FILE NO. 120-200229

TOSHIBA

SERVICE MANUAL

VIDEO CASSETTE RECORDER

V-E59
V-E39
V-E29

APR, 2002

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1. Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

2. When reinstalling the chassis and its assemblies, be sure to restore all pretective devices, including : control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people--particularly children --might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

   If the measured resistance is less than 1.0 megohm or greater than 5.2 megohms, an abnormality exists that must be corrected before the unit is returned to the customer.

4. Leakage Current Hot Check (See Fig. 1-1) :
   Warning : Do not use an isolation transformer during this test. Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI C101.1, *Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

5. With the unit completely reassembled, plug the AC line cord directly the power outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known erath ground (metal water pipe, conduit, etc.) and all exposed metal parts, including : antennas, handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

6. X-ray Limits :
   The picture tube is designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type as the original.

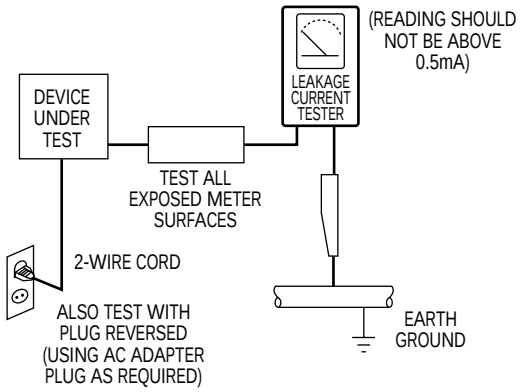


Fig. 1-1 AC Leakage Test

7. Antenna Cold Check :
   With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. Connect one lead of the ohmmeter to an AC prong.
   Connect the other lead to the coaxial connector.

8. High Voltage Limit :
   High voltage must be measured each time servicing is done on the B+, horizontal deflection or high voltage circuits.

   Heed the high voltage limits. These include the *X-ray protection Specifications Label*, and the *Product Safety and X-ray Warning Note* on the service data schematic.

9. Some semiconductor ("solid state") devices are easily damaged by static electricity.
   Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.

10. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging Wrist-strap device. (Be sure to remove it prior to applying power--this is an electric shock precaution.)

11. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

12. Design Alteration Warning :
Never alter or add to the mechanical or electrical design of this unit. Example : Do not add auxiliary audio or video connectors.
Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.

13. Hot Chassis Warning :
Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord. If an isolation transformer is not used, these units may be safely serviced only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC source.

To confirm that the AC power plug is inserted correctly, do the following : Using an AC voltmeter, measure the voltage between the chassis and a known earth ground. If the reading is greater than 1.0V, remove the AC power plug, reverse its polarity and reinsert. Re-measure the voltage between the chassis and ground.

14. Some TV chassis are designed to operate with 85 volts AC between chassis and ground, regardless of the AC plug polarity. These units can be safely serviced only if an isolation transformer inserted between the receiver and the power source.

15. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

16. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

17. Observe the original lead dress, especially near the following areas : Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.

18. Picture Tube Implosion Warning :
The picture tube in this receiver employs "integral implosion" protection. To ensure continued implosion protection, make sure that the replacement picture tube is the same as the original.

19. Do not remove, install or handle the picture tube without first putting on shatterproof goggles equipped with side shields. Never handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; do not try to remove such "permanently attached" yokes from the picture tube.

20. Product Safety Notice :
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original--even if the replacement is rated for higher voltage, wattage, etc.

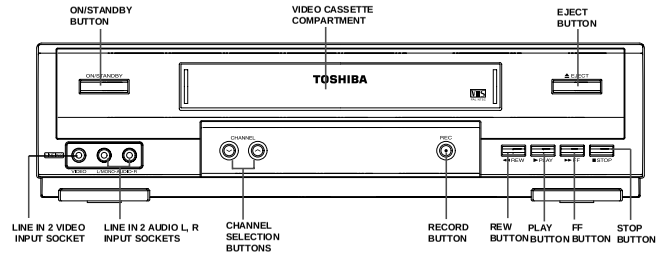
Components that are critical for safety are indicated in the circuit diagram by shading, ( or).
Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

2. Reference Information

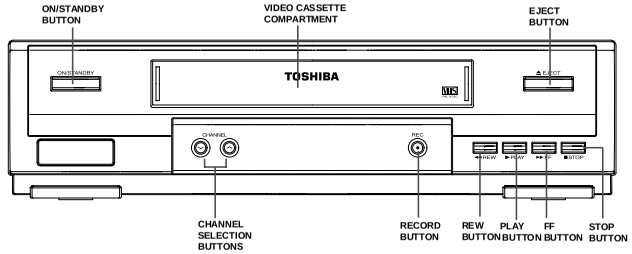
2-1 Operation of Controls

Front View of the VCR

V-E59



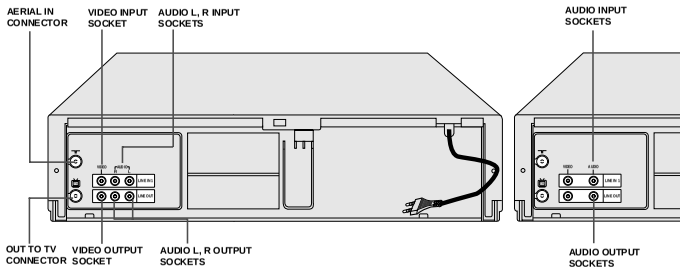
V-E39/V-E29



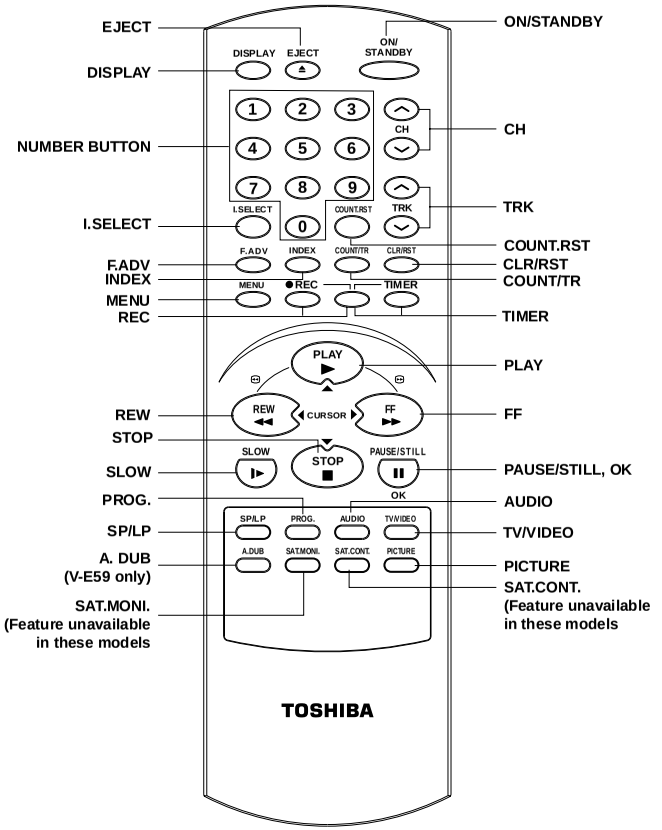
Rear View of the VCR

V-E59

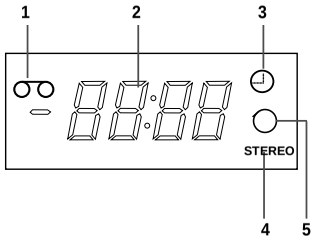
V-E39/V-E29



Infrared Remote Control



Display Indicator



1 Cassette loaded indicator
2 Multi-function display
3 Timer indicator (HH):MM
4 Hi-Fi Stereo indicator (V-E59 only)
5 Rec indicator

Accessories

You have just purchased a Toshiba Video Cassette Recorder (VCR).
Together with your VCR, you will find the following accessories in the box.

Deciding How to Connect Your VCR

You must take into account various factors when connecting audio or video systems:

- ***Types of connectors available on your systems***
- ***Systems connected permanently to the VCR or temporarily (camcorder for example)***

Your VCR is equipped with the following connectors.

Connector	Location	Type	Direction	Recommended Use
LINE IN 1 V-E59 V-E39/V-E29	Rear  	Audio/Video RCA	In	◆ Camcorder ◆ Other VCR
Line out V-E59 V-E39/V-E29	Rear  	Audio/Video RCA	Out	◆ Television ◆ Other VCR ◆ Audio Hi-Fi system (V-E59 only)
LINE IN 2 V-E59	Front 	Audio/Video RCA	In	◆ Audio Hi-Fi system ◆ Camcorder ◆ Other VCR
OUT TO TV	Rear 	75 Ω coaxial	Out	◆ Television
IN FROM ANT.	Rear 	75 Ω coaxial	In	◆ Aerial ◆ Cable television network

Whenever you connect an audio or video system to your VCR, ensure that all elements are switched off.

Refer to the documentation supplied with your equipment for detailed connection instructions and associated safety precautions.

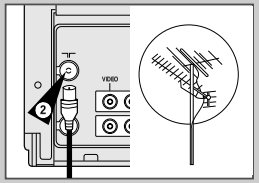
Connecting Your VCR to the TV using the Coaxial Cable

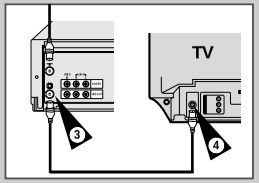
To receive television programmes a signal must be received from one of the following sources:

- ***An outdoor aerial***
- ***An indoor aerial***
- ***A cable television network***

Make sure that both the television and the VCR are switched off before connecting the cables.

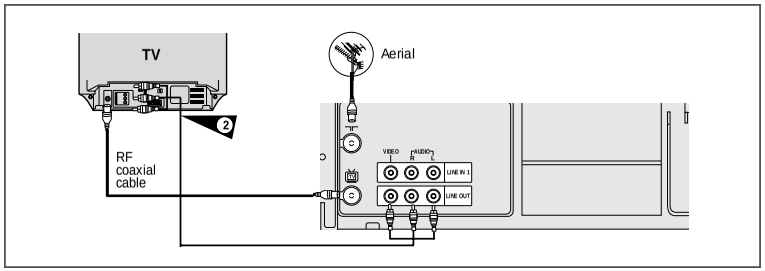
1	Remove the aerial or network input cable from the television.
2	Connect this cable to the 75Ω coaxial socket marked ⊐⊏ on the rear of your VCR.
3	Plug the coaxial cable supplied into the TV socket on your VCR.
4	Plug the other end of the coaxial cable into the connector previously used for the aerial on the television.
5	To obtain better quality pictures and sound on your television, you can also connect your VCR to the television via the RCA cable (see section below) if your television is equipped with this type of connection.





This owner's manual uses the illustration of V-E59. V-E39/V-E29 models may have some differences in appearance from the illustration.

Connecting Your VCR to the TV using the RCA Cable



You can connect your VCR to the television using the RCA cable if the appropriate input is available on the television. You thus:

- ***Obtain better quality sound and pictures***
- ***Simplify the setting up procedure of your VCR***

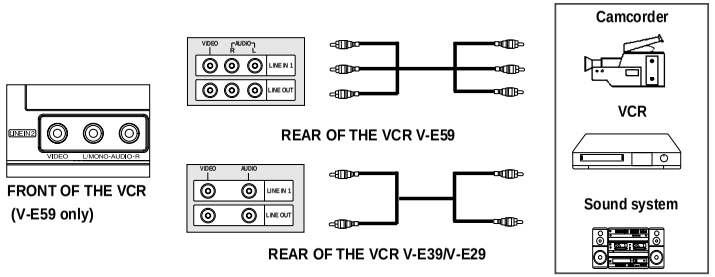
- Regardless of the type of connection chosen, you must always connect the coaxial cable supplied. Otherwise, no picture will be visible on the screen when the VCR is switched off.
- Make sure that both the television and the VCR are switched off before connecting the cables.

1	Connect the coaxial cable as indicated in the above section.
2	Connect one end of the RCA Audio/Video cable to the Video output and Audio L, R output socket on the rear of the VCR.
3	Plug the other end into the appropriate connector on the television.

Connecting Other Equipment to Your VCR

You can connect other audio and/or video equipment to your VCR in different ways. The following illustrations give a few examples of the connection possibilities.

The RCA input/output connectors on the rear of the VCR are used for equipment, such as camcorders, VCRs or sound systems.



Plug & Auto Set Up

Your VCR will automatically set itself up when it is plugged into the mains for the first time. TV stations will be stored in memory. The process takes a few minutes. Your VCR will then be ready for use.

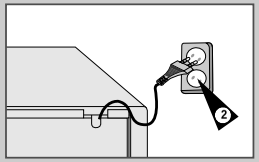
1 Connect the coaxial cable as indicated on page 9.
(Connecting Your VCR to the TV Using the Coaxial Cable)

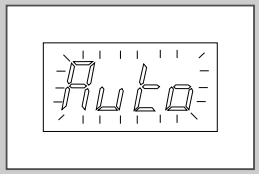
2 Plug the VCR into the mains.
A message appears "AUTO SET-UP WILL BE STARTED. CHECK ANTENNA AND TV CABLE CONNECTION" and then press OK button to proceed.

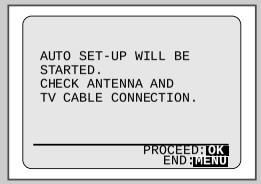
3 Press the ▶ button, until the RF Receiving **System** option is selected and press OK to continue..

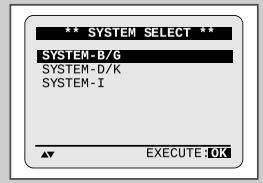
4 The process will finish after a few minutes.
- The number of stations automatically stored by the VCR depends on the number of stations that it has found.

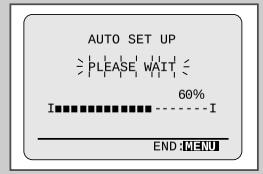
5 On completion, press MENU twice to exit the menu.

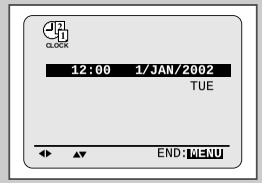




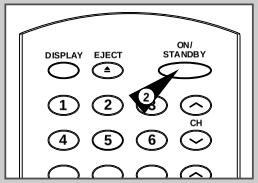


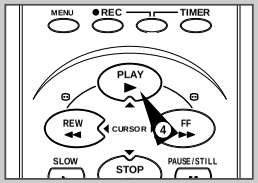






Tuning Your Television for the VCR





You must tune your television for the VCR only if you are <u>not</u> using a RCA cable

➢ To view pictures from your VCR when a RCA cable is used, the television must be set to the audio/video mode (AV).

1 Switch on the television.

2 Switch on the VCR by pressing ON/STANDBY on the front of the VCR or VCR ON/STANDBY on the remote control.

3 Select a programme position on the television to be reserved for use with your VCR.

4 Insert the video cassette in the VCR. Check that the VCR starts reading the cassette; if not, press ▶ button.

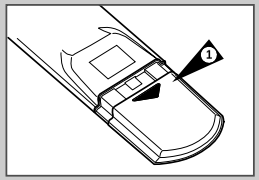
5 Start a scan on your television or set the television to UHF channel 60.

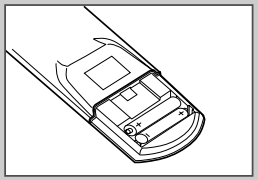
6 Fine tune the television until the pictures and sound are obtained clearly.

7 If you cannot find the pictures and sound, or there is interference from nearby channels, it may be necessary to change the setting of the VCR output channel (see Solving Problems section of this manual).

8 When the picture and sound are perfectly clear, store this channel at the desired programme position on the television.
<u>Result</u>: That programme is now reserved for use with your VCR.

Inserting Batteries in the Remote Control





You must insert or replace the batteries in the remote control when you:

- ***Purchase the video cassette recorder***
- ***Find that the remote control is no longer working correctly***

1 Push the tab in the direction of the arrow to release the battery compartment cover on the rear of the remote control.

2 Insert two AAA, R03 or equivalent batteries, taking care to respect the polarities:
- + on the battery with + on the remote control
- – on the battery with – on the remote control

3 Replace the cover by aligning it with the base of the remote control and pushing it back into place.

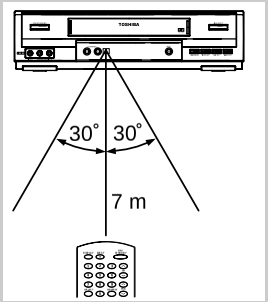
➢ Do not mix different battery types (manganese and alkaline for example).

Notes on Batteries

- ***The life of the batteries is about 1 year depending on the conditions of use.***
- ***If the remote control does not operate correctly, replace all batteries with new ones.***
- ***Do not dispose of the batteries by fire.***
- ***If the remote controller is not to be used for a long period of time, remove the batteries to avoid possible damage from battery corrosion.***

Caring for the Remote Controller

- ***When using the remote controller, press the buttons at intervals of about 1 second to ensure the correct mode of operation.***
- ***Keep the remote controller away from extremely hot or humid places and avoid sharp impacts.***
- ***Do not expose the remote sensor of the VCR to a strong light source such as direct sunlight or illumination (especially high-frequency lighting) when using the remote controller.***
- ***Be careful do not to spill water on the remote controller or to place it on anything wet.***



Notes:
Point the remote controller at the VCR and press the buttons within the operating range as illustrated.
Distance: within about 7 m from the front of the remote sensor.
Angles : within about 30° in every direction.

Setting the Date and Time

Your VCR contains a 24-hour clock and calendar used to:

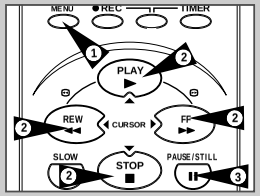
- ***Automatically stop programme recording***
- ***Preset your VCR to record a programme automatically***

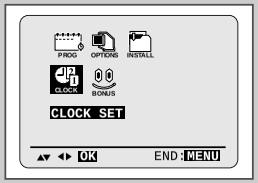
You must set the date and time when:

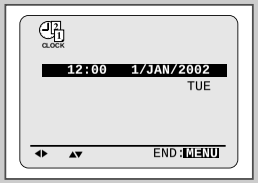
- ***You purchase the video cassette recorder***
- ***The power supply remains off for more than 1 hour***

☞ Do not forget to reset the time when you change clocks from winter to summer time and vice versa.

1	Press MENU on the remote control. Result: The programming menu is displayed.
2	Press the corresponding ▲, ▼ or ◄, ► buttons to select the **CLOCK SET** option.
3	Press the OK button to select this option. Result: The **CLOCK SET** menu is displayed.
4	Press ◄ or ► to select the hour, minutes, day, month and year. Result: The option selected flashes.
5	Press the ▲ or ▼ buttons to increase or decrease the value. Result: The day of the week is displayed automatically. ➢ You can hold the ▲ or ▼ buttons down to scroll more quickly through the values.
6	On completion, press MENU twice to exit the menu.



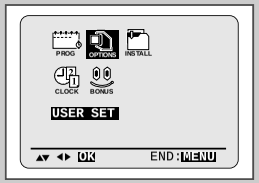




Displaying/Hiding On-Screen Information

Your VCR displays most information both on the VCR and the television.

You can choose to display or hide this information on the television screen (except for the Index, Programming MENU which cannot be hidden).



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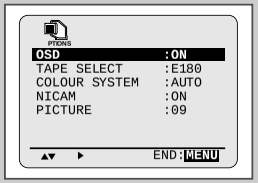
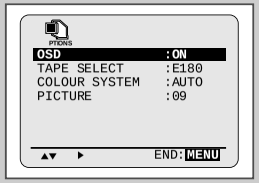


V-E39/V-E29

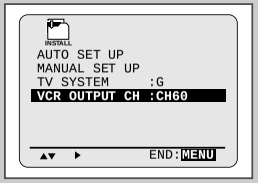


1	Press MENU on the remote control. Result: The programming menu is displayed.	
2	Press the corresponding ▲, ▼ or ◄, ► buttons to select the **USER SET** option.	
3	Press the OK button to select this option. Result: The **USER SET** menu is displayed.	
4	Press the corresponding ▲ or ▼ buttons, until the **OSD** option is selected.	
5	**To...**	**Press ◄ or ►, until...**
	Display on-screen information	**ON** is displayed.
	Hide on-screen information	**OFF** is displayed.
6	On completion, press MENU twice to exit the menu.	

Setting the VCR Output Channel

Your VCR output channel may need to be changed if the pictures suffer from interference or if your TV cannot find the pictures. Also, you can change the VCR output channel to adjust the frequency in which information is displayed on the screen.

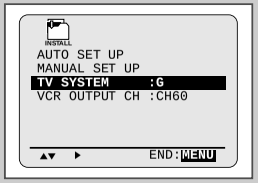
1. Press MENU on the remote control.
   Result: The programming menu is displayed.
2. Press the corresponding ▲, ▼ or ◄, ► buttons to select the **INSTALLATION** option.
3. Press the OK button to select this option.
   Result: The **INSTALLATION** menu is displayed.
4. Press the corresponding ▲ or ▼ buttons, until the **VCR OUTPUT CH** option is selected.
5. Select the required output channel by pressing the ◄ or ► buttons.
6. On completion, press MENU twice to exit the menu.
   Then tune your television again (see page 12).



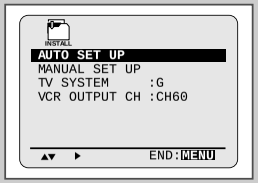
Selecting the RF OUT Sound Mode (G, I, K)

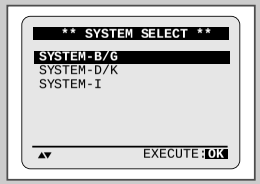
You must choose the sound mode (G, I ,K) according to the TV set connected to your VCR.

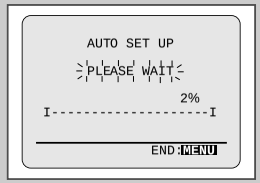
1. Press MENU on the remote control.
   Result: The programming menu is displayed.
2. Press the corresponding ▲, ▼ or ◄, ► buttons to select the **INSTALLATION** option.
3. Press the OK button to select this option.
   Result: The **INSTALLATION** menu is displayed.
4. Press the corresponding ▲ or ▼ buttons, until the **TV SYSTEM** option is selected.
5. Press the ► button to select G, I ,K.
6. On completion, press MENU twice to exit the menu.



Presetting the Stations Automatically







☛ You do not need to preset the stations if you have already set them automatically (see Plug & Auto Set Up on page 11).

Your VCR contains a built-in tuner used to receive television broadcasts.

You must preset the stations received through the tuner. This can be done:

- ***Plug & Auto Set up (see page 11)***
- ***Automatically***
- ***Manually (see page 17)***

You can store up to 80 stations.

1. Press the MENU button on the remote control.
   Result: The programming menu is displayed.
2. Press the corresponding ▲, ▼ or ◄, ► buttons to select the **INSTALLATION** option.
3. Press the OK button to select this option.
   Result: The **INSTALLATION** menu is displayed.
4. Press the corresponding ▲ or ▼ buttons, until the **AUTO SET UP** option is selected.
   Press the ► button to select this option.
5. Press the ► button, until the RF Receiving **System** option is selected.
6. Press OK to start the auto scanning.
   Result:
   - The **PLEASE WAIT** indication flashes on the television screen.
   - The first frequency band is scanned and the first station found is displayed and stored.
   - The VCR then searches for the second station and so on.
   - When the automatic scanning procedure has finished, the VCR switches automatically to programme 1.

   ➢ The number of stations automatically stored by the VCR depends on the number of stations that it has found.
7. If you wish to cancel the auto scanning before the end, press the MENU button three times to exit the menu.

➢
- Once the auto scanning procedure has finished, some stations may have been stored more than once; select the stations with the best reception and delete the ones no longer required (see page 18).

Presetting the Stations Manually

Your VCR contains a built-in tuner used to receive television broadcasts.

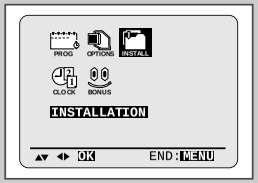
You must preset the stations received through the tuner. This can be done:

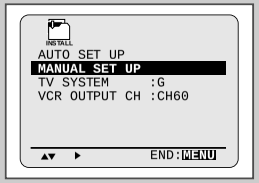
- ***Plug & Auto Set up (see page 11)***
- ***Automatically (see page 16)***
- ***Manually***

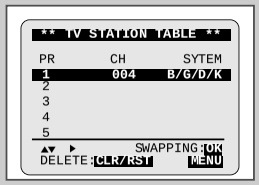
You can store up to 50 stations.

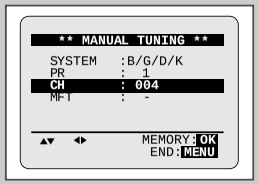
You do not need to preset the stations manually if you have already set them automatically.

1	Press the MENU button on the remote control. Result: The programming menu is displayed.
2	Press the corresponding ▲, ▼ or ◀, ▶ buttons to select the **INSTALLATION** option.
3	Press the OK button to select this option. Result: The **INSTALLATION** menu is displayed.
4	Press the corresponding ▲ or ▼ buttons, until the **MANUAL SET UP** option is selected.
5	Press the ▶ button to select **MANUAL SET UP** option. Result: The **TV STATION TABLE** menu is displayed.
6	Press the ▲ or ▼ buttons to select a programme number as required.
7	Press the ▶ button to preset the station. Result: The **MANUAL TUNING** menu is displayed.
8	Press the ◀ or ▶ buttons to start scanning. Result: The frequency band is scanned and the first station found is displayed. If you know the number of the channel you want, press the numeric buttons on the remote control for example, for channel 04, first press "0" and then press "0", "4" (see page 41).
9	**If you... / Then...** Wish to store the station displayed: ◆ Press the corresponding ▲ or ▼ buttons, until the **MFT** is selected. ◆ Press the ◀ or ▶ buttons to adjust the picture, if necessary. ◆ Press OK to store the station . Do not wish to store the station displayed: ◆ Press the corresponding ▲ or ▼ buttons, until the **CH** is selected. ◆ Press the ◀ or ▶ buttons to go on scanning the frequency band and display the next station ◆ Go back to the beginning of Step **9**
10	Repeat this procedure from Step **6** onwards, until all the required stations have been stored.
11	On completion, press the MENU button three times to exit the menu.









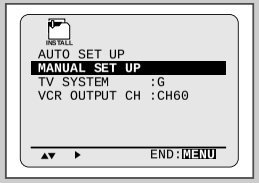
Clearing a Preset Station

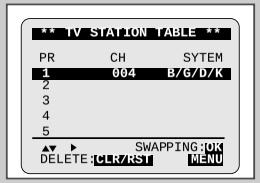
If you have stored a TV station:

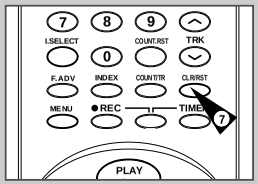
- ***That you do not require***
- ***At the wrong programme position***

you can cancel it.

1	Press the MENU button on the remote control. Result: The programming menu is displayed.
2	Press the corresponding ▲, ▼ or ◀, ▶ buttons to select the **INSTALLATION** option.
3	Press the OK button to select this option. Result: The **INSTALLATION** menu is displayed.
4	Press the corresponding ▲ or ▼ buttons, until the **MANUAL SET UP** option is selected.
5	Press the ▶ button to select this option. Result: The **TV STATION TABLE** menu is displayed.
6	Press the corresponding ▲ or ▼ buttons, until the required preset TV station (PR) is selected.
7	Press the CLR/RST button.
8	Repeat the same procedure from Step **6** onwards until all the required stations have been cleared.
9	On completion, press the MENU button three times to exit the menu.



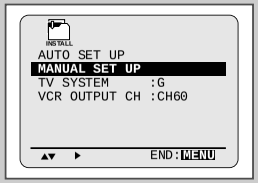


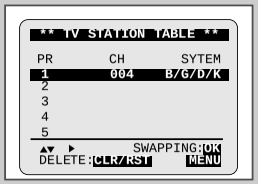


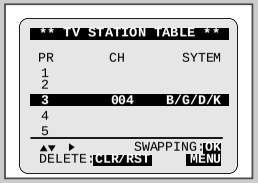
Changing the Preset Station Table

You can rearrange the preset TV stations according to your own preferences programme number assigned to the station.

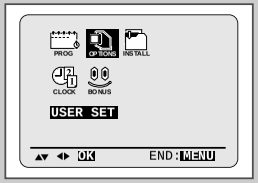
1. Press the MENU button on the remote control.
   Result: The programming menu is displayed.
2. Press the corresponding ▲, ▼ or ◄, ► buttons to select the **INSTALLATION** option.
3. Press the OK button to select this option.
   Result: The **INSTALLATION** menu is displayed.
4. Press the corresponding ▲ or ▼ buttons, until the **MANUAL SET UP** option is selected.
   And then press the ► button to select this option.
   Result: The **TV STATION TABLE** menu is displayed.
5. Press the corresponding ▲ or ▼ buttons, until the required preset TV programme is selected.
   Result: The selected station is displayed at the same time on the television screen.
6. To change the programme number assigned to a station press the OK button on the remote control. (For example, To move a TV station in programme 1 to programme 3)
7. Press the ▲ or ▼ buttons to select required position. And then press OK again to swap the position.
8. You can modify this station by repeating the same procedure from Step **5** onwards.
9. On completion, press the MENU button three times to exit the menu.



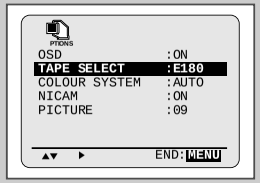




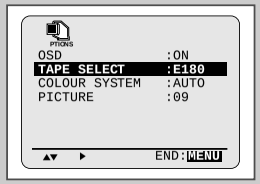
Selecting the Cassette Type



V-E59



V-E39/V-E29

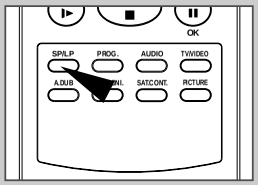


If you wish to use the tape counter to display the time remaining on a cassette, you must indicate the type of cassette inserted.

1. Press MENU on the remote control.
   Result: The programming menu is displayed.
2. Press the corresponding ▲, ▼ or ◄, ► buttons to select the **USER SET** option.
3. Press the OK button to select this option.
4. Press the corresponding ▲ or ▼ buttons, until the **TAPE SELECT** option is selected.
5. Press the ◄ or ► buttons as many times as required, until the correct cassette length is displayed.
   E180 → E240 → E260 → E 300 → (back to E180)
6. Press MENU twice to exit the menu.

Selecting the Recording Speed

Type	Recording Time (in SP)
E-180	180 mins. or 3 hours
E-240	240 mins. or 4 hours
E-260	260 mins. or 4 hours and 20 mins.
E-300	300 mins. or 5 hours



You can record a cassette at two different speeds:

- ***SP (Standard Play)***
- ***LP (Long Play)***

In Long Play modes:

- ***Each cassette lasts twice as long***

To record a cassette...	Press the SPEED button on the remote control, until...
In standard play mode	**SP** is displayed.
In long play mode	**LP** is displayed.

NICAM (V-E59 only)

NICAM programmes are divided into 3 types. NICAM Stereo, NICAM Mono and Bilingual (transmission in another language). NICAM programmes are always accompanied by a standard mono sound broadcast and you can select the desired sound. Please refer to page 29.

1 Press MENU on the remote control.
Result: The programming menu is displayed.

2 Press the corresponding ▲, ▼ or ◄, ► buttons to select the **USER SET** option.

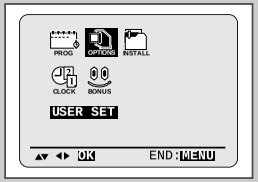
3 Press the OK button to select this option.
Result: The **USER SET** menu is displayed.

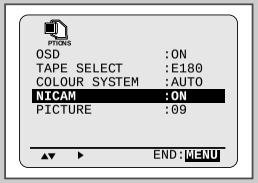
4 Press the corresponding ▲ or ▼ buttons, until the **NICAM** option is selected.

5

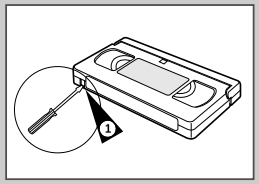
To...	Press ◄ or ►, until...
Mono mode	**OFF** is displayed. **OFF**: Only set at this position to record the standard mono sound during a NICAM broadcast if the stereo sound is distorted due to inferior reception conditions.
NICAM mode	**ON** is displayed. **ON**: Normally set at this position.

6 On completion, press MENU twice to exit the menu.





Protecting a Recorded Cassette

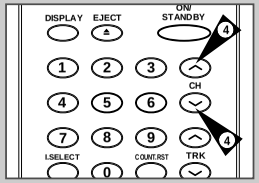


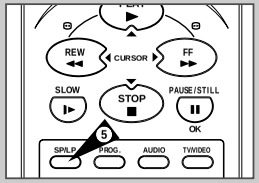
Video cassettes have a safety tab to prevent accidental erasure. When this tab has been removed, you cannot record on the tape.

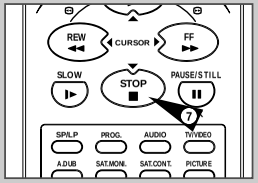
1 If you wish to protect a cassette, break off the tab using a small screwdriver.

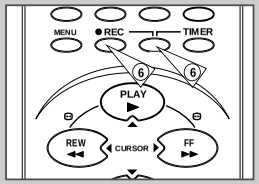
2 To re-record over a protected cassette (safety tab broken), cover the hole with adhesive tape.

Recording a Programme Immediately









Before recording a programme, you must have preset the corresponding station (unless you are recording via an external video source). If you have not done so, refer to pages 16 and 17.

1 Switch on the television.

2 To monitor the programme being recorded, select the television channel reserved for use with your VCR (or the AV input if used).

3 Insert the cassette on which the programme is to be recorded, with the window visible and the safety tab intact or the opening covered with adhesive tape.
Result: The VCR is switched on automatically.

4 Select:
- The station to be recorded using the CH (⌃ or ⌄) buttons
  or
- The LINE IN 1 or LINE IN 2 source using the I.SELECT button for a satellite tuner or external video source

Result: The station number is displayed and the programme can be seen on the television.

5 Select the recording speed (SP/LP) by pressing the SP/LP button as many times as required (see page 20).

6 Press both REC button simultaneously to start recording.
Result: The record indicator appears on the television and VCR display. An index is recorded on the tape (see page 32).

7 To stop recording, press ■ once.

- If the cassette is ejected when you start recording, check that the safety tab is intact or the opening is covered with adhesive tape.
- If you reach the end of the tape while recording, the cassette rewinds automatically.

Recording a Programme with Automatic Stop

This function enables you to record up to nine hours of programmes. (LP)

Your VCR stops automatically after the requested length of time.

1 Switch on the television.

2 To monitor the programme being recorded, select the television channel reserved for use with your VCR (or the AV input if used)

3 Insert the cassette on which the programme is to be recorded, with the window visible and the safety tab intact or the opening covered with adhesive tape.
Result: The VCR is switched on automatically.

4 Select:
- The station to be recorded using the CH (⌃ or ⌄) buttons
  or
- The LINE IN 1 or LINE IN 2 source using the I.SELECT button for a satellite tuner or external video source

Result: The channel number is displayed and the programme can be seen on the television.

5 Select the recording speed (SP/LP) by pressing the SP/LP button as many times as required (see page 20).

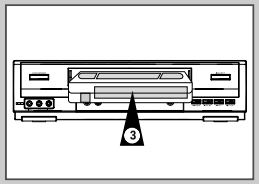
6 Press both REC button simultaneously to start recording.
Result: The record indicator appears on the television screen and VCR display. An index is recorded on the tape (see page 32).

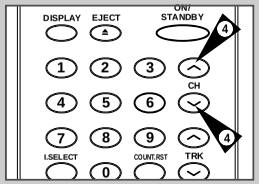
7 Press the REC button several times to increase the recording time in:
- 30-minute intervals up to four hours
- 1-hour intervals up to nine hours (LP)

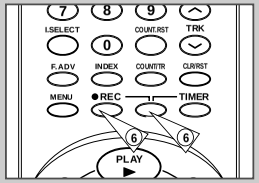
Result: The length is displayed on the television displays. The selected programme is recorded for the length of time requested. At the end of that time, the VCR stops recording automatically.

8 If you wish to cancel the recording before the end, press ON/STANDBY.

☞ If the end of the tape is reached while recording:
- The recording stops
- The VCR automatically turns off



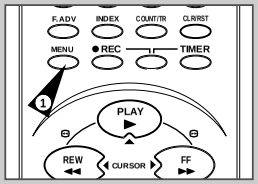


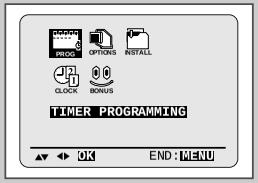


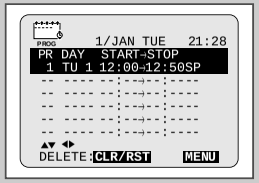
Using the Timer Programming Feature

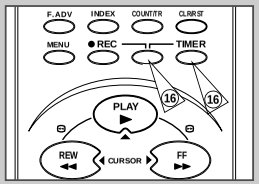
The Timer Programming feature allows you to preset the VCR to record a programme up to one month before that programme is to be broadcast. Up to six programmes can be preset.

☞ Before presetting a recording, check that the date and time are correct.









1 Press MENU on the remote control.
Result: The programming menu is displayed.

2 Press the OK button to select **TIMER PROGRAMMING** option.
Result: The **TIMER PROGRAMMING** menu is displayed.

3 Press ▶ to select the input source.

4 Select the required station by pressing the ▲ , ▼ buttons or I.SELECT to select the LINE IN 1 or LINE IN 2 input sources.

5 Press ▶ to select the recording day.

6 Select the required day by pressing the ▲ or ▼ buttons.

7 Press ▶ to select the recording start time.

8 Select the required hour value by pressing the ▲ or ▼ buttons.

9 Press ▶ to select the minutes.

10 Select the required minute value by pressing the ▲ or ▼ buttons.

11 Press ▶ to select the recording end time.

12 Select the required recording end time by pressing the ▲ or ▼ buttons, following the same procedure as when selecting the recording start time.

13 Press ▶ to select the recording speed (AUTO/SP/LP).

14 Press the ▲ or ▼ buttons to switch between the **AUTO**, **SP** (Standard Play) or **LP** (Long Play).

15 When you have finished, press the MENU button.

16 Press both TIMER simultaneously to activate the timer.
If you wish to turn the timer off, simply press the two TIMER button again.
Result: Before starting recording, the VCR compares the timer duration with the remaining time on the cassette.

☞ Auto Tape Speed Select

The VCR's "Auto Tape Speed Select" function compares the duration of the timer recording to the actual recording time remaining on the tape loaded. If there is insufficient tape to complete a timer recording in AUTO mode, the VCR automatically switches to LP mode to record the whole programme.

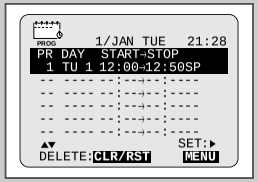
E.g. If there is a one hour AUTO mode timer recording to be started, but only 40 minutes of tape remaining, the VCR will record in SP for 20 minutes and switch to LP mode for the remaining 40 minutes.

Checking a Preset Recording

You can check your preset recordings:

- ***When you have finished presetting the VCR***
- ***If you have forgotten which programmes will be recorded***

1	Press MENU on the remote control. Result: The programming menu is displayed.
2	Press the OK button to select **TIMER PROGRAMMING** option. Result: The **TIMER PROGRAMMING** menu is displayed.
2	Press the ▲ or ▼ buttons to select the required programme.
3	Press the ◄ or ► buttons to select and change any values as required. For more details, refer to the previous page.
4	On completion, press MENU twice.

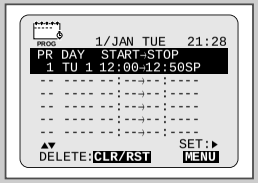


Cancelling a Preset Recording

You can cancel any programmes that are:

- ***Incorrect***
- ***No longer required***

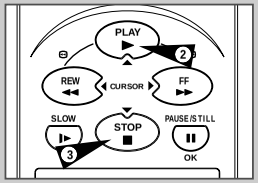
1	Press MENU on the remote control. Result: The programming menu is displayed.
2	Press the OK button to select **TIMER PROGRAMMING** option. Result: The **TIMER PROGRAMMING** menu is displayed.
3	Select the programme to be cancelled by pressing the ▲ or ▼ buttons.
4	Press the CLR/RST button to cancel the selected programme. Result: All the recording information is deleted and the broadcast will not be recorded.
5	On completion, press MENU twice.



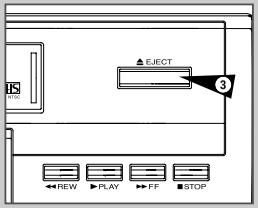
Playing a Cassette

This function allows you to play back any pre-recorded cassette.

1	Switch on both the television and your VCR.
2	Insert the video cassette to be played. If the safety tab on the cassette is intact, press ►. Otherwise, the cassette is played automatically. ➢ When a cassette is loaded, the tape position is optimized automatically to reduce disturbance (Digital Auto Tracking). When playing a cassette, if the end of the tape is reached, the cassette is rewound automatically.



3	**To...**	**Then press...**
	Stop the playback	■ (STOP).
	Eject the cassette	⏏ (EJECT).

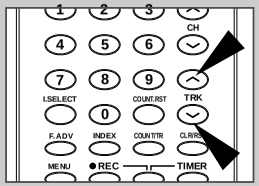


Adjusting Picture Alignment Manually

The Picture Alignment feature allows you to adjust the alignment manually to obtain the best possible picture.

When noise bars or streaks appear during playback, adjust alignment manually by pressing the TRK (^ or v) buttons until the picture is clear and stable.

Result:
- The tracking bar appears.
- The image is adjusted.
- The tracking bar disappears when you release the button.



Picture Control

The picture control feature allows you to adjust the sharpness of the image manually, according to your own preferences.

1 During playback, press the MENU button on the remote control
Result: The MAIN menu is displayed.

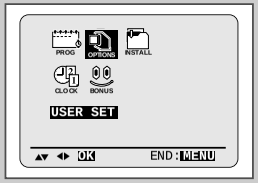
2 Press the corresponding ▲, ▼ or ◀, ▶ buttons to select the **USER SET** option.

3 Press the OK buttons to select this option
Result This **USER SET** menu is displayed.

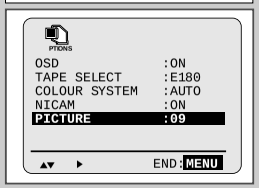
4 Press the corresponding ▲ or ▼buttons, until the **PICTURE** option
is selected.

5 Press the ◀ or ▶ buttons,until the picture is displayed according to your preferences .

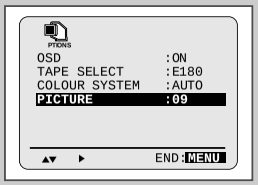
➢ ***The Picture control feature allows you to adjust the sharpness of the image manually by pressing PICTURE button on the Remote Control.***

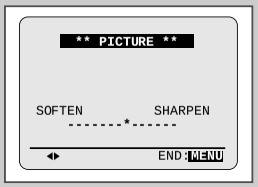


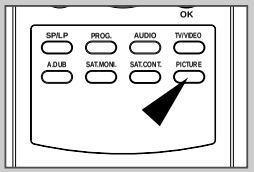
V-E59



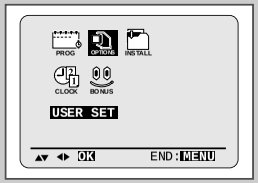
V-E39/E29



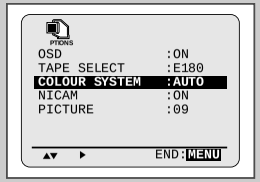




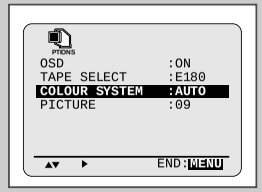
Selecting the Colour Mode



V-E59



V-E39/V-E29



Before recording or playing back a cassette, you can select the required system standard.

➢ ◆ When you playback an NTSC-recorded tape on this VCR make a setting on the colour system according to your TV.
If your TV is a PAL system only TV, set NTPB.
If your TV is Multi System TV (NTSC 4.43/3.58 compatible), set NT4.43/3.58 and you can record NT4.43/3.58.

1 Press MENU on the remote control.
Result: The programming menu is displayed.

2 Press the corresponding ▲, ▼ or ◀, ▶ buttons to select the **USER SET** option.

3 Press the OK button to select this option.
Result: The **USER SET** menu is displayed.

4 Press the corresponding ▲ or ▼ buttons, until the **COLOUR SYSTEM** option is selected.

5 Press the ▶ button to select **AUTO→PAL→MESECAM →B/W or NT4.43→NTPB** during playback.

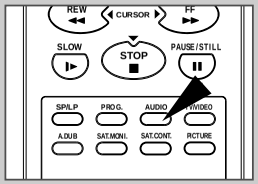
AUTO	When playing back a cassette, the system standard is automatically selected by the VCR.
B/W	Black and White

6 On completion, press MENU twice to exit the menu.

Selecting the Audio Output Mode (V-E59 only)

When monitoring a TV programme or playing back a Hi-Fi recorded video tape, press the AUDIO button to select a desired sound output. As the AUDIO button is pressed, the sound output and the indicator change as below:

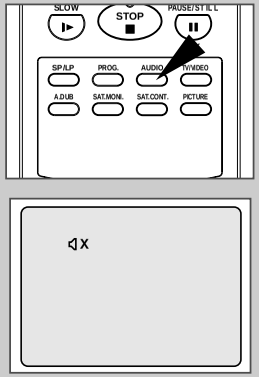
Sound type / OSD display	Stereo sound	Bilingual sound	Standard sound broadcast
L R	Heard in stereo. (left channel and right channel)	Channel I (MAIN) heard from the left speaker, channel II (SUB) heard from the right speaker.	Heard in monaural.
L	Left channel heard from both the left and right speakers.	Channel I (MAIN) heard from both the left and the right speakers.	Heard in monaural.
R	Right channel heard from both the left and right speakers.	Channel II-(SUB) heard from both the left and the right speakers.	Heard in monaural.
MIX	Sound mixed the left and right channels, and the normal audio track.		
MONO	Heard in monaural.	Channel I (MAIN) heard from both the left and the right speakers.	Heard in monaural.



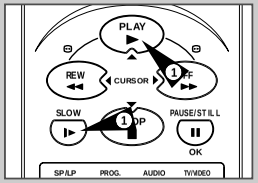
Selecting the Audio Mute Mode (V-E39/V-E29 only)

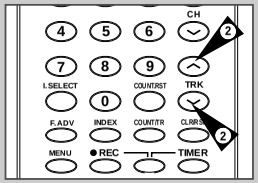
You can select the mode in which the sound is mute.

To select the audio mute on and off, simply press the AUDIO button on the remote control.



Playing a Cassette in Slow Motion





You can play a cassette in slow motion.

No sound is heard when playing back a cassette in slow motion.

1 Press:
- PLAY (►)to start playing the cassette
- Press SLOW (▮►) and release SLOW button on the remote control. If you press the SLOW (▮►) button twice, the playback will slow down to 1/12 th of normal speed.
- To return to the normal speed, press the PLAY (►) button.

2 When playing back in slow motion, picture interference may occur. Press the TRK (^ or v) buttons to minimize this effect.

When you have been using the Slow Motion function for more than about five minutes, the VCR will automatically play to protect the:
- Cassette
- Video heads

Playing a Sequence Frame by Frame

You can:

- ***Stop the cassette at a given frame (image)***
- ***Advance one frame at a time***

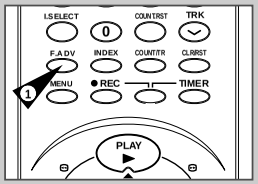
No sound is heard when playing back frame by frame.

1 Press:
- PLAY (►) to start playing the cassette
- PAUSE/STILL (II) to stop the tape at a given frame
- F.ADV to advance frame by frame

2 To return to normal playback, press PAUSE/STILL (II) button again.

When you have been using the Frame-by-Frame function for more than about five minutes, the VCR will automatically play to protect the cassette and video heads.

Vertical stability: When playing back frame by frame, interference may be seen on the screen. Press the TRK (^ or v) buttons to minimize this effect.



Picture Search, Fast Forward/Rewind

Picture Search enables you to Fast Forward or Rewind and look for a particular part of a tape.

1 Press PLAY, the VCR will enter normal play mode. While in play, press and release the ►► (or ◄◄) button. The VCR will search at 5 times the normal playback speed.

2 To return to normal playback mode, press the ► button.

3 If you press and HOLD down the ►► (or ◄◄) button the VCR will search at 9 times the normal speed. Releasing the ►► button will return the VCR to search at 5 times the normal speed. To return to normal playback mode, press the ► button.

4 Whilst in Picture Search mode, if you press the ►► button again, the VCR will enter normal Fast Forward mode.

5 Likewise, whilst in Picture Search ◄◄ mode, if you press the ◄◄ button again, the VCR will enter normal Rewind mode.

6 If, when Rewinding (◄◄) or Fast Forwarding (►►), you press the ◄◄ or (►►) button, the VCR will enter the Picture Search mode.

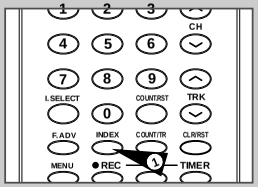
Searching for a Specific Sequence

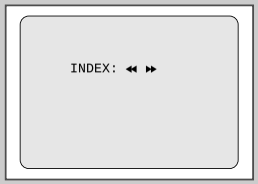
Each time you record a cassette on this VCR, an "index" is automatically marked on the tape when recording starts.

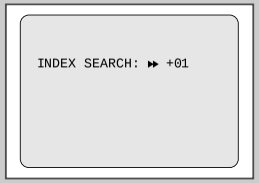
The Search function allows you to fast-forward or rewind to a specific index and start playback from that point. Depending on the direction selected, the indexes are numbered as follows:

		↓		
etc.	*Prev Seq.*	*Seq. being played*	*Next Seq.*	*etc.*
	2 *1*		*1* *2*	

This VCR uses a standard indexing system (VISS). As a result, it will recognize any indexes marked by other VCRs using the same system and vice versa.







INTRO SCAN

1 To search for a specific index, press INDEX.

2 Press the ◄◄ or ►► buttons depending on the direction where your desired programme is located.

3 When an Index mark is found the VCR will playback the tape for 5 seconds, after which it will continue searching for the next Index mark.

4 If you want to watch the tape from a particular Index, simply press ►.

Index Skip Search:

This feature will enable you to fast forward/rewind to a specific point on a tape: E.g. if you have recorded 3 different programmes on a tape and you have rewound the tape to the beginning, by using this feature you can go directly to the start of programme 2 simply by pressing the INDEX button.

1 Press the INDEX to start the Index search.

2 Press the ◄◄ or ►► buttons twice more. This will take you directly to the start of the desired programme is located.

3 These Index searches can be made forwards: (press ►►) or backwards: (press ◄◄).

4 To cancel an Index search simply press the ► or ■ button.

Auto Repeat Play

You can set repeat play to repeat the tape continuously from beginning to end.

1 Press MENU on the remote control.
Result: The programming menu is displayed.

2 Press the corresponding ▲, ▼ or ◀, ▶ buttons to select the **EASY OPERATION** option.

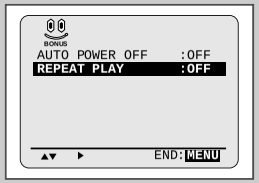
3 Press the OK button to select this option.
Result: The **EASY OPERATION** menu is displayed.

4 Press the corresponding ▲ or ▼ buttons, until the **REPEAT PLAY** option is selected.

5

To...	Press ◀ or ▶, until...
Repeat play	**ON** is displayed.
Do not wish to repeat play	**OFF** is displayed.

6 On completion, press MENU twice to exit the menu.

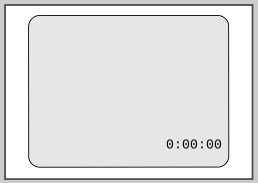


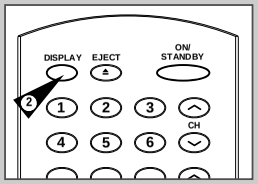
Using the Tape Counter

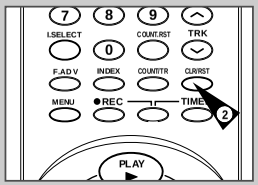
The tape counter:

- ***Indicates the elapsed time in the play and record modes (hours, minutes and seconds)***
- ***Is reset when a cassette is inserted in the VCR***
- ***Allows you to find the beginning of a sequence easily***

If the remaining time is to be calculated correctly, you must indicate the type of cassette being used.







1 Insert a cassette in your VCR.

2 To set the tape counter to zero at the beginning of a sequence:
- Press DISPLAY twice to display the counter
- Press CLR/RST when you want to set the tape counter to zero

3 When you are ready,
- Start playback or Recording.
- Press the ■ button.
- To fast-froward or rewind to the sequence at which the counter was set to zero, press ◀◀ or ▶▶.

Some VCR information, such as the counter, can be displayed on the television screen (unless you have deactivated the OSD mode; refer to page 14).

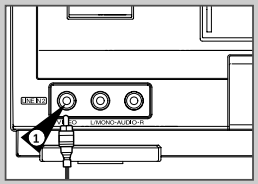
Press DISP:
- Once to display the current function, programme number, recording speed, date, time and counter
- Twice to display the counter only
- Three times to display the time remaining on the cassette
- Four times to clear the display

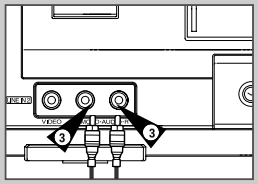
Connecting an RCA Audio/Video Input Cable (V-E59 only)

You can connect other audio/video equipment to your VCR using audio/video cables if the appropriate outputs are available on the equipment chosen.

Examples:
- ***You wish to copy a video cassette with the help of a second VCR (see page 36).***
- ***You wish to play back and/or copy pictures taken with a camcorder (see page 36).***
- ***You wish to dub a prerecorded video cassette with sound from a stereo system (see page 37).***

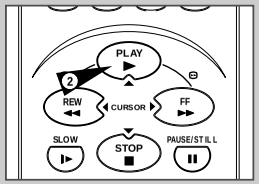
- Regardless of the type of connection chosen, you must always connect the coaxial cable supplied. Otherwise, no picture will be visible on the screen when the VCR is switched off.
- Make sure that both the television and the VCR are switched off before connecting the cables.





1. Connect one end of the RCA audio/video cable into the VIDEO INPUT socket on the front of the VCR.
2. Plug the other end of the audio/video cable into the appropriate output connector on the other system (VCR or camcorder).
3. Connect one end of the RCA audio cable supplied into the AUDIO INPUT sockets on the front of the VCR.
   - Take care to respect the colour coding of the left and right channels.
4. Plug the other end of the audio cable into the appropriate output connectors on the other system (VCR, camcorder or Hi-Fi sound system).

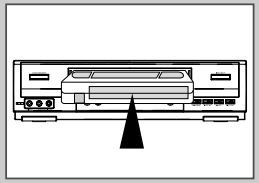
Using the Assemble Edit Function

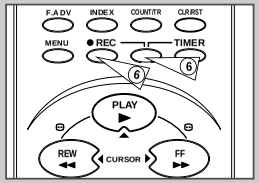


This function allows you to start a new recording at a specific position on the cassette while maintaining a very smooth scene change.

1. Insert the cassette to be edited in your VCR.
2. Press the ▶ button to start playback.
3. When you reach the position from which you wish to start the new recording, press the PAUSE/STILL button.
4. Press the F.ADV button as often as necessary to advance frame by frame, until the exact recording position is located.
5. While the VCR is in still mode, hold the REC button down for a while to activate the Assemble Edit function.
   Result: Record symbol flashes in the display.
6. Select the source from which you wish to record by pressing:
   - The CH (∧ or ∨) buttons for television channels
   - The I.SELECT button for the LINE IN 1 or LINE IN 2 input sources
7. Press the ▶ button to start recording.
8. When you have finished recording, press ■.

Recording from Another VCR or Camcorder





You can copy a cassette to your VCR from another video source, such as another VCR or a camcorder.

- It is an infringement of copyright laws to copy prerecorded cassettes or to re-record them in any form without the permission of the owners of the corresponding copyright.

1. Connect the VCR, from which the cassette is to be copied, to the appropriate RCA audio and video input connectors on the rear of your VCR, as indicated on page 10.
   You can also use an RCA audio and video cable to connect the LINE IN 2 input on the front of your VCR.
2. Insert a blank cassette in your VCR.
3. Insert the pre-recorded cassette in the other video source (VCR or camcorder).
4. Press the I.SELECT button to select the appropriate input on your VCR:
   - LINE IN 1 for the rear input
   - LINE IN 2 for the front input
5. Start playing back the cassette to be copied.
6. Hold REC down for a while to start recording on your VCR.
7. When you have finished recording, press ■ on both VCRs.

- If you wish to view the cassette being copied:
  - Your VCR must be connected as usual to the television (see page 9 for further details)

Audio Dubbing a Pre-recorded Cassette (V-E59 only)

With the Audio Dubbing function, you erase the previously recorded sound and replace it with a new soundtrack from:

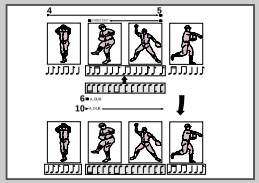
- ***A CD player***
- ***A microphone connected to a sound system***
- ***A cassette player***

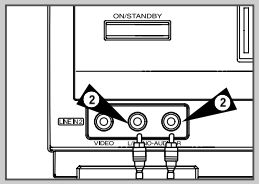
Restriction:

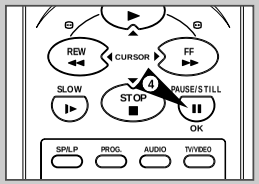
Audio dubbing is applicable only to the longitudinal audio track (normal audio).

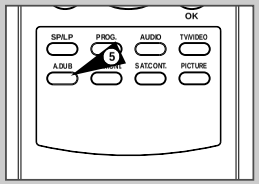
1	Connect an RCA audio cable to the appropriate output on your sound system (CD/cassette player for example).
2	Connect the other end of the RCA audio cable to the audio input connectors (L, R) on the front of your VCR.
3	Insert the pre-recorded cassette on which the audio track is to be replaced, and press the PLAY (►) to start playback.
4	Find the scene that you want to over-dub and press PAUSE/STILL (**II**) on the remote control.
5	Press A.DUB. Result: Your VCR is now in the Audio dubbing Pause mode.
6	On the sound system, locate the point on the CD or cassette at which you wish to start playback. Example: The track that you wish to record on the cassette.
7	When you are ready: ◆ Start playback on the sound system ◆ Press PAUSE/STILL (**II**) on the remote control. Result: The soundtrack is replaced on the pre-recorded cassette.

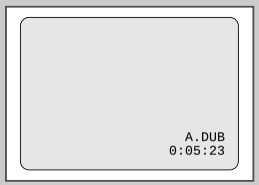
The new sound will be recorded on the normal sound track of the tape, and the original sound will remain on the Hi-Fi sound track.
To hear the new sound and original sound mixed together, press the Audio button on the remote control until the MIX option is displayed (see page 29).











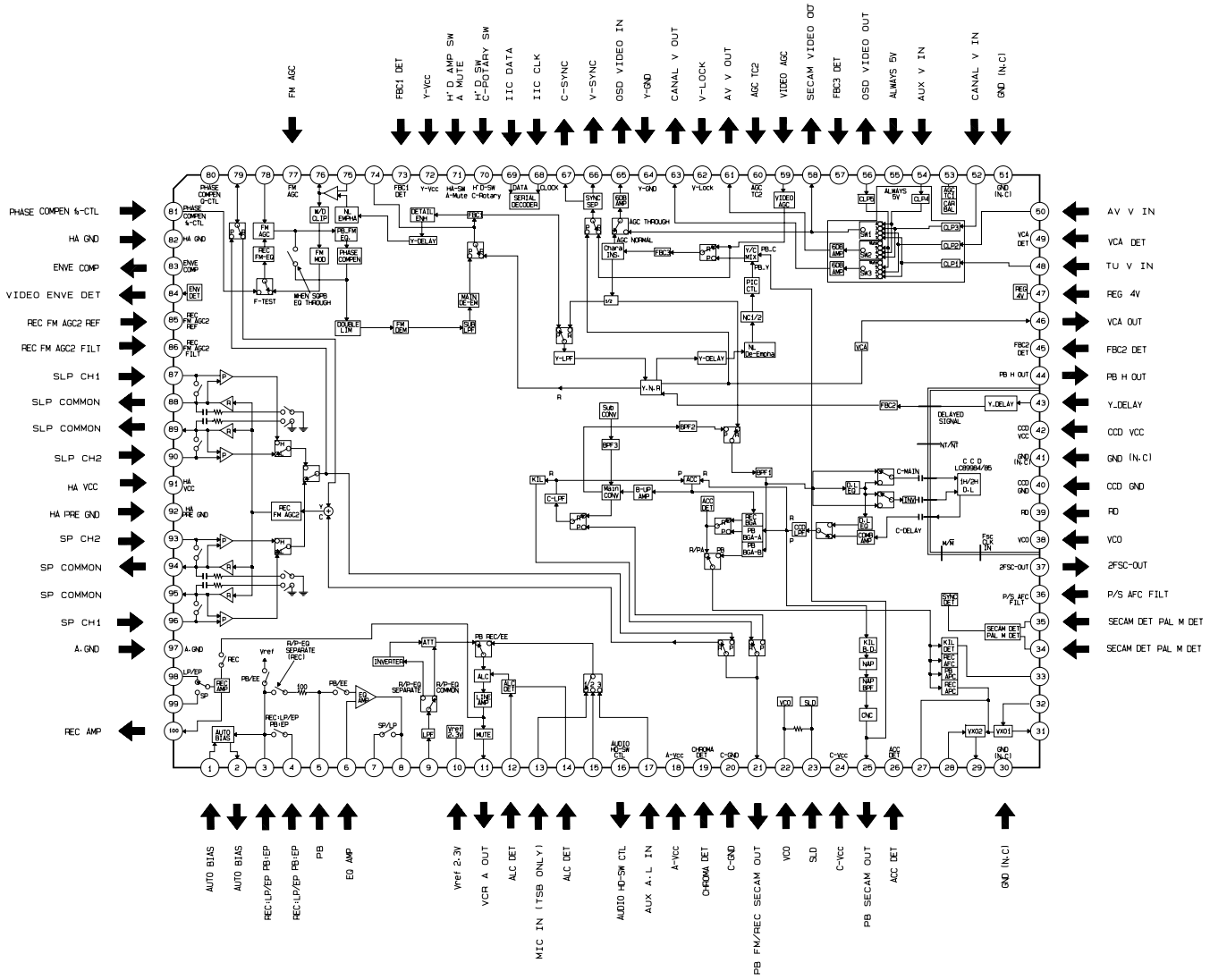
Auto Power Off

The Auto Power Off feature automatically turns off your VCR if no signal is received and you do not press any button for the selected time.

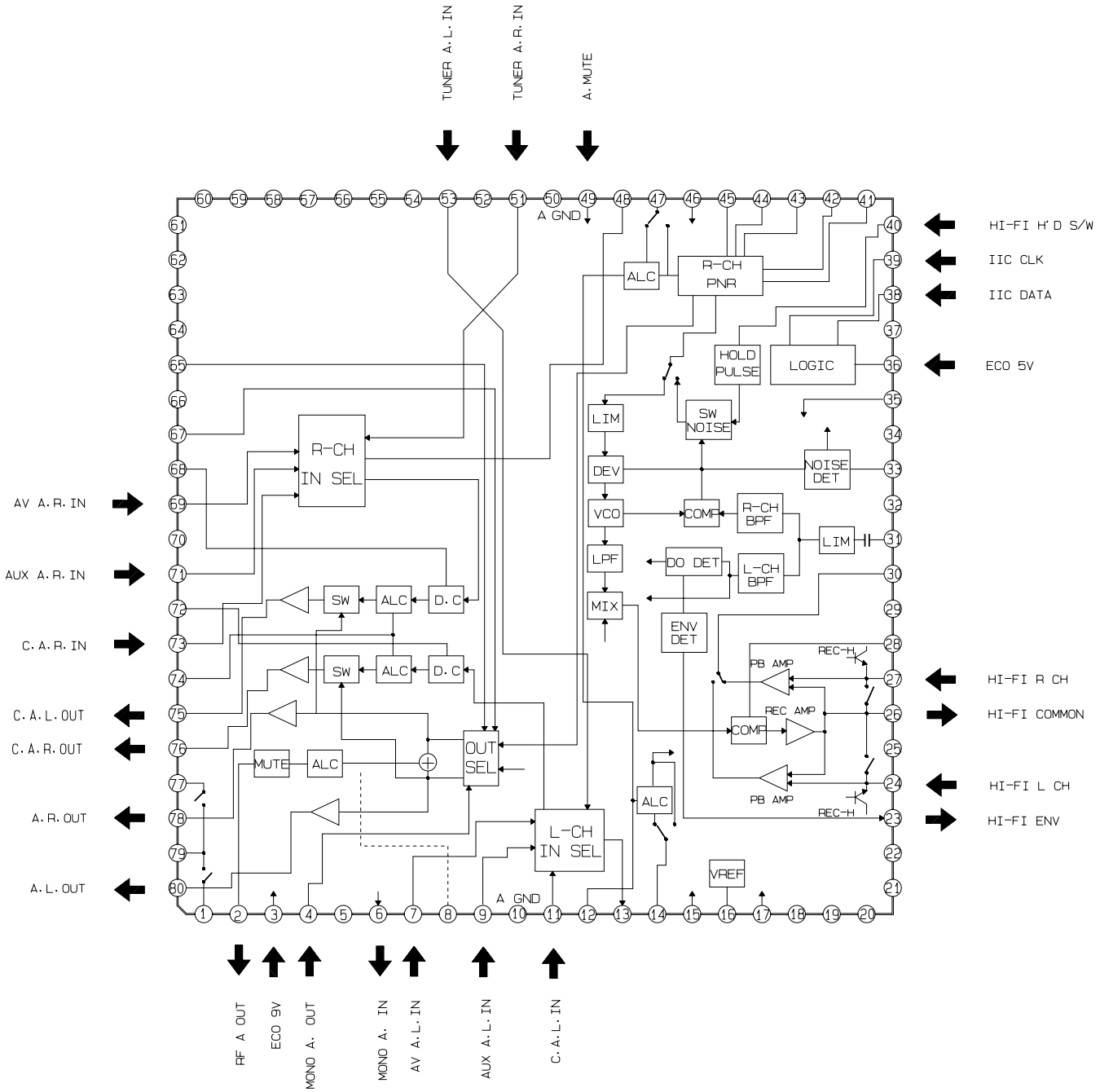
1	Press MENU on the remote control. Result: The programming menu is displayed.
2	Press the corresponding ▲, ▼ or ◄, ► buttons to select the **EASY OPERATION** option.
3	Press the OK button to select this option. Result: The **EASY OPERATION** menu is displayed.
4	Press the corresponding ▲ or ▼ buttons, until the **AUTO POWER OFF** option is selected.
5	Press the ► button, until you select the time of Auto Power off interval. **OFF → 2HOUR → 3HOUR**
6	On completion, press MENU twice to exit the menu.

2-2 IC Blocks

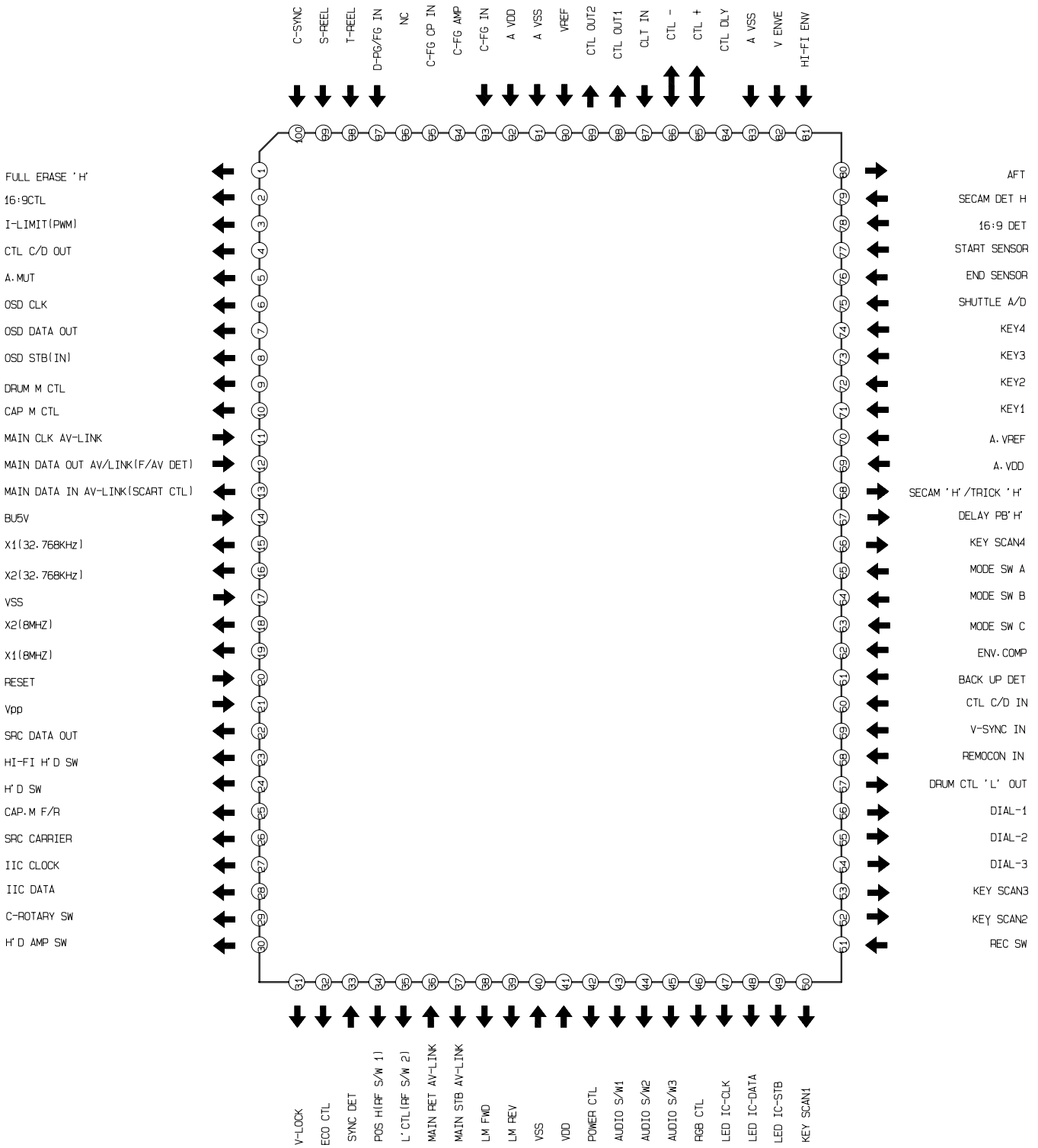
2-2-1 IC301 (LA71750M)



2-2-2 IC501 (LA72646M) V-E59 ONLY



2-2-3 IC601 (uPD784927GF)



3. Product Specifications

Design and specifications are subject to change without notice.

Format	VHS PAL standard			
Heads	V-E59/V-E39 : 4 heads V-E29 : 2 heads Hi-Fi audio: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase head			
Receiving channel	VHF-I, VHF-III, UHF, Interband/Hyperband			
Television system	STANDARD B/G-D/K-I			
Luminance	FM azimuth recording			
Colour system	PAL/MESECAM/NTSC: Down converted subcarrier phase shifted direct recording NTSC PB on PAL TV			
	<PAL/MESECAM>		<NTSC>	
Tape speed	SP	23.39 mm/sec	SP	33.35 mm/sec
	LP	11.69 mm/sec	SLP	11.12 mm/sec
	<PAL/MESECAM>			
Recording/playback time	SP	3 hours (E-180 Tape)		
	LP	6 hours (E-180 Tape)		
REW time	About 60 sec in REW with E-180			

VIDEO	
Input	0.5 to 2.0 Vp-p; 75 ohm unbalanced
Output	1.0 ± 0.2 Vp-p; 75 ohm unbalanced
Signal-to-noise ratio	Better than 43 dB (SP)
Horizontal resolution	More than 240 lines (SP)

AUDIO	
Input	-8 dBm, 47 Kohm unbalanced
Output	-8 ± 3 dBm, 1 Kohm unbalanced
Wow and flutter (WTD)	0.4% max (SP)
Signal-to-noise ratio	68 dB min (IHF A filter)
Frequency response	20Hz - 20kHz (Hi-Fi) 100 Hz - 10 kHz (Mono)

Power requirement	AC 100-240V 50/60 Hz
Power consumption	V-E59 : Approx. 17 watts V-E39/V-E29 : Approx. 15 watts
Operation temperature	41°F-104°F (5°C-40°C)
Operation humidity	10%-75%
Weight	2.8 Kg (net)
Dimensions (WxHxD)	360 x 94 x 240 mm

MEMO

4. Disassembly and Reassembly

4-1 Cabinet Assembly

4-1-1 Cabinet Top Removal

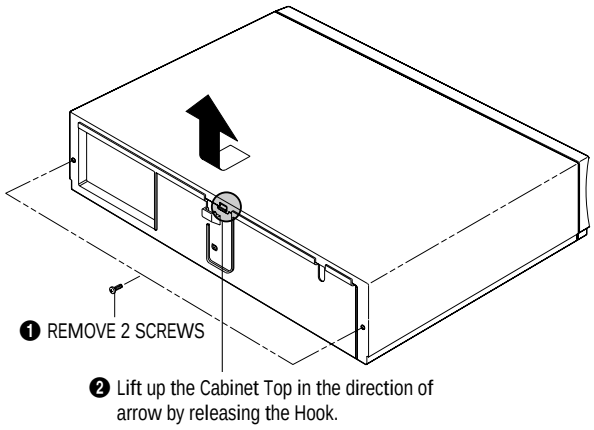


Fig. 4-1 Cabinet Top Removal

4-1-2 Ass'y Front Panel Removal

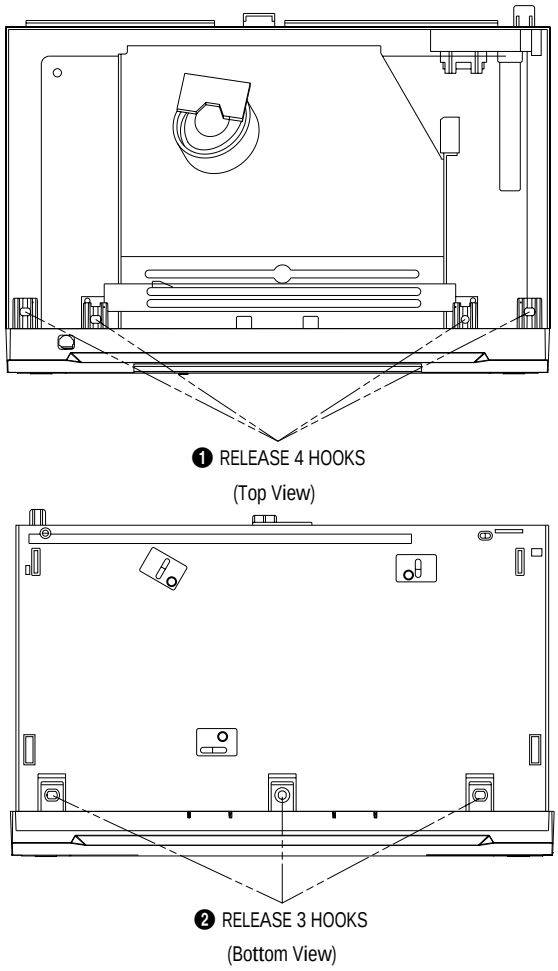


Fig. 4-2 Ass'y Front Panel Removal

4-1-3 Ass'y Front A/V PCB Removal V-E59 Only

Disconnect the CN701 from the Ass'y PCB-Main and then lift the Ass'y Front A/V PCB up.

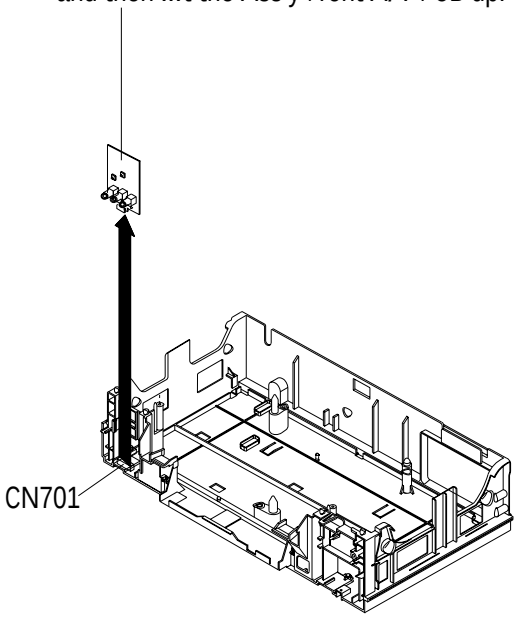


Fig. 4-3 Ass'y Front A/V PCB Removal

4-1-4 Chassis Removal

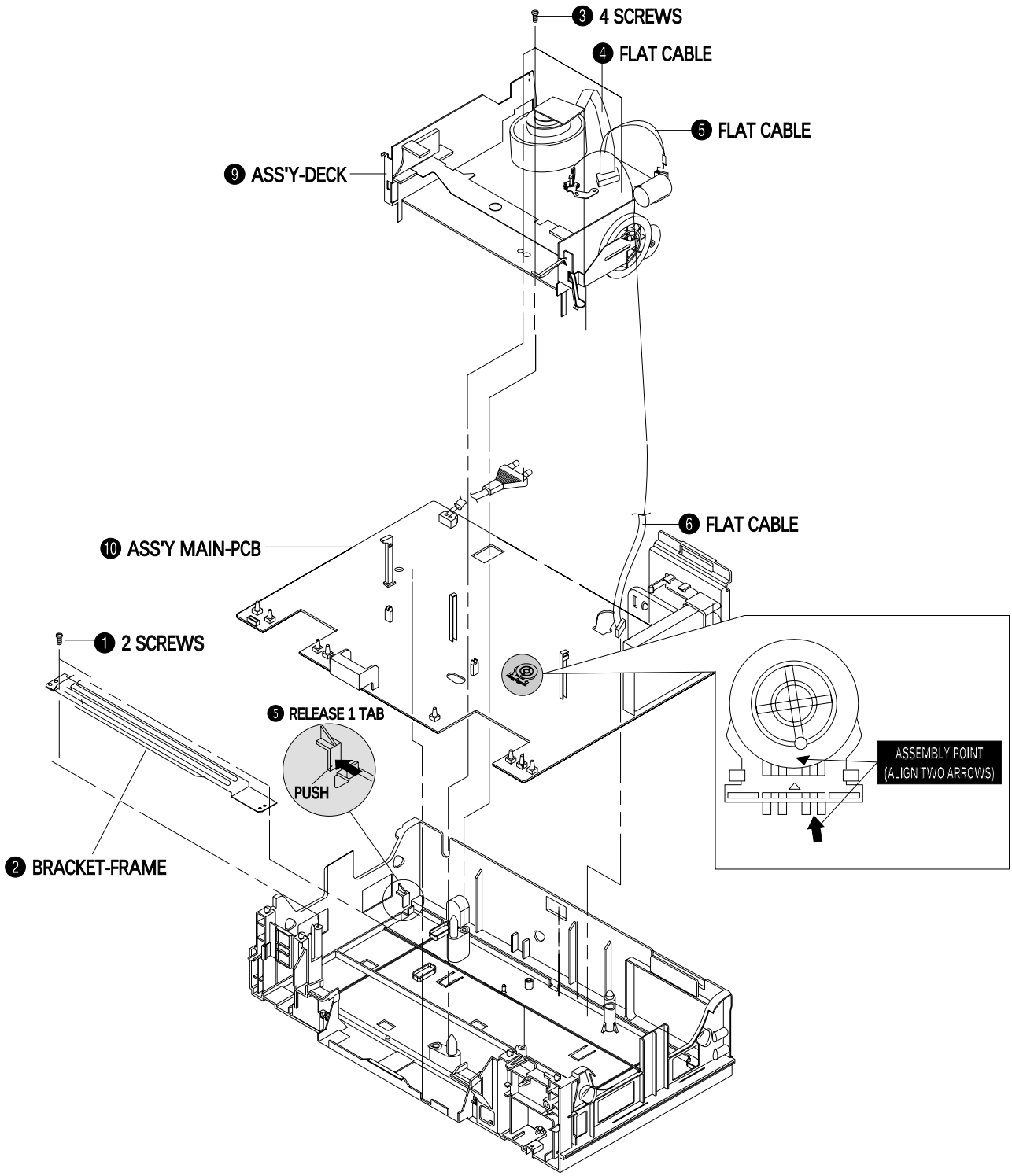


Fig. 4-4 Chassis Removal

4-2 Deck Parts Locations

4-2-1 Top View

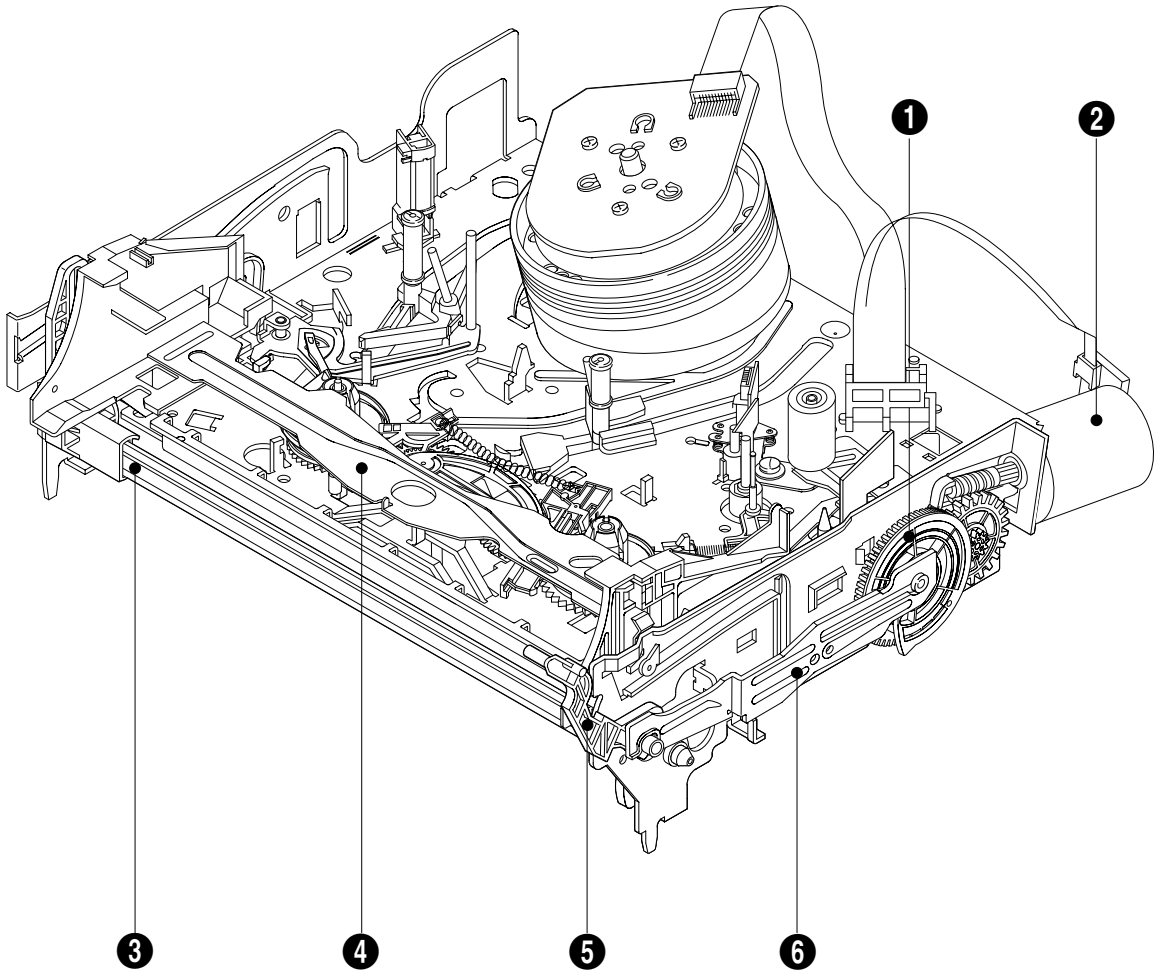


Fig. 4-5 Top parts Location-1

❶ GEAR FL CAM
❷ MOTOR LOADING ASS'Y
❸ LEVER FL ARM ASS'Y
❹ HOLDER FL CASSETTE ASS'Y
❺ LEVER FL DOOR
❻ SLIDER FL DRIVE

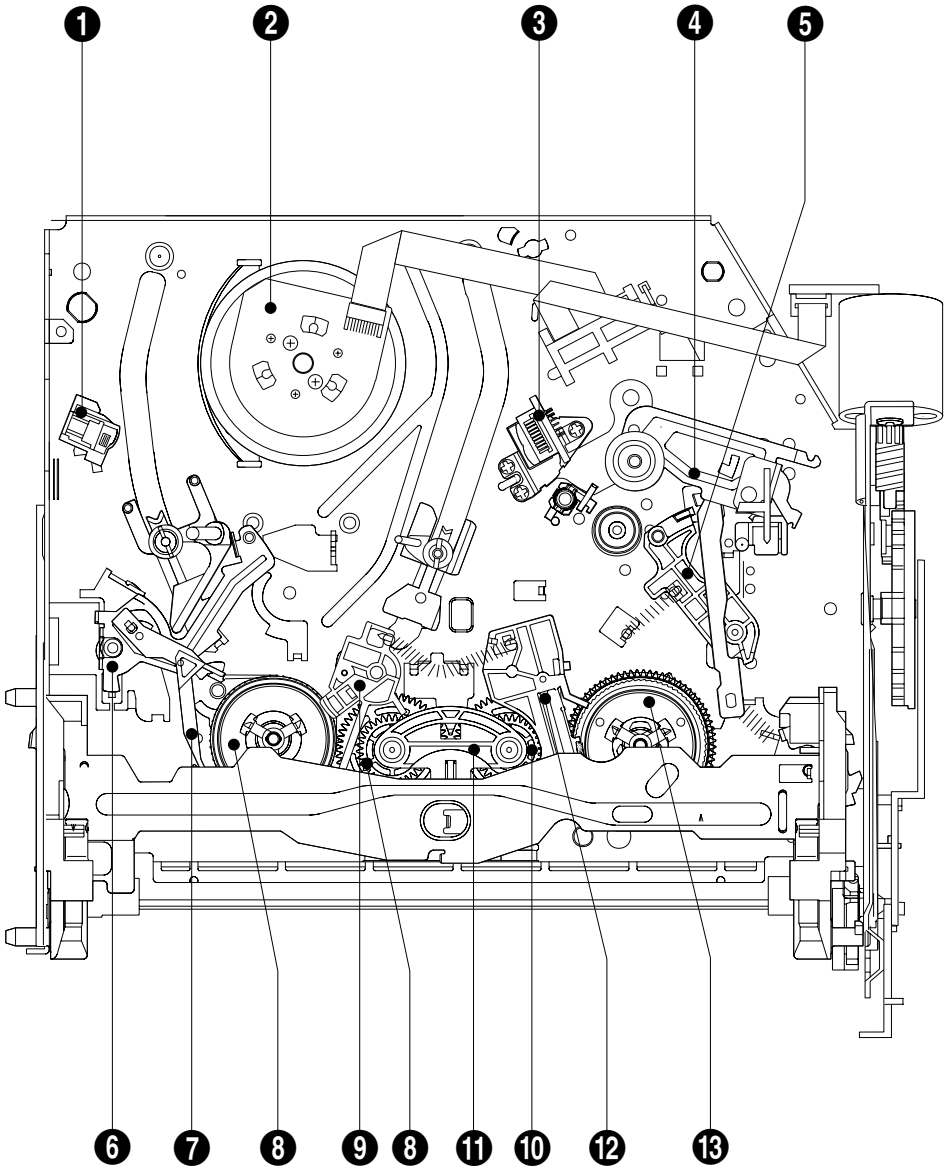


Fig. 4-6 Top Parts Location-2

❶ FE HEAD
❷ CYLINDER ASS'Y
❸ ACE HEAD ASS'Y
❹ LEVER UNIT PINCH ASS'Y
❺ LEVER #9 GUIDE ASS'Y
❻ LEVER TENSION ASS'Y
❼ BAND BRAKE ASS'Y
❽ DISK S REEL
❾ LEVER S BRAKE ASS'Y
❿ GEAR IDLE
⓫ LEVER IDLE
⓬ LEVER T BRAKE ASS'Y
⓭ DISK T REEL

1-1-2 Bottom View

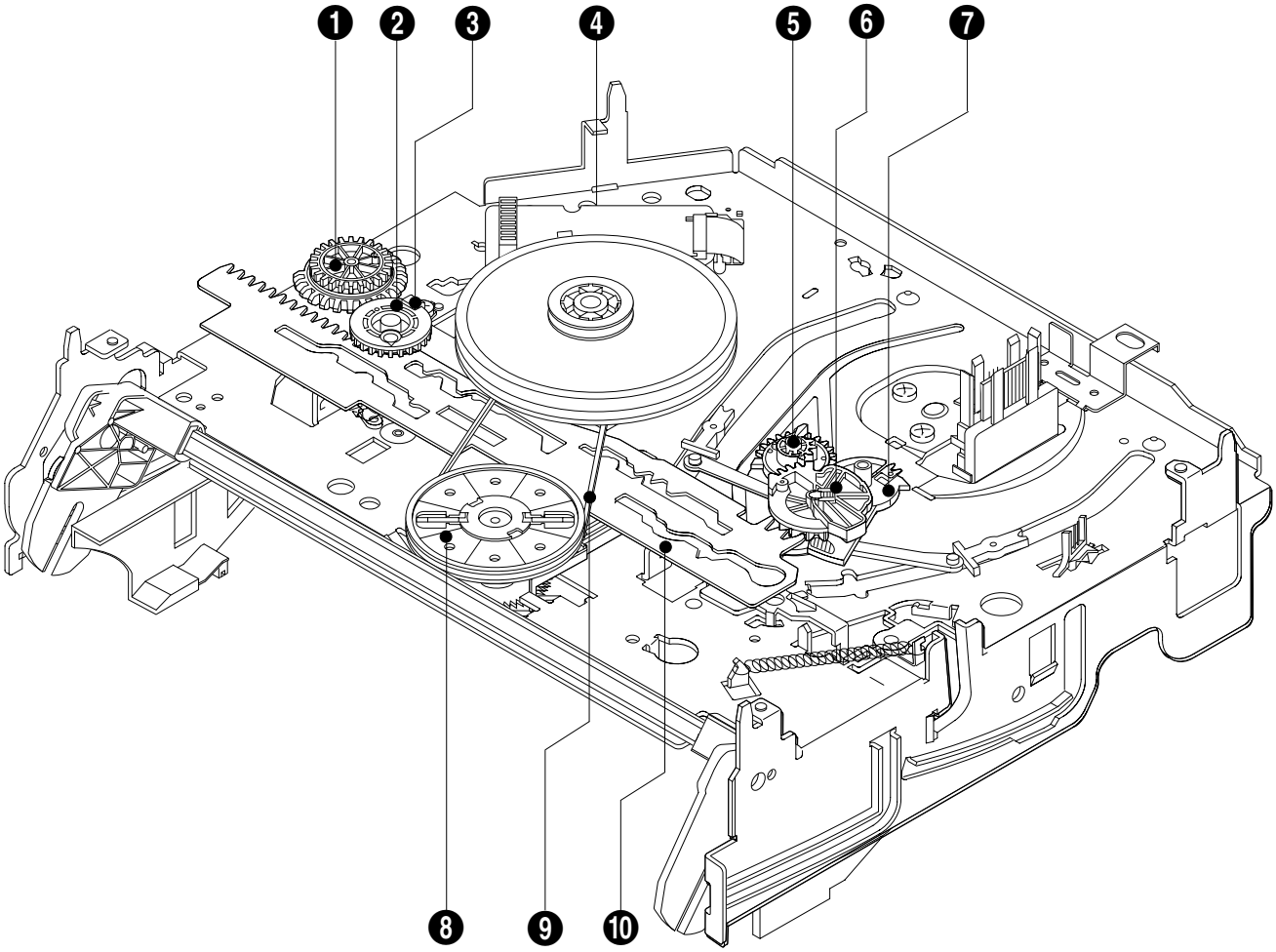


Fig. 4-7 Bottom Parts Location

❶ GEAR JOINT 1
❷ GEAR JOINT 2
❸ BRACKET GEAR
❹ MOTOR CAPSTAN ASS'Y
❺ LEVER T LOAD ASS'Y
❻ GEAR LOADING DRIVE
❼ LEVER S LOAD ASS'Y
❽ HOLDER CLUTCH ASS'Y
❾ BELT PULLEY
❿ SLIDER CAM

1-2 Main Deck

1-2-1 Holder FL Cassette Ass'y Removal

1) Pull the Holder FL Cassette Ass'y ❶ to the eject position.
2) Pull the Holder FL Cassette Ass'y ❶ as grasping the Holder FL Cassette Ass'y ❶ and Lever FL Cassette-R ❷ in the same time to release hooking from Main Base until the Boss [A] of Holder FL Cassette Ass'y ❶ is taken out from the Rail [B].
3) Lift the Holder FL Cassette Ass'y ❶, in this time, you have to grasp the Lever FL Cassette-R ❷ Continuously until the Holder FL Cassette Ass'y ❶ is taken out completely.

Note : Be sure to insert Lever FL Cassette-R ❷ in the direction of "A" to prevent separation and breakage of the Lever FL Cassette-R ❷ at disassembling and reassembling.

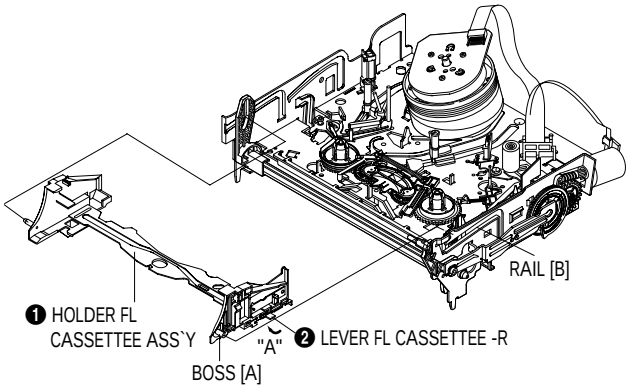


Fig. 4-8 Holder FL Cassette Ass'y Removal

1-2-2 Lever FL Door Removal

1) Release the Hook ❷ and Remove the Lever FL Door ❶ in the direction of arrow "B".

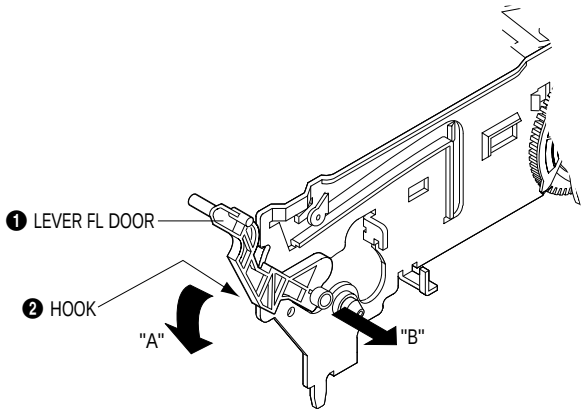


Fig. 4-9 Lever FL Door Removal

1-2-3 Slider FL Drive, Gear FL Cam Removal

1) Pull the Slider FL Drive ❶ to the front direction.
2) Remove the Slider FL Drive ❶ in the direction of arrow. (Refer to Fig. 4-10)
3) Remove the Gear FL cam ❷.

Note : When reinstalling be sure to reassemble Slider FL drive ❶ after you insert the Boss of Lever FL ARM-R in Groove of Slider Fl drive ❶.

Assembly : Align the Gear FL Cam ❶ with the Gear worm wheel Post as shown drawing.
(Refer to Timing point)

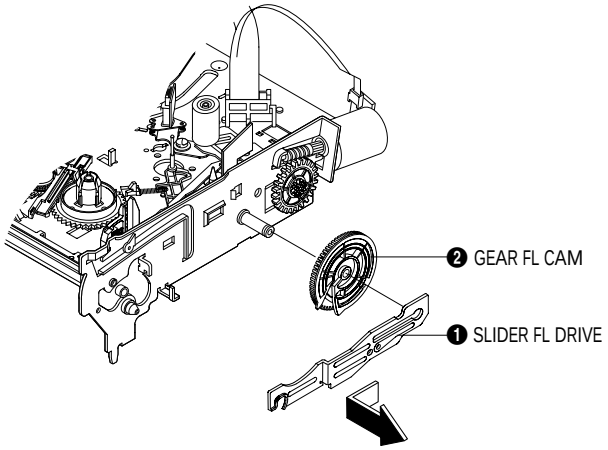


Fig. 4-10 Slider FL Drive Removal

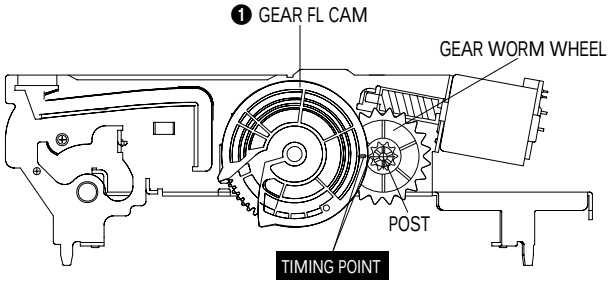


Fig. 4-11 Gear FL Cam, Gear Worm

1-2-4 Lever FL Arm Ass'y Removal

1) Push the hole "A" in the direction of arrow "B" use the pin.(about Dia. 2.5)
2) Pull out the Lever FL Arm Ass'y ❶ from the Boss of Main Base.
3) Remove the Lever FL Arm Ass'y ❶ in the direction of arrow "C".

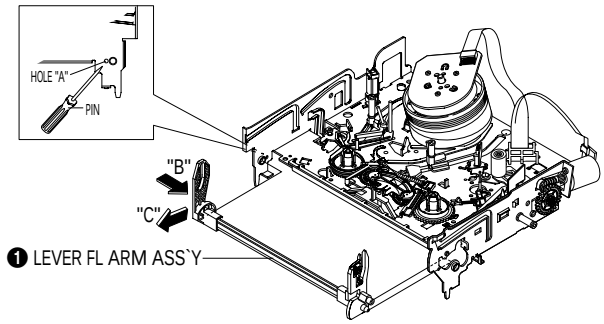


Fig. 4-12 Lever FL Arm Ass'y Removal

1-2-5 Gear Worm Wheel Removal

1) Remove the Gear Worm wheel ❶.

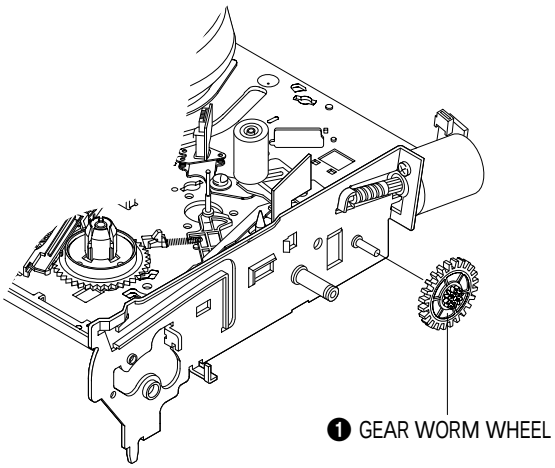


Fig. 4-13 Gear Worm Wheel Removal

1-2-6 Cable Flat Removal

1) Remove the Drum connecting part of Cable Flat ❶ from Connector Waffer ❷.
2) Remove the Loading Motor connecting part of Cable Flat ❶ from Connector Waffer ❸.
3) Rotate the Damper Capstan ❹ in the direction of arrow "A" and remove it toward "B".
4) Pull the Cable Flat ❶ in the direction of arrow "C" to remove.

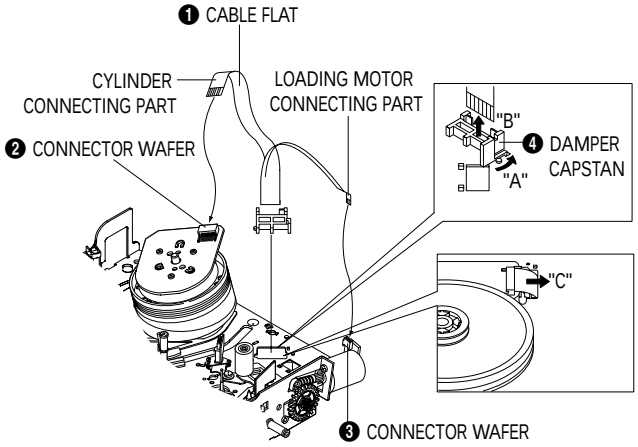


Fig. 4-14 Cable Flat Removal

1-2-7 Motor Loading Ass'y Removal

1) Remove the screw ❶.
2) Remove the Motor Loading Ass'y ❷.

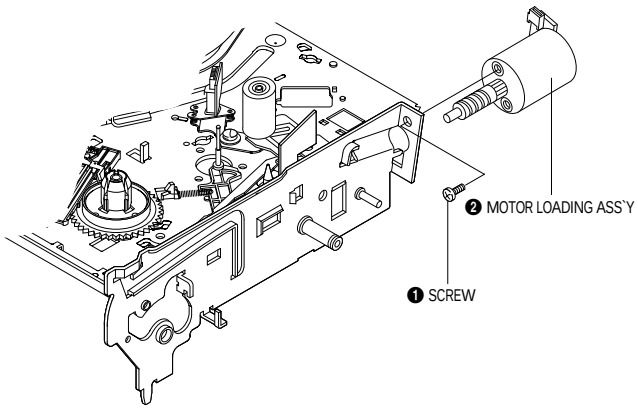


Fig. 4-15 Motor Loading Ass'y Removal

1-2-8 Bracket Gear, Gear Joint 2, 1 Removal

1) Remove the SCREW ❶.
2) Remove the Bracket Gear ❷.
3) Remove the Gear Joint 2 ❸.
4) Remove the Gear Joint 1 ❹.

Assembly :
1) Be sure to align dot mark of Gear Joint 1 ❶ with dot mark of Gear Joint 2 ❷ as shown Fig 4-17. (Refer to Timing point1)
2) Confirm the Timing Point 2 of the Gear Joint 2 ❷ and Slider Cam ❸.

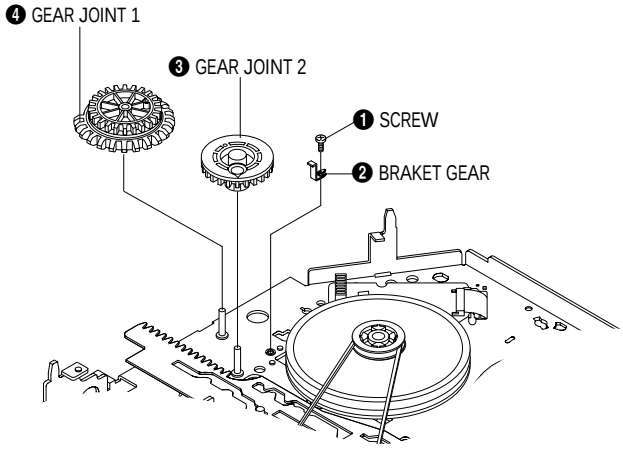


Fig. 4-16 Bracket Gear, Gear Joint 1,2 Removal

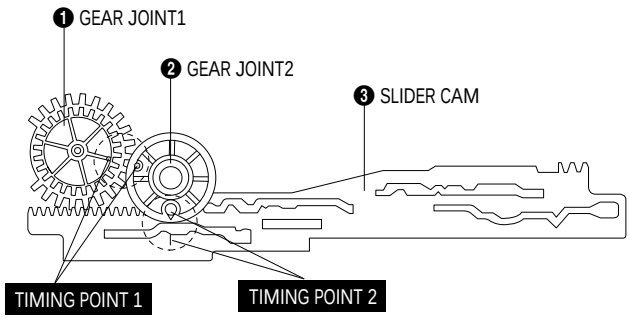


Fig. 4-17 Gear Joint 1,2 Assembly

1-2-9 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Removal

1) Remove the Belt Pulley. (Refer to Fig. 4-35)
2) Remove the Gear Loading Drive ❶ after releasing Hook [A] in the direction arrow as shown in detail drawing.
3) Remove the Slider Cam ❷.
4) Remove the Lever Load ❸, Link Load ❺ & Lever Load ❹, Link Load ❻.

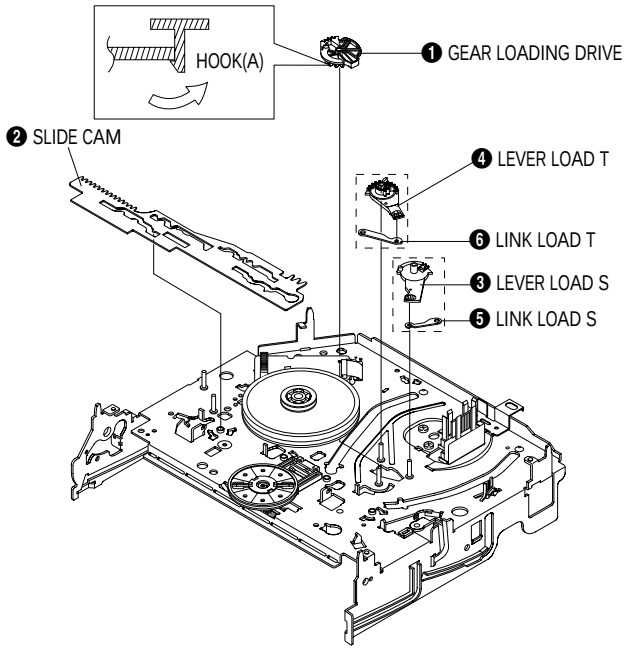


Fig. 4-18 Gear Loading Drive, Slider Cam, Lever T, S Load Ass'y Removal

1-2-10 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Assembly

1) When reinstalling, be sure to align dot of Lever Load T Ass'y ❶ with dot of Lever Load S Ass'y ❷ as shown in drawing, (Refer to Timing Point 1).
2) Insert the Pin A,B,C,D into the Slider Cam ❸ hole,
3) Be sure to align dot of Lever Load T ❶ and dot of Gear Loading Drive ❹, (Refer to Timing Point 2).
4) Aline dot of Gear Loading drive ❹ with mark of Slider Cam ❸ as shown in drawing(Refer to Timing Point 3).

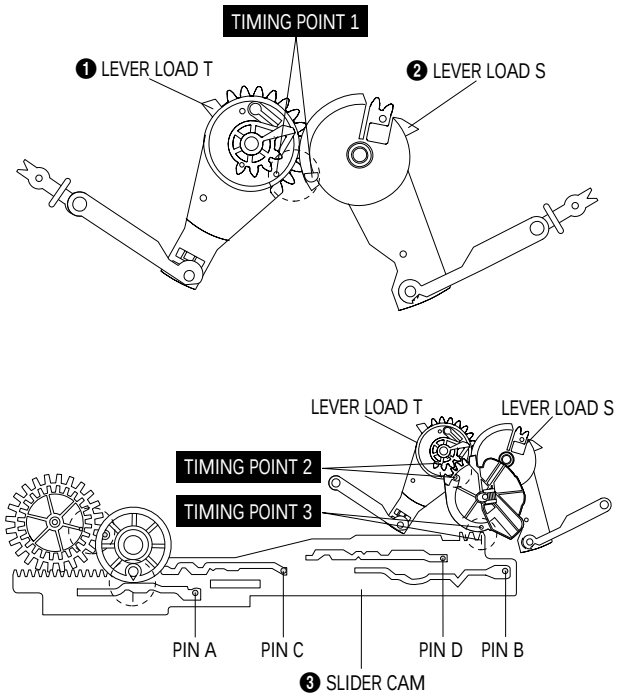


Fig. 4-19 Gear Loading Drive, Slider Cam, Lever Load S, T Ass'y Assembly

1-2-11 Lever Pinch Drive, Lever Tension Drive Removal

1) Remove the Lever Pinch Drive ❶, Lever Tension Drive ❷.

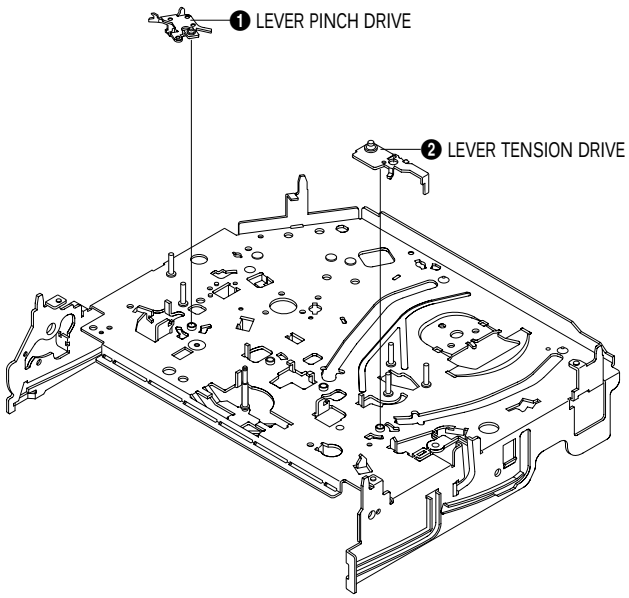


Fig. 4-20 Lever Pinch Drive, Lever Tension Drive Removal

1-2-12 Lever Tension Ass'y, Band Brake Ass'y Removal

1) Remove the Lever Brake S Ass'y (Refer to Fig 4-22)
2) Remove the Spring Tension Lever ❶.
3) Rotate stopper of Main Base in the direction of arrow "A".
4) Lift the Lever Tension Ass'y ❷ & Band brake Ass'y ❸.

Note :
1) When replacing the Lever Tension Ass'y ❷, be sure to apply Grease on the post,
2) Take care not to touch stain on the felt side, and not to be folder and broken Band brake Ass'y
3) After Lever Tension Ass'y seated, Rotate stopper of Main Base to the Mark[B].

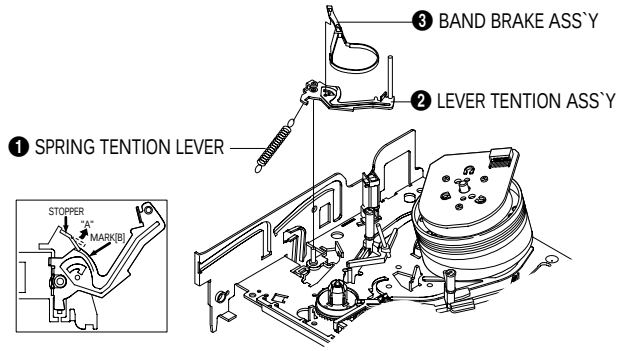


Fig. 4-21 Lever Tension Ass'y, Band Brake Ass'y Removal

1-2-13 Lever Brake S, T Ass'y Removal

1) Release the Hook [A] and the Hook [B], [C] in the direction of arrow as shown in Fig 4-22.
2) Lift the Lever S, T Brake Ass'y ❶, ❷ with spring brake ❸.

Assembly :
1)Assembly the Lever S Brake Ass'y ❶ on the Main Base.
2)Assembly the Lever T Brake Ass'y ❷ with spring brake ❸.

Note : Take extreme care not to be folded and transformed Spring Brake at removing or reinstalling.

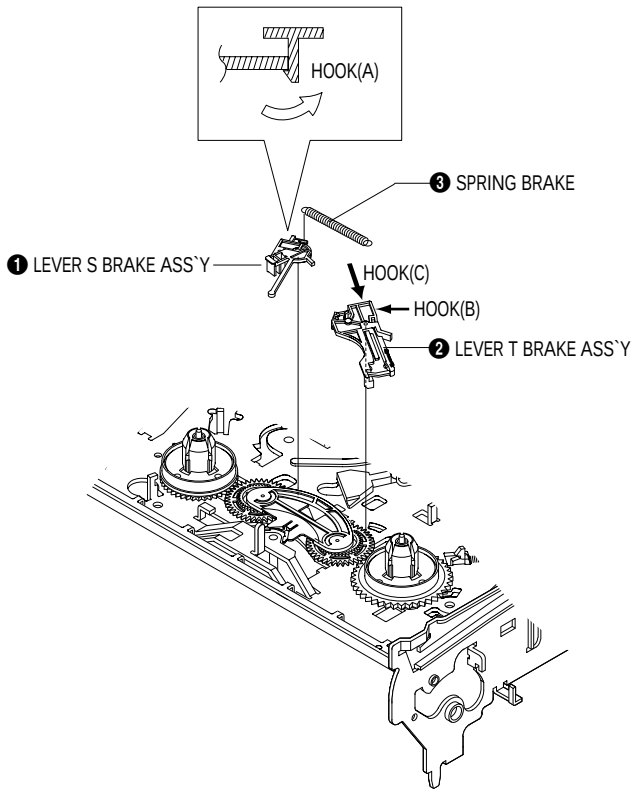


Fig. 4-22 Lever Brake S, T Ass'y Removal

1-2-14 Gear Idle Ass'y Removal

1) Push the Lever Idle ❶ in the direction of arrow "A", "B".
2) Lift the Lever Idle ❶.

Assembly :
1) Apply oil in two Bosses of Lever Idle ❶.
2) Assemble the Gear Idle ❷ with the Lever Idle ❶.

Note : When replacing the Gear Idle ❷, be sure to add oil in the boss of Lever Idle ❶.

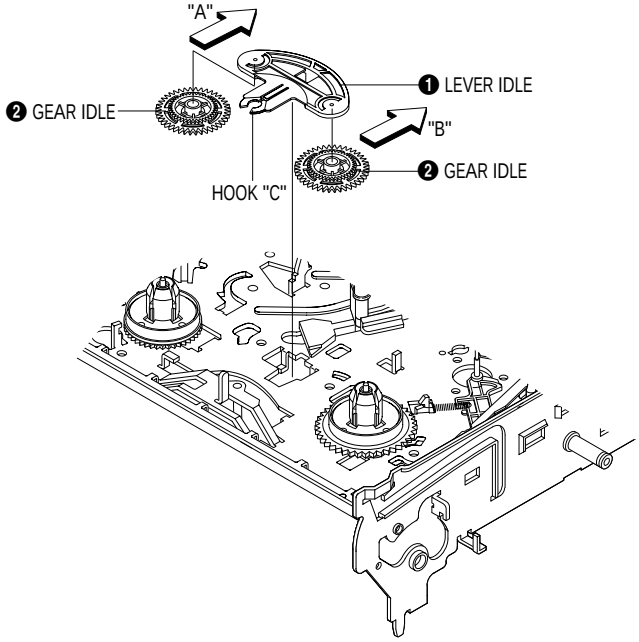


Fig. 4-23 Gear Idle Ass'y Removal

1-2-15 Disk S, T Reel Removal

1) Lift the Disk S, T Reel ❶, ❷.

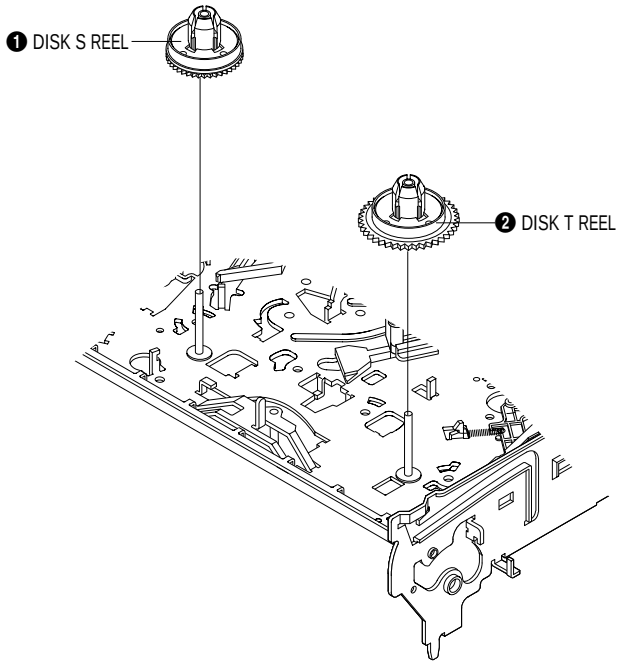
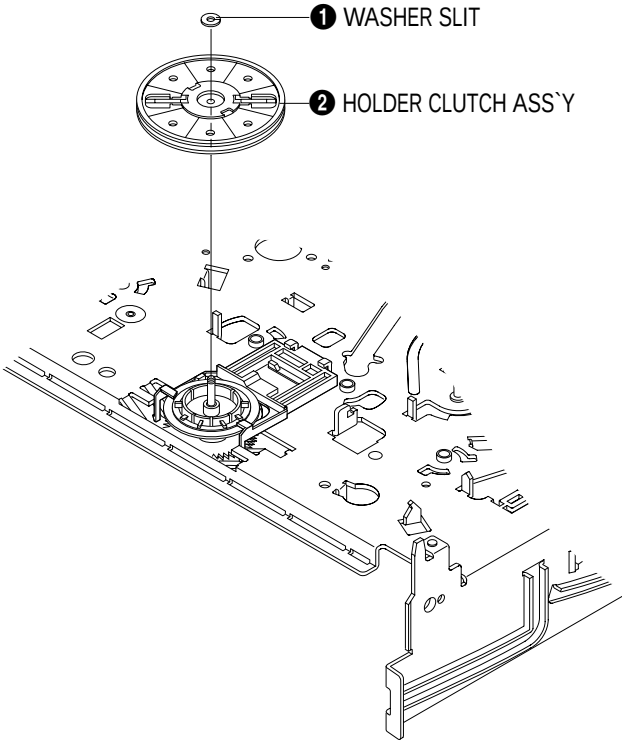


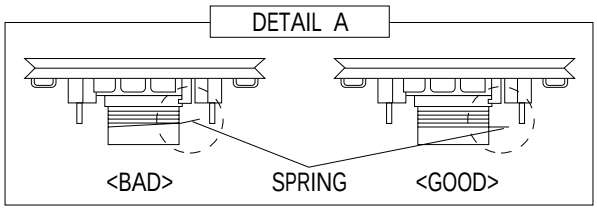
Fig. 4-24 Disk S, T Reel Removal

1-2-16 Holder Clutch Ass'y Removal

1) Remove the Washer Slit ❶.
2) Lift the Holder Clutch Ass'y ❷.

Note : When you reinstall Holder Clutch Ass'y
1) Check the condition of spring as shown in detail A.
2) Don't push Holder Clutch Ass'y down with excessive force Just insert Holder Clutch Ass'y into post center with dead force and Rotate it smoothly.
Be sure to confirm that spring is in the slit of Gear Center Ass'y as shown in detail B.





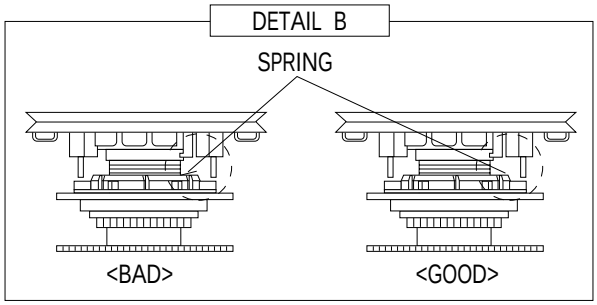


Fig. 4-25 Holder Clutch Ass'y Removal

1-2-17 Lever Up Down Ass'y, Gear Center Ass'y Removal

1) Remove the 2 hooks in the direction of arrow as shown Fig. 4-26 and lift the Lever Up Down Ass'y ❶.
2) Lift the Gear Center Ass'y ❷.

Assembly :
1) Insert the Lever Up Down Ass'y ❶ in the rectangular holes on Main Base as shown in Fig 4-27.
2) Lift the Lever Up Down Ass'y ❶ about 35°. (Refer to Fig 4-27)
3) Insert Ring of the Gear Center Ass'y ❷ in the Guide of the Lever Up Down Ass'y ❶.
4) Insert the Gear Center Ass'y ❷ in the post on Main Base.
5) Push down the Lever Up Down Ass'y ❶ for locking of the Hook.

Note :
1) Take care not to separate and sentence does not mark sense.
2) Be sure to confirm that Ring of the Gear Center Ass'y ❷ is in the Guide of the Lever Up Down Ass'y ❶ after finishing assembly of Lever Up Down Ass'y ❶ and Gear Center Ass'y ❷.

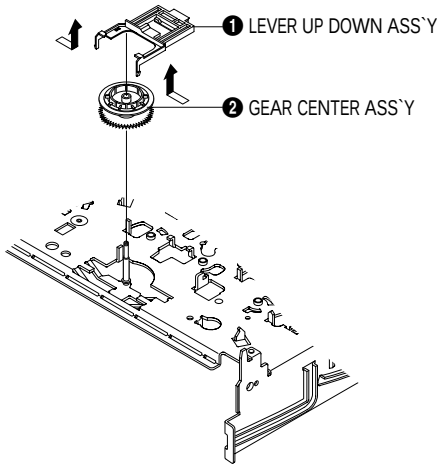


Fig. 4-26 Lever Up Down Ass'y Removal

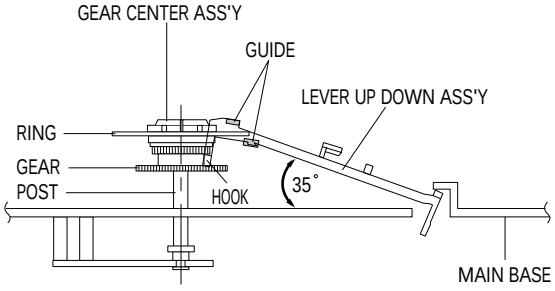


Fig. 4-27 Lever Up Down Ass'y Removal

1-2-18 Guide Cassette Door Removal

1) Lift the Hook [A].
2) Rotate the Guide Cassette Door ❶ in the direction of arrow.

Note : After reinstalling the Guide Cassette Door ❶ sure the Hook [A].

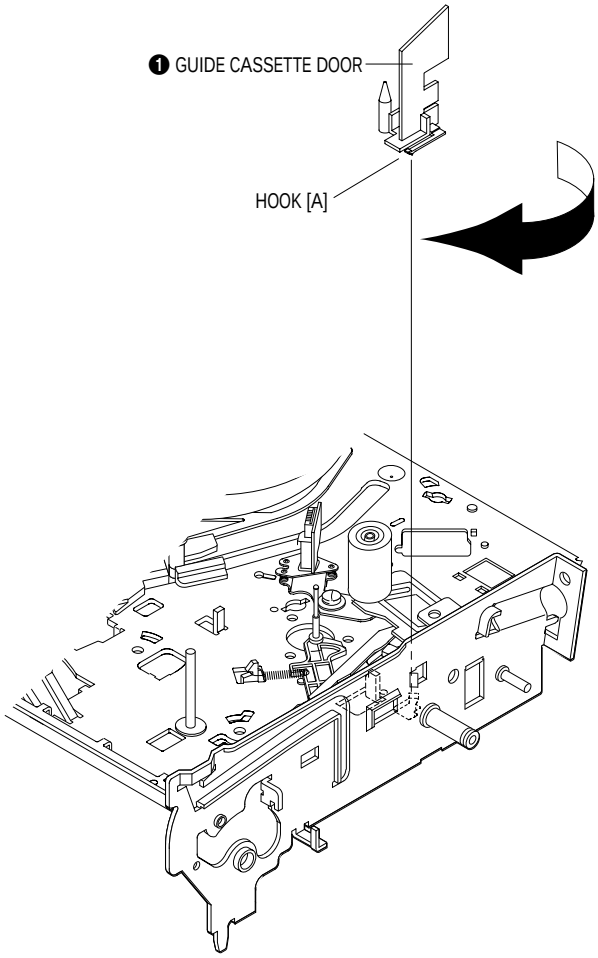


Fig. 4-28 Guide Cassette Door Removal

1-2-19 Lever Unit Pinch Ass'y, Plate Joint, Spring Pinch Drive Removal

1) Lift the Unit Pinch Ass'y ❶.
2) Remove the Plate Joint ❷ from Lever Pinch Drive.
3) Remove the Spring Pinch Drive ❸.

Note :
1) Take extreme care not to touch the grease on the Roller Pinch.
2) When reinstalling, be sure to apply grease on the post pinch roller.

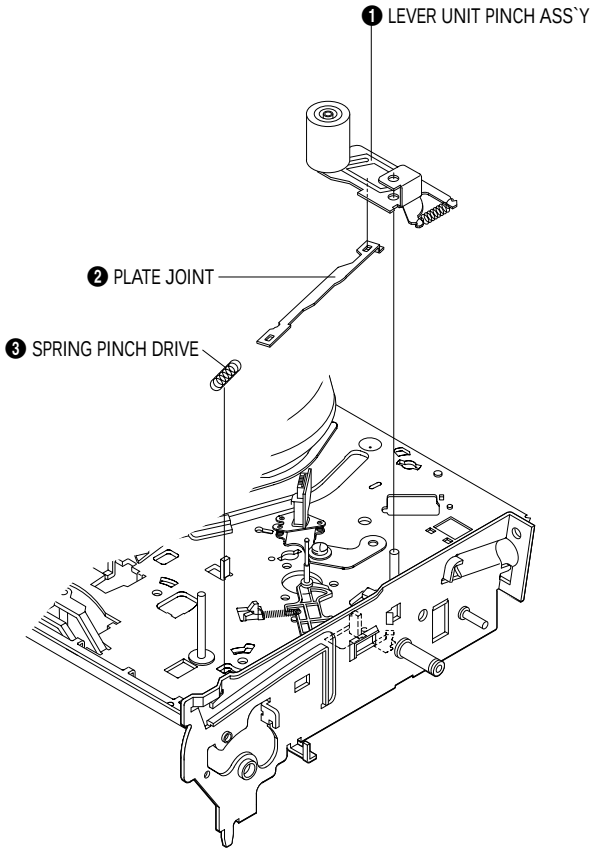


Fig. 4-29 Lever Unit Pinch Ass'y, Plate Joint, Spring Pinch Drive Removal

1-2-20 Lever #9 Guide Ass'y Removal

1) Remove the Spring #9 Guide ❶.
2) Lift the Spring #9 Guide Ass'y ❷ in the direction of arrow "A".

Note :
1) Take extreme care not to get grease on the tape Guide Post.
2) After reinstalling, check the bottom side of the Post #9 Guide to the top side of Main Base.

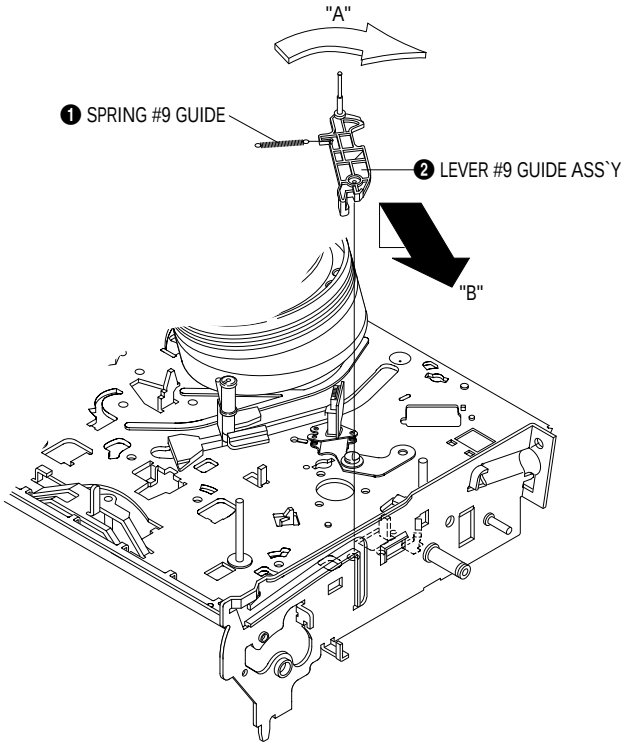


Fig. 4-30 Lever #9 Guide Ass'y Removal

1-2-21 FE Head Removal

1) Remove the screw ❶.
2) Lift the FE Head ❷.

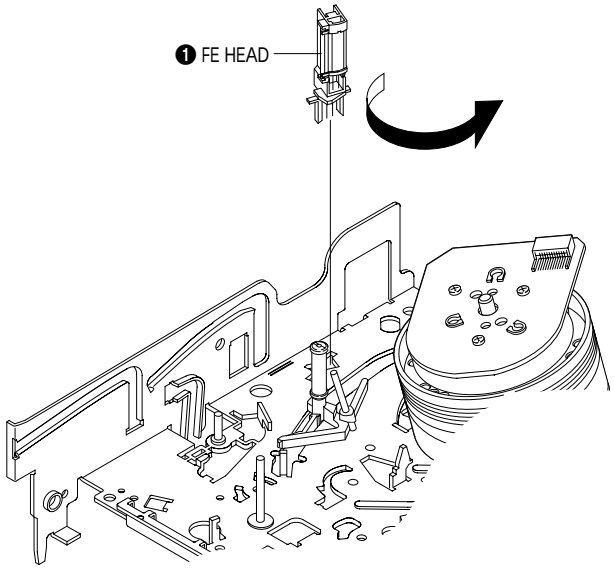


Fig. 4-31 FE Head Removal

1-2-22 ACE Head Removal

1) Pull out the FPC from connector of ACE Head Ass'y ❷.
2) Remove the screw ❶.
3) Lift the ACE Head Ass'y ❷.

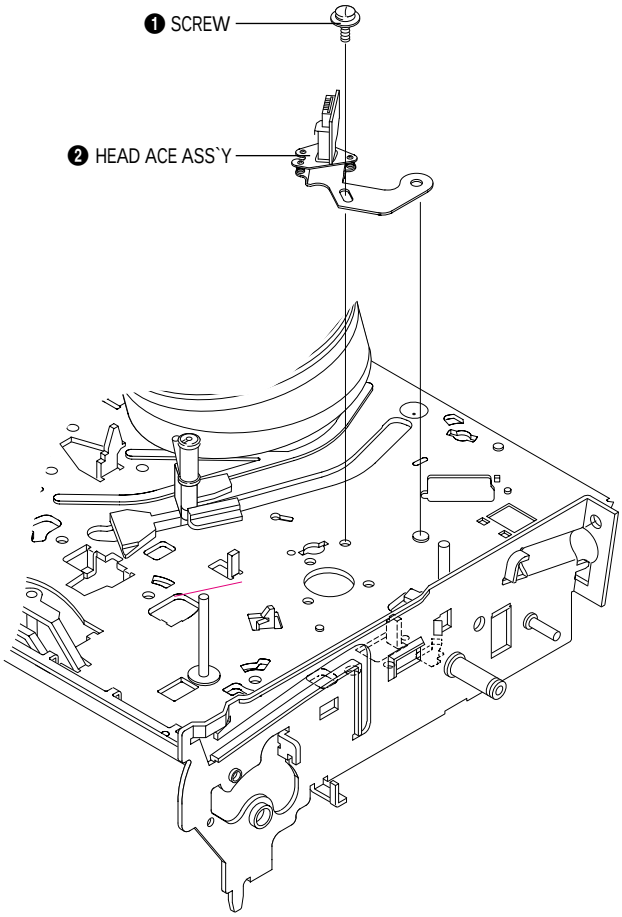


Fig. 4-32 ACE Head Removal

1-2-23 Slider S, T Ass'y Removal

1) Move the Slider S, T Ass'y ❶, ❷ to slot, and then lift it to remove. (Refer to arrow)

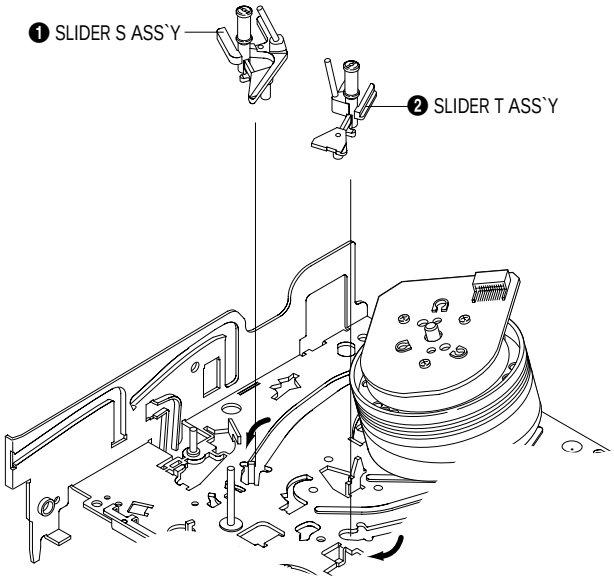


Fig. 4-33 Slider S, T Ass'y Removal

1-2-24 Plate Ground Deck, Cylinder Ass'y Removal

1) Remove the 3 Screws ❶.
2) Lift the Plate Ground Deck ❷.
3) Lift the Cylinder Ass'y ❸.

Assembly :
1) Match the 3 holes in the bottom of Cylinder ass'y ❸ to the 3 holes of Main Base as attending not to drop or knock the Cylinder ass'y ❸.
2) Tighten the 1 Screw ❶.
3) Match the Plate Ground Deck ❷ to the Hole of Base Main.
4) Tighten the other 2 Screws ❶.

Note :
1) Take care not to touch the Cylinder Ass'y ❸ and the tape guide post at reinstalling.
2) When reinstalling, Don't push down too much on Screw Driver.

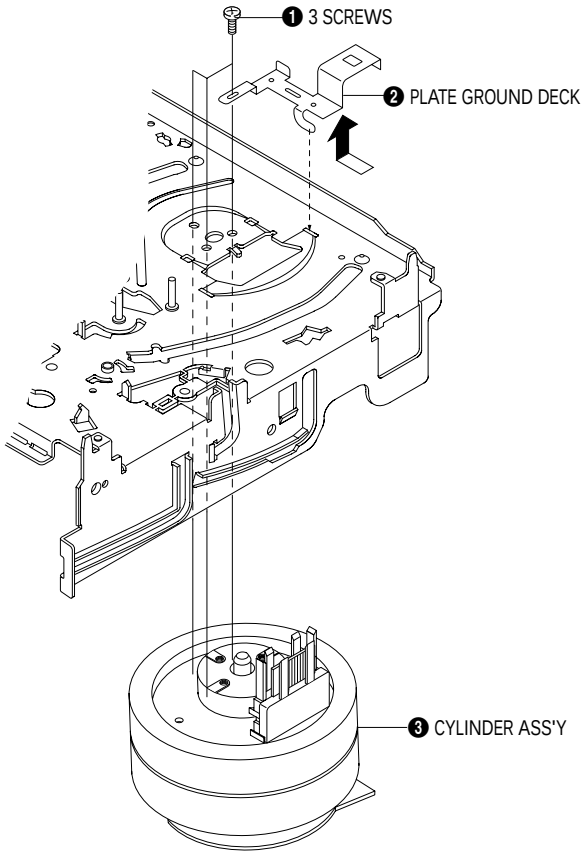


Fig. 4-34 Plate Ground Deck, Cylinder Ass'y Removal

1-2-25 Belt Pulley Removal

1) Remove the Belt Pulley ❶.

Note : Take extreme care not to get grease on Belt Pulley ❶ at assembling or reassembling.

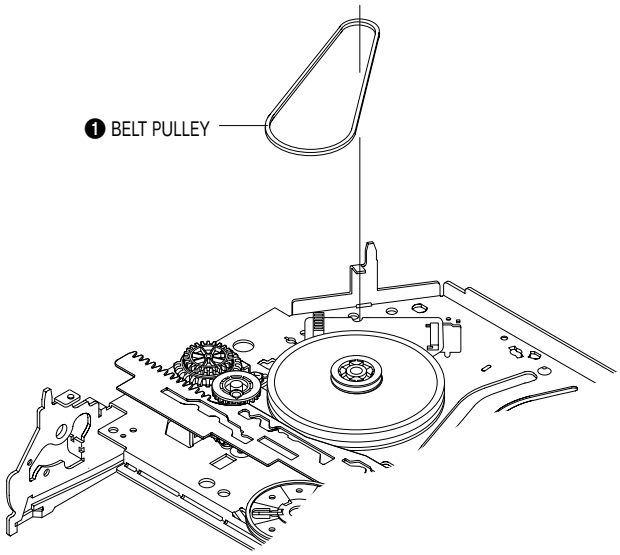


Fig. 4-35 Belt Pulley Removal

1-2-26 Damper Capstan, Motor Capstan Ass'y Removal

1) Remove the Damper Capstan ❶ in the direction of arrow.
2) Remove the 3 Screws ❷.
3) Remove the Motor Capstan Ass'y ❸.

Assembly :
1) Match the 3 holes of Motor Capstan Ass'y ❸ to the 3 holes of Main Base. Be careful not to drop or knock the Motor Capstan Ass'y ❸.
2) Tighten the 3 Screws ❷ in the direction of arrow as shown detail drawing.
3) Assemble the Damper Capstan ❶.

Note : After tightening screws, check if there is gap between the head of screws and the top side of Main Base. There should have no gap between the head of screws and the top side of Main Base.
After reinstalling, adjusting the tape transport system again.

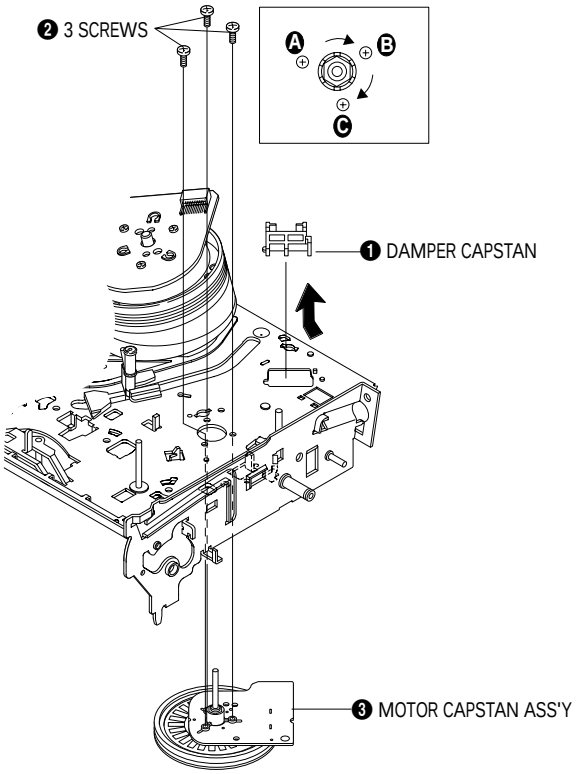


Fig. 4-36 Damper Capstan,Motor Capstan Ass'y Removal

1-2-27 Post #8 Guide Ass'y Removal

1) Rotate the Post #8 Guide Ass'y ❶ in the direction of arrow to lift up.

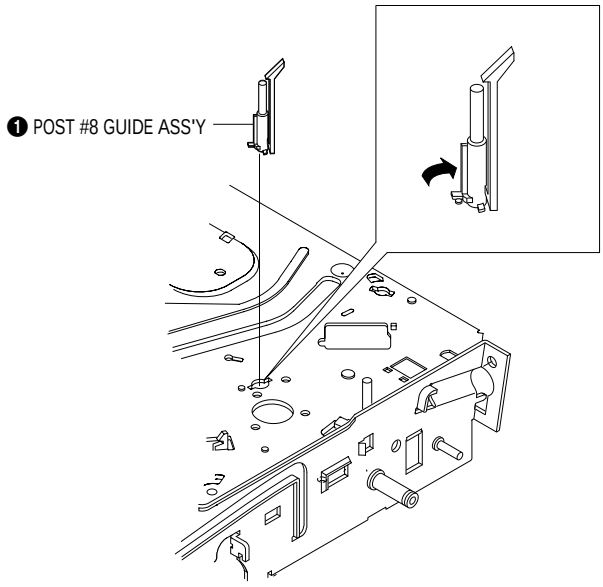


Fig. 4-37 Post #8 Guide Ass'y Removal

1-2-28 Level Head Cleaner Ass'y Removal (Optional)

1) Release the Hook ❶.
2) Lift the Lever Head Cleaner Ass'y ❷.

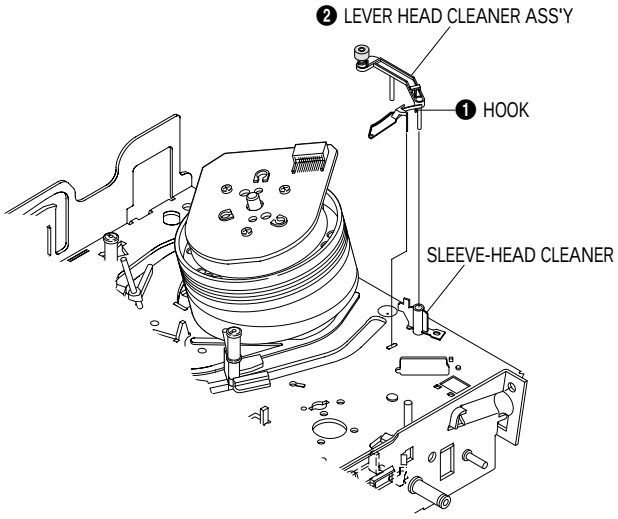


Fig. 4-38 Post #8 Guide Ass'y Removal

1-2-29 How to Eject the Cassette Tape (If the unit does not operate on condition that is inserted into housing ass'y)

1) Turn the Gear worm ❶ clockwise with screw driver.(Refer to arrow)
(Other method : Remove the Screw of Motor Load Ass'y, Separate the Motor Load Ass'y)

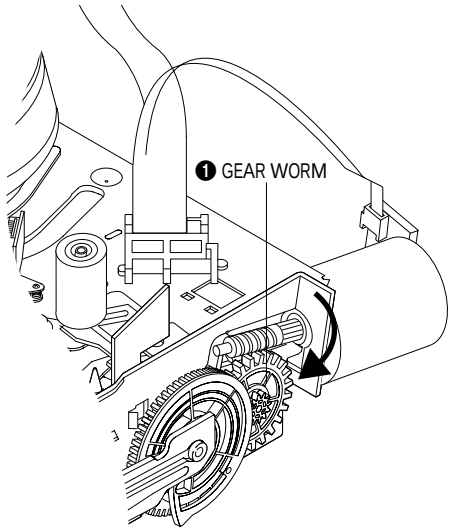


Fig. 4-39

2) When Slider S,T are approched in the position of unloading, rotate holder Clutch counterclockwise after inserting screw driver in the hole of frame's bottom in order to wind the unwinded tape. (Refer to Fig.4-40)
(If you rotate Gear Worm ❶ continuously when tape is in state of unwinding, you may cause a tape contamination by grease and tape damage. Be sure to wind the unwinded tape in the state of set horizontly.)
3) Rotate Gear Worm ❶ clockwise using screw driver again up to the state of eject mode and then pick out the tape.(Refer to Fig.4-39)

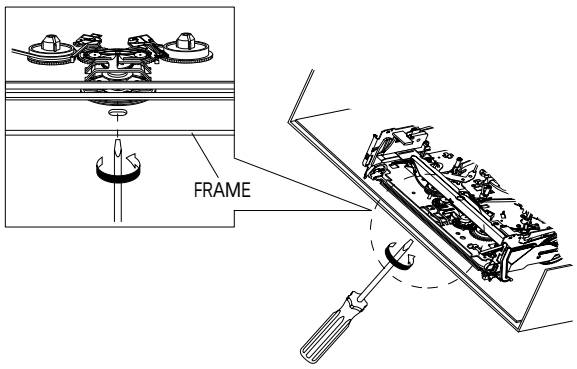


Fig. 4-40

1-3 The table of clearing, Lubrication and replacement time about principal parts

1) The replacement time of parts is not life of parts.
2) The table 1-1 is that the VCR Set is in normal condition (normal temperature, normal humidity).
   The checking period may be changed owing to the condition of use, runtime and environmental conditions.
3) Life of the Cylinder Ass'y is depend on the condition of use.
4) See exploded view for location of each parts.

<Table 1-1>

*	Parts Name	Checking Period										Remark
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
TAPE PATH SYSTEM	POST TENSION	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	- To clean the parts, use patch and alcohol (solvent). - After cleaning, use the video tape after alcohol is gone away completely. - We recommend to use oil [EP-50] or solvent. - One or two drops of oil should be applied after cleaning with alcohol.
	SLANT POST S, T	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#8 GUIDE SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	CAPSTAN SHAFT	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#9 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	#3 GUIDE POST	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
	GUIDE ROLLER S, T	Δ	Δ	Δ	O	O	O	O	O	O	O	
	CYLINDER ASS'Y	Δ	O	O	O	O	O	O	O	O	O	
	FE HEAD	Δ	Δ	Δ	O	O	O	O	O	O	O	
	ACE HEAD	Δ	O	O	O	O	O	O	O	O	O	
	PINCH ROLLER	Δ	O	O	O	O	O	O	O	O	O	
	POST REEL S, T											- Periodic time of applying oil (Apply oil after cleaning) - The excessive applying oil may be the cause of malfunction.
	SLEEVE TENSION											
	POST CENTER											
	LEVER IDLE BOSS (2Point)											
DRIVING SYSTEM	CAPSTAN MOTOR PULLEY	Δ	Δ	Δ	Δ	Δ	O	O	O	O	O	
	BELT PULLEY				O	O	O	O	O	O	O	
	HOLDER CLUTCH ASS'Y	Δ	O	O	O	O	O	O	O	O	O	
	GEAR CENTER ASS'Y		O	O	O	O	O	O	O	O	O	
	GEAR IDLE (2Point)		O	O	O	O	O	O	O	O	O	
	LOADING MOTOR		O	O	O	O	O	O	O	O	O	
BRAKE SYSTEM	BAND BRAKE ASS'Y		O	O	O	O	O	O	O	O	O	
	BRAKE T ASS'Y		O	O	O	O	O	O	O	O	O	

Δ : Cleaning O : Check and replacement in necessary : Add Oil

5. Alignment and Adjustment

5-1 Reference

1) X-Point (Tracking center) adjustment, “Head switching adjustment” and “NVRAM option setting” can be adjusted with remote control.
2) When replacing the Micom (IC601) and NVRAM (IC605 ; EEPROM) be sure to adjust the “Head switching adjustment” and “NVRAM option setting”.
3) When replacing the cylinder ass’y, be sure to adjust the “X-Point” and “Head switching adjustment”.
4) Remote control used for same chassis as a accessory is available for all adjustments.
5) How to adjustment.
   - Press the “SW701” button on Main PCB to set the adjustment mode.
   - If the corresponding adjustment button is pressed, the adjustment is performed automatically.
   - If the adjustment is completed, be sure to turn the power off.

5-1-1 Location of adjustment button of remote control

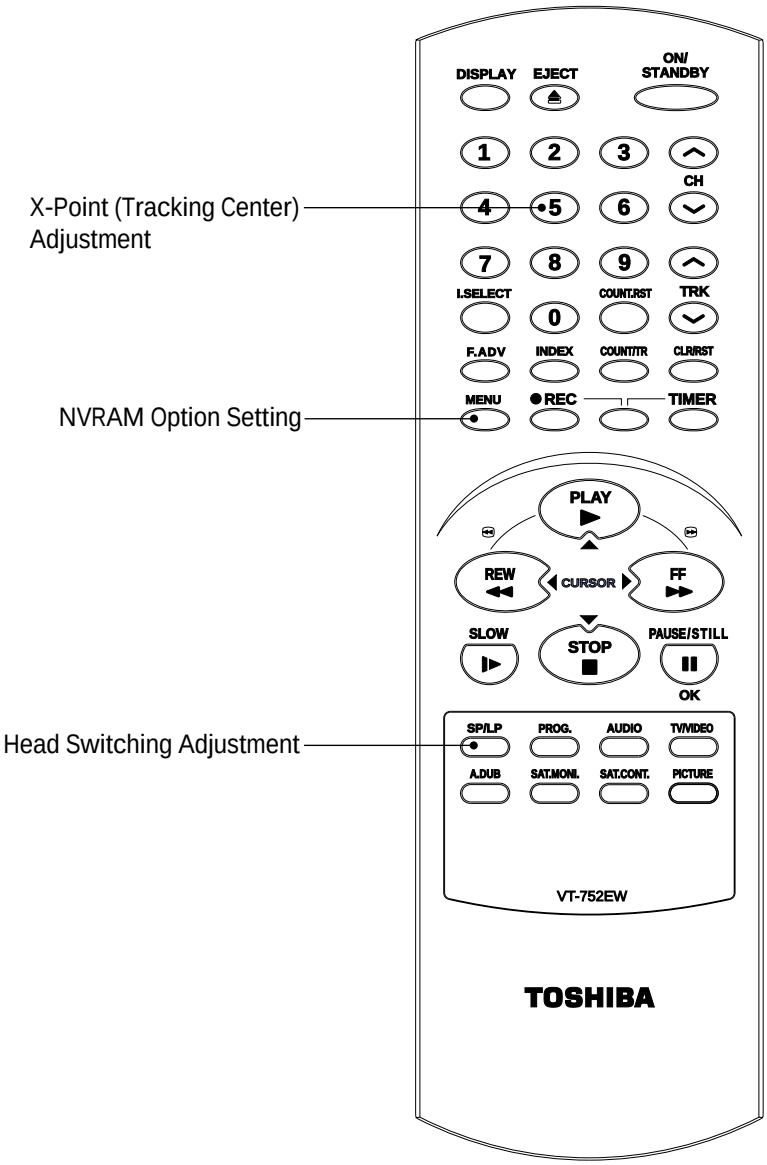


Fig. 5-1

5-1-2 SW701 location for adjustment mode setting

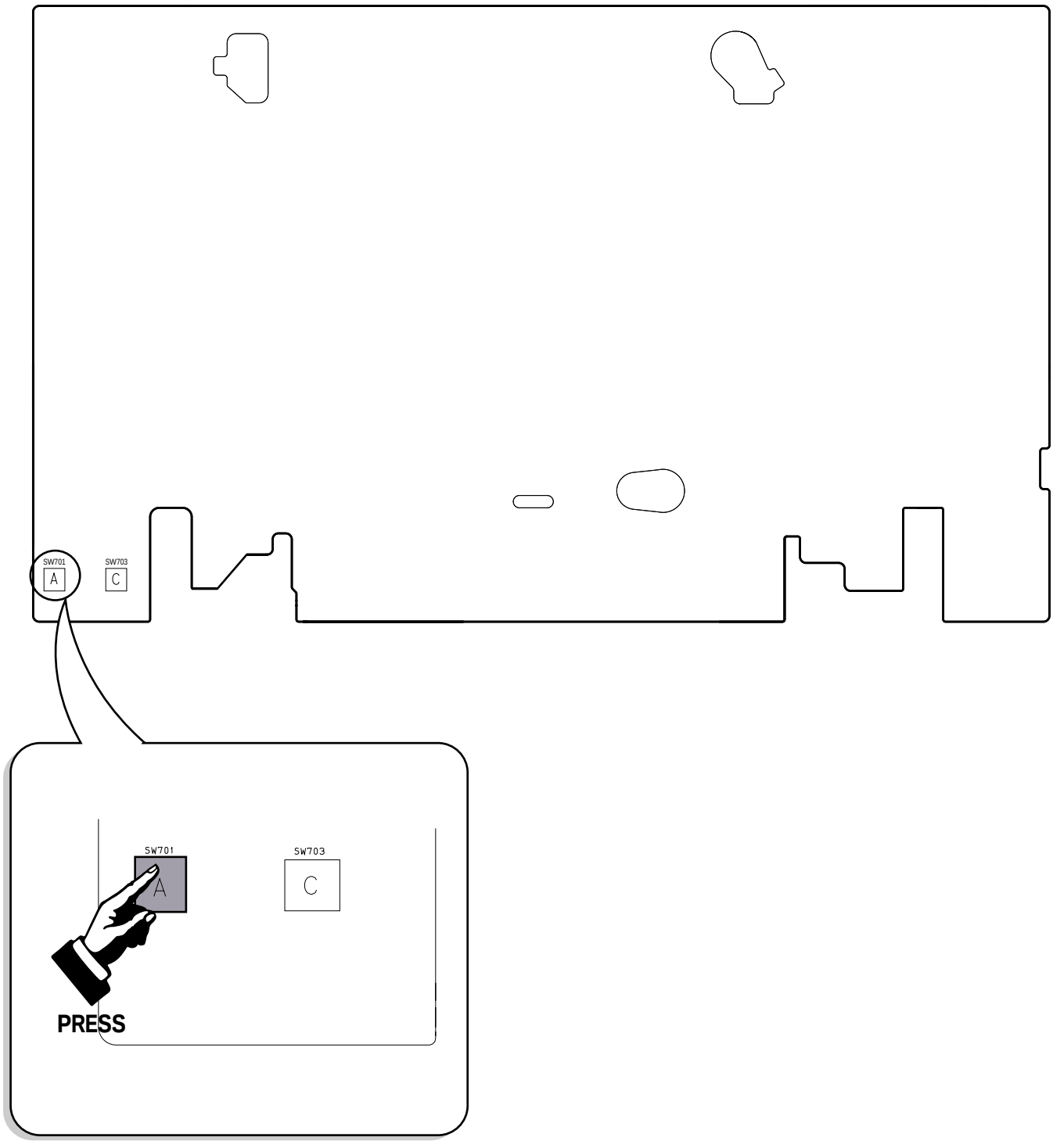


Fig. 5-2 Main PCB (Top View)

5-2 Mechanical Adjustment

5-2-1 Tape Transport System and Adjustment Locations

The tape transport system has been adjusted precisely in the factory. Alignment is not necessary except for the following :
1) Noise observed on the screen.
2) Tape damage.
3) Parts replacement in the tape transport system.

Lower flange height of tape guide is used as the reference for the transport adjustment.
To maintain the height of the tape guide and prevent damage, do not apply excessive force onto the main base.

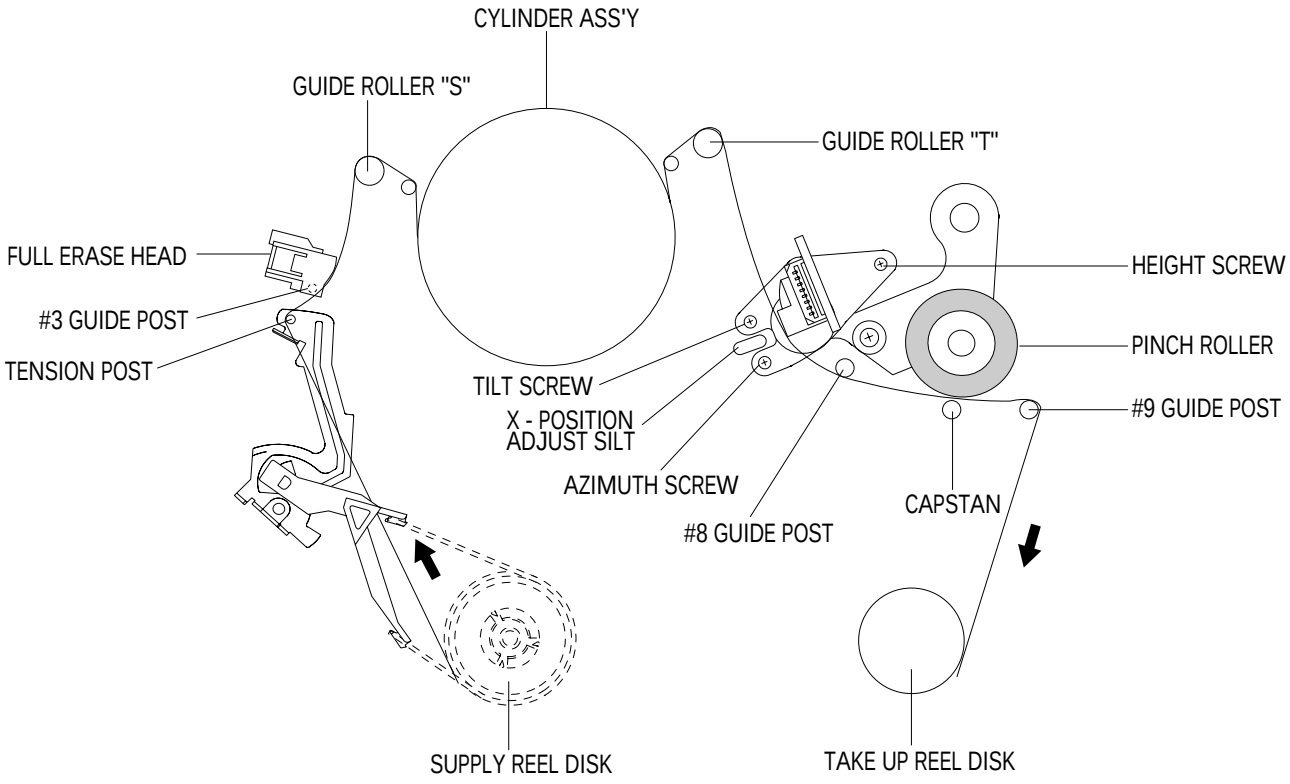


Fig. 5-3 Location of Tape Transport Adjustment

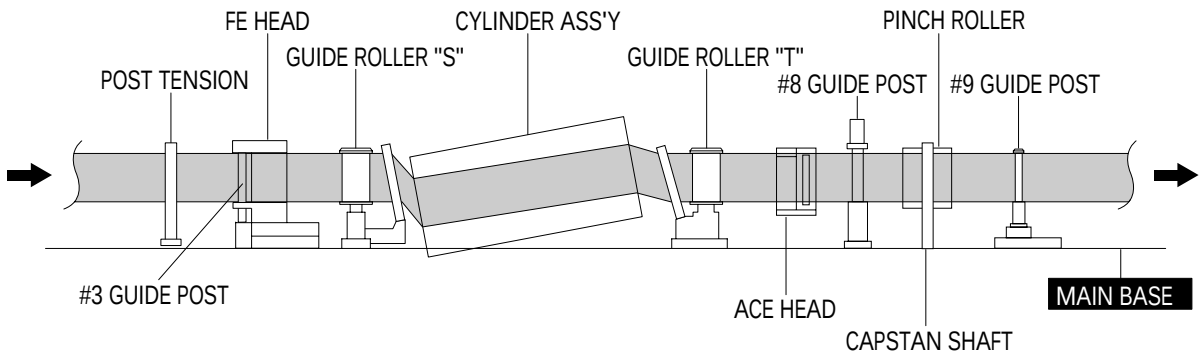


Fig. 5-4 Tape Travel Diagram

5-2-2 Tape Transport System Adjustment

When parts are replaced, perform the required adjustments by referring to precedures for the tape transport system. If there are any changes to the tape path, first run a T-120 tape and make sure excessive tape wrinkle does not occur at the tape guides.

1) If tape wrinkle is observed at the guide roller S, T, turn the guide roller S, T until wrinkle disappears.
2) If the tape wrinkle is still observed at the tape guide, perform the tilt adjustment of the ACE head.

(1) ACE Head Assembly Adjustment

Test point :	TP601 (Control Pulse)
	TP602 (H'D S/W -Trigger)
	TP301 (Envelope)
	TP302 (Audio output)
	TP303 (Video output)
Test tape :	ST-N1
	BLANK TAPE : T-160

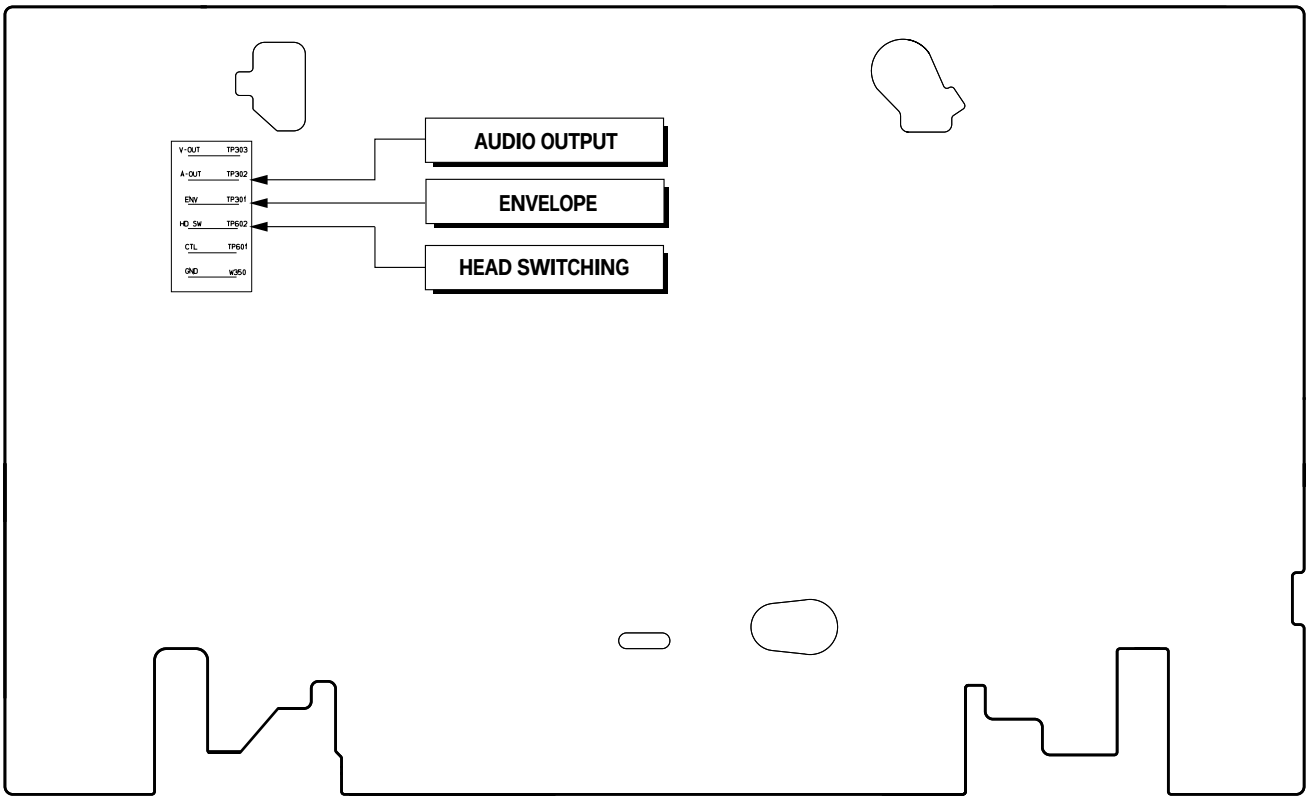


Fig. 5-5 Location of Test point (Main PCB-Top View)

a. ACE HEAD HEIGHT ADJUSTMENT

1) Run the alignment tape (Color bar) in the playback mode.
2) Observe surface of the audio head using a dental mirror.
3) Turn screw (C) clockwise or counterclockwise until the gap of lower tape edge and the lower edge of the control head is about 0.25mm.
(Refer to Fig. 5-6 and 5-7)

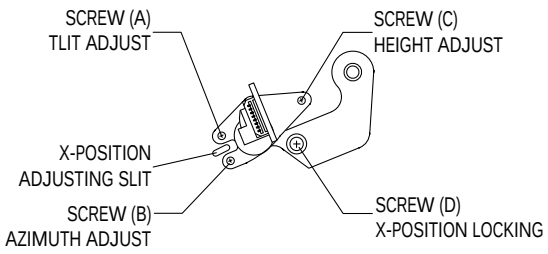


Fig. 5-6 Location of ACE Head Adjustment Screw

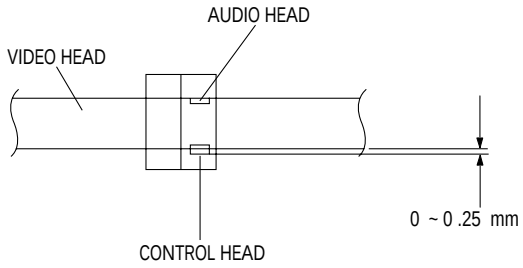


Fig. 5-7 ACE Head Height Adjustment

b. ACE HEAD TILT ADJUSTMENT

1) Playback a blank tape and observe the position of the tape at the lower flange of tape guide.
2) Confirm that there is no curl or wrinkle at the lower flange of tape guide as shown in Fig. 5-8 (B).
3) If a curl or wrinkle of the tape occurrs, slightly turn the screw (A) tilt adjust on the ACE head ass'y.
4) Reconfirm the ACE head height.

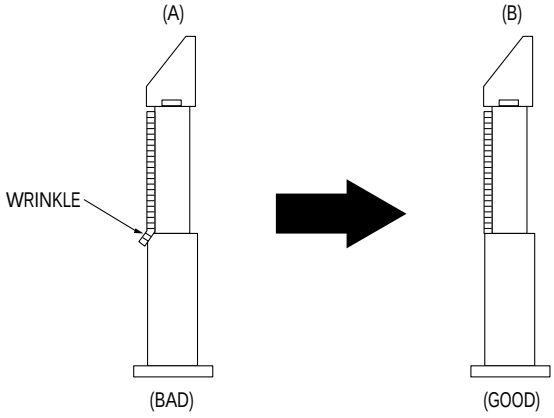


Fig. 5-8 Tape Guide Check

c. AUDIO AZIMUTH ADJUSTMENT

1) Load alignment tape (Mono scope) and playback the 6KHz signal.
2) Connect channel-1 scope probe to audio output test point (TP302).
3) Adjust screw (B) to achieve maximum audio level. (See Fig. 5-6)

d. ACE HEAD POSITION (X-POINT) ADJUSTMENT

1) Playback the alignment tape (Color bar).
2) Press the "SW701" button on Main PCB to set the adjustment mode. (See Fig. 5-2)
3) Press the "5" button of remote control then adjustment is operated automatically. (See Fig. 5-1)
4) Connect the CH-1 probe to TP303 (Envelope) the CH-2 probe to TP601 (H'D switching pulse) and then trigger to CH-1.
5) Insert the (-) driver into the X-Point adjustment hole and adjust it so that envelope waveform is maximum.
6) Turn the Power off.

(2) Linearity adjustment (Guide roller S, T adjustment)

1) Playback the Mono Scope alignment tape (SP mode).
2) Observe the video envelope signal on an oscilloscope (triggered by the video switching pulse).
3) Make sure the video envelope waveform (at its minimum) meets the specification shown in Fig. 5-9.
   If it does not, adjust as follows :

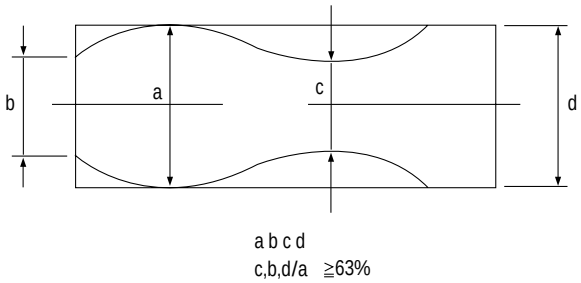


Fig. 5-9 Envelope Waveform Adjustment

Note :
a=Maximum output of the video RF envelope.
b=Minimum output of the video RF envelope at the entrance side.
c=Minimum output of the video RF envelope at the center point.
d=Maximum output of the video RF envelope at the exit side.

4) If the section A in Fig. 5-10 does not meet the specification, adjust the guide roller S up or down.
5) If the section B in Fig. 5-10 does not meet the specification, adjust the guide roller T up or down.

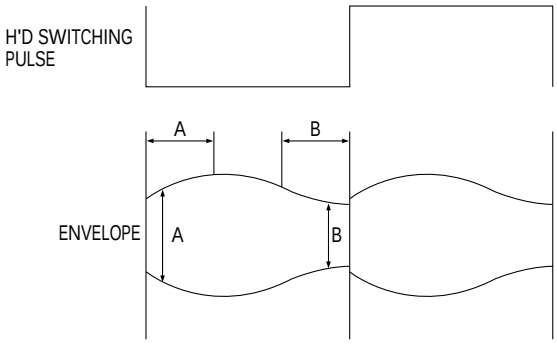


Fig. 5-10 Adjustment Points

6) Play back the Mono Scope alignment tape (SP mode).
7) Connect an oscilloscope CH-1 to the Envelope and CH-2 to the H'D SW Pulse for triggering.
8) Turn the guide roller heads with a flat head (▬) driver to obtain a flat video RF envelope as shown in Fig. 5-11.

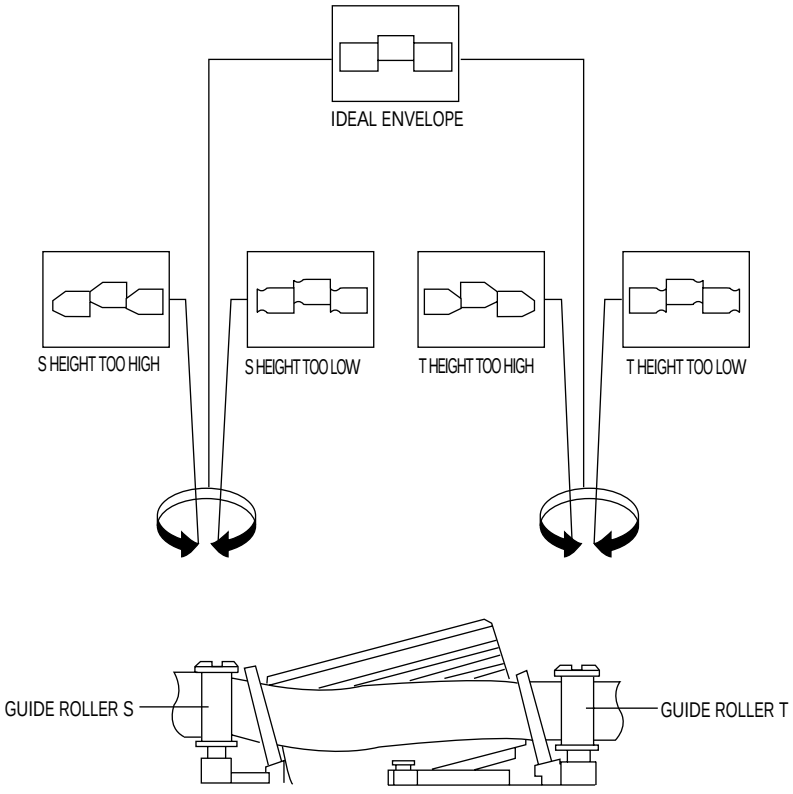


Fig. 5-11 Guide Roller S, T Height Adjustment

(3) Check Transitional Operation from RPS to Play

Check transition from RPS mode to play mode :
Using a pre-recorded SP tape, make sure the entry side of envelope comes to an appropriate steady state within 3 seconds (as shown in Fig. 5-12).
If the envelope waveform does not reach specified peak-to peak amplitude within 3 seconds, adjust as follows :

1) Make sure there is no gap between the supply roller lower flange and the tape.
   If there is a gap, adjust the supply guide roller again.
2) Change operation mode from the RPS to the play mode (again) and make sure the entry side of envelope rises within 3 second.

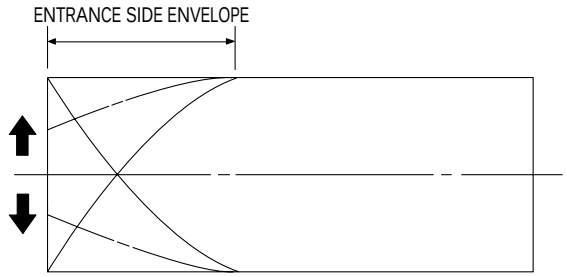


Fig. 5-12 Video Envelope Rising when Operation mode Changes from RPS to Play Mode

(4) Envelope Check

1) Make recordings on T-120 (E-120) and T-160 (E-180) tape.
   Make sure the playback output envelope meets the specification as shown in Fig. 5-13.
2) Play back a self recorded tape (recording made on the unit using with T-120 (E-120).
   The video envelope should meet the specification as shown in Fig. 5-13.
   In SP mode, (A) should equal (B).
   If the head gap is wide, upper cylinder should be checked.

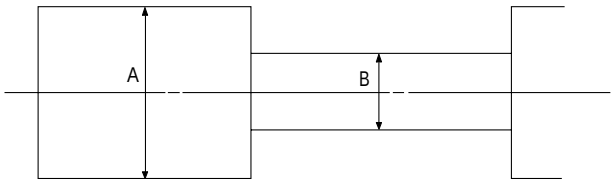


Fig. 5-13 Envelope Output and Output Level

(5) Tape Wrinkle Check

1) Run the T-160 (E-180) tape in the playback, FPS, RPS and Pause modes and observe tape wrinkle at each guide.
2) If excessive tape wrinkle is observed, perform the following adjustments in Playback mode :

- Tape wrinkle at the guide roller S, T section : Linearity adjustment.
- Tape wrinkle at tape guide flange : ACE head assembly coarse adjustment.

5-2-3 Reel Torque

1) The rotation of the capstan motor causes the Holder Clutch Ass'y to rotate through the Belt Pulley.
2) The spring wrap PLAY / REV of holder clutch ass'y drives the disk reel S, T through gear idle by rotation of gear center ass'y.
3) Brake is operated by slider cam at FF / REW mode.
4) Transportation of accurate driving force is done by gears. (Gear Center Ass'y)

Note : If the spec. does not meet the followings specifications, replace the holder clutch ass'y and then recheck.

<Table 5-1>

MODE	TORQUE g/cm	GAUGE
PB	42 ± 11	Cassette Torquemeter
RPS	145 ± 30	Cassette Torquemeter

5-3 Head Switching Point Adjustment

1) Playback the alignment tape.
2) Press the “SW701” button on Main PCB with pincers to set the adjustment mode. (See Fig. 5-2)
3) Press the “SP/LP” button of remote control then adjustment is operated automatically. (See Fig. 5-1)
4) Turn the Power off.

5-4 NVRAM Option Setting

1) NVRAM Option is adjusted at production line basically.
2) In case Micom (IC601) and NVRAM (IC605 ; EEPROM) is replaced, be sure to set the corresponding ooption number of the repaired model. (If the option is not set, the unit is not operated.)

1) Press the “SW701” button on Main PCB to set the adjustment mode. (See Fig. 5-2)
2) Press the “MENU” button on the remote control about 5 seconds then option setting display is appeared. (See Fig. 5-14)
3) Select the option number (See Table 5-2) of corresponding model with “CURSOR” button on the remote control.
4) If selecting the option number is completed, press the “OK” button of remote control. (If “OK” button is pressed, the selected number is changes reversed color. ; See Fig. 5-14)
5) Press the “MENU” button of remote control again to store the option number. (“PLEASE WAIT” is displayed for a second as shown Fig. 5-15 and this setting is completed.)
6) Turn the Power off.

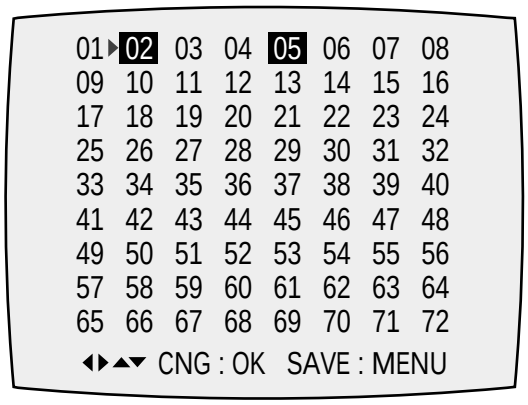


Fig. 5-14

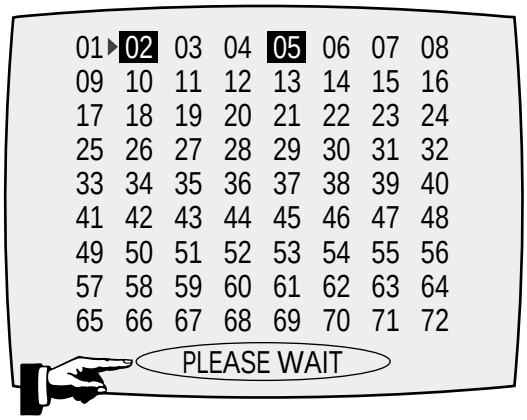


Fig. 5-15

<Table 5-2>

MODEL	OPTION NUMBER
V-E59	6, 7, 8, 9, 10, 12, 15, 20, 22, 25, 27, 29, 33, 35, 38, 42, 44, 49, 51, 52, 53, 57, 60, 61, 62, 63
V-E39	9, 10, 12, 20, 22, 25, 27, 33, 35, 38, 42, 44, 49, 51, 52, 53, 57, 60, 61, 62, 63
V-E29	10, 12, 20, 22, 25, 27, 33, 35, 38, 42, 44, 49, 51, 52, 53, 57, 60, 61, 62, 63

6. Exploded View

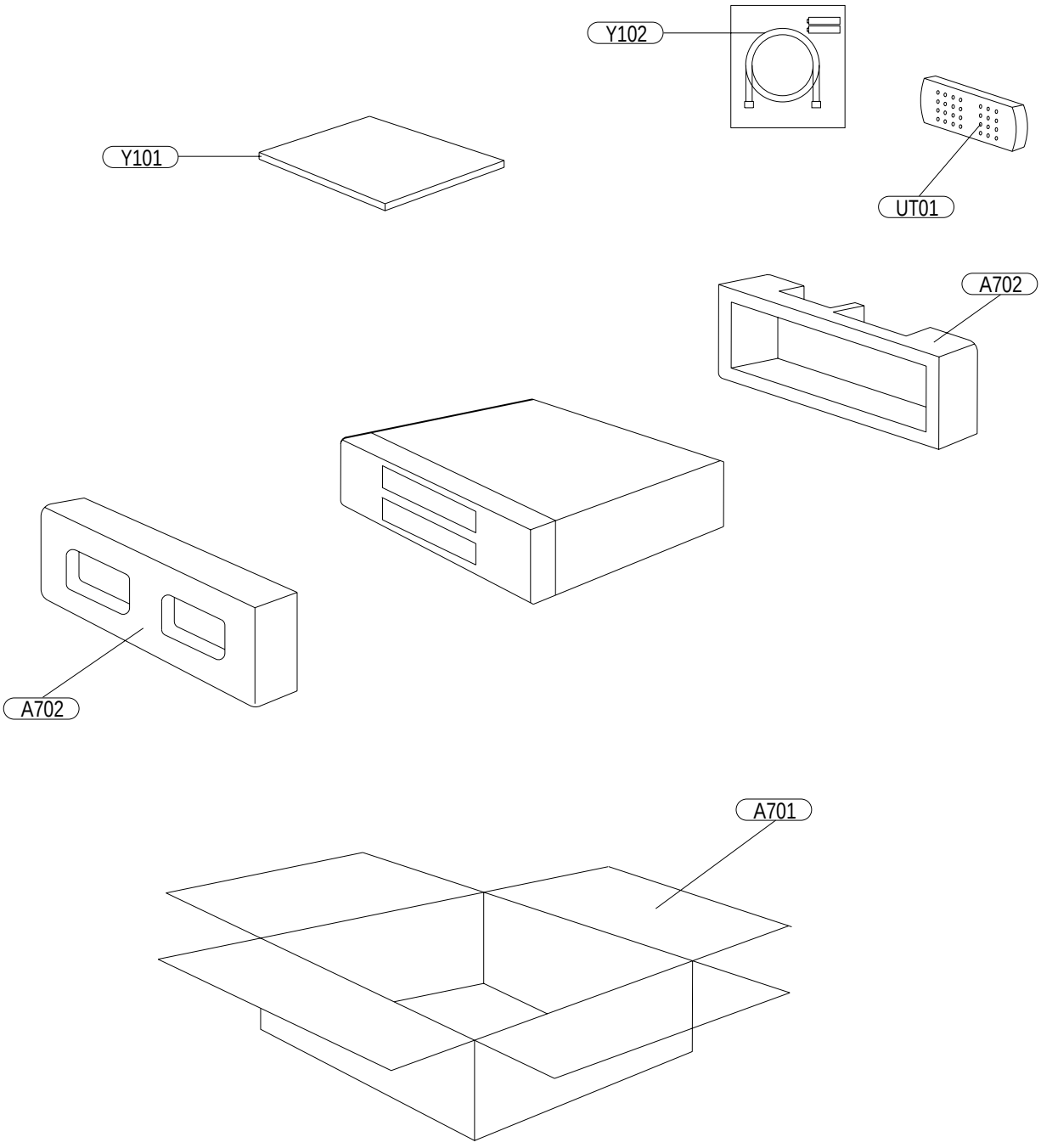
6-1 Packing Assembly - 6-2

6-2 Instrument Assembly - 6-3

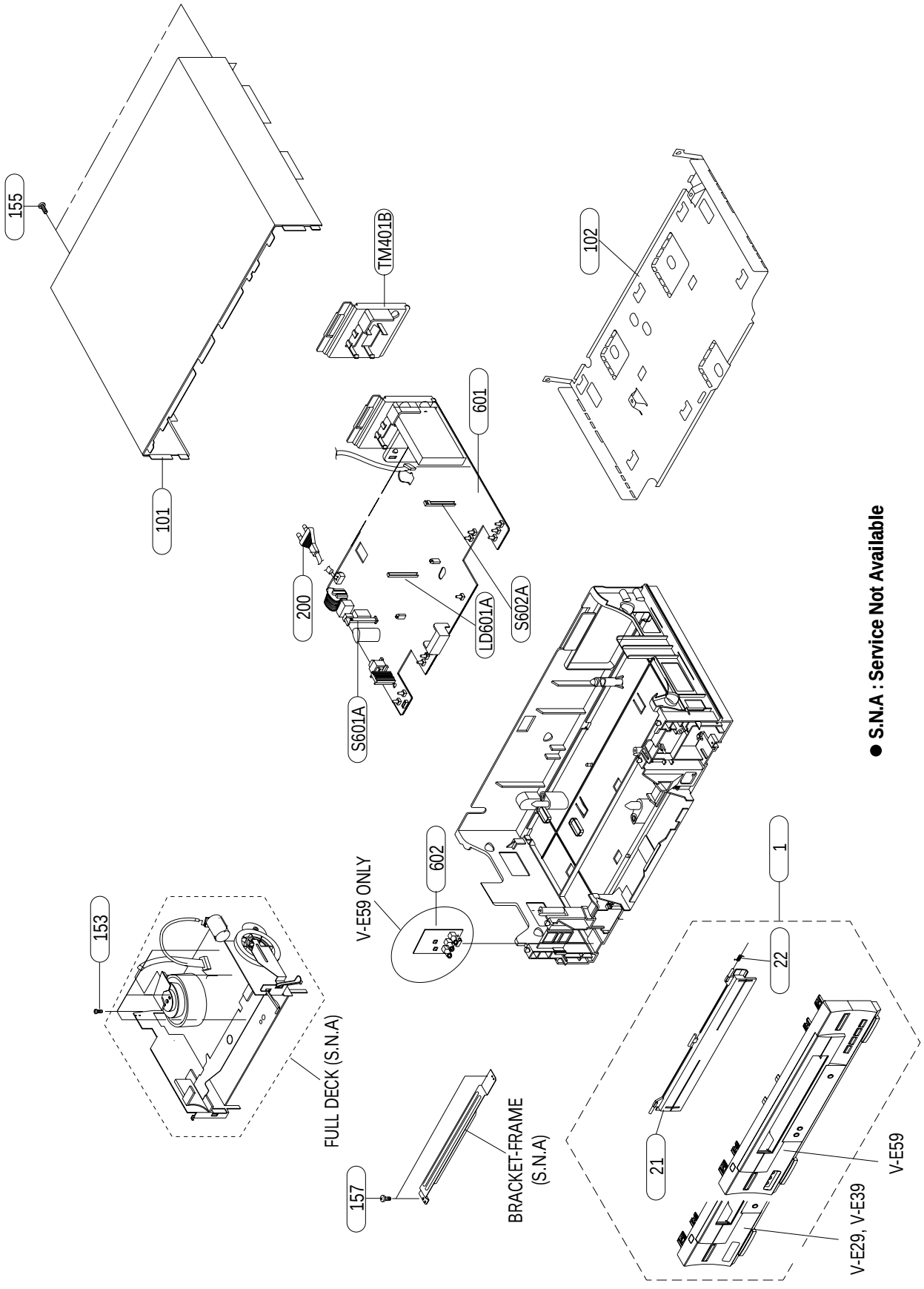
6-3 Mechanical Parts (Top Side) - 6-4

6-4 Mechanical Parts (Bottom Side) - 6-5

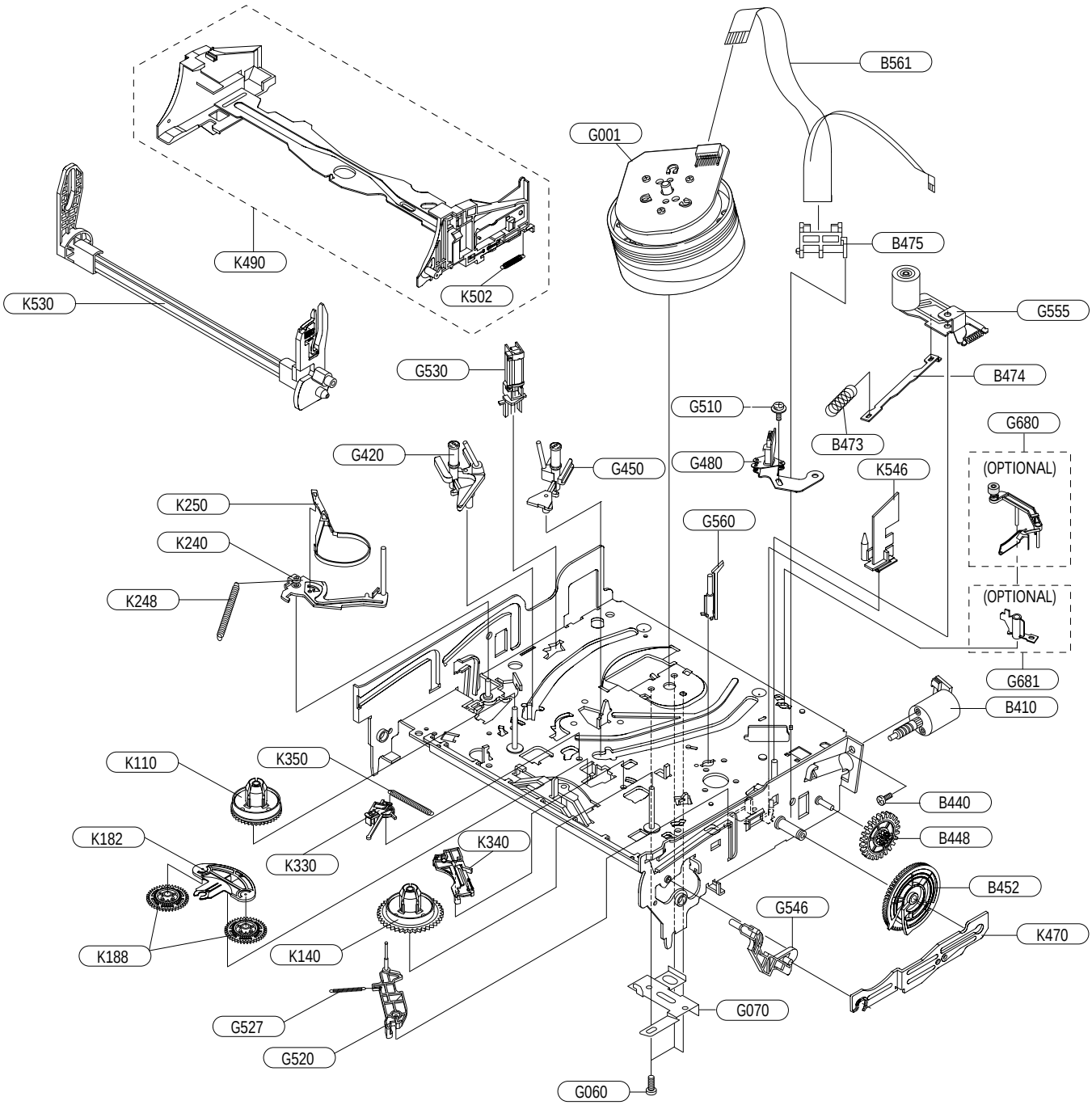
6-1 Packing Assembly



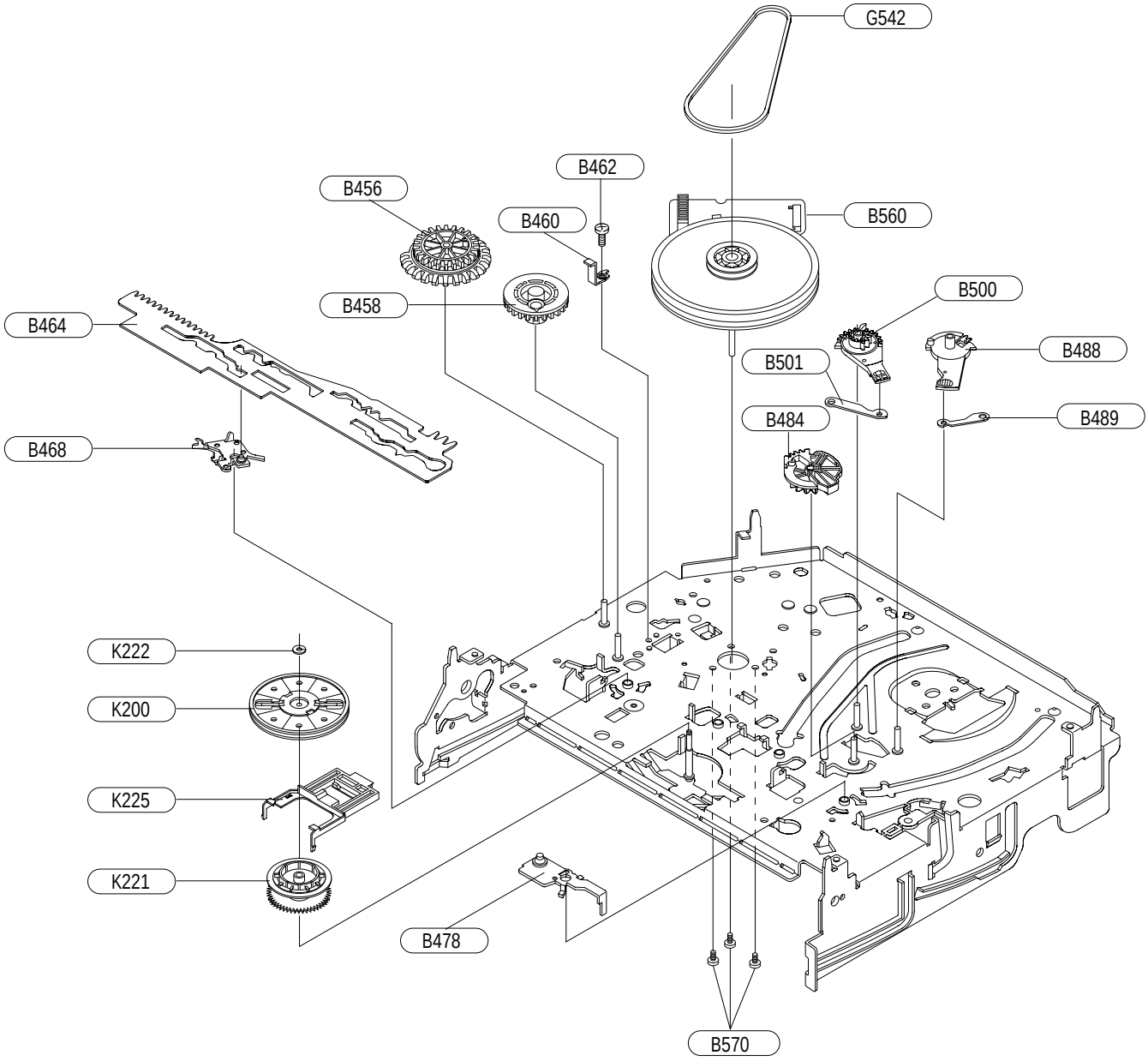
6-2 Instrument Assembly



6-3 Mechanical Parts (Top Side)



6-4 Mechanical Parts (Bottom Side)



MEMO

7. Replacement Parts List

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
- PACKING PARTS -				
A701	BY731259	AC69-00266H	PACKING CASE;V-E59/TSB,-,-,-,W326,L428,H	V-E59
	BY731257	AC69-00266K	PACKING CASE;V-E39/TSB,-,-,-,W326,L428,H	V-E39
	BY731253	AC69-00266L	PACKING CASE;V-E29/TSB,-,-,-,W326,L428,H	V-E29
A702	BY730464	AC69-00041A	CUSHION-F/B;M-656/TSB,EPS,-,-,-,-,-	
UT01	BY731070	AC59-00063D	REMOCON-ASSY;V-752EW/TSB,TOSHIBA,-,-,-,-	
Y101	BY634733	AC68-01772A	MANUAL USERS;V - E79 ,TSB,ENGLISH + RUSS	
	BY634734	AC68-01773A	MANUAL USERS;V - E79 ,TSB,ARABIC,-,-,-,-	
Y102	BY634253	AC39-00017A	CABLE-ETC-RF(PAL);-,MALE/FEMALE,1200MM,R	
- INSTRUMENT PARTS -				
1	BY731260	AC97-01787E	ASSY-FRONT PANEL;HIPS 94HB,V-E59/TSB,-	V-E59
	BY731258	AC97-01787G	ASSY-FRONT PANEL;HIPS 94HB,V-E39/TSB,-	V-E39
	BY731254	AC97-01787H	ASSY-FRONT PANEL;HIPS 94HB,V-E29/TSB,-	V-E29
21		AC64-01100B	DOOR-CASSETTE;V-E59/TSB,ABS94HB ,-,-,-,-,-,-	V-E59
		AC64-01100D	DOOR-CASSETTE;V-E39/TSB,ABS94HB ,-,-,-,-,-,-	V-E39
		AC64-01100E	DOOR-CASSETTE;V-E29/TSB,ABS94HB ,-,-,-,-,-,-	V-E29
22		AC61-62032A	SPRING ETC-MASK;SV-C130,SUS,4.4,-,-,-,-	
101	BY731243	AC64-01054D	CABINET-TOP;V-632EF,PCM(SECC),T0.525,-,-	
102	BY731112	AC63-00074A	COVER-BOTTOM;SV-653F,SECC,T0.5,-,-,-,-,-	
153	70790218	AC60-12126A	SCREW-BH;-,-,FE,FZY,BH,-,-,4*12,-,-	
155	70790082	AC60-12134A	SCREW-TAP BH;-,FZB,2-4X16,FE,BH,-,-,2-4X	
157	70790002	AC60-10063A	SCREW-TAPTITE;-,-,L12,ZPC3,+,-,M3,-,SWRC	
200	BY634124	AC39-10019A	POWER CORD;KKP-419C,H03VVH2-F,VDE/KEMA-K	
CN3A1S	BY634415	3809-001206	CABLE-FLAT;30V,-20to+80C,140mm,6P,1.25mm	
LD601A	BY730082	AC61-21009A	HOLDER-LED;X-9,POM(M90-44),-,-,-,BLK,-	
S601A	BY731054	AC61-00229A	HOLDER-SENSOR;SCORPIO2,POM,-,-,-,BLACK,-	
S602A	BY731054	AC61-00229A	HOLDER-SENSOR;SCORPIO2,POM,-,-,-,BLACK,-	
TM401B	BY634540	AC61-00150A	CHASSIS-ASSY;SV-640G,HIPS94HB,T2,-,-,-,-	V-E59
	BY634557	AC61-00151A	CHASSIS-ASSY;SV-445G,HIPS94HB,T2,-,-,-,-	V-E29/E39
- MECHANICAL PARTS -				
B410	BY631184	AC31-00018A	MOTOR-LOADING ASSY;-,SCORPIO2(TS-10A),-,	
B440	BY730072	AC60-10515A	SCREW-MACHINE;-,-,M3,L3,PH,+,-,-,ZPC,-	
B448	BY730743	AC66-00008A	GEAR-WORM WHEEL;TS-10,POM,0.8,40,-,NAT,3	
B452	BY730745	AC66-00011A	GEAR-FL CAM;TS-10,POM,0.8,59,-,BLK,48.48	
B456	BY730744	AC66-00009A	GEAR-JOINT 1;TS-10,POM,1.5,17.5(22),-,NA	
B458	BY730746	AC66-00012A	GEAR-JOINT 2;TS-10,POM,1.0,23,-,BLK,24.6	
B460	BY730851	AC61-00090A	BRACKET-GEAR;TS-10,SECC E20/20,0.8,-,-,-	
B462	BY730073	AC60-10517A	SCREW-TAP TITE;-,-,M2.6,L5,PH,+,-,-,ZPC,	
B464	BY730749	AC66-00019A	SLIDER-CAM;TS-10,SECC E20/20,1.2,-,-,-,-	
B468	BY730748	AC66-00017A	LEVER-PINCH DRIVE;TS-10,SECC E20/20,1.0	
B473	BY730723	AC61-00105A	SPRING ETC-PINCH DRIVE;TS-10,SUS304-WPB,	
B474	BY730244	AC61-30180A	PLATE-JOINT;X-9,SECC20/20,T0.8,-,-,-,-	
B475	BY731053	AC47-00003A	DAMPER-CAPSTAN;SCORPIO2,POM, NATUAL,-,-,	
B478	BY730747	AC66-00016A	LEVER-TENSION DRIVE;TS-10,SECC E20/20,1	
B484	BY730755	AC66-00030A	GEAR-LOADING DR. ASS'Y;TS-10,POM+SWPB,-,	
B488	BY730753	AC66-00023A	LEVER-S LOADING;TS-10,POM,-,-,-,-,NAT,-	
B489	BY730751	AC66-00021A	LINK-LOADING S;TS-10,SECC E20/20,0.8,-,-	
B500	BY730754	AC66-00024A	LEVER-T LOADING;TS-10,POM,-,-,-,-,NAT,-	
B501	BY730752	AC66-00022A	LINK-LOADING T;TS-10,SECC E20/20,0.8,-,-	
B560	BY631187	AC31-00016A	MOTOR-CAPSTAN;F2QVB05,SCORPIO2(TS-10A),-	
B561	BY634670	3809-001270	CABLE-FLAT;30V,80C,140MM,10P,1.25MM,UL28	
B570	BY730071	AC60-10514A	SCREW-CAPSTAN;-,-,M2.6,L6,PH,+,-,-,-,-	
G001	BY630267	AC97-01754A	ASSY-CYLINDER;6P-SEM'S HEAD,CTS10A-SEM,P	V-E59
	BY630266	AC97-01752A	ASSY-CYLINDER;4P-SEM'S HEAD,CTS10A-SEM,P	V-E39
	BY630265	AC97-01750A	ASSY-CYLINDER;2PL(LP)-SEM'S HEAD,CTS10A-	V-E29
G060	BY634416	6006-001092	SCREW-ASS'Y MACH;WS,PH,+,M3.0,L6.0,ZPC(Y	
G070	BY730728	AC61-00161A	PLATE-GROUND DECK;TS-10,SPTE,T0.3,-,-,-,	
G420	BY730124	AC66-80142A	SLIDER-SUPPLY ASSY;X-9,X-9(TS),-,-,-,-,-	
G450	BY730123	AC66-80141A	SLIDER-TAKE UP ASSY;X-9,X-9(TS),-,-,-,-,	
G480	BY630248	AC97-01660A	ASSY-HEAD ACE;-,SCORPIO2(TS-10A),VTR-1*2	
G510	BY730479	6006-001075	SCREW-ASS'Y TAPT;WSP,PH,+,M2.6,L5.0,ZPC(	
G520	BY730757	AC66-00033A	LEVER-#9 GUIDE ASS'Y;TS-10,-,-,-,-,-,-,-	
G527	BY730088	AC61-60553A	SPRING ETC-GUIDE 9;X-9,SUS304-WPB,0.25,-	
G530	BY730775	AC33-00007A	HEAD-FE;-,-,HVFHPOO43A,-,-	
G542	BY730122	AC66-60051A	BELT-PULLEY;-,5CM-70,2 * 2,-,71.3,-,X-9	
G546	BY730741	AC66-00005A	LEVER-FL DOOR;TS-10,POM,-,-,-,-,NAT,-	
G555	BY730756	AC66-00032A	LEVER-UNIT PINCH ASS'Y;TS-10,-,-,-,-,-,-	

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
GP301	BY730731	AC63-00043A	SHIELD CASE-GROUND PCB;SV-643F,STPE,T0.3	
HS01	BY731110	AC62-00003A	HEAT SINK-MAIN;SV-653F,A1050R,T6,W15,L25	
HS02	BY731110	AC62-00003A	HEAT SINK-MAIN;SV-653F,A1050R,T6,W15,L25	
K110	BY730102	AC66-10267A	REEL-DISK S;X-9,POM,-,-,-,-,-,-	
K140	BY730103	AC66-10268A	REEL-DISK T;X-9,POM,-,-,-,-,-,-	
K182	BY730112	AC66-30524A	LEVER-IDLER;-,POM,-,-,-,-,-,-	
K188	BY730760	AC66-00039A	GEAR-IDLE;TS-10,PET K3372,0.5,-,-,NTR,28	
K200	BY730084	AC61-21012A	HOLDER-CLUTCH ASSY;X-9,-,-,-,-,-,-	
K221	BY730111	AC66-20581A	GEAR-CENTER ASSY;-,POM,M=O.5,-,HIGHT T.,	
K222	BY730076	AC60-30306A	WASHER-SLIT;-,-,ID2.1,OD5.0,T0.5,-,POLYS	
K225	BY730742	AC66-00006A	LEVER-UP DOWN;TS-10,POM,-,-,-,-,NAT,-	
K240	BY730759	AC66-00035A	LEVER-TENSION ASS'Y;TS-10,SECC E20/20+SU	
K248	BY730725	AC61-00107A	SPRING ETC-TENSION LEVER;TS-10,SUS304-WP	
K250	BY730762	AC69-00104A	BAND-BRAKE ASS'Y;TS-10,-,-,-,-,-,-	
K330	BY730121	AC66-30550A	LEVER-S.BRAKE ASSY;-,POM+SUS,-,-,-,X-9	
K340	BY730120	AC66-30549A	LEVER-T.BRAKE ASSY;-,POM+SUS,-,-,-,X-9	
K350	BY730724	AC61-00106A	SPRING ETC-BRAKE;TS-10,SUS304-WPB,-,-,-,	
K470	BY730750	AC66-00020A	SLIDER-FL DRIVE;TS-10,SECC E20/20,1.0,-,	
K490	BY730726	AC61-00120A	HOLDER-FL CASS. ASS'Y;TS-10,-,-,-,-,-,-	
K502	BY730091	AC61-60561A	SPRING ETC-FL.LEVER-LR;X-9,SUS304 WPB,OD	
K530	BY730758	AC66-00034A	LEVER-FL ARM ASS'Y;TS-10,-,-,-,-,-,-,-	
K546	BY730086	AC61-50658A	GUIDE-CASS. DOOR;X-9,POM,-,-,-,NTR	
SC01	22797145	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SM20	
SC02	22797145	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SM20	

- ELECTRICAL PARTS -

601	BY630297	AC92-01099B	ASSY PCB-MAIN;V-E59/TSB,4D,G/I/K HI-FI	V-E59
	BY630296	AC92-01099D	ASSY PCB-MAIN;V-E29/TSB,4D,G/I/K MONO	V-E29/E39
602	BY630288	AC94-00091J	ASSY-F/AV,HI-FI;V-632EW,TS-10A,HI-FI,TSB	V-E59 Only
< INTEGRATED CIRCUITS >				
IC1SF1	BY631087	1203-001802	IC-PWM CONTROLLER;STR-G6551,TO-220F,5P,-	
IC1SS1	BY530021	0604-000186	PHOTO-COUPLER;TR,-,200mW,DIP-4,ST	⚠
IC1SS2	70795271	AC14-12006D	IC;KA431Z,TO-92,TAPING	
IC301	BY631196	1204-001923	IC-VIDEO PROCESS;LA71730M,QFP,100P,-,PLA	
IC4N01	BY631149	1204-001765	IC-AUDIO PROCESSOR;MSP3417D(PQFP),PQFP,4	V-E59 Only
IC501	BY631189	1204-001920	IC-AUDIO PROCESSOR;LA72646M,QFP,80P,14X1	V-E59 Only
IC601	BY631197	AC09-00337A	IC MICOM;N128-A50-3BA,V-652F,100PINS,5V	
IC604	70795269	AC14-12006C	IC;KA7533,DIP,-	
IC605	BY631069	1103-001150	IC-EEPROM;524C80D81,8KBit,DIP,8P,300MIL,	V-E59
	BY631045	1103-001148	IC-EEPROM;24C021,2KBIT,DIP,8P,300MIL,10M	V-E29/E39
IC608	BY631059	1203-000515	IC-VOL. DETECTOR;7042,TO-92,3P,177MIL,PL	
IC6P01	BY631150	AC09-00077A	IC-OSD;LC74758JM-9779,LC74758JM-9779,	
IC701	BY631188	1003-001443	IC-LED DRIVER;PT6959,SOIC,28P,300MIL,-,-	
< TRANSISTORS >				
PT601	BY530048	0604-001206	PHOTO-INTERRUPTER;TR,-,150mW,CY5894102,B	
PT602	BY530048	0604-001206	PHOTO-INTERRUPTER;TR,-,150mW,CY5894102,B	
Q1P101	70693265	0501-000616	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1W,TO-92L	
Q1P102	70693265	0501-000616	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1W,TO-92L	
Q1P103	70693265	0501-000616	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1W,TO-92L	V-E59 Only
Q1P104	70693410	0501-000610	TR-SMALL SIGNAL;KSA928A-Y,PNP,1W,TO-92L,	
Q1P105	70795137	0504-000116	TR-DIGITAL;KSR1001,NPN,300MW,4.7K/4.7K,T	
Q350	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q3A01	70795136	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	
Q3A02	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q3A03	70795142	0501-000442	TR-SMALL SIGNAL;KTC3203-Y,NPN,400mW,T0-9	
Q3A04	70795142	0501-000442	TR-SMALL SIGNAL;KTC3203-Y,NPN,400mW,T0-9	
Q3A05	70795142	0501-000442	TR-SMALL SIGNAL;KTC3203-Y,NPN,400mW,T0-9	
Q3A06	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q3D01	70795142	0501-000442	TR-SMALL SIGNAL;KTC3203-Y,NPN,400mW,T0-9	V-E59 Only
Q3D02	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	V-E59 Only
Q3D07	BY530014	0504-000119	TR-DIGITAL;KSR1004,NPN,300MW,47K/47K,TO-	V-E59 Only
Q601	BY530014	0504-000119	TR-DIGITAL;KSR1004,NPN,300MW,47K/47K,TO-	
Q603	70795136	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	V-E59 Only
Q6P01	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q6P02	70795134	0501-000303	TR-SMALL SIGNAL;KSA733,PNP,250mW,TO-92,T	
Q806	70693084	0504-000142	TR-DIGITAL;KSR2001,PNP,300MW,4.7K/4.7K,T	V-E29/E39 Only
Q809	70795136	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	
S601	BY530003	0603-001011	PHOTO TR;NPN,35V,6V,50mA,75mW,BK	
S602	BY530003	0603-001011	PHOTO TR;NPN,35V,6V,50mA,75mW,BK	
< DIODES >				
D1P101	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D1P103	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	V-E59 Only

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
D1SD11	BY430011	0402-001195	DIODE-RECTIFIER;F1T4,400V,1.0A,TS-1,TP	
D1SD31	BY430011	0402-001195	DIODE-RECTIFIER;F1T4,400V,1.0A,TS-1,TP	
D1SF05	BY430012	0402-001196	DIODE-RECTIFIER;1T5,600V,1A,TS-1,TP	
D1SF12	BY430011	0402-001195	DIODE-RECTIFIER;F1T4,400V,1.0A,TS-1,TP	
D1SS01	BY430012	0402-001196	DIODE-RECTIFIER;1T5,600V,1A,TS-1,TP	
D1SS02	BY430012	0402-001196	DIODE-RECTIFIER;1T5,600V,1A,TS-1,TP	
D1SS03	BY430012	0402-001196	DIODE-RECTIFIER;1T5,600V,1A,TS-1,TP	
D1SS04	BY430012	0402-001196	DIODE-RECTIFIER;1T5,600V,1A,TS-1,TP	
D1SS11	BY430047	0402-000012	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	
D1SS31	BY430011	0402-001195	DIODE-RECTIFIER;F1T4,400V,1.0A,TS-1,TP	
D1SS32	BY430010	0402-001194	DIODE-RECTIFIER;UG2D,200V,2A,DO-204AC,TP	
D1SS33	BY430051	0404-001097	DIODE-SCHOTTKY;SG45,45V,7500mA,TO-220A,B	
D301	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D302	70796385	0402-000127	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	
D410	70796385	0402-000127	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	
D4N01	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	V-E59 Only
D4N02	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	V-E59 Only
D603	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D605	70796385	0402-000127	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	
D612	70796385	0402-000127	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	
D701	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D702	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D703	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D704	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
D805	70795150	0401-000101	DIODE-SWITCHING;1N4148,100V,200mA,DO-35,	
LD601	BY430016	0601-000517	LED-IR;RECTANGULA,4x6.0mm,75mW,6V,950	
ZD1P02	BY430005	0403-000717	DIODE-ZENER;MTZJ5.1B,5.1V,4.94-5.2V,500m	
ZD1P03	BY430013	0403-000720	DIODE-ZENER;MTZJ9.1B,9.1V,8.57-9.01V,500	V-E59 Only
ZD1P04	BY430013	0403-000720	DIODE-ZENER;MTZJ9.1B,9.1V,8.57-9.01V,500	
ZD401	70795272	0403-000390	DIODE-ZENER;UZP33B,33V,31.4-34.6V,1W,DO-	
ZD810	BY430015	0403-001211	DIODE-ZENER;MTZJ12B,11.44-12.03V,500MW,D	V-E59 Only
ZD811	BY430015	0403-001211	DIODE-ZENER;MTZJ12B,11.44-12.03V,500MW,D	V-E59 Only
ZD812	BY430015	0403-001211	DIODE-ZENER;MTZJ12B,11.44-12.03V,500MW,D	
ZD813	BY430015	0403-001211	DIODE-ZENER;MTZJ12B,11.44-12.03V,500MW,D	
< INDUCTORS >				
BD1SD1	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
BD1SF1	BY330019	3301-000297	CORE-FERRITE BEAD;AA,3.6x1.2x5.7mm,1400,	
BD1SF2	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
BD1SF3	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
BD1SS1	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
BD1SS2	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	
L1SS02	BY330065	AC29-00003A	FILTER LINE NOISE;-,20mH MIN,-,-,-	⚠
L1SS31	70796213	AC27-12001N	COIL-CHOKE;10UH-15%,RA,K-30,Q80,150KHZ,-	
L1SS32	70796213	AC27-12001N	COIL-CHOKE;10UH-15%,RA,K-30,Q80,150KHZ,-	
FL3A01	70795862	2702-000166	INDUCTOR-RADIAL;47uH,5%,6x6.4mm	
FL3D01	70795862	2702-000166	INDUCTOR-RADIAL;47uH,5%,6x6.4mm	V-E59 Only
L301	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	
L302	70796003	2702-000106	INDUCTOR-RADIAL;100uH,10%,6.2x7.4mm	
L370	70796003	2702-000106	INDUCTOR-RADIAL;100uH,10%,6.2x7.4mm	
L3A01	70795171	2702-000120	INDUCTOR-RADIAL;15mH,5%,6.2x7.4mm	
L3A02	70796003	2702-000106	INDUCTOR-RADIAL;100uH,10%,6.2x7.4mm	
L3A03	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	
L3A50	70693395	2702-000119	INDUCTOR-RADIAL;150uH,5%,6x6.4mm	V-E59 Only
L3D01	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	V-E59 Only
L402	70796003	2702-000106	INDUCTOR-RADIAL;100uH,10%,6.2x7.4mm	
L4N01	BY330066	2702-000160	INDUCTOR-RADIAL;4.7uH,10%,6x6.4mm	V-E59 Only
L4N02	70796003	2702-000106	INDUCTOR-RADIAL;100uH,10%,6.2x7.4mm	V-E59 Only
L4N03	BY330066	2702-000160	INDUCTOR-RADIAL;4.7uH,10%,6x6.4mm	V-E59 Only
L501	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	V-E59 Only
L602	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	
L603	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	
L6P03	70795162	2701-000160	INDUCTOR-AXIAL;22uH,5%,2.4x3.4mm	
L6P05	BY330052	2701-000165	INDUCTOR-AXIAL;27uH,5%,2.4x3.4mm	
L701	BY330009	2701-000002	INDUCTOR-AXIAL;100uH,10%,4.2x9.8mm	
L807	BY330053	2701-000181	INDUCTOR-AXIAL;33uH,5%,2.4x3.4mm	
L808	BY330053	2701-000181	INDUCTOR-AXIAL;33uH,5%,2.4x3.4mm	V-E59 Only
L809	BY330053	2701-000181	INDUCTOR-AXIAL;33uH,5%,2.4x3.4mm	V-E59 Only
L810	BY330053	2701-000181	INDUCTOR-AXIAL;33uH,5%,2.4x3.4mm	
L814	70795644	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	V-E59 Only
< CAPACITORS >				
C1P102	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C1P103	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C1P104	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	
C1P105	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C1P106	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
C1P108	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C1P120	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C1SD03	BY130216	2201-000812	C-CERAMIC,DISC;2.2nF,20%,400V,Y5U,BK,12.	
C1SD04	BY130216	2201-000812	C-CERAMIC,DISC;2.2nF,20%,400V,Y5U,BK,12.	
C1SD11	BY130289	2401-003303	C-AL;82uF,20%,400V,GP,BK,22X30,10	
C1SD12	BY130226	2305-001029	C-FILM,MPEF;10nF,10%,630V,TP,12x9x12.5,5	
C1SD13	70795070	2201-000376	C-CERAMIC,DISC;0.22nF,5%,50V,SL,TP,6.3x3	
C1SF12	BY130290	2401-001200	C-AL;33UF,20%,50V,WT,TP,6.3X11,2.5	
C1SS01	BY130272	2305-001021	C-FILM,MPEF;100nF,20%,275V,TP,17.5x7x13.	⚠
C1SS02	BY130272	2305-001021	C-FILM,MPEF;100nF,20%,275V,TP,17.5x7x13.	⚠
C1SS03	BY130216	2201-000812	C-CERAMIC,DISC;2.2nF,20%,400V,Y5U,BK,12.	
C1SS12	BY130258	2201-000129	C-CERAMIC,DISC;0.1nF,10%,1kV,Y5P,TP,7x4,	
C1SS31	70795431	2401-000385	C-AL;10uF,20%,100V,GP,TP,6.3x11,5	
C1SS32	BY130187	2401-003137	C-AL;330UF,20%,50V,WT,TP,10X16MM,5	
C1SS33	BY130248	2401-003477	C-AL;330UF,20%,25V,LZ,TP,10X12.5MM,	
C1SS34	BY130248	2401-003477	C-AL;330UF,20%,25V,LZ,TP,10X12.5MM,	
C1SS35	BY130339	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	
C1SS36	70796210	2401-000118	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	
C1SS39	70796098	2301-000129	C-FILM,PEF;100nF,5%,50V,TP,10X9X4.3X5,5m	
C315	BY130293	2203-000989	C-CERAMIC,CHIP;47nF,10%,50V,X7R,TP,2012	
C316	BY130390	2203-001728	C-CERAMIC,CHIP;0.047nF,10%,50V,X7R,TP,20	
C317	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C318	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C319	BY130207	2203-000844	C-CERAMIC,CHIP;39nF,10%,50V,X7R,TP,2012,	
C320	BY130021	2202-000854	C-CERAMIC,MLC-AXIAL;47nF,30%,50V,Y5R,TP,	
C321	70693249	2202-000807	C-CERAMIC,MLC-AXIAL;22nF,+80-20%,25V,Y5V	
C322	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C324	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C325	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C326	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C327	BY130432	2202-000720	C-CERAMIC,MLC-AXIAL;8.2nF,20%,16V,Y5R,TP	
C328	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C329	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C330	BY130293	2203-000989	C-CERAMIC,CHIP;47nF,10%,50V,X7R,TP,2012	
C331	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C332	BY130021	2202-000854	C-CERAMIC,MLC-AXIAL;47nF,30%,50V,Y5R,TP,	
C333	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	
C335	BY130030	2203-000925	C-CERAMIC,CHIP;470NF,+80-20%,50V,Y5V,TP,	
C336	BY130021	2202-000854	C-CERAMIC,MLC-AXIAL;47nF,30%,50V,Y5R,TP,	V-E59 Only
C337	BY130030	2203-000925	C-CERAMIC,CHIP;470NF,+80-20%,50V,Y5V,TP,	
C338	70693249	2202-000807	C-CERAMIC,MLC-AXIAL;22nF,+80-20%,25V,Y5V	
C339	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	
C340	BY130016	2401-001226	C-AL;4.7uF,20%,16V,BP,TP,4x7,5mm	
C341	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C342	BY130027	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
C343	BY130191	2203-000476	C-CERAMIC,CHIP;1000nF,+80-20%,16V,Y5V,TP	
C344	BY130433	2203-000321	C-CERAMIC,CHIP;0.12nF,5%,50V,SL,TP,2012	
C345	72531473	2203-000595	C-CERAMIC,CHIP;0.22nF,5%,50V,NP0,TP,2012	
C346	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C347	BY130191	2203-000476	C-CERAMIC,CHIP;1000nF,+80-20%,16V,Y5V,TP	
C348	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C349	BY130191	2203-000476	C-CERAMIC,CHIP;1000nF,+80-20%,16V,Y5V,TP	
C350	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C351	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C352	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C353	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C354	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C355	BY130021	2202-000854	C-CERAMIC,MLC-AXIAL;47nF,30%,50V,Y5R,TP,	
C356	70795969	2203-000239	C-CERAMIC,CHIP;0.1nF,5%,50V,NP0,TP,2012	V-E59 Only
C371	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C372	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C380	70693249	2202-000807	C-CERAMIC,MLC-AXIAL;22nF,+80-20%,25V,Y5V	
C384	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C385	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
C3A01	70795626	2401-003122	C-AL;4.7uF,20%,50V,LL,TP,4X7,1.5	
C3A02	BY130044	2401-000922	C-AL;22uF,20%,16V,GP,TP,5x5,5	
C3A08	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C3A09	70796337	2203-001105	C-CERAMIC,CHIP;6.8nF,10%,50V,X7R,TP,2012	
C3A10	70796409	2203-001214	C-CERAMIC,CHIP;8.2nF,10%,50V,X7R,TP,2012	
C3A11	BY130204	2301-000180	C-FILM,PEF;18nF,0.05,100V,TP,7.2x4.5x8.0	V-E59
	BY130375	2301-000174	C-FILM,PEF;15nF,5%,100V,TP,7.2x4.0x7.5mm	V-E29/E39
C3A12	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C3A14	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	
C3A15	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C3A16	70795626	2401-003122	C-AL;4.7uF,20%,50V,LL,TP,4X7,1.5	
C3A17	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	
C3A18	BY130434	2203-001223	C-CERAMIC,CHIP;0.82nF,10%,50V,X7R,TP,201	
C3A21	BY130147	2203-000170	C-CERAMIC,CHIP;1.8nF,10%,50V,X7R,TP,2012	
C3A22	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E29/E39 Only

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
C3A23	BY130245	2401-002069	C-AL;33uF,20%,16V,GP,TP,6.3x5,5	
C3A24	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C3A29	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C3A30	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C3A40	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	
C3A41	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C3D01	BY130082	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5	V-E59 Only
C3D02	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	V-E59 Only
C3D03	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	V-E59 Only
C3D04	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	V-E59 Only
C401	BY130015	2401-001479	C-AL;470uF,20%,10V,GP,TP,-,-	
C402	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C403	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	
C404	BY130431	2401-001077	C-AL;330nF,20%,50V,GP,TP,4x7mm,5mm	
C405	BY130281	2401-003046	C-AL;47uF,20%,50V,WT,TP,6.3x11,2.5	
C406	70795075	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	
C407	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	
C408	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C410	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C4N01	BY130351	2203-000142	C-CERAMIC,CHIP;1.5nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N02	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C4N03	72531473	2203-000595	C-CERAMIC,CHIP;0.22nF,5%,50V,NP0,TP,2012	V-E59 Only
C4N04	BY130424	2401-000665	C-AL;2.2uF,20%,50V,GP,TP,3.5x5,5	V-E59 Only
C4N05	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N06	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N07	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	V-E59 Only
C4N08	BY130351	2203-000142	C-CERAMIC,CHIP;1.5nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N09	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C4N10	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C4N11	BY130159	2401-001020	C-AL;3.3UF,20%,50V,GP,TP,4X7,5	V-E59 Only
C4N12	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N13	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N14	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C4N15	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C4N16	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	V-E59 Only
C4N17	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	V-E59 Only
C4N18	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	V-E59 Only
C4N19	70693047	2202-000279	C-CERAMIC,MLC-AXIAL;47pF,5%,50V,SL,TP,3.	V-E59 Only
C4N21	BY130261	2201-002069	C-CERAMIC,DISC;1.5pF,0.25pF,50V,NPO,TP,4	V-E59 Only
C4N22	BY130261	2201-002069	C-CERAMIC,DISC;1.5pF,0.25pF,50V,NPO,TP,4	V-E59 Only
C4N23	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	V-E59 Only
C4N24	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	V-E59 Only
C4N25	BY130027	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	V-E59 Only
C4N30	70795075	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	V-E59 Only
C501	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C502	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C503	BY130044	2401-000922	C-AL;22uF,20%,16V,GP,TP,5x5,5	V-E59 Only
C504	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C505	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C506	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C507	BY130044	2401-000922	C-AL;22uF,20%,16V,GP,TP,5x5,5	V-E59 Only
C508	BY130174	2203-000891	C-CERAMIC,CHIP;4.7nF,10%,50V,X7R,TP,2012	V-E59 Only
C510	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	V-E59 Only
C511	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C513	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C517	BY130174	2203-000891	C-CERAMIC,CHIP;4.7nF,10%,50V,X7R,TP,2012	V-E59 Only
C518	BY130044	2401-000922	C-AL;22uF,20%,16V,GP,TP,5x5,5	V-E59 Only
C519	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	V-E59 Only
C520	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C521	BY130273	2401-000414	C-AL;10uF,20%,16V,GP,TP,4x7,5	V-E59 Only
C522	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C523	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C524	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C525	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C526	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	V-E59 Only
C527	70795075	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	V-E59 Only
C529	BY130136	2401-002299	C-AL;4.7uF,20%,50V,GP,TP,5x7,5	V-E59 Only
C530	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	V-E59 Only
C537	BY130424	2401-000665	C-AL;2.2uF,20%,50V,GP,TP,3.5x5,5	V-E59 Only
C538	BY130424	2401-000665	C-AL;2.2uF,20%,50V,GP,TP,3.5x5,5	V-E59 Only
C541	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	V-E59 Only
C542	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	V-E59 Only
C601	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C602	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C605	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C607	BY130131	2401-002259	C-AL;0.1F,+80-20%,5.5V,-,TP,12.5x11	
C609	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C618	BY130317	2401-000360	C-AL;100uF,20%,50V,GP,TP,8x11.5,5	
C620	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
C622	BY130373	2203-001137	C-CERAMIC,CHIP;68nF,+80-20%,50V,Y5V,TP,2	
C623	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C624	BY130152	2203-000634	C-CERAMIC,CHIP;0.022nF,5%,50V,NP0,TP,201	
C625	BY130152	2203-000634	C-CERAMIC,CHIP;0.022nF,5%,50V,NP0,TP,201	
C626	BY130152	2203-000634	C-CERAMIC,CHIP;0.022nF,5%,50V,NP0,TP,201	
C627	BY130152	2203-000634	C-CERAMIC,CHIP;0.022nF,5%,50V,NP0,TP,201	
C633	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C634	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C635	BY130166	2203-000495	C-CERAMIC,CHIP;2.2nF,10%,50V,X7R,TP,2012	
C636	BY130166	2203-000495	C-CERAMIC,CHIP;2.2nF,10%,50V,X7R,TP,2012	
C637	70795976	2203-000938	C-CERAMIC,CHIP;0.47nF,5%,50V,NP0,TP,2012	
C638	70796152	2401-002196	C-AL;4.7UF,20,25V,GP,TP,4X5,5MM,-	
C639	70795969	2203-000239	C-CERAMIC,CHIP;0.1nF,5%,50V,NP0,TP,2012	
C640	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C641	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
C642	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C644	70693317	2202-000806	C-CERAMIC,MLC-AXIAL;220pF,10%,50V,Y5P,TP	
C646	BY130027	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	
C650	BY130166	2203-000495	C-CERAMIC,CHIP;2.2nF,10%,50V,X7R,TP,2012	
C651	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C652	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
C655	70795363	2202-000791	C-CERAMIC,MLC-AXIAL;150pF,10%,50V,Y5P,TP	
C679	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C680	70796210	2401-000118	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	
C681	BY130280	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	
C690	BY130293	2203-000989	C-CERAMIC,CHIP;47nF,10%,50V,X7R,TP,2012	
C691	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C692	BY130048	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	
C693	70796291	2401-001992	C-AL;2200UF,20%,10V,WT,TP,10X20MM,5	
C695	BY130151	2203-000361	C-CERAMIC,CHIP;0.15nF,5%,50V,NP0,TP,2012	
C697	70795974	2203-000609	C-CERAMIC,CHIP;22nF,10%,50V,X7R,TP,2012	
C698	BY130144	2203-000802	C-CERAMIC,CHIP;33nF,10%,50V,X7R,TP,2012	V-E59 Only
C6B07	BY130262	2202-000173	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,1	V-E59 Only
C6B08	BY130262	2202-000173	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,1	V-E59 Only
C6P01	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C6P02	70795250	2203-000316	C-CERAMIC,CHIP;0.12nF,5%,50V,NP0,TP,2012	
C6P04	BY130154	2203-000683	C-CERAMIC,CHIP;0.027nF,5%,50V,NP0,TP,201	
C6P05	BY130154	2203-000683	C-CERAMIC,CHIP;0.027nF,5%,50V,NP0,TP,201	
C6P08	BY130173	2202-000286	C-CERAMIC,MLC-AXIAL;56pF,5%,50V,SL,TP,1.	
C6P10	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C6P11	BY130042	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	
C6P12	BY130282	2401-003107	C-AL;47uF,20%,16V,GP,TP,5x7,5	
C6P13	BY130352	2203-000206	C-CERAMIC,CHIP;100nF,10%,50V,X7R,TP,2012	
C701	BY130015	2401-001479	C-AL;470uF,20%,10V,GP,TP,-,-	
C702	70796281	2203-000260	C-CERAMIC,CHIP;10nF,10%,50V,X7R,TP,2012	
C703	BY130167	2203-000444	C-CERAMIC,CHIP;1nF,10%,50V,X7R,TP,2012,-	
C806	70795969	2203-000239	C-CERAMIC,CHIP;0.1nF,5%,50V,NP0,TP,2012	
C822	70795969	2203-000239	C-CERAMIC,CHIP;0.1nF,5%,50V,NP0,TP,2012	
C837	BY130344	2203-000784	C-CERAMIC,CHIP;0.33nF,5%,50V,NP0,TP,2012	
C838	BY130344	2203-000784	C-CERAMIC,CHIP;0.33nF,5%,50V,NP0,TP,2012	V-E59 Only
C844	BY130344	2203-000784	C-CERAMIC,CHIP;0.33nF,5%,50V,NP0,TP,2012	V-E59 Only
C845	BY130344	2203-000784	C-CERAMIC,CHIP;0.33nF,5%,50V,NP0,TP,2012	
< RESISTORS >				
J301	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
J302	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E59 Only
J303	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
J813	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
J814	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
R1P101	BY230022	2001-000034	R-CARBON;220OHM,5%,1/4W,AA,TP,2.4X6.4MM	
R1P102	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R1P104	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	V-E59 Only
R1P105	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R1P106	70795020	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
R1P107	70795684	2007-000282	R-CHIP;100KOHM,5%,1/10W,DA,TP,2012	
R1P108	BY230024	2001-000611	R-CARBON;3.9KOHM,5%,1/4W,AA,TP,2.4X6.4M	
R1P110	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R1P115	70795025	2001-000554	R-CARBON;270OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R1SD12	BY230106	2001-000938	R-CARBON;68OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R1SD13	BY230171	2001-000076	R-CARBON;47KOHM,5%,1/4W,AA,TP,2.4X6.4MM	
R1SD14	BY230171	2001-000076	R-CARBON;47KOHM,5%,1/4W,AA,TP,2.4X6.4MM	
R1SD15	BY230171	2001-000076	R-CARBON;47KOHM,5%,1/4W,AA,TP,2.4X6.4MM	
R1SD16	BY230027	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
R1SD31	70795039	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R1SD32	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R1SF11	BY230171	2001-000076	R-CARBON;47KOHM,5%,1/4W,AA,TP,2.4X6.4MM	
R1SF15	70795031	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2M	
R1SF19	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
R1SF20	BY230146	2003-000105	R-METAL OXIDE;0.33ohm,5%,2W,AD,TP,6x16mm	
R1SF21	BY230036	2001-000096	R-CARBON(S);1MOHM,5%,1/2W,AA,TP,2.4X6.4M	
R1SS03	BY230265	2008-001033	R-FUSIBLE(S);10ohm,5%,2W,AF,TP,3.9x10mm	
R1SS10	BY230170	2006-000262	R-CEMENT;2.7ohm,10%,2W,CB,TP,7.5x11x20.	
R1SS11	BY230027	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	
R1SS32	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R1SS33	70795640	2004-000869	R-METAL;3Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R1SS34	70795638	2004-000459	R-METAL;2.2Kohm,1%,1/8W,AA,TP,1.8x3.2m	
R315	70795519	2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,2012	
R316	70795546	2007-001177	R-CHIP;8.2KOHM,5%,1/10W,DA,TP,2012	
R320	70795016	2001-000411	R-CARBON;18KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R321	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R322	70795016	2001-000411	R-CARBON;18KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R323	70795535	2007-000710	R-CHIP;3.9KOHM,5%,1/10W,DA,TP,2012	
R325	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R326	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R327	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	
R328	70795519	2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,2012	
R329	70795529	2007-000518	R-CHIP;2.7KOHM,5%,1/10W,DA,TP,2012	
R330	70795542	2007-001071	R-CHIP;6.8KOHM,5%,1/10W,DA,TP,2012	
R331	70795523	2007-000267	R-CHIP;1.8KOHM,5%,1/10W,DA,TP,2012	
R333	70795708	2007-001039	R-CHIP;56KOHM,5%,1/10W,DA,TP,2012	
R334	70795520	2007-000241	R-CHIP;1.5KOHM,5%,1/10W,DA,TP,2012	V-E59
	70795519	2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,2012	V-E29/E39
R335	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R336	BY230097	2007-001166	R-CHIP;75OHM,5%,1/10W,DA,TP,2012	V-E59 Only
R360	BY230092	2007-000068	R-CHIP;470KOHM,5%,1/10W,DA,TP,2012	
R370	70795358	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R372	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R373	70795521	2007-000409	R-CHIP;15KOHM,5%,1/10W,DA,TP,2012	
R374	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R3A01	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R3A04	70795519	2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,2012	
R3A05	BY230093	2007-000615	R-CHIP;24KOHM,5%,1/10W,DA,TP,2012	
R3A06	70795522	2007-000449	R-CHIP;180OHM,5%,1/10W,DA,TP,2012	
R3A07	BY230094	2007-000757	R-CHIP;330KOHM,5%,1/10W,DA,TP,2012	
R3A08	70795686	2007-000355	R-CHIP;12KOHM,5%,1/10W,DA,TP,2012	
R3A09	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
R3A11	70795526	2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,2012	
R3A12	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R3A13	70795527	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	V-E59
	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	V-E29/E39
R3A14	70795021	2001-000522	R-CARBON;22KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R3A16	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R3A17	70795526	2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,2012	
R3A18	70795526	2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,2012	
R3A23	70795011	2001-000331	R-CARBON;12KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R3A24	70795527	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	
R3A25	70795519	2007-000221	R-CHIP;1.2KOHM,5%,1/10W,DA,TP,2012	
R3A26	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R3A27	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
R3A28	70795523	2007-000267	R-CHIP;1.8KOHM,5%,1/10W,DA,TP,2012	V-E59
	BY230007	2007-000964	R-CHIP;5.1KOHM,5%,1/10W,DA,TP,2012	V-E29/E39
R3A31	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E59
	BY230220	2007-000003	R-CHIP;43KOHM,5%,1/10W,DA,TP,2012	V-E29/E39
R3A32	70795038	2001-000766	R-CARBON;43KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E29/E39 Only
R3A50	BY230007	2007-000964	R-CHIP;5.1KOHM,5%,1/10W,DA,TP,2012	
R3A51	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R3A60	70795609	2001-000605	R-CARBON;3.6KOHM,5%,1/8W,AA,TP,1.8X3.2M	V-E59 Only
R3D01	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R3D02	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R3D03	70795527	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R3D04	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R401	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	
R402	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R403	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R404	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	
R406	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59
	70795021	2001-000522	R-CARBON;22KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E29/E39
R407	70795526	2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,2012	V-E59
	70795546	2007-001177	R-CHIP;8.2KOHM,5%,1/10W,DA,TP,2012	V-E29/E39
R408	BY230019	2001-000221	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	
R4N01	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R4N02	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	V-E59 Only
R4N03	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	V-E59 Only
R4N04	70795696	2007-000653	R-CHIP;27KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R4N05	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R4N06	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R501	BY230220	2007-000003	R-CHIP;43KOHM,5%,1/10W,DA,TP,2012	V-E59 Only

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
R502	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R503	70795704	2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2012	V-E59 Only
R505	BY230220	2007-000003	R-CHIP;43KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R506	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R507	70795038	2001-000766	R-CARBON;43KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R508	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R509	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R510	70795038	2001-000766	R-CARBON;43KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R511	70795686	2007-000355	R-CHIP;12KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R512	70795533	2007-000774	R-CHIP;33KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R514	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R516	70795041	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
R517	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R518	BY230220	2007-000003	R-CHIP;43KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R519	70795541	2007-001055	R-CHIP;6.2KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R520	BY230220	2007-000003	R-CHIP;43KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R545	BY230239	2007-000511	R-CHIP;2.4KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R546	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R547	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R570	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R571	70795708	2007-001039	R-CHIP;56KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R601	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R602	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R603	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R604	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R605	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R607	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R608	70795047	2001-000864	R-CARBON;56KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R609	70795047	2001-000864	R-CARBON;56KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R610	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R611	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R613	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R614	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R630	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R631	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R632	70795045	2001-000837	R-CARBON;51KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R637	BY230225	2007-000947	R-CHIP;47OHM,5%,1/10W,DA,TP,2012	
R638	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R639	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R640	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R641	70795704	2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2012	
R642	70795704	2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2012	
R644	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R651	BY230091	2007-000001	R-CHIP;68KOHM,5%,1/10W,DA,TP,2012	
R656	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R657	70795052	2001-000010	R-CARBON;68KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R660	70795041	2001-000786	R-CARBON;47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R661	70795533	2007-000774	R-CHIP;33KOHM,5%,1/10W,DA,TP,2012	
R666	70795704	2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2012	
R667	70795704	2007-000931	R-CHIP;470OHM,5%,1/10W,DA,TP,2012	
R668	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R669	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R670	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	
R671	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	
R672	70795589	2007-000872	R-CHIP;4.7KOHM,5%,1/10W,DA,TP,2012	
R674	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R675	BY230164	2001-000032	R-CARBON;180OHM,5%,1/4W,AA,TP,2.4X6.4MM	
R676	72532205	2007-000738	R-CHIP;30KOHM,5%,1/10W,DA,TP,2012	
R678	70795527	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	
R679	70795019	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R680	70795021	2001-000522	R-CARBON;22KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R682	70795527	2007-000586	R-CHIP;22KOHM,5%,1/10W,DA,TP,2012	
R685	70795539	2007-000981	R-CHIP;5.6KOHM,5%,1/10W,DA,TP,2012	
R690	70795708	2007-001039	R-CHIP;56KOHM,5%,1/10W,DA,TP,2012	
R691	70795019	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R692	70795024	2001-000568	R-CARBON;27OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R693	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	
R694	70795705	2007-000941	R-CHIP;47KOHM,5%,1/10W,DA,TP,2012	
R696	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R697	70795683	2007-000290	R-CHIP;100OHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
R698	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R6P05	70795006	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
R6P07	70795525	2007-000572	R-CHIP;220OHM,5%,1/10W,DA,TP,2012	
R6P08	70795534	2007-000822	R-CHIP;390OHM,5%,1/10W,DA,TP,2012	
R6P09	70795526	2007-000493	R-CHIP;2.2KOHM,5%,1/10W,DA,TP,2012	
R6P10	70795019	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R727	70795521	2007-000409	R-CHIP;15KOHM,5%,1/10W,DA,TP,2012	
R728	70795521	2007-000409	R-CHIP;15KOHM,5%,1/10W,DA,TP,2012	
R729	70795521	2007-000409	R-CHIP;15KOHM,5%,1/10W,DA,TP,2012	

Loc.No.	TSB Parts No.	Reference No.	Description ; Specification	Remark
R730	70795521	2007-000409	R-CHIP;15KOHM,5%,1/10W,DA,TP,2012	
R731	70795516	2007-000300	R-CHIP;10KOHM,5%,1/10W,DA,TP,2012	
R732	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R733	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R734	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R735	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R736	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R737	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R738	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R741	BY230222	2007-000658	R-CHIP;27OHM,5%,1/10W,DA,TP,2012	
R753	70795684	2007-000282	R-CHIP;100KOHM,5%,1/10W,DA,TP,2012	V-E59 Only
R807	BY230097	2007-001166	R-CHIP;75OHM,5%,1/10W,DA,TP,2012	
R810	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
R812	BY230097	2007-001166	R-CHIP;75OHM,5%,1/10W,DA,TP,2012	
R813	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R814	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R815	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R816	70795515	2007-000468	R-CHIP;1KOHM,5%,1/10W,DA,TP,2012	
R828	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	
R842	70795358	2001-000857	R-CARBON;560OHM,5%,1/8W,AA,TP,1.8X3.2MM	
W000	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E59 Only
W050	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
W062	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
W064	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
W066	70795005	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	
W140	70795004	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	V-E59 Only
W172	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W199	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	V-E29/E39 Only
W376	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W383	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W384	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W386	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W506	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W515	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W701	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W702	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W750	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W751	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
W752	70795513	2007-000029	R-CHIP;0OHM,5%,1/10W,DA,TP,2012	
< MISCELLANEOUS >				
CN1SS1	70796223	3711-000178	CONNECTOR-HEADER;1WALL,2P,1R,3.96mm,STRA	
CN301	70796387	3708-000391	CONNECTOR-FPC/FFC/PIC;10P,1.25mm,STRAIGH	V-E59
	BY634421	3708-000394	CONNECTOR-FPC/FFC/PIC;6P,1.25mm,STRAIGHT	V-E29/E39
CN3A01	BY634023	3708-001165	CONNECTOR-FPC/FFC/PIC;6P,1.25mm,STRAIGHT	
CN3A02	BY634412	3710-001648	CONNECTOR-SOCKET;2P,1R,2.5mm,STRAIGHT,SN	
CN604	BY634669	3711-004833	CONNECTOR-HEADER;BOX,12P,2R,2MM,STRAIGHT	
CN705	BY634269	3710-001564	CONNECTOR-SOCKET;11P,1R,2mm,ANGLE,SN	V-E59 Only
CN708	BY634284	3711-004415	CONNECTOR-HEADER;3WALL,11P,1R,2mm,STRAIG	V-E59 Only
DT701	BY634694	AC07-00032A	LED DISPLAY;LTG-0130M,-,38,8,5,55.2*18.5	
F1SS01	BY634112	3601-001123	FUSE-CARTRIDGE;250V,1.6A,TIME-LAG,CERAMI	⚠
FC1SS1	BY634083	3602-000103	FUSE-CLIP;-,-,10mohm	
FC1SS2	BY634083	3602-000103	FUSE-CLIP;-,-,10mohm	
GP401	BY634725	AC63-00076A	GROUND-RF;SV-653F,SUS304,T0.3,-,-,-,-	
JC801	BY634436	3722-001577	JACK-PIN;6P,3.5mm,NI,BLK,-	V-E59
	BY634558	3722-001575	JACK-PIN;4P/6P,3.5mm,NI,BLK,-	V-E29/E39
JK701	BY634408	AC37-00006A	JACK-PIN;3.2MM,DPSE-9872,3P,ARREY,10MM	V-E59 Only
RM701	BY630162	AC32-00006A	MODULE REMOCON;TSOP2238WE1,38KHZ,-,5.08m	
PT1SS1	BY330068	AC26-00002C	TRANS SWITCHING;-,-,EE2621,-,UL/CSA/DEMK	⚠
RS601	BY632005	AC34-20100B	SWITCH-REC;-,-,X-9,-	
SW601	BY632004	AC34-20100A	SWITCH-MODE;-,-,X-9,-	
TM401	BY634728	AC40-00014A	TM BLOCK;TCMK0601PD13A,G/I/K(MONO,HIFI)	
VA1SS1	BY634022	1405-001026	VARISTOR;470V,600A,9x7mm,TP	⚠
XT301	BY633009	2801-001397	CRYSTAL-UNIT;4.433619MHz,20ppm,28-AAA,S,	
XT302	BY633012	2801-003399	CRYSTAL-UNIT;3.579545MHz,15ppm,28-AAA,S,	
XT4N01	BY633011	2801-003171	CRYSTAL-UNIT;18.432MHz,20PPM,28-AAM,4PF,	V-E59 Only
XT601	BY633003	2801-003318	CRYSTAL-UNIT;32.768KHz,20ppm,28-AAP,12.5	
XT602	BY633010	2801-003139	CRYSTAL-UNIT;8MHz,50ppm,28-AAA,22pF,80oh	

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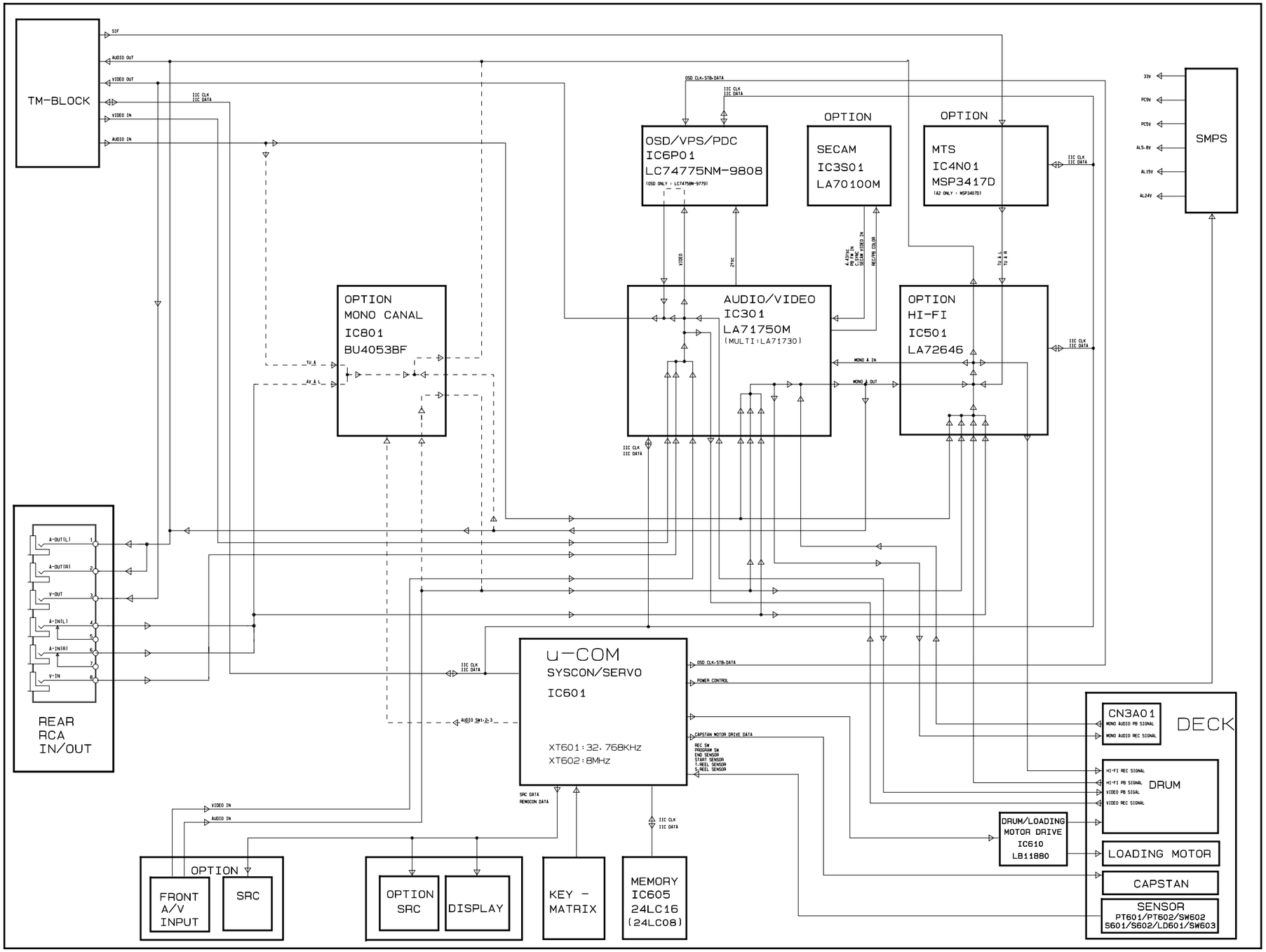
SERVICE MANUAL

VIDEO CASSETTE RECORDER

V-E59
V-E39
V-E29

APR, 2002

8. Block Diagram



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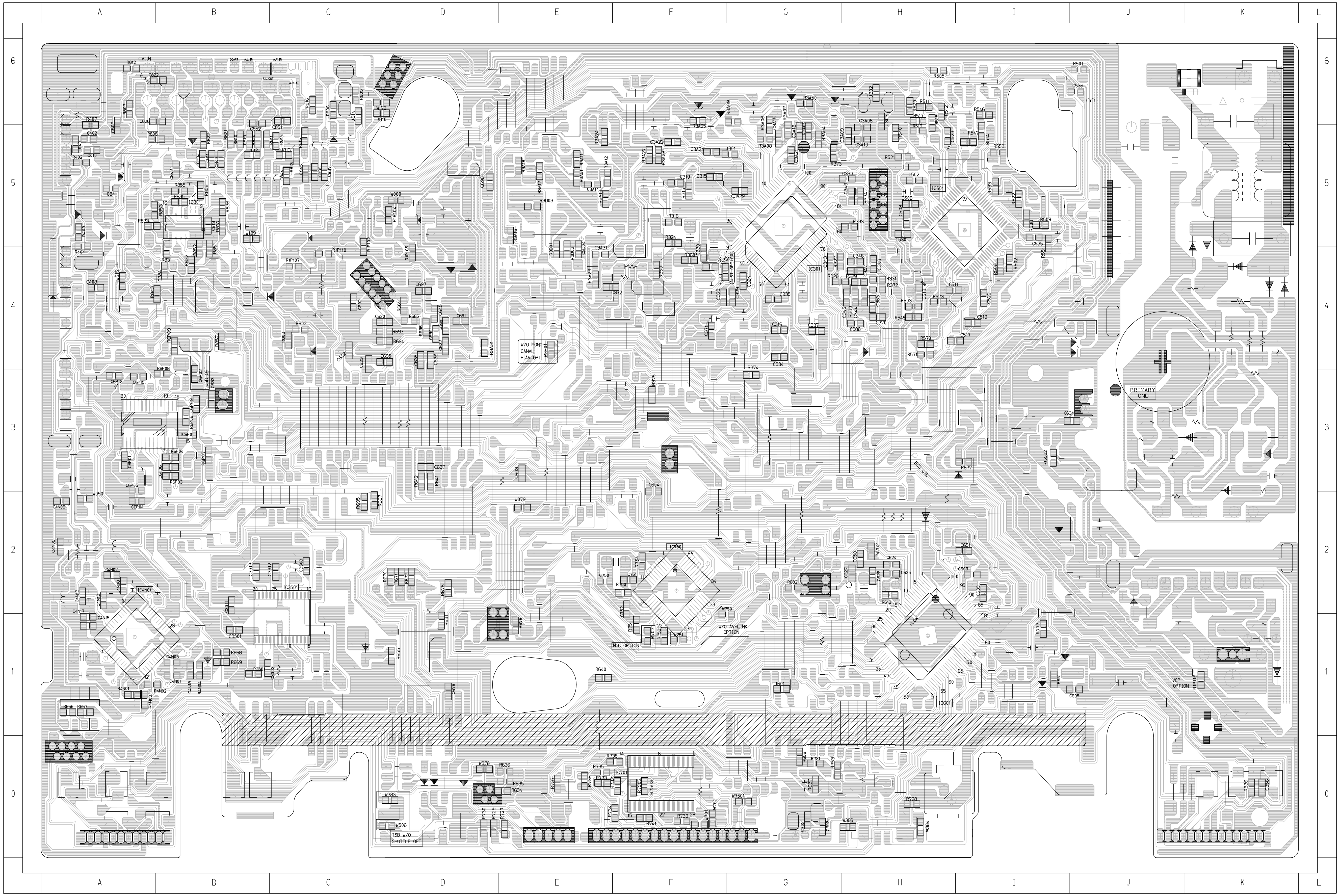
9. PCB Diagrams

9-1 Main - 9-2

9-2 F-A/V (V-E59 Only)- 9-4

9-1 Main



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BD1SF1 (K3)
BD1SF2 (K3)
BD1SF3 (K3)
BD1SS1 (K2)
BD1SS2 (J1)
C1P102 (C4)
C1P103 (C4)
C1P104 (D5)
C1P105 (D5)
C1P106 (D5)
C1P108 (D5)
C1P109 (C5)
C1P120 (C4)
C1SD03 (J5)
C1SD04 (J5)
C1SD12 (J3)
C1SD13 (K3)
C1SF12 (K3)
C1SS01 (K6)
C1SS02 (K5)
C1SS03 (K1)
C1SS12 (J3)
C1SS31 (J2)
C1SS32 (J2)
C1SS33 (K1)
C1SS34 (K1)
C1SS35 (J1)
C1SS36 (J1)
C1SS39 (J3)
C317 (F5)
C318 (F5)
C320 (F5)
C321 (F5)
C322 (F5)
C325 (G4)
C326 (F4)
C327 (F4)
C332 (G4)
C333 (G4)
C336 (G3)
C338 (G4)
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C340 (G4)
C341 (F5)
C342 (F5)
C351 (G5)
C352 (F4)
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C355 (G4)
C357 (B2)
C380 (F3)
C382 (G4)
C385 (B4)
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CN3A1S (D6)
CN604 (C4)
CN701 (A0)
CN703 (A0)
CN708 (J0)
CN709 (E0)
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CN703S (A0)
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D1P103 (D4)
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D1SS02 (K5)
D1SS03 (K4)
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D1SS11 (J3)
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D4N02 (B1)
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D703 (D0)
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DT701 (F0)
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FC1SS2 (J6)
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FL3D01 (F5)
GP301 (H6)
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IC1SS2 (I3)
IC604 (J1)
IC608 (H0)
JC801 (A6)
JC802 (C6)
L1SS02 (K5)
L1SS31 (K1)
L1SS32 (K1)
L301 (F5)
L302 (F4)
L370 (H4)
L3A01 (H5)
L3A02 (F5)
L3A03 (F5)
L3A50 (E5)
L3D01 (E5)
L402 (A4)
L4N01 (A1)
L4N02 (A2)
L4N03 (A2)
L4N04 (B1)
L501 (I3)
L502 (I6)
L602 (H2)
L603 (D4)
L6P03 (B3)
L6P05 (A3)
L701 (E0)
L803 (C5)
L804 (C5)
L805 (B5)
L806 (B5)
L807 (C5)
L808 (B5)
L809 (C5)
L810 (C5)
L811 (B5)
L812 (B5)
L814 (A5)
LD601 (F3)
LD601A (F3)
PT1SS1 (J2)
PT601 (D1)
PT602 (G2)
Q1P101 (D5)
Q1P102 (D5)
Q1P103 (D5)
Q1P104 (C4)
Q1P105 (C4)
Q1P106 (D4)
Q1P107 (C5)
Q1P108 (J4)
Q302 (F5)
Q350 (F4)
Q351 (B4)
Q3A01 (G6)
Q3A02 (E6)
Q3A03 (F5)
Q3A04 (E5)
Q3A05 (E5)
Q3A06 (E5)
Q3D01 (E5)
Q3D02 (E5)
Q3D07 (F4)
Q601 (D1)
Q602 (C1)
Q603 (D5)
Q6P01 (B3)
Q6P02 (B4)
Q802 (C4)
Q803 (C4)
Q804 (C4)
Q806 (B5)
Q809 (F4)
Q810 (A4)
R1P101 (I2)
R1P103 (I4)
R1P106 (D3)
R1P109 (C3)
R1P115 (D4)
R1SS33 (I3)
R1SS34 (I3)
R320 (E2)
R321 (G3)
R322 (E2)
R325 (H4)
R326 (H4)
R335 (B3)
R370 (E4)
R371 (B4)
R3A01 (G3)
R3A14 (E4)
R3A23 (F5)
R3A26 (F5)
R3A32 (F5)
R3A33 (E4)
R3A60 (F5)
R3D04 (E4)
R408 (A5)
R4N05 (A2)
R507 (I5)
R510 (I6)
R516 (C5)
R550 (I5)
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R602 (H2)
R603 (H2)
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R605 (I3)
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R614 (G1)
R632 (F0)
R638 (I1)
R639 (I1)
R644 (H2)
R654 (C1)
R660 (D3)
R674 (H0)
R675 (F2)
R679 (D1)
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R696 (C3)
R6P01 (A2)
R6P02 (A3)
R6P05 (A3)
R6P10 (B3)
R740 (F0)
R7S01 (F0)
R7S04 (G0)
R7S05 (G0)
R7S06 (G0)
R809 (A5)
R828 (A5)
R839 (A5)
R842 (F4)
RM701 (G0)
RS601 (H0)
S601 (J3)
S601A (J3)
S602 (B3)
S602A (B3)
SC02 (K1)
SW601 (C2)
SW701 (K0)
SW702 (K0)
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SW711 (D0)
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SW720 (B0)
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R1SD32 (J2)
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R1SF20 (K4)
R1SF21 (J3)
R1SS03 (K1)
R1SS10 (J4)
R1SS11 (J3)
R3S02 (C1)
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W017 (H0)
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W040 (H3)
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W419 (G5)
W420 (D5)
W421 (H4)
W422 (G5)
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W428 (C5)
W429 (C5)
W430 (I6)
W431 (I6)
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W439 (A5)
W440 (H6)
W441 (H6)
W442 (C2)
W443 (F3)
W444 (C4)
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W502 (A4)
W503 (C3)
W504 (C2)
W507 (E4)
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W513 (H4)
W514 (B4)
W520 (C2)
W521 (C2)
W522 (B2)
W531 (A1)
W532 (A0)
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W534 (A0)
W535 (B0)
W555 (K0)
W556 (F5)
W558 (I3)
W660 (I3)
W704 (G1)
W705 (G2)
W706 (G3)
W759 (H5)
W760 (B4)
W7S02 (G0)
W7S03 (G0)
XT301 (F5)
XT302 (F5)
XT4N01 (A1)
XT601 (H2)
XT602 (H2)
XT750 (F2)
ZD1P01 (J4)
ZD1P02 (D5)
ZD1P03 (D4)
ZD1P04 (C5)
ZD1SS1 (I2)
ZD401 (A4)
ZD801 (C4)
ZD802 (A5)
ZD803 (A5)
ZD804 (A5)
ZD805 (B5)
ZD806 (B4)
ZD807 (C4)
ZD808 (A5)
ZD809 (A5)
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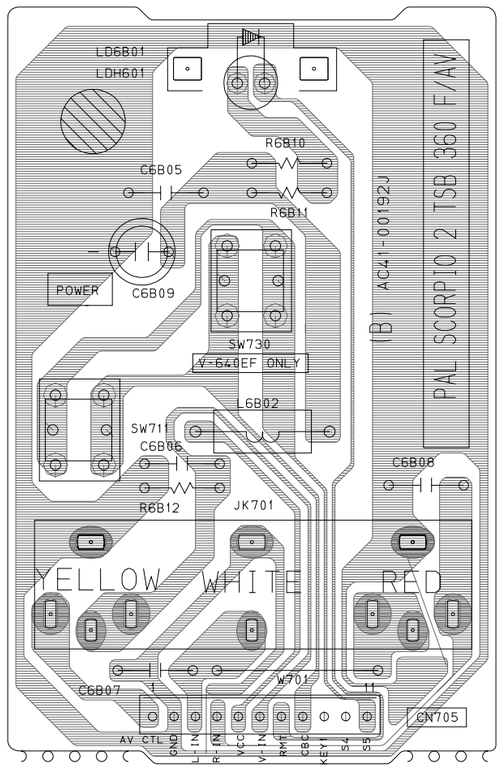
ZD811 (F5)
ZD812 (G6)
ZD813 (G6)

9-2 F-A/V (V-E59 Only)



10. Schematic Diagrams

◆ Block Identification of Main PCB - 10-2

10-1 S.M.P.S. (Free Voltage) - 10-3

10-2 Power - 10-4

10-3 System Control/Servo/Display - 10-5

10-4 Audio/Video - 10-6

10-5 Hi-Fi (For V-E59 Only) - 10-7

10-6 TM-Block - 10-8

10-7 NICAM (For V-E59 Only) - 10-9

10-8 OSD/VPS/PDC - 10-10

10-9 Input-Output - 10-11

10-10 Sub F A/V (For V-E59 Only)- 10-12

Note

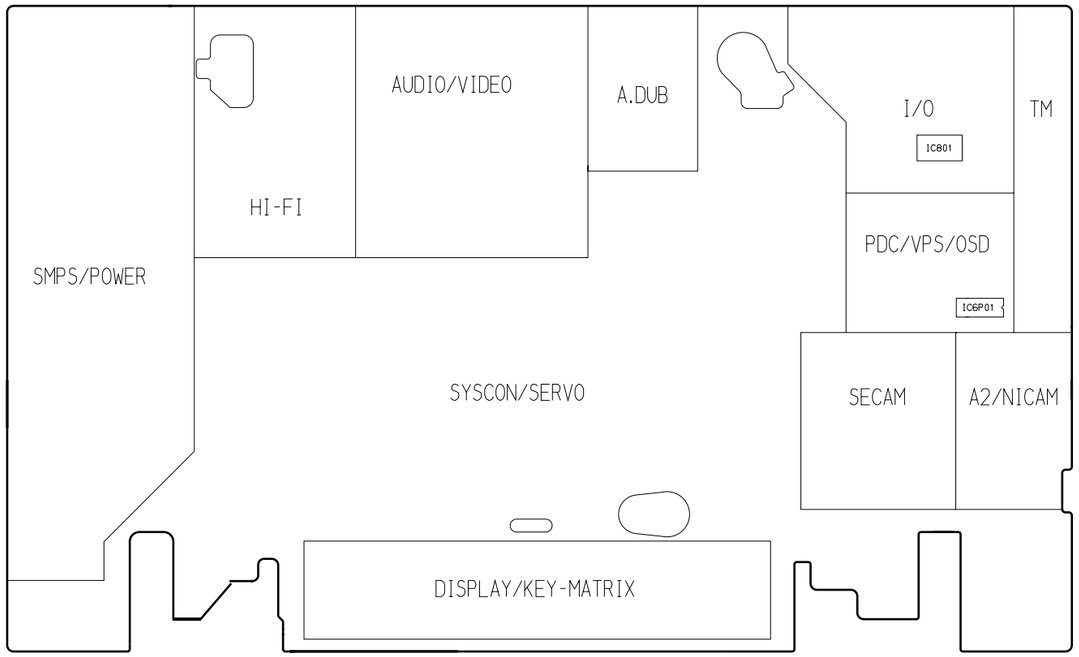
For schematic Diagram
- Resistors are in ohms, 1/8W unless otherwise noted.

Special note :
Most semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

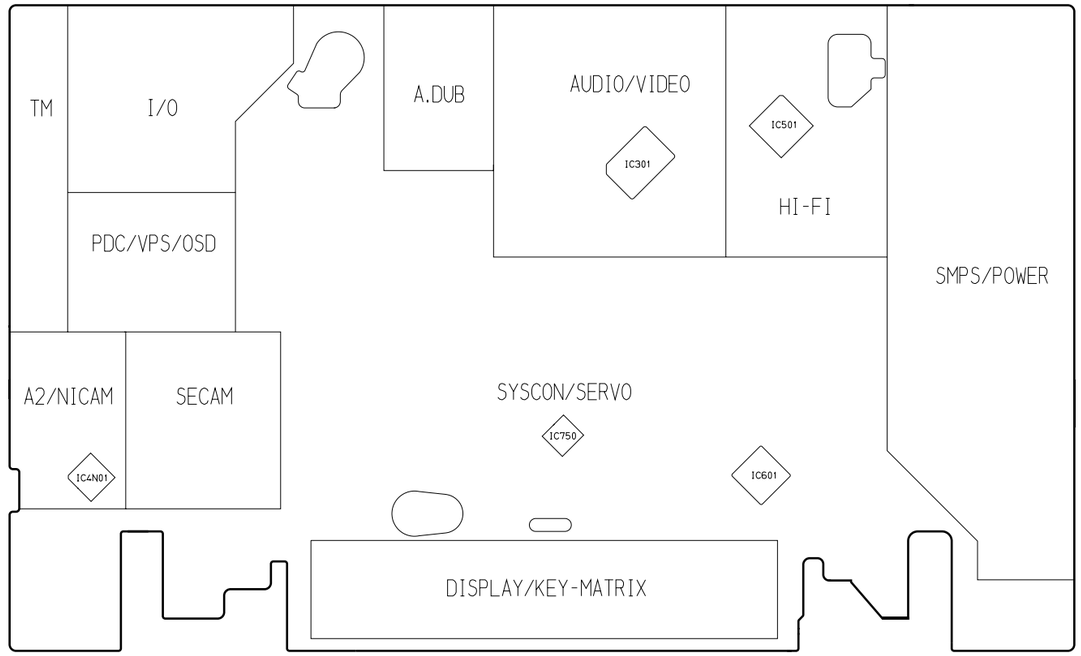
Note :
Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list (may be slightly different or amended since this drawing was prepared).

Important safety notices :
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components.
Use only the same type.

◆ Block Identification of Main PCB

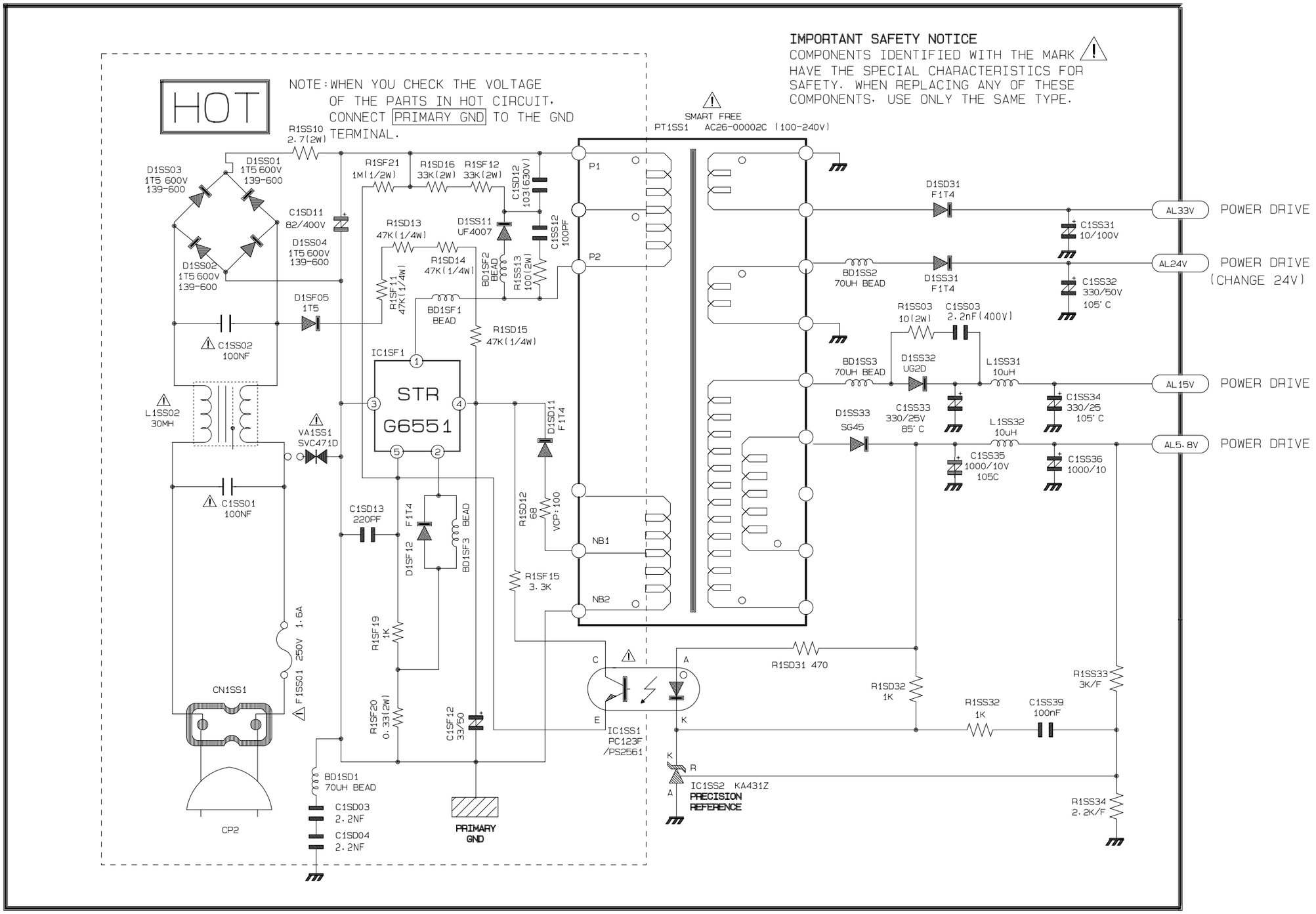


Component Side

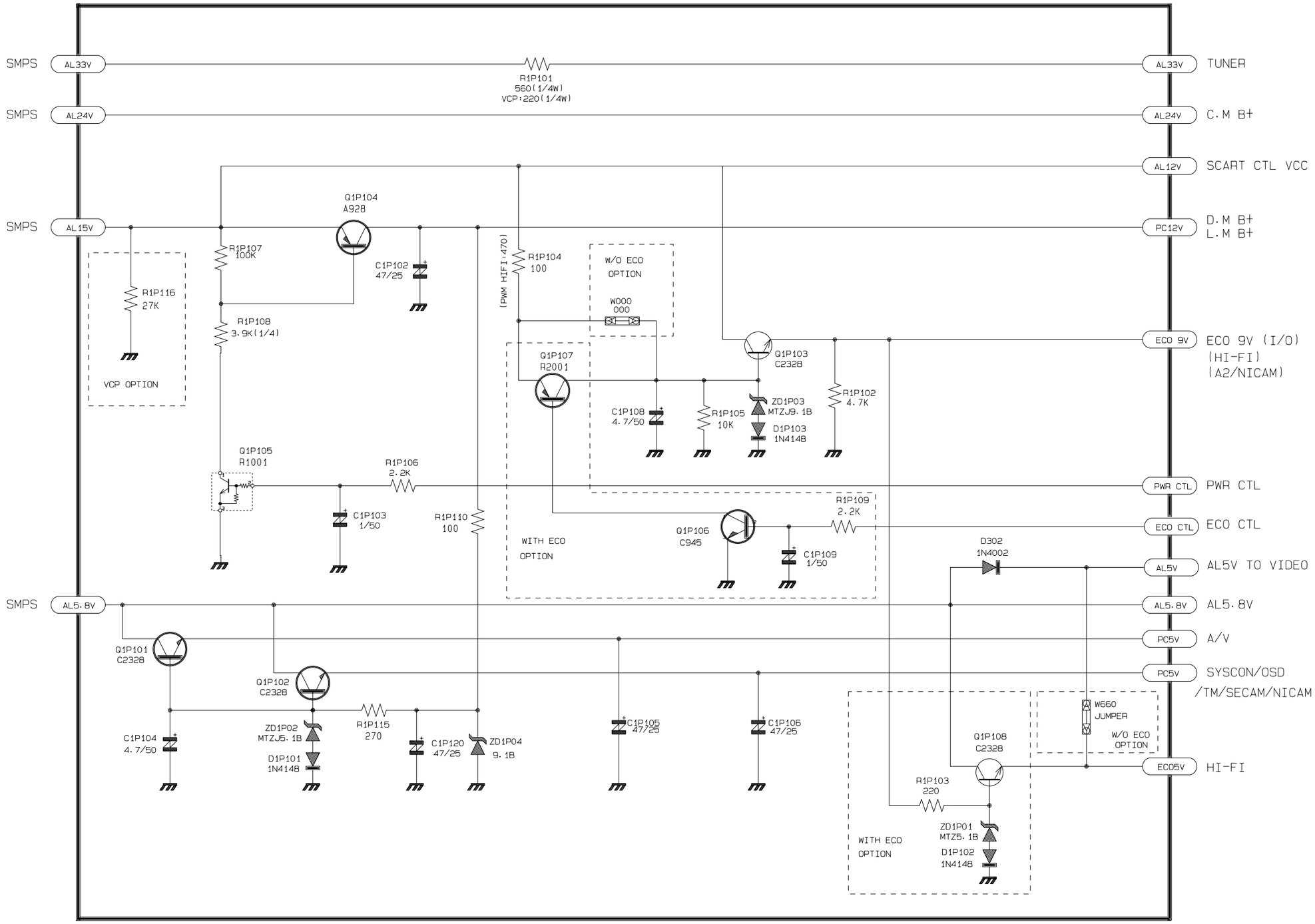


Conductor Side

10-1 S.M.P.S. (Free Voltage)



10-2 Power


SMPS
AL33V
R1P101
560(1/4W)
VCP:220(1/4W)
AL33V
TUNER
SMPS
AL24V
AL24V
C.M B+
AL12V
SCART CTL VCC
SMPS
AL15V
Q1P104
A928
R1P107
100K
C1P102
47/25
R1P104
100
(PWM HIFI:470)
W/O ECO
OPTION
W000
000
PC12V
D.M B+
L.M B+
R1P116
27K
VCP OPTION
R1P108
3.9K(1/4)
Q1P107
R2001
Q1P103
C2328
ECO 9V
ECO 9V (I/O)
(HI-FI)
(A2/NICAM)
C1P108
4.7/50
R1P105
10K
ZD1P03
MTZJ9.1B
D1P103
1N4148
R1P102
4.7K
Q1P105
R1001
R1P106
2.2K
C1P103
1/50
R1P110
100
WITH ECO
OPTION
Q1P106
C945
R1P109
2.2K
C1P109
1/50
PWR CTL
PWR CTL
ECO CTL
ECO CTL
D302
1N4002
AL5V
AL5V TO VIDEO
SMPS
AL5.8V
AL5.8V
AL5.8V
PC5V
A/V
PC5V
SYSCON/OSD
/TM/SECAM/NICAM
Q1P101
C2328
Q1P102
C2328
C1P104
4.7/50
ZD1P02
MTZJ5.1B
D1P101
1N4148
R1P115
270
C1P120
47/25
ZD1P04
9.1B
C1P105
47/25
C1P106
47/25
W660
JUMPER
W/O ECO
OPTION
Q1P108
C2328
ECO5V
HI-FI
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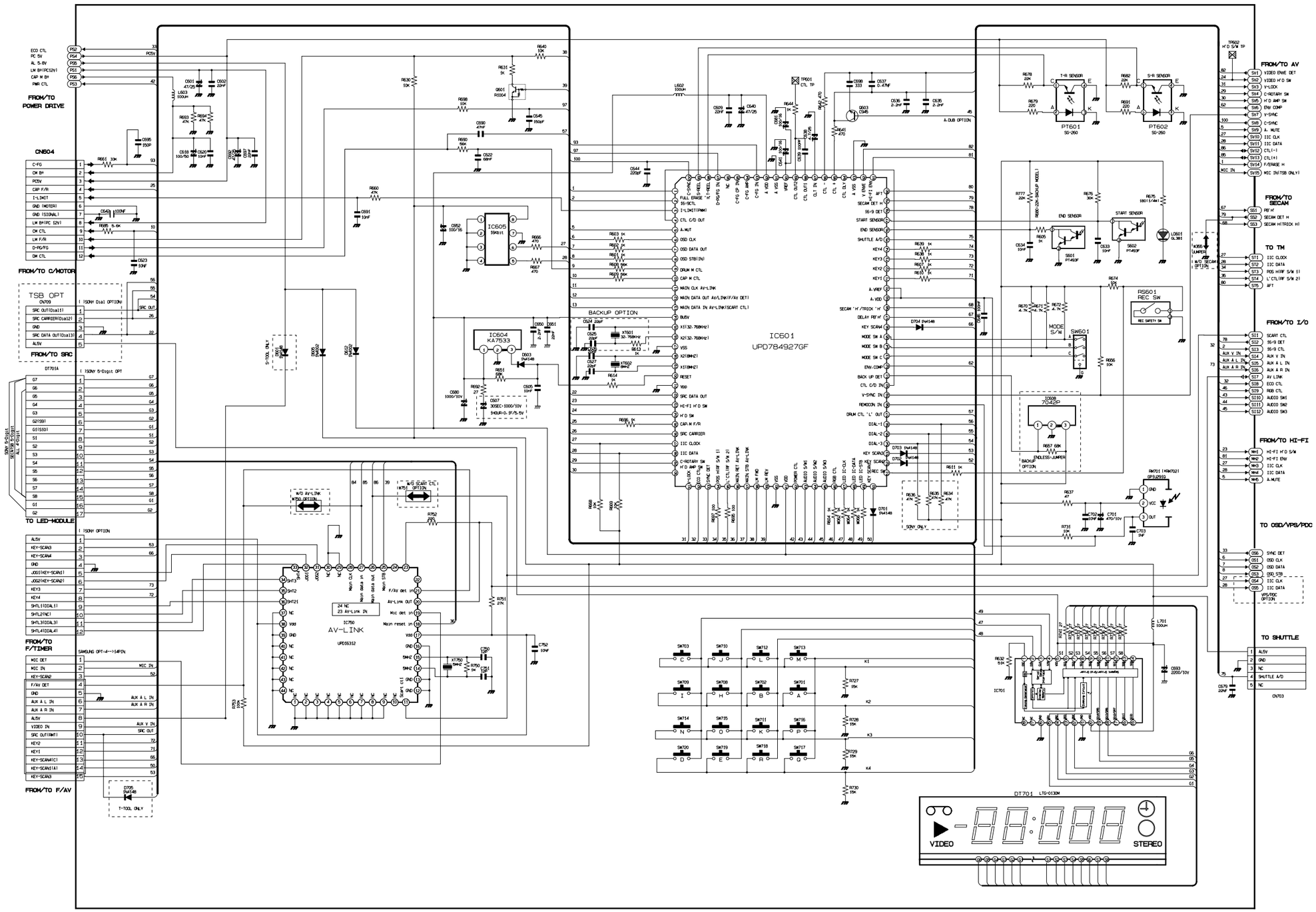
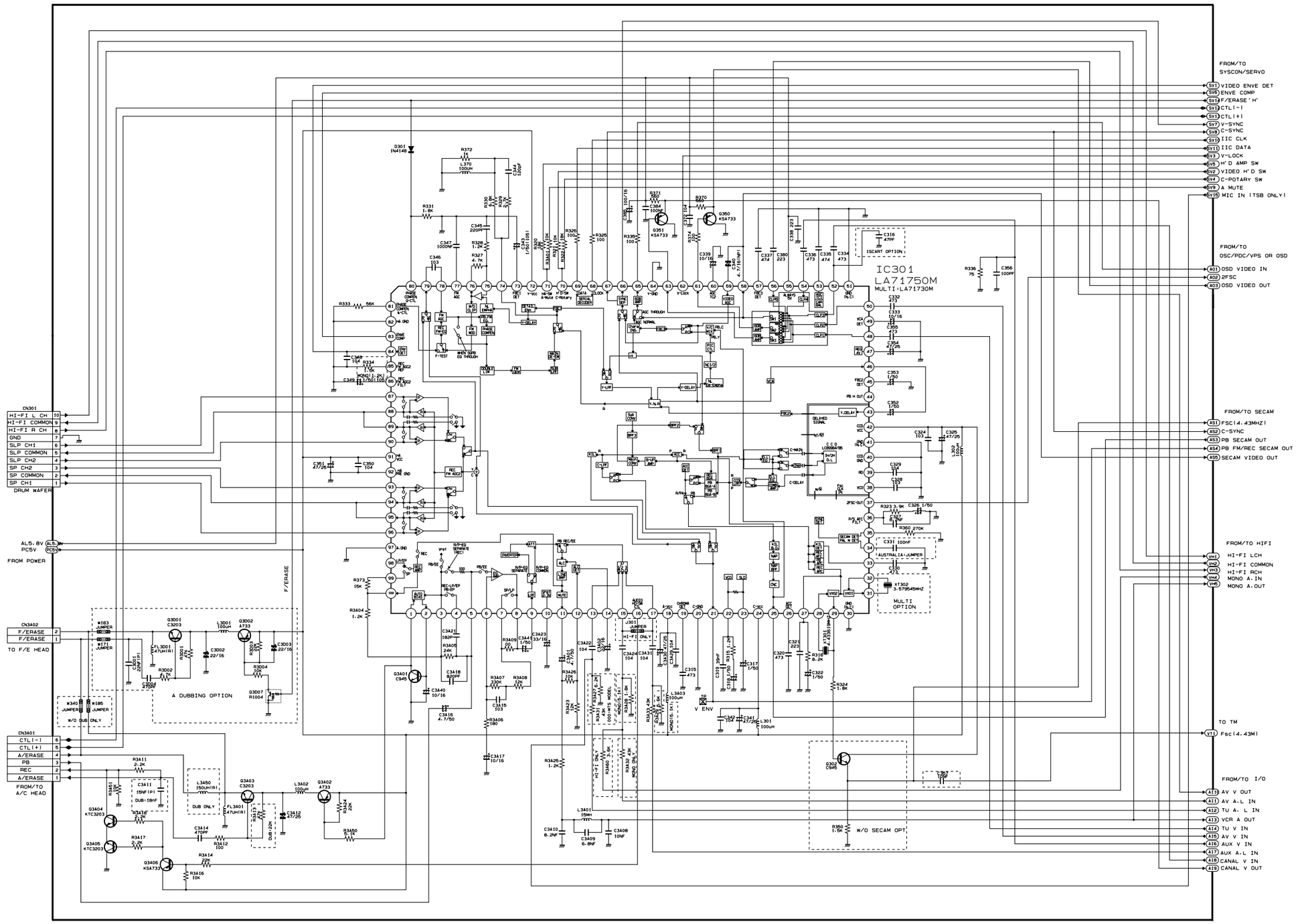
220
ZD1P01
MTZ5.1B
D1P102
1N4148
WITH ECO
OPTION

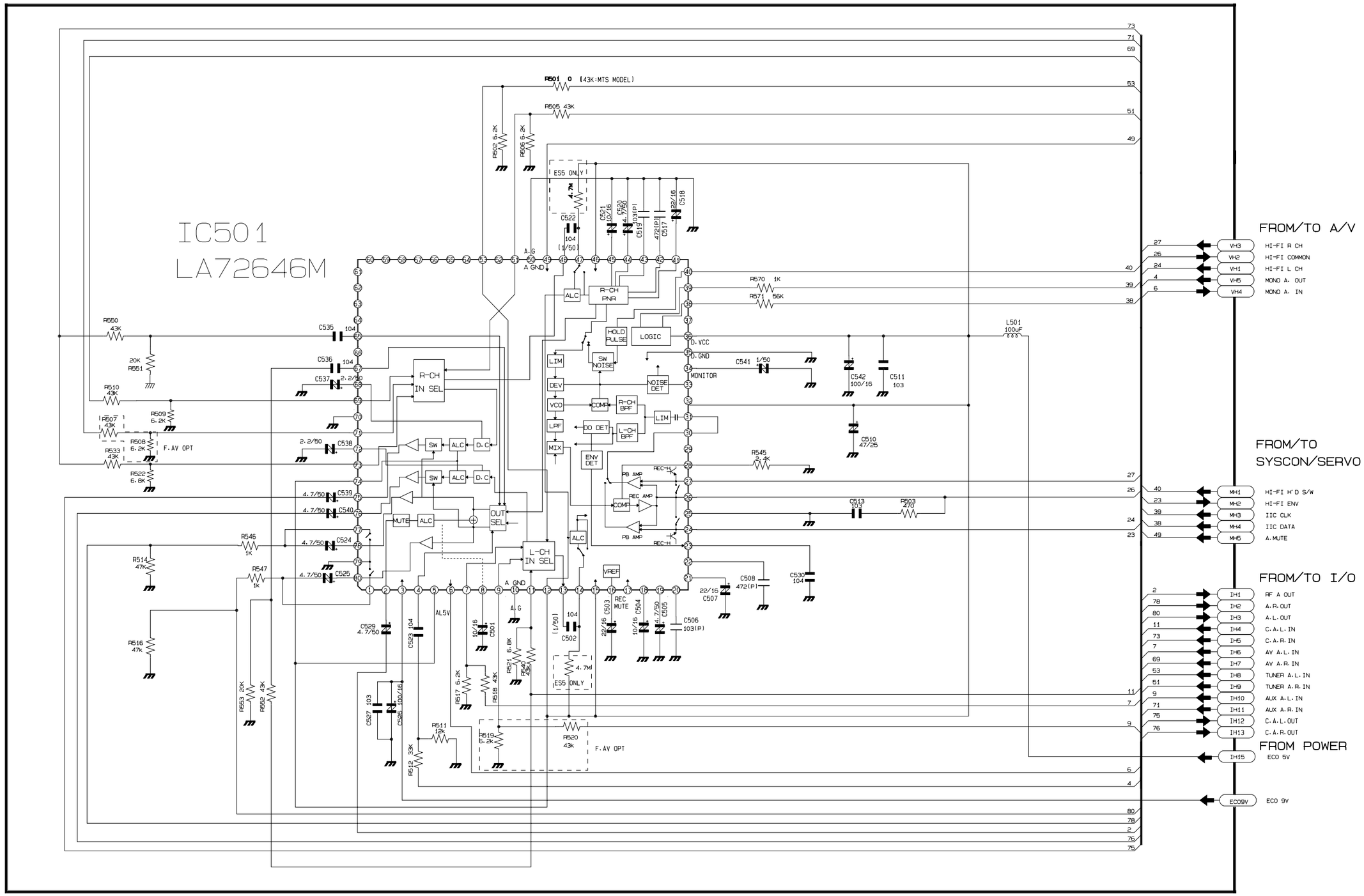
10-3 System Control/Servo/Display



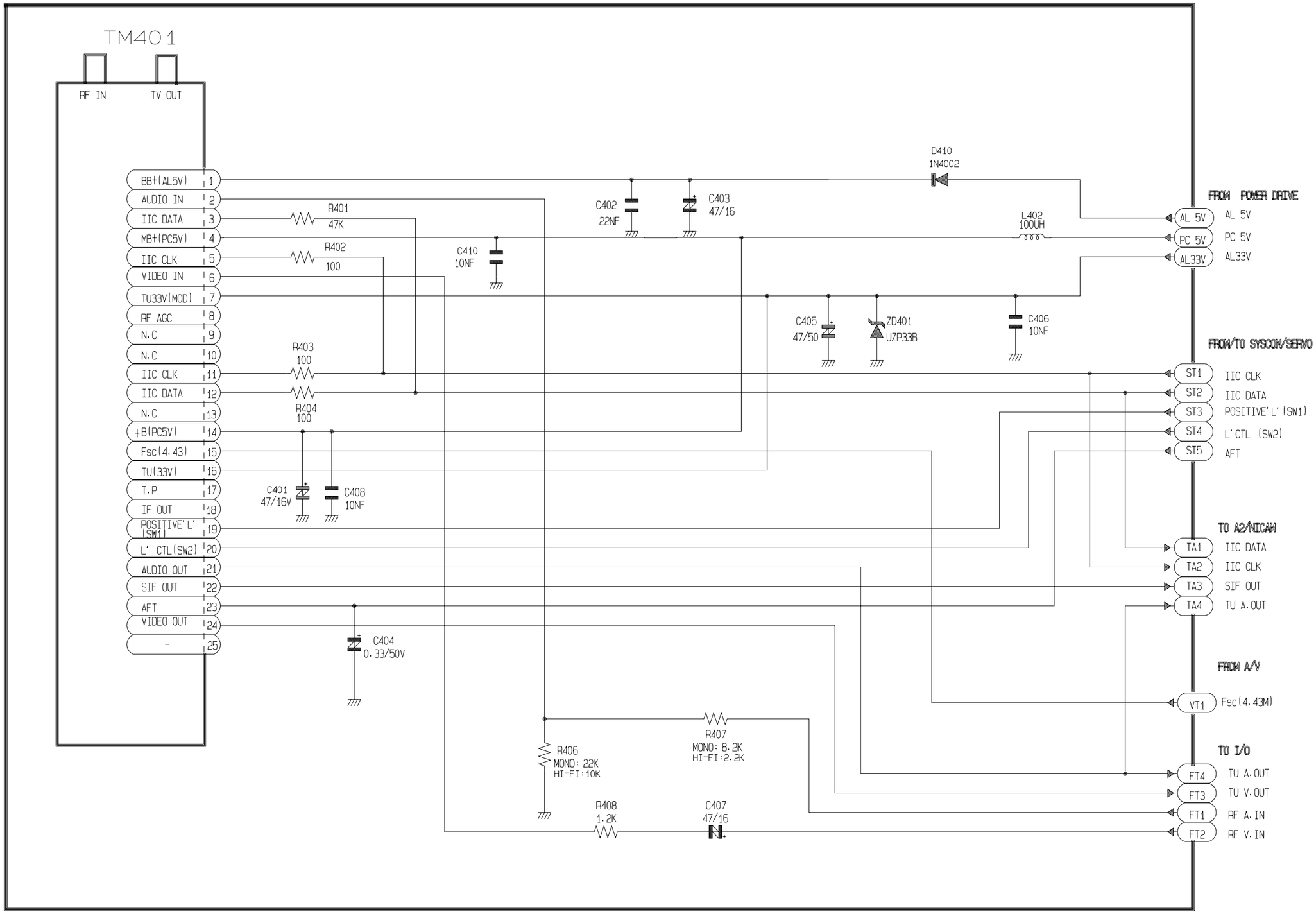
10-4 Audio/Video



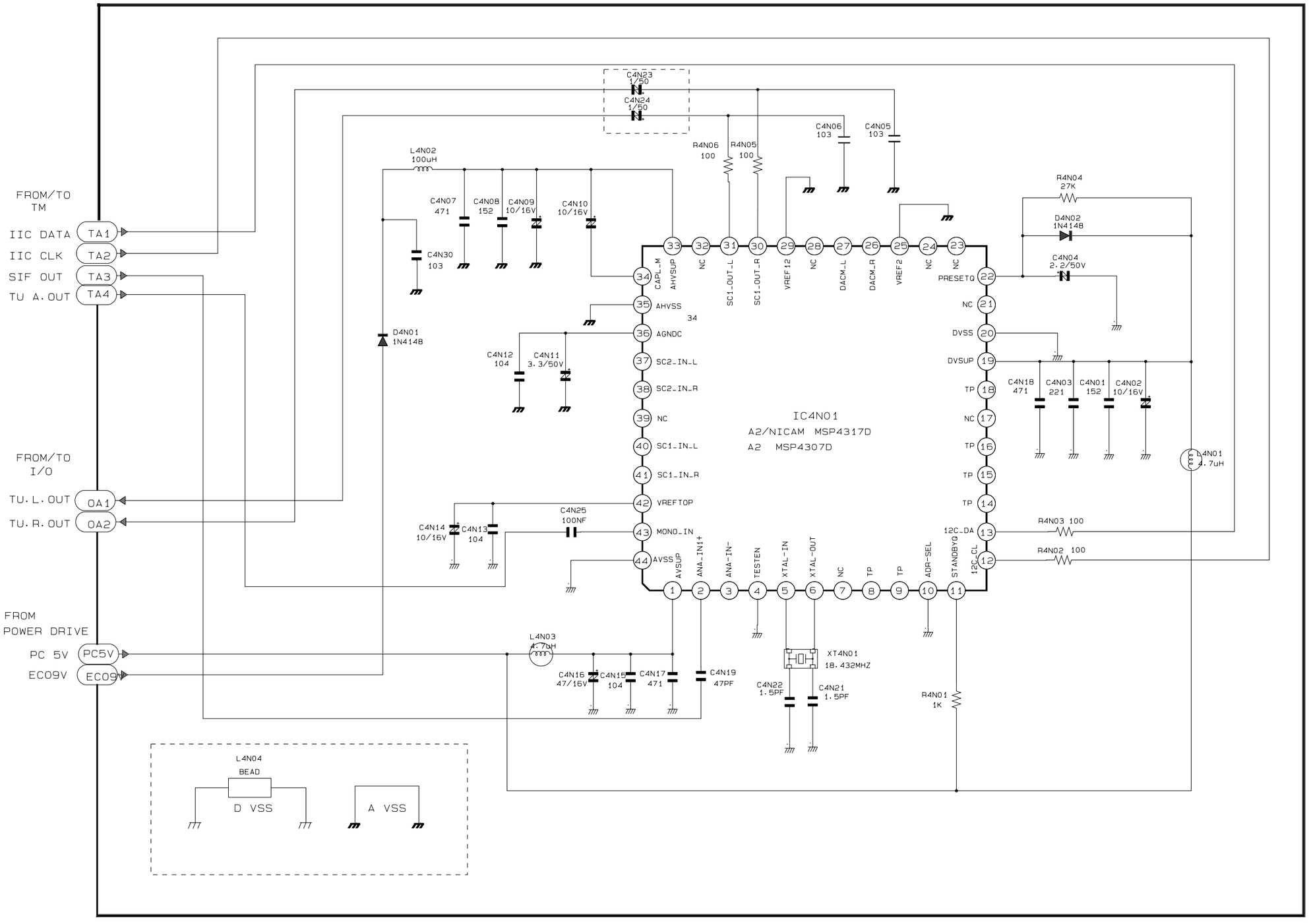
10-5 Hi-Fi (For V-E59 Only)



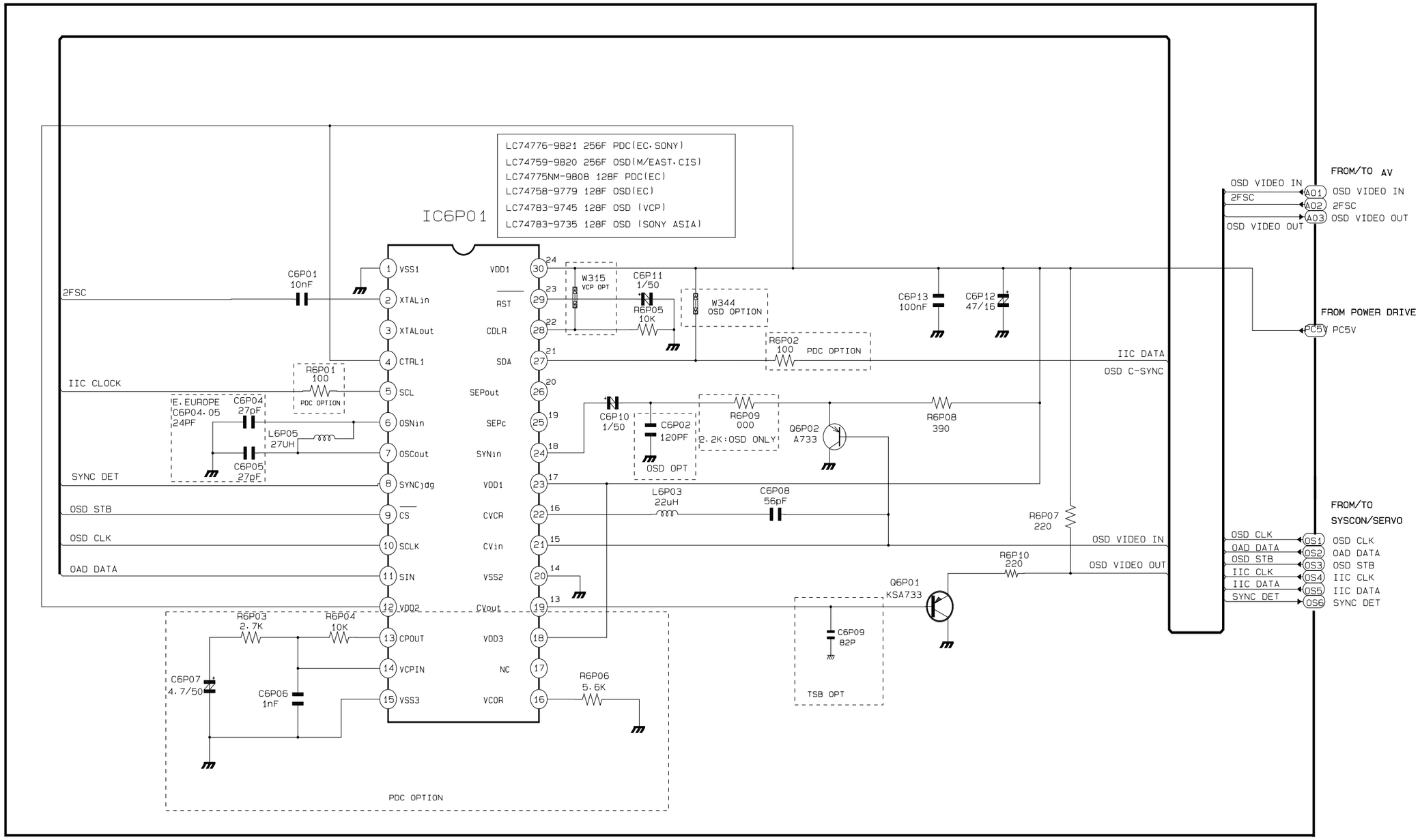
10-6 TM-Block


TM401
RF IN
TV OUT
BB+(AL5V) 1
AUDIO IN 2
IIC DATA 3
MB+(PC5V) 4
IIC CLK 5
VIDEO IN 6
TU33V(MOD) 7
RF AGC 8
N.C 9
N.C 10
IIC CLK 11
IIC DATA 12
N.C 13
+B(PC5V) 14
Fsc(4.43) 15
TU(33V) 16
T.P 17
IF OUT 18
POSITIVE'L' (SW1) 19
L' CTL(SW2) 20
AUDIO OUT 21
SIF OUT 22
AFT 23
VIDEO OUT 24
- 25
R401 47K
R402 100
R403 100
R404 100
C401 47/16V
C408 10NF
C410 10NF
C402 22NF
C403 47/16
C404 0.33/50V
C405 47/50
C406 10NF
C407 47/16
D410 1N4002
ZD401 UZP33B
L402 100UH
R406 MONO: 22K HI-FI: 10K
R407 MONO: 8.2K HI-FI: 2.2K
R408 1.2K
FROM POWER DRIVE
AL 5V
PC 5V
AL33V
FROM/TO SYSCON/SERVO
ST1 IIC CLK
ST2 IIC DATA
ST3 POSITIVE'L' (SW1)
ST4 L'CTL (SW2)
ST5 AFT
TO A2/NICAM
TA1 IIC DATA
TA2 IIC CLK
TA3 SIF OUT
TA4 TU A.OUT
FROM A/V
VT1 Fsc(4.43M)
TO I/O
FT4 TU A.OUT
FT3 TU V.OUT
FT1 RF A.IN
FT2 RF V.IN

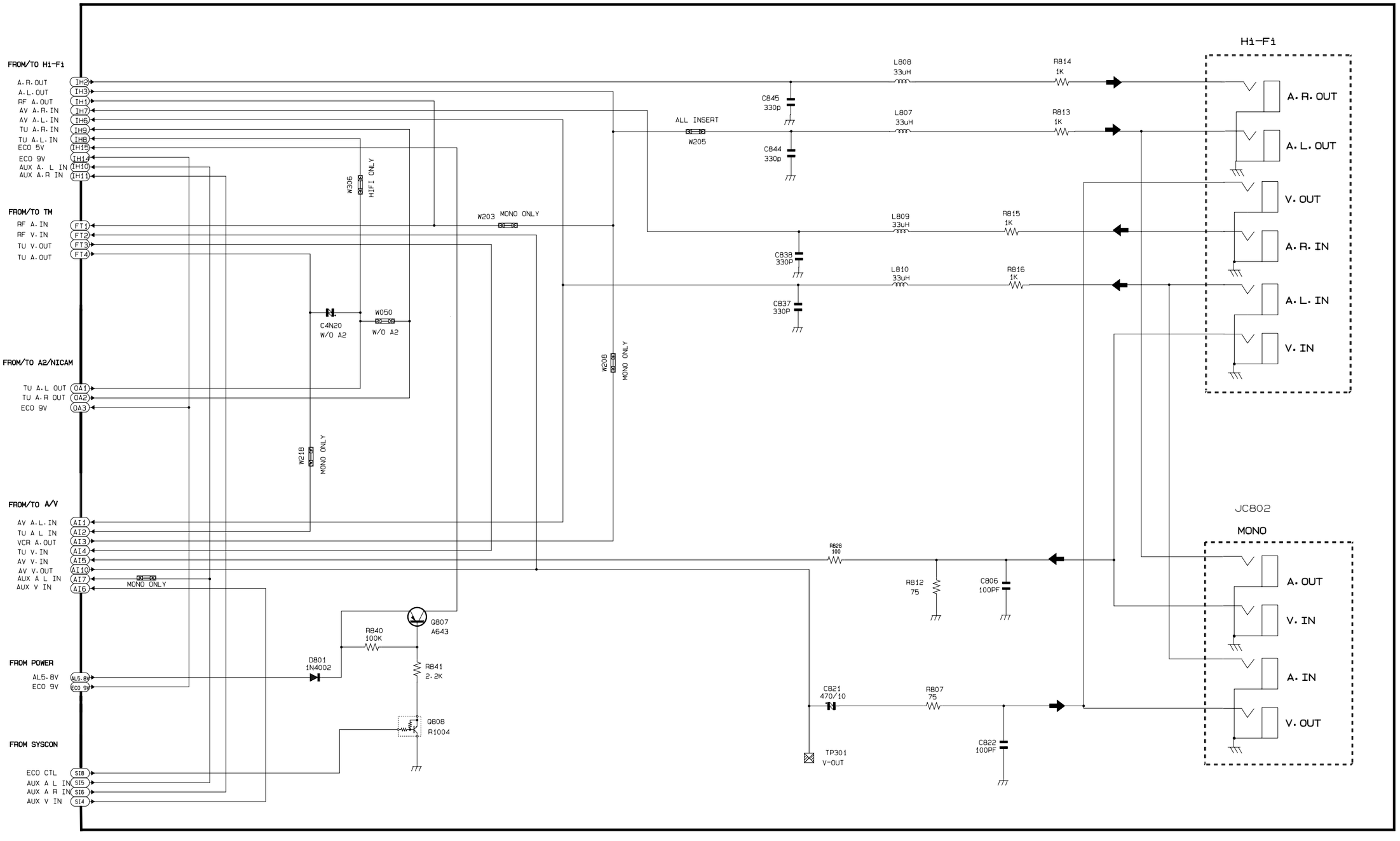
10-7 NICAM (For V-E59 Only)



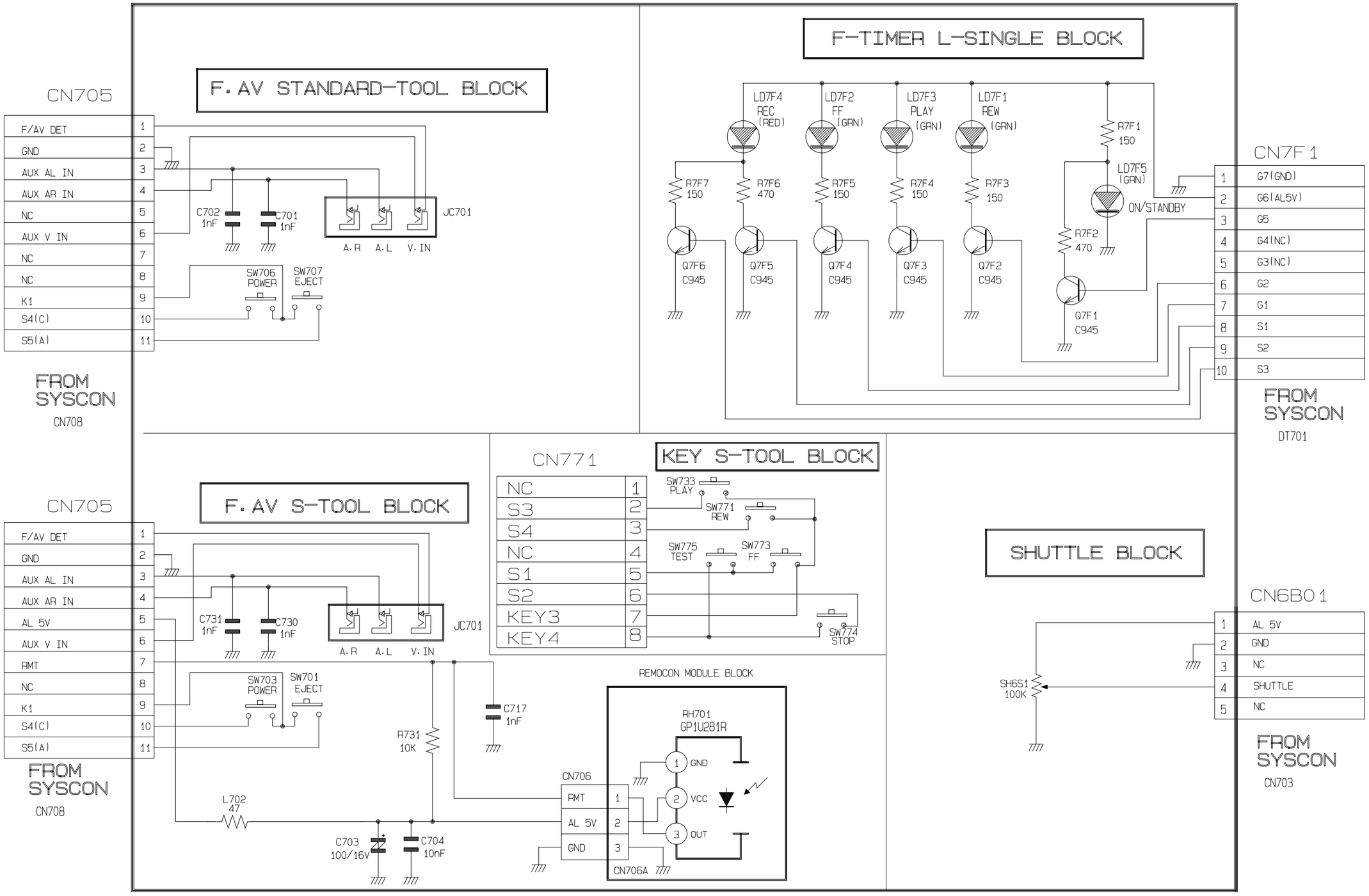
10-8 OSD/VPS/PDC



10-9 Input-Output



10-10 Sub F A/V (For V-E59 Only)



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