

# TOSHIBA

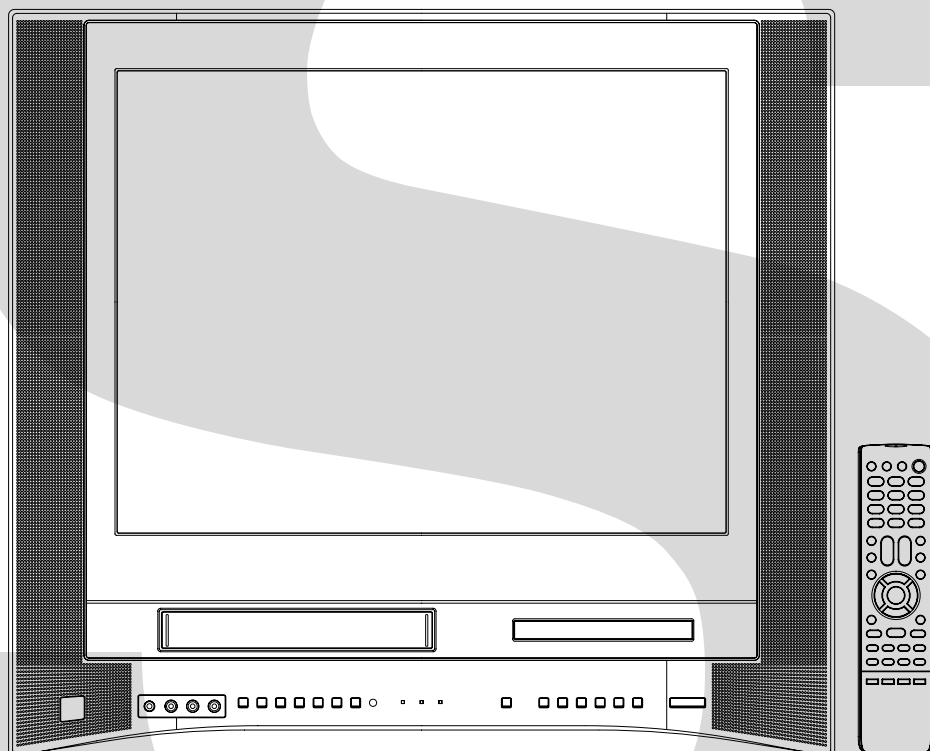
FILE NO. 810-200551

## SERVICE MANUAL



# COMBINATION 21" FLAT TV AND VIDEO CASSETTE RECORDER/DVD VIDEO PLAYER TELE TEXT

# VTW21FQR



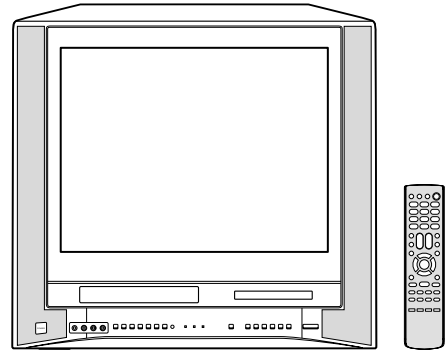
# TOSHIBA

Модель VTW21FQR  
MODEL VTW21FQR

Руководство по эксплуатации  
USER GUIDE



Только для дисков с региональными кодами 5 / ALL  
Region 5 / ALL discs only



Совмещенный телевизор с плоским 21" кинескопом  
видеомагнитофон и DVD-проигрыватель  
ТЕЛТЕКСТ  
Combination 21" Flat TV and  
Video Recorder/DVD Video Player  
TELE TEXT



# TOSHIBA



JST20521A SH 05/05

## ENGLISH

### IMPORTANT

Unauthorized recording of copyright television programmes, films, video tapes and other materials may infringe on the rights of copyright owners and be contrary to copyright laws.

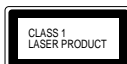
### WARNING

To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

### MAINS SUPPLY

This unit is designed to operate from AC 230V~240V 50Hz household mains supply.

**CAUTION:**  
THIS UNIT IS A CLASS 1 LASER PRODUCT. HOWEVER THIS UNIT USES A VISIBLE LASER BEAM WHICH COULD CAUSE HAZARDOUS RADIATION EXPOSURE IF DIRECTED. BE SURE TO OPERATE THE PLAYER CORRECTLY AS INSTRUCTED.  
THE FOLLOWING CAUTION LABEL IS LOCATED ON THE REAR PANEL OF THE UNIT.



WHEN THIS UNIT IS PLUGGED INTO THE WALL OUTLET, DO NOT PLACE YOUR EYES CLOSE TO THE OPENING OF THE DISC TRAY AND OTHER OPENINGS TO LOOK INTO THE INSIDE OF THIS UNIT.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

DO NOT OPEN COVERS AND DO NOT REPAIR YOURSELF. REFER SERVICING TO QUALIFIED PERSONNEL.

## FEATURES

### TV/VCR

- HQ(High Quality)
- TELETEXT Function
- 1 Month, 8 Programme Timer
- One-Touch Timer Recording (OTR)
- 30 Minute Back Up
- Real Time Tape Counter with Zero Return
- NTSC Playback (PAL 60Hz)
- Hi-Fi Stereo
- Picture Control Adjustments
- Slow Motion
- Video Index Search System
- Digital Auto Tracking
- Programmable ON/OFF Timer
- Auto Power On/Auto Play
- Auto Rewind/Auto Eject
- Dual Speed Picture Search
- 2 Speed (SP/LP) Record/ Playback

- On Screen 5 Language Display
- Sleep Timer
- Auto Repeat Play

### DVD Player

- Digital Audio Jack (Coaxial)
- Multi-Language
- Multi-Angle
- Repeat Playback
- Memory/Random Playback
- Zoom
- Video Aspect Ratio
- Parental Control
- Digital output for Dolby Digital (AC-3) and DTS
- MP3/WMA/JPEG CD Playback
- PAL & NTSC DVDs playback
- A-B Repeat playback

## CONTENTS

### PREPARATION

PRECAUTIONS .....	2
LOCATION OF CONTROLS .....	4
REMOTE CONTROL .....	5
AERIAL CONNECTIONS .....	7
CONNECTIONS TO OTHER EQUIPMENT .....	8

### TV OPERATION

ON-SCREEN LANGUAGE SELECTION .....	10
TO SET THE CLOCK .....	11
TUNING THE TV CHANNELS .....	12
TV OPERATION .....	15
PICTURE CONTROL ADJUSTMENTS .....	17
TO SET THE ON TIMER .....	18
TO SET THE OFF TIMER .....	19

### TAPE PLAYBACK OPERATION

LOADING AND UNLOADING THE VIDEO CASSETTE TAPE .....	20
COLOUR SYSTEM SELECTION .....	21
PLAYBACK .....	22
SPECIAL PLAYBACK .....	23

### RECORDING

RECORDING A TV PROGRAMME .....	24
TIMER RECORDING .....	25
OTHER FUNCTIONS FOR TIMER RECORDING .....	26
ONE-TOUCH TIMER RECORDING (OTR) .....	27

### ADVANCED FUNCTIONS OF VCR SECTION

USING THE REAL TIME TAPE COUNTER .....	28
USING ZERO RETURN .....	29
VIDEO INDEX SEARCH SYSTEM (INDEX) .....	29
STEREO PLAYBACK/RECEPTION DISTURBANCE .....	30
DUPLICATING A VIDEO TAPE .....	32
DUPLICATING A DISC MATERIAL ONTO A VIDEO TAPE .....	33
TELETEXT .....	34

### DISC PLAYBACK OPERATION

DISC .....	36
PREPARATION .....	37
DISC STATUS .....	37
PLAYBACK PROCEDURE .....	38
SPECIAL PLAYBACK .....	39
MP3/WMA/JPEG PLAYBACK .....	40
ZOOMING .....	42
CHANGING ANGLES .....	42
LOCATING DESIRED SCENE .....	42
REPEAT PLAYBACK .....	42
PROGRAM PLAYBACK/RANDOM PLAYBACK (VCD/CD) .....	44
CHANGING SOUNDTRACK LANGUAGE .....	45
SUBTITLES .....	45
KARAOKE PLAYBACK .....	46
TITLE SELECTION .....	46
DVD MENU .....	46

### FUNCTION SETUP

CUSTOMIZING THE FUNCTION SETTINGS .....	47
TEMPORARY DISABLING OF RATING LEVEL BY DVD DISC .....	51

### ADDITIONAL INFORMATION

LANGUAGE CODE LIST .....	52
BEFORE REQUESTING SERVICE .....	53
SPECIFICATION .....	55

ENGLISH

## PRECAUTIONS

### NOTES ON MOISTURE CONDENSATION

Moisture condensation damages the unit. Please read the following carefully.

Moisture condensation occurs, for example, when you pour a cold drink into a glass on a warm day. Drops of water form on the outside of the glass. In the same way, moisture may condense on the head drum or the optical pick-up lens inside this unit, one of the most crucial internal parts of the unit.

#### Moisture condensation occurs during the following cases.

- When you bring the unit directly from a cold place to a warm place.
- When you use the unit in a room where you just turned on the heater, or a place where the cold wind from the air conditioner directly hits the unit.
- In summer, when you use the unit in a hot and humid place just after you move the unit from an air conditioned room.
- When you use the unit in a humid place.

#### Do not use the unit when moisture condensation may occur.

If you use the unit in such a situation, it may damage discs and internal parts. Remove the disc, connect the power cord of the unit to the wall outlet, turn on the unit, and leave it for two or three hours. After two or three hours, the unit will have warmed up and evaporated any moisture. Keep the unit connected to the wall outlet and moisture condensation will seldom occur.

## SOME DOS AND DON'TS ON THE SAFE USE OF EQUIPMENT

This equipment has been designed and manufactured to meet international safety standards but, like any electrical equipment, care must be taken if you are to obtain the best results and safety is to be assured. So, please read the points below for your own safety. They are of a general nature, intended to help you with all your electronic consumer products and some points may not apply to the goods you have just purchased.

\*\*\*\*\*

**DO** read the operating instructions before you attempt to use the equipment.  
**DO** ensure that all electrical connections (including the mains plug, extension leads and inter-connections between the pieces of equipment) are properly made and in accordance with the manufacturer's instructions. Switch off and withdraw the mains plug before making or changing connections.

**DO** consult your dealer if you are ever in doubt about the installation, operation or safety of your equipment.

**DO** be careful with glass panels or doors on equipment.

\*\*\*\*\*

- DON'T** remove any fixed cover as this may expose dangerous voltages.  
**DON'T** obstruct the ventilation openings of the equipment with items such as newspapers, tablecloths, curtains, etc. Overheating will cause damage and shorten the life of the equipment.  
**DON'T** allow electrical equipment to be exposed to dripping or splashing, or objects filled with liquids, such as vases, to be placed on the equipment.  
**DON'T** place hot objects or naked flame sources such as lighted candles or nightlights on, or close to equipment. High temperatures can melt plastic and lead to fires.  
**DON'T** use makeshift stands and NEVER fix legs with wood screws - to ensure complete safety always fit the manufacturer's approved stand or legs with the fixings provided according to the instructions.  
**DON'T** use equipment such as personal stereos or radios so that you are distracted from the requirements of traffic safety. It is illegal to watch television whilst driving.  
**DON'T** listen to headphones at high volume, as such use can permanently damage your hearing.  
**DON'T** leave equipment switched on when it is unattended unless it is specifically stated that it is designed for unattended operation or has a stand-by mode. Switch off using the switch on the equipment and make sure that your family know how to do this. Special arrangements may need to be made for infirm or handicapped people.  
**DON'T** continue to operate the equipment if you are in any doubt about it working normally, or if it is damaged in any way - switch off, withdraw the mains plug and consult your dealer.

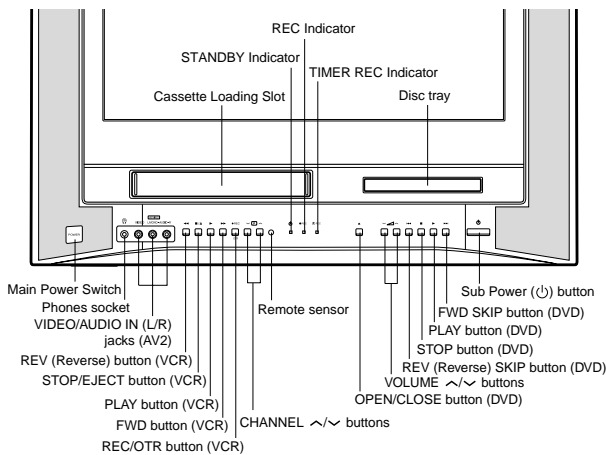
#### ABOVE ALL

- NEVER let anyone especially children push anything into holes, slots or any other opening in the case - this could result in a fatal electrical shock;
- NEVER guess or take chances with electrical equipment of any kind
- it is better to be safe than sorry!

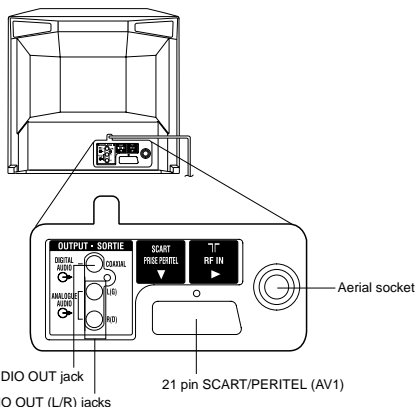
\*\*\*\*\*

## LOCATION OF CONTROLS

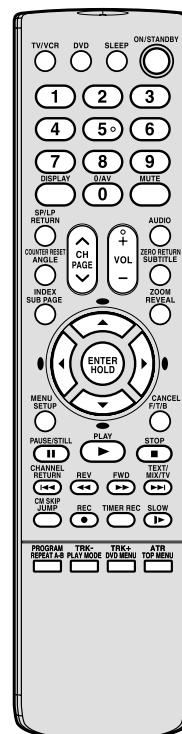
### Front



### REAR

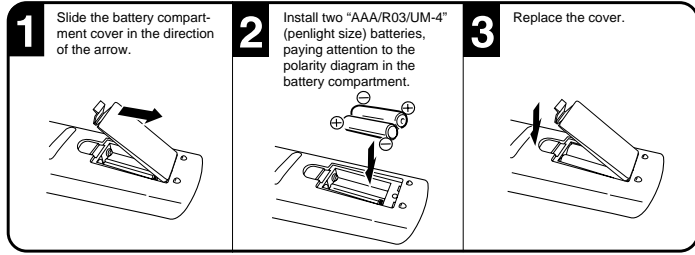


## REMOTE CONTROL



	page
TV/VCR	Select to operate TV/VCR 10
DVD	Select to operate DVD 37
SLEEP	Sleep timer 16
ON/STANDBY	Sub Power on/off 10
0-9	Direct channel selection of TV 15,24,27
	Input setting 13,30,35,41,42,44
	Enter a security code 50,51
DISPLAY	Display VCR or DVD operation status 16,28,29,37
AV	Scart Input or AV-Front input 9,32
MUTE	Mute 16
SPLP	Sets the tape speed for recording 24,27
RETURN	Remove DVD set up menu 47
CH/PAGE $\sim\sim$	Select channel of the VCR 16,24
	Utilize the teletext 35
VOLUME +/-	Volume +/- 15
AUDIO	Switches sound between mono and stereo 31
	Change sound track language of DVD 45
COUNTER RESET	Reset the counter to 00:00 28,29
ANGLE	Change playback angle of a DVD disc 42
ZERO RETURN	Stop the tape when the counter reaches 00:00:00 29
SUBTITLE	Set Subtitle of a DVD disc 45
INDEX	Search for INDEX marks 30
SUB PAGE	Sub page 35
ZOOM	Zoom (for DVD playback) 42
REVEAL	Reveal 35
$\blacktriangle/\blacktriangledown/\blacktriangleleft/\blacktriangleright$	Cursor buttons
Four Coloured buttons	Access the Teletext 34
ENTER	Enter information in the menu/Select option in the menu
HOLD	Hold 34
MENU/SETUP	Display menu of setup 10-14,17-19,21,25,47
CANCEL	Delete Timer program 26
	Cancel input data in the setting mode 42,44,50
F/T/B	F/T/B 35
PAUSE/STILL	Still picture/Recording pause on/off 23,24,39
PLAY	Playback 22,38
STOP	Stop 22,38
CHANNEL RETURN	Switch between present/ last channel 16
SKIP $\ll/\gg$	Skip chapter to forward or reverse direction 39
REV	Reverse/Review playback 22,23,39
FWD	Fast Forward/Forward search playback 22,23,39
TEXT/MIX/TV	Select teletext 34
CM SKIP	Skip the unwanted short material of a tape 23
JUMP	Locating desired scene 42
REC	Recording/OTR 27,28,33
TIMER REC	Timer recording On/Off 25
SLOW	Slow motion playback 23,39
PROGRAM	Confirmation of Timer-Recording 26
REPEAT A-B	Repeat playback between A and B (DVD/CD) 43
TRK (TRACKING) +/-	Manual tracking 22
PLAY MODE	Select playback mode 43,44
DVD MENU	Select menu of a DVD disc 46
ATR	Auto tracking 22
TOP MENU	Select title of a DVD disc 46

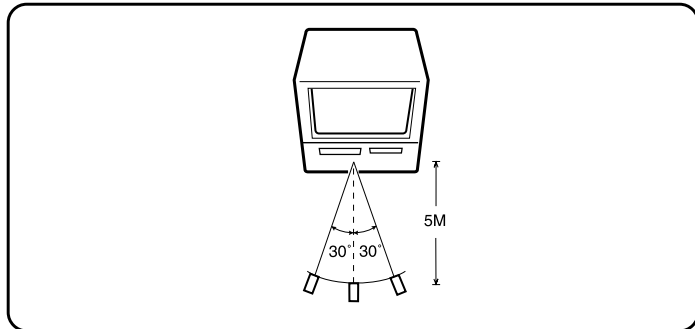
**BATTERY INSTALLATION**



**BATTERY CAUTIONS**

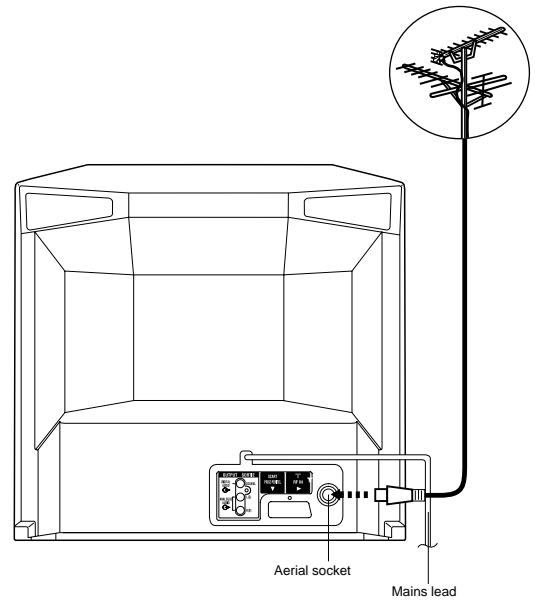
- Use two "AAA/R03/UM-4" size batteries for the remote control transmitter.
- The batteries may last approximately one year depending on how much the remote control is used. For best performance it is recommended batteries be replaced on a yearly basis, or when remote operation becomes erratic.
- Do not mix old and new batteries.
- Weak batteries can leak and severely damage the remote control transmitter. Always remove batteries as soon as they become weak.
- Dispose of batteries in a designated disposal area. Never throw batteries into a fire.

**EFFECTIVE DISTANCE OF THE REMOTE CONTROL TRANSMITTER**



- NOTES:**
- When direct sunlight, an incandescent lamp, fluorescent lamp or any other strong light shines on the remote sensor, the remote operation may be unstable.
  - When there is an obstacle between the unit and the transmitter, the remote control transmitter may not operate.

Connect an indoor or outdoor aerial to the aerial socket at the rear panel as shown below. For all aerial circuit problems, please consult your local dealer.



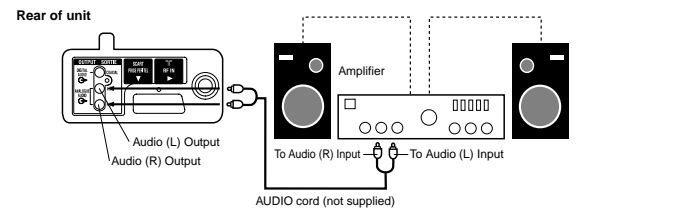
**EXTERNAL AERIAL**

The type of aerial required depends on the position of your home, its distance from the transmitter and local interference. If you do not have an aerial and you are uncertain of what to buy, you should seek the advice of a local aerial contractor.

**CONNECTIONS TO OTHER EQUIPMENT**

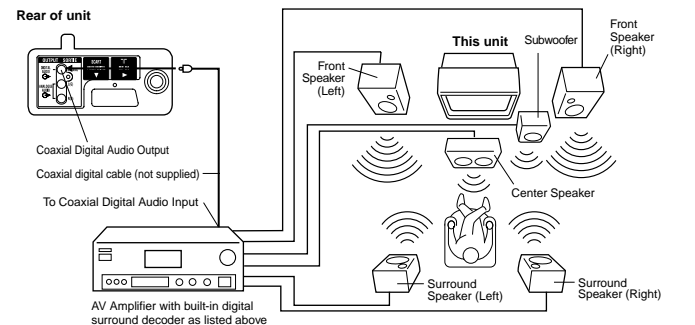
The exact arrangement you use to interconnect various video and audio components to the unit is dependent on the model and features of each component. Check the Owner's Manual provided with each component for the location of video and audio inputs and outputs.

**Using an Audio Amplifier**



**Using an AV Amplifier with built-in digital surround**

If you are using an Amplifier with a built-in digital surround sound decoder (such as Dolby Digital / DTS / MPEG / etc.), you can connect it as shown below.



\* Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.  
 \* DTS and DTS Digital Out are trademarks of Digital Theatre Systems, Inc.

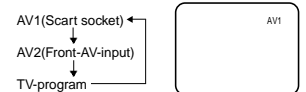
- NOTES:**
- When you make the connections above, make sure that the power of all units is switched off at the mains.
  - Some DTS decoders which do not support DVD-DTS interface may not work properly with the unit.
  - When playing DTS encoded material, the sound will only be available through the Digital Audio Output Socket.

**CONNECTIONS TO OTHER EQUIPMENT**

**Input Selection**

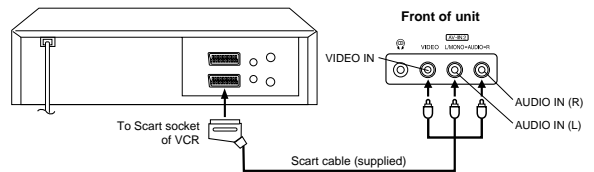
If you connect the unit to a VCR, camcorder or games console, you can select this input by pressing the **AV** button.

Press the **TV/VCR** button to select the TV mode and then press the **AV** button repeatedly to select AV1 or AV2.



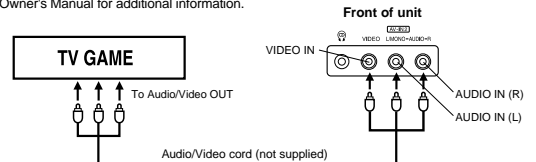
**1. To connect the unit to a VCR**

Press the **AV** button to select AV2 to use the TV as a monitor.



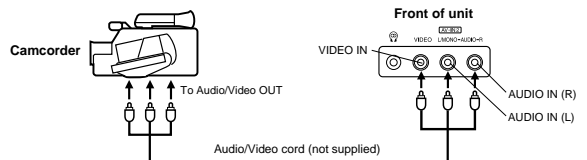
**2. To connect the TV to a TV Game**

The unit can also be used as a display device for many video games. However, due to the wide variety of different types of signal generated by these devices and subsequent hook-up variations required, they have not all been included in the suggested connection diagrams. Press the **AV** button to select AV2 to use the TV as a monitor. You'll need to consult each component's Owner's Manual for additional information.



**3. To connect the TV to a camcorder**

To playback from a camcorder, connect the camcorder to the unit as shown. Press the **AV** button to select AV2 to use the TV as a monitor. If you wish to make a recording from the camcorder, follow the same instructions as recording a TV programme (P.24), but select AV2 for the channel.

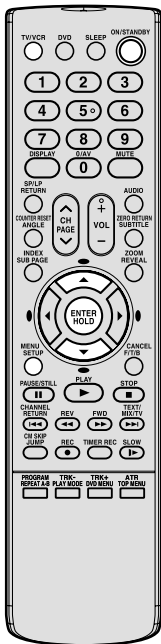


**4. To connect the unit to another TV set (ie. a widescreen set)**

Connect this unit to the other TV set using the SCART connection. You should select the external input setting on the other TV, eg. AV/EXT/etc.

## ON-SCREEN LANGUAGE SELECTION

This unit can display five languages, English, German, Russian, Italian, or Spanish. Please select the English for the language selection below.

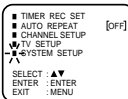


### Preparation

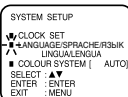
- Make sure that the MAIN POWER (ON) switch on the front panel is pushed in (ON). (The STANDBY (⏻) indicator lights up.)
- Press ON/STANDBY (⏻) to turn on the unit. (The STANDBY (⏻) indicator goes off.)

1 Press TV/VCR to select TV/VCR mode. Press MENU.

2 Press ▲ or ▼ to select the SYSTEM SETUP mode. Then press ENTER.



3 Press ▲ or ▼ to select the LANGUAGE mode. Then press ENTER.



4 Press ▲ or ▼ to select the desired language. Then press ENTER.



5 Press MENU twice to return to normal TV screen.

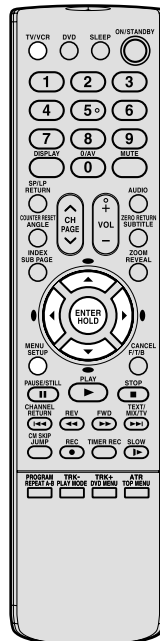
### NOTE:

When you plug the AC mains lead into the mains socket for the first time the MENU screens shown in step 2 and step 3 will be skipped and the language selecting screen shown in step 4 will appear. This is not a fault - please select the language first before proceeding with setting the unit up.

10

## TO SET THE CLOCK

Besides displaying the channel number and functions symbols on the screen, the unit also displays the present time and the day of the week. The digital clock is the 24 hour type.



### Preparation

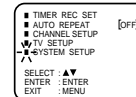
Press TV/VCR to select TV/VCR mode.

### Example:

Setting the clock to 11:30, 29 October, 2005.

1 Press MENU.

Press ▲ or ▼ to select the SYSTEM SETUP mode, then press ENTER.

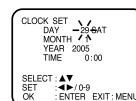


2 Press ▲ or ▼ to select the CLOCK SET mode, then press ENTER.

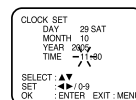


3 Press ◀ or ▶ to select the current date, then press ▼.

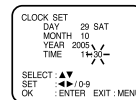
- The day of the week shown will not be correct until you have finished entering the month and year settings.



4 Set the month, year and hour in the same way as in step 3.



5 Press ◀ or ▶ to select current minute, then press ENTER. The time and day will be displayed.



- You can change in 10-minutes step by holding down ▶.

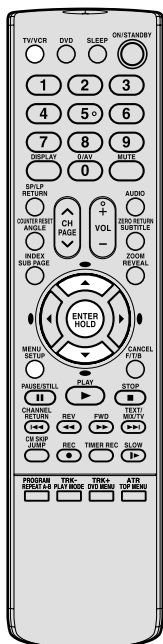
### NOTES:

- During a power failure, disconnection of the mains lead or if the MAIN POWER (ON) Switch is switched off, the clock and all its programmed setting will remain in the memory for 30 minutes. If the power failure is longer than 30 minutes you will have to reset the present time.
- If you want to correct the digits while setting, press ▲ until the item you want to correct is blinking, then press ◀ or ▶ to correct the desired setting.

11

## TUNING THE TV CHANNELS

This unit has 110 channels for you to tune and memorize into the Television. You must tune in the broadcast stations before you can enjoy watching them.

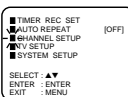


### AUTO TUNING

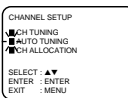
1 Press TV/VCR to select TV/VCR mode. Press MENU.

Note: If the clock is not set, press MENU twice.

2 Press ▲ or ▼ to select the CHANNEL SETUP mode, then press ENTER.



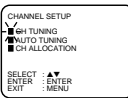
3 Press ▲ or ▼ to select the AUTO TUNING mode, then press ENTER.



4 The Auto Tuning will start and memorize all the channels in sequence available in your area.



5 When the Auto Tuning is finished, the CHANNEL SETUP screen will appear. Then press MENU twice to return to the normal screen.



12

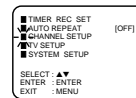
## TUNING THE TV CHANNELS

### TO CHANGE THE TV STATIONS TO ANOTHER CHANNEL POSITION

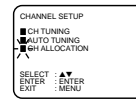
### Example:

Changing the TV Station from CH 4 to CH 6 position.

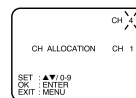
1 Press TV/VCR to select TV/VCR mode. Press MENU. Press ▲ or ▼ to select the CHANNEL SETUP mode, then press ENTER.



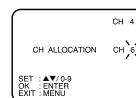
2 Press ▲ or ▼ to select the CH ALLOCATION mode, then press ENTER.



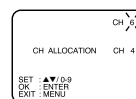
3 Press ▲ or ▼ or Direct Channel Selection to select the TV station to be moved. Then press ENTER.



4 Press ▲ or ▼ or Number buttons to select the new CH number you want the station to be.



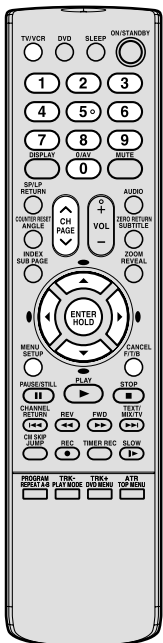
5 Press ENTER. Press MENU to return to the normal screen.



ENGLISH

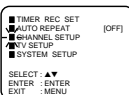
13

In certain areas of the countries which have poor reception the Automatic Tuning System may not tune your unit to the strongest broadcast signal. If you are not satisfied with the automatic tuning then select the Manual Tuning.

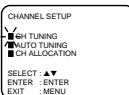


MANUAL TUNING

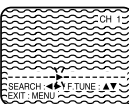
1 Press TV/VCR to select TV/VCR mode. Press MENU. Press ▲ or ▼ to select the CHANNEL SETUP mode, then press ENTER.



2 Press ▲ or ▼ to select the CH TUNING mode, then press ENTER.

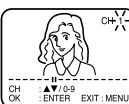


3 Press ◀ or ▶ to search the broadcast stations. Each time a station is found the search will stop. Press ◀ or ▶ to continue searching until all the stations you want are found, then press ENTER to store the station you have selected.



If you can not get a clear picture, press ▲ or ▼ until the picture becomes clear. When you have a clear crisp picture store this setting by pressing ENTER.

4 Press ▲ or ▼ to select the required channel number (1-110). Press ENTER to store the channel number. The unit channels can be preset to different TV broadcast channels anytime simply by repeating step 3-4.



When all required stations have been set, press MENU 3 times to return to normal TV screen.

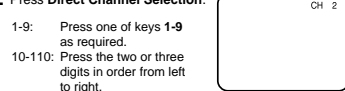
TO SKIP A CHANNEL

To skip unwanted channels press CH/PAGE to select the channel you want to skip. Then press CANCEL. The channel number flashes.

To cancel the skip setting, select the skipped channel using Direct Channel Selection, then press CANCEL.

1 Press ON/STANDBY. Then press TV/VCR to select TV/VCR mode.

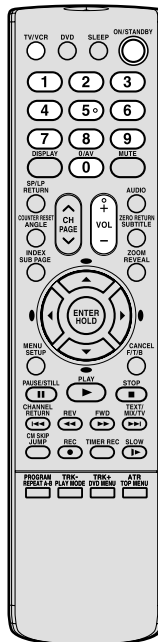
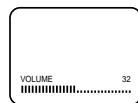
2 Press Direct Channel Selection.



1-9: Press one of keys 1-9 as required.

10-110: Press the two or three digits in order from left to right.

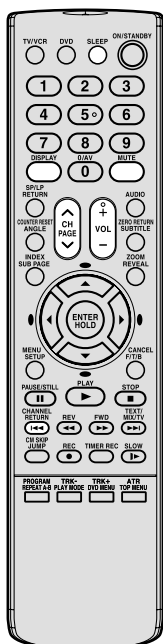
3 The VOLUME can be adjusted to a desired level by pressing VOLUME + or -. The VOLUME control is represented by a green bar on the screen.



NOTE: If the station being viewed stops broadcasting, the TV will shut off after 15 minutes.

ENGLISH

TV OPERATION (CONTINUED)



MUTE

To cut off the sound, press this button once. The unit will be silenced and the symbol "MUTE" will appear on the screen. The muting can be released by pressing MUTE again or VOLUME + or -.

USING CH/PAGE ^ OR v BUTTON

Press and release CH/PAGE ^ or v. For channels to change properly, they must be correctly tuned into the unit's memory (P.12-14).

CHANNEL RETURN

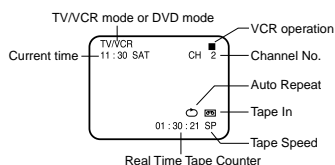
This button allows you to go back to the last channel selected by pressing CHANNEL RETURN. Press this button again to return to the last channel you were watching.

SLEEP

To set the TV to turn off at a set time, press SLEEP on the remote control. The clock will count down 10 minutes each time the button is pressed in the order of 120, 110, ..., 20, 10, 0. After the sleep time is programmed, the display will disappear and will reappear every 10 minutes. To confirm the sleep time setting, press SLEEP once and the remaining time will be momentarily displayed. To cancel the sleep time, press SLEEP repeatedly until the display turns to 0.

DISPLAY

Press DISPLAY. The current time, channel number, real time tape counter, tape speed and VCR operation etc. will be indicated. Press DISPLAY again to remove the call display.



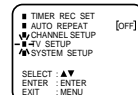
NOTE: If SLEEP is pressed when the unit is the REC mode, the clock will count down and the picture will shut off at the set time, but the recording continues.

PICTURE CONTROL ADJUSTMENTS

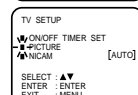
The picture settings have been factory adjusted under optimum signal reception. However, conditions may not be the same in your area. After tuning in the unit, allow it to warm up for a few minutes. If the picture is not to your liking, make the following adjustments using the remote control.

Preparation Press TV/VCR to select TV/VCR mode.

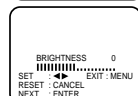
1 To adjust the picture, press MENU. Press ▲ or ▼ to select the TV SETUP mode, then press ENTER.



2 Press ▲ or ▼ to select the PICTURE mode, then press ENTER.



3 Press ENTER until your desired PICTURE mode appears eg. BRIGHTNESS, CONTRAST, COLOUR, SHARPNESS. Then press ◀ or ▶ to adjust the level of the PICTURE. (See the below for detail.)



4 After finishing the adjustment, press MENU 3 times to return to normal TV screen.

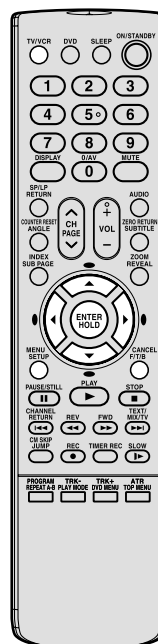
Each time you press ENTER the picture adjustment Screen changes as follows.

**BRIGHTNESS** Press ENTER until "BRIGHTNESS" appears on the screen, then press ◀ or ▶ to adjust the brightness. When ▶ is pressed, the darker portions of the picture become lighter.

**CONTRAST** Press ENTER until "CONTRAST" appears on the screen, then press ◀ or ▶ to adjust the contrast. Pressing ▶ improves the contrast and enhances the colour. Picture looks sharper in the daytime by increasing the contrast level and sharper at night by lowering the contrast level.

**COLOUR** Press ENTER until "COLOUR" appears on the screen, then press ◀ or ▶ to adjust the intensity of the colours. This should be set to where the colours appear normal in intensity and brilliance.

**SHARPNESS** Press ENTER until "SHARPNESS" appears on the screen, then press ◀ or ▶ to adjust the sharpness. In weak reception areas, the picture may be more pleasing when the SHARPNESS is set at a lower level.



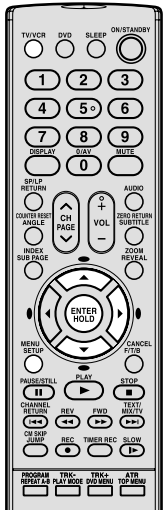
NOTE: To resume the normal picture adjustment, press CANCEL, while in the picture mode menu.

NOTES: • The picture settings can only be adjusted by using ◀ or ▶ and ENTER when they are displayed on the screen. • Press MENU 3 times to return to normal TV screen. • The On-screen display will disappear about one minute after finishing an adjustment.

ENGLISH

## TO SET THE ON TIMER

This feature allows you to have the TV automatically turn "ON" at predetermined time. If you programme the ON TIMER once the timer will turn "ON" the TV daily at the same time and to the same channel.



### Preparation

Press TV/VC to select TV/VCR mode.

**Example:**

Turning on the TV to channel 3 at 7:45, MONDAY-FRIDAY.

- Press **MENU**. Select the TV SETUP mode using  $\blacktriangle$  or  $\blacktriangledown$  then press **ENTER**.
  - TIMER REC SET [OFF]
  - AUTO REPEAT
  - CHANNEL SETUP
  - TV SETUP
  - SYSTEM SETUP
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to select the ON/OFF TIMER SET mode, then press **ENTER**.
  - TV SETUP
  - ON/OFF TIMER SET
  - PICTURE [AUTO]
  - NICAM
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to set the ON TIMER option, then press **ENTER**.
  - ON/OFF TIMER SET
  - ON TIMER
  - 0:00 CH 1 CANCEL
  - SUN/SAT
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to set the desired hour, then press  $\blacktriangleright$ .
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 CANCEL
  - SUN/SAT
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU
- Set the desired minute, channel and daily or weekly timer date as in step 4, then press  $\blacktriangleright$ .
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to select the SET mode, then press **ENTER**. Press **MENU** 3 times to return to normal TV screen.
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU

### NOTES:

- The TV will automatically turn off approximately 1 hour later after the ON TIMER turns on the TV. If you wish to continue watching the TV, press any button to cancel the one hour automatic shut off. This shut off feature prevents the TV from playing continuously if no OFF TIMER is set.
- To cancel the ON TIMER function: To cancel ON TIMER, follow above steps 1-6, then press  $\blacktriangle$  or  $\blacktriangledown$  to select the CANCEL position. Press **MENU** to return to the TV.
- After setting the ON TIMER, "I" of the OFF TIMER will flash on and off. If you wish to set the OFF TIMER, press **ENTER** then follow the steps 3-6 on page 19.

18

## TO SET THE OFF TIMER

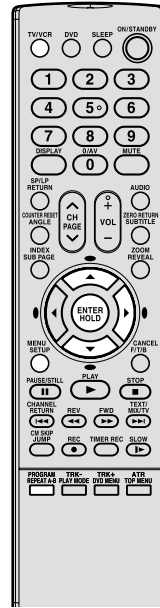
This feature allows you to have the TV turn "OFF" automatically at a predetermined time. If you programme the OFF TIMER once, the TV will be automatically turned off at the same time daily.

### Preparation

Press TV/VC to select TV/VCR mode.

**Example:**

Turning off the TV at 8:30.



### NOTES:

- If a station being viewed stops broadcasting, the TV will automatically shut itself off after 15 minutes.
- To cancel the OFF TIMER function: To cancel OFF TIMER, follow above step 1-5, then press  $\blacktriangle$  or  $\blacktriangledown$  to select the CANCEL position. Press **MENU** to return to the TV.
- To confirm the ON/OFF TIMER: Press **PROGRAM** three times to indicate the programmes on the screen.

ENGLISH

- Press **MENU**. Select the TV SETUP mode using the  $\blacktriangle$  or  $\blacktriangledown$  button, then press **ENTER**.
  - TIMER REC SET [OFF]
  - AUTO REPEAT
  - CHANNEL SETUP
  - TV SETUP
  - SYSTEM SETUP
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to select the ON/OFF TIMER SET mode, then press **ENTER**.
  - TV SETUP
  - ON/OFF TIMER SET
  - PICTURE [AUTO]
  - NICAM
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to set the OFF TIMER option, then press **ENTER**.
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to set the desired hour, then press  $\blacktriangleright$ .
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to set the desired minute, then press  $\blacktriangleright$ .
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to select the SET mode, then press **ENTER**. Press **MENU** 3 times to return to normal TV screen.
  - ON/OFF TIMER SET
  - ON TIMER
  - 7:45 CH 3 SET
  - MON/FRI
  - OFF TIMER CANCEL
  - 0:00
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - SET:  $\blacktriangle$  /  $\blacktriangledown$  / 0-9
  - OK: ENTER EXIT: MENU

19

## LOADING AND UNLOADING THE VIDEO CASSETTE TAPE

Use only video cassette tapes marked **VHS**.

**Preparation:** Press TV/VC to select TV/VCR mode.

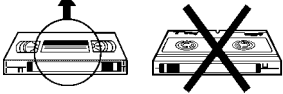
### LOADING

Push the centre of the tape until it is automatically inserted.

**AUTOMATIC POWER ON AND PLAY** (Make sure that the MAIN POWER switch is pushed in.)

When loading a cassette tape without the erase prevention tab intact, the unit will turn on and playback will start immediately.

Insert the cassette with its labelled side facing you. An inverted cassette cannot be inserted.

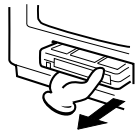


### UNLOADING

- To unload a video cassette, press the  $\blacksquare$  /  $\blacktriangle$  (STOP/EJECT) button on the unit twice. The first press will stop the tape in any mode. The second press will eject the tape.



- Pull the cassette out.



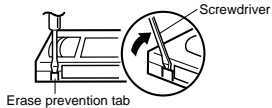
### AUTOMATIC EJECT

When the unit is automatically rewinding the tape and reaches its end (AUTO REWIND), the tape will be ejected automatically (See NOTE on page 24).

- NOTES:**
- Always eject the tape when not in use.
  - The cassette can be ejected even if the ON (I) button is OFF.

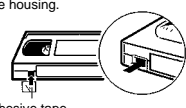
### TO PREVENT ACCIDENTAL ERASURE

After recording, break off the erase prevention tab if you do not wish to record over the tape.



### TO RECORD AGAIN

Cover the hole with adhesive tape. Be careful the tape does not extend past the edges of the cassette housing.



### TAPE SPEED AND MAXIMUM RECORDING/PLAYBACK TIME

TAPE SPEED	VIDEO CASSETTE TAPE					
	E-300	E-240	E-180	E-90	E-60	E-30
SP (Standard Play)	5 hours	4 hours	3 hours	1-1/2 hours	1 hour	30 minutes
LP (Long Play)	10 hours	8 hours	6 hours	3 hours	2 hours	1 hour

20

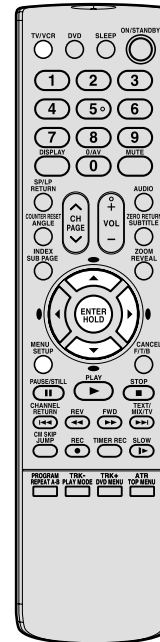
## COLOUR SYSTEM SELECTION

Select your appropriate Colour System.

### Preparation

Press TV/VC to select TV/VCR mode.

- Press **MENU**. Press  $\blacktriangle$  or  $\blacktriangledown$  to select the SYSTEM SETUP mode. Then press **ENTER**.
  - TIMER REC SET [OFF]
  - AUTO REPEAT
  - CHANNEL SETUP
  - TV SETUP
  - SYSTEM SETUP
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangle$  or  $\blacktriangledown$  to select the COLOUR SYSTEM mode.
  - SYSTEM SETUP
  - CLOCK SET
  - LANGUAGE/SPRACHERSUK
  - LINGUALENGUA
  - COLOUR SYSTEM [AUTO]
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU
- Press  $\blacktriangleright$  to select the AUTO, PAL or MESECAM. Press **MENU** twice to return to normal TV screen.
  - SYSTEM SETUP
  - CLOCK SET
  - LANGUAGE/SPRACHERSUK
  - LINGUALENGUA
  - COLOUR SYSTEM [MESECAM]
  - SELECT:  $\blacktriangle$  /  $\blacktriangledown$
  - ENTER: ENTER
  - EXIT: MENU

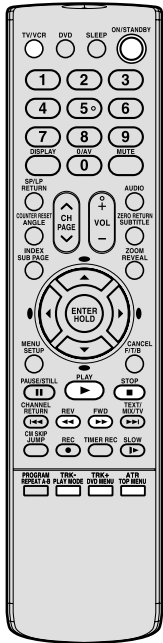


ENGLISH

21

# PLAYBACK

To play a pre-recorded cassette tape.

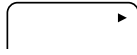


## TO START PLAYBACK

- 1 To turn "ON" the power of the TV/VCR, press **ON/STANDBY**. Press **TV/VCR** to select TV/VCR mode.
- 2 Load a pre-recorded tape (When loading a cassette tape without the erase prevention tab, playback will start automatically).



- 3 Press **PLAY**. Playback will start. "▶" will appear on the screen.



## TO STOP PLAYBACK

Press **STOP**. "■" will appear on the screen.



## TO REWIND OR FORWARD THE TAPE RAPIDLY

Press **REV** when in the STOP mode. "◀" will appear on the screen.

Press **FWD** when in the STOP mode. "▶" will appear on the screen.



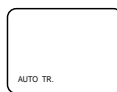
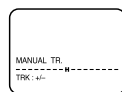
## FORWARD/REVERSE PICTURE SEARCH

If you want to see the tape program during REV(F.FWD) mode, press and hold the REV(F.FWD) button. The backward(forward) visual search picture will be seen on the screen. Release the button to return to the REV(F.FWD) mode.

## DIGITAL AUTO TRACKING ADJUSTMENTS

When a tape is played, the Digital Auto Tracking system automatically adjusts the tracking to obtain the best possible picture. If noise bars appear during playback, adjust the tracking manually as follows:

- Press **TRK +** or **-** to obtain the best possible picture. "MANUAL TR." will appear for 4 seconds on the screen. To resume automatic tracking, press **ATR**.
- "AUTO TR." will appear for 4 seconds on the screen.



**NOTE:**  
In Mesecam playback (e.g. with Secam tape), during PAUSE, SLOW and FF, there will be no color or the color might be incorrect. This is not a defect of the set.

# SPECIAL PLAYBACK

## NTSC TAPE PLAYBACK

Your TV/VCR can playback Video tapes recorded in the NTSC Colour System (TV system usually used in America and Japan).

Load a NTSC recorded tape (When loading a cassette tape without an erase prevention tab, playback will start automatically).



To play the NTSC tape press **PLAY**. Your TV/VCR will playback Video tapes recorded using NTSC Standard play, Long play (LP) and Extended play (EP). However there will be a deterioration in sound quality in the Long play and Extended play modes.

## TO VISUALLY SEARCH FOR DESIRED POINTS

When either **FWD** or **REV** is pressed in the PLAYBACK mode, the speed search picture will appear. When pressed twice the search picture will increase in speed. Speed search times depend upon the speed used (SP or LP) during recording. To rewind or fast forward a tape, press **STOP** and then press **REV** or **FWD**.

TAPE SPEED	PICTURE SEARCH SPEED		
	PRESS ONCE	PRESS TWICE	
PAL	SP (Standard Play)	5 X	7 X
	LP (Long Play)	7 X	13 X
NTSC	SP (Standard Play)	3 X	5 X

Press **REV** once or twice in the PLAYBACK mode. Press **FWD** once or twice in the PLAYBACK mode. To return to playback, press **PLAY**.

## STILL PICTURE

- 1 Press **PAUSE/STILL** in the PLAYBACK mode. To prevent damage to the tape, STILL playback is automatically resumed to the PLAY mode after 5 minutes.
- 2 To continue the normal playback, press **PLAY**.

## FRAME BY FRAME ADVANCE

Press **PAUSE/STILL** during STILL playback. The still picture will advance by one frame each time you press the button. Hold the button for continuous frame by frame viewing. Press **PLAY** again to resume normal playback.

## SLOW MOTION PLAYBACK

Press **SLOW** in the PLAYBACK mode. Each additional press of **SLOW** will change the slow speed. Press **PLAY** again to resume normal playback.

## NOTE: SLOW TRACKING AND VERTICAL LOCK ADJUSTMENT

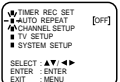
If noise bars appear in the picture during slow motion, press **TRK +** or **-** to reduce the noise bars. If the still picture jitters excessively, press **TRK +** or **-** to stabilize the still picture.

## NOTES:

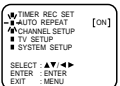
- The audio output is muted during SPEED SEARCH and STILL.
- A few noise bars will appear on the picture during SPEED SEARCH.
- It is normal for the picture to be noisy in the STILL mode.

## TO WATCH A TAPE REPEATEDLY

- 1 Press **MENU**. Press **▲** or **▼** to select **AUTO REPEAT** option.



- 2 Press **▶** to select the ON position.



- 3 Press **MENU** to return to normal TV screen. If you press **PLAY**, the TV/VCR will repeat playing the video tape until the repeat mode is cancelled (you can still stop the tape by pressing **STOP**).

## NOTE:

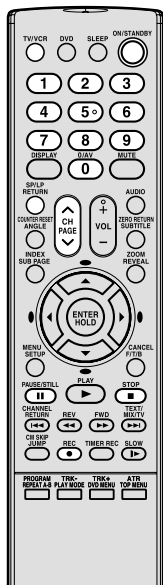
To cancel repeat mode, follow above steps 1 and 2, then press **▶** to select the OFF position. Press **MENU** to return to the TV.

## CM SKIP

Press **CM SKIP** in the PLAY mode. The TV/VCR will search forward through approximately 30 seconds of the tape (e.g. unwanted commercial time) for each press of **CM SKIP** (maximum six presses) and then resume normal playback.

- For example : 1 press: 30 seconds of tape  
2 press: 60 seconds of tape  
3 press: 90 seconds of tape

# RECORDING A TV PROGRAMME



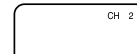
## RECORDING AND VIEWING THE SAME TV PROGRAMME

- 1 To turn "ON" the TV/VCR, press **ON/STANDBY**. Press **TV/VCR** to select TV/VCR mode.
- 2 Load a cassette tape with the erase prevention tab intact. Load a cassette tape with the erase prevention tab intact.

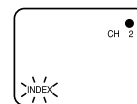


- 3 Press **SP/LP** to select the desired tape speed SP or LP.

- 4 Press **Direct channel selection** or **CH/PAGE** **▲** or **▼** to select the channel to be recorded (Example: Channel 2).

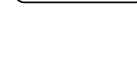


- 5 Press **REC**. "●" and the channel number will appear on the screen and the REC indicator will light.



## TO STOP RECORDING

Press **STOP** to stop recording. "■" will appear on the screen.



## TO STOP RECORDING TEMPORARILY

Press **PAUSE/STILL** to stop recording of unwanted material. "||" will appear on the screen and the REC indicator will blink on and off. Press again to continue the recording.

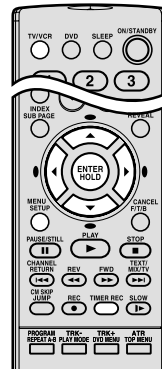


**NOTE:**  
To prevent damage to the video head and video tape the pause function will stop the VCR operation after about 5 minutes.

- NOTES:**
- If the power is switched off during recording, the TV section shuts off and the VCR section continues to record.
  - The unit channel cannot be changed during recording.
  - If you change the channel during a recording, "RECORDING IN PROGRESS" will appear on the TV screen for approx. 4 seconds.
  - **AUTO REWIND FEATURE:** This unit will automatically rewind and eject the tape when the tape has ended (except during OTR and TIMER REC).
  - If the erase prevention tab has been removed, the tape will eject when **REC** is pressed.

# TIMER RECORDING

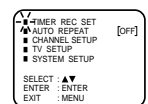
Timer recording can be programmed on screen with the remote control. The built-in timer allows automatic unattended recording of up to 8 programmes within 1 month.



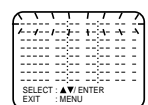
## Preparation

- Load a cassette tape with the erase prevention tab intact. The unit will automatically turn on.
  - Make sure that the clock shows the present time correctly.
- Example:**  
Programme a timer recording for 13:00-14:30, channel 3 (Tape speed : LP).

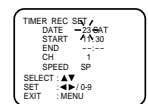
- 1 Press **TV/VCR** to select TV/VCR mode. Press **MENU**.



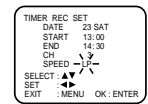
- 2 Check that the **TIMER REC SET** option is selected, then press **ENTER**.



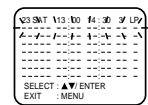
- 3 Press **▲** or **▼** to select one of the program line, then press **ENTER**.



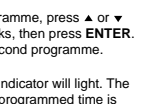
- 4 Press **◀** or **▶** to select the desired date or every day or every week setting (See next page.), then press **▼**.



- 5 Set the start time, end time, channel and tape speed as in step 4. When you have finished setting all your recordings, press **ENTER**. Press the **MENU** twice to return to normal TV screen.



- When you set the minute, you can change in 10-minutes step by holding down **▶**.



- 6 To set the timer for another programme, press **▲** or **▼** until a blank programme line blinks, then press **ENTER**. Repeat steps 4 to 5 to set the second programme.



- 7 Press **TIMER REC**. The **REC** indicator will light. The Timer is programmed, when the programmed time is reached, the recording starts automatically.



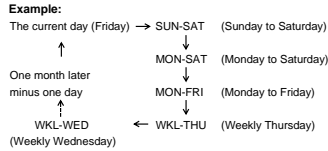
To cancel timer recording, press the buttons again and **REC** indicator will go out.



## OTHER FUNCTIONS FOR TIMER RECORDING

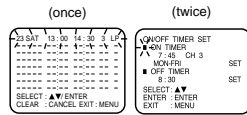
### TO SET DAILY/WEEKLY TIMER

When setting the date in the step 4 on page 25, press **←** repeatedly when the current day is displayed. The setting changes as follows:



### TO CONFIRM THE SETTINGS

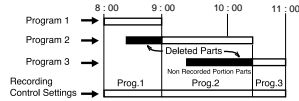
Press **PROGRAM** once. The TV screen displays the timer program list.  
 Press **PROGRAM** again. The TV screen displays the ON/OFF TIMER setting.



Press **PROGRAM** 3 times. The screen returns to the normal screen.

### IF THE PROGRAM OVERLAPS ANOTHER

**NOTE:** Do not overlap programs as portions of the conflicting programs will be lost. The first recording time has priority over the next recording time as shown in the diagram.

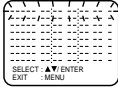


**NOTES:**

- You can correct or cancel the programmed setting in program confirm mode.
- If you press an invalid button during timer recording (such as **PLAY**, **STOP**, **REC** etc.), "RECORDING IN PROGRESS" will appear on the TV screen for approx. 4 seconds.

### TO CANCEL A PROGRAM

Press **▲** or **▼** to select the **TIMER REC SET** option in the **MENU**, then press **ENTER**. Press **▲** or **▼** to select the unnecessary program, and press **CANCEL** to cancel the program. Press **MENU** twice to return to normal TV screen.



**NOTES:**

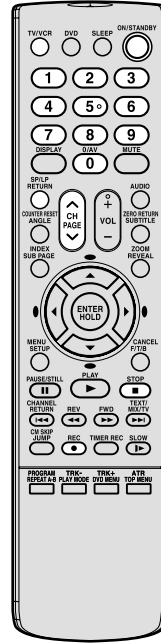
- The everyday/every week recording can be made continuously until the recording is canceled or the tape reaches the end.
- During timer recording, the automatic rewinding mechanism does not function.

## ONE-TOUCH TIMER RECORDING (OTR)

The One-touch Timer Recording feature provides a simple and convenient way to make a timed recording.

**Example:**  
 One-touch Timer Recording for 30 minutes.

- Press **ON/STANDBY** to turn on the unit. Then press **TV/VCR** to select TV/VCR mode.
- Load a video cassette with the erase prevention tab intact.
- Press **SP/LP** to select the desired tape speed (SP or LP). SP or LP will appear on the screen.
- Press **Direct Channel Selection** or **CH/PAGE** **▲** or **▼** to select the channel to be recorded (Example: Channel 2).
- Press **REC** to begin recording. Press the buttons again to stop recording after 30 minutes. Each additional press of **REC** will increase recording time as shown below, up to a maximum of 5 hours. "OTR" will appear on the screen.



Press **REC** to increase the time needed for recording (See the chart below).

Press	Recording time	Press	Recording time
once	NORMAL REC	6 times	3:00
twice	0:30	7 times	4:00
3 times	1:00	8 times	5:00
4 times	1:30	9 times	NORMAL REC
5 times	2:00		

When the tape speed LP is selected, the recording time can be set up to 10 hours.

**NOTES:**

- To cancel OTR, press **STOP**.
- The unit channel can be changed during recording.

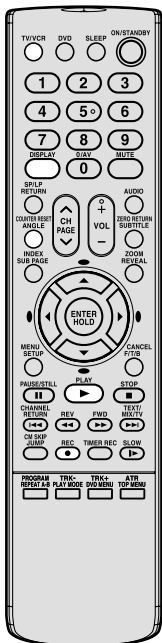
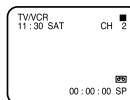
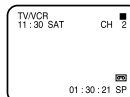
ENGLISH

## USING THE REAL TIME TAPE COUNTER

The On-Screen Real Time Tape Counter shows the tape running time in Hours, Minutes and Seconds.

### TO VIEW THE COUNTER DISPLAY

- Press **TV/VCR** to select TV/VCR mode. Press **DISPLAY** to display the Real Time Tape counter.
- Press **COUNTER RESET** to set the counter to "00:00:00".
- Press **PLAY** or **REC** to start the tape, the counter will display the passed time.
- When you wish to make the counter disappear, press **DISPLAY** once again.



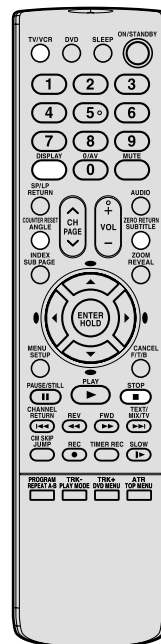
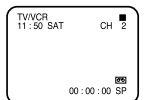
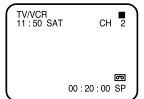
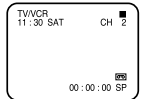
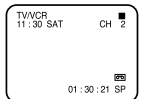
**NOTES:**

- If you rewind the tape from "00:00:00", a minus sign "-" will be displayed in front of the counter.
- When you load a tape, the counter will change to "00:00:00".
- The counter does not function on non-recorded (blank) sections of the tape. When you rewind, fast forward or play tapes through blank sections, the counter stops.

## USING ZERO RETURN

The zero return function provides a convenient method of rapidly returning to the starting point of recording or playback. The starting point can be indexed for any location on the tape by pressing the **COUNTER RESET** button and **ZERO RETURN** button.

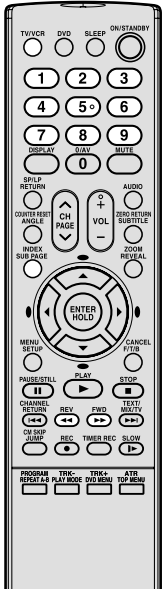
- Press **TV/VCR** to select TV/VCR mode. Press **DISPLAY**.
- Before playback or recording, press **COUNTER RESET** to set the counter to "00:00:00".
- Begin playback or recording.
- Press **STOP**.
- Press **ZERO RETURN**. The tape will rewind and automatically stop at the "00:00:00" position.



ENGLISH

## VIDEO INDEX SEARCH SYSTEM (INDEX)

The VIDEO INDEX SEARCH SYSTEM (INDEX) enables you to locate the beginning of any recording made on the unit. The Index Search function automatically records an INDEX mark on the tape whenever a recording is initiated. This mark can easily be located by using FWD and REV.



### SEARCHING FOR AN INDEX MARK

1 Press TV/VCR to select TV/VCR mode. To search for an index mark, or skip over a number of index marks: Press INDEX during stop or playback.

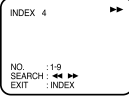


2 Select the number of INDEX marks to be skipped by using Number buttons (1-9).



**EXAMPLE:** When the tape has four separate recorded Programmes, select 4 to go to the beginning of the 4th programme (4th index mark).

3 Press FWD or REV. The unit will skip over the selected number of INDEX marks and will start playback at the selected mark.



#### NOTES:

- When you recorded an INDEX mark at the very beginning of the tape, the mark may not be found.
- During INDEX search, the tape may stop and begin to play at a slightly different location.
- INDEX may not function properly with old or worn out video tapes.

30

## STEREO PLAYBACK/RECEPTION DISTURBANCE

### SELECTING STEREO OR BILINGUAL SOUND FOR A PRE-RECORDED TAPE

Press AUDIO to select stereo/mono or bilingual playback. See the table below for more information.

On-screen indications (for 4 sec.)	Stereo programme	Bilingual programme	On-screen indications (for 4 sec.)	Stereo programme	Bilingual programme
STEREO	Stereo	Main sound from L CH speaker, sub sound from R CH speaker.	R CH	Right channel signal output from both loudspeakers	Sub (MONO B) sound heard from both speakers.
L CH	Left channel signal output from both loudspeakers	Main (MONO A) sound heard from both speakers.	MONO	Mono	Main (MONO A) sound heard from both speakers.

### Hi-Fi signal indication

Press DISPLAY. It will be displayed for approx. 4 seconds when playing Hi-Fi video cassette tapes.



**NOTE:** When playing Hi-Fi cassette tapes recorded on another VCR, the sound output may be distorted. This is normal and no indication of a unit malfunction. Try to minimize sound distortions by using TRK +/- or change to MONO by pressing of AUDIO.

### RECEPTION DISTURBANCE

The most common types of television interference are as follows.

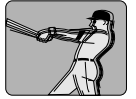
#### IGNITION

Black spots or horizontal streaks may appear, picture may flutter or drift. Usually caused by interference from car ignition systems, neon lamps, electrical drills and other electrical appliances.



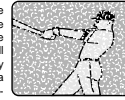
#### GHOSTS

Ghosts are caused by the television signal following two paths. One is the direct path and the other is reflected from tall buildings, hills or some other object. Changing the direction or position of the antenna may improve the reception.



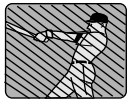
#### SNOW

If your receiver is located in the fringe area of a television station where the signal is weak, your picture may be marred by the appearance of small dots. When the signal is extremely weak, it may be necessary to install a special antenna to improve the picture.



#### RADIO FREQUENCY INTERFERENCE

The interference produces moving ripples or diagonal streaks, and in some cases, causes loss of contrast in the picture.



#### CARE AND MAINTENANCE

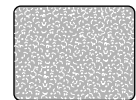
To prevent fire or shock hazard, disconnect the unit from the AC power source before cleaning. The finish on the cabinet may be cleaned with mild soap and a soft damp cloth. Take care when cleaning or wiping the plastic parts.

#### VIDEO HEAD CLOGGING

The video heads record and playback picture and sound on the video tape. In the event that they become dirty you won't be able to do a perfect recording and the playback picture will be extremely snowy with good sound. If this happens have the unit checked by qualified service personnel.



Good Picture



Snowy Picture

#### VIDEO HEAD CLEANING

AUTO HEAD CLEANING cleans the video heads automatically when a cassette is inserted or ejected. This prevents dirt from accumulating onto the heads which can cause snowy picture.

Manual head cleaning is needed if the picture on playback is still unclear although the picture on program is normal. This failure signifies that the head is getting dirty and can occur when playing poor quality or damaged tapes. If the heads require cleaning, use a high quality head-cleaning cassette or have them cleaned professionally.

#### NOTES:

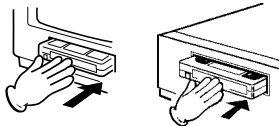
- Video heads may eventually wear out and should be replaced when they fail to produce clear pictures.
- To help prevent video head cleaning, use only good quality VHS tapes. Discard worn tapes.

31

## DUPLICATING A VIDEO TAPE

If you connect the unit to another VCR or VIDEO CAMERA, you can duplicate a previously recorded tape. Make all connections before turning on the power.

1 Load a blank cassette tape with the erase prevention tab intact into the recording unit. Load a previously recorded tape into the playback VCR or VIDEO CAMERA.



2 Press AV to select the AV2 channel. AV2 will be displayed.

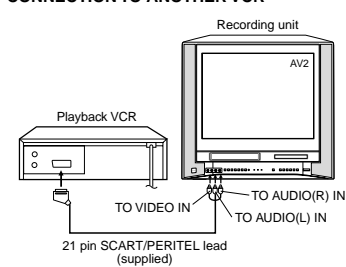
**NOTE:** You can also use the rear 21 pin SCART socket. Select "AV1" by pressing AV.

3 Press REC on the remote control of the unit, then press the PAUSE/STILL.

4 Press the PLAY button on the playback VCR, then press the PAUSE button.

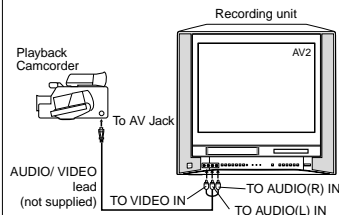
5 Release the Recording Pause and Still Playback to begin the duplicating process.

### CONNECTION TO ANOTHER VCR



### CONNECTION TO CAMCORDER

For duplicating a previously recorded tape from a camcorder, follow the camcorder manufacturer's instructions. A typical camcorder dubbing hookup is shown below.



- NOTES:**
- It is recommended that the tape speed be set to the SP mode on the TV/VCR for best results.
  - Unauthorized recording of copyrighted television programs, films, video cassettes and other materials may infringe the rights of copyright owners and be contrary to copyright laws.

32

## DUPLICATING A DISC MATERIAL ONTO A VIDEO TAPE

With this unit it is theoretically possible to record from a DVD or Audio CD to a video tape.

If the DVD disc has a Copy-guard feature, the duplication is not possible. A symbol mark "C" will appear on the screen for approx. 4 seconds. See page 36 for more information about the DVD Disc.

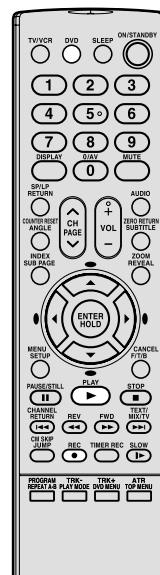
#### Preparation

- Load a cassette tape with the erase prevention tab intact.
- Select the tape speed in the TV/VCR mode. (see P.24)
- Load a disc you wish to duplicate.

1 Press DVD to select the DVD mode.

2 Press PLAY to start the disc playback.

3 During disc playback, press REC.



#### NOTES:

- You can set the duplicating time using the OTR-function. At step 3 above press REC repeatedly until the desired duplicating time appears on the screen. (P.27)
- Unauthorized recording of copyrighted television programs, films, video cassettes and other materials may infringe the rights of copyright owners and be contrary to copyright laws.

33

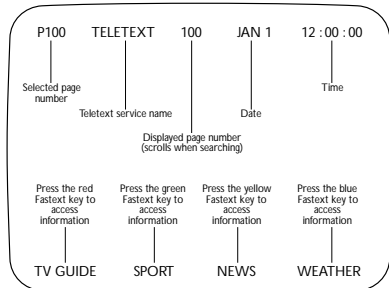
Most broadcasting stations offer a Teletext service in addition to their standard TV program. Teletext offers news, weather forecast, winning Lotto numbers, TV listings and other interesting news. The text is received page by page, as soon as you select the broadcasting station. A single page can be displayed on the screen. The pages are numbered and broadcasted one by one. Therefore you'll have to wait a certain time until the selected page is displayed on the screen. The page will be displayed as soon as it is broadcast. Certain pages can be displayed more easily by pressing one of **FOUR COLOURED FASTTEXT**.

**Basic operation**

- 1 Select the broadcasting station, whose text you want to read. In order to do so, select the station's channel with the remote handset.
- 2 Push **TEXT/MIX/TV**.  
The first push on **TEXT/MIX/TV** switches the Teletext on.  
The second push on **TEXT/MIX/TV** displays the TV program and the Teletext together (MIX).  
The third push on **TEXT/MIX/TV** switches the Teletext off and returns the screen back to the TV program.

The first operation of the teletext normally opens the page 100 with the table of contents.

Example for a teletext page:



Select the desired teletext page from the broadcasting station's table of contents.

**HOLD**

Some pages hold more text than can be displayed on one page. The broadcasting station separates these pages into sub-pages, which are broadcasted one by one automatically. To study one sub-page thoroughly push **HOLD**. The **HOLD**-symbol will be displayed. The associated sub-pages will scroll through automatically, when you push **HOLD** a second time to release it.

**To call a teletext page**

Leaf through the pages with **PAGE** (←/→) (forward or backward).

**NOTE:** You will not necessarily find a page for every page number you enter. E.g. you have entered page no. 116 but it does not offer this page. Available page numbers can be found on the Index page (most stations offer this page 100).

Enter the three-digit page number with the number buttons.

Example:

You want to display page 300.  
Enter: 3 then 0 and 0.

If you enter an incorrect digit, complete all three digits with any numbers, then you can enter the correct page number.

Inside the teletext mode you cannot change to another broadcasting station. To switch to another channel, leave the teletext mode by pushing **TEXT/MIX/TV**.

**How to call a specific sub-page**

Push **SUB PAGE** (0000).

The screen's left upper corner will display: - - -

To call sub-page 2 enter: **0 0 0 2**.

Your input will be displayed in the left upper corner: **0002**.

It may take some time until sub-page 2 is broadcast.

The sub-page can only be displayed when the broadcaster transmits it.

To leave sub-page mode push **SUB PAGE** again.

Within the sub-page mode no other pages other than the sub-pages of the selected page can be called. To call other teletext pages you must leave the sub-page mode.

**Magnifying**

To magnify the letters push **F/T/B**.

You can magnify either the upper or the lower half of the screen.

Each push on the **F/T/B** button switches between the screen's upper and lower half and the full screen. (F/T/B = Full / Top / Bottom)

**REVEAL**

Pushing **REVEAL** will give you the hidden answers to the questions on a Quiz-page.

Not every broadcasting station offers Quiz-pages and they are not constantly offered.

DISC

The region number of this unit is 5. If region numbers, which stand for their playable area, are printed on your DVD video disc and you do not find (5) or (4), disc playback will not be allowed by the player. (In this case, the unit will display a message on-screen.)

**Playable Discs**

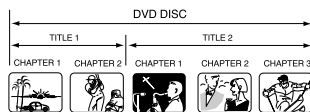
The loaded Disc (DVD, Video-CD, Audio-CD, SVCD and MP3/WMA/JPEG-CD) will be recognized automatically. The suitable Disc-formats are: DVD, CD-R and CD-RW. Some CD-R/RW discs may be incompatible.

Do not play DVD-ROM, DVD-Audio, CDV, CD-G or Photo CD to prevent accidental erasure of prerecorded material.

Some DVDs are copy protected and forbid dubbing on to video tape. Picture Distortion will occur. This is not a defect of this unit.

**Title**

When two or more movies are recorded on a disc, the disc is divided into two or more sections. Each section is called a "TITLE".



**Chapter**

The titles can be subdivided into many sections. Each section is called a "CHAPTER".

**Track**

An Audio CD can contain several items. These are assigned to tracks.



**On handling Discs**

- Do not touch the playback side of the disc.
- Do not attach paper or tape to discs.

**Removing Disc from Case**

Be sure to hold the edge of disc. Do not touch the surface of the disc. Pick up the disc gently from the case.

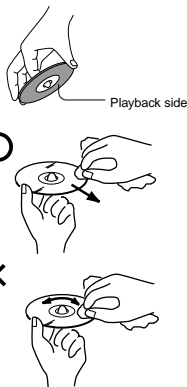
- Do not scratch the disc.
- Do not get dirt on the surface of the disc.
- Do not stick a label or adhesive tape on the disc.
- Do not drop or bend the disc.

**On Storing Discs**

- Store the disc in the case to avoid risk of scratches, dirt or damage.
- Do not leave disc exposed to direct sunlight or in hot or humid places.

**On Cleaning Discs**

- Fingerprints and dust on the disc cause picture and sound deterioration. Wipe the disc from the center outwards with a soft cloth. Always keep the disc clean.
- If you cannot wipe off the dust with a soft cloth, wipe the disc lightly with a slightly moistened soft cloth and finish with a dry cloth.
- Do not use any type of solvent such as thinner, benzine, commercial available cleaners or antistatic spray for vinyl LPs. It may damage the disc.



PREPARATION/DISC STATUS

The following pages describe the setup/operation in DVD mode.



**Preparation**

Before DVD/CD operation, please make preparations as follows.

- 1 Insert the AC cord plug into a standard 230V~240V 50Hz AC outlet.  
• If the AC cord plug is plugged in for the first time, wait for about 5 seconds before pressing the Main POWER switch on the front.
- 2 Press **ON/STANDBY** on the remote control to turn on the unit.  
• Every time you press **ON/STANDBY**, the unit starts from TV mode.  
• When using an amplifier, switch on the amplifier.
- 3 Press **DVD** to select DVD mode.  
The DVD startup screen will appear on the screen.



**Disc status**

With each press of **DISPLAY**, the status of the disc will appear on the screen and change as follows.

[DVD]



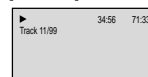
To make status display disappear, press **DISPLAY** again.

[Video CD]



To make status display disappear, press **DISPLAY** again.

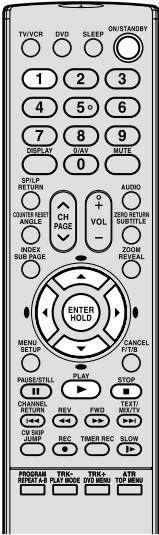
[Audio CD]



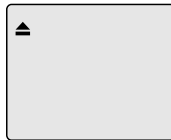
When you playback the CD disc, the status display will appear on the screen and continue displaying.

**NOTE:**

**If the unit does not operate properly:**  
Static electricity can adversely affect the operation of this player. Sometimes this can be remedied by unplugging the unit for a short time, then reconnecting it.



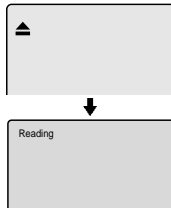
1 Press **OPEN/CLOSE** on the unit.  
The disc tray will open.



2 Place the disc on the disc tray.  
Position it with the printed label side up, align it with the guides, and place it in its proper position.



3 Press **PLAY**.  
The disc tray closes automatically.  
On the TV-screen, "▲" changes to "Reading" and then playback commences.



- A menu screen will appear on the TV screen, if the disc has a menu feature. Press **▲** / **▼** or **◀** / **▶** to select title, then press **ENTER**. Title is selected and play commences.

4 Press **STOP** to end playback.

- The unit records the stopped point, depending on the disc. "■" appears on the screen. Press **PLAY** to resume playback (from the scene point).
- If you press **STOP** again or unload the disc ("■" appears on the screen.), the unit will clear the stopped point.

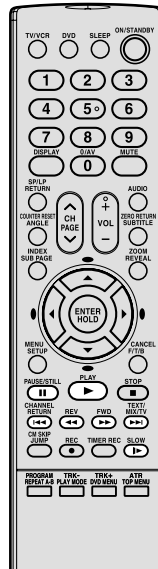
5 To stop the playback, press **STOP**.  
Then press **OPEN/CLOSE**.  
The disc tray opens.  
Remove the disc and press **ON/STANDBY**.  
The disc tray closes automatically and unit turns off.

■ **To turn off the PBC**  
Press **Number button 1** in the stop mode, then press **ENTER**.

**NOTES:**

- If a non-compatible disc is loaded, "Incorrect Disc", "Region Code Error" or "Parental Error" will appear on the TV screen according to the type of loaded disc. If these appear, check your disc again (see pages 36 and 49).
- Some discs may take a minute or so to start playback.
- When you set a single-faced disc label downwards (ie. the wrong way up) and press **PLAY** or **OPEN/CLOSE** on the unit, "Reading" will appear on the display for approx. 30 seconds and then "Incorrect Disc" will be displayed.
- Some playback operations of DVDs may be intentionally fixed by software producers. Since this unit plays DVDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs.

You can play discs at various speeds.



**Playing in fast reverse or fast forward directions**

Press **REV** or **FWD** during playback.

**REV:** Fast reverse playback  
**FWD:** Fast forward playback

Each time you press the **REV** or **FWD** button, the playback speed changes.

■ **To resume normal playback**  
Press **PLAY**.

- The DVD video player mutes sound and subtitles during reverse and forward scan of DVD/VCD video discs. However, this unit plays sound during fast forward or fast reverse play of audio CDs.
- The playback speed may differ depending on the disc.

**Playing frame by frame**

Press **PAUSE/STILL** during still playback.

Each time you press **PAUSE/STILL**, the picture advances one frame.

■ **To resume normal playback**  
Press **PLAY**.

- The sound is muted during frame by frame playback.

**Playing in slow-motion**

Press **SLOW** during normal playback or still playback. Each press of **SLOW** will change the speed of the slow x1/2, x1/4, x1/6, x1/7.

- The sound is muted during slow-motion playback.

**Locating a chapter or track**

Press **SKIP** (◀◀) or **SKIP** (▶▶) repeatedly to display the chapter or track number you want. Playback starts from the selected chapter or track.

**SKIP** (▶▶) : To locate succeeding chapters or tracks.  
**SKIP** (◀◀) : Playback starts from the beginning of the current chapter or track.  
When you press twice in quick successions, playback starts from the beginning of the preceding chapter or track.

**NOTES:**

- A "Prohibition" symbol (⊘) may appear at the upper left of the screen. This symbol means either the feature you tried is not available on the disc, or the DVD can not access the feature at this time. This does not indicate a problem with the DVD.
- The unit is capable of holding a still video image or On screen display image on your television screen indefinitely. If you leave the still video image or On screen display image displayed on your TV for an extended period of time, you risk permanent damage to your television screen. Projection televisions are very susceptible.

MP3/WMA/JPEG PLAYBACK

This player can play back the MP3/WMA/JPEG data which has been recorded on CD-R or CD-RW. To produce the MP3/WMA/JPEG data, you need a Windows-PC with CD-R/RW drive and a MP3/WMA/JPEG-encoding Software (not supplied).  
The Apple-HFS-System cannot be played.

**MP3/WMA/JPEG CD information**

**Limitations on MP3/WMA/JPEG CD playback**

- MP3/WMA/JPEG CD is the disc that is standardized by ISO9660, its file name must include 3-digits extension letters, "mp3", "wma", "jpg".
- This unit can read 600 files per disc. If one directory has more than 600 files, it reads up to 600 files, the remaining files will be omitted.
- The unit is able to recognize up to a maximum of 50 directories per disc.
- MP3/WMA/JPEG CDs cannot be used for playback for the purpose of recording.
- If the CD has both audio tracks and MP3/WMA/JPEG files, only audio tracks are played.
- It may take more than one minute for this unit to read MP3/WMA/JPEG files depending on its structure.
- Music recorded by "Joliet Recording Specification" can be played back, the file name is displayed (within 16 letters) on the screen. Long file names will be condensed.
- The music files recorded by "Hierarchical File System" (HFS) cannot be played.

**Limitations on display**

- The maximum number for display is 16 letters. Available letters for display are the following: capital or small alphabets of A through Z, numbers of 0 through 9, and \_ (under score).
- Other letters than those above are replaced in hyphen.

**Notes on MP3/WMA/JPEG files**

To play back MP3/WMA/JPEG CD in the recorded order,

- Use MP3/WMA/JPEG software that records data alphabetically or numerically.
- Name each file including two-digit or three-digit number (e.g. "01" "02" or "001" "002").
- Refrain from making too many sub-folders.

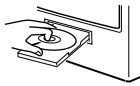
**CAUTION:**

- Some MP3/WMA/JPEG CDs cannot be played back depending on the recording conditions.
- The CD-R/RW that has no music data or non-MP3/WMA/JPEG files can not be played back.

**MP3/WMA CD playback**

1 Press **▲** (**OPEN/CLOSE**).  
The disc tray will open.

Place a disc on which MP3 or WMA files have been recorded onto the tray.

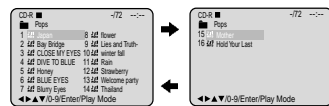


2 A file menu screen will appear on the TV screen.  
Press **◀** or **▶** to select folder.



3 Press **▲** / **▼** / **◀** / **▶** or **Number button (0-9)** to select the desired file.

- In case the folder includes more than 15 files, press **◀** / **▶** to display next file list.



- When **PLAY** has been pressed after displaying the file menu, or when the disc tray has been closed after using **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is an MP3/WMA file, only MP3/WMA files are played back in order. If the first file is a JPEG file, the first JPEG file is played back.

4 Press **ENTER**.  
The selected file starts playing back.

5 Press **STOP** to end playback.

- The unit records the stopped point. "■" appears on the screen. Press **PLAY** to resume playback (from the scene point).
- If you press **STOP** again or unload the disc, the unit will clear the stopped point.

**NOTES:**

- During MP3/WMA/JPEG-Playback, you cannot use **SEARCH**, **A-B Repeat** functions.
- You can use **Repeat** (Track or All), **Random** functions and **Program** playback for MP3/WMA/JPEG CD playback (see pages 43 and 44).
- In the case of a CD containing a mixture of MP3, WMA and JPEG files, the files are played back by selecting them from the file menu.

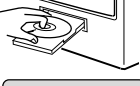
Microsoft, Windows Media, and Windows Logo are trademarks or registered trademarks of Microsoft Corporation in both the United States and other countries.

MP3/WMA/JPEG PLAYBACK

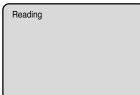
**JPEG CD playback**

1 Press **OPEN/CLOSE**.  
The disc tray will open.

Place a disc on which JPEG files have been recorded onto the tray.



2 Press **OPEN/CLOSE** or **PLAY**.  
The disc tray closes automatically. On the TV-screen, "Reading" will appear. Reading will take as much time as the number of file.



3 A file menu screen will appear on the TV screen.  
Press **◀** / **▶** to select folder.



4 Press **▲** / **▼** / **◀** / **▶** or **Number buttons (0-9)** to select the desired file.

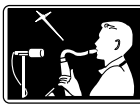


To display a picture menu, press **DVD MENU**. (To return to a file menu, press **TOP MENU**.)  
Press **▲** / **▼** / **◀** / **▶** to select the desired file.



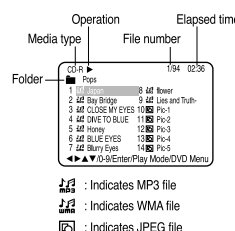
- To display next list, press **SKIP** (▶▶) / (◀◀).
- When **PLAY** has been pressed after displaying the file menu, or when the disc tray has been closed after pressing **PLAY**, playback begins automatically starting from the first file. In this case, if the first file is a JPEG file, the first JPEG file is played back. If the first file is an MP3/WMA file, only MP3/WMA files are played back in order.

5 Press **ENTER**.  
The selected picture appears on the TV screen.



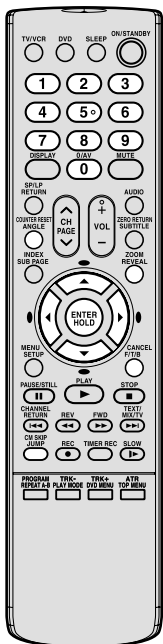
6 Press **STOP** to end playback.  
The file menu appears on the TV screen.  
If you want to watch the other file, repeat steps 3-5.

**About file menu**



**NOTES:**

- The picture menu is displayed when the FUJICOLOR CD or the Kodak Picture CD are played. To display the file menu press **TOP MENU**.
- MP3 file on the KODAK Picture CD is not recognized on this unit.



**Zooming**

This unit will allow you to zoom in on the frame image. You can then make selections by switching the position of the frame.

- Press **ZOOM** during playback. The centre part of the image will be zoomed in. Each press of **ZOOM** will change the ZOOM Q<sub>1</sub> (x 1.3), Q<sub>2</sub> (x 1.5) and Q<sub>3</sub> (x 2.0). **NOTE:** In case of the Video CD recorded with PAL colour system, Q<sub>3</sub> (x 2.0) zooming does not work.

- Press **▲ / ▼ / ◀ / ▶** to view a different part of the frame. You may move the frame from the centre position to UP, DOWN, LEFT or RIGHT direction.

- In the zoom mode press **ZOOM** repeatedly to return to a 1:1 view (Q Off).

**Changing Angles**

When playing back a disc recorded with multi-angle facility, you can change the angle that you are viewing the scene from.

- Press **ANGLE** during playback. The current angle will appear.
- Press **ANGLE** repeatedly until the desired angle is selected.

**Locating Desired Scene**

Use the title, chapter and time recorded on the disc to locate the desired point to play back.

- Press **JUMP** during playback or stop mode.
  - "Time" only works in playback or resume stop mode.
- Press **▲** or **▼** to select the "Time", "Title" or "Chapter".
- Press **Number buttons (0-9)** to change the number.
  - If you input a wrong number, press **CANCEL**.
  - Refer to the package supplied with the disc to check the numbers.
- Press **ENTER**. Playback starts.
  - When you change the title, playback starts from Chapter 1 of the selected title.
  - Some discs may not work in the above operation.

- NOTES:**
- You can select the Pause, Slow or Search playback in the zoom mode.
  - Some discs may not respond to zoom feature.

**Repeat Playback**

- Press **PLAY MODE** during playback or stop mode.
 

DVD	VCD/CD
Repeat : Off	Play Mode : Off
Repeat : Off	Repeat : Off
◀▶▶▶ Play Mode	◀▶▶▶ Play Mode
- Press **▲ / ▼** to select "Chapter" or "Title". In case of CD, at first press **▼** to select "Repeat" and then press **▲ / ▼** to select "Track" or "All".
 

DVD	VCD/CD
Repeat : Chapter	Play Mode : Off
Repeat : Chapter	Repeat : All
◀▶▶▶ Play Mode	◀▶▶▶ Play Mode
- Press **PLAY MODE** again to make the screen disappear.
  - Press **PLAY** to start Repeat playback.
  - To resume normal playback Select Repeat : "Off" in step 2.

**A-B Repeat Playback**

A-B repeat playback allows you to repeat material between two selected points.

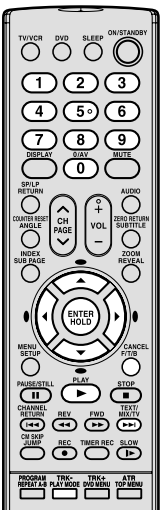
- Press **REPEAT A-B** during playback. The start point is selected.
 

A-
----
- Press **REPEAT A-B** again. The end point is selected. Playback starts at the point that you selected. Playback stops at the end point, returns to Point A automatically, then starts again.
 

A-B
-----
- To resume normal playback Press **REPEAT A-B** again. "Off" appears on the screen.

- NOTES:**
- Some discs may not work with the repeat operation.
  - In A-B repeat mode, subtitles near the A or B locations may not be displayed.
  - You can not set the A-B Repeat for the scenes that include multiple angles.
  - You may not be able to set A-B Repeat, during certain scenes of the DVD.
  - A-B Repeat Playback does not work when Repeat Playback is activated.

ENGLISH



**Program playback**

You can arrange the playback order of tracks or files on the disc.

- Press **PLAY MODE** during stop mode.
 

Play Mode : Off
Repeat : Off
◀▶▶▶ Play Mode
- Press **▲ / ▼** to select Play Mode, then press **◀ / ▶** to select "Program".
 

Play Mode : Program
Repeat : 0
1 --- 4 --- 7 --- 10 ---
2 --- 5 --- 8 --- 11 ---
3 --- 6 --- 9 --- 12 ---
[Clear] [Program Playback]
◀▶▶▶ / Enter 0-9 / Cancel Play Mode
- Press **▲ / ▼** or **◀ / ▶** to select the programming position. Use **Number buttons (0-9)** to input the track or file numbers.
  - To program others, repeat step 3.
  - If you input a wrong number, press **CANCEL**.

Play Mode : Program
Repeat : Off
1 9 --- 4 --- 7 --- 10 ---
2 3 --- 5 --- 8 --- 11 ---
3 11 --- 6 --- 9 --- 12 ---
[Clear] [Program Playback]
◀▶▶▶ / Enter 0-9 / Cancel Play Mode
- Press **▲ / ▼** or **◀ / ▶** to select "Program Playback" and press **ENTER**. The programs you selected will start to playback in the order.
  - In case of JPEG file, press **SKIP (▶▶)** to continue the program playback.
  - To resume to normal playback, select "Play Mode: Off" at step 2.

Play Mode : Program
Repeat : Off
1 9 --- 4 --- 7 --- 10 ---
2 3 --- 5 --- 8 --- 11 ---
3 11 --- 6 --- 9 --- 12 ---
[Clear] [Program Playback]
◀▶▶▶ / Enter 0-9 / Cancel Play Mode

**Random playback**

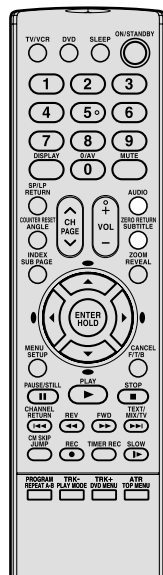
- Press **PLAY MODE** during playback or stop mode.
 

Play Mode : Off
Repeat : Off
◀▶▶▶ Play Mode
- Press **▲ / ▼** to select Play Mode, then press **◀ / ▶** to select "Random".
 

Play Mode : Random
Repeat : Off
◀▶▶▶ Play Mode
- Press **PLAY**. The Random Playback will start.
  - If you set "Random" during playback mode, Random playback will begin after the track that is currently being played has ended.
  - To resume normal playback, select Play Mode: "Off" in step 2.

- To change the program
  1. In the program mode, press **▲ / ▼** or **◀ / ▶** to select the track number.
  2. Press **Number buttons (0-9)** to select the track number to be replaced.
- To clear the program one by one
  1. In the program mode, press **▲ / ▼** or **◀ / ▶** to select the track number. Then press **CANCEL**.
- To clear all the programs
  1. In the program mode, press **▲ / ▼** or **◀ / ▶** to select "Clear". Then press **ENTER**.

- NOTES:**
- In playing back the Video CD with PBC, you can not set Program playback.
  - The program is cancelled when you open the disc tray or turn the power off.
  - In playing back the Video CD with PBC, you can not set Random playback.



**Changing soundtrack language**

You can select the language when you play a multilingual disc.

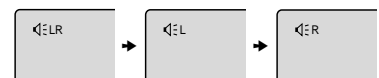
- Press **AUDIO** during playback.
 

1/8 Eng Dolby Digital
-----------------------

The current soundtrack language will appear.
  - Press **AUDIO** repeatedly until the desired language is selected.
 

2/8 Fra Dolby Digital
-----------------------

The on screen display will disappear after a few seconds.
- In case of video CD playback**  
Audio type changes as follows each time you press **AUDIO**.



**Subtitles**

When playing back a disc recorded with subtitles, you can select the subtitle language or turn the subtitles off.

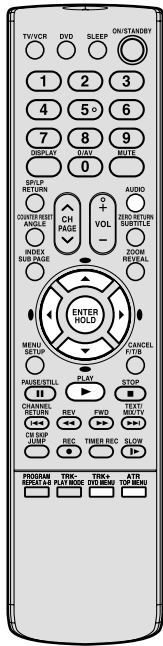
- Press **SUBTITLE** repeatedly during playback until your desired language appears.
 

1/32 Eng
----------
- To turn off the subtitle, press **SUBTITLE** until "Off" appears.
  - The on screen display will disappear after a few seconds.

Off
-----

- NOTES:**
- If the desired language is not heard after pressing the button several times, the language is not recorded on the disc.
  - Changing soundtrack language is cancelled when you open the disc tray. The initial default language or available language will be heard if the disc is played back again.
  - Depending on the DVD, you may not be able to change subtitles, or to turn subtitles on or off.
  - While playing a DVD, the subtitle may change when you open or close the disc tray.
  - In some cases, a selected subtitle language may not be changed immediately.

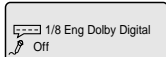
ENGLISH



**Karaoke playback**

You can turn the vocal on or off recorded on the DVD KARAOKE.

- During DVD KARAOKE disc playback, press **AUDIO**. The KARAOKE symbol (K) appears.
  - If you play non-Karaoke disc, the KARAOKE symbol (K) does not appear.
  - Some Karaoke discs may not have the vocal on/off function. In this case, the KARAOKE symbol (K) does not appear.
- Press **◀** or **▶** to select "On" or "Off".
  - On**: The primary vocal is output when it is recorded on the disc.
  - Off**: The primary vocal is not output.
  - The on screen display will disappear after a few second.



**Title Selection**

Two or more titles are recorded on some discs. If the title menu is recorded on the disc, you can select the desired title.

- Press **TOP MENU** during playback. Title menu appears on the screen.
- Press **▲ / ▼ / ◀ / ▶** to select the desired title.
- Press **ENTER** or **PLAY**. The playback of the selected title will start.

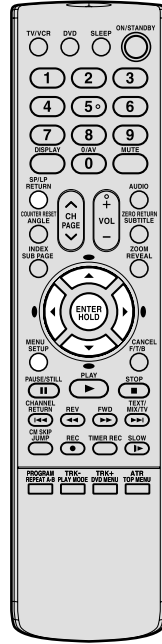
**DVD Menu**

Some DVDs allow you to select the disc contents using the menu. When you play back these DVDs, you can select the subtitle language and soundtrack language, etc. using the DVD menu.

- Press **DVD MENU** during playback. The DVD menu appears on the screen.
  - Press **DVD MENU** again to resume playback at the scene when you pressed **DVD MENU**.
- Press **▲ / ▼ / ◀ / ▶** to select the desired item.
- Press **ENTER**. The menu continues to another screen. Repeat steps 2 and 3 to set the item completely.

- NOTES:**
- The vocal output feature is used during playback of Dolby Digital (multi-channel) recorded DVD KARAOKE discs. This feature allows you to turn off vocal audio tracks, or restore them for background accompaniment.
  - When playing Karaoke, connect appropriate audio equipment such as an amplifier to the unit.

You can change the default settings to customize performance to your preference.

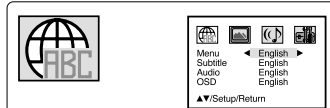


- Press **SETUP** during stop mode. The following on-screen display appears.



- Press **◀** or **▶** to select the desired section, then press **▼** or **ENTER**.
- Press **▲** or **▼** to select the desired option.
- Change the selection using **◀** or **▶**, by referring to the corresponding pages 48-50.
  - To select another operation, go back to step 2 by pressing **▲** repeatedly.
- To make SETUP screen disappear, press **SETUP** or **RETURN**.

Section	Option	Details	Page
	<b>Menu Subtitle Audio</b>	To select the language of "Menu", "Subtitle" and "Audio" if more than one language are recorded on the disc.	48
	<b>OSD</b>	To select a preferred language for on screen display.	
	<b>Tv Screen</b>	To select a picture size according to the aspect ratio of your TV.	48
	<b>Display</b>	To turn on or de-activate the operational status display on the screen.	
	<b>Picture Mode</b>	To select a preferred picture mode from "Video", "Film" or "Auto".	
	<b>JPEG Interval</b>	To select a preferred setting for the slide show playback.	49
	<b>DRC</b>	To select On or Off for DRC (Dynamic Range Control).	
	<b>Password</b>	Input 4-digit password to set the parental level.	
	<b>Parental</b>	To select a preferred parental level for the parental setting.	50
	<b>Select Files</b>	To select a preferred file type for playing back a CD containing a mixture of file types.	



**Menu, Subtitle, Audio**

You can select the language of "Menu", "Subtitle" and "Audio" if more than one languages are recorded onto the disc.

**English, Deutsch, Russian, Italiano, Espanol:**  
The selected language will be heard or seen.

**Other:**  
Other language can be selected (see the "Language code list" on page 52).

**Original: (Audio)**  
The unit will select the first priority language of each disc.

**Off: (Subtitle)**  
Subtitles do not appear.

**Note:**  
If the selected language is not recorded on the disc, the first priority language is selected.

**OSD**

The setup language can be selected.

**English:** To display OSD language in English.  
**Deutsch:** To display OSD language in Deutsch.  
**Russian:** To display OSD language in Russian.  
**Italiano:** To display OSD language in Italiano.  
**Espanol:** To display OSD language in Espanol.



**Tv Screen**

You have the following screen sizes to choose from:

**4:3 Letter box:**  
Select this mode when connecting to a conventional TV. When playing back a wide screen-DVD disc, it displays the wide picture with black bands at the top and bottom of screen.

**4:3 Pan scan:**  
It displays the wide picture on the whole screen with left and right edges automatically cut off.

**16:9 Wide:**  
Select this mode when connecting to a wide-screen TV. A wide screen picture is displayed full size.

It is possible to connect this set to an external widescreen (16:9) TV set via the SCART socket (see P.9).

**Note:**  
If the DVD disc is not formatted in the pan & scan style, it displays 4:3 style.

**Display**

On screen display can be switched on or off when you press the buttons.

**On:** On screen displays appear when you press the buttons (factory setting).  
**Off:** On screen displays do not appear when you press any buttons.

**Picture Mode**

There are two types of source content in pictures recorded in DVD video discs: film content (pictures recorded from films at 24 frames per second) and video content (video signals recorded at 30 frames per second). Make this selection according to the type of content being viewed.

**Auto:** Select this position normally. The DVD player automatically detects source content, film or video, of playback source, and converts that signal in the progressive output format in an appropriate method.

**Film:** The DVD player converts film content pictures in the progressive output format appropriately. Suitable for playback of film content pictures. The progressive output feature will be most effective under this selection.

**Video:** The DVD player filters video signal, and converts it in the progressive output format appropriately. Suitable for playback of video content pictures.

**Note:**  
Depending on the disc, pictures may be cut off or doubled. In this case, select "Video".

**JPEG Interval**

You can continuously play back all JPEG files automatically. After the setting below, start playing the disc on which JPEG files have been recorded.

**Off:**  
Plays back one file at a time.

**5 Seconds:**  
Plays back images in the form of a slide show at 5 second intervals.

**10 Seconds:**  
Plays back images in the form of a slide show at 10 second intervals.

**15 Seconds:**  
Plays back images in the form of a slide show in 15 second intervals.



**DRC**

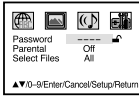
DRC (Dynamic Range Control) enables you to control the dynamic range so as to achieve a suitable sound for your equipment.

**On:**  
Loud sound such as explosion or similar is toned down slightly when played back. This makes it suitable for when it is connected to a stereo.

**Off:**  
It plays back at the recording level on the disc.

**Notes:**

- This function works only during playback of Dolby Digital recorded discs.
- The level of Dynamic Range Reduction may differ depending on DVD video disc.



**Parental control setting**

Some discs are specified not suitable for children. Such discs can be limited not to play back with the unit.

- Press **▲** or **▼** to select "Parental", then press **◀** or **▶** until the level you require appears.
  - Level Off:** The parental control setting does not function.
  - Level 8:** All DVD software can be played back.
  - Level 1:** DVD software for adults cannot be played back.
 Select from the level 1 to level 8. The limitation will be more severe as the level number is lower.
- Press **▲** or **▼** to select "Password". Press **Number buttons (0-9)** to input a 4-digit password. Be sure to remember this number!
  - If you input a wrong number, press **CANCEL**.
- Press **ENTER** to store the password.
 

Note: Now the rating is locked and the setting cannot be changed unless you enter the correct password.
- Press **OPEN/CLOSE** to activate Parental control setting. (See "Temporary disabling of rating level by DVD disc" on page 51.)

- Notes:**
- Depending on the discs, the unit cannot limit playback.
  - Some discs may not be encoded with specific rating level information though its disc jacket says "adult." For those discs, the age restriction will not work.

**To change the parental level**

- Press **▲** or **▼** to select "Password".
- Press **Number buttons (0-9)** to enter the password you have stored.
- Press **ENTER**.
  - The rating is now unlocked.
- Press **▲** or **▼** to select "Parental", then press **◀** or **▶** to change the parental level.
- Press **▲** or **▼** to select "Password", then press **Number buttons (0-9)** to enter the password.
 

Note: You can change the password if you want.
- Press **ENTER**.
 

Now the parental level is changed and locked.

**If you forget the password...**

- Press **OPEN/CLOSE** to open the disc tray.
- Remove the disc.
- Press **OPEN/CLOSE** again to close the disc tray. "No Disc" appears on the screen.
- While holding **STOP** down on the front panel, press **7** on the remote control. "PASSWORD CLEAR" appears on the screen.
- Enter a new password again.

**Select Files**

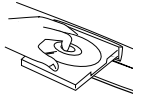
When playing back a CD containing a mixture of MP3 and JPEG files, only MP3 or JPEG files can be displayed on the file menu.

- All:** Displays all files.  
**Music Only:** Displays only MP3 files.  
**Pictures Only:** Displays only JPEG files.

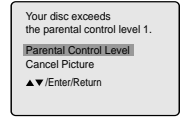
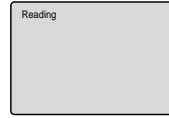
**Note:** If each setup (pages 48-50) has been completed, the unit can always be worked under the same conditions (especially with DVD discs). Each setup will be retained in the memory even if you turn the power off.

Depending on the DVD disc, the disc may try to temporarily cancel the rating level that you have set. It is up to you to decide whether to cancel the rating level or not.

- Load a DVD disc and press **PLAY** or **OPEN/CLOSE** on the unit (see page 38).

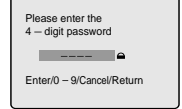


- If the DVD disc has been designed to temporarily cancel the Rating level, the screen which follows the "Reading" screen will change, depending on which disc is played. If you select "YES" with **ENTER** key, "Your disc exceeds the parental control level 1." screen will then appear.



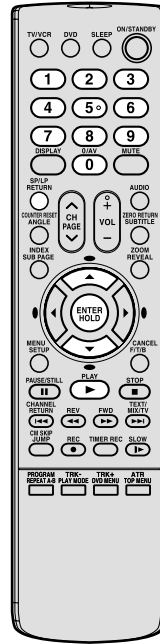
- If you wish to cancel the set rating level temporarily, select "Parental Control Level" with **▲** or **▼**, then press **ENTER**. If the 4-digit password at step 2 on page 50 has been set, the password entering screen will appear as shown in step 4. Alternatively, if the password has not been set, playback will commence. If you don't know (or have forgotten) the password, select "Cancel Picture". The setting screen will disappear. Press **OPEN/CLOSE** to remove the disc.

- Enter the password with **Number buttons (0-9)**. Then press **ENTER**.



If you interrupt the entering, press **ENTER**.

- Playback will commence if the entered password was correct.



**NOTE:** This temporary cancellation of rating level will be kept until the disc is ejected. When the disc is ejected, the original rating level will be set again automatically.

LANGUAGE CODE LIST

Enter the appropriate code number for the initial settings "Menu", "Subtitle" and/or "Audio" (see page 48).

Language	Name Code	Language	Name Code	Language	Name Code	Language	Name Code
Abkhazian	1112	Fiji	1620	Lingala	2224	Singhalese	2919
Afar	1111	Finnish	1619	Lithuanian	2230	Slovak	2921
Afrikaans	1116	French	1628	Macedonian	2321	Slovenian	2922
Albanian	2927	Frisian	1635	Malagasy	2317	Somali	2925
Amharic	1123	Galician	1722	Malay	2329	Spanish	1529
Arabic	1128	Georgian	2111	Malayalam	2322	Sundanese	2931
Armenian	1835	German	1415	Maltese	2330	Swahili	2933
Assamese	1129	Greek	1522	Maori	2319	Swedish	2932
Aymara	1135	Greenlandic	2122	Marathi	2328	Tagalog	3022
Azerbaijani	1136	Guarani	1724	Moldavian	2325	Tajik	3017
Bashkir	1211	Gujarati	1731	Mongolian	2324	Tamil	3011
Basque	1531	Hausa	1811	Nauru	2411	Tatar	3030
Bengali, Bangla	1224	Hebrew	1933	Nepali	2415	Telugu	3015
Bhutani	1436	Hindi	1819	Norwegian	2425	Thai	3018
Bihari	1218	Hungarian	1831	Oriya	2528	Tibetan	1225
Breton	1228	Icelandic	1929	Panjabi	2611	Tigrinya	3019
Bulgarian	1217	Indonesian	1924	Pashto, Pushto	2629	Tonga	3025
Burmese	2335	Interlingua	1911	Persian	1611	Turkish	3028
Byelorussian	1215	Irish	1711	Polish	2622	Turkmen	3021
Cambodian	2123	Italian	1930	Portuguese	2630	Twi	3033
Catalan	1311	Japanese	2011	Quechua	2731	Ukrainian	3121
Chinese	3618	Javanese	2033	Rhaeto-Romance	2823	Urdu	3128
Corsican	1325	Kannada	2124	Romanian	2825	Uzbek	3136
Croatian	1828	Kashmiri	2129	Russian	2831	Vietnamese	3219
Czech	1329	Kazakh	2121	Samoan	2923	Volapük	3225
Danish	1411	Kirghiz	2135	Sanskrit	2911	Welsh	1335
Dutch	2422	Korean	2125	Scots Gaelic	1714	Wolof	3325
English	1524	Kurdish	2131	Serbian	2928	Xhosa	3418
Esperanto	1525	Laothian	2225	Serbo-Croatian	2918	Yiddish	2019
Estonian	1530	Latin	2211	Shona	2924	Yoruba	3525
Faroese	1625	Latvian, Lettish	2232	Sindhi	2914	Zulu	3631

BEFORE REQUESTING SERVICE

If your unit does not work properly check the following before calling a service engineer.

SYMPTOMS	CAUSE	SOLUTION	PAGE
<b>POWER</b>			
No power.	The Mains lead is not connected.	Connect Mains lead to AC outlet.	7
	Main power (POWER) switch is OFF.	Set it to ON.	4
Recorder does not work even though STANDBY light is on.	TIMER REC button is ON. (TIMER REC indicator is on.)	Set it to OFF. (TIMER REC indicator is off.)	25
	Moisture condensation has formed inside recorder.	Wait for a few hours.	2
<b>TV BROADCAST RECEPTION</b>			
No picture, no sound.	The Mains lead is disconnected.	Connect the Mains lead to the AC outlet.	7
	Aerial connector is not connected or wires are broken.	Check aerial connections or broken wires.	7
	ON/STANDBY button is off.	Press the ON/STANDBY button.	4
	Possibly station trouble.	Try another channel.	15
	Possibly station trouble.	Try another channel.	15
Sound OK, poor picture.	Aerial connector is not connected or wires are broken.	Check aerial connections or broken wires.	7
	Possibly local interference.	Move the aerial away from the source of interference.	31
	Possibly station trouble.	Try another channel.	15
Picture OK, poor sound.	Possibly local interference.	Move the aerial away from the source of interference.	31
	Volume control set at minimum position.	Increase VOLUME control.	15
Poor reception.	Aerial connector is not connected or wires are broken.	Check aerial connections or broken wires.	7
	Possibly station trouble.	Try another channel.	15
Poor colour or no colour.	Aerial connector is not connected or wires are broken.	Check aerial connections or broken wires.	7
	Possibly station trouble.	Try another channel.	15
	Possibly local interference.	Move the aerial away from the source of interference.	31
	Colour control is not adjusted.	Adjust the colour settings.	17
<b>VCR</b>			
Recording does not work.	Protection tab on the cassette tape has been removed.	Place an adhesive tape over the gap.	20
	Main power (POWER) switch is OFF.	Set main power to ON.	4
	Clock is not set.	Set the clock.	11
Timer recording does not work.	START/END time is not correctly.	Set the START/END time correctly.	25,26
	TIMER REC button is OFF.	Set the TIMER REC button to ON.	25
	Present time is not set correctly.	Set the present time correctly.	11
	One-Touch Timer Recording (OTR) is ON.	After OTR recording, set the timer recording.	27
INDEX mark was not registered.	INDEX mark was recorded at the beginning of the tape.	Let the tape run for a couple of seconds before recording the first INDEX mark.	30
	Tracking is not adjusted.	Adjust the TRACKING control.	22
Noise bars on screen.	Video heads are dirty.	Clean the video heads.	31
	The tape is worn or damaged.	Try another tape.	-
Can not locate INDEX mark.	The tape is worn or damaged.	Try another tape.	-
<b>DVD</b>			
The playback picture has occasional distortion.	The disc is dirty.	Eject the disc and clean it.	36
	It is in fast forward or fast reverse playback.	Some times a small amount of picture distortion may appear. This is not a malfunction.	-

# BEFORE REQUESTING SERVICE

SYMPTOMS	CAUSE	SOLUTION	PAGE
<b>DVD</b>			
The unit does not start playback.	No disc is inserted.	Insert a disc.	38
	An unplayable disc is inserted.	Insert a playable disc (Check the disc type and colour system).	36
	The disc is placed upside down.	Place the disc with the playback side down.	38
	The disc is not placed within the guide.	Place the disc correctly inside the guide on the disc tray.	38
	The disc is dirty.	Clean the disc.	36
	The parental lock function is set.	Cancel the parental lock function or change the parental lock level.	50
Playback does not follow the course of the disc's program.	It is in the mode of repeat playback, memory playback, etc.	These operations may prevent a proper progress of the contents.	-
Hand icon appears on the screen.	The function is prohibited with the unit or the disc.	-	39
<b>REMOTE CONTROL</b>			
Remote control does not work.	It is not aimed at the remote sensor.	Aim it at the remote control sensor.	6
	Distance too far or there is too much light in the room.	Operate within 5 metres and reduce the light of the room.	6
	Obstacle in the path of beam.	Clear the path of the beam.	6
	Batteries are weak.	Replace batteries.	6
	Polarities of the batteries, + or -, are not inserted correctly.	Install batteries correctly.	6

\* This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation or other rights owners and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation or other rights owners. Reverse engineering or disassembly is prohibited.

\* Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

\* "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

\* Unauthorized recording of copyrighted television programs, films, video cassettes and other materials may infringe the rights of copyright owners and be contrary to copyright laws.

## TELEVISION

Picture Tube:

21" (51 cm "V") measured diagonally  
90 degree deflection  
CCIR 625 Lines 50 Fields  
PAL/SECAM BG/DK  
Electronic Tuners  
E2-E12, XZ+2, S1-S41, E21-E69  
VHF/ UHF 75 ohm unbalanced  
1.5 W+1.5W (max)  
(4.6 x 9.9 cm 8 ohm) x 2

Tuner:

Receiving Channels:

Antenna Input:

Audio Output Power:

Speaker:

## VCR

Video Recording System:

VHS, 4 Rotary Heads Helical Scanning System  
Luminance: FM azimuth recording  
Color signal: converted sub-carrier phase shift recording  
1 Track  
12.65mm high density tape  
Approx. 1 minute 48 seconds (With E-180 Cassette Tape)  
SP: 23.39 mm/s, LP: 11.69 mm/s (NTSC SP: 33.35 mm/s)  
300 min. with E-300 video cassette (PAL)  
210 min. with T-210 video cassette (NTSC)

Input Level:

Output Level:

Hi-Fi Dynamic Range:

Frequency Response:

VIDEO: 1 Vp-p, 75 Ω  
AUDIO: 500 mV, 50 k Ω  
VIDEO: 1 Vp-p, 75 Ω  
AUDIO: 500 mV, 1 k Ω  
More than 75dB  
20Hz to 20,000Hz

## DVD

Signal system:

Applicable disc:

Audio characteristics:

Frequency response:

S/N Ratio:

Harmonic distortion:

Wow and flutter:

Dynamic range:

Output:

Pickup:

PAL, NTSC  
DVD (12cm, 8cm), CD (12cm, 8cm)  
DVD: 4Hz - 22KHz  
CD: 4Hz - 20KHz  
90dB  
0.06%  
Below Measurable Level  
90dB  
Audio: (RCA) -12.0 dBm, 1Kohm  
Digital Audio: 0.5Vp-p/75 ohm  
CD: Wavelength: 775 - 805 nm  
DVD: Wavelength: 640 - 660 nm  
Maximum output power: 0.5 mW  
Maximum output power: 1.0 mW

## GENERAL

Power Source:

Power Consumption:

Weight:

Dimensions:

Operating Temperature:

AC 230-240V, 50Hz  
80 W  
27.5 kg  
573(W) x 517(H) x 482(D)mm  
5°C to 40°C

## REMOTE CONTROL UNIT

Power Supply:

DC 3V (Two batteries, AAA/ R03/ UM-4)

## ACCESSORIES

Remote Control unit  
2 Batteries (AAA/ R03/ UM-4)  
21 pin-RCA Cable  
RF-Cable

Weight and Dimensions are approximate. Because we continually strive to improve our products we may change specifications and designs without prior notice.

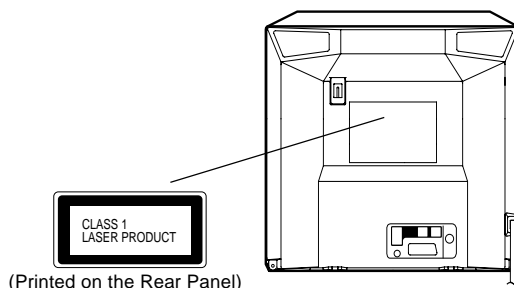


## IMPORTANT WARNING

### CAUTION:

DVD PLAYER IS A CLASS 1 LASER PRODUCT. HOWEVER THIS PLAYER USES A VISIBLE LASER BEAM WHICH COULD CAUSE HAZARDOUS RADIATION EXPOSURE IF DIRECTED. BE SURE TO OPERATE THE PLAYER CORRECTLY AS INSTRUCTED.

THE FOLLOWING CAUTION LABEL IS LOCATED ON THE REAR PANEL OF THE PLAYER.



WHEN THIS PLAYER IS PLUGGED TO THE WALL OUTLET, DO NOT PLACE YOUR EYES CLOSE TO THE OPENING OF THE DISC TRAY AND OTHER OPENINGS TO LOOK INTO THE INSIDE OF THIS PLAYER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

DO NOT OPEN COVERS AND DO NOT REPAIR YOURSELF. REFER SERVICING TO QUALIFIED PERSONNEL.

## SERVICING NOTICES ON CHECKING

### 1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

### 2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  $\triangle$  mark, the designated parts must be used.

### 3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

### 4. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

## HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

#### 1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

#### 2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

## WHEN REPLACING DVD DECK

### [ When removing the DVD Deck ]

Before removing Pick Up PCB and DVD PCB connector, the short circuit the position shown in **Fig. 1** using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.

### [ When installing the DVD Deck ]

Remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

### NOTE

- Before your operation, please read "PREPARATION OF SERVICING".
- Use the Lead Free solder.
- Manual soldering conditions
  - Soldering temperature:  $320 \pm 20^{\circ}\text{C}$
  - Soldering time: Within 3 seconds
  - Soldering combination: Sn-3.0Ag-0.5Cu
- When Soldering/Removing of solder, use the draw in equipment over the Pick Up Unit to keep the Flux smoke away from it.

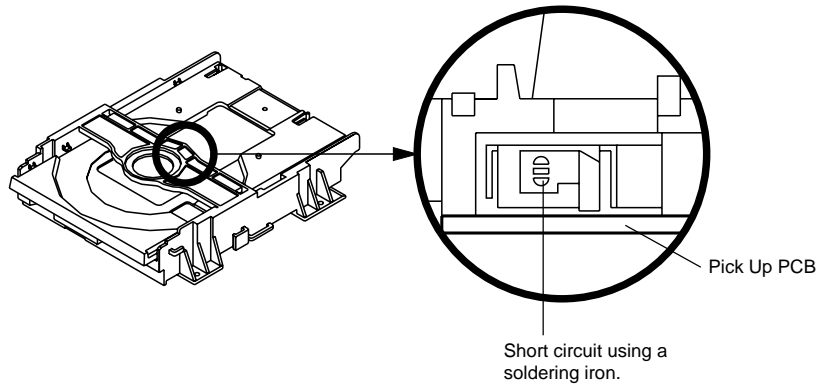


Fig. 1

## TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the DVD/VCR block from the main unit and the Fig. 1 below can be seen.  
**(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Remove one screw of the Loading Motor from the insert hole for screw driver and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.  
**(Refer to Fig. 2)**
4. Rotate the Clutch Ass'y either of the directions to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch on the tape.

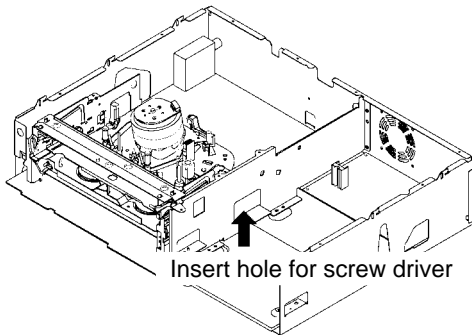


Fig. 1

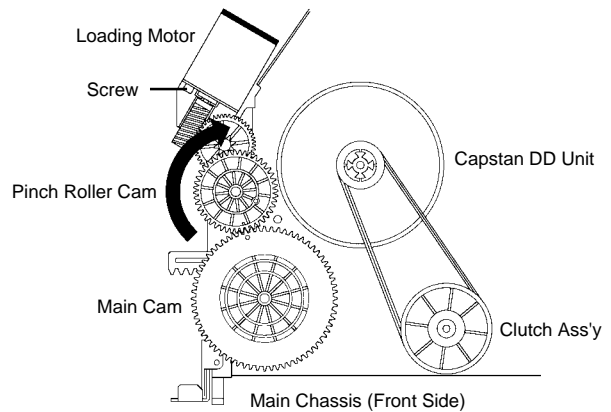


Fig. 2

## DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Back Cabinet and TV//DVD/VCR Block. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Rotate the Main Gear in the direction of the arrow by hand.  
**(Refer to Fig. 1)**
3. Draw the Tray.

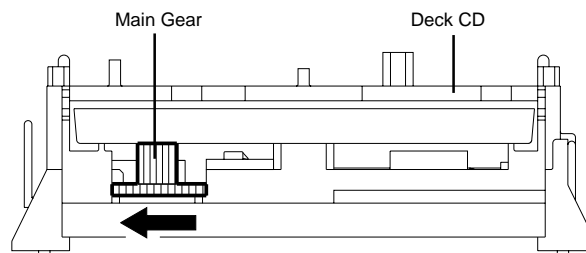


Fig. 1

## **PARENTAL CONTROL - RATING LEVEL 4 DIGIT PASSWORD CANCELLATION**

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Check that the 'No disk' is displayed on the screen.
4. Press and hold the 'STOP' button on the front panel.
5. Simultaneously press and hold the '7' key on the remote control unit.
6. Hold both keys for more than 3 seconds.
7. The On Screen Display message 'PASSWORD CLEAR' will appear.
8. The 4 digit password has now been cleared.

## **TRAY LOCK**

Tray cannot be opened by setting the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO' and '0' key of a remote control unit.
4. The On Screen Display message '🔒' will appear.
5. The Tray Lock has now been set up.

To unlock the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press it in order of 'SETUP', 'SUBTITLE', '3', 'AUDIO' and '0' key of a remote control unit.
4. The On Screen Display message '🔓' will appear.
5. The Tray Lock has now been cleared.

## **PREPARATION OF SERVICING**

The laser diode used for a pickup head may be destroyed with external static electricity.

Moreover, even if it is operating normally after repair, when static electricity discharge is received at the time of repair, a life of product may become short.

Please perform the following measure against static electricity, be careful of destruction of a laser diode enough at the time of repair, and work.

- It works on the desk which performed measures against static electricity, such as conductive mat.
- Soldering iron with ground wire or ceramic type is used.
- A worker needs to use a ground conductive wrist strap for body.

## ABOUT LEAD FREE SOLDER (PbF)

### Distinction of PbF PCB:

PCBs (manufactured) using lead free solder will have a PbF printing on the PCB.  
(Please refer to figures.)



### Caution:

- Pb free solder has a higher melting point than standard solder;  
Typically the melting point is 50°F~70°F(30°C~40°C) higher.  
Please use a soldering iron with temperature control and adjust it to 650°F ± 20°F (350°C ± 10°C).  
In case of using high temperature soldering iron, please be careful not to heat too long.
- Pb free solder will tend to splash when heated too high (about 1100°F/ 600°C).
- All products with the printed circuit board with PbF printing must be serviced with lead free solder.  
When soldering or unsoldering, completely remove all of the solder from the pins or solder area,  
and be sure to heat the soldering points with the lead free solder until it melts sufficiently.

### Recommendations

Recommended lead free solder composition is Sn-3.0Ag-0.5Cu.

# CONTENTS

## • OWNER'S MANUAL

<b>IMPORTANT WARNING</b> .....	A1-1
<b>SERVICING NOTICES ON CHECKING</b> .....	A1-1
<b>HOW TO ORDER PARTS</b> .....	A1-1
<b>WHEN REPLACING DVD DECK</b> .....	A1-2
<b>TAPE REMOVAL METHOD AT NO POWER SUPPLY</b> .....	A1-3
<b>DISC REMOVAL METHOD AT NO POWER SUPPLY</b> .....	A1-3
<b>PARENTAL CONTROL - RATING LEVEL</b> .....	A1-4
<b>TRAY LOCK</b> .....	A1-4
<b>PREPARATION OF SERVICING</b> .....	A1-4
<b>ABOUT LEAD FREE SOLDER (PbF)</b> .....	A1-5
<b>TABLE OF CONTENTS</b> .....	A2-1
<b>GENERAL SPECIFICATIONS</b> .....	A3-1~A3-7
<b>DISASSEMBLY INSTRUCTIONS</b>	
1.REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS .....	B1-1~B1-3
2.REMOVAL OF VCR DECK PARTS .....	B2-1~B2-6
3.REMOVAL OF DVD DECK PARTS .....	B3-1~B3-4
4.REMOVAL OF ANODE CAP .....	B4-1
5.REMOVAL AND INSTALLATION OF FLAT PACKAGE IC .....	B5-1, B5-2
<b>KEY TO ABBREVIATIONS</b> .....	C1-1, C1-2
<b>SERVICE MODE LIST</b> .....	C2-1
<b>PREVENTIVE CHECKS AND SERVICE INTERVALS</b> .....	C3-1, C3-2
<b>WHEN REPLACING EEPROM (MEMORY) IC</b> .....	C4-1
<b>SERVICING FIXTURES AND TOOLS</b> .....	D1-1
<b>PREPARATION FOR SERVICING</b> .....	D1-1
<b>MECHANICAL ADJUSTMENTS</b> .....	D2-1~D2-4
<b>ELECTRICAL ADJUSTMENTS</b> .....	D3-1~D3-5
<b>TROUBLESHOOTING GUIDE</b> .....	E-1~E-24
<b>BLOCK DIAGRAMS</b>	
DVD .....	F-1, F-2
TV .....	F-3, F-4
Y/C/AUDIO/HEAD AMP .....	F-5, F-6
MICON .....	F-7, F-8
DEMODULATOR/21PIN/NICAM .....	F-9, F-10
T'TEXT/Hi-Fi/SOUND AMP .....	F-11, F-12
<b>PRINTED CIRCUIT BOARDS</b>	
DVD .....	G-1, G-2
VCR .....	G-3~G-6
MAIN/CRT/OPERATION/POWER SW .....	G-7, G-8
STEREO/LOADING MOTOR/SW .....	G-9, G-10
<b>SCHEMATIC DIAGRAMS</b>	
MPEG/MICON/DSP/RF_AMP .....	H-1, H-2
MEMORY .....	H-3, H-4
MOTOR DRIVE .....	H-5, H-6
AUDIO/VIDEO .....	H-7, H-8
Y/C/AUDIO/HEAD AMP .....	H-9, H-10
MICON .....	H-11, H-12
DVD IN/OUT .....	H-13, H-14
CHROMA/IF .....	H-15, H-16
DEMODULATOR/21PIN .....	H-17, H-18
T'TEXT/RGB SW .....	H-19, H-20
SOUND AMP .....	H-21, H-22
SECAM CHROMA/Hi-Fi .....	H-23, H-24
REGULATOR1 .....	H-25, H-26
DEFLECTION .....	H-27, H-28
CRT/POWER SW/OPERATION .....	H-29, H-30
TV POWER .....	H-31, H-32
POWER2 .....	H-33, H-34
NICAM .....	H-35, H-36
CHOKES COIL .....	H-37, H-38
LOADING MOTOR/SW .....	H-39, H-40
<b>INTERCONNECTION DIAGRAM</b> .....	H-41, H-42
<b>WAVEFORMS</b> .....	I-1~I-3
<b>MECHANICAL EXPLODED VIEWS</b> .....	J1-1~J1-3
<b>CHASSIS EXPLODED VIEWS</b> .....	J2-1, J2-2
<b>DVD DECK EXPLODED VIEWS</b> .....	J3-1
<b>MECHANICAL REPLACEMENT PARTS LIST</b> .....	K1-1, K1-2
<b>CHASSIS REPLACEMENT PARTS LIST</b> .....	K2-1
<b>DVD DECK REPLACEMENT PARTS LIST</b> .....	K3-1
<b>ELECTRICAL REPLACEMENT PARTS LIST</b> .....	K4-1~K4-20

## GENERAL SPECIFICATIONS

G-1	TV System	CRT	CRT Size / Visual Size	21 inch / 508.0mmV	
			CRT Type	Flat	
			Magnetic Field	BV/BH	+ 0.45 G / 0.18 G
			Color System		PAL/SECAM
			Speaker		2 Speaker
				Position	Front
				Size	1.8 x 3.9 Inch
				Impedance	8 ohm
			Sound Output	MAX	1.5W + 1.5W
				10%(Typical)	—
G-2	VCR System	NTSC4.43, 3.58(AV)		No	
		System		VHS Player / Recorder	
		Video System		PAL/MESECAM	
		Hi-Fi STEREO		Yes	
		NTSC PB(PAL 60Hz)		Yes	
		Deck	DECK		OVD-7
		Heads	Video Head		4 Head
			FM Audio Head		2 Head
			Audio /Control		Mono /Yes
			Erase(Full Track Erase)		Yes
		Tape	Rec	PAL	SP/LP
		Speed		NTSC	-
			Play	PAL	SP/LP
				NTSC	SP
			Fast Forward / Rewind Time (Approx.) at 25oC	Cassette	FF:1'48"/REW:1'48" at E-180
	Forward/Reverse	NTSC or PAL-M	SP=3x,5x		
	Picture Search	PAL or SECAM	SP/LP=5x,7x/7x,13x		
	Frame Advance		Yes		
	Slow Speed		1/5, 1/10,1/30		
G-3	DVD System	Color System		PAL, NTSC	
		Disc		DVD, CD-DA, CD-R/RW, VIDEO CD,SVCD DVD-R/RW (Video Format Only)	
		Disc Diameter		120 mm , 80 mm	
		Drive		DM3PA	
		Search speed	Fwd	Actual	4 step 2-120 times(DVD, VIDEO CD) 4-40 times (CD)
			Rev	Actual	4 step 2-120 times(DVD, VIDEO CD) 4-40 times (CD)
		Slow speed		Actual	Fwd 1/7 - 1/2 times --
				Actual	Rev --
				Actual	--
		G-4	Tuning System	Broadcasting System	
Tuner and	System			1 Tuner	
Receive CH	Destination			CCIR HYPER	
	CH Coverage			E2-E4, X-Z+2, S1~S10, E5-E12,S11~S41,E21~E69	
Intermediate	Picture(FP)				38.9MHz
Frequency	Sound(FS)				33.4 / 32.4 MHz
	FP-FS				5.5 / 6.5MHz
Auto Tuning Method					ALL Band (Not C.C.I.R. CH Plan)
Preset CH					110CH
Stereo/Dual TV Sound					G.ST/NICAM DUAL
Tuner Sound Muting			Yes		

## GENERAL SPECIFICATIONS

<b>G-5</b>	<b>Signal</b>	Video Signal	Input Level	1 V p-p/75 ohm		
			Output Level	1 V p-p/75 ohm		
			S/N Ratio (Weighted) at DVD Mode	65dB		
			S/N Ratio (Weighted) at VCR Mode	53dB		
			Horizontal Resolution at DVD Mode	400 Lines		
				Horizontal Resolution at VCR(SP)Mode	240 Lines	
				RGB Signal	Output Level	-
				Audio Signal	Input Level	-3.8dBm/50k ohm
					Output Level (0dB=0.775Vrms)	-3.8dBm/1k ohm
				VCR	Output Level (-20dBFs 0dBFs=2.0Vrms)	-12.0dBm/1k ohm
				DVD	Digital Output Level	0.5 V p-p/75 ohm(DVD)
					S/N Ratio at DVD (Weighted)	90 dB
					S/N Ratio at VCR(SP) (Weighted)	42 dB
					Harmonic Distortion at DVD Mode	0.06% (1kHz)
					Harmonic Distortion at VCR(SP) Mode	1.5% (1kHz) Typical
					Frequency Response :	
					DVD Mode	
			at DVD	4Hz - 22kHz		
			at Video CD	4Hz - 20kHz		
			at SVCD	4Hz - 20kHz		
			at CD	4Hz - 20kHz		
			VCR Mode			
			at SP	100Hz - 10kHz		
			at LP	100Hz - 5kHz		
			at SLP(EP)	-		
		Hi-Fi Audio Signal	Dynamic Range : More than	75 dB		
			Frequency Response :	20Hz - 20kHz		
			Wow And Flutter : Less than	0.01 %Wrms		
			Channel Separation : More than	60 dB		
			Harmonic Distortion : Less than	1.0 %		
<b>G-6</b>	<b>Power</b>	Power Source	AC	230~240V 50Hz		
			DC	-		
		Power Consumption		at AC	80 W at 230 V 50 Hz	
				at DC	-	
			Stand by (at AC)		6 W at 230 V 50 Hz	
			Per Year		-	
Protector	Power Fuse		Yes			
	Safety Circuit		Yes			
	IC Protector		No			
	Dew Sensor		No			
<b>G-7</b>	<b>Regulation</b>	Safety	GOST			
		Radiation	GOST			
		X-Radiation	NONE			
<b>G-8</b>	<b>Temperature</b>	Operation	+5oC ~ +40oC			
		Storage	-20oC ~ +60oC			
<b>G-9</b>	<b>Operating Humidity</b>		Less than 80% RH			



## GENERAL SPECIFICATIONS

<b>G-10</b>	<b>On Screen Display (TV/VCR)</b>	Menu	Yes	
		Menu Type	Character	
		Timer Rec Set	Yes	
		VCR Setup		No
		Auto Repeat On/Off	Yes	
		System Select		No
		Channel Setup	Yes	
		Auto Tuning	Yes	
		Ch Mapping		No
		Ch Tuning	Yes	
		Ch Allocation	Yes	
		Guide Ch Set		No
		TV Setup	Yes	
		On/Off Timer Set	Yes	
		Picture	Yes	
		Audio		No
		NICAM Auto On/Off	Yes	
		System Setup	Yes	
		Clock Set	Yes (Calendar 24h)	
		Language	Yes	
		System Select	Yes	
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		No
		Stereo/Audio Output	Yes	
		Bilingual	Yes	
		NICAM	Yes	
		Control Volume	Yes	
		Level Brightness / Contrast / Sharpness / Color	Yes	
		Tint		No
		Bass/Treble/Balance		No
		Manual Tracking	Yes	
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)	Yes	
		TV/VCR	Yes	
		DVD	Yes	
Clock / Date	Yes			
CH/AV	Yes			
Tape Counter(Linear Counter)	Yes			
Tape Speed	Yes			
Sleep Time	Yes			
Auto Tracking/Manual Tracking	Yes			
Index	Yes			
Mute	Yes			
Hi-Fi	Yes			
PDC		No		
Repeat	Yes			
Zero Return	Yes			
DEW		No		

## GENERAL SPECIFICATIONS

G-11	On Screen Display (DVD)	Menu (DVD)	Yes	
		Menu Type	Icon	
		Language	Yes	
		Menu	Yes	
		Subtitle	Yes	
		Audio	Yes	
		OSD Language(Set up Language)	Yes	
		Video	Yes	
		E.B.L. (Enhanced Black Level)	No	
		TV Screen Size(4:3/16:9)	Yes	
		OSD Display On/Off	Yes	
		Picture Mode (Video/Film/Auto)	Yes	
		JPEG Interval	Yes	
		Audio	Yes	
		DRC (Dynamic Range Control)	Yes	
		Dialogue (On DRC[TV] / Off DRC[Std])	No	
		Surround	No	
		System	Yes	
		Disc/Card Slot	No	
		Password Lock/ Un Lock	Yes	
		Parental	Yes	
		Select Files	Yes	
		HDMI (480p/1080i/720p)	No	
		Output(RGB/Composite)	No	
		Open	Yes	
		Close	Yes	
		No disc	Yes	
		Reading	Yes	
		Play	Yes	
		Still/Pause	Yes	
		Stop	Yes	
		Prohibit Mark	Yes	
		PBC	Yes	
		Step	Yes	
		Skip(>> )	Yes	
		Skip( <<)	Yes	
		Random	Yes (CD, SVCD, VIDEO CD, MP3, WMA, JPEG )	
		Repeat	Yes	
		Slow+	Yes	
		Slow-	No	
		Search+	Yes	
		Search-	Yes	
		Jump	Yes	
		Resume	Yes	
		Title No.	Yes	
		Chapter No.	Yes	
		Track No.	Yes	
		Time	Yes	
		Sub Title No.	Yes	
		Angle No.	Yes	
Audio No.	Yes			
Audio Stereo L/R	Yes (SVCD, VIDEO CD)			
Zoom	Yes			
Marker No.	No			
Program Play Back	Yes (CD, SVCD, VIDEO CD, MP3, WMA, JPEG )			
Surround On/Off	No			
Screen Saver	No			
MP3, WMA, JPEG	Folder Name	Yes		
	File Name	Yes		
	File No	Yes		
	Time	Yes (MP3, WMA Only)		
	Track No	Yes		
G-12	OSD Language	TV/VCR DVD	English, Russian, Spanish, German, Italian English, Russian, Spanish, German, Italian	
G-13	Clock,Timer and Timer Back-up	Calendar	1990/1/1 ~ 2081/12/31	
		Timer Events	8 Program/ 1 Month	
		One Touch Recording Max Time	SP 5 Hours LP 10 Hours	
		Sleep Timer	Max Time	120 Min
			Step	10 Min
		On/Off Timer	Program(On Timer / Off Timer)	1 Program
		Auto Shut Off	No Signal	15 Min
			No Operation	- Min
	Timer Back-up (at Power Off Mode)	30 min.		

## GENERAL SPECIFICATIONS

G-14	Remote Control Unit	Unit(for TOSHIBA)	RC-KT	
		Glow in Dark Remocon	Yes	
		Remocon Format	ORION	
		Format	NEC	
		Custom Code	71-8E	
		Power Source	Voltage(D.C) UM size x pcs	3V UM-4 x 2 pcs
		Total Keys		48
		Keys	TV/VCR	Yes
			DVD	Yes
			Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0/AV	Yes
			CH / Page Up	Yes
			CH / Page Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			Display	Yes
			Sleep	Yes
			Audio Select	Yes
			Mute	Yes
			Skip- / Channel Return	Yes
			Skip+ / TEXT/MIX/TV	Yes
			T-REC	Yes
			Rec/OTR	Yes
			Slow	Yes
			Play	Yes
			Stop	Yes
			Rev	Yes
			Fwd	Yes
			Pause/Still	Yes
			CM Skip / Jump	Yes
			SP/LP / Return	Yes
			Counter Reset / Angle	Yes
			Zero Return / Subtitle	Yes
			Zoom / Reveal	Yes
			Menu /Setup	Yes
			Program/ Repeat A-B	Yes
			D.Tracking / Top Menu	Yes
			Tracking+ / DVD Menu	Yes
	Tracking- / Play Mode	Yes		
	Cancel / F/T/B	Yes		
	Enter / Hold	Yes		
	Index / Sub Page	Yes		
	Cursor Up / Green	Yes		
	Cursor Down / Yellow	Yes		
	Cursor Left / Red	Yes		
	Cursor Right / Blue	Yes		
	Position	No		
	Wide	No		

## GENERAL SPECIFICATIONS

<b>G-15</b>	<b>Features (TV/VCR)</b>	Auto Head Cleaning	Yes		
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No	
		CH Auto Setup/Auto Clock		No	
		PDC		No	
		Forward / Reverse Picture Search	Yes		
		TV Auto Shut off Function	Yes		
		Index Search	Yes		
		SQPB		No	
		CM Skip(30sec x 6 Times)	Yes		
		VM Circuit		No	
		TV/REC Monitor		No	
		Choke Coil	Yes		
		Energy Star		No	
		Protect of FBT Leak Circuit	Yes		
		Zero Return	Yes		
	Power On Memory		No		
	<b>Features (DVD)</b>	TText	Yes		
		Text type	Fastext		
		Text Language	English, Russian, Estonian, German Ukrainian, Czech, Lettish/Lithunian		
	<b>Features (DVD)</b>	Tray Lock	Yes		
Auto Stop (Pause, and Resume Stop after 5min.)		Yes			
VIDEO CD Playback		Yes			
SVCD Playback		Yes			
MP3 Playback		Yes			
WMA Playback		Yes			
JPEG Playback		Yes			
Digital Out		(Dolby Digital)	Yes		
		(MPEG)	Yes		
		(PCM)	Yes		
		(DTS)	Yes		
Down Mix Out		(Dolby Digital)	Yes		
		(DTS)		No	
3D Surround				No	
Screen Saver				No	
Copy (Disc to Tape)		Yes (by Conditioning)			
Audio DAC		192kHz / 24bit			
<b>G-16</b>	<b>Accessories</b>	Owner's Manual	Language	English, Russian	
			w/Guarantee Card	No	
		Remote Control Unit		Yes	
		Rod Antenna			No
			Poles	-	
			Terminal	-	
			w/300 ohm to 75 ohm Antenna Adapter	-	
		Loop Antenna			No
			Terminal		--
		U/V Mixer			No
		DC Car Cord (Center+)			No
		Guarantee Card		Yes	
		Warning Sheet			No
		Circuit Diagram			No
		Antenna Change Plug			No
		Service Facility List			No
		Important Safeguard			No
		Dew/AHC Caution Sheet			No
		AC Plug Adapter			No
		Quick Set-up Sheet		Yes	
		Battery		Yes	
			UM size x pcs	UM-4 x 2 pcs	
			OEM Brand		No
		AC Cord			No
		AV Cord (2Pin-1Pin)			No
		21pin-RCA Cable		Yes	
		RF Cable		Yes (0.9m)	
		Registration Card			No
PTB Sheet			No		
Anti-Theft Sheet			No		
Euro Warranty Information Sheet			No		
Helpline Sheet			No		

## GENERAL SPECIFICATIONS

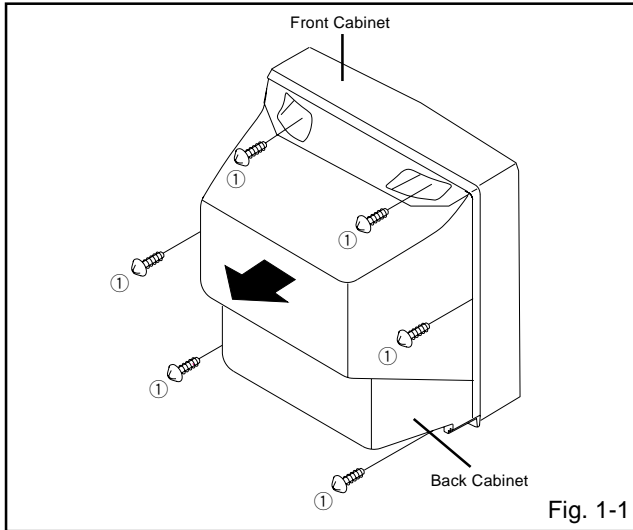
<b>G-17</b>	<b>Interface</b>	Switch	Front	Standby	Yes
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
				Play (VCR)	Yes
				Stop / Eject (VCR)	Yes
				F.FWD/Cue (VCR)	Yes
				Rew/Rev (VCR)	Yes
				REC/OTR (VCR)	Yes
				Play (DVD)	Yes
				Stop (DVD)	Yes
				Skip+/Search+ (DVD)	Yes
				Skip-/Search- (DVD)	Yes
				Open/Close (DVD)	Yes
		Indicator	Front	Input Select	No
				Main Power SW	Yes
				Standby	Yes(Red)
				REC/OTR	Yes(Red)
				T-REC	Yes(Red)
				TV/VCR	No
		Terminals	Front	DVD	No
				Video Input	RCA x1
				Audio Input	RCA x2(STEREO)
Rear	Other Terminal		Headphone (Stereo & Mono, 3.5mm)		
	Video Input		No		
	Audio Input		No		
	Video Output		No		
	Audio Output		RCA x2(STEREO)		
	Digital Audio Output		Coaxial (DVD Only)		
	Euro Scart		1-SCART		
	VHF/UHF Antenna Input		DIN type		
	AC Inlet		No		
	<b>G-18</b>		<b>Set Size</b>	Approx. W x D x H (mm)	
<b>G-19</b>		<b>Weight</b>		Net (Approx.)	27.5kg (60.5lbs)
	Gross (Approx.)		31.0kg (68.2lbs)		
<b>G-20</b>	<b>Carton</b>	Master Carton	No		
			Content	-	
			Material	-	
			Dimensions W x D x H(mm)	-	
		Gift Box	Description of Origin	-	
			Material	Double/White	
			Dimensions W x D x H(mm)	658 x 575 x 625	
		Drop Test	Description of Origin	Yes	
			Height (cm)	Natural Dropping At 1 Corner / 2 Edges / 4 Surfaces 60 (ORION SPEC:31)	
			Container Stuffing(40' container)	216 Sets	
<b>G-21</b>	<b>Material</b>	Cabinet	Front	PS 94HB	
			Rear	PS 94V0 Non Decabrom	
			Jack Panel	-	
		PCB	Non-Halogen	Yes(w/o MPEG PCB)	
			Eyelet Demand	Yes	
<b>G-22</b>	<b>Environment</b>	<b>Green procurement of TOSHIBA</b>		<b>Not accomplished</b>	
		Pb-free		Phase3(Phase3A)	

# DISASSEMBLY INSTRUCTIONS

## 1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

### 1-1: BACK CABINET (Refer to Fig. 1-1)

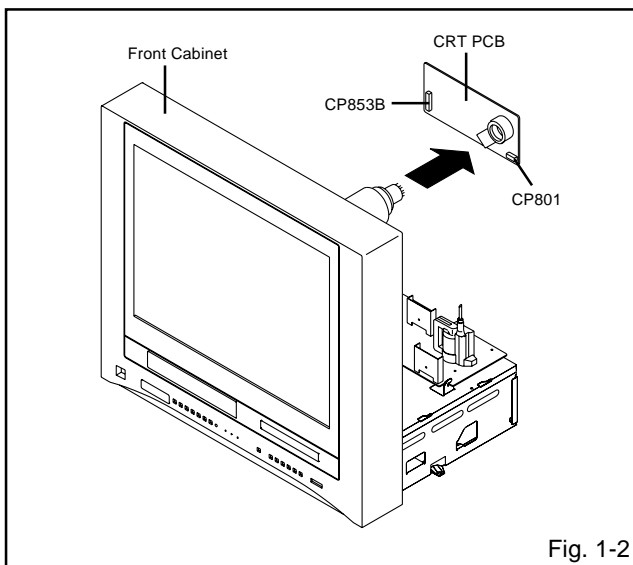
1. Remove the 6 screws ①.
2. Remove the Back Cabinet in the direction of arrow.



### 1-2: CRT PCB (Refer to Fig. 1-2)

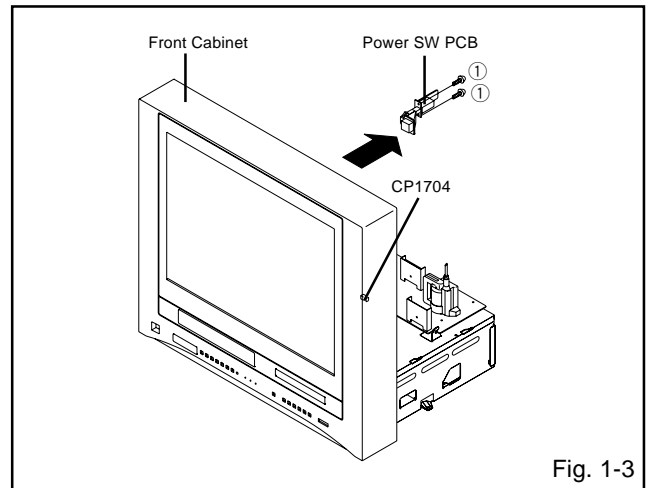
**CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.**

1. Remove the Anode Cap.  
(Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:  
**(CP801 and CP853B).**
3. Remove the CRT PCB in the direction of arrow.



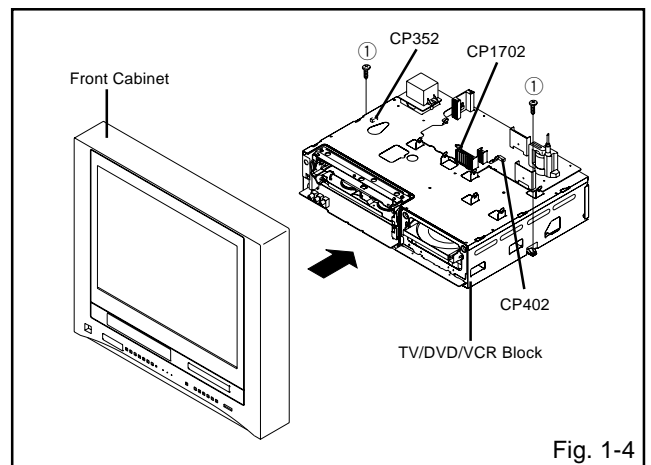
### 1-3: POWER SW PCB (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connector: **(CP1704).**
3. Remove the Power SW PCB in the direction of arrow.



### 1-4: TV/DVD/VCR BLOCK (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:  
**(CP352, CP402 and CP1702).**
3. Remove the TV/DVD/VCR Block in the direction of arrow.



# DISASSEMBLY INSTRUCTIONS

## 1-5: FILTER PCB (Refer to Fig. 1-5)

1. Remove the screw ①.
2. Disconnect the following connector: **(CP504)**.
3. Remove the Filter PCB in the direction of arrow.

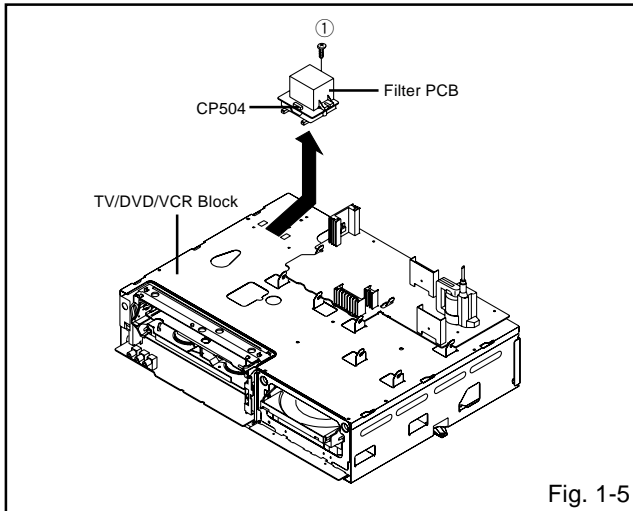


Fig. 1-5

## 1-6: MAIN PCB (Refer to Fig. 1-6)

1. Remove the 2 screws ①.
2. Remove the 4 screws ②.
3. Disconnect the following connectors: **(CP3601, CP3602 and CP3603)**.
4. Remove the Main PCB in the direction of arrow.

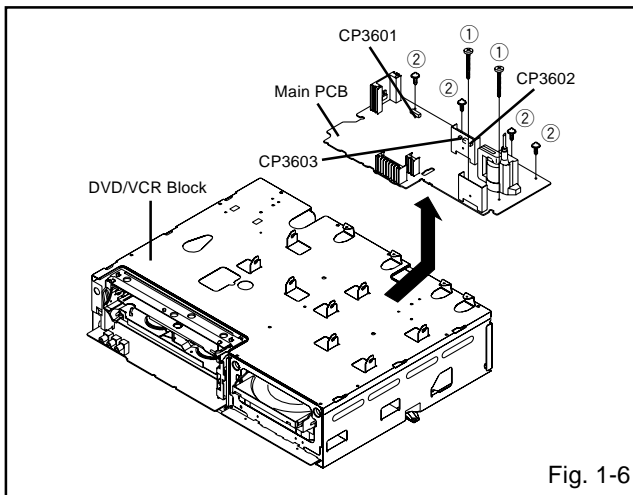


Fig. 1-6

## 1-7: TOP SHIELD (Refer to Fig. 1-7)

1. Remove the 11 screws ①.
2. Remove the Top Shield in the direction of arrow.

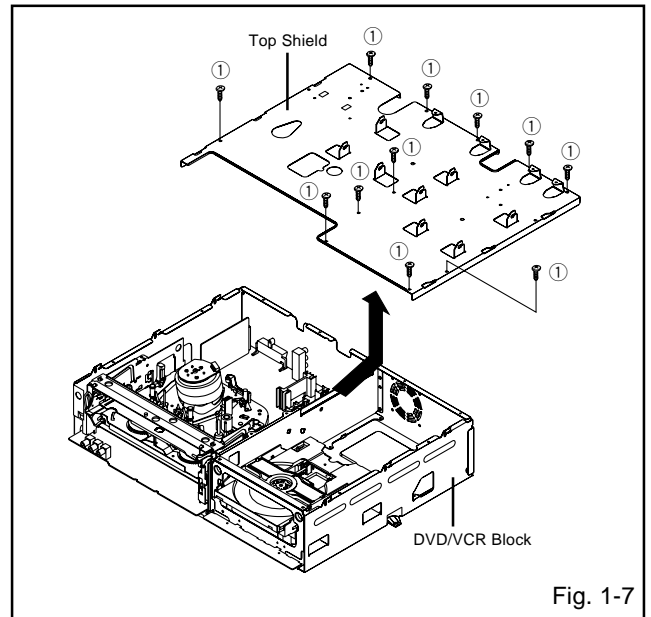


Fig. 1-7

## 1-8: DVD BLOCK (Refer to Fig. 1-8)

1. Remove the 2 screws ①.
2. Remove the VCR Holder.
3. Remove the 4 screws ②.
4. Disconnect the following connectors: **(CP8001 and CP8002)**.
5. Remove the DVD Block in the direction of arrow.

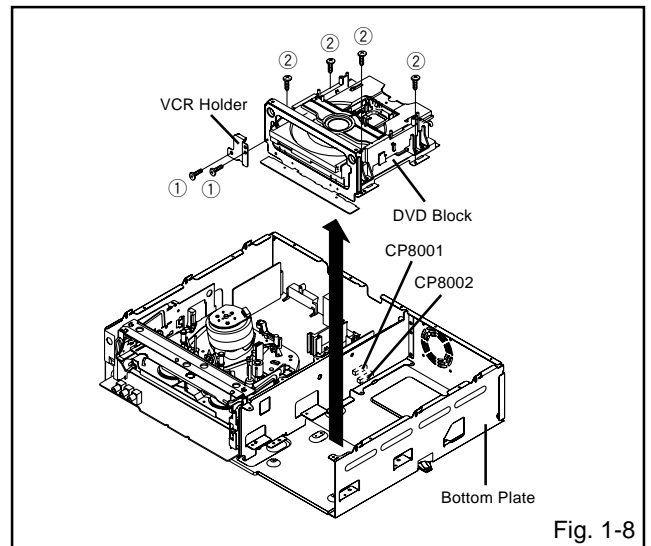


Fig. 1-8

# DISASSEMBLY INSTRUCTIONS

## 1-9: OPERATION PCB/DVD PCB/DVD DECK (Refer to Fig. 1-9)

1. Short circuit the position shown in **Fig. 1-9** using a soldering iron. If you remove the DVD Deck with no soldering, the Laser may be damaged.
2. Remove the 2 screws ①.
3. Remove the Operation PCB in the direction of arrow (A).
4. Remove the 2 screws ②.
5. Remove the Front Shield in the direction of arrow (B).
6. Disconnect the following connectors:  
**(CP2301, CP2302 and CP2303).**
7. Remove the 2 screws ③.
8. Remove the DVD PCB in the direction of arrow (C).
9. Remove the 4 screws ④.
10. Remove the DVD Deck in the direction of arrow (D).

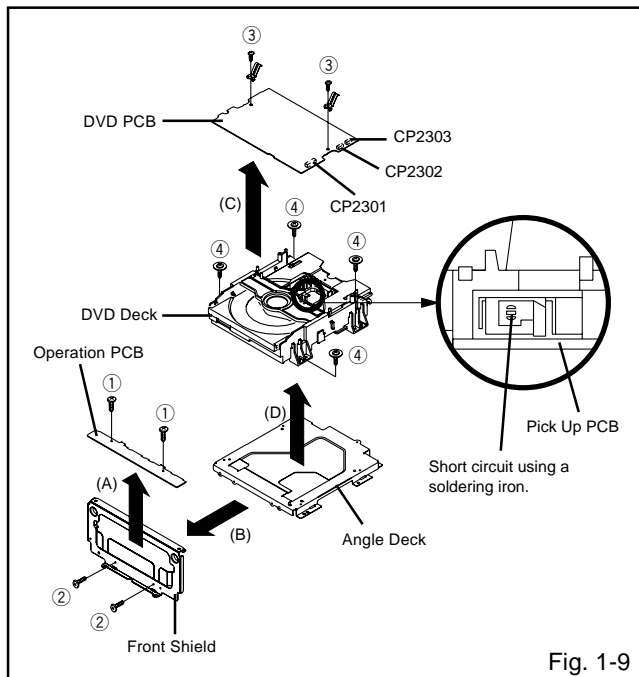


Fig. 1-9

### NOTE

1. Before your operation, please read "PREPARATION OF SERVICING".
2. Use the Lead Free solder.
3. Manual soldering conditions
  - Soldering temperature:  $320 \pm 20^{\circ}\text{C}$
  - Soldering time: Within 3 seconds
  - Soldering combination: Sn-3.0Ag-0.5Cu
4. When Soldering/Removing of solder, use the drawing equipment over the Pick Up Unit to keep the Flux smoke away from it.
5. When installing the DVD Deck, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

## 1-10: VCR DECK (Refer to Fig. 1-10)

### NOTE

Do not remove the cable at the FE Head section. The FE Head may be damaged if you remove the cable by force.

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the screw ①.
3. Remove the FE Head.
4. Remove the 3 screws ②.
5. Remove the screw ③.
6. Disconnect the following connectors:  
**(CP1001, CP4501 and CP4505).**
7. Remove the AC Head Cover and VCR Deck in the direction of arrow.

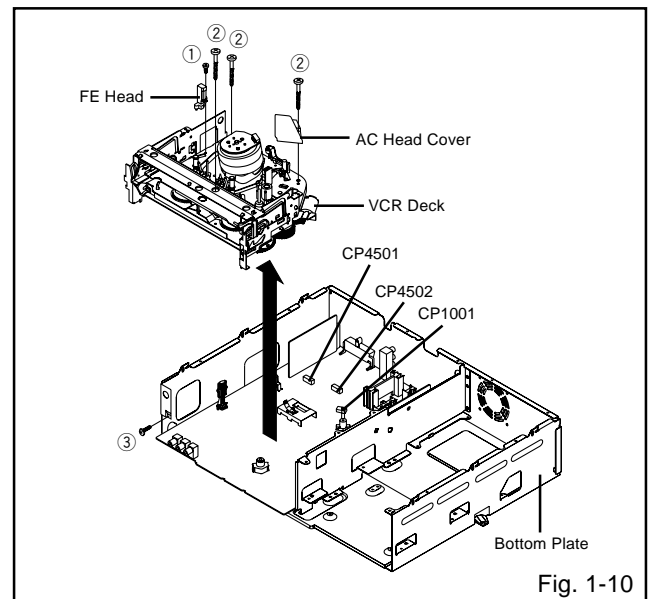


Fig. 1-10

## 1-11: VCR PCB (Refer to Fig. 1-11)

1. Remove the 4 screws ①.
2. Remove the AV Jack Shield.
3. Remove the VCR PCB in the direction of arrow.

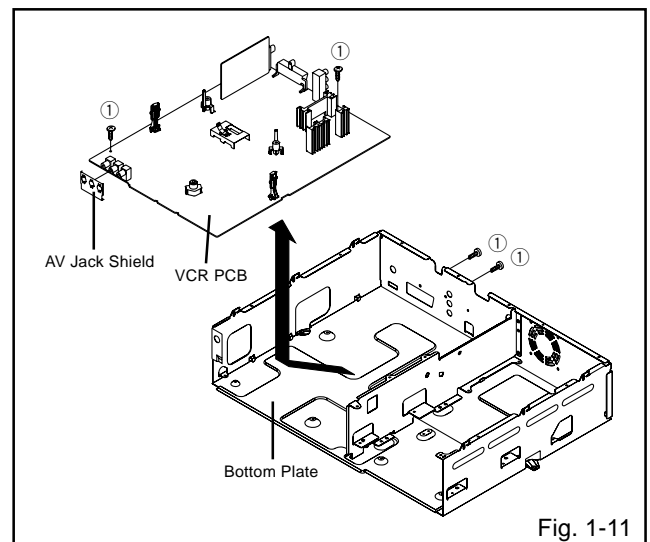


Fig. 1-11



# DISASSEMBLY INSTRUCTIONS

## 2. REMOVAL OF VCR DECK PARTS

### 2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

#### NOTE

1. After installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.

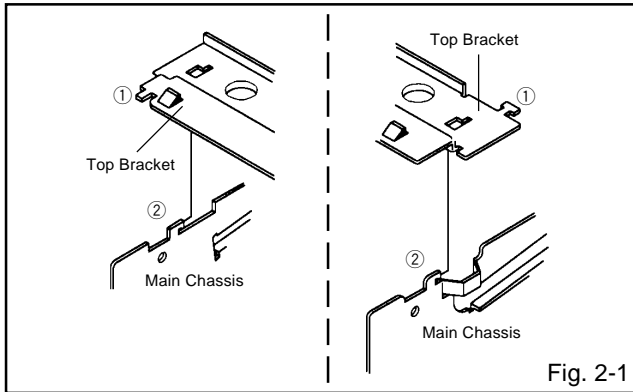


Fig. 2-1

### 2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

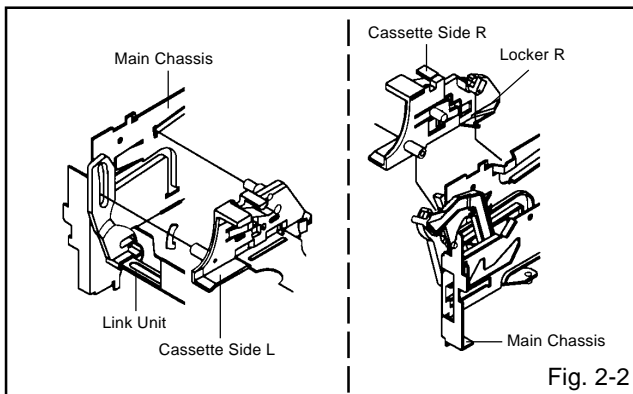


Fig. 2-2

### 2-3: LINK UNIT (Refer to Fig. 2-3)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.

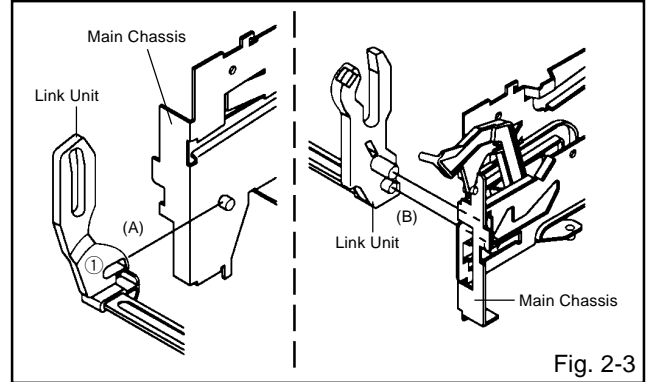


Fig. 2-3

### 2-4: LINK LEVER/FLAP LEVER (Refer to Fig. 2-4)

1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.

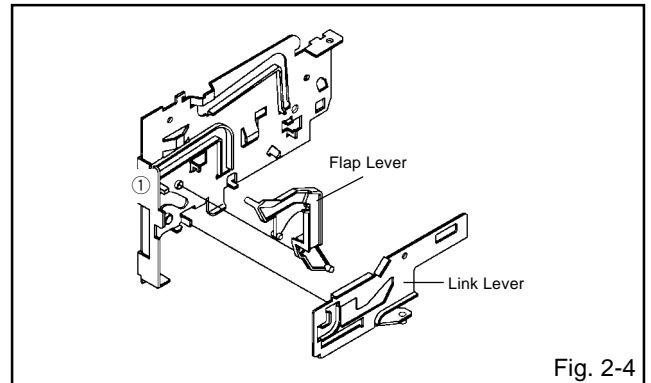
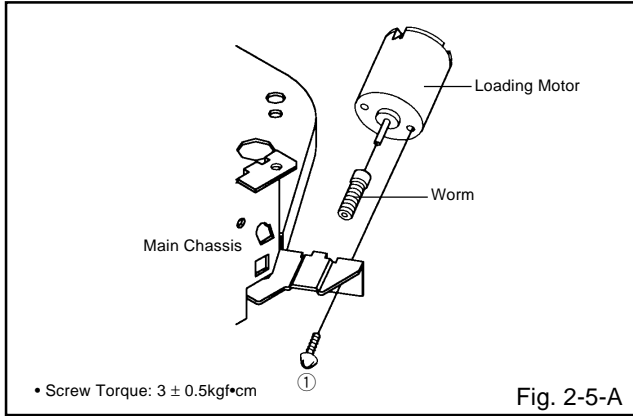


Fig. 2-4

# DISASSEMBLY INSTRUCTIONS

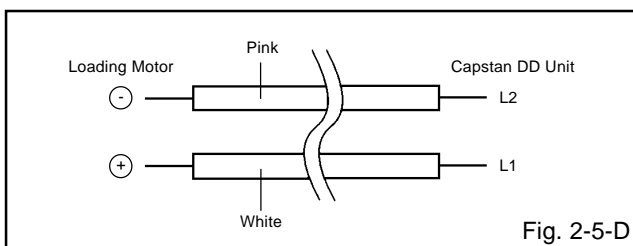
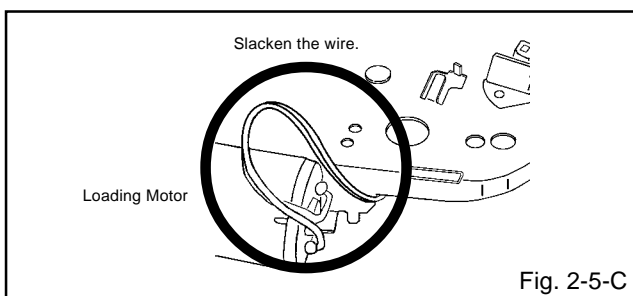
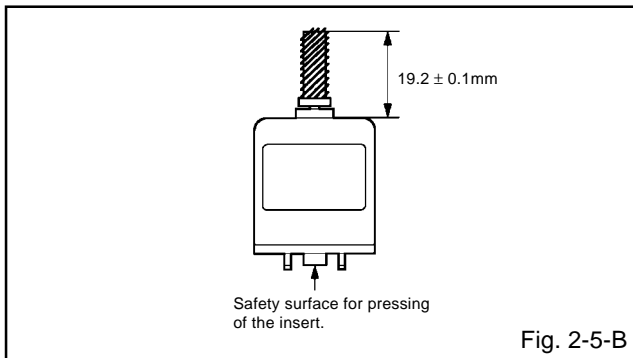
## 2-5: LOADING MOTOR/WORM (Refer to Fig. 2-5-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.



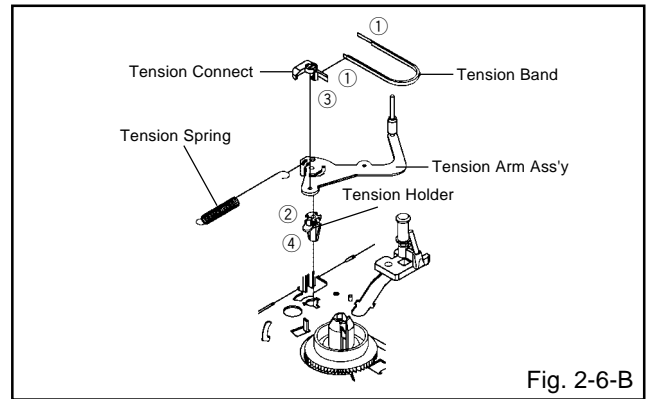
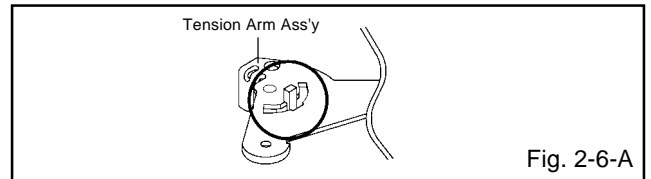
### NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-5-B is correct.
2. In case of the Loading Motor installation, slacken the wire as shown Fig. 2-5-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-5-D.



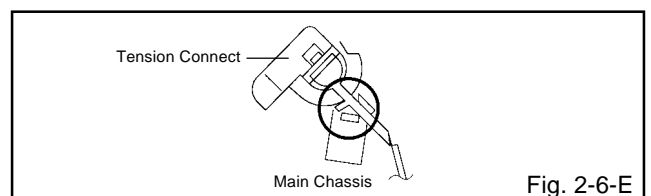
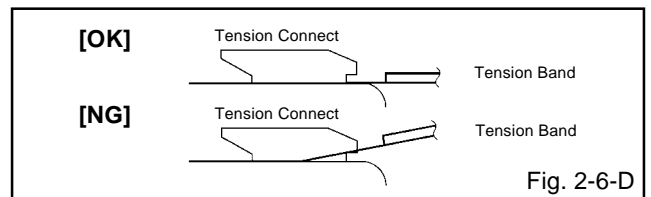
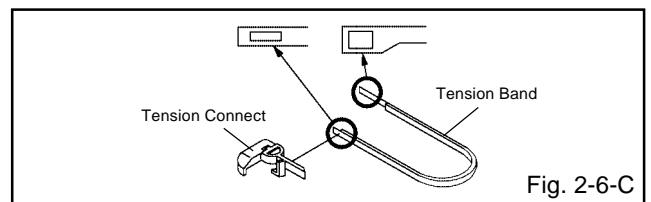
## 2-6: TENSION ASS'Y (Refer to Fig. 2-6-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-6-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.



### NOTE

1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-6-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-6-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-6-E.



# DISASSEMBLY INSTRUCTIONS

## 2-7: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-7-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.

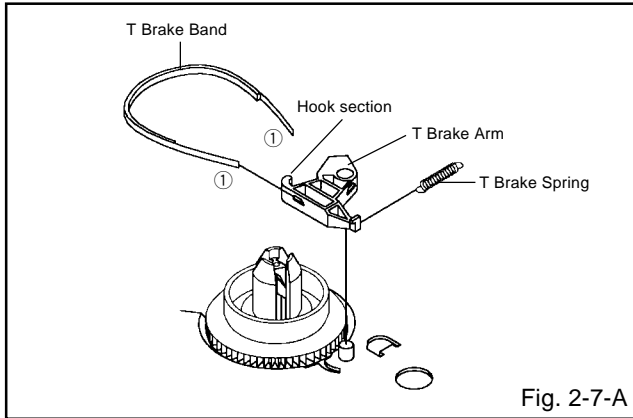


Fig. 2-7-A

### NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-7-B.

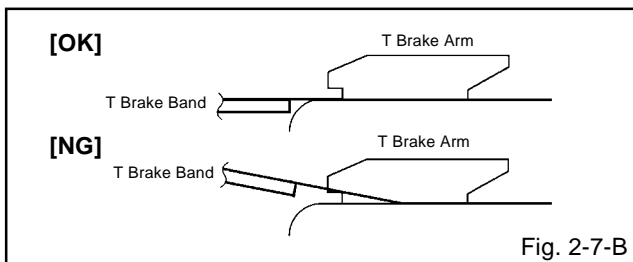


Fig. 2-7-B

## 2-8: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-8-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

### NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may remain on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-8-A) Touching may leave stains on section "A".
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)

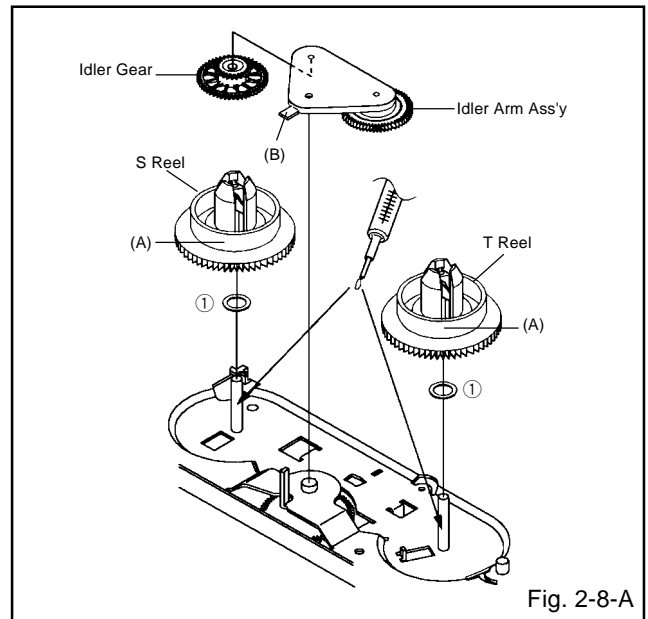


Fig. 2-8-A

### NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-8-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-8-C. And also set it so that the section "B" of Fig. 2-8-A is placed under the Main Chassis tab.

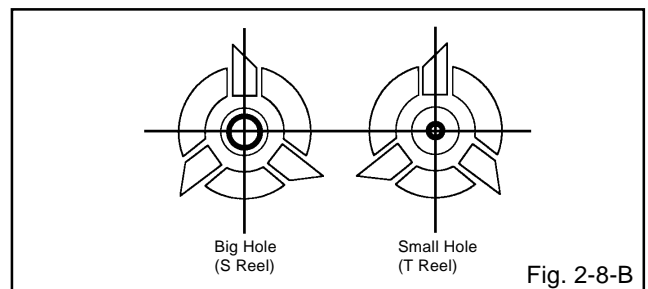


Fig. 2-8-B

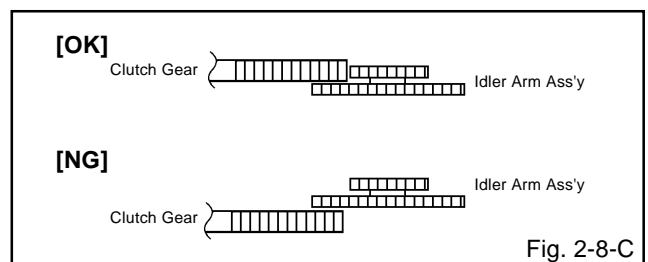
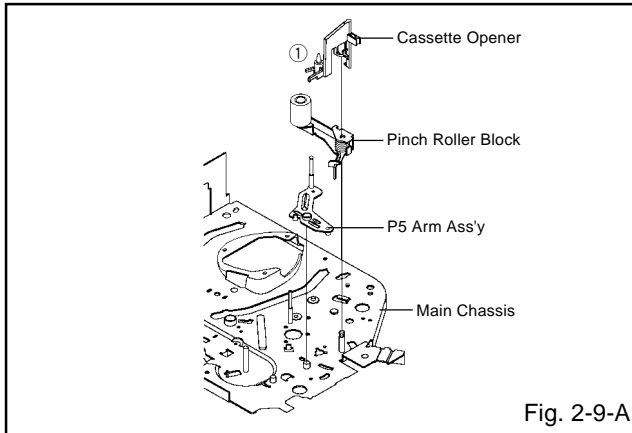


Fig. 2-8-C

# DISASSEMBLY INSTRUCTIONS

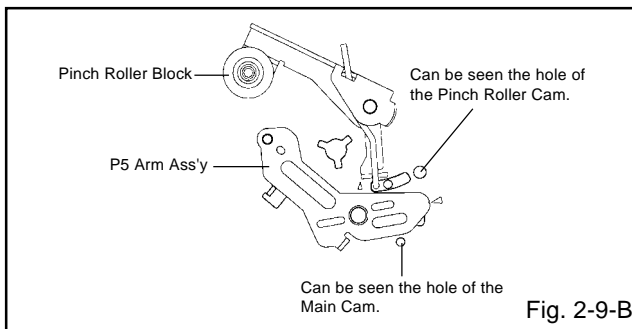
## 2-9: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-9-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.



### NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-9-B.

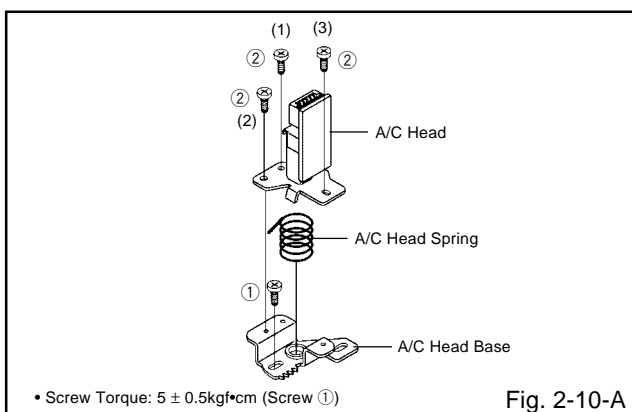


## 2-10: A/C HEAD (Refer to Fig. 2-10-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

### NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-10-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque:  $5 \pm 0.5\text{kgf}\cdot\text{cm}$  (Screw ①)

Fig. 2-10-A

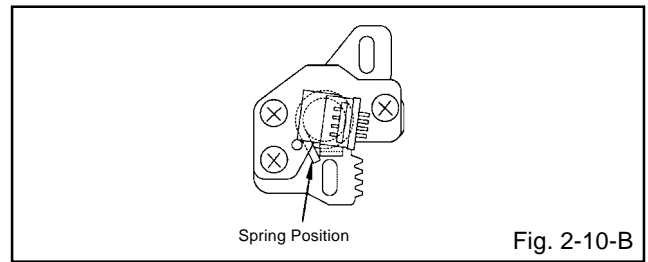
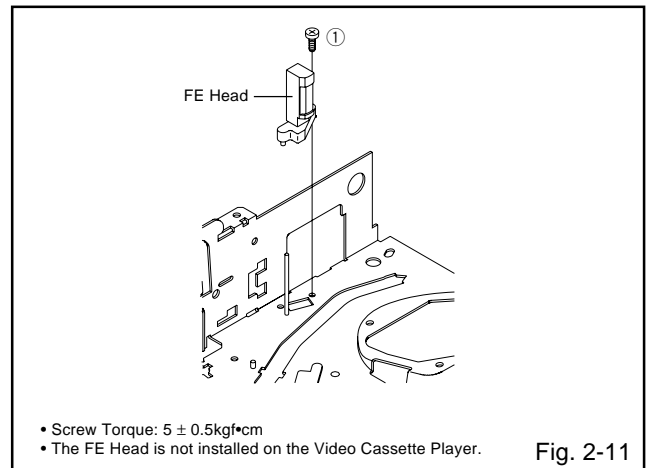


Fig. 2-10-B

## 2-11: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-11)

1. Remove the screw ①.
2. Remove the FE Head.



- Screw Torque:  $5 \pm 0.5\text{kgf}\cdot\text{cm}$
- The FE Head is not installed on the Video Cassette Player.

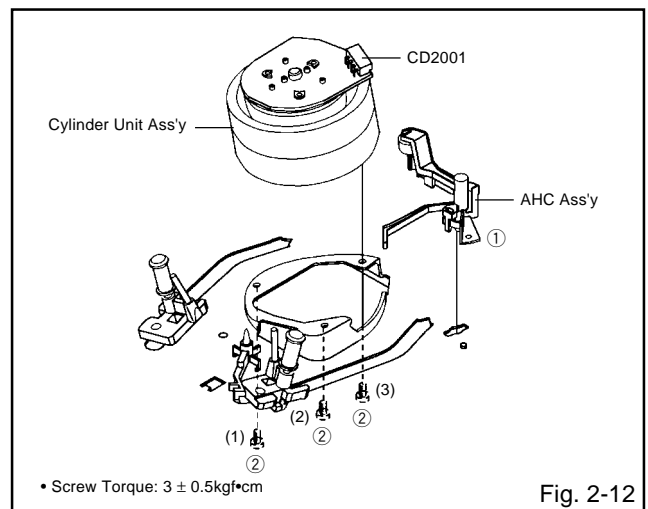
Fig. 2-11

## 2-12: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-12)

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001).
3. Remove the 3 screws ②.
4. Remove the Cylinder Unit Ass'y.

### NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



• Screw Torque:  $3 \pm 0.5\text{kgf}\cdot\text{cm}$

Fig. 2-12

# DISASSEMBLY INSTRUCTIONS

## 2-13: CAPSTAN DD UNIT (Refer to Fig. 2-13)

1. Remove the Capstan Belt.
2. Remove the screw ①.
3. Remove the Capstan Holder.
4. Remove the 3 screws ②.
5. Remove the Capstan DD Unit.

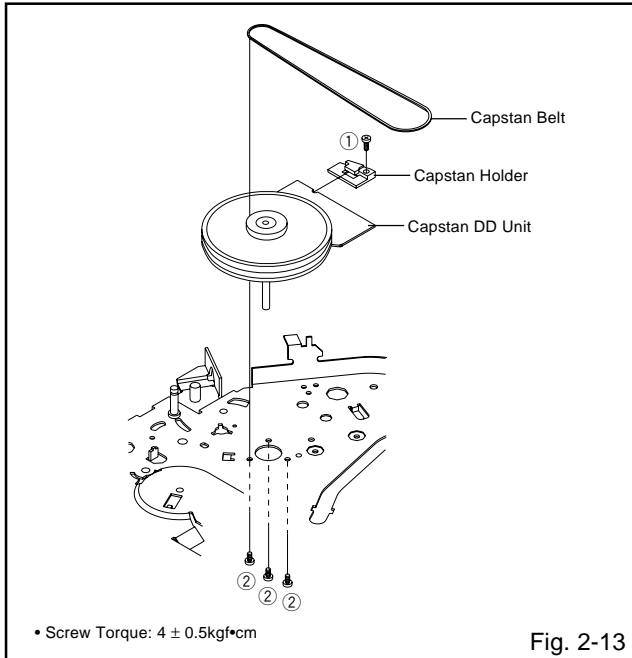


Fig. 2-13

## 2-14: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-14-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

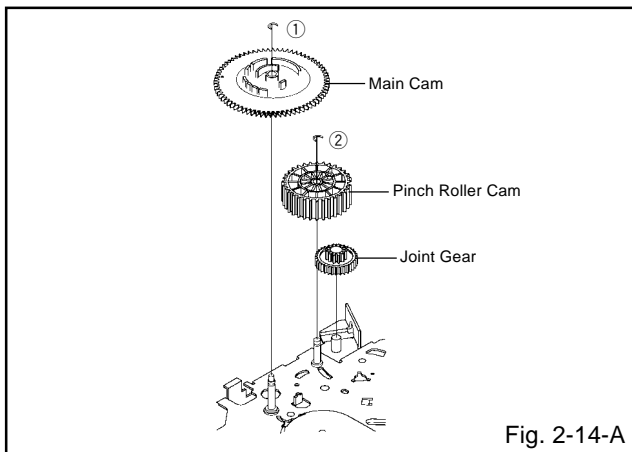


Fig. 2-14-A

### NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as shown in the circled section of Fig. 2-14-B so that the markers meet. (Refer to Fig. 2-14-B) And also can be seen the Main Chassis hole through the Main Cam maker hole.

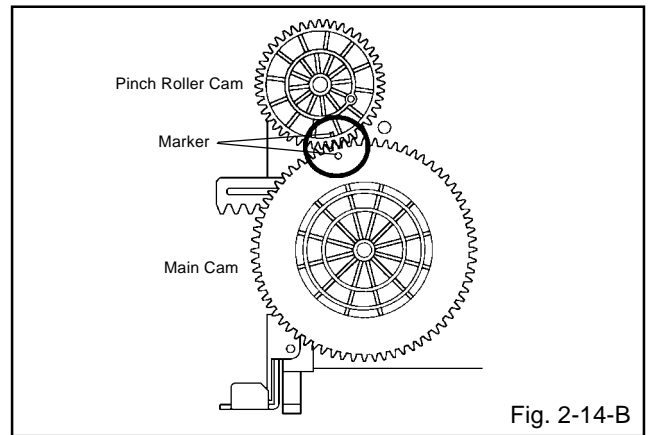


Fig. 2-14-B

## 2-15: LOADING GEAR S/T UNIT (Refer to Fig. 2-15-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

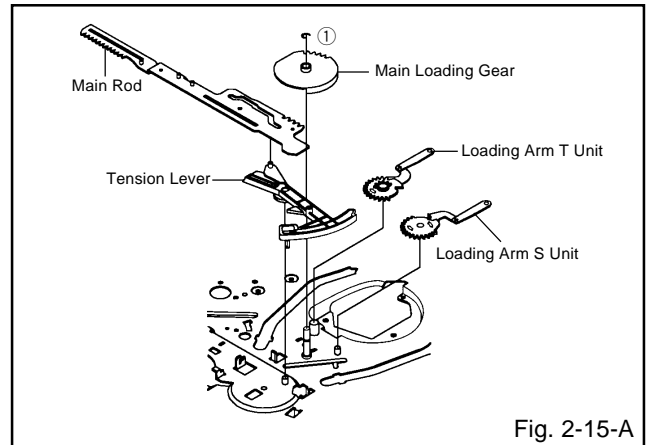


Fig. 2-15-A

### NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. (Refer to Fig. 2-15-B)

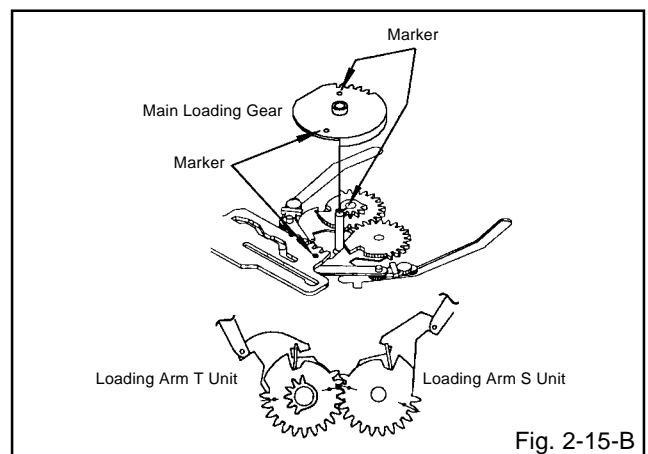


Fig. 2-15-B

# DISASSEMBLY INSTRUCTIONS

## 2-16: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-16-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.

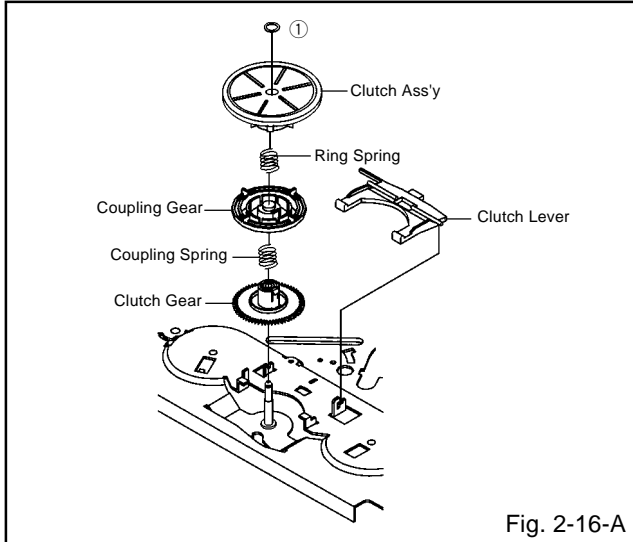


Fig. 2-16-A

### NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-16-B)

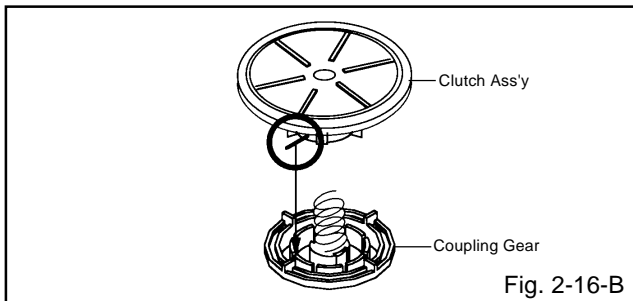


Fig. 2-16-B

## 2-17: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP/LED REFLECTOR (Refer to Fig. 2-17-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw ②.
5. Remove the LED Reflector.

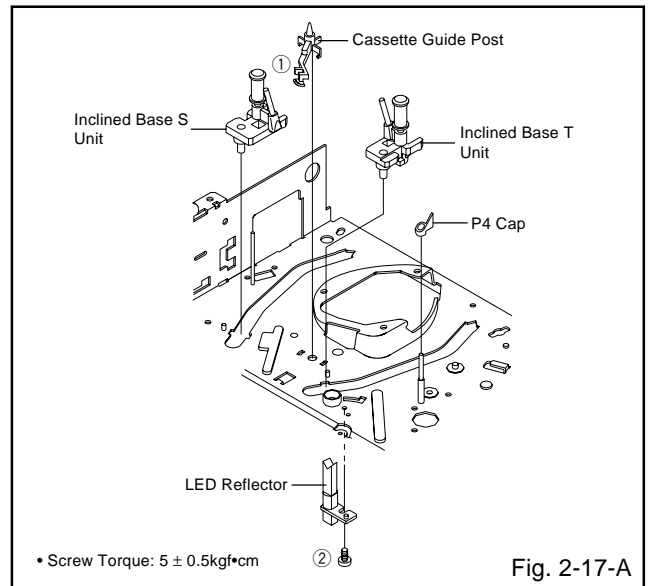


Fig. 2-17-A

### NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-17-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-17-C.

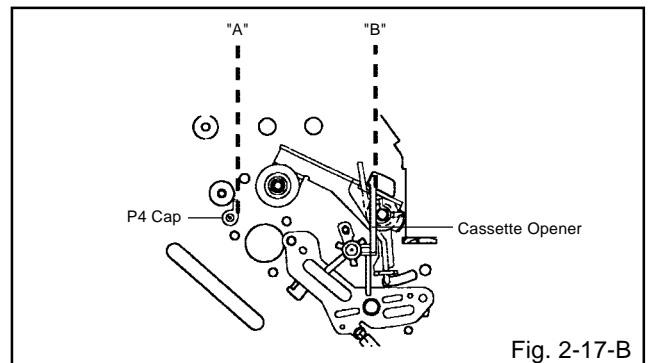


Fig. 2-17-B

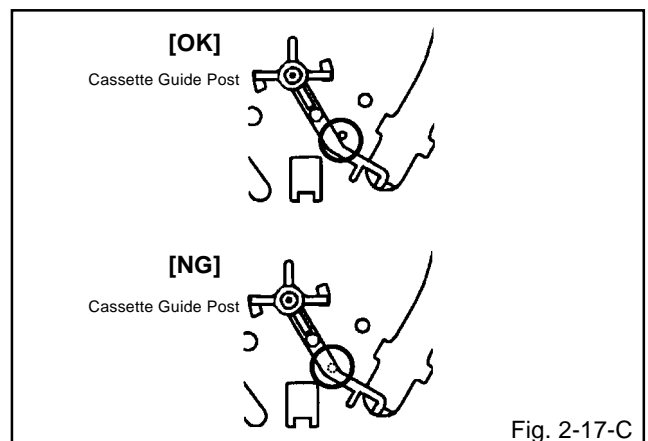


Fig. 2-17-C

# DISASSEMBLY INSTRUCTIONS

## 3. REMOVAL OF DVD DECK PARTS

### NOTE

1. Disassemble only the DVD DECK PARTS parts listed here. Minute adjustments are needed if the disassembly is done. If the repair is needed except listed parts, replace the DVD MECHA ASS'Y.

### 3-1: TRAY (Refer to Fig. 3-1-A)

1. Set the Tray opened. (Refer to the DISC REMOVAL METHOD AT NO POWER SUPPLY)
2. Unlock the 2 supports ① and remove the Tray.

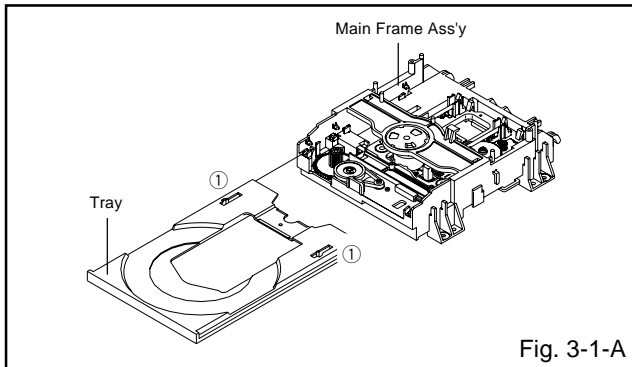


Fig. 3-1-A

### NOTE

1. In case of the Tray installation, install them as the circled section of Fig. 3-1-B so that the each markers are met.

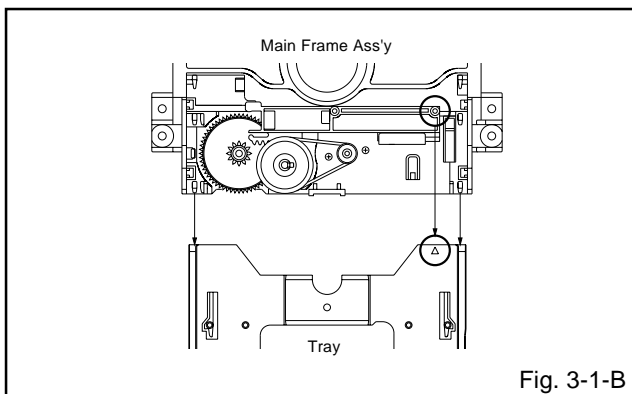


Fig. 3-1-B

### 3-2: MAIN CHASSIS ASS'Y (Refer to Fig. 3-2-A)

1. Remove the screw ①.
2. Unlock the 2 supports ②.
3. Remove the Insulator (R) from the Main Frame Ass'y.
4. Remove the Main Chassis Ass'y.

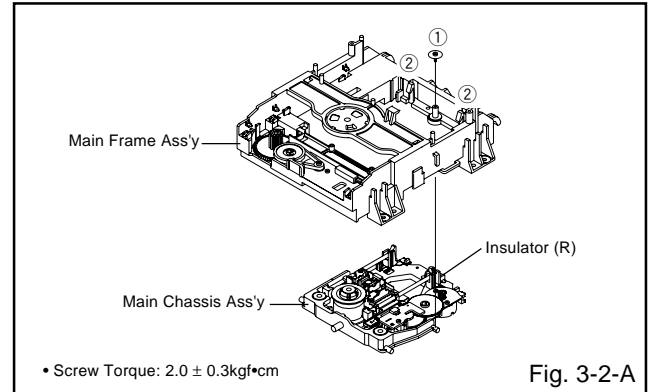


Fig. 3-2-A

### NOTE

1. In case of the Main Chassis Ass'y, install it from (1) to (4) in order. (Refer to Fig. 3-2-B)
2. In case of the Main Chassis Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-2-C.

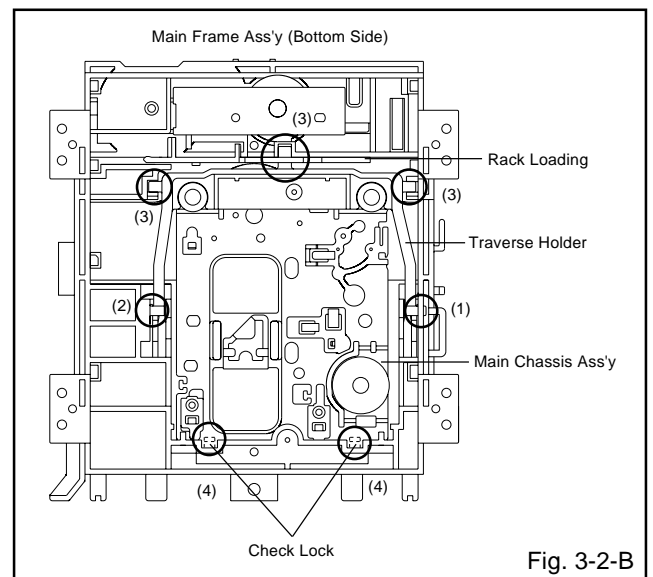


Fig. 3-2-B

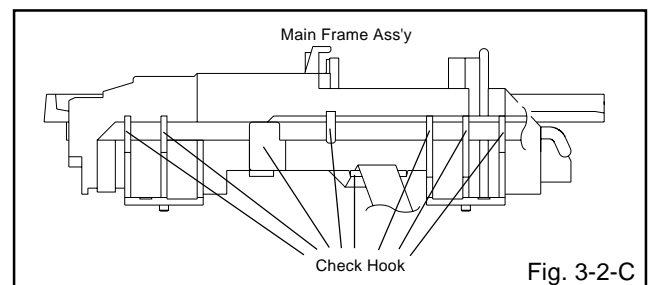
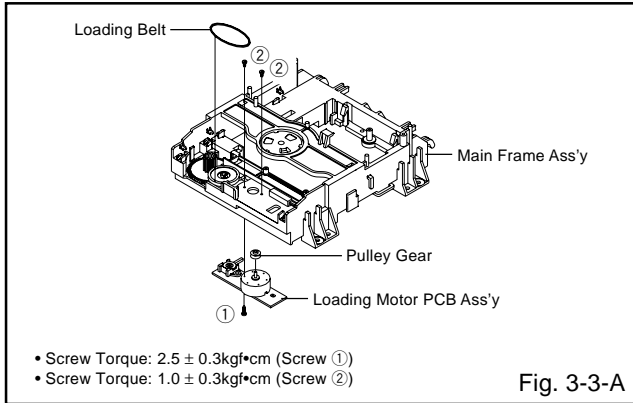


Fig. 3-2-C

# DISASSEMBLY INSTRUCTIONS

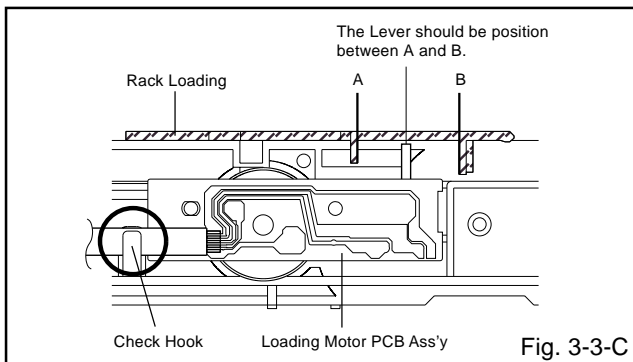
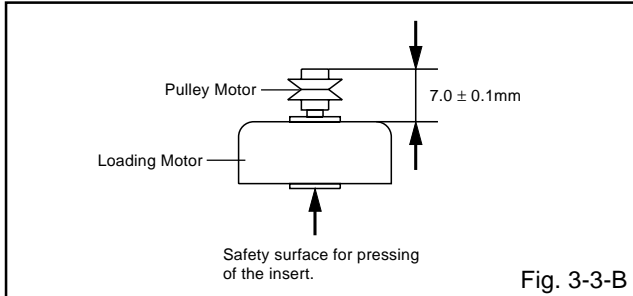
## 3-3: LOADING MOTOR PCB ASS'Y/ LOADING BELT (Refer to Fig. 3-3-A)

1. Remove the Loading Belt.
2. Remove the screw ①.
3. Remove the 2 screws ②.
4. Remove the Loading Motor PCB Ass'y.
5. Remove the Pulley Gear.



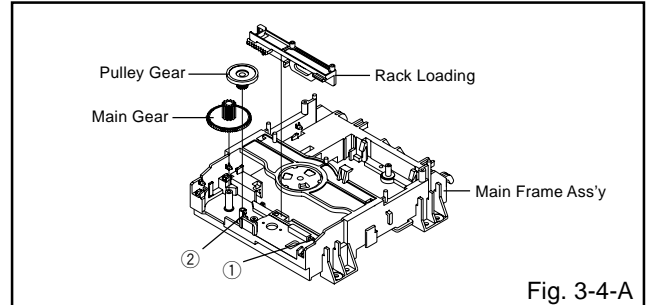
### NOTE

1. In case of the Pulley Motor installation, check if the value of the Fig. 3-3-B is correct.
2. When installing the Loading Motor PCB Ass'y, install it correctly as Fig. 3-3-C.
3. In case of the Loading Motor PCB Ass'y installation, hook the wire on the Main Frame Ass'y as shown Fig. 3-3-C.



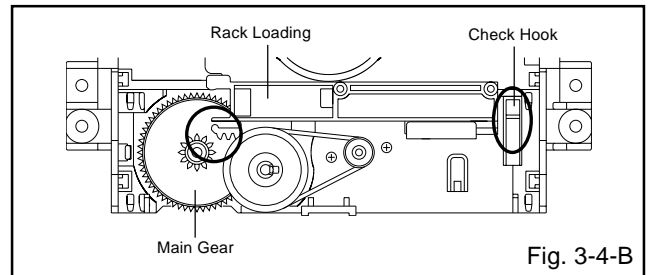
## 3-4: RACK LOADING/MAIN GEAR/PULLEY GEAR (Refer to Fig. 3-4-A)

1. Press down the catcher ① and slide the Rack Loading.
2. Unlock the support ② and remove the Pulley Gear.
3. Remove the Main Gear.



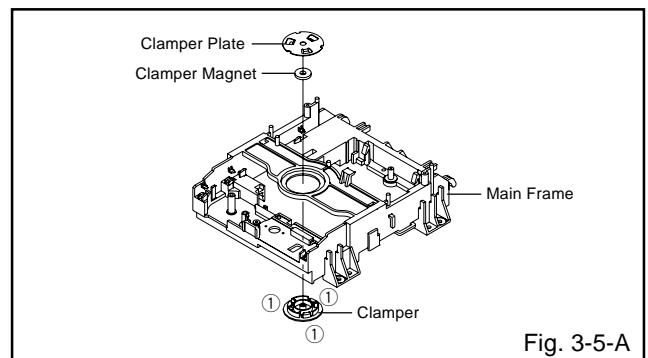
### NOTE

1. In case of the Rack Loading installation, do not mesh it to the Main Gear as shown the Fig. 3-4-B.



## 3-5: CLAMPER ASS'Y (Refer to Fig. 3-5-A)

1. Press the Clamper and rotate the Clamper Plate clockwise, then unlock the 3 supports ①.
2. Remove the Clamper Plate, Clamper Magnet and Clamper.





# DISASSEMBLY INSTRUCTIONS

## NOTE

1. In case of the Clamper Ass'y installation, install correctly as Fig. 3-5-B.

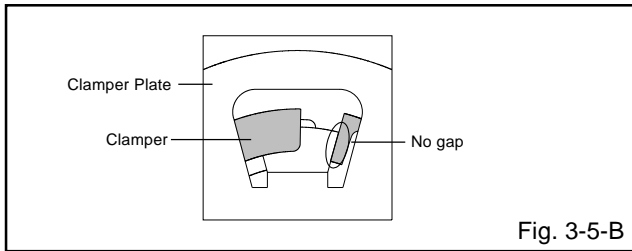


Fig. 3-5-B

## 3-6: TRAVERSE HOLDER/INSULATOR (F)/INSULATOR (R) (Refer to Fig. 3-6-A)

1. Remove the Traverse Holder.
2. Remove the 2 Insulator (F).
3. Remove the Insulator (R).

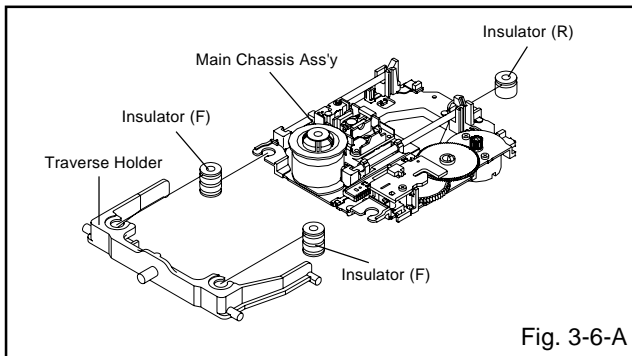


Fig. 3-6-A

## NOTE

1. In case of the Insulator (F) installation, install correctly as Fig. 3-6-B.
2. In case of the Insulator (R) installation, install correctly as Fig. 3-6-C.

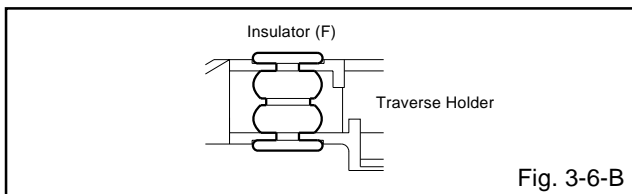


Fig. 3-6-B

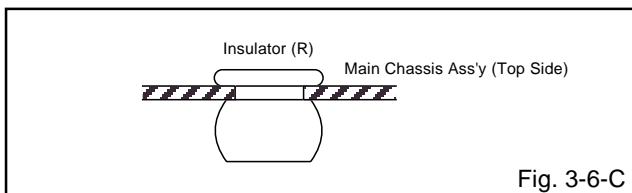


Fig. 3-6-C

## 3-7: SWITCH PCB ASS'Y/MIDDLE GEAR/FEED MOTOR (Refer to Fig. 3-7-A)

1. Remove the screw ①.
2. Remove the Switch PCB Ass'y.
3. Unlock the support ②.
4. Remove the Middle Gear.
5. Remove the 2 screws ③.
6. Remove the Feed Motor.
7. Remove the Motor Gear.

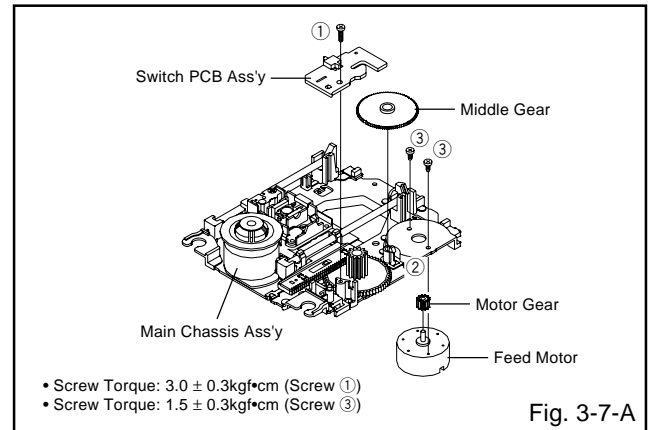


Fig. 3-7-A

## NOTE

1. In case of the Motor Gear installation, check if the value of the Fig. 3-7-B is correct.
2. When installing the wire of the Switch PCB Ass'y, install it correctly as Fig. 3-7-C.
3. After the assembly of the Main Chassis Ass'y, hook the wire on the Main Chassis Ass'y as shown Fig. 3-7-D.

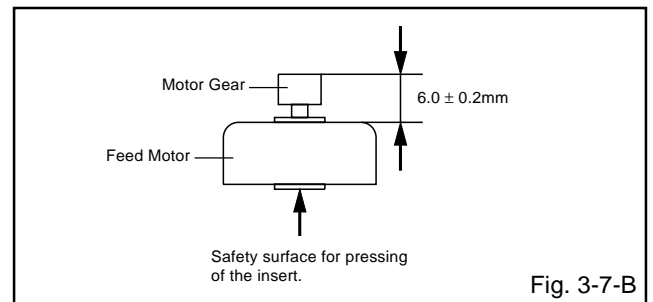


Fig. 3-7-B

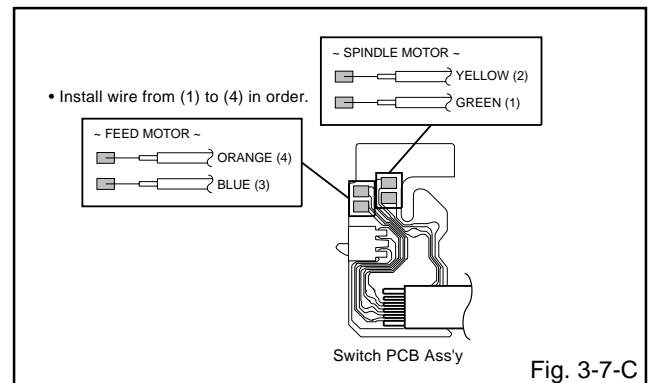
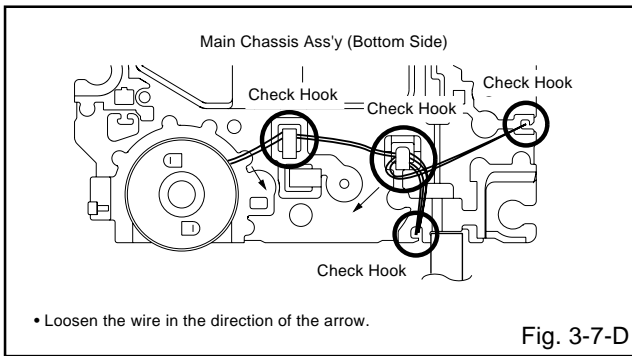


Fig. 3-7-C

# DISASSEMBLY INSTRUCTIONS

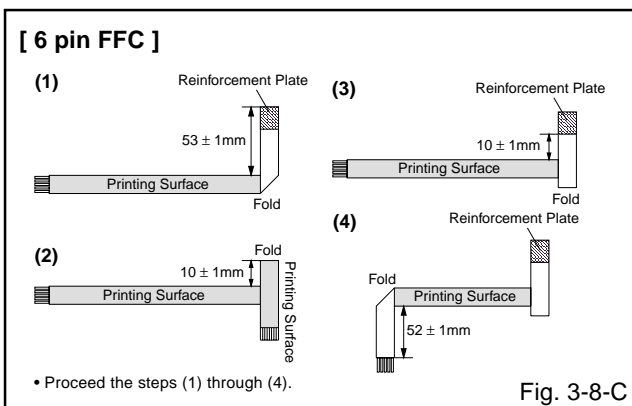
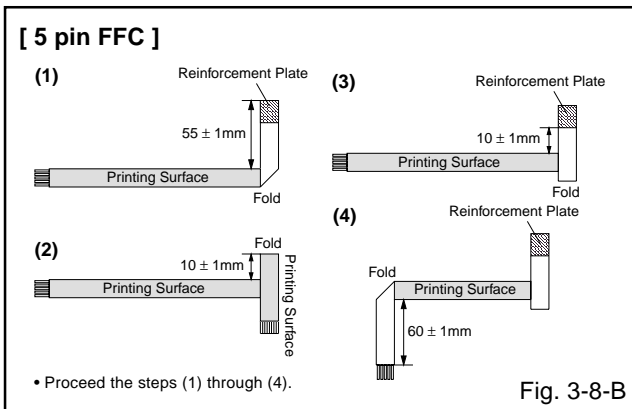
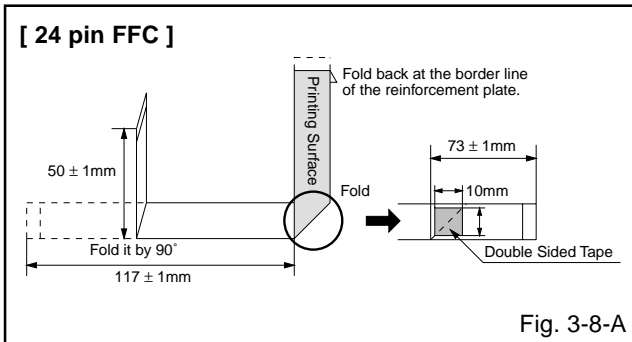


## 3-8: FFC WIRE HANDLING

1. When installing the FFC, fold it correctly and install it as shown from Fig. 3-8-A to Fig. 3-8-C.

### NOTE

1. Do not make the folding lines except the specified positions for the FFC.



# DISASSEMBLY INSTRUCTIONS

## 4. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

- \* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- \* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

### REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. (Refer to Fig. 4-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.

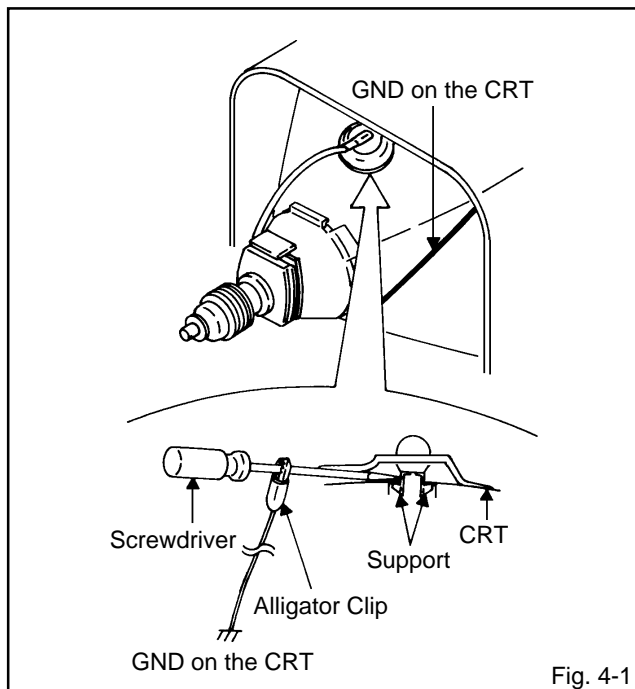


Fig. 4-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. (Refer to Fig. 4-2.)

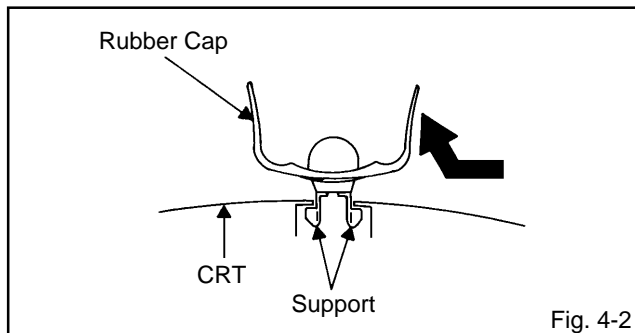


Fig. 4-2

3. After one side is removed, pull in the opposite direction to remove the other.

### NOTE

Take care not to damage the Rubber Cap.

### INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 4-3.)

### NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

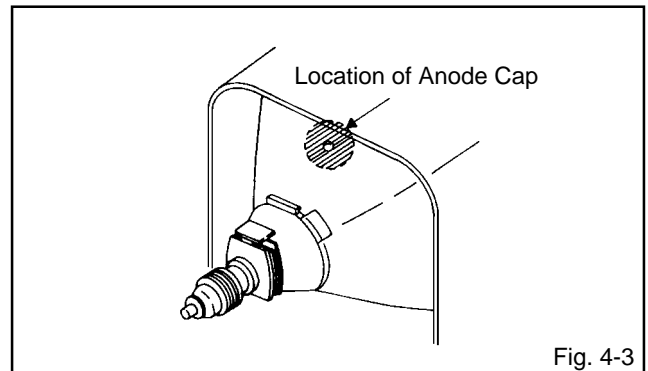


Fig. 4-3

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 4-4.)

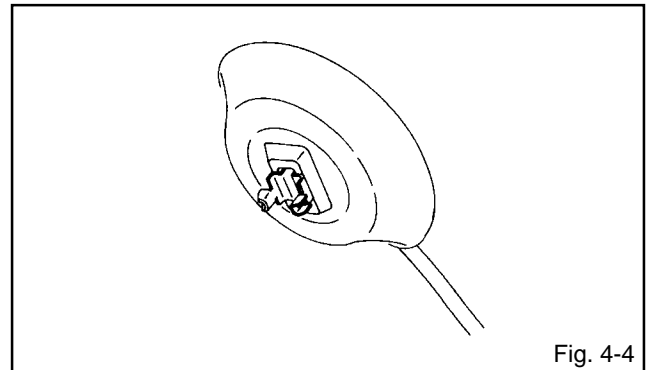


Fig. 4-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 4-5.

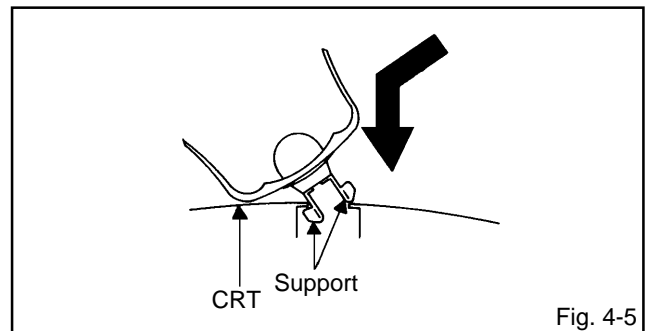


Fig. 4-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

# DISASSEMBLY INSTRUCTIONS

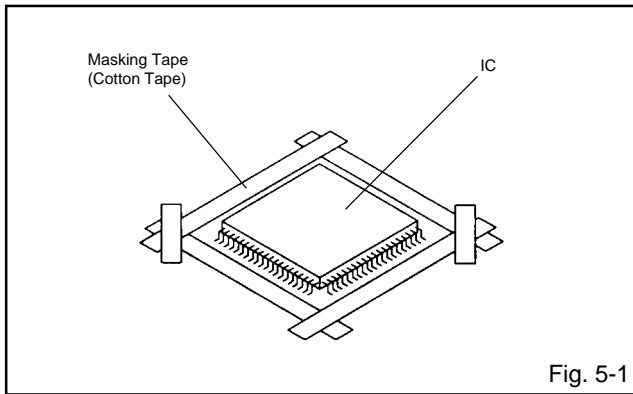
## 5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

### REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 5-1.)

#### NOTE

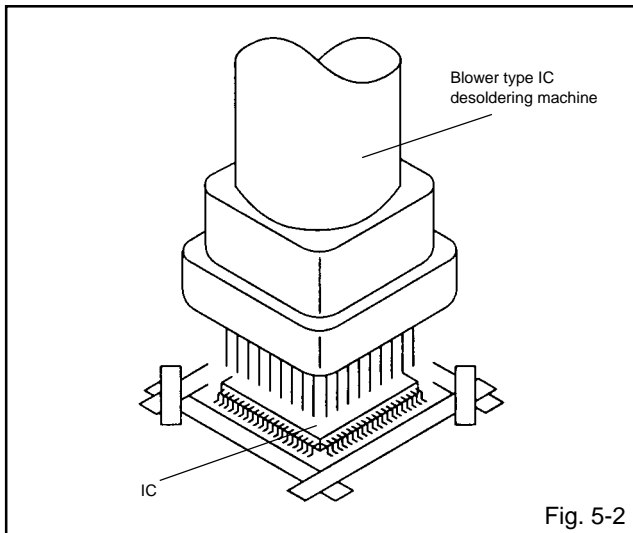
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 5-2.)

#### NOTE

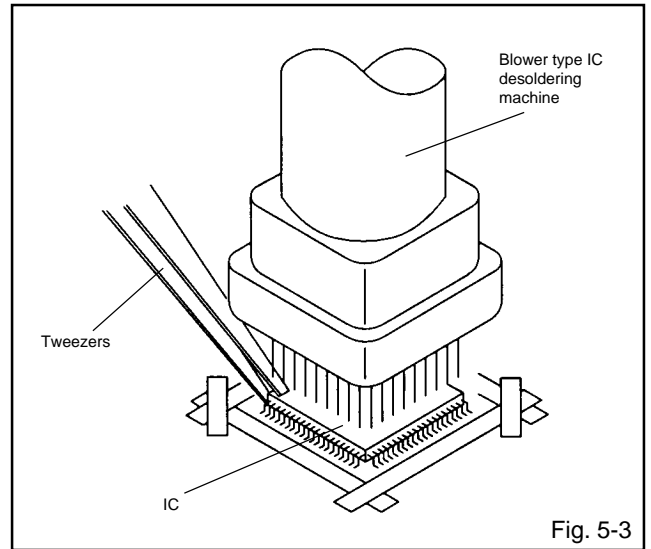
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 5-3.)

#### NOTE

Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

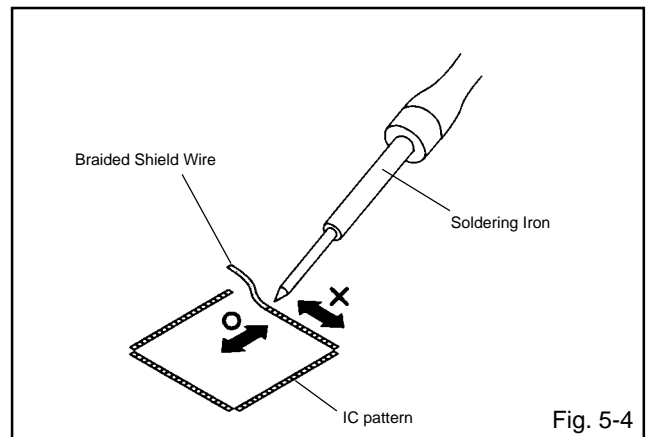


4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 5-4.)

#### NOTE

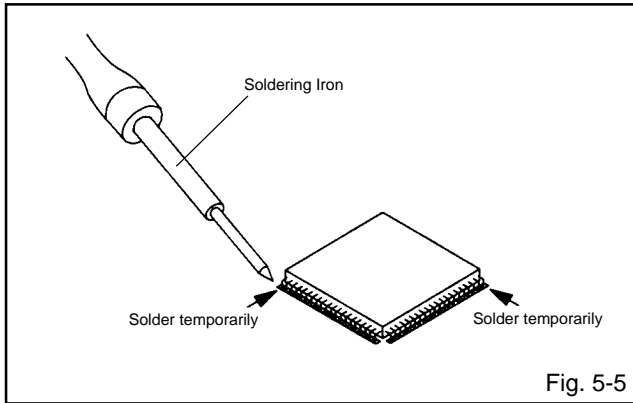
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



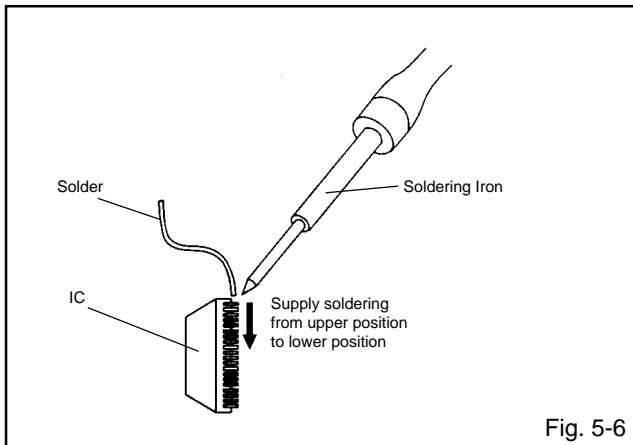
# DISASSEMBLY INSTRUCTIONS

## INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 5-5.)**



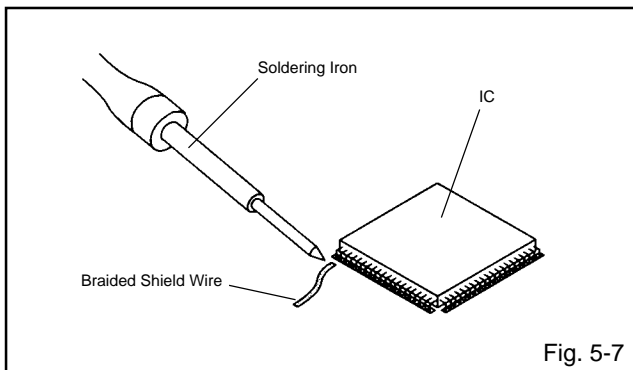
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 5-6.)**



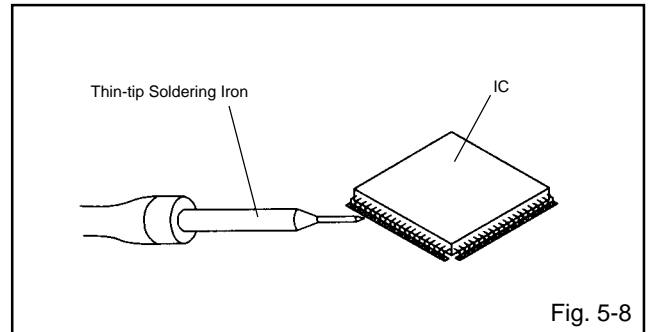
3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 5-7.)**

### NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 5-8.)**



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

### NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, always be sure to replace the IC in this case.

## KEY TO ABBREVIATIONS

<b>A</b>	<b>A/C</b>	: Audio/Control	<b>H.SW</b>	: Head Switch
	<b>ACC</b>	: Automatic Color Control	<b>Hz</b>	: Hertz
	<b>AE</b>	: Audio Erase	<b>I IC</b>	: Integrated Circuit
	<b>AFC</b>	: Automatic Frequency Control	<b>IF</b>	: Intermediate Frequency
	<b>AFT</b>	: Automatic Fine Tuning	<b>IND</b>	: Indicator
	<b>AFT DET</b>	: Automatic Fine Tuning Detect	<b>INV</b>	: Inverter
	<b>AGC</b>	: Automatic Gain Control	<b>K KIL</b>	: Killer
	<b>AMP</b>	: Amplifier	<b>L L</b>	: Left
	<b>ANT</b>	: Antenna	<b>LED</b>	: Light Emitting Diode
	<b>A.PB</b>	: Audio Playback	<b>LIMIT AMP</b>	: Limiter Amplifier
	<b>APC</b>	: Automatic Phase Control	<b>LM, LDM</b>	: Loading Motor
	<b>ASS'Y</b>	: Assembly	<b>LP</b>	: Long Play
	<b>AT</b>	: All Time	<b>L.P.F</b>	: Low Pass Filter
	<b>AUTO</b>	: Automatic	<b>LUMI.</b>	: Luminance
	<b>A/V</b>	: Audio/Video	<b>M M</b>	: Motor
<b>B</b>	<b>BGP</b>	: Burst Gate Pulse	<b>MAX</b>	: Maximum
	<b>BOT</b>	: Beginning of Tape	<b>MINI</b>	: Minimum
	<b>BPF</b>	: Bandpass Filter	<b>MIX</b>	: Mixer, mixing
	<b>BRAKE SOL</b>	: Brake Solenoid	<b>MM</b>	: Monostable Multivibrator
	<b>BUFF</b>	: Buffer	<b>MOD</b>	: Modulator, Modulation
	<b>B/W</b>	: Black and White	<b>MPX</b>	: Multiplexer, Multiplex
<b>C</b>	<b>C</b>	: Capacitance, Collector	<b>MS SW</b>	: Mecha State Switch
	<b>CASE</b>	: Cassette	<b>N NC</b>	: Non Connection
	<b>CAP</b>	: Capstan	<b>NR</b>	: Noise Reduction
	<b>CARR</b>	: Carrier	<b>O OSC</b>	: Oscillator
	<b>CH</b>	: Channel	<b>OPE</b>	: Operation
	<b>CLK</b>	: Clock	<b>P PB</b>	: Playback
	<b>CLOCK (SY-SE)</b>	: Clock (Syscon to Servo)	<b>PB CTL</b>	: Playback Control
	<b>COMB</b>	: Combination, Comb Filter	<b>PB-C</b>	: Playback-Chrominance
	<b>CONV</b>	: Converter	<b>PB-Y</b>	: Playback-Luminance
	<b>CPM</b>	: Capstan Motor	<b>PCB</b>	: Printed Circuit Board
	<b>CTL</b>	: Control	<b>P. CON</b>	: Power Control
	<b>CYL</b>	: Cylinder	<b>PD</b>	: Phase Detector
	<b>CYL-M</b>	: Cylinder-Motor	<b>PG</b>	: Pulse Generator
	<b>CYL SENS</b>	: Cylinder-Sensor	<b>P-P</b>	: Peak-to Peak
<b>D</b>	<b>DATA (SY-CE)</b>	: Data (Syscon to Servo)	<b>R R</b>	: Right
	<b>dB</b>	: Decibel	<b>REC</b>	: Recording
	<b>DC</b>	: Direct Current	<b>REC-C</b>	: Recording-Chrominance
	<b>DD Unit</b>	: Direct Drive Motor Unit	<b>REC-Y</b>	: Recording-Luminance
	<b>DEMODO</b>	: Demodulator	<b>REEL BRK</b>	: Reel Brake
	<b>DET</b>	: Detector	<b>REEL S</b>	: Reel Sensor
	<b>DEV</b>	: Deviation	<b>REF</b>	: Reference
<b>E</b>	<b>E</b>	: Emitter	<b>REG</b>	: Regulated, Regulator
	<b>EF</b>	: Emitter Follower	<b>REW</b>	: Rewind
	<b>EMPH</b>	: Emphasis	<b>REV, RVS</b>	: Reverse
	<b>ENC</b>	: Encoder	<b>RF</b>	: Radio Frequency
	<b>ENV</b>	: Envelope	<b>RMC</b>	: Remote Control
	<b>EOT</b>	: End of Tape	<b>RY</b>	: Relay
	<b>EQ</b>	: Equalizer	<b>S S. CLK</b>	: Serial Clock
	<b>EXT</b>	: External	<b>S. COM</b>	: Sensor Common
<b>F</b>	<b>F</b>	: Fuse	<b>S. DATA</b>	: Serial Data
	<b>FBC</b>	: Feed Back Clamp	<b>SEG</b>	: Segment
	<b>FE</b>	: Full Erase	<b>SEL</b>	: Select, Selector
	<b>FF</b>	: Fast Forward, Flip-flop	<b>SENS</b>	: Sensor
	<b>FG</b>	: Frequency Generator	<b>SER</b>	: Search Mode
	<b>FL SW</b>	: Front Loading Switch	<b>SI</b>	: Serial Input
	<b>FM</b>	: Frequency Modulation	<b>SIF</b>	: Sound Intermediate Frequency
	<b>FSC</b>	: Frequency Sub Carrier	<b>SO</b>	: Serial Output
	<b>FWD</b>	: Forward	<b>SOL</b>	: Solenoid
<b>G</b>	<b>GEN</b>	: Generator	<b>SP</b>	: Standard Play
	<b>GND</b>	: Ground	<b>STB</b>	: Serial Strobe
<b>H</b>	<b>H.P.F</b>	: High Pass Filter	<b>SW</b>	: Switch

## KEY TO ABBREVIATIONS

<b>S</b>	<b>SYNC</b>	: Synchronization
	<b>SYNC SEP</b>	: Sync Separator, Separation
<b>T</b>	<b>TR</b>	: Transistor
	<b>TRAC</b>	: Tracking
	<b>TRICK PB</b>	: Trick Playback
	<b>TP</b>	: Test Point
<b>U</b>	<b>UNREG</b>	: Unregulated
<b>V</b>	<b>V</b>	: Volt
	<b>VCO</b>	: Voltage Controlled Oscillator
	<b>VIF</b>	: Video Intermediate Frequency
	<b>VP</b>	: Vertical Pulse, Voltage Display
	<b>V.PB</b>	: Video Playback
	<b>VR</b>	: Variable Resistor
	<b>V.REC</b>	: Video Recording
	<b>VSF</b>	: Visual Search Fast Forward
	<b>VSR</b>	: Visual Search Rewind
	<b>VSS</b>	: Voltage Super Source
	<b>V-SYNC</b>	: Vertical-Synchronization
	<b>VT</b>	: Voltage Tuning
<b>X</b>	<b>X'TAL</b>	: Crystal
<b>Y</b>	<b>Y/C</b>	: Luminance/Chrominance

## SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter to the SERVICE MODE function, press and hold both buttons simultaneously on the main unit or on the main unit and on the remote control for more than a standard time (second).

In case of the main unit and remote control, press the remote control buttons first, then press the main unit buttons.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On or alternatively, discharge backup capacitor.

Set Condition	Set Key	Remocon Key	Standard Time	Operations
TV mode	VOL. DOWN (Minimum)	1	2 sec.	Initialization of the factory on TV. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the channel setting, POWER ON total hours and PLAY/REC total hours.
TV mode	VOL. DOWN (Minimum)	2	2 sec.	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VCR mode (Playback)	VOL. DOWN (Minimum)	3	2 sec.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VCR mode (Playback)	VOL. DOWN (Minimum)	4	2 sec.	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VCR mode (Playback)	VOL. DOWN (Minimum)	5	2 sec.	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
TV mode	VOL. DOWN (Minimum)	6	2 sec.	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF USING HOURS).  Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
TV mode	VOL. DOWN (Minimum)	7	2 sec.	Releasing of PROTECTION PASSWORD.
TV mode	VOL. DOWN (Minimum)	8	2 sec.	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
ALL mode	VOL. DOWN (Minimum)	9	2 sec.	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).
DVD mode (No disc)	STOP	4	2 sec.	Initialization of the factory on DVD. NOTE: Do not use this for the normal servicing. The function will only work without the setting of DVD disc at DVD mode.
DVD mode (No disc)	STOP	2	2 sec.	Releasing of PARENTAL LOCK. Refer to the "PARENTAL CONTROL - RATING LEVEL". NOTE: The function will only work without the setting of DVD disc at DVD mode.

Method	Operations
Press the following remocon keys continuously. SETUP → SUBTITLE → 3 → AUDIO → 0	Tray cannot be opened. Refer to the "TRAY LOCK". NOTE: No indications on the screen when the Tray Lock is setting.
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"



## PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

Parts replacing time does not mean the life span for individual parts.

Also, long term storage or misuse may cause transformation and aging of rubber parts.

The following list means standard hours, so the checking hours depends on the conditions.

Parts Name \ Time	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean

● : Check it and if necessary, replace it.

### CONFIRMATION OF HOURS USED

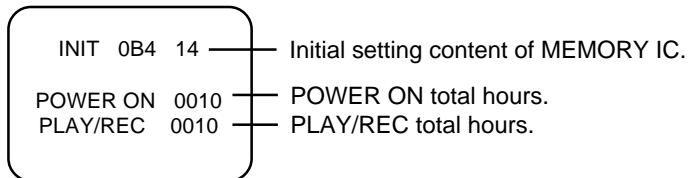
POWER ON total hours and PLAY/REC total hours can be checked on the screen.

Total hours are displayed in 16 system of notation.

**NOTE: If you set a factory initialization, the total hours is reset to "0".**

**The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On or alternatively, discharge backup capacitor.**

1. Turn on the POWER, and set to the TV mode.
2. Set the VOLUME to minimum.
3. Press both VOL. DOWN button on the set and the Channel button (6) on the remote control for more than 2 seconds.
4. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

# PREVENTIVE CHECKS AND SERVICE INTERVALS

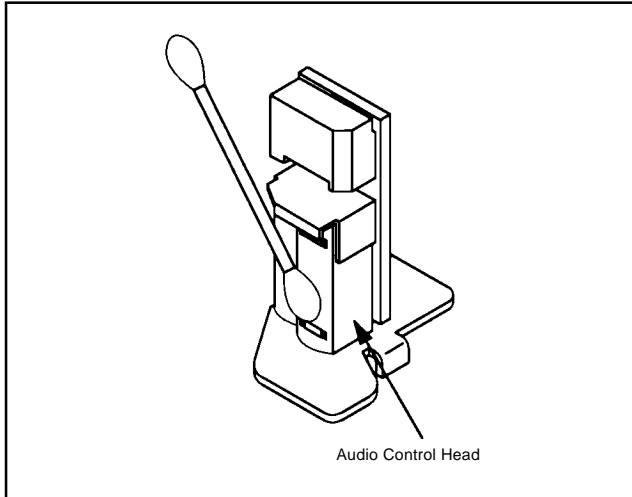
## CLEANING

### NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

### 1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



### 2. TAPE RUNNING SYSTEM

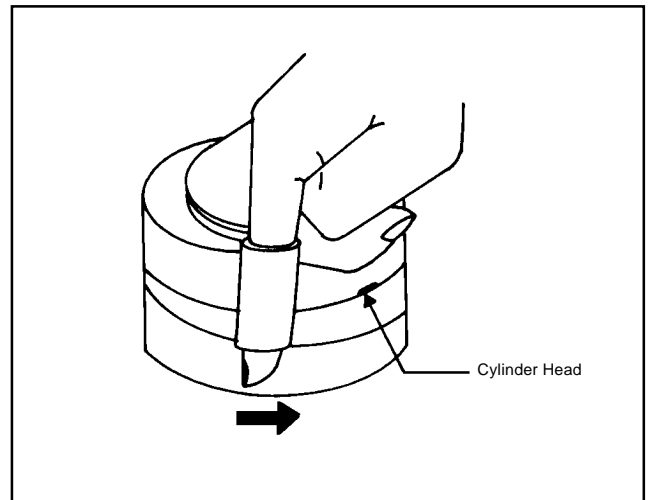
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

### 3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

### NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



## WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

**NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On or alternatively, discharge backup capacitor. No need setting for after INI 11F due to the adjustment value.**

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
0B0	---	---	---	---	11	10	B0	92	C0	0C	9E	EF	C0	CF	B5	82
0C0	82	6B	98	B2	D8	01	63	65	66	27	18	3B	27	17	15	1B
0D0	3A	0F	11	20	45	68	64	65	64	CA	00	37	87	0C	87	5F
0E0	00	DF	6F	F9	5F	01	FF	23	F9	6F	9F	B2	9A	97	8C	B2
0F0	A0	C4	20	08	BF	50	2B	B5	C1	41	00	34	13	13	77	40
100	27	03	47	55	00	00	00	00	00	00	00	00	00	00	82	00
110	00	03	04	27	40	20	A0	00	00	40	00	00	09	98	FF	01

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button (6) on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

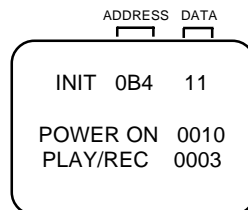


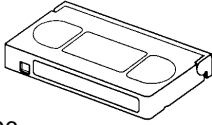
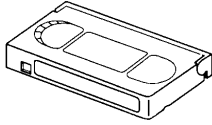
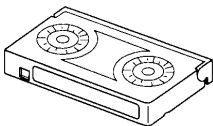
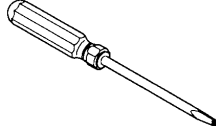
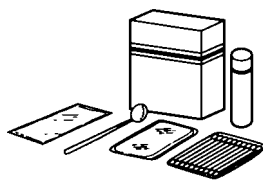


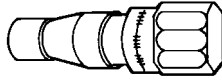
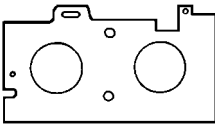
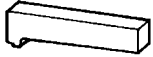
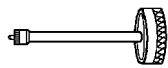
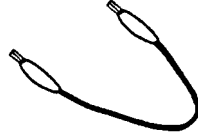
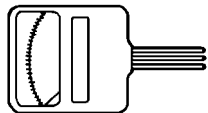
Fig. 1

4. ADDRESS is now selected and should "blink". Using the UP/DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
5. Press ENTER to select DATA. When DATA is selected, it will "blink".
6. Again, step through the DATA using UP/DOWN button until required DATA value has been selected.
7. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
8. Repeat steps 4 to 7 until all data has been checked.
9. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

**After the data input, set to the initializing of shipping.**

10. Turn POWER on.
  11. Press both VOL. DOWN button on the set and Channel button (1) on the remote control for more than 2 seconds.
  12. After the finishing of the initializing of shipping, the unit will turn off automatically.
- The unit will now have the correct DATA for the new MEMORY IC.

## SERVICING FIXTURES AND TOOLS

<p>Alignment Tape</p>  <p>ST-C6 ST-C7</p>	<p>Back tension cassette gauge</p>  <p>70909103</p>	<p>Torque cassette gauge (KT-300NR)</p>  <p>70909199</p>	<p>Taper nut driver</p>  <p>70909228</p>
<p>VTR cleaning kit</p> 	<p>VTR lubrication kit</p> 	<p>Grease</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm)</p> 
<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG154 Cable</p> 
<p>JG185 Tentelometer</p> 			

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG185	APJG185000	Tentelometer	Confirmation of Tape Tension on Playback

## PREPARATION FOR SERVICING

### How to use the Servicing Fixture

- Remove the TV/VCR/DVD block from the set.  
Be sure to place the parts on a paper so that they have no short-circuit each other.
- Short circuit between **TP1001** and **Ground** with the cable JG154.  
(The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
- In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.  
Turn on the power and re-check the cable before checking the trouble points.

# MECHANICAL ADJUSTMENTS

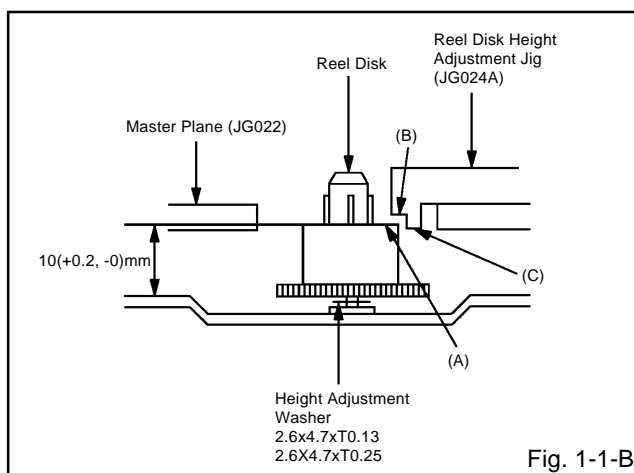
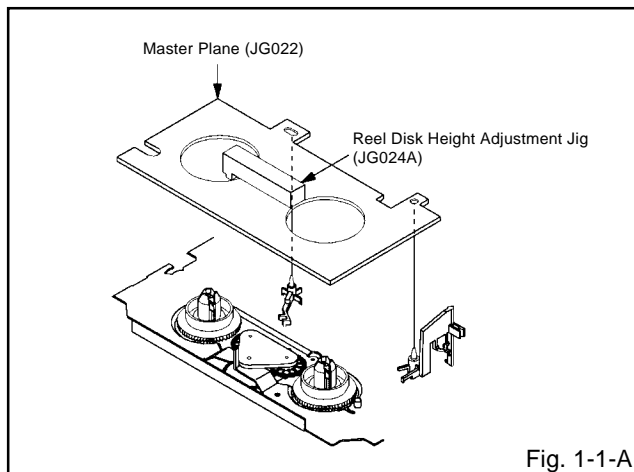
## 1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

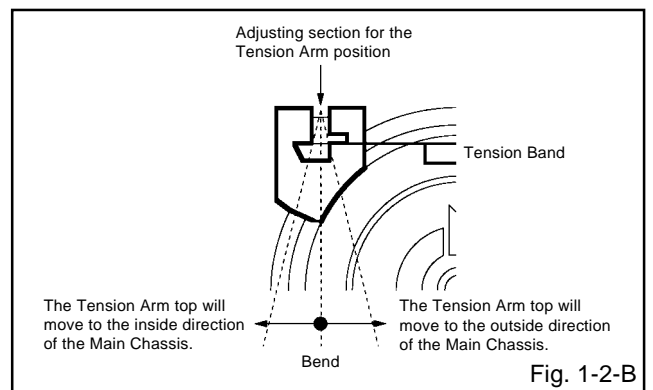
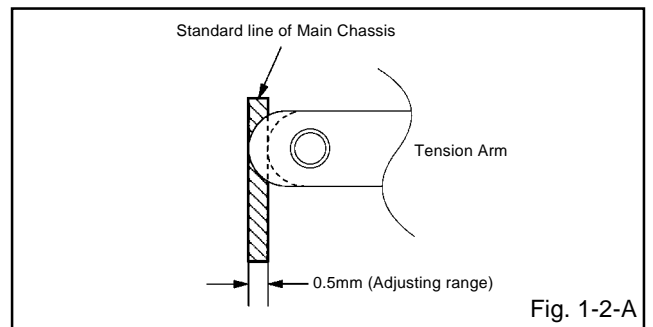
### 1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- Turn on the power and set to the STOP mode.
- Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
- While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig (**JG024A**) and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
- Adjust the other reel in the same way.



### 1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

- Set to the PLAY mode.
- Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
- While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

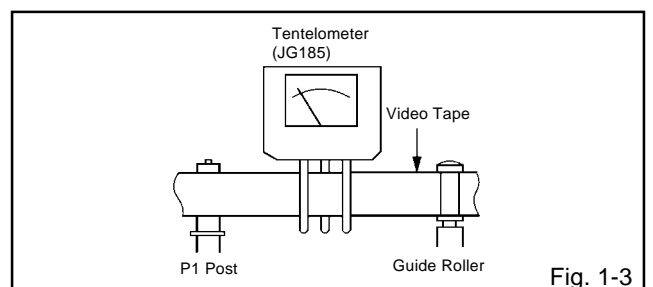


### 1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

- Load a video tape (E-180) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer (JG185) as shown in **Fig. 1-3**. Confirm that the meter indicates  $20 \pm 2\text{gf}$  in the beginning of playback.

#### • USING A CASSETTE TYPE TORQUE TAPE (**KT-300NR**)

- After confirmation and adjustment of Tension Post position (**Refer to item 1-2**), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
- Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
- Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.



# MECHANICAL ADJUSTMENTS

## 1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Set to the Picture Search (Rewind) mode. (Refer to Fig.1-4-B)
2. Then, confirm that it indicates 120~180gf•cm.

### NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

## 1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (**JG002F**) and Adapter (**JG002B**) on the S Reel. Turn the Torque Gauge (**JG002F**) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of Fig. 1-4-A.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (**JG002E**) and Adapter (**JG002B**) on the T reel. Turn the Torque Gauge (**JG002E**) counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

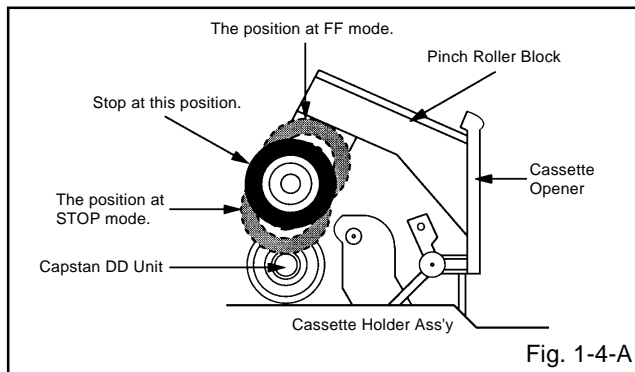


Fig. 1-4-A

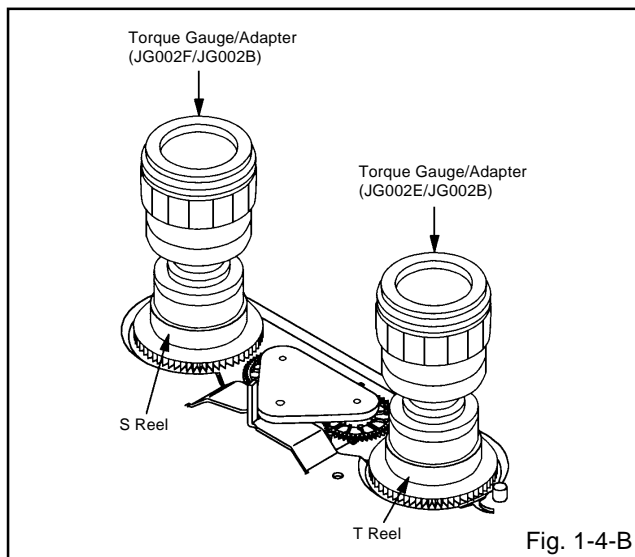


Fig. 1-4-B

### NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

## 2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

### 2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4502 (Envelope)** and CH-2 to **TP4501 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. (Refer to the ELECTRICAL ADJUSTMENTS)

### NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

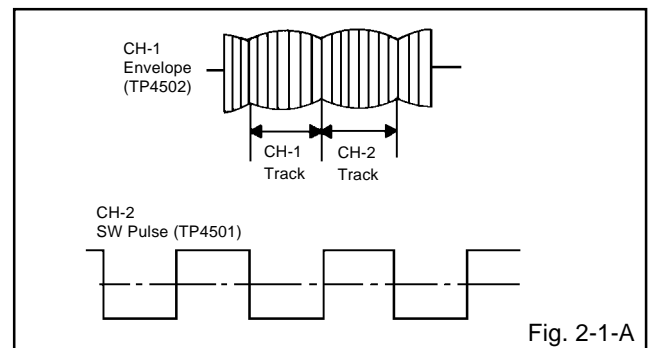


Fig. 2-1-A

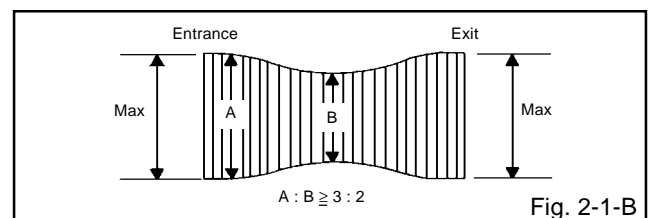


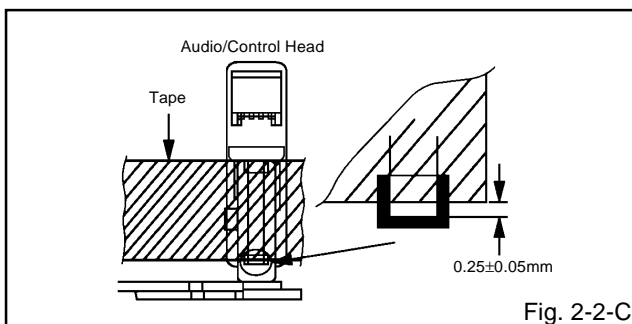
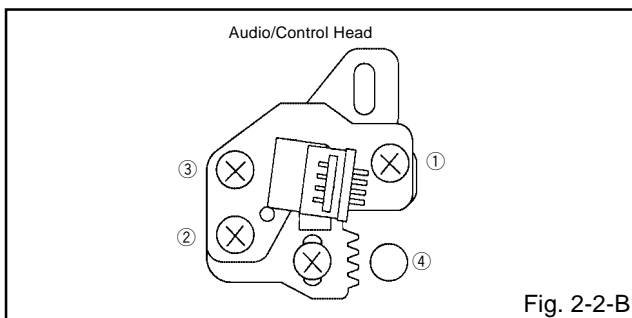
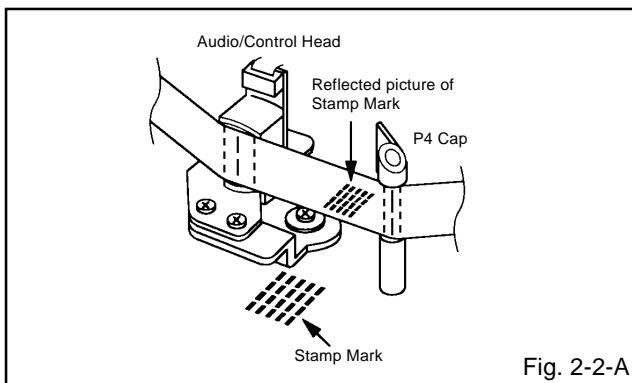
Fig. 2-1-B

## MECHANICAL ADJUSTMENTS

### 2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

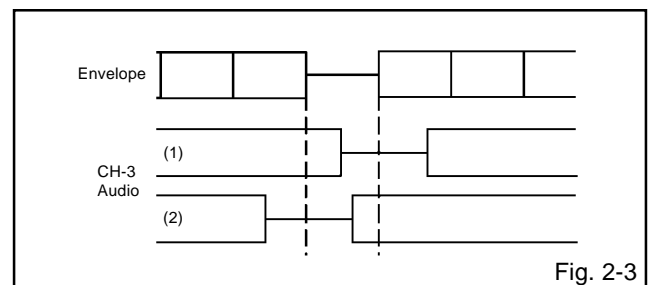
When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
  - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
  - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
  - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.



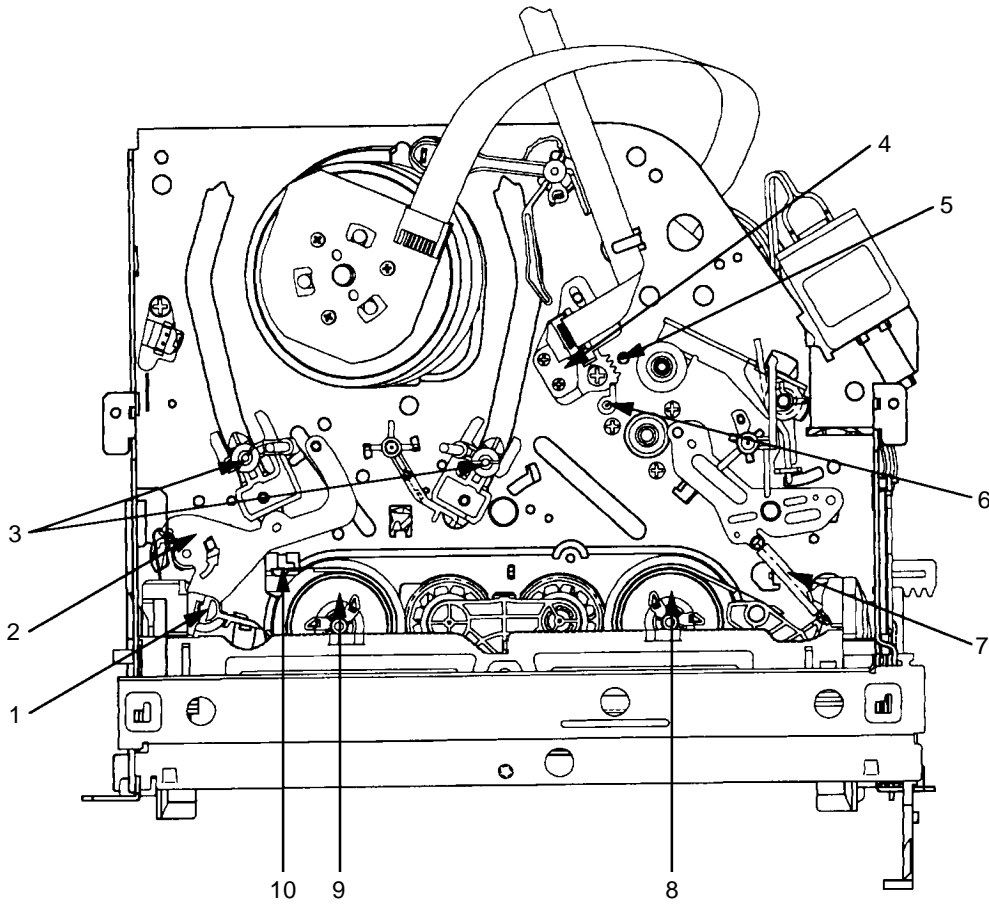
### 2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP4501**, CH-2 to **TP4502** and CH-3 to **Audio Out of 21 Pin Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.



# MECHANICAL ADJUSTMENTS

## 3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- |                                   |  |
|-----------------------------------|--|
| 1. Tension Connect                | 6. P4 Post   |
| 2. Tension Arm                    | 7. T Brake Spring                                  |
| 3. Guide Roller                   | 8. T Reel  |
| 4. Audio/Control Head             | 9. S Reel  |
| 5. X value adjustment driver hole | 10. Adjusting section for the Tension Arm position |



# ELECTRICAL ADJUSTMENTS

## 1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

### CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Pattern Generator

### On-Screen Display Adjustment

1. Unplug the AC plug for more than 30 minutes to set the clock to the non-setting state. (To release the Back-Up immediately, take the short circuit between **C1003** and **GND** at the Power Off.) Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the channel button **(9)** on the remote control for more than 2 seconds to display adjustment mode on the screen as shown in **Fig. 1-1**.

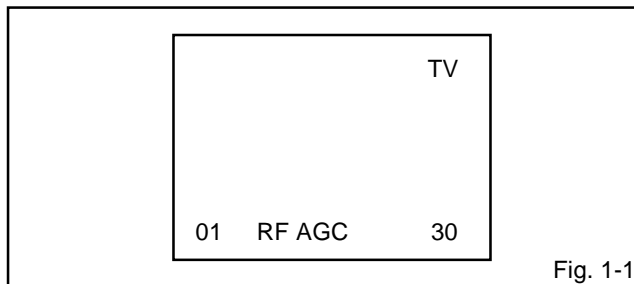


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	CUT OFF	20	CONTRAST CENT
01	RF AGC	21	CONTRAST MAX
02	AGC GAIN	22	CONTRAST MIN
03	R DRIVE	23	COLOR CENT
04	R CUTOFF	24	COLOR MAX
05	G DRIVE	25	COLOR MIN
06	G CUTOFF	26	TINT
07	B DRIVE	27	SHARP
08	H POSI 50Hz /60Hz	28	M R CUT OFF
09	V POSI 50Hz /60Hz	29	M G CUT OFF
10	---	30	M B CUT OFF
11	V SIZE 50Hz /60Hz	31	H POS OSD
12	---	32	---
13	VCO COARSE	33	---
14	VCO FINE	34	---
15	VCO COARSE L1	35	CVBS OUT
16	VCO FINE L1	36	APR THRESHOLD
17	BRIGHT CENT	37	BELL FILTER
18	BRIGHT MAX	38	BANDPASS
19	BRIGHT MIN		

Fig. 1-2

## 2. BASIC ADJUSTMENTS

### (VCR SECTION)

#### 2-1: PG SHIFTER

1. Playback the alignment tape.
2. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
3. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

4. Connect CH-1 on the oscilloscope to **TP4502** and CH-2 to **TP4501**.
5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes  $6.5 \pm 0.5H$ . (Refer to **Fig. 2-1-A, B**)
7. Stop the alignment tape.

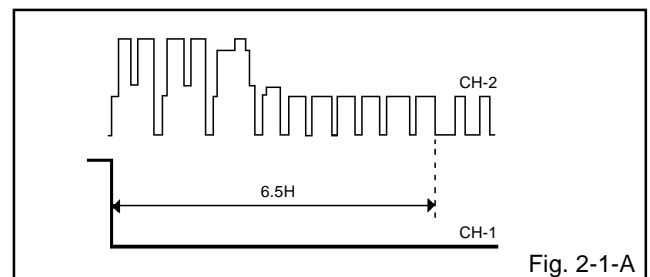


Fig. 2-1-A

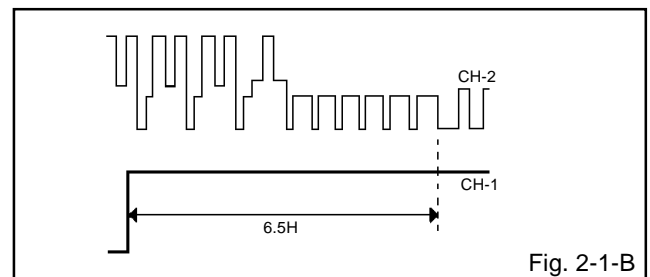


Fig. 2-1-B

#### 2-2: VCO

### (MONITOR TUNER)

1. Place the set in Aging Test for more than 10 minutes.
2. Connect the oscillator (38.5MHz) to **TP601**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "VCO COARSE".
4. Press the LEFT/RIGHT button on the remote control until the "OK" appear on the screen. If the "OK" is not displayed, select the "-" side on the changed from "+" to "-".
5. Press the channel button **(14)** to set to "VCO FINE" mode.
6. Press the LEFT/RIGHT button on the remote control to select the 5 step down point from the upper limit on the "OK".  
(Example: In case of the "OK" point 41, select 36.)

# ELECTRICAL ADJUSTMENTS

## 2-3: RF AGC

### (MONITOR TUNER)

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the UHF ( $63 \pm 1$ dB).
3. Connect the digital voltmeter between the **pin 5 of CP603** and the **pin 1 (GND) of CP603**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**01**) on the remote control to select "RF AGC".
5. Press the LEFT/RIGHT button on the remote control until the digital voltmeter is  $2.6 \pm 0.05$ V.

## (TV SECTION)

### 2-4: CONSTANT VOLTAGE

1. Connect the digital voltmeter to **TP401**.
2. Place the set in AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Adjust the **VR1701** until the digital voltmeter is  $115 \pm 1$ V.

### 2-5: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

### 2-6: HORIZONTAL POSITION

1. Receive the monoscope pattern from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**08**) on the remote control to select "H POSI (50)".
4. Press the LEFT/RIGHT button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.
5. Receive the cross hatch signal of NTSC. (Audio Video Input)
6. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

### 2-7: VERTICAL SIZE

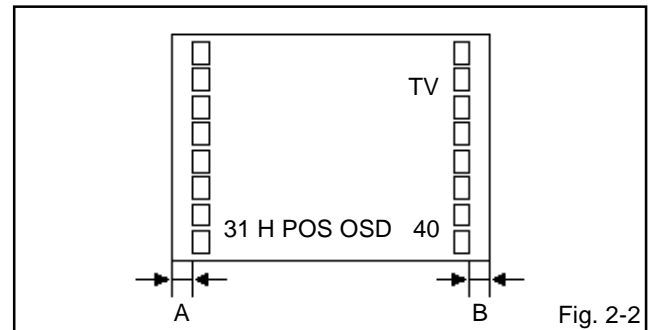
1. Receive the monoscope pattern from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**11**) on the remote control to select "V SIZE (50)".
4. Adjust by using the LEFT/RIGHT button on the remote control so that the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.
5. Receive a broadcast and check if the picture is normal.
6. Receive the cross hatch signal of NTSC. (Audio Video Input)
7. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

### 2-8: VERTICAL LINEARITY

1. Receive the monoscope pattern from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the VR401 until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

### 2-9: OSD HORIZONTAL

1. Using the remote control, set the brightness and contrast to normal position.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**31**) on the remote control to select "H POS OSD".
3. Press the LEFT/RIGHT button on the remote control until the difference of A and B becomes minimum. (Refer to **Fig. 2-2**)



### 2-10: CUT OFF

1. Place the set in AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Place the set with Aging Test for more than 15 minutes.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**00**) on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

### 2-11: WHITE BALANCE

**NOTE:** Adjust after performing CUT OFF adjustment.

1. Place the set in Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator with Burst On.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**03**) on the remote control to select "R DRIVE".
5. Press the CH. UP/DOWN button on the remote control to select the "R DRIVE", "G DRIVE", "M R CUTOFF" or "M G CUTOFF".
6. Adjust the LEFT/RIGHT button on the remote control to whiten the R DRIVE, G DRIVE, M R CUT OFF, and M G CUT OFF at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is achieved.

# ELECTRICAL ADJUSTMENTS

## 2-12: BRIGHT CENT

1. Receive the PAL black pattern\*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "BRIGHT CENT".
4. Press the LEFT/RIGHT button on the remote control until the screen begin to shine.
5. Receive the PAL black pattern\*. (Audio Video Input)
6. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the DVD button on the remote control to set to the DVD mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "BRIGHT CENT".
9. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

\*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

## 2-13: CONTRAST CENT

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(20)** on the remote control to select "CONTRAST CENT".
2. Press the LEFT/RIGHT button on the remote control until the contrast step No. becomes "40".
3. Receive a broadcast and check if the picture is normal.
4. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.
5. Press the DVD button on the remote control to set to the DVD mode.
6. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(20)** on the remote control to select "CONTRAST CENT".
7. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

## 2-14: COLOR CENT

1. Receive the PAL color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast and color to normal position.
3. Connect the oscilloscope to **TP024**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COLOR CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the LEFT/RIGHT button on the remote control until the red color level is adjusted to  $90 \pm 5\%$  of the white level. (**Refer to Fig. 2-3**)
7. Receive the VIDEO PAL color bar pattern. (Audio Video Input)
8. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.
9. Press the DVD button on the remote control to set to the DVD mode.
10. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COLOR CENT".
11. Press the LEFT/RIGHT button on the remote control to set the same step numbers as the AV mode.

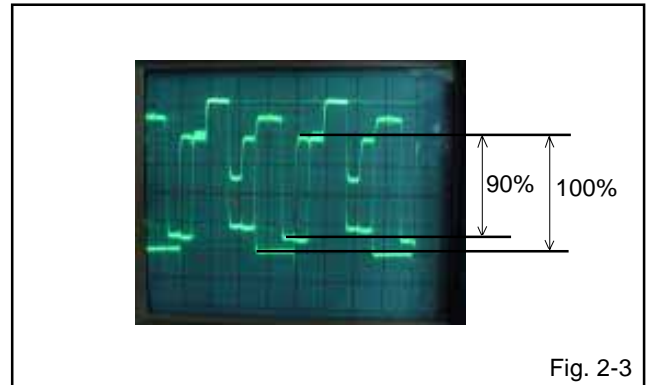


Fig. 2-3

## 2-15: Confirmation of Fixed Value (Step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	STEP NO.
02	AGC GAIN	00
04	R CUTOFF	31
06	G CUTOFF	31
07	B DRIVE	31
09	V POSI 50Hz /60Hz	5/15
15	VCO COARSE L1	00
16	VCO FINE L1	00
18	BRIGHT MAX	55
19	BRIGHT MIN	10
21	CONTRAST MAX	48
22	CONTRAST MIN	10
24	COLOR MAX	50
25	COLOR MIN	10
27	SHARP	07
30	M B CUT OFF	50
35	CVBS OUT	25
36	APR THRESHOLD	05
37	BELL FILTER	00
38	BANDPASS	00

# ELECTRICAL ADJUSTMENTS

## 3. PURITY AND CONVERGENCE ADJUSTMENTS

### NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

### 3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**  
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

### 3-2: PURITY

#### NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.  
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue color.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

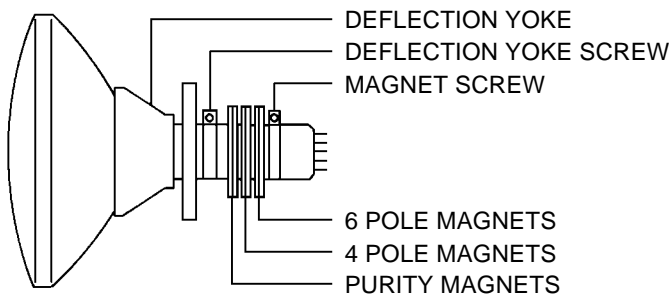


Fig. 3-1

### 3-3: STATIC CONVERGENCE

#### NOTE

Adjust after performing adjustments in section 3-2.

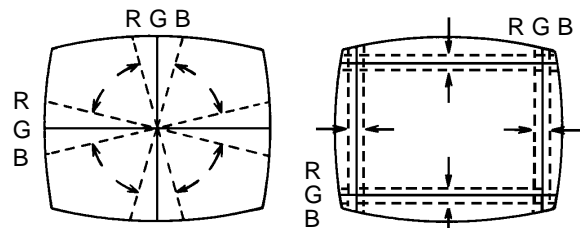
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

### 3-4: DYNAMIC CONVERGENCE

#### NOTE

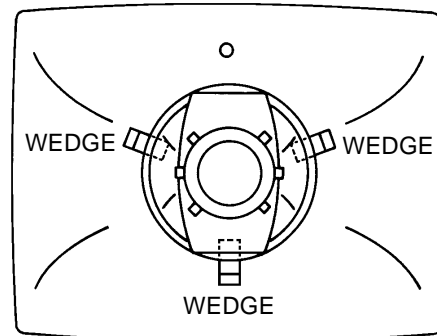
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT    RIGHT/LEFT SLANT

Fig. 3-2-a

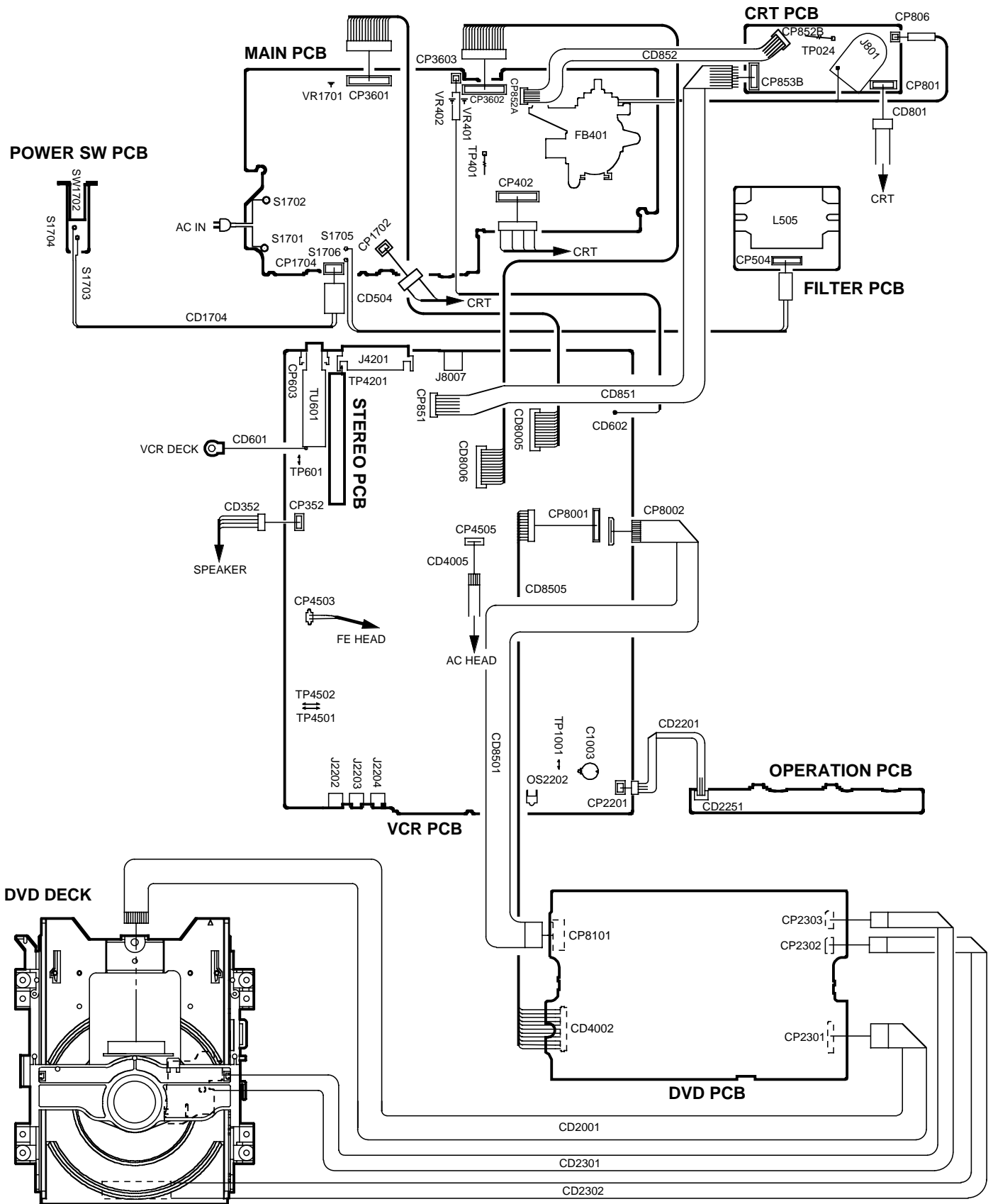


WEDGE POSITION

Fig. 3-2-b

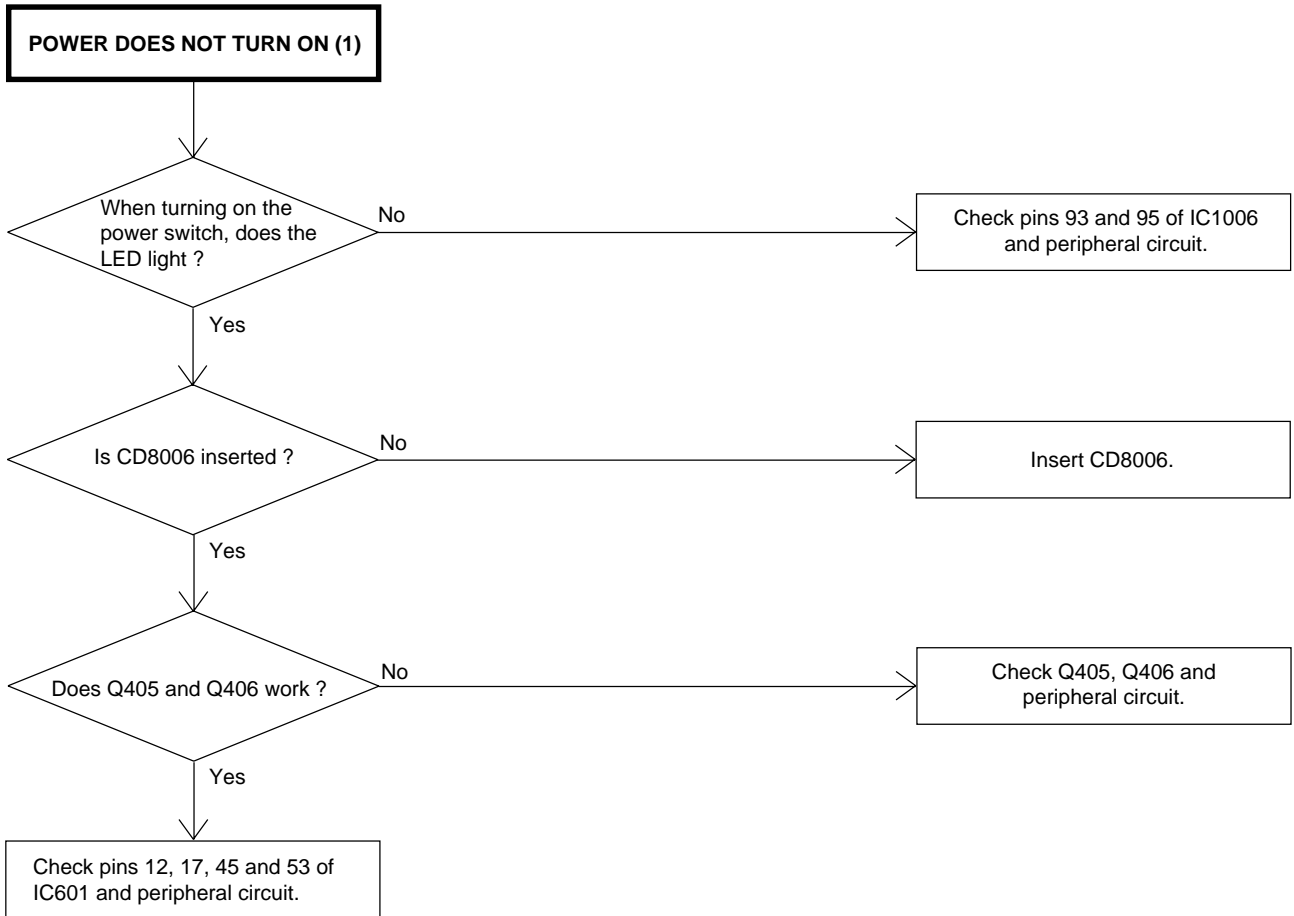
# ELECTRICAL ADJUSTMENTS

## 4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)

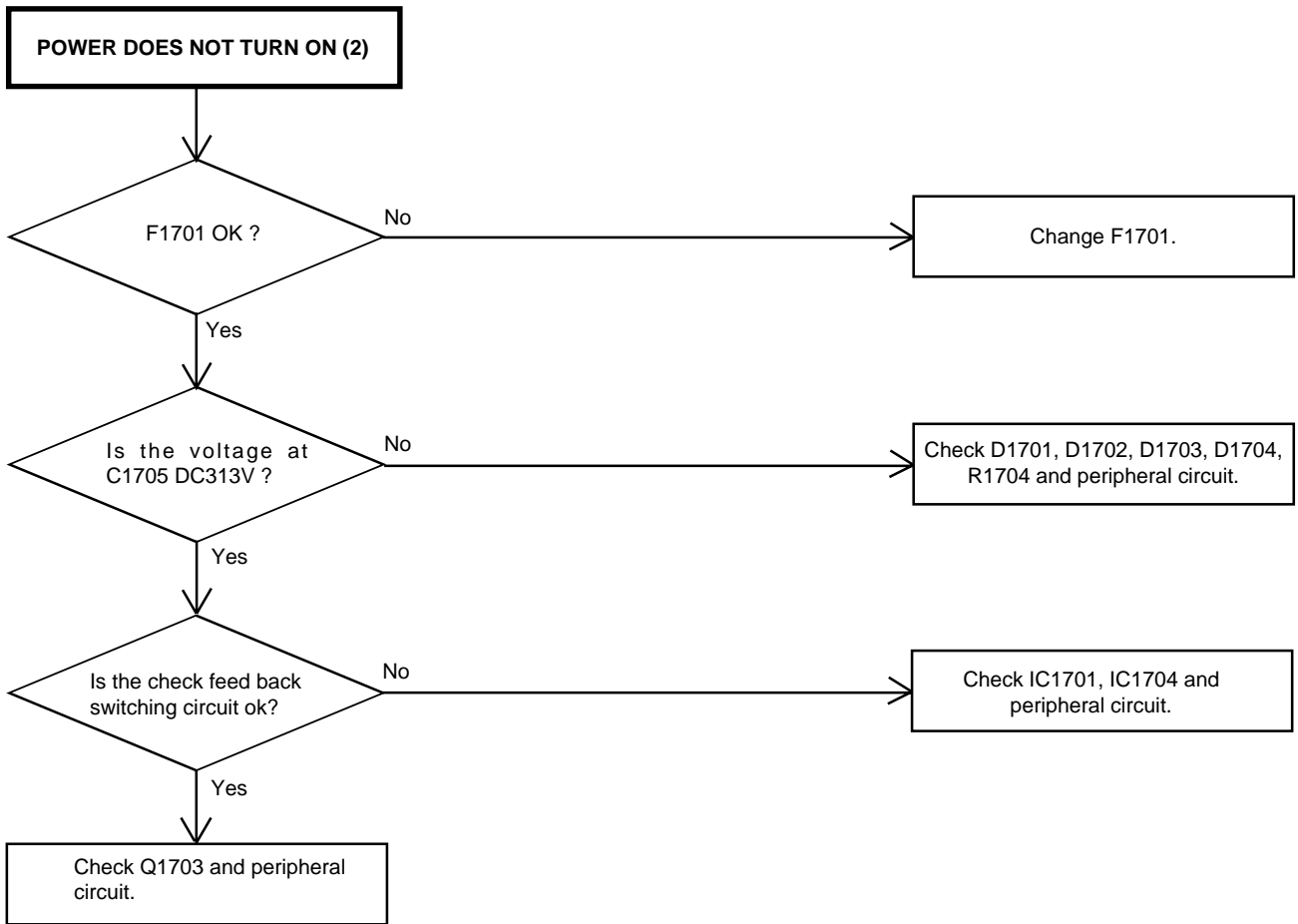


# TROUBLESHOOTING GUIDE

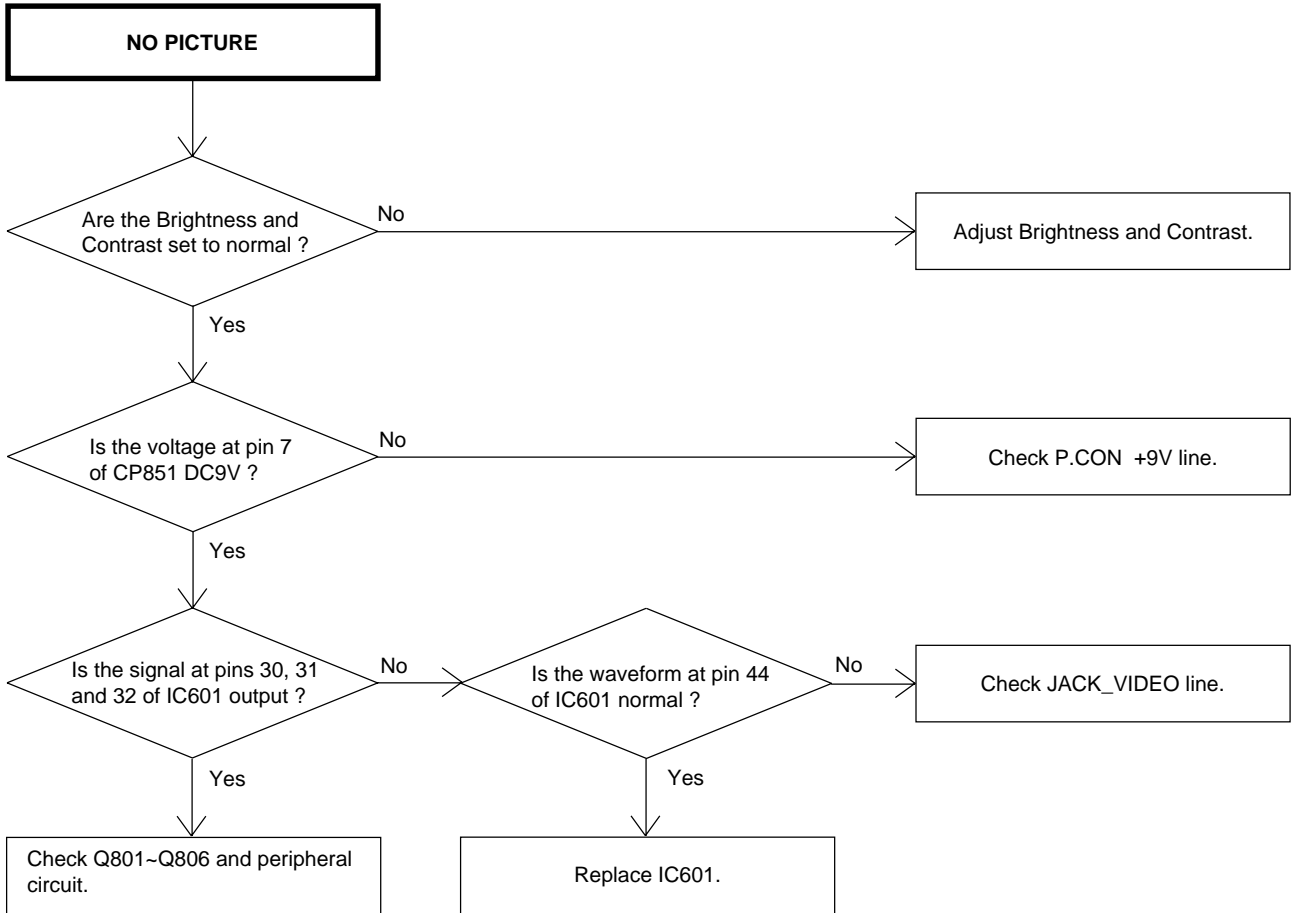
## (TV SECTION)



# TROUBLESHOOTING GUIDE

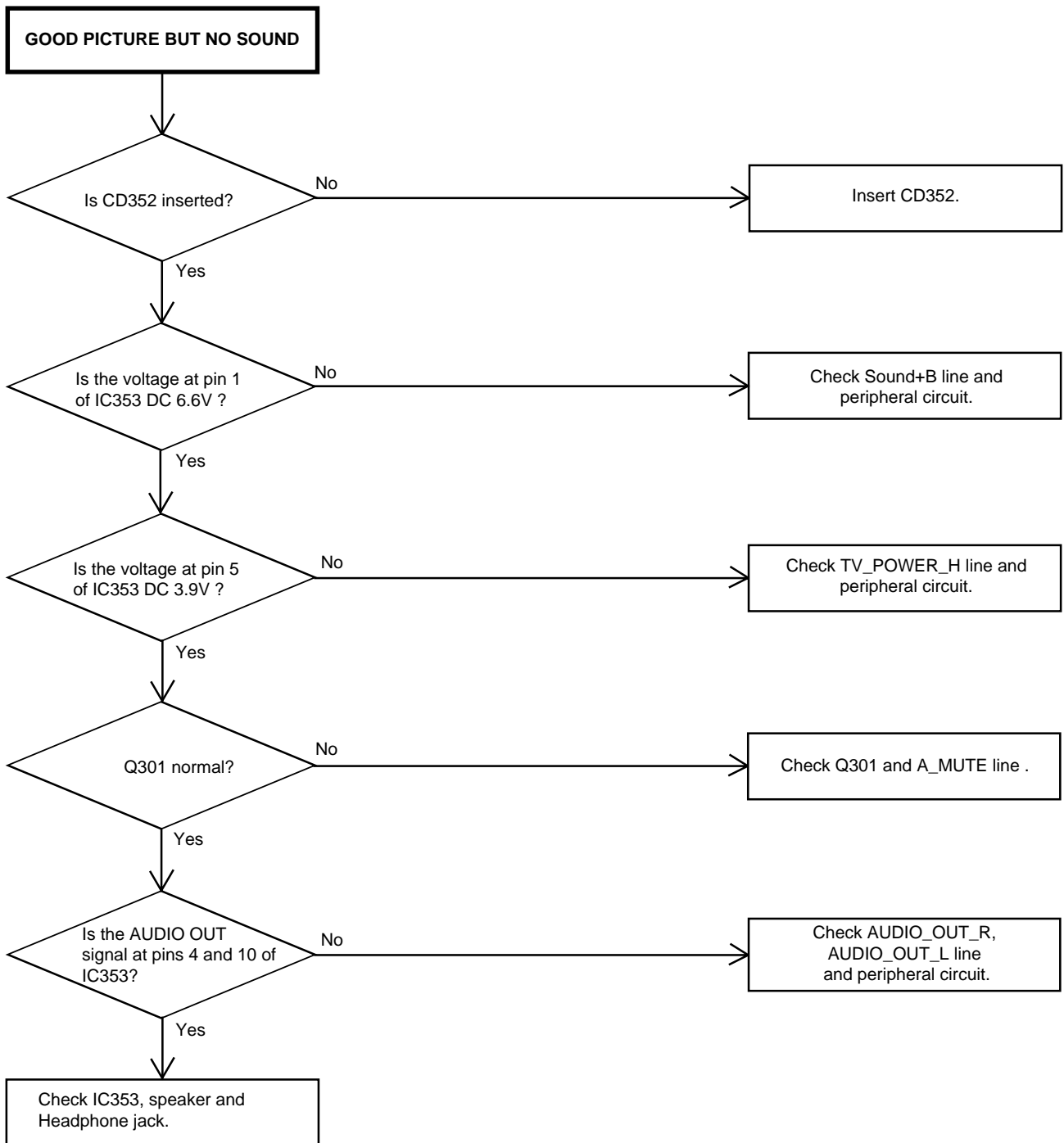


# TROUBLESHOOTING GUIDE

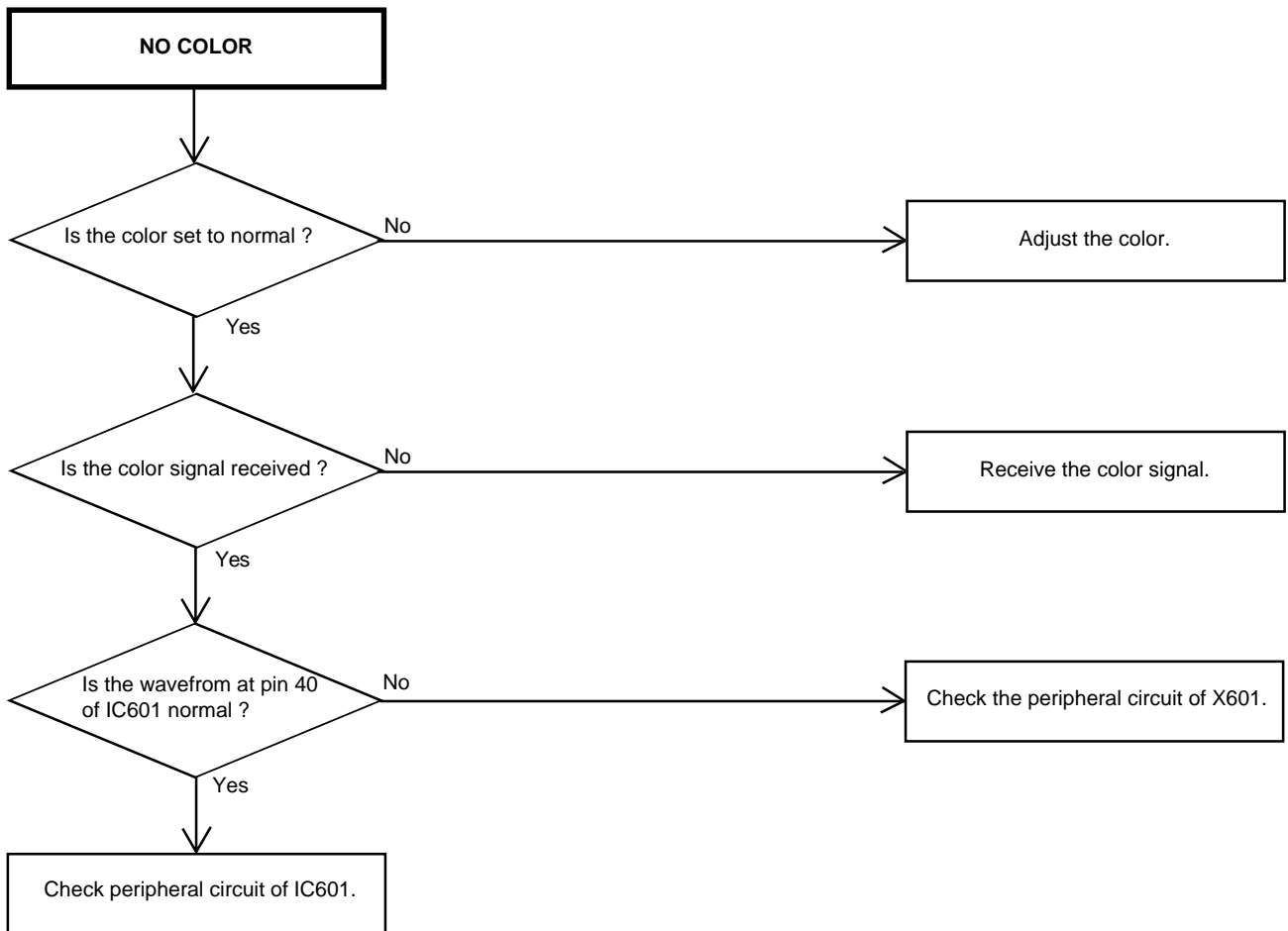




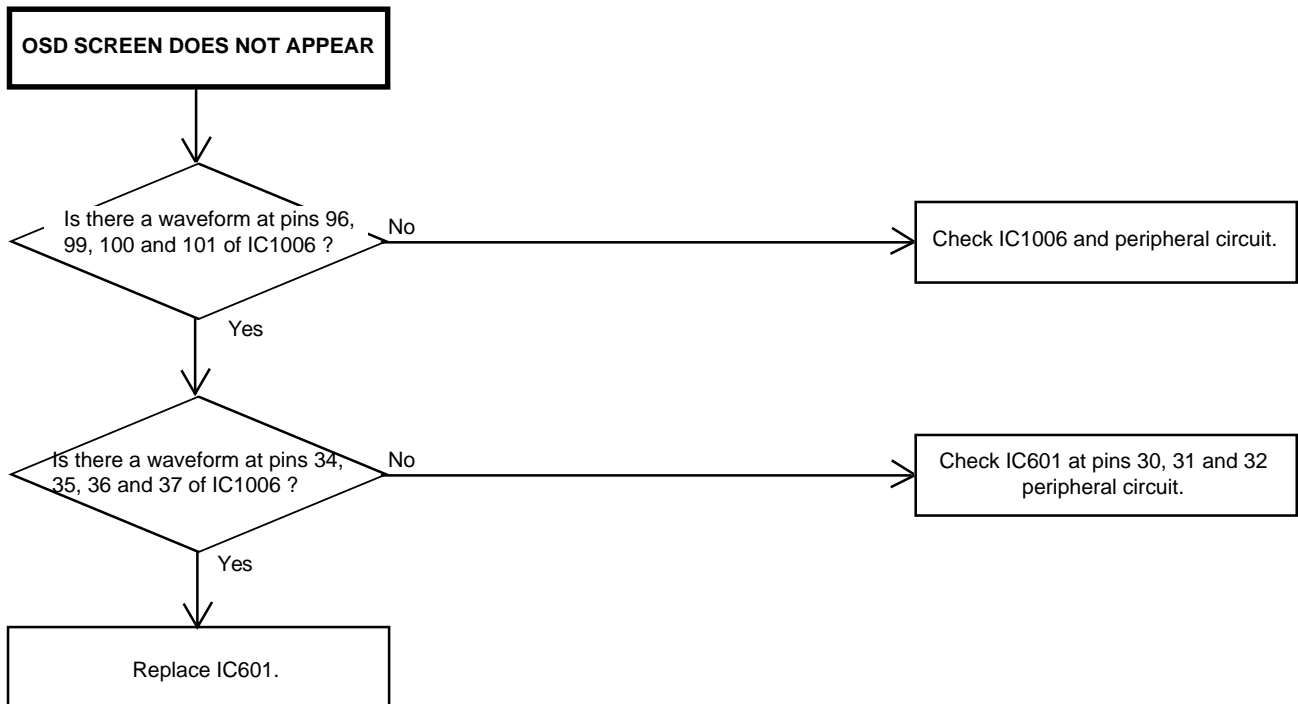
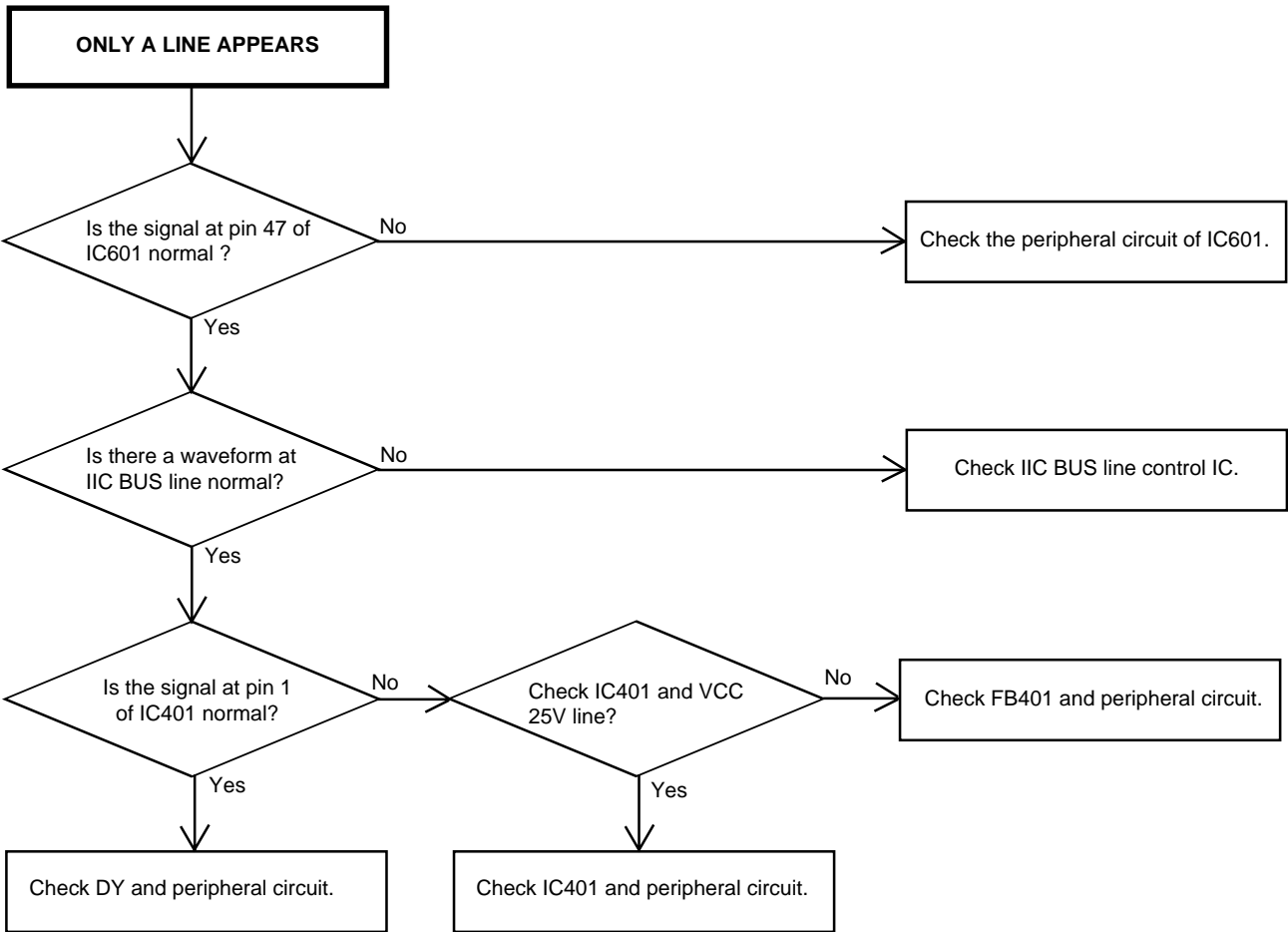
# TROUBLESHOOTING GUIDE



# TROUBLESHOOTING GUIDE

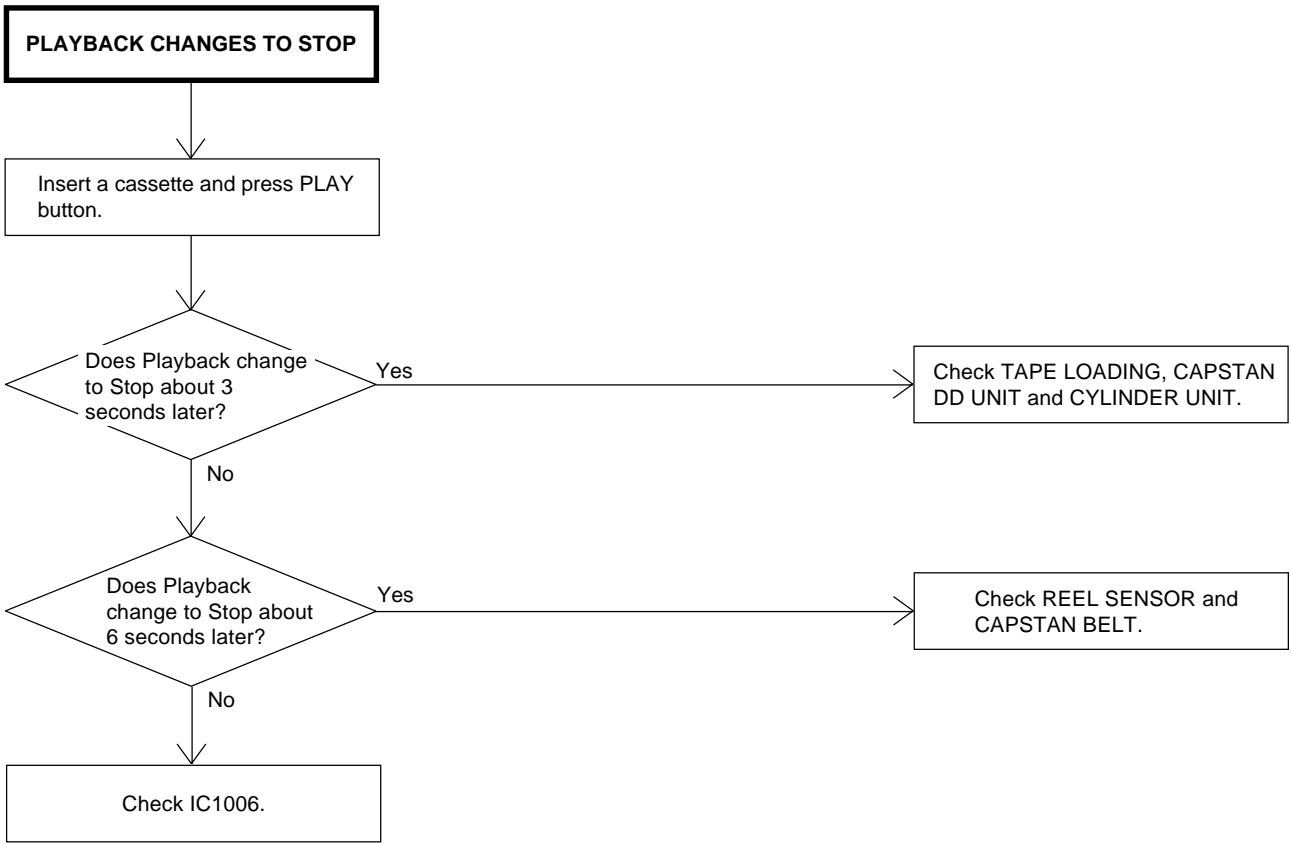


# TROUBLESHOOTING GUIDE

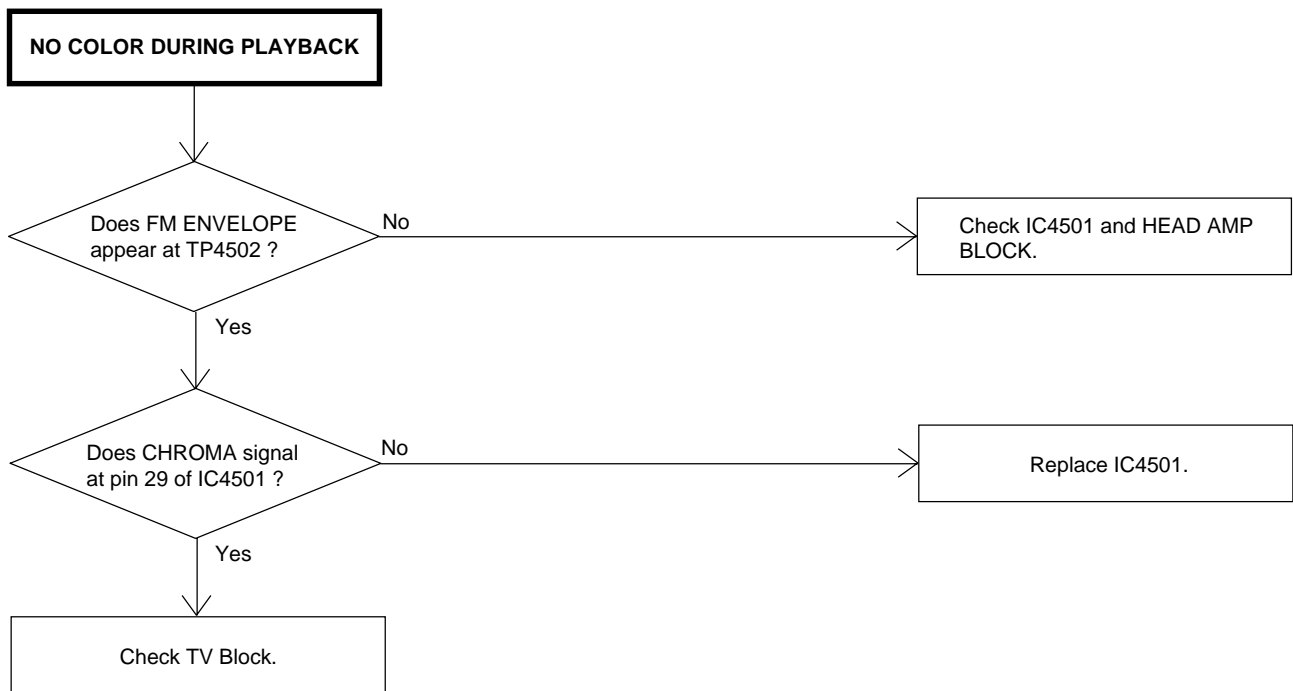
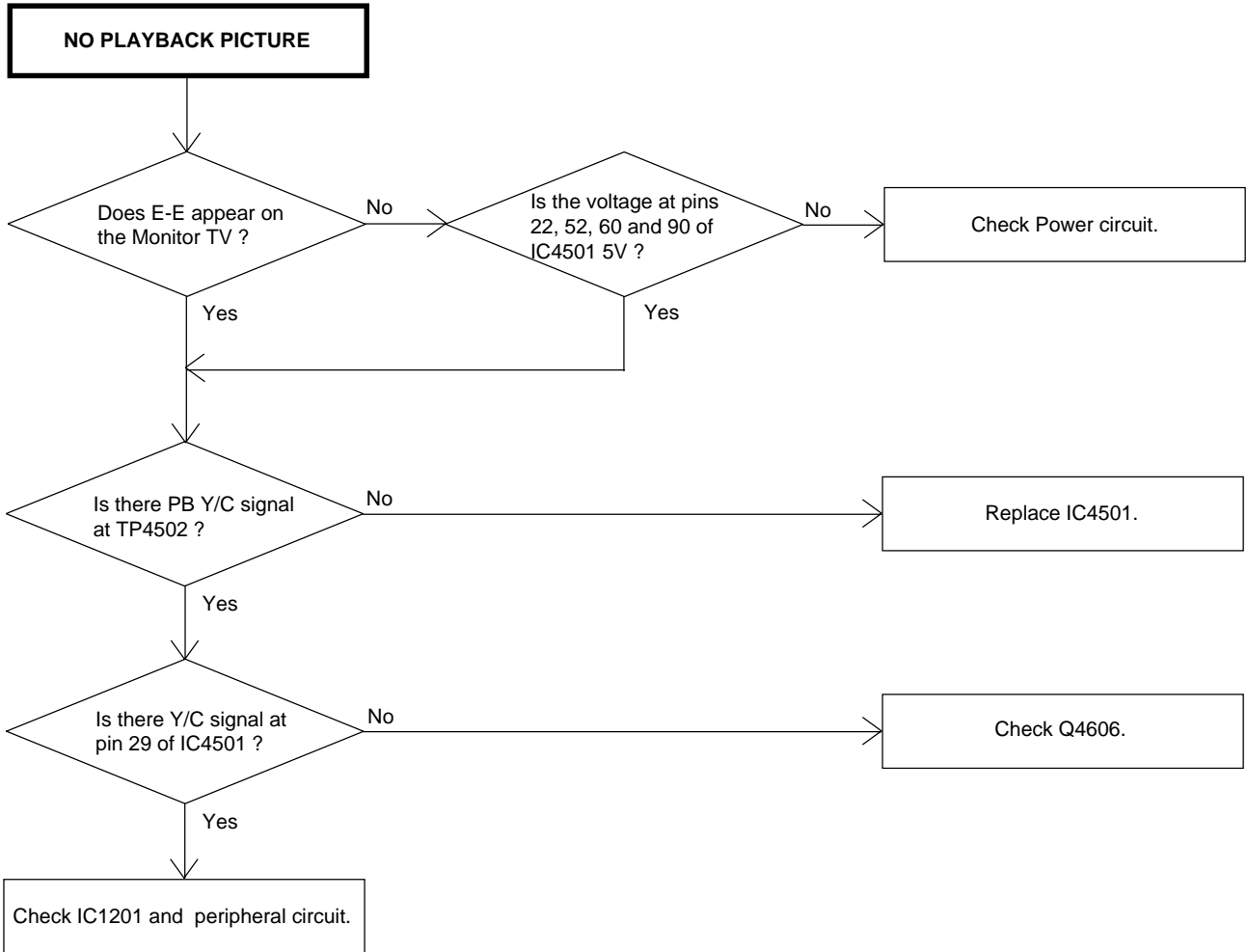


# TROUBLESHOOTING GUIDE

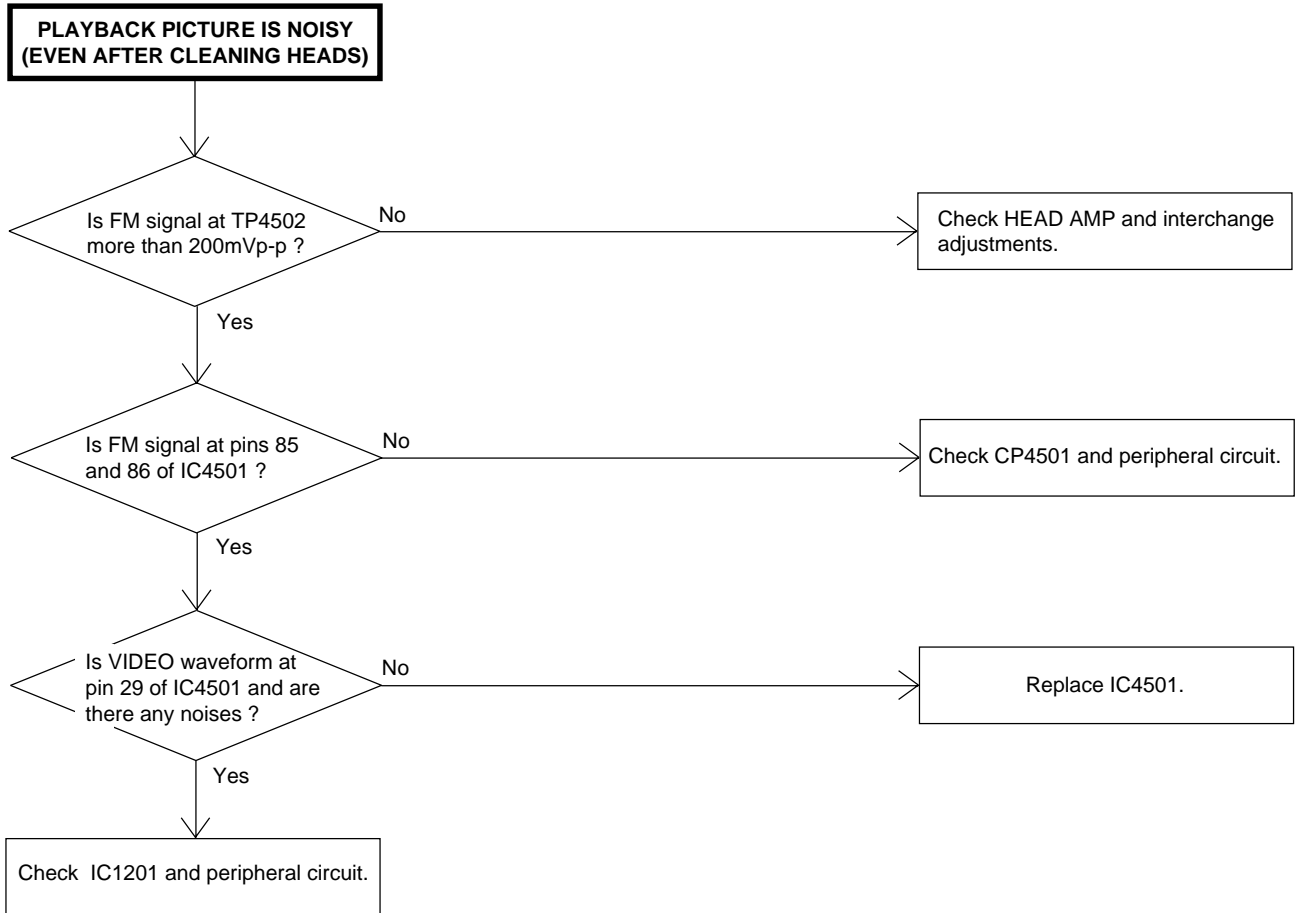
## (VCR SECTION)



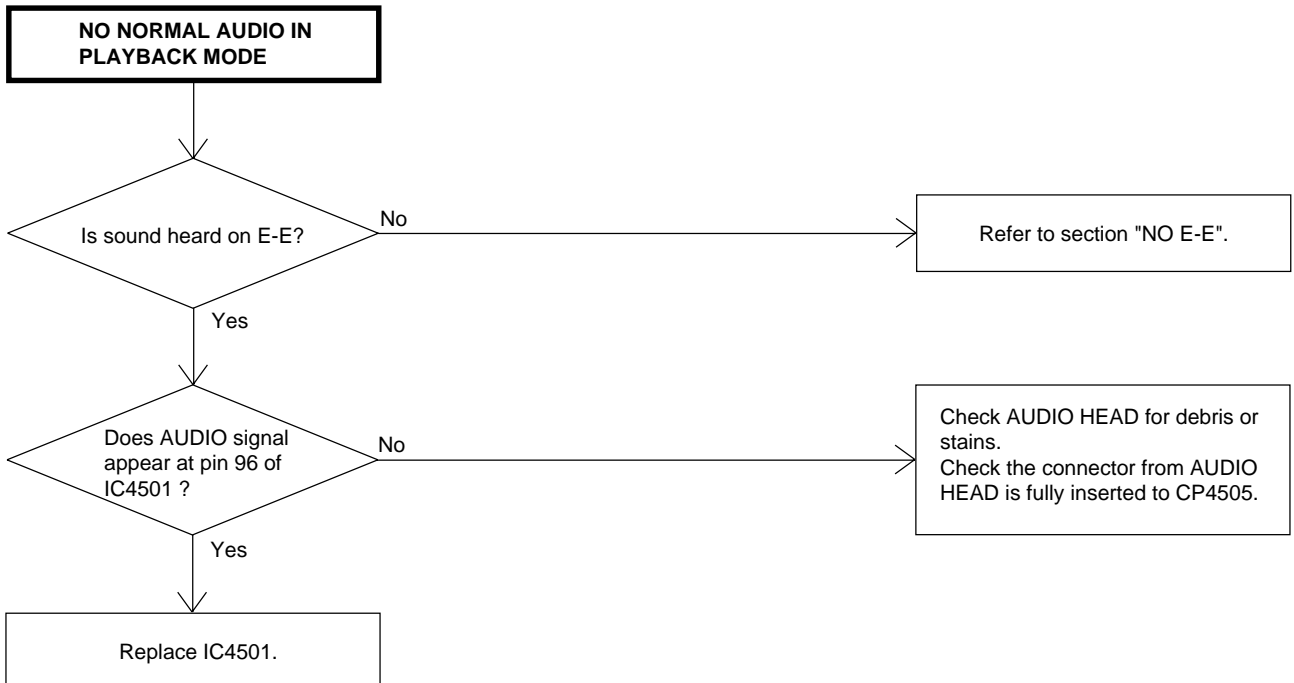
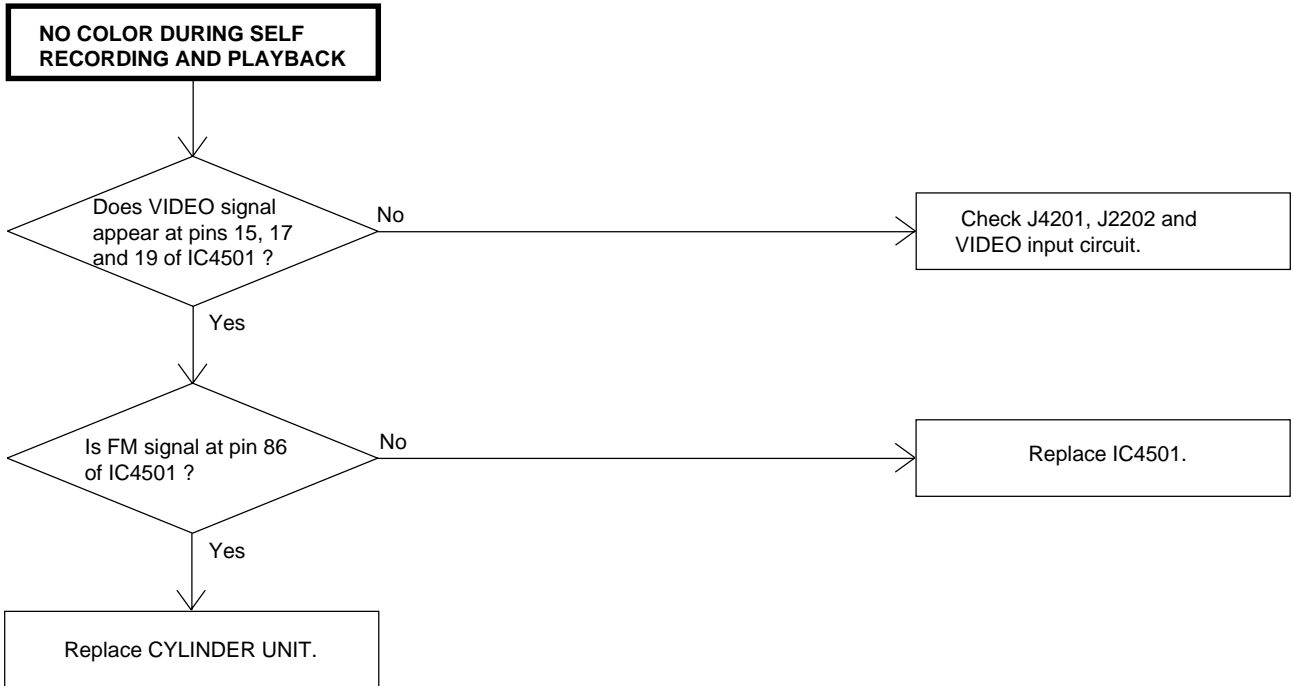
# TROUBLESHOOTING GUIDE



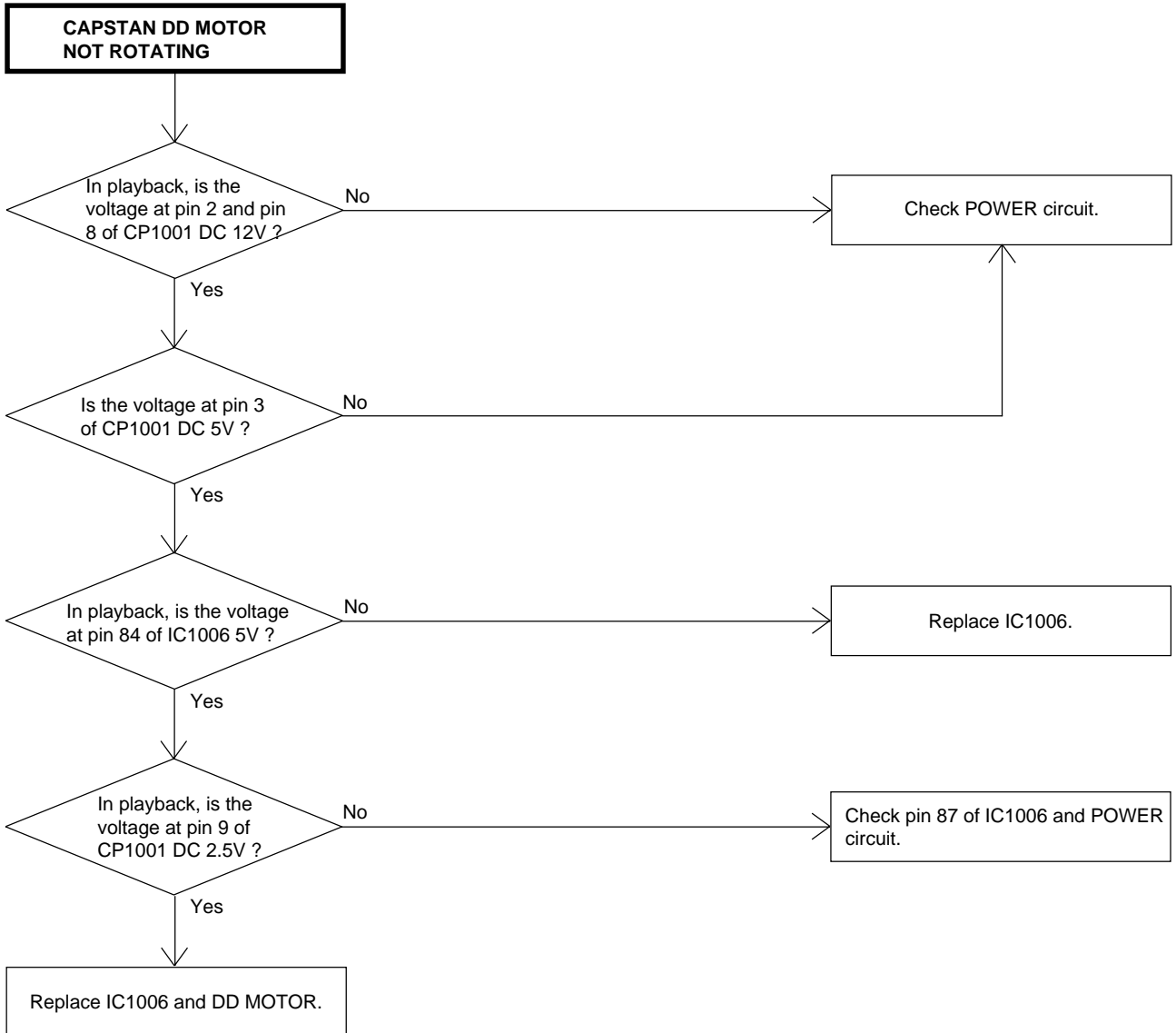
# TROUBLESHOOTING GUIDE



# TROUBLESHOOTING GUIDE

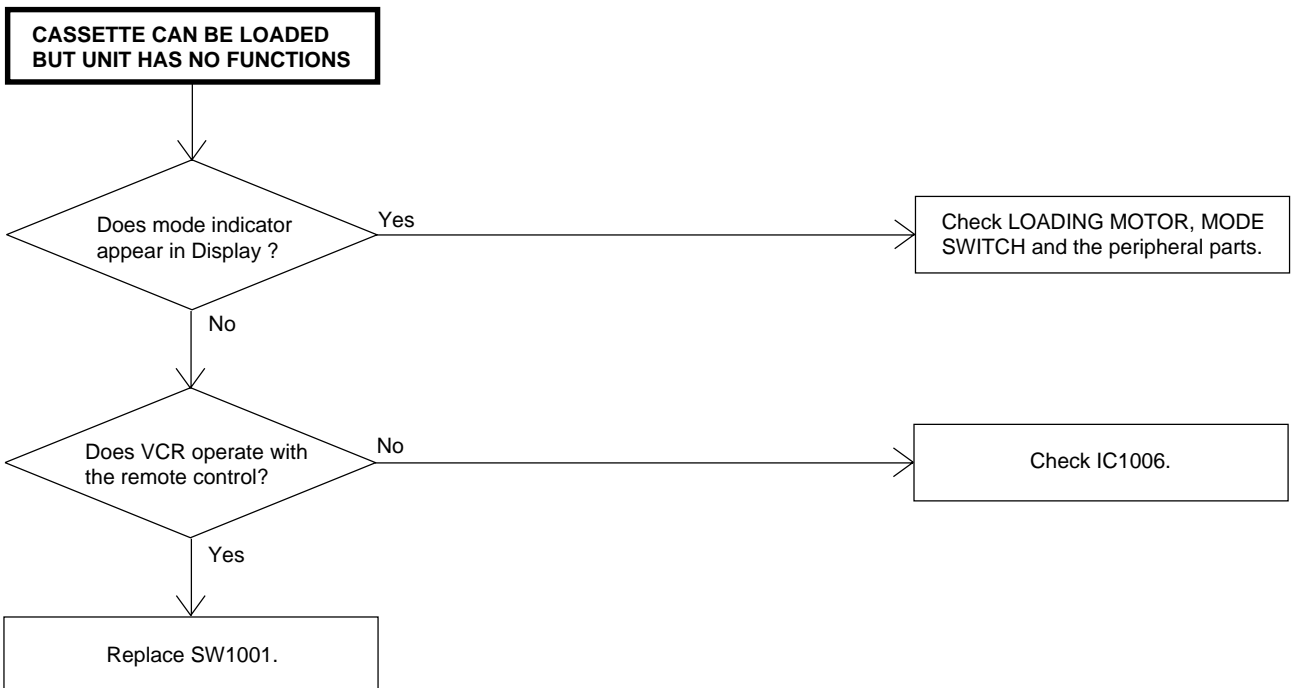
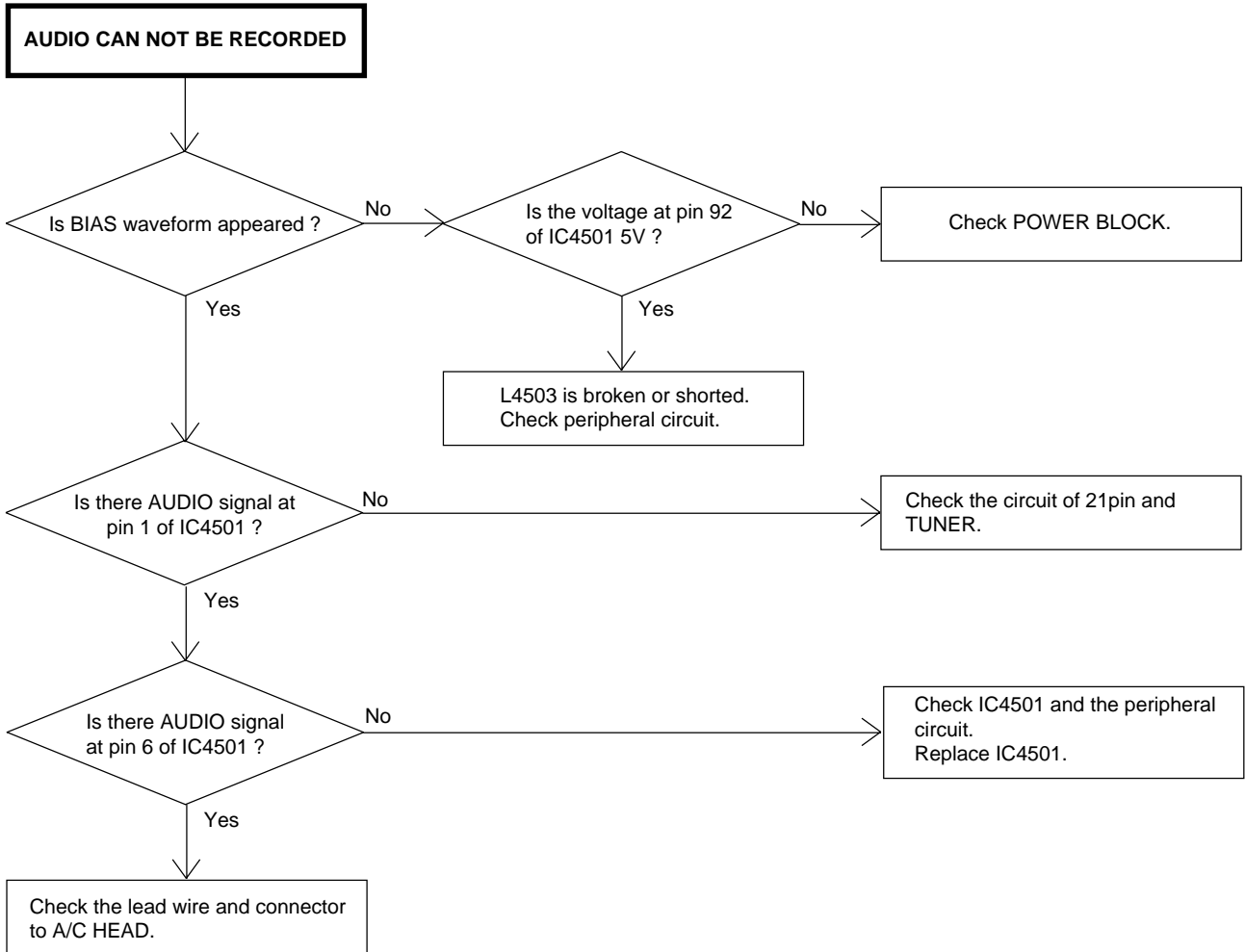


# TROUBLESHOOTING GUIDE

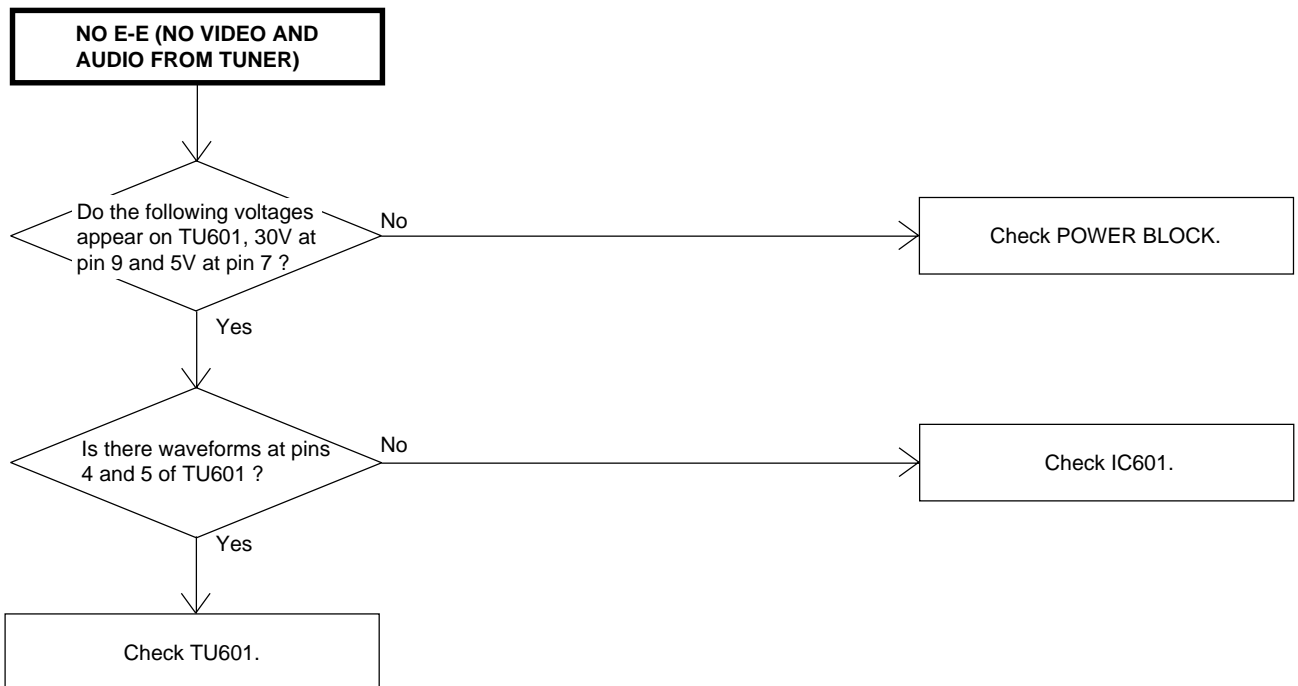
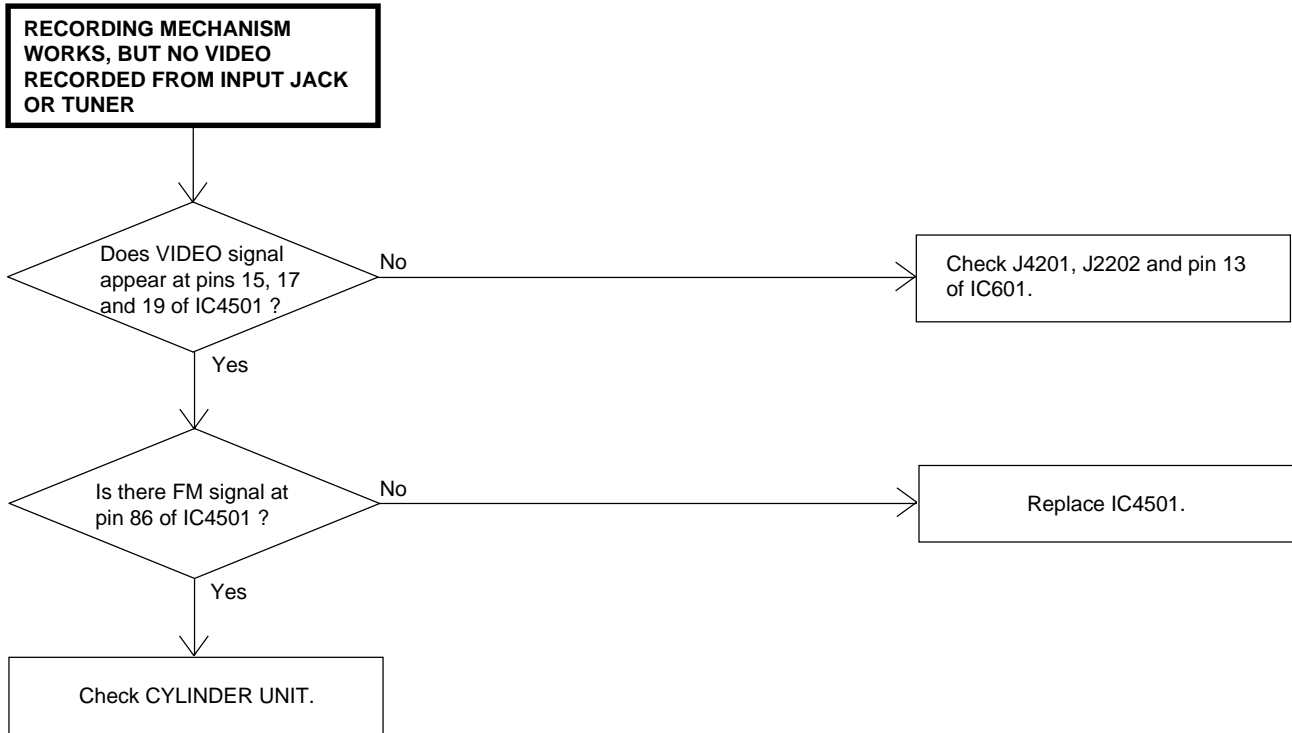




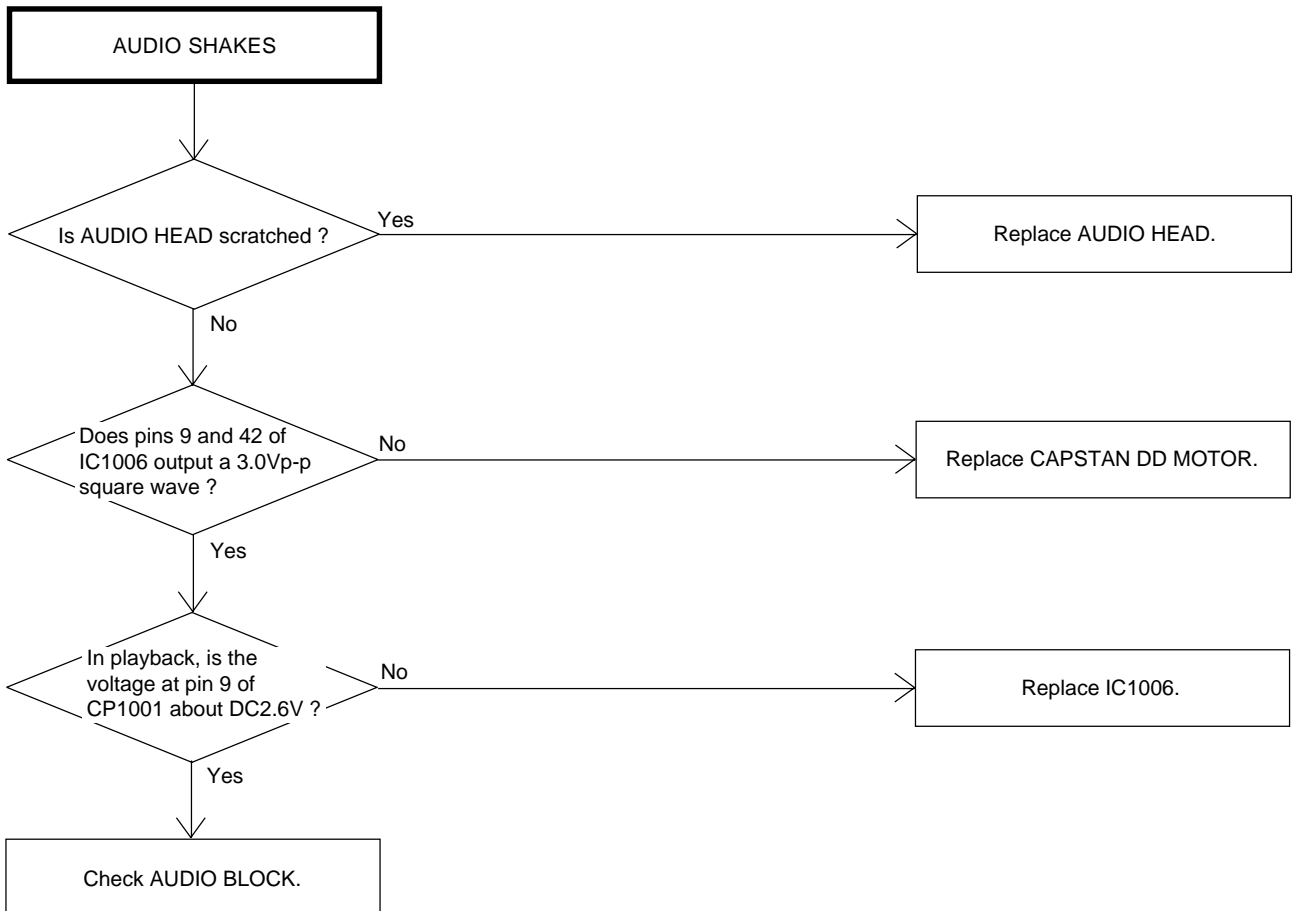
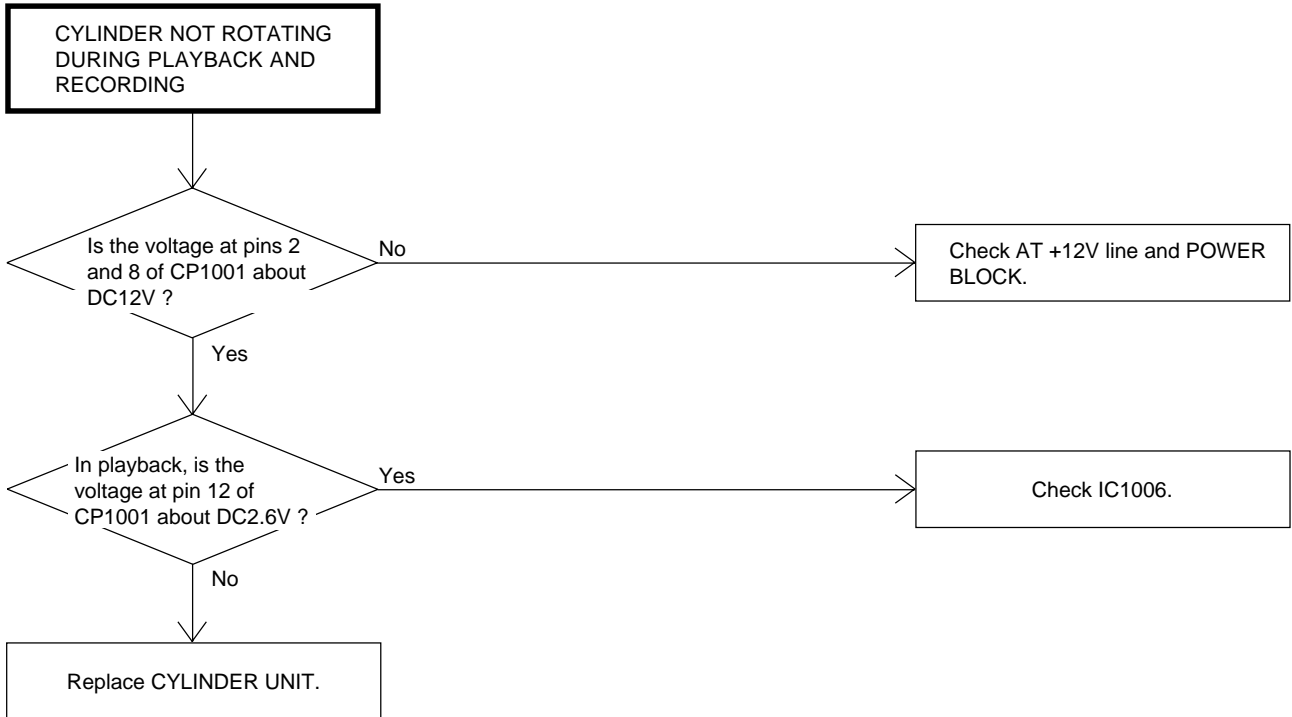
## TROUBLESHOOTING GUIDE



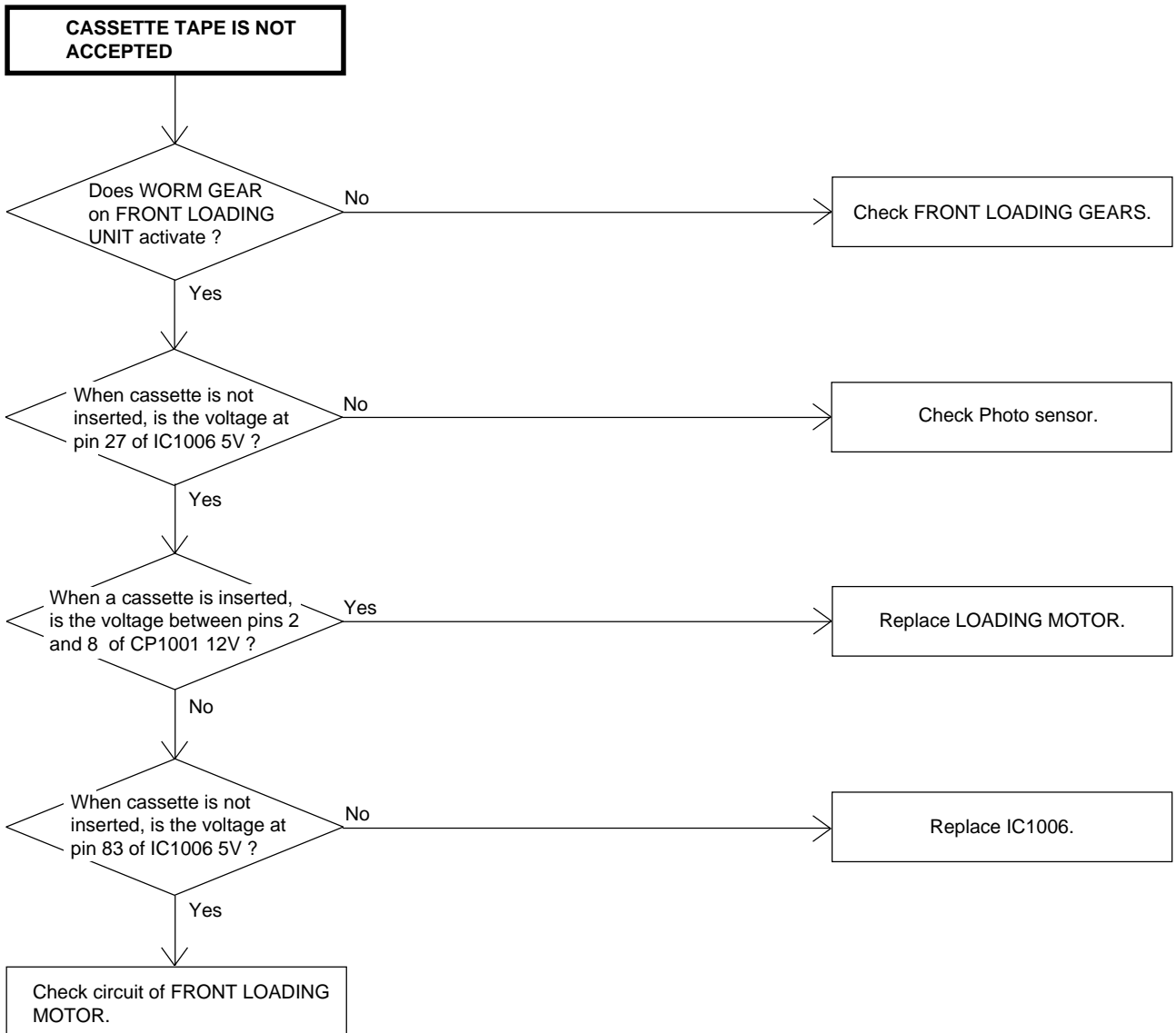
# TROUBLESHOOTING GUIDE



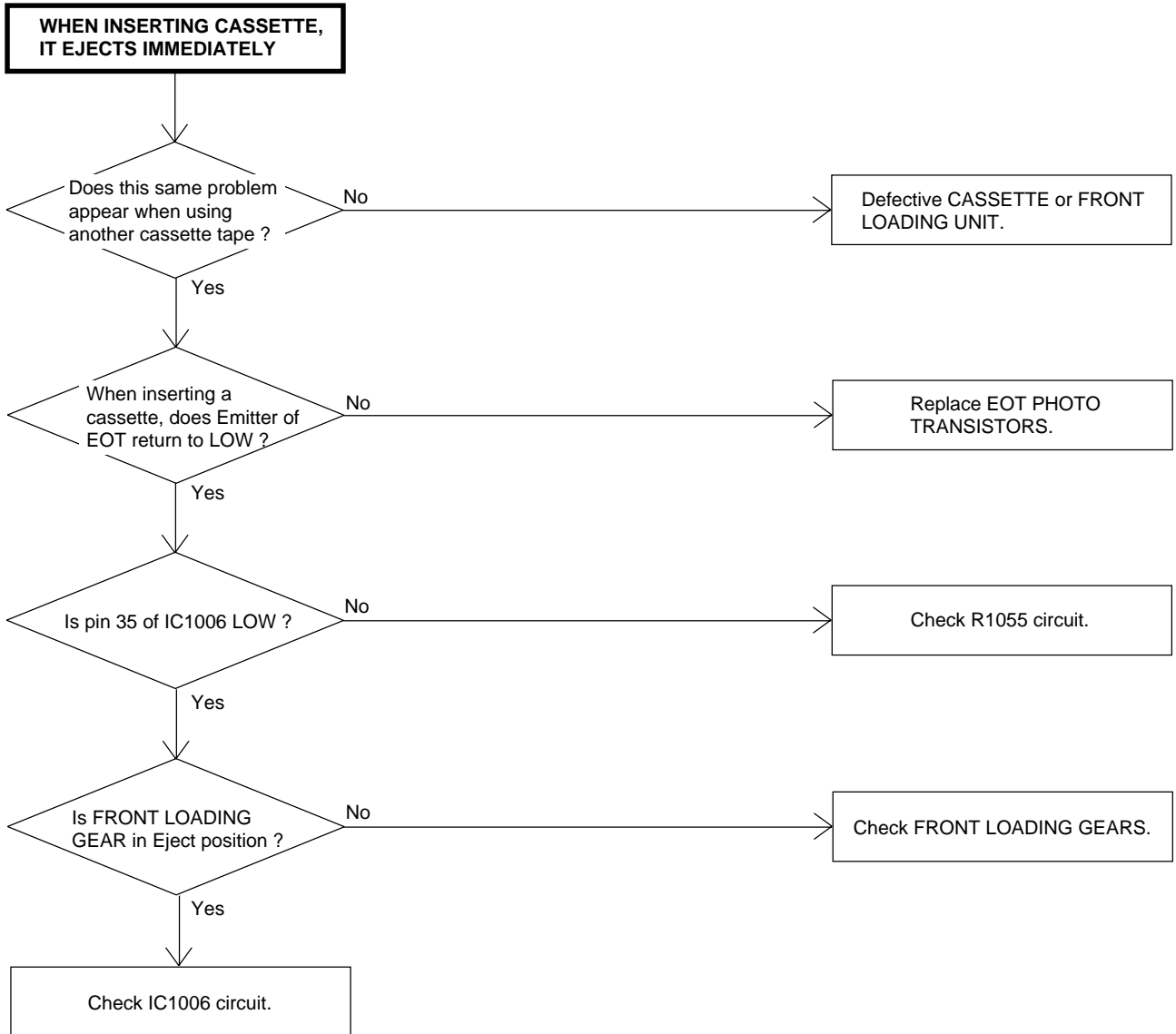
# TROUBLESHOOTING GUIDE



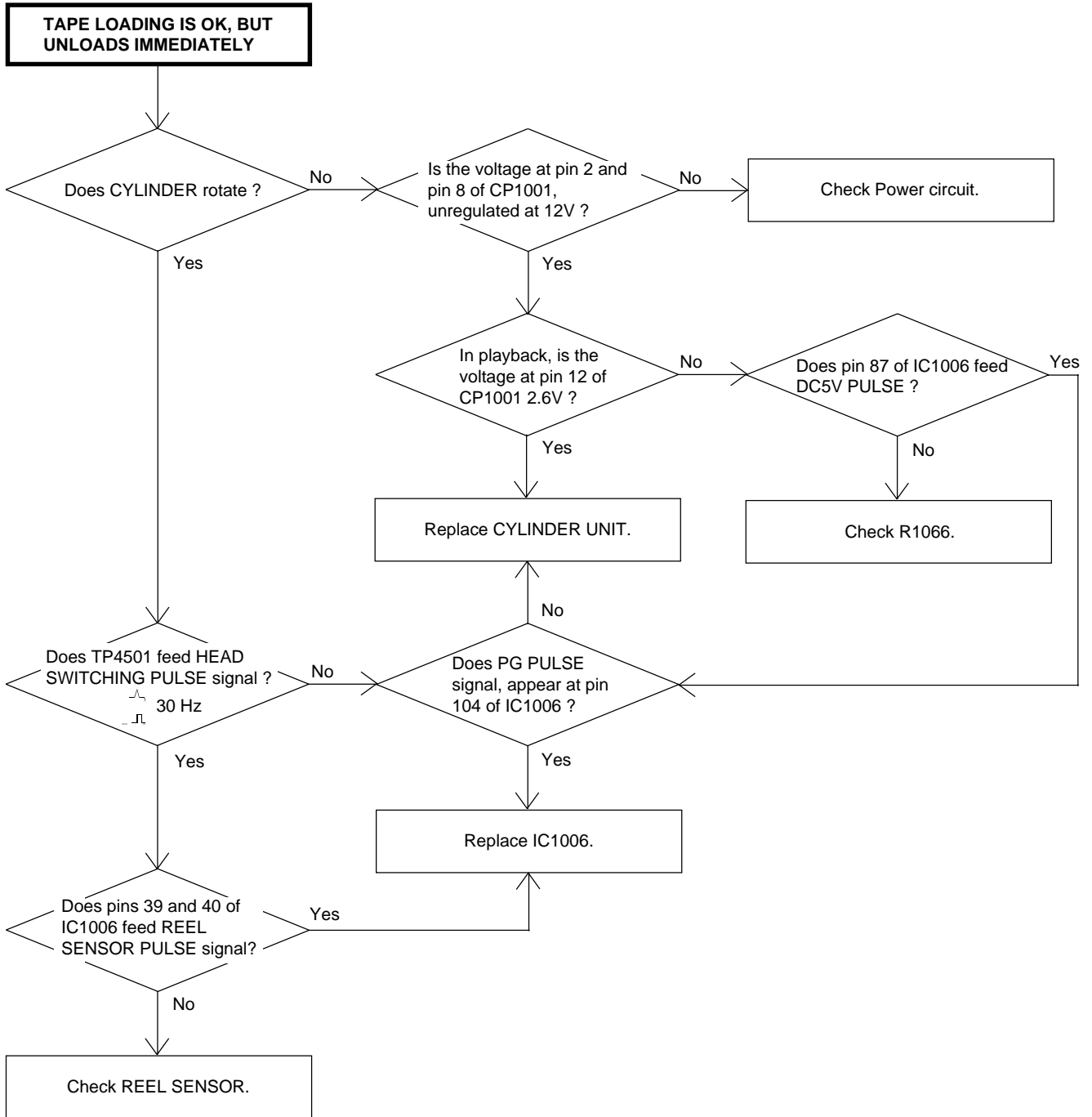
# TROUBLESHOOTING GUIDE



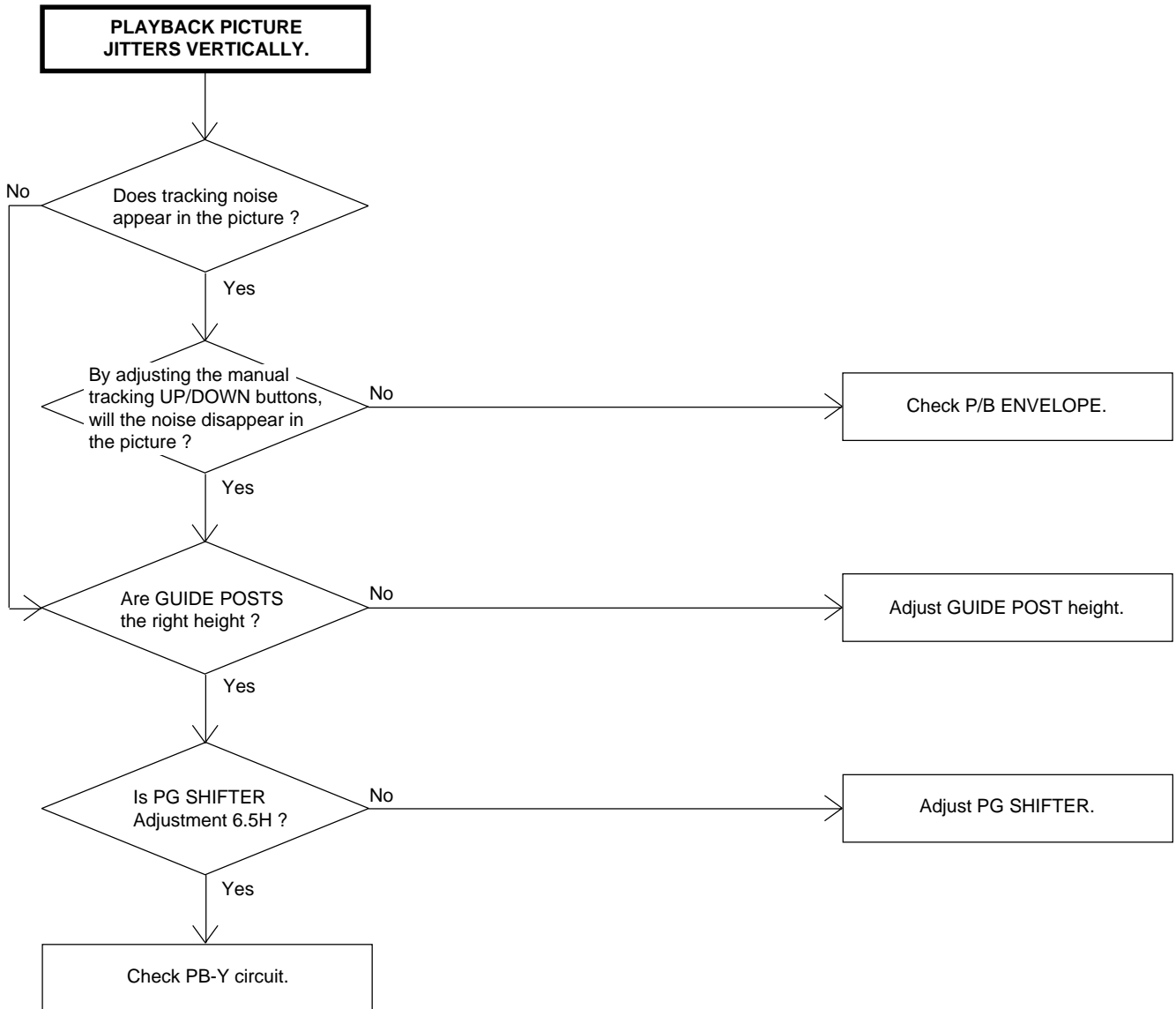
# TROUBLESHOOTING GUIDE



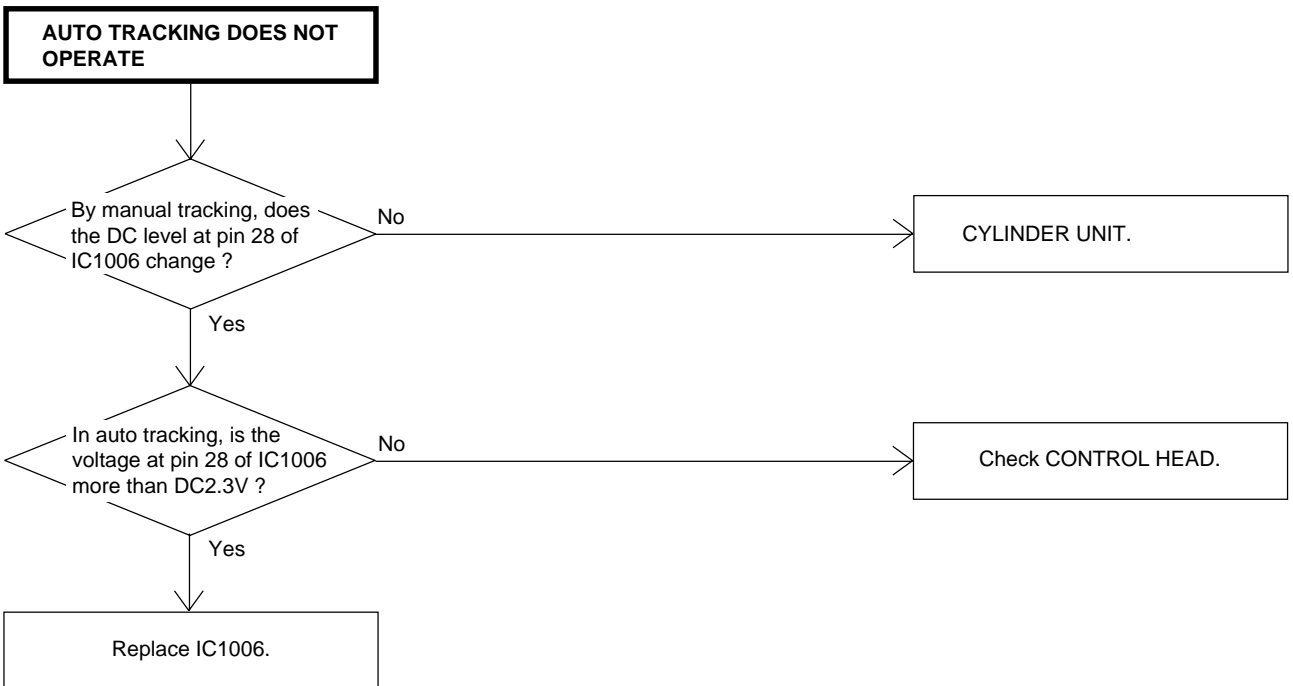
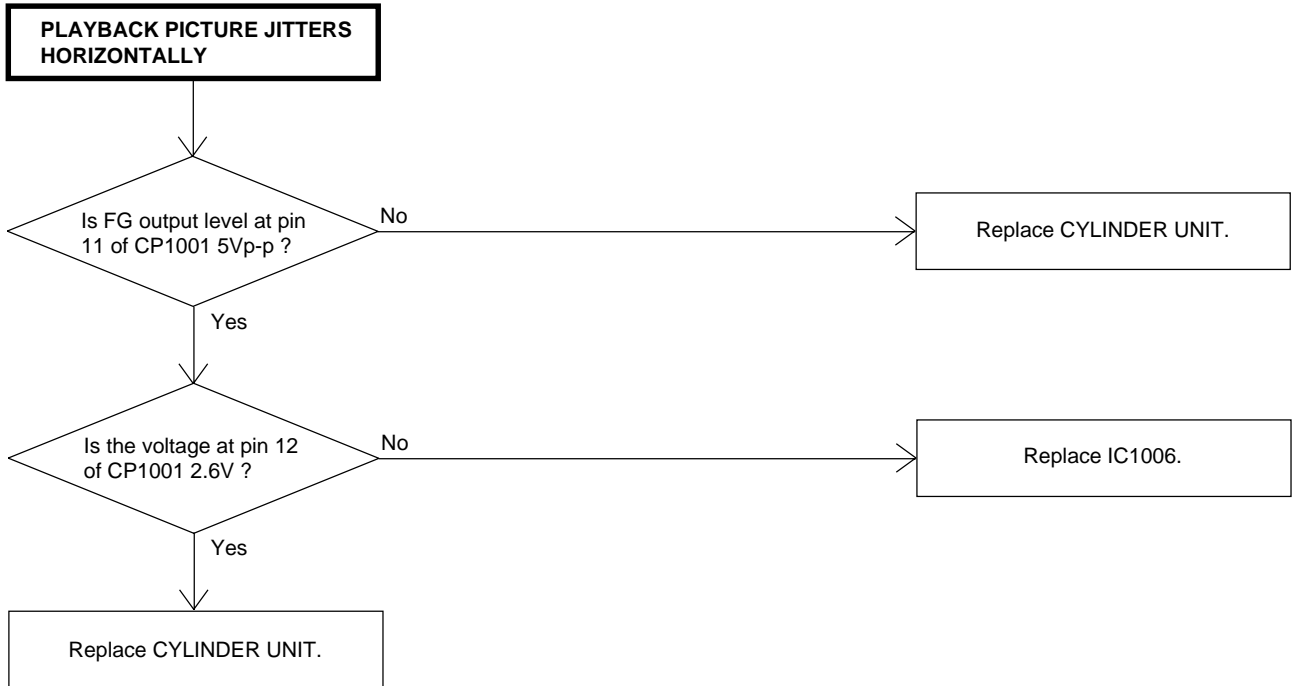
# TROUBLESHOOTING GUIDE



# TROUBLESHOOTING GUIDE

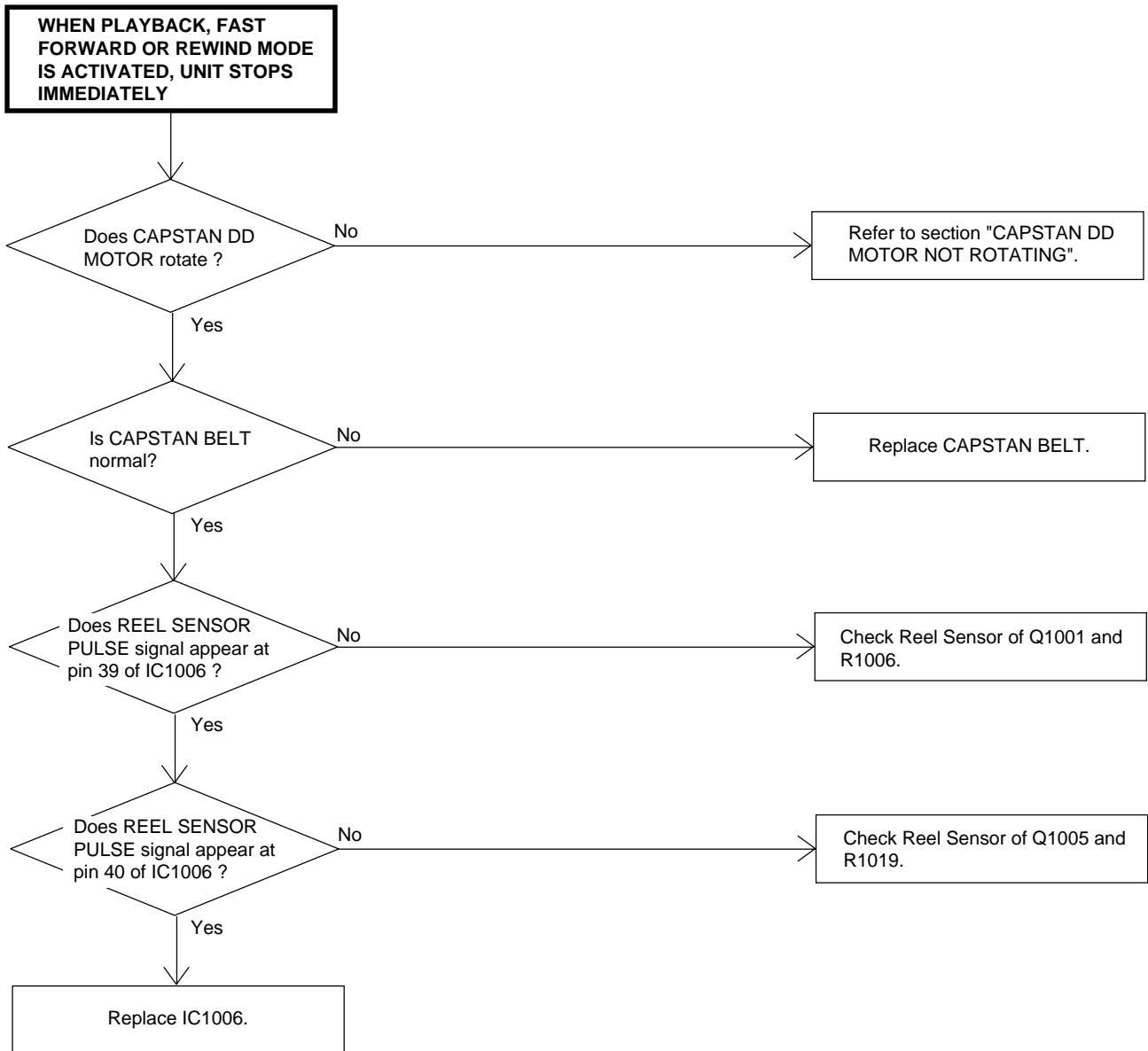


# TROUBLESHOOTING GUIDE



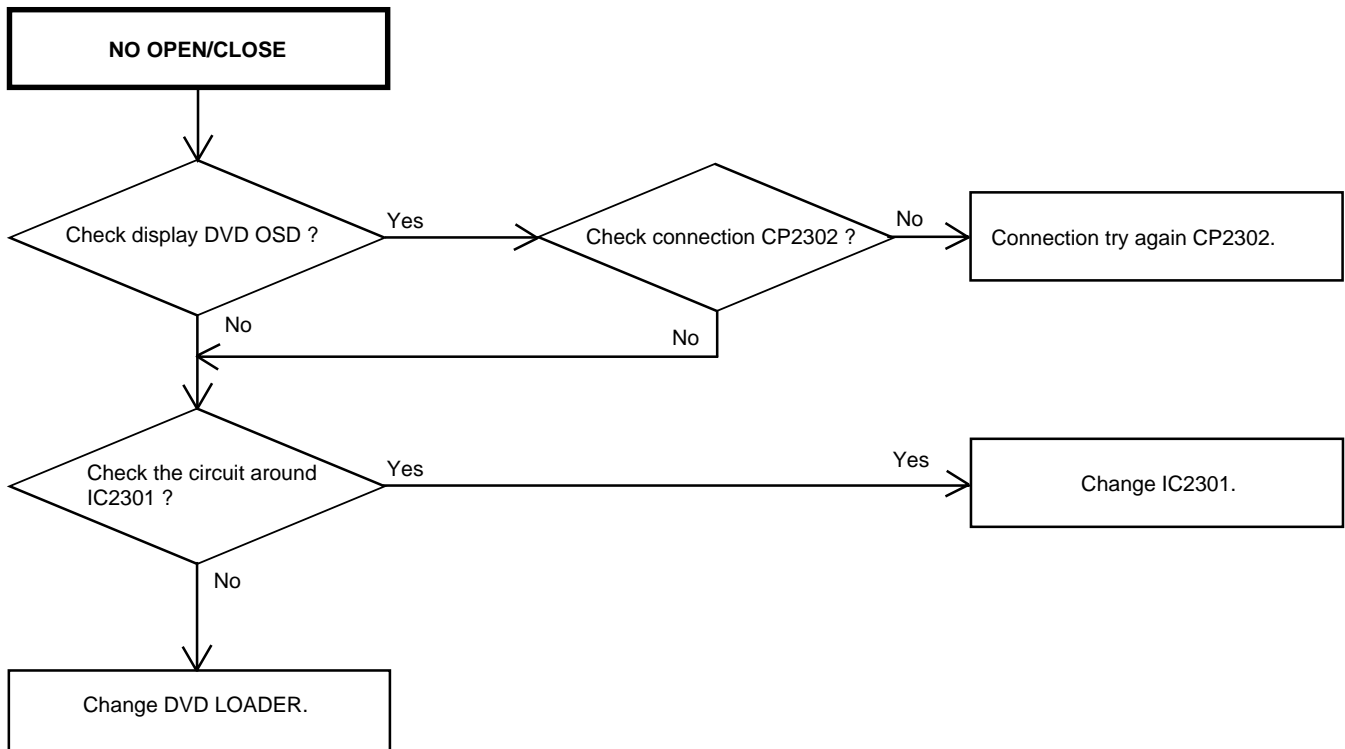


# TROUBLESHOOTING GUIDE

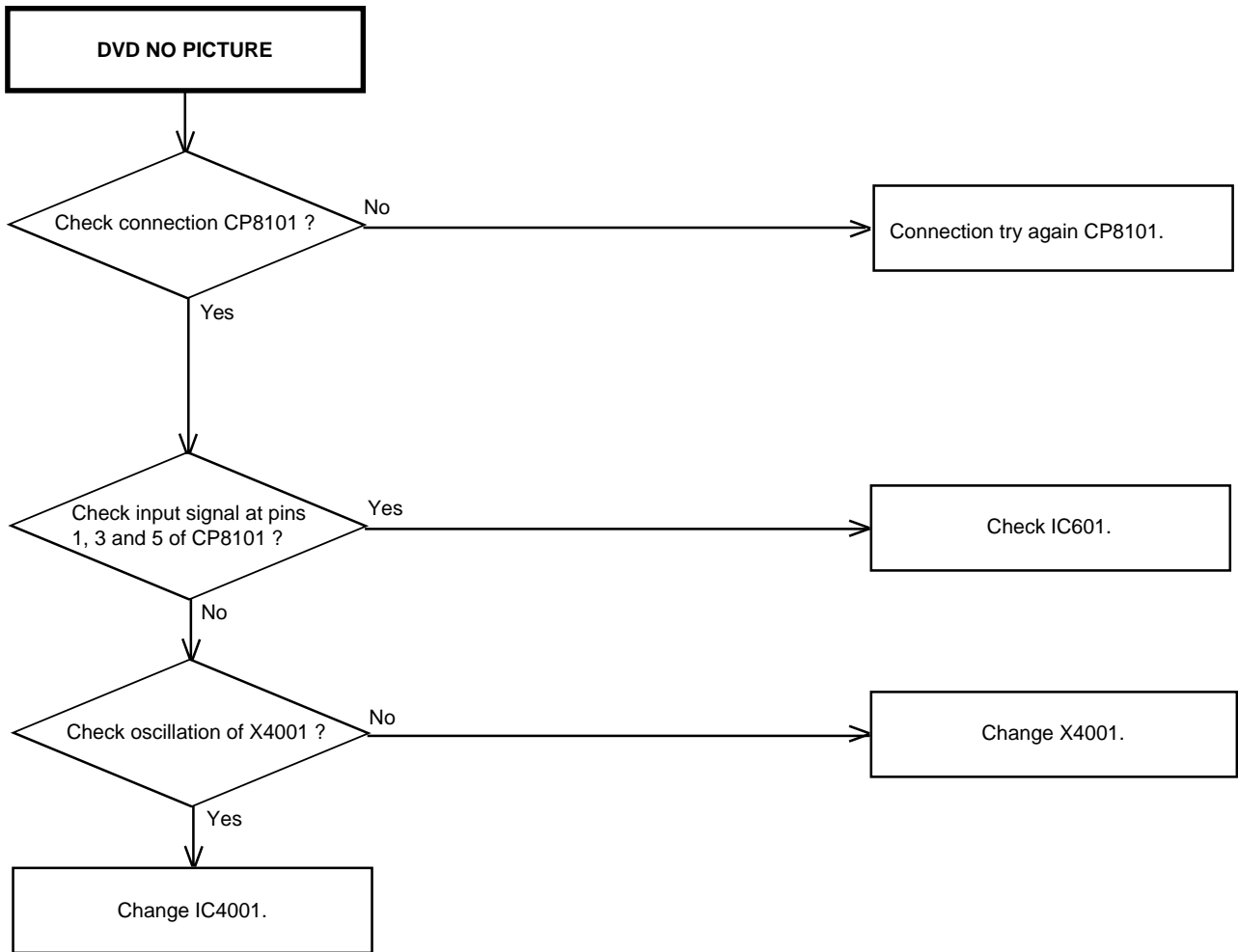


# TROUBLESHOOTING GUIDE

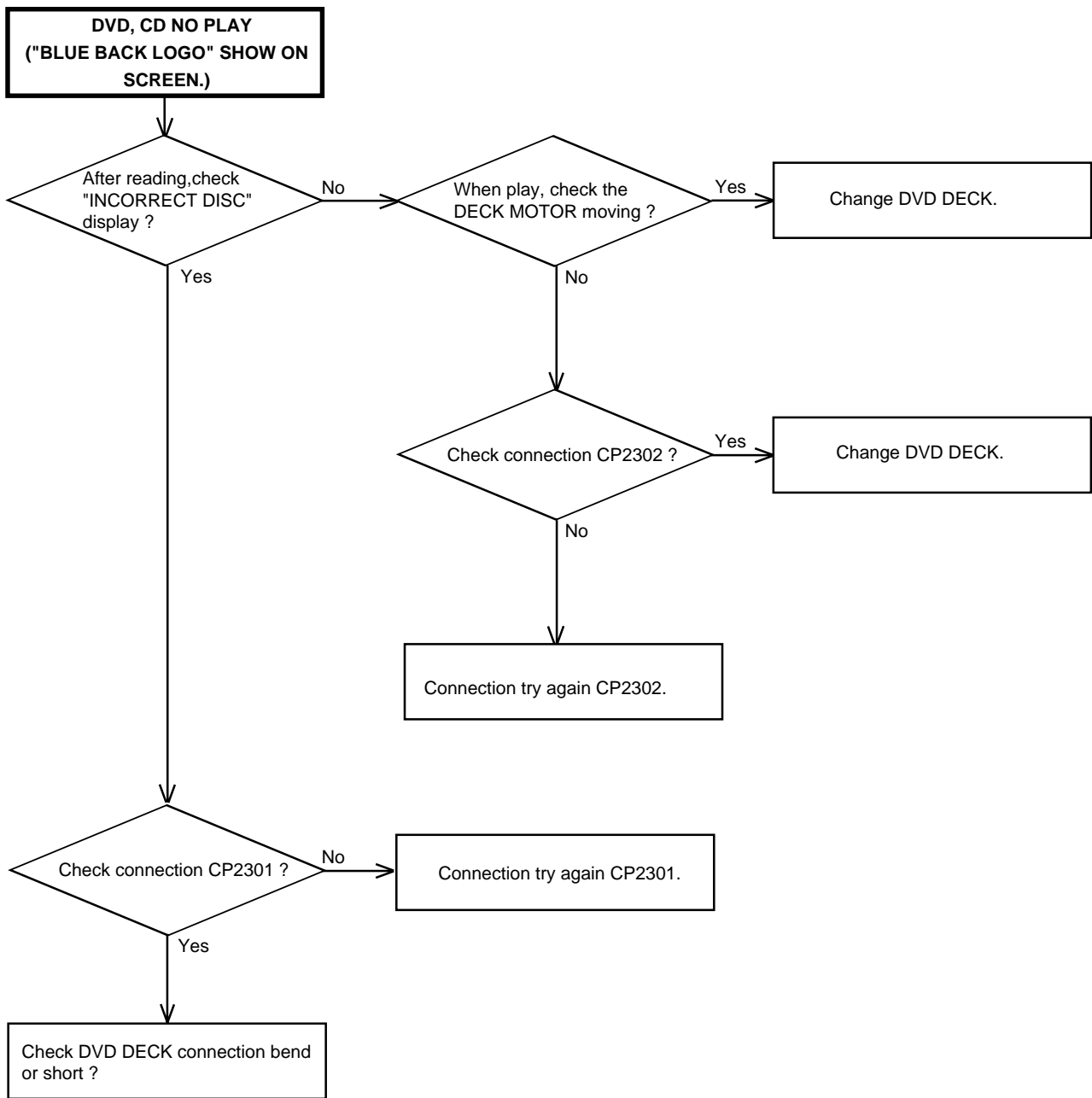
## (DVD SECTION)



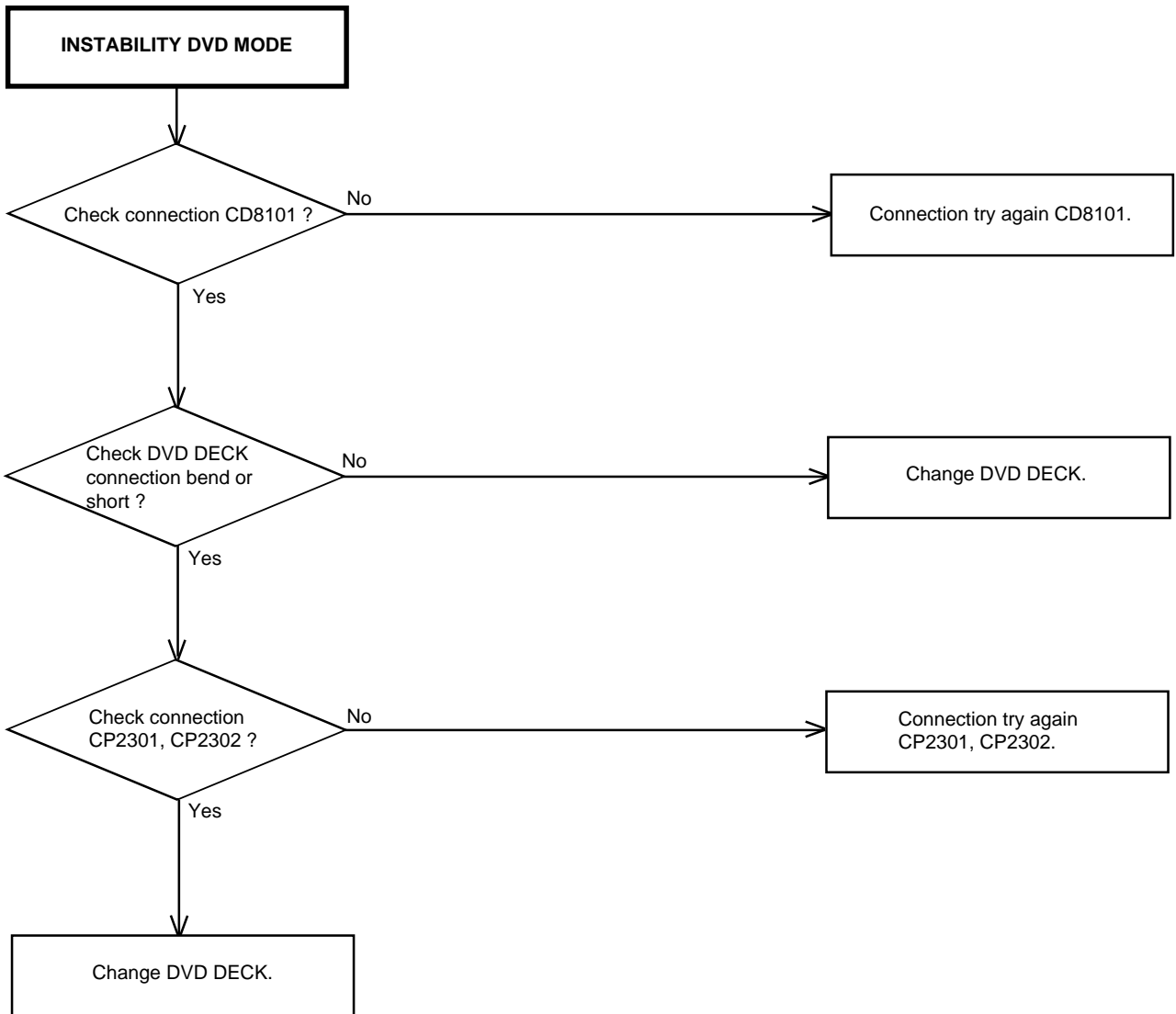
# TROUBLESHOOTING GUIDE



# TROUBLESHOOTING GUIDE

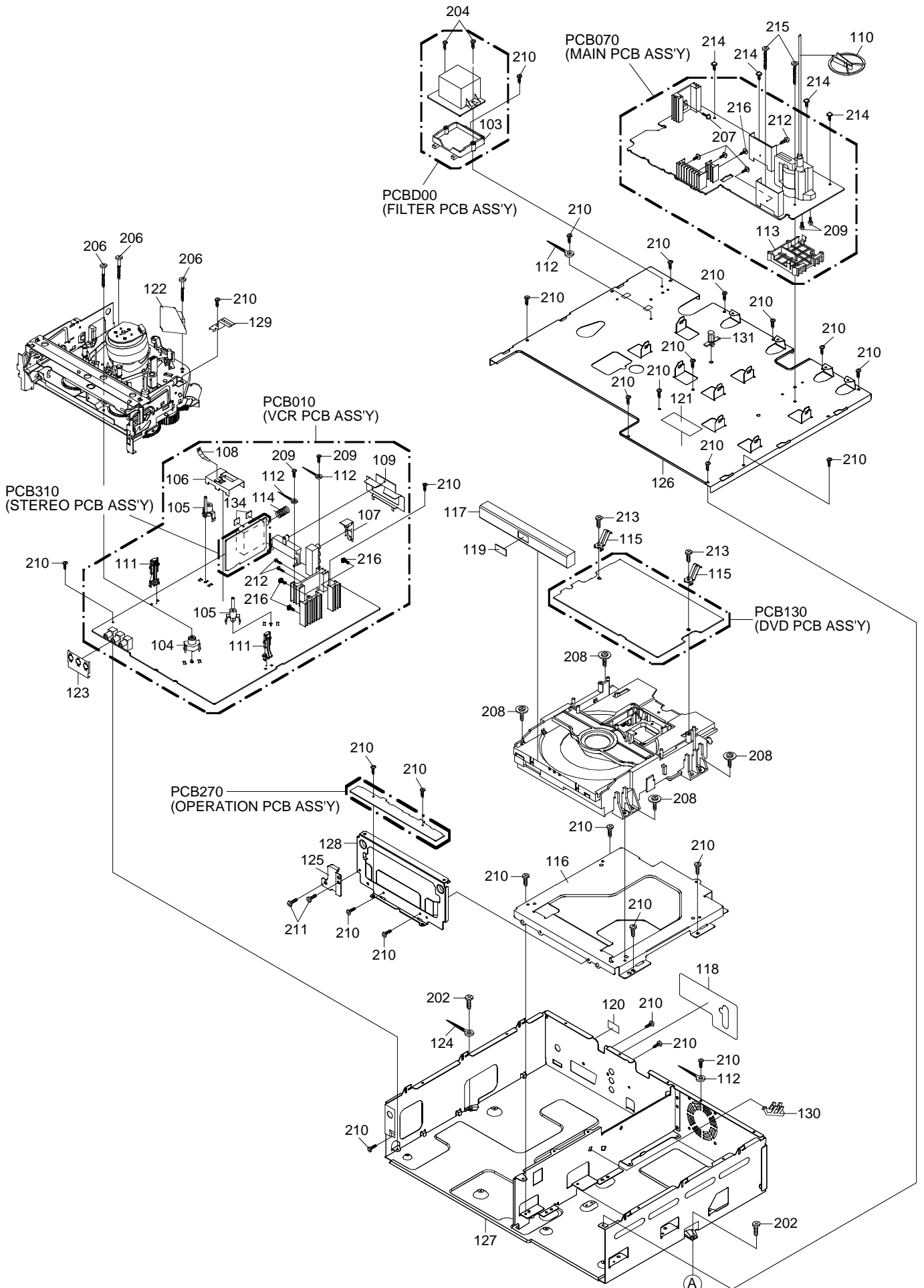


# TROUBLESHOOTING GUIDE

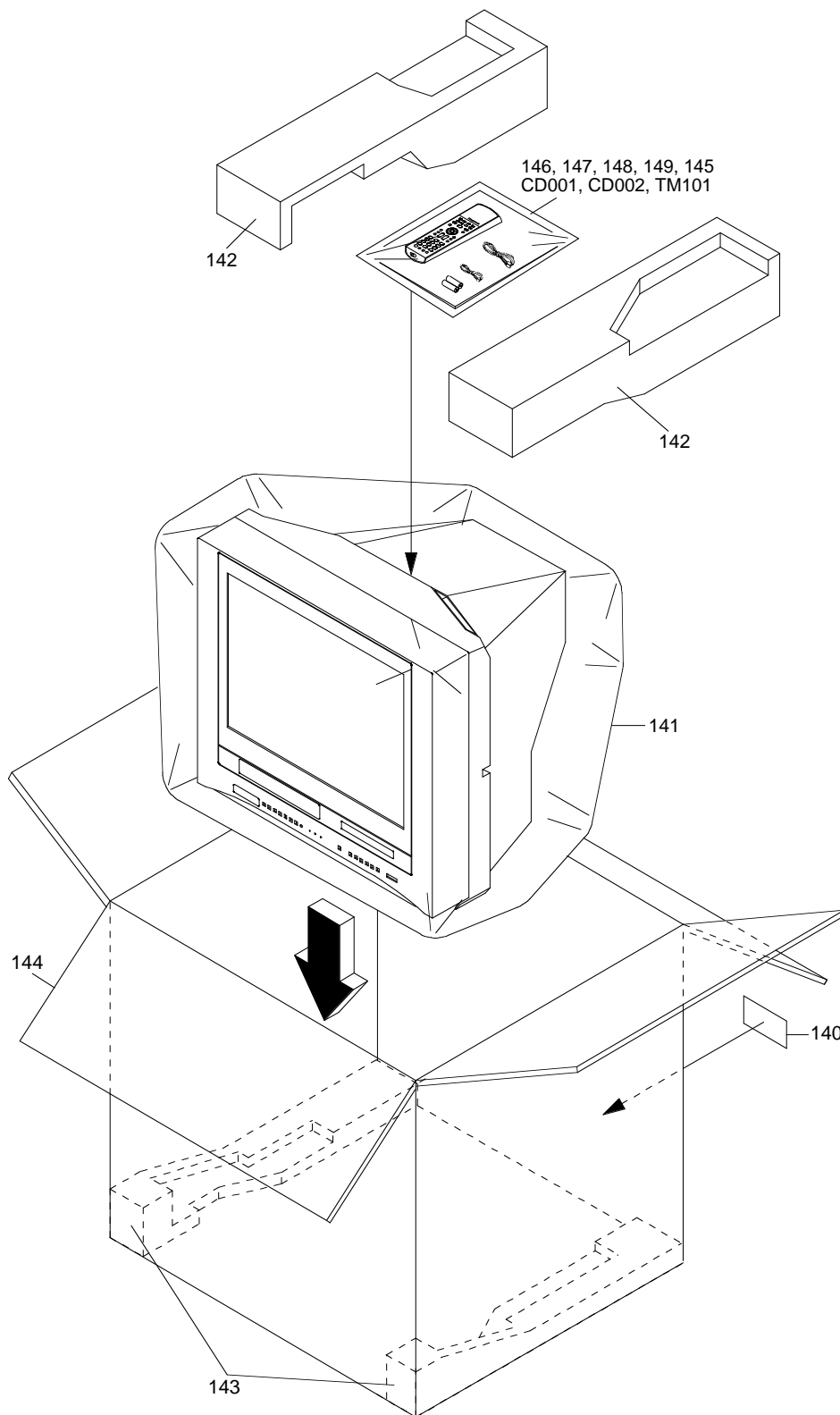




# MECHANICAL EXPLODED VIEW

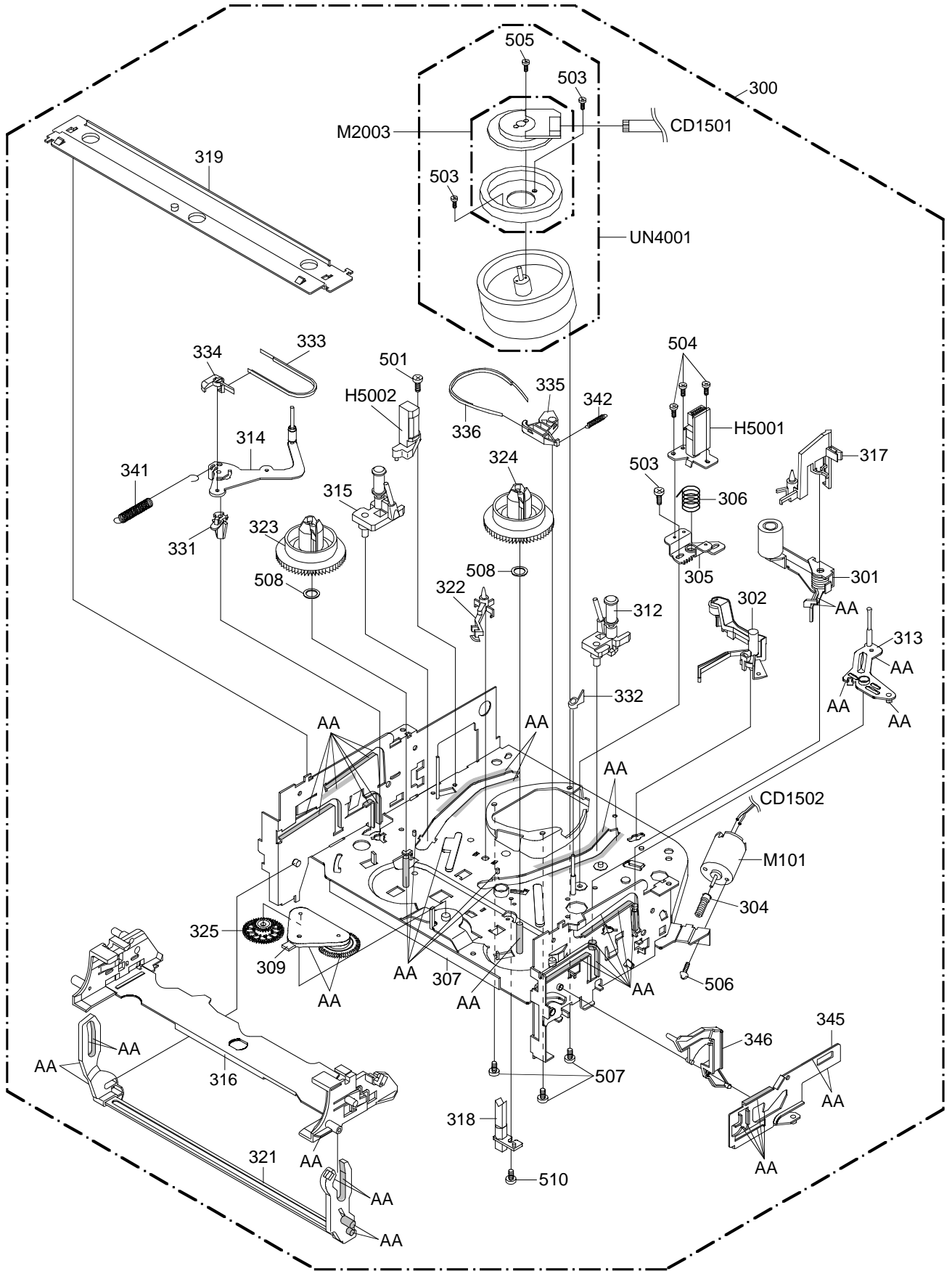


# MECHANICAL EXPLODED VIEW (PACKING DIAGRAM)





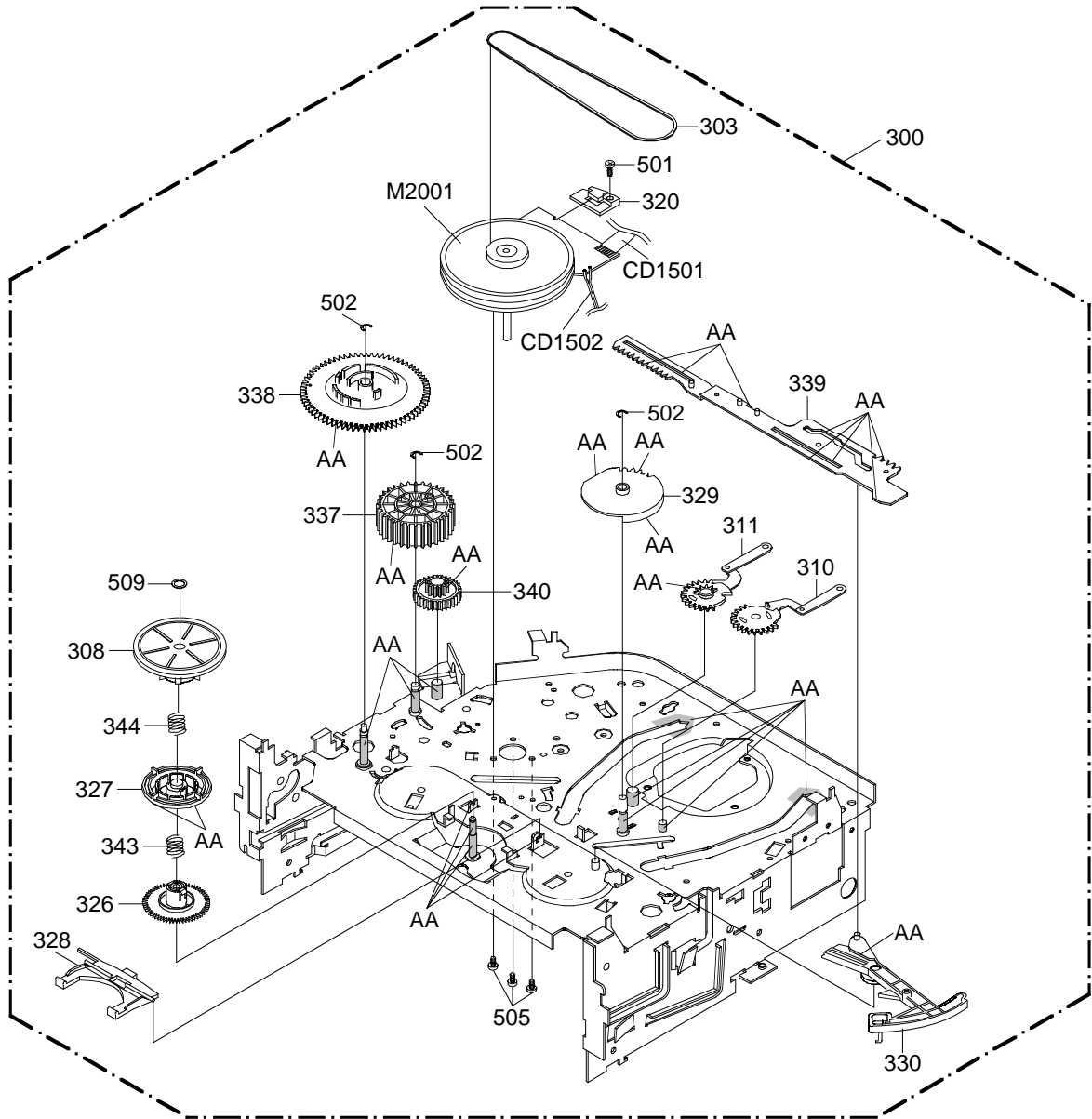
# CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

**NOTE:** Applying positions AA for the grease are displayed for this section.  
Check if the correct grease is applied for each position.

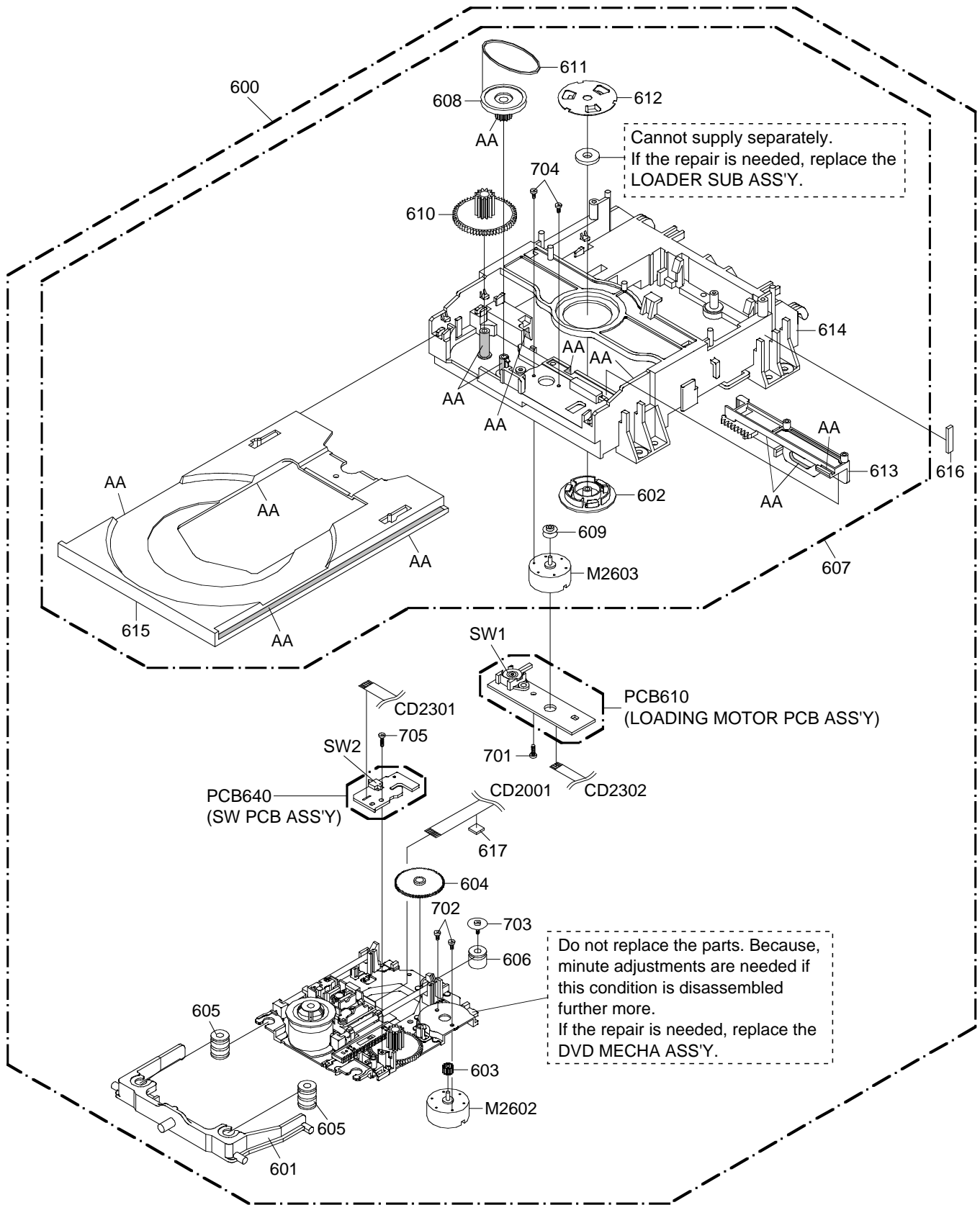
# CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

**NOTE:** Applying positions AA for the grease are displayed for this section. Check if the correct grease is applied for each position.

# DVD DECK EXPLODED VIEW



CLASS	MARK
GREASE	AA

**NOTE:** Applying positions AA for the grease are displayed for this section. Check if the correct grease is applied for each position.

# MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
101	AE007638	7A701A470A	FRONT CABI ASS'Y
101A	AE007639	701WPJD070	CABINET,FRONT
101B	AE007640	712WPJC154	FLAT,FLAP
101C	BZ710665	713WPA0160	GUIDE,REMOCON
101D	BZ710666	713WPA0195	GLASS,LED
101E	AE000155	7235490021	BADGE,BRAND
101F	AE007641	735WPBB425	BUTTON,FRAME 1
101G	AE007642	735WPBB426	BUTTON,FRAME 2
101H	AD301686	743WKA0037	SPRING,FLAP
101I	AE003069	800WQ0A070	FELT SHEET
102	AE007643	7A702A146A	BACK CABI ASS'Y
102A	AE007644	702WPAA886	CABINET,BACK
102B	AE003113	800WQ0A036	FELT SHEET
102C	AE003112	800WQ0A032	FELT SHEET
103	AE001085	761WPA0281	HOLDER,TRANS
104	BZ710577	701WPA0686	HOLDER,DECK
105	BZ710658	701WPA0751	HOLDER,DECK
106	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP
107	BZ710659	752WSA0290	SHIELD,COMPO
108	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP
109	AE005665	761WSA0212	SHIELD,21PIN
110	BZ710260	899HV3T000	HOLDER,ANODE WIRE
111	BZ710498	85OP700038	HOLDER,END SENSOR
112	BZ710039	8995034000	CORD CLIP UL CO.
113	BZ710459	761WPA0223	HOLDER,FBT
114	AE003418	743WCAA011	SPRING,TUNER
115	AE004480	753WUAA0069	SPRING,EARTH
116	AE004907	761WSAA023	ANGLE,DECK
117	AE007645	712WPBA137	PLATE,TRAY-FRONT
118	AE001087	7230007658	SHEET,JACK
119	AE000156	7235630001	SHEET,DVD
120	AE004261	7250000586	SHEET,PC
121	AE005122	726000A073	SHEET,CAUTION
122	BZ710633	752WSA0275	COVER,AC HEAD
123	BZ710671	752WSA0292	SHIELD,AV JACK
124	AD301370	899EFBA002	WIRING-CLIP
125	AE005974	752WSAA102	HOLDER,VCR
126	AE007646	752WSA0498	SHIELD,TOP
127	AE004926	7G7520003A	PLATE,BOTTOM ASS'Y
128	AE005976	753WSAA018	SHIELD,FRONT
129	AE001093	753WUA0062	SPRING,EARTH-TOP
130	BZ710694	774WPA0002	HOLDER,WIRE
131	BZ710284	890PS70100	PUSH SPACER
132	AE007647	723000C955	POP LABEL
133	AE007648	722549A473	SHEET,RATING
134	AE004266	800WRA0002	CUSHION,DVD
135	AE007649	735WPJA857	BUTTON,POWER
136	BZ710660	741WUA0021	SPRING,EARTH
137	AE005981	752WSAA083	ANGLE,FRONT
138	BZ710259	762WPA0011	HOLDER,CRT WIRE
139	AE005971	769WSAA012	WASHER CRT T=0.5
140	AE007650	723000C954	SHEET,BAR CODE
141	AE005914	791WHAA114	FILM BAG
142	BZ710679	792WHA0352	PACKAGE, TOP
143	AE000524	792WHA0473	PACKAGE, BOTTOM
144	AE007651	793WCDC753	GIFT BOX
145	AE007652	A5T205T975	INSTRUCTION BOOK KIT
146	AE007590	JB5ND300	POLYBAG,INSTRUCTION(REDCAUTION)
147	AE007653	J5T20507A	QUICK SET-UP SHEET
148	AE007654	J5T20521A	INSTRUCTION BOOK(R/E)
149	AE007591	J5U70102A	WARRANTY CARD

## MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
201	AE004847	8117540A6U	SCREW,TAP TITE(B0) TRUSS	4x16
202	AE003523	811754080U	SCREW,TAP TITE(B0) TRUSS	4x8
203	AE005916	8141J50C5U	SCREW,TAP TITE(P) GW22	5x35
204	AE003528	8110630A0U	SCREW,TAP TITE(P) BRAZIER	3x10
205	AE003529	811063080U	SCREW,TAP TITE(P) BRAZIER	3x8
206	AE005536	8109130B9U	SCREW,TAP TITE(B) R PAN	3x29
207	AE003524	8109130A0U	SCREW,TAP TITE(B) WH7	3x10
208	AE005541	810F13080U	SEMS(F)	3x8
209	AE005917	810963080Q	SCREW,TAP TITE(B) BRAZIER	3x8
210	AE003526	810923080U	SCREW,TAP TITE(B) BIND	3x8
211	AE005987	810723060U	SCREW,TAP TITE(S) BIND	3x6
212	AE003531	810763080U	SCREW,TAP TITE(S) BRAZIER	3x8
213	AE003530	811022680U	SCREW,TAP TITE(P) BIND	2.6x8
214	AE005988	810793060U	SCREW,CUP(S)	3x6
215	AE005989	8107630A8U	SCREW,TAP TITE(S) BRAZIER	3x18
216	AE005659	810913080U	SCREW,TAP TITE(B) WH7	3x8

# CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
300	AE007655	A5U501M420A	DECK ASSY	A5U501M420A
301	AE005514	85OA400245	PINCH ROLLER BLOCK VA2	
302	BZ710682	85OA500026	AHC ASSY	
303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
304	BZ710515	85OP600581	WORM	
305	AE005919	85OP500091	BASE,AC HEAD	
306	BZ710112	85OP800324	SPRING,AC HEAD	
307	AE005835	85OA000528	MAIN CHASSIS ASS'Y	
308	BZ710517	85OA200089	CLUTCH ASS'Y	
309	AE005920	85OA200092	ARM IDLER ASS'Y	
310	AE005836	85OA300068	LOADING ARM S UNIT	
311	AE005837	85OA300070	LOADING ARM T UNIT	
312	BZ710521	85OA400223	INCLINED BASE T UNIT 3S	
313	AE005838	85OA400249	P5 ARM ASS'Y 2	
314	AE005839	85OA400248	TENSION ARM ASS'Y 2	
315	BZ710524	85OA400231	INCLINED BASE S UNIT	
316	AE005840	85OA900234	CASS HOLDER ASS'Y	
317	BZ710552	85OP900745	CASS,OPENER	
318	BZ710106	85OP700035	REFLECTOR,LED	
319	AE005841	85OP900755	BRACKET,TOP 3V	
320	AE007221	85OP400554	HOLDER,CAPSTAN	
321	AE005842	85OA900233	LINK UNIT	
322	BZ710531	85OP000496	POST,CASS GUIDE	
323	BZ710532	85OP200316	REEL,S (S)	
324	BZ710533	85OP200317	REEL,T (S)	
325	BZ710534	85OP200308	GEAR,IDLER	
326	BZ710535	85OP200311	GEAR,CLUTCH	
327	BZ710536	85OP200312	GEAR,COUPLING	
328	BZ710537	85OP200313	LEVER,CLUTCH	
329	BZ710538	85OP300194	GEAR,MAIN LOADING	
330	BZ710092	85OP400490	LEVER,TENSION	
331	BZ710093	85OP400492	HOLDER,TENSION	
332	BZ710366	85OP400520	CAP,P4	
333	BZ710762	85OP400542	BAND,TENSION	
334	BZ710540	85OP400533	CONNECT,TENSION	
335	BZ710541	85OP600573	ARM,BRAKE T	
336	BZ710763	85OP600584	BAND,BRAKE T	
337	BZ710543	85OP600577	CAM,PINCH ROLLER	
338	BZ710544	85OP600578	CAM,MAIN	
339	AE005843	85OP600585	ROD,MAIN	
340	BZ710546	85OP600582	GEAR,JOINT	
341	BZ710110	85OP800322	SPRING,TENSION	
342	BZ710547	85OP800360	SPRING,BRAKE T	
343	BZ710548	85OP800355	SPRING,COUPLING	
344	BZ710549	85OP800356	SPRING,RING	
345	AE005844	85OP900754	LEVER,LINK	
346	BZ710551	85OP900744	LEVER,FLAP	
501	AE005845	810722680U	SCREW,TAP TITE(S) BIND	M2.6x8
502	AE005846	83ETW3000U	E-RING	3.0
503	AE005847	810722640U	SCREW,TAP TITE(S) BIND	M2.6x4
504	AE005848	810212060U	SCREW,PAN	M2x6
505	AE005849	810912660U	SCREW,TAP TITE(B) PAN	M2.6x6
506	AE005850	810A13040U	SCREW/WASHER(A)	M3x4
507	AE005851	810A12650U	SCREW/WASHER(A)	M2.6x5
508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
510	AE005540	810722660U	SCREW,TAP TITE(S) BIND	2.6x6
CD1501	BZ614292	122H071704	CORD JUMPER	2H071704
CD1502	AD301953	122Y021002	CORD JUMPER	2Y021002
H5001	AD301675	1523Q91003	HEAD (AUDIO CONTROL)	VTR-1X2RPE22-756
H5002	AD301676	1543Q02014	HEAD (FULL ERASE)	VTR-1X2ERS11-154
M101	AE005552	1596S98002	MOTOR,LOADING	MDB2B66B
M2001	AE005853	1510S98044	CAPSTAN DD UNIT	F2QVB73B
M2003	AE006792	1589S11025	MICRO MOTOR	I20AL34K
UN4001	AE007656	A5U501M500	CYLINDER UNIT ASS'Y	A5U501M500

# DVD DECK REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
△ 600	AE007595	A2F3P4H650	DVD MECHA ASS'Y	A2F3P4H650
601	AE005003	92P100109A	HOLDER, TRAVERSE	
602	AE003550	92P100094A	CLAMPER	
603	AE003551	92P100088A	GEAR, MOTOR	
604	AE005414	92P100108A	GEAR, MIDDLE	
605	AE003538	92P200013A	INSULATOR(F)	
606	AE003539	92P200014A	INSULATOR(R)	
607	AE005929	92SBB0030A	LOADER SUB ASS'Y	
608	AE003541	92P100095A	GEAR, PULLEY	
609	AE003542	92P100097A	PULLEY, MOTOR	
610	AE003549	92P100096A	GEAR, MAIN	
611	AE003544	92P200012A	BELT, LOADING	
612	AE003545	92P000014A	PLATE, CLAMPER	
613	AE003546	92P100093A	RACK, LOADING	
614	AE003547	92P100091A	FRAME, MAIN	
615	AE004280	92P100100A	TRAY	
616	BZ710149	800WFAA008	CUSHION C	
617	AE007578	7230007850	SHEET, FFC	
701	AE003530	811022680U	SCREW, TAP TITE(P) BIND	2.6x8
702	AE003554	814011723U	SCREW, PAN	M1.7x2.3 P3
703	AE003555	816112080U	SEMS. TAP TITE(P) PAN W10	2x8
704	AE003556	814011730U	SCREW, PAN	M1.7x3 P3
705	AE003557	811022080U	SCREW, TAP TITE(P) BIND	2x8
CD2001	AD301855	122H001901	CORD JUMPER	2H001901
CD2301	AE003558	122H062102	CORD JUMPER	2H062102
CD2302	AE003559	122H052601	CORD JUMPER	2H052601
△ M2602	AE005930	1515S98003	FEED MOTOR	BCZ3B03B
△ M2603	AE005931	1596S18003	MOTOR, LOADING	BCZ3B52B
PCB610	AE005932	A5R801V610	PCB ASS'Y	DED003A
PCB640	AE006740	A2F401H640	PCB ASS'Y	DED012B
SW1	AE003564	0515S32002	SWITCH	SSS-13-2
SW2	AE003565	0500101037	PUSH SWITCH	ESE22MH24

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
		<b>RESISTORS</b>	
R301	AD301388	R002T4273J	RC 27K OHM 1/4W
R302	AE001805	R803R9822J	RC 8.2K OHM 1/16W
R303	AD302291	R803R9683J	RC 68K OHM 1/16W
R304	AD300651	R002T4272J	RC 2.7K OHM 1/4W
R306	AE001783	R803R9102J	RC 1K OHM 1/16W
▲R307	BZ210083	R3X28A010J	R,METAL OXIDE 1 OHM 2W
R308	AE001805	R803R9822J	RC 8.2K OHM 1/16W
R309	AE001784	R803R9103J	RC 10K OHM 1/16W
R310	AD301388	R002T4273J	RC 27K OHM 1/4W
R311	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R401	BZ210192	R002T4223J	RC 22K OHM 1/4W
▲R402	AE000607	R3X28AR56J	R,METAL OXIDE 0.56 OHM 2W
R403	AE000365	R4X5T6394F	R,METAL 390K OHM 1/6W
R404	AE000364	R4X5T6334F	R,METAL 330K OHM 1/6W
R405	AE000349	R002T21R2J	RC 1.2 OHM 1/2W
R406	BZ210162	R002T4682J	RC 6.8K OHM 1/4W
R407	BZ210150	R002T2010J	RC 1 OHM 1/2W
▲R408	BZ210087	R3X18A221J	R,METAL OXIDE 220 OHM 2W
R409	AE000934	R002T2391J	RC 390 OHM 1/2W
R411	AE000934	R002T2391J	RC 390 OHM 1/2W
R412	BZ210122	R002T4472J	RC 4.7K OHM 1/4W
R413	79097787	R002T2681J	RC 680 OHM 1/2W
R415	BZ210180	R002T2102J	RC 1K OHM 1/2W
R416	BZ210053	R002T22R2J	RC 2.2 OHM 1/2W
R417	BZ210233	R4X5T6272F	R,METAL 2.7K OHM 1/6W
R419	AE000358	R002T4471J	RC 470 OHM 1/4W
R420	AE000488	R002T4822J	RC 8.2K OHM 1/4W
R421	79097787	R002T2681J	RC 680 OHM 1/2W
R422	BZ210081	R002T2124J	RC 120K OHM 1/2W
R424	BZ210118	R002T4473J	RC 47K OHM 1/4W
R425	BZ210122	R002T4472J	RC 4.7K OHM 1/4W
▲R426	AE000609	R5X2CD4R7J	R,CEMENT 4.7 OHM 5W
R429	AE004243	R002T2152J	RC 1.5K OHM 1/2W
▲R430	BZ210087	R3X18A221J	R,METAL OXIDE 220 OHM 2W
▲R447	BZ210021	R65582680J	R,FUSE 68 OHM 1/2W
▲R448	BZ210003	R3K181102J	R,METAL OXIDE 1K OHM 1W
▲R450	BZ210159	R6558A2R2J	R,FUSE 2.2 OHM 2W
R456	AE000353	R002T2471J	RC 470 OHM 1/2W
R460	AD301203	R002T4101J	RC 100 OHM 1/4W
R490	AE000271	R002T4683J	RC 68K OHM 1/4W
R603	AE002152	R803R9561J	RC 560 OHM 1/16W
R604	AE002872	R803R9271J	RC 270 OHM 1/16W
R605	AE002152	R803R9561J	RC 560 OHM 1/16W
R607	AE001801	R803R9682J	RC 6.8K OHM 1/16W
R608	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R609	79091139	R803R9151J	RC 150 OHM 1/16W
R610	AE001783	R803R9102J	RC 1K OHM 1/16W
R611	AE001892	R803R9331J	RC 330 OHM 1/16W
R612	AE001892	R803R9331J	RC 330 OHM 1/16W
R613	AE001892	R803R9331J	RC 330 OHM 1/16W
R614	79091390	R002T2101J	RC 100 OHM 1/2W
R615	AE000350	R002T2221J	RC 220 OHM 1/2W
R618	79091139	R803R9151J	RC 150 OHM 1/16W
R619	AE002152	R803R9561J	RC 560 OHM 1/16W
R620	AE001799	R803R9562J	RC 5.6K OHM 1/16W
R622	AE001282	R803R9334J	RC 330K OHM 1/16W
R623	AE000849	R803R9152J	RC 1.5K OHM 1/16W
R624	79091139	R803R9151J	RC 150 OHM 1/16W
R625	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R626	AE001781	R803R9101J	RC 100 OHM 1/16W
R631	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R634	AE002874	R803R9390J	RC 39 OHM 1/16W
R635	79091390	R002T2101J	RC 100 OHM 1/2W
R636	AE001797	R803R9473J	RC 47K OHM 1/16W
R637	AE001781	R803R9101J	RC 100 OHM 1/16W
R638	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R639	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R640	AE001781	R803R9101J	RC 100 OHM 1/16W
R641	AE002145	R803R9153J	RC 15K OHM 1/16W
R642	AE001784	R803R9103J	RC 10K OHM 1/16W
R643	AE001796	R803R9471J	RC 470 OHM 1/16W
R645	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R646	AE001797	R803R9473J	RC 47K OHM 1/16W
R647	AE000360	R002T4561J	RC 560 OHM 1/4W
R648	AE002148	R803R9183J	RC 18K OHM 1/16W
R649	AE001796	R803R9471J	RC 470 OHM 1/16W
R650	AE000350	R002T2221J	RC 220 OHM 1/2W



# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
		<b>RESISTORS</b>	
R651	BZ210060	R002T4332J	RC 3.3K OHM 1/4W
R652	AE001783	R803R9102J	RC 1K OHM 1/16W
R654	AE001787	R803R9122J	RC 1.2K OHM 1/16W
R655	AE001783	R803R9102J	RC 1K OHM 1/16W
R656	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R662	AE001783	R803R9102J	RC 1K OHM 1/16W
R664	AE000964	R002T4681J	RC 680 OHM 1/4W
R666	AE001801	R803R9682J	RC 6.8K OHM 1/16W
R667	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R670	AE001797	R803R9473J	RC 47K OHM 1/16W
R675	AE001800	R803R9680J	RC 68 OHM 1/16W
R678	AE001805	R803R9822J	RC 8.2K OHM 1/16W
R679	AE001788	R803R9123J	RC 12K OHM 1/16W
R689	AE001781	R803R9101J	RC 100 OHM 1/16W
R801	BZ210135	R002T4221J	RC 220 OHM 1/4W
R802	AD300651	R002T4272J	RC 2.7K OHM 1/4W
▲ R803	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
R804	AD300651	R002T4272J	RC 2.7K OHM 1/4W
▲ R805	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
R806	AD300651	R002T4272J	RC 2.7K OHM 1/4W
▲ R807	BZ210050	R3X18A123J	R,METAL OXIDE 12K OHM 2W
R808	BZ210135	R002T4221J	RC 220 OHM 1/4W
R809	BZ210126	R002T4222J	RC 2.2K OHM 1/4W
R810	BZ210135	R002T4221J	RC 220 OHM 1/4W
R811	BZ210126	R002T4222J	RC 2.2K OHM 1/4W
R812	BZ210135	R002T4221J	RC 220 OHM 1/4W
R813	BZ210135	R002T4221J	RC 220 OHM 1/4W
R814	BZ210126	R002T4222J	RC 2.2K OHM 1/4W
R815	BZ210135	R002T4221J	RC 220 OHM 1/4W
R816	BZ210135	R002T4221J	RC 220 OHM 1/4W
R817	AE000487	R002T4560J	RC 56 OHM 1/4W
R818	AE000487	R002T4560J	RC 56 OHM 1/4W
R819	AE000487	R002T4560J	RC 56 OHM 1/4W
R820	BZ210135	R002T4221J	RC 220 OHM 1/4W
R821	BZ210135	R002T4221J	RC 220 OHM 1/4W
R1001	AE000850	R803R9185J	RC 1.8M OHM 1/16W
R1002	AE001775	R002T4121J	RC 120 OHM 1/4W
R1003	AE001784	R803R9103J	RC 10K OHM 1/16W
R1004	AE001783	R803R9102J	RC 1K OHM 1/16W
R1006	BZ210118	R002T4473J	RC 47K OHM 1/4W
R1007	AE001784	R803R9103J	RC 10K OHM 1/16W
R1008	BZ210119	R002T4102J	RC 1K OHM 1/4W
R1009	AE002872	R803R9271J	RC 270 OHM 1/16W
R1010	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R1011	AE002149	R803R9274J	RC 270K OHM 1/16W
R1012	AE002872	R803R9271J	RC 270 OHM 1/16W
R1013	AE001784	R803R9103J	RC 10K OHM 1/16W
R1014	AE001783	R803R9102J	RC 1K OHM 1/16W
R1015	AE001891	R803R9223J	RC 22K OHM 1/16W
R1016	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R1017	AE002152	R803R9561J	RC 560 OHM 1/16W
R1019	BZ210118	R002T4473J	RC 47K OHM 1/4W
R1020	AE002152	R803R9561J	RC 560 OHM 1/16W
R1021	AE002533	R803R9681J	RC 680 OHM 1/16W
R1022	AD302291	R803R9683J	RC 68K OHM 1/16W
R1023	AE001891	R803R9223J	RC 22K OHM 1/16W
R1024	AE001788	R803R9123J	RC 12K OHM 1/16W
R1026	AE001784	R803R9103J	RC 10K OHM 1/16W
R1027	AE001784	R803R9103J	RC 10K OHM 1/16W
R1028	AE001801	R803R9682J	RC 6.8K OHM 1/16W
R1029	BZ210119	R002T4102J	RC 1K OHM 1/4W
R1030	AE001784	R803R9103J	RC 10K OHM 1/16W
R1031	BZ210192	R002T4223J	RC 22K OHM 1/4W
R1032	AE002149	R803R9274J	RC 270K OHM 1/16W
R1033	AE001891	R803R9223J	RC 22K OHM 1/16W
R1035	BZ210192	R002T4223J	RC 22K OHM 1/4W
R1039	AE001891	R803R9223J	RC 22K OHM 1/16W
R1040	AE001889	R803R9121J	RC 120 OHM 1/16W
R1042	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R1044	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R1045	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R1047	AE001889	R803R9121J	RC 120 OHM 1/16W
R1048	AE001890	R803R9221J	RC 220 OHM 1/16W
R1049	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R1050	AE001890	R803R9221J	RC 220 OHM 1/16W
R1051	AE001799	R803R9562J	RC 5.6K OHM 1/16W
R1052	AE001783	R803R9102J	RC 1K OHM 1/16W

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>RESISTORS</b>			
R1053	AE001783	R803R9102J	RC 1K OHM 1/16W
R1054	AE002872	R803R9271J	RC 270 OHM 1/16W
R1055	BZ210182	R002T4103J	RC 10K OHM 1/4W
R1056	BZ210182	R002T4103J	RC 10K OHM 1/4W
R1057	BZ210166	R002T4562J	RC 5.6K OHM 1/4W
R1058	AE002152	R803R9561J	RC 560 OHM 1/16W
R1059	AE001783	R803R9102J	RC 1K OHM 1/16W
R1060	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R1061	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R1062	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R1063	AE001787	R803R9122J	RC 1.2K OHM 1/16W
R1064	AE001898	R803R9563J	RC 56K OHM 1/16W
R1065	AE002150	R803R9333J	RC 33K OHM 1/16W
R1066	AE001783	R803R9102J	RC 1K OHM 1/16W
R1067	AE001898	R803R9563J	RC 56K OHM 1/16W
R1068	BZ210121	R002T4182J	RC 1.8K OHM 1/4W
R1069	AE001784	R803R9103J	RC 10K OHM 1/16W
R1070	AE001784	R803R9103J	RC 10K OHM 1/16W
R1071	AE001891	R803R9223J	RC 22K OHM 1/16W
R1072	AE002154	R803R9821J	RC 820 OHM 1/16W
R1073	AE002154	R803R9821J	RC 820 OHM 1/16W
R1074	AE002154	R803R9821J	RC 820 OHM 1/16W
R1075	BZ210180	R002T2102J	RC 1K OHM 1/2W
R1076	AE001890	R803R9221J	RC 220 OHM 1/16W
R1077	AE001784	R803R9103J	RC 10K OHM 1/16W
R1078	AE001784	R803R9103J	RC 10K OHM 1/16W
R1079	AE002152	R803R9561J	RC 560 OHM 1/16W
R1080	AE001784	R803R9103J	RC 10K OHM 1/16W
R1082	AD301203	R002T4101J	RC 100 OHM 1/4W
R1083	AE002150	R803R9333J	RC 33K OHM 1/16W
R1087	AE002150	R803R9333J	RC 33K OHM 1/16W
R1090	AE001891	R803R9223J	RC 22K OHM 1/16W
R1094	AE001783	R803R9102J	RC 1K OHM 1/16W
R1096	AE001783	R803R9102J	RC 1K OHM 1/16W
R1108	AE002154	R803R9821J	RC 820 OHM 1/16W
R1115	AE002152	R803R9561J	RC 560 OHM 1/16W
R1117	AE001800	R803R9680J	RC 68 OHM 1/16W
R1118	AE002147	R803R9182J	RC 1.8K OHM 1/16W
R1119	AE001892	R803R9331J	RC 330 OHM 1/16W
R1120	AE001783	R803R9102J	RC 1K OHM 1/16W
R1202	AE001783	R803R9102J	RC 1K OHM 1/16W
R1203	AE001783	R803R9102J	RC 1K OHM 1/16W
R1204	79091139	R803R9151J	RC 150 OHM 1/16W
R1206	AE001781	R803R9101J	RC 100 OHM 1/16W
R1207	AE001784	R803R9103J	RC 10K OHM 1/16W
R1209	AE002533	R803R9681J	RC 680 OHM 1/16W
R1210	BZ210182	R002T4103J	RC 10K OHM 1/4W
R1211	AE000360	R002T4561J	RC 560 OHM 1/4W
R1212	AE001783	R803R9102J	RC 1K OHM 1/16W
R1213	AE001783	R803R9102J	RC 1K OHM 1/16W
R1214	AE001783	R803R9102J	RC 1K OHM 1/16W
R1251	AE001781	R803R9101J	RC 100 OHM 1/16W
R1253	AE001891	R803R9223J	RC 22K OHM 1/16W
R1254	AE001797	R803R9473J	RC 47K OHM 1/16W
R1255	AE001892	R803R9331J	RC 330 OHM 1/16W
R1256	AE001781	R803R9101J	RC 100 OHM 1/16W
R1262	AE001783	R803R9102J	RC 1K OHM 1/16W
R1263	AE002533	R803R9681J	RC 680 OHM 1/16W
R1272	AE001784	R803R9103J	RC 10K OHM 1/16W
R1279	AE001783	R803R9102J	RC 1K OHM 1/16W
R1280	AE001781	R803R9101J	RC 100 OHM 1/16W
R1289	AE001893	R803R9332J	RC 3.3K OHM 1/16W
▲R1701	BZ210206	R002T2155J	RC 1.5M OHM 1/2W
▲R1703	AE005735	R63881R22J	R,FUSE 0.22 OHM 1W
▲R1704	BZ210017	R5X2CE2R2J	R,CEMENT 2.2 OHM 7W
R1705	BZ210182	R002T4103J	RC 10K OHM 1/4W
▲R1706	AE000489	R3X28BR27J	R,METAL OXIDE 0.27 OHM 3W
▲R1707	AD301921	R5X34F332J	R,CEMENT 0 3.3K OHM 10W
R1711	BZ210119	R002T4102J	RC 1K OHM 1/4W
R1712	AE004252	RC31T4334J	RC 330K OHM 1/4W
R1714	AE000352	R002T2470J	RC 47 OHM 1/2W
R1719	79091390	R002T2101J	RC 100 OHM 1/2W
R1721	AD300651	R002T4272J	RC 2.7K OHM 1/4W
R1722	BZ210192	R002T4223J	RC 22K OHM 1/4W
R1723	AE004244	R002T4244J	RC 240K OHM 1/4W
R1725	BZ210060	R002T4332J	RC 3.3K OHM 1/4W
R1727	AE000356	R002T4271J	RC 270 OHM 1/4W

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
		<b>RESISTORS</b>	
R1728	BZ210182	R002T4103J	RC 10K OHM 1/4W
R1729	BZ210119	R002T4102J	RC 1K OHM 1/4W
▲R1730	BZ210248	R3X181R15J	R,METAL OXIDE 0.15 OHM 1W
R1732	BZ210135	R002T4221J	RC 220 OHM 1/4W
R1734	BZ210158	R002T2563J	RC 56K OHM 1/2W
▲R1735	AE000608	R3X28B104J	R,METAL OXIDE 100K OHM 3W
R1736	79091119	R002T4331J	RC 330 OHM 1/4W
R2201	AE001801	R803R9682J	RC 6.8K OHM 1/16W
R2203	AE001895	R803R9392J	RC 3.9K OHM 1/16W
R2204	AE002532	R803R9272J	RC 2.7K OHM 1/16W
R2205	AE001788	R803R9123J	RC 12K OHM 1/16W
R2206	AE002147	R803R9182J	RC 1.8K OHM 1/16W
R2207	AE002872	R803R9271J	RC 270 OHM 1/16W
R2208	AE000849	R803R9152J	RC 1.5K OHM 1/16W
R2209	AE002148	R803R9183J	RC 18K OHM 1/16W
R2211	AE002872	R803R9271J	RC 270 OHM 1/16W
R2225	AD301203	R002T4101J	RC 100 OHM 1/4W
R2226	AD301203	R002T4101J	RC 100 OHM 1/4W
R2228	AE002872	R803R9271J	RC 270 OHM 1/16W
R2251	AE002142	R002T4393J	RC 39K OHM 1/4W
R2252	AE001007	R002T4123J	RC 12K OHM 1/4W
R2253	BZ210162	R002T4682J	RC 6.8K OHM 1/4W
R2254	AE001777	R002T4392J	RC 3.9K OHM 1/4W
R2255	AD300651	R002T4272J	RC 2.7K OHM 1/4W
R2256	BZ210121	R002T4182J	RC 1.8K OHM 1/4W
R2257	AD301301	R002T4152J	RC 1.5K OHM 1/4W
R2301	AE001783	R803R9102J	RC 1K OHM 1/16W
R2302	AE005767	R803R9101F	RC 100 OHM 1/16W
R2303	AE001793	R803R92R2J	RC 2.2 OHM 1/16W
R2304	AE001793	R803R92R2J	RC 2.2 OHM 1/16W
R2305	AE001792	R803R9273J	RC 27K OHM 1/16W
R2306	AE005768	R803R96R8J	RC 6.8 OHM 1/16W
R2307	AE005031	R803R9753J	RC 75K OHM 1/16W
R2308	AE001784	R803R9103J	RC 10K OHM 1/16W
R2309	AE005767	R803R9101F	RC 100 OHM 1/16W
R2318	AE005768	R803R96R8J	RC 6.8 OHM 1/16W
R2319	AE001898	R803R9563J	RC 56K OHM 1/16W
R2321	AE001784	R803R9103J	RC 10K OHM 1/16W
R2323	AE004247	R803R91R2J	RC 1.2 OHM 1/16W
R2324	AE001783	R803R9102J	RC 1K OHM 1/16W
R2325	AE001801	R803R9682J	RC 6.8K OHM 1/16W
R2326	AE001799	R803R9562J	RC 5.6K OHM 1/16W
R2327	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R2328	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R2329	AE004247	R803R91R2J	RC 1.2 OHM 1/16W
R2330	AE001783	R803R9102J	RC 1K OHM 1/16W
R2332	AE001890	R803R9221J	RC 220 OHM 1/16W
R2333	AE001890	R803R9221J	RC 220 OHM 1/16W
R2334	AE001784	R803R9103J	RC 10K OHM 1/16W
R2335	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R2336	AE002151	R803R9391J	RC 390 OHM 1/16W
R2337	AE001784	R803R9103J	RC 10K OHM 1/16W
R2338	AE001788	R803R9123J	RC 12K OHM 1/16W
R2339	AE001787	R803R9122J	RC 1.2K OHM 1/16W
R2340	AE005768	R803R96R8J	RC 6.8 OHM 1/16W
R2341	AE005768	R803R96R8J	RC 6.8 OHM 1/16W
R2342	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R2346	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R2347	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R2348	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R2349	AE001781	R803R9101J	RC 100 OHM 1/16W
R2350	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R2351	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R2352	AE001781	R803R9101J	RC 100 OHM 1/16W
R2353	AE001781	R803R9101J	RC 100 OHM 1/16W
R2355	AE001783	R803R9102J	RC 1K OHM 1/16W
R2356	AE004251	R803R9820J	RC 82 OHM 1/16W
R2357	AE001783	R803R9102J	RC 1K OHM 1/16W
R2358	AE001889	R803R9121J	RC 120 OHM 1/16W
R2359	AE004251	R803R9820J	RC 82 OHM 1/16W
R2360	AE001794	R803R9330J	RC 33 OHM 1/16W
R2361	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R2362	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R3001	BZ210180	R002T2102J	RC 1K OHM 1/2W
▲R3002	AE000612	R655U4100J	R,FUSE 10 OHM 1/4W
R3003	BZ210126	R002T4222J	RC 2.2K OHM 1/4W
R3005	BZ210135	R002T4221J	RC 220 OHM 1/4W

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
		<b>RESISTORS</b>	
△R3006	AE000612	R655U4100J	R,FUSE
R3007	BZ210126	R002T4222J	RC
R3008	AE000356	R002T4271J	RC
R3022	BZ210135	R002T4221J	RC
R3101	BZ210182	R002T4103J	RC
R3102	AE001783	R803R9102J	RC
R3104	BZ210119	R002T4102J	RC
△R3108	AE000612	R655U4100J	R,FUSE
R3109	BZ210126	R002T4222J	RC
R3601	BZ210182	R002T4103J	RC
R3602	AE007675	R4X5T6750F	R,METAL
R3603	AE007674	R4X5T6331F	R,METAL
R3604	BZ210119	R002T4102J	RC
R3605	AD301203	R002T4101J	RC
R3606	AE000485	R002T4391J	RC
R3607	BZ210135	R002T4221J	RC
△R3608	AE000612	R655U4100J	R,FUSE
R3609	BZ210126	R002T4222J	RC
R3610	BZ210182	R002T4103J	RC
R3611	BZ210119	R002T4102J	RC
△R3612	AE006480	R638U4220J	R,FUSE
R3613	BZ210126	R002T4222J	RC
△R3614	AE006480	R638U4220J	R,FUSE
R3615	AE000356	R002T4271J	RC
R3616	AE000363	R002T4824J	RC
R3617	BZ210125	R002T4224J	RC
R3618	BZ210158	R002T2563J	RC
R3619	BZ210158	R002T2563J	RC
R3620	BZ210119	R002T4102J	RC
R3621	BZ210118	R002T4473J	RC
R3622	BZ210182	R002T4103J	RC
△R3623	BZ210191	R3X28B010J	R,METAL OXIDE
R3624	BZ210119	R002T4102J	RC
R4001	AE001804	R803R9821F	RC
R4002	AE001899	R803R9750F	RC
R4003	AE001899	R803R9750F	RC
R4004	AE001899	R803R9750F	RC
R4005	AE001899	R803R9750F	RC
R4008	AE001781	R803R9101J	RC
R4009	AE006714	R803R9331F	RC
R4011	AD302345	R803R9472J	RC
R4012	AE001887	R803R9105J	RC
R4013	AE001797	R803R9473J	RC
R4014	AD302345	R803R9472J	RC
R4016	AE001781	R803R9101J	RC
R4019	AE001794	R803R9330J	RC
R4020	AE001794	R803R9330J	RC
R4021	AE001794	R803R9330J	RC
R4022	AE000845	R803R9103F	RC
R4024	AD302345	R803R9472J	RC
R4025	AE001890	R803R9221J	RC
R4026	AE001890	R803R9221J	RC
R4027	AE001890	R803R9221J	RC
R4031	AD302345	R803R9472J	RC
R4035	AD302345	R803R9472J	RC
R4036	AD302345	R803R9472J	RC
R4037	AD302345	R803R9472J	RC
R4038	AD302345	R803R9472J	RC
R4039	AD302345	R803R9472J	RC
R4040	AD302345	R803R9472J	RC
R4041	AD302345	R803R9472J	RC
R4042	AE001889	R803R9121J	RC
R4043	AE000845	R803R9103F	RC
R4044	AD302345	R803R9472J	RC
R4045	AE002152	R803R9561J	RC
R4048	AE001797	R803R9473J	RC
R4049	AD302345	R803R9472J	RC
R4050	AD302345	R803R9472J	RC
R4051	AD302345	R803R9472J	RC
R4052	AD302345	R803R9472J	RC
R4053	AE001783	R803R9102J	RC
R4054	AE001783	R803R9102J	RC
R4057	AE001797	R803R9473J	RC
R4058	AE001890	R803R9221J	RC
R4059	AE001781	R803R9101J	RC
R4060	AE001888	R803R9113J	RC
R4061	AE001888	R803R9113J	RC

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
		<b>RESISTORS</b>	
R4062	79091400	R803R9393J	RC 39K OHM 1/16W
R4063	AE002145	R803R9153J	RC 15K OHM 1/16W
R4064	AE001781	R803R9101J	RC 100 OHM 1/16W
R4069	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R4070	AE001797	R803R9473J	RC 47K OHM 1/16W
R4071	79091139	R803R9151J	RC 150 OHM 1/16W
R4073	AE001794	R803R9330J	RC 33 OHM 1/16W
R4076	AE001794	R803R9330J	RC 33 OHM 1/16W
R4077	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R4078	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R4080	AE002876	R803R9472F	RC 4.7K OHM 1/16W
R4081	AE006622	R803R9392F	RC 3.9K OHM 1/16W
R4201	AE001898	R803R9563J	RC 56K OHM 1/16W
R4202	AE001784	R803R9103J	RC 10K OHM 1/16W
R4203	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R4204	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R4205	AE001788	R803R9123J	RC 12K OHM 1/16W
R4206	AE001891	R803R9223J	RC 22K OHM 1/16W
R4207	AE000358	R002T4471J	RC 470 OHM 1/4W
R4208	AE001788	R803R9123J	RC 12K OHM 1/16W
R4209	AE002533	R803R9681J	RC 680 OHM 1/16W
R4210	AD302345	R803R9472J	RC 4.7K OHM 1/16W
R4211	AE001785	R803R9104J	RC 100K OHM 1/16W
R4212	AE001785	R803R9104J	RC 100K OHM 1/16W
R4213	AE001784	R803R9103J	RC 10K OHM 1/16W
R4214	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R4215	AE001796	R803R9471J	RC 470 OHM 1/16W
R4216	AE001803	R803R9750J	RC 75 OHM 1/16W
R4217	AE001803	R803R9750J	RC 75 OHM 1/16W
R4218	AE001783	R803R9102J	RC 1K OHM 1/16W
R4219	AE002530	R803R9124J	RC 120K OHM 1/16W
R4220	AE002533	R803R9681J	RC 680 OHM 1/16W
R4221	AE001803	R803R9750J	RC 75 OHM 1/16W
R4222	AE004251	R803R9820J	RC 82 OHM 1/16W
R4223	AE001800	R803R9680J	RC 68 OHM 1/16W
R4224	79091126	R002T4680J	RC 68 OHM 1/4W
R4225	AE001781	R803R9101J	RC 100 OHM 1/16W
R4226	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R4228	AE002530	R803R9124J	RC 120K OHM 1/16W
R4229	AE001788	R803R9123J	RC 12K OHM 1/16W
R4230	AE001783	R803R9102J	RC 1K OHM 1/16W
R4231	AE001805	R803R9822J	RC 8.2K OHM 1/16W
R4232	AE001805	R803R9822J	RC 8.2K OHM 1/16W
R4233	AE001783	R803R9102J	RC 1K OHM 1/16W
R4234	AE000358	R002T4471J	RC 470 OHM 1/4W
R4235	AE001796	R803R9471J	RC 470 OHM 1/16W
R4236	AE001784	R803R9103J	RC 10K OHM 1/16W
R4237	AE001784	R803R9103J	RC 10K OHM 1/16W
R4238	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R4239	BZ210122	R002T4472J	RC 4.7K OHM 1/4W
R4240	BZ210119	R002T4102J	RC 1K OHM 1/4W
R4241	AE000849	R803R9152J	RC 1.5K OHM 1/16W
R4242	AE001893	R803R9332J	RC 3.3K OHM 1/16W
R4243	AE001784	R803R9103J	RC 10K OHM 1/16W
R4244	AE001784	R803R9103J	RC 10K OHM 1/16W
R4245	AE001790	R803R9222J	RC 2.2K OHM 1/16W
R4246	AE001784	R803R9103J	RC 10K OHM 1/16W
R4248	AE001784	R803R9103J	RC 10K OHM 1/16W
R4249	AE001890	R803R9221J	RC 220 OHM 1/16W
R4250	79091126	R002T4680J	RC 68 OHM 1/4W
R4251	AE001781	R803R9101J	RC 100 OHM 1/16W
R4252	AE001781	R803R9101J	RC 100 OHM 1/16W
R4253	AE000358	R002T4471J	RC 470 OHM 1/4W
R4254	AE001783	R803R9102J	RC 1K OHM 1/16W
R4255	AE001785	R803R9104J	RC 100K OHM 1/16W
R4256	AE001784	R803R9103J	RC 10K OHM 1/16W
R4257	AE001784	R803R9103J	RC 10K OHM 1/16W
R4258	AE001788	R803R9123J	RC 12K OHM 1/16W
R4259	AE001783	R803R9102J	RC 1K OHM 1/16W
R4260	BZ210122	R002T4472J	RC 4.7K OHM 1/4W
R4261	AE000358	R002T4471J	RC 470 OHM 1/4W
▲ R4265	AE007676	R655U4101J	R,FUSE 100 OHM 1/4W
R4283	AE001803	R803R9750J	RC 75 OHM 1/16W
R4501	BZ210126	R002T4222J	RC 2.2K OHM 1/4W
R4502	AE001891	R803R9223J	RC 22K OHM 1/16W
R4503	AE002145	R803R9153J	RC 15K OHM 1/16W
R4504	79091263	R803R93R3J	RC 3.3 OHM 1/16W

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
<b>RESISTORS</b>				
R4505	AE001783	R803R9102J	RC	1K OHM 1/16W
R4506	AE001784	R803R9103J	RC	10K OHM 1/16W
R4507	AE001890	R803R9221J	RC	220 OHM 1/16W
R4508	AD302345	R803R9472J	RC	4.7K OHM 1/16W
R4509	AD302345	R803R9472J	RC	4.7K OHM 1/16W
R4510	AE001282	R803R9334J	RC	330K OHM 1/16W
R4511	79091400	R803R9393J	RC	39K OHM 1/16W
R4512	AE004248	R803R9222F	RC	2.2K OHM 1/16W
R4513	AE001797	R803R9473J	RC	47K OHM 1/16W
R4514	AE001805	R803R9822J	RC	8.2K OHM 1/16W
R4515	AE002145	R803R9153J	RC	15K OHM 1/16W
R4517	AE001784	R803R9103J	RC	10K OHM 1/16W
R4518	AE002533	R803R9681J	RC	680 OHM 1/16W
R4519	AE001007	R002T4123J	RC	12K OHM 1/4W
R4520	AD302345	R803R9472J	RC	4.7K OHM 1/16W
R4521	AE001787	R803R9122J	RC	1.2K OHM 1/16W
R4522	AE001801	R803R9682J	RC	6.8K OHM 1/16W
R4523	AE001787	R803R9122J	RC	1.2K OHM 1/16W
R4524	AE001792	R803R9273J	RC	27K OHM 1/16W
R4525	AD302345	R803R9472J	RC	4.7K OHM 1/16W
R4526	AE001893	R803R9332J	RC	3.3K OHM 1/16W
R4527	AE001783	R803R9102J	RC	1K OHM 1/16W
R4528	AE002147	R803R9182J	RC	1.8K OHM 1/16W
R4532	AE001781	R803R9101J	RC	100 OHM 1/16W
R4533	AE002235	R002T4106J	RC	10M OHM 1/4W
R4535	BZ210192	R002T4223J	RC	22K OHM 1/4W
R4536	AE001887	R803R9105J	RC	1M OHM 1/16W
R4601	AE000849	R803R9152J	RC	1.5K OHM 1/16W
R4620	AE002235	R002T4106J	RC	10M OHM 1/4W
R4629	AE004010	R803R9106J	RC	10M OHM 1/16W
R4640	AE002872	R803R9271J	RC	270 OHM 1/16W
R4641	AE000350	R002T2221J	RC	220 OHM 1/2W
R4652	AE001783	R803R9102J	RC	1K OHM 1/16W
R4653	AE001299	R803R9564J	RC	560K OHM 1/16W
R4654	AE001282	R803R9334J	RC	330K OHM 1/16W
R4655	AE001796	R803R9471J	RC	470 OHM 1/16W
R4663	BZ210124	R002T4122J	RC	1.2K OHM 1/4W
R4665	BZ210119	R002T4102J	RC	1K OHM 1/4W
R4667	AE001893	R803R9332J	RC	3.3K OHM 1/16W
R4669	AE007677	R803R9685J	RC	6.8M OHM 1/16W
R5502	AE001784	R803R9103J	RC	10K OHM 1/16W
R5503	AE001796	R803R9471J	RC	470 OHM 1/16W
R5504	79091400	R803R9393J	RC	39K OHM 1/16W
R5505	AE001893	R803R9332J	RC	3.3K OHM 1/16W
R5506	AD301011	R4X5T6393F	R,METAL	39K OHM 1/6W
R5507	AE001893	R803R9332J	RC	3.3K OHM 1/16W
R5509	79091400	R803R9393J	RC	39K OHM 1/16W
R5511	AE002148	R803R9183J	RC	18K OHM 1/16W
R5513	AE001801	R803R9682J	RC	6.8K OHM 1/16W
R5514	AE001801	R803R9682J	RC	6.8K OHM 1/16W
R5520	BZ210166	R002T4562J	RC	5.6K OHM 1/4W
R5521	AE001799	R803R9562J	RC	5.6K OHM 1/16W
R5522	AE001805	R803R9822J	RC	8.2K OHM 1/16W
R5523	AE001805	R803R9822J	RC	8.2K OHM 1/16W
R5524	AE001783	R803R9102J	RC	1K OHM 1/16W
R5525	AE001783	R803R9102J	RC	1K OHM 1/16W
R5526	AE001801	R803R9682J	RC	6.8K OHM 1/16W
R5527	AE001801	R803R9682J	RC	6.8K OHM 1/16W
R6605	AE002875	R803R9432J	RC	4.3K OHM 1/16W
R6606	AE001781	R803R9101J	RC	100 OHM 1/16W
R6608	AE001781	R803R9101J	RC	100 OHM 1/16W
R8112	AE001796	R803R9471J	RC	470 OHM 1/16W
R8113	AE001796	R803R9471J	RC	470 OHM 1/16W
R8114	AE001785	R803R9104J	RC	100K OHM 1/16W
R8115	AE001785	R803R9104J	RC	100K OHM 1/16W
R8116	AE002152	R803R9561J	RC	560 OHM 1/16W
R8121	AE002152	R803R9561J	RC	560 OHM 1/16W
<b>CAPACITORS</b>				
C301	AE001544	E50HU3100M	CE	10 UF 25 V
C302	BZ110263	E50HU2220M	CE	22 UF 16 V
C303	AE001726	CS0PB0414K	CC	0.01 UF 50V B
C306	BZ110074	E50HU5010M	CE	1 UF 50V
C308	BZ110074	E50HU5010M	CE	1 UF 50V
C309	AE001728	CS0PB04Q3K	CC	0.0047UF 50V B
C310	AE001728	CS0PB04Q3K	CC	0.0047UF 50V B
C313	AE000838	CS0PB0N16K	CC	1 UF 10V B
C314	AE000838	CS0PB0N16K	CC	1 UF 10V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C316	AE001726	CS0PB0414K	0.01 UF 50V B
C322	BZ110053	E02LF3102M	1000 UF 25V
C402	AD301729	E02LU52R2M	2.2 UF 50V
C403	AE000477	P235W1474J	0.47 UF 100V MKT
C404	AE000416	P232W1103J	0.01 UF 100V MMTS
C405	BZ110101	E5EZF3222M	2200 UF 25V
C408	AD301348	E02LU5100M	10 UF 50V
C412	AE000343	P232T0473J	0.047 UF 50V MMTV
C413	AD300789	CQGTFO415Z	0.1 UF 50V F
C414	AD301434	E02LU4101M	100 UF 35V
C417	AE001769	E50HU1330M	33 UF 10 V
C418	AE000339	E5EZU5220M	22 UF 50V
C421	BZ110055	E5EZF4102M	1000 UF 35V
C422	BZ110212	E5EZTD2R2M	2.2 UF 250V
C423	BZ110136	P4J7F3394J	0.39 UF 250V PMS
C424	AE007673	P4G8FJ133H	0.013 UF 1.25KV PHE
C429	AE000923	C0JTB05H3K	0.0022UF 500V B
C430	BZ110061	C0JTB0513K	0.001 UF 500V B
C431	BZ110225	E5EZF0220M	22 UF 250V
C432	AE000345	P235W1104J	0.1 UF 100V MKT
C450	BZ110202	C0PLRR713K	0.001 UF 2KV R
C601	79091058	CS0PCH430C	3 PF 50V CH
C603	AE000838	CS0PB0N16K	1 UF 10V B
C604	AE001726	CS0PB0414K	0.01 UF 50V B
C605	AE001725	CS0PB0413K	0.001 UF 50V B
C606	BZ110143	E02LU0221M	220 UF 6.3V
C607	AE002882	CS0PB0NL5K	0.33 UF 10V B
C609	AE002124	CS0PB0315K	0.1 UF 25V B
C610	BZ110074	E50HU5010M	1 UF 50V
C611	79091097	E50HU2101M	100 UF 16 V
C612	AE001728	CS0PB04Q3K	0.0047UF 50V B
C613	BZ110074	E50HU5010M	1 UF 50V
C614	AE002124	CS0PB0315K	0.1 UF 25V B
C615	AE000838	CS0PB0N16K	1 UF 10V B
C617	AE002124	CS0PB0315K	0.1 UF 25V B
C618	AE002824	CS0PB04H4K	0.022 UF 50V B
C619	AE002124	CS0PB0315K	0.1 UF 25V B
C620	AE002124	CS0PB0315K	0.1 UF 25V B
C621	AE002124	CS0PB0315K	0.1 UF 25V B
C624	AE002124	CS0PB0315K	0.1 UF 25V B
C626	AE001543	E50HU0470M	47 UF 6.3V
C627	AE000466	E02LU1221M	220 UF 10V
C628	AE001725	CS0PB0413K	0.001 UF 50V B
C629	AE000838	CS0PB0N16K	1 UF 10V B
C630	AE001544	E50HU3100M	10 UF 25 V
C631	AE002124	CS0PB0315K	0.1 UF 25V B
C633	AE001725	CS0PB0413K	0.001 UF 50V B
C634	AE001725	CS0PB0413K	0.001 UF 50V B
C638	AE000958	E50HU5R47M	0.47 UF 50V
C639	AE001726	CS0PB0414K	0.01 UF 50V B
C640	AE001726	CS0PB0414K	0.01 UF 50V B
C641	BZ110074	E50HU5010M	1 UF 50V
C642	BZ110074	E50HU5010M	1 UF 50V
C643	AE001726	CS0PB0414K	0.01 UF 50V B
C644	AE001727	CS0PB04H3K	0.0022UF 50V B
C645	BZ110074	E50HU5010M	1 UF 50V
C648	AE001544	E50HU3100M	10 UF 25 V
C649	79091097	E50HU2101M	100 UF 16 V
C650	AD301762	E50HU52R2M	2.2 UF 50V
C651	BZ110074	E50HU5010M	1 UF 50V
C652	AE000272	E50HU2470M	47 UF 16V
C653	79091097	E50HU2101M	100 UF 16 V
C654	AE002124	CS0PB0315K	0.1 UF 25V B
C655	AE001275	CS0PF0415Z	0.1 UF 50V F
C656	AE001728	CS0PB04Q3K	0.0047UF 50V B
C658	AE002124	CS0PB0315K	0.1 UF 25V B
C664	BZ110205	E02LU5220M	22 UF 50V
C667	AD301002	E50HU50R1M	0.1 UF 50 V
C669	AE000600	CQGTCH4H2J	220 PF 50V CH
C675	AE003853	CS0PCH413J	0.001 UF 50V CH
C677	AE003843	CS0PB02U4K	0.068 UF 16V B
C679	AD301002	E50HU50R1M	0.1 UF 50 V
C680	AD301002	E50HU50R1M	0.1 UF 50 V
C681	AE000332	E00NU2100M	10 UF 16 V
C802	BZ110226	C0JBB07H3K	0.0022UF 2KV B
C803	BZ110074	E50HU5010M	1 UF 50V
C809	AE004233	CHGTB04K2K	270 PF 50V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C810	AE004233	CHGTB04K2K	270 PF 50V B
C811	AE004233	CHGTB04K2K	270 PF 50V B
C1002	AE002824	CS0PB04H4K	0.022 UF 50V B
C1003	BZ110170	E51A0P104Z	0.1 F 5.5V
C1004	AE002124	CS0PB0315K	0.1 UF 25V B
C1005	BZ110263	E50HU2220M	22 UF 16 V
C1006	AE001725	CS0PB0413K	0.001 UF 50V B
C1007	AE001728	CS0PB04Q3K	0.0047UF 50V B
C1008	AE003842	CS0PB02G5K	0.18 UF 16V B
C1009	AE002824	CS0PB04H4K	0.022 UF 50V B
C1010	AE001725	CS0PB0413K	0.001 UF 50V B
C1011	AE001731	CS0PCH4G2J	180 PF 50V CH
C1012	79091569	CQGTB04N3K	0.0039UF 50V B
C1013	BZ110263	E50HU2220M	22 UF 16 V
C1014	AE001275	CS0PF0415Z	0.1 UF 50V F
C1015	AE003845	CS0PB04G3K	0.0018UF 50V B
C1016	AE004239	E00NU0470M	47 UF 6.3V
C1017	AE002124	CS0PB0315K	0.1 UF 25V B
C1018	AE001733	CS0PCH4H2J	220 PF 50V CH
C1019	AE002124	CS0PB0315K	0.1 UF 25V B
C1021	AE001769	E50HU1330M	33 UF 10 V
C1022	AE002494	CS0PB04N3K	0.0039UF 50V B
C1023	AE002124	CS0PB0315K	0.1 UF 25V B
C1024	AE002129	CS0PCH4E1J	15 PF 50V CH
C1025	AE003854	CS0PCH4B1J	12 PF 50V CH
C1026	79091061	CS0PCH4G1J	18 PF 50V CH
C1027	AE002124	CS0PB0315K	0.1 UF 25V B
C1028	79091061	CS0PCH4G1J	18 PF 50V CH
C1030	AE001275	CS0PF0415Z	0.1 UF 50V F
C1032	BZ210177	E02LU2470M	47 UF 16V
C1034	AE001726	CS0PB0414K	0.01 UF 50V B
C1035	AE000838	CS0PB0N16K	1 UF 10V B
C1036	AE002124	CS0PB0315K	0.1 UF 25V B
C1037	79091384	CS0PCH4L2J	330 PF 50V CH
C1038	AE002129	CS0PCH4E1J	15 PF 50V CH
C1040	AE000837	CS0PB04U3K	0.0068UF 50V B
C1043	AE002124	CS0PB0315K	0.1 UF 25V B
C1044	AE001726	CS0PB0414K	0.01 UF 50V B
C1047	AE001544	E50HU3100M	10 UF 25 V
C1048	AE001770	E50HU54R7M	4.7 UF 50V
C1050	AE003853	CS0PCH413J	0.001 UF 50V CH
C1052	AE002124	CS0PB0315K	0.1 UF 25V B
C1055	AE002832	CS0PCH4S2J	560 PF 50V CH
C1056	AE003853	CS0PCH413J	0.001 UF 50V CH
C1058	AE001733	CS0PCH4H2J	220 PF 50V CH
C1060	AE002124	CS0PB0315K	0.1 UF 25V B
C1062	AE002124	CS0PB0315K	0.1 UF 25V B
C1063	AE001733	CS0PCH4H2J	220 PF 50V CH
C1067	AE002124	CS0PB0315K	0.1 UF 25V B
C1069	BZ110274	CHGTCH4H1J	22 PF 50V CH
C1070	BZ110143	E02LU0221M	220 UF 6.3V
C1071	79091070	CS0PCH4U1J	68 PF 50V CH
C1072	79091070	CS0PCH4U1J	68 PF 50V CH
C1073	AE001726	CS0PB0414K	0.01 UF 50V B
C1074	AE001726	CS0PB0414K	0.01 UF 50V B
C1078	AE002124	CS0PB0315K	0.1 UF 25V B
C1081	AE003853	CS0PCH413J	0.001 UF 50V CH
C1082	AE004477	CS0PB03H5K	0.22 UF 25V B
C1090	BZ110263	E50HU2220M	22 UF 16 V
C1092	AE001725	CS0PB0413K	0.001 UF 50V B
C1093	BZ110150	E50HU0101M	100 UF 6.3V
C1102	AE001734	CS0PCH4U2J	680 PF 50V CH
C1103	BZ110143	E02LU0221M	220 UF 6.3V
C1201	79091068	CS0PCH4S1J	56 PF 50V CH
C1202	AD301535	E02LU2101M	100 UF 16V
C1204	AE001726	CS0PB0414K	0.01 UF 50V B
C1205	AE000272	E50HU2470M	47 UF 16V
C1206	AE001543	E50HU0470M	47 UF 6.3V
C1207	AE004239	E00NU0470M	47 UF 6.3V
C1208	AE001275	CS0PF0415Z	0.1 UF 50V F
C1209	AE001275	CS0PF0415Z	0.1 UF 50V F
C1210	AE004236	CS0PB0NQ5K	0.47 UF 10V B
C1211	AE001275	CS0PF0415Z	0.1 UF 50V F
C1213	AE001275	CS0PF0415Z	0.1 UF 50V F
C1214	AE001543	E50HU0470M	47 UF 6.3V
C1215	AE002824	CS0PB04H4K	0.022 UF 50V B
C1216	AE001275	CS0PF0415Z	0.1 UF 50V F



# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			<b>CAPACITORS</b>	
C1217	AE002830	CS0PCH4L1J	CC	33 PF 50V CH
C1218	AE001737	CS0PF0N16Z	CC	1 UF 10V F
C1219	AE002824	CS0PB04H4K	CC	0.022 UF 50V B
C1220	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C1224	AE004236	CS0PB0NQ5K	CC	0.47 UF 10V B
C1225	AE002824	CS0PB04H4K	CC	0.022 UF 50V B
C1255	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C1256	BZ110150	E50HU0101M	CE	100 UF 6.3V
C1257	AE001543	E50HU0470M	CE	47 UF 6.3V
C1259	AE002830	CS0PCH4L1J	CC	33 PF 50V CH
C1273	AD301535	E02LU2101M	CE	100 UF 16V
C1274	AD301535	E02LU2101M	CE	100 UF 16V
C1279	79091383	CS0PCH4K2J	CC	270 PF 50V CH
C1284	AE000336	E02LU1101M	CE	100 UF 10V
▲C1701	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL
C1703	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B
C1704	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B
C1705	BZ110251	E52D0H221M	CE	220 UF 400V
C1706	BZ110098	CHGTB0413K	CC	0.001 UF 50V B
C1707	AD300512	C0JTB0512K	CC	100 PF 500V B
C1709	BZ110205	E02LU5220M	CE	22 UF 50V
C1710	BZ110161	CQGTB04H3K	CC	0.0022UF 50V B
C1712	BZ110032	E5EZF3102M	CE	1000 UF 25V
C1713	BZ110129	E5EZF2222M	CE	2200 UF 16V
C1715	BZ110175	C03L0R7H2K	CC	220 PF 2KV R
C1716	AE002208	CHGTB04Q2K	CC	470 PF 50V B
C1717	BZ110130	E62NFC221M	CE	220 UF 200V
▲C1718	AE000308	CD39B0MQ2K	CC	470 PF 250V
C1719	BZ110071	CHGTB04L2K	CC	330 PF 50V B
C1720	AE001544	E50HU3100M	CE	10 UF 25 V
C1721	AE002208	CHGTB04Q2K	CC	470 PF 50V B
C1722	AD300512	C0JTB0512K	CC	100 PF 500V B
C1723	BZ110028	E5EZF2102M	CE	1000 UF 16V
C1724	BZ110117	CQGTB04Q3K	CC	0.0047UF 50V B
C1726	AE002207	CHGTB0412K	CC	100 PF 50V B
▲C1727	AE000308	CD39B0MQ2K	CC	470 PF 250V
▲C1728	AD301026	CD39E0M13M	CC	0.001 UF 250V
C1729	BZ110161	CQGTB04H3K	CC	0.0022UF 50V B
C1730	BZ210176	E02LF3222M	CE	2200 UF 25V
C1731	AD301729	E02LU52R2M	CE	2.2 UF 50V
▲C1732	AD301026	CD39E0M13M	CC	0.001 UF 250V
C1733	AE000606	P3N1F5103J	CPP	0.01 UF 630V
C1734	AE000599	C0PLRR712K	CC	100 PF 2KV R
▲C1735	BZ110175	C03L0R7H2K	CC	220 PF 2KV R
C2201	BZ210177	E02LU2470M	CE	47 UF 16V
C2202	AE001727	CS0PB04H3K	CC	0.0022UF 50V B
C2203	AE001727	CS0PB04H3K	CC	0.0022UF 50V B
C2205	BZ210177	E02LU2470M	CE	47 UF 16V
C2206	AE001726	CS0PB0414K	CC	0.01 UF 50V B
C2207	AE001726	CS0PB0414K	CC	0.01 UF 50V B
C2208	AE001729	CS0PCH412J	CC	100 PF 50V CH
C2301	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2302	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2303	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2304	AE002824	CS0PB04H4K	CC	0.022 UF 50V B
C2305	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2306	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2307	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2309	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2310	BZ110034	E50HU1101M	CE	100 UF 10 V
C2313	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2314	BZ110034	E50HU1101M	CE	100 UF 10 V
C2315	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2316	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2318	AE001725	CS0PB0413K	CC	0.001 UF 50V B
C2326	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2327	AE001543	E50HU0470M	CE	47 UF 6.3V
C2328	AE001543	E50HU0470M	CE	47 UF 6.3V
C2329	AE001543	E50HU0470M	CE	47 UF 6.3V
C2331	AE002124	CS0PB0315K	CC	0.1 UF 25V B
C2332	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2340	BZ110150	E50HU0101M	CE	100 UF 6.3V
C2341	BZ110150	E50HU0101M	CE	100 UF 6.3V
C2342	AE001275	CS0PF0415Z	CC	0.1 UF 50V F
C2343	AE001543	E50HU0470M	CE	47 UF 6.3V
C2346	AE001543	E50HU0470M	CE	47 UF 6.3V
C2347	AE001275	CS0PF0415Z	CC	0.1 UF 50V F

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C2348	AE002124	CS0PB0315K	0.1 UF 25V B
C2350	AE000838	CS0PB0N16K	1 UF 10V B
C2357	AE001729	CS0PCH412J	100 PF 50V CH
C2358	AE001729	CS0PCH412J	100 PF 50V CH
C2359	AE001729	CS0PCH412J	100 PF 50V CH
C2360	AE001729	CS0PCH412J	100 PF 50V CH
C3001	AE000838	CS0PB0N16K	1 UF 10V B
C3002	BZ110143	E02LU0221M	220 UF 6.3V
C3003	AE001544	E50HU3100M	10 UF 25 V
C3004	AE000838	CS0PB0N16K	1 UF 10V B
C3005	AE001544	E50HU3100M	10 UF 25 V
C3006	AE002124	CS0PB0315K	0.1 UF 25V B
C3007	BZ210177	E02LU2470M	47 UF 16V
C3008	AE001275	CS0PF0415Z	0.1 UF 50V F
C3009	BZ110143	E02LU0221M	220 UF 6.3V
C3010	BZ110207	E02LT2102M	1000 UF 16V
C3012	AE001544	E50HU3100M	10 UF 25 V
C3021	79091068	CS0PCH4S1J	56 PF 50V CH
C3022	79091068	CS0PCH4S1J	56 PF 50V CH
C3026	AE001544	E50HU3100M	10 UF 25 V
C3101	BZ110190	E02LU2221M	220 UF 16V
C3102	AD301536	E02LU2331M	330 UF 16V
C3103	AE001544	E50HU3100M	10 UF 25 V
C3104	AE000838	CS0PB0N16K	1 UF 10V B
C3106	BZ110081	E02LT2471M	470 UF 16V
C3601	BZ110041	E02LT3471M	470 UF 25V
C3602	AE002207	CHGTB0412K	100 PF 50V B
C3603	AE001544	E50HU3100M	10 UF 25 V
C3604	AE002123	CQGTF0416Z	1 UF 50V F
C3605	BZ110229	E02LU4220M	22 UF 35V
C3606	BZ110042	E02LU1471M	470 UF 10V
C3607	AE001544	E50HU3100M	10 UF 25 V
C3608	AE002123	CQGTF0416Z	1 UF 50V F
C3609	BZ110189	E02LU0471M	470 UF 6.3V
C3610	AD301535	E02LU2101M	100 UF 16V
C3611	BZ110189	E02LU0471M	470 UF 6.3V
C3612	AD300789	CQGTF0415Z	0.1 UF 50V F
C3613	AE001544	E50HU3100M	10 UF 25 V
C3614	BZ110189	E02LU0471M	470 UF 6.3V
C3615	BZ110189	E02LU0471M	470 UF 6.3V
C3616	AE000602	E0ELF2222M	2200 UF 16V
C4001	AE002125	CS0PB04B3K	0.0012UF 50V B
C4002	AE001275	CS0PF0415Z	0.1 UF 50V F
C4003	AE003847	CS0PB04K4K	0.027 UF 50V B
C4004	AE001275	CS0PF0415Z	0.1 UF 50V F
C4007	AE001275	CS0PF0415Z	0.1 UF 50V F
C4008	AE001275	CS0PF0415Z	0.1 UF 50V F
C4009	AE000272	E50HU2470M	47 UF 16V
C4010	AE001275	CS0PF0415Z	0.1 UF 50V F
C4011	BZ110150	E50HU0101M	100 UF 6.3V
C4012	AE001275	CS0PF0415Z	0.1 UF 50V F
C4013	AE001275	CS0PF0415Z	0.1 UF 50V F
C4014	AE001275	CS0PF0415Z	0.1 UF 50V F
C4015	AE001275	CS0PF0415Z	0.1 UF 50V F
C4016	AE001275	CS0PF0415Z	0.1 UF 50V F
C4017	AE001275	CS0PF0415Z	0.1 UF 50V F
C4018	AE001275	CS0PF0415Z	0.1 UF 50V F
C4019	AE001275	CS0PF0415Z	0.1 UF 50V F
C4020	AE001275	CS0PF0415Z	0.1 UF 50V F
C4021	BZ110150	E50HU0101M	100 UF 6.3V
C4022	AE001275	CS0PF0415Z	0.1 UF 50V F
C4023	AE001275	CS0PF0415Z	0.1 UF 50V F
C4024	AE001275	CS0PF0415Z	0.1 UF 50V F
C4025	AE001275	CS0PF0415Z	0.1 UF 50V F
C4026	AE001275	CS0PF0415Z	0.1 UF 50V F
C4027	AE001275	CS0PF0415Z	0.1 UF 50V F
C4028	AE001275	CS0PF0415Z	0.1 UF 50V F
C4029	AE001275	CS0PF0415Z	0.1 UF 50V F
C4030	AE001275	CS0PF0415Z	0.1 UF 50V F
C4031	AE001726	CS0PB0414K	0.01 UF 50V B
C4032	AE001725	CS0PB0413K	0.001 UF 50V B
C4033	AE001275	CS0PF0415Z	0.1 UF 50V F
C4034	AE004237	CS0PCH450C	5 PF 50V CH
C4035	AE003856	CS0PCH411J	24 PF 50V CH
C4036	AE002124	CS0PB0315K	0.1 UF 25V B
C4037	AE001275	CS0PF0415Z	0.1 UF 50V F
C4038	AE001726	CS0PB0414K	0.01 UF 50V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C4039	AE001275	CS0PF0415Z	0.1 UF 50V F
C4040	AE001275	CS0PF0415Z	0.1 UF 50V F
C4041	AE001275	CS0PF0415Z	0.1 UF 50V F
C4042	AE002825	CS0PCH411D	10 PF 50V CH
C4043	AE002130	CS0PCH4Q1J	47 PF 50V CH
C4044	BZ110150	E50HU0101M	100 UF 6.3V
C4045	AE001275	CS0PF0415Z	0.1 UF 50V F
C4046	AE001275	CS0PF0415Z	0.1 UF 50V F
C4047	AE001275	CS0PF0415Z	0.1 UF 50V F
C4050	AE001275	CS0PF0415Z	0.1 UF 50V F
C4051	AE001275	CS0PF0415Z	0.1 UF 50V F
C4052	AE001275	CS0PF0415Z	0.1 UF 50V F
C4053	BZ110150	E50HU0101M	100 UF 6.3V
C4056	AE003847	CS0PB04K4K	0.027 UF 50V B
C4057	AE001731	CS0PCH4G2J	180 PF 50V CH
C4058	AE001275	CS0PF0415Z	0.1 UF 50V F
C4059	AE001275	CS0PF0415Z	0.1 UF 50V F
C4060	AE001275	CS0PF0415Z	0.1 UF 50V F
C4061	AE001275	CS0PF0415Z	0.1 UF 50V F
C4062	AE001275	CS0PF0415Z	0.1 UF 50V F
C4063	AE001768	E50HU0221M	220 UF 6.3V
C4064	AE001275	CS0PF0415Z	0.1 UF 50V F
C4065	AE001726	CS0PB0414K	0.01 UF 50V B
C4066	AE000838	CS0PB0N16K	1 UF 10V B
C4067	AE001543	E50HU0470M	47 UF 6.3V
C4068	BZ110150	E50HU0101M	100 UF 6.3V
C4069	AE001543	E50HU0470M	47 UF 6.3V
C4070	AE001768	E50HU0221M	220 UF 6.3V
C4071	AE001543	E50HU0470M	47 UF 6.3V
C4072	AE001275	CS0PF0415Z	0.1 UF 50V F
C4074	AE001275	CS0PF0415Z	0.1 UF 50V F
C4075	AE001275	CS0PF0415Z	0.1 UF 50V F
C4076	AE001275	CS0PF0415Z	0.1 UF 50V F
C4077	AE001275	CS0PF0415Z	0.1 UF 50V F
C4078	BZ110150	E50HU0101M	100 UF 6.3V
C4080	AE001726	CS0PB0414K	0.01 UF 50V B
C4081	AE001275	CS0PF0415Z	0.1 UF 50V F
C4082	AE001275	CS0PF0415Z	0.1 UF 50V F
C4083	BZ110150	E50HU0101M	100 UF 6.3V
C4084	AE001543	E50HU0470M	47 UF 6.3V
C4085	AE001725	CS0PB0413K	0.001 UF 50V B
C4086	AE001725	CS0PB0413K	0.001 UF 50V B
C4087	AE001275	CS0PF0415Z	0.1 UF 50V F
C4088	AE001275	CS0PF0415Z	0.1 UF 50V F
C4089	BZ110034	E50HU1101M	100 UF 10 V
C4090	BZ110034	E50HU1101M	100 UF 10 V
C4091	AE001729	CS0PCH412J	100 PF 50V CH
C4092	AE001729	CS0PCH412J	100 PF 50V CH
C4093	AE001729	CS0PCH412J	100 PF 50V CH
C4094	AE001729	CS0PCH412J	100 PF 50V CH
C4095	AE001726	CS0PB0414K	0.01 UF 50V B
C4096	AE001725	CS0PB0413K	0.001 UF 50V B
C4097	AE001726	CS0PB0414K	0.01 UF 50V B
C4098	AE002825	CS0PCH411D	10 PF 50V CH
C4099	AE001726	CS0PB0414K	0.01 UF 50V B
C4100	BZ110034	E50HU1101M	100 UF 10 V
C4104	AE001725	CS0PB0413K	0.001 UF 50V B
C4201	AE000336	E02LU1101M	100 UF 10V
C4202	AE000838	CS0PB0N16K	1 UF 10V B
C4203	79091097	E50HU2101M	100 UF 16 V
C4204	AE000838	CS0PB0N16K	1 UF 10V B
C4205	AE004235	CS0PB04G4K	0.018 UF 50V B
C4206	AD301762	E50HU52R2M	2.2 UF 50V
C4207	AD301762	E50HU52R2M	2.2 UF 50V
C4208	AE002124	CS0PB0315K	0.1 UF 25V B
C4209	AE001544	E50HU3100M	10 UF 25 V
C4210	AE001735	CS0PCH4W2J	820 PF 50V CH
C4212	AE001735	CS0PCH4W2J	820 PF 50V CH
C4213	AD301536	E02LU2331M	330 UF 16V
C4214	AE001769	E50HU1330M	33 UF 10 V
C4215	AE001727	CS0PB04H3K	0.0022UF 50V B
C4216	AE001727	CS0PB04H3K	0.0022UF 50V B
C4217	79091097	E50HU2101M	100 UF 16 V
C4218	AE001544	E50HU3100M	10 UF 25 V
C4219	BZ110161	CQGTB04H3K	0.0022UF 50V B
C4220	AE002822	CS0PB04E3K	0.0015UF 50V B
C4222	AE002822	CS0PB04E3K	0.0015UF 50V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C4223	AE001544	E50HU3100M	10 UF 25 V
C4225	AE001729	CS0PCH412J	100 PF 50V CH
C4226	AE000838	CS0PB0N16K	1 UF 10V B
C4228	AE001544	E50HU3100M	10 UF 25 V
C4229	AE001544	E50HU3100M	10 UF 25 V
C4230	AE001727	CS0PB04H3K	0.0022UF 50V B
C4231	AE001727	CS0PB04H3K	0.0022UF 50V B
C4232	BZ110263	E50HU2220M	22 UF 16 V
C4233	AE001733	CS0PCH4H2J	220 PF 50V CH
C4234	AE001770	E50HU54R7M	4.7 UF 50V
C4236	AE000336	E02LU1101M	100 UF 10V
C4238	AE002824	CS0PB04H4K	0.022 UF 50V B
C4239	AE001544	E50HU3100M	10 UF 25 V
C4241	AE001544	E50HU3100M	10 UF 25 V
C4242	AE002124	CS0PB0315K	0.1 UF 25V B
C4243	AE002124	CS0PB0315K	0.1 UF 25V B
C4244	AE001729	CS0PCH412J	100 PF 50V CH
C4245	AD301762	E50HU52R2M	2.2 UF 50V
C4246	BZ110263	E50HU2220M	22 UF 16 V
C4247	AD301762	E50HU52R2M	2.2 UF 50V
C4249	AE001728	CS0PB04Q3K	0.0047UF 50V B
C4250	AE001728	CS0PB04Q3K	0.0047UF 50V B
C4252	AE001544	E50HU3100M	10 UF 25 V
C4253	AE001544	E50HU3100M	10 UF 25 V
C4254	AE001544	E50HU3100M	10 UF 25 V
C4255	AE001544	E50HU3100M	10 UF 25 V
C4256	AE001727	CS0PB04H3K	0.0022UF 50V B
C4257	AE000838	CS0PB0N16K	1 UF 10V B
C4258	AE000838	CS0PB0N16K	1 UF 10V B
C4259	AE001733	CS0PCH4H2J	220 PF 50V CH
C4260	AE001729	CS0PCH412J	100 PF 50V CH
C4266	AE002124	CS0PB0315K	0.1 UF 25V B
C4274	AE002124	CS0PB0315K	0.1 UF 25V B
C4275	AE002124	CS0PB0315K	0.1 UF 25V B
C4501	AE001725	CS0PB0413K	0.001 UF 50V B
C4502	AE000838	CS0PB0N16K	1 UF 10V B
C4503	AE001769	E50HU1330M	33 UF 10 V
C4504	AE001770	E50HU54R7M	4.7 UF 50V
C4506	AE001726	CS0PB0414K	0.01 UF 50V B
C4507	AE001275	CS0PF0415Z	0.1 UF 50V F
C4508	AE001728	CS0PB04Q3K	0.0047UF 50V B
C4509	AE001726	CS0PB0414K	0.01 UF 50V B
C4510	BZ110143	E02LU0221M	220 UF 6.3V
C4511	AE001773	P232W1223J	0.022 UF 100V MMTS
C4512	AE001733	CS0PCH4H2J	220 PF 50V CH
C4513	AE002131	CS0PF0414Z	0.01 UF 50V F
C4514	AE001543	E50HU0470M	47 UF 6.3V
C4515	AE001726	CS0PB0414K	0.01 UF 50V B
C4516	BZ110263	E50HU2220M	22 UF 16 V
C4517	AE002124	CS0PB0315K	0.1 UF 25V B
C4519	BZ110263	E50HU2220M	22 UF 16 V
C4520	AE003853	CS0PCH413J	0.001 UF 50V CH
C4521	AE001543	E50HU0470M	47 UF 6.3V
C4522	BZ110074	E50HU5010M	1 UF 50V
C4523	AE001770	E50HU54R7M	4.7 UF 50V
C4524	AE001544	E50HU3100M	10 UF 25 V
C4525	AE001729	CS0PCH412J	100 PF 50V CH
C4526	AE002131	CS0PF0414Z	0.01 UF 50V F
C4527	AD300667	CQGTf0414Z	0.01 UF 50V F
C4528	AE002131	CS0PF0414Z	0.01 UF 50V F
C4529	AE002131	CS0PF0414Z	0.01 UF 50V F
C4530	AE001729	CS0PCH412J	100 PF 50V CH
C4532	AE002131	CS0PF0414Z	0.01 UF 50V F
C4537	AE000838	CS0PB0N16K	1 UF 10V B
C4538	AE001770	E50HU54R7M	4.7 UF 50V
C4539	AE001770	E50HU54R7M	4.7 UF 50V
C4540	AE001544	E50HU3100M	10 UF 25 V
C4541	AE003851	CS0PB04U2K	680 PF 50V B
C4542	AE001730	CS0PCH4E2J	150 PF 50V CH
C4543	AE002824	CS0PB04H4K	0.022 UF 50V B
C4544	AE002124	CS0PB0315K	0.1 UF 25V B
C4545	AE000958	E50HU5R47M	0.47 UF 50V
C4546	AE002124	CS0PB0315K	0.1 UF 25V B
C4547	AE002130	CS0PCH4Q1J	47 PF 50V CH
C4548	AE000835	CS0PB03L4K	0.033 UF 25V B
C4549	AE002124	CS0PB0315K	0.1 UF 25V B
C4550	AE002124	CS0PB0315K	0.1 UF 25V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C4551	AD301762	E50HU52R2M	CE 2.2 UF 50V
C4552	AE000838	CS0PB0N16K	CC 1 UF 10V B
C4553	BZ110217	E50HU53R3M	CE 3.3 UF 50V
C4554	BZ110143	E02LU0221M	CE 220 UF 6.3V
C4556	AD301762	E50HU52R2M	CE 2.2 UF 50V
C4557	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4558	AE000838	CS0PB0N16K	CC 1 UF 10V B
C4559	AE001726	CS0PB0414K	CC 0.01 UF 50V B
C4560	AE000838	CS0PB0N16K	CC 1 UF 10V B
C4561	AE001726	CS0PB0414K	CC 0.01 UF 50V B
C4562	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4563	AE001543	E50HU0470M	CE 47 UF 6.3V
C4564	79091058	CS0PCH430C	CC 3 PF 50V CH
C4565	AE001732	CS0PCH4H1J	CC 22 PF 50V CH
C4566	AE002130	CS0PCH4Q1J	CC 47 PF 50V CH
C4567	AE002131	CS0PF0414Z	CC 0.01 UF 50V F
C4568	AE002131	CS0PF0414Z	CC 0.01 UF 50V F
C4569	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4570	AE001726	CS0PB0414K	CC 0.01 UF 50V B
C4572	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4573	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4576	AE004478	E52H05100M	CE 10 UF 50V
C4577	AE001543	E50HU0470M	CE 47 UF 6.3V
C4578	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4579	BZ110217	E50HU53R3M	CE 3.3 UF 50V
C4580	AE001544	E50HU3100M	CE 10 UF 25 V
C4581	AE001726	CS0PB0414K	CC 0.01 UF 50V B
C4583	AE004479	CQG0CH4N2J	CC 390 PF 50V CH
C4584	AE000838	CS0PB0N16K	CC 1 UF 10V B
C4587	AE001543	E50HU0470M	CE 47 UF 6.3V
C4588	AE002130	CS0PCH4Q1J	CC 47 PF 50V CH
C4601	BZ110255	CQGTB0415K	CC 0.1 UF 50V B
C4602	AE002824	CS0PB04H4K	CC 0.022 UF 50V B
C4603	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4607	AE002824	CS0PB04H4K	CC 0.022 UF 50V B
C4608	BZ110042	E02LU1471M	CE 470 UF 10V
C4622	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C4633	AE003845	CS0PB04G3K	CC 0.0018UF 50V B
C4684	BZ110034	E50HU1101M	CE 100 UF 10 V
C4689	BZ110255	CQGTB0415K	CC 0.1 UF 50V B
C4693	AE002822	CS0PB04E3K	CC 0.0015UF 50V B
C5501	AE001726	CS0PB0414K	CC 0.01 UF 50V B
C5502	AE001543	E50HU0470M	CE 47 UF 6.3V
C5503	AE002124	CS0PB0315K	CC 0.1 UF 25V B
C5504	AE002825	CS0PCH411D	CC 10 PF 50V CH
C5505	79091097	E50HU2101M	CE 100 UF 16 V
C5506	AE001275	CS0PF0415Z	CC 0.1 UF 50V F
C5507	AE002124	CS0PB0315K	CC 0.1 UF 25V B
C5508	AE002124	CS0PB0315K	CC 0.1 UF 25V B
C5509	AE001544	E50HU3100M	CE 10 UF 25 V
C5510	AE000836	CS0PB04S3K	CC 0.0056UF 50V B
C5511	AE001543	E50HU0470M	CE 47 UF 6.3V
C5512	AE001544	E50HU3100M	CE 10 UF 25 V
C5513	AD301762	E50HU52R2M	CE 2.2 UF 50V
C5514	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5515	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5516	AE001544	E50HU3100M	CE 10 UF 25 V
C5517	AE001544	E50HU3100M	CE 10 UF 25 V
C5518	AE001543	E50HU0470M	CE 47 UF 6.3V
C5519	AE001544	E50HU3100M	CE 10 UF 25 V
C5520	AE000836	CS0PB04S3K	CC 0.0056UF 50V B
C5521	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5522	AE001544	E50HU3100M	CE 10 UF 25 V
C5523	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5524	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5525	AE002123	CQGTF0416Z	CC 1 UF 50V F
C5526	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5527	AE001544	E50HU3100M	CE 10 UF 25 V
C5528	AE001544	E50HU3100M	CE 10 UF 25 V
C5529	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5530	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5533	AE000838	CS0PB0N16K	CC 1 UF 10V B
C5539	BZ110150	E50HU0101M	CE 100 UF 6.3V
C5543	AE001737	CS0PF0N16Z	CC 1 UF 10V F
C6614	BZ110217	E50HU53R3M	CE 3.3 UF 50V
C6615	AE002124	CS0PB0315K	CC 0.1 UF 25V B
C6616	AE002124	CS0PB0315K	CC 0.1 UF 25V B

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>CAPACITORS</b>			
C6617	AE001544	E50HU3100M	10 UF 25 V
C6620	BZ110074	E50HU5010M	1 UF 50V
C6621	AE004234	CS0PB02L5K	0.33 UF 16V B
C6622	AE002124	CS0PB0315K	0.1 UF 25V B
C6623	AE002124	CS0PB0315K	0.1 UF 25V B
C6624	AE002130	CS0PCH4Q1J	47 PF 50V CH
C6625	AE002130	CS0PCH4Q1J	47 PF 50V CH
C6626	AE002128	CS0PCH480D	8 PF 50V CH
C6627	AE002128	CS0PCH480D	8 PF 50V CH
C6628	BZ110150	E50HU0101M	100 UF 6.3V
C6630	BZ110150	E50HU0101M	100 UF 6.3V
C6631	AD301535	E02LU2101M	100 UF 16V
C6632	AE000272	E50HU2470M	47 UF 16V
C6633	AD301535	E02LU2101M	100 UF 16V
C6638	AE004235	CS0PB04G4K	0.018 UF 50V B
C6639	AE004235	CS0PB04G4K	0.018 UF 50V B
C8104	AE001730	CS0PCH4E2J	150 PF 50V CH
C8105	AE003854	CS0PCH4B1J	12 PF 50V CH
C8106	AE001730	CS0PCH4E2J	150 PF 50V CH
C8107	AE001730	CS0PCH4E2J	150 PF 50V CH
C8108	AE003854	CS0PCH4B1J	12 PF 50V CH
C8109	AE001730	CS0PCH4E2J	150 PF 50V CH
C8110	AE001729	CS0PCH412J	100 PF 50V CH
C8111	AE003854	CS0PCH4B1J	12 PF 50V CH
C8112	AE002830	CS0PCH4L1J	33 PF 50V CH
C8113	AE000838	CS0PB0N16K	1 UF 10V B
C8114	AE000838	CS0PB0N16K	1 UF 10V B
C8119	BZ110150	E50HU0101M	100 UF 6.3V
C8120	AE001275	CS0PF0415Z	0.1 UF 50V F
C8121	AE001544	E50HU3100M	10 UF 25 V
C8122	AE001725	CS0PB0413K	0.001 UF 50V B
C8125	AE000838	CS0PB0N16K	1 UF 10V B
C8126	AE000838	CS0PB0N16K	1 UF 10V B
<b>DIODES</b>			
D351	BZ410006	D1VT001330	DIODE,SILICON
D401	BZ410019	D97U03001B	DIODE,ZENER
D402	BZ410019	D97U03001B	DIODE,ZENER
D403	BZ410043	D2WT011E10	DIODE,SILICON
D404	BZ410043	D2WT011E10	DIODE,SILICON
D406	BZ410043	D2WT011E10	DIODE,SILICON
D407	BZ410059	D2WT11ES10	DIODE,SILICON
D411	AD300731	D2WXN49370	DIODE,SILICON
D413	AD300731	D2WXN49370	DIODE,SILICON
D601	AE000331	DD1R0MA770	DIODE,SILICON
D602	BZ410043	D2WT011E10	DIODE,SILICON
D603	BZ410043	D2WT011E10	DIODE,SILICON
D606	BZ410058	D97U08R21B	DIODE,ZENER
D607	BZ410058	D97U08R21B	DIODE,ZENER
D608	BZ410058	D97U08R21B	DIODE,ZENER
D609	BZ410061	D97U01001B	DIODE,ZENER
D611	BZ410061	D97U01001B	DIODE,ZENER
D801	BZ410006	D1VT001330	DIODE,SILICON
D802	BZ410006	D1VT001330	DIODE,SILICON
D803	BZ410006	D1VT001330	DIODE,SILICON
D804	BZ410006	D1VT001330	DIODE,SILICON
D805	BZ410006	D1VT001330	DIODE,SILICON
D806	BZ410006	D1VT001330	DIODE,SILICON
D1001	BZ410066	D97U06R21B	DIODE,ZENER
D1003	AD301638	0010E00330	INFRARED LED
D1004	BZ410006	D1VT001330	DIODE,SILICON
D1005	BZ410006	D1VT001330	DIODE,SILICON
D1006	BZ410077	D2WXS1400	DIODE,SCHOTTKY
D1008	BZ410020	D97U05R11B	DIODE,ZENER
D1009	BZ410006	D1VT001330	DIODE,SILICON
D1010	BZ410077	D2WXS1400	DIODE,SCHOTTKY
D1021	BZ410006	D1VT001330	DIODE,SILICON
D1201	BZ410006	D1VT001330	DIODE,SILICON
D1202	BZ410077	D2WXS1400	DIODE,SCHOTTKY
D1252	BZ410006	D1VT001330	DIODE,SILICON
D1261	BZ410006	D1VT001330	DIODE,SILICON
△D1701	BZ410062	D2WTRM11C0	DIODE,SILICON
△D1702	BZ410062	D2WTRM11C0	DIODE,SILICON
△D1703	BZ410062	D2WTRM11C0	DIODE,SILICON
△D1704	BZ410062	D2WTRM11C0	DIODE,SILICON
D1706	BZ410006	D1VT001330	DIODE,SILICON
D1708	BZ410006	D1VT001330	DIODE,SILICON
D1709	AD300731	D2WXN49370	DIODE,SILICON

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		<b>DIODES</b>			
	D1712	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
▲	D1713	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
▲	D1715	BZ410115	D2LKB340L0	DIODE,SCHOTTKY	SB340L-6737
▲	D1716	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
▲	D1717	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
	D1719	BZ410080	D2WXRU2AM0	DIODE,SILICON	RU2AM-EIC
▲	D1720	AD300731	D2WXN49370	DIODE,SILICON	1N4937
▲	D1721	BZ410126	D2WXRU3AM0	DIODE,SILICON	RU3AM-EIC
	D1723	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D1725	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
▲	D1727	AE000601	D28F31DQ06	DIODE,SILICON	31DQ06-FC
	D2201	BZ410054	0021721150	LED	SLR-342VCT32
	D2203	BZ410054	0021721150	LED	SLR-342VCT32
	D2204	BZ410054	0021721150	LED	SLR-342VCT32
	D2303	BZ410086	DD7R0S3550	DIODE,SILICON	1SS355 TE-17
	D2304	BZ410086	DD7R0S3550	DIODE,SILICON	1SS355 TE-17
	D3001	BZ410094	D97U01501B	DIODE,ZENER	MTZJ15B T-77
	D3002	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
	D3003	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
	D3602	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
	D4001	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D4002	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D4003	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D4004	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D4005	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D4203	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D4501	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D8101	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D8111	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
	D8112	BZ410086	DD7R0S3550	DIODE SILICON	1SS355 TE-17
			<b>ICS</b>		
▲	IC353	AD302184	I0FSP7522N	IC	AN7522N
▲	IC401	BZ611081	I0WTD81740	IC	TDA8174A
	IC601	AE004240	I0WDE2248H	IC	STV2248H
	IC1003	AD301641	I9UF032310	IC	PST3231NR
	IC1006	AE007671	I54F50144C	IC	OEC0144C
	IC1099	AE007663	A5T205T015	INIT DATA	BR24L08F-WE2
	IC1201	AE007672	ICKF0310A1	IC	ET-TV0310A/Q
	IC1202	BZ611091	I0UF012310	IC	MM1231XF
▲	IC1701	AE000604	I2BT068530	IC	STR-W6853
▲	IC1704	AE002809	000220002W	PHOTO COUPLER	PS2561AL1-1-V(W)
▲	IC2301	AE003581	I03F065650	IC	LA6565-TE-L-E
	IC2304	AE005769	I07J003580	IC	BA10358FV-E2
▲	IC3002	BZ611015	I1KA97805A	IC	KIA7805API
▲	IC3003	BZ611015	I1KA97805A	IC	KIA7805API
▲	IC3101	BZ611033	I1KA97809A	IC	KIA7809API
▲	IC3601	BZ611033	I1KA97809A	IC	KIA7809API
▲	IC3602	BZ611015	I1KA97805A	IC	KIA7805API
▲	IC3603	BZ611015	I1KA97805A	IC	KIA7805API
	IC4001	AE005760	ICQK068620	IC	ZR36862PQCG
	IC4002	AE005421	I57J0L02F0	IC	BR24L02F-WE2
▲	IC4003	AE006061	I07F9E00W0	IC	BA33E00WHFP-TR
	IC4007	AE007678	S5T205TF01	MEMORY DATA	SST39VF800A-70-4C-EKE
	IC4008	AE006454	IFLJ0622H6	IC	K4S161622H-UC60
	IC4009	AE006454	IFLJ0622H6	IC	K4S161622H-UC60
	IC4201	AE001295	I0QJ045800	IC	NJM4580M(Te1)
	IC4204	AD301988	I0UF015010	IC	MM1501XNRE
	IC4205	AD301988	I0UF015010	IC	MM1501XNRE
	IC4501	AE000033	I04F38225F	IC	HA118225F
	IC5501	BZ611051	I0KF79605H	IC	TDA9605H
	IC5502	AD301988	I0UF015010	IC	MM1501XNRE
	IC5503	AD301988	I0UF015010	IC	MM1501XNRE
	IC6602	BZ611137	I19FF34150	IC	MSP3415G-QG-B8
▲	IC6603	BZ611015	I1KA97805A	IC	KIA7805API
	IC8102	AE003584	I17F017530	IC	PCM1753DBQR
			<b>TRANSISTORS</b>		
	Q301	AE002626	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
	Q302	AE002626	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
	Q303	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
	Q305	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
	Q306	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
▲	Q401	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
	Q405	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT
▲	Q406	BZ510040	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)
	Q602	AE002626	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
	Q603	BZ510025	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146
	Q604	BZ510114	T8AA03881S	TRANSISTOR,SILICON	KTC3881S-RTK

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>TRANSISTORS</b>			
Q607	AE005961	TCATC31970	TRANSISTOR,SILICON
Q608	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
Q610	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q611	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
▲Q801	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
▲Q802	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
▲Q803	BZ510100	TCATC3199Y	TRANSISTOR,SILICON
▲Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON
▲Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON
▲Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON
Q1001	BZ410107	0002700690	PHOTO COUPLER
Q1002	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
Q1003	BZ410106	0002700680	PHOTO COUPLER
Q1004	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
Q1005	BZ410107	0002700690	PHOTO COUPLER
Q1006	BZ410097	0000M00390	PHOTO TRANSISTOR
Q1007	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
Q1008	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
Q1009	BZ410106	0002700680	PHOTO COUPLER
Q1010	BZ510026	TPYJC05001	COMPOUND TRANSISTOR
Q1011	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1015	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1016	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1017	BZ410097	0000M00390	PHOTO TRANSISTOR
Q1101	BZ510074	TDAT00863Y	TRANSISTOR,SILICON
Q1104	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1253	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1262	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q1703	BZ510069	TCATC31980	TRANSISTOR,SILICON
Q1705	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q1706	BZ510087	TCAT032070	TRANSISTOR,SILICON
Q2301	BZ510112	T67J1036K0	TRANSISTOR,SILICON
Q2302	AE003592	T67J048TL0	TRANSISTOR,SILICON
Q2303	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q2304	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q2305	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
▲Q3001	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
▲Q3002	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
▲Q3006	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
▲Q3101	BZ510057	TAAT01281Y	TRANSISTOR,SILICON
Q3102	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q3601	BZ510070	TCAT032034	TRANSISTOR,SILICON
! Q3602	AD301934	TBA0013660	TRANSISTOR,SILICON
Q3603	BZ510070	TCAT032034	TRANSISTOR,SILICON
▲Q3605	BZ510057	TAAT01281Y	TRANSISTOR,SILICON
Q3606	BZ510069	TCATC31980	TRANSISTOR,SILICON
▲Q3607	BZ510105	TCAT03209Y	TRANSISTOR,SILICON
▲Q3608	BZ510005	TA3T1371A0	TRANSISTOR,SILICON
Q3609	BZ510011	TC3T029090	TRANSISTOR,SILICON
Q3611	AE000613	TNATC03002	COMPOUND TRANSISTOR
Q4004	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4201	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4202	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
Q4203	BZ510045	TNYJD05001	COMPOUND TRANSISTOR
Q4204	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4205	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4206	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4207	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4208	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4209	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
Q4210	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4211	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4212	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4213	BZ510025	TPYJB05001	COMPOUND TRANSISTOR
Q4214	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4215	BZ510081	TPYJA05001	COMPOUND TRANSISTOR
Q4216	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4217	BZ510025	TPYJB05001	COMPOUND TRANSISTOR
Q4218	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4501	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4502	BZ510070	TCAT032034	TRANSISTOR,SILICON
Q4505	BZ510026	TPYJC05001	COMPOUND TRANSISTOR
Q4506	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4507	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4508	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q4606	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
Q4607	AE002626	T8YJ2412K0	TRANSISTOR,SILICON



# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>TRANSISTORS</b>			
Q4618	AE002626	T8YJ2412K0	TRANSISTOR,SILICON
Q8101	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
<b>COILS &amp; TRANSFORMERS</b>			
L352	BZ310181	02A6B2E0A1	CORE,FERRITE
L401	BZ310004	021679472K	COIL
L402	BZ310013	0221000013	COIL,LINEARITY
▲L505	AE002186	02D1000060	COIL,CHOKE
L602	BZ310005	02167D101K	COIL
L603	79091204	021LA61R5J	COIL
L606	BZ310077	021LA61R0M	COIL
L607	BZ310049	021LA6R22M	COIL
L608	AD301445	021LA6100J	COIL
L610	BZ310002	021673101K	COIL
L611	BZ310002	021673101K	COIL
L612	BZ310148	033700005R	COIL,VIDEO IFT
L613	BZ310041	02167F101J	COIL
L614	AD301445	021LA6100J	COIL
L617	AE007657	021LA6180J	COIL
L801	BZ310170	021673151K	COIL
L802	BZ310170	021673151K	COIL
L803	BZ310170	021673151K	COIL
L1001	AD300910	021LA6150J	COIL
L1203	BZ310141	02167F100J	COIL
L1204	BZ310041	02167F101J	COIL
L1205	BZ310141	02167F100J	COIL
▲L1701	AE000571	029X000109	COIL,LINE FILTER
L1702	BZ310181	02A6B2E0A1	CORE,FERRITE
▲L1703	BZ310195	028R200015	COIL,DEGAUSS
L2201	BZ310052	021LA6100K	COIL
L2202	BZ310052	021LA6100K	COIL
L3001	BZ310002	021673101K	COIL
L4001	BZ310191	02167F2R2J	COIL
L4002	BZ310118	02AHB9A972	CORE,FERRITE
L4201	AD301445	021LA6100J	COIL
L4202	BZ310041	02167F101J	COIL
L4203	AD301445	021LA6100J	COIL
L4204	AD301445	021LA6100J	COIL
L4207	BZ310001	021673101J	COIL
L4208	AD301445	021LA6100J	COIL
L4502	BZ310005	02167D101K	COIL
L4503	BZ310054	0316260088	COIL,BIAS OSC
L4505	BZ310041	02167F101J	COIL
L4506	BZ310041	02167F101J	COIL
L4507	BZ310071	021LA6820K	COIL
L4508	BZ310039	02167F220J	COIL
L4509	BZ310039	02167F220J	COIL
L4510	AE000773	021LA6120J	COIL
L4511	AE004221	021LA6390J	COIL
L4512	BZ310041	02167F101J	COIL
L4514	BZ310010	021LA6390K	COIL
L4601	BZ310171	032623004T	COIL,TRAP
L4602	BZ310041	02167F101J	COIL
L4608	BZ310056	021673102K	COIL
L5501	BZ310041	02167F101J	COIL
L5502	BZ310041	02167F101J	COIL
L6601	BZ310198	02167D220K	COIL
L6602	BZ310198	02167D220K	COIL
L6603	BZ310198	02167D220K	COIL
L8102	AE000828	02167F1R0K	COIL
L8103	AE000828	02167F1R0K	COIL
L8104	AE000828	02167F1R0K	COIL
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRI
▲T1701	AE000573	0481420674	TRANSFORMER,SWITCHIN
<b>JACKS</b>			
▲J801	AD301356	066F130020	SOCKET,CATHODE RAY,TUBE
J2201	AE003431	060J131016	HEADPHONE JACK
J2202	AE002949	060J421036	RCA JACK
J2203	AE002950	060J421037	RCA JACK
J2204	AE002951	060J421030	RCA JACK
J4201	AE002430	063D100050	SOCKET,21PIN
J8007	AE002760	060J411033	RCA JACK
<b>SWITCHES</b>			
SW1001	BZ612016	0508S11001	SWITCH (LEAF)
▲SW1702	AE000574	0530105019	SWITCH
SW2201	BZ612010	0504101T34	SWITCH,TACT
SW2202	BZ612010	0504101T34	SWITCH,TACT
SW2203	BZ612010	0504101T34	SWITCH,TACT
			LSA-1144EAU
			ESB92S22B
			EVQ21505R
			EVQ21505R
			EVQ21505R



# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>MISCELLANEOUS</b>			
▲CD1701	AE005263	1206455820	CORD,AC BUSH 6455820
CD1704	BZ614180	06CHU2017A	CORD,CONNECTOR CHU2017A
CD2201	BZ614264	06CH01429A	CORD,EIS CONNECTOR CH01429A
CD2251	AE000583	06CU230702	CORD,JUMPER CU230702
CD4002	AE005945	06C32B3303	CORD,CONNECTOR C32B3303
CD4005	BZ614373	122F061502	CORD,JUMPER 2F061502
CD4501	BZ614373	122F061502	CORD,JUMPER 2F061502
CD4503	AE007029	W9L6012042	FLAT CABLE AWM2468 A WG26 2C BLACK 120MM
CD8005	AE000584	06CU2F2201	CORD,CONNECTOR CU2F2201
CD8006	BZ614414	06CU2D3001	CORD,CONNECTOR CU2D3001
CD8101	AE000134	122HOC2204	CORD,JUMPER 2HOC2204
CP1001	BZ614289	06972C0010	CONNECTOR PCB SIDE TMC-J12P-B2
CP1702	BZ614283	069S420110	CONNECTOR PCB SIDE A1561WV2-2P
CP1704	BZ614176	069S320419	CONNECTOR PCB SIDE A3963WV2-3PD
CP2201	BZ614350	069S230629	CONNECTOR PCB SIDE A2001WV2-3P
CP2301	AE003571	069GYOT119	CONNECTOR PCB SIDE 09-5000-024-001-001
CP2302	AE005934	069EV53030	CONNECTOR PCB SIDE 00_6232_005_006_800+
CP2303	AE005935	069EV63030	CONNECTOR PCB SIDE 00_6232_006_006_800+
CP3601	AE000579	069S2F0629	CONNECTOR PCB SIDE A2001WV2-15P
CP3602	BZ614420	069S2D0629	CONNECTOR PCB SIDE A2001WV2-13P
CP3603	BZ614444	069D01001A	CONNECTOR PCB SIDE 003P-2100
CP4501	BZ614011	0697290620	CONNECTOR PCB SIDE TOC-C09X-A1
CP4503	AD301649	067U002019	WIRE HOLDER B2013H02-2P
CP4505	AE001239	069J760599	CONNECTOR PCB SIDE IMSA-9604S-06C
CP6601	AE006483	069J1D0271	CONNECTOR PCB SIDE IMSA-6035B-13Z002-PT
CP6602	AE006484	069J150271	CONNECTOR PCB SIDE IMSA-6035B-05Z002-PT
CP8001	BZ614214	069S2B0629	CONNECTOR PCB SIDE A2001WV2-11P
CP8002	AE004335	069J7C0599	CONNECTOR PCB SIDE IMSA-9604S-12C
CP8101	AE006053	069J7C0589	CONNECTOR PCB SIDE IMSA-9604S-12F
CP852A	BZ614334	067U004029	WIRE HOLDER B2013H02-4P
CP852B	BZ614334	067U004029	WIRE HOLDER B2013H02-4P
CP853B	AD300098	069R270589	CONNECTOR PCB SIDE 52147-0710
CUS011	BZ710279	800WFAA006	CUSHION A
CUS012	BZ710148	800WFAA007	CUSHION B
CUS013	BZ710149	800WFAA008	CUSHION C
EL001	BZ614044	124120301A	EYE LET XRY20X30BD
EL002	BZ614043	124116281A	EYE LET XRY16X28BD
▲F1701	BZ614486	080NT04004	FUSE 50T040H
▲FB401	AE003174	043220060F	TRANSFORMER,FLYBACK FJN20A002_M
FH1701	AE002634	06710T0009	HOLDER,FUSE EYF-52BCY
FH1702	AE002634	06710T0009	HOLDER,FUSE EYF-52BCY
OS2202	AD301949	0773071003	REMOTE RECEIVER RPM7138-WH10
▲RY1701	AE007598	0560V20119	RELAY ALKS321_M60
▲SP351	AE006459	070N546012	SPEAKER YDP4010-2
▲SP353	AE006459	070N546012	SPEAKER YDP4010-2
TM101	AE007658	076D0KT030	TRANSMITTER ORT204N2605010-Z
▲TU601	AE007596	0145517015	TUNER,VHF-UHF FUJWRF4EG-778F2D P3
▲TH1701	BZ410050	D8R0A140M0	DEGAUSS ELEMENT PTDA11BF140M200
▲V801	AE005627	0981210456	CRT W/DY A51LYZ095X80
X601	BZ613024	100CT4R408	CRYSTAL HC-49/U
X1001	AE004679	100GT01006	CRYSTAL B10000C001
X1002	BZ613006	100DA32R01	CRYSTAL DT-26
X1201	BZ613012	100CT01302	CRYSTAL HC-49/U-S
X4001	AD301803	100BT02701	CRYSTAL HC-49U/S
X4501	AE000023	100DT4R410	CRYSTAL AT-49
X6602	BZ613042	100CT01803	CRYSTAL HC-49/U-S
<b>RESISTOR</b>			
	RC.....	CARBON RESISTOR	
<b>CAPACITORS</b>			
	CC.....	CERAMIC CAPACITOR	
	CE.....	ALUMI ELECTROLYTIC CAPACITOR	
	CP.....	POLYESTER CAPACITOR	
	CPP.....	POLYPROPYLENE CAPACITOR	
	CPL.....	PLASTIC CAPACITOR	
	CMP.....	METAL POLYESTER CAPACITOR	
	CMPL.....	METAL PLASTIC CAPACITOR	
	CMPP.....	METAL POLYPROPYLENE CAPACITOR	

**TOSHIBA CORPORATION**

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN