SLV-SE35/SE50/SE60/SE70/SE80/SX60/SX70/SX80

RMT-V256A/V257B/V259/V259A/V259B/V259C

SERVICE MANUAL

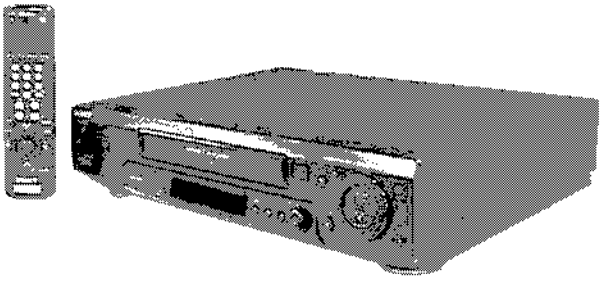


Photo: SLV-SE80
RMT-V259B

AEP Model
SLV-SE60AE1/SE60AE2

UK Model
SLV-SE70UX/SE80UX

E Model
SLV-SE70EN/SE80EN/SX70EN

French Model
SLV-SE70B/SE80B/SX70B

German Model
SLV-SE70VC1/SE70VC2/SE80VC1/
SE80VC2/SX70VC/SX80VC

Spanish Model
SLV-SE60NP/SE70NP1/SE70NP2/
SE80NP/SX60NP

East European Model
SLV-SE50EE/SE70EE

Greek Model
SLV-SE35EG/SE50EG/SE70EG/SE80EG

Irish Model
SLV-SE70EX

VHS
Hi-Fi
S MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)

SPECIFICATIONS

System

Channel coverage
B MODEL
SECAM(L)
VHF:E2 to E12
UHF:E21 to E69
CATV B to Q
HYPER S22 to S41

B/AE1/AE2/NP/NP1/NP2/VC1/VC2 MODEL
PAL:B/G
VHF:E2 to E12
VHF:Italian channels A to H
UHF:E21 to E69
CATV S01 to S05,S1 to S20
HYPER S22 to S41

EE/EG/EN MODEL
PAL:B/G,D/K
VHF:E2 to E12,R1 to R12
UHF:E21 to E69,R21 to R69
CATV S1 to S11,S01 to S05

SE70EX MODEL
PAL:D
VHF:A to H,SA-2 to SA13
UHF:B21 to B69
CATV S01 to S05,S1 to S20
HYPER S22 to S41

SE70UX/SE80UX MODEL
PAL:D
UHF:B21 to B69(SE70UX)
UHF:E21 to E69(SE80UX)

RF output signal
UHF channels 21 to 69
Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs
LINE-1
(TV)
21-pin
Video input: pin 20
Audio input: pins 2 and 6
Video output: pin 19
Audio output: pins 1 and 3

SE50/SE70EE/EG/EN/SE80/SX70EN/SX80/VC MODEL
LINE-2 IN
VIDEO IN, phono jack (1)
Input signal: 1 Vp-p,
75 ohms, unbalanced,sync negative
AUDIO IN, phono jack (2)(EXCEPT SE50 MODEL)
AUDIO IN, phono jack (1)(SE50 MODEL)
Input level: 327 mVrms
Input impedance : more than 47 kilohms

EXCEPT AE2/EE/SE35
LINE-2 IN(SL65NP/SL70B/EX/NP1/NP2/UX/VC1/VC2/SX70B/VC/SX60)
LINE-3 IN(SE50EG/SE70EG/EN/SE80/SX70EN/SX80)
21-pin
Video input: pin 20
Audio input: pins 2 and 6

EXCEPT SE35/SE50/SE60/SE70EE/SE80EG/SX60
AUDIO OUT
Phono jack (2)
Rated output
level: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

SE50EE/SE70EE/SE80EG MODEL
LINE-2 OUT
AUDIO OUT:Phono jack(2)
Rated output level:327mVrms
Load impedance:47 kilohms
Output impedance:less than 10 kilohms
VIDEO OUT:Phono jack(1)
Rated output level:327mVrms
Load impedance:47 kilohms
Output impedance:less than 10 kilohms

General

Power requirements
220 - 240 V AC, 50 Hz
Power consumption
22 W
Operating temperature
5 °C to 40 °C
Storage temperature
-20 °C to 60 °C

Dimensions
EXCEPT SE80B/NP/UX/VC1/VC2/SX80
Approx. 430 x 103 x 314 mm
(Approx. 17 x 4 x 12 3/8inches(w/h/d))
SE80B/NP/UX/VC1/VC2/SX80 MODEL
Approx. 430 x 103 x 317 mm
(Approx. 17 x 4 x 12 1/2inches(w/h/d))
including projecting parts and controls
Mass
SE50/SE70EE/EG/EN/SE80/SX70EN/SX80 MODEL
Approx. 4.6 kg
(Approx. 10 lb 2 oz)
EXCEPT SE50/SE70EE/EG/EN/SE80/SX70EN/SX80
Approx. 4.5 kg
(Approx. 9 lb 15 oz)

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
EURO AV cable (1)
AC Plug adapter(1)
Audio cable(1)

Design and specifications are subject to change without notice.

VIDEO CASSETTE RECORDER

MICROFILM

SONY

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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

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, through 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.

FEATURE DIFFERENCE

MODEL NAME		SE35EG	SE50EE	SE50EG	SE60AE1/ SE60AE2	SE60NP	SE70B	SE70EE	SE70EG
FEATURE									
BASE	4Head VIDEO		○	○	○	○	○	○	○
	Hi-Fi STEREO				○	○	○	○	○
	SECAM(REC/PB)						○/○		
	ME-SECAM(REC/PB)	○/○	○/○	○/○			×/○	○/○	○/○
	BODY COLOR(TV BLACK)								
	CE	○		○	○	○	○		○
PANEL	SOCCER	○			○	○	○	○	○
	CLICK SHUTTLE(JOG)		○	○					
	New Dial								
SW	EDIT		○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD
	ARC		○	○				○	
	TIMER RECORDING								
	SIMULATED STEREO		○						
I/O	FRONT IN		○	○				○	○
	AUDIO OUT2						○		○
	EUR IN (2nd)								
	C+ (2nd)			○ (SW. IN)		○ (SW. C−)	○ (SW. C−)		○ (SW. IN)
	LINE THROUGH		○ (mono × 2)			○	○		○
	LINE2 OUT		○					○	
MEDIA FEATURE	SMARTLINK	○		○			○		○
	VCR+/G-code/Show V/V+	Show V		Show V			Show V		Show V
	ACS (Δ : ACA)	Δ		Δ			○		Δ
	PDC/VPS	PDC/VPS		PDC/VPS			PDC/VPS		PDC/VPS
	ITP	○		○			○		○
	DIMMER								
	SECURITY FUNCTION								
	CTL MUTE	×	×	×	○	○	○	×	×
	TUNER EE MUTE	○	○	○	○	○	○	○	○
VIDEO	APC	2○	3○	3○	3○	3○	3○	3○	3○
	ARC(NEW PICTURE IMP.)		○	○				○	
TUNER	SYSTEM 1	DK	DK	DK	BG	BG	L	DK	DK
	STEREO				ZWEI	N/Z	NI		ZWEI
	SYSTEM 2	BG	BG	BG			BG	BG	BG
	STEREO						ZWEI		ZWEI
	CATV	○	○	○	○	○	○	○	○
	RF OUT SYS	K/G	K/G	K/G	G	G	L/G	K/G	K/G
AUDIO	Hi-Fi STEREO				○	○	○	○	○
	SIMULATED STEREO		○						
TIMER	New DIAL RECORDING								
FUNCTION	INDEX SEARCH(RMT)		○	○			○	○	○
EDIT	AUDIO DUB		○	○					
REMOTE COMMANDER	NAME	RMT-V257B	RMT-V259B	RMT-V259B	RMT-V256A	RMT-V256A	RMT-V259A	RMT-V259	RMT-V259

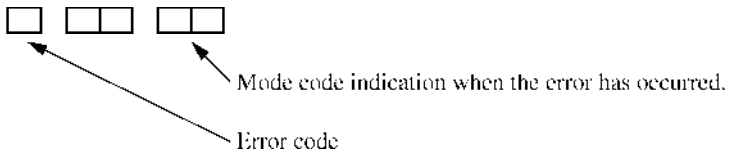
MODEL NAME		SE70EN	SE70EX	SE70NP1/ SE70NP2	SE70UX	SE70VC1/ SE70VC2	SE80B	SE80EG	SE80EN
FEATURE									
BASE	4Head VIDEO	○	○	○	○	○	○	○	○
	Hi-Fi STEREO	○	○	○	○	○	○	○	○
	SECAM(REC/PB)						○/○		
	ME-SECAM(REC/PB)	○/○					×/○	○/○	○/○
	BODY COLOR(TV BLACK)		○		○				
	CE	○	○	○	○	○	○	○	○
PANEL	SOCCER	○	○	○	○	○			
	CLICK SHUTTLE(JOG)						○	○	○
	NewDial						○		
SW	EDIT	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD
	ARC						○	○	○
	TIMER RECORDING						○		
	SIMULATED STEREO								
I/O	FRONT IN	○					○	○	○
	AUDIO OUT2	○	○	○	○	○	○		○
	EUR IN (2nd)		○		○				
	C+ (2nd)	○ (SW, IN)		○ (SW, C+)		○ (SW, C+)	○ (SW, C−)	○ (SW, IN)	○ (SW, IN)
	LINE THROUGH	○	○	○	○	○	○	○	○
	LINE2 OUT							○	
MEDIA	SMARTLINK	○	○	○	○	○	○	○	○
FEATURE	VCR+/G-code/Show V/V+	Show V	VPLUS	Show V	VPLUS	Show V	Show V	Show V	Show V
	ACS (Δ : ACA)	Δ	○	○	○	Δ	○	Δ	Δ
	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS
	FTP	○	○	○	○	○	○	○	○
	DIMMER						○	○	○
	SECURITY FUNCTION		○		○				
	CTL MUTE	×	○	○	○	○	○	×	×
	TUNER EE MUTE	○	○	○	○	○	○	○	○
VIDEO	APC	3○	3○	3○	3○	3○	3○	3○	3○
	ARC(NEW PICTURE IMP.)						○	○	○
TUNER	SYSTEM 1	DK	I	BG	I	BG	L	DK	DK
	STEREO	N/Z	NI	N/Z	NI	ZWEI	NI	ZWEI	N/Z
	SYSTEM 2	BG					BG	BG	BG
	STEREO	N/Z					ZWEI	ZWEI	N/Z
	CATV	○	○	○		○	○	○	○
	RF OUT SYS	K/G	I	G	I	G	L/G	K/G	K/G
AUDIO	Hi-Fi STEREO	○	○	○	○	○	○	○	○
	SIMULATED STEREO								
TIMER	New DIAL RECORDING						○		
FUNCTION	INDEX SEARCH(RMT)	○	○	○	○	○	○	○	○
EDIT	AUDIO DUB						○	○	○
REMOTE COMMANDER	NAME	RMT-V259	RMT-V259	RMT-V259	RMT-V259	RMT-V259	RMT-V259C	RMT-V259B	RMT-V259B

MODEL NAME		SE80NP	SE80UX	SE80VC1/ SE80VC2	SX60NP	SX70B	SX70EN	SX70VC	SX80VC
FEATURE									
BASE	4Head VIDEO	○	○	○	○	○	○	○	○
	Hi-Fi STEREO	○	○	○	○	○	○	○	○
	SECAM(REC/PB)					○/○			
	ME-SECAM(REC/PB)					×/○	○/○		
	BODY COLOR(TV BLACK)		○		○	○	○	○	○
	CE	○	○	○	○	○	○	○	○
PANEL	SOCCER				○	○	○	○	
	CLICK SHUTTLE(JOG)	○	○	○					○
	New Dial	○	○	○					○
SW	EDIT	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD	○ OSD
	ARC	○	○	○					○
	TIMER RECORDING	○	○	○					○
	SIMULATED STEREO								
I/O	FRONT IN	○	○	○			○		○
	AUDIO OUT2	○	○	○		○	○	○	○
	EUR IN (2nd)		○						
	C+ (2nd)	○ (SW, C+)		○ (SW, C+)	○ (SW, C−)	○ (SW, C+)	○ (SW, IN)	○ (SW, C+)	○ (SW, C−)
	LINE THROUGH	○	○	○	○	○	○	○	○
	LINE2 OUT								
MEDIA FEATURE	SMARTLINK	○	○	○		○	○	○	○
	VCR+/G-code/Show V/V+	Show V	VPLUS	Show V		Show V	Show V	Show V	Show V
	ACS (Δ : ACA)	○	○	Δ		○	Δ	Δ	Δ
	PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS		PDC/VPS	PDC/VPS	PDC/VPS	PDC/VPS
	FTP	○	○	○		○	○	○	○
	DIMMER	○	○	○					○
	SECURITY FUNCTION		○						
	CTL MUTE	○	○	○	○	○	×	○	○
	TUNER EE MUTE	○	○	○	○	○	○	○	○
VIDEO	APC	3○	3○	3○	3○	3○	3○	3○	3○
	ARC(NEW PICTURE IMP.)	○	○	○					○
TUNER	SYSTEM 1	BG	I	BG	BG	L	DK	BG	BG
	STEREO	N/Z	NI	ZWEI	N/Z	NI	N/Z	ZWEI	ZWEI
	SYSTEM 2					BG	BG		
	STEREO					ZWEI	N/Z		
	CATV	○		○	○	○	○	○	○
	RF OUT SYS	G	I	G	G	L/G	K/G	G	G
AUDIO	Hi-Fi STEREO	○	○	○	○	○	○	○	○
	SIMULATED STEREO								
TIMER	New DIAL RECORDING	○	○	○					○
FUNCTION	INDEX SEARCH(RMT)	○	○	○		○	○	○	○
EDIT	AUDIO DUB	○	○	○					○
REMOTE COMMANDER	NAME	RMT-V259B	RMT-V259B	RMT-V259B	RMT-V256A	RMT-V259A	RMT-V259	RMT-V259	RMT-V259B

TABLE OF CONTENTS

1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
  "At this time, Colon ":" between character is not indicated."



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

MODE CODE

0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading
9	PB	19	Mecha. error (Power off)		(No auto PB check)

SECTION 1 GENERAL

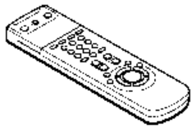
This section is extracted from instruction manual.

Step 1

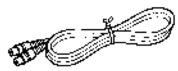
Unpacking

Check that you have received the following items with the VCR.

- Remote commander



- Aerial cable



- EURO AV cable (SE80, SX80 model)

- R6 (size AA) batteries

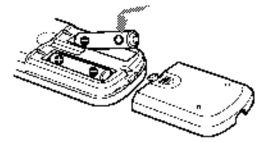
Step 2

Setting up the remote commander

Inserting the batteries

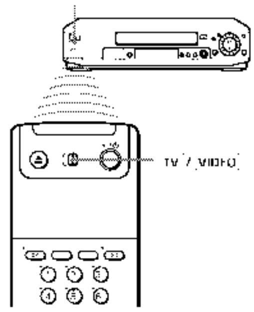
Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

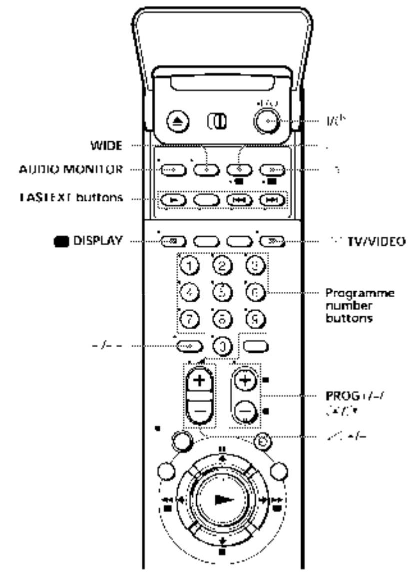
You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the ⊠ symbol near the remote sensor, this remote commander will not operate the TV.



To operate	Set TV / VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

continued

Step 2 : Setting up the remote commander (continued)



TV control buttons

To	Press
Set the TV into standby mode	I/⏻
Select an input source of the TV either from aerial in or from line in	•TV/VIDEO
Select the programme position of the TV	Programme number buttons, -/--, PROG +/–
Adjust the volume of the TV	VOL +/–

To	Press
Switch to TV (Teletext off)	(TV)
Switch to Teletext	(Teletext)
Select the sound	AUDIO MONITOR
Use FASTEXT	FASTEXT buttons
Call up the on-screen display	DISPLAY
Change the Teletext page	▲/▼
Switch to/from wide mode of a Sony wide TV (for other manufacturer's wide TV, see "Controlling other TVs with the remote commander" below)	WIDE

Notes

- With normal use, the batteries should last about 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 together.
- Do not use different types of batteries together.
- Some buttons may not work with certain Sony TVs.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV / VIDEO at the top of the remote commander to TV.

2 Hold down I/⏻, and enter your TV's code number(s) using the programme number buttons. Then release I/⏻.

Now you can use the following TV control buttons to control your TV: I/⏻, TV/VIDEO, programme number buttons, -/-- (ten's digit), PROG +/–, VOL +/–, (TV), (Teletext), FASTEXT buttons, WIDE*, MENU*, ↑*/↓*/←*/→*, and OK*.

* These buttons may not work with all TVs.

Tip

- When you set your TV's code number correctly while the TV is turned on, the TV turns off automatically.

continued

Step 2 : Setting up the remote commander (continued)

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

To make wide mode settings, see the footnotes below this table for the applicable code numbers.

Manufacturer	Code number	Manufacturer	Code number
Sony	01*, 02	Panasonic	17*, 19
Akai	68	Philips	06*, 07*, 08*
Ferguson	[illegible]	Saba	12, 13
Grundig	10*, 11*	Samsung	[illegible]
Hitachi	02	Sanyo	25
JVC	33	Sharp	29
Loewe	45	Telefunken	36
Mivar	09, 20	Thomson	43*
NEC	66	Toshiba	38
Nokia	15, 16, 69*		

* Press WIDE to switch the wide picture mode on or off.
* Press WIDE, then press +/– to select the wide picture mode you want.
* Press WIDE. The menu appears on the TV screen. Then press ↑/↓/←/→ to select the wide picture mode you want and press OK.

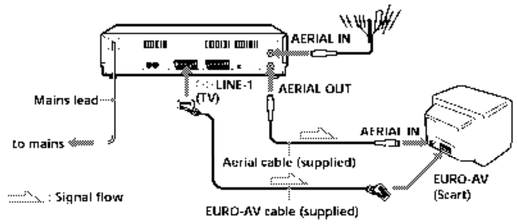
Notes
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number may change. Set the appropriate code number every time you replace the batteries.

Step 3

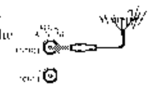
Connecting the VCR

If your TV does not have a EURO AV connector, see page 12.

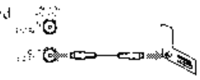
If your TV has a EURO-AV (Scart) connector



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.

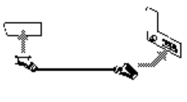


continued

Step 3 : Connecting the VCR (continued)

3 Connect LINE-1 (TV) on the VCR and the EURO-AV (Scart) connector on the TV with the supplied EURO AV cable.

This connection improves picture and sound quality. Whenever you want to watch the VCR picture, press TV/VIDEO to display the VIDEO indicator in the display window.



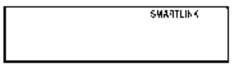
4 Connect the mains lead to the mains.

If the mains plug does not fit in the mains, use the supplied plug adapter.

Note
- If the TV is connected to the LINE-1 (TV) connector, setting the RF MODULATOR in the OPTIONS-2 menu to OFF is recommended. In the OFF position, only the signal from the tuner is output through the AERIAL OUT connector (see page 67). You do not have to tune your TV to the VCR. Skip "Tuning your TV to the VCR" on page 15.

About the SMARTLINK features

If the connected TV complies with SMARTLINK, MEGALOGIC*[1], EASYLINK*[2], Q-Link*[3] or EURO VIEW LINK*[4], you can use the SMARTLINK function after you complete the steps on the previous page (the SMARTLINK indicator appears in the VCR's display window when you turn on the TV). You can enjoy the following SMARTLINK features.



- Preset Download
  You can download your TV tuner preset data to this VCR and tune the VCR according to that data in Auto Set Up. This greatly simplifies the Auto Set Up procedure. Be careful not to disconnect the cables or exit the Auto Set Up function during the procedure.

  See "Setting up the VCR with the Auto Set Up function" on page 14.

- TV Direct Rec
  You can easily record what you are watching on the TV (other than tapes being played on this VCR). For details, see "Recording what you are watching on the TV (TV Direct Rec)" on page 40.
- One Touch Play
  With One Touch Play, you can start playback automatically without turning on the TV. For details, see "Starting playback automatically with one button (One Touch Play)" on page 36.
- One Touch Menu
  You can turn on the VCR and TV, set the TV to the video channel, and display the VCR's on-screen display automatically by pressing MENU on the remote commander.
- One Touch Timer
  You can turn on the VCR and TV, set the TV to the video channel, and display the timer recording menu (the TIMER METHOD menu, the TIMER menu, or the VIDEO PLUS+ menu) automatically by pressing ⏻ TIMER on the remote commander.

  You can set which timer recording menu is displayed using TIMER OPTIONS in the OPTIONS-2 menu (see page 67).

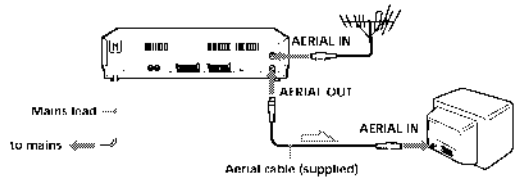
*[1] "MEGALOGIC" is a registered trademark of Grundig Corporation.
*[2] "EASYLINK" is a trademark of Philips Corporation.
*[3] "Q-Link" is a trademark of Panasonic Corporation.
*[4] "EURO VIEW LINK" is a trademark of Toshiba Corporation.

Note
- Not all the TVs respond to the functions above.

continued

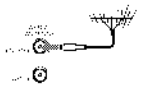
Step 3 : Connecting the VCR (continued)

If your TV does not have a EURO-AV (Scart) connector

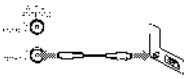


: Signal flow

1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT on the VCR and the aerial input on your TV using the supplied aerial cable.



3 Connect the mains lead to the mains.

If the mains plug does not fit in the mains, use the supplied plug adaptor.

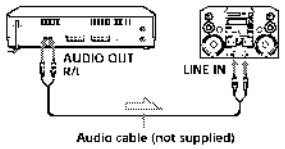
Note

- When you connect the VCR and your TV only with an aerial cable, you have to set AUDIO OUT MODE in the OPTIONS 2 menu to ON (initial setting) (see page 67).

Additional connections

To a stereo system

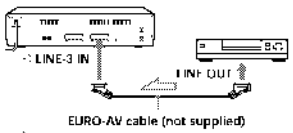
You can improve sound quality by connecting a stereo system to the AUDIO OUT R/L jacks as shown on the right.



: Signal flow

To a satellite tuner

You can watch programmes from the satellite tuner connected to this VCR on the TV even when the VCR is turned off, using the Line Through function. When you turn on the satellite tuner, this VCR automatically sends the signal from the satellite tuner to the TV without turning itself on.



: Signal flow

1 Connect the satellite tuner to the LINE-3 IN connector as shown above.

2 Set POWER SAVE to OFF in the OPTIONS-2 menu.

3 Turn off the VCR.

To watch a satellite programme, turn on the satellite tuner and the TV.

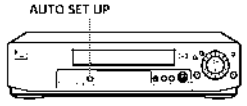
Note

- You cannot watch satellite programmes on the TV while recording unless you record a satellite programme.

Step 4

Setting up the VCR with the Auto Set Up function

Before using the VCR for the first time, set up the VCR using the Auto Set Up function. With this function, you can set TV channels, guide channels for the VIDEO Plus+ system, the RF channel, and VCR clock automatically.



Hold down AUTO SET UP on the VCR for more than three seconds.

The VCR automatically turns on and starts searching for all of the receivable channels and presets them in the appropriate order for your local area.

If you use the SMARTLINK connection, the Preset Download function starts and the SMARTLINK indicator flashes in the display window during download.

After the search or download is complete, the current time appears in the display window for any stations that transmit a time signal. If the time does not appear, set the clock manually. See page 28.

To cancel the Auto Set Up function

Press AUTO SET UP.

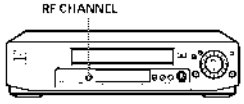
Note

- Do not cancel the Auto Set Up function. If you do, repeat the step above.

Step 5

Tuning your TV to the VCR

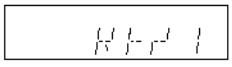
If you have connected the VCR to your TV using the EURO AV cable, skip this step.



1 Press RF CHANNEL on the VCR.

The factory-preset RF channel appears in the display window.

The VCR signal is output through this channel to the TV.



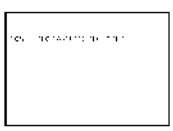
2 Turn on your TV and select a programme position for the VCR picture.

This programme position will now be referred to as the video channel.

3 Tune the TV to the same channel as that shown in the display window, so that the picture on the right appears clearly on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.



continued

Step 6 : Setting the clock (continued)

4 Press RF CHANNEL.

You have now tuned your TV to the VCR. Whenever you want to play a tape, set the TV to the video channel.

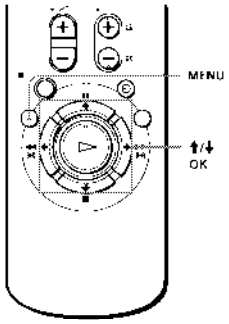
To check to see if the TV tuning is correct

Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct.

To obtain a clear picture from the VCR

If the screen does not appear clearly in step 3 above, press PROGRAM +/– so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Selecting a language

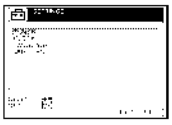


If you prefer an on-screen language other than English, use the on-screen display to select another language.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.



2 Press ↑/↓ to highlight LANGUAGE, then press OK.

3 Press ↑/↓ to highlight the desired language, then press OK.

continued

Selecting a language (continued)

4 Press MENU to exit the menu.

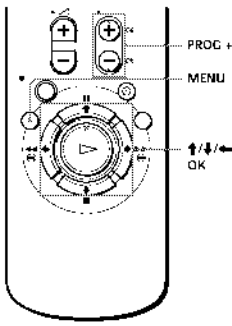
Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Presetting channels

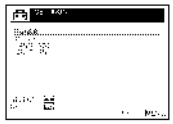


If some channels could not be preset using the Auto Set Up function, you can preset them manually.

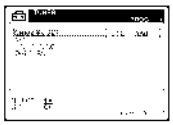
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.



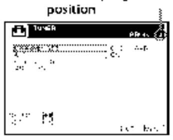
2 Press ↑/↓ to highlight FUNCTN, then press OK.



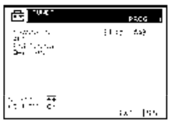
continued

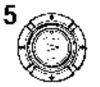
Presetting channels (continued)

3 
Press PROG +/– to select the programme position.


Selected programme position

4 
Press ↑/↓ to highlight CHANNEL SET, then press OK.



5 
Press ↑/↓ repeatedly until the channel you want is displayed.

The channels appear in the following order:

- UHF 321 – B69

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."

6 To allocate another channel to another programme position, repeat steps 3 and 5.

7 
Press MENU to exit the menu.

Disabling unwanted programme positions

After presetting channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1 In step 5 above, press programme number button "0" twice to display the number "00" beside CHANNEL SET.

2 Press MENU to exit the menu.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– or the programme number buttons to select the programme position for which you cannot obtain a clear picture.

2 Press MENU, then select SETTINGS and press OK.

3 Select TUNER, then press OK.

4 Select FINE TUNING, then press OK.

The fine tuning meter appears.


Selected programme position

5 Press ←/→ to get a clearer picture, then press MENU to exit the menu.

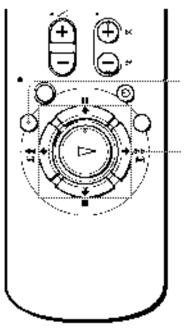
Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Tip
- If you want to return to the previous menu, highlight RETURN and press OK.

Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

Getting Started

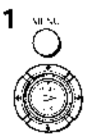
Changing/disabling programme positions



After setting the channels, you can change the programme positions and the station names as you like. If any programme positions are unused or contain unwanted channels, you can disable them.

Changing programme positions

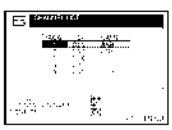
Before you start...
- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 
Press MENU, then press ↑/↓ to highlight LISTS and press OK.

2 
Press ↑/↓ to highlight CHANNEL LIST, then press OK.

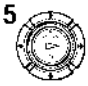
3 
Press ↑/↓ to highlight the row on which you want to change the programme position, then press →.

To display other pages for programme positions 6 to 60, press ↑/↓ repeatedly.



4 
Press ↑/↓ until the selected channel row moves to the desired programme position.

The selected channel is inserted at the new programme position and the intermediate channels are displaced to fill the gap.

5 
Press OK to confirm the setting.

6 To change the programme position of another station, repeat steps 3 to 5.

7 
Press MENU to exit the menu.

Tip
- If you want to return to the previous menu, highlight RETURN and press OK.

Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

continued

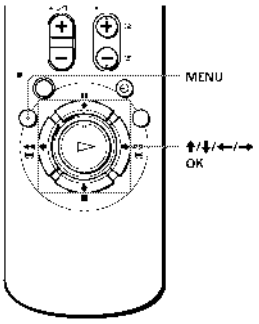
Getting Started

Changing the station names

You can change the station names (up to 5 characters).

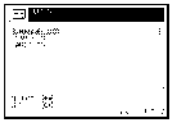
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



1 MENU

Press MENU, then press ↑/↓ to highlight LISTS and press OK.



2

Press ↑/↓ to highlight CHANNEL LIST, then press OK.

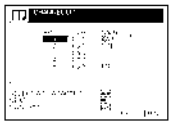
3

Press ↑/↓ to highlight the row on which you want to change the station name, then press ➡.

To display other pages for programme positions 6 to 60, press ↑/↓ repeatedly.

4

Press ➡.

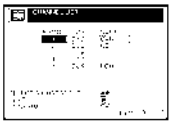


5

Enter the station name.

1 Press ↑/↓ to select a character.
Each time you press ↑, the character changes as shown below.

A ➝ B ➝ ... ➝ Z ➝ a ➝ b ➝ ... ➝ z ➝ 0 ➝ 1 ➝ ... ➝ 9 ➝ (symbols) ➝ (blank space) ➝ A



2 Press ➡ to set the next character.
The next space is highlighted.
To correct a character, press ←/➡ until the character you want to correct is highlighted, then reset it.

You can set up to 5 characters for the station name.

6

Press OK to confirm the new name.

7 MENU

Press MENU to exit the menu.

Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

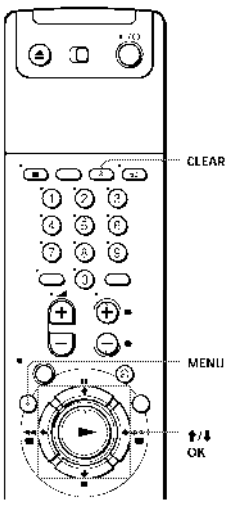
continued

Disabling unwanted programme positions

After presetting channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

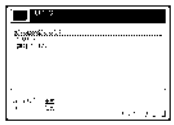
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



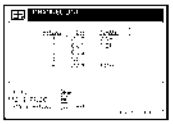
1 MENU

Press MENU, then press ↑/↓ to highlight LISTS and press OK.



2

Press ↑/↓ to highlight CHANNEL LIST, then press OK.



3

Press ↑/↓ to highlight the row on which you want to disable.

4 CLEAR

Press CLEAR.

The selected row will be cleared, as shown on the right.

5

Repeat steps 3 and 4 for any other programme positions you want to disable.

6 MENU

Press MENU to exit the menu.

Tip

- If you want to return to the previous menu, highlight RETURN and press OK.

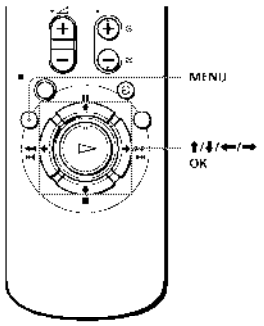
Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you will need to reset that channel manually.

Setting the clock

You must set the time and date on the VCR to use the timer recording features properly. If the VCR clock was not set in the Auto Set Up procedure, you need to set it manually.

The Auto Clock Set function works only if a station in your area is broadcasting a time signal. If the Auto Set Up function did not set the clock correctly for your local area, try another station for the Auto Clock Set function.



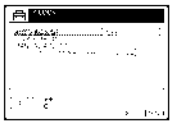
Setting the clock manually

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

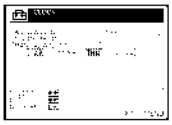
1 Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

2 Press ↑/↓ to highlight CLOCK, then press OK.



3 Press ↑/↓ to highlight MANUAL ADJUST, then press OK.

4 Press ↑/↓ to set the date.



5 Press ➡ to highlight the month and set the month pressing ↑/↓.

6 Set the year, hour, and minutes in sequence, pressing ➡ to highlight the item to be set, and press ↑/↓ to select the digits.

The day of the week is set automatically.

7 Press OK to start the clock.

8 Press MENU to exit the menu.

Tips

- To change three digits during setting, press ⬅ to move the cursor to the digits to be changed, and select the digits pressing ↑/↓.
- If you want to return to the previous menu, highlight RETURN and press OK.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

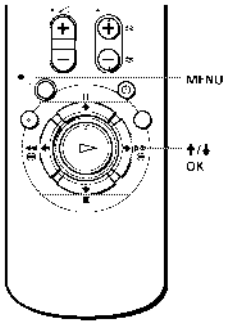
continued

Setting the clock (continued)

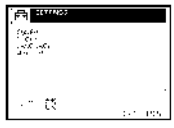
Changing the station for the Auto Clock Set function

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

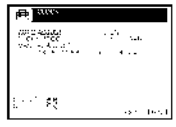


1 Press MENU, then press ↑/↓ to highlight SETTINGS and press OK.

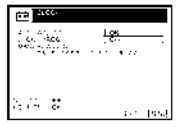


2 Press ↑/↓ to highlight CLOCK, then press OK.

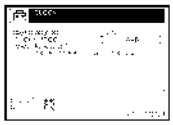
AUTO ADJUST is highlighted.



3 Press OK.



4 Press ↑/↓ to highlight ON, then press OK.



5 Press ↓ to highlight CLOCK PROG, then press OK.

6 Press ↑/↓ repeatedly until the programme position of the station that carries the time signal appears.

If the VCR does not receive the time signal from any station, AUTO ADJUST returns to OFF automatically.

7 Press MENU to exit the menu.

Tips

- If you set AUTO ADJUST to ON, the Auto Clock Set function is activated whenever the VCR is turned off. The time is adjusted automatically by using reference to the time signal from the station whose programme position is displayed in the "CLOCK PROG" row.

  If you do not need the Auto Clock Set, set it to OFF.
- If you want to return to the previous menu, highlight RETURN and press OK.

Note

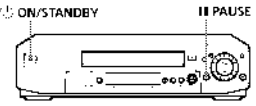
- The menu disappears automatically if you don't proceed for more than a few minutes.

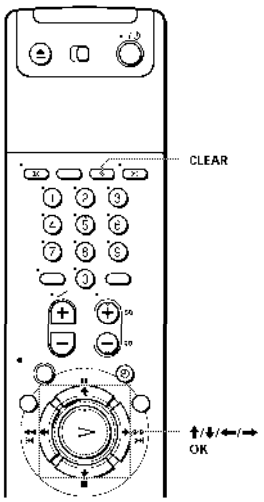
Setting your personal code

For identification, you can enter a personal code into the VCR. Once you enter your personal code, you can confirm it any time but can never change it. Please make a note of the code to quote to the police if your VCR is stolen.

Before you start...

- Turn on your TV and set it to the video channel.
- If there is a tape in the VCR, remove it.
- Turn off the VCR.

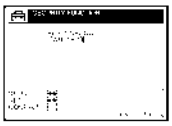




1 Hold down II PAUSE and I/⏻ on the VCR simultaneously for more than three seconds.

2 Enter your personal code.

1 Press ↑/↓ to select a character.
Each time you press ↑, the character changes as shown below.
A → B → ... → Z → 0 → 1 → ... → 9 → (blank space) → – (hyphen) → A



2 Press → to set the next character.
The next space is highlighted.
To correct a character, press ←/→ until the character you want to correct is highlighted, then reset it.
You can set up to 11 characters for your personal code.

3 Press OK.
A confirmation screen appears.

4 If the displayed personal code is correct, press OK.

CLEAR If the displayed personal code is wrong, press CLEAR and continue from step 2.

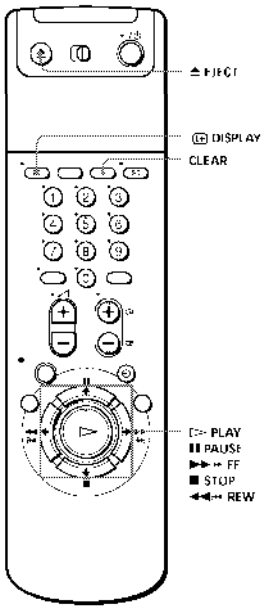
To confirm your personal code

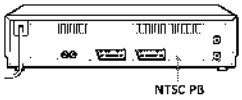
While the VCR is turned off and there is no tape in the VCR, hold down II PAUSE and I/⏻ on the VCR simultaneously for more than three seconds. The entered personal code appears on the TV screen. Press any button to enter normal viewing mode.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

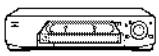
Playing a tape





1 Turn on your TV and set it to the video channel.

2 Insert a tape.
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 Press ▷ PLAY.
When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast forward the tape	▶▶ (to stop, stop)
Rewind the tape	◀◀ (to stop, stop)
Eject the tape	⏏ EJECT

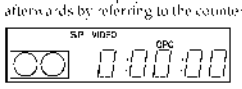
To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the colour system of your TV.

When your TV is	Set NTSC PB to
PAL only	ON (PAL TV)
PAL and NTSC	NTSC 4.43

To use the time counter

At the point on the tape that you want to find later, press CLEAR. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.



To display the counter on the TV screen, press DISPLAY.

continued

Playing a tape (continued)

Notes
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- The time counter does not appear on the TV screen when using an NTSC recorded tape.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - The picture becomes black and white.
  - The picture shakes.
  - No picture appears on the TV screen.
  - Black streaks appear horizontally on the TV screen.
  - The colour density increases or decreases.
- If you play back a tape in LP or SP mode with NTSC system, the sound is heard in monaural.
- While setting the menu on the TV screen, buttons for playback on the remote commander do not function.

Starting playback automatically with one button (One Touch Play)

If you use the SMARTLINK connection, you can turn on the VCR and the TV, set the TV to the video channel, and start playback automatically with one button.

1 Insert a tape.

The VCR automatically turns on.

If you insert a tape with its safety tab removed, the TV turns on and switches to the video channel. Playback starts automatically.

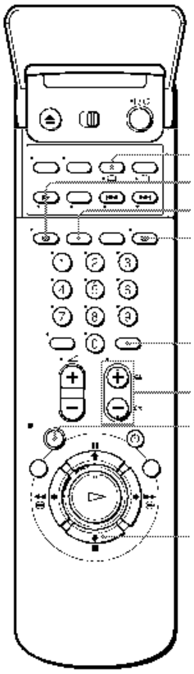
2 Press ▷ PLAY.

The TV turns on and switches to the video channel automatically. Playback starts.

Tip
- When there already is a tape in the VCR, the VCR and the TV turn on, the TV is set to the video channel, and playback starts automatically in one sequence when you press ▷ PLAY.

Note
- When you use the One Touch Play function, leave the TV power in the standby mode.

Recording TV programmes



1 Turn on your TV and set it to the video channel.

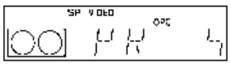
continued

Recording TV programmes (continued)

2 Insert a tape with its safety tab in place.

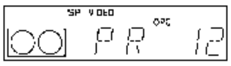
3 

Press INPUT SELECT until a programme position number appears in the display window.



4 

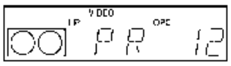
Press PROG +/– to select the programme position you want to record.



5 

Press SP/LP to select the tape speed, SP or LP.

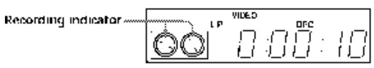
LP (Long Play) provides recording time twice as long as SP. However, SP (Standard Play) produces better picture and audio quality.



6 

Press ● REC to start recording.

The recording indicator lights up red in the display window.

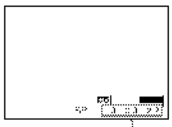


To stop recording

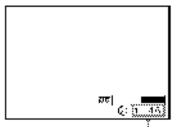
Press ■ STOP.

To check the remaining time

Press DISPLAY. With the display on, press COUNTER/REMAIN to check the remaining time. Each time you press COUNTER/REMAIN, the time counter and the remaining time appear alternately. The remaining time with the indicator also appears in the display window.



Time counter



Remaining time

To correctly check the remaining time of the tape, set TAPE LENGTH in the OPTIONS-1 menu according to the tape type you use (see page 68).

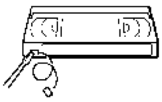
To watch another TV programme while recording

1 Press TV/VIDEO to turn off the VIDEO indicator in the display window.

2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



Safety tab

Tips
- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 (TV) connector, the LINE IN jacks, or the LINE-3 IN (Smart) connector also using the INPUT SELECT button.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

continued

Recording TV programmes (continued)

Notes

- The display does not appear during still (pause) mode or slow motion playback.
- The display will not appear while playing an NTSC recorded tape.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.
- When you insert a non-standard commercially available tape, the remaining time may not be correct.
- The remaining time is provided for rough measurement only.
- About 8 seconds after the tape begins playback, the tape remaining time will be displayed.

Recording what you are watching on the TV (TV Direct Rec)

If you use the SMARTLINK connection, you can easily record what you are watching on the TV (other than tapes being played on the VCR).

1 Insert a tape with its safety tab in place.

2 Press ● REC while you are watching a TV programme or external source.

The VCR automatically turns on, then the TV indicator lights up and the VCR starts recording what you are watching on the TV.

Tips

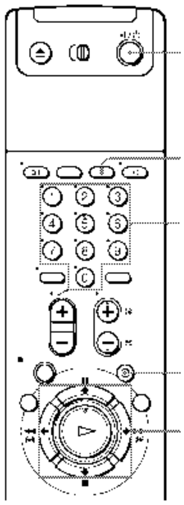
- The TV indicator appears in the display window after you press ● REC in some situations such as:
  when you are watching a source connected to the TV's line input, or
  when the TV tuner preset data for the programme position is different from the data in the VCR tuner preset.
- If there is a tape with its safety tab in place in the VCR, the VCR automatically turns on and starts recording what you are watching on the TV when you press ● REC.
- You can turn the TV Direct Rec function ON and OFF in the OPTIONS-2 menu (see page 67).

Notes

- You cannot record what you are watching using this method when the VCR is in the following modes: pause, timer standby, tuner preset, Auto Set Up, and recording.
- When the TV indicator is lit in the display window, do not turn off the TV nor change the TV programme position. When the TV indicator is not lit, the VCR continues recording the programme even if you change the TV programme position on the TV.

Recording TV programmes using the VIDEO Plus+ system

The VIDEO Plus+ system is the feature that simplifies programming the VCR to make timer recording. Just enter the Plus Code listed in the TV programme guide. The date, times, and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

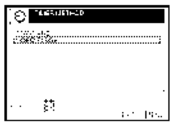


Before you start...

- Check that the VCR clock is set to the correct time and date.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.
- Set TIMER OPTIONS to VIDEO PLUS+ or VARIABLE in the OPTIONS-2 menu (see page 67).

1 Press ⏲ TIMER.

- When you set TIMER OPTIONS to VARIABLE
  The TIMER METHOD menu appears on the TV screen. Press ↑/↓ to select VIDEO PLUS+, then press OK.



- When you set TIMER OPTIONS to VIDEO PLUS+
  The VIDEO PLUS+ menu appears on the TV screen.

continued

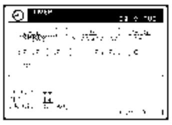
Recording TV programmes using the ShowView system (continued)

2 Press the programme number buttons to enter the Plus Code.

If you make a mistake, press CLEAR and re-enter the correct number.

3 Press OK.

The date, start and stop times, programme position, tape speed, and VPS/PDC setting appear on the TV screen.



- If "- -" appears in the "PROG." (programme) column (this may happen for local broadcasts), you have to set the appropriate programme position manually.
  Press ↑/↓ to select the desired programme position.
  To record from another source connected to the LINE-1 (TV) connector, the LINE-2 IN jacks, or the LINE-3 IN (Scart) connector, press INPUT SELECT to display "L1," "L2," or "L3."
  You will only have to do this operation once for the selected channel. The VCR will then store your setting.

If the information is incorrect, press CLEAR to cancel the setting.

4 If you want to change the date, tape speed, and the VPS/PDC function setting:

1 Press ←/→ to highlight the item you want to change.
2 Press ↑/↓ to reset it.

- To record the same programme every day or the same day every week, see "Daily/weekly recording" on page 43.
- To use the VPS/PDC function, set VPS/PDC to ON.
  For details of the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 43.

5 Press MENU to exit the menu.

6 Press I/⏻ to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 4 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

TODAY → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → SAT (every Saturday) ..... → MON (every Monday) → SUN (every Sunday) → 1 month later → (dates count down) → TOMORROW → TODAY

Timer recording with VPS/PDC signals

Some broadcast systems transmit VPS (Video Programme System) or PDC (Programme Delivery Control) signals with their TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delays, early starts, or broadcast interruptions (with the VPS or PDC indicator in the display window lit).

To use the VPS/PDC function, set VPS/PDC to ON in step 4 above. You can also use the VPS/PDC function for a source connected to the LINE-1 (TV) connector, the LINE-2 IN jacks, or the LINE-3 IN (Scart) connector.

continued

Recording TV programmes using the ShowView system (continued)

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes.

1 Turn on the satellite tuner.

2 On the satellite tuner, select the satellite programme for which you want to make a timer setting.

3 Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⊙ indicator turns off and the VCR switches on. Remember to press I/⏻ to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Tips

- To set the programme position with a two-digit number, press -/-- (ten's digit) button followed by the programme number button.
- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use the SP/LP button.
- When you are recording a programme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO LONG PLAY to OFF in the OPTIONS-1 menu (page 66).
- To check, change, or cancel the programme setting, press ←/→ to choose LIST, then press OK after step 4. For details, see step 3 in "Checking/changing/cancelling timer settings" (page 50).

Notes

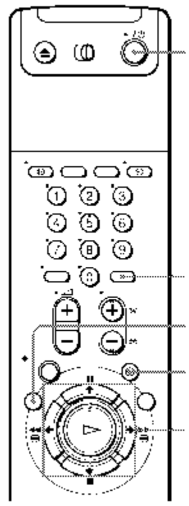
- If the VPS/PDC signal is too weak or the broadcasting station failed to transmit VPS/PDC signals, the VCR will start recording at the set time without using the VPS/PDC function.
- The ⊙ indicator flashes in the display window when you press I/⏻ with no tape inserted.
- When you set TIMER OPTIONS to STANDARD in the OPTIONS-2 menu, the VIDEO Plus+ menu does not appear on the TV screen. Select VIDEO Plus+ or VARIABLE.

Setting the timer manually

If the VIDEO Plus+ system is not available in your area, follow the instructions below to set the timer to record programmes.

Before you start...

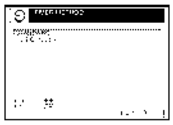
- Check that the VCR clock is set to the correct time and date.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.
- Set TIMER OPTIONS to STANDARD or VARIABLE in the OPTIONS-2 menu (see page 67).



1 Press ⊙ TIMER.

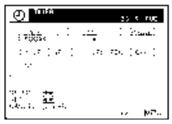
- When you set TIMER OPTIONS to VARIABLE

The TIMER METHOD menu appears on the TV screen. Press ↑/↓ to select STANDARD, then press OK.



- When you set TIMER OPTIONS to STANDARD

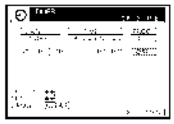
The TIMER menu appears on the TV screen.



continued

Setting the timer manually (continued)

2 Set the date, start and stop times, programme position, tape speed, and VPS/PDC function:



1 Press → to highlight each item in turn.
2 Press ↑/↓ to set each item.

To correct a setting, press ← to return to that setting and reset.

- To record the same programme every day or the same day every week, see "Daily/weekly recording" below.
- To use the VPS/PDC function, set VPS/PDC to ON. For details of the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 43.
- To record from another source connected to the LINE 1 (TV) connector, the LINE 2 IN jacks, or the LINE 3 IN (Scart) connector, press INPUT SELECT to display "L1," "L2," or "L3" in the "PROG." position.

3 Press MENU to exit the menu.

4 Press I/⏻ to turn off the VCR.

The ⊙ indicator appears in the display window and the VCR stands by for recording.

To record from another source, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

TODAY → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → SAT (every Saturday) ..... → MON (every Monday) → SUN (every Sunday) → 1 month later → (dates count down) → TOMORROW → TODAY

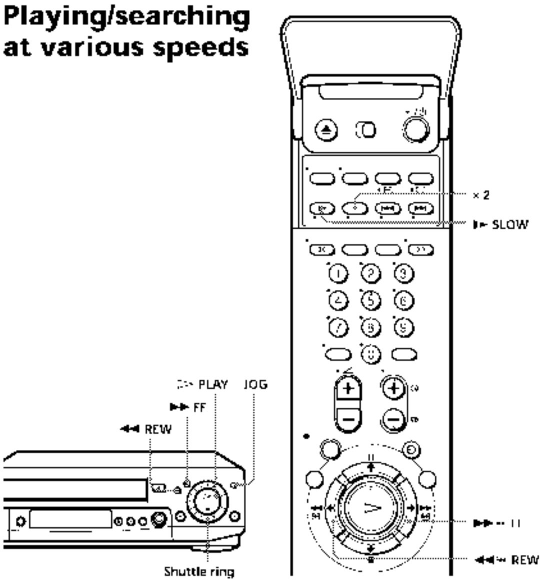
Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use the SP/LP button.
- When you are recording a programme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO LONG PLAY to OFF in the OPTIONS-1 menu (page 66).
- Even if you set TIMER OPTIONS to VIDEO Plus+ in the OPTIONS-2 menu, you can set the timer manually. Press MENU to select TIMER, then go to step 2.

Notes

- When setting the timer with VPS/PDC signals, enter the start and stop times exactly as indicated in the TV programme guide, otherwise the VPS/PDC function won't work.
- If the VPS/PDC signal is too weak or the broadcasting station failed to transmit VPS/PDC signals, the VCR will start recording at the set time without using the VPS/PDC function.
- The ⊙ indicator flashes in the display window when you press I/⏻ with no tape inserted.

Playing/searching at various speeds



Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ►►•• II/►► FF. During rewind, hold down ◄◄•• REW/◄◄ REW.
Play at high speed	• During playback, press ►►•• FF or ◄◄•• REW on the remote commander. • During playback, hold down ►►•• FF/►► FF or ◄◄•• REW/◄◄ REW. When you release the button, normal playback resumes.

Playback options	Operation
Play at twice the normal speed	During playback, press ×2.
Play in slow motion	During playback, press I► SLOW.
Play frame by frame	During pause, press ►►•• FF or ◄◄•• REW on the remote commander. Hold down ►►•• FF or ◄◄•• REW to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding down ◄◄ REW on the VCR.

To resume normal playback

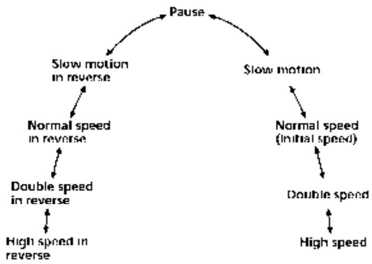
Press ▷ PLAY.

Using the shuttle ring

With the shuttle ring, you can operate a variety of playback options. There are two ways for using the shuttle ring, normal mode and jog mode.

To use the shuttle ring in normal mode

During playback or pause, turn the shuttle ring clockwise or anticlockwise. Each change in the shuttle ring position changes the playback mode in the following way:



continued

Playing/searching at various speeds (continued)

To use the shuttle ring in jog mode

Use this mode for frame by frame playback.

Press JOG to enter the jog mode. The JOG button lights up. If you change to the jog mode during any playback mode, the playback pauses so you can see a still picture. Each change in the shuttle ring position shifts the picture one frame. To shift frames in reverse, turn the shuttle ring anticlockwise. The frame shift speed depends on the speed you turn the shuttle ring.

To resume normal mode, press JOG again. The JOG button goes off.

Tip

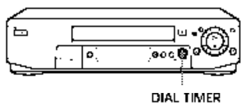
- Adjust the picture using the TRACKING +/– buttons if:
  - Streaks appear while playing in slow motion
  - Bands appear at the top or bottom while pausing
  - The picture shakes while pausing

  To set tracking to the centre position, press both buttons (+/–) at the same time.

Notes

- The sound is muted during these operations.
- In the LP mode, noise may appear or there may be no colour.

Recording TV programmes using Dial Timer



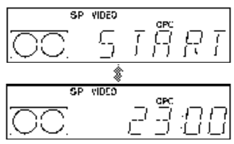
The Dial Timer function allows you to make timer recordings of programmes without turning on your TV. Set the recording timer to record up to eight programmes that will be broadcast within the next 24 hours using DIAL TIMER. The recording start time and stop time can be set at 15 minutes intervals.

Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

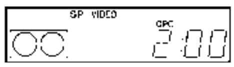
1 Press DIAL TIMER.

"START" and the recording start time appear alternately in the display window.



2 Turn DIAL TIMER to set the recording start time.

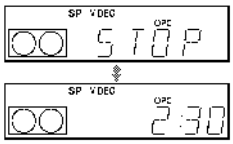
The time changes in 15 minute intervals.



continued

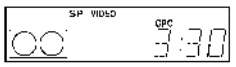
3 Press DIAL TIMER.

"STOP" and the recording stop time appear alternately in the display window.



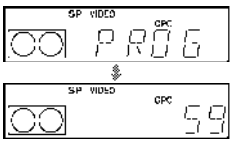
4 Turn DIAL TIMER to set the recording stop time.

The time changes in 15-minute intervals.



5 Press DIAL TIMER.

"PROG" and the programme position appear alternately in the display window.



6 Turn DIAL TIMER to set the programme position.

To record from a decoder or other source connected to the LINE-1 (TV) connector, the LINE-2 IN jacks, or the LINE-3 IN (Scart) connector, press INPUT SELECT to display "L1," "L2," or "L3."

7 Press DIAL TIMER to complete the setting.

"OK" appears in the display window for about five seconds.

The ⊖ indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⊖ indicator turns off and the VCR switches off. Remember to press I/⏻ to reset the VCR after using the VCR.

Tips

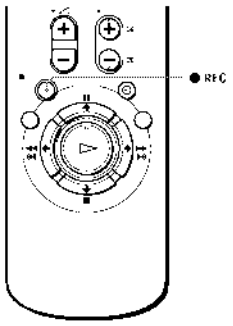
- The programme is recorded in the current tape speed mode. To change the tape speed, press SLP before you complete the setting — step 7.
- To check, change or cancel the programme setting, see "Changing/checking/cancelling timer settings" (page 55).

Notes

- The ⊖ indicator flashes in the display window when you complete the setting in step 7 if no tape is inserted.
- If eight programmes have already been set, "FULL" appears in the display window for about three seconds in step 7.

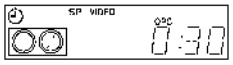
Setting the recording duration time

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press ● REC.

The ⊖ indicator appears in the display window.



2 Press ● REC repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

→ 0:30 → 1:00 ····· 5:30 → 6:00 → Normal recording

The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press ● REC repeatedly to set a new duration.

To cancel the duration

Press ● REC repeatedly until the ⊖ indicator disappears and the VCR returns to normal recording mode.

To stop recording

To stop the VCR while recording, press ■ STOP.

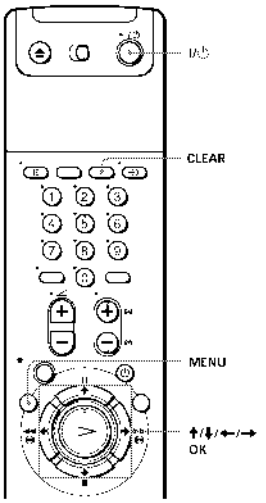
Note

- You can not display the current superimpose the display window when setting the recording duration.

Checking/ changing/ cancelling timer settings

Before you start...

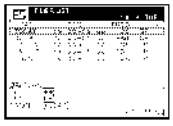
- Turn on your TV and set it to the video channel.



1 Press I/⏻ to turn on the VCR.

2 Press MENU, then press ↑/↓ to highlight TIMER SET, then press OK.

3 Press ↑/↓ to highlight TIMER LIST, then press OK.



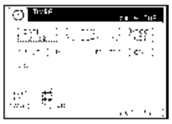
- If you want to change or cancel a setting, go on to the next step.
- If you do not need to change or cancel the settings, press MENU, then turn off the VCR to return to recording standby.

continued

Checking/changing/cancelling timer settings (continued)

4 Press ↑/↓ to select the setting you want to change or cancel. Then press OK.

The selected setting appears in the TIMER menu.



5 • To change the setting, press ←/→ to highlight the item you want to change, and press ↑/↓ to reset it.

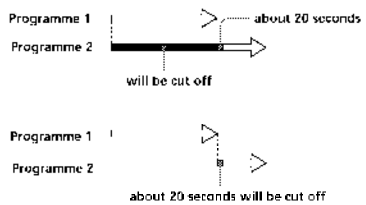
• To cancel the setting, press CLEAR.

6 Press MENU.

If any settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

In NICAM system

This VCR receives and records stereo and bilingual programmes based on the NICAM system (the NICAM indicator appears). When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To record a NICAM programme, HIFI AUDIO in the OPTIONS-1 menu should be set to NICAM (initial setting). To check the menu setting, see page 66 for details.

To select the sound while recording

Press AUDIO MONITOR to select the sound you want.

Stereo programme

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Standard sound*	No indicator	No indicator

* Usually mixed sound of left and right channels (monaural)

Bilingual programme

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO
Standard sound*	No indicator	No indicator

* Usually the main sound (monaural)

Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want.

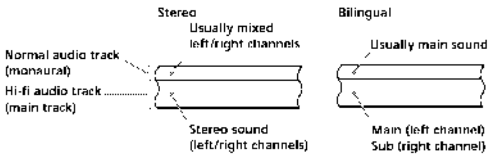
To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/Main	LCH	STEREO
Right channel/Sub	RCH	STEREO
Standard sound	No indicator	No indicator

continued

Recording stereo and bilingual programmes (continued)

How sound is recorded on a video tape

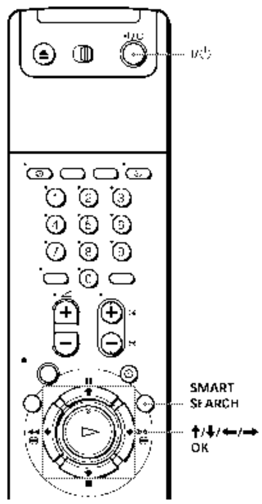
The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



Notes

- To listen to playback sounds in stereo, you must use the EURO-AV or AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the OPTIONS-1 menu is set to OFF (see page 66).
- If HIFI AUDIO is set to STANDARD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

Searching using the Smart Search function



If you record multiple programmes on a tape, use the Smart Search function to see what has been recorded on your tape. You can see information such as date, time, and channel of programmes recorded on a tape. You can also start playback directly from the selected programme using the SMART SEARCH screen.

All programmes are listed on the screen, regardless of how the programme was recorded.

The data of the last tape inserted into the VCR is automatically stored in memory. If you want to recall the latest data screen, select LATEST DATA in the SMART SEARCH screen (see page 60).

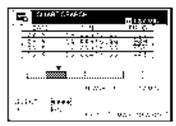
Before you start...

- Turn on your TV and set it to the video channel.

1 After recording, press I/⏻ to turn on the VCR.

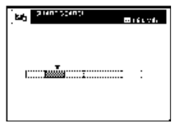
2 Press SMART SEARCH.

3 Press ↑/↓/←/→ to select the programme you want to start viewing.



4 Press OK.

The VCR starts searching, and playback starts automatically from the beginning of the selected programme.



continued

Searching using the Smart Search function (continued)

To stop searching

Press ■ STOP.

To exit the SMART SEARCH screen

Press SMART SEARCH.

To record in a blank space

Blank space on the tape will appear as a blank row in the SMART SEARCH screen. Select the blank row in step 3, then press OK. The VCR rewinds/fast forwards the tape to the beginning of the blank space, then stops. Start recording.

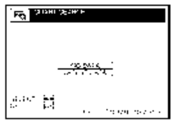
To recall the latest data screen after you remove the tape

You can display the data of the last tape used to record a programme, even after you have removed the tape.

If you reinsert the tape and record additional programmes, be sure to select LATEST DATA. Otherwise, all of the data for the tape is deleted.

1 Reinsert the last tape that you used to record a programme.

2 Press SMART SEARCH.

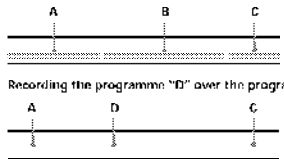


3 Press ↑/↓ to highlight LATEST DATA.
If you want to reset the latest data screen, highlight NO DATA and press OK, then record a programme.

4 Press OK.
The latest data stored in the VCR's memory is displayed.

Tips
- You can store information for up to 21 programmes on a single list.
- While recording, you can display the SMART SEARCH screen using the SMART SEARCH button. If you decide to stop recording, press SMART SEARCH to make the SMART SEARCH screen disappear first. Then press ■ STOP.

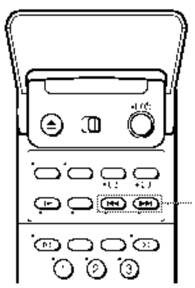
Notes
- If you begin recording a programme "D" from the middle of a previously recorded programme "A" and into another previously recorded programme "B", the Smart Search information for the second programme "B" which is recorded over is deleted.



- You cannot use this function unless the clock is set.
- Depending on the tape, the total or remaining time may not appear correctly.
- When recording a short programme (less than 10 minutes in SP mode, or 20 minutes in LP mode), the Smart Search function may not be available or the programme information may not appear. Also, if you record a long programme directly after a short programme, the Smart Search information for the short programme may be deleted.
- Blank space is measured from the end of the last recorded programme to the end of the tape. However, if you eject the tape then make a new recording on the same tape, the original recorded programme(s) is displayed as a blank space.
- If no information is stored in the VCR's memory, LATEST DATA does not appear in the SMART SEARCH screen.

Searching using the index function

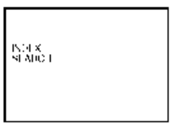
The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording.



1 Insert an indexed tape into the VCR.

2 Press ⏮/⏭ INDEX SEARCH.
- To search ahead, press ⏭ INDEX SEARCH.
- To search backwards, press ⏮ INDEX SEARCH.

The VCR starts searching, and playback starts automatically from that point.



To stop searching

Press ■ STOP.

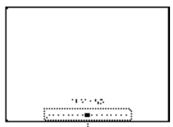
Note
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the programme position during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

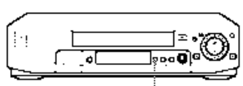
During playback, press TRACKING +/– to display the tracking meter. The distortion should disappear as you press one of the two buttons (the indicator lights up). To resume automatic tracking adjustments, eject the tape and re-insert it.


Tracking meter

About the Reality Regenerator (RR) function

The Reality Regenerator (RR) function automatically restores the picture to its original quality during playback.

To use the RR function, press REALITY REGENERATOR. The REALITY REGENERATOR button lights up. You can set RR to NORMAL or HIGH in the OPTIONS 2 menu (see page 67).



To turn it off, press REALITY REGENERATOR. The REALITY REGENERATOR button goes off.

continued

About the Optimum Picture Control (OPC) function

The Optimum Picture Control (OPC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set OPC to ON in the OPTIONS-1 menu (with the OPC indicator in the display window lit). For details, see page 66.

OPC playback

The OPC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with OPC.

OPC recording

Whenever you insert a tape and start recording for the first time, the VCR adjusts to the tape using the OPC function (the OPC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the OPC function

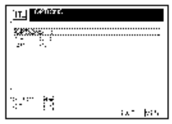
Set OPC to OFF in the OPTIONS-1 menu. The OPC indicator in the display window goes off.

Tip
- To set tracking to the centre position, press the TRACKING + and – buttons at the same time.

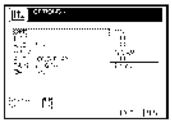
Notes
- You can adjust the tracking for the NTSC-recorded tape but the tracking meter won't be displayed.
- With the Auto Long Play function on, the OPC function will work only in SP mode. If the tape speed automatically switches from SP to LP, the OPC function turns off. If, however, the entire programme is recorded in LP mode, the OPC function will work.
- There is a delay of about ten seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the OPC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the OPC indicator flashes rapidly). After the OPC indicator stops flashing, press II PAUSE to start recording immediately. If you want to start recording quickly without using the OPC function, first set the VCR to recording pause (the OPC indicator flashes slowly) and press II PAUSE to start recording.

Changing menu options

1 Press MENU, then select OPTIONS and press OK.



2 Press ↑/↓ to highlight OPTIONS-1 or OPTIONS-2, then press OK.



3 Press ↑/↓ to select the option, then press OK.

4 Press ↑/↓ to change the setting, then press OK.

5 Press MENU to return to the original screen.

continued

Menu choices

Initial settings are indicated in bold print.

OPTIONS-1

Menu option	Set this option to
OPC	• **ON** to switch on the OPC (Optimum Picture Control) function and improve picture quality. • OFF to switch off OPC.
EDIT	• ON to minimize picture deterioration when editing. • **OFF** to turn off EDIT.
AUDIO MIX	• ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. • **OFF** to listen to the hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button. For details, see page 58.
HIFI AUDIO	• **NICAM** to record NICAM broadcasts on the hi-fi audio tracks. • STANDARD to record standard sound on the hi-fi audio track. For details, see page 57.
AUTO LONG PLAY	• ON to change the tape recording speed automatically to the LP mode when the remaining tape becomes shorter than the recording time. • **OFF** to keep the set tape speed.
TAPE LENGTH	• **E180** to use an E-180 or shorter type tape. • E195 to use an E-195 type tape. • E240 to use an E-240 type tape. • E300 to use an E-300 type tape.

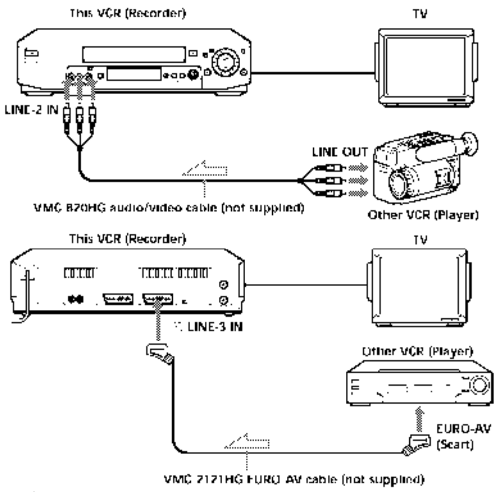
OPTIONS-2

Menu option	Set this option to
TIMER OPTIONS	• **VARIABLE** to display the TIMER METHOD menu for selecting STANDARD or VIDEO Plus+ when pressing ⊕ TIMER button. • STANDARD to display the TIMER menu when pressing the ⊕ TIMER button. • VIDEO PLUS+ to display the VIDEO Plus+ menu when pressing the ⊕ TIMER button. For details, see pages 41 and 45.
BUZZER	• ON to output a beep sound when any illegal operation is made. • **OFF** to cancel it.
POWER SAVE	• ON to turn off the indicators in the display window to conserve the VCR power. • **OFF** to turn on the indicators in the display window while the VCR is standing by.
RF MODULATOR	• **ON** if you connect the VCR to your TV using only the aerial cable. • OFF if you connect the VCR to your TV using the EURO-AV cable.
TV DIRECT REC	• **ON** to activate the TV Direct Rec function. • OFF to deactivate it.
NR	• **NORMAL** for normal everyday use. • HIGH for well used video tapes such as rented tapes. Select this option when NORMAL does not improve the picture quality.

Notes
- When you set a timer recording, the indicators in the display window remain on, even though POWER SAVE is set to ON.
- With the EDIT option ON, the OPC function does not work.

Connecting to a VCR or stereo system

How to connect to record on this VCR



Tip

- You can also use the LINE-1 (TV) connector instead.

Notes

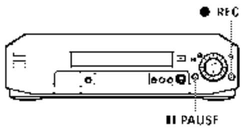
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- If you connect this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- If the other VCR does not have a EURO-AV (Scart) connector, use the VMC-2105HG cable instead and connect the cable to the line out jacks of the other VCR.

How to connect to a stereo system

Connect the LINE-2 IN AUDIO L/R jacks on this VCR to the audio output jacks on the stereo system, using the RK-C510HG audio cable (not supplied).

Basic editing

(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" ("L1" or "L3") in the display window.
- Press SP/LP to select the tape speed, SP or LP.
- On this VCR, set EDIT to ON in the OPTIONS 1 menu. If the other VCR has a similar function, turn it on also.

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR to set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tip

- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording.

Note

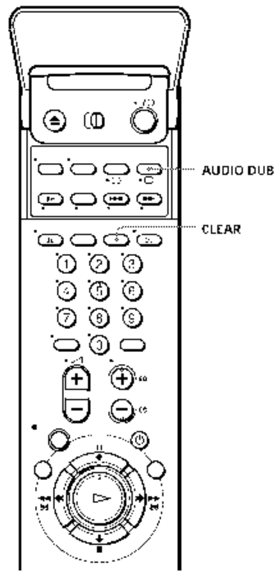
- If you start editing following the procedure above, the VCR won't start recording with the OPC function. To record a tape with the OPC function, press ● REC again during recording pause in step 3 so the VCR analyses the tape. Then, when you start editing in step 4, press II PAUSE after the OPC indicator stops flashing. If you press II PAUSE before the OPC indicator stops flashing, the OPC function is cancelled.

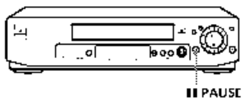
Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.

Before you start...

- Connect a playback source to the LINE-2 IN AUDIO L/R jacks on the front panel.
- Turn on the TV and set it to the video channel.





1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.

2 Insert a prerecorded tape with its safety tab in place into this (recording) VCR. Search for the end of the section to be replaced and press II PAUSE.

3 Press CLEAR to reset the counter to "0H00M00S."

4 Rewind the prerecorded tape to the beginning of the section to be replaced.

The VCR enters pause mode.

5 Press AUDIO DUB.

The programme position changes "L2," and the indicator appears in the display window.

6 To start editing, press the II PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while editing

Press ■ STOP on this VCR and the stereo system (or other VCR).

Note

- After you use this feature, the audio in playback mode is automatically set to monaural.

To listen to both the hi-fi and normal audio

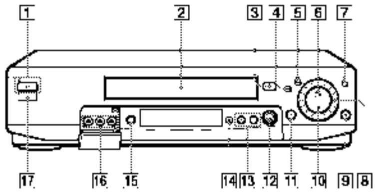
Set AUDIO MIX to ON in the OPTIONS 1 menu (page 66). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function.

Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

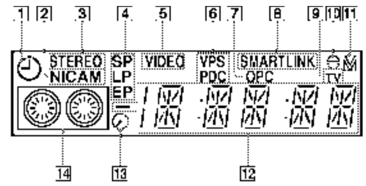
Refer to the pages indicated in parentheses ( ) for details

Front panel



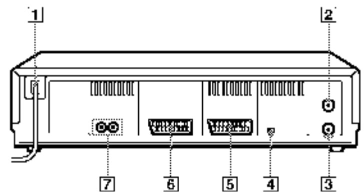
1 I/⏻ ON/STANDBY switch/indicator (32)
2 Tape compartment
3 ⏏ EJECT button (35)
4 ◀◀ REW (rewind) button (35, 48)
5 ▶▶ FF (fast-forward) button (35, 48)
6 ▷ PLAY button (35, 49)
7 JOG button (50)
8 Shuttle ring (49)
9 ● REC (record) button (38, 54, 69)
10 ■ STOP button (35, 69)
11 ❚❚ PAUSE button (32, 35, 69)
12 DIAL TIMER control (51)
13 PROGRAM/TRACKING +/– buttons (30, 63)
14 REALITY REGENERATOR button (63)
15 AUTO SET UP/RF (Radio Frequency) CHANNEL button (14, 15)
16 LINE-2 IN VIDEO/AUDIO L/R jacks (68)
17 Remote sensor (5)

Display window



1 Timer indicator (43, 46)
2 NICAM indicator (57)
3 STEREO indicator (57)
4 Tape speed indicators (38)
5 VIDEO indicator (10, 39)
6 VPS (Video Programme System)/PDC (Programme Delivery Control) indicator (43)
7 OPC (Optimum Picture Control) indicator (64)
8 SMARTLINK indicator (10)
9 TV indicator (40)
10 Audio Dubbing indicator (71)
11 Tracking indicator (63)
12 Time counter/clock/line/programme position indicator (35, 38, 69)
13 Remaining time indicator (39)
14 Tape/recording indicator (38)

Rear panel

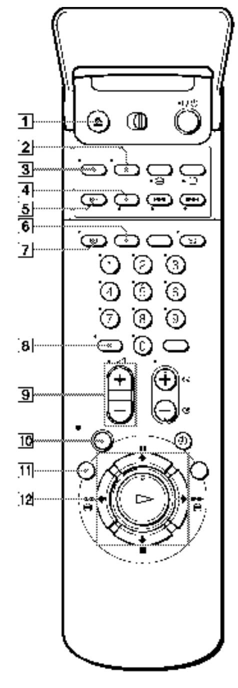


1 Mains lead (9, 12)
2 AERIAL IN ANTENNE ENTREE connector (9, 12)
3 AERIAL OUT ANTENNE SORTIE connector (9, 12)
4 NTSC PB (Play Back) switch (35)
5 ⇥ LINE-3 IN ⇥ ENTREE LIGNE 3 connector (13, 68)
6 ⇔ LINE-1 (TV) ⇔ LIGNE-1 (TV) connector (9)
7 AUDIO OUT R (right)/L (left) SORTIE AUDIO D/G jacks (13)

continued

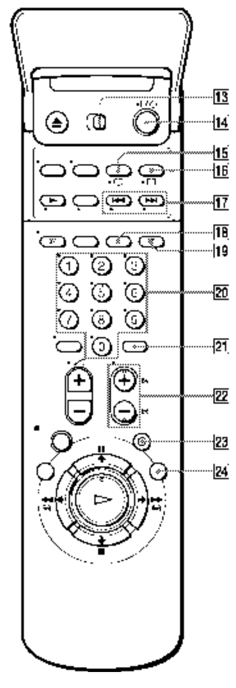
Index to parts and controls (continued)

Remote commander



1 ⏏ EJECT button (35)
2 WIDE button (for TV) (7)
3 AUDIO MONITOR button (57)
4 × 2 button* (49)
5 ❙▶ SLOW button* (49)
6 SP (Standard Play)/LP (Long Play) button (38)
7 ⓘ DISPLAY button (39)
8 -/-- (ten's digit) button (6, 39)
9 ◢ (volume) +/– buttons (for TV) (6)
10 ● REC (record) button (38, 54)
11 MENU button (17, 55, 63)
12 ❚❚ PAUSE/⬆ button (17, 35)
■ STOP/⬇ button (17, 35)
◀◀ REW (rewind)/⬅ button (35, 48)
▶▶ FF (fast-forward)/➡ button (35, 48)
▷ PLAY/OK button (17, 35)

* FASTEXT buttons (for TV)



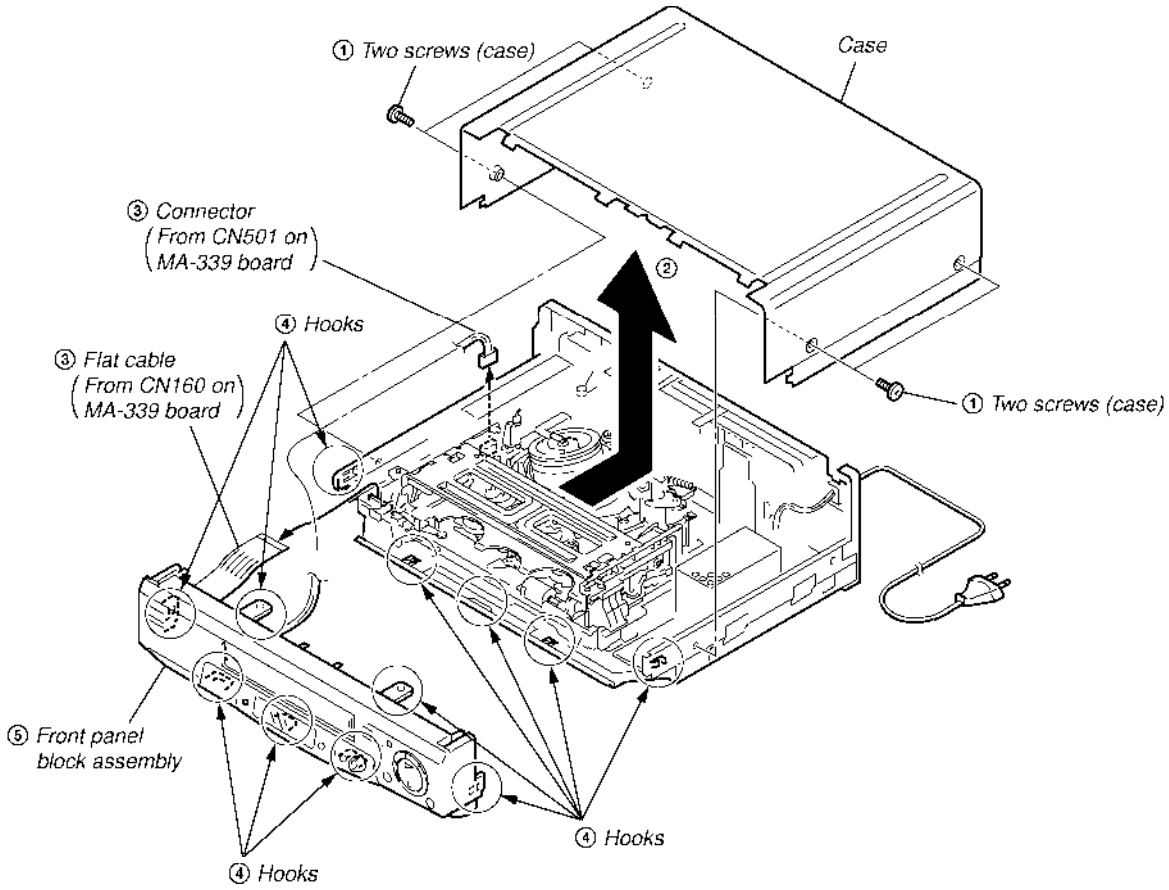
13 TV / VIDEO remote control switch (5)
14 I/⏻ (on/standby) switch (6, 43)
15 COUNTER/REMAIN button (39)
 (teletext) button (for TV) (7)
16 AUDIO DUB button (71)
 TV power on / TV mode select button (for TV) (7)
17 ⏮/⏭ INDEX SEARCH buttons* (62)
18 CLEAR button (35, 42, 56)
19 ⇥ TV/VIDEO button (6, 10, 39)
20 Programme number buttons (6, 39)
21 INPUT SELECT button (38, 46, 69)
22 PROG (programme) +/– buttons (6, 20, 38)
 Teletext page access buttons (for TV) (7)
23 ⊙ TIMER button (41, 45)
24 SMART SEARCH button (59)

* FASTEXT buttons (for TV)

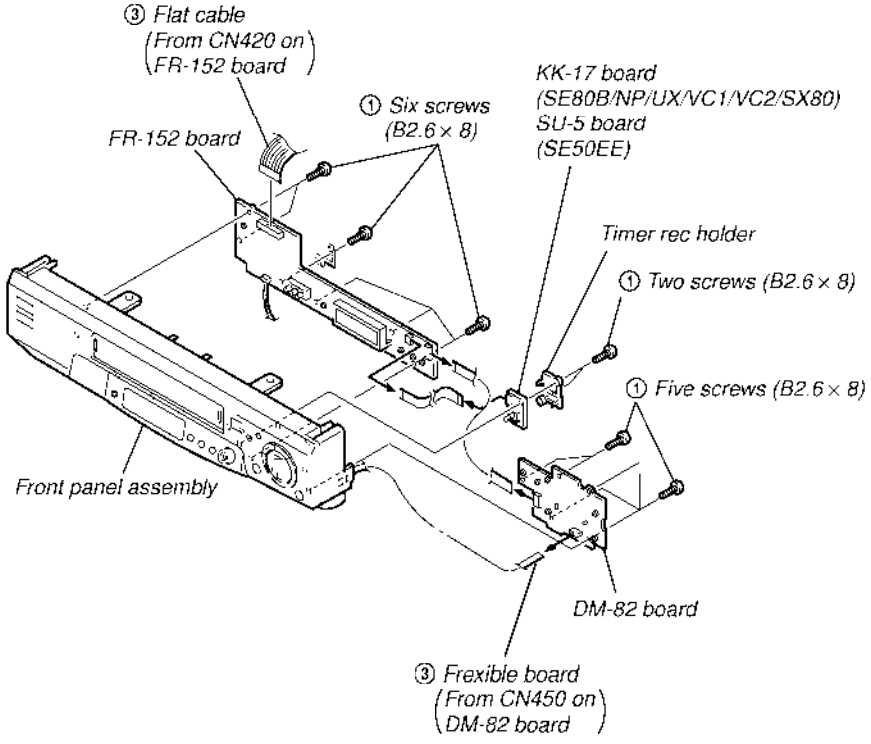
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

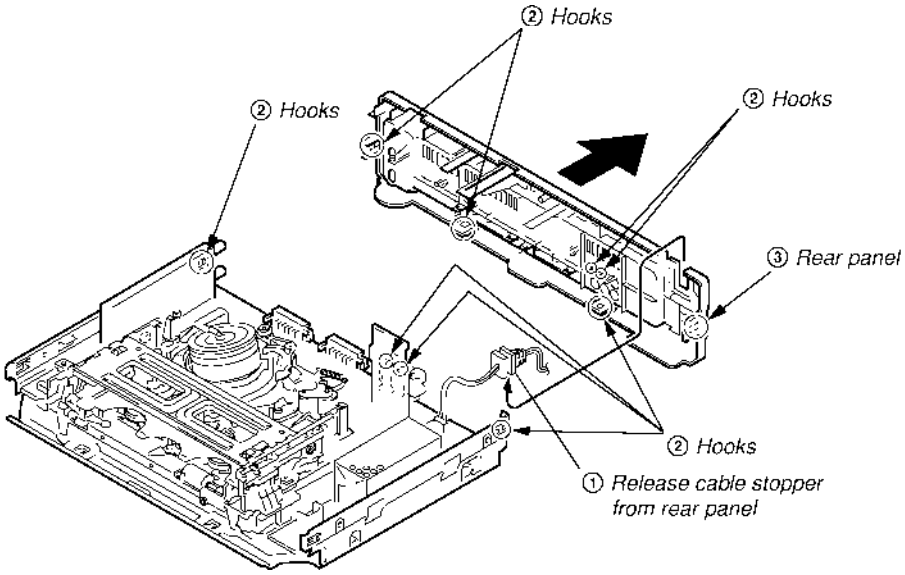
2-1. CASE, FRONT PANEL BLOCK ASSEMBLY



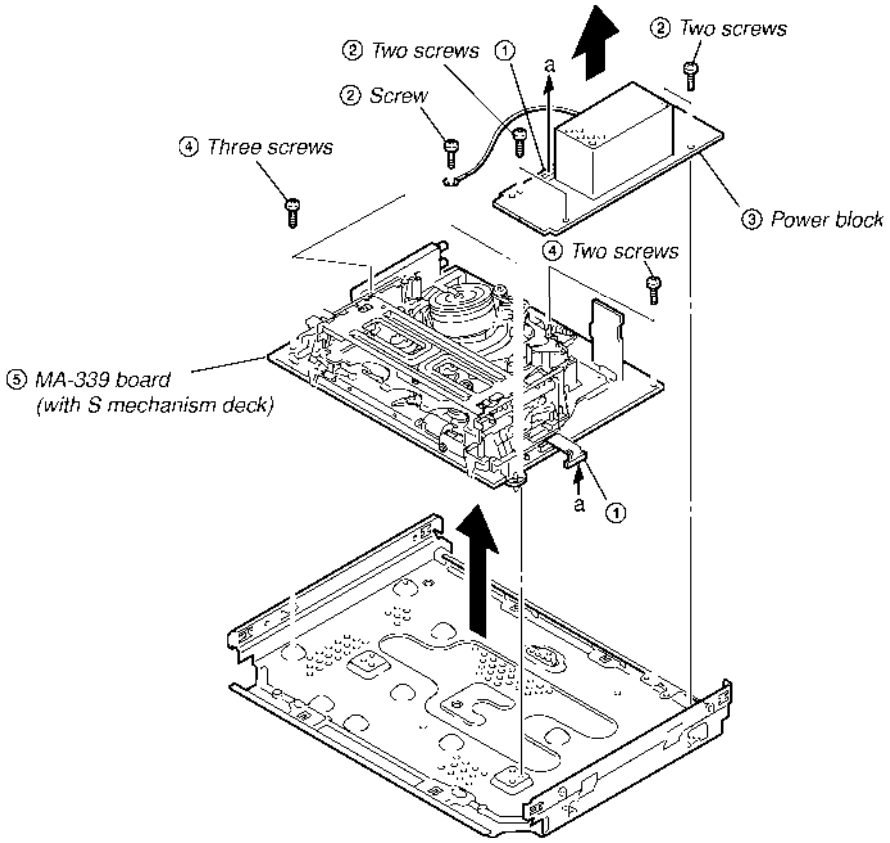
2-2. FR-152 BOARD, DM-82 BOARD, KK-17 BOARD, SU-5 BOARD



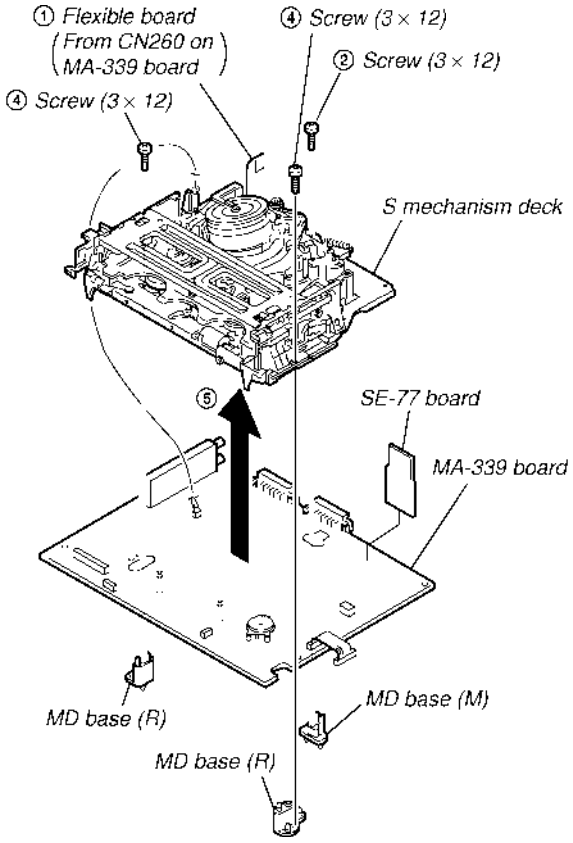
2-3. REAR PANEL



2-4. POWER BLOCK, MA-339 BOARD (WITH S MECHANISM DECK)

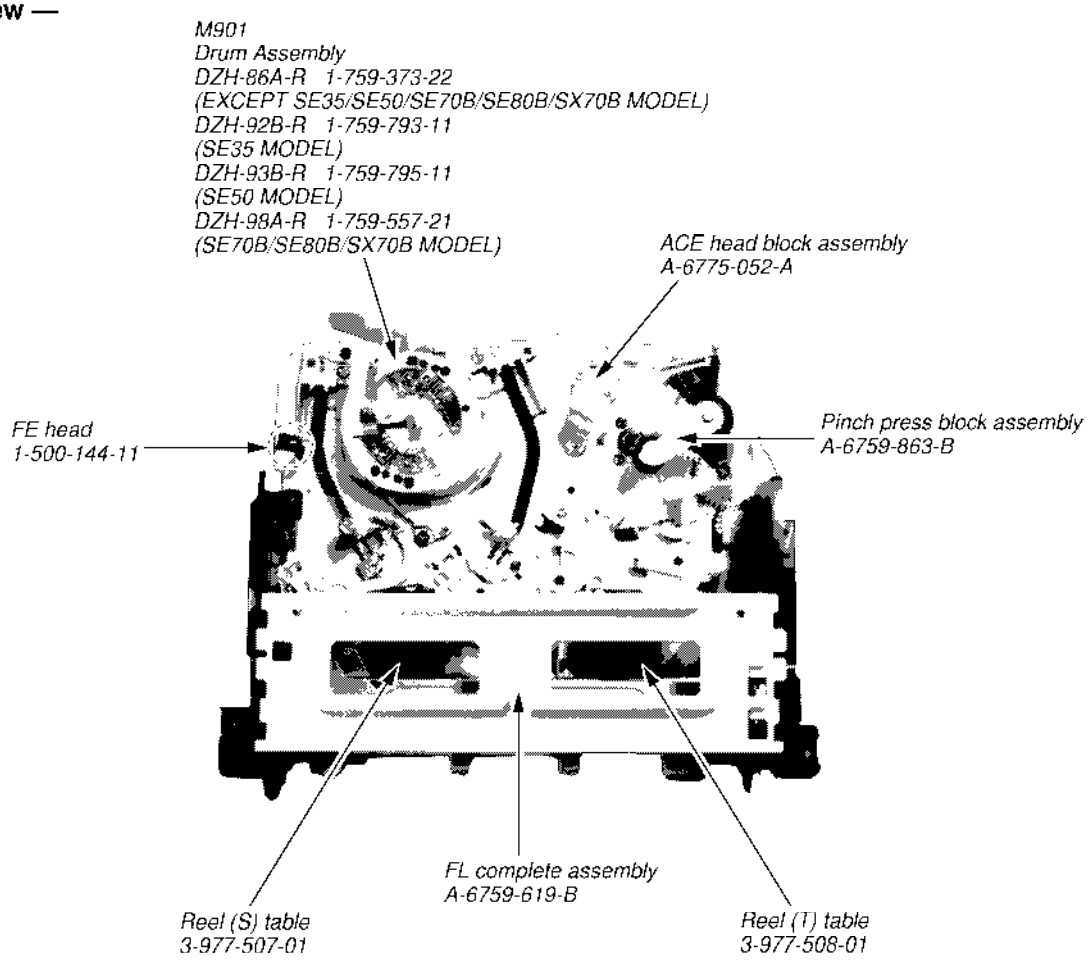


2-5. S MECHANISM DECK

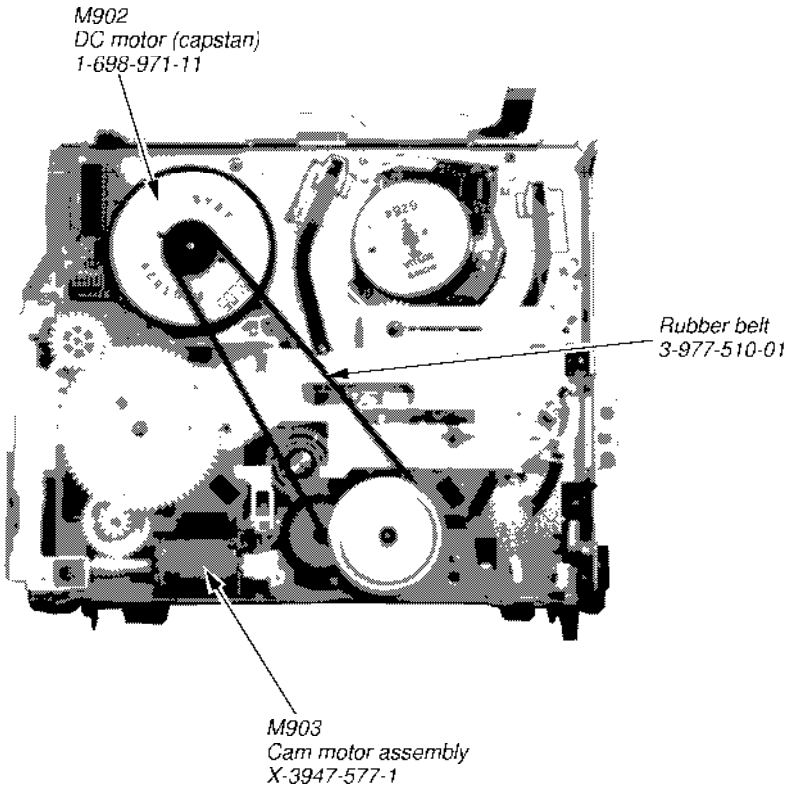


2-6. INTERNAL VIEWS

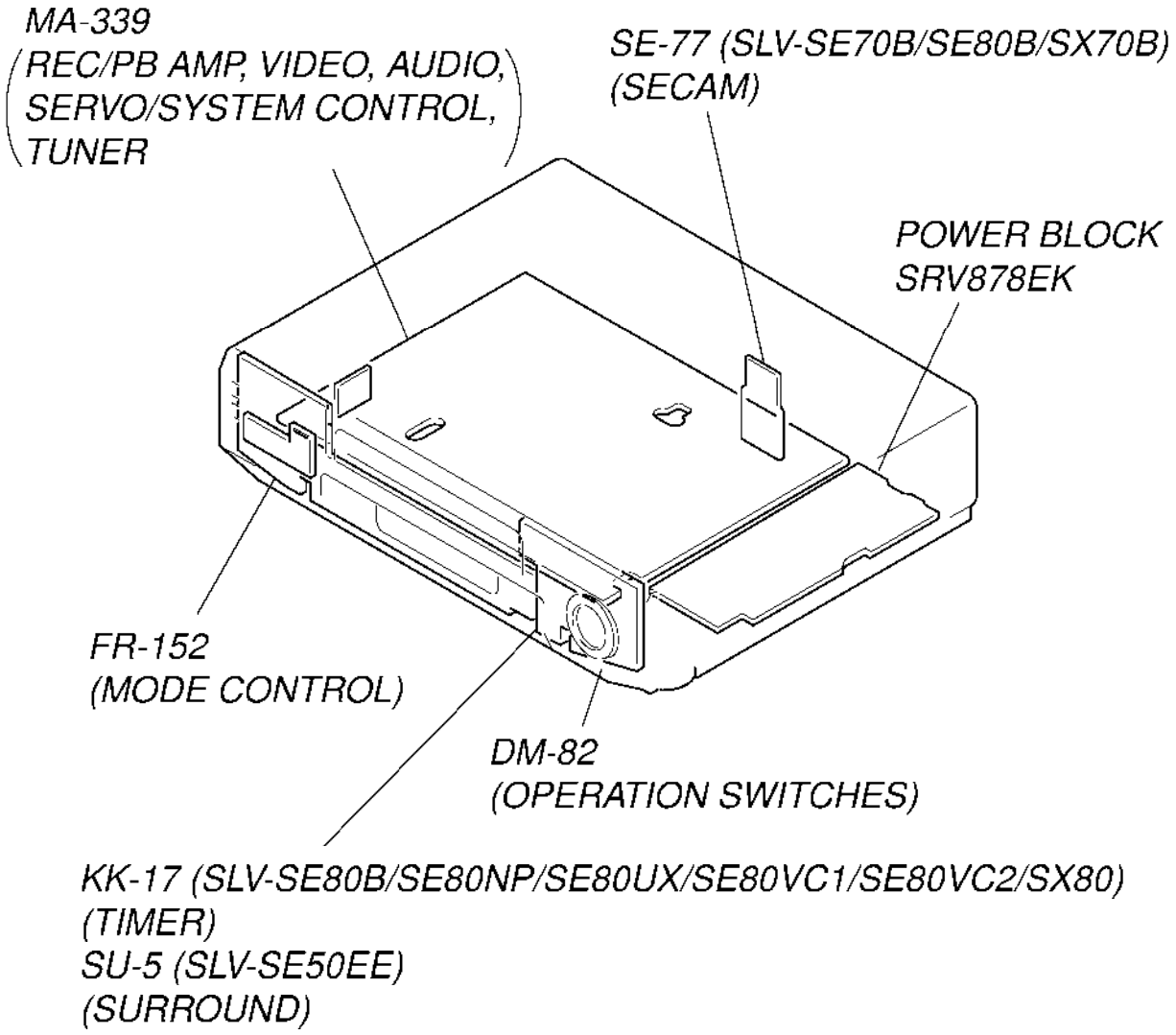
— Top View —



— Bottom View —

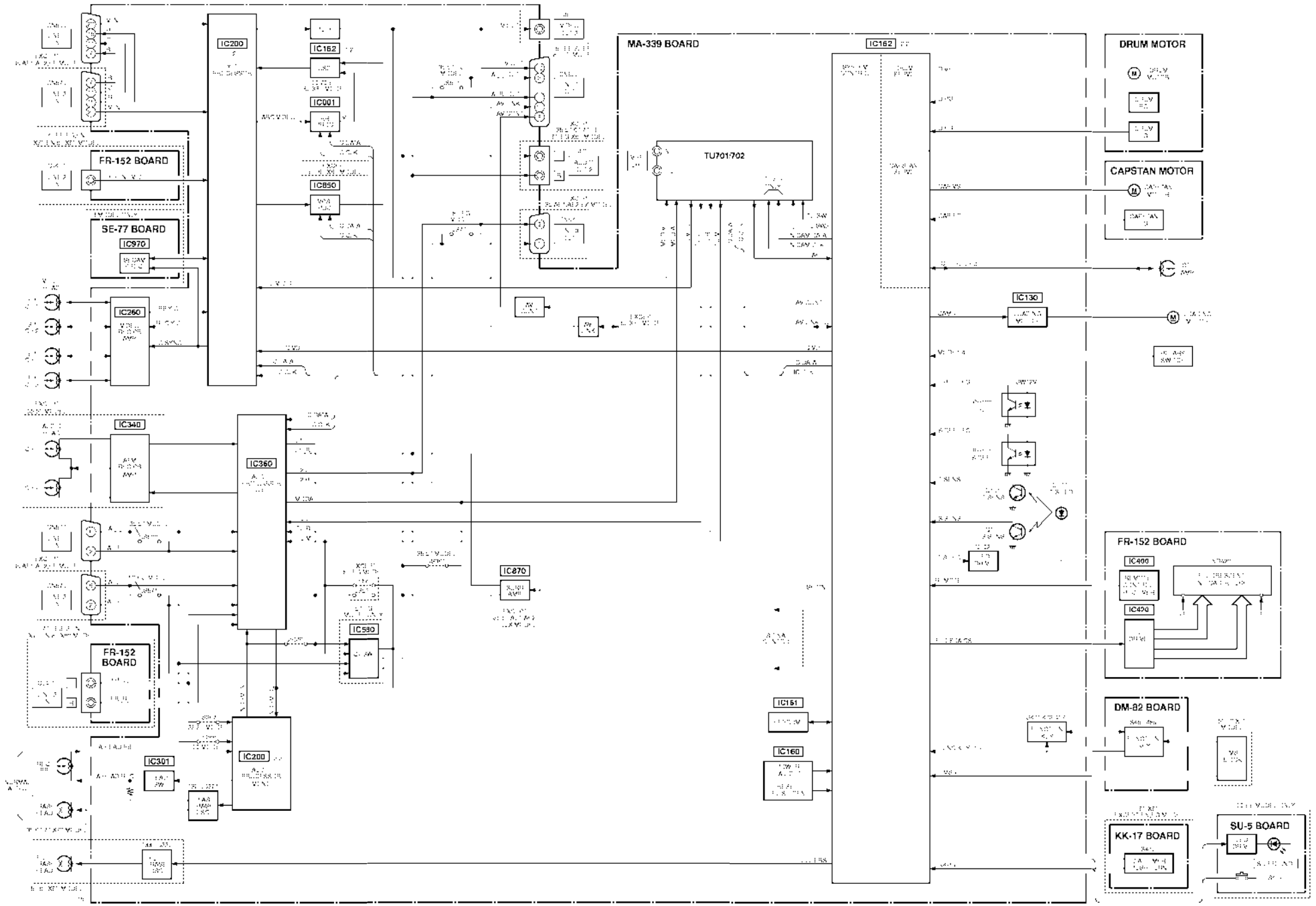


2-7. CIRCUIT BOARDS LOCATION

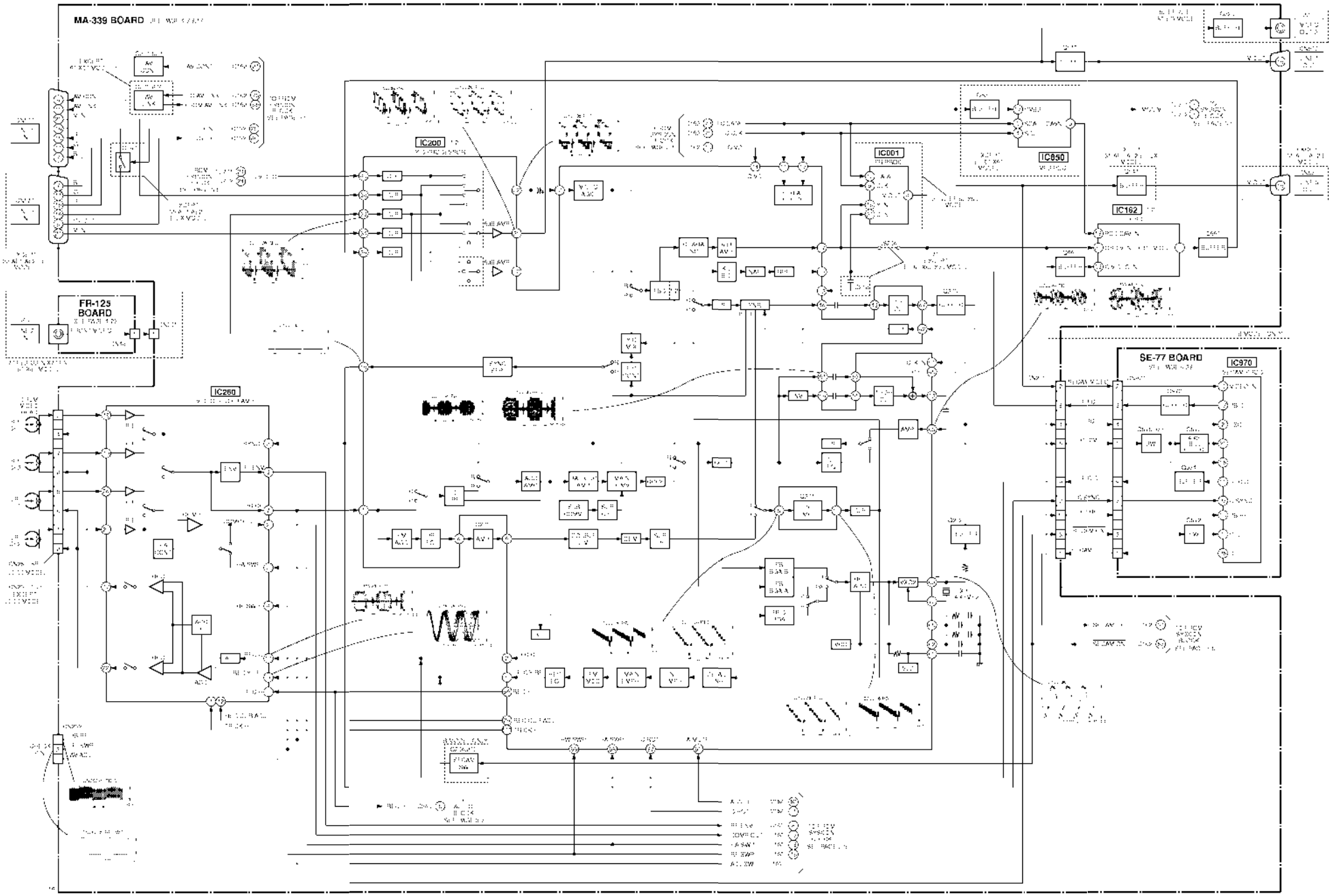


SECTION 3
BLOCK DIAGRAMS

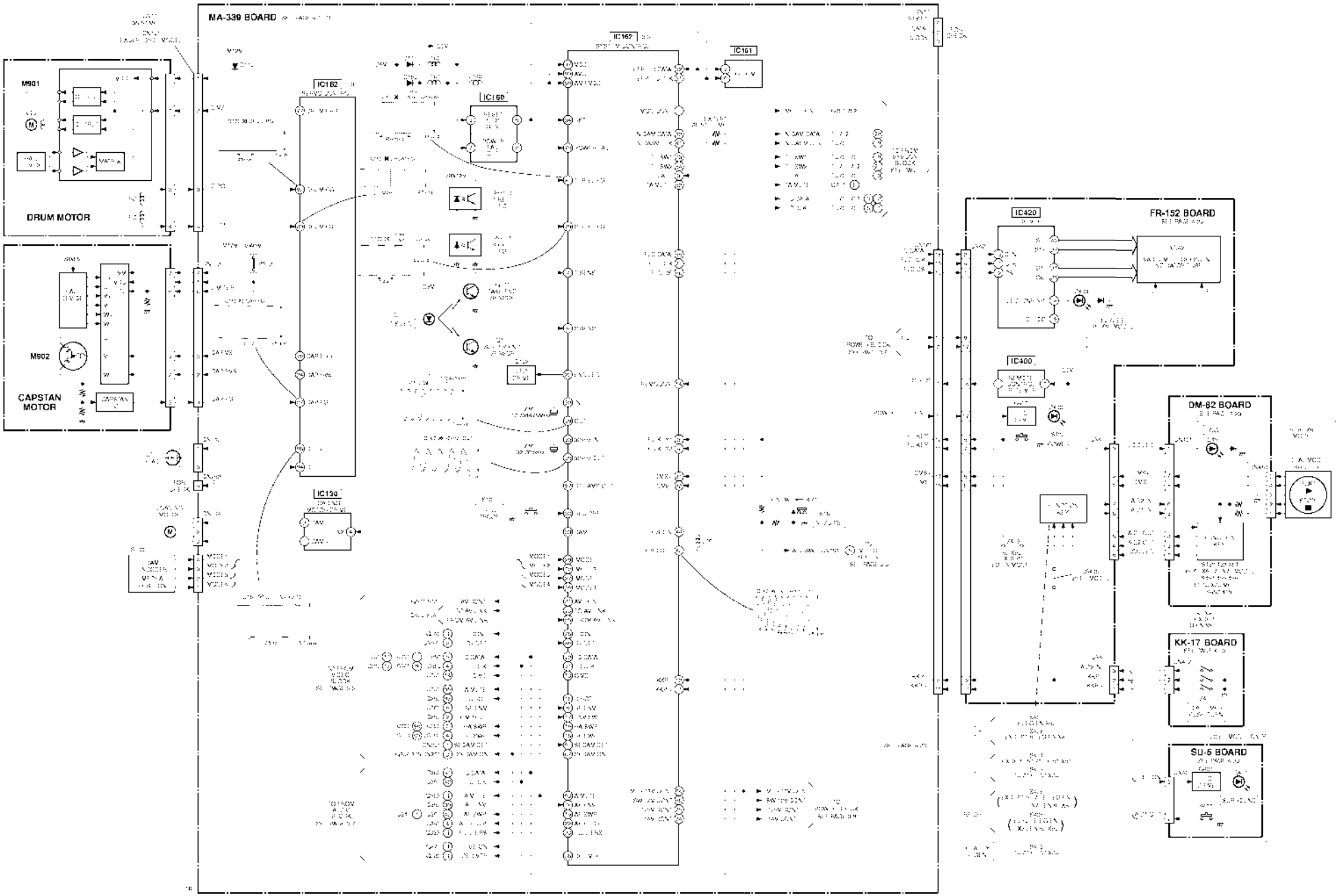
3-1. OVERALL BLOCK DIAGRAM



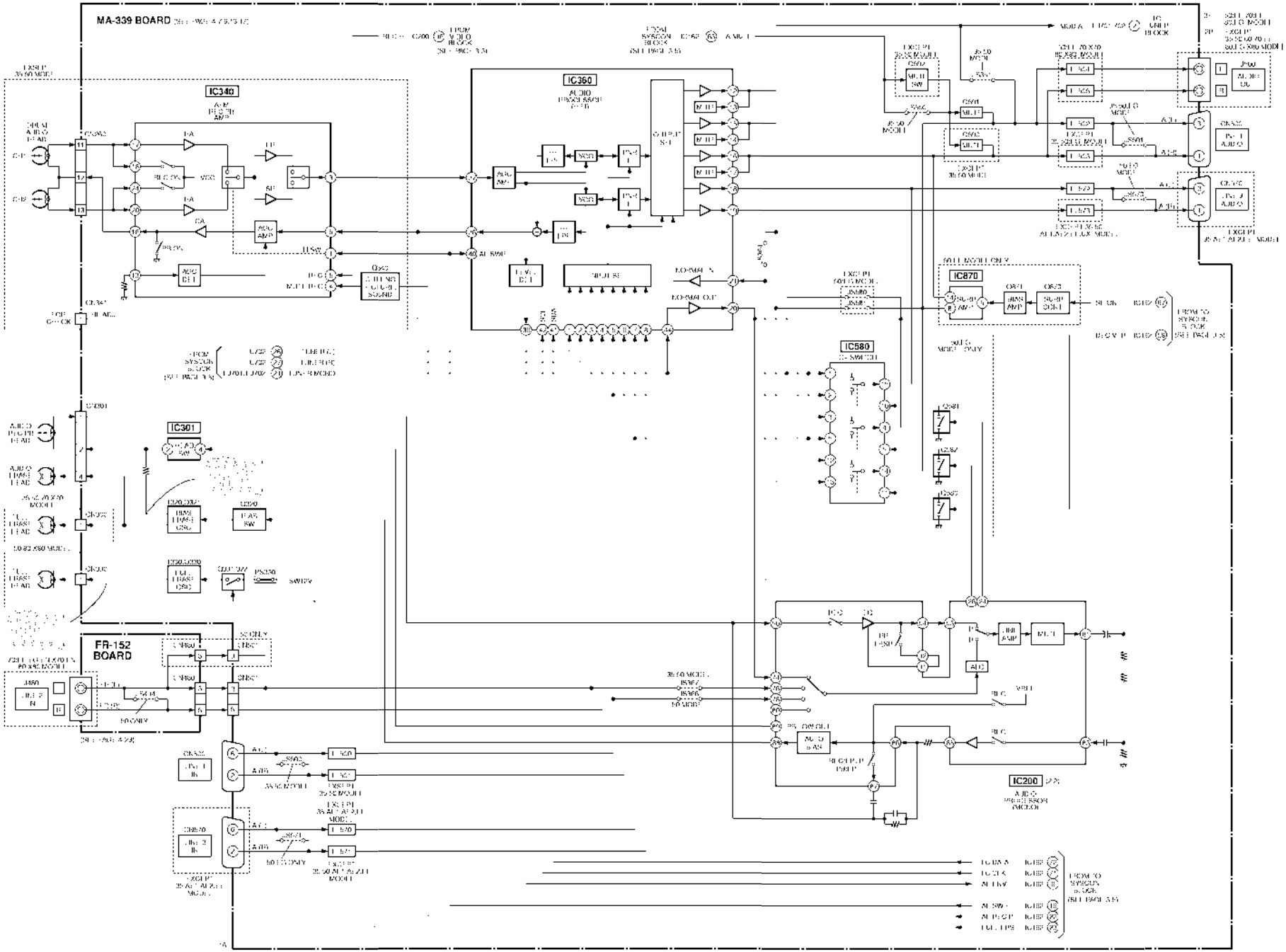
3-2. VIDEO BLOCK DIAGRAM



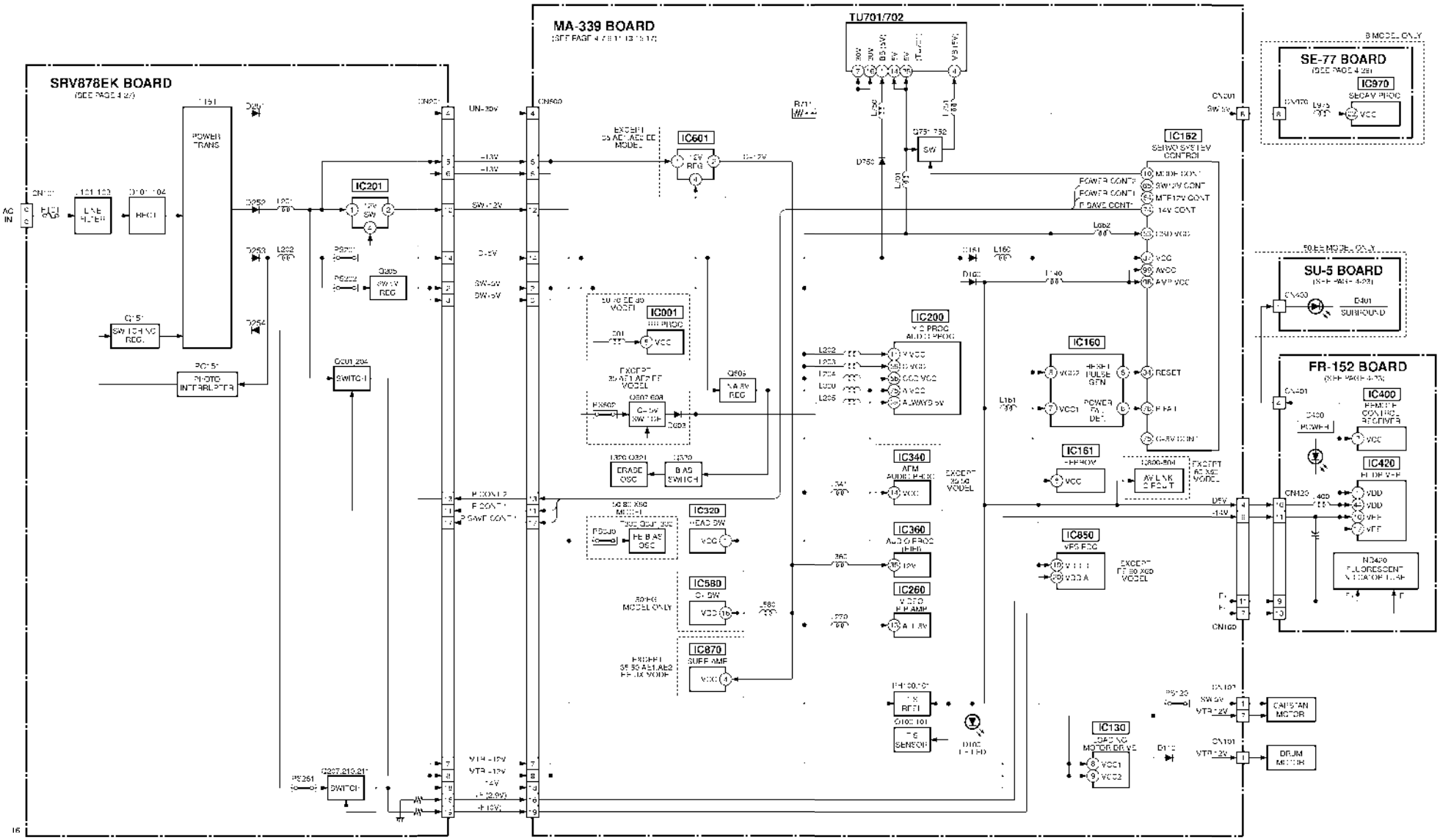
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



3-4. AUDIO BLOCK DIAGRAM



3-5. POWER BLOCK DIAGRAM

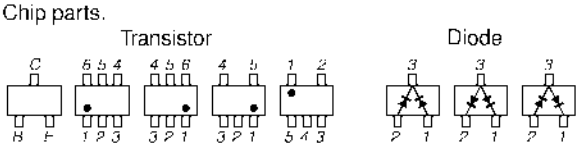


SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

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

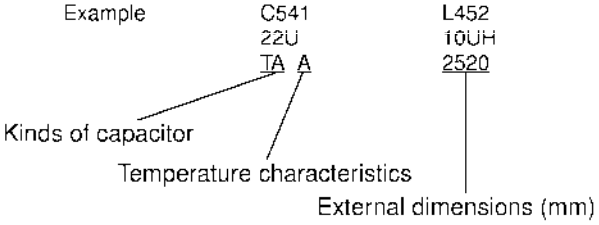
(For printed wiring boards)

- ▒▒▒: Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.



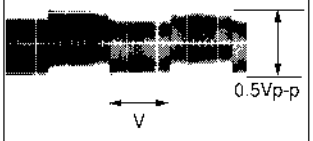
- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
  In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination.
  Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT › $\overline{\text{EDIT}}$ PB/XREC › PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component.
- B+ : B+ Line.
- B : B− Line.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- : adjustment for repair.
- Circled numbers refer to waveforms.

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

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

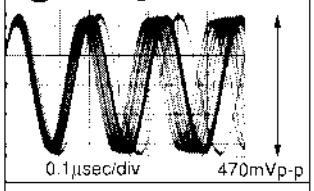
MA-339 BOARD
(REC/PB BLOCK)

① CN262 ① PB RF
IC260 ⑦ PB

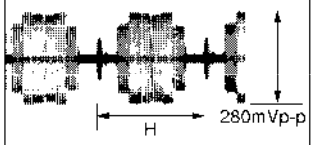


② CN262 ② RF SWP

③ IC260 ⑨ REC



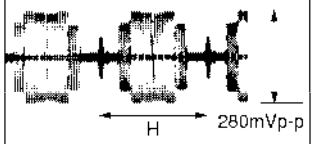
④ IC260 ⑩ REC



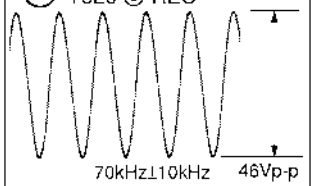
(VIDEO BLOCK)

⑤ IC200 ⑤ REC

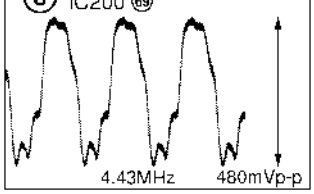
⑥ IC200 ② REC



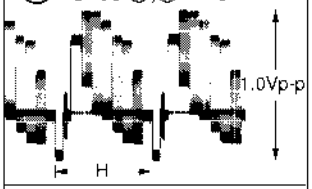
⑦ T320 ⑥ REC



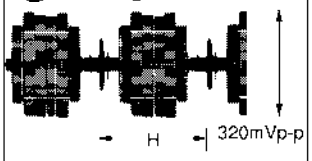
⑧ IC200 ⑥⑨



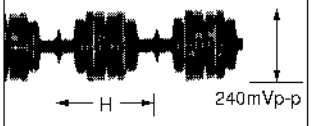
⑨ IC200 ㉜,㊱ REC



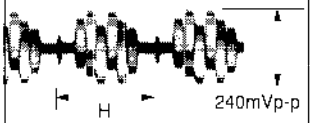
⑩ IC200 ⑥① REC



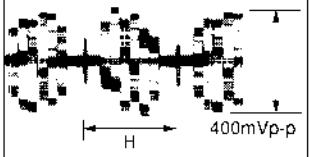
⑩ IC200 ⑥① PB



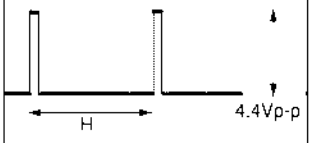
⑪ IC200 ⑥③ PB



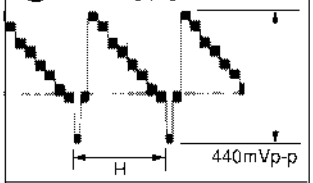
⑪ IC200 ⑥③ REC



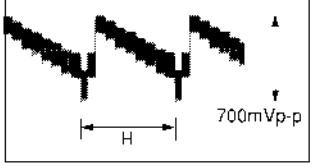
⑫ IC200 ⑲



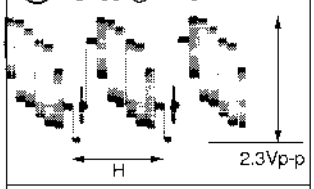
⑬ IC200 ⑨, ⑩ REC



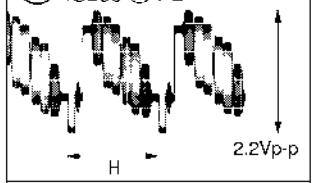
⑬ IC200 ⑨, ⑩ PB



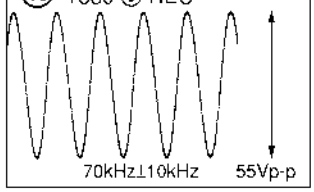
⑭ IC200 ㉘ REC



⑭ IC200 ㉘ PB

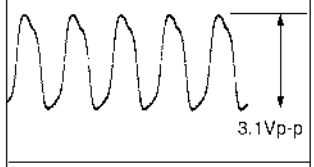


⑮ T330 ⑥ REC

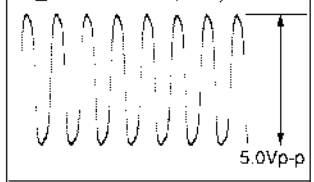


(SERVO/SYSTEM CONTROL BLOCK)

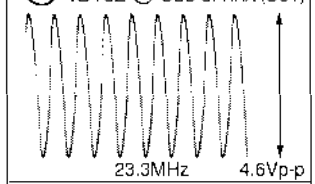
⑯ IC162 ㊱ 32kHz (OUT)



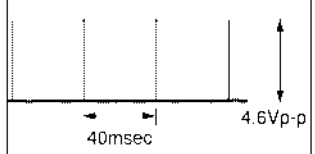
⑰ IC162 ㊴ 17.734475kHz (OUT)



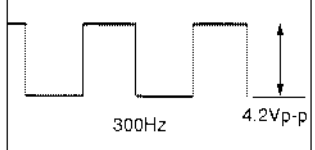
⑱ IC162 ㊺ OSC CHARA (OUT)



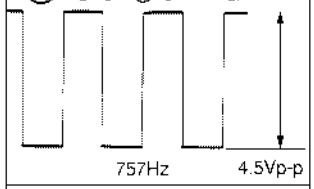
⑲ IC162 ㊿ DRUM PG



⑳ IC162 ㊾ DRUM FG

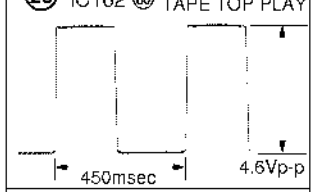


㉑ IC162 ㊼ CAP FG

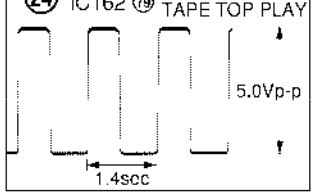


㉒ IC162 ㊾ CTL IN+ REC

㉓ IC162 ㊿ T REEL TAPE TOP PLAY

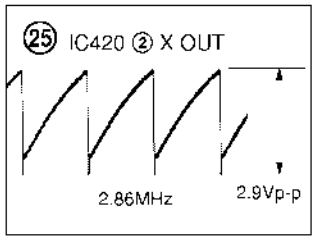


㉔ IC162 ㊾ S REEL TAPE TOP PLAY

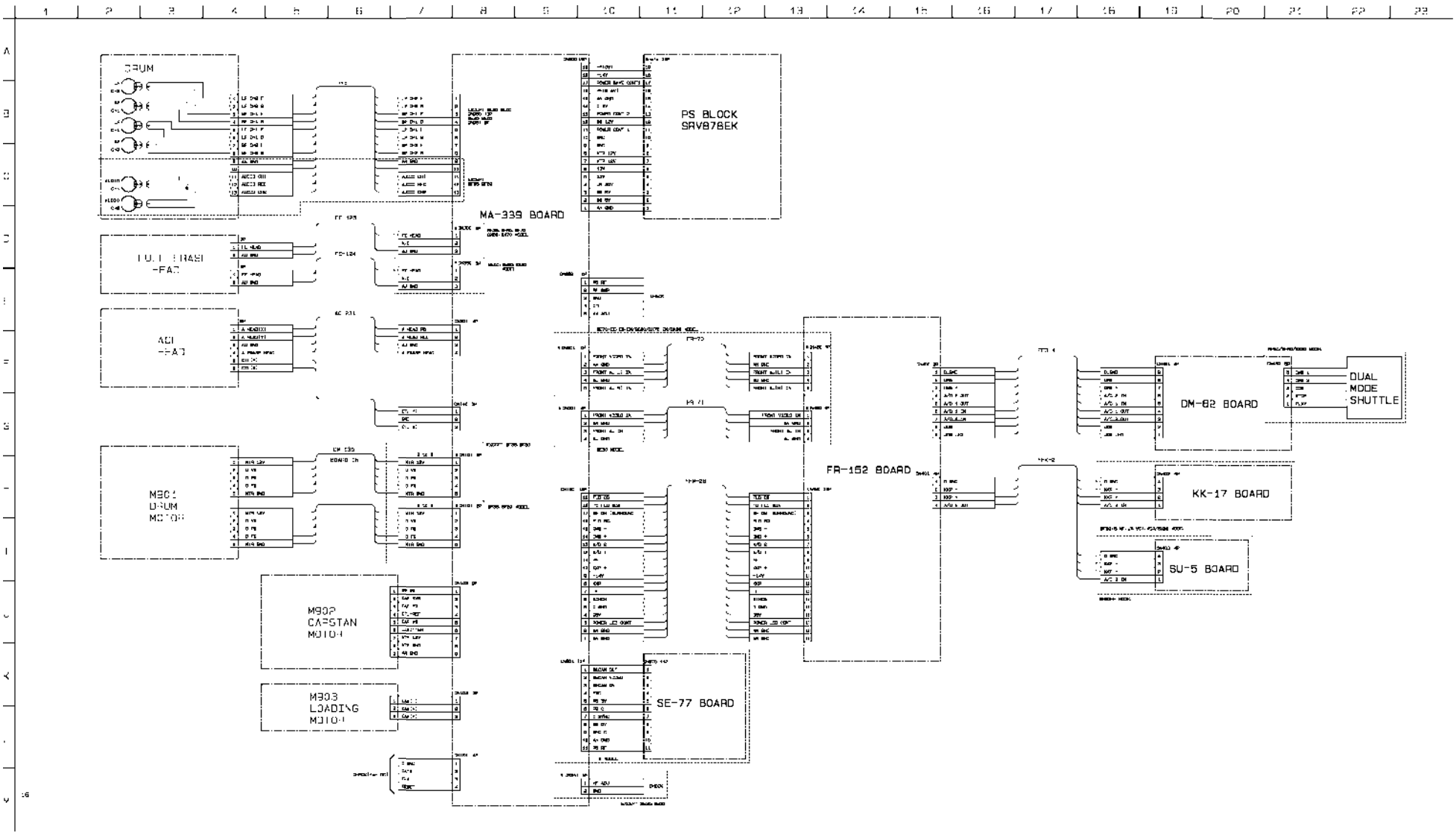


FR-152 BOARD
(FRONT PANEL BLOCK)

㉕ IC420 ② X OUT



4-1. FRAME SCHEMATIC DIAGRAM



4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

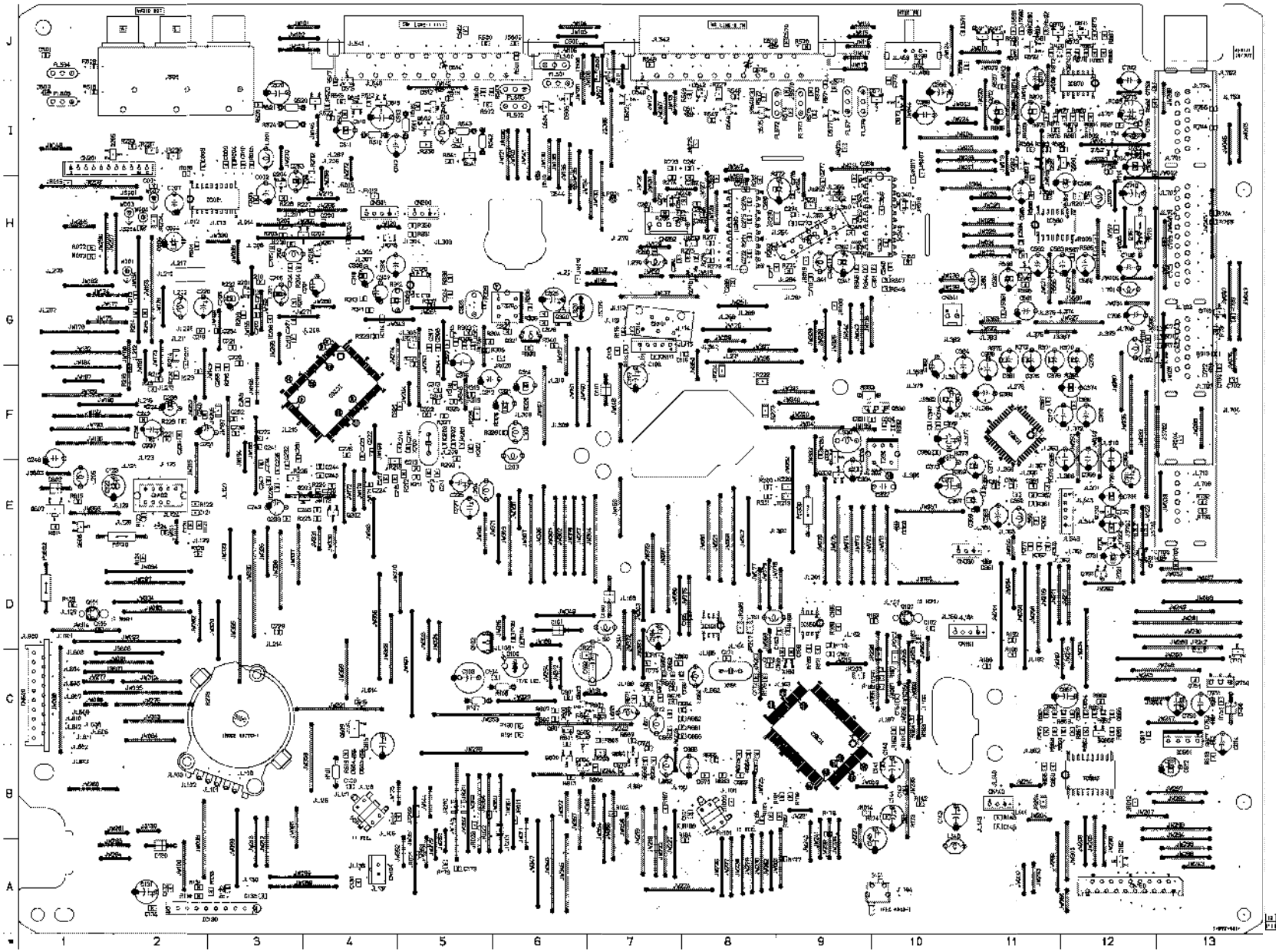
MA-339 (VIDEO, AUDIO, SERVO/SYSTEM CONTROL,TUNER) PRINTED WIRING BOARD

— Ref. No. MA-339 Board: 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

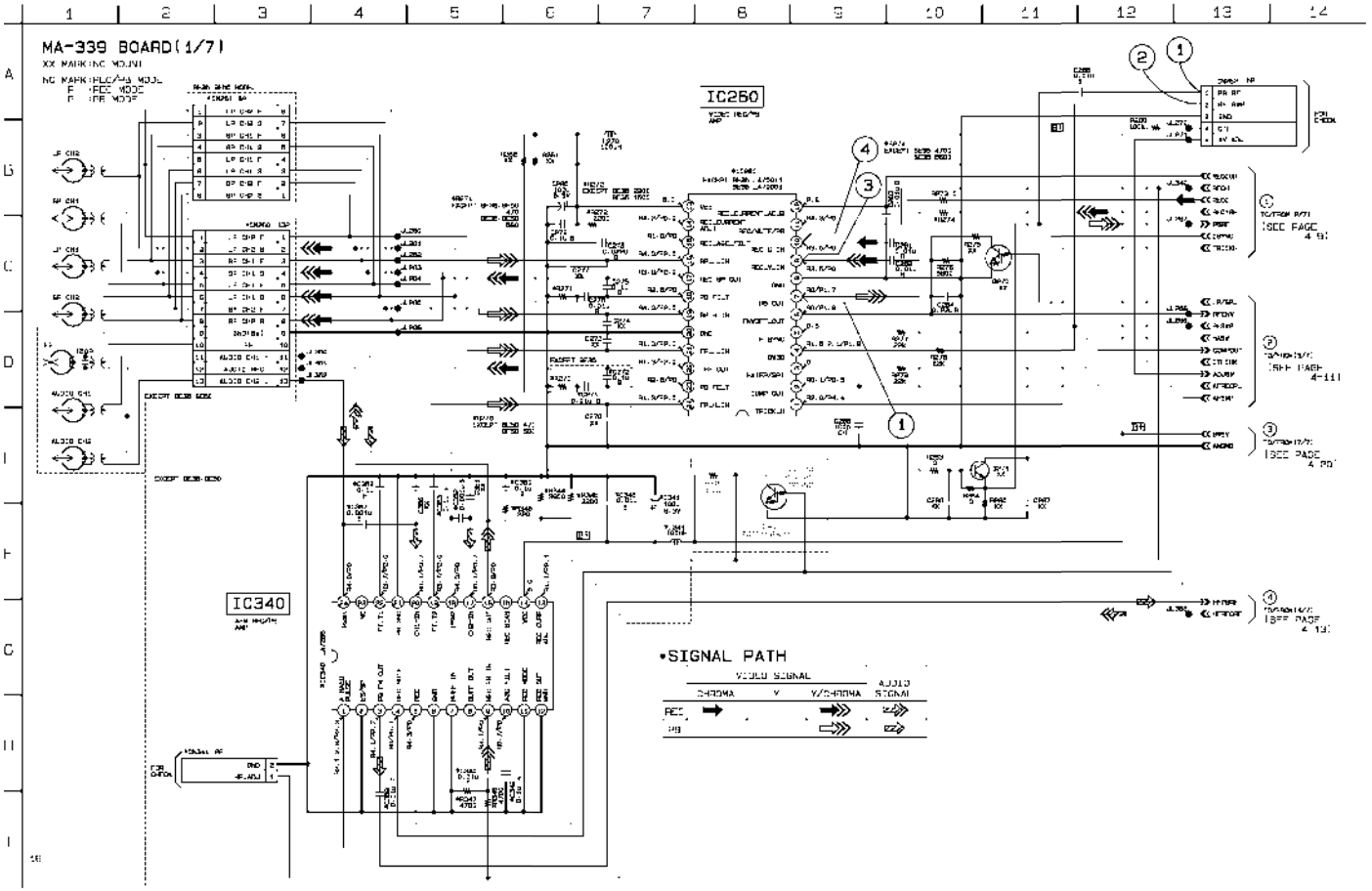
MA-339 BOARD

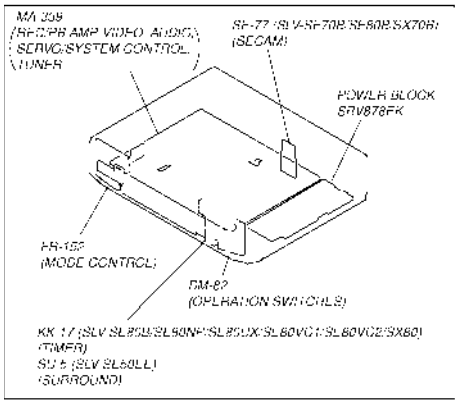
MA-339 BOARD



MA-339 (1/7) (REC/PB AMP) SCHEMATIC DIAGRAM
— Ref. No. MA-339 Board:1,000 Series —

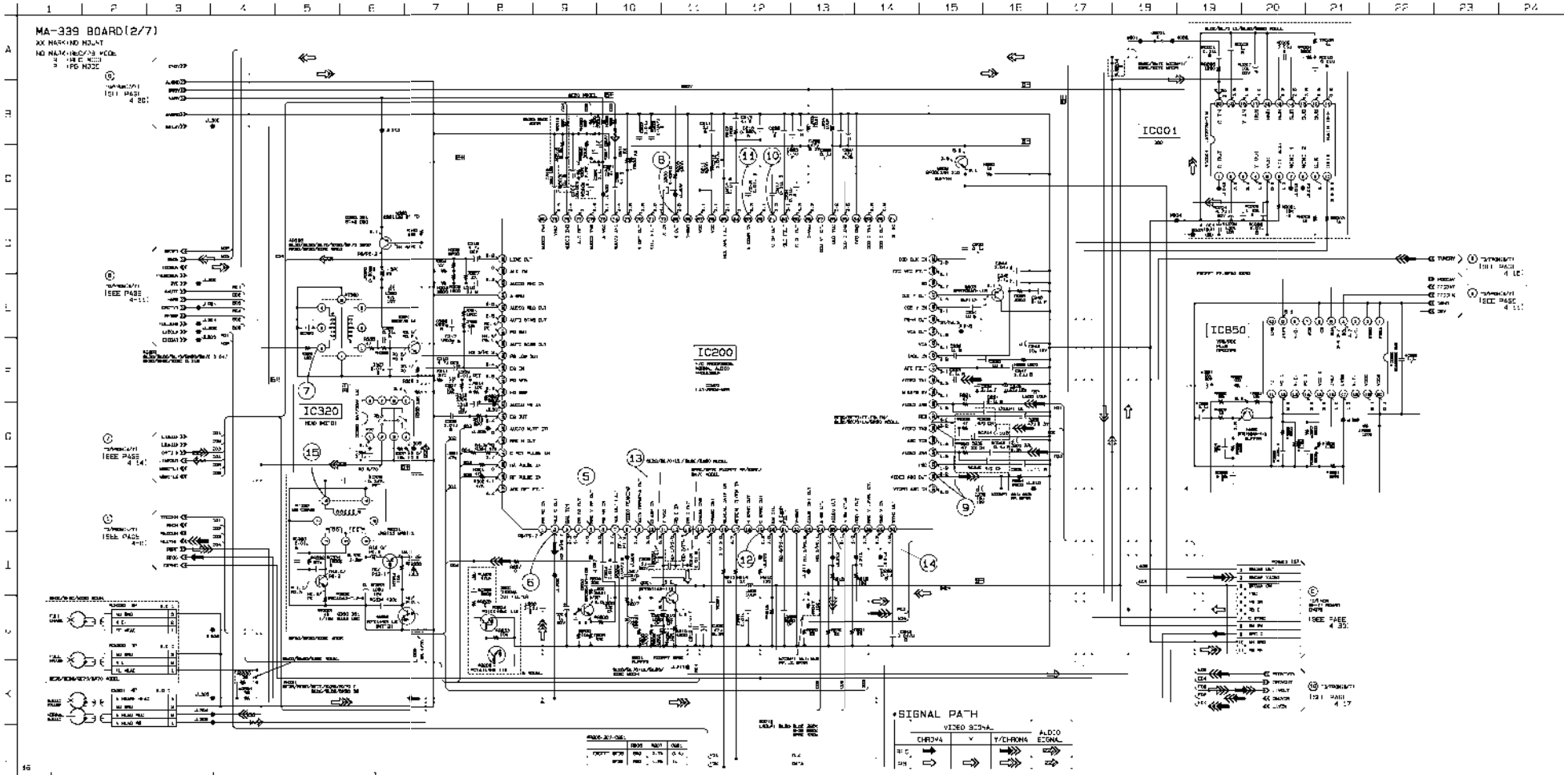
For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-2 for waveforms.





MA-339 (2/7) (VIDEO/NORMAL AUDIO) SCHEMATIC DIAGRAM
— Ref. No. MA-339 Board: 1,000 Series —

For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-2 for waveforms.



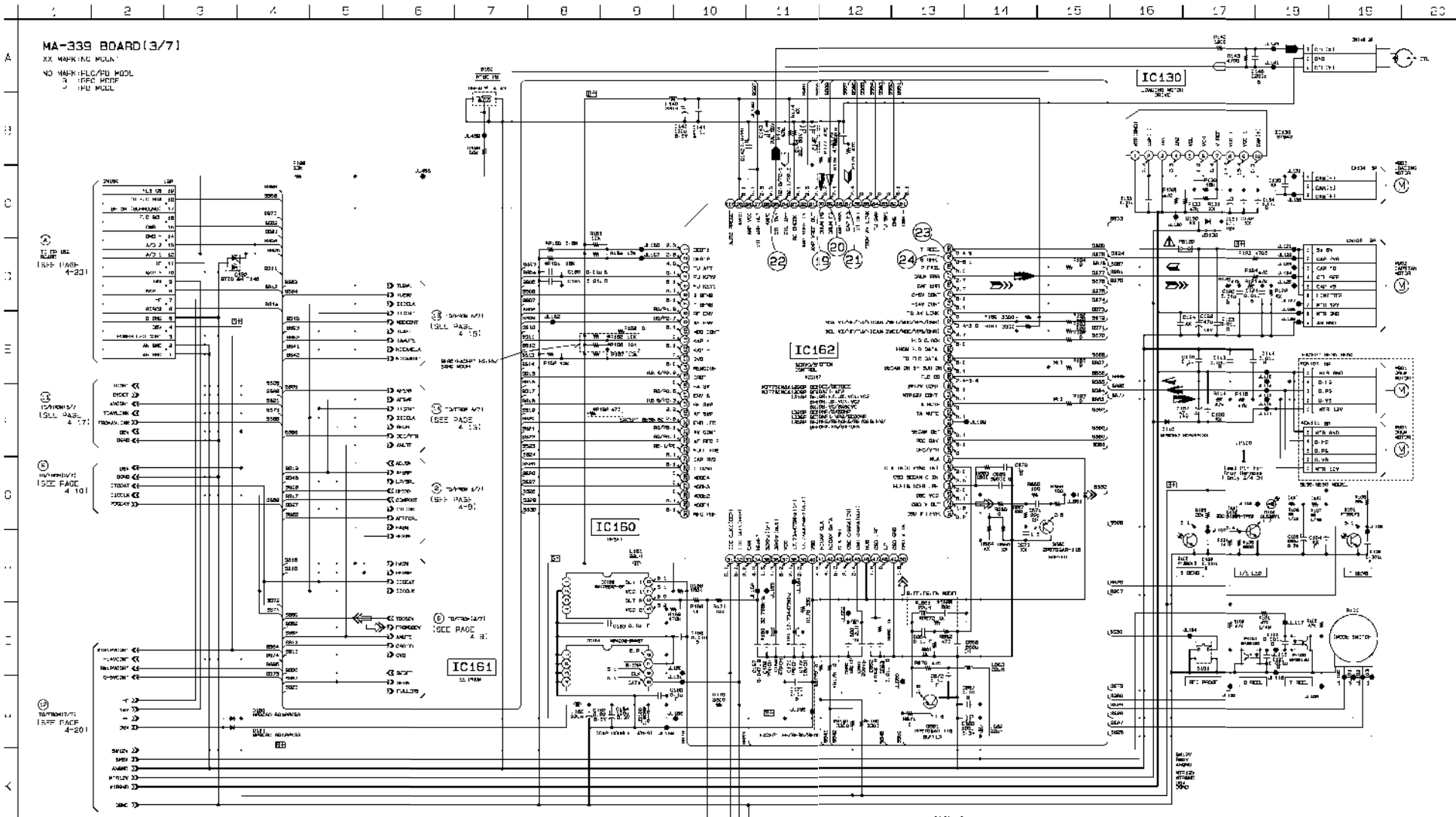
Note :	Note :
The components identified by mark ! or dotted line with mark ! are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ! sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MA-339 (3/7) (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

— Ref. No. MA-339 Board, 1,000 Series —

For schematic diagram

- Refer to page 4-5 for printed wiring board.
- Refer to page 4-2 for waveforms.



•SIGNAL PATH

	VIDEO SIGNAL	
	Y/CHROMA	V/CHROMA
REC		
PB	⇨	

•SIGNAL PATH

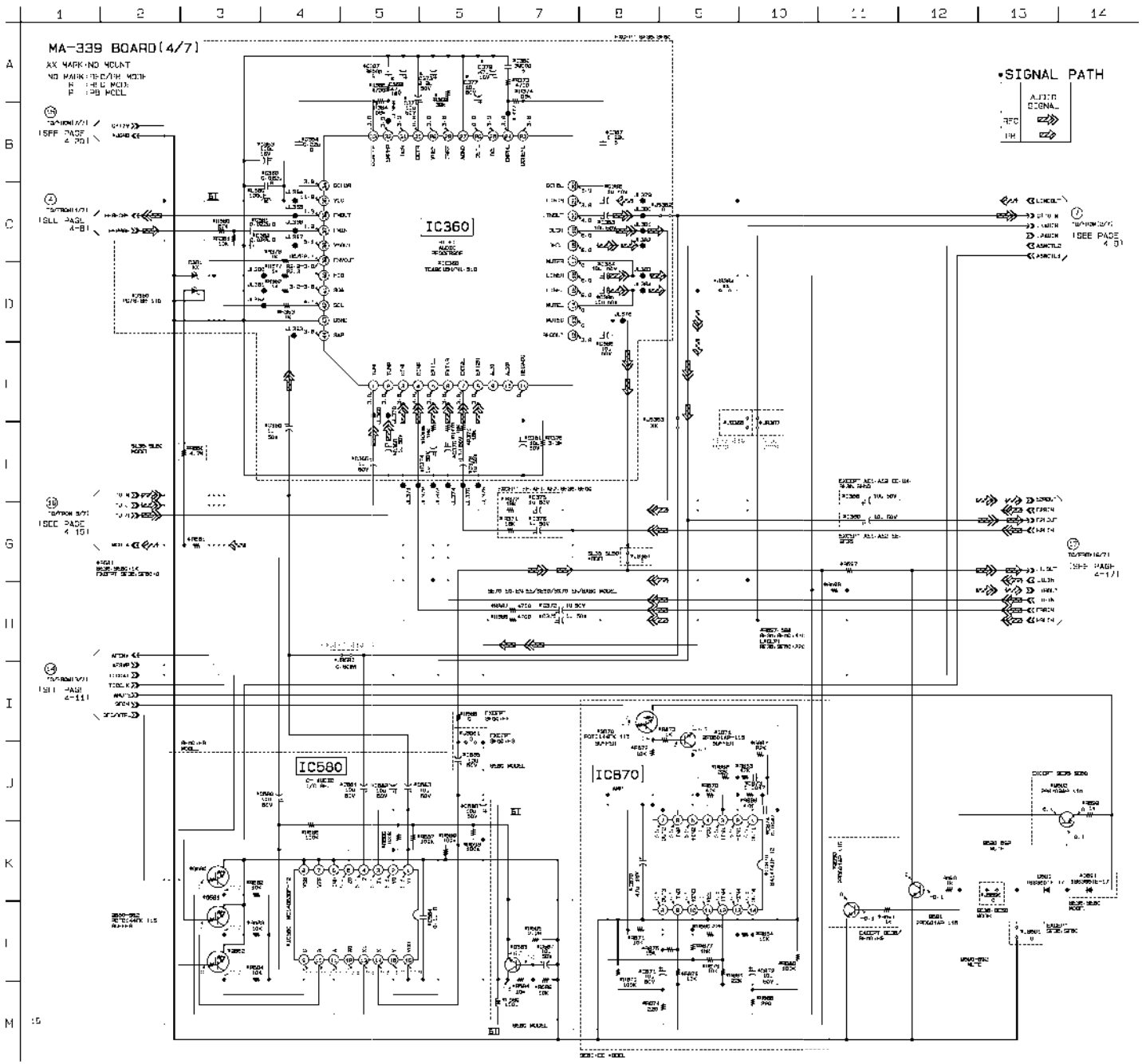
	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶	
Drum servo (speed and phase)		▶	
Capstan speed servo		▶	
Capstan servo (speed and phase)		▶»	
Servo ref. signal	■	▶	▷

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

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

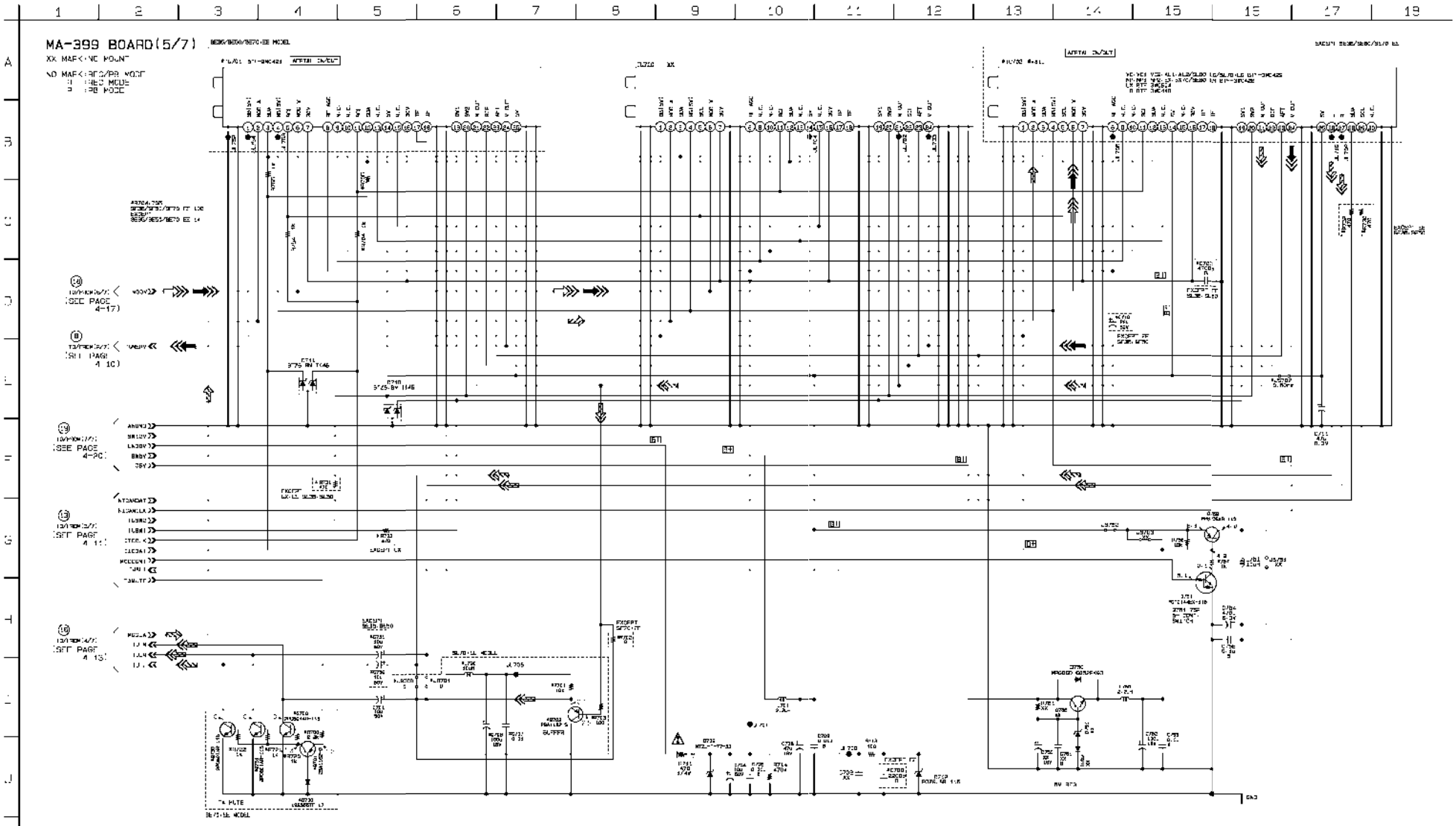
MA-339 (4/7) (AFM AUDIO) SCHEMATIC DIAGRAM
— Ref. No. MA-339 Board: 1,000 Series —

For schematic diagram
• Refer to page 4-5 for printed wiring board.



MA-339 (5/7) (TUNER) SCHEMATIC DIAGRAM
— Ref. No. MA-339 Board: 1,000 Series —

For schematic diagram
• Refer to page 4-5 for printed wiring board.



Note :	Note :
The components identified by mark ! or dotted line with mark ! are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ! sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

•SIGNAL PATH

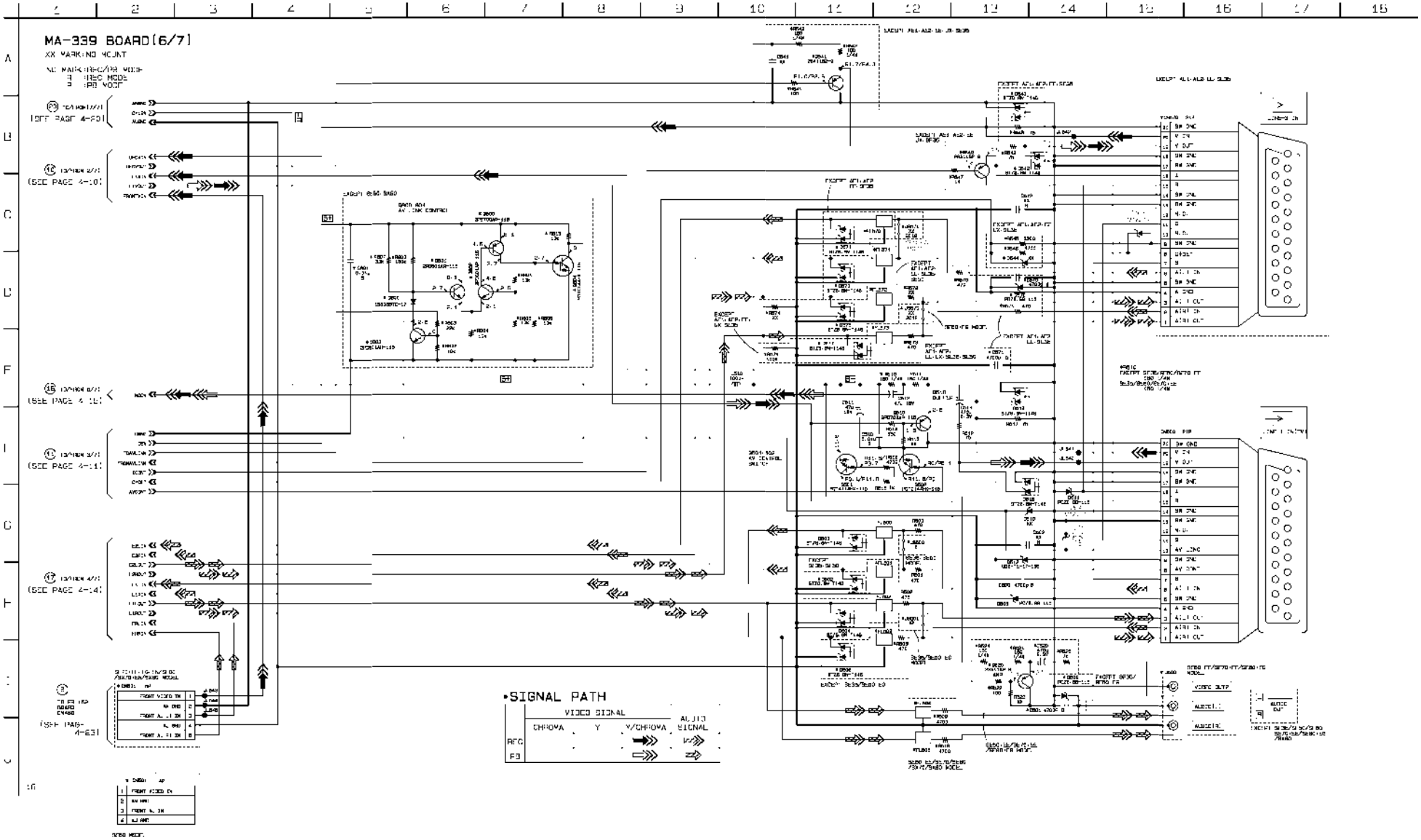
	VIDEO SIGNAL		AUDIO SIGNAL
	Y-CHROMA	Y/C-CHROMA	
REC	⇒	⇒	⇒
PB	⇒		⇒

MA-339 (6/7) (INPUT/OUTPUT) SCHEMATIC DIAGRAM

— Ref. No. MA-339 Board: 1000 Series —

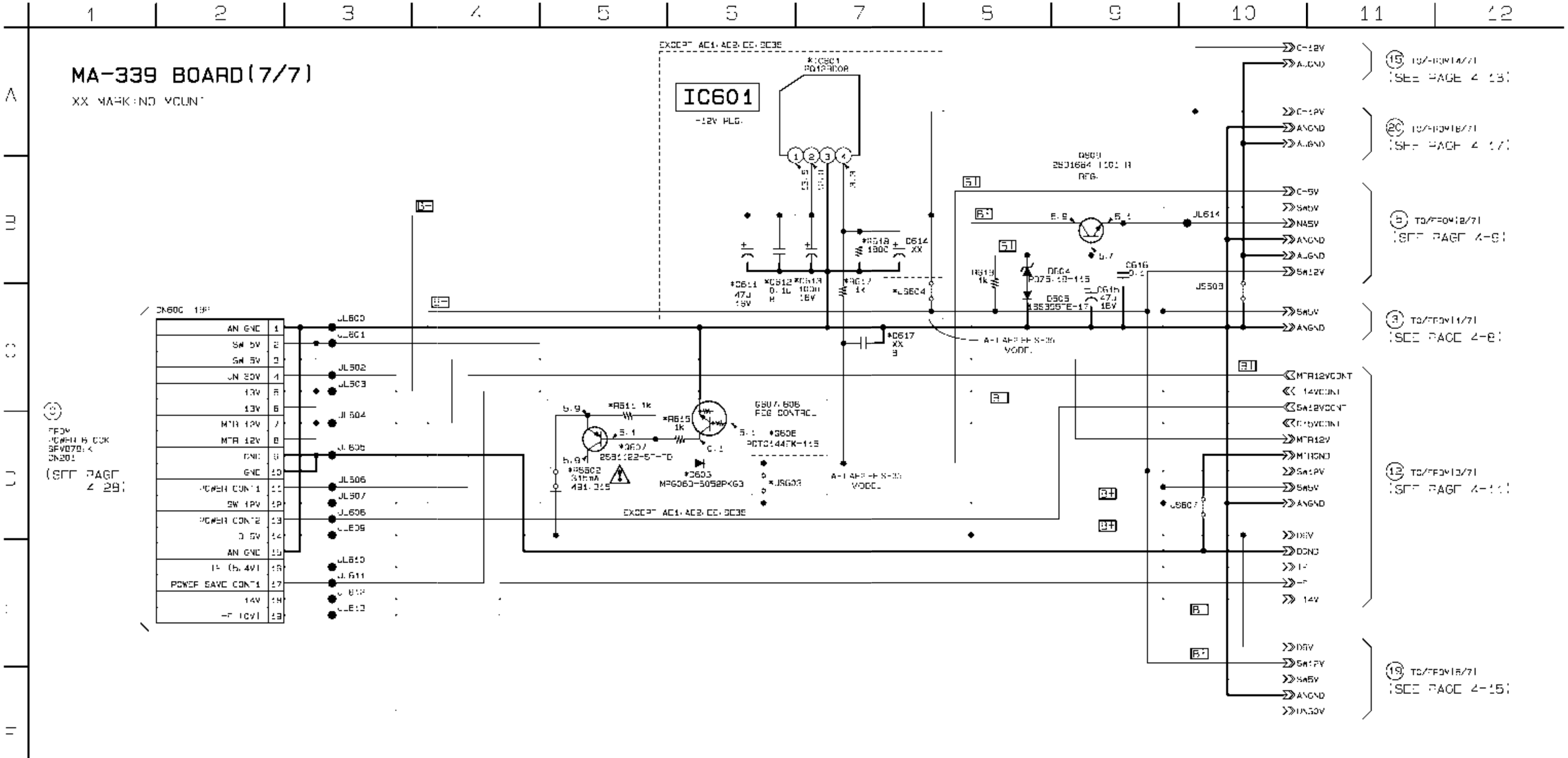
For schematic diagram

• Refer to page 4-5 for printed wiring board.



MA-339 (7/7) (POWER SUPPLY) SCHEMATIC DIAGRAM
— Ref. No. MA-339 Board, 1,000 Series —

For schematic diagram
• Refer to page 4-5 for printed wiring board.



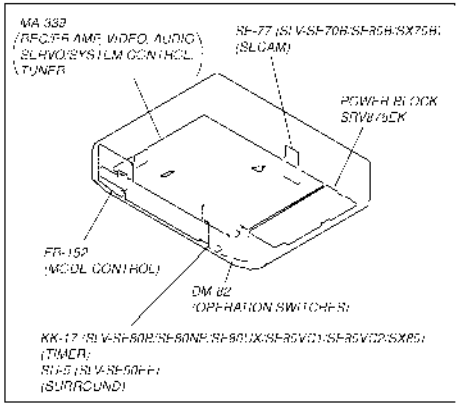
Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

FR-152 (MODE CONTROL)/ KK-17 (TIMER)/ DM-82 (OPERATION SWITCHES)/SU-5 (SURROUND) PRINTED WIRING BOARDS

— Ref. No. FR-152 Board:2,000 Series/KK-17 Board:3,000 Series/DM-82 Board:4,000 Series/SU-5 Board: 5,000 Series —

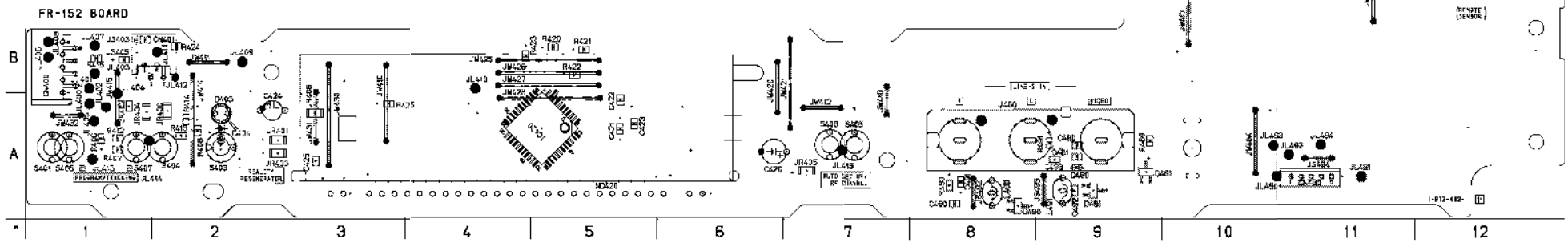
There are few cases that the part printed on this diagram isn't mounted in this model.



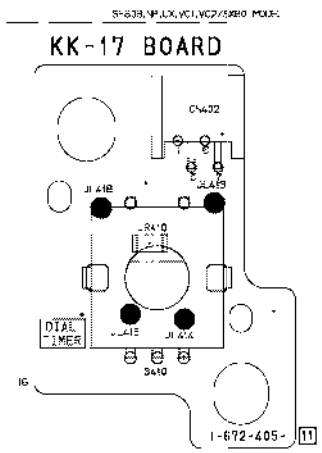
FR-152 BOARD

D400	B-12
D403	A-2
D404	A-2
D480	A-9
D481	A-9
D490	A-8
D491	A-9
IC400	B-12
IC420	A-5
Q400	B-12

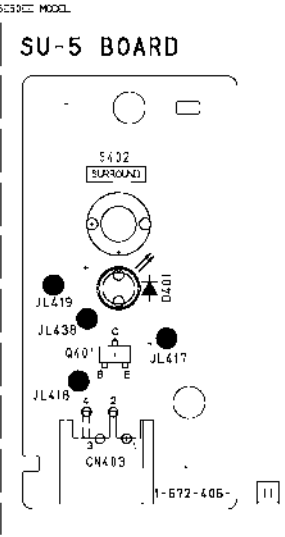
FR-152 BOARD



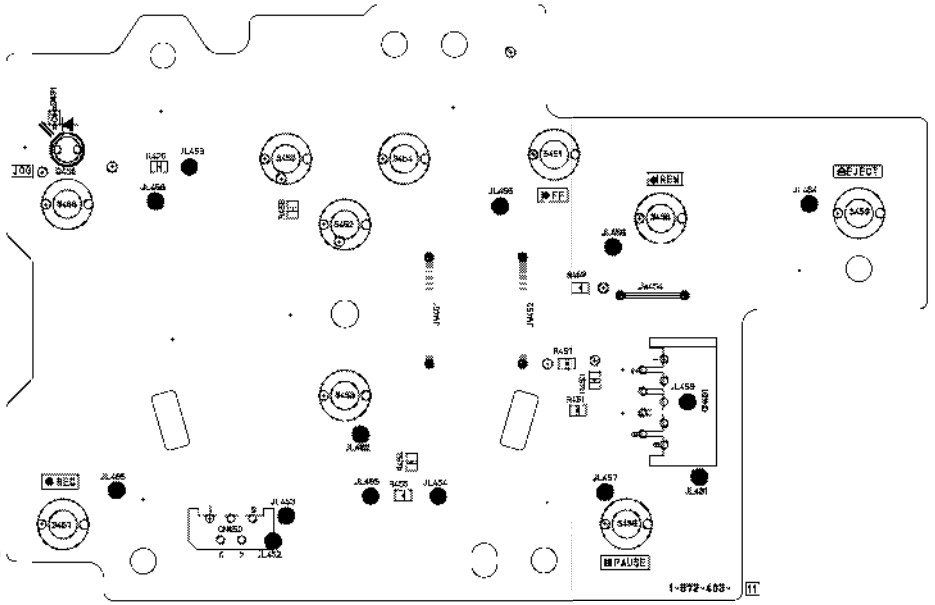
KK-17 BOARD



SU-5 BOARD



DM-82 BOARD

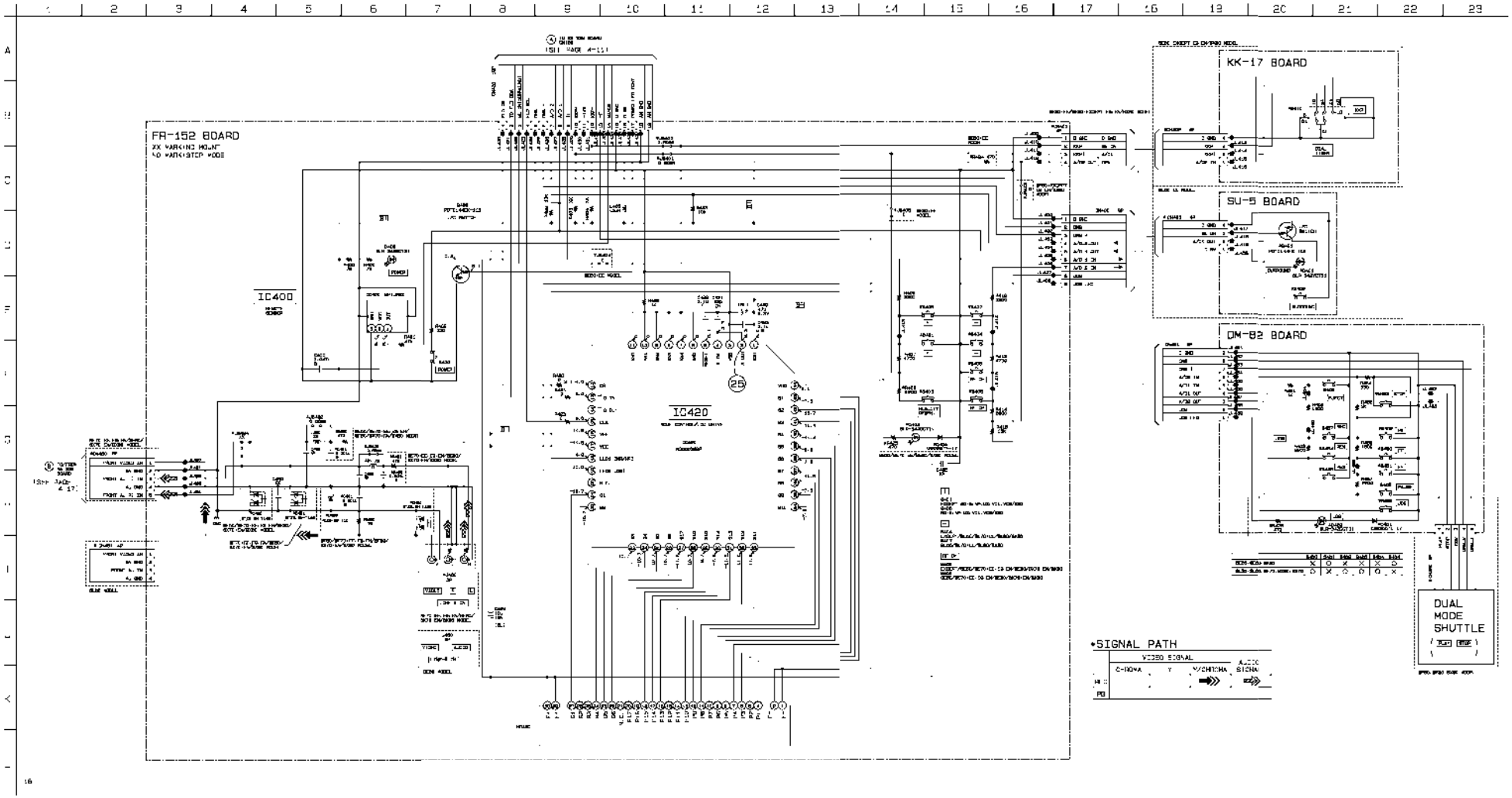


MODE CONTROL / TIMER / OPERATION SWITCHES / SURROUND
FR-152 / KK-17 / DM-82 / SU-5

FR-152 (MODE CONTROL)/ KK-17 (TIMER)/ DM-82 (OPERATION SWITCHES)/SU-5 (SURROUND) SCHEMATIC DIAGRAM

— Ref. No. FR-152 Board:2,000 Series/KK-17 Board:3,000 Series/DM-82 Board:4,000 Series/SU-5 Board: 5,000 Series —

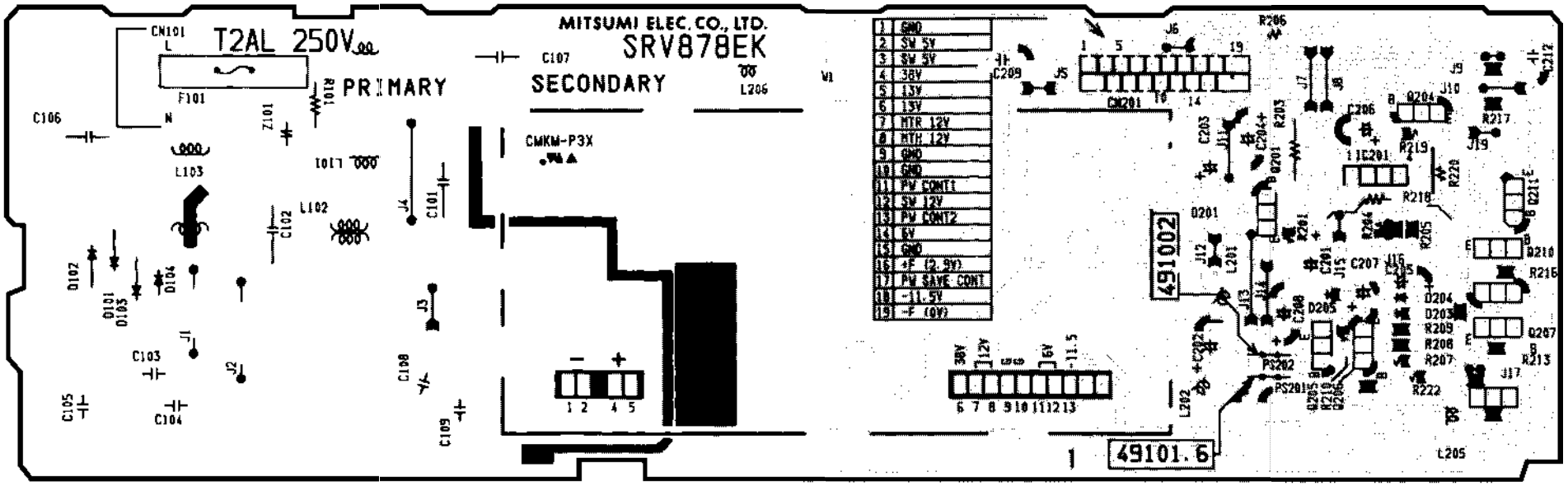
For schematic diagram
• Refer to page 4-9 for waveforms.



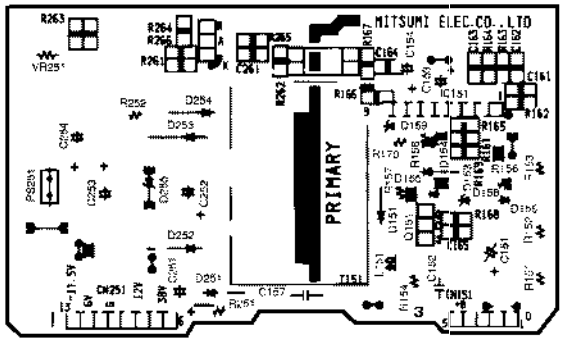
POWER BLOCK SRV878EK (SWITCHING REGURATOR) PRINTED WIRING BOARD
— Ref. No. SRV878 Board:9,000 Series —

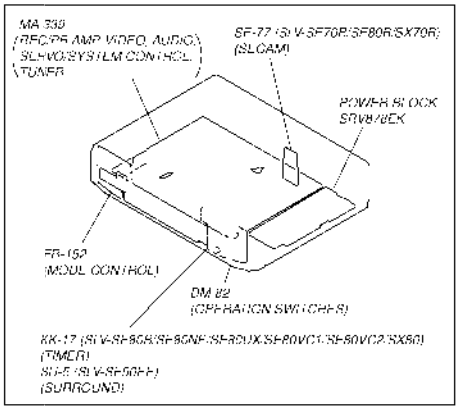
There are few cases that the part printed on this diagram isn't mounted in this model.

POWER BLOCK SR878EK
MAIN BOARD (CONDUCTOR SIDE)



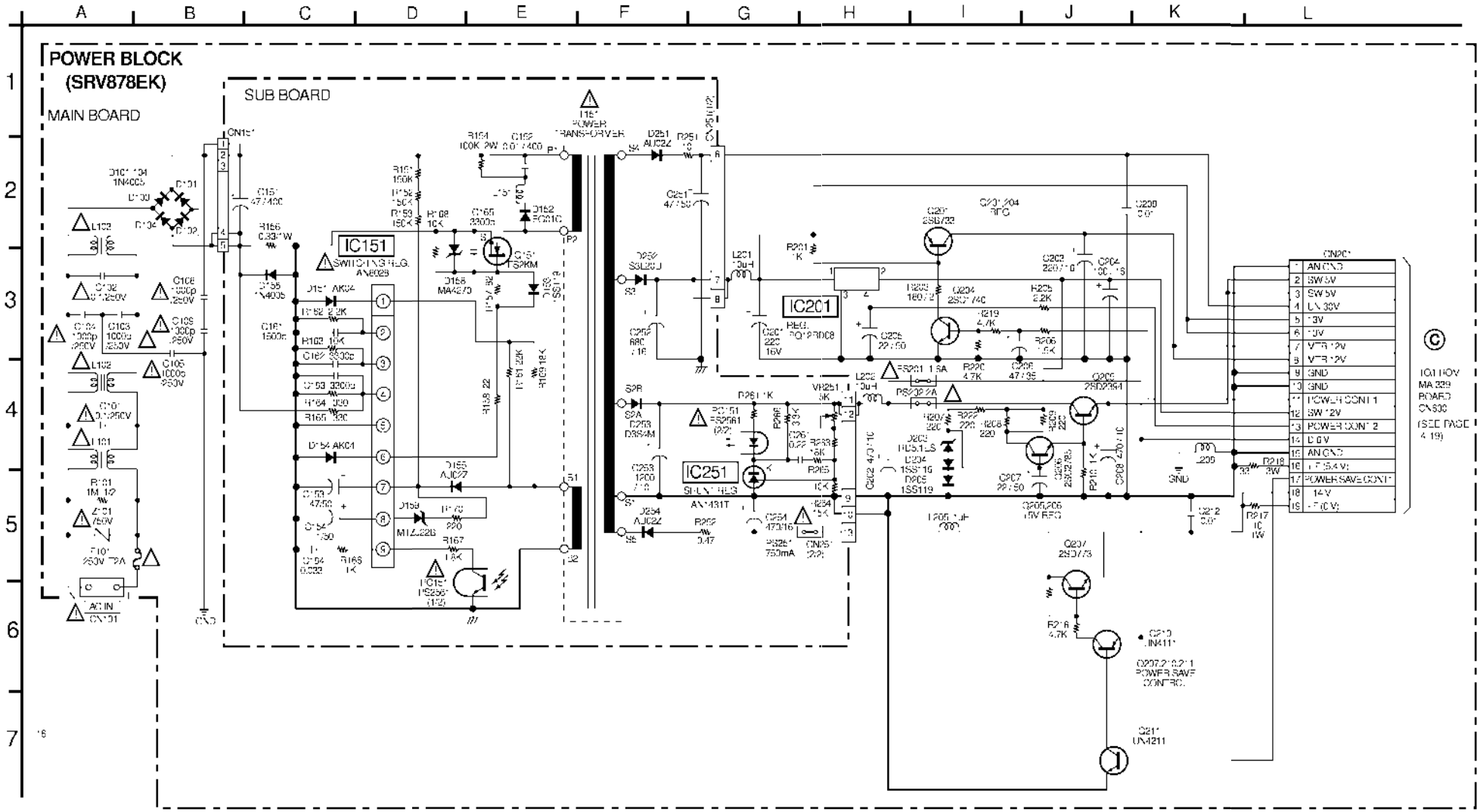
SUB BOARD (CONDUCTOR SIDE)





POWER BLOCK SRV878EK (SWITCHING REGURATOR) SCHEMATIC DIAGRAM

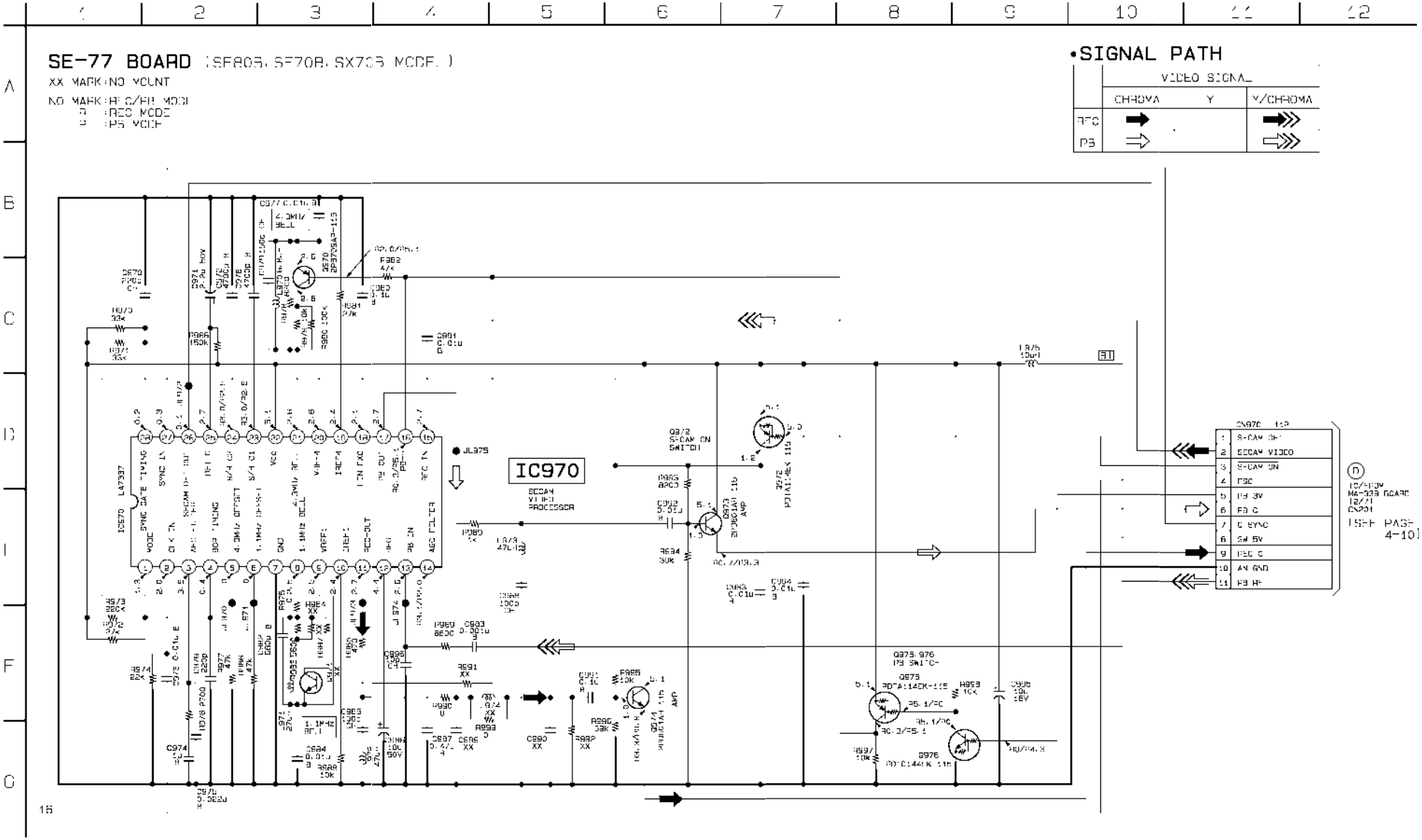
— Ref. No. SRV878 Board:9,000 Series —



Note :	Note :
The components identified by mark ! or dotted line with mark ! are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ! sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

SE-77(SECAM VIDEO SIGNAL PROCESSOR) SCHEMATIC DIAGRAM

— Ref. No. SE-77 Board: 1000 Series —

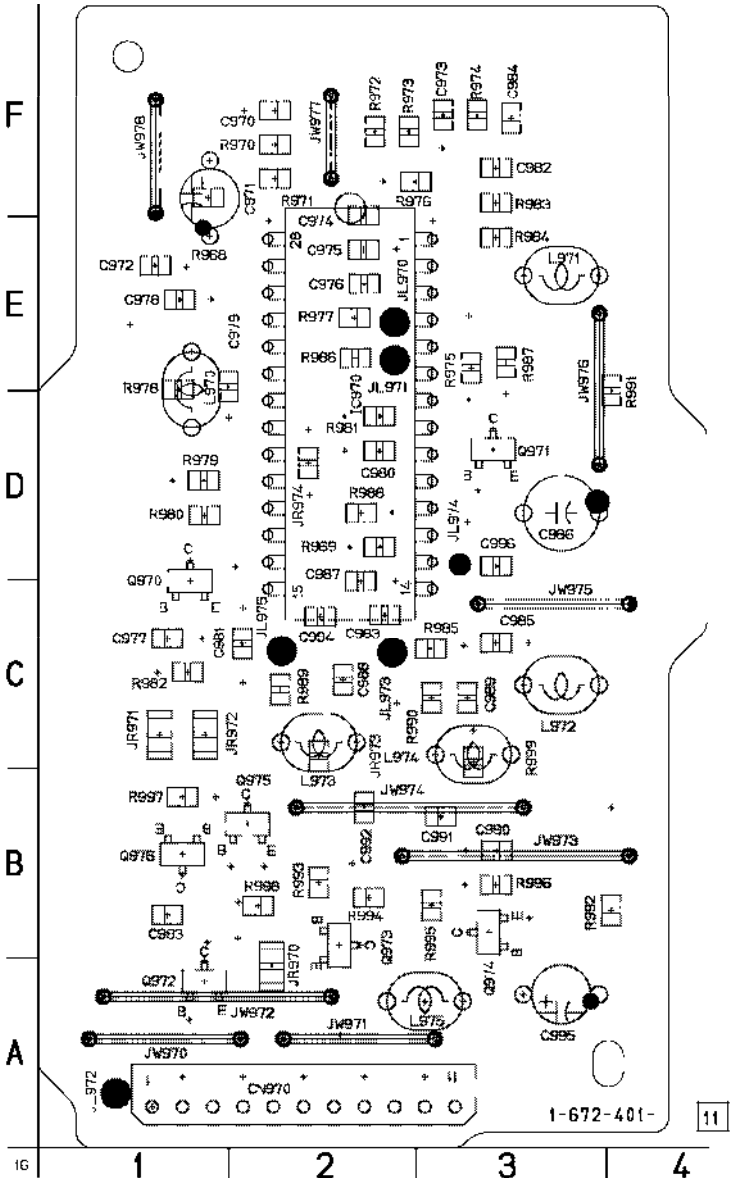


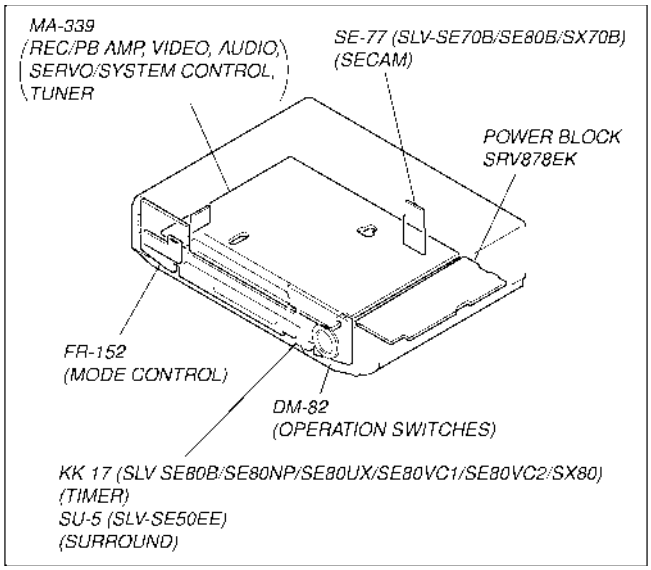
SE-77(SECAM VIDEO SIGNAL PROCESSOR) PRINTED WIRING BOARD (SE70B/SE80B/SX70B MODEL)

— Ref. No. SE-77 Board: 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

SE-77 BOARD





5-1. SYSTEM CONTROL — VIDEO/RP BLOCK INTERFACE (MA-339 BOARD IC162)

Signal	Pin No.	I/O	STOP/ FF/REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC/PAUSE
RF SWP	MA-339 IC162 ⑱	O	*1	*1	*1	*1	*1	*1
QVD	MA-339 IC162 ⑬	O	L	L	L	*2	L	L
CSYNC	MA-339 IC162 ⑯	I	*3	*3	*3	*3	*3	*3

*1 Synchronized with drum rotation. 25 Hz 50% duty pluse.
*2 Normally "L", "H" when video signal is not generated.
*3 Composite sync signal (positive).

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-339 BOARD IC162)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE LOADING	TAPE UNLOADING	PB	REC
CTL IN1-4	MA-339 IC162 ⑮	O	*7	*7	*7	*7	*7	*7	*1
DRM PG	MA-339 IC162 ⑭	I	*3	*3	*3	*3	*3	*3	*3
DRM FG	MA-339 IC162 ⑯	I	*2	*4	*4	*4	*4	*4	*4
CAP PG	MA-339 IC162 ⑰	I	H/L	*2	*2	*5	*5	*2	*2
CAP RVS	MA-339 IC162 ⑭	O	H/L	L	H	L	H	L	L
CAP ERR	MA-339 IC162 ⑯	O	L	*6	*6	*6	*6	*6	*6
DRM ERR	MA-339 IC162 ⑰	O	*6	*6	*6	*6	*6	*6	*6

*1. 25 Hz pulse.
*2. Pulse in period in proportion to tape speed.
*3. 25 Hz "H" pulse.
*4. 330 Hz pulse.
*5. Unstable period pulse.
*6. DC voltage 1 to 5V.
*7. Hi-Z (2.5 V)

5-3. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE (MA-339 BOARD IC162)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	REC
CAM	MA-339 IC162 ㊽	O	M	H/M	L/M	H/M	L/M	M	M	M	M	M
MODE 1	MA-339 IC162 ㉘	I	H			L	L	H	H	H	H	H
MODE 2	MA-339 IC162 ㉙	I	H			L	L	H	H	H	L	L
MODE 3	MA-339 IC162 ㉗	I	I			H	H	H	I	I	I	L
MODE 4	MA-339 IC162 ㉖	I	L			H	H	L	H	H	L	L
REC PRT	MA-339 IC162 ㊾	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL	MA-339 IC162 ㊿	I	H/I	H/I	H/I	H/L	H/I	H/L	*2	*2	*2	*2
S REEL	MA-339 IC162 ㊾	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2
END LED	MA-339 IC162 ㉚	O	I	I	I	*3	*3	*3	*3	*3	*3	*3
T SENS	MA-339 IC162 ⑦	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4
S SENS	MA-339 IC162 ⑥	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4

*1. "L" when erasing protection tab is bent. "H" when not bent.
*2. Pulse of period in proportion to reel rotating speed.
*3. Approx. 2 msec period "H" pulse.
*4. Normally "L", 2 msec period "H" pulse when tape top or tape end is detected.
*5. Hi-Z

5-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-339 BOARD IC162)

Signal	Pin No.	I/O	I/O level
RESET	MA-339 IC162 ㉔	I	Normal "H", "L" when service interruption is detected or restored.
NRAM DATA TUNER	MA-339 IC162 ㊷	O	Serial communication data to Tuner
NRAM CLOCK TUNER	MA-339 IC162 ㊶	O	Serial communication clock with Tuner.

5-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-339 BOARD IC162)

Signal	Pin No.	I/O	STOP/ FF/REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC/PAUSE
A MUTE	MA-339 IC162 ㊸	O	L	I	I	L	I	H

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-339 BOARD IC162)

Pin No.	Pin Name	I/O	Function
1	DEST1	I	Destination identification input 1
2	DEST2	I	Destination identification input 2
3	TU AFT	I/O	AFT input to TUNER for station selection
4	FU KEY2	I	Function key input (9 keys)
5	FU KEY1	I	Function key input (9 keys)
6	S SENS	I	Tape end sensor input
7	T SENS	I	Tape top sensor input
8	RF ENV	I/O	Video RF envelop input
9	AF ENV	I	HiFi envelop input
10	MOD CONT	O	RF modulator ON/OFF control
11	KKP+	I	KKP 2-phase pulse B input
12	KKP–	I	KKP 2-phase pulse A input
13	O VD	O	Pseudo VO output
14	REMOCON	I	Remote control SIRCS signal input
15	COLOR ROT	O	Head azimuth information
16	HA SW P	O	SP/EP head switching signal
17	ENV SW	I	Identification signal of SP/EP head output comparison & detection
18	RF SW P	I/O	Video RF switching pulse output
19	AF SW P	O	HiFi switching pulse output
20	END LED	O	End sensor LED output
21	AV CONT	O	EURO 21 pin AV CONT signal output
22	AF REC P	O	HiFi record control signal
23	FULL ERS	I/O	Full erase control signal for A DUB
24	CAP RVS	O	Inverted capstan signal
25	I CONT	O	EURO 21 pin I CONT signal output
26	MODE 4	I	Cam encode data 4
27	MODE 3	I	Cam encode data 3
28	MODE 2	I	Cam encode data 2
29	MODE 1	I	Cam encode data 1
30	REC PRF	I	Safety tab detection input
31	IIC CLK EEP	O	IIC clock (EEPROM control)
32	IIC DATA EEP	I/O	IIC data (EEPROM control)
33	CAM	O	Cam motor control signal
34	RESET	I	Reset input
35	Xc IN (32kHz)	I	Sub clock input
36	Xc OUT (32kHz)	O	Sub clock output
37	Vcc		Power supply input terminal (high speed mode: 4.0 to 5.5 V, low speed mode: 2.6 to 5.5 V)
38	X IN (17.734475MHz)	I	Main clock input
39	X OUT (17.734475MHz)	O	Main clock output
40	Vss		Ground terminal
41	NICAM CLK	I/O	Clock for NICAM control
42	NICAM DATA	O	Data for NICAM control
43	CLK SEL	I	Selection of oscillation clock when reset is canceled. L: sub clock, H: main & sub clocks
44	OSC IN	I/O	Clock input for OSD character size
45	OSC OUT	I/O	Clock output for OSD character size
46	NUB		Connected to Ground
47	OSD LPF	I/O	External filter that doubles the fsc, is connected to this terminal
48	LP	O	L at SP
49	OSD GND		Ground terminal of OSD/slicer
50	OSD V IN	I	Video signal input for OSD overlay

Pin No.	Pin Name	I/O	Function
51	OSD W LEVEL	I	OSD white level input
52	OSD V OUT	O	OSD video signal output
53	OSD Vcc		Power supply input terminal for OSD/slicer (4.75 V to 5.25 V)
54	HLF	I/O	LPF connection terminal for slicer/AFC (This terminal is used as the HLF terminal when C. Video is input to pin-56.)
55	OSD SECAM C IN	I	Color signal input for SECAM OSD
56	C. VIDEO IN	I	Video signal input for tuner's station selection, OSD and servo sync signal detection (after passing filter)
57	NUA		Connected to Ground
58	DEC/VTR	O	Decoder/VTR switching
59	PDC DAV	I	PDC/VPS signal reception identification input
60	SECAM DET	I	SECAM identification input
61	DNR RESET	O	DNR IC reset signal
62	TA MUTE	O	Tuner audio mute signal output
63	A MUTE	O	Audio mute signal output
64	MTR 12V CONT.	O	Motor 12 V power control signal
65	SW 12V CONT.	O	SW 12 V power control signal
66	FLD CS	O	Chip selection signal for display tube driver
67	$\overline{\text{SECAM ON/SUR ON}}$	O	SECAM ON signal/surround audio control (switched by destination)
68	FLD OUT	O	Serial data out CH0 (FLD)
69	FLD IN	I	Serial data in CH0 (FLD)
70	FLD CLK	O	Serial clock CH0 (FLD)
71	SCL	I/O	I2C clock (video/HiFi/tuner/ARC/modulator/VPS/DNR control)
72	SDA	I/O	I2C data (video/HiFi/tuner/ARC/modulator/VPS/DNR control)
73	AV-LINK OUT	O	AV-LINK data output for communication
74	–14V CONT	O	Power save control (equivalent of pin-98 save CONT 1)
75	C+ 5V CONT	O	Power save control (equivalent of pin-98 save CONT C+)
76	CAP ERROR	O	Capstan error output
77	DRUM ERROR	O	Drum error output
78	P FAIL	I	Power failure detection input
79	S REEL	I	Supply reel sensor input
80	T REEL	I	Tape up reel sensor input
81	DMS+	I	DMS 2-phase pulse 1 input
82	DMS–	I	DMS 2-phase pulse 2 input
83	TU SW1	O	Tuner system BG/L selection signal
84	TU SW2	O	Tuner system BGI L selection signal
85	AV-LINK IN	I	Data inpu for AV-LINK communication
86	C+ DET	I	CANAL + connection identification input
87	CAP FG	I	Capstan FG input
88	AMP Vss		Ground terminal for analog amplifier (connected to Vss)
89	DRUM FG	I	Drum FG input
90	DRUM PG	I	Drum PG input
91	AMP VREF OUT		Analog amplifier reference power supply output terminal
92	AMP VREF IN		Analog amplifier reference power supply output terminal
93	RC CHECK	I	Input for RC setting
94	CTL –IN	I/O	CTL signal input/output terminal
95	CTL +IN	I/O	CTL signal input/output terminal
96	AMP C		CTL amplifier AC Ground terminal
97	CTL AMP OUT	O	CTL amplifier output
98	AMP Vcc		Power supply input terminal for analog amplifier (connected to Vcc)
99	AVcc		Power supply input and reference voltage input to A-D converter
100	AUTO PRESET	O	H at Auto preset

5-7. MODE CONTROL PIN FUNCTIONS (FR-152 BOARD IC420)

Pin No.	Pin Name	I/O	Function
1	VDD		D5V
2	X OUT	O	X' tal out
3	VSS		Ground.
4	X IN	I	X' tal in
5	$\overline{\text{RESET}}$	I	RESET input.
6	AN5		Ground.
7	AN4		Ground.
8	AN3		Ground.
9	AN2		Ground.
10	AN1		Ground.
11	AN0		Ground.
12	$\overline{\text{CS}}$	O	FLD chip select signal out.
13	D IN	I	FLD IIC BUS (data) input.
14	D OUT	O	Not connect.
15	CLK	O	FLD clock.
16	VEE		14V
17	VEE		14V
18	LED1	O	LED control signal input.
19	LED2	O	JOG LED control signal output.
20	NC		Not Connect.
21	G1	O	Grid terminal 1.
22	G2	O	Grid terminal 2.
23	G3	O	Grid treminal 3.
24	G4	O	Grid treminal 4.
25	G5	O	Grid treminal 5.
26	G6	O	Grid treminal 6.
27	S17	O	Segment terminal 17.
28	S16	O	Segment terminal 16.
29	S15	O	Segment terminal 15.
30	S14	O	Segment terminal 14.
31	S13	O	Segment terminal 13.
32	S12	O	Segment terminal 12.
33	S11	O	Segment terminal 11.
34	S10	O	Segment terminal 10.
35	S9	O	Segment terminal 9.
36	S8	O	Segment terminal 8.
37	S7	O	Segment terminal 7.
38	S6	O	Segment terminal 6.
39	S5	O	Segment terminal 5.
40	S4	O	Segment terminal 4.
41	S3	O	Segment terminal 3.
42	S2	O	Segment terminal 2.
43	S1	O	Segment terminal 1.
44	VDD		D5V

SECTION 6
ADJUSTMENTS

6-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL VI (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 6-6 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30 MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) PAL Pattern generator
5) Remote commander
6) Digital voltmeter
7) Audio generator
8) Audio level meter
9) Audio attenuator
10) Alignment tapes
    KRV-51P (PAL) Part No. : 8-192-955-57

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

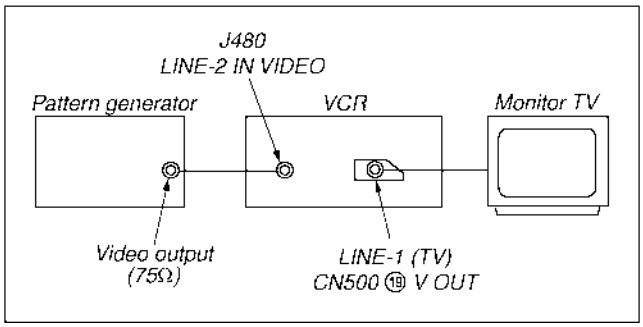


Fig. 6-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL pattern generator is connected with LINE-2 input terminal. When check to tuner, connected AERIAL terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7 V and that the burst signal has an amplitude of approximately 0.3 V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

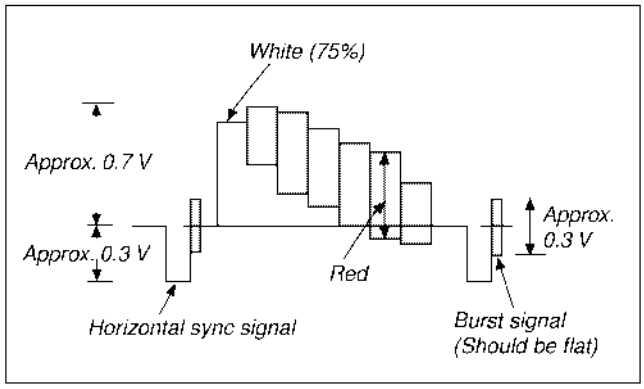


Fig. 6-2-2 Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

• Contents of KRV-51P

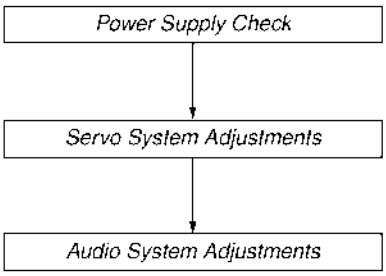
	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

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

Video input: LINE-1 (TV)/LINE-2 IN/LINE-3 IN
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output: LINE-1 (TV)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input: LINE-1 (TV)/LINE-2 IN/LINE-3 IN
Input level: –7.5 dBs
(0 dBs= 0.775 Vrms)
Input impedance: more than 47 kilohms
Audio output: LINE-1 (TV)
Standard level: –7.5 dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-339 Board)

Mode	E-E
+38 V Check	
Measurement point	CN600 pin ④
Specified value	35.0 to 41.0 V
+13 V Check	
Measurement point	CN600 pin ⑤,⑥
Specified value	12.5 to 14.5 V
+12 V Check	
Measurement point	IC601 pin ②
Specified value	11.0 to 13.0 V
+6 V Check	
Measurement point	CN600 pin ⑭
Specified value	5.40 to 6.40 V
+5 V Check	
Measurement point	CN600 pin ②, ③
Specified value	4.7 to 5.7 V
MTR12 V Check	
Measurement point	CN600 pin ⑦, ⑧
Specified value	12.5 to 14.5 V
C +5V Check	
Measurement point	D603 Cathode
Specified value	4.5 to 5.5 V
+F, –F Check	
Measurement point	CN600 pin ⑯, ⑲
Specified value	1.9 to 3.9 V
–11 V Check	
Measurement point	CN600 pin ⑱
Specified value	12.5 to 10.5 V

[Check Method]

1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

2-3-1. RF Switching Position Adjustment (MA-339 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: CN262 pin ① (PB RF) CH2: CN262 pin ② (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	Remote commander CH+/–
Specified value	A=minimize

[Adjustment Method]

1) Playback the alignment tape.
2) Short CN262 pin ⑤ to Ground.
3) Check that "A P" is indicated on FL display.
4) Adjust so that part A becomes minimized at CH +/–.
5) Write data in EEPROM by pressing PAUSE button.
6) The display changes to "A H" and the mode goes to the HiFi switching position Adjustment.

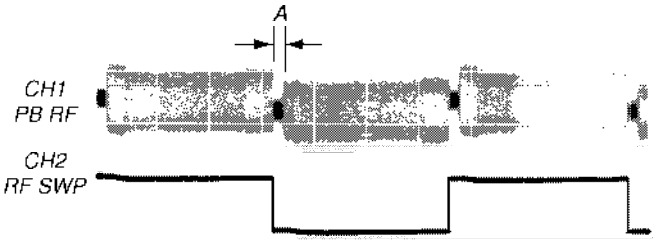


Fig. 6-2-3

2-4. AUDIO SYSTEM ADJUSTMENT

- Adjust both L ch and R ch.

[Connecting Instruments]

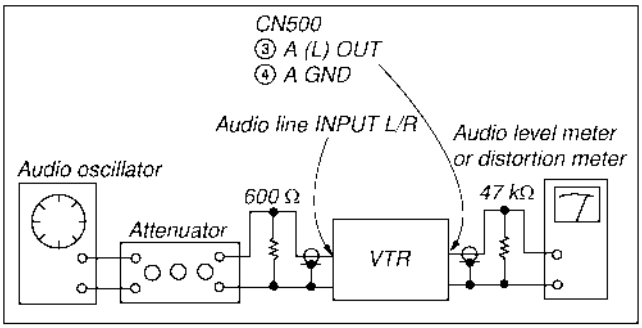


Fig. 6-2-4

2-4-1. Hi-Fi Audio System Adjustment

- Perform the adjustment setting the switch on the following positions.
- AUDIO MONITOR ..... STEREO

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual VI (S MECHANISM)(9-921-647-11).
2. E-E output level check
3. "Recording Bias Adjustment"

2-4-2. Hi-Fi Switching Position Adjustment (MA-339 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Pin ① of CN341 (HF ADJ) CH2: Pin ② of CN270 (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	Remote commander CH +/–
Specified value	B=minimize

[Adjustment Method]

1) Check that "A H" is indicated on FL display.
2) Adjust so that part B becomes minimized at CH +/–.
3) Write data EEPROM by pressing PAUSE button.
4) Check that "A H" indicator turns off.

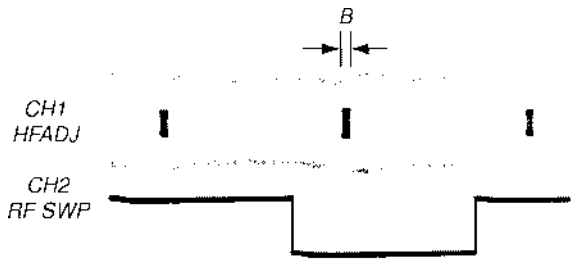


Fig. 6-2-5

2-4-3. Normal Audio System Adjustment

- Make adjustment in the SP mode unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

2-4-4. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual VI (S MECHANISM) (9-921-647-11).

2-4-5. E-E Output Level Check

[Adjustment purpose]

Confirm that the output level adjust the reference input is within the specification.

Mode	E-E
Signal	400 Hz, –6.3 dBs
Measurement point	CN500 Pin ③
Measuring instrument	Audio level meter
Specified value	–6.3 ± 2 dBs

[Check Method]

1) Input signal of 400 Hz and –6.3 dBs to the J480.
2) Check that the audio output level is –6.3 ± 2 dBs.

2-4-6. Frequency Response Check

[Adjustment purpose]

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –26.3 dBs 4 kHz, –26.3 dBs
Measurement point	CN500 Pin ③
Measuring instrument	Audio level meter
Specified value	–6 dB to +4 dB

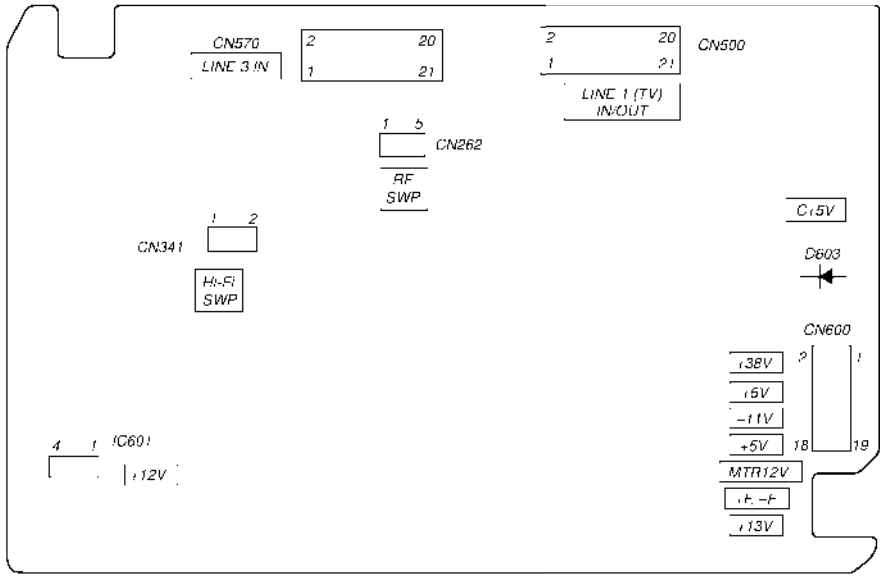
Note: Tape path adjustment must have been completed.

[Confirmation Method]

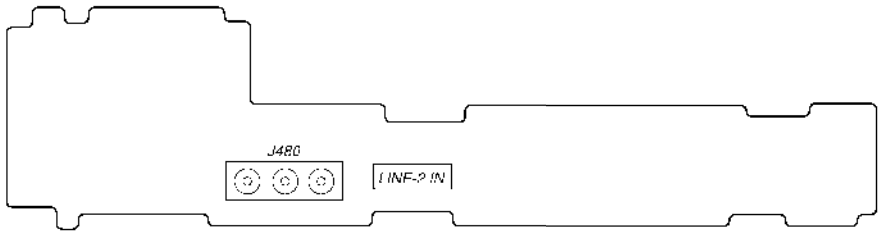
1) Supply a signal of 400 Hz, –26.3 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to CN500 Pin ③.
3) Adjust the attenuator so that the audio level meter will indicate –26.3 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 4 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 4 kHz.
7) Confirm that the 4 kHz playback output level within a range of the 400 Hz playback output level –6 dB to +4 dB.

2-5. ADJUSTING PARTS LOCATION DIAGRAM

MA-339 BOARD
(CONDUCTOR SIDE)



FR-152 BOARD
(CONDUCTOR SIDE)



SECTION 7
REPAIR PARTS LIST

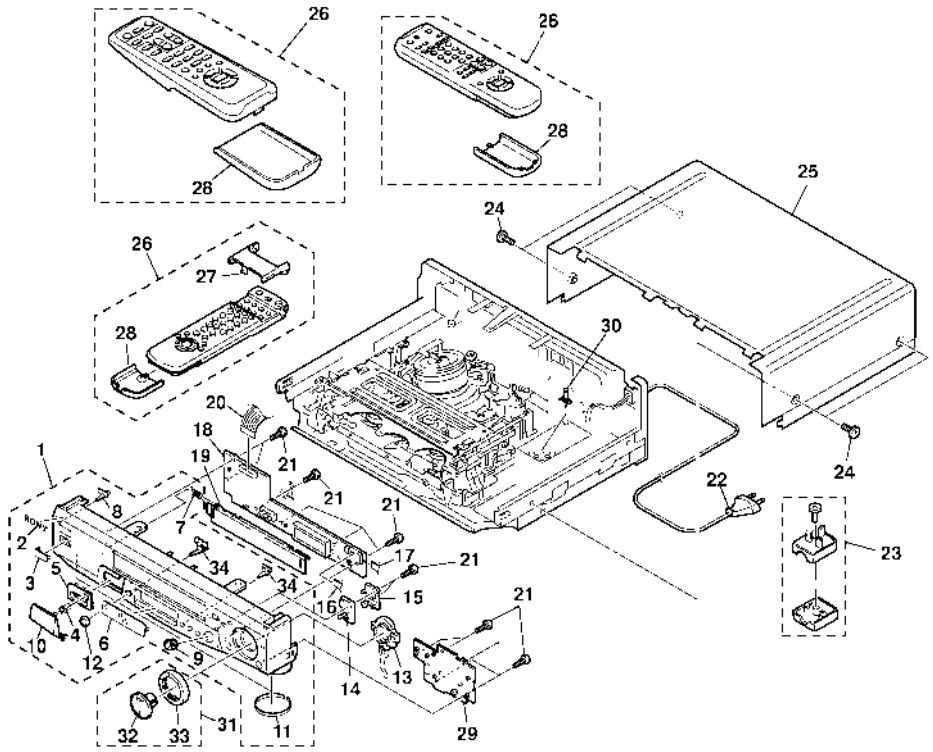
7-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences 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 and accessories and packing materials are given in the last of this parts list.

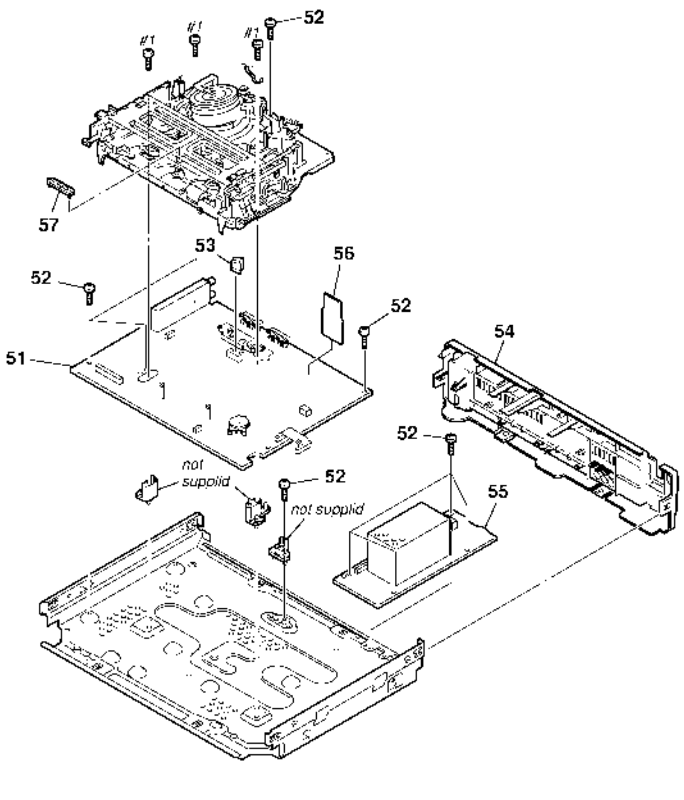
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-1-1. FRONT PANEL AND UPPER CASE SECTION



Ref. No.	Part No.	Description	Remarks
*	X-3949-219-*	PANEL ASSY, FRONT (X80)	
*	X-3949-220-*	PANEL ASSY, FRONT (80:JX)	
*	X-3949-221-*	PANEL ASSY, FRONT (80:B)	
*	X-3949-222-*	PANEL ASSY, FRONT (80:NP,VC1,VC2)	
*	X-3949-223-*	PANEL ASSY, FRONT (70:JX,JX)	
*	X-3949-224-*	PANEL ASSY, FRONT (70:B)	
*	X-3949-225-*	PANEL ASSY, FRONT (70:NP,AP2,VC1,VC2)	
*	X-3949-226-*	PANEL ASSY, FRONT (X70:B)	
*	X-3949-227-*	PANEL ASSY, FRONT (X70:VC)	
*	X-3949-228-*	PANEL ASSY, FRONT (X60)	
*	X-3949-229-*	PANEL ASSY, FRONT (60)	
*	X-3949-236-*	PANEL ASSY, FRONT (35)	
*	X-3949-285-*	PANEL ASSY, FRONT (70:G)	
*	X-3949-287-*	PANEL ASSY, FRONT (70:EN)	
*	X-3949-288-*	PANEL ASSY, FRONT (X70:EN)	
*	X-3949-289-*	PANEL ASSY, FRONT (70:EE)	
*	X-3949-290-2	PANEL ASSY, FRONT (80:EG)	
*	X-3949-291-2	PANEL ASSY, FRONT (80:EN)	
*	X-3949-292-*	PANEL ASSY, FRONT (50:EG)	
*	X-3949-293-*	PANEL ASSY, FRONT (50:EE)	
2	3-053-435-01	EMBLEM (NG.5), SONY	
3	3-053-397-01	WINDOW, RAY CATCHER (EE,EG,EN)	
3	3-053-397-11	WINDOW, RAY CATCHER (EXCEPT EE,EG,EN)	
4	4-247-464-01	CATCHER, PUSH	(50/70:EE,EG,EN/80/X70:EN/X80)
5	3-053-384-01	HOLDER, JACK (60)	
5	3-053-384-11	HOLDER, JACK (70:EG,EN,EE/80:EG,EN/X70:EN)	
5	3-053-384-21	HOLDER, JACK(80:B)	
5	3-053-384-31	HOLDER, JACK(80:NP,JX,VC1,VC2/X60)	
6	3-053-389-01	PLATE(S), FROSTED	(60/80:EG,EN,EE/80:EG,EN/X70:EN)
6	3-053-389-11	PLATE(S), FROSTED	(80:B,NP,JX,VC1,VC2/X80)
6	3-053-375-01	PLATE(L), FROSTED (35)	
6	3-053-375-11	PLATE(L), FROSTED	(50/70:B,EX,NP1,NP2,LX,VC1,VC2/X60/X70:B,VC)
7	3-053-432-01	SPRING (EE), FT	
8	3-053-305-01	INDICATOR (EE,EG,EN)	
8	3-053-395-11	INDICATOR (EXCEPT EE,EG,EN)	
9	3-053-385-01	KNOB, TIMER REC (80:B,NP,JX,VC1,VC2/X80)	
10	3-053-382-01	DOOR, SWITCHING (50/70:EE,EG,EN/60:EG,EN)	
11	3-053-395-01	INSULATOR (EE,EG,EN)	
11	3-053-395-11	INSULATOR (EXCEPT EE,EG,EN)	
12	3-053-405-01	RING, AUTO BUTTON (EE,EG,EN)	
12	3-053-405-11	RING, AUTO BUTTON (EXCEPT EE,EG,EN)	
13	1-762-841-31	SWITCH, ROTARY (50/60,X80)	
* 14	A-6794-674-A	SJ-5A BOARD, COMPLETE (50:EE)	
* 14	A-6794-668-A	KK-17A BOARD, COMPLETE	(80 EXCEPT EG,EN/X80)
15	3-053-383-01	HOLDER, TIMER REC	(80:B,NP,JX,VC1,VC2/X80)
16	1-762-327-11	CABLE, FLAT (FFC-7)	(50:EE/60:B,NP,JX,VC1,VC2/X80)
17	1-790-325-11	CABLE, FLAT (FFC-4)	
* 18	A-6791-794-A	TR-762A BOARD, COMPLETE (70:EE/80:EG,EN)	
* 18	A-6791-795-A	TR-762B BOARD, COMPLETE	(80 EXCEPT EG,EN/X80)
* 18	A-6791-790-A	TR-762C BOARD, COMPLETE	(70:EG,EN/X70:EN)
* 18	A-6791-801-A	TR-762D BOARD, COMPLETE (35)	
* 18	A-6791-775-A	TR-762D BOARD, COMPLETE	(60/70:EXCEPT EE,EG,EN/X60/X70:B,VC)
* 18	A-6791-792-A	TR-762E BOARD, COMPLETE (50:EG)	
* 18	A-6791-788-A	TR-762E BOARD, COMPLETE (50:EE)	
19	3-053-400-21	DOOR(D), CASSETTE	(70:LX,UX/80:UX/X60/X80)
19	3-979-302-11	DOOR(AV), CASSETTE	(60/70:B,NP1,NP2,VC1,VC2/80:B,NP,VC1,VC2)
19	3-987-850-31	DOOR(D), CASSETTE (80:EG,EN)	
20	1-790-325-11	CABLE, FLAT (FFC-26)	
21	4-912-277-41	SCREW (B2.6×8), TAPPING, BIND	
△ 22	1-787-012-11	CORD, POWER	
△ 23	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	(70:EX,UX/80:LX)
24	3-363-099-01	SCREW (CASE 3 TP2)	
25	3-054-434-21	CASE, UPPER (EXCEPT UX,EX,X60,X70,X80)	
25	3-987-664-41	CASE, UPPER (X70:EN)	
25	3-987-664-51	CASE, UPPER	(70:EX,LX/80:UX/X60/X70:B,VC/X80)
26	1-478-007-21	COMMANDER, STANDARD (RMT-V266A)	(60:NP,AP1/AP2/X60)
26	1-478-008-31	COMMANDER, STANDARD (RMT-V257B) (35)	
26	1-478-010-11	COMMANDER, STANDARD (RMT-V260)	(70:EE,EG,EN,EX,NP1,AP2,JX,VC1,VC2/X70:EN,VC)
26	1-478-010-21	COMMANDER, STANDARD (RMT-V259A)	(70:B/X70:B)
26	1-478-010-31	COMMANDER, STANDARD (RMT-V259B)	(50/80:EG,EN,NP,UX,VC1,VC2/X80)
26	1-478-010-41	COMMANDER, STANDARD (RMT-V259C) (80:B)	
27	3-709-430-01	COVER, REMOTE CONTROL	(50/60:AE1/70:B/X70:B/X80)
28	3-709-322-01	COVER, BATTERY (60:AE2,NP/X60)	
28	3-709-431-01	COVER, REMOTE CONTROL BATTERY	(50/60:AE1/70:B/X70:B/X80)
28	3-709-433-01	COVER, REMOTE CONTROL BATTERY (35)	
28	3-709-322-01	COVER, BATTERY (60:AE1)	
* 29	A-6794-673-A	DM-82A BOARD, COMPLETE (50/80:EG,EN)	
* 29	A-6794-667-A	DM-82A BOARD, COMPLETE	(80:EXCEPT EG,EN/X80)
* 29	A-6794-664-A	DM-82B BOARD, COMPLETE	(60/70:EXCEPT EE,EG,EN/X60/X70:B,VC)
* 29	A-6794-669-A	DM-82B BOARD, COMPLETE	(35/70:EE,EG,EN/X70:EN)
30	3-670-570-01	SPACER, SUPPORT	
31	X-3948-232-1	BUTTON ASSY, FUNCTION	(35/60/70:NP1,NP2,VC1,VC2,EG,EN,EE)
31	X-3948-307-1	BUTTON ASSY, FUNCTION (70:B)	
31	X-3949-584-1	BUTTON ASSY, FUNCTION	(70:EX,UX/X60/X70:EN,VC)
31	X-3949-585-1	BUTTON ASSY, FUNCTION (X70:B)	
32	3-979-309-21	BUTTON (AV), CENTER (80:VC2)	
32	3-979-309-31	BUTTON (AV), CENTER (80:B)	
32	3-979-309-41	BUTTON (AV), CENTER (80:UX/X80)	
32	3-979-309-81	BUTTON (AV), CENTER (60/80:EG,EN,NP,VC1)	
32	3-987-939-22	BUTTON CENTER	(35/60/70:EE,EG,EN,NP1,NP2,VC1,VC2)
32	3-987-939-32	BUTTON CENTER(D/35)	
32	3-987-722-11	BUTTON, JOG (60/80:EG,EN)	
33	3-979-310-21	RING(AV), JOG (60/80:B,EG,EN,NP,VC1,VC2)	
33	3-979-310-31	RING(AV), JOG(80:UX/X60)	
33	3-987-938-21	BUTTON, RING	(35/60/70:EE,EG,EN,NP1,NP2,VC1,VC2)
33	3-987-938-31	BUTTON, RING (70:B)	
34	3-053-390-01	INDICATOR (EE) (50/70:EE/80:EG,EN)	

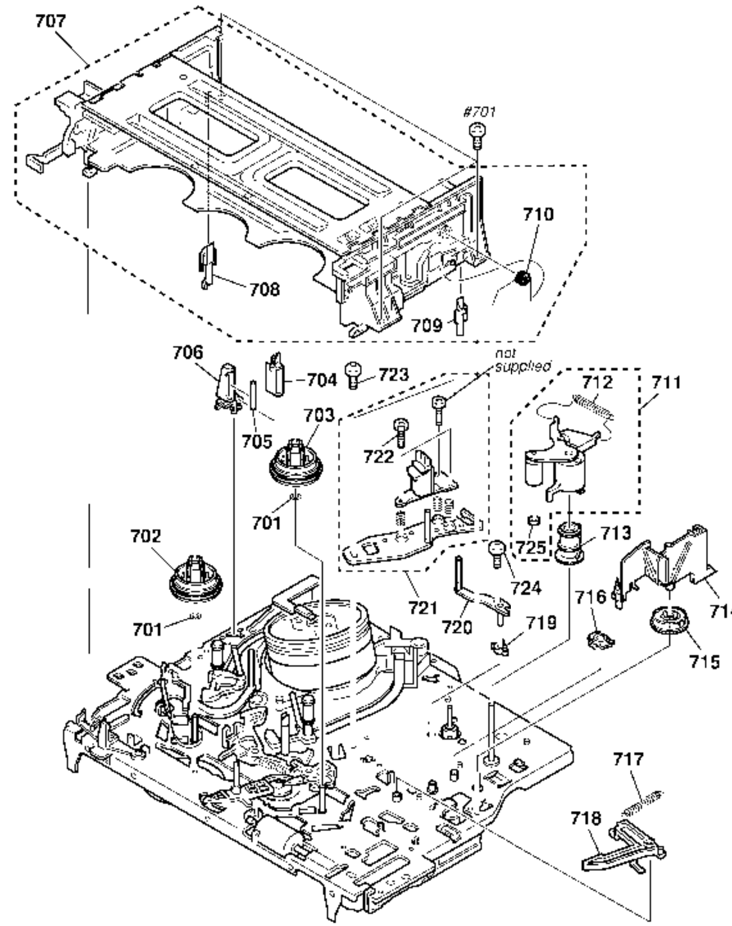
7-1-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
* 51	A-6791-793-A	MA-339A BOARD, COMPLETE (80:EG)	
* 51	A-6791-795-A	MA-339B BOARD, COMPLETE (80:EN)	
* 51	A-6791-784-A	MA-339C BOARD, COMPLETE (80:VC1,VC2/X80)	
* 51	A-6791-788-A	MA-339D BOARD, COMPLETE (80 UX)	
* 51	A-6791-787-A	MA-339E BOARD, COMPLETE (80:B)	
* 51	A-6791-785-A	MA-339F BOARD, COMPLETE (80 NP)	
* 51	A-6791-789-A	MA-339G BOARD, COMPLETE (70 EG)	
* 51	A-6791-796-A	MA-339H BOARD, COMPLETE (70 EN/X70:EN)	
* 51	A-6791-799-A	MA-339I BOARD, COMPLETE (70:EE)	
* 51	A-6791-773-A	MA-339J BOARD, COMPLETE (70 B/X70:B)	
* 51	A-6791-775-A	MA-339K BOARD, COMPLETE (70:VC1,VC2/X70:VC)	
* 51	A-6791-781-A	MA-339L BOARD, COMPLETE (70:EX)	
* 51	A-6791-779-A	MA-339M BOARD, COMPLETE (70 UX)	
* 51	A-6791-780-A	MA-339N BOARD, COMPLETE (70 NP1,NP2)	
* 51	A-6791-783-A	MA-339O BOARD, COMPLETE (60 NP/X60)	
* 51	A-6791-782-A	MA-339P BOARD, COMPLETE (60:AE1,AE2)	
* 51	A-6791-791-A	MA-339Q BOARD, COMPLETE (50 EG)	
* 51	A-6791-797-A	MA-339R BOARD, COMPLETE (50 EE)	
* 51	A-6791-800-A	MA-339S BOARD, COMPLETE (35)	
52	3-970-608-21	SUMITITE (B3), TRV	
53	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P (EXCEPT 35,50)	
54	3-053-407-01	PANEL, REAR (60 AE1,AE2/70:B,NP1,NP2,VC1,VC2/X70:B,VC)	
54	3-053-407-21	PANEL, REAR (70 EX,UX)	
54	3-053-407-31	PANEL, REAR (60 NP/X60)	
54	3-053-407-41	PANEL, REAR (80 VC1,VC2,B,NP/X80)	
54	3-053-407-51	PANEL, REAR (80 UX)	
54	3-053-634-11	PANEL, REAR (50 EE)	
54	3-053-634-21	PANEL, REAR (35)	
54	3-053-634-41	PANEL, REAR (70 EG,EN/80 EN/X70:EN)	
54	3-053-634-51	PANEL, REAR (50 EG)	
54	3-053-634-61	PANEL, REAR (80 EG)	
54	3-053-634-71	PANEL, REAR (70 EE)	
⚠ 55	1-468-367-11	POWER BLOCK	
* 56	A-6794-675-A	SE-774 BOARD, COMPLETE (B)	
57	3-978-737-11	CUSHION (FP), RUBBER (EXCEPT EE,EG,EN)	

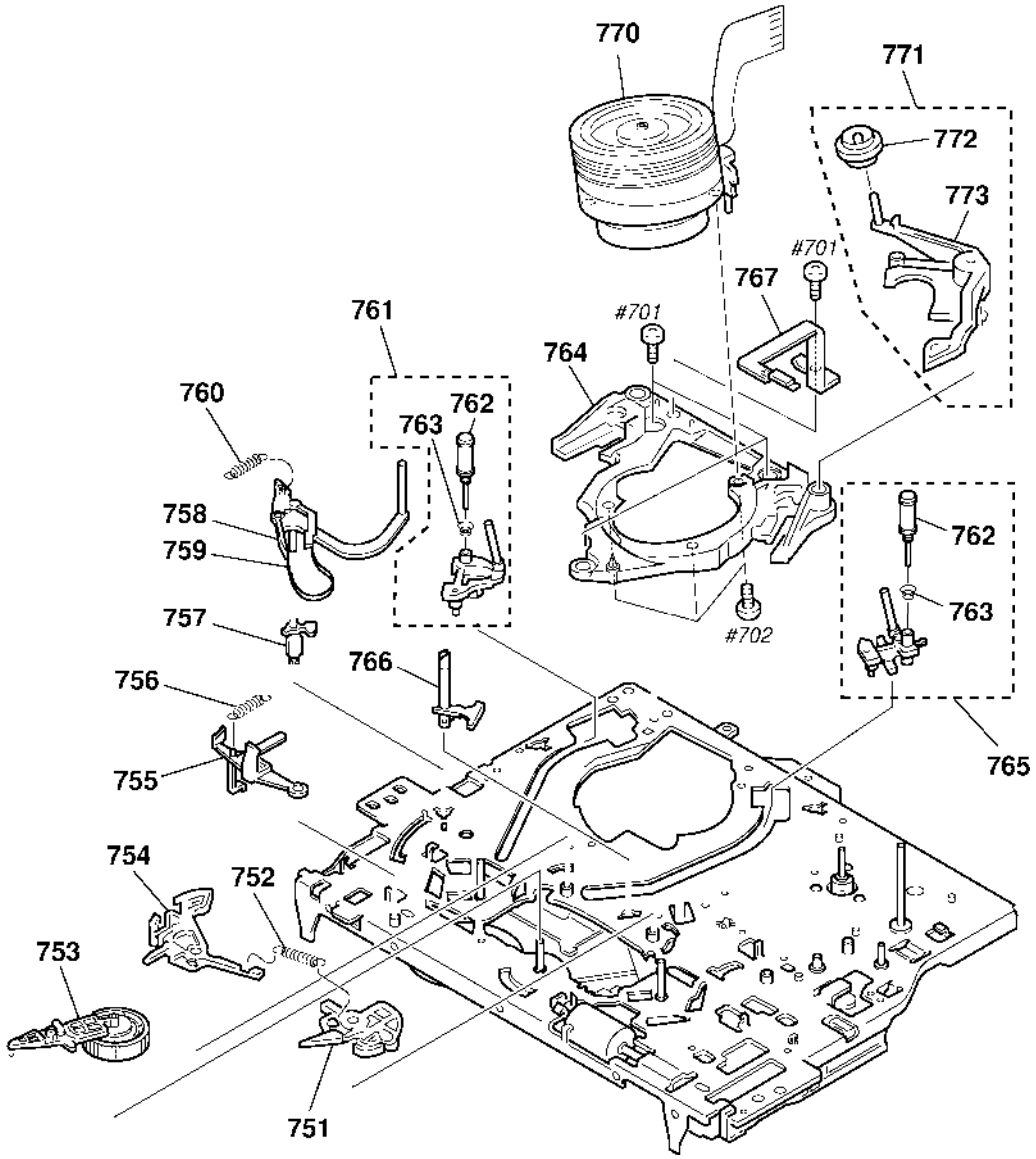
Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-1-3. MECHANISM DECK SECTION-1



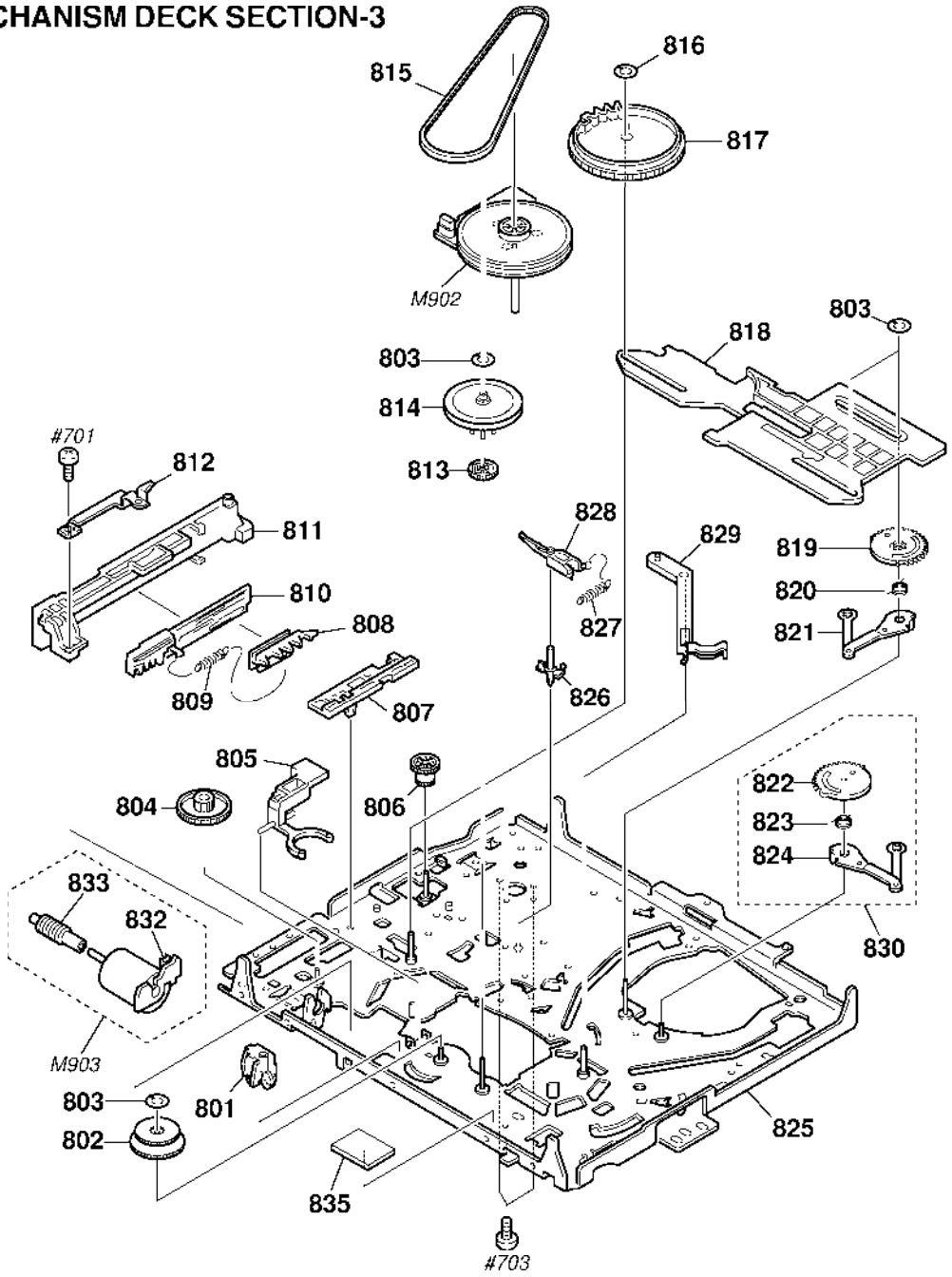
Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FE	
707	A-6759-619-B	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6775-052-A	ACE BLOCK ASSY (ALPS) (EURO 2)	
722	3-974-556-11	+HEXA TT 2.6 × 8 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3 × 8	
724	3-719-381-01	SCREW (M2 × 4)	
725	3-736-045-01	BEARING (NO FLANG), BALL	

7-1-4. MECHANISM DECK SECTION-2



Ref. No.	Part No.	Description	Remarks
751	X-3947-581-4	BRAKE ASSY, MAIN (T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARMASSY, PENDULUM	
754	X-3947-580-5	BRAKE ASSY, MAIN(S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-761-01	SPRING, TENS. (REC. PROOF)	
757	3-977-481-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT (EXCEPT 35,50)	
770	1-759-373-22	DRUM ASSY, DZH-86A-R(EXCEPT B,35,50)	
770	1-759-793-11	DRUM ASSY, DZH-92B-R(35)	
770	1-759-795-11	DRUM ASSY, DZH-93B-R(50)	
770	1-759-557-21	DRUM ASSY, DZH-98A-R(B)	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-01	ARM, HC	

7-1-5. MECHANISM DECK SECTION-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	

Ref. No.	Part No.	Description	Remarks
819	3-977-455-01	GEAR, LOADING (T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING (T)	
822	3-977-451-01	GEAR, LOADING (S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING (S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING (S)	
832	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
833	3-977-436-01	WORM	
835	3-989-917-01	SPACER (RLC PROOF)	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

7-2. ELECTRICAL PARTS LIST

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, -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.
- CAPACITORS;
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH

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

- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD.... µPD...

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

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			Remarks
*	A-6794-673-A	DM-82A BOARD, COMPLETE (50/80:EG,EN)			
		**********			
*	A-6794-667-A	DM-82A BOARD, COMPLETE			
		**********			
					(80:EXCEPT EG,EN/X80)
*	A-6794-664-A	DM-82B BOARD, COMPLETE			
		**********			
					(60/70:EXCEPT EE,EG,EN/X60/X70:B,VC)
*	A-6794-669-A	DM-82B BOARD, COMPLETE			
		**********			
					(35/70:FF,JG,FN/X70:FN)
					(Ref.No.:4,000 series)
		< CONNECTOR >			
CN450	1-784-484-11	CONNECTOR, FFC/FPC 5P (50,80,X80)			
CN451	1-784-451-11	CONNECTOR, FFC/FPC 9P			
		< DIODE >			
D450	8-719-056-06	DIODE SLR-342DC3F (JOG) (50,80,X80)			
D451	8-719-988-61	DIODE 1SS355TE-17 (50,80,X80)			
		< RESISTOR >			
R426	1-216-041-00	METAL CHIP	470	5%	1/10W
					(50,80,X80)
R451	1-216-049-91	RES,CHIP	1K	5%	1/10W
R452	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R453	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R454	1-216-037-00	METAL CHIP	330	5%	1/10W
R455	1-216-049-91	RES,CHIP	1K	5%	1/10W
R456	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R457	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		< SWITCH >			
S450	1-771-410-21	SWITCH, TACT(FF) (35,60,70,X60,X70)			
S451	1-771-410-21	SWITCH, TACT(FF) (50,80,X80)			
S452	1-771-410-21	SWITCH, TACT(PLAY) (35,60,70,X60,X70)			
S453	1-771-410-21	SWITCH, TACT(STOP) (35,60,70,X60,X70)			
S454	1-771-410-21	SWITCH, TACT(REW) (35,60,70,X60,X70)			
S455	1-771-410-21	SWITCH, TACT (REW) (50,80,X80)			
S456	1-771-410-21	SWITCH, TACT (JOG) (50,80,X80)			
S457	1-771-410-21	SWITCH, TACT (REC)			
S458	1-771-410-21	SWITCH, TACT (PAUSE)			
S459	1-771-410-21	SWITCH, TACT (EJECT)			

Ref.No.	Part No.	Description			Remarks
*	A-6791-794-A	FR-152A BOARD, COMPLETE (70:FF/80:FG,FN)			
		**********			
*	A-6791-786-A	FR-152B BOARD, COMPLETE			
		**********			
					(80:EXCEPT EG,EN/X80)
*	A-6791-790-A	FR-152C BOARD, COMPLETE			
		**********			
					(70:EG,EN/X70:EN)
*	A-6791-801-A	FR-152D BOARD, COMPLETE (35)			
		**********			
*	A-6791-775-A	FR-152D BOARD, COMPLETE			
		**********			
					(60/70:EXCEPT EE,EG,EN/X60/X70:B,VC)
*	A-6791-792-A	FR-152F BOARD, COMPLETE (50:FG)			
		**********			
*	A-6791-798-A	FR-152F BOARD, COMPLETE (50:EE)			
		**********			
					(Ref.No.:2,000 series)
	3-053-372-01	HOLDER(FF), FL (LL,LG,LN)			
	3-053-372-11	HOLDER(FT), FL (EXCEPT EE,EG,EN)			
		< CAPACITOR >			
C400	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C420	1-124-589-11	ELECT	47uF	20%	16V
C421	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C422	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C423	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C424	1-126-157-11	ELECT	10uF	20%	16V
C481	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
					(50/70:LL,LG,LN/80/X70:LN/X80)
C491	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
					(50/70:EE,EG,EN/80/X70:EN/X80)
C493	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
					(70:EE,EG,EN/80/X70:EN/X80)
		< CONNECTOR >			
CN400	1-784-451-11	CONNECTOR, FFC/FPC 9P			
CN401	1-784-483-A	CONNECTOR, FFC/FPC 4P			
					(50:EE/80:EXCEPT EG,EN/X80)
CN470	1-784-461-11	CONNECTOR, FFC/FPC 19P			
CN480	1-506-469-11	PIN, CONNECTOR 4P(50)			
* CN480	1-568-954-11	PIN, CONNECTOR 5P			
					(70:EE,EG,EN/80/X70:EN/X80)

FR-152 **KK-17**

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D400	8-719-056-07	DIODE SLR-342MC3F(POWER)	
D403	8-719-056-06	DIODE SLR-342DC3F	
		(REALITY REGENERATOR)	
		(50/70:EE/80/X80)	
D404	8-719-988-61	DIODE 1SS355TF-17 (50/70:FF/80/X80)	
D480	8-719-070-59	DIODE PD76.8B-115	
		(50/70:LL,LG,LN/80/X70:LN/X80)	
D481	8-719-067-40	DIODE STZ6.8N-T146	
		(50/70:EE,EG,EN/80/X70:EN/X80)	
D490	8-719-067-40	DIODE ST76.8N-T146	
		(50/70:FF,FG,FN/80/X70:FN/X80)	
D491	8-719-067-40	DIODE STZ6.8N-T146	
		(70:EE,EG,EN/80/X70:EN/X80)	
		< IC >	
IC400	8-749-011-05	IC GP1U28X (REMOTE SENSOR)	
IC420	8-759-547-59	IC M35500BGP	
		< JACK >	
J480	1-785-672-11	JACK, PIN 2P (LINE-2 IN) (50)	
J480	1-770-071-11	JACK, PIN 3P (LINE-2 IN)	
		(70:FF,FG,FN/80/X70:FN/X80)	
		< JUMPER RESISTOR >	
JR400	1-216-296-91	SHORT 0	
JR401	1-216-296-91	SHORT 0	
JR402	1-216-296-91	SHORT 0	
JR403	1-216-296-91	SHORT 0	
JR404	1-216-296-91	SHORT 0	
JR405	1-216-296-91	SHORT 0	
JR406	1-216-296-91	SHORT 0	
		< JUMPER RESISTOR >	
JS403	1-216-295-91	SHORT 0 (80:EXCEPT EG,EN/X80)	
JS404	1-216-295-91	SHORT 0 (50:FF)	
JS405	1-216-295-91	SHORT 0 (50:FF)	
		< COIL >	
L400	1-414-934-21	INDUCTOR 10uH	
		< FLUORECENT INDICATOR >	
ND420	1-517-832-21	INDICATOR TUBE, FLUORESCENT	
		< TRANSISTOR >	
Q400	8-729-043-29	TRANSISTOR PDTC144EK-115	
		< RESISTOR >	
R400	1-216-022-00	METAL CHIP 75 5% 1/10W	
R401	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R402	1-216-037-00	METAL CHIP 330 5% 1/10W	
R405	1-216-022-00	METAL CHIP 75 5% 1/10W	
R406	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	

Ref. No.	Part No.	Description			Remarks
R407	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R408	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
					(50/70:LL/80/X80)
R412	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R413	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R414	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R415	1-216-077-00	METAL CHIP	15K	5%	1/10W
R420	1-216-295-91	SHORT	0		
R421	1-216-295-91	SHORT	0		
R422	1-216-049-91	RES,CHIP	1K	5%	1/10W
R423	1-216-295-91	SHORT	0		
R424	1-216-041-00	METAL CHIP	470	5%	1/10W
					(50:LL)
R425	1-216-041-00	METAL CHIP	470	5%	1/10W
					(50/70:EE/80/X80)
R480	1-216-022-00	METAL CHIP	75	5%	1/10W
					(50/70:FF,FG,FN/80/X70:FN/X80)
R490	1-216-041-00	METAL CHIP	470	5%	1/10W
					(50/70:LL,LG,LN/80/X70:LN/X80)
R491	1-216-041-00	METAL CHIP	470	5%	1/10W
					(70:EE,EG,EN/80/X70:EN/X80)
R492	1-216-073-00	METAL CHIP	10K	5%	1/10W
R493	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< SWITCH >			
S400	1-771-410-21	SWITCH, TACT (POWER)			
S401	1-771-410-21	SWITCH, TACT (CH –)			
		(EXCEPT 80:B,NP,UX,VC1,VC2/X80)			
S403	1-771-410-21	SWITCH, TACT(REALITY REGENERATOR)			
					(50/70:EE/80/X80)
S404	1-771-410-21	SWITCH, TACT (CH –)			
		(EXCEPT 50/70:EE/80/X80)			
S405	1-771-410-21	SWITCH, TACT (RF CHANNEL)			
		(EXCEPT 50/70:FF,FG,FN/80/X70:FN/X80)			
S406	1-771-410-21	SWITCH, TACT(PROGRAM/TRACKING+)			
		(80:B,NP,UX,VC1,VC2/X80)			
S407	1-771-410-21	SWITCH, TACT(PROGRAM/TRACKING–)			
					(50/70:FF/80/X80)
S408	1-771-410-21	SWITCH, TACT(AUTO SETUP/RF CHANNEL)			
					(50/70:LL,LG,LN/80/X70:LN/X80)
*	A-6794-668-A	KK-17A BOARD, COMPLETE			
		**********			
					(80:EXCEPT EG,EN/X80)
					(Ref.No.:3,000 series)
		< CONNECTOR >			
CN402	1-784-483-A	CONNECTOR, FFC/FPC 4P			
					(80:EXCEPT EG,EN/X80)
		< JUMPER RESISTOR >			
JR410	1-216-296-91	SHORT 0 (80:EXCEPT EG,EN/X80)			
		< SWITCH >			
S410	1-418-156-11	ENCODER, ROTARY(DIAL TIMER)			
					(80:EXCEPT EG,EN/X80)

Ref.No.	Part No.	Description	Remarks
*	A-6791-793-A	MA-339A BOARD, COMPLETE (80:FG)	
		**********	
*	A-6791-795-A	MA-339B BOARD, COMPLETE (80:EN)	
		**********	
*	A-6791-784-A	MA-339C BOARD, COMPLETE	
		**********	
			(80:VC1,VC2/X80)
*	A-6791-788-A	MA-339D BOARD, COMPLETE (80:UX)	
		**********	
*	A-6791-787-A	MA-339E BOARD, COMPLETE (80:B)	
		**********	
*	A-6791-785-A	MA-339F BOARD, COMPLETE (80:NP)	
		**********	
*	A-6791-789-A	MA-339G BOARD, COMPLETE (70:EG)	
		**********	
*	A-6791-796-A	MA-339H BOARD, COMPLETE (70:EN/X70:EN)	
		**********	
*	A-6791-799-A	MA-339I BOARD, COMPLETE (70:EE)	
		**********	
*	A-6791-773-A	MA-339J BOARD, COMPLETE (70:B/X70:B)	
		**********	
*	A-6791-776-A	MA-339K BOARD, COMPLETE	
		**********	
			(70:VC1,VC2/X70:VC)
*	A-6791-781-A	MA-339L BOARD, COMPLETE (70:EX)	
		**********	
*	A-6791-779-A	MA-339M BOARD, COMPLETE (70:UX)	
		**********	
*	A-6791-780-A	MA-339N BOARD, COMPLETE (70:NP1,NP2)	
		**********	
*	A-6791-783-A	MA-339O BOARD, COMPLETE (60:NP/X60)	
		**********	
*	A-6791-782-A	MA-339P BOARD, COMPLETE (60:AL1,AL2)	
		**********	
*	A-6791-791-A	MA-339Q BOARD, COMPLETE (50:EG)	
		**********	
*	A-6791-797-A	MA-339R BOARD, COMPLETE (50:FF)	
		**********	
*	A-6791-800-A	MA-339S BOARD, COMPLETE (35)	
		**********	
			(Ref.No.:1,000 series)
*	3-960-273-01	SPACER, TOP END	
*	3-960-274-01	SPACER, LED	

Ref.No.	Part No.	Description			Remarks
		< CAPACITOR >			
C001	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
					(50/70:EE/80/X80)
C002	1-126-933-11	ELECT	100uF	20%	16V
					(50/70:EE/80/X80)
C003	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
					(50/70:FF/80/X80)
C004	1-126-963-11	ELECT	4.7uF	20%	50V
					(50/70:EE/80/X80)
C006	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
					(50/70:EE/80/X80)
C007	1-126-964-11	ELECT	10uF	20%	50V
					(50/70:FF/80/X80)
C008	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
					(50/70:EE/80/X80)
C009	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
					(50/70:EE/80/X80)
C010	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
					(50/70:FF/80/X80)
C100	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-128-057-11	ELECT	330uF	20%	6.3V
C105	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-124-589-11	ELECT	47uF	20%	16V
C113	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C114	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C115	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C120	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C121	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C122	1-124-589-11	ELECT	47uF	20%	16V
C123	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C131	1-124-589-11	ELECT	47uF	20%	16V
C133	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C134	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C140	1-124-584-00	ELECT	100uF	20%	10V
C141	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C142	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C143	1-128-131-11	ELECT	22uF	20%	50V
C144	1-128-131-11	ELECT	22uF	20%	50V
C145	1-124-584-00	ELECT	100uF	20%	10V
C146	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C160	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C161	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C162	1-104-905-11	CAPACITOR	0.22F		5.5V
C163	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C164	1-124-584-00	ELECT	100uF	20%	10V
C165	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C166	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C167	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C168	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C169	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C170	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C171	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C172	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C173	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C200	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C201	1-126-160-11	ELECT	1uF	20%	50V
C202	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C203	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V

MA-339

Ref. No.	Part No.	Description			Remarks
C204	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C205	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C206	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C207	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C208	1-126-160-11	ELECT	1uF	20%	50V
C209	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C210	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C211	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C212	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C213	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C214	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C215	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C216	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C217	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C218	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (70:EXCEPT EE/60/X60/X70)
C219	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C220	1-124-589-11	ELECT	47uF	20%	16V
C221	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (35)
C221	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (EXCEPT 35)
C222	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C223	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C224	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C225	1-124-589-11	ELECT	47uF	20%	16V
C226	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C227	1-124-589-11	ELECT	47uF	20%	16V
C228	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C229	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C230	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C231	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C234	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C235	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C236	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (EXCEPT FF)
C237	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C238	1-126-157-11	ELECT	10uF	20%	16V
C240	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (EXCEPT AE1,AE2,EE,35)
C241	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (50/70:FF,FG,FN/80/X70:FN/X80)
C242	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (EXCEPT AE1,AE2,EE,35)
C243	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C244	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C246	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C247	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C248	1-104-664-11	ELECT	47uF	20%	16V
C249	1-126-157-11	ELECT	10uF	20%	16V
C250	1-124-589-11	ELECT	47uF	20%	16V
C251	1-126-153-11	ELECT	22uF	20%	6.3V
C252	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C253	1-163-139-00	CERAMIC CHIP	820PF	5%	50V (B)

Ref. No.	Part No.	Description			Remarks
C254	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (50/70:FF/80/X80)
C255	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C271	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (EXCEPT 35)
C272	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (EXCEPT 35)
C275	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C276	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C282	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C283	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C284	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C285	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C288	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C306	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C307	1-126-157-11	ELECT	10uF	20%	16V
C308	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C309	1-137-370-11	FILM	0.01uF	5%	50V
C310	1-126-163-11	ELECT	4.7uF	20%	50V
C312	1-126-966-11	ELECT	33uF	20%	16V
C313	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (35,50)
C314	1-126-964-11	ELECT	10uF	20%	50V
C315	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C316	1-126-163-11	ELECT	4.7uF	20%	50V
C317	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C318	1-126-160-11	ELECT	1uF	20%	50V
C319	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (50)
C320	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C321	1-104-664-11	ELECT	47uF	20%	16V
C322	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C323	1-137-462-11	FILM	0.018uF	5%	100V (50,80,X80)
C323	1-137-397-11	FILM	0.047uF	5%	100V (35,60,70,X60,X70)
C324	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C325	1-124-589-11	ELECT	47uF	20%	16V
C326	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C327	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C330	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (50,80,X80)
C331	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (50,80,X80)
C332	1-137-397-11	FILM	0.047uF	5%	100V (50,80,X80)
C333	1-126-933-11	ELECT	100uF	20%	16V (50,80,X80)
C334	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (50,80,X80)
C340	1-163-031-11	CERAMIC CHIP	0.01uF		50V (EXCEPT 35,50)
C341	1-124-584-00	ELECT	100uF	20%	10V (EXCEPT 35,50)
C342	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (EXCEPT 35,50)
C346	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (EXCEPT 35,50)
C350	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (EXCEPT 35,50)

Ref.No.	Part No.	Description				Remarks
C352	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	(EXCEPT 35,50)
C353	1-163-038-91	CERAMIC CHIP	0.1uF		25V	(EXCEPT 35,50)
C357	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	(EXCEPT 35,50)
C358	1-163-038-91	CERAMIC CHIP	0.1uF		25V	(EXCEPT 35,50)
C359	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(EXCEPT 35,50)
C360	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	(EXCEPT 35,50)
C361	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	(EXCEPT 35,50)
C362	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	(EXCEPT 35,50)
C363	1-126-933-11	ELECT	100uF	20%	16V	(EXCEPT 35,50)
C364	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	(EXCEPT 35,50)
C365	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C366	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C367	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(EXCEPT 35,50)
C368	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C369	1-104-664-11	ELECT	47uF	20%	16V	(EXCEPT 35,50)
C370	1-126-960-11	ELECT	1uF	20%	50V	(70:FF,FG,FN/80/X70:FN/X80)
C371	1-124-261-00	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C372	1-126-960-11	ELECT	1uF	20%	50V	(70:EE,EG,EN/80/X70:EN/X80)
C373	1-124-257-00	ELECT	2.2uF	20%	50V	(EXCEPT 35,50)
C374	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C375	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C376	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT AE1,AE2,FF,35,50)
C377	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C378	1-126-960-11	ELECT	1uF	20%	50V	(EXCEPT AE1,AE2,EE,35,50)
C379	1-124-589-11	ELECT	47uF	20%	16V	(EXCEPT 35,50)
C380	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(EXCEPT 35,50)
C381	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C382	1-126-160-11	ELECT	1uF	20%	50V	(EXCEPT 35,50)
C383	1-124-261-00	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C384	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C385	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C386	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT 35,50)
C387	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	(EXCEPT 35,50)
C388	1-124-261-00	ELECT	10uF	20%	50V	(EXCEPT AE1,AE2,EE,UX,35,50)
C389	1-126-964-11	ELECT	10uF	20%	50V	(EXCEPT AE1,AE2,EE,UX,35)
C500	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C501	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(50:EE/70:EE/80:EG)
C510	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C511	1-104-664-11	ELECT	47uF	20%	16V	
C512	1-104-664-11	ELECT	47uF	20%	16V	
C513	1-126-935-11	ELECT	470uF	20%	6.3V	
C520	1-126-935-11	ELECT	470uF	20%	6.3V	(50:EE/70:EE/80:EG)
C570	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(EXCEPT AE1,AE2,FF,35)
C571	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(EXCEPT AE1,AE2,EE,35)
C580	1-126-964-11	ELECT	10uF	20%	50V	(50:EG)
C581	1-126-964-11	ELECT	10uF	20%	50V	(50:FG)
C582	1-126-964-11	ELECT	10uF	20%	50V	(50:EG)
C583	1-126-964-11	ELECT	10uF	20%	50V	(50:FG)
C584	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(50:EG)
C585	1-126-964-11	ELECT	10uF	20%	50V (50)	
C586	1-126-964-11	ELECT	10uF	20%	50V	(50:FG)
C587	1-126-964-11	ELECT	10uF	20%	50V (50)	
C611	1-104-664-11	ELECT	47uF	20%	16V	(EXCEPT AE1,AE2,EE,35)
C612	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(EXCEPT AE1,AE2,EE,35)
C613	1-126-933-11	ELECT	100uF	20%	16V	(EXCEPT AE1,AE2,EE,35)
C615	1-124-589-11	ELECT	47uF	20%	16V	
C616	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C660	1-163-233-11	CERAMIC CHIP	18PF	5%	50V	
C661	1-163-234-11	CERAMIC CHIP	20PF	5%	50V	
C662	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C663	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V	
C664	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C665	1-163-245-11	CERAMIC CHIP	56PF	5%	50V	(B,EE,EG,EN)
C666	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	
C667	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C668	1-124-584-00	ELECT	100uF	20%	10V	
C669	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	
C670	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	
C671	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C672	1-163-038-91	CERAMIC CHIP	0.1uF		25V	

MA-339

Ref. No.	Part No.	Description			Remarks
C700	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V (FXCFPT FF)
C701	1-126-964-11	ELECT	10uF	20%	50V
C703	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V (EXCEPT EE,35,50)
C704	1-126-964-11	ELECT	10uF	20%	50V
C705	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C706	1-126-933-11	ELECT	100uF	20%	16V (70:EE)
C707	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (70:EE)
C708	1-104-664-11	ELECT	47uF	20%	16V
C709	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C710	1-128-131-11	ELECT	22uF	20%	50V (EXCEPT EE,35,50)
C711	1-124-589-11	ELECT	47uF	20%	16V
C730	1-126-964-11	ELECT	10uF	20%	50V (EXCEPT 35,50)
C731	1-126-964-11	ELECT	10uF	20%	50V (EXCEPT 35,50)
C752	1-126-933-11	ELECT	100uF	20%	16V
C753	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C754	1-126-935-11	ELECT	470uF	20%	6.3V
C755	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C801	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (FXCFPT 60,X60)
C850	1-163-038-91	CERAMIC CHIP	0.1uF		25V (EXCEPT EE,60,X60)
C851	1-124-261-00	ELECT	10uF	20%	50V (FXCFPT FF,60,X60)
C852	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V (EXCEPT EE,60,X60)
C853	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V (EXCEPT EE,60,X60)
C855	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V (LXCLP1 LL,60,X60)
C856	1-163-038-91	CERAMIC CHIP	0.1uF		25V (EXCEPT EE,60,X60)
C870	1-104-664-11	ELECT	47uF	20%	16V (50:EE)
C871	1-126-964-11	ELECT	10uF	20%	50V (50:LL)
C872	1-126-964-11	ELECT	10uF	20%	50V (50:EE)
C873	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V (50:EE)
C874	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V (50:FF)
		< CONNECTOR >			
CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P			(FXCFPT 35,50)
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P			
CN104	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN140	1-506-468-11	PIN, CONNECTOR 3P			
CN160	1-784-498-11	CONNECTOR, FFC/FPC 19P			
CN161	1-506-469-11	PIN, CONNECTOR 4P			
CN260	1-784-497-11	CONNECTOR, FFC/FPC 13P (FXCFPT 35,50)			
CN261	1-785-550-11	CONNECTOR, FFC/FPC 8P (35,50)			
* CN262	1-560-893-00	PIN, CONNECTOR 5P			
CN300	1-506-468-11	PIN, CONNECTOR 3P (35,60,70,X60,X70)			

Ref. No.	Part No.	Description	Remarks
CN301	1-506-469-11	PIN, CONNECTOR 4P	
* CN341	1-560-890-00	PIN, CONNECTOR 2P (FXCFPT 35,50)	
CN500	1-785-636-11	CONNECTOR, SQUARE TYPE 21P (LINE-1(1V))	
* CN501	1-568-954-11	PIN, CONNECTOR 5P	(70:EE,EG,EN/80/X70:EN/X80)
CN501	1-506-469-11	PIN, CONNECTOR 4P(50)	
CN570	1-785-636-11	CONNECTOR, SQUARE TYPE 21P(LINE-3 IN)	(FXCFPT AF1,AF2,FF,35)
CN600	1-778-674-21	CONNECTOR, BOARD TO BOARD 19P	
		< DIODE >	
D100	8-719-048-26	DIODE GL528V1	
D110	8-719-700-87	DIODE 11FS7	
D160	8-719-200-82	DIODE 11LS2	
D161	8-719-200-82	DIODE 11LS2	
D162	8-719-067-40	DIODE STZ6.8N-T146	
D360	8-719-070-59	DIODE PDZ6.8B-115(EXCEPT 35,50)	
D500	8-719-067-40	DIODE ST76.8N-T146	
D502	8-719-067-40	DIODE STZ6.8N-T146 (LXCLP1 35,50)	
D504	8-719-067-40	DIODE STZ6.8N-T146	
D506	8-719-067-40	DIODE STZ6.8N-T146 (EXCEPT 35/50:EG)	
D508	8-719-070-59	DIODE PDZ6.8B-115	
D509	8-719-070-59	DIODE PDZ6.8B-115 (FXCFPT 35/50:FG)	
D511	8-719-070-59	DIODE PDZ6.8B-115	
D512	8-719-977-40	DIODE UDZ-TE-17-13B	
D513	8-719-067-40	DIODE STZ6.8N-T146	
D514	8-719-921-86	DIODE MTZJ-13	
D515	8-719-067-40	DIODE ST76.8N-T146	
D540	8-719-067-40	DIODE STZ6.8N-T146	(LXCLP1 AL1,AL2,LL,35)
D542	8-719-067-40	DIODE STZ6.8N-T146	(EXCEPT AE1,AE2,EE,UX,35)
D570	8-719-070-59	DIODE PDZ6.8B-115 (EXCEPT AE1,AE2,EE,35)	
D571	8-719-067-40	DIODE STZ6.8N-T146	(LXCLP1 AL1,AL2,LL,35)
D573	8-719-067-40	DIODE STZ6.8N-T146	(EXCEPT AE1,AE2,EE,35,50)
D575	8-719-067-40	DIODE STZ6.8N-T146	(FXCFPT AF1,AF2,FF,UX,35)
D576	8-719-921-86	DIODE MTZJ-13 (LXCLP1 AL1,AL2,LL,35)	
D577	8-719-067-40	DIODE STZ6.8N-T146	(EXCEPT AE1,AE2,EE,UX,35,50)
D590	8-719-988-61	DIODE 1SS355TE-17	
D591	8-719-988-61	DIODE 1SS355TE-17 (35,50)	
D603	8-719-700-87	DIODE 11FS7 (FXCFPT AF1,AF2,FF,35)	
D604	8-719-070-56	DIODE PDZ5.1B-115	
D605	8-719-988-61	DIODE 1SS355TE-17	
D700	8-719-988-61	DIODE 1SS355TE-17 (70:EE)	
D702	8-719-982-26	DIODE MTZJ-33B	
D710	8-719-067-40	DIODE ST76.8N-T146	
D711	8-719-067-40	DIODE ST76.8N-T146	
D712	8-719-070-59	DIODE PDZ6.8B-115	
D750	8-719-200-82	DIODE 11ES2	
D800	8-719-988-61	DIODE 1SS355TE-17 (EXCEPT 60,X60)	

Ref.No.	Part No.	Description	Remarks
		< FILTER >	
FL500	1-236-163-11	ENCAPSULATED COMPONENT	
FL501	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT 35,50)	
FL502	1-236-163-11	ENCAPSULATED COMPONENT	
FL503	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT 35/50:EG)	
FL504	1-236-163-11	ENCAPSULATED COMPONENT (50:FF/70/80/X70/X80)	
FL505	1-236-163-11	ENCAPSULATED COMPONENT (50:EE//0/80/X/0/X80)	
FL570	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT AE1,AE2,EE,35)	
FL571	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT AE1,AE2,EE,35,50)	
FL572	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT AE1,AE2,EE,UX,35)	
FL573	1-236-163-11	ENCAPSULATED COMPONENT (EXCEPT AE1,AE2,EE,UX,35,50)	
		< IC >	
IC001	8-759-566-07	IC LA7277M-TLM (50/70:EE/80/X80)	
IC130	8-759-481-46	IC LB1943	
IC160	8-759-248-87	IC MM1256XF-BE	
IC161	8-759-575-72	IC M24C08-WMN6T	
IC162	8-759-590-64	IC M37760MCA131GP (B,FX,UX,VC,VC1,VC2)	
IC162	8-759-590-66	IC M37760MCA133GP (70:NP1,NP2/80:NP)	
IC162	8-759-590-68	IC M37760MCA135GP (EG,EN)	
IC162	8-759-590-62	IC M37760M8A129GP (50:EE//0:EE)	
IC162	8-759-590-65	IC M37760MCA137GP (60:NP/X60)	
IC162	8-759-590-63	IC M37760MCA130GP (60:AL1,AL2)	
IC200	8-759-547-32	IC LA71560M-MPB	
IC260	8-759-549-79	IC LA70001(35)	
IC260	8-759-564-36	IC LA70011(EXCEPT 35)	
IC320	8-759-499-30	IC BA7755AF-E2	
IC340	8-759-486-92	IC LA7256 (LXCLPT 35,50)	
IC360	8-759-486-63	IC TDA9615H/N1,518 (EXCEPT 35,50)	
IC580	8-759-300-71	IC HD14053BFP(50:EG)	
IC601	8-759-438-18	IC PQ12RD08 (EXCEPT AE1,AE2,EE,35)	
IC850	8-759-484-61	IC SDA5650X-GFG (FXCEPT FF,60,X60)	
IC870	8-759-988-36	IC BA14741F (50:LL)	
		< JACK >	
J500	1-784-414-11	JACK, PIN 2P (AUDIO OUT) (EXCEPT 35/50/60/70:EE/80:EE/X60)	
J500	1-784-412-11	JACK, PIN 3P (AUDIO OUT) (70:FF/80:FG)	
J500	1-784-413-11	JACK, PIN 3P (AUDIO OUT) (50:FF)	
		< JUMPER RESISTOR >	
JR001	1-216-295-91	SHORT 0 (50:EE)	
JR002	1-216-295-91	SHORT 0 (50:FF)	
JR003	1-216-295-91	SHORT 0	
JR004	1-216-295-91	SHORT 0	
JR005	1-216-295-91	SHORT 0 (EXCEPT 35,50)	
JR006	1-216-295-91	SHORT 0	
JR007	1-216-295-91	SHORT 0	
JR008	1-216-295-91	SHORT 0	
JR009	1-216-295-91	SHORT 0	
JR010	1-216-295-91	SHORT 0	

Ref.No.	Part No.	Description	Remarks
JR011	1-216-295-91	SHORT 0	
JR012	1-216-295-91	SHORT 0 (50:FG)	
JR013	1-216-295-91	SHORT 0	
JR014	1-216-295-91	SHORT 0	
JR015	1-216-295-91	SHORT 0	
JR016	1-216-295-91	SHORT 0	
JR017	1-216-295-91	SHORT 0 (EXCEPT 35,50)	
JR018	1-216-295-91	SHORT 0 (FXCEPT 35,50)	
JR019	1-216-295-91	SHORT 0	
JR020	1-216-295-91	SHORT 0	
JR021	1-216-295-91	SHORT 0	
JR022	1-216-295-91	SHORT 0	
JR023	1-216-295-91	SHORT 0 (B)	
JR024	1-216-295-91	SHORT 0	
JR025	1-216-295-91	SHORT 0	
JR026	1-216-295-91	SHORT 0	
JR201	1-216-296-91	SHORT 0 (50:EG)	
JR202	1-216-296-91	SHORT 0	
JR203	1-216-296-91	SHORT 0 (LXCLPT 35,50)	
JR204	1-216-296-91	SHORT 0	
JR205	1-216-296-91	SHORT 0	
JR206	1-216-296-91	SHORT 0	
JR207	1-216-296-91	SHORT 0	
JR208	1-216-296-91	SHORT 0	
JR209	1-216-296-91	SHORT 0	
JR210	1-216-296-91	SHORT 0 (EXCEPT 35,50)	
JR211	1-216-296-91	SHORT 0 (EXCEPT 35,50)	
JR212	1-216-296-91	SHORT 0	
JR213	1-216-296-91	SHORT 0	
JR214	1-216-296-91	SHORT 0	
JR215	1-216-296-91	SHORT 0	
JR216	1-216-296-91	SHORT 0	
JR217	1-216-296-91	SHORT 0	
JR218	1-216-296-91	SHORT 0	
JR219	1-216-296-91	SHORT 0	
JR220	1-216-296-91	SHORT 0	
JR221	1-216-296-91	SHORT 0	
JR222	1-216-296-91	SHORT 0	
JR223	1-216-296-91	SHORT 0 (LXCLPT AE1,AE2,EE,35)	
JR224	1-216-296-91	SHORT 0	
JR225	1-216-296-91	SHORT 0	
JR226	1-216-296-91	SHORT 0	
JR227	1-216-296-91	SHORT 0 (EXCEPT AE1,AE2,EE,35)	
JR228	1-216-296-91	SHORT 0	
JR229	1-216-296-91	SHORT 0 (FXCEPT 35,50)	
JR230	1-216-296-91	SHORT 0	
JR231	1-216-296-91	SHORT 0	
JR232	1-216-296-91	SHORT 0	
JR233	1-216-296-91	SHORT 0	
JR234	1-216-296-91	SHORT 0 (50/70:FF/80/X80)	
JR235	1-216-296-91	SHORT 0	
JR236	1-216-296-91	SHORT 0	
JR237	1-216-296-91	SHORT 0	

Ref. No.	Part No.	Description	Remarks
		< JUMPER RESISTOR >	
JS204	1-216-295-91	SHORT 0	(70:EXCEPT EE/60/X60/X70)
JS361	1-216-295-91	SHORT 0 (35,50)	
JS362	1-216-295-91	SHORT 0 (EXCEPT 35,50)	
JS500	1-216-295-91	SHORT 0 (35,50)	
JS501	1-216-295-91	SHORT 0 (35/50:FG)	
JS570	1-216-295-91	SHORT 0 (50:EG)	
JS571	1-216-295-91	SHORT 0 (50:EG)	
JS581	1-216-295-91	SHORT 0 (EXCEPT 50:EG)	
JS590	1-216-295-91	SHORT 0 (35,50)	
JS591	1-216-295-91	SHORT 0 (EXCEPT 35,50)	
JS700	1-216-296-91	SHORT 0 (70:EE)	
JS701	1-216-296-91	SHORT 0 (70:EE)	
		< RESISTOR >	
JW081	1-249-437-11	CARBON 47K 5% 1/4W	
		< COIL >	
L001	1-414-934-21	INDUCTOR 10uH (50/70:FF/80/X80)	
L140	1-414-936-21	INDUCTOR 22uH	
L160	1-414-936-21	INDUCTOR 22uH	
L161	1-414-936-21	INDUCTOR 22uH	
L200	1-414-946-21	INDUCTOR 39uH	
L201	1-414-940-21	INDUCTOR 100uH	
L202	1-414-934-21	INDUCTOR 10uH	
L203	1-414-934-21	INDUCTOR 10uH	
L204	1-414-934-21	INDUCTOR 10uH	
L205	1-414-934-21	INDUCTOR 10uH	
L206	1-414-938-21	INDUCTOR 47uH (B)	
L270	1-414-940-21	INDUCTOR 100uH	
L300	1-414-940-21	INDUCTOR 100uH	
L330	1-410-687-11	INDUCTOR 1.2mH (50,80,X80)	
L341	1-414-940-21	INDUCTOR 100uH (EXCEPT 35,50)	
L360	1-414-940-21	INDUCTOR 100uH (FXCEPT 35,50)	
L510	1-414-940-21	INDUCTOR 100uH	
L580	1-414-940-21	INDUCTOR 100uH (50)	
L660	1-414-930-21	INDUCTOR 2.2uH	
L661	1-414-936-21	INDUCTOR 22uH (B,LL,LG,LN)	
L662	1-414-936-21	INDUCTOR 22uH	
L663	1-414-936-21	INDUCTOR 22uH	
L700	1-414-934-21	INDUCTOR 10uH (70:FF)	
L701	1-414-930-21	INDUCTOR 2.2uH	
L750	1-414-930-21	INDUCTOR 2.2uH	
L751	1-414-934-21	INDUCTOR 10uH	
		< PHOTO INTERUPTER >	
PH100	8-749-013-23	PHOTO INTERRUPTER GP3S120	
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120	
		< IC LINK >	
⚠PS120	1-533-586-31	LINK, IC	
⚠PS330	1-533-586-31	LINK, IC (50,80,X80)	
⚠PS602	1-533-586-31	LINK, IC (EXCEPT AE1,AE2,EE,35)	

Ref. No.	Part No.	Description	Remarks
		< TRANSISTOR >	
Q100	8-729-043-84	TRANSISTOR PT380F3	
Q101	8-729-043-84	TRANSISTOR PT380F3	
Q102	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q200	8-729-422-33	TRANSISTOR 2PD601AR-115	
Q201	8-729-422-33	TRANSISTOR 2PD601AR-115	
Q202	8-729-422-33	TRANSISTOR 2PD601AR-115	
Q203	8-729-216-22	TRANSISTOR 2SA1162-G	
Q204	8-729-043-29	TRANSISTOR PDTC144EK-115 (B)	
Q205	8-729-043-32	TRANSISTOR PDTA114EK-115 (B)	
Q320	8-729-804-41	TRANSISTOR 2SB1122-S	
Q321	8-729-802-91	TRANSISTOR 2SD879	
Q330	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q (50,80,X80)	
Q331	8-729-900-51	TRANSISTOR DTA114TK (50,80,X80)	
Q332	8-729-043-29	TRANSISTOR PDTC144EK-115 (50,80,X80)	
Q340	8-729-043-29	TRANSISTOR PDTC144EK-115	(FXCEPT 35,50)
Q501	8-729-043-32	TRANSISTOR PDTA114EK-115	
Q502	8-729-043-29	TRANSISTOR PDTC144EK-115	
Q510	8-729-216-22	TRANSISTOR 2SA1162-G	
Q520	8-729-216-22	TRANSISTOR 2SA1162-G	(50:EE/70:EE/80:EG)
Q540	8-729-216-22	TRANSISTOR 2SA1162-G	(LXCEPT AL1,AL2,LE,UX,35)
Q541	8-729-216-22	TRANSISTOR 2SA1162-G	(EXCEPT AE1,AE2,EE,UX,35)
Q580	8-729-043-29	TRANSISTOR PDTC144EK-115 (50:FG)	
Q581	8-729-043-29	TRANSISTOR PDTC144EK-115 (50:LG)	
Q582	8-729-043-29	TRANSISTOR PDTC144EK-115 (50:EG)	
Q583	8-729-422-33	TRANSISTOR 2PD601AR-115 (50)	
Q590	8-729-422-33	TRANSISTOR 2PD601AR-115	(FXCEPT 35/50:FG)
Q591	8-729-422-33	TRANSISTOR 2PD601AR-115	
Q592	8-729-216-22	TRANSISTOR 2SA1162-G (EXCEPT 35,50)	
Q607	8-729-804-41	TRANSISTOR 2SB1122-S	(EXCEPT AE1,AE2,EE,35)
Q608	8-729-043-29	TRANSISTOR PDTC144EK-115	(FXCEPT AF1,AF2,FF,35)
Q609	8-729-106-68	TRANSISTOR 2SD1615A-GP	
Q660	8-729-216-22	TRANSISTOR 2SA1162-G	
Q661	8-729-216-22	TRANSISTOR 2SA1162-G	
Q700	8-729-422-33	TRANSISTOR 2PD601AR-115 (70:EE)	
Q701	8-729-216-22	TRANSISTOR 2SA1162-G (70:EE)	
Q702	8-729-216-22	TRANSISTOR 2SA1162-G (70:LL)	
Q730	8-729-422-33	TRANSISTOR 2PD601AR-115 (70:LL)	
Q731	8-729-422-33	TRANSISTOR 2PD601AR-115 (70:EE)	
Q751	8-729-043-29	TRANSISTOR PDTC144EK-115	
Q752	8-729-216-22	TRANSISTOR 2SA1162-G	
Q800	8-729-216-22	TRANSISTOR 2SA1162-G (LXCEPT 60,X60)	
Q801	8-729-422-33	TRANSISTOR 2PD601AR-115	(EXCEPT 60,X60)
Q802	8-729-422-33	TRANSISTOR 2PD601AR-115	(EXCEPT 60,X60)
Q803	8-729-422-33	TRANSISTOR 2PD601AR-115	(LXCEPT 60,X60)
Q804	8-729-043-29	TRANSISTOR PDTC144EK-115	(EXCEPT 60,X60)

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

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			Remarks
Q850	8-729-716-77	TRANSISTOR	2SA1162-G		(EXCEPT FF,60,X60)
Q870	8-729-043-29	TRANSISTOR	PD1C144LK-115(50:LL)		
Q871	8-729-422-33	TRANSISTOR	2PD601AR-115(50:EE)		
		< RESISTOR >			
R001	1-208-806-11	RES,CHIP	10K	0.50% 1/10W	(50/70:FF/80/X80)
R002	1-216-049-91	RES,CHIP	1K	5% 1/10W	(50/70:LL/80/X80)
R003	1-216-049-91	RES,CHIP	1K	5% 1/10W	(50/70:EE/80/X80)
R004	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	(50/70:FF/80/X80)
R005	1-216-049-91	RES,CHIP	1K	5% 1/10W	(50/70:LL/80/X80)
R006	1-216-051-00	METAL CHIP	1.2K	5% 1/10W	(50/70:EE/80/X80)
R100	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R101	1-249-413-11	CARBON	470	5% 1/4W F	
R102	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R103	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R104	1-216-049-91	RES,CHIP	1K	5% 1/10W	
R105	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	
R106	1-249-400-11	CARBON	39	5% 1/4W F	
R107	1-249-400-11	CARBON	39	5% 1/4W F	
R108	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R114	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R115	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R120	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R121	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R123	1-216-065-91	RES,CHIP	4.7K	5% 1/10W	
R124	1-216-041-00	METAL CHIP	470	5% 1/10W	
R130	1-216-077-00	METAL CHIP	15K	5% 1/10W	
R132	1-216-041-00	METAL CHIP	470	5% 1/10W	
R133	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R142	1-216-051-00	METAL CHIP	1.2K	5% 1/10W	
R143	1-216-065-91	RES,CHIP	4.7K	5% 1/10W	
R160	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(AL1,AL2,VC,VC1,VC2)
R160	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	(LX,UX/50:LL)
R160	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	(B/70:EE)
R160	1-216-085-00	METAL CHIP	33K	5% 1/10W	(NP,NP1,NP2)
R160	1-216-079-00	METAL CHIP	18K	5% 1/10W	(80:EG,EN/70:EG,EN/X70:EN)
R160	1-216-075-00	METAL CHIP	12K	5% 1/10W	(35/50:EG)
R161	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(35/80:EN,VC1,VC2/X80)
R161	1-216-079-00	METAL CHIP	18K	5% 1/10W	(70:NP1,NP2/80:UX)
R161	1-216-075-00	METAL CHIP	12K	5% 1/10W	(50:EG/60:NP/70:EX/80:B/X60)
R161	1-216-085-00	METAL CHIP	33K	5% 1/10W	(80:NP)
R161	1-216-067-00	METAL CHIP	5.6K	5% 1/10W	(80:EG)
R161	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	(60:AE1,AE2/70:B,UX/X70:B)
R161	1-216-295-91	SHORT	0		(70:EN,VC1,VC2/X70:EN,VC)
R161	1-216-053-00	METAL CHIP	1.5K	5% 1/10W	(70:LG)
R162	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R163	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R164	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R165	1-216-073-00	METAL CHIP	10K	5% 1/10W	(80:EXCEPT LG,LN/X80)
R166	1-216-073-00	METAL CHIP	10K	5% 1/10W	(80:EXCEPT EG,EN/X80)
R167	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R168	1-216-101-00	METAL CHIP	150K	5% 1/10W	
R169	1-216-113-00	METAL CHIP	470K	5% 1/10W	
R170	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R171	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R172	1-216-295-91	SHORT	0 (EXCEPT EE,35,50)		
R173	1-216-089-91	RES,CHIP	47K	5% 1/10W	
R175	1-216-295-91	SHORT	0 (EXCEPT FF,35,50)		
R176	1-216-037-00	METAL CHIP	330	5% 1/10W	
R177	1-216-041-00	METAL CHIP	470	5% 1/10W	
R178	1-216-041-00	METAL CHIP	470	5% 1/10W	
R179	1-216-041-00	METAL CHIP	470	5% 1/10W	
R180	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R181	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	
R182	1-216-033-00	METAL CHIP	220	5% 1/10W	
R183	1-216-033-00	METAL CHIP	220	5% 1/10W	
R184	1-216-295-91	SHORT	0		
R185	1-216-295-91	SHORT	0		
R186	1-216-295-91	SHORT	0		
R187	1-216-295-91	SHORT	0		
R188	1-216-295-91	SHORT	0		
R189	1-216-049-91	RES,CHIP	1K	5% 1/10W	
R190	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(EXCEPT EE,35,50)
R191	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(EXCEPT EE,35,50)
R192	1-216-041-00	METAL CHIP	470	5% 1/10W	(EXCEPT 35,50)
R198	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R199	1-216-093-91	RES,CHIP	68K	5% 1/10W	
R200	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R203	1-216-055-00	METAL CHIP	1.8K	5% 1/10W	
R204	1-216-037-00	METAL CHIP	330	5% 1/10W	
R205	1-216-037-00	METAL CHIP	330	5% 1/10W	
R206	1-216-047-91	RES,CHIP	820	5% 1/10W	(35)
R206	1-216-045-00	METAL CHIP	680	5% 1/10W	(EXCEPT 35)
R207	1-216-053-00	METAL CHIP	1.5K	5% 1/10W	(35)
R207	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	(EXCEPT 35)

MA-339

Ref. No.	Part No.	Description			Remarks
R208	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R210	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R211	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R212	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R213	1-216-049-91	RES,CHIP	1K	5%	1/10W
R214	1-216-049-91	RES,CHIP	1K	5%	1/10W
R215	1-216-025-91	RES,CHIP	100	5%	1/10W
R216	1-216-117-00	METAL CHIP	680K	5%	1/10W
					(35)
R216	1-216-105-91	RES,CHIP	220K	5%	1/10W
					(EXCEPT 35,50)
R216	1-216-109-00	METAL CHIP	330K	5%	1/10W
					(50)
R217	1-216-025-91	RES,CHIP	100	5%	1/10W
			(EXCEPT AE1,AE2,EE,UX,35)		
R218	1-216-295-91	SHORT	0		
R219	1-216-025-91	RES,CHIP	100	5%	1/10W
R220	1-216-049-91	RES,CHIP	1K	5%	1/10W
R221	1-216-017-91	RES,CHIP	47	5%	1/10W
R222	1-216-017-91	RES,CHIP	47	5%	1/10W
			(50/70:EE,EG,EN/80/X70:EN/X80)		
R223	1-216-017-91	RES,CHIP	47	5%	1/10W
			(EXCEPT AE1,AE2,FF,35)		
R224	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R225	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R226	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R227	1-216-295-91	SHORT	0		
R228	1-216-295-91	SHORT	0 (B)		
R232	1-216-077-00	METAL CHIP	15K	5%	1/10W
					(EXCEPT 50)
R233	1-216-073-00	METAL CHIP	10K	5%	1/10W
					(B)
R270	1-216-041-00	METAL CHIP	470	5%	1/10W
					(EXCEPT 35,50)
R270	1-216-043-91	RES,CHIP	560	5%	1/10W
					(50)
R271	1-216-041-00	METAL CHIP	470	5%	1/10W
					(EXCEPT 35,50)
R271	1-216-043-91	RES,CHIP	560	5%	1/10W
					(35,50)
R272	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
					(35)
R272	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
					(EXCEPT 35)
R273	1-216-295-91	SHORT	0		
R274	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
					(35)
R274	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
					(EXCEPT 35)
R276	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R277	1-216-081-00	METAL CHIP	22K	5%	1/10W
R278	1-216-081-00	METAL CHIP	22K	5%	1/10W
R279	1-216-081-00	METAL CHIP	22K	5%	1/10W
R280	1-216-097-91	RES,CHIP	100K	5%	1/10W
R283	1-216-295-91	SHORT	0		
R284	1-216-295-91	SHORT	0		
R300	1-216-089-91	RES,CHIP	47K	5%	1/10W
R301	1-216-089-91	RES,CHIP	47K	5%	1/10W
R303	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R305	1-216-071-00	METAL CHIP	8.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R306	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R311	1-216-035-00	METAL CHIP	270	5%	1/10W
R312	1-216-109-00	METAL CHIP	330K	5%	1/10W
R313	1-216-047-91	RES,CHIP	820	5%	1/10W
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W
R318	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
					(35,50)
R319	1-216-093-91	RES,CHIP	68K	5%	1/10W
					(35,50)
R320	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R321	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R322	1-216-079-00	METAL CHIP	18K	5%	1/10W
R323	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R324	1-216-089-91	METAL CHIP	47K	5%	1/10W
R325	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
					(50)
R326	1-216-093-91	RES,CHIP	68K	5%	1/10W
					(50)
R327	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R328	1-216-093-91	RES,CHIP	68K	5%	1/10W
R329	1-216-031-00	METAL CHIP	180	5%	1/10W
R330	1-216-015-00	METAL CHIP	39	5%	1/10W
					(50,80,X80)
R331	1-216-015-00	METAL CHIP	39	5%	1/10W
					(50,80,X80)
R331	1-216-295-91	SHORT	0 (35,60,70,X60,X70)		
R332	1-216-083-00	METAL CHIP	27K	5%	1/10W
					(50,80,X80)
R333	1-249-394-11	CARBON	12	5%	1/4W
					(50,80,X80)
R334	1-216-073-00	METAL CHIP	10K	5%	1/10W
					(50,80,X80)
R335	1-216-017-91	RES,CHIP	47	5%	1/10W
R336	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
					(50,80,X80)
R336	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
					(35,60,70,X60,X70)
R337	1-216-075-00	METAL CHIP	12K	5%	1/10W
R338	1-216-079-00	METAL CHIP	18K	5%	1/10W
R339	1-217-671-11	METAL CHIP	1	5%	1/10W
R340	1-216-081-00	METAL CHIP	22K	5%	1/10W
R344	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
					(EXCEPT 35,50)
R345	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
					(EXCEPT 35,50)
R346	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
					(EXCEPT 35,50)
R347	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
					(EXCEPT 35,50)
R348	1-216-033-00	METAL CHIP	220	5%	1/10W
					(EXCEPT 35,50)
R349	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
					(EXCEPT 35,50)
R360	1-216-083-00	METAL CHIP	27K	5%	1/10W
					(EXCEPT 35,50)
R361	1-216-073-00	METAL CHIP	10K	5%	1/10W
					(EXCEPT 35,50)
R362	1-216-049-91	RES,CHIP	1K	5%	1/10W
					(EXCEPT 35,50)
R363	1-216-049-91	RES,CHIP	1K	5%	1/10W
					(EXCEPT 35,50)

Ref.No.	Part No.	Description				Remarks
R364	1-216-091-00	METAL CHIP	56K	5%	1/10W	(EXCEPT 35,50)
R365	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(EXCEPT 35,50)
R366	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(70:EE,EG,EN/80/X70:EN/X80)
R367	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(70:EE,EG,EN/80/X70:EN/X80)
R368	1-216-079-00	METAL CHIP	18K	5%	1/10W	(EXCEPT 35,50)
R369	1-208-820-11	RES,CHIP	39K	0.50%	1/10W	(EXCEPT 35,50)
R370	1-216-079-00	METAL CHIP	18K	5%	1/10W	(EXCEPT 35,50)
R371	1-216-079-00	METAL CHIP	18K	5%	1/10W	(EXCEPT AE1,AE2,EE,35,50)
R372	1-216-079-00	METAL CHIP	18K	5%	1/10W	(EXCEPT AE1,AE2,EE,35,50)
R373	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(EXCEPT 35,50)
R374	1-216-091-00	METAL CHIP	56K	5%	1/10W	(EXCEPT 35,50)
R375	1-216-133-00	METAL CHIP	3.3M	5%	1/10W	(EXCEPT 35,50)
R376	1-216-049-91	RES,CHIP	1K	5%	1/10W	(EXCEPT 35,50)
R377	1-216-049-91	RES,CHIP	1K	5%	1/10W	(EXCEPT 35,50)
R500	1-216-041-00	METAL CHIP	470	5%	1/10W	
R501	1-216-041-00	METAL CHIP	470	5%	1/10W	
R502	1-216-041-00	METAL CHIP	470	5%	1/10W	
R503	1-216-041-00	METAL CHIP	470	5%	1/10W	(EXCEPT 35/50:EG)
R509	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(50:EE/70/80/X70/X80)
R510	1-249-408-11	CARBON	180	5%	1/4W F	(EXCEPT EE,35,50)
R510	1-249-407-11	CARBON	150	5%	1/4W F	(35/50/70:EE)
R511	1-249-407-11	CARBON	150	5%	1/4W F	
R512	1-216-022-00	METAL CHIP	75	5%	1/10W	
R514	1-216-037-00	METAL CHIP	330	5%	1/10W	
R515	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R516	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	
R517	1-216-022-00	METAL CHIP	75	5%	1/10W	
R518	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(50:FF/70/80/X70/X80)
R520	1-216-022-00	METAL CHIP	75	5%	1/10W	(50:LL/70:LL/80:LG)
R521	1-249-408-11	CARBON	180	5%	1/4W F	(50:EE/70:EE/80:EG)
R522	1-216-025-91	RES,CHIP	100	5%	1/10W	(50:FF/70:FF/80:FG)
R524	1-249-407-11	CARBON	150	5%	1/4W F	(50:EE/70:EE/80:EG)
R541	1-216-025-91	RES,CHIP	100	5%	1/10W	(EXCEPT AE1,AE2,EE,UX,35)
R542	1-249-408-11	CARBON	180	5%	1/4W F	(EXCEPT AF1,AF2,FF,UX,35)
R543	1-249-407-11	CARBON	150	5%	1/4W F	(EXCEPT AE1,AE2,EE,UX,35)
R545	1-216-085-00	METAL CHIP	33K	5%	1/10W	(EXCEPT AF1,AF2,FF,UX,35)
R546	1-216-089-91	RES,CHIP	47K	5%	1/10W	(EXCEPT AE1,AE2,EE,UX,35)
R547	1-216-049-91	RES,CHIP	1K	5%	1/10W	(EXCEPT AE1,AE2,EE,UX,35)
R548	1-216-022-00	METAL CHIP	75	5%	1/10W	(EXCEPT AE1,AE2,EE,35)
R549	1-216-022-00	METAL CHIP	75	5%	1/10W	(EXCEPT AL1,AL2,LL,UX,35)
R570	1-216-041-00	METAL CHIP	470	5%	1/10W	(EXCEPT AE1,AE2,EE,35)
R571	1-216-041-00	METAL CHIP	470	5%	1/10W	(EXCEPT AF1,AF2,FF,35)
R572	1-216-041-00	METAL CHIP	470	5%	1/10W	(EXCEPT AL1,AL2,LL,UX,35)
R573	1-216-041-00	METAL CHIP	470	5%	1/10W	(EXCEPT AE1,AE2,EE,UX,35,50)
R574	1-216-097-91	RES,CHIP	100K	5%	1/10W	(EXCEPT AF1,AF2,FF,UX,35)
R575	1-216-097-91	RES,CHIP	100K	5%	1/10W	(EXCEPT AE1,AE2,EE,UX,35,50)
R580	1-216-065-91	RES,CHIP	4.7K	5%	1/10W	(35,50)
R581	1-216-295-91	SHORT	0 (EXCEPT 35,50)			
R581	1-216-049-91	RES,CHIP	1K	5%	1/10W	(35,50)
R582	1-216-073-00	METAL CHIP	10K	5%	1/10W	(50:EG)
R583	1-216-073-00	METAL CHIP	10K	5%	1/10W	(50:EG)
R584	1-216-073-00	METAL CHIP	10K	5%	1/10W	(50:EG)
R585	1-216-097-91	RES,CHIP	100K	5%	1/10W	(50:EG)
R586	1-216-097-91	RES,CHIP	100K	5%	1/10W	(50:EG)
R587	1-216-097-91	RES,CHIP	100K	5%	1/10W	(50:EG)
R588	1-216-295-91	SHORT	0 (EXCEPT 50:EE)			
R589	1-216-097-91	RES,CHIP	100K	5%	1/10W	(50:EG)
R590	1-216-049-91	RES,CHIP	1K	5%	1/10W	
R591	1-216-049-91	RES,CHIP	1K	5%	1/10W	(EXCEPT 35/50:EG)
R592	1-216-049-91	RES,CHIP	1K	5%	1/10W	(EXCEPT 35,50)
R593	1-216-097-91	RES,CHIP	100K	5%	1/10W	(50:EG)
R594	1-216-073-00	METAL CHIP	10K	5%	1/10W	(50)
R595	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(50)
R596	1-216-077-00	METAL CHIP	15K	5%	1/10W	(50)
R597	1-216-033-00	METAL CHIP	220	5%	1/10W	(EXCEPT 35,50)

MA-339

Ref. No.	Part No.	Description			Remarks
R597	1-216-041-00	METAL CHIP	470	5%	1/10W (35,50)
R598	1-216-033-00	METAL CHIP	220	5%	1/10W (EXCEPT 35,50)
R598	1-216-041-00	METAL CHIP	470	5%	1/10W (35,50)
R611	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT AE1,AE2,EE,35)
R615	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT AE1,AE2,FF,35)
R617	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT AE1,AE2,FF,35)
R618	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (EXCEPT AE1,AE2,EE,35)
R619	1-216-049-91	RES,CHIP	1K	5%	1/10W
R660	1-216-049-91	RES,CHIP	1K	5%	1/10W
R661	1-216-121-91	RES,CHIP	1M	5%	1/10W
R662	1-216-041-00	METAL CHIP	470	5%	1/10W
R663	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R666	1-216-295-91	SHORT	0		
R667	1-216-037-00	METAL CHIP	330	5%	1/10W
R668	1-216-025-91	RES,CHIP	100	5%	1/10W
R669	1-216-025-91	RES,CHIP	100	5%	1/10W
R670	1-216-041-00	METAL CHIP	470	5%	1/10W
R671	1-216-295-91	SHORT	0		
R672	1-216-049-91	RES,CHIP	1K	5%	1/10W (B,EE,EG,EN)
R700	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (70:FF)
R701	1-216-073-00	METAL CHIP	10K	5%	1/10W (70:EE)
R702	1-216-295-91	SHORT	0 (EXCEPT 70:EE)		
R703	1-216-025-91	RES,CHIP	100	5%	1/10W (70:LL)
R704	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT 35,50/70:EE)
R704	1-216-025-91	RES,CHIP	100	5%	1/10W (35/50/70:EE)
R705	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT 35,50/70:LL)
R705	1-216-025-91	RES,CHIP	100	5%	1/10W (35/50/70:EE)
R711	1-212-897-00	FUSIBLE	470	5%	1/4W F
R713	1-216-025-91	RES,CHIP	100	5%	1/10W
R714	1-216-113-00	METAL CHIP	470K	5%	1/10W
R720	1-216-049-91	RES,CHIP	1K	5%	1/10W (70:EE)
R721	1-216-049-91	RES,CHIP	1K	5%	1/10W (70:EE)
R722	1-216-049-91	RES,CHIP	1K	5%	1/10W (70:FF)
R730	1-216-041-00	METAL CHIP	470	5%	1/10W (EXCEPT EE,35,50)
R731	1-216-041-00	METAL CHIP	470	5%	1/10W (EXCEPT EE,UX,35,50)
R732	1-216-041-00	METAL CHIP	470	5%	1/10W (EXCEPT FF,35,50)
R733	1-216-041-00	METAL CHIP	470	5%	1/10W (EXCEPT UX)
R754	1-216-049-91	RES,CHIP	1K	5%	1/10W
R755	1-216-049-91	RES,CHIP	1K	5%	1/10W
R756	1-216-073-00	METAL CHIP	10K	5%	1/10W
R757	1-216-049-91	RES,CHIP	1K	5%	1/10W
R800	1-216-101-00	METAL CHIP	150K	5%	1/10W (EXCEPT 60,X60)

Ref. No.	Part No.	Description			Remarks
R801	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R802	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R803	1-216-081-00	METAL CHIP	22K	5%	1/10W (EXCEPT 60,X60)
R804	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R805	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R806	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R807	1-216-085-00	METAL CHIP	33K	5%	1/10W (EXCEPT 60,X60)
R813	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT 60,X60)
R850	1-216-025-91	RES,CHIP	100	5%	1/10W (EXCEPT LL,60,X60)
R851	1-216-077-00	METAL CHIP	15K	5%	1/10W (EXCEPT EE,60,X60)
R852	1-216-081-00	METAL CHIP	22K	5%	1/10W (EXCEPT FF,60,X60)
R853	1-216-049-91	RES,CHIP	1K	5%	1/10W (EXCEPT LL,60,X60)
R856	1-216-097-91	RES,CHIP	100K	5%	1/10W (EXCEPT EE,60,X60)
R857	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (EXCEPT FF,60,X60)
R858	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (EXCEPT LL,60,X60)
R859	1-216-123-11	METAL CHIP	1.2M	5%	1/10W (EXCEPT EE,60,X60)
R860	1-216-123-11	METAL CHIP	1.2M	5%	1/10W (EXCEPT LL,60,X60)
R861	1-216-117-00	METAL CHIP	680K	5%	1/10W (EXCEPT EE,60,X60)
R862	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (EXCEPT EE,60,X60)
R870	1-216-097-91	RES,CHIP	100K	5%	1/10W (50:LL)
R871	1-216-073-00	METAL CHIP	10K	5%	1/10W (50:EE)
R872	1-216-073-00	METAL CHIP	10K	5%	1/10W (50:FF)
R873	1-216-049-91	RES,CHIP	1K	5%	1/10W (50:LL)
R874	1-216-033-00	METAL CHIP	220	5%	1/10W (50:EE)
R875	1-216-077-00	METAL CHIP	15K	5%	1/10W (50:EE)
R876	1-216-073-00	METAL CHIP	10K	5%	1/10W (50:LL)
R877	1-216-077-00	METAL CHIP	15K	5%	1/10W (50:EE)
R878	1-216-089-91	RES,CHIP	47K	5%	1/10W (50:FF)
R879	1-216-073-00	METAL CHIP	10K	5%	1/10W (50:LL)
R880	1-216-081-00	METAL CHIP	22K	5%	1/10W (50:EE)

Ref.No.	Part No.	Description			Remarks
R881	1-216-081-00	METAL CHIP	22K	5%	1/10W (50:FF)
R882	1-216-081-00	METAL CHIP	22K	5%	1/10W (50:EE)
R883	1-216-089-91	RES,CHIP	4.7K	5%	1/10W (50:EE)
R884	1-216-073-00	METAL CHIP	10K	5%	1/10W (50:FF)
R885	1-216-033-00	METAL CHIP	220	5%	1/10W (50:EE)
R886	1-216-089-91	RES,CHIP	47K	5%	1/10W (50:FF)
R887	1-216-081-00	METAL CHIP	22K	5%	1/10W (50:LL)
R888	1-216-097-91	RES,CHIP	100K	5%	1/10W (50:EE)
		< SWITCH >			
S100	1-771-155-11	SWITCH, ROTARY (MODE SWITCH)			
S101	1-762-108-11	SWITCH, PUSH (1 KEY) (REC PROOF)			
S160	1-571-588-31	SWITCH, SLIDE (NTSC PB)			
		< TRANSFORMER >			
T320	1-431-100-11	TRANSFORMER, BIAS OSCILLATION (50,80,X80)			
T320	1-431-097-11	TRANSFORMER, BIAS OSCILLATION (35,60,70,X60,X70)			
T330	1-423-415-11	TRANSFORMER, BIAS OSCILLATION (50,80,X80)			
		< TUNER >			
TU701	1-693-431-11	TUNER, IF (BTF-2MC421) (AERIAL IN/OUT) (35/50/70:FF)			
TU702	1-693-439-11	TUNER, IF (BTF-3WC429) (AERIAL IN/OUT) (AL1,AL2,VC,VC1,VC2/80,70:LG)			
TU702	1-693-437-11	TUNER, IF (BTF-3WU604) (AERIAL IN/OUT) (UX)			
TU702	1-693-438-11	TUNER, IF (BTF-3WC446) (AERIAL IN/OUT) (B)			
TU702	1-693-436-11	TUNER, IF (BTF-3WC428) (AERIAL IN/OUT) (FX,NP,NP1,NP2/80:FN/X70)			
		< VIBRATOR >			
X160	1-579-463-11	VIBRATOR, CRYSTAL 32.768KHz			
X161	1-577-789-11	VIBRATOR, CRYSTAL 17.734475MHz			
X200	1-579-608-11	VIBRATOR, CRYSTAL 4.43MHz			
⚠	1-468-367-11	POWER BLOCK SRV878EK ********** (Ref.No.: 9,000 Series)			
		< CAPACITOR >			
C151	9-980-236-01	ELECT	47uF	400V	
C153	1-126-967-11	ELECT	47uF	50V	
C154	1-126-960-11	ELECT	1uF	50V	
C201	1-126-934-11	ELECT	220uF	16V	
C202	1-126-925-11	ELECT	470uF	10V	
C203	1-126-934-11	ELECT	220uF	16V	
C204	1-126-933-11	ELECT	100uF	16V	
C205	1-126-965-11	ELECT	22uF	50V	
C206	1-126-947-11	ELECT	47uF	35V	
C207	1-126-965-11	ELECT	22uF	50V	
C208	1-126-925-11	ELECT	470uF	10V	
C251	1-126-967-11	ELECT	47uF	50V	
C254	1-126-935-11	ELECT	470uF	16V	
		< DIODE >			
D101	9-880-927-01	DIODE 1N4005			
D102	9-880-927-01	DIODE 1N4005			
D103	9-880-927-01	DIODE 1N4005			
D104	9-880-927-01	DIODE 1N4005			
D151	8-719-043-74	DIODE AK04			
D152	9-880-932-01	DIODE FG01C			
D153	8-719-911-19	DIODE 1SS119			
D154	8-719-043-74	DIODE AK04			
D155	9-900-535-01	DIODE AU02Z			
D156	9-880-927-01	DIODE 1N4005			
D158	9-880-991-01	DIODE MA4270			
D159	8-719-922-11	DIODE MTZJ22B			
D203	8-719-109-85	DIODE RD5.1ES			
D204	8-719-911-19	DIODE 1SS119			
D205	8-719-911-19	DIODE 1SS119			
D251	9-900-535-01	DIODE AU02Z			
D252	8-719-510-73	DIODE S3L20U			
D253	8-719-027-20	DIODE D3S4M			
D254	9-900-535-01	DIODE AU02Z			
		< FUSE >			
⚠F101	1-532-388-31	FUSE T2A, 250V			
		< IC >			
IC151	9-980-235-01	IC AN8028			
IC201	8-759-438-18	IC PQ12RD08			
		< PHOTOCOUPLER >			
⚠PC151	8-749-974-80	PHOTOCOUPLER PS2561			
		< IC LINK >			
⚠PS201	1-533-592-21	LINK, IC 1.6A			
⚠PS202	1-533-593-21	LINK, IC 2.0A			
⚠PS251	1-533-589-11	FUSE 750mA			
		< TRANSISTOR >			
Q151	9-880-931-01	FET	2SK304/		
Q201	8-729-113-32	TRANSISTOR	2SB733		
Q204	9-880-929-01	TRANSISTOR	2SC1740		
Q205	8-729-019-01	TRANSISTOR	2SD2394		
Q206	8-729-119-78	TRANSISTOR	2SC2785		
Q207	8-729-117-32	TRANSISTOR	2SD773		
Q210	9-880-930-01	TRANSISTOR	UN4111		
Q211	8-729-422-72	TRANSISTOR	UN4211		

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

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

POWER BLOCK SRV878EK | SE-77

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R251	9-880-993-01	RESISTO	10	1/4W F	
R252	9-980-233-01	FUSIBLE	0.47	1/4W	
		< VARISTOR >			
⚠Z101	9-880-928-01	VARISTOR	LRZV10D751		
*	A-6794-675-A	SE-77A BOARD, COMPLETE (B)			
		**********			
		(Ref.No.:1,000 series)			
		< CAPACITOR >			
C970	1-163-259-91	CERAMIC CHIP	220PF	5%	50V (B)
C971	1-124-257-00	ELECT	2.2uF	20%	50V (B)
C972	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V (B)
C973	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C974	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (B)
C975	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V (B)
C976	1-163-259-91	CERAMIC CHIP	220PF	5%	50V (B)
C977	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C978	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V (B)
C979	1-163-121-00	CERAMIC CHIP	150PF	5%	50V (B)
C980	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (B)
C981	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C982	1-163-007-11	CERAMIC CHIP	680PF	10%	50V (B)
C983	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (B)
C984	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C985	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (B)
C986	1-126-964-11	ELECT	10uF	20%	50V (B)
C987	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V (B)
C988	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (B)
C991	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V (B)
C992	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C993	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C994	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V (B)
C995	1-126-157-11	ELECT	10uF	20%	16V (B)
C996	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V (B)
		< CONNECTOR >			
CN970	1-573-825-11	CONNECTOR, BOARD TO BOARD 11P (B)			
		< IC >			
IC970	8-759-438-17	IC LA7337 (B)			
		< JUMPER RESISTOR >			
JR970	1-216-296-91	SHORT	0 (B)		
JR971	1-216-296-91	SHORT	0 (B)		
JR972	1-216-296-91	SHORT	0 (B)		
JR973	1-216-295-91	SHORT	0 (B)		
JR974	1-216-295-91	SHORT	0 (B)		
		< COIL >			
L970	1-414-933-21	INDUCTOR	6.8uH (B)		
L971	1-414-945-21	INDUCTOR	27uH (B)		
L972	1-414-938-21	INDUCTOR	47uH (B)		
L973	1-414-938-21	INDUCTOR	47uH (B)		
L975	1-414-934-21	INDUCTOR	10uH (B)		

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q970	8-729-216-22	TRANSISTOR	2SA1162-G (B)		
Q972	8-729-043-32	TRANSISTOR	PDTA114EK-115 (B)		
Q973	8-729-422-33	TRANSISTOR	2PD601AR-115 (B)		
Q974	8-729-422-33	TRANSISTOR	2PD601AR-115 (B)		
Q975	8-729-043-32	TRANSISTOR	PDTA114EK-115 (B)		
Q976	8-729-043-29	TRANSISTOR	PDTC144EK-115 (B)		
		< RESISTOR >			
R968	1-216-101-00	METAL CHIP	150K	5%	1/10W (B)
R969	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (B)
R970	1-216-085-00	METAL CHIP	33K	5%	1/10W (B)
R971	1-216-085-00	METAL CHIP	33K	5%	1/10W (B)
R972	1-216-083-00	METAL CHIP	27K	5%	1/10W (B)
R973	1-216-105-91	RES,CHIP	220K	5%	1/10W (B)
R974	1-216-081-00	METAL CHIP	22K	5%	1/10W (B)
R975	1-216-295-91	SHORT	0 (B)		
R976	1-216-059-00	METAL CHIP	2.7K	5%	1/10W (B)
R977	1-216-089-91	RES,CHIP	47K	5%	1/10W (B)
R978	1-216-071-00	METAL CHIP	8.2K	5%	1/10W (B)
R979	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R980	1-216-097-91	RES,CHIP	100K	5%	1/10W (B)
R981	1-216-083-00	METAL CHIP	27K	5%	1/10W (B)
R982	1-216-089-91	RES,CHIP	47K	5%	1/10W (B)
R983	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (B)
R985	1-216-041-00	METAL CHIP	470	5%	1/10W (B)
R986	1-216-089-91	RES,CHIP	47K	5%	1/10W (B)
R988	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R989	1-216-049-91	RES,CHIP	1K	5%	1/10W (B)
R990	1-216-295-91	SHORT	0 (B)		
R993	1-216-071-00	METAL CHIP	8.2K	5%	1/10W (B)
R994	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (B)
R995	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R996	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (B)

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

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
R997	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R998	1-216-073-00	METAL CHIP	10K	5%	1/10W (B)
R999	1-216-295-91	SHORT	0 (B)		
*	A-6794-674-A	SU-5A BOARD, COMPLETE (50:EE) **********			(Ref.No.:5,000 series)
		< CONNECTOR >			
CN403	1-784-483-A	CONNECTOR, FFC/FPC 4P (50:EE)			
		< DIODE >			
D401	8-719-045-63	DIODE SLR342YC-A-47 (SURROUND) (50:EE)			
		< TRANSISTOR >			
Q401	8-729-043-79	TRANSISTOR PDTC144EK-115 (50:EE)			
		< SWITCH >			
S402	1-771-410-21	SWITCH, TACT (SURROUND) (50:EE)			
		MISCELLANEOUS **********			
13	1-762-844-31	SWITCH, ROTARY (50,80,X80)			
16	1-790-327-11	CABLE, FLAT (FFK-2)			(50:EE/80:B,NP,UX,VC1,VC2/X80)
17	1-790-326-11	CABLE, FLAT (FFD-4)			
20	1-790-325-11	CABLE, FLAT (FFM-26)			
⚠22	1-782-012-11	CORD, POWER			
⚠23	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P			(70:EX,UX/80:UX)
53	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P			
⚠55	1-468-367-11	POWER BLOCK			
704	1-500-144-11	HEAD, FE			
704	1-500-471-11	HEAD, FE			
770	1-759-373-22	DRUM ASSY, DZH-86A-R(EXCEPT B,35,50)			
770	1-759-793-11	DRUM ASSY, DZH-92B-R(35)			
770	1-759-795-11	DRUM ASSY, DZH-93B-R(50)			
770	1-759-957-21	DRUM ASSY, DZH-98A-R(B)			
832	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P			
M902	1-698-971-11	MOTOR, DC			
M903	X-3947-577-1	MOTOR ASSY, CAM			

Ref. No.	Part No.	Description	Remarks
		ACCESSORIE & PACKING MATERIALS **********	
	1-418-007-21	COMMANDER, STANDARD (RMT-V256A)	(60:AL1,AL2,NP/X60)
	1-418-008-31	COMMANDER, STANDARD (RMT-V257B) (35)	
	1-418-010-11	COMMANDER, STANDARD (RMT-V259)	(70:EE,EG,EN,EX,NP1,NP2,UX,VC1,VC2/X70:EN,VC)
	1-418-010-21	COMMANDER, STANDARD (RMT-V259A)	(70:B/X70:B)
	1-418-010-31	COMMANDER, STANDARD (RMT-V259B)	(50/80:EG,EN,NP,UX,VC1,VC2/X80)
	1-418-010-41	COMMANDER, STANDARD (RMT-V259C)	(80:B)
	1-696-861-11	CORD,CONNECTION (80:EG,EN)	(FOR AUDIO) 1.5m
⚠	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	(70:EX,UX/80:UX)
	1-782-213-11	CABLE,CONNECTION (21P) (80/X80)	(FOR EURO-AV) 1.5m
	1-696-593-11	CORD,CONNECTION (PAL) (FOR RF) 1.5m	
	3-865-147-11	MANUAL, INSTRUCTION (FRENCH) (60:NP)	
	3-865-147-11	MANUAL, INSTRUCTION (FRENCH) (60:NP)	
	3-865-147-21	MANUAL, INSTRUCTION (GERMAN)	(60:NP,AE2)
	3-865-147-31	MANUAL, INSTRUCTION (ITALIAN) (60:AE1)	
	3-865-147-41	MANUAL, INSTRUCTION (DUTCH) (60:NP,AF1)	
	3-865-147-51	MANUAL, INSTRUCTION (SPANISH)	(60:NP/X60)
	3-865-147-61	MANUAL, INSTRUCTION(SWEDISH)	(60:NP/X60)
	3-865-147-71	MANUAL, INSTRUCTION(DANISH)	(60:NP/X60)
	3-865-147-81	MANUAL, INSTRUCTION(FINNISH)	(60:NP/X60)
	3-865-147-91	MANUAL, INSTRUCTION (GREEK) (60:AE1)	
	3-865-150-11	MANUAL, INSTRUCTION (ENGLISH)	(50:EG/70:EG,EN/X70:EN)
	3-865-150-21	MANUAL, INSTRUCTION (POLISH)	(50:EG/70:EN/X70:EN)
	3-865-150-31	MANUAL, INSTRUCTION (CZECH)	(X70:EN/70:EG/50:EG)
	3-865-150-41	MANUAL, INSTRUCTION (HUNGARIAN)	(50:EG/70:EN/X70:EN)
	3-865-151-11	MANUAL, INSTRUCTION (ENGLISH) (35)	
	3-865-151-21	MANUAL, INSTRUCTION (POLISH) (35)	
	3-865-151-31	MANUAL, INSTRUCTION(CZECH) (35)	
	3-865-151-41	MANUAL, INSTRUCTION (HUNGARIAN) (35)	
	3-865-152-11	MANUAL, INSTRUCTION (ENGLISH)	(50:FF/70:FF)
	3-865-152-21	MANUAL, INSTRUCTION (RUSSIAN)	(50:EE/70:EE)
	3-865-318-11	MANUAL, INSTRUCTION (FRENCH) (80:B)	
	3-865-319-12	MANUAL, INSTRUCTION (ENGLISH) (80:UX)	
	3-865-320-11	MANUAL, INSTRUCTION (FRENCH)	(80:NP,VC2)
	3-865-320-21	MANUAL, INSTRUCTION (GERMAN)	(80:NP,VC1,VC2/X80)
	3-865-320-31	MANUAL, INSTRUCTION (ITALIAN)	(80:VC2/X80)

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

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remarks
	3-865-320-41	MANUAL, INSTRUCTION (DUTCH)	(80,NP,VC2/X80)
	3-865-320-51	MANUAL, INSTRUCTION (GREEK) (80:VC2)	
	3-865-321-11	MANUAL, INSTRUCTION (SPANISH) (80:NP)	
	3-865-321-21	MANUAL, INSTRUCTION (PORTUGUESE)	(80:NP)
	3-865-321-31	MANUAL, INSTRUCTION (SWEDISH) (80:NP)	
	3-865-321-41	MANUAL, INSTRUCTION (DANISH) (80:NP)	
	3-865-321-51	MANUAL, INSTRUCTION (FINNISH) (80:NP)	
	3-865-322-11	MANUAL, INSTRUCTION (FRENCH)	(70:B/X70:B)
	3-865-323-11	MANUAL, INSTRUCTION (ENGLISH) (70:EX,UX)	
	3-865-324-11	MANUAL, INSTRUCTION (FRENCH)	(70:NP2,VC2/X70:VC)
	3-865-324-21	MANUAL, INSTRUCTION (GERMAN)	(70:NP2,VC1,VC2/X70:VC)
	3-865-324-31	MANUAL, INSTRUCTION (ITALIAN)	(70:VC2/X70:VC)
	3-865-324-41	MANUAL, INSTRUCTION (DUTCH)	(70:NP2,VC2/X70:VC)
	3-865-324-51	MANUAL, INSTRUCTION (GREEK) (70:VC2)	
	3-865-325-11	MANUAL, INSTRUCTION (SPANISH) (70:NP1)	
	3-865-325-21	MANUAL, INSTRUCTION (PORTUGUESE)	(70:NP1)
	3-865-325-31	MANUAL, INSTRUCTION (SWEDISH) (70:NP2)	
	3-865-325-41	MANUAL, INSTRUCTION (DANISH) (70:NP2)	
	3-865-325-51	MANUAL, INSTRUCTION (FINNISH) (70:NP2)	
	3-865-443-11	MANUAL, INSTRUCTION (ENGLISH) (80:EG,EN)	
	3-865-443-21	MANUAL, INSTRUCTION (POLISH) (80:EN)	
	3-865-443-31	MANUAL, INSTRUCTION (CZECH) (80:EG)	
	3-865-443-41	MANUAL, INSTRUCTION (HUNGARIAN) (80:EN)	
	3-865-443-51	MANUAL, INSTRUCTION (RUSSIAN) (80:EG)	

Ref. No.	Part No.	Description	Remarks
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-648-79	SCREW +BVTP 3 × 12 TYPE2	
#701	7-685-646-79	SCREW +BVTP 3 × 8 TYPE2 IT-3	
#702	7-682-147-01	SCREW +P 3 × 6	
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

9-921-714-11

Sony Corporation
Home A&V Products Company

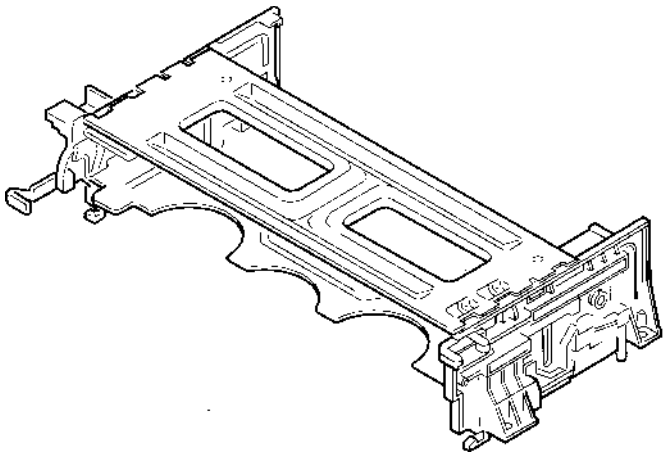
99B1663-1
Printed in Japan
Published by Quality Assurance Dept.
(Shinagawa)

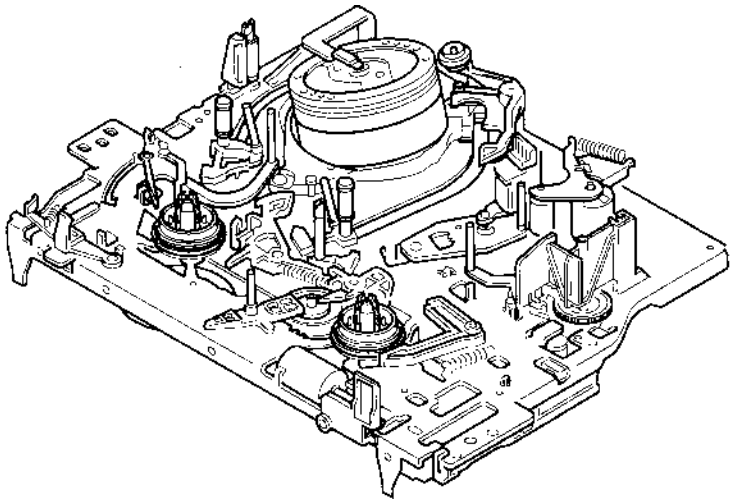
VHS MECHANICAL ADJUSTMENT MANUAL VI

S MECHANISM

VHS

Please use with the service manual.





VHS TAPE TRANSPORT MECHANISM DECK

MICROFILM

SONY®

ADJUSTMENTS REQUIRED THE FOLLOWING PARTS REPLACEMENT

ADJUSTMENTS / PARTS		4-1-1 TENSION REGULATOR POSITION/TENSION ADJUSTMENT	4-1-2 CHECKING THE TENSION AND TORQUE	4-1-3 X-VALUE ADJUSTMENT	4-1-4 HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6	4-1-5 ACE HEAD HEIGHT AND AZIMUTH ADJUSTMENT	4-1-6 X-VALUE FINE ADJUSTMENT	4-1-7 HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8	4-1-8 CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT
3-25	REEL (S) TABLE	O	△	×	△	×	×	×	×
3-25	TG1 ASSEMBLY	O	×	×	△	×	×	×	×
3-6	FEH ASSEMBLY	×	×	×	△	×	×	×	×
3-23	DRUM BASE	×	×	O	O	O	O	O	O
3-2	DRUM ASSEMBLY	×	×	O	O	O	O	O	O
3-24	SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES	×	×	O	O	O	O	O	×
3-5	ACE HEAD BLOCK	×	×	O	△	O	O	△	×
3-4	CAPSTAN MOTOR	×	×	×	△	O	O	O	×
3-3	PINCHI PRESS BLOCK ASS'Y	×	×	×	×	O	O	O	×
3-3	TG8 ASSEMBLY	×	×	×	×	×	×	O	×
3-10	REEL (T) TABLE	×	×	×	×	×	×	△	×
3-19	PULLEY GEAR ASSEMBLY	×	O	×	×	×	×	×	×
3-11	PENDULUM ARM ASSEMBLY	×	O	×	×	×	×	×	×

O: ADJUST
△: CHECK
×: NOT REQUIRED

1. PREPARATION FOR MECHANISM CHECKS, ADJUSTMENTS AND REPLACEMENT

For removal of the cabinet, printed wiring boards and others, please refer to the service manual "DISASSEMBLY".

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9V (300mA) to cam motor with regulated DC power supply makes it loading and threading.

Note : When loading and threading without cassette, claws are caught in four positions as following figure (in the order ①-②-③-④).
So release them with hands.

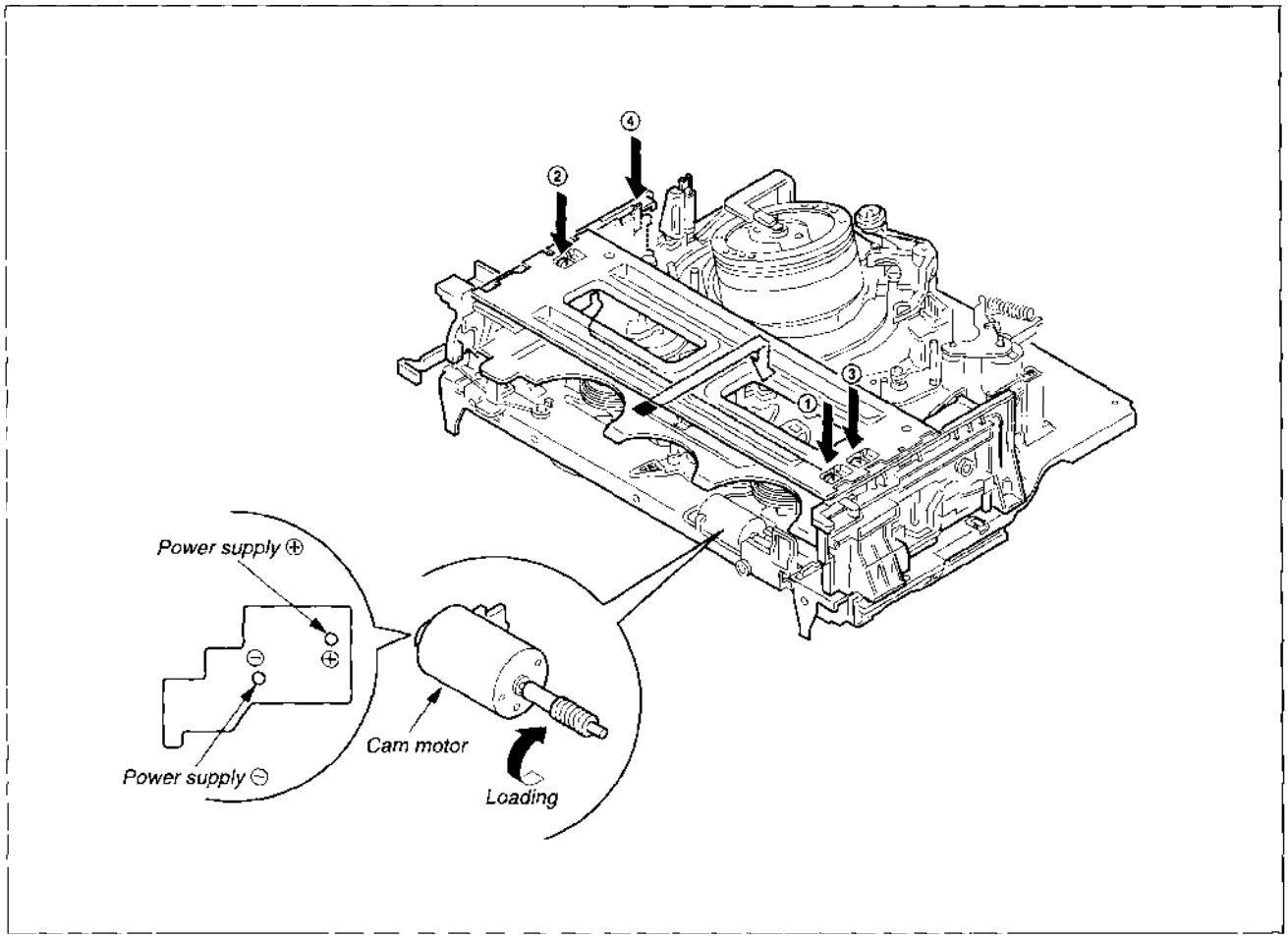


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +5V (300mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their initial positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note : When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note : Take care that tape is not caught at pinch roller.

4) Check that tape is no loosened completely, and apply approx. +5V (300mA) to contrary polarities of cam motor with regulated DC power supply.

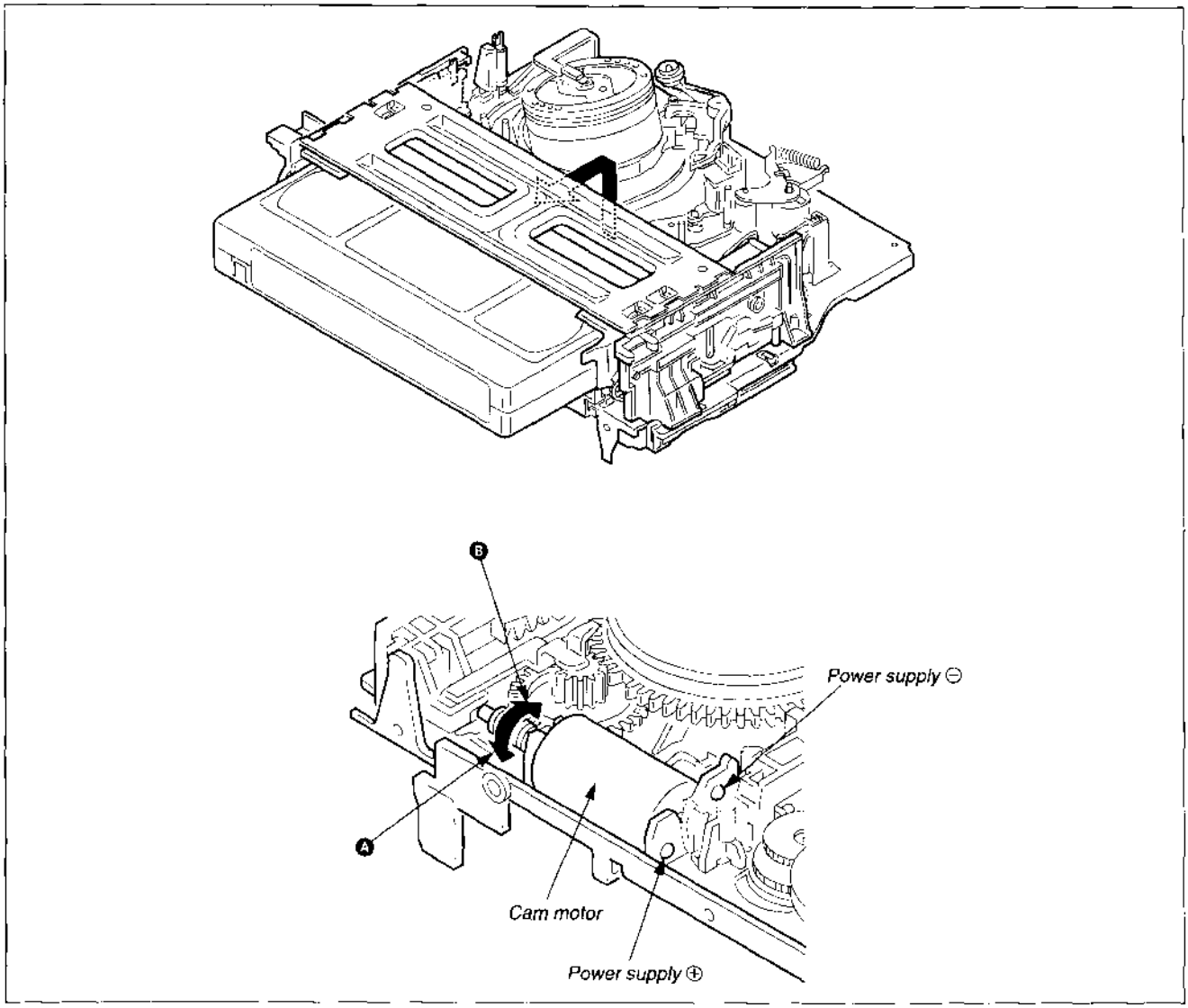


Fig. 1-2

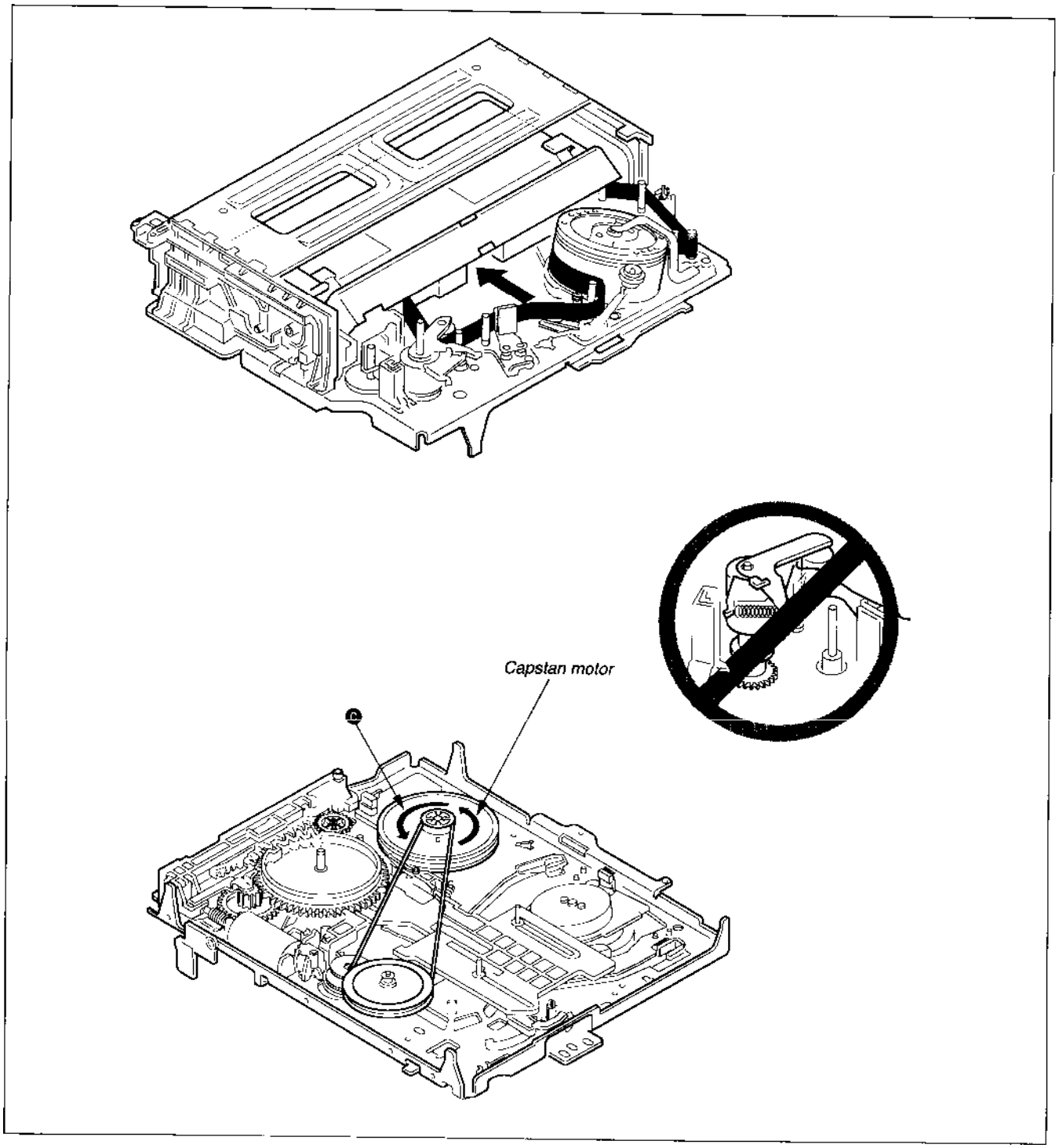


Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT

Note 1 : Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them.

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape or the like.
3) Connect AC plug to wall outlet.

Note 2 : In this condition, some modes can not be set.
To make loading in this condition, set the video cassette tape without REC proof claw, pull the REC proof lever once and release it.
On loading without video cassette tape, it is necessary to deceive the microcomputer by turning the reel (T) table with hand.
Fast forward and rewind are not available.

Note 3 : After above mentioned operation, be sure to return the mode in the following order.

4) Pull out AC plug from wall outlet to reset the system control microcomputer.
5) Remove the tape near the end and top sensors.

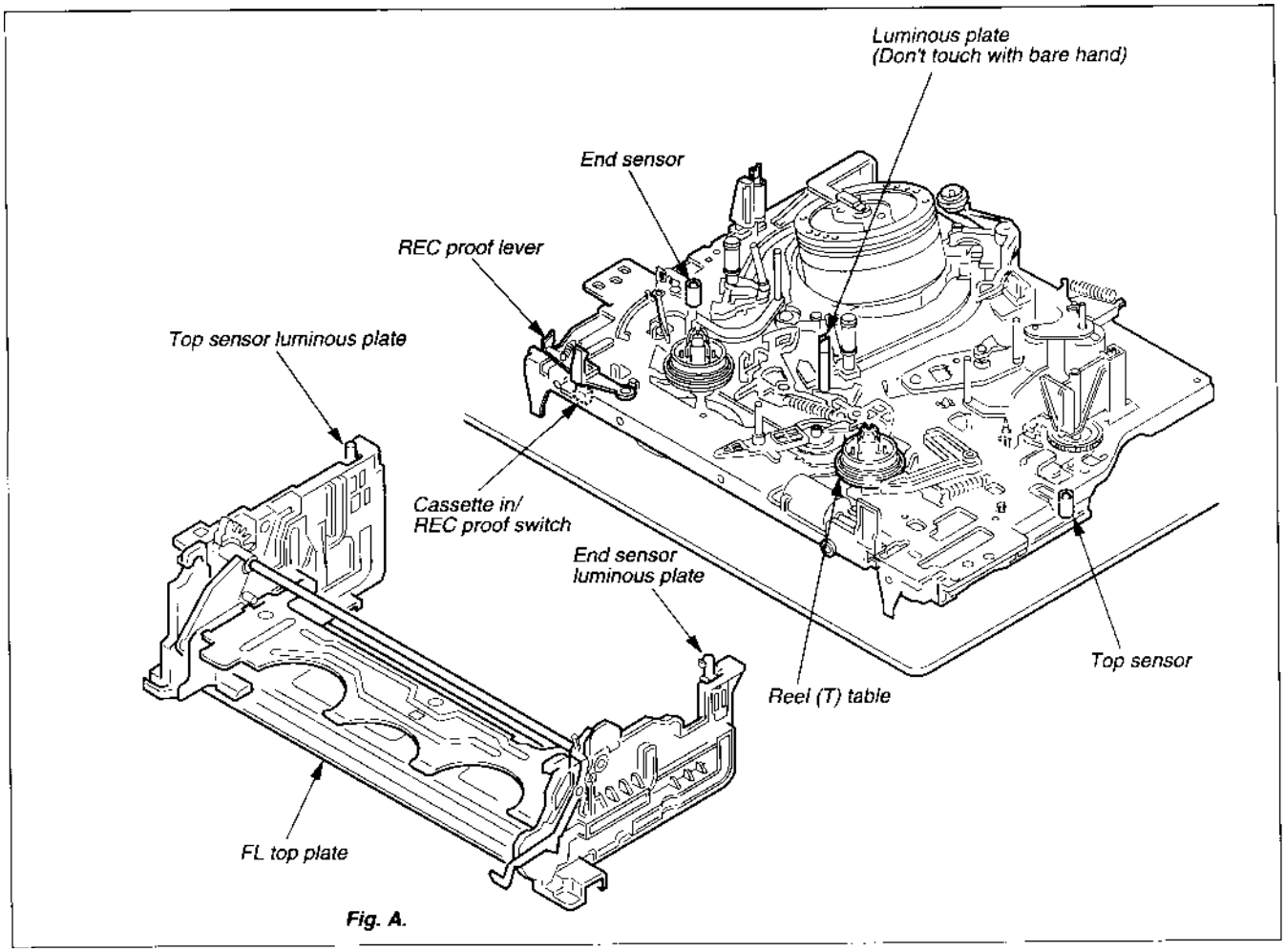


Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

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

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

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-4) which has been dipped in cleaning fluid (Jig Ref. No. J-3) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by the hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

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

2-3. CLEANING THE DRIVE SYSTEM

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

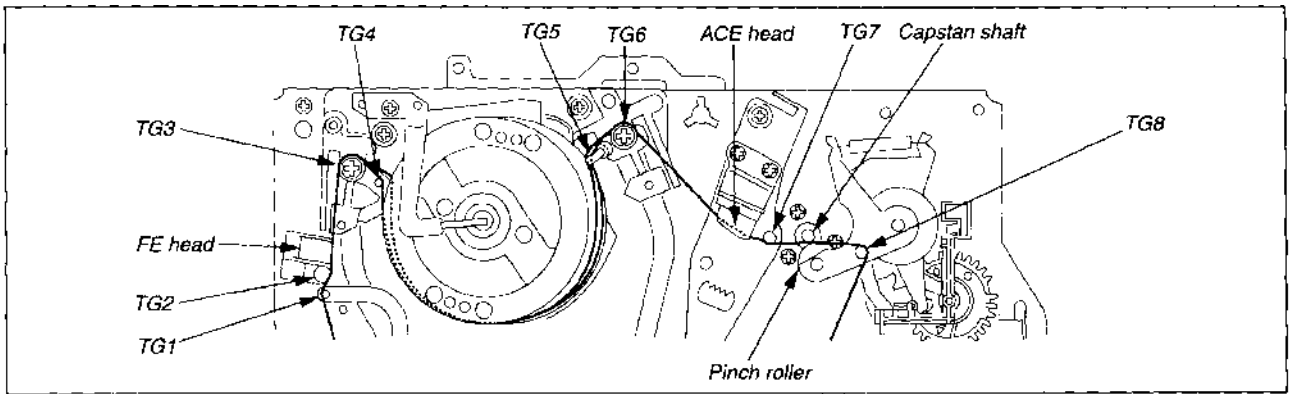


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users' operating hours.

Maintenance & Check \ Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	–	☆	—	☆	–	☆	—	☆	—	☆	Confirmation must be made according to 4-1-1. Specified value : Adjust to 5.0504 to 6.5214mN•m (51.5 to 66.5g•cm) (without TC assembly*) or 3.7755 to 5.0994mN•m (38.5 to 52.0g•cm)(with TC assembly*)
	Confirmation of brake system	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section.
	Confirmation of record and playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 4.9033 to 8.8259mN•m (50 to 90 g•cm)

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

○ : Cleaning ☆ : Confirmation

2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name		Part No.	Caved Jig No.	Remarks
J-1	Torque Measurement Cassette VHT-103S		J-6090-072-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S		J-6082-012-A		For CUE and REVIEW torque measurement.
J-2	Alignment Tape	KRV-52NE* (NTSC)	8-192-605-41		Tape path, Audio azimuth, X-value adjustments
		KRV-51N2 (NTSC)	8-192-605-32		Electrical adjustments, Operation checks
		KRV-52PL (PAL)	8-192-605-46		Tape path, Audio azimuth, X-value adjustments
		KRV-51P (PAL)	8-192-605-36		Electrical adjustments, Operation checks
J-3	Cleaning fluid		Y-2031-001-0	—	
J-4	Chamois Leather		2-034-697-00	—	
J-5	Dental Mirror (With Handle) Dental Mirror (Mirror)		J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-6	FLOIL SG-646		7-651-000-44		Net. 20g
J-7	Diamond Oil NT-68		7-661-018-18		
J-8	Screw Lock G (1401B)		7-432-114-11		
J-9	X-value adjusting driver		J-6090-073-A		X-value adjustment
J-10	Mode Selector II		J-6082-282-A	—	For S mechanism stand-alone operation
J-11	Connector Conversion Jig		J-6090-052-A	—	For S mechanism stand-alone operation
J-12	S Type Capstan Board		J-6090-075-A	—	For S mechanism stand-alone operation

* Be sure to use KRV-52NE having version number.

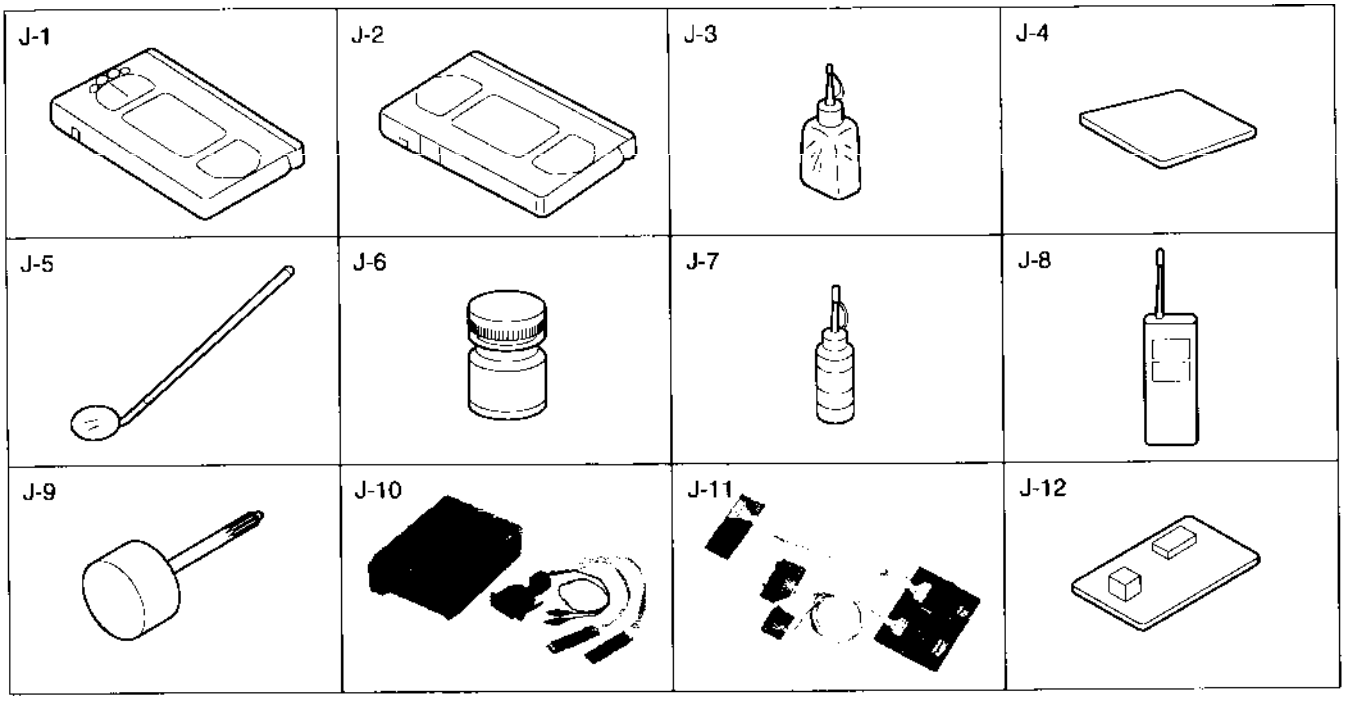


Fig. 2-2

2-6. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING S TYPE MECHANISM ASSEMBLY

2-6-1. OUTLINE

To activate the VHS system S type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A) and the S type capstan board (J-6090-075-A). By using the connector conversion jig and the S type capstan board, the following operations are possible.

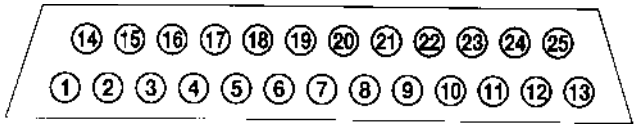
- Loading and unloading action by the loading motor.
- Normal and reverse rotation of the capstan motor.

2-6-2. PREPARATION

1) In order to drive the capstan motor, the power +5V and +12V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	D-SUB connector of the Mode Selector II	Voltage
Pin 1 (Red index)	Pin 20	+12V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5V

- Connector pin number assignment of the D-SUB connector (From the soldering side)



- When connections are made, check that +5V and +12V are available at the 3-pin cable connector.

2) CHECKING THE SOFTWARE VERSION
Turn on the power of the Mode Selector II.
If the reading of the software version on the Mode Selector II is not 1.10 or higher, replace the new ROM (J-6082-314-A).

2-6-3. CONNECTION

1) S TYPE CAPSTAN BOARD ATTACHMENT
Replace the capstan board supplied with the connector conversion jig (J-6090-052-A) with the S type capstan board (J-6090-075-A).

2) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II.
Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the Mode Selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).

3) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE S TYPE MECHANISM ASSEMBLY
With the power of the Mode Selector II turned off, insert the following two connectors to the corresponding connectors on the S type mechanism assembly.
   - 3-pin connector for the loading motor
   - 10-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counterclockwise).

2-6-4. OPERATION

1) OPERATION OF THE LOADING MOTOR ON THE S TYPE MECHANISM ASSEMBLY
   ① Select the H type mechanism assembly setting on the Mode Selector II.
   ② Operating procedures after the mechanism selection
   For the operating procedures, see pages 3 to 5 of "8mm Video Mechanical Adjustment Manual IV (TK Mechanism) Supplement-1".
   For the loading procedure, see page 4 of "VHS Mechanical Adjustment manual IV (S Mechanism)".

2) OPERATION OF THE CAPSTAN MOTOR ON THE S TYPE MECHANISM ASSEMBLY
   ① By the loading motor operation under the item 1), change the mode setting to the FF/REW mode.
   ② Turn the speed control gradually in clockwise direction, then the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FF/REW setting of the rotating direction switch.

2-6-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the Mode Selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the Mode Selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via peripheral conductive materials.

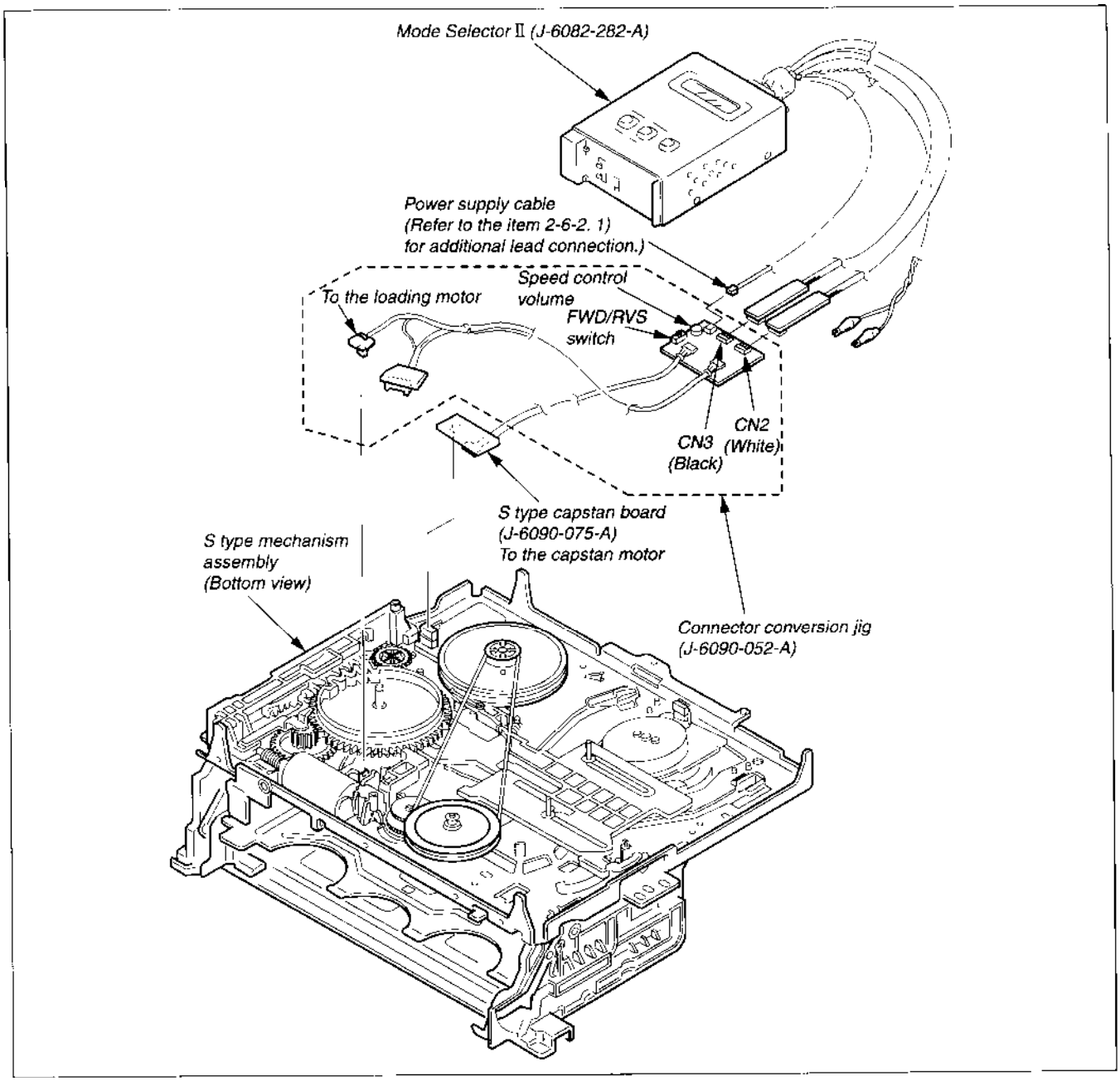


Fig. 2-3

2-6-6. CHECKING THE MECHANISM MODE BY THE MARK CARVED ON THE SLIDER

As shown in the right figure, the mechanism mode can be identified by checking the mark carved on the slider pointed by the loading gear shaft.

Carved mark	Mode
CD	Cassette down
EJ	Eject
UL	Unload end
LE	Load end
RV	Reverse
PR	Pinch release
FP	FWD pause
FW	FWD
ST	Stop
FR	FF/REW

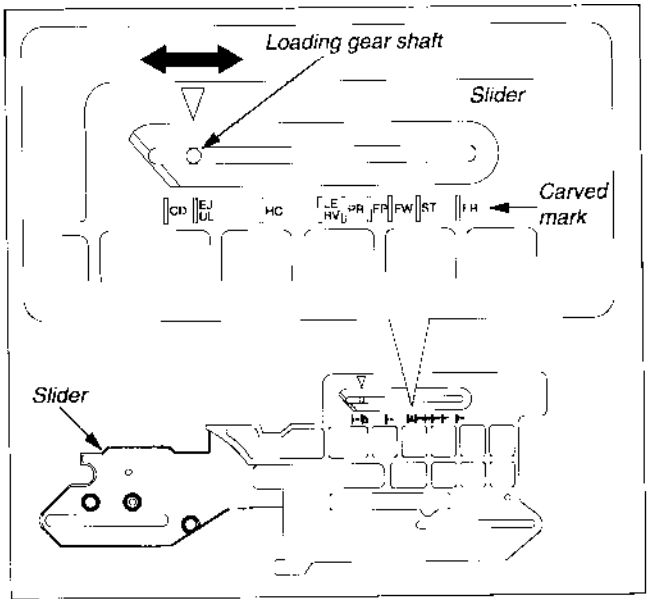


Fig. 2-4

2-7. PHASE ADJUSTMENT ON ATTACHING S TYPE MECHANISM ASSEMBLY

As shown below, adjust the phase between the rotary switch on the MA board and the cam gear.

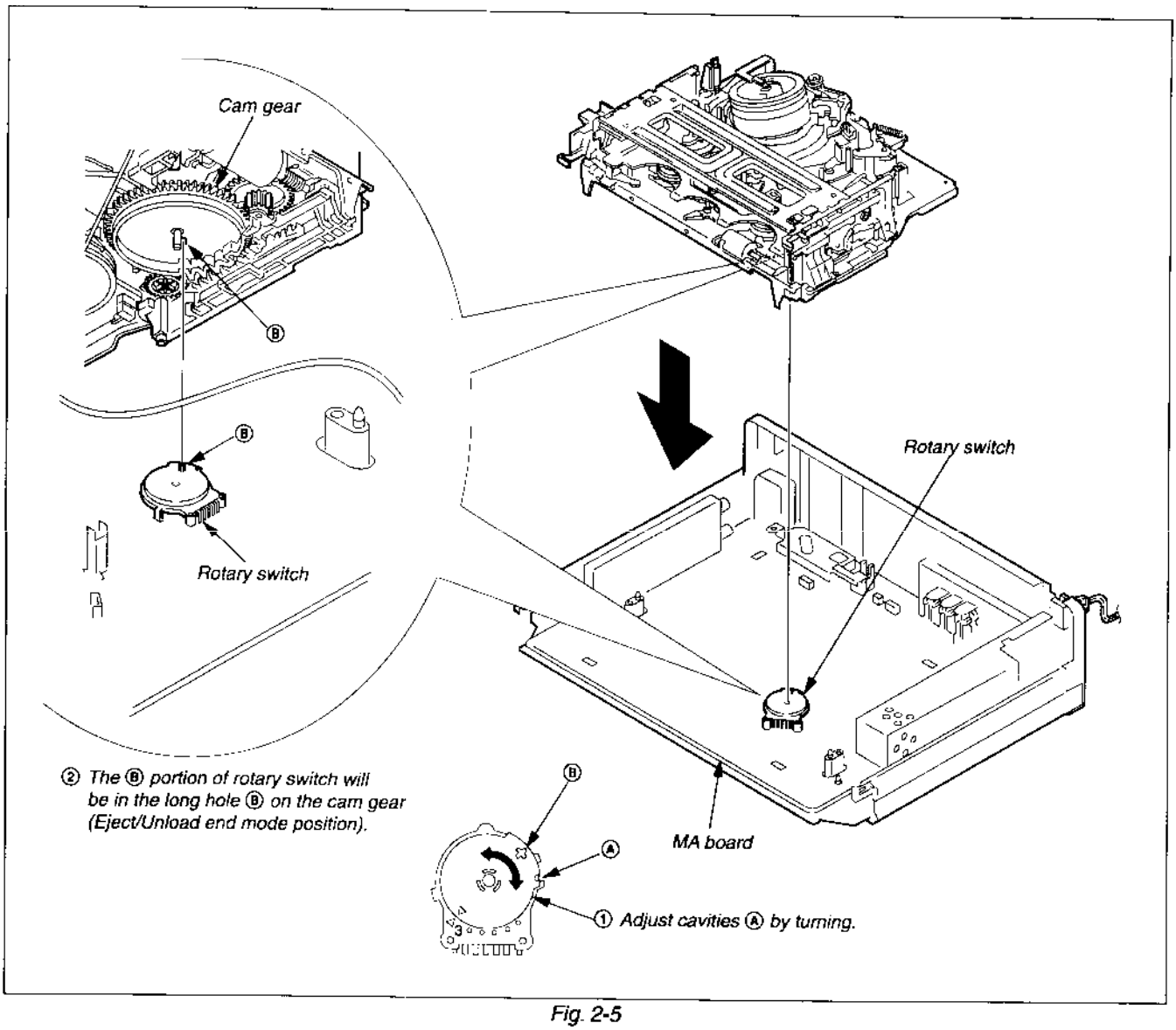


Fig. 2-5

3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

For the removal of cabinets, printed circuit boards or the like, please refer to the "DISASSEMBLY" section on the service manual of the respective models.

To assemble the mechanical parts which are disassembled in the following sections, perform the disassembly steps in reverse, unless otherwise specified.

When replacing greased parts, grease them in the same way.

Do not oil, grease or touch with bare hands the surfaces that contacts tape of guides and brake shoes.

Install gears to engage each other.

Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL COMPLETE ASSEMBLY

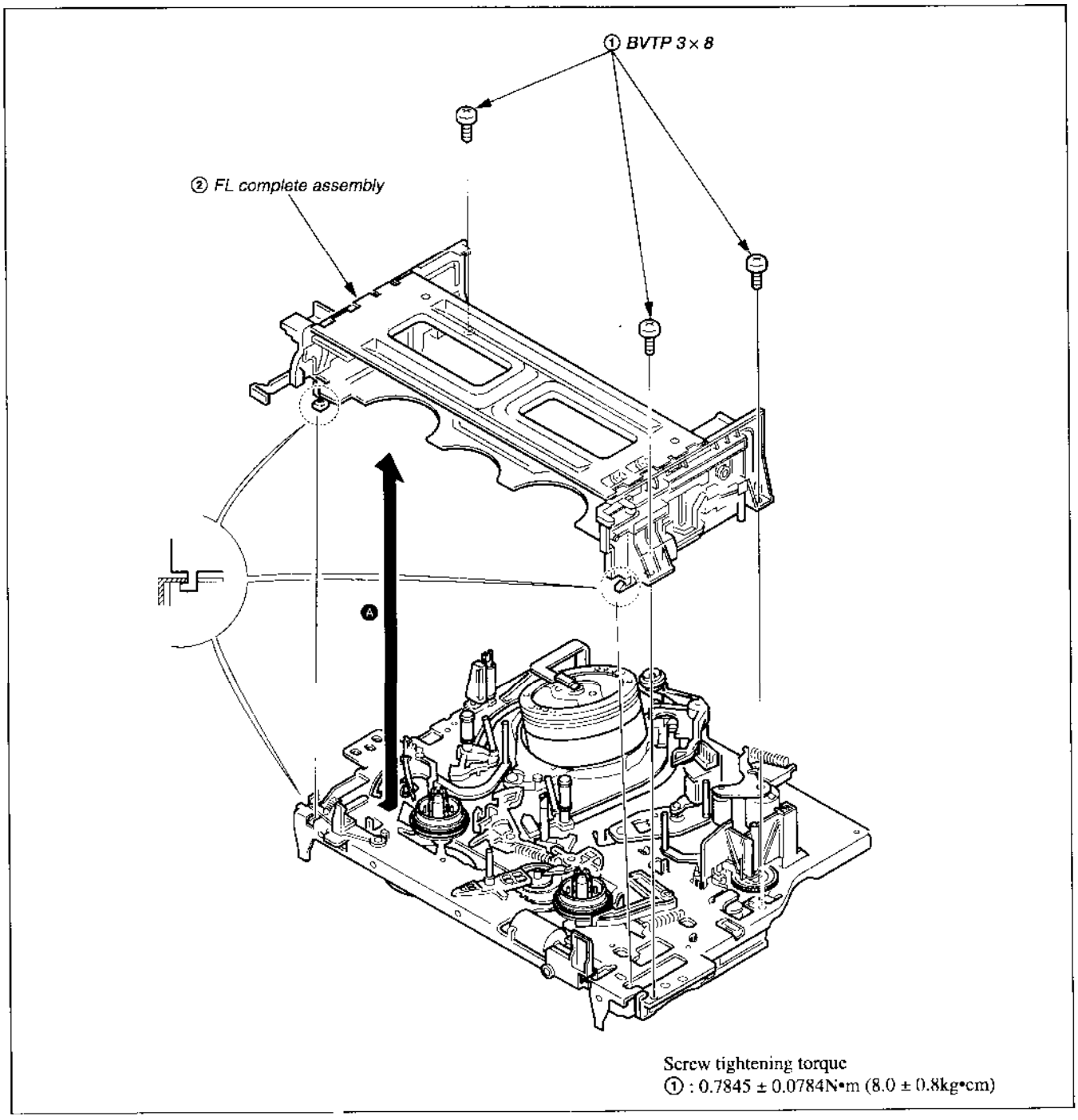
1) Remove screws (BVTP3 × 8) ①.
2) Remove FL complete assembly ② in the arrow Ⓐ direction.

Note : Be careful not to damage claws on the bottom and front.

3) Remove torsion spring (deck open) ③.
4) Remove luminous plate (top sensor) ④ and luminous plate (end sensor) ⑤.

[Note on Mounting]

- When mounting FL complete assembly, first insert claws on the bottom and front not to damage.
- Keep clean top sensor and end sensor luminous plates.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-1

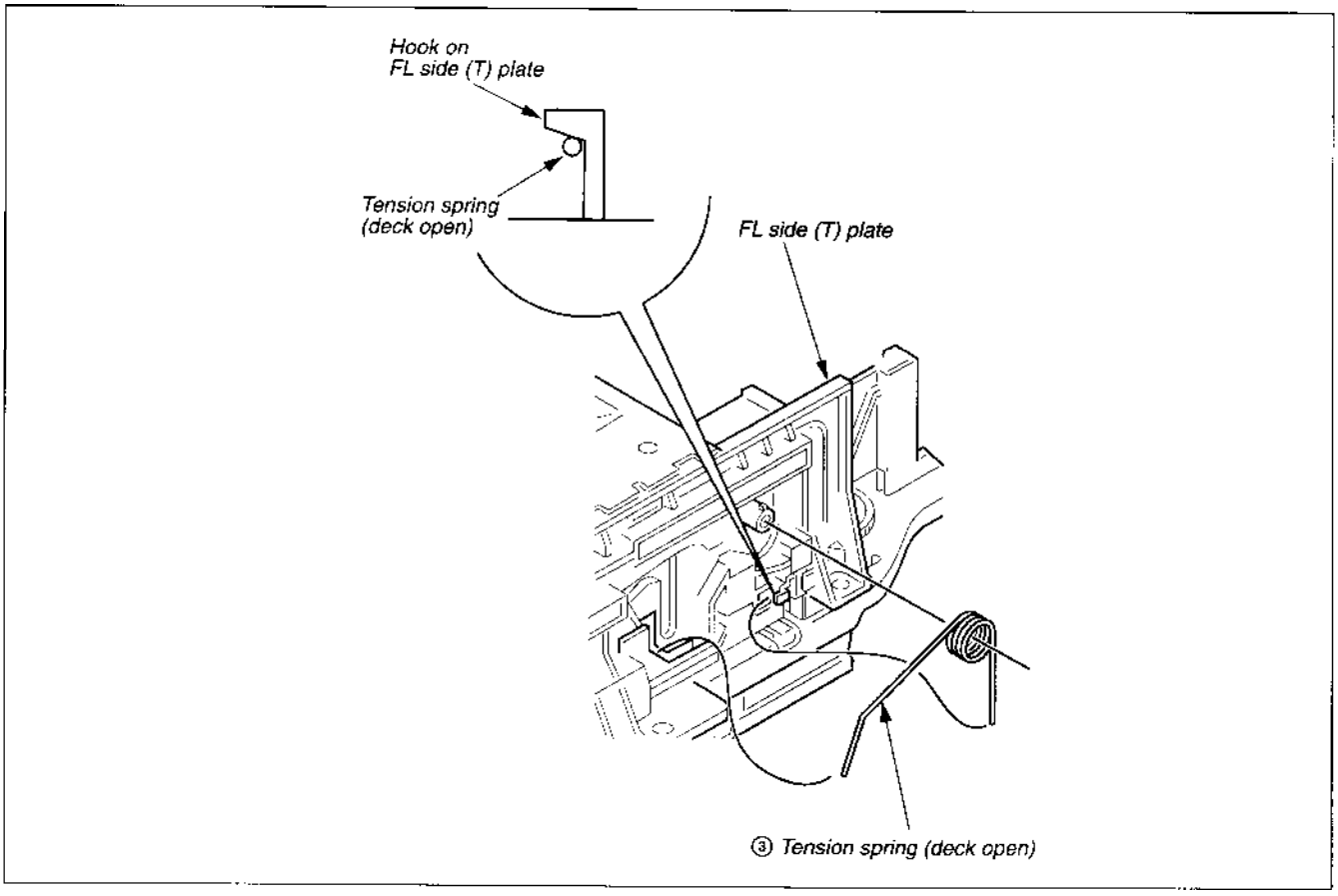

Hook on
FL side (T) plate
Tension spring
(deck open)
FL side (T) plate
③ Tension spring (deck open)

Fig. 3-2

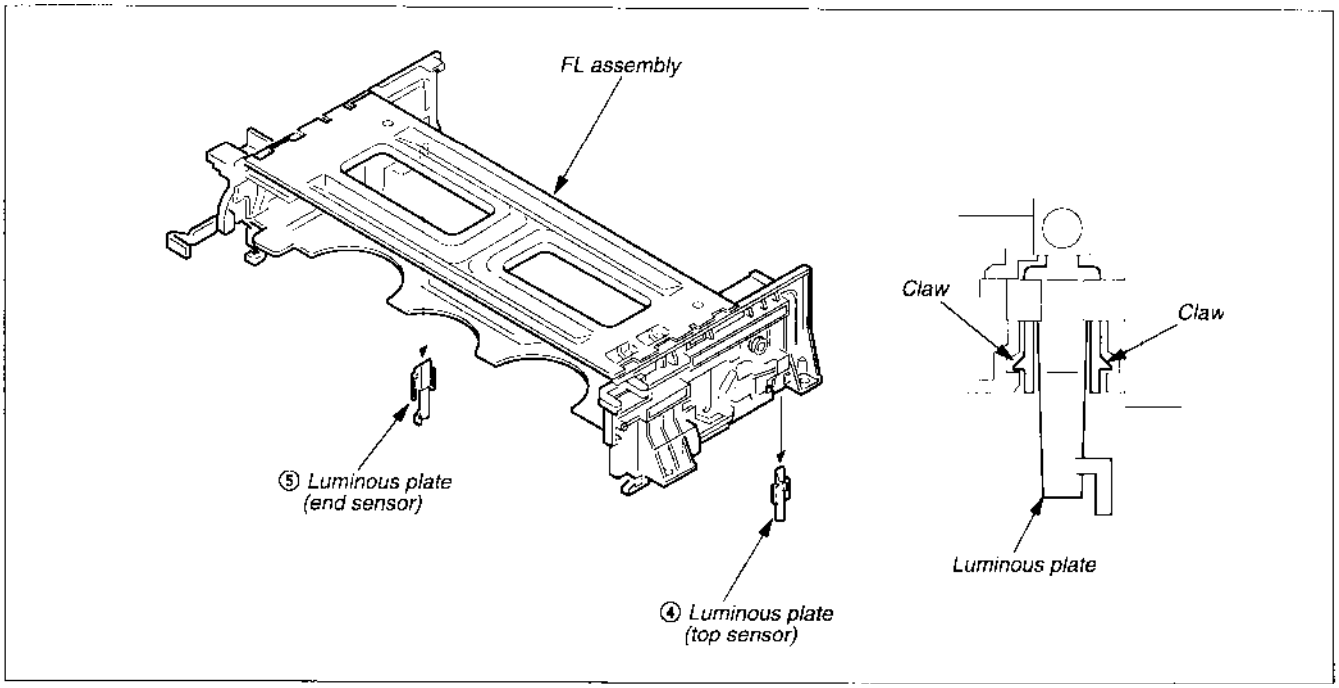

FL assembly
⑤ Luminous plate
(end sensor)
④ Luminous plate
(top sensor)
Claw
Claw
Luminous plate

Fig. 3-3

3-2. DRUM ASSEMBLY

1) Remove screw (BVTP3 x 8) ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand.
3) Remove screws ③ to remove drum assembly ④.

[Notes on Mounting]

- Don't touch head chips and tip of ground shaft assembly with bare hand.
- Keep clean the surface that contacts tape of drum assembly.
- Tighten screw ③ in the order ⓐ, ⓑ, ⓒ.

[Adjusting after Mounting]

- 4-1. Tape path adjustment

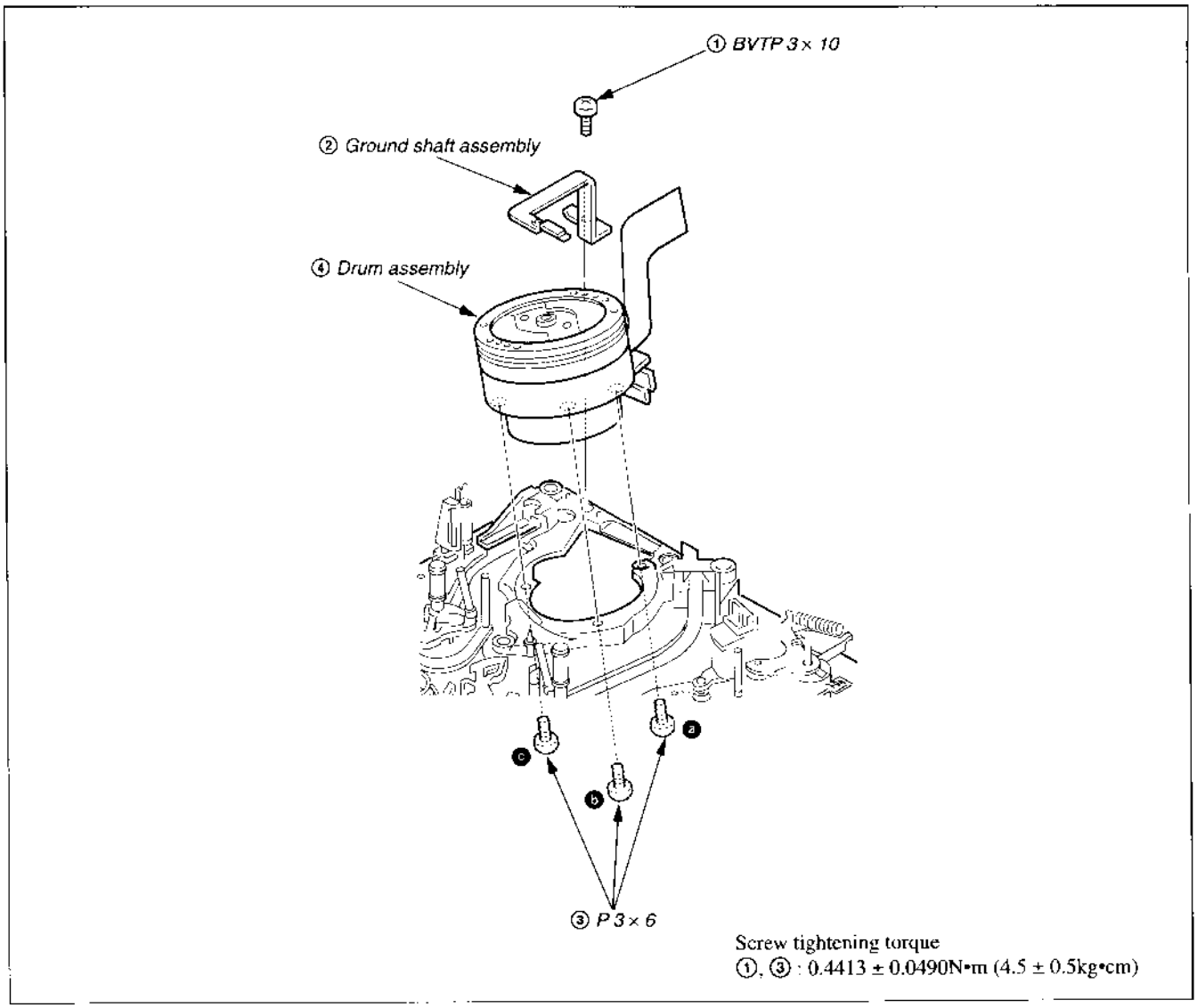


Fig. 3-4

3-3. PINCH PRESS BLOCK ASSEMBLY, TG8 ASSEMBLY AND THEIR PERIPHERY

1) Remove pinch press block assembly ① while releasing its tip from the claw of lid opener ②.
2) Remove lid opener ② while releasing claw in the arrow Ⓐ direction from mechanical chassis.
3) Remove elevator gear ③.
4) Remove TG8 assembly ④, TG8 arm gear ⑤ and TG8 arm driving gear ⑥.
5) Then remove pinch pressing gear ⑦.

[Notes on Mounting]

- When attaching pinch pressing gear ⑦ and elevator gear ③, be sure to adjust their phases as shown in Fig. A.
- Apply grease to elevator gear ⑦ and pinch shaft as shown in Fig. B.
- Don't touch surface of pinch roller with bare hand.

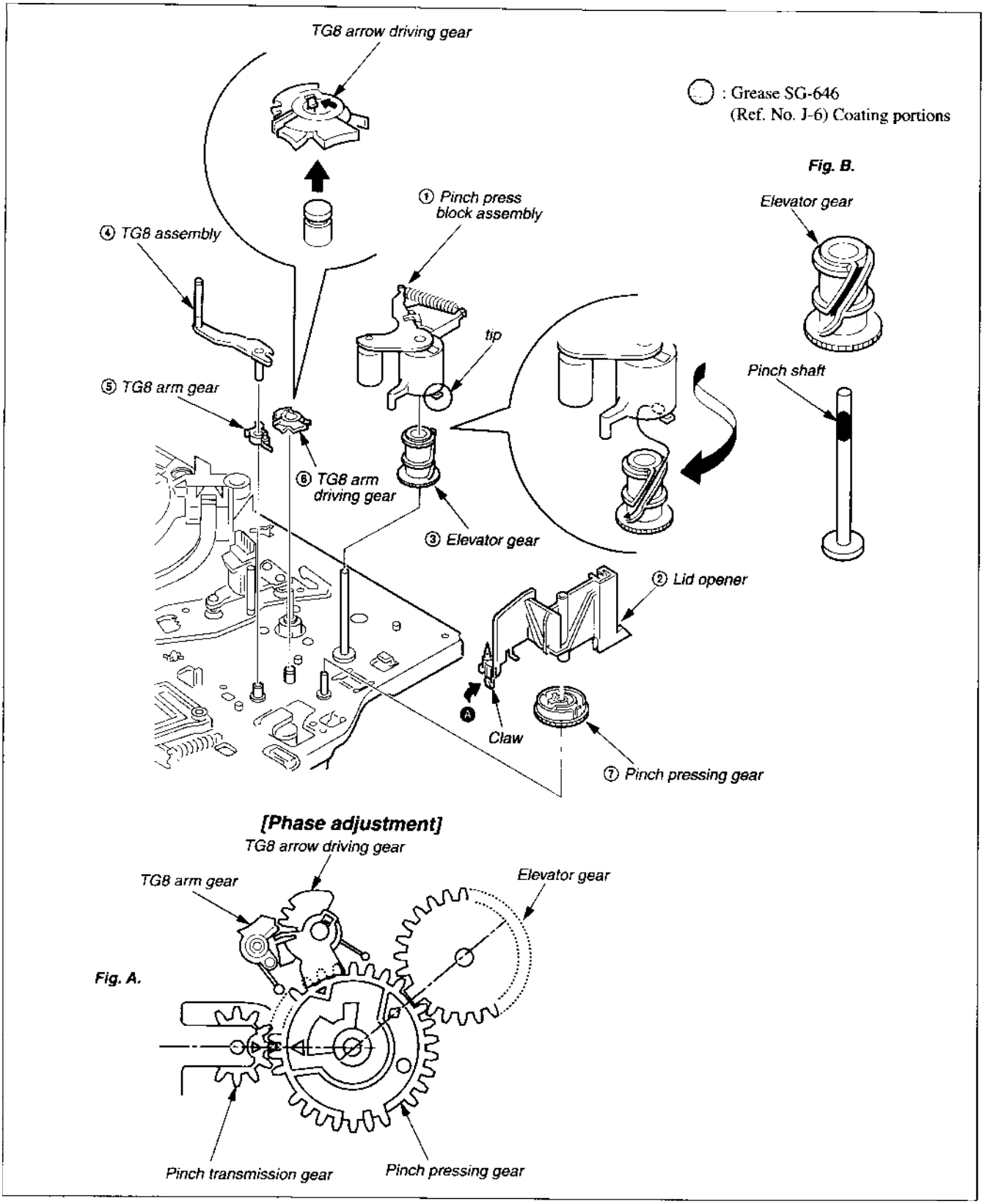


Fig. 3-5

3-4. RUBBER BELT, CAPSTAN MOTOR

1) Remove rubber belt ①.
2) Remove screws ② to pull out capstan motor ③.

[Notes on Mounting]

- Attach rubber belt not to twist it.
- Don't touch capstan motor with bare hand to keep clean capstan motor.
- Tighten screws ② in the order ⓐ, ⓑ, ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

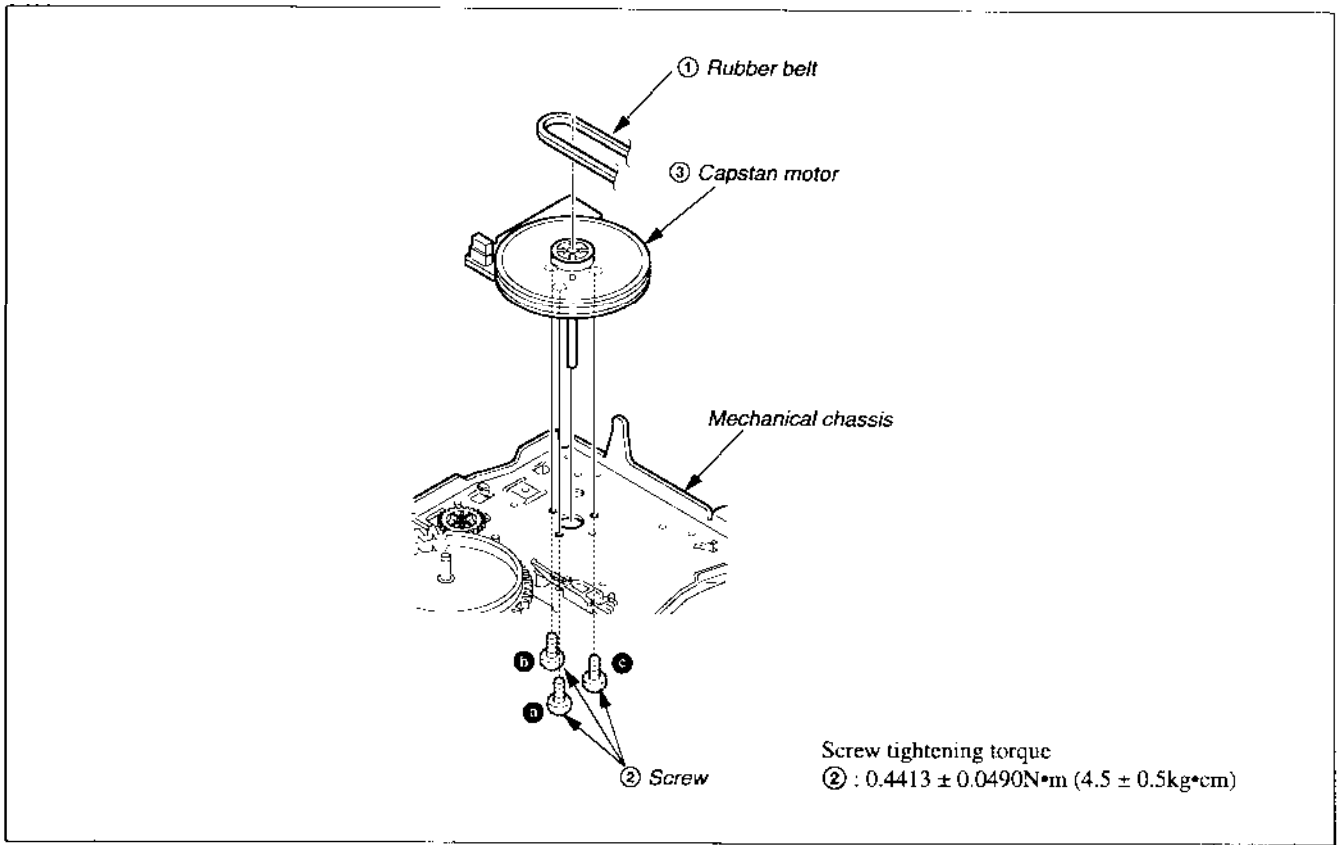


Fig. 3-6

3-5. ACE HEAD BLOCK ASSEMBLY

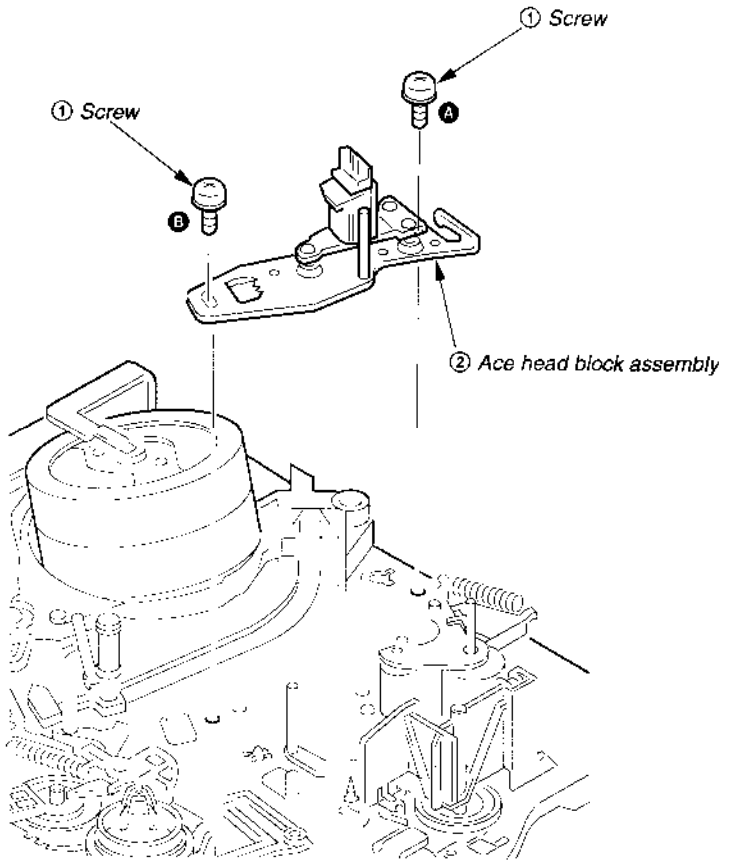
1) Remove screws ① to remove ACE head block assembly ②.

[Notes on Mounting]

- Don't touch capstan motor with bare hand to keep clean capstan motor.
- On tightening screws ①, first, tighten in the order Ⓐ, Ⓑ, next loosen Ⓑ 180 degrees or more and perform adjustments. After adjustments tighten with torque screwdriver (torque; 0.29 ± 0.29 N•m (3.0 ± 0.3kg•cm)).

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-7

3-6. FEH ASSEMBLY

1) While putting the boss out from mechanical chassis, turn FEH assembly ① in the arrow Ⓐ direction and pull out FEH assembly above.
2) Slide FE head ② out from FEH holder not to break claw (Recorder only).
3) Remove TG2 shaft ③ by pushing with a screwdriver covered with cloth or the like not to scratch the surface.

[Note on Mounting]

• Don't touch FE head and TG2 shaft with bare hand.

[Adjustment after Mounting]

• 4-1. Tape path adjustment.

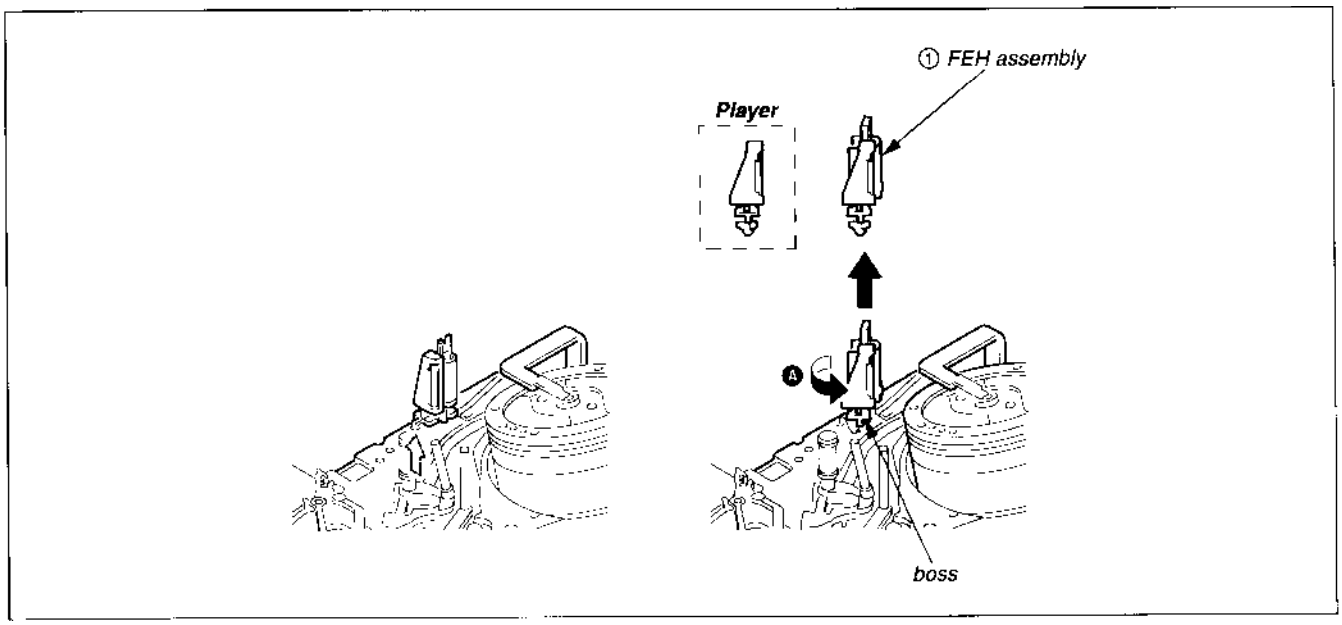


Fig. 3-8

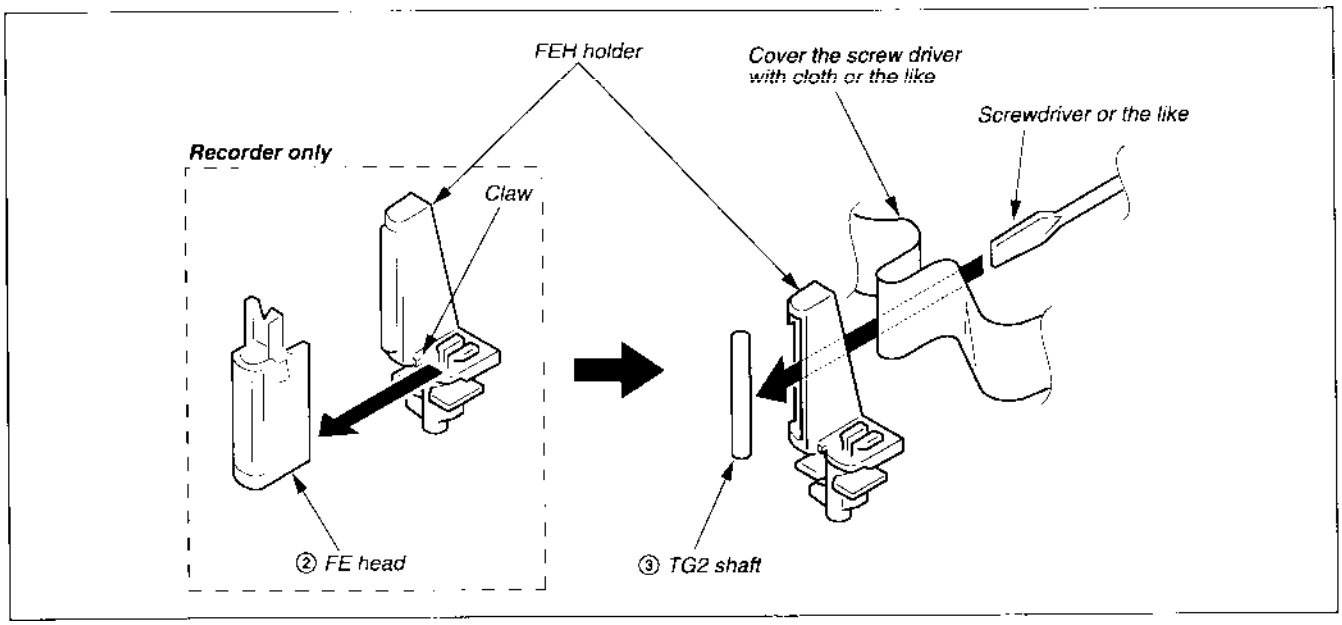


Fig. 3-9

3-7. REC PROOF LEVER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove tension spring (REC proof) ①.
3) Remove REC proof lever ② in the arrow Ⓑ by pushing claw in the arrow Ⓐ direction.

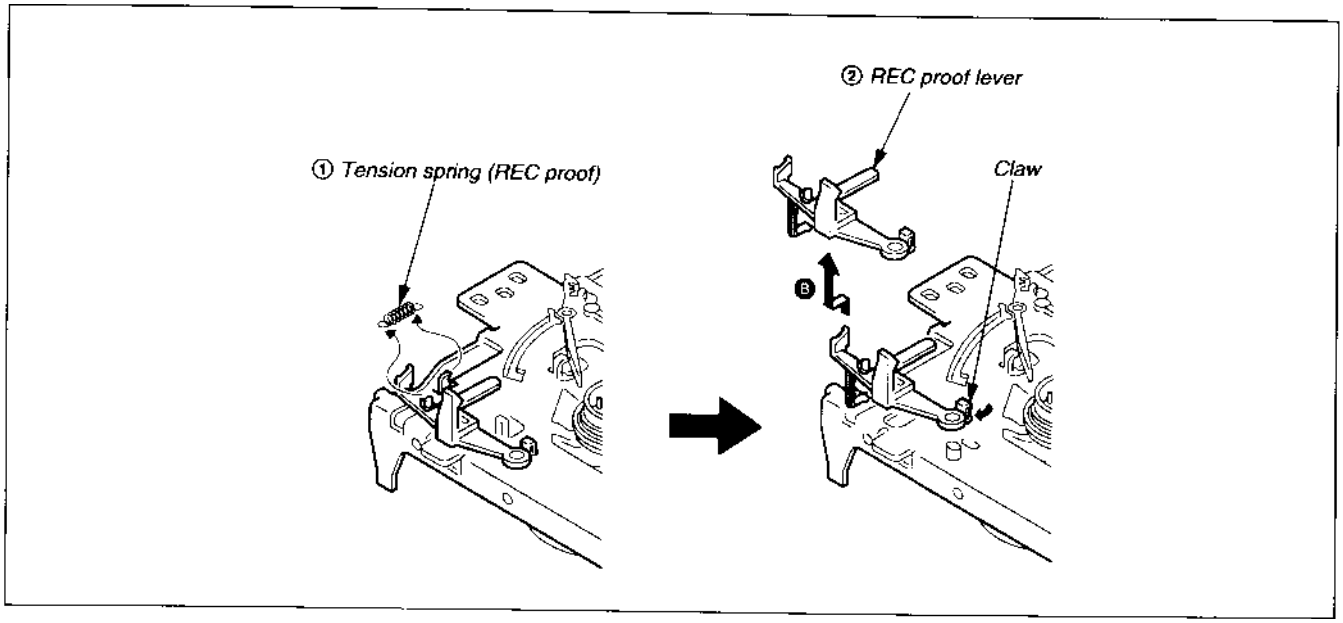


Fig. 3-10

3-8. RVS BRAKE ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (RVS brake) ①.
3) Turn RVS brake arm assembly ② in the arrow Ⓐ direction and remove it in the arrow Ⓑ.

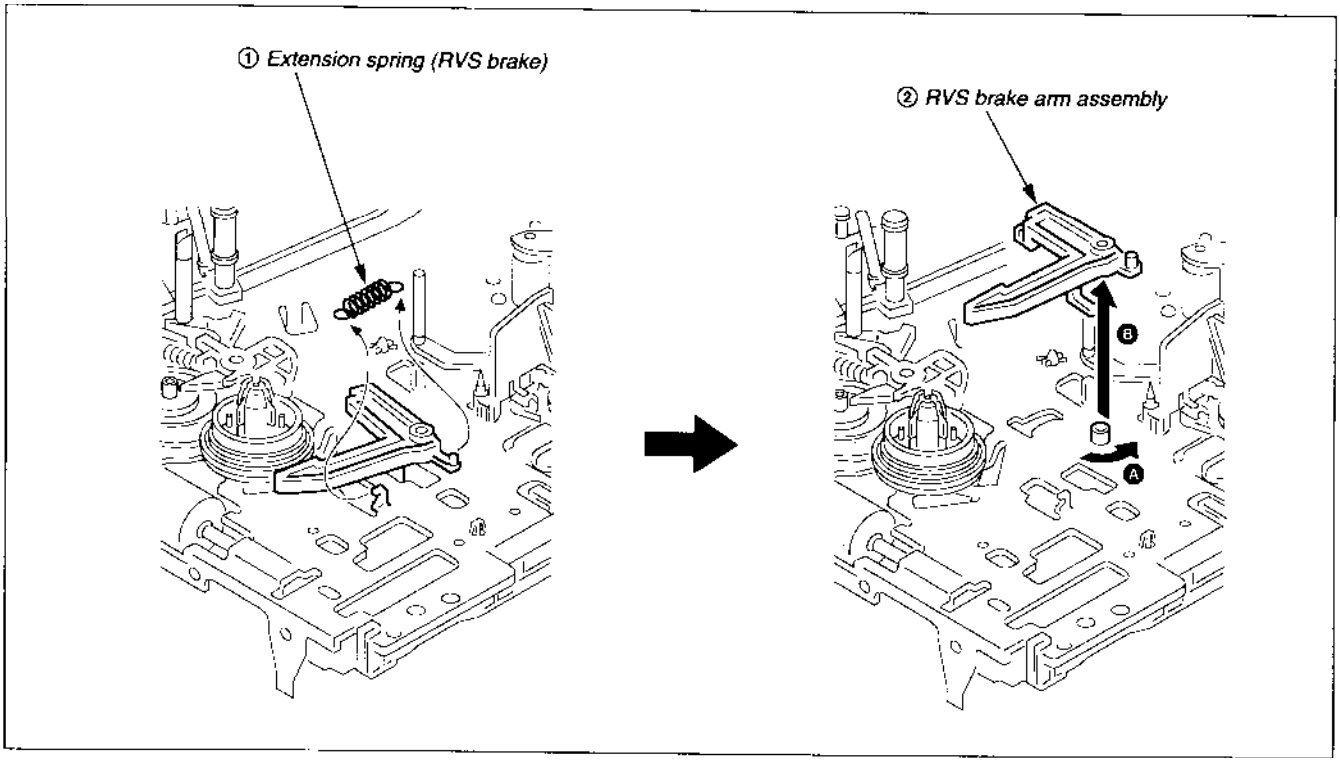


Fig. 3-11

3-9. MAIN (S) AND MAIN (T) BRAKE ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (main brake) ①.
3) Turn main (S) brake assembly ② in the arrow Ⓐ direction and remove it in the arrow Ⓑ.
4) Turn main (T) brake assembly ③ in the arrow Ⓒ direction and remove it in the arrow Ⓓ.

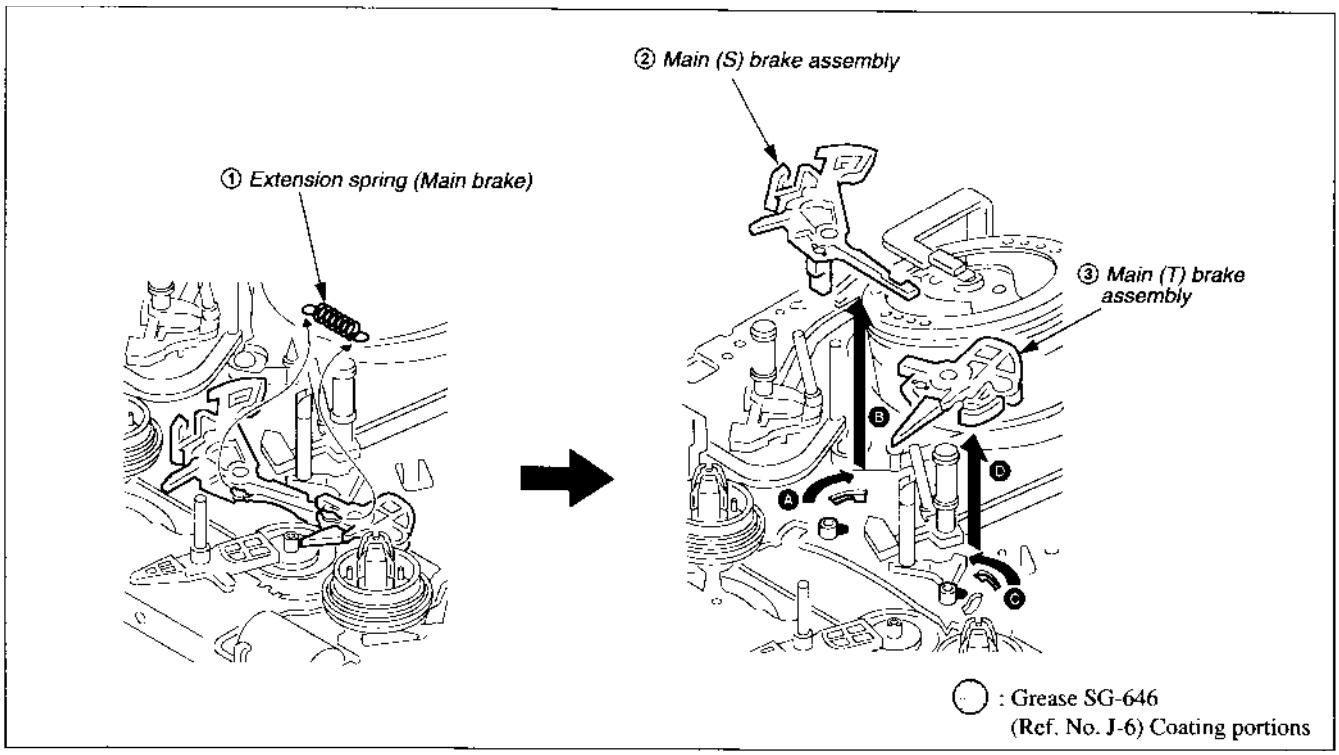


Fig. 3-12

3-10. REEL (T) TABLE (BLACK)

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove stopper washer ① to pull reel (T) table ② out.
3) Remove thrust washer ③.

[Note on Mounting]

• Before attaching, confirm the oil is applied at the top of reel (T) shaft.

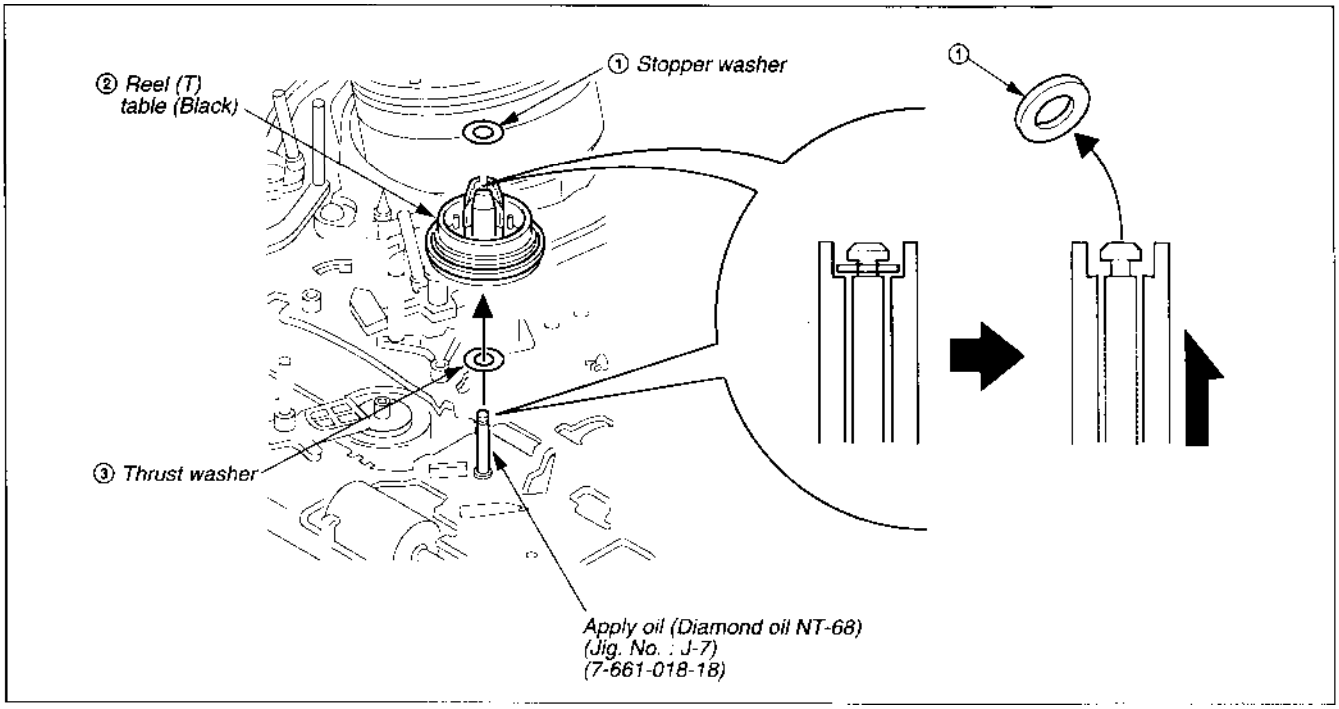


Fig. 3-13

3-11. PENDULUM ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove main (S) and main (T) brake assemblies. (Refer to 3-9.)
3) While releasing claws from the pendulum arm shaft in the arrow A direction, pull out pendulum arm assembly ①.

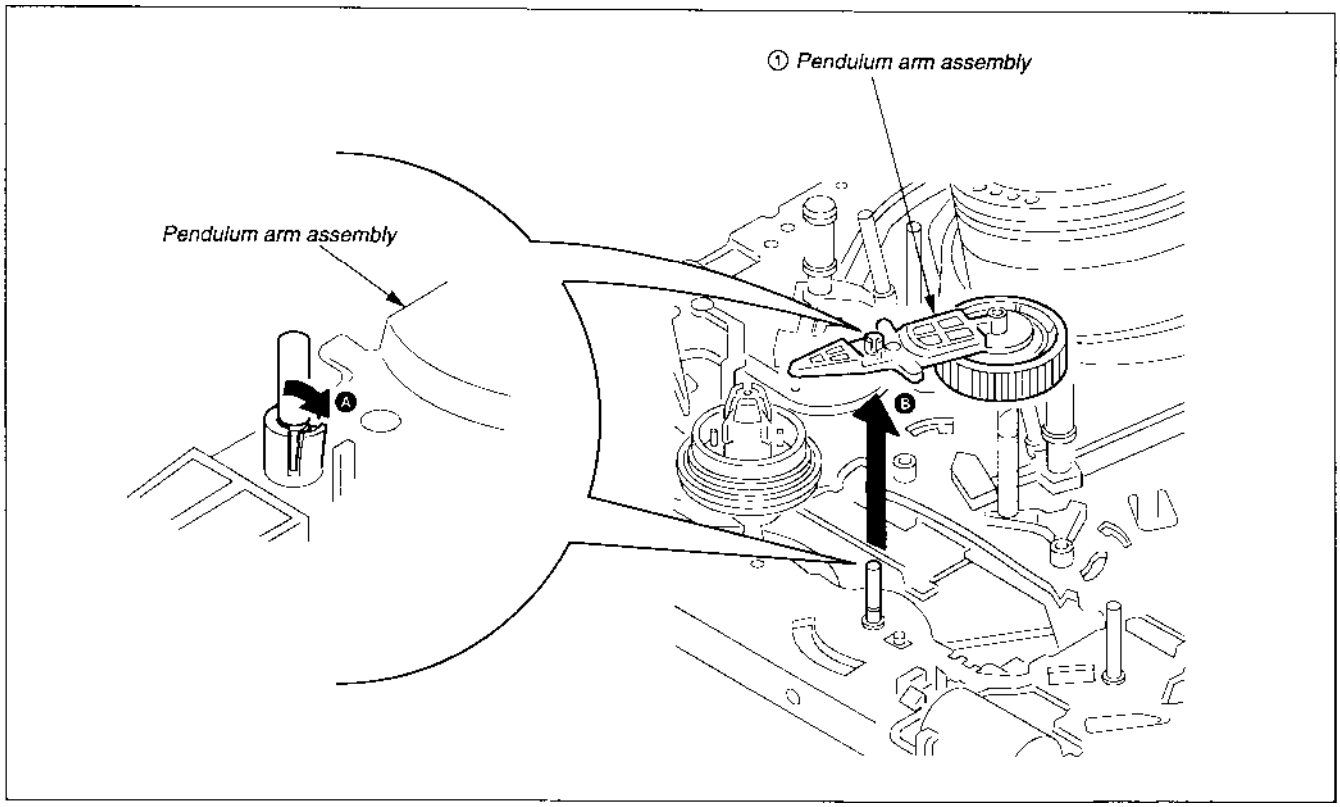


Fig. 3-14

3-12. FL SLIDER BLOCK ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Set the mechanism deck upside down.
3) Remove a screw (BVTP 3 × 8) ① and then retainer plate ② is getting out of place.
4) Slide FL slider block assembly ③ off in the arrow Ⓐ direction and raise it up.

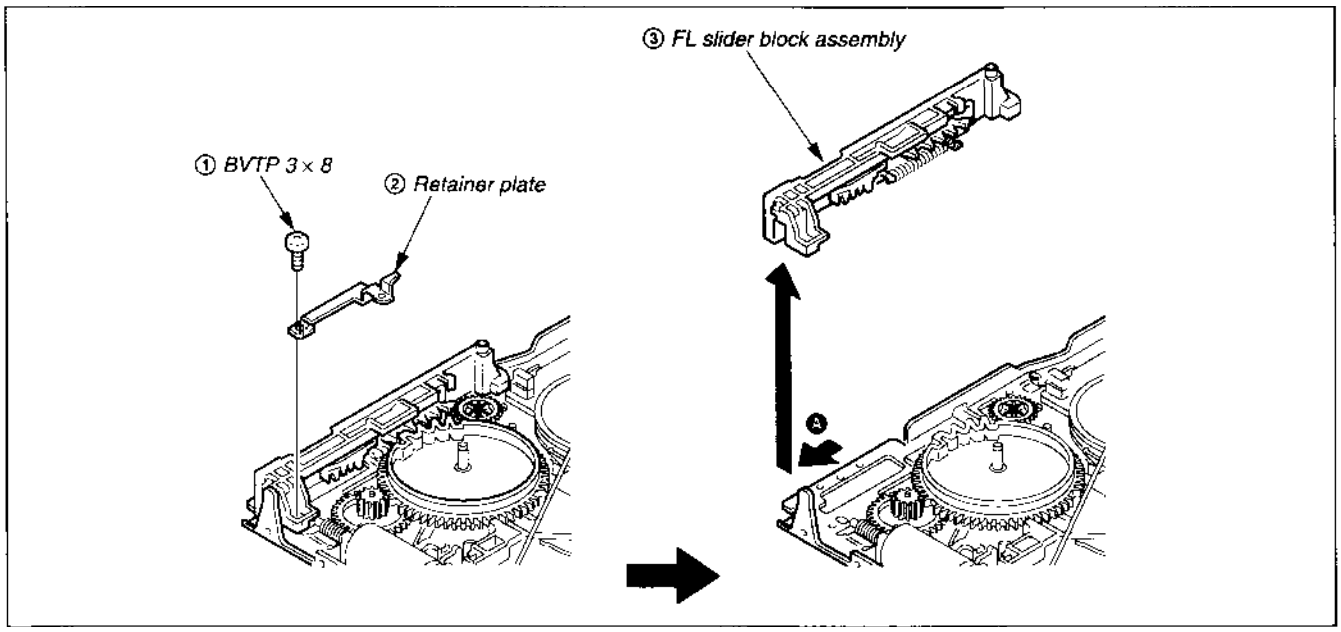


Fig. 3-15

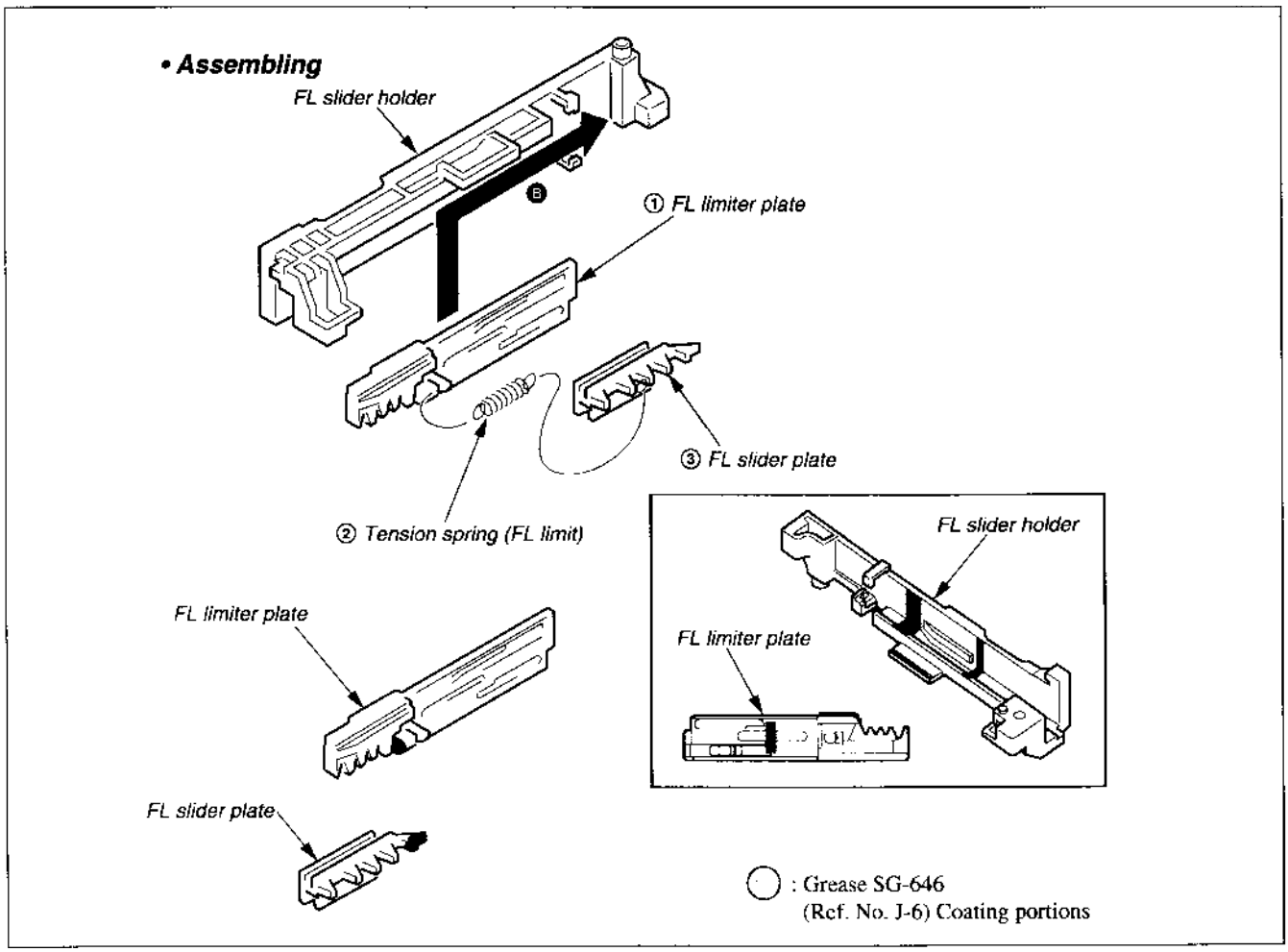


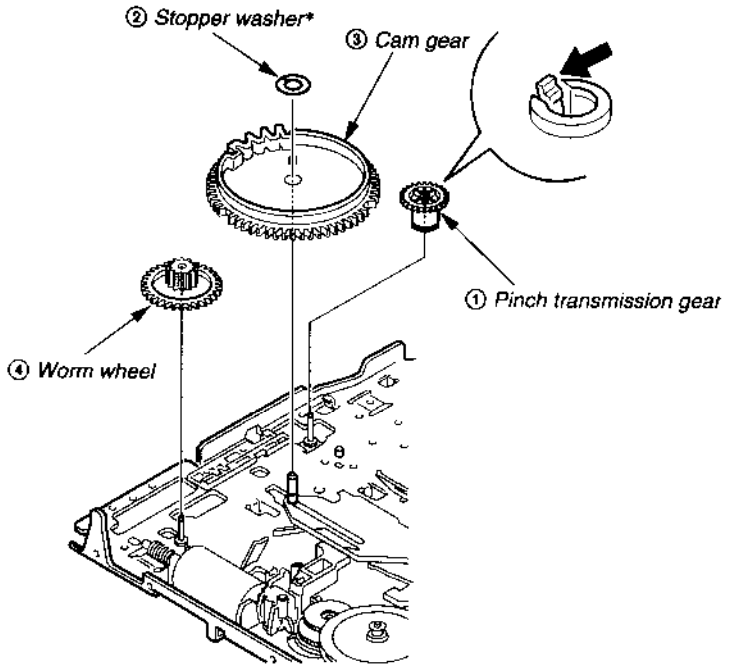
Fig. 3-16

3-13. PINCH TRANSMISSION GEAR, CAM GEAR, WORM WHEEL

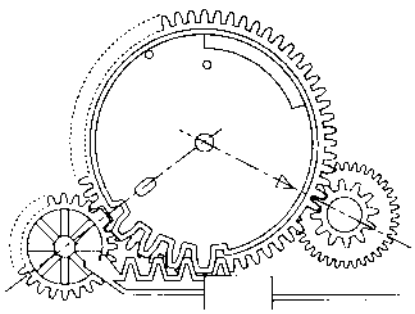
1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove pinch transmission gear ① by putting off its claw from shaft.
4) Remove stopper washer ②* to pull out cam gear ③.
5) Remove worm wheel ④ by putting off its claw from shaft.

[Note on Mounting]

- Before attaching cam gear ③, confirm that the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Adjust the phase of gears each other.

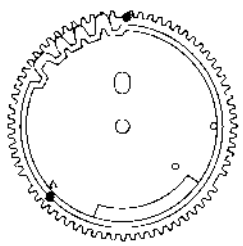


• Phase adjustment

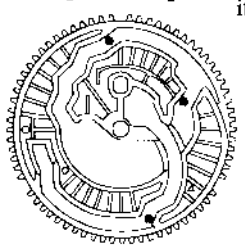


: Grease SG-646 (Ref. No. J-6) Coating portions

[Top]



[Bottom]



*Once remove stopper washer ②, don't use it again. Replace it with new one.

Fig. 3-17

3-14. CAPSTAN BRAKE ASSEMBLY, CAPSTAN BRAKE SHAFT

1) Remove rubber belt. (Refer to 3-4.)
2) Remove cap brake spring ①.
3) Remove capstan brake assembly ② by putting off claw of capstan brake shaft ③.
4) Set the mechanical chassis bottom side down.
5) While pushing the boss of capstan brake shaft ③, turn it clockwise to remove it.

[Note on Mounting]

• Don't touch shoe of capstan brake assembly with bare hand.

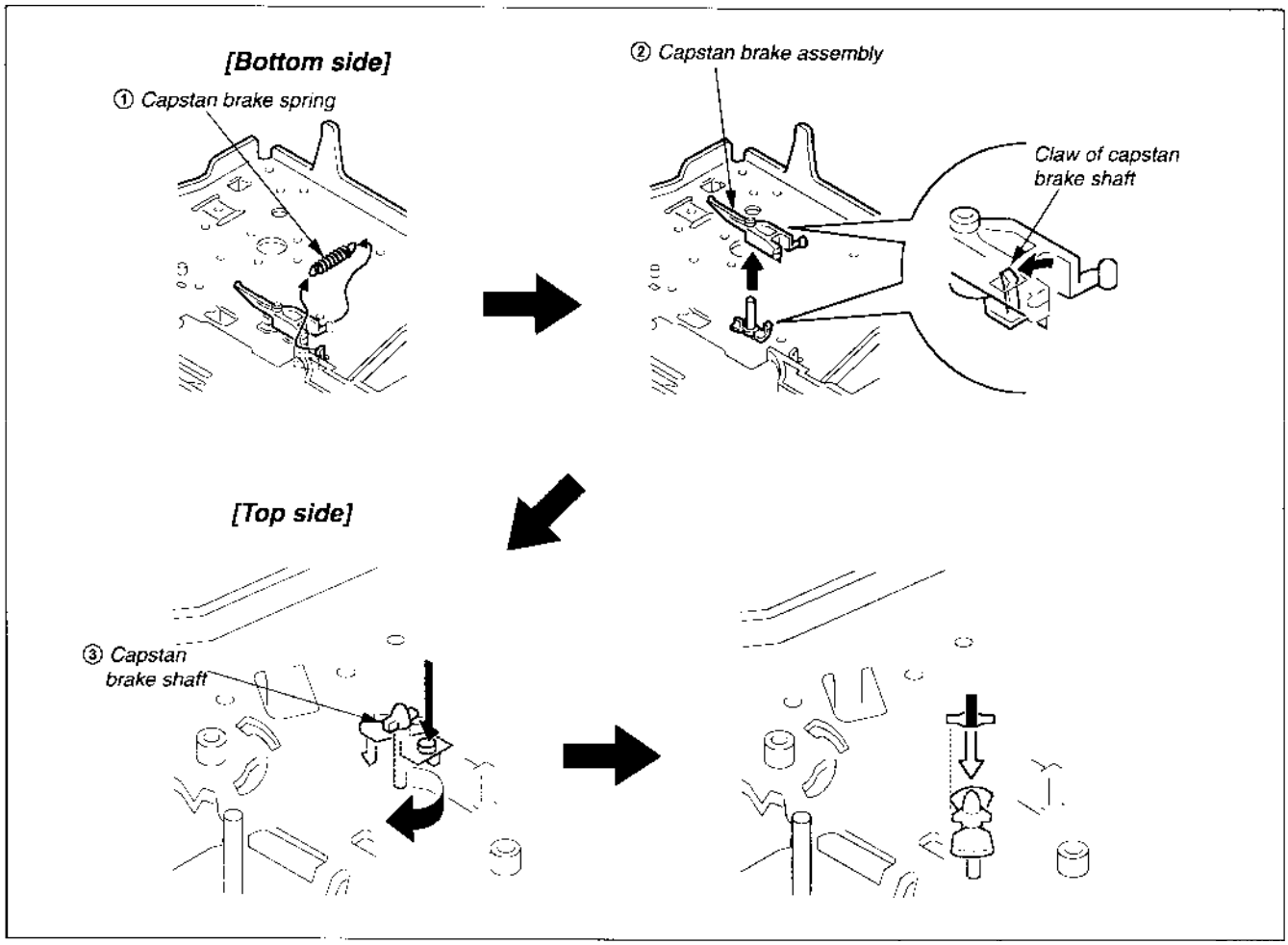


Fig. 3-18

3-15. FL SLIDER GUIDE

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove FL slider guide ① while pushing claws in the arrow Ⓐ direction.

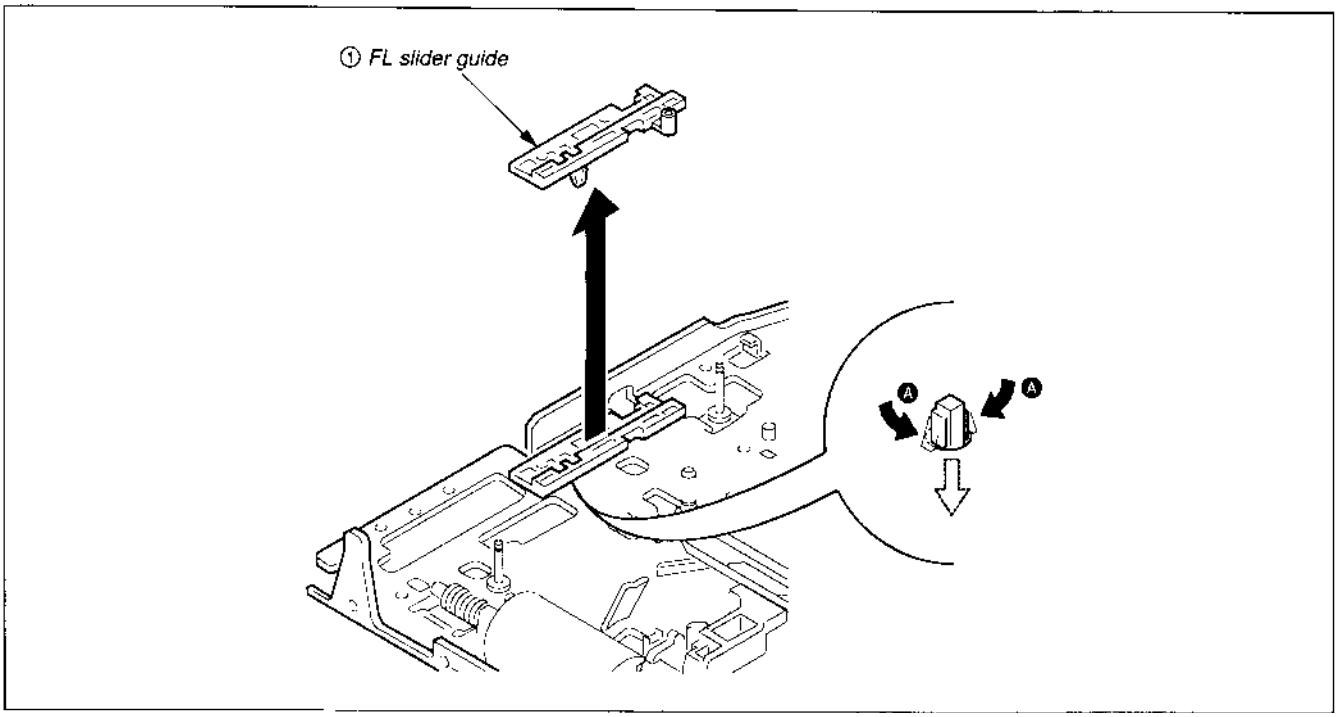


Fig. 3-19

3-16. SLIDER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove stopper washers ① and remove slider ② in the arrow direction.

[Note on Mounting]

- Before attaching slider ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- When attaching slider ②, adjust "Δ" mark on slider to loading gear (T) shaft as shown in Fig. A.

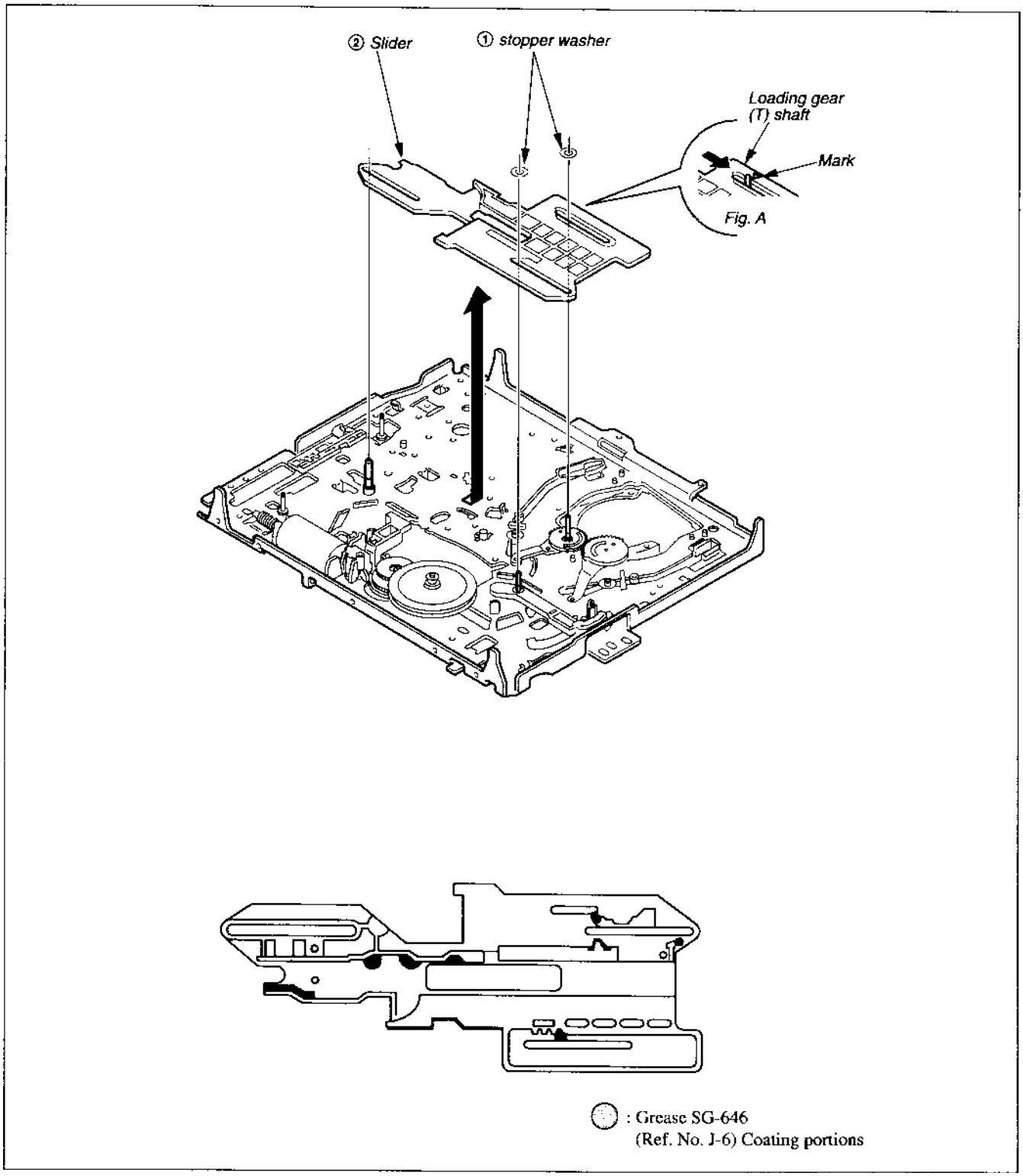


Fig. 3-20

3-17. TG1 DRIVING ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove spring (power tension) ① from TG1 driving arm ②.
7) Remove TG1 driving arm ② by turning it in the arrow Ⓐ to Ⓑ direction.

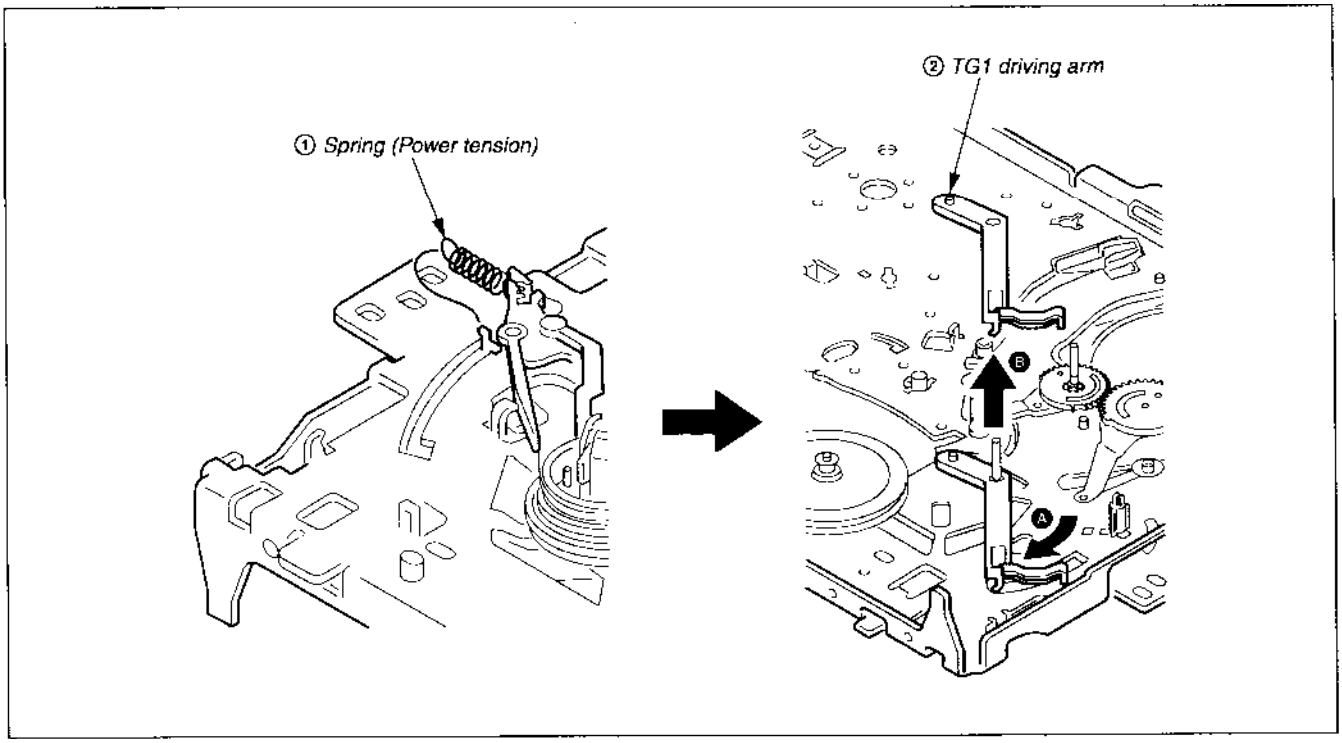


Fig. 3-21

3-18. LOADING (T) AND LOADING (S) GEAR ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove loading (T) gear assembly ① and loading (S) gear assembly ② in the arrow direction.

[Note on Mounting]

• When attaching them, be sure to adjust the phase each other.

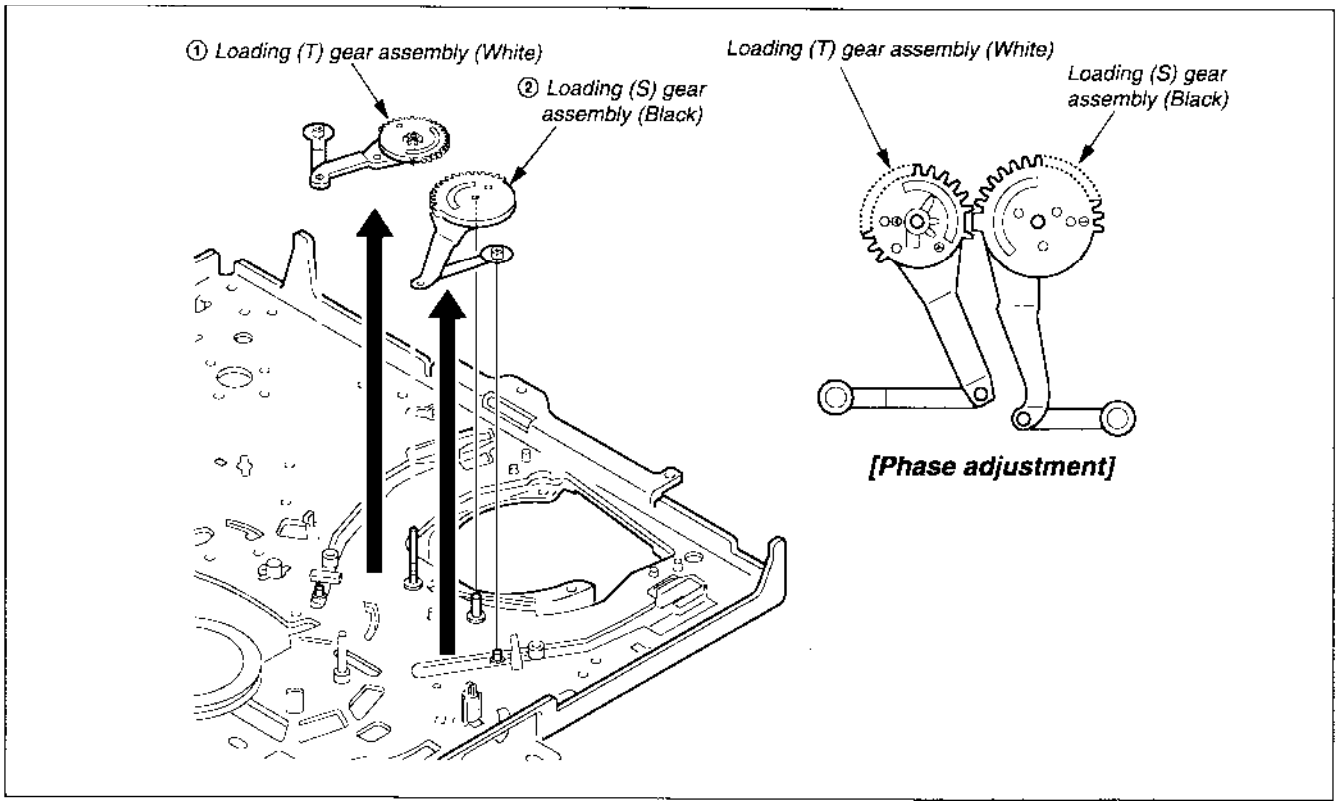


Fig. 3-22

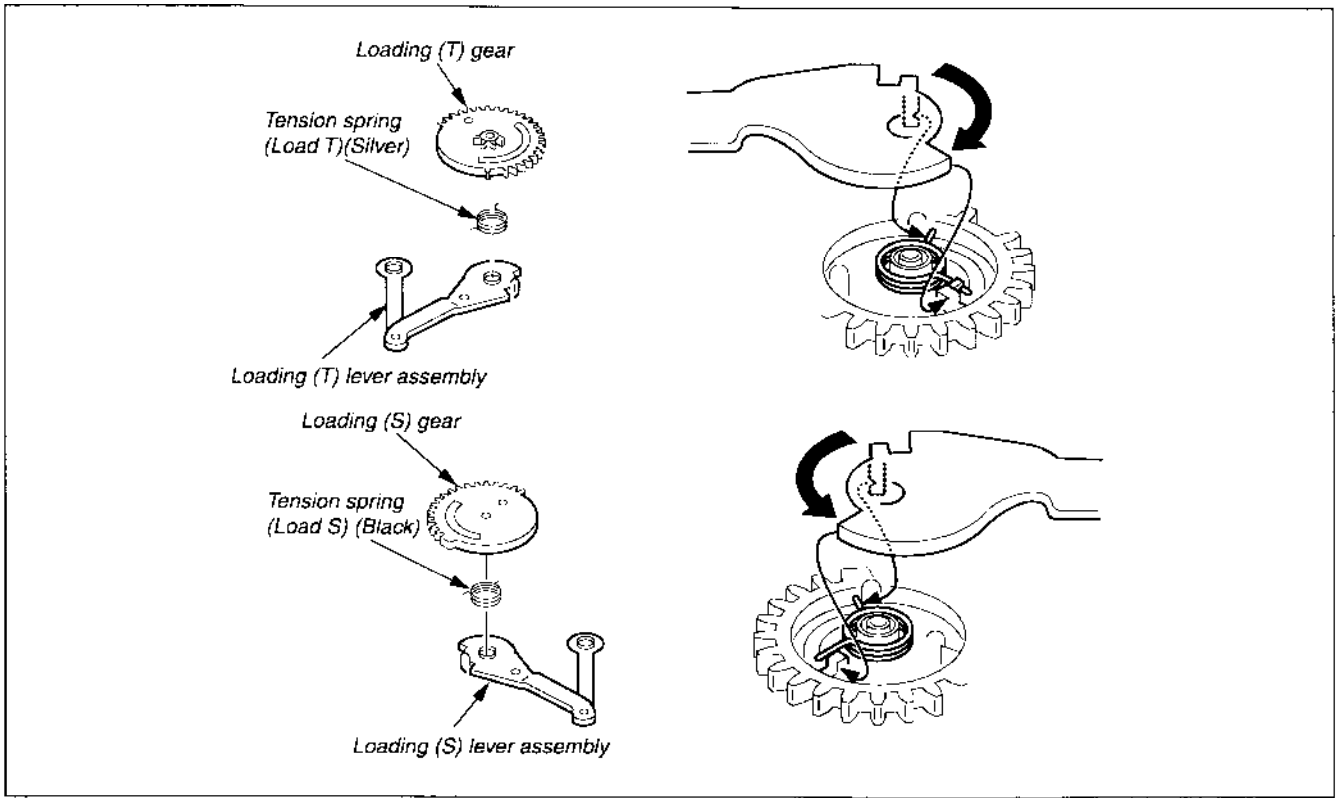


Fig. 3-23

3-19. PULLEY GEAR ASSEMBLY, CLUTCH GEAR

1) Remove rubber belt. (Refer to 3-4.)
2) Remove stopper washer ①.
3) Remove pulley gear assembly ② with clutch gear ③.

[Note on Mounting]
• When attaching them, don't insert strongly.

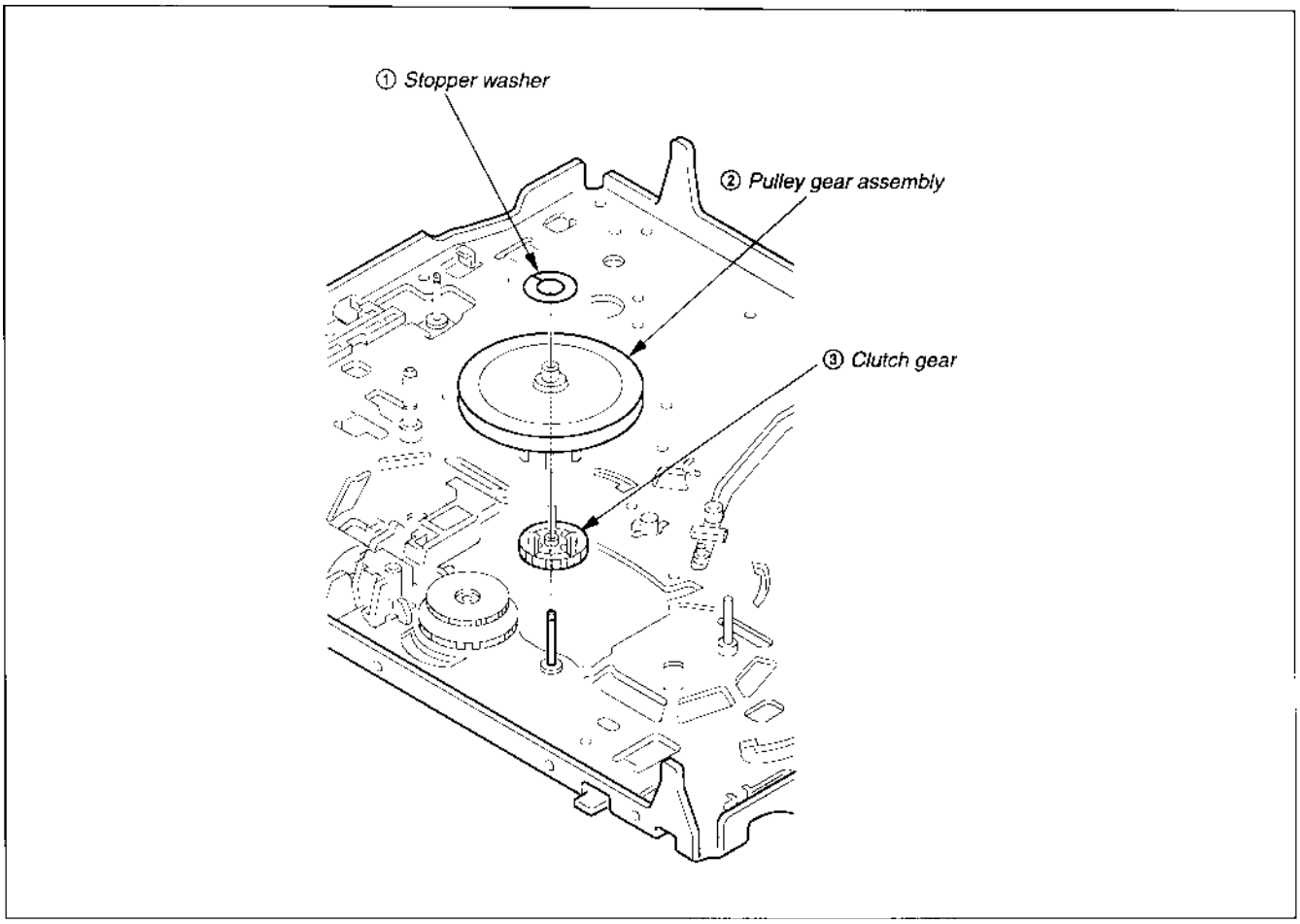


Fig. 3-24

3-20. REEL DIRECT ASSEMBLY

1) Remove rubber belt. (Refer to 3-5.)
2) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
3) Remove stopper washer ① and reel direct assembly ②.

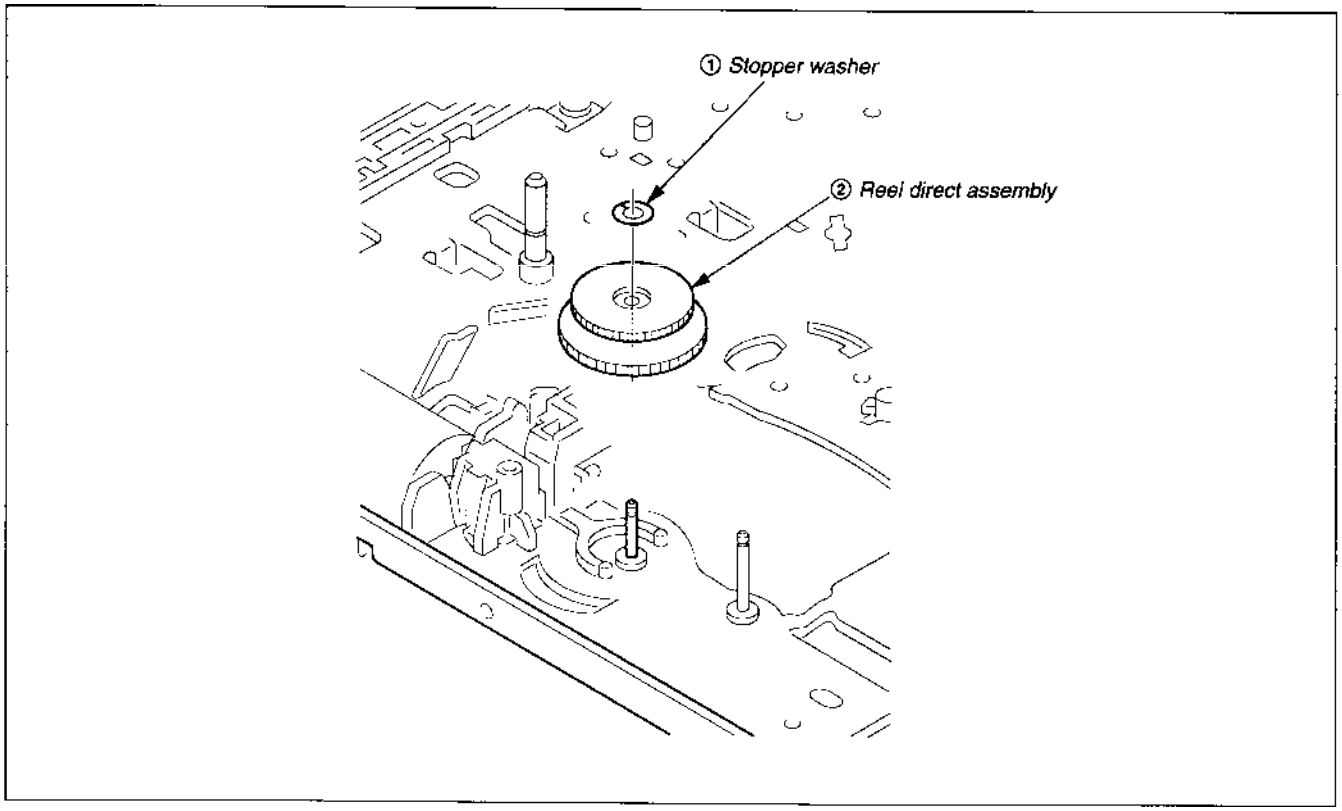


Fig. 3-25

3-21. CASSETTE GUIDE PLATE

1) Remove a screw (P 3 × 8) ① and remove cassette guide plate ②.

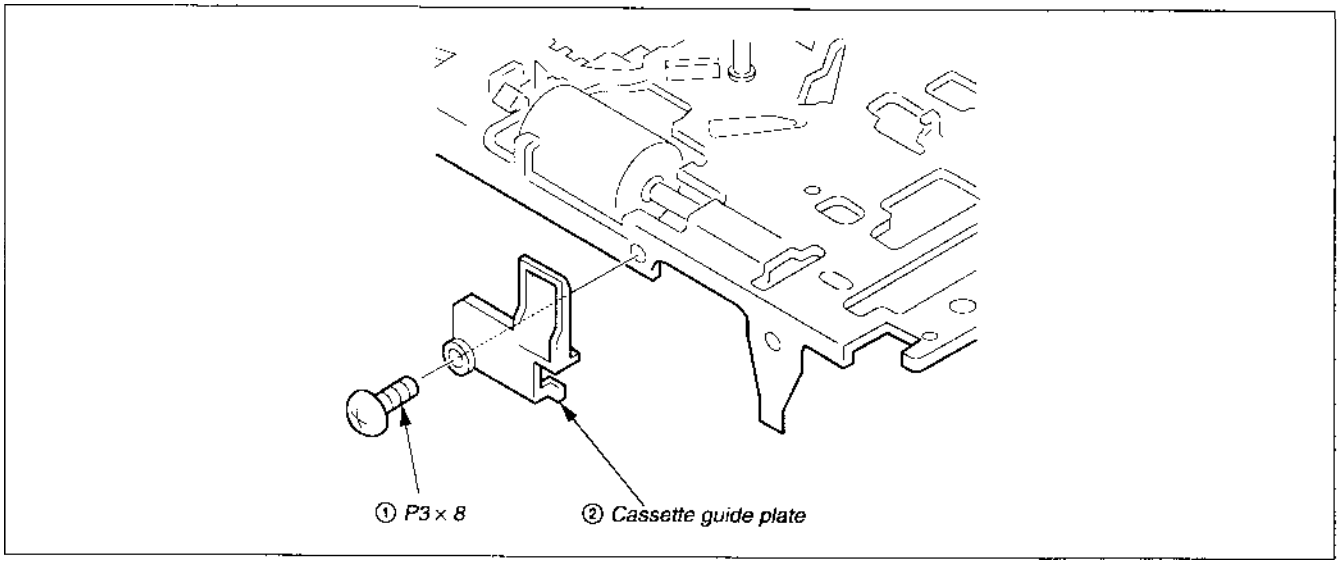


Fig. 3-26

3-23. DRUM BASE, HC ROLLER BLOCK ASSEMBLY

1) Remove the drum assembly. (Refer to 3-2.)
2) Remove screws BVTP 3 × 8 ①.
3) Remove drum base ②.
4) Pull out HC roller assembly ③ straight in the arrow Ⓐ direction.

[Note on Mounting]

- Before attaching drum base ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Tightening screws ① in the order Ⓐ to Ⓑ to Ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

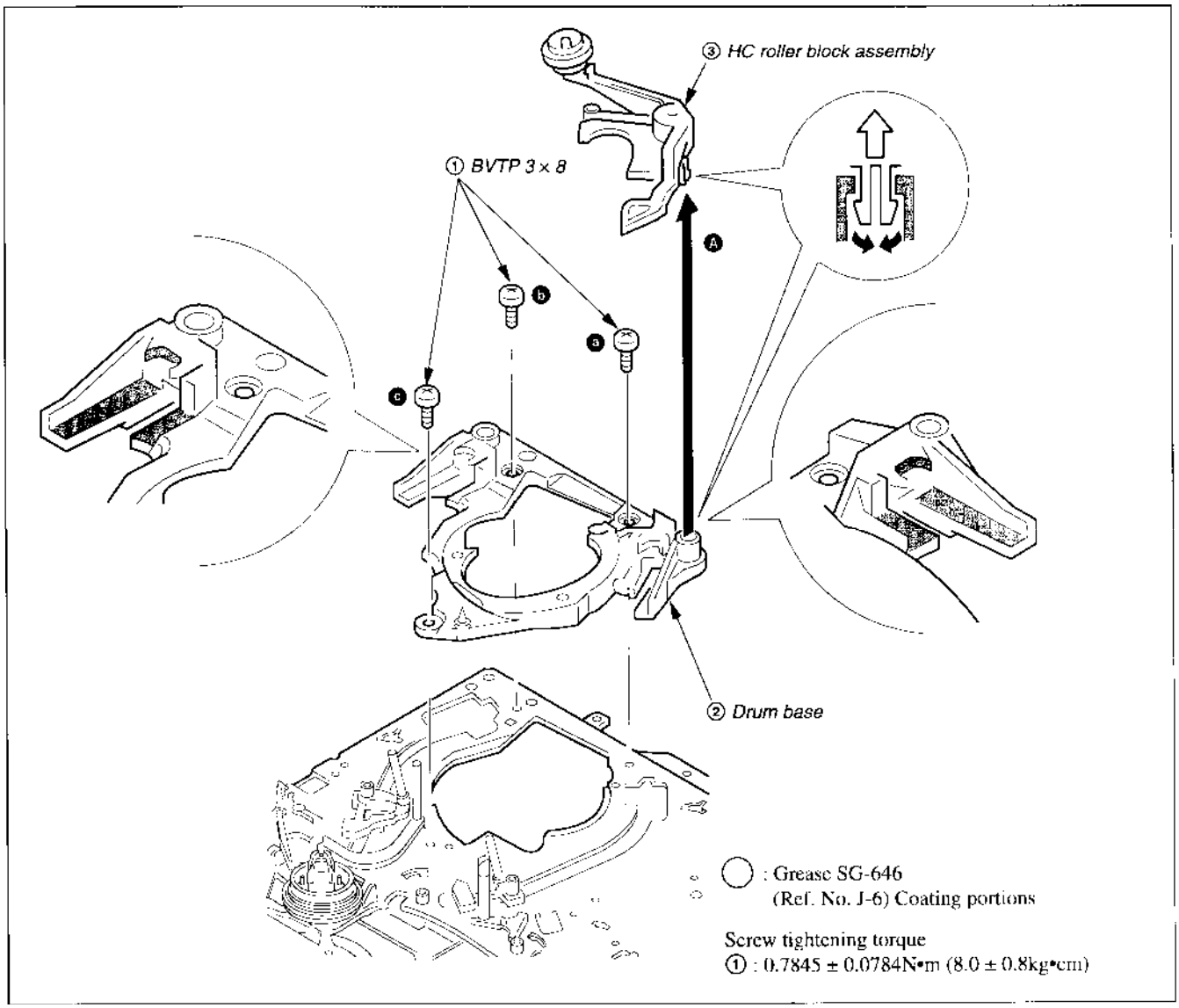


Fig. 3-28

3-24. SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES

1. Guide Roller Assemblies

1) Turn them counterclockwise, then they are out of place, also springs.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

• 4-1. Tape path adjustment

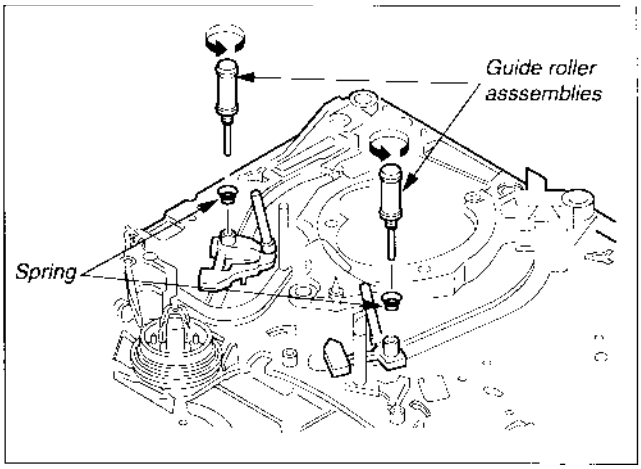


Fig. 3-29

2. Shuttle (S) and Shuttle (T) Assemblies

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove the drum assembly. (Refer to 3-2.)
3) Remove rubber belt. (Refer to 3-4.)
4) Remove FL slider block assembly. (Refer to 3-12.)
5) Remove cam gear. (Refer to 3-13.)
6) Remove slider. (Refer to 3-16.)
7) Remove loading (T) gear assembly and loading (S) gear assembly. (Refer to 3-18.)
8) Remove drum base. (Refer to 3-23.)
9) Remove shuttle (S) or shuttle (T) assembly by slide them backward.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

• 4-1. Tape path adjustment

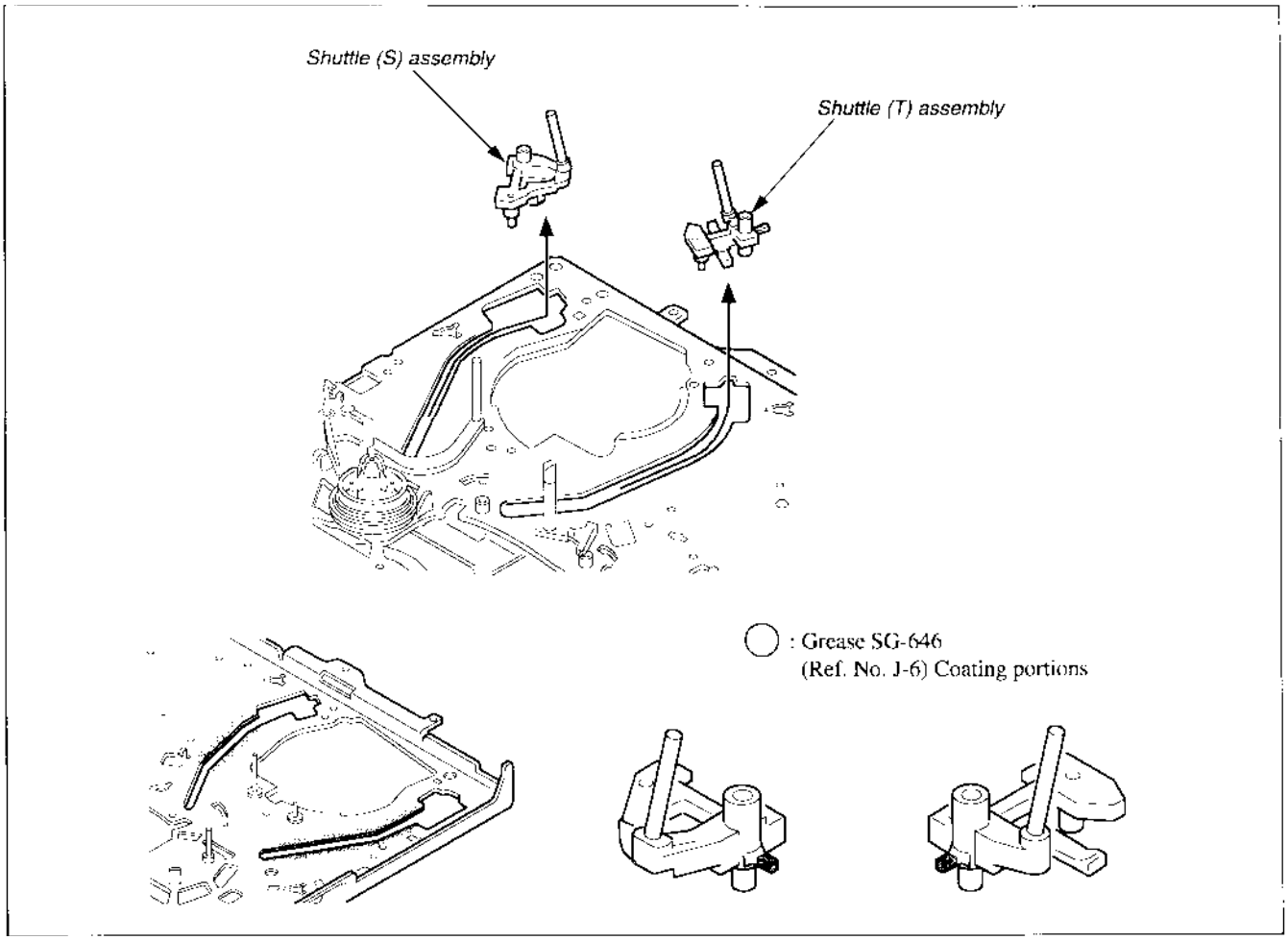


Fig. 3-30

3-25. TG1 ASSEMBLY, REEL (S) TABLE

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove spring (power tension) ① from TG1 driving arm.
3) While spreading claws on the bottom in the arrows Ⓐ direction, pull TG1 assembly ② out.
4) While spreading claws on the top in the arrows Ⓑ direction, pull reel (S) table ③ out.
5) Remove thrust washer ④.

[Note on Mounting]
Don't touch the surface that contacts tape and the braking surface of TG1 assembly with bare hand.

[Adjustment after Mounting]
▪ 4-1. Tape path adjustment

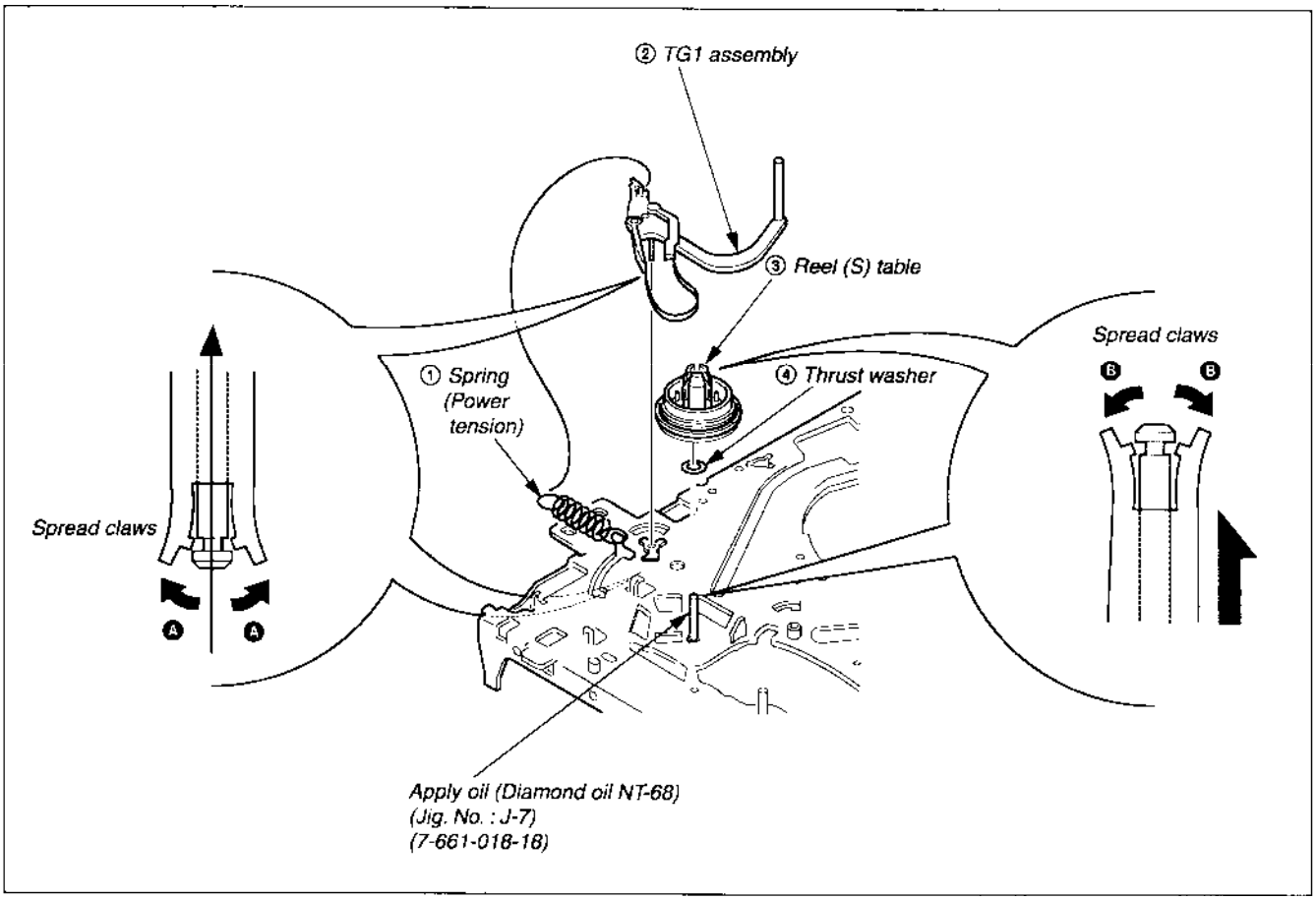


Fig. 3-31

3-26. TG1 FULCRUM BOSS

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove TG1 assembly. (Refer to 3-25.)
3) Turn TG1 fulcrum boss counterclockwise and pull it out.

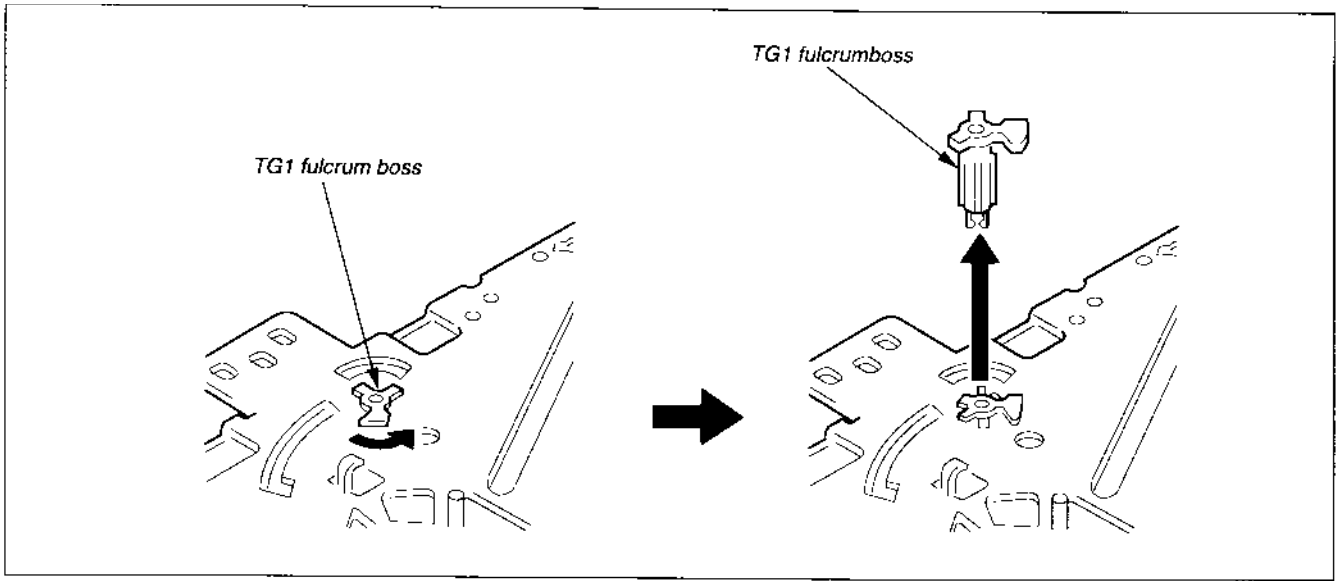


Fig. 3-32

3-27. LUMINOUS PLATE

1) Remove main (T) brake assembly. (Refer to 3-9.)
2) Turn luminous plate clockwise while raising a portion Ⓐ slightly and pull out it.

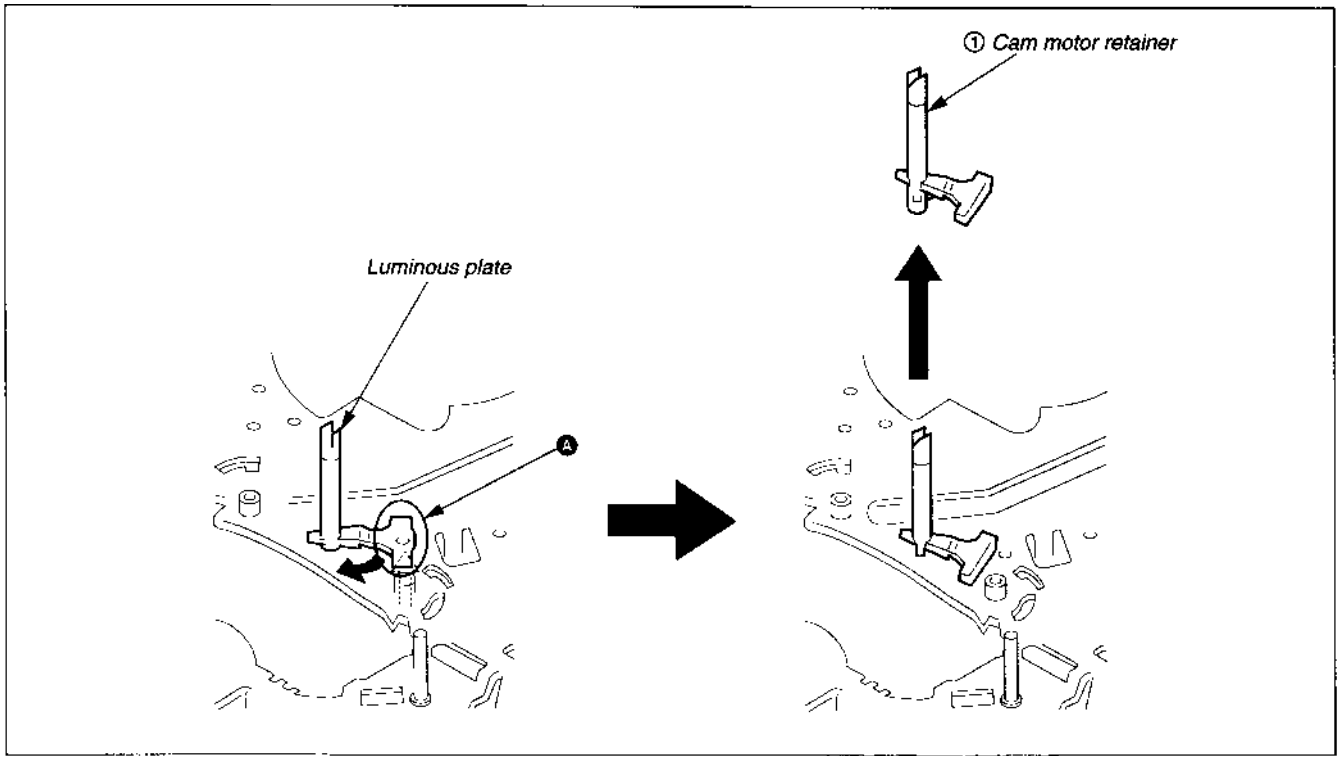


Fig. 3-33

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.
Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.
The tape path system is factory pre-adjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Threading is completed without a cassette loaded (Playback)
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback (SP)
Measuring instrument/tool	Torque cassette VHT-103S (Ref. No. J-1)
Adjustment locations	Position for hooking the tension spring
Specified value	5.05 to 6.52 mN•m (51.5 to 66.5g•cm) (without TC assembly) 3.78 to 5.10 mN•m (38.5 to 52.0g•cm) (with TC assembly)

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards : Move the spring toward direction Ⓐ.
   When the reading is less than the standards : Move the spring toward direction Ⓑ.

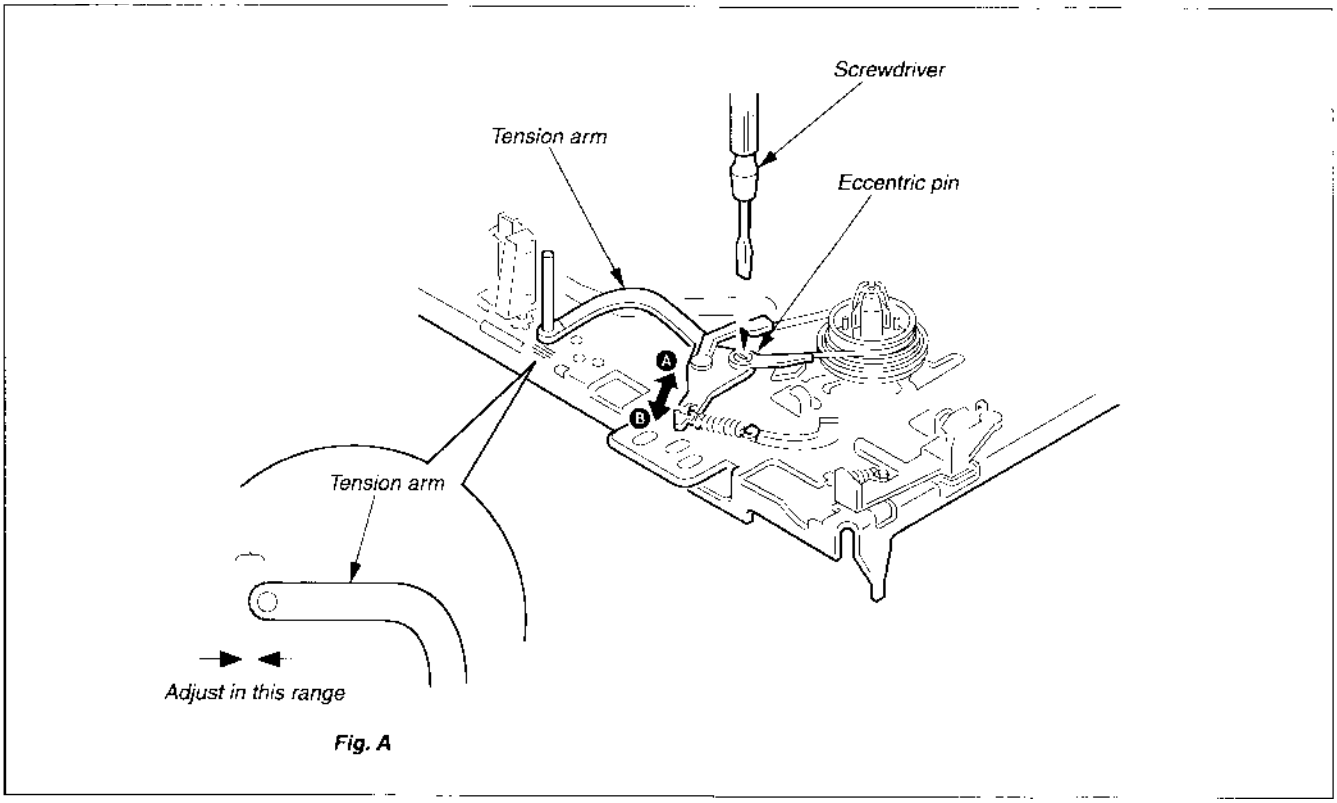


Fig. 4-1

4-1-2. CHECKING THE TENSION AND TORQUE

Purpose : To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.
If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode
Measuring instrument	Torque cassette VHT-103S, VHT-404S

Item	VTR operation mode	Reel to be measured	Measurement value
Review torque	Review	S reel	12.7 to 19.6 mN•m (130 to 200 g•cm)
Take-up torque	Playback	T reel	4.41 to 10.8 mN•m (45 to 110g•cm)
Back tension torque	Playback	S reel	See section 4-1-1.

4-1-3. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the [▲] and [▼] tracking control keys, press both the [▲] and [▼] tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking [AUTO/MANUAL] key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/ 52PL(PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

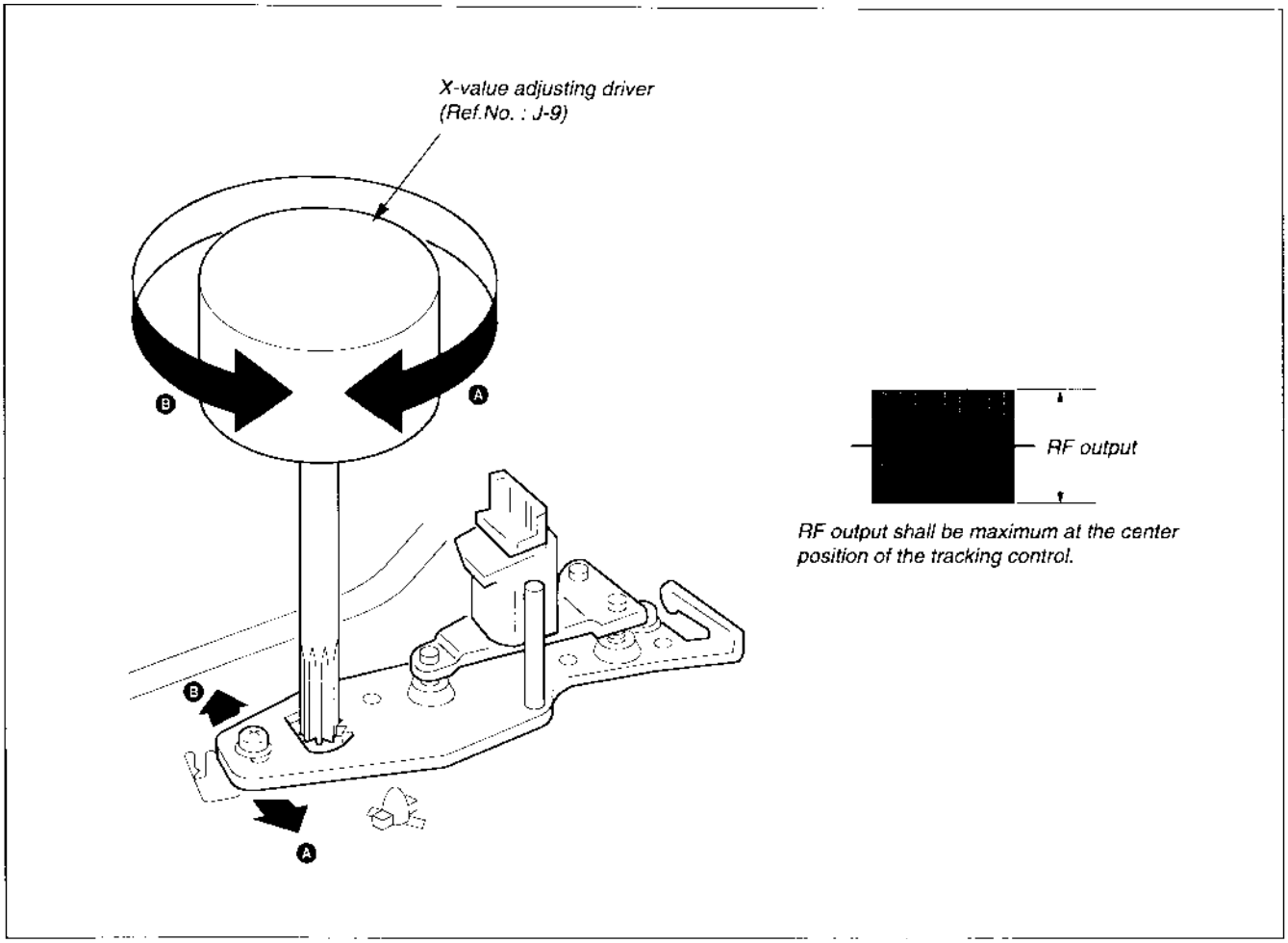


Fig. 4-2

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the ACE head position with X-value adjusting driver where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

* TYPE OF DRUM

DZH-68D	DZH-89A
DZH-71D	DZH-90A
DZH-77A	DZH-91A
DZH-78A	DZH-92A
DZH-78B	

1. Adjusting X-value (Using the tape having the version No.)

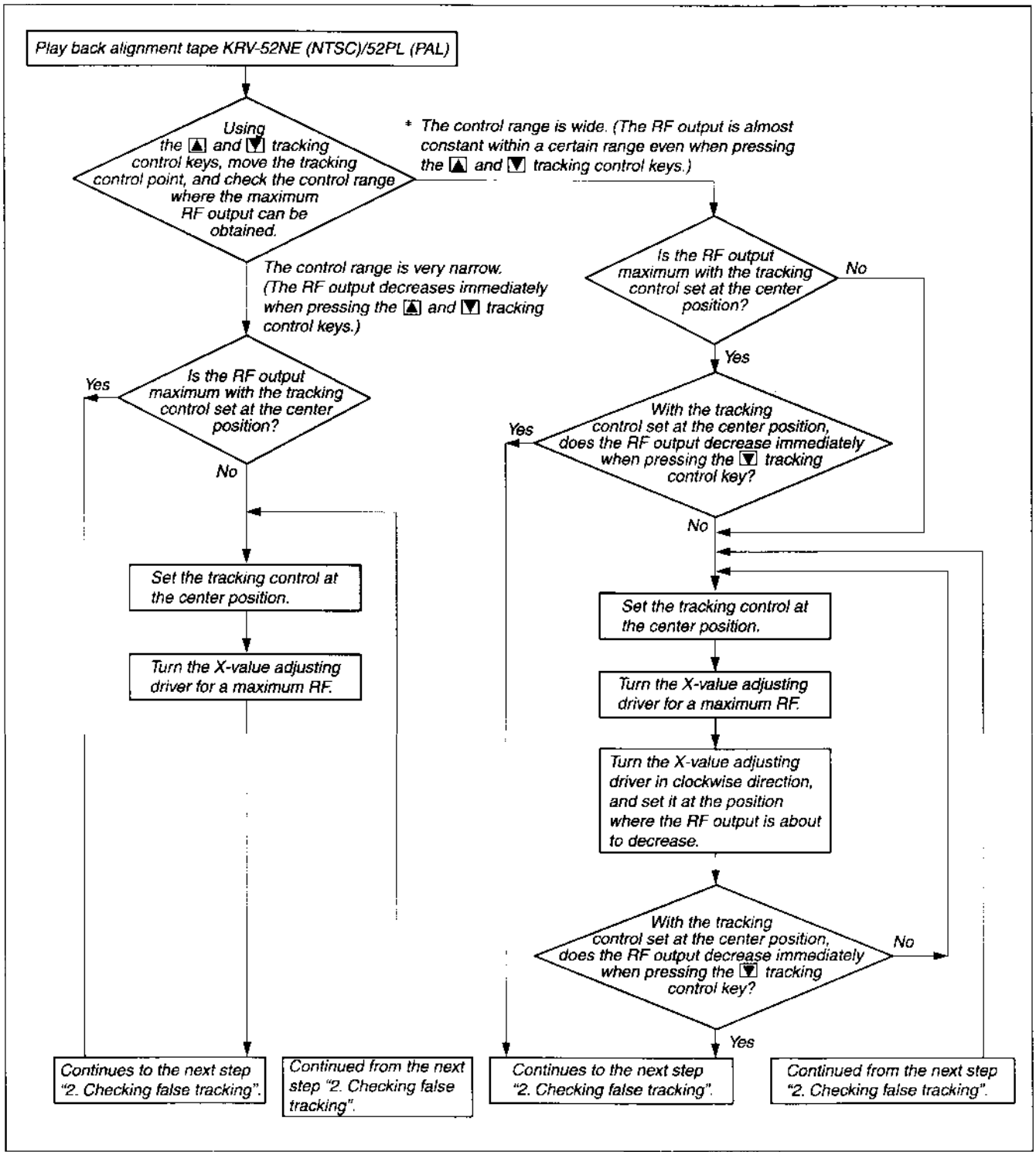


Table. 4-1

2. Checking false tracking
(Using the tape having the version No.)

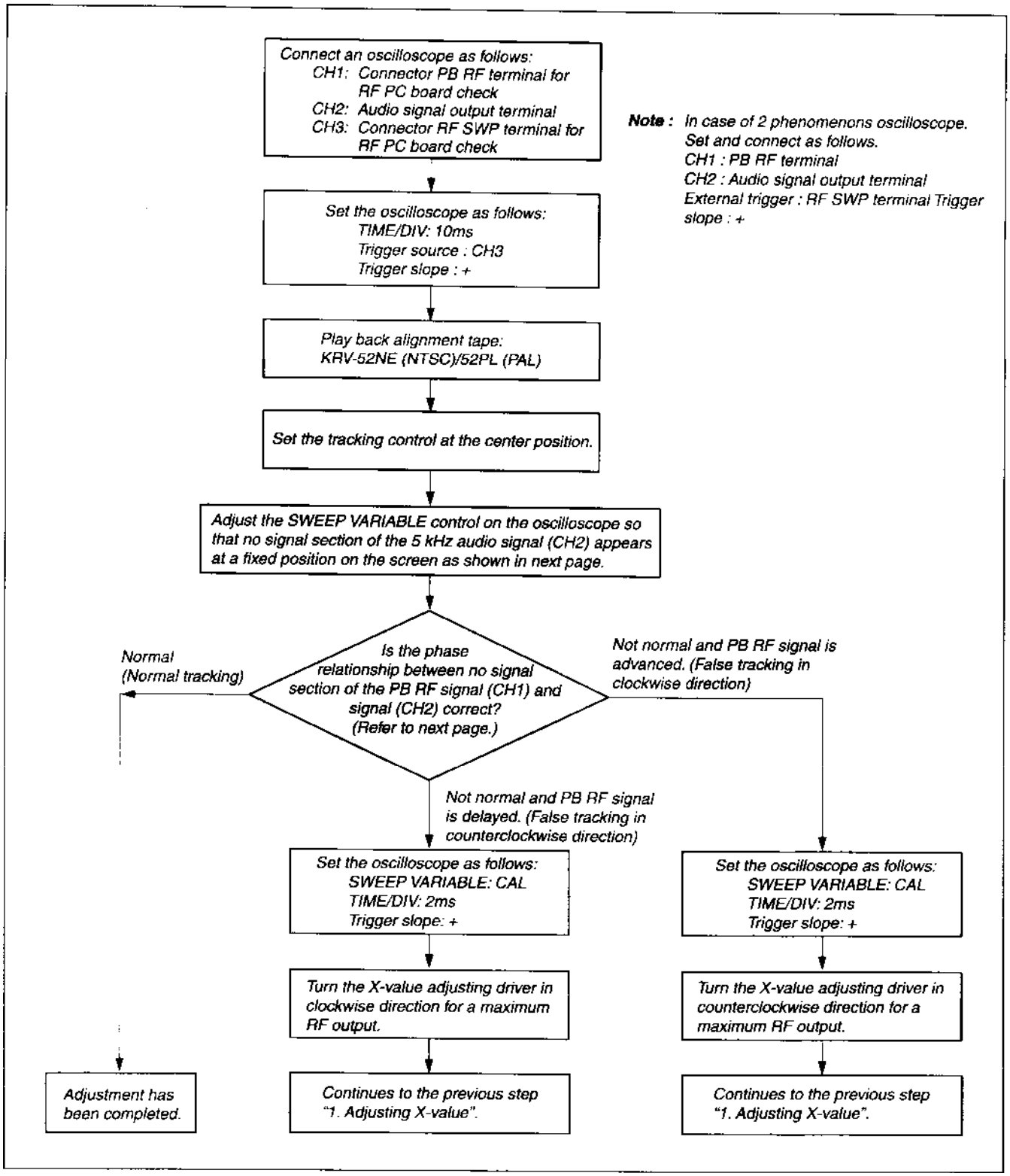


Table. 4-2

Using the tape having the version No.

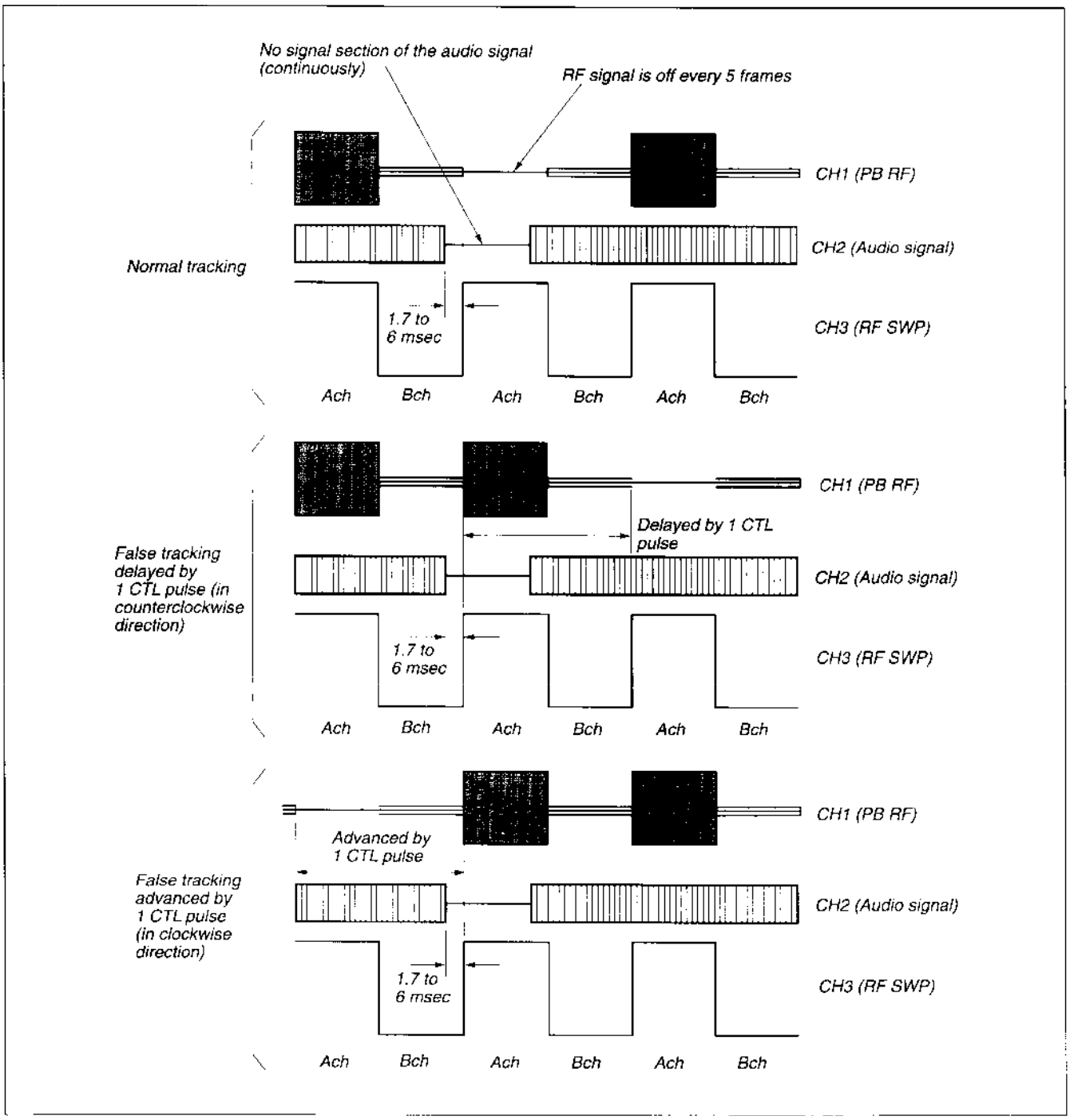


Table. 4-3

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

1. Adjusting X-value
(Using the tape having the version No.)

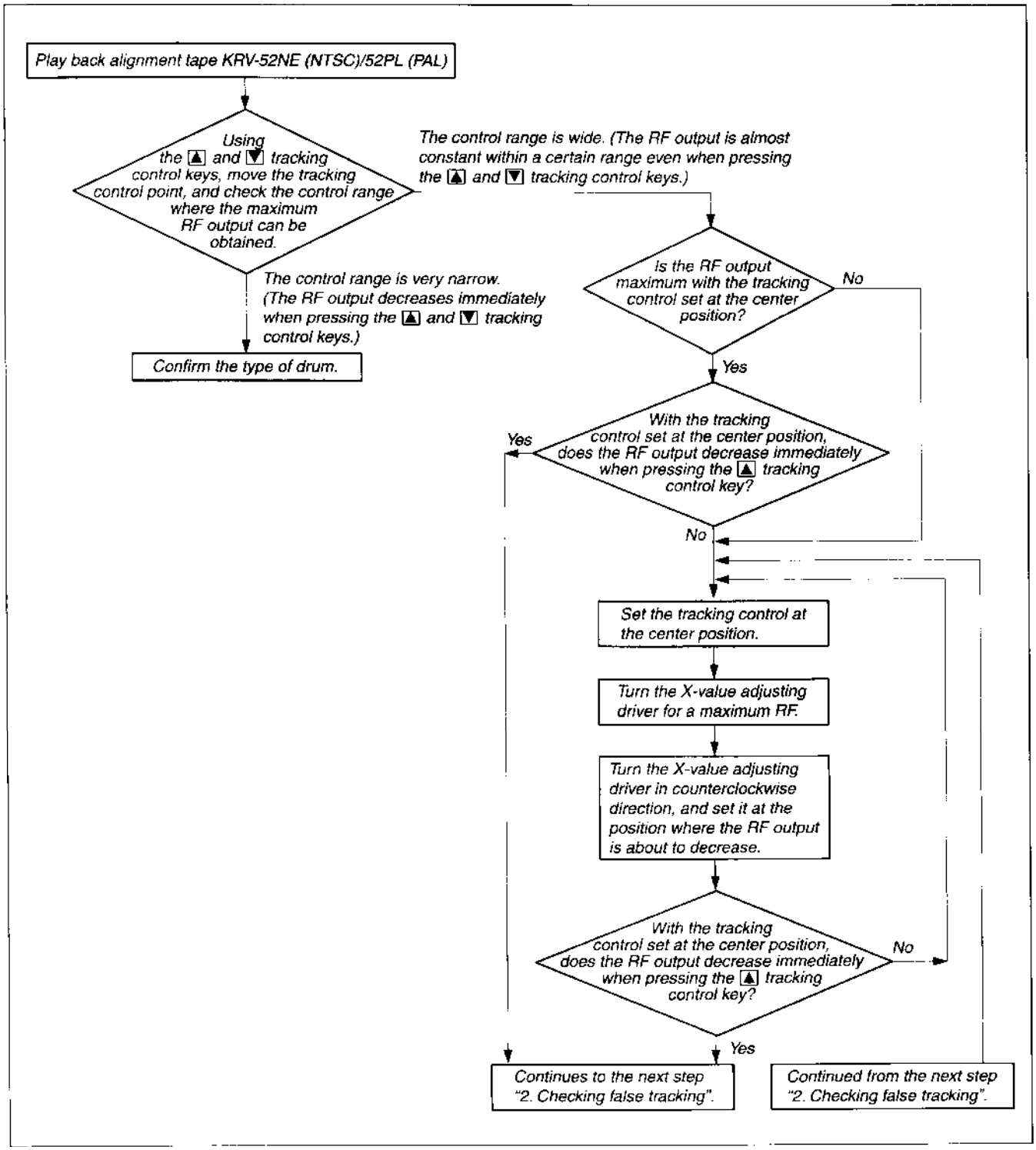


Table. 4-4

2. Checking false tracking (Using the tape having the version No.)

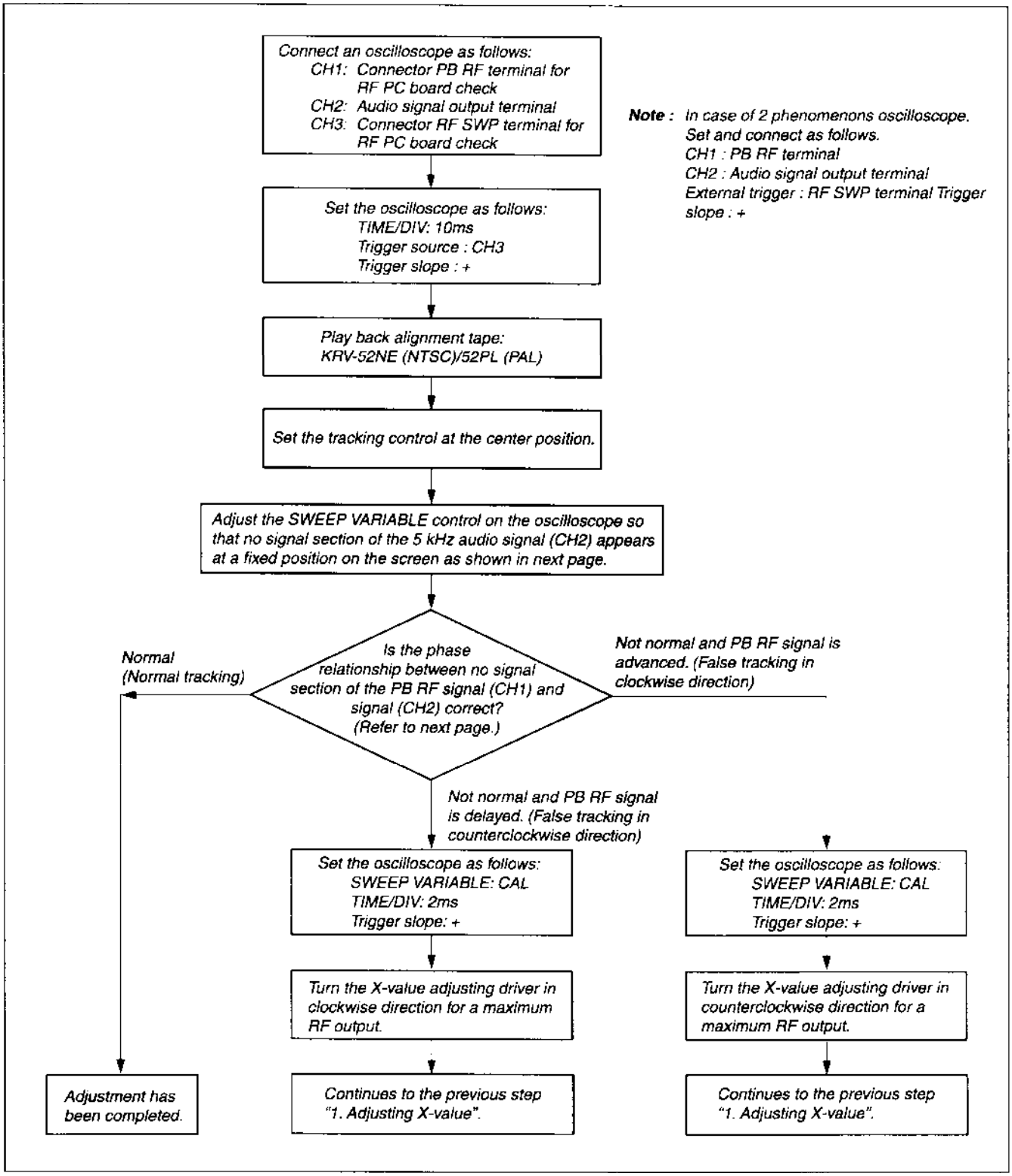


Table. 4-5

Using the tape having the version No.

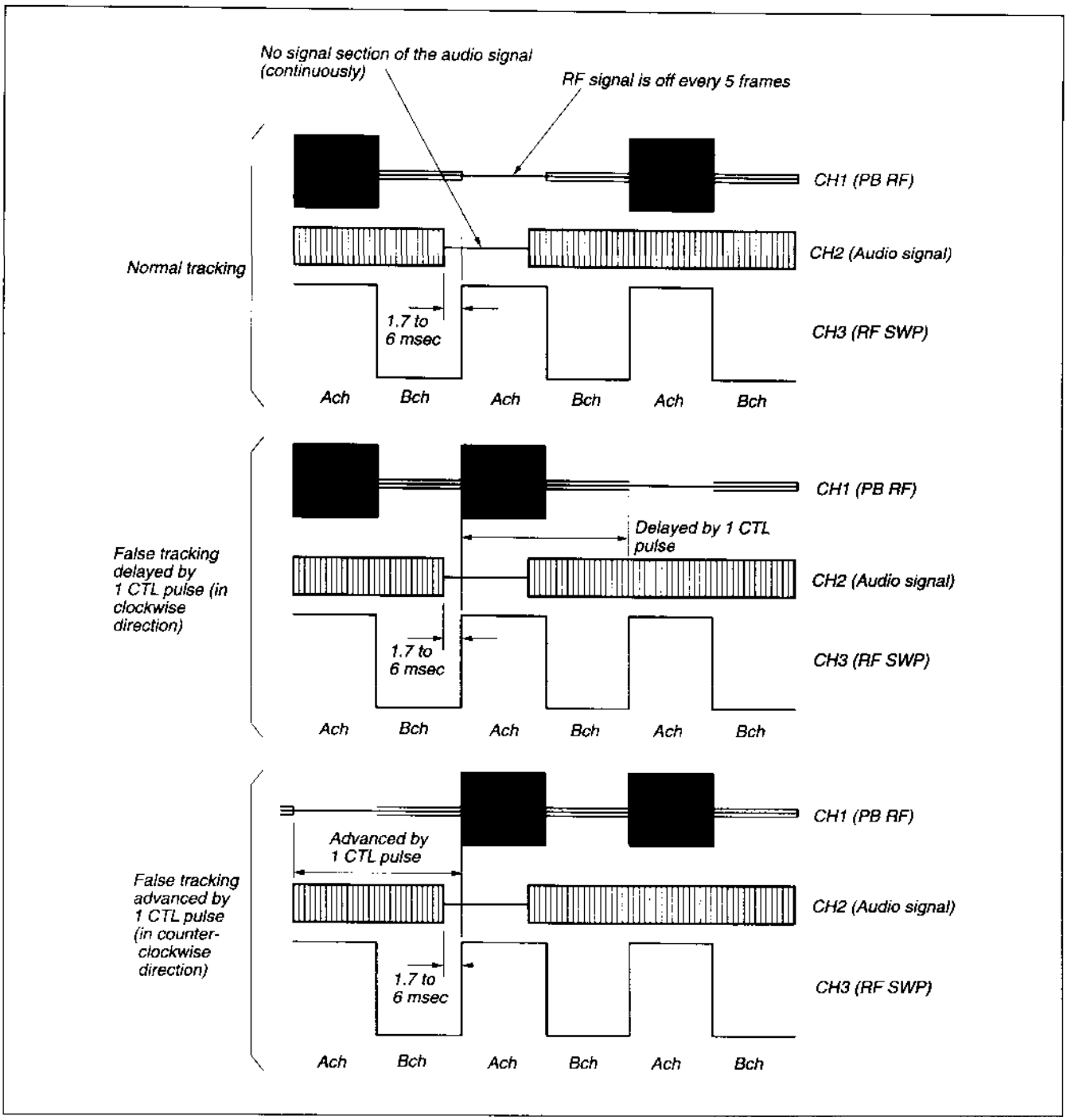


Table. 4-6

3-22. CAM MOTOR ASSEMBLY, LIMITER SELECTION ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove worm wheel. (Refer to 3-13.)
5) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
6) Remove and reel direct assembly. (Refer to 3-20.)
7) Remove cam motor retainer ① in the arrow Ⓑ while pushing its claw in the arrow Ⓐ direction.
8) Then cam motor assembly ② is out of place.
9) Remove the boss of limiter selection arm ③ from the hole on the mechanical chassis by pushing in the arrow Ⓒ direction and push it in the arrow Ⓓ direction and remove it in the arrow Ⓔ direction.

[Note on Mounting]

• Before attaching cam motor assembly ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).

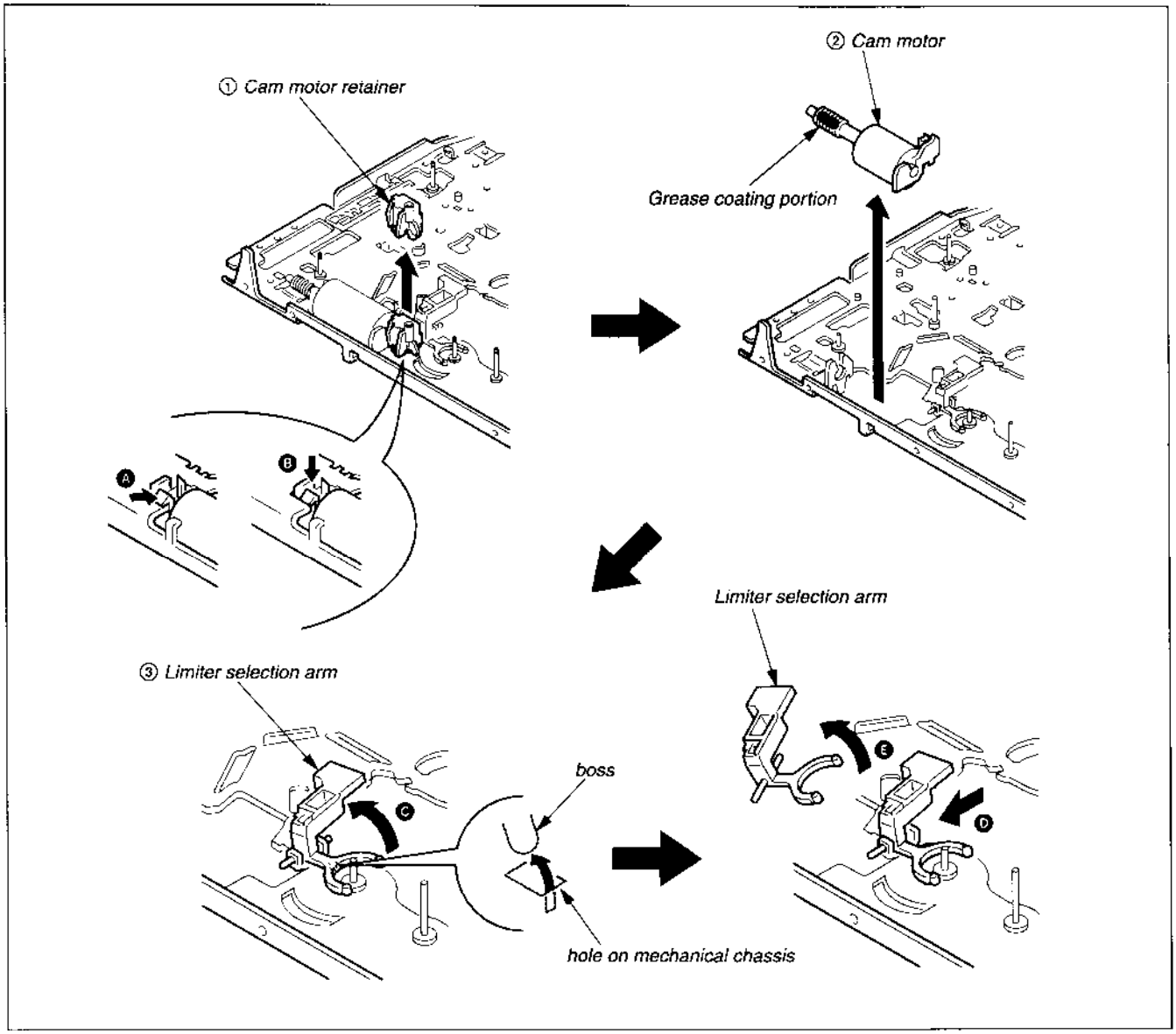


Fig. 3-27

Reference

• X-VALUE ADJUSTMENT
(Using KRV-52NE having no version No.)

Purpose : To obtain compatibility with other VCRs.

Precaution : Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys. Press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2 : Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

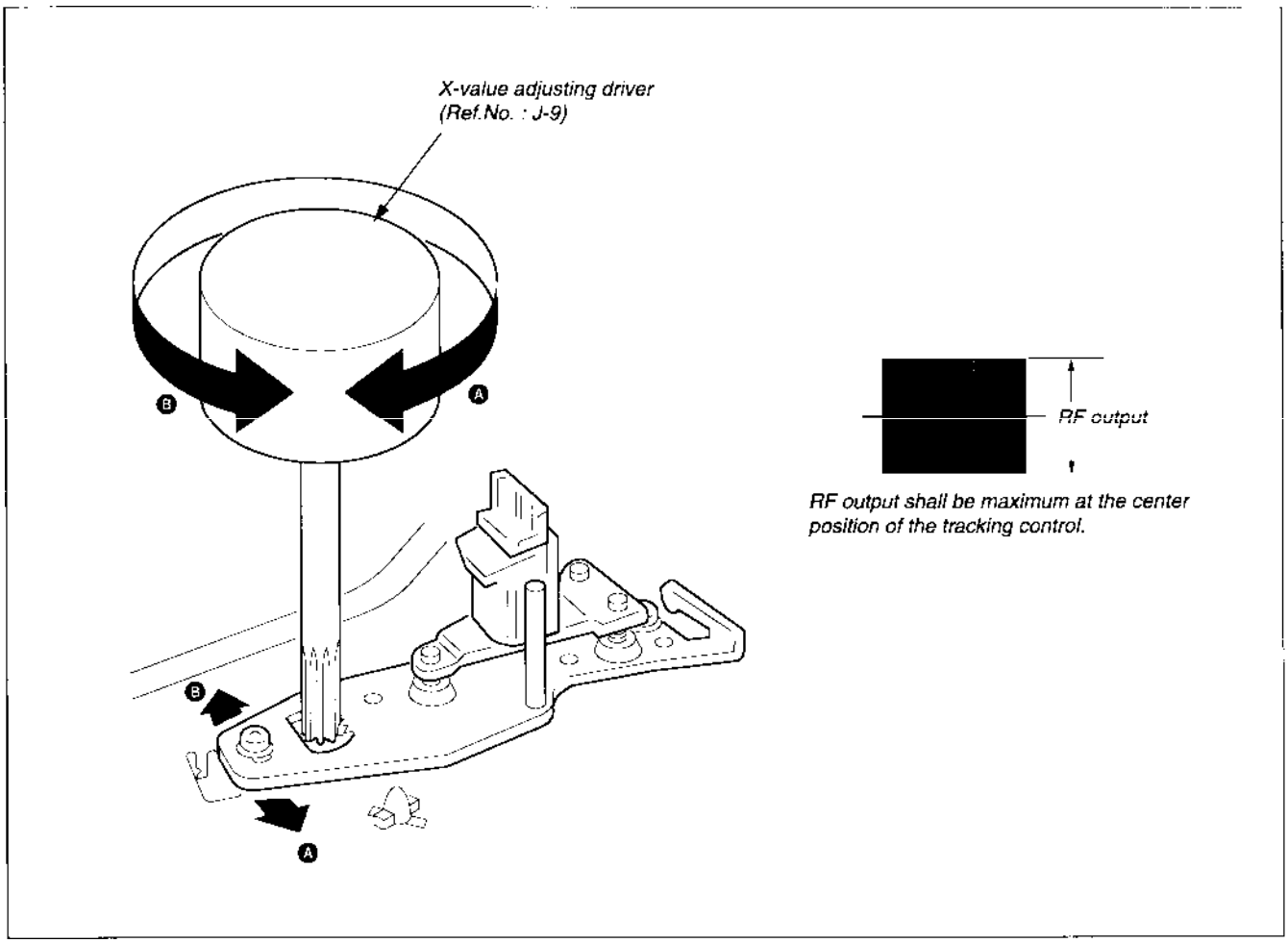


Fig. 4-3

X-VALUE ADJUSTMENT
(Using the tape having no version No.)

* TYPE OF DRUM

DZH-68D	DZH-89A
DZH-71D	DZH-90A
DZH-77A	DZH-91A
DZH-78A	DZH-92A
DZH-78B	

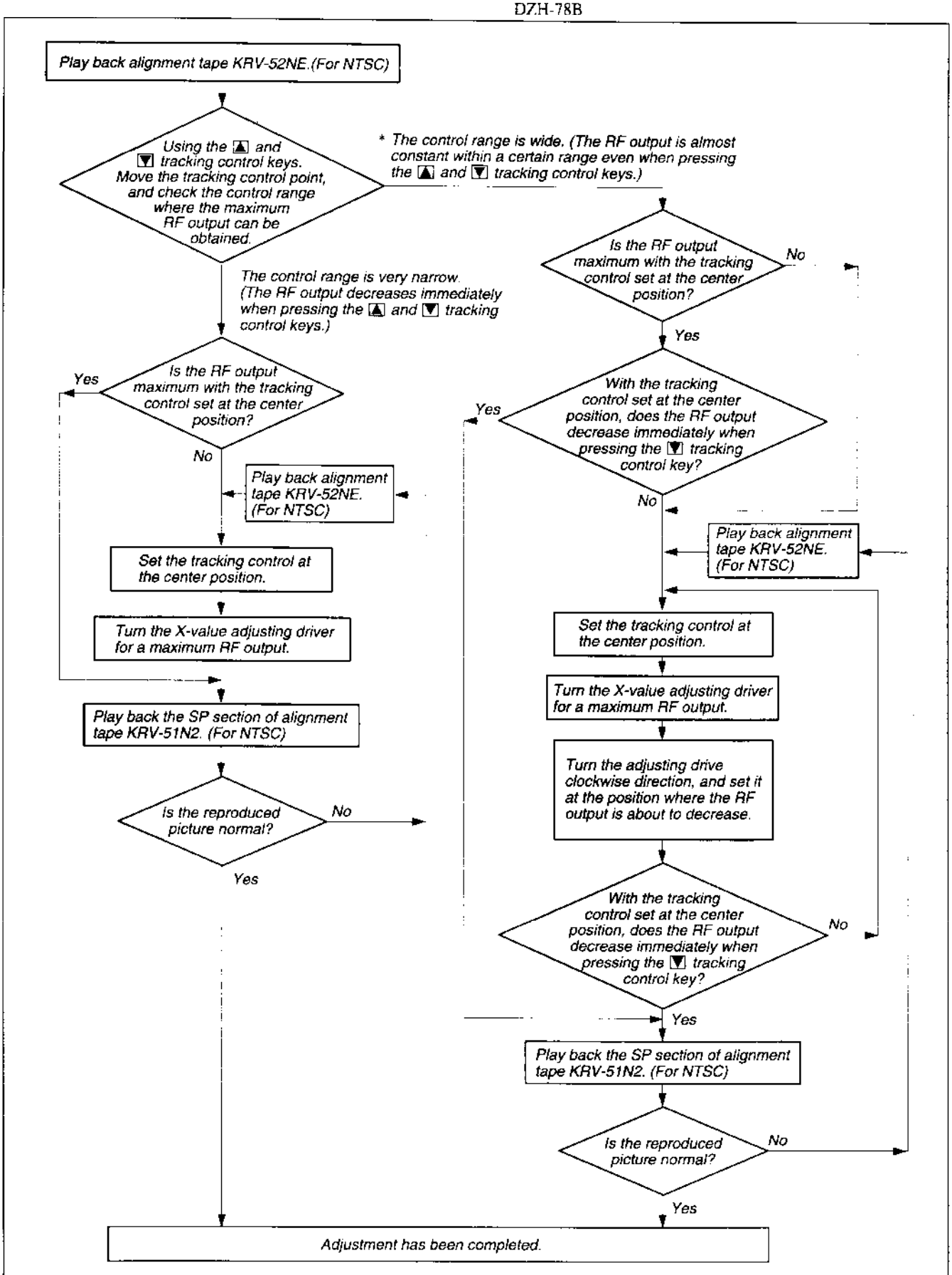


Table. 4-7

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

Using the tape having the version No.

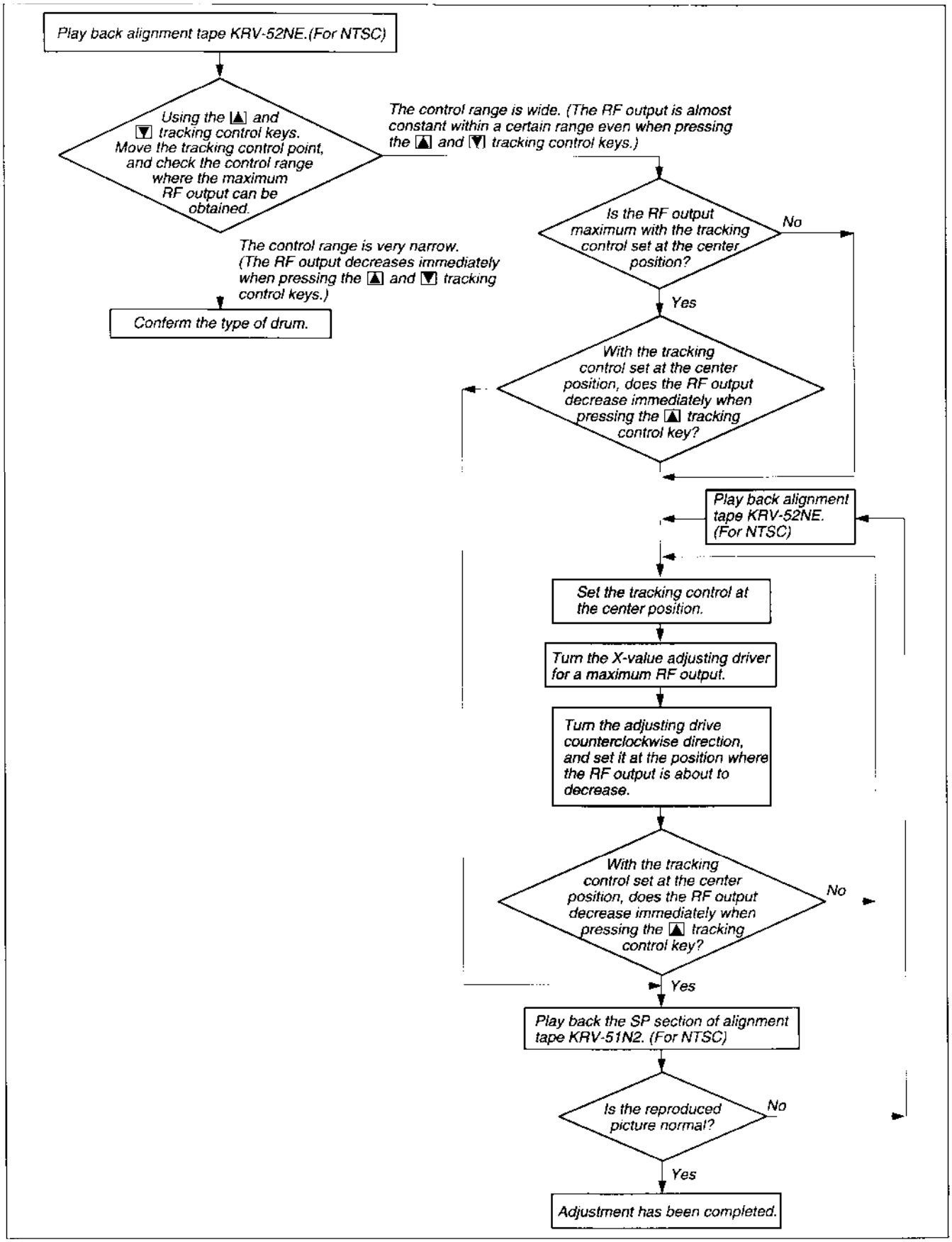


Table. 4-9

4-1-4. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No. 3 tape guide roller Height adjustment screw for No. 6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 4-1-2. X-VALUE ADJUSTMENT.

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the [▲] and [▼] tracking control keys, press both the [▲] and [▼] tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking [AUTO/MANUAL] key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

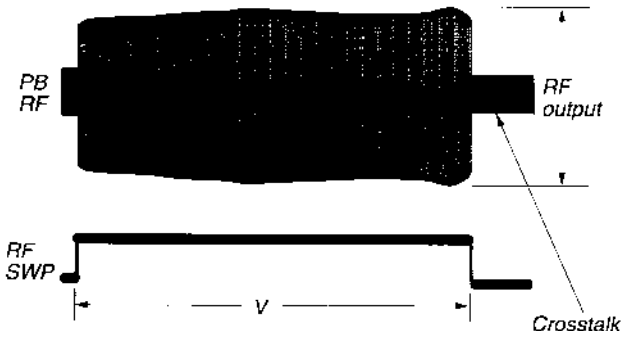


Fig. 4-4

3) Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 so that the RF output envelope becomes as flat as possible.
4) Press the [▲] tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
5) Press the [▼] tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

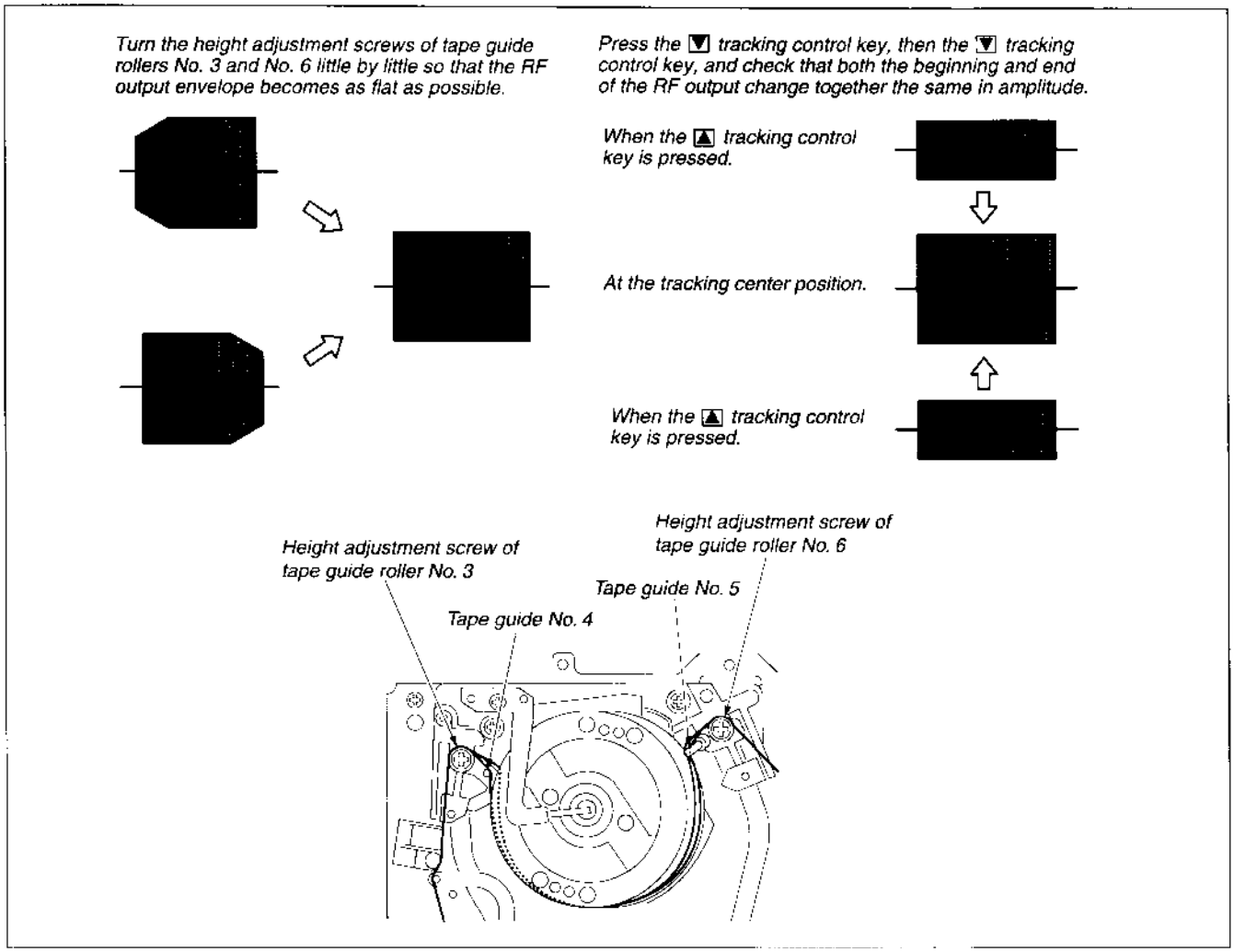


Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY HEIGHT AND AZIMUTH ADJUSTMENT

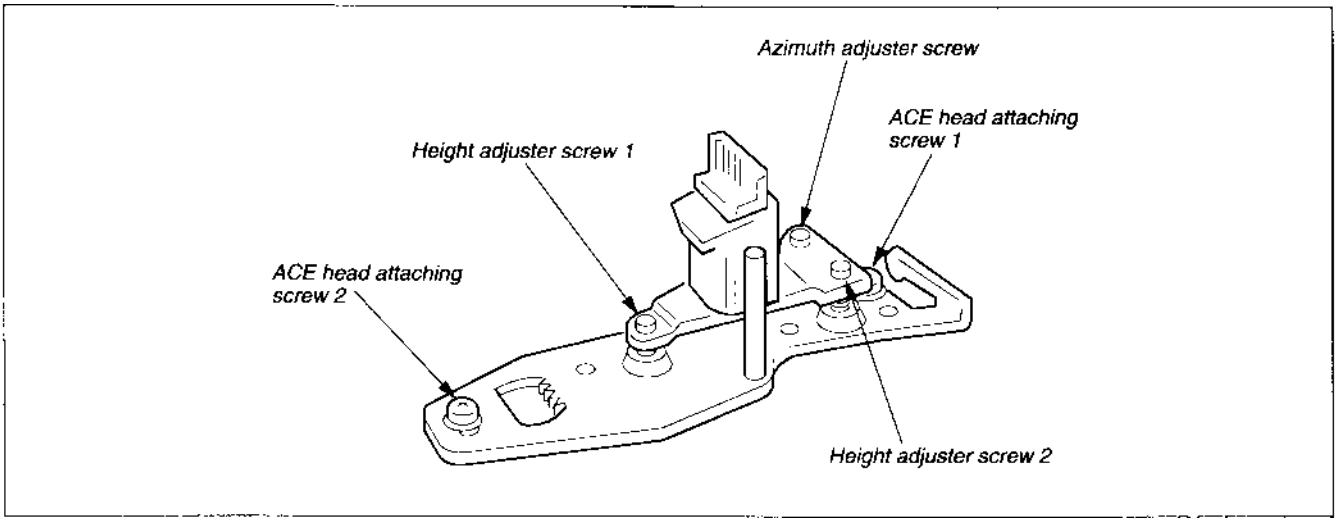


Fig. 4-6

Mode	Playback
Signal	Alignment tape: (5kHz) KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster screws 1 and 2.

[Adjustment Method]

1) Adjust the height as shown in the figure with turning the height adjuster screws 1 and 2, and the azimuth adjuster screw in the same direction, the same degree gradually.

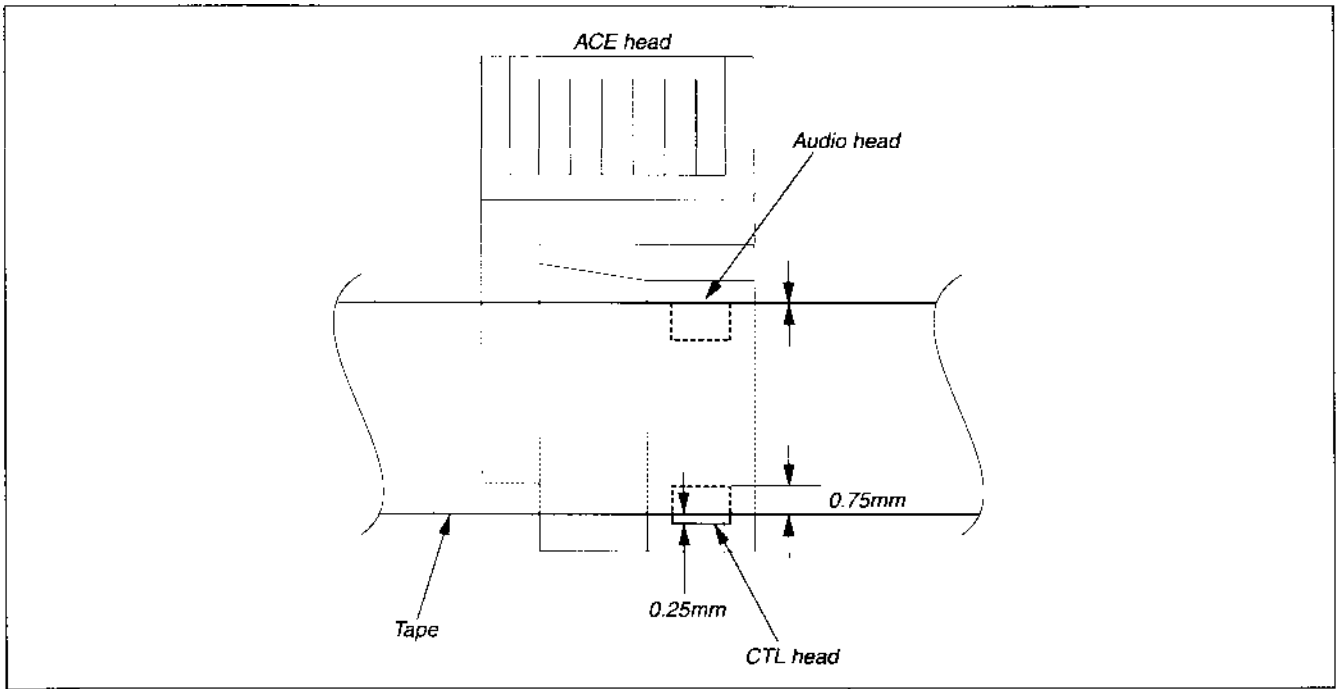


Fig. 4-7

2) Alternately adjust the azimuth adjuster screw to make A maximum and B minimum. (To maintain even audio output at maximum with minimum deviation.)
3) Perform section 4-1-2. X-VALUE ADJUSTMENT.
4) Tighten ACE head attaching screw 2. (Torque: More than 0.29 N•m (3.0 kg•cm)).

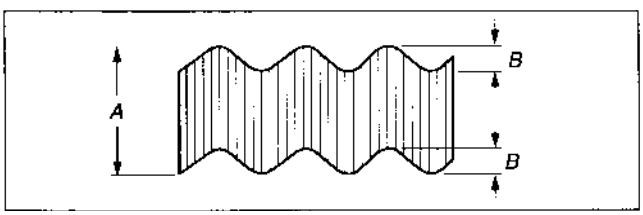


Fig. 4-8

4-1-6. X-VALUE FINE ADJUSTMENT

The procedure is the same as the item 4-1-3. Please refer to pages 37 to 46.

4-1-7. HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8

Note : Applicable to the set having TG8 height adjusting screw as shown in the figure. Do not adjust when TG8 height adjusting screw is not attached.

Mode	Playback
Signal	Any signal on thin tape (T-160 or the like) near the tape top.
Adjustment location	TG8 height adjusting screw

[Adjustment Method]

1) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 10 seconds CUE running.
2) When there is curls or wrinkles, adjust with TG8 height adjusting screw.
3) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 8 seconds REV running.
4) When there is curls or wrinkles, adjust with TG8 height adjusting screw.

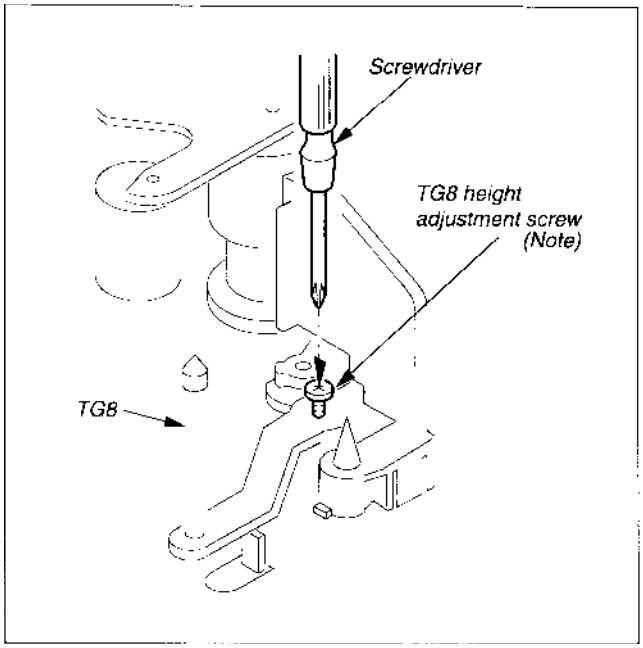


Fig. 4-9

4-1-8. CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT

1) Set the RF output to the maximum level using the tracking buttons.

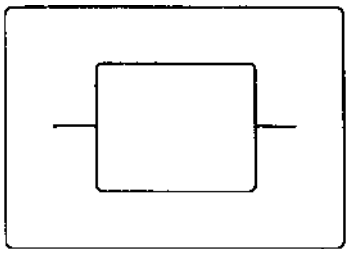


Fig. 4-10-1

2) Perform fine adjustment of the voltage level range of the oscilloscope, adjust the RF output deviation to within 6 gradations.

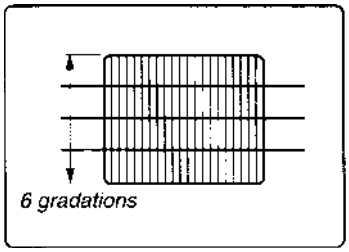


Fig. 4-10-2

3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 4 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.

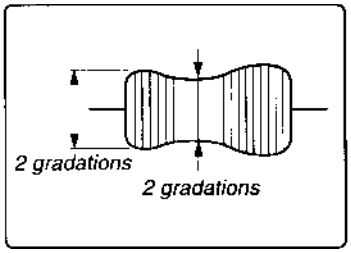


Fig. 4-10-3

5) Check that RF output fluctuation between minimum and maximum levels is within 13%.

5. EXPLODED VIEWS

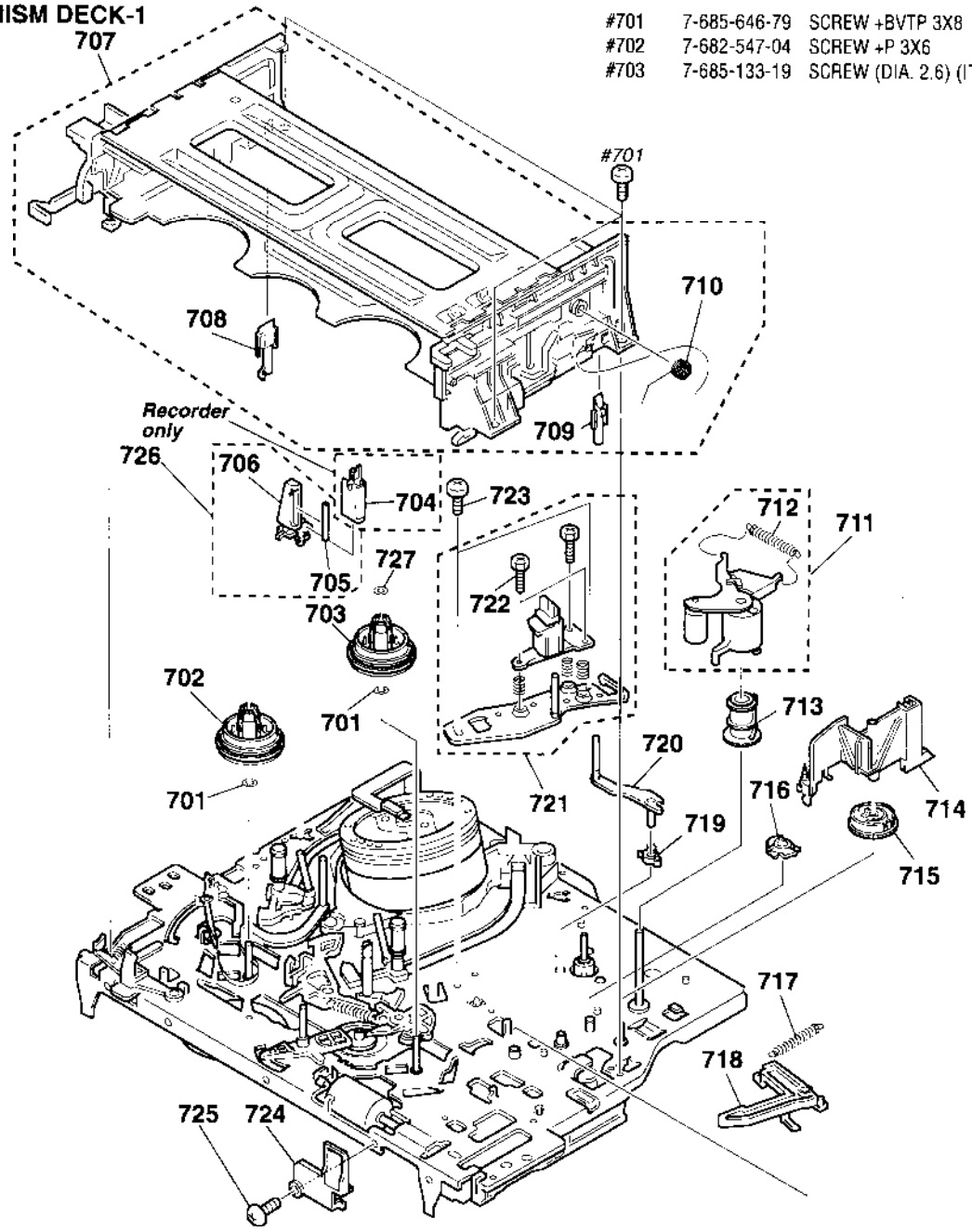
Note:

- -XX, -X mean standardized parts, so they may have some differences 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 LIST
****

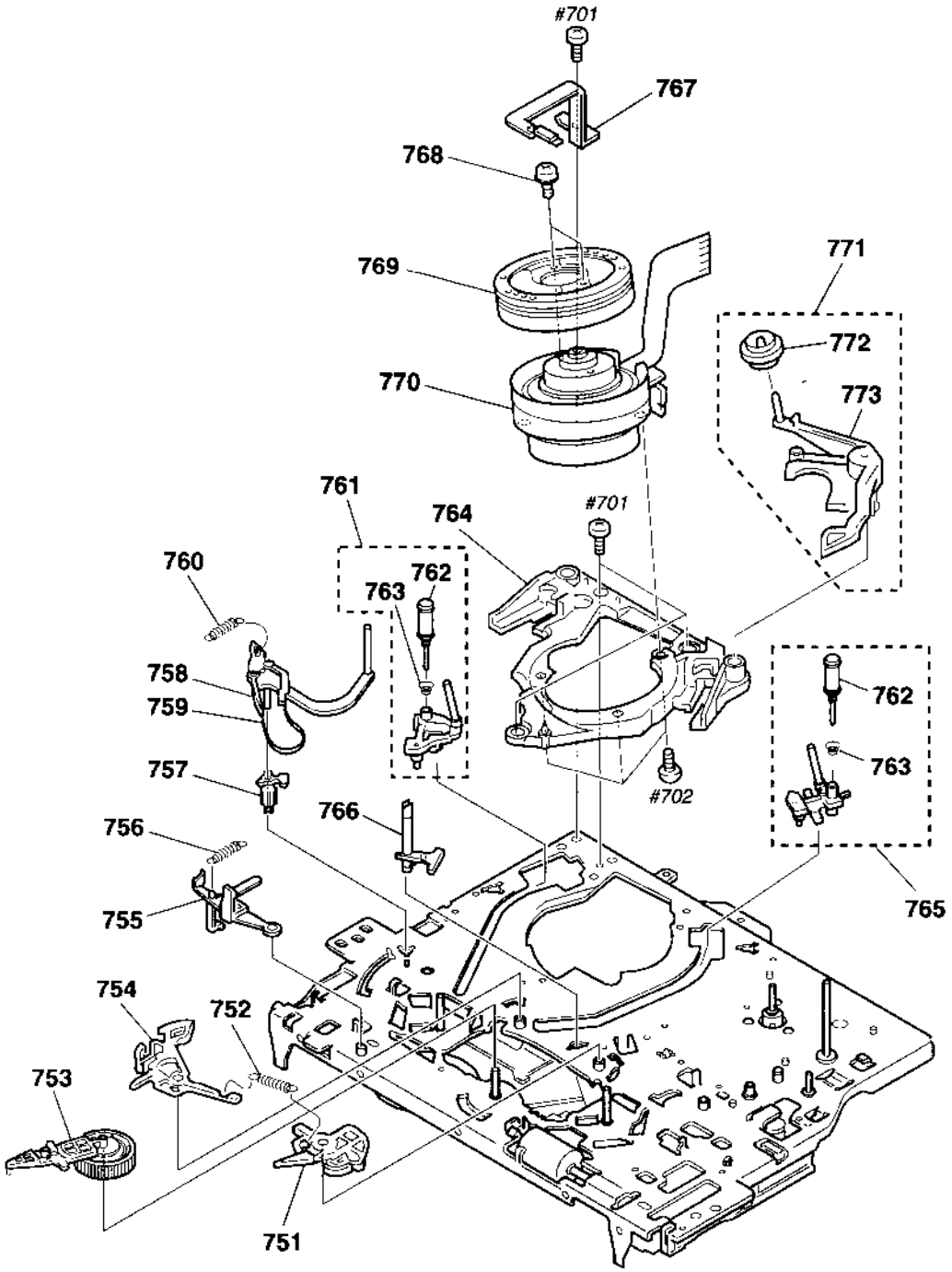
#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#702	7-682-547-04	SCREW +P 3X6
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)

5-1. MECHANISM DECK-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S) (GRAY)	
703	3-977-508-01	TABLE, REEL (T) (BLACK)	
704	1-500-144-11	HEAD, FE (RECORDER)	
705	3-977-495-01	SHAFT TG2 (RECORDER)	
706	3-977-494-01	HOLDER, FEH (RECORDER)	
707	A-6759-619-A	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW	
724	3-978-485-01	PLATE, GUIDE CASSETTE	
725	3-696-519-01	+P IT3 SCREW 3X8	
726	X-3947-817-1	FEH, ASSY (PLAYER)	
727	3-977-443-01	WASHER, STOPPER	

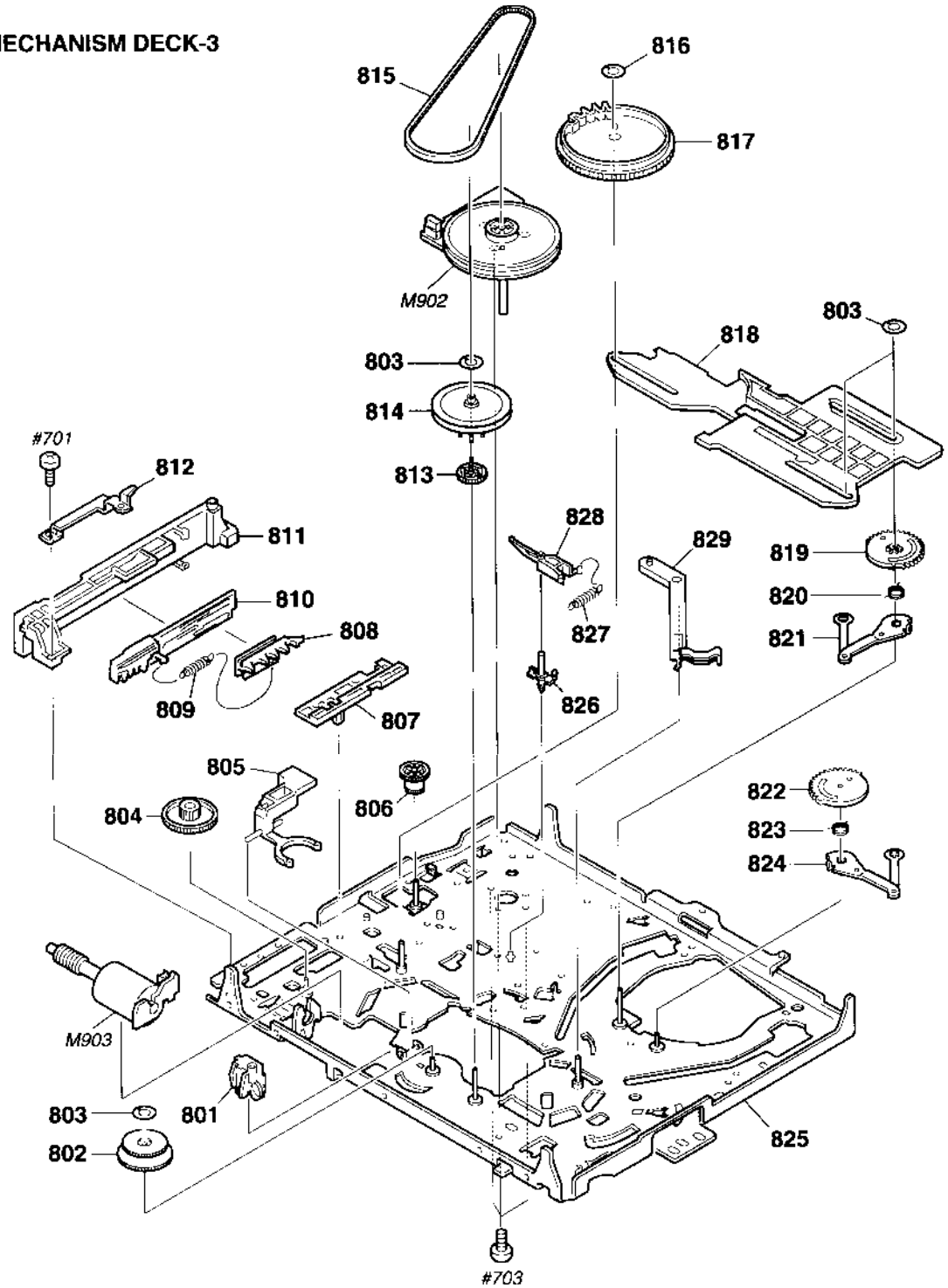
5-2. MECHANISM DECK-2



Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-1	BRAKE ASSY, MAIN(S)	
755	3-977-513-01	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	

Ref. No.	Part No.	Description	Remarks
763	3-965-178-01	SPRING	
764	3-969-629-01	BASE, DRUM	
765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	2-643-205-01	SCREW	
769	Refer to the service manual for each model.		
770	Refer to the service manual for each model.		
771	A-6759-614-A	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-977-537-01	ARM, HC ROLLER	

5-3. MECHANISM DECK-3



Ref. No.	Part No.	Description	Remarks
* 801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-01	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remarks
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-01	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-1	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-01	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-469-01	ARM, TG1 DRIVING	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

9-921-647-13
(Including 9-921-647-11, -12(81))

Sony Corporation
Home A&V Products Company

98E16101-1(2)
Printed in Japan
Published by Quality Assurance Dept.
(Osaki East)