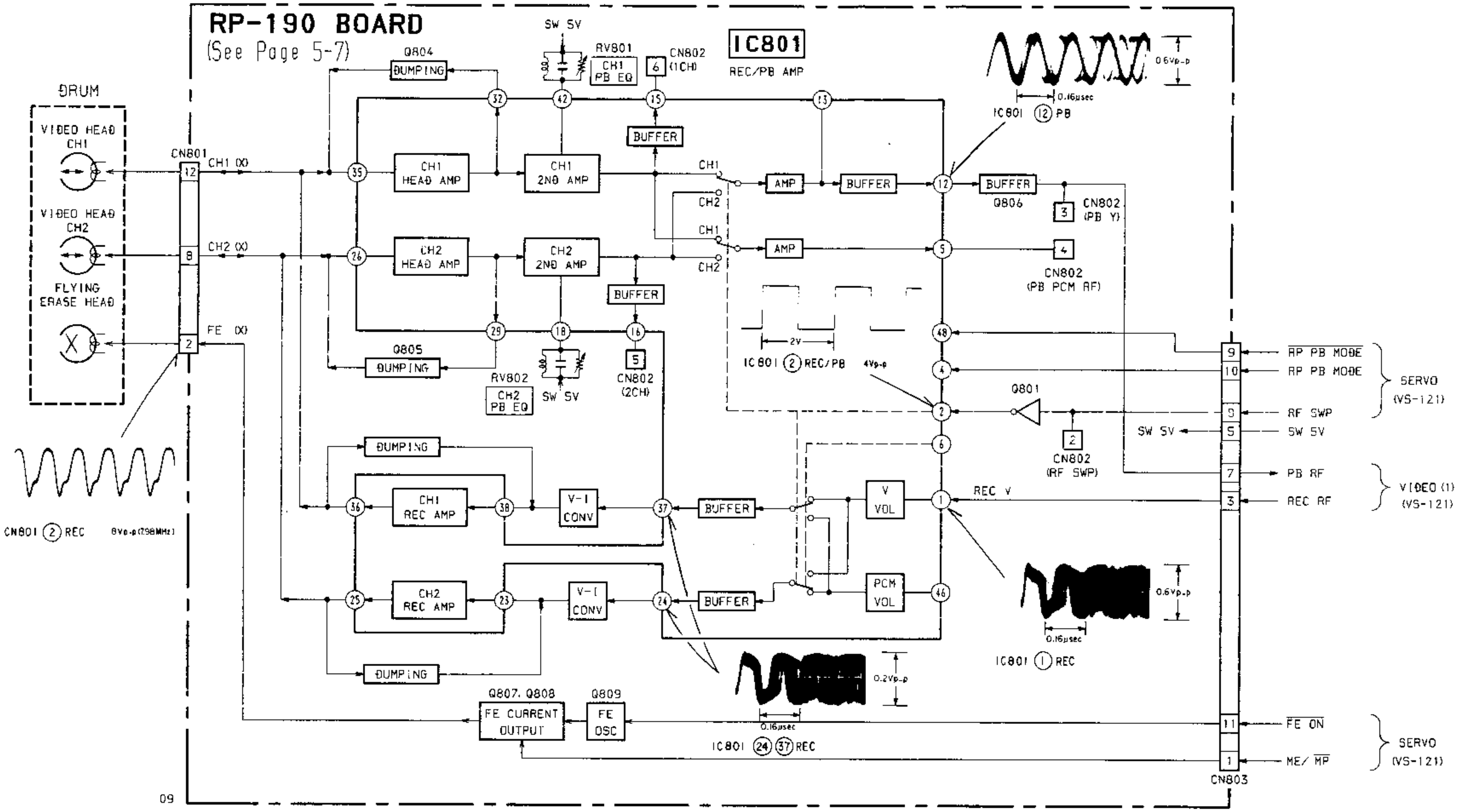


M902 CAPSTAN
IC609
CAPSTAN MOTOR DRIVE
IC607 (1/2)
IC610 (1/2)
PWM DRIVE
CAPSTAN ERROR AMP
HALL DEVICE
CAPSTAN FG
IC608
PG/FG WAVE SHAPER
CAP ON
CAP FWD
CAP ERR
CAP FG
DRUM FG
DRUM PG
IC109
LIMITER AMP
H/B DET
IC108
RF AGC
E DET
REC Y
RP-190 BOARD (See Page 5-7)
IC801 REC/PB AMP
SERIAL DATA
REC RF
REC C
PB RF
PB C
PB AFM
REC AFM
REC ATF
PB ATF
RF SWP
M903 LOADING
IC606
LOADING MOTOR DRIVER
CAM LOAD
CAM UNLOAD
M901 DRUM
FLYING ERASE
1CH
2CH
VIDEO, AUDIO CONTROL SIGNALS
IC607 (2/2)
DRUM MOTOR DRIVE
PWM DRIVER
DRUM ERR DR AMP
DRUM ERR
IC610 (2/2)
IC602
SERVO, MECHANISM CONTROL
DRUM PG/FG
FEON
FE OSC DRIVER
IC603
ATF PROCESS
ATF ERR
REF PILOT
FE ON
SERIAL BUS
MD (See Page 5-34)
MD-59 BOARD
REC PROOF
ME/MP
MPHG
TOP SENS
TAPE TOP SENSOR
TAPE TOP/END LED
TOP/END LED
T REEL FG
REEL FG AMP
T REEL FG SENSOR
S REEL FG
S REEL FG SENSOR
IC604, IC605
END SENS
TAPE END SENSOR
MODE SW 0-3
MODE SW
CC DOWN
POWER BLOCK (See Page 5-44)
AC IN
SWITCHING REG
UN 13.5V
UN 6V
SIRCS IN
COSMO RESET
J500 CONTROL L
Q500, D500 LANC INTERFACE
LANC IN
LANC OUT
IC500 MODE CONTROL
IC501 RESET
FC-57/FL-68
IC080 REMOTE CONTROL RECEIVER
LED
(See Page 5-39)
POWER SW
PLAY SW
FF SW
REW SW
STOP SW
REC SW
PAUSE SW
EJECT SW, F-REW SW

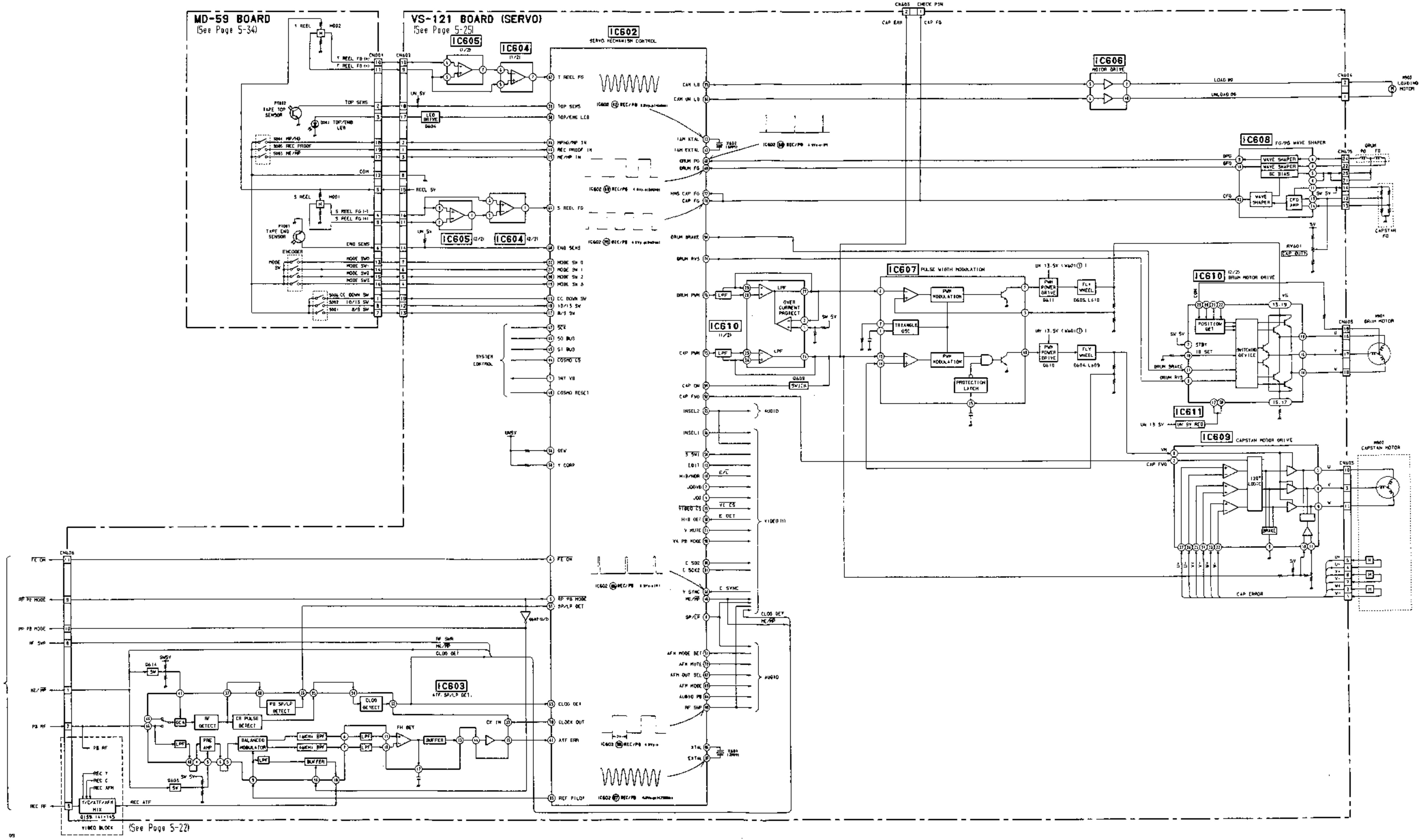
4-2. VIDEO (1) BLOCK DIAGRAM



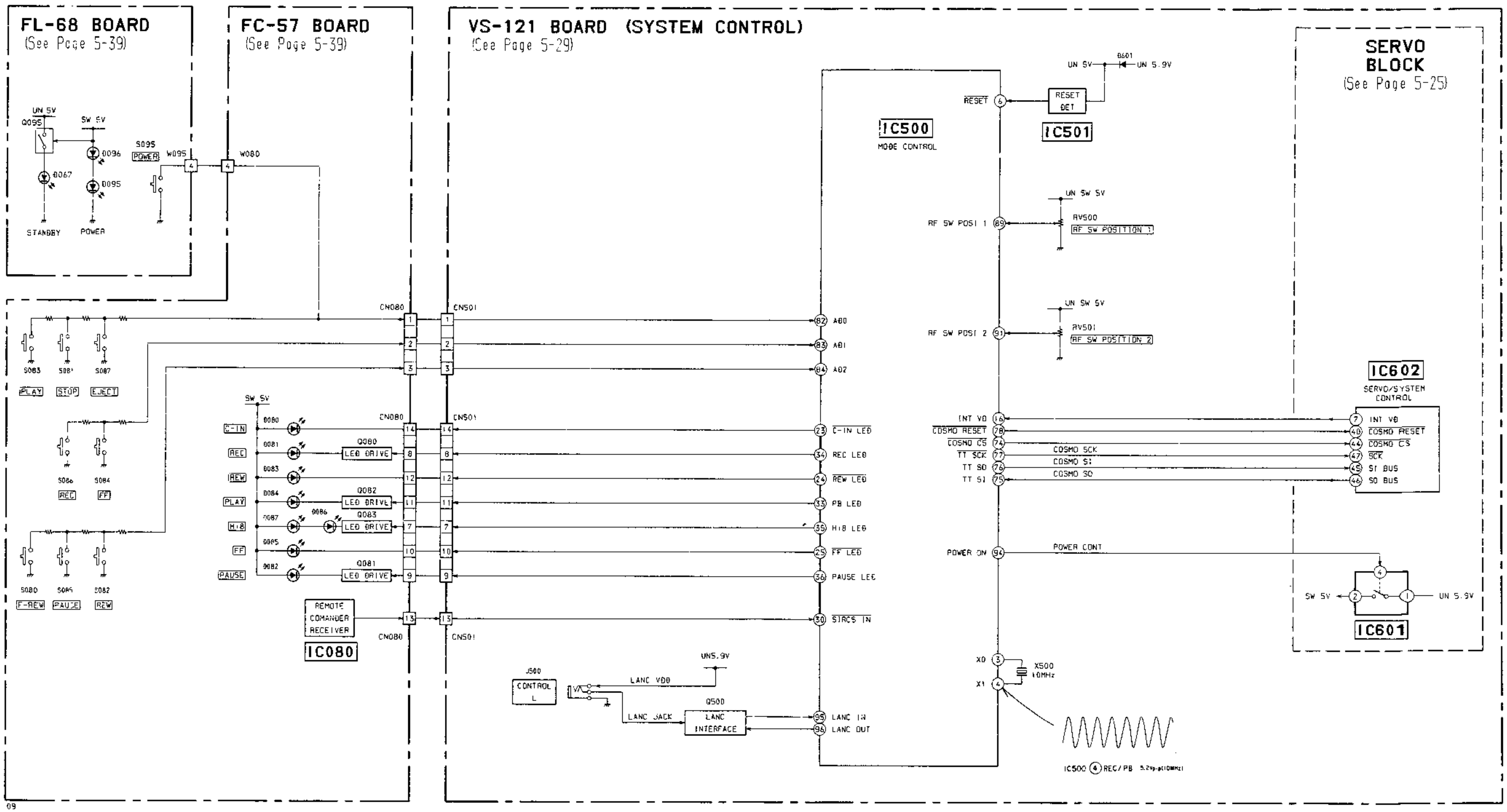
4-3. VIDEO (2) BLOCK DIAGRAM



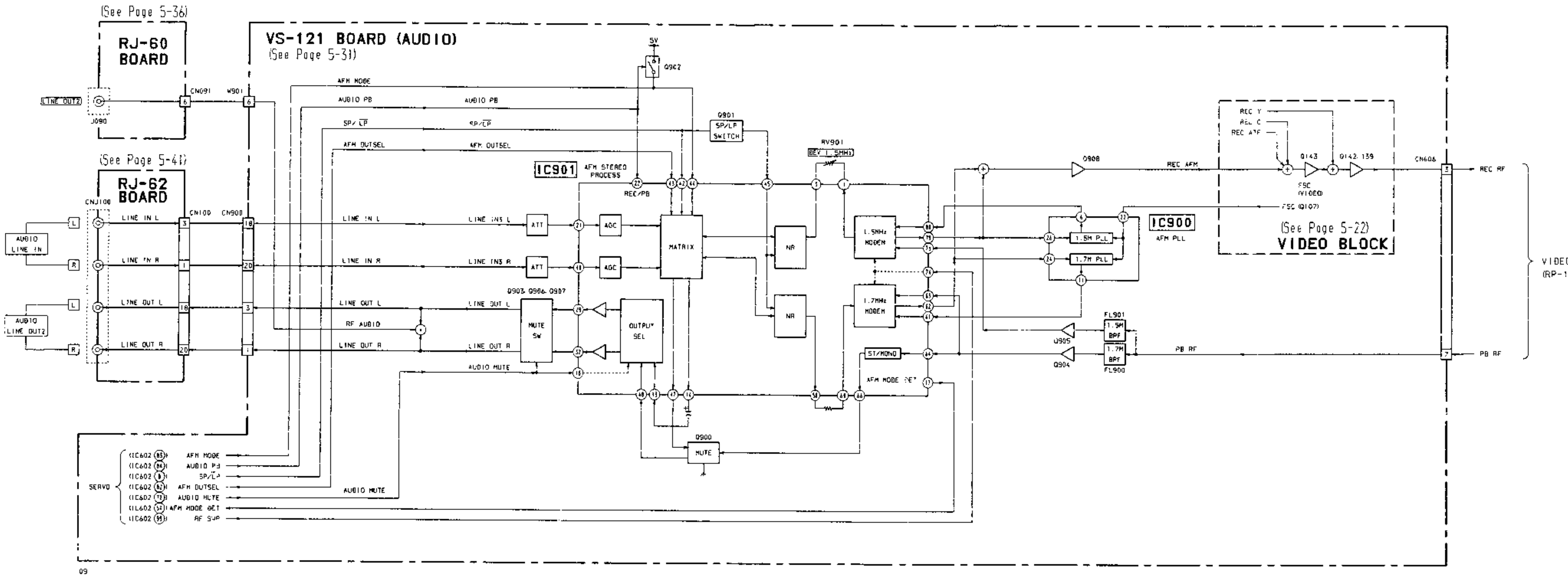
4-4. SERVO BLOCK DIAGRAM



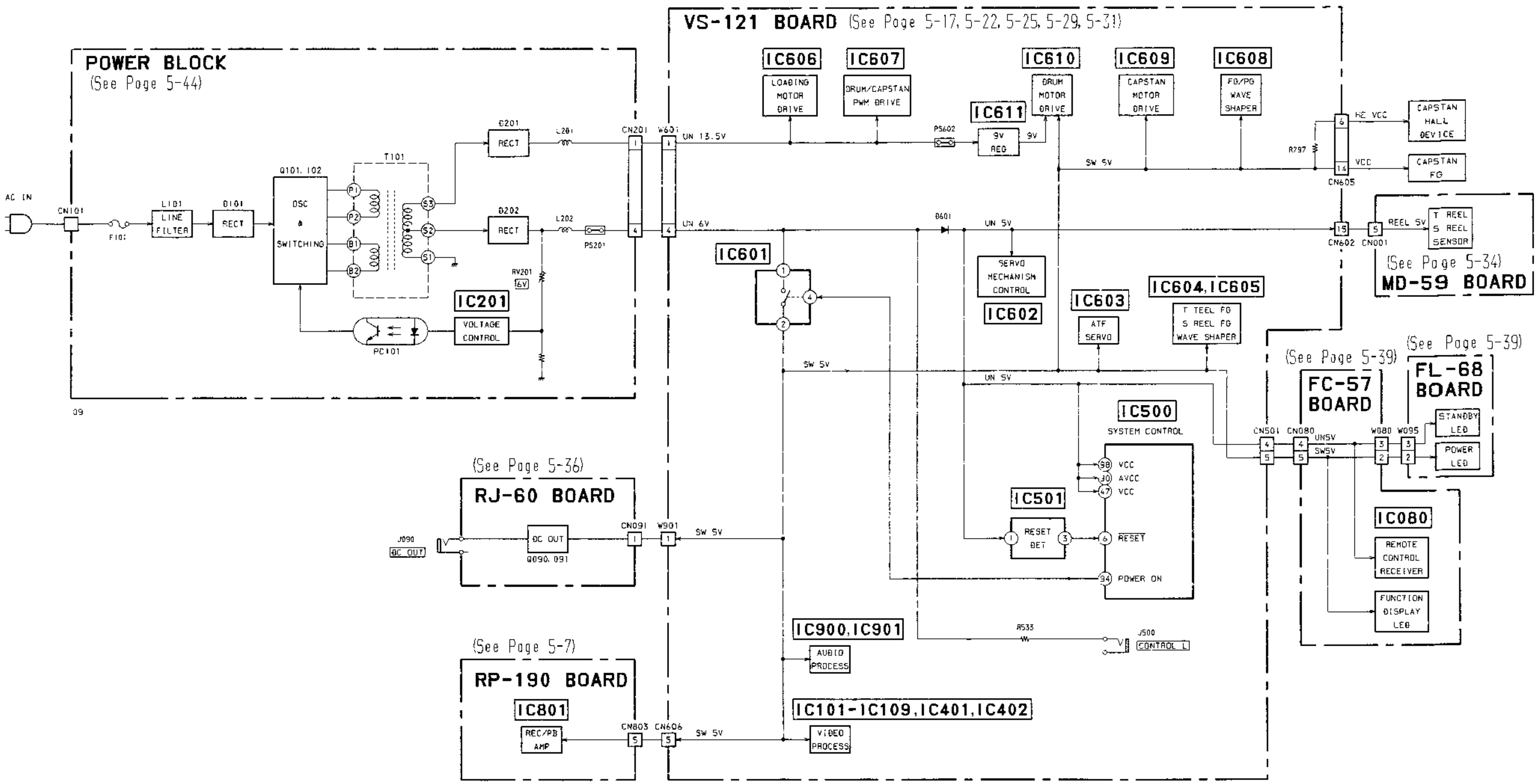
4-5. SYSTEM CONTROL BLOCK DIAGRAM



4-6. AUDIO BLOCK DIAGRAM

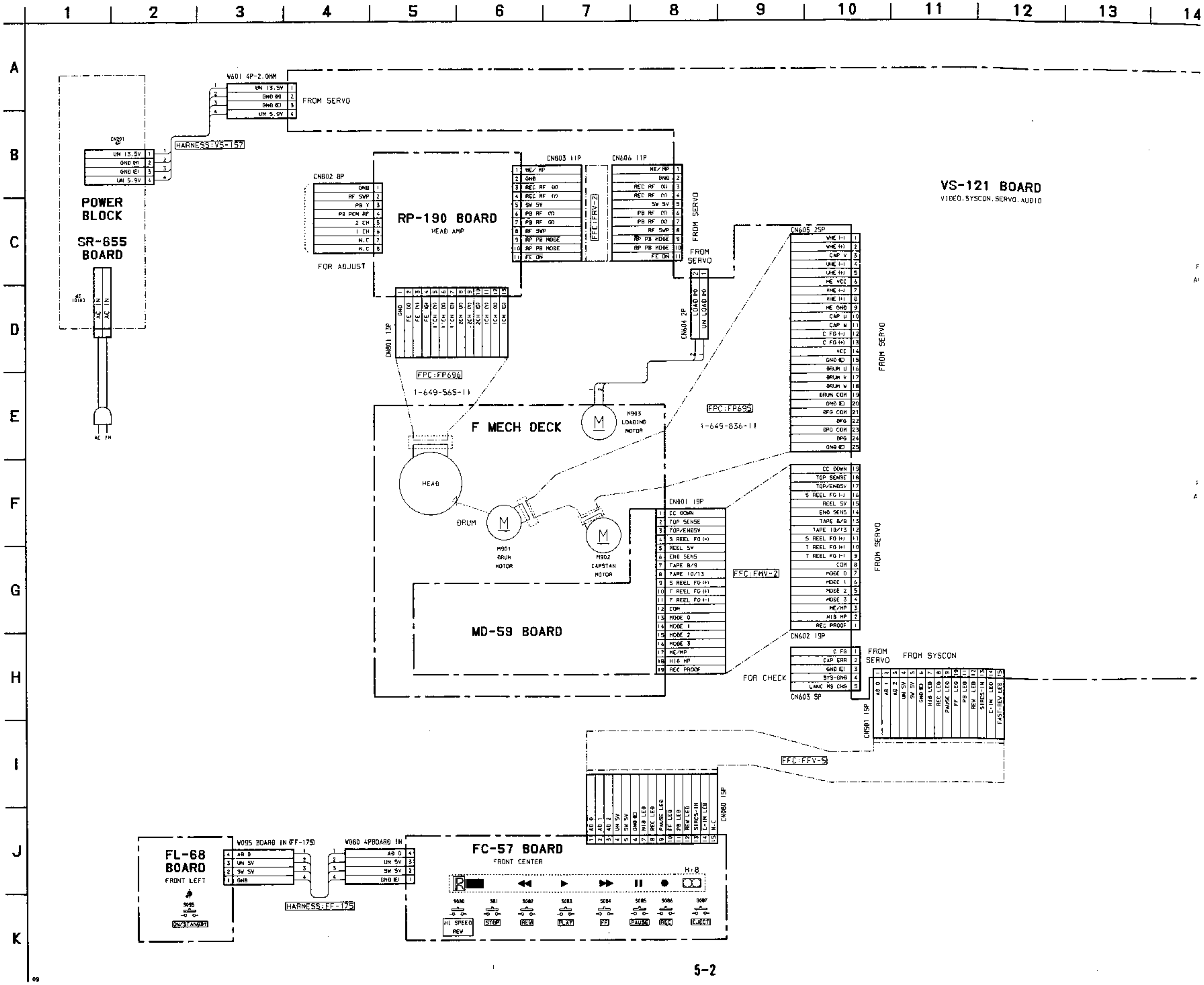


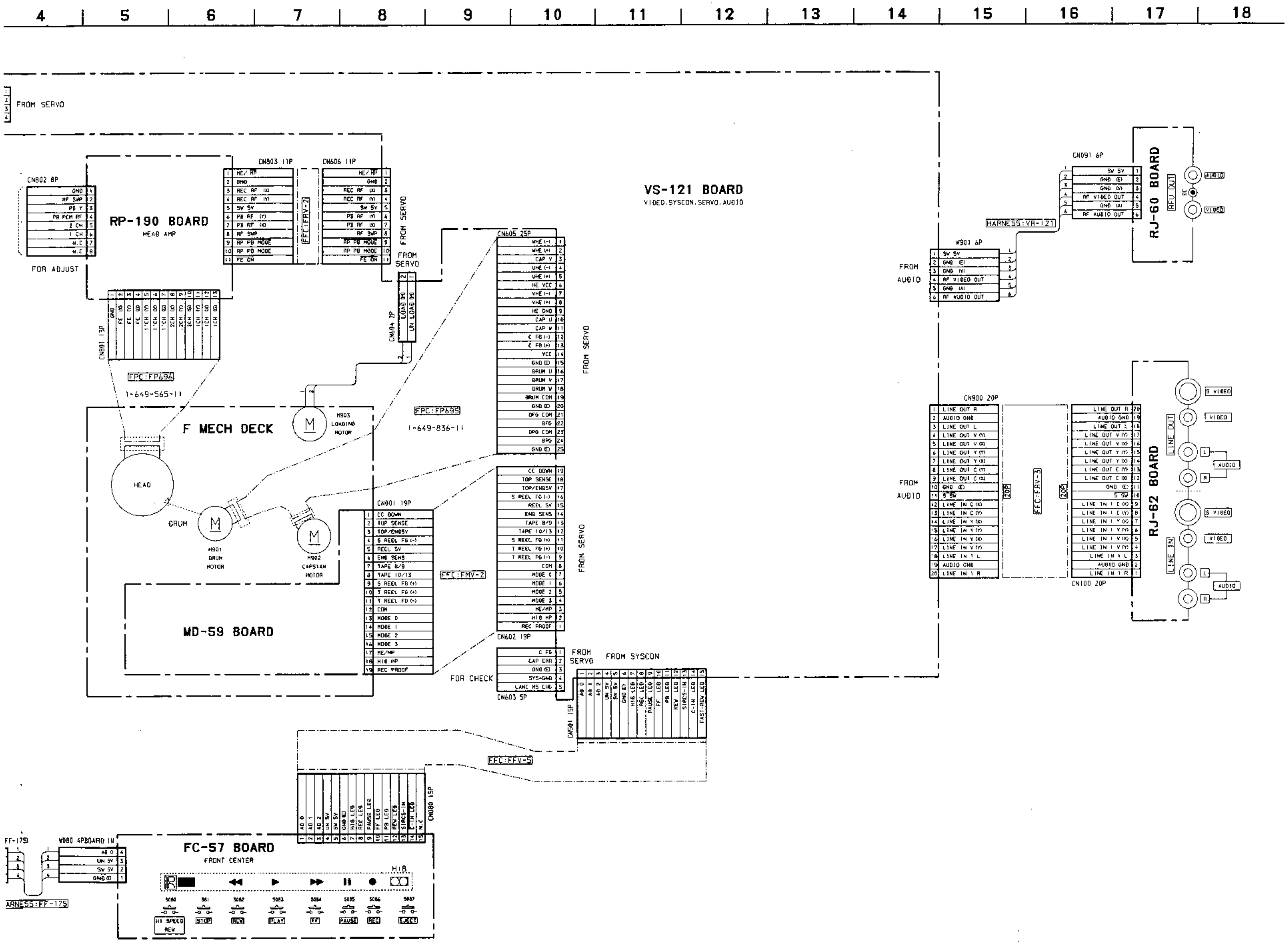
4-7. POWER BLOCK DIAGRAM



SECTION 5
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

5-1. FRAME SCHEMATIC DIAGRAM




4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
FROM SERVO
CN802 8P
RP-190 BOARD
HEAD AMP
FOR ADJUST
CN803 11P
CN606 11P
FFC:FRV-2
FROM SERVO
FROM SERVO
VS-121 BOARD
VIDEO, SYSCON, SERVO, AUDIO
CN605 25P
CN604 2P
CN801 13P
FPC:FP696
1-649-565-11
F MECH DECK
M903
LOADING
MOTOR
FPC:FP695
1-649-836-11
HEAD
DRUM
M901
DRUM
MOTOR
M902
CAPSTAN
MOTOR
CN601 19P
FFC:FMV-2
MD-59 BOARD
CN602 19P
FOR CHECK
CN603 5P
FROM SERVO
FROM SYSCON
CN501 15P
FFC:FFV-5
CN080 15P
W980 4P BOARD IN
FC-57 BOARD
FRONT CENTER
H.I.B.
HI SPEED REW
STOP
REW
PLAY
FF
PAUSE
REC
EJECT
HARNESS:FF-175
CN091 6P
HARNESS:VR-121
W901 6P
FROM AUDIO
RJ-60 BOARD
RFU OUT
AUDIO
VIDEO
CN900 20P
FFC:FRV-3
CN100 20P
FROM AUDIO
RJ-62 BOARD
LINE OUT
LINE IN
S VIDEO
VIDEO
AUDIO

FRAME

5-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- Through hole is omitted.
- : Pattern from the side which enables seeing. (The other layer's patterns are not indicated.)
- Circled numbers refer to waveforms.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in orms, 1/4 unless otherwise noted.
- Chip resistor are 1/10W unless otherwise noted. kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.*
- : B+ Line.*
- : B– Line.*
- : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

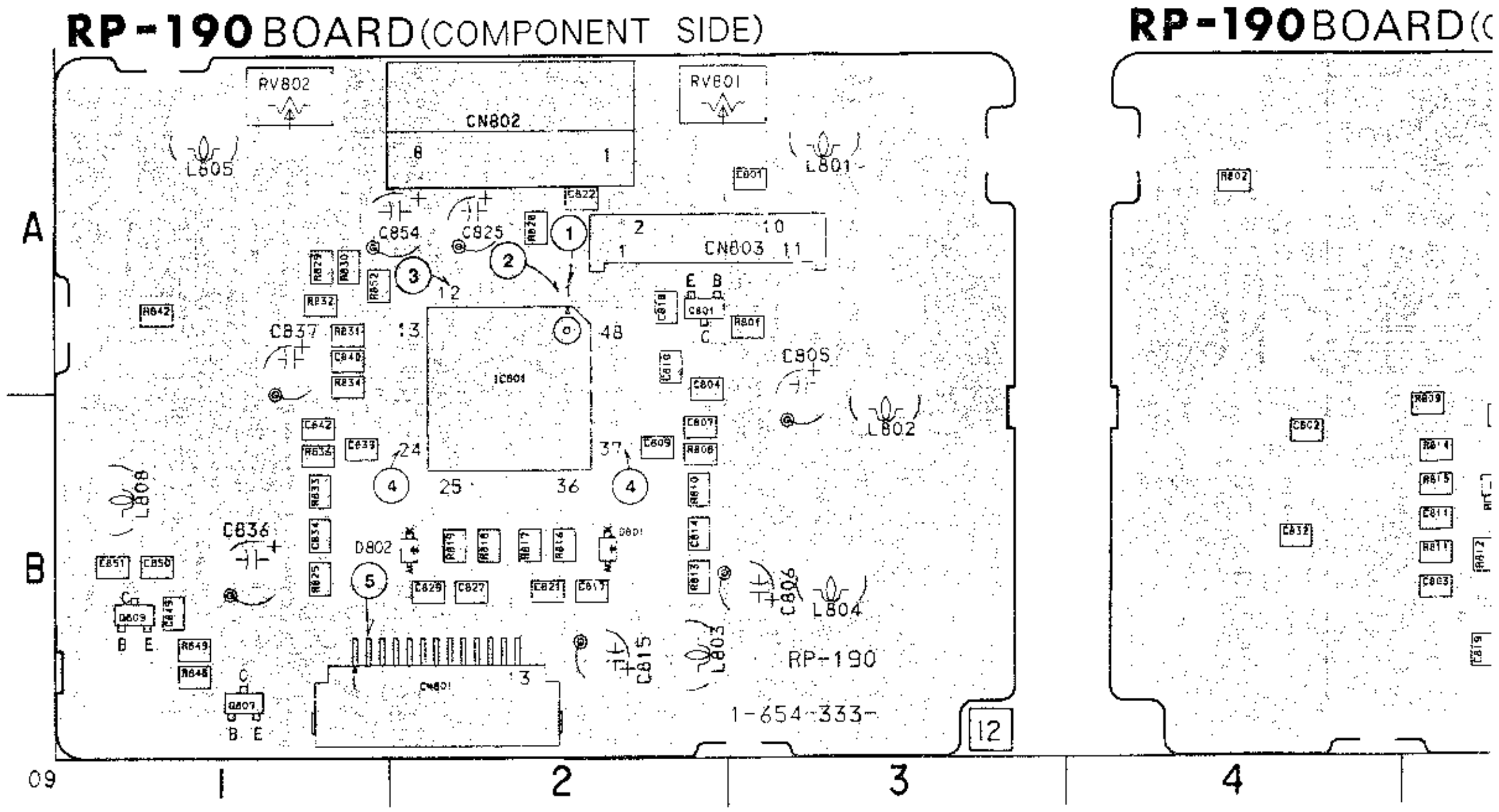
Note:
The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

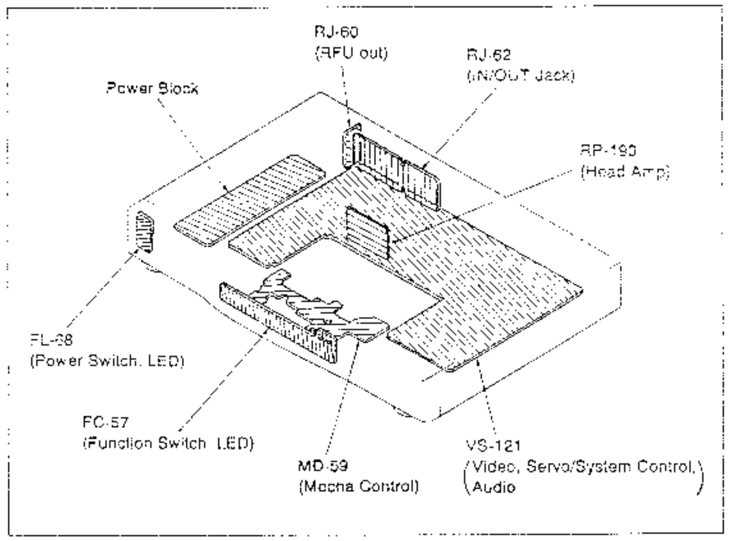
When indicating parts by refer- ence number, please include the board name.

*: indicated by the color red.

RP-190 (HEAD AMP) PRINTED WIRING BOARD

— Ref. No. RP-190 BOARD: 1000 series —



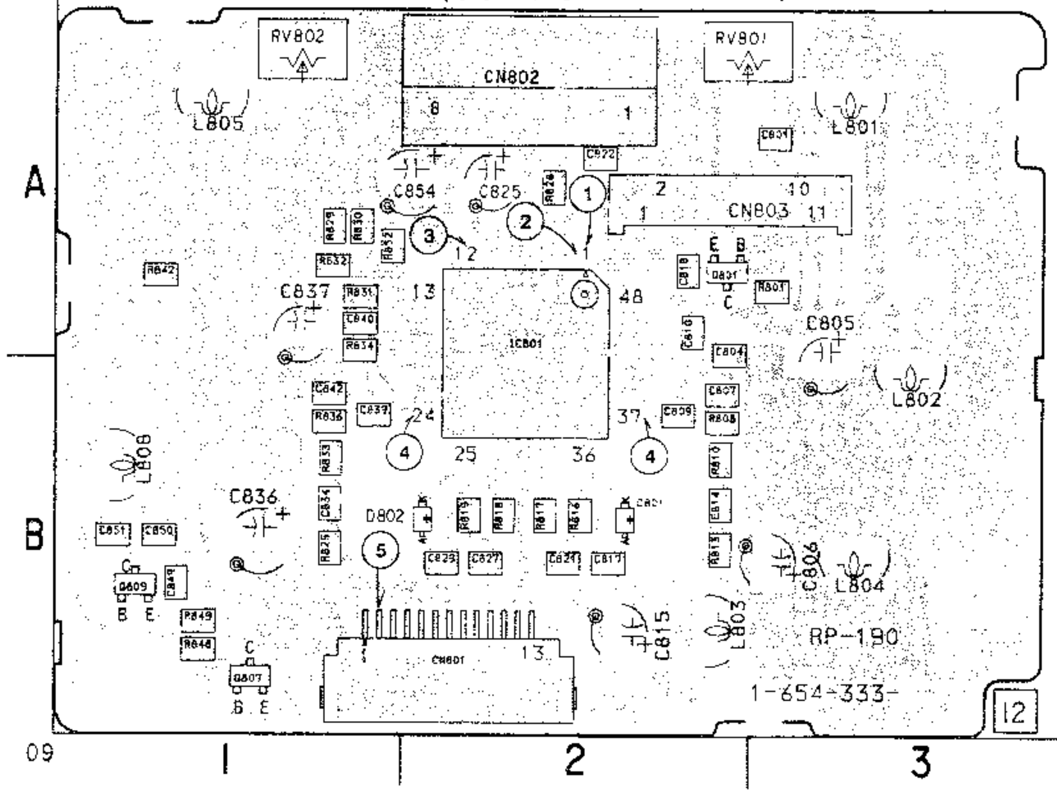


HEAD AMP

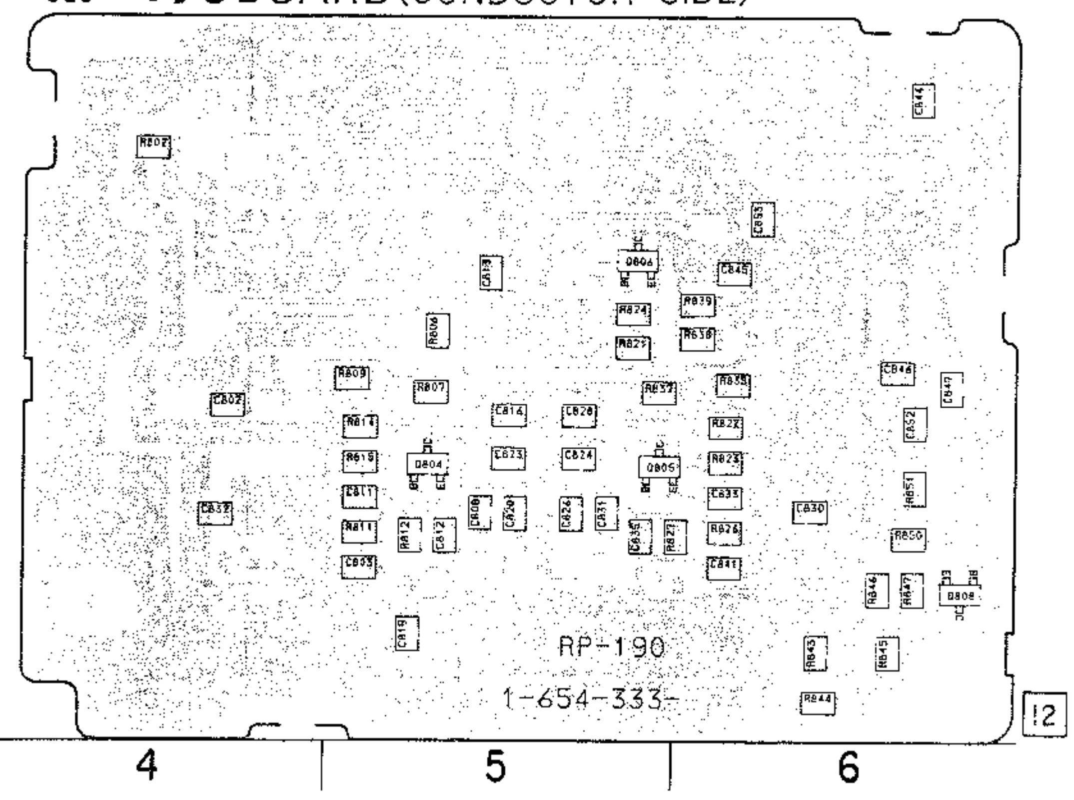
RP-190 (HEAD AMP) PRINTED WIRING BOARD

— Ref. No. RP-190 BOARD: 1000 series —

RP-190 BOARD (COMPONENT SIDE)

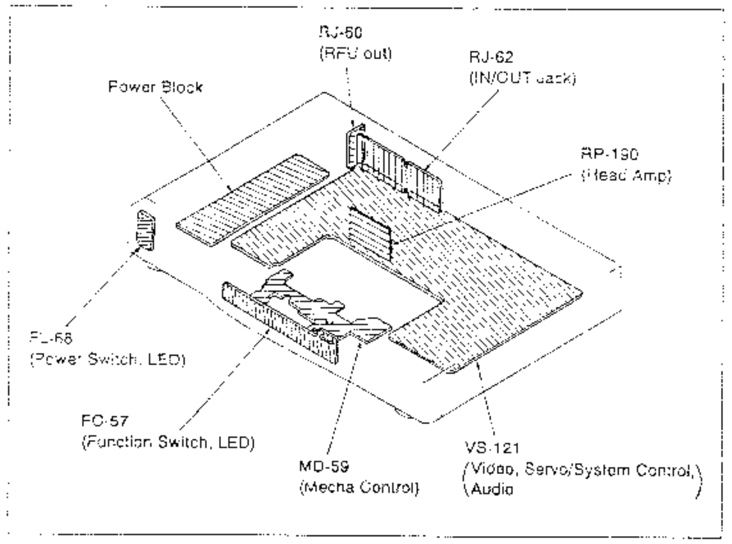


RP-190 BOARD (CONDUCTOR SIDE)



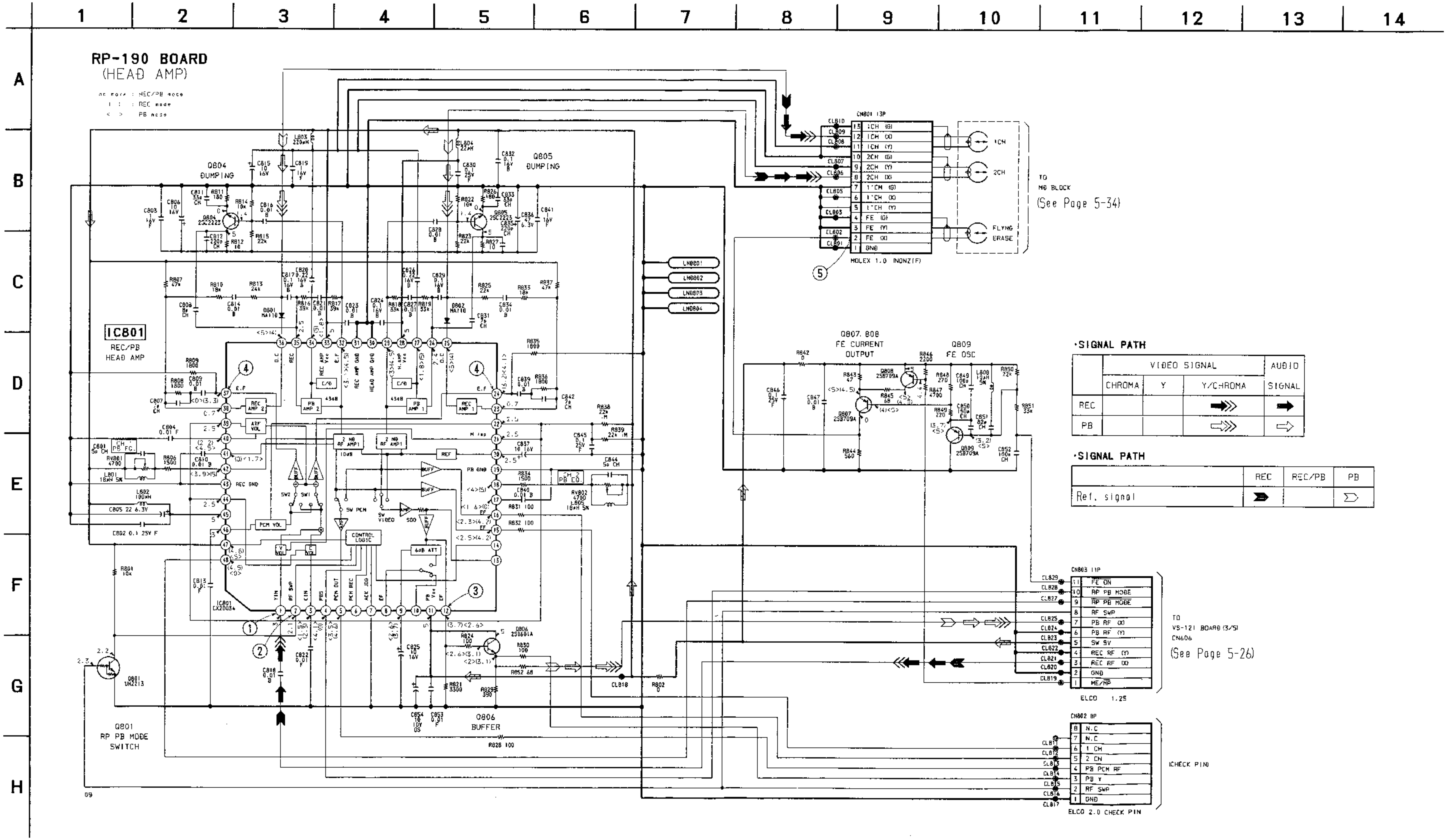
RP-190 BOARD

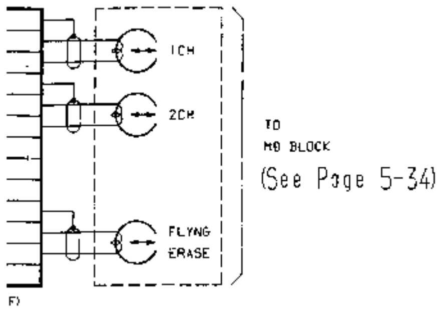
CN801	B-2
CN802	A-2
CN803	A-3
D801	B-2
D802	B-1
IC801	A-2
Q801	A-2
Q804	B-5
Q805	B-5
Q806	A-5
Q807	B-1
Q808	B-6
Q809	B-1

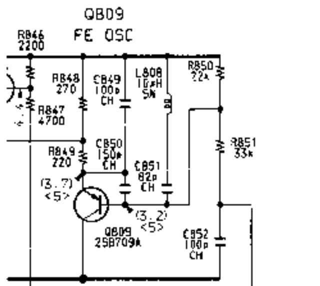


RP-190 (HEAD AMP) SCHEMATIC DIAGRAM

— Ref. No. RP-190 BOARD: 1000 series —





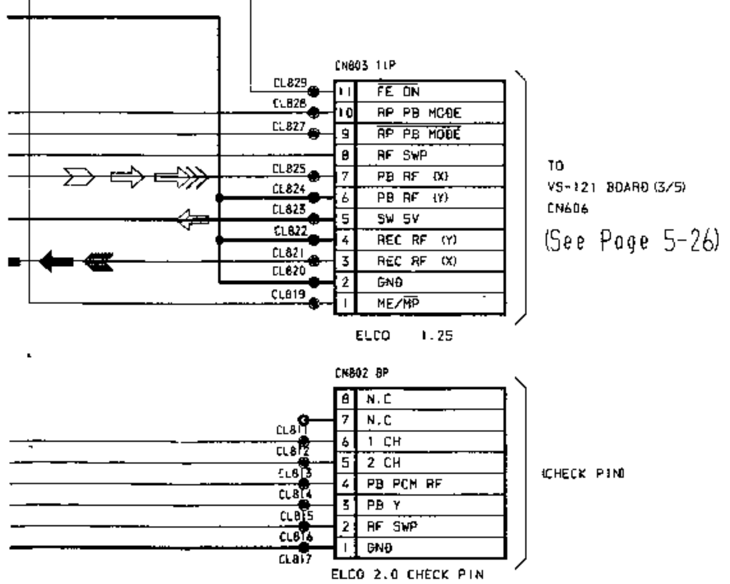


·SIGNAL PATH

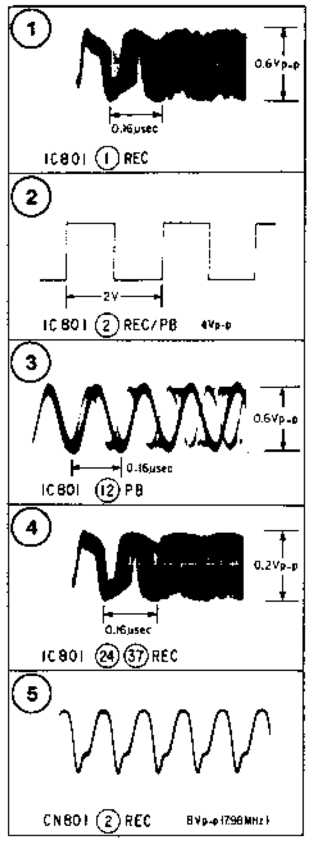
	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
REC			➡⟫	➡
PB			⇨⟫	⇨

·SIGNAL PATH

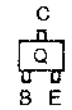
	REC	REC/PB	PB
Ref. signal	➤		▷



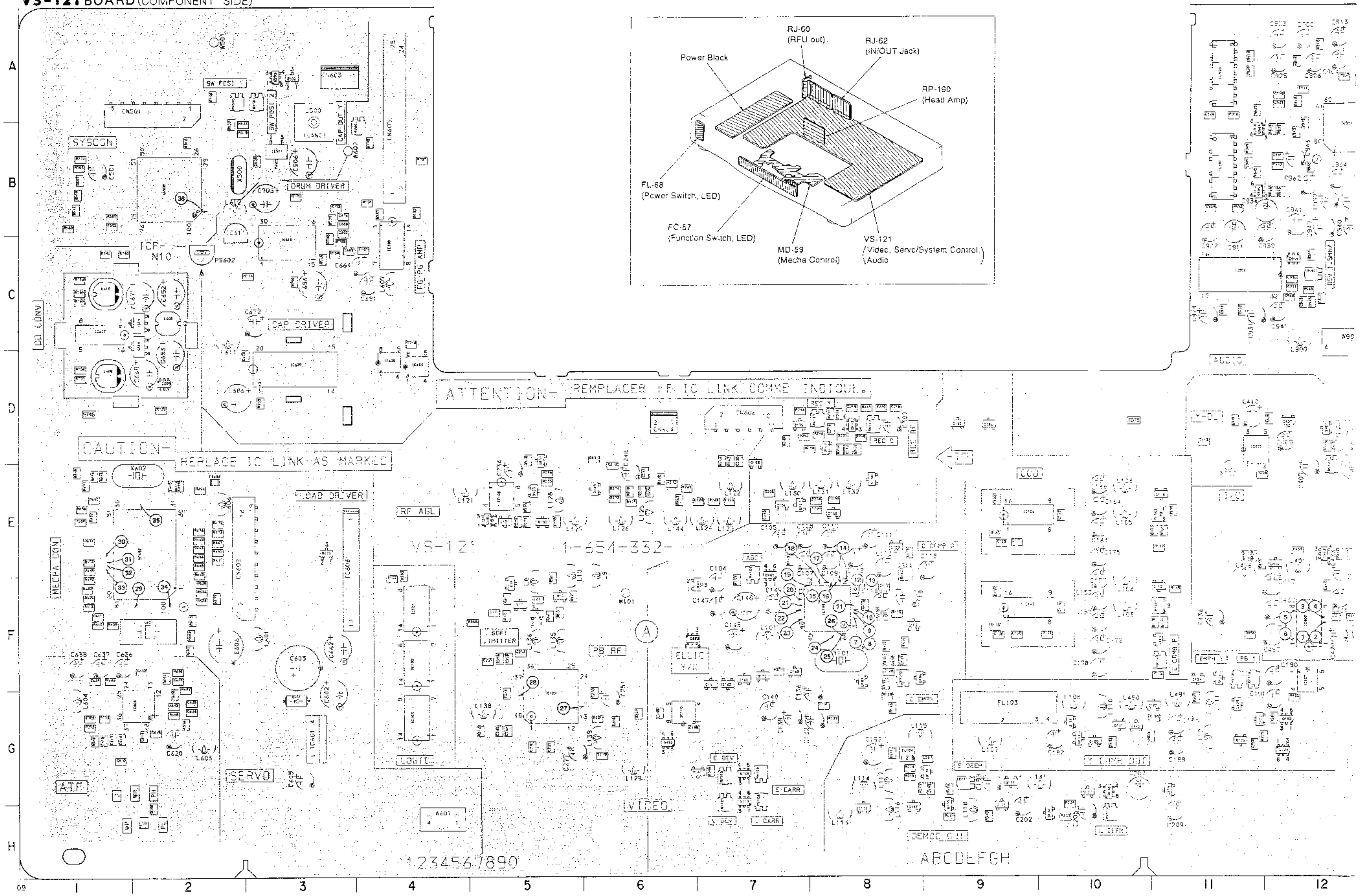
RP-190 BOARD



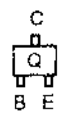
• Chip transistor

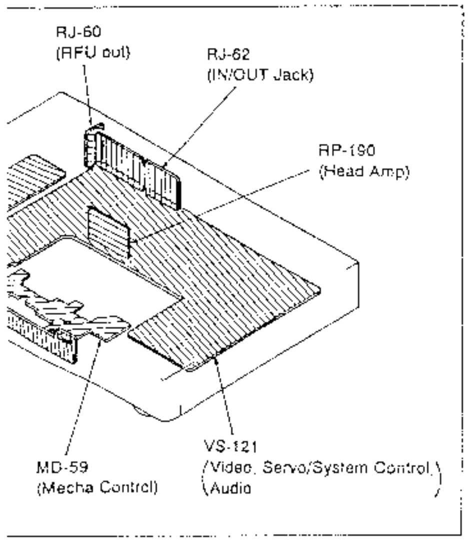


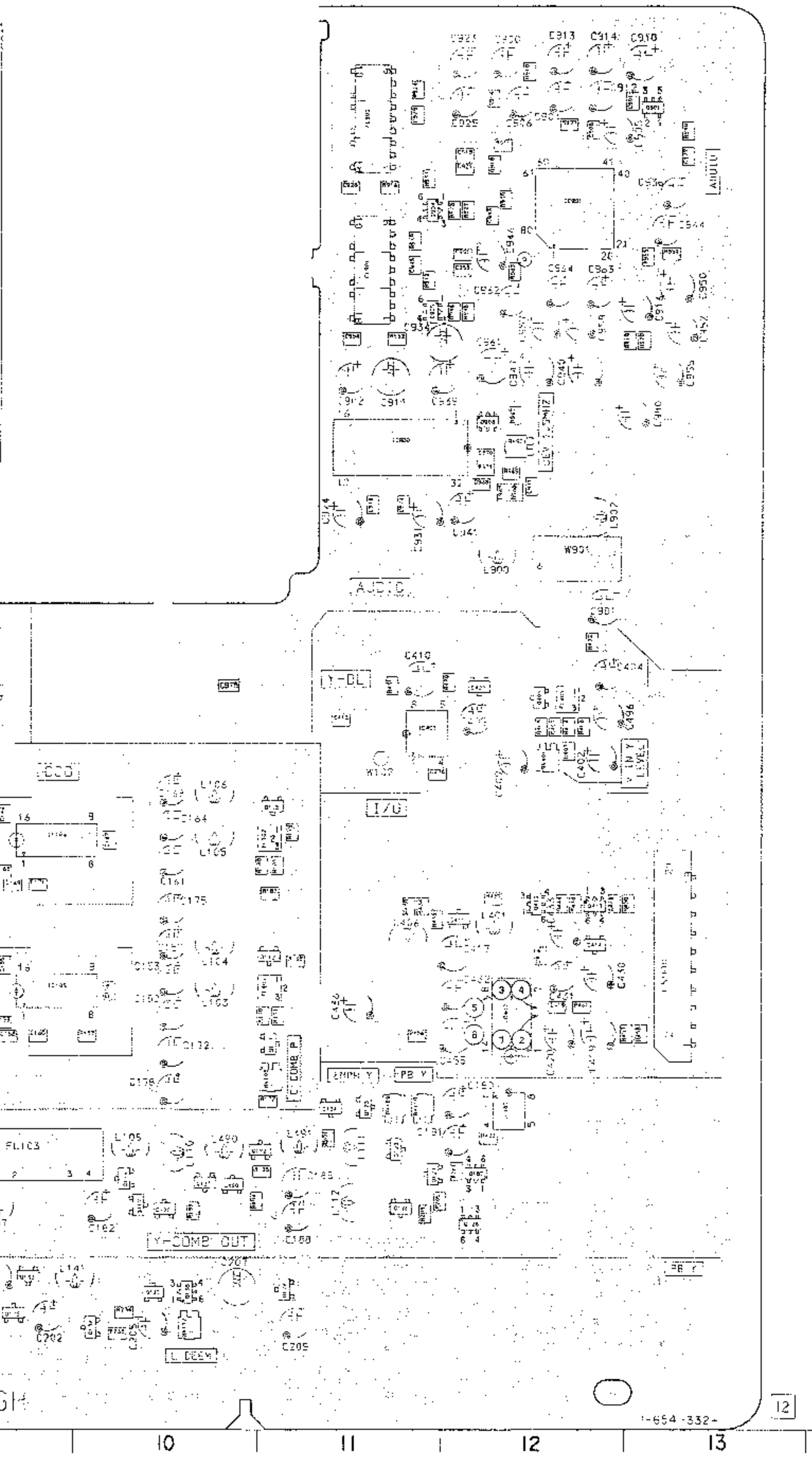
VS-121 BOARD (COMPONENT SIDE)



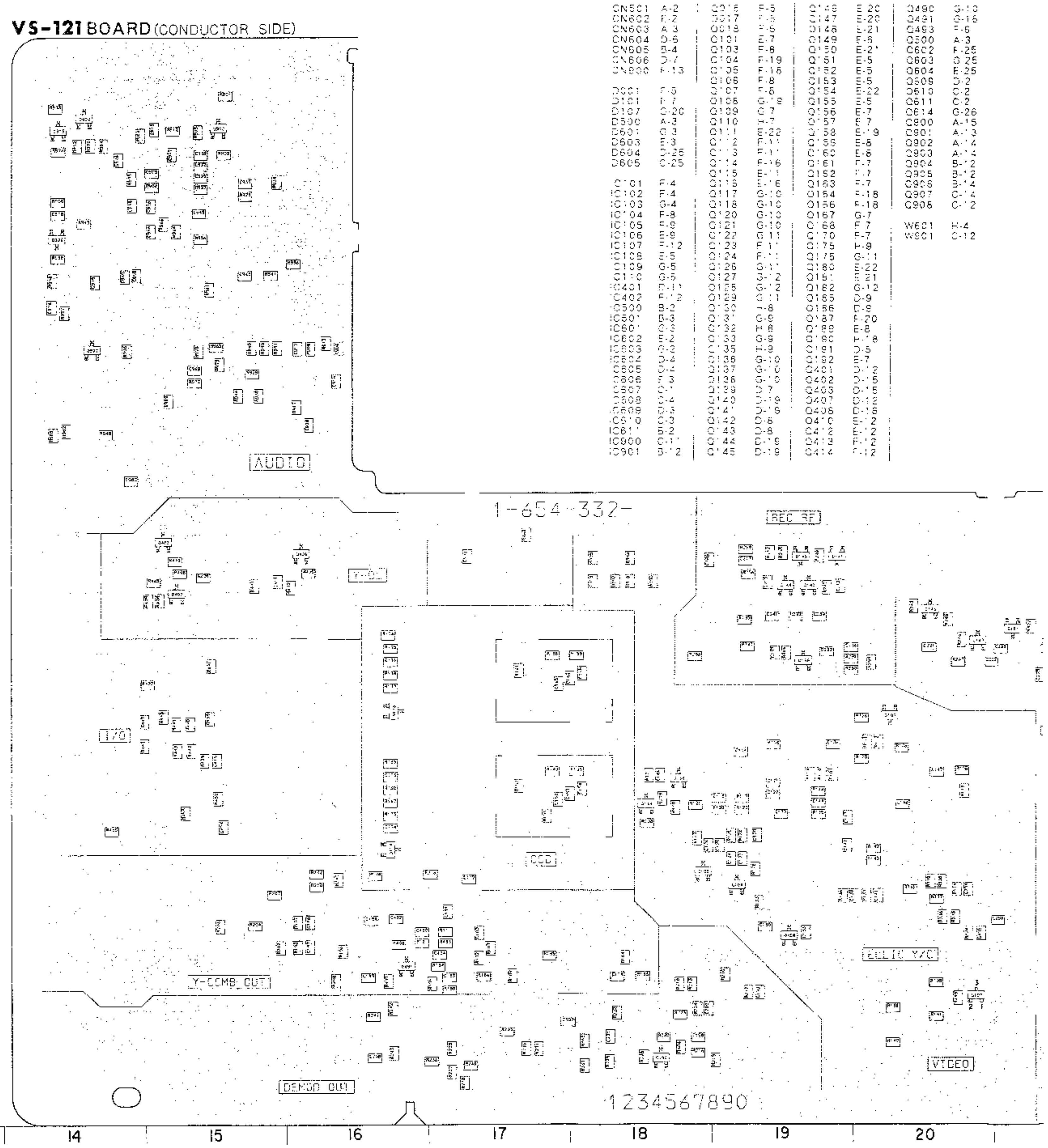
• Chip transistor







VS-121 BOARD (CONDUCTOR SIDE)



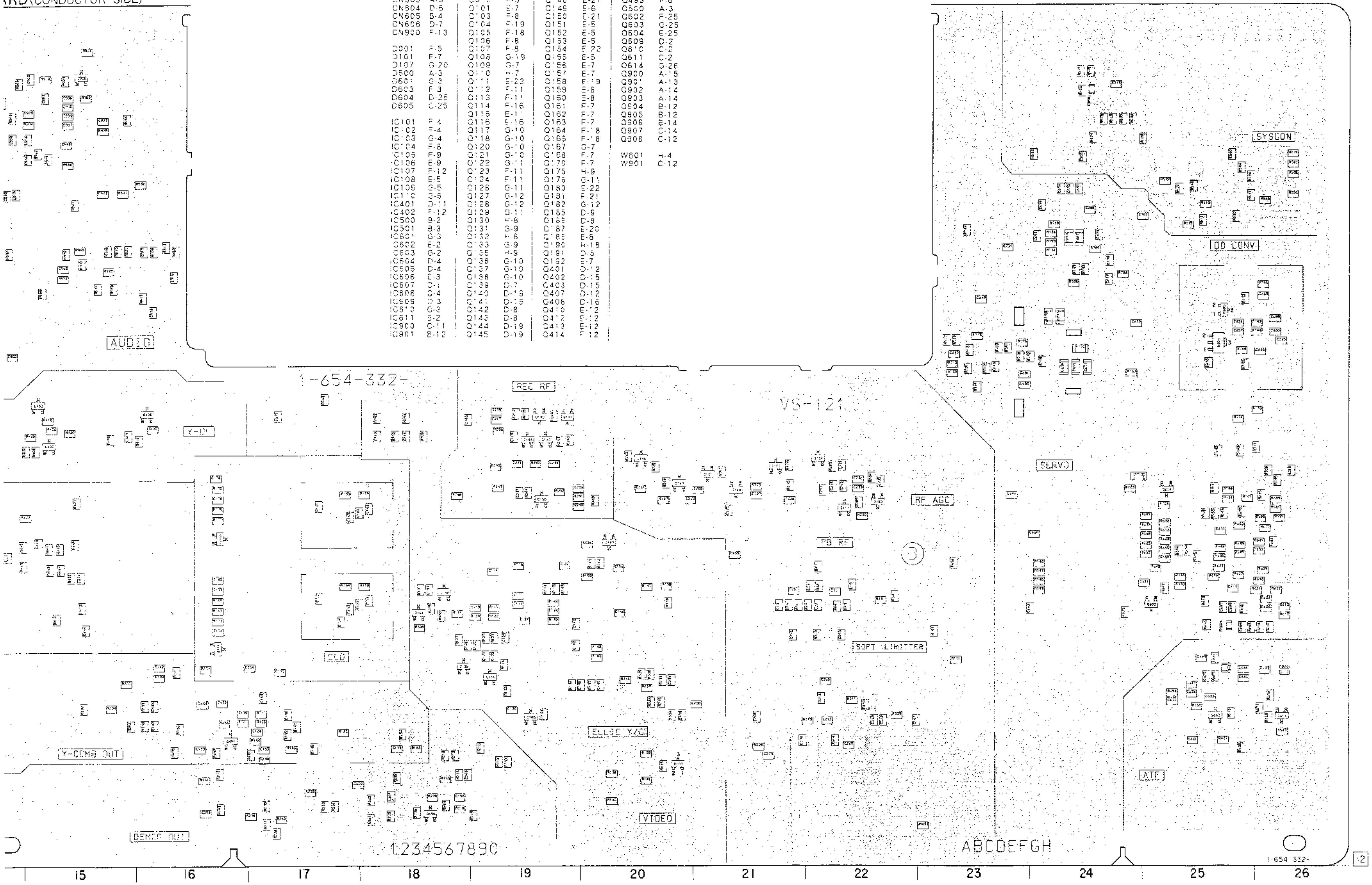
VS-121 BOARD

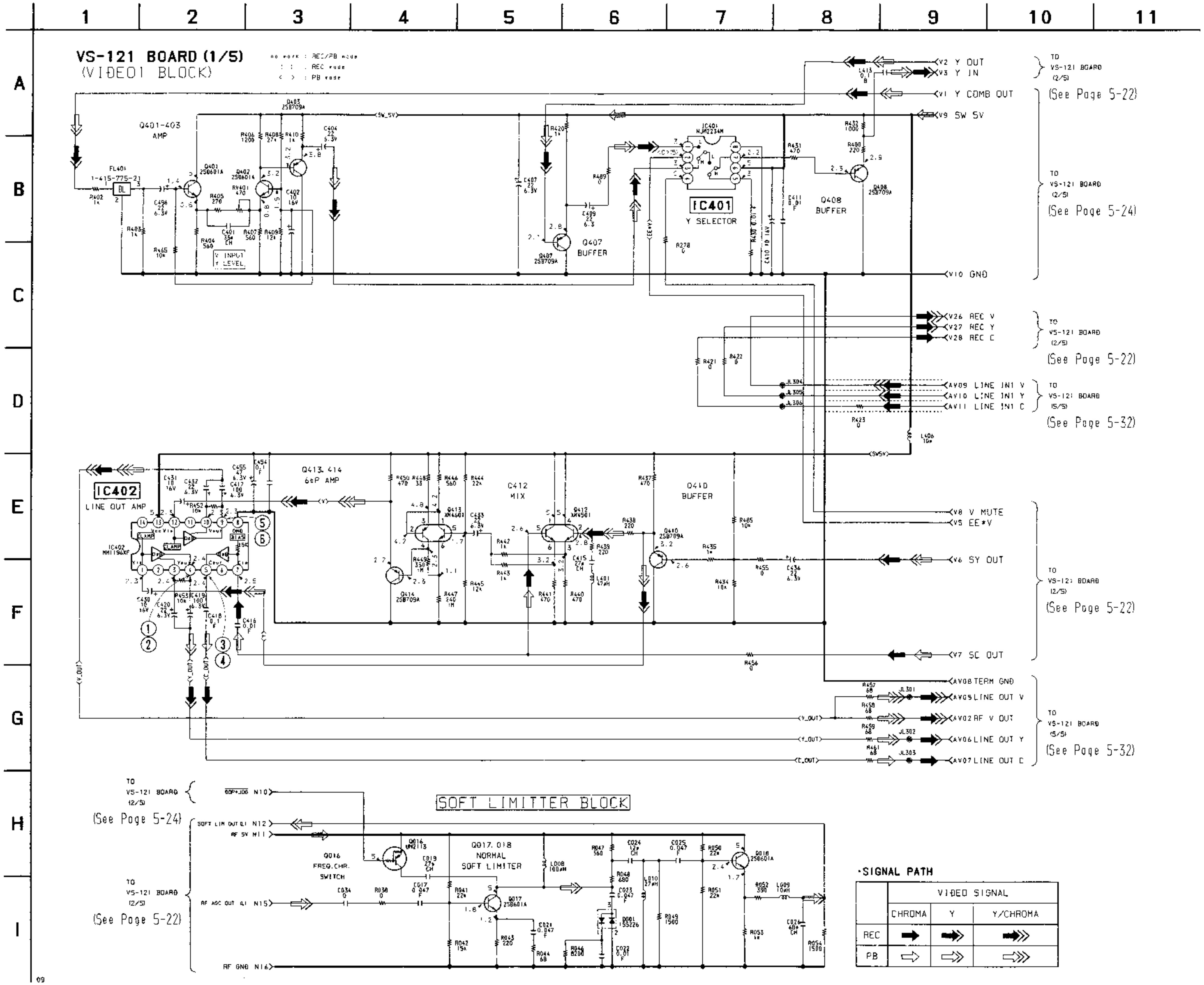
CN501	A-2	Q016	F-5	Q146	E-20	Q490	G-10
CN602	E-2	Q017	F-5	Q147	E-20	Q491	G-16
CN603	A-3	Q018	F-5	Q148	E-21	Q493	F-6
CN604	D-6	Q101	E-7	Q149	E-6	Q500	A-3
CN605	B-4	Q103	F-8	Q150	E-21	Q602	F-25
CN606	D-7	Q104	F-19	Q151	E-5	Q603	G-25
CN900	F-13	Q105	F-16	Q152	E-5	Q604	E-25
		Q106	F-8	Q153	E-5	Q609	D-2
D001	F-5	Q107	F-6	Q154	E-22	Q610	C-2
D101	F-7	Q108	G-19	Q155	E-5	Q611	C-2
D107	C-20	Q109	G-7	Q156	E-7	Q614	G-26
D500	A-3	Q110	H-7	Q157	E-7	Q900	A-15
D601	C-3	Q111	E-22	Q158	E-19	Q901	A-13
D603	E-3	Q112	F-11	Q159	E-6	Q902	A-14
D604	C-25	Q113	F-11	Q160	E-6	Q903	A-14
D605	C-25	Q114	F-16	Q161	F-7	Q904	B-12
		Q115	E-11	Q162	F-7	Q905	B-12
IC101	F-4	Q116	E-16	Q163	F-7	Q906	B-14
IC102	F-4	Q117	G-10	Q154	F-18	Q907	C-14
IC103	G-4	Q118	G-10	Q156	F-18	Q908	C-12
IC104	F-8	Q120	G-10	Q167	G-7		
IC105	F-9	Q121	G-10	Q168	F-7	W601	H-4
IC106	E-9	Q122	G-11	Q170	F-7	W901	C-12
IC107	F-12	Q123	F-11	Q175	H-9		
IC108	E-5	Q124	F-11	Q175	G-11		
IC109	G-5	Q126	G-11	Q180	E-22		
IC110	G-5	Q127	G-12	Q181	E-21		
IC401	D-11	Q128	G-12	Q182	G-12		
IC402	F-12	Q129	G-11	Q185	D-9		
IC500	B-2	Q130	H-8	Q186	D-9		
IC501	B-3	Q131	G-9	Q187	F-20		
IC601	C-3	Q132	H-8	Q189	E-8		
IC602	E-2	Q133	G-9	Q190	H-18		
IC603	C-2	Q135	H-9	Q191	D-5		
IC604	D-4	Q136	G-10	Q192	E-7		
IC605	C-4	Q137	G-10	Q401	D-12		
IC606	F-3	Q138	G-10	Q402	D-15		
IC607	C-1	Q139	D-7	Q403	D-15		
IC608	C-4	Q140	D-19	Q407	D-12		
IC609	D-3	Q141	D-19	Q408	D-18		
IC610	C-3	Q142	D-6	Q410	E-12		
IC611	B-2	Q143	D-8	Q412	E-12		
IC900	C-11	Q144	D-19	Q413	F-12		
IC901	B-12	Q145	D-19	Q414	F-12		

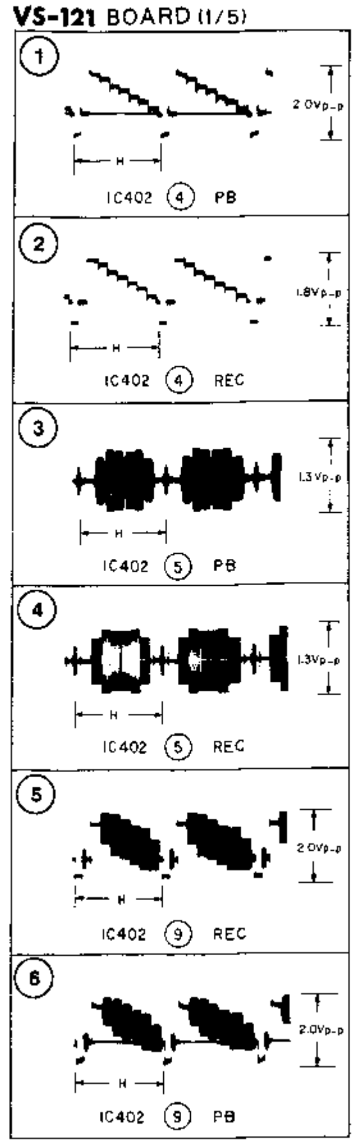
ARD (CONDUCTOR SIDE)

VS-121 BOARD

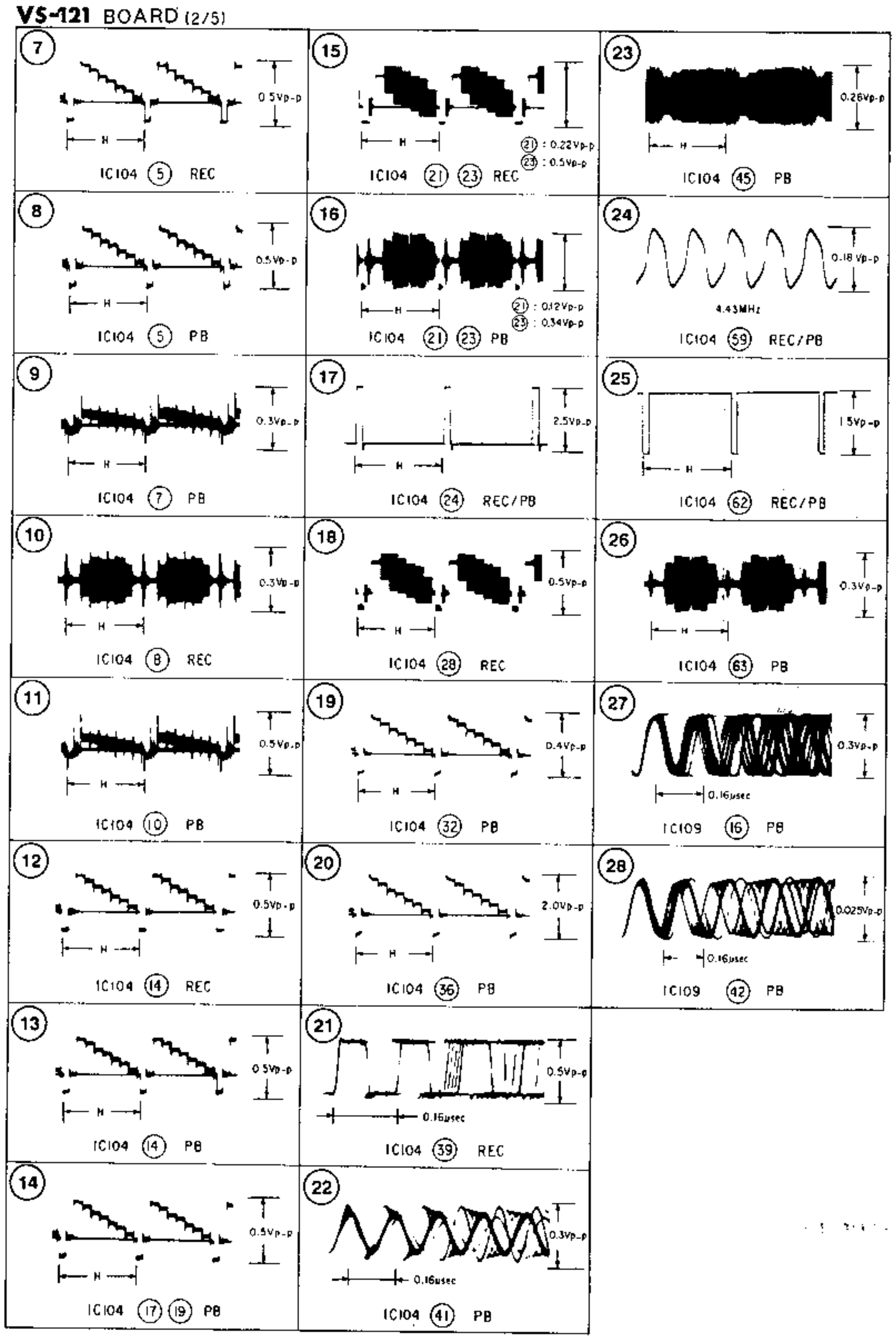
CN501	A-2	Q016	F-5	Q146	E-20	Q490	G-10
CN502	E-2	Q017	F-5	Q147	E-20	Q491	G-16
CN503	A-3	Q018	F-5	Q148	E-21	Q493	F-6
CN504	D-5	Q101	E-7	Q149	E-6	Q500	A-3
CN605	B-4	Q103	F-8	Q150	E-21	Q602	F-25
CN606	D-7	Q104	F-19	Q151	E-5	Q603	G-25
CN900	F-13	Q105	F-18	Q152	E-5	Q604	E-25
		Q106	F-8	Q153	E-5	Q609	D-2
D001	F-5	Q107	F-8	Q154	E-22	Q610	C-2
D101	F-7	Q108	G-19	Q155	E-5	Q611	C-2
D107	G-20	Q109	G-7	Q156	E-7	Q614	G-26
D500	A-3	Q110	F-7	Q157	E-7	Q900	A-15
D601	G-3	Q111	E-22	Q158	E-19	Q901	A-13
D603	F-3	Q112	F-11	Q159	E-8	Q902	A-14
D604	D-25	Q113	F-11	Q160	E-8	Q903	A-14
D605	C-25	Q114	F-16	Q161	F-7	Q904	B-12
		Q115	E-11	Q162	F-7	Q905	B-12
IC101	F-4	Q116	E-16	Q163	F-7	Q906	B-14
IC102	F-4	Q117	G-10	Q164	F-18	Q907	C-14
IC103	G-4	Q118	G-10	Q165	F-18	Q908	C-12
IC104	F-8	Q120	G-10	Q167	G-7		
IC105	F-9	Q121	G-10	Q168	F-7	W601	H-4
IC106	E-9	Q122	G-11	Q170	F-7	W901	C-12
IC107	F-12	Q123	F-11	Q175	H-9		
IC108	E-5	Q124	F-11	Q176	G-11		
IC109	G-5	Q126	G-11	Q180	E-22		
IC110	G-6	Q127	G-12	Q181	E-21		
IC401	D-11	Q128	G-12	Q182	G-12		
IC402	F-12	Q129	G-11	Q185	D-9		
IC500	B-2	Q130	F-8	Q186	D-9		
IC501	B-3	Q131	G-9	Q187	E-20		
IC601	G-3	Q132	F-8	Q189	E-8		
IC602	E-2	Q133	G-9	Q190	H-18		
IC603	G-2	Q135	H-9	Q191	D-5		
IC604	D-4	Q136	G-10	Q192	E-7		
IC605	D-4	Q137	G-10	Q401	D-12		
IC606	E-3	Q138	G-10	Q402	D-15		
IC607	C-1	Q139	D-7	Q403	D-15		
IC608	C-4	Q140	D-19	Q407	D-12		
IC609	D-3	Q141	D-19	Q408	D-16		
IC610	C-3	Q142	D-8	Q410	E-12		
IC611	B-2	Q143	D-8	Q412	E-12		
IC900	C-11	Q144	D-19	Q413	E-12		
IC901	B-12	Q145	D-19	Q414	E-12		




VS-121 BOARD (1/5)
(VIDEO1 BLOCK)
Q401-403 AMP
Q407 BUFFER
IC401 Y SELECTOR
Q408 BUFFER
IC402 LINE OUT AMP
Q413, 414 6dB AMP
Q412 MIX
Q410 BUFFER
V2 Y OUT
V3 Y IN
V1 Y COMB OUT
V9 SW 5V
V10 GND
V26 REC V
V27 REC Y
V28 REC C
AV09 LINE IN1 V
AV10 LINE IN1 Y
AV11 LINE IN1 C
V8 V MUTE
V5 EE*V
V6 SY OUT
V7 SC OUT
AV08 TERM GND
AV05 LINE OUT V
AV02 RF V OUT
AV06 LINE OUT Y
AV07 LINE OUT C
TO VS-121 BOARD (2/5)
(See Page 5-22)
(See Page 5-24)
TO VS-121 BOARD (5/5)
(See Page 5-32)
SOFT LIMITTER BLOCK
Q016 FREQ.CHR. SWITCH
Q017, 018 NORMAL SOFT LIMITER
SIGNAL PATH
VIDEO SIGNAL
CHROMA
Y
Y/CHROMA
REC
PB

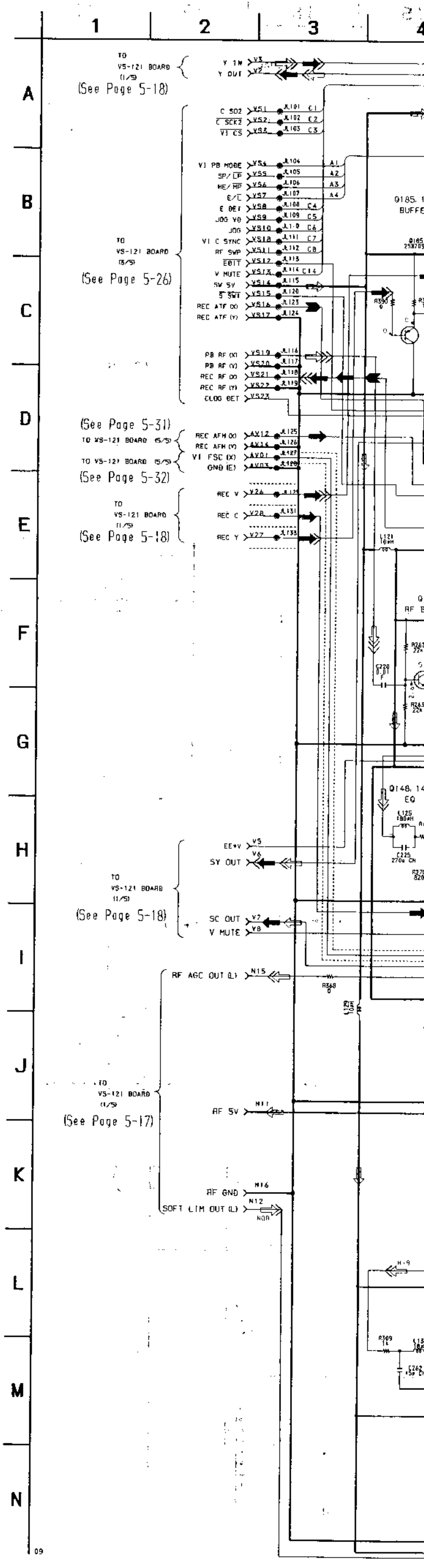

VS-121 BOARD (1/5)
IC402 4 PB
IC402 4 REC
IC402 5 PB
IC402 5 REC
IC402 9 REC
IC402 9 PB

VS-121 BOARD (2/5)

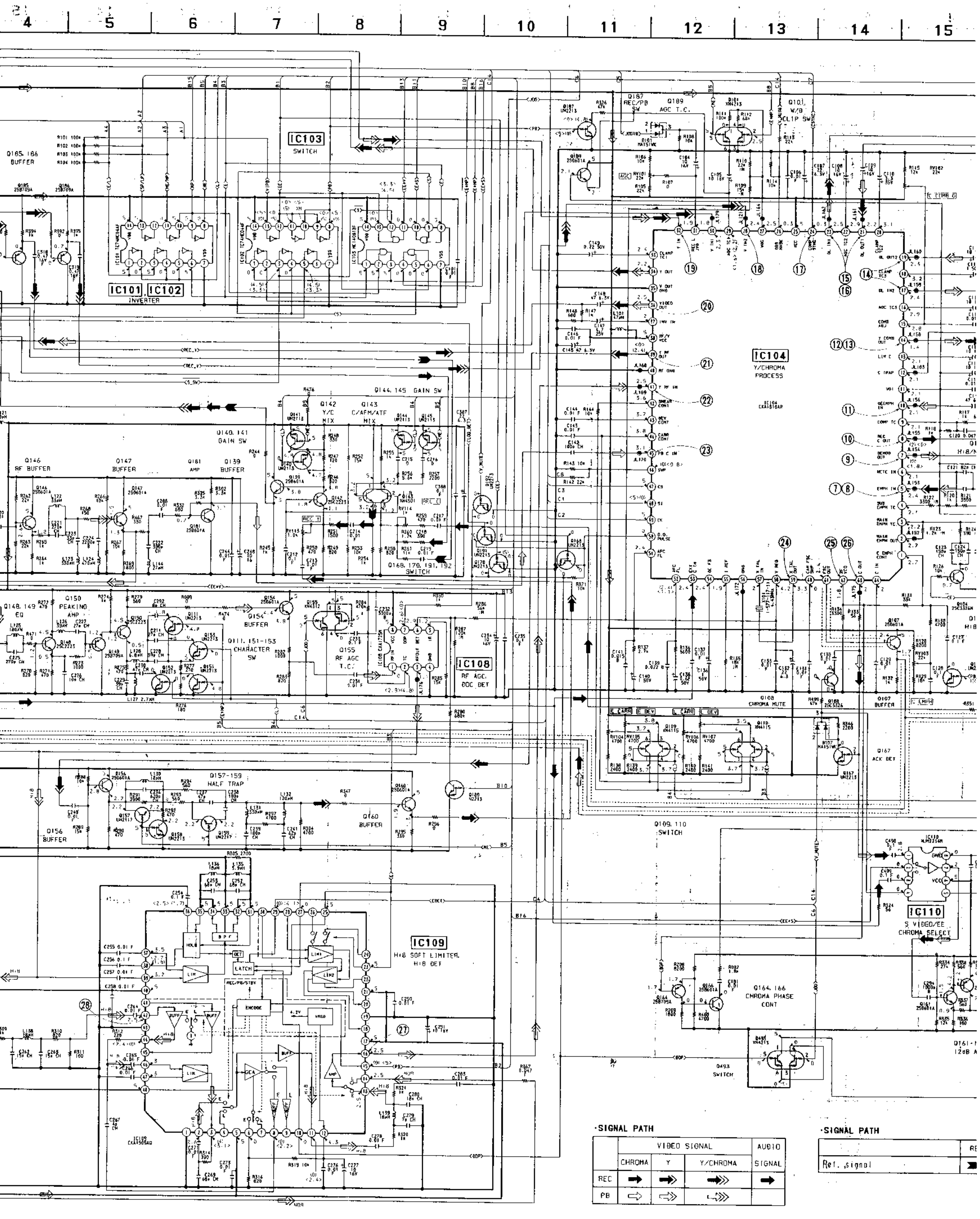


VS-121 (VIDEO (2)) SCHEMATIC DIAGRAM

— Ref. No. VS-121 BOARD: 2000 series —



• Refer to page 5-12 for Printed Wiring Board.



·SIGNAL PATH

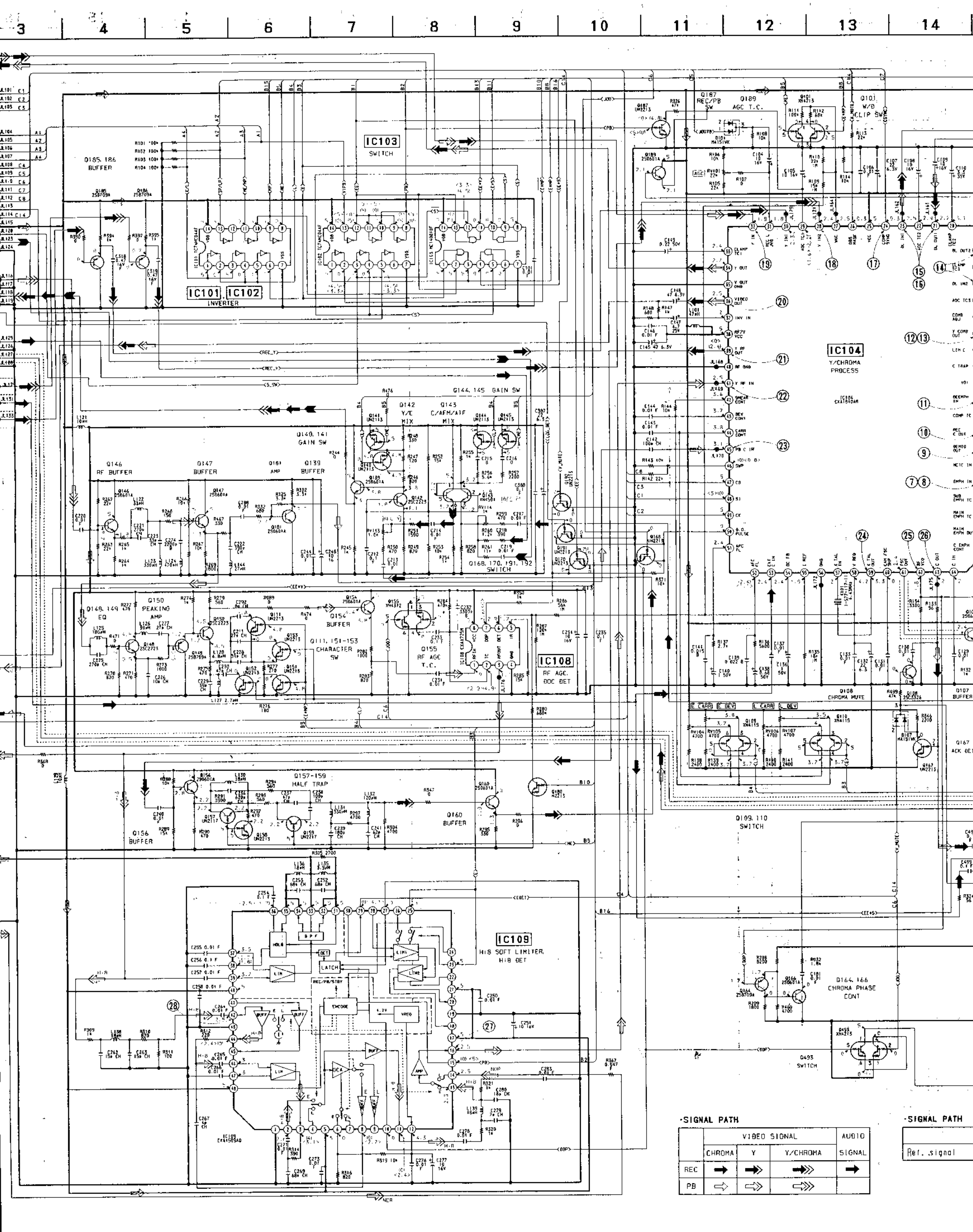
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	SIGNAL
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	

·SIGNAL PATH

	RE
Ref. signal	➡

C DIAGRAM

• Refer to page 5-12 for Printed Wiring Board.

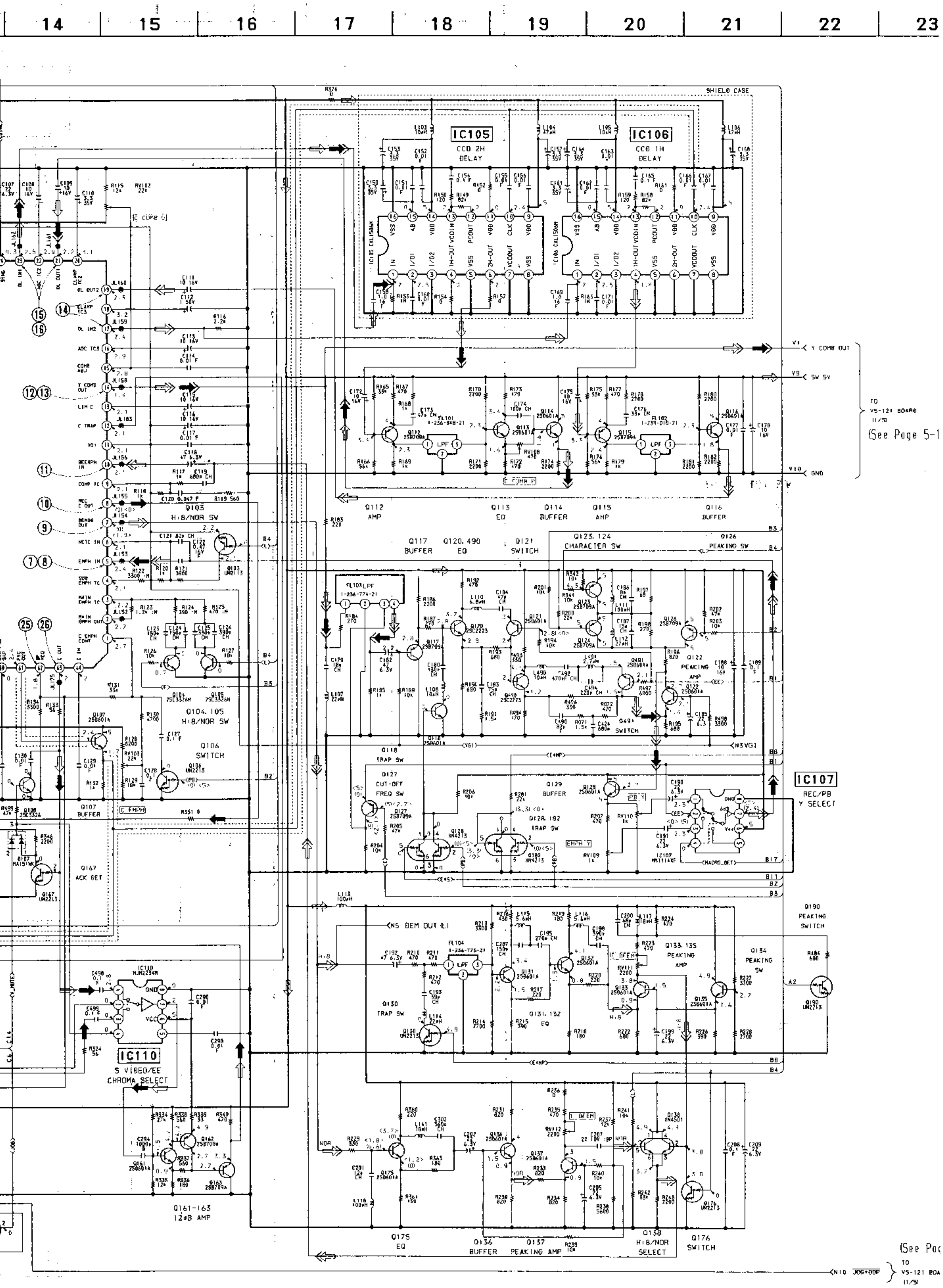


·SIGNAL PATH

	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	

·SIGNAL PATH

Ref. signal



·SIGNAL PATH

	REC	REC/PB	PB
Ref. signal	➤		

VS-121 BOARD (2/5)
(VIDEO2 BLOCK)

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

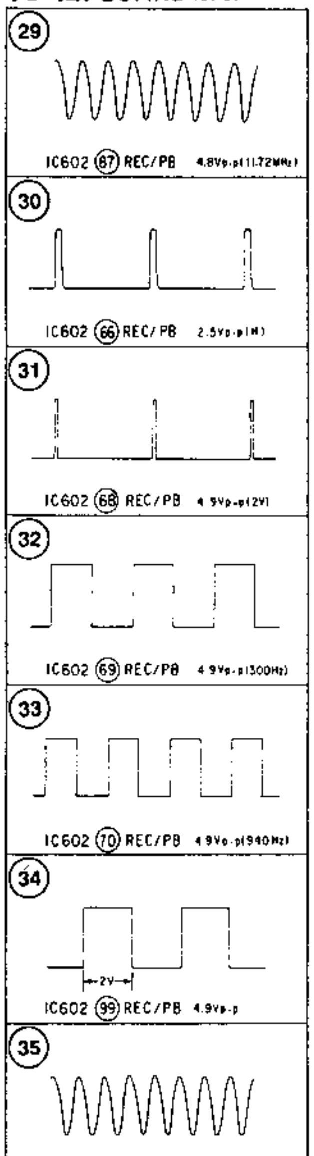
(VI

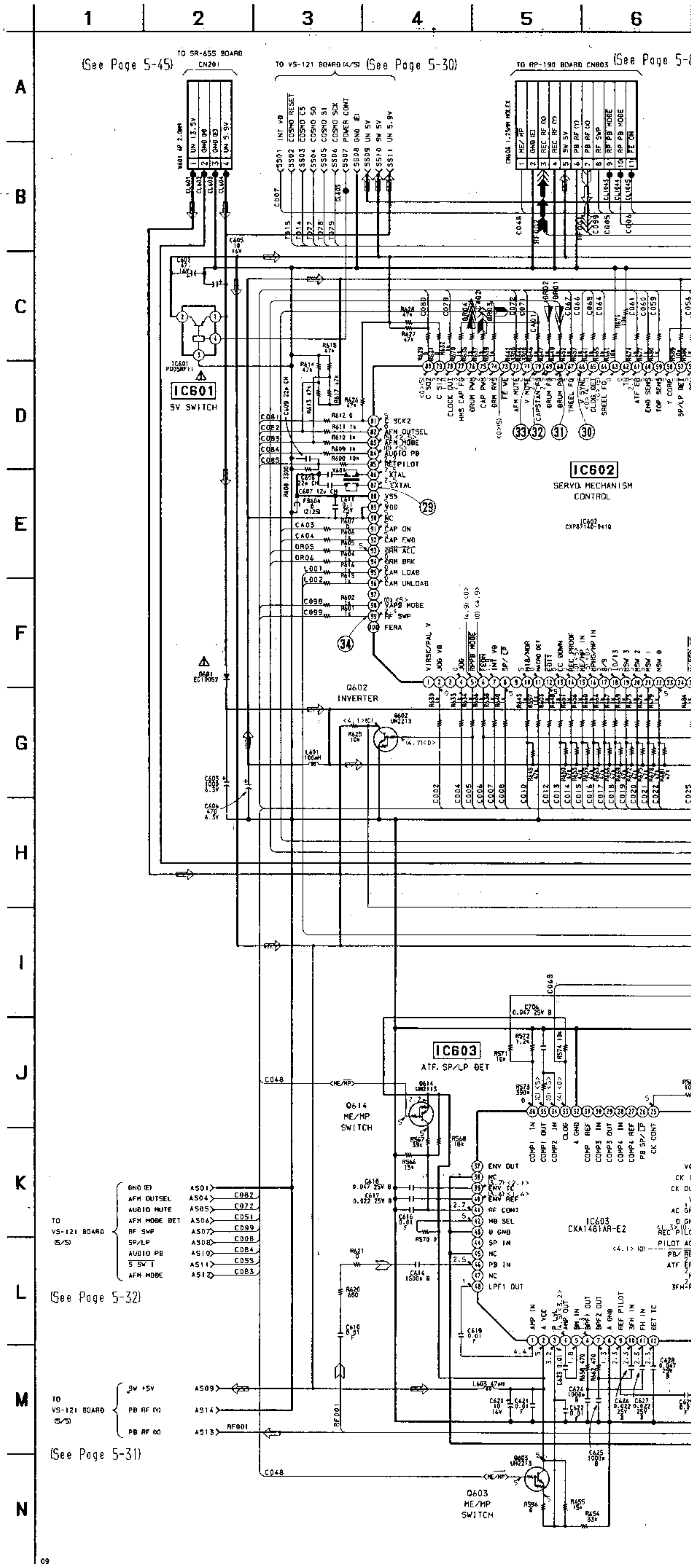
VS-121 (SERVO) SCHEMATIC DIAGRAM

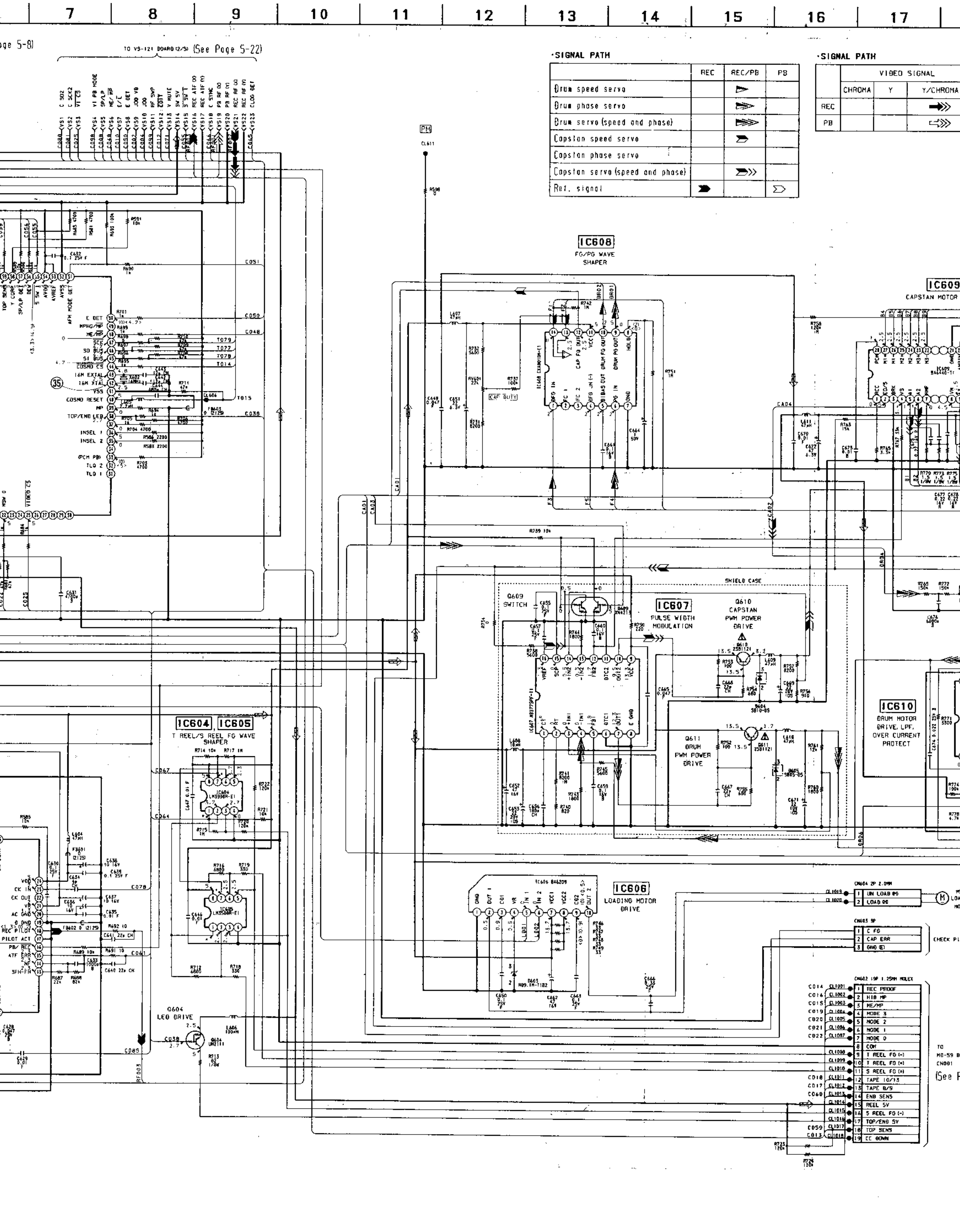
— Ref. No. VS-121 BOARD: 2000 series —

• Refer to page 5-12 for Printed Wiring Board.

VS-121 BOARD (3/5)





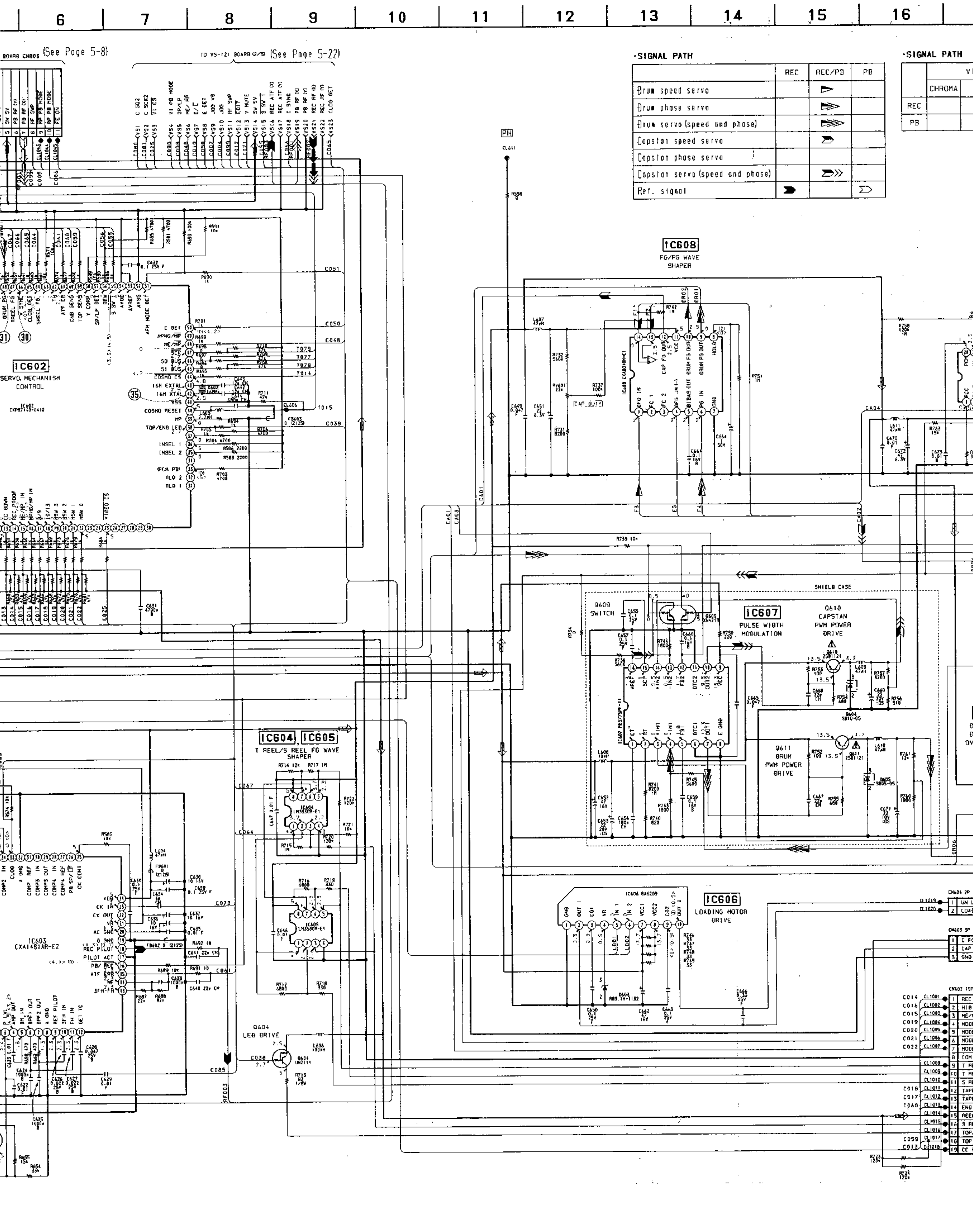


·SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal			

·SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			
PB			



·SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal			

·SIGNAL PATH

	V...	
	CHROMA	
REC		
PB		

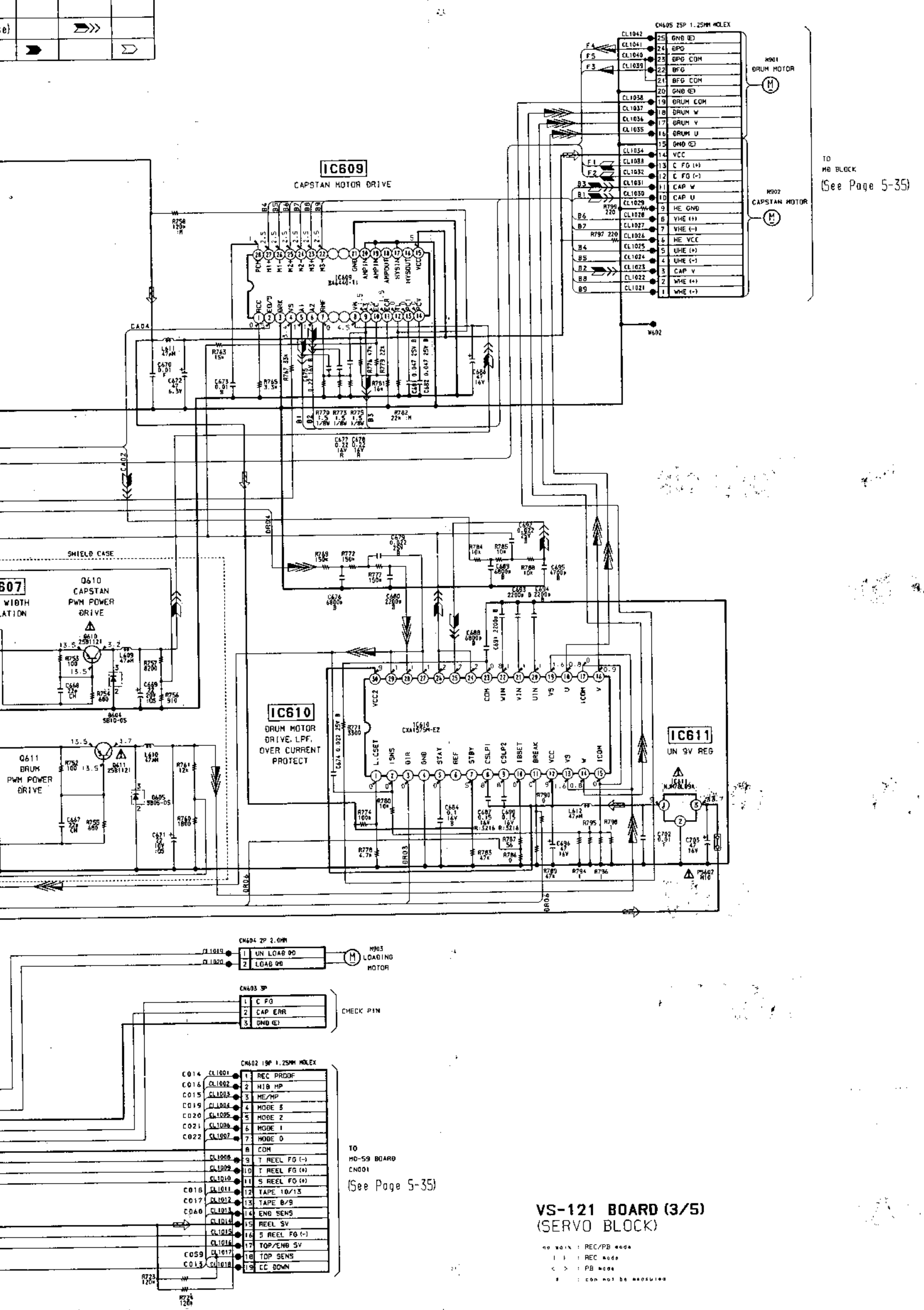
15	16	17	18	19	20	21	22

	REC	REC/PB	PB
e)			

·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

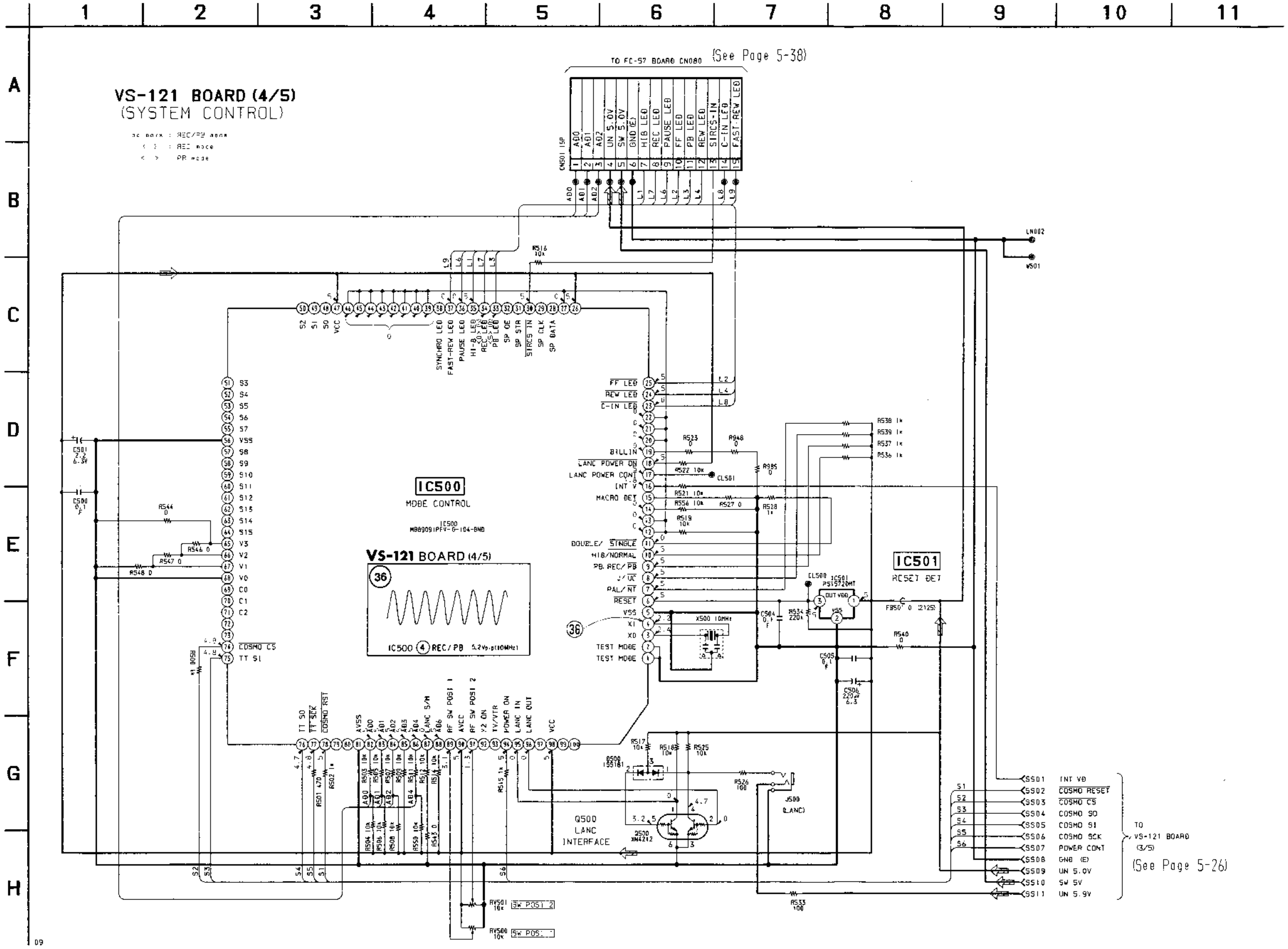


VS-121 BOARD (3/5)
(SERVO BLOCK)

no mark : REC/PB mode
( ) : REC mode
< > : PB mode
* : can not be measured

• Refer to page 5-12 for Printed Wiring Board.

— Ref. No. VS-121 BOARD: 2000 series —

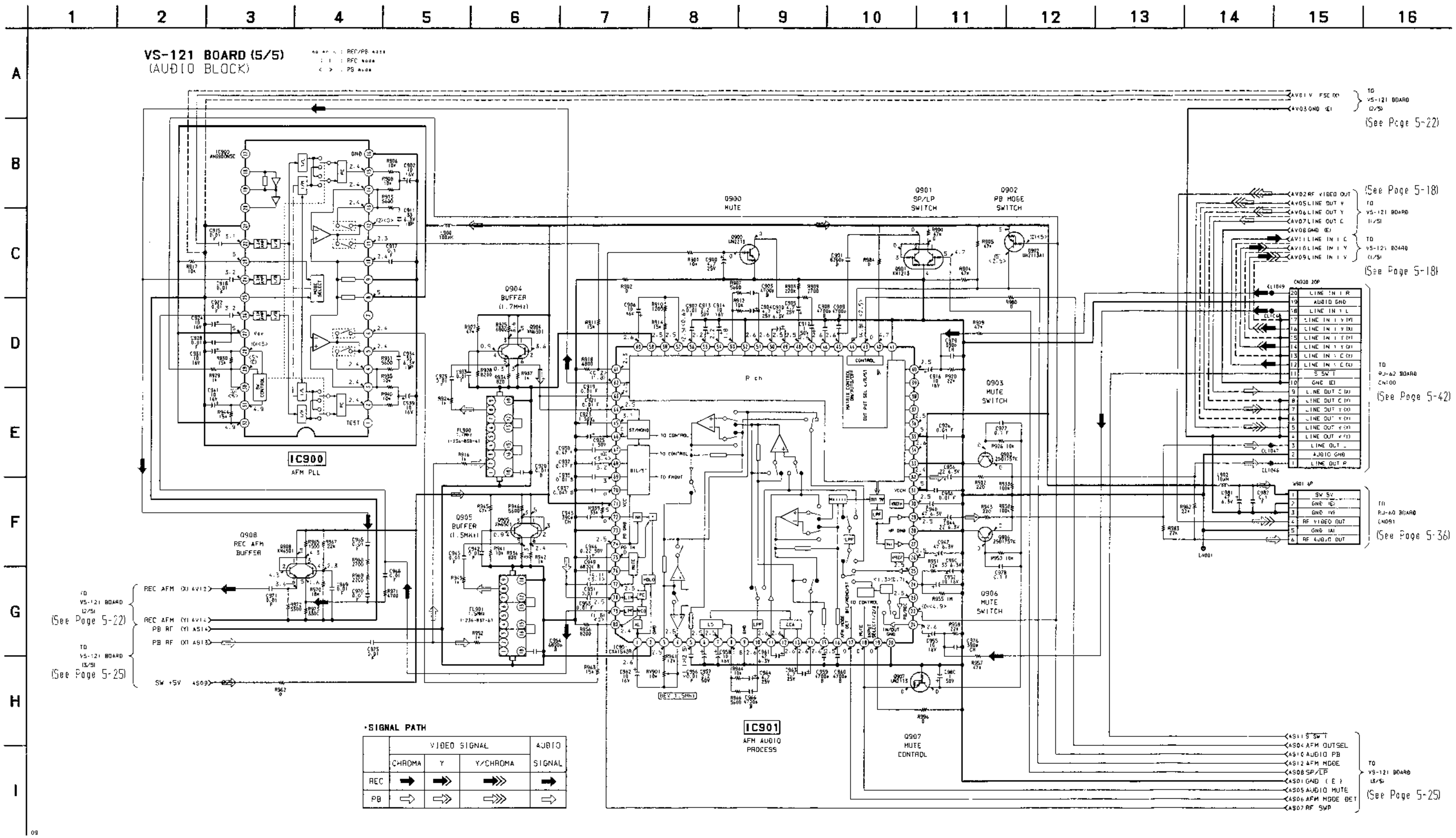


— Ref. No. VS-1

VS-121 (AUDIO) SCHEMATIC DIAGRAM

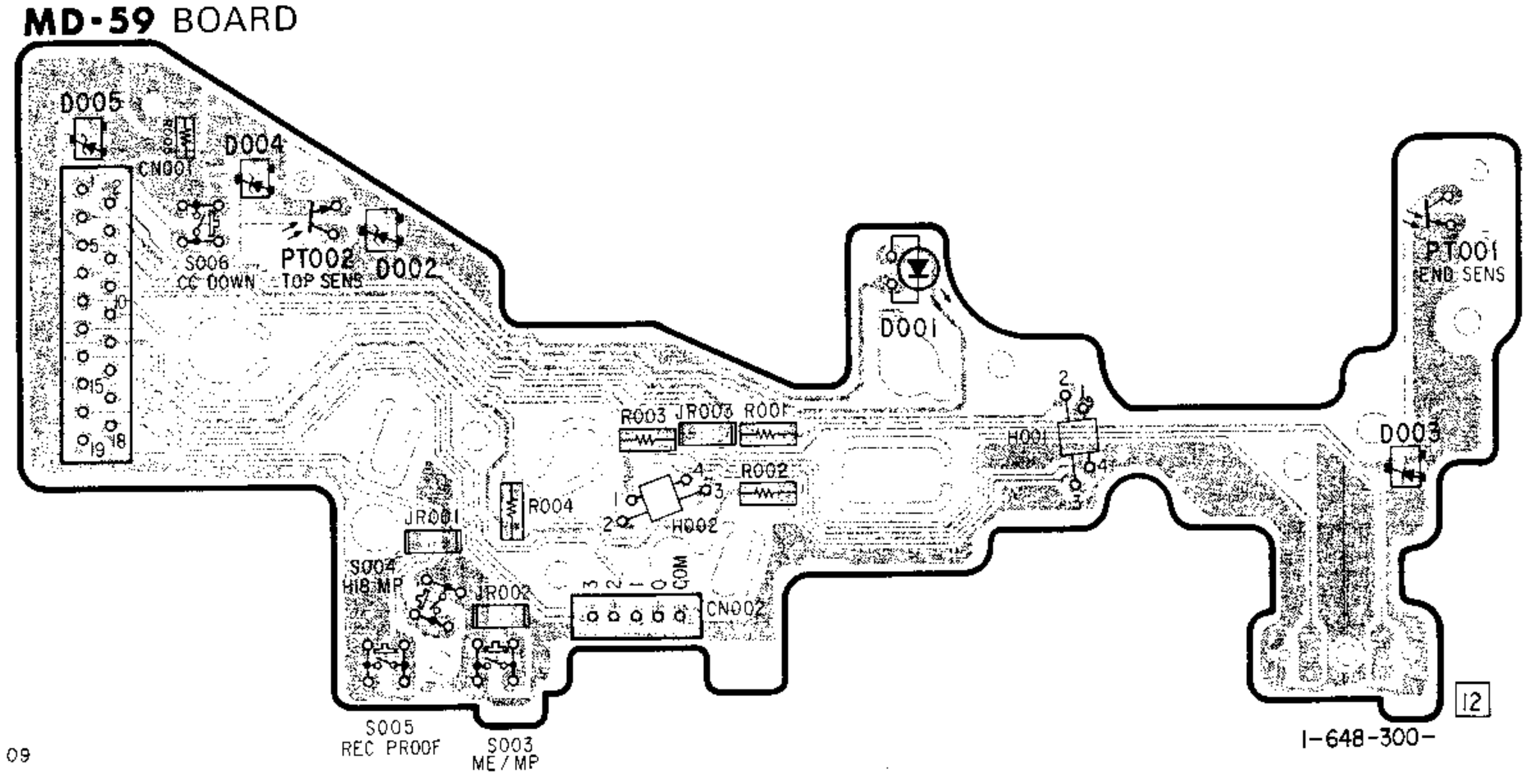
• Refer to page 5-12 for Printed Wiring Board.

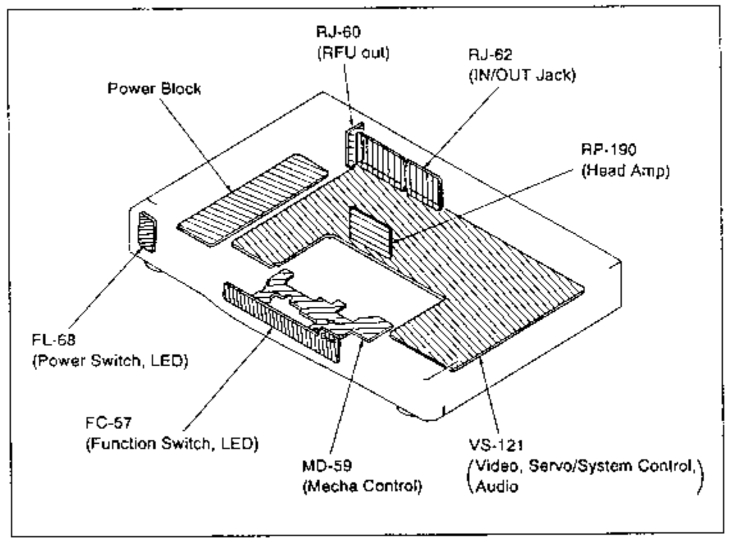
— Ref. No. VS-121 BOARD: 2000 series —



MD-59 (MECHA CONTROL) PRINTED WIRING BOARD

— Ref. No. MD-59 BOARD: 3000 series —





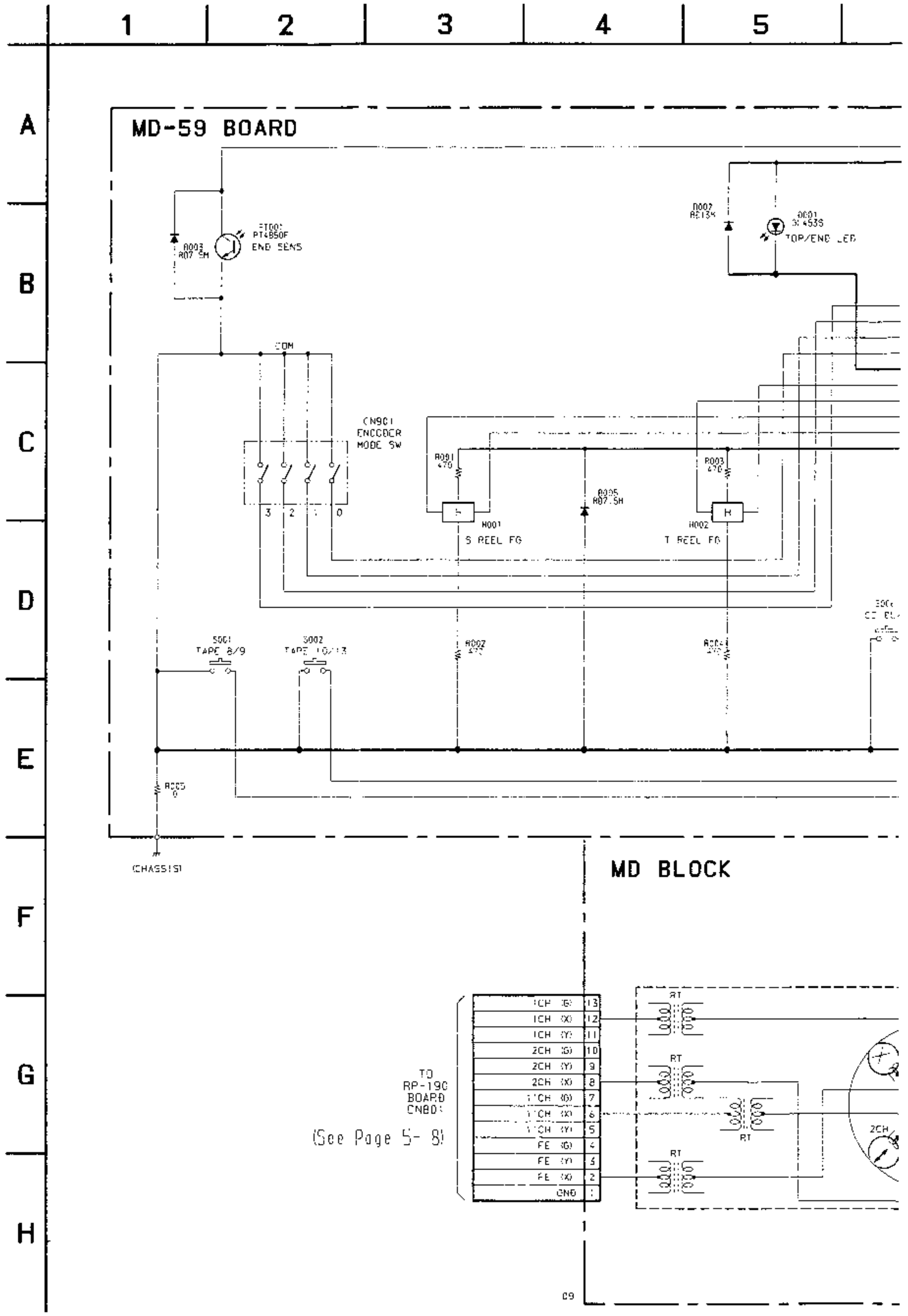
MD-59 (MECHA CONTROL) SCHEMATIC DIAGRAM

— Ref. No. MD-59 BOARD. 3000 series —

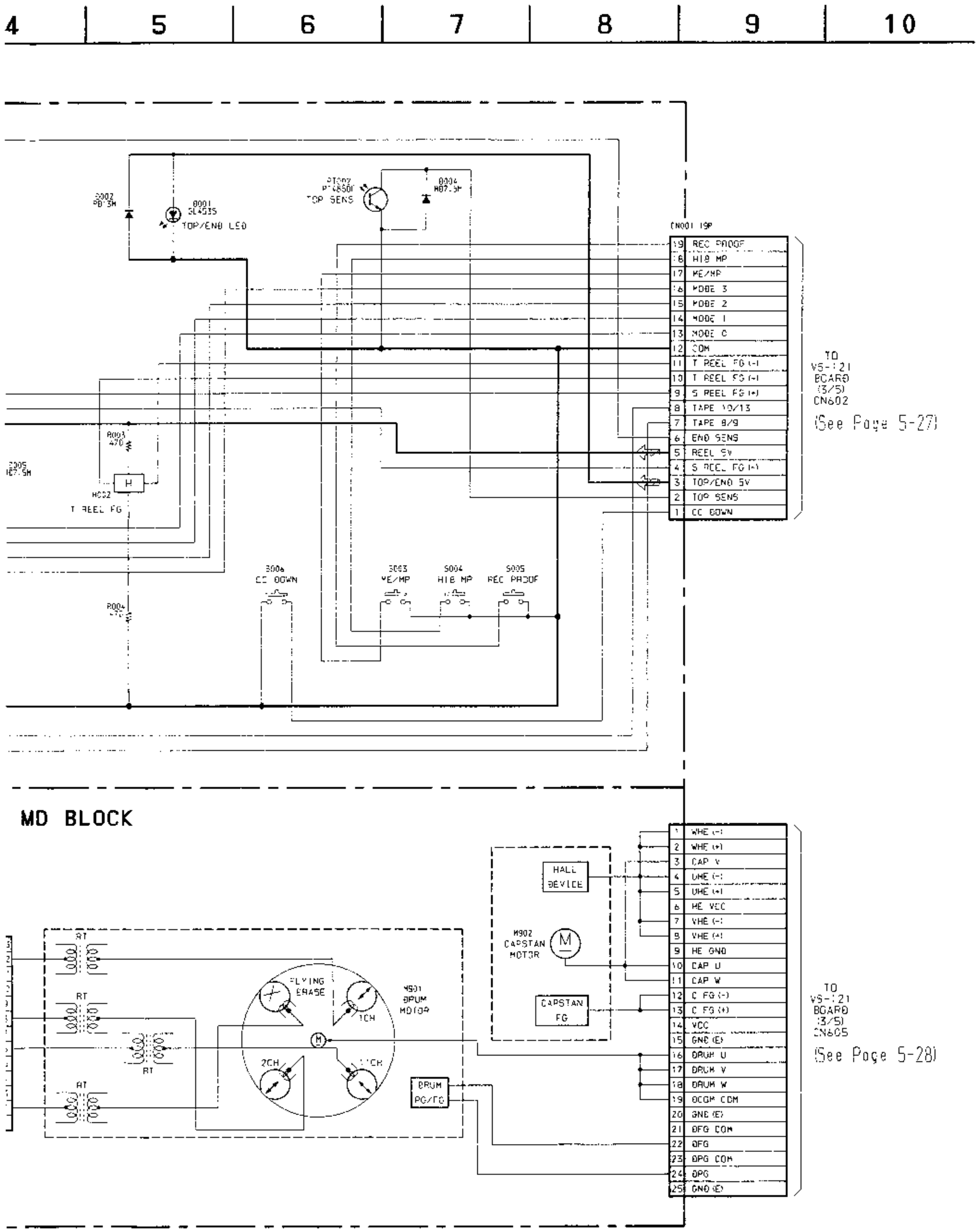
• For schem

• Chip resistor

kΩ : 1000Ω .

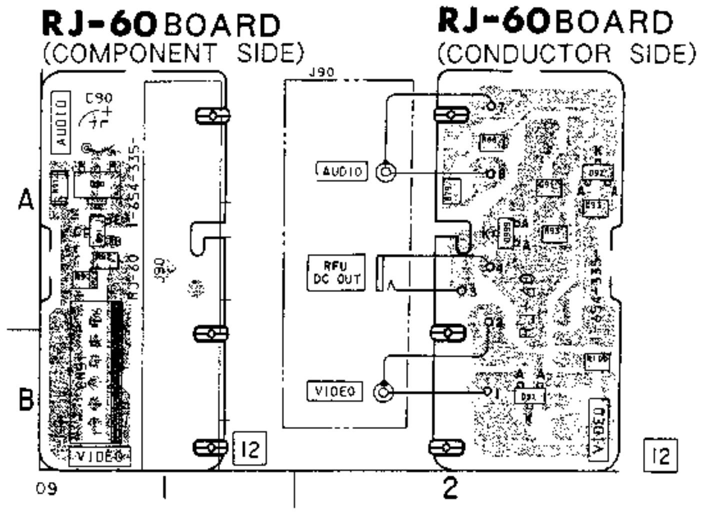


- **For schematic diagram.**
- Chip resistor are 1/8W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .



RJ-60 (RFU OUT) PRINTED WIRING BOARD

— Ref. No. RJ-60 BOARD: 4000 series —



RJ-60 BOARD

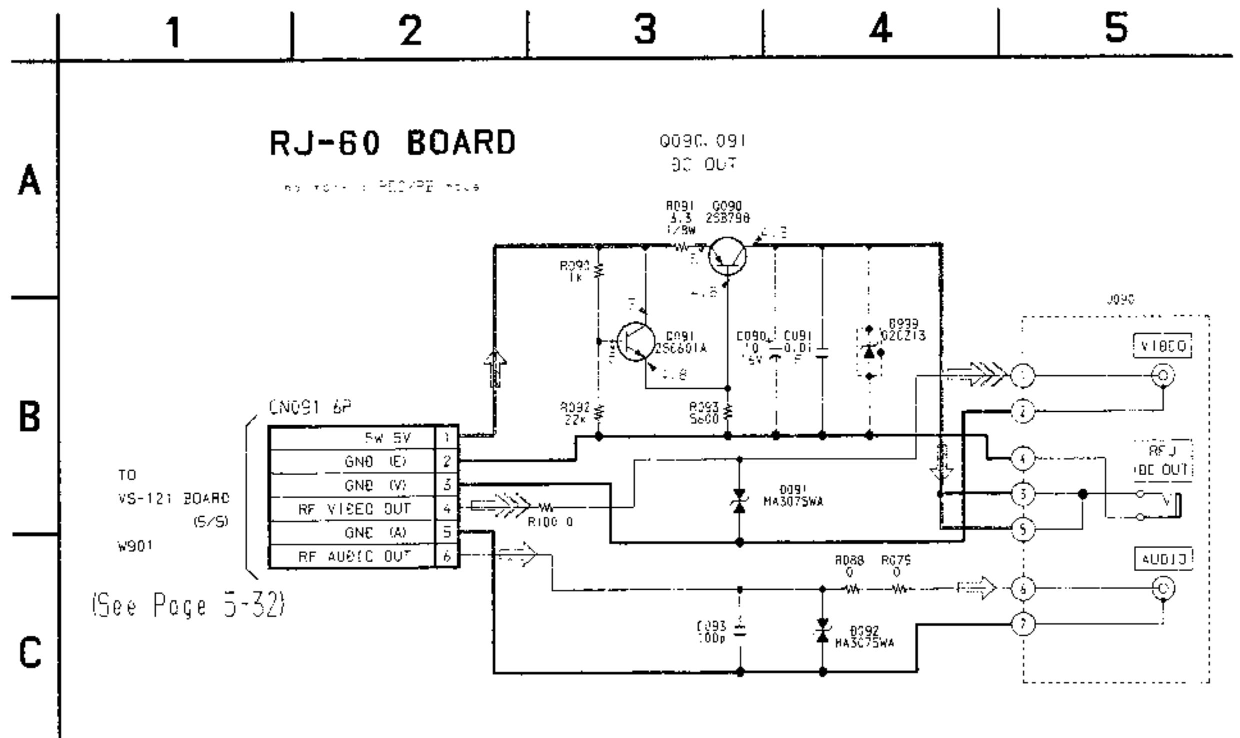
CN091 B-1

D091 B-2
D092 A-2
D999 A-2

Q090 A-1
Q091 A-1

RJ-60 (RFU OUT) SCHEMATIC DIAGRAM

— Ref. No. RJ-60 BOARD: 4000 series —

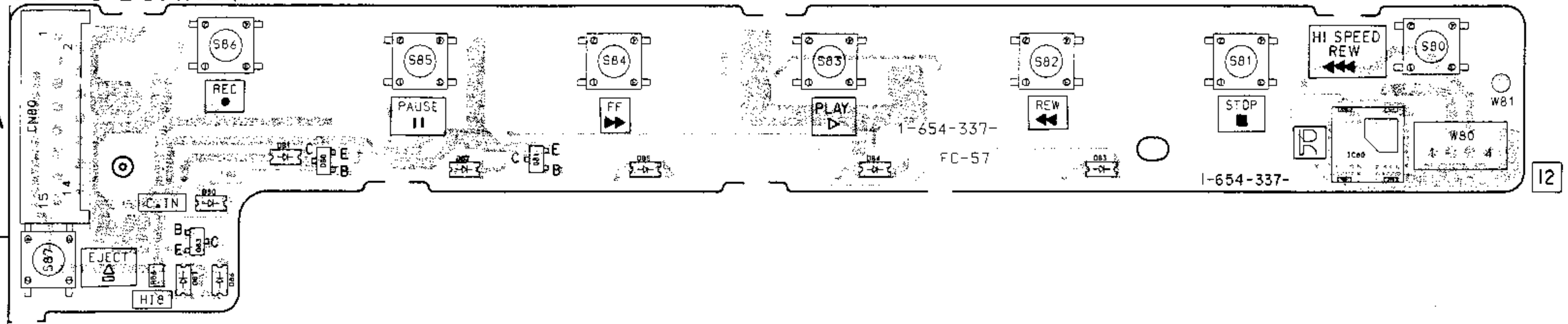


·SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB			⇒	→

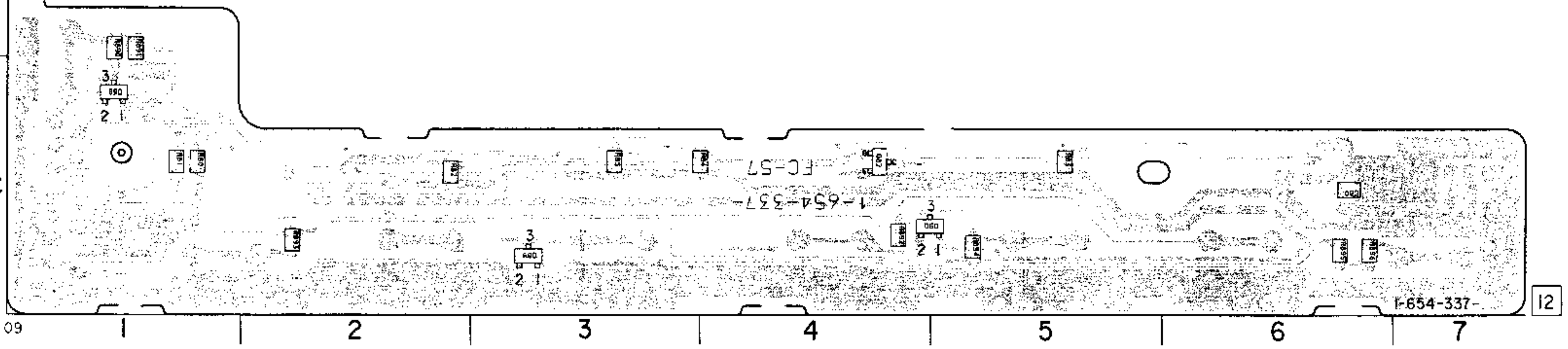
RFU OUT

FC-57 BOARD (COMPONENT SIDE)

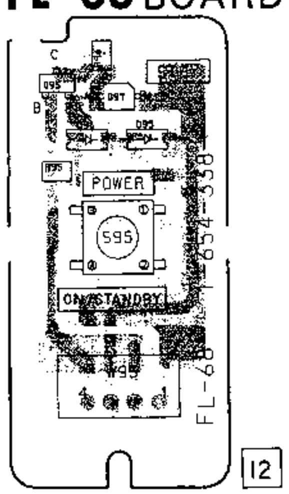


FC-57 BOARD	
CN080	A-1
D080	A-1
D081	A-2
D082	A-2
D083	A-5
D084	A-4
D085	A-3
D086	B-1
D087	B-1
D088	C-1
D089	C-3
D090	C-4
IC080	A-6
Q080	A-2
Q081	A-3
Q082	C-4
Q083	B-1
W080	A-7

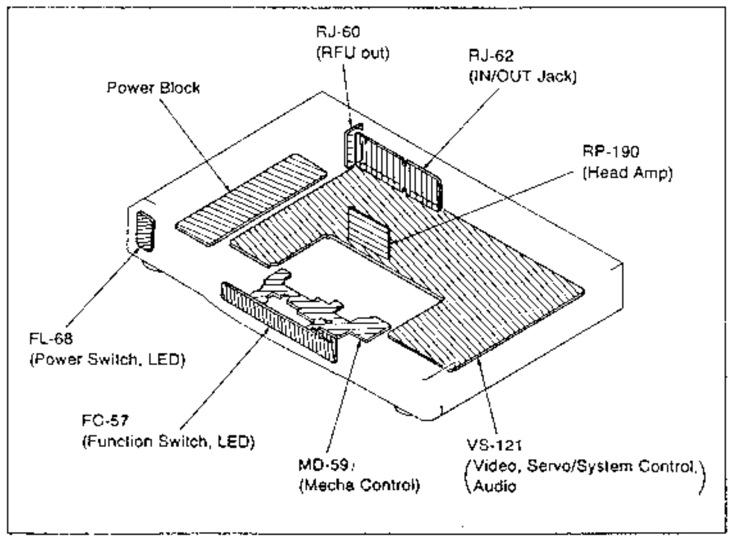
FC-57 BOARD (COMPONENT SIDE)



FL-68 BOARD

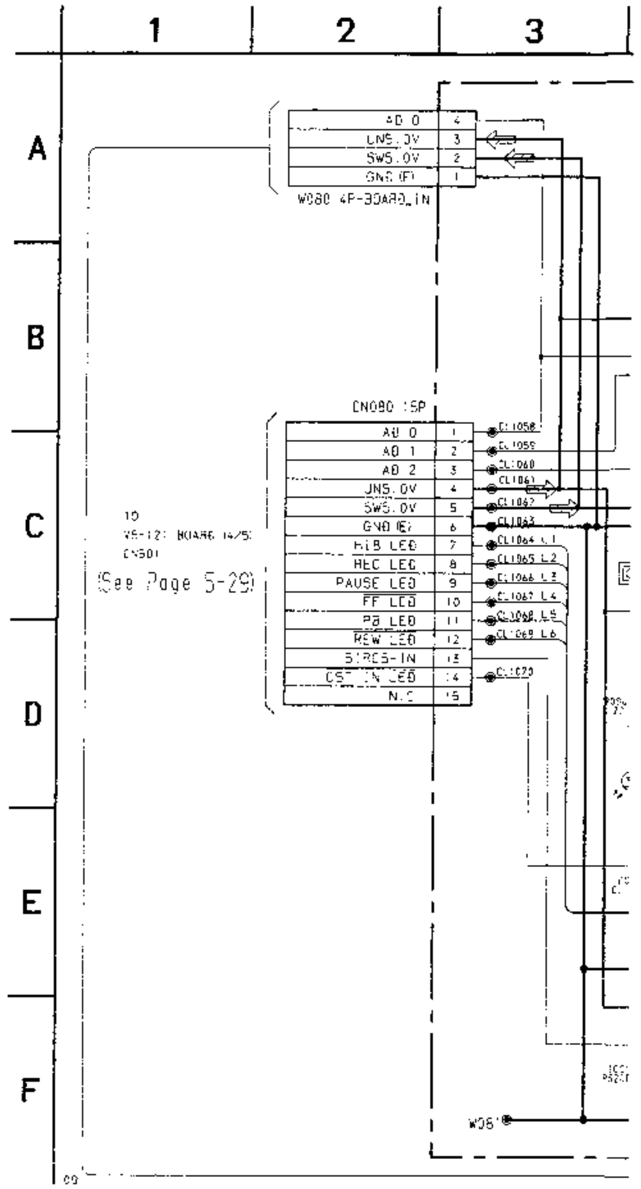


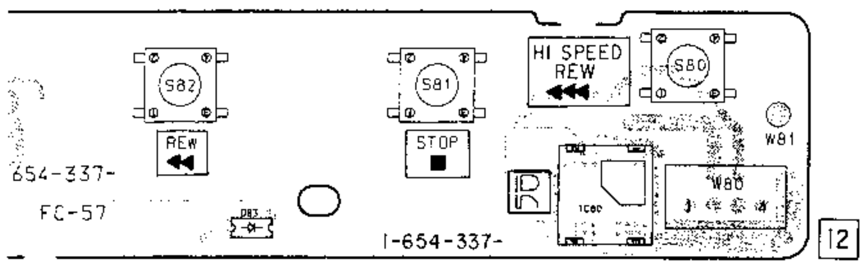
- For printed wiring board of FL-68 board.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.



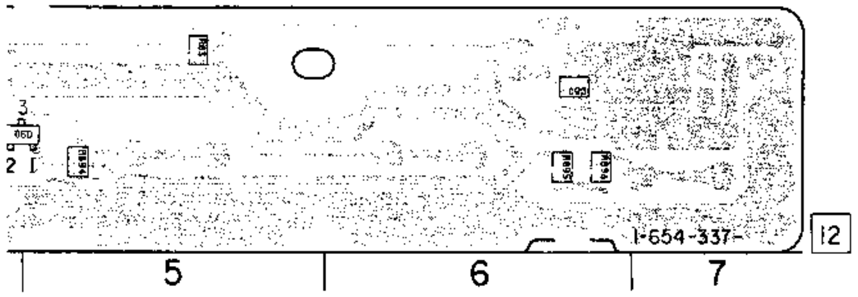
FC-57 (FUNCTION SWITCH, LED), FL-68 (POWER

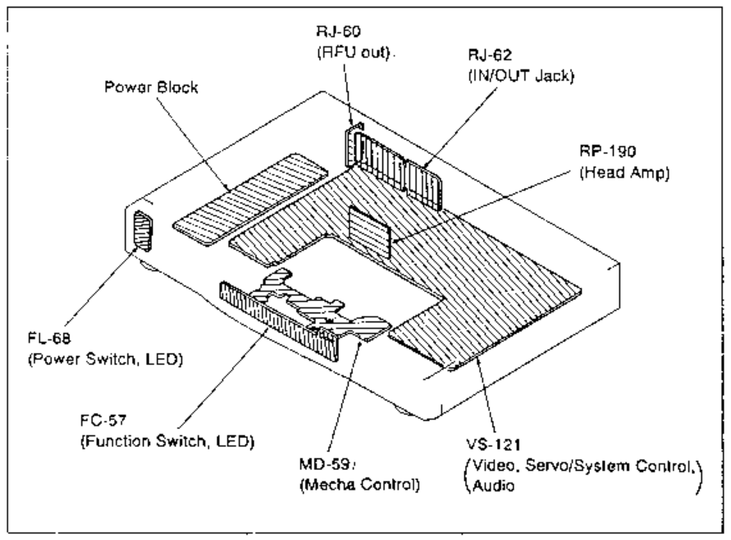
— Ref. No. FC-57 BOARD: 5000 series, FL-68 BOARD: 6000 series —





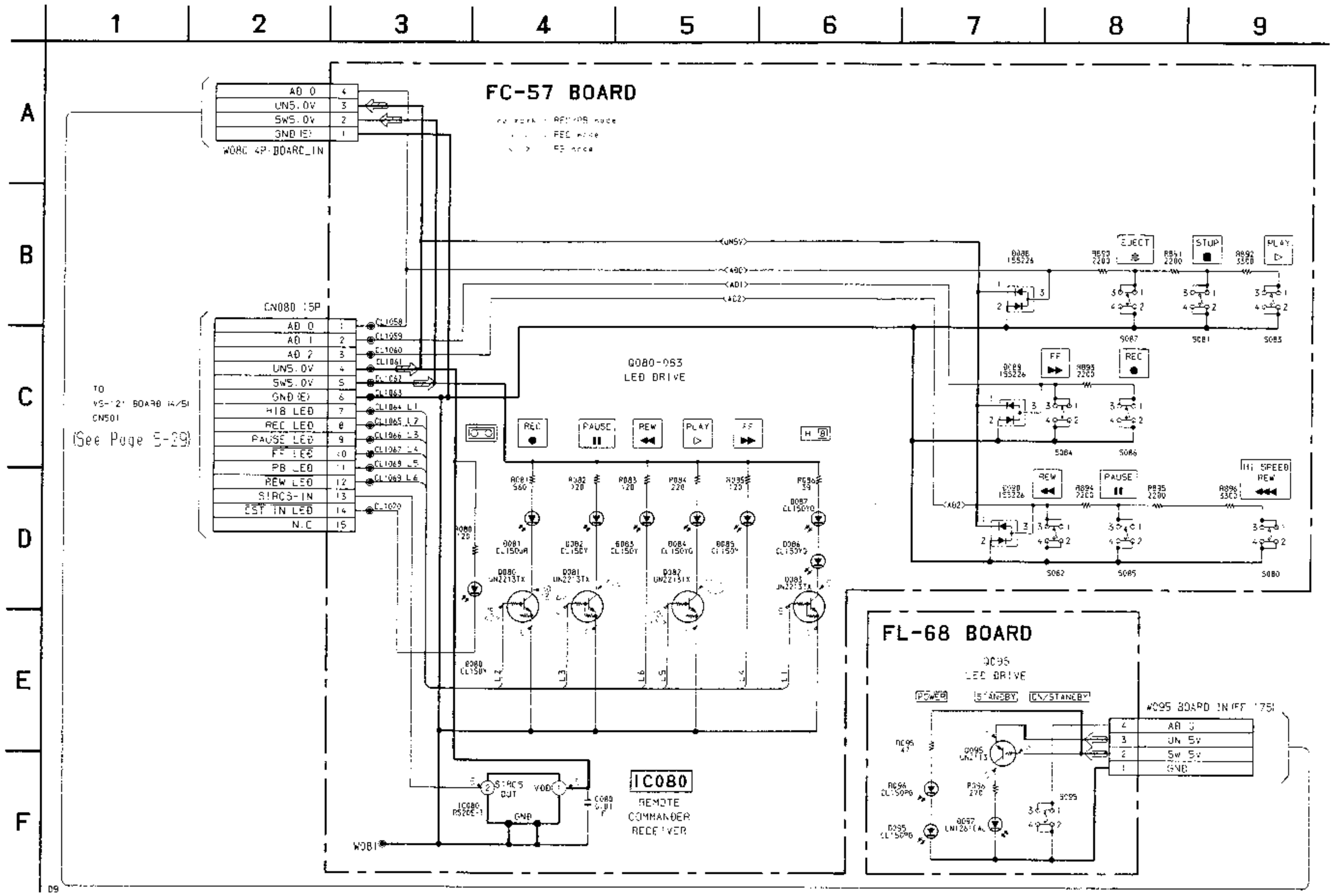
FC-57 BOARD	
CN080	A-1
D080	A-1
D081	A-2
D082	A-2
D083	A-5
D084	A-4
D085	A-3
D086	B-1
D087	B-1
D088	C-1
D089	C-3
D090	C-4
IC080	A-6
Q080	A-2
Q081	A-3
Q082	C-4
Q083	B-1
W080	A-7





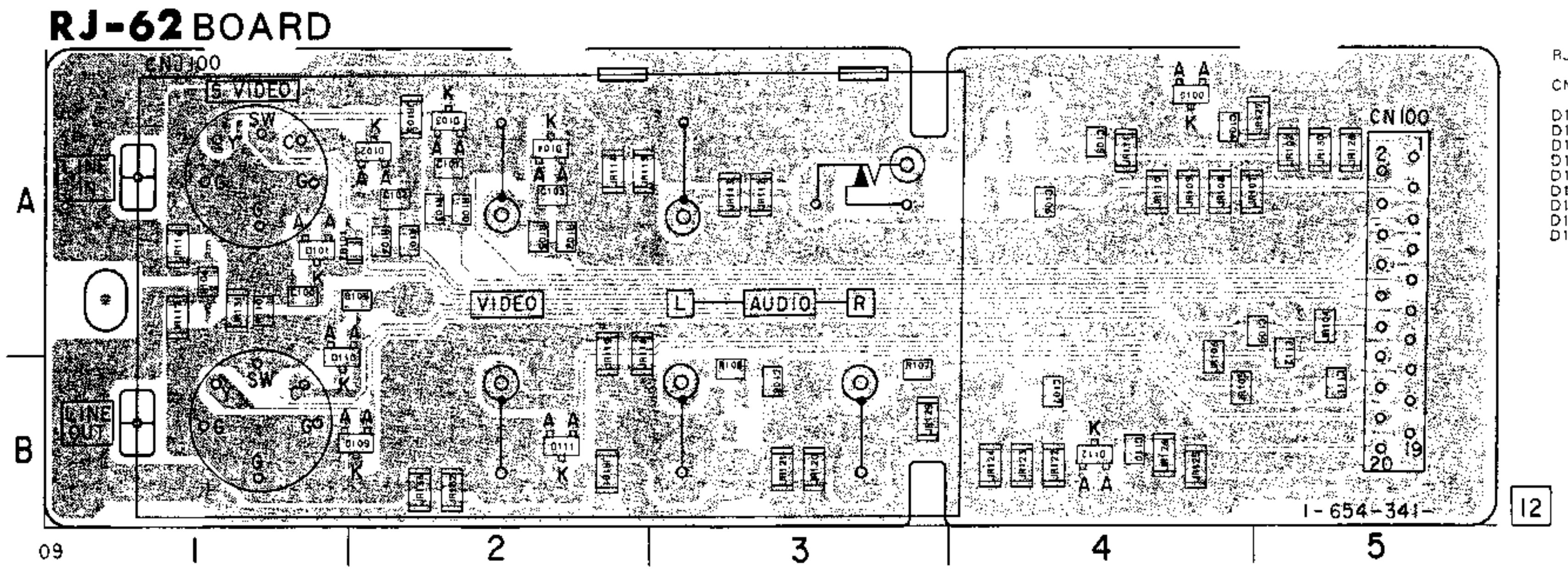
FC-57 (FUNCTION SWITCH, LED), FL-68 (POWER SWITCH, LED) SCHEMATIC DIAGRAMS

— Ref. No. FC-57 BOARD: 5000 series, FL-68 BOARD: 6000 series —

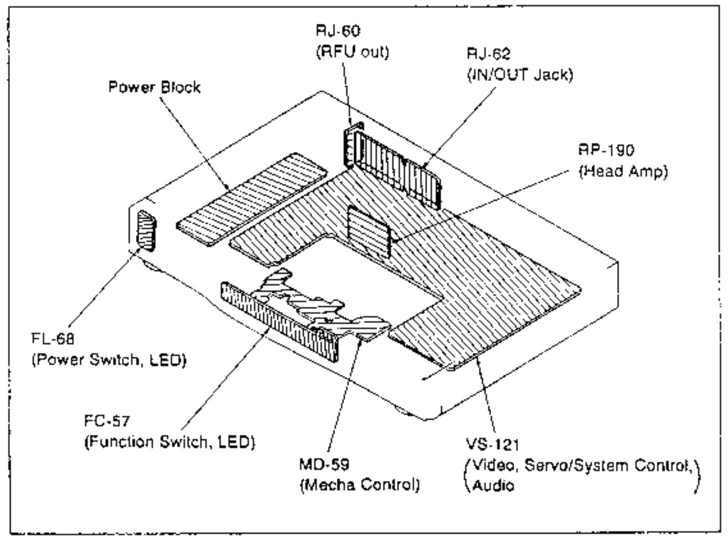


RJ-62 (IN/OUT JACK) PRINTED WIRING BOARD

— Ref. No. RJ-62 BOARD: 7000 series —

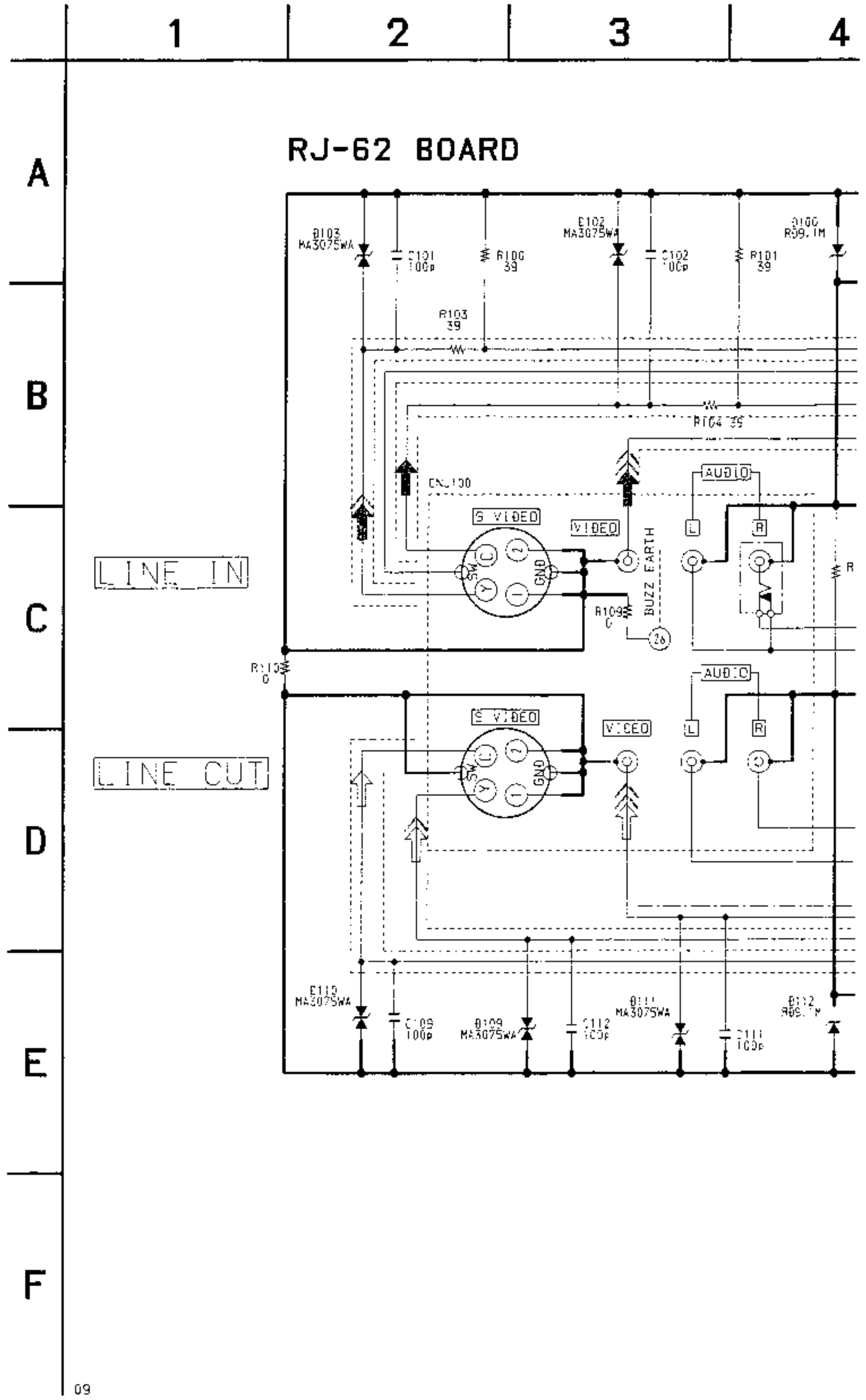


RJ-62 BOARD	
CN100	A-5
D100	A-4
D101	A-1
D102	A-2
D103	A-2
D104	A-2
D109	B-2
D110	B-1
D111	B-2
D112	B-4

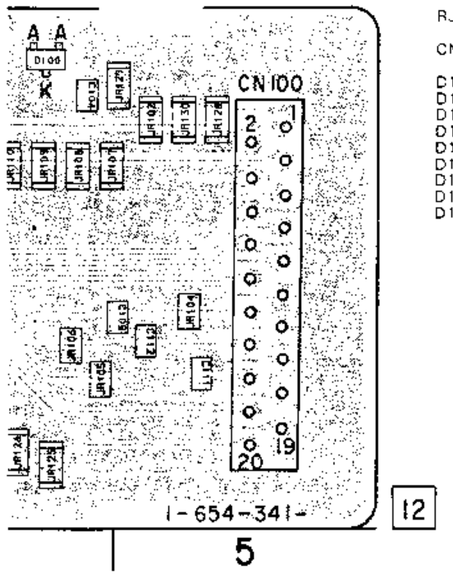


RJ-62 (IN/OUT JACK) SCHEMATIC DIAGRAM

— Ref. No. RJ-62 BOARD: 7000 series —

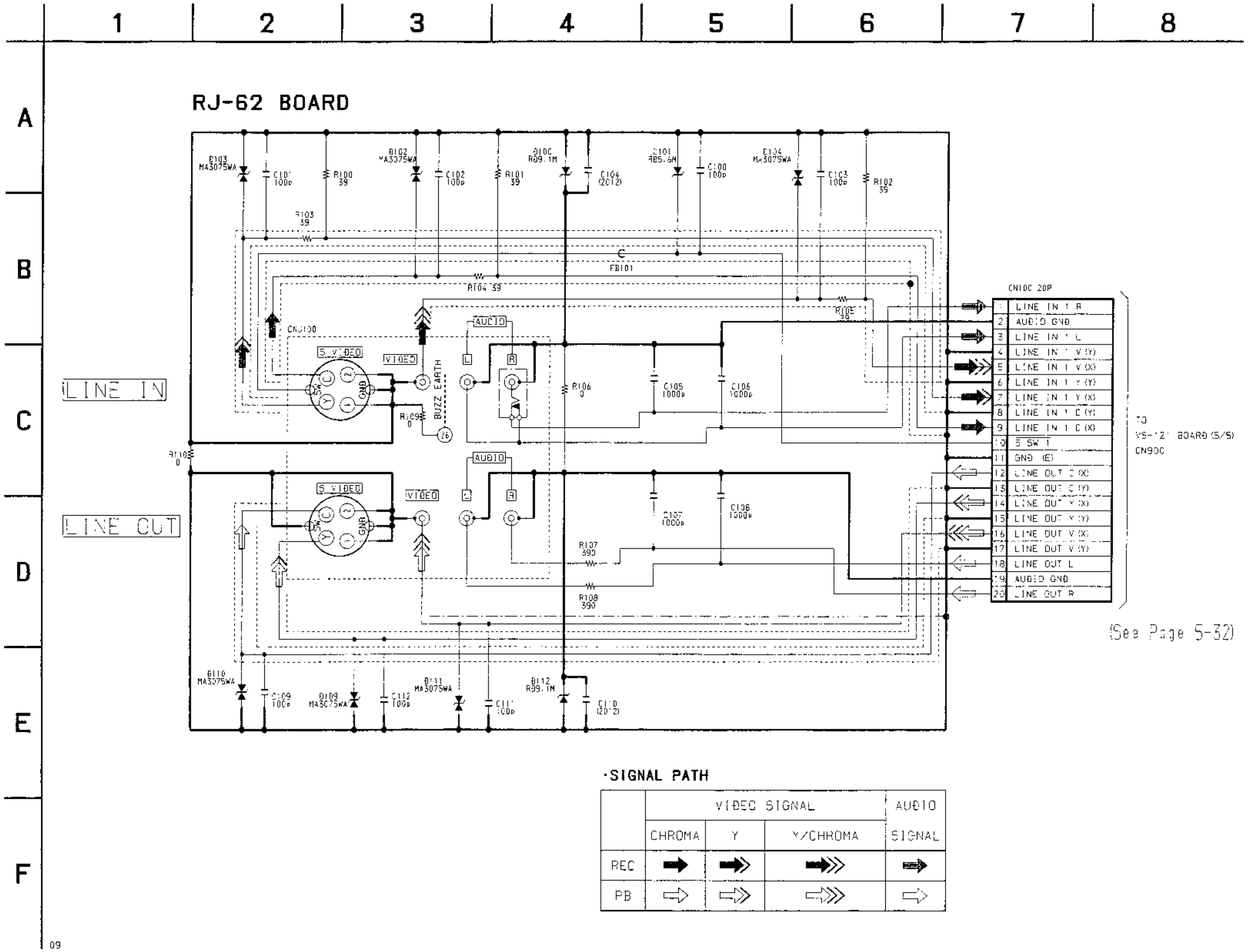


— Ref. No. RJ-62 BOARD: 7000 series —



RJ-62 BOARD

CN100	A-5
D100	A-4
D101	A-1
D102	A-2
D103	A-2
D104	A-2
D109	B-2
D110	B-1
D111	B-2
D112	B-4



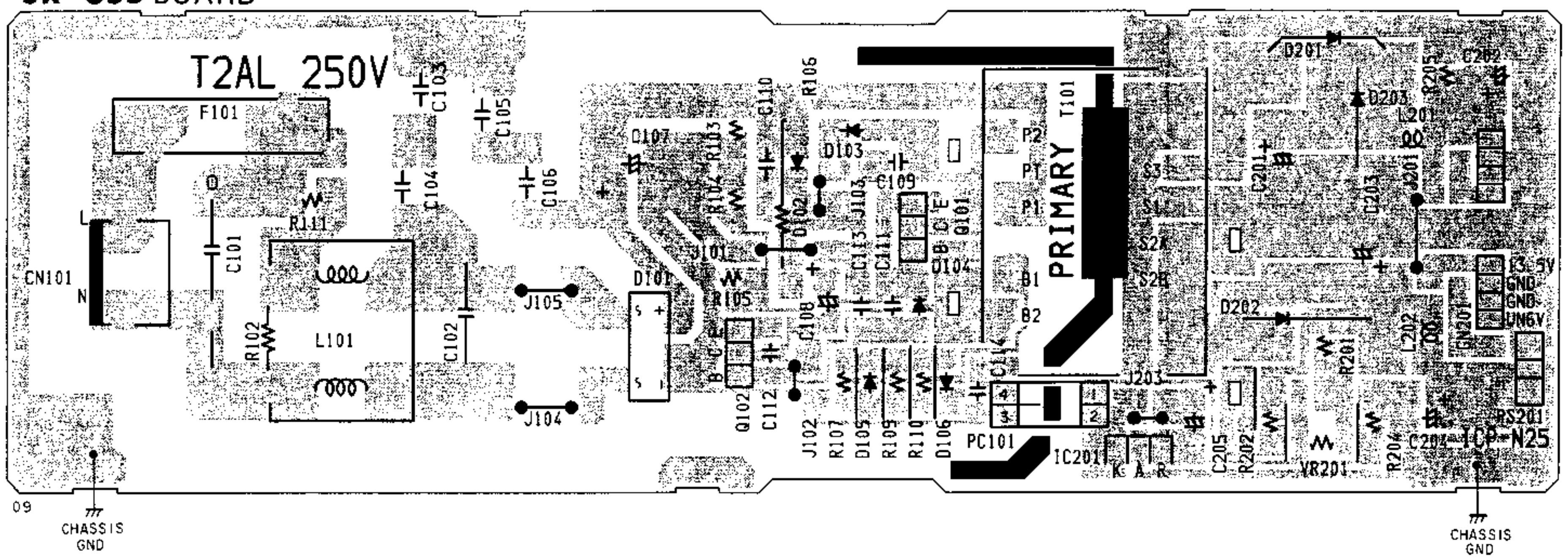
·SIGNAL PATH

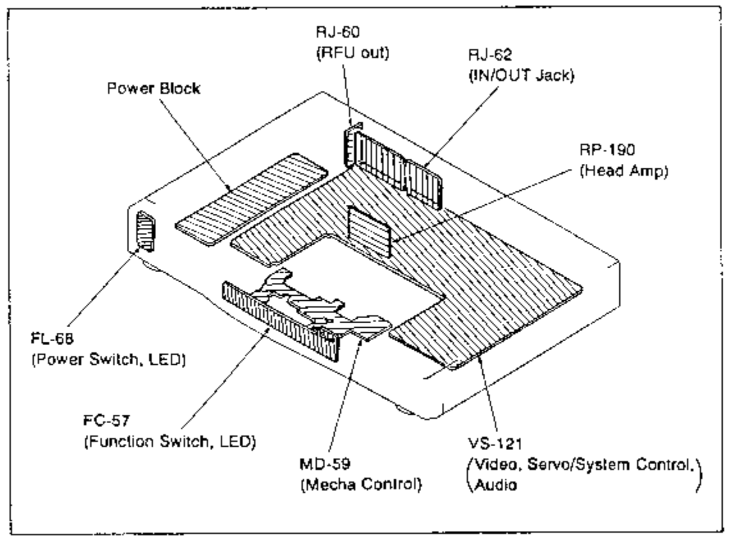
	VIDEO SIGNAL			AUDIO
	CHROMA	Y	Y/CHROMA	SIGNAL
REC				
PB				

POWER BLOCK (SR-655) (POWER) PRINTED WIRING BOARD

— Ref. No. POWER BLOCK (SR-655): 8000 series —

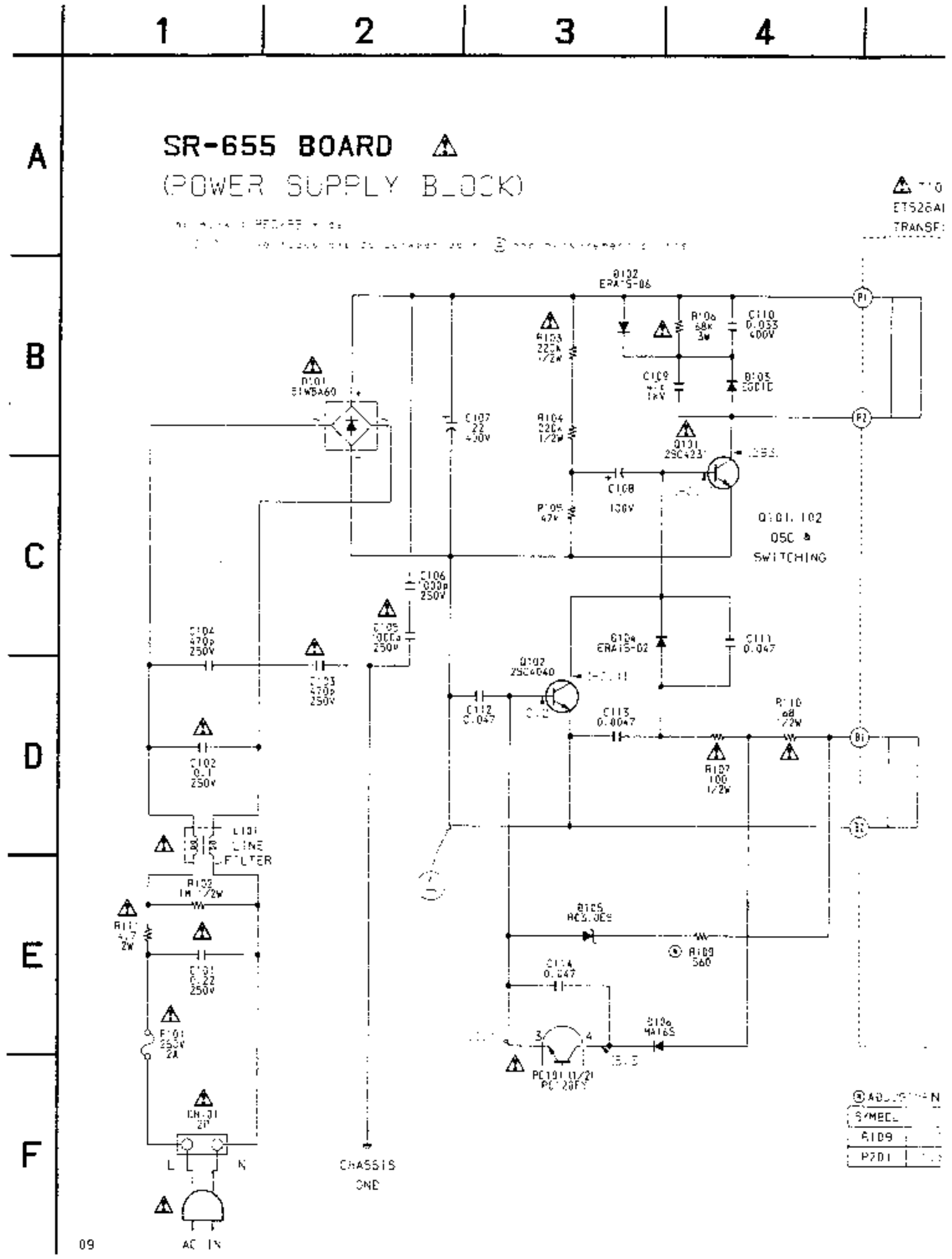
SR-655 BOARD





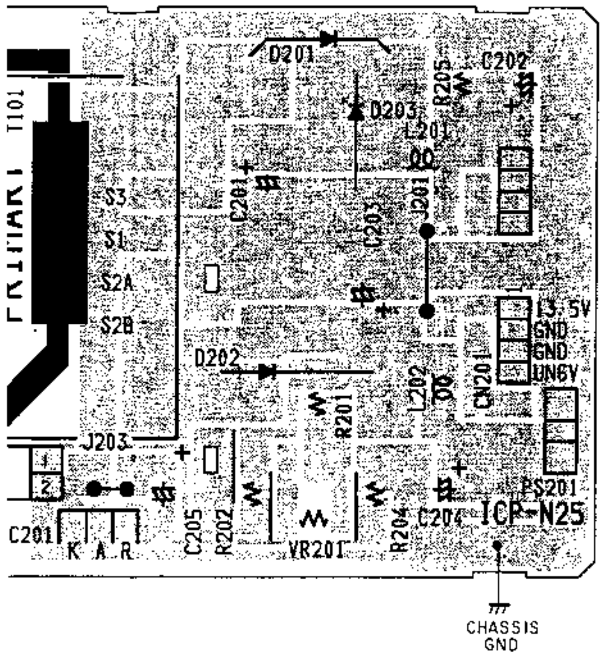
POWER BLOCK (SR-655) (POWER) SCHEMATIC DIAGRAM

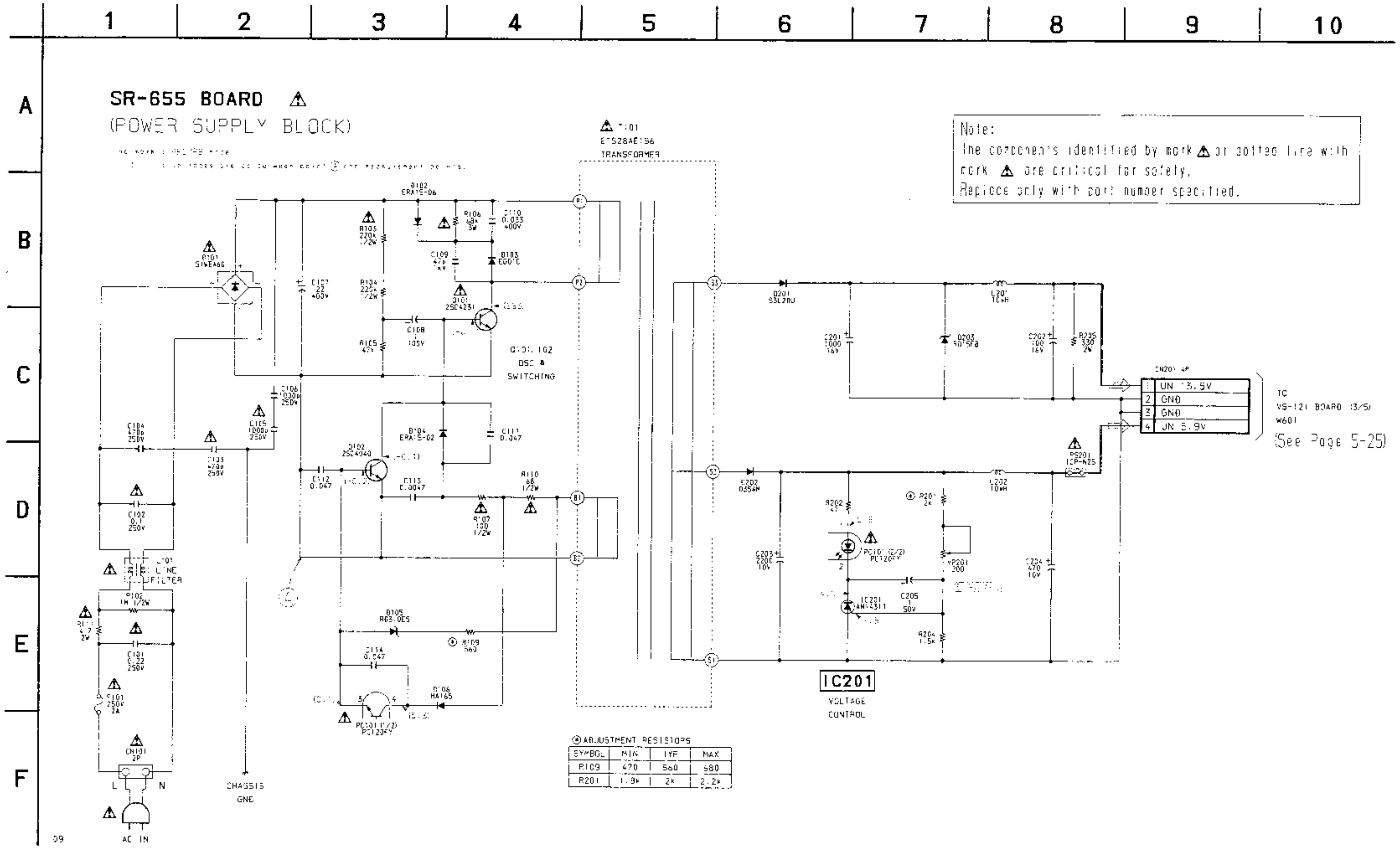
— Ref. No. POWER BLOCK (SR-655): 8000 series —



POWER BLOCK (SR-655) (POWER) SCHEMATIC DIAGRAM

— Ref. No. POWER BLOCK (SR-655), 8000 series —





Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

⊛ADJUSTMENT RESISTORS

SYMBOL	MIN	TYP	MAX
R109	470	560	680
R201	1.9k	2k	2.2k

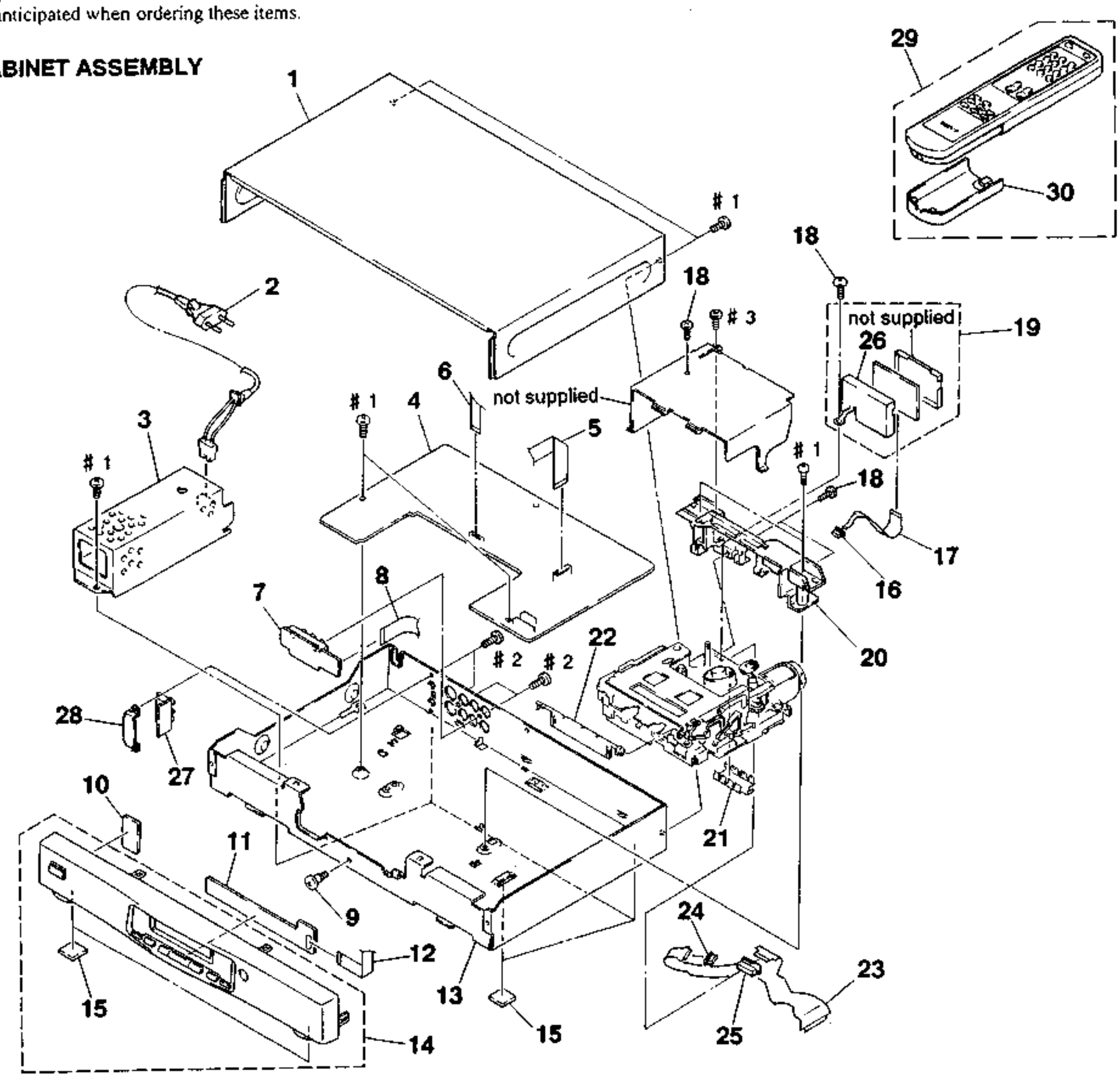
SECTION 6
REPAIR PARTS LIST

6-1. EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

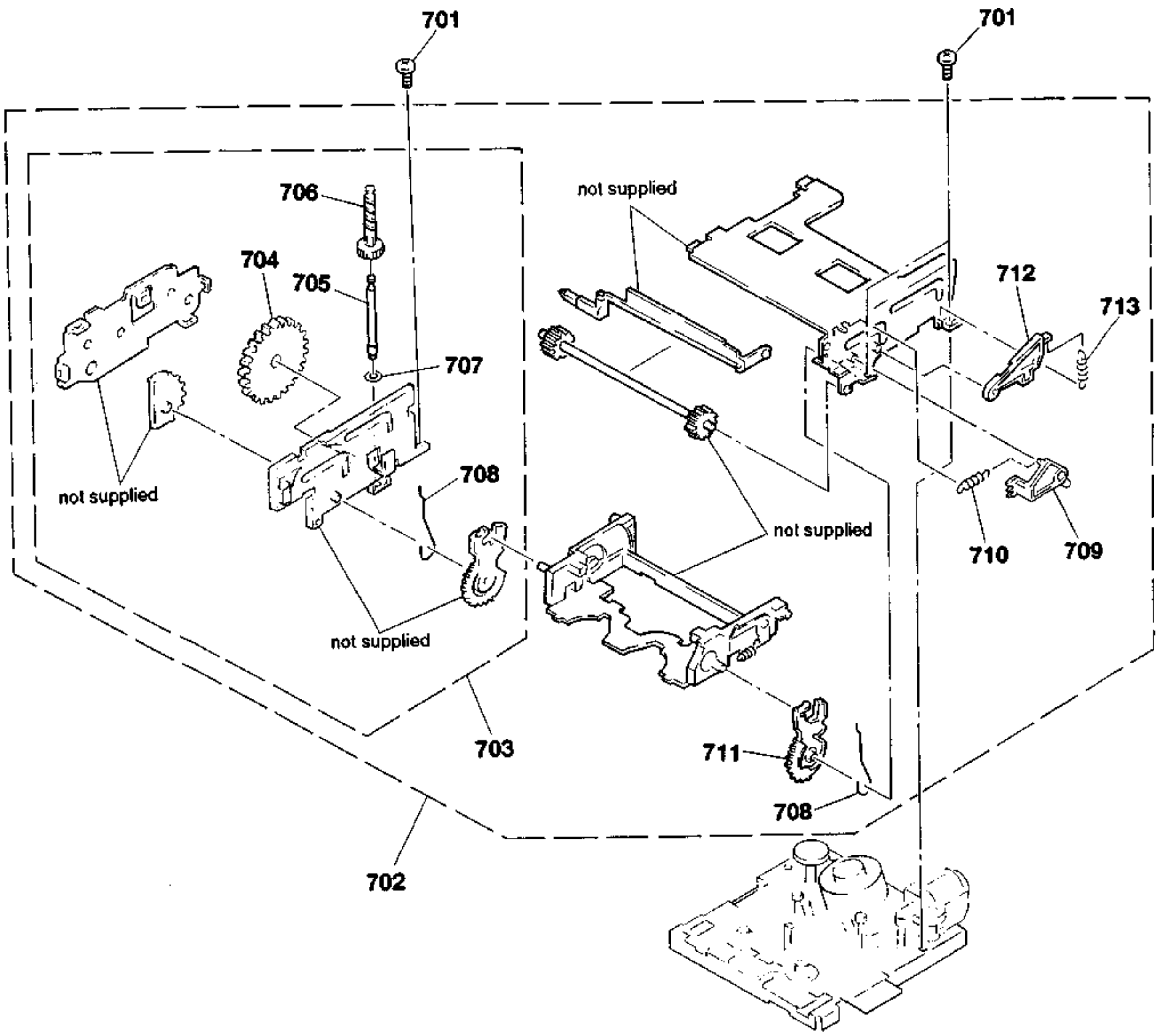
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-1-1. CABINET ASSEMBLY



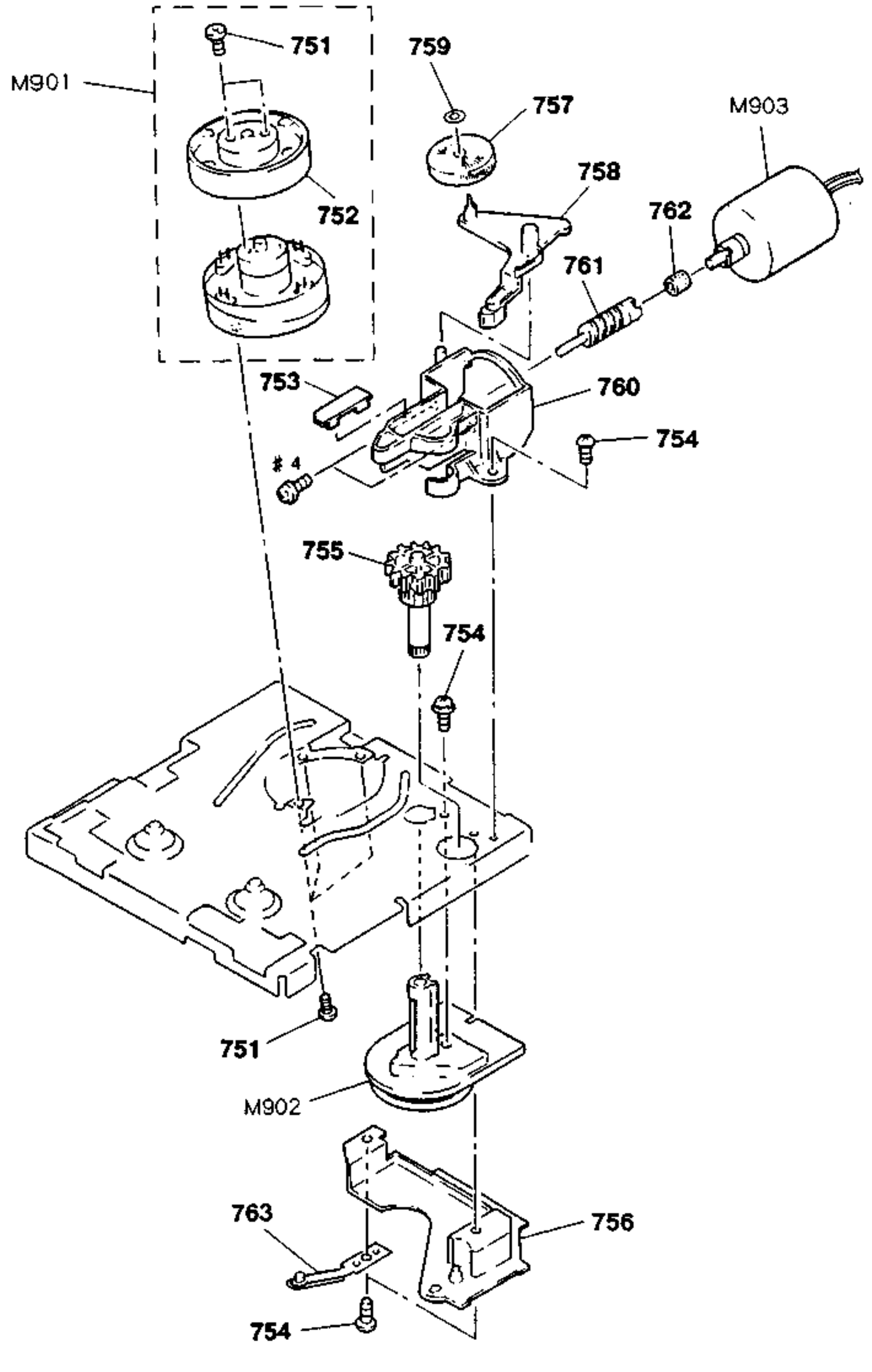
Ref. No.	Part No.	Description	Remark
* 1	3-960-843-01	CASE, UPPER	
⚠2	1-769-767-11	CORD, POWER	
⚠3	1-468-021-11	POWER BLOCK	
* 4	A-7066-358-A	VS-121PH BOARD, COMPLETE	
5	1-769-100-11	CABLE, FLAT (FMV-2)	
6	1-769-099-11	CABLE, FLAT (FRV-2)	
* 7	A-7072-189-A	RJ-62PH BOARD, COMPLETE	
8	1-769-103-11	CABLE, FLAT (FRV-3)	
9	3-741-948-01	SCREW (3), SPECIAL (+) TAPPING	
* 10	A-7072-186-A	FL-68PH BOARD, COMPLETE	
* 11	A-7072-187-A	FC-57PH BOARD, COMPLETE	
12	1-769-102-11	CABLE, FLAT (FFV-5)	
13	3-960-833-21	BASE	
14	X-3944-912-1	PANEL ASSY, FRONT	
15	3-960-832-01	FELT	
16	1-691-471-11	CONNECTOR, TRANSLATION 11P	
17	1-649-565-11	FP-696 FLEXIBLE BOARD	
18	3-732-817-01	SCREW (2X4.5), TAPPING	
* 19	A-7066-354-A	RP-190PH BOARD, COMPLETE	
* 20	3-960-834-01	FRAME, RP	
* 21	X-3944-471-1	PLATE ASSY, GROUND, ST	
22	3-955-929-41	DOOR, CASSETTE COMPARTMENT	
23	1-649-836-11	FP-695 FLEXIBLE BOARD	
24	1-691-254-13	CONNECTOR, TRANSLATION 10P	
25	1-764-137-11	CONNECTOR, TRANSLATION 15P	
* 26	3-955-621-01	CASE (MAIN), SHIELD, RP	
* 27	A-7072-188-A	RJ-60PH BOARD, COMPLETE	
* 28	3-949-486-01	BRACKET, RJ	
29	1-473-181-11	REMOTE COMMANDER (RMT-V176)	
30	9-900-029-01	COVER, BATTERY (for RMT-V176)	

6-1-2. FL CASSETTE COMPARTMENT ASSEMBLY



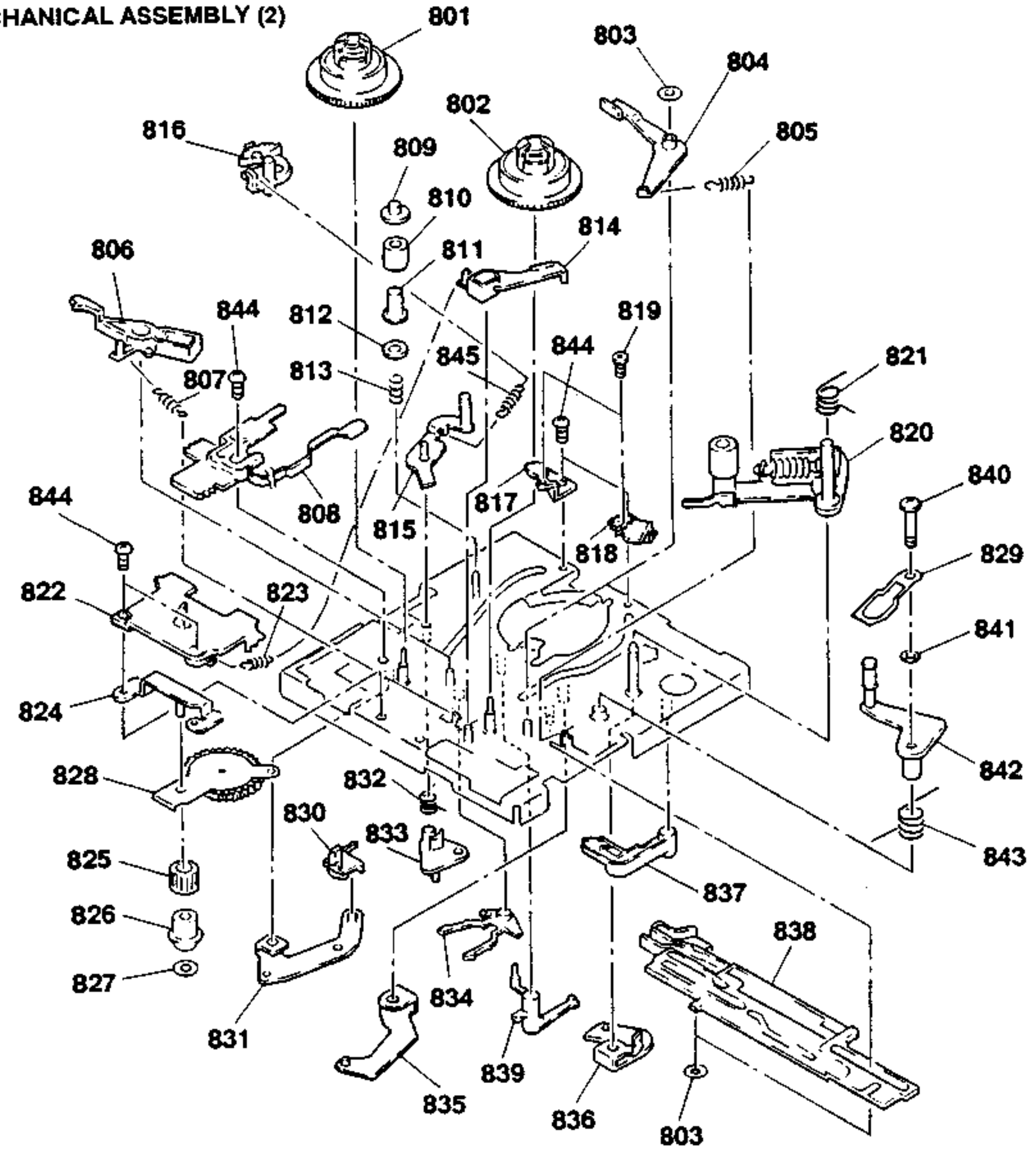
Ref. No.	Part No.	Description	Remark
701	3-732-817-01	SCREW (2X4.5), TAPPING	
702	A-7091-941-A	FL BLOCK ASSY	
703	A-7091-942-A	PLATE (S) BLOCK ASSY, SIDE	
704	3-954-019-01	WHEEL, FL WORM	
* 705	3-954-029-01	SHAFT, FL WORM GEAR	
706	3-954-028-01	GEAR, FL WORM	
707	3-738-212-11	RETAINER, THRUST, REEL TABLE	
708	3-954-042-01	SPRING, PRESS	
* 709	3-954-041-01	ARM, DOOR SWITCHING	
710	3-954-044-01	SPRING, TENSION	
711	3-954-033-01	ARM (T), DRIVING	
* 712	3-954-040-01	ARM, CASSETTE IN SWITCH	
713	3-954-043-01	SPRING, TENSION	

6-1-3. MECHANICAL ASSEMBLY (1)



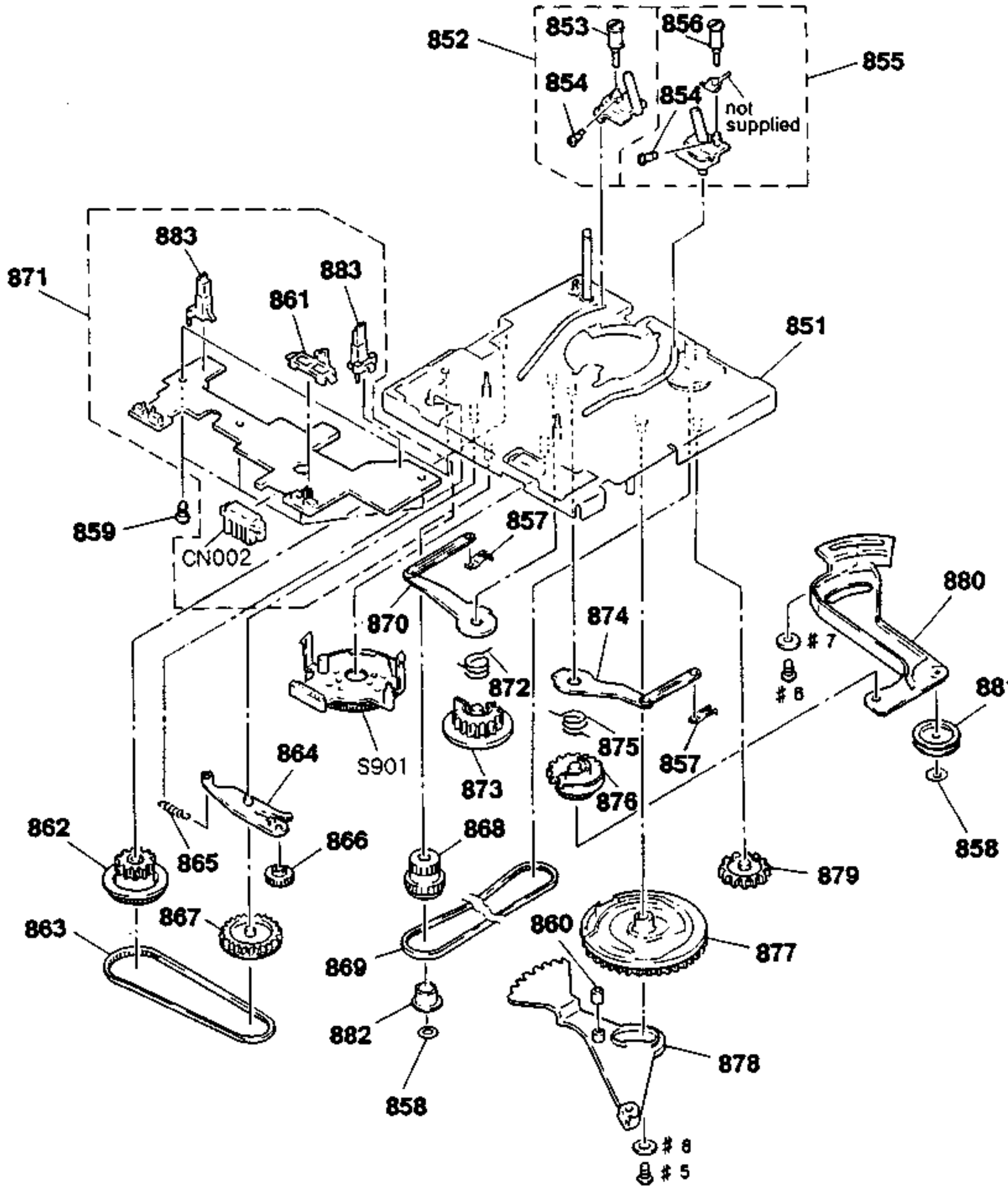
Ref. No.	Part No.	Description	Remark
751	3-686-493-01	SCREW (M2X5), P1	
752	A-7049-660-A	DRUM ASSY, UPPER, ROTARY (DGR-0B8-R)	
* 753	3-958-047-01	COVER, MOTOR HOLDER	
754	3-732-817-01	SCREW (2X4.5), TAPPING	
755	3-954-023-01	WHEEL, CAM WORM	
* 756	3-954-049-01	RETAINER, WORM WHEEL	
757	X-3943-192-1	ROLLER ASSY, HC	
758	X-3942-947-1	ARM ASSY, HC	
759	3-321-393-01	WASHER, STOPPER	
760	3-954-024-03	HOLDER, MOTOR	
761	3-733-395-01	GEAR (CAM), WORM	
762	3-962-295-01	RUBBER, JOINT	
763	X-3942-960-1	GROUND ASSY, SHAFT	
M901	A-7048-787-A	DRUM ASSY (DGU-0B8A-R)	
M902	8-835-499-01	MOTOR, DC SCE-0501A (CAPSTAN)	
M903	X-3942-946-1	MOTOR ASSY, CAM (LOADING)	

6-1-4. MECHANICAL ASSEMBLY (2)



Ref.No.	Part No.	Description	Remark
801	X-3942-954-1	TABLE (S) ASSY, REEL	
802	X-3942-953-2	TABLE (T) ASSY, REEL	
803	3-669-465-01	WASHER (1.5), STOPPER	
804	X-3943-161-3	BRAKE (T) ASSY	
805	3-953-978-01	SPRING, TENSION	
806	3-954-071-01	ARM, BRAKE (S)	
807	3-954-085-01	SPRING, TENSION	
808	X-3942-956-1	BAND ASSY, TENSION REGULATOR	
809	3-726-884-01	FLANGE, UPPER, TG2	
810	3-943-670-02	ROLLER, TG2	
811	3-726-885-01	SLEEVE, TG2	
812	3-726-882-02	FLANGE, LOWER, TG2	
813	3-954-001-01	SPRING, COMPRESSION	
814	X-3943-111-1	BRAKE (T) ASSY, SOFT	
815	X-3942-955-1	TENSION REGULATOR ASSY	
816	3-954-103-01	ARM, TENSION ADJUSTMENT	
817	3-954-090-01	CATCHER (S)	
818	3-954-091-01	CATCHER (T)	
819	3-954-285-01	SCREW (M1.4X0.2)	
820	X-3942-945-1	ARM ASSY, PINCH	
821	3-954-105-01	SPRING (PINCH DRIVING)	
* 822	3-954-063-01	PLATE, RELEASE, REEL LOCK	
823	3-955-142-01	SPRING, TENSION	
824	X-3943-162-1	BASE ASSY, PENDULUM	
825	3-954-059-01	GEAR, PENDULUM DRIVING	
826	3-954-321-01	BEARING, PENDULUM DRIVING	
827	3-726-829-01	WASHER, STOPPER	
828	X-3942-951-1	GEAR ASSY, PENDULUM	
829	3-954-093-01	SPACER, TG7	
830	3-953-975-01	CLAW, S TAKE-UP	
* 831	3-953-974-01	ARM, S TAKE-UP	
832	3-956-366-01	SPRING, TORSION	
833	3-954-100-01	ARM, TENSION REGULATOR SUB	
834	3-953-973-01	ARM, PENDULUM COMPULSION	
* 835	3-954-007-01	LEVER, SLIDE PLATE DRIVING	
* 836	3-954-009-01	LEVER, PINCH DRIVING	
837	3-954-016-01	LEVER, TG7 DRIVING	
838	3-953-972-01	PLATE, SLIDE	
839	3-954-072-01	LEVER, BRAKE (S) DRIVING	
840	3-954-096-01	SCREW, TG7 HEIGHT ADJUSTMENT	
841	3-738-212-11	RETAINER, THRUST, REEL TABLE	
842	X-3942-958-1	ARM ASSY, TG7	
843	3-954-003-01	SPRING (TG7), TORSION	
844	3-732-817-01	SCREW (2X4.5), TAPPING	
845	3-954-074-01	SPRING, TENSION	

6-1-5. MECHANICAL ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
* 851	X-3942-952-1	CHASSIS ASSY, MECHANICAL	
852	A-7040-338-A	COASTER (S) BLOCK ASSY	
853	X-3941-755-1	ROLLER ASSY (2), TG3	
854	3-947-504-01	SCREW (M1.2X2)	
855	A-7040-339-A	COASTER (T) BLOCK ASSY	
856	X-3941-756-1	ROLLER ASSY (2), TG6	
857	3-956-649-01	SPRING, LEAF, COASTER	
858	3-726-829-01	WASHER, STOPPER	
859	3-732-817-01	SCREW (2X4.5), TAPPING	
860	3-954-323-01	ROLLER, LOADING	
861	3-954-639-01	HOLDER (T), PUSH SWITCH	
862	3-953-983-01	GEAR, FL PULLEY	
863	3-954-079-01	BELT (FL), TIMING	
864	3-953-979-01	ARM, FL SELECTION	
865	3-953-982-01	SPRING, TENSION	
866	3-953-980-01	GEAR, FL SELECTION	
867	3-953-981-01	GEAR (DRIVING), FL PULLEY	
868	3-954-061-01	GEAR, REEL RELAY	
869	3-953-986-01	BELT, TIMING	
870	X-3942-949-1	ARM (S) ASSY, LOADING	
* 871	A-7056-213-A	MD-59A BOARD, COMPLETE	
872	3-953-998-01	SPRING (S), TORSION	
873	3-953-991-01	GEAR (S), LOADING	
874	X-3942-948-1	ARM (T) ASSY, LOADING	
875	3-954-000-01	SPRING (T), TORSION	
876	3-953-992-01	GEAR (T), LOADING	
877	3-954-050-01	CAM, MAIN	
* 878	3-954-014-01	LEVER, LOADING DRIVING	
879	3-954-015-01	GEAR, CAM RELAY	
880	X-3942-962-1	BASE ASSY, PULLEY	
881	X-3943-016-1	PULLEY ASSY, BELT	
882	3-954-102-02	FLANGE, REEL RELAY	
883	3-953-985-01	HOLDER, ST SENSOR	
CN002	1-750-620-11	CONNECTOR (MM8 MD)	
S901	1-692-498-11	SWITCH, ROTARY	

FC-57PH | FL-68PH

6-2. ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
*	A-7072-187-A	FC-57PH BOARD, COMPLETE	
		************************	
		(Ref. No. 5,000 Series)	
		< CAPACITOR >	
C080	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
* CN080	1-691-074-11	HOUSING, CONNECTOR 15P	
		< DIODE >	
D080	8-719-987-41	LED CL-150Y-CD (▭)	
D081	8-719-026-39	DIODE CL-150UR-CD (REC ●)	
D082	8-719-987-41	LED CL-150Y-CD (PAUSE ▮▮)	
D083	8-719-987-41	LED CL-150Y-CD (REW ◀◀)	
D084	8-719-989-XX	DIODE CL-150YG-CD (PLAY ▷)	
D085	8-719-987-41	LED CL-150Y-CD (FF ▶▶)	
D086	8-719-989-XX	DIODE CL-150YG-CD (Hi8)	
D087	8-719-989-XX	DIODE CL-150YG-CD (Hi8)	
D088	8-719-800-76	DIODE 1SS226	
D089	8-719-800-76	DIODE 1SS226	
D090	8-719-800-76	DIODE 1SS226	
		< IC >	
IC080	8-749-923-29	IC RS-20E-T	
		< TRANSISTOR >	
Q080	8-729-421-19	TRANSISTOR UN2213	
Q081	8-729-421-19	TRANSISTOR UN2213	
Q082	8-729-421-19	TRANSISTOR UN2213	
Q083	8-729-421-19	TRANSISTOR UN2213	
		< RESISTOR >	
R080	1-216-027-00	METAL CHIP 120 5% 1/10W	
R081	1-216-043-91	METAL GLAZE 560 5% 1/10W	
R082	1-216-027-00	METAL CHIP 120 5% 1/10W	
R083	1-216-027-00	METAL CHIP 120 5% 1/10W	
R084	1-216-033-00	METAL CHIP 220 5% 1/10W	
R085	1-216-027-00	METAL CHIP 120 5% 1/10W	
R086	1-216-015-00	METAL CHIP 39 5% 1/10W	

Ref. No.	Part No.	Description	Remark
R890	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R891	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R892	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R893	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R894	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R895	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R896	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
		< SWITCH >	
S080	1-554-303-21	SWITCH, TACTILE (HI SPEED REW ◀◀◀)	
S081	1-554-303-21	SWITCH, TACTILE (STOP ■)	
S082	1-554-303-21	SWITCH, TACTILE (REW ◀◀)	
S083	1-554-303-21	SWITCH, TACTILE (PLAY ▷)	
S084	1-554-303-21	SWITCH, TACTILE (FF ▶▶)	
S085	1-554-303-21	SWITCH, TACTILE (PAUSE ▮▮)	
S086	1-554-303-21	SWITCH, TACTILE (REC ●)	
S087	1-554-303-21	SWITCH, TACTILE (EJECT ⏏)	
**			
*	A-7072-186-A	FL-68PH BOARD, COMPLETE	
		************************	
		(Ref. No. 6,000 Series)	
		< DIODE >	
D095	8-719-987-43	DIODE CL-150PG-CD (POWER)	
D096	8-719-987-43	DIODE CL-150PG-CD (POWER)	
D097	8-719-024-87	DIODE LN1261CAL (STANDBY)	
		< TRANSISTOR >	
Q095	8-729-901-06	TRANSISTOR DTA144EK	
		< RESISTOR >	
R095	1-216-017-00	METAL CHIP 47 5% 1/10W	
R096	1-216-035-00	METAL CHIP 270 5% 1/10W	
		< SWITCH >	
S095	1-554-303-21	SWITCH, TACTILE (ON/STANDBY)	
**			

Ref. No.	Part No.	Description				Remark
*	A-7056-213-A	MD-59A BOARD, COMPLETE				
		**********************				
		(Ref. No. 3,000 Series)				
*	1-648-300-11	MD-59 BOARD				
	3-953-985-01	HOLDER, ST SENSOR				
	3-954-639-01	HOLDER (T), PUSH SWITCH				
		< CONNECTOR >				
CN001	1-691-051-21	HOUSING, CONNECTOR 19P				
CN002	1-750-620-11	CONNECTOR (MM8 MD)				
		< DIODE >				
D001	8-719-988-42	DIODE	GL453S (TOP/END)			
D002	8-719-106-79	DIODE	RD13M-B1			
D003	8-719-106-73	DIODE	RD7.5M-B2			
D004	8-719-106-73	DIODE	RD7.5M-B2			
D005	8-719-106-73	DIODE	RD7.5M-B2			
		< HALL ELEMENT >				
H001	1-808-118-11	ELEMENT, HALL HW-300A (S REEF FG)				
H002	1-808-118-11	ELEMENT, HALL HW-300A (T REEF FG)				
		< JUMPER RESISTOR >				
JR001	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR002	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR003	1-216-296-00	METAL CHIP	0	5%	1/8W	
		< TRANSISTOR >				
PT001	8-729-907-25	TRANSISTOR	PT4850F (END SENS)			
PT002	8-729-907-25	TRANSISTOR	PT4850F (TOP SENS)			
		< RESISTOR >				
R001	1-216-190-00	METAL GLAZE	470	5%	1/8W	
R002	1-216-190-00	METAL GLAZE	470	5%	1/8W	
R003	1-216-190-00	METAL GLAZE	470	5%	1/8W	
R004	1-216-190-00	METAL GLAZE	470	5%	1/8W	
R005	1-216-296-00	METAL CHIP	0	5%	1/8W	
		< SWITCH >				
S003	1-692-497-11	SWICH, PUSH (ME/MP)				
S004	1-692-497-11	SWICH, PUSH (Hi8 MP)				
S005	1-692-497-11	SWICH, PUSH (REC PROOF)				
S006	1-570-953-11	SWITCH, PUSH (1 KEY)(CC DOWN)				

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Ref. No.	Part No.	Description			Remark
⚠*	1-468-021-11	POWER BLOCK (SR-655)			
		*******************			
		(Ref. No. 8,000 Series)			
	9-902-059-01	CLIP, FUSE			
		< CAPACITOR >			
⚠C101	1-130-711-00	METALIZED	0.22uF		50V
⚠C102	1-136-189-00	METALIZED	0.1uF		250V
⚠C103	9-905-279-01	CERAMIC	470PF		250V
C104	9-905-279-01	CERAMIC	470PF		250V
⚠C105	9-904-183-01	CERAMIC	1000PF		250V
C106	9-904-183-01	CERAMIC	1000PF		250V
C107	9-907-232-01	ELECT	22uF		400V
C108	9-904-185-01	ELECT	1uF		100V
C109	9-902-101-01	CERAMIC	47PF		1KV
C110	1-129-720-00	METALIZED	0.033uF		400V
C111	1-130-491-00	FILM	0.047uF		50V
C112	1-130-491-00	FILM	0.047uF		50V
C113	1-130-479-00	FILM	0.0047uF		50V
C114	1-130-491-00	FILM	0.047uF		50V
C201	1-129-720-00	ELECT	1000uF		16V
C202	1-126-933-11	ELECT	100uF		16V
C203	1-126-927-11	ELECT	2200uF		10V
C204	1-126-925-11	ELECT	470uF		10V
C205	1-124-903-11	ELECT	1uF		50V
		< CONNECTOR >			
⚠CN101	9-907-239-01	CONNECTOR 2P (B2P3-VH)			
CN201	1-564-014-11	CONNECTOR 4P			
		< DIODE >			
⚠D101	8-719-510-06	DIODE	SIWB60 (600V, 1A)		
D102	8-719-304-63	DIODE	RM119 (600V, 1A)		
D103	8-719-030-25	DIODE	EG01C (100V, 0.5A)		
D104	8-719-200-02	DIODE	10E-2 (200V, 1A)		
D105	8-719-109-63	DIODE	RD3.0ESB2 (3V, 400mA)		
D106	8-719-911-19	DIODE	1SS119-25 (35V, 100mA)		
D201	9-904-701-01	DIODE	S3L20U (200V, 3A)		
D202	8-719-981-00	DIODE	ERC81-004 (40V, 3A)		
D203	8-719-160-63	DIODE	RD15FB3 (15V, 1000mW)		
		< FUSE >			
⚠F101	1-532-203-00	FUSE (250V, 2A)			
		< IC >			
IC201	8-759-420-19	IC AN1431T			
		< COIL >			
⚠L101	9-905-326-01	FILTER, LINE (ELF18D290H)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

POWER BLOCK | RJ-60PH | RJ-62PH

Ref. No.	Part No.	Description	Remark
L201	9-900-520-01	INDUCTOR 10uH	
L202	9-900-520-01	INDUCTOR 10uH	
		< PHOTO COUPLER >	
⚠PC101	8-719-037-65	ON3171	
		< IC LINK >	
⚠PS201	1-532-637-21	LINK, IC (ICP-N25)	
		< TRANSISTOR >	
⚠Q101	9-902-497-11	TRANSISTOR 2SC4231 (800V, 2A)	
Q102	8-729-012-30	TRANSISTOR 2SC4040 (32V, 1A)	
		< RESISTOR >	
R102	9-902-945-01	CARBON, NONFLAMMABLE 1M 1/2W	
⚠R103	1-260-127-11	CARBON 220K 1/2W	
R104	1-260-127-11	CARBON 220K 1/2W	
R105	1-249-437-11	CARBON 47K 1/4W	
⚠R106	9-933-767-01	METAL OXIDE 68K 3W	
⚠R107	1-247-739-11	CARBON 100 1/2W	
R109	1-249-413-11	CARBON(ADJUSTMENT) 470 1/4W	
R109	1-249-414-11	CARBON(ADJUSTMENT) 560 1/4W	
R109	1-249-415-11	CARBON(ADJUSTMENT) 680 1/4W	
⚠R110	1-247-737-11	CARBON 68 1/2W	
⚠R111	9-904-186-01	CEMENT 4.7 2W	
R201	1-249-420-11	METAL(ADJUSTMENT) 1.8K 1/4W	
R201	9-933-771-01	METAL(ADJUSTMENT) 2K 1/4W	
R201	1-249-421-11	METAL(ADJUSTMENT) 2.2K 1/4W	
R202	1-247-735-11	CARBON 47 1/4W	
R204	1-249-419-11	METAL 1.5K 1/4W	
R205	9-933-772-01	METAL OXIDE 330 2W	
		< TRANSFORMER >	
⚠T101	9-933-765-01	TRANSFORMER, SWITCHING (ETS28AE156)	
		< VARIABLE RESISTOR >	
VR201	9-909-295-01	RES, ADJ 200	

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Ref. No.	Part No.	Description	Remark
*	A-7072-188-A	RJ-60PH BOARD, COMPLETE	
		************************	
		(Ref. No. 4,000 Series)	
		< CAPACITOR >	
C090	1-126-157-11	ELECT 10uF 20% 16V	
C091	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C093	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
		< CONNECTOR >	
* CN091	1-564-005-11	PIN, CONNECTOR 6P	
		< DIODE >	
D091	8-719-421-59	DIODE MA3075WA-TX	
D092	8-719-421-59	DIODE MA3075WA-TX	
D999	8-719-025-48	DIODE 02CZ13-TE85L	
		< JACK >	
J090	1-537-179-11	TERMINAL BOARD (AUDIO/RFU DC OUT/VIDEO)	
		< TRANSISTOR >	
Q090	8-729-101-07	TRANSISTOR 2SB798-DL	
Q091	8-729-422-27	TRANSISTOR 2SD601A-Q	
		< RESISTOR >	
R079	1-216-295-91	CONDCTOR, CHIP (2012)	
R088	1-216-295-91	CONDCTOR, CHIP (2012)	
R090	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R091	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R092	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R093	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R100	1-216-295-91	CONDCTOR, CHIP (2012)	

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Ref. No.	Part No.	Description	Remark
*	A-7072-189-A	RJ-62PH BOARD, COMPLETE	
		************************	
		(Ref. No. 7,000 Series)	
	3-963-510-01	PLATE, GROUND, JACK	
		< CAPACITOR >	
C100	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C101	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
C102	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
C103	1-163-251-11	CERAMIC CHIP 100PF 5% 50V	
C104	1-216-295-91	CONDCTOR, CHIP (2012)	
C105	1-163-275-11	CERAMIC CHIP 0.001uF 5% 50V	
C106	1-163-275-11	CERAMIC CHIP 0.001uF 5% 50V	
C107	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C108	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C109	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C110	1-216-295-91	CONDCTOR, CHIP (2012)	
C111	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C112	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
		< CONNECTOR >	
* CN100	1-695-343-41	PIN, CONNECTOR (PC BOARD) 20P	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
CNJ100	1-750-664-11	TERMINAL BLOCK, S (S VIDEO, VIDEO, AUDIO IN/OUT)				
		< DIODE >				
D100	8-719-106-43	DIODE RD9.1M-B1				
D101	8-719-157-30	DIODE RD5.6M-B				
D102	8-719-421-59	DIODE MA3075WA-TX				
D103	8-719-421-59	DIODE MA3075WA-TX				
D104	8-719-421-59	DIODE MA3075WA-TX				
D109	8-719-421-59	DIODE MA3075WA-TX				
D110	8-719-421-59	DIODE MA3075WA-TX				
D111	8-719-421-59	DIODE MA3075WA-TX				
D112	8-719-106-43	DIODE RD9.1M-B1				
		< FERRITE BEAD >				
FB101	1-412-390-21	INDUCTOR CHIP 0uH				
		< JUMPER RESISTOR >				
JR101	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR102	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR103	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR104	1-216-295-91	CONDCTOR, CHIP (2012)				
JR105	1-216-295-91	CONDCTOR, CHIP (2012)				
JR106	1-216-295-91	CONDCTOR, CHIP (2012)				
JR107	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR108	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR109	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR110	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR111	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR112	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR113	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR114	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR115	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR116	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR117	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR118	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR119	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR120	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR121	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR122	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR123	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR124	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR125	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR126	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR127	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR128	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR129	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR130	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR131	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR132	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR133	1-216-296-00	METAL CHIP	0	5%	1/8W	
		< RESISTOR >				
R100	1-216-015-00	METAL CHIP	39	5%	1/10W	
R101	1-216-015-00	METAL CHIP	39	5%	1/10W	
R102	1-216-015-00	METAL CHIP	39	5%	1/10W	
R103	1-216-015-00	METAL CHIP	39	5%	1/10W	
R104	1-216-015-00	METAL CHIP	39	5%	1/10W	
R105	1-216-015-00	METAL CHIP	39	5%	1/10W	
R106	1-216-295-91	CONDCTOR, CHIP (2012)				
R107	1-216-039-00	METAL CHIP	390	5%	1/10W	
R108	1-216-039-00	METAL CHIP	390	5%	1/10W	
R109	1-216-295-91	CONDCTOR, CHIP (2012)				
R110	1-216-295-91	CONDCTOR, CHIP (2012)				

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* A-7066-354-A RP-190PH BOARD, COMPLETE
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(Ref. No. 1,000 Series)

* 3-955-621-01 CASE (MAIN), SHIELD, RP

Ref. No.	Part No.	Description				Remark
		< CAPACITOR >				
C801	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V	
C802	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C803	1-164-634-11	CERAMIC CHIP	1uF		16V	
C804	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C805	1-124-638-11	ELECT	22uF	20%	10V	
C806	1-126-157-11	ELECT	10uF	20%	16V	
C807	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V	
C808	1-163-091-00	CERAMIC CHIP	8PF		50V	
C809	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C810	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C811	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C812	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	
C813	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C814	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C815	1-126-157-11	ELECT	10uF	20%	16V	
C816	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C817	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C818	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C819	1-164-634-11	CERAMIC CHIP	1uF		16V	
C820	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
C821	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C822	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C823	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C824	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C825	1-126-157-11	ELECT	10uF	20%	16V	
C826	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
C827	1-164-232-11	CERAMIC CHIP	0.01uF		50V	

RP-190PH

Ref. No.	Part No.	Description			Remark
C828	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C829	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C830	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C831	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C832	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C833	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C834	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C835	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C836	1-126-154-11	ELECT	47uF	20%	6.3V
C837	1-126-157-11	ELECT	10uF	20%	16V
C839	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C840	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C841	1-164-634-11	CERAMIC CHIP	1uF		16V
C842	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C844	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C845	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C846	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C847	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C849	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C850	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C851	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C852	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C853	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C854	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
		< CONNECTOR >			
CN801	1-566-545-41	CONNECTOR, FPC (NON ZIF) 13P			
CN802	1-506-487-11	PIN, CONNECTOR 8P			
CN803	1-691-043-21	HOUSING, CONNECTOR 11P			
		< DIODE >			
D801	8-719-404-46	DIODE MA110			
D802	8-719-404-46	DIODE MA110			
		< IC >			
IC801	8-752-003-44	IC CX20034			
		< COIL >			
L801	1-408-973-21	INDUCTOR 18uH			
L802	1-408-982-21	INDUCTOR 100uH			
L803	1-408-948-00	INDUCTOR 220uH			
L804	1-408-974-21	INDUCTOR 22uH			
L805	1-408-973-21	INDUCTOR 18uH			
L808	1-408-970-21	INDUCTOR 10uH			
		< TRANSISTOR >			
Q801	8-729-421-19	TRANSISTOR UN2213			
Q804	8-729-102-07	TRANSISTOR 2SC2223-F13			
Q805	8-729-102-07	TRANSISTOR 2SC2223-F13			
Q806	8-729-422-27	TRANSISTOR 2SD601A-Q			
Q807	8-729-216-22	TRANSISTOR 2SA1162-G			
Q808	8-729-216-22	TRANSISTOR 2SA1162-G			
Q809	8-729-216-22	TRANSISTOR 2SA1162-G			
		< RESISTOR >			
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W
R802	1-216-295-91	CONDCTOR, CHIP (2012)			
R806	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R807	1-216-089-00	METAL CHIP	47K	5%	1/10W
R808	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R809	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R810	1-216-079-00	METAL CHIP	18K	5%	1/10W
R811	1-216-031-00	METAL CHIP	180	5%	1/10W
R812	1-216-001-00	METAL CHIP	10	5%	1/10W
R813	1-216-082-00	METAL GLAZE	24K	5%	1/10W
R814	1-216-073-00	METAL CHIP	10K	5%	1/10W
R815	1-216-081-00	METAL CHIP	22K	5%	1/10W
R816	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R817	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R818	1-216-085-00	METAL CHIP	33K	5%	1/10W
R819	1-216-085-00	METAL CHIP	33K	5%	1/10W
R821	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R822	1-216-073-00	METAL CHIP	10K	5%	1/10W
R823	1-216-081-00	METAL CHIP	22K	5%	1/10W
R824	1-216-025-91	METAL GLAZE	100	5%	1/10W
R825	1-216-081-00	METAL CHIP	22K	5%	1/10W
R826	1-216-031-00	METAL CHIP	180	5%	1/10W
R827	1-216-001-00	METAL CHIP	10	5%	1/10W
R828	1-216-025-91	METAL GLAZE	100	5%	1/10W
R829	1-216-039-00	METAL CHIP	390	5%	1/10W
R830	1-216-025-91	METAL GLAZE	100	5%	1/10W
R831	1-216-025-91	METAL GLAZE	100	5%	1/10W
R832	1-216-025-91	METAL GLAZE	100	5%	1/10W
R833	1-216-079-00	METAL CHIP	18K	5%	1/10W
R834	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R835	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R836	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R837	1-216-089-00	METAL CHIP	47K	5%	1/10W
R838	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R839	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W
R842	1-216-295-91	CONDCTOR, CHIP (2012)			
R843	1-216-017-00	METAL CHIP	47	5%	1/10W
R844	1-216-043-91	METAL GLAZE	560	5%	1/10W
R845	1-216-021-00	METAL CHIP	68	5%	1/10W
R846	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R847	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R848	1-216-035-00	METAL CHIP	270	5%	1/10W
R849	1-216-033-00	METAL CHIP	220	5%	1/10W
R850	1-216-081-00	METAL CHIP	22K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R851	1-216-085-00	METAL CHIP	33K	5%	1/10W
R852	1-216-021-00	METAL CHIP	68	5%	1/10W

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
RV801	1-230-720-11	RES, ADJ, CARBON 4.7K
RV802	1-230-720-11	RES, ADJ, CARBON 4.7K

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* A-7066-358-A VS-121PH BOARD, COMPLETE
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(Ref.No. 2,000 Series)

* 3-947-505-01 CASE, SHIELD, PWM

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C017	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C019	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C021	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C022	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C023	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C024	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C025	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C026	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C034	1-216-295-91	CONDCTOR, CHIP (2012)			
C101	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C104	1-126-157-11	ELECT	10uF	20%	16V
C105	1-126-157-11	ELECT	10uF	20%	16V
C106	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C107	1-124-638-11	ELECT	22uF	20%	10V
C108	1-126-157-11	ELECT	10uF	20%	16V
C109	1-126-157-11	ELECT	10uF	20%	16V
C110	1-126-162-11	ELECT	3.3uF	20%	50V
C111	1-126-157-11	ELECT	10uF	20%	16V
C112	1-126-301-11	ELECT	1uF	20%	50V
C113	1-126-157-11	ELECT	10uF	20%	16V
C114	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C115	1-126-157-11	ELECT	10uF	20%	16V
C116	1-126-157-11	ELECT	10uF	20%	16V
C117	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C118	1-126-154-11	ELECT	47uF	20%	6.3V
C119	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C120	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C121	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C122	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C123	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C124	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C125	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C126	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C127	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C128	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C129	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C130	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C131	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C132	1-124-638-11	ELECT	22uF	20%	10V
C133	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C136	1-126-301-11	ELECT	1uF	20%	50V
C137	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C138	1-124-254-00	ELECT	0.68uF	20%	50V
C139	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C140	1-126-301-11	ELECT	1uF	20%	50V
C141	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C144	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C145	1-126-154-11	ELECT	47uF	20%	6.3V
C146	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C147	1-126-163-11	ELECT	4.7uF	20%	50V
C148	1-126-154-11	ELECT	47uF	20%	6.3V
C149	1-124-464-11	ELECT	0.22uF	20%	50V
C150	1-126-162-11	ELECT	3.3uF	20%	50V
C151	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C152	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C153	1-126-162-11	ELECT	3.3uF	20%	50V
C154	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C155	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C156	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C157	1-126-162-11	ELECT	3.3uF	20%	50V
C158	1-164-634-11	CERAMIC CHIP	1uF		16V
C160	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C161	1-126-162-11	ELECT	3.3uF	20%	50V
C162	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C163	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C164	1-126-162-11	ELECT	3.3uF	20%	50V
C165	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C166	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C167	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C168	1-126-162-11	ELECT	3.3uF	20%	50V
C169	1-164-634-11	CERAMIC CHIP	1uF		16V
C171	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C172	1-126-157-11	ELECT	10uF	20%	16V
C173	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C174	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C175	1-126-157-11	ELECT	10uF	20%	16V
C176	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C177	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C178	1-126-157-11	ELECT	10uF	20%	16V
C179	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C180	1-163-120-00	CERAMIC CHIP	130PF	5%	50V
C181	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C182	1-126-154-11	ELECT	47uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C183	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C184	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C185	1-124-638-11	ELECT	22uF	20%	10V
C186	1-163-091-00	CERAMIC CHIP	8PF		50V
C187	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C188	1-126-157-11	ELECT	10uF	20%	16V
C189	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C190	1-124-638-11	ELECT	22uF	20%	10V
C191	1-124-638-11	ELECT	22uF	20%	10V
C192	1-126-154-11	ELECT	47uF	20%	6.3V
C193	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C195	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C198	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C199	1-124-638-11	ELECT	22uF	20%	10V
C200	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C201	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C202	1-124-638-11	ELECT	22uF	20%	10V
C205	1-124-638-11	ELECT	22uF	20%	10V
C207	1-124-288-00	ELECT	22uF	20%	10V
C208	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C209	1-124-638-11	ELECT	22uF	20%	10V
C211	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C212	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C213	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C214	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C215	1-216-295-91	CONDCTOR, CHIP (2012)			
C216	1-216-295-91	CONDCTOR, CHIP (2012)			
C217	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C218	1-216-039-00	METAL CHIP	390	5%	1/10W
C219	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C220	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C221	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C222	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C223	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C224	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C225	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C226	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C227	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C228	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C229	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C230	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C231	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C232	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C233	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C234	1-126-157-11	ELECT	10uF	20%	16V
C235	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C236	1-163-136-00	CERAMIC CHIP	620PF	5%	50V
C237	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C238	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C239	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C240	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C241	1-163-112-00	CERAMIC CHIP	62PF	5%	50V
C244	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C248	1-126-157-11	ELECT	10uF	20%	16V
C250	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C251	1-126-157-11	ELECT	10uF	20%	16V
C252	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C253	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C254	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C255	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C256	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C257	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C258	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C262	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C263	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C264	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C265	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C266	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-087-00	CERAMIC CHIP	4PF		50V
C269	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C271	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C273	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C276	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C277	1-126-157-11	ELECT	10uF	20%	16V
C278	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C279	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C280	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C283	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C287	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C288	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C290	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C292	1-163-091-00	CERAMIC CHIP	8PF		50V
C294	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C298	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C302	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C318	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C319	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C387	1-124-638-11	ELECT	22uF	20%	10V
C388	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C401	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C402	1-126-157-11	ELECT	10uF	20%	16V
C404	1-124-638-11	ELECT	22uF	20%	10V
C407	1-124-638-11	ELECT	22uF	20%	10V
C409	1-124-638-11	ELECT	22uF	20%	10V
C410	1-126-157-11	ELECT	10uF	20%	16V
C411	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C413	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C415	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C416	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C417	1-124-443-00	ELECT	100uF	20%	10V

Ref. No.	Part No.	Description			Remark
C418	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C419	1-124-443-00	ELECT	100uF	20%	10V
C420	1-124-638-11	ELECT	22uF	20%	10V
C424	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C430	1-126-157-11	ELECT	10uF	20%	16V
C431	1-126-157-11	ELECT	10uF	20%	16V
C432	1-124-638-11	ELECT	22uF	20%	10V
C433	1-124-638-11	ELECT	22uF	20%	10V
C436	1-124-638-11	ELECT	22uF	20%	10V
C454	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C455	1-126-154-11	ELECT	47uF	20%	6.3V
C490	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C492	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C494	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C496	1-124-638-11	ELECT	22uF	20%	10V
C498	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C499	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C500	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C501	1-124-638-11	ELECT	22uF	20%	10V
C504	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C505	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C506	1-126-176-11	ELECT	220uF	20%	10V
C602	1-124-589-11	ELECT	47uF	20%	16V
C603	1-124-471-00	ELECT	1000uF	20%	6.3V
C605	1-126-157-11	ELECT	10uF	20%	16V
C606	1-124-472-11	ELECT	470uF	20%	10V
C607	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C608	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C609	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C610	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C611	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C614	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C616	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C617	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C618	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C619	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C620	1-126-157-11	ELECT	10uF	20%	16V
C621	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C622	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C623	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C624	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C625	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C626	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C627	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C628	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C629	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C630	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C631	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C632	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C633	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C634	1-163-087-00	CERAMIC CHIP	4PF		50V
C635	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C636	1-126-157-11	ELECT	10uF	20%	16V
C637	1-126-157-11	ELECT	10uF	20%	16V
C638	1-126-157-11	ELECT	10uF	20%	16V
C639	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C640	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C641	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C642	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C643	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C644	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C646	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C647	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C649	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C650	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C651	1-124-638-11	ELECT	22uF	20%	10V
C652	1-124-589-11	ELECT	47uF	20%	16V
C653	1-127-530-11	ELECT(SOLID)	22uF	20%	20V
C655	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C656	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C657	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C659	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C660	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C661	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C662	1-124-589-11	ELECT	47uF	20%	16V
C663	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C664	1-126-301-11	ELECT	1uF	20%	50V
C665	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C666	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C667	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C668	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C669	1-127-530-11	ELECT(SOLID)	22uF	20%	20V
C670	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C671	1-127-491-00	ELECT(SOLID)	22uF	20%	10V
C672	1-126-154-11	ELECT	47uF	20%	6.3V
C673	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C674	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C675	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C676	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C677	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C678	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C679	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C680	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C681	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C682	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C684	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C686	1-124-589-11	ELECT	47uF	20%	16V
C687	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V
C688	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C689	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V

Ref. No.	Part No.	Description				Remark
C690	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V	
C691	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C692	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C693	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C694	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C695	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C696	1-124-589-11	ELECT	47uF	20%	16V	
C702	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C703	1-124-589-11	ELECT	47uF	20%	16V	
C706	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C900	1-126-163-11	ELECT	4.7uF	20%	50V	
C901	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V	
C902	1-126-157-11	ELECT	10uF	20%	16V	
C903	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C904	1-126-163-11	ELECT	4.7uF	20%	50V	
C905	1-126-163-11	ELECT	4.7uF	20%	50V	
C906	1-126-157-11	ELECT	10uF	20%	16V	
C907	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C908	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C909	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C910	1-126-154-11	ELECT	47uF	20%	6.3V	
C911	1-124-292-00	ELECT	33uF	20%	6.3V	
C912	1-126-301-11	ELECT	1uF	20%	50V	
C913	1-124-257-00	ELECT	2.2uF	20%	50V	
C914	1-126-157-11	ELECT	10uF	20%	16V	
C915	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C916	1-126-157-11	ELECT	10uF	20%	16V	
C917	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C918	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C919	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C920	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C921	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C922	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C923	1-126-301-11	ELECT	1uF	20%	50V	
C924	1-126-157-11	ELECT	10uF	20%	16V	
C925	1-126-301-11	ELECT	1uF	20%	50V	
C926	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C928	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C929	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C930	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C931	1-126-157-11	ELECT	10uF	20%	16V	
C932	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C933	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C934	1-124-292-00	ELECT	33uF	20%	6.3V	
C935	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C936	1-124-638-11	ELECT	22uF	20%	10V	
C937	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C938	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C939	1-126-157-11	ELECT	10uF	20%	16V	
C940	1-126-154-11	ELECT	47uF	20%	6.3V	

Ref. No.	Part No.	Description				Remark
C941	1-126-157-11	ELECT	10uF	20%	16V	
C942	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C943	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	
C944	1-124-638-11	ELECT	22uF	20%	10V	
C945	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C946	1-124-464-11	ELECT	0.22uF	20%	50V	
C947	1-126-154-11	ELECT	47uF	20%	6.3V	
C949	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
C950	1-124-229-00	ELECT	33uF	20%	10V	
C951	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C952	1-126-157-11	ELECT	10uF	20%	16V	
C953	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C954	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
C955	1-126-157-11	ELECT	10uF	20%	16V	
C956	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C957	1-124-257-00	ELECT	2.2uF	20%	50V	
C958	1-126-157-11	ELECT	10uF	20%	16V	
C959	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C960	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C961	1-126-154-11	ELECT	47uF	20%	6.3V	
C962	1-126-157-11	ELECT	10uF	20%	16V	
C963	1-126-163-11	ELECT	4.7uF	20%	50V	
C964	1-126-163-11	ELECT	4.7uF	20%	50V	
C965	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C966	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C968	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C969	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C970	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C971	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C975	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C976	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	
C977	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C978	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C979	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	
C980	1-126-301-11	ELECT	1uF	20%	50V	
C981	1-126-154-11	ELECT	47uF	20%	6.3V	
C982	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
		< CONNECTOR >				
CN501	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P				
CN602	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P				
* CN603	1-564-002-11	PIN, CONNECTOR 3P				
* CN604	1-564-001-11	PIN, CONNECTOR 2P				
* CN605	1-563-373-11	SOCKET, CONNECTOR 25P				
* CN606	1-695-334-11	PIN, CONNECTOR (PC BOARD) 11P				
* CN900	1-695-343-41	PIN, CONNECTOR (PC BOARD) 20P				
		< DIODE >				
D001	8-719-800-76	DIODE 1SS226				
D101	8-719-801-78	DIODE 1SS184				

Ref. No.	Part No.	Description		Remark
D107	8-719-801-78	DIODE	1SS184	
D500	8-719-820-05	DIODE	1SS181	
⚠D601	8-719-210-33	DIODE	EC10DS2	
D603	8-719-106-44	DIODE	RD9.1M	
D604	8-719-938-78	DIODE	SB10-05PCP	
D605	8-719-938-75	DIODE	SB05-05CP	
		< FERRITE BEAD >		
FB501	1-412-390-21	INDUCTOR CHIP 0uH		
FB601	1-412-390-21	INDUCTOR CHIP 0uH		
FB602	1-412-390-21	INDUCTOR CHIP 0uH		
FB603	1-412-390-21	INDUCTOR CHIP 0uH		
FB604	1-412-390-21	INDUCTOR CHIP 0uH		
		< FILTER >		
FL101	1-236-848-21	FILTER, LOW PASS		
FL102	1-239-010-11	FILTER, LOW PASS (CCD. PAL. Y)		
FL103	1-236-774-11	FILTER, LOW PASS (Y)		
FL104	1-236-775-11	FILTER, LOW PASS (DEM)		
FL401	1-415-775-21	DELAY LINE, LC		
FL900	1-236-838-21	FILTER, BAND PASS		
FL901	1-236-837-21	FILTER, BAND PASS		
		< IC >		
IC101	8-759-925-74	IC	SN74HC04ANS	
IC102	8-759-925-74	IC	SN74HC04ANS	
IC103	8-759-009-19	IC	MC14081BF	
IC104	8-752-072-55	IC	CXA1810AR-T6	
IC105	8-752-333-24	IC	CXL1506M	
IC106	8-752-333-24	IC	CXL1506M	
IC107	8-759-711-32	IC	NJM2245M	
IC108	8-752-066-68	IC	CXA1725M	
IC109	8-752-058-03	IC	CXA1509AQ	
IC110	8-759-710-07	IC	NJM2234M	
IC401	8-759-710-07	IC	NJM2234M	
IC402	8-759-182-16	IC	MM1196XFBE	
IC500	8-759-288-83	IC	MB89091PFV-G-104-BND	
IC501	8-759-074-40	IC	PST572DMT-T1	
⚠IC601	8-759-069-28	IC	PQ05RF11	
IC602	8-752-857-50	IC	CXP87140-041Q	
IC603	8-759-059-42	IC	CXA1481AR	
IC604	8-759-998-92	IC	LM393D	
IC605	8-759-998-98	IC	LM358D	
IC606	8-759-913-06	IC	BA6209	
IC607	8-759-945-17	IC	MB3775PF	
IC608	8-759-327-49	IC	CXA1512M-T3	
IC609	8-759-518-43	IC	BA6440-FP	
IC610	8-759-169-11	IC	CXA1575M-E2	
⚠IC611	8-759-168-20	IC	TA7809S	
IC900	8-759-189-19	IC	AN3900NSC-E2	
IC901	8-759-077-12	IC	CXA1542R	
		< JACK >		
J500	1-568-800-11	JACK, ULTRA SMALL (LANC)		
		< COIL >		
L008	1-408-982-21	INDUCTOR 100uH		
L009	1-408-970-21	INDUCTOR 10uH		
L010	1-408-975-21	INDUCTOR 27uH		
L101	1-408-978-21	INDUCTOR 47uH		
L103	1-408-970-21	INDUCTOR 10uH		
L104	1-408-978-21	INDUCTOR 47uH		
L105	1-408-970-21	INDUCTOR 10uH		
L106	1-408-978-21	INDUCTOR 47uH		
L107	1-408-974-21	INDUCTOR 22uH		
L108	1-408-970-21	INDUCTOR 10uH		
L110	1-408-968-21	INDUCTOR 6.8uH		
L111	1-408-982-21	INDUCTOR 100uH		
L112	1-408-975-21	INDUCTOR 27uH		
L113	1-408-982-21	INDUCTOR 100uH		
L114	1-408-974-21	INDUCTOR 22uH		
L115	1-408-967-21	INDUCTOR 5.6uH		
L116	1-408-967-21	INDUCTOR 5.6uH		
L117	1-408-973-21	INDUCTOR 18uH		
L118	1-408-982-21	INDUCTOR 100uH		
L121	1-408-970-21	INDUCTOR 10uH		
L122	1-408-976-21	INDUCTOR 33uH		
L123	1-408-987-21	INDUCTOR 330uH		
L124	1-408-989-21	INDUCTOR 470uH		
L125	1-408-985-21	INDUCTOR 180uH		
L126	1-408-977-21	INDUCTOR 39uH		
L127	1-408-963-11	INDUCTOR 2.7uH		
L128	1-408-968-21	INDUCTOR 6.8uH		
L129	1-408-970-21	INDUCTOR 10uH		
L130	1-408-973-21	INDUCTOR 18uH		
L131	1-408-987-21	INDUCTOR 330uH		
L132	1-408-983-21	INDUCTOR 120uH		
L135	1-408-965-21	INDUCTOR 3.9uH		
L136	1-408-973-21	INDUCTOR 18uH		
L138	1-408-973-21	INDUCTOR 18uH		
L139	1-408-973-21	INDUCTOR 18uH		
L141	1-408-973-21	INDUCTOR 18uH		
L144	1-408-975-21	INDUCTOR 27uH		
L401	1-408-978-21	INDUCTOR 47uH		
L406	1-408-970-21	INDUCTOR 10uH		
L490	1-408-970-21	INDUCTOR 10uH		
L491	1-408-963-11	INDUCTOR 2.7uH		
L601	1-408-982-21	INDUCTOR 100uH		
L603	1-408-978-21	INDUCTOR 47uH		
L604	1-408-978-21	INDUCTOR 47uH		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description		Remark
L605	1-410-997-31	INDUCTOR CHIP 2.2uH		
L606	1-408-982-21	INDUCTOR 100uH		
L607	1-408-978-21	INDUCTOR 47uH		
L608	1-424-522-21	COIL, CHOKE 10uH		
L609	1-424-524-21	COIL, CHOKE 47uH		
L610	1-424-524-21	COIL, CHOKE 47uH		
L611	1-408-978-21	INDUCTOR 47uH		
L612	1-408-978-21	INDUCTOR 47uH		
L900	1-408-982-21	INDUCTOR 100uH		
L902	1-408-970-21	INDUCTOR 10uH		
		< IC LINK >		
⚠PS602	1-532-605-00	LINK, IC 0.4A ICP-N10		
		< TRANSISTOR >		
Q106	8-729-901-06	TRANSISTOR	DTA144EK	
Q017	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q018	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q101	8-729-420-12	TRANSISTOR	XN4213	
Q103	8-729-901-06	TRANSISTOR	DTA144EK	
Q104	8-729-202-38	TRANSISTOR	2SC3326N-A	
Q105	8-729-202-38	TRANSISTOR	2SC3326N-A	
Q106	8-729-421-19	TRANSISTOR	UN2213	
Q107	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q108	8-729-202-38	TRANSISTOR	2SC3326N-A	
Q109	8-729-420-10	TRANSISTOR	XN4115	
Q110	8-729-420-10	TRANSISTOR	XN4115	
Q111	8-729-421-19	TRANSISTOR	UN2213	
Q112	8-729-216-22	TRANSISTOR	2SA1162-G	
Q113	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q114	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q115	8-729-216-22	TRANSISTOR	2SA1162-G	
Q116	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q117	8-729-216-22	TRANSISTOR	2SA1162-G	
Q118	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q121	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q122	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q123	8-729-216-22	TRANSISTOR	2SA1162-G	
Q124	8-729-216-22	TRANSISTOR	2SA1162-G	
Q126	8-729-216-22	TRANSISTOR	2SA1162-G	
Q127	8-729-216-22	TRANSISTOR	2SA1162-G	
Q128	8-729-420-12	TRANSISTOR	XN4213	
Q129	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q130	8-729-421-19	TRANSISTOR	UN2213	
Q131	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q132	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q133	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q135	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q136	8-729-422-27	TRANSISTOR	2SD601A-Q	

Ref. No.	Part No.	Description		Remark
Q137	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q138	8-729-402-81	TRANSISTOR	XN4501	
Q139	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q140	8-729-901-06	TRANSISTOR	DTA144EK	
Q141	8-729-901-06	TRANSISTOR	DTA144EK	
Q142	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q143	8-729-402-81	TRANSISTOR	XN4501	
Q144	8-729-901-06	TRANSISTOR	DTA144EK	
Q145	8-729-901-06	TRANSISTOR	DTA144EK	
Q146	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q147	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q148	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q149	8-729-216-22	TRANSISTOR	2SA1162-G	
Q150	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q151	8-729-421-19	TRANSISTOR	UN2213	
Q152	8-729-421-19	TRANSISTOR	UN2213	
Q153	8-729-421-19	TRANSISTOR	UN2213	
Q154	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q155	8-729-420-20	TRANSISTOR	XN4312	
Q156	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q157	8-729-424-32	TRANSISTOR	UN2117	
Q158	8-729-421-19	TRANSISTOR	UN2213	
Q159	8-729-424-70	TRANSISTOR	UN2217	
Q160	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q161	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q162	8-729-216-22	TRANSISTOR	2SA1162-G	
Q163	8-729-216-22	TRANSISTOR	2SA1162-G	
Q164	8-729-216-22	TRANSISTOR	2SA1162-G	
Q166	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q167	8-729-421-19	TRANSISTOR	UN2213	
Q168	8-729-421-19	TRANSISTOR	UN2213	
Q170	8-729-421-19	TRANSISTOR	UN2213	
Q175	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q176	8-729-421-19	TRANSISTOR	UN2213	
Q180	8-729-421-19	TRANSISTOR	UN2213	
Q181	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q182	8-729-420-12	TRANSISTOR	XN4213	
Q185	8-729-216-22	TRANSISTOR	2SA1162-G	
Q186	8-729-216-22	TRANSISTOR	2SA1162-G	
Q187	8-729-421-19	TRANSISTOR	UN2213	
Q189	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q190	8-729-901-06	TRANSISTOR	DTA144EK	
Q191	8-729-421-19	TRANSISTOR	UN2213	
Q192	8-729-421-19	TRANSISTOR	UN2213	
Q401	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q402	8-729-422-27	TRANSISTOR	2SD601A-Q	
Q403	8-729-216-22	TRANSISTOR	2SA1162-G	
Q407	8-729-216-22	TRANSISTOR	2SA1162-G	
Q408	8-729-216-22	TRANSISTOR	2SA1162-G	
Q410	8-729-216-22	TRANSISTOR	2SA1162-G	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description					Remark
Q412	8-729-402-81	TRANSISTOR	XN4501				
Q413	8-729-402-84	TRANSISTOR	XN4601				
Q414	8-729-216-22	TRANSISTOR	2SA1162-G				
Q490	8-729-102-07	TRANSISTOR	2SC2223-F13				
Q491	8-729-422-27	TRANSISTOR	2SD601A-Q				
Q493	8-729-420-12	TRANSISTOR	XN4213				
Q500	8-729-403-02	TRANSISTOR	XN4212				
Q602	8-729-421-19	TRANSISTOR	UN2213				
Q603	8-729-421-19	TRANSISTOR	UN2213				
Q604	8-729-424-08	TRANSISTOR	UN2111				
Q609	8-729-420-12	TRANSISTOR	XN4213				
⚠Q610	8-729-820-86	TRANSISTOR	2SB1121-ST				
⚠Q611	8-729-820-86	TRANSISTOR	2SB1121-ST				
Q614	8-729-901-06	TRANSISTOR	DTA144EK				
Q900	8-729-421-19	TRANSISTOR	UN2213				
Q901	8-729-403-07	TRANSISTOR	XN1213				
Q902	8-729-901-06	TRANSISTOR	DTA144EK				
Q903	8-729-922-87	TRANSISTOR	2SD1757K-RS				
Q904	8-729-402-19	TRANSISTOR	XN6501				
Q905	8-729-402-19	TRANSISTOR	XN6501				
Q906	8-729-922-87	TRANSISTOR	2SD1757K-RS				
Q907	8-729-901-06	TRANSISTOR	DTA144EK				
Q908	8-729-402-19	TRANSISTOR	XN6501				
		< RESISTOR >					
R032	1-216-055-00	METAL CHIP		1.8K	5%	1/10W	
R038	1-216-295-91	CONDUCTOR, CHIP (2012)					
R041	1-216-081-00	METAL CHIP		22K	5%	1/10W	
R042	1-216-077-00	METAL CHIP		15K	5%	1/10W	
R043	1-216-033-00	METAL CHIP		220	5%	1/10W	
R044	1-216-021-00	METAL CHIP		68	5%	1/10W	
R046	1-216-071-00	METAL CHIP		8.2K	5%	1/10W	
R047	1-216-043-91	METAL GLAZE		560	5%	1/10W	
R048	1-216-045-00	METAL CHIP		680	5%	1/10W	
R049	1-216-053-00	METAL CHIP		1.5K	5%	1/10W	
R050	1-216-081-00	METAL CHIP		22K	5%	1/10W	
R051	1-216-081-00	METAL CHIP		22K	5%	1/10W	
R052	1-216-039-00	METAL CHIP		390	5%	1/10W	
R053	1-216-049-91	METAL GLAZE		1K	5%	1/10W	
R054	1-216-053-00	METAL CHIP		1.5K	5%	1/10W	
R071	1-216-053-00	METAL CHIP		1.5K	5%	1/10W	
R072	1-216-041-00	METAL CHIP		470	5%	1/10W	
R089	1-216-295-91	CONDCTOR, CHIP (2012)					
R101	1-216-097-00	METAL CHIP		100K	5%	1/10W	
R102	1-216-097-00	METAL CHIP		100K	5%	1/10W	
R103	1-216-097-00	METAL CHIP		100K	5%	1/10W	
R104	1-216-097-00	METAL CHIP		100K	5%	1/10W	
R105	1-216-081-00	METAL CHIP		22K	5%	1/10W	
R106	1-216-073-00	METAL CHIP		10K	5%	1/10W	
R107	1-216-295-91	CONDCTOR, CHIP (2012)					

Ref. No.	Part No.	Description				Remark
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R109	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W	
R110	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W	
R111	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R112	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R113	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R114	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R115	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R116	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R117	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R118	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R119	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R120	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R121	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R122	1-208-794-11	METAL GLAZE	3.3K	0.50%	1/10W	
R123	1-208-784-11	METAL GLAZE	1.2K	0.50%	1/10W	
R124	1-208-772-11	METAL GLAZE	390	0.50%	1/10W	
R125	1-208-774-11	METAL GLAZE	470	0.50%	1/10W	
R126	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R127	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R128	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R129	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R130	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R131	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R132	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R133	1-216-019-00	METAL CHIP	56	5%	1/10W	
R134	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R135	1-208-812-11	METAL GLAZE	18K	0.50%	1/10W	
R136	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R137	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R138	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	
R139	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	
R140	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	
R141	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	
R142	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R144	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R147	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R148	1-216-045-00	METAL CHIP	680	5%	1/10W	
R149	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R150	1-216-027-00	METAL CHIP	120	5%	1/10W	
R152	1-216-295-91	CONDCTOR, CHIP (2012)				
R153	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R154	1-216-295-91	CONDCTOR, CHIP (2012)				
R157	1-216-295-91	CONDCTOR, CHIP (2012)				
R158	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R159	1-216-027-00	METAL CHIP	120	5%	1/10W	
R161	1-216-295-91	CONDCTOR, CHIP (2012)				
R163	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R165	1-216-085-00	METAL CHIP	33K	5%	1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
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Ref. No.	Part No.	Description				Remark
R166	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R167	1-216-041-00	METAL CHIP	470	5%	1/10W	
R168	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R169	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R170	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R171	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R172	1-216-041-00	METAL CHIP	470	5%	1/10W	
R173	1-216-041-00	METAL CHIP	470	5%	1/10W	
R174	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R175	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R176	1-216-091-00	METAL CHIP	56K	5%	1/10W	
R177	1-216-041-00	METAL CHIP	470	5%	1/10W	
R178	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R179	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R180	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R181	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R182	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R183	1-216-033-00	METAL CHIP	220	5%	1/10W	
R184	1-216-035-00	METAL CHIP	270	5%	1/10W	
R185	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R186	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R187	1-216-035-00	METAL CHIP	270	5%	1/10W	
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R190	1-216-045-00	METAL CHIP	680	5%	1/10W	
R191	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R192	1-216-041-00	METAL CHIP	470	5%	1/10W	
R193	1-216-045-00	METAL CHIP	680	5%	1/10W	
R194	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R195	1-216-045-00	METAL CHIP	680	5%	1/10W	
R196	1-216-047-00	METAL CHIP	820	5%	1/10W	
R197	1-216-021-00	METAL CHIP	68	5%	1/10W	
R198	1-216-035-00	METAL CHIP	270	5%	1/10W	
R200	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R201	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R202	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R203	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R204	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R205	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R206	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R207	1-216-041-00	METAL CHIP	470	5%	1/10W	
R208	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R210	1-216-041-00	METAL CHIP	470	5%	1/10W	
R211	1-216-041-00	METAL CHIP	470	5%	1/10W	
R212	1-216-041-00	METAL CHIP	470	5%	1/10W	
R213	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R214	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R215	1-216-039-00	METAL CHIP	390	5%	1/10W	
R216	1-216-040-00	METAL CHIP	430	5%	1/10W	
R217	1-216-033-00	METAL CHIP	220	5%	1/10W	
R218	1-216-031-00	METAL CHIP	180	5%	1/10W	
R219	1-216-031-00	METAL CHIP	180	5%	1/10W	
R220	1-216-033-00	METAL CHIP	220	5%	1/10W	
R222	1-216-045-00	METAL CHIP	680	5%	1/10W	
R223	1-216-041-00	METAL CHIP	470	5%	1/10W	
R224	1-216-041-00	METAL CHIP	470	5%	1/10W	
R226	1-216-039-00	METAL CHIP	390	5%	1/10W	
R227	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R228	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R229	1-216-037-00	METAL CHIP	330	5%	1/10W	
R230	1-216-047-00	METAL CHIP	820	5%	1/10W	
R231	1-216-047-00	METAL CHIP	820	5%	1/10W	
R233	1-216-047-00	METAL CHIP	820	5%	1/10W	
R234	1-216-047-00	METAL CHIP	820	5%	1/10W	
R235	1-216-041-00	METAL CHIP	470	5%	1/10W	
R236	1-216-295-91	CONDCTOR, CHIP (2012)				
R237	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R238	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R239	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R240	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R241	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R242	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R243	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R244	1-216-295-91	CONDCTOR, CHIP (2012)				
R245	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R246	1-216-047-00	METAL CHIP	820	5%	1/10W	
R247	1-216-027-00	METAL CHIP	120	5%	1/10W	
R248	1-216-037-00	METAL CHIP	330	5%	1/10W	
R249	1-216-047-00	METAL CHIP	820	5%	1/10W	
R250	1-216-041-00	METAL CHIP	470	5%	1/10W	
R251	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R252	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R253	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R254	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R255	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R256	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R257	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R258	1-216-047-00	METAL CHIP	820	5%	1/10W	
R259	1-216-041-00	METAL CHIP	470	5%	1/10W	
R260	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R261	1-216-074-00	METAL CHIP	11K	5%	1/10W	
R262	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R263	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R264	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R265	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R266	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R267	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R268	1-216-029-00	METAL CHIP	150	5%	1/10W	
R269	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R270	1-216-047-00	METAL CHIP	820	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R271	1-216-041-00	METAL CHIP	470	5%	1/10W	
R272	1-216-041-00	METAL CHIP	470	5%	1/10W	
R273	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R274	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R275	1-216-041-00	METAL CHIP	470	5%	1/10W	
R276	1-216-031-00	METAL CHIP	180	5%	1/10W	
R277	1-216-035-00	METAL CHIP	270	5%	1/10W	
R278	1-216-295-91	CONDCTOR, CHIP	(2012)			
R279	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R280	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R281	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R282	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R283	1-216-047-00	METAL CHIP	820	5%	1/10W	
R284	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R285	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R286	1-208-824-11	METAL GLAZE	56K	0.50%	1/10W	
R287	1-208-832-11	METAL GLAZE	120K	0.50%	1/10W	
R288	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R289	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R290	1-216-041-00	METAL CHIP	470	5%	1/10W	
R291	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R292	1-216-041-00	METAL CHIP	470	5%	1/10W	
R293	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R294	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R295	1-216-037-00	METAL CHIP	330	5%	1/10W	
R296	1-216-295-91	CONDCTOR, CHIP	(2012)			
R297	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R302	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R304	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R305	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R309	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R310	1-216-047-00	METAL CHIP	820	5%	1/10W	
R311	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R312	1-216-033-00	METAL CHIP	220	5%	1/10W	
R314	1-216-039-00	METAL CHIP	390	5%	1/10W	
R316	1-216-047-00	METAL CHIP	820	5%	1/10W	
R319	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R320	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R321	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R324	1-216-019-00	METAL CHIP	56	5%	1/10W	
R325	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R326	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R332	1-216-045-00	METAL CHIP	680	5%	1/10W	
R334	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R335	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R336	1-216-031-00	METAL CHIP	180	5%	1/10W	
R337	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R338	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R339	1-216-013-00	METAL CHIP	33	5%	1/10W	
R340	1-216-041-00	METAL CHIP	470	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R341	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R342	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R346	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R347	1-216-295-91	CONDCTOR, CHIP	(2012)			
R350	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R351	1-216-295-91	CONDCTOR, CHIP	(2012)			
R360	1-216-033-00	METAL CHIP	220	5%	1/10W	
R361	1-216-029-00	METAL CHIP	150	5%	1/10W	
R363	1-216-031-00	METAL CHIP	180	5%	1/10W	
R367	1-163-035-00	CERAMIC CHIP	0.047uF			50V
R368	1-216-295-91	CONDCTOR, CHIP	(2012)			
R371	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R376	1-216-295-91	CONDCTOR, CHIP	(2012)			
R390	1-216-295-91	CONDCTOR, CHIP	(2012)			
R392	1-216-295-91	CONDCTOR, CHIP	(2012)			
R394	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R395	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R400	1-216-033-00	METAL CHIP	220	5%	1/10W	
R402	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R403	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R404	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R405	1-216-035-00	METAL CHIP	270	5%	1/10W	
R406	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R407	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R408	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R409	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R410	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R420	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R421	1-216-295-91	CONDCTOR, CHIP	(2012)			
R422	1-216-295-91	CONDCTOR, CHIP	(2012)			
R423	1-216-295-91	CONDCTOR, CHIP	(2012)			
R430	1-163-031-11	CERAMIC CHIP	0.01MF			50V
R431	1-216-041-00	METAL CHIP	470	5%	1/10W	
R432	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R434	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R435	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R437	1-216-041-00	METAL CHIP	470	5%	1/10W	
R438	1-216-033-00	METAL CHIP	220	5%	1/10W	
R439	1-216-033-00	METAL CHIP	220	5%	1/10W	
R440	1-216-041-00	METAL CHIP	470	5%	1/10W	
R441	1-216-041-00	METAL CHIP	470	5%	1/10W	
R442	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R443	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R444	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R445	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R446	1-216-043-91	METAL GLAZE	560	5%	1/10W	
R447	1-208-768-11	METAL GLAZE	240	0.50%	1/10W	
R448	1-216-013-00	METAL CHIP	33	5%	1/10W	
R449	1-208-770-11	METAL GLAZE	330	0.50%	1/10W	
R450	1-216-041-00	METAL CHIP	470	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R452	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R453	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R455	1-216-295-91	CONDCTOR, CHIP	(2012)			
R456	1-216-295-91	CONDCTOR, CHIP	(2012)			
R457	1-216-021-00	METAL CHIP	68	5%	1/10W	
R458	1-216-021-00	METAL CHIP	68	5%	1/10W	
R459	1-216-021-00	METAL CHIP	68	5%	1/10W	
R460	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R461	1-216-021-00	METAL CHIP	68	5%	1/10W	
R465	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R467	1-216-037-00	METAL CHIP	330	5%	1/10W	
R471	1-216-295-91	CONDCTOR, CHIP	(2012)			
R474	1-216-295-91	CONDCTOR, CHIP	(2012)			
R476	1-216-295-91	CONDCTOR, CHIP	(2012)			
R484	1-216-021-00	METAL CHIP	68	5%	1/10W	
R485	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R489	1-216-295-91	CONDCTOR, CHIP	(2012)			
R493	1-216-037-00	METAL CHIP	330	5%	1/10W	
R494	1-216-041-00	METAL CHIP	470	5%	1/10W	
R496	1-216-037-00	METAL CHIP	330	5%	1/10W	
R497	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R498	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R499	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R500	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R501	1-216-041-00	METAL CHIP	470	5%	1/10W	
R502	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R503	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R504	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R505	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R507	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R509	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R511	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R512	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R515	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R516	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R517	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R518	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R519	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R523	1-216-295-91	CONDCTOR, CHIP	(2012)			
R525	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R526	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R527	1-216-295-91	CONDCTOR, CHIP	(2012)			
R528	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R533	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R534	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R536	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R537	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R538	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R539	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R540	1-216-295-91	CONDCTOR, CHIP	(2012)			
R543	1-216-295-91	CONDCTOR, CHIP	(2012)			
R544	1-216-295-91	CONDCTOR, CHIP	(2012)			
R546	1-216-295-91	CONDCTOR, CHIP	(2012)			
R547	1-216-295-91	CONDCTOR, CHIP	(2012)			
R548	1-216-295-91	CONDCTOR, CHIP	(2012)			
R550	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R556	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R566	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R567	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R568	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R570	1-216-295-91	CONDCTOR, CHIP	(2012)			
R571	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R572	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R573	1-216-111-00	METAL CHIP	390K	5%	1/10W	
R574	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R580	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R581	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R583	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R585	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R586	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R589	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R591	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R596	1-216-295-91	CONDCTOR, CHIP	(2012)			
R597	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R598	1-216-295-91	CONDCTOR, CHIP	(2012)			
R600	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R601	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R602	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R603	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R604	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R605	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R606	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R607	1-216-295-91	CONDCTOR, CHIP	(2012)			
R608	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R609	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R610	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R611	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R612	1-216-295-91	CONDCTOR, CHIP	(2012)			
R613	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R614	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R615	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R616	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R617	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R618	1-216-089-00	METAL CHIP	47K	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R620	1-216-045-00	METAL CHIP	680	5%	1/10W	
R621	1-216-295-91	CONDCTOR, CHIP (2012)				
R625	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R626	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R627	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R628	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R629	1-216-295-91	CONDCTOR, CHIP (2012)				
R630	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R631	1-216-295-91	CONDCTOR, CHIP (2012)				
R632	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R633	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R634	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R635	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R636	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R637	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R638	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R639	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R640	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R641	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R642	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R643	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R644	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R645	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R646	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R647	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R648	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R649	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R650	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R651	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R652	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R653	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R654	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R655	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R656	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R657	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R658	1-216-041-00	METAL CHIP	470	5%	1/10W	
R659	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R660	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R661	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R662	1-216-041-00	METAL CHIP	470	5%	1/10W	
R663	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R664	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R665	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R666	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R667	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R668	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R669	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R670	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R671	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R672	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R673	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R674	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R675	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R676	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R677	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R678	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R679	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R680	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R681	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R684	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R685	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R686	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R687	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R688	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R689	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R690	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R691	1-216-001-00	METAL CHIP	10	5%	1/10W	
R692	1-216-001-00	METAL CHIP	10	5%	1/10W	
R693	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R694	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R695	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R696	1-216-295-91	CONDCTOR, CHIP (2012)				
R697	1-216-295-91	CONDCTOR, CHIP (2012)				
R698	1-216-295-91	CONDCTOR, CHIP (2012)				
R699	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R701	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R703	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R704	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R705	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R706	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R708	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R709	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R710	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R711	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R712	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R713	1-216-172-00	METAL CHIP	82	5%	1/8W	
R714	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R715	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R716	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R717	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R718	1-216-037-00	METAL CHIP	330	5%	1/10W	
R719	1-216-037-00	METAL CHIP	330	5%	1/10W	
R720	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R721	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R722	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R723	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R724	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R731	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R732	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R734	1-216-295-91	CONDCTOR, CHIP (2012)				

Ref. No.	Part No.	Description				Remark
R737	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R738	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R739	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R740	1-216-047-00	METAL CHIP	820	5%	1/10W	
R741	1-208-804-11	METAL GLAZE	8.2K	0.50%	1/10W	
R742	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R743	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R744	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R745	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R746	1-216-013-00	METAL CHIP	33	5%	1/10W	
R747	1-216-013-00	METAL CHIP	33	5%	1/10W	
R748	1-216-013-00	METAL CHIP	33	5%	1/10W	
R749	1-216-013-00	METAL CHIP	33	5%	1/10W	
R750	1-216-033-00	METAL CHIP	220	5%	1/10W	
R751	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R752	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R753	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R754	1-216-045-00	METAL CHIP	680	5%	1/10W	
R755	1-216-045-00	METAL CHIP	680	5%	1/10W	
R756	1-216-048-00	METAL CHIP	910	5%	1/10W	
R757	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R758	1-208-832-11	METAL GLAZE	120K	0.50%	1/10W	
R760	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R761	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R763	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R765	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R767	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R769	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R770	1-219-107-91	METAL GLAZE	1.5	5%	1/8W	
R771	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R772	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R773	1-219-107-91	METAL GLAZE	1.5	5%	1/8W	
R774	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R775	1-219-107-91	METAL GLAZE	1.5	5%	1/8W	
R776	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R777	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R778	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R779	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R780	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R781	1-216-078-00	METAL GLAZE	16K	5%	1/10W	
R782	1-208-814-11	METAL GLAZE	22K	0.50%	1/10W	
R783	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R784	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R785	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R786	1-216-295-91	CONDCTOR, CHIP	(2012)			
R787	1-216-019-00	METAL CHIP	56	5%	1/10W	
R788	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R789	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R790	1-216-295-91	CONDCTOR, CHIP	(2012)			
R794	1-217-671-11	METAL CHIP	1	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R795	1-217-671-11	METAL CHIP	1	5%	1/10W	
R796	1-217-671-11	METAL CHIP	1	5%	1/10W	
R797	1-216-033-00	METAL CHIP	220	5%	1/10W	
R798	1-217-671-11	METAL CHIP	1	5%	1/10W	
R799	1-216-033-00	METAL CHIP	220	5%	1/10W	
R900	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R901	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R902	1-216-295-91	CONDCTOR, CHIP	(2012)			
R903	1-216-105-91	METAL GLAZE	220K	5%	1/10W	
R904	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R905	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R906	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R907	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R908	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R909	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R910	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R911	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R912	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R913	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R914	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R916	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R917	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R918	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R919	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R920	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R924	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R925	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R926	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R927	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R928	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R929	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R930	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R931	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R932	1-216-033-00	METAL CHIP	220	5%	1/10W	
R933	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R934	1-216-047-00	METAL CHIP	820	5%	1/10W	
R935	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R936	1-216-047-00	METAL CHIP	820	5%	1/10W	
R937	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R938	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R939	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R940	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R941	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R942	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R943	1-216-033-00	METAL CHIP	220	5%	1/10W	
R944	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R945	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R946	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R948	1-216-295-91	CONDCTOR, CHIP	(2012)			
R949	1-216-049-91	METAL GLAZE	1K	5%	1/10W	

Ref. No.	Part No.	Description				Remark
R950	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R951	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R952	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R955	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R956	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R957	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R958	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R961	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R962	1-216-295-91	CONDCTOR, CHIP (2012)				
R963	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R964	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R965	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R966	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R967	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R968	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R969	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R970	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R971	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R972	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R973	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R980	1-216-295-91	CONDCTOR, CHIP (2012)				
R982	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R983	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R984	1-216-295-91	CONDCTOR, CHIP (2012)				
R989	1-216-295-91	CONDCTOR, CHIP (2012)				
R996	1-216-295-91	CONDCTOR, CHIP (2012)				

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K	
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K	
RV103	1-241-396-11	RES, ADJ, METAL GLAZE 22K	
RV104	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K	
RV105	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K	
RV106	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K	
RV107	1-241-394-11	RES, ADJ, METAL GLAZE 4.7K	
RV108	1-241-391-11	RES, ADJ, METAL GLAZE 470	
RV109	1-241-392-11	RES, ADJ, METAL GLAZE 1K	
RV110	1-241-392-11	RES, ADJ, METAL GLAZE 1K	
RV111	1-241-393-21	RES, ADJ, METAL GLAZE 2.2K	
RV112	1-241-393-21	RES, ADJ, METAL GLAZE 2.2K	
RV113	1-241-392-11	RES, ADJ, METAL GLAZE 1K	
RV114	1-241-392-11	RES, ADJ, METAL GLAZE 1K	
RV401	1-241-391-11	RES, ADJ, METAL GLAZE 470	
RV500	1-241-395-11	RES, ADJ, METAL GLAZE 10K	
RV501	1-241-395-11	RES, ADJ, METAL GLAZE 10K	
RV601	1-241-396-11	RES, ADJ, METAL GLAZE 22K	
RV901	1-241-395-11	RES, ADJ, METAL GLAZE 10K	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X101	1-577-117-11	VIBRATOR, CRYSTAL (4.43MHz)	
X500	1-579-175-11	VIBRATOR, CERAMIC (10MHz)	
X601	1-579-368-31	VIBRATOR, CRYSTAL (12MHz)	
X602	1-577-116-21	OSCILLATOR, CRYSTAL (16MHz)	

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MISCELLANEOUS
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Ref. No.	Part No.	Description	Remark
⚠2	1-769-767-11	CORD, POWER	
⚠3	1-468-021-11	POWER BLOCK	
5	1-769-100-11	CABLE, FLAT (FMV-2)	
6	1-769-099-11	CABLE, FLAT (FRV-2)	
8	1-769-103-11	CABLE, FLAT (FRV-3)	
12	1-769-102-11	CABLE, FLAT (FFV-5)	
16	1-691-471-11	CONNECTOR, TRANSLATION 11P	
17	1-649-565-11	FP-696 FLEXIBLE BOARD	
23	1-649-836-11	FP-695 FLEXIBLE BOARD	
24	1-691-254-13	CONNECTOR, TRANSLATION 10P	
25	1-764-137-11	CONNECTOR, TRANSLATION 15P	
752	A-7049-660-A	DRUM ASSY, UPPER, ROTARY (DGR-0B8-R)	
CN002	1-750-620-11	CONNECTOR (MM8 MD)	
M901	A-7048-787-A	DRUM ASSY (DGU-0B8A-R)	
M902	8-835-499-01	MOTOR, DC SCE-0501A (CAPSTAN)	
M903	X-3942-946-1	MOTOR ASSY, CAM (LOADING)	
S901	1-692-498-11	SWITCH, ROTARY	

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ACCESSORIES & PACKING MATERIALS
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Ref. No.	Part No.	Description	Remark
	1-473-181-11	REMOTE COMMANDER (RMT-V176)	
	1-573-291-11	CONNECTOR, CONVERSION	
	1-575-334-11	CORD, CONNECTION (A/V connecting cable (STEREO), 1.5m)	
	1-751-498-21	CORD, CONNECTION (S VIDEO connecting cable, 1.5m)	
	3-798-424-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH, DUTCH, SWEDISH, ITALIAN, PORTUGUESE, DANISH)	
*	3-965-123-01	CUSHION (R)	
*	3-965-122-01	CUSHION (F)	
*	3-963-028-01	INDIVIDUAL CARTON	

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****
HARDWARE LIST
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Ref. No.	Part No.	Description	Remark
#1	7-685-871-01	SCREW +BVTT 3X6 (S)	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2	
#3	7-685-133-19	SCREW +P 2.6X6 TYPE2 NON-SLIT	
#4	7-682-645-01	SCREW +PS 3X4	
#5	7-621-255-15	SCREW +B 2X3	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
#6	7-628-253-15	SCREW +PS 2X5	
#7	7-688-001-01	W 2, MIDDLE	
#8	7-688-003-01	W 3, SMALL	

SECTION 7
INTERFACES, IC PIN FUNCTIONS

7-1. SYSTEM CONTROL – VIDEO • AUDIO BLOCK INTERFACE (VS-121 BOARD)

NAME	I/O	No.	VTR MODE								
			STOP	FF	REW	×2	PB	PICTURE SEARCH		PB·PAUSE	REC
								CUE	REVIEW		
SP/LP	O	IC602 8	*1	H	H	*1	*2	*2	*2	*1	*H
V PB MODE	O	IC002 98	L	L	L	H	H	H	H	H	L
JOG VD	O	IC602 2	L	L	L	*3	L	*3	*3	*3	L
RP PB MODE	O	IC602 5	L	L	L	L	L	L	L	L	H
FE ON	O	IC602 6	H	H	H	H	H	H	H	H	L
RF SWP	O	IC602 99	L	*4	*4	*4	*4	*4	*4	*4	*4
JOG	O	IC602 4	L	L	L	H	L	H	H	H	L
V SYNC	I	IC602 66	*5	*5	*5	*5	*5	*5	*5	*5	*5
AUDIO PB	O	IC602 84	L	L	L	H	H	H	H	H	L
AUDIO MUTE	O	IC602 72	L	L	L	H	L	H	H	H	L
VIDEO CS	O	IC602 25	V-cycle "Low" pulse								
C SO2	O	IC602 80	V-cycle pulse rank								
C SCK2	O	IC602 81	V-cycle "Low" pulse rank								

*1. This outputs the result of determining what was the previous mode. "High" output in SP mode, "Low" output in LP mode.
*2. This outputs the result of determinig which recode mode the playback tape has. It becomes "High" when SP mode is entered and "Low" when LP mode is entered.
*3. Pseudo VD signal.
*4. Pulse of 25Hz, 50% duty (synchronized with the rotation of the drum).
*5. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (This signal has positive polarity).

7-2. MECHANICAL CONTROL – SERVO BLOCK INTERFACE (VS-121 BOARD)

NAME	I/O	No.	VTR MODE								
			STOP	FF	REW	×2	PB	PICTURE SEARCH		PB·PAUSE	REC
								CUE	REVIEW		
T.REEL FG	I	IC602 67	—	*1	*1	*1	*1	*1	*1	—	*1
S.REEL FG	I	IC602 64	—	*1	*1	*1	*1	*1	*1	—	*1
ATF ERROR	I	IC602 61	—	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC602 68	—	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC602 69	—	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ HMS CAP FG	I	IC602 70, 71	—	*5	*5	*5	*5	*5	*5	—	*5
CAP ON	O	IC602 91	L	H	H	H	H	H	H	L	H
REF PILOT	O	IC602 89	*7	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC602 5	L	L	L	L	L	L	L	L	H
DRUM RVS *9	O	IC602 74	L	L	L	L	L	L	L	L	L
CAP FWD/ RVS	O	IC602 92	L	H	L	H	H	H	L	L	H
DRUM PWM	O	IC602 76	*8	*8	*8	*8	*8	*8	*8	*8	*8
CAP PWM	O	IC602 75	L	*8	*8	*8	*8	*8	*8	L	*8

*1. Pulses are input by the rotation of the reel. (0.7 to 2sec period during REC/PB mode)
*2. ATF error voltage input.
*3. One PG pulse is input by one rotation of the drum. Approximately 25Hz.
*4. 12 FG pulses are input by one rotation of the drum. Approximately 300Hz.
*5. FG pulses are input by one rotation of the capstan. Approximately 1000Hz during REC/PB (SP)mode.
*6. Four frequencies are output as synchronized with the rotation of the drum. f1=101.02kHz, f2=117.19kHz, f3=162.76kHz, f4=146.45kHz
*7. f2 (117.19kHz) or f3 (162.76kHz) is output.
*8. PWM signal with a period of 16 μsec.
*9. Normally "Low". Temporarily "High" when a full top cassette is loaded (drum reverse rotation).

7-3. MECHANICAL CONTROL MICROCOMPUTER CXP87140-041Q (VS-121 BOARD IC602) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	VIRSK	–	Not used.
2	JOG VD	O	Pseudo VD signal to be inserted into playback video signal when speed change playback is performed.
3	N. C.	-	Not used.
4	JOG	O	Speed change playback/normal playback select signal for the video circuit. "High" to select speed change playback.
5	$\overline{\text{RP PB MODE}}$	O	REC/PB select signal for REC/PB amplifier and ATF servo IC. "Low" to select PB mode.
6	$\overline{\text{FE ON}}$	O	Flying erase oscillation ON/OFF control signal. "Low" to activate the oscillation.
7	INT VD	O	Timing reference for serial data communication. V-cycle "Low" pulse.
8	SP/$\overline{\text{LP}}$	O	SP/LP select signal. "Low" to select LP.
9	N. C.	-	Not used.
10	Hi8/$\overline{\text{NORMAL}}$	O	Hi8/$\overline{\text{NORMAL}}$ select signal (On play, Auto). "High" for Hi8.
11	MACRO DET	I	Connected to GND.
12	$\overline{\text{EDIT}}$	I	Not used.
13	CC DOWN	I	Cassette compartment lock switch input. "Low" for lock.
14	REC PROOF SW	I	REC PROOF switch input. "High" for protected REC.
15	ME/$\overline{\text{MP}}$ SW	I	ME/MP switch input. "Low" for MP, "High" for ME.
16	MPHG/$\overline{\text{MP}}$ SW	I	MPHG/MP switch input. "Low" for MP, "High" for MPHG.
17	8/9 SW	I	Not used.
18	10/13 SW	I	Not used.
19	MSW 3	I	Mechanical deck MATRIX input SW 3.
20	MSW 2	I	Mechanical deck MATRIX input SW 2.
21	MSW 1	I	Mechanical deck MATRIX input SW 1.
22	MSW 0	I	Mechanical deck MATRIX input SW 0.
23, 24		O	Not used.
25	$\overline{\text{VIDEO CS}}$	O	Serial data communication chip select signal to the video IC. V-cycle "Low" pulse.
26–30		O	Not used.
31	TLQ 1	O	Not used.
32	TLQ 2	O	Not used.
33	PCM PB	O	Not used.
34	VOICE BOOST	I	Not used.
35	INSEL 2	O	Fixed at "Low".
36	INSEL 1	O	
37	AF REC	O	Not used.
38	TOP/END LED	O	ON/OFF signal for TAPE TOP/END LED.
39	MP	I	Connected to GND.
40	$\overline{\text{COSMO RESET}}$	I	Reset signal. "Low" to reset.
41	VSS	I	GND
42	X'TAL	I	} 16MHz clock oscillation circuit.
43	X'TAL	I	
44	$\overline{\text{COSMO CS}}$	I	Clip select signal from the mode control microcomputer. V-cycle "Low" pulse.
45	SI BUS	I	Serial data input.

Pin No.	Signal	I/O	Function
46	SO BUS	O	Serial data output.
47	$\overline{\text{SCK}}$	O	Serial clock output.
48	ME/$\overline{\text{MP}}$	O	ME/MP select signal output. "Low" when MP Tape is used.
49	MPHG/$\overline{\text{MP}}$	O	Not used.
50	Hi8 DET	I	Video Hi8 discrimination signal input.
51	APM MODE DET	I	Audio multiplex discrimination input.
52	A VSS	-	GND
53	AVREF	I	Analog board reference voltage. Conneted to +5V.
54	AVDD	I	Analog board power (+5V).
55	$\overline{\text{S SW 1}}$	I	S terminal switch detection input. "Low" for S termian input.
56	N. C.	-	Not used.
57	SP/$\overline{\text{LP}}$ DET	I	SP/LP discrimination input when CUE, REVIEW, FF and REW. "Low" for LP.
58	CORREH	I	Fixed at "High".
59	TOP SENS	I	Tape top sensing signal. This is normally "Low" and switches to "High" pulse input at tape top.
60	END SENS	I	Tape end sensing signal. This is normally "Low" and switches to "High" pulse input at tape end.
61	ATP ERROR	I	ATP error, ATF lock error input.
62	TH	O	Not used.
63	ORC	O	Not used.
64	S REEL FG	I	S reel FG signal input.
65	CLOG DET	I	This determines whether playback RF is present or not. "Low" under normal condition.
66	V SYNC	I	Composite sync signal separated form record/playback Y signal.
67	T REEL FG	I	T reel FG signal input.
68	DRUM PG	I	Durm PG signal input. Used for the drum phase servo. 40msec periodic "High" pulse.
69	DRUM FG	I	Drum FG signal input. Used for the drum speed servo. 3.3msec periodic pulse.
70	CAPSTAN FG	I	Capstan FG signal input. For the capstan speed servo.
71	V MUTE	O	Video mute signal.
72	APM MUTE	O	Audio mute signal.
73	$\overline{\text{FE WE}}$	O	Not used.
74	DRUM RVS	O	Drum rotational direction control signal. Normally "Low".
75	CAP PWM	O	Capstan error signal output. 16 μsec PWM signal.
76	DRUM PWM	O	Drum error signal output. 16 μsec PMM signal.
77	HMS CAP FG	I	Capstan FG signal input. Used tape counter.
78	CLOCK OUT	O	Clock output for ATF.
79	C SI 2	I	Not used.
80	C SO 2	O	Serial data for the video IC.
81	C SCK 2	O	Serial comunication timing reference signal for the video IC.
82	AFM OUTSEL	O	AFM output select signal. (Note 1)
83	AFM MODE	O	"High" for STOP/REC, "M" (Hi8) for PB.
84	AUDIO PB	O	REC/PB select signal for the audio circuit. "High" for PB mode.

Pin No.	Signal	I/O	Function
85	REF PILOT	O	Reference pilot signal for the ATF servo. Four frequencies are selectively switched from one to another as synchronized with the rotation of the drum. $f_1 = 101.02kHz$, $f_2 = 117.19kHz$, $f_3 = 162.76kHz$, $f_4 = 146.45kHz$.
86	X'TAL	I	11.718kHz clock oscillation circuit.
87	X'TAL	I	11.718kHz clock oscillation circuit.
88	VSS	-	GND
89	VDD	I	+5V power.
90	VDD	I	+5V power.
91	CAP ON	O	Capstan driver ON/OFF control signal. "High" to turn capstan ON.
92	CAP FWD/$\overline{\text{RVS}}$	O	Capstan rotation direction control signal. "High" for FWD. "Low" for RVS.
93	$\overline{\text{DRUM ACCEL}}$	O	Drum acceleration pulse.
94	DRUM BRAKE	O	Drum deceleration pulse.
95	CAM LOAD	O	Cam motor control signal. "High" for loading.
96	CAM UNLOAD	O	Cam motor control signal. "High" for unloading.
97	MEMO ON	O	Not used.
98	VA PB MODE	O	REC/PB select signal for the video circuit. "High" for PB mode.
99	RF SWP	O	RF switching pulse signal. 25Hz. 50% duty pulse.
100	FE RA	O	Not used.

Note 1: AFM OUT SEL

AFM mode	Audio monitor	Poret output
Stereo	Stereo	L
	L ch	H
	R ch	M (Hi-Z)
Bilingual	Main	H
	Sub	M (Hi-Z)
	Main/Sub	L
Monaural	-	H

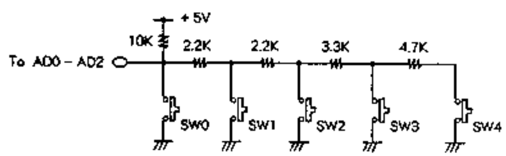
7-4. MODE CONTROL MICRO COMPUTER MB89091PFV-G-104 (VS-121 BOARD IC500) PORT FUNCTION DESCRIPTION

Pin No.	Signal	I/O	Function
1	TEST MODE 1	I	Connected to GND.
2	TEST MODE 2	I	Connected to GND.
3	X0		System clock (10MHz).
4	X1		System clock (10MHz).
5	VSS	I	Connected to GND.
6	$\overline{\text{RESET}}$	I	Reset input.
7	PAL/$\overline{\text{NT}}$	I	PAL/NTSC select. "High" for PAL.
8	J/$\overline{\text{UC}}$	I	J/UC select. "High" for PAL.
9	PB. REC/$\overline{\text{PB}}$	I	PB. REC/PB selected "High" for REC/PB.
10	Hi8/$\overline{\text{Normal}}$	I	Hi8/Normal 8 selected "High" for Hi8.
11-14	———	I	Not used. Fixed at "Low".
15	———	I	Not used. Fixed at "Low".
16	INT V	I	V synchronization signal input.
17	LANC POWER CONT	O	No connected.
18	$\overline{\text{LANC POWER ON}}$	I	Not used. Fixed at "High".
19-22	N.C.	I	Connected to GND.
23	C-IN LED	O	CASSETTE-IN LED lighting up on "Low".
24	REW LED	O	REW LED lighting up on "Low".
25	FF LED	O	FF LED lighting up on "Low".
26	———	I	Connected to VCC.
27	———	I	Not used. Fixed at "Low".
28	SP DATA	O	No connected.
29	SP CLK	O	No connected.
30	$\overline{\text{SIRCS IN}}$	I	SIRCS input.
31	SP STR	O	No connected.
32	SP OE	O	No connected.
33	PB LED	O	PB LED lighting up on "High".
34	REC LED	O	REC LED lighting up on "High".
35	Hi-8 LED	O	Hi-8 LED lighting up on "High".
36	PAUSE LED	O	PAUSE LED lighting up on "High".
37	FAST-REW LED	O	Not used.
38	SYNCHRO LED	O	Not used.
39-46	———	I	Not used. Fixed at "Low".
47	VCC	I	+5V power.
48-55	S0-S7	O	Not used.
56	VSS	-	GND
57-64	S8-S15	O	Not used.
65-68	V3-V0	I	Not used.
69-71	C0-C2	O	Not used.
72	———	-	No connected.
73	———	-	No connected.
74	$\overline{\text{COSMO CS}}$	O	Chip select signal to the MECHA-COM (VS-121 board IC602).
75	TT SI	I	Serial date input.
76	TT SO	O	Serial date output.

Pin No.	Signal	I/O	Function
77	TT SCK	O	Serial date send clock.
78	COSMO RST	O	Reset signal to the MECHA-COM (VS-121 board IC602).
79	———	–	No connected.
80	———	–	No connected.
81	AVSS	–	Analog GND.
82	AD0	I	KEY input 0.
83	AD1	I	KEY input 1.
84	AD2	I	KEY input 2.
85	AD3	I	KEY input 3.
86	AD4	I	Not used.
87	LANC S/M (AD5)	I	LANC M/S select input. Fixed at "Low".
88	AD6	I	Remote commander mode input. Fixed at "High".
89	RF SW POSI 1	I	RF SWP position adjustment VR1 input.
90	AVCC	–	Analog power.
91	RF SW POSI 2	I	RF SWP position adjustment VR2 input.
92	×2 ON	O	No connected.
93	TV/VTR	O	No connected.
94	POWER ON	O	Power control signal. "H" when power is on.
95	LANC IN	I	LANC DATA input.
96	LANC OUT	O	LANC DATA output.
97	N.C.	–	No connected.
98	VCC	–	+5V power.
99	———	–	No connected.
100	———	–	No connected.

● A/D PORT ALLOCATION

• The A/D ports are allocated as shown below.



AD \ SW	Pin No.	SW0 0.01 [V]	SW1 0.9 [V]	SW2 1.5 [V]	SW3 2.2 [V]	SW4 2.8 [V]	NO INPUT 5.0 [V]
AD0	82	POWER	EJECT	STOP	PLAY	—	—
AD1	83	FF	REC	—	—	—	—
AD2	84	REW	PAUSE	—	HI-SPEED REW	—	—

• KEY input signals pass through the A/D ports as shown above.

SECTION 8
ADJUSTMENTS

8-1. MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

For the procedures how to adjust and check the mechanism, as well as how to replace mechanical parts, refer to the separate "8 mm Video Mechanical Adjustment Manual V $\boxed{\text{F Mechanism}}$" (9-973-445-11).
However, for the procedures how to set the Track Shift mode, refer to the following text.

1-1. TAPE PATH ADJUSTMENT

[TRACK SHIFT]
The 8 mm Video Tape Recorder system uses the AFT (Automatic Track Finding) function in which four different pilot signals are used for controlling the tape speed instantaneously to provide high precision tracking. This eliminates the Tracking Adjustment control, thus allowing accurate tracing.
In spite of its advantageous feature, the AFT system may have a difficulty in adjusting the tape pass system. The ATF will automatically corrects tracing even if the head has only a little tracing distortion. This may make it impossible to perform a complete adjustment.
Therefore, when performing a fine adjustment for tracking, the Track Shift mode should be entered before starting this adjustment. This mode will force to operate the ATF to shift the amount of tracking by a given quantity (approximately 1/4), so that tracking can be easily fine adjusted. Furthermore, no track shift jig is needed.

1-1-1. Setting the Track Shift Mode

1) Place the adjustment remote control RM-95 (J-6082-053-B) in the HOLD ON position.
2) Operate the EDIT +/– button to select adjustment page 4.
3) Operate the FF/REW button to select adjustment address 00.
4) Operate the PB/STOP button to set to adjustment data 02.
5) Operate the FF/REW button to select adjustment address 01.
6) Operate the PB/STOP button to set to adjustment data 01. (This will go to the Test Mode 1 (Pass Adjustment).)

Note 1: For details of the Test Mode, refer to "SECTION 8. SERVICE MODE."
Note 2: After adjustment, operate the PB/STOP button to reset to adjustment data 00. Place the remote control in the HOLD OFF position to return to the normal mode.

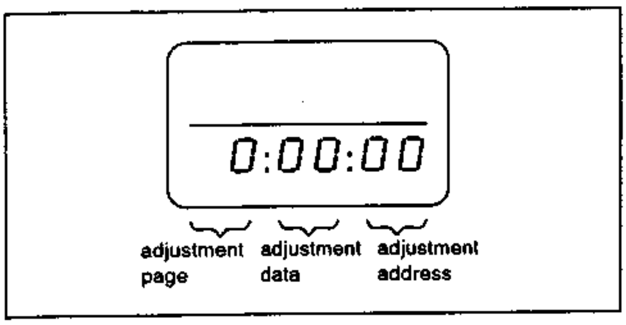


Fig. 8-1-1.

1-1-2. Preparation before Adjustment

1) Clean the surfaces over which tape moves past (of the tape guides, drum, capstan shaft and pinch rollers).
2) Oscilloscope Connection and Waveform Output:
   1 ch: Drum head's RF signal output, RP-190 board CN802 pin ③ (PB Y)
   External trigger input: RP-190 board CN802 pin ② (RF SWP)
   GND: RP-190 board CN802 pin ① (GND)
3) Play back alignment tape for tracking (WR5-1CP).
4) Check the RF waveform observed on the oscilloscope is flat on both entrance and exit sides.
   If not flat, perform necessary adjustment according to the separate "8 mm Video Mechanical Adjustment Manual V (F Mechanism)".

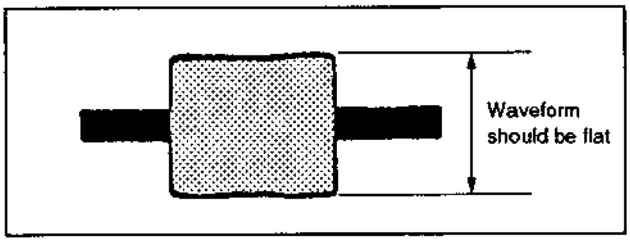


Fig. 8-1-2.

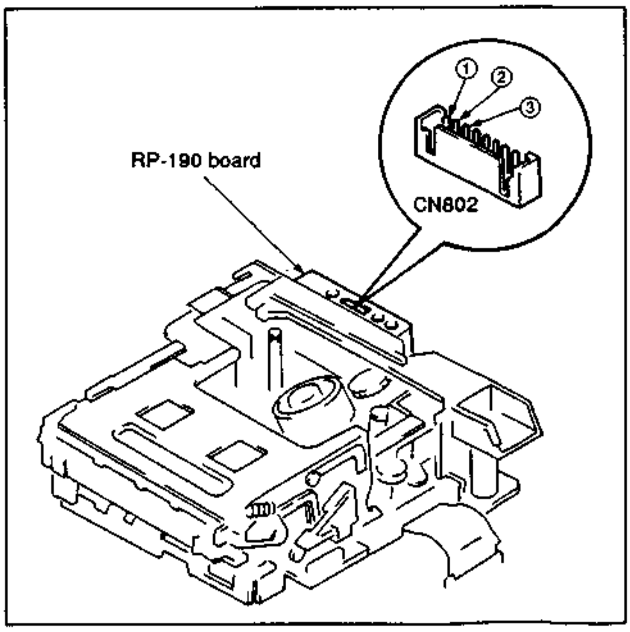


Fig. 8-1-3.

8-2. ELECTRICAL ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 8–24.

2-1. PREPARATIONS BEFORE ADJUSTMENTS

2-1-1. Equipment Used

Use the following measuring instruments for the adjustments of this unit.

1) TV Monitor
2) Oscilloscope 2 phenomena, band 30 MHz or wider, with delay mode (Use 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator
   (With a video output terminal. Refer to "2-1-2. Connecting the Equipment".)
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Alignment tape
    - For adjusting tracking (WR5-1CP)
      Part No.: 8-967-995-07
    - For adjusting video frequency characteristics (WR5-7CE)
      Part No.: 8-967-995-18
    - For checking standard 8 mm mode operations
      For SP (WR5-5CSP)
      Part No.: 8-967-995-47
      Or (WR5-4CSP)
      Part No.: 8-967-995-46
      For LP (WR5-4CL)
      Part No.: 8-967-995-56
    - For checking Hi8 mode operations (ME tape)
      For SP (WR5-8CSE)
      Part No.: 8-967-995-48
      For LP (WR5-8CLE)
      Part No.: 8-967-995-57
    - For checking AFM stereo operations (WR5-9CS)
      Part No.: 8-967-995-28
11) Adjusting remote commander (J-6082-053-B)

2-1-2. Connecting the Equipments

Connect the measuring instruments as shown in Fig. 8-2-1 according to the input terminal specifications (S VIDEO or VIDEO), and perform the adjustments.

The input terminal is specified in the ( ) in the signal column. Either input terminal can be used when there are no specifications. However, the S video input terminal will have the priority. When adjusting with the video input terminal input, disconnect the connector from the S video input terminal.

Note 1: If the VIDEO input is used for adjustments which specify for the S VIDEO input to be used, the product specifications of the unit may not be satisfied in some cases. Be sure to perform according to the specifications.

Note 2: When adjustments are performed with the S video output terminal VTR as the signal source, the efficiencies of the unit may be affected by the VTR. It is recommended that a pattern generator with a Y/C separation output terminal be used as much as possible.

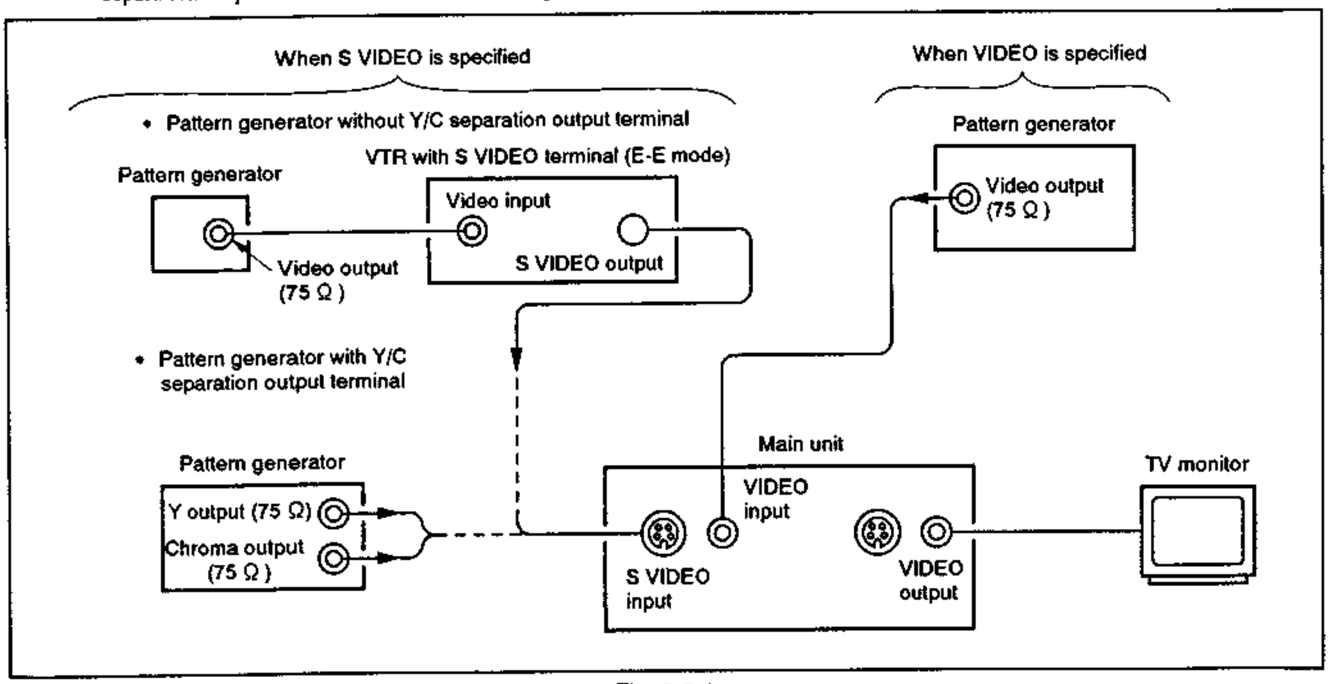


Fig. 8-2-1.

2-1-3. Checking the Input Signals

As the video signal obtained from the pattern generator is used as the adjusting signal for adjusting this unit, this video output signal must be within the given specifications.

1. For S VIDEO Input

Connect the oscilloscope to the Y signal terminal of the S video IN terminal, and check that the sync signal of the Y signal is approximately 0.3 Vp-p and that the amplitude of the video section is approximately 0.7 Vp-p. (When the VTR with a S video output terminal is used, check that the chroma signal and burst signal have not remained as well.) Connect the oscilloscope to the chroma signal terminal of the S VIDEO IN terminal, and check that the burst signal amplitude of the chroma signal is approximately 0.3 Vp-p and flat, and that the amplitude ratio of the burst signal to the chroma signal is 0.30: 0.66. The Y and chroma signals used in the adjustment are shown in Fig. 8-2-2.

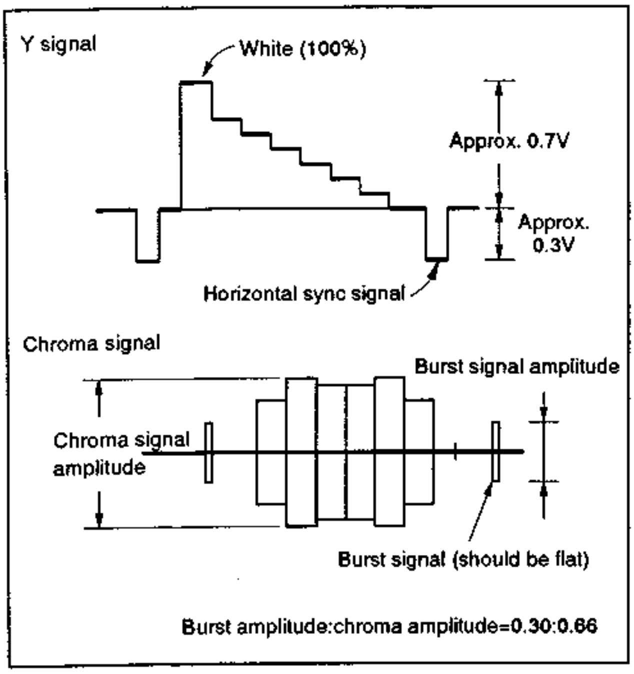


Fig. 8-2-2. Color Bar Signal of the Pattern Generator

2. For VIDEO Input

Connect the oscilloscope to the video input terminal, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66.

The video signal (color bar) used for electric adjustments of the VTR section is shown in Fig. 8-2-3.

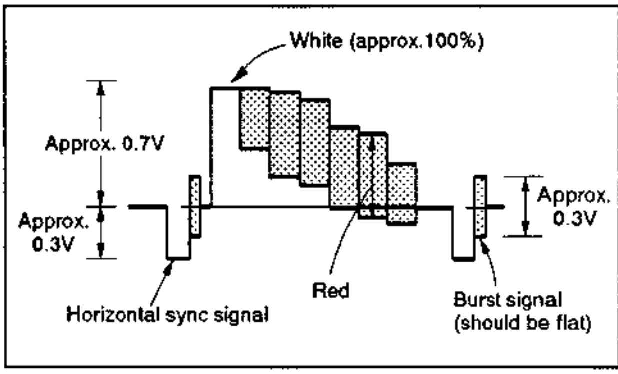


Fig. 8-2-3. Color Bar Signal of the Pattern Generator

2-1-4. Alignment Tape

The following table lists alignment tapes which are available.
Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

<table>
<tr><th rowspan="2">Name</th><th rowspan="2">Record-ing mode</th><th rowspan="2">Tape type</th><th rowspan="2">Tape speed</th><th colspan="2">Recording contents</th><th rowspan="2">Usage</th></tr>
<tr><th>Video area</th><th>PCM area</th></tr>
<tr><td>Tracking
WR5-1CP</td><td>Standard 8 mm</td><td>MP</td><td>SP</td><td colspan="2">CH2: Signal for 1 MHz tape path adjustment
Marker for switching position adjustment</td><td>Tape path adjustment
Switching position adjustment</td></tr>
<tr><td>Video frequency characteristics
WR5-7CE</td><td>Hi8</td><td>ME</td><td>LP</td><td>RF sweep 0 to 15 MHz
Marker
2, 4.5, 7, 8.5, 10 MHz</td><td></td><td>Frequency characteristics adjustment</td></tr>
<tr><td>Operation check (SP mode)
WR5-4CSP
or WR5-5CSP</td><td>Standard 8 mm</td><td>MP</td><td>SP</td><td rowspan="2">• Video signal
Color bar 4 minutes
Monoscope 4 minutes
• Audio signal (AFM)
400 Hz 60% modulation</td><td>• Audio signal (PCM)
Monoscope section
20 Hz 20 sec.
400 Hz 20 sec.
14 kHz 20 sec.
Repeated 4 times
Color bar section
1 kHz 4 minutes</td><td rowspan="4">Checking operations</td></tr>
<tr><td>Operation check
WR5-8CSE</td><td>Hi8</td><td>ME</td><td>SP</td><td>• Audio signal (PCM)
400 Hz</td></tr>
<tr><td>Operation check
WR5-4CL</td><td>Standard 8 mm</td><td>MP</td><td>LP</td><td rowspan="2">• Video signal
Color bar 4 minutes
Monoscope 4 minutes
• Audio signal (AFM)
400 Hz 60% modulation</td><td></td></tr>
<tr><td>Operation check
WR5-8CLE</td><td>Hi8</td><td>ME</td><td>LP</td><td>• Audio signal (PCM)
400 Hz</td></tr>
<tr><td>AFM stereo
Operation check
WR5-9CS</td><td>Standard 8 mm</td><td>MP</td><td>SP</td><td>• Video signal
Color bar 4 minutes
Monoscope 4 minutes
• Audio signal (AFM)
Stereo section (color bar)
Lch: 400 Hz, Rch: 1 kHz
(L+R:
1.5 MHz ± 60 kHz DEV
L-R:
1.7 MHz ± 30 kHz DEV)
Bilingual section
(Monoscope)
MAIN: 400 Hz
(1.5 MHz ± 60 kHz DEV)
SUB: 1 kHz
(1.7 MHz ± 30 kHz DEV)</td><td>• Audio signal (PCM)
400 Hz 8 minutes</td><td>AFM stereo
Checking operations</td></tr>
</table>

Tape type
MP············· Particle type metal tape
ME············· Evaporated type metal tape

Table 8-2-1.

Fig. 8-2-4. shows the 75% color bar signals recorded on the alignment tape.

Note: Measured at VIDEO OUT terminal (75Ω termination).

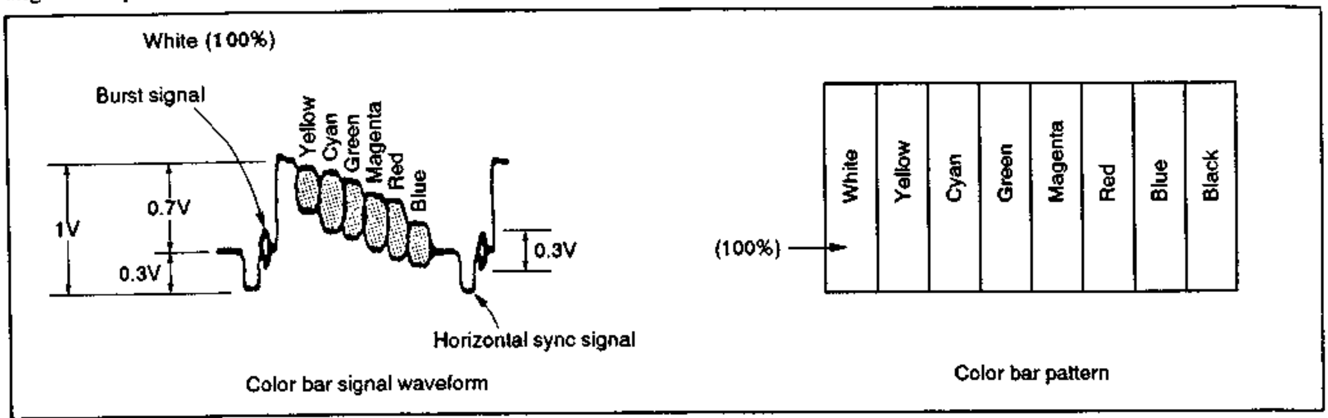


Fig. 8-2-4. Alignment tape color bar signal

2-1-5. Input/Output Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75Ω unbalance, sync negative
Video output	Pin jack Output signal: 1 Vp-p, 75Ω unbalance, sync negative
S Video input	4-pin mini DIN Luminance signal: 1 Vp-p, 75Ω unbalance, sync negative Color signal: 0.3 Vp-p, 75Ω unbalance
S Video output	4-pin mini DIN Luminance signal: 1 Vp-p, 75Ω unbalance, sync negative Color signal: 0.3 Vp-p, 75Ω unbalance
Audio input	Pin jack Input level: –7.5 dBs (0dBs=0.775 Vrms) Input unbalance: Above 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output unbalance: Below 10 kΩ

2-2. SERVICE MODE

☆ This unit uses the EVR (Electronic Variable Resistor) for performing adjustments and test. These functions are implemented by the SENSER LANC system.

1. Senser Lanc

SENSER LANC is the LANC format designed to perform EVR (electronic variable resistor) adjustments and various tests for this 8 mm VTR by using the LANC (Control L). The SENSER LANC is synonymous with the old SERVICE LANC. But there have been enhancements and the SENSER LANC is now used as a unified word.

2. How to use the RM-95 Jig (Adjustment Remote Control)

The RM-95 jig is used to operate the SENSER LANC. This jig will create the SENSER LANC Mode. Because of this, the HOLD switch has been modified for service purpose.
Note that the old models of the RM-95 have no page display function and it is needed to replace their microcomputers within these old models.

Old	UPD7503G-A71-12 UPD7503G-C23-12	8-759-142-56 8-759-146-77	No Page display (The microcomputer must be replaced.)
New	UPD7503G-C56-12	8-759-148-35	Page display

LCD Display of RM-95

0:00:00

Page Data Address

Example

1:37:3d

This means that the data on page 1, address 3D is 37.

3. How to Change the Service Mode with RM-95

Step	Mode	LCD Display (Hexadecimal form)
START	Normal Mode	
"HOLD" ON	Change to Service Mode	P : DD : AA (F : 00 : 00)
"EDIT +/–" PUSH	Page Change → Refer to the Memory Map	P : 00 : 00
"FF/REW" PUSH	Address Change → Refer to the Memory Map	P : DD : AA
"PLAY/STOP" PUSH	DATA Change	
"PAUSE" PUSH	DATA STOP ← Write to EE PROM.	
"HOLD" OFF		

Display Data
The data at the selected address will be displayed. The page entered first from Normal mode is 0.

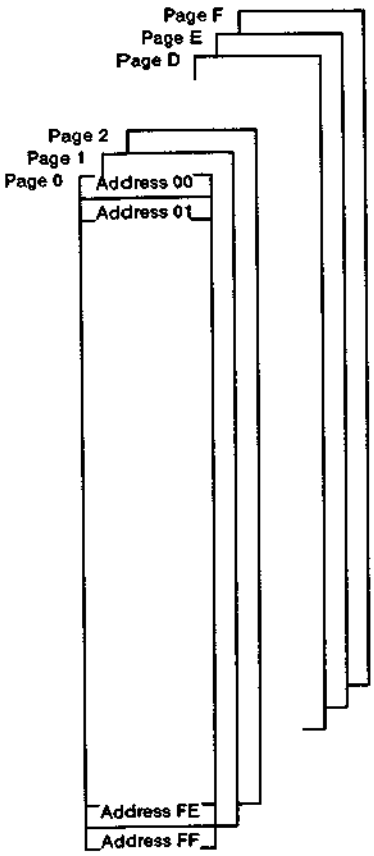
If a selected page is not incorporated, the preset data value will be indefinite. When a change is made within an incorporated page, the address will remain intact.

<When ADJ Data Has Been Changed>
The EVR value (RAM) will be renewed by changed data. (This data will not be written to EE PROM.)

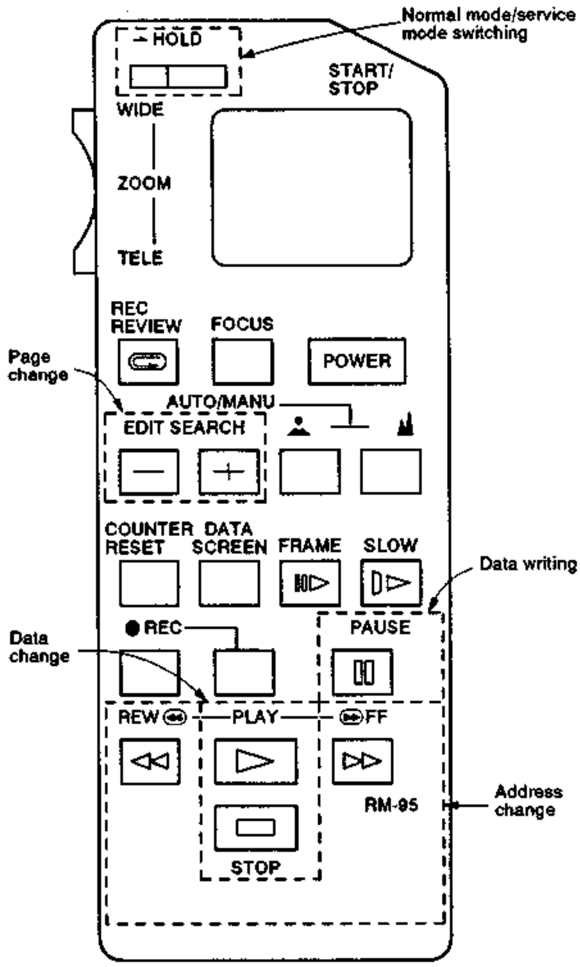
When writing changed data to EEPROM, WRITE PROTECT must be released before it cannot be written.

Command	Action	RM-95 Control Button Pushed
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Writes data to EEPROM, RAM	Pause

SENSER LANC Memory Map



Adjusting remote commander RM-95 (J-6082-053-B)



This unit has page 0 to F allocated as listed below.

PAGE	Page Allocation
0	Service
1	
2	System Controler
3	System Controler
4	System Controler
5	
6	
7	Timer/Tuner Controler
8	
9	
A	
B	
C	
D	
E	
F	

Note 1: This set has no EE-PROM built-in and so it has no "D page".

5. Test Mode Setting

Variety of test modes are established and changed as listed below.

Page 4	Address 02

Data	Function
00	Normal
01	Test mode 1 SP/LP Automatic Discrimination Inhibit
02	Test mode 2 Various Emergencies, Inhibit and Release Drum, Capstan, Loading Motor, Reel, Tape top and Tape end

※ Before setting test mode, set data 02 to page 4, address 00.

※ After compleating necessary adjustments/repairs, be sure to return the data at address 02 to 00.

6. Adjustment Mode Setting

Variety of adjustment modes are established and changed as listed below.

Page 4	Address 01

Data	Function
00	Normal
01	Tape Path Adjustment Mode (Track shift playback mode)
04	Chroma Emphasis Adjustment Mode

※ Before setting adjustment mode, set data 02 to page 4, address 00.

※ After compleating necessary adjustments/repairs, be sure to return the data at address 01 to 00.

2-3. POWER SUPPLY CHECK

2-3-1. Output Voltage Check (Power Supply Block)

Mode	POWER OFF (STANDBY)
Measuring Instrument	Digital voltmeter
UN13.5V check	
Measurement Point	Pin ① of CN201
Specified Value	13.5 ± 0.5 Vdc
UN6.0V check	
Measurement Point	Pin ④ of CN201
Specified Value	6.0 ± 0.1 Vdc

Checking Method:

1) Check that each power supply voltage satisfies its specification.

2-3-2. Power Supply Block RV201 Adjusting Method

- Set up conditions that a 800 mA current is output from UN6.0V and a 150 mA current is output from UN13.5V.
- Adjust RV201 so that the UN6.0V voltage becomes 5.9V.

2-4. SYSTEM CONTROL SYSTEM ADJUSTMENTS

2-4-1. Clock Check (VS-121 Board)

Mode	E-E
Signal	Arbitrary
Measurement Point	Pin ④ of IC500
Measuring Instrument	Frequency counter
Specified Value	10000 ± 100 kHz

Note: Connect the frequency counter via a high impedance and low capacity buffer amplifier (oscilloscope, etc.).

Checking Method:

1) Check that the clock is 10000 ± 100 kHz.

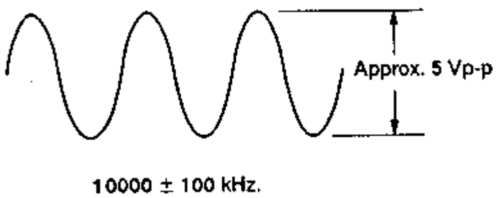


Fig. 8-2-5.

2-5. SERVO SYSTEM ADJUSTMENTS

(Adjusting Procedure)

1. PWM frequency check
2. Switching position adjustment
3. CAP DUTY adjustment

2-5-1. PWM Frequency Check (VS-121 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑦ of IC607
Measuring Instrument	Frequency counter
Specified Value	480 ± 50 kHz

Checking Method:

1) Check that the frequency is 480 ± 50 kHz.

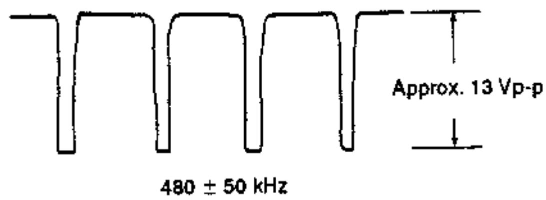


Fig. 8-2-6.

2-5-2. Switching Position Adjustment (VS-121 Board)

<Purpose> To set the switching timing of the video head.
If the timing is incorrect, switching noises and jitters will be produced on the played back image.

Mode	Playback
Signal	Alignment tape: For adjusting tracking (WR5-1CP)
Measurement Point	CH1: Pin ② of CN802 of the RP-190 board (RF SWP) CH2: Pin ③ of CN802 of the RP-190 board (PB RF)
Measuring Instrument	Oscilloscope
Adjusting Element	RV500, RV501 of VS-121 board
Specified Value	t=0 ± 10 μsec

Adjusting Method:

1) Connect the adjusting remote commander RM-95 (J-6082-053-B) to J500 of the VS-121 board.
2) Set the adjusting remote commander to HOLD ON.
3) Set to page 7 using the EDIT SEARCH +/– button.
4) Set to address 8 0 using the FF/REW button.
5) Set to data 0 5 using the PLAY/STOP button.
   (Setting of the switching position adjustment mode.)
6) Set to page 0 using the EDIT SEARCH +/– button,
7) Set to address 0 4 using the FF/REW button.
8) Rotate RV500 and adjust to t=0 ± 255 μsec.
   (The data of address 0 4 should be from " 0 4 " to " 1 2 ".)
9) Set to address 0 3 using the FF/REW button.
10) Rotate RV501 and adjust to t=0 ± 10 μsec.
11) Set to page 0 using the EDIT SEARCH +/– button.
12) Set to address 0 0 using the FF/REW button.
13) Set to data 0 0 using the PLAY/STOP button.

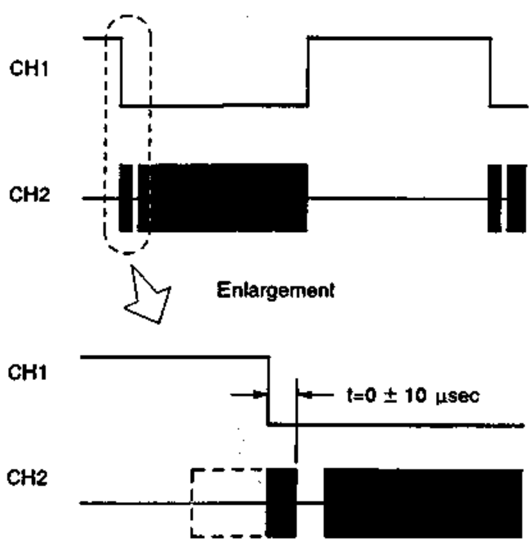


Fig. 8-2-7.

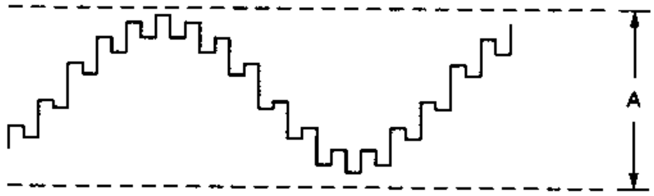
2-5-3. CAP DUTY Adjustment (VS-121 Board)

<Purpose> To stabilize the servo on LP mode.
(Both edge of leading and trailing of CAP FG signal are detected on LP ode.)

Mode	Play
Signal	Alignment tape: For checking operations on LP mode (WR5-4CL)
Measurement Point	CN603 ② pin (CAP ERROR)
Measuring Instrument	Oscilloscope
Adjusting Element	RV601
Specified Value	Minimum amplitude (A)

Adjusting Method:

1) Playback the tape and let the amplitude (A) be minimum.



A=MIN

Fig. 8-2-8.

2-6. VIDEO ADJUSTMENTS

The color video signal supplied from the pattern generator is used as the video input signal for video system adjustments performed in the recording mode. Check that the signals satisfy the specifications in Fig. 8-2-2, Fig. 8-2-3, and "Input Signal Check".
Perform the adjustments in the following order.

[Order of Adjustments]

1) Playback frequency characteristics adjustment
2) EE level adjustment
3) Comb filter adjustment
4) Emphasis input Y level adjustment
5) Standard 8 mm mode Y FM carrier frequency adjustment
6) Standard 8 mm mode Y FM deviation adjustment
7) Hi8 mode Y FM carrier frequency adjustment
8) Hi8 mode Y FM deviation adjustment
9) Chroma emphasis adjustment
10) VIDEO input Y level adjustment
11) Playback CCD input level adjustment
12) Hi8 mode playback Y level adjustment
13) Standard 8 mm mode playback Y level adjustment
14) REC Y level adjustment

Note: Normally, to perform REC chroma emphasis adjustment (RV114) is not necessary. And do not touch this adjusting element.

2-6-1. Playback Frequency Characteristics Adjustment (RP-190 Board)

<Purpose> To set the RF output of the head to the optimum frequency. If the frequency used is incorrect, the played back image will not be clear or pulse noises will be produced.

Note: [ ] contains the adjusting element of CH2.

Mode	Playback
Signal	Alignment tape: For adjusting frequency characteristics (WR5-7CE)
Measurement Point	Pin ③ of CN802 (PB Y) External trigger: Pin ② of CN802 (RF SWP) Trigger strobe: + [–]
Measuring Instrument	Oscilloscope
Adjusting Element	RV801 [RV802]
Specified Value	4.5 MHz level: 8.5 MHz level=3.0 : 2.2 ± 0.2

Adjusting Method:

1) Adjust the 4.5 MHz and 8.5 MHz level ratio of the PB RF output waveform to 3.0 : 2.2 ± 0.2 using RV801 [RV802].

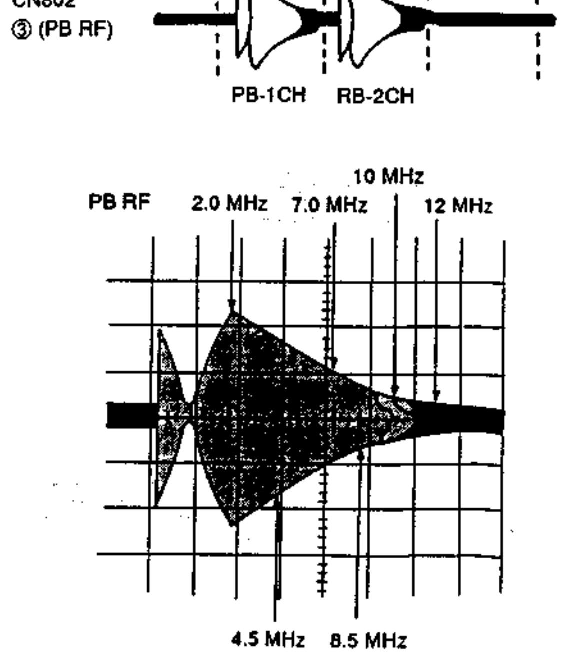


Fig. 8-2-9.

2-6-2. E-E Level Adjustment (VS-121 Board)

<Purpose> Set the E-E/Record Y signal level.
If the level is incorrect, the E-E and the record/playback pictures will be bright or dark too much. And the correct color will not be reprocuded.

Mode	E-E
Signal	Color bar (S VIDEO)
Measurement Point	Pin ⑦ of CN900 (LINE OUT Y (X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV101
Specified Value	1.00 ± 0.05 Vp-p

Note: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75 Ω.

Adjusting Method:
1) Insert a ME type cassette tape.
2) Adjust to 1.00 ± 0.05 Vp-p using RV101.

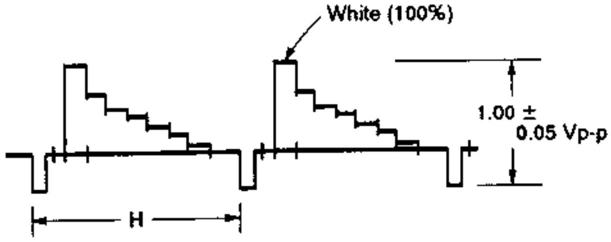


Fig. 8-2-10.

2-6-3. Comb Filter Adjustment (VS-121 Board)

<Purpose> To adjust the comb filter using the composite video signal to eliminate the crosstalk components of the playback chroma signal. The beat produced on the played back image will be great if the level is incorrect.

Mode	E-E
Signal	Color bar (VIDEO)
Measurement Point	Pin ⑭ of IC104 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV102, RV108
Specified Value	Minimum residual chroma component. (Below 30 mVp-p)

Adjusting Method:
1) Check that any plug is not inserted to the S VIDEO input terminal.
2) Adjust RV102 and RV108 alternately so that the residual chroma component becomes minimum. (Below 30 mVp-p)

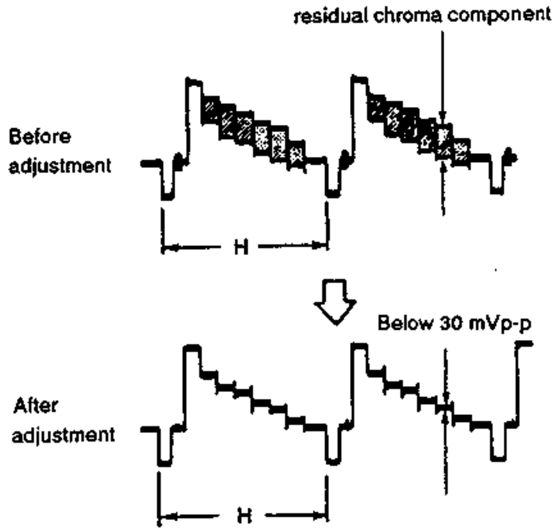


Fig. 8-2-11.

2-6-4. Emphasis Y Input Level Adjustment (VS-121 Board)

<Purpose> To set the Y input level of the emphasis circuit. If the level is incorrect, the played back image will be too bright or too dark.

Mode	E-E
Signal	Color bar (VIDEO)
Measurement Point	Pin ⑤ of IC104 (EMPH IN) or Pin ⑦ of IC107
Measuring Instrument	Oscilloscope
Adjusting Element	RV109
Specified Value	500 ± 20 mVp-p

Adjusting Method:

1) Adjust to 500 ± 20 mVp-p using RV109.

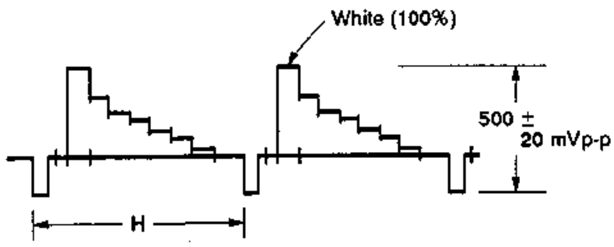


Fig. 8-2-12.

2-6-5. Standard 8 mm Mode Y FM Carrier Frequency Adjustment (VS-121 Board)

<Purpose> Standard 8 mm mode FM carrier frequency of REC Y setting. If deviated, this caused blurred played back picture or deteriorated resolution.

Mode	E-E
Signal	No signal
Measurement Point	Pin ③ of CN606 (REC RF (X))
Measuring Instrument	Frequency counter, oscilloscope
Adjusting Element	RV106
Specified Value	4.38 ± 0.05 MHz

Note: Connect the frequency counter via high impedance and low capacity buffer amplifier (oscilloscope, etc.).

Adjusting method:

1) Insert a Standard 8 mm MP type cassette tape.
2) Adjust RV106 so that the Y FM carrier frequency becomes the specified value.

Fig. 8-2-13.

2-6-6. Standard 8 mm Mode Y FM Deviation Adjustment (VS-121 Board)

<Purpose> Standard 8 mm mode FM deviation of REC Y setting. If deviated, this causes too bright/dark image, or marked occurrence of black picture or deteriorated resolution.

Mode	Record and playback
Signal	Color bar (S VIDEO)
Measurement Point	Pin ⑦ of CN900 (LINE OUT (X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV107
Specified Value	A=1.00 ± 0.05 Vp-p

Note 1: Check that "2-6-13. Standard 8 mm mode playback level adjustment" have been completed.

Note 2: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75Ω .

Adjusting method:

1) Insert a Standard 8 mm MP type cassette tape.
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification: A=1.00 ± 0.05 Vp-p
5) If the specification is not satisfied, adjust RV107, and repeat steps 2) to 4).

Playback signal level	Turning direction of RV107
When smaller than the specified value	Clockwise (○)
When bigger than the specified value	Counter clockwise (○)

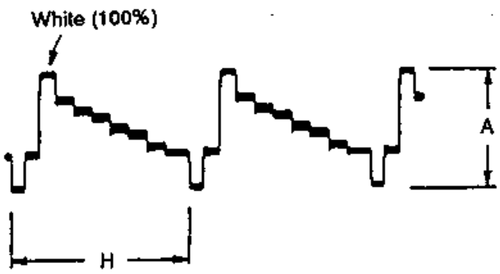


Fig. 8-2-14.

2-6-7. Hi8 Mode Y FM Carrier Frequency Adjustment (VS-121 Board)

<Purpose> Hi8 mode FM carrier frequency of REC Y setting. If deviated, this caused blurred played back picture or deteriorated resolution.

Mode	E-E
Signal	Non signal
Measurement Point	Pin ③ of CN606 (REC RF (X))
Measuring Instrument	Frequency counter, oscilloscope
Adjusting Element	RV104
Specified Value	5.96 ± 0.05 MHz

Note: Connect the frequency counter via a high impedance and low capacity buffer amplifier (oscilloscope, etc.).

Adjusting method:

1) Insert a ME type cassette tape.
2) Adjust RV104 so that the Y FM carrier frequency becomes the specified value.

Fig. 8-2-15.

2-6-8. Hi8 Mode Y FM Deviation Adjustment (VS-121 Board)

<Purpose> Hi8 mode FM deviation of REC Y setting. If deviated, this causes too bright/dark image, or marked occurrence of black picture or deteriorated resolution.

Mode	Record and playback
Signal	Color bar (S VIDEO)
Measurement Point	Pin ⑦ of CN900 (LINE OUT Y (X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV105
Specified Value	A=1.00 ± 0.05 Vp-p

Note 1: Check that "2-6-12. Hi8 mode playback level adjustment" have been completed.

Note 2: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75Ω.

Adjusting method:

1) Insert a ME type cassette tape.
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification: A=1.00 ± 0.05 Vp-p
5) If the specification is not satisfied, adjust RV105, and repeat steps 2) to 4).

Playback signal level	Turning direction of RV105
When smaller than the specified value	Clockwise (○)
When bigger than the specified value	Counter clockwise (○)

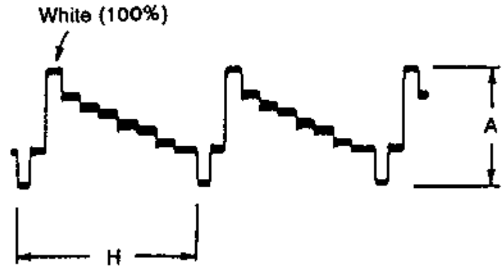


Fig. 8-2-16.

2-6-9. Chroma Emphasis Adjustment (VS-121 Board)

<Purpose> To set the center frequency of the emphasis.
If the frequency is incorrect, the color will change.

Mode	E-E
Signal	Color bar (S VIDEO)
Measurement Point	Pin ⑧ of IC104 (B.EMPH OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV103
Specified Value	Minimum fo components

Adjusting Method:

1) Insert a ME type cassette tape.
2) Connect the adjusting remote commander RM-95 (J-6082-053-B) to J500 of the VS-121 board.
3) Set the HOLD switch of the adjusting remote commander to ON position.
4) Set to page 4 using the EDIT SEARCH +/– button.
5) Set to address 00 using the FF/REW button.
6) Set to data 02 using the PLAY/STOP button.
7) Set to address 01 using the FF/REW button.
8) Set to data 04 using the PLAY/STOP button.
9) Minimize the amplitude of the latter section of the yellow part of the chroma signal using RV103.
10) Set to address 01 using the FF/REW button.
11) Set to data 00 using the PLAY/STOP button.
12) Set the HOLD switch of the adjusting remote commander to OFF position.

Minimize the amplitude of the latter section of the yellow part.

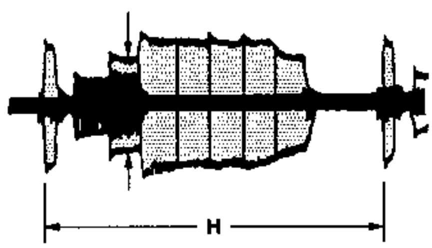


Fig. 8-2-17.

2-6-10. VIDEO Input Y Level Adjustment (VS-121 Board)

<Purpose> To set the E-E Y signal level of VIDEO input (Video terminal input). If the level is incorrect, the E-E image of VIDEO input will be too bright or too dark.

Mode	E-E
Signal	Color bar (VIDEO)
Measurement Point	Pin ⑦ of CN900 (LINE OUT Y (X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV401
Specified Value	A=1.00 ± 0.05 Vp-p

Note: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75Ω .

Adjusting method:

1) Adjust RV401 so that the Y signal level becomes 1.00 ± 0.05 Vp-p.

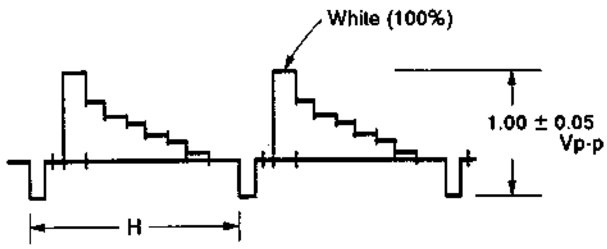


Fig. 8-2-18.

2-6-11. Playback CCD Input Level Adjustment (VS-121 Board)

<Purpose> To set the de-emphasize input level.
If the level is incorrect, the image will be too bright or dark.

Mode	Playback
Signal	Alignment tape: Color bar section for checking operations (WR5-8CSE)
Measurement Point	Pin ⑰ of IC104 or pin ① of IC106
Measuring Instrument	Oscilloscope
Adjusting Element	RV111
Specified Value	0.5 ± 0.02 Vp-p

Adjusting Method:

1) Adjust to 0.5 ± 0.02 Vp-p using RV111.

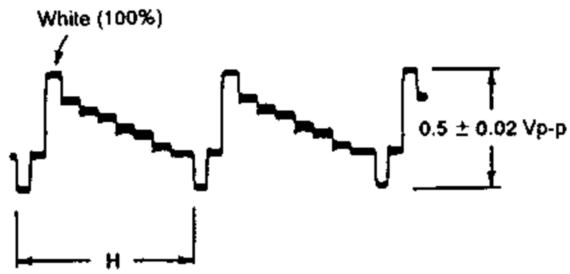


Fig. 8-2-19.

2-6-12. Hi8 Mode Playback Y Level Adjustment (VS-121 Board)

<Purpose> To set the luminance level in Hi8 playback.
If the level is incorrect, the Hi8 image will be too bright or dark.

Mode	Playback
Signal	Alignment tape: Color bar section for checking operations (WR5-8CSE)
Measurement Point	Pin ⑦ of CN900 (LINE OUT Y(X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV110
Specified Value	1.00 ± 0.02 Vp-p

Note: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75 Ω.

Adjusting Method:
1) Adjust to 1.00 ± 0.02 Vp-p using RV110.

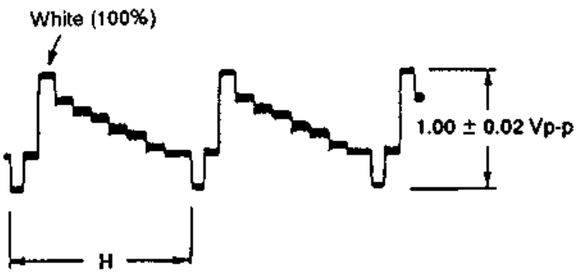


Fig. 8-2-20.

2-6-13. Standard 8 mm Mode Playback Y Level Adjustment (VS-121 Board)

<Purpose> To set the luminance level in normal playback.
If the level is incorrect, the normal image will be too bright or dark.

Mode	Playback
Signal	Alignment tape: Color bar section for checking operations (WR5-5CSP)
Measurement Point	Pin ⑦ of CN900 (LINE OUT Y(X))
Measuring Instrument	Oscilloscope
Adjusting Element	RV112
Specified Value	1.00 ± 0.02 Vp-p

Note: Terminate the Y signal terminal of the S VIDEO OUT terminal at 75 Ω.

Adjusting Method:
1) Adjust to 1.00 ± 0.02 Vp-p using RV112.

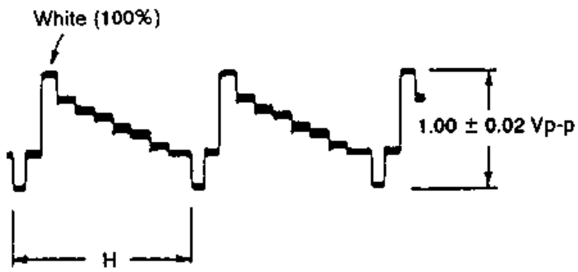


Fig. 8-2-21.

2-6-14. REC Y Level Adjustment (VS-121 Board)

<Purpose> Recording level of luminance signal setting.
If deviated, this causes black strech over modulation noise or color shade.

Mode	Record
Signal	No signal
Measurement Point	Pin ③ of CN606 (REC RF (X))
Measuring Instrument	Oscilloscope (Band width limit: 20 MHz)
Adjusting Element	RV113
Specified Value	500 ± 10 mVp-p

Note: Set the band width limit of the oscilloscope to 20 MHz.

Adjusting Method:
1) Insert a ME type cassette tape.
2) Record no signal.
3) Adjust to 500 ± 10 mVp-p with RV113.

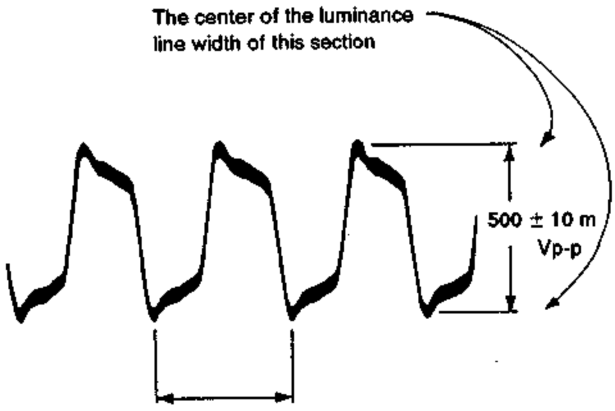


Fig. 8-2-22.

2-7. AFM AUDIO SYSTEM ADJUSTMENTS

Perform the following adjustments using the color bar signal as the video signal input.

[Connection of Audio Measuring Equipment]
Connect the audio system measuring equipment as shown in the figure below, apart from the video system measuring equipment.

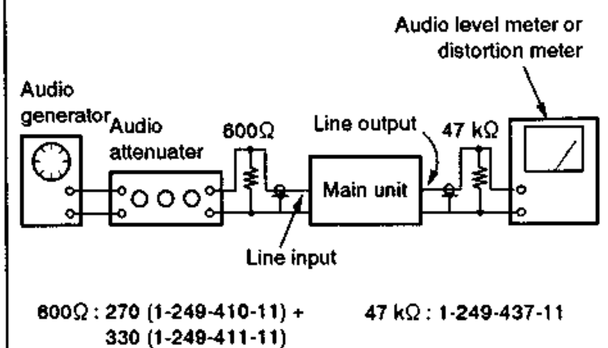


Fig. 8-2-23.

Perform the adjustments in the following order.

[Order of Adjustments]
1) Carrier frequency 1.5 MHz check
2) Carrier frequency 1.7 MHz check
3) 1.5 MHz deviation adjustment
4) 1.7 MHz deviation check
5) Playback separation 2 adjustment
6) Playback separation 1 check
7) E-E output level check
8) Overall frequency characteristics check
9) Overall distortion check
10) Overall noise level check

2-7-1. Carrier Frequency 1.5 MHz Check (VS-121 Board)

Mode	Record
Signal	No signal
Measurement Point	Pin 79 of IC901 (VCO OUT)
Measuring Instrument	Frequency counter
Specified Value	1500 ± 3 kHz

Note: Connect the frequency counter via a high impedance and low capacity buffer amplifier (oscilloscope, etc).

Checking Method:
1) Check that the frequency is 1500 ± 3 kHz.

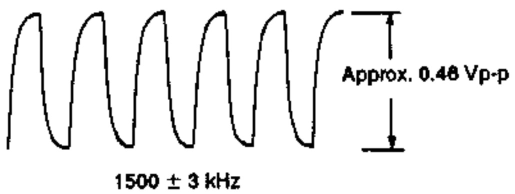


Fig. 8-2-24.

2-7-2. Carrier Frequency 1.7 MHz Check (VS-121 Board)

Mode	Record
Signal	No signal
Measurement Point	Pin 62 of IC901 (VCO OUT)
Measuring Instrument	Frequency counter
Specified Value	1700 ± 3 kHz

Note: Connect the frequency counter via a high impedance and low capacity buffer amplifier (oscilloscope, etc).

Checking Method:
1) Check that the frequency is 1700 ± 3 kHz.

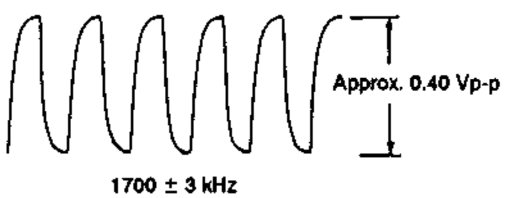


Fig. 8-2-25.

2-7-3. 1.5 MHz Deviation Adjustment (VS-121 Board)

<Purpose> To adjust the deviation. If there is deviation, signals from the alignment tape will not separate properly (when the stereo signal is used).

Mode	Playback
Signal	Alignment tape: Bilingual section for checking operations (WR5-9CS)
Measurement Point	Left audio line output terminal
Measuring Instrument	Audio level meter
Adjusting Element	RV901
Specified Value	–7.5 ± 3.0 dBs

Checking Method:
1) Set the audio output to main or sub using the audio monitor button of the remote commander (with the 400 Hz signal output from the left channel and the 1 kHz signal output from the right channel).
2) Adjust the 400 Hz signal level to –7.5 ± 3.0 dBs using RV901.

2-7-4. 1.7 MHz Deviation Check (VS-121 Board)

<Purpose> To adjust the deviation. If there is deviation, signals from the alignment tape will not separate properly (when the stereo signal is used).

Mode	Playback
Signal	Alignment tape: Bilingual section for checking operations (WR5-9CS)
Measurement Point	Right audio line output terminal
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3.0 dBs

Checking Method:
1) Set the audio output to main or sub using the audio monitor button of the remote commander (with the 400 Hz signal output from the left channel and the 1 kHz signal output from the right channel).
2) Check that the 1 kHz signal level is –7.5 ± 3.0 dBs.

2-7-5. Playback Separation 2 Adjustment (VS-121 Board)

Mode	Playback
Signal	Alignment tape: Stereo section for checking operations (WR5-9CS)
Measurement Point	Right audio line output terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV901
Specified Value	Minimum 400 Hz components (Below –35 dBs (below 40 mVp-p))

Adjusting Method:

1) Adjust the crosstalk components (400 Hz) of the right channel to minimum (below –35 dBs (below 40 mVp-p)) using RV901.

2-7-6. Playback Separation 1 Check (VS-121 Board)

Mode	Playback
Signal	Alignment tape: Stereo section for checking operations (WR5-9CS)
Measurement Point	Left audio line output terminal
Measuring Instrument	Oscilloscope
Specified Value	1 kHz components (Below –35 dBs (below 40 mVp-p))

Checking Method:

1) Check that the crosstalk components (1 kHz) of the left channel is below –35 dBs (below 40 mVp-p).

2-7-7. E-E Output Level Check (VS-121 Board)

Mode	E-E
Signal	400 Hz, –7.5 dBs Audio line input terminal left and right
Measurement Point	Left and right audio line output terminals
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3.0 dBs

Checking Method:

1) Check that the levels of the left and right audio line output terminals are –7.5 ± 3.0 dBs.

2-7-8. Overall Frequency Characteristics Check (VS-121 Board)

Mode	Self-recording and playback
Signal	Ⓐ: 400 Hz, –7.5 dBs Ⓑ: 20 Hz, –7.5 dBs Ⓒ: 14 kHz, –7.5 dBs Left and right audio line input terminals
Measurement Point	Left and right audio line output terminals
Measuring Instrument	Audio level mter
Specified Value	When the 400 Hz playback output level is specified as 0 dB, the playback output levels of 20 Hz and 14 kHz become both 0 ± 3.0 dB.

Checking Method:

1) Record the signal of Ⓐ to Ⓒ in sequence.
2) Playback the recorded section.
3) Be sure that when the 400 Hz playback output level is specified as 0 dB, the playback output levels of 20 Hz and 14 kHz become both 0 ± 3.0 dB.

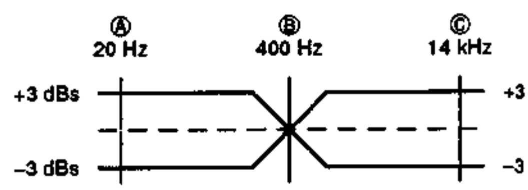


Fig. 8-2-26.

2-7-9. Overall Distortion Check (VS-121 Board)

Mode	Self-recording and playback
Signal	400 Hz, -7.5 dBs Left and right audio line input terminals
Measurement Point	Left and right audio line output terminals
Measuring Instrument	Audio distortion meter
Specified Value	Left: Less than 0.5% (note 1) Right: Less than 1.0% (note 1)

Checking Method:
1) Record the signal.
2) Playback the recorded section.
3) Be sure that the distortion of the left channel is less than 0.5% and that of the right channel is less than 1.0% (note 1).

Note 1: The value when a 200 Hz to 6 kHz BPF is used.

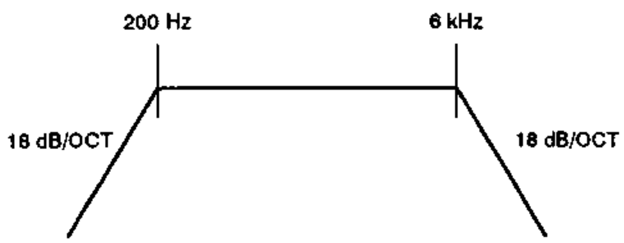


Fig. 8-2-27.

2-7-10. Overall Noise Level Check (VS-121 Board)

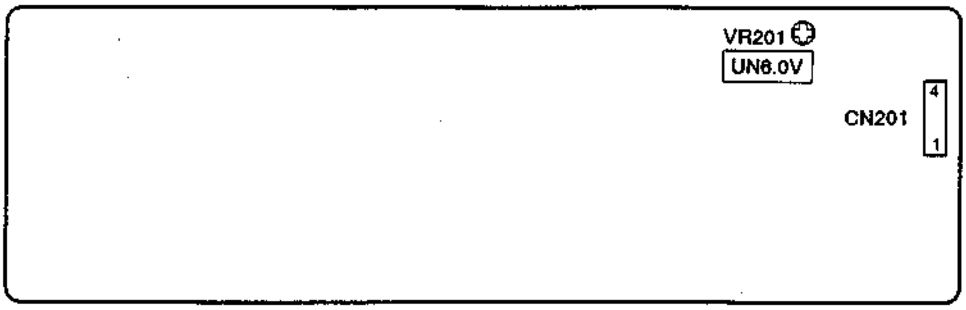
Mode	Self-recording and playback
Signal	No signal (Insert shorting plugs to the left and right audio line input terminals.)
Measurement Point	Left and right audio line output terminals
Measuring Instrument	Audio level meter
Specified Value	Left: Below –63 dBs (note 2) Right: Below –63 dBs (note 2)

Checking Method:
1) Record the signal.
2) Playback the recorded section.
3) Be sure that the noise level of left channel is below –63 dBs and that of the right channel is below –63 dBs (note 2).

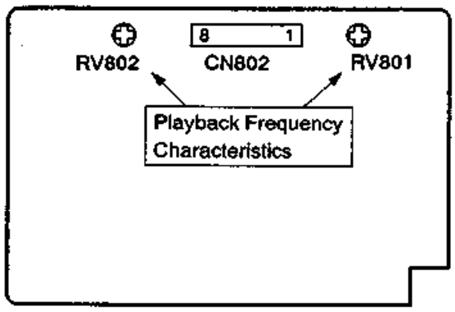
Note 2: The value when an IHF-A listening sensitivity correction filter is used.

2-8. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

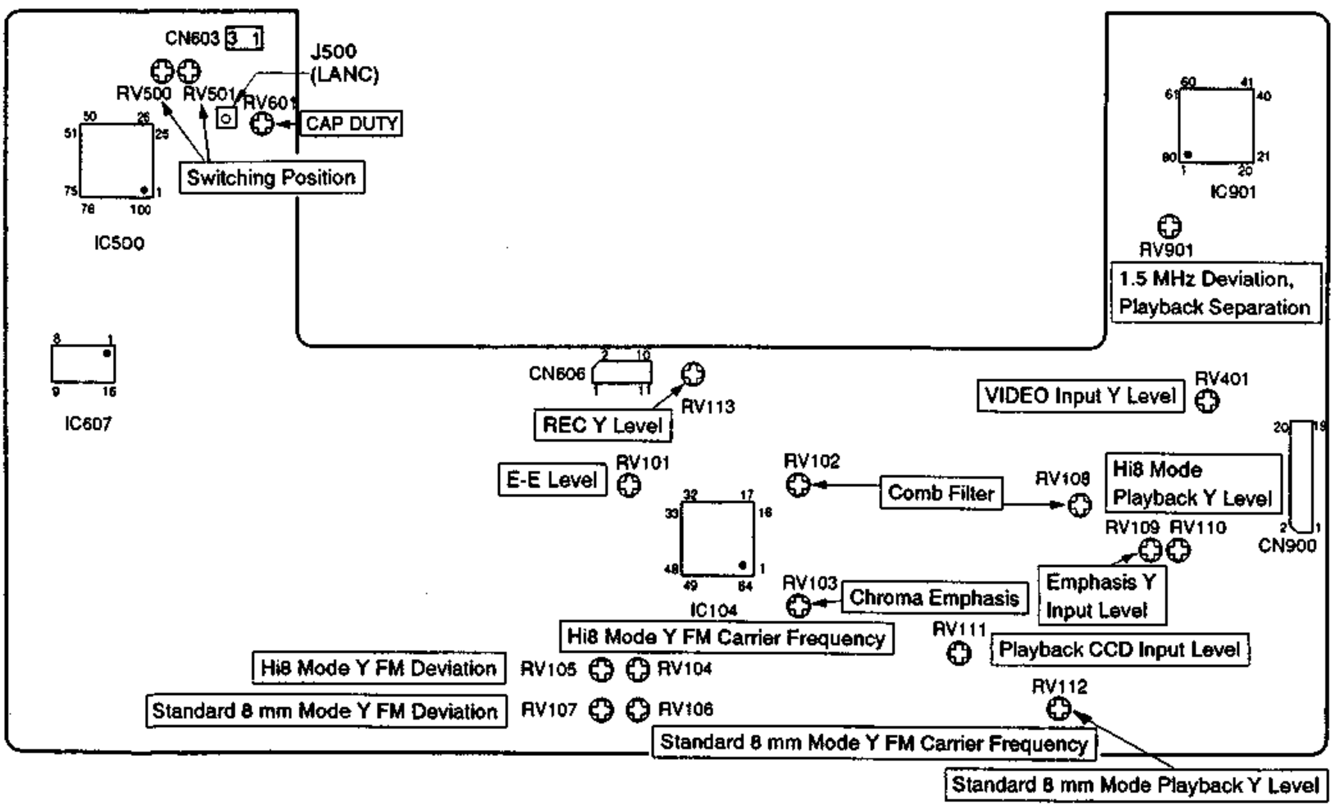
SR-655 BOARD
(POWER SUPPLY BLOCK: COMPONENT SIDE)



RP-190 BOARD (COMPONENT SIDE)



VS-121 BOARD (COMPONENT SIDE)



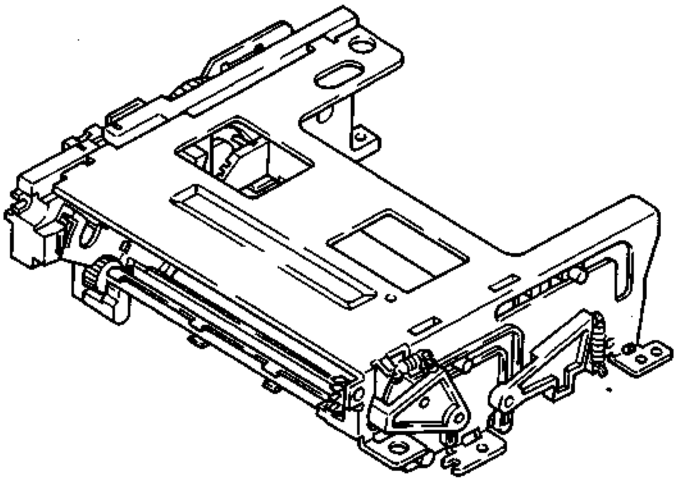
V13000

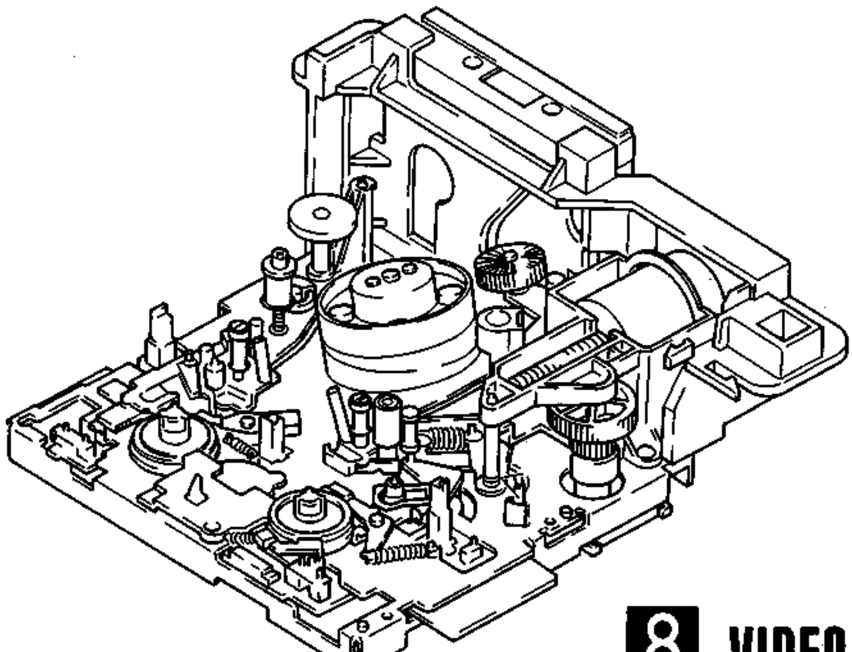
8 mm Video MECHANICAL ADJUSTMENT MANUAL V

F MECHANISM

Video 8

File with the SERVICE MANUAL





8 VIDEO RECORDER

SONY®

TABLE OF CONTENTS

1. MAIN FEATURES

The mechanism developed exclusively for the 8mm video provides the following features.

1. Faster rewind time than U mechanism.
   4 times high speed. (about 1 minute in case of P120 cassette.)

2. Jog shuttle supporting by addition of forced swing mechanism.

3. High speed start on Picture mechanism.
   Stop → playback about 0.8 sec.

4. Head clogging prevention by adoption of new cleaning roller.

5. Reduction of the number of parts. (about 40 parts less than U mechanism.)

6. FL capstan motor drive.

2. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the $\boxed{\text{EJECT}}$ mode. (To select the $\boxed{\text{EJECT}}$ mode, refer to "2-3, Handling of Mode Selector II".)

2-1. FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 1)

1. Removal

1) Select the $\boxed{\text{EJECT}}$ mode.
2) Remove three screws ① and remove the FL cassette compartment ② toward the arrow.

2. Mounting

1) Select the $\boxed{\text{EJECT}}$ mode.
2) Mount the FL cassette compartment ② with its tab Ⓐ engaged with the hole Ⓑ in mechanical chassis.
3) Tighten three screws ①.

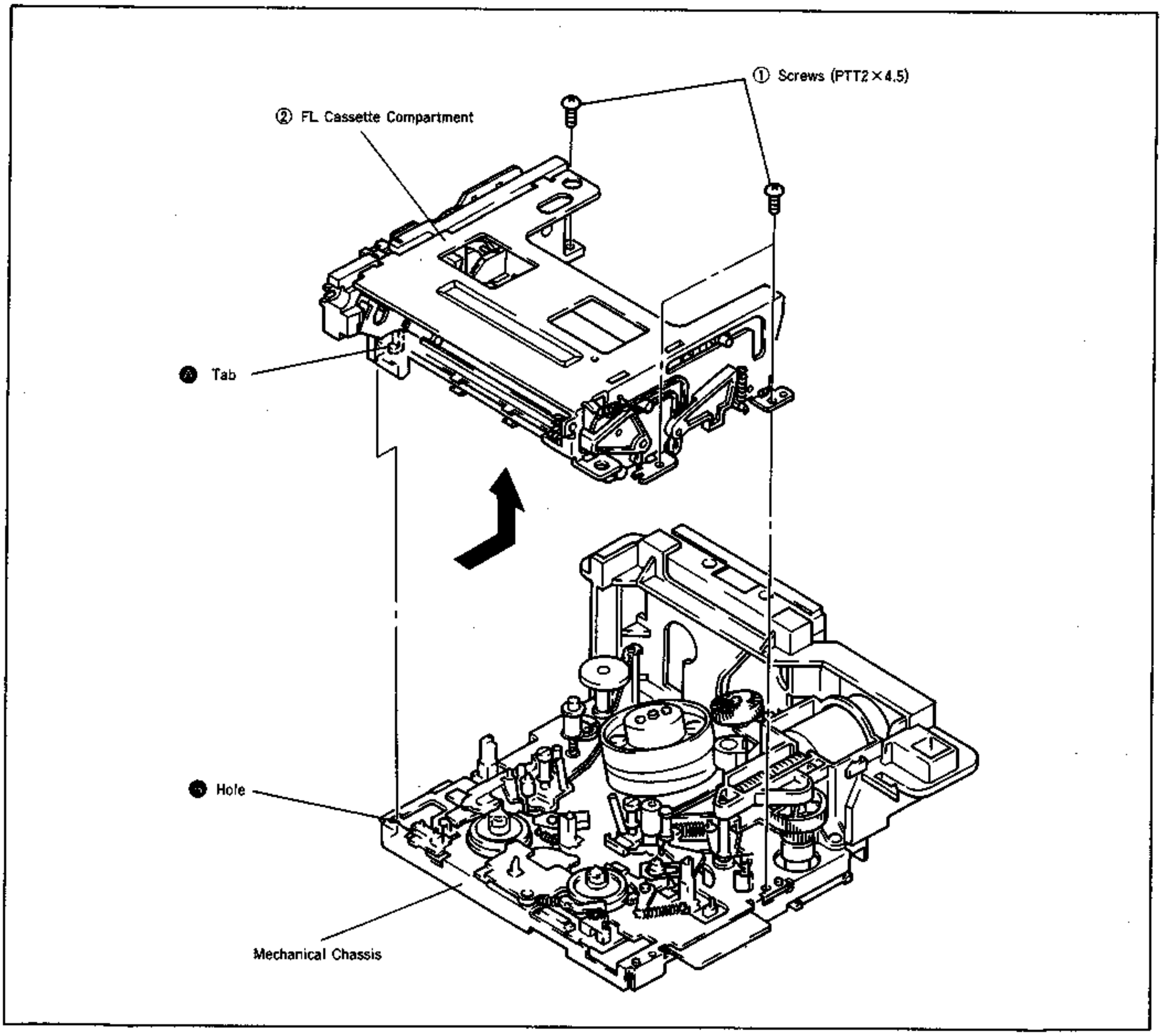


Fig. 1

2-2. OPERATION WITH FL CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 2)

2-2-1. Activating Loading

1) Referring to the Service Guide, supply the power with the cabinet removed.
2) Cover the LED ① with an opaque cap ②.
3) Press the cassette down switch ③ three times.

2-2-2. Activating Play Status

1) Perform each step in 2-2-1. Activating Loading.
2) Press the PLAY button while keeping the cassette down switch pressed.

2-2-3. Activating Ejection

1) Press the EJECT button.

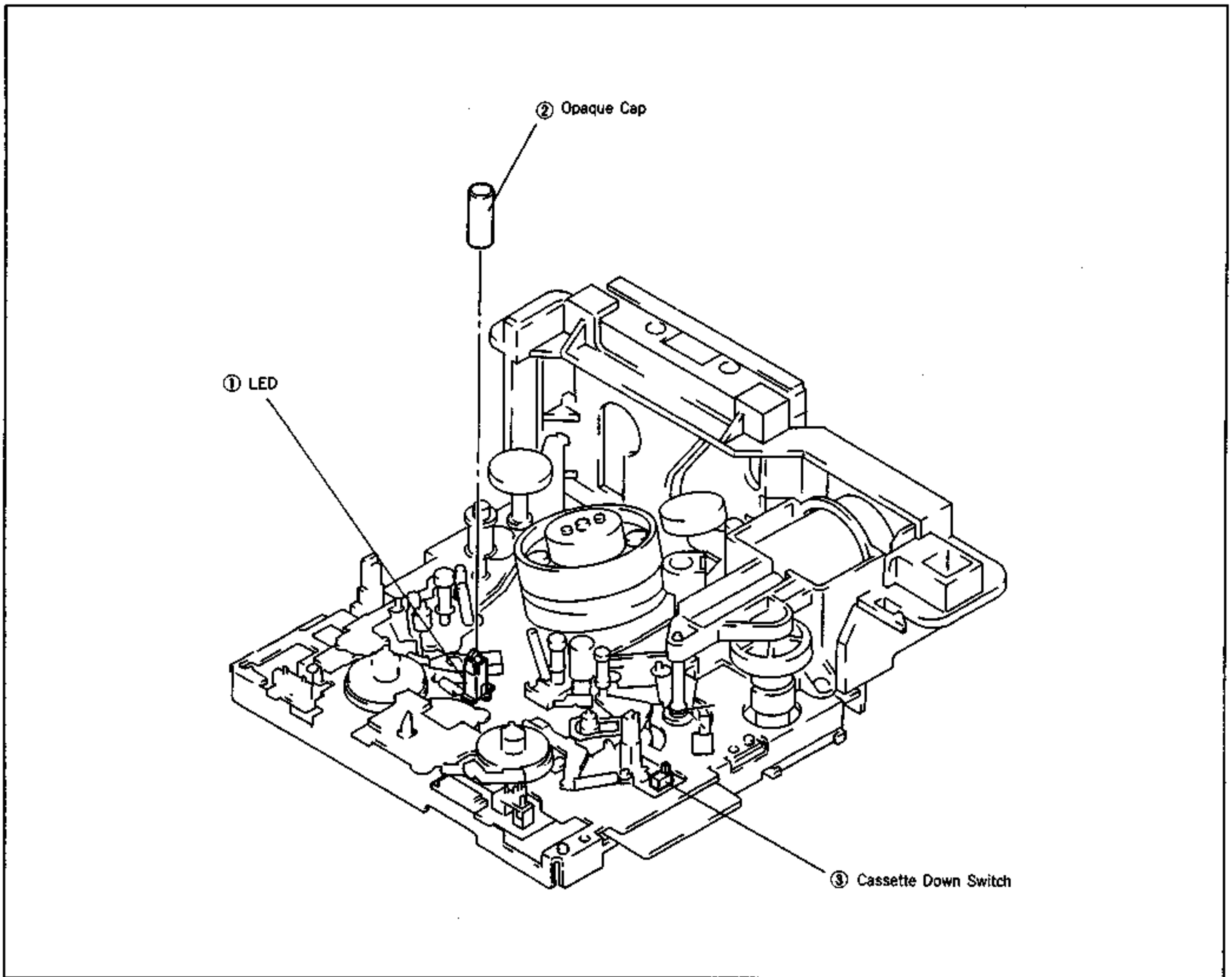


Fig. 2

2-3. HANDLING OF MODE SELECTOR II

2-3-1. General

The mode selector is used as a mechanism drive tool to help maintenance of various mechanical decks, and it provides the following functions.

1. MANUAL test

   In this mode, the motor is driven only during the time that the switch is pressed, so that the operator can control the motor freely.

2. STEP test

   In this mode, the motor is driven from the present status attained from sensor until the status changes to another status, so that the operator can confirm every operations.

3. AUTO test

   This mode checks if the mechanism operates normally following the status change table registered to each mechanical deck through a sequence of operation in all statuses of the mechanism. If it detects a faulty status change during operation, it displays "NG" and stops operation.

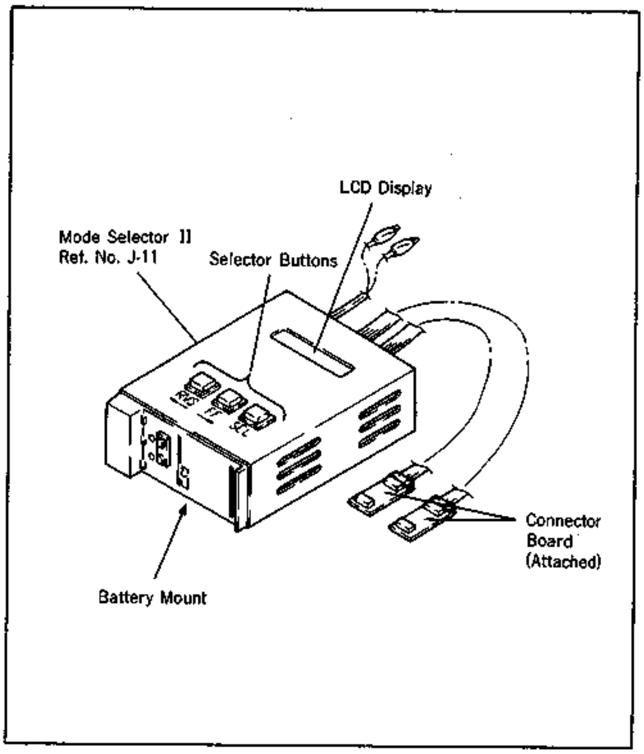


Fig. 3

MODE SELECTOR II (J-6082-282-A) CONNECTION

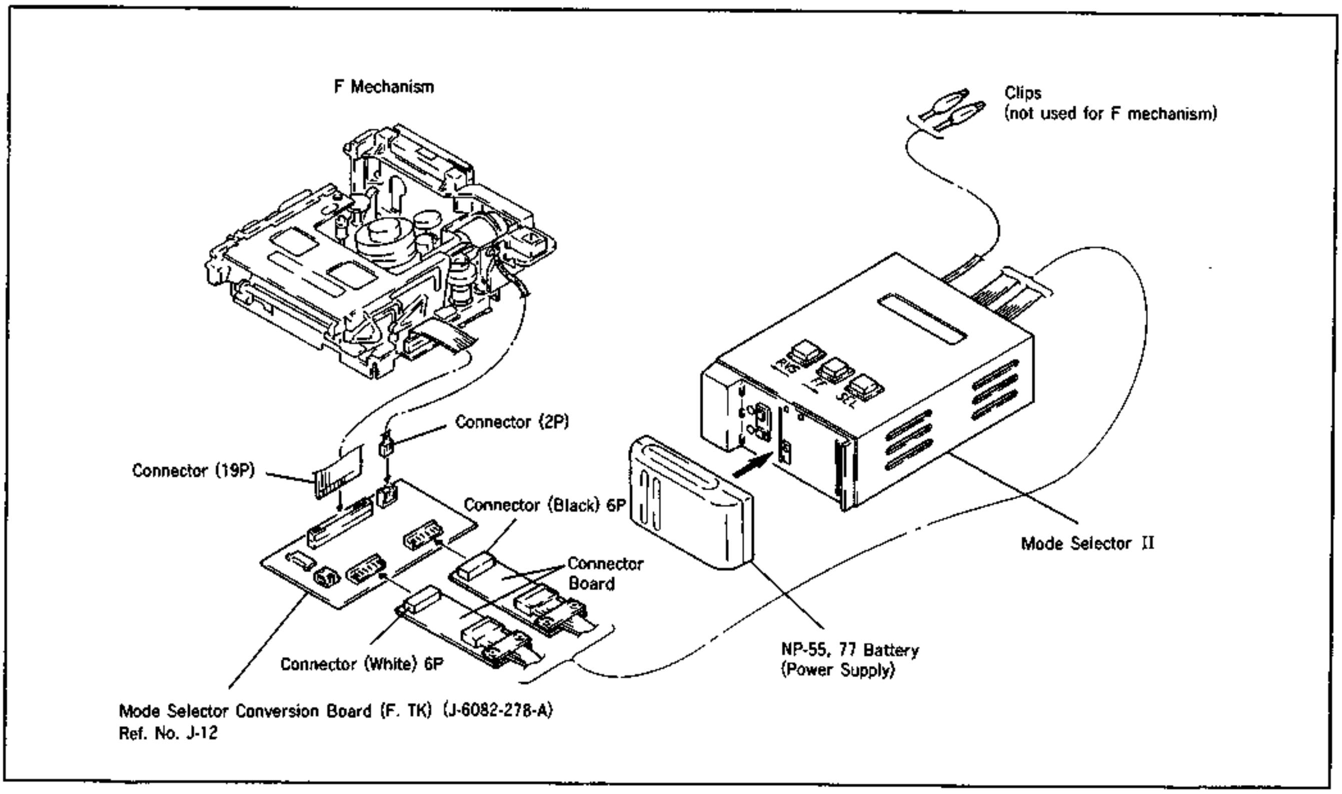
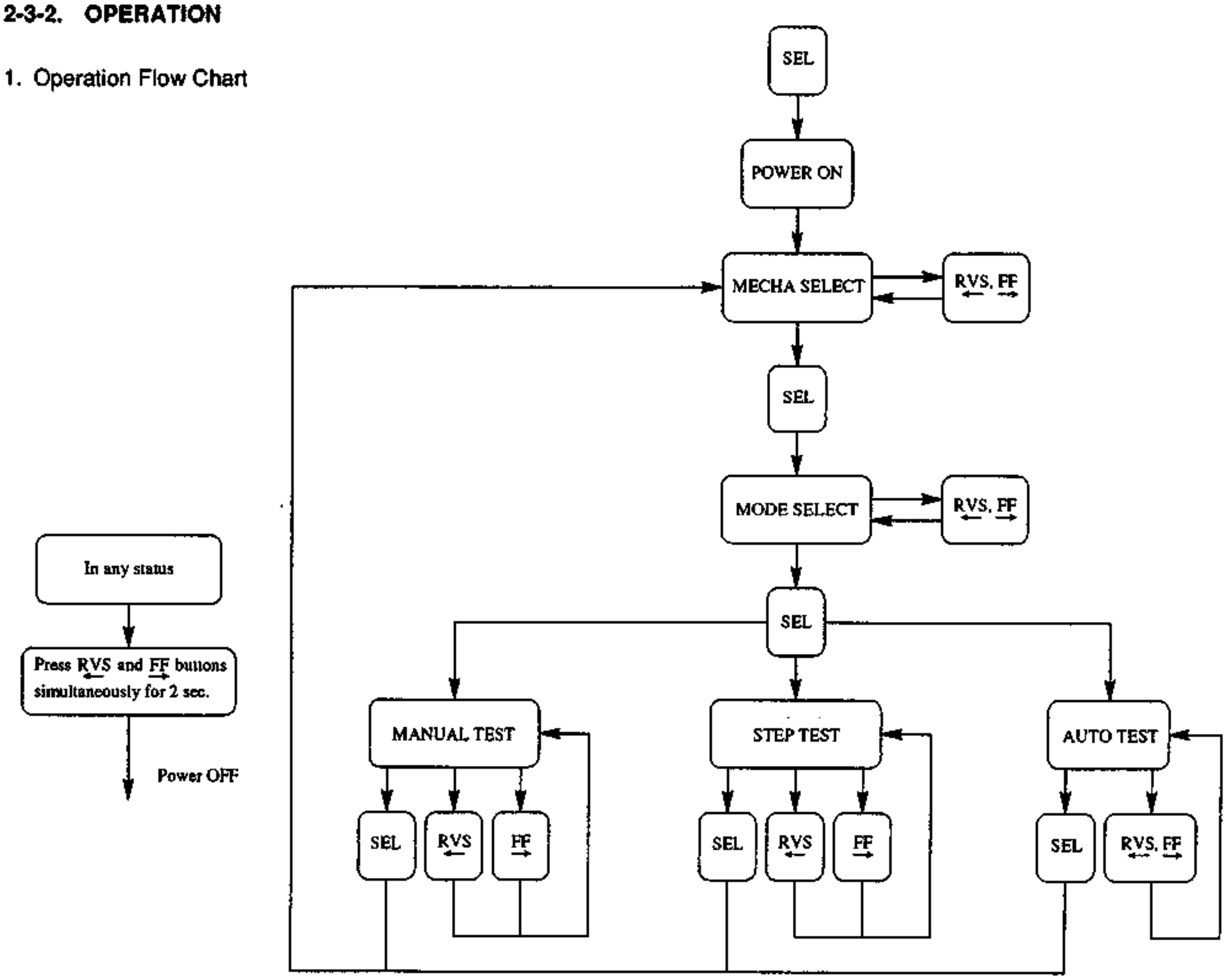


Fig. 4

2-3-2. OPERATION

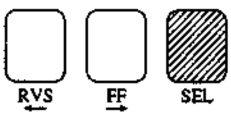
1. Operation Flow Chart



(Except K mechanism)

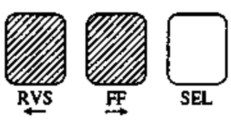
2. Mode Selector II power ON

Press the SEL button to turn on the power supply.



3. Mode Selector II power OFF

At the power ON, press RVS and FF buttons simultaneously for more than 2 seconds to turn off the power supply.



4. Mechanism selection

The "MECHA SELECT" is displayed on LCD immediately after the power supply is turned on. Call the desired mechanism by pressing the RVS or FF button, and press the SEL button. Thus, the mechanism has been selected. (Fig. 5-1 indicates F mechansim.)

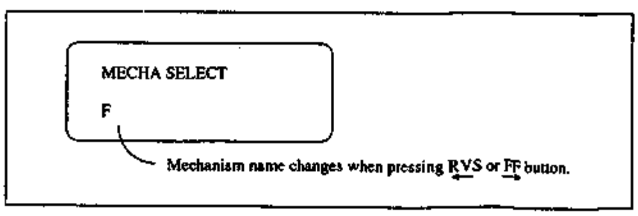


Fig. 5-1

5. Mode selection

Select the test mode "MANUAL", "STEP" or "AUTO" to be executed.
Call the desired mode by pressing the RVS or FF button, and press the SEL button. Thus, the mode has been selected.

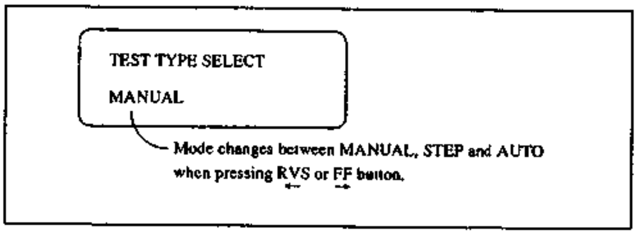


Fig. 5-2

6. MANUAL test

This mode drives the motor only during the time that the RVS or FF button is pressed.

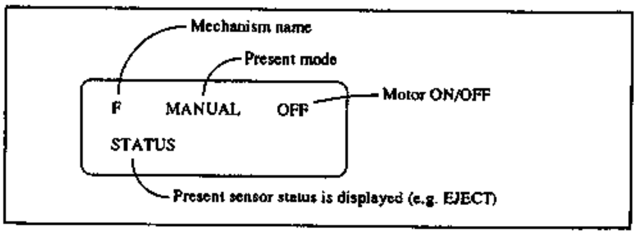


Fig. 5-3

7. STEP test

This mode drives the motor from the present status until the status changes in the direction selected with RVS or FF button.

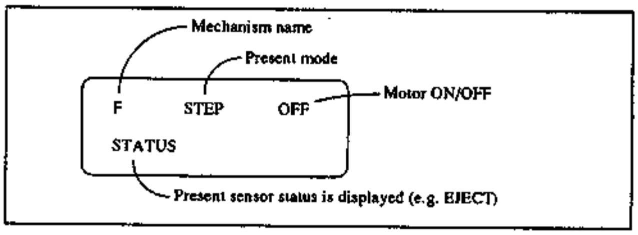


Fig. 5-4

8. AUTO test

This mode checks if the operation sequence stored for each mechanical deck is normal, and if the signals from sensors that execute a sequence of operation meet the stored sequence. The same operation is executed if either RVS or FF is pressed.

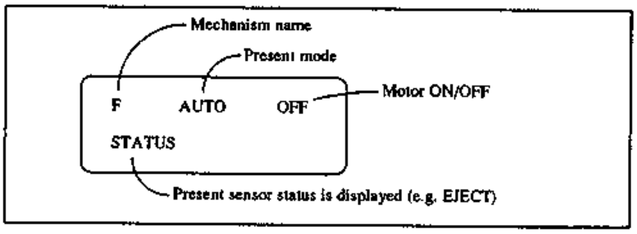


Fig. 5-5

Mechanism status (position) change sequence

After selection of mechanism, if either MANUAL or STEP mode is selected and the RVS or FF button is pressed, the mechanism status (position) can be designated. (Designated status is displayed at STATUS position.)
EJECT ←→ UNLOAD END ←→ STOP 1 ←→ HIGH SPEED REW ←→ DEW ←→ LOAD END ←→ STOP 2 ←→ FWD. P ←→ RVS. P

Code \ MD name					F mechanism
A	B	C	D		
0	1	1	1	1	EJECT
0	0	1	1	2	UNLOAD END
1	0	1	0	3	STOP 1
1	0	1	1	4	HIGH SPEED REW
1	0	0	0	5	DEW
1	1	0	0	6	
1	1	1	0	7	LOADE END
0	1	1	0	8	STOP 2
0	1	0	0	9	
1	1	0	1	10	FWD. P/FWD
0	0	0	1	11	RVS. P/RVS
1	0	0	1	12	

9. Battery alarm display

In case of low voltage of battery, which is a power supply of Mode Selector, the alarm message is displayed (not synchronous display).
In such a case, no operation is available, requiring battery replacement.

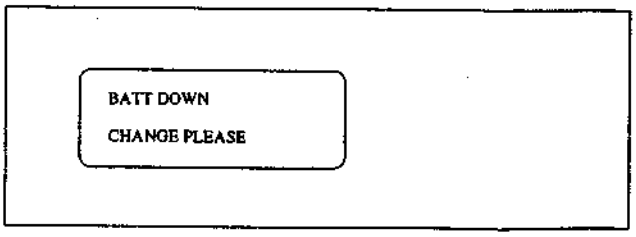


Fig. 5-6

3. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

3-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

3-2. CLEANING OF TAPE PATH (Fig.6)

1) In the $\boxed{\text{EJECT}}$ mode, clean the tape running system (TG1, 2, 3, 4, 5, 6, 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

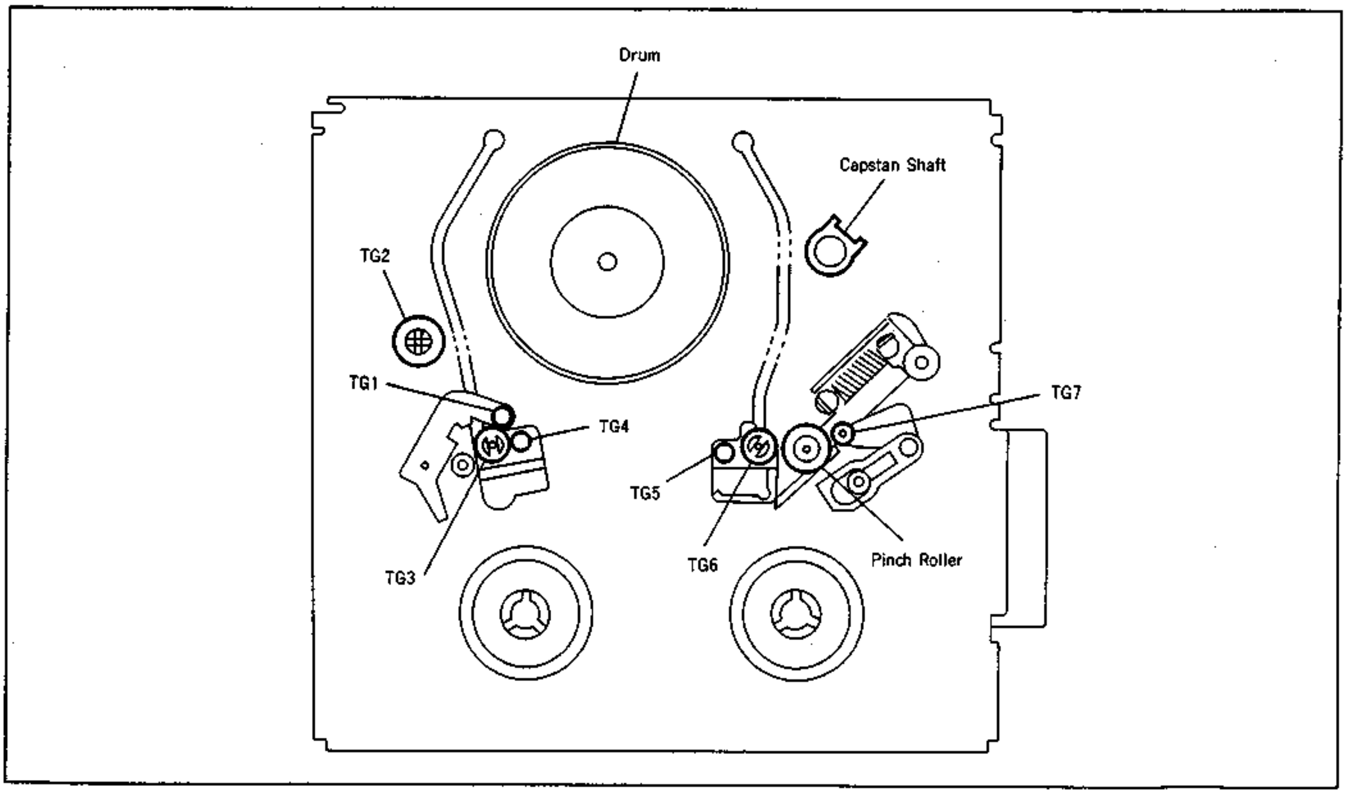


Fig. 6

3-3. PERIODIC CHECK ITEMS

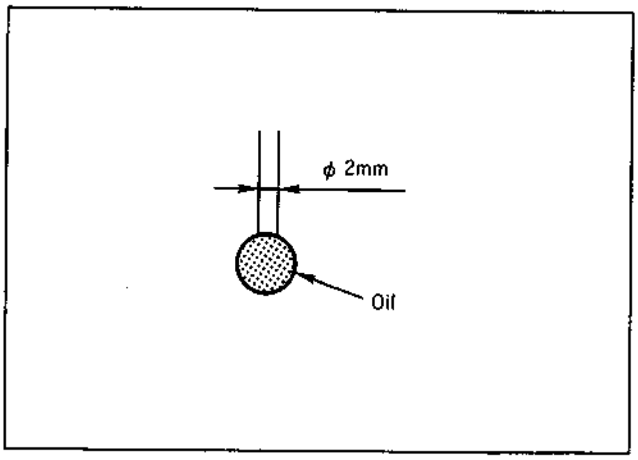
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Timing belt Timing belt (FL)	–	☆	–	☆	–	☆	–	☆	–	☆	3-953-986-01 3-954-079-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Be absolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	X-3942-946-1
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD. RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concering oil

- Be sure to use specified oil. (If you use oil with different viscosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be wron out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.



3-4. SERVICE JIGS LIST

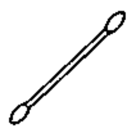
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1NP) PAL (WR5-1CP)	8-967-995-02 8-967-995-07		Tape path
J-7	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-8	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-9	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-10	Adjusting remote controller (Modified RM-95)	J-6082-053-B		Tape pathe (Setting of PATH mode)
J-11	Mode selector II	J-6082-282-A		For all models
J-12	Mode selector conversion board (F, TK)	J-6082-278-A		
J-13	FWD B.T. adjusting driver chip	J-6082-187-A		

Other equipment • Oscilloscope
• Analog tester (20 kΩ)

J-1

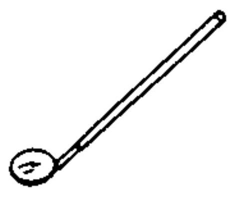
J-2

J-3

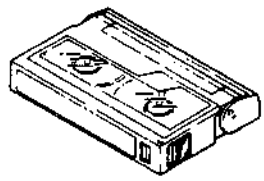


J-4

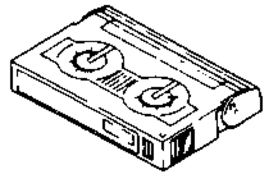
J-5



J-6



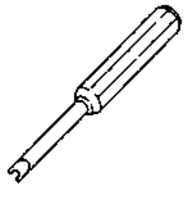
J-7



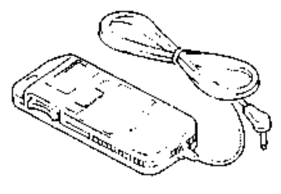
J-8

(Attached to the maintenance rotary upper drum)

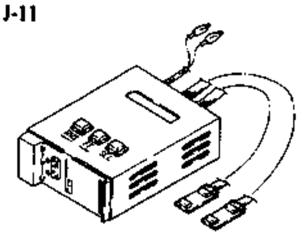
J-9



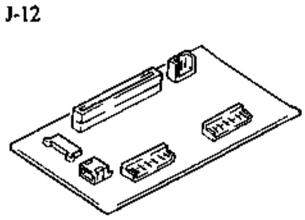
J-10



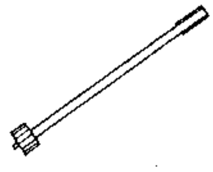
J-11



J-12



J-13



4. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the Mode selector II (Ref. No. J-11) for the following mechanical checks, adjustments and replacements.

Note : The modes in [ ] are those set by pressing the Mode selector buttons.

4-1. RP BLOCK (Fig.7)

1. Removal

1) Remove a screw ①.
2) Disconnect the connector ②.
3) Disengage claws Ⓐ at two places and remove the RP block ③.
4) Remove a screw ④, then the RP frame ⑤ in arrow direction.

2. Mounting

1) Mount the RP frame with its slot Ⓑ engaged with the chassis Ⓒ.
2) Tighten a screw ④.
3) Mount the RP block ③ and tighten a screw ①.
4) Connect the connector ②.

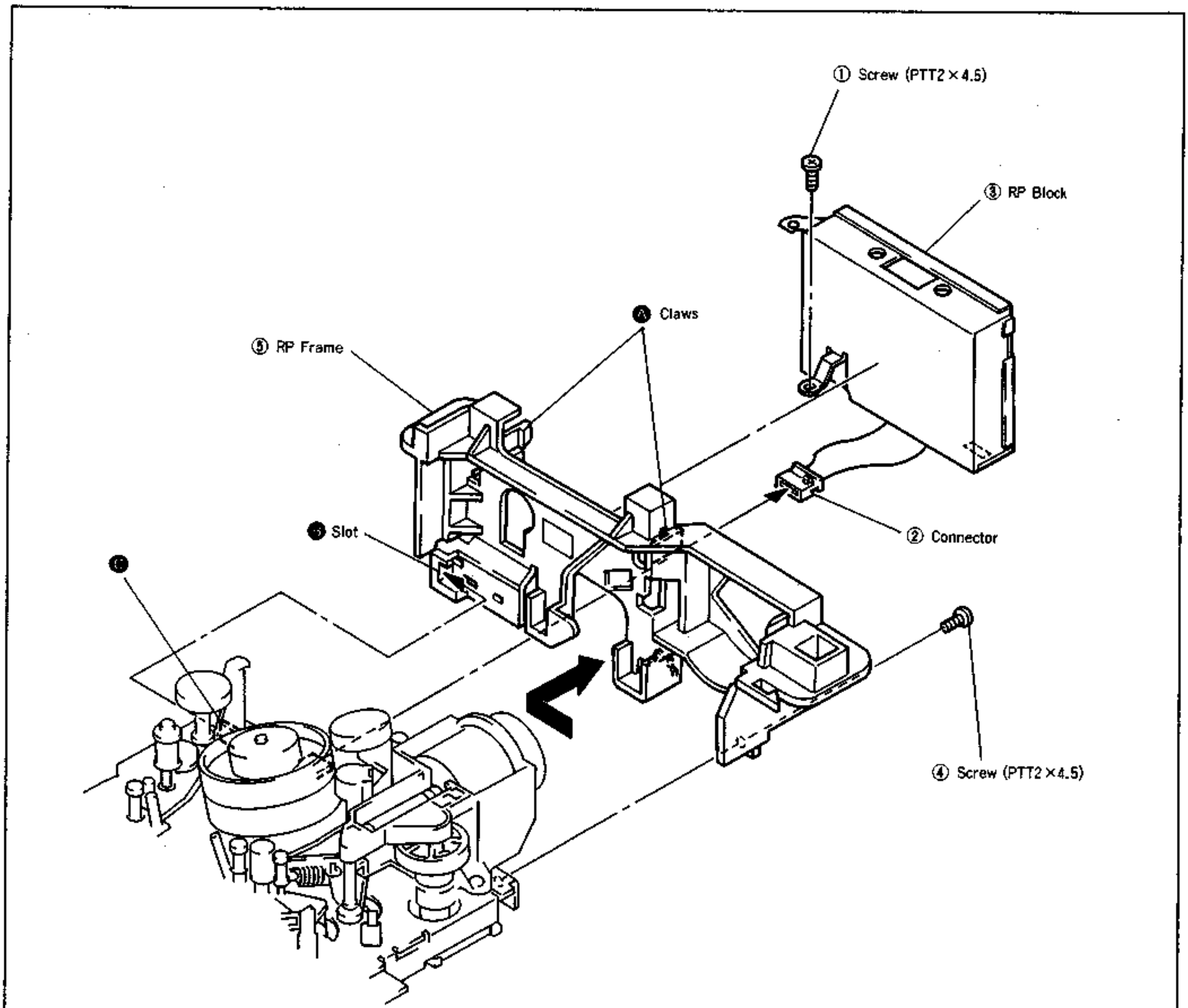


Fig. 7

4-2. IMPEDANCE ROLLER (Fig. 8)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Referring to 4-1, remove the RP block.
3) Remove a tension coil spring ①.
4) Disengage a claw Ⓐ and remove the impedance roller base assembly ②.
5) Disengage a claw Ⓑ and remove the impedance roller ③.

2. Mounting

1) Mount the impedance roller ③, then the impedance roller base assembly ②.
2) Attach a tension coil spring ①.
3) Referring to 4-1, mount the RP block.
4) Referring to 2-1, mount the FL cassette compartment assembly.

4-3. HC ROLLER ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 4-1, remove the RP block.
2) Disengage a claw Ⓐ and remove the HC arm assembly ①.
3) Remove a lock washer ②, then the HC roller assembly ③.

2. Mounting

1) Mount the HC roller assembly ③ and fix with a lock washer ②.
2) Mount the HC arm assembly ①.
3) Referring to 4-1, mount the RP block.

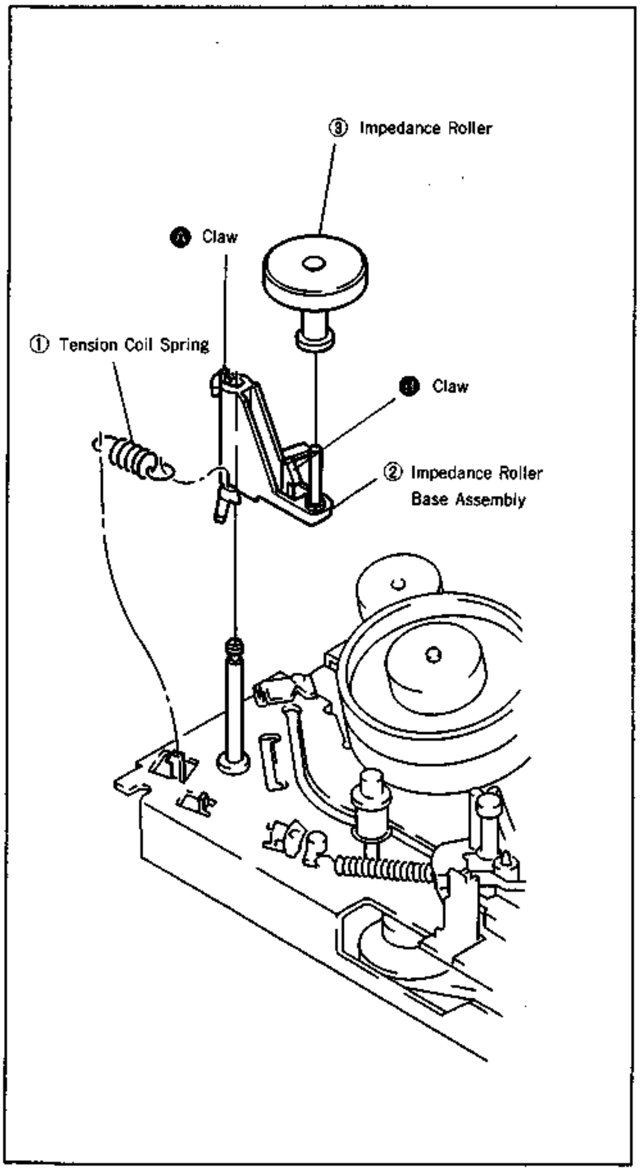


Fig. 8

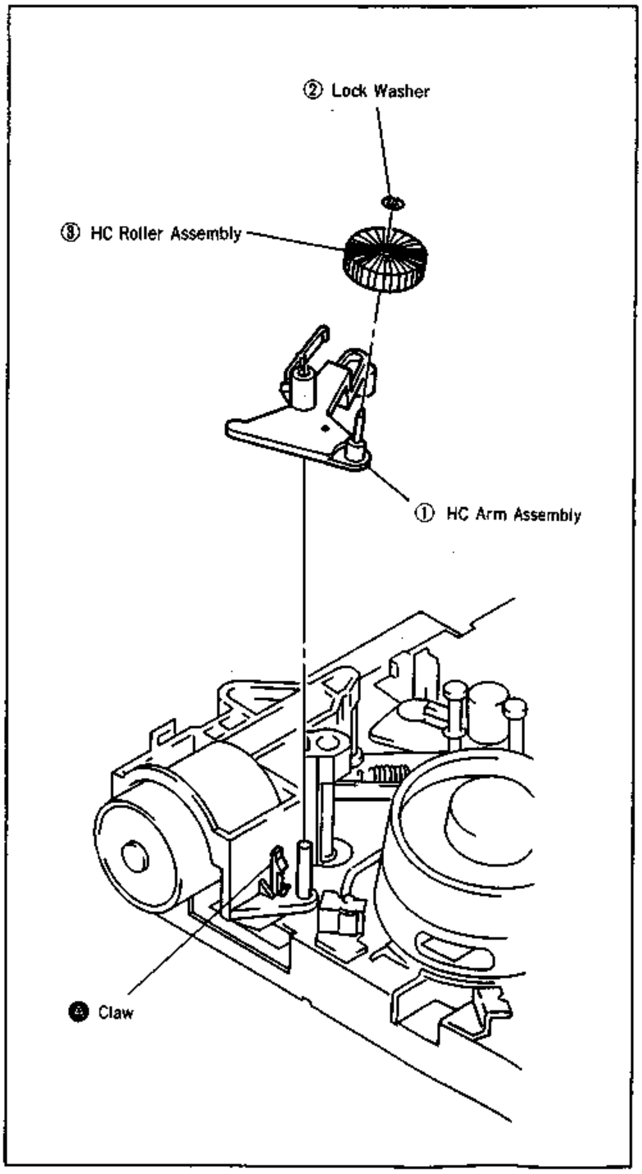


Fig. 9

4-4. PENDULUM BASE ASSEMBLY AND SOFT BRAKE ASSEMBLY (T) (Fig. 10)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove a tension coil spring ①.
3) Disengage a claw Ⓐ and remove the soft brake (T) assembly ②.
4) Remove two screws ③, then the reel unlock plate ④.
5) Remove the pendulum base assembly ⑤.

2. Mounting

1) Mount the pendulum base assembly ⑤ with its shaft Ⓑ inserted in the Ⓒ of pendulum forcing arm.
2) Mount the reel unlock plate ④ and tighten two screws (3).
3) Mount the soft brake (T) assembly ② and attach a tension coil spring ①.
4) Referring to 2-1, mount the FL cassette compartment assembly.

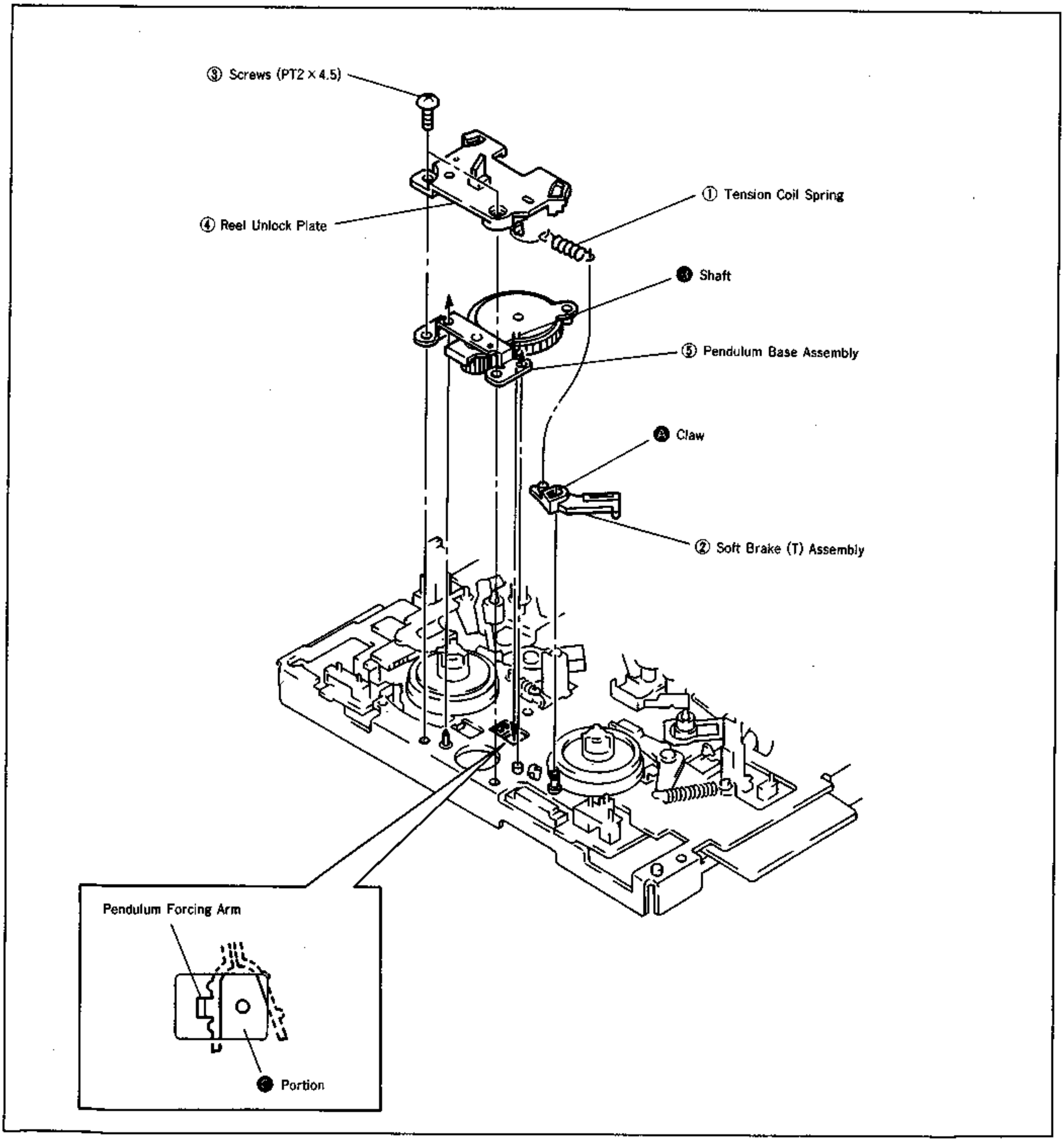


Fig. 10

4-5. BRAKE (S) ARM AND BRAKE (T) ARM ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove a tension coil spring ①.
3) Disengage a claw Ⓐ and remove the brake (S) arm ②.
4) Remove a tension coil spring ③.
5) Remove a lock washer 1.5 ④, then the brake (T) arm assembly ⑤.

2. Mounting

1) Mount the brake (T) arm assembly ⑤ with its shaft inserted into a hole Ⓓ in mechanical chassis.
2) Attach a lock washer ④.
3) Attach a tension coil spring ③.
4) Insert the shaft Ⓔ of brake (S) arm ② into a groove Ⓕ of slide plate, and the shaft Ⓖ of brake (S) drive lever into a hole Ⓗ in brake (S) arm respectively.
5) Attach a tension spring ①.
6) Referring to 2-1, mount the FL cassette compartment assembly.

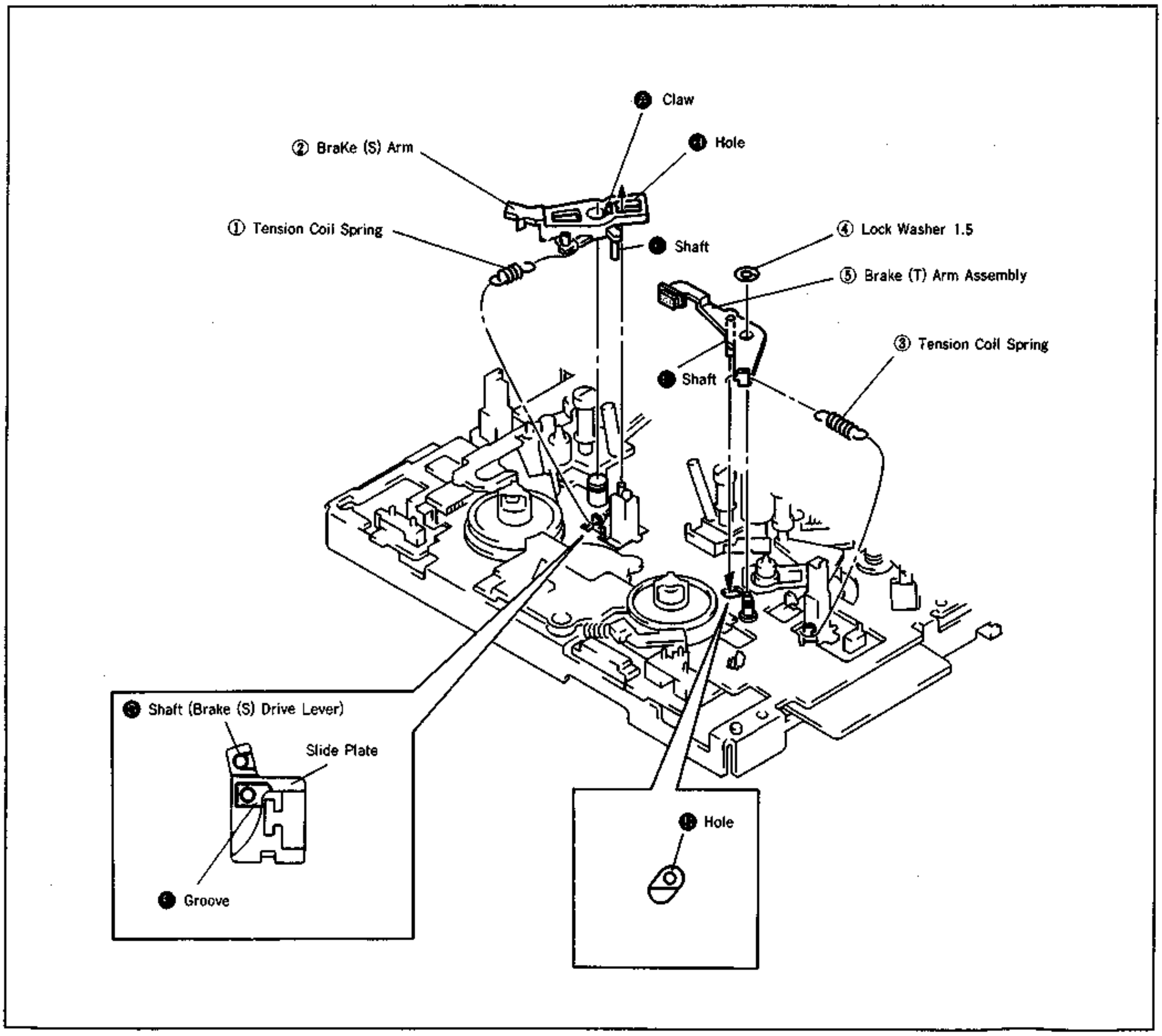


Fig. 11

4-6. TENSION REGULATOR ASSEMBLY, REEL TABLE (S) ASSEMBLY AND REEL TABLE (T) ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Referring to 4-5, remove the brake (S) arm and brake (T) arm assembly.
3) Remove a tension coil spring ①.
4) Remove a screw ②, then the tension regulator band assembly ③ and the tension regulator assembly ④.

Note : Do not twist or bend, or do not touch the felt surface when removing the tension regulator band assembly.

5) Remove the reel table (S) assembly ⑤ and the reel table (T) assembly ⑥.

2. Mounting

1) Mount the reel table (S) assembly ⑤ and the reel table (T) assembly ⑥.
2) Mount the tension regulator assembly ④ with its shafts Ⓐ, Ⓑ inserted into holes Ⓒ, Ⓓ in chassis respectively.
3) Wind the tension regulator band assembly ③ onto the reel table (S) assembly ⑤.

Note : Do not twist or bend, or do not touch the felt surface when mounting the tension regulator band assembly.

4) Mount the tension regulator band assembly ③, meeting with the dowels Ⓔ of the chassis.
5) Tighten a screw ②.
6) Attach a tension coil spring ①.
7) Referring to 4-5, mount the brake (S) arm and the brake (T) arm assembly.
8) Referring to 2-1, mount the FL cassette compartment assembly.
9) Referring to 4-23, adjust the tension regulator position.
10) Referring to 4-24, adjust the FWD back tension.

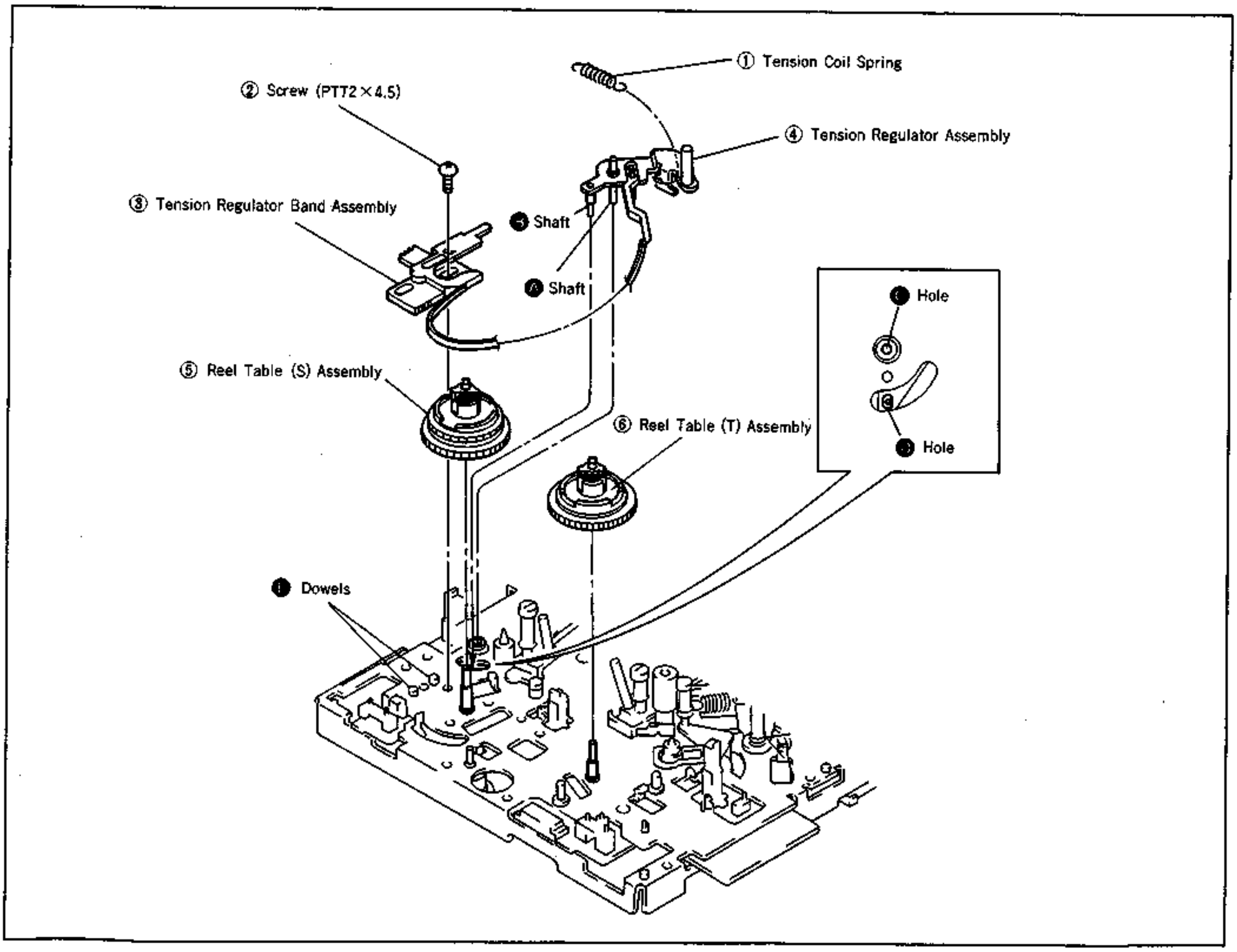


Fig. 12

4-7. TG2 ASSEMBLY (Fig. 13)

1. Removal

1) Remove the TG2 upper flange ①.
2) Remove the TG2 roller ②, TG2 sleeve ③, TG2 lower flange ④ and compression coil spring ⑤.

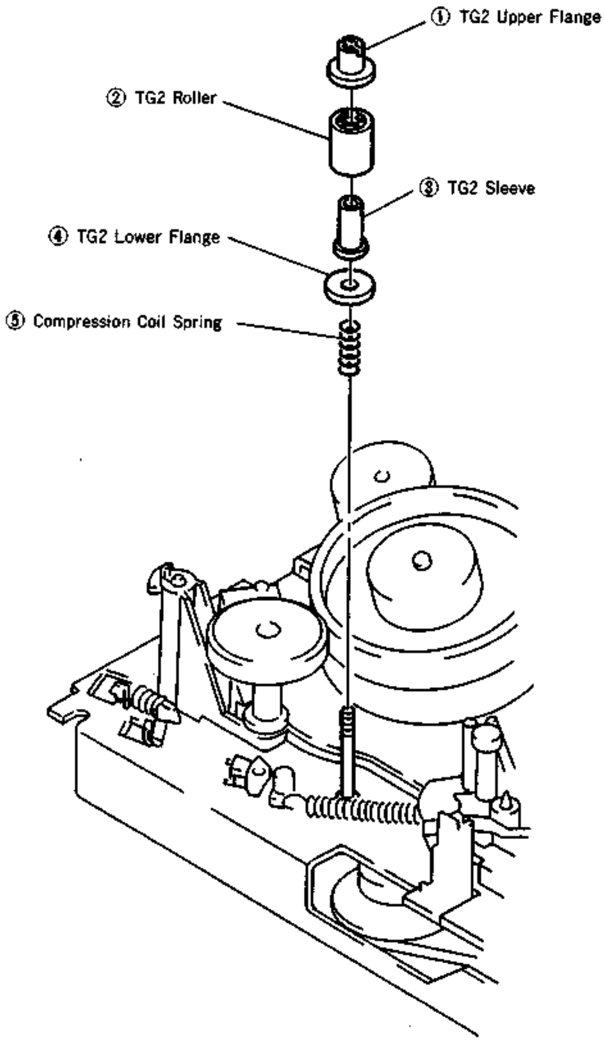
2. Mounting

1) Mount the compression coil spring ⑤, TG2 lower flange ④, TG2 sleeve ③ and TG2 roller ②.
2) Rotate the TG2 upper flange ① by 4 to 6 turns to fix on the shaft.

3. Presetting of TG2 Height

1) Rotate to adjust the TG2 upper flange ① so that the height from top surface of mechanical chassis to top surface of TG2 upper flange is 22.12mm.

Note : After mounting, perform 5. Tape Path Adjustment.



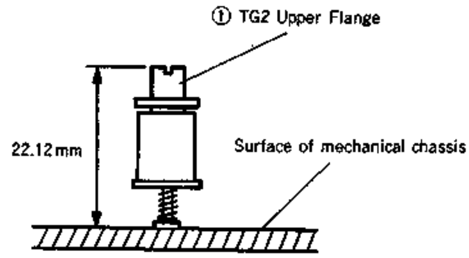


Fig. 13

4-8. TG7 ARM ASSEMBLY (Fig.14)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove the TG7 height adjusting screw ①, then the TG7 spacer ② and reel table thrust washer ③.
3) Remove the TG7 arm assembly ④ and a torsion coil spring ⑤.

2. Mounting

1) Insert the shaft Ⓐ of TG7 arm assembly ④ into a groove Ⓑ in TG7 drive lever, and attach a torsion coil spring ⑤ as shown below.
2) Mount a reel table thrust washer ③ and a TG7 spacer ②, and tighten tentatively the TG7 height adjusting screw.
   At this time, the height from mechanical chassis top surface to TG7 arm top surface should be 3.3mm.
3) Referring to 2-1, mount the FL cassette compartment assembly.

Note : After mounting, perform 5. Tape Path Adjustment.

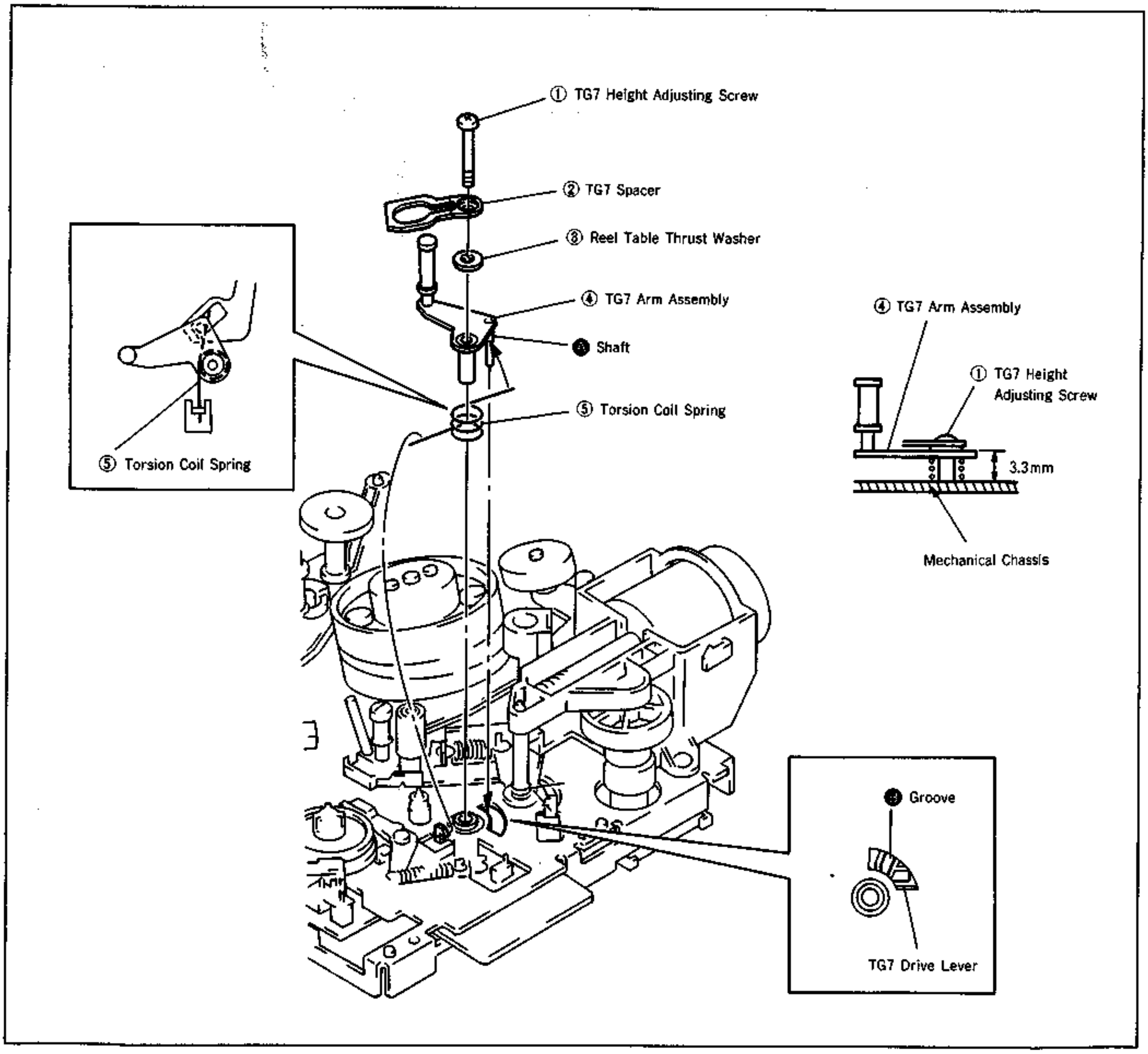


Fig. 14

4-9. CAM MOTOR ASSEMBLY (Fig. 15)

1. Removal

1) Referring to 4-1, remove the RP block.
2) Remove a screw ①.
3) Disengage a claw Ⓐ and remove the cam motor assembly ② in the arrow direction.

2. Mounting

1) Mount the cam motor assembly ② with its hole Ⓒ inserted into the shaft Ⓑ of chassis.
2) Tighten a screw ①.
3) Referring to 4-1, mount the RP block.

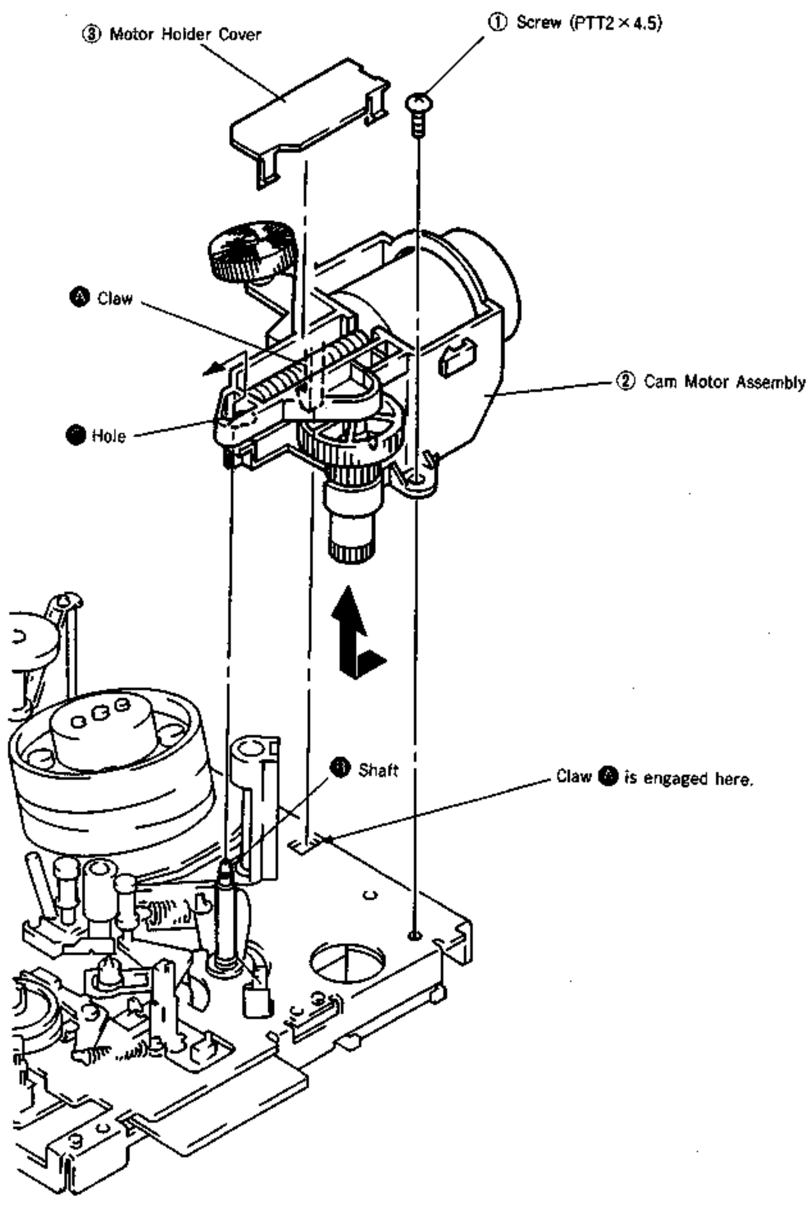


Fig. 15

4-10. PINCH ARM ASSEMBLY (Fig. 16)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Execute the loading until the pinch arm assembly ② becomes level.
3) Referring to 4-9, remove the cam motor assembly.
4) Remove a torsion coil spring ①, then the pinch arm assembly ②.

2. Mounting

1) Mount the pinch arm assembly ② with its hole Ⓐ inserted into the claw Ⓑ of pinch drive lever on the chassis.
2) Attach a torsion coil spring ① as shown below.
3) Referring to 4-9, mount the cam motor assembly.
4) Referring to 2-1, mount the FL cassette compartment assembly.

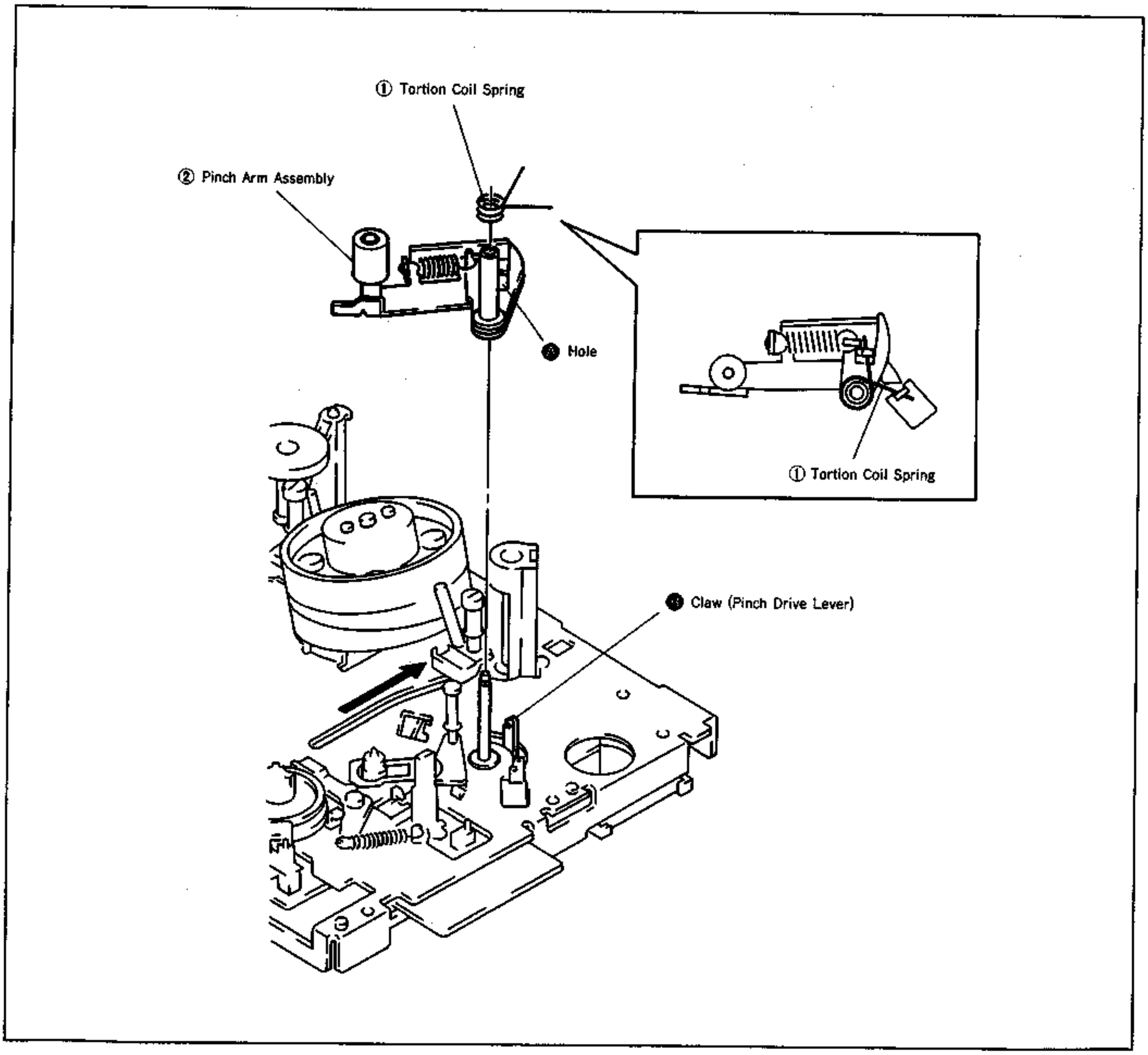


Fig. 16

4-11. WORM WHEEL BRACKET (Fig. 17)

1. Removal

1) Remove a screw ①, then the shaft earth assembly ②.
2) Remove a screw ③, then the worm wheel bracket ④ in the arrow direction.

2. Mounting

1) Mount the worm wheel bracket ④ with its hole Ⓑ inserted into the shaft Ⓐ of mechanical chassis.
2) Tighten a screw ③.
3) Mount the shaft earth assembly ② and tighten a screw ①.

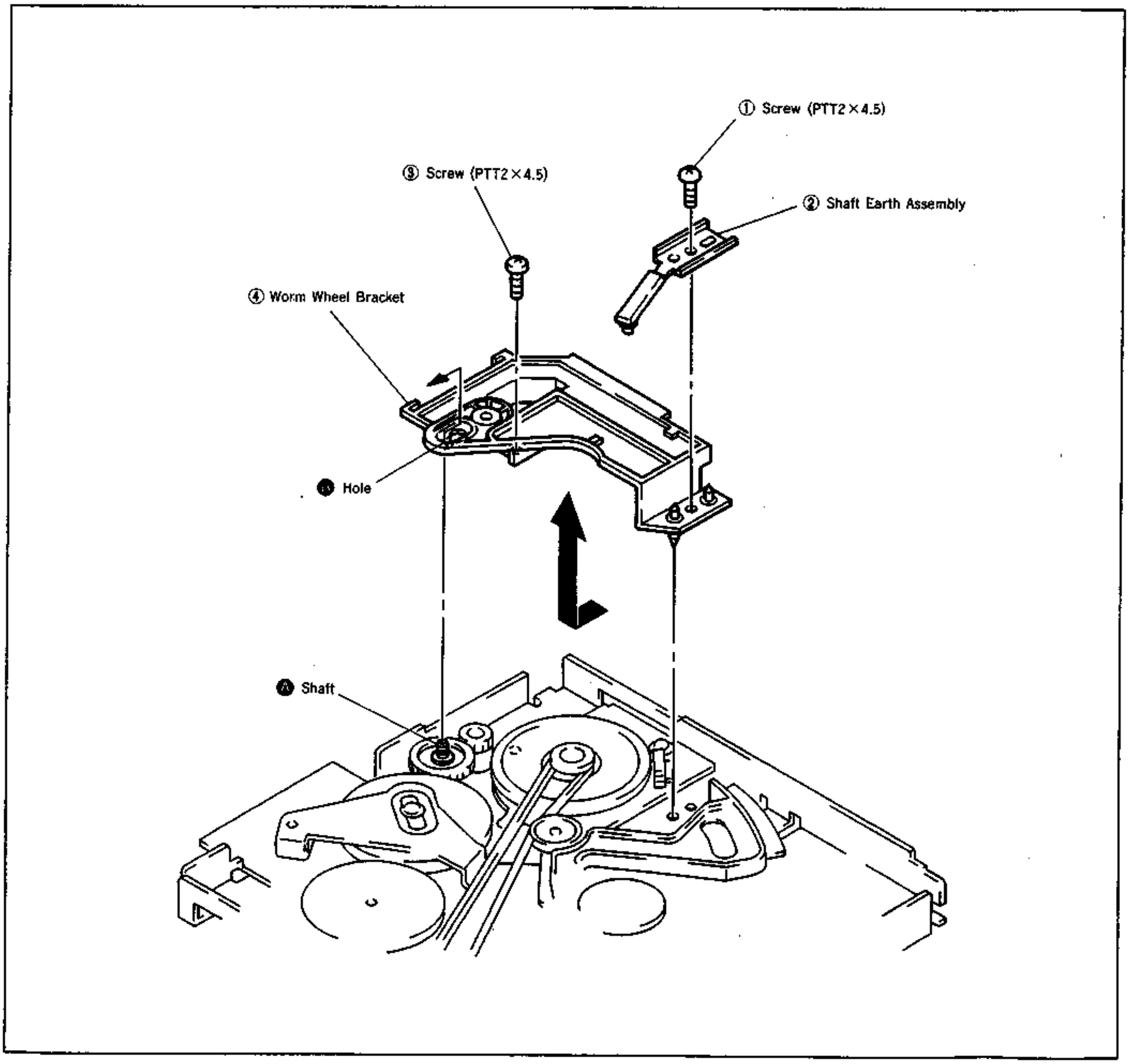


Fig. 17

4-12. CAPSTAN MOTOR (Fig. 18)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Disengage the timing belt ①.
3) Remove a screw ②, then the capstan motor ③.

2. Mounting

1) Mount the capstan motor ③ with its dowels Ⓑ inserted into holes Ⓐ in the mechanical chassis at two places.

Note : Do not touch the capstan motor shaft, oil seal and rotor.

2) Tighten a screw ②.
3) Engage the timing belt ①.
4) Referring to 4-11, mount the worm wheel bracket.

Note : After mounting, perform 5. Tape Path Adjustment.

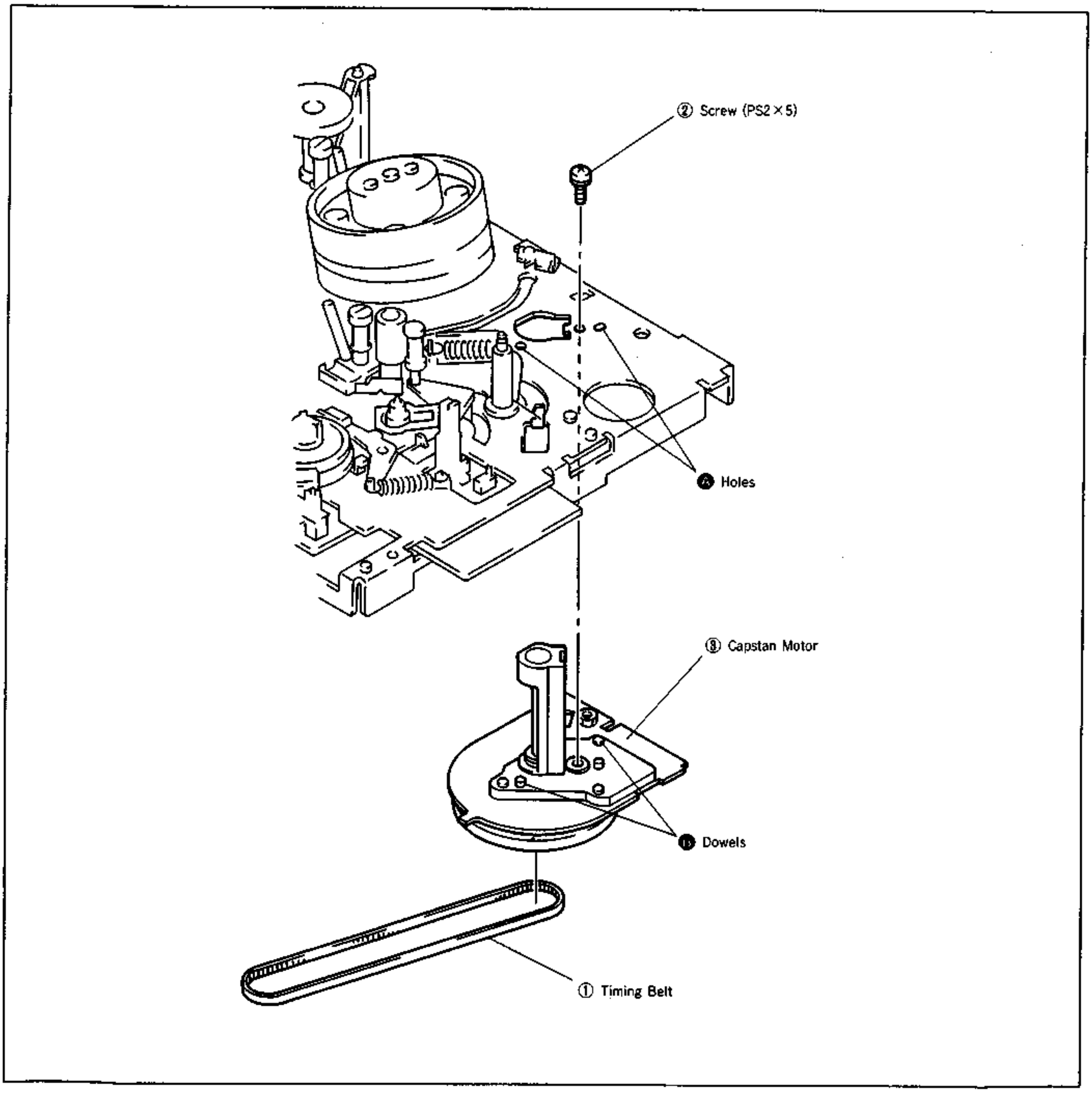


Fig. 18

4-13. DRUM ASSEMBLY (Fig. 19)

1. Removal

1) Referring to 4-1. RP Block, disconnect the connector for drum.
2) Remove three screws (M2x5) ①.
3) Remove the drum assembly ②.

Note : Do not touch the outer surface of drum; hold portions (A) and (B) of drum.

2. Mounting

1) Mount the drum ② while aligning with dowels Ⓐ of chassis at two places.

Note : Do not touch the outer surface of drum; hold portions (A) and (B) of drum.

2) Tighten three screws (M2x5) ①.
   2)-1 Tighten a screw ⓐ to the torque 29.42mN·m (300g·cm).
   2)-2 Tighten a screw ⓑ to the torque 29.42mN·m (300g·cm), then return 45°. (Apply a screw locking agent.)
   2)-3 Tighten a screw ⓒ to the torque 29.42mN·m (300g·cm), then return 45°. (Apply a screw locking agent.)

Note : After mounting, perform 5. Tape Path Adjustment.

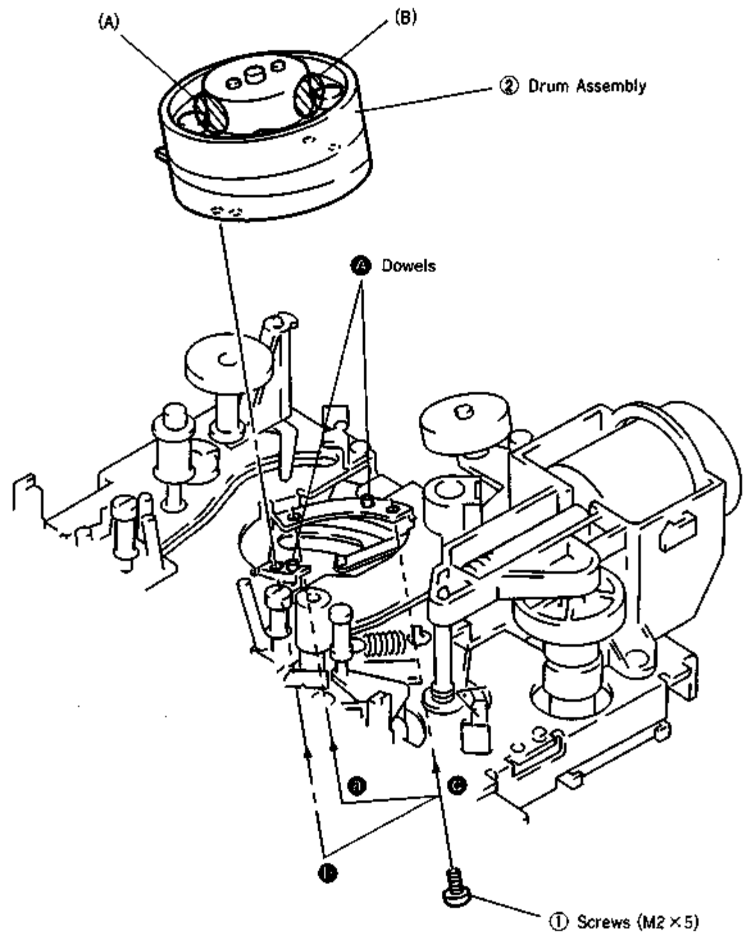


Fig. 19

4-14. PULLEY BASE ASSEMBLY (Fig. 20)

1. Removal

1) Remove a screw ①, then the W2, middle ②.
2) Disengage a claw Ⓐ and remove the pulley base assembly ③.

2. Mounting

1) Mount the pulley base assembly ③ on the shaft Ⓓ of mechanical chassis, and engage the timing belt Ⓒ with the pulley Ⓑ.
2) Mount the W2, middle ② and tighten tentatively the screw ①.
3) Tighten the screw ① at the position where the portion (A) of pulley base assembly ③ is pushed with 14g force.

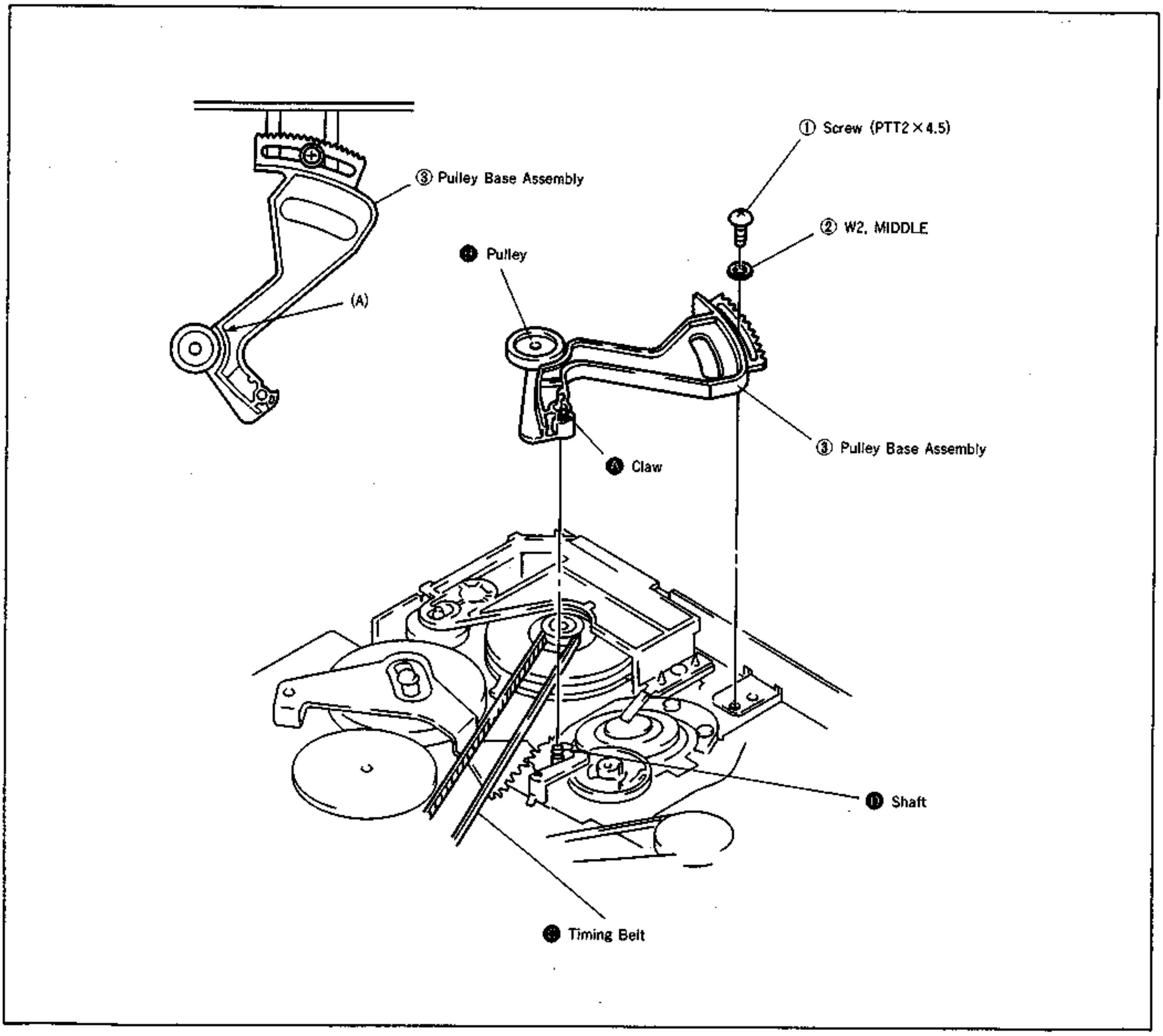


Fig. 20

4-15. LOADING DRIVE LEVER (Fig. 21)

1. Removal

1) Disengage the timing belt ①.
2) Remove a screw ②, then the W3, small ③.
3) Remove the loading drive lever ④.

2. Mounting

1) Mount the loading drive lever ④ on the shaft Ⓐ of chassis with its shaft Ⓓ inserted into the loading roller ⑤.
   At this time, insert the shaft Ⓑ of main cam into the hole Ⓒ in loading drive lever, the shaft Ⓓ of loading drive lever into a slot Ⓔ in main cam, and align a line Ⓕ on loading drive lever with a line Ⓖ on loading gear (T) respectively.
2) Mount the W3, small ③ and tighten tentatively the screw ②.
3) Engage the timing belt ①.

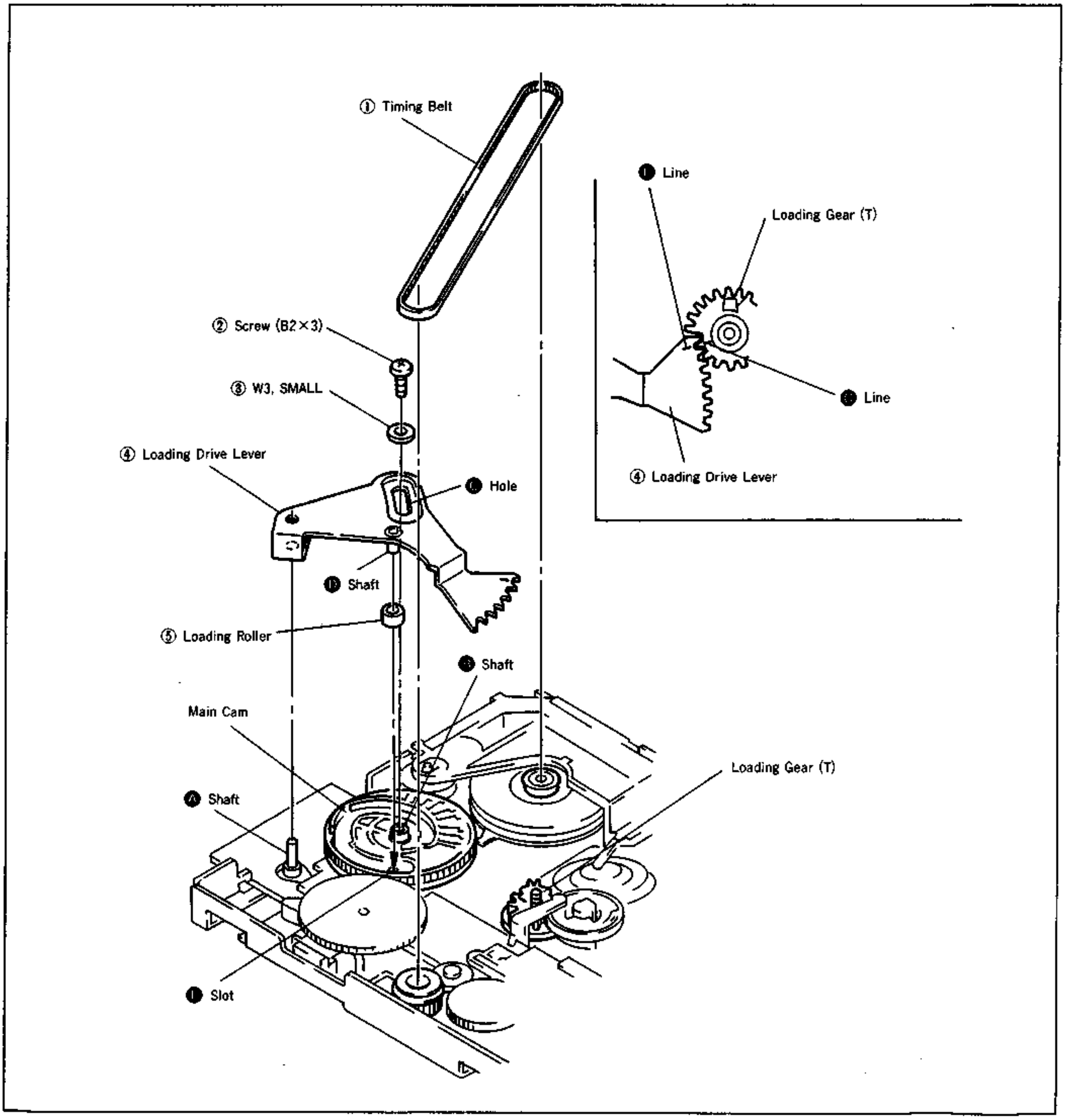


Fig. 21

4-16. ROTARY SWITCH AND MAIN CAM (Fig. 22)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Referring to 4-15, remove the loading drive lever.
3) Remove the cam relay gear ①.
4) Disengage claws Ⓐ at two places, and disconnect the rotary switch ② from the connector Ⓑ.
5) Remove the main cam ③.

2. Mounting

1) Mount the main cam ③ with its cam groove Ⓒ inserted into the shaft Ⓓ of slide plate drive lever, and cam groove Ⓔ into the shaft Ⓕ of pinch drive lever respectively.
2) Referring to 4-15, mount the loading drive lever.
3) Mount the cam relay gear ①.
4) Referring to 4-11, mount the worm wheel bracket.
5) Connect the rotary switch ② to the connector Ⓑ while aligning ▲ marks each other, and its recess Ⓗ with the recess Ⓖ of main cam ③.

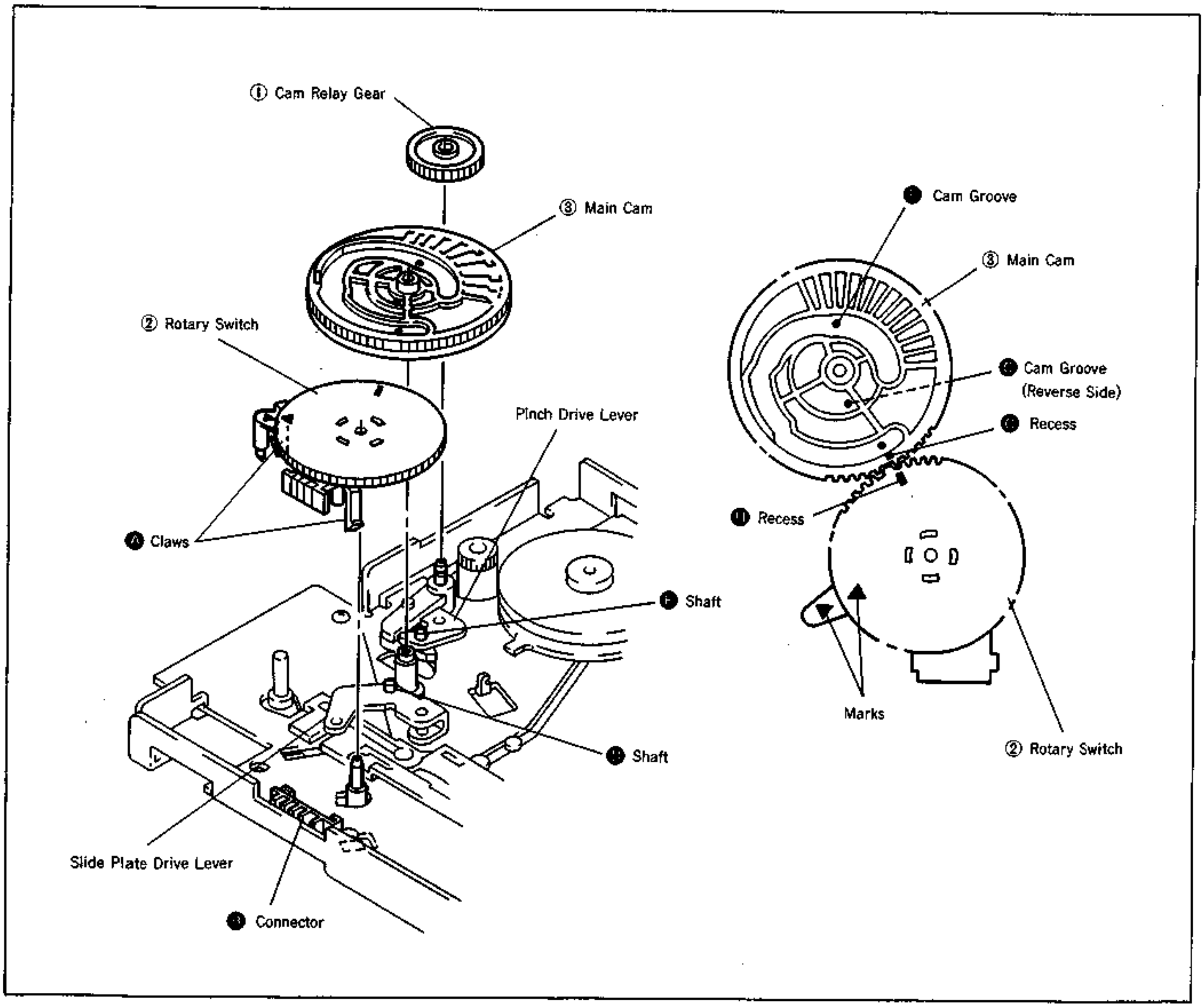


Fig. 22

4-17. SLIDE PLATE (Fig. 23)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Referring to 4-15, remove the loading drive lever.
3) Referring to 4-16, remove the rotary switch and main cam.
4) Remove the slide plate drive lever ①.
5) Disengage the timing belt ②.
6) Disengage a claw Ⓐ and remove the FL pulley gear (drive) ③.
7) Remove a tension coil spring ④, then the FL switching arm assembly ⑤.
8) Remove the brake (S) drive lever ⑧.
9) Remove two lock washers 1.5 ⑥, then the slide plate ⑦.

2. Mounting

1) Mount the slide plate ⑦ with its groove Ⓑ inserted into the shaft Ⓒ of chassis, the groove Ⓓ into the shaft Ⓔ of S take-up assembly, and the groove Ⓕ into the shaft Ⓖ respectively.
   At this time, insert the shaft Ⓗ into the groove Ⓚ in slide plate while holding the tension regulator sub-arm toward the arrow.
2) Mount two lock washers 1.5 ⑥.
3) Referring to 3) of Mounting in 4-18, mount the brake (S) drive lever ⑧.
4) Mount the FL switching arm assembly ⑤ and a tension coil spring (4).
5) Mount the FL pulley gear (drive) ③ and engage the timing belt ②.
6) Mount the slide plate drive lever ① with its shaft Ⓜ inserted into a groove Ⓞ in slide plate ⑦, and its hole into the shaft Ⓟ of chassis.
7) Referring to 4-16, mount the rotary switch and main cam.
8) Referring to 4-15, mount the loading drive lever.
9) Referring to 4-11, mount the worm wheel bracket.

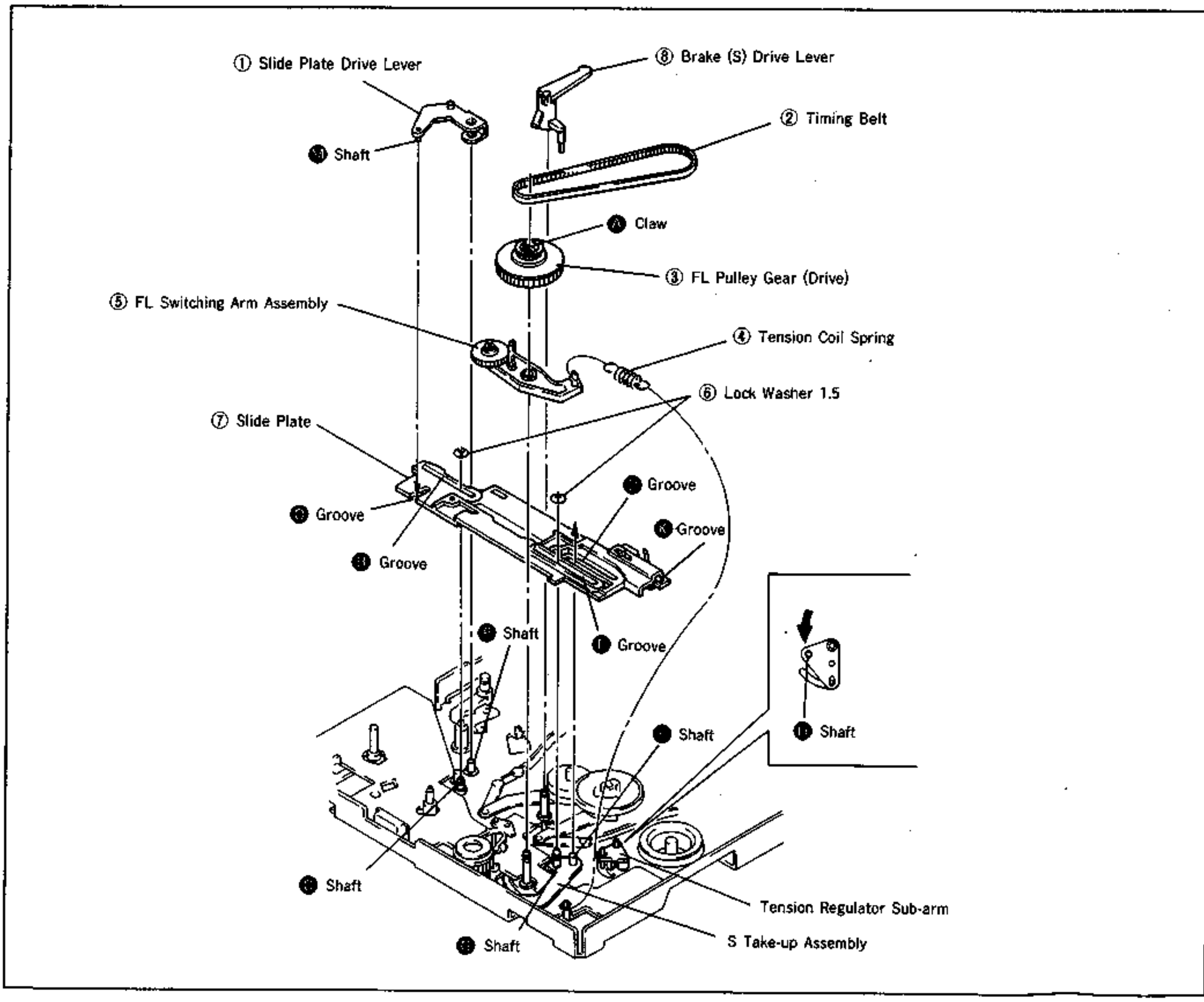


Fig. 23

4-18. LOADING GEAR (S) ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 4-15, remove the loading drive lever.
2) Disengage a claw Ⓐ and remove the brake (S) drive lever ①.
3) Remove the coaster leaf spring ②.
4) Disengage a claw Ⓑ and remove the loading gear (S) assembly ③.

2. Mounting

1) Mount the loading gear (S) assembly ③ on the shaft Ⓒ of chassis with its arm engaged with the shaft Ⓓ of coaster.
   At this time, align the portion Ⓔ of loading gear (T) assembly with the portion Ⓕ of loading gear (S) assembly.
2) Mount the coaster leaf spring ②.
3) Mount the brake (S) drive lever ① on the shaft Ⓖ of chassis with its shaft Ⓙ inserted into the portion Ⓖ of brake (S) arm, and the shaft Ⓗ into the groove Ⓚ in loading gear (S) assembly ③.
4) Referring to 4-15, mount the loading drive lever.

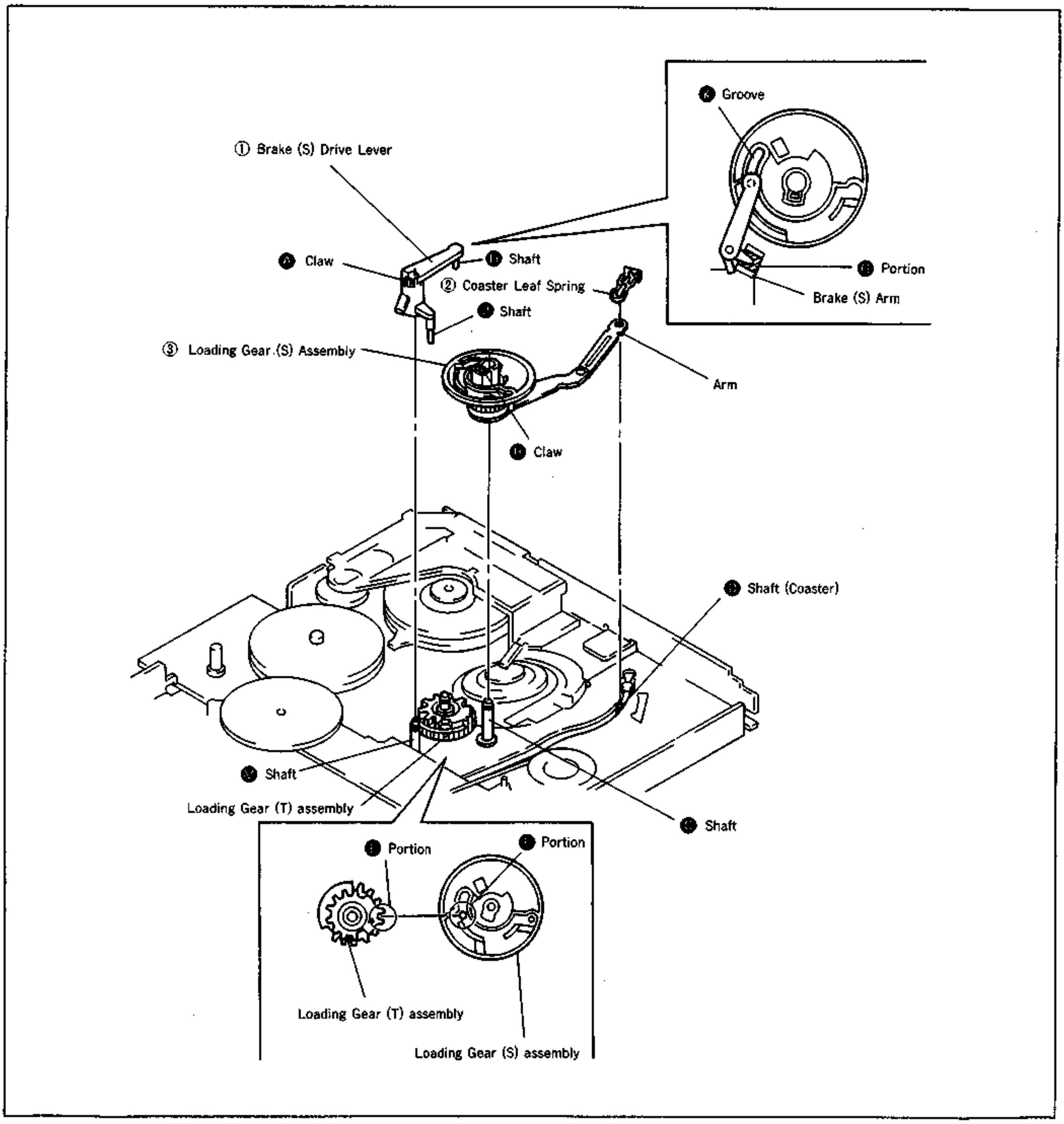


Fig. 24

4-19. LOADING GEAR (T) ASSEMBLY (Fig. 25)

1. Removal

1) Referring to 4-15, remove the loading drive lever.
2) Referring to 4-18, remove the loading gear (S) assembly.
3) Remove the coaster leaf spring ①, then the loading gear (T) assembly ②.

2. Mounting

1) Mount the loading gear (T) assembly ② on the shaft Ⓐ of chassis with its arm engaged with the shaft Ⓑ of coaster.
2) Mount the coaster leaf spring ①.
3) Referring to 4-18, mount the loading gear (S) assembly.
4) Referring to 4-15, remove the loading drive lever.

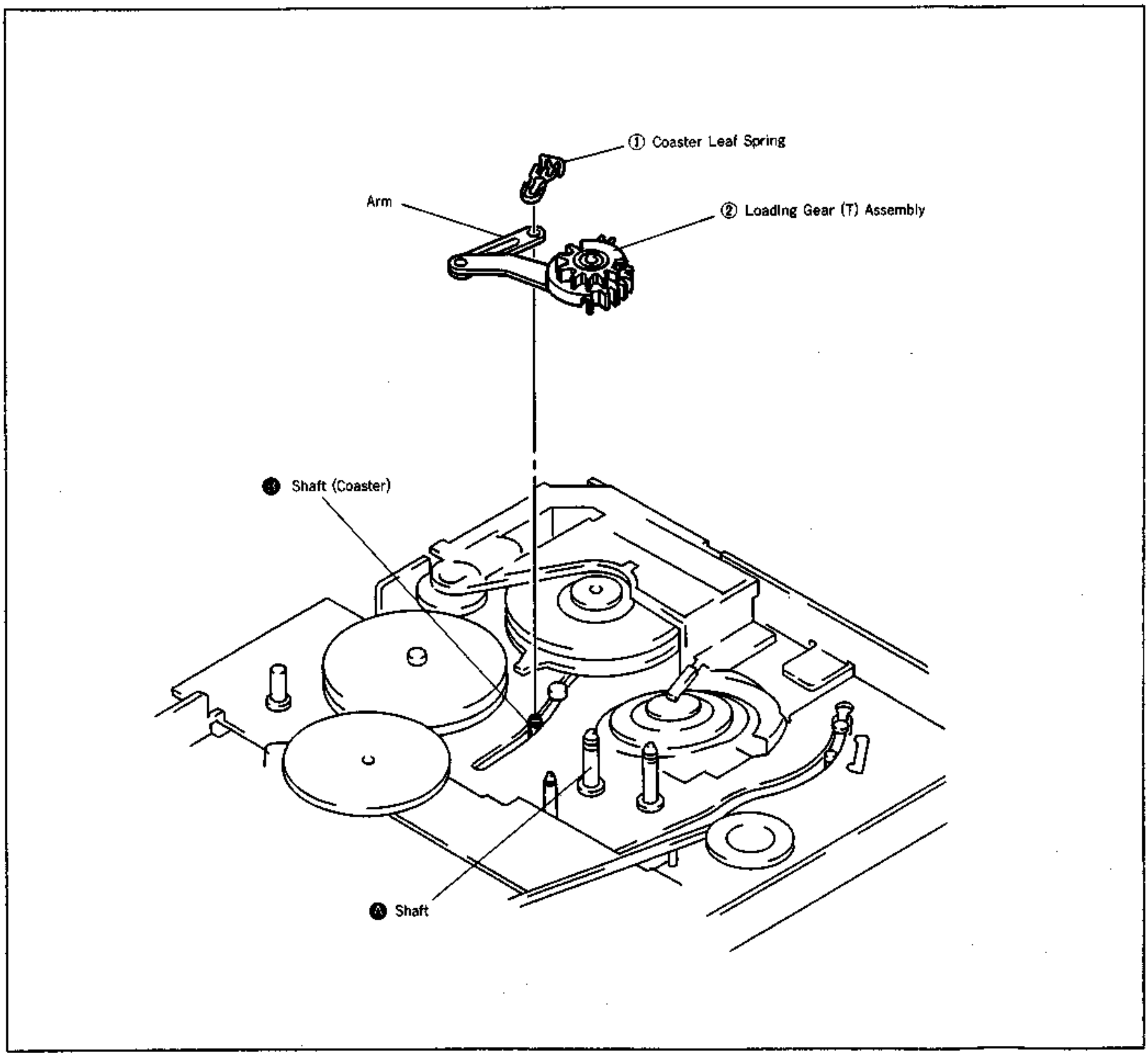


Fig. 25

4-20. COASTER (S) (Fig. 26)

1. Removal

1) Referring to 4-2, remove the impedance roller assembly.
2) Remove a screw ①, then the catcher (S) ②.
3) Remove the coaster leaf spring ③, then the coaster (S) ④.

2. Mounting

1) Mount the coaster (S) ④.
2) Mount the catcher (S) ② with its holes inserted into dowels Ⓐ of chassis at two places.
3) Tighten a screw ①.
4) Referring to 4-18 Loading Gear (S) Assembly, mount the coaster leaf spring ③.
5) Referring to 4-2, mount the impedance roller assembly.

4-21. COASTER (T) (Fig. 27)

1. Removal

1) Remove a screw ①, then the catcher (T) ②.
2) Remove the coaster leaf spring ③, then the coaster (T) ④.

2. Mounting

1) Mount the coaster (T) ④.
2) Mount the catcher (T) ② with its holes inserted into dowels Ⓐ of chassis at two places.
3) Referring to 4-19 Loading Gear (T) Assembly, mount the coaster leaf spring ③.

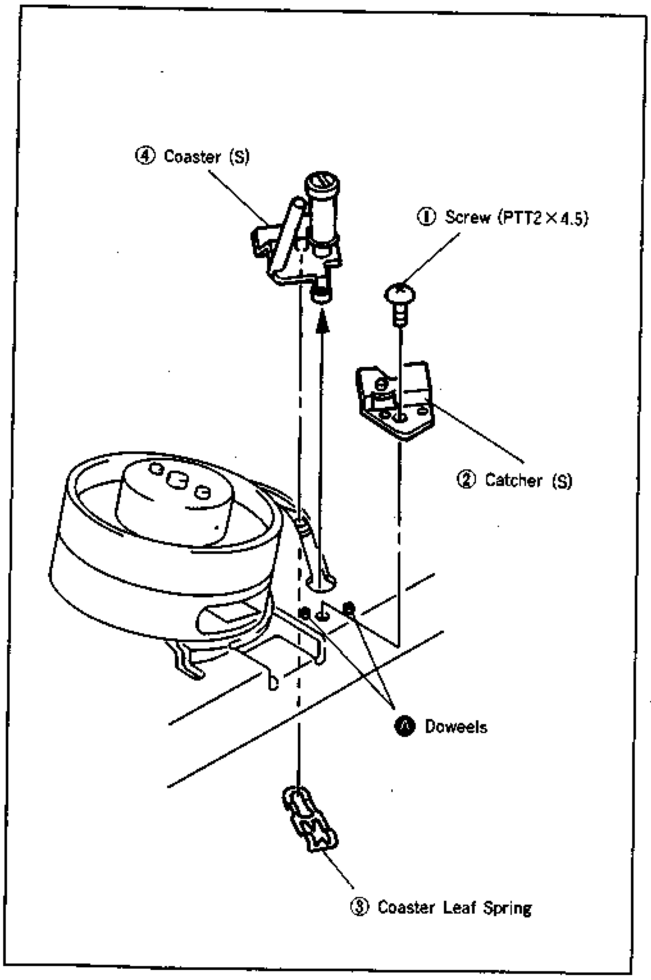


Fig. 26

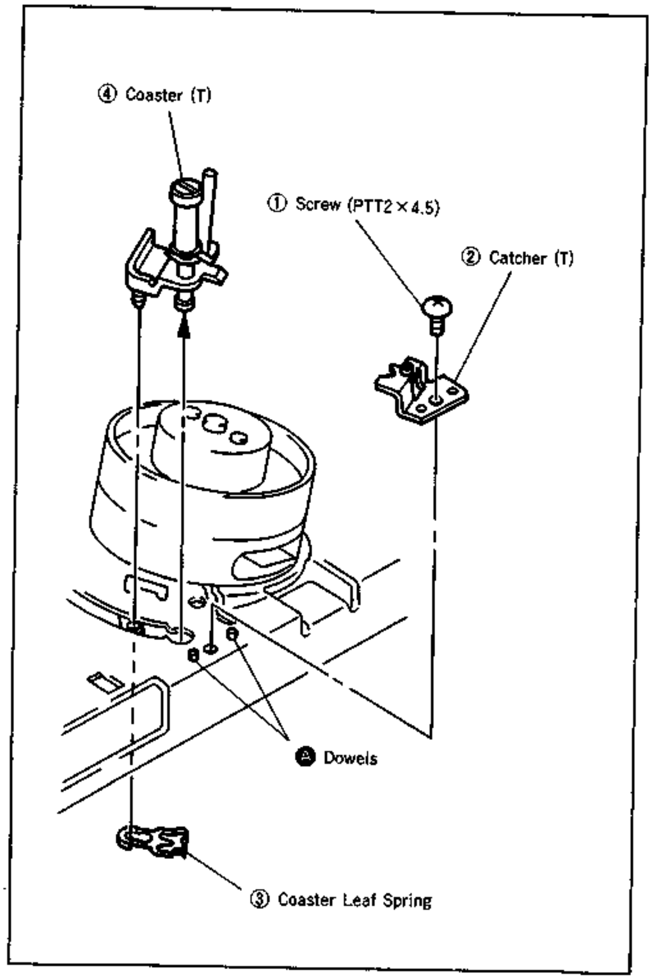


Fig. 27

4-22. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws ① (Fig. 28).
2) Mount the jig ② (Ref. No. J-8) with the two supplied screws ③, then screw the attached hexagon socket screws ④ to the jig ②. The rotary upper drum ⑤ will move upward and come off (Fig. 29).

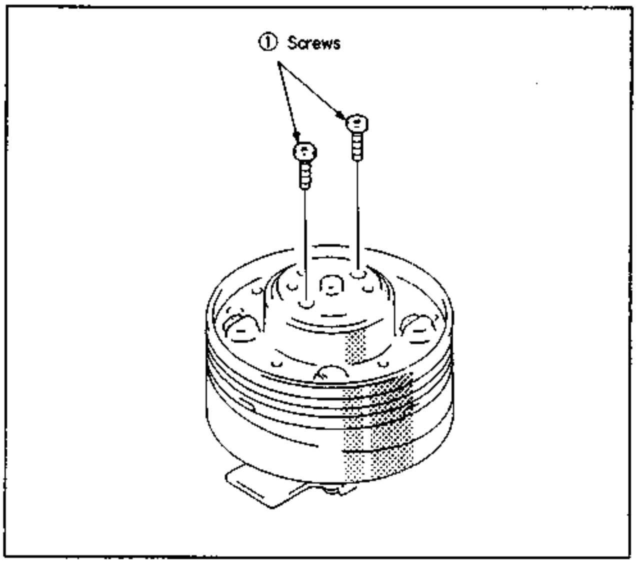


Fig. 28

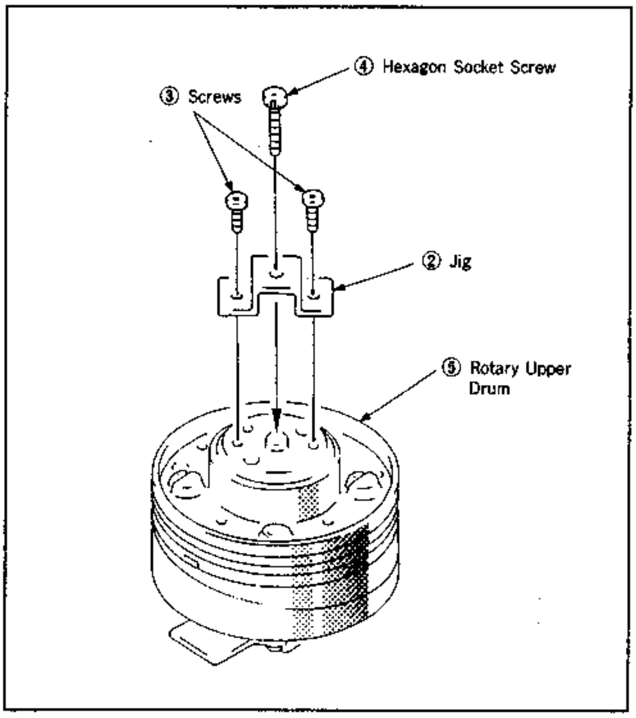


Fig. 29

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ⑤ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ⑥ (Ref. No. J-8) into the drum positioining hole, then set then set the rotary upper drum ⑤ by passing the jig through its positioning hole ⑦. (Fig.30)
3) Remove the jig ⑥ and push down the rotary upper drum ⑤ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws ① alternately (Fig.28).
4) Tighten strongly both two screws ①, and loosen both screws once, then tighten them again (for stable seating).
5) Insert the jig ⑥ into the positioning hole ⑦ again and confirm that it goes in smoothly. If it does not, loosen the two screws ①, repeat step 2) of the Removal paragraph and restart the setting procedure.
6) Tighten the screws ①.

Note : After installing, be sure to perform tape path adjustment as described in section 5.

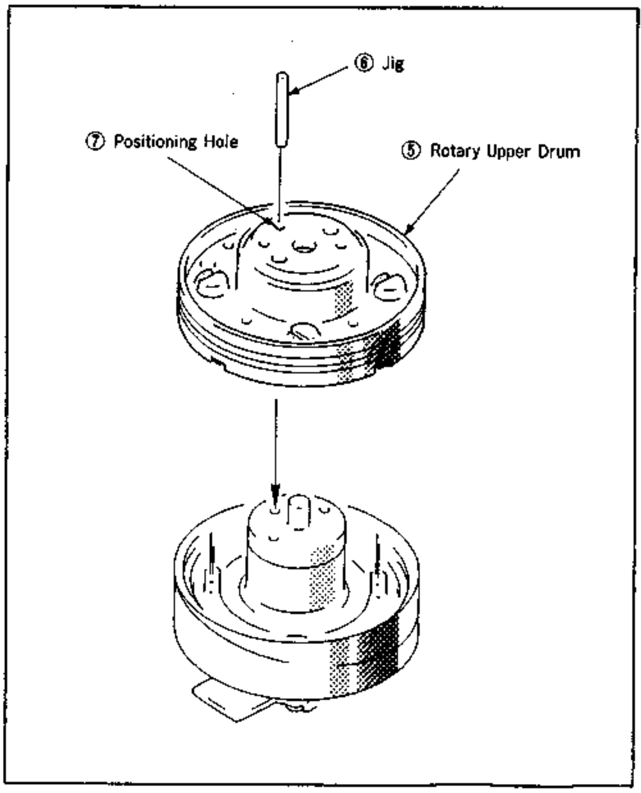


Fig. 30

4-23. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 31)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 5.5 mm. (On the centerline of TG2 guide)
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ①.
5) If No.1 guide is located inside the specified position, shift the tension adjusting base toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-13). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ①.

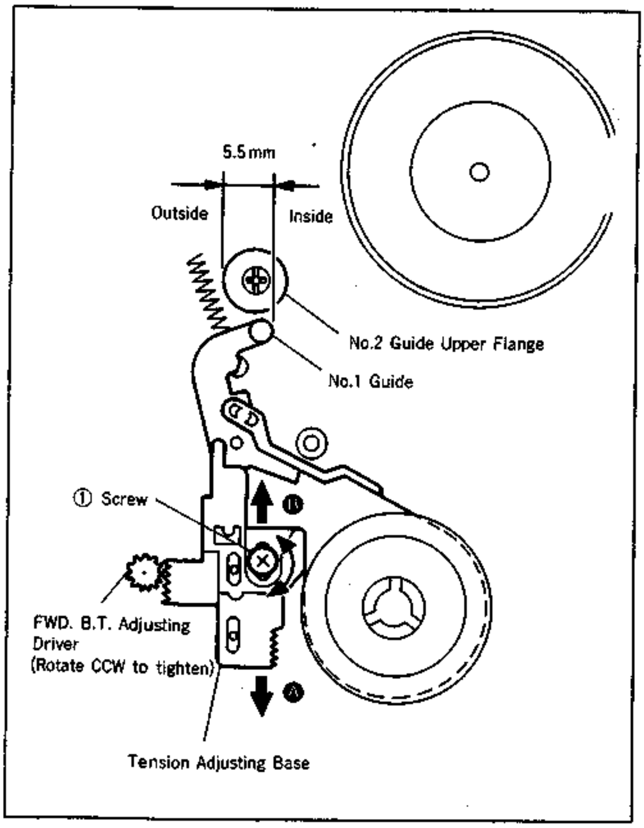


Fig. 31

4-24. FWD BACK TENSION ADJUSTMENT (Fig. 32)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-10).
2) Set the torque cassette (Ref No. J-7).
3) Select the FWD mode, and check that the torque of S reel table is 0.88 ~ 1.17mN·m (9 ~ 12g·cm). If it is out of standard, adjust the tension adjusting arm position.

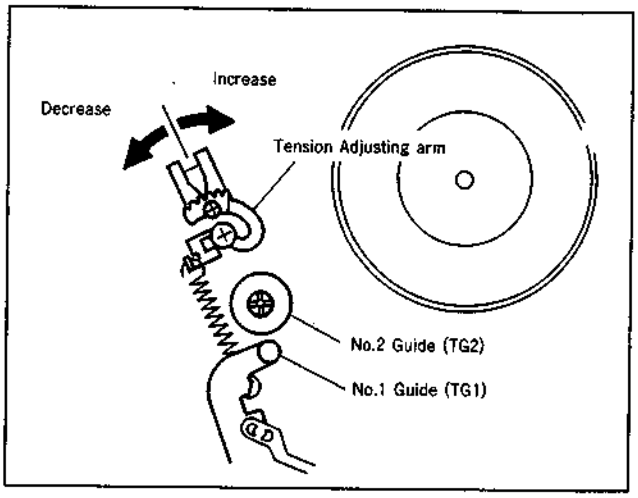


Fig. 32

4-25. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 0.98 ~ 1.96mN·m (10 ~ 20g·cm).
3) Select the RVS mode, and check that the torque fluctuation center of S reel table is 1.77 ~ 2.75mN·m (18 ~ 28g·cm).
4) Select the REV mode, and check that the torque of T reeltable is 0.98 ~ 1.96mN·m (10 ~ 20g·cm).
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4-26. FL WORM WHEEL (Fig. 33)

1. Removal

1) Disengage tabs Ⓐ at four places and remove the gear cover ①.
2) Remove the drive gear ②, then the FL worm wheel ③.

2. Mounting

1) Mount the FL worm wheel ③.
2) Meet a hole Ⓑ in drive arm (T) on right side with a hole in chassis, and also a hole Ⓒ in FL worm wheel ③ with a hole in side plate.
   Meet a hole Ⓓ in drive gear ② with a hole in side plate.
   Meeting respective holes, mount the drive gear ②.
3) Mount the gear cover ①.

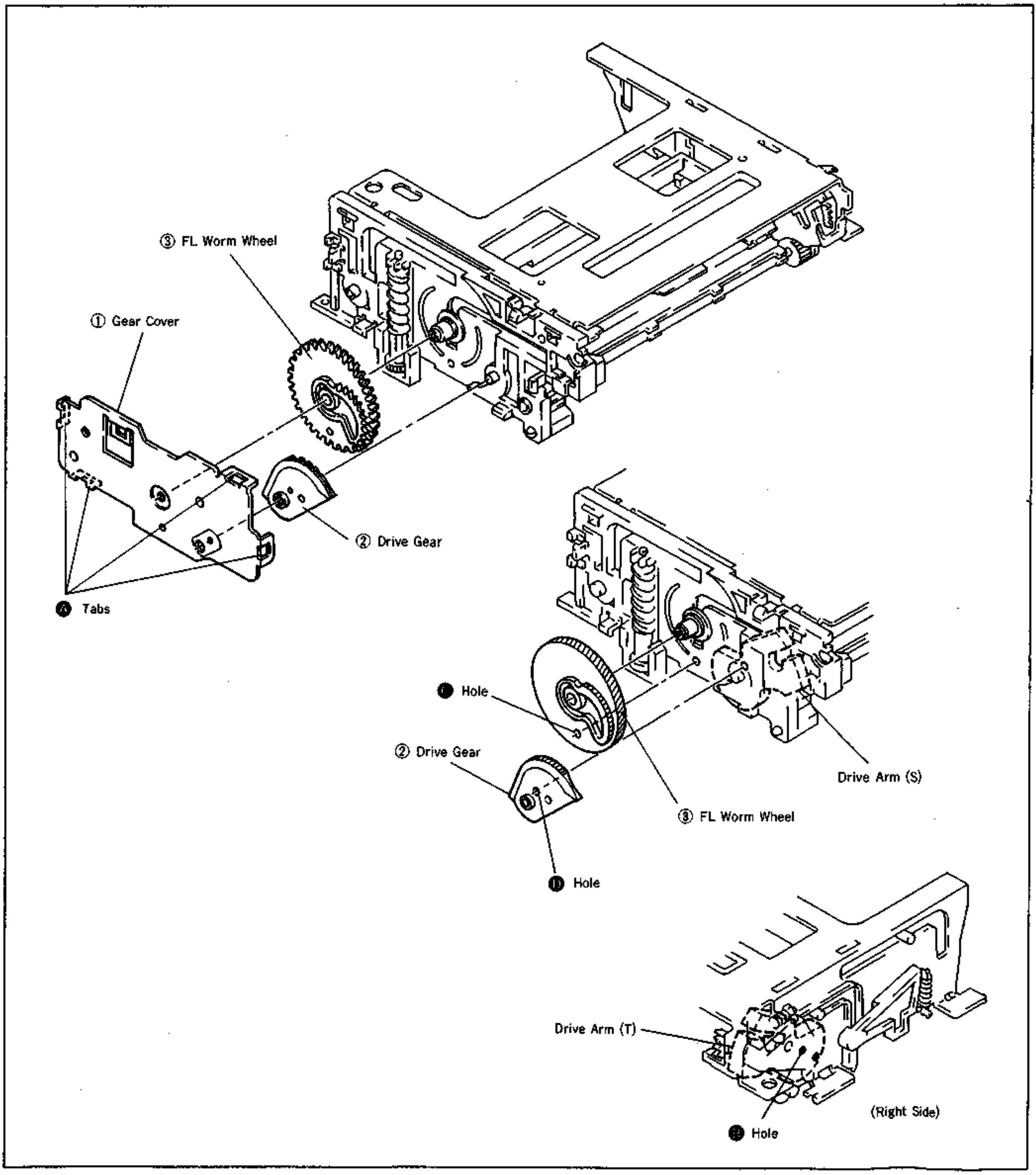


Fig. 33

5. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the F mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No. J-10). So, fine tracking adjustment can be easily done.
Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

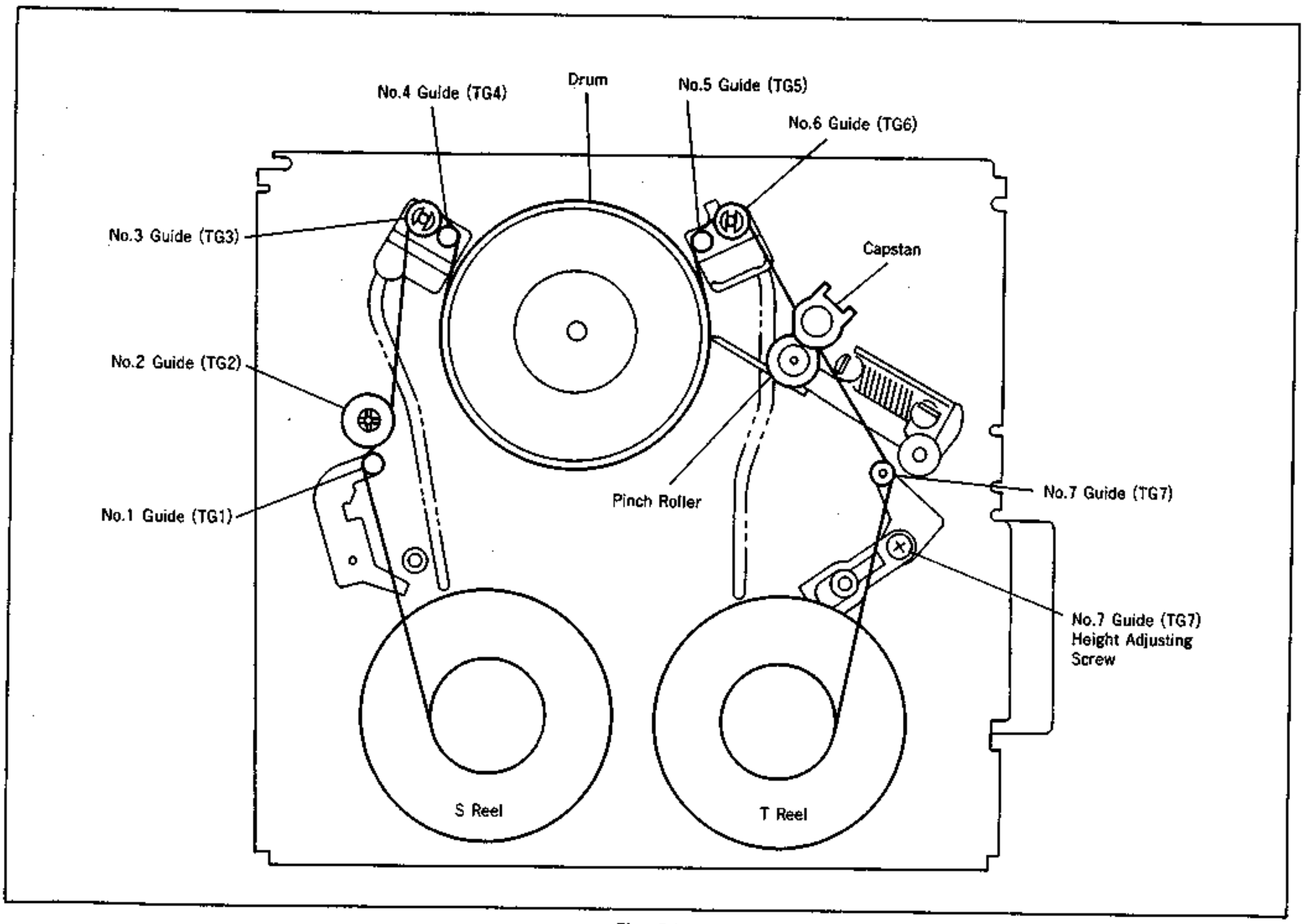


Fig. 34

[Note on Adjustment of No.7 Guide (TG7)]

The height adjustment screw for No.7 guide (TG7) is located at some distance from the guide (refer to Fig.42).
Therefore, when performing section 5-4. No.7 Guide (TG7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

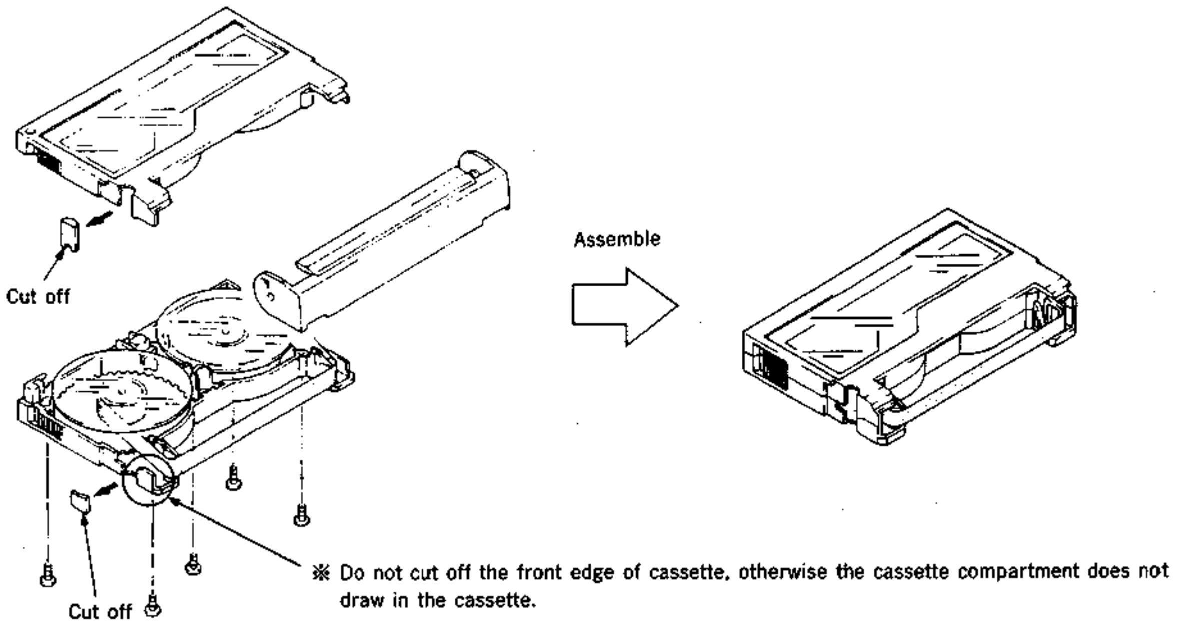


Fig. 35

5-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
4) Play back a tracking alignment tape (NTSC : WR5-1NP, or PAL : WR5-1CP).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 36 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 36 ⓑ and ⓒ.

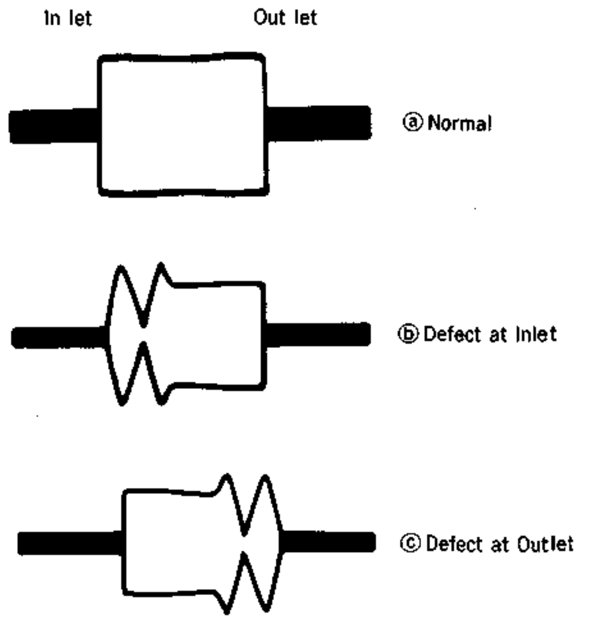


Fig. 36

5-2. TRACKING ADJUSTMENT (Fig. 37, 38)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG3) lock screw ① and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG3) lock screw ① to lock the No.3 guide.
4) Loosen the No.6 guide (TG6) lock screw ② and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG6) lock screw ② to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

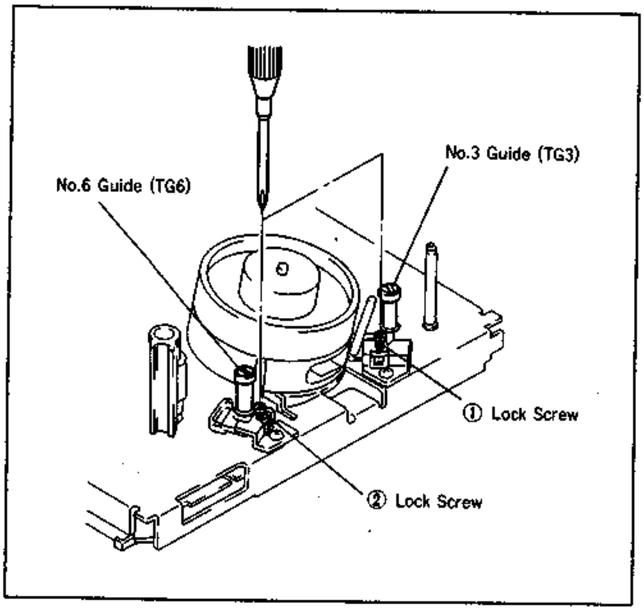


Fig. 37

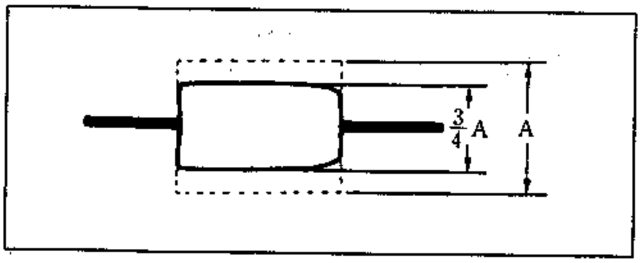


Fig. 38

5-3. No.2 GUIDE (TG2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

5-3-1. No. 2 GUIDE (TG2) HEIGHT PRESETTING (Fig. 39)

1) Rotating the TG2 upper flange, adjust the height from top surface of mechanical chassis to top surface of TG2 upper flange to 22.12mm.

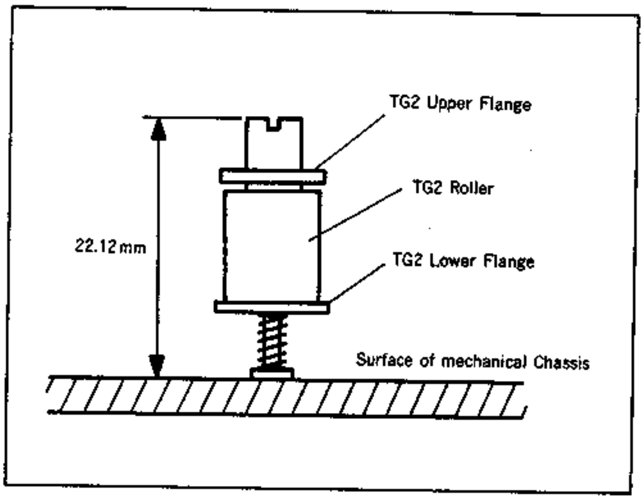


Fig. 39

[Reference]
This F mechanism is equipped with four adjustable guides (TG2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG7	Raise	Clockwese
	Lower	Counterclockwise

5-3-2. No. 2 GUIDE (TG2) ADJUSTMENT (Fig. 40, 41)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ② of the No.2 guide (TG2) ① (Fig. 40). If it is, turn the upper flange ③ of the No.2 guide (TG2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 5-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 41), turn the upper flange ③ of the No. 2 guide (TG2) ① 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

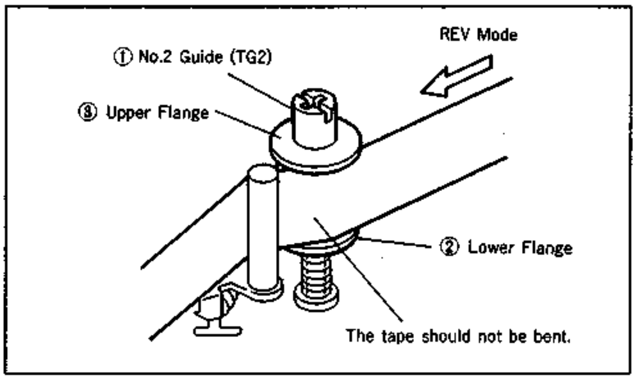


Fig. 40

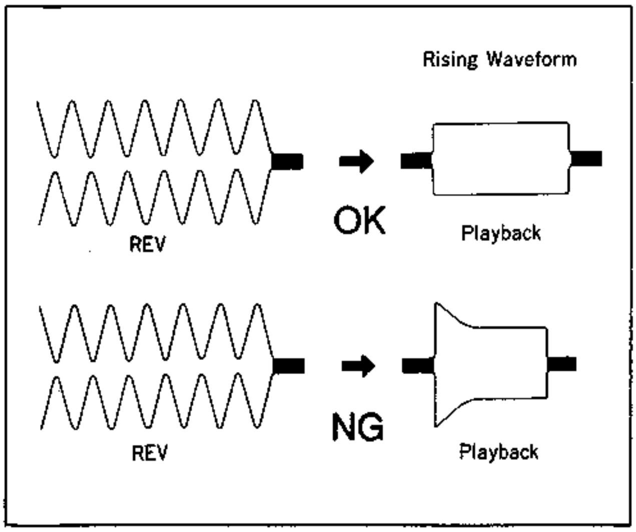


Fig. 41

5-4. No.7 GUIDE (TG7) ADJUSTMENT (Fig. 42)

Note: This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 35).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG6) ① and the capstan ②. If it is, turn the hight adjusting screw ④of the No.7 guide (TG7) ③ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the No.7 guide (TG7) ③ (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the hight adjusting screw ④ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG6) ① and the capstan ② is 0.3mm or less, adjustment can be considered completed.

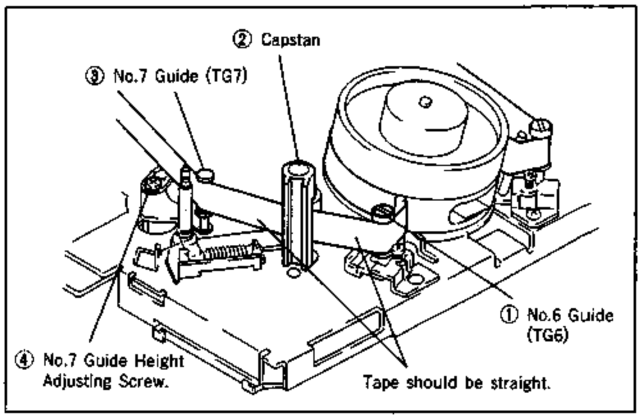


Fig. 42

5-5. CUE AND REV WAVEFORM CHECK (Fig. 43)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 43). In case pitch is not constant, perform section 5-2.Tracking Fine Adjustment and section 5-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig. 43).
   Otherwise, perform section 5-2 Tracking Fine Adjustment.

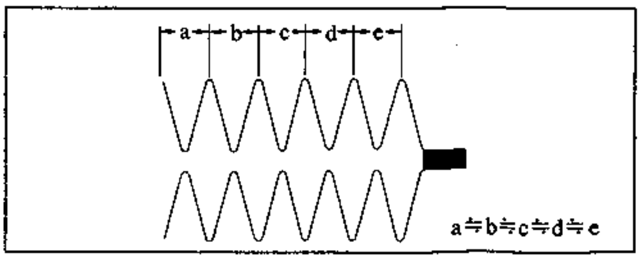


Fig. 43

5-6. CHECK AFTER ADJUSTMENT

5-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 44).
2) Then, confirm that the minimum amplitude value (E_{MIN}) is 65% of the maximum value (E_{MAX}) or larger (Fig. 45).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

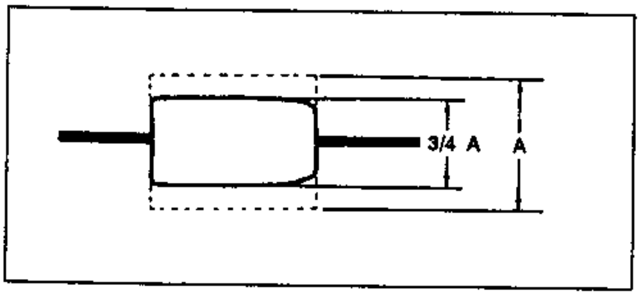
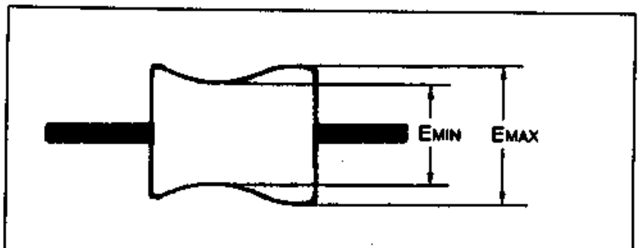
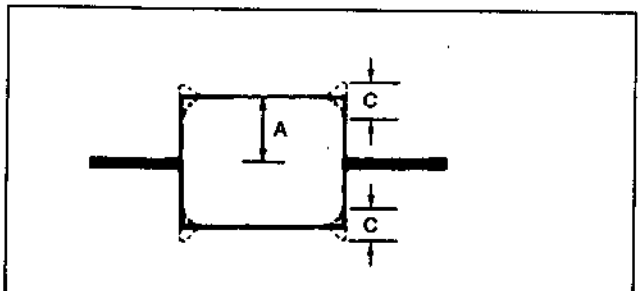


Fig. 44



$$\frac{E_{MIN}}{E_{MAX}} \geq 65\ (\%)$$

Fig. 45



$C \leq 1/8\ A$

Fig. 46

5-6-2. RISING CHECK (Fig. 47)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

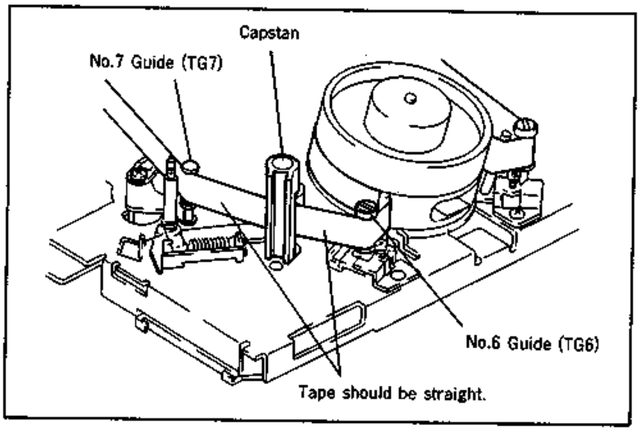


Fig. 47

5-6-3. TAPE PATH CHECK (Fig. 48)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

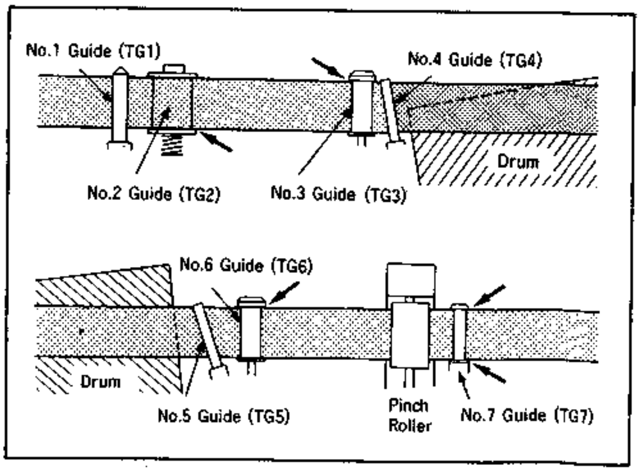


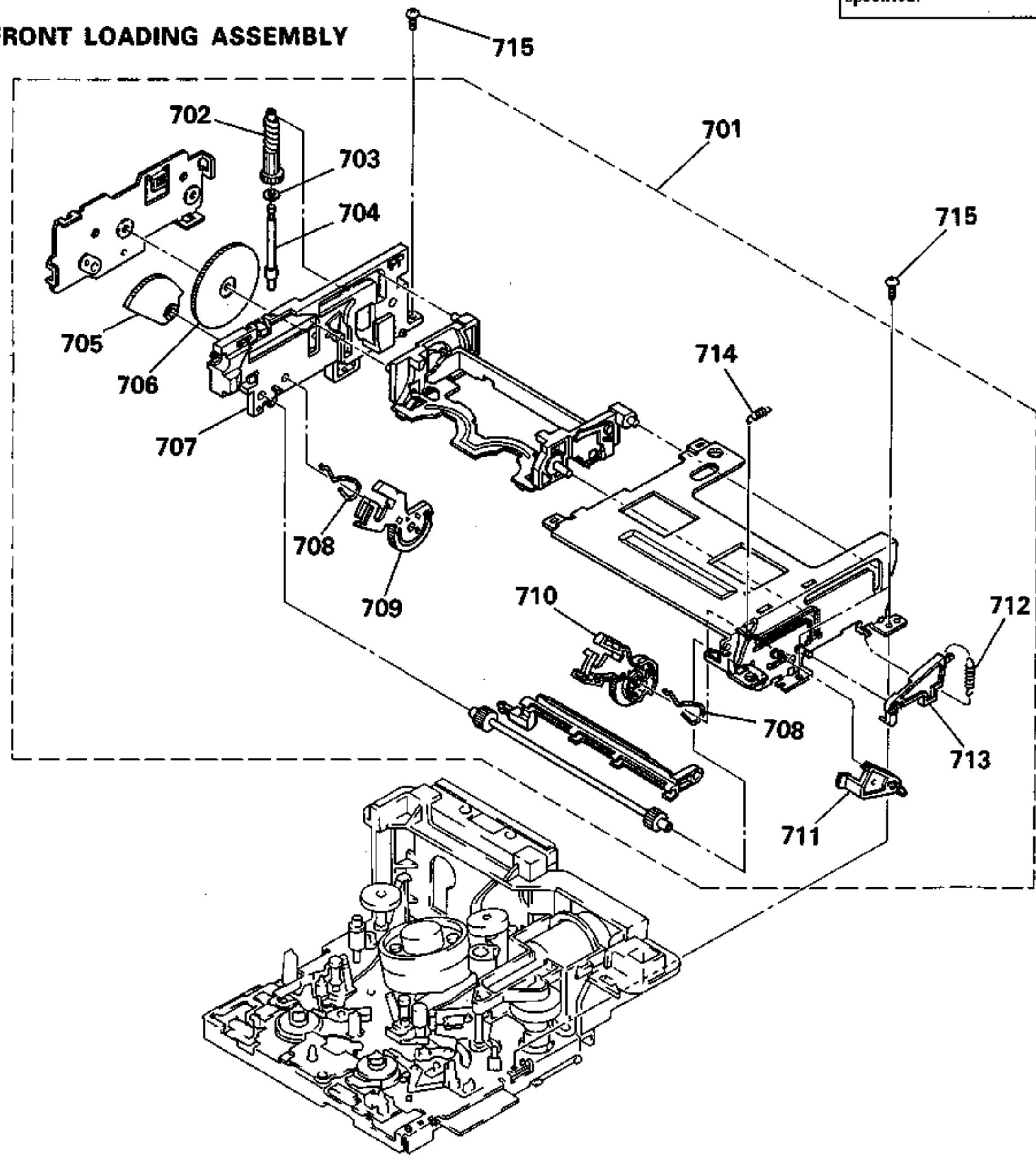
Fig. 48

SECTION 6
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

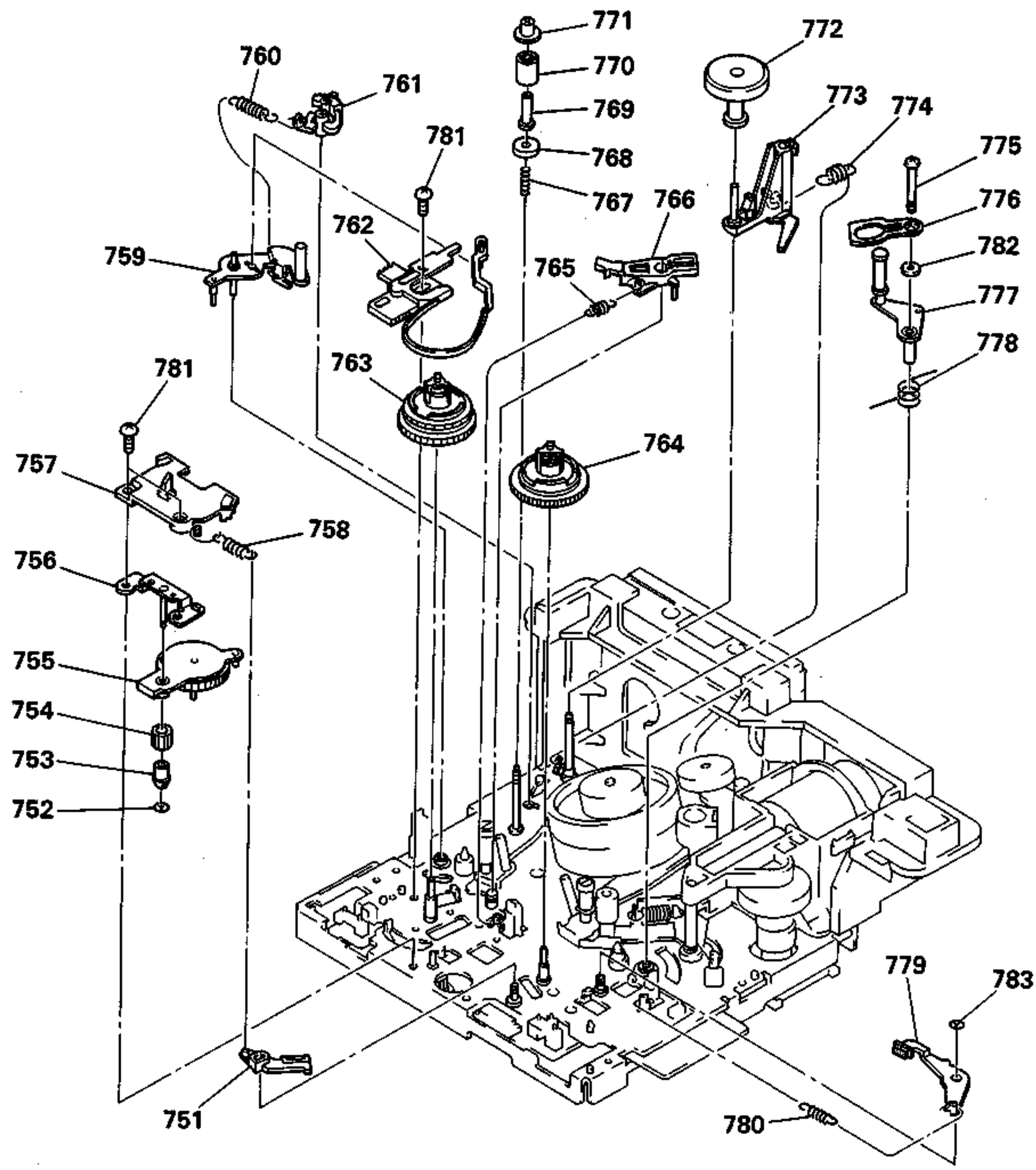
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

6-1. FRONT LOADING ASSEMBLY



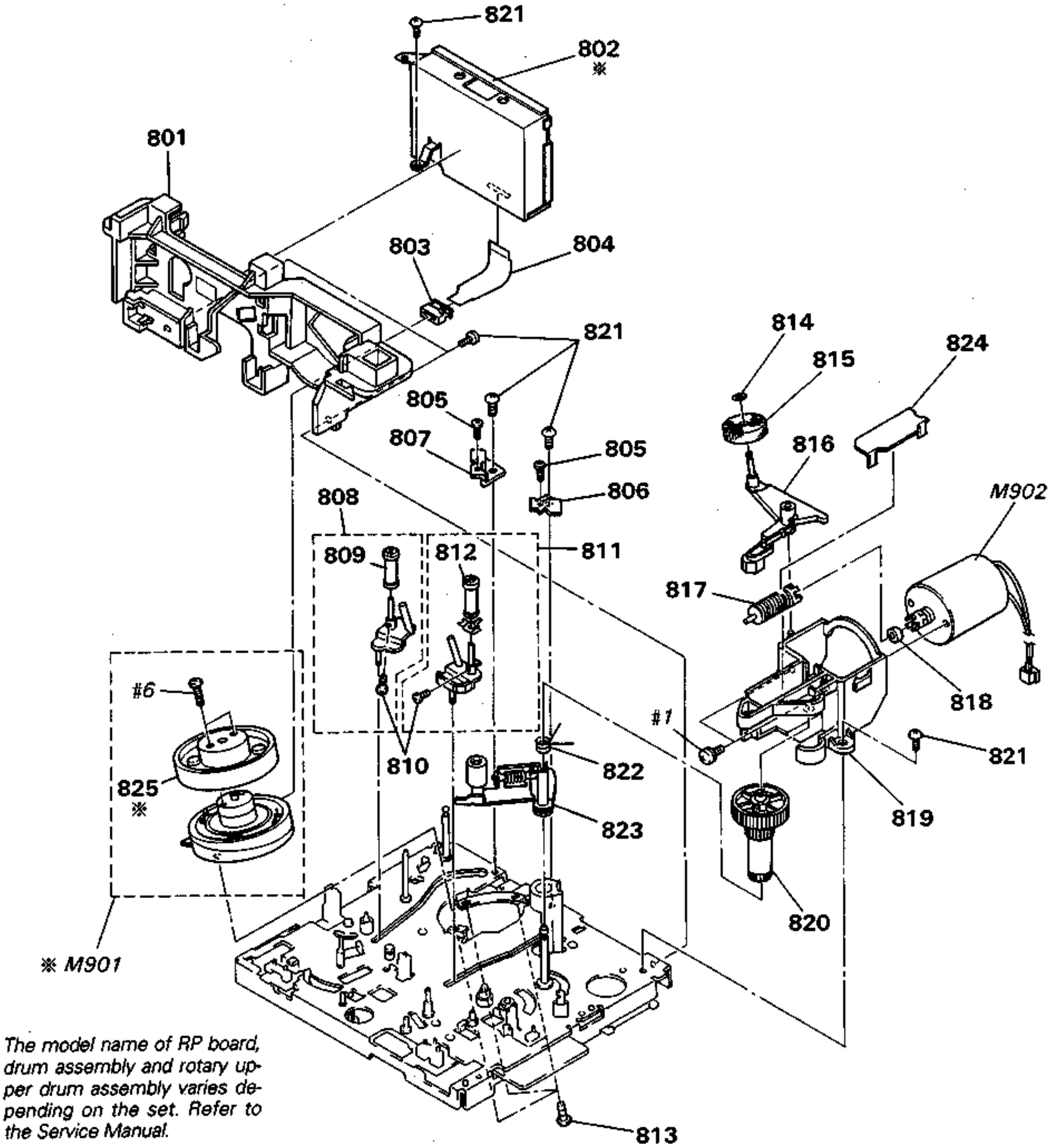
Ref.No.	Part No.	Description	Remark
701	A-7091-941-A	FL BLOCK ASSY	
702	3-954-028-01	GEAR, FL WORM	
703	3-738-212-11	RETAINER, THRUST, REEL TABLE	
*704	3-954-029-01	SHAFT, FL WORM GEAR	
705	3-954-020-01	GEAR, DRIVING	
706	3-954-019-01	WHEEL, FL WORM	
*707	3-954-032-01	PLATE (S), SIDE	
708	3-954-042-01	SPRING, PRESS	
709	3-954-034-01	ARM (S), DRIVING	
710	3-954-033-01	ARM (T), DRIVING	
*711	3-954-041-01	ARM, DOOR SWITCHING	
712	3-954-043-01	SPRING, TENSION	
*713	3-954-040-01	ARM, CASSETTE IN SWICH	
714	3-954-044-01	SPRING, TENSION	
715	3-732-817-01	SCREW (2X4.5), TAPPING	

6-2. MD CHASSIS ASSEMBLY (1)



Ref.No.	Part No.	Description	Remark
751	X-3943-111-1	BRAKE (T) ASSY, SOFT	
752	3-726-829-01	WASHER, STOPPER	
753	3-954-321-01	BEARING, PENDULUM DRIVING	
754	3-954-059-01	GEAR, PENDULUM DRIVING	
755	X-3942-951-1	GEAR ASSY, PENDULUM	
756	X-3943-162-1	BASE ASSY, PENDULUM	
*757	3-954-063-01	PLATE, RELEASE, REEL LOCK	
758	3-955-142-01	SPRING, TENSION	
759	X-3942-955-1	TENSION REGULATOR ASSY	
760	3-954-074-01	SPRING, TENSION	
761	3-954-103-01	ARM, TENSION ADJUSTMENT	
762	X-3942-956-1	BAND ASSY, TENSION REGULATOR	
763	X-3942-954-1	TABLE (S) ASSY, REEL	
764	X-3942-953-1	TABLE (T) ASSY, REEL	
765	3-954-085-01	SPRING, TENSION	
766	3-954-071-01	ARM, BRAKE (S)	
767	3-954-001-01	SPRING, COMPRESSION	
768	3-726-882-02	FLANGE, LOWER, TG2	
769	3-726-885-01	SLEEVE, TG2	
770	3-726-883-31	ROLLER, TG2	
771	3-726-884-01	FLANGE, UPPER, TG2	
772	3-954-282-01	ROLLER (M)	
773	X-3943-015-1	BASE ASSY, ROLLER	
774	3-954-284-01	SPRING, TENSION	
775	3-954-096-01	SCREW, TG7 HEIGHT ADJUSTMENT	
776	3-954-093-01	SPACER, TG7	
777	X-3942-958-1	ARM ASSY, TG7	
778	3-954-003-01	SPRING (TG7), TORSION	
779	X-3943-161-1	BRAKE (T) ASSY	
780	3-953-978-01	SPRING, TENSION	
781	3-732-817-01	SCREW (2X4.5), TAPPING	
782	3-738-212-11	RETAINER, THRUST, REEL TABLE	
783	3-669-465-00	WASHER (1.5), STOPPER	

6-3. MD CHASSIS ASSEMBLY (2)

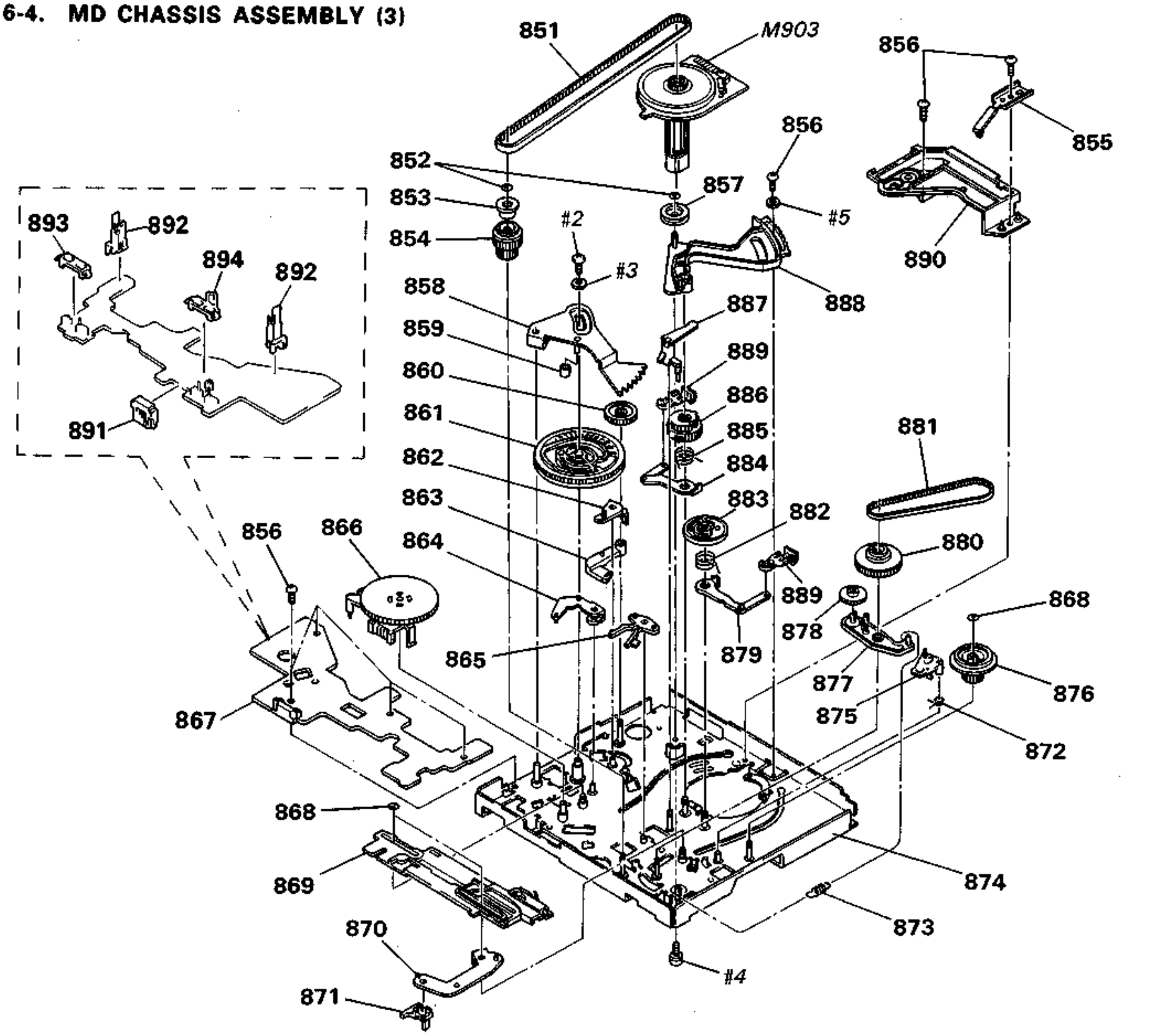


※ *The model name of RP board, drum assembly and rotary upper drum assembly varies depending on the set. Refer to the Service Manual.*

Ref.No.	Part No.	Description	Remark
*801	3-955-623-01	FRAME, RP	
*802	※	RP BOARD, COMPLETE	
803	1-691-471-11	CONNECTOR, TRANSLATION 11P	
804	1-649-565-11	FP-696 FLEXIBLE BOARD	
805	3-954-285-01	SCREW (M1.4X0.2)	
806	3-954-091-01	CATCHER (T)	
807	3-954-090-01	CATCHER (S)	
808	A-7040-338-A	COASTER (S) BLOCK ASSY	
809	X-3941-755-1	ROLLER ASSY (2), TG3	
810	3-947-504-01	SCREW (M1.2X2)	
811	A-7040-339-A	COASTER (T) BLOCK ASSY	
812	X-3941-756-1	ROLLER ASSY (2), TG6	
813	3-686-493-01	SCREW (M2X5), P1	
814	3-321-393-01	WASHER, STOPPER	

Ref.No.	Part No.	Description	Remark
815	X-3943-192-1	ROLLER ASSY, HC	
816	X-3942-947-1	ARM ASSY, HC	
817	3-733-395-01	GEAR (CAM), WORM	
818	3-696-388-01	RUBBER, JOINT	
819	3-954-024-01	HOLDER, MOTOR	
820	3-954-023-01	WHEEL, CAM WORM	
821	3-732-817-01	SCREW (2X4.5), TAPPING	
822	3-954-105-01	SPRING (PINCH DRIVING)	
823	X-3942-945-1	ARM ASSY, PINCH	
824	3-958-047-02	MOTOR HOLDER COVER	
825	※	DRUM, UPPER, ROTARY	
M901	※	DRUM ASSY	
M902	X-3942-946-1	MOTOR ASSY, CAM	

6-4. MD CHASSIS ASSEMBLY (3)

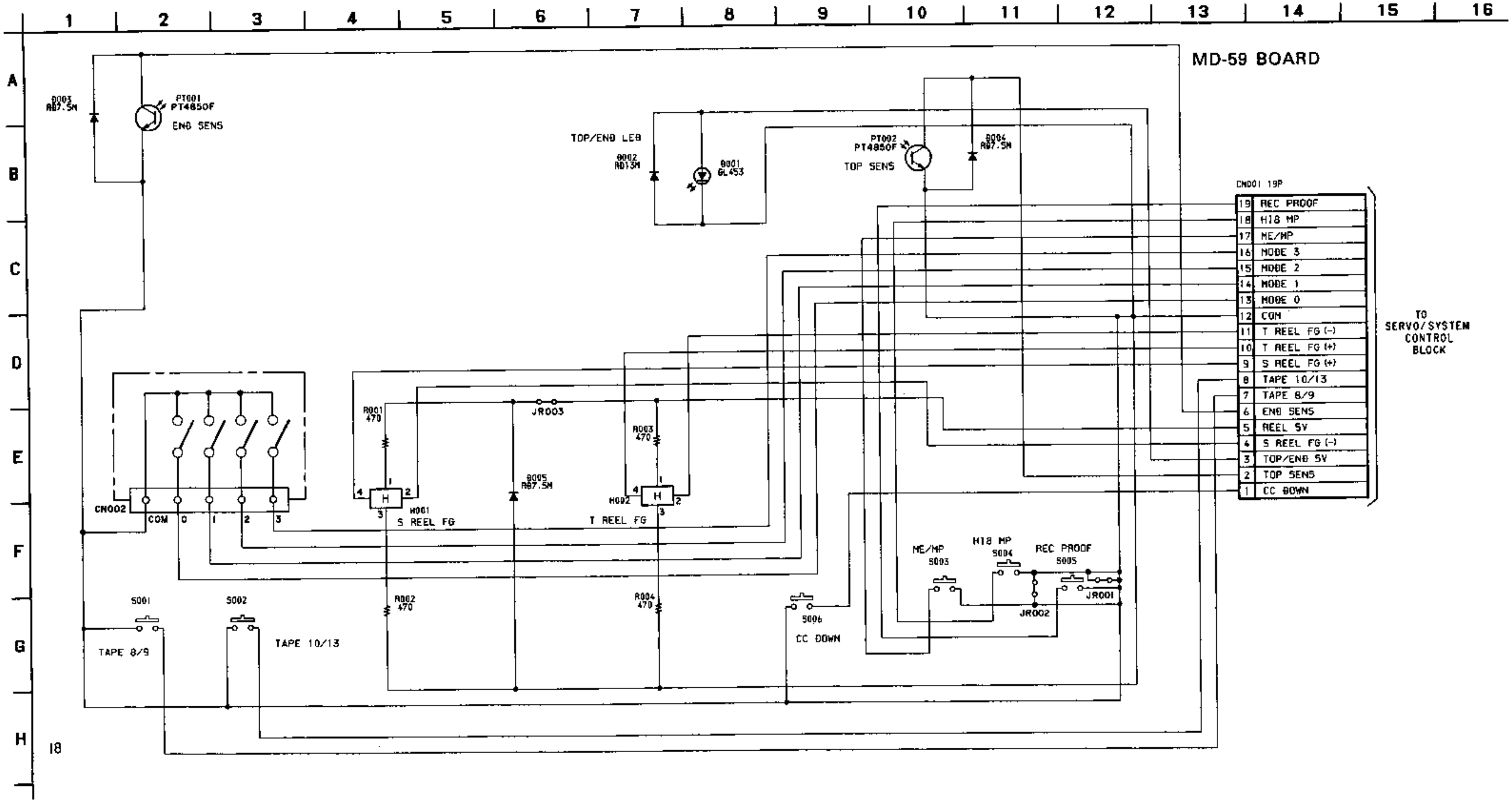


Ref.No.	Part No.	Description	Remark
851	3-953-986-01	BELT, TIMING	
852	3-726-829-01	WASHER, STOPPER	
853	3-954-102-02	FLANGE, REEL RELAY	
854	3-954-061-01	GEAR, REEL RELAY	
855	X-3942-960-1	GROUND ASSY, SHAFT	
856	3-732-817-01	SCREW (2X4.5), TAPPING	
857	X-3943-016-1	PULLEY ASSY, BELT	
*858	3-954-014-01	LEVER, LOADING DRIVING	
859	3-954-323-01	ROLLER, LOADING	
860	3-954-015-01	GEAR, CAM RELAY	
861	3-954-050-01	CAM, MAIN	
*862	3-954-009-01	LEVER, PINCH DRIVING	
863	3-954-016-01	LEVER, TG7 DRIVING	
*864	3-954-007-01	LEVER, SLIDE PLATE DRIVING	
865	3-953-973-01	ARM, PENDULUM COMPULSION	
866	1-692-498-11	SWITCH, ROTARY	
*867	1-648-300-11	MD-59 BOARD	
868	3-669-465-00	WASHER (1.5), STOPPER	
869	3-953-972-01	PLATE, SLIDE	
*870	3-953-974-01	ARM, S TAKE-UP	
871	3-953-975-01	CLAW, S TAKE-UP	
872	3-956-366-01	SPRING, TORSION	
873	3-953-982-01	SPRING, TENSION	

Ref.No.	Part No.	Description	Remark
*874	X-3942-952-1	CHASSIS ASSY, MECHANICAL	
875	3-954-100-01	ARM, TENSION REGULATOR SUB	
876	3-953-983-01	GEAR, FL PULLEY	
877	3-953-979-01	ARM, FL SELECTION	
878	3-953-980-01	GEAR, FL SELECTION	
879	X-3942-949-1	ARM (S) ASSY, LOADING	
880	3-953-981-01	GEAR (DRIVING), FL PULLEY	
881	3-954-079-01	BELT (FL), TIMING	
882	3-953-998-01	SPRING (S), TORSION	
883	3-953-991-01	GEAR (S), LOADING	
884	X-3942-948-1	ARM (T) ASSY, LOADING	
885	3-954-000-01	SPRING (T), TORSION	
886	3-953-992-01	GEAR (T), LOADING	
887	3-954-072-01	LEVER, BRAKE (S) DRIVING	
888	X-3942-962-1	BASE ASSY, PULLEY	
889	3-956-649-01	SPRING, LEAF, COASTER	
*890	3-954-049-01	RETAINER, WORM WHEEL	
891	1-750-620-11	CONNECTOR (MM8 MD)	
892	3-953-985-01	HOLDER, ST SENSOR	
893	3-954-638-01	HOLDER (S), PUSH SWITCH	
894	3-954-639-01	HOLDER (T), PUSH SWITCH	
M903	8-835-499-01	MOTOR, DC SCE-0501A	

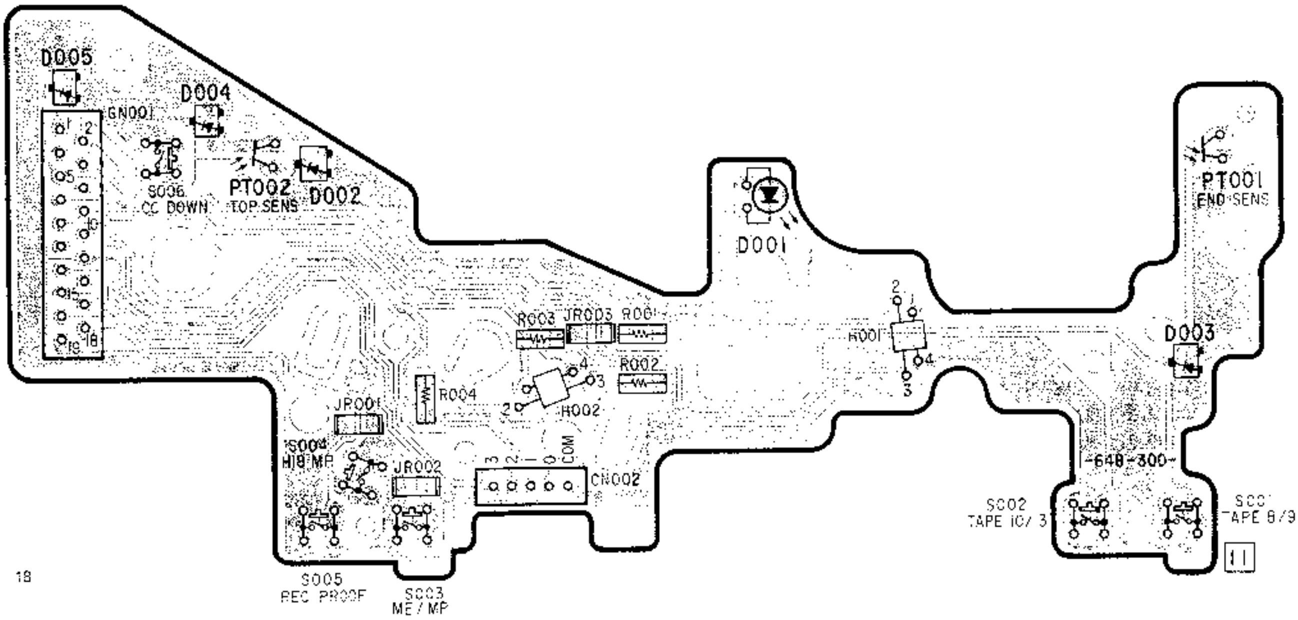
SECTION 7
DIAGRAMAS

SCHEMATIC DIAGRAM



PRINTED WIRING BOARD

MD-59 BOARD



SECTION 8
ELECTRICAL PARTS LIST

MD-59

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA··· : μA···, uPA··· : μPA···,
  uPB··· : μPB···, uPC··· : μPC···, uPD··· : μPD···
- CAPACITORS
  uF : μF
- COILS
  uH : μH

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

Ref.No.	Part No.	Description	Remark
*	1-648-300-11	MD-59 BOARD ************	
	3-953-985-01	HOLDER, ST SENSOR	
	3-954-638-01	HOLDER (S), PUSH SWITCH	
	3-954-639-01	HOLDER (T), PUSH SWITCH	
		< CONNECTOR >	
CN001	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	
*CN002	1-750-620-11	CONNECTOR (MM8 MD)	
		< DIODE >	
D001	8-719-988-42	DIODE GL453S	
D002	8-719-106-79	DIODE RD13M-B1	
D003	8-719-106-23	DIODE RD7.5M-B2	
D004	8-719-106-23	DIODE RD7.5M-B2	
D005	8-719-106-23	DIODE RD7.5M-B2	
		< HOLE ELEMENT >	
H001	1-808-118-11	ELEMENT, HALL HW-300A	
H002	1-808-118-11	ELEMENT, HALL HW/300A	
		< JUMPER RESISTOR >	
JR001	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR002	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR003	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< TRANSFORMER >	
PT001	8-729-907-25	TRANSISTOR PT4850F	
PT002	8-729-907-25	TRANSISTOR PT4850F	
		< RESISTOR >	
R001	1-216-190-00	METAL GLAZE 470 5% 1/8W	
R002	1-216-190-00	METAL GLAZE 470 5% 1/8W	
R003	1-216-190-00	METAL GLAZE 470 5% 1/8W	
R004	1-216-190-00	METAL GLAZE 470 5% 1/8W	
		< SWITCH >	
S001	1-692-497-11	SWICH, PUSH (TAPE 8/9)	
S002	1-692-497-11	SWICH, PUSH (TAPE 10/13)	
S003	1-692-497-11	SWICH, PUSH (ME/MP)	
S004	1-692-497-11	SWICH, PUSH (HI8 MP)	
S005	1-692-497-11	SWICH, PUSH (REC PROOF)	
S006	1-570-953-11	SWITCH, PUSH (1 KEY) (CC DOWN)	

****

Ref.No.	Part No.	Description	Remark
		MISCELLANEOUS *************	
803	1-691-471-11	CONNECTOR, TRANSLATION 11P	
804	1-649-565-11	FP-696 FLEXIBLE BOARD	
825	※	DRUM ASSY	
866	1-692-498-11	SWITCH, ROTARY	
891	1-750-620-11	CONNECTOR (MM8 MD)	
M901	※	DRUM ASSY	
M902	X-3942-946-1	MOTOR ASSY, CAM	
M903	8-835-499-01	MOTOR, DC SCE-0501A	

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****
HARDWARE LIST
****

Ref.No.	Part No.	Description
#1	7-682-645-01	SCREW +PS 3X4
#2	7-621-772-08	SCREW +B 2X3
#3	7-688-003-01	W 3, SMALL
#4	7-628-253-15	SCREW +PS 2X5
#5	7-688-001-01	W 2, MIDDLE
#6	7-627-853-57	PRECISION SCREW +P 2X5 TYPE3

8 mm Video MECHANICAL ADJUSTMENT MANUAL V

F MECHANISM

CORRECTION-1

Correct your MECHANICAL ADJUSTMENT MANUAL V as shown below.

Subject:

1. Change of Mounting and Removal of FL Worm Wheel
2. Change of Disassembly Figure, Parts

4-26. FL WORM WHEEL (Fig. 33)(Page 33)

1. Removal

1) Disengage tabs Ⓐ at four places and remove the gear cover ①.
2) Remove the FL worm wheel ②.

2. Mounting

1) Mount the FL worm wheel ②.
2) Meeting the hole Ⓓ in drive gear with the hole in side plate, mount the FL worm wheel ② while meeting the hole Ⓒ in FL worm wheel with the hole in side plate.
3) Mount the gear cover ①.

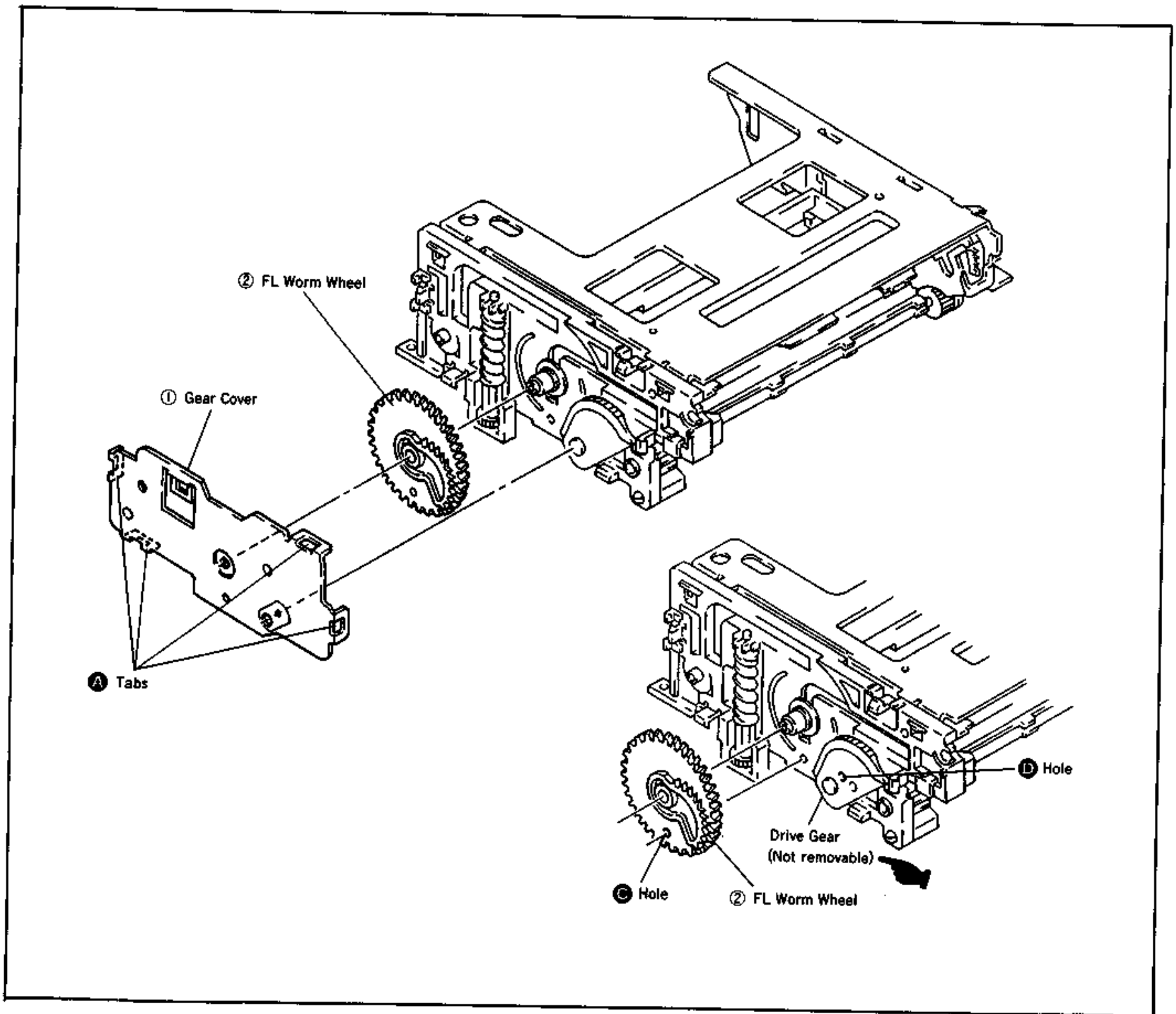
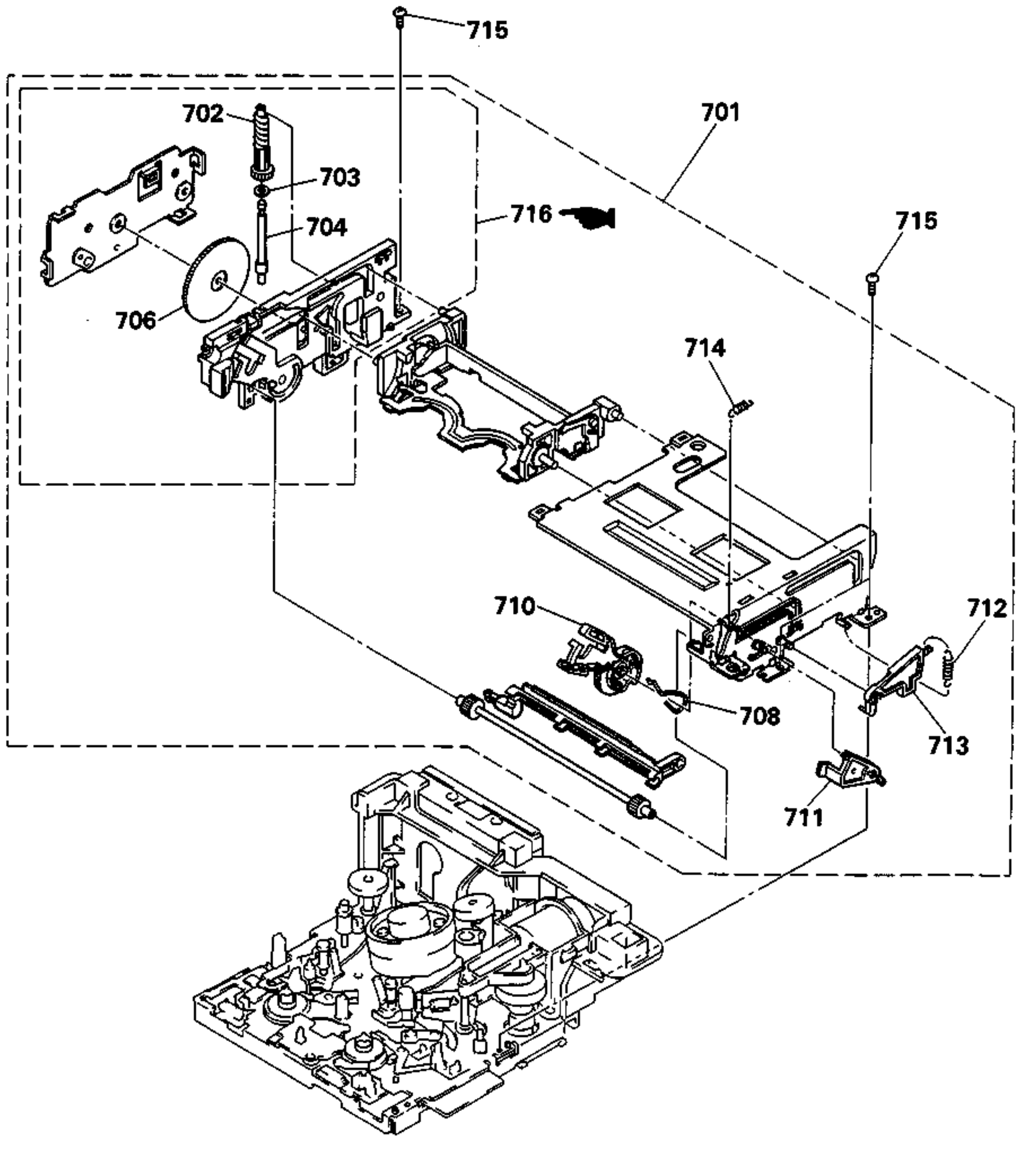


Fig. 33

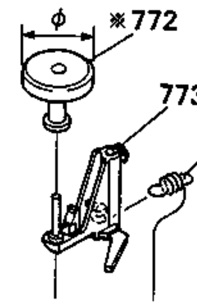
: Indicates Corrected portion

6-1. FRONT LOADING ASSEMBLY (Page 39)



Ref. No.	Part No.	Description	Remark
701	A-7091-941-A	FL BLOCK ASSY	
702	3-954-028-01	GEAR, FL WORM	
703	3-738-212-11	RETAINER, THRUST, REEL TABLE	
* 704	3-954-029-01	SHAFT, FL WORM GEAR	
706	3-954-019-01	WHEEL, FL WORM	
708	3-954-042-01	SPRING, PRESS	
710	3-954-033-01	ARM (T), DRIVING	
* 711	3-954-041-01	ARM, DOOR SWITCHING	
712	3-954-043-01	SPRING, TENSION	
* 713	3-954-040-01	ARM, CASSETE IN SWICH	
714	3-954-044-01	SPRING, TENSION	
715	3-732-817-01	SCREW (2X4.5), TAPPING	
716	A-7091-942-A	PLATE (S), SIDE ASSY	

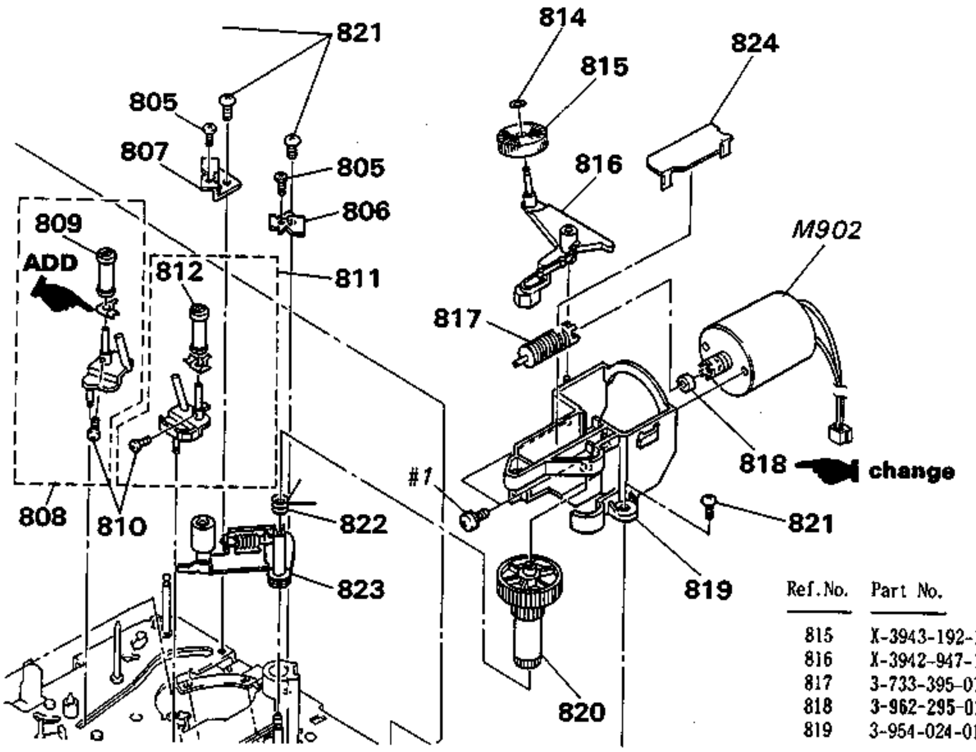
6-2. MD CHASSIS ASSEMBLY (1) (Page 40)



※ Note that there are two kinds of impedance roller (M) weights whose diameters are as follows.
NTSC model : φ 19
PAL model : φ 10

Ref.No.	Part No.	Description	Remark
768	3-726-882-02	FLANGE, LOWER, TG2	
769	3-726-885-01	SLEEVE, TG2	
770	3-726-883-31	ROLLER, TG2	
771	3-726-884-01	FLANGE, UPPER, TG2	
772	3-954-282-01	ROLLER (M NTSC), IMPEDANCE	ADD
772	3-962-051-01	ROLLER (M PAL), IMPEDANCE	ADD
773	X-3943-015-1	BASE ASSY, ROLLER	
774	3-954-284-01	SPRING, TENSION	
775	3-954-096-01	SCREW, TG7 HEIGHT ADJUSTMENT	
776	3-954-093-01	SPACER, TG7	
777	X-3942-958-1	ARM ASSY, TG7	
778	3-954-003-01	SPRING (TG7), TORSION	
779	X-3943-161-1	BRAKE (T) ASSY	
780	3-953-978-01	SPRING, TENSION	
781	3-732-817-01	SCREW (2X4.5), TAPPING	
782	3-738-212-11	RETAINER, THRUST, REEL TABLE	
783	3-669-465-00	WASHER (1.5), STOPPER	

6-3. MD CHASSIS ASSEMBLY (2) (Page 41)



Ref.No.	Part No.	Description	Remark
815	X-3943-192-1	ROLLER ASSY, HC	
816	X-3942-947-1	ARM ASSY, HC	
817	3-733-395-01	GEAR (CAM), WORM	
818	3-962-295-01	RUBBER, JOINT	
819	3-954-024-01	HOLDER, MOTOR	
820	3-954-023-01	WHEEL, CAM WORM	
821	3-732-817-01	SCREW (2X4.5), TAPPING	
822	3-954-105-01	SPRING (PINCH DRIVING)	
823	X-3942-945-1	ARM ASSY, PINCH	
824	3-958-047-02	MOTOR HOLDER COVER	
825	※	DRUM, UPPER, ROTARY	
M901	※	DRUM ASSY	
M902	X-3942-946-1	MOTOR ASSY, CAM	

8mm Video MECHANICAL ADJUSTMENT MANUAL V

F MECHANISM

video 8

CORRECTION-2

Please correct your 8mm Video MECHANICAL ADJUSTMENT MANUAL V.

Subject : 5-2. TRACKING ADJUSTMENT

(97-005)

8mm Video MECHANICAL ADJUSTMENT MANUAL V

Page 36

Incorrect

5-2. TRACKING ADJUSTMENT (Fig. 37, 38)

1) Play back the tracking alignment tape.
2) Loosen the No. 3 guide (TG3) lock screw ① and turn the No. 3 guide to flatten the waveform at the inlet.
3) Tighten the No. 3 guide (TG3) lock screw ① to lock the No. 3 guide.
4) Loosen the No. 6 guide (TG6) lock screw ② and turn the No. 6 guide to flatten the waveform at the outlet.
5) Tighten the No. 6 guide (TG6) lock screw ② to lock the No. 6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

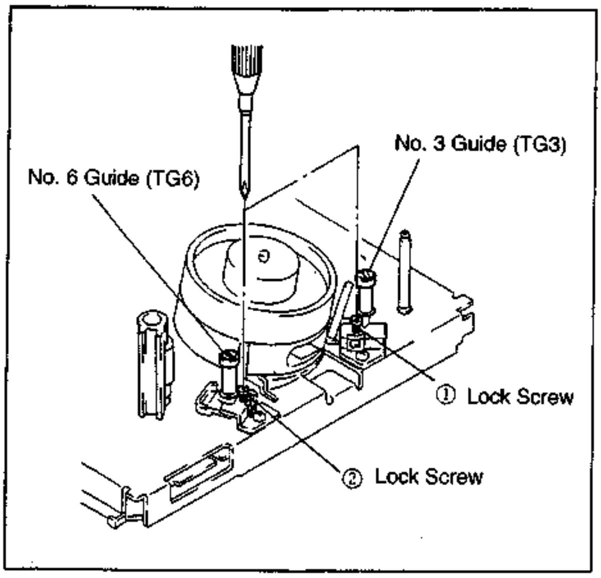


Fig. 37

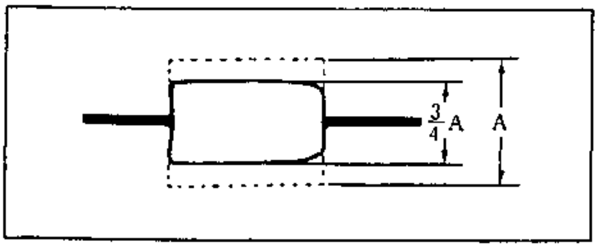


Fig. 38

Correct

5-2. TRACKING ADJUSTMENT (Fig. 37, 38)

1) Play back the tracking alignment tape.
2) Turn the No. 3 guide to flatten the waveform at the inlet.
3) Turn the No. 6 guide to flatten the waveform at the outlet.

Note : Be careful not to touch the lock screw.

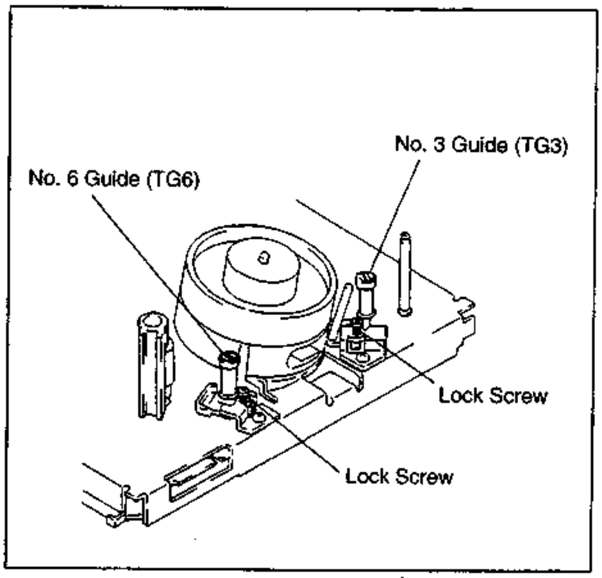


Fig. 37

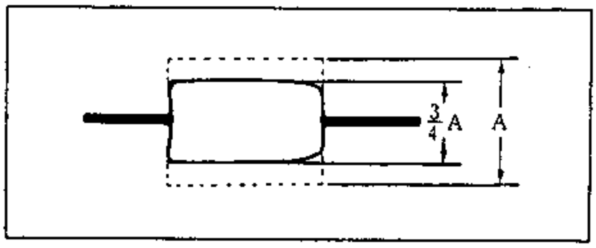


Fig. 38