

TOSHIBA

FILE NO. 810-200213

SERVICE MANUAL

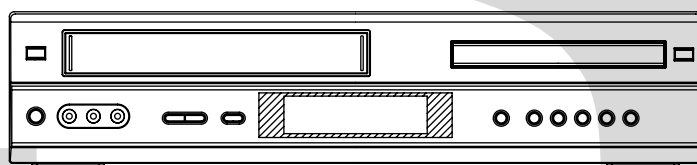


DVD VIDEO PLAYER & VIDEO CASSETTE RECORDER

SD-22VB

SD-22VE

SD-22VL



OCT., 2002

Specifications

GENERAL

Power supply:	AC 230-240V 50Hz
Power consumption:	Operation: 23W Stand by: 7W
Weight:	4.5 kg
Dimensions:	Width : 430 mm Height : 99 mm Depth : 314.5 mm
Input Level:	SCART-socket: VIDEO: 1 Vp-p, 75 Ω AUDIO: 500 mV, 50 k Ω
Output Level:	SCART-socket: VIDEO: 1 Vp-p, 75 Ω AUDIO: 500 mV, 1 k Ω Audio OUT jack: 500 mV, 1 k Ω
Hi-Fi Frequency Response:	20Hz to 20,000Hz
Hi-Fi Dynamic Range:	More than 75dB

VCR section

Video Head:	4 Rotary Heads
Audio Track:	Hi-Fi Sound - 2 Tracks / MONO Sound - 1 Track
Channel coverage:	2-12, X, Y, Z, S1-S41, 21-69
RF Channel Output:	UHF channel 36 (23 to 69)
F.FWD/REW Time at 25°C:	Approx. 1minute and 48 seconds (with E-180 Cassette Tape)

DVD section

Signal system:	PAL
Applicable disc:	DVD (12cm, 8cm), CD (12cm, 8cm)
Audio characteristics:	DVD: 4Hz - 22KHz CD: 4Hz - 20KHz
Frequency response:	90dB
S/N Ratio:	0.1%
Harmonic distortion:	Below Measurable Level
Wow and flutter:	90dB
Dynamic range:	Audio : (RCA) 500 mV, 1Kohm Digital Audio : 0.5Vp-p/75 ohm
Output:	CD : Wavelength: 775 - 805 nm Maximum output power: 0.5 mW
Pickup:	DVD : Wavelength: 640 - 660 nm Maximum output power: 1.0 mW

ACCESSORIES:

Remote control x 1
75 ohm Coaxial Cable x 1
Battery AAA x 2

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TOSHIBA

DVD PLAYER

SD-22VB

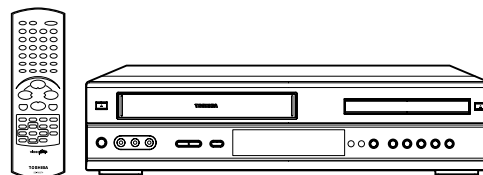
USER'S GUIDE

Hi-Fi VIDEO CASSETTE RECORDER

VHS SGPB

4 HEAD

Hi-Fi



Safety Precautions

SAFETY FIRST

The rating plate and the safety caution are on the rear of the unit.

WARNING: DANGEROUS VOLTAGE INSIDE

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT

- Please read the various precautions on page 2 and 3 before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

IMPORTANT

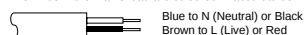
Connection to the mains supply in the United Kingdom. DO NOT cut off the mains plug from this equipment. If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain a proper safety approved extension lead/adaptor or consult your dealer. **In the unlikely event of the plug fuse failing be sure to replace the fuse only with an identical approved type, as originally fitted, and to replace the fuse cover. If the fuse fails again consult your nearest dealer.**

If nonetheless the mains plug is cut off remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not supplied fitted with a mains plug then follow the instructions given below:

DO NOT make any connection to the Larger Terminal coded E or Green.

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



If these colours do not correspond with the terminal identifications of your plug, connect as follows:

Blue wire to terminal coded N (Neutral) or coloured Black.

Brown wire to terminal coded L (Live) or coloured Red.

If in doubt - consult a competent electrician.

The STANDBY/ON button does not completely shut off mains power from the unit, but switches operating current on and off. "O" shows electrical power standby and "I" shows ON.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

MOISTURE CONDENSATION

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions-just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

Safety Precautions

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

This equipment has been designed and manufactured to meet international safety standards but, like any electrical equipment, care must be taken if you are to obtain the best results and safety is to be assured.

DO read the operating instructions before you attempt to use the equipment.

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

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

DO be careful with glass panels or doors on equipment

DON'T remove any fixed cover as this may expose dangerous voltages.

DON'T obstruct the ventilation openings of the equipment with items such as newspapers, tablecloths, curtains, etc. Overheating will cause damage and shorten the life of the equipment.

DON'T allow electrical equipment to be exposed to dripping or splashing, or objects filled with liquids, such as vases, to be placed on the equipment.

DON'T place hot objects or naked flame sources such as lighted candles or nightlights on, or close to equipment. High temperatures can melt plastic and lead to fires.

DON'T use makeshift stands and NEVER fix legs with wood screws - to ensure complete safety always fit the manufacturer's approved stand or legs with the fixings provided according to the instructions.

DON'T use equipment such as personal stereos or radios so that you are distracted from the requirements of traffic safety. It is illegal to watch television whilst driving.

DON'T listen to headphones at high volume, as such use can permanently damage your hearing.

DON'T leave equipment switched on when it is unattended unless it is specifically stated that it is designed for unattended operation or has a stand-by mode. Switch off using the switch on the equipment and make sure that your family know how to do this. Special arrangements may need to be made for infirm or handicapped people.

DON'T continue to operate the equipment if you are in any doubt about it working normally, or if it is damaged in any way -switch off, withdraw the mains plug and consult your dealer.

ABOVE ALL

—NEVER let anyone especially children push anything into holes, slots or any other opening in the case - this could result in a fatal electrical shock;

**—NEVER guess or take chances with electrical equipment of any kind
—it is better to be safe than sorry!**

Features

Video Cassette Recorder

- High Quality (HQ) Images
- On-Screen Displays (OSD)
- Nicam Hi-Fi Stereo Audio Recording and Playback
- Auto TV Station Tuning and Auto Clock Set
- 80 Memory for presets
- Auto Time Setting
- 30 Minute Back-Up in case of Power failure
- 6 Rotary Head (4 Video Head and 2 Hi-Fi Audio Head)
- Long play
- Programme Delivery Control System
- Timer Recording of up to 8 Programme per Month
- VIDEO Plus+® rapid timer programming
- One-touch Timer Recording (OTR)
- Video index Search System
- Slow Motion
- NTSC Video Cassette Tape Playback on PAL TV
- Real-Time Tape Counter with ZERO RETURN-Function

- Digital AUTO Tracking (ATR Function)
- Repeat Playback
- On-Screen Display in 3 Language
- AV-Front input jack
- Audio Mixing

DVD Player

- Digital Audio Jack (Coaxial)
- Multi-Language
- Multi-Angle
- Surround audio
- Repeat Playback
- Memory/Random Playback
- Zoom
- Video Aspect Ratio
- Parental Control
- 3 Scene memory
- Digital (Optical or Coaxial) output for Dolby Digital (AC-3) and DTS
- Playback of DVD, Video-CD and Audio-CD
- PAL & NTSC DVDs playback
- A-B Repeat playback
- MP3 CD playback



- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SGPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- VIDEO Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VIDEO Plus+ system is manufactured under license from Gemstar Development Corporation.

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Additional information

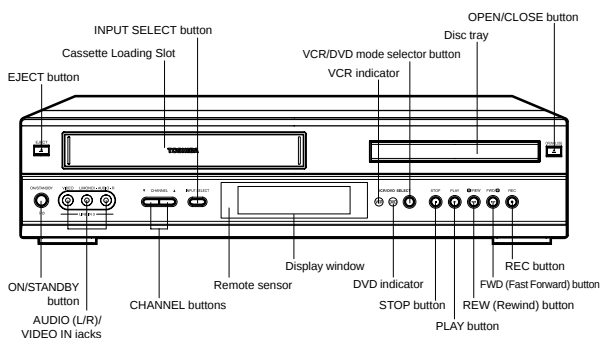
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- * Manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories. Confidential unpublished works. © 1992-1997 Dolby Laboratories, Inc. All rights reserved.
- * "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.
- * Certain audio features of this product manufactured under license from Desper Products, Inc. Spatializer and the circle - in - square device are trademarks owned by Desper Products, Inc.
- * Unauthorized recording of copyrighted television programs, films, video cassettes and other materials may infringe the rights of copyright owners and be contrary to copyright laws.

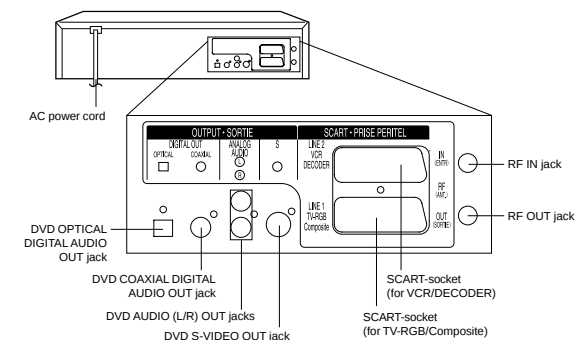
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Parts and functions

Front



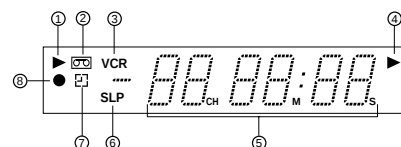
Rear



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Display

Display window

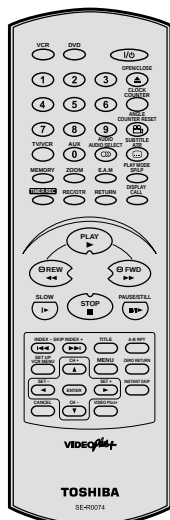


No.	Display	Description
1	▶	Play indicator (VCR)
2	▶	Video tape is in the unit
3	VCR	VCR mode of TV/VCR switch
4	▶	Play indicator (DVD)
5	10 : 00	Clock display (colon [:] flashes)
6	01:00:00	Counter display by hour/minute/second
7	tr 2	Track number display for CD
8	2 CH	TV channel position display
9	L1/L2/L3	External input display
10	SP	Tape speed indicator (VCR)
11	▶	Timer recording display
12	●	Normal recording display (flashes during Recording PAUSE mode)

Note:
Some discs may be displayed wrong or e.g. chapter number, playback time, etc. may not be displayed.

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Remote control



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Remote control

How to install the batteries

Use micro batteries type AAA.

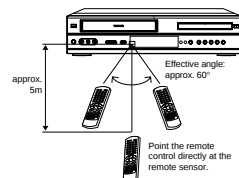
- 1 Slide the battery compartment cover in the direction of the arrow.
- 2 Install two "AAA" batteries (supplied), paying attention to the polarity diagram in the battery compartment.
- 3 Replace the compartment cover.

Battery precautions

The precautions below should be followed when using batteries in this device:

- 1 Use only the size and type of batteries specified.
- 2 Be sure to follow the correct polarity when installing the batteries as indicated in the battery compartment. Reversed batteries may cause damage to the device. To avoid a potential short circuit, insert the "+" end first.
- 3 Do not mix different types of batteries together (e.g. Alkaline and Carbon-zinc) or old batteries with fresh ones.
- 4 If the device is not to be used for a long period of time, remove the batteries to prevent damage or injury from possible battery leakage.
- 5 Do not try to recharge batteries not intended to be recharged; they can overheat and rupture.

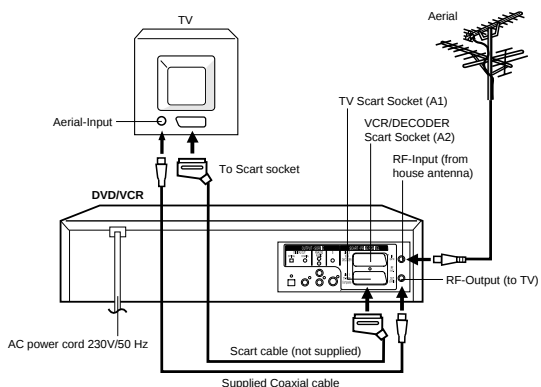
Distance of Remote Control Operation



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Connections and Installation

Connect your DVD/VCR to your home's aerial and to your TV-set as shown in the illustration.
When you have finished these connections you connect your DVD/VCR to the 230-240 V / 50 Hz mains.



Connect a TV with the Scart socket

In addition to the coaxial cable connection, connect also with scart cable. The picture and sound will be transmitted best through the scart cable. In this case, the TV need not be tuned to the video recorder. The Video channel also need not be tuned. The video recorder switch the television to video operation through the scart cable automatically. The stereo-playback is possible in only case through a scart cable!

If your TV-set does not switch to video-playback operation automatically, please turn your TV's video switch to VIDEO position manually.

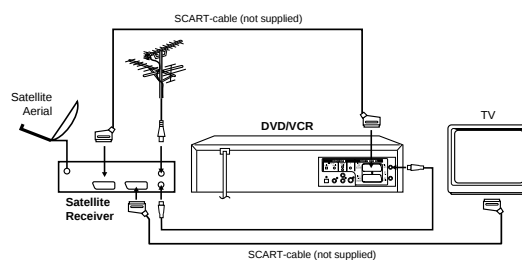
10

Playback connection

The exact arrangement you use to interconnect various video and audio components to the DVD/VCR is dependent on the model and features of each component. Check the Owner's Manual provided with each component for the location of SCART socket.

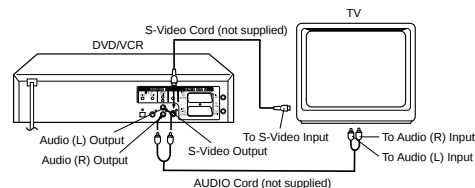
Connection to a Satellite Receiver

If a Satellite Receiver is used, we recommend the following configuration:



To record from Satellite Receiver press "AUX" on the remote control of DVD/VCR twice. "A2" will appear on the front display. Select the desired TV-program at Satellite Receiver.

Connect to a TV with S-Video Output



Notes:

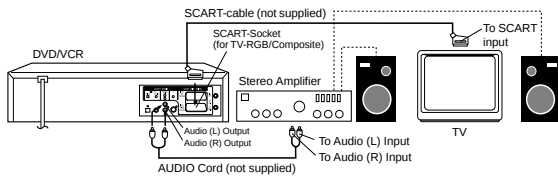
- The S-VIDEO jack is useful only for DVD section.
- If you use the connection with S-Video Cord, set the "Video Out Select" (P.40) to "Video".

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Playback connection

Connect to a Stereo Amplifier with Audio Output

If your DVD/VCR is connected to a stereo amplifier, the video soundtrack can output through the loudspeakers of the stereo system.

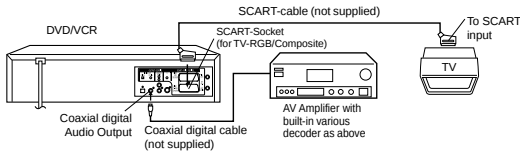


Connect to an AV Amplifier with built-in digital surround

If you are using an Amplifier with a built-in digital surround as follows, you can enjoy the various audio systems such as Dolby Digital and DTS by using the Coaxial Digital Output.

Use this connection to connect an:

- AV amplifier with built-in *Dolby Digital decoder
- AV amplifier with built-in *DTS decoder



Connecting the optical digital cable

You may connect to an AV Amplifier with an Optical digital cable (not supplied) instead of a Coaxial digital cable.

When you connect the optical digital cable (not supplied), remove the dust protection cap from the rear panel. When not using the optical digital cable, attach the dust protection cap to protect against dust.

NOTES:

- The OPTICAL, COAXIAL jacks are useful only for DVD section.
- VHS signal is output only from the SCART-sockets, AUDIO L/R jacks and RF OUT jack.
- When you make the connections above, do not set DOLBY DIGITAL to DOLBY DIGITAL or DTS to ON on the AV Amplifier. If you do, a loud noise will suddenly come out from the speakers, affecting your ears or causing the speakers to be damaged.
- DTS audio will be output only from the COAXIAL output. To hear DTS audio, DTS-Decoder is necessary.
- When playing DTS-encoded CDs, only noise will be heard from the speakers or analogue stereo outputs.
- Some DTS decoders which do not support DVD-DTS interface may not work properly with the unit.

Tuning the TV Stations and Setting the Time and Date Automatically

Plug your DVD/VCR into the mains supply and it will start to automatically tune itself in and set the correct date and time. After setting itself up, you must set the TV to the video channel.

Preparation

- Make sure that your DVD/VCR is connected properly to the TV.
- If a satellite receiver is connected with the coaxial lead, make sure it's switched ON and set to SKY ONE.
- Turn on the TV and select the channel you wish to allocate for video use.

1 Plug your DVD/VCR's plug into the mains supply. "Auto" will start to flash in the display. Your DVD/VCR will automatically tune itself in and set the correct time and date (This may take approx. 4 minutes).

2 Press and hold the **CH** button on the front of your DVD/VCR in the Standby mode until "RF" and RF output channel "36" will appear in the display.

3 If you have used a 21PIN scart lead you now, simply select the AV channel on your TV and go to step 5. Tune the TV in the same way as tuning in a TV broadcast station until the word "TEST" flashes on the TV screen. Refer to the TV operating instructions for tuning.

Now the output from the DVD/VCR is tuned to this channel. Whenever you want to play back a tape, select this channel.

4 If there is interference in the picture (wavy lines, picture roll, etc.), press **CHANNEL** on your DVD/VCR to select any RF channel between 23 and 69, returning your TV until the word "TEST" flashes on the TV screen.

If you connected a satellite receiver as explained on page 11, you must switch off the DVD/VCR's transmitter. Press the VCR's **CHANNEL** repeatedly until OFF appears in the display window (OFF will appear after 69 or before 23).

5 Press the **CH** button to turn OFF the DVD/VCR.

Now the TV is tuned to your DVD/VCR.

To skip a channel position

Unwanted channels can be skipped so that they cannot be called up by pressing **CHANNEL**. Select the channel to be skipped.

...e.g. channel 29. Select channel 29, then press

CANCEL. This channel's number will be flashing. That way you can cancel further channels one after the other.

Notes:

- The DVD/VCR automatically corrects the clock setting every hour and automatically adjusts the clock setting for Daylight Saving Time.
- Your DVD/VCR will tune the TV stations as follows.

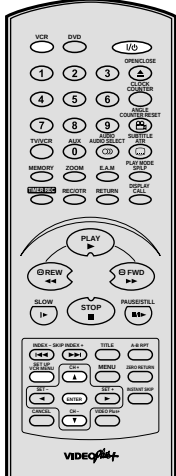
- CH 1 BBC 1
- CH 2 BBC 2
- CH 3 ITV
- CH 4 Channel 4
- CH 5 Channel 5
- CH 6 Satellite
- CH 7 etc.

For VIDEO Plus+ recording to work correctly, this order should not be changed.

- If you want to change the RF output channel or switch to "OFF", press and hold the DVD/VCR **CH** on the front of your DVD/VCR in the Standby mode until the current RF output channel appears. Press **CHANNEL** on your DVD/VCR to select the RF channel you desire.
- Skipped channels still may be selected directly through the **1 to 0** keys.
- To cancel skipping select the skipped channel using the **1 to 0** keys, then press **CANCEL**. The channel No. does not blink any longer, and the channel No. now may be selected again using **CHANNEL**.

On-screen Language Selection

Turn on your TV and select the VCR channel which you have already tuned on your TV. The TV will switch to AV (VCR mode) automatically by the SCART lead connection. The on-screen menu can display any of three languages; English, German and French.



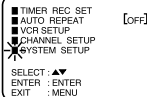
Notes:

- If the unit does not operate properly, or No key operation (by the unit and / or the remote control): Static electricity, etc., may affect the player's operation. Disconnect the AC power cord once, then connect it again.
- If you use the unit for the first time and press **VCR MENU**, instead of the **MENU** screen in steps 1 and 2, the one in step 3 may appear. This is normal for this DVD/VCR and is no indication of a malfunction. Please first select the language to operate this unit.

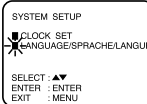
Preparation

- Press the **I/O** button to turn on the DVD/VCR.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

1 Press **VCR MENU**. Press **▲** or **▼** to select the **SYSTEM SETUP**. Then press **ENTER**.



2 Press **▲** or **▼** to select the **LANGUAGE**. Then press **ENTER**.



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



4 Press **VCR MENU** repeatedly until the TV picture appears on the screen.

Setting the Time and Date Manually

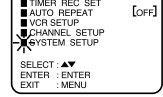
You must set the date and time manually for timer recordings if Automatic tuning process did not set them correctly.

Preparation

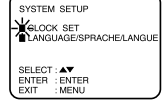
- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

Example: Setting the clock to 11:30, 26 Oct. 2002.

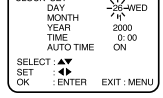
1 Press **VCR MENU**. Press **▲** or **▼** to select the **SYSTEM SETUP**. Then press **ENTER**. The step-2 will appear when clock is not set.



2 Press **▲** or **▼** to select the **CLOCK SET**. Then press **ENTER**.

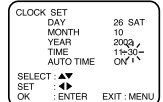


3 Press **▲** or **▼** repeatedly until 26 appears. Then press **▼** to continue.



4 Set the **month, year, hour and minute** in the same way as in step 3. Then press **ENTER**.

- In case of an error, press **▲** to go back to one step and enter again.



5 Press **▲** or **▼** to select **AUTO TIME ON** or **OFF**. The VCR automatically corrects the clock setting every hour once you set **AUTO TIME** to ON.

6 Press **VCR MENU** repeatedly until the TV picture appears on the screen.

7 The clock will begin operation.

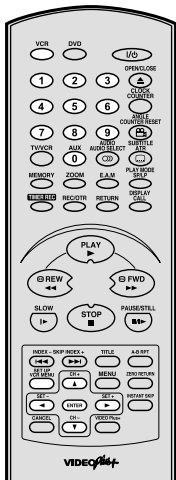


Notes:

- The **AUTO TIME** function adjusts the clock only if the error is within 5 minutes.
- The VCR automatically adjusts the clock setting for Daylight Saving Time once you set **AUTO TIME** to ON.

Tuning the TV Stations Manually

This VCR has one built-in tuner to receive broadcasts. Before you preset a TV broadcast, you must set and preset all channels. This VCR can preset up to 80 channels.



CH 01	BBC 1
CH 02	BBC 2
CH 03	ITV
CH 04	CH4
CH 05	CH5
CH 06	SATELLITE

Note:
Occasionally, the auto search might catch a weak signal and stop. If the TV station signal is weak, you shouldn't store this station.
In that case restart the auto search using ◀ or ▶.

Preparation

- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

Example: Preset the BBC 2 on programme position 2.

- Press **VCR MENU**. Press ▲ or ▼ to select the **CHANNEL SETUP**. Then press **ENTER**.

TIMER REC SET [OFF]
 AUTO REPEAT
 VCR SETUP
 CHANNEL SETUP
 SYSTEM SETUP
 SELECT: ▲▼
 ENTER: ENTER
 EXIT: MENU
- Press ▲ or ▼ to select the **CH TUNING**. Press **ENTER** to select CH TUNING screen.

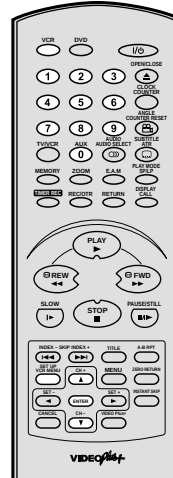
CHANNEL SETUP
 CH TUNING
 GUIDE CH SET
 SELECT: ▲▼
 ENTER: ENTER
 EXIT: MENU
- Press ◀ (falling frequency) or ▶ (rising frequency) once to start the search. It stops at each broadcast automatically ("I"). Press ◀ or ▶ repeatedly until BBC 2 appears. Only in case of receiving a weak broadcast (drifting picture), does search fail to stop. If you want to stop, press ◀ or ▶. Press **ENTER** to preset. The search menu screen will disappear if the next mode is not activated in less than 50 seconds.

CH 1
 SEARCH: ◀▶
 EXIT: MENU
 CH 1
 OK: ENTER
 EXIT: MENU
- Press ▲ or ▼ repeatedly until 2 is displayed. (Or enter 0 2 with the 1 to 0 numbered keys). Then press **ENTER**.

CH 2
 SEARCH: ◀▶
 EXIT: MENU
 CH 2
 OK: ENTER
 EXIT: MENU
- Repeat the steps 3 and 4 to preset other TV stations.
- Press **VCR MENU** repeatedly until the TV picture appears on the screen.

Setting the VIDEO Plus+® Channel Number (Guide CH)

The TV stations must be stored according to the tuning guide given on page 13, otherwise the VIDEO Plus+ feature will not work. If for any reason you did not select channels BBC1, BBC2, ITV, CH4, CH5 and Satellite in channel positions 1 through to 6 respectively, you must set each VIDEO Plus+ channel number (GUIDE CH) manually.



GUIDE CHANNEL TABLE

TV STATION	GUIDE CH
BBC1	1
BBC2	2
ITV	3
CH4	4
CH5	5
Satellite	6

Preparation

- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

Example: Satellite channel has been incorrectly stored on channel 8 of your VCR.

- Press **VCR MENU**. Press ▲ or ▼ to select the **CHANNEL SETUP**. Then press **ENTER**.

TIMER REC SET [OFF]
 AUTO REPEAT
 VCR SETUP
 CHANNEL SETUP
 SYSTEM SETUP
 SELECT: ▲▼
 ENTER: ENTER
 EXIT: MENU
- Press ▲ or ▼ to select the **GUIDE CH SET**. Then press **ENTER**.

CHANNEL SETUP
 CH TUNING
 GUIDE CH SET
 SELECT: ▲▼
 ENTER: ENTER
 EXIT: MENU
- Enter "SAT" with ▲ or ▼ or number keys. Then press **ENTER**.

GUIDE CH SET
 GUIDE CH VCR
 CH 8
 SET: ▲▼/0-9
 OK: ENTER
 EXIT: MENU
- Enter "6" with ▲ or ▼ or number keys. Then press **ENTER**. If you have connected your satellite using the scart socket, you must select "AV" for the VCR CH number.

GUIDE CH SET
 GUIDE CH VCR
 CH 6
 SET: ▲▼/0-9
 OK: ENTER
 CLEAR: CANCEL
 EXIT: MENU
- For other Codes, repeat steps 3 and 4.
- Press **VCR MENU** repeatedly until the TV picture appears.

Loading and Unloading a Cassette Tape

Use only video cassette tapes marked **VHS** and **S-VHS**.

SQPB

- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SQPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- SQPB playback can be seen only at PAL SP mode.

Loading

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



Insert the cassette tape with its labeled side facing up and the erase prevention tab positioned at your left. An inverted cassette tape cannot be inserted.



Automatic power ON

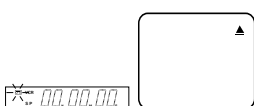
When you insert a cassette tape the DVD/VCR power will turn ON automatically.

Automatic playback

When loading a cassette tape without an erase prevention tab, playback will start automatically.

Unloading

- Press **EJECT** on the unit. Even if a tape is being played, press this button only once.

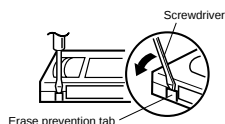


Automatic tape eject

This VCR will automatically rewind the tape when the tape has ended. And when the tape is rewinded to its beginning, the cassette tape will be ejected automatically.

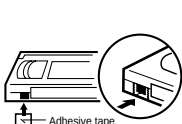
To prevent accidental erasure

Remove the erase prevention tab with a screwdriver.



To record again

Cover the hole with a piece of adhesive tape.



Cassette tape playback

Preparation:

- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

- Load a prerecorded tape (When loading a cassette tape without the erase prevention tab, playback will start automatically).

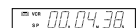


- To start playback Press **PLAY**. Playback will start. If the cassette has not loaded yet, [00:00:00] will blink for 4 seconds.



To stop playback

Press **STOP**.



To rewind the tape or forward it rapidly

Stop the playback or recording with **STOP**.

To rewind the tape:

Press **REW**.



To forward the tape:

Press **FWD**.



To stop the tape-winding, press **STOP**. To switch to playback directly (without ■), press **PLAY**.

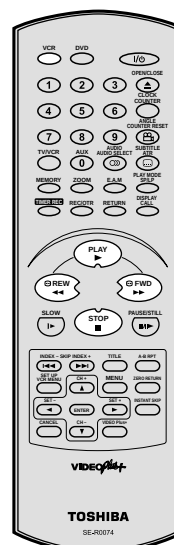
Forward/Reverse picture search mode

When the tape is being wound, you can switch to picture search mode (see next page). To do this, press **REW** or **FWD** and hold it down. The unit will resume the tape winding as soon as the button is released.

NTSC video cassette playback

When using a pre-recorded NTSC video cassette tape, the connected TV set must operate with a 60 Hz vertical frequency. Otherwise the on-screen picture will be affected by vertical rolling. Even if your VCR set is capable of processing NTSC video signals, the picture may be shortened vertically (appearance of black bars at the top and at the bottom of the TV screen). The dubbing of a NTSC video cassette tape to a standard PAL VCR is not possible.

- This VCR selects the playback tape speed SP or LP automatically.
- The Cassette tape and DVD disc can be played back simultaneously. If you press **VCR** or **DVD**, the tape playback and DVD playback alternate with each other on the screen.



Special playback/Playback sharpness/Skip Search

Special playback

Picture Search

Reverse search function

Press **REW** x 1 or x 2 during the playback.

Forward picture search function

Press **FWD** x 1 or x 2 during the playback.

To return to playback: Press **PLAY**.

Still Picture

Press **PAUSE/STILL** during playback. To resume normal playback: Press **PLAY**.

Slow Motion

During playback press **SLOW**.

You can change the slow speed by the additional pressing of **SLOW**.

To return to playback: Press **PLAY**.

Slow tracking and vertical lock adjustment

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

Frame by Frame picture

During playback, press **PAUSE/STILL** one by one: The picture advances frame by frame.

To return to playback: Press **PLAY**.

Adjusting tracking condition

Automatic tracking adjustment

Whenever you insert a tape and start playback, automatic tracking starts working and continuously analyzes the signal to enable optimum picture quality during playback.

Manual tracking adjustment

If automatic tracking cannot eliminate noises well during playback, press **SET** + or **SET** - to eliminate the noises. "MANUAL TR." will appear. Press it briefly for a fine adjustment, or press and hold for a coarse adjustment.

To return to automatic tracking, press **A. TRK**.

Notes:

- The audio output is muted during **SPEED SEARCH**, **STILL**, **FRAME ADVANCE** and **SLOW MOTION**.
- During picture search mode there will be noise bars which are caused by the system.
- The Special Playback will automatically change to playback after approx. 5 minutes to protect the video tape against excessive wear.

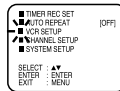
Playback sharpness

Adjust the sharpness of playback picture during playback. During slow motion, still picture and picture search, sharpness-adjusting is impossible.

1 Start the playback of video tape.

2 Press **VCR MENU**.

Press **▲** or **▼** to select **VCR SETUP**. Then press **ENTER**.



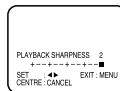
3 Press **▲** or **▼** to select **PLAYBACK SHARP-**

NES. Then press **ENTER**.



4 Press **▶** or **◀** to adjust

the playback sharpness to the level you require.



5 Press **VCR MENU** repeatedly until the TV picture appears on the screen.

Note:

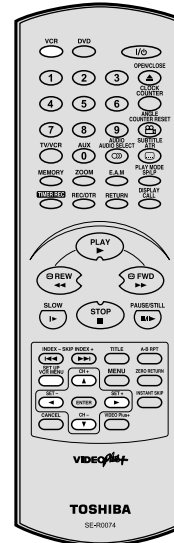
To return to the initial sharpness setting, press **CANCEL** while the sharpness setting screen is appearing.

Skip Search

Each time you press **INSTANT SKIP** while a tape is playing, the unit will fast-forward ahead 30 seconds on the tape. You may press the button up to six times in a row to move 180 seconds (three minutes) ahead.

For example: 1 press: Approx. 30 seconds of tape
2 presses: Approx. 60 seconds of tape
3 presses: Approx. 90 seconds of tape

If the Repeat function is switched on, the playback will continue until it reaches the tape-end and then rewind to the beginning of the tape. This process will repeat until the unit is turned off.



Note:

To cancel the auto repeat mode, follow the above steps 1 and 2, then select "OFF" and confirm by pressing **VCR MENU**.

Repeat Playback

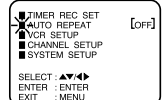
To set the Repeat function

Preparation

- Turn on the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode.

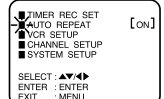
1 Press **VCR MENU**.

Press **▲** or **▼** to select the **AUTO REPEAT**.



2 Press **◀** or **▶** to select

[ON] or [OFF].



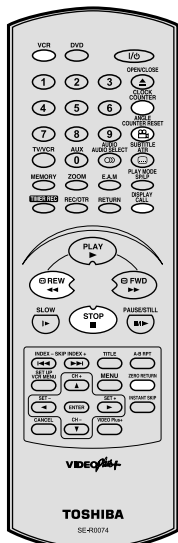
3 Press **VCR MENU** repeatedly until the TV picture appears.

If "ON" has been selected, the tape will be repeatedly played.

Counter Display

ZERO RETURN function

This function makes tape-rewinding stop at the counter 00:00:00 position automatically.



Notes:

- When you load a video cassette, the display indication changes to "00:00:00".
- The counter display does not function on non-recorded (blank) sections of the tape. When you rewind, fast forward or play tapes through blank sections, the counter display stops.

Preparation:

- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

1 Press **DISPLAY**.

The counter display shows the tape running time during playback or recording. The Recorder will indicate REC during recording for itself.

2 Press **COUNTER RESET** at the

desired tape position. The counter display will be reset to the "00:00:00" position (e.g. the beginning of recording).

3 Press **STOP** when playback or recording is finished.

Press **ZERO RETURN**.

The tape will be rewinded or fast forwarded and automatically stop at the "00:00:00" position.

4 Press **DISPLAY** once again to make the all indicator disappear.

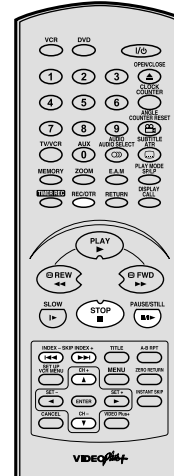
The CLOCK COUNTER button

Press **CLOCK COUNTER** during the playback. The clock and tape counter alternate with each other in the display.

Note:

You can set the tape counter to 00:00:00 with **COUNTER RESET** anytime. Therefore, the counter display can also indicate 00:00:00, even when the tape counter does not reach its beginning yet. Even if the tape counter indicates 00:00:00, it can be rewinded moreover. If the tape was rewinded over the point of 00:00:00, the minus mark (-) appears in the counter display. Although the tape counter seems to forward when you press **REW**, in fact the tape is being rewinded. When the tape reaches the beginning, the tape-rewinding stops automatically.

Whenever a recording is begun an invisible index mark is recorded on the tape. These index marks are all identical, and each mark means: "Here starts a new recording". Every DVD/IVCR equipped with the Video Index Search System (VISS) can locate these marks at the beginning of any recording.



Notes:

- When you record an INDEX mark at the very beginning of the tape, the mark may not be found.
- During INDEX search, the tape may stop and begin to play at a slightly different location.
- INDEX may not function properly with old or worn out video tapes.
- INDEX marks may not be found if it is extremely close to the point where the search began.
- In recording, if you stop recording temporarily, the INDEX mark is not recorded on the tape.

Video Index Search System

Example: Indexing of TV commercials.

1 Start playback and wait until

the end of the TV commercial is reached, then press **STOP**.

2 Press **REC/OTR**. When the "INDEX" on-screen indication

goes off, **STOP** may be pressed. This short recording process will be sufficient to set an index mark.

This will result in about 10 seconds of the TV commercials to be overwritten by another recording. Due to the system the end of this recording will be followed by a recording gap (noise signal) of approx. 5 seconds.

Recording several Index Marks

Due to the system only one index mark will be recorded at the beginning of a recording. If you intend to set several index marks during a single recording, follow the procedure below:

1 At the point of the recording

where an index mark is to be set press **PAUSE/STILL**. The unit will switch to the recording pause mode.

2 Press **CH** repeatedly to switch

back to the original TV program. Press **PAUSE/STILL** to resume recording.

Index Search

Press **INDEX** + or - during stop

or play mode.

For Succeeding programs:

Press **INDEX** +.

For Preceding programs:

Press **INDEX** -.

(Additional press increases the

INDEX NO. up to 9.)

When the **INDEX** + or - is

pressed, the unit starts

searching the INDEX NO.

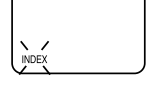
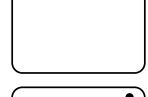
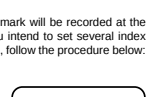
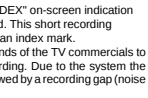
selected and finds the portion,

then playback starts automati-

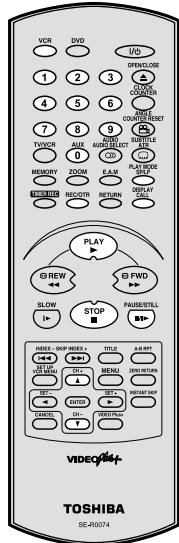
cally.

To stop the Index Search, press

STOP.



Recording a TV Programme



Preparation:

- Turn on the TV, and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

- 1 Load a blank cassette tape with the erase prevention tab intact. (The DVD/VCR will automatically turn on.)
- 2 Select the program (e.g. 29) you want to record with **CH +/-** or number keys.

1-9 : e.g. 5 = press "5"
10-80 : e.g. 29 = press "2" and "9".

- 3 If a recording in Long Play mode is intended, press **SP/LP** to display "LP". (see Note below)
- 4 On the VCR, press **REC**. Or on the Remote, press **REC/OTR**. "●" will appear on the screen for about 4 seconds and "●" will appear on the display.

If the erase prevention tab is removed, the tape will eject when **REC/OTR** are pressed for recording. (see p.18)

To Stop Recording

Press **STOP**.

To Stop Recording Temporarily

To stop a recording for a short period of time press **PAUSE/STILL**. Press this button again if you want to resume the recording.

Attention:

A safety circuit turns the pause mode off automatically after 5 minutes, and the DVD/VCR will stop the recording mode.

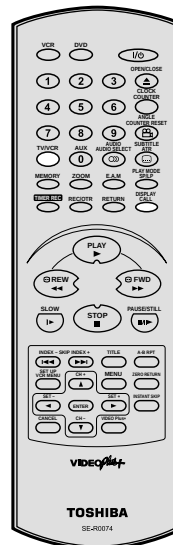
- Notes:**
- Since the DVD/VCR has a built-in TV tuner the TV set may be turned off when recording. The TV set may only be used to check for accurate program adjustments or to monitor recordings.
 - You can confirm on the TV-screen whether you selected SP or LP. Press **DISPLAY** to see the status display. (see page 25)
 - If you wish to watch the DVD playback during the normal recording on VCR, press **DVD** to change to DVD mode and perform the DVD playback (see page 38).

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Recording a TV Programme

Recording with a SCART Lead:

You can record a programme using the TV receiver of the DVD/VCR and at the same time watch another programme on the TV set using its receiver. As the DVD/VCR automatically switches the TV set the following points should be observed:



- 1 Press **TV/VCR** until "VCR" appears on the display. Select the program on the DVD/VCR you want to record. This program can be watched on the screen and recorded by the DVD/VCR.

00.00.00
"VCR" indicator goes on.

- 2 While the VCR is recording press **TV/VCR** until the "VCR" indicator on the display goes off. The TV set now displays the program of its built-in receiving module. Select the TV channel you want to watch on the TV set. Although the TV set now shows another program the DVD/VCR will continue recording the previously selected programme.

00.00.00
"VCR" indicator goes off.

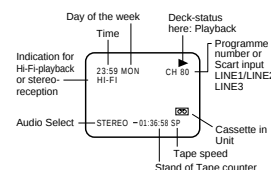
- 3 Using **TV/VCR** you can switch the TV screen between the DVD/VCR picture and the TV picture. If the "VCR" indicator is lit on the display, you will watch the DVD/VCR picture. This has no trouble on the recording.

00.00.03
"VCR" indicator goes on.

To Display VCR operation Status

Press **DISPLAY**. The clock, day of the week and more informations will be indicated.

To cancel the indicating: Press **DISPLAY** until all indicator disappear.



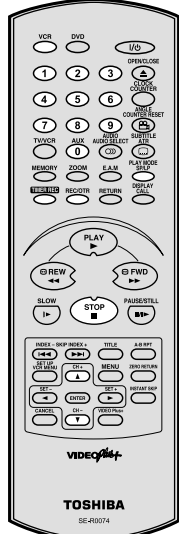
Auto Rewind Feature

The DVD/VCR will automatically rewind when the tape has ended (except during OTR and TIMER REC). It will also eject the cassette tape.

25

One-touch Timer Recording (OTR)

The one-touch timer recording feature provides a simple and convenient way to make a timed recording.



Preparation:

- Turn ON the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

- 1 Load a blank cassette tape with the erase prevention tab intact. (The DVD/VCR will automatically turn on.)
- 2 Select the program (e.g. 29) you want to record with **CH +/-** or number keys.
- 3 If a recording in Long Play mode is intended, press **SP/LP** (TAPE SPEED) to display "LP". (see note on page 28)
- 4 Press **REC** on the VCR or **REC/OTR** on the Remote to begin recording. Press **REC** on the VCR again to stop recording after 30 minutes. Each additional press of **REC** will increase recording time as shown in the chart below, up to a maximum of 5 hours. The OTR and recording time will appear on the screen for about 4 seconds.

Tape speed: SP
Recording → 0:30 1:00 → 1:30
5:00 → 4:00 → 3:00 → 2:00

Tape speed: LP
Recording → 0:30 → 1:00 → 1:30 → 2:00
10:00 → 5:00 → 4:00 → 3:00

To Extend the Recording Time

Press **REC/OTR** repeatedly until the desired time appears on the display.

To stop the OTR

Press **STOP**.

- Notes:**
- If you wish to watch the DVD playback during the OTR, press **DVD** to change to DVD mode and perform the DVD playback (see page 38).
 - If the tape supply has not sufficed for OTR recording, the clock symbol (⌚) will blink at the tape-end and then VCR mode will change to DVD mode. In this case, press **TIMER REC** to cancel the ⌚ blink or press **EJECT** to remove the cassette tape.

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VIDEO Plus+® Recording

VIDEO Plus+ VIDEO Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VIDEO Plus+ system is manufactured under license from Gemstar Development Corporation.

Preparation

- Turn on the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

- 1 Press **VIDEO Plus+**.

Note: If any button is not pressed within 60 seconds, the Recorder switches back to TV operation.

PLUSCODE NO. -----
• ONCE
DAILY
WEEKLY
PLUSCODE NO.: 0-9
SELECT : ▲▼
CLEAR : CANCEL
OK : ENTER
EXIT : VIDEO PLUS+

- 2 Enter the PlusCode Number using number keys.

• In case of an error, press **CANCEL** and enter the desired number again.

PLUSCODE NO. 57378----
• ONCE
DAILY
WEEKLY
PLUSCODE NO.: 0-9
SELECT : ▲▼
CLEAR : CANCEL
OK : ENTER
EXIT : VIDEO PLUS+

- 3 Press **▲** or **▼** to select ONCE, DAILY or WEEKLY.

ONCE = To record a programme only once

DAILY = To record TV programmes transmitted daily

WEEKLY = To record TV programmes transmitted once a week.

PLUSCODE NO. 57378----
• ONCE
DAILY
WEEKLY
PLUSCODE NO.: 0-9
SELECT : ▲▼
CLEAR : CANCEL
OK : ENTER
EXIT : VIDEO PLUS+

- 4 Press **ENTER**. By the PlusCode Number, the entered data appears on the screen. Select your tape speed.

• If the entered Number is not correct, the indicator "PLUS CODE NO. ERROR" will appear. Enter the correct number.

PLUSCODE NO. 57378----
DATE 15 FRI
START 17:30
END 18:00
CH 29
SPEED -SP-
PBC
SELECT : ▲▼
SET : ●
EXIT : MENU OK: ENTER

- Notes:**
- The built-in timer stores 8 memories. If the "PROGRAM FULL" indication appears, you must delete one memory (see page 31).
 - When the power supply is interrupted for more than 30 minutes, the preset programme is cleared. In this case, you have to set the timer again.

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VIDEO Plus+ Recording

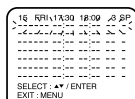
If you have selected Daily or Weekly in step 3, then you can select a recording date again. The date must blink. If it does not blink, then press **▲** or **▼** repeatedly until the DATE blinks. Then press **◀** or **▶** repeatedly until the desired date appears. The following date options are available:

SUN-SAT: all dates from Sunday to Saturday, or
 MON-SAT: only from Monday to Saturday, or
 MON-FRI: only from Monday to Friday.
 WKL-MON: each Monday, WKL-TUE: each Tuesday
 WKL-SUN: each Sunday, etc.

Recording period extension

The recording end-time will be set by VIDEO Plus+ automatically. However you can extend the recording end-time manually. The time END must blink. If it does not blink, then press **▲** or **▼** repeatedly until the time end blinks. Then press **▶** to extend.

- Press **ENTER** after the confirmation. Then press **VCR MENU** repeatedly until the TV picture appears. To enter another programme, repeat steps 1 - 5.



- Although the data is stored in the timer memory, the timer function is not yet ready for recording. To accomplish this, activate it by pressing **TIMER REC**. If no cassette tape is loaded, the clock symbol is blinking.

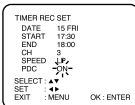


Notes:

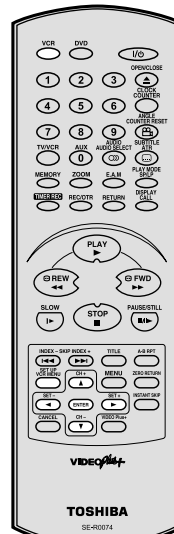
- As long as the timer is activated (clock symbol indicated on the display), you cannot use the VCR. If you want to use the VCR, first press **TIMER REC** to deactivate the timer.
- Not all TV Stations transmit PDC signal all of the time, therefore it is advisable to check before setting PDC to ON, if you do set PDC to ON and no signal is received your recording might not take place at all. To check PDC status, change to the channel on your DVD/VCR you wish to record from, if the word "PDC" appears on the screen for a few seconds then that channel is broadcasting PDC and you can set the feature to ON.

To record with the PDC (Programme Delivery Control) system

The PDC system starts recording when it picks up a special signal transmitted by the broadcaster with the TV programme – even if the TV programme starts early, late or runs on longer than scheduled. In step 4, press **▼** repeatedly until PDC OFF flashes, then press **◀** or **▶** to display "ON" for recording with PDC.



The built-in timer allows unattended recording of up to 8 programmes within 1 month.



Notes:

- When the power supply is interrupted for more than 30 minutes, the preset programme is cleared. In this case, you have to set the timer again.
- If you want to set the timer with the PDC function, see "To record with the PDC system" on page 28.

Timer Recording Manually

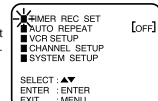
Preparation

- Turn on the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)
- Load a video cassette with the erase prevention tab intact. Make sure that the time and date are correct.

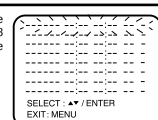
Example: Timer recording for the 23rd, Friday, on channel 3, 19:30 to 21:30 and LP mode.

- Press **VCR MENU**.

Press **▲** or **▼** to select the **TIMER REC SET**. Then press **ENTER**.

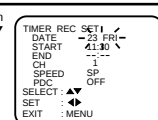


- Each line stands for one programme of the 8 memories. Select one line with **▲** or **▼**. Then press **ENTER**.

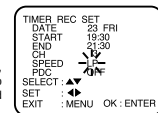


- Set the desired dates with **◀** or **▶**. Then press **▼** to accept them.

- Daily/weekly settings can be found by pressing **◀** or **▶** repeatedly (see page 30).



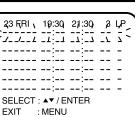
- Set the Starting time (19:30), ending time (21:30) channel (3) and tape speed (LP) in the same way as in step 3.



- In case of an error, press **▲** to go back to the previous step and repeat.

Timer Recording Manually

- Press **ENTER** to accept them. To enter other programmes, repeat steps 2 to 4, or press **VCR MENU** repeatedly until the TV picture appears.



- Although the data is stored in the timer, it is not ready for recording. To start timer recording, press **TIMER REC** to turn it on. When no video cassette is loaded, the clock symbol is blinking.



Notes:

- In case of a timer recording from the Scart socket, proceed as follows: When "CH" is blinking in picture/step 4, press **◀** or **▶** repeatedly until "LINE" appears.
- If the clock symbol blinks when the timer recording is completed, the TV programme has not been completely recorded because of an insufficient tape supply.
- As long as the timer is activated (clock symbol indicated on the display), you cannot use the DVD/VCR. If you want to use the DVD/VCR, press **TIMER REC** to deactivate the timer.

When you turn the unit off, the timer will be switched on automatically. The clock symbol will appear on the display. If you still want to use the recorder, press **TIMER REC** first. Then the clock symbol will disappear from the display.

Weekly (e.g. WKL-TUE: each Tuesday) or daily (e.g. MON-SAT Monday to Saturday) Timer recording

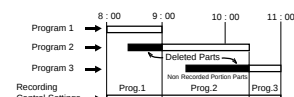
Follow the procedure for timer recording on the previous page. In picture/step 3 (when date and day is blinking), press **▶** repeatedly until the desired setting appears (weekly or daily).



Set other START, END, CH, SPEED as previous pages.

In case of overlapping Timer programmes

- Do not overlap timer programmes as portions of the conflicting programmes will be lost. The first recording time has priority over the next recording time as shown in the diagram below.



Notes:

- The daily/weekly recording can be made continuously until the recording is cancelled or the tape reaches the end.
- During timer recording, the automatic rewinding mechanism does not function.

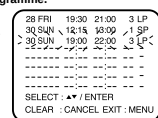
Timer Recording Manually

Confirmation/Cancellation of the Timer Recording

- If the timer has been activated, now press **TIMER REC** to deactivate the timer. The clock symbol will disappear. Then press **VCR** to change to VCR mode.

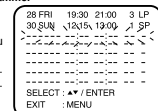
- To confirm a Timer programme.

Press **VIDEO Plus+** twice. All the timer programmes will appear.

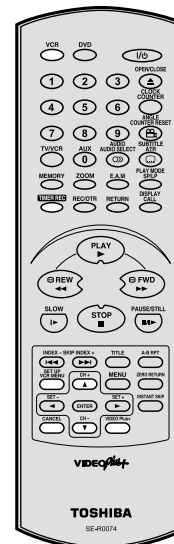


- To cancel a Timer programme.

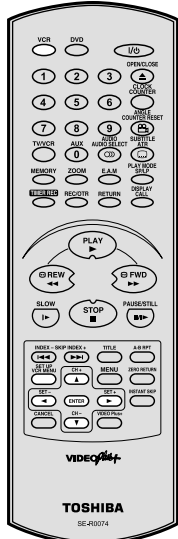
Press **▲** or **▼** to select the timer programme you wish to cancel. Then press **CANCEL**. This line is now cancelled.



- Press **VCR MENU** (or **VIDEO Plus+**) button repeatedly until the TV picture appears.



This DVD/VCR is capable of recording sound in Hi-Fi system. The recording will be performed automatically. NICAM STEREO broadcasts are recorded in its original sound system regardless of the setting. If you wish to record NICAM programmes, select NICAM "AUTO" as follows.



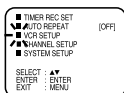
Note:
When listening to a stereo broadcast or playing back a tape Hi-Fi recorded in stereo, you have to connect the DVD/VCR with the stereo audio system or the stereo TV. The sound which is output from the RF OUT jack is monaural.

Preparation:

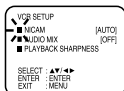
- Turn ON the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

NICAM stereo sound reception:

- 1** Press **VCR MENU**. Press **▲** or **▼** to select **VCR SETUP**. Then press **ENTER**.



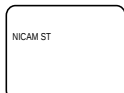
- 2 Press **▲** or **▼** to select **NICAM**.
Then press **◀ / ▶** or **ENTER** to
select **[AUTO]**.



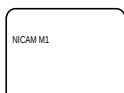
- 3** Press the **VCR MENU** repeatedly until the TV picture appears.

NICAM programmes are divided into 4 types as shown below.

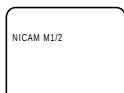
NICAM STEREO broadcast
"NICAM ST" illuminates when a
NICAM STEREO broadcast signal is
received.



NICAM MONO A broadcast
"NICAM M1" illuminates when a
NICAM MONO A broadcast signal is
received.



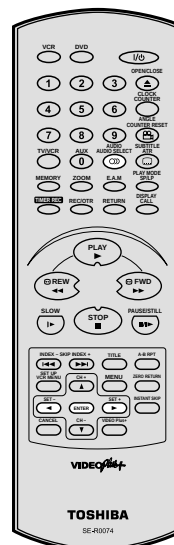
NICAM MONO A B broadcast
"NICAM M1/2" illuminates when a
NICAM MONO A and MONO B
broadcast signal is received.



NICAM OFF
It will be displayed for the NICAM signal when the "NICAM [OFF]" is selected in menu screen.



Playback
Use **AUDIO** to select under stereo/mono or bilingual playback.
See the table below for more information.



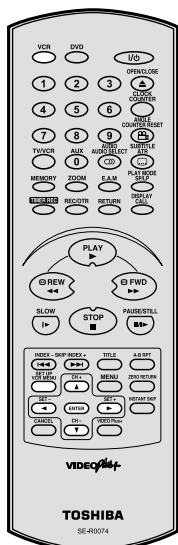
Note:
When playing HiFi cassette tapes recorded on another VCR, the sound output may be distorted. This is normal and no indication of a unit malfunction. Try to minimize sound distortions by using **SET +/-** or change to **MONO** by pressing of **AUDIO**.

On-screen indications (for 4 sec.)	Stereo playback performed in:	Bilingual playback performed as follows:
STEREO	Stereo	Simultaneously from both languages from HiFi track (Mixed sounds)
L CH	Left channel signal output from both loudspeakers	One's mother tongue dubbing (Main sound)
R CH	Right channel signal output from both loudspeakers	Original sound track (Sub sound)
MONO	Mono	One's mother tongue dubbing (Main sound)

HiFi signal indication
It will be displayed for a few seconds when playing HiFi cassette tapes.



You can listen to both sound tracks (Hi-Fi and MONO), by setting AUDIO MIXING mode.

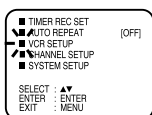


Note:
To deactivate the AUDIO MIX function follow the above procedure from steps **1** to **3**, select [OFF], and confirm the setting by pressing **VCR MENU**.

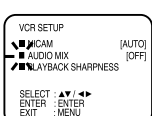
Preparation:

- Turn ON the TV and select the VCR channel on TV.
- Press **VCR** to select the VCR mode. (The VCR indicator will light)

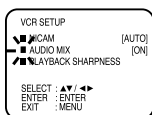
- 1** Press **VCR MENU**.
Press **▲** or **▼** to select
VCR SETUP. Then press
ENTER.



- 2 Press ▲ or ▼ to select **AUDIO MIX**.



- 3** Press **◀/▶** or **ENTER** to select **[ON]**.
If you select **[ON]**, the unit will play both sound tracks (Hi-Fi and MONO) until the **AUDIO MIXING** mode is cancelled.



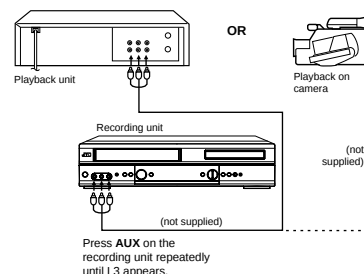
- 4 Press **VCR MENU** repeatedly until the TV picture appears.

When you try to connect with a cable, make sure the power of both units have been turned off.
Connect the recording unit with the TV. Therefore you can just watch what the recording unit is recording.

- 1 Load a blank cassette tape with the erase prevention tab intact into the recording DVD/VR. Load the previously recorded cassette tape into the playback VCR or a video camera.
 - 2 Use **AUX** or **CH** of the recording DVD/VCR to select the "LINE1", "LINE2" or "LINE3" instead of the preset channel.
 - 3 Press **REC/OTR** and then **PAUSE/STILL** of Recording unit.
 - 4 Press **PLAY**-button and then **PAUSE/STILL**-button of Playback unit. Now you can see the still picture of the scene that you wish to duplicate.
 - 5 Press **PAUSE/STILL** of both units simultaneously to start the Duplicating.
- Note:**
Before starting the duplicating process, select the proper tape speed using **SP/LP**. For a pre-recorded tape the correct tape speed will be set automatically during

Note:
Before starting the duplicating process, select the proper tape speed using **SP/LP**. For a pre-recorded tape the correct tape speed will be set automatically during playback.

Connection with second Video recorder or Video camera



Disc

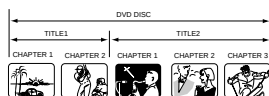
This unit applies to DVD discs from Region 2 only.
The loaded Disc (DVD, Video-CD, Audio-CD and MP3-CD) will be recognized automatically.
The suitable Disc-formats are: DVD, CD-R and CD-RW.
Some CD-R/RW discs may be incompatible.
This DVD/VCR uses the PAL color system. The NTSC-DVDs can be playback on PAL 60Hz.

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

Some DVDs is played back with a Copy guard system. In case of a dubbing on video tape, strong disturbance may occur. This is not a defect of this DVD/VCR.

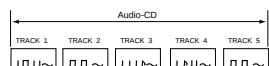
Title

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



Chapter

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



Track

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

Removing Disc from Case

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

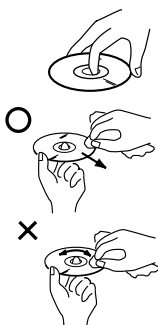
- Do not scratch the disc.
- Do not get dirt on the surface of the disc.
- Do not stick a label or adhesive tape on the disc.
- Do not drop or bend the disc.

Storing Disc

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

Cleaning Disc

- Wipe the disc with a clean, dry cloth from centre to edge.
- Do not wipe the disc round.
- Do not use liquid or aerosol cleaners.



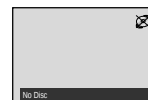
Setting setup language

The setup language can be selected.

Preparation:

- Turn ON the TV and set to the video input mode.
- When using an amplifier, switch on the amplifier.

- Press **DVD** to select the DVD mode. (The DVD indicator will light.)
"No Disc" will appear on the screen. (If a DVD disc has already loaded, the playback will start automatically.)



- Press **SET UP** in the stop mode. The SETUP MENU of DVD will appear on the screen. Then press **▲** or **▶** to select "Language".



- Press **▲/▼** to select On-Screen Language, then press **ENTER**.



- Press **▲/▼** to select desired language: English (English), German (Deutsch) or French (Français).



- To make the SETUP screen disappear, press **SET UP** (or **RETURN**).

If the DVD/VCR does not operate properly: Static electricity, etc., may affect the player's operation. Disconnect the AC power cord once, then connect it again.

Playback procedure

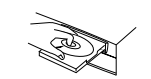
Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

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



- Place a disc onto the tray. Hold the disc, position it with the printed label side up, align it with the guides, and place it in its proper position.



- Press **PLAY** or **OPEN/CLOSE**. The disc tray closes automatically. On the screen, **▶** changes to **▶** and then playback will commence.



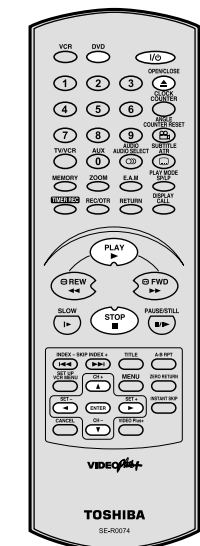
- A menu screen may appear on the TV screen, if the disc has a menu feature. In this case, press **▲**, **▼**, **◀**, **▶** or **ENTER** to operate a menu feature.

- Press **STOP** to end playback.

- The DVD/VCR memorizes the stopped point, depending on the disc. "To Return To The Last Scene Viewed, Press Play. To Disable This Operation, Press STOP Again." appears on the screen for approx. 4 seconds. Press **PLAY** to resume playback (from the scene point).
- If you press **STOP** again (**■** appears on the screen) or unload the disc, the DVD/VCR will clear the stopped point.

- Then press **OPEN/CLOSE**.

The disc tray opens.
Remove the disc and press **I/O**, (**POWER**).
The disc tray closes automatically and DVD/VCR turns off.



NOTES:

- If a non-compatible disc is loaded, "Please Check Disc", "Disc playback unauthorized Consult owners manual for further information" or "Parental Lock" will appear on the TV screen according to the type of loaded disc. In this case, check your disc again (See pages 36 and 46, 47).
- Some discs may take a minute or so to start playback.
- A "Prohibition" symbol **Ⓢ** may appear at the upper right of the screen. This symbol means either the feature you tried is not available on the disc, or the DVD/VCR can not access the feature at this time. This does not indicate a problem with the DVD/VCR.
- When you set a single-faced disc label downwards (i.e. the wrong way up) and press **PLAY** or **OPEN/CLOSE**, **Ⓢ** will appear and remain on the screen for approx. 30 seconds and then it will change to "Please Check Disc".
- Some playback operations of DVDs may be intentionally fixed by software producers. Since this DVD/VCR plays DVDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs.
- When playing DTS-encoded Audio CDs, excessive noise will be heard from the analog stereo outputs. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo outputs of the DVD/VCR are connected to an amplification system.

Special playback

Note: There may be a slight delay between pressing the button and the function activation.

Fast Forward Playback

Press **FWD** during normal playback. Each press of **FWD** will increase the speed of the search x2 (**▶▶**), x8 (**▶▶▶**), x30 (**▶▶▶▶**), x100 (**▶▶▶▶▶**). (In case of Audio-CD: x4 (**▶▶**) and x8 (**▶▶▶**) are available)

- To resume normal playback, press **PLAY**.

Review Playback

Press **REW** during normal playback. Each press of **REW** will increase the speed of the search x2 (**◀◀**), x8 (**◀◀◀**), x30 (**◀◀◀◀**), x100 (**◀◀◀◀◀**). (In case of Audio-CD: x4 (**◀◀**) and x8 (**◀◀◀**) are available)

- To resume normal playback, press **PLAY**.

Still Playback

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

To resume normal playback, press **PLAY**.



Frame Advance

Press **PAUSE/STILL** during still playback. One frame is advanced each time you press **PAUSE/STILL**.

To resume normal playback, press **PLAY**.



Slow-motion Playback

Press **SLOW** during normal playback or still playback. Each press of **SLOW** will change the speed of the slow x1/2, x1/4, x1/8.

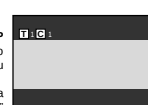
- To resume normal playback, press **PLAY**.
- To resume the still playback, press **PAUSE/STILL**.

Locating a chapter or track

Press **SKIP** (**▶▶▶**) Forward or **SKIP** (**◀◀◀**) Reverse during playback to locate a chapter or track that you want to watch.

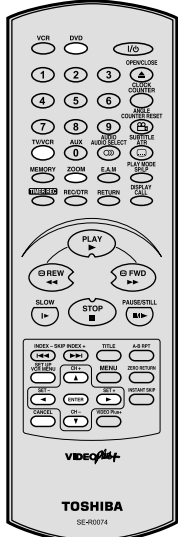
Each time you press the button, a "C (chapter)" number or "T (track)" number is skipped.

When you press **SKIP** (**▶▶▶**), playback starts from the beginning of the current chapter or track. When you press **SKIP** (**◀◀◀**) twice, playback starts from the beginning of the preceding chapter or track.



DVD Picture Signal Selection/Zooming

You can select the output signal of DVD playback picture to the TV screen as an VIDEO signal or a RGB signal.



Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

- 1 Press **SET UP** in the stop mode.

Press **◀** or **▶** to select "Picture", then press **▲** or **▼** to select "Video Out Select".



- 2 Press **ENTER**.

Press **▲** or **▼** to select the desired picture signal, "Video" or "RGB".



- 3 To make SETUP screen disappear, press **SET UP**.

Notes:

- If you use the connection with S-Video cord, be sure to set the "Video Out Select" at step 2 above to "Video". If you select "RGB", the TV screen will be disturbed.
- If you selected "RGB" at step 2 above, press **TV/VCR** to select VCR. (VCR indicator will appear on the display) Otherwise, the TV screen will be disturbed when you select the channel with TV's CHANNEL UP/DOWN buttons.

Zooming

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

- 1 Press **ZOOM** during playback.

The centre part of the image will be zoomed in. As you repeatedly press the **ENTER** or **ZOOM** while "ZOOM" is selected, the magnification level changes. Variation of the levels includes image reduction.



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

- If you select "EXIT" and press the **ENTER**, you can turn off the symbol mark, keeping the current magnification level.
- Press **CANCEL** to restore the zoom point to the centre of the picture.

- 3 While "ZOOM" is selected, press **ZOOM** repeatedly to return to a 1:1 view.

Notes:

- Picture Signal Selection is only available for connecting with a 21 pin Scart Cable.
- Depending on your TV, NTSC disc may not playback correctly in colour. In this case, it is recommended to select the Picture Signal RGB on step 2.
- Only use RGB setting if your TV is RGB compatible.

40

Repeat playback

Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

REPEAT PLAYBACK

- 1 Press **PLAY MODE** repeatedly to select "Chapter Repeat", "Title Repeat" or "All Repeat". (In case of CD, select "Track Repeat" or "All Repeat")



- 2 During playback repeat playback will start automatically. To start repeat playback during stop mode, press **PLAY** within about 5 seconds after you press **PLAY MODE**.
 - To resume normal playback, press **PLAY MODE** repeatedly until "Off" appears on the TV-screen.

A-B Repeat Playback

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

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



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



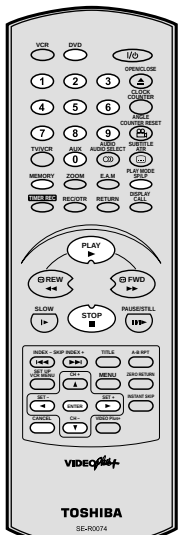
To resume normal playback, press **A-B RPT** again. "Repeat Off" appears on the screen.

NOTES:

- Some discs may not work with the repeat operation.
- In A-B repeat mode, subtitles near point A or B may not appear.
- During the A-B Repeat Playback the ANGLE feature will not operate.
- You may not be able to set A-B Repeat, depending on the scenes of the DVD.
- A-B repeat does not work with an interactive DVD and MP3-CD.
- Random playback can not be combined with Repeat playback.

41

Memory playback/Random playback



Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Memory playback

You can arrange the order of titles, chapters or tracks on the disc.

- 1 Press **MEMORY**.



- 2 Press **◀/▶** to select "T" Title number or "CT" Chapter or Track number. Use number keys to input the favorite number.

- If you input a large number than the number that is recorded on the disc, the bar will be skipped.
- The input number into "T" for CD or MP3 is not effective.

- 3 Press **▼** or **ENTER**.

Set the "T" and "CT" in the next bar as in step 2.



- When you select another chapter in the same title, you do not need to select the title number.
- To cancel the programmed selection, press **CANCEL**.

- 4 Press **PLAY** to start MEMORY playback.

- To resume normal playback, press **CANCEL**.

Random playback

- 1 Press **PLAY MODE** repeatedly to select "Chapter Random" or "Title Random". (In case of CD, select Track Random)



- 2 During playback random playback will start automatically.

To start random playback during stop mode, press **PLAY** within about 5 seconds after you press the **PLAY MODE**. To resume normal playback, press **PLAY MODE** repeatedly until "Off" appears on the TV-screen.

NOTES:

- The memory playback is cancelled when press **STOP** during memory playback.
- Random playback can not be combined with Repeat playback.
- You can program up to 30 selections into the memory.
- Depending on the DVD, Chapter Random operation may not work during playback.
- You cannot use the random playback with memory playback.

42

MP3 Playback

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

MP3 CD Information

Limitations on MP3 CD playback

- MP3 CD is the disc that is standardized by ISO9660, its file name must include 3-digits extension letters, "mp3".
- The directory and file names of the MP3 CD must correspond to the ISO standardized files.
- This unit can read 200 files per disc. If one directory has more than 200 files, it reads up to 200 files, the remaining files will be omitted.
- As for multi-session disc, only the first session can be played.
- If the CD has both audio tracks and MP3 files, only audio tracks are played.
- It may take more than one minute for this unit to read MP3 files depending on its structure.
- Music recorded by "Joliet Recording Specification" can be played back, the file name is displayed (within 8 letters) on the screen. Long file names will be condensed.
- The music files recorded by "Hierarchical File System" (HFS) cannot be played.

Limitations on display

The maximum number for display is 8 letters. Available letters for display are the following: capital or small alphabets of A through Z, numbers of 0 through 9, and _ (under score).

Notes on MP3 files

- To play back MP3 CD in the recorded order,
 1. Use MP3 software that records data alphabetically or numerically.
 2. Name each file including a two-digit or three-digit number (e.g. "01" "02" or "001" "002").
 3. Refrain from making too many sub-folders.

CAUTION:

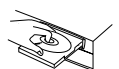
- Some MP3 CDs can not be played back depending on the recording conditions.
- The CD-R/RW that has no music data or non-MP3 files can not be played back.

Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

- 1 Press **OPEN/CLOSE**.

The disc tray will open. Place a disc onto the tray.



- 2 Press **PLAY** or **OPEN/CLOSE**.

The disc tray closes automatically. On the TV-screen, "MP3" and then reading file number will appear. Then playback will commence.



- Reading will take as much time as the number of file.
- Press **STOP** to end playback.

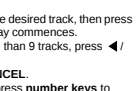
- 3 Press **DISPLAY**.

Then press **◀/▶** to select MP3 and press **ENTER**.



- 4 Press **▲/▼** or **◀/▶** to select the desired track, then press **ENTER**. Track is selected and play commences.

- In case the folder includes more than 9 tracks, press **◀/▶** to display next track list.
- To remove track list, press **CANCEL**.
- Press **◀/▶** to select "T" and press number keys to input your desired track.



- 5 Press **STOP** to end playback.

The disc records the stopped track. Press **PLAY** to resume playback (from the beginning of track).

- If you press **STOP** again or unload the disc, the unit will clear the stopped track.



- 6 Press **OPEN/CLOSE**.

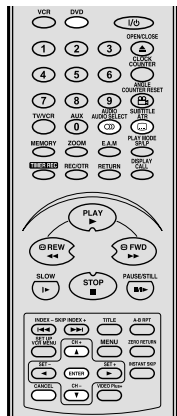
The disc tray opens. Remove the disc and press **I/O**. The disc tray closes automatically and DVD/VCR turns off.

NOTES:

- During MP3-Playback, you can not use SEARCH, A-B Repeat functions.
- You can use Repeat(Track or All), Memory and Random functions for MP3 CD Playback. (See page 41 and 42)

43

Changing soundtrack language / Changing Subtitles language



Preparation:

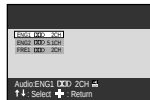
- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Changing soundtrack language

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

- 1 Press **AUDIO** during playback.
The current soundtrack language is displayed.
- 2 Press **AUDIO** repeatedly until the desired language is selected.
The on-screen display will disappear after a few seconds.

- To turn off the soundtrack setting display, press the **CANCEL** or **ENTER** button.



In case of VIDEO CD playback

Audio type changes as follows each time you press **AUDIO**.



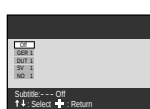
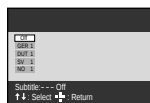
Changing Subtitles language

You can select the language when playing back a disc recorded with multi-lingual subtitles.

- 1 Press **SUBTITLE** during playback.
Then press **▲/▼** to select the desired language.

- To turn off the subtitle setting display, press the **CANCEL** or **ENTER** button.

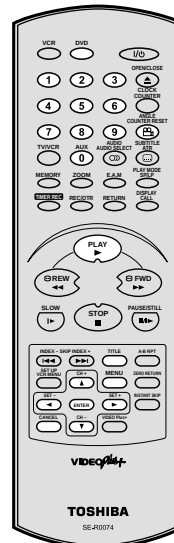
- To turn the subtitles off, select "Off".



NOTES:

- If the desired language is not heard after pressing **AUDIO** several times, the language is not recorded on the disc.
- Changing soundtrack or subtitle language is cancelled when you open the disc tray or turn the power off. The initial default language or available language will be heard and seen if the disc is played back again.
- Depending on the DVD you may be unable to turn on, turn off, or change the subtitles, even if they are recorded on the disc. While playing the DVD, the subtitle may change while opening or closing the disc tray, or while changing the title.
- During some scenes, the subtitles may not appear immediately after you select "On".
- The abbreviation of the language appears instead of the language name. Refer to the list of languages and their abbreviations. (See on page 57.)

Changing angles / Title selection / DVD menu



Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

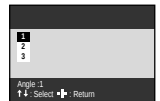
Changing Angles

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

- 1 Press **ANGLE** during playback.
The current angle will appear.
- 2 Press **ANGLE** or **▲/▼** repeatedly until the desired angle is selected.

- To turn off the angle number display, press the **CANCEL**.

- You can change the camera angle directly by pressing the **number keys** corresponding to its angle number instead of using the **▲/▼** buttons.



Title Selection

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

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

DVD Menu

Some DVDs allow you to select the disc contents using the menu.

When you play back these DVDs, you can select the subtitle language and sound-track language, etc. using the DVD menu.

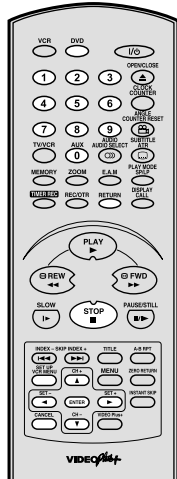
- 1 Press **MENU** during playback.
The DVD menu appears on the screen.
- 2 Press **▲/▼** or **◀/▶** to select the desired item.
- 3 Press **ENTER**.
The menu continues to another screen. Repeat steps 2 and 3 to set the item completely.

NOTE:

Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the disc, or you may be unable to select the title, and a "title menu" may simply be called a "menu" or "title" in the instructions supplied with the disc.

Parental control

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

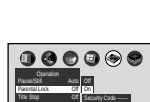


Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Parental control setting

- 1 Press **SET UP** in the stop mode.
Press **▲/▼** to select "Operation".
- 2 Press **▲/▼** to select "Parental Lock", then press **ENTER**.
- 3 Press **▲/▼** to select Off or On.
Off: The parental lock feature does not function.
After pressing **ENTER**, follow step 4 and 6 below.
On: To activate the parental lock feature, or change the setting, press **ENTER** and follow steps 4-6 below.
- 4 Press **number keys** to input a 4-digits security code then press **ENTER**.
• If you input a wrong number, press **CANCEL**.
• To return to the before step, press **RETURN**.
- 5 Enter the code of a country/area whose standards were used to rate the DVD disc. (See the list on the page 47)



Example: Set to GB (UNITED KINGDOM).
Press **▲/▼** to select "G" then press **▶** to move to the right character. Then select "B" same as above. Then press **ENTER**.

NOTES:

- If each setup (page 46-55) has been completed, the unit can always be worked under the same conditions (especially with DVD discs). Each setup will be retained in the memory if you turn the power off.
- Depending on the discs, the unit can not limit playback.
- Some discs may not be encoded with specific rating level information though its disc jacket says "adult". For those discs, the age restriction will not work.
- Do not forget the security code. If you forget the security code, delete it. (See step 7 on next page)

Parental control

Country/Area	Code	Country/Area	Code
AUSTRALIA	AU	NETHERLANDS	NL
BELGIUM	BE	NORWAY	NO
CANADA	CA	PHILIPPINES	PH
CHINA	CN	RUSSIAN FEDERATION	RU
CHINA HONG KONG	HK	SINGAPORE	SG
DENMARK	DK	SPAIN	ES
FINLAND	FI	SWEDEN	SE
FRANCE	FR	SWITZERLAND	CH
GERMANY	DE	TAIWAN	TW
INDONESIA	ID	THAILAND	TH
ITALY	IT	UNITED KINGDOM	GB
JAPAN	JP	UNITED STATES	US
MALAYSIA	MY		

- 6 Press **▲/▼** to select the parental lock level, then press **ENTER**.



You cannot play DVD discs rated higher than the level you selected unless you cancel the parental lock function.
For example, when you select level 7, discs rated higher than level 7 are locked out and cannot be played.

- **Level 1:** DVD software for adults cannot be played back.
- **Level 8:** All DVD software can be played back.
- Select from the level 1 to level 8. The limitation will be more severe as the level number is lower.

- 7 To make the SET UP screen disappear, press **SET UP**.

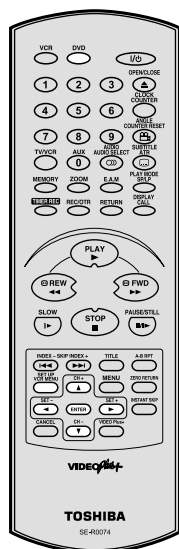
- **To change the parental lock level**
Follow steps 1-6.

- **To change your 4-digit security code**

- 1) After selecting "On" or "Off" at step 3 press **STOP** four times, then press **ENTER**.
The 4-digit security code is deleted.
- 2) Press **number keys** to create a new 4-digit security code at step 4.

Setting menu language

You can select the language of the disc menu messages of DVDs.



Preparation:

- Turn ON the TV and set to the video input mode.
- Press DVD to select the DVD mode. (The DVD indicator will light)

- 1 Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Language".



- 2 Press **▲** or **▼** to select "Disc Menu Language".



- 3 Press **ENTER**. Press **▲** or **▼** to select your desired language, then press **ENTER**.



English, French, German

The selected language is the first-priority Menu language.

Others: Other languages can be selected (See the Table of languages on page 57).

Example:

Set to EN (ENGLISH). Press **▲** or **▼** to select "E" then press **▶** to move to the right character. Then select "N" same as above. Then press **ENTER**.

- 4 To make the SETUP screen disappear, press **SET UP**.

Setting audio soundtrack language

The same audio soundtrack language can always be selected by your unit even if you replace the disc or turn the power off.

Preparation:

- Turn ON the TV and set to the video input mode.
- Press DVD to select the DVD mode. (The DVD indicator will light)

- 1 Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Language".



- 2 Press **▲** or **▼** to select "Audio Language".



- 3 Press **ENTER**. Press **▲** or **▼** to select your desired Audio Language, then press **ENTER**.



English, French, German

The language you have selected will play if it is recorded on the disc.

Others: If you want to select another language, enter the language code (See the Table of languages on page 57).

Example:

Set to EN (ENGLISH). Press **▲** or **▼** to select "E" then press **▶** to move to the right character. Then select "N" same as above. Then press **ENTER**.

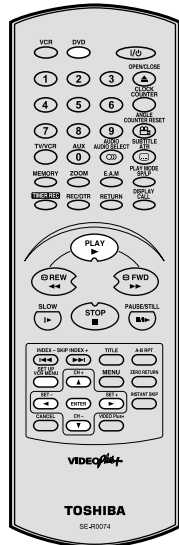
- 4 To make the SETUP screen disappear, press **SET UP**.

NOTES:

- If the selected language is not recorded on the disc, the original language will be heard.
- Some DVD discs may be played in a different language than you selected. A prior language may be programmed on the disc.

Setting subtitle language

The same subtitle language can always be selected even if you replace the disc or turn the power off.



Preparation:

- Turn ON the TV and set to the video input mode.
- Press DVD to select the DVD mode. (The DVD indicator will light)

- 1 Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Language".



- 2 Press **▲** or **▼** to select "Subtitle Language".



- 3 Press **ENTER**. Press **▲** or **▼** to select your desired language, then press **ENTER**.



English, French, German

The subtitle is displayed with the selected language if it is recorded on the disc.

No Subtitle:

Subtitles do not appear.

Others: If you want to select another language, enter the language code (See the Table of languages on page 57).

Example:

Set to EN (ENGLISH). Press **▲** or **▼** to select "E" then press **▶** to move to the right character. Then select "N" same as above. Then press **ENTER**.

- 4 To make the SETUP screen disappear, press **SET UP**.

NOTES:

- If the selected language is not recorded on the disc, the first-priority language is selected.
- Some DVD discs may be set to display subtitles in a different language than you selected. A prior subtitle language may be programmed on the disc.

Setting the aspect ratio of TV screen / Setting on Screen display

You can select the aspect ratio for your TV.

Preparation:

- Turn ON the TV and set to the video input mode.
- Press DVD to select the DVD mode. (The DVD indicator will light)

Setting the aspect ratio of TV screen

- 1 Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Picture", then press **▲** or **▼** to select "TV shape".



- 2 Press **ENTER**. Press **▲** or **▼** to select your desired screen type.



You have the following screen sizes to choose from:

4:3 Letterbox:

Select when a standard 4:3 TV is connected. Displays theatrical images with masking bars above and below the picture.

4:3 Normal:

Select when a standard 4:3 TV is connected. Displays pictures cropped to fill your TV screen. Either or both sides of the picture are cut off.

16:9 Widescreen:

Select this mode when connecting to a wide-screen TV. A wide screen picture is displayed full size.

- 3 To make the SETUP screen disappear, press **SET UP**.

Setting on Screen display

- 1 Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Display".



- 2 Press **▲** or **▼** to select "On-Screen Displays".



- 3 Press **ENTER**. Press **▲** or **▼** to select "On" or "Off".



On: Operational modes (e.g. "11", "11", "11") appear when you press the buttons (factory setting).

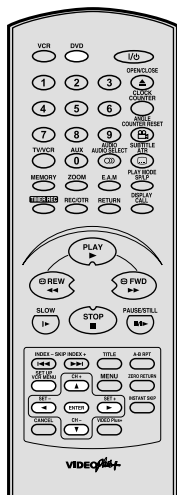
Off: Operational modes (e.g. "11", "11", "11") do not appear when you press any buttons.

- 4 To make the SETUP screen disappear, press **SET UP**.

NOTES:

- The displayable picture size is preset on the DVD video disc. Therefore, the playback picture of some DVD video discs may not conform to the picture size you select.
- When you play DVD video discs recorded in the 4:3 picture size only, the playback picture always appears in the 4:3 picture size regardless of the TV shape setting.
- If you select "16:9 widescreen" and you own a 4:3 TV set, the DVD playback picture will be horizontally distorted during playback. Images will appear to be horizontally compressed. Always be sure that your TV shape conforms to the actual TV in use.

Setting Audio



NOTES:

- The Dynamic Range Control function works only during playback of Dolby Digital recorded discs.
- The level of Dynamic Range Control may differ depending on the DVD video disc.
- The vocal output feature is used during playback of Dolby Digital (multi-channel) recorded DVD KARAOKE discs. This feature allows you to turn off vocal audio tracks, or restore them for background accompaniment.
- When playing KARAOKE, connect the appropriate audio equipment such as an amplifier to the DVD player.

Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Audio Out Select

Select the output sound format corresponding to your system connection. For details of sound recording systems, see on page 55.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Audio".
- Press **▲** or **▼** to select "Audio Out Select", then press **ENTER**. Press **▲** or **▼** to select your desired output sound.



Bitstream:

Select when connected to an amplifier equipped with a Dolby Digital, DTS, MPEG1 or MPEG2 decoder. The DVD/VCR outputs digital audio information in the bitstream format when you play a DVD video disc recorded on the Dolby Digital, DTS, MPEG1 or MPEG2 recording system.

Analog 2ch:

Select when connected to a TV, Dolby Pro Logic or stereo system via the analog audio jacks.

PCM:

Select when connected to a 2 channel digital stereo amplifier. The DVD/VCR outputs sounds in the PCM 2ch format when you play a DVD video disc recorded on the Dolby Digital, MPEG1 or MPEG2 recording system.

- To make the SETUP screen disappear, press **SET UP**.

Dynamic Range Control

Turn on or off a function that makes faint sounds easier to hear even if you lower the volume during late hours playback.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Audio".
- Press **▲** or **▼** to select "Dynamic Range Control", then press **ENTER**. Press **▲** or **▼** to select "On" or "Off".



Off: Full dynamic range is maintained.
On: Dynamic range is reduced.

- To make the SETUP screen disappear, press **SET UP**.

Karaoke Vocal

Turn on or off the vocal output during DVD KARAOKE disc playback.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Audio".
- Press **▲** or **▼** to select "Karaoke Vocal", then press **ENTER**. Press **▲** or **▼** to select "On" or "Off".



Off: The primary vocal is not output.
On: The primary vocal is output when it is recorded on the disc.

- To make the SETUP screen disappear, press **SET UP**.

Setting Operation

Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Pause/Still

Select the resolution of still pictures.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Operation".



- Press **▲** or **▼** to select "Pause/Still", then press **ENTER**. Press **▲** or **▼** to select "Auto" or "Frame", then press **ENTER**.



Auto: For normal use. Still and fast motion images can be paused.

Frame: The resolution of still pictures is improved, so that you can make a motionless picture clearer when you pause it.

- To make the SETUP screen disappear, press **SET UP**.

Title Stop

Turn on or off a feature that automatically stops playback after a title has been viewed.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Operation".



- Press **▲** or **▼** to select "Title Stop", then press **ENTER**. Press **▲** or **▼** to select "On" or "Off", then press **ENTER**.



Off: The DVD/VCR continues after playback of a title is completed.

On: The DVD/VCR stops after playback of a title is completed.

- To make the SETUP screen disappear, press **SET UP**.

PBC

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Operation".



- Press **▲** or **▼** to select "PBC", then press **ENTER**. Press **▲** or **▼** to select "On" or "Off", then press **ENTER**.



Off: When playing a VIDEO CD without using the menu.

On: To use the menu when playing a PBC-featured VIDEO CD.

- To make the SET UP screen disappear, press **SET UP**.

Selecting the sound enhancement (E.A.M.)/Setting Background/Setting Screen Saver

Preparation:

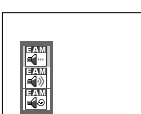
- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Selecting the sound enhancement (E.A.M.)

You can easily switch a preferred audio enhancement.

*E.A.M.: Enhanced Audio Mode

- Press E.A.M.



- Select the sound enhancement by pressing **▲/▼**. Each time you press the button, the sound enhancement changes.

E.A.M. Normal: Normal sound.

E.A.M. 3D: To obtain expansive virtual surround sound effects from just two speakers.

E.A.M. Dialogue: To control critical centre channel information to make dialogue more intelligible (only when playing a DVD video disc recorded on the Dolby Digital recording system).
• To use this enhancement on sounds output from the BITSTREAM/PCM jack, be sure to set "Audio Out Select" to "PCM." (see page 55).

- To exit the audio enhancement selection Press **CANCEL**.

NOTES:

- Actual effects to sounds may vary depending on the speaker system. Make selection according to your preference.
- Actual effects to sounds may vary depending on the disc.
- When the DVD/VCR is connected to an amplifier equipped with Dolby Pro Logic Surround, select "Normal". Otherwise, Dolby Pro Logic Surround may function differently than usual.
- Selecting "Dialogue" disables "Dynamic Range Control" function (see page 52).
- During MP3 playback, the sound enhancement is not effective.

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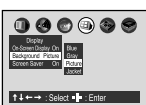
Setting Background

Select the background color or background picture.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Display".



- Press **▲** or **▼** to select "Background", then press **ENTER**. Press **▲** or **▼** to select your desired background, then press **ENTER**.



Blue: Blue background.
Gray: Gray background.
Picture: Use the picture which appears when you turn on the DVD/VCR as a background.
Jacket: Use the jacket picture included on some discs as a background. If it is not included, a gray background will be substituted.

- To make the SETUP screen disappear, press **SET UP**.

Setting Screen Saver (DVD only)

To turn the screen saver on or off.

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Display".



- Press **▲** or **▼** to select "Screen Saver", then press **ENTER**. Press **▲** or **▼** to select "On" or "Off", then press **ENTER**.



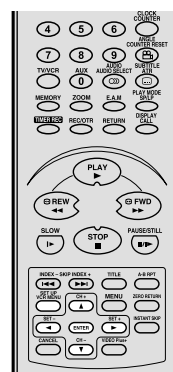
Off: The screen saver is disengaged.

On: The screen saver operates in 10 minutes after you press **PAUSE/STILL**.

- To make the SETUP screen disappear, press **SET UP**.

Setting initial setup/output sound conversion table

You can install the initial system setting.

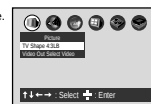


Preparation:

- Turn ON the TV and set to the video input mode.
- Press **DVD** to select the DVD mode. (The DVD indicator will light)

Setting initial setup

- Press **SET UP** in the stop mode. Press **◀** or **▶** to select "Initial Setup".



- Press **ENTER**, then press **▲** or **▼** to select "On-Screen Language", "TV Shape" or "Audio Out Select".



On-Screen Language: See on page 37.

TV Shape: See on page 51.

Audio Out Select: See on page 52.

- To make the SETUP screen disappear, press **SET UP**.

Output sound conversion table (sampling frequency/quantization bit)

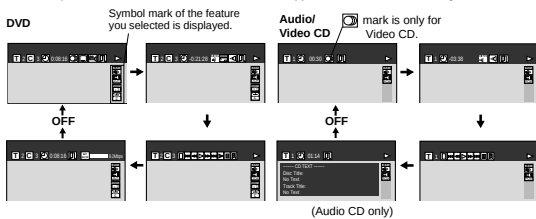
You can select the output sound format corresponding to your system connection (see page 52).

Discs	Recording system	Bitstream		Analog 2ch		PCM	
		DIGITAL AUDIO OUT jack	ANALOG AUDIO OUT jack	DIGITAL AUDIO OUT jack	ANALOG AUDIO OUT jack	DIGITAL AUDIO OUT jack	ANALOG AUDIO OUT jack
DVD video discs	Dolby Digital	Bitstream	48 kHz/20 bit	Bitstream	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
	Linear PCM	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
		48 kHz/20 bit	48 kHz/20 bit	48 kHz/20 bit	48 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		48 kHz/24 bit	48 kHz/24 bit	48 kHz/24 bit	48 kHz/24 bit	48 kHz/16 bit	48 kHz/20 bit
		96 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit	96 kHz/16 bit	48 kHz/16 bit	48 kHz/20 bit
		96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit	96 kHz/20 bit	48 kHz/16 bit	48 kHz/20 bit
		96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit	96 kHz/24 bit	48 kHz/16 bit	48 kHz/24 bit
	DTS	Bitstream	—	Bitstream	—	—	—
	MPEG1, MPEG2	Bitstream	48 kHz/16 bit	Bitstream	48 kHz/16 bit	48 kHz/16 bit	48 kHz/16 bit
	Linear PCM 44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit	44.1 kHz/16 bit
CDs	DTS	Bitstream	(Noise)	Bitstream	(Noise)	Bitstream	(Noise)
		—	—	—	—	—	—

Status display of Disc

You can view information on the operation status and access and settings.

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



2 Press **◀** or **▶** to select the desired symbol mark, then press **ENTER**.

T: Title number (Track number)

Press **▲/▼** or **number keys** to locate a title or track, then press **ENTER**.

E: Elapsed (remaining) time of the current title
Press **number keys** to locate a desired Location, then press **ENTER**.

S: Subtitle setting
See page 44.

Z: To zoom a picture
See page 40.

P: To stop playback
See page 38.

F: Fast reverse playback
See Page 39.

FF: Fast forward playback
See page 39.

SL: To begin slow motion playback
See page 39.

OFF: To turn off the display

C: Chapter number

Press **▲/▼** or **number keys** to locate a Chapter, then press **ENTER**.

A: Audio setting
See page 44.

AS: Angle setting
See page 45.

E.A.M. (Enhanced Audio Mode)
See page 54.

AS: Audio Out Select setting
BST: Bitstream 2CH:Analog 2ch PCM:PCM
See page 52.

BS: Playback starts from the beginning of the current chapter or track.
See page 39.

▶: To start playback
See page 38.

▶: To locate succeeding chapters or tracks.
See page 39.

▶: To pause playback
See page 39.

Data transfer rate (Mbit/s)
Amount of picture, sound and subtitle data in the DVD video disc transferred per second.
The larger the value is, the more data processed, but this does not necessarily insure better picture quality.

CD TEXT

Displays CD text data if included on the audio CDs. (Some letters may not be displayed properly depending on the disc.)

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Table of languages

Enter the appropriate code for the initial settings "Menu", "Audio" and/or "Subtitle" (see pages 48-50).

Abbreviation	Language	Abbreviation	Language	Abbreviation	Language
---	No alternate language	GN	Guarani	PT	Portuguese
CHI (ZH)	Chinese	GU	Gujarati	QU	Quechua
DUT (NL)	Dutch	HA	Hausa	RM	Rhaeto-Romance
ENG (EN)	English	HI	Hindi	RN	Kirundi
FRE (FR)	French	HR	Croatian	RO	Rumanian
GER (DE)	German	HU	Hungarian	RU	Russian
ITA (IT)	Italian	HY	Armenian	RW	Kinyarwanda
JPN (JA)	Japanese	IA	Interlingua	SA	Sanskrit
KOR (KO)	Korean	IE	Interlingue	SD	Sindhi
MAY (MS)	Malay	IK	Inupiak	SG	Sango
SPA (ES)	Spanish	IN	Indonesian	SH	Serbo-Croatian
AA	Afar	IS	Icelandic	SI	Singhalese
AB	Abkhazian	IW	Hebrew	SK	Slovak
AF	Afrikaans	JI	Yiddish	SL	Slovenian
AM	Amharic	JW	Javanese	SM	Samoan
AR	Arabic	KA	Georgian	SN	Shona
AS	Assamese	KK	Kazakh	SO	Somali
AY	Aymara	KL	Greenlandic	SQ	Albanian
AZ	Azerbaijani	KM	Cambodian	SR	Serbian
BA	Bashkir	KN	Kannada	SS	Siswati
BE	Belorussian	KS	Kashmiri	ST	Sesotho
BG	Bulgarian	KU	Kurdish	SU	Sundanese
BH	Bihari	KY	Kirghiz	SV	Swedish
BI	Bislama	LA	Latin	SW	Swahili
BN	Bengali, Bangla	LN	Lingala	TA	Tamil
BO	Tibetan	LO	Laotian	TE	Telugu
BR	Breton	LT	Lithuanian	TG	Tajik
CA	Catalan	LV	Latvian, Lettish	TH	Thai
CO	Corsican	MG	Malagasy	TI	Tigrinya
CS	Czech	MI	Maori	TK	Turkmen
CY	Welsh	MK	Macedonian	TL	Tagalog
DA	Danish	ML	Malayalam	TN	Setswana
DZ	Bhutani	MN	Mongolian	TO	Tongan
EL	Greek	MO	Moldavian	TR	Turkish
EO	Esperanto	MR	Marathi	TS	Tsonga
ET	Estonian	MY	Maltese	TT	Tatar
EU	Basque	NA	Nauru	UK	Ukrainian
FA	Persian	NE	Nepali	UR	Urdu
FJ	Finnish	NO	Norwegian	UZ	Uzbek
FI	Fiji	OC	Occitan	VI	Vietnamese
FO	Faroese	OM	(Afan) Oromo	VO	Volapuk
FY	Frisian	OR	Oriya	WO	Wolof
GA	Irish	PA	Panjabi	XH	Xhosa
GD	Scottish Gaelic	PL	Polish	YO	Yoruba
GL	Galician	PS	Pashto, Pushto	ZU	Zulu

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Problems and troubleshooting

Use the following check list for troubleshooting when you have problems with your unit. Consult your local dealer or service outlet if problems persist.
Be sure all connections are properly made when using with other units.

SYMPTOMS	POSSIBLE SOLUTIONS	PAGE
DVD/VCR		
DVD/VCR does not operate.	• Make sure the power cord is plugged in. • Try another AC outlet. • Power is off, check fuse or circuit breaker. • Unplug unit, then plug it back in. • Select the DVD or VCR mode before operating.	14, 37
No picture.	• Antenna connection is not correct or antenna cable is disconnected. • The video channel is not in the correct position or the TV is not set to the video channel. • Check the unit is connected correctly. • The video input selector of the TV is not set to VIDEO. Set to VIDEO (or equivalent). • Channel is set to the external mode.	10-12
No sound.	• Check the unit is connected correctly. • Check the input selector of the amplifier is set properly. • The unit is in the Special playback mode.	10-12
The remote control does not function.	• Aim the remote control at the remote sensor. • Operate within Approx. 5 Meters or reduce the light in the room. • Clear the path of the beam. • The batteries are weak. Replace the batteries. • Check the batteries are inserted correctly.	9
VCR		
TV recording does not work.	• The erase prevention tab of the video cassette is broken off. • The unit is in the external input mode.	18
Timer recording does not work.	• The time is not set correctly. • The recording start/end time is not set correctly. • The TIMER REC has not been pressed (2 is not lit).	15 29 30
Noise bars on screen.	• Tracking adjustment beyond range of automatic tracking circuit. • Try Manual tracking adjustment. • Video heads are dirty. • The tape is worn or damaged.	20 59
DVD		
Display is not shown in your language.	• Select proper language in the menu options.	37
Playback doesn't start.	• No disc is inserted. • The disc may be dirty. Clean up the disc. • The unit cannot play DVD-ROMs, etc.	38 36 36
Stopping playback, slow-motion play, repeat play, or memory play, etc. cannot be performed.	• Some discs may not do some of the functions.	-

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Problems and troubleshooting / Video head cleaning

SYMPTOMS	POSSIBLE SOLUTIONS	PAGE
No 4:3 (16:9) picture	• The setup does not match your TV.	51
No on-screen display	• Select Display On.	51
No surround sound	• The setup does not match your stereo system.	12
The unit or remote operation key is not functioning.	• Turn off the unit and unplug the AC power cord for several minutes, then replug it.	14
Playback does not start when the title is selected.	• Check the Parental control setting.	46
Audio soundtrack and/or subtitle language is not changed when you play back a DVD.	• Multilingual language is not recorded on the DVD disc.	49, 50
No subtitle	• Some discs have no subtitles. • Subtitles are cleared. Press SUB TITLE.	50 44
Angle cannot be changed.	• Multi-angles are not recorded on the DVD disc.	45
appears on the screen.	• The function is prohibited with the unit or the disc.	-

Video head cleaning

Video head clogging

The video heads are the means by which the DVD/VCR reads the picture from the tape during playback. In the unlikely event that the heads become dirty enough to be clogged, no picture will be played back. This can easily be determined if, during playback of a known good tape, there is good sound, but no picture (picture is extremely snowy). If this is the case, have the DVD/VCR checked by qualified service personnel.



Good Picture



Snowy Picture

NOTES:

- DO NOT ATTEMPT TO CLEAN THE VIDEO HEADS OR SERVICE THE UNIT BY REMOVING THE REAR COVER.
- Video heads may eventually wear out and should be replaced when they fail to produce clear pictures.
- To help prevent video head clogging, use only good quality VHS tapes. Discard worn out tapes.

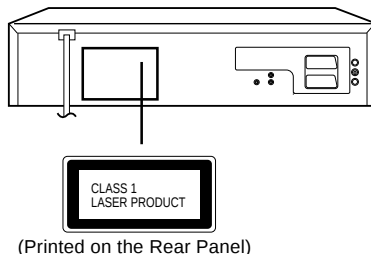
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IMPORTANT WARNING

CAUTION:

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

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



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

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

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

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

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

2. USE THE DESIGNATED PARTS

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

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

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

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

4. PERFORM A SAFETY CHECK AFTER SERVICING

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

HOW TO ORDER PARTS

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

1. MODEL NUMBER and VERSION LETTER

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

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

TAPE REMOVAL METHOD AT NO POWER SUPPLY

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

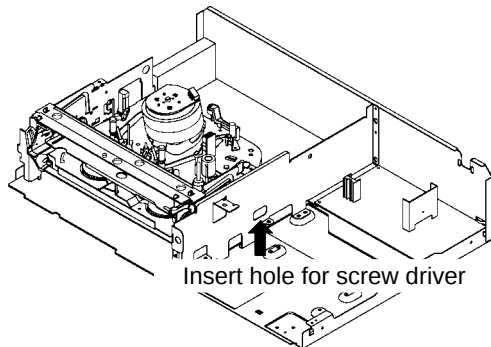


Fig. 1

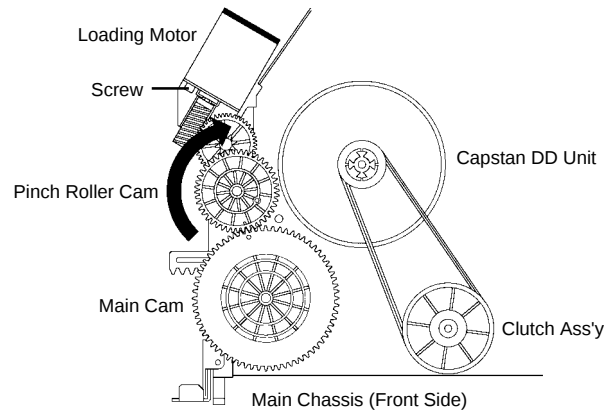


Fig. 2

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Top Cabinet and Front Cabinet. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Rotate the gear of Deck CD section in the direction of the arrow by hand, remove the disc from Deck CD. **(Refer to Fig. 3)**

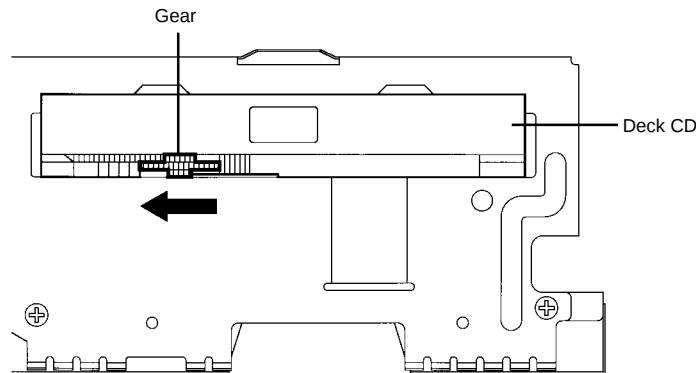


Fig. 3

PARENTAL CONTROL - RATING LEVEL 4-DIGIT SECURITY CODE CANCELLATION

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

1. Connect the set to TV Monitor.
2. Turn on the power, and set to the DVD stop mode.
3. Press the SET UP button to display the DVD menu.
4. Press the SET +/- button to select the "Operation" menu.
5. Press the CH UP/DOWN button to select the Parental Lock, then press the ENTER button.
6. Press the CH UP/DOWN button to select the ON or OFF, then press the ENTER button.
7. Press the STOP button four times on the remote control, then press the ENTER button.
The 4-digit security code is cleared.
8. Press the SET UP button to disappear the DVD menu.

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GENERAL SPECIFICATIONS (SD-22VB)

G-1	Outline of the product		DVD VIDEO PLAYER & VHS Player / Recorder
G-2	DVD System	Color System	PAL
		Disc	DVD, CD-DA, CD-R/RW, VIDEO CD
		Disc Diameter	120 mm , 80 mm
		Deck	Front Disc Loading
		Disc Loading System Motor	3 Motors
		Pick up	1-Lens 2-Beams System
		Playback time (Max)	DVD 1-Layer 135min (4.7GB) DVD 2-Layer 245min (8.5GB) CD 74min VIDEO CD 74min
		Search speed	Fwd 2-100 times / 4 steps (DVD) 4-8 times / 2 steps (CD) 5-15 times / 2 steps (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
			Actual
			Rev 2-100 times / 4 steps (DVD) 4-8 times / 2 steps (CD) 5-15 times / 2 steps (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
			Actual
		Slow speed	Fwd 1/8-1/2 times (DVD, VIDEO CD) 1/7-1/2 times (DVD, VIDEO CD)
			Actual
			Rev --
			Actual --
G-3	VCR System	System	VHS Player / Recorder
		Video System	PAL
		Hi-Fi STEREO	Yes
		NTSC PB(PAL60Hz)	Yes
		Deck	DECK Loading System Motor
		Heads	Video Head 4Head
			FM Audio Head 2Head
			Audio /Control Mono/Yes
			Erase(Full Track Erase) Yes
		Tape Rec	PAL SP/LP
		Speed	NTSC -
		Play	PAL SP/LP
			NTSC SP
		Fast Forward / Rewind Time (Approx.) at 25oC	FF:1'48"/REW:1'48"
			with Cassette E-180
		Forward/Reverse	NTSC or PAL-M SP=3x, 5x
		Picture Search	PAL or SECAM SP/LP=5x, 7x / 7x, 13x
		Frame Advance	1/10
		Slow Speed	1/5, 1/10, 1/30
G-4	Tuning System	Broadcasting System	U.K./I.R. System I/I
		Tuner and	1Tuner
		Receive CH	Destination I.R. + CCIR Hyper
			Tuning System F-Synth
			Input Impedance VHF/UHF 75 OHM
			CH Coverage IRE2-E4,X-Z+2,S1-S10,E5-E12, S11-S41,E21-E69
		Intermediate	Picture(FP) 39.5MHz
		Frequency	Sound(FS) 33.5MHz
			FP-FS 6.0MHz
		Preset CH	80CH
		RF Converter Output	Yes
		Channel	23-69 CH
		Level/Impedance	73 dBu / 75 Ohm
		Sound Selector	No
		Stereo/Dual TV Sound	NICAM
		Tuner Sound Muting	Yes
G-5	Power	Power Source	AC 230-240V 50Hz
			DC -
		Power Consumption	23 W at 230V 50Hz 7 W at 230V 50Hz -- W
		Stand by Per Year	
		Protector	Power Fuse Yes
G-6	Regulation	Safety	BEAB
		Radiation	CE
G-7	Temperature	Operation	5oC - 40oC
		Storage	-20oC - 60oC
G-8	Operating Humidity		Less than 80% RH

GENERAL SPECIFICATIONS (SD-22VB)

G-9	Signal	Video Signal	Output Level	1 V p-p/75 ohm (DVD,VCR)
			S/N Ratio (Weighted)	65 dB(DVD) 53 dB(VCR)
			Horizontal Resolution	500 Lines (DVD) 240 Lines(VCR at SP)
		RGB Signal	Output Level	0.7V p-p / 75 ohm
		Audio Signal (0dB=0.775Vrms)	Input Level Microphone	-
			Input Level Line	-3.8 dBm/ 50k ohm(VCR)
			Output Level Line	-3.8 dBm/ 1k ohm(DVD,VCR)
			Digital Output Level	0.5 V p-p / 75 ohm(DVD)
			S/N Ratio at (Weighted)	90dB(DVD) 42dB(VCR at SP)
			Harmonic Distortion (1KHz) Typical	0.1% (DVD) 1.5% (VCR at SP)
			Frequency Response : DVD Mode at DVD	4 Hz - 22 KHz
			DVD Mode at VIDEO CD	4 Hz - 20 KHz
			DVD Mode at CD	4 Hz - 20 KHz
			VCR Mode at SP	100Hz - 10 KHz
			VCR Mode at LP	100Hz - 5 KHz
			VCR Mode at SLP	-
		Hi-Fi Audio Signal	Dynamic Range : More than	75dB
			Frequency Response	20Hz ~20kHz
			Wow And Flutter : Less than	0.01 %Wrms
			Channel Separation : More than	60 dB
			Harmonic Distortion : Less than	0.01
G-10	On Screen Display	(DVD)	Menu	Yes
			Menu Type	Icon
		Picture		Yes
			TV Shape	Yes
			PAL/Auto	No
		Output Sound	Video Out Select	Yes
				Yes
			Audio Out Select	Yes
			Dynamic Range Control	Yes
			Karaoke Vocal	Yes
		Language		Yes
			On-Screen Language	Yes
			Disc Menu Language	Yes
			Audio Language	Yes
			Subtitle Language	Yes
		Display		Yes
			On-Screen Displays	Yes
			Background	Yes
		Operational	Screen Saver	Yes
				Yes
			Pause/Still	Yes
			Parental Lock	Yes
			Title Stop	Yes
		Initial Setup	PBC	Yes
				Yes
			On-Screen Displays	Yes
			TV Shape	Yes
			Audio Out Select	Yes
		Open		Yes
			Close	Yes
			No disc	Yes
			Reading	Yes
			Play	Yes
			Still/Pause	Yes
			Stop	Yes
			Prohibit Mark	Yes
			Step	Yes
			Skip+	Yes
			Skip-	Yes
			Random	Yes
			Repeat	Yes
			A-B Repeat	Yes
			Slow+ ##	Yes
			Slow- ##	No
			Search+ ##	Yes
			Search- ##	Yes
			Resume	Yes
			Title No.	Yes
			Chapter No.	Yes
			Track No.	Yes
			Time	Yes
			Sub Title No.	Yes
			Angle No.	Yes
			Audio No.	Yes
			Zoom	Yes
			Enter	Yes
			Exit	Yes
			Bit Rate	Yes
			Memory	Yes
			Screen Saver	Yes
			E.A.M	Yes

GENERAL SPECIFICATIONS (SD-22VB)

	On Screen Display(VCR)	Menu		Yes
		Menu	Type	Character
		ATS		No
		Timer Rec Set		Yes
		VCR Extension		No
		Auto Repeat On/Off		Yes
		Scene Repeat		No
		Audio Dubbing		No
		VCR Set-Up		Yes
		NICAM Auto/Off		Yes
		Audio Mix On/Off		Yes
		Color System		No
		Sharpness		Yes
		BBE On/Off		No
		CH Set-Up		Yes
		CH Tuning		Yes
		Auto Tuning		No
		CH Mapping		No
		Guide CH Set		Yes
		Pin Code Registration		No
		System Set-Up		Yes
		Clock Set		Yes (Calendar 24H)
		Language		Yes
		AV2 DEC/AV		No
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		Yes
		NICAM 1/2,NICAM Off,Audio Output		Yes
		Stereo,Audio Output,Bilingual		No
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)		Yes
		Others	CH/AV	Yes
			Clock/Date	Yes
			Repeat	No
			Pin Code	No
			Tape Counter	Yes
			Index	Yes
			Hotel Lock	No
			Tape Speed	Yes
			Manual Tracking (Bar Setting)	Yes
			Hi-Fi	Yes
			S-Repeat/SR-R/SR-Play	No
			VPS	No
			PDC	Yes
			TEST Signal	Yes
G-11	OSD Language	DVD OSD		Eng Ger Fre
		VCR OSD		Eng Ger Fre
G-12	Clock,Timer and Timer Back-up	Calendar		1990/1/1 ~ 2081/12/31
		Timer Events		8 Program/ 1 Month
		One Touch Recording Max Time		SP:5Hours LP:10 Hours
		OTPB Valid Time		No
		Timer Back-up (at Power Off Mode)		30 Min

GENERAL SPECIFICATIONS (SD-22VB)

G-13	Display	DISPLAY		
		DISPLAY type	Fluorescent Indicator	
		Clock/Counter,CH,Timer Rec,OTR, Play Rec,FF(Cue),Rew(Rev),Stop,ATR,Eject	No	
		VCR	Yes	
		DVD	No	
		CD	No	
		Clock	Yes (24h)	
			AM	No
			PM	No
		Counter	VCR	Yes (hour:min:sec)
			DVD	Yes (hour:min:sec)
			CD	Yes (min:sec)
		Counter Remain		No
		Play		Yes
		Stop		No
		Rec		Yes
		FF / Cue		No
		REW /Review		No
		Pause/Still		No
		OTR		No
		T-Rec		Yes
		Chapter		No
		TITLE		No
		TRACK		Yes
		Repeat		No
		Hi-Fi		No
		SP		Yes
		LP		Yes
		SLP(EP)		Yes
		CH		Yes
		RF Output CH		Yes
		Auto Tuning		Yes
		Eject		Yes
Tape In		Yes		
PBC(Play Back Control)		Yes		

GENERAL SPECIFICATIONS (SD-22VB)

G-14	Remote Control	Unit	RC-FW
		Glow in Dark Remocon	Yes
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	48 Keys
		Keys	
		Power	Yes
		VCR	Yes
		DVD	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0/AV	Yes
		DVD MENU	Yes
		MEMORY	Yes
		RETURN	Yes
		OPEN/CLOSE	Yes
		CLOCK / COUNTER	Yes
		SUB TITLE/ATR	Yes
		ANGLE/COUNTER RESET	Yes
		ZERO RETURN	Yes
		PLAY MODE/SPEED	Yes
		ZOOM	Yes
		TITLE	Yes
		REPEAT A-B	Yes
		PROGRAM/G-CODE	Yes
		T-REC	Yes
		TV/VCR	Yes
		FF(Cue)/SEARCH+	Yes
		REW(Review)/SEARCH-	Yes
		PLAY	Yes
		STOP	Yes
		PAUSE/STILL	Yes
		REC/OTR	Yes
		SKIP+ / INDEX+	Yes
		SKIP- / INDEX-	Yes
		UP/CH+	Yes
		DOWN/CH-	Yes
		LEFT/ SET- / TRACKING-	Yes
		RIGHT/ SET+ / TRACKING+	Yes
		SELECT/ENTER	Yes
		SET UP MENU/ VCR MENU	Yes
		CLEAR/CANCEL	Yes
		DISPLAY/CALL	Yes
		AUDIO / AUDIO SELECT	Yes
		SLOW(Forward)	Yes
		E.A.M.	Yes
		CM SKIP(Skip search)	Yes
		REC END SEARCH/ONE TOUCH REPLAY	No

GENERAL SPECIFICATIONS (SD-22VB)

G-15	Features (DVD)	Auto Power Off	No	
		Parental Lock	Yes	
		Video CD Playback	Yes	
		MP3 Playback	Yes	
		Digital Out	Dolby Digital	Yes
			PCM	Yes
			DTS	Yes
			MPEG1,MPEG2	Yes
		Down Mix Out	(Dolby Digital, MPEG1,MPEG2)	Yes
		Self Diagnostic	No	
		Spatializer (N-2-2)	Yes	
		Screen Saver	Yes	
		Frame Advance	Yes	
		One Touch Replay (10 Sec reverse)	No	
	Features (VCR)	Auto Head Cleaning	Yes	
		Auto Tracking	Yes	
		Index Search	Yes	
		HQ (VHS Standard High Quality)	Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes	
		Auto Repeat	Yes	
		Auto Power Off	No	
		VIDEO PLUS+(SHOWVIEW,G-CODE)	Yes	
		ATS	No	
		Auto Set Up (CH Auto Set-Up/Auto Clock)	Yes	
		PDC	Yes	
		VPS	No	
		Reverse Slow	No	
		One Touch Playback	No	
		Picture Control(Sharpness)	Yes	
		Channel Lock	No	
		Hotel Lock	No	
		Anti Theft	No	
		Audio Dubbing	No	
		Remote Control Code 1/2	No	
		BBE Audio	No	
		Rec END Search	No	
		SQPB(PAL SP MODE)	Yes	
		CATV	Yes	
		CM Skip(30sec x 6 Times)	Yes	
G-16	Accessories	Owner's Manual	Yes	
		Language	English	
		w/Guarantee Card	No	
		Buyer Model No	SD-22VB	
		Remote Control Unit	Yes	
		Dew Caution Sheet	No	
		Battery	Yes	
		UM size x pcs	UM-4 x 2 pcs	
		Tape Rewinder	No	
		Safety Tip	No	
		Toll Free Insert Sheet	No	
		Quick Set-Up Sheet	Yes	
		Information Sheet	No	
		75 Ohm Coaxial Cable	Yes (0.9m)	
		type	Single shield	
		U/V Mixer	No	
		DC Car Cord (Center+)	No	
		Guarantee Card	Yes	
		Warning Sheet	No	
		Circuit Diagram	No	
		Antenna Change Plug	No	
		Service Facility List	No	
		Important Safeguard	No	
		Dew/AHC Caution Sheet	No	
		AC Plug Adapter	No	
		AC Cord	No	
		AV Cord (2Pin-1Pin)	No	
		Registration Card	No	
		21pin Cable	No	
		300 ohm to 75 ohm Antenna Adapter	No	

GENERAL SPECIFICATIONS (SD-22VB)

G-17	Interface	Switch	Front	Power	Yes		
				Play	Yes		
				Eject (VCR)	Yes		
				Stop	Yes		
				Rec/OTR	Yes		
				Open/Close (DVD)	Yes		
				CH +	Yes		
				CH -	Yes		
				FF/ Search(>>)	Yes		
				Rew/Search(<<)	Yes		
				Still/Pause	No		
				Shuttle(Search/REV/FWD)	No		
				DVD/VCR	Yes		
				Input Select	Yes		
		Rear	Main Power SW	No			
			Attenuator	No			
			Video/RGB Selector	No			
			RF Out(Slide SW)	No			
		Volume	Main Power SW	No			
			Phones Volume	No			
			Mic Volume	No			
			Echo Volume	No			
		Terminals	Front	Rec/OTR	No		
				Video In	RCA x1(Black)		
			Rear	Audio In	RCA x 2(Stereo, Black)		
				Video Output	No		
				Audio Output	RCA x 2(Stereo, White/Red) Coaxial x 1 (Digital Audio,DVD Signal Only)		
				Video Input	No		
				Audio Input	No		
				Optical Digital Audio Out (Option)	Yes		
				Euro Scart	2SCART		
				S-Video Output	Yes (DVD Signal Only)		
				Ext Speaker	No		
				VHF/UHF Antenna Input/Output	DIN Type		
		Indicator	LED	AC Inlet	No		
				Power	No		
				Rec	No		
				T-Rec	No		
				TV/VCR	No		
				DVD	Yes (GREEN)		
VCR	Yes (GREEN)						
Surround	No						
G-18	Set Size		Approx.	W x D x H (mm)	430 x 314.5 x 99		
G-19	Weight					Net (Approx.)	4.5 kg(9.9lbs)
						Gross (Approx.)	5.5 kg(12.1lbs)
G-20	Carton	Master Carton			No		
				Content	--- Sets		
				Material	--- / ---		
				Dimensions W x D x H(mm)	---		
		Gift Box		Description of Origin	---		
					Yes		
				Material	Single Full Color Carton		
				W/Color Photo Label	No		
				Dimensions W x D x H(mm)	500 x 430 x 180		
				Pulp Package	No		
				Design	As Per BUYER 's		
				Description of Origin	Yes		
		Drop Test		Buyer Model No	SD-22VB		
					Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces		
				Height (cm)	80 cm		
				Container Stuffing	1,623 Sets/40' container		
G-21	Cabinet Material		Cabinet Front		PS 94HB		

GENERAL SPECIFICATIONS (SD-22VE)

G-1	Outline of the product		DVD VIDEO PLAYER & VHS Player / Recorder
G-2	DVD System	Color System	PAL
		Disc	DVD, CD-DA, CD-R/RW, VIDEO CD
		Disc Diameter	120 mm , 80 mm
		Deck	Front Disc Loading
		Disc Loading System Motor	3 Motors
		Pick up	1-Lens 2-Beams System
		Playback time (Max)	DVD 1-Layer 135min (4.7GB) DVD 2-Layer 245min (8.5GB) CD 74min VIDEO CD 74min
		Search speed	Fwd 2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
		Actual	Rev 2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
		Slow speed	Fwd 1/8-1/2 times (DVD, VIDEO CD) 1/7-1/2 times (DVD, VIDEO CD)
		Actual	Rev --
		Actual	--
G-3	VCR System	System	VHS Player / Recorder
		Video System	PAL/SECAM/MESECAM
		Hi-Fi STEREO	Yes
		NTSC PB(PAL60Hz)	Yes
		Deck	DECK Loading System Motor
		Heads	Video Head 4Head
		FM Audio Head	2Head
		Audio /Control	Mono/Yes
		Erase(Full Track Erase)	Yes
		Tape Rec	PAL SP/LP
		Speed	NTSC -
		Play	PAL SP/LP NTSC SP
		Fast Forward / Rewind Time (Approx.) at 25oC	FF:1'12"/REW:1'12"
		with Cassette	E-180
		Forward/Reverse	NTSC or PAL-M SP=3x, 5x
G-4	Tuning System	Picture Search	PAL or SECAM SP/LP=5x, 7x / 7x, 13x
		Frame Advance	1/10
		Slow Speed	1/5, 1/10, 1/30
		Broadcasting System	CCIR,FRENCH System BG,L
		Tuner and Receive CH	System 1Tuner
		Destination	Oscar(W/HYPER), France CATV
		Tuning System	F-Synth
		Input Impedance	VHF/UHF 75 OHM
		CH Coverage (SECAM)	F2~F4, FB~FQ, F21~F69
		(PAL)	E2~E4, X~Z+2, S1~S10, E5~E12, S11~S41, F21~F69
		Intermediate	Picture(FP) PAL/SECAM(U&VH)/SECAM(VL)
		Frequency	Sound(FS) 38.9 / 38.9 / 34.4MHz FP-FS 33.4 / 32.4 / 40.9MHz 5.5 / 6.5 / 6.5MHz
		Preset CH	80CH
		RF Converter Output	No
		Channel	-
		Level/Impedance	-
		Sound Selector	No
		Stereo/Dual TV Sound	G.ST/NICAM DUAL
		Tuner Sound Muting	Yes
G-5	Power	Power Source	AC 230V 50Hz
		DC	-
		Power Consumption	23 W at 230V 50Hz 7 W at 230V 50Hz -- W
		Stand by Per Year	Protector
G-6	Regulation	Power Fuse	Yes
		Safety	CE
		Radiation	CE
G-7	Temperature	Operation	5oC - 40oC
		Storage	-20oC - 60oC

GENERAL SPECIFICATIONS (SD-22VE)

G-8	Operating Humidity			Less than 80% RH
G-9	Signal	Video Signal	Output Level	1 V p-p/75 ohm (DVD,VCR)
			S/N Ratio (Weighted)	65 dB(DVD) 53 dB(VCR)
			Horizontal Resolution	500 Lines (DVD) 240 Lines(VCR at SP)
		RGB Signal	Output Level	0.7V p-p / 75 ohm
			Audio Signal (0dB=0.775Vrms)	Input Level Microphone
		Input Level Line		-3.8 dBm/ 50k ohm(VCR)
		Output Level Line		-3.8 dBm/ 1k ohm(DVD,VCR)
		Digital Output Level		0.5 V p-p / 75 ohm(DVD)
		S/N Ratio at (Weighted)		90dB(DVD) 42dB(VCR at SP)
		Harmonic Distortion (1KHz) Typical		0.1% (DVD) 1.5% (VCR at SP)
		Frequency Response : DVD Mode at DVD		4 Hz - 22 KHz
		DVD Mode at VIDEO CD		4 Hz - 20 KHz
		DVD Mode at CD		4 Hz - 20 KHz
		VCR Mode at SP		100Hz - 10 KHz
		VCR Mode at LP		100Hz - 5 KHz
		VCR Mode at SLP		-
		Hi-Fi Audio Signal	Dynamic Range : More than	75dB
Frequency Response	20Hz ~20kHz			
Wow And Flutter : Less than	0.01 %Wrms			
Channel Separation : More than	60 dB			
Harmonic Distortion : Less than	0.01			
G-10	On Screen Display	(DVD)	Menu	Yes
			Menu Type	Icon
		Picture	Yes	
			TV Shape	Yes
			PAL/Auto	No
			Video Out Select	Yes
		Output Sound	Yes	
			Audio Out Select	Yes
			Dynamic Range Control	Yes
			Karaoke Vocal	Yes
		Language	Yes	
			On-Screen Language	Yes
			Disc Menu Language	Yes
			Audio Language	Yes
			Subtitle Language	Yes
		Display	Yes	
			On-Screen Displays	Yes
			Background	Yes
		Operational	Screen Saver	Yes
			Yes	
			Pause/Still	Yes
			Parental Lock	Yes
			Title Stop	Yes
			PBC	Yes
			Initial Setup	Yes
		On-Screen Displays	Yes	
		TV Shape	Yes	
		Audio Out Select	Yes	
		Open	Yes	
		Close	Yes	
		No disc	Yes	
		Reading	Yes	
		Play	Yes	
		Still/Pause	Yes	
		Stop	Yes	
		Prohibit Mark	Yes	
		Step	Yes	
		Skip+	Yes	
		Skip-	Yes	
		Random	Yes	
		Repeat	Yes	
		A-B Repeat	Yes	
		Slow+ ##	Yes	
		Slow- ##	No	
		Search+ ##	Yes	
		Search- ##	Yes	
		Resume	Yes	
		Title No.	Yes	
		Chapter No.	Yes	
		Track No.	Yes	
Time	Yes			
Sub Title No.	Yes			
Angle No.	Yes			
Audio No.	Yes			
Zoom	Yes			
Enter	Yes			
Exit	Yes			
Bit Rate	Yes			
Memory	Yes			
Screen Saver	Yes			
E.A.M	Yes			

GENERAL SPECIFICATIONS (SD-22VE)

	On Screen Display(VCR)	Menu	Menu	Type	Yes	Character
			ATS			No
			Timer Rec Set		Yes	
			VCR Extension		Yes	
				Auto Repeat On/Off	Yes	
				Scene Repeat	Yes	
				Audio Dubbing	Yes	
			VCR Set-Up		Yes	
				NICAM Auto/Off	Yes	
				Audio Mix On/Off	Yes	
				Color System	Yes	
				Sharpness	Yes	
				BBE On/Off		No
			CH Set-Up		Yes	
				CH Tuning	Yes	
				Auto Tuning	Yes	
				CH Mapping	Yes	
				Guide CH Set		No
			Pin Code Registration			No
			System Set-Up		Yes	
				Clock Set	Yes	(Calendar 24H)
				Language	Yes	
				AV2 DEC/AV	Yes	
			G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		Yes	
			NICAM 1/2, NICAM Off, Audio Output		Yes	
			Stereo, Audio Output, Bilingual		Yes	
			Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)		Yes	
			Others	CH/AV	Yes	
				Clock/Date	Yes	
				Repeat		No
				Pin Code		No
				Tape Counter	Yes	
				Index	Yes	
				Hotel Lock		No
				Tape Speed	Yes	
				Manual Tracking (Bar Setting)	Yes	
				Hi-Fi	Yes	
				S-Repeat/SR-R/SR-Play	Yes	
				VPS	Yes	
				PDC	Yes	
				TEST Signal		No
G-11	OSD Language		DVD OSD		Eng Ger Fre	
			VCR OSD		Eng Ger Fre	
G-12	Clock, Timer and Timer Back-up	Calendar	Timer Events		1990/1/1 ~ 2081/12/31	
			One Touch Recording Max Time		8 Program/ 1 Month	
			OTPB Valid Time		SP:5Hours LP:10 Hours	
			Timer Back-up (at Power Off Mode)		30	No
						Min
G-13	Display	DISPLAY			Yes	
				DISPLAY type	Fluorescent Indicator	
				Clock/Counter, CH, Timer Rec, OTR, Play Rec, FF(Cue), Rew(Rev), Stop, ATR, Eject		No
				VCR	Yes	
				DVD		No
				CD		No
				Clock	Yes (24h)	
					AM	No
					PM	No
				Counter	VCR	Yes (hour:min:sec)
					DVD	Yes (hour:min:sec)
					CD	Yes (min:sec)
				Counter Remain		No
				Play	Yes	
				Stop		No
				Rec	Yes	
				FF / Cue		No
				REW /Review		No
				Pause/Still		No
				OTR		No
				T-Rec	Yes	
				Chapter		No
				TITLE		No
				TRACK	Yes	
				Repeat		No
				Hi-Fi		No
				SP	Yes	
				LP	Yes	
				SLP(EP)	Yes	
				CH	Yes	
				RF Output CH		No
				Auto Tuning	Yes	
				Eject	Yes	
				Tape In	Yes	
				PBC(Play Back Control)	Yes	

GENERAL SPECIFICATIONS (SD-22VE)

G-14	Remote Control	Unit	RC-FW
		Glow in Dark Remocon	Yes
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	48 Key
		Keys	
		Power	Yes
		VCR	Yes
		DVD	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0/AV	Yes
		DVD MENU	Yes
		MEMORY	Yes
		RETURN	Yes
		OPEN/CLOSE	Yes
		CLOCK / COUNTER	Yes
		SUB TITLE/ATR	Yes
		ANGLE/COUNTER RESET	Yes
		ZERO RETURN	Yes
		PLAY MODE/SPEED	Yes
		ZOOM	Yes
		TITLE	Yes
		REPEAT A-B	Yes
		PROGRAM/G-CODE	Yes
		T-REC	Yes
		TV/VCR	Yes
		FF(Cue)/SEARCH+	Yes
		REW(Review)/SEARCH-	Yes
		PLAY	Yes
		STOP	Yes
		PAUSE/STILL	Yes
		REC/OTR	Yes
		SKIP+ / INDEX+	Yes
		SKIP- / INDEX-	Yes
		UP/CH+	Yes
		DOWN/CH-	Yes
		LEFT/ SET- / TRACKING-	Yes
		RIGHT/ SET+ / TRACKING+	Yes
		SELECT/ENTER	Yes
		SET UP MENU/ VCR MENU	Yes
		CLEAR/CANCEL	Yes
		DISPLAY/CALL	Yes
		AUDIO / AUDIO SELECT	Yes
		SLOW(Forward)	Yes
		E.A.M.	Yes
		CM SKIP(Skip search)	Yes
		REC END SEARCH/ONE TOUCH REPLAY	No

GENERAL SPECIFICATIONS (SD-22VE)

G-15	Features (DVD)	Auto Power Off		No
		Parental Lock	Yes	
		Video CD Playback	Yes	
		MP3 Playback	Yes	
		Digital Out	Dolby Digital	Yes
			PCM	Yes
			DTS	Yes
			MPEG1,MPEG2	Yes
		Down Mix Out	(Dolby Digital, MPEG1,MPEG2)	Yes
		Self Diagnostic		No
		Spatializer (N-2-2)		Yes
		Screen Saver		Yes
		Frame Advance		Yes
		One Touch Replay (10 Sec reverse)		No
	Features (VCR)	Auto Head Cleaning	Yes	
		Auto Tracking	Yes	
		Index Search	Yes	
		HQ (VHS Standard High Quality)	Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes	
		Auto Repeat	Yes	
		Auto Power Off		No
		VIDEO PLUS+(SHOWVIEW,G-CODE)	Yes	
		Auto Tuning/Auto Clock/Auto Guide ch	Yes	
		Auto Set Up (CH Auto Set-Up/Auto Clock)		No
		PDC	Yes	
		VPS	Yes	
		Reverse Slow		No
		One Touch Playback		No
		Picture Control(Sharpness)	Yes	
		Channel Lock		No
		Hotel Lock		No
		Anti Theft		No
		Audio Dubbing	Yes	
		Remote Control Code 1/2		No
		BBE Audio		No
		Rec END Search		No
		SQPB(PAL SP MODE)	Yes	
		CATV	Yes	
		CM Skip(30sec x 6 Times)	Yes	
		Copy Disc to Tape	Yes (by Conditioning)	
G-16	Accessories	Owner's Manual	Yes	
		Language	French/ German	
		w/Guarantee Card		No
		Buyer Model No	SD-22VE	
		Remote Control Unit	Yes	
		Dew Cation Sheet		No
		Battery	Yes	
		UM size x pcs	UM-4 x 2 pcs	
		Tape Rewinder		No
		Safety Tip		No
		Toll Free Insert Sheet		No
		Quick Set-Up Sheet	Yes(English)	
		Information Sheet		No
		75 Ohm Coaxial Cable	Yes (0.9m)	
		type	Single shield	
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Important Safeguard		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card		No
		21pin Cable(Double Shield)	Yes	
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS (SD-22VE)

G-17	Interface	Switch	Front	Power	Yes	
				Play	Yes	
				Eject (VCR)	Yes	
				Stop	Yes	
				Rec/OTR	Yes	
				Open/Close (DVD)	Yes	
				CH +	Yes	
				CH -	Yes	
				FF/ Search(>>)	Yes	
				Rew/Search(<<)	Yes	
				Still/Pause	No	
				Shuttle(Search/REV/FWD)	No	
				DVD/VCR	Yes	
				Input Select	Yes	
				Main Power SW	No	
			Rear	Attenuator	No	
				Video/RGB Selector	No	
				RF Out(Slide SW)	No	
				Main Power SW	No	
		Volume	Phones Volume	No		
			Mic Volume	No		
			Echo Volume	No		
			Rec/OTR	No		
		Terminals	Front	Video In	RCA x1(Black)	
				Audio In	RCA x 2(Stereo, Black)	
			Rear	Video Output	No	
				Audio Output	RCA x 2(Stereo, White/Red) Coaxial x 1 (Digital Audio,DVD Signal Only)	
				Video Input	No	
				Audio Input	No	
				Optical Digital Audio Out (Option)	Yes	
				Euro Scart	2SCART	
				S-Video Output	Yes (DVD Signal Only)	
				Ext Speaker	No	
				VHF/UHF Antenna Input/Output	DIN Type (France)	
				AC Inlet	No	
			Indicator	LED	Power	No
					Rec	No
					T-Rec	No
					TV/VCR	No
					DVD	Yes (GREEN)
					VCR	Yes (GREEN)
					Surround	No
		Level Meter			No	
G-18	Set Size	Approx.	W x D x H (mm)	430 x 314.5 x 99		
G-19	Weight	Net (Approx.)		4.5 kg(9.9lbs)		
		Gross (Approx.)		5.5 kg(12.1lbs)		
G-20	Carton	Master Carton		No		
			Content	--- Sets		
			Material	--- / ---		
			Dimensions W x D x H(mm)	---		
		Gift Box	Description of Origin	---		
				Yes		
			Material	Single Full Color Carton		
			W/Color Photo Label	No		
			Dimensions W x D x H(mm)	500 x 430 x 180		
			Pulp Package	No		
			Design	As Per BUYER 's		
			Description of Origin	Yes		
		Drop Test	Buyer Model No	SD-22VE		
				Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces		
			Height (cm)	80 cm		
			Container Stuffing	1,623 Sets/40' container		
G-21	Cabinet Material	Cabinet Front		PS 94HB		

GENERAL SPECIFICATIONS (SD-22VL)

G-1	Outline of the product		DVD VIDEO PLAYER & VHS Player / Recorder
G-2	DVD System	Color System	PAL
		Disc	DVD, CD-DA, CD-R/RW, VIDEO CD
		Disc Diameter	120 mm , 80 mm
		Deck	Front Disc Loading
		Disc Loading System	3 Motors
		Motor	1-Lens 2-Beams System
		Pick up	
		Playback time (Max)	DVD 1-Layer 135min (4.7GB) DVD 2-Layer 245min (8.5GB) CD 74min VIDEO CD 74min
		Search speed	Fwd 2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
		Actual	
		Rev	2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD) 2-70 times (DVD) 4-12times (CD) 4-18times (VIDEO CD)
		Actual	
		Slow speed	Fwd 1/8-1/2 times (DVD, VIDEO CD) 1/7-1/2 times (DVD, VIDEO CD)
		Actual	
		Rev	--
		Actual	--
G-3	VCR System	System	VHS Player / Recorder
		Video System	PAL
		Hi-Fi STEREO	Yes
		NTSC PB(PAL60Hz)	Yes
		Deck	DECK
		Loading System	Front
		Motor	3
		Heads	Video Head 4Head
		FM Audio Head	2Head
		Audio /Control	Mono/Yes
		Erase(Full Track Erase)	Yes
		Tape Rec	PAL SP/LP
		Speed NTSC	-
		Play	PAL SP/LP NTSC SP
		Fast Forward / Rewind Time (Approx.) at 25oC	FF:1'12"/REW:1'12"
G-4	Tuning System	with Cassette	E-180
		Forward/Reverse	NTSC or PAL-M
		Picture Search	PAL or SECAM
		Frame Advance	1/10
		Slow Speed	1/5, 1/10,1/30
		Broadcasting System	CCIR System BG
		Tuner and	1Tuner
		Receive CH	Destination Oscar(W/HYPER)
		Tuning System	F-Synth
		Input Impedance	VHF/UHF 75 OHM
		CH Coverage	E2~E4, X~Z+2, S1~S10, E5~E12,S11~S41,E21~E69
		Intermediate	Picture(FP) 38.9 MHz
		Frequency	Sound(FS) 33.4 MHz FP-FS 5.5 MHz
		Preset CH	80CH
		RF Converter Output	Yes
G-5	Power	Power Source	AC 230V 50Hz DC -
		Power Consumption	23 W at 230V 50Hz 7 W at 230V 50Hz -- W
		Stand by	
		Per Year	
		Protector	Power Fuse Yes
G-6	Regulation	Safety	CE
		Radiation	CE
G-7	Temperature	Operation	5oC - 40oC
		Storage	-20oC - 60oC

GENERAL SPECIFICATIONS (SD-22VL)

G-8	Operating Humidity			Less than 80% RH
G-9	Signal	Video Signal	Output Level	1 V p-p/75 ohm (DVD,VCR)
			S/N Ratio (Weighted)	65 dB(DVD) 53 dB(VCR)
			Horizontal Resolution	500 Lines (DVD) 240 Lines(VCR at SP)
		RGB Signal	Output Level	0.7V p-p / 75 ohm
		Audio Signal (0dB=0.775Vrms)	Input Level Microphone	-
			Input Level Line	-3.8 dBm/ 50k ohm(VCR)
			Output Level Line	-3.8 dBm/ 1k ohm(DVD,VCR)
			Digital Output Level	0.5 V p-p / 75 ohm(DVD)
			S/N Ratio at (Weighted)	90dB(DVD) 42dB(VCR at SP)
			Harmonic Distortion (1KHz)	0.1% (DVD) 1.5% (VCR at SP)
			Frequency Response : DVD Mode at DVD	4 Hz - 22 KHz
			DVD Mode at VIDEO CD	4 Hz - 20 KHz
			DVD Mode at CD	4 Hz - 20 KHz
			VCR Mode at SP	100Hz - 10 KHz
			VCR Mode at LP	100Hz - 5 KHz
			VCR Mode at SLP	-
		Hi-Fi Audio Signal	Dynamic Range : More than	75dB
			Frequency Response	20Hz ~20kHz
			Wow And Flutter : Less than	0.01 %Wrms
			Channel Separation : More than	60 dB
			Harmonic Distortion : Less than	0.01
G-10	On Screen Display	(DVD)	Menu	Yes
			Menu Type	Icon
		Picture		Yes
			TV Shape	Yes
			PAL/Auto	No
		Video Out Select	Yes	
			Yes	
			Yes	
			Yes	
		Output Sound	Yes	
			Yes	
			Yes	
			Yes	
		Karaoke Vocal	Yes	
			Yes	
			Yes	
			Yes	
		Language	Yes	
			Yes	
			Yes	
			Yes	
		Subtitle Language	Yes	
			Yes	
			Yes	
			Yes	
		Display	Yes	
			Yes	
			Yes	
			Yes	
		Screen Saver	Yes	
			Yes	
			Yes	
			Yes	
		Operational	Yes	
			Yes	
			Yes	
			Yes	
		Parental Lock	Yes	
			Yes	
			Yes	
			Yes	
		Title Stop	Yes	
			Yes	
			Yes	
			Yes	
		PBC	Yes	
			Yes	
			Yes	
			Yes	
		Initial Setup	Yes	
Yes				
Yes				
Yes				
Audio Out Select	Yes			
	Yes			
	Yes			
	Yes			
Open	Yes			
	Yes			
	Yes			
	Yes			
Close	Yes			
	Yes			
	Yes			
	Yes			
No disc	Yes			
	Yes			
	Yes			
	Yes			
Reading	Yes			
	Yes			
	Yes			
	Yes			
Play	Yes			
	Yes			
	Yes			
	Yes			
Still/Pause	Yes			
	Yes			
	Yes			
	Yes			
Stop	Yes			
	Yes			
	Yes			
	Yes			
Prohibit Mark	Yes			
	Yes			
	Yes			
	Yes			
Step	Yes			
	Yes			
	Yes			
	Yes			
Skip+	Yes			
	Yes			
	Yes			
	Yes			
Skip-	Yes			
	Yes			
	Yes			
	Yes			
Random	Yes			
	Yes			
	Yes			
	Yes			
Repeat	Yes			
	Yes			
	Yes			
	Yes			
A-B Repeat	Yes			
	Yes			
	Yes			
	Yes			
Slow+ ##	Yes			
	No			
	No			
	No			
Slow- ##	Yes			
	Yes			
	Yes			
	Yes			
Search+ ##	Yes			
	Yes			
	Yes			
	Yes			
Search- ##	Yes			
	Yes			
	Yes			
	Yes			
Resume	Yes			
	Yes			
	Yes			
	Yes			
Title No.	Yes			
	Yes			
	Yes			
	Yes			
Chapter No.	Yes			
	Yes			
	Yes			
	Yes			
Track No.	Yes			
	Yes			
	Yes			
	Yes			
Time	Yes			
	Yes			
	Yes			
	Yes			
Sub Title No.	Yes			
	Yes			
	Yes			
	Yes			
Angle No.	Yes			
	Yes			
	Yes			
	Yes			
Audio No.	Yes			
	Yes			
	Yes			
	Yes			
Zoom	Yes			
	Yes			
	Yes			
	Yes			
Enter	Yes			
	Yes			
	Yes			
	Yes			
Exit	Yes			
	Yes			
	Yes			
	Yes			
Bit Rate	Yes			
	Yes			
	Yes			
	Yes			
Memory	Yes			
	Yes			
	Yes			
	Yes			
Screen Saver	Yes			
	Yes			
	Yes			
	Yes			
E.A.M	Yes			
	Yes			
	Yes			
	Yes			

GENERAL SPECIFICATIONS (SD-22VL)

	On Screen Display(VCR)	Menu	Menu	Type	Yes	Character
			ATS			No
			Timer Rec Set		Yes	
			VCR Extension		Yes	
				Auto Repeat On/Off	Yes	
				Scene Repeat	Yes	
				Audio Dubbing	Yes	
			VCR Set-Up		Yes	
				NICAM Auto/Off	Yes	
				Audio Mix On/Off	Yes	
				Color System		No
				Sharpness	Yes	
				BBE On/Off		No
			CH Set-Up		Yes	
				CH Tuning	Yes	
				Auto Tuning	Yes	
				CH Mapping	Yes	
				Guide CH Set		No
			Pin Code Registration			No
			System Set-Up		Yes	
				Clock Set	Yes	(Calendar 24H)
				Language	Yes	
				AV2 DEC/AV	Yes	
			G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		Yes	
			NICAM 1/2,NICAM Off,Audio Output		Yes	
			Stereo,Audio Output,Bilingual		Yes	
			Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)		Yes	
			Others	CH/AV	Yes	
				Clock/Date	Yes	
				Repeat		No
				Pin Code		No
				Tape Counter	Yes	
				Index	Yes	
				Hotel Lock		No
				Tape Speed	Yes	
				Manual Tracking (Bar Setting)	Yes	
				Hi-Fi	Yes	
				S-Repeat/SR-R/SR-Play	Yes	
				VPS	Yes	
				PDC	Yes	
				TEST Signal	Yes	
G-11	OSD Language		DVD OSD		Ger Spa Ita	
			VCR OSD		Ger Spa Ita	
G-12	Clock,Timer and Timer Back-up	Calendar			1990/1/1 ~ 2081/12/31	
		Timer Events			8 Program/ 1 Month	
		One Touch Recording Max Time			SP:5Hours LP:10 Hours	
		OTPB Valid Time				No
		Timer Back-up (at Power Off Mode)			30	Min
G-13	Display	DISPLAY			Yes	
			DISPLAY type		Fluorescent Indicator	
			Clock/Counter,CH,Timer Rec,OTR, Play Rec,FF(Cue),Rew(Rev),Stop,ATR,Eject			No
			VCR		Yes	
			DVD			No
			CD			No
			Clock		Yes (24h)	
				AM		No
				PM		No
			Counter	VCR	Yes (hour:min:sec)	
				DVD	Yes (hour:min:sec)	
				CD	Yes (min:sec)	
			Counter Remain			No
			Play		Yes	
			Stop			No
			Rec		Yes	
			FF / Cue			No
			REW /Review			No
			Pause/Still			No
			OTR			No
			T-Rec		Yes	
			Chapter			No
			TITLE			No
			TRACK		Yes	
			Repeat			No
			Hi-Fi			No
			SP		Yes	
			LP		Yes	
			SLP(EP)		Yes	
			CH		Yes	
			RF Output CH		Yes	
			Auto Tuning		Yes	
			Eject		Yes	
			Tape In		Yes	
			PBC(Play Back Control)		Yes	

GENERAL SPECIFICATIONS (SD-22VL)

G-14	Remote Control	Unit	RC-FW
		Glow in Dark Remocon	Yes
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	48 Keys
		Keys	
		Power	Yes
		VCR	Yes
		DVD	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0/AV	Yes
		DVD MENU	Yes
		MEMORY	Yes
		RETURN	Yes
		OPEN/CLOSE	Yes
		CLOCK / COUNTER	Yes
		SUB TITLE/ATR	Yes
		ANGLE/COUNTER RESET	Yes
		ZERO RETURN	Yes
		PLAY MODE/SPEED	Yes
		ZOOM	Yes
		TITLE	Yes
		REPEAT A-B	Yes
		PROGRAM/G-CODE	Yes
		T-REC	Yes
		TV/VCR	Yes
		FF(Cue)/SEARCH+	Yes
		REW(Review)/SEARCH-	Yes
		PLAY	Yes
		STOP	Yes
		PAUSE/STILL	Yes
		REC/OTR	Yes
		SKIP+ / INDEX+	Yes
		SKIP- / INDEX-	Yes
		UP/CH+	Yes
		DOWN/CH-	Yes
		LEFT/ SET- / TRACKING-	Yes
		RIGHT/ SET+ / TRACKING+	Yes
		SELECT/ENTER	Yes
		SET UP MENU/ VCR MENU	Yes
		CLEAR/CANCEL	Yes
		DISPLAY/CALL	Yes
		AUDIO / AUDIO SELECT	Yes
		SLOW(Forward)	Yes
		E.A.M.	Yes
		CM SKIP(Skip search)	Yes
		REC END SEARCH/ONE TOUCH REPLAY	No

GENERAL SPECIFICATIONS (SD-22VL)

G-15	Features (DVD)	Auto Power Off		No
		Parental Lock	Yes	
		Video CD Playback	Yes	
		MP3 Playback	Yes	
		Digital Out	Dolby Digital	Yes
			PCM	Yes
			DTS	Yes
			MPEG1,MPEG2	Yes
		Down Mix Out	(Dolby Digital, MPEG1,MPEG2)	Yes
		Self Diagnostic		No
		Spatializer (N-2-2)		Yes
		Screen Saver		Yes
		Frame Advance		Yes
		One Touch Replay (10 Sec reverse)		No
	Features (VCR)	Auto Head Cleaning	Yes	
		Auto Tracking	Yes	
		Index Search	Yes	
		HQ (VHS Standard High Quality)	Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes	
		Auto Repeat	Yes	
		Auto Power Off		No
		VIDEO PLUS+(SHOWVIEW,G-CODE)	Yes	
		Auto Tuning/Auto Clock/Auto Guide Ch	Yes	
		Auto Set Up (CH Auto Set-Up/Auto Clock)		No
		PDC	Yes	
		VPS	Yes	
		Reverse Slow		No
		One Touch Playback		No
		Picture Control(Sharpness)	Yes	
		Channel Lock		No
		Hotel Lock		No
		Anti Theft		No
		Audio Dubbing	Yes	
		Remote Control Code 1/2		No
		BBE Audio		No
		Rec END Search		No
		SQPB(PAL SP MODE)	Yes	
		CATV	Yes	
		CM Skip(30sec x 6 Times)	Yes	
		Copy (Disc to Tape)	Yes (by Conditioning)	
G-16	Accessories	Owner's Manual	Yes	
		Language	German/ Italian/ Spanish	
		w/Guarantee Card		No
		Buyer Model No	SD-22VL	
		Remote Control Unit	Yes	
		Dew Cation Sheet		No
		Battery	Yes	
		UM size x pcs	UM-4 x 2 pcs	
		Tape Rewinder		No
		Safety Tip		No
		Toll Free Insert Sheet		No
		Quick Set-Up Sheet	Yes (English)	
		Information Sheet		No
		75 Ohm Coaxial Cable	Yes (0.9m)	
		type	Single shield	
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Service Extended Plan		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Important Safeguard		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Registration Card		No
		21pin Cable		No
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS (SD-22VL)

G-17	Interface	Switch	Front	Power	Yes	
				Play	Yes	
				Eject (VCR)	Yes	
				Stop	Yes	
				Rec/OTR	Yes	
				Open/Close (DVD)	Yes	
				CH +	Yes	
				CH -	Yes	
				FF/ Search(>>)	Yes	
				Rew/Search(<<)	Yes	
				Still/Pause	No	
				Shuttle(Search/REV/FWD)	No	
				DVD/VCR	Yes	
				Input Select	Yes	
				Main Power SW	No	
			Rear	Attenuator	No	
				Video/RGB Selector	No	
				RF Out(Slide SW)	No	
				Main Power SW	No	
		Volume	Phones Volume	No		
			Mic Volume	No		
			Echo Volume	No		
			Rec/OTR	No		
		Terminals	Front	Video In	RCA x1(Black)	
				Audio In	RCA x 2(Stereo, Black)	
			Rear	Video Output	No	
				Audio Output	RCA x 2(Stereo, White/Red) Coaxial x 1 (Digital Audio,DVD Signal Only)	
				Video Input	No	
				Audio Input	No	
				Optical Digital Audio Out (Option)	Yes	
				Euro Scart	2SCART	
				S-Video Output	Yes (DVD Signal Only)	
				Ext Speaker	No	
				VHF/UHF Antenna Input/Output	DIN Type	
				AC Inlet	No	
		Indicator	LED	Power	No	
				Rec	No	
				T-Rec	No	
				TV/VCR	No	
				DVD	Yes (GREEN)	
				VCR	Yes (GREEN)	
				Surround	No	
				Level Meter	No	
G-18	Set Size			Approx. W x D x H (mm)		430 x 314.5 x 99
G-19	Weight			Net (Approx.)		4.5 kg(9.9lbs)
		Gross (Approx.)		5.5 kg(12.1lbs)		
G-20	Carton	Master Carton			No	
			Content		--- Sets	
			Material		--- / ---	
			Dimensions W x D x H(mm)		---	
		Gift Box	Description of Origin		---	
					Yes	
			Material		Single Full Color Carton	
			W/Color Photo Label		No	
			Dimensions W x D x H(mm)		500 x 430 x 180	
			Pulp Package		No	
			Design		As Per BUYER 's	
			Description of Origin		Yes	
		Drop Test	Buyer Model No		SD-22VL	
					Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces	
			Height (cm)		80 cm	
		Container Stuffing		1,623 Sets/40' container		
G-21	Cabinet Material	Cabinet Front		PS 94HB		

DISASSEMBLY INSTRUCTIONS

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

1-1: TOP CABINET AND FRONT CABINET (Refer to Fig. 1-1)

1. Remove the 5 screws ①.
2. Remove the Top Cabinet in the direction of arrow (A).
3. Disconnect the following connectors: (CP681, CP601).
4. Unlock the 8 supports ②.
5. Remove the Front Cabinet in the direction of arrow (B).

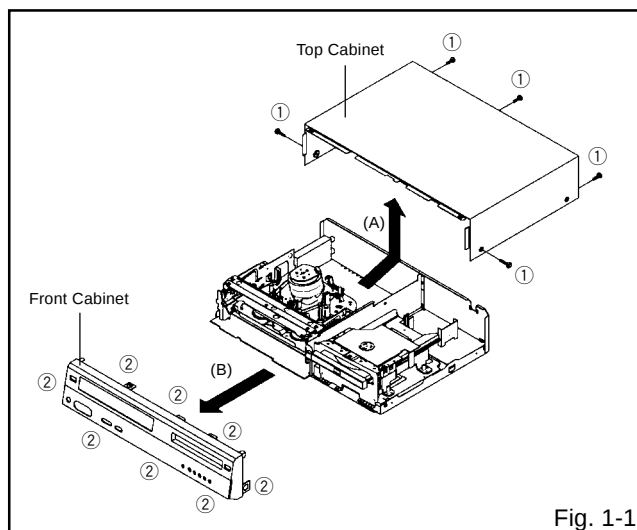


Fig. 1-1

1-2: DISPLAY PCB AND OPERATION 1/2 PCB (Refer to Fig. 1-2)

1. Remove the 11 screws ①.
2. Remove the Display PCB and Operation 1/2 PCB in the direction of arrow.

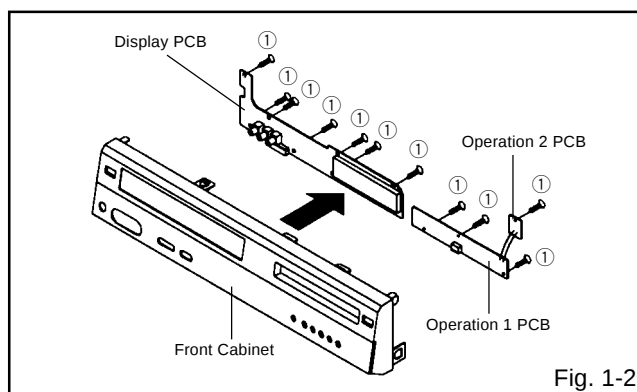


Fig. 1-2

1-3: FLAP (Refer to Fig. 1-3)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).

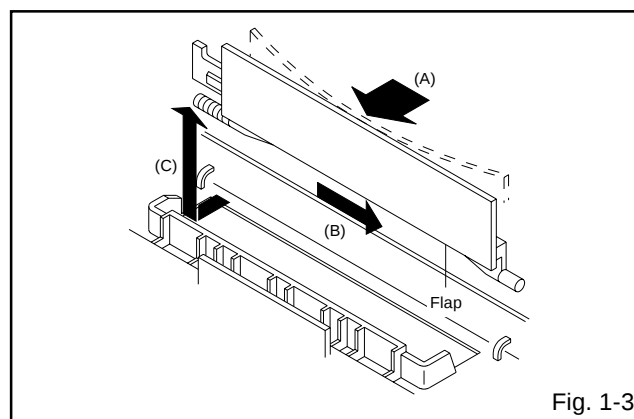


Fig. 1-3

1-4: DECK CD AND DVD PCB (Refer to Fig. 1-4)

1. Make the short circuit on the position as shown Fig. 1-4 using a soldering. If you remove the Deck CD with no soldering, the Laser may be damaged.
2. Disconnect the following connectors: (CP503, CP8001, CP8002).
3. Remove the 4 screws ①.
4. Remove the Deck Angle in the direction of arrow (A).
5. Remove the 2 screws ②.
6. Remove the Front-DVD Shield in the direction of arrow (B).
7. Remove the 4 screws ③.
8. Disconnect the following connectors: (CP2601, CP2602 and CP2603).
9. Remove the Deck CD in the direction of arrow (C).
10. Remove the 4 screws ④.
11. Remove the DVD PCB in the direction of arrow (D).

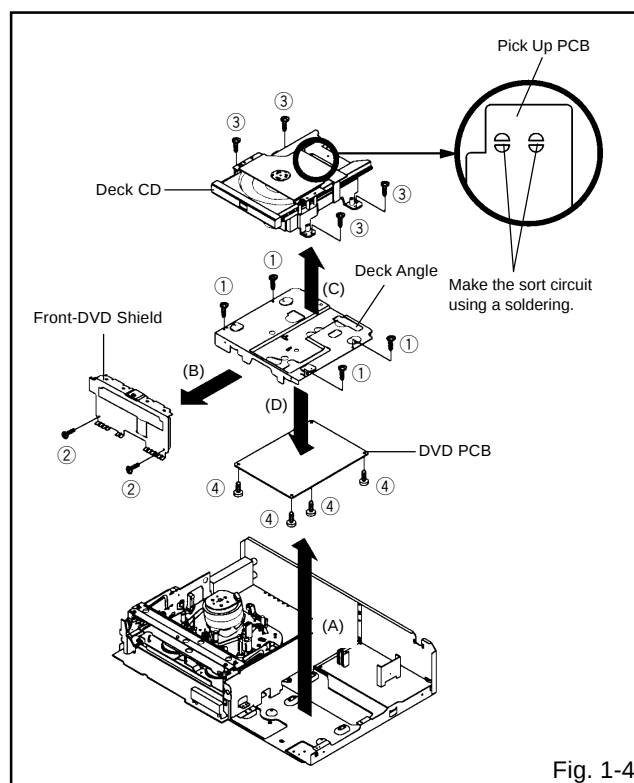


Fig. 1-4

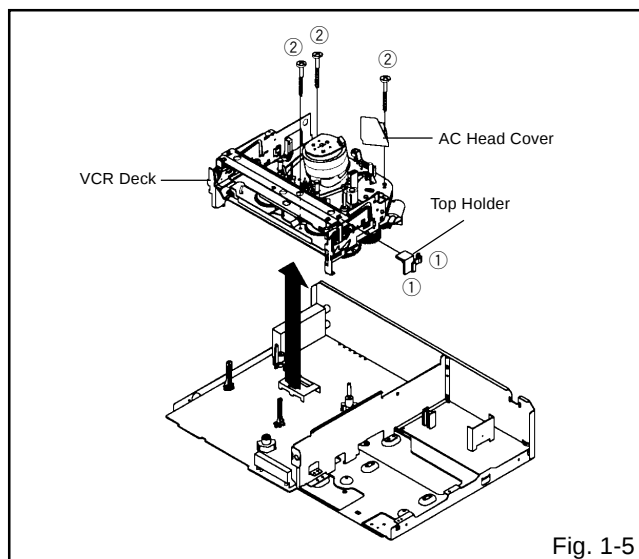
NOTE

When the installation of the Deck CD, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

DISASSEMBLY INSTRUCTIONS

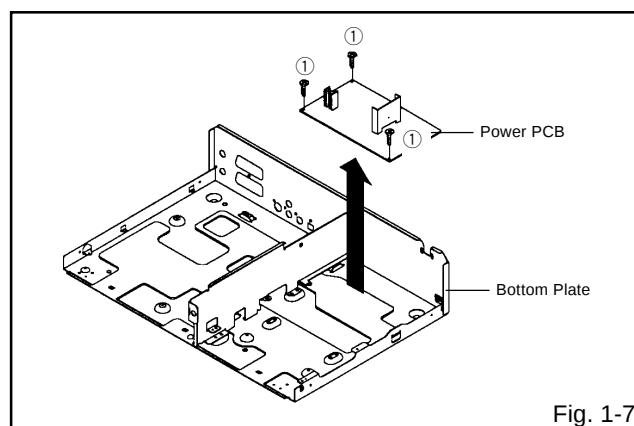
1-5: VCR DECK (Refer to Fig. 1-5)

1. Unlock the 2 supports ① and remove the Top Holder.
2. Remove the 3 screws ②.
3. Disconnect the following connectors: (CP101, CP102, CP103 and CP3001).
4. Remove the AC Head Cover and VCR Deck in the direction of arrow.



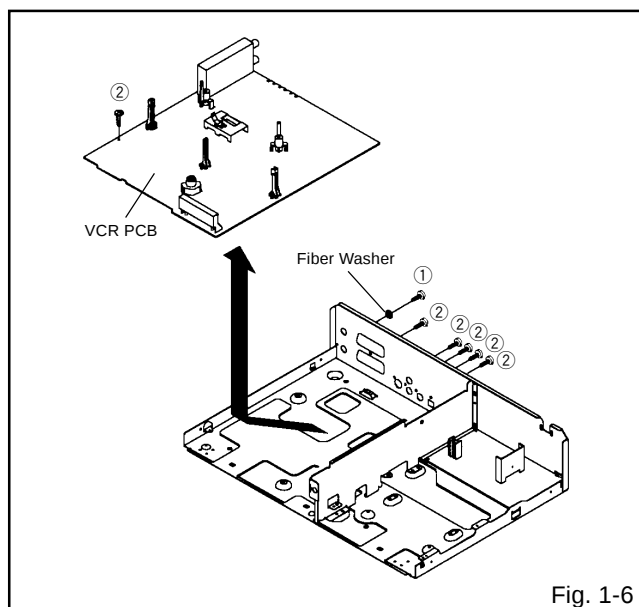
1-7: POWER PCB (Refer to Fig. 1-7)

1. Remove the 3 screws ①.
2. Remove the Power PCB in the direction of arrow.



1-6: VCR PCB (Refer to Fig. 1-6)

1. Remove the screw ① and Fiber Washer.
2. Remove the 5 screws ②.
3. Disconnect the following connector: (CP1701).
4. Remove the VCR PCB in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

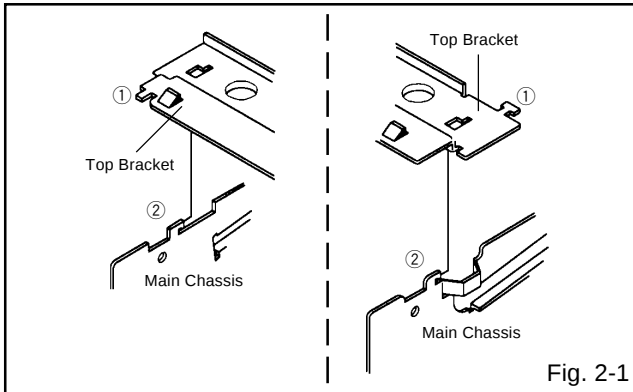
2. REMOVAL OF DECK PARTS

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

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

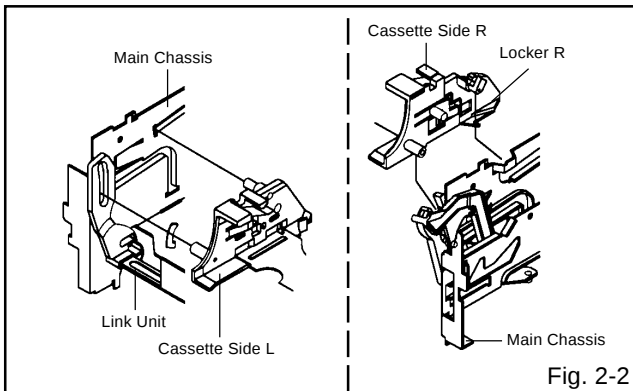
NOTE

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



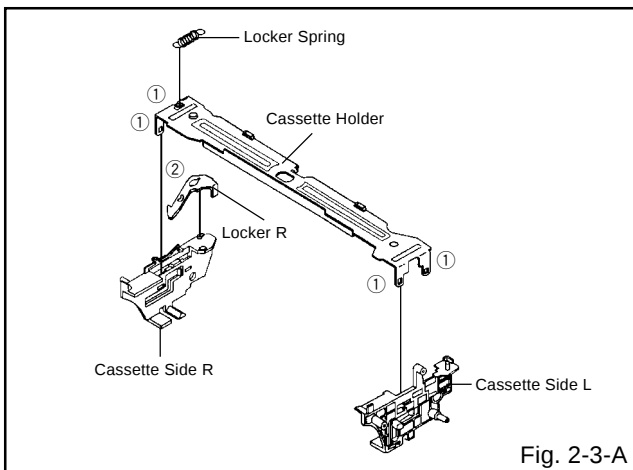
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

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



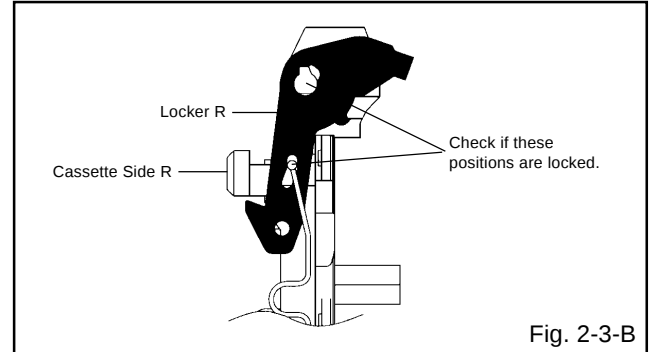
2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.



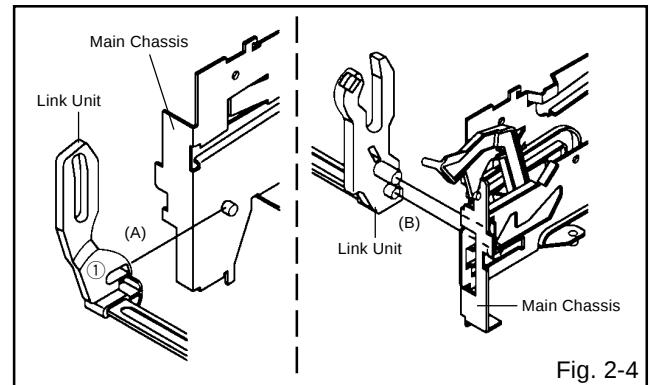
NOTE

1. In case of the Locker R installation, check if the two positions of Fig.2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.



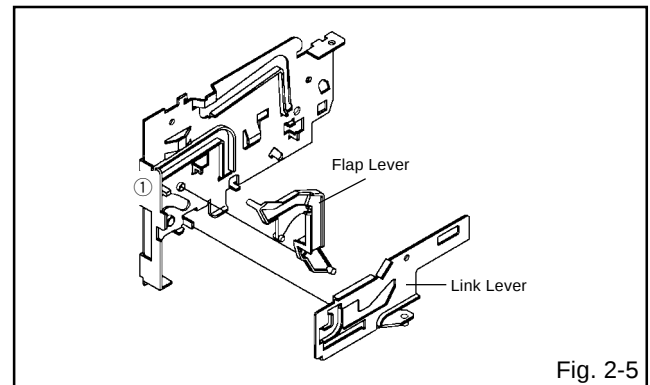
2-4: LINK UNIT (Refer to Fig. 2-4)

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



2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

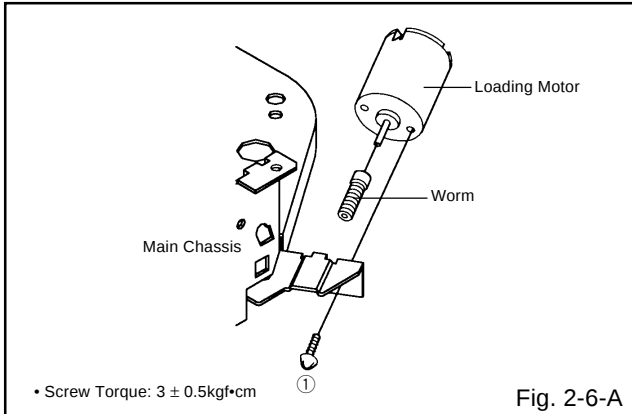
1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

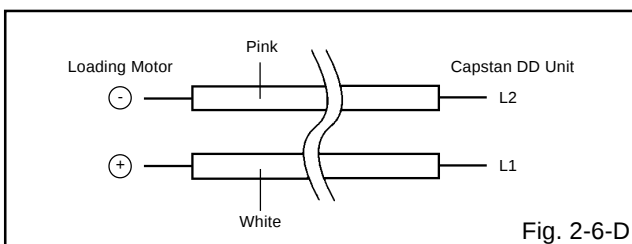
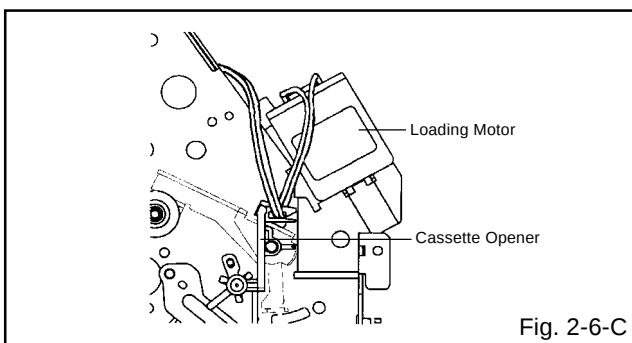
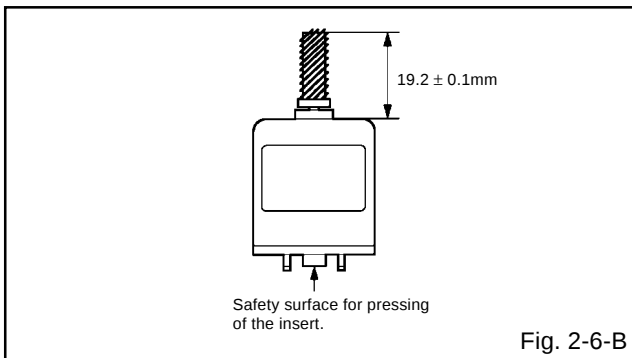
2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

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



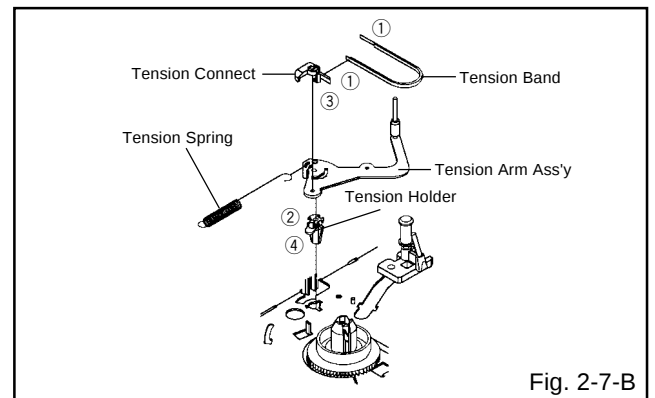
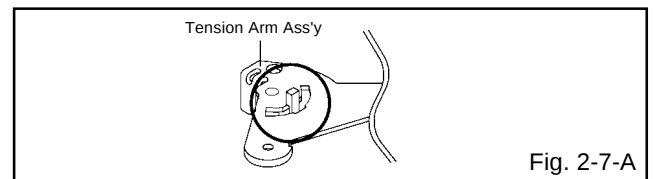
NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-6-D.



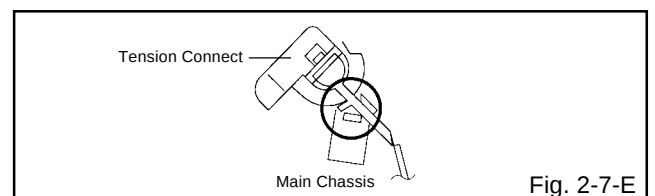
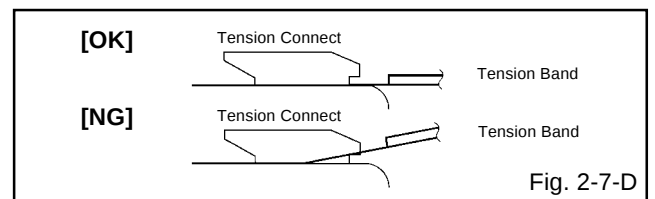
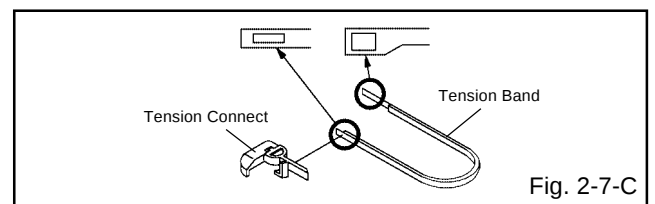
2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.



NOTE

1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-7-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.



DISASSEMBLY INSTRUCTIONS

2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

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

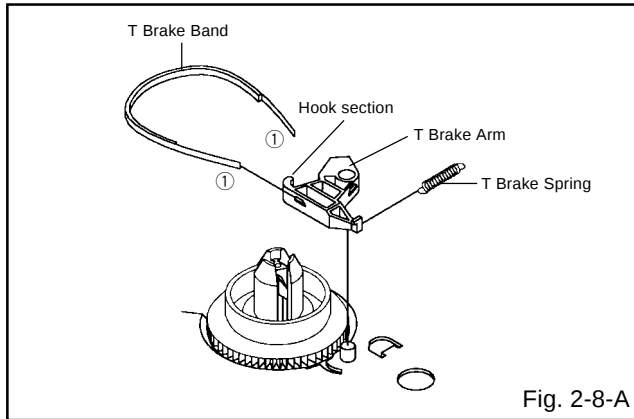


Fig. 2-8-A

NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

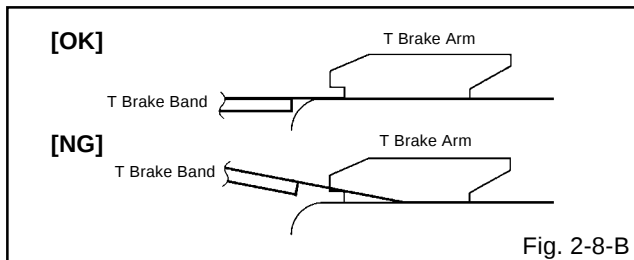


Fig. 2-8-B

2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

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

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-9-A) Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)

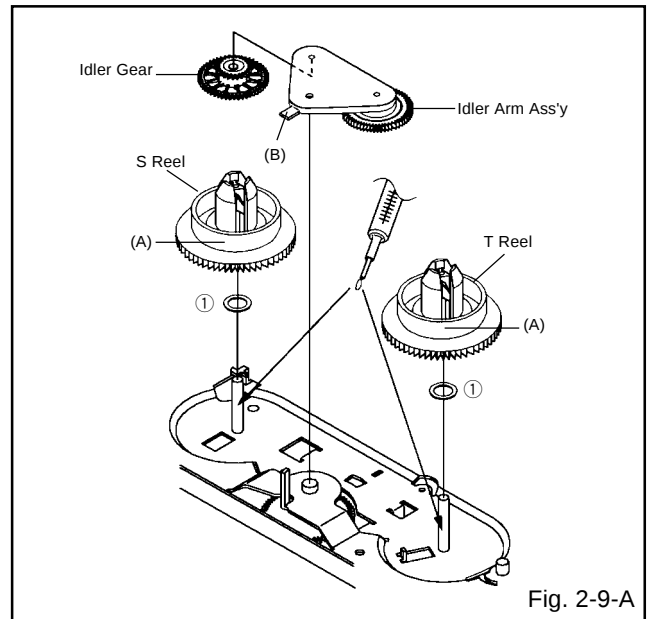


Fig. 2-9-A

NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-9-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.

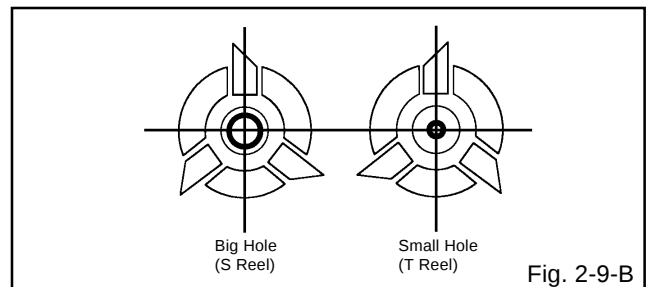


Fig. 2-9-B

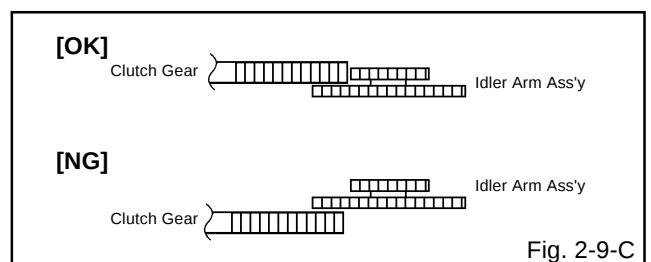
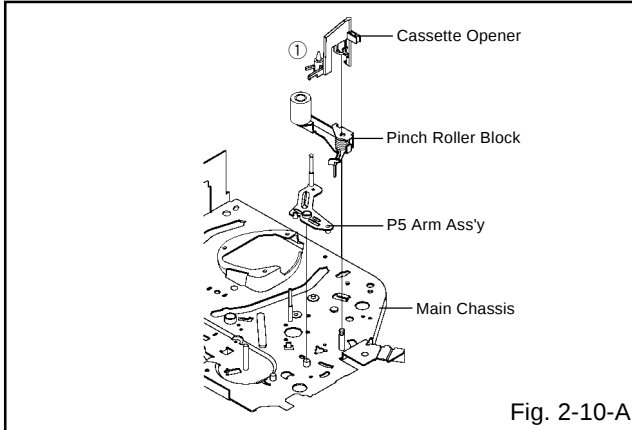


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

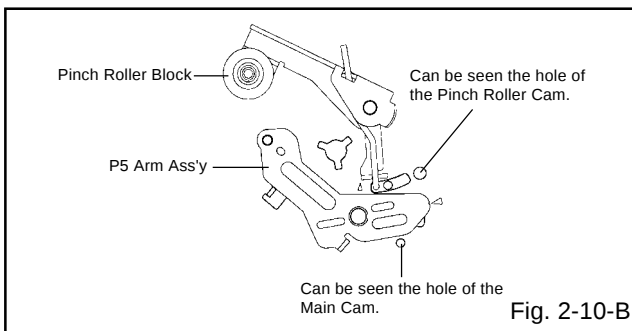
2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

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



NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

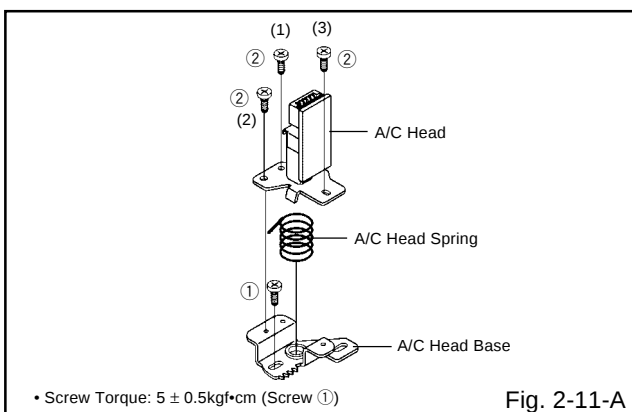


2-11: A/C HEAD (Refer to Fig. 2-11-A)

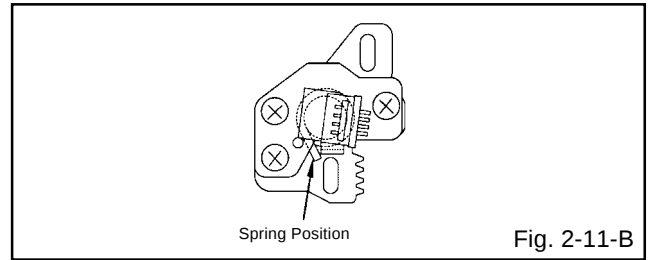
1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).

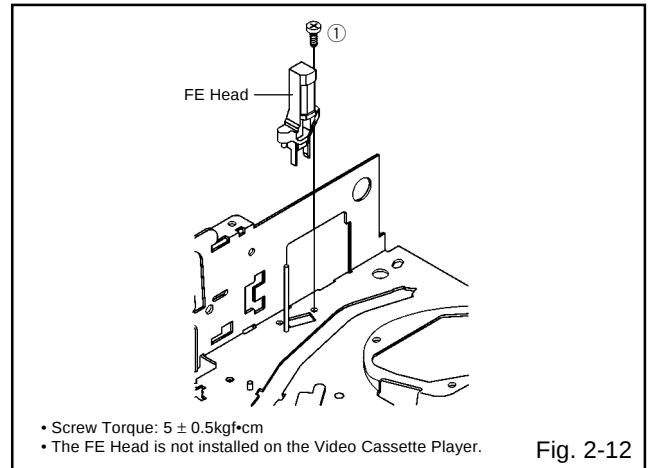


• Screw Torque: $5 \pm 0.5\text{kgf}\cdot\text{cm}$ (Screw ①)



2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

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



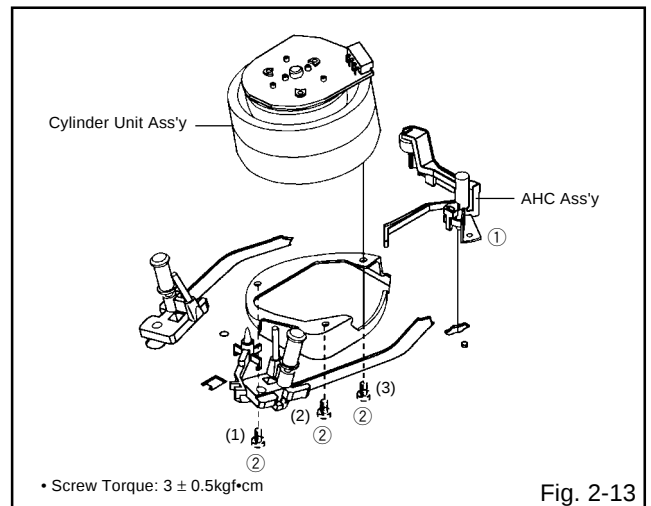
- Screw Torque: $5 \pm 0.5\text{kgf}\cdot\text{cm}$
- The FE Head is not installed on the Video Cassette Player.

2-13: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

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

NOTE

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

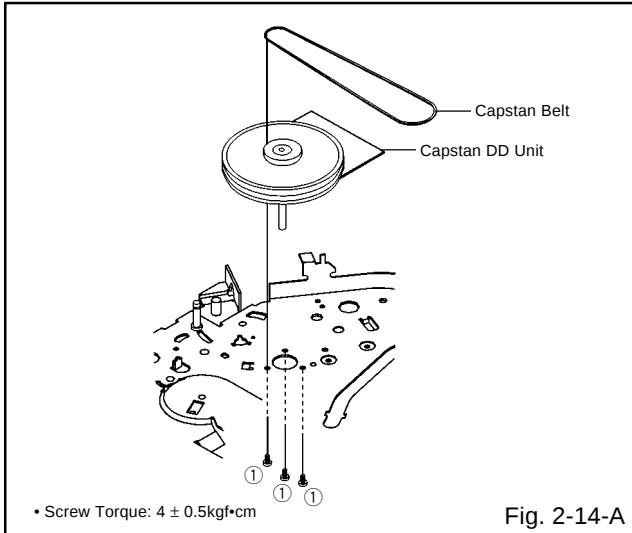


• Screw Torque: $3 \pm 0.5\text{kgf}\cdot\text{cm}$

DISASSEMBLY INSTRUCTIONS

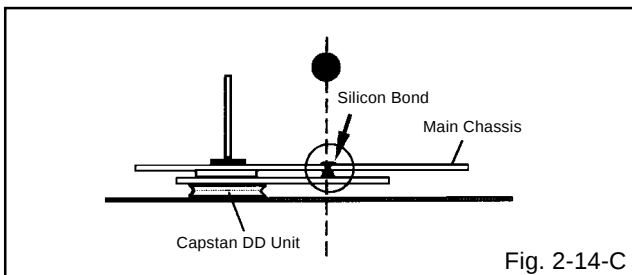
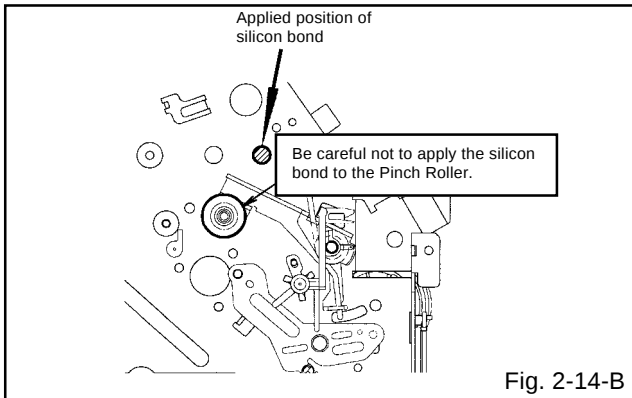
2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.



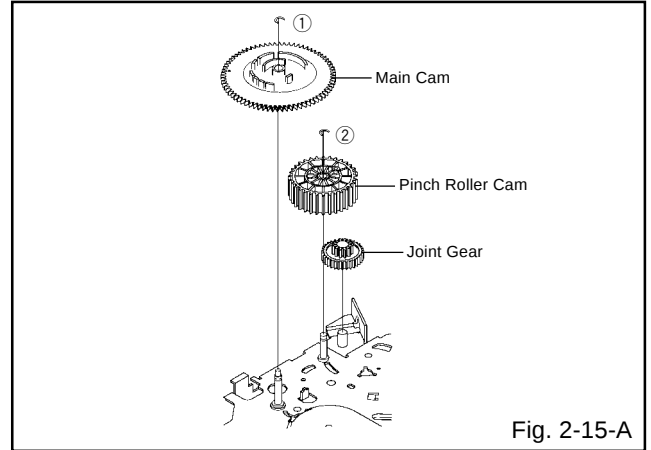
NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.)
(Refer to Fig. 2-14-B, C)



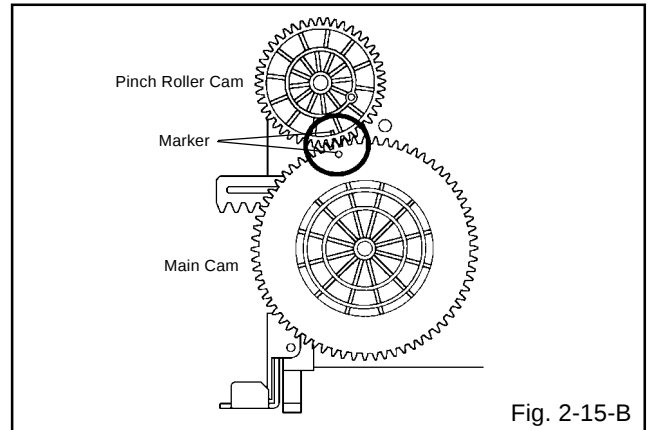
2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

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



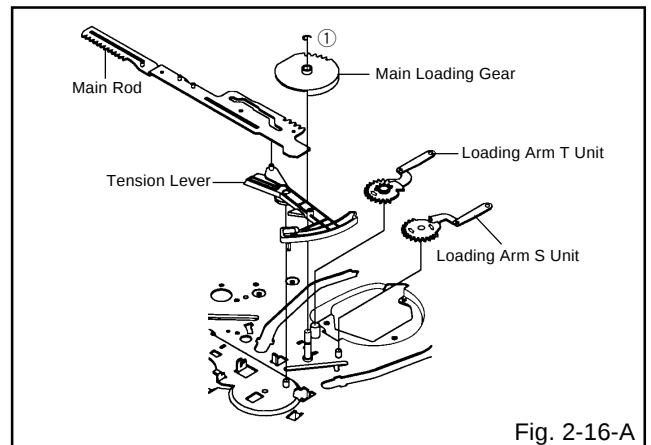
NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. (Refer to Fig. 2-15-B)



2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

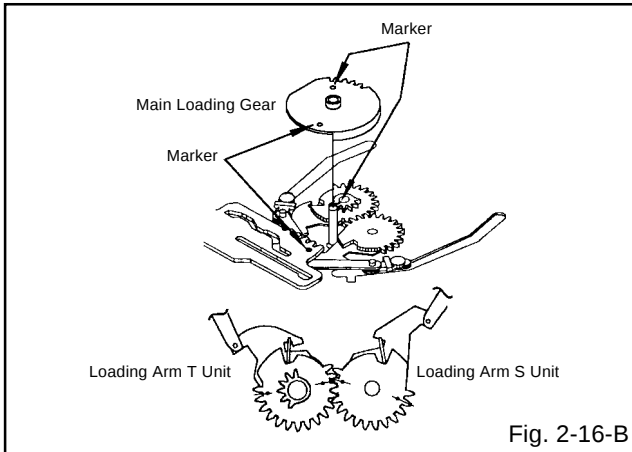
1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.



DISASSEMBLY INSTRUCTIONS

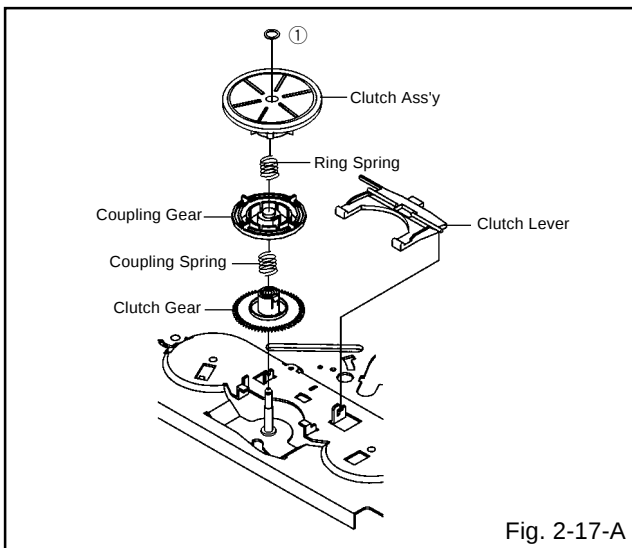
NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker.
(Refer to Fig. 2-16-B)



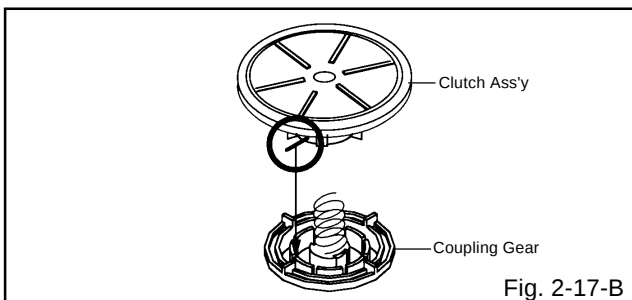
2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/CLUTCH GEAR (Refer to Fig. 2-17-A)

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



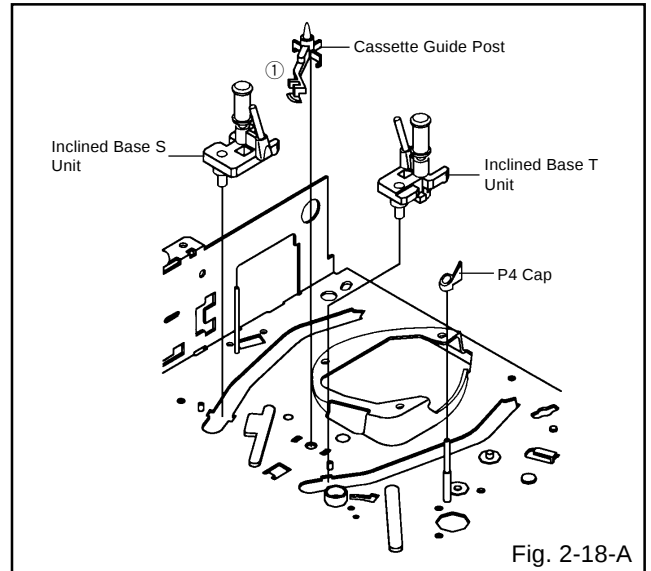
NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-17-B)



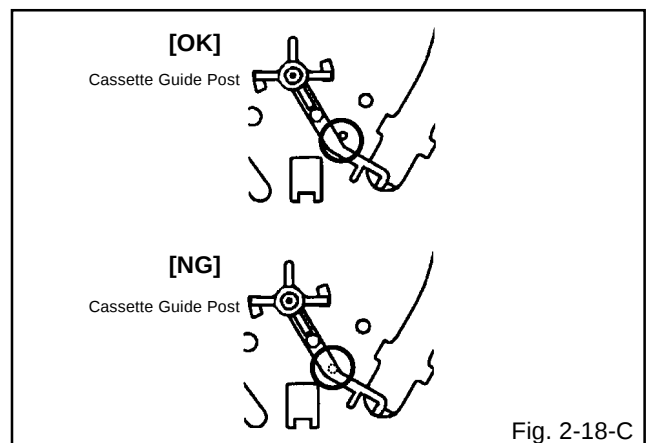
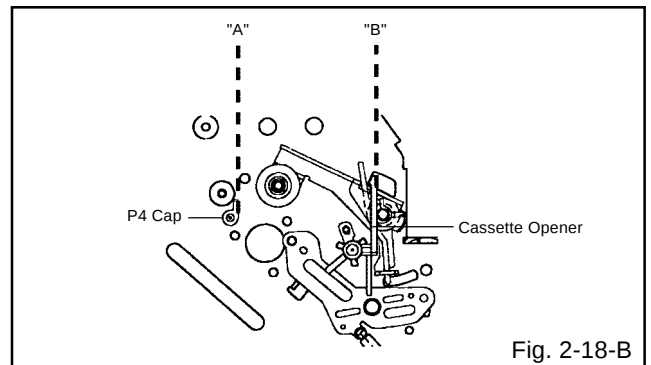
2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S Unit and Inclined Base T Unit.



NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.



DISASSEMBLY INSTRUCTIONS

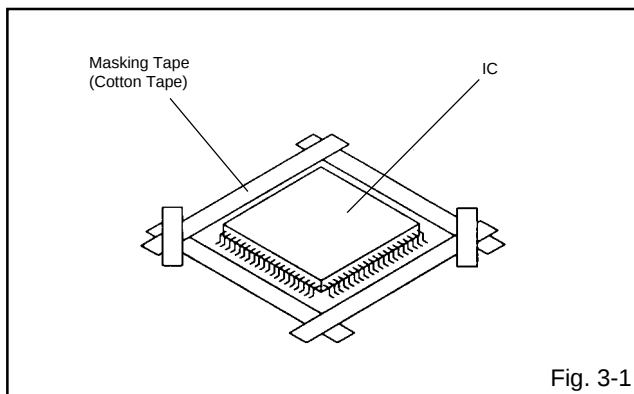
3.REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 3-1.)**

NOTE

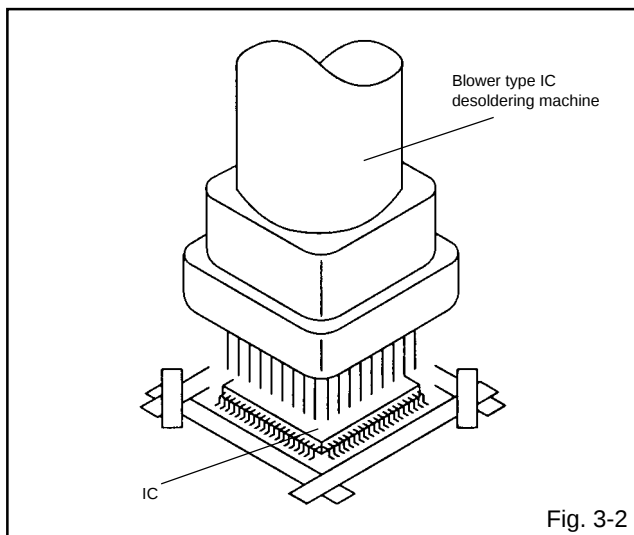
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 3-2.)**

NOTE

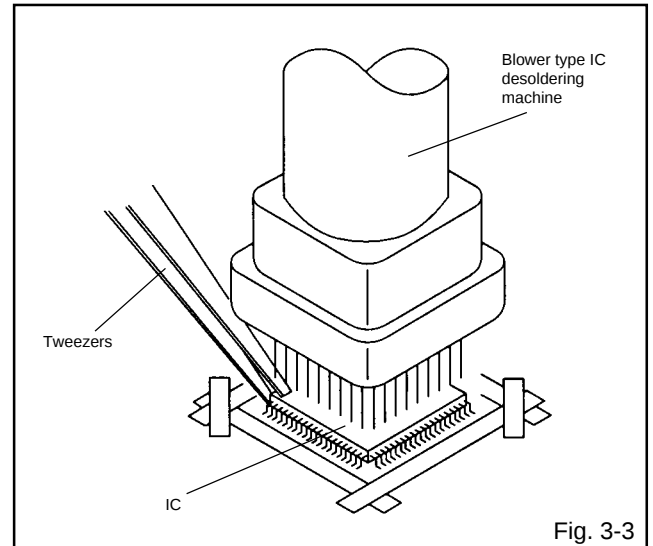
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

NOTE

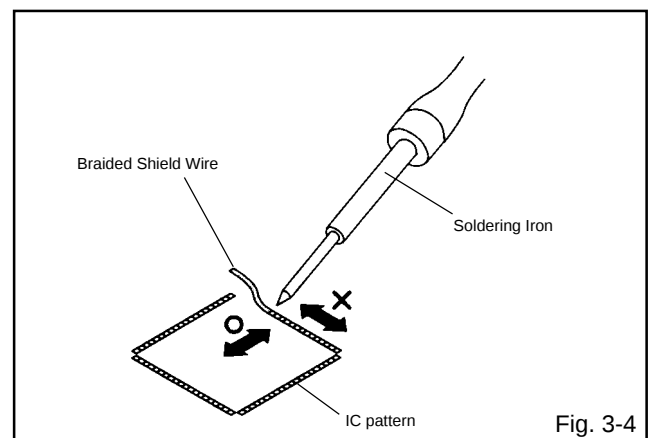
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 3-4.)**

NOTE

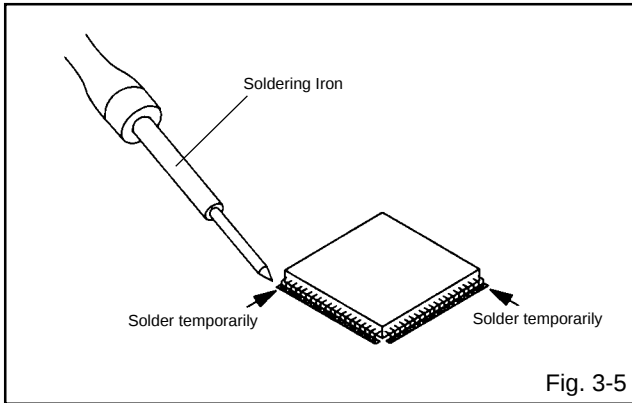
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



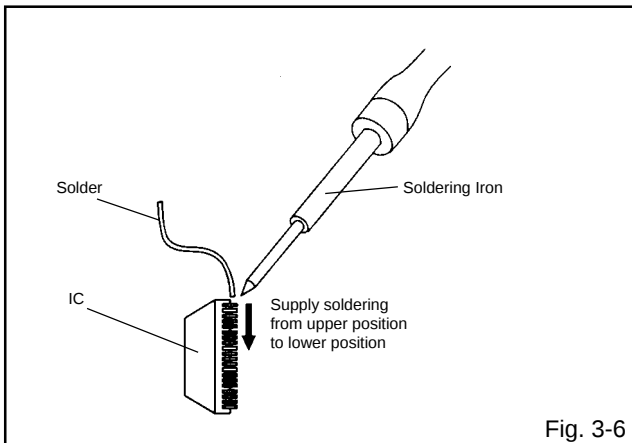
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 3-5.)**



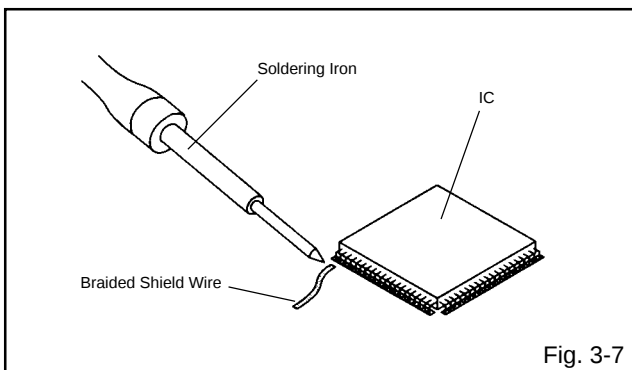
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 3-6.)**



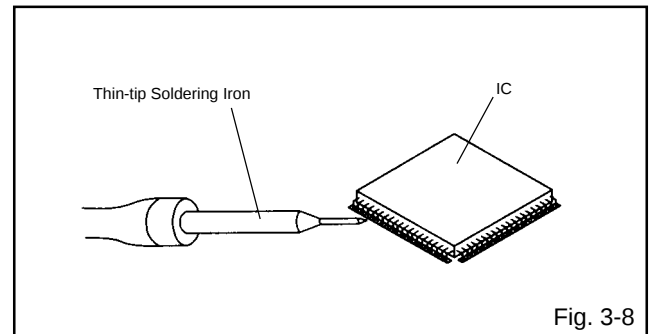
3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 3-7.)**

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 3-8.)**



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

NOTE

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

KEY TO ABBREVIATIONS

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

KEY TO ABBREVIATIONS

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

SERVICE MODE LIST

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

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

Set Key	Set Key	Standard Time (seconds)	Operations
CH UP	FF	2	PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
CH UP	STOP	2	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
CH UP	PLAY	2	Initialization of the factory on VCR. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, and PLAY/REC total hours.
CH DOWN	POWER	2	VCR operation mode at no connection of DVD. Refer to the "PREPARATION FOR SERVICING" NOTE: Although the DVD is connected, the DVD mode cannot be selected.

Set Key	Remocon Key	Standard Time (seconds)	Operations
REC	4	2	Initialization of the factory on DVD. NOTE: Do not use this for the normal servicing. The function will only work without the setting of DVD disc at DVD mode. While pressing the Remocon Key for more than the Standard Time, press the Set Key simultaneously.
REC	6	2	DVD Write mode. Refer to the "RE-WRITE FOR DVD FIRMWARE". NOTE: Do not use this for the normal servicing. The function will only work at the DVD stop mode.
STOP	1	3	Check for the firmware version. Refer to the "RE-WRITE FOR DVD FIRMWARE". NOTE: Do not use this for the normal servicing. The function will only work at the DVD stop mode.

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

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

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

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

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

■ : Clean

● : Check it and if necessary, replace it.

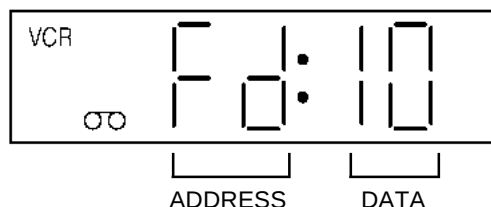
CONFIRMATION OF HOURS USED

PLAY/REC total hours can be checked on the FIP.

Total hours are displayed in 16 system of notation.

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

1. Turn on the POWER.
2. While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds.
3. Adjust the ADDRESS to "FD" by SET + or - button and read the DATA.
(This DATA becomes the thousands digit and hundreds digit value of the following formula.)
4. Adjust the ADDRESS to "FE" by SET + or - button and read the DATA.
(This DATA becomes the tens digit and ones digit value of the following formula.)
5. After the confirmation of using hours, turn off the power.



PREVENTIVE CHECKS AND SERVICE INTERVALS

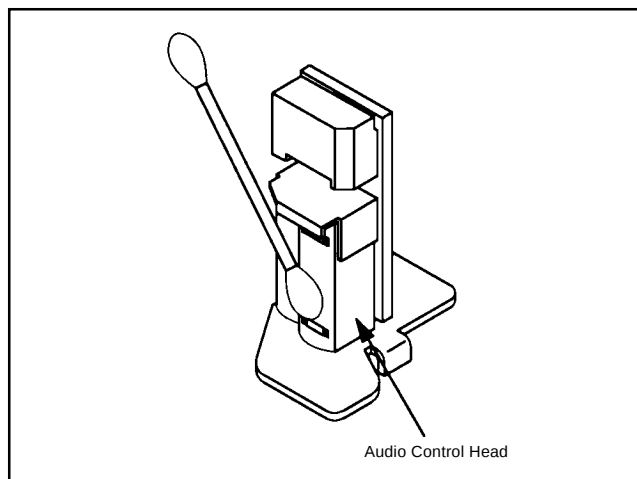
CLEANING

NOTE

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

1. AUDIO CONTROL HEAD

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



2. TAPE RUNNING SYSTEM

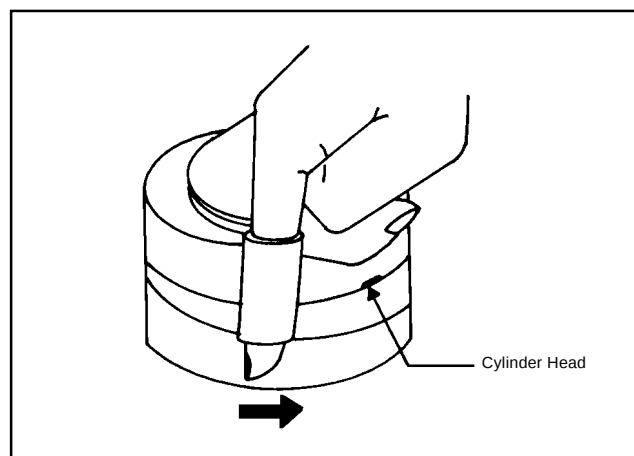
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

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

NOTE

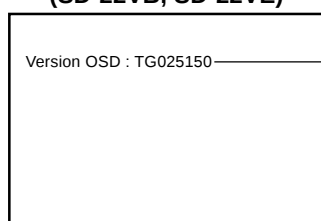
Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



RE-WRITE FOR DVD FIRMWARE

1. Turn on the power, and set the DVD mode.
2. Open the DVD tray.
3. Press both Channel button **(6)** on the remote control and the REC button on the set for more than 2 seconds.
4. Press OPEN/CLOSE button on the unit to check if all the keys on the unit do not function.
NOTE: To check if DVD Write mode is set.
When inserting Up-Date Disc at Non DVD Write mode, the read error will happen.
5. Place the Up-Date Disc and close the tray by hand. **(Refer to SERVICING FIXTURE AND TOOLS)**
6. Automatic read will start and "ROM_WRITE_START" will be displayed on the screen.
 At this time, the horizontal noise lines may appear. But no problem.
7. Approx. 60 seconds later, the tray will open automatically.
8. Remove the Up-Date Disc and close the tray by hand.
9. Unplug the AC cord, then plug it in.
10. **After the write, set to the initializing of shipping.**
 Set to the DVD mode, press both Channel button **(4)** on the remote control and the REC button on the set for more than 2 seconds.
11. The "COMPLETE" will appear on the screen.
 Then unplug the AC cord, and plug it in.
12. **CHECK FOR THE FIRMWARE VERSION**
 Set to the DVD mode, press both Channel button **(1)** on the remote control and the STOP button on the set for more than 3 seconds.
 Firmware version will be displayed on the top left of the screen.

(SD-22VB, SD-22VE)



T G 0 2 5 1 5 0

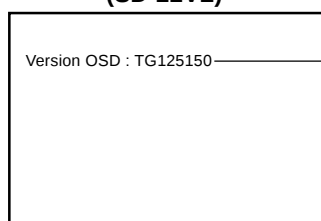
Fixed

Released times on the same date
 Release date (Example: 2002.5.15)

When the changed version displays, the Re-write will be completed.

A = October
 B = November
 C = December

(SD-22VL)



T G 1 2 5 1 5 0

Fixed

Released times on the same date
 Release date (Example: 2002.5.15)

When the changed version displays, the Re-write will be completed.

A = October
 B = November
 C = December

13. Turn off the power

WHEN REPLACING EEPROM (MEMORY) IC

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

NOTE: INI FD and INI FE cannot be set. Because, the total time for the PLAY/REC of the main unit is recorded.

(SD-22VB)

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
C0	---	---	---	---	8B	C9	D2	01	FF	FF	FF	FF	F1	64	2D	8A
D0	9B	17	81	00	02	FF	03	01	7D	9F	02	02	42	35	23	5B
E0	76	5F	08	F8	04	FB	B2	9A	92	8C	51	5F	09	F0	05	F3
F0	B2	2F	9C	42	42	80	3D	6B	0B	7E	04	3A	00	---	---	---

(SD-22VE)

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
B0	---	---	---	---	---	---	---	---	---	8B	C9	D2	71	6F	A9	00
C0	B2	17	90	50	60	F1	58	51	51	D1	B2	9F	97	8E	07	FA
D0	DD	66	2A	08	02	FF	40	00	7D	9F	82	02	42	35	63	5B
E0	76	5F	08	F0	0A	FB	5E	08	F0	00	F2	5F	09	F0	05	F3
F0	16	2F	9F	42	42	80	3D	68	08	89	04	3A	00	---	---	---

(SD-22VL)

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
B0	---	---	---	---	---	---	---	---	---	8B	C9	D2	71	6F	A9	00
C0	B2	17	00	00	00	F1	58	51	00	D1	B2	9F	97	8E	07	CA
D0	DF	E2	45	08	02	FF	00	00	7D	9F	82	02	42	35	23	5B
E0	76	5F	08	F0	0A	FB	5E	00	00	00	F2	5F	09	F0	05	F3
F0	12	2F	9F	42	42	80	3D	68	08	89	04	3A	00	---	---	---

Table 1

1. Turn on the POWER.
2. Press both CH UP button on the set and the FF button on the set for more than 2 seconds.
ADDRESS and DATA will appear on FIP as Fig 1.

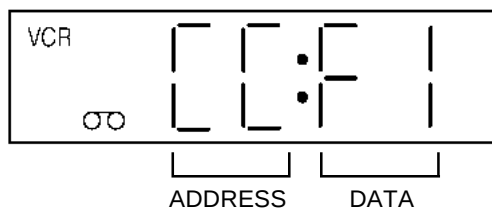


Fig. 1

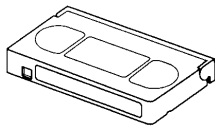
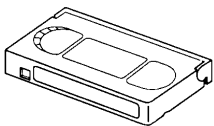
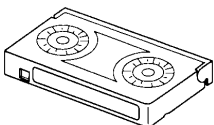
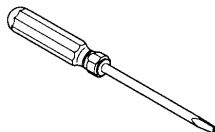
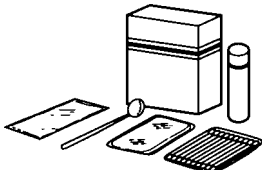
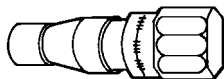
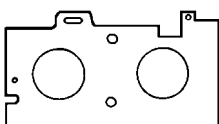
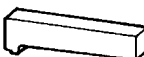
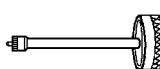
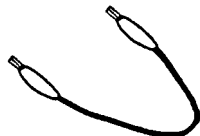
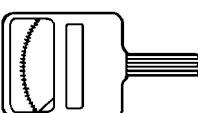
3. ADDRESS is now selected and should "blink". Using the SET + or - button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET + or - button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

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

9. Turn POWER on.
10. Press both CH UP button on the set and the PLAY button on the set for more than 2 seconds.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-C6 ST-C7	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG154 Cable 
JG176 Up-Date Disc 	Tentelometer 		

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG176	APJG176013	Up-Date Disc (SD-22VB, SD-22VE)	Up-Date of the Firmware
	APJG176013	Up-Date Disc (SD-22VL)	

PREPARATION FOR SERVICING

How to use the Servicing Fixture

- Short circuit between **TP3001** and **Ground** with the cable JG154.
(The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
- In case of using a cassette tape, press the EJECT button to insert or eject a cassette tape.
Turn on the power and re-check the cable before checking the trouble points.

When you servicing without the connection of DVD, perform the following operations before step 1.

While pressing the POWER button on the set for more than 2 seconds, press the CH DOWN button on the set simultaneously at the Power OFF. Although the DVD is connected, the DVD mode cannot be selected.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

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

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

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

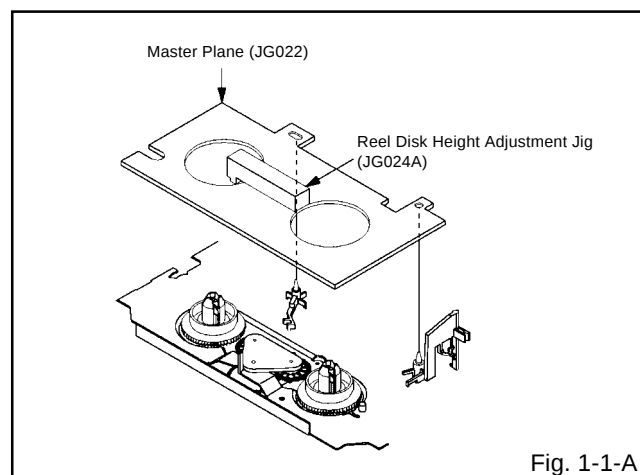


Fig. 1-1-A

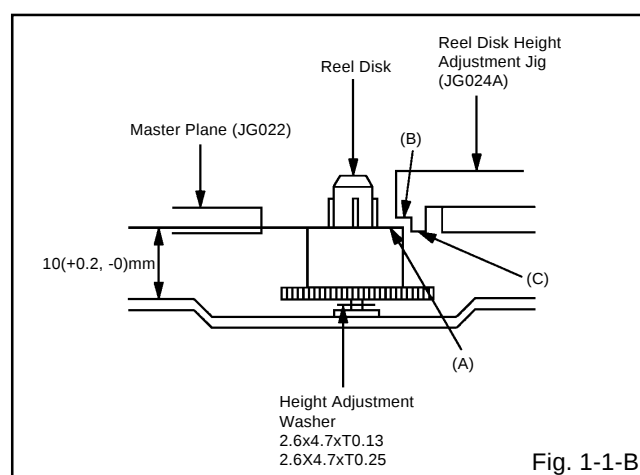


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

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

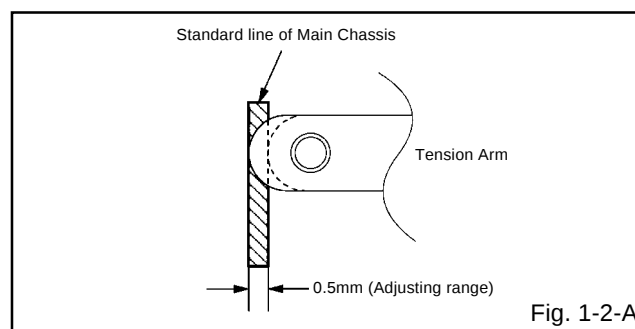


Fig. 1-2-A

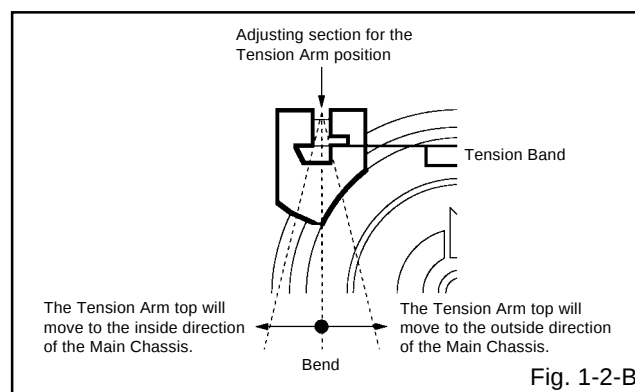


Fig. 1-2-B

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

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

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

- After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
- Confirm that the right meter of the torque tape indicates $50\sim90\text{gf}\cdot\text{cm}$ during playback in SP mode.
- Confirm that the left meter of the torque tape indicates $25\sim40\text{gf}\cdot\text{cm}$ during playback in SP mode.

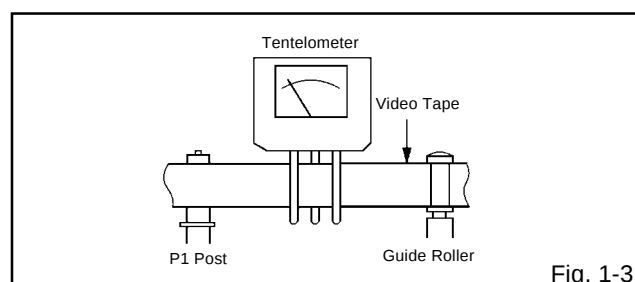


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

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

NOTE

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

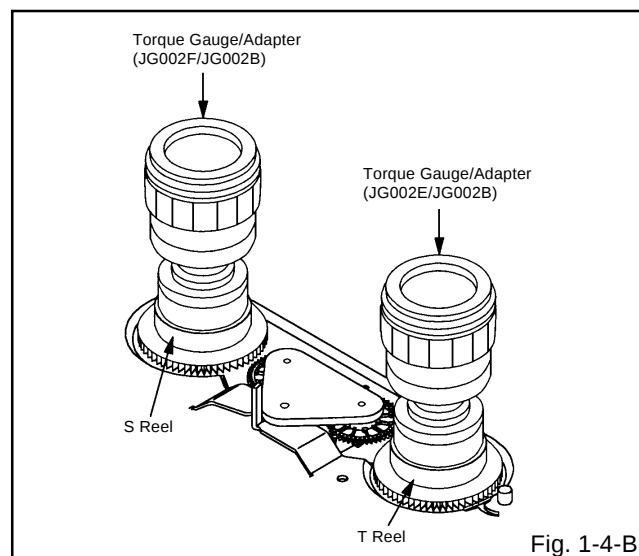
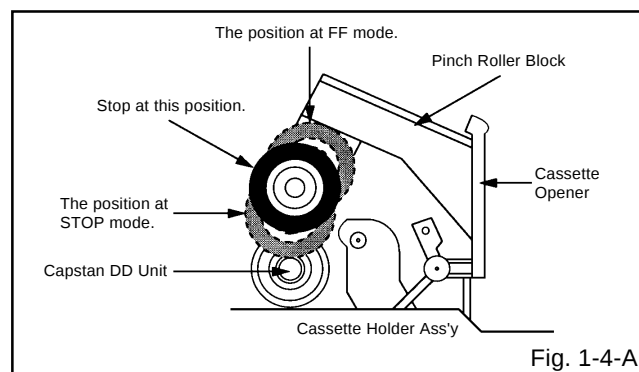
1-5: CONFIRMATION OF REEL BRAKE TORQUE

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

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

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

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



NOTE

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

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

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

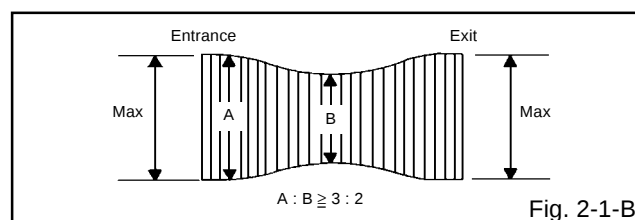
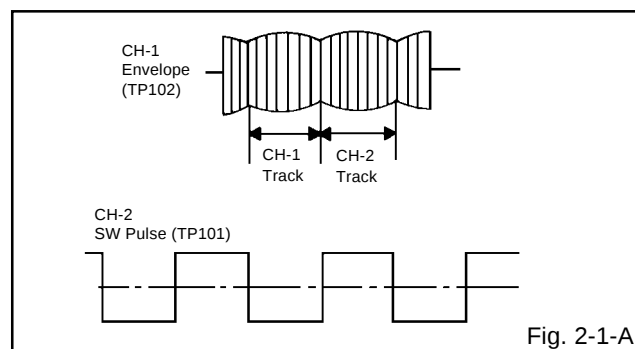
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP102 (Envelope)** and CH-2 to **TP101 (SW Pulse)**.
3. Press and hold the ATR button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. (Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

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



MECHANICAL ADJUSTMENTS

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

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

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

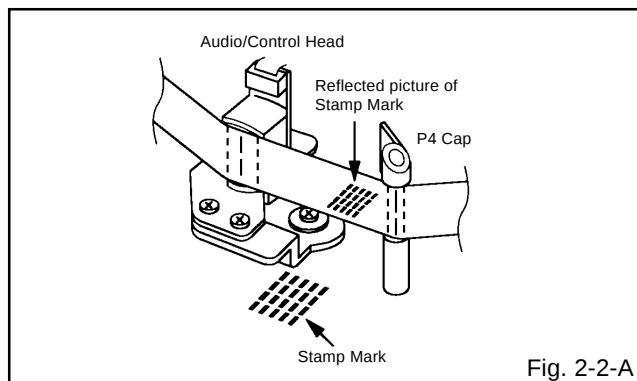


Fig. 2-2-A

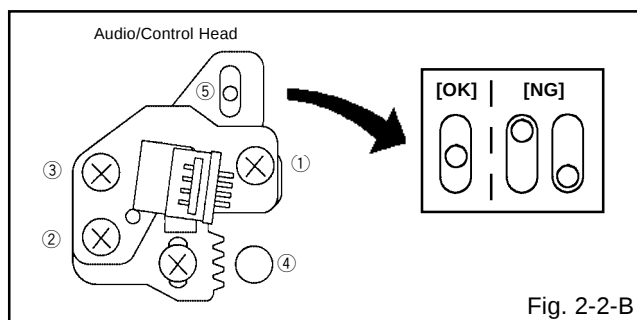


Fig. 2-2-B

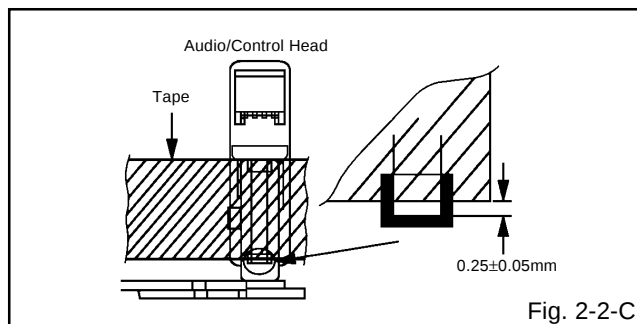


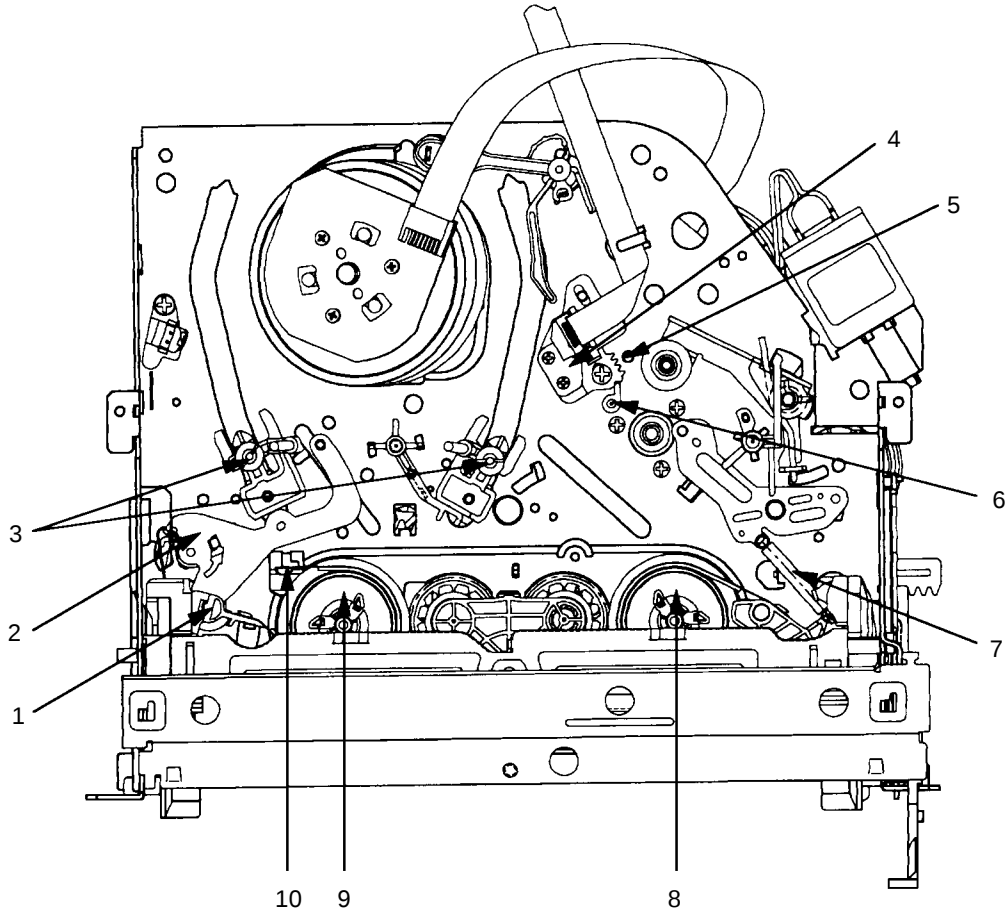
Fig. 2-2-C

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

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP101** and CH-2 to **TP102**.
6. Playback the VHS Alignment Tape (Monoscope of ST-C6 MODE1).
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Then, check if the ⑤ section of **Fig. 2-2-B** is on the center position (or rather to the cylinder side). In case of the envelope maximum at the difference position from the center, adjust the matching of picture and sound again.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



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

ELECTRICAL ADJUSTMENTS

Read and perform this adjustment when repairing the circuits or replacing electrical parts or PCB assemblies.

1. BASIC ADJUSTMENT

CAUTION

When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

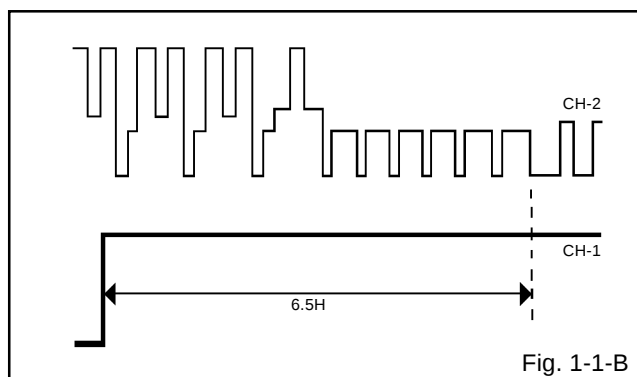
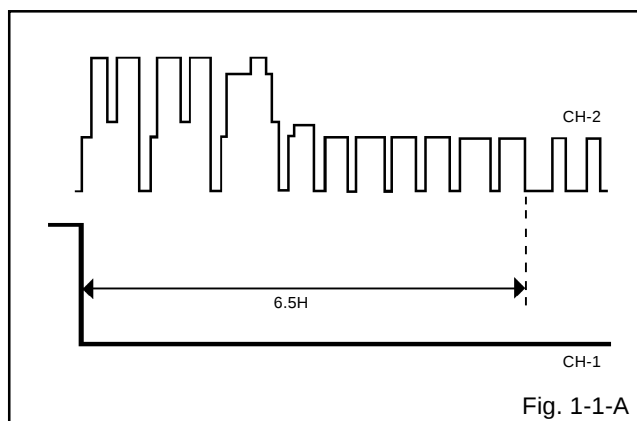
1-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape

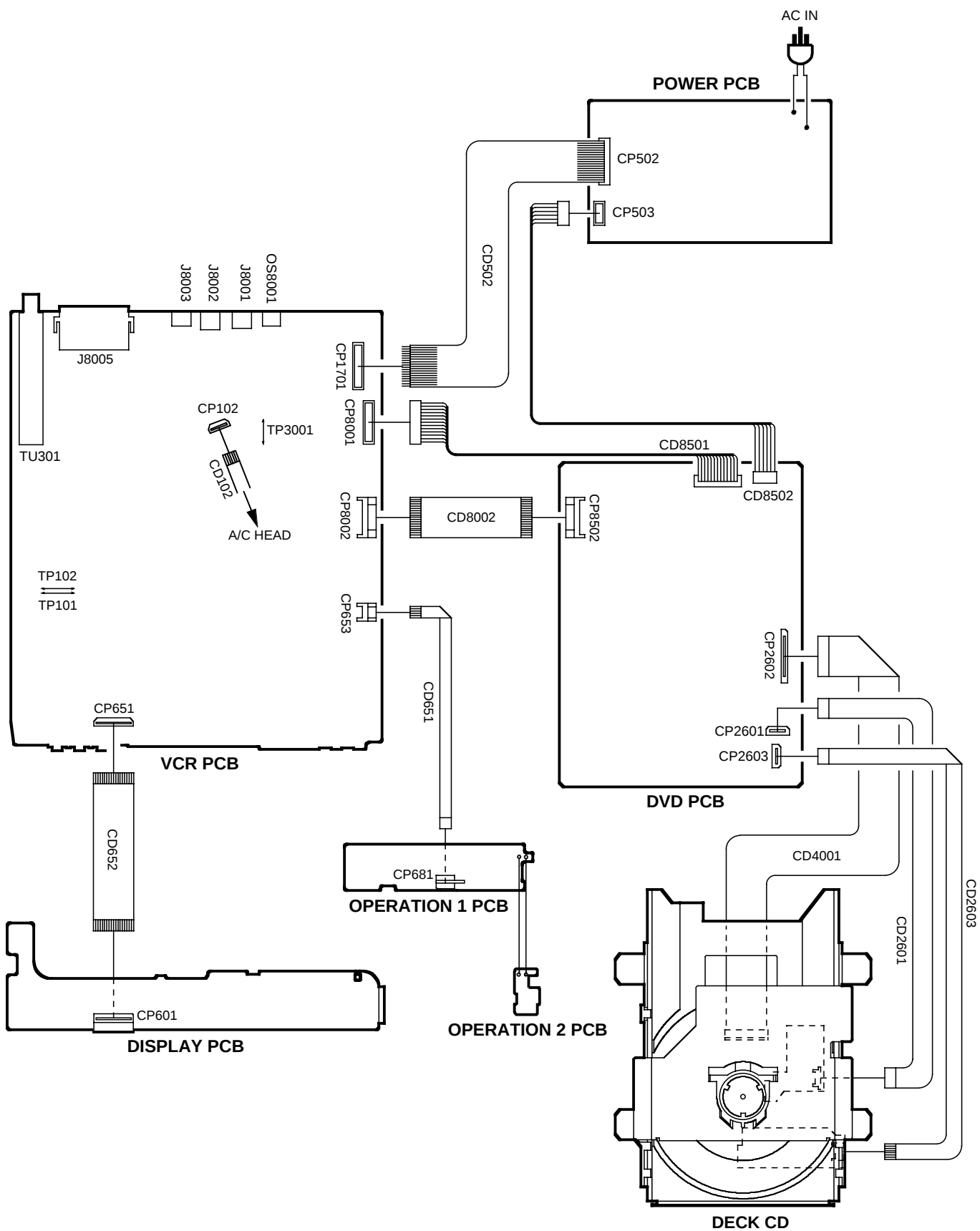
INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to **TP101** and CH-2 to **pin 19 of J8005**.
2. Playback the alignment tape.
3. Press and hold the ATR button on the remote control more than 2 seconds to set tracking to center.
4. Press both CH UP button on the set and the STOP button on the set for more than 2 seconds.



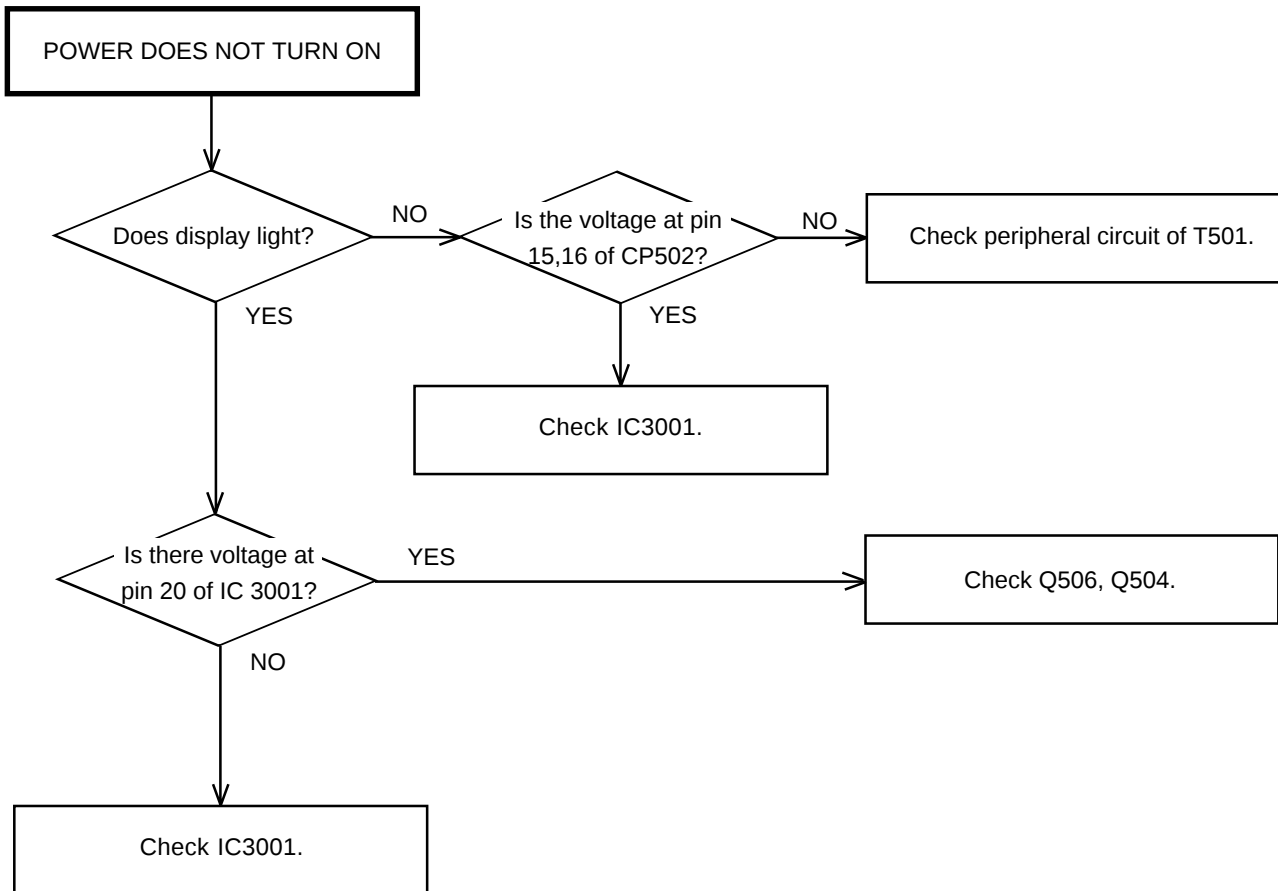
ELECTRICAL ADJUSTMENTS

2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)

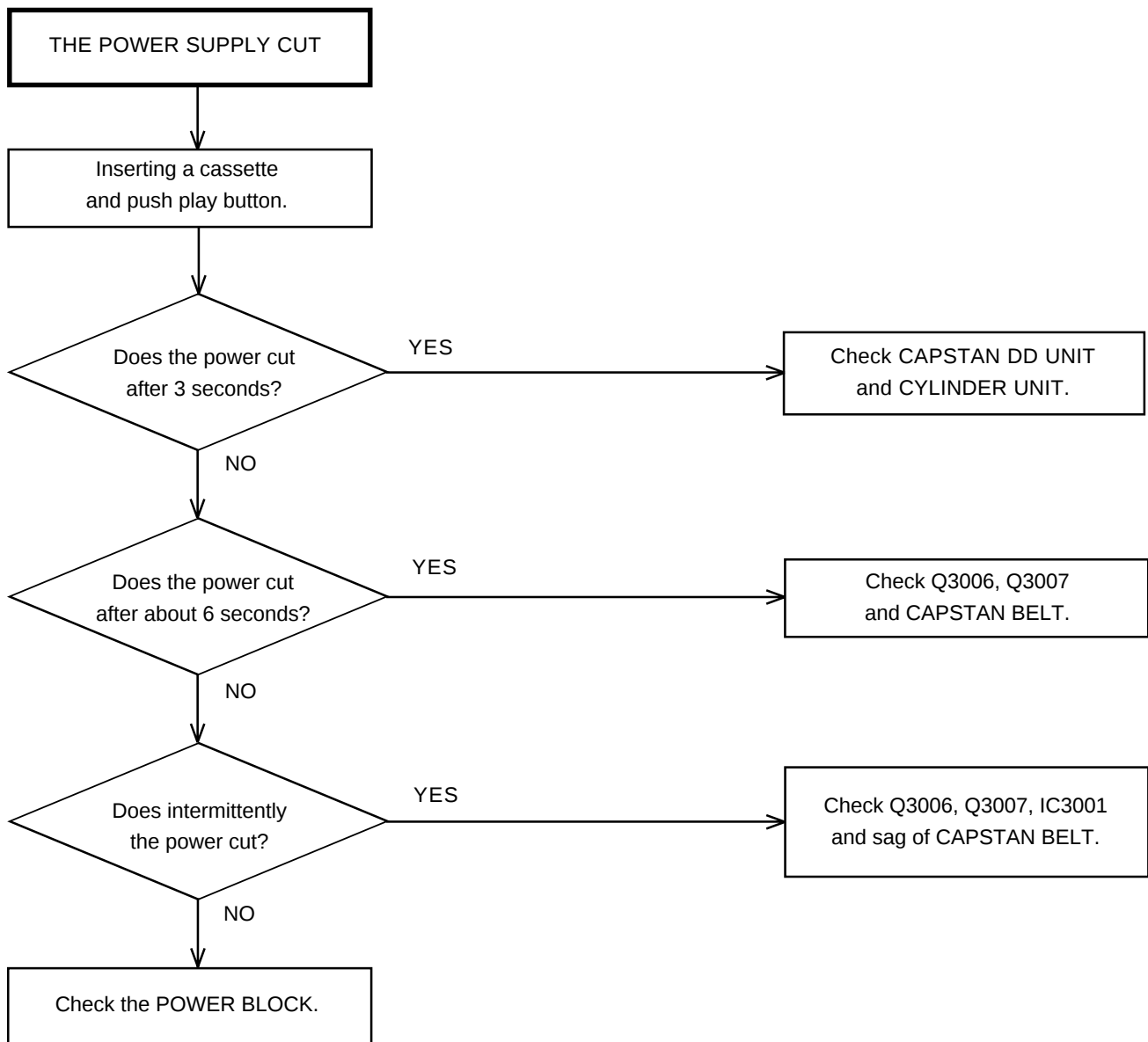


TROUBLESHOOTING GUIDE

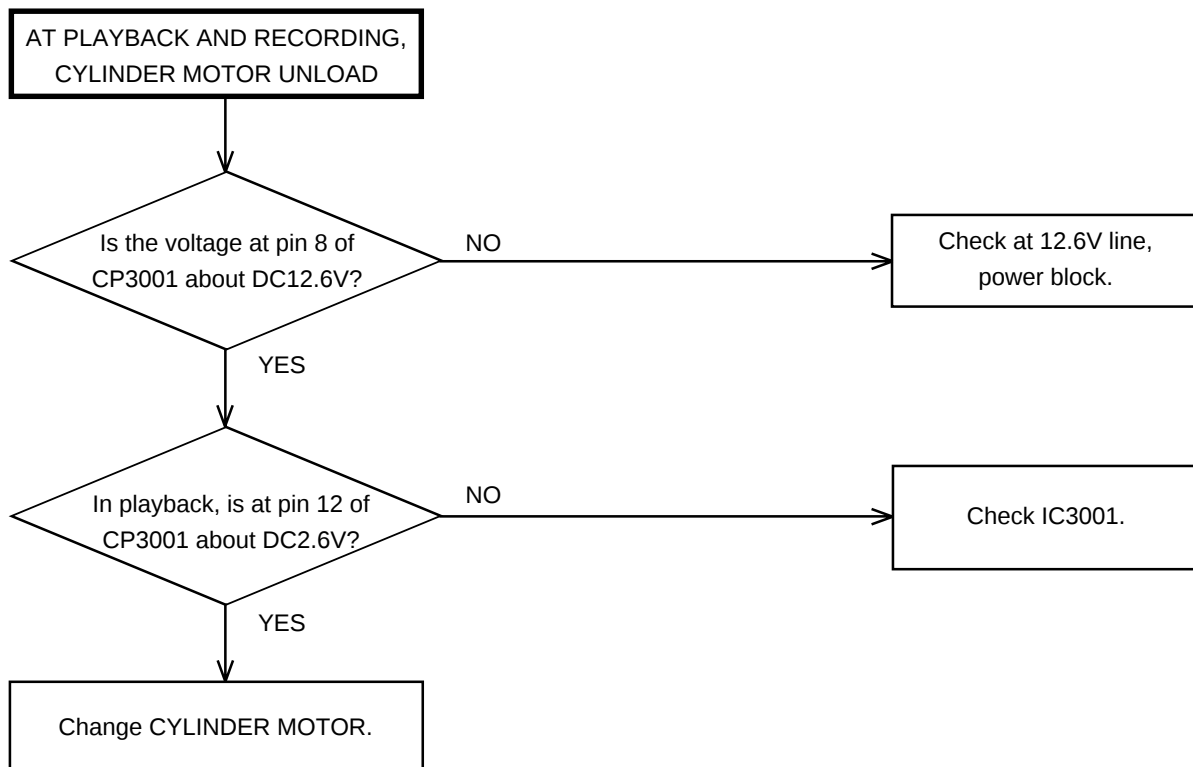
(VCR SECTION)



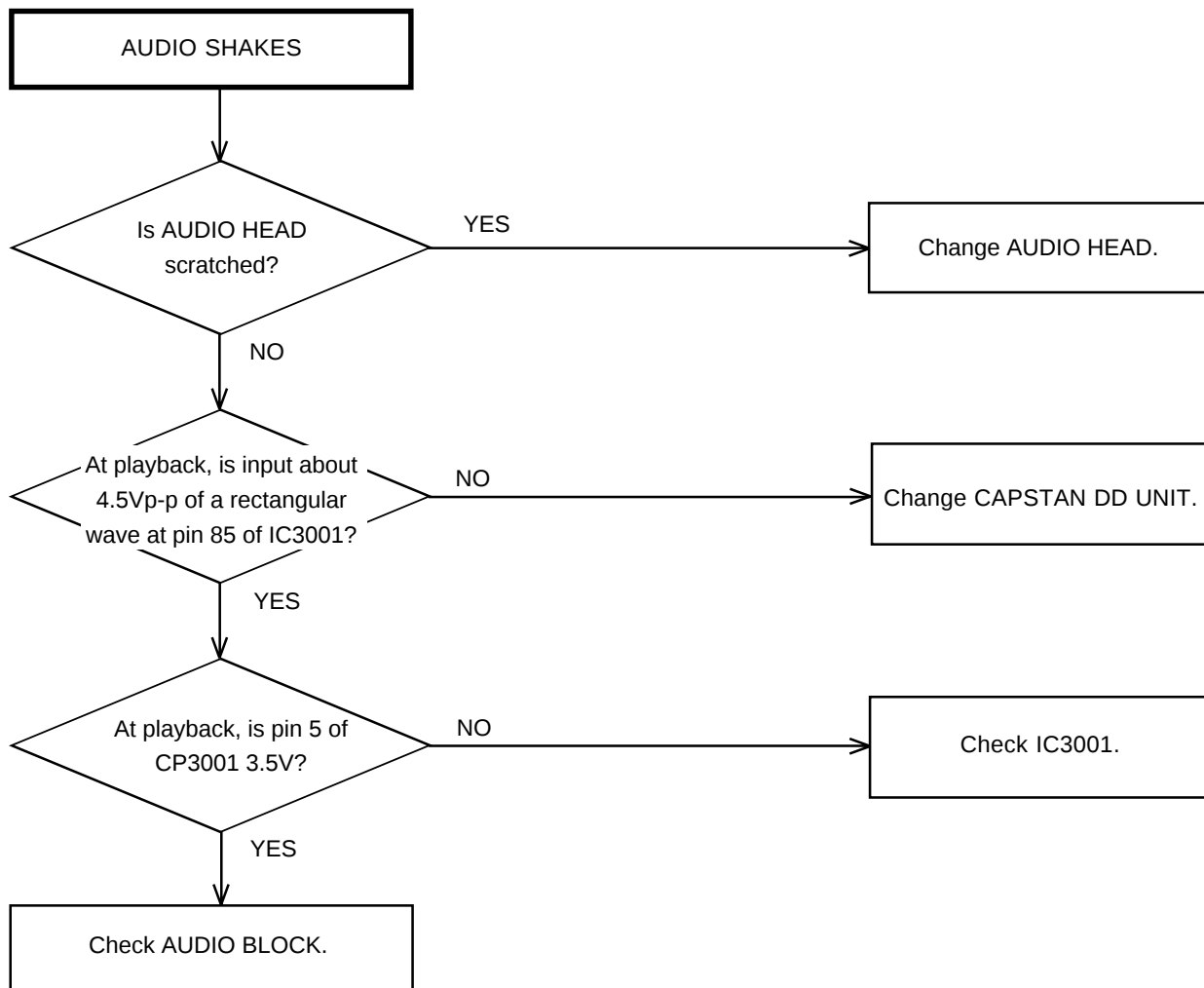
TROUBLESHOOTING GUIDE



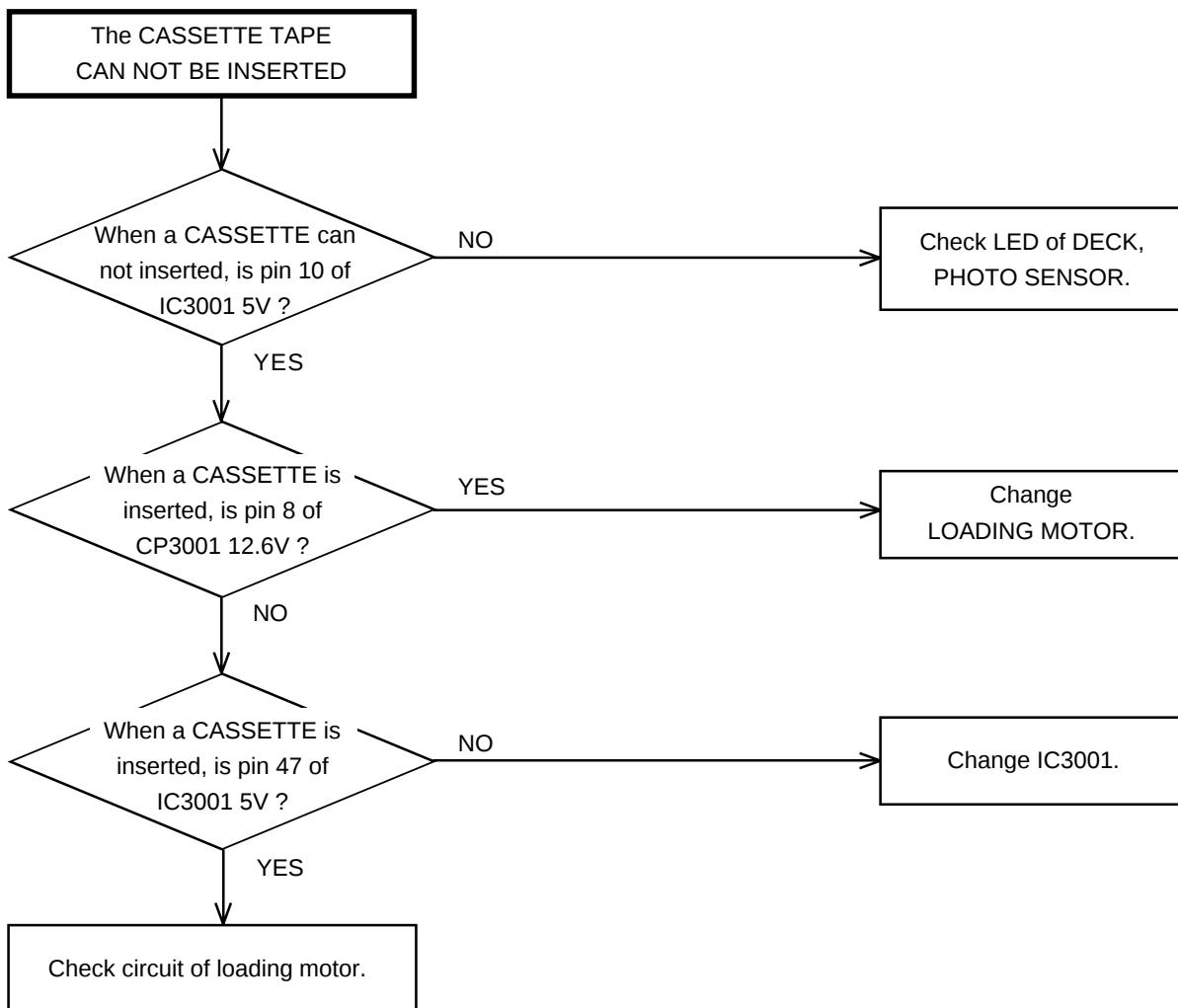
TROUBLESHOOTING GUIDE



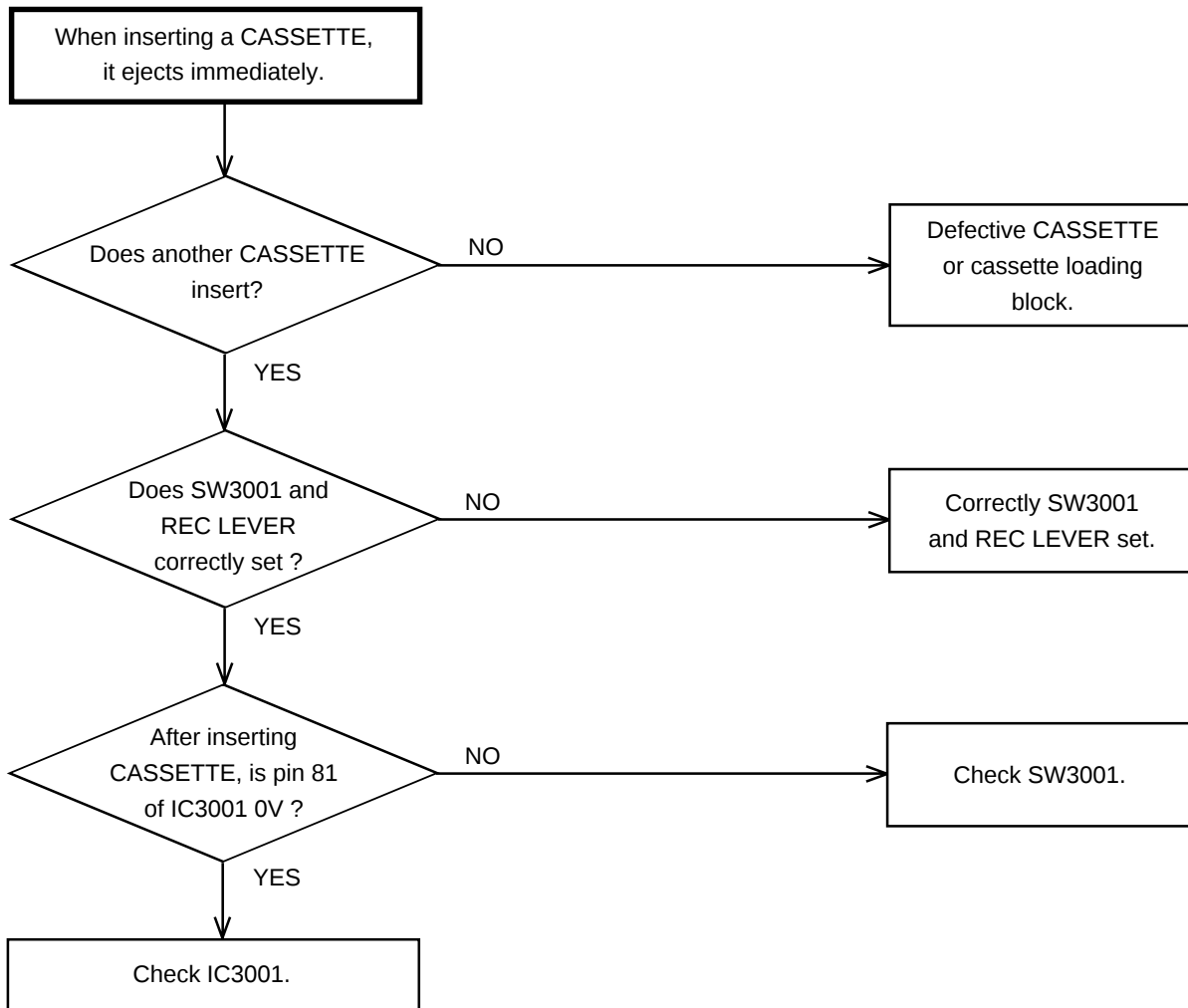
TROUBLESHOOTING GUIDE



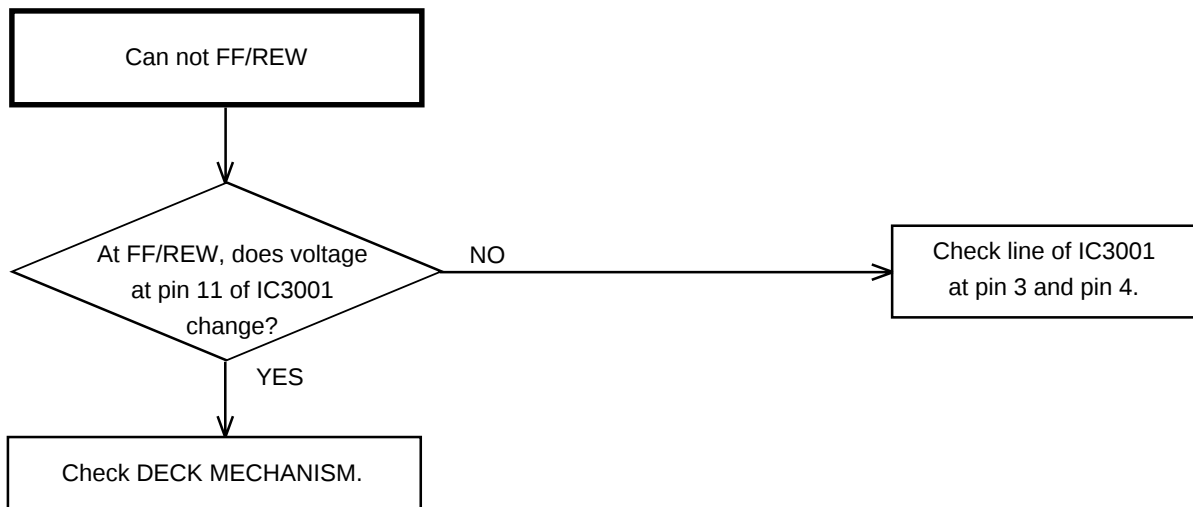
TROUBLESHOOTING GUIDE



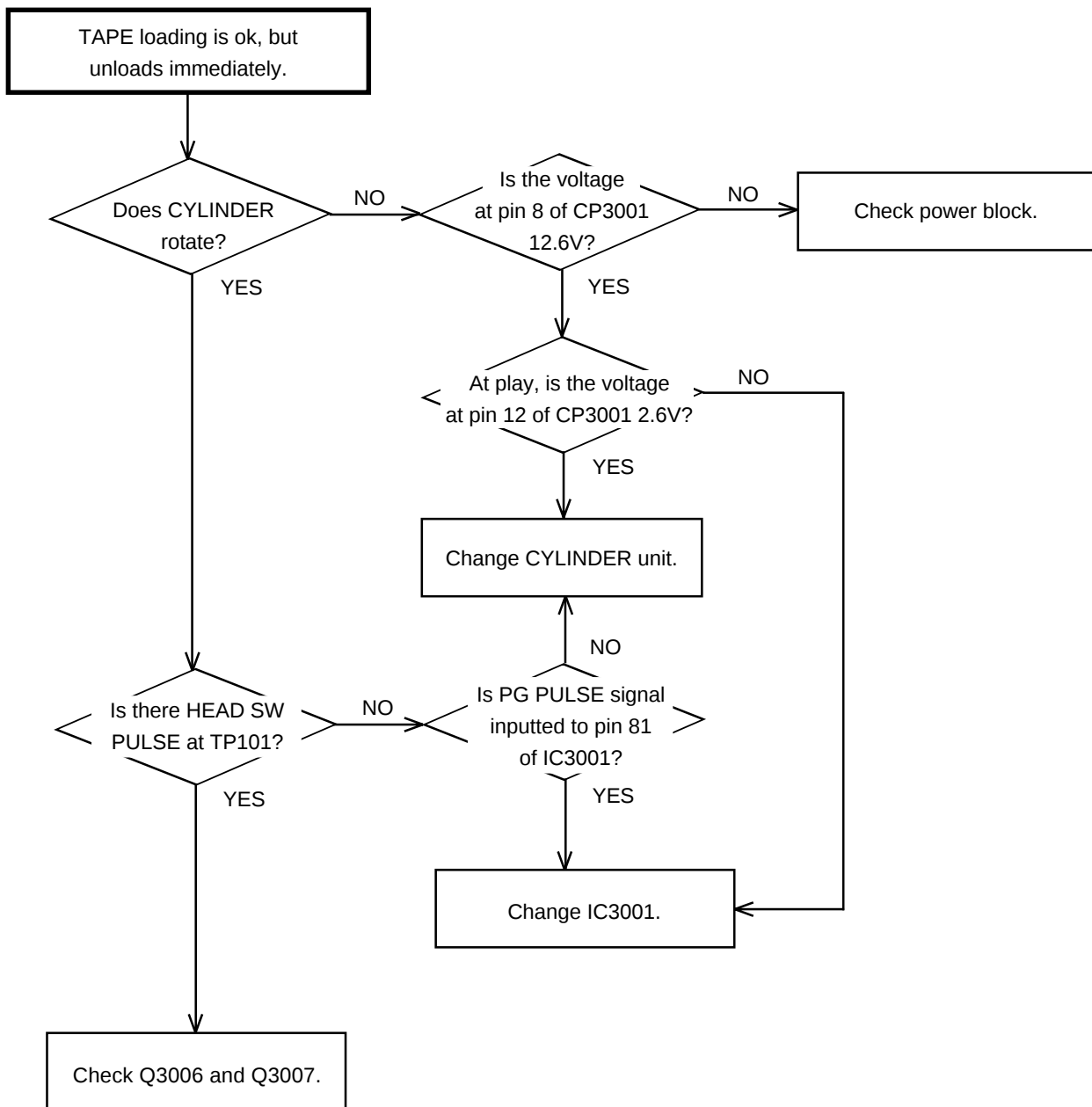
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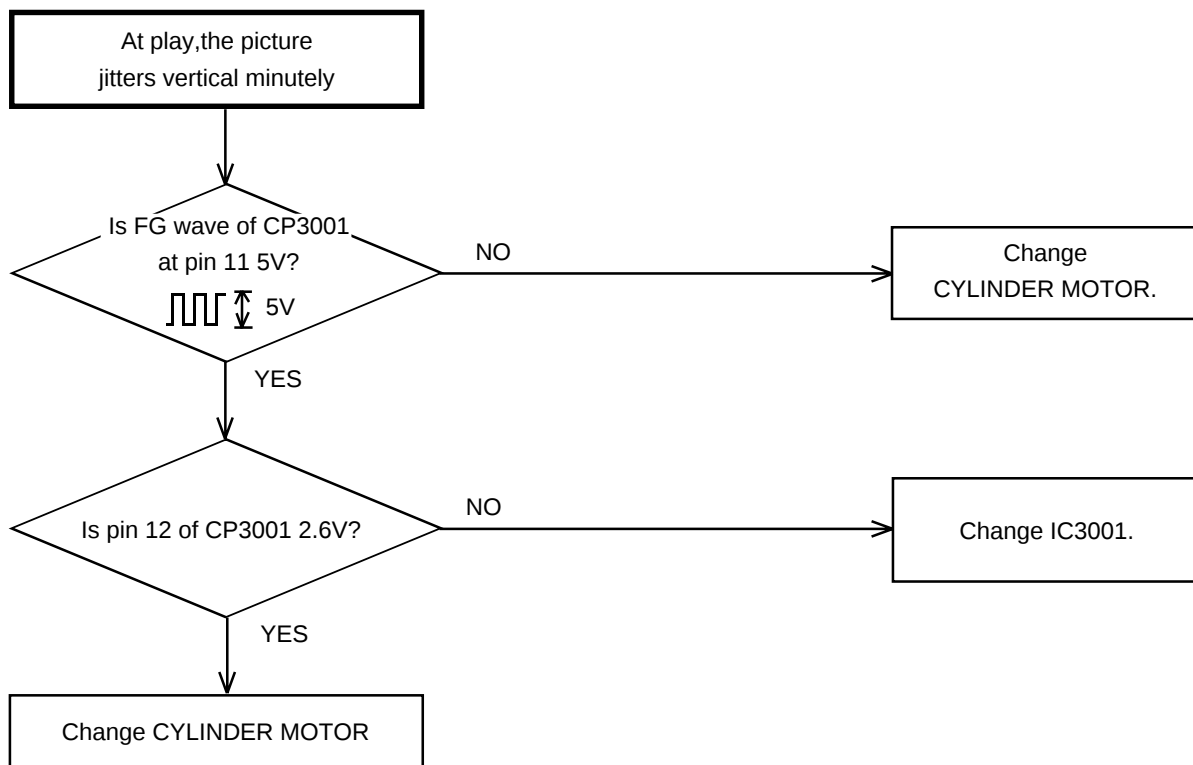
TROUBLESHOOTING GUIDE



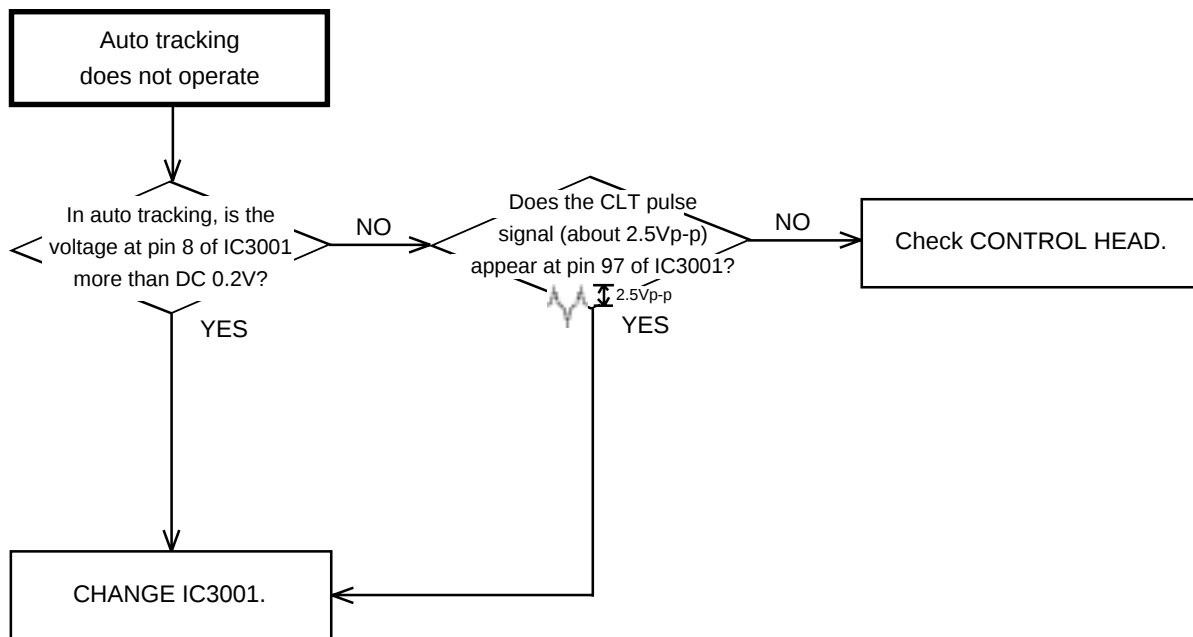
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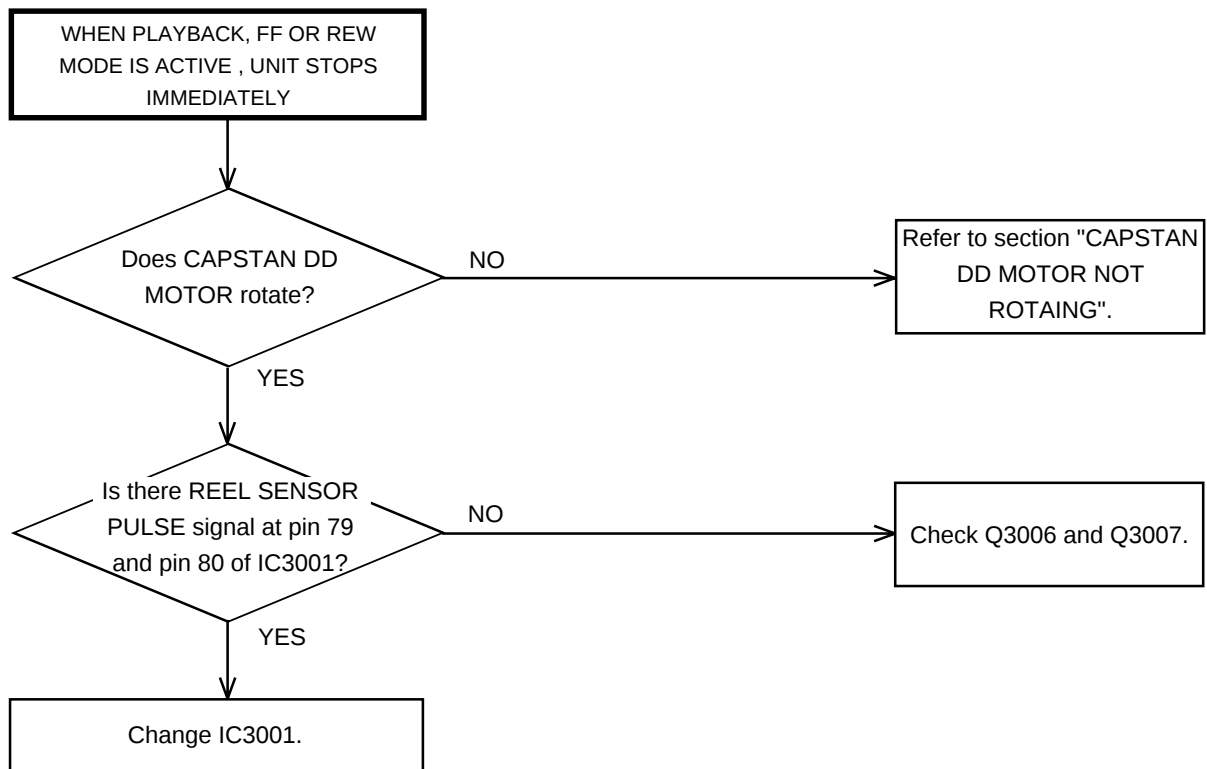
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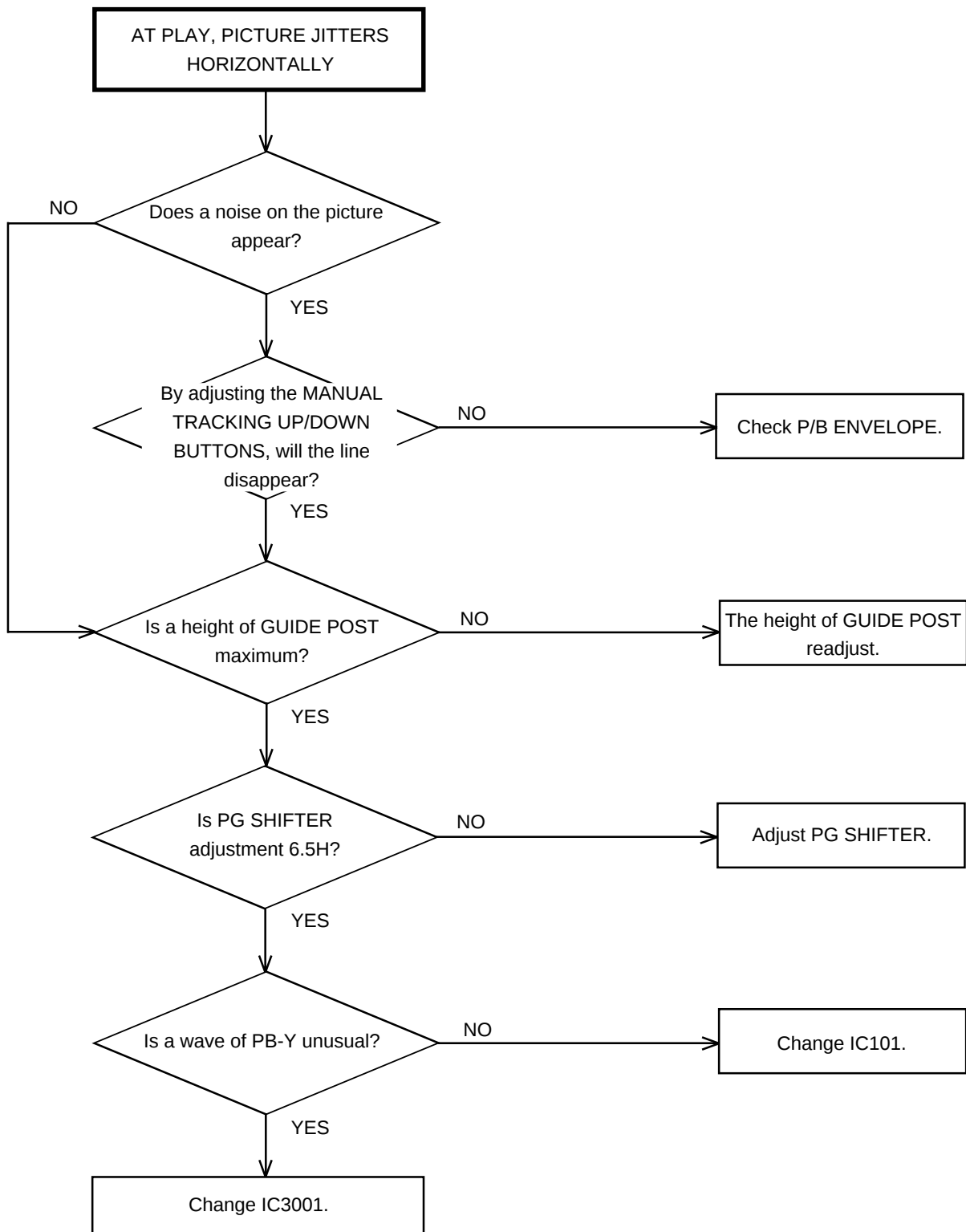
TROUBLESHOOTING GUIDE



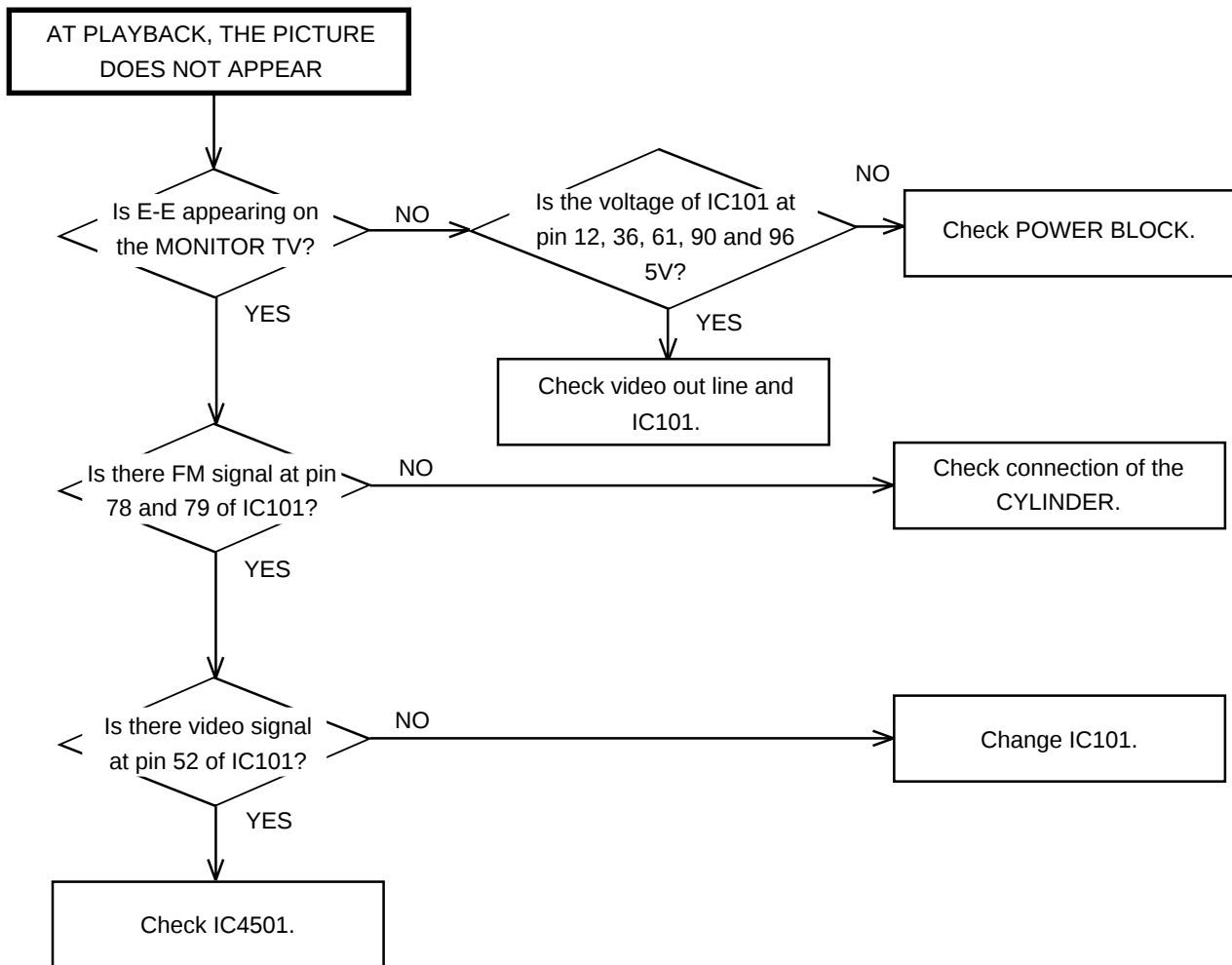
TROUBLESHOOTING GUIDE



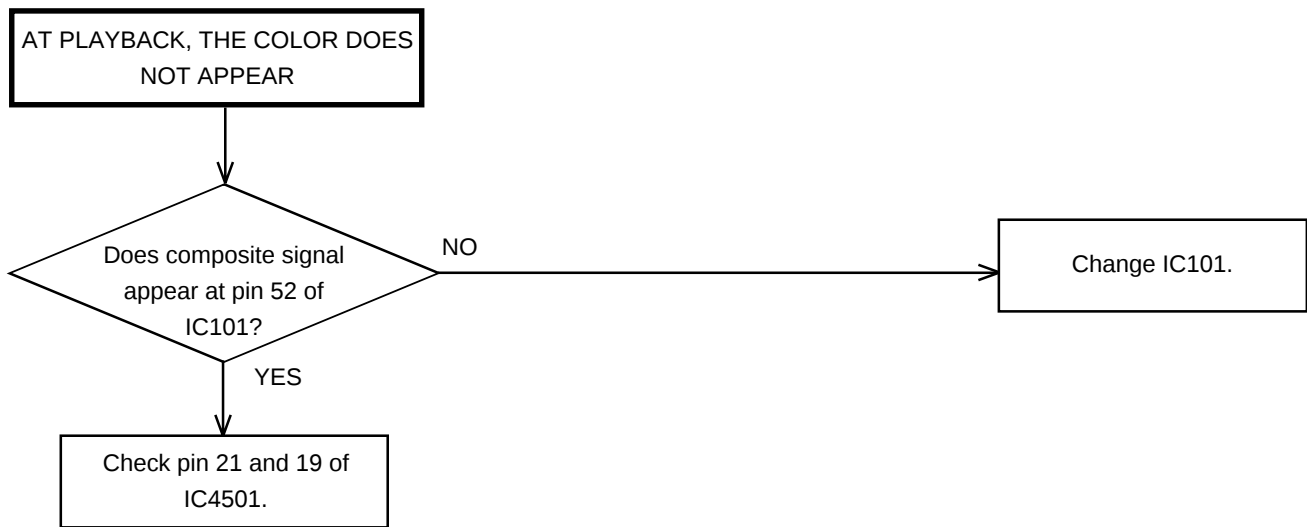
TROUBLESHOOTING GUIDE



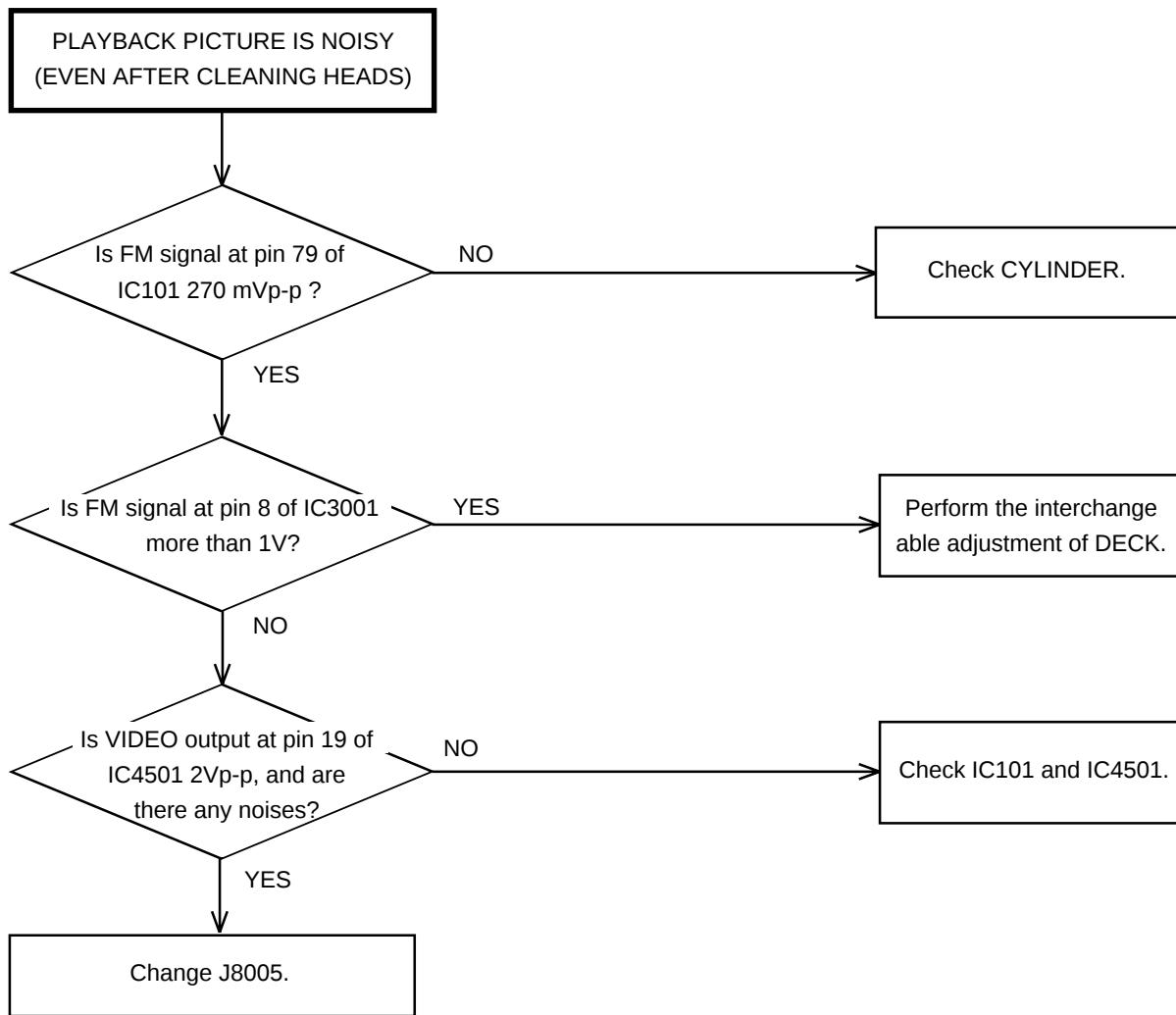
TROUBLESHOOTING GUIDE



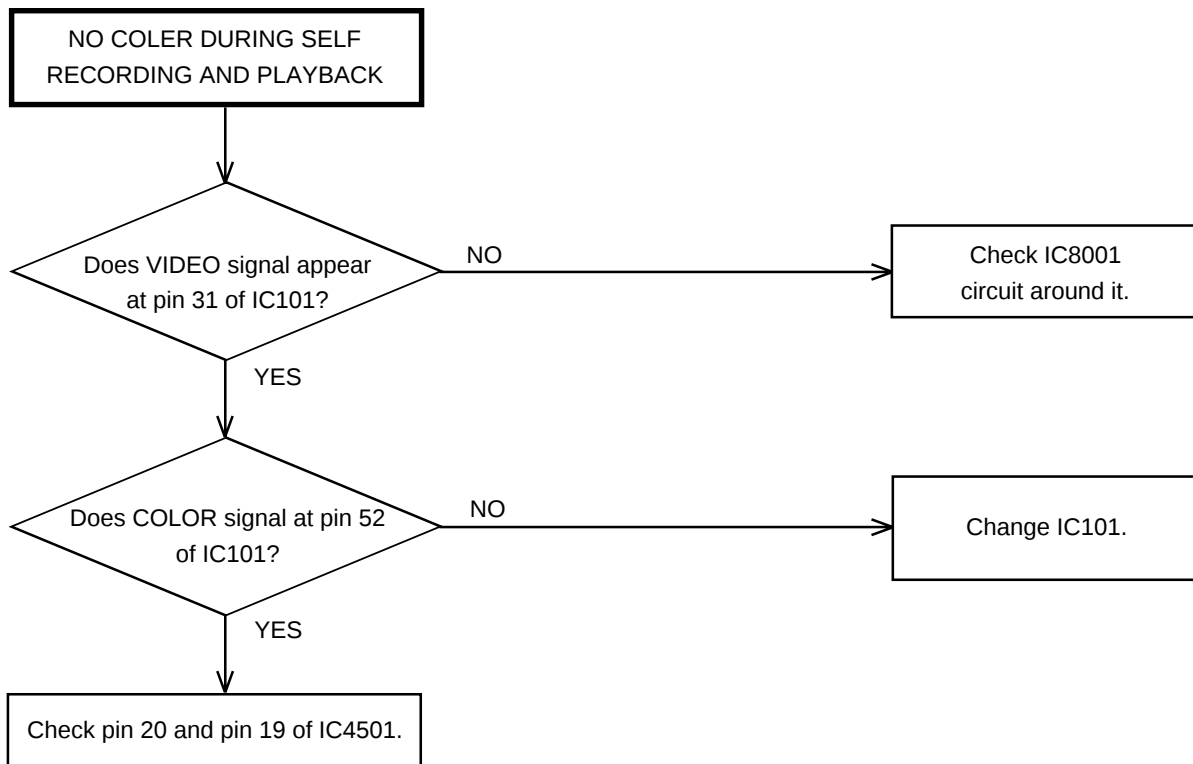
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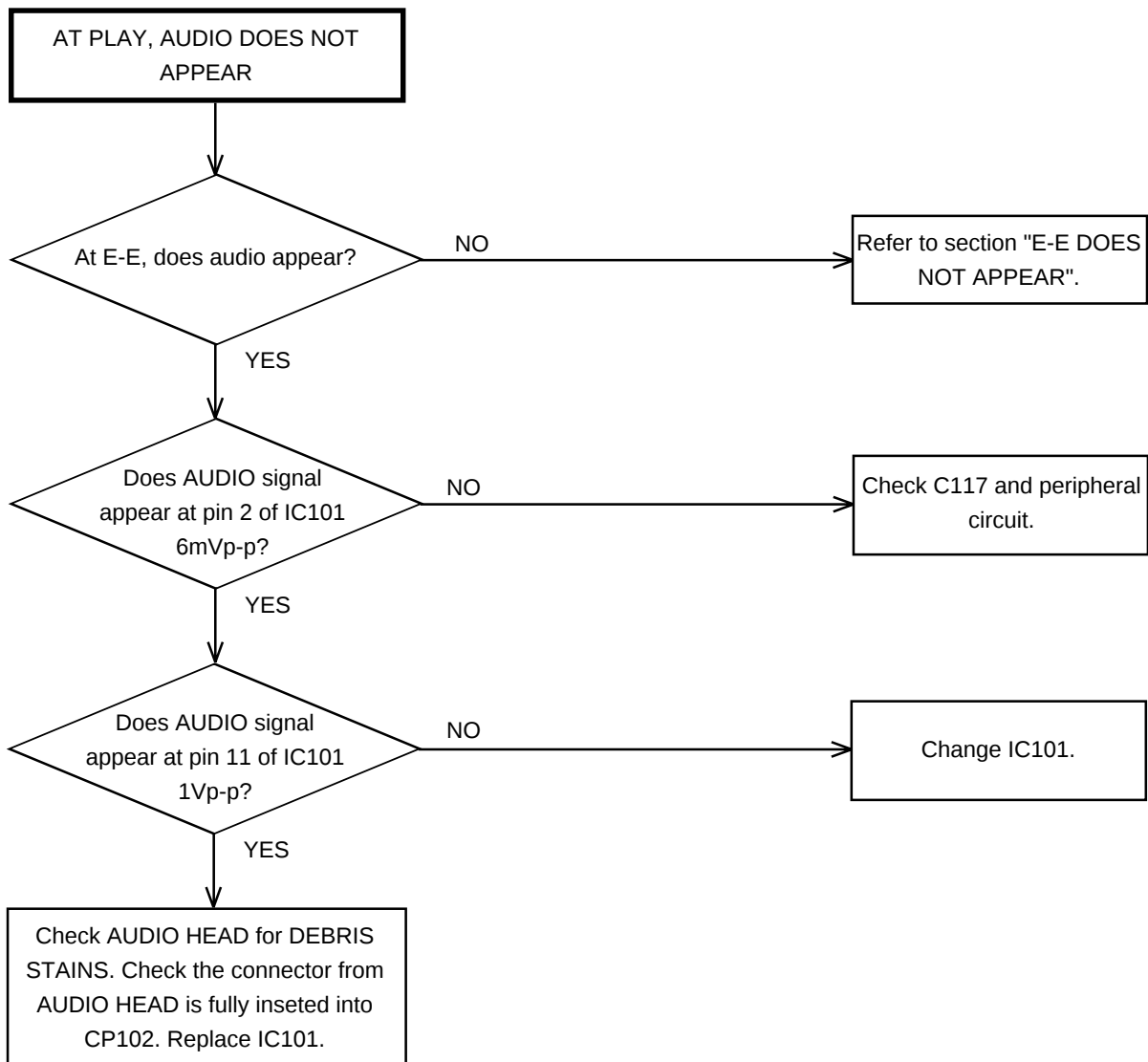
TROUBLESHOOTING GUIDE



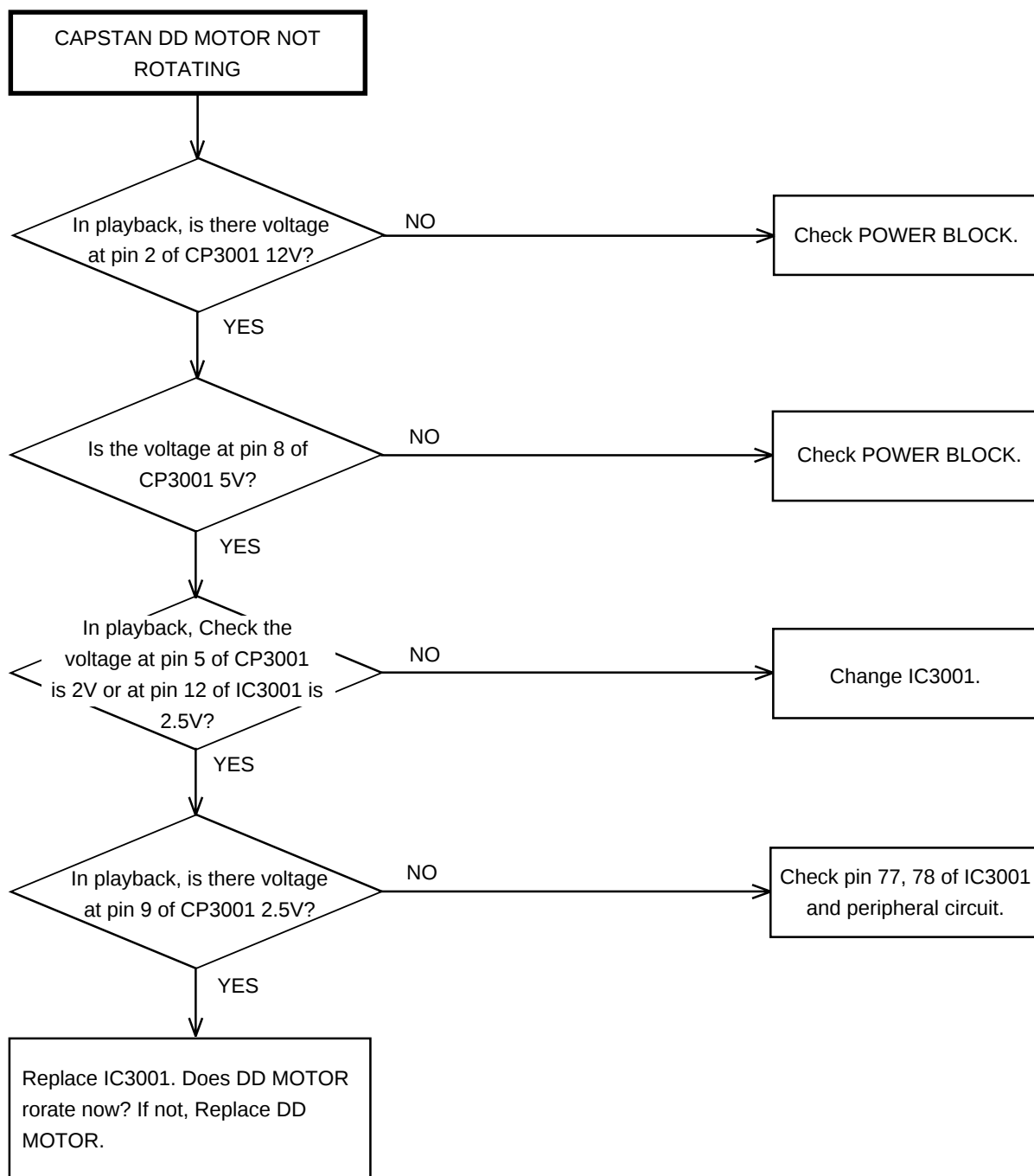
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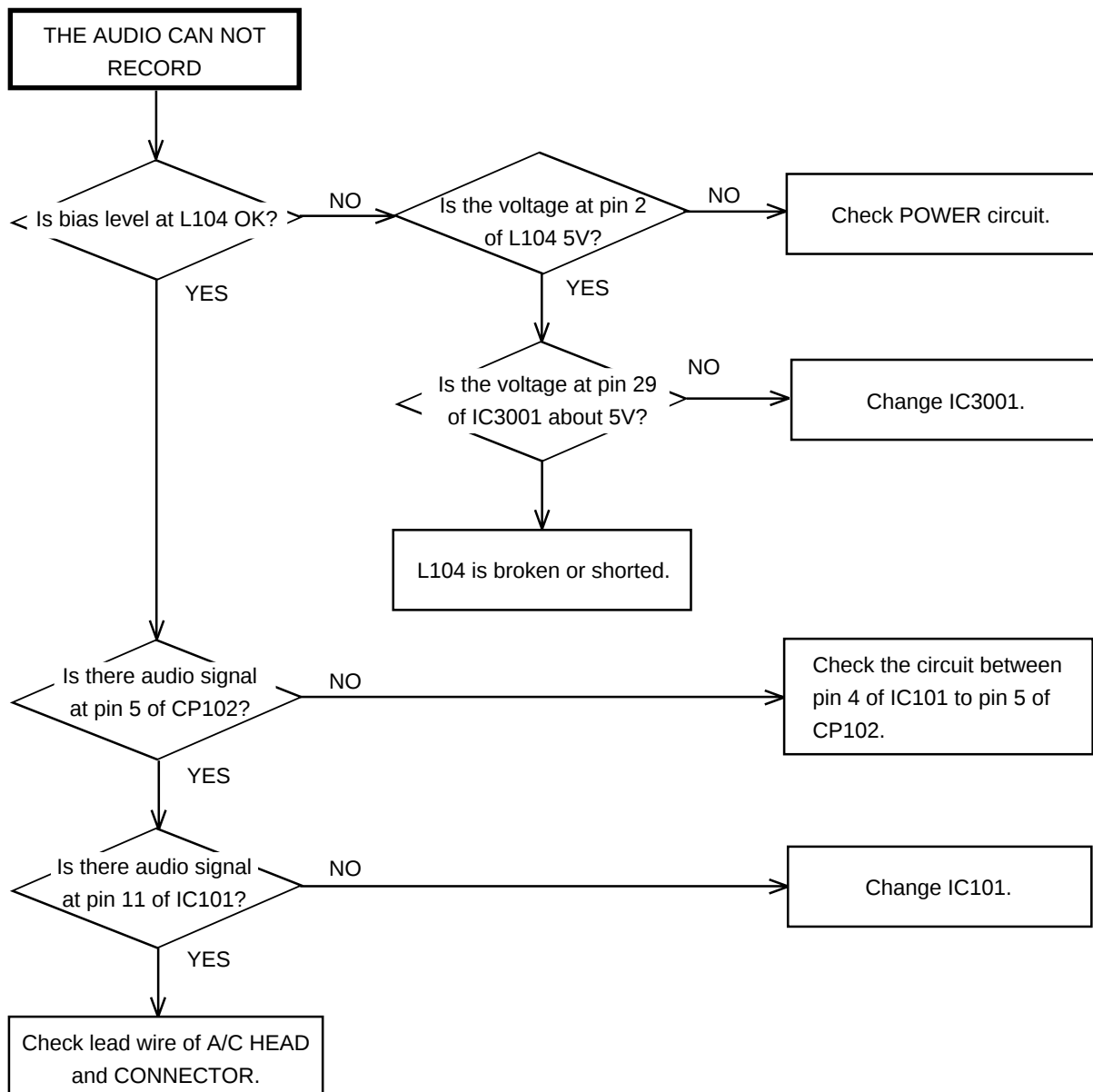
TROUBLESHOOTING GUIDE



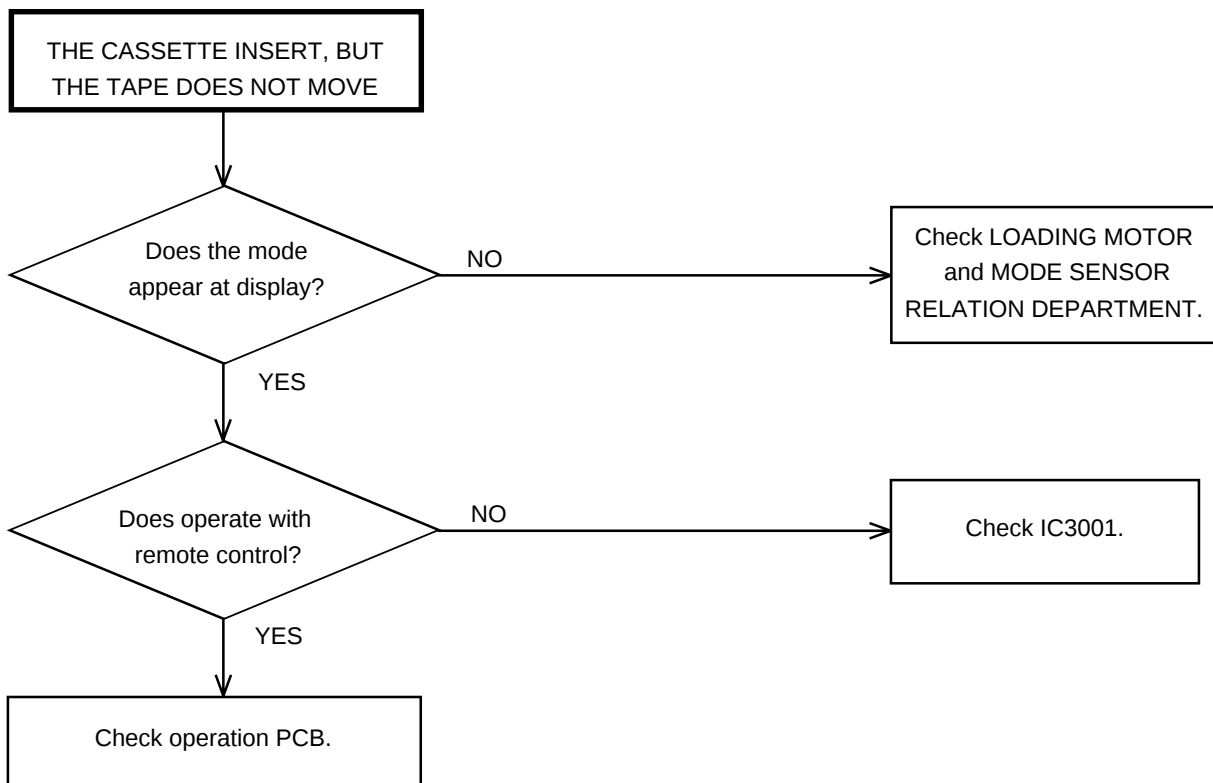
TROUBLESHOOTING GUIDE



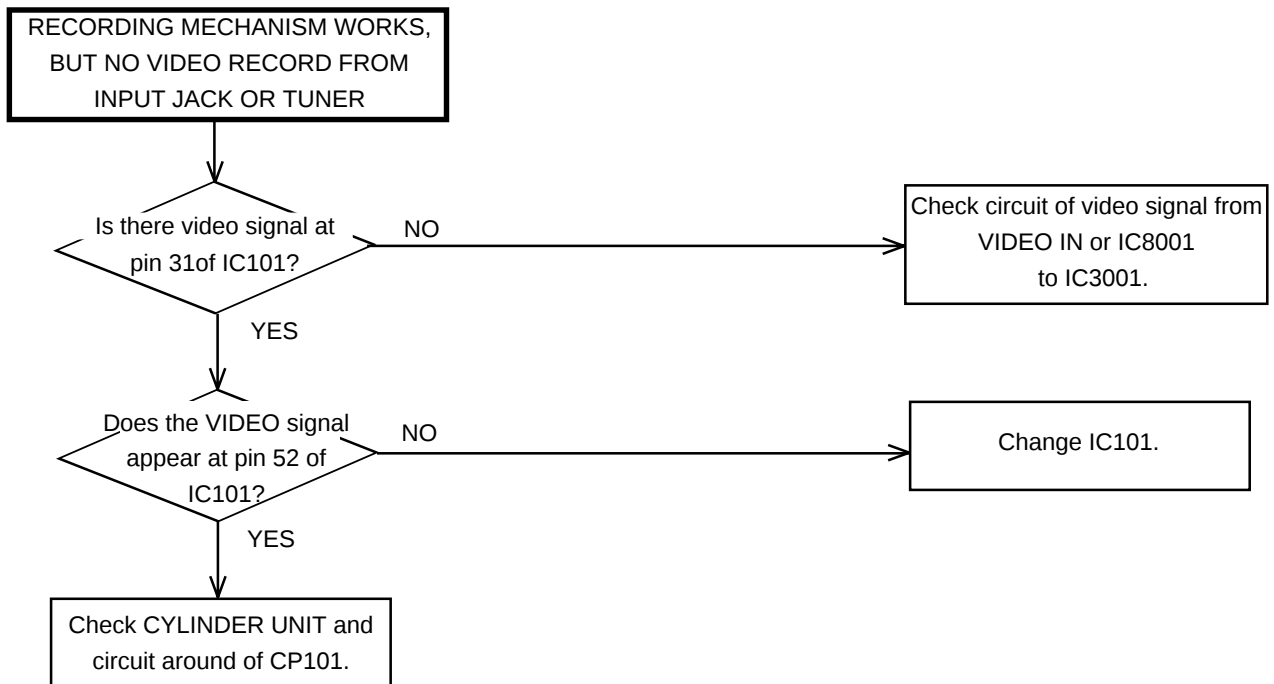
TROUBLESHOOTING GUIDE



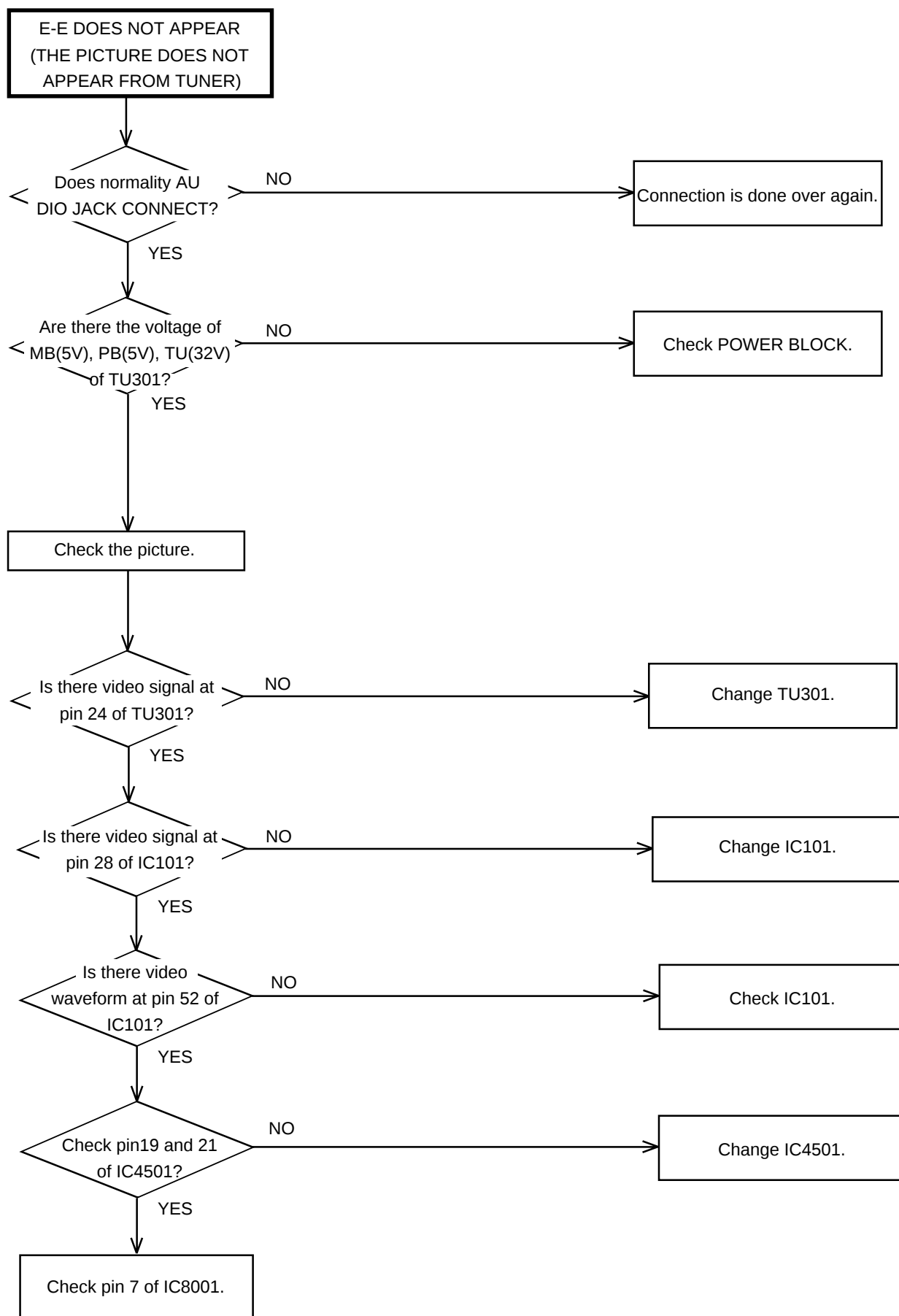
TROUBLESHOOTING GUIDE



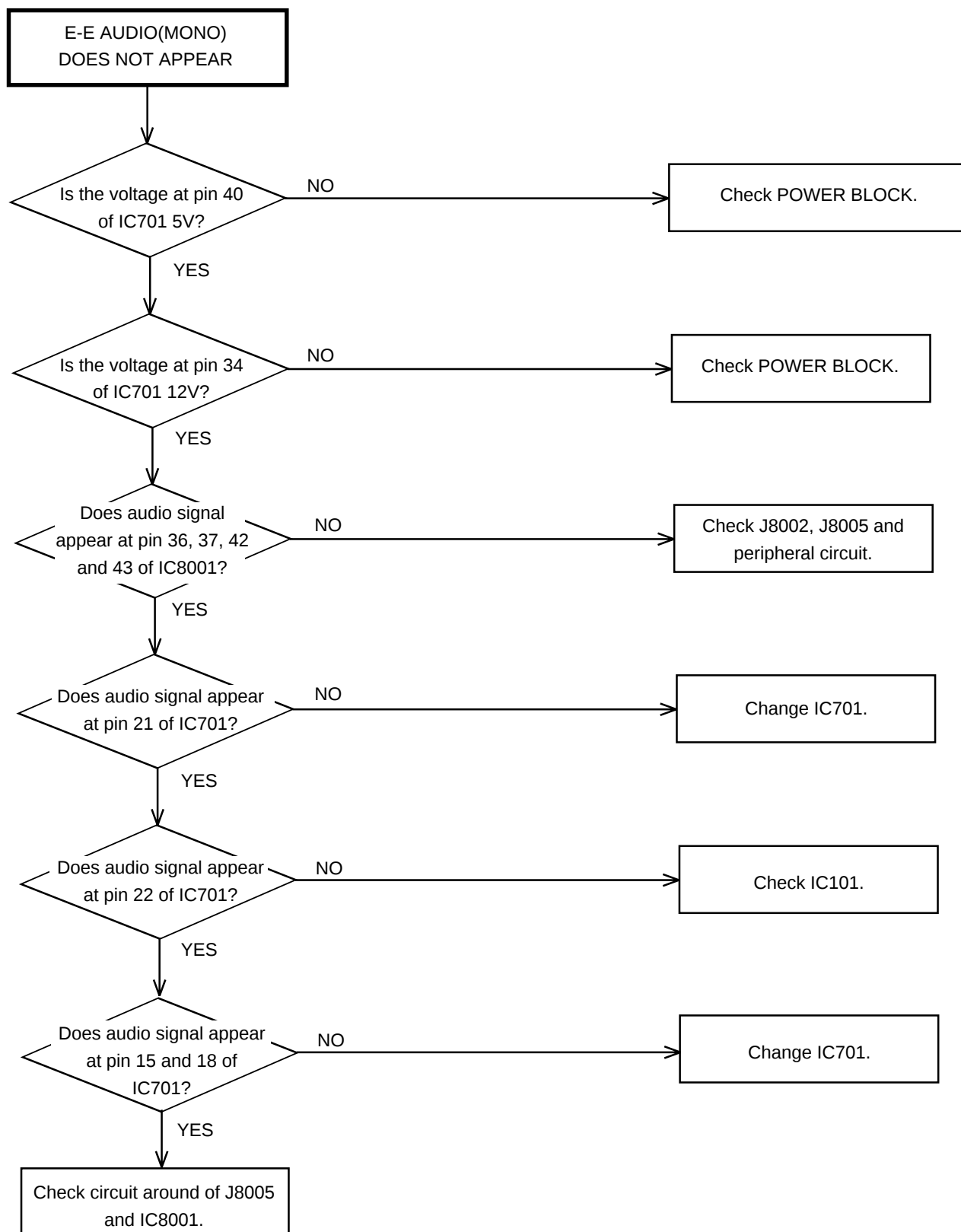
TROUBLESHOOTING GUIDE



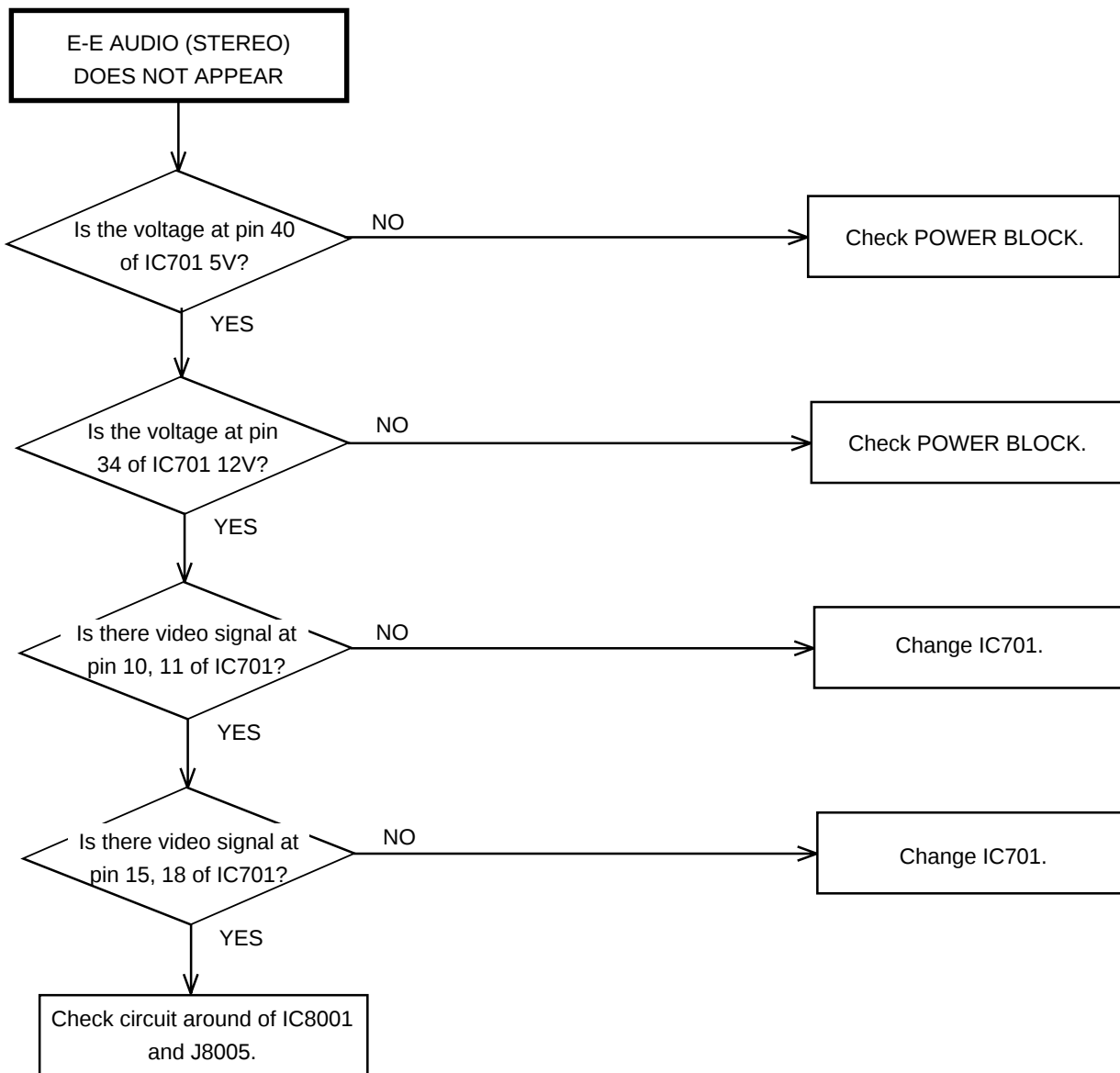
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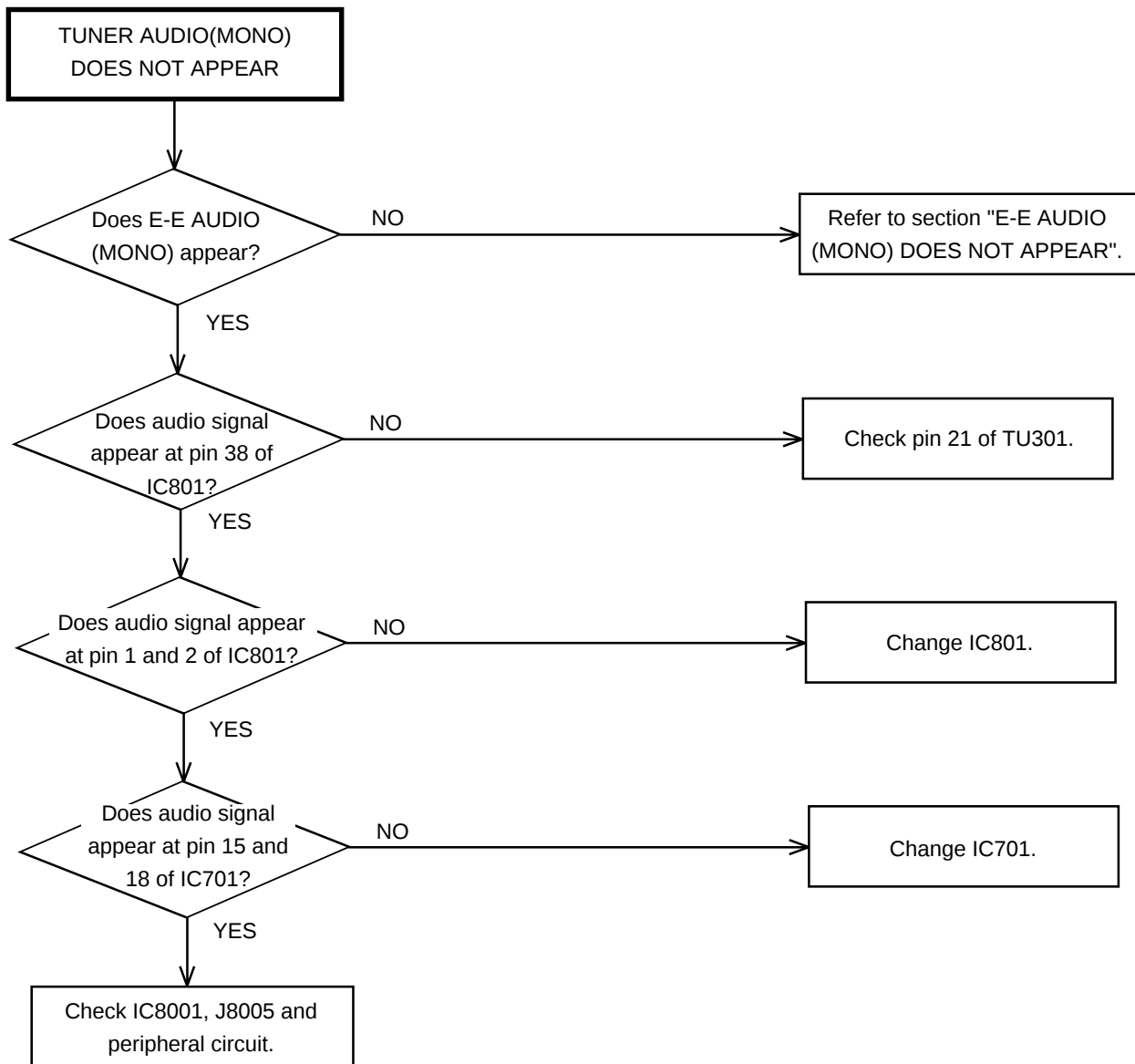
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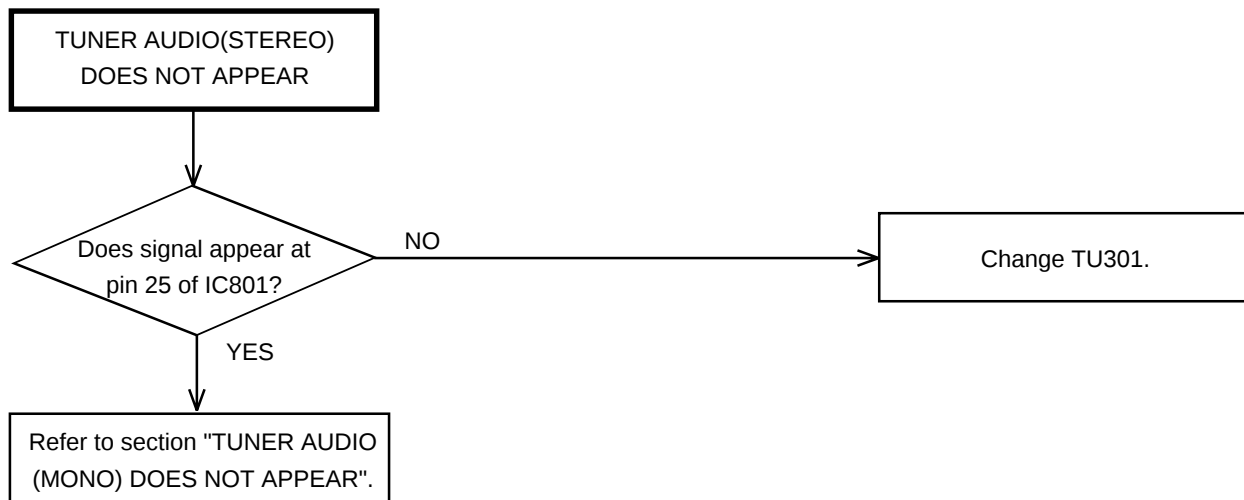
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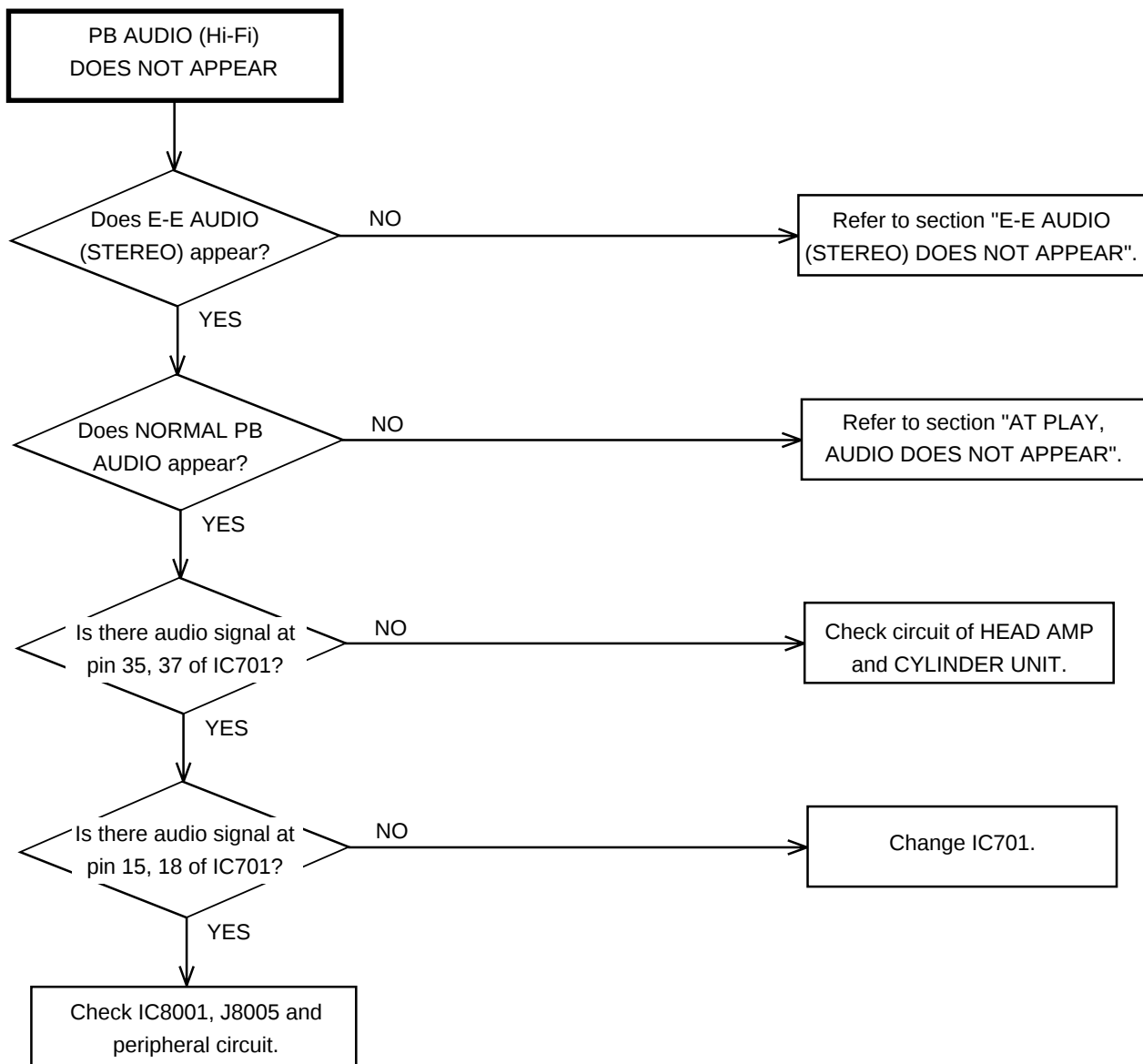
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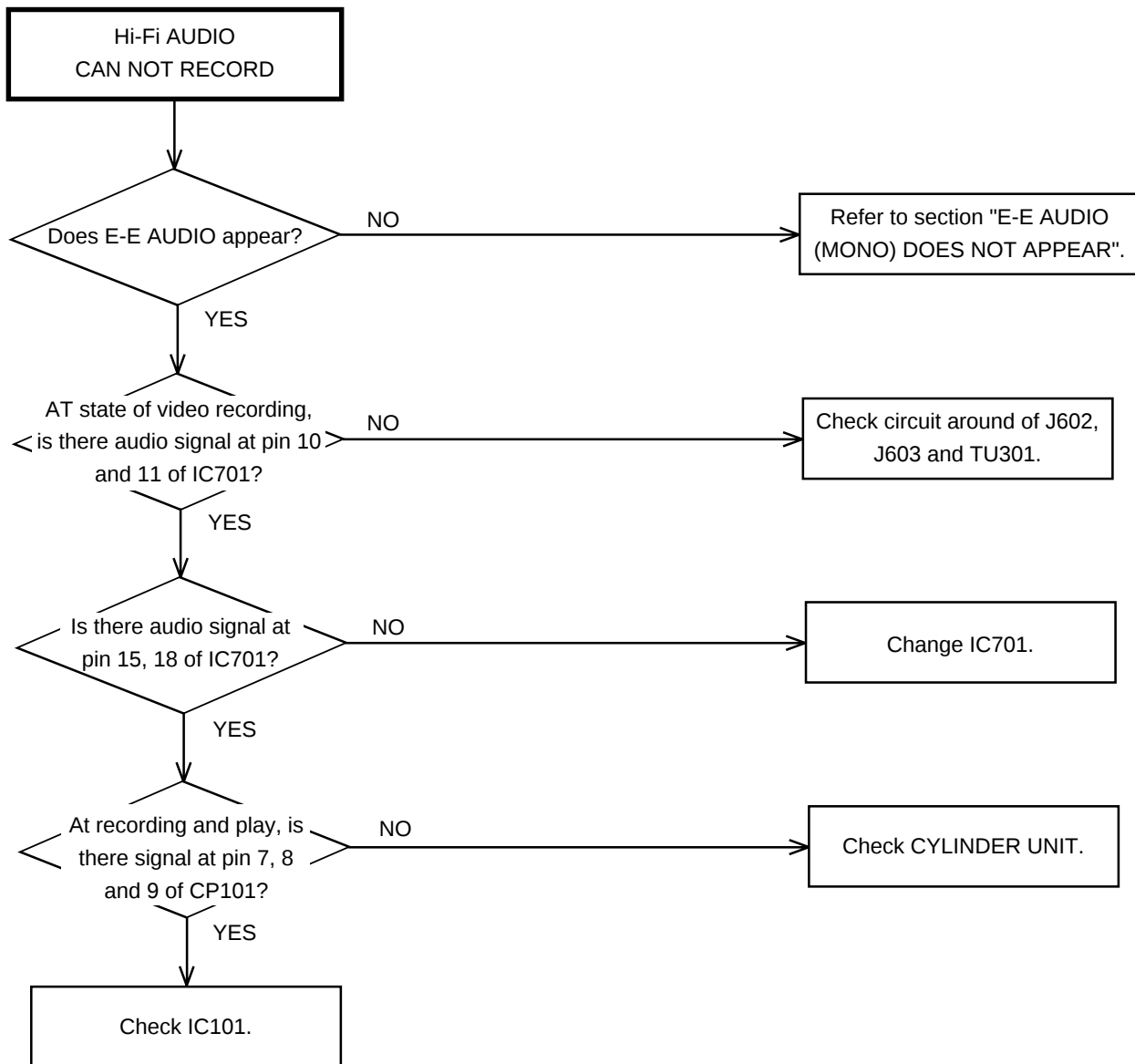
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

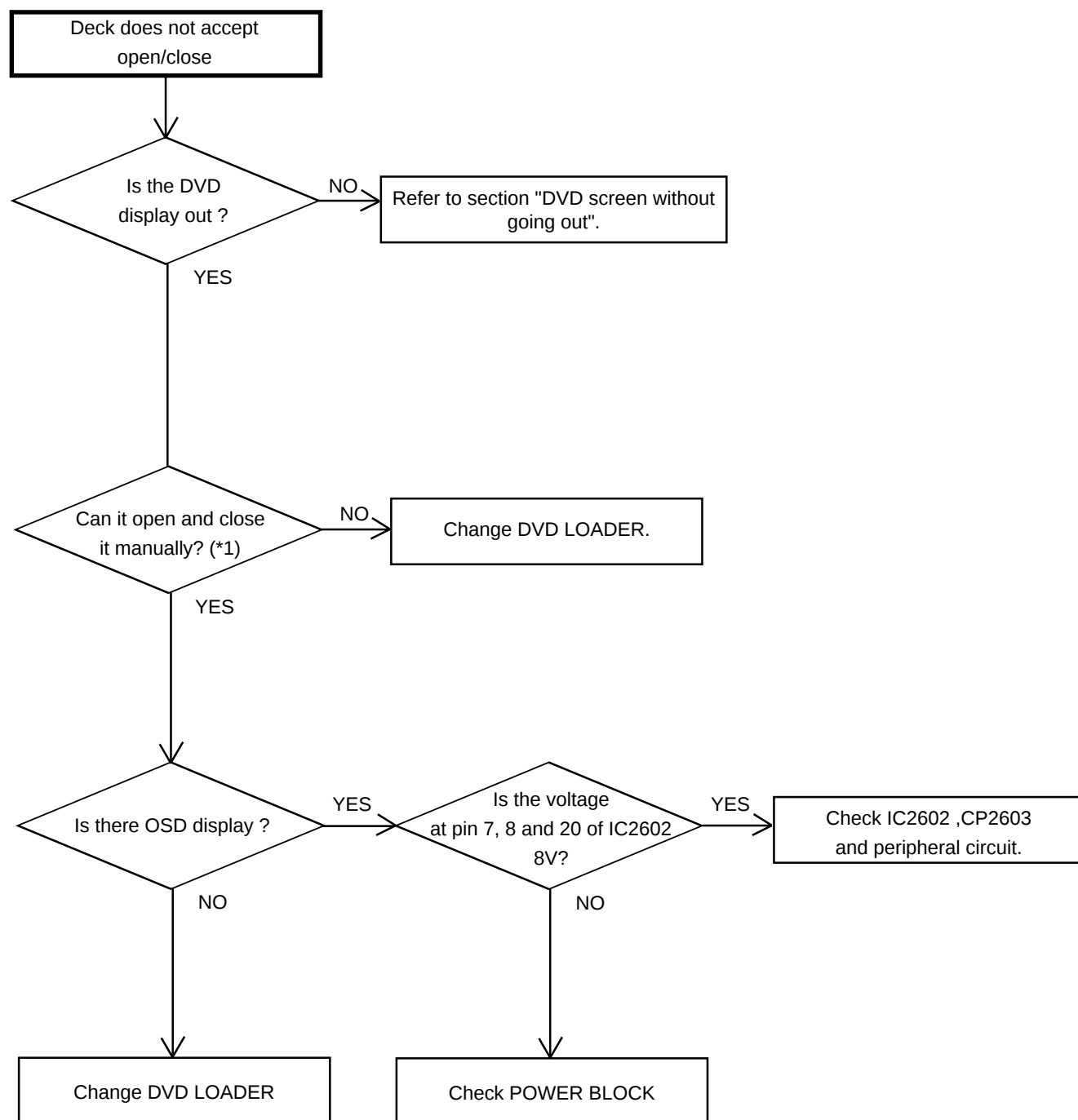


TROUBLESHOOTING GUIDE



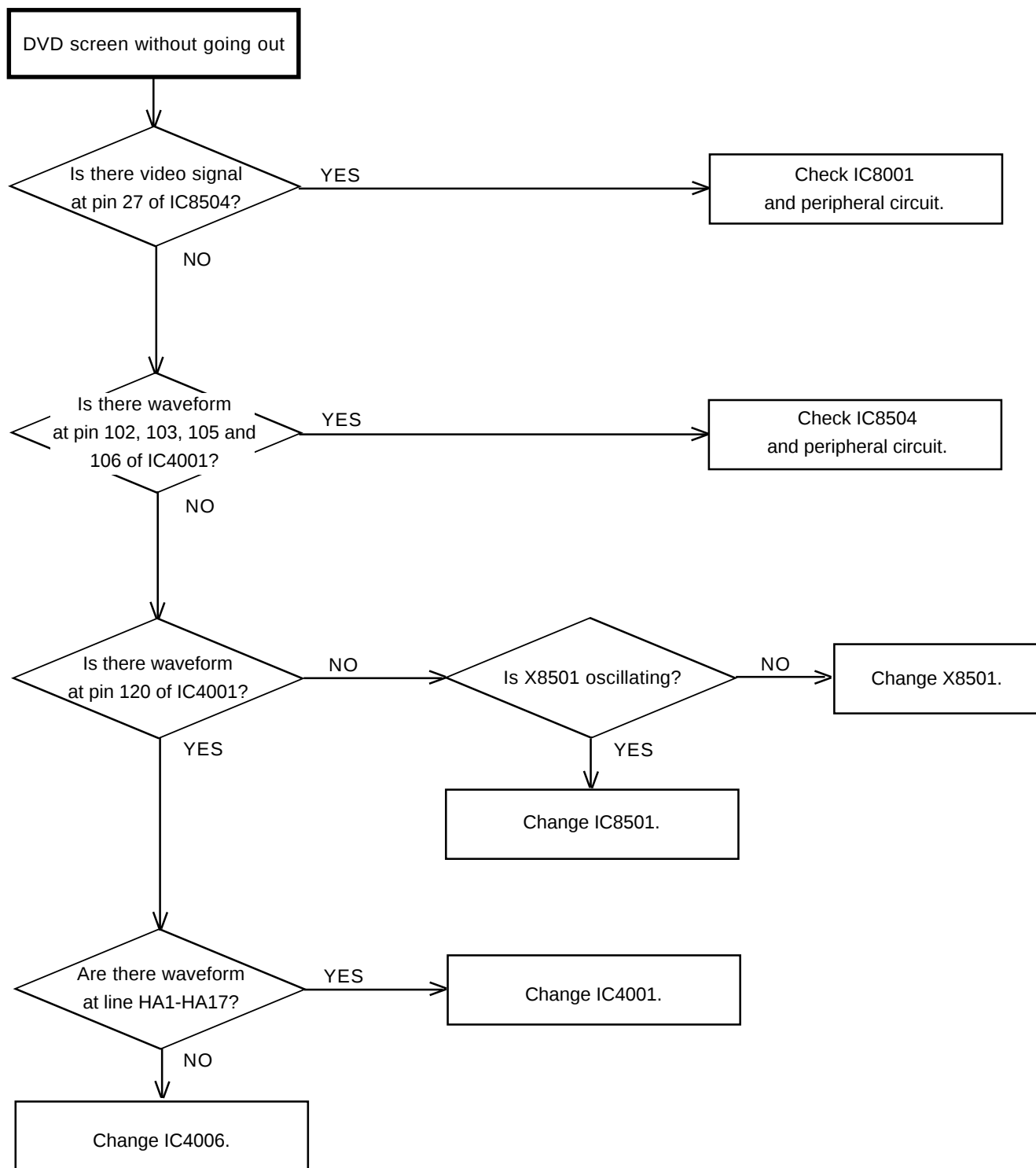
TROUBLESHOOTING GUIDE

(DVD SECTION)

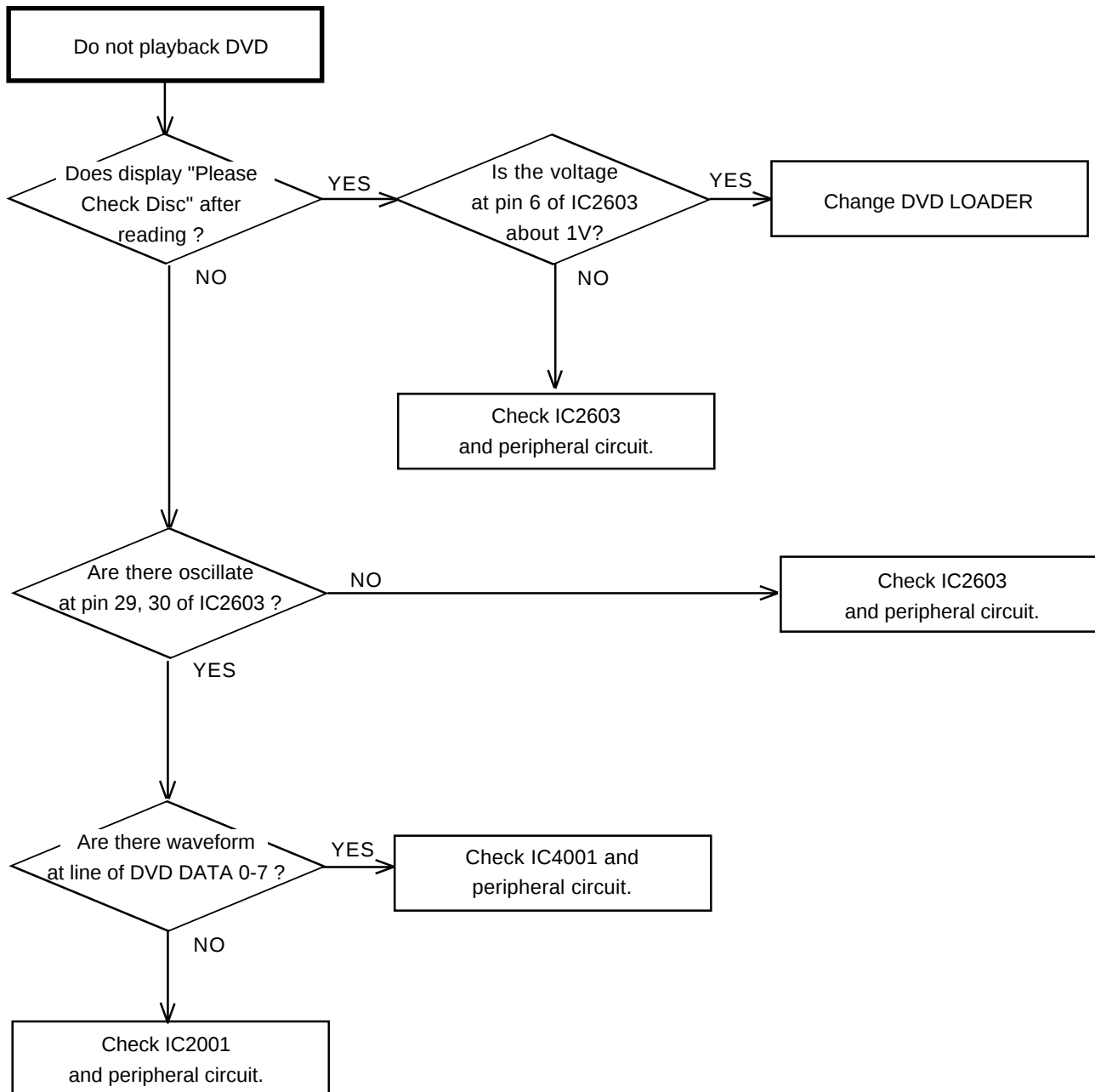


*1: Turn GEAR of DVD DECK front lower part, to open and close TRAY manually

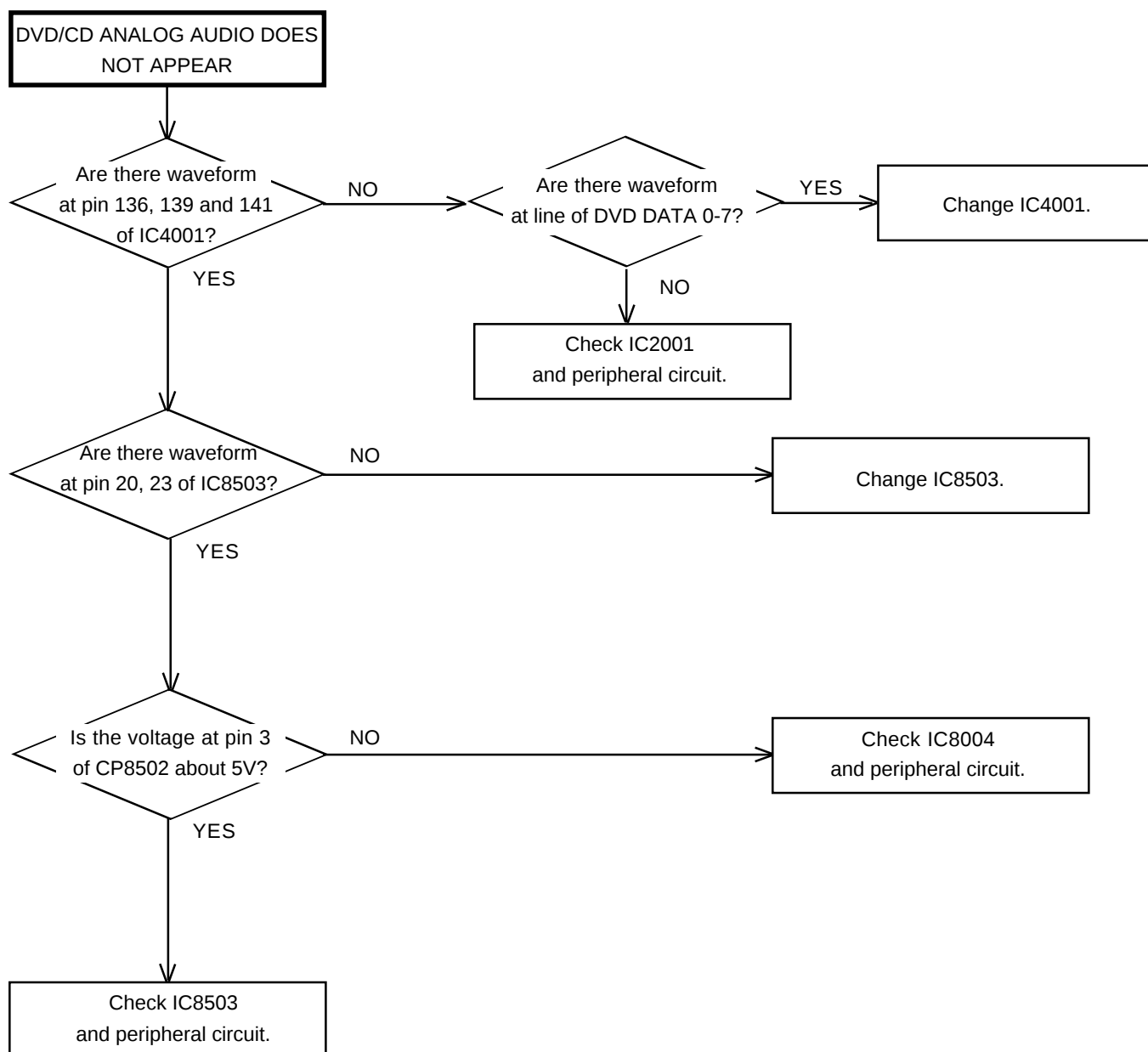
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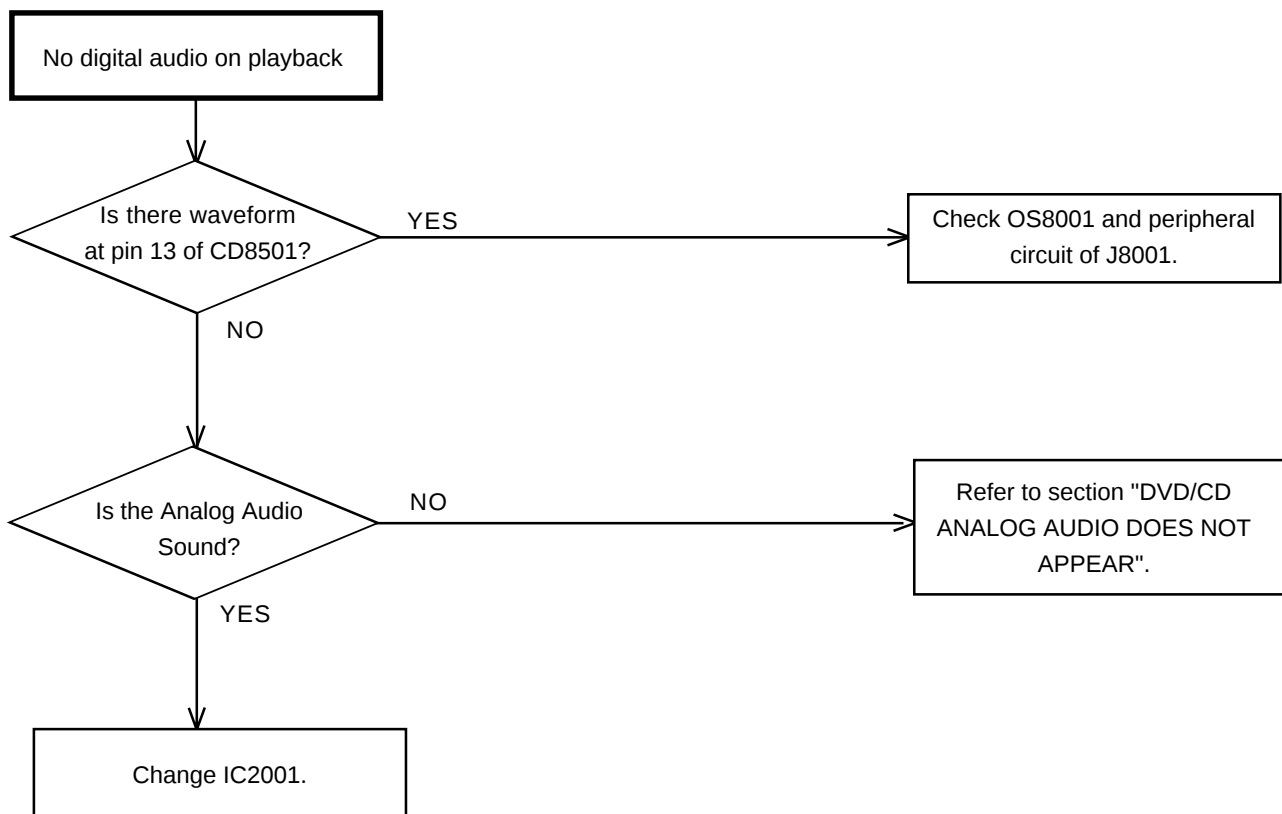
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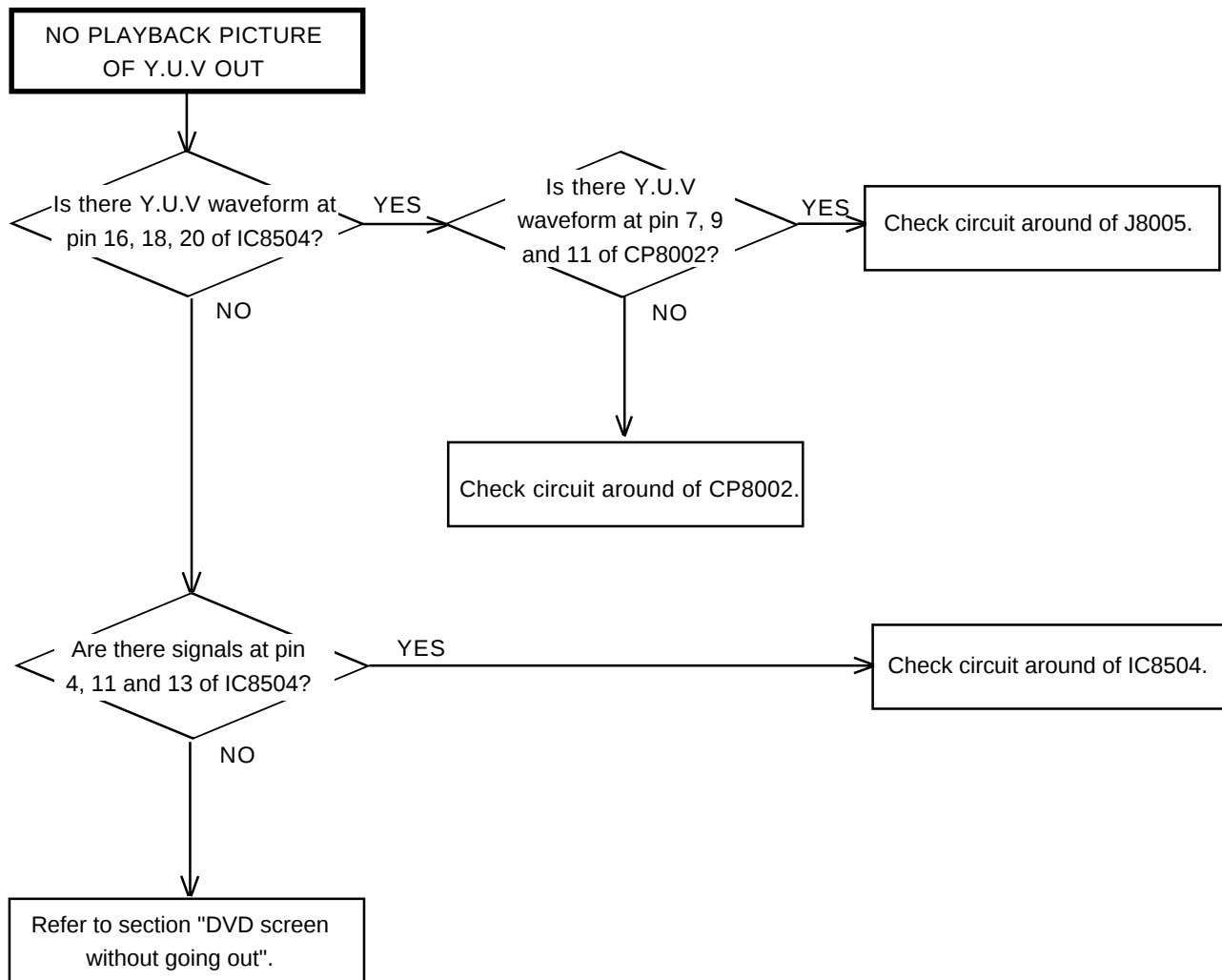
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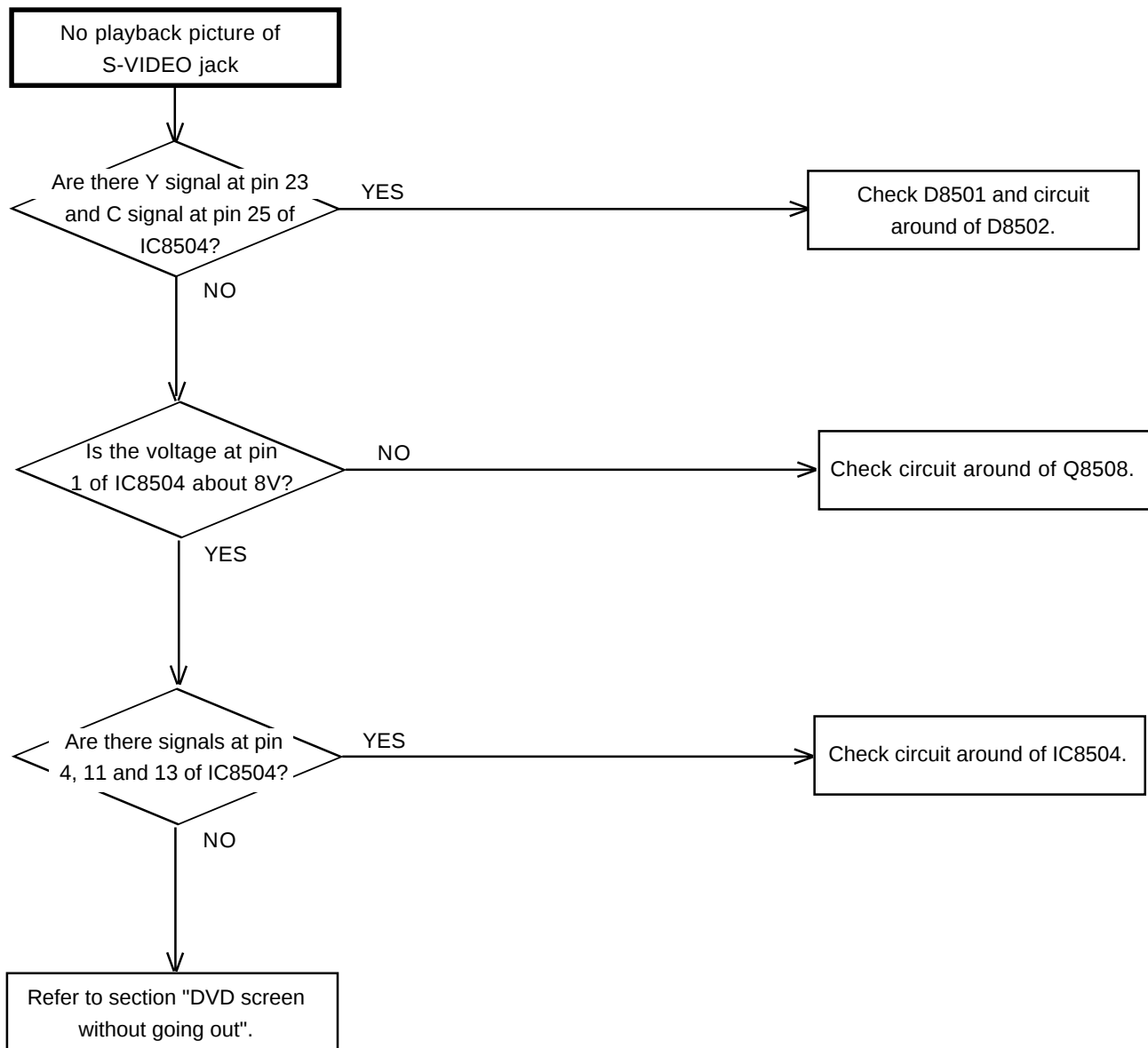
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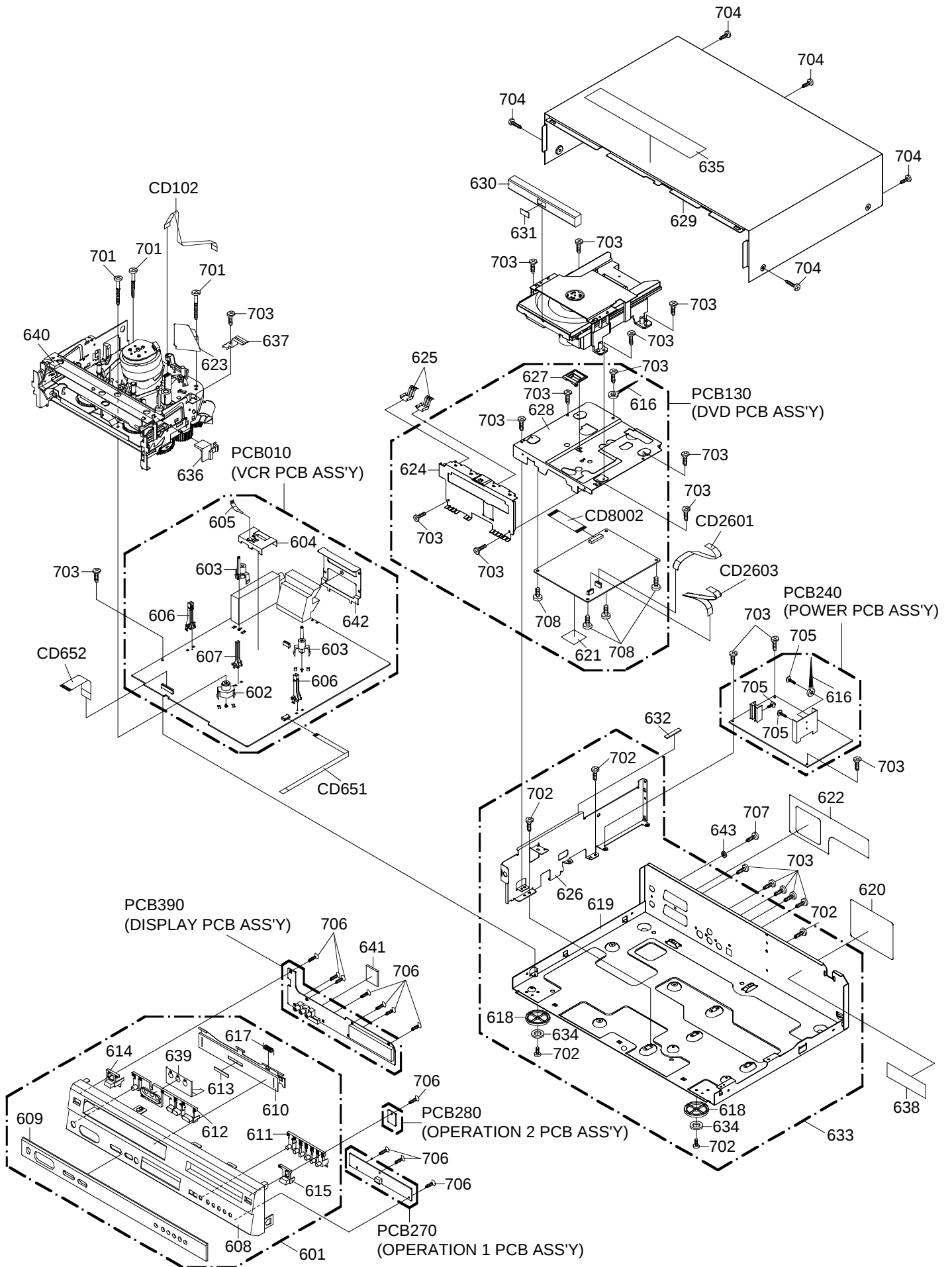
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



MECHANICAL EXPLODED VIEW



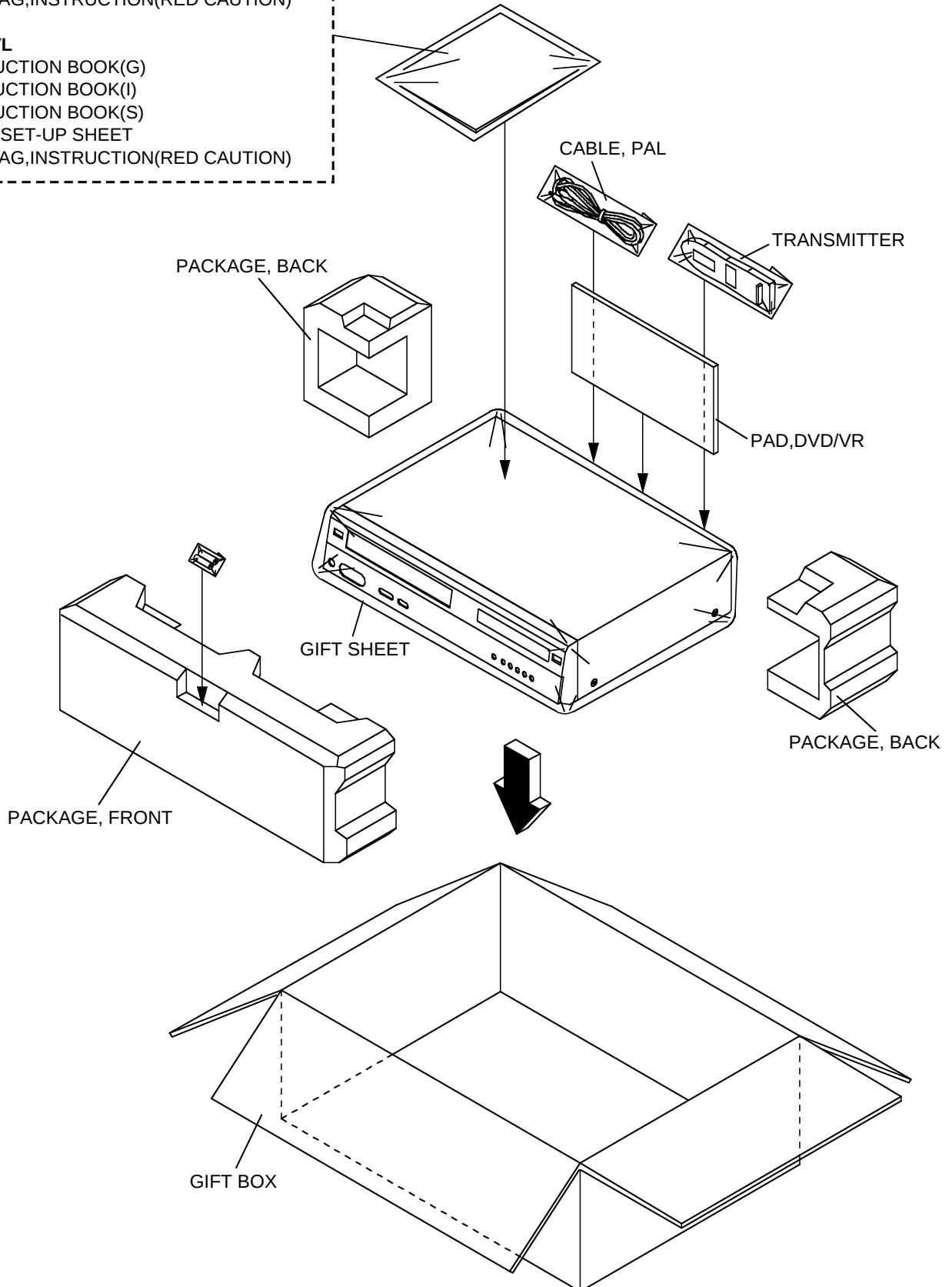
PACKING DIAGRAM (SD-22VB, SD-22VL)

SD-22VB

INSTRUCTION BOOK
QUICK SET UP SHEET
REGISTRATION CARD
POLYBAG, INSTRUCTION (RED CAUTION)

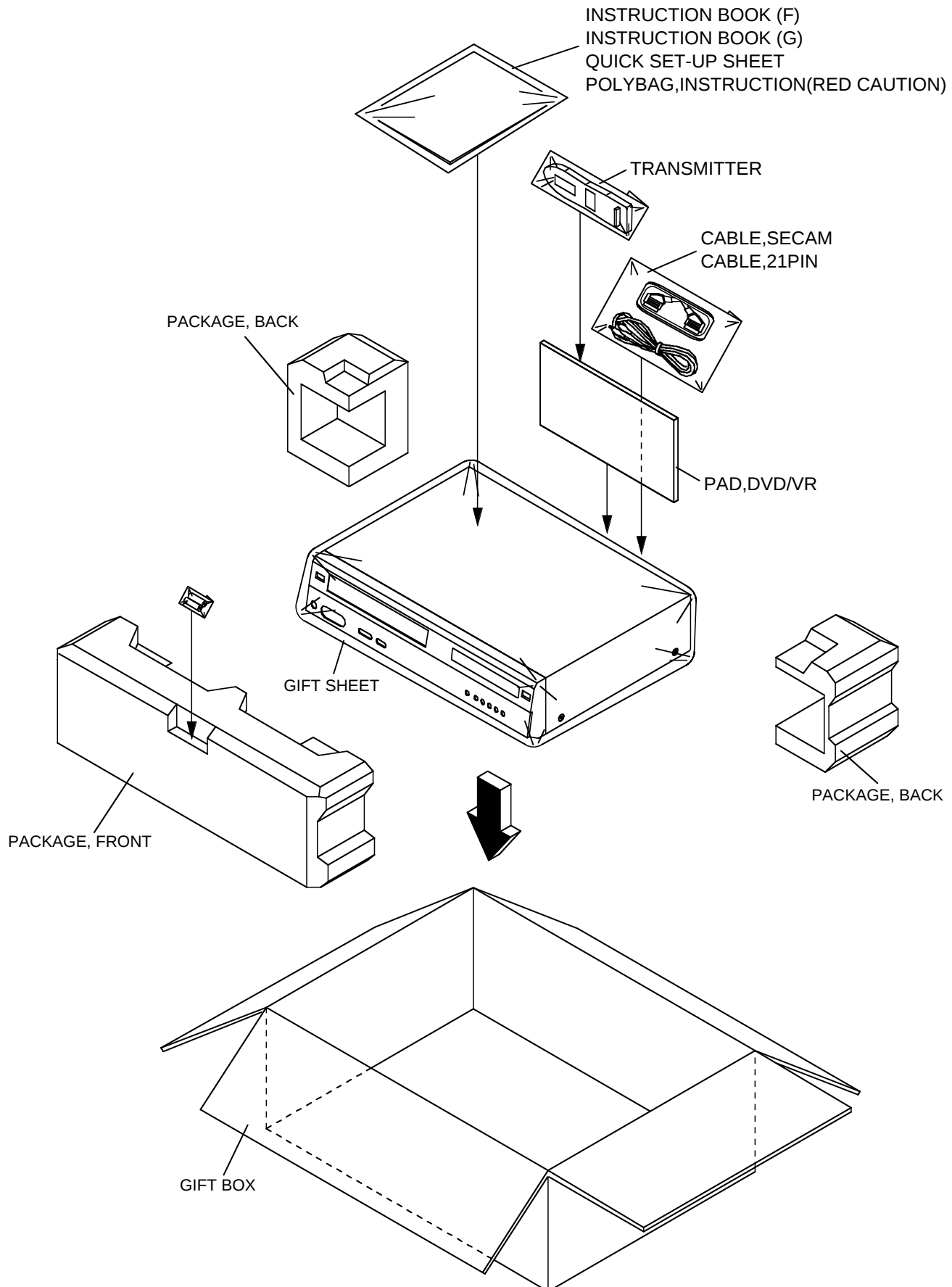
SD-22VL

INSTRUCTION BOOK (G)
INSTRUCTION BOOK (I)
INSTRUCTION BOOK (S)
QUICK SET-UP SHEET
POLYBAG, INSTRUCTION (RED CAUTION)

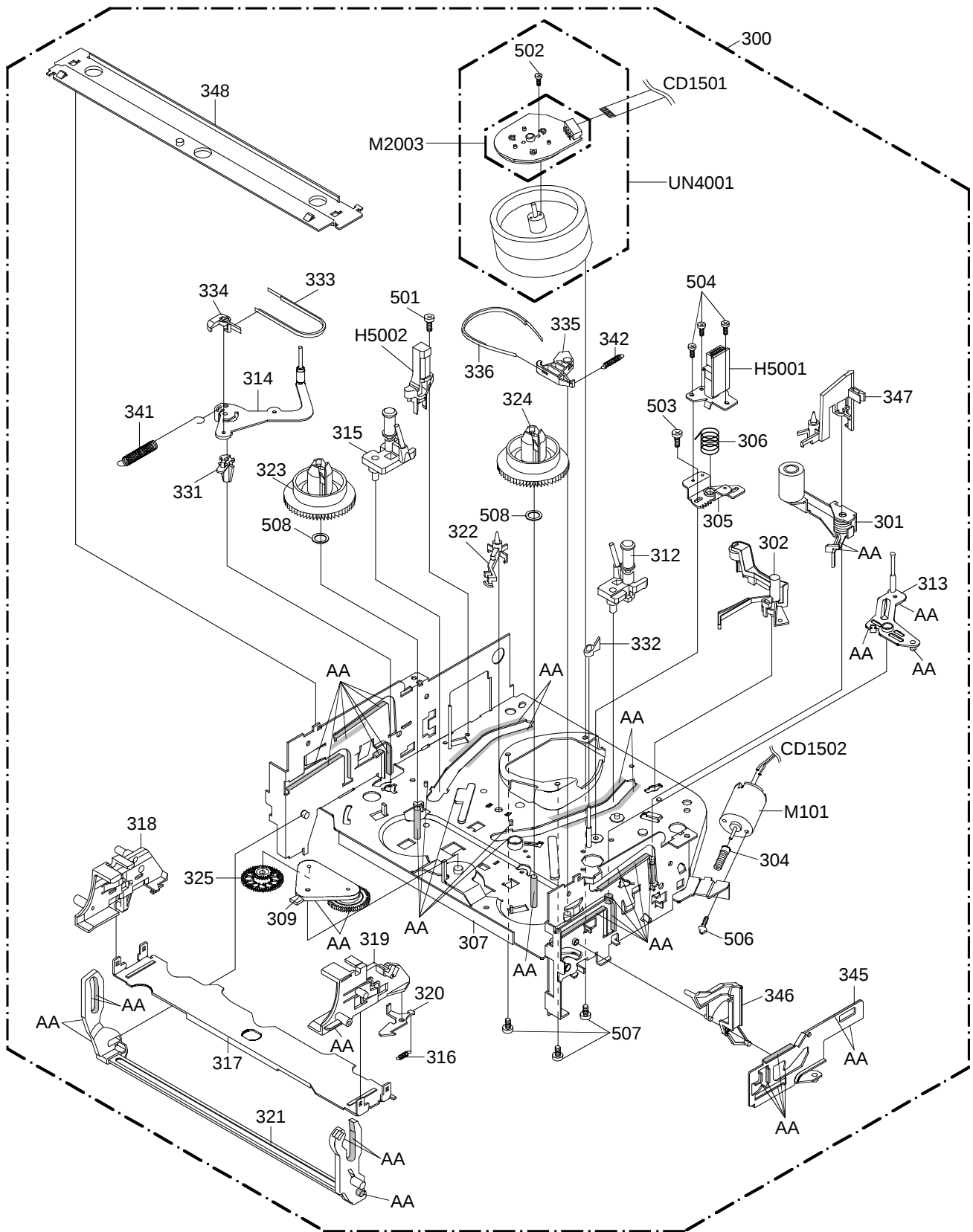


PACKING DIAGRAM (SD-22VE)

INSTRUCTION BOOK (F)
INSTRUCTION BOOK (G)
QUICK SET-UP SHEET
POLYBAG, INSTRUCTION (RED CAUTION)



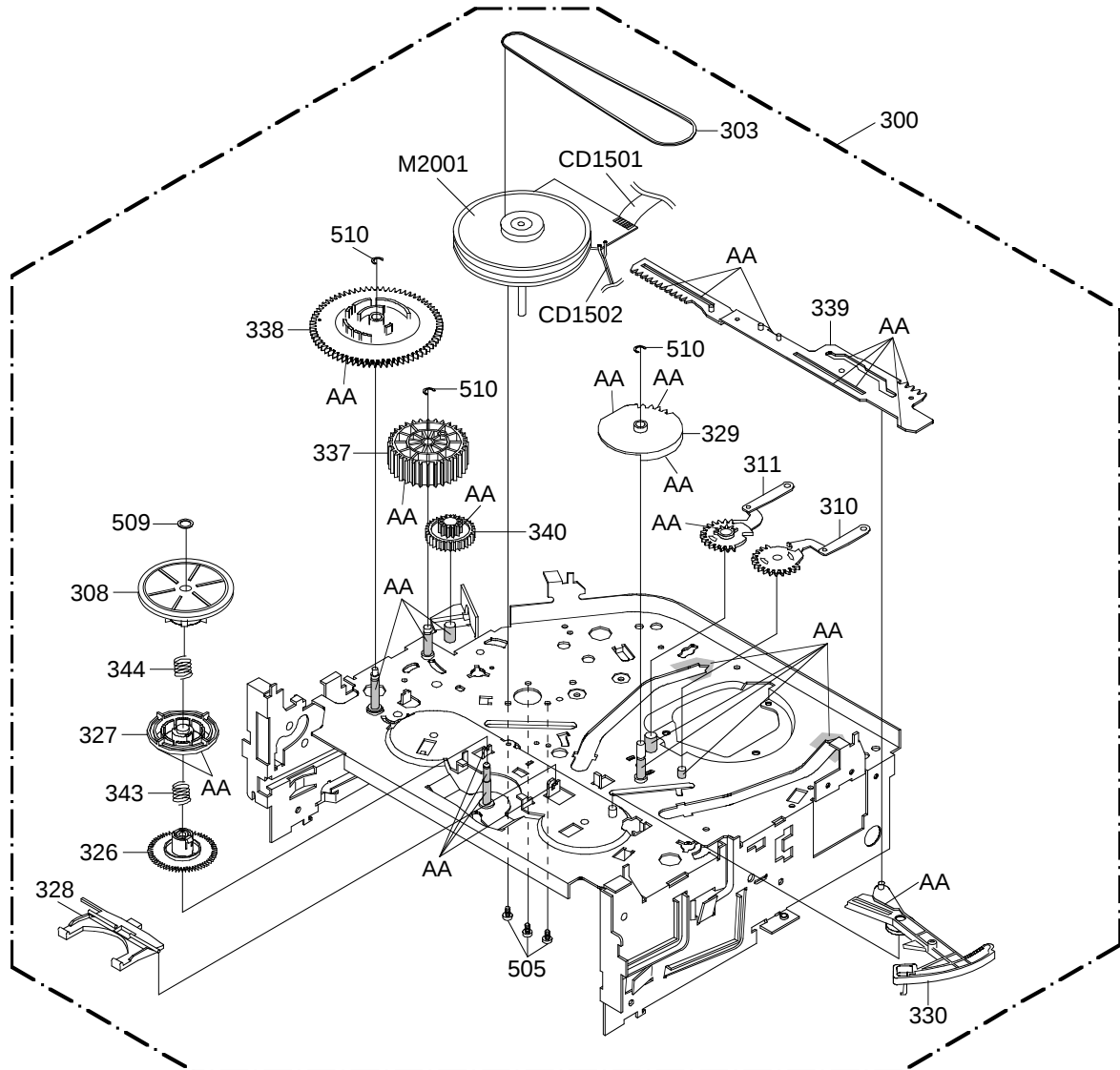
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

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

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

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

REPLACEMENT PARTS LIST

Location No.	Part No.	LG PART No.	Description
601	79097739	A2A7A1E720	CABINET,FRONT ASSY, SD-22VB
601	79097731	A2A7A0E720	CABINET,FRONT ASSY, SD-22VE
601	79097746	A2A7A2E720	CABINET,FRONT ASSY, SD-22VL
602	79099161	701WPA0686	HOLDER,DECK
603	79099162	701WPA0751	HOLDER,DECK
604	79099163	752WSA0230	SHIELD,CASE HEAD AMP
605	79099164	753WUAA006	SPRING,EARTH HEAD AMP
607	79099166	85OP700037	HOLDER,LED
613	79099167	7235490018	BADGE,BRAND
618	79099168	704WPC0001	LEG,BOTTOM
623	79099169	752WSA0275	COVER,AC HEAD
625	79097709	753WUA0060	SPRING,EARTH
629	79099170	702WSB0066	CABINET,TOP
630	79099171	712WPB0107	PLATE,TRAY FRONT
631	79099172	7235630003	SHEET,DVD
634	79097713	800WR0A023	CUSHION 23x13xT3
637	79097710	753WUA0062	SPRING,EARTH-TOP
640	79097712	800WFAA013	CUSHION,LEG
	79097781	J2A7A101A	INSTRUCTION BOOK, SD-22VB
	79097779	J2A7A001A	INSTRUCTION BOOK, SD-22VE
	79097781	J2A7A101A	INSTRUCTION BOOK, SD-22VL
	79097784	J2A7A201A	INSTRUCTION BOOK, SD-22VL
	79097785	J2A7A210A	INSTRUCTION BOOK, SD-22VL
	79097786	J2A7A211A	INSTRUCTION BOOK, SD-22VL
	79097782	J2A7A107A	QUICK SET-UP SHEET, SD-22VB
	79097780	J2A7A007A	QUICK SET-UP SHEET, SD-22VE
	79097778	J2A78807A	QUICK SET-UP SHEET, SD-22VL
	79097783	J2A7A117A	REGISTRATION CARD, SD-22VB
300	79097730	A2A7A0E420A	DECK ASSY A2A7A0E420A
301	79099178	85OA400234	PINCH ROLLER BLOCK
302	79099179	85OA500026	AHC ASS'Y
303	79099180	85OP200290	BELT,CAPSTAN (S)
304	79099181	85OP600581	WORM
305	79099182	85OP500083	BASE,AC HEAD
306	79099183	85OP800324	SPRING,AC HEAD
307	79099184	85OA000459	MAIN CHASSIS ASS'Y
308	79099185	85OA200089	CLUTCH ASS'Y
309	79099186	85OA200090	ARM IDLER ASS'Y
310	79099187	85OA300065	LOADING ARM S UNIT
311	79099188	85OA300066	LOADING ARM T UNIT
312	79099189	85OA400223	INCLINED BASE T UNIT 3S
313	79099190	85OA400232	P5 ARM ASS'Y 2
314	79099191	85OA400235	TENSION ARM ASS'Y 2
315	79099192	85OA400231	INCLINED BASE S UNIT
316	79099193	85OP800358	SPRING,LOCKER
317	79099194	85OP900736	CASS,HOLDER
318	79099195	85OP900748	CASS,SIDE L
319	79099196	85OP900749	CASS,SIDE R

Location No.	Part No.	LG PART No.	Description
320	79099197	85OP900739	LOCKER,R
321	79099198	85OA900228	LINK UNIT
322	79099199	85OP000496	POST,CASS GUIDE
323	79099200	85OP200316	REEL,S (S)
324	79099201	85OP200317	REEL,T (S)
325	79099202	85OP200308	GEAR,IDLER
326	79099203	85OP200311	GEAR,CLUTCH
327	79099204	85OP200312	GEAR,COUPLING
328	79099205	85OP200313	LEVER,CLUTCH
329	79099206	85OP300194	GEAR,MAIN LOADING
330	79099207	85OP400490	LEVER,TENSION
331	79099208	85OP400492	HOLDER,TENSION
332	79099209	85OP400520	CAP.P4
333	79097714	85OP400542	BAND,TENSION
334	79099211	85OP400533	CONNECT,TENSION
335	79099212	85OP600573	ARM,BRAKE T
336	79097715	85OP600584	BAND,BRAKE T
337	79099214	85OP600577	CAM,PINCH ROLLER
338	79099215	85OP600578	CAM,MAIN
339	79099216	85OP600579	ROD,MAIN
340	79099217	85OP600582	GEAR,JOINT
341	79099218	85OP800322	SPRING,TENSION
342	79099219	85OP800360	SPRING,BRAKE T
343	79099220	85OP800355	SPRING,COUPLING
344	79099221	85OP800356	SPRING,RING
345	79099222	85OP900750	LEVER,LINK 2
346	79099223	85OP900744	LEVER,FLAP
347	79099224	85OP900745	CASS,OPENER
348	79099225	85OP900746	BRACKET, TOP 3V
501	79099226	8107226804	SCREW,TAP TITE(S) BIND 2.6x8
502	79099230	8109126604	SCREW,TAP TITE(B) PAN 2.6x6
503	79099228	8107226404	SCREW,TAP TITE(S) BIND 2.6x4
504	79099229	8102120604	SCREW,PAN M2x6
505	79099230	8109126604	SCREW,TAP TITE(B) PAN 2.6x6
506	79099231	810A130404	SCREW/WASHER(A) M3x4
507	79099232	810A126504	SCREW/WASHER(A) M2.6x5
508	79099233	82Q264713N	POLYSLIDER WASHER 2.6x4.7xT0.13
509	79099234	82P184505N	POLYSLIDER WASHER(CUT) 1.8x4.5xT0.5
510	79099235	83ETW30000	E-RING 3.0
CD1501	79099236	122H071603	CORD JUMPER SMCD-7X151
CD1502	79099237	122Y021902	CORD JUMPER 2Y021902
H5001	79099238	1523D91034	HEAD (AUDIO CONTROL) HVMXA1072A
H5002	79099239	1543D02013	HEAD (FULL ERASE) HVFHP0032A
⚠ M101	79097706	1596S98001	MOTOR (LOADING) MDB2B66
⚠ M2001	79099241	1510S98036	CAPSTAN DD UNIT F2QVB08
M2003	79099242	1589S11017	MICRO MOTOR I2OAL05
⚠ UN4001	79097716	A2A752B500	CYLINDER UNIT ASS'Y A2A752B500
⚠ R502	79097788	R3X1811R5J	R,METAL OXIDE 1.5 OHM 1W
⚠ R504	AD301141	R3X181561J	R,METAL OXIDE 560 OHM 1W
⚠ R512	79097789	R3X18A823J	R,METAL OXIDE 82K OHM 2W
⚠ R516	79099005	R63581R22J	R,FUSE 0.22 OHM 1W
⚠ R517	79097787	R002T2681J	RC 680 OHM 1/2W

	Location No.	Part No.	LG PART No.	Description
⚠	C501	79099006	E02L03222M	CE 2200 UF 25V
⚠	C502	79099007	P2472B104M	CMP 0.1 UF 275V PHE840
⚠	C505	79099008	E02LU2221M	CE 220 UF 16V
⚠	C511	79097757	E62QFH101M	CE 100 UF 400V
⚠	C516	AD301391	CD39E0MQ3M	CC 0.0047UF 250V
⚠	C518	79099012	E02LF1332M	CE 3300 UF 10V
⚠	C522	79097756	E50HU5100M	CE 10 UF 50V
⚠	C529	79097755	E02LT0102M	CE 1000 UF 6.3V
	D101	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
⚠	D502	79099015	D2WTRM11C0	DIODE,SILICON RM11C-EIC
⚠	D503	79099015	D2WTRM11C0	DIODE,SILICON RM11C-EIC
⚠	D505	79099015	D2WTRM11C0	DIODE,SILICON RM11C-EIC
⚠	D506	79099015	D2WTRM11C0	DIODE,SILICON RM11C-EIC
⚠	D507	79099016	D2WXB290S0	DIODE,SILICON SB290S
	D508	79097747	D23T0UG2D0	DIODE,SILICON UG2D-G23, SD-22VE/VL
	D509	79097748	D2WXGP10K0	DIODE,RECTIFIER RGP10K-EIC
	D510	79097751	D97U02201B	DIODE,ZENER MTZJ22B T-77
⚠	D512	79099019	D2LKB340L0	DIODE,SCHOTTKY SB340L-6737
⚠	D515	79099019	D2LKB340L0	DIODE,SCHOTTKY SB340L-6737
⚠	D518	AD300075	D28TELS6N6	DIODE,RECTIFIER 10ELS6N-TA1B2
	D521	79099021	D28TELS2N2	DIODE,RECTIFIER 10ELS2N-TA1B2
⚠	D522	AD300075	D28TELS6N6	DIODE,RECTIFIER 10ELS6N-TA1B2
	D523	79099023	D97U03301B	DIODE,ZENER MTZJ33B T-77
	D524	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D525	79099025	D2WXN40050	DIODE,SILICON 1N4005-EIC
	D526	79099028	D97U02401B	DIODE,ZENER MTZJ24B T-77
⚠	D529	79099016	D2WXB290S0	DIODE,SILICON SB290S
	D530	AD300075	D28TELS6N6	DIODE,RECTIFIER 10ELS6N-TA1B2
	D531	79097750	D97U01501B	DIODE,ZENER MTZJ15B T-77
	D532	79099021	D28TELS2N2	DIODE,RECTIFIER 10ELS2N-TA1B2
	D601	79099027	D97U05R11C	DIODE,ZENER MTZJ5.1C T-77
	D681	79099024	0021E5Q210	LED LTL-1CHGE-002A
	D685	79099024	0021E5Q210	LED LTL-1CHGE-002A
	D1702	79097749	D97U01201B	DIODE,ZENER MTZJ12B T-77
	D1703	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D1708	79099031	D97U01301B	DIODE,ZENER MTZJ13B T-77
	D1709	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D1710	79099032	D97U01001B	DIODE,ZENER MTZJ10B T-77
	D1711	79099025	D2WXN40050	DIODE,SILICON 1N4005-EIC
	D1712	79099033	D1VT001330	DIODE,SILICON 1SS133T-77, SD-22VE/VL
	D2601	79099003	DD5R003680	DIODE,SILICON 1SS368(TPH3)
	D2602	79099003	DD5R003680	DIODE,SILICON 1SS368(TPH3)
	D3001	79099030	0010100320	INFRARED LED LNA2702L010R
	D3002	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D4001	79099025	D2WXN40050	DIODE,SILICON 1N4005-EIC
	D4601	79099033	D1VT001330	DIODE,SILICON 1SS133T-77, SD-22VE
	D8001	79097754	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
	D8004	79099032	D97U01001B	DIODE,ZENER MTZJ10B T-77
	D8005	79099032	D97U01001B	DIODE,ZENER MTZJ10B T-77
	D8006	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D8007	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D8009	79099033	D1VT001330	DIODE,SILICON 1SS133T-77

	Location No.	Part No.	LG PART No.	Description
	D8010	79099033	D1VT001330	DIODE,SILICON 1SS133T-77
	D8013	79097752	D97U04R71B	DIODE,ZENER MTZJ4.7B T-77, SD-22VE/VL
	D8501	79099034	DD5R002260	DIODE,SILICON 1SS226(TE85L)
	D8502	79099034	DD5R002260	DIODE,SILICON 1SS226(TE85L)
	D8503	79099034	DD5R002260	DIODE,SILICON 1SS226(TE85L)
	D8504	79099034	DD5R002260	DIODE,SILICON 1SS226(TE85L)
	D8505	79099034	DD5R002260	DIODE,SILICON 1SS226(TE85L)
	IC101	79097760	I04F38217F	IC HA118217F
	IC102	79097766	I55F0384FU	IC TC7SB384FU
⚠	IC501	79099036	I1KJ9A4310	IC KIA431
⚠	IC502	79099037	I1KA97809A	IC KIA7809API
⚠	IC503	79099038	0002E00610	PHOTO COUPLER LTV-817M-VB
	IC601	79099039	I07F529770	IC BU2977FS
	IC701	79097762	I0KF79605H	IC TDA9605H
	IC801	79097763	I0KFA9874A	IC TDA9874AH
	IC1001	79099041	I55K0251AF	IC OEC6069A
	IC1002	79099042	I5HJ001BF0	IC S-24C01BFJ-TB
	IC1005	79099043	I55F07S08F	IC TC7S08F-TE85L
	IC1006	79099044	I55F0W2410	IC TC7W241FU-TE12L
	IC2001	79099045	I05F094A03	IC OEC6068A
	IC2002	79099046	I59J0258B3	IC MSM5416258B-30
	IC2002	79097774	ICUJ0256A2	IC M11B416256A-25T
	IC2601	79099047	I55F07S04F	IC TC7S04F(TE85L)
	IC2602	79099048	I07FV58130	IC BA5813FM
	IC2603	79099049	I05FR1323F	IC OEC6067A
	IC3001	79097768	I56F57078C	IC OEC7078C, SD-22VB
	IC3001	79097769	I56F57079D	IC OEC7079D, SD-22VE/VL
	IC3004	79099051	I9UF032310	IC PST3231NR
	IC3005	79097767	I56F07080A	IC OEC7080A
	IC3099	79097733	A2A7A1E015	IC S-24C08ADPA-01, SD-22VB
	IC3099	79097725	A2A7A0E015	IC S-24C08ADPA-01, SD-22VE
	IC3099	79097741	A2A7A2E015	IC S-24C08ADPA-01, SD-22VL
	IC4001	79099053	ICQF067320	IC ZR36732
	IC4002	79099054	I5HF96A250	IC S-816A25AMC-BAA-T2
	IC4003	79099055	I59J0160FB	IC MSM56V16160F-8
	IC4003	79040348	ICLJ0610DB	IC HY57V161610DTC-8
	IC4004	79099055	I59J0160FB	IC MSM56V16160F-8
	IC4004	79040348	ICLJ0610DB	IC HY57V161610DTC-8
	IC4005	79099046	I59J0258B3	IC MSM5416258B-30
	IC4005	79097775	ICUJ0256A2	IC M11B416256A-25T
	IC4006	79097770	I5QJ0F8325	IC MBM29F800BA-55PFTN-SFK-32, SD-22VB
	IC4006	79097772	I5QJ0F8U15	IC MBM29F800BA-55PFTN-SFK-U1, SD-22VE
	IC4006	79097773	I5QJ0F8V15	IC MBM29F800BA-55PFTN-SFK-V1, SD-22VL
	IC4501	79097764	I53J4775MA	IC LC74775M-9839
	IC4601	79097759	I03F073580	IC LA7358M, SD-22VE
	IC8001	79097758	I03F030260	IC LA73026V
	IC8002	79099058	I0QF02533V	IC NJN2533V(TE2), SD-22VE/VL
	IC8003	79097761	I07F033080	IC BA3308F, SD-22VB/VL
	IC8004	79099059	I0QF045800	IC NJM4580M
	IC8501	79099060	I55F0H08F0	IC TC7SH08FU(TE85L)
	IC8503	79099061	I1BF019590	IC AD1959YRSRL
	IC8504	79099062	I0UFG540A0	IC MM1540AFBE

	Location No.	Part No.	LG PART No.	Description
	Q101	79099065	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT, SD-22VE/VL
	Q102	79099065	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
	Q103	79097793	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146, SD-VE/VL
	Q104	79099065	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
	Q105	79099064	TPAAC05002	COMPOUND TRANSISTOR KRA103SRTK
	Q106	79099063	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
	Q107	79099063	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
	Q108	79097793	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146
	Q109	79099069	TNAAC05002	COMPOUND TRANSISTOR KRA103SRTK, SD-22VE
	Q110	79097793	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146
	Q111	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q111	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q112	79097796	TPATC03002	COMPOUND TRANSISTOR KRA103MAT, SD-22VE
	Q113	79097793	TNYJA05001	COMPOUND TRANSISTOR DTC143EKAT146
⚠	Q501	79097790	T410K26470	FET 2SK2647-01MR
⚠	Q502	79099065	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
⚠	Q504	79097791	TAAT01241Y	TRANSISTOR,SILICON KTA1241_Y-AT
⚠	Q505	79099073	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
	Q506	79099074	TNATA03002	COMPOUND TRANSISTOR KRC101MAT
	Q601	79099063	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
	Q651	79099064	TPAAC05002	COMPOUND TRANSISTOR KRA103SRTK
	Q652	79099075	TPAAB05001	COMPOUND TRANSISTOR KRA102SRTK
	Q1003	79099086	TPYJB05001	COMPOUND TRANSISTOR DTA114EKAT146
	Q1004	79099086	TPYJB05001	COMPOUND TRANSISTOR DTA114EKAT146
	Q1701	79099065	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
	Q1702	79099073	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
	Q1703	79099073	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
	Q1705	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q1705	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q1706	79097791	TAAT01241Y	TRANSISTOR,SILICON KTA1241_Y-AT
	Q1707	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q1707	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q1708	79099073	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
	Q1709	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK
	Q1711	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK
	Q1712	79099073	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
	Q1713	79099087	TAAT012714	TRANSISTOR,SILICON KTA1271_Y-AT
	Q1714	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK
	Q2001	79099088	T85A03326B	TRANSISTOR,SILICON 2SC3326_B(TE85L)
	Q2601	79099089	TNAAB05003	COMPOUND TRANSISTOR KRC102SRTK
	Q2602	79099090	TS5M000037	COMPOUND TRANSISTOR HN1C03F_B(TE85L)
	Q2603	79099091	TS5M000036	COMPOUND TRANSISTOR HN1B01F_Y(TE85L)
	Q2604	79099091	TS5M000036	COMPOUND TRANSISTOR HN1B01F_Y(TE85L)
	Q2605	79099092	T65A01213Y	TRANSISTOR,SILICON 2SA1213_Y(TE12L,C)
	Q3001	79097377	0000M00390	PHOTO TRANSISTOR ST-304L
	Q3002	79097377	0000M00390	PHOTO TRANSISTOR ST-304L
	Q3003	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK
	Q3004	79099094	0002700680	PHOTO COUPLER RPI-352C40N
	Q3005	79099094	0002700680	PHOTO COUPLER RPI-352C40N
	Q3006	79099093	0002700690	PHOTO COUPLER RPI-303
	Q3007	79099093	0002700690	PHOTO COUPLER RPI-303
	Q3008	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SRTK, SD-22VB/VE/VL

	Location No.	Part No.	LG PART No.	Description
	Q3009	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SR TK, SD-22VB/VE/VL
	Q4001	79099092	T65A01213Y	TRANSISTOR,SILICON 2SA1213_Y(TE12L,C)
	Q4501	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK, SD-22VB/VE
	Q4501	79099067	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S, SD-22VL
	Q4601	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VE
	Q4602	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK, SD-22VE
	Q4603	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VE
	Q4604	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SR TK, SD-22VE
	Q4605	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VE
	Q4606	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VE
	Q8001	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK, SD-22VB/VE
	Q8001	79099067	T6YJ1037K0	TRANSISTOR,SILICON 2SA1037AKT146R,S, SD-22VL
	Q8002	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q8002	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q8003	79097795	TNYJD05001	COMPOUND TRANSISTOR DTC144EKAT146, SD-22VB/VE/VL
	Q8004	79099075	TPAAB05001	COMPOUND TRANSISTOR KRA102SR TK
	Q8005	79097792	TCATC3199Y	TRANSISTOR,SILICON KTC3199_Y-AT, SD-22VB
	Q8005	79097873	TCYT1740S0	TRANSISTOR,SILICON 2SC1740SP TP, SD-22VL
	Q8006	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB
	Q8006	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q8012	79099069	TNAAC05002	COMPOUND TRANSISTOR KRC103SR TK
	Q8013	79099097	TPAAA05001	COMPOUND TRANSISTOR KRA101SR TK
	Q8014	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q8014	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q8015	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK, SD-22VB/VE
	Q8015	79099068	T8YJ2412K0	TRANSISTOR,SILICON 2SC2412KT146 R,S, SD-22VL
	Q8501	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
	Q8502	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
	Q8503	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
	Q8505	79099098	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
	Q8507	79097794	TNYJB05001	COMPOUND TRANSISTOR DTC114EKAT146
	Q8508	79099090	TS5M000037	COMPOUND TRANSISTOR HN1C03F_B(TE85L)
	Q8509	79099099	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
	Q8510	79099075	TPAAB05001	COMPOUND TRANSISTOR KRA102SR TK
	Q8511	79099075	TPAAB05001	COMPOUND TRANSISTOR KRA102SR TK
	Q8512	79099088	T85A03326B	TRANSISTOR,SILICON 2SC3326_B(TE85L)
	Q8513	79099088	T85A03326B	TRANSISTOR,SILICON 2SC3326_B(TE85L)
⚠	L501	79097384	029T000083	COIL,LINE FILTER 0R3A433F20
⚠	L503	79099101	02167E220K	COIL 22 UH
⚠	T501	79097385	048129102S	TRANSFORMER,SWITCHING 8129102S
	J601	79099103	060Q401086	RCA JACK AV1-06DG-1
	J602	79099103	060Q401086	RCA JACK AV1-06DG-1
	J603	79099104	060Q421024	RCA JACK AV1-06DSG-1
	J8001	79099108	060J401082	RCA JACK MSP-251V-05PBSN
	J8002	79099110	060J411020	RCA JACK MSP-242V2-01PBSN
	J8003	79099107	063D700005	JACK MDC-070V
	J8005	79097387	063G000072	SOCKET,21PIN 035_0_8183_00
	SW601	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW602	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW603	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW604	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW605	79099112	0504201T32	SWITCH,TACT SKQNAED010

	Location No.	Part No.	LG PART No.	Description
	SW681	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW682	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW684	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW686	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW687	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW688	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW689	79099112	0504201T32	SWITCH,TACT SKQNAED010
	SW3001	79097386	0508S11001	SWITCH (LEAF) LSA-1144EAU, SD-22VB
	SW3001	79099113	0508A11001	SWITCH (LEAF) MXS01350MVP0, SD-22VL
	PCB010	79097732	A2A7A1E010	PCB ASS'Y VMB252A, SD-22VB
	PCB010	79097724	A2A7A0E010	PCB ASS'Y VMB252A, SD-22VE
	PCB010	79097740	A2A7A2E010	PCB ASS'Y VMB252A, SD-22VL
	PCB130	79097734	A2A7A1E130	PCB ASS'Y VMA249B, SD-22VB/VE
	PCB130	79097742	A2A7A2E130	PCB ASS'Y VMA249B, SD-22VL
	PCB240	79097735	A2A7A1E240	PCB ASS'Y VPA152B, SD-22VB
	PCB240	79097726	A2A7A0E240	PCB ASS'Y VPA152B, SD-22VE/VL
	PCB270	79097736	A2A7A1E270	PCB ASS'Y VEA978A, SD-22VB
	PCB270	79097727	A2A7A0E270	PCB ASS'Y VEA978A, SD-22VE
	PCB270	79097743	A2A7A2E270	PCB ASS'Y VEA978A, SD-22VL
	PCB280	79097737	A2A7A1E280	PCB ASS'Y VEA979A, SD-22VB
	PCB280	79097728	A2A7A0E280	PCB ASS'Y VEA979A, SD-22VE
	PCB280	79097744	A2A7A2E280	PCB ASS'Y VEA979A, SD-22VL
	PCB390	79097738	A2A7A1E390	PCB ASS'Y VEA972A, SD-22VB
	PCB390	79097729	A2A7A0E390	PCB ASS'Y VEA972A, SD-22VE
	PCB390	79097745	A2A7A2E390	PCB ASS'Y VEA972A, SD-22VL
	CD102	79099120	122F061502	CORD,JUMPER 2F061502, SD-22VB/VE
	CD102	79097703	122F061501	CORD,JUMPER 2F061501, SD-22VL
⚠	CD501	79097599	120G639803	CORD,AC BUSH 0G639803, SD-22VB
⚠	CD501	79097597	1206459801	CORD,AC BUSH 06459801, SD-22VE/VL
	CD502	79099122	122Y0G1701	CORD,JUMPER 2Y0G1701
	CD601	79097389	06CDVA5003	CABLE,21PIN S-1002B, SD-22VE
	CD651	79099123	122H072402	CORD,JUMPER 2H072402
	CD652	79099124	122S0I0802	CORD,JUMPER 2S0I0802
	CP102	79099126	069J760029	CONNECTOR PCB SIDE IMSA-9604S-06Z14
	CP502	79099128	067U016019	WIRE HOLDER B2013H02-16P
	CP503	79099129	069S260629	CONNECTOR PCB SIDE A2001WV2-6P
	CP601	79099130	069R7I0479	CONNECTOR PCB SIDE 52492-1820
	CP651	79099132	069J7I0029	CONNECTOR PCB SIDE IMSA-9604S-18Z14
	CP653	79099131	069J770019	CONNECTOR PCB SIDE IMSA-9604S-07Z13
	CP681	79099133	069R770479	CONNECTOR PCB SIDE 52492-0720
	CD2601	79099134	122H081006	CORD,JUMPER 2H081006
	CD2603	79099135	122H060806	CORD,JUMPER 2H060806
	CD6002	79097388	06CDL02003	CABLE,PAL CDL02003
	CD8002	79099138	122H0I1801	CORD,JUMPER 2H0I1801
	CD8501	79099139	06CU2D3001	CORD,CONNECTOR CU2D3001
	CD8502	79099140	06CU262501	CORD,CONNECTOR CU262501
	CP1701	79099141	069R2G0589	CONNECTOR PCB SIDE 52147-1610
	CP2601	79099142	069EV8T020	CONNECTOR PCB SIDE 04_6232_108_015
	CP2602	79099143	069EVNT020	CONNECTOR PCB SIDE 04_6232_123_015
	CP2603	79099126	069J760029	CONNECTOR PCB SIDE IMSA-9604S-06Z14
	CP3001	79099011	06972C0010	CONNECTOR PCB SIDE TMC-J12P-B2
	CP8001	79099144	069S2D0629	CONNECTOR PCB SIDE A2001WV2-13P

	Location No.	Part No.	LG PART No.	Description
	CP8002	79099145	069J7I0019	CONNECTOR PCB SIDE IMSA-9604S-18Z13
	CP8502	79099145	069J7I0019	CONNECTOR PCB SIDE IMSA-9604S-18Z13
	CUS011	79097711	800WFAA008	CUSHION C
	CUS131	79099146	800WFAA006	CUSHION A, SD-22VB/VE/VL
	CUS811	79099146	800WFAA006	CUSHION A
⚠	DK4001	79097707	169J00017A	DECK CD TU2120R
	DK4001	79097708	169J00018A	DECK CD TU2320R
	DK4001	79099147	169J00010A	DECK CD TU2020R
	EL001	79097705	124120301A	EYE LET XRY20X30BD
	EL002	79097704	124116281A	EYE LET XRY16X28BD
⚠	F501	79097394	080NT04003	FUSE 50T040HCC, SD-22VB
⚠	F501	79097395	080NT04004	FUSE 50T040H, SD-22VE/VL
	OS601	79099149	077Q037002	REMOTE RECEIVER PIC-37143TH5
	OS8001	79099150	07A9000004	OPTICAL DEVICE GP1FA550TZ
	TM601	79097391	076D0FW010	TRANSMITTER ORV202N33010, SD-22VB
	TM601	79097392	076D0FW020	TRANSMITTER ORV202N33020, SD-22VE/VL
⚠	TU301	79097381	0162K01022	RF UNIT TCMI0600PD08D, SD-22VB
⚠	TU301	79097383	0162K17001	RF UNIT TCPL0601PD08D, SD-22VE
⚠	TU301	79097382	0162K01029	RF UNIT TCMB0601PD13D, SD-22VL
	V601	79097396	096F90R403	TUBE FLUORSCENT DISPLAY HNV-09SS33
	X101	79097596	100CT4R407	CRYSTAL HC-49/U
	X801	79097399	100CT02401	CRYSTAL HC-49/U
	X1001	79099155	1002T00901	CERAMIC OSCILLATOR CSTCC9M00G53-R0
	X3001	79099157	100DA32R01	CRYSTAL DT-26
	X3002	79097398	100CT01207	CRYSTAL HC-49/U-S
	X3003	79097397	1001T4R010	CERAMIC OSCILLATOR EFOMC4004T4
	X8501	79099159	100WT02706	CRYSTAL HC-49/U-S

TOSHIBA CORPORATION

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

TOSHIBA

FILE NO. 810-200213

SERVICE MANUAL

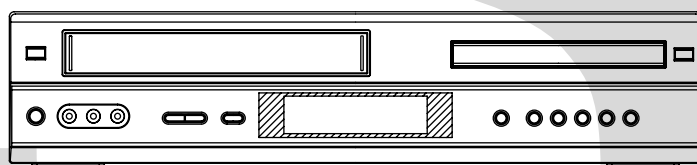


DVD VIDEO PLAYER & VIDEO CASSETTE RECORDER

SD-22VB

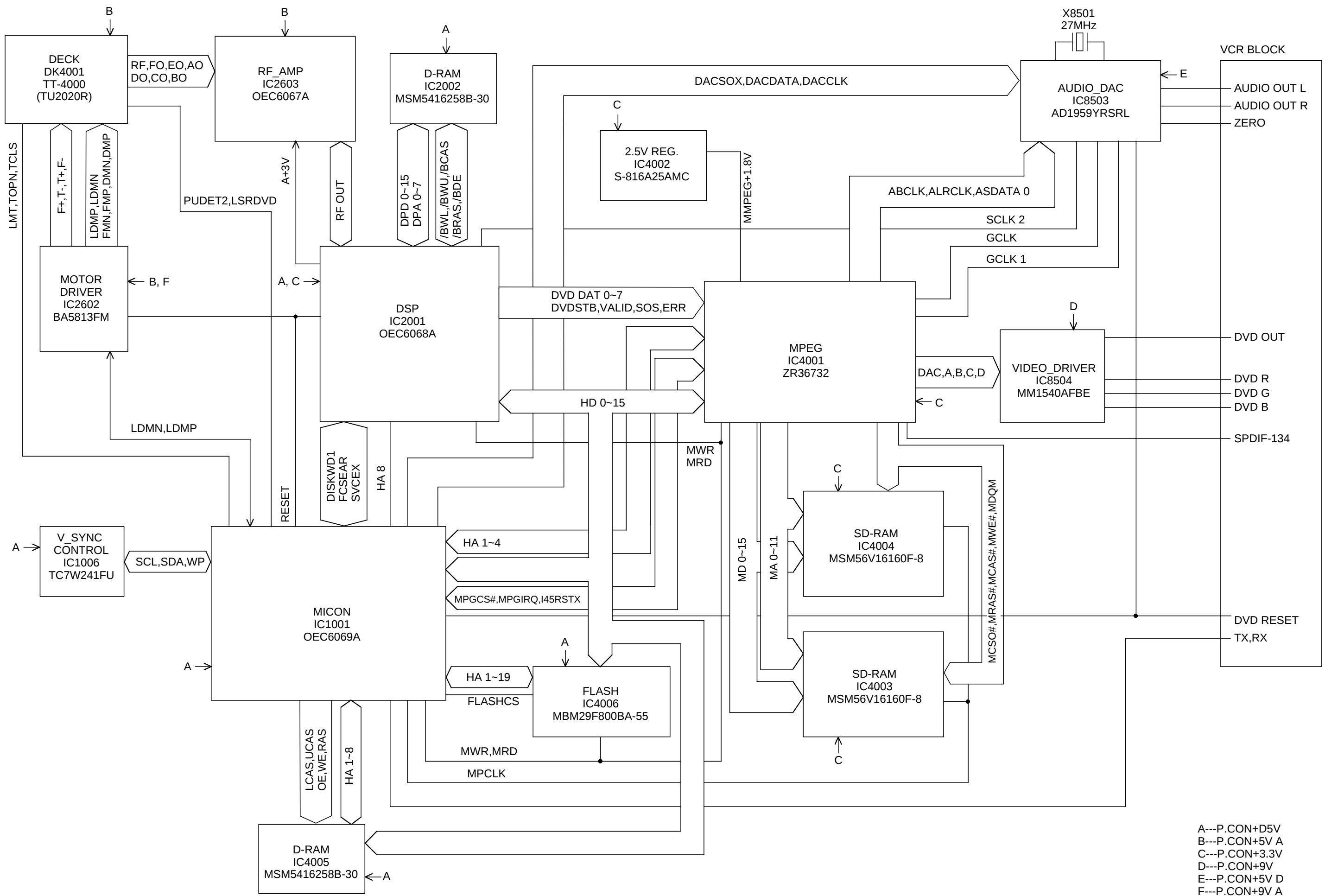
SD-22VE

SD-22VL



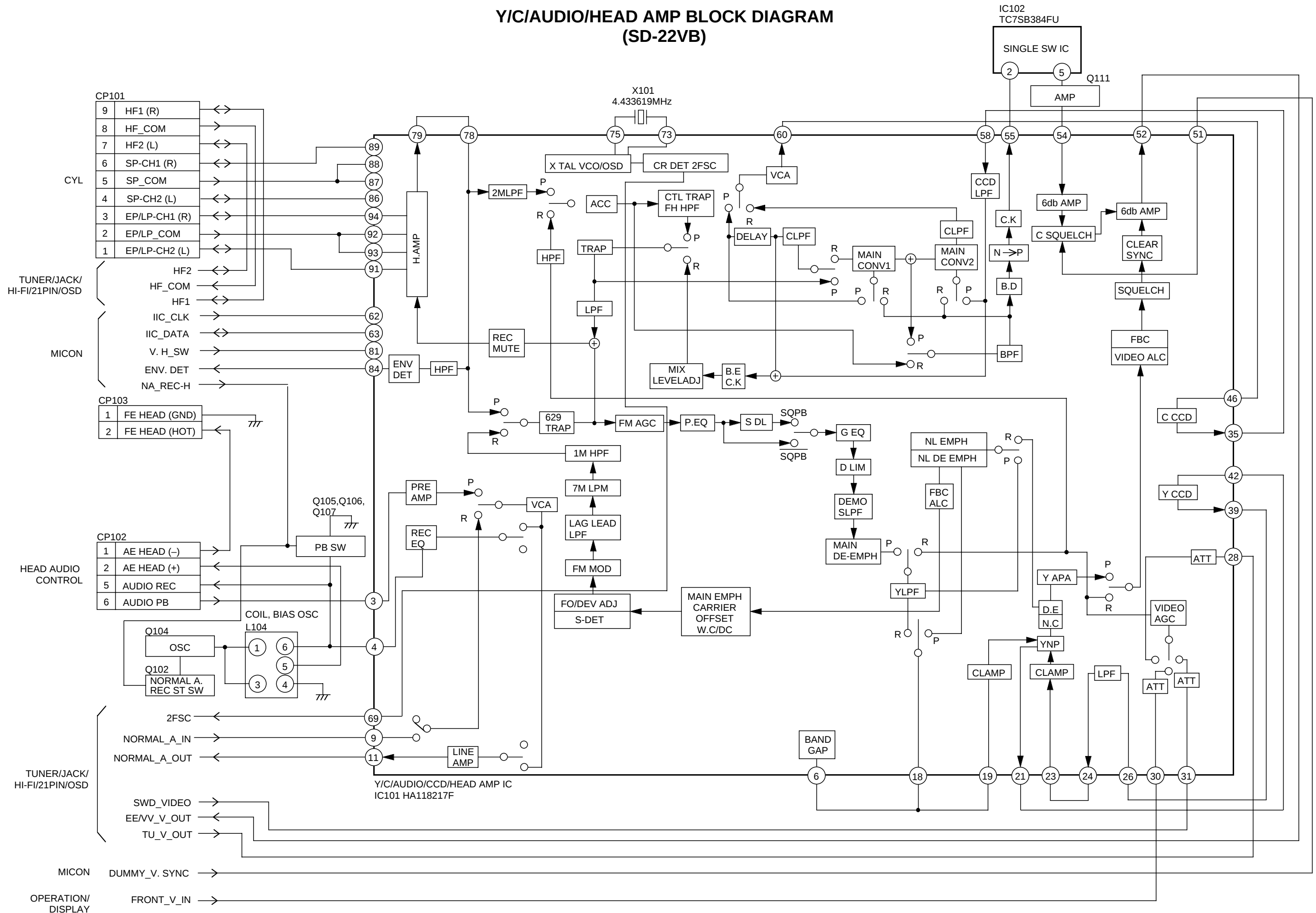
OCT., 2002

DVD BLOCK DIAGRAM

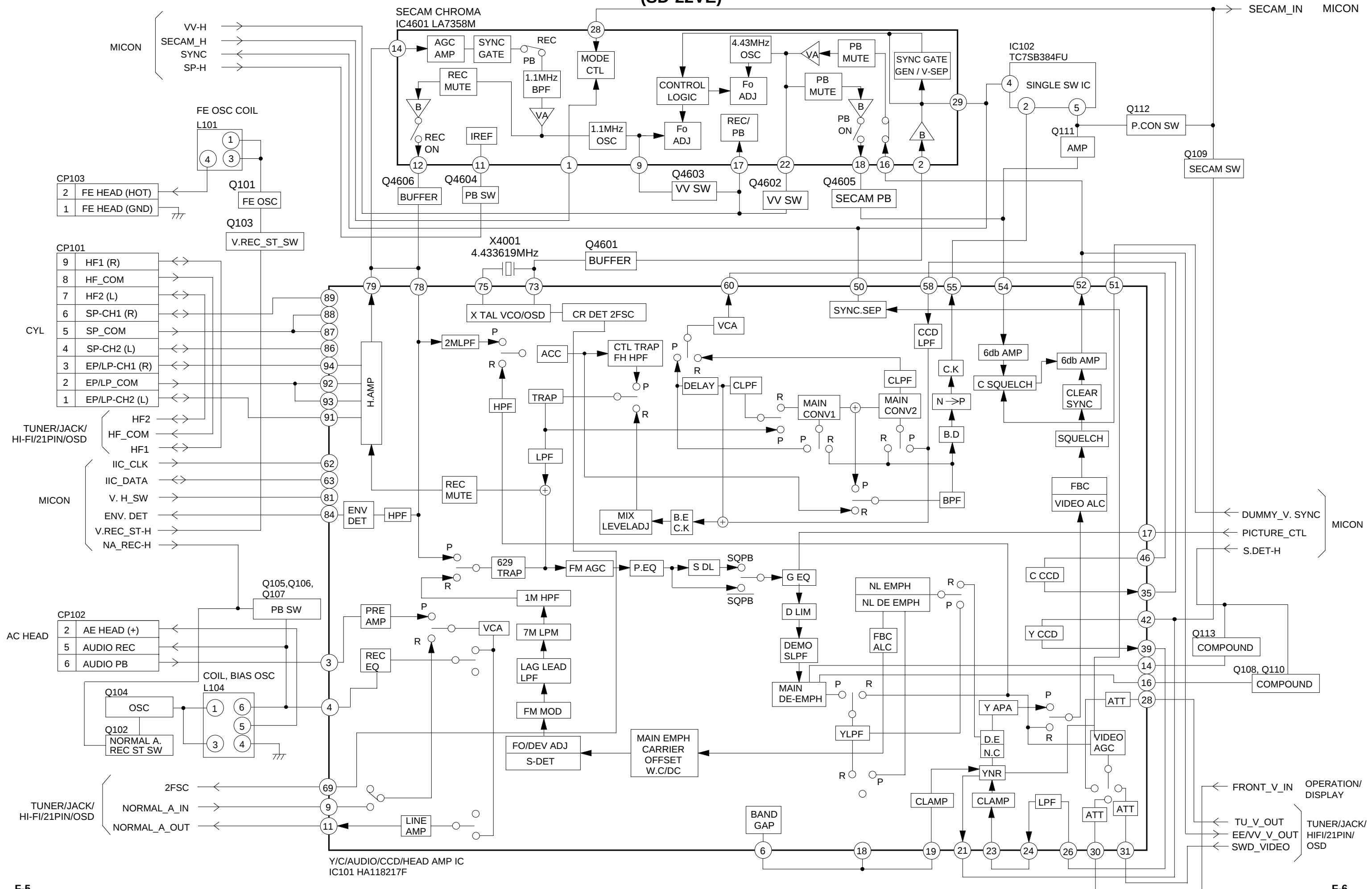


A---P.CON+D5V
B---P.CON+5V A
C---P.CON+3.3V
D---P.CON+9V
E---P.CON+5V D
F---P.CON+9V A

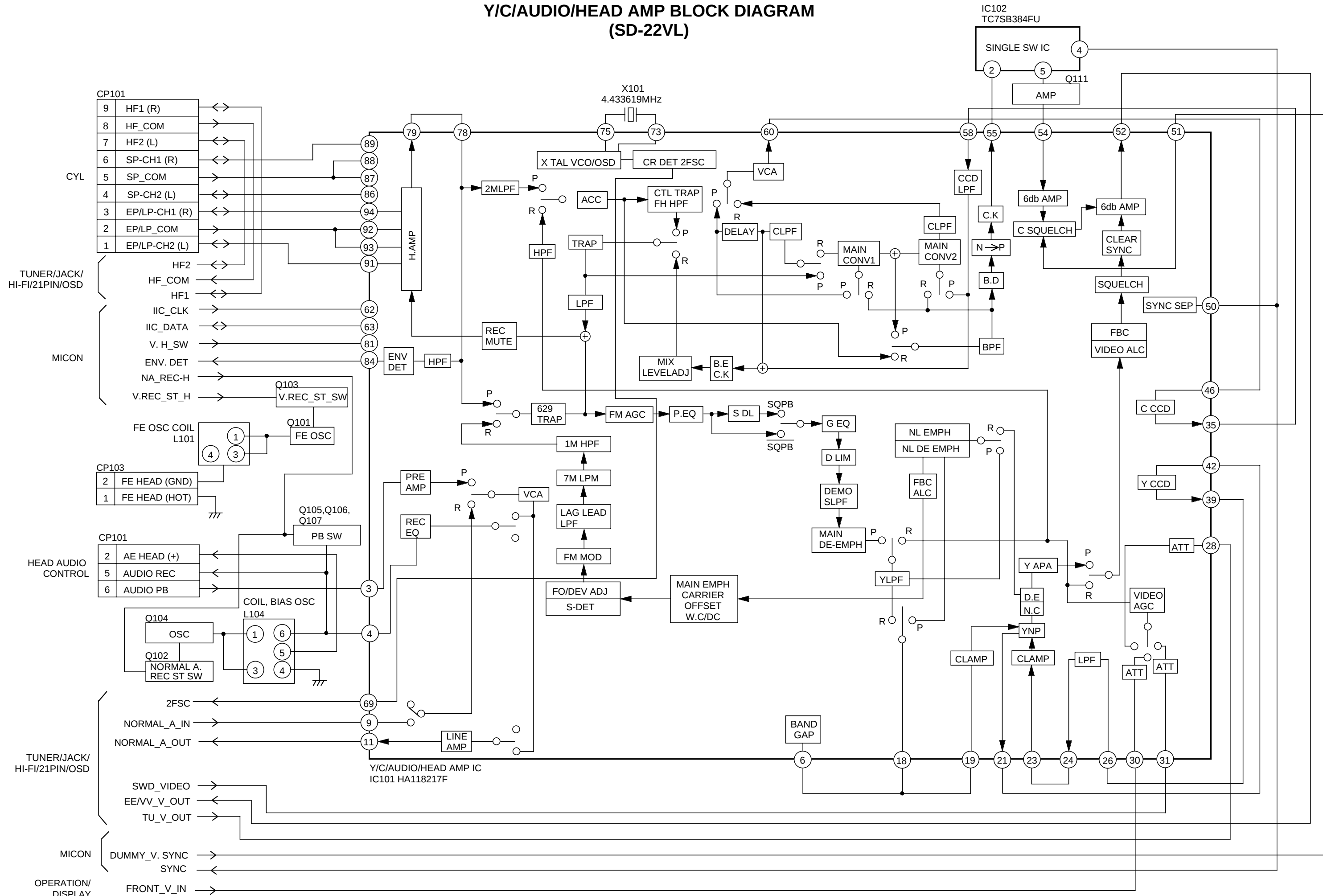
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM (SD-22VB)



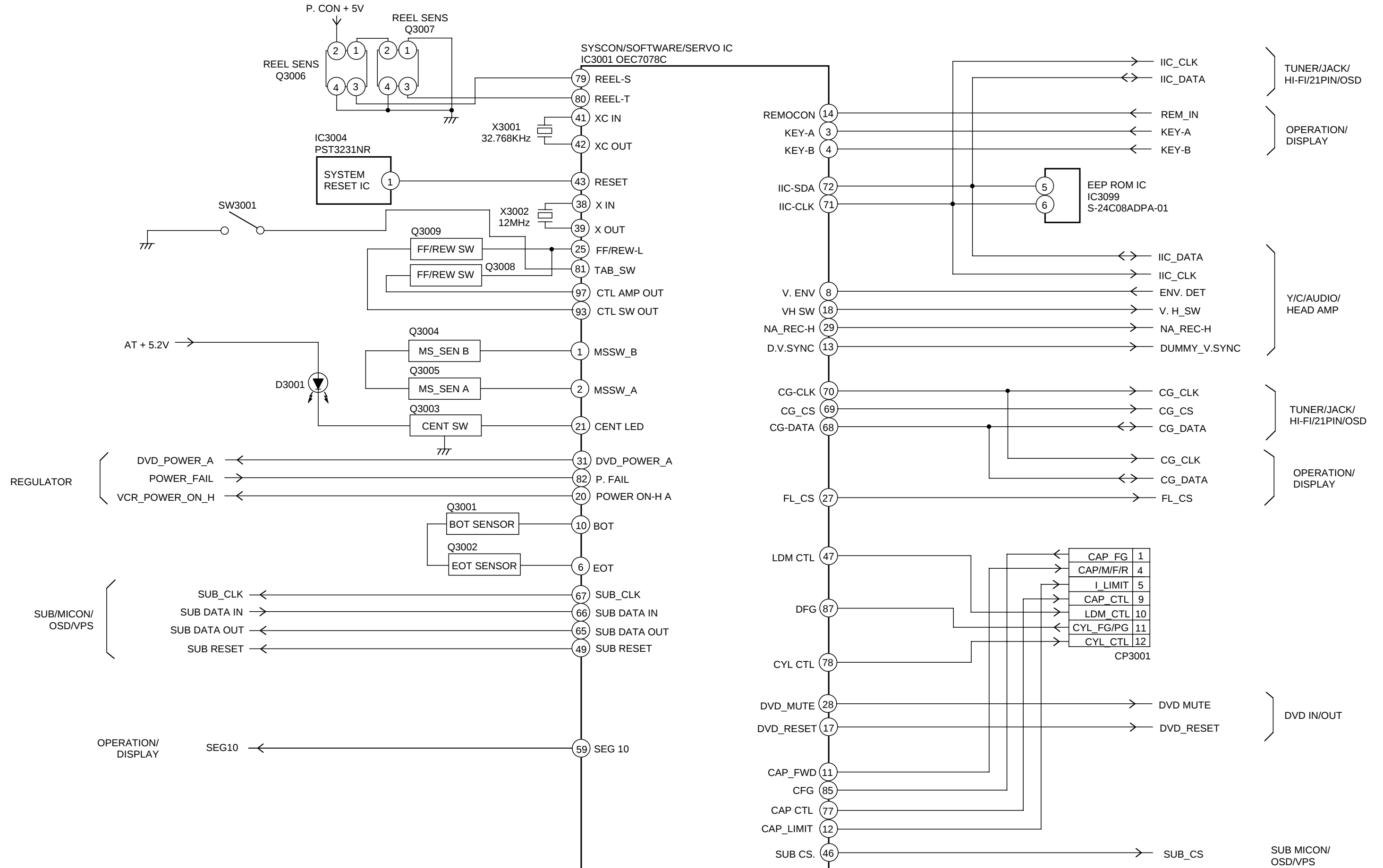
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM (SD-22VE)



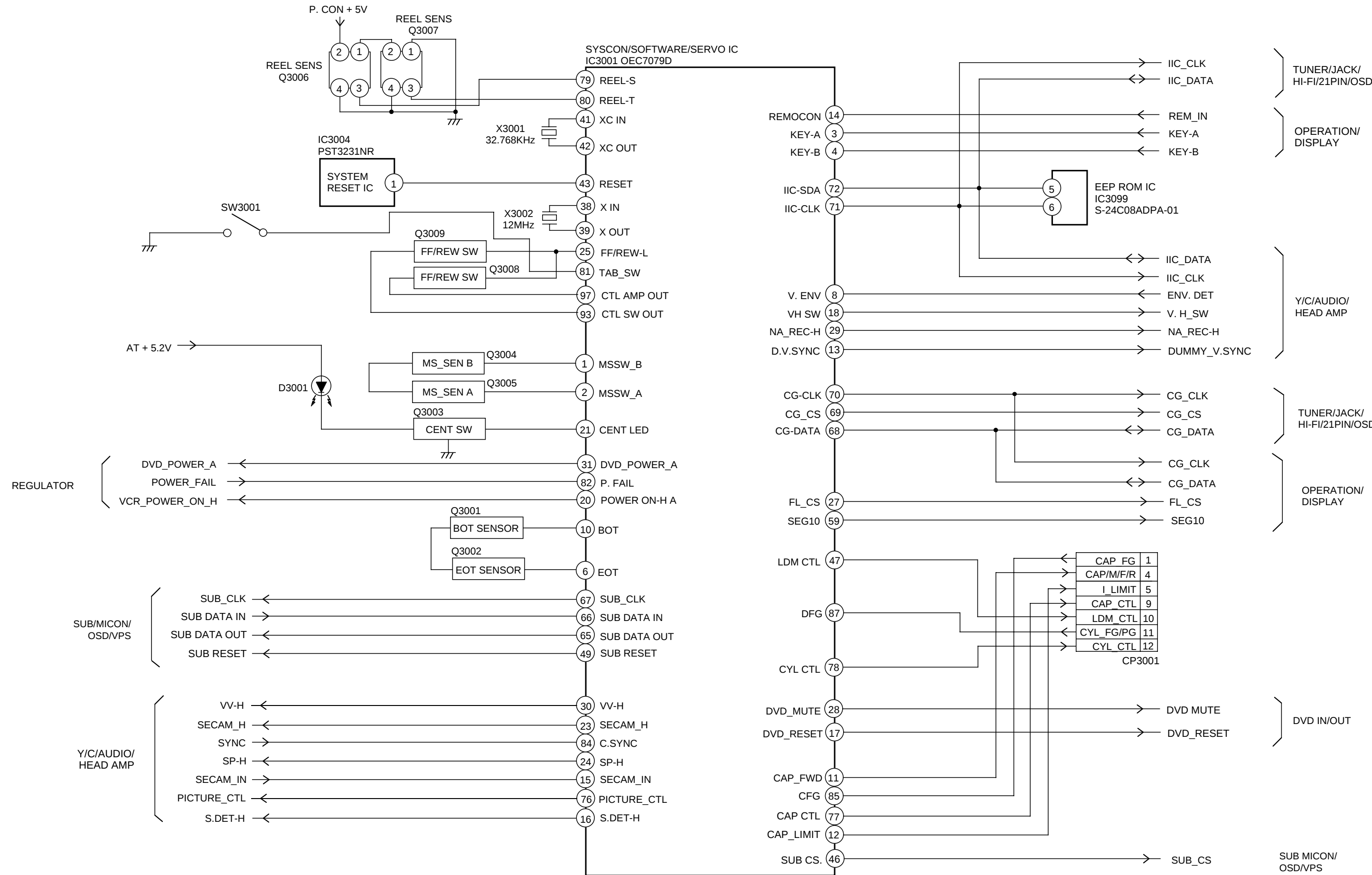
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM
(SD-22VL)



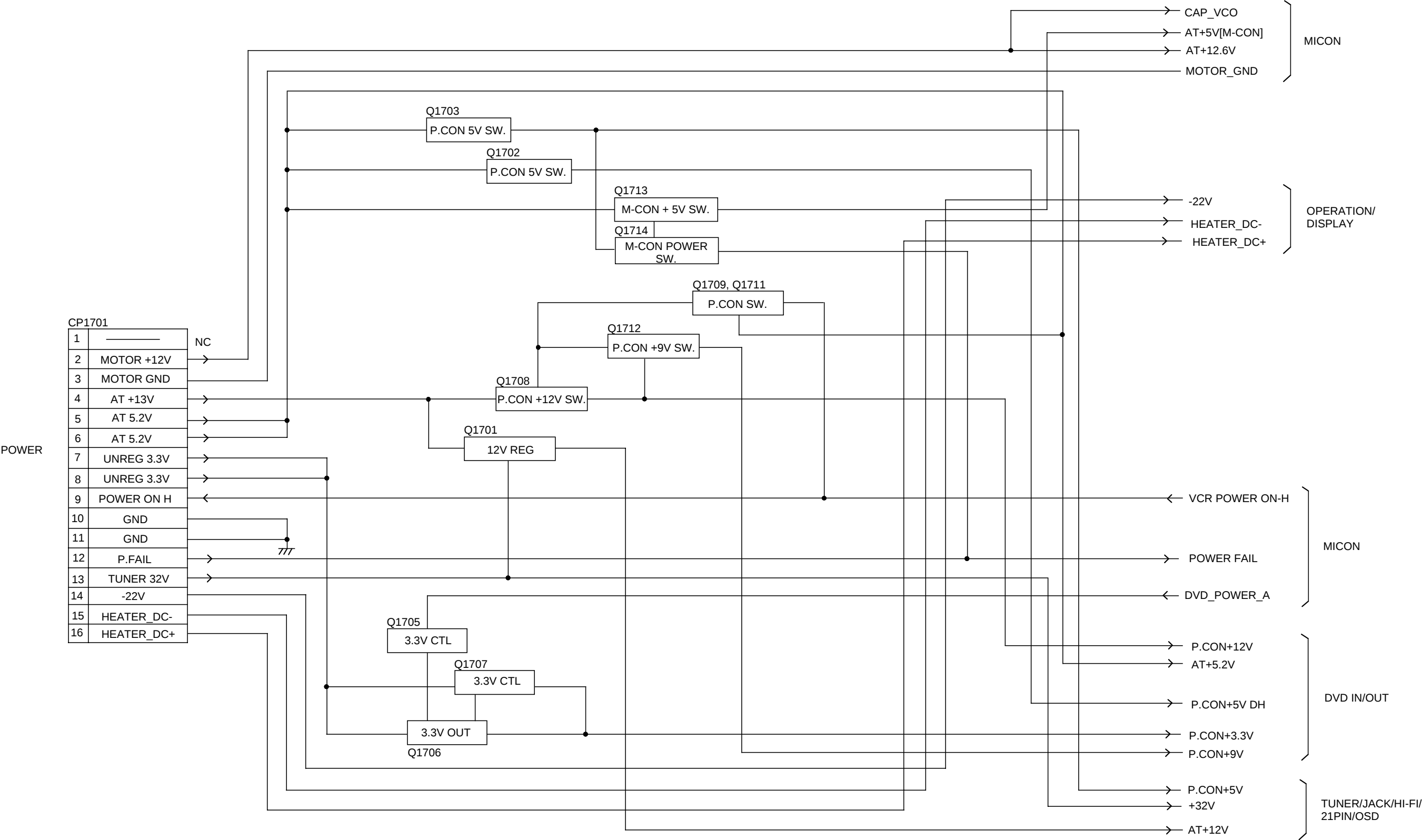
MICON BLOCK DIAGRAM (SD-22VB)



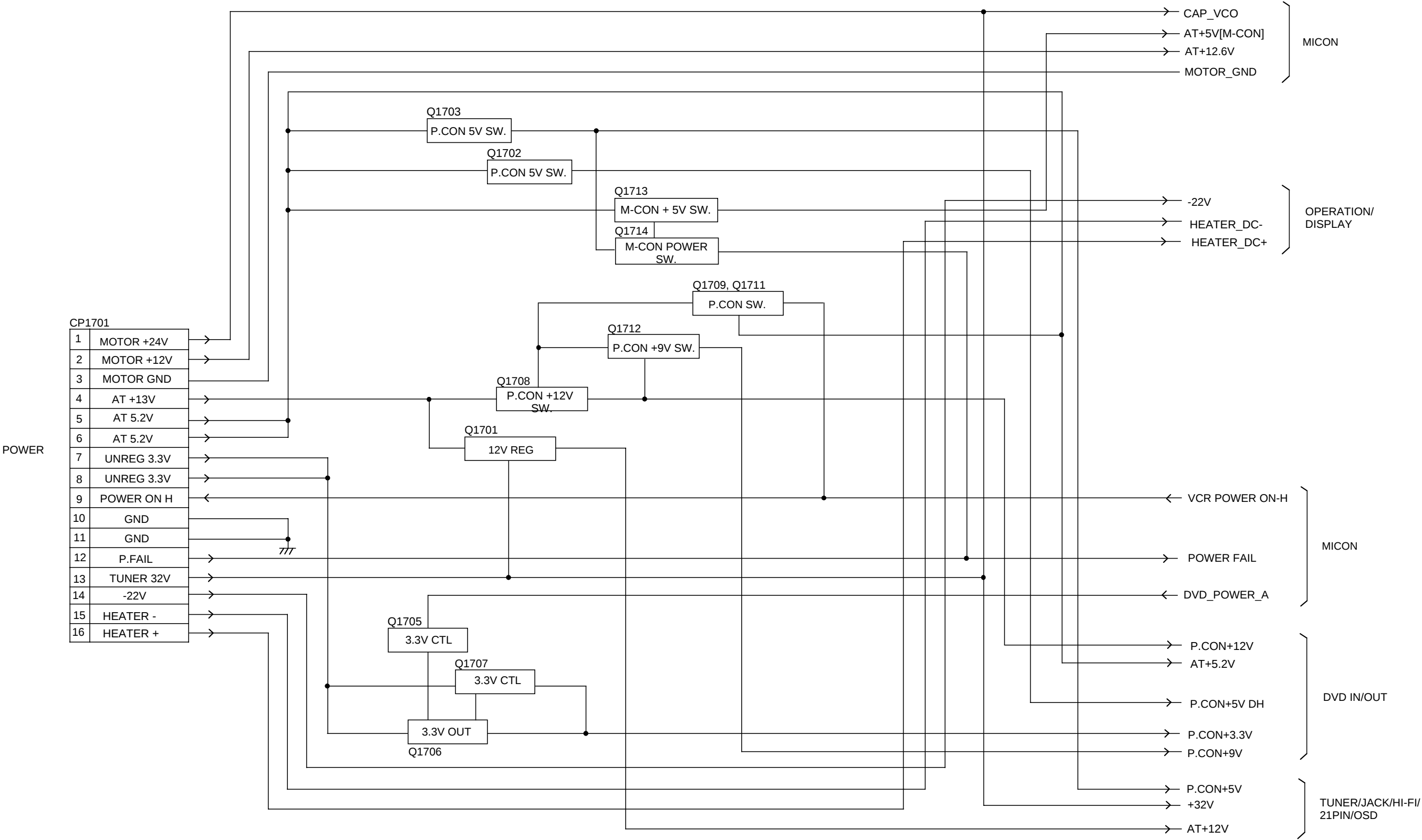
MICON BLOCK DIAGRAM
(SD-22VE, SD-22VL)



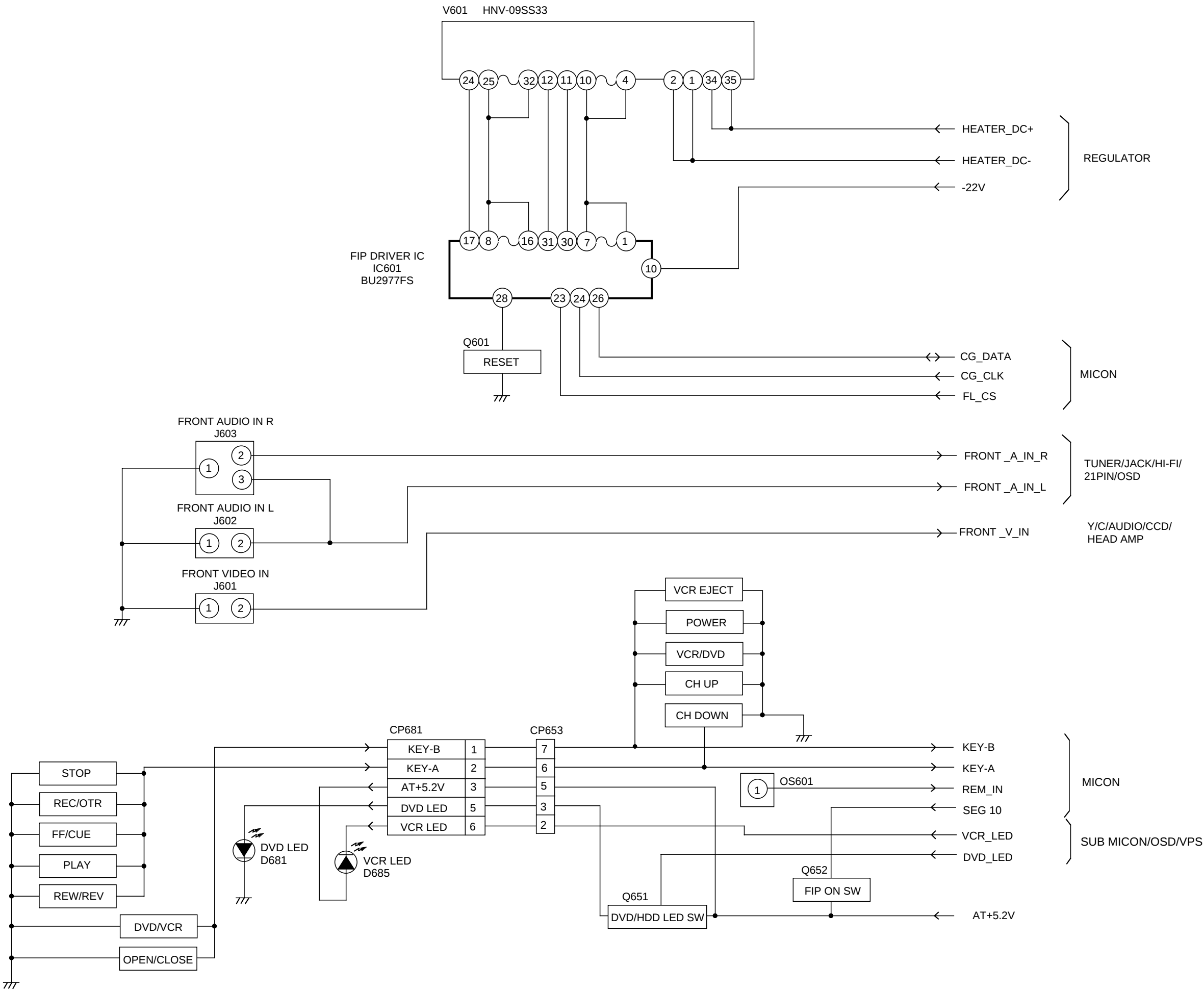
REGULATOR BLOCK DIAGRAM
(SD-22VB)



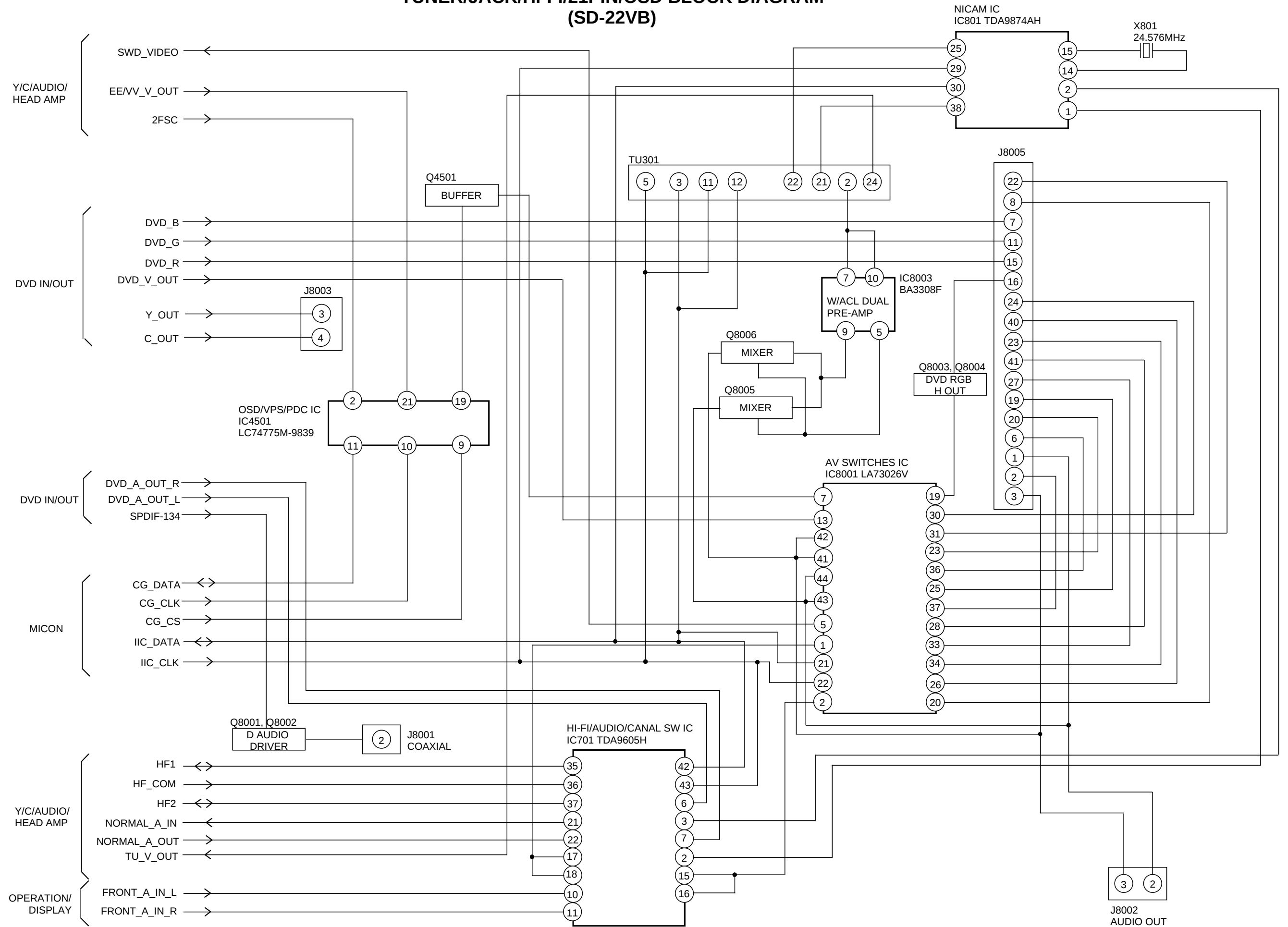
REGULATOR BLOCK DIAGRAM
(SD-22VE, SD-22VL)



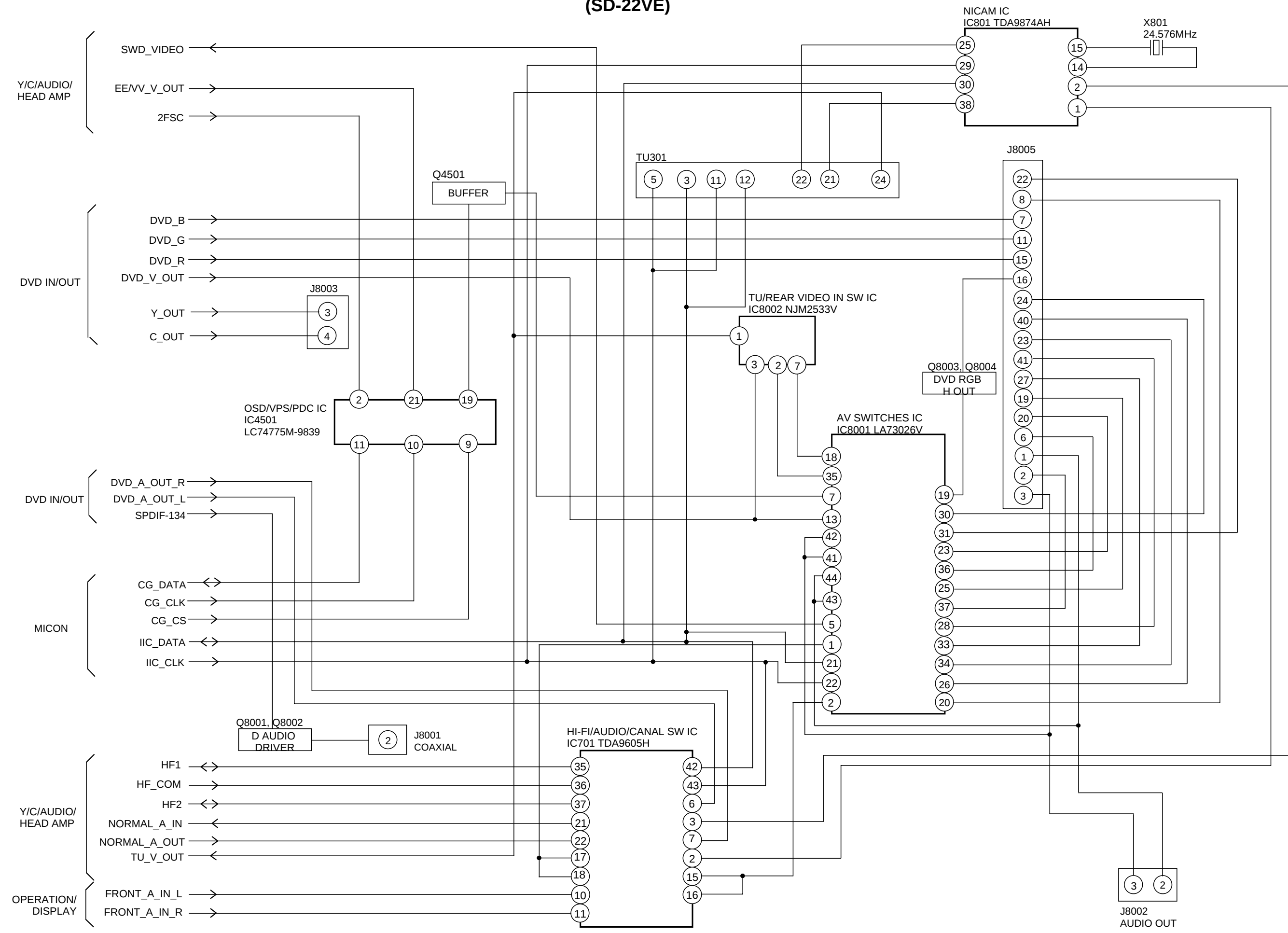
OPERATION/DISPLAY BLOCK DIAGRAM



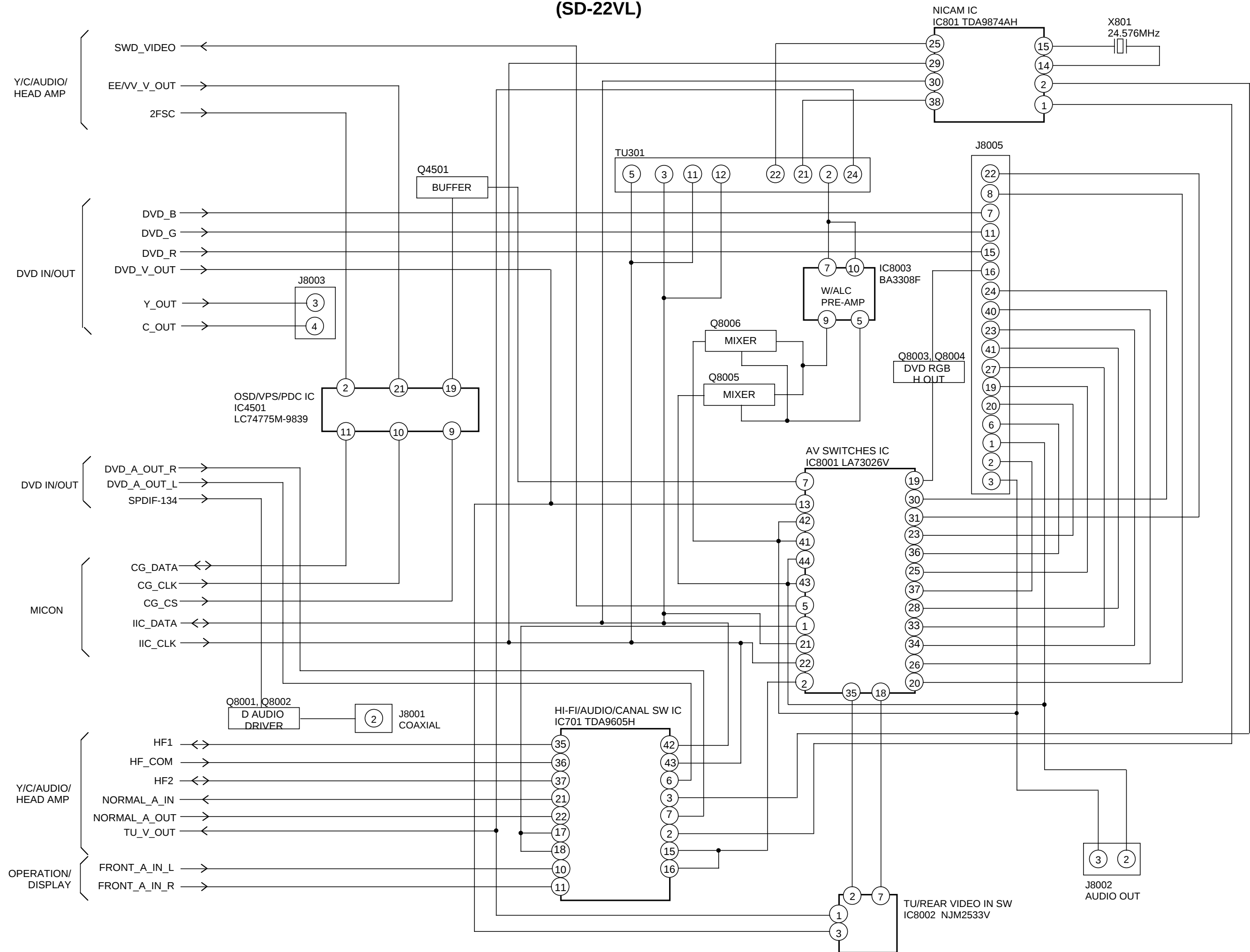
TUNER/JACK/Hi-Fi/21PIN/OSD BLOCK DIAGRAM (SD-22VB)



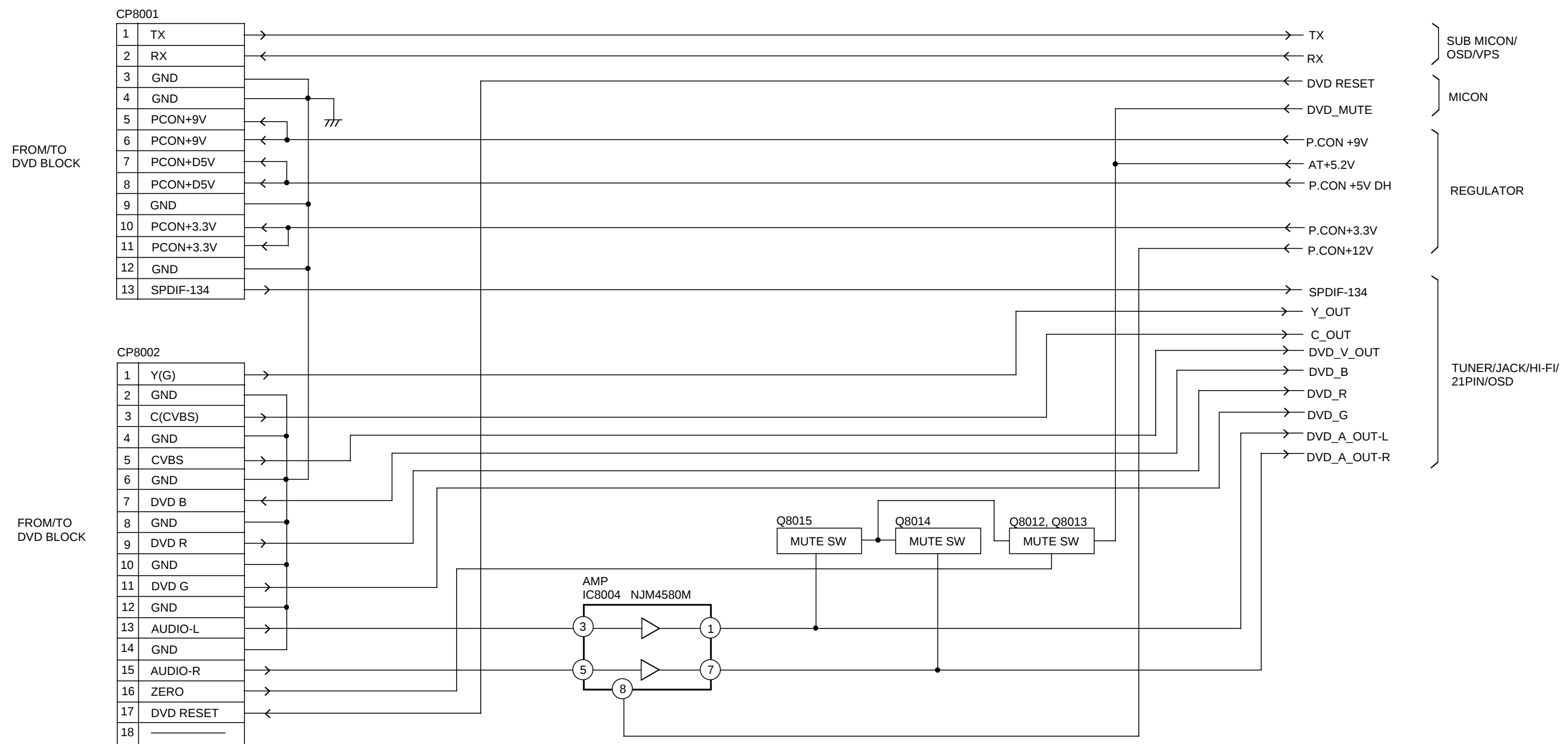
TUNER/JACK/Hi-Fi/21PIN/OSD BLOCK DIAGRAM
(SD-22VE)



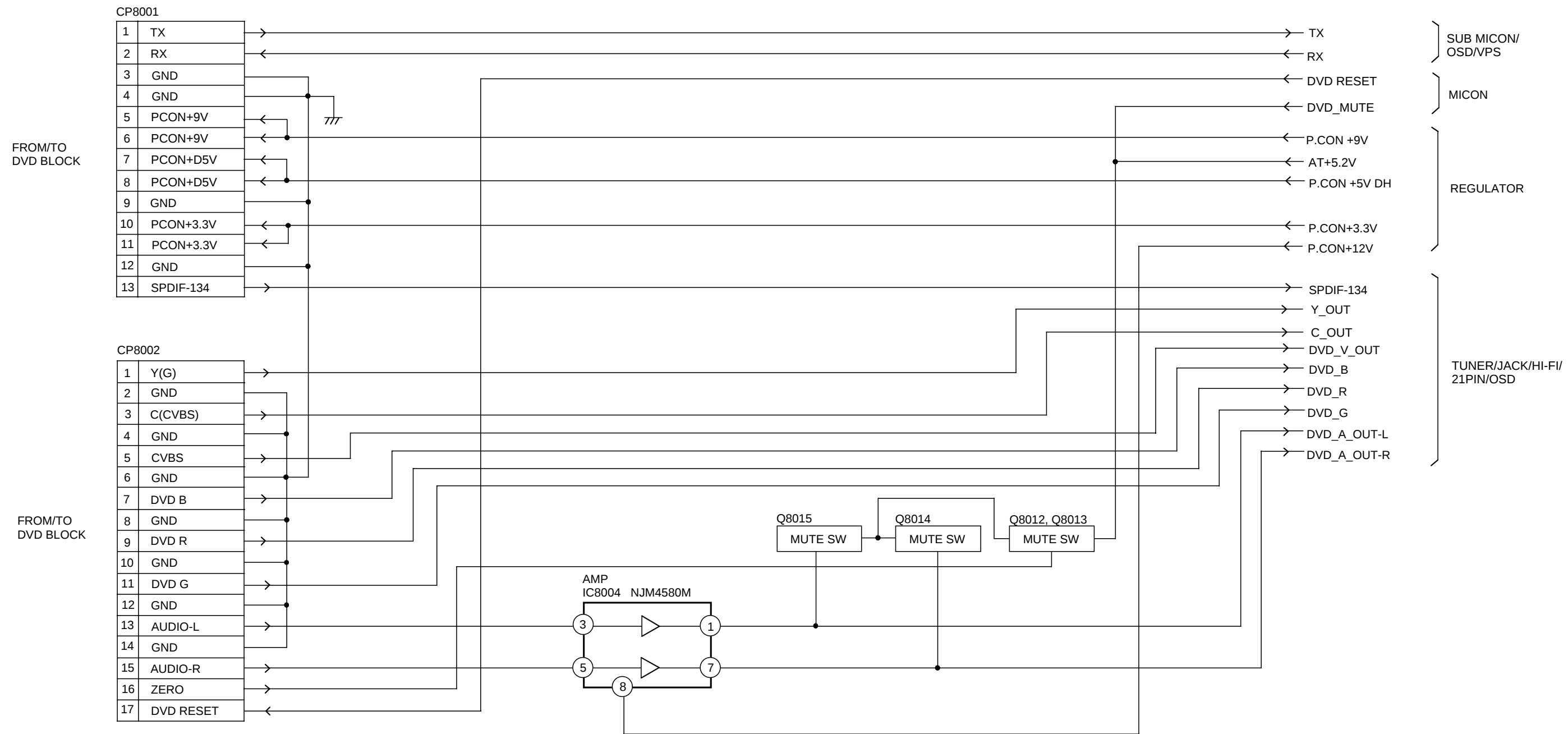
**TUNER/JACK/Hi-Fi/21PIN/OSD BLOCK DIAGRAM
(SD-22VL)**



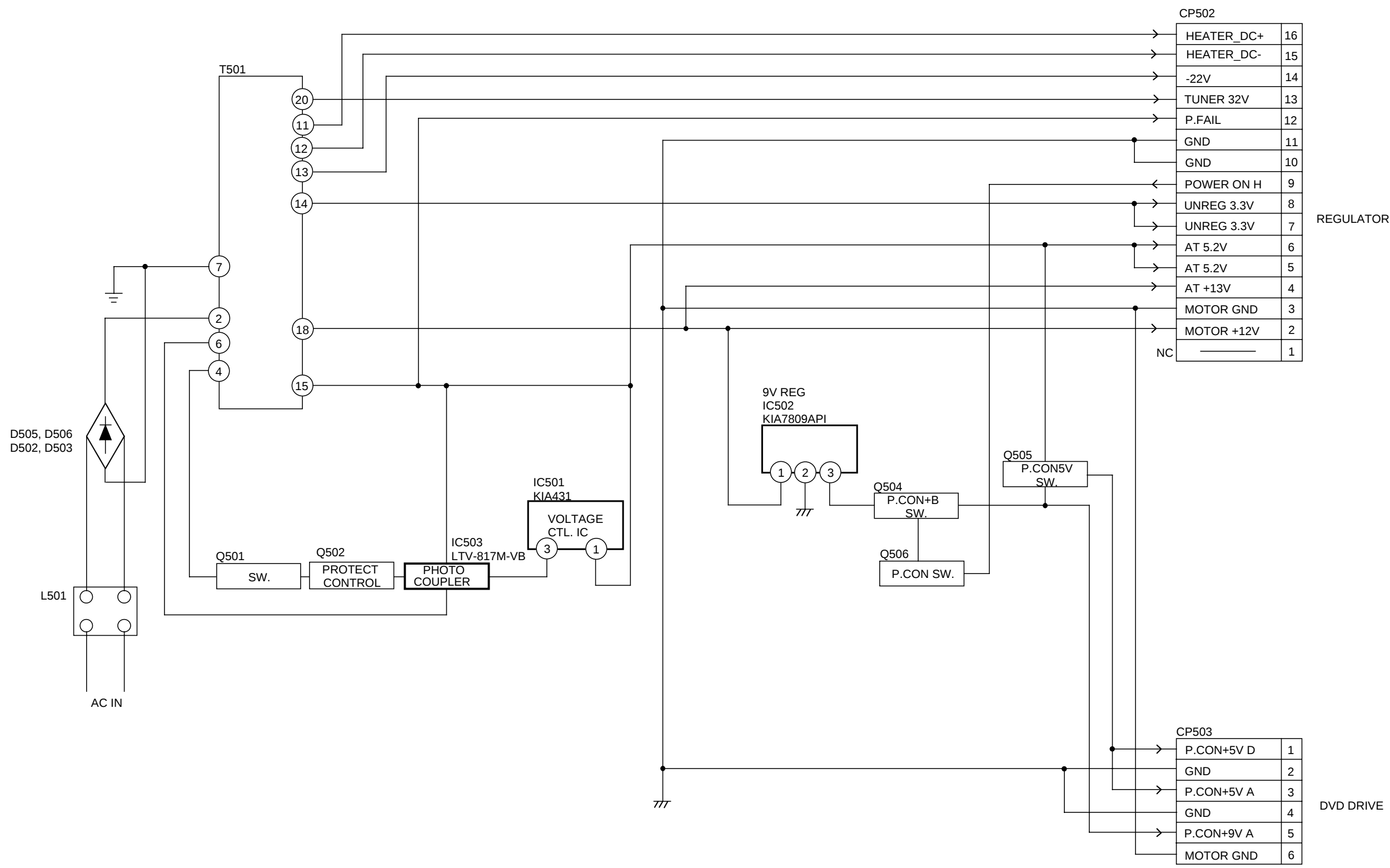
DVD IN/OUT BLOCK DIAGRAM
(SD-22VB, SD-22VE)



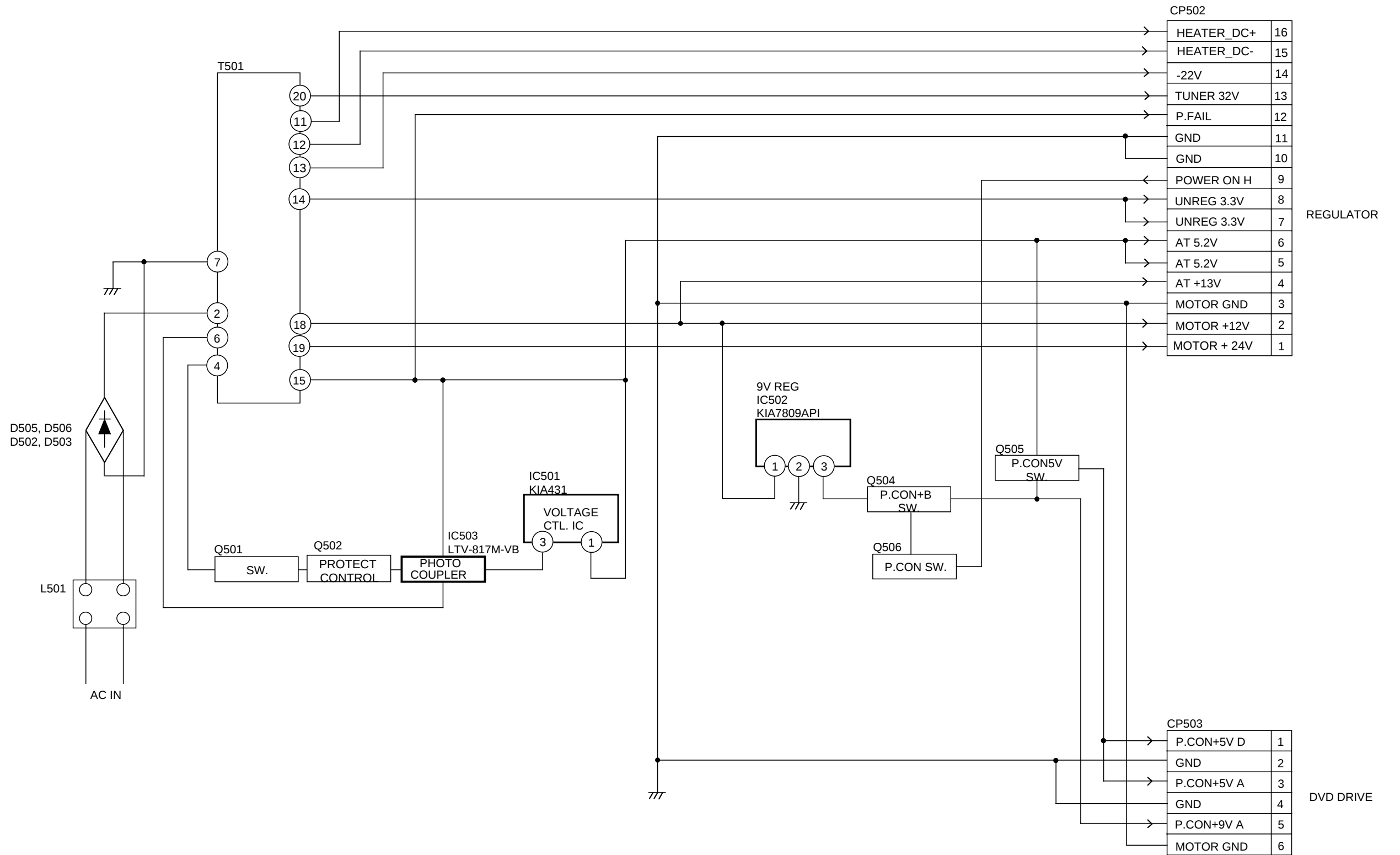
DVD IN/OUT BLOCK DIAGRAM
(SD-22VL)



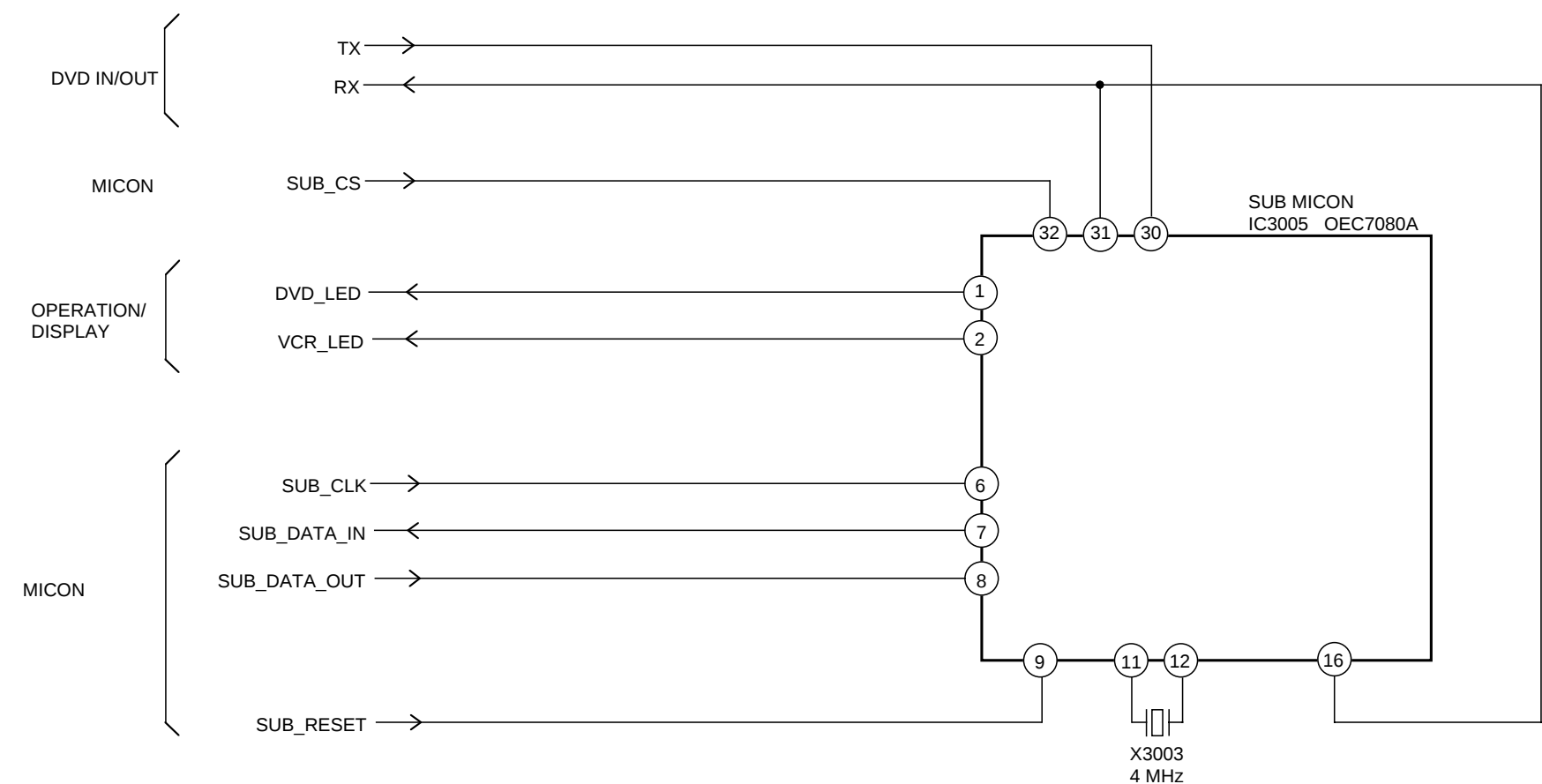
POWER BLOCK DIAGRAM
(SD-22VB, SD-22VE)



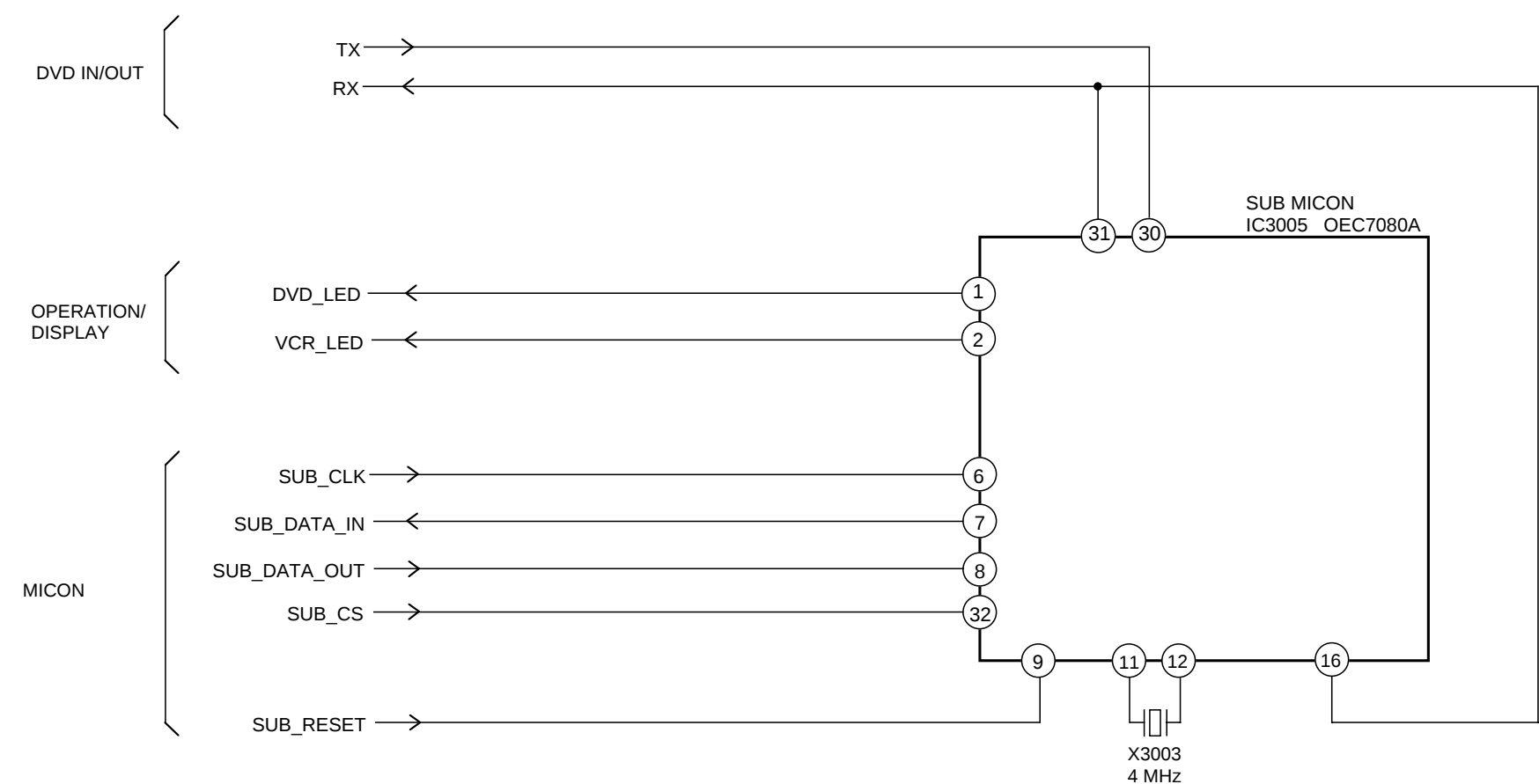
POWER BLOCK DIAGRAM (SD-22VL)



**SUB MICON/OSD/VPS BLOCK DIAGRAM
(SD-22VB)**

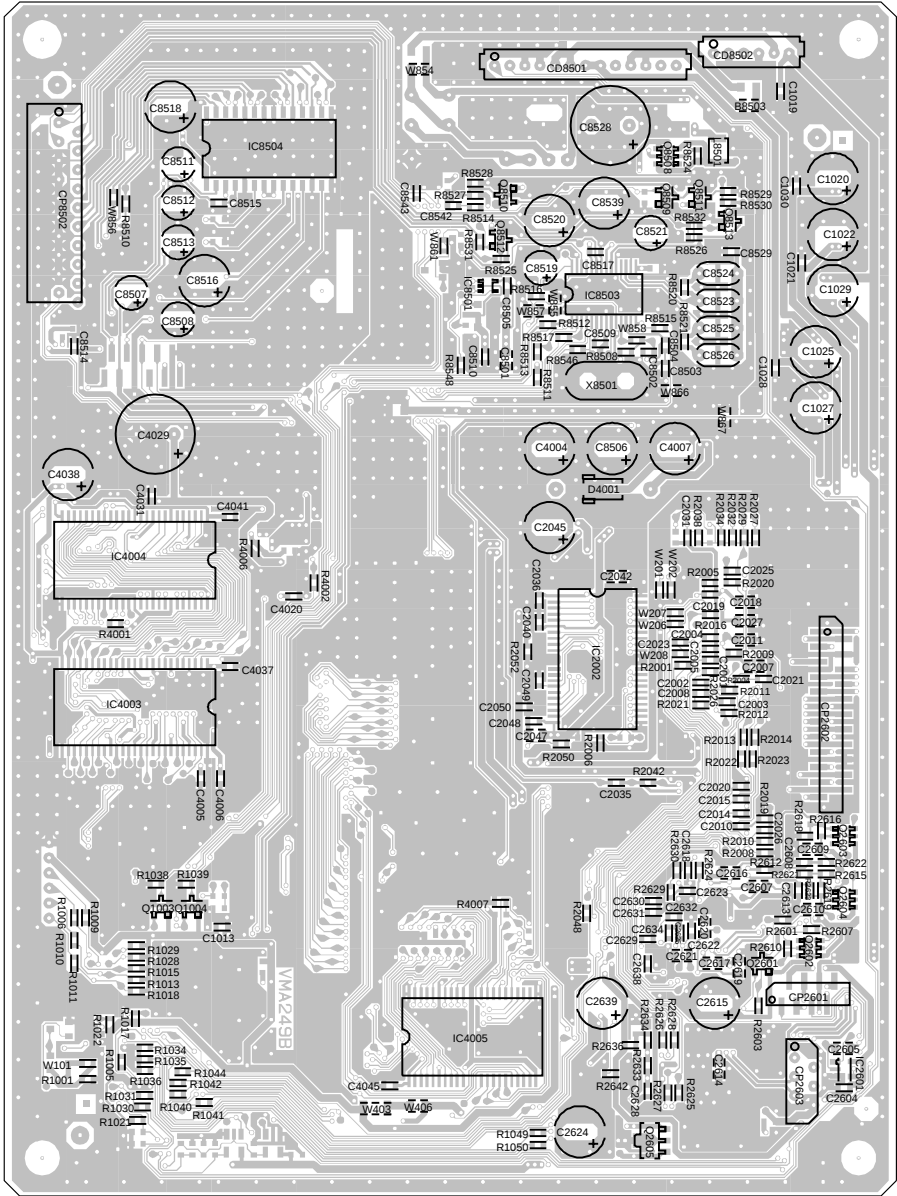


SUB MICON/OSD/VPS BLOCK DIAGRAM (SD-22VE, SD-22VL)

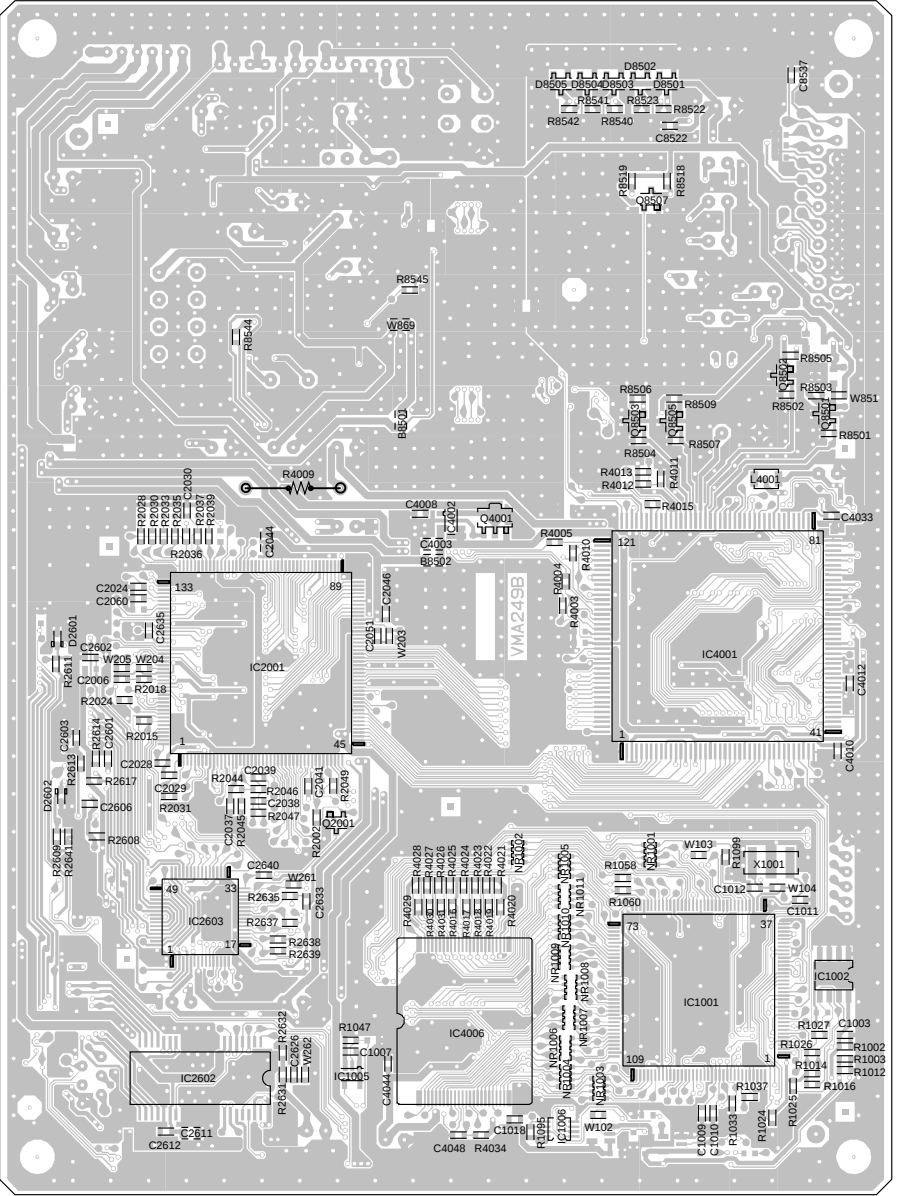


PRINTED CIRCUIT BOARDS

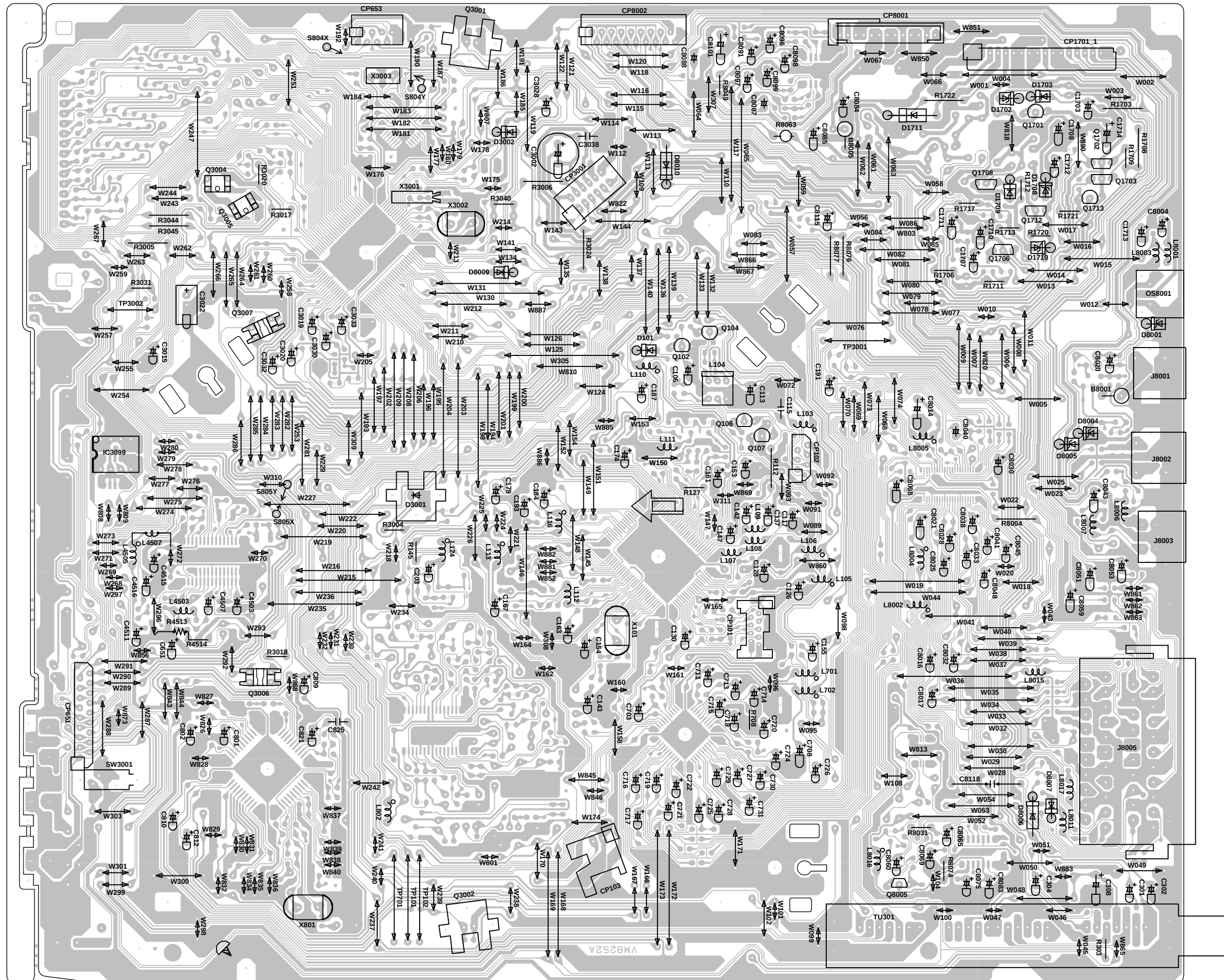
DVD (TOP SIDE)



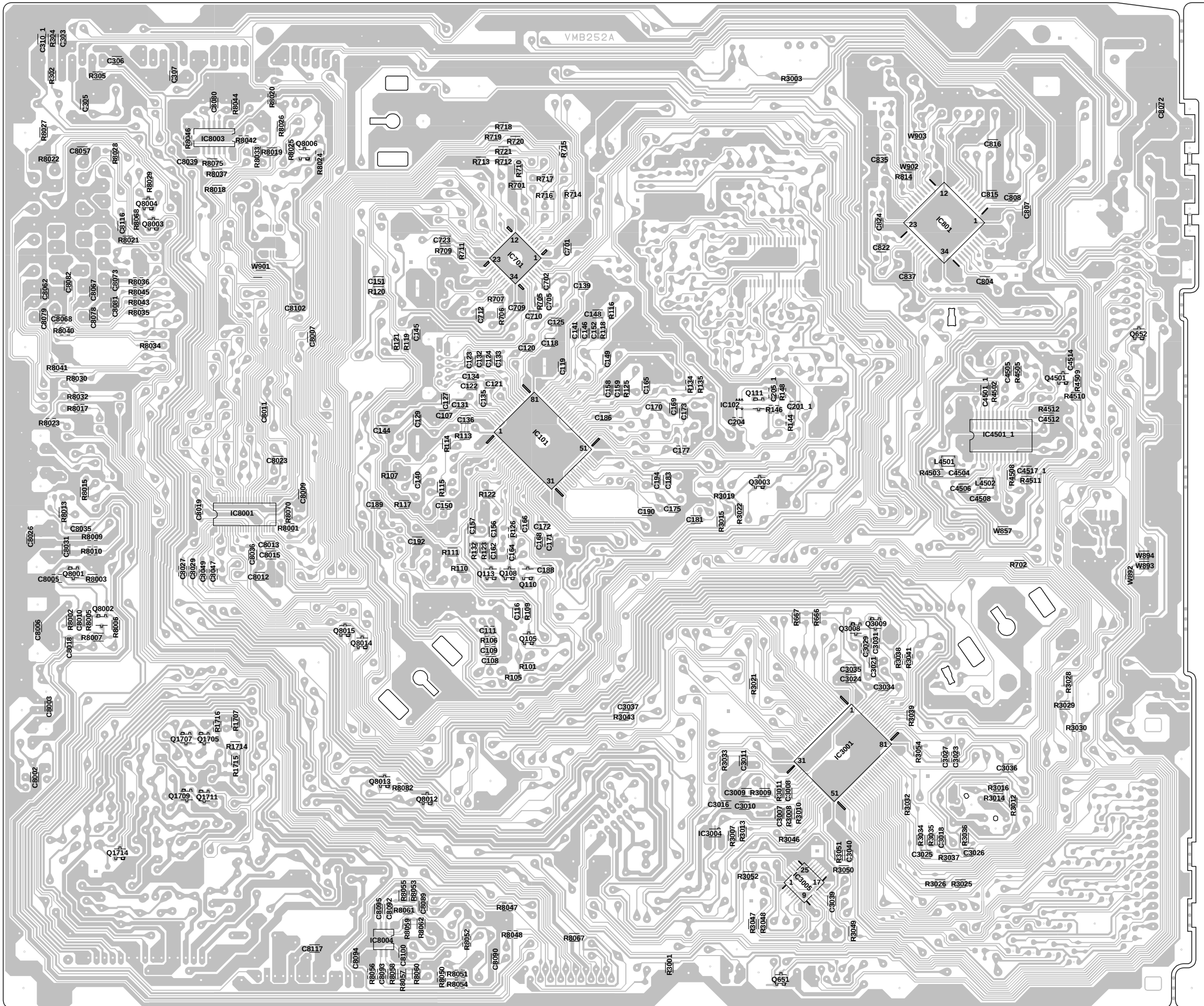
DVD (BOTTOM SIDE)



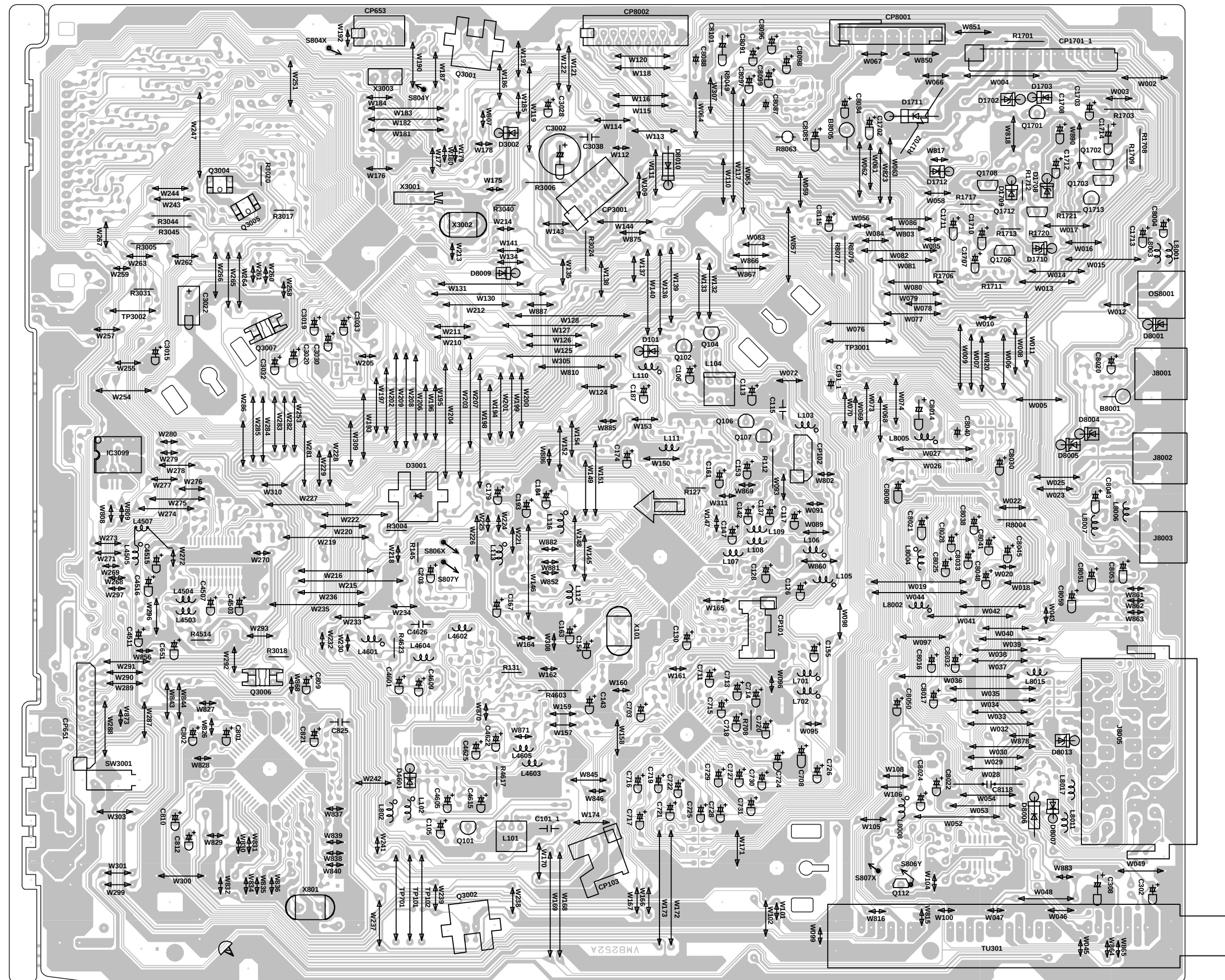
**PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE
(SD-22VB)**



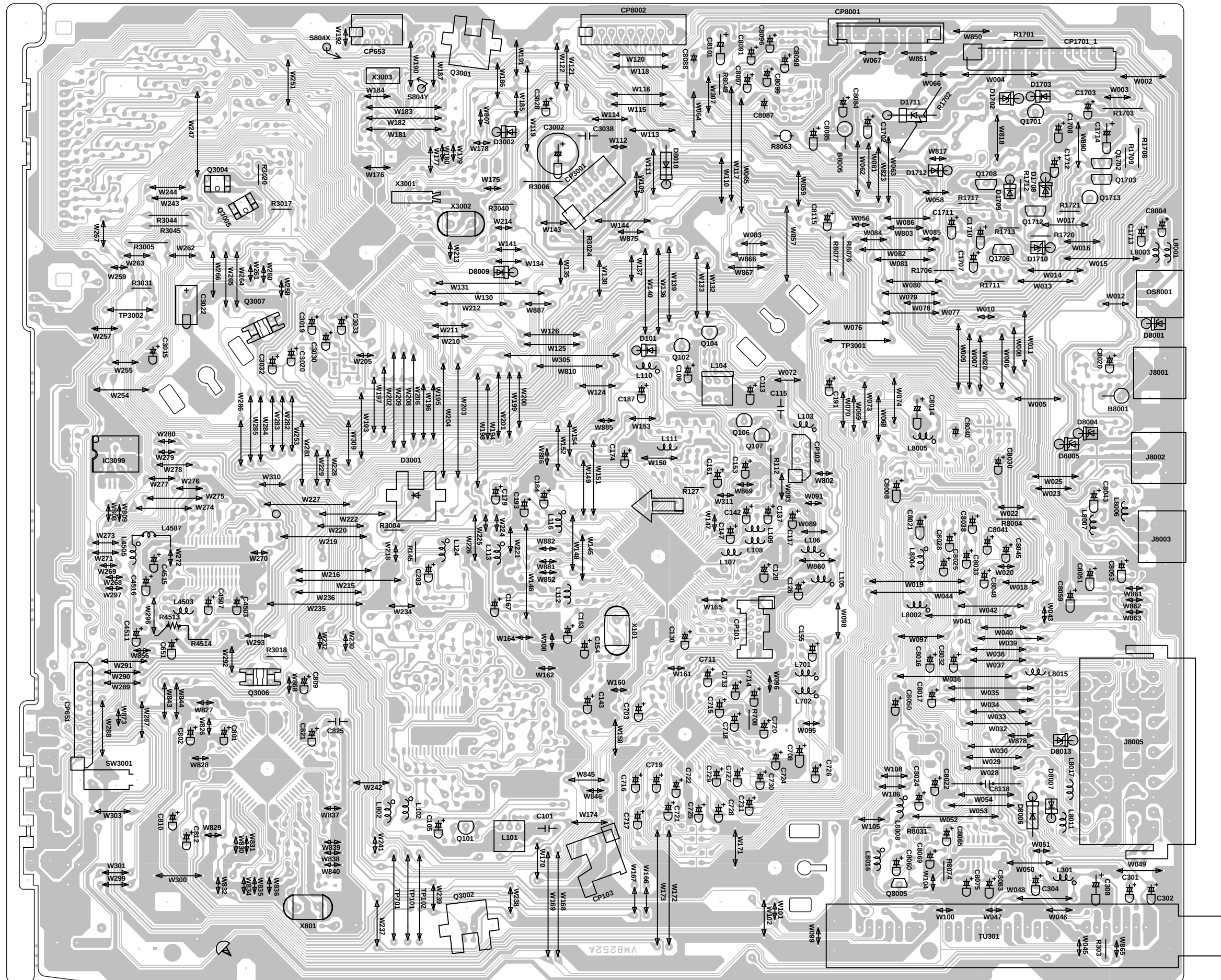
**SOLDER SIDE
(SD-22VB)**



**PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE
(SD-22VE)**



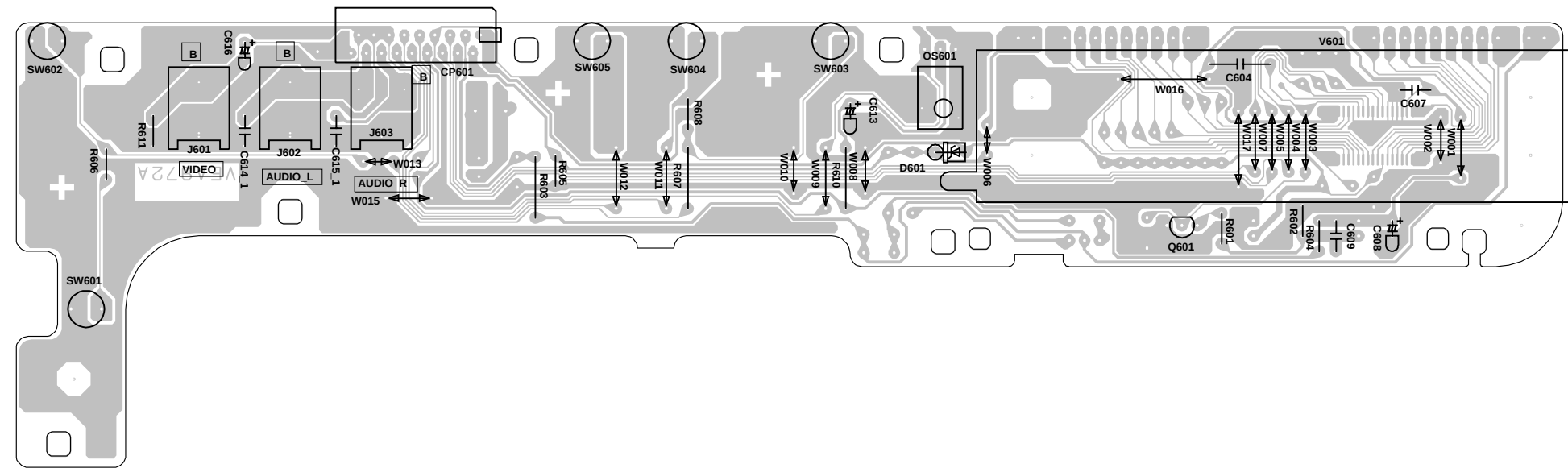
**PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE
(SD-22VL)**



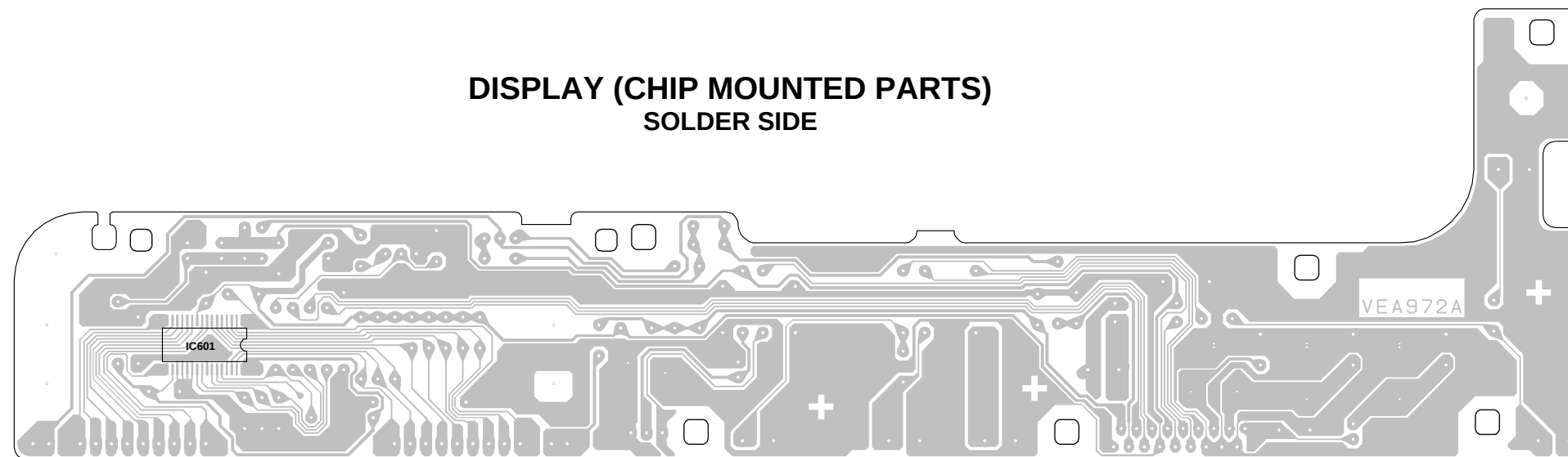
VMB252A



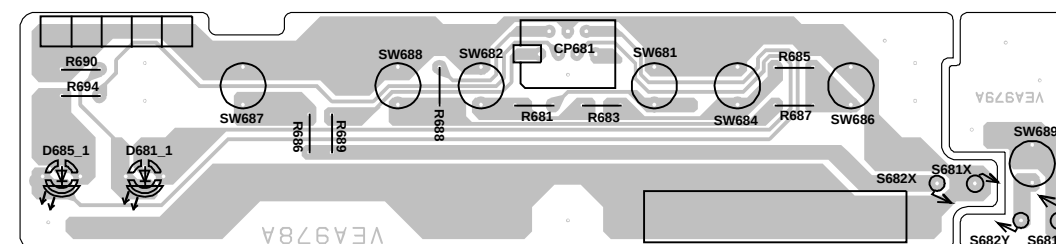
DISPLAY (INSERTED PARTS)
SOLDER SIDE



DISPLAY (CHIP MOUNTED PARTS) SOLDER SIDE

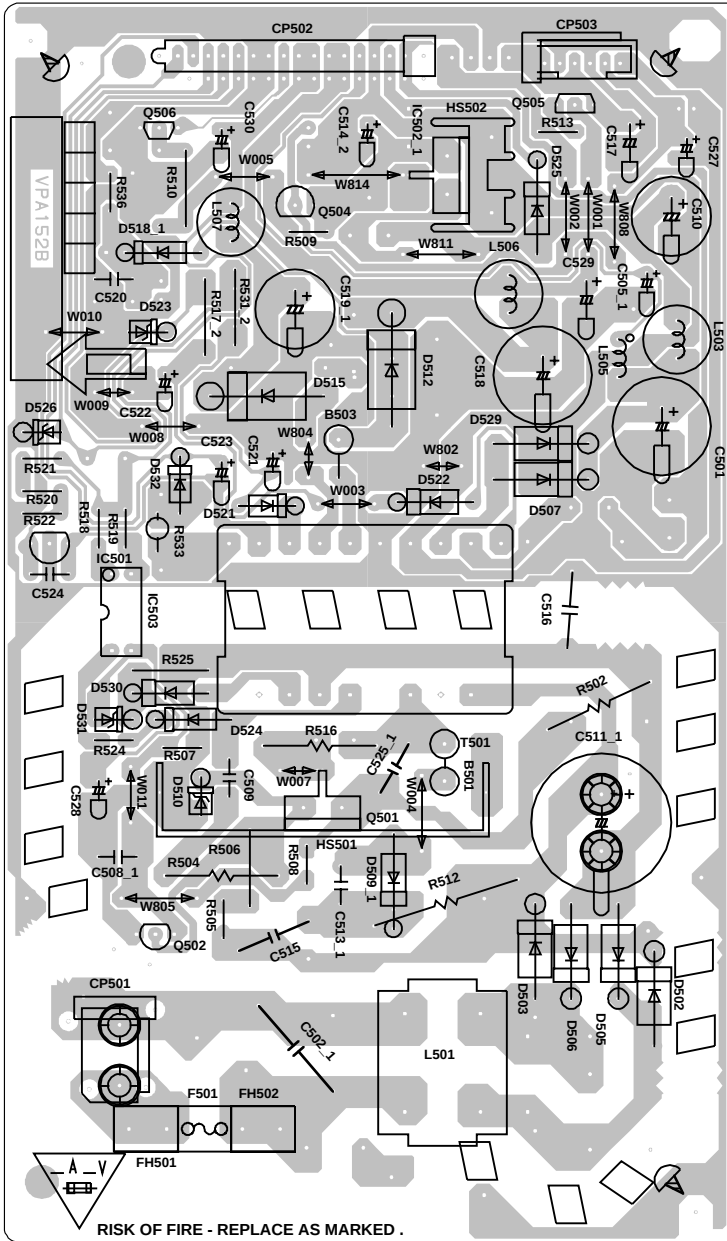


OPERATION1/OPERATION2
SOLDER SIDE

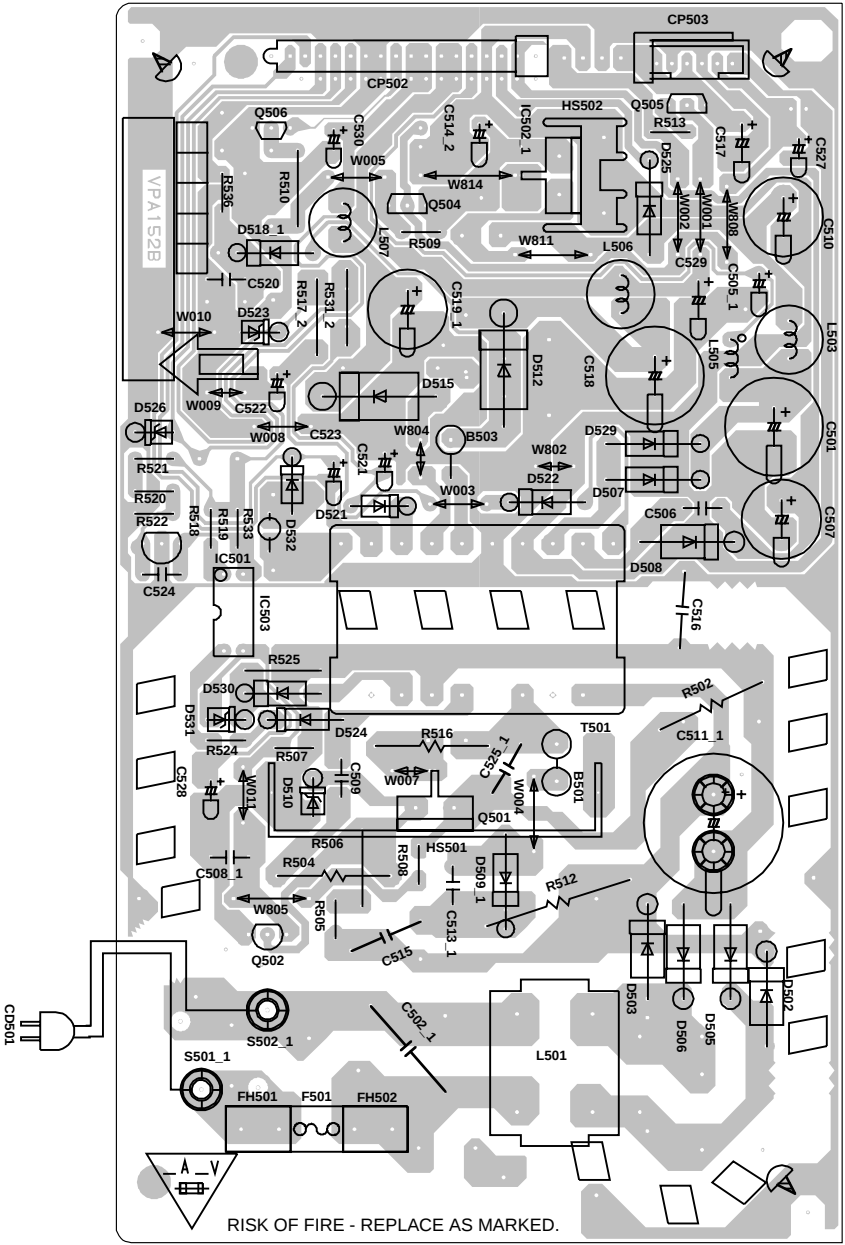


PRINTED CIRCUIT BOARDS

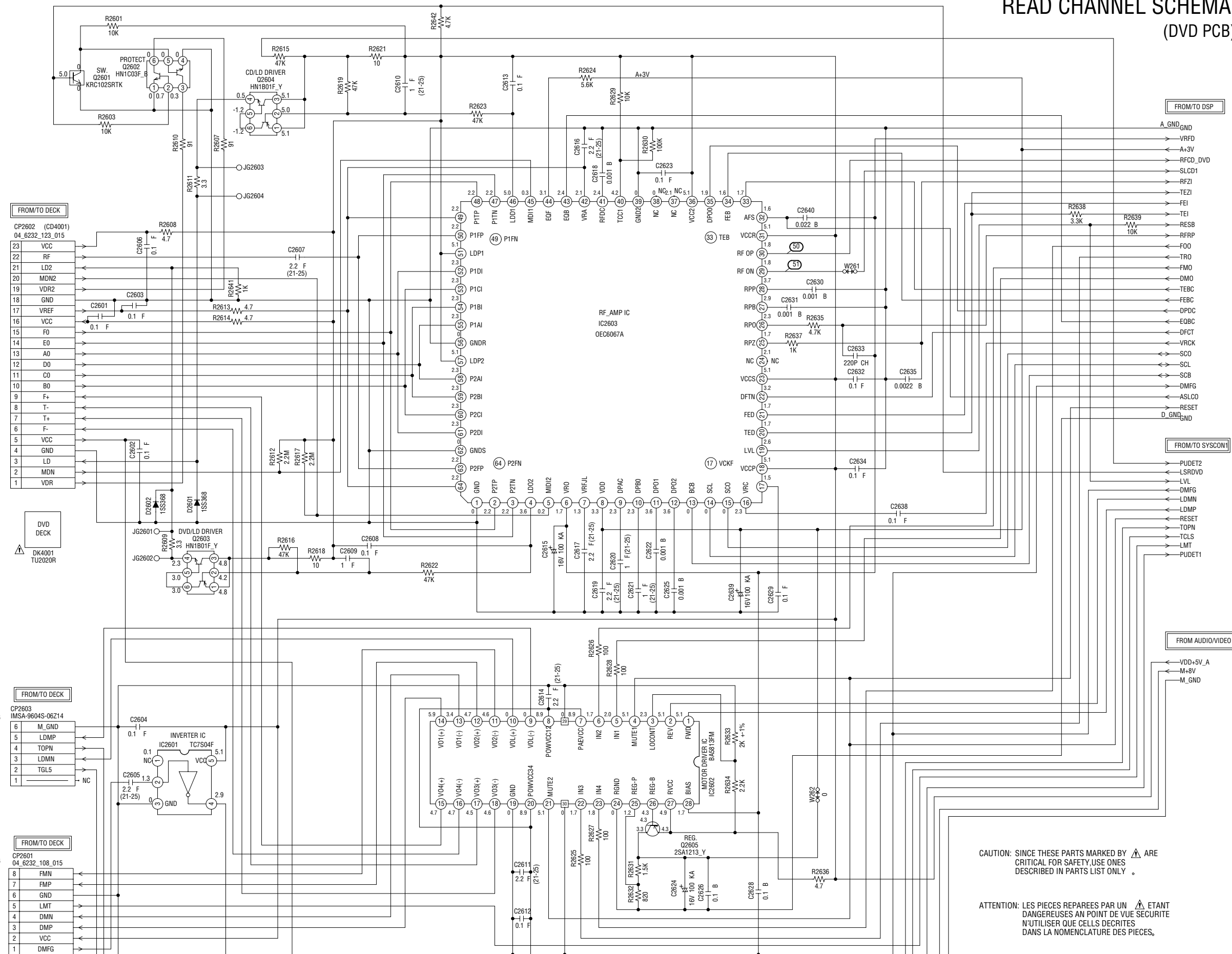
POWER
SOLDER SIDE
(SD-22VB)



POWER
SOLDER SIDE
(SD-22VE, SD-22VL)



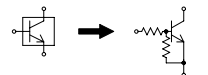
READ CHANNEL SCHEMATIC DIAGRAM (DVD PCB)



CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

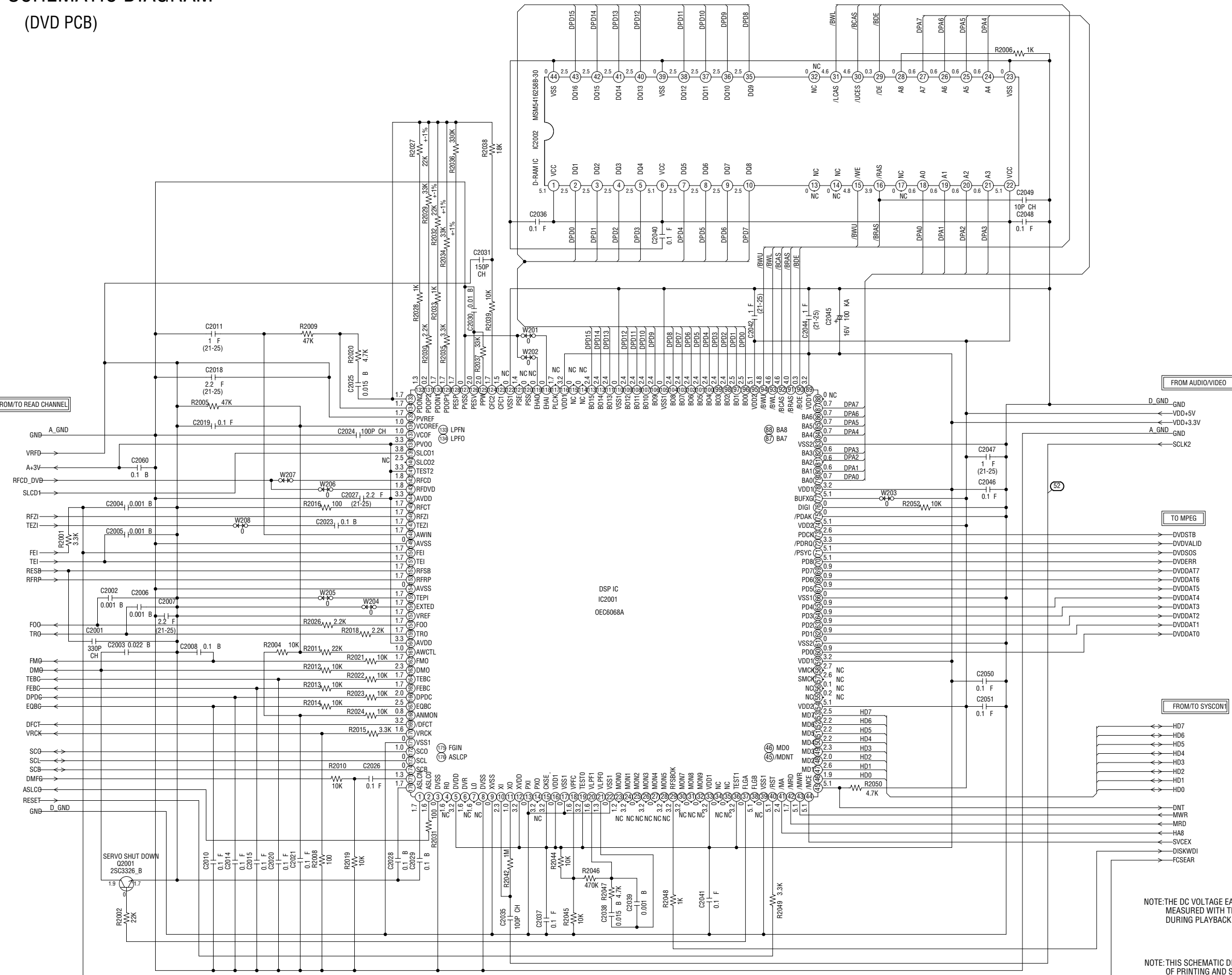
CAUTION: DIGITAL TRANSISTOR



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

DSP SCHEMATIC DIAGRAM

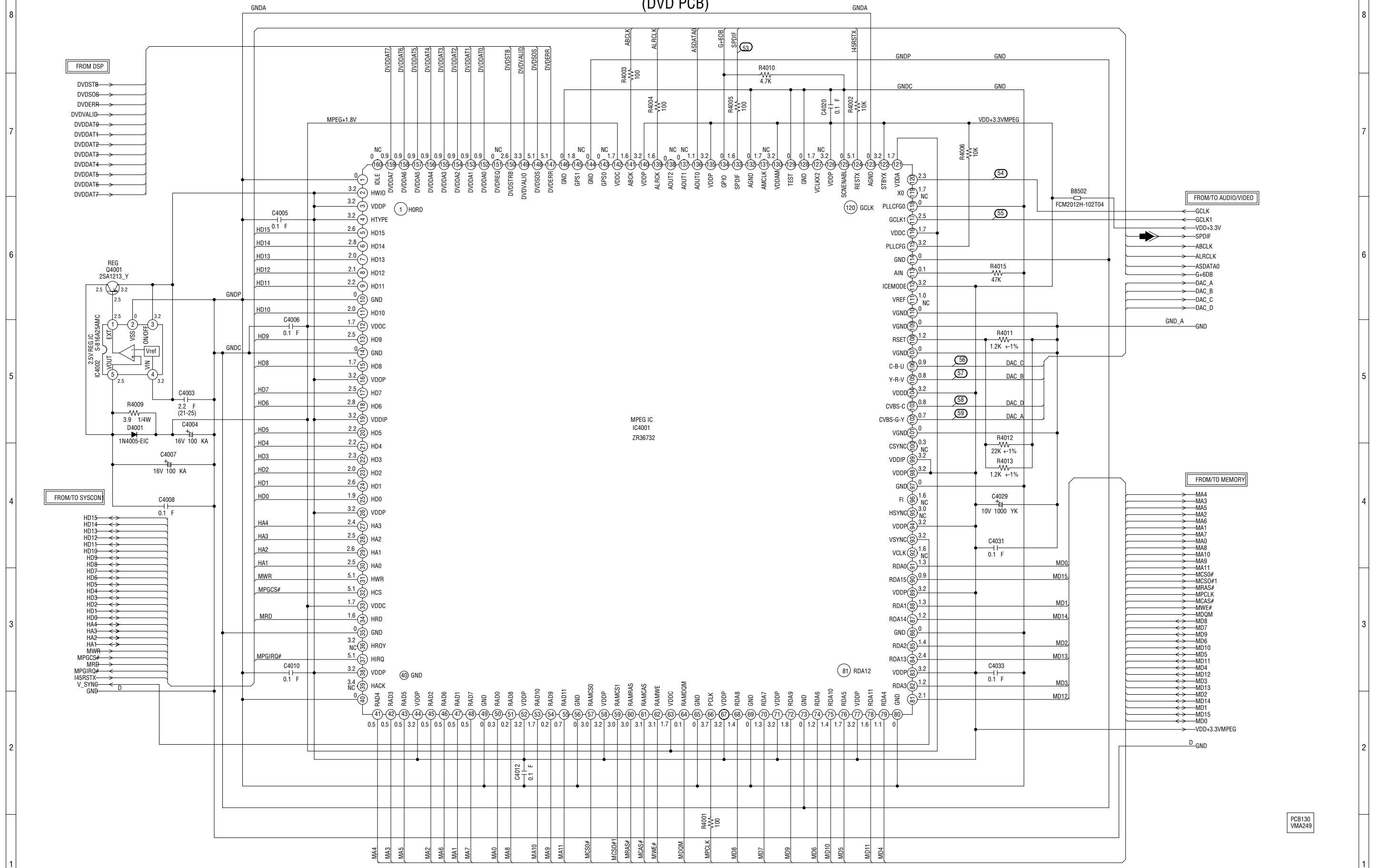


NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB130
VMA249

MPEG SCHEMATIC DIAGRAM



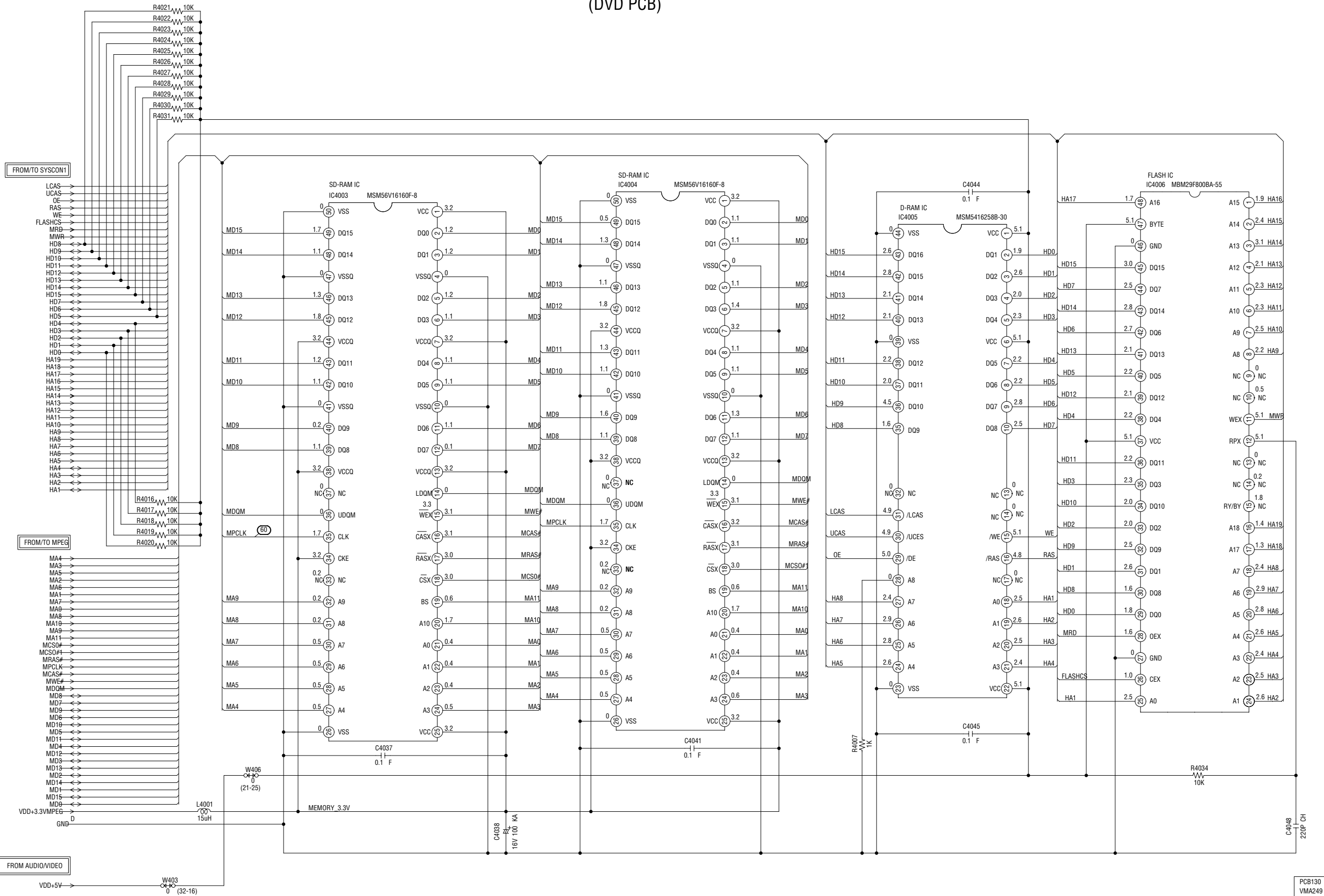
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

◀ DIGITAL AUDIO SIGNAL(PB)

PCB130
VMA249

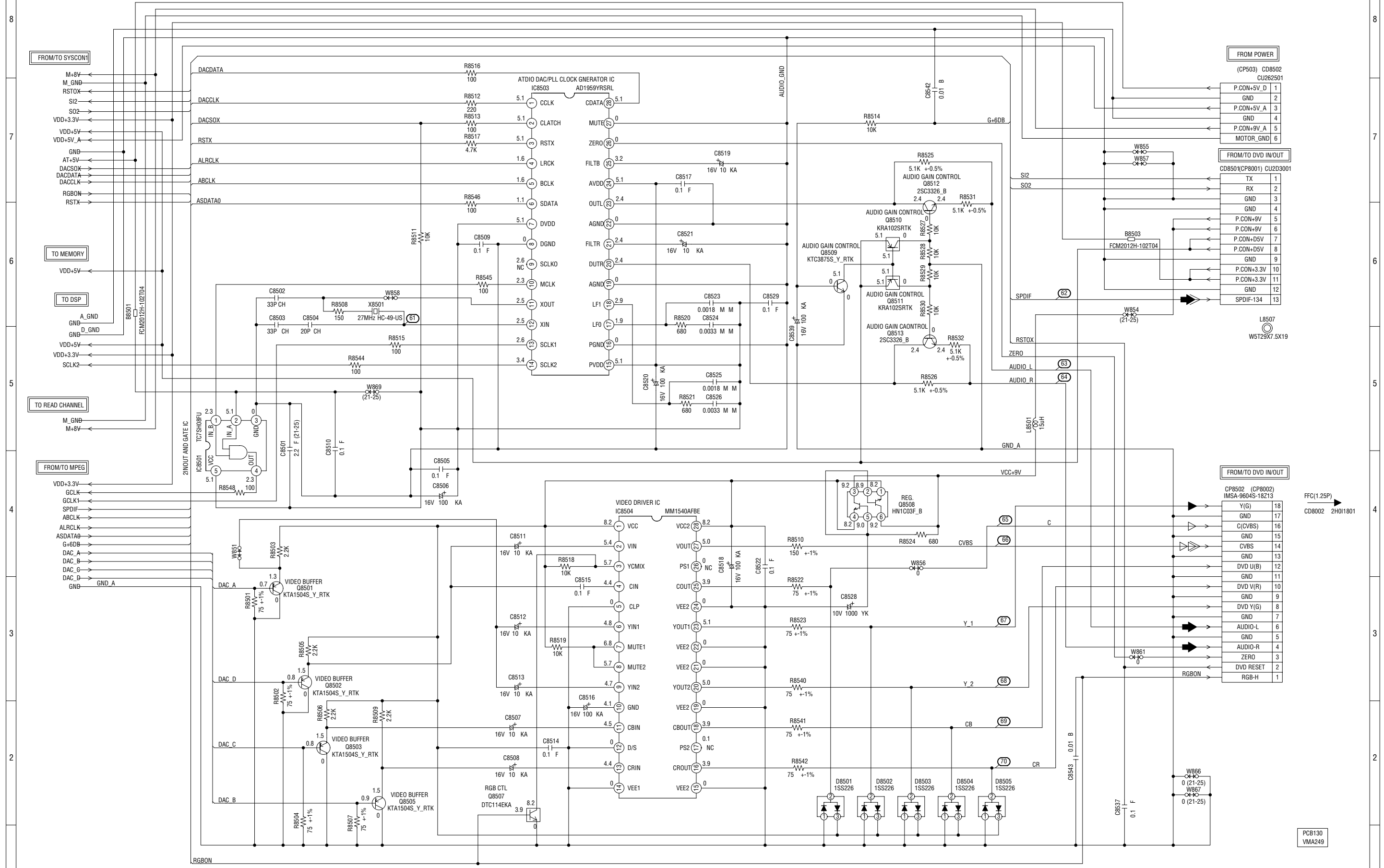
MEMORY SCHEMATIC DIAGRAM
(DVD PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

AUDIO/VIDEO SCHEMATIC DIAGRAM (DVD PCB)



CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

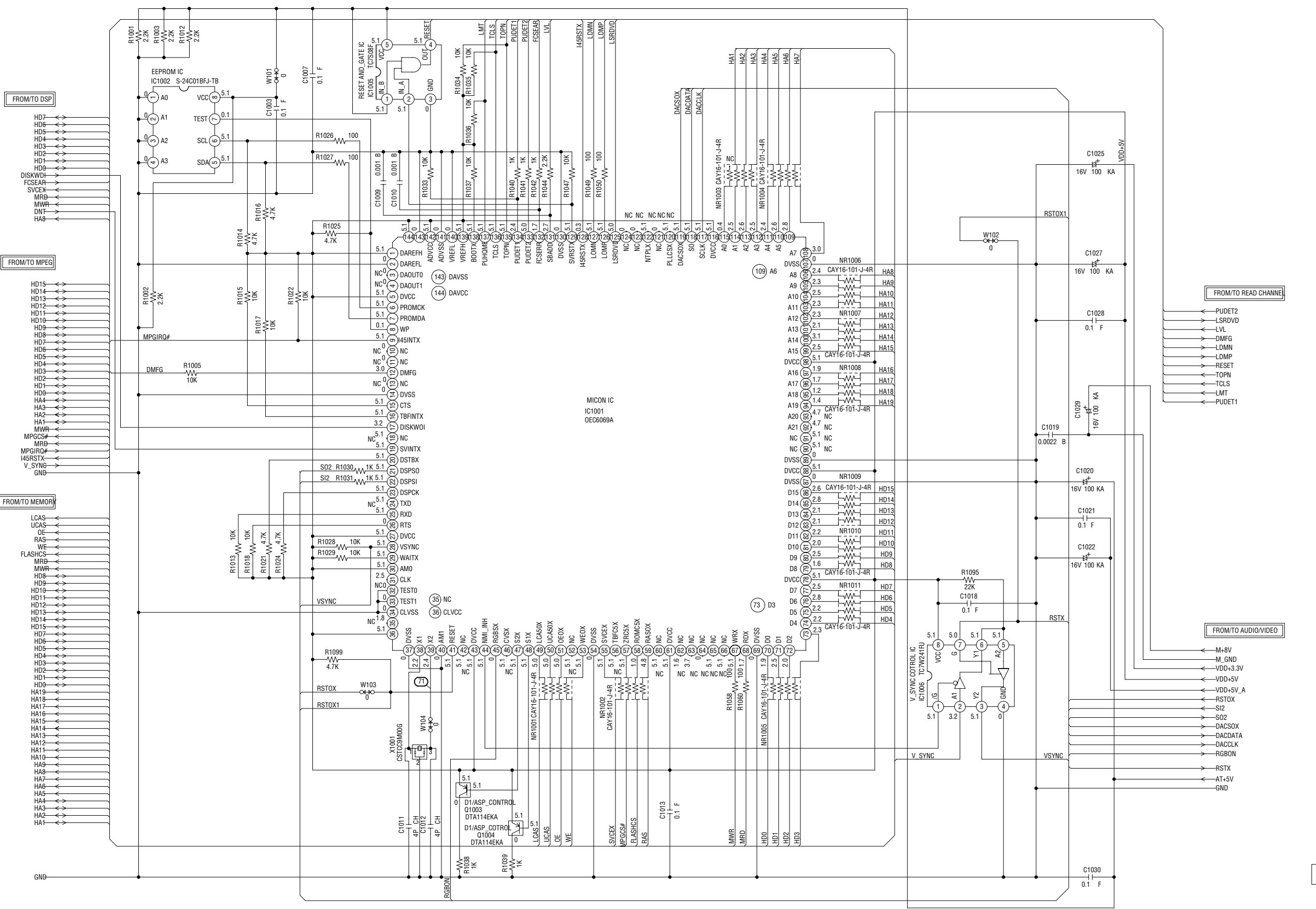
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

- ◀ PLAYBACK LUMINANCE SIGNAL
- ◀ PLAYBACK COLOR SIGNAL
- ◀◀ PLAYBACK VIDEO SIGNAL
- ◀◀◀ DIGITAL AUDIO SIGNAL(PB)
- ◀◀◀ AUDIO SIGNAL(PB)

PCB130
VMA249

SYSCON1 SCHEMATIC DIAGRAM

(DVD PCB)



CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB130
VMA249

Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (VCR PCB) (SD-22VB)

FROM/TO VCR SYSCON

V.H. SW
PICTURE_CTL
NA_REC-H
DUMMY_V_SYNC
SYNG
A_MUTE/TRICK-H
IIC_DATA
IIC_CLK
ENV_DET
CTL-
CTL+
MSECAM-M/AGC/S_DET
S_DET-H

FROM TUNER/JACK

SWD_VIDEO
FRONT_V_IN
TU_V_OUT

FROM/TO HI-FI/DEMODULATOR

NORMAL_A_IN
NORMAL_A_OUT
HF1
HF2
HF_COM

FROM REGULATOR

P.CON+5V
GND

FROM OPERATION/DISPLAY

FRONT_V_IN

TO SUB MICON/OSD/VPS

2FSC
EE/VV_V_OUT

FROM/TO CYL

CP101 TOC-C08X-A1

9	HF1 (R)	HF1
8	HF_COM	HF_COM
7	HF2 (L)	HF2
6	SP-CH1 (R)	SP-R
5	SP_COM	SP_COM
4	SP-CH2 (L)	SP-L
3	EP/LP-CH1 (R)	EP-R
2	EP/LP_COM	EP_COM
1	EP/LP-CH2 (L)	EP-L

FROM/TO HEAD AUDIO CONTROL

CP102 IMSA-9604S-06Z14

1	AE_HEAD(-)	CTL-
2	AE_HEAD(+)	CTL+
3	CTL-	CTL+
4	CTL+	CTL-
5	AUDIO_REC	AUDIO_REC
6	AUDIO_PB	AUDIO_PB

TO FULL ERASE HEAD

CP103 TMC-T02X-E1

1	FE_HEAD(GND)	FE_HEAD(GND)
2	FE_HEAD(HOT)	FE_HEAD(HOT)

CAUTION: DIGITAL TRANSISTOR

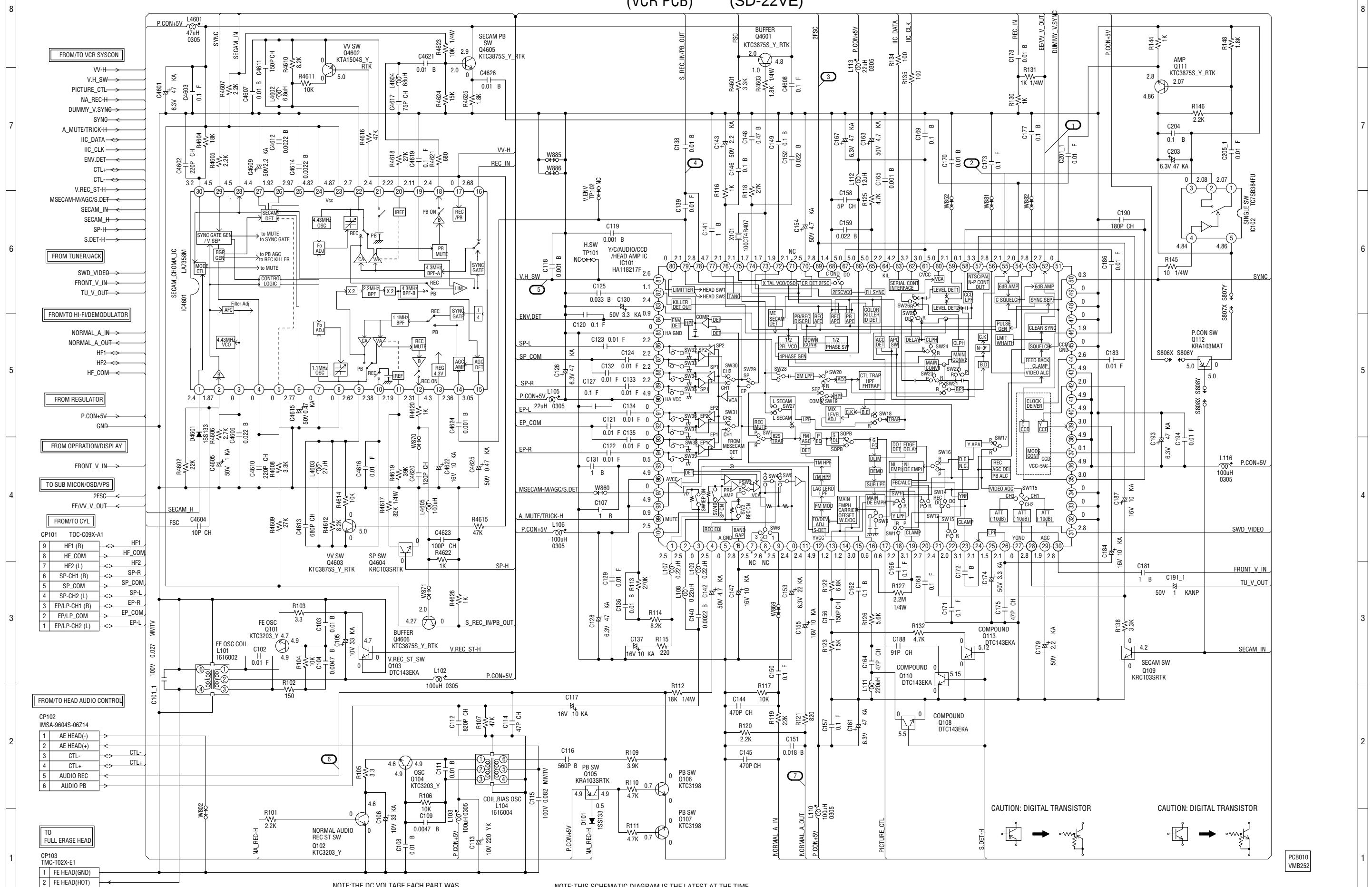
CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE EACH PART WAS
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DURING PLAYBACK.

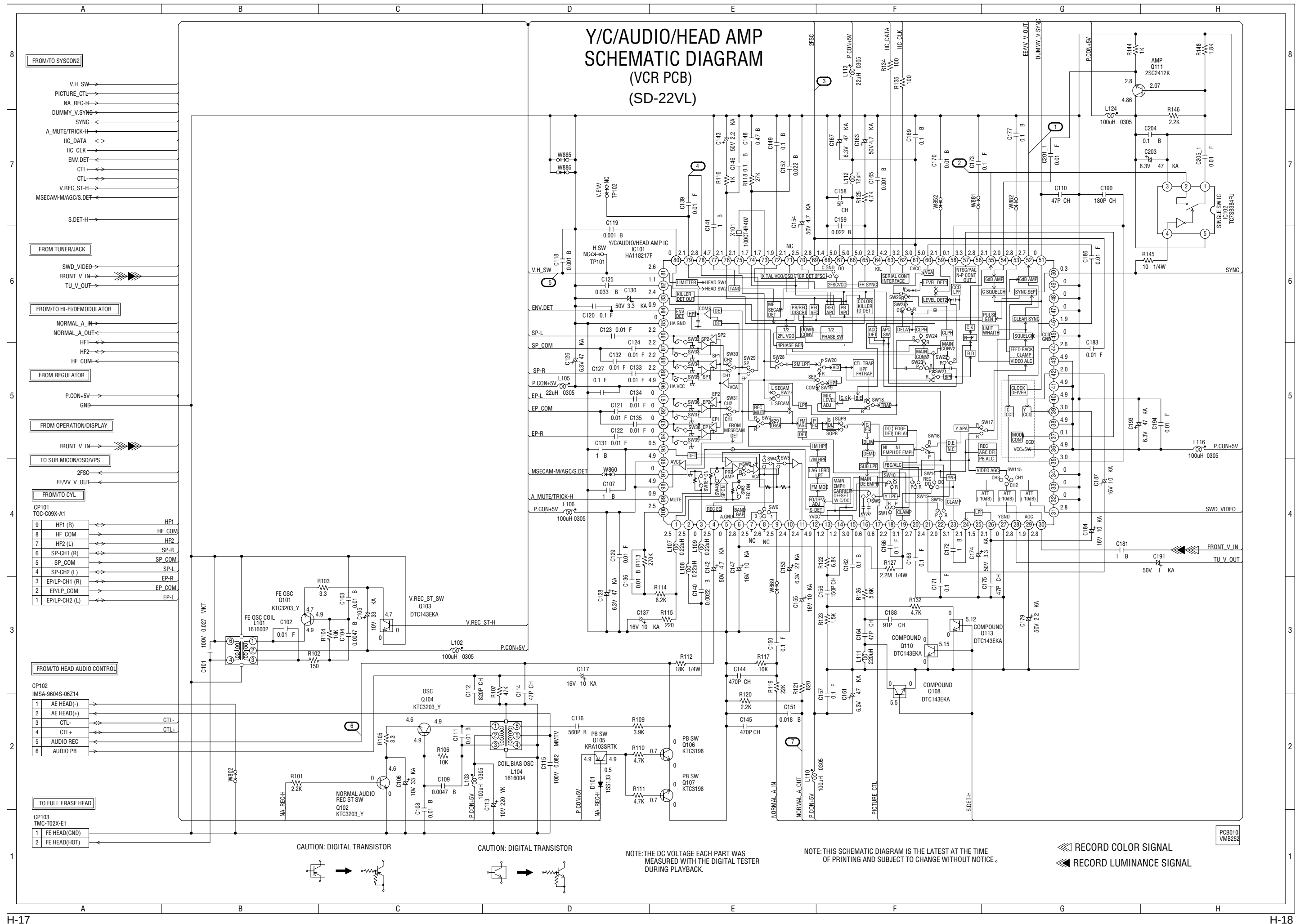
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB010
VMA252

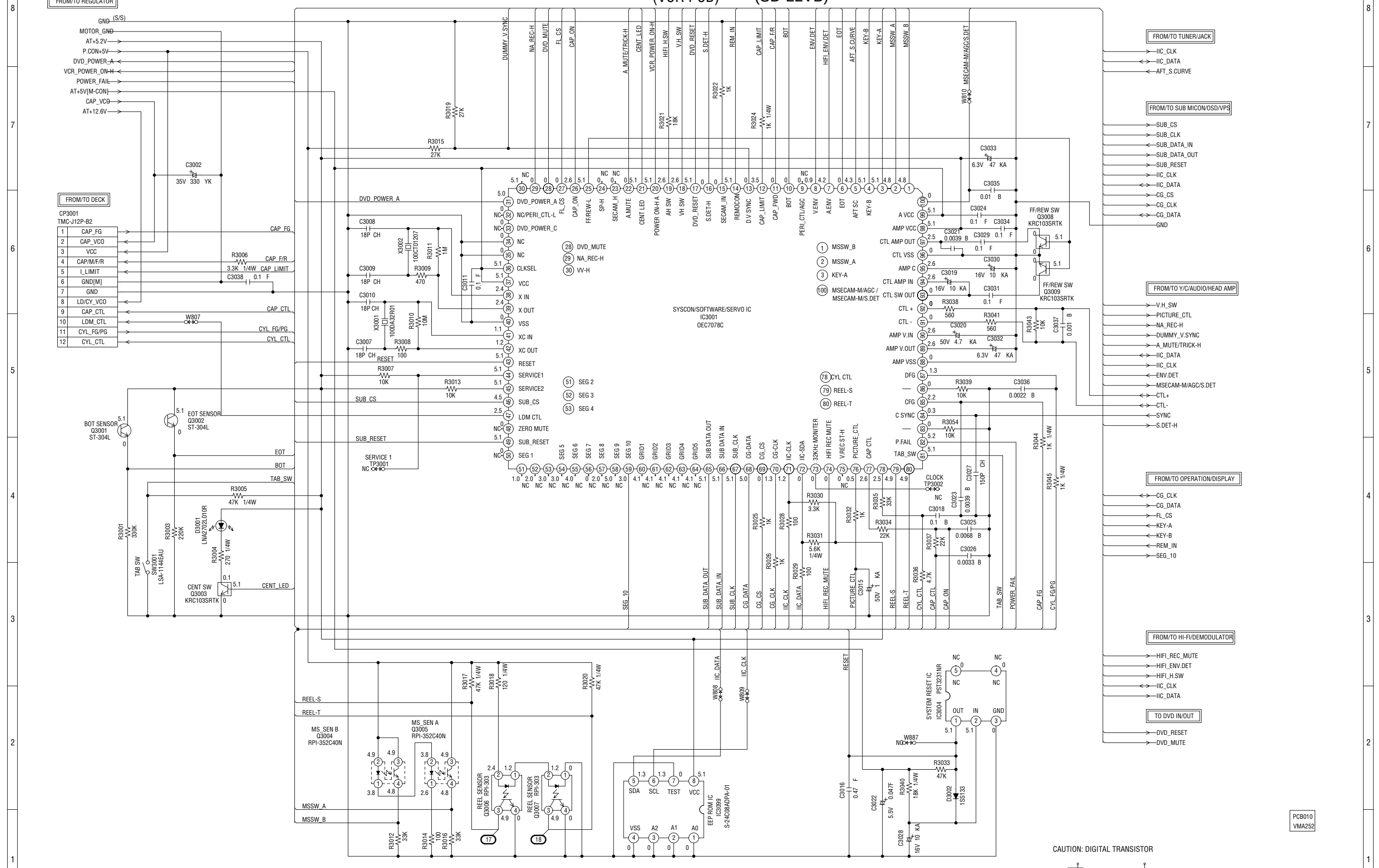
Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (VCR PCB) (SD-22VE)



Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (VCR PCB) (SD-22VL)

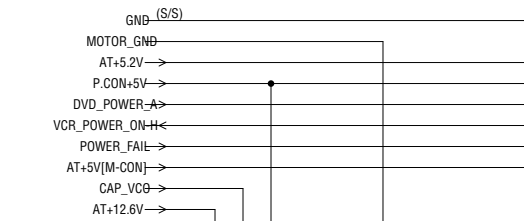


VCR SYSCON SCHEMATIC DIAGRAM (VCR PCB) (SD-22VB)

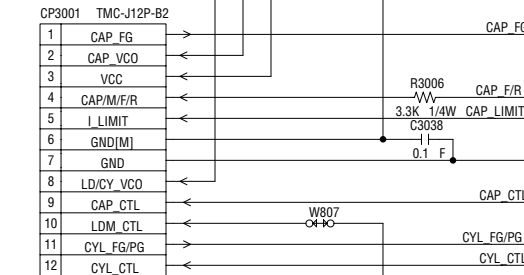


VCR SYSCON SCHEMATIC DIAGRAM
(VCR PCB) (SD-22VE)

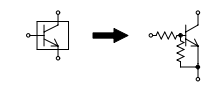
FROM/TO REGULATOR



FROM/TO DECK

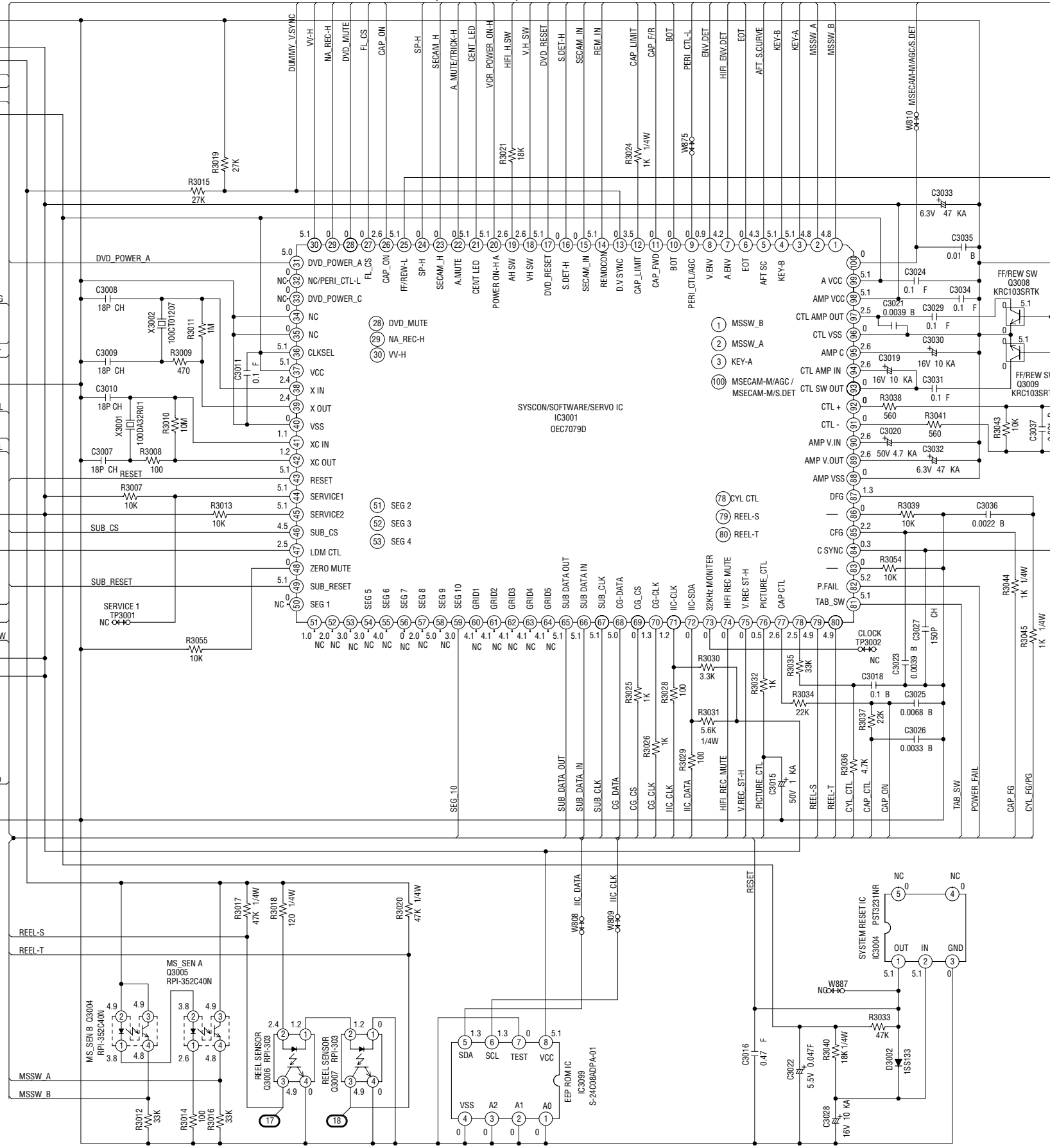


CAUTION: DIGITAL TRANSISTOR

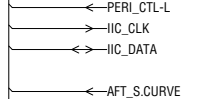


NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

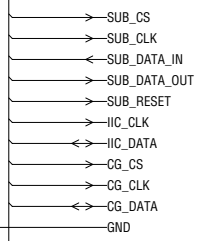
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.



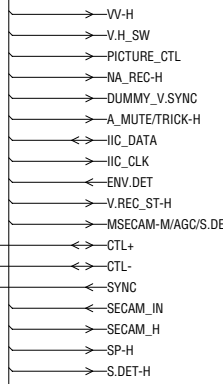
FROM/TO TUNER/JACK



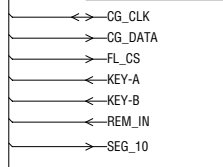
FROM/TO SUB MICON/OSD/VPS



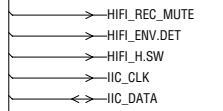
FROM/TO Y/C/AUDIO/HEAD AMP



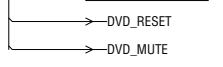
FROM/TO OPERATION/DISPLAY



FROM/TO HI-FI/DEMODULATOR

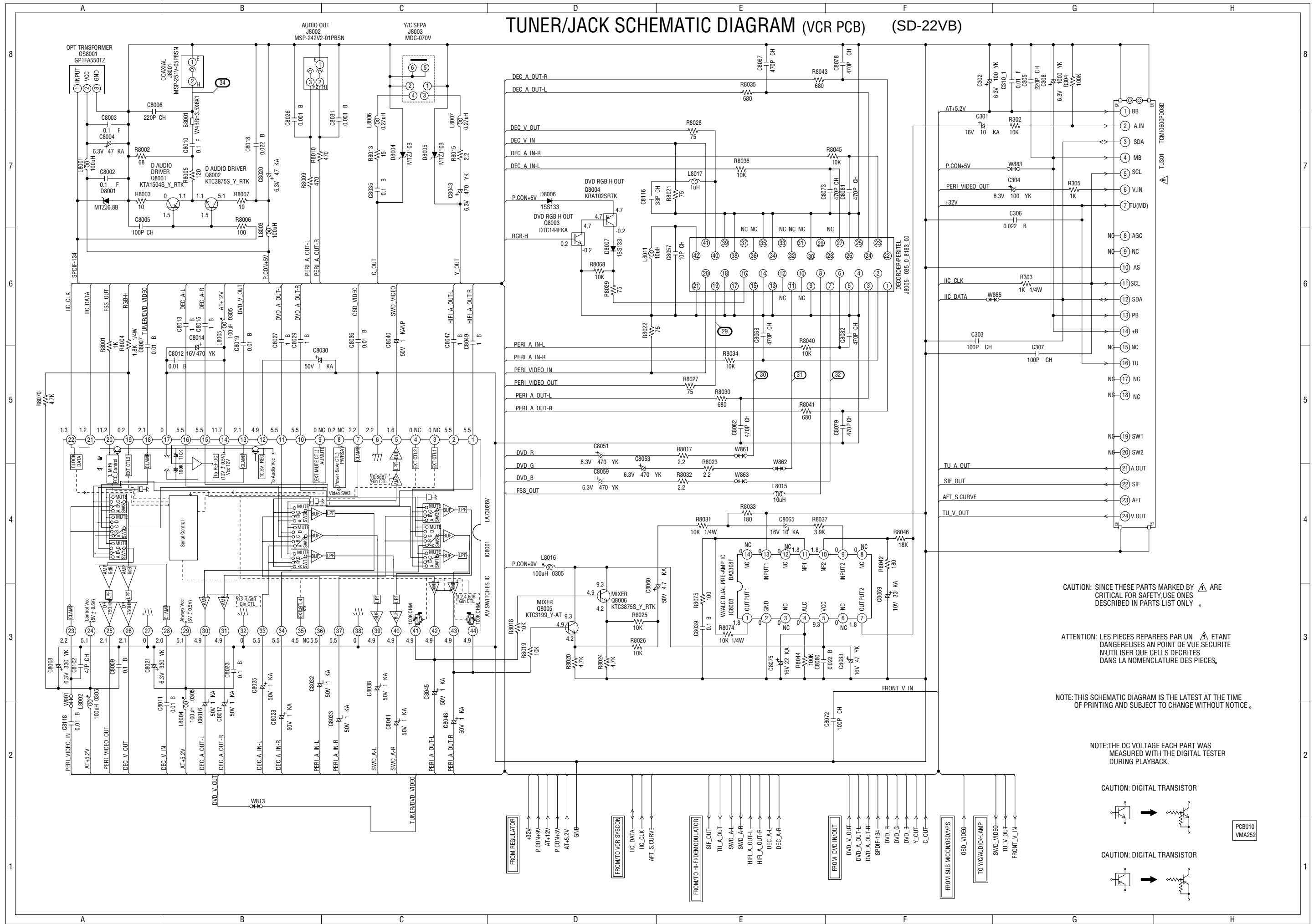


TO DVD IN/OUT



PCB010
VMB252

TUNER/JACK SCHEMATIC DIAGRAM (VCR PCB) (SD-22VB)



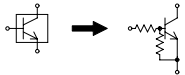
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIECES REPARÉES PAR UN  ÉTANT DANGEREUSES AN POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLS DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

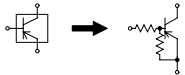
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR

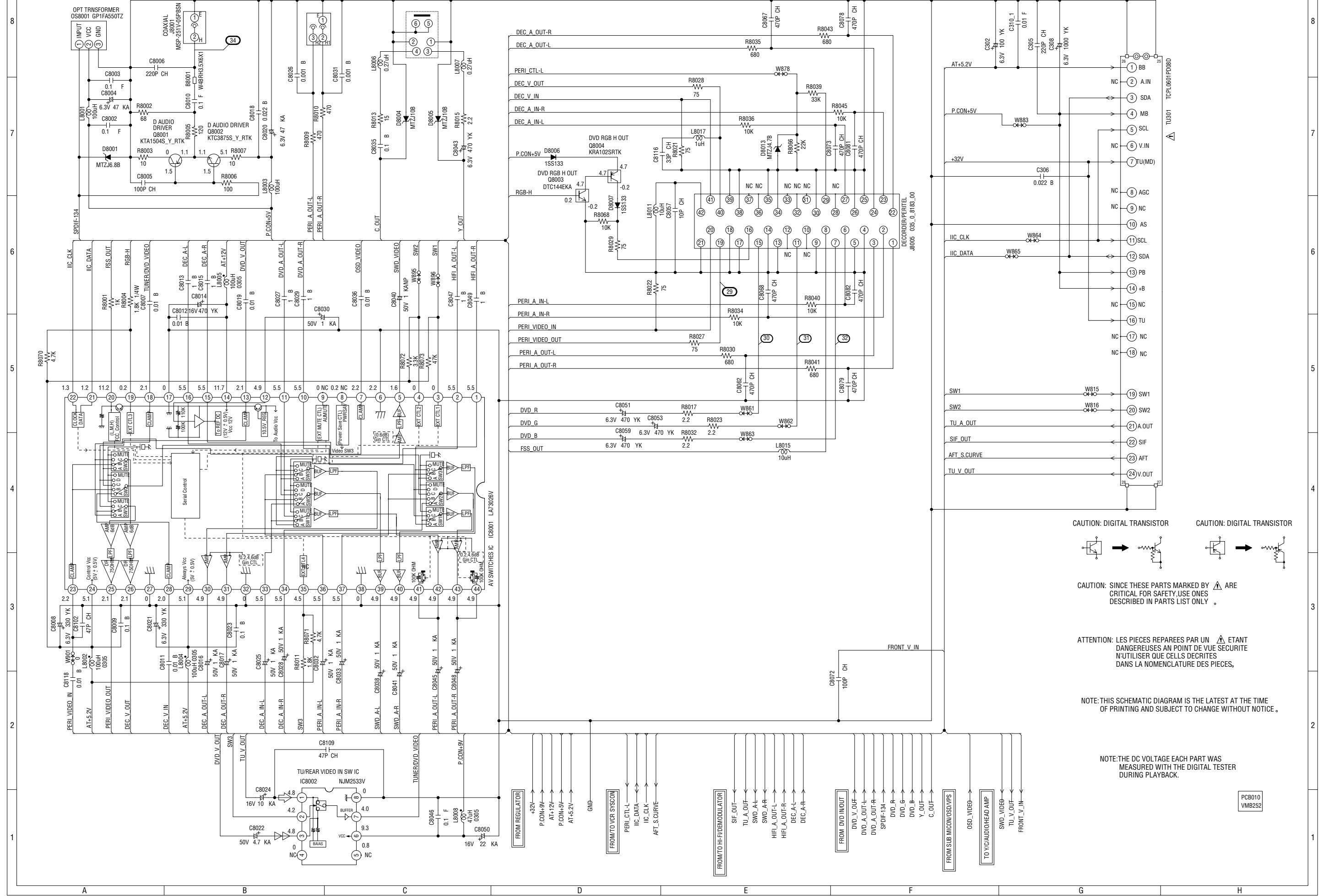


CAUTION: DIGITAL TRANSISTOR



PCB010
VMA252

TUNER/JACK SCHEMATIC DIAGRAM (VCR PCB) (SD-22VE)



CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR

CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

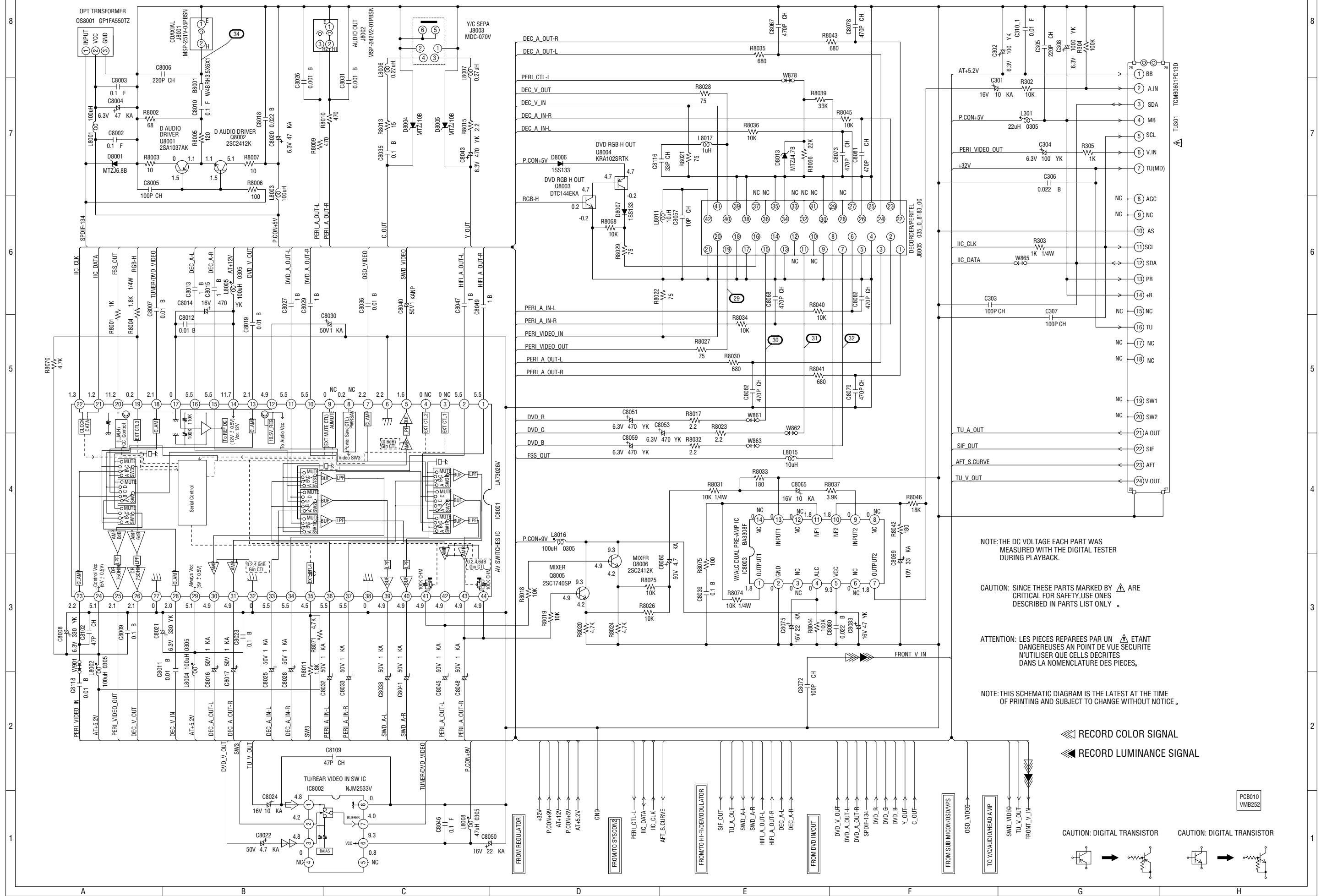
ATTENTION: LES PIECES REPARÉES PAR UN  ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

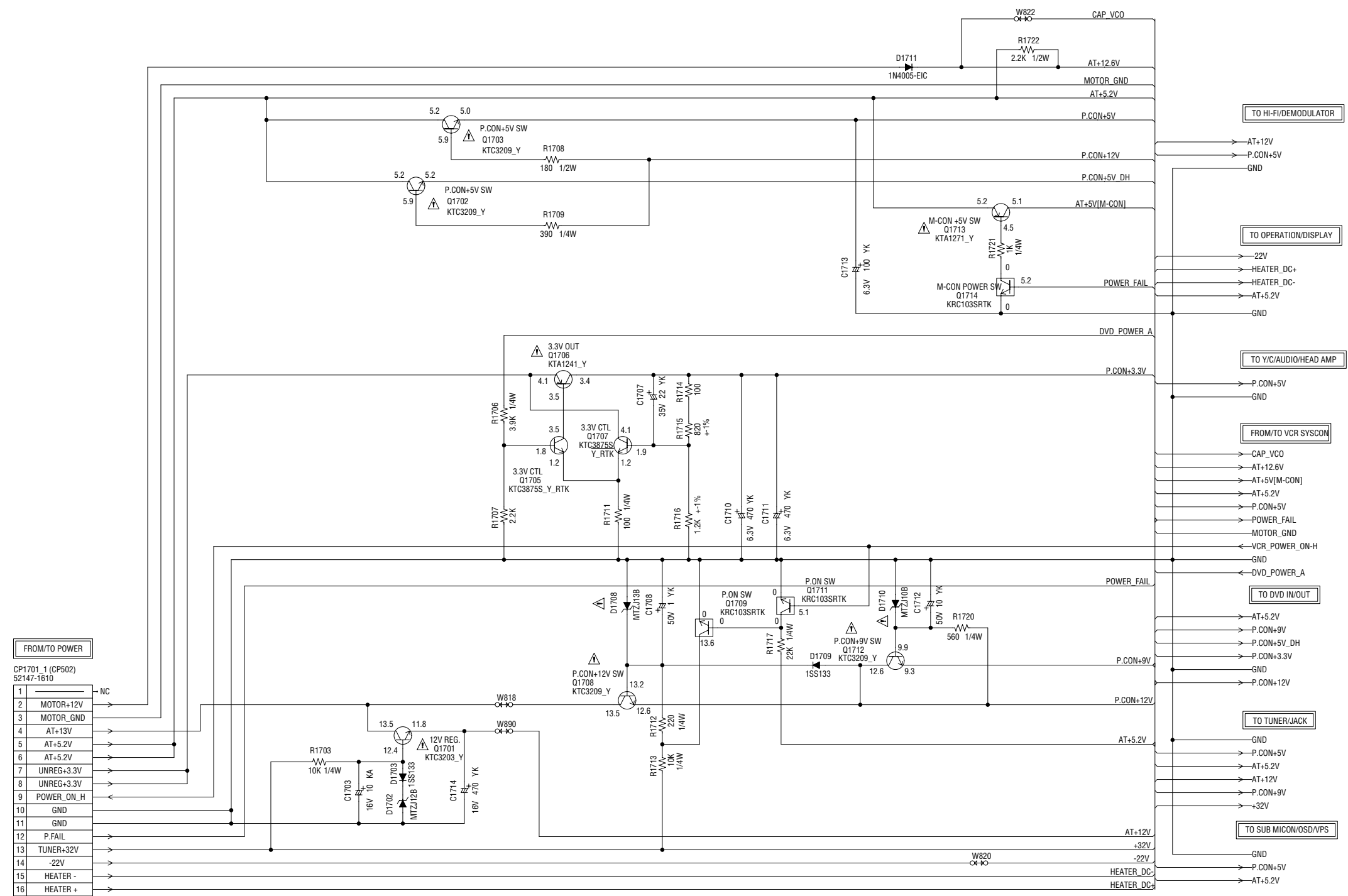
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PC8010
VMB252

TUNER/JACK SCHEMATIC DIAGRAM (VCR PCB) (SD-22VL)



REGULATOR SCHEMATIC DIAGRAM
(VCR PCB)
(SD-22VB)



NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

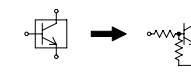
ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMÉNCLEATURE DES PIÈCES.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

CAUTION: DIGITAL TRANSISTOR

PC8010
VMA252

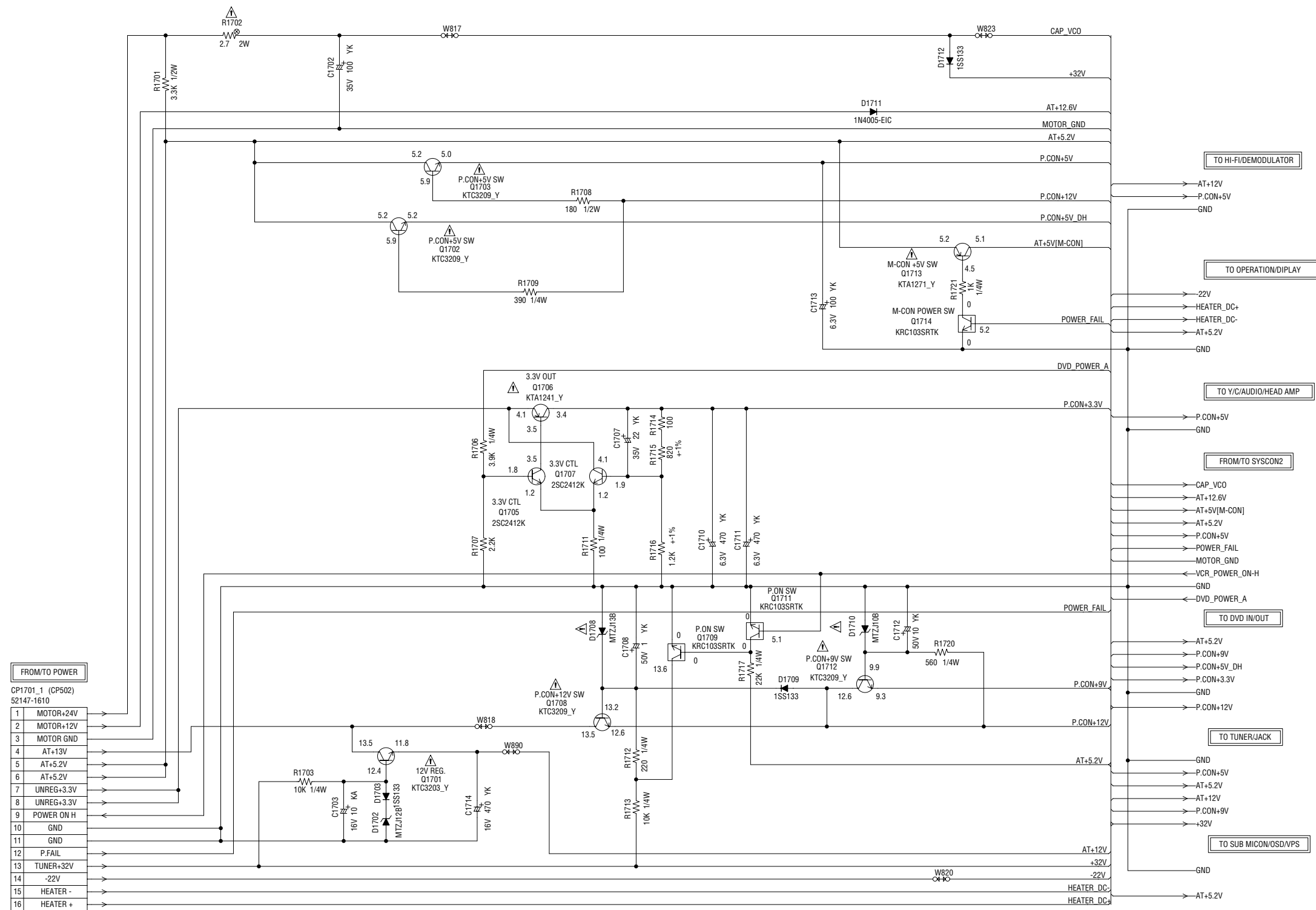
(SD-22VE)



REGULATOR SCHEMATIC DIAGRAM

(VCR PCB)

(SD-22VL)



FROM/TO POWER	
1	MOTOR+24V
2	MOTOR+12V
3	MOTOR GND
4	AT+13V
5	AT+5.2V
6	AT+5.2V
7	UNREG+3.3V
8	UNREG+3.3V
9	POWER ON H
10	GND
11	GND
12	P.FAIL
13	TUNER+32V
14	-22V
15	HEATER -
16	HEATER +

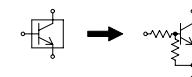
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

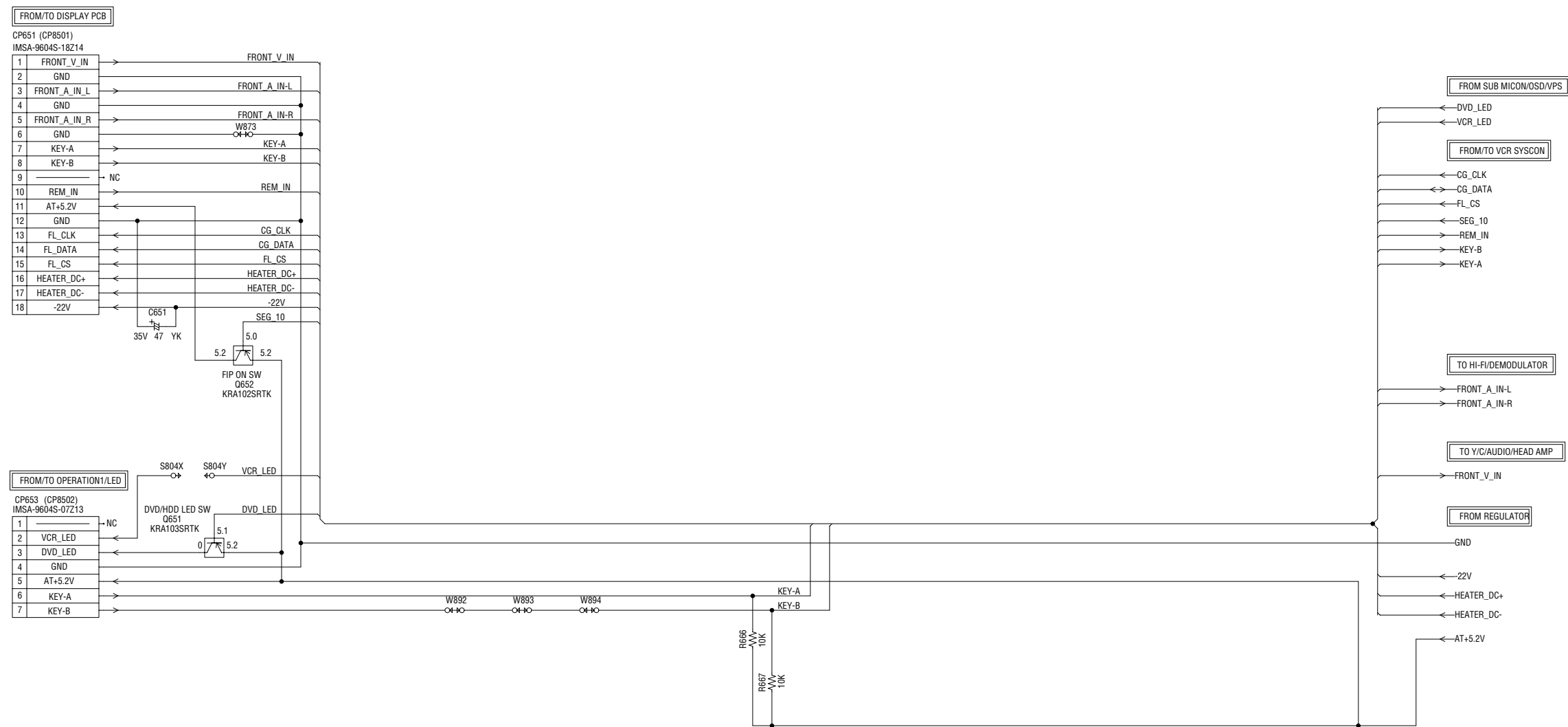
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

CAUTION: DIGITAL TRANSISTOR



PCB010
VMB252

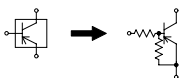
OPERATION/DISPLAY SCHEMATIC DIAGRAM
(VCR PCB)



NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

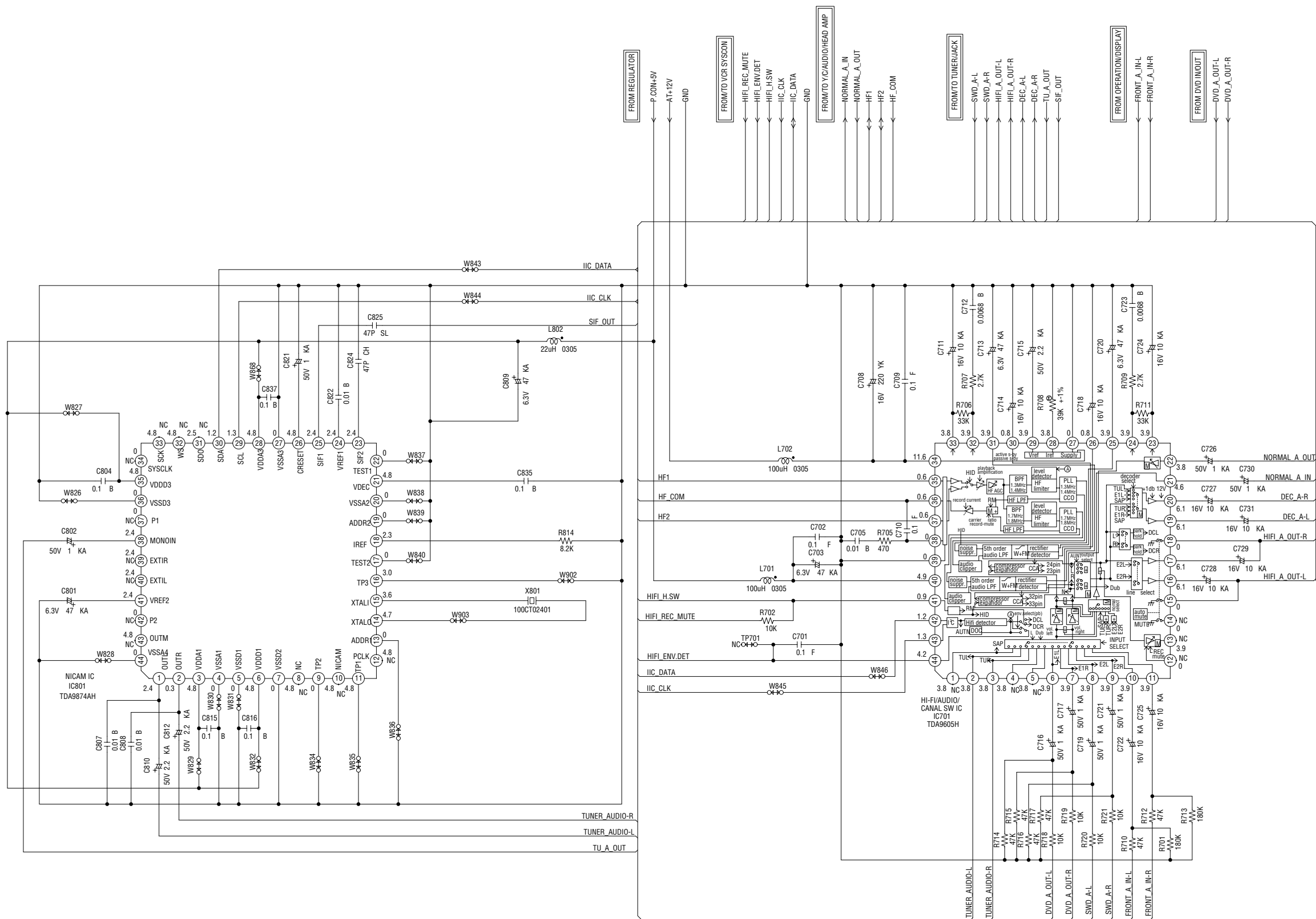
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR



PC8010
VMA252

HI-FI/DEMODULATOR SCHEMATIC DIAGRAM
(VCR PCB)

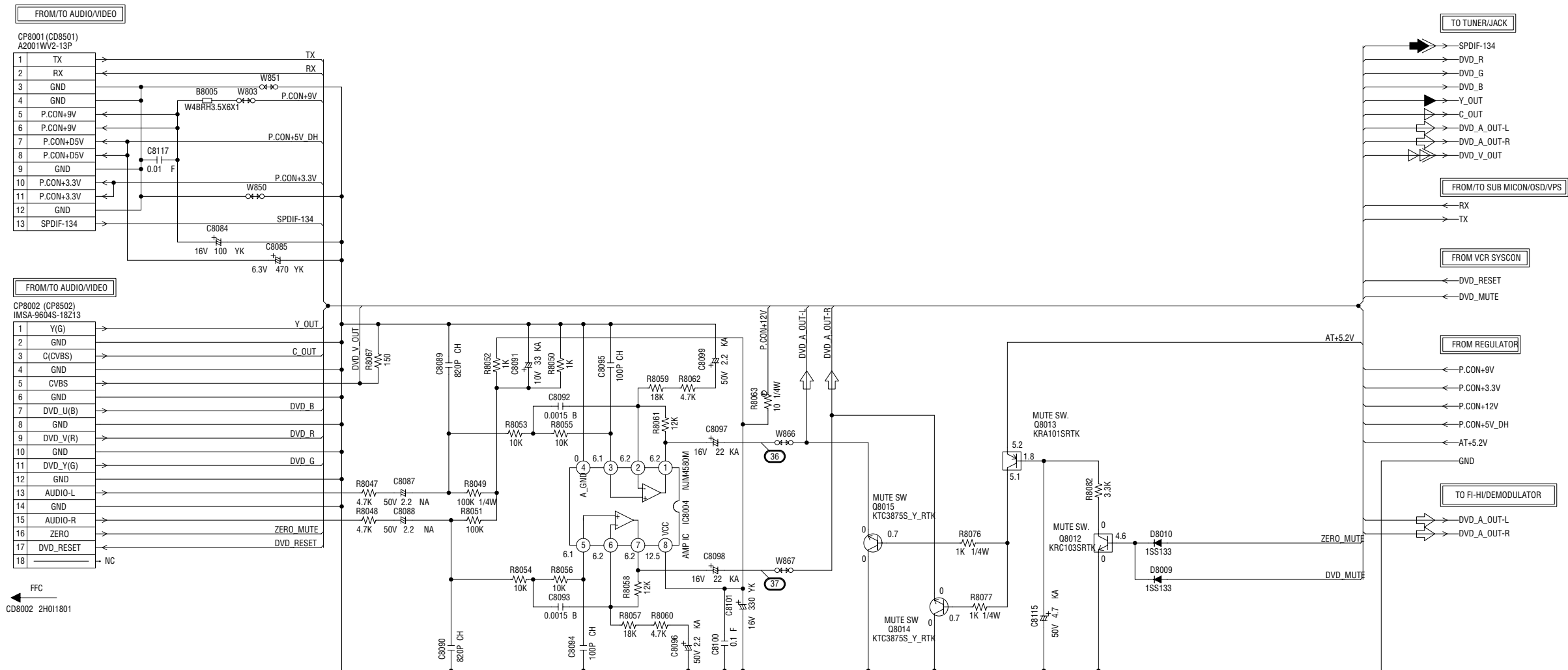


NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB010
VMA252

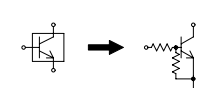
DVD IN/OUT SCHEMATIC DIAGRAM
(VCR PCB)
(SD-22VB, SD-22VE)



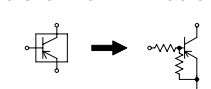
NOTE:THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR

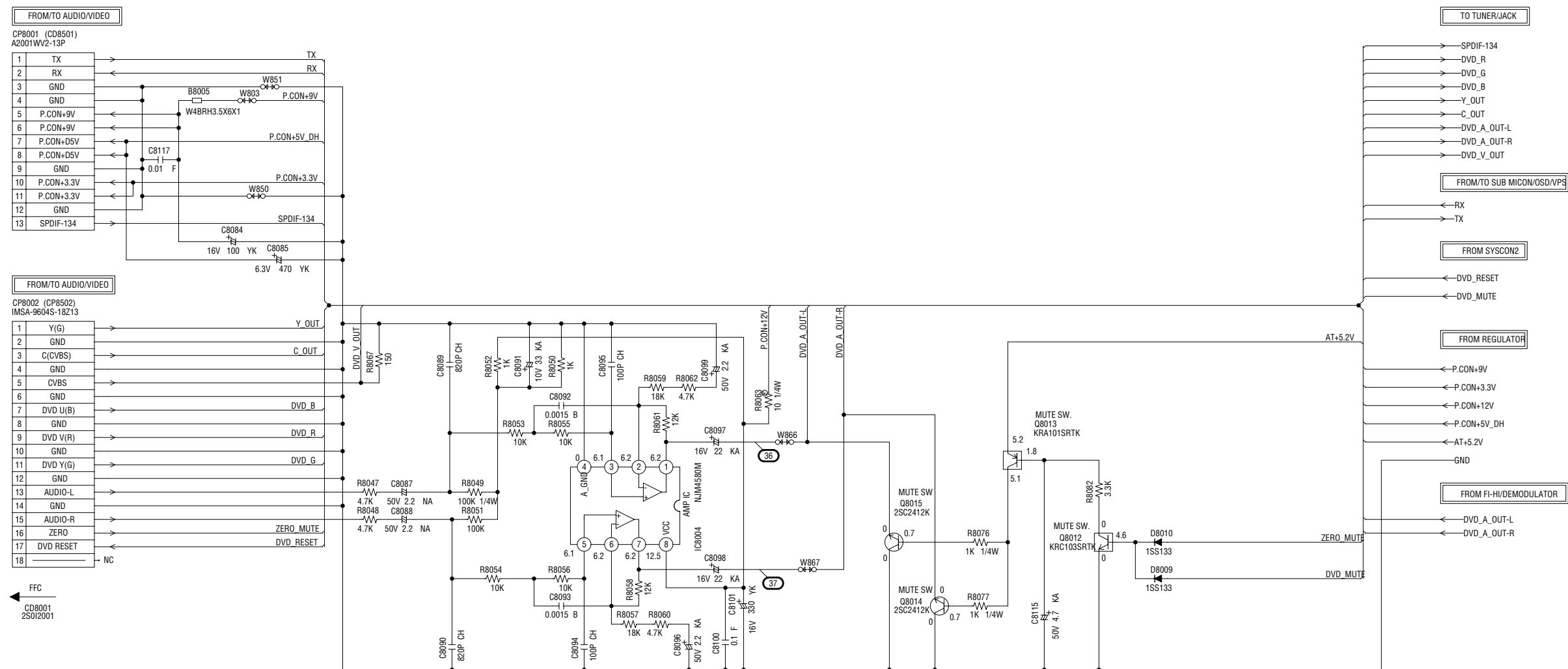


CAUTION: DIGITAL TRANSISTOR



PCB010
VMA252

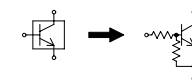
DVD IN/OUT SCHEMATIC DIAGRAM
(VCR PCB)
(SD-22VL)



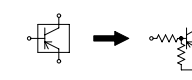
NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR



CAUTION: DIGITAL TRANSISTOR

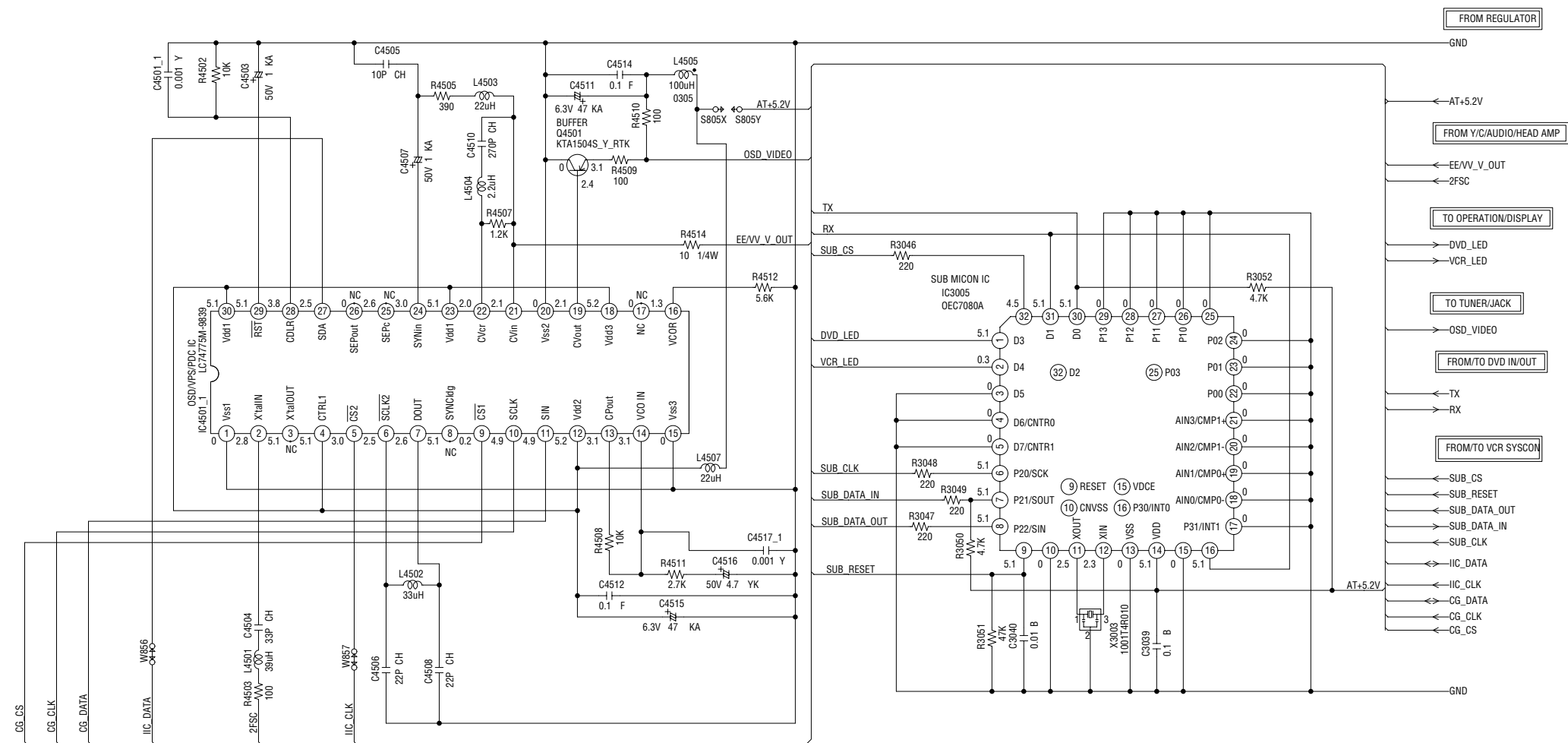


PCB010
VMB252

(SD-22VB, SD-22VL)

PCB010
VMA252

SUB MICON/OSD/VPS SCHEMATIC DIAGRAM
(VCR PCB)
(SD-22VE)

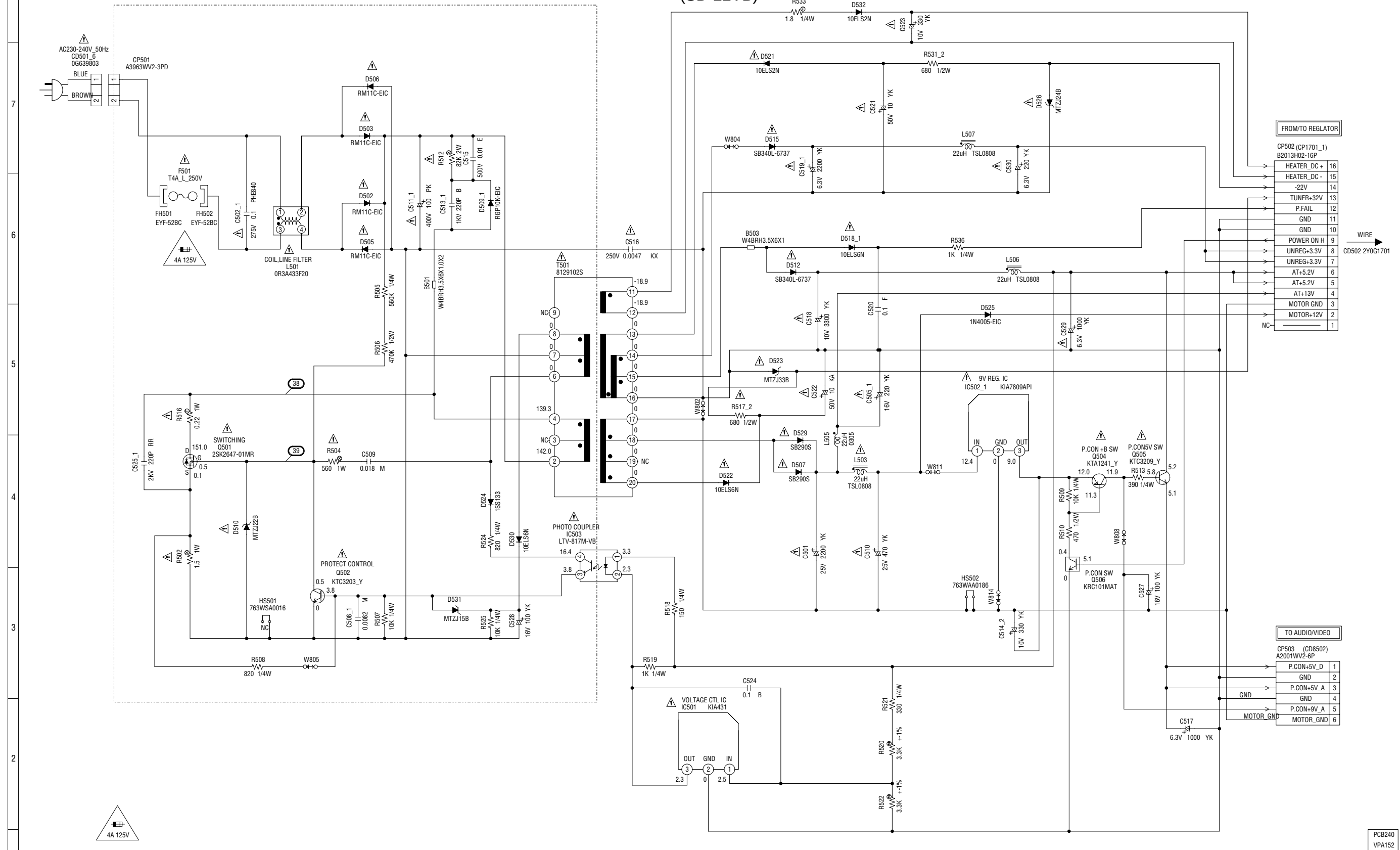


NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

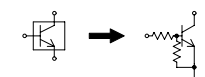
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB010
VMB252

(POWER PCB)
(SD-22VB)



CAUTION: DIGITAL TRANSISTOR



CAUTION:FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE 4A 125V(F501).

ATTENTION:POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE
N'UTOLISER QUE DES FUSIBLE DE MEME TYPE 4A 125V(F501).

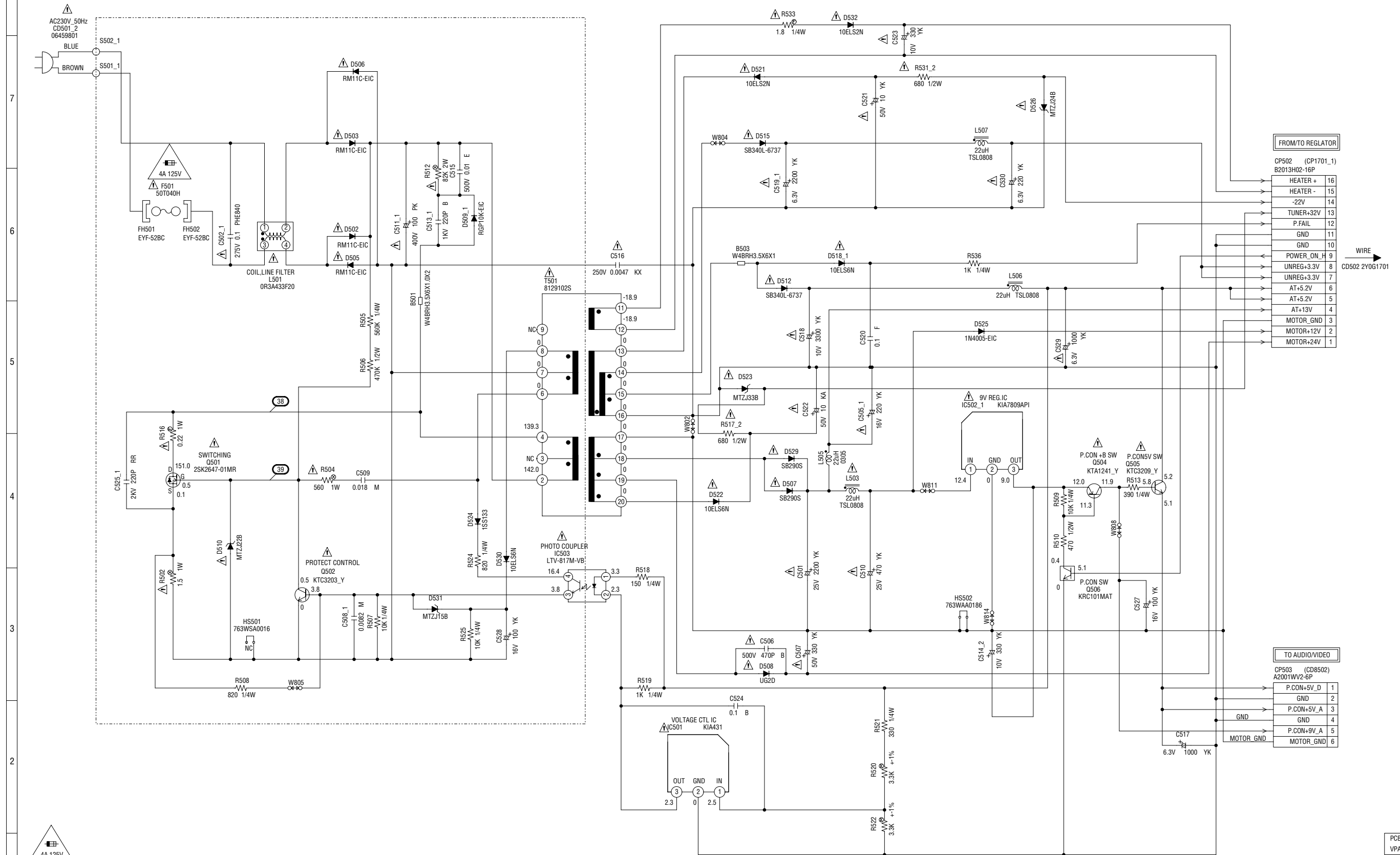
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIÈCES RÉPARÉES PAR UN  ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

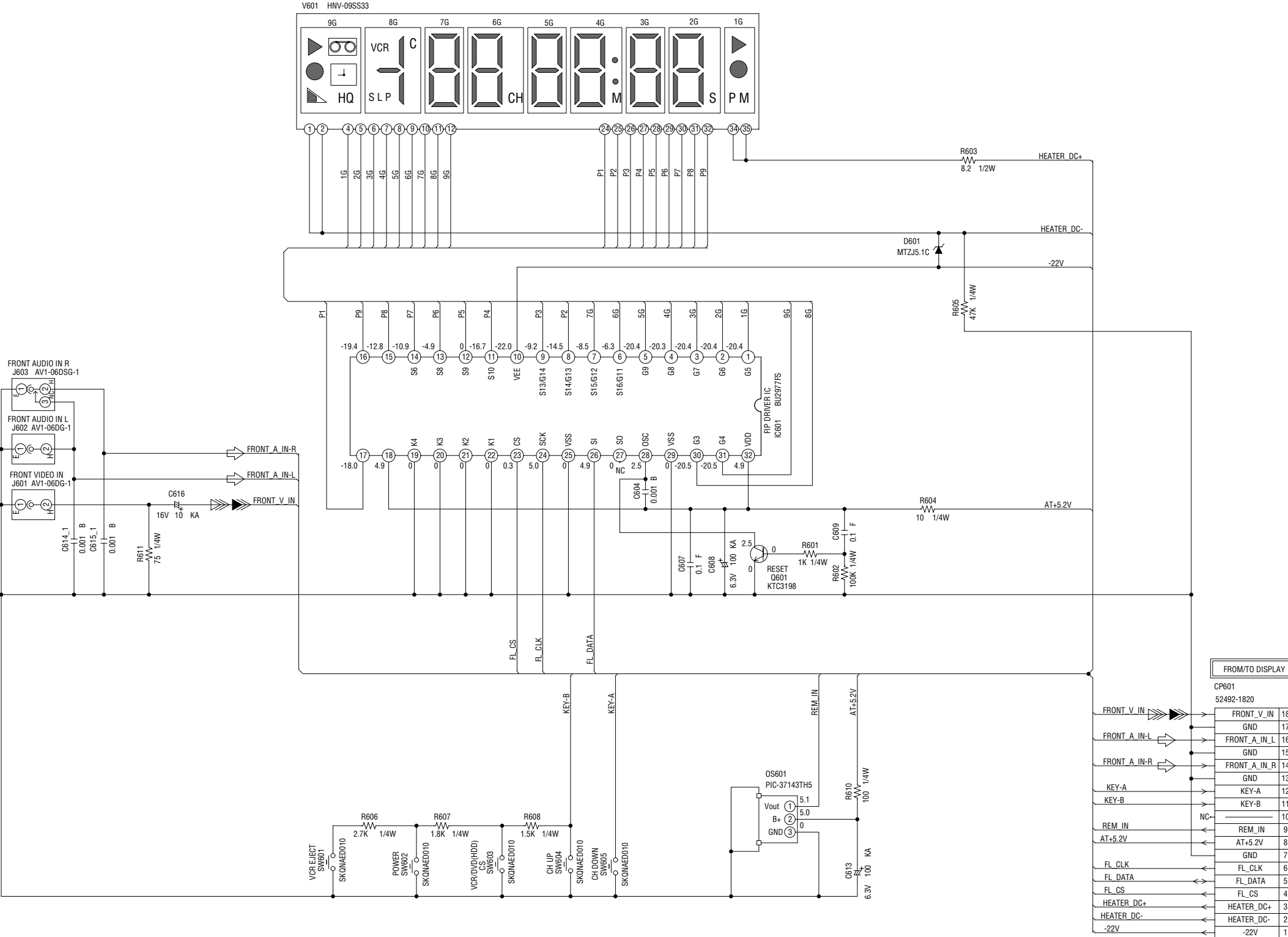
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE:THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

POWER SCHEMATIC DIAGRAM (POWER PCB) (SD-22VE, SD-22VL)



(DISPLAY PCB)



NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

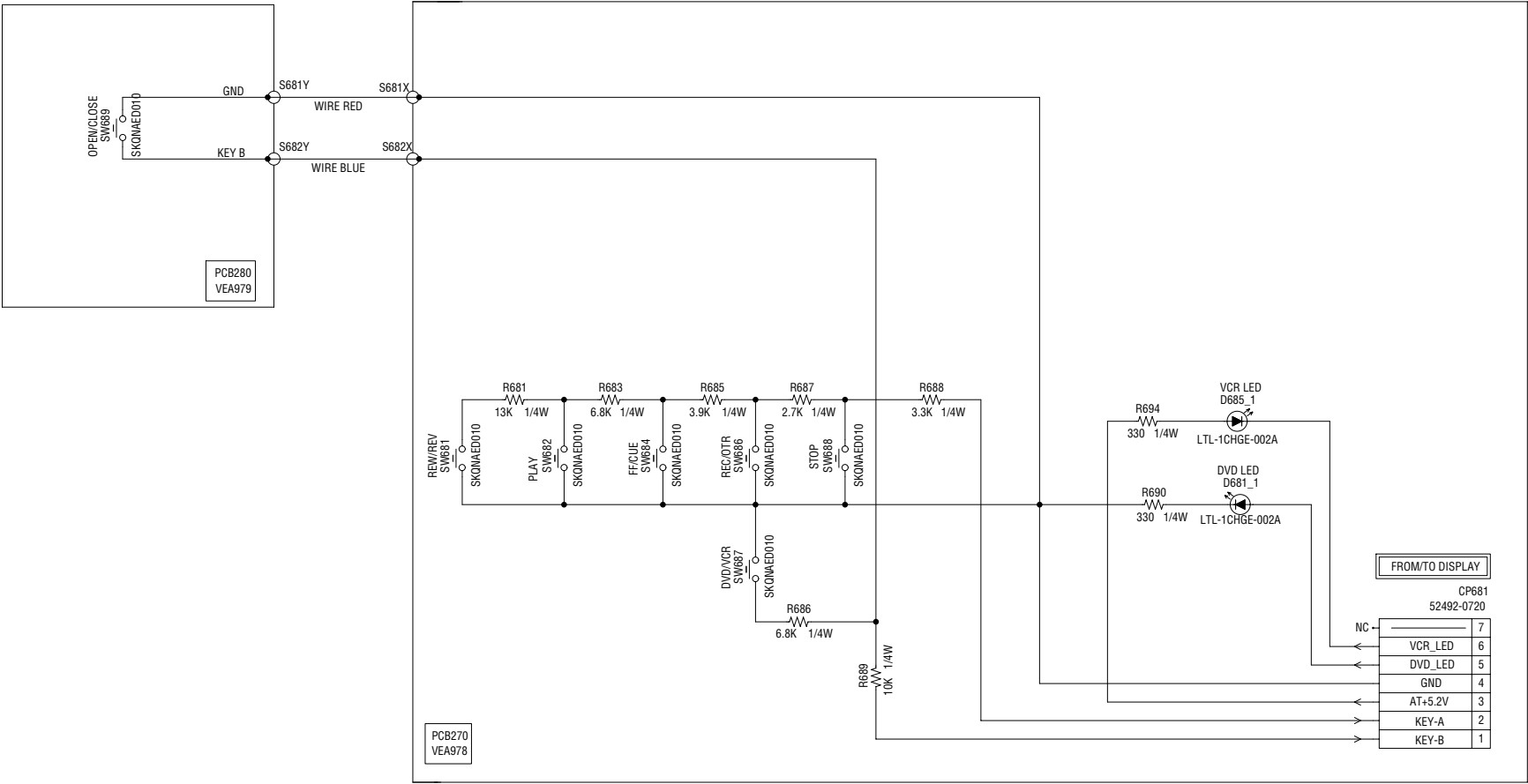
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

≪≪ RECORD COLOR SIGNAL
 ≪≡ RECORD LUMINANCE SIGNAL
 ≪= AUDIO SIGNAL(REC)

OPERATION SCHEMATIC DIAGRAM

(OPERATION2 PCB)

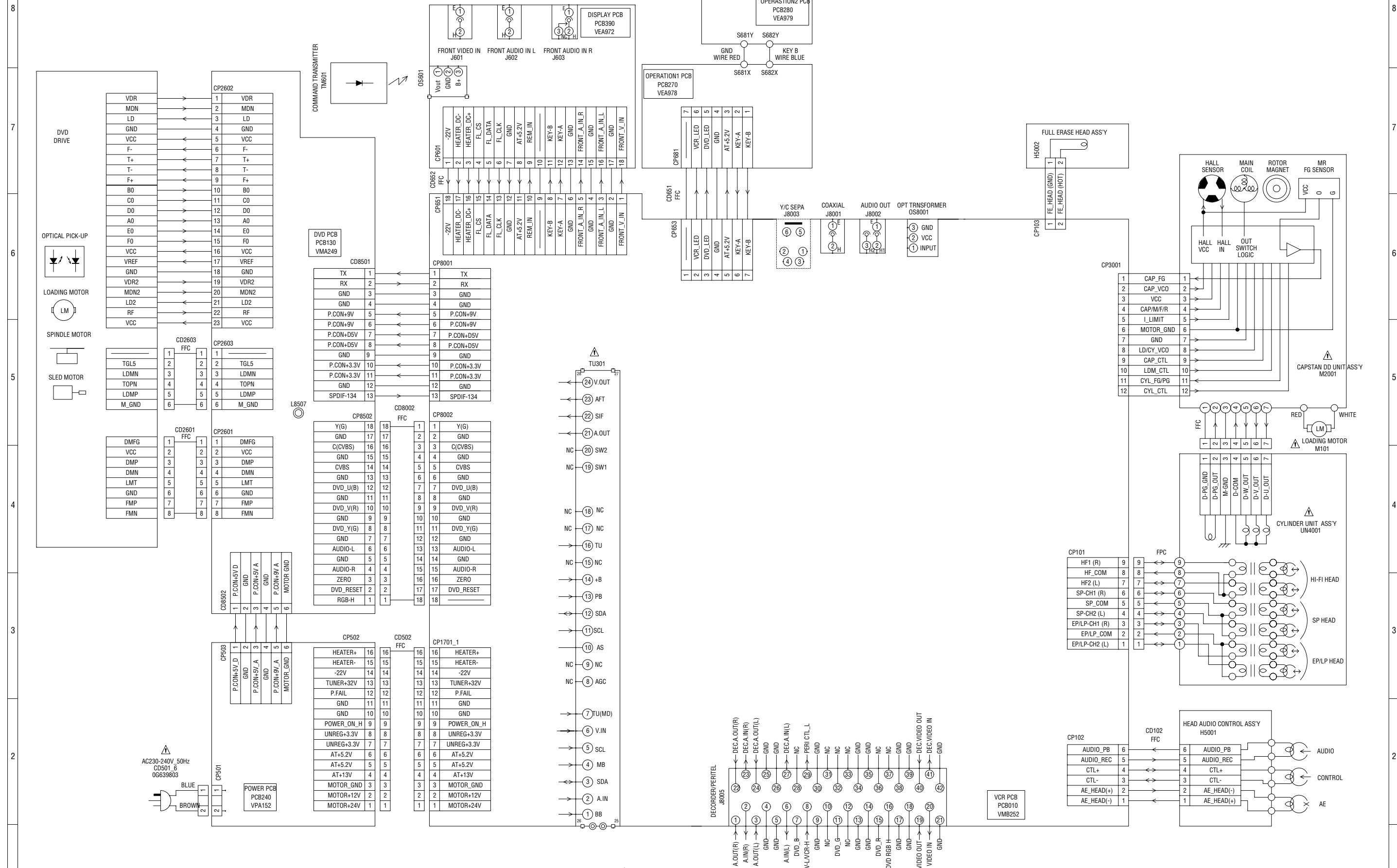
(OPERATION1 PCB)



NOTE:THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

INTERCONNECTION DIAGRAM (SD-22VB)



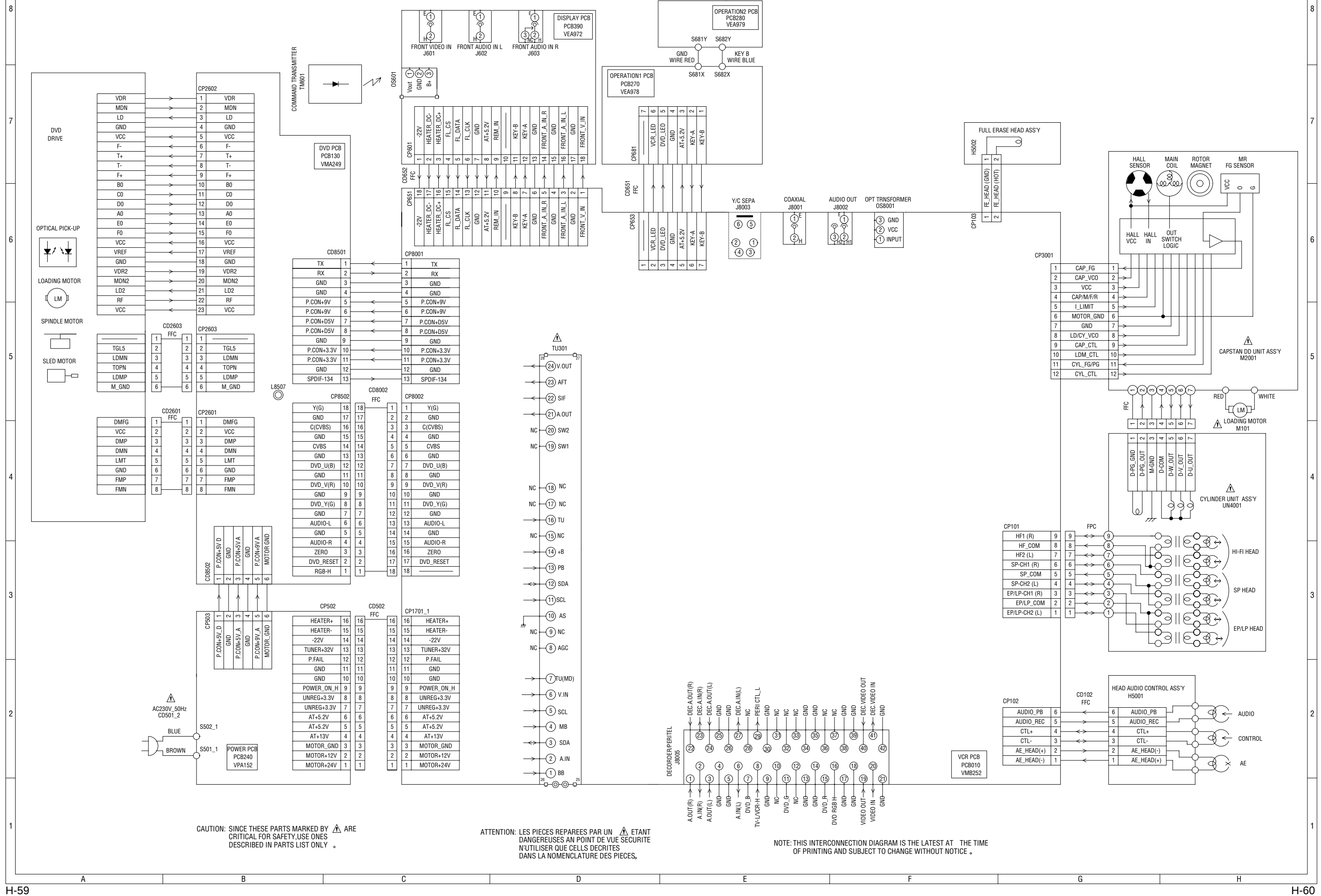
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ⚠ ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

INTERCONNECTION DIAGRAM

(SD-22VE, SD-22VL)

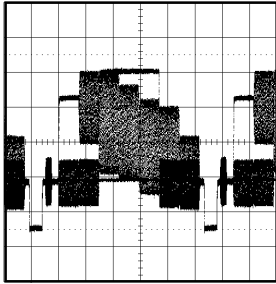


WAVEFORMS

Y/C/AUDIO/HEAD AMP

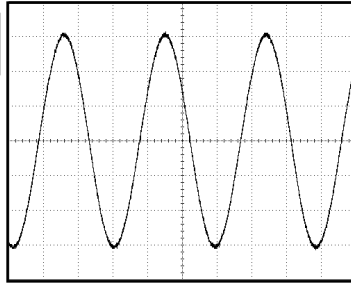
REC
10 μ s
0.5V

①



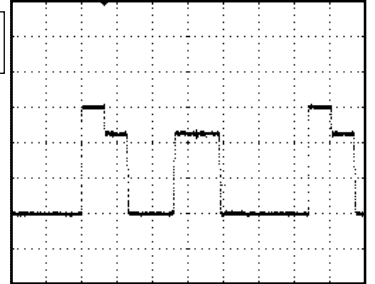
REC
5 μ s
10V

⑥



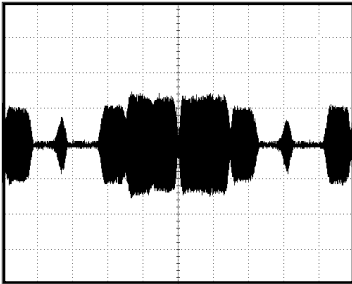
10 μ s
500mV

③⑦



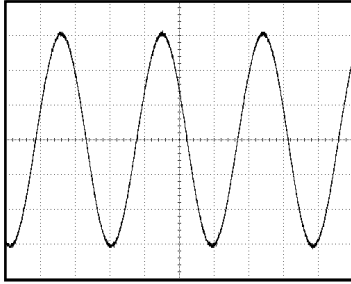
PB
10 μ s
200mV

②



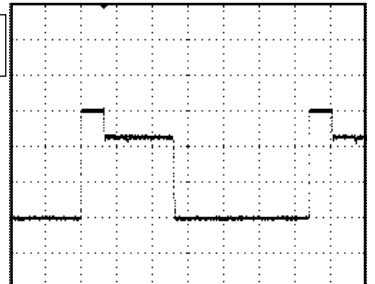
REC
5 μ s
10V

⑦



10 μ s
500mV

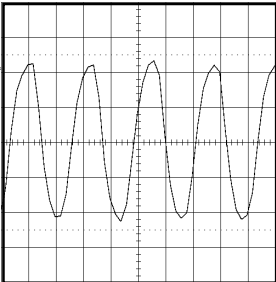
③①



VCR SYSCON

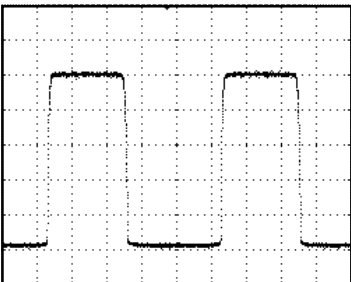
POWER ON
50ns
100mV

③



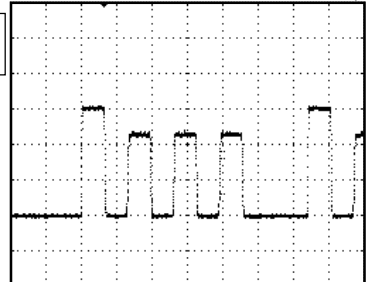
PB
200ms
1.0V

①⑦



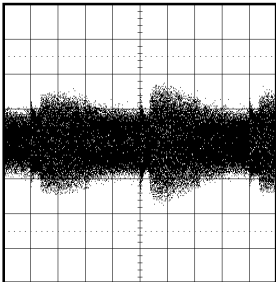
10 μ s
500mV

③②



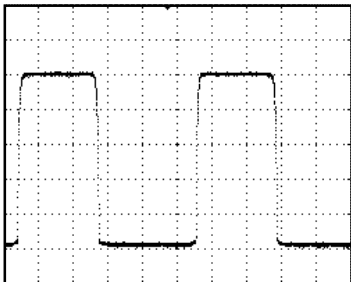
PB
5ms
100mV

④



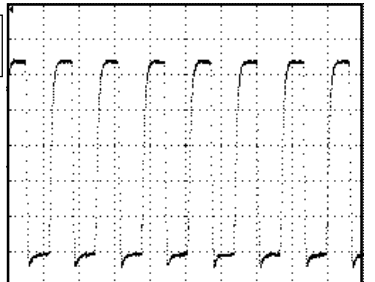
PB
200ms
1.0V

①⑧



500ns
100mV

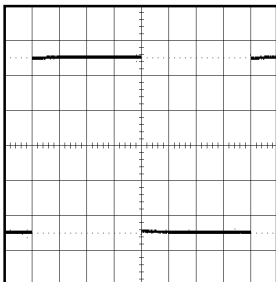
③④



TUNER/JACK

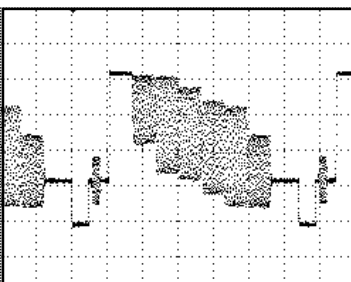
REC, PB
5ms
1V

⑤



10 μ s
500mV

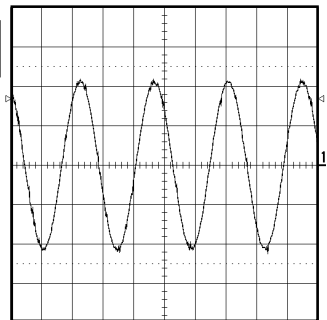
②⑨



DVD IN/OUT

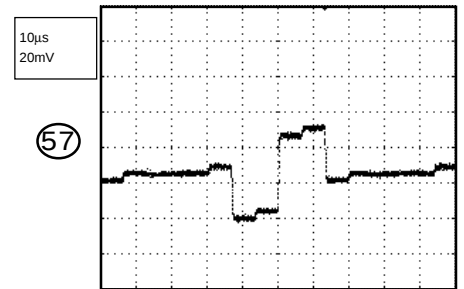
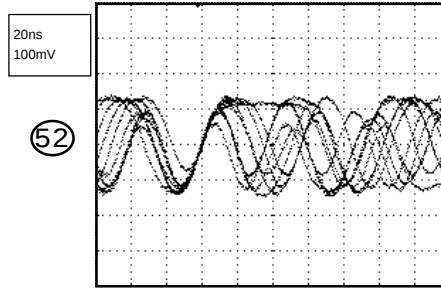
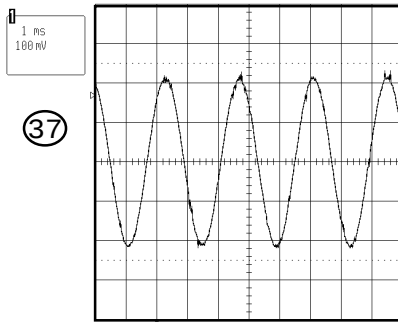
1 ns
100 mV

③⑥

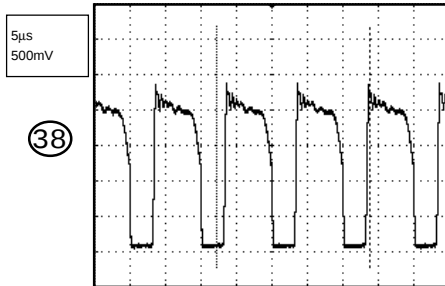


NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

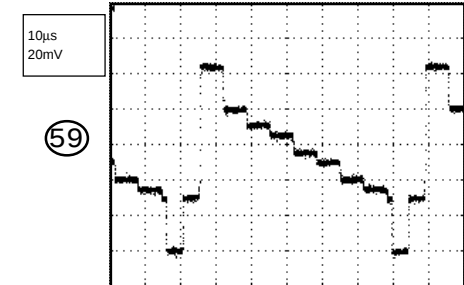
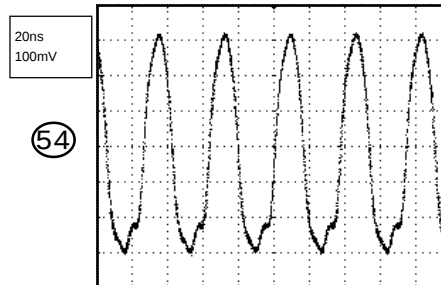
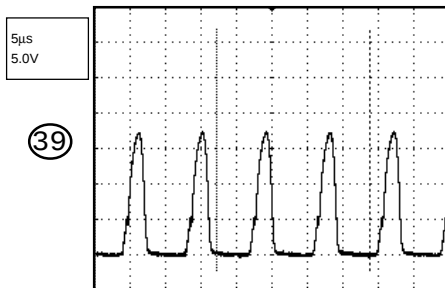
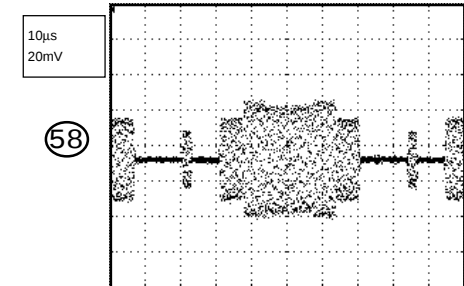
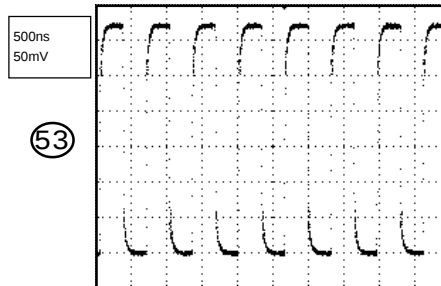
WAVEFORMS



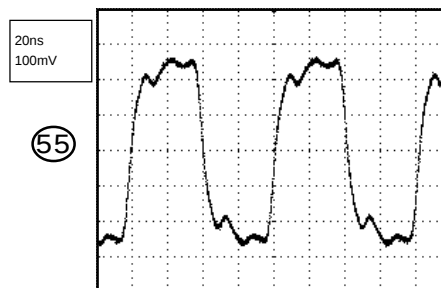
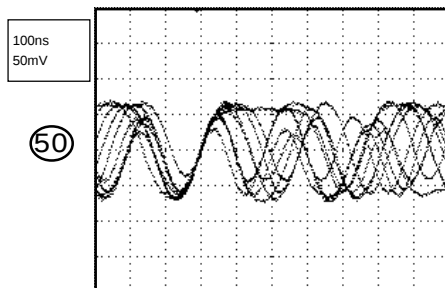
POWER



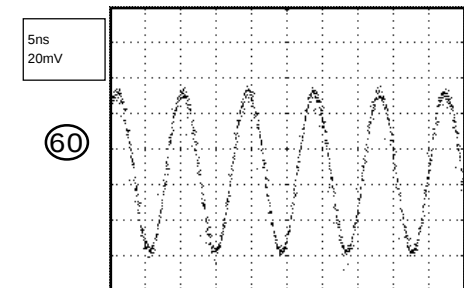
MPEG



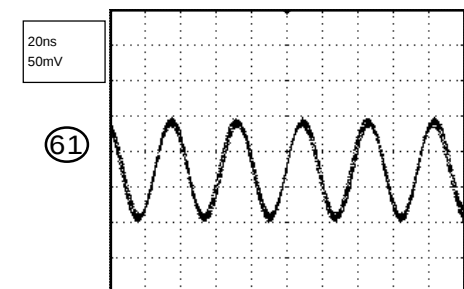
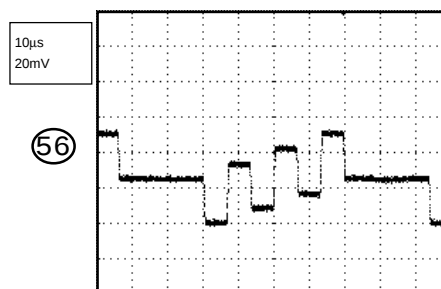
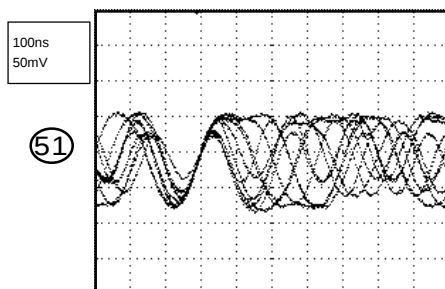
READ CHANNEL



MEMORY

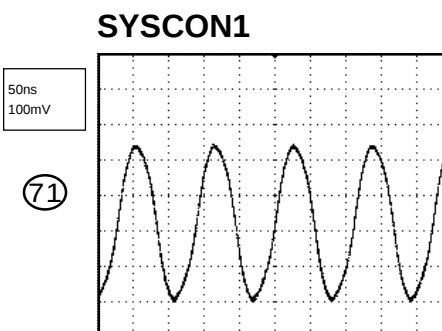
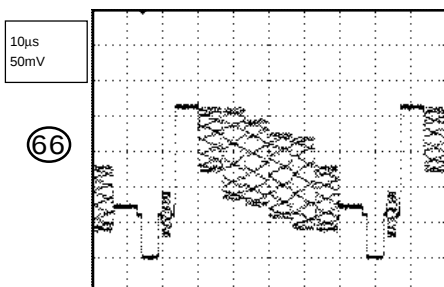
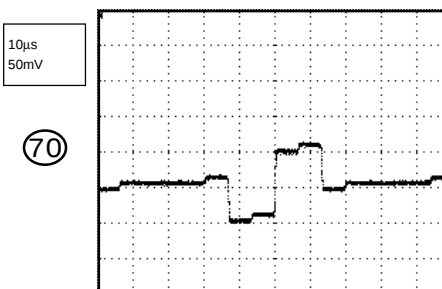
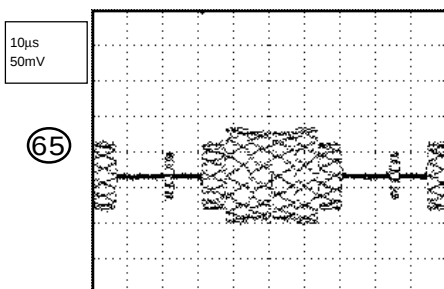
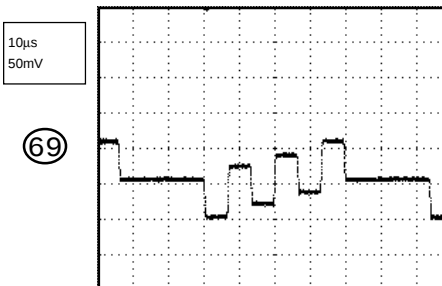
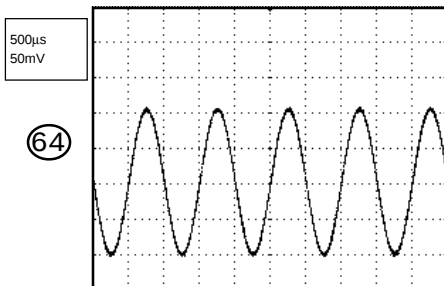
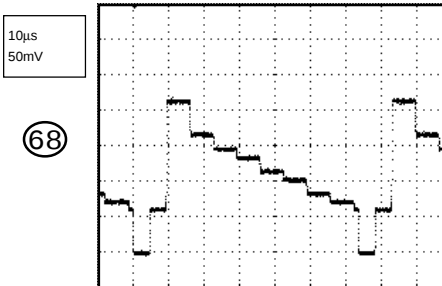
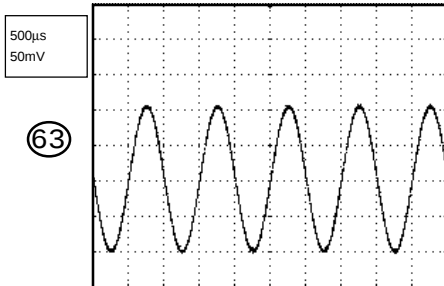
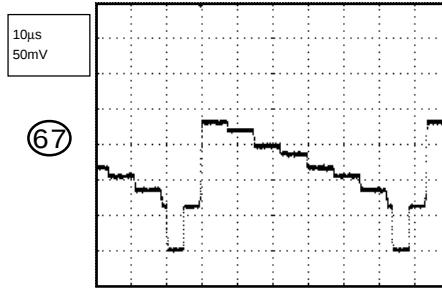
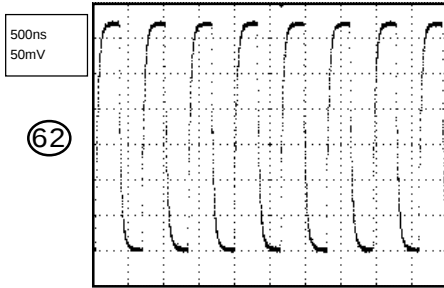


AUDIO/VIDEO



NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS



SYSCON1

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

TOSHIBA CORPORATION

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