

Service Manual

Portable Video CD Player

SL-VP50



Colour

(K)... Black Type

Area

| Suffix for Model No. | Area | Colour |
|----------------------|----------------|--------|
| (EB) | Great Britain. | (K) |
| (EG) | Europe. | |

* MASH is a trademark of NTT.

TRAVERSE DECK: RAE0133Z MECHANISM SERIES

SPECIFICATIONS

Audio

| | |
|-------------------------|--|
| No. of channels: | 2 channels (left and right, stereo) |
| Output voltage: | 0.65V (50k Ω) ϕ 3.5 stereo mini jack |
| Frequency response: | 20~20,000Hz (+0.5dB, -1.5dB) |
| S/N: | more than 94dB |
| Wow and flutter: | Below measurable limit |
| Digital filter: | 8 times over sampling |
| DA converter: | 1 bit, MASH 4 DAC |
| Headphone output level: | max. 9mW+9mW/16 Ω (variable) stereo mini jack ϕ 3.5 |

Video

| | |
|-----------------|------------------------|
| Output format: | NTSC/PAL |
| Output voltage: | 1.0Vp-p (75 Ω) |

Pickup

| | |
|---------------|---------------------|
| Type: | One beam |
| Light source: | Semiconductor laser |
| Wavelength: | 780nm |
| Lens: | Glass pressed lens |

Playing time;

(When used in hold mode, at 25°C temperature and on flat and stable surface.)

| | |
|---|---------------|
| Rechargeable batteries (SH-CDB8D) | About 2 hours |
| Panasonic alkaline dry cell batteries (LR6) | About 5 hours |

The play time may be less depending on the operating conditions.

Recharging time;

About 4 hours

General

Operational temperature range:
Power requirement:

0°C—40°C (32°F—104°F)
AC; with an included panasonic AC adaptor
RFEA903B-W(EB)
RFEA903E-W(EG)
Batteries; 9V (two "AA" size (LR6) batteries, not included)
(Panasonic R6P/LR6 or equivalent, not included)
Rechargeable Batteries; DC 7.2V with an optional Panasonic Rechargeable Batteries (SH-CDB8D) (set of 2×3)
9.0V
Using AC adaptor; 7.3W
Using Batteries; 2.4W
Dimensions (W×H×D):
135×43×160mm
Weight:
580g (20.5 oz) (with batteries)
460g (16.2 oz) (without batteries)

DC IN:

Power consumption:

Dimensions (W×H×D):

Weight:

Note: Design and specifications are subject to change without notice.
Weight and dimensions are approximate.
These specifications were measured using the AC adaptor.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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CONTENTS

| | Page |
|---|------|
| PRECAUTION OF LASER DIODE | 2 |
| LOCATION OF CONTROLS | 3 |
| REMOTE CONTROL PREPARATIONS..... | 3 |
| ACCESSORIES | 3 |
| POWER SOURCE | 4, 5 |
| CAUTION FOR AC MAINS LEAD | 4, 5 |
| BEFORE OPERATING THE UNIT | 5 |
| PLAYING VIDEO CDs (with the playback control feature)..... | 6 |
| PLAYING AUDIO CDs AND VIDEO CDs (not equipped with the playback control feature) | 7 |
| DESCRIPTION OF TERMS | 7 |
| VARIOUS PLAY USING THE REMOTE CONTROL UNIT | 8~11 |
| CAUTIONS | 8, 9 |
| USING THE UNIT WITH OPTIONAL ACCESSORIES..... | 10 |
| AUDIO CHANNEL SELECTION | 11 |
| IF THE TV SCREEN IS IN THE FOLLOWING CONDITION..... | 11 |
| MAINTENANCE | 11 |
| CONCERNING THE TV DISPLAY | 12 |

| | Page |
|---|----------------|
| HANDLING PRECAUTIONS FOR TRAVERSE DECK..... | 13 |
| OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES..... | 14~18 |
| MEASUREMENTS AND ADJUSTMENTS | 18, 19 |
| AUTOMATIC ADJUSTMENT RESULTS DISPLAY FUNCTION (SELF-CHECK FUNCTION)..... | 20, 21 |
| TROUBLESHOOTING GUIDE | 22~27 |
| CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP)..... | 28 |
| BLOCK DIAGRAM..... | 29~34 |
| PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM | 35~38 |
| TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES | 39 |
| SCHEMATIC DIAGRAM | 39~50 |
| TERMINAL GUIDE | 51~63 |
| REPLACEMENT PARTS LIST | 64, 65, 68, 70 |
| RESISTORS AND CAPACITORS..... | 66~68 |
| CABINET PARTS LOCATION..... | 69 |
| PACKAGING | 70 |

PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.

Wave length: 780nm

Maximum output radiation power from pickup: 100µW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

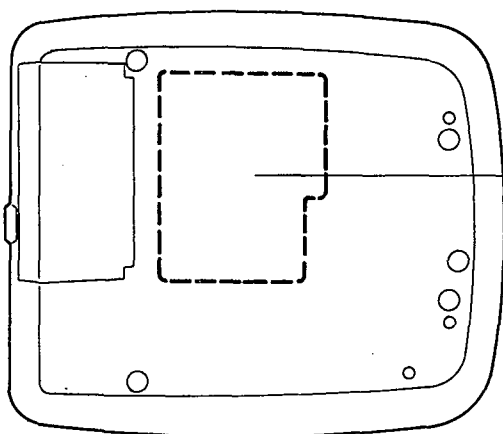
Wellenlänge: 780nm

Maximale Strahlungsleistung der Lasereinheit: 100µW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlines blicken.

ADVARSEL: I dette a apparat anvendes laser.



RQLS0077-2

| | | |
|---|--|--|
| CLASS 1 LASER PRODUCT | | VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömän lasersäteilylle. Älä katso säteeseen. |
| ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNØGÅ UDSÆTTELSE FOR STRÅLING. | | VARNING! Osynlig laserstråling når denne del er åben og spærren er urkopplad. Betrakta ej strålen. |
| VORSICHT Unsichtbare Laserstrahlung wenn Abdeckung geöffnet und Sicherheitsverriegelung überbrückt. Nicht dem Strahl aussetzen | DANGER Invisible laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM | ADVARSEL! Usynlig laserstråling når deksel åbnes og sikkerhedsfås brytes. Unngå eksponering for strålen. RQLS0077-2 |

LOCATION OF CONTROLS

Main unit **A**

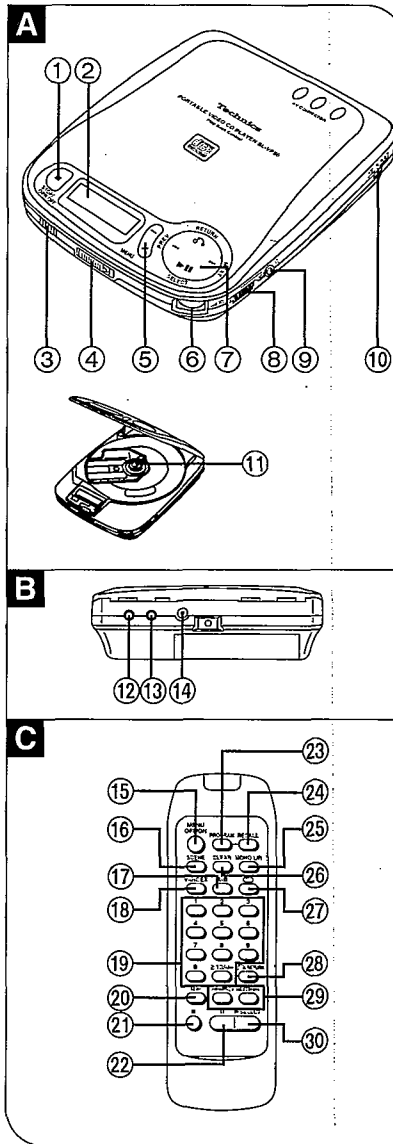
- ① Stop/operation off button
- ② Display
- ③ Remote control signal sensor
- ④ Open switch
- ⑤ Menu, +, - button
- ⑥ Headphones volume control
- ⑦ Multi operation button (NEXT, PREV, SELECT, RETURN)
- ⑧ Hold switch
- ⑨ Headphones jack (⌀) 16Ω φ3.5
- ⑩ Video format selector (NTSC, PAL, PAL AUTO)
- ⑪ Push button

Rear panel of the unit **B**

- ⑫ Video output terminal (VIDEO OUT)
- ⑬ Audio output terminal (AUDIO OUT)
- ⑭ DC in jack (DC IN 9 V)

Remote control unit **C**

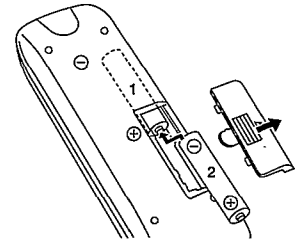
- ⑮ Menu on/off button
- ⑯ Scene button
- ⑰ A-B repeat button
- ⑱ VCD index button
- ⑲ Numeric button
- ⑳ **II**▶ (Frame skip) button
- ㉑ **■** Stop button
- ㉒ **II** Pause button
- ㉓ Program button
- ㉔ Recall button
- ㉕ Audio channel select button
- ㉖ Clear button
- ㉗ **↺** Repeat button
- ㉘ **↻** Return button
- ㉙ **◀▶** Previous, next **▶▶** button
- ㉚ **▶** Select button



REMOTE CONTROL PREPARATIONS

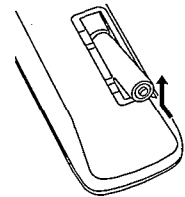
Battery installation

Insert two "R03" size (UM-4, included) as shown below. Insert batteries in the correct polarities (+, -).



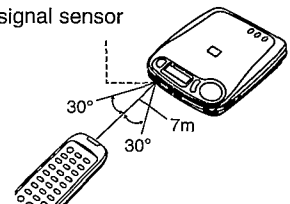
Battery removal

Press and push up batteries in the direction of the arrow to remove them.



Remote control transmitter's operation range and precautions

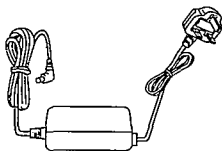
Remote control signal sensor



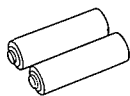
- Do not place obstacles between the remote control signal sensor and remote control transmitter.
- Take care to keep the remote control signal sensor and end of the remote control unit free from dust.
- Do not leave it where it will be exposed to direct sunlight.

ACCESSORIES

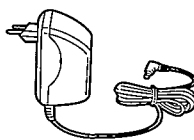
AC adaptor
[For (EB) area.]
(RFEA903B-W) 1 pc.



Batteries (for remote control)
(R03, "AAA") 2 pcs.



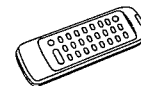
[For (EG) area.]
(RFEA903E-W) 1 pc.



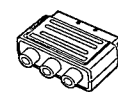
Connection cable
(RJL3X001X15) 1 pc.



Remote control transmitter
(RAK-SL408WH) 1 pc.



21 pin adaptor
(VFA0151-1) 1 pc.



Note: These are available on sale route.

POWER SOURCE

AC Adaptor **A**

Connect the AC adaptor.

Use only the AC adaptor provided with this unit.

Note

- The configuration of the AC adaptor differs depending on the area.
- The unit is in the standby condition when the AC adaptor is connected. The primary circuit is always "live" as long as the AC adaptor is connected to an electrical outlet.

For (EB) only:

The indicator on the AC adaptor lights when the AC adaptor is connected.

CAUTION

Do not use the AC adaptor provided with this unit for other products.

Dry cell batteries (not included) **B**

Install six "R6/LR6" (UM-3) alkaline batteries as shown in the figure.

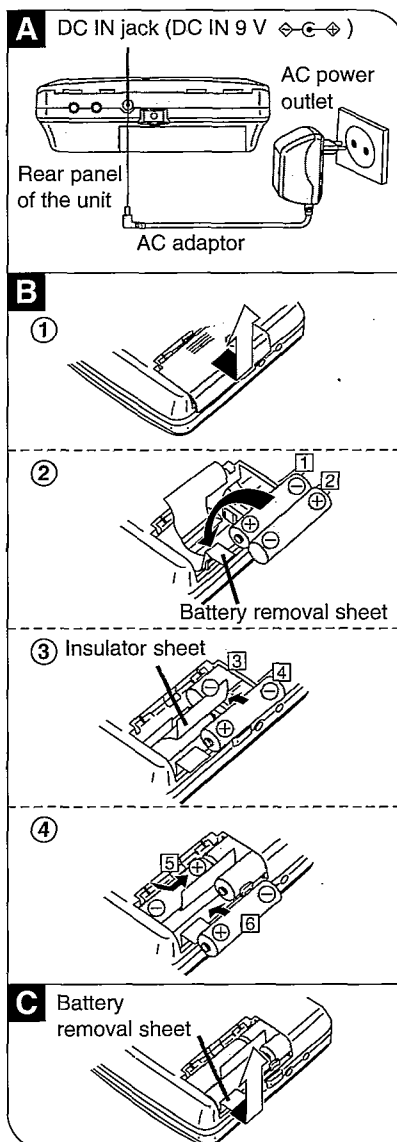
Make sure that the AC adaptor is disconnected from the AC power outlet and the unit.

- 1 Slide the battery cover to open.
- 2 Put the battery removal sheet under the batteries, and then install batteries 1 and 2.
- 3 Put the insulator sheet on top of the batteries and install battery 3.
- 4 Now install batteries 5 and 6.

Battery removal **C**

Pull the battery removal sheet and remove the batteries with your finger.

Refer to the cautions on page 8, 9.



Rechargeable batteries (not included)

Make sure that the batteries have been charged before use.

Recharging batteries

1 Install six rechargeable batteries.

Only the SH-CDB8D batteries can be recharged.


Refer to the "Dry cell batteries" concerning the installation and removal of the batteries.

2 Connect the AC adaptor.

Note

The configuration of the AC adaptor differs depending on the area.

It takes about 4 hours to fully recharge them.

The recharging indicator  flashes when you start recharging and the light off when recharging has completed.

3 After completing recharging of the batteries, disconnect the AC adaptor from the DC in jack and the AC power outlet.

- Recharging is possible only when the unit is switched to the standby mode.
- The batteries can be used for about 10 months (300 times) if they are recharged every day. After that, their operating time will be shortened, and you will have to replace them. Obtain new rechargeable batteries (SH-CDB8D) designed exclusively for the unit.
- While recharging, the AC adaptor and rechargeable batteries may get warm. This is normal.

CAUTION FOR AC MAINS LEAD

For (EB) area.



("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 3-ampere fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 3-ampere and that it is approved by ASTA or BSI to BS1362.

Check for the ASTA mark  or the BSI mark  on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

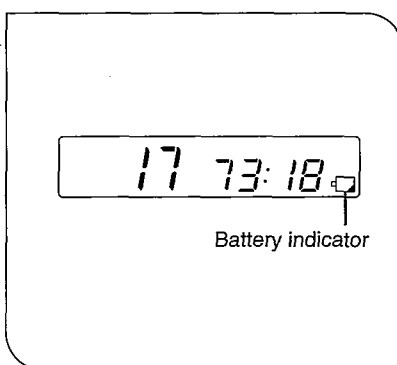
Battery indicator

This starts flashing when the batteries have run down. After a short while the power automatically shuts off.

(The amount of time the unit will continue to play after the indicator has started flashing differs slightly, depending on the type of batteries used.)

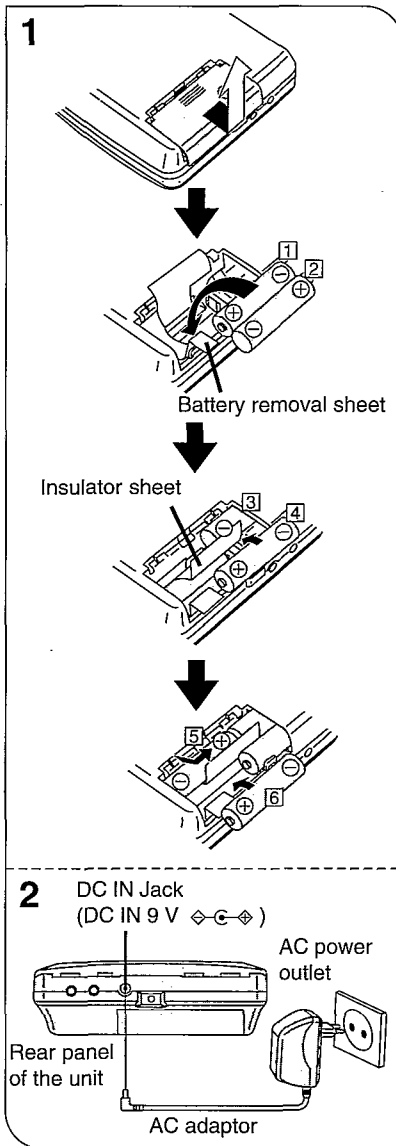
| Type of battery | Action |
|------------------------|-------------------------------|
| Rechargeable batteries | Recharge the batteries again. |
| Dry cell batteries | Replace with new batteries. |

(The battery indicator may not flash if rechargeable batteries, other than those designated by Panasonic, are used.)



Battery indicator

(POWER SOURCE)



■ BEFORE OPERATING THE UNIT

1 When you install a video CD
Connect the unit to the TV.

Use the connection cable (included) and the 21 pin adaptor (included only for Continental Europe and United Kingdom). Set the NTSC, PAL, PAL AUTO selector according to the television set.

NTSC: When connecting the NTSC system TV

PAL: When connecting the PAL system TV

PAL AUTO: When connecting the TV which has PAL 60 system. (This is the system which enable to enjoy NTSC software.) For details, refer to the operating instructions of the TV.

If your television set has 21 pin plug terminal:

1. Connect the connection cable to the 21 pin adaptor.
2. Connect the 21 pin adaptor to the TV set.

2 Release the hold mode.■ Accidental Operation Prevention Function **A**

This function prevents the unit from operating even if its function buttons are pressed accidentally. (However, the disc lid can be opened or closed.) Use the function to prevent the following situations:

Example 1: While the unit is not in use, the power is inadvertently tuned on and the batteries run down.

Example 2: Play is interrupted while the unit is in use.

To use the accidental operation prevention function

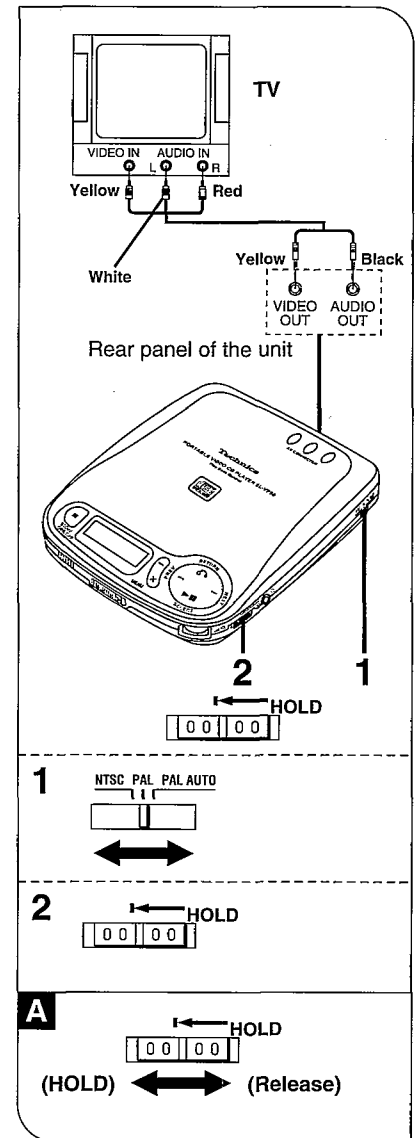
Set HOLD to the HOLD position. It is possible to operate the unit from the remote control in the "hold" mode (except for turning on or off the unit). **Before operation, release the unit from the hold state.**

"hold" indicator

If the unit is in the hold mode, the "hold" indicator appears when any of the unit's function buttons is pressed.

When the unit is turned off

The "hold" indicator appears only when **▶▶** button is pressed.



(CAUTION FOR AC MAINS LEAD)

CAUTION!

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond

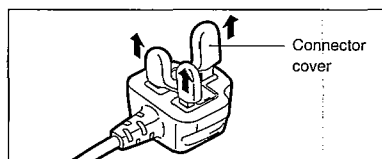
with the coloured markings identifying the terminals in your plug, proceed as follows: The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

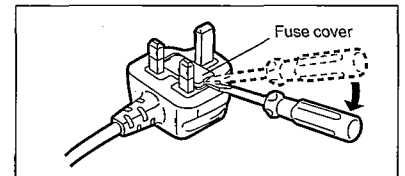
Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol \perp .

Before use

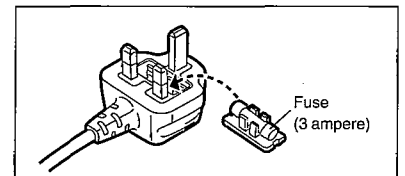
Remove the connector cover as follows.

**How to replace the fuse**

1. Remove the fuse cover with a screwdriver.



2. Replace the fuse and attach the fuse cover.



PLAYING VIDEO CDs (with the playback control feature)

Menu Playback

(See description of terms on page 7)

The playback method described below is only for video CDs equipped with the playback control feature. Menu playback is automatically played when a video CD is playback control supported. If the video CD is not playback control supported, refer to the regular playback mode described on page 13.

- 1** Switch on the TV and select the VIDEO input mode.
- 2** Slide OPEN to open the lid, and insert the video CD.
Press the area near the center hole of the disc until it clicks into position. Close the lid.
- 3** Press ►||.
The menu screen appears on the TV. (with some discs, it may not appear immediately.) The menu screen that appears differs depending on the disc.
- 4**
 - ① Press MENU (+ or -) to select the menu.
 - ② Press SELECT ►|| to start playback.

MENU +: When selecting the bigger number
MENU -: When selecting the smaller number

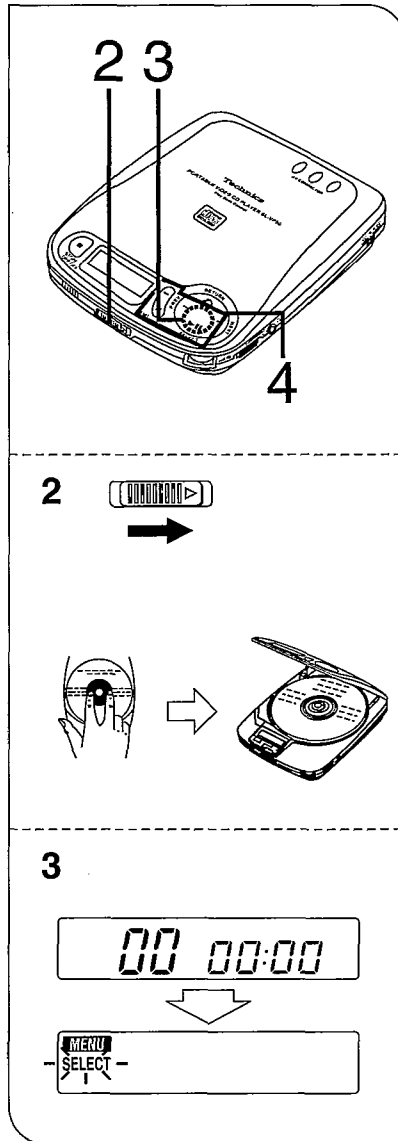
The display shows the menu number, and then playback will start. The unit also identifies and plays the high-resolution still image automatically.
- 5** Adjust the TV volume level.
VOLUME control on this unit is exclusively for the headphones.

The menu configuration differs depending on the disc. Select the menu by following the instructions accompanying the disc or the screen display.

For your reference:

Concerning the display that appears on the TV screen, refer to page 12.

Menu numbers can also be selected using the numeric buttons on the remote control unit.



| Menu operation | |
|--|--|
| To return to the previous menu | RETURN ↶ |
| To advance to the continuation of the menu | ▶▶ NEXT |
| To return to the previous screen | PREV ◀◀ |
| Playback operation | |
| To temporarily stop disc play Press during play. To resume play, press the button once again. | ▶ |
| To stop play Press during play. | ■ |
| To turn off the unit Press in the stop condition. | ■ |
| To skip forward or backward (skip) (Regular playback mode only) Press during play | PREV ◀◀: Skip backward ▶▶ NEXT Skip forward |
| To search forward or backward Press and hold during play. | PREV ◀◀: Search backward ▶▶ NEXT Search forward |

Note

- The pictures moving on the menu screen will not pause even when ►|| is pressed during playback.
- You cannot search forward or backward with a "slide show" disc.

■ To switch to the menu play/regular play mode

(Available only from the remote control)
Press MENU OFF/ON.

Refer to page 7 for regular playback. When the power is switched to on, the menu playback will be automatically selected.

FEATURES

This unit is the portable video CD player which is the playback control method. The following CDs shown below can be played on this unit.

Video CD:

(Motion picture + audio)
Only compact discs having this mark can be used.



Version 2.0

The disc with the playback control feature. In addition to the motion picture playback, menu playback and high-resolution still image playback are possible.

Version 1.1

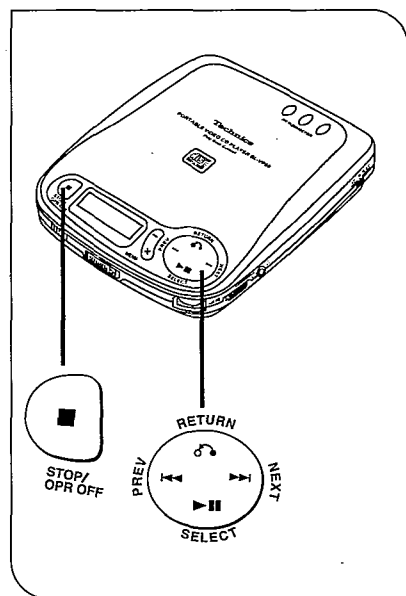
The disc not equipped with the playback control feature
Only the motion picture playback is possible.

Audio CD:

Only compact discs having this mark can be used.



Only the audio playback is possible.



PLAYING AUDIO CDs AND VIDEO CDs (not equipped with the playback control feature)

Regular Playback

(See description of terms on page 7)

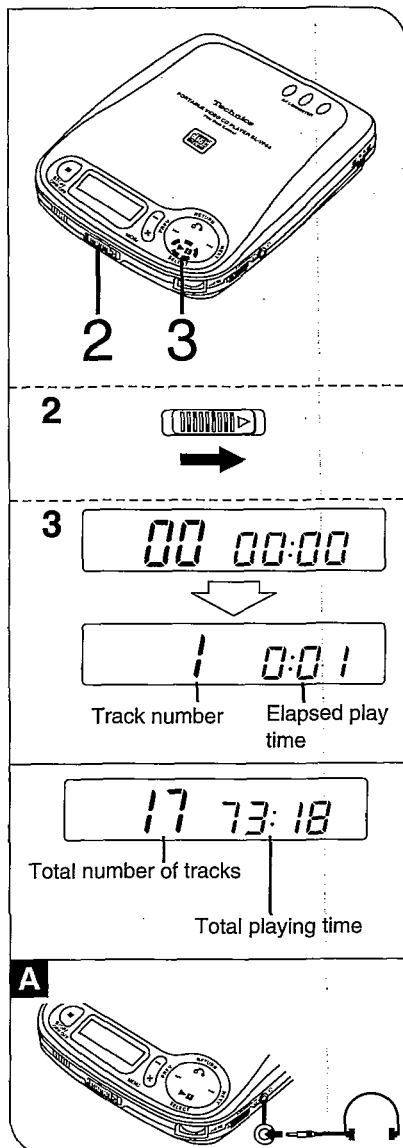
The playback method described below will playback the disc in sequence from the beginning. Regular playback can also playback video CDs equipped with the playback control feature. However, it is impossible to playback some moving or still pictures. In this case, use the menu playback.

- 1 For playing a video CD only:
Switch on the TV and select the VIDEO input mode.
- 2 Slide OPEN to open the lid, and insert the CD.
Close the lid.
- 3 Press ►||. Play starts from the first track. Play stops when all the tracks have been played.
- 4 For playing a video CD only:
Adjust the TV volume level to set sound level.
VOLUME control on this unit is exclusively for the headphones.

To listen through the headphones

(not included) **A**

- Before connecting the headphones, reduce the volume level.
- Plug Type: Stereo mini type



Removing the disc **A**

After the disc has stopped rotating, press PUSH and release the disc.

Note

Do not open the lid during play.

Automatic Shut-Off:

This functions, in order to prevent rechargeable and other batteries from becoming discharged. If you leave the unit in the stop mode for about 10 minutes, it will automatically shut off.

“no disc” display

This appears for about 30 seconds when a disc has not been inserted or when a disc has not been inserted properly and then ►|| is pressed.

This display also appears when a disc or the lens are stained.

“OPEN” display

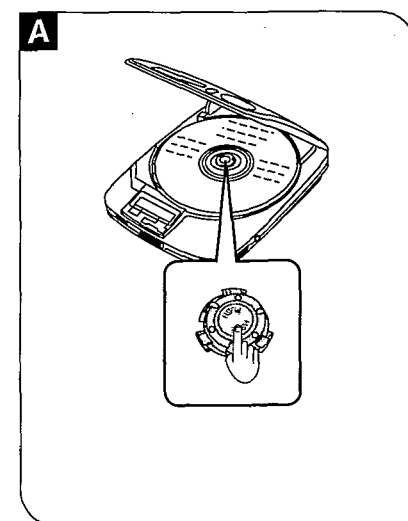
This appears for about 10 minutes after the lid is opened. (It does not appear when the unit is turned off.)

The backlight of the display

When using the AC adaptor, the backlight of the display turns on.

Note

When you listen to an audio CD, disconnect the yellow video pin plug from the VIDEO OUT terminal to prevent from battery consumption.



DESCRIPTION OF TERMS

(Read this section together with the instructions accompanying the disc.)

Playback control:

This refers to the control signals which have already been recorded on a disc. These signals enable moving picture and still picture playback by selecting menus. There are two types of video CDs, those which support playback control and those which do not. The type is indicated in the disc's instructions and on the CD case.

Menu (playback control) playback:

This method plays back the moving pictures or high-definition still pictures on a video CD by selecting a menu.

Regular playback:

This method plays back a disc in sequence from the beginning without using menus.

Track (number):

Video and audio programs are divided up into units called tracks. The numbers allocated to the tracks are called track numbers.

Video index (number):

A track is subdivided into smaller units called indexes. The numbers allocated to the video indexes are called index numbers.

Scene:

Scenes refer to an individual menu, moving picture, still picture, etc. which are recorded only on video CDs equipped with the playback control feature. The numbers allocated to the scenes are called scene numbers.

VARIOUS PLAY USING THE REMOTE CONTROL UNIT

(Only for video CDs)

To find the particular scene you want to watch **A**

■ To find the scene using a video index number

(See description of terms on page 7)

A particular scene in a track you want to watch can be located by selecting a video index number. This can be done only with the video index recorded.

- 1 Press **V-INDEX** in the play mode.
- 2 Press **◀◀ PREV** or **NEXT ▶▶** to select the video index number corresponding to the scene.
Play now starts at the video index selected.

To cancel this function:
Press **V-INDEX** again.

■ To find the scene using the numeric buttons **B**

- 1 Press **V-INDEX**.
- 2 Press the numeric button to select the index number corresponding to the scene.
- 3 Press **▶ SELECT**.
Play now starts at the video index selected.

To select a two-digit video index number:

Press the numeric button corresponding to the desired index number.

Example:

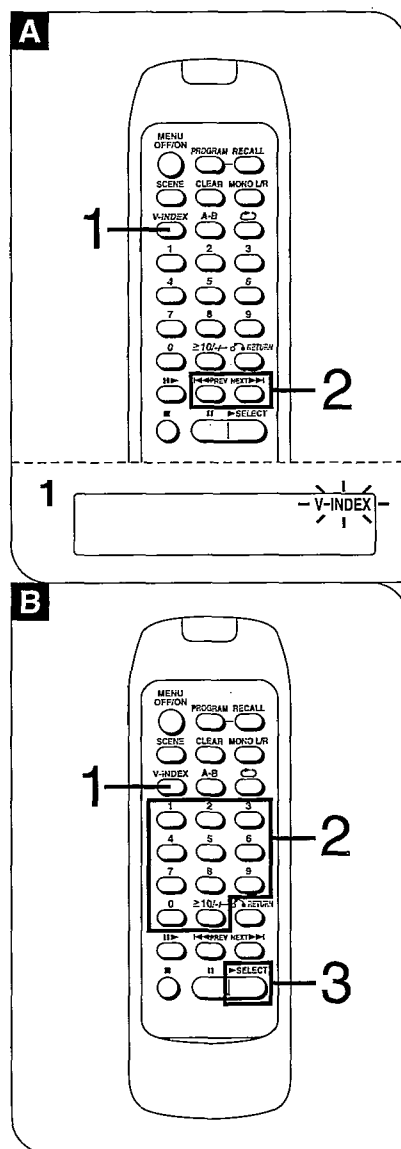
15: 1→5

24: 2→4

When you make an error, press **CLEAR** to cancel.

Note

- The video index search function is available with a track in play only.
- It may not be possible to make a video index search with the motion picture.



(Only for video CDs)

■ To find the scene using a scene number **A**

(See description of terms on page 7)

A particular scene in a track you want to watch can be located by selecting the scene number. Refer to the instructions accompanying the disc for details on the scene numbers.

Scene playback is possible only with video CDs equipped with the playback control feature (Menu playback mode).

- 1 Press **SCENE**.
- 2 Press the numeric button to select the scene number corresponding to the scene you desired to watch.
- 3 Press **▶ SELECT**.

To cancel this function:
Press **SCENE** again.

To select a two-digit scene number:

Press the numeric button corresponding to the desired scene number.

Example:

15: 1→5

208: 2→0→8

Frame skip **B**

Press **II▶** during play.

Each time it is pressed, the video frame will go forward.

Continually pressing the button, the unit performs a still playback.

To cancel the frame skip mode.
Press **II**.

CAUTIONS

Rechargeable batteries

- Only the SH-CDB8D batteries can be recharged.
- If the power delivered by the batteries lasts for a very short time after recharging, it means that the batteries' service life is over. Do not use them any more. Please replace the batteries.
- Recharging already charged batteries will shorten their service life.
- When recharging batteries for the first time or when they have not been used for a long period of time, the play time may be shorter than usual. In a case like this, repeatedly recharge and discharge the batteries. This will restore them to their regular state.
- Do not allow any metal objects to touch the terminals of rechargeable batteries since this may cause short-circuiting which is dangerous.

Dry cell batteries/rechargeable batteries

To prevent damage to the batteries and electrolyte leakage, heed the following points.

- Align the ⊕ and ⊖ polarities properly when inserting the batteries into the unit.
- Do not mix different types or makes of batteries or old and new batteries.
- Remove the batteries if you do not plan to use the unit for extended period of time.
- Do not throw batteries into a fire, and do not short-circuit, disassemble or subject them to excessive heat.
- Do not attempt to recharge dry cell batteries.
- Do not peel off the plastic covering on the rechargeable batteries. Short-circuiting may occur which is dangerous.
- When inserting the batteries into the unit, be sure to set the insulator sheet properly. (see pages 4, 5).

Carrying dry cell batteries/rechargeable batteries around

When putting dry cell or rechargeable batteries in a pocket or bag, ensure that no other metal objects such as a necklace are placed in the pocket of bag with them. Contact with metal may cause short-circuiting which, in turn, may cause a fire. Be absolutely sure to carry the rechargeable batteries in the battery carrying case.

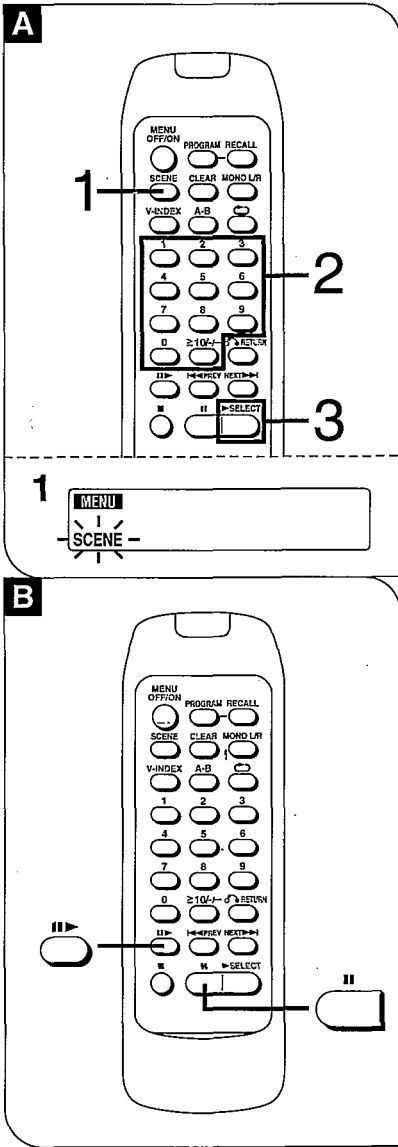
When driving a car

In the interest of traffic safety, do not either operate the unit or watch the video CD while driving.

Precautions for Listening with the Headphones

- Do not play your headset at a high volume. Hearing experts advise against continuous extended play.
- If you experience a ringing in your ears, reduce volume or discontinue use.

(Various play using the remote control unit)



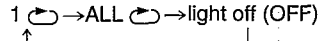
(For video CDs and audio CDs)

Playing Tracks repeatedly (Repeat Function)

(Preparation: Press MENU OFF/ON on the remote control and set the unit to be regular playback mode)

■ **To repeat only one track A**
 Press once in the play or stop mode.

Each time you press the button, the display will change as follows:



■ **To repeat all tracks on the disc B**

Press twice in the play or stop mode.

For your reference:

In the program play mode, only all the programmed tracks will be repeated.

To cancel repeat function:

Press and the " " indicator goes out.

■ **To repeat a particular section C (A-B repeat)**

1 Press A-B during play at the point where repeat play is to be started (point A).

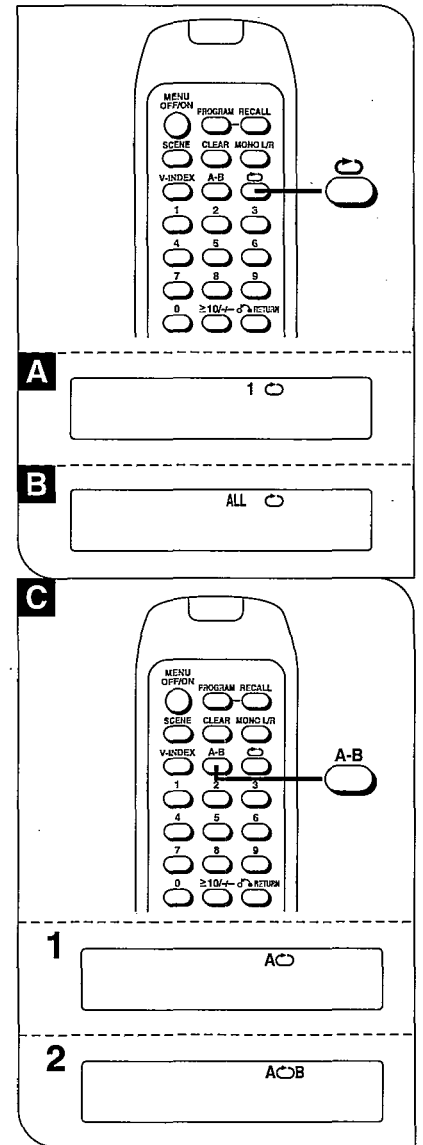
2 Press A-B at the point where repeat play is to be ended (point B).

To cancel the A-B repeat

Press A-B again.

Note

- A-B repeat is not possible during program play.
- A-B repeat between a track and another track is not possible.
- When using a video CD, A-B repeat of within 2 seconds is not possible.



(Cautions)

- Do not use while operating a motorized vehicle. It may create a traffic hazard and is illegal in many areas.
- You should use extreme caution or temporarily discontinue use in potentially hazardous situations.
- Even if your headset is an open-air type designed to let you hear outside sounds, don't turn up the volume so high that you can't hear what's around you.

When purchasing rechargeable batteries

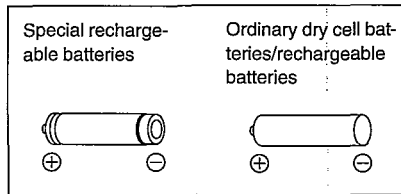
As a safety precaution, the portable video CD players made by our company have a construction designed to make it impossible to recharge ordinary batteries.

To use rechargeable batteries, be absolutely sure to purchase the rechargeable Ni-Cd batteries designed especially for this unit.

Special rechargeable NI-Cd batteries:

SH-CDB8D (set of 2×3)

For details, consult with your dealer.



Notice about the rechargeable battery

The battery is designated recyclable.

Please follow your local recycling regulations.

(Various play using the remote control unit)

(For video CDs and audio CDs)

Playing Tracks in a Particular Sequence (Program Play)

With program play, you can program up to 24 tracks on the disc in any order you choose.

Before operation:

1. Press MENU OFF/ON to set the unit to the regular playback mode.
2. Set the unit to the stop mode.

- 1 Press PROGRAM.**
- 2 Press the numeric buttons corresponding to the track number in sequence.**

To select a two-digit track number:

First press $\geq 10/-/$ and then press the numeric button corresponding to the desired track number.

Example:

- 15: $\geq 10/-/ \rightarrow 1 \rightarrow 5$
 20: $\geq 10/-/ \rightarrow 2 \rightarrow 0$

- 3 Press \blacktriangleright SELECT.**

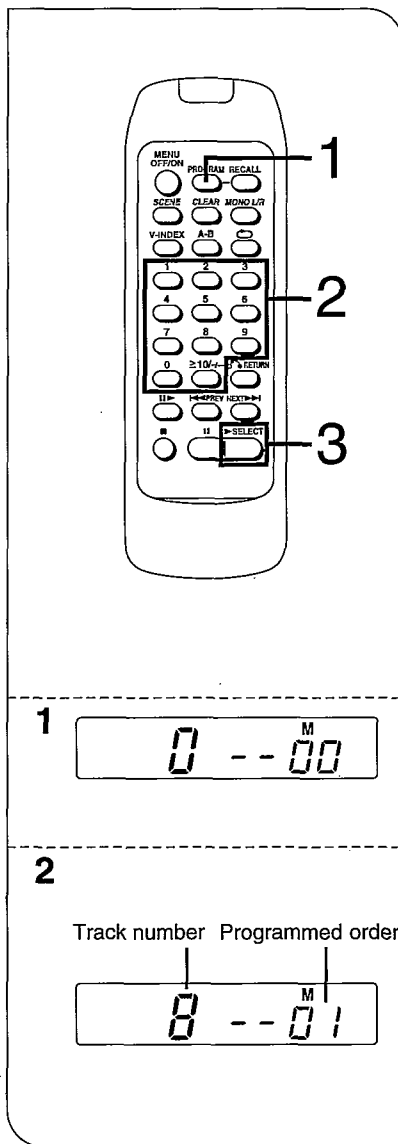
When all the programmed tracks have been played, the unit will automatically stop.

To cancel program play:

Press PROGRAM again.

Concerning the "F" indication:

It shows no further tracks can be programmed.



■ To confirm the programmed contents

Press RECALL.

The display shows the programmed track numbers in the sequence you have entered.

■ To cancel the programmed track

Press CLEAR (during play, press twice). The track you programmed last will be cancelled.

■ To cancel all the programmed tracks

Press ■.

For your reference:

During the program play, the selections play in the same order as you programmed them.

Press \blacktriangleleft PREV or NEXT \blacktriangleright to skip other programmed tracks.

Starting play from a desired track (Direct access play)

Before operation:

Press MENU OFF/ON to set the unit to the regular playback mode.

Direct access play can be operated either in stop mode or play mode.

Press the numeric buttons corresponding to the track number.

All the tracks are played in the original track order starting with the one selected and ending with the final track, and then play stops automatically.

To select a two-digit track number:

First press $\geq 10/-/$, and then press the numeric button corresponding to the desired track number.

Example:

- 15: $\geq 10/-/ \rightarrow 1 \rightarrow 5$
 20: $\geq 10/-/ \rightarrow 2 \rightarrow 0$

■ USING THE UNIT WITH OPTIONAL ACCESSORIES

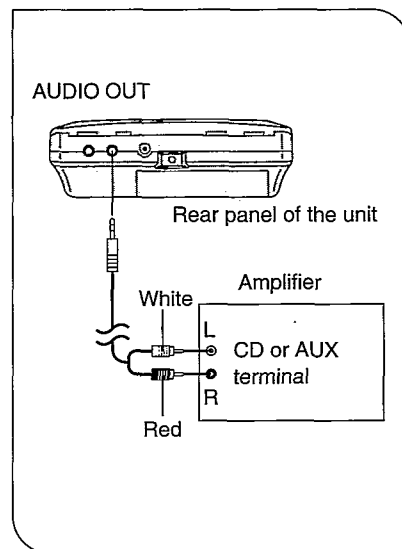
Using the unit with an audio system

- Adjust the volume level on the amplifier.
- Do not connect the cable to the PHONO jacks on the amplifier.
- When you do not connect the provided yellow pin plug connection cable to the VIDEO OUT terminal, you can only listen to the audio portion of the video CD.
- Obtain the optional connecting cable if the amplifier comes with mini-phone jacks.
- When you connect to the speaker system which has a built-in amplifier, make the connection to the headphones jack (Ω).
- When you connect the microphone to an audio system, you can enjoy "KARAOKE" (singing with an accompaniment) by selecting the audio channel

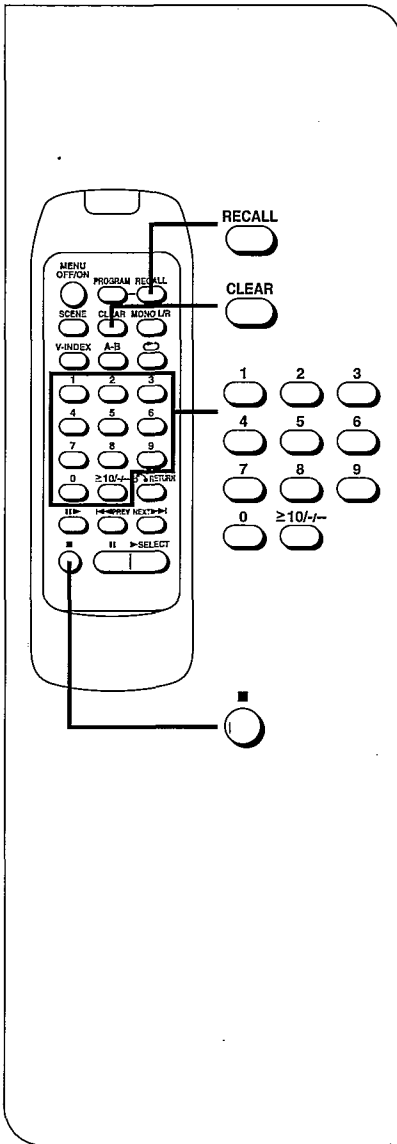
using the remote control unit. (See page 11.)

Note

You cannot use this unit with a car audio system.



(Various play using the remote control unit)



AUDIO CHANNEL SELECTION

When you use a multi audio CDs, you can hear only the vocal track or accompaniment by selecting the audio channel.

Press MONO L/R.

Pressing this button once displays the present audio condition. If you press the button continuously, the audio mode will change as follows.

●LR: Accompaniment+vocal **A**

You can hear an accompaniment (main audio) from the left channel, and vocal track (sub audio) from the right channel.

●L : Accompaniment only **B**

You can hear an accompaniment (main audio) only.

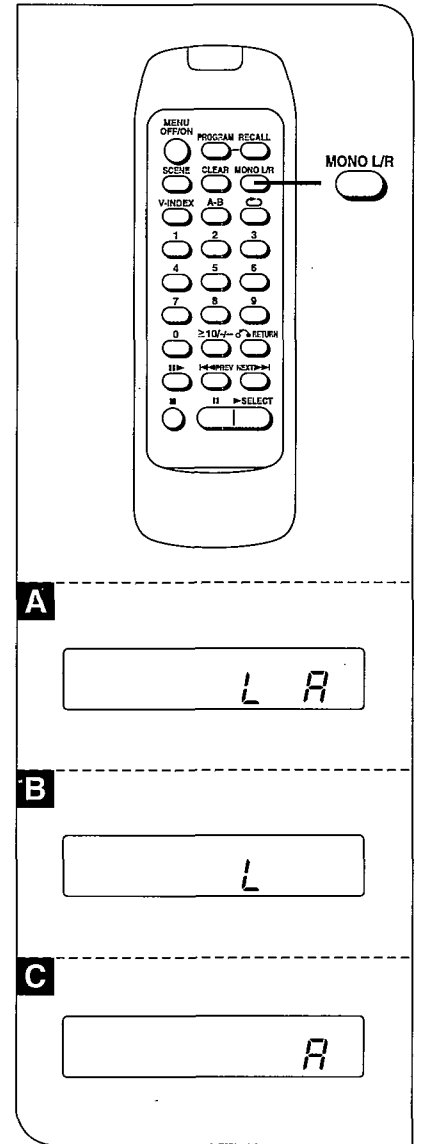
●R : Vocal track only **C**

You can hear a vocal track (sub audio) only.

(With some discs, accompaniment may be heard)

Note

If you open or close the lid, the audio channel selection retains in the memory. However, the LR mode resumes once the power is turned off and on again.



IF THE TV SCREEN IS IN THE FOLLOWING CONDITION

If the TV screen is in the following condition



- Picture is smaller than screen.
- Picture appears too wide.
- Picture movements are not smooth.

It is possible that software recorded using the NTSC system is being viewed on a PAL type TV.

Set the video format selector on the unit's rear panel to "PAL AUTO".

Note

- Depending on the TV set used, the picture may shrink vertically and black bars may appear both at the top and bottom of the screen. This is not an indication of a malfunction.
- If the picture remains unchanged even when the switch has been set to the "PAL AUTO" position, set it to the normal viewing position.
- When the picture on the TV is displayed in monochrome or so with AUTO mode, switch the video format selector to PAL mode on this unit.

MAINTENANCE

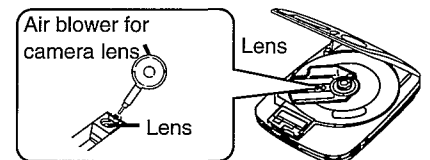
Maintaining the lens

Open the lid and clean the lens as shown in the figure.

Use a cotton swab to gently wipe off any finger-prints.

Recommended product:

Lens cleaner kit



Maintaining the unit

Wipe the unit with a soft cloth. Remove stubborn dirt using a cloth which has been dipped in water or soapy water and wrung out, and then wipe dry.

- If you intend to use a chemical cleaning cloth, read its directions first.
- Do not use alcohol or paint thinners.

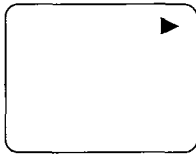
■ CONCERNING THE TV DISPLAY

(On screen display)

You can confirm the unit's operating condition on the TV screen. The display will disappear after a few seconds. □: Reference page

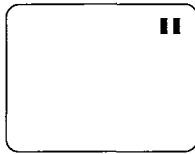
●When starting play

6, 7



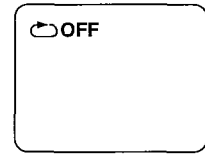
●When stopping the play temporarily

6



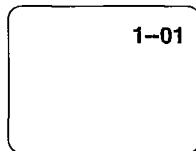
●When canceling the repeat function

9



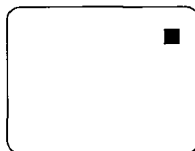
●When selecting a track for program play

10



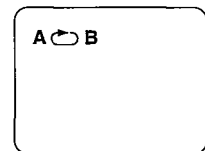
●When stopping the play

6



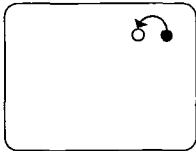
●When repeating a particular section (A-B repeat)

9



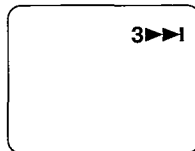
●When returning to the previous menu (RETURN)

6



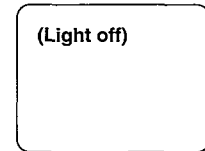
●When skipping forward to the track "3" (track skip)

6



●When canceling the A-B repeat function

9



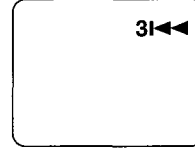
●When advancing to the continuation of the menu (NEXT)

6



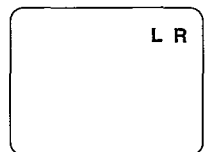
●When skipping backward to the track "3" (track skip)

6



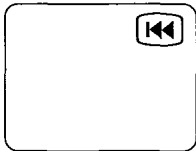
●When changing the audio channel to select "accompaniment+vocal track" channel

11



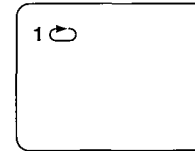
●When returning to the previous screen

6



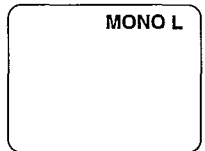
●When repeating only one track (one track repeat)

9



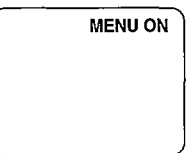
●When changing the audio channel to select "accompaniment" channel only

11



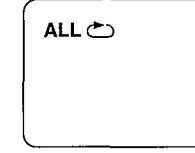
●When making a menu play

6



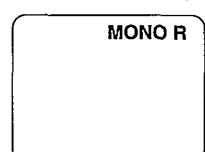
●When repeat all tracks (all repeat)

9



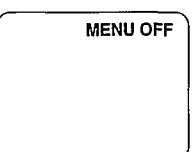
●When changing the audio channel to select "vocal" channel only

11



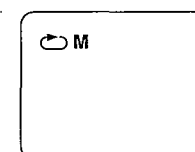
●When making a regular play

6



●When repeating the programmed tracks

9



.....
When you making a frame skip, video index search, or scan playback, the operating conditions is also displayed on the TV screen.
Besides, the display is varied depending on discs.

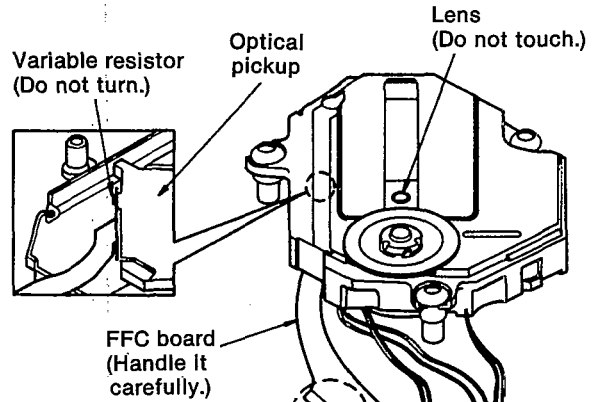
HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.

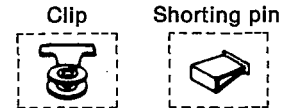
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

• Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FFC board).
When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FFC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.



Be sure to short this position.
(Use the shorting pin or clip)

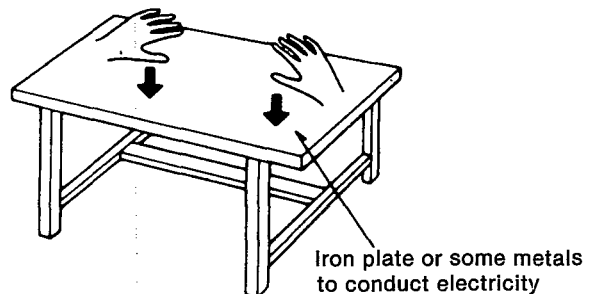
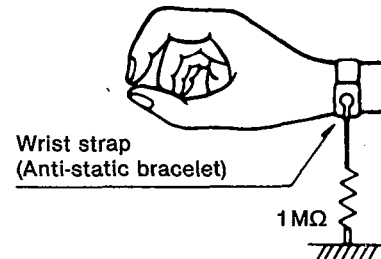


• Grounding for electrostatic breakdown prevention

1. Human body grounding.
Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).



OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES

Warning: This product uses a laser diode. Refer to caution statements on page 2.

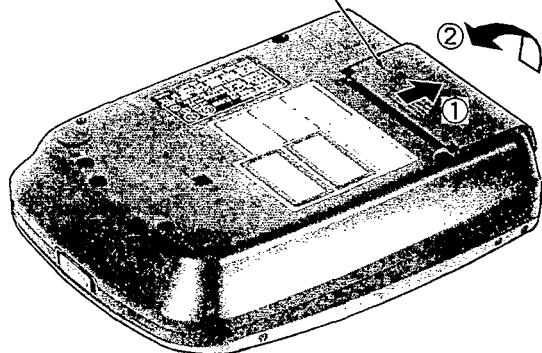
ACHTUNG: • Die lasereinheit nicht zerlegen.

• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

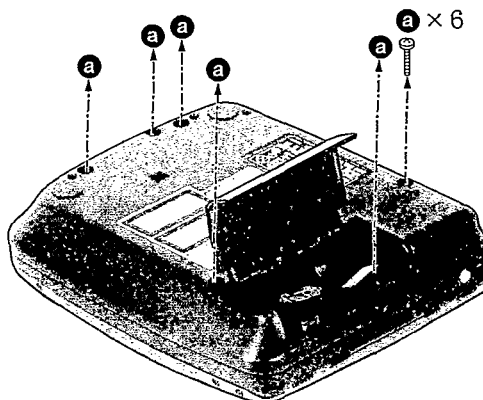
- NOTE**
1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
 2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
 3. Illustrated screws are equivalent to actual size.
 4. [] indicates parts No.

Checking for the video P.C.B.(Front side)

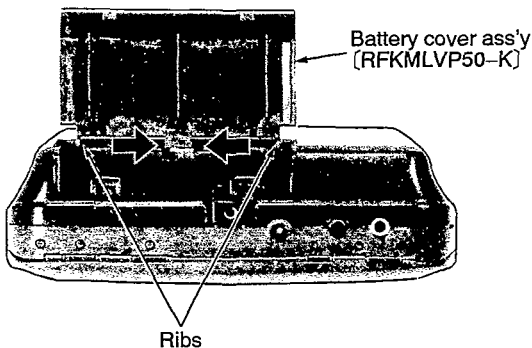
Step 1
Open the battery cover ass'y.



Step 2
Remove the 6 screws.



Removal of the battery cover ass'y

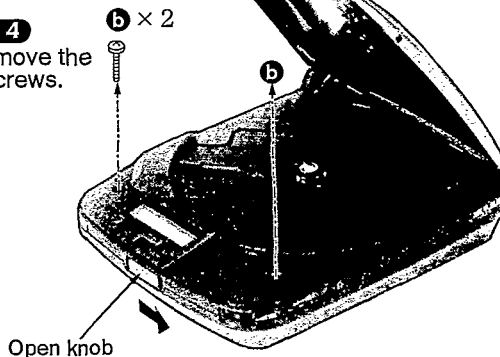



• Release the ribs in the direction of arrow.

CD cover ass'y

Step 3
Slide the open knob and then open the CD cover ass'y.

Step 4
Remove the 2 screws.



 a, b
[XTN17+6GFZ]

Bottom cabinet ass'y
 (RFKJLVP50EBK(EB)
 RFKJLVP50EGK(EG))

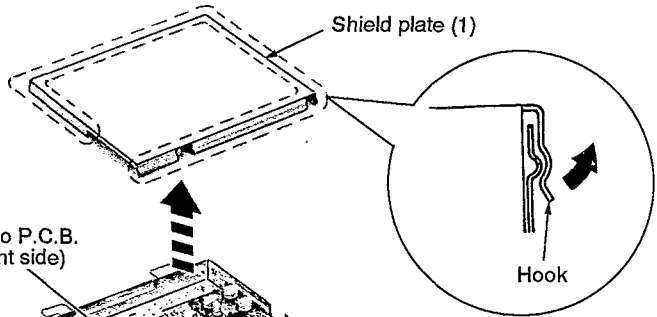
Step 5
 Remove the bottom cabinet ass'y.

NOTE

When removing bottom cabinet ass'y, the hold knob and video format selector knob will be also removed. So, take care not lose the hold knob and video format selector knob.

Step 6
 Place the shield case aside the main cabinet.

• Check the video P.C.B. (Front side) as shown below.




Step 7
 Release the hook, and then remove the shield plate (1).

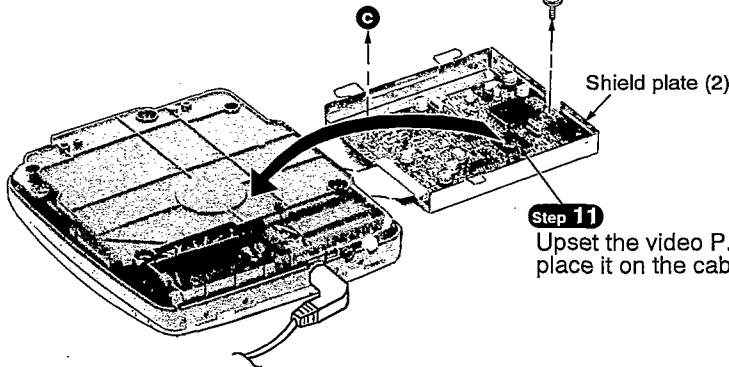
Step 9
 Put the video CD disc into the cabinet, and then play it.

Step 8
 For supply power, connect the AC adaptor to the DC IN jack.

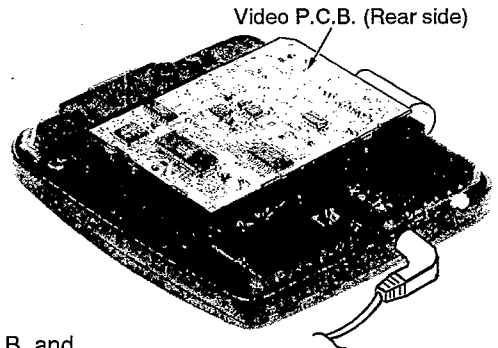
Checking for the video P.C.B.(Rear side)

• Check the video P.C.B. (Rear side) as shown below.

Step 10
 Remove the 2 screws.  × 2



Step 11
 Upset the video P.C.B. and place it on the cabinet.

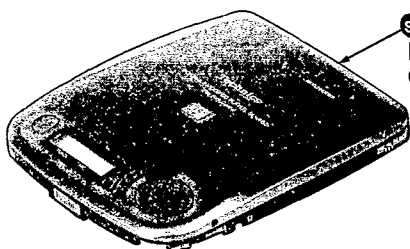
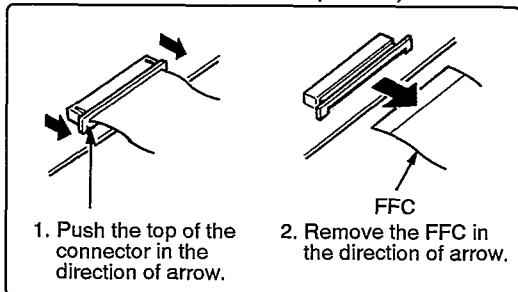


Checking for the main P.C.B.(Component side)

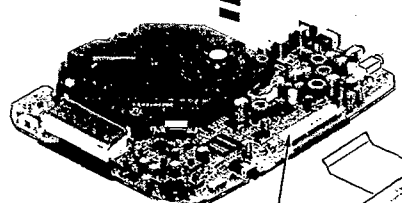
NOTE

After checking the video P.C.B., pull the AC adaptor and take the video CD disc out the cabinet.

• Removal of the connector (CN801)

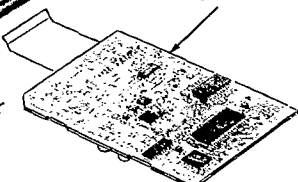


Step 12
Remove the intermediate cabinet ass'y.



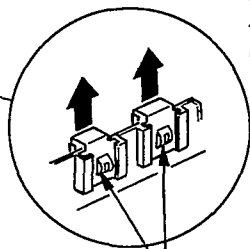
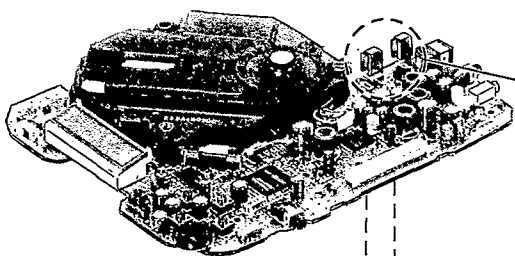
Step 13
Remove the connector, and then remove the video P.C.B.

Connector (CN801)



NOTE

When removing the video P.C.B., the AC adaptor must be disconnected.



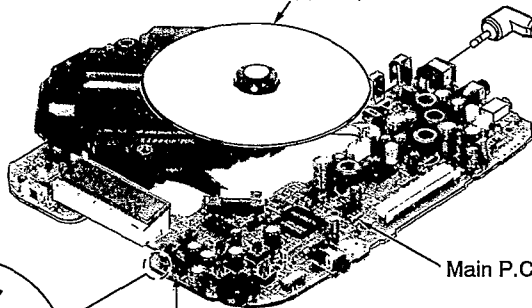
Step 14
Pull the battery terminals.



Step 15
Remove the mechanism chassis.

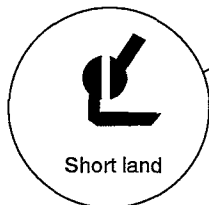
• Check the main P.C.B. (Component side) as shown below.

Step 17
Set the CD-DA(Conventional CD only with audio tracks)(8cm).



Step 18
For supply power, connect the AC adaptor to the DC IN jack.

Step 16
Short-circuit the land by soldering.



Laser ON/OFF switch (S201)

Main P.C.B. (Component side)

NOTE

After checking, unsolder the short land to open circuit.

• Prepare the following procedures when checking the unit with test disc or CD-DA (Conventional CD only with audio tracks) (16cm)

Step 19 Sustain the traverse deck with the floating rubber inserted screws and nuts as shown below.

NOTE
The tip of screw must not protrude above the floating rubber. (The protruded screw may be damaged the test disc.)

• Check the main P.C.B. (Component side) as shown below.

Step 20 Short-circuit the land by soldering.

Step 21 Set the test disc or CD-DA (16cm).

Step 22 For supply power, connect the AC adaptor to the DC IN jack.

NOTE
After checking, unsolder the short land to open circuit.

■ Removal of the traverse deck

Removal of the FFC.
1. Nip the metal and resin sections of the socket with a pair of pliers and then move the metal section in the direction of arrows ①.
2. Remove the FFC in the direction or arrow ②.

Note: The flat edge of the metal section must be nipped.

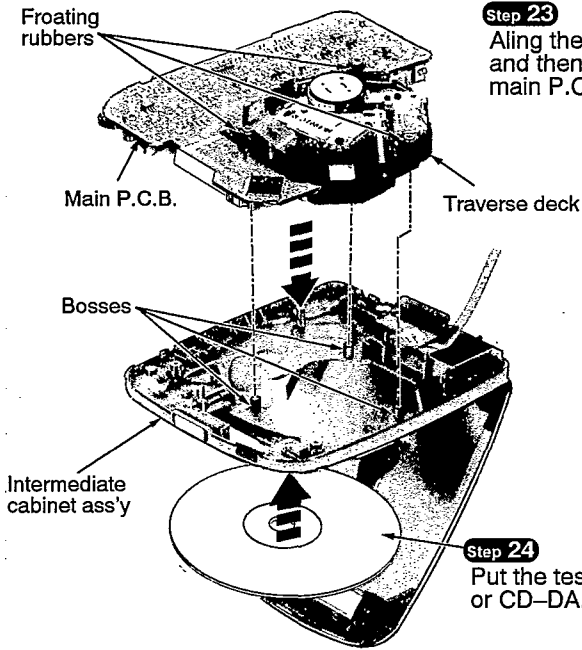
Caution: Insert a short pin into the traverse deck's FFC. (Refer to "handling precautions for traverse deck" on page 13)

• Remove the 2 connectors and socket.

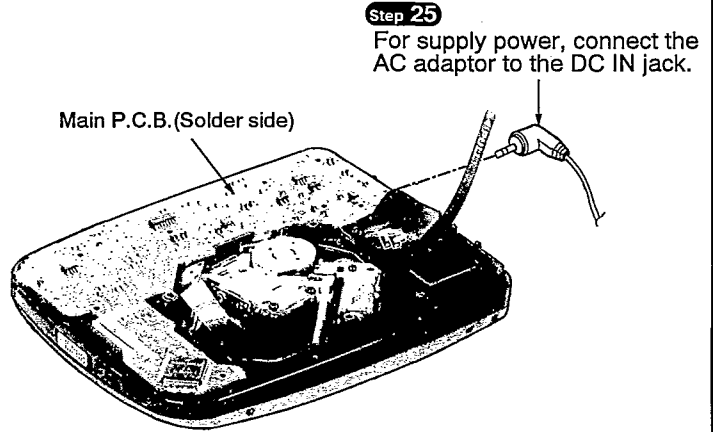
Checking for the main P.C.B.(Solder side) and mechanical adjustment

NOTE

After checking the main P.C.B. (Component side), remove the AC adaptor and test disc or CD-DA (Conventional CD only with audio tracks).



Step 23
Align the floating rubbers with the boss, and then install the traverse deck and main P.C.B. to the intermediate cabinet.



Step 25
For supply power, connect the AC adaptor to the DC IN jack.

Step 24
Put the test disc or CD-DA.

• When performing the mechanical adjustment, place the unit as shown above. Refer to the mechanical adjustment in "MEASUREMENTS AND ADJUSTMENT" on page 18 and 19.

MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 2.

ACHTUNG: • Die lasereinheit nicht zerlegen.

- Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

• Measuring instruments and special tools

• Test discs

1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

• Lock paint (RZZ0L01)

- Musical program disc (ordinary)
- Lead wire (for test points)

• Allen wrench (M2.0) (SZZP1101C)

• DC voltmeter

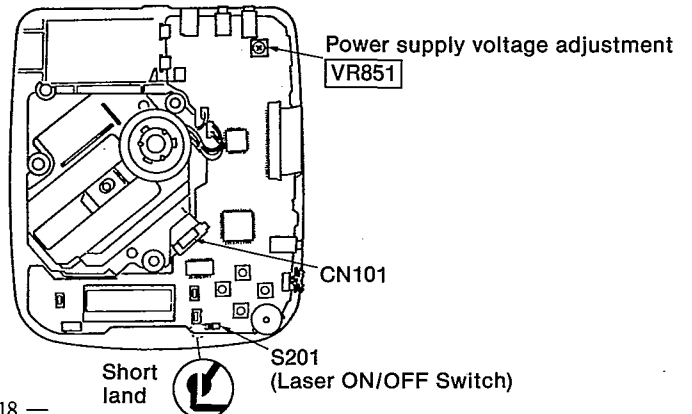
• Test short land

Short-circuit the lands of the laser ON/OFF switch (S201) by soldering them. It turns "ON" position. (Refer to below figure or printed circuit board and wiring connection diagram for short land location on pages 35~36.)

Note: Remove the solders from the lands after adjustment.

• Adjustment point

- Notes:**
1. Please refer to the printed circuit board and wiring connection diagram for test point locations.
 2. Take care to connect CN101.



• Adjustment procedure

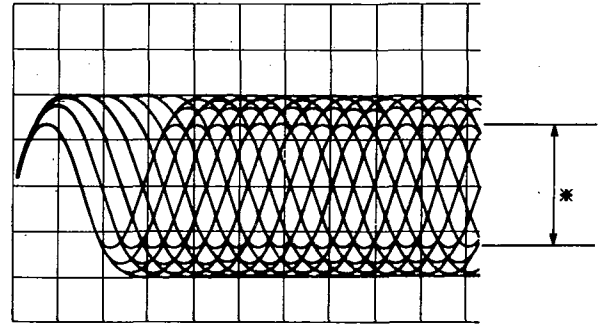
(1) MECHANICAL ADJUSTMENT

- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability if the traverse deck has not been replaced.

1. Connect the oscilloscope's CH. 1 probe across **TP101** (RF) (+) and **TP102** (RF GND) (-) on the P.C.B.

Oscilloscope setting: VOLT 100mV
 SWEEP 0.5 μ s.
 Input coupling AC

2. Switch the player power ON, and play track 9 on the test disc (SZZP1056C).
 (Playing any other track will prevent, the HEX screws from being accessed.)
3. Alternately adjust the HEX screws with the 2.0mm allen wrench (SZZP1101C) until the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
 (Refer to Fig. 1 and Fig. 2)
4. After completing the adjustment, lock the HEX screws with lock paint (RZZ0L01).



※ Most stretched eye pattern.

Fig. 1

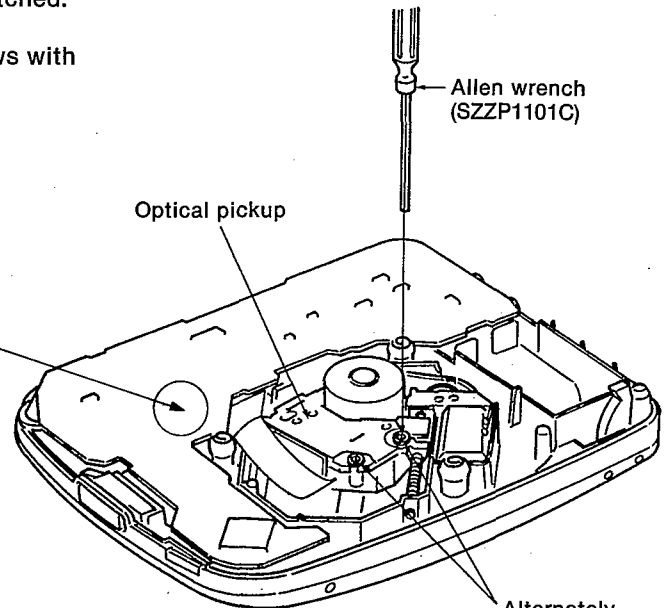
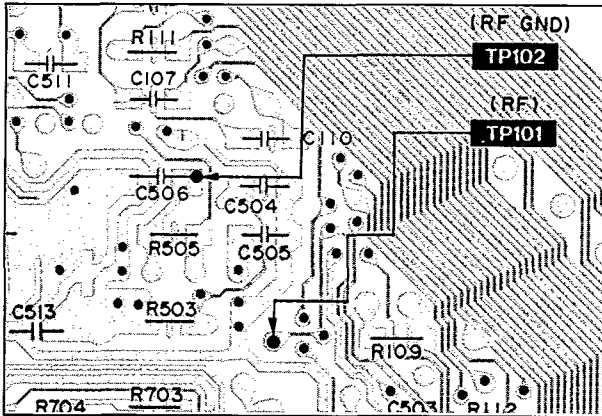


Fig. 2

Alternately adjustment HEX screws

(2) POWER SUPPLY VOLTAGE ADJUSTMENT

1. Connect the DC voltmeter to **TP103** (VCC) (+) and **TP104** (GND) on the P.C.B.
2. Connect the AC adaptor cord to the DC (IN) port.
 (Use a new dry cell battery or a rechargeable battery that is full charged.)
3. Connect the connection cable to the video out jack.
4. Insert the CD-DA (Conventional CD only with audio tracks), and switch the player power ON.
5. Switch the player power OFF.
6. Adjust VR851 on the P.C.B. at 4.76~4.80V.

(3) CHECK OF PLAY OPERATION

* Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and backward directions).

* Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and backward directions).

* Checking Playability

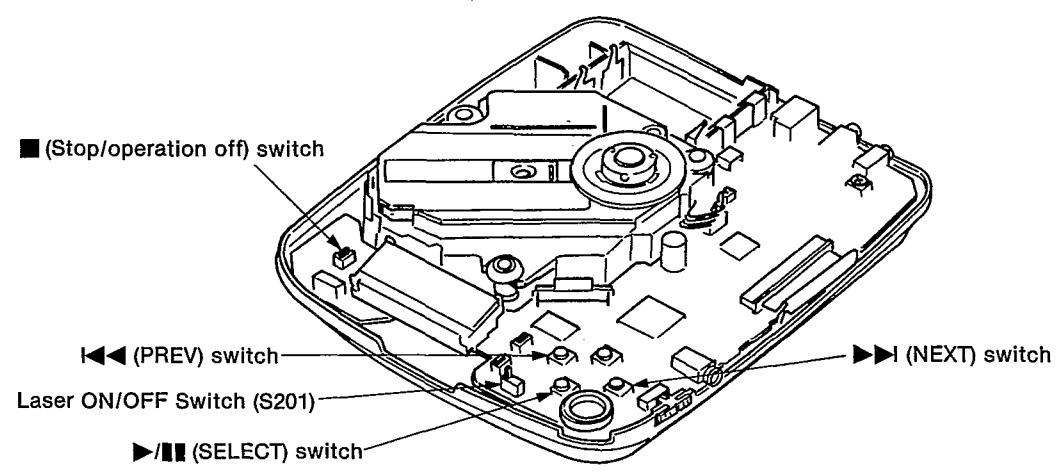
1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

AUTOMATIC ADJUSTMENT RESULTS DISPLAY FUNCTION (SELF-CHECK FUNCTION)

On this unit (SL-VP50), each automatic adjustment result are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatic adjustment result displays (self-check function).

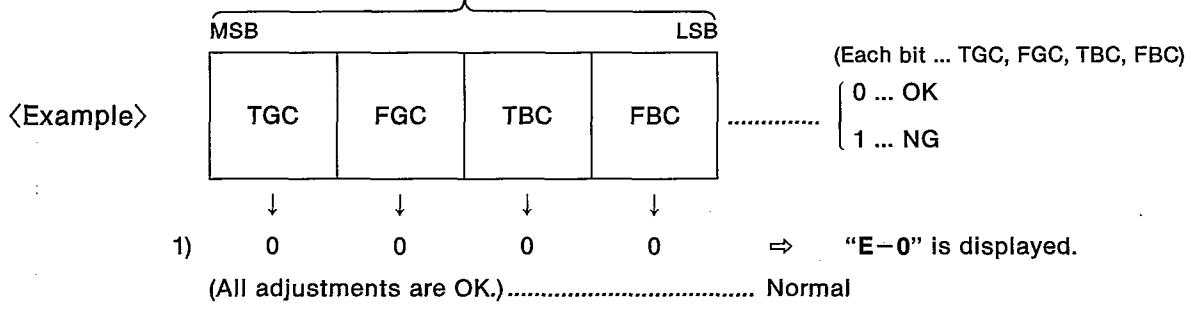
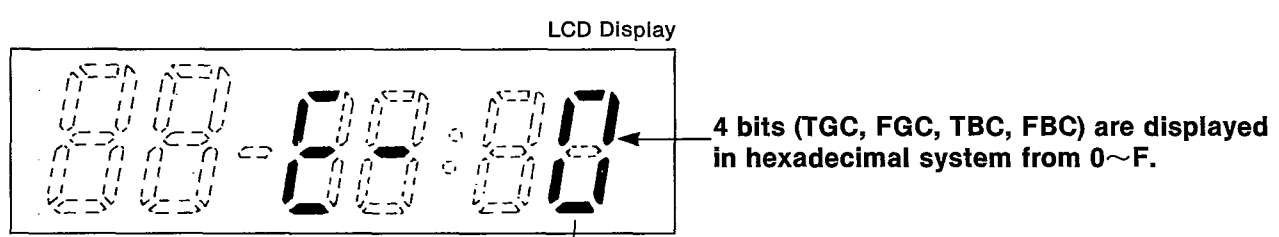
• How to display automatic adjustment results

- Disassemble the unit into the following state, in which the CD lid and intermediate cabinet are removed.
(Complete **Step 1** through **Step 4** in "Operation checks and main component replacement procedures" on page 12.)



- Load the test disc (SZZP1054C).
- Press the Laser ON/OFF Switch (S201).
- Press the **◀◀** (PREV) and **▶▶** (NEXT) switches simultaneously and hold them, and additionally press the **▶/■** (SELECT) switch.
- Press the **■** (STOP/OPERATION OFF) switch once.
- An automatic adjustment result is displayed on the LCD.

• Display of automatic adjustment results (self-check function)



- 2) 0 0 0 1 ⇒ "E-1" is displayed.
 (OK) (OK) (OK) (NG)
 (Focus balance adjustment is NG (incorrect.))
- 3) 0 1 0 0 ⇒ "E-4" is displayed.
 (OK) (NG) (OK) (OK)
 (Focus gain adjustment is NG.)
- 4) 1 1 1 1 ⇒ "E-F" is displayed.
 (All adjustments are NG.)

〈Example〉 **Follow the below steps when "E-1" is displayed.**

(Cause: Focus balance (FBC) is set beyond the limit.)

• Check if

- (1) R101 (4 resistors) is not defective by measuring the value,
- (2) the waveform or voltage of the focus servo circuit is correct, and
- (3) the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E-4" is displayed.

(Cause: Focus gain (FGC) is set beyond the limit.)

• Check if

- (1) the waveform or voltage of the focus servo circuit is correct,
- (2) the focus coil of the optical pickup is correct (around 8 ohms), and
- (3) the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E-F" is displayed.

(Cause: All adjustments (TGC, FGC, TBC, FBC) are set beyond the limit.)

• Check if

- (1) the optical pickup returns to the normal state by exchanging the traverse deck, and
- (2) the waveform or voltage of the servo IC's (IC101, 501) are correct.

Note:

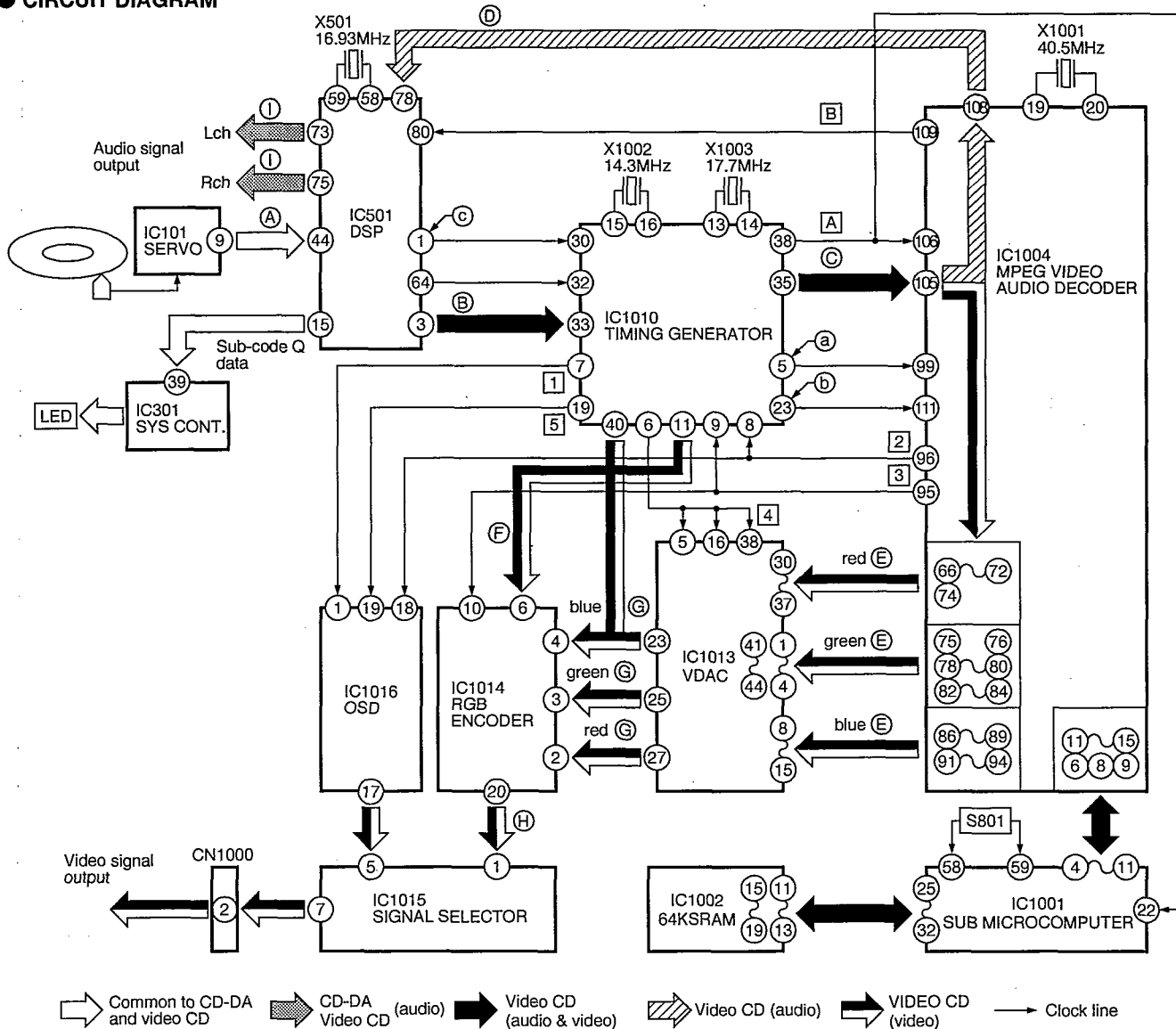
It is not always necessary to exchange the traverse deck when an error message is displayed. Be sure to check if the circuit is defective or not before exchanging the traverse deck.

Note:

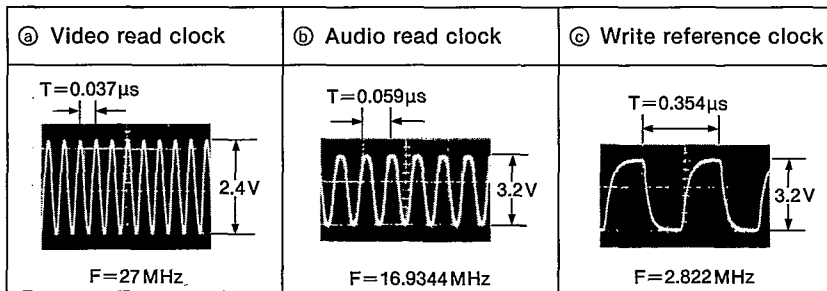
If any other disc than the test disc (SZZP1054C) is used, an error message may be displayed. This is not a malfunction.

TROUBLESHOOTING GUIDE

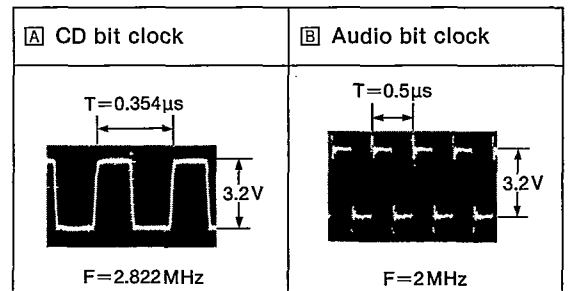
CIRCUIT DIAGRAM



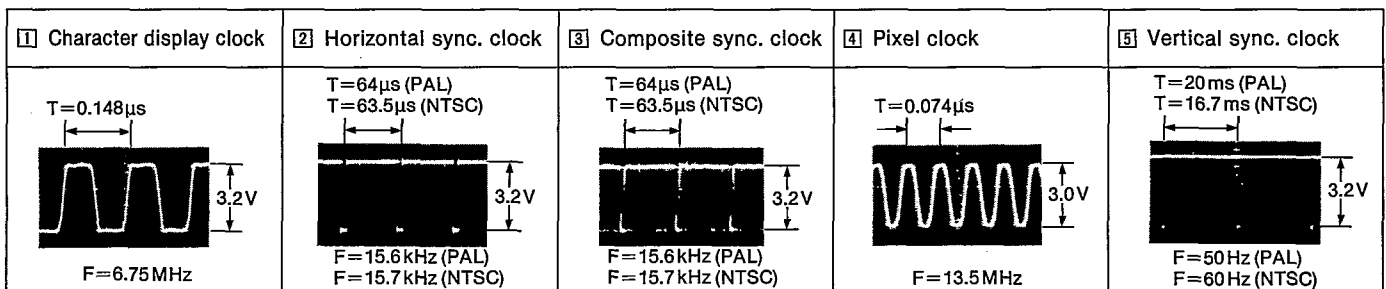
MASTER CLOCK SYSTEM WAVEFORM



AUDIO DATA CLOCK SYSTEM WAVEFORM



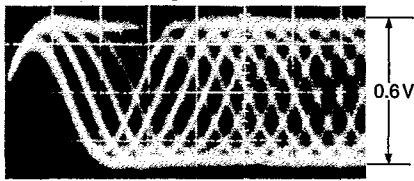
VIDEO DATA CLOCK SYSTEM WAVEFORM



DATA SIGNAL LINE WAVEFORMS

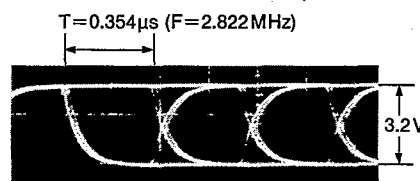
Note: Use the PVCD_K06 video CD test disc (menu playback feature is available on version 2.0). For color bar display, play back the 1st track when the menu playback feature is used, or the 3rd track when the feature is not used.

A IC501 ④ RF signal



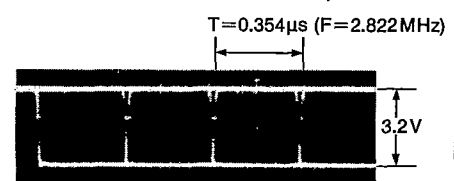
PLAY X: 0.5µs
Y: 0.02V x 10

B IC1010 ⑬ CD serial data input



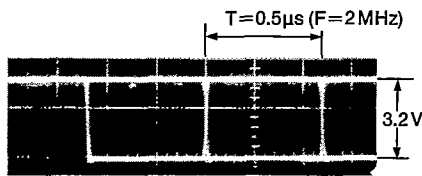
PLAY X: 0.2µs
Y: 0.2V x 10

C IC1010 ⑭ CD serial data output



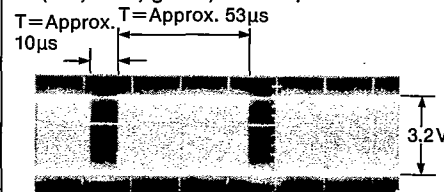
PLAY X: 0.2µs
Y: 0.2V x 10

D IC1004 ⑩ Audio serial data output



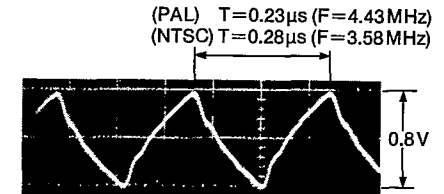
PLAY X: 0.2µs
Y: 0.2V x 10

E IC1013 ⑩~⑭, ①~④, ⑪~⑭, ⑧~⑯ (red, blue, green) data input



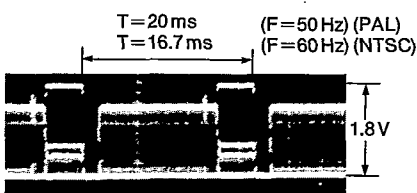
PLAY X: 20µs
Y: 0.2V x 10

F IC1014 ⑥ Subcarrier signal input



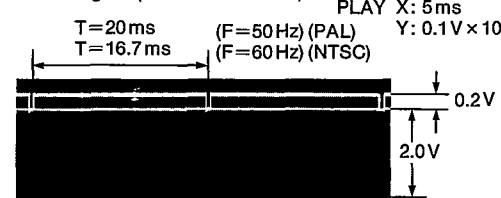
PLAY X: 0.1µs
Y: 0.05V x 10

G IC1013 ⑳ ㉔ ㉗ Analog color (blue, green, red) output



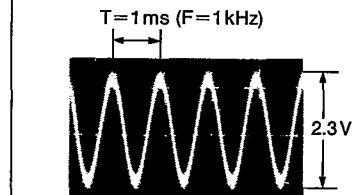
PLAY X: 5ms
Y: 0.1V x 10

H IC1013 ㉔ Analog color (blue) output



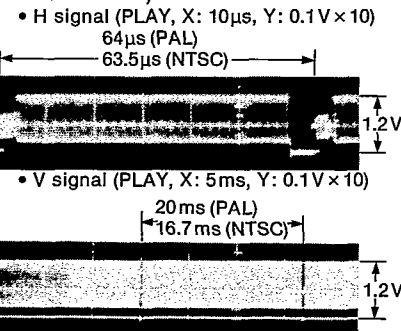
• The blue-back signal is output at pin ㉔. It is superimposed with a 2V (DC) signal, as shown above. The signals at ㉔ and ㉔ are always 2V.

I IC501 ㉓, ㉕ Audio signal output



• Test disc played at 1kHz, 0dB (1st track. SZZP1056C)
PLAY X: 1ms
Y: 0.1V x 10

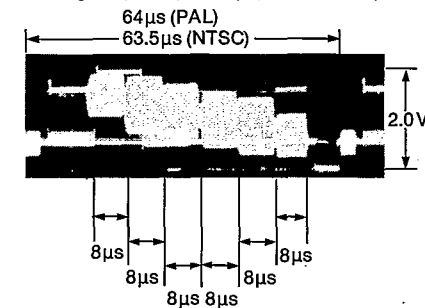
J IC1014 ㉒ Video signal output (Blue-Back screen)



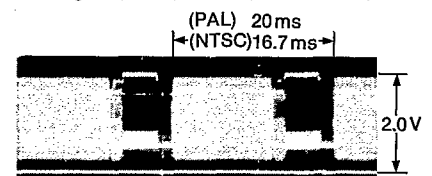
• H signal (PLAY, X: 10µs, Y: 0.1V x 10)
64µs (PAL)
63.5µs (NTSC)

(color bar screen)

• H signal (PLAY, X: 10µs, Y: 0.1V x 10)



• V signal (PLAY, X: 5ms, Y: 0.1V x 10)

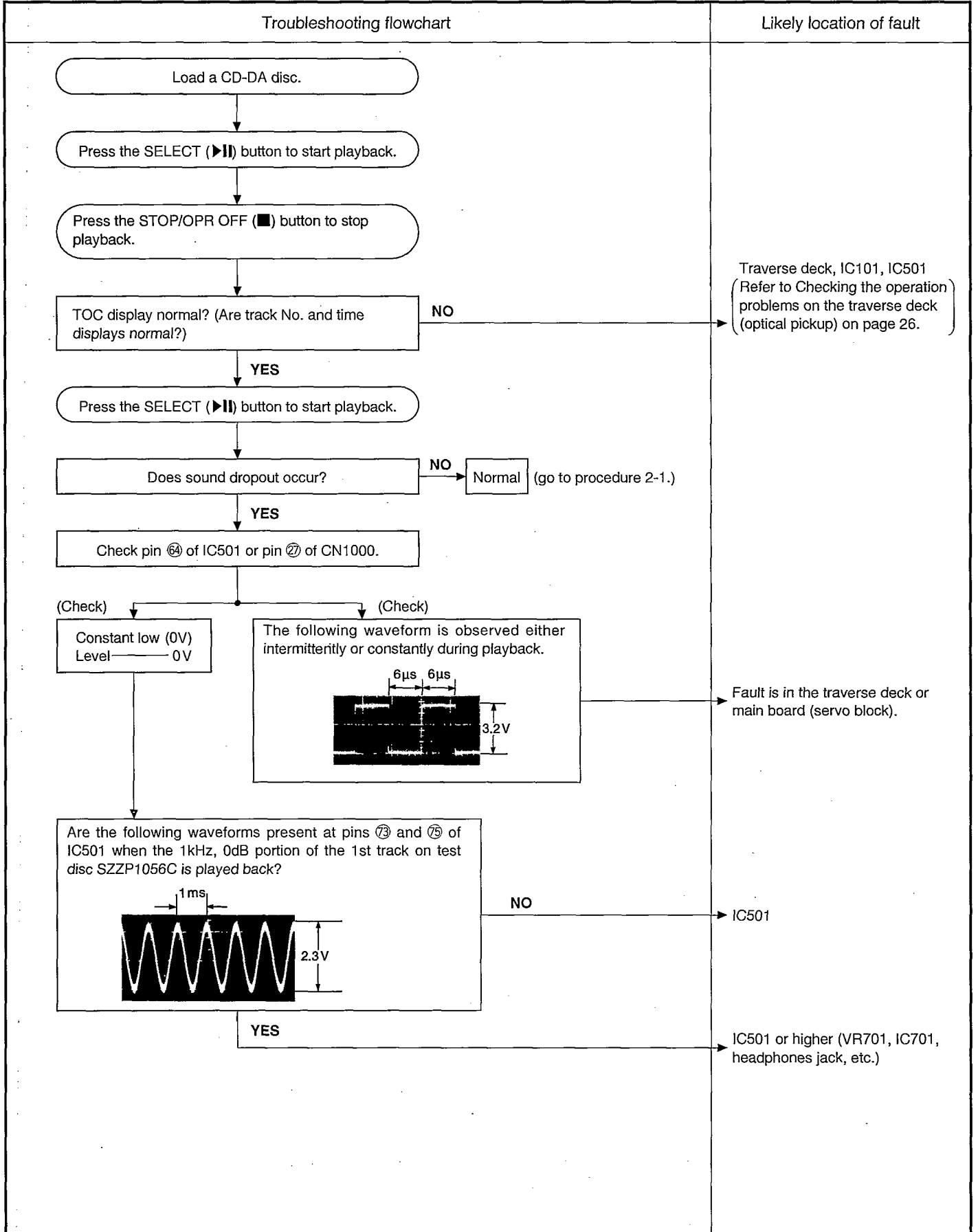


DIAGNOSTIC PROCEDURES BY SYMPTOM

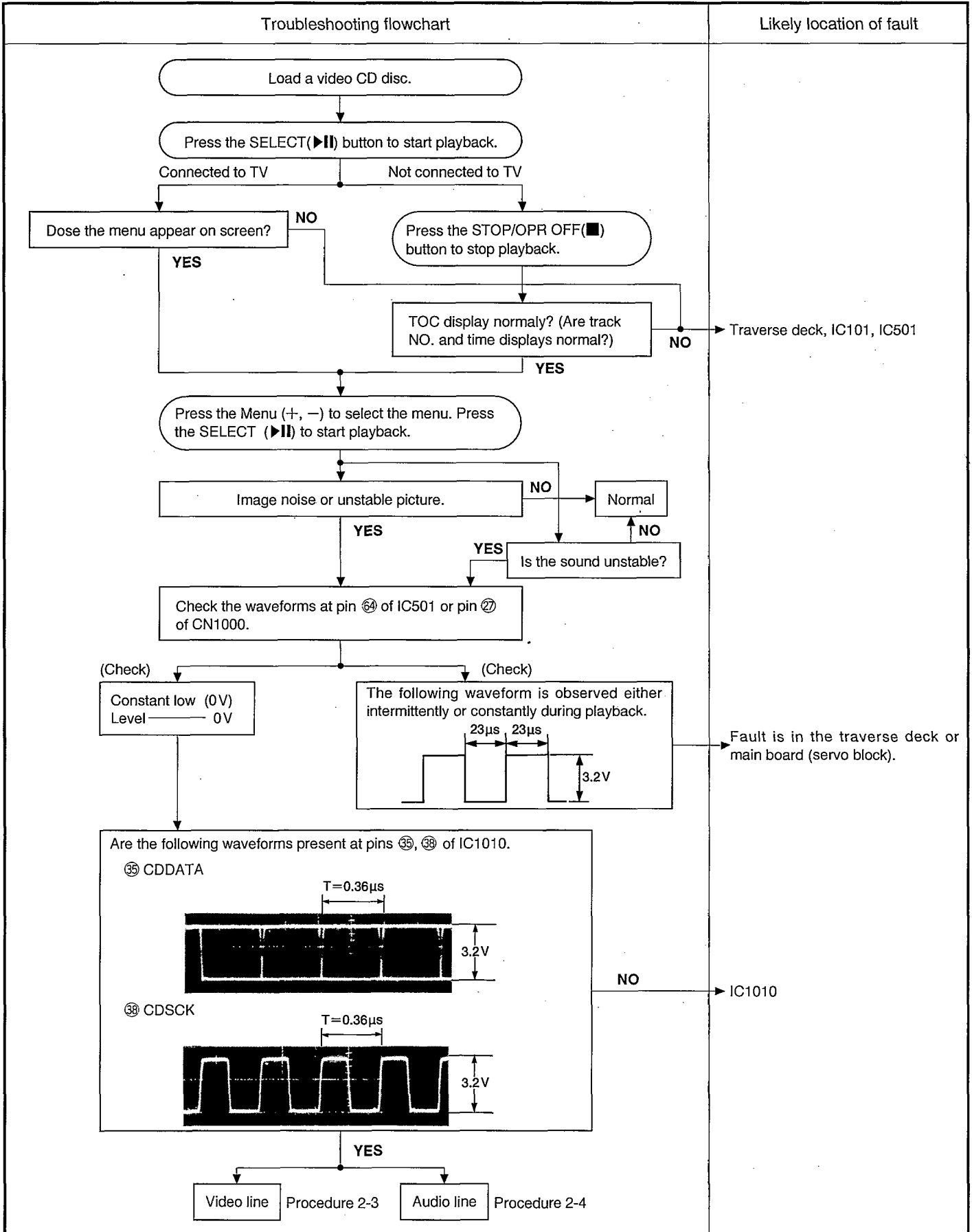
| Symptom | | |
|-----------------------------------|---|--|
| CD-DA | Video-CD | Likely location of fault |
| TOC NG | TOC NG (both audio and video are NG.) Blue back display | → For TOC NG, fault in the CD-DA circuit, IC101, IC501, IC11, or traverse system |
| Turntable fails to rotate. | Fails to rotate. | → Traverse system, focus servo system (IC101, IC11), supply line, clock line, system control (IC301) |
| Turntable rotates. | Rotates. | → Traverse system, tracking servo system/CLV servo system/traverse servo system (IC101, IC501, IC11) |
| Audio normal | Audio normal, Video NG. | IC1013, IC1014, IC1015 |
| Audio normal | No sound, Video NG. | IC1010, IC1004, IC1013, IC1014, IC1015 |
| TOC OK, counter OK, but no sound. | TOC OK, counter OK, but no sound and video NG. | CD disc other than DV 'Karaoke' soft, video CD and CD-DA |

| | | |
|-----------------------------|-------|----------|
| Troubleshooting Procedure 1 | CD-DA | No sound |
|-----------------------------|-------|----------|

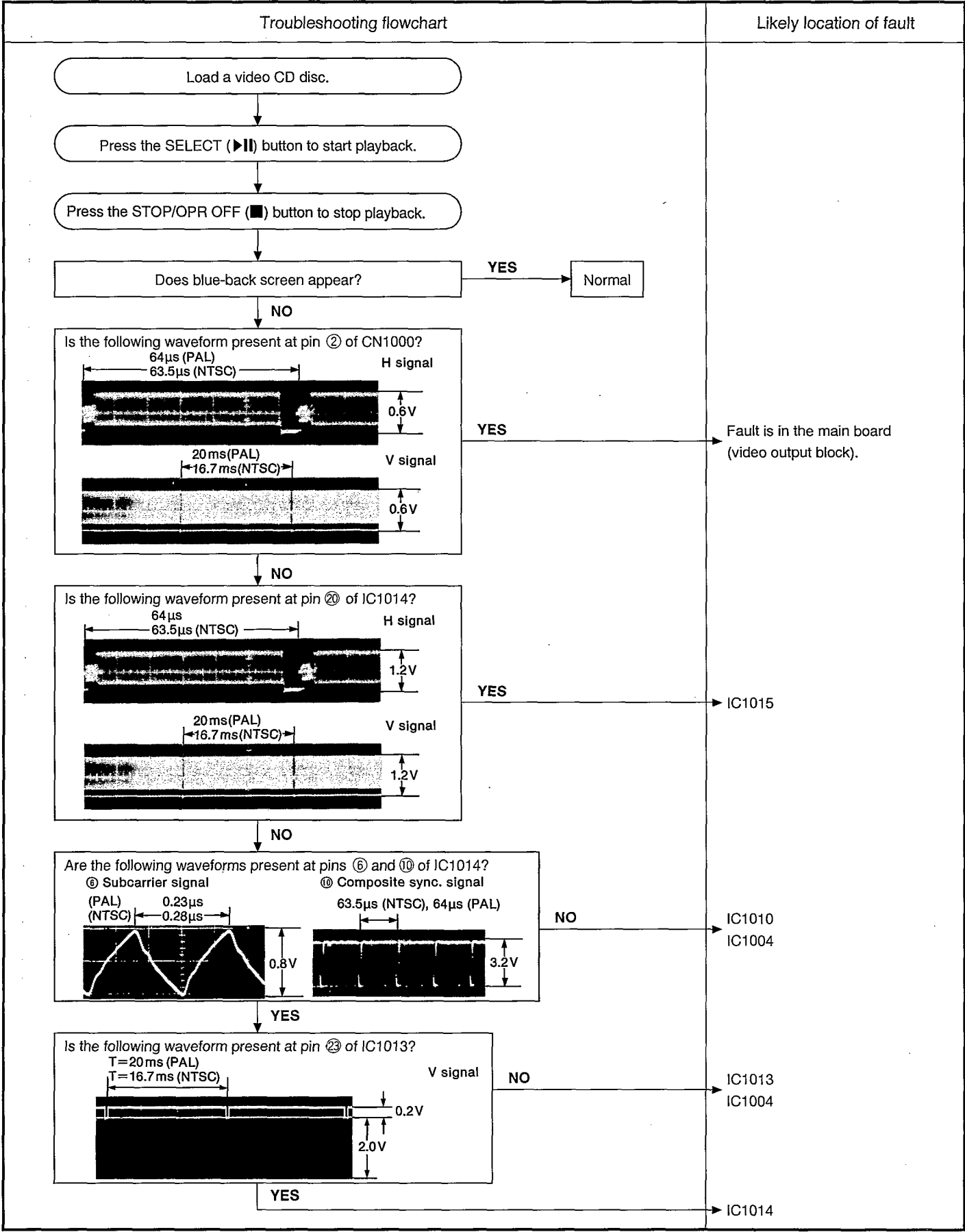
CD-DA: Compact disc digital audio (conventional CD only with audio tracks)



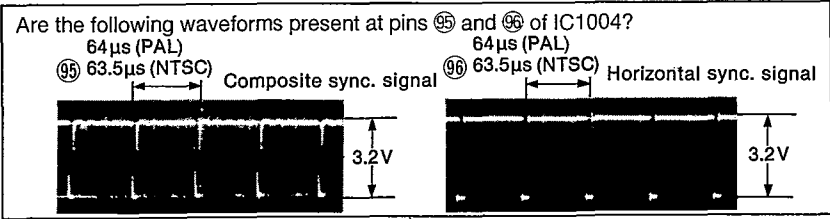
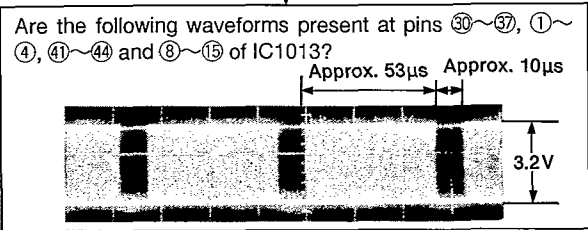
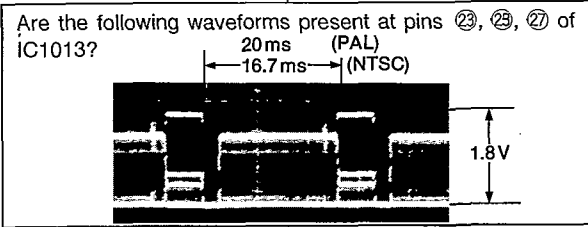
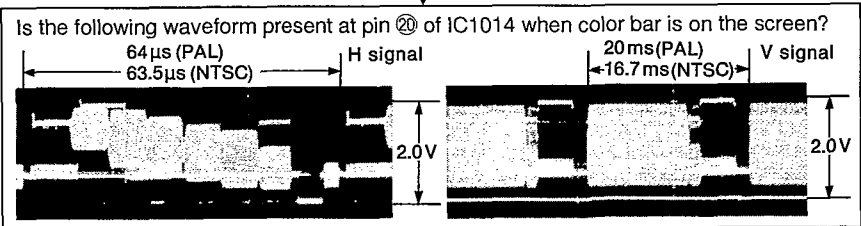
| | | |
|-------------------------------|----------|------------------------|
| Troubleshooting Procedure 2-1 | Video CD | No picture or No sound |
|-------------------------------|----------|------------------------|



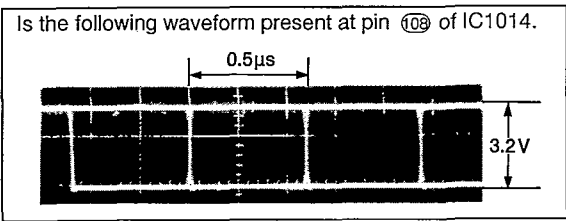
| | | |
|-------------------------------|--------------------|--------------|
| Troubleshooting Procedure 2-2 | Video CD blue back | No blue back |
|-------------------------------|--------------------|--------------|



| | | |
|-------------------------------|---------------------------|------------|
| Troubleshooting Procedure 2-3 | Video portion of video CD | No picture |
|-------------------------------|---------------------------|------------|

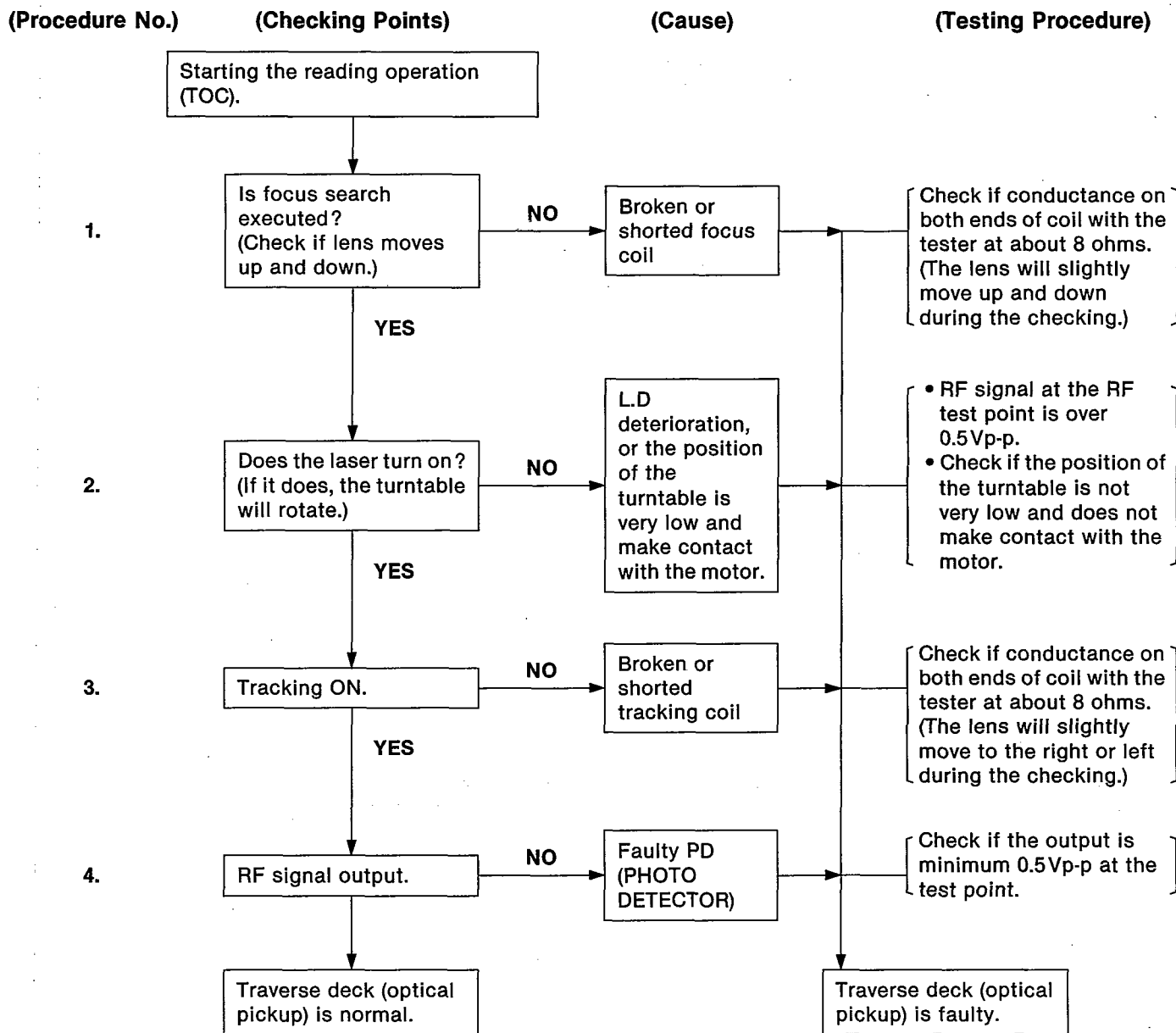
| Troubleshooting flowchart | | Likely location of fault |
|--|--|--------------------------|
| <p>• Video signal line</p> <p>Are the following waveforms present at pins ⑤ and ⑥ of IC1004? 64 μs (PAL) 64 μs (PAL) ⑤ 63.5 μs (NTSC) Composite sync. signal ⑥ 63.5 μs (NTSC) Horizontal sync. signal</p>  <p>NO → IC1004</p> <p>YES</p> <p>Are the following waveforms present at pins ⑩~⑬, ①~④, ①①~①④ and ⑧~⑮ of IC1013? Approx. 53 μs Approx. 10 μs</p>  <p>NO → IC1004</p> <p>YES</p> <p>Are the following waveforms present at pins ②③, ②⑤, ②⑦ of IC1013? 20 ms (PAL) 16.7 ms (NTSC)</p>  <p>NO → IC1013</p> <p>YES</p> <p>Is the following waveform present at pin ⑩ of IC1014 when color bar is on the screen? 64 μs (PAL) H signal 20 ms (PAL) V signal 63.5 μs (NTSC) 16.7 ms (NTSC)</p>  <p>NO → IC1014</p> <p>YES → IC1015 or beyond</p> | | |

| | | |
|-------------------------------|---------------------------|----------|
| Troubleshooting Procedure 2-4 | Audio portion of video CD | No sound |
|-------------------------------|---------------------------|----------|

| Troubleshooting flowchart | | Likely location of fault |
|---|--|--------------------------|
| <p>• Audio signal line</p> <p>Is the following waveform present at pin ⑩ of IC1014.</p>  <p>NO → IC1004</p> <p>YES → IC501</p> | | |

CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP)

Make sure to follow the procedures below to check the operation problems of the traverse deck (optical pickup) before replacing it. Replace the traverse deck only after the problem is identified. Use the CD-DA (Conventional CD only with audio tracks).



※ Replace traverse deck.

- Check electrical circuit.
- Check for flaws on disc or if it is warped or not centered.

• Check the operations described below on the traverse deck after replacing it.

* Checking Skip Search

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

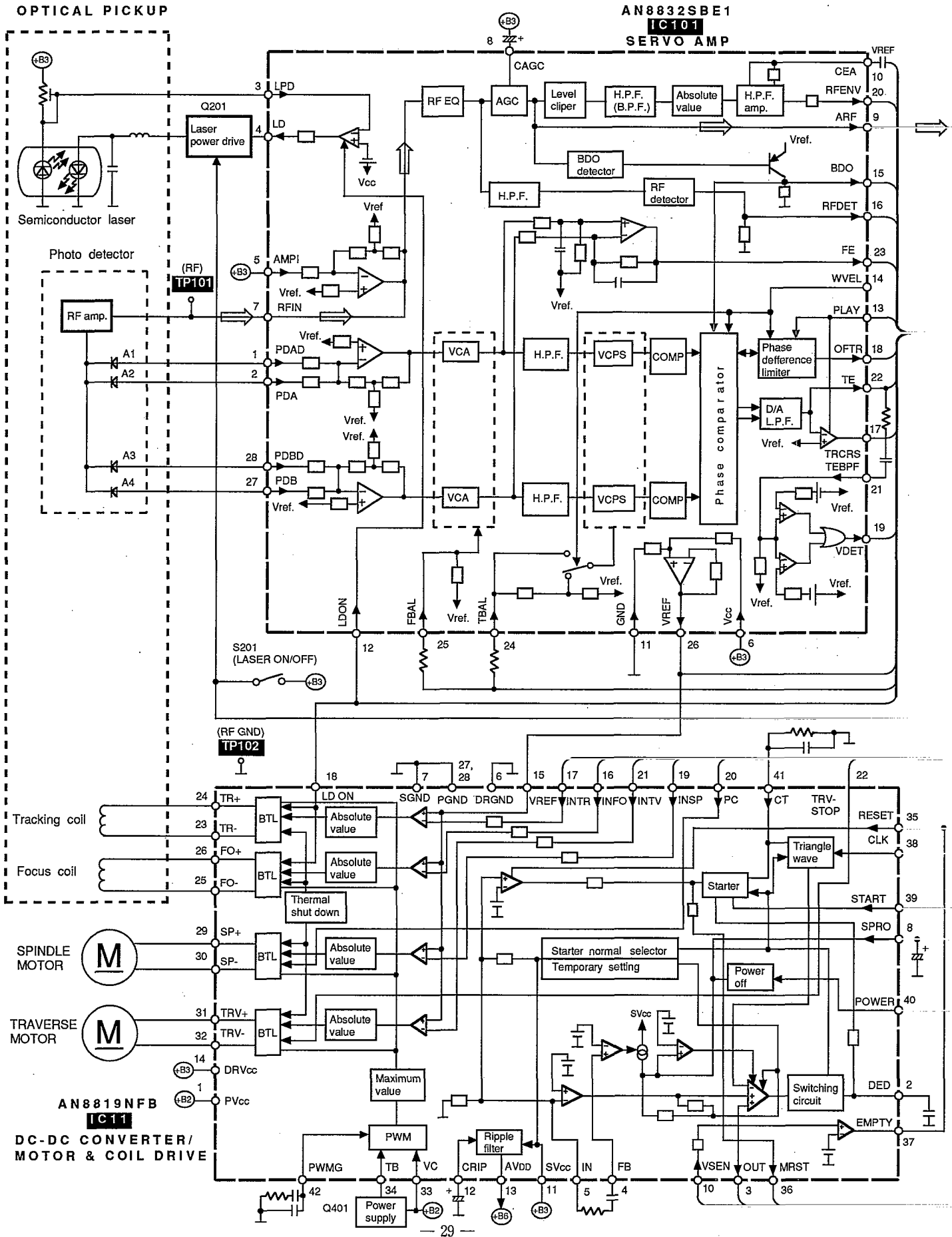
* Checking Manual Search

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* Checking Playability

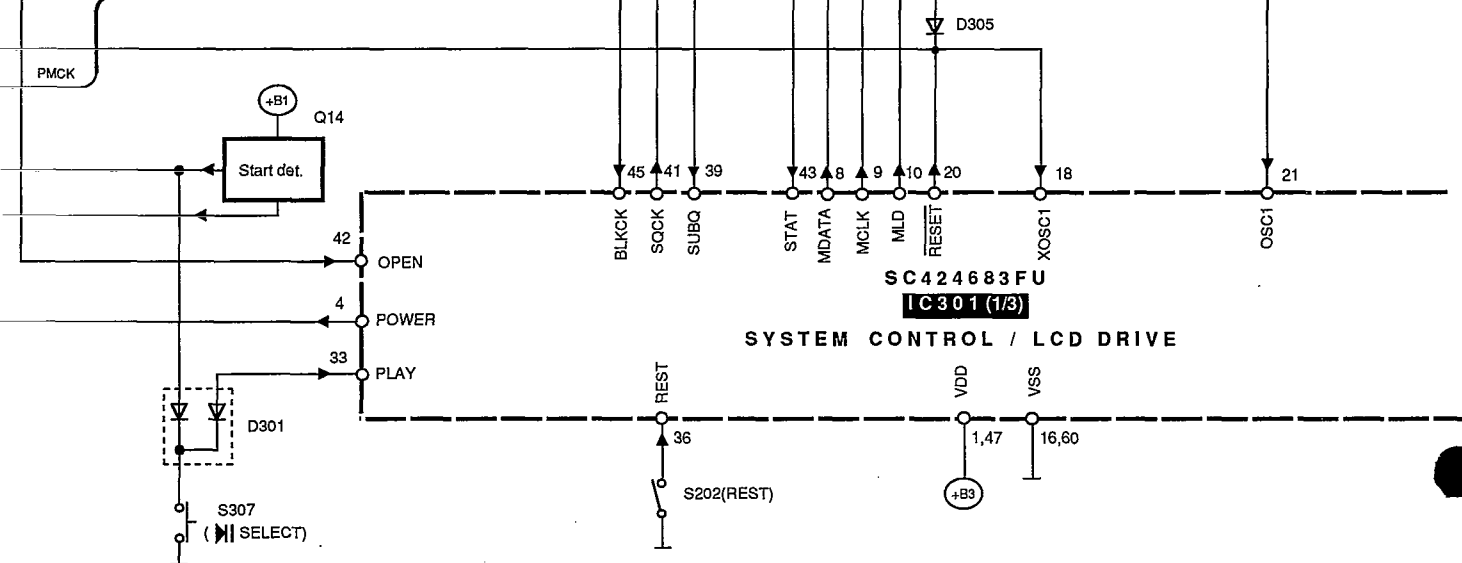
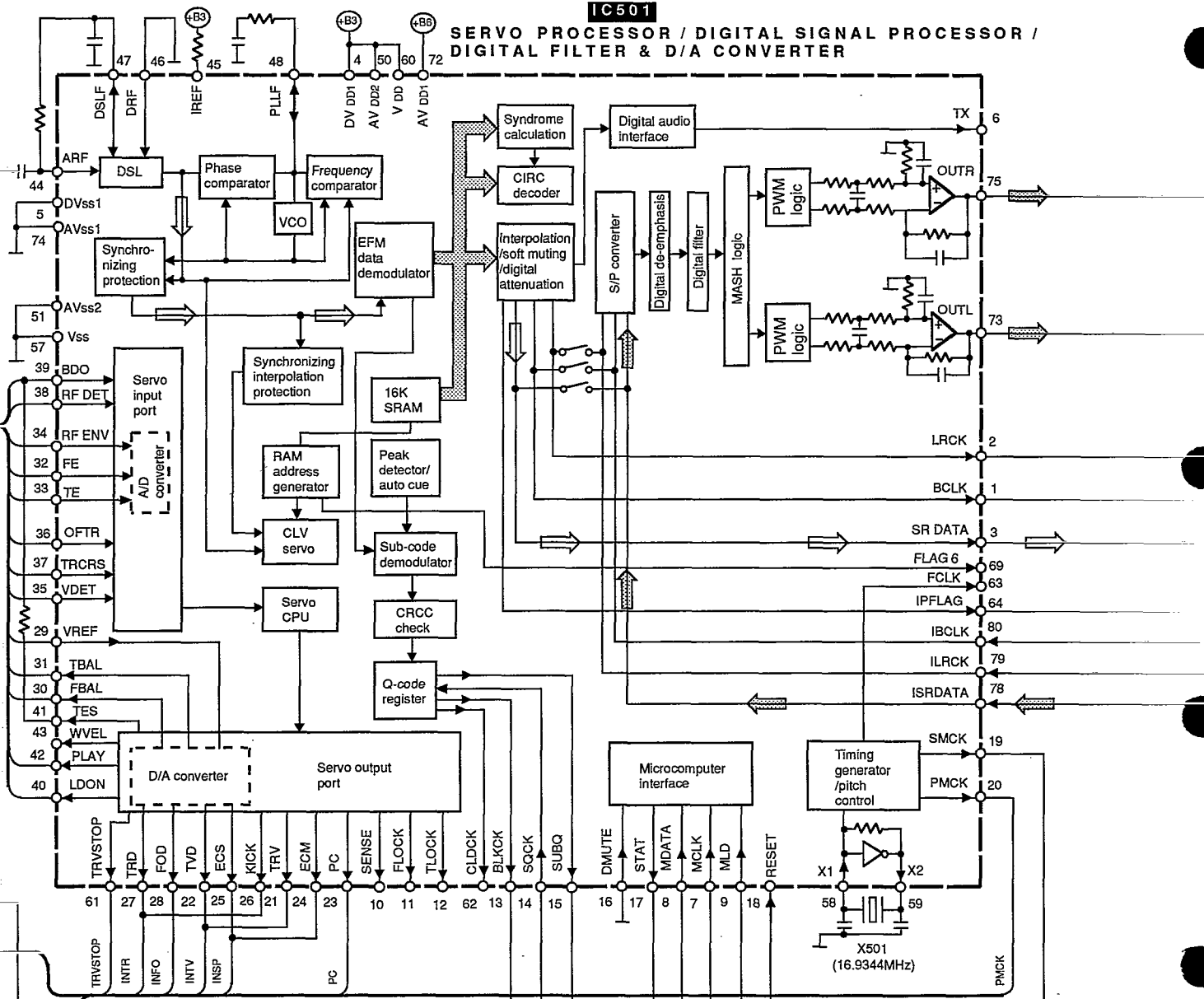
1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

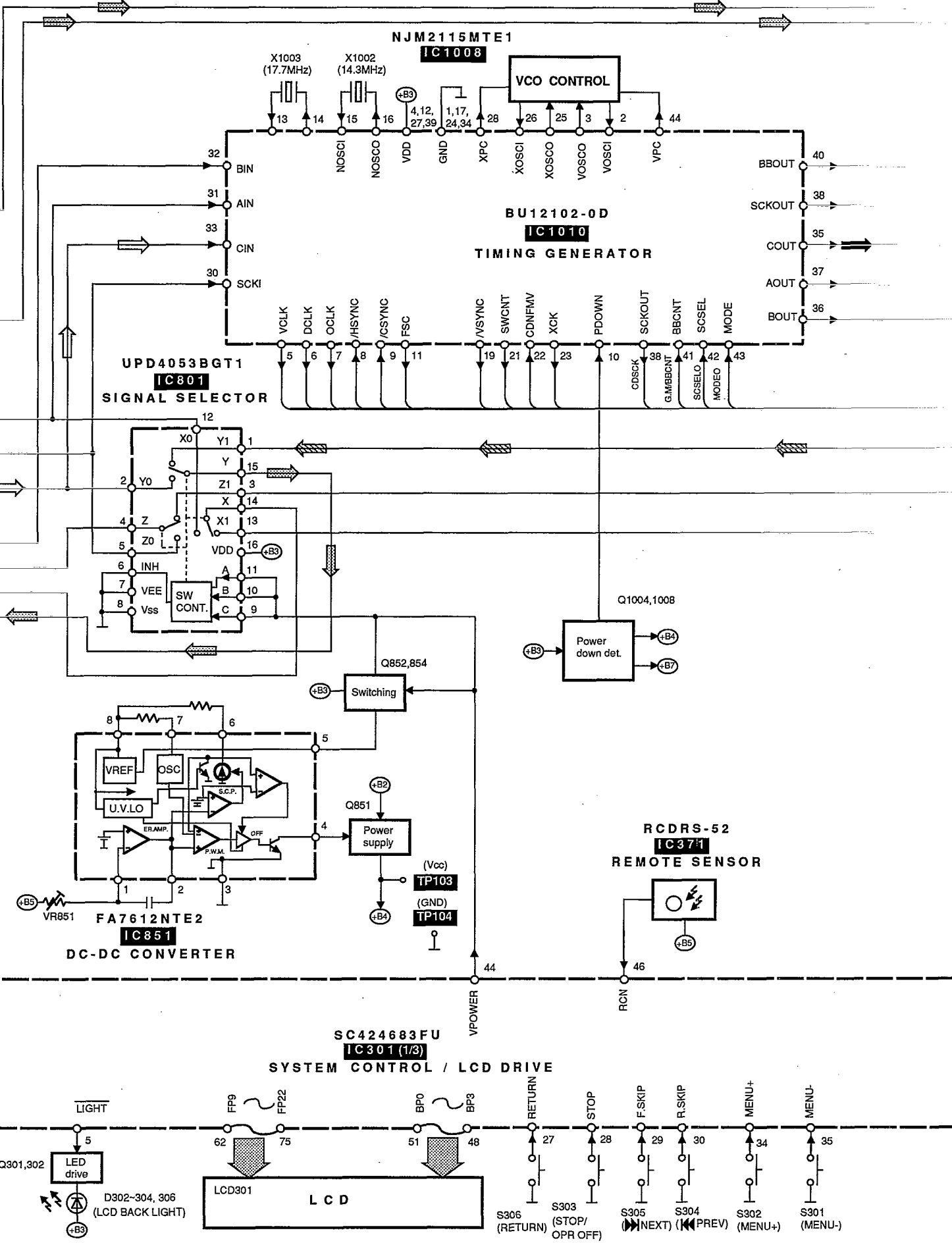
BLOCK DIAGRAM

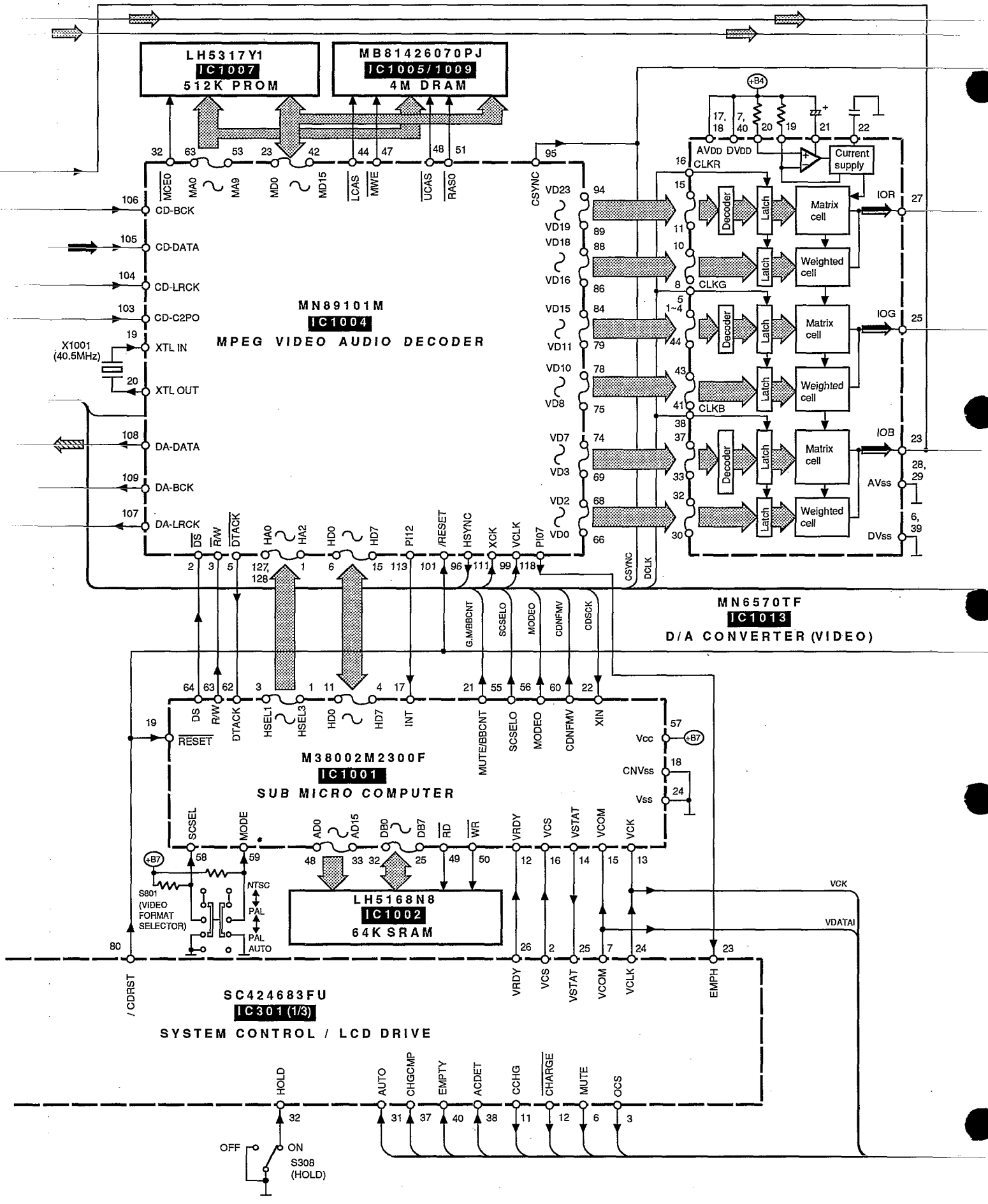


MN662740RE
IC501

SERVO PROCESSOR / DIGITAL SIGNAL PROCESSOR /
DIGITAL FILTER & D/A CONVERTER



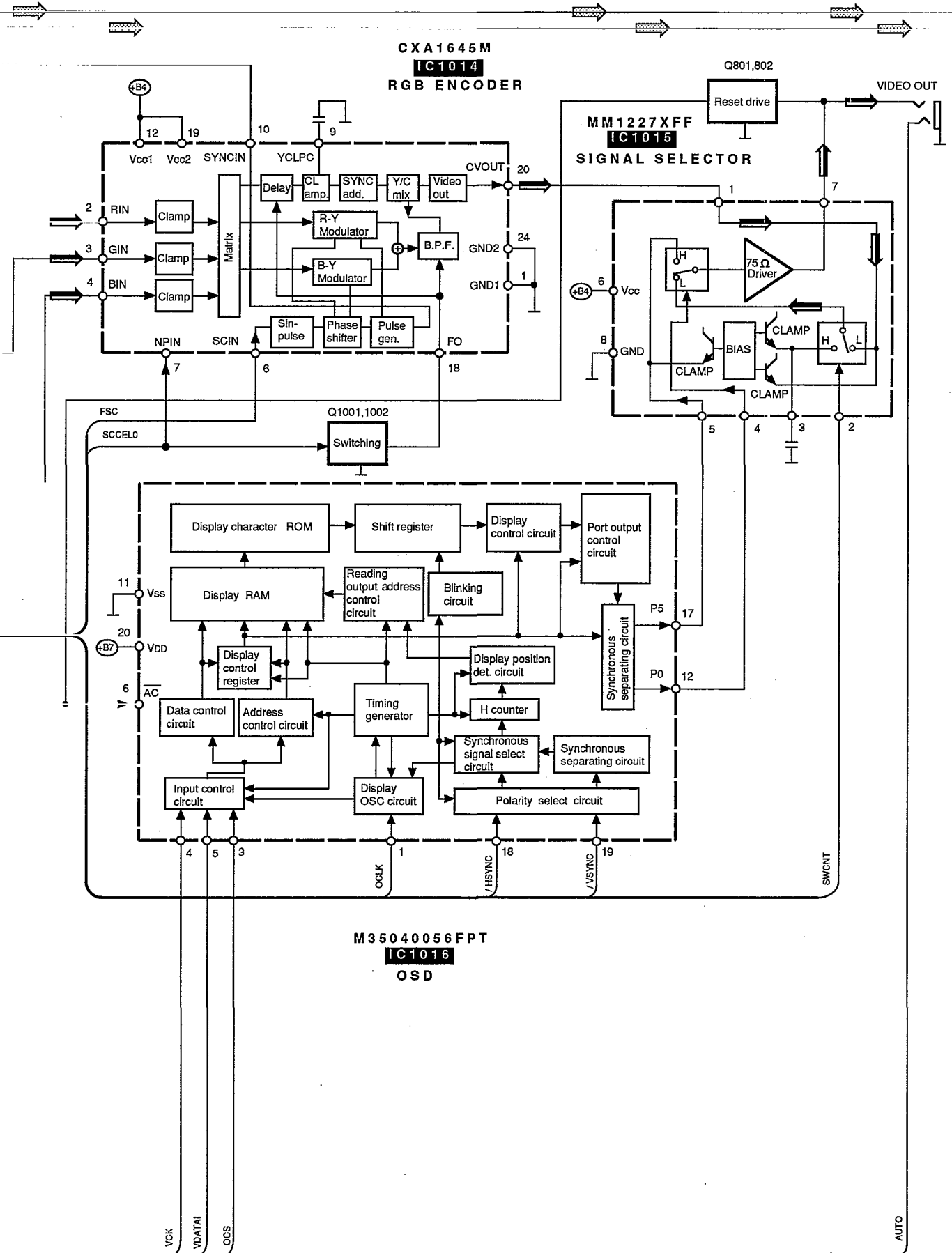


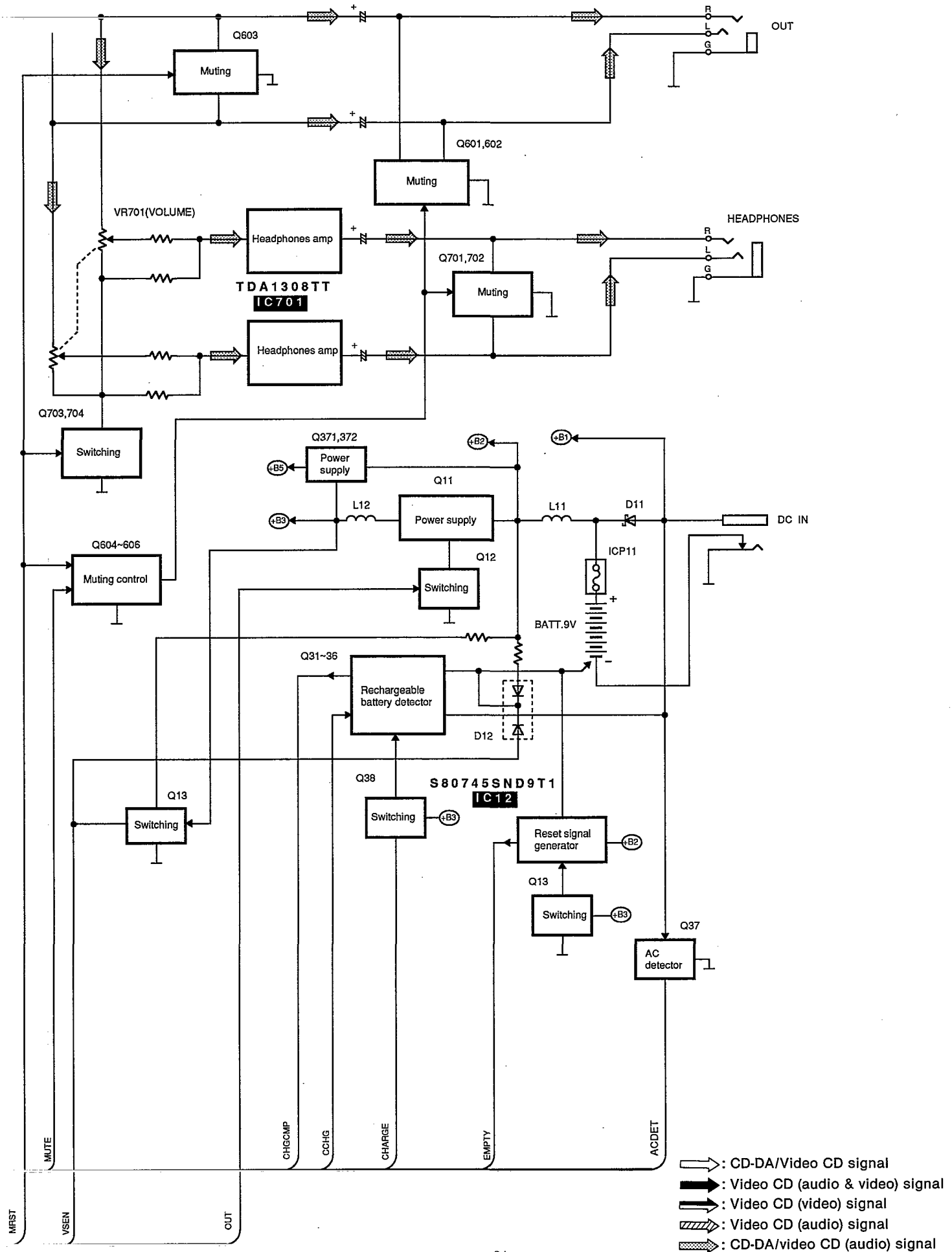


CXA1645M
IC1014
RGB ENCODER

MM1227XFF
IC1015
SIGNAL SELECTOR

M35040056FPT
IC1016
OSD

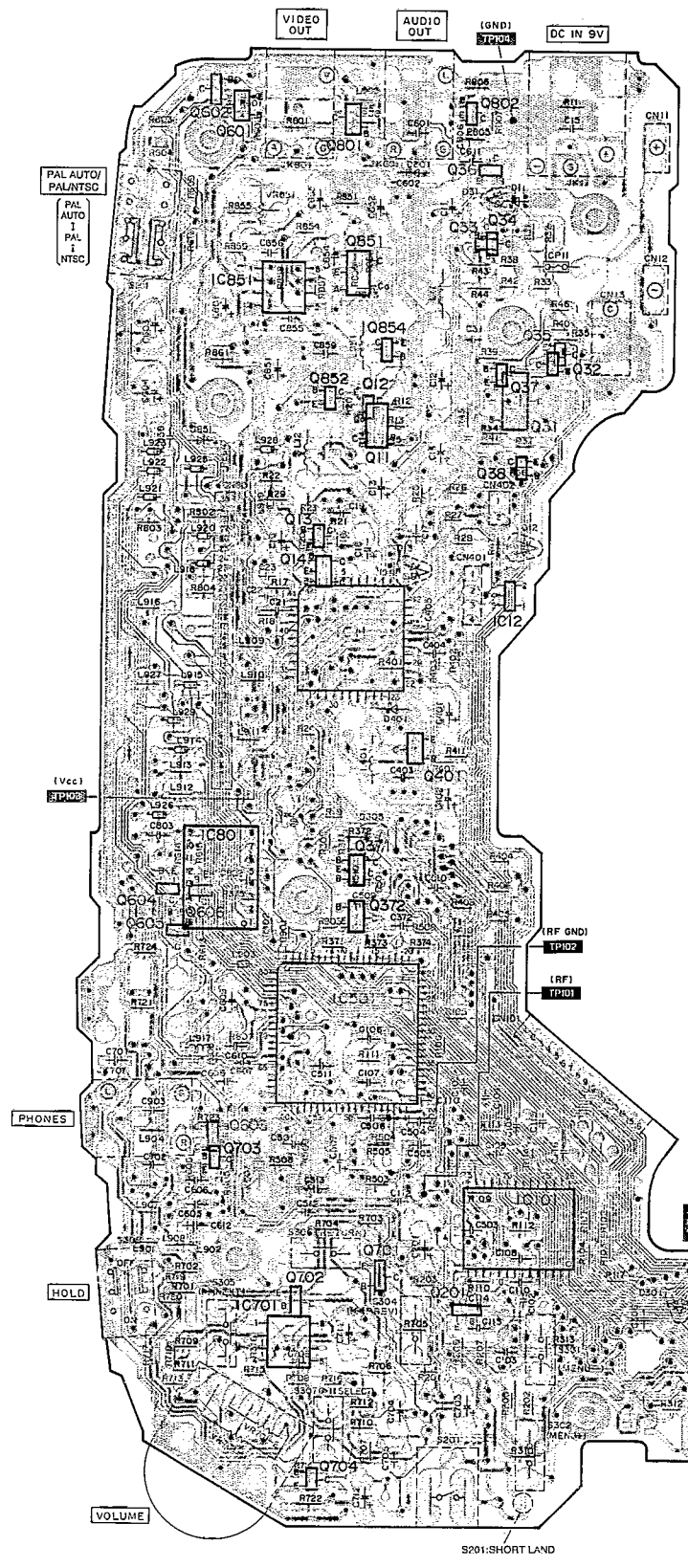




- ➡ : CD-DA/Video CD signal
- ➡ : Video CD (audio & video) signal
- ➡ : Video CD (video) signal
- ➡ : Video CD (audio) signal
- ➡ : CD-DA/video CD (audio) signal

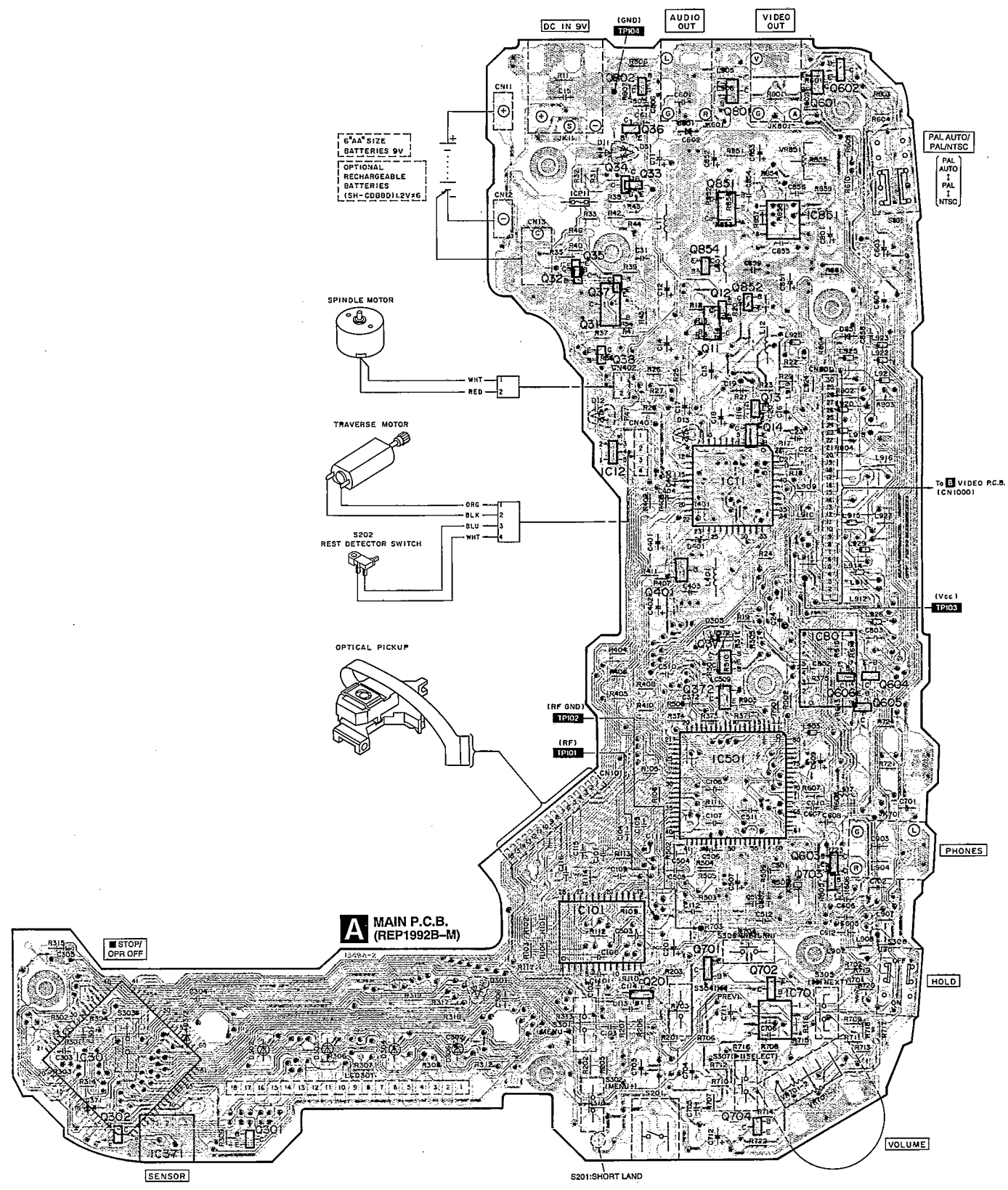
PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

A
B
C
D
E
F
G



A MAIN P.C.B. (REP1992B-M)

- Notes:**
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black. The opposite side is printed in blue.
 - The “●” and “●” marks denote the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
 - This printed circuit board diagram may be modified at any time with the development of new technology.



6"AA" SIZE BATTERIES 9V
 OPTIONAL RECHARGEABLE BATTERIES (SM-C0000)12Vx6

SPINDLE MOTOR
 WHT 1
 RED 2

TRAVERSE MOTOR
 ORG 1
 BLK 2
 BLU 3
 WHT 4

5002 REST DETECTOR SWITCH
 WHT 1

OPTICAL PICKUP
 (RF) TPI01
 (RF) TPI02

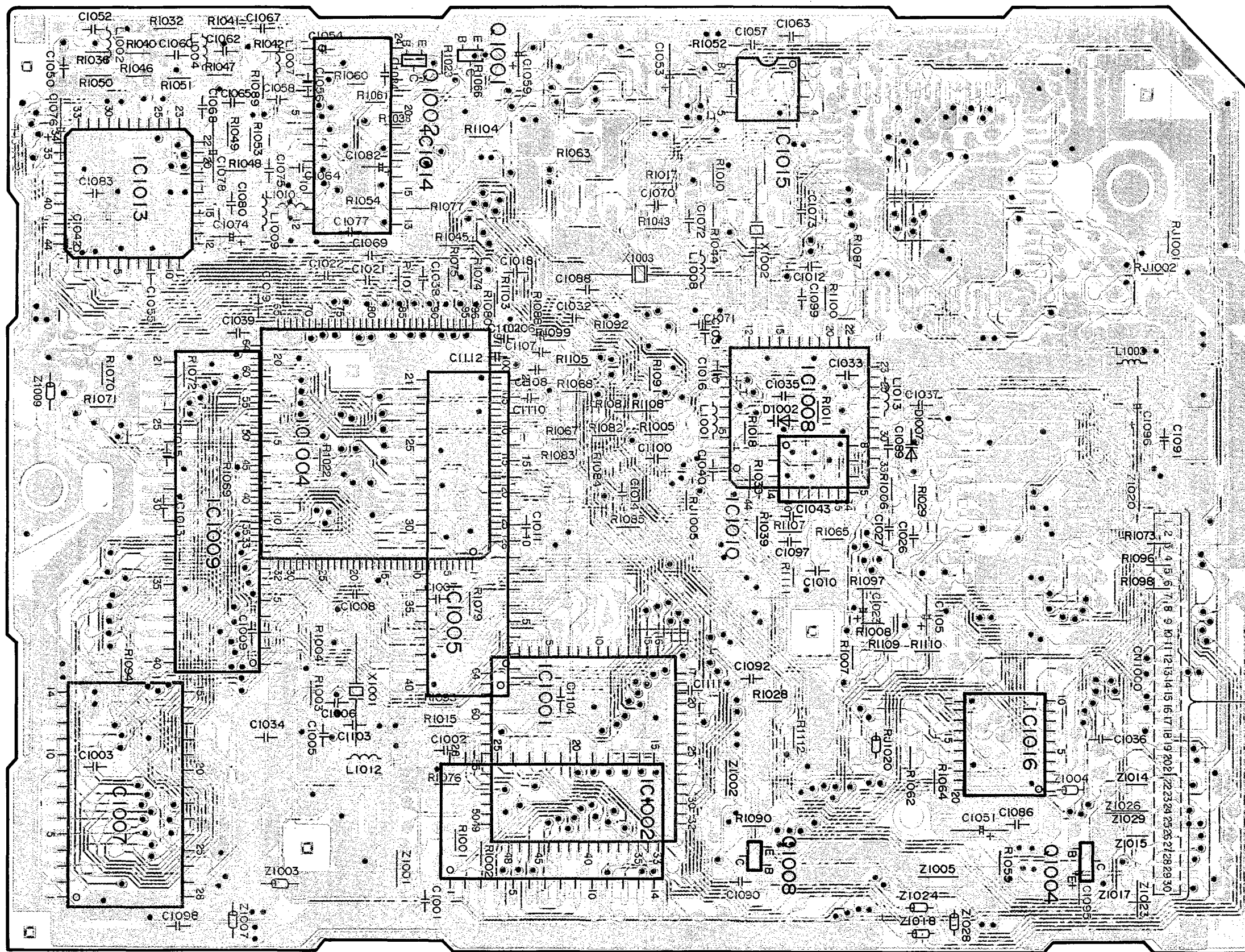
A MAIN P.C.B. (REP1992B-M)

B VIDEO P.C.B. (REP2118A-T)

Notes:

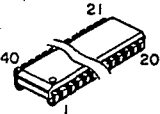
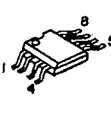
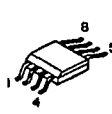
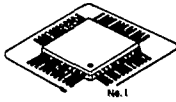
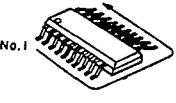


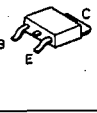



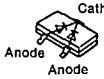
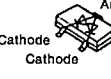
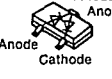
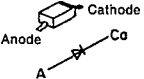
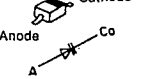

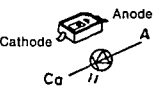
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in blue. The opposite side is printed in black.

- The "•" mark denote the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.



To A MAIN P.C.B. (CN801)

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES







| | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|-------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--|--|------------|--------|--|--|----------|---------|
| MB81426070PJ  | MM1227XFF  | FA7612NTE2 TDA1308TT  | | | | | | | | | | | | | | | | | | | | |
|  <table border="1"> <tbody> <tr> <td>BU12102-0D</td> <td>32 Pin</td> <td>MN6570TF</td> <td>44 Pin</td> </tr> <tr> <td>AN8819NFB</td> <td>44 Pin</td> <td>M38002M2300F</td> <td>64 Pin</td> </tr> <tr> <td></td> <td></td> <td>SC424683FU</td> <td>80 Pin</td> </tr> <tr> <td></td> <td></td> <td>MN662740RE</td> <td>80 Pin</td> </tr> <tr> <td></td> <td></td> <td>MN89101M</td> <td>128 Pin</td> </tr> </tbody> </table> | | | BU12102-0D | 32 Pin | MN6570TF | 44 Pin | AN8819NFB | 44 Pin | M38002M2300F | 64 Pin | | | SC424683FU | 80 Pin | | | MN662740RE | 80 Pin | | | MN89101M | 128 Pin |
| BU12102-0D | 32 Pin | MN6570TF | 44 Pin | | | | | | | | | | | | | | | | | | | |
| AN8819NFB | 44 Pin | M38002M2300F | 64 Pin | | | | | | | | | | | | | | | | | | | |
| | | SC424683FU | 80 Pin | | | | | | | | | | | | | | | | | | | |
| | | MN662740RE | 80 Pin | | | | | | | | | | | | | | | | | | | |
| | | MN89101M | 128 Pin | | | | | | | | | | | | | | | | | | | |
|  <table border="1"> <tbody> <tr> <td>NJM2115MTE1</td> <td>8 Pin</td> <td>M35040056FPT</td> <td>20 Pin</td> </tr> <tr> <td>UPD4053BGT1</td> <td>16 Pin</td> <td>CXA1645M</td> <td>24 Pin</td> </tr> <tr> <td></td> <td></td> <td>AN8832SBE1</td> <td>28 Pin</td> </tr> <tr> <td></td> <td></td> <td>LH5168NB</td> <td>28 Pin</td> </tr> <tr> <td></td> <td></td> <td>LH5317Y1</td> <td>28 Pin</td> </tr> </tbody> </table> | | | NJM2115MTE1 | 8 Pin | M35040056FPT | 20 Pin | UPD4053BGT1 | 16 Pin | CXA1645M | 24 Pin | | | AN8832SBE1 | 28 Pin | | | LH5168NB | 28 Pin | | | LH5317Y1 | 28 Pin |
| NJM2115MTE1 | 8 Pin | M35040056FPT | 20 Pin | | | | | | | | | | | | | | | | | | | |
| UPD4053BGT1 | 16 Pin | CXA1645M | 24 Pin | | | | | | | | | | | | | | | | | | | |
| | | AN8832SBE1 | 28 Pin | | | | | | | | | | | | | | | | | | | |
| | | LH5168NB | 28 Pin | | | | | | | | | | | | | | | | | | | |
| | | LH5317Y1 | 28 Pin | | | | | | | | | | | | | | | | | | | |
| S80745SND9T1  | RCDRS-52  | 2SD1758TLPQR  | | | | | | | | | | | | | | | | | | | | |
|  <table border="1"> <tbody> <tr> <td>2SB709QRSTX</td> <td>UN5112TX</td> </tr> <tr> <td>2SB970RSTX</td> <td>UN5114TX</td> </tr> <tr> <td>2SB1218QRSTX</td> <td>UN5115TX</td> </tr> <tr> <td>2SD1328STTX</td> <td>UN5210TX</td> </tr> <tr> <td>2SD1328RSTTX</td> <td>UN5213TX</td> </tr> <tr> <td>2SD1819QRSTX</td> <td>UN5215TX</td> </tr> </tbody> </table> | | | 2SB709QRSTX | UN5112TX | 2SB970RSTX | UN5114TX | 2SB1218QRSTX | UN5115TX | 2SD1328STTX | UN5210TX | 2SD1328RSTTX | UN5213TX | 2SD1819QRSTX | UN5215TX | | | | | | | | |
| 2SB709QRSTX | UN5112TX | | | | | | | | | | | | | | | | | | | | | |
| 2SB970RSTX | UN5114TX | | | | | | | | | | | | | | | | | | | | | |
| 2SB1218QRSTX | UN5115TX | | | | | | | | | | | | | | | | | | | | | |
| 2SD1328STTX | UN5210TX | | | | | | | | | | | | | | | | | | | | | |
| 2SD1328RSTTX | UN5213TX | | | | | | | | | | | | | | | | | | | | | |
| 2SD1819QRSTX | UN5215TX | | | | | | | | | | | | | | | | | | | | | |
| FMG4T148 FMG6T148 FMW1T98  | | FP106TL  | | | | | | | | | | | | | | | | | | | | |
| MA141WKTX MA741WKTX  | MA141WATX  | MA143TX  | | | | | | | | | | | | | | | | | | | | |
| MA110TX  | MA304TX  | D1FS4  | | | | | | | | | | | | | | | | | | | | |
| SML-010MTT87  | | | | | | | | | | | | | | | | | | | | | | |

■ SCHEMATIC DIAGRAM

(Parts list on pages 64~68.)

(This schematic diagram may be modified at any time with development of new technology.)

Notes:

- **S201** : Laser ON/OFF switch in "OFF" position.
(It turns "ON" with disc holder closed.)
- **S202** : Rest detector in "OFF" position.
(It turns "ON" when optical pickup comes to innermost periphery.)
- **S301** : Menu (-)
- **S302** : Menu (+)
- **S303** : Stop/operation off (■)
- **S304** : PREV/NEXT/RETURN/SELECT (◀◀/▶▶/↶/▶▶▶) switch.
- **307** [(S304: PREV, S305: NEXT, S306: RETURN, S307: SELECT)]
- **S308** : Hold lock (HOLD-LOCK) switch in "OFF" position.
- **S801** : Video format selector switch in "NTSC" position.
- The voltage value and waveforms are the reference voltage of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack). Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
- * The parenthesized is the voltage for Video CD test disc (1 kHz, L+R, 0dB) in play mode, and the other, for no disc in stop mode.
- * AC adaptor is used for power supply.
-  : Positive voltage lines.
-  : CD-DA/Video CD signal
-  : Video CD (audio & video) signal
-  : Video CD (video) signal
-  : Video CD (audio) signal
-  : CD-DA/Video CD (audio) signal

Important safety notice:

- Components identified by Δ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply parts number is described alone in the replacement parts.

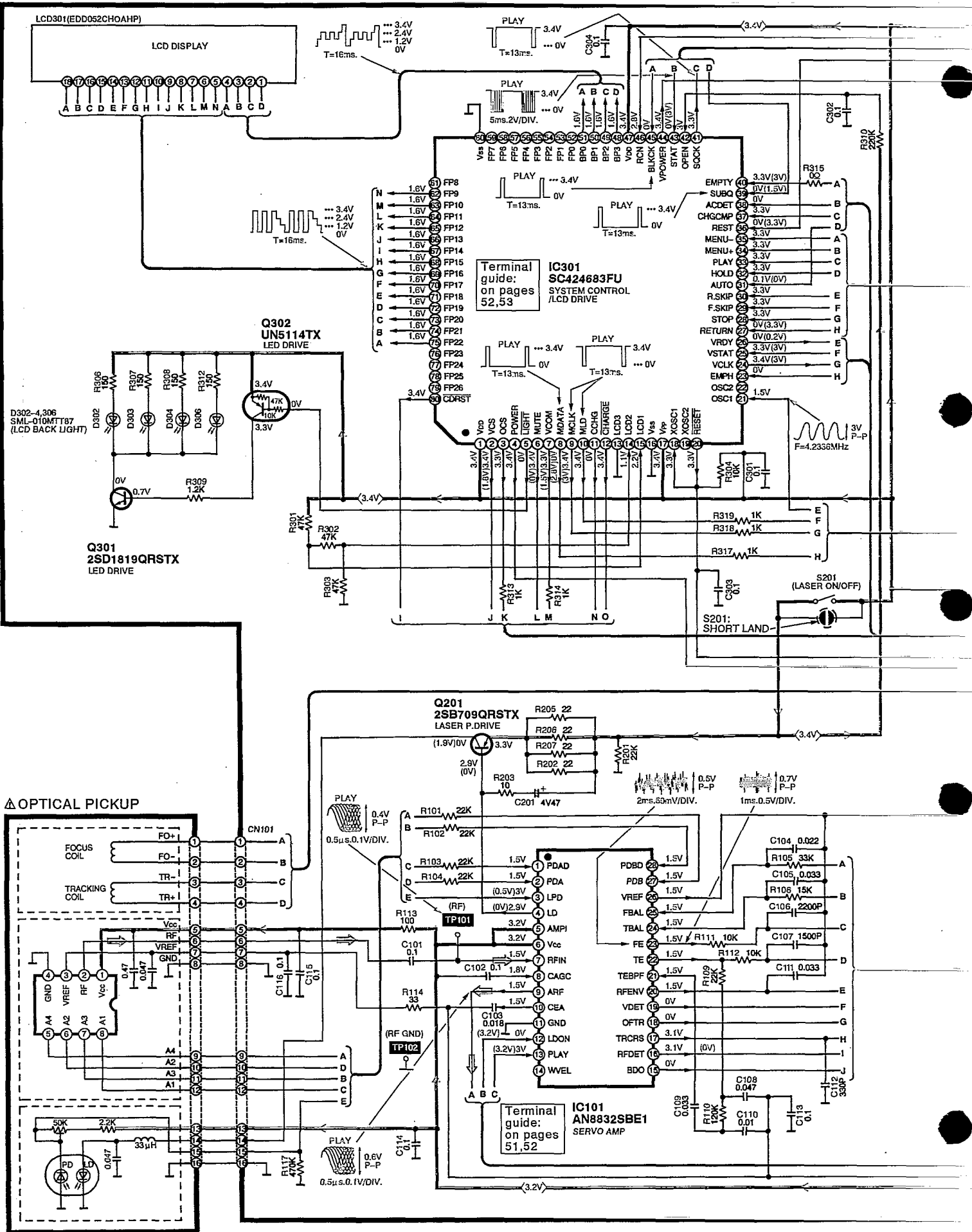
| Part No. | Original Part No. | Supply Part No. |
|----------------------------|-------------------|-----------------|
| IC1008 | NJM2115MTE1 | NJM2115MT1 |
| Q601, 602, 701 702, 801 | 2SD1328RSTTX | 2SD1328QRSTX |
| Q1004 | 2SD1328STTX | 2SD1328-S |

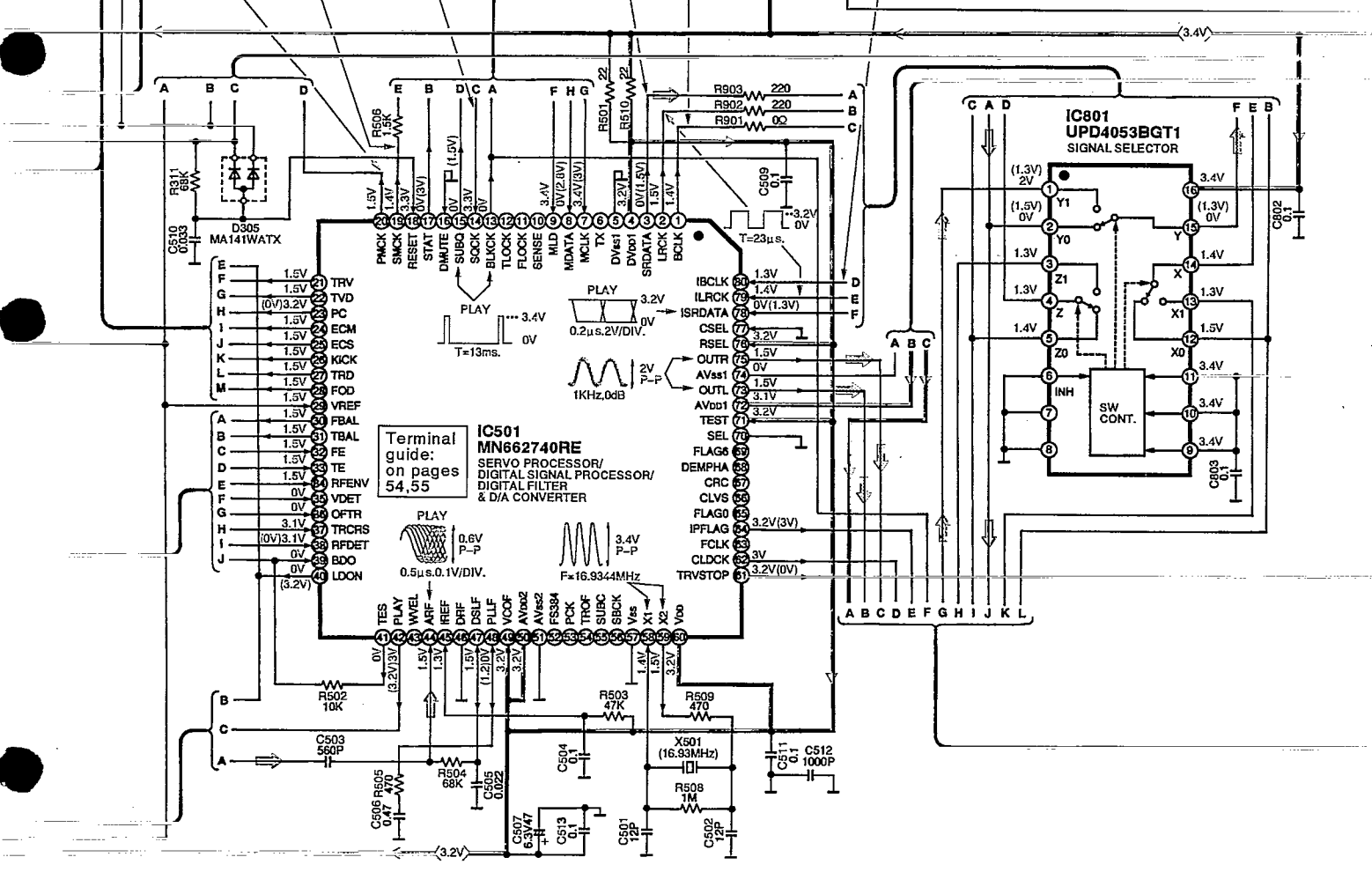
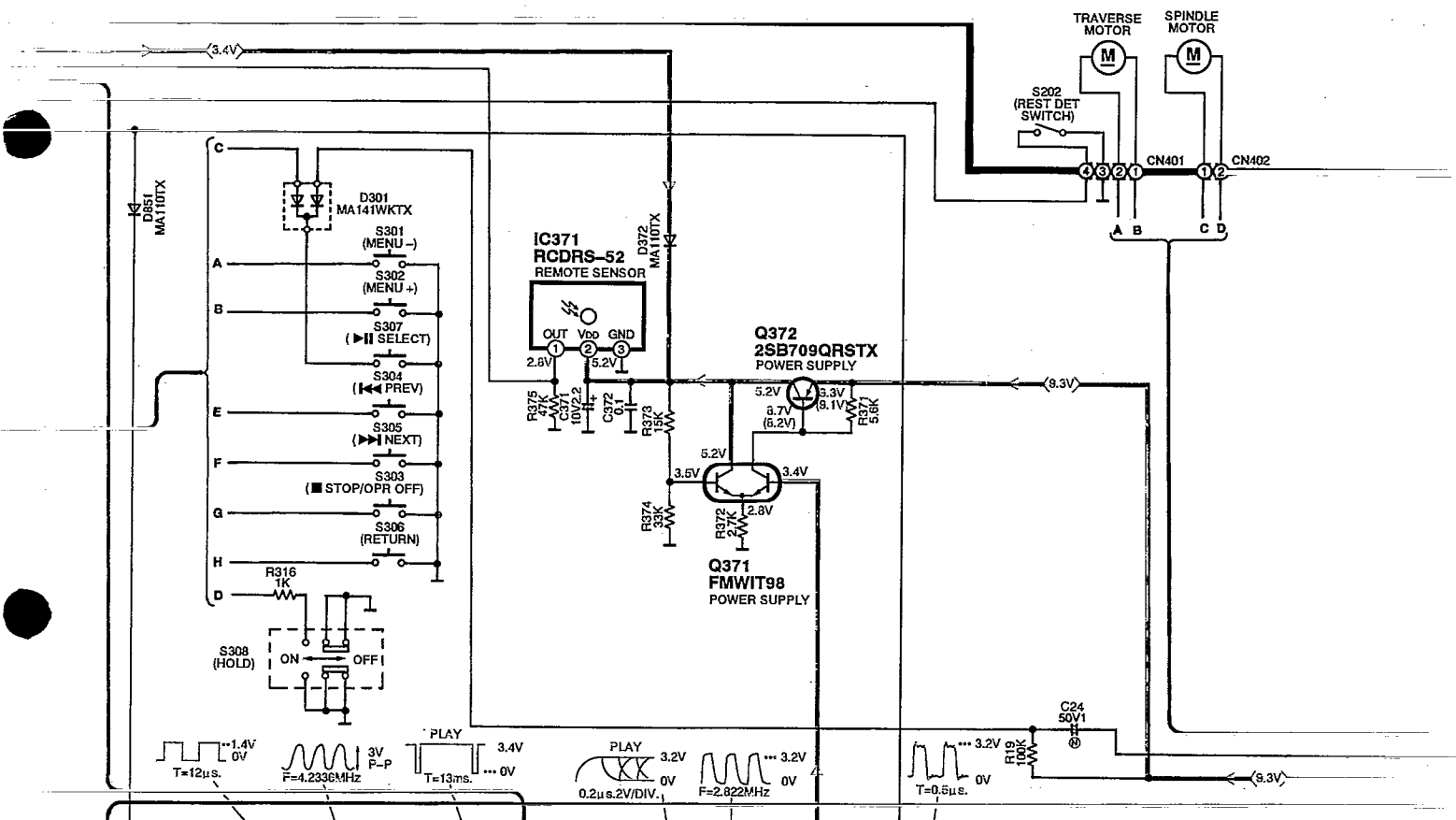
Caution!

IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.

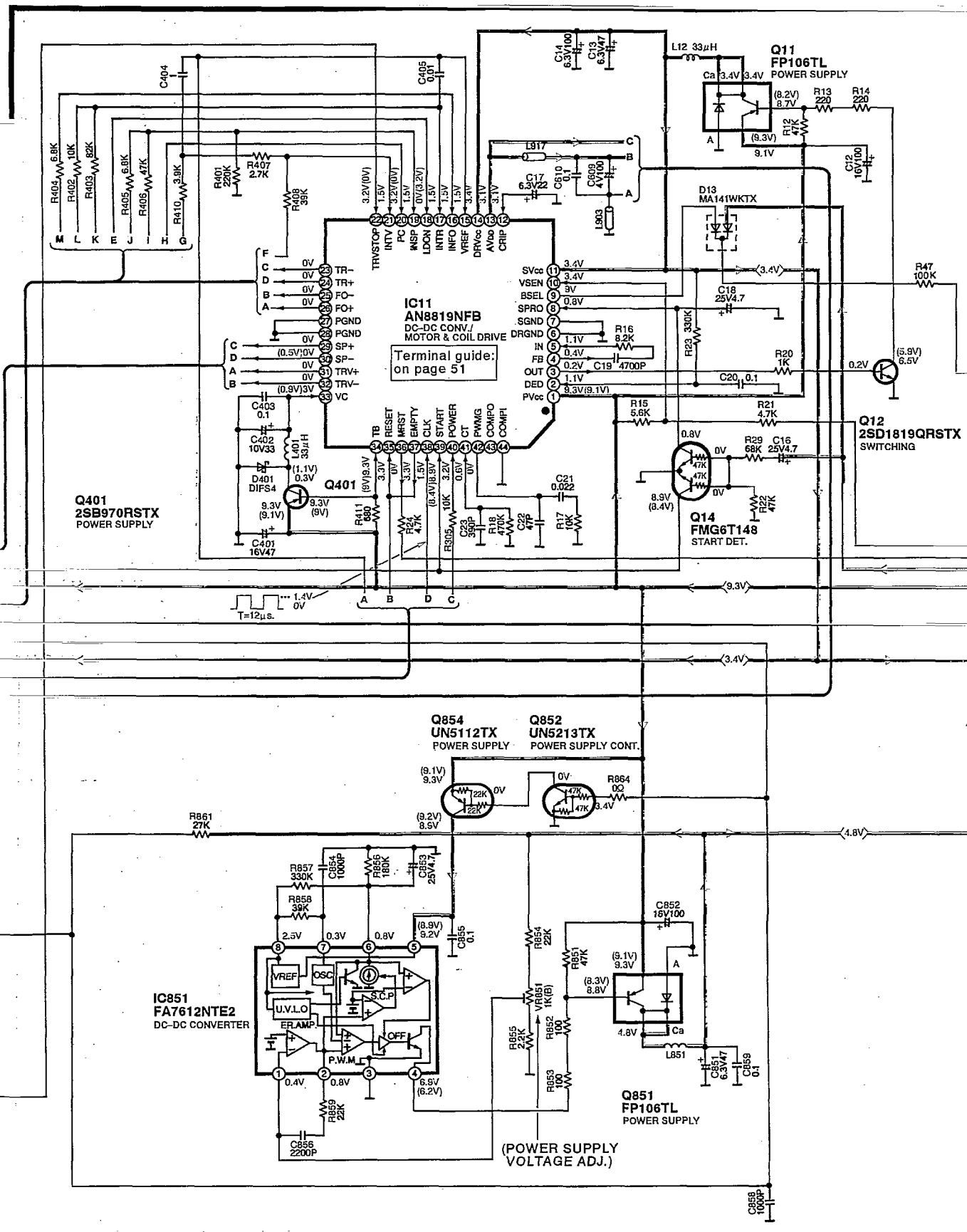
- Cover the parts boxes made of plastics with aluminium foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

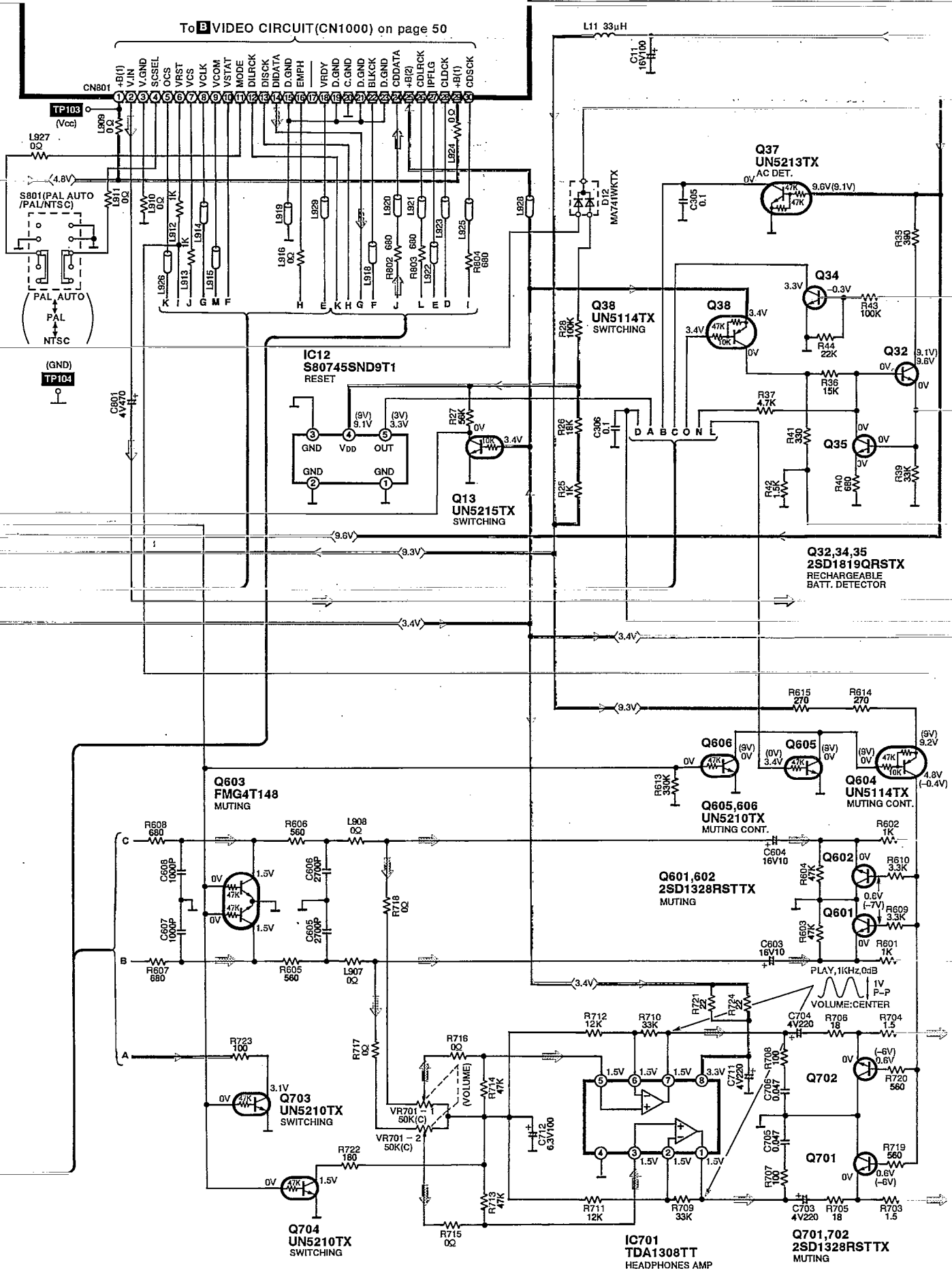
A MAIN CIRCUIT (P.C.Board: on pages 35,36)



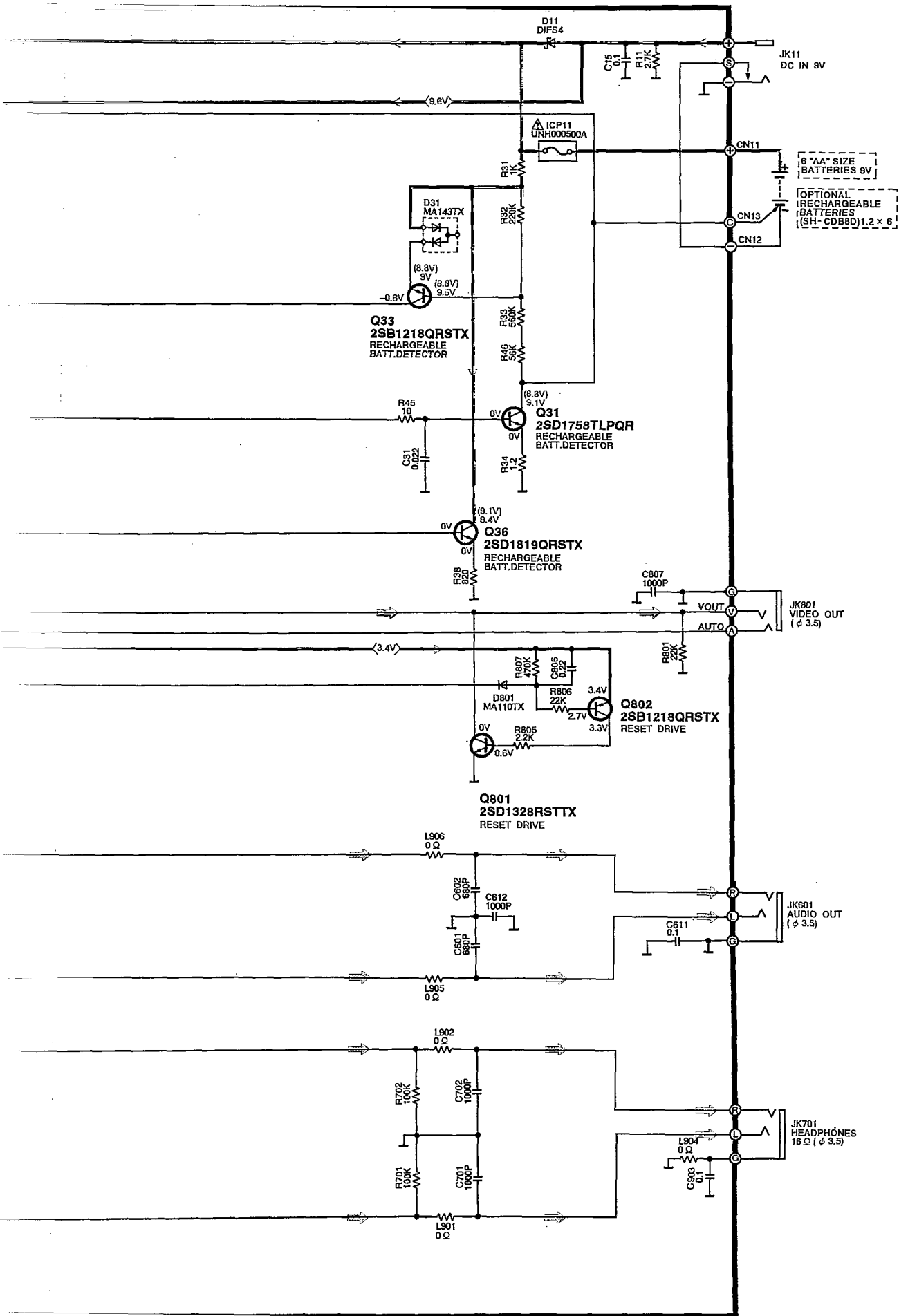


A MAIN CIRCUIT (P.C.Board: on pages 35,36)

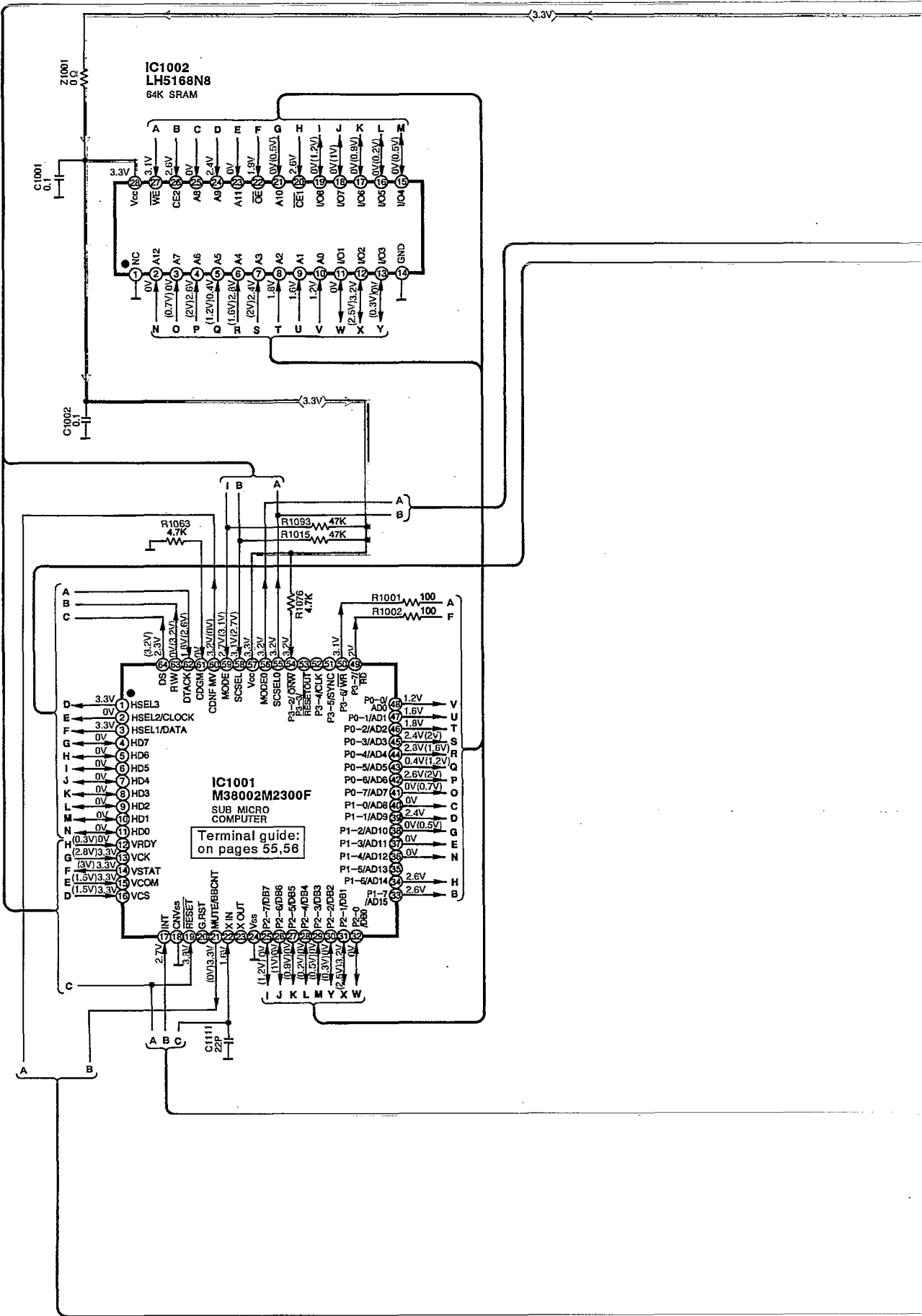




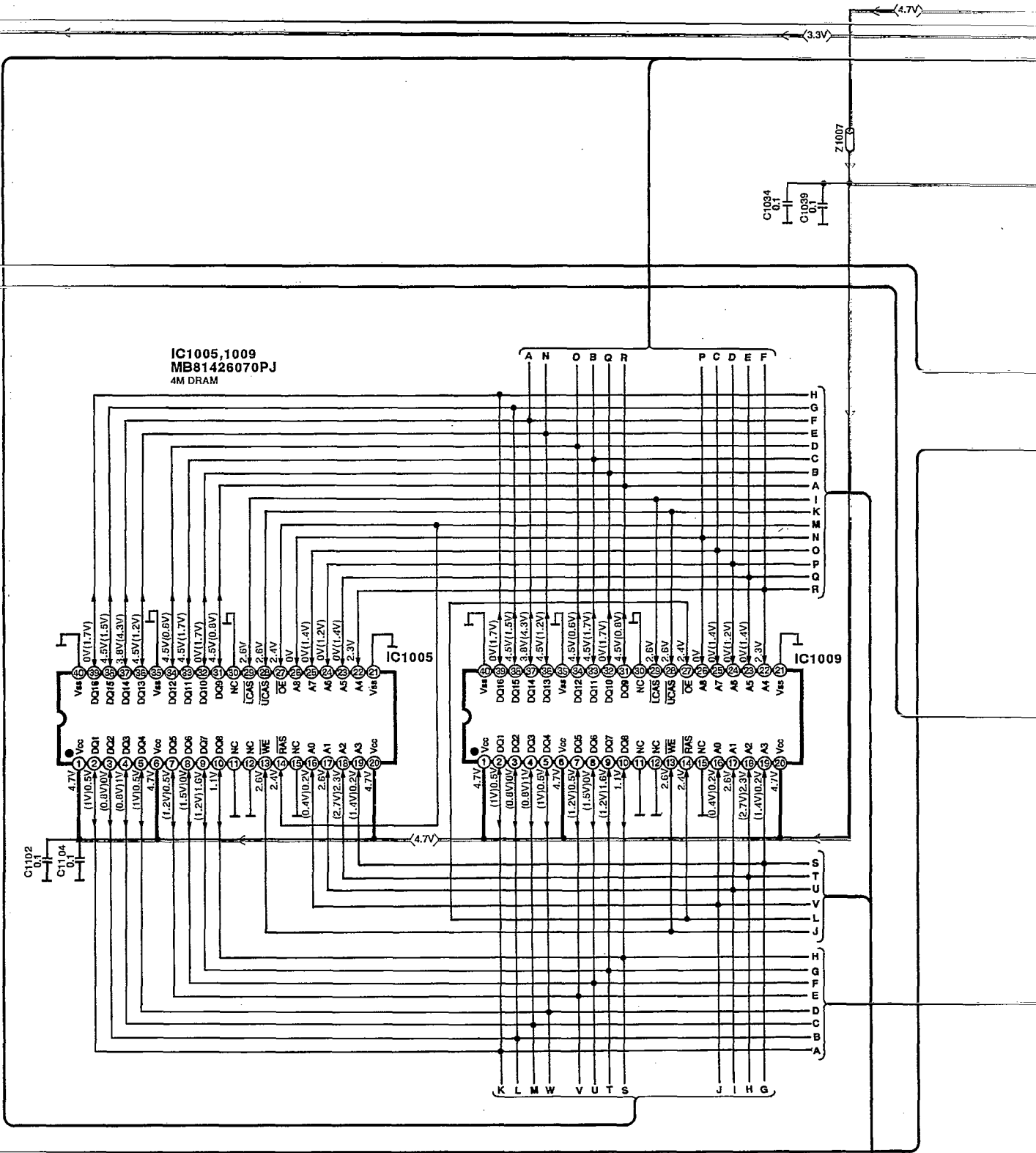
A MAIN CIRCUIT (P.C.Board: on pages 35,36)

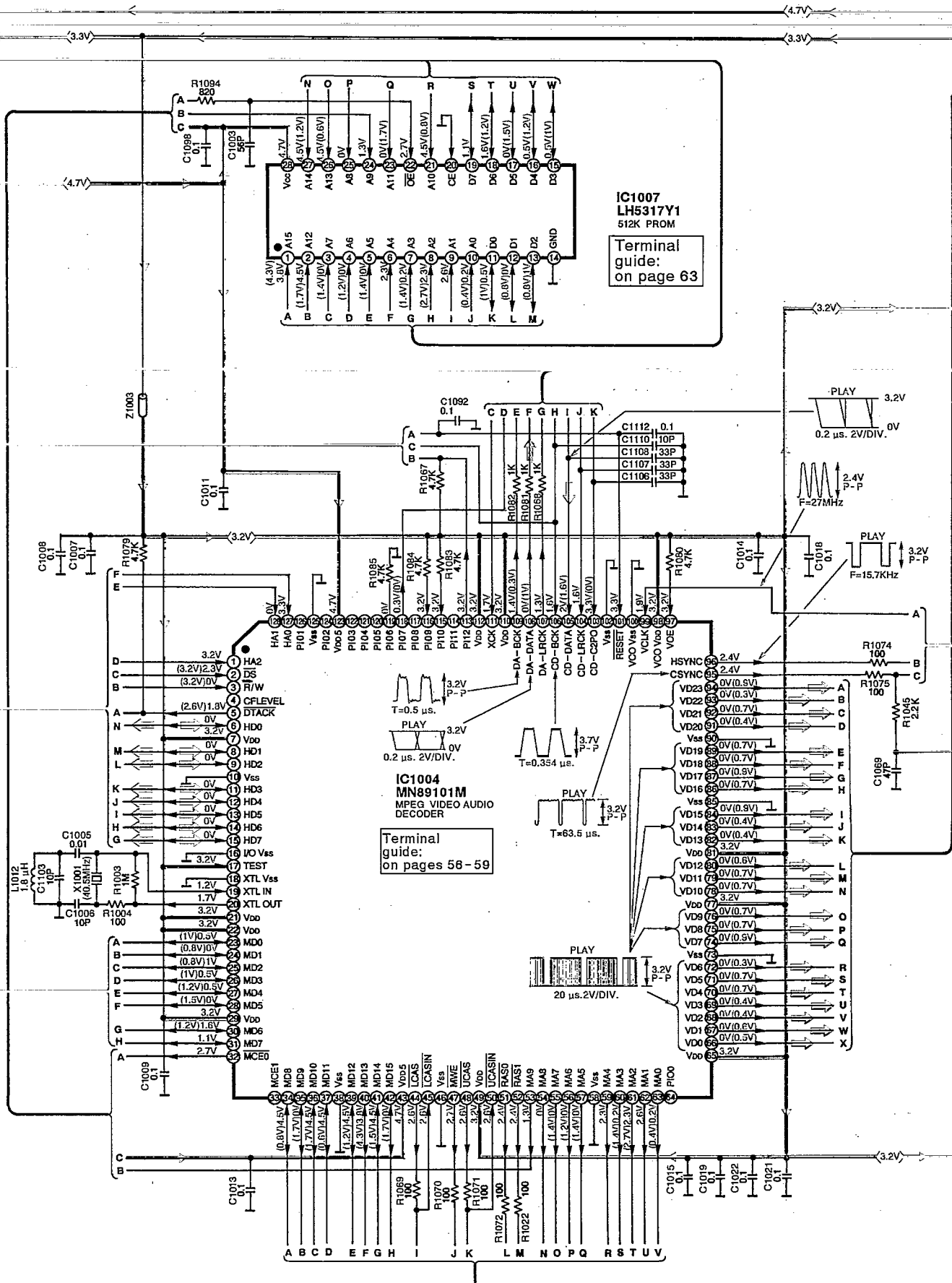


B VIDEO CIRCUIT (P.C.Board: on pages 37,38)



B VIDEO CIRCUIT (P.C.Board: on pages 37,38)



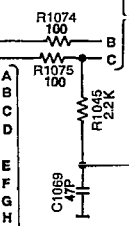
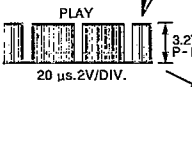
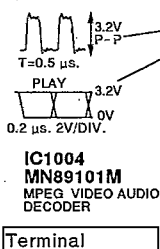
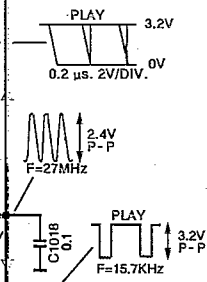


**IC1007
LH5317Y1
512K PROM**

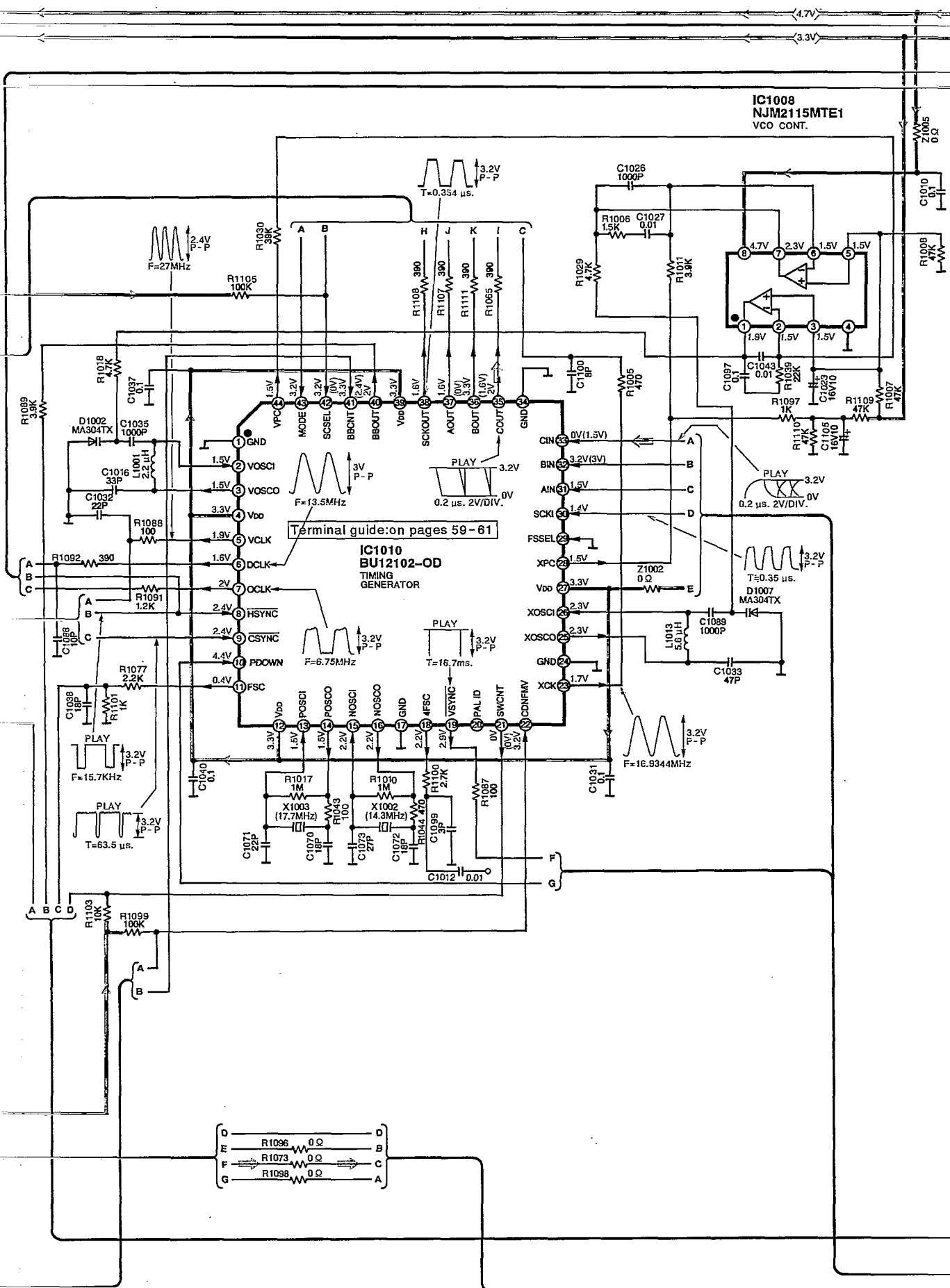
Terminal
guide:
on page 63

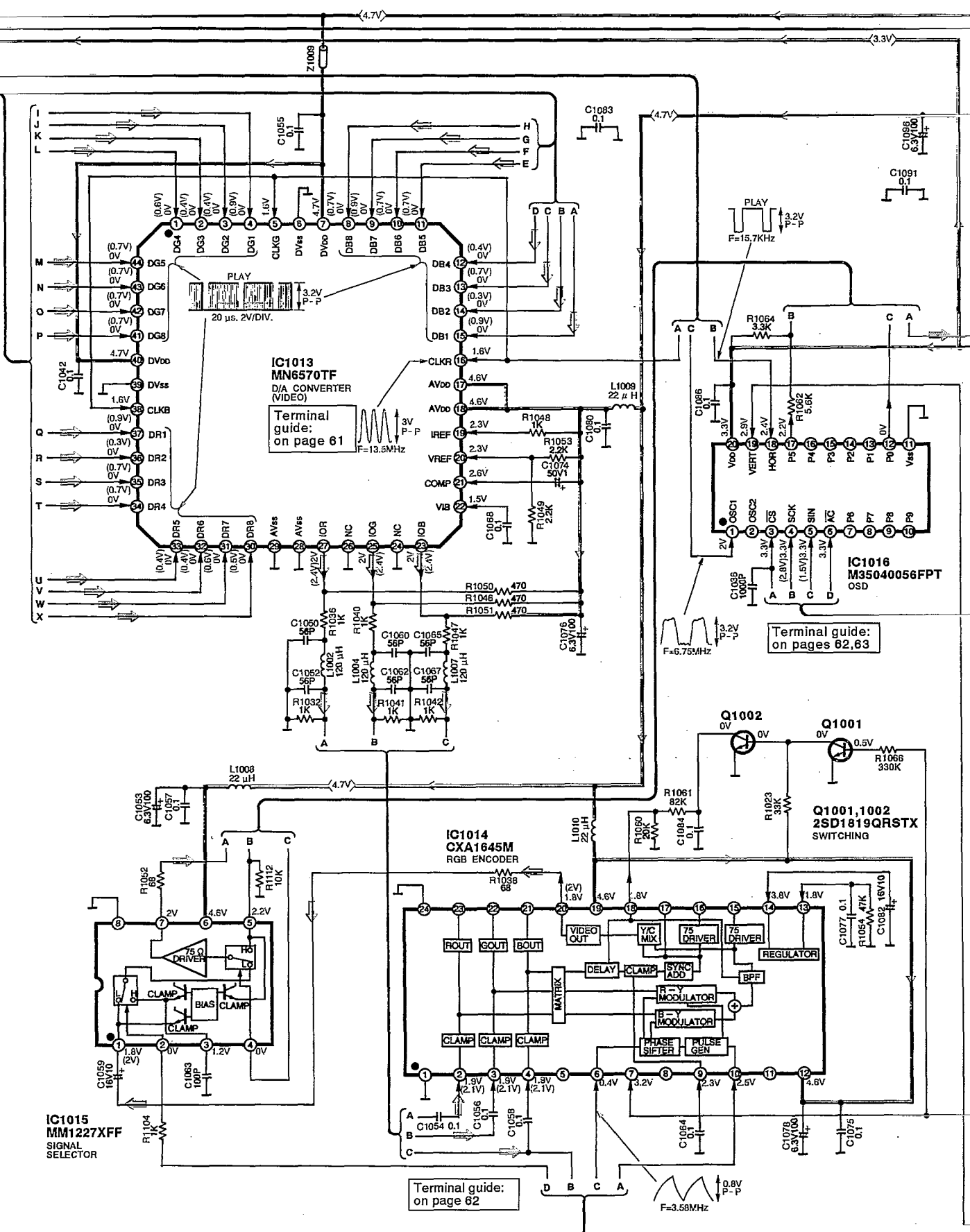
**IC1004
MN89101M
MPEG VIDEO AUDIO
DECODER**

Terminal
guide:
on pages 58 - 59

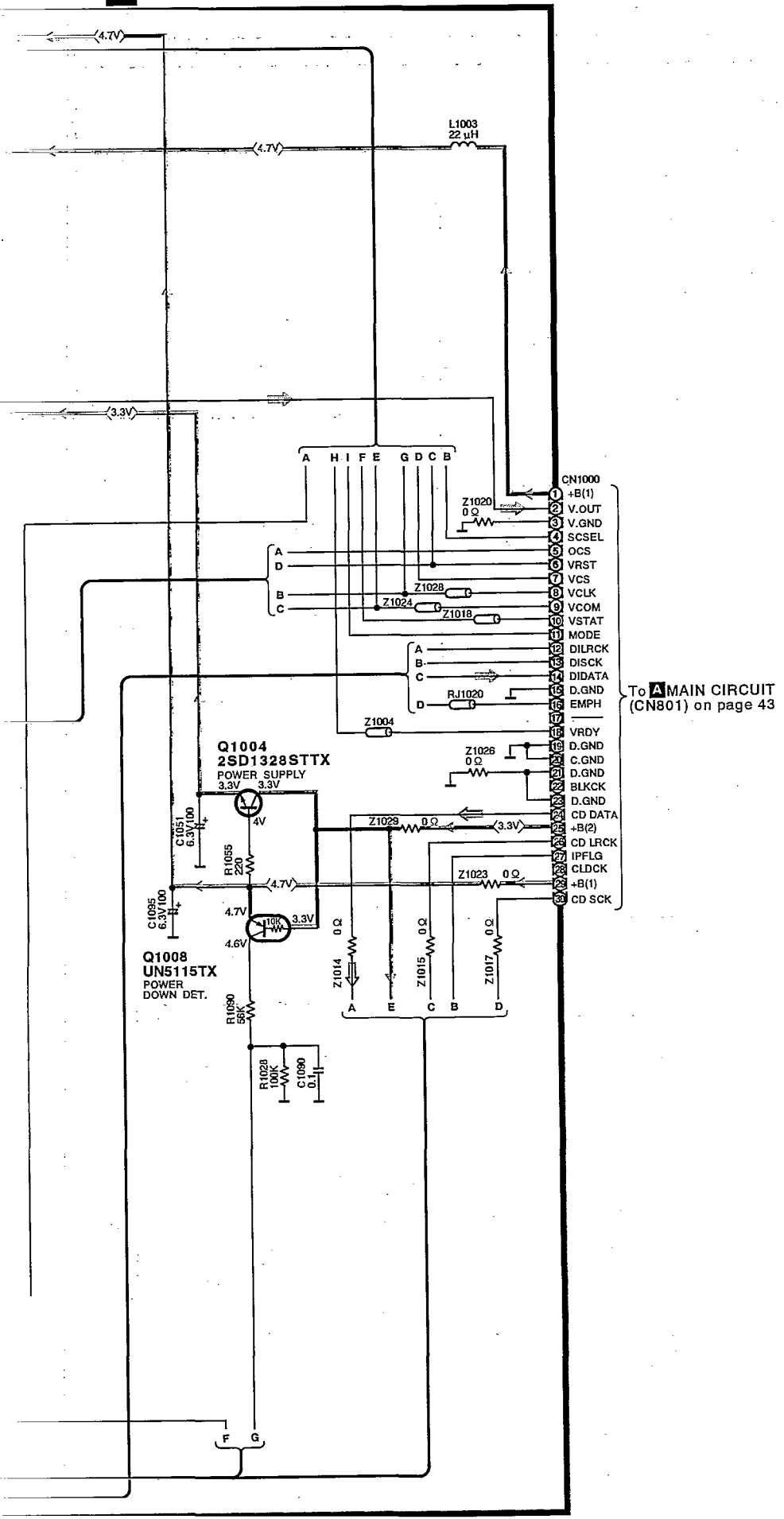


B VIDEO CIRCUIT (P.C.Board: on pages 37,38)





B VIDEO CIRCUIT (P.C.Board: on pages 37,38)



■ TERMINAL GUIDE

• IC11 (AN8819NFB): DC-DC converter control/motor & coil drive

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|--------------------------------------|
| 1 | PV _{CC} | I | Power supply terminal |
| 2 | DED | I | Dead time input |
| 3 | OUT | O | Switching output |
| 4 | FB | O | Error amp output |
| 5 | IN | I | Error amp input |
| 6 | DRGND | — | Ground terminal |
| 7 | SGND | — | Ground terminal |
| 8 | SPRO | I | Short protect circuit |
| 9 | BSEL | I | Battery select terminal |
| 10 | VSEN | I | Empty detect terminal |
| 11 | SV _{CC} | I | Power supply terminal |
| 12 | CRIP | I | Ripple filter terminal |
| 13 | AV _{DD} | O | Power supply terminal |
| 14 | DRV _{CC} | I | Power supply terminal |
| 15 | VREF | I | Reference voltage input |
| 16 | INFO | I | Focus coil control signal input |
| 17 | INTR | I | Tracking coil control signal input |
| 18 | LDON | I | Laser ON/OFF control signal input |
| 19 | INSP | I | Spindle motor control signal input |
| 20 | PC | I | Phase control terminal |
| 21 | INTV | I | Traverse motor control signal input |
| 22 | TRVSTOP | I | Traverse motor stopping signal input |

| Pin No. | Mark | I/O Division | Function |
|---------|--------|--------------|---|
| 23 | TR- | O | Tracking coil drive signal output |
| 24 | TR+ | | |
| 25 | FO- | O | Focus coil drive signal output |
| 26 | FO+ | | |
| 27 | P. GND | — | Ground terminal |
| 28 | P. GND | — | Ground terminal |
| 29 | SP+ | O | Spindle motor drive signal output |
| 30 | SP- | | |
| 31 | TRV+ | O | Traverse motor drive signal output |
| 32 | TRV- | | |
| 33 | VC | I | PWM control terminal |
| 34 | TB | I | PWM control terminal |
| 35 | RESET | I | Reset signal input |
| 36 | MRST | O | Muting signal output |
| 37 | EMPTY | O | Empty signal output |
| 38 | CLK | I | Clock signal input (f=88.2kHz) |
| 39 | START | I | Start detection input |
| 40 | POWER | I | Power ON/OFF detection terminal |
| 41 | CT | I | Triangular wave oscillator capacitor input |
| 42 | PWMG | I | PWM control terminal |
| 43 | COMPO | — | Not used, open |
| 44 | COMPI | — | Laser power drive terminal (Not used, connected to GND) |

• IC101 (AN8832SBE1): Servo amp

| Pin No. | Mark | I/O Division | Function |
|---------|-----------------|--------------|---|
| 1 | PDAD | I | Photo detector current input |
| 2 | PDA | I | Photo detector current input |
| 3 | LPD | I | Non-inverting laser power input |
| 4 | LD | O | Laser power auto control output |
| 5 | AMPI | I | RF signal input Not used, connected to V _{CC} |
| 6 | V _{CC} | I | Power supply terminal |
| 7 | RFIN | I | RF signal input |
| 8 | CAGC | I | AGC detecting capacitor terminal |
| 9 | ARF | O | RF signal output |
| 10 | CEA | O | HPF-amp. terminal |

| Pin No. | Mark | I/O Division | Function |
|---------|-------|--------------|----------------------------|
| 11 | GND | — | Ground terminal |
| 12 | LDON | I | Laser ON/OFF control input |
| 13 | PLAY | I | Play control terminal |
| 14 | WVEL | — | Not used, open |
| 15 | BDO | O | Dropout detection output |
| 16 | RFDET | O | NRFDET signal output |
| 17 | TRCRS | O | CROSS signal output |
| 18 | OFTR | O | OFTR signal output |
| 19 | VDET | O | VDET signal output |
| 20 | RFENV | O | Envelope signal output |

| Pin No. | Mark | I/O Division | Function |
|---------|-------|--------------|-------------------------------|
| 21 | TEBPF | I | Shock detection signal input |
| 22 | TE | O | Tracking error signal output |
| 23 | FE | O | Focus error signal output |
| 24 | TBAL | I | Tracking balance signal input |

| Pin No. | Mark | I/O Division | Function |
|---------|------|--------------|------------------------------|
| 25 | FBAL | I | Focus balance signal input |
| 26 | VREF | O | Reference voltage output |
| 27 | PDB | I | Photo detector current input |
| 28 | PDBD | I | Photo detector current input |

IC301 (SC424683FU): System Control & LCD Drive

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|----------------------------|--------------|-------------------------------------|---|
| 1 | V _{DD} | I | Power supply terminal | 3.3V |
| 2 | VCS | O | Chip Select signal output | When set to Low, communication with VCDM and VSTAT of the sub-microcomputer (IC1001) is enabled |
| 3 | OSC | O | Chip Select signal output | When set to Low, serial data transfer to SIN of OSD (IC1016) is enabled |
| 4 | POWER | O | Power On/Off signal output | Output to the DC-DC converter (IC11) |
| 5 | $\overline{\text{LIGHT}}$ | O | LCD Backlight Control signal output | LED (D302~304, D306) control |
| 6 | MUTE | O | Muting signal output | Active high mute signal |
| 7 | VCOM | O | Command data output | Supplies the sub-microcomputer (IC1001) and OSD (IC1016) with command data |
| 8 | MDATA | O | CPU command data output | Supplies the DSP (IC501) with command data |
| 9 | MCLK | O | CPU Command Clock signal output | Supplies the DSP (IC501) with command clock signal |
| 10 | MLD | O | CPU Command Load signal output | Supplies the DSP (IC501) with command load signal |
| 11 | CCHG | O | Charging control output | High=Charging |
| 12 | $\overline{\text{CHARGE}}$ | | | Low=Quick charging, High=Trickle charging |
| 13 | LCD3 | — | — | Not used, connected to GND |
| 14 | LCD2 | I | Power supply terminal | 1.1V |
| 15 | LCD1 | | | 2.2V |
| 16 | V _{SS} | — | GND terminal | 0V |
| 17 | V _{PP} | I | Power supply terminal | 3.3V |
| 18 | XOSC1 | I | Reset signal input | Normally at 3.3V |
| 19 | XOSC2 | — | — | Not used, open |
| 20 | $\overline{\text{RESET}}$ | O | Reset signal output | Supplies the DC-DC converter (IC11) and DSP (IC501) with reset signal |
| 21 | OSC1 | I | Main System Clock input | f=4.2336 MHz |
| 22 | OSC2 | — | — | Not used, open |
| 23 | EMPH | I | DAC emphasis signal input | Receives the signal from MPGE video audio encoder (IC1004) |
| 24 | VCLK | O | Video Clock output | When set to Low, VCOM (command data) and VSTAT (status data) can be transferred |
| 25 | VSTAT | I | Status signal input | Status input from the sub-microcomputer (IC1001) |
| 26 | VRDY | O | Ready signal output | When set to Low, communication with VCOM and VSTAT of sub-microcomputer (IC1001) is enabled |
| 27 | RETURN | I | Return input | Receives an active signal when the "RETURN" button is pressed |

| Pin No. | Mark | I/O Division | Function description | Remarks |
|------------|---------------------------|--------------|---|---|
| 28 | STOP | I | STOP/OFF input | Received an active signal when the "■ STOP/POWER OFF" button is pressed |
| 29 | F. SKIP | I | Forward input | Received an active signal when the "▶▶ NEXT" button is pressed |
| 30 | R. SKIP | I | Rewind input | Received an active signal when the "PREV ◀◀" button is pressed |
| 31 | AUTO | I | VIDEO OUT cable detection input | Identifies whether or not a video cable is plugged into the VIDEO OUT jack |
| 32 | HOLD | I | HOLD input | Receives an active signal when the "HOLD" button is pressed |
| 33 | PLAY | I | Play input | Received an active signal when the "▶ SELECT" button is pressed |
| 34 | MENU+ | I | MENU+ input | Received an active signal when the "MENU+" button is pressed |
| 35 | MENU- | I | MENU- input | Received an active signal when the "MENU-" button is pressed |
| 36 | REST | I | Rest (innermost position) detection input | It turns "L" when optical pickup comes to innermost periphery |
| 37 | CHGCMP | I | Charging control input | Identifies the presence of battery or status of charging process |
| 38 | ACDET | I | Supply type detection input | Determines whether the supply power is AC or DC Low=AC, High=DC |
| 39 | SUBQ | I | Subcode (Q data) input | Accepts time and track information from the DSP (IC501). Common to CD-DA and video CD |
| 40 | EMPTY | I | Empty signal input | Active low signal, used to identify low battery condition |
| 41 | SQCK | O | Subcode Q register clock output | Clock used to receive sub-code Q from the DSP (IC501) |
| 42 | OPEN | I | Disc Holder Open Detection signal input | Low=open, High=closed |
| 43 | STAT | I | Status signal input | Receives CRC, CUE, CLVS, TTSTOP, FCLV and SQOK from the DSP (IC501) |
| 44 | VPOWER | O | Module Power On/Off signal output | Supplies the DC-DC converter (IC11) with active high signal |
| 45 | BLKCK | I | Subcode clock (Q data) input | F=75Hz |
| 46 | RCN | I | Remote control input | Receives a signal from the remote control receiver |
| 47 | V _{DD} | I | Power supply terminal | 3.3V |
| 48 } 51 | BP3 } BP0 | O | LCD segment signal outputs | Used to display time and track information on the LCD panel |
| 52 } 59 | FP0 } FP7 | — | — | Not used, open |
| 60 | V _{SS} | — | GND terminal | 0V |
| 61 | FP8 | — | — | Not used, open |
| 62 } 75 | FP9 } FP22 | O | LCD segment signal outputs | Used to display time and track information on the LCD panel |
| 76 } 79 | FP23 } FP26 | — | — | Not used, open |
| 80 | $\overline{\text{CDRST}}$ | O | Reset signal output | Supplies the sub-microcomputer (IC1001) and OSD (IC1016) with a reset signal |

• IC501 (MN662740RE): Servo processor/digital signal processor/digital filter/D/A converter

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|--|
| 1 | BCLK | O | Serial bit clock output |
| 2 | LRCK | O | L/R discriminating signal output |
| 3 | SRDATA | O | Serial data signal output |
| 4 | DV _{DD1} | I | Power supply (digital circuit) terminal |
| 5 | DV _{SS1} | — | GND (digital circuit) terminal |
| 6 | TX | — | Digital audio interface signal (Not used, open) |
| 7 | MCLK | I | Command clock signal |
| 8 | MDATA | I | Command data signal |
| 9 | MLD | I | Command load signal ("L": LOAD) |
| 10 | SENSE | — | Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG) (Not used, open) |
| 11 | FLOCK | — | Optical servo condition (focus) ("L": lead-in) (Not used, open) |
| 12 | TLOCK | — | Optical servo condition (tracking) ("L": lead-in) (Not used, open) |
| 13 | BLKCK | O | Sub-code block clock (f=75Hz) |
| 14 | SQCK | I | Sub-code Q register clock |
| 15 | SUBQ | O | Sub-code Q data |
| 16 | DMUTE | I | Muting input ("H": MUTE) (Not used, connected to GND) |
| 17 | STAT | O | Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK) |
| 18 | RESET | I | Reset signal ("L": reset) |
| 19 | SMCK | O | System clock (f=4.2336MHz) |
| 20 | PMCK | O | Frequency division clock signal ($f = \frac{1}{192} \times ck = 88.2\text{kHz}$) |
| 21 | TRV | O | Traverse servo control |
| 22 | TVD | O | Traverse drive signal |
| 23 | PC | O | Spindle motor drive signal ("L": ON) |
| 24 | ECM | O | Spindle motor drive signal (Forced mode) |
| 25 | ECS | O | Spindle motor drive signal (Servo error signal) |
| 26 | KICK | O | Kick pulse output |
| 27 | TRD | O | Tracking drive signal output |
| 28 | FOD | O | Focus drive signal output |
| 29 | VREF | I | D/A drive output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal |

| Pin No. | Mark | I/O Division | Function |
|---------|-------------------|--------------|--|
| 30 | FBAL | O | Focus balance adj. output |
| 31 | TBAL | O | Tracking balance adj. output |
| 32 | FE | I | Focus error signal (analog input) |
| 33 | TE | I | Tracking error signal (analog input) |
| 34 | RFENV | I | RF envelope signal |
| 35 | VDET | I | Oscillation det. signal ("H": det.) |
| 36 | OFTR | I | Off track signal ("H": Off track.) |
| 37 | TRCRS | I | Track cross signal input |
| 38 | RFDET | I | RF detection signal ("L": detection) |
| 39 | BDO | I | Dropout detection signal ("H": dropout) |
| 40 | LDON | O | Laser power control ("H": ON) |
| 41 | TES | O | Tracking error shunt output ("H": dropout) |
| 42 | PLAY | O | Play signal ("H": play) |
| 43 | WVEL | — | Double velocity status signal ("H": double) (Not used, open) |
| 44 | ARF | I | RF signal input |
| 45 | IREF | I | Reference current input |
| 46 | DRF | — | DSL bias terminal (Not used, connected to GND) |
| 47 | DSLFL | I/O | DSL loop filter terminal |
| 48 | PLLFL | I/O | PLL loop filter terminal |
| 49 | VCOFL | I | VCO loop filter terminal (Not used, connected to AV _{DD2}) |
| 50 | AV _{DD2} | I | Power supply (analog circuit) terminal (2) |
| 51 | AV _{SS2} | — | GND (analog circuit) terminal |
| 52 | FS384 | O | 384 fs (16.9344MHz) output (Not used, open) |
| 53 | PCK | — | PLL extract clock (f=4.3218MHz) (Not used, open) |
| 54 | TROF | — | Tracking servo OFF signal (Not used, open) |
| 55 | SUBC | — | Sub-code serial output data (Not used, open) |
| 56 | SBCK | — | Sub-code serial input clock (Not used, open) |
| 57 | V _{SS} | — | GND terminal |
| 58 | X1 | I | Crystal oscillator terminal (f=16.9344 MHz) |
| 59 | X2 | O | |
| 60 | V _{DD} | I | Power supply terminal |
| 61 | TRVSTOP | O | Traverse motor stop control terminal |

| Pin No. | Mark | I/O Division | Function |
|---------|--------|--------------|--|
| 62 | CLDCK | O | Sub-code frame clock signal (f CLDCK=7.35kHz: Normal) (Not used, open) |
| 63 | FCLK | — | Crystal frame clock (Not used, open) |
| 64 | IPFLAG | O | Interpolation flag terminal |
| 65 | FLAG0 | — | Flag terminal (Not used, open) |
| 66 | CLVS | — | Turntable servo phase synchro signal ("H": CLV, "L": Rough servo) (Not used, open) |
| 67 | CRC | — | Sub-code CRC check terminal ("H": OK, "L": NG) (Not used, open) |
| 68 | DEMPHA | — | DE-emphasis ON signal ("H": ON) (Not used, open) |
| 69 | FLAG6 | — | Flag terminal (Not used, open) |

| Pin No. | Mark | I/O Division | Function |
|---------|--------------------|--------------|---|
| 70 | SEL | — | Not used, connected to GND |
| 71 | TEST | I | Test terminal (Normal: "H") |
| 72 | AV _{DD} 1 | I | Power supply (analog circuit) terminal (1) |
| 73 | OUTL | O | Lch audio signal |
| 74 | AV _{SS} 1 | — | GND (analog circuit) terminal |
| 75 | OUTR | O | Rch audio signal |
| 76 | RSEL | I | Polarity direction control terminal of RF signal (Not used connected to power supply) |
| 77 | CSEL | — | Frequency control terminal of crystal oscillator (Not used, connected to GND) |
| 78 | ISRDATA | I | Audio serial data input |
| 79 | ILRCK | I | Audio L/R clock input |
| 80 | IBCLK | I | Audio bit clock input |


• IC1001 (M38002M2300F): Sub-Microcomputer



| Pin No. | Mark | I/O Division | Function description | Remarks |
|--------------|---------------------------|--------------|------------------------------------|---|
| 1 | HSEL3 | O | Data/address mode selection output | Accepts a mode switching signal for HD0~HD7 (address/data I/O lines) |
| 2 | HSEL2/CLOCK | O | Data/address mode selection output | Accepts a mode switching signal for HD0~HD7 (address/data I/O lines) |
| 3 | HSEL1/DATA | O | Data/address mode selection output | Accepts a mode switching signal for HD0~HD7 (address/data I/O lines) |
| 4 5 11 | HD7 HD0 | I/O | Address/data I/O lines | Used to exchange address or data with the MPEG video/audio decoder. Address is transferred in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004 |
| 12 | VRDY | I | Ready signal input | When set to low, communication with VCOM and VSTAT of system controller (IC301) is enabled |
| 13 | VCK | I | Video clock input | Used to clock VCOM (command data) and VSTAT (status data) transfers. When set to low, communication with VCOM and VSTAT is enabled |
| 14 | VSTAT | O | Status data output | Supplies the system controller (IC301) with status data |
| 15 | VCOM | I | Command data input | Receives command data from the system controller (IC301) |
| 16 | VCS | I | Chip select signal input | Transferred from the system controller (IC301), this signal is used to select either sub-microcomputer (IC1001) or OSD (IC1016) |
| 17 | INT | I | Soft interrupt signal input | Receives soft interrupt signal from the MPEG video audio decoder (IC1004) |
| 18 | CNV _{SS} | — | GND terminal | 0V |
| 19 | $\overline{\text{RESET}}$ | I | Reset signal | Active low reset input from the system controller (IC301) |
| 20 | G. RST | — | CD-G reset signal | Not used, open |
| 21 | MUTE/BBCNT | O | Blue back control signal output | When a high signal is supplied to the timing generator (IC1010), the screen turns entirely blue |





| Pin No. | Mark | I/O Division | Function description | Remarks | | | | | | | | | | | |
|------------|-----------------------------|--------------|--|---|---|--|-------|--------|--------|---|---|-----|---|---|------|
| 22 | XIN | I | CD bit clock input | Clock Input from the timing generator (IC1010) | | | | | | | | | | | |
| 23 | XOUT | O | — | Not used, open | | | | | | | | | | | |
| 24 | V _{ss} | — | GND terminal | 0V | | | | | | | | | | | |
| 25 } 32 | P2-7/DB7 } P2-0/DB0 | I/O | 8-bit parallel data I/O lines | Data I/O from/to the 64K SRAM (IC1002) | | | | | | | | | | | |
| 33 34 | P1-7/AD15 P1-6/AD14 | O | Address output | Supply the 64K SRAM (IC1002) with address information | | | | | | | | | | | |
| 35 | P1-5/AD13 | — | — | Not used, open | | | | | | | | | | | |
| 36 } 48 | P1-4/AD12 } P0-0/AD0 | O | Address output | Supply the 64K SRAM (IC1002) with address information | | | | | | | | | | | |
| 49 | P3-7/ \overline{RD} | O | Read control output | When set to Low, data is read out of the 64K SRAM (IC1002) | | | | | | | | | | | |
| 50 | P3-6/ \overline{WR} | O | Write control output | When set to Low, data is read out of the 64K SRAM (IC1002) | | | | | | | | | | | |
| 51 | P3-5/SYNC | — | — | Not used, open | | | | | | | | | | | |
| 52 | P3-4/CLK | — | — | Not used, open | | | | | | | | | | | |
| 53 | P3-3/ $\overline{RESETOUT}$ | — | — | Not used, open | | | | | | | | | | | |
| 54 | P3-2/ \overline{ONW} | I | ON_WAIT input | Used to insert a wait cycle into CPU cycle | | | | | | | | | | | |
| 55 | SCSELO | O | NTSC/PAL selection signal output | *When SCSELO is High, NTSC is selected no matter whether MODE0 is High or Low | | | | | | | | | | | |
| 56 | MODE0 | O | | | <table border="1"> <tr> <td></td> <td>MODE0</td> <td>SCSELO</td> </tr> <tr> <td>PAL 60</td> <td>H</td> <td>L</td> </tr> <tr> <td>PAL</td> <td>L</td> <td>L</td> </tr> <tr> <td>NTSC</td> <td>—</td> <td>H</td> </tr> </table> | | MODE0 | SCSELO | PAL 60 | H | L | PAL | L | L | NTSC |
| | MODE0 | SCSELO | | | | | | | | | | | | | |
| PAL 60 | H | L | | | | | | | | | | | | | |
| PAL | L | L | | | | | | | | | | | | | |
| NTSC | — | H | | | | | | | | | | | | | |
| 57 | V _{cc} | I | Power supply terminal | 3.3V | | | | | | | | | | | |
| 58 | SCSEL | I | NTSC/PAL selection signal input | *When SCSEL is High, NTSC is selected no matter whether MODE is High or Low | | | | | | | | | | | |
| 59 | MODE | I | | | <table border="1"> <tr> <td></td> <td>MODE</td> <td>SCSEL</td> </tr> <tr> <td>PAL 60</td> <td>H</td> <td>L</td> </tr> <tr> <td>PAL</td> <td>L</td> <td>L</td> </tr> <tr> <td>NTSC</td> <td>—</td> <td>H</td> </tr> </table> | | MODE | SCSEL | PAL 60 | H | L | PAL | L | L | NTSC |
| | MODE | SCSEL | | | | | | | | | | | | | |
| PAL 60 | H | L | | | | | | | | | | | | | |
| PAL | L | L | | | | | | | | | | | | | |
| NTSC | — | H | | | | | | | | | | | | | |
| 60 | CDNFMV | O | CD-DA audio line/video CD line selection signal output | High: Selects CD-DA Low: Selects video CD | | | | | | | | | | | |
| 61 | CDGM | I | — | — | | | | | | | | | | | |
| 62 | DTACK | I | Data acknowledge signal input | Data acknowledgement from MPEG (IC1004) received in response to data output to MPEG | | | | | | | | | | | |
| 63 | R/W | O | Read/write control output | Controls address or data read/write operations performed with MPEG (IC1004) | | | | | | | | | | | |
| 64 | DS | O | Data strobe signal output | When set to Low, address or data is exchanged with MPEG (IC1004) through HD0~HD7 | | | | | | | | | | | |

• IC1004 (MN89101M): MPEG Video audio decoder





| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|------------------|--------------|-----------------------------------|---|
| 1 | HA2 | I | Data/address mode switching input | Used to switch the mode for HD0~HD7 (address/data I/O) lines |
| 2 | \overline{DS} | I | Data strobe signal input | When set to Low, address or data is read/written from/to the sub-microcomputer (IC1001) to/from HD0~HD7 |
| 3 | $\overline{R/W}$ | I | Read/Write signal input | Read/write signal Low=read, High=write |
| 4 | CFLEVEL | — | — | Not used, open |




| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------------|-----------------------------|--------------|------------------------------------|--|
| 5 | $\overline{\text{DTACK}}$ | O | Data acknowledge signal output | This signal is output to IC1001 when data is received from IC1001 to HD0~HD7 |
| 6 | HD0 | I/O | Address/data I/O | Used to exchange address or data between IC1001 and IC1004 |
| 7 | V _{DD} | I | Power supply terminal | 3.3V |
| 8 | HD1 | I/O | Address/data I/O | Used exchange address or data between IC1001 and IC1004. Address is transferred only in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004 (IC1004's status is transferred to IC1001, commands are transferred from IC1001 to IC1004) |
| 9 | HD2 | I/O | Address/data I/O | |
| 10 | V _{SS} | — | GND terminal | 0V |
| 11 } 15 | HD3 } HD7 | I/O | Address/data I/O | Used exchange address or data between IC1001 and IC1004. Address is transferred only in one direction from IC1001 to IC1004. Data is transferred in both directions between IC1001 and IC1004. |
| 16 | I/O V _{SS} | — | GND terminal | 0V |
| 17 | TEST | I | — | Not used, connected to power supply |
| 18 | XTL V _{SS} | — | GND for crystal resonator | 0V |
| 19 | XTL IN | I | Crystal resonator terminals |  F=40.5MHz (T=0.0247μs) |
| 20 | XTL OUT | O | | |
| 21, 22 | V _{DD} | I | Supply input for crystal resonator | 3.3V |
| 23 } 28 | MD0 } MD5 | I/O | DRAM/ROM data I/O lines | Used to exchange data with DRAM (IC1009, IC1005) and ROM (IC1007). Data used to control MPEG (IC1004) is transferred from ROM, while video data with CD-ROM format comes from DRAM |
| 29 | V _{DD} | I | Power supply terminal | 3.3V |
| 30 | MD6 | I/O | DRAM/ROM data I/O lines | Used exchange data with DRAM (IC1009, IC1005) and ROM (IC1007) |
| 31 | MD7 | | | |
| 32 | $\overline{\text{MCE0}}$ | O | ROM chip enable signal output | Low selects ROM (IC1007) |
| 33 | MCE1 | — | — | Not used, open |
| 34 } 37 | MD8 } MD11 | I/O | DRAM data/ROM address I/O lines | Used to exchange data with DRAM (IC1009, IC1005) and ROM (IC1007) |
| 38 | V _{SS} | — | GND terminal | 0V |
| 39 } 42 | MD12 } MD15 | I/O | DRAM data/ROM address I/O lines | Used to exchange data with DRAM (IC1009, IC1005) and ROM (IC1007) |
| 43 | V _{DD5} | I | Power supply terminal | 4.7V |
| 44 | $\overline{\text{LCAS}}$ | O | DRAM LCAS/ROM address output | Lower address/data command output for DRAM (IC1009, IC1005) |
| 45 | $\overline{\text{LCAS IN}}$ | I | DRAM LCAS input | Lower address/data command input for DRAM (IC1009, IC1005) |
| 46 | V _{SS} | — | GND terminal | 0V |
| 47 | $\overline{\text{MWE}}$ | O | DRAM write enable signal output | Low writes to IC1009, IC1005 High reads from IC1009, IC1005 |
| 48 | $\overline{\text{UCAS}}$ | O | DRAM UCAS/ROM address output | Higher address/data command output for DRAM (IC1009, IC1005) |
| 49 | V _{DD} | I | Power supply terminal | 3.3V |
| 50 | $\overline{\text{UCAS IN}}$ | I | DRAM UCAS input | Higher address/data command input for DRAM (IC1009, IC1005) |

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------------|---------------------------|--------------|--|--|
| 51 | $\overline{\text{RAS0}}$ | O | DRAM RAS0 output | Higher address output for DRAM (IC1009) |
| 52 | $\overline{\text{RAS1}}$ | O | DRAM RAS1 output | Higher address output for DRAM (IC1005) |
| 53 ┆ 57 | MA9 ┆ MA5 | O | DRAM/ROM address output | Address output for DRAM (IC1009, IC1005) |
| 58 | V_{SS} | — | GND terminal | 0V |
| 59 ┆ 63 | MA4 ┆ MA0 | O | DRAM/ROM address output | Address output for DRAM (IC1009, IC1005) |
| 64 | PIO 0 | — | — | Not used, open |
| 65 | V_{DD} | I | Power supply terminal | 3.3V |
| 66 ┆ 72 | VD0 ┆ VD6 | O | Video data output (red) | Video data output (red) to D/A converter (video) (IC1013) |
| 73 | V_{SS} | — | GND terminal | 0V |
| 74 ┆ 76 | VD7 ┆ VD9 | O | Video data outputs Pin 74: Red Pins 75~76: Green | Video data outputs (red and green) to D/A converter (video) (IC1013) |
| 77 | V_{DD} | I | Power supply terminal | 3.3V |
| 78 ┆ 80 | VD10 ┆ VD12 | O | Video data output (Green) | Video data output (green) to D/A converter (video) (IC1013) |
| 81 | V_{DD} | I | Power supply terminal | 3.3V |
| 82 ┆ 84 | VD13 ┆ VD15 | O | Video data output (Green) | Video data output (green) to D/A converter (video) (IC1013) |
| 85 | V_{SS} | — | GND terminal | 0V |
| 86 ┆ 89 | VD16 ┆ VD19 | O | Video data output (blue) | Video data output (blue) to D/A converter (video) (IC1013) |
| 90 | V_{SS} | — | GND terminal | 0V |
| 91 ┆ 94 | VD20 ┆ VD23 | O | Video data output (blue) | Video data output (blue) to D/A converter (video) (IC1013) |
| 95 | CSYNC | O | Composite Sync. signal output | Output to the timing generator (IC1010) and RGB encoder (IC1014) (F=15.7kHz: NTSC, F=15.6kHz: PAL) |
| 96 | HSYNC | O | Horizontal Sync. signal output | Output to the timing generator (IC1010) and OSD (IC1016) (F=15.7kHz: NTSC, F=15.6kHz: PAL) |
| 97 | VOE | I | Video enable signal input | Not used connected to power supply |
| 98 | VCO V_{DD} | I | Power supply terminal | 3.3V |
| 99 | VCLK | I | Video read clock input |  F=27MHz (T=0.037μs) |
| 100 | VCO V_{SS} | — | GND terminal | 0V |
| 101 | $\overline{\text{RESET}}$ | I | Reset signal input | Active low reset signal from the system controller (IC301) |
| 102 | V_{SS} | — | GND terminal | 0V |
| 103 | CD-C2PO | I | Data Error Flag signal input | Accepts a flag signal when serial data error is uncorrectable |
| 104 | CD-LRCK | I | CD LR clock input |  F=87kHz (T=11.5μs) |

| Pin No. | Mark | I/O Division | Function description | Remarks |
|------------|------------------|--------------|-----------------------------------|---|
| 105 | CD-DATA | I | CD serial data input | F=2.822MHz (T=0.354μs) |
| 106 | CD-BCK | I | CD bit clock input |  F=2.822MHz (T=0.354μs) |
| 107 | DA-LRCK | O | Audio LR clock output |  F=87kHz (T=11.5μs) |
| 108 | DA-DATA | O | Audio serial data output | F=2MHz (T=0.5μs) |
| 109 | DA-BCK | O | Audio bit clock output |  F=2MHz (T=0.5μs) |
| 110 | V _{DD} | I | Power supply terminal | 3.3V |
| 111 | XCK | I | Audio read clock input |  F=16.9344MHz (T=0.059μs) |
| 112 | V _{DD} | I | Power supply terminal | 3.3V |
| 113 | PI12 | O | Soft interrupt signal output | Issued when IC1004 wants to transfer its own information to the sub-microcomputer (IC1001) |
| 114 | PI11 | — | — | Not used, open |
| 115 | PI10 | I | Host Enable signal input | Raised to high level |
| 116 | PI09 | I | Boot ROM Enable signal input | Raised to high level |
| 117 | PI08 | — | — | Not used, open |
| 118 | PI07 | O | DAC emphasis output | High frequency emphasis signal output |
| 119 122 | PI06 PI03 | — | — | Not used, open |
| 123 | V _{DD5} | I | Power supply terminal | 4.7V |
| 124 | PI02 | — | — | Not used, open |
| 125 | V _{SS} | — | GND terminal | 0V |
| 126 | PI01 | — | — | Not used, open |
| 127 | HA0 | I | Data/address mode switching input | Used to switch the mode for HD0~HD7 (address/data I/O) lines |
| 128 | HA1 | I | Data/address mode switching input | Used to switch the mode for HD0~HD7 (address/data I/O) lines |

• IC1010 (BU12102-0D): Timing generator

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|-----------------|--------------|--|--|
| 1 | GND | — | GND terminal | 0V |
| 2 | VOSCI | I | Video clock OSC input |  F=27MHz (T=0.037μs) |
| 3 | VOSCO | O | Video clock OSC output | |
| 4 | V _{DD} | I | Power supply terminal | 3.3V |
| 5 | VCLK | O | Video clock output |  F=27MHz (T=0.037μs) |
| 6 | DCLK | O | Pixel clock output |  F=13.5MHz (T=0.074μs) |
| 7 | OCLK | O | TV screen character display clock output |  F=6.75MHz (T=0.148μs) |
| 8 | HSYNC | I | Horizontal Sync. signal input | F=15.7kHz (T=63.5μs) NTSC F=15.6kHz (T=64μs) PAL |

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|---------------------------|--------------|---|---|
| 9 | $\overline{\text{CSYNC}}$ | I | Composite Sync. signal input | F=15.7kHz (T=63.5 μ s) (NTSC) F=15.6kHz (T=64 μ s) (PAL) |
| 10 | PDOWN | I | Power Down signal input | Active low selects power down mode |
| 11 | FSC | O | Subcarrier signal output | Subcarrier signal output to the OSD (IC1016) (F=3.58MHz: NTSC, F=4.43MHz: PAL) |
| 12 | V _{DD} | I | Power supply terminal | 3.3V |
| 13 | POSCI | I | Crystal OSC circuit input |  F=17.734475MHz (PAL) (T=0.056 μ s) |
| 14 | POSCO | O | Crystal OSC circuit output | |
| 15 | NOSCI | I | Crystal OSC circuit input |  F=14.31818MHz (NTSC) (T=0.07 μ s) |
| 16 | NOSCO | O | Crystal OSC circuit output | |
| 17 | GND | — | GND terminal | 0V |
| 18 | 4FSC | O | Frequency output 4 times the subcarrier frequency | F=14.31818MHz (T=0.07 μ s) (NTSC) F=17.734475MHz (T=0.06 μ s) (PAL) |
| 19 | $\overline{\text{VSYNC}}$ | O | Vertical Sync. signal output | Vertical Sync. signal output to the OSD (IC1016) |
| 20 | PALID | — | — | Not used, open |
| 21 | SWCNT | O | Switch control signal output | Signal output to the signal selector (IC1015) |
| 22 | CDNFMV | I | CD-DA audio line/video CD line switching signal input | Switching signal from the sub-microcomputer (IC1001) |
| 23 | XCK | O | Reference signal output |  F=16.9344MHz (T=0.059 μ s) |
| 24 | GND | — | GND terminal | 0V |
| 25 | XOSCO | O | Reference signal generator output |  F=16.9344MHz (T=0.059 μ s) |
| 26 | XOSCI | I | Reference signal generator input | |
| 27 | V _{DD} | I | Power supply terminal | 3.3V |
| 28 | XPC | O | Reference signal phase comparator output | SCK (Serial data bit clock) frequency is compared with one sixth the XCK (reference signal) frequency to lock the SCK frequency |
| 29 | FSSEL | — | GND terminal | 0V |
| 30 | SCKI | I | Serial data bit clock input | F=2.822MHz (T=0.354 μ s) |
| 31 | AIN | I | L/R Discrimination signal input |  F=87kHz (T=11.5 μ s) |
| 32 | BIN | I | Data Error Flag signal input | Accepts a flag signal when serial data error is uncorrectable |
| 33 | CIN | I | CD serial data input | CD serial data from the DSP (IC501) |
| 34 | GND | — | GND terminal | 0V |
| 35 | COUT | O | CD serial data output | Serial data output to MPEG video audio decoder (IC1004) |
| 36 | BOUT | O | Data Error Flag signal output | Accepts a flag signal when serial data error is uncorrectable |
| 37 | AOUT | O | CD LR clock output |  F=87kHz (T=11.5 μ s) |
| 38 | SCKOUT | O | CD bit clock |  F=2.822MHz (T=0.354 μ s) |
| 39 | V _{DD} | I | Power supply terminal | 3.3V |
| 40 | BBOUT | O | Blue back output | Applied to analog blue data input of RGB encoder (IC1014) |

| Pin No. | Mark | I/O Division | Function description | Remarks | | | | | | | | | | | | |
|---------|-------|--------------|-------------------------------------|---|--|------|-------|--------|---|---|-----|---|---|------|---|---|
| 41 | BBCNT | I | Blue back control signal input | Control signal from the sub-microcomputer (IC1001). The screen turns entirely blue when this signal is high | | | | | | | | | | | | |
| 42 | SCSEL | I | NTSC/PAL Selection signal input | <table border="1"> <thead> <tr> <th></th> <th>MODE</th> <th>SCSEL</th> </tr> </thead> <tbody> <tr> <td>PAL 60</td> <td>H</td> <td>L</td> </tr> <tr> <td>PAL</td> <td>L</td> <td>L</td> </tr> <tr> <td>NTSC</td> <td>—</td> <td>H</td> </tr> </tbody> </table> *NTSC is selected when SCSEL is high, no matter whether MODE is High or Low | | MODE | SCSEL | PAL 60 | H | L | PAL | L | L | NTSC | — | H |
| | MODE | SCSEL | | | | | | | | | | | | | | |
| PAL 60 | H | L | | | | | | | | | | | | | | |
| PAL | L | L | | | | | | | | | | | | | | |
| NTSC | — | H | | | | | | | | | | | | | | |
| 43 | MODE | I | | | | | | | | | | | | | | |
| 44 | VPC | O | Video clock phase comparator output | /HSYNC (horizontal sync.) frequency is compared with 4FSC (4 times the subcarrier frequency) to lock the former to the latter | | | | | | | | | | | | |

• IC1013 (MN6570TF): D/A converter (video)

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------------|------------------|--------------|--|---|
| 1 ┆ 4 | DG4 ┆ DG1 | I | Pixel (green) output (bits 1~4) | Pixel signals from MPEG video audio decoder (IC1004) |
| 5 | CLKG | I | Pixel (green) clock input | Clock signal (F=13.5MHz) from timing generator (IC1010) |
| 6 | DV _{SS} | — | Ground | 0V |
| 7 | DV _{DD} | I | Digital system power supply | 4.7V |
| 8 ┆ 15 | DB8 ┆ DB1 | I | Pixel (blue/chrominance) output (bits 2~7) | Pixel signals from MPEG video audio decoder (IC1004) |
| 16 | CLKR | I | Pixel (red) clock input | Clock signal (F=13.5MHz) from timing generator (IC1010) |
| 17 • 18 | AV _{DD} | I | Analog power supply | 4.7V |
| 19 | IREF | I | Internal reference current | Connected to power supply via a 1kΩ resistance |
| 20 | VREF | I | Internal reference voltage | Connected in parallel to power supply and ground via a 2.2kΩ resistance |
| 21 | COMP | I | Time constant setting | 1μF capacitor between terminal and power supply |
| 22 | VIB | I | Time constant setting | 0.1μF capacitor connected between terminal and ground |
| 23 | IOB | O | Analog RGB (blue) output | RGB signal for RGB encoder (IC1014) |
| 24 | NC | — | Ground | 0V |
| 25 | IOG | O | Analog RGB (green) output | RGB signal for RGB encoder (IC1014) |
| 26 | NC | — | Ground | 0V |
| 27 | IOR | O | Analog RGB (red) output | RGB signal for RGB encoder (IC1014) |
| 28 • 29 | AV _{SS} | — | Ground | 0V |
| 30 ┆ 37 | DR8 ┆ DR1 | I | Pixel (red/luminance) input (bits 1~8) | Pixel signals from MPEG video audio decoder (IC1004) |
| 38 | CLKB | I | Pixel (blue) clock input | Clock signal (F=13.5MHz) from timing generator (IC1010) |
| 39 | DV _{SS} | — | Ground | 0V |
| 40 | DV _{DD} | I | Power supply | 4.7V |
| 41 ┆ 44 | DG8 ┆ DG5 | I | Pixel (green) input (bits 0~3) | Pixel signals from MPEG video audio decoder (IC1004) |

• IC1014 (CXA1645M): RGB encoder

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|------------------|--------------|--|--|
| 1 | GND1 | — | Ground | 0V |
| 2 | RIN | I | Analog RGB (red) input | RGB signal from D/A converter (video) (IC1013) |
| 3 | GIN | I | Analog RGB (green) input | RGB signal from D/A converter (video) (IC1013) |
| 4 | BIN | I | Analog RGB (blue) input | RGB signal from D/A converter (video) (IC1013) |
| 5 | NC | — | Ground | 0V |
| 6 | SCIN | I | Subcarrier input | Subcarrier signal (F=3.58MHz) from timing generator (IC1010) |
| 7 | NPIN | I | NTSC/PAL mode switching | NTSC: "H" PAL: "L" |
| 8 | BFOUT | — | Output for BF pulse monitor | Not used, open |
| 9 | YCLPC | I | Y signal clamp time constant | 0.1 μ F capacitor connected between terminal and ground |
| 10 | SYNC IN | I | Composite sync signal When L ($\leq 0.8V$): Sync period | Sync signal from timing generator (IC1010) |
| 11 | NC | — | Not connected | Not used, open |
| 12 | V _{cc1} | I | Power supply | 5V |
| 13 | IREF | I | Internal reference current | 47k Ω resistance connected between terminal and ground |
| 14 | VREF | I | Internal reference voltage | 10 μ F capacitor connected between terminal and ground |
| 15 | COUT | — | Chroma signal output | Not used, open |
| 16 | YOUT | — | Y signal output | Not used, open |
| 17 | YTRAP | — | Cross color power supply regulated by subcarrier frequency component of Y signal | Not used, open |
| 18 | FO | O | Frequency adjust (fo) for internal filter | Resistance connected between terminal and ground in accordance with mode NTSC: 20k Ω ($\pm 1\%$) PAL: 16k Ω ($\pm 1\%$) |
| 19 | V _{cc2} | I | Power supply | 4.6V |
| 20 | CVOUT | O | Composite video signal output | Video signal from a video CD |
| 21 | BOUT | — | Analog RGB signal output | Not used, open |
| 22 | GOUT | — | Analog RGB signal output | Not used, open |
| 23 | ROUT | — | Analog RGB signal output | Not used, open |
| 24 | GND 2 | — | Ground | 0V |

• IC1016 (M35040056FPT): OSD

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------|-----------------|--------------|--------------------------------------|--|
| 1 | OSC1 | I | External network I/O for display OSC | The display OSC's oscillation frequency determines the horizontal display position and character width on the TV screen. OSC2 is not used and open |
| 2 | OSC2 | — | | |
| 3 | \overline{CS} | I | Chip select input | Set to Low during serial data transfer. Hysteresis input with internal pull-up resistor |
| 4 | SCK | I | Serial clock input | The SIN input reads serial data at the rising edge of SCK when the /CS input is low. Hysteresis input with internal pull-up resistor |

| Pin No. | Mark | I/O Division | Function description | Remarks |
|---------------|------------------------|--------------|------------------------|--|
| 5 | SIN | I | Serial data input | Accepts data and address for the display control register and display data memory. Hysteresis input with internal pull-up resistor |
| 6 | $\overline{\text{AC}}$ | I | Auto clear input | Clears the IC's internal logics when set to Low. Hysteresis input with internal pull-up resistor |
| 7 } 10 | P6 } P9 | — | — | Not used, open |
| 11 | V _{SS} | — | GND terminal | 0V |
| 12 | P0 | O | Port 0 output | Outputs TV screen display character data to pin 4 of the signal selector (IC1015) |
| 13 } 16 | P1 } P4 | — | — | Not used, open |
| 17 | P5 | O | Port 5 output | Outputs TV screen display character control signal to pin 5 of the signal selector (IC1015) |
| 18 | HOR | I | Horizontal Sync. input | Hysteresis input to accept H. Sync. signal from the MPEG video audio decoder (IC1004) |
| 19 | VERT | I | Vertical Sync. input | Hysteresis input to accept V. Sync. signal from the MPEG video audio decoder (IC1004) |
| 20 | V _{DD} | — | Power supply terminal | 3.3V |

• IC1007 (LH5317Y1): 512K PROM

| Pin No. | Mark | I/O Division | Function description | Remarks | | | | | | | | | | | | |
|------------------------|----------------------------|----------------|------------------------|--|------------------------|----------------------------|-------------|---|-------------|----------------|---|-----|----------------|---|-----|--------|
| 1 • 2 | A15 • A12 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 3 } 10 | A7 } A0 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 11 } 13 | D0 } D2 | I/O | Data output terminal | Control data output to MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 14 | GND | — | GROUND | 0V | | | | | | | | | | | | |
| 15 } 19 | D3 } D7 | I/O | Data output terminal | Control data output to MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 20 | $\overline{\text{CE}}$ | I | Chip enable input | <table border="1"> <thead> <tr> <th>$\overline{\text{CE}}$</th> <th>OE/$\overline{\text{OE}}$</th> <th>Data output</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>Do not care</td> <td>High impedance</td> </tr> <tr> <td>L</td> <td>L/H</td> <td>High impedance</td> </tr> <tr> <td>L</td> <td>H/L</td> <td>Output</td> </tr> </tbody> </table> <p>Connected to ground</p> | $\overline{\text{CE}}$ | OE/ $\overline{\text{OE}}$ | Data output | H | Do not care | High impedance | L | L/H | High impedance | L | H/L | Output |
| $\overline{\text{CE}}$ | OE/ $\overline{\text{OE}}$ | Data output | | | | | | | | | | | | | | |
| H | Do not care | High impedance | | | | | | | | | | | | | | |
| L | L/H | High impedance | | | | | | | | | | | | | | |
| L | H/L | Output | | | | | | | | | | | | | | |
| 21 | A10 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 22 | OE/ $\overline{\text{OE}}$ | I | Output enable input | Refer to the Remarks of pin No. 20 | | | | | | | | | | | | |
| 23 | A11 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 24 • 25 | A9 • A8 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 26 • 27 | A13 • A14 | I | Address input terminal | Address data from MPEG video audio decoder (IC1004) | | | | | | | | | | | | |
| 28 | V _{CC} | I | Power supply | 4.7V | | | | | | | | | | | | |

REPLACEMENT PARTS LIST

Notes: *Important safety notice:

 Components identified by Δ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

*Warning: This product uses a laser diode. Refer to caution statements on page 2.

*ACHTUNG: Die lasereinheit nicht zerlegen.

Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|-----------|--------------|---------------------------|---------|-------------|--------------|---------------------------|----------|
| | | INTEGRATED CIRCUIT(S) | | Q604 | UN5114TX | TRANSISTOR | |
| IC11 | AN8819NFB | DC-DC CONV. & MOTOR DRIVE | | Q605, 606 | UN5210TX | TRANSISTOR | |
| IC12 | S80745SND9T1 | RESET | | Q701, 702 | 2SD1328QRSTX | TRANSISTOR | |
| IC101 | AN8832SBE1 | SERVO AMP | | Q703, 704 | UN5210TX | TRANSISTOR | |
| IC301 | SC424683FU | SYSTEM CONT. & LCD DRIVE | | Q801 | 2SD1328QRSTX | TRANSISTOR | |
| IC371 | RCDRS-52 | REMOTE CONTROL SENSOR | | Q802 | 2SB1218QRSTX | TRANSISTOR | |
| IC501 | MN662740RE | SERVO PROCESSOR | | Q851 | FP106TL | TRANSISTOR | |
| IC701 | TDA1308TT | HEADPHONES AMP | | Q852 | UN5213TX | TRANSISTOR | |
| IC801 | UPD4053BGT1 | SIGNAL SELECTOR | | Q854 | UN5112TX | TRANSISTOR | |
| IC851 | FA7612NTE2 | DC-DC CONV. | | Q1001, 1002 | 2SD1819QRSTX | TRANSISTOR | |
| IC1001 | M38002M2300F | SUB MICROCOMPUTER | | Q1004 | 2SD1328-S | TRANSISTOR | |
| IC1002 | LH5168N8 | 64K SRAM | | Q1008 | UN5115TX | TRANSISTOR | |
| IC1004 | MN89101M | MPEG VIDEO AUDIO DECODER | | | | DIODE(S) | |
| IC1005 | MB81426070PJ | 4M DRAM | | D11 | D1FS4 | DIODE | |
| IC1007 | LH5317Y1 | 512K PROM | | D12 | MA741WKTX | DIODE | |
| IC1008 | NJM2115MT1 | VCO CONTROL | | D13 | MA141WKTX | DIODE | |
| IC1009 | MB81426070PJ | 4M DRAM | | D31 | MA143TX | DIODE | |
| IC1010 | BU12102-0D | TIMING GENERATOR | | D301 | MA141WKTX | DIODE | |
| IC1013 | MN6570TF | D/A CONVERTER | | D302-304 | SML-010MT87 | L. E. D. | |
| IC1014 | CXA1645M | RGB ENCODER | | D305 | MA141WATX | DIODE | |
| IC1015 | MM1227XFF | SIGNAL SELECTOR | | D306 | SML-010MT87 | L. E. D. | |
| IC1016 | M35040056FPT | OSD | | D372 | MA110TX | DIODE | |
| | | TRANSISTOR(S) | | D401 | D1FS4 | DIODE | |
| Q11 | FP106TL | TRANSISTOR | | D801 | MA110TX | DIODE | |
| Q12 | 2SD1819QRSTX | TRANSISTOR | | D851 | MA110TX | DIODE | |
| Q13 | UN5215TX | TRANSISTOR | | D1002 | MA304TX | DIODE | |
| Q14 | FMG6T148 | TRANSISTOR | | D1007 | MA304TX | DIODE | |
| Q31 | 2SD1758TLPQR | TRANSISTOR | | | | IC PROTECTOR(S) | |
| Q32 | 2SD1819QRSTX | TRANSISTOR | | ICP11 | UNH00500A | IC PROTECTOR | Δ |
| Q33 | 2SB1218QRSTX | TRANSISTOR | | | | VARIABLE RESISTOR(S) | |
| Q34-36 | 2SD1819QRSTX | TRANSISTOR | | | | | |
| Q37 | UN5213TX | TRANSISTOR | | VR701 | EVUT2EA25C54 | VOLUME | |
| Q38 | UN5114TX | TRANSISTOR | | VR851 | EVNDXAA00B13 | POWER SUPPLY VOLTAGE ADJ. | |
| Q201 | 2SB709QRSTX | TRANSISTOR | | | | COIL(S) AND BEADS | |
| Q301 | 2SD1819QRSTX | TRANSISTOR | | Z1003 | RLB0003 | BEADS | |
| Q302 | UN5114TX | TRANSISTOR | | Z1004 | RLBN102V-Y | BEADS | |
| Q371 | FMW1T98 | TRANSISTOR | | Z1007 | RLB0003 | BEADS | |
| Q372 | 2SB709QRSTX | TRANSISTOR | | Z1009 | RLB0003 | BEADS | |
| Q401 | 2SB970RSTX | TRANSISTOR | | | | | |
| Q601, 602 | 2SD1328QRSTX | TRANSISTOR | | | | | |
| Q603 | FMG4T148 | TRANSISTOR | | | | | |

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|------------|--------------|-----------------------------|---------|----------|-------------|-------------------------|---------|
| Z1018 | RLBN102V-Y | BEADS | | CN401 | RJT068W04V | CONNECTOR(4P) | |
| Z1024 | RLBN102V-Y | BEADS | | CN402 | RJT068W02V | CONNECTOR(2P) | |
| Z1028 | RLBN102V-Y | BEADS | | CN801 | RJS2A0630T | CONNECTOR(30P) | |
| L11, 12 | RLQB330KT-M | COIL | | CN1000 | RJS2A0630T | CONNECTOR(30P) | |
| L401 | RLQB330KT-M | COIL | | | | JACK(S) | |
| L851 | RLQB330KT-M | COIL | | | | | |
| L903 | RLB0003 | BEADS | | | | | |
| L914, 915 | RLB0003 | BEADS | | JK11 | RJJ43K06-C | DC IN JACK(9V) | |
| L917-923 | RLB0003 | BEADS | | JK601 | RJJD3S5ZB-C | AUDIO OUT JACK | |
| L925, 926 | RLB0003 | BEADS | | JK701 | RJJD3S5ZB-C | HEADPHONES JACK | |
| L928, 929 | RLB0003 | BEADS | | JK801 | RJJ33TY04-C | VIDEO OUT JACK | |
| L1001 | RLQM2R2KT2-W | COIL | | | | | |
| L1002 | RLQM121JT2-W | COIL | | | | | |
| L1003 | RLQU220KT-W | COIL | | | | | |
| L1004 | RLQM121JT2-W | COIL | | | | | |
| L1007 | RLQM121JT2-W | COIL | | | | | |
| L1008-1010 | RLQU220KT-W | COIL | | | | | |
| L1012 | RLQM1R8KT2-W | COIL | | | | | |
| L1013 | RLQM5R6KT2-W | COIL | | | | | |
| RJ1020 | RLBN102V-Y | BEADS | | | | | |
| | | OSCILLATOR(S) | | | | | |
| X501 | RSXC1693S01T | OSCILLATOR(16.93MHz) | | | | | |
| X1001 | RSXZ40M5S01T | OSCILLATOR(40.5MHz) | | | | | |
| X1002 | RSXC14M3S03M | OSCILLATOR(14.3MHz) | | | | | |
| X1003 | RSXC17M7S02M | OSCILLATOR(17.7MHz) | | | | | |
| | | LCD(S) | | | | | |
| LCD301 | EDD052CHOAHP | LCD | | | | | |
| | | SWITCH(ES) | | | | | |
| S201 | RSH1A91ZA-A | LASER ON/OFF | | | | | |
| S202 | SSH5 | REST DETECTOR | | | | | |
| S301 | EVQPJH05K | MENU, - | | | | | |
| S302 | EVQPJH05K | MENU, + | | | | | |
| S303 | RSG0024-A | STOP/OPERATION OFF | | | | | |
| S304 | EVQ21405R | MULTI OPERATION(PREV) | | | | | |
| S305 | EVQ21405R | MULTI OPERATION(NEXT) | | | | | |
| S306 | EVQ21405R | MULTI OPERATION(RETURN) | | | | | |
| S307 | EVQ21405R | MULTI OPERATION(SELECT) | | | | | |
| S308 | ESD11H220 | HOLD | | | | | |
| S801 | ESD11H230 | VIDEO FORMAT SELECTOR | | | | | |
| | | CONNECTOR(S) AND SOCKET(S) | | | | | |
| CN11 | RJC93015-1 | BATTERY TERMINAL(+) | | | | | |
| CN12 | RJC93015-1 | BATTERY TERMINAL(-) | | | | | |
| CN13 | RJH5102-1 | RECHARGEABLE BATT. TERMINAL | | | | | |
| CN101 | RJS1A6116 | SOCKET(16P) | | | | | |

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (μF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
 * Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

| Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks |
|-----------|--------------|------------------|-----------|--------------|------------------|-------------|--------------|------------------|
| | | RESISTORS | R202 | ERJ8GEYJ220V | 1/8W 22 | R719, 720 | ERJ6GEYJ561V | 1/10W 560 |
| | | | R203 | ERJ6GEYJ100 | 1/10W 10 | R721 | ERJ6GEYJ220 | 1/10W 22 |
| | | | R205-207 | ERJ8GEYJ220V | 1/8W 22 | R722 | ERJ6GEYJ181V | 1/10W 180 |
| L912, 913 | ERJ6GEYJ102V | 1/10W 1K | R301-303 | ERJ6GEYJ473V | 1/10W 47K | R723 | ERJ6GEYJ101V | 1/10W 100 |
| R11 | ERJ6GEYJ272V | 1/10W 2.7K | R304, 305 | ERJ6GEYJ103V | 1/10W 10K | R724 | ERJ6GEYJ220 | 1/10W 22 |
| R12 | ERJ6GEYJ473V | 1/10W 47K | R306-308 | ERJ6GEYJ151V | 1/10W 150 | R801 | ERJ6GEYJ223V | 1/10W 22K |
| R13, 14 | ERJ6GEYJ221V | 1/10W 220 | R309 | ERJ6GEYJ122V | 1/10W 1.2K | R802-804 | ERJ6GEYJ681V | 1/10W 680 |
| R15 | ERJ6GEYD562V | 1/10W 5.6K | R310 | ERJ6GEYJ224V | 1/10W 220K | R805 | ERJ6GEYJ222V | 1/10W 2.2K |
| R16 | ERJ6GEYJ822V | 1/10W 8.2K | R311 | ERJ6GEYJ683V | 1/10W 68K | R806 | ERJ6GEYJ223V | 1/10W 22K |
| R17 | ERJ6GEYJ103V | 1/10W 10K | R312 | ERJ6GEYJ151V | 1/10W 150 | R807 | ERJ6GEYJ474V | 1/10W 470K |
| R18 | ERJ6GEYJ474V | 1/10W 470K | R313, 314 | ERJ6GEYJ102V | 1/10W 1K | R851 | ERJ6GEYJ473V | 1/10W 47K |
| R19 | ERJ6GEYJ104V | 1/10W 100K | R316-319 | ERJ6GEYJ102V | 1/10W 1K | R852, 853 | ERJ6GEYJ101V | 1/10W 100 |
| R20 | ERJ6GEYJ102V | 1/10W 1K | R371 | ERJ6GEYJ562V | 1/10W 5.6K | R854 | ERJ6GEYJ223V | 1/10W 22K |
| R21 | ERJ6GEYD472V | 1/10W 4.7K | R372 | ERJ6GEYJ272V | 1/10W 2.7K | R855 | ERJ6GEYJ222V | 1/10W 2.2K |
| R22 | ERJ6GEYJ473V | 1/10W 47K | R373 | ERJ6GEYJ153V | 1/10W 15K | R856 | ERJ6GEYJ184V | 1/10W 180K |
| R23 | ERJ6GEYJ334V | 1/10W 330K | R374 | ERJ6GEYJ333V | 1/10W 33K | R857 | ERJ6GEYJ334V | 1/10W 330K |
| R24 | ERJ6GEYJ472V | 1/10W 4.7K | R375 | ERJ6GEYJ473V | 1/10W 47K | R858 | ERJ6GEYJ393V | 1/10W 39K |
| R25 | ERJ6GEYJ102V | 1/10W 1K | R401 | ERJ6GEYJ224V | 1/10W 220K | R859 | ERJ6GEYJ223V | 1/10W 22K |
| R26 | ERJ6GEYD183V | 1/10W 18K | R402 | ERJ6GEYJ103V | 1/10W 10K | R861 | ERJ6GEYJ273V | 1/10W 27K |
| R27 | ERJ6GEYD563V | 1/10W 56K | R403 | ERJ6GEYJ823 | 1/10W 82K | R902, 903 | ERJ3GEYJ221V | 1/16W 220 |
| R28 | ERJ6GEYD104V | 1/10W 100K | R404, 405 | ERJ6GEYJ682V | 1/10W 6.8K | R1001, 1002 | ERJ6GEYJ101V | 1/10W 100 |
| R29 | ERJ6GEYJ683V | 1/10W 68K | R406 | ERJ6GEYJ473V | 1/10W 47K | R1003 | ERJ6GEYJ105 | 1/10W 1M |
| R31 | ERJ6GEYJ102V | 1/10W 1K | R407 | ERJ6GEYJ272V | 1/10W 2.7K | R1004 | ERJ6GEYJ101V | 1/10W 100 |
| R32 | ERJ6GEYD224V | 1/10W 220K | R408 | ERJ6GEYJ393V | 1/10W 39K | R1005 | ERJ6GEYJ471V | 1/10W 470 |
| R33 | ERJ6GEYD564V | 1/10W 560K | R410 | ERJ6GEYJ392V | 1/10W 3.9K | R1006 | ERJ6GEYJ152V | 1/10W 1.5K |
| R34 | ERJ12YJR2H | 1/2W 1.2 | R411 | ERJ6GEYJ681V | 1/10W 680 | R1007, 1008 | ERJ6GEYJ473V | 1/10W 47K |
| R35 | ERJ6GEYJ391V | 1/10W 390 | R501 | ERJ6GEYJ220 | 1/10W 22 | R1010 | ERJ6GEYJ105 | 1/10W 1M |
| R36 | ERJ6GEYJ153V | 1/10W 15K | R502 | ERJ6GEYJ103V | 1/10W 10K | R1011 | ERJ6GEYJ392V | 1/10W 3.9K |
| R37 | ERJ6GEYJ472V | 1/10W 4.7K | R503 | ERJ6GEYJ473V | 1/10W 47K | R1015 | ERJ6GEYJ473V | 1/10W 47K |
| R38 | ERJ6GEYJ821V | 1/10W 820 | R504 | ERJ6GEYJ683V | 1/10W 68K | R1017 | ERJ6GEYJ105 | 1/10W 1M |
| R39 | ERJ6GEYJ333V | 1/10W 33K | R505 | ERJ6GEYJ471V | 1/10W 470 | R1018 | ERJ6GEYJ472V | 1/10W 4.7K |
| R40 | ERJ6GEYJ681V | 1/10W 680 | R506 | ERJ6GEYJ152V | 1/10W 1.5K | R1022 | ERJ6GEYJ101V | 1/10W 100 |
| R41 | ERJ6GEYJ331V | 1/10W 330 | R508 | ERJ6GEYJ105 | 1/10W 1M | R1023 | ERJ6GEYJ333V | 1/10W 33K |
| R42 | ERJ6GEYJ152V | 1/10W 1.5K | R509 | ERJ6GEYJ471V | 1/10W 470 | R1028 | ERJ6GEYJ104V | 1/10W 100K |
| R43 | ERJ6GEYJ104V | 1/10W 100K | R510 | ERJ6GEYJ220 | 1/10W 22 | R1029 | ERJ6GEYJ472V | 1/10W 4.7K |
| R44 | ERJ6GEYJ223V | 1/10W 22K | R601, 602 | ERJ6GEYJ102V | 1/10W 1K | R1030 | ERJ6GEYJ393V | 1/10W 39K |
| R45 | ERJ6GEYJ100 | 1/10W 10 | R603, 604 | ERJ6GEYJ473V | 1/10W 47K | R1032 | ERJ6GEYJ102V | 1/10W 1K |
| R46 | ERJ6GEYJ563V | 1/10W 56K | R605, 606 | ERJ6GEYJ561V | 1/10W 560 | R1036 | ERJ6GEYJ102V | 1/10W 1K |
| R47 | ERJ6GEYJ104V | 1/10W 100K | R607, 608 | ERJ6GEYJ681V | 1/10W 680 | R1038 | ERJ6GEYJ680V | 1/10W 68 |
| R101-104 | ERJ6GEYJ223V | 1/10W 22K | R609, 610 | ERJ6GEYJ332V | 1/10W 3.3K | R1039 | ERJ6GEYJ223V | 1/10W 22K |
| R105 | ERJ6GEYJ333V | 1/10W 33K | R613 | ERJ6GEYJ334V | 1/10W 330K | R1040-1042 | ERJ6GEYJ102V | 1/10W 1K |
| R106 | ERJ6GEYJ153V | 1/10W 15K | R614, 615 | ERJ6GEYJ271V | 1/10W 270 | R1043 | ERJ6GEYJ101V | 1/10W 100 |
| R109 | ERJ6GEYJ223V | 1/10W 22K | R701, 702 | ERJ6GEYJ104V | 1/10W 100K | R1044 | ERJ6GEYJ471V | 1/10W 470 |
| R110 | ERJ6GEYJ124V | 1/10W 120K | R703, 704 | ERJ6GEYJ1R5V | 1/10W 1.5 | R1045 | ERJ6GEYJ222V | 1/10W 2.2K |
| R111, 112 | ERJ6GEYJ103V | 1/10W 10K | R705, 706 | ERJ6GEYJ180V | 1/10W 18 | R1046 | ERJ6GEYJ471V | 1/10W 470 |
| R113 | ERJ6GEYJ101V | 1/10W 100 | R707, 708 | ERJ6GEYJ101V | 1/10W 100 | R1047, 1048 | ERJ6GEYJ102V | 1/10W 1K |
| R114 | ERJ6GEYJ330V | 1/10W 33 | R709, 710 | ERJ6GEYJ333V | 1/10W 33K | R1049 | ERJ6GEYJ222V | 1/10W 2.2K |
| R117 | ERJ6GEYJ474V | 1/10W 470K | R711, 712 | ERJ6GEYJ123V | 1/10W 12K | R1050, 1051 | ERJ6GEYJ471V | 1/10W 470 |
| R201 | ERJ6GEYJ223V | 1/10W 22K | R713, 714 | ERJ6GEYJ473V | 1/10W 47K | R1052 | ERJ6GEYJ680V | 1/10W 68 |

| Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks |
|-------------|--------------|------------------|-----------|--------------|------------------|-------------|--------------|------------------|
| R1053 | ERJ6GEYJ222V | 1/10W 2.2K | L924 | ERJ6GEYOR00V | CHIP JUMPER | C504 | ECUV1C104KBN | 16V 0.1U |
| R1054 | ERJ6GEYJ473V | 1/10W 47K | L927 | ERJ6GEYOR00V | CHIP JUMPER | C505 | ECUV1E223KBN | 25V 0.022U |
| R1055 | ERJ6GEYJ221V | 1/10W 220 | RJ1001 | ERJ6GEYOR00V | CHIP JUMPER | C506 | ECUV1C474KBM | 16V 0.47U |
| R1060 | ERJ3GED203V | 1/16W 20K | RJ1002 | ERJ6GEYOR00V | CHIP JUMPER | C507 | RCE0JSL470IX | 6.3V 47U |
| R1061 | ERJ3GED823V | 1/16W 82K | RJ1005 | ERJ3GEYOR00V | CHIP JUMPER | C509 | ECUV1C104ZFN | 16V 0.1U |
| R1062 | ERJ6GEYJ562V | 1/10W 5.6K | R315 | ERJ6GEYOR00V | CHIP JUMPER | C510 | ECUV1C333KBN | 16V 0.033U |
| R1063 | ERJ6GEYJ472V | 1/10W 4.7K | R715-718 | ERJ6GEYOR00V | CHIP JUMPER | C511 | ECUV1C104ZFN | 16V 0.1U |
| R1064 | ERJ6GEYJ332V | 1/10W 3.3K | R864 | ERJ6GEYOR00V | CHIP JUMPER | C512 | ECUV1H102KBN | 50V 1000P |
| R1065 | ERJ6GEYJ391V | 1/10W 390 | R901 | ERJ3GEYOR00V | CHIP JUMPER | C513 | ECUV1C104ZFN | 16V 0.1U |
| R1066 | ERJ6GEYJ334V | 1/10W 330K | R1073 | ERJ6GEYOR00V | CHIP JUMPER | C601, 602 | ECUV1H681KBN | 50V 680P |
| R1067 | ERJ6GEYJ472V | 1/10W 4.7K | R1096 | ERJ6GEYOR00V | CHIP JUMPER | C603, 604 | ECEA1CPD100I | 16V 10U |
| R1068 | ERJ6GEYJ102V | 1/10W 1K | R1098 | ERJ6GEYOR00V | CHIP JUMPER | C605, 606 | ECUV1H272KBN | 50V 2700P |
| R1069-1072 | ERJ6GEYJ101V | 1/10W 100 | | | | C607, 608 | ECUV1H102KBN | 50V 1000P |
| R1074, 1075 | ERJ6GEYJ101V | 1/10W 100 | | | CAPACITORS | C609 | RCE0GKS101IV | 4V 100U |
| R1076 | ERJ6GEYJ472V | 1/10W 4.7K | | | | C610, 611 | ECUV1C104ZFN | 16V 0.1U |
| R1077 | ERJ6GEYJ222V | 1/10W 2.2K | C11, 12 | RCE1CKA101IV | 16V 100U | C612 | ECUV1H102KBN | 50V 1000P |
| R1079, 1080 | ERJ6GEYJ472V | 1/10W 4.7K | C13 | RCE0JSA470IX | 6.3V 47U | C701, 702 | ECUV1H102KBN | 50V 1000P |
| R1081, 1082 | ERJ6GEYJ102V | 1/10W 1K | C14 | RCE0JKA101IV | 6.3V 100U | C703, 704 | ECEA0GPD221I | 4V 220U |
| R1083-1085 | ERJ6GEYJ472V | 1/10W 4.7K | C15 | ECUV1C104ZFN | 16V 0.1U | C705, 706 | ECUV1C473KBN | 16V 0.047U |
| R1087 | ERJ6GEYJ101V | 1/10W 100 | C16 | ECEA1EKA4R7I | 25V 4.7U | C711 | ECEA0GPD221I | 4V 220U |
| R1088 | ERJ3GEYJ101V | 1/16W 100 | C17 | RCE0JKA220IG | 6.3V 22U | C712 | ECEA0JPD101I | 6.3V 100U |
| R1089 | ERJ6GEYJ392V | 1/10W 3.9K | C18 | ECEA1EKA4R7I | 25V 4.7U | C801 | ECEA0GKA471I | 4V 470U |
| R1090 | ERJ6GEYJ563V | 1/10W 56K | C19 | ECUV1H472KBN | 50V 4700P | C802, 803 | ECUV1C104ZFN | 16V 0.1U |
| R1091 | ERJ6GEYJ122V | 1/10W 1.2K | C20 | ECUV1C104KBN | 16V 0.1U | C806 | ECUV1C224KBN | 16V 0.22U |
| R1092 | ERJ6GEYJ391V | 1/10W 390 | C21 | ECUV1E223KBN | 25V 0.022U | C807 | ECUV1H102KBN | 50V 1000P |
| R1093 | ERJ6GEYJ473V | 1/10W 47K | C22 | ECUV1H470KCN | 50V 47P | C851 | RCE0JSA470IX | 6.3V 47U |
| R1094 | ERJ6GEYJ821V | 1/10W 820 | C23 | ECUV1H391KBN | 50V 390P | C852 | RCE1CKA101IV | 16V 100U |
| R1097 | ERJ6GEYJ102V | 1/10W 1K | C24 | ECEA1HKN010I | 50V 1U | C853 | ECEA1EKA4R7I | 25V 4.7U |
| R1099 | ERJ6GEYJ104V | 1/10W 100K | C31 | ECUV1E223KBN | 25V 0.022U | C854 | ECUV1H102KBN | 50V 1000P |
| R1100 | ERJ6GEYJ272V | 1/10W 2.7K | C101, 102 | ECUV1C104KBN | 16V 0.1U | C855 | ECUV1C104ZFN | 16V 0.1U |
| R1101 | ERJ6GEYJ102V | 1/10W 1K | C103 | ECUV1E183KBN | 25V 0.018U | C856 | ECUV1H222KBN | 50V 2200P |
| R1103 | ERJ6GEYJ103V | 1/10W 10K | C104 | ECUV1E223KBN | 25V 0.022U | C858 | ECUV1H102KBN | 50V 1000P |
| R1104 | ERJ6GEYJ102V | 1/10W 1K | C105 | ECUV1C333KBN | 16V 0.033U | C859 | ECUV1C104ZFN | 16V 0.1U |
| R1105 | ERJ6GEYJ104V | 1/10W 100K | C106 | ECUV1H222KBN | 50V 2200P | C903 | ECUV1C104ZFN | 16V 0.1U |
| R1107, 1108 | ERJ6GEYJ391V | 1/10W 390 | C107 | ECUV1H152KBN | 50V 1500P | C1001, 1002 | ECUV1E104ZFN | 25V 0.1U |
| R1109, 1110 | ERJ6GEYJ473V | 1/10W 47K | C108 | ECUV1C473KBN | 16V 0.047U | C1003 | ECUV1H560KCN | 50V 56P |
| R1111 | ERJ3GEYJ391V | 1/16W 390 | C109 | ECUV1C333KBN | 16V 0.033U | C1005 | ECUV1H103KBN | 50V 0.01U |
| R1112 | ERJ3GEYJ103V | 1/16W 10K | C110 | ECUV1E103KBN | 25V 0.01U | C1006 | ECUV1H100DCN | 50V 10P |
| | | | C111 | ECUV1C333KBN | 16V 0.033U | C1007-1011 | ECUV1E104ZFN | 25V 0.1U |
| | | CHIP JUMPERS | C112 | ECUV1H331KBN | 50V 330P | C1012 | ECUV1H103KBN | 50V 0.01U |
| | | | C113-116 | ECUV1C104ZFN | 16V 0.1U | C1013-1015 | ECUV1E104ZFN | 25V 0.1U |
| Z1001, 1002 | ERJ8GEYOR00V | CHIP JUMPER | C201 | RCE0GKS470IV | 4V 47U | C1016 | ECUV1H330JCN | 50V 33P |
| Z1005 | ERJ8GEYOR00V | CHIP JUMPER | C301-306 | ECUV1C104ZFN | 16V 0.1U | C1018, 1019 | ECUV1E104ZFN | 25V 0.1U |
| Z1014, 1015 | ERJ6GEYOR00V | CHIP JUMPER | C371 | ECST1AY225RR | 10V 2.2U | C1021, 1022 | ECUV1E104ZFN | 25V 0.1U |
| Z1017 | ERJ6GEYOR00V | CHIP JUMPER | C372 | ECUV1C104ZFN | 16V 0.1U | C1023 | ECEV1CA100R | 16V 10U |
| Z1020 | ERJ8GEYOR00V | CHIP JUMPER | C401 | RCE1CKA470IV | 16V 47U | C1026 | ECUV1H102KBN | 50V 1000P |
| Z1023 | ERJ8GEYOR00V | CHIP JUMPER | C402 | RCE1ASA330IX | 10V 33U | C1027 | ECUV1H103KBN | 50V 0.01U |
| Z1026 | ERJ8GEYOR00V | CHIP JUMPER | C403 | ECUV1C104ZFN | 16V 0.1U | C1031 | ECUV1E104ZFN | 25V 0.1U |
| Z1029 | ERJ8GEYOR00V | CHIP JUMPER | C404 | ECUVNC105ZFN | 16V 1U | C1032 | ECUV1H220JCV | 50V 22P |
| L901, 902 | ERJ6GEYOR00V | CHIP JUMPER | C405 | ECUV1E103KBN | 25V 0.01U | C1033 | ECUV1H470KCN | 50V 47P |
| L904-911 | ERJ6GEYOR00V | CHIP JUMPER | C501, 502 | ECUV1H120JCN | 50V 12P | C1034 | ECUV1E104ZFN | 25V 0.1U |
| L916 | ERJ6GEYOR00V | CHIP JUMPER | C503 | ECUV1H561KBN | 50V 560P | C1035, 1036 | ECUV1H102KBN | 50V 1000P |

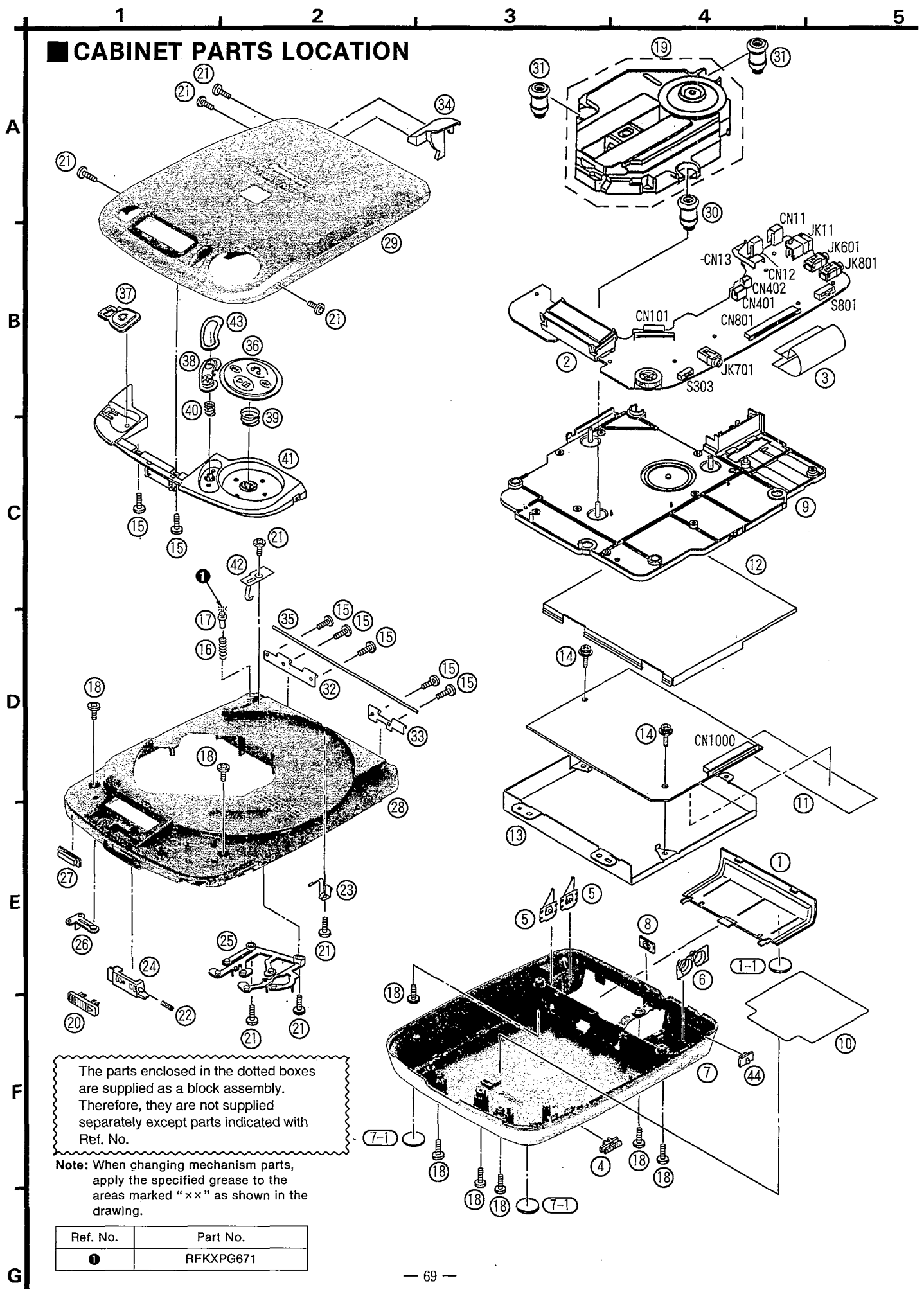
| Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks | Ref. No. | Part No. | Values & Remarks |
|-------------|--------------|------------------|-------------|--------------|------------------|-------------|--------------|------------------|
| C1037 | ECUV1E104ZFN | 25V 0.1U | C1067 | ECUV1H560KCN | 50V 56P | C1088 | ECUV1H100DCN | 50V 10P |
| C1038 | ECUV1H180JCN | 50V 18P | C1068 | ECUV1E104ZFN | 25V 0.1U | C1089 | ECUV1H102KBN | 50V 1000P |
| C1039, 1040 | ECUV1E104ZFN | 25V 0.1U | C1069 | ECUV1H470KCN | 50V 47P | C1090-1092 | ECUV1E104ZFN | 25V 0.1U |
| C1042 | ECUV1E104ZFN | 25V 0.1U | C1070 | ECUV1H180JCN | 50V 18P | C1095, 1096 | ECEVOJA101P | 6.3V 100U |
| C1043 | ECUV1H103KBN | 50V 0.01U | C1071 | ECUV1H220JCN | 50V 22P | C1097 | ECUV1C104KBN | 16V 0.1U |
| C1050 | ECUV1H560KCN | 50V 56P | C1072 | ECUV1H180JCN | 50V 18P | C1098 | ECUV1E104ZFN | 25V 0.1U |
| C1051 | ECEVOJA101P | 6.3V 100U | C1073 | ECUV1H270KCN | 50V 27P | C1099 | ECUV1H030DN | 50V 3P |
| C1052 | ECUV1H560KCN | 50V 56P | C1074 | ECEV1HA010R | 50V 1U | C1100 | ECUV1H080DCN | 50V 8P |
| C1053 | ECEVOJA101P | 6.3V 100U | C1075 | ECUV1E104ZFN | 25V 0.1U | C1102 | ECUV1C104ZFN | 16V 0.1U |
| C1054-1058 | ECUV1E104ZFN | 25V 0.1U | C1076 | ECEVOJA101P | 6.3V 100U | C1103 | ECUV1H100DCN | 50V 10P |
| C1059 | ECEV1CA100R | 16V 10U | C1077 | ECUV1E104ZFN | 25V 0.1U | C1104 | ECUV1E104ZFN | 25V 0.1U |
| C1060 | ECUV1H560KCN | 50V 56P | C1078 | ECEVOJA101P | 6.3V 100U | C1105 | ECEV1CA100R | 16V 10U |
| C1062 | ECUV1H560KCN | 50V 56P | C1080 | ECUV1E104ZFN | 25V 0.1U | C1106-1108 | ECUV1H330KCV | 50V 33P |
| C1063 | ECUV1H101KCN | 50V 100P | C1082 | ECEV1CA100R | 16V 10U | C1110 | ECUV1H100DCV | 50V 10P |
| C1064 | ECUV1E104ZFN | 25V 0.1U | C1083, 1084 | ECUV1E104ZFN | 25V 0.1U | C1111 | ECUV1H220JCN | 50V 22P |
| C1065 | ECUV1H560KCN | 50V 56P | C1086 | ECUV1E104ZFN | 25V 0.1U | C1112 | ECUV1C104ZFN | 16V 0.1U |

REPLACEMENT PARTS LIST

Notes: *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|-------------------------|---------|----------|--------------|----------------------------|---------|
| | | CABINET AND CHASSIS | | 20 | RGU1215-H | OPEN KNOB | |
| 1 | RFKMLVP50-K | BATTERY COVER ASS'Y | | 21 | RHE5079YA | SCREW | |
| 1-1 | RKA0063-K | FOOT | | 22 | RMB0389 | OPEN KNOB RETURN SPRING | |
| 2 | RJF0022 | LCD HOLDER | | 23 | RMCO259 | EARTH PLATE | |
| 3 | REZO750-1 | FFC(30P) | | 24 | RML0365 | LOCK LEVER | |
| 4 | RGV0145-K | HOLD KNOB | | 25 | RMRO836-K1 | SWITCH MOVING PIECE (1) | |
| 5 | RJC93021 | COMMON BATTERY TERMINAL | | 26 | RMRO837-K | SWITCH MOVING PIECE (2) | |
| 6 | RJC93022 | COMMON BATTERY TERMINAL | | 27 | RMRO842-Q | REMOTE CONTROL FILTER | |
| 7 | RFKJLVP50EBK | BOTTOM CABINET ASS'Y | (EB) | 28 | RFKMLVP50EGK | INTERMEDIATE CABINET ASS'Y | |
| 7 | RFKJLVP50EGK | BOTTOM CABINET ASS'Y | (EG) | 29 | RFKMLVP50EGK | CD COVER ASS'Y | |
| 7-1 | RKA0063-K | FOOT | | 30 | RXQ0321 | FLOATING RUBBER(1) | |
| 8 | RMA0677 | REAR ORNAMENT PLATE | | 31 | RXQ0322 | FLOATING RUBBER(2) | |
| 9 | RMRO841-K | MECHA. CHASSIS | | 32 | RMA0846 | SHAFT PLATE (A) | |
| 10 | RMZO342 | INSULATING SHEET | | 33 | RMA0847 | SHAFT PLATE (B) | |
| 11 | RMZO343 | INSULATING SHEET | | 34 | RMRO839-K | FULL-OPEN BASE | |
| 12 | RFKMLVP50KA | SHIELD PLATE (1) | | 35 | RMS0495 | SHAFT | |
| 13 | RFKMLVP50KB | SHIELD PLATE (2) | | 36 | RGU1216-K | OPERATION BUTTON(1) | |
| 14 | XYC26+JF6 | SCREW | | 37 | RGU1217-K | OPERATION BUTTON(2) | |
| 15 | RHE5097ZA | SCREW | | 38 | RGU1218-K2 | OPERATION BUTTON(3) | |
| 16 | RMB0390 | SPRING | | 39 | RMB0391 | SPRING | |
| 17 | RMS0462 | PUSH SHAFT | | 40 | RMB0392-2 | SPRING | |
| 18 | XTN17+6GFZ | SCREW | | 41 | RMRO840-K1 | BUTTON COVER | |
| 19 | RFKNLS180-K | TRAVERSE DECK | | 42 | RMCO279 | BRAKE SPRING | |
| | | | | 43 | RMZO350 | BUTTON SHEET | |
| | | | | 44 | RGU1214-K | VIDEO FORMAT SELECTOR KNOB | |

CABINET PARTS LOCATION



The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately except parts indicated with Ref. No.

Note: When changing mechanism parts, apply the specified grease to the areas marked "x" as shown in the drawing.

| Ref. No. | Part No. |
|----------|-----------|
| 1 | RFKXPG671 |

REPLACEMENT PARTS LIST

Notes: *Important safety notice:
 Components identified by Δ mark have special characteristics important for safety.
 Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
 When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
 *The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
 Parts without these indications can be used for all areas.
 *Remote Control Ass'y: Supply period for three years from termination of production.

| Ref. No. | Part No. | Part Name & Description | Remarks | Ref. No. | Part No. | Part Name & Description | Remarks |
|----------|--------------|----------------------------|---------------------|----------|------------|-----------------------------------|---------|
| | | PACKING MATERIAL | | | | TEST DISC | |
| P1 | RPK0570 | PACKING CASE | | SA1 | SZZP1054C | PLAYABILITY TEST DISC | |
| P2 | RPF0171 | PROTECTION BAG (UNIT) | | SA2 | SZZP1056C | UNEVEN TEST DISC | |
| P3 | RPF0046 | PROTECTION BAG (F. B.) | | | | ALLEN WRENCH | |
| P4 | RPH0168 | MIRROR SHEET | | SA3 | SZZP1101C | ALLEN WRENCH(M2.0) | |
| | | ACCESSORIES | | | | LOCK PAINT | |
| A1 | RQT2876-B | INSTRUCTION MANUAL | (EB) | SA4 | RZZ0L01 | LOCK PAINT | |
| A1 | REKSLVP50EGK | INSTRUCTION MANUAL ASS'Y | (EG) | | | GREASE | |
| A2 | RQA0013 | WARRANTY CARD | | SA5 | RFKXPG671 | MOLYCOAT GREASE PG671 | |
| A3 | RQCB0169 | SERVICENTER LIST | | | | <PRINTED CIRCUIT BOARDS ASS'Y> | |
| A4 | RAK-SL408WH | REMOTE CONTROL TRANSMITTER | | PCB1 | REP1992B-M | MAIN P. C. B. | (RTL) |
| A4-1 | RKK0080-H | BATTERY COVER | FOR R/C TRANSMITTER | PCB2 | REP2118B-T | VIDEO P. C. B. | (RTL) |
| A5 | RFEA903B-W | AC ADAPTOR | (EB) Δ | | | | |
| A5 | RFEA903E-W | AC ADAPTOR | (EG) Δ | | | | |
| A6 | RJL3X001X15 | CONNECTION CABLE | | | | | |
| A7 | VFA0151-1 | 21 PIN ADAPTOR | | | | | |
| | | <GREASE OR JIG/TOOL> | | | | | |

• The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

PACKAGING

