



SERVICE MANUAL

NETWORK 3D BLU-RAY DISC / DVD PLAYER

SERVICE MANUAL

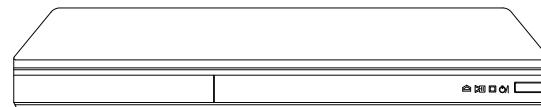
MODEL: BP630

CAUTION

BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS" IN THIS MANUAL.

P/NO : AFN75875764

APRIL, 2013



LG

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SECTION 1

SUMMARY

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PRODUCT SAFETY SERVICING GUIDELINES FOR BLU-RAY DISC / DVD PLAYER PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard.

These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

CAUTION : Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS

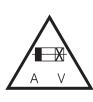
The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:



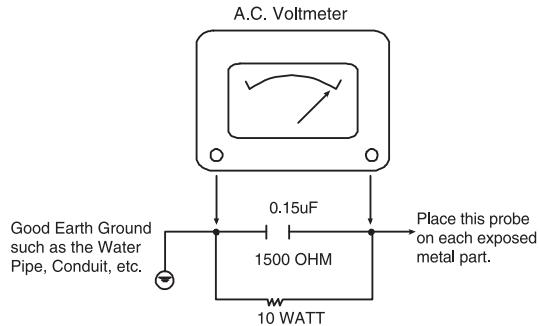
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 millamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

SERVICING PRECAUTIONS

CAUTION: Before servicing the BLU-RAY DISC / DVD PLAYER covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS.

NOTE: if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.

Remember Safety First :

General Servicing Precautions

1. Always unplug the BLU-RAY DISC / DVD PLAYER AC power cord from the AC power source before:

- (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
- (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
- (3) Connecting a test substitute in parallel with an electrolytic capacitor.

Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this BLU-RAY DISC / DVD PLAYER or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.

Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

5. Do not apply AC power to this BLU-RAY DISC / DVD PLAYER and / or any of its electrical assemblies unless all solidstate device heat sinks are correctly installed.

6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.

Note 1 : Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks,etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil,or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

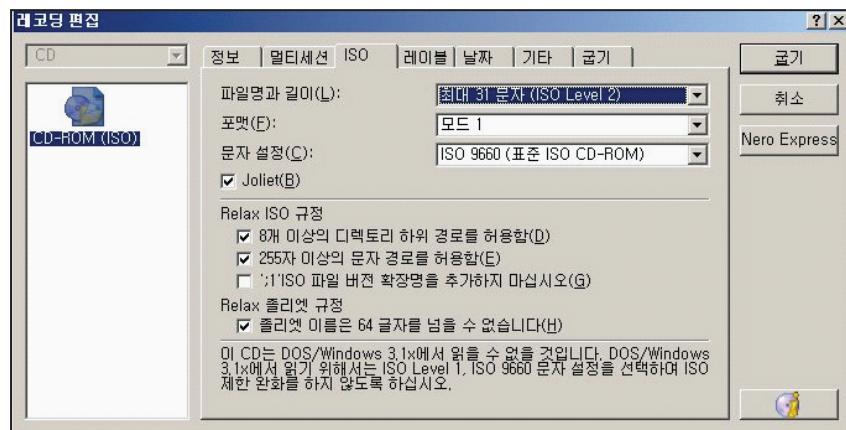
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

FIRMWARE UPDATE GUIDE

1. COPY AN UPDATE FILE TO A MEDIA (USB OR CD-ROM)

Update File Name: LG_BD_8110M60.ROM

- 1) An update file have to be copied onto the root of file system.
- 2) USB and CD-ROM are able to use firmware update.

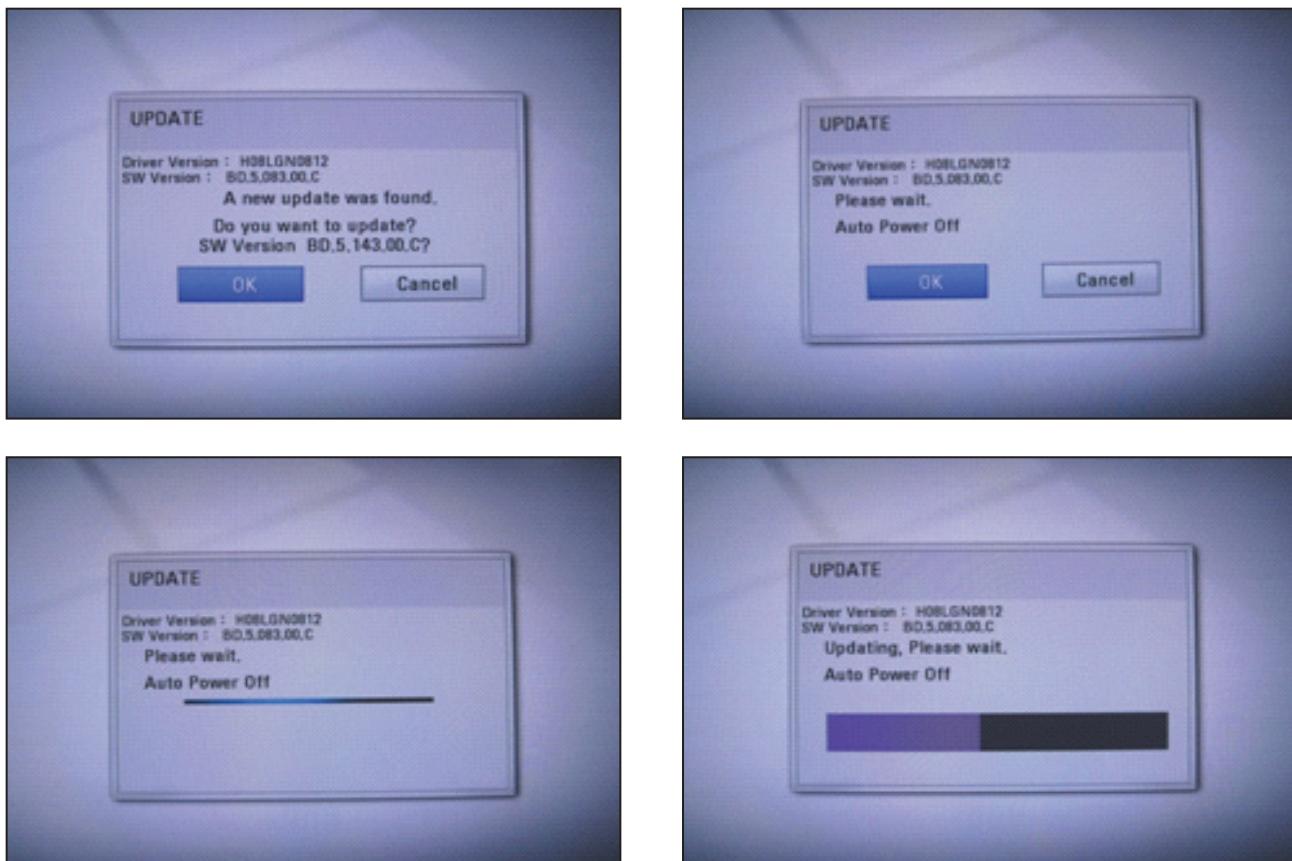


< Example: Nero Burning Rom >

FIRMWARE UPDATE GUIDE

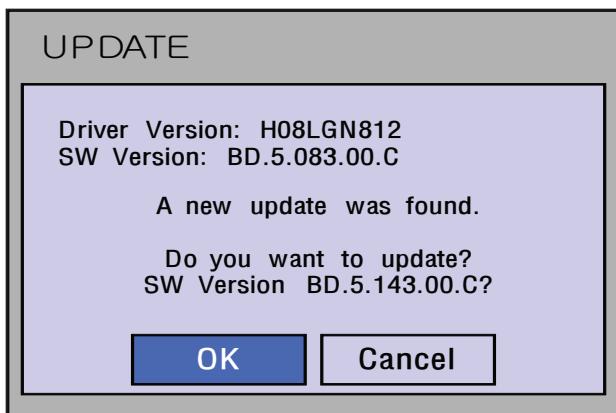
2. UPDATE FIRMWARE

- 1) Insert USB or CD-ROM which has an update file.
- 2) OSD responds to the insertion event.
- 3) OSD is shown as below.

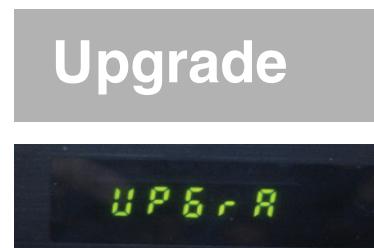


< Firmware Update OSD >

OSD contents:



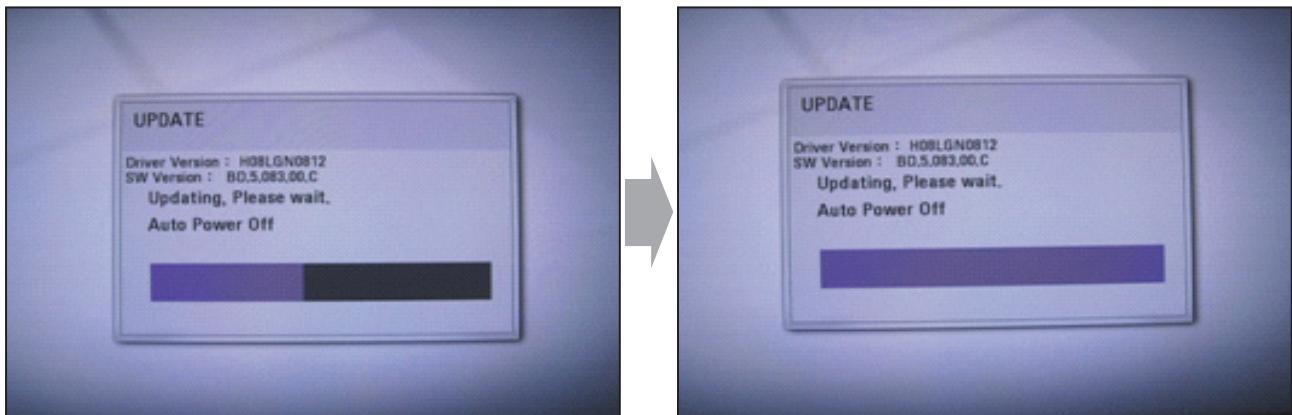
Front Panel contents:



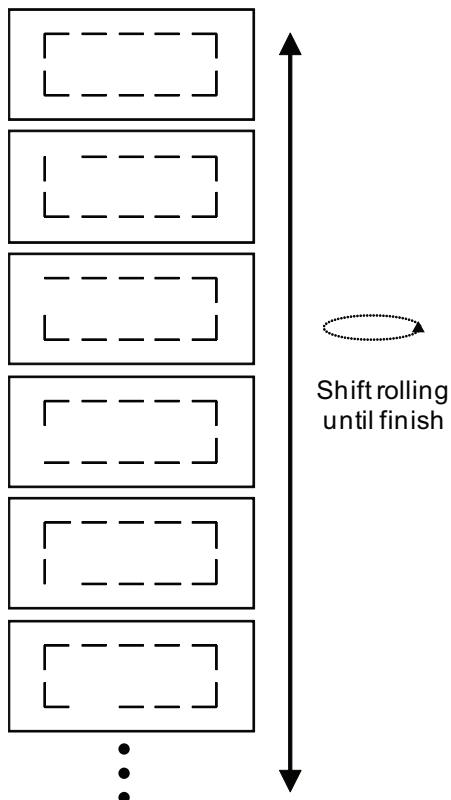
FIRMWARE UPDATE GUIDE

3. DURING UPDATING

- 1) Progressive bar is shown on the update time repeatedly.
- 2) Tray is opened.



Front Panel contents:



4. AFTER UPDATE COMPLETE

- 1) Power off / on automatically after update complete.
- 2) Tray will be closed.

ADVANCED FEATURES

Wi-Fi Direct™

Connecting to a Wi-Fi Direct™ certified device

MOVIE MUSIC PHOTO

This player can play movie, music and photo files located in a Wi-Fi Direct™ certified device. The Wi-Fi Direct™ technology make the player to be directly connected to a Wi-Fi Direct™ certified device without connecting to a network device such as an access point.

On Wi-Fi Direct™ certified device

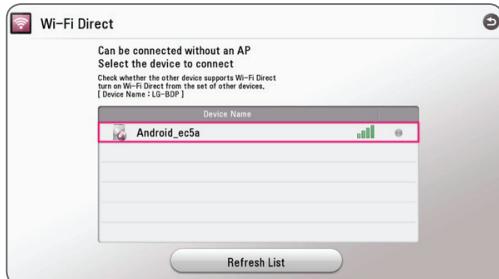
1. Turn on the Wi-Fi Direct™ certified device and run its Wi-Fi Direct function.
2. Run DLNA application on the device.

On your player

3. Select [NETWORK] option in the [Settings] menu then press ENTER (◎).
4. Select [Wi-Fi Direct] option, and press ENTER (◎).



5. Select a Wi-Fi Direct™ device on the list using **▲/▼**, and press ENTER (◎).

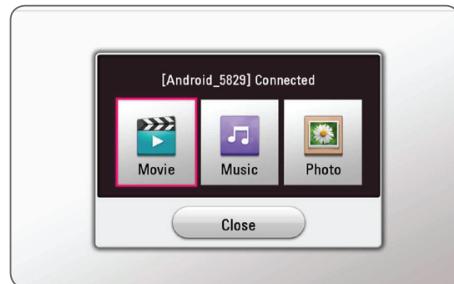


Wi-Fi Direct™ connection will be proceeded. follow the procedure on the screen.

If you want to rescan available Wi-Fi Direct™ device, Select the [Refresh List] and press ENTER (◎).

To select a server from the device list, files or folders must be shared by DLNA server from the connected Wi-Fi Direct™ device.

6. Select [Movie], [Photo] or [Music] using **▲/▼/◀/▶**, and press ENTER (◎).



7. Select a file using **▲/▼/◀/▶**, and press ENTER (◎) to play the file.

Note

- For the purpose of the better transmission, placing the player from the Wi-Fi Direct™ certified server as close as possible.
- This unit can connect only 1 device at a time. Multiple connection is not available.
- If you try to connect wireless network while a device is connected by Wi-Fi Direct™ function , Wi-Fi Direct™ connection will be force disconnected.
- If this player and a Wi-Fi Direct™ device are connected to the different local area network, Wi-Fi Direct™ connection may not available.
- If a Wi-Fi Direct™ certified device is not in Wi-Fi direct standby mode, this product can not find the device.
- When you connect a Wi-Fi Direct™ certified device to your player, PIN network connection is not supported.
- This product cannot connect to a Wi-Fi direct™ device which is in Group Owner mode.

Enjoying Miracast™

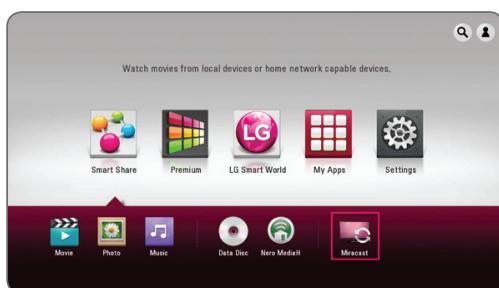
You can mirror Miracast certified device's screen and sound onto TV screen through your player wirelessly.

On Miracast™ certified device

1. Turn on the Miracast certified device and run its [Miracast] function.

On your player

2. Press HOME ().
3. Select [Miracast] and press ENTER ().



4. Select a Miracast device on the list using **A / V**, and press ENTER ().

Miracast function will be proceeded automatically.

If you want to rescan available Miracast device, select [Refresh List] and press ENTER ().

Note

- For the purpose of the better mirroring, place Miracast certified device from the player as close as possible.
- This unit can connect only 1 device at a time. Multiple connection is not available.
- While mirroring, Wireless network or Wi-Fi Direct cannot be used simultaneously.
- If a Miracast certified device is not in [Miracast] standby mode, this player cannot find the device.
- Depending on your wireless network condition, mirroring may be unstable.
- While mirroring, the screen may be cut off depending on your TV's setting. In this case, please adjust the display settings on your TV.

Enjoying BD-Live™

BD

BD-ROM supporting BD-Live that has a network extension function allows you to enjoy more functions such as downloading new movie trailers by connecting this unit to the internet.

1. Check the network connection and settings (page 16).
2. Insert an USB storage device to the USB port on the front panel.
An USB storage device is needed to download bonus content.
3. Press HOME (), and set the [BD-LIVE connection] option on the [Settings] menu (page 22).

Depending on a disc, the BD-Live function may not be operated if [BD-LIVE connection] option is set to [Partially Permitted].

4. Insert a BD-ROM with BD-Live.

The operations may differ depending on the disc. Refer to the manual supplied with the disc.



Caution

Do not extract the connected USB device while content is being downloaded or a Blu-ray disc is still in the disc tray. Doing so may damage the connected USB device and BD-Live features may not operate properly with the damaged USB device anymore. If the connected USB device seems damaged from such an action, you can format the connected USB device from the PC and reuse it with this player.



Note

- Some BD-Live content may be restrictively accessed in some territories by content provider's own decision.
- It may take up to several minutes to load and start enjoying BD-Live content.
- For BD-Live, use the USB flash drive / external HDD formatted in FAT32 only.

LG Tag On

LG Tag On allows you to install and open "LG AV Remote" app to NFC-enabled phone.

1. Stick the supplied LG Tag On sticker on this player.



Note

We suggest you first think carefully about the sticker position, because it is difficult to remove after sticking it once.

2. Tag the back of your NFC-enabled phone over the LG Tag On sticker.
 - If "LG AV Remote" app is not installed on your NFC-enabled phone, the linked screen with "LG AV Remote" app is displayed.
 - If "LG AV Remote" app is installed on your NFC-enabled phone, "LG AV Remote" app is activated.



Note

- You must activate the NFC feature of your NFC-enabled phone for Android 4.0 or later.
- If your NFC-enabled phone's screen is locked, it will not read the LG Tag On sticker.
- If your smart phone case is plated with chrome, NFC is unavailable. Depending on your case's material or thickness, NFC may not be read well.

LG AV Remote

You can control this player with your iPhone or Android phone via your home network. This player and your phone must be connected to your wireless network device such as access point. Visit "Apple iTunes" or "Google Android Market (Google Play Store)" for detailed information of "LG AV Remote".

Private Sound Mode

By downloading "LG AV Remote" application on your smart phone or tablet, you can connect your headsets, and enjoy the sound from your player on your smart devices.

This feature transmits video signal to TV through HDMI and Audio signal to smart phone or tablet through Wi-Fi. For more detailed information, please refer to the Help menu on "LG AV Remote" application.

Viewing information from Gracenote Media Database

The player can access the Gracenote Media Database and load the music information so that Track name, Artist Name, Genre and other text information can be displayed on the list.

Audio CD

When you insert an Audio CD, the player starts playback automatically and loads the music title from the Gracenote Media Database.

If there is no music information from the database, music titles will not appear on the screen.

Music file

Select a music file using **▲/▼</>** and press INFO/MENU (□).

The player accesses to Gracenote Media Database for the music information.

Blu-ray Disc/DVD/Movie file

1. While listening to a music from the movie being played, press INFO/MENU (□).
2. Select a [Music ID] using **</>**, and press ENTER (◎).

The player starts loading the music information from the Gracenote Media Database.

! Note

- The player must be connected to the broadband internet for accessing the Gracenote Media Database.
- If the music information is not in the Gracenote Media Database, message appears on the screen.
- Depending on the cases, it will take a few minutes to load music information from the Gracenote Media Database.
- Information may be displayed in broken letters, if the language you selected is not available on the Gracenote Media Database.
- This function is not available for on-line content and content in DLNA servers.
- LG is a licensee of Gracenote technology and is not responsible or liable for information from the Gracenote Media Database.
- Audio CDs that users made for their only private purposes cannot be supported in this feature because they are not in the Gracenote Media Database.
- Supported music file extensions : mp3, wma, m4a, wav

SPECIFICATIONS

• GENERAL

Power requirements	Refer to main label on the rear panel.
Power consumption	12 W
Dimensions (W x H x D)	Approx. 430 mm x 43.5 mm X 208.5 mm
Net Weight (Approx.)	1.45 kg
Operating temperature	5 °C to 35 °C
Operating humidity	5 % to 90 %

• OUTPUTS

HDMI OUT (video/audio)	19 pin (Type A, HDMI™ Connector)
DIGITAL AUDIO OUT (OPTICAL)	3 V (p-p), Optical jack x 1

• SYSTEM

Laser	Semiconductor laser
wavelength	405 nm / 650 nm
Signal system	Standard PAL/NTSC colour TV system
LAN port	Ethernet jack x 1, 10BASE-T / 100BASE-TX
Wireless LAN (internal antenna)	Integrated IEEE 802.11n (5 GHz and 2.4 GHz bands) wireless networking access, compatible with 802.11a/b/g Wi-Fi networks.
Bus Power Supply (USB)	DC 5 V ≈ 500 mA

Note : Design and specifications are subject to change prior notice.

SECTION 2

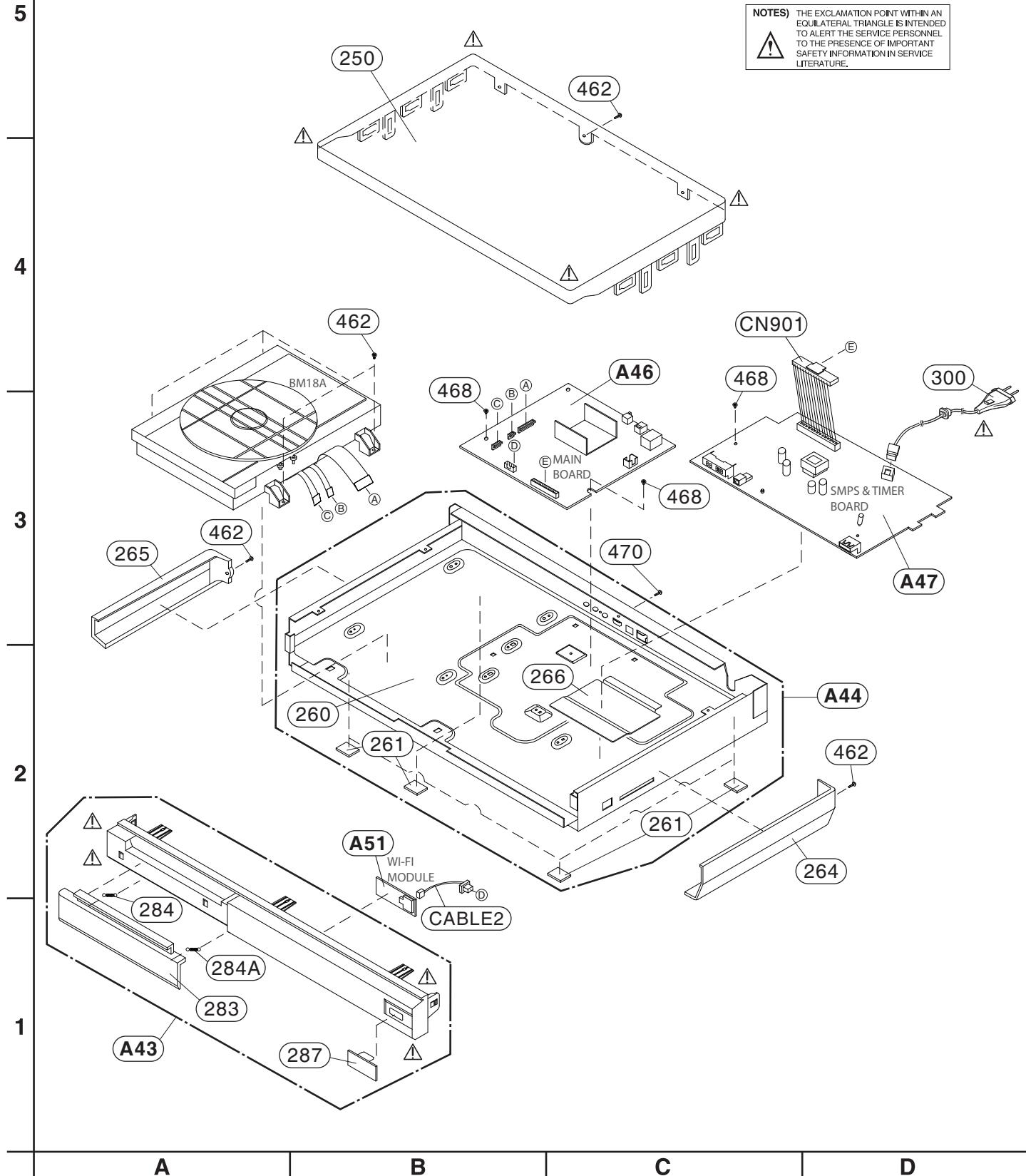
CABINET & MAIN CHASSIS

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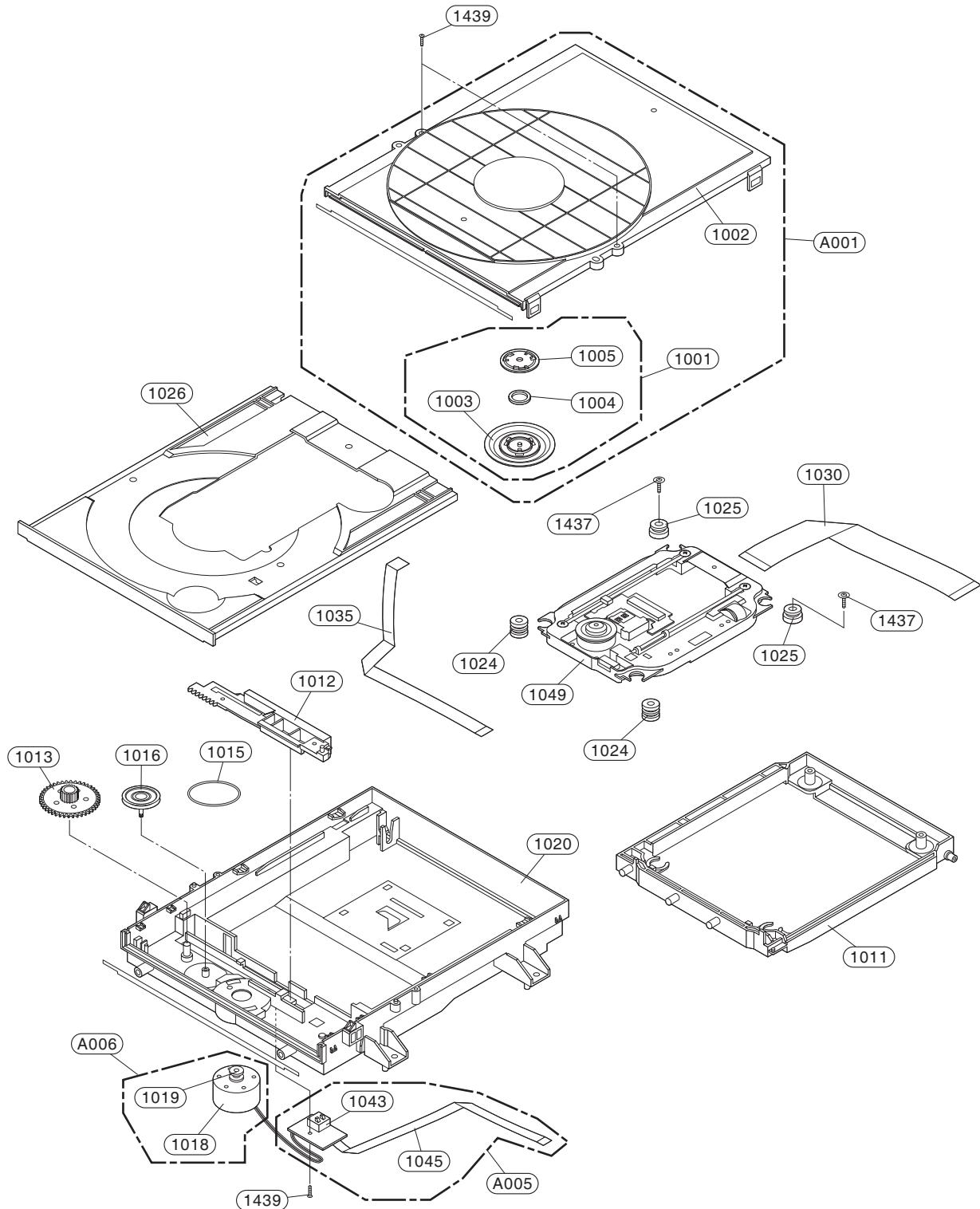
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EXPLODED VIEWS

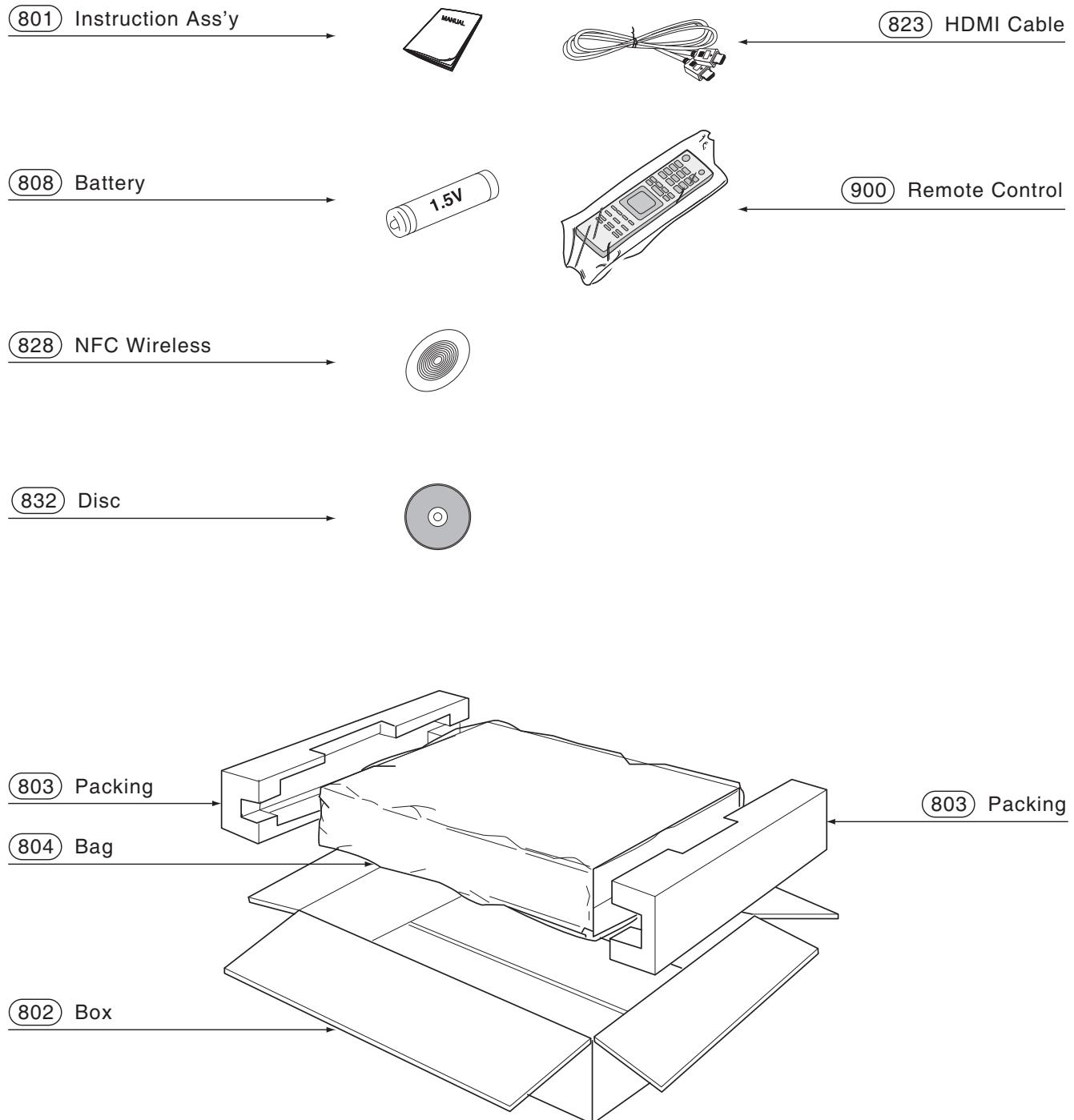
1. CABINET AND MAIN FRAME SECTION



2. DECK MECHANISM SECTION, BM18A(IM13)



3. PACKING ACCESSORY SECTION



SECTION 3

ELECTRICAL

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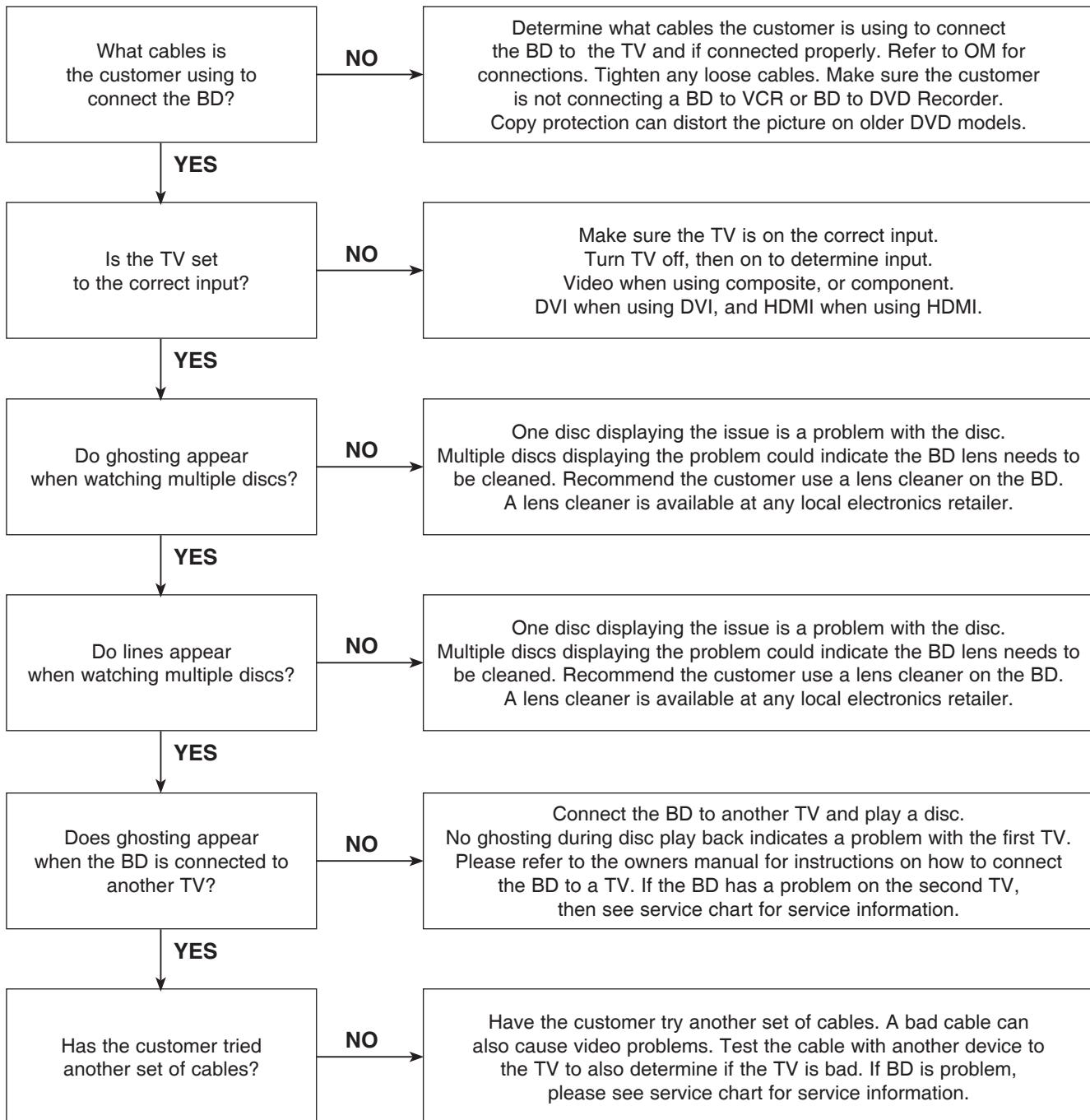
DIGITAL DISPLAY & MEDIA TRAINING MASTER

Objective: To provide clear and concise guidelines for customer service agents to handle calls on box goods calls.

1. DISTORTED PICTURE

1-1. Lines on Picture

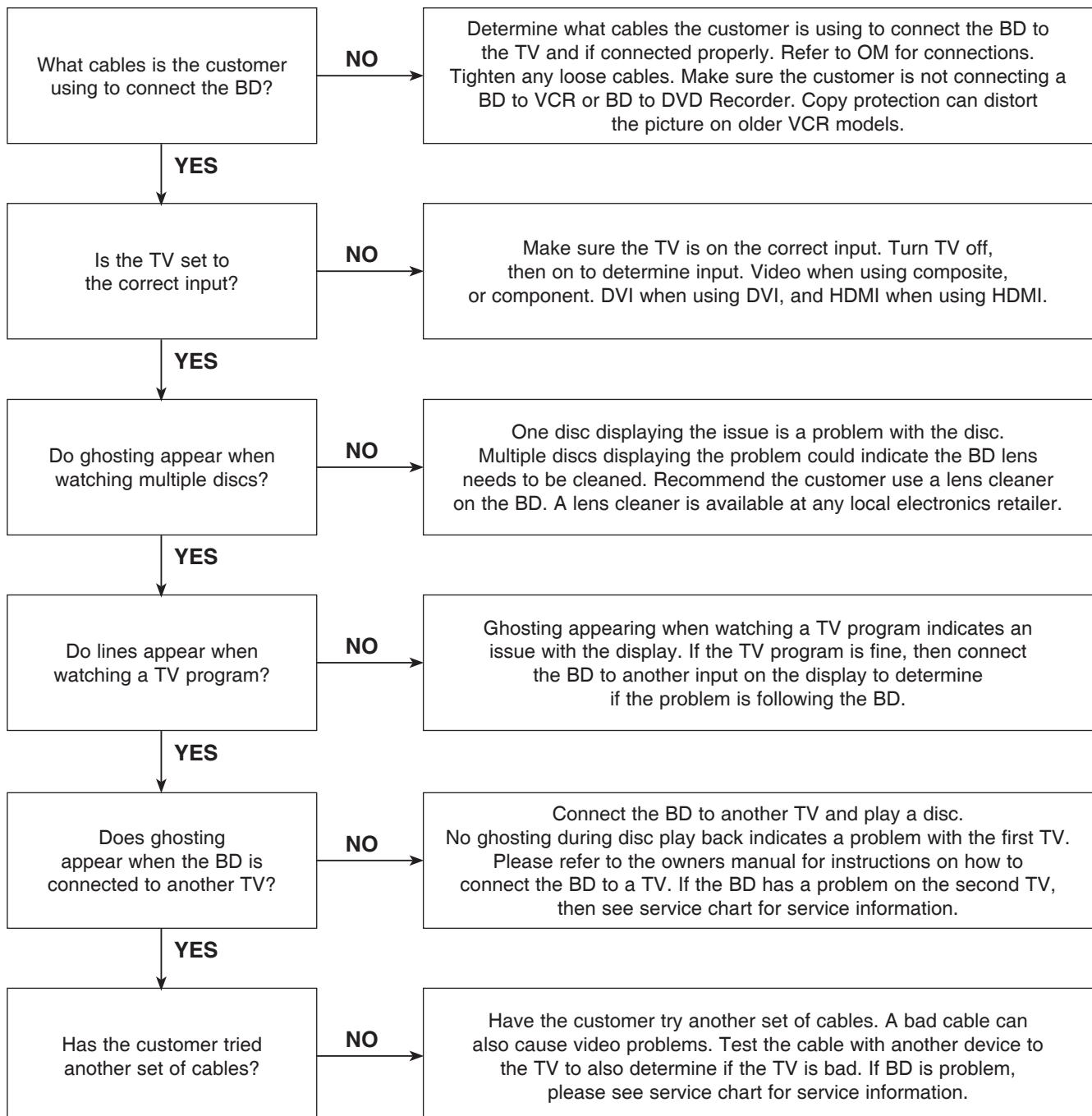
Distorted picture refers to the customer getting video, but there is a problem with the video.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

1-2. Ghost Picture

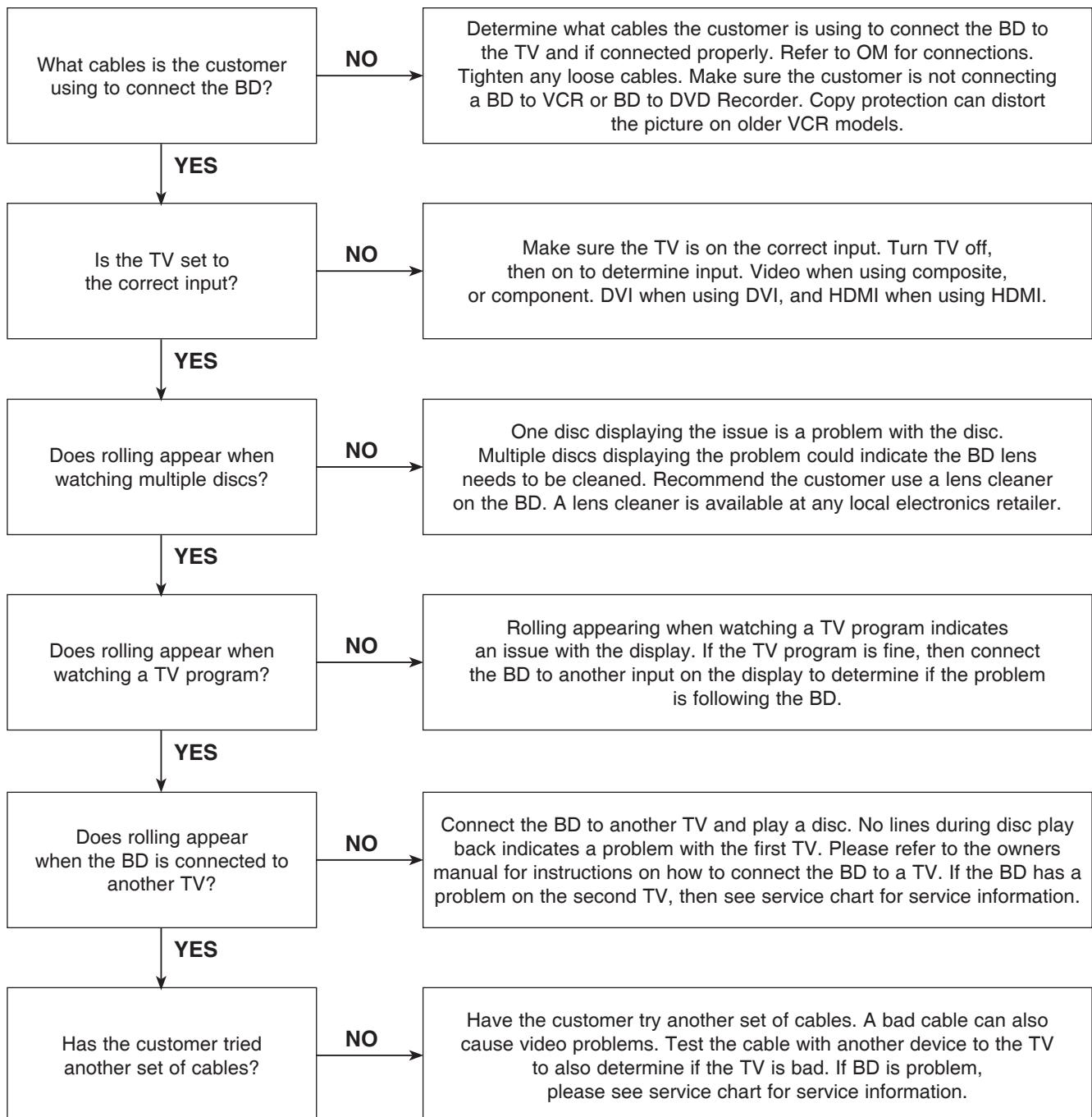
Distorted picture refers to the customer getting video, but there is a problem with the video.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

1-3. Rolling Picture

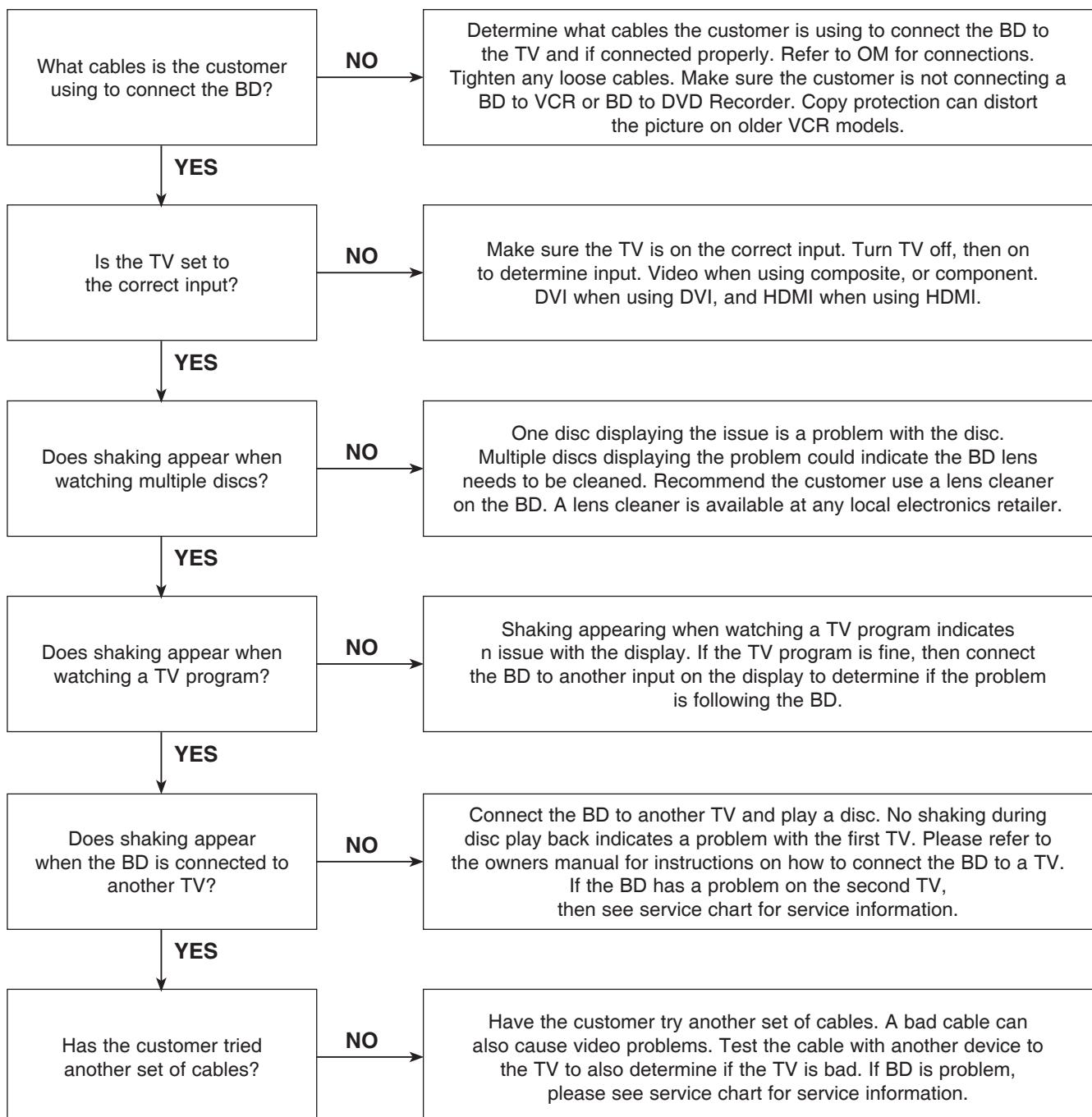
Distorted picture refers to the customer getting video, but there is a problem with the video.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

1-4. Shaky Picture

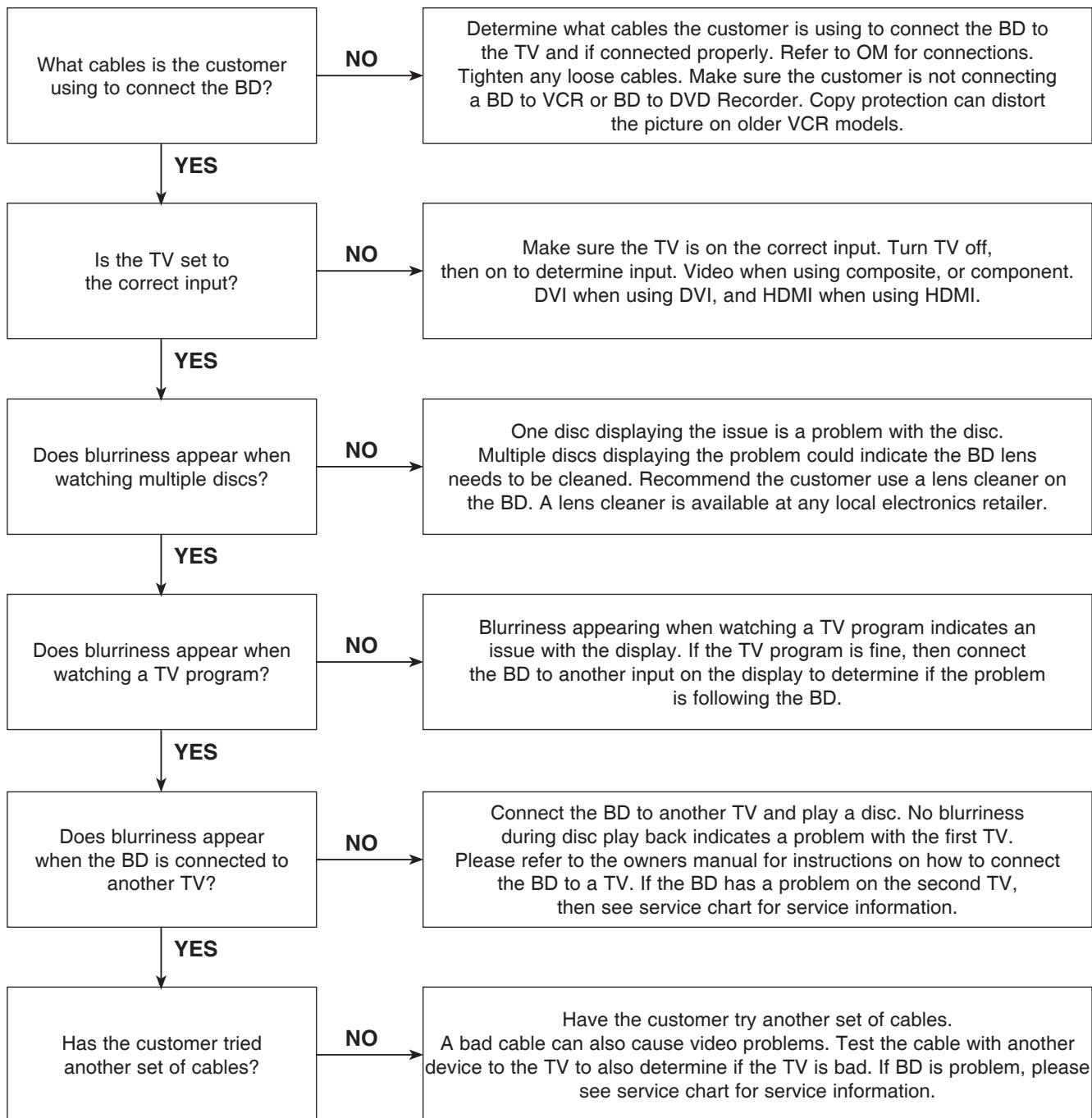
Distorted picture refers to the customer getting video, but there is a problem with the video.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

1-5. Blurry Picture

Distorted picture refers to the customer getting video, but there is a problem with the video.

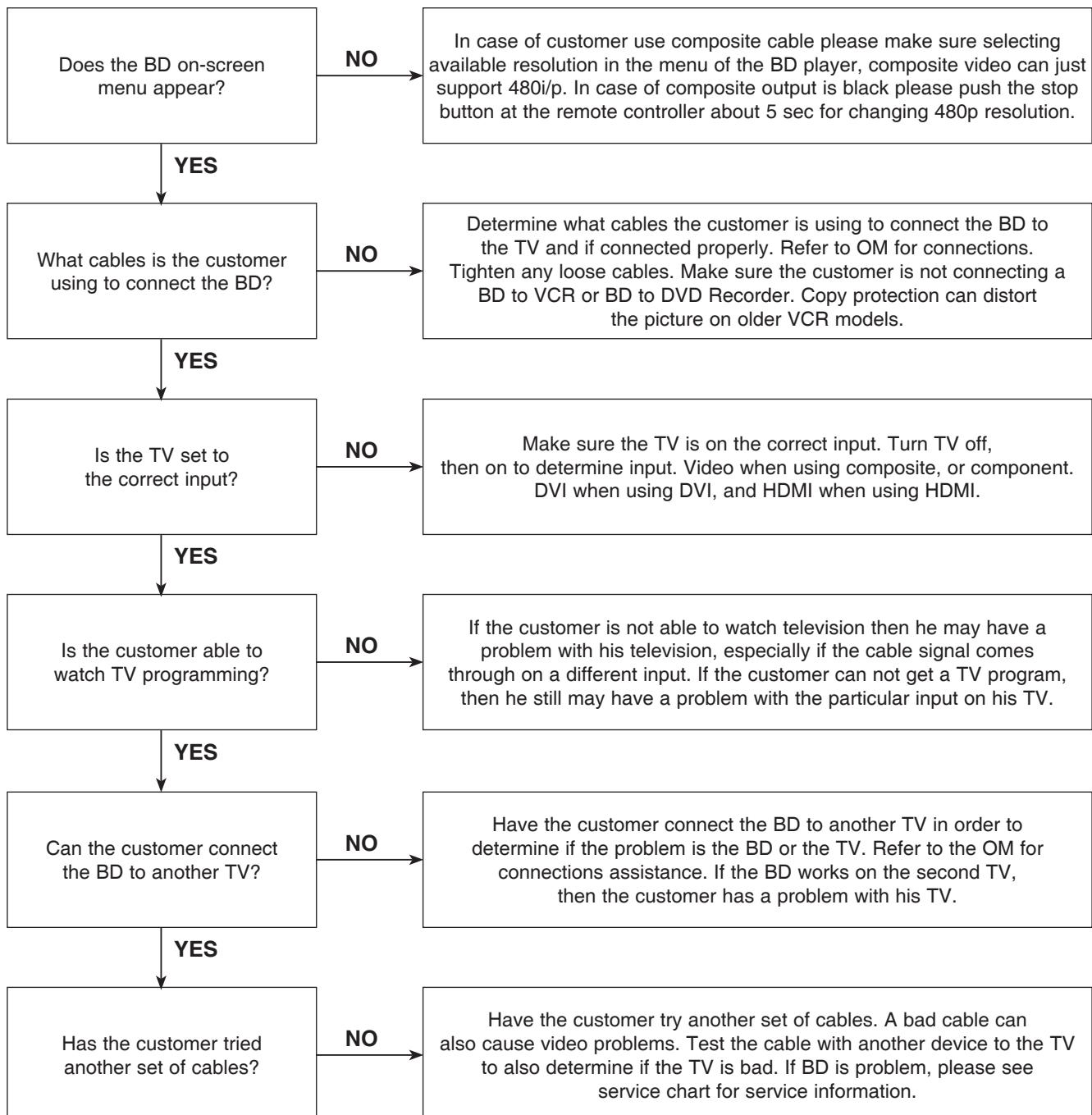


DIGITAL DISPLAY & MEDIA TRAINING MASTER

2. NO PICTURE

2-1. Black Screen

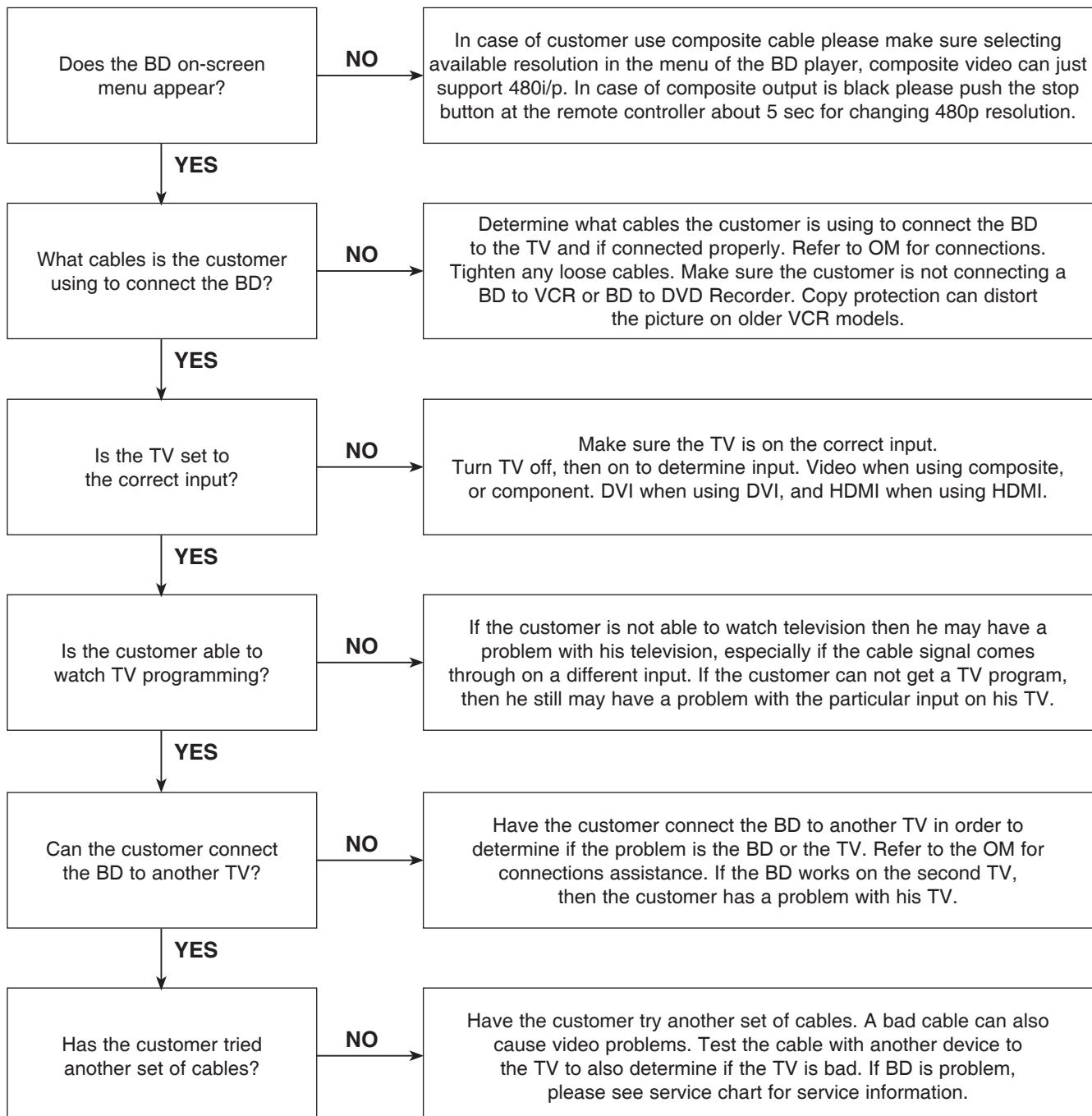
The entire screen is black.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

2-2. Blue Screen

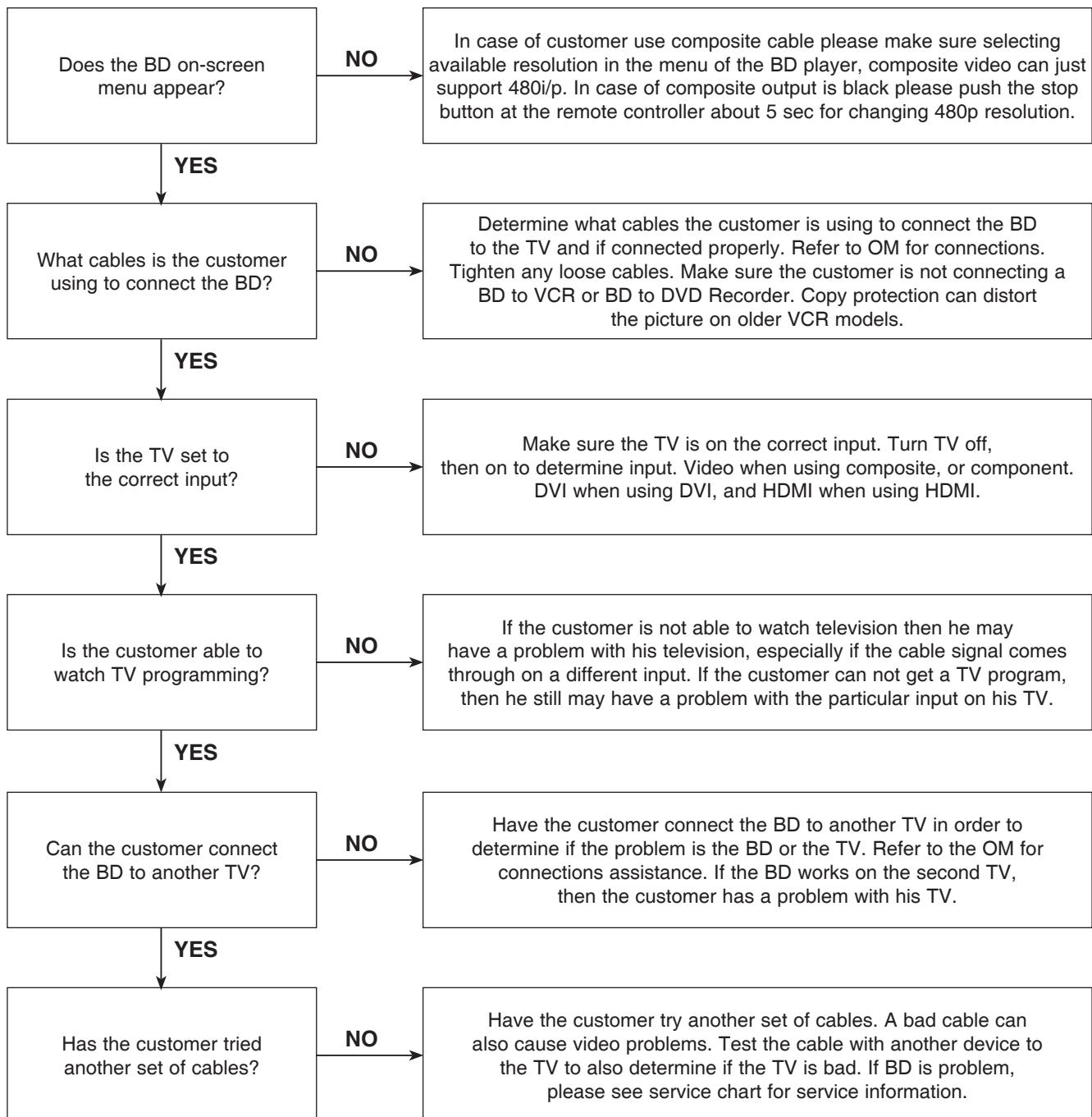
The entire screen is a solid blue color.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

2-3. Snowy Screen

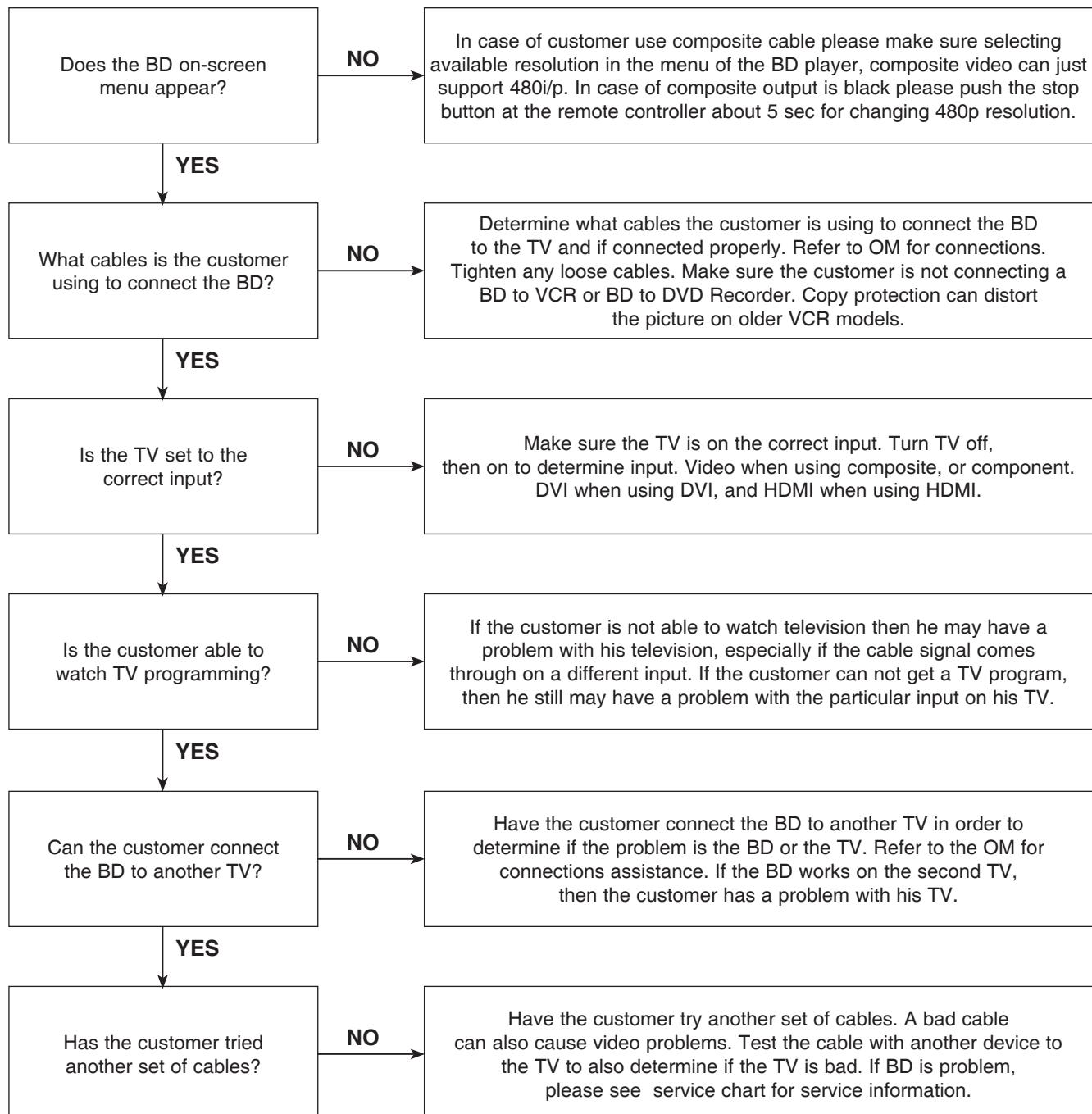
A snowy picture is when black and white dots are all over the screen.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

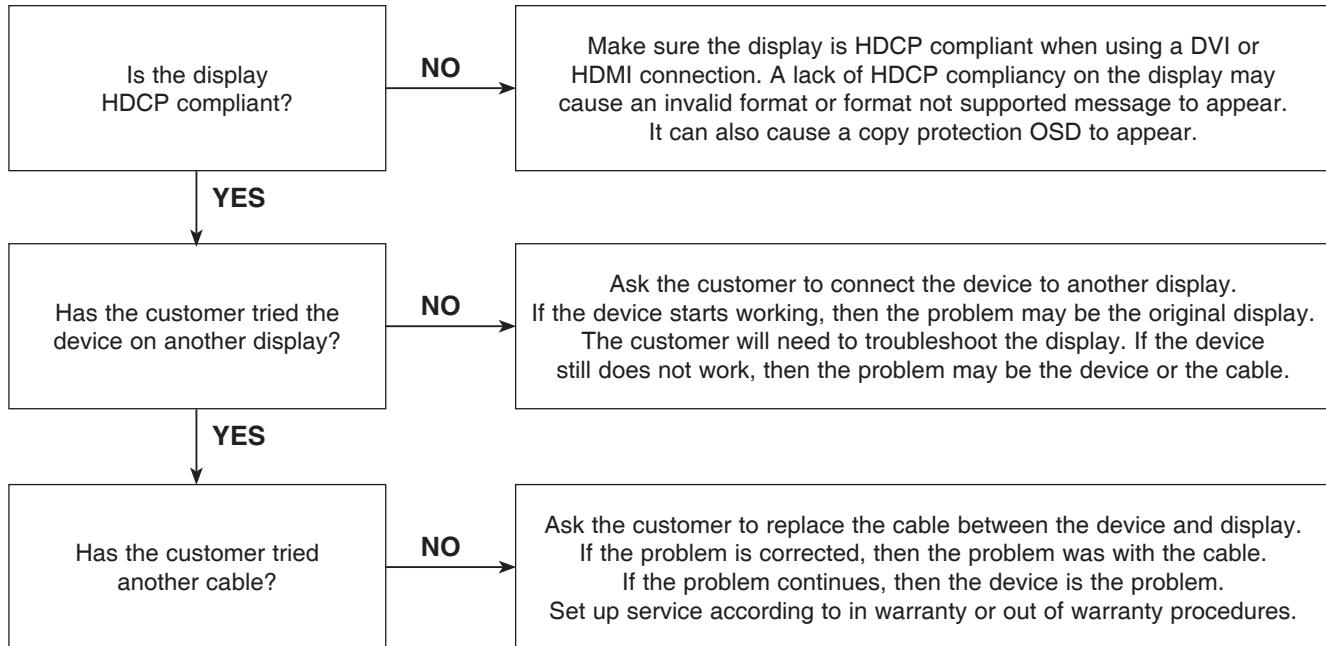
2-4. No Signal

A "no signal" message appears on the screen of the display.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

2-5. Invalid Format or Format Not Supported

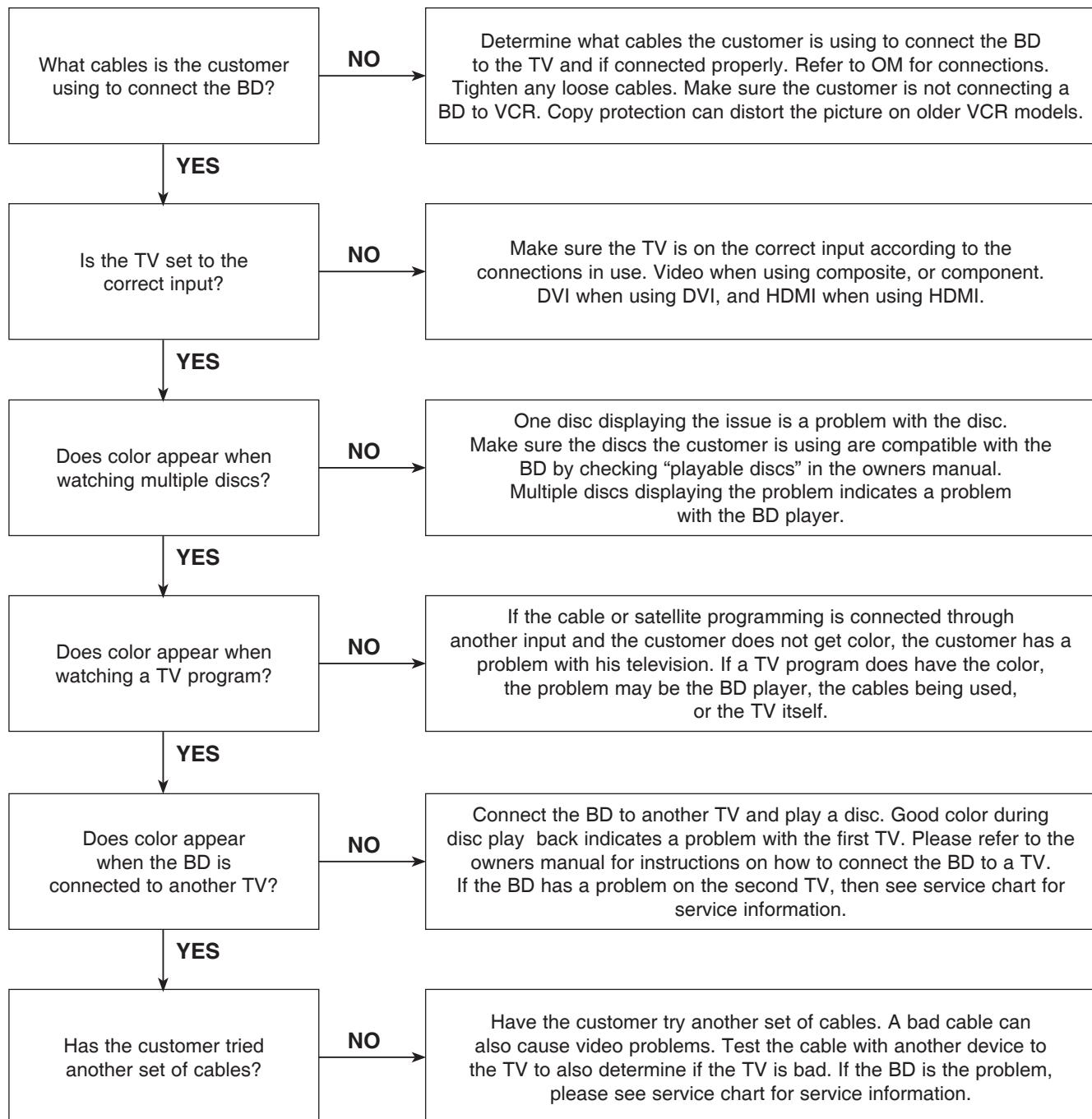


DIGITAL DISPLAY & MEDIA TRAINING MASTER

3. PICTURE COLOR

3-1. No Color

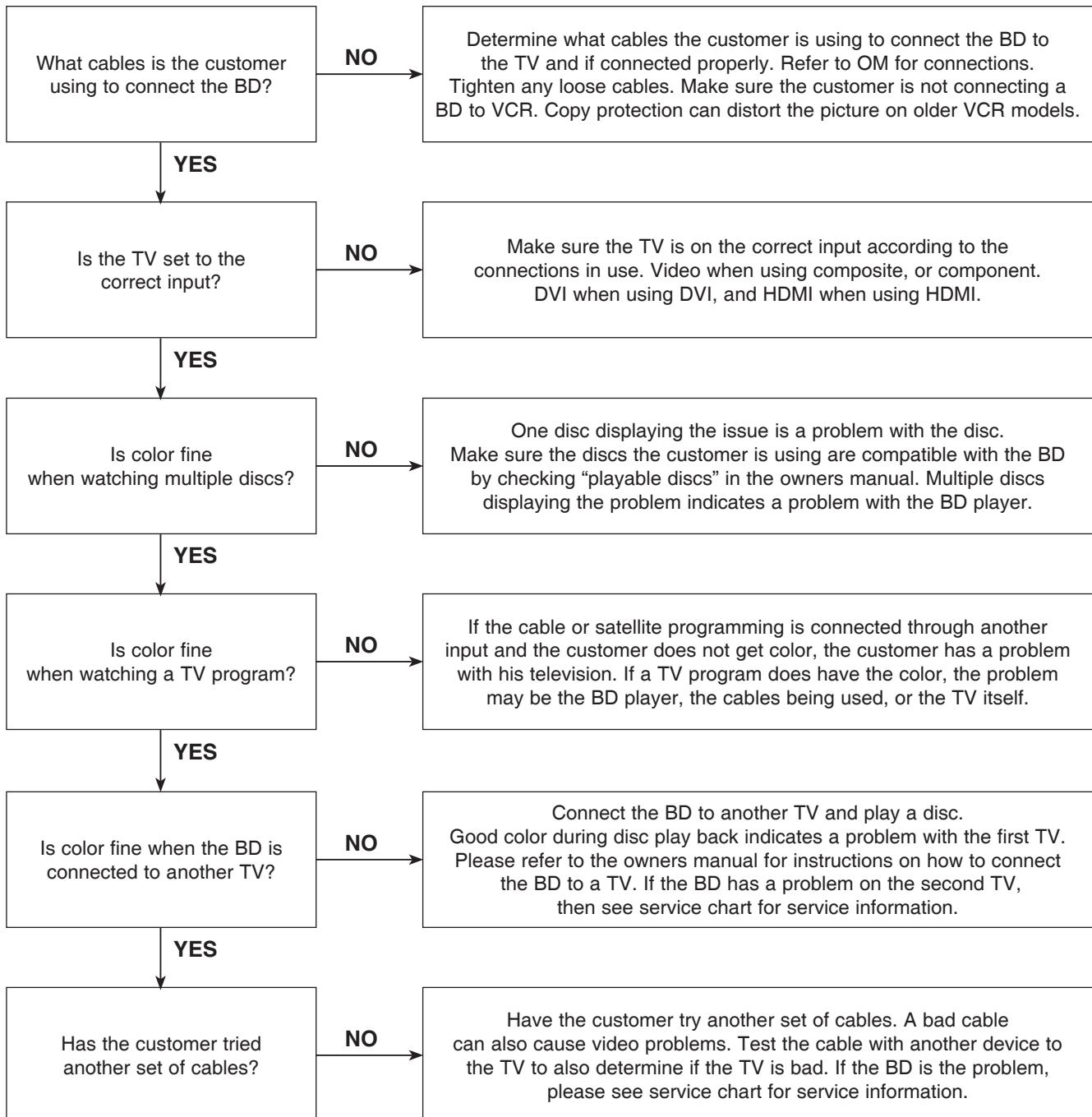
The video displays no color and only shows in black and white.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

3-2. Poor Color

The color is poor. Examples would be washed out colors, colors bleeding into one another, or a solid tint to a screen.

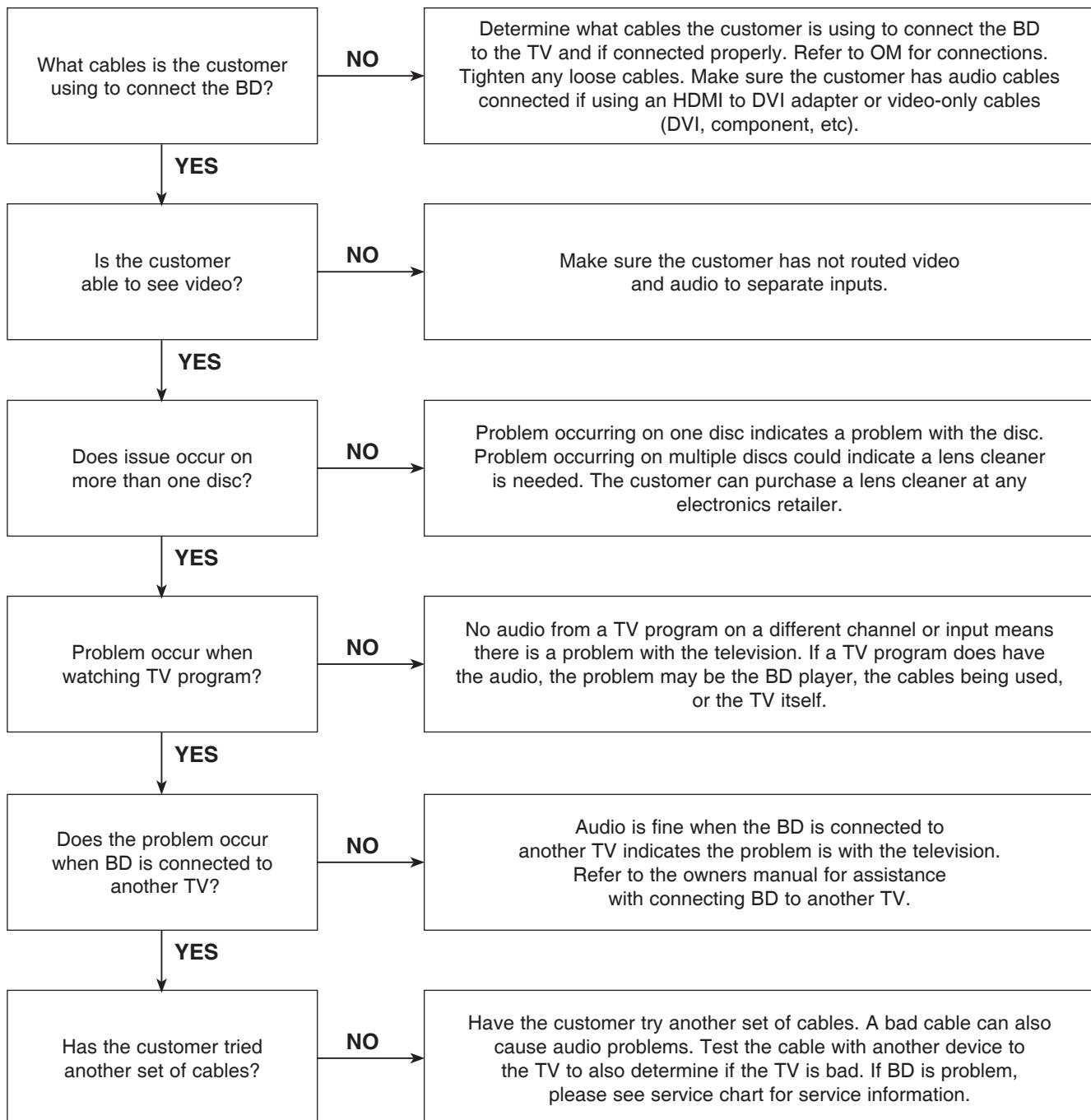


DIGITAL DISPLAY & MEDIA TRAINING MASTER

4. NOISE/AUDIO PROBLEMS

4-1. No Audio

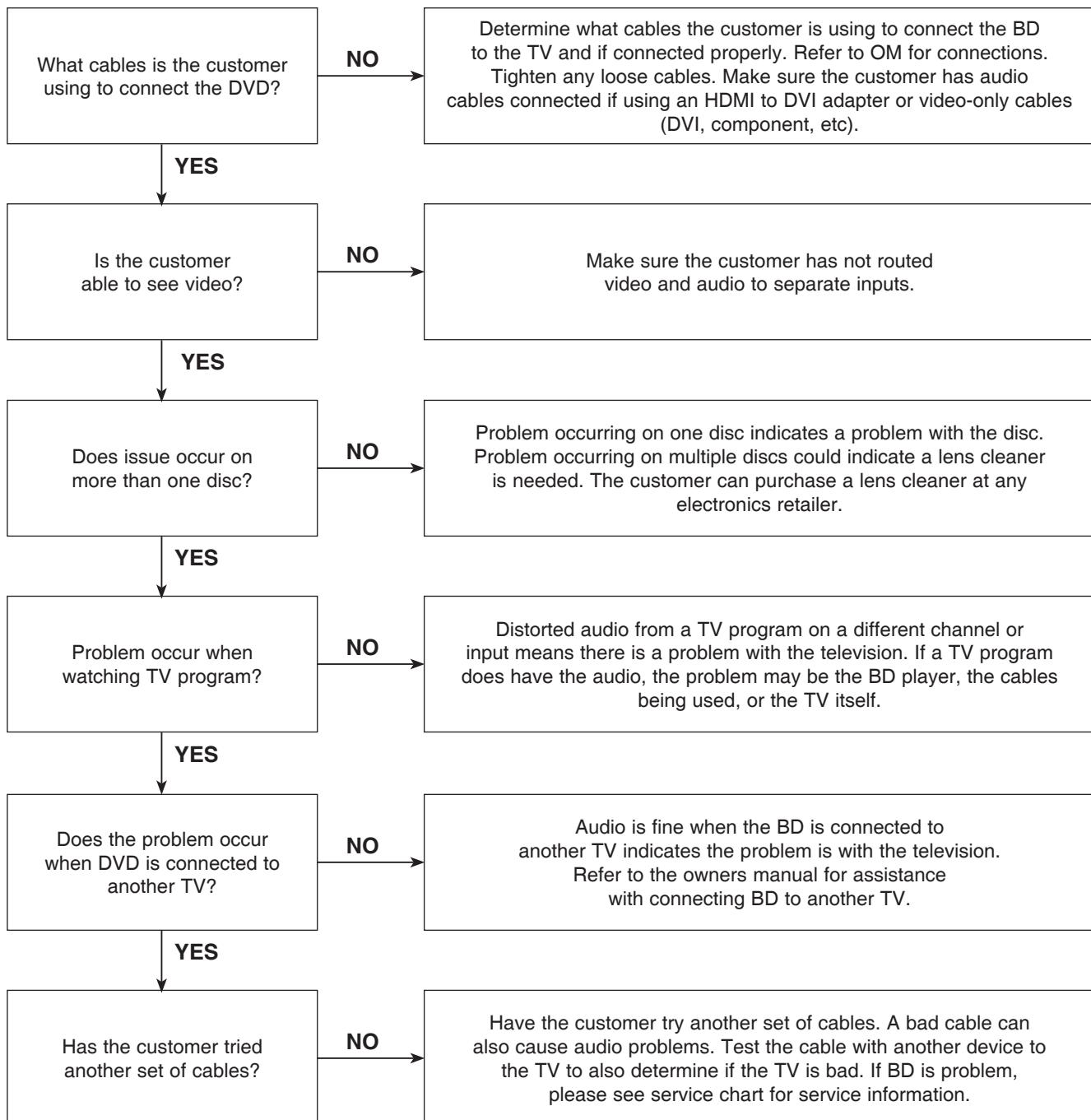
The customer is not able to get audio.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

4-2. Distorted Audio

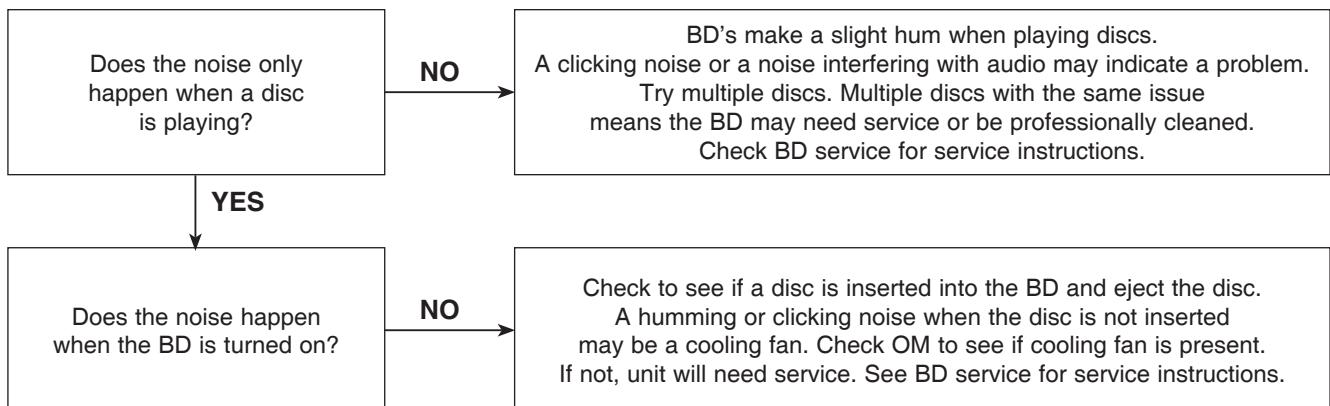
The audio sounds muffled, scratchy, or the audio skips.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

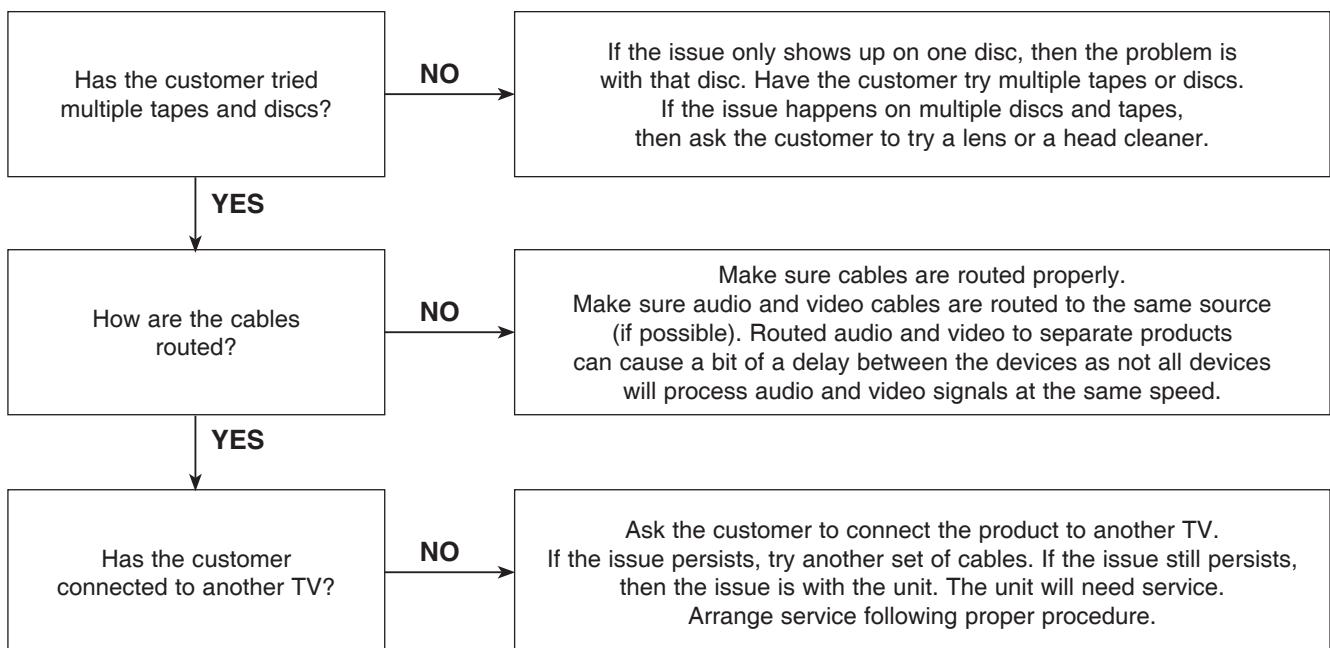
4-3. Humming/Clicking Noise

The unit is making a humming noise or a clicking noise.



4-4. Audio/Video Out of Synch

The audio and video do not match up. People look to be talking, but their voices are delayed by a few seconds.

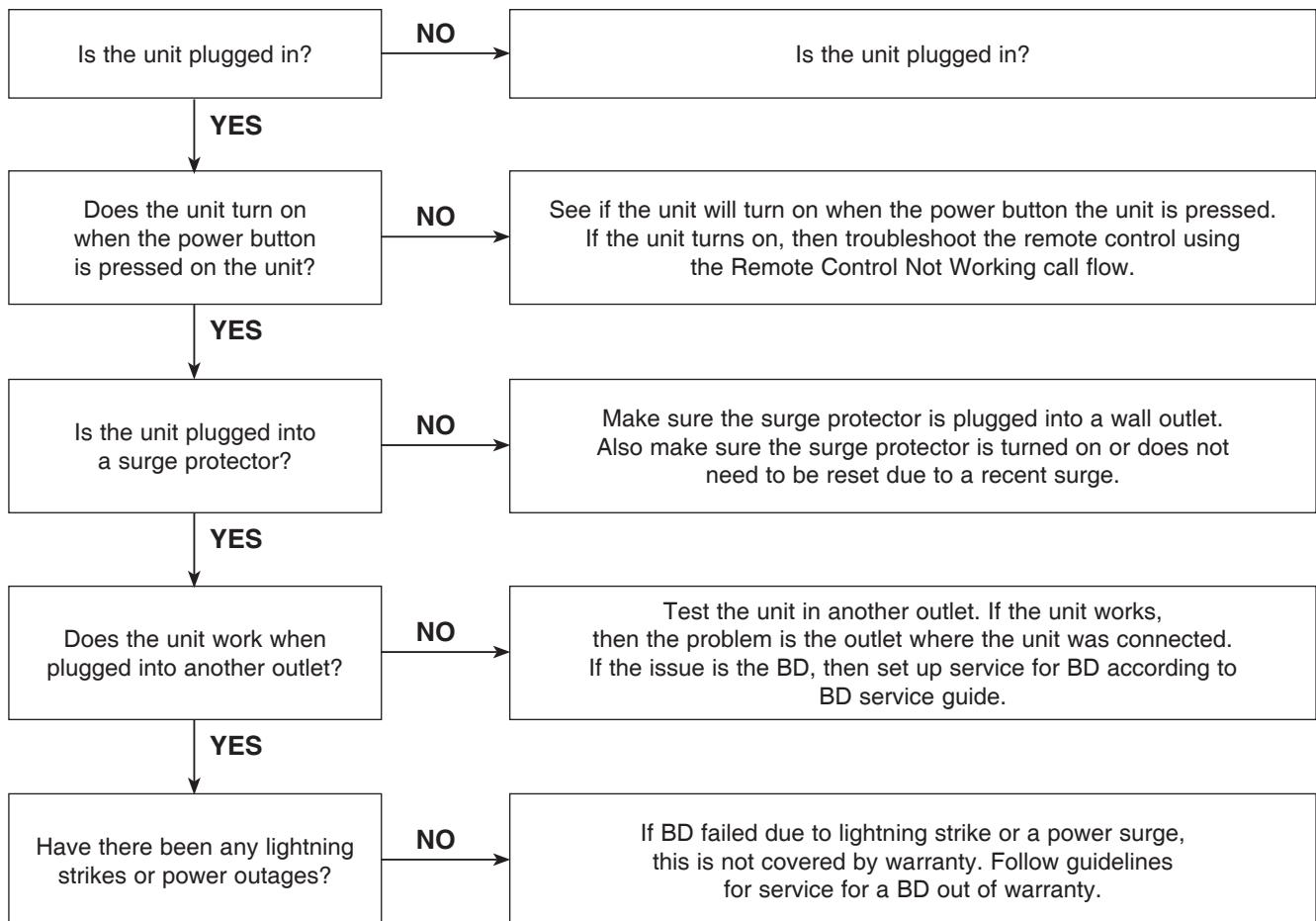


DIGITAL DISPLAY & MEDIA TRAINING MASTER

5. MISCELLANEOUS

5-1. No Power

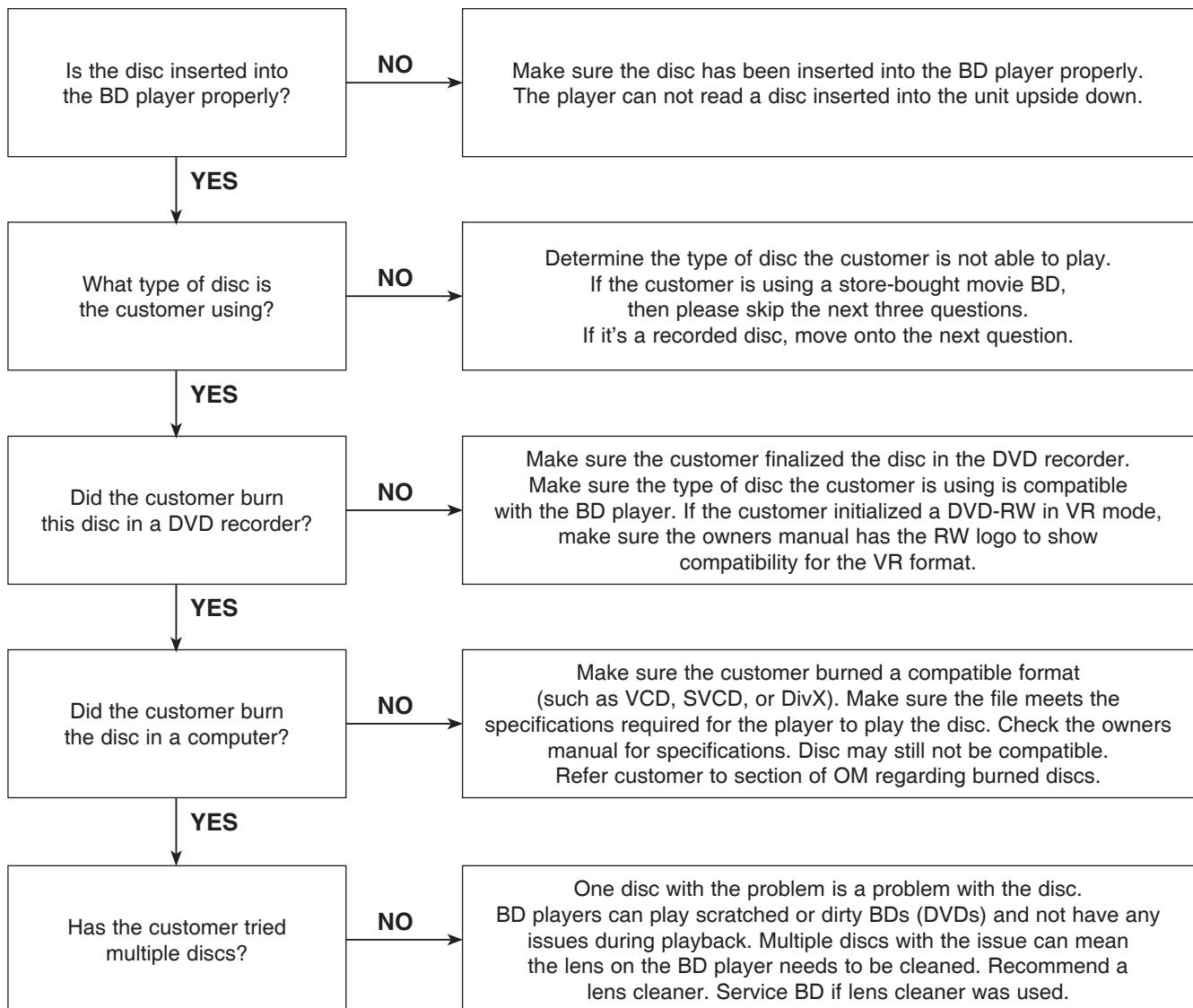
The unit will not turn on.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

5-2. Disc Error

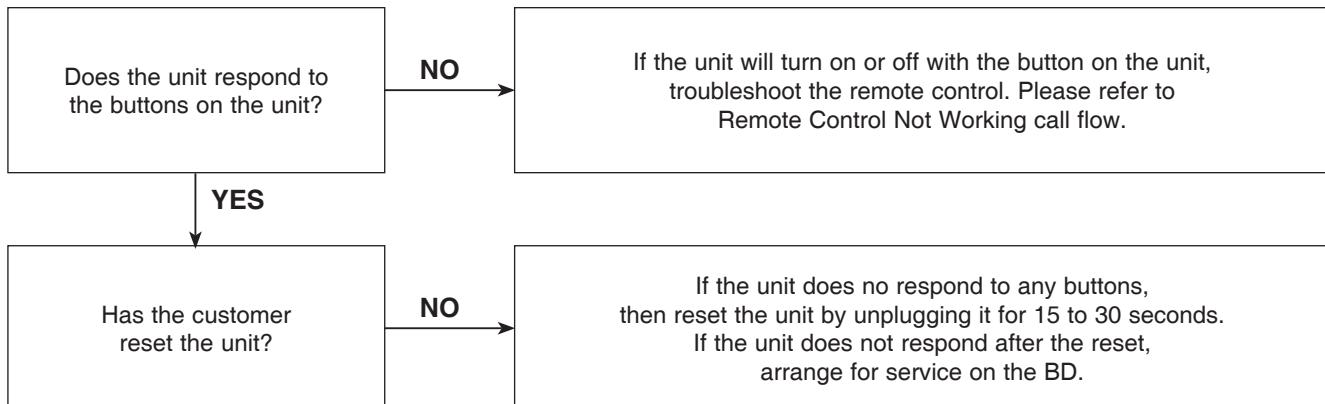
The unit displays “disc error” when a disc is inserted into the BD player.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

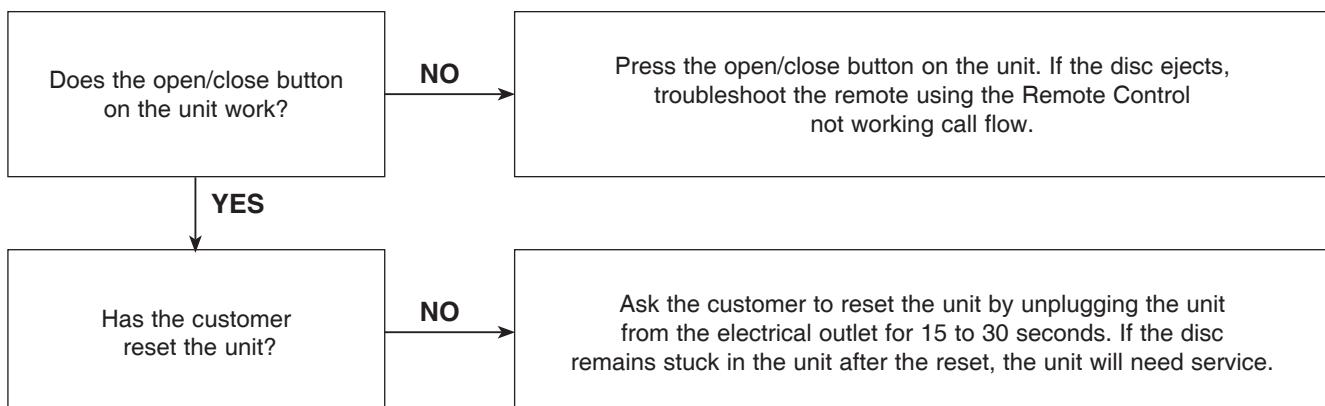
5-3. Unit Locks Up

Unit does not respond to any commands.



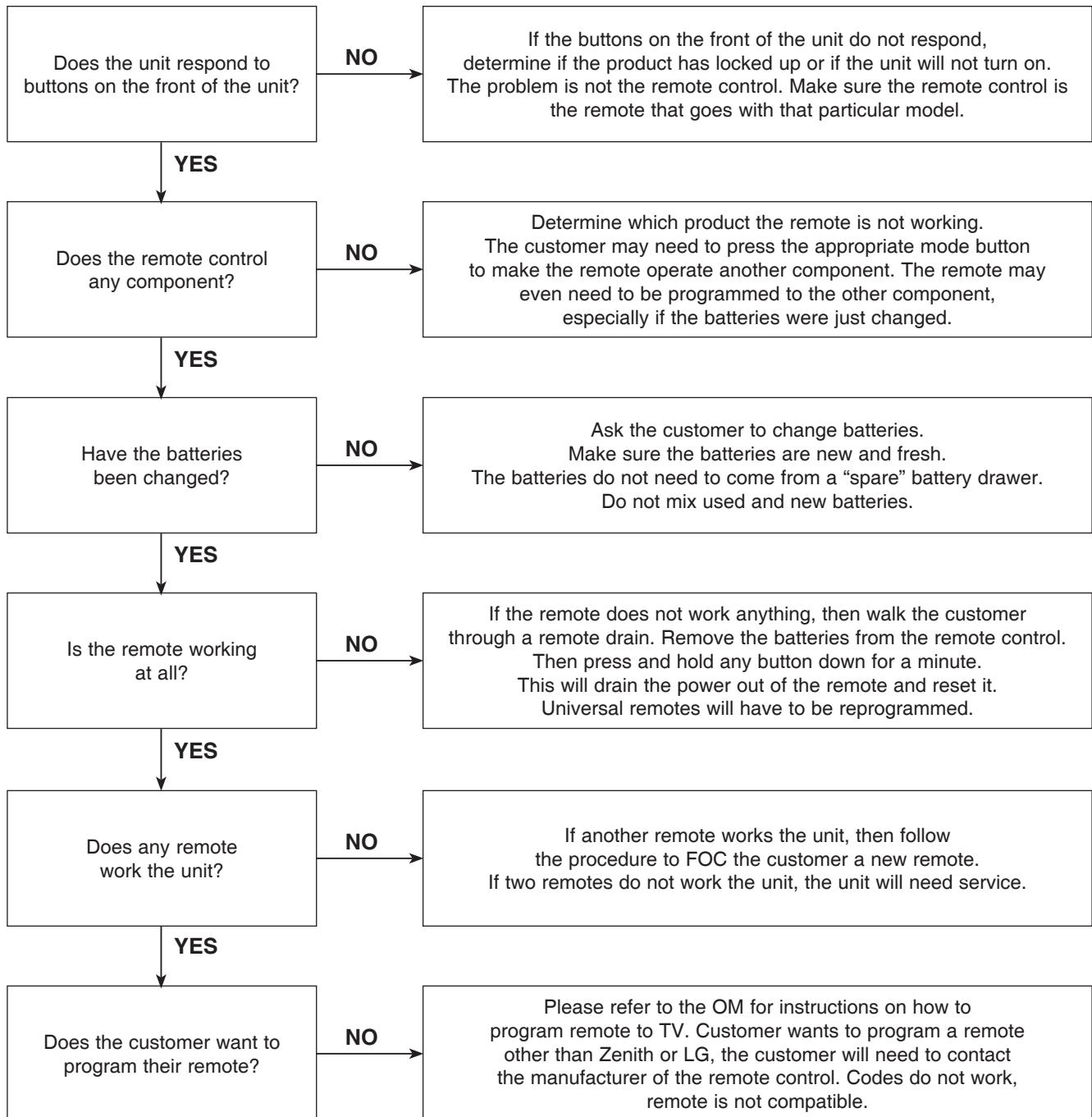
5-4. Disc Stuck

A BD disc is stuck in the unit.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

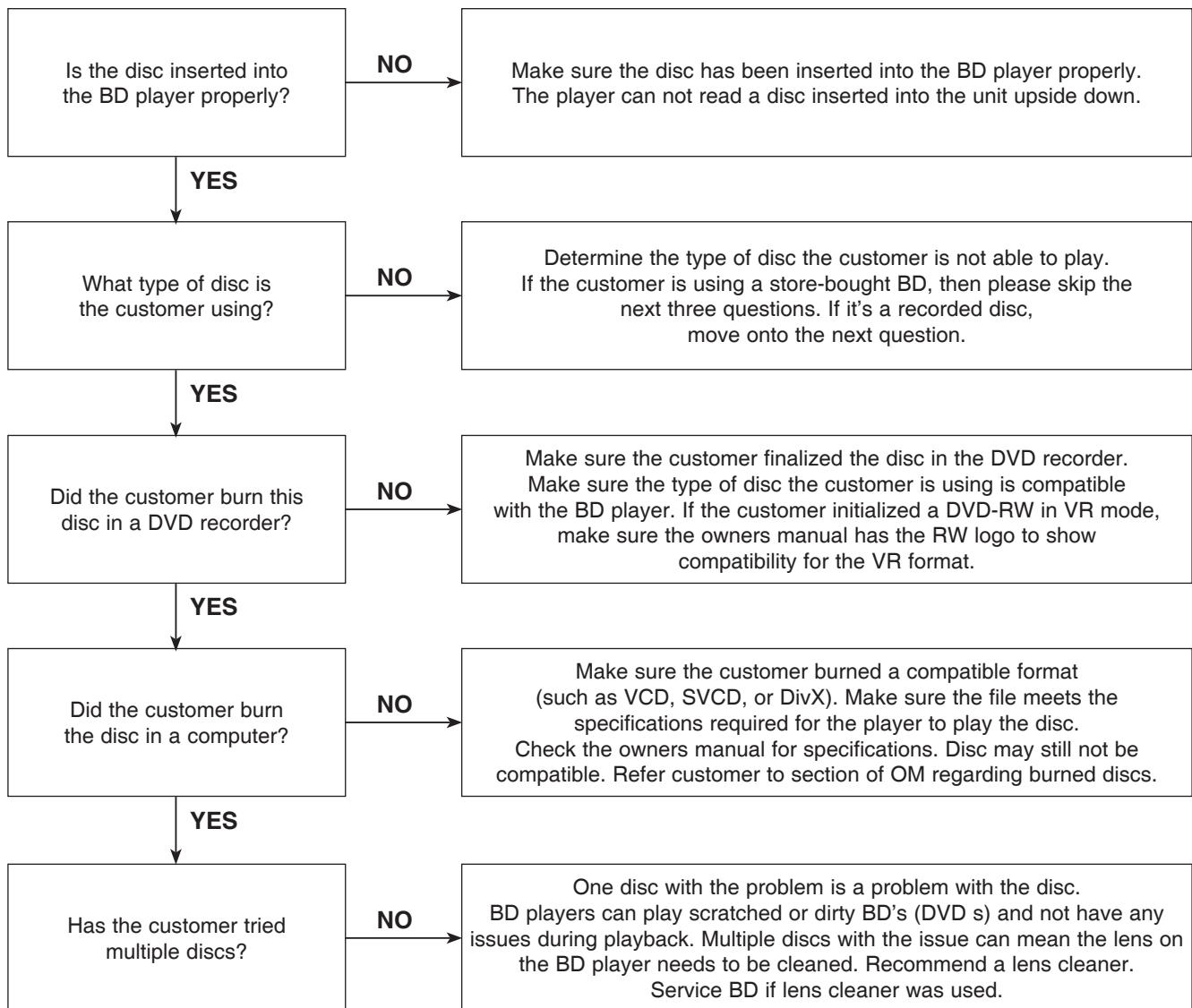
5-5. Remote Control Not Working



DIGITAL DISPLAY & MEDIA TRAINING MASTER

5-6. Will Not Play Disc

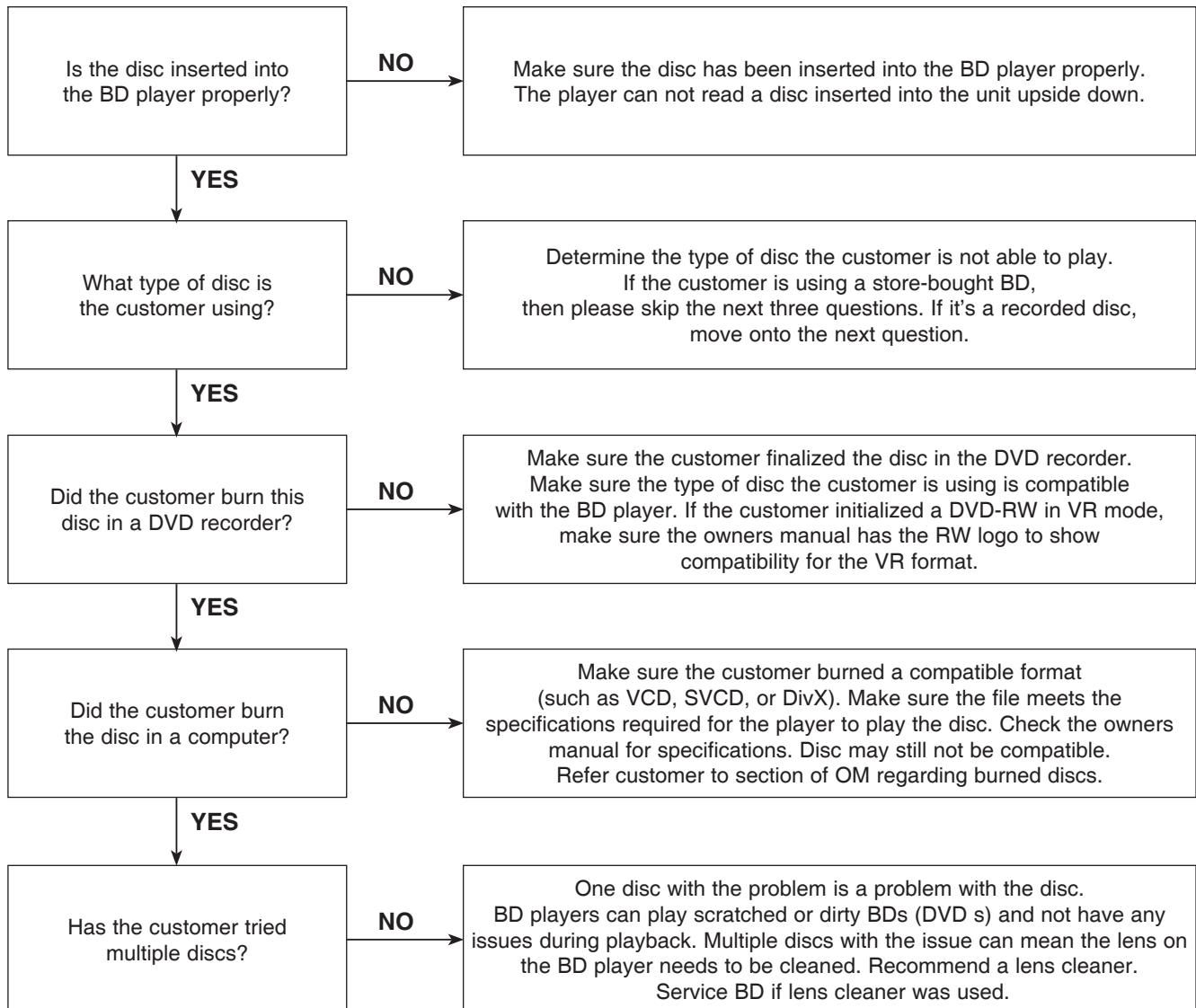
The unit will not play a disc when a disc is inserted into the player.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

5-7. Disc Freezes or Skips

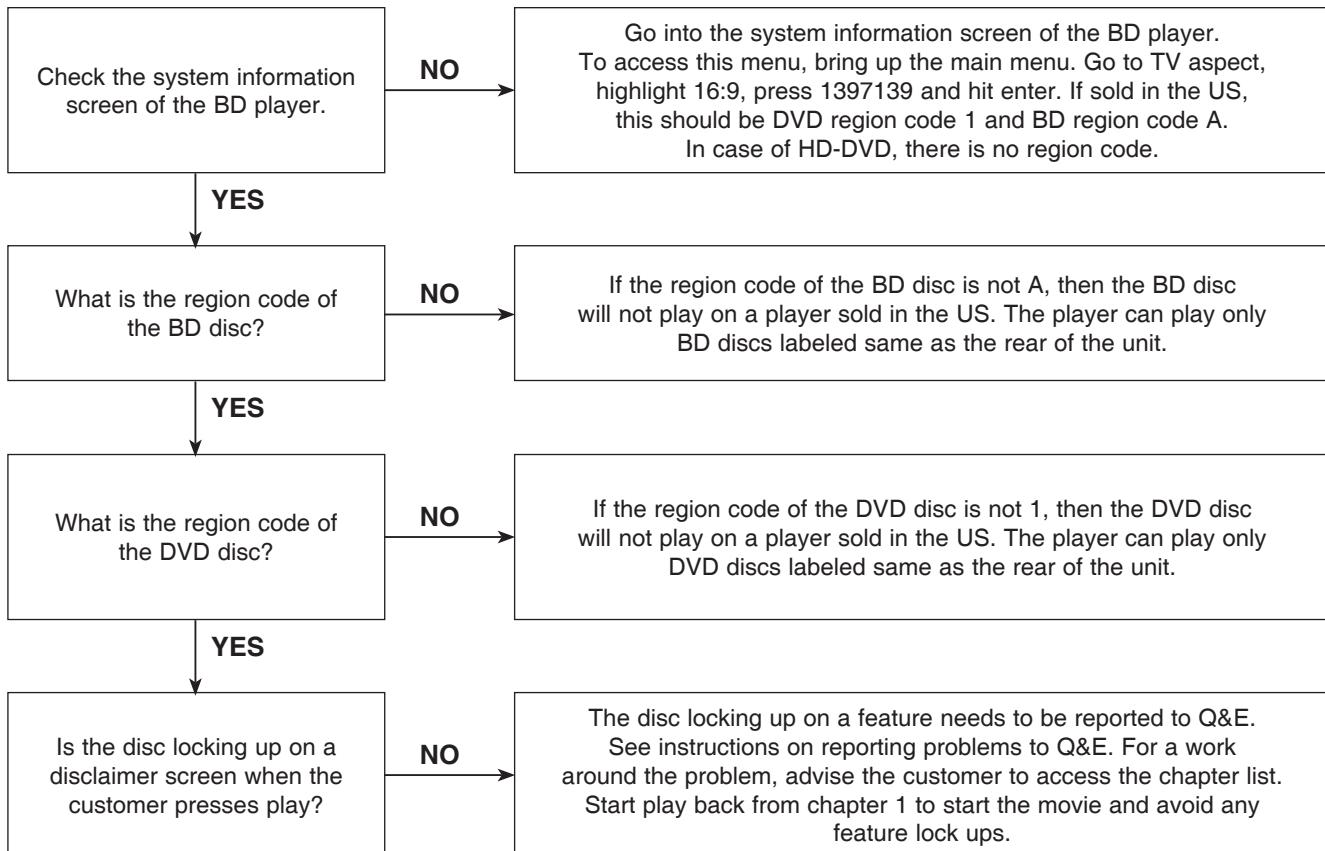
The audio and video freeze and skip during play back of a BD or DVD disc.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

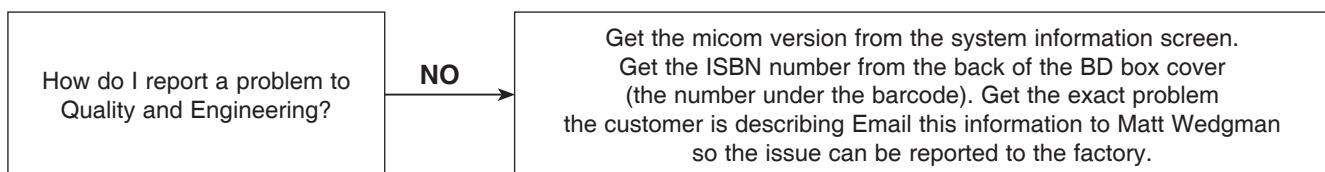
5-8. Can Access Menu, but Not Play a Movie

The disc menu is displayed but the disc will not play.



5-9. Reporting a problem to Quality & Engineering

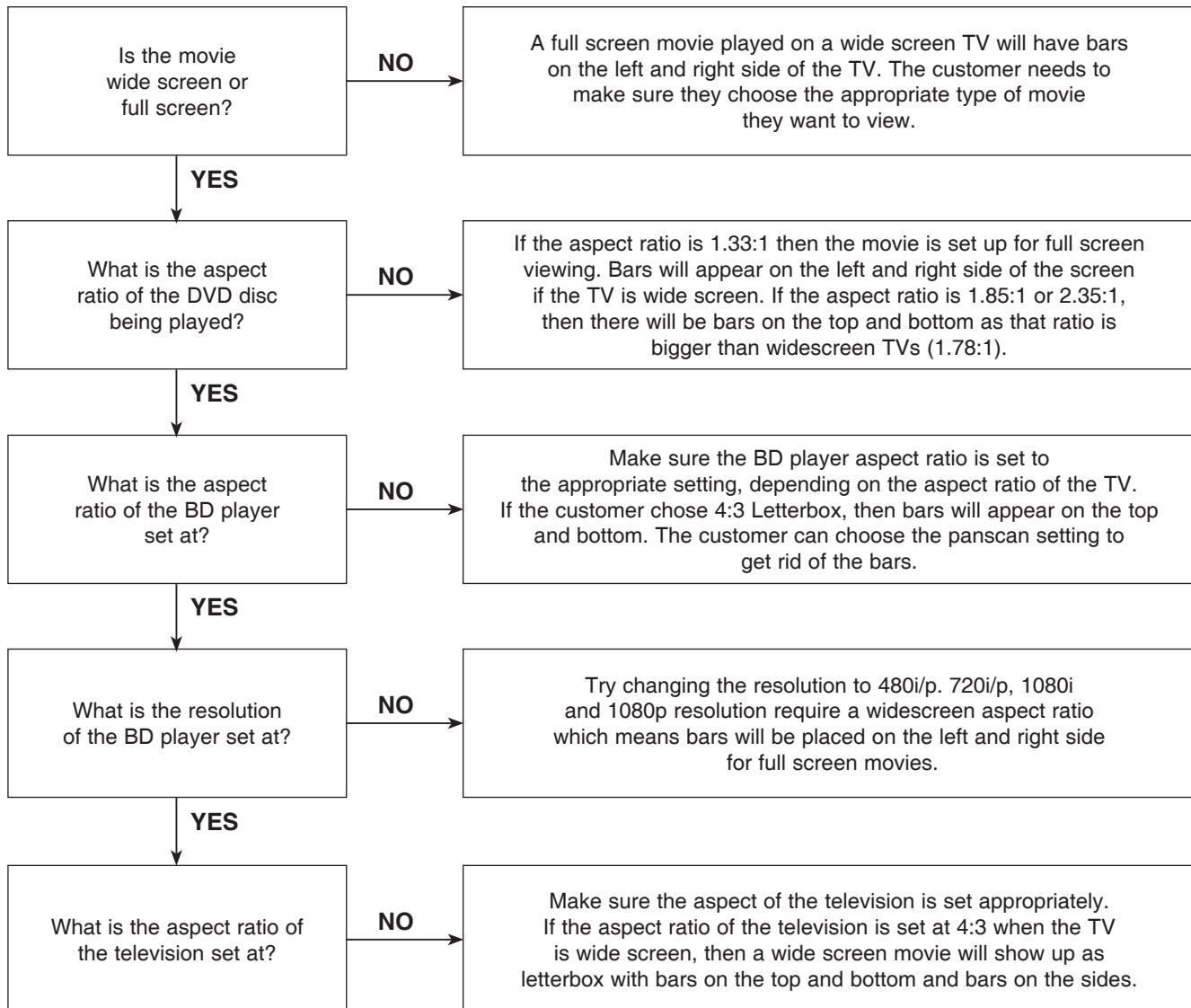
Reporting a problem that may require a firmware update to fix.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

5-10. Aspect Ratio

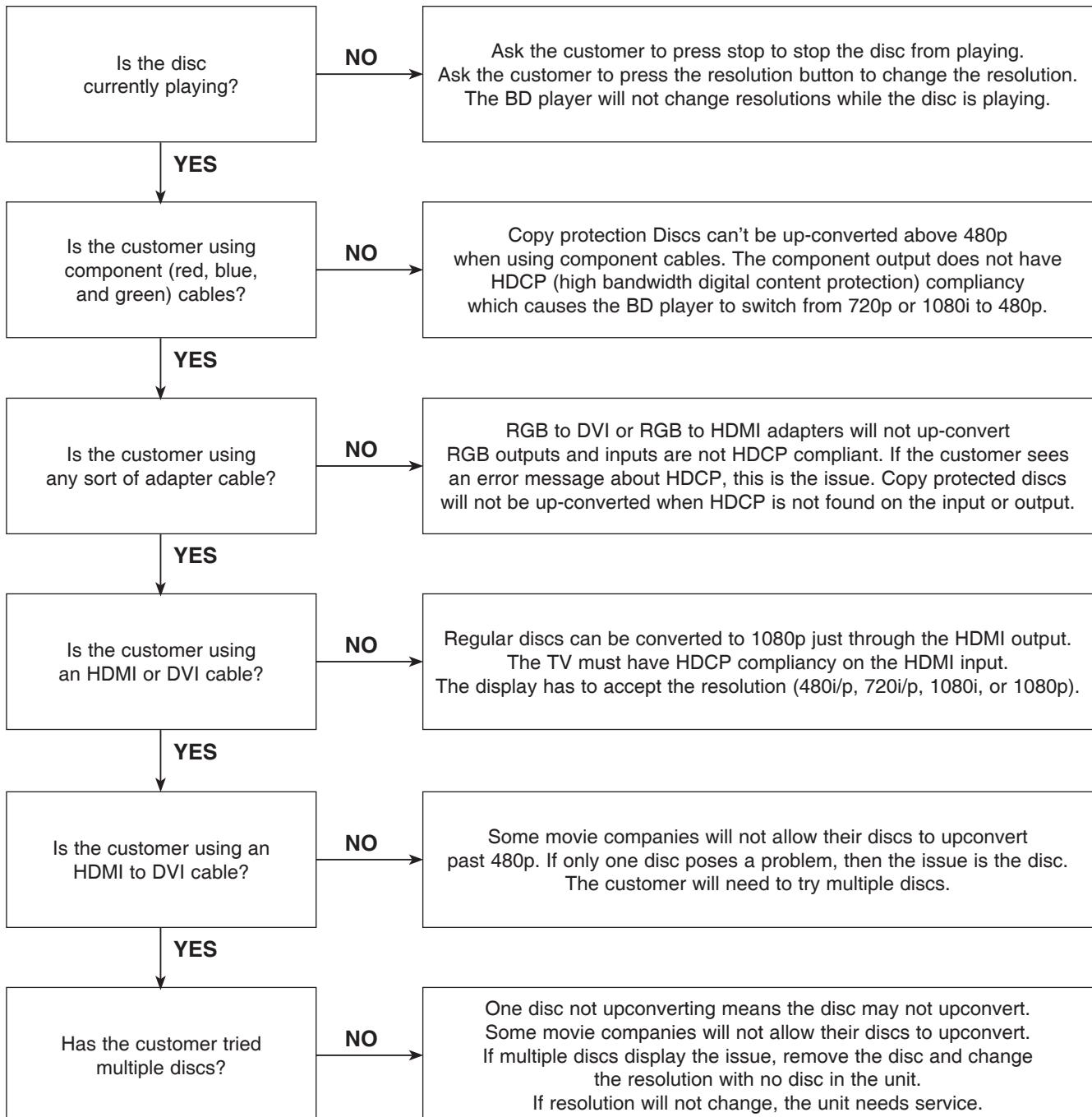
The customer has bars on the top and bottom of the screen, the left and right of the screen, or both.



DIGITAL DISPLAY & MEDIA TRAINING MASTER

5-11. My Unit Won't be up-converted

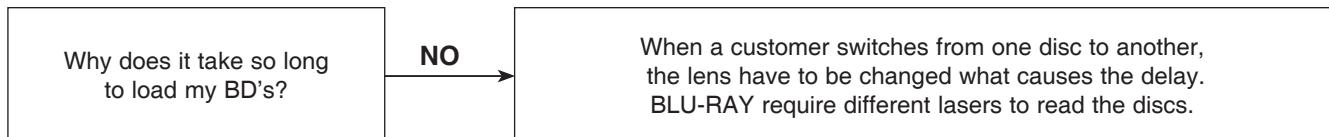
The customer has a problem with getting the unit to change resolutions to 480i/p, 720i/p, 1080i, or 1080p.



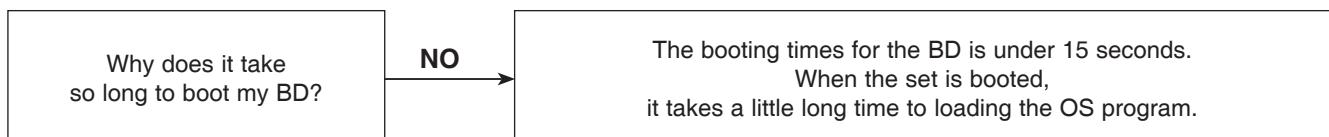
DIGITAL DISPLAY & MEDIA TRAINING MASTER

6. BLU-RAY PLAYER

6-1. Slow Loading Times for BD's



6-2. Booting Times



ONE POINT REPAIR GUIDE

1. NO POWER PROBLEM

No power problem occurs when you power on the unit.

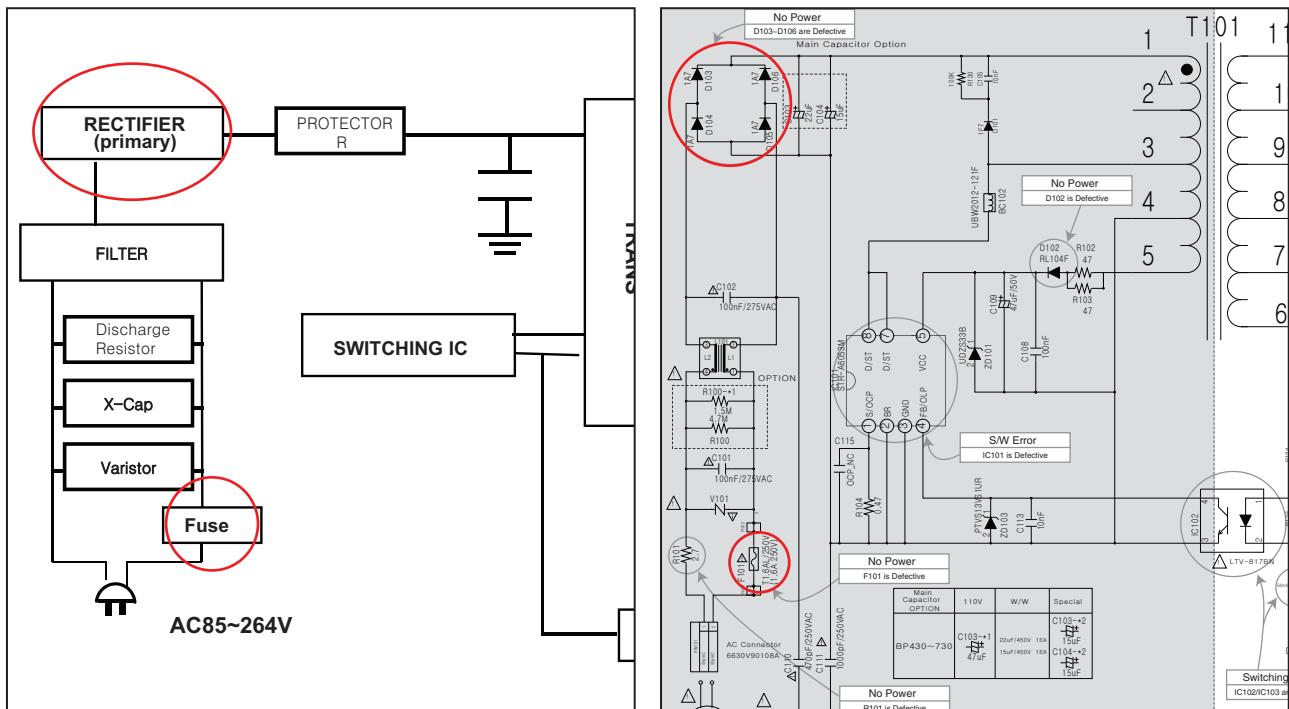
1-1. Fuse & bridge diodes

1-1-1. Solution

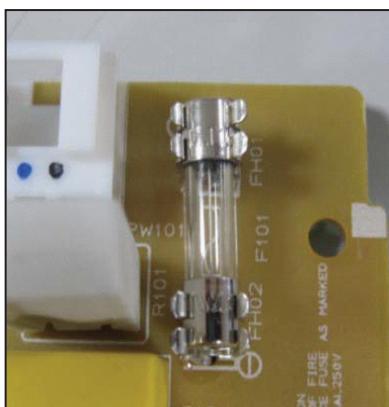
Replace F101, D103 ~ D106, R101 on SMPS board.

1-1-2. How to troubleshoot (Countermeasure)

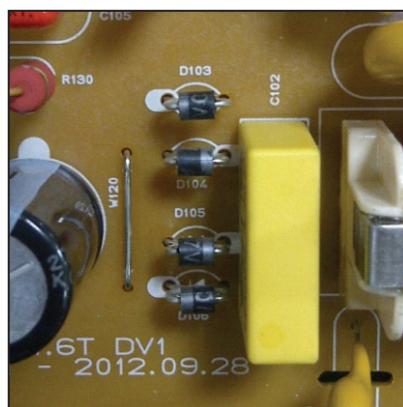
- 1) Look at the physical of fuse F101.
- 2) Check the bridge diode D103/ D104/ D105/ D106.
- 3) Check the R101 short or open.



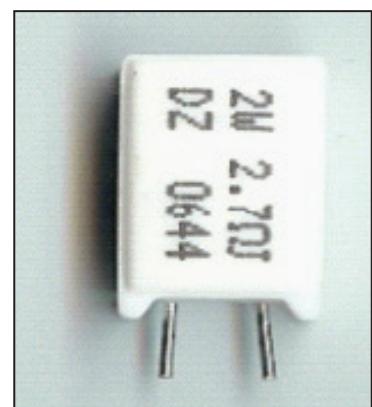
1-1-3. Service hint (Any picture / Remark)



< Fuse, F101 >



< Bridge diode, D103 ~ D106 >



< Resistor, R101 >

If R101 open state,
it is change new component.

ONE POINT REPAIR GUIDE

No power problem occurs when you power on the unit.

1-2. 12 VA & 5.1 VA abnormal

1-2-1. Solution

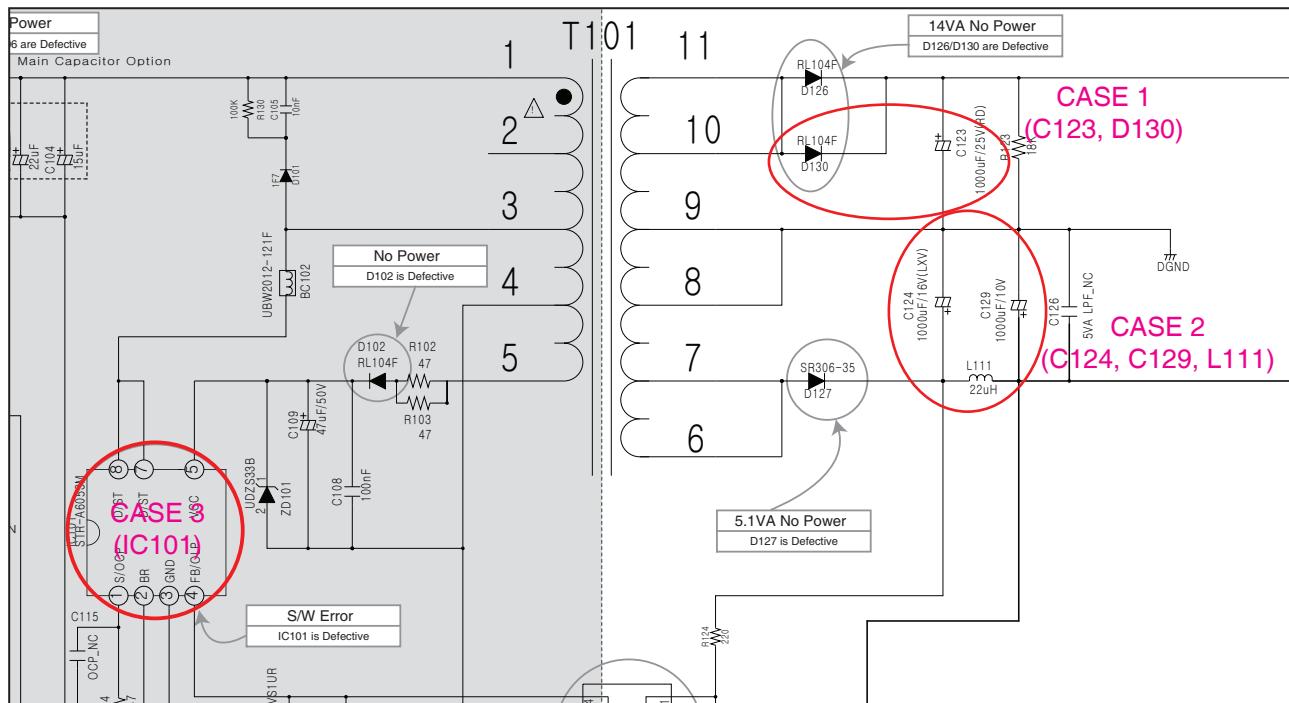
Replace C123, D130 / C124, C129, L111, IC101.

1-2-2. How to troubleshoot (Countermeasure)

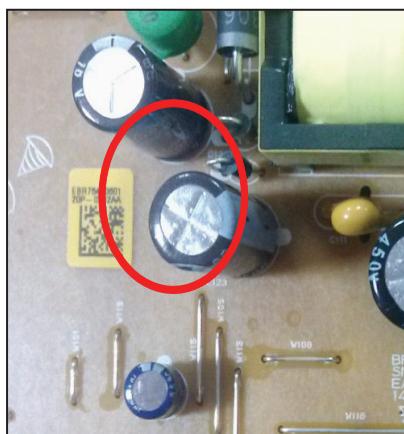
Case 1) 12 VA abnormal: Check C123 and replace it.

Case 2) 5.1 VA abnormal: Check C124, C129, L111 and replace it.

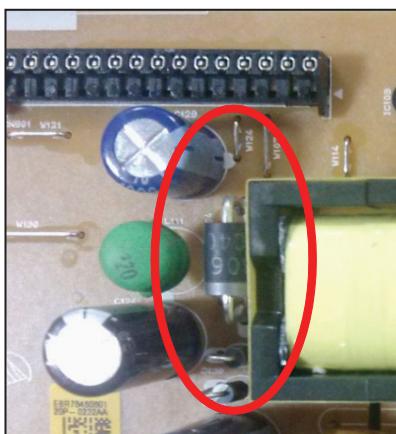
Case 3) 12 VA & 5.1 VA abnormal: Check IC101 and replace it.



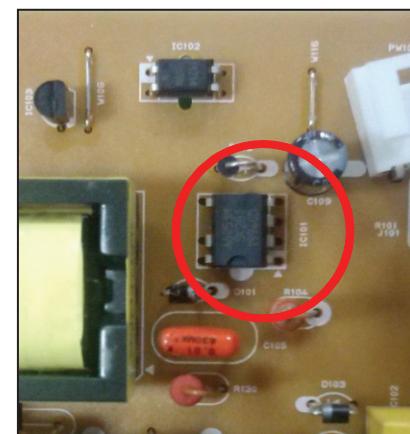
1-2-3. Service hint (Any picture / Remark)



< Case 1, C123 >



< Case 2, C129/ L111/ C124 >



< Case 3, IC101 >

ONE POINT REPAIR GUIDE

2. CLOCK DOESN'T DISPLAY

Timer board doesn't work. (abnormal display)

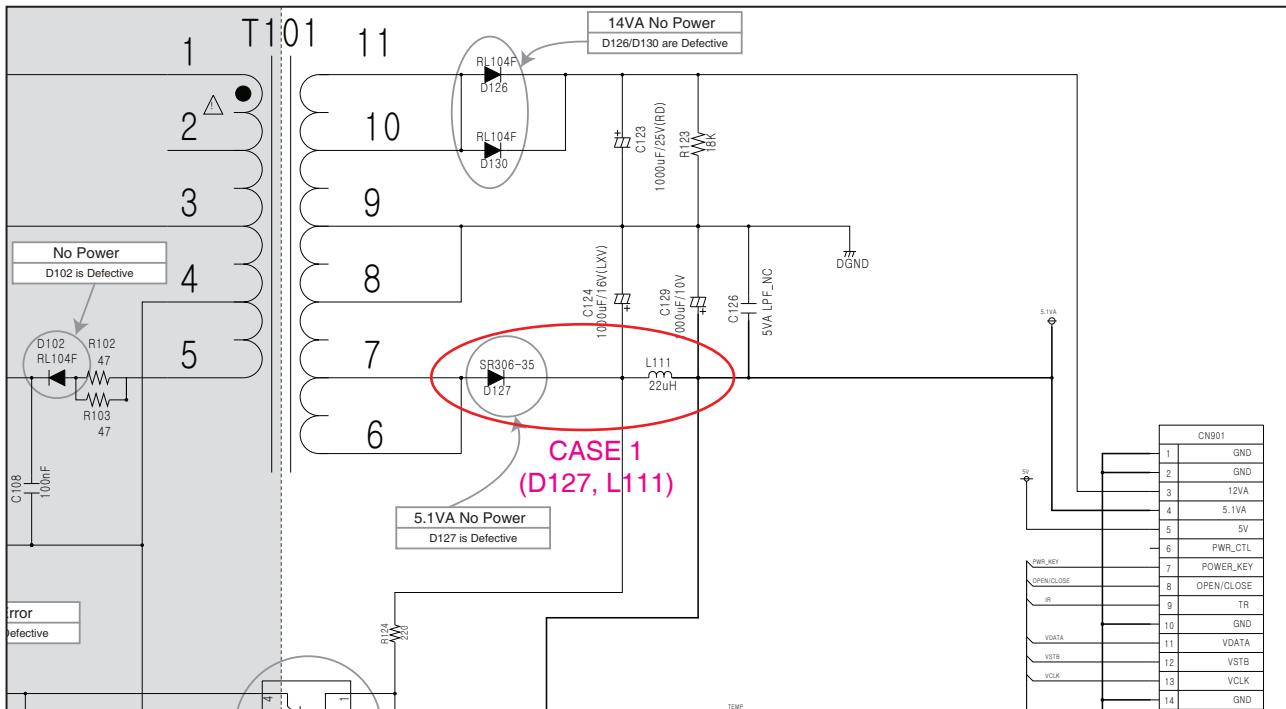
2-1. 5.1 VA abnormal

2-1-1. Solution

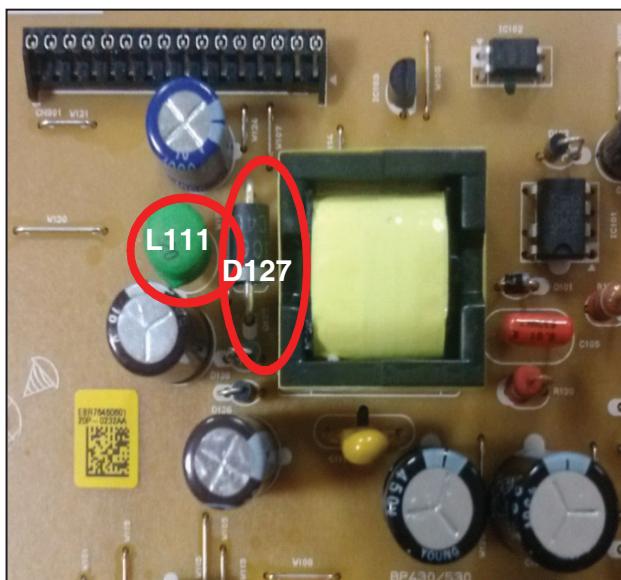
Replace D127 or L111 on SMPS board.

2-1-2. How to troubleshoot (Countermeasure)

Case 1) 5.1 VA abnormal: Replace D127 or L111 on SMPS board.



2-1-3. Service hint (Any picture / Remark)



ONE POINT REPAIR GUIDE

3. NO BOOTING WHEN YOU TURN THE UNIT ON, NO MESSAGE OR "HELLO" ON FRONT PANEL

When you turn on your set, it will blank / no message or hello on front panel, and it will not boot-up.

3-1. IC153 (No 3.3 VA)

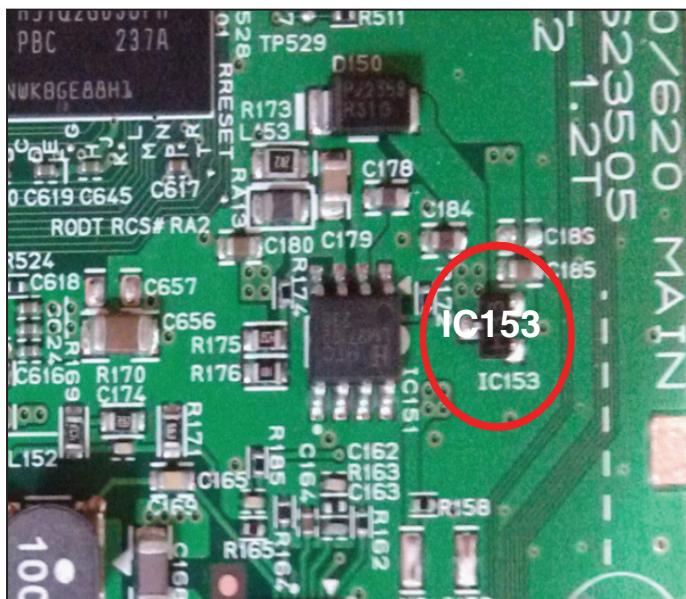
3-1-1. Solution

Replace IC153 on main board.

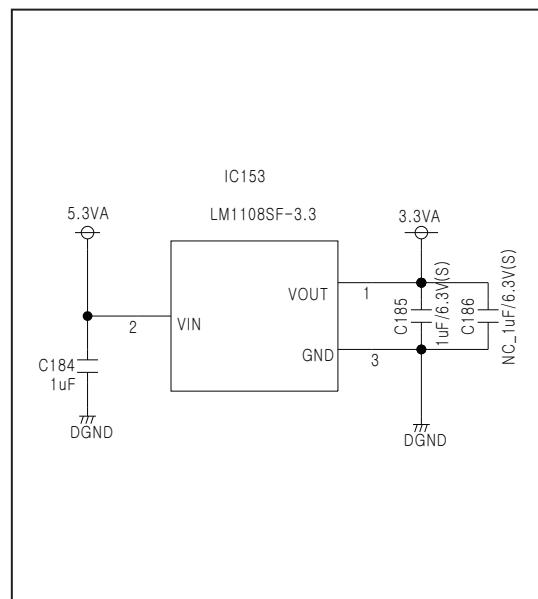
3-1-2. How to troubleshoot (Countermeasure)

- 1) Please check 5.1 VA of IC153 pin2 (Vin).
- 2) If 5.1 VA is abnormal, follow the stage 2-1 case1 at the previous page.
- 3) If 5.1 VA is OK, but 3.3 VA is abnormal at the IC153 pin1(Vout), replace IC153.

3-1-3. Service hint (Any picture / Remark)



< Main board top view >



ONE POINT REPAIR GUIDE

When you turn on your set, it will blank / no message or hello on front panel, and it will not boot-up.

3-2. IC151 (No 3.3 V)

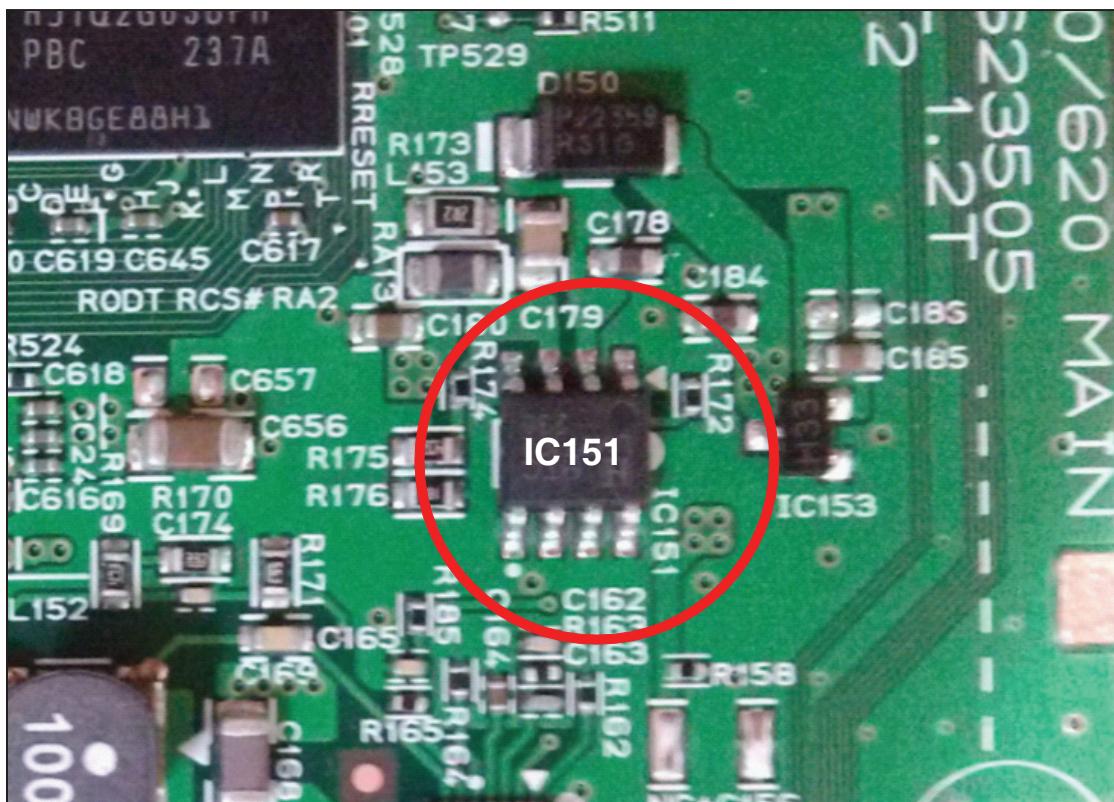
3-2-1. Solution

Replace IC151 on main board.

3-2-2. How to troubleshoot (Countermeasure)

- 1) Please check 3.3 V of L153 on main board.
- 2) If 3.3 V voltage doesn't come out, check IC151 pin2(Vcc 5.1 VA).
When you figure out those power, if there is no 5.1 VA, please check 5.1 VA from SMPS.
For the solution please back to the solution 2.
- 3) If 5.1 VA input is normal, first of all check the PWR_CTL is high(CN150 pin6).
If PWR_CTL is high, check R172, L153, C179, R173, R174, R175, R176
and if there's no defective component then replace IC151.
- 4) After changing it, if the set is still not booting :
 - Refer to the next page for checking another power source. (1.1 V, 1.2 V, 1.5 V)
 - Check crystal X501 refer to item 3-5.
 - Check NAND flash IC(IC603) refer to item 3-6.
 - Check DDR IC(IC601, IC602) refer to item 3-7.
 - Check MT8560C IC(IC501) refer to item 3-8.

3-2-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will blank / no message or hello on front panel, and it will not boot-up.

3-3. IC150 (No 1.5 V)

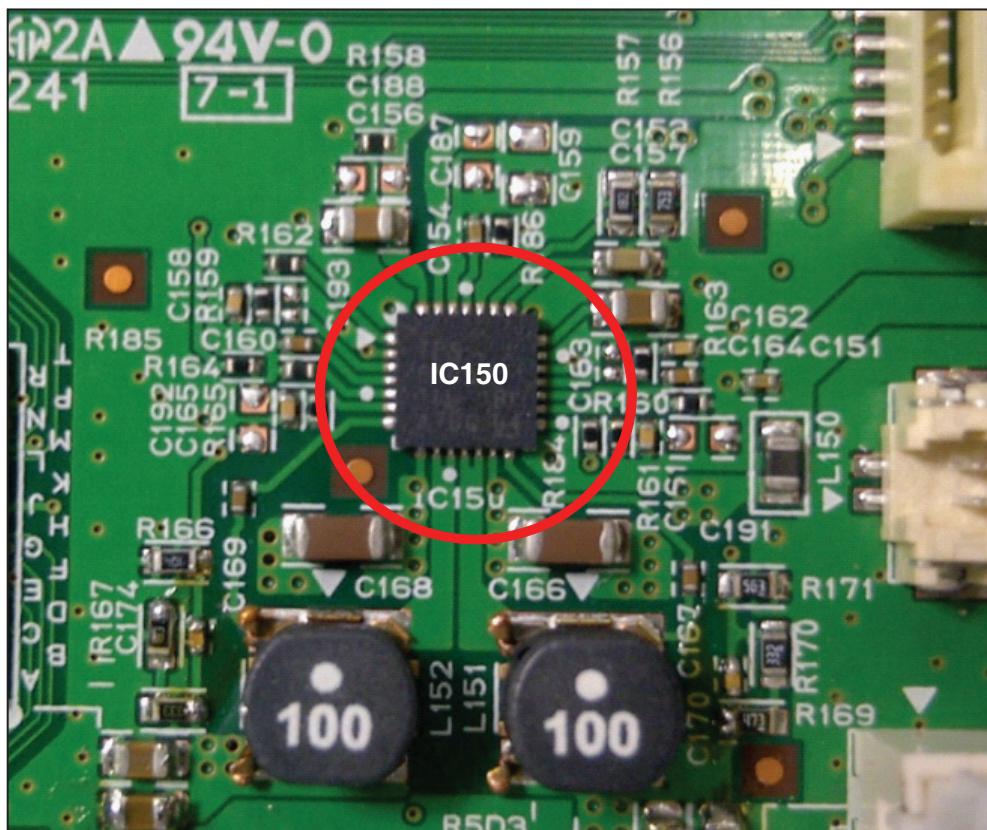
3-3-1. Solution

Replace IC150 on main board.

3-3-2. How to troubleshoot (Countermeasure)

- 1) Please check 1.5 V of IC150 on main board.
- 2) If 1.5 V voltage doesn't come out, check IC150 pin8(Vcc 13 VA).
If there is no 13 V, please check 13 VA from SMPS. (go to previous page to check it)
- 3) If Vcc input IC150, there are 13 V signal,
First of all, check the PWR_CTL is high and if it's high check C165, R165, L152, C169, R169, R170, R171, C174, C175, C176, C177 and if there's no defective component, please replace IC150.
- 4) After changing it, if the set is still not booting :
 - Check 1.1 / 1.2 / 3.3 V / 3.3 VA is normal. (please refer to other sections of this guide)
 - Check Crystal X501 refer to item 3-5.
 - Check NAND flash IC(IC603) refer to item 3-6.
 - Check DDR IC(IC601, IC602) refer to item 3-7.
 - Check MT8560C IC(IC501) refer to item 3-8.

3-3-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will blank / no message or hello on front panel, and it will not boot-up.

3-4. IC150 (No 1.2 V)

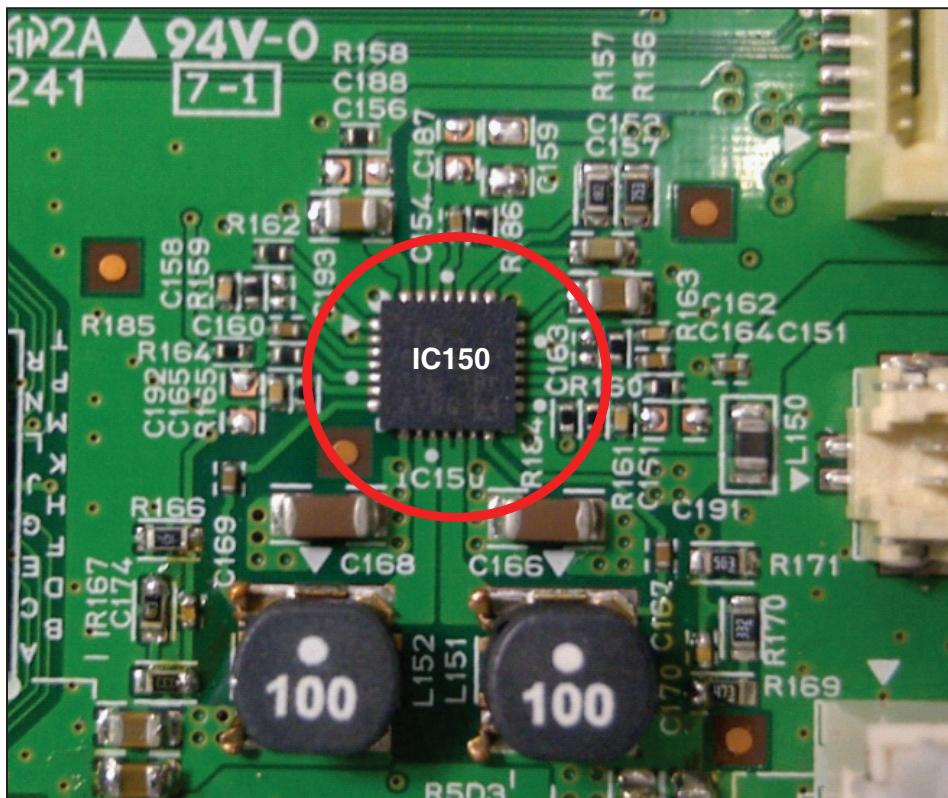
3-4-1. Solution

Replace IC150 on main board.

3-4-2. How to troubleshoot (Countermeasure)

- 1) Please check 1.2 V of IC150 on main board.
- 2) If 1.2 V voltage doesn't come out,
 - Check IC150 pin12 (Vcc 13 VA).
If there is no 13 V, please check 13 VA from SMPS. (go to previous page to check it)
- 3) If VCC input IC150, there are 13 VA signal,
First of all, check the PWR_CTL is high and if it's high check C161, R161, C167, L151, R166, R167, R168, C170, C171, C172, C173 and if there's no defective component please replace IC150.
- 4) After changing it, if the set is still not booting:
 - Check 1.2 / 3.3 V / 3.3 VA is normal. (please refer to other sections of this guide)
 - Check Crystal X501 refer to item 3-5.
 - Check NAND flash IC(IC603) refer to item 3-6.
 - Check DDR IC(IC601, IC602) refer to item 3-7.
 - Check MT8560C IC(IC501) refer to item 3-8.

3-4-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will display “HELLO” on front panel, and it will not boot-up normally.

3-5. X501

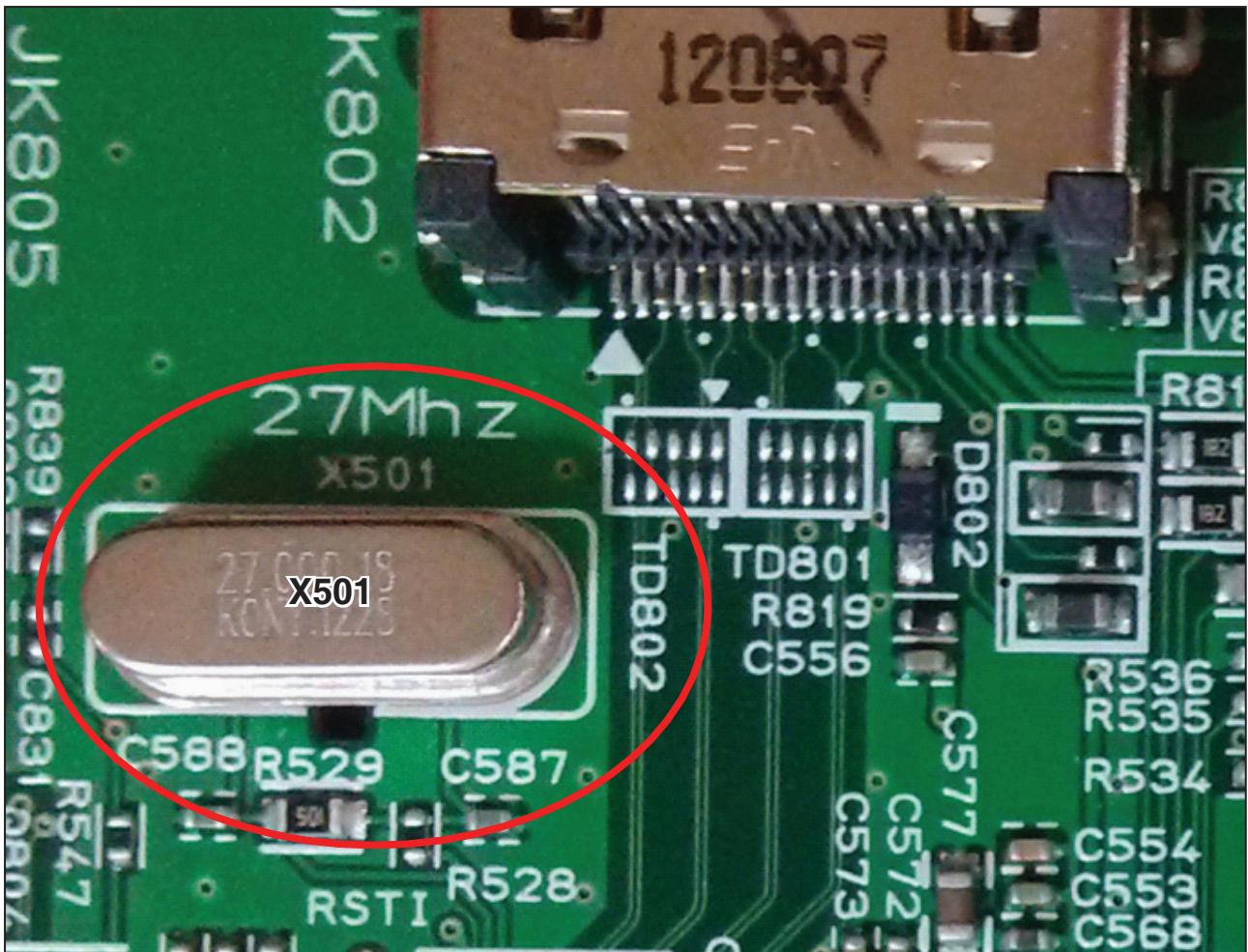
3-5-1. Solution

Replace X501 on main board.

3-5-2. How to troubleshoot (Countermeasure)

- 1) Please check the soldering status of 27 MHz crystal(X501).
- 2) Please check the frequency of 27 MHz crystal(X501).
- 3) If the crystal doesn't oscillate, replace X501.
- 4) After changing it, if the set is still not booting:
 - Check NAND flash IC(IC603) refer to item 3-6.
 - Check DDR IC(IC601, IC602) refer to item 3-7.
 - Check MT8560C IC(IC501) refer to item 3-8.

3-5-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will display “HELLO” on front panel, and it will not boot-up normally.

3-6. IC603 (NAND FLASH MEMORY)

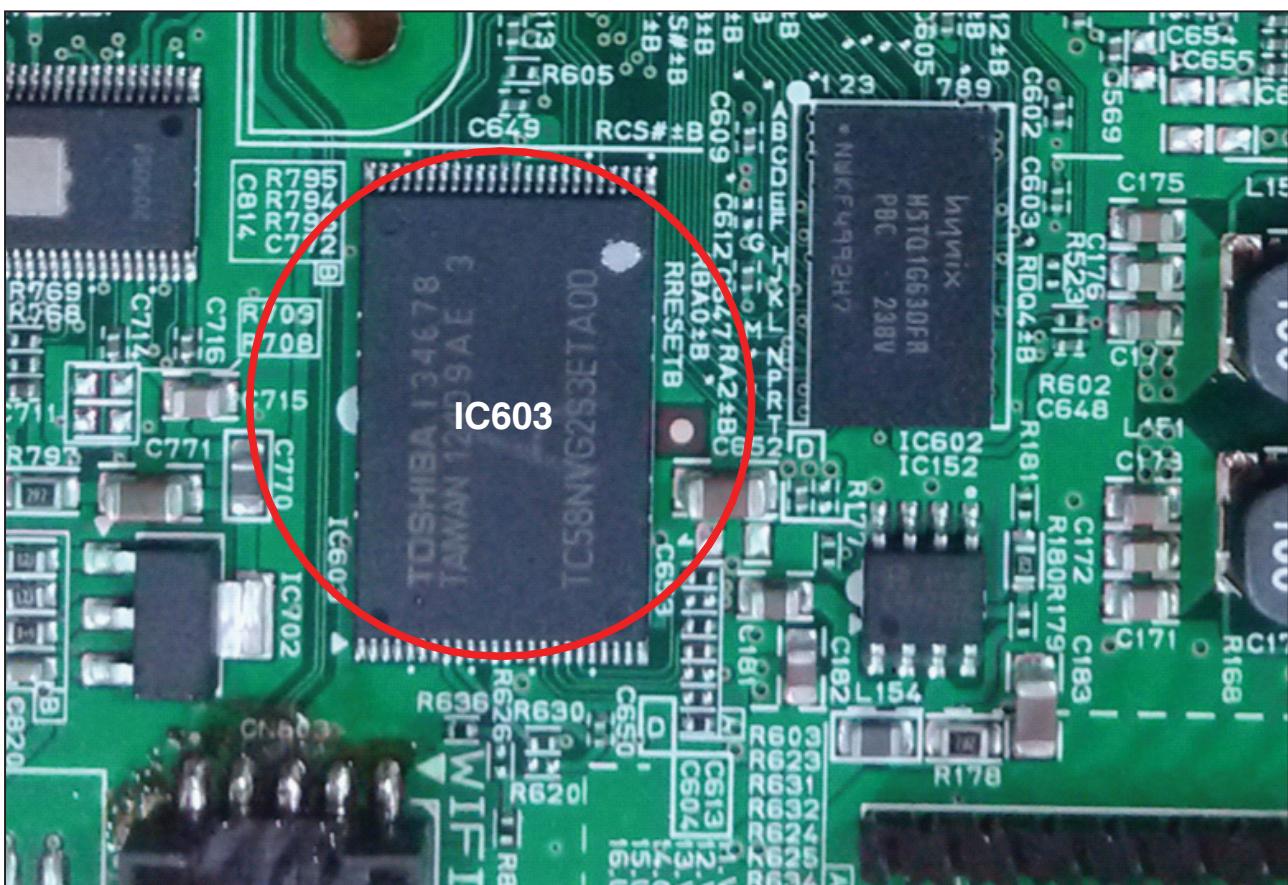
3-6-1. Solution

Replace IC603 on main board.

3-6-2. How to troubleshoot (Countermeasure)

- 1) Please check physical status of IC603 on your eyes.
- 2) Check the Vcc(3.3 V) of IC603 and if it's normal please replace IC603.
(Please make sure IC603 has proper program.)
- 3) After changing it, if the set is still not booting:
 - Check DDR IC(IC601, IC602) refer to item 3-7.
 - Check MT8560C IC(IC501) refer to item 3-8.

3-6-3. Service hint (Any picture / Remark)



< Main board bottom view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will display “HELLO” on front panel, and it will not boot-up normally.

3-7. IC601, IC602 (DDR3 MEMORY)

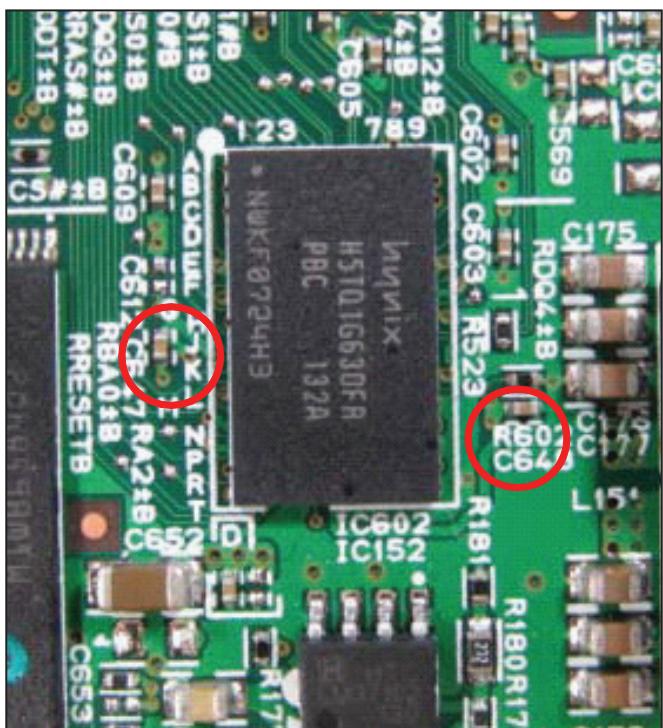
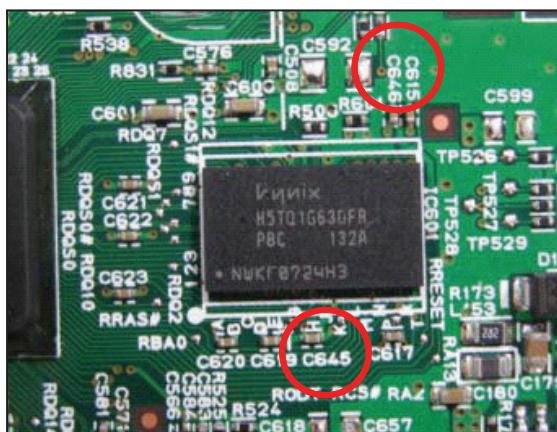
3-7-1. Solution

Replace IC601, IC602 on main board.

3-7-2. How to troubleshoot (Countermeasure)

- 1) Please check 0.75 V of DDR3_VREF.(between C645 and C646).
Please check 0.75 V of DDR3_VREF.(between C647 and C648).
Please check 1.5 V of C601.
- 2) If it doesn't work even though IC150, IC151, IC152, IC153 are no problem,
IC601, IC602 (DDR memory) could have problem.
- 3) After changing it, if the set is still not booting:
 - Check MT8560C IC(IC501) refer to item 3-8.
 - Check main board refer to item 3-9.

3-7-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will display “HELLO” on front panel, and it will not boot-up normally.

3-8. IC501 (MPEG IC)

3-8-1. Solution

Replace IC501 on main board.

3-8-2. How to troubleshoot (Countermeasure)

1) Please check 1.2 V of C502 on main board.

Please check 3.3 V of C553 on main board.

Please check 1.5 V of C602 on main board.

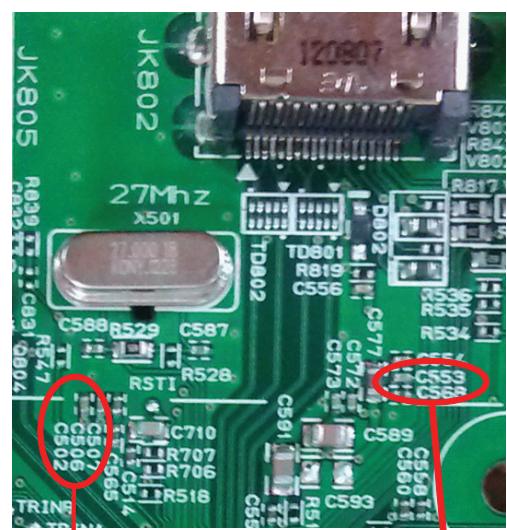
2) If it doesn't work even though IC150, IC151 are no problem,
IC501 MT8560C could have problem.

3) After changing it, if the set is still no booting, check main board refer to item 3-9.

3-8-3. Service hint (Any picture / Remark)



C602(1.5V)



C502(1.2V)

C553(3.3V)



< Main board top view >

ONE POINT REPAIR GUIDE

When you turn on your set, it will display “HELLO” on front panel, and it will not boot-up normally.

3-9. Main board

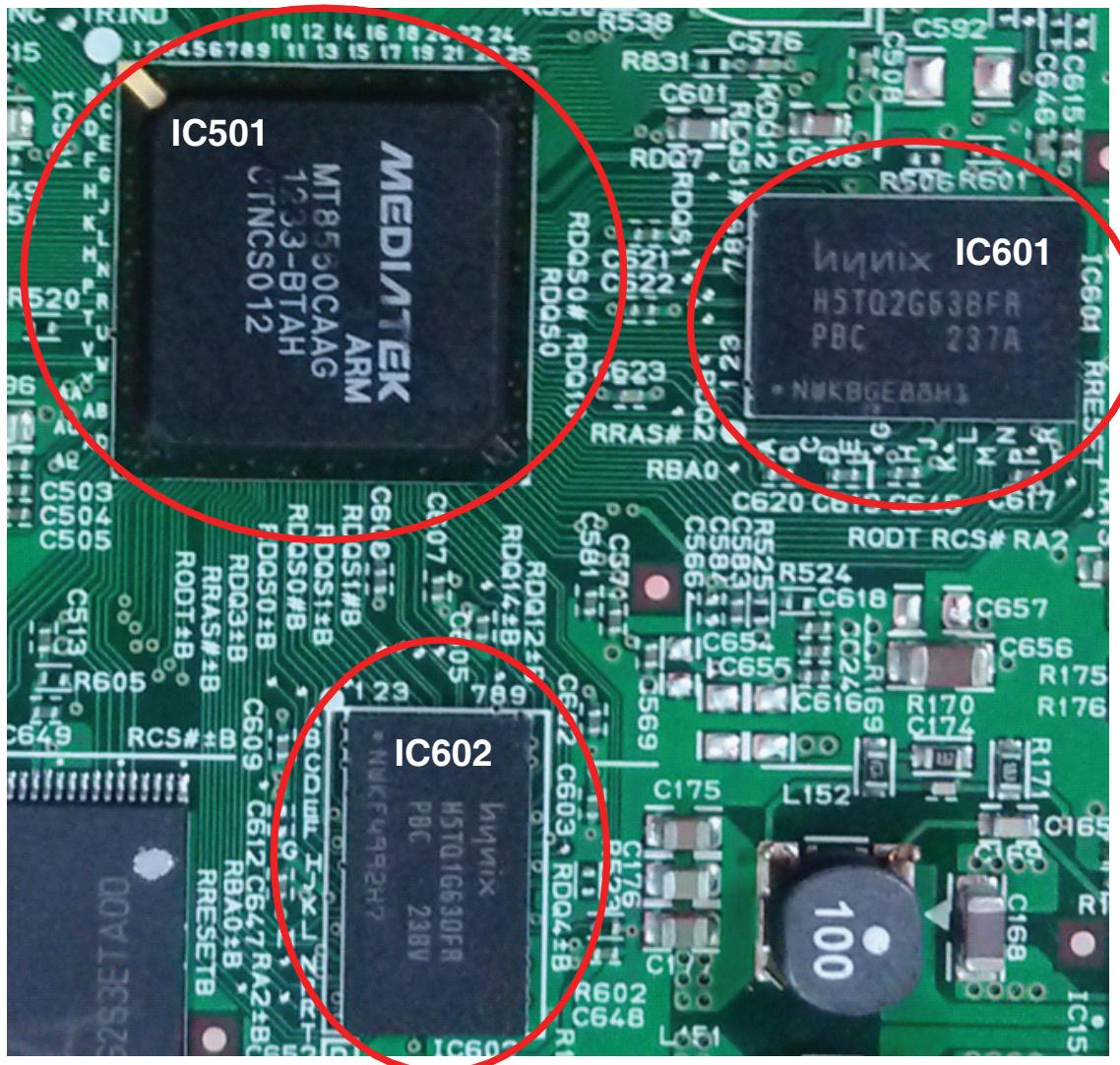
3-9-1. Solution

Replace main board.

3-9-2. How to troubleshoot (Countermeasure)

- 1) Please remove IC501 and IC601, IC602, and then check the Impedance between each signal (DATA, ADDRESS and so on.)
- 2) If there is some Impedance (a few ohm or infinite ohm) especially power source trace, PCB via might be broken. You'd better change main board.

3-9-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

4. WIRED NETWORK CONNECTION ERROR

When you connect online service (like Youtube or Netflix2.1) through the wired LAN, the “no connection” message appears.

4-1. JK803 (Ethernet Jack)

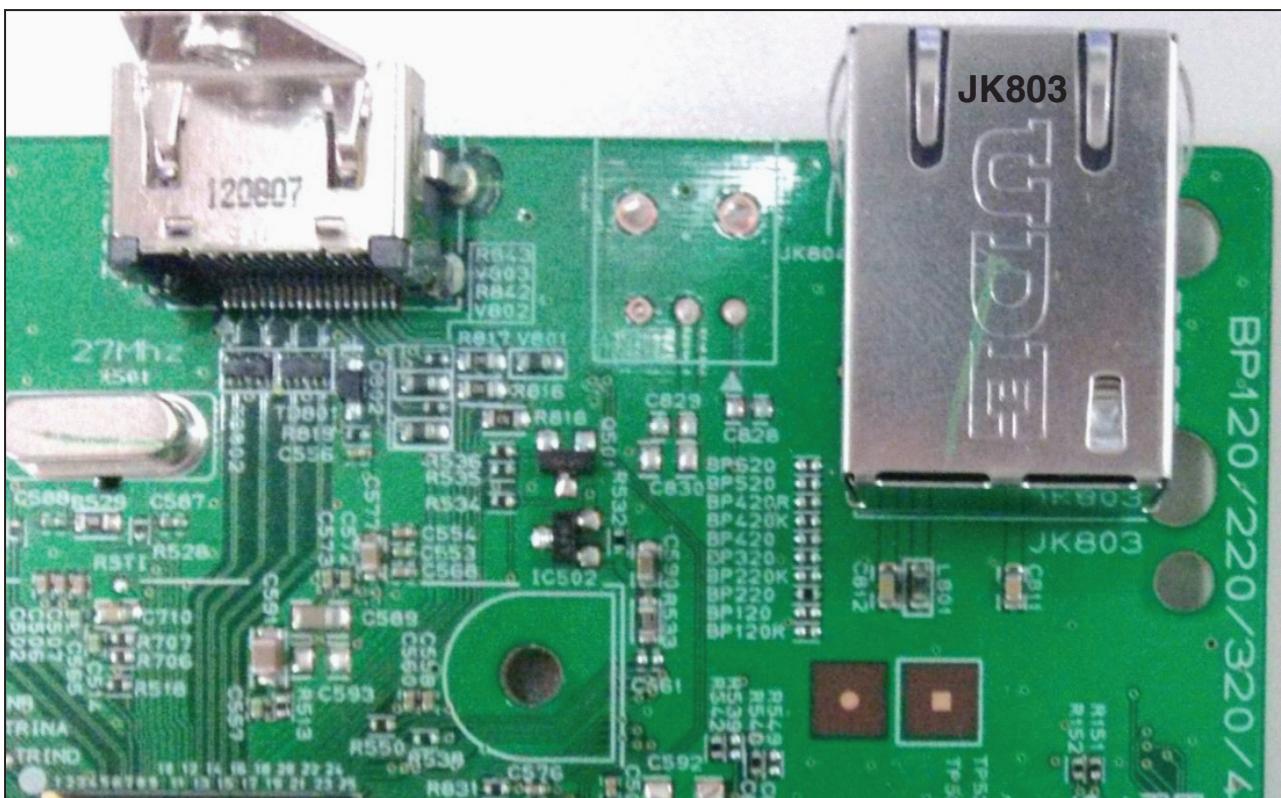
4-1-1. Solution

Replace JK803(Ethernet Jack) on main board.

4-1-2. How to troubleshoot (Countermeasure)

- 1) Check your internet connection. Make sure it connects properly to modem or router.
- 2) If internet connection OK, please check the Ethernet Jack (JK803).
- 3) If there is soldering problem, please re-soldering pin JK803.
- 4) If after re-soldering problem still occurs, replace JK803.
- 5) If problem still occurs after changing JK803, check MT8560C IC (IC501). Refer to item 3-8.

4-1-3. Service hint (Any picture / Remark)



< Main board top view >

ONE POINT REPAIR GUIDE

5. WIRELESS NETWORK CONNECTION ERROR

When you connect online service (like Youtube or Netflix2.1) through the Wi-Fi, the “no connection” message appears.

5-1. Wi-Fi Module

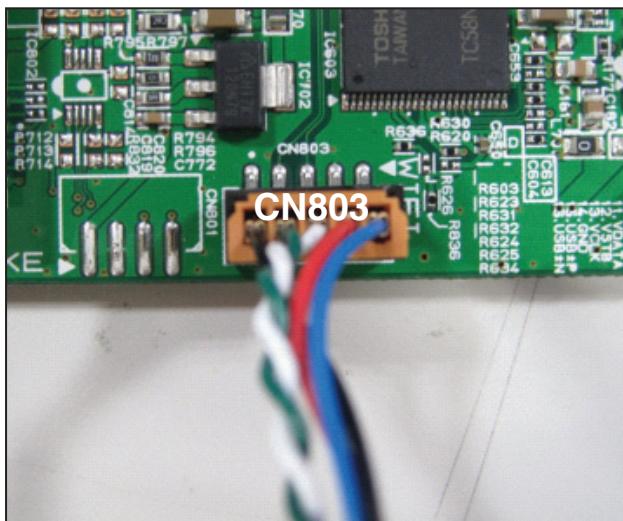
5-1-1. Solution

Replace Wi-Fi module on front panel.

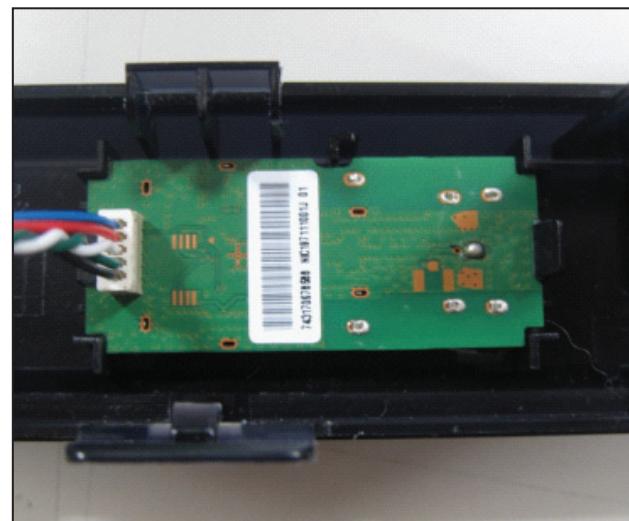
5-1-2. How to troubleshoot (Countermeasure)

- 1) Check your internet connection. Make sure it connects properly to modem or router.
- 2) If internet connection OK, please check the CN803.
- 3) If there is soldering problem, please re-soldering pin CN803.
- 4) If after re-soldering problem still occurs, replace Wi-Fi module.
- 5) If problem still occurs after changing Wi-Fi module, check MT8560C IC (IC501). Refer to item 3-8.

5-1-3. Service hint (Any picture / Remark)



< Main board top view >



< Wi-Fi module >

ONE POINT REPAIR GUIDE

6. BAD HDMI VIDEO / AUDIO OUTPUT

When unit is connected to HDMI TV using HDMI cable, picture shows bad color, no output or mixed color on the screen. But component output is OK.

6-1. JK802 (HDMI Jack)

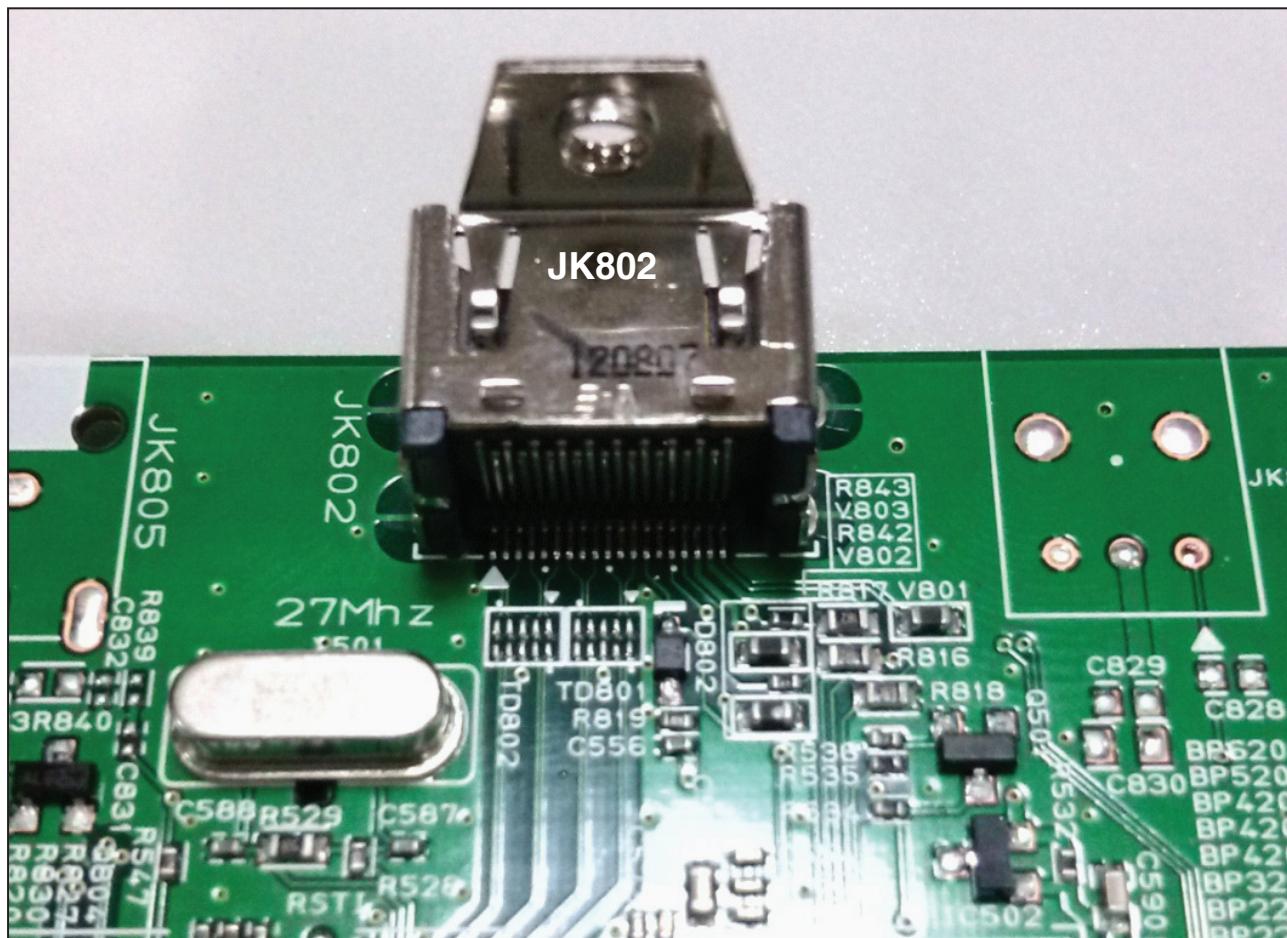
6-1-1. Solution

Replace JK802 (HDMI Jack)

6-1-2. How to troubleshoot (Countermeasure)

- 1) Check JK802 pin soldering.
- 2) If there is short soldering on pin JK802, re-soldering pin JK802.
- 3) If problem still occurs, check HDMI data:
 - If all data OK, replace JK802.
 - If data NG, check set on BD Mode:
Replace IC501.

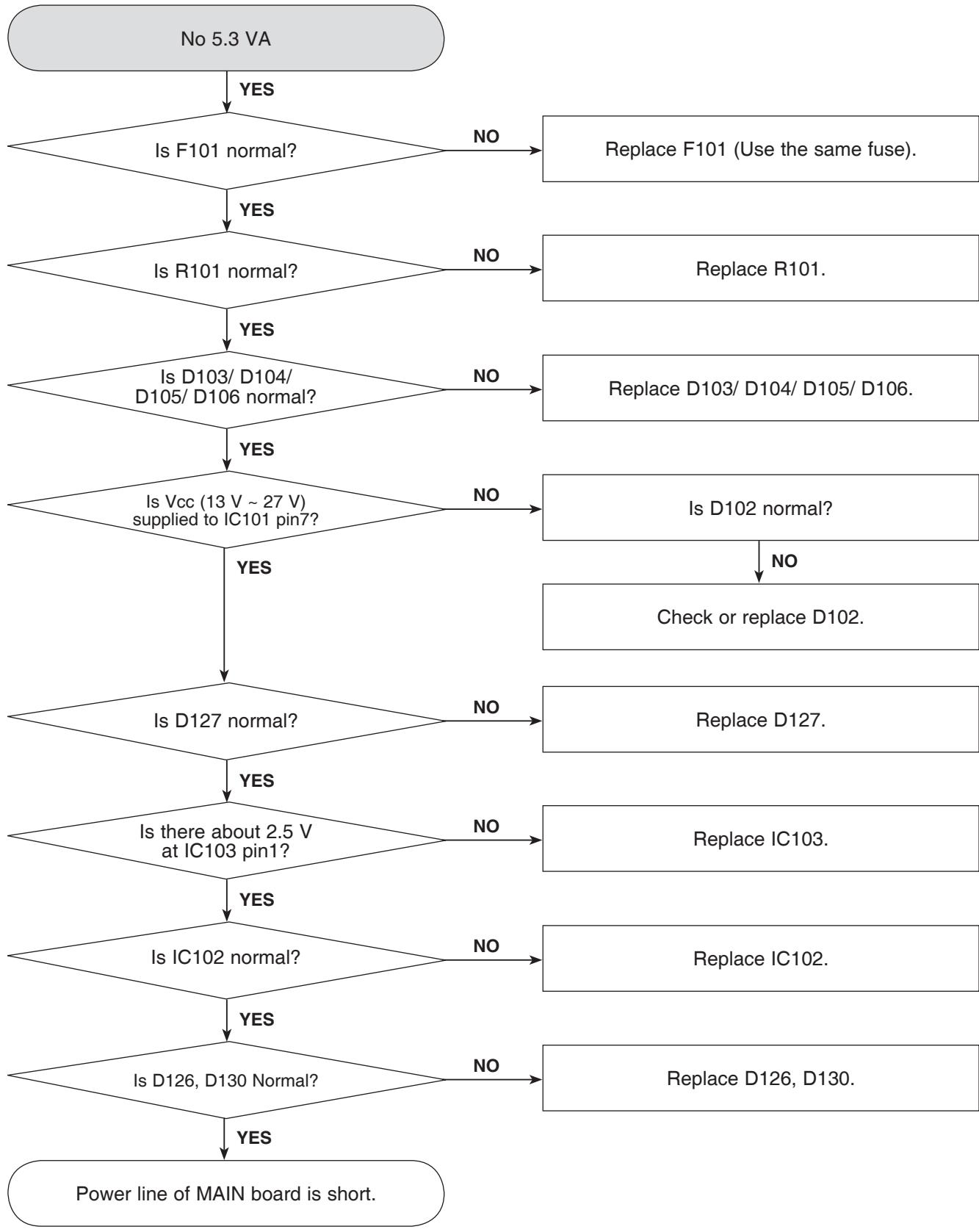
6-1-3. Service hint (Any picture / Remark)



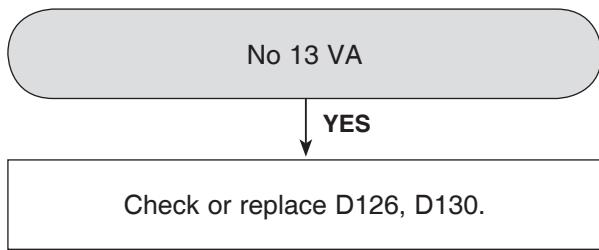
< Main board top view >

ELECTRICAL TROUBLESHOOTING GUIDE

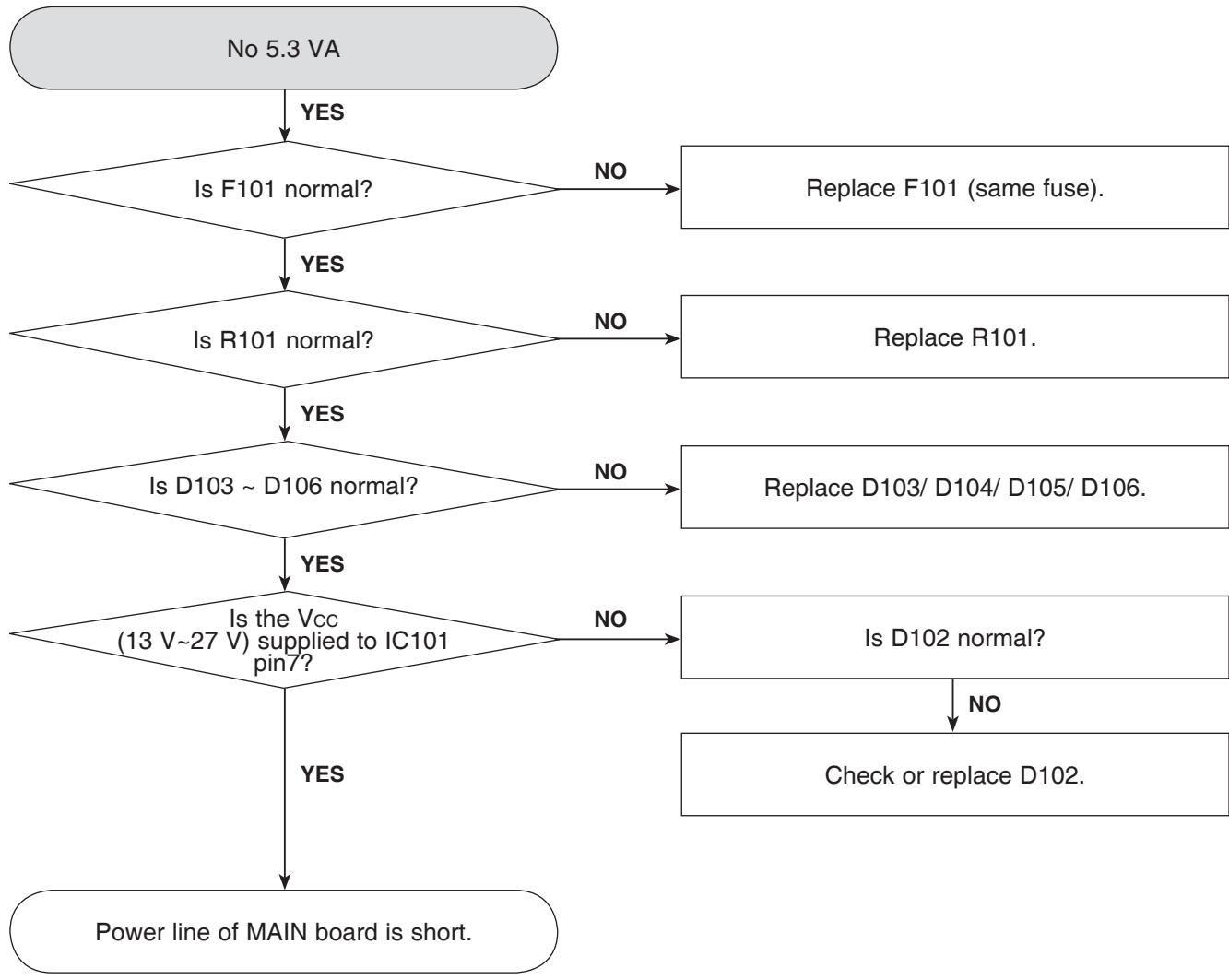
1. SMPS TROUBLESHOOTING FLOW



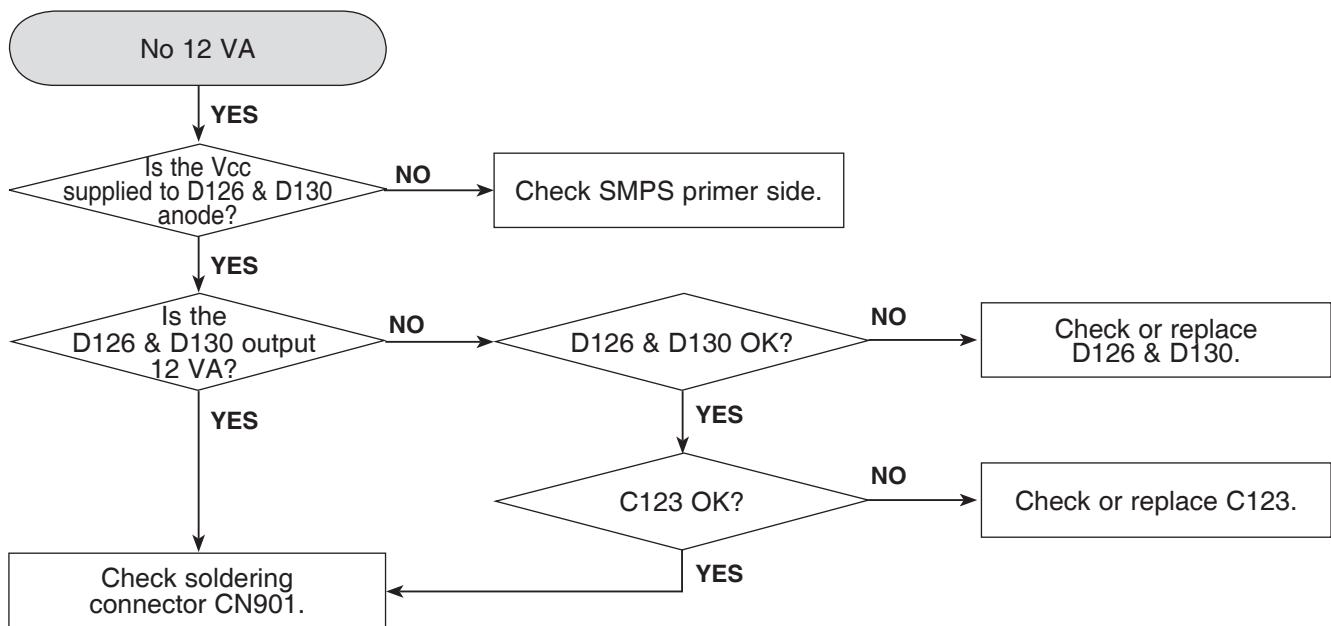
ELECTRICAL TROUBLESHOOTING GUIDE



2. POWER SUPPLY ON SMPS BOARD

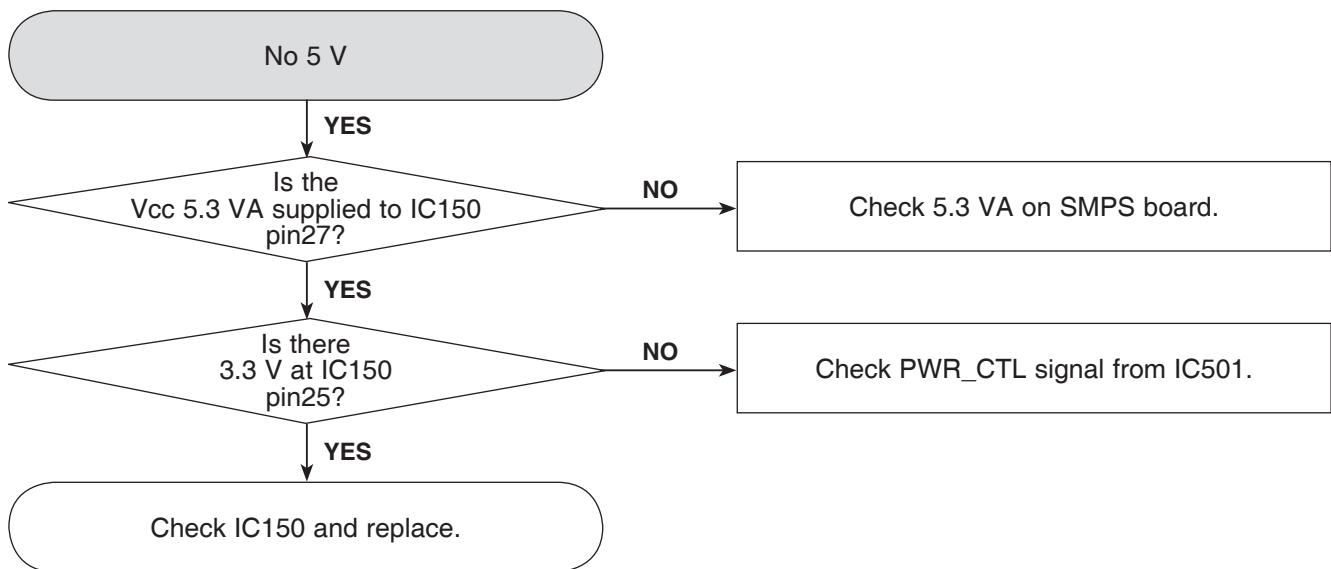
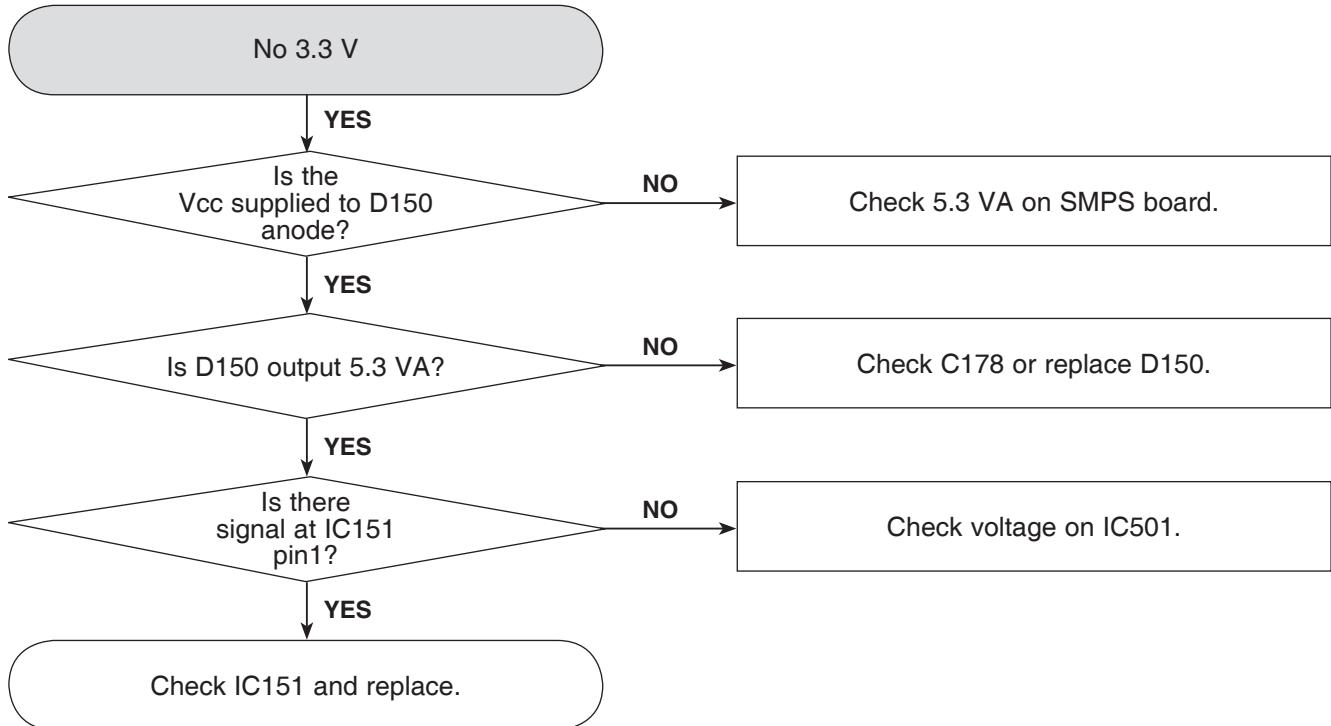


ELECTRICAL TROUBLESHOOTING GUIDE

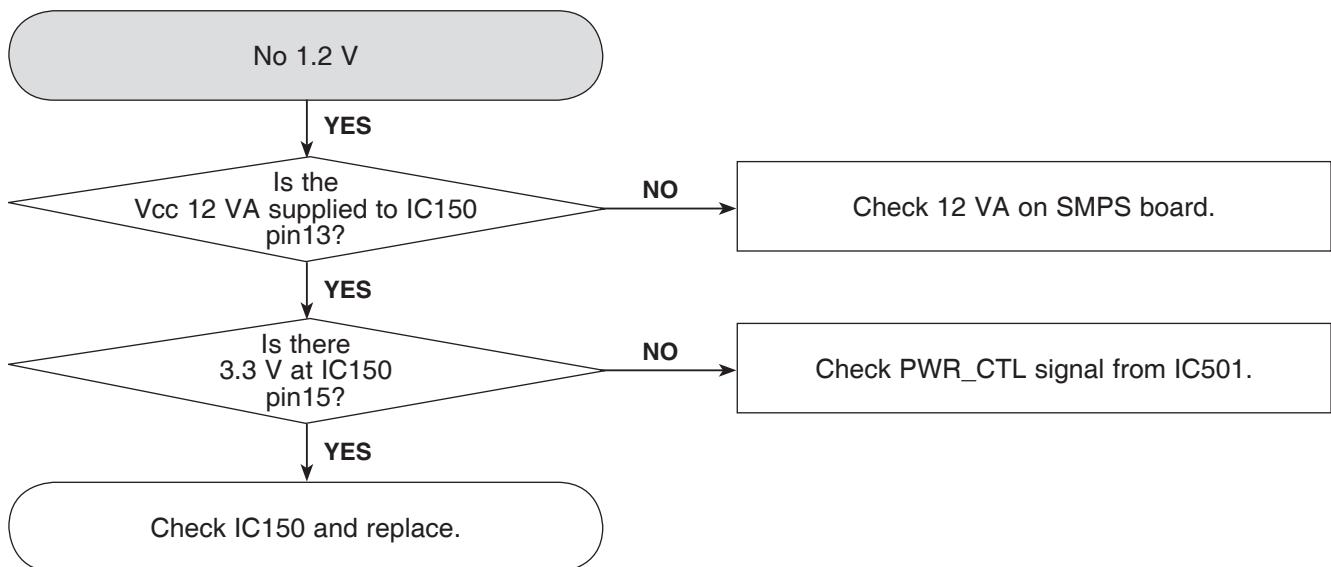
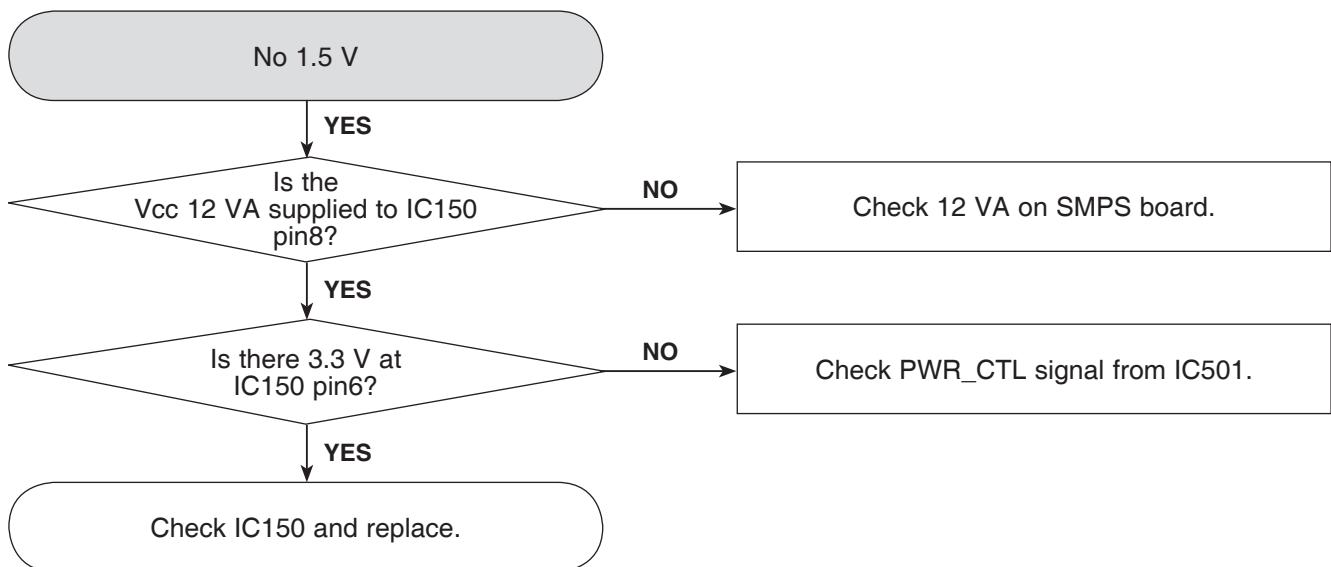


ELECTRICAL TROUBLESHOOTING GUIDE

3. POWER SUPPLY ON MAIN BOARD

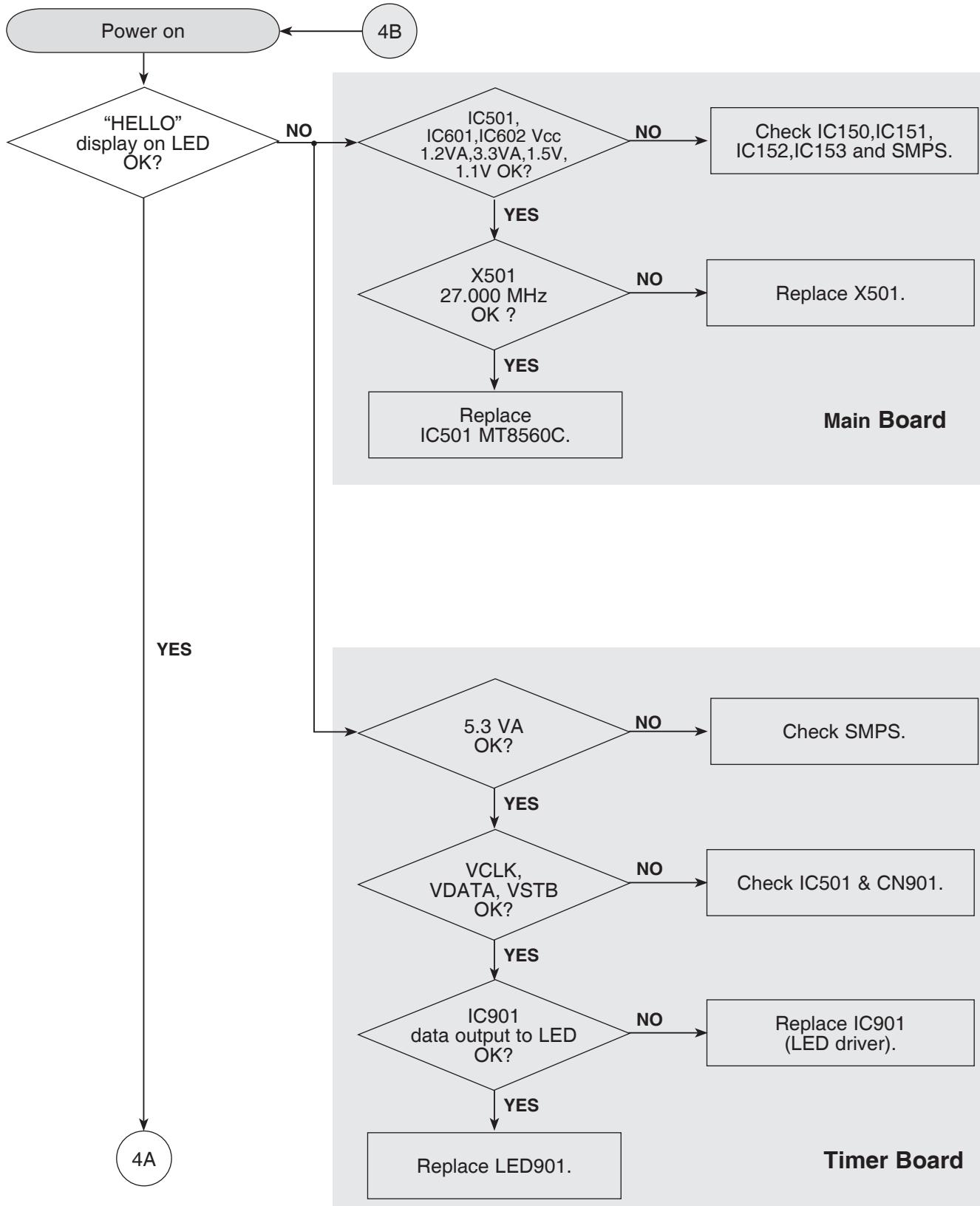


ELECTRICAL TROUBLESHOOTING GUIDE

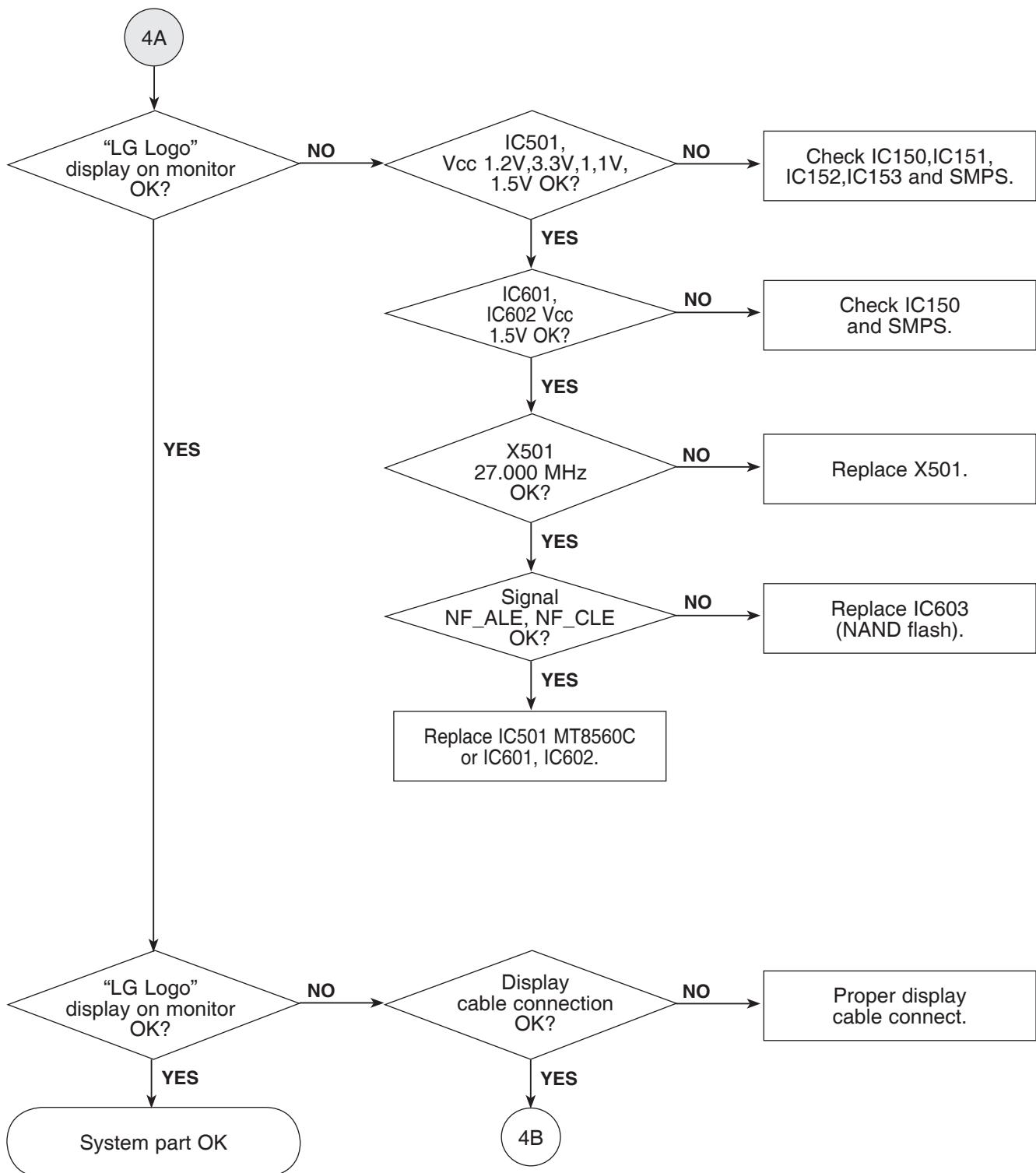


ELECTRICAL TROUBLESHOOTING GUIDE

4. SYSTEM PART

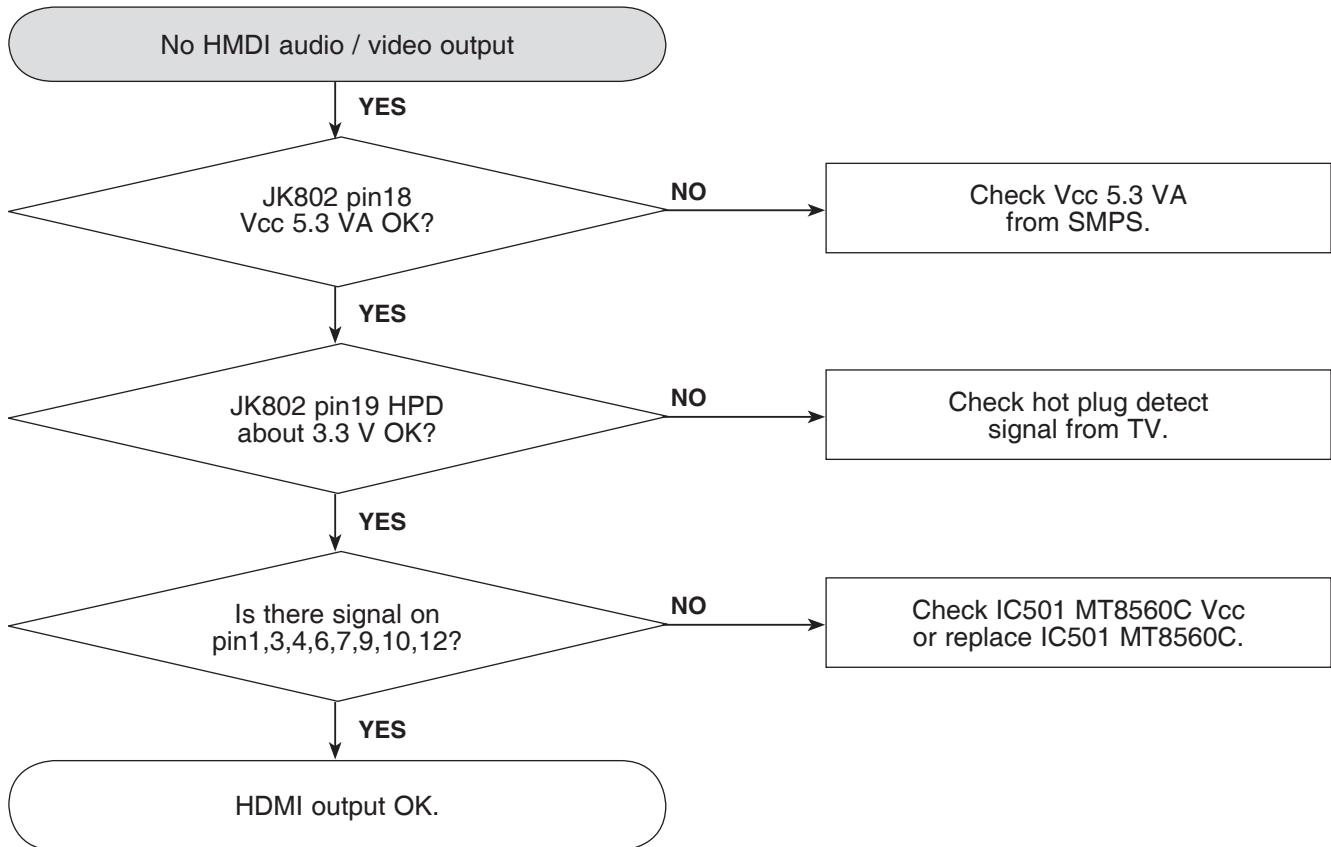


ELECTRICAL TROUBLESHOOTING GUIDE



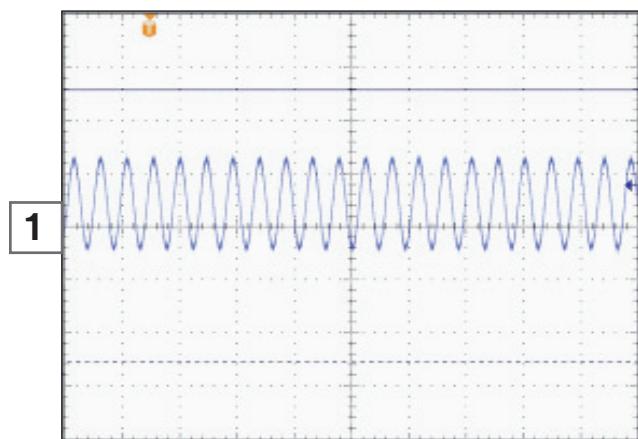
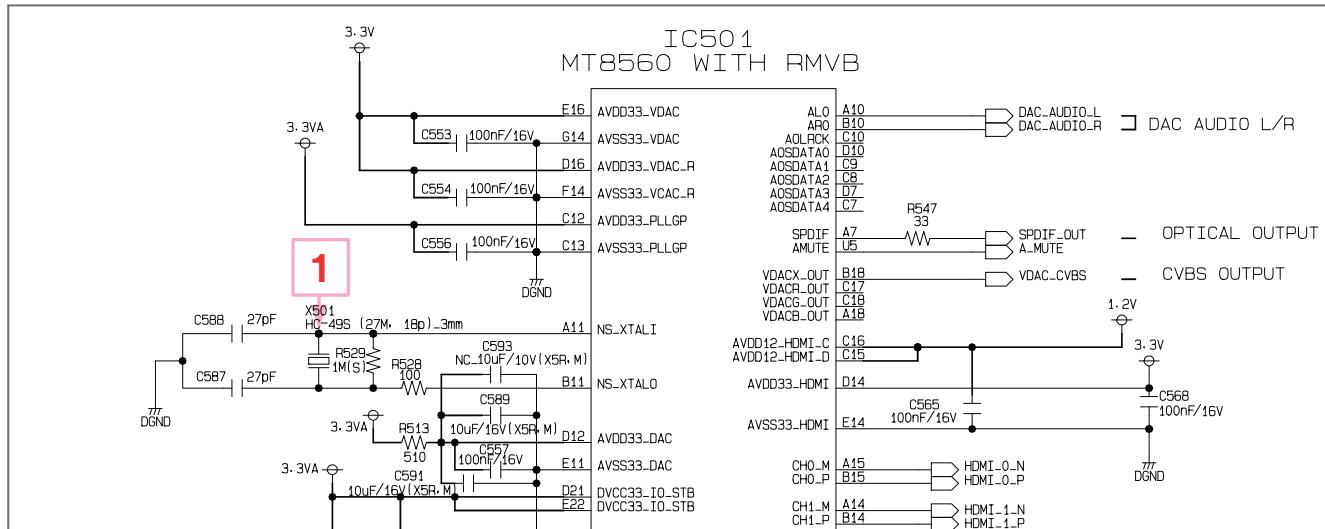
ELECTRICAL TROUBLESHOOTING GUIDE

5. NO HDMI OUTPUT



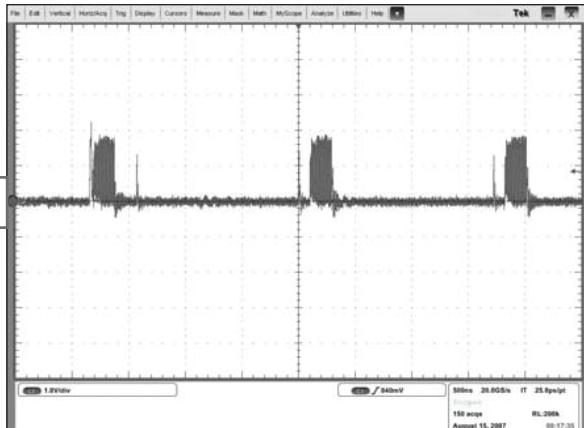
WAVEFORMS OF MAJOR CHECK POINT

1. SYSTEM PART - 1

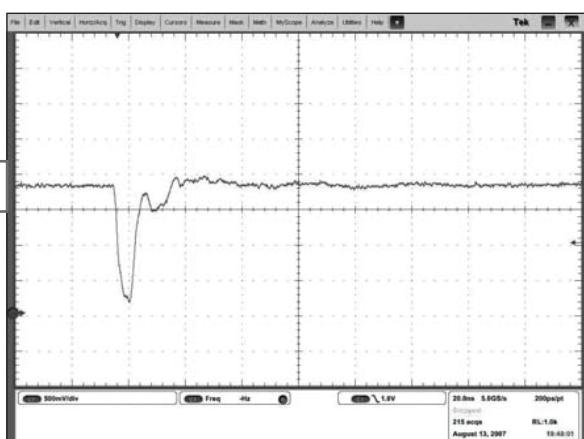


IC501 MT8560C X-TAL 27 MHz

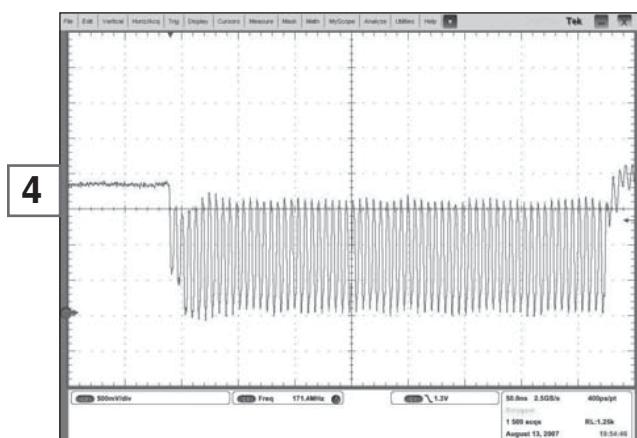
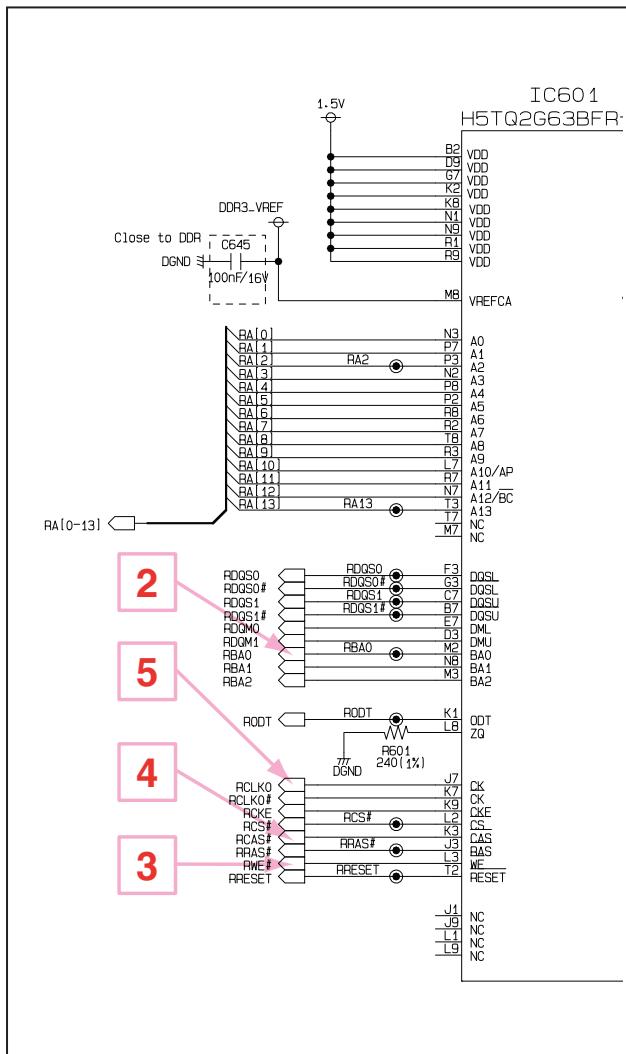
2. SYSTEM PART - 2 (SYSTEM MEMORY)



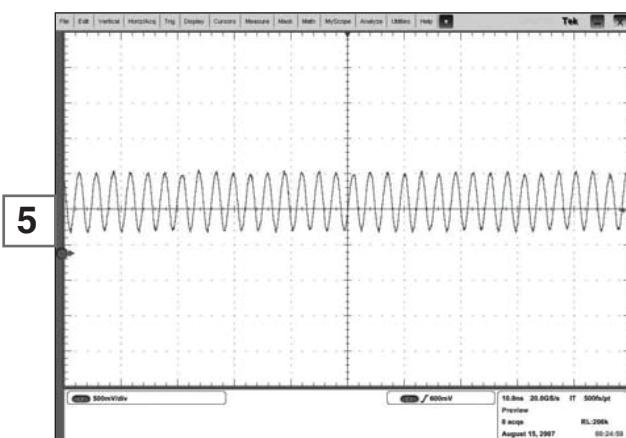
IC601 BA0



IC601 WE#

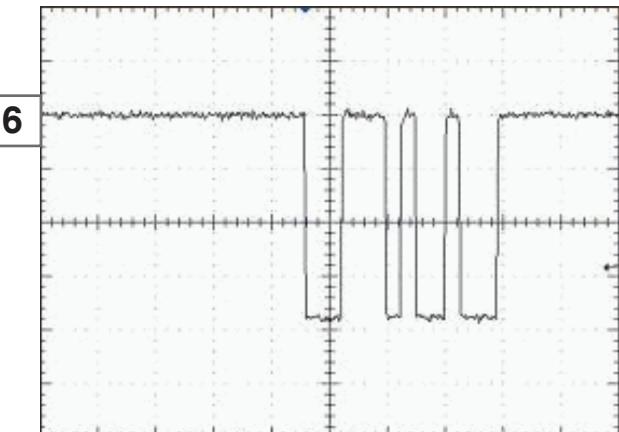


IC601 CAS#

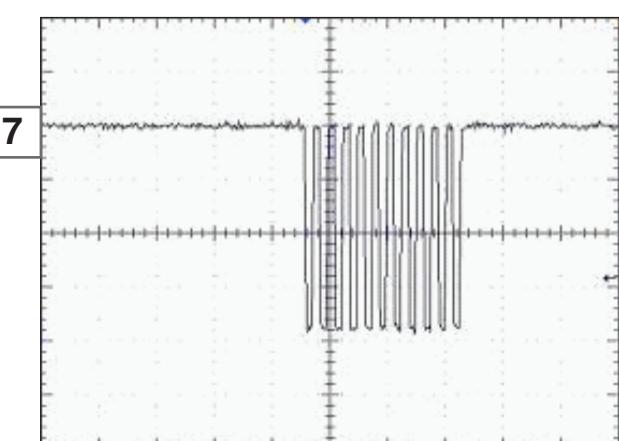


IC601 CK

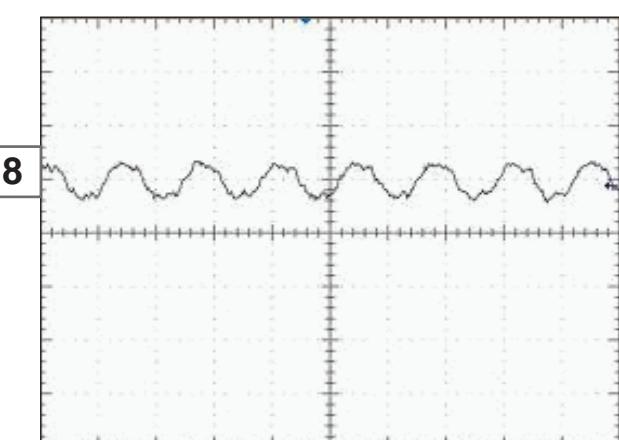
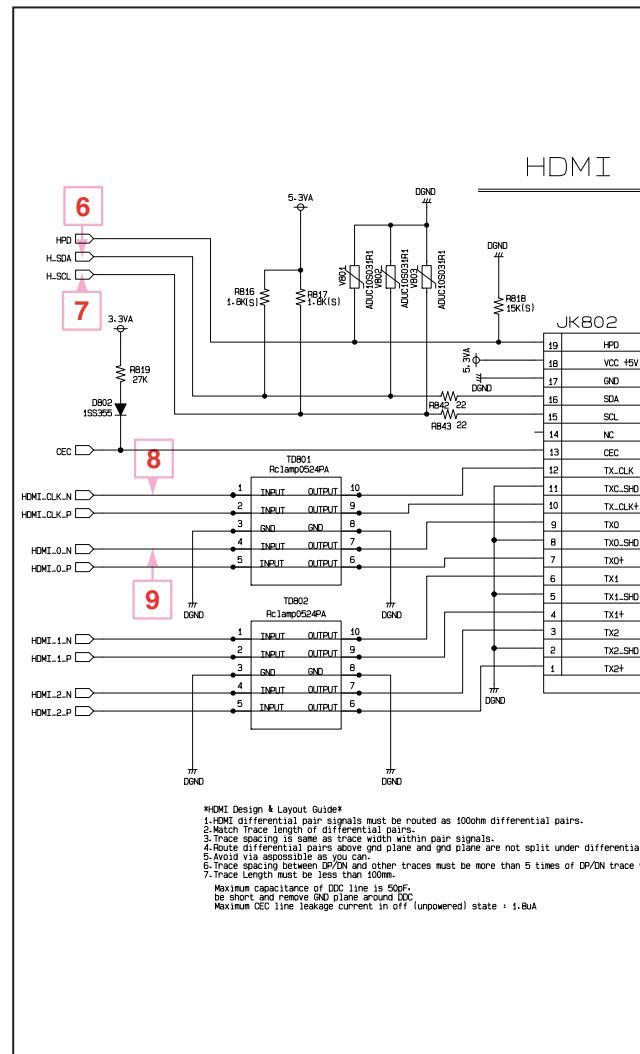
3. HDMI PART



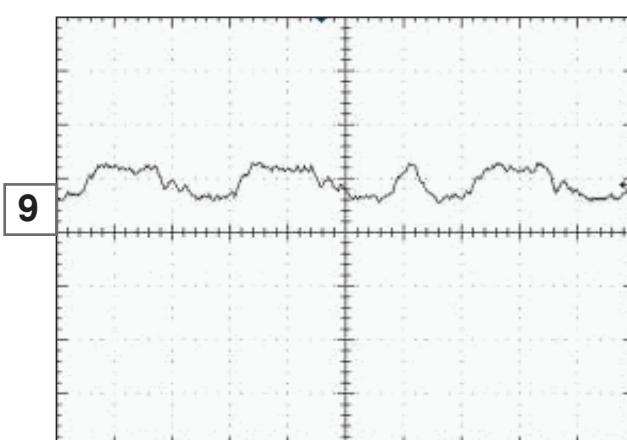
H_SDA



H_SCL

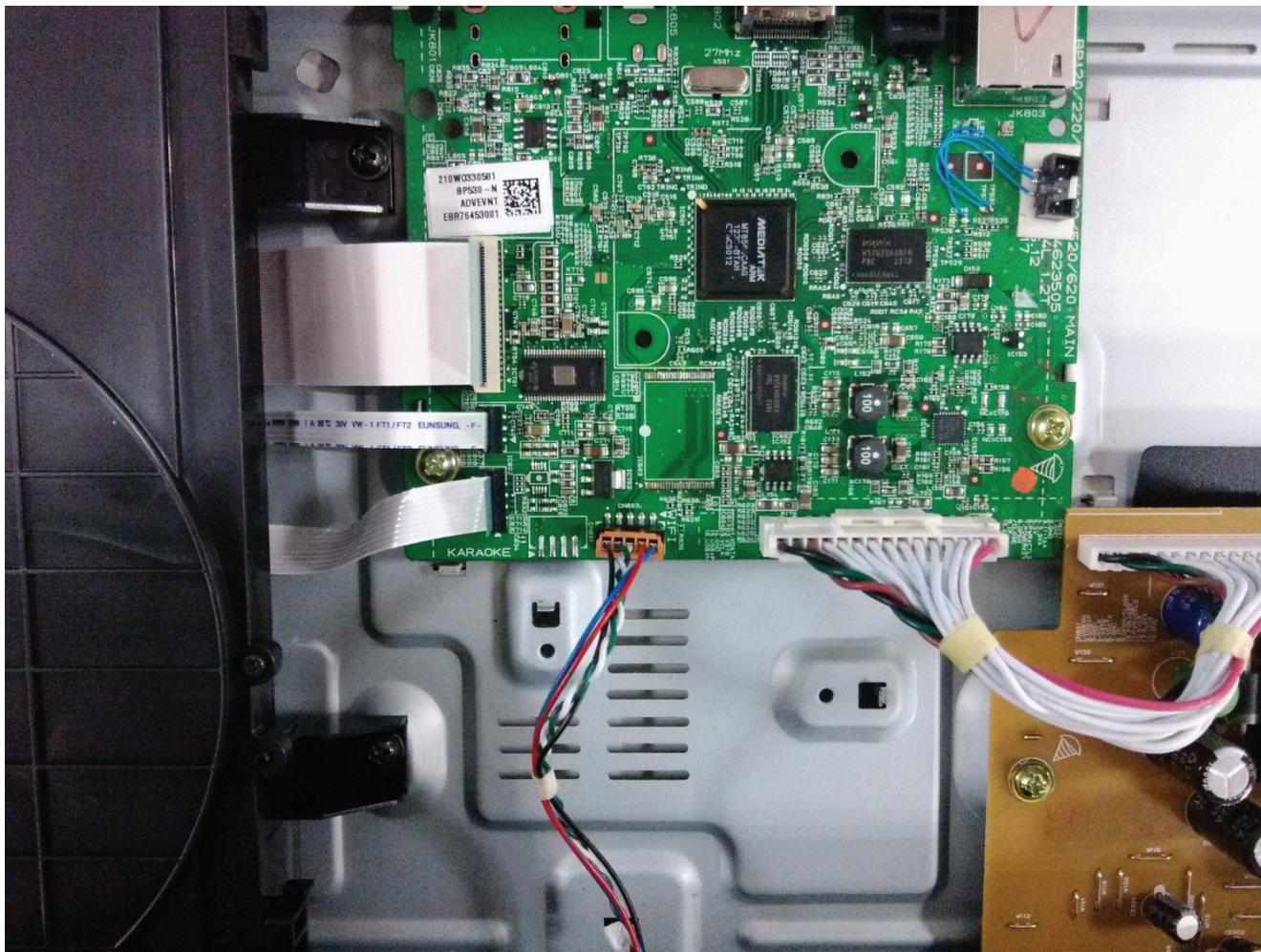
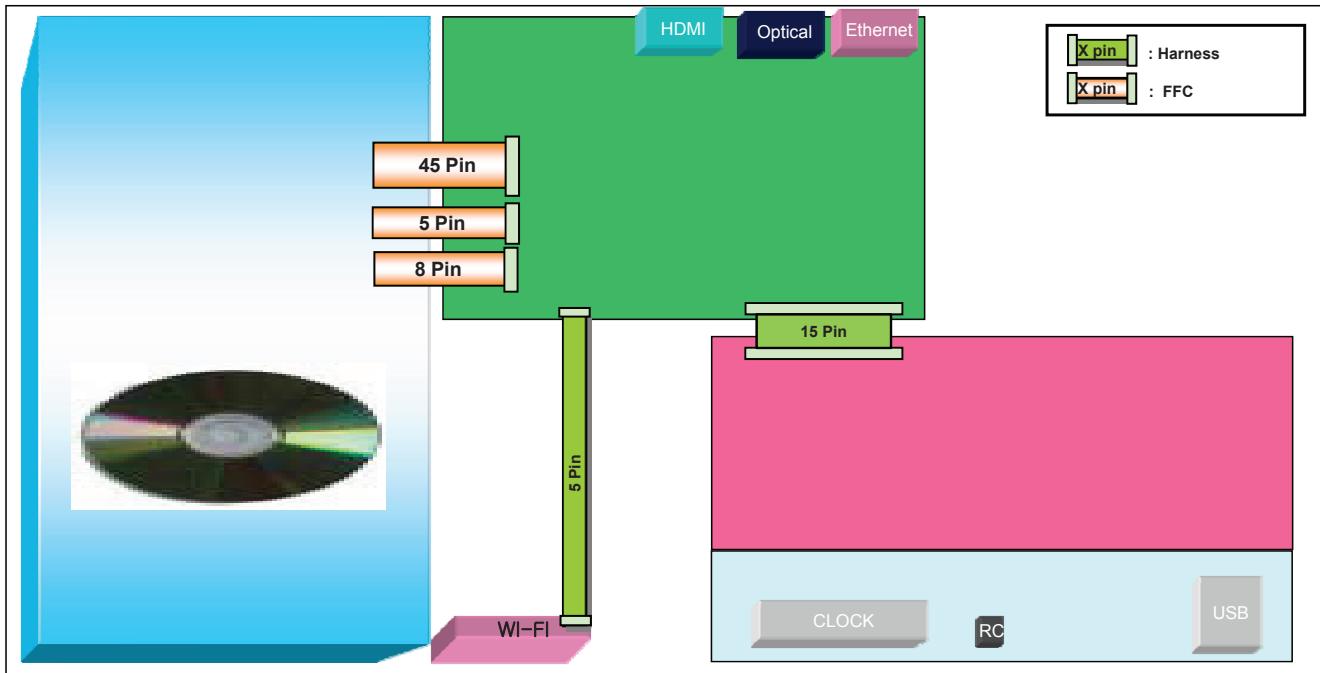


HDMI_CLK_N



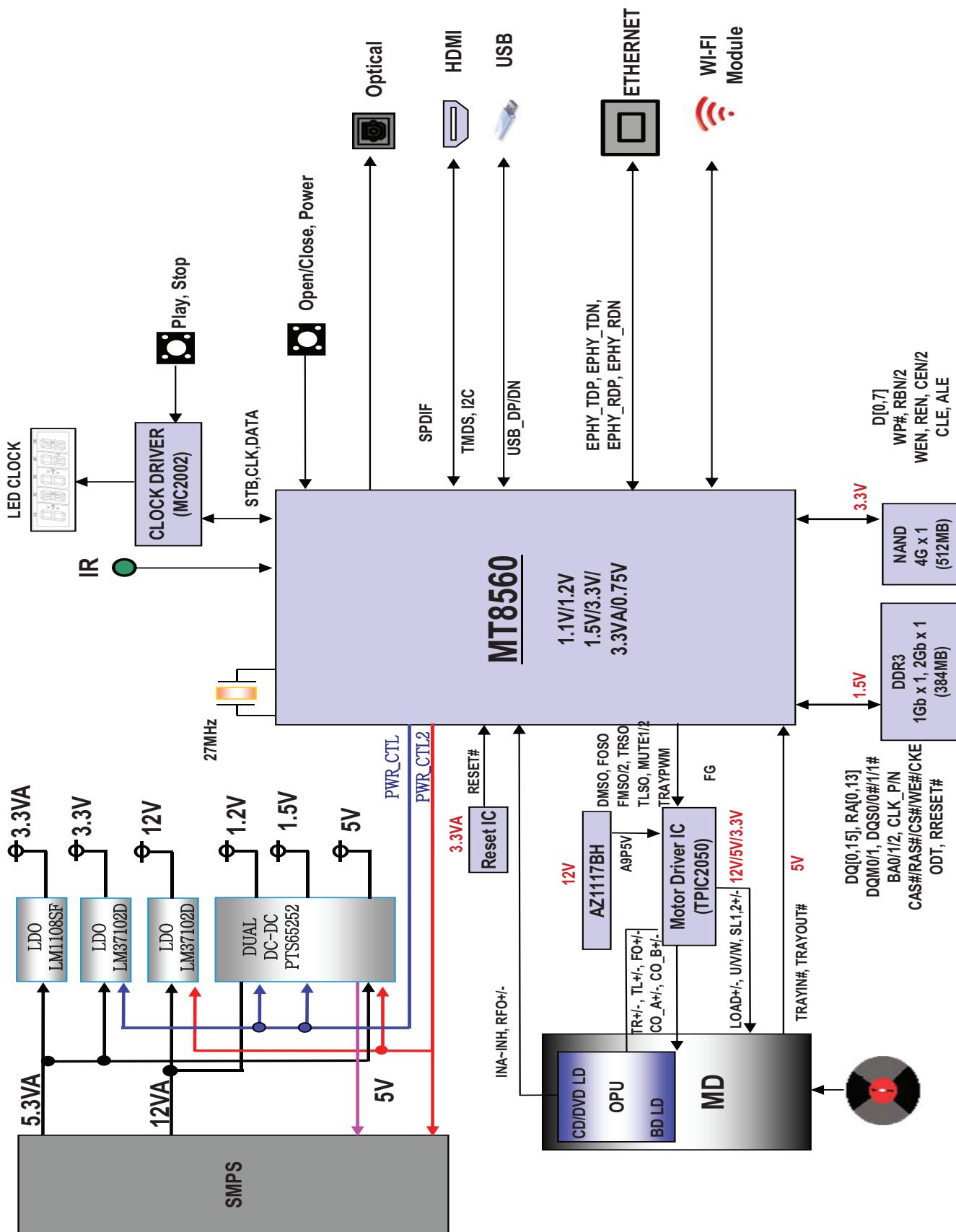
HDMI_O_N

WIRING DIAGRAMS

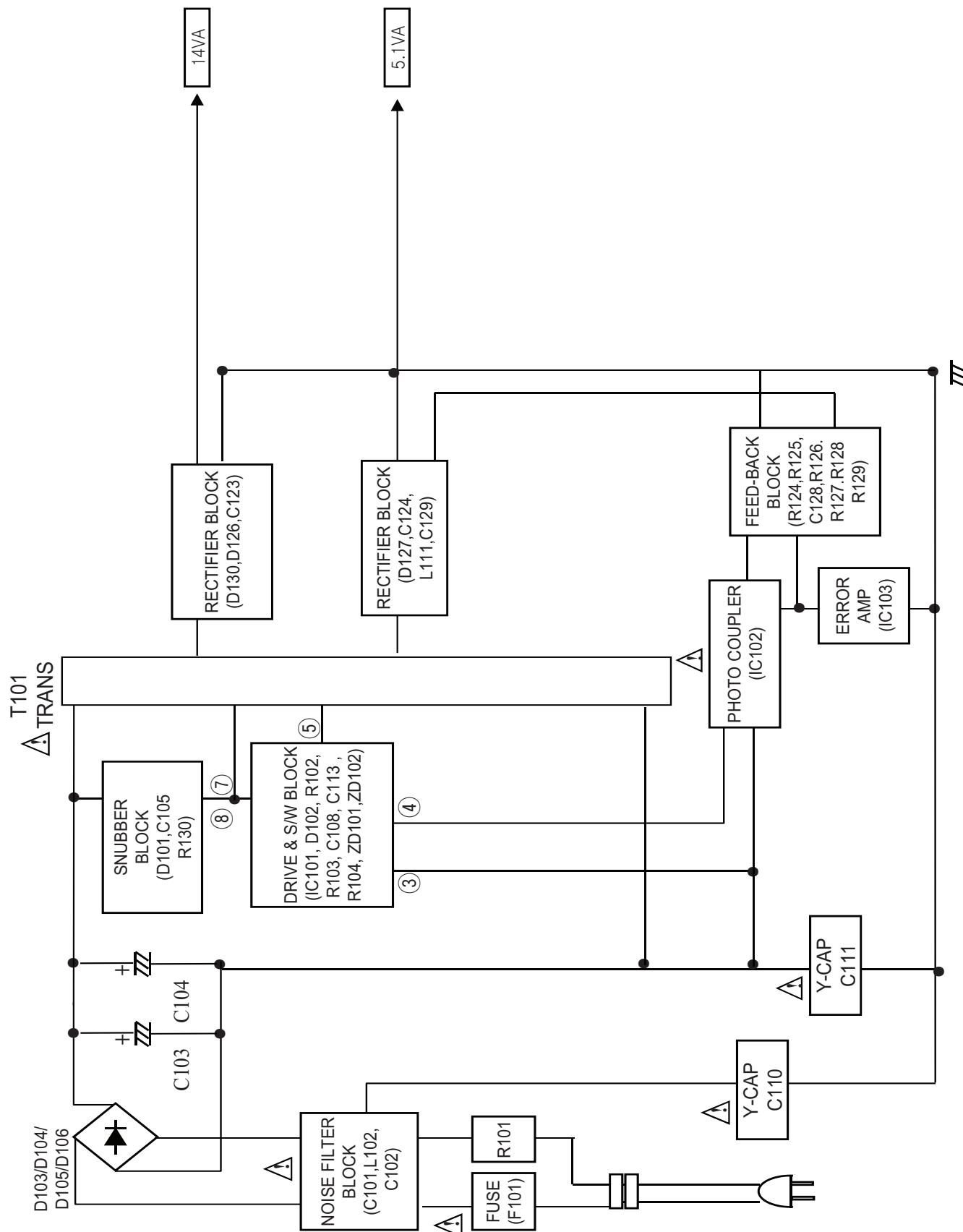


BLOCK DIAGRAMS

1. SYSTEM BLOCK DIAGRAM



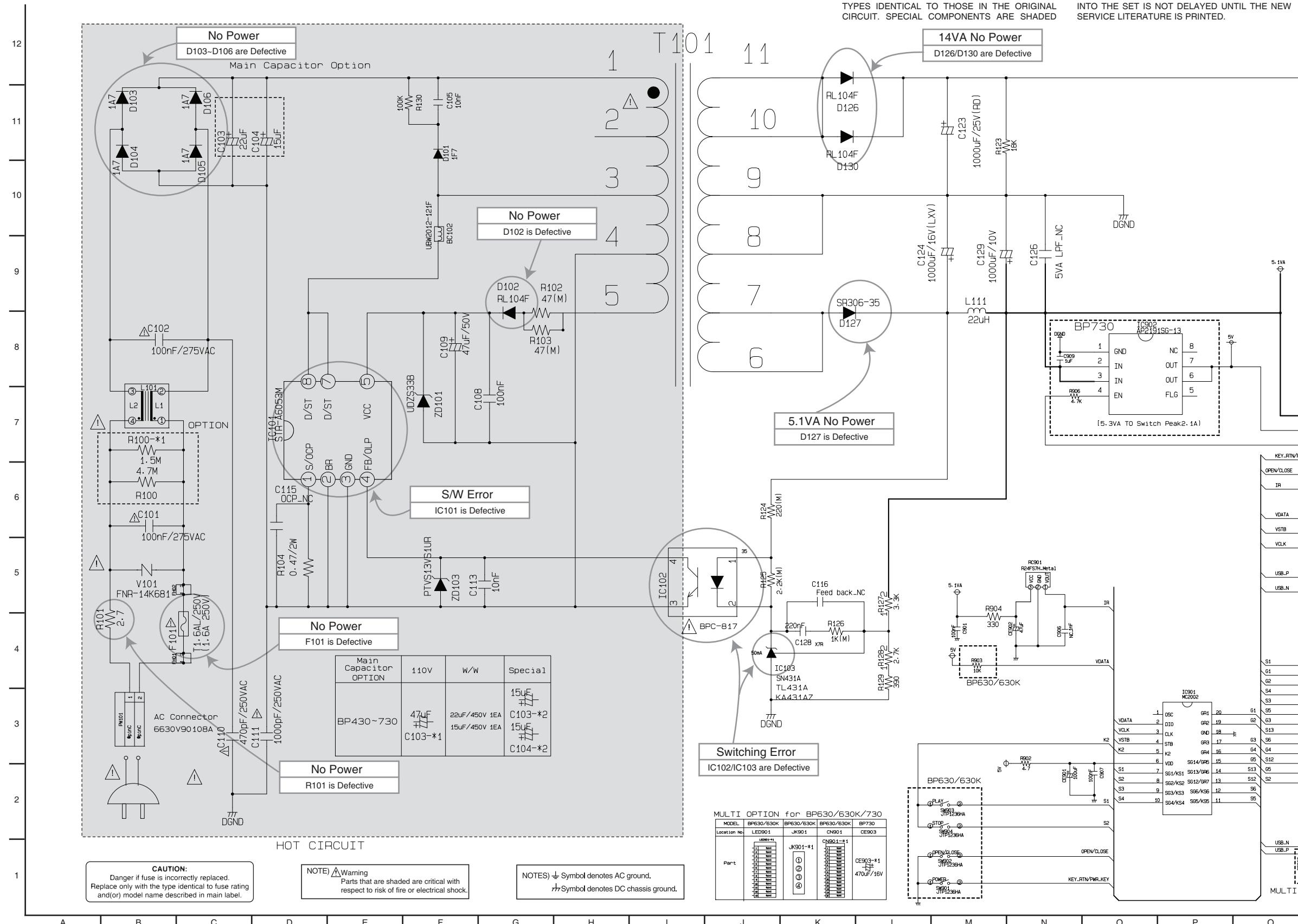
2. SMPS BLOCK DIAGRAM



MEMO

CIRCUIT DIAGRAMS

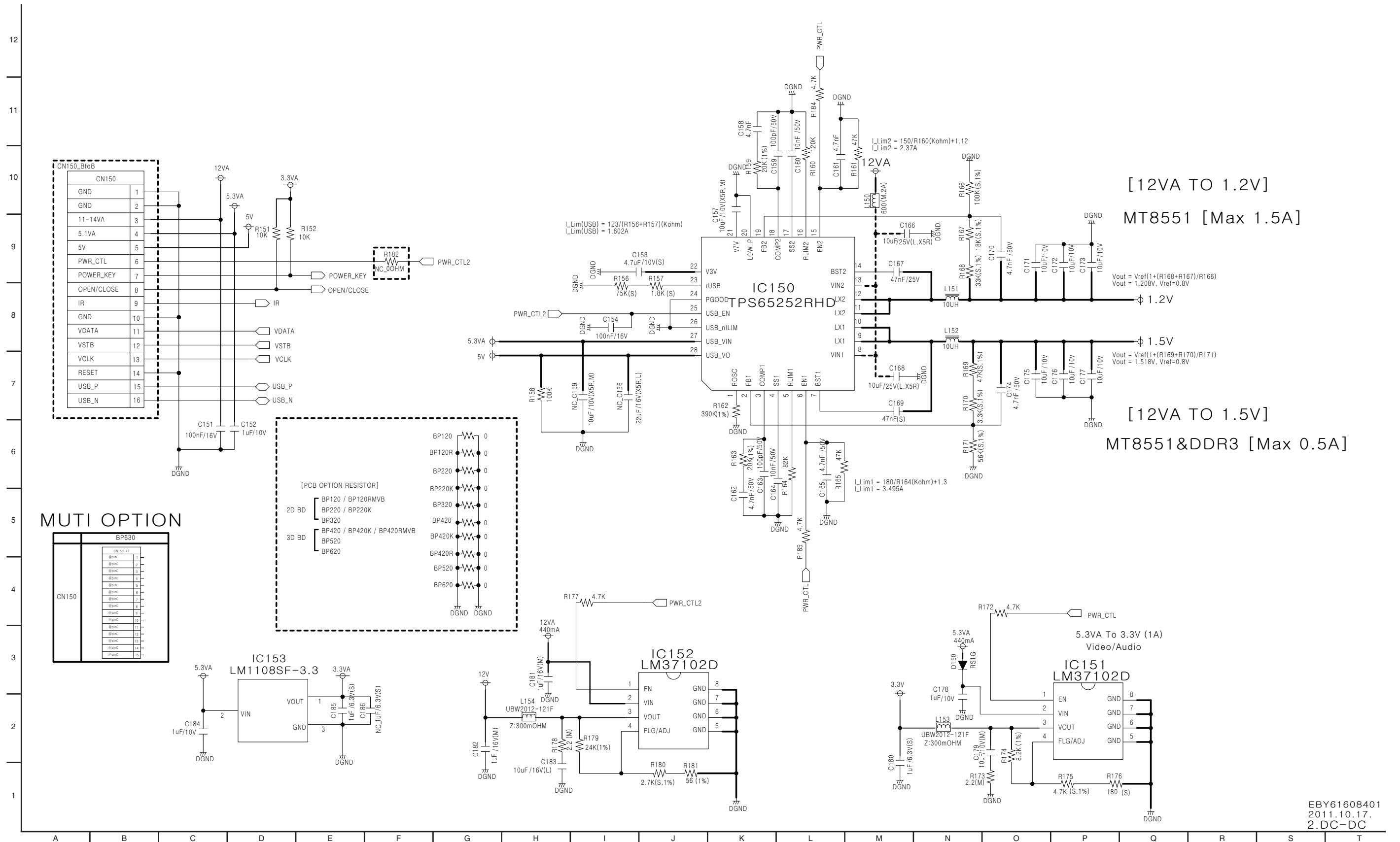
1. SMPS & TIMER CIRCUIT DIAGRAM



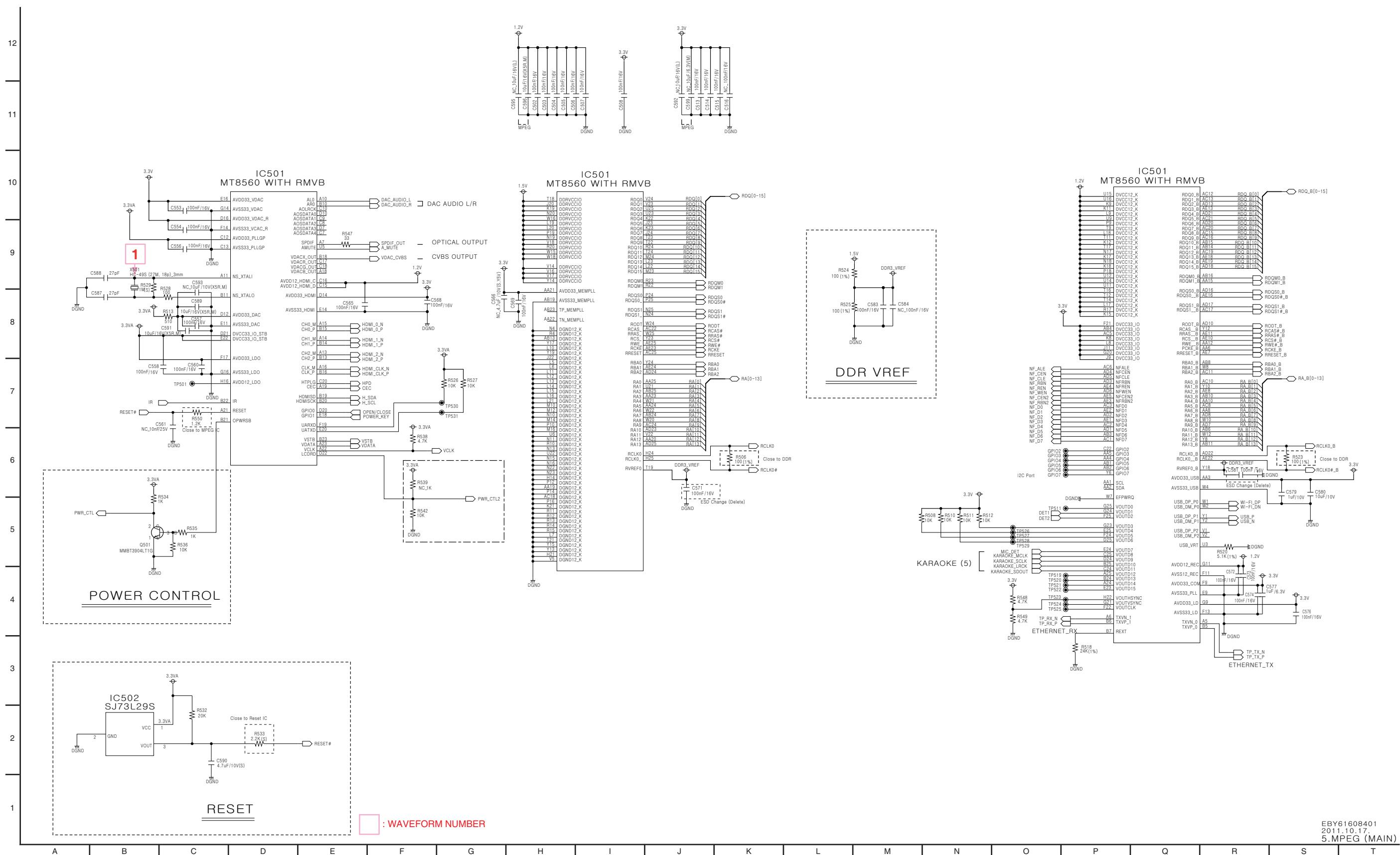
- NOTE :**
- Shaded (■) parts are critical for safety. Replace only with specified part number.
 - Voltages are DC-measured with a digital voltmeter during Play mode.

(COMPONENT SIZE)
1608 SIZE : S
2012 SIZE : M
3216 SIZE : L
(CAPACITOR CHARACTERISTIC)
COG > X7R > X5R > Y5V

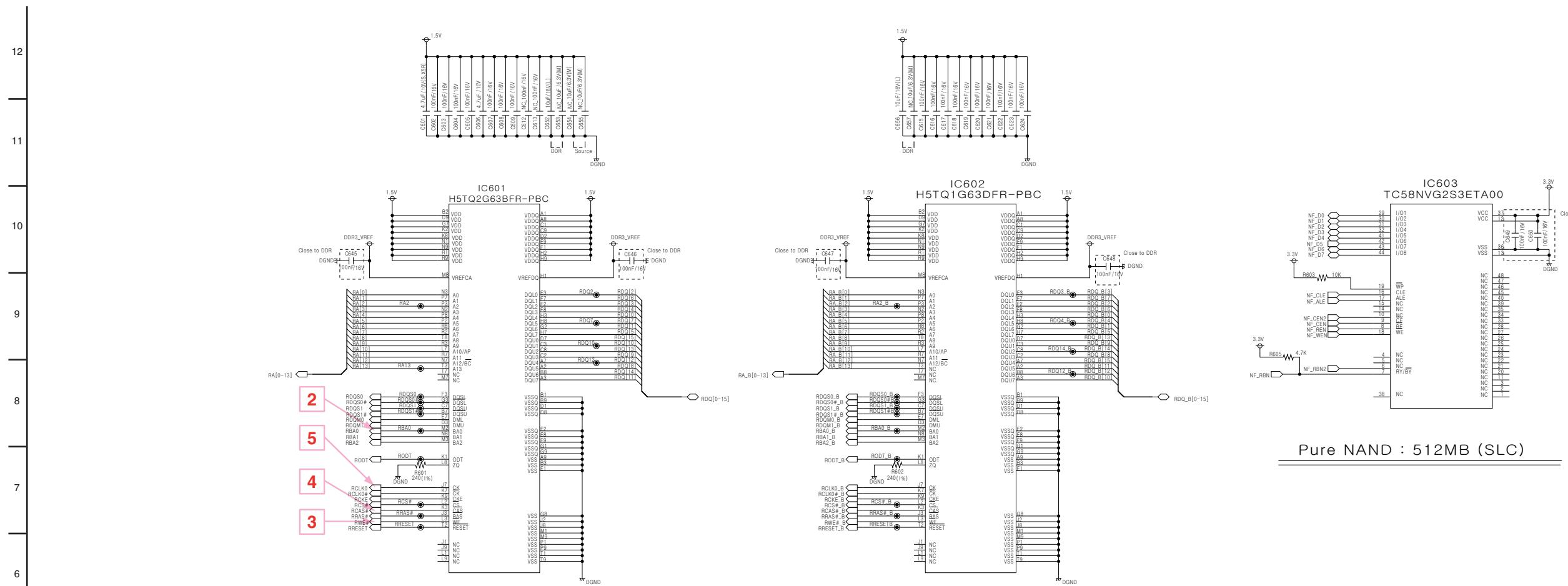
2. MAIN - DC-DC CIRCUIT DIAGRAM



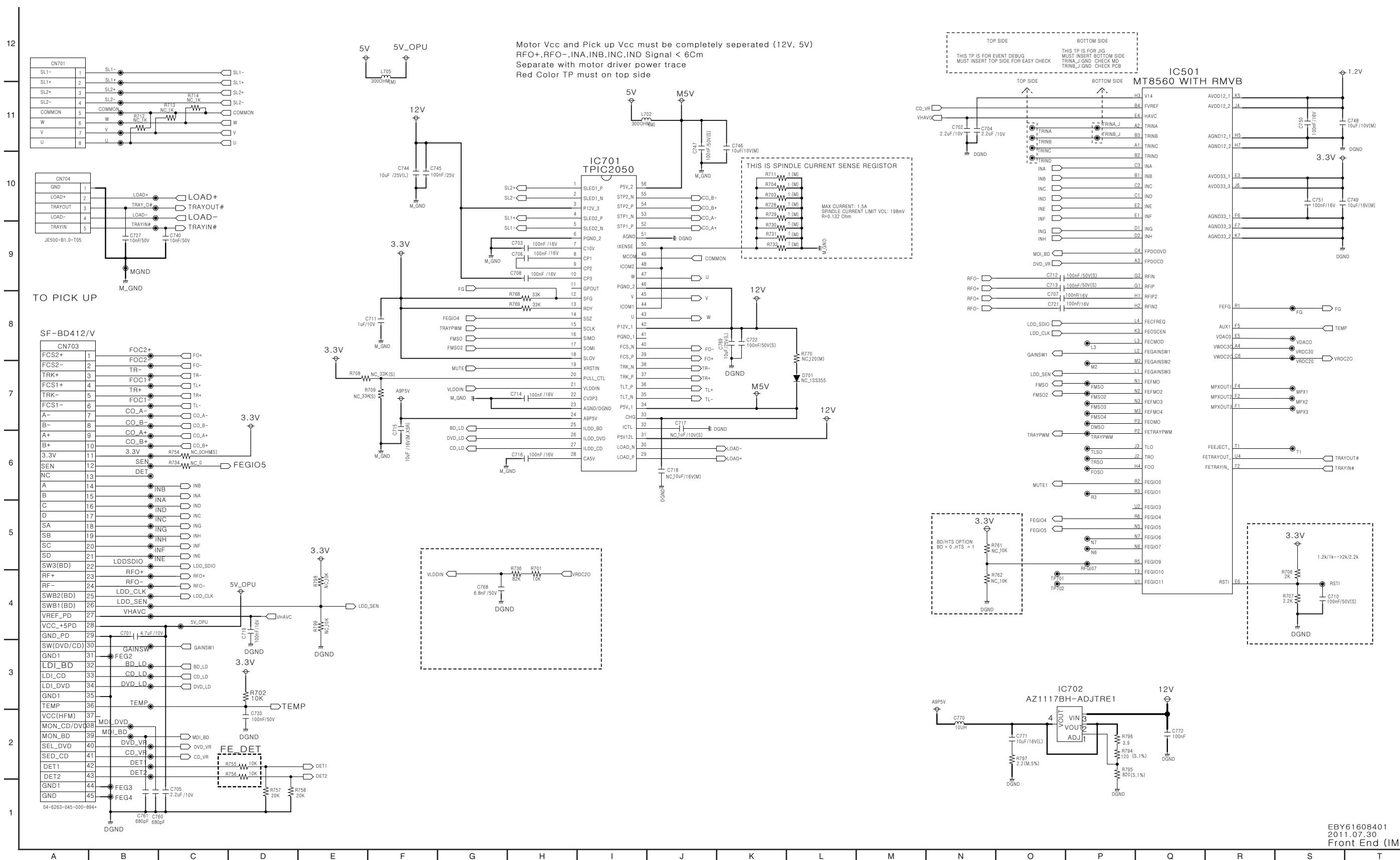
3. MAIN - MPEG CIRCUIT DIAGRAM



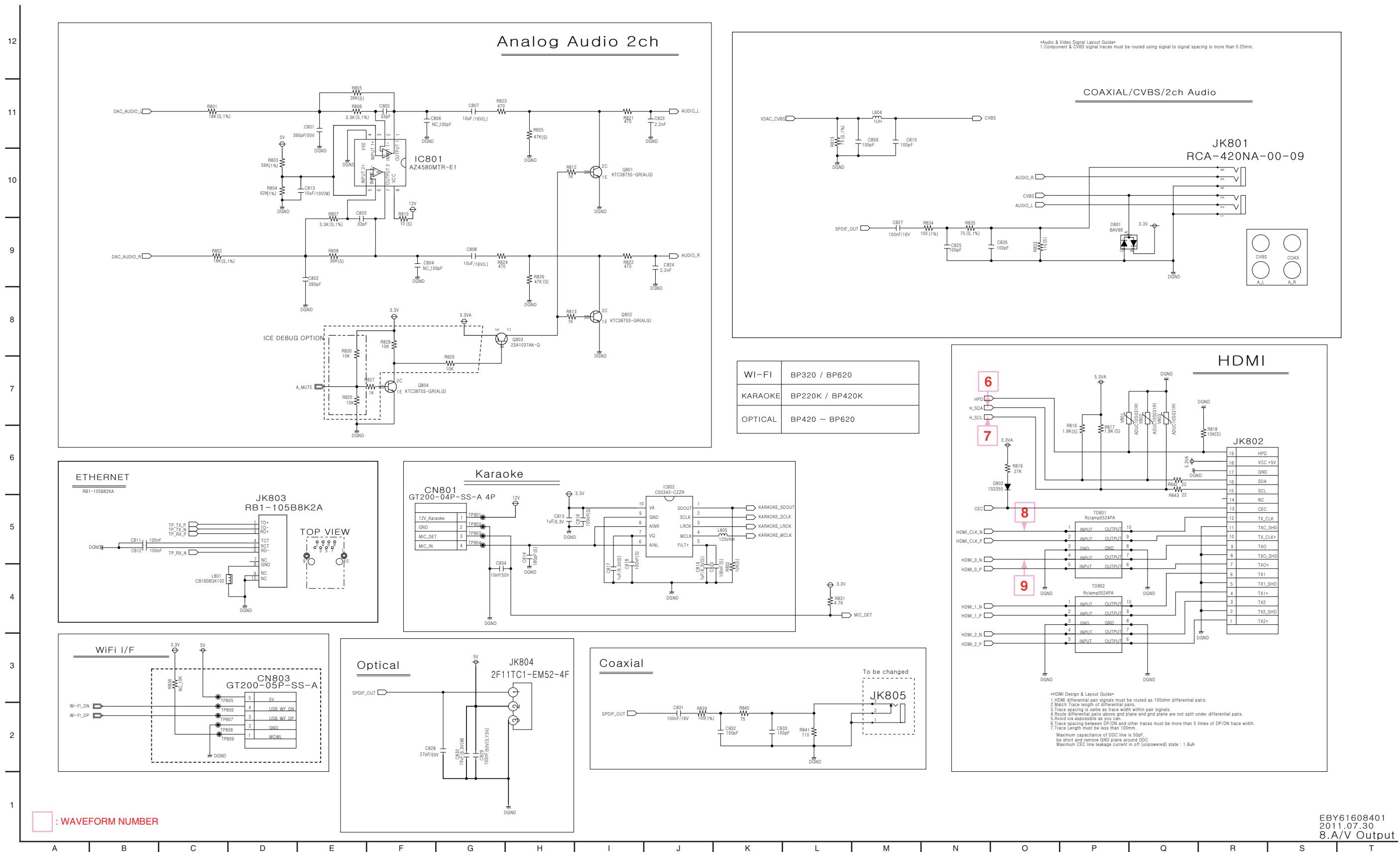
4. MAIN - MEMORY & STRAP CIRCUIT DIAGRAM



5. MAIN - FRONT END CIRCUIT DIAGRAM



6. MAIN - A/V OUTPUT CIRCUIT DIAGRAM



CIRCUIT VOLTAGE CHART

MEMO

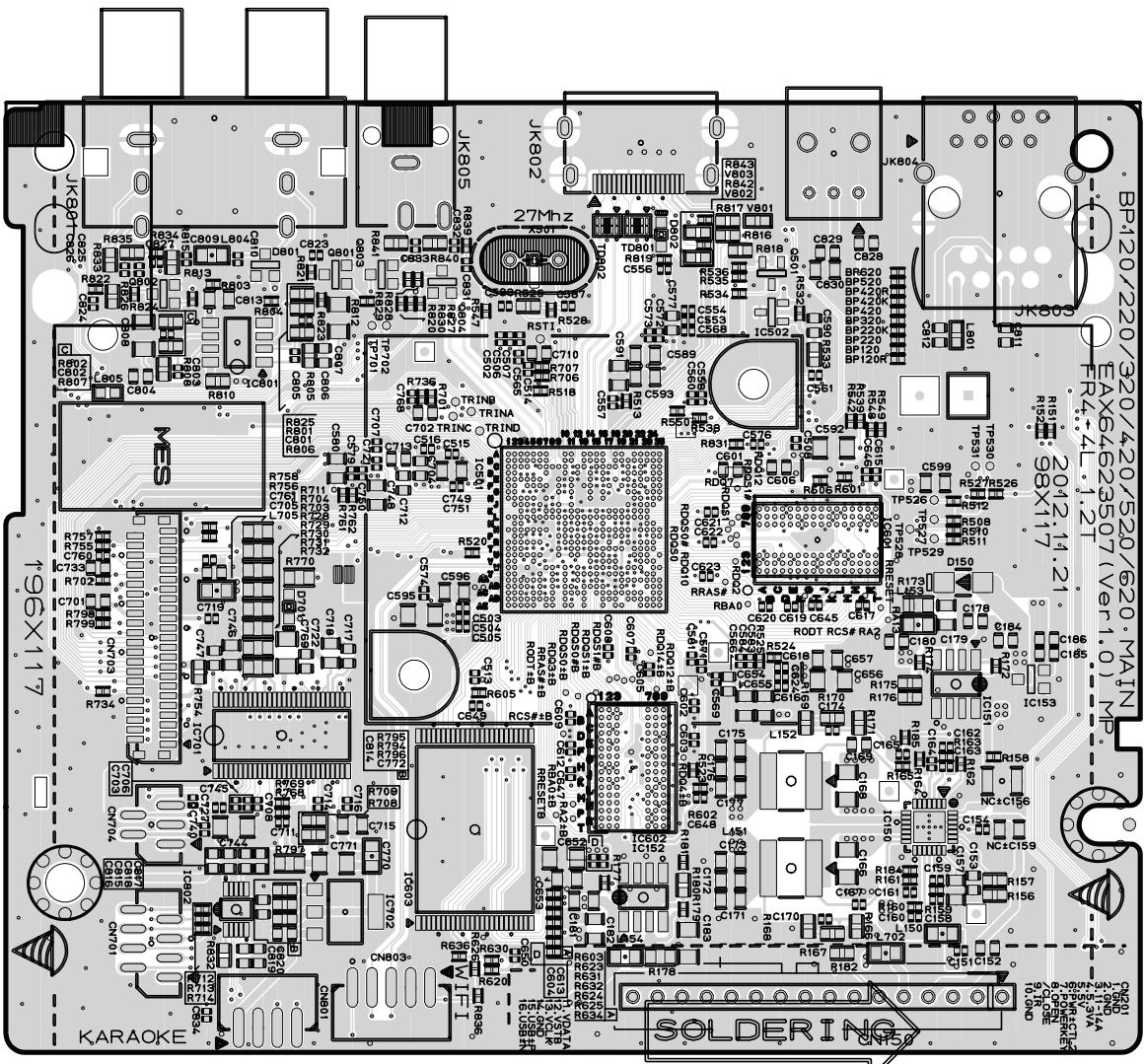
Pin No.	Desc.	Stanby	Home	Play
IC150 TPS65252				
8	Vin1	14.737	13.436	12.96
9	LX1	0	1.528	1.534
12	LX2	0	1.223	1.229
13	Vin2	14.737	13.436	12.945
27	USB_VIN	5.136	5.122	5.134
28	USB_VO	0	5.106	5.113
IC151 LM37102D				
2	Vin	4.879	4.272	4.330
3	Vout	0.312	3.306	3.332
IC152 LM37102D				
2	Vin	14.742	13.428	12.974
3	Vout	0	12.059	12.138
IC153 LM1108SF-3.3				
1	Vout	3.304	3.305	3.307
2	Vin	5.136	5.120	5.134
IC502 KIA7029AT				
1	Vin	3.303	3.306	3.307
3	Vot	3.300	3.303	3.303
IC152 LM37102D				
2	Vin	14.742	13.428	12.974
3	Vout	0	12.059	12.138
IC603 NAND (Toshiba)				
12	VCC	0.311	3.299	3.327
37	VCC	0.311	3.299	3.327
IC701 TPIC2050				
3	P12V_3	-	12.059	12.132
24	A9P5V	-	9.595	9.535
42	P12V_1	-	12.059	12.132
46	P12V_2	-	12.059	12.132
56	P5V_2	-	5.104	5.110
IC702 AZ117BH				
3	VIN	-	12.059	12.134
2	VOUT	-	9.596	9.556
4	VOUT	-	9.596	9.556

Pin No.	Stanby	Home	Play
Q501 MMBT3904			
Emiter	-	0	0
Base	-	0	0
Collector	0.733	3.178	3.164

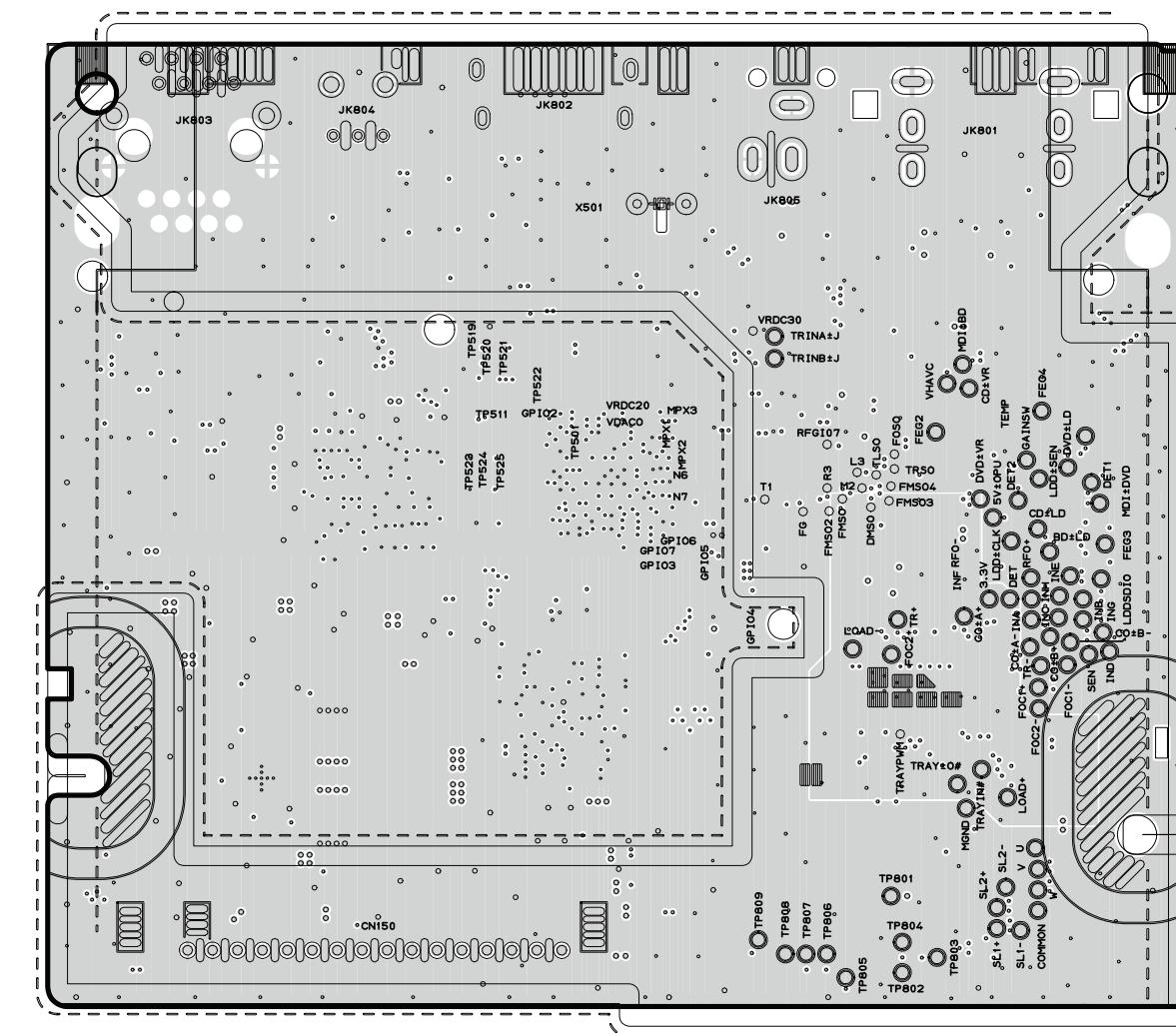
PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C. BOARD

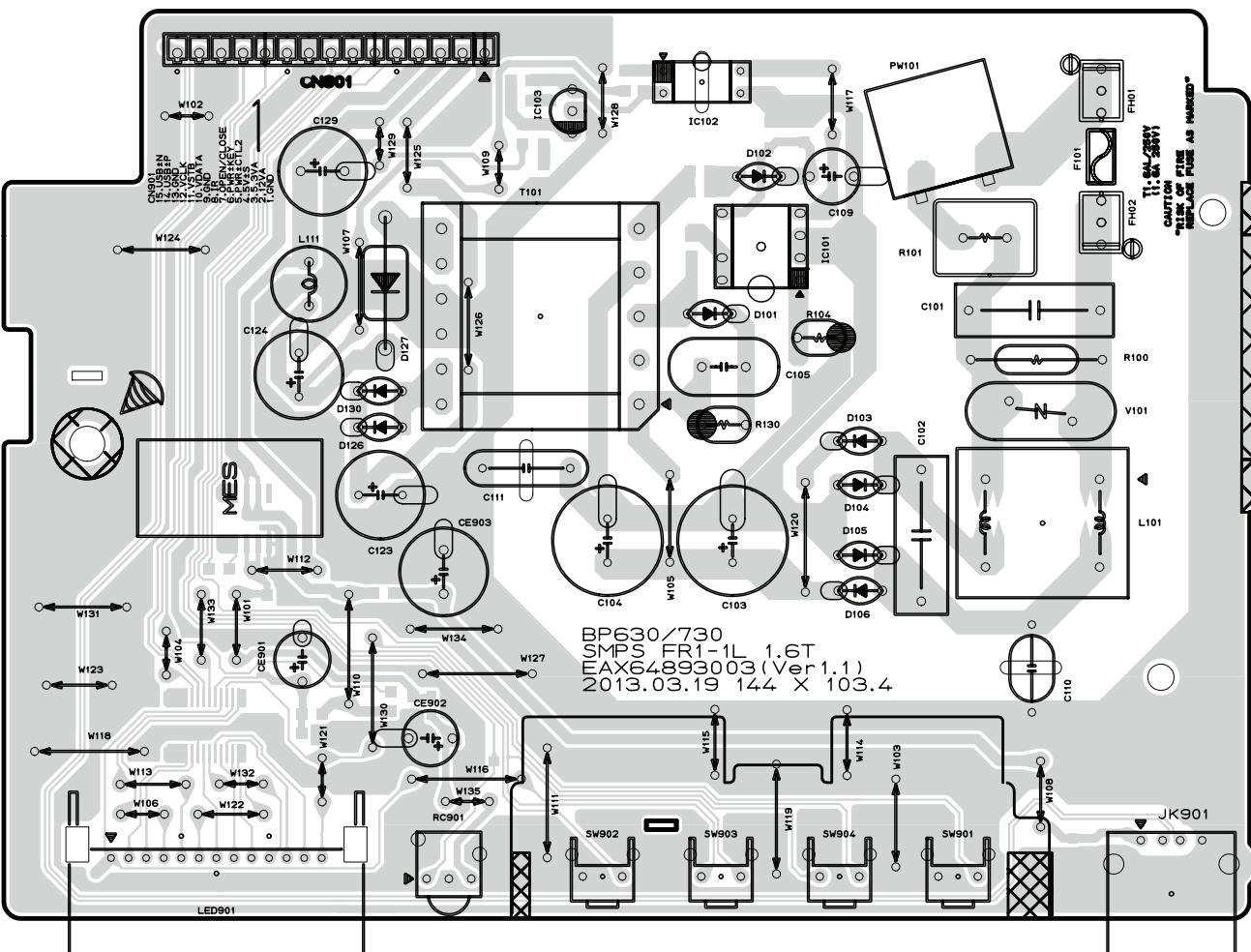
(TOP VIEW)



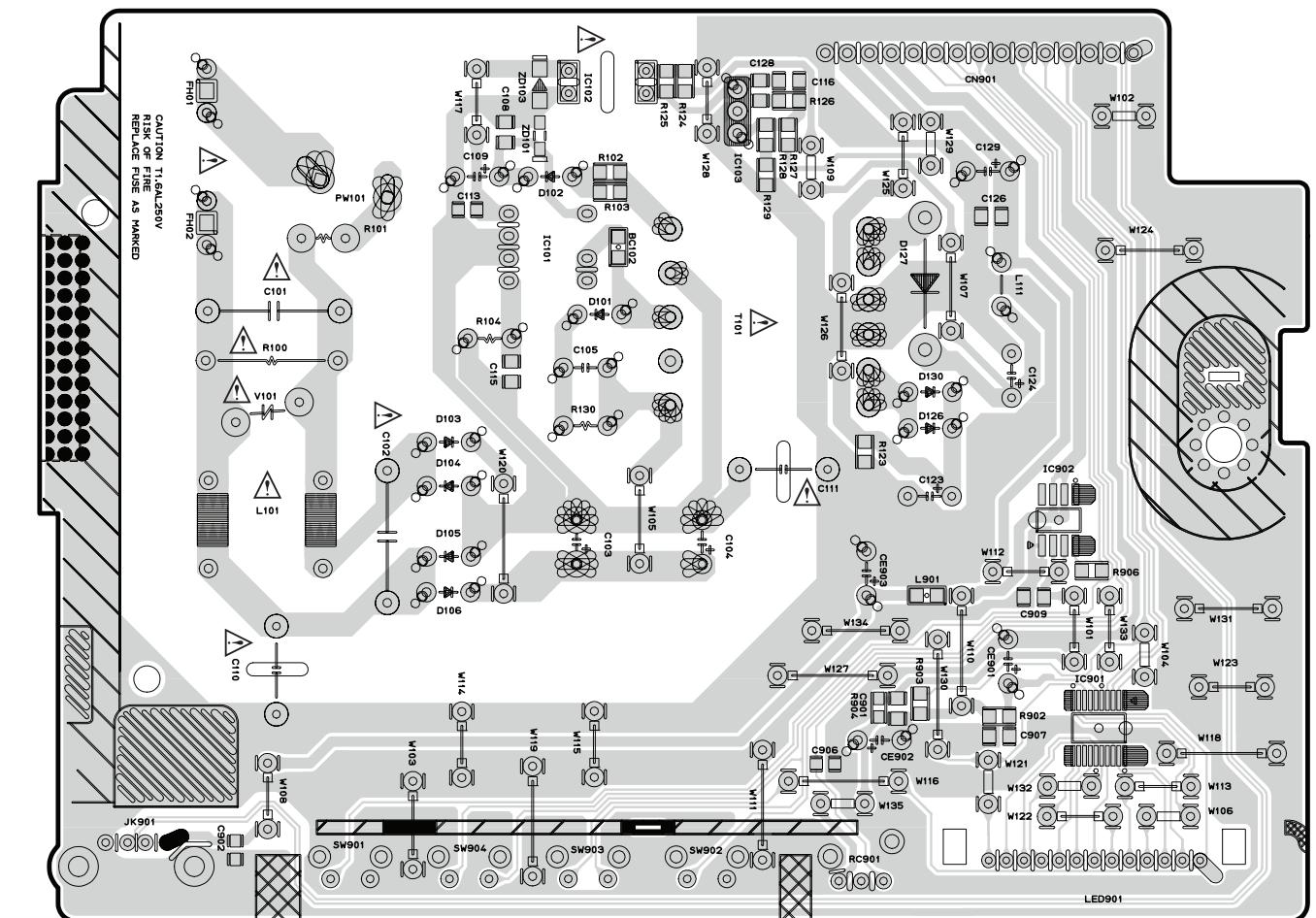
(BOTTOM VIEW)



2. SMPS & TIMER P.C. BOARD
(TOP VIEW)



(BOTTOM VIEW)



NOTE) Warning
⚠ Parts that are critical with respect to risk of fire or electrical shock.

MEMO

MEMO

SECTION 4

MT8560C F/E LOADER PART

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2. "ALL DVD DISC" READING ERROR.....	4-3
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HOW TO USE THE SA RESET FUNCTION.....	4-5
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2. IC701 (TPIC2050): 9CH MOTOR DRIVE WITH 3 BEAM LASER DIODE DRIVER	4-10
3. PICK-UP CONNECTOR TERMINAL PIN ASSIGNMENTS.....	4-12
BLOCK DIAGRAM	4-13

ONE POINT REPAIR GUIDE

1. "ALL BD DISC" READING ERROR

- All BD disc did not recognized, but DVD and CD are recognized normally.
- If LD output current's level is abnormal, set can not recognize BD disc.

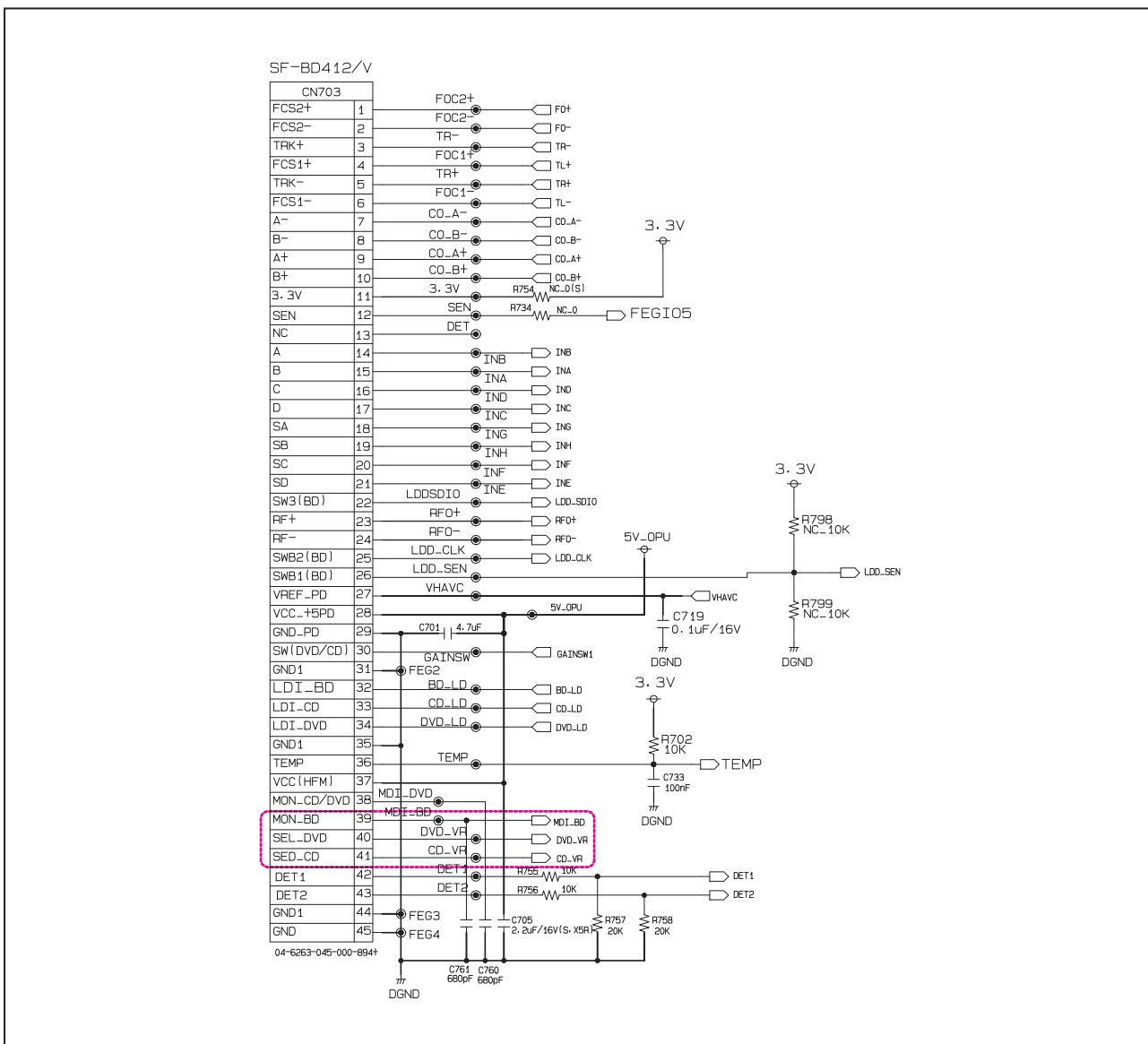
1-1. Component

- 1) MD (Traverse Assembly)
- 2) IC701 (TPIC2050), CN703

1-2. How to troubleshoot (Countermeasure)

- 1) Check MD's cable's status. (Pick-up/ Sled-Spindle/ Tray Cable)
- 2) Check power source of IC701. (pin42 \Rightarrow 12 V, pin24 \Rightarrow 9.5 V, pin34 \Rightarrow 5 V)
- 3) Check pin39 (Mon_BD) of CN703 during BD single layer playback.
(pin39 = 180 mV)

1-3. Service hint (Any picture / Remark)



ONE POINT REPAIR GUIDE

2. "ALL DVD DISC" READING ERROR

- All DVD disc did not recognized, but BD and CD are recognized normally.
- If LD output current's level is abnormal, set can not recognize DVD disc.

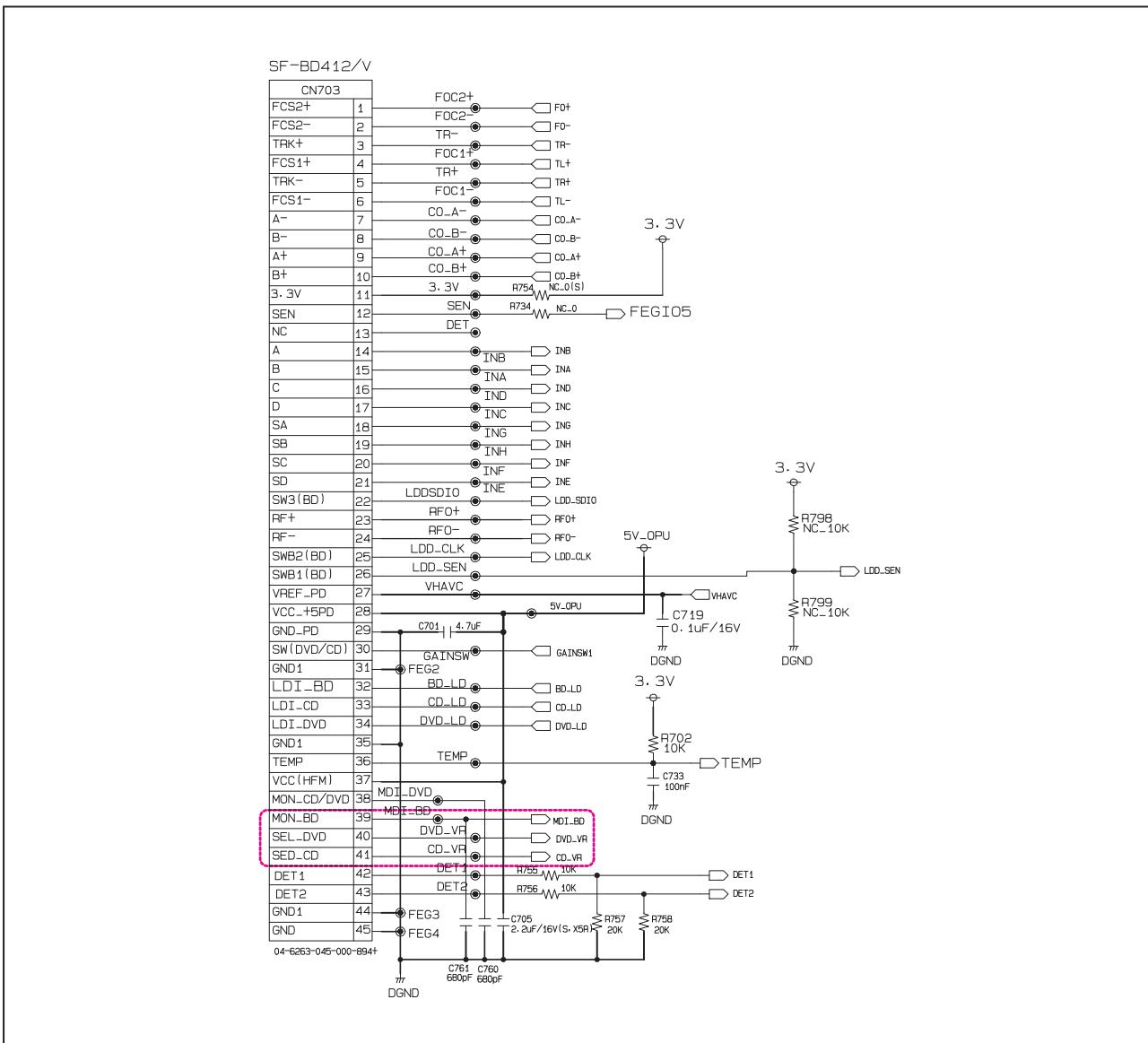
2-1. Component

- 1) MD (Traverse Assembly)
- 2) IC701 (TPIC2050), CN703

2-2. How to troubleshoot (Countermeasure)

- 1) Check MD's cable's status. (Pick-up/ Sled-Spindle/ Tray Cable)
- 2) Check power source of IC701. (Pin42 \Rightarrow 12 V, pin24 \Rightarrow 9.5 V, pin34 \Rightarrow 5 V)
- 3) Check pin40 (SEL_DVD) of CN703 during DVD playback.
(pin40 = 180 mV)

2-3. Service hint (Any picture / Remark)



ONE POINT REPAIR GUIDE

3. "ALL CD DISC" READING ERROR

- All CD disc did not recognized, but BD and DVD are recognized normally.
- If LD output current's level is abnormal, set can not recognize CD disc.

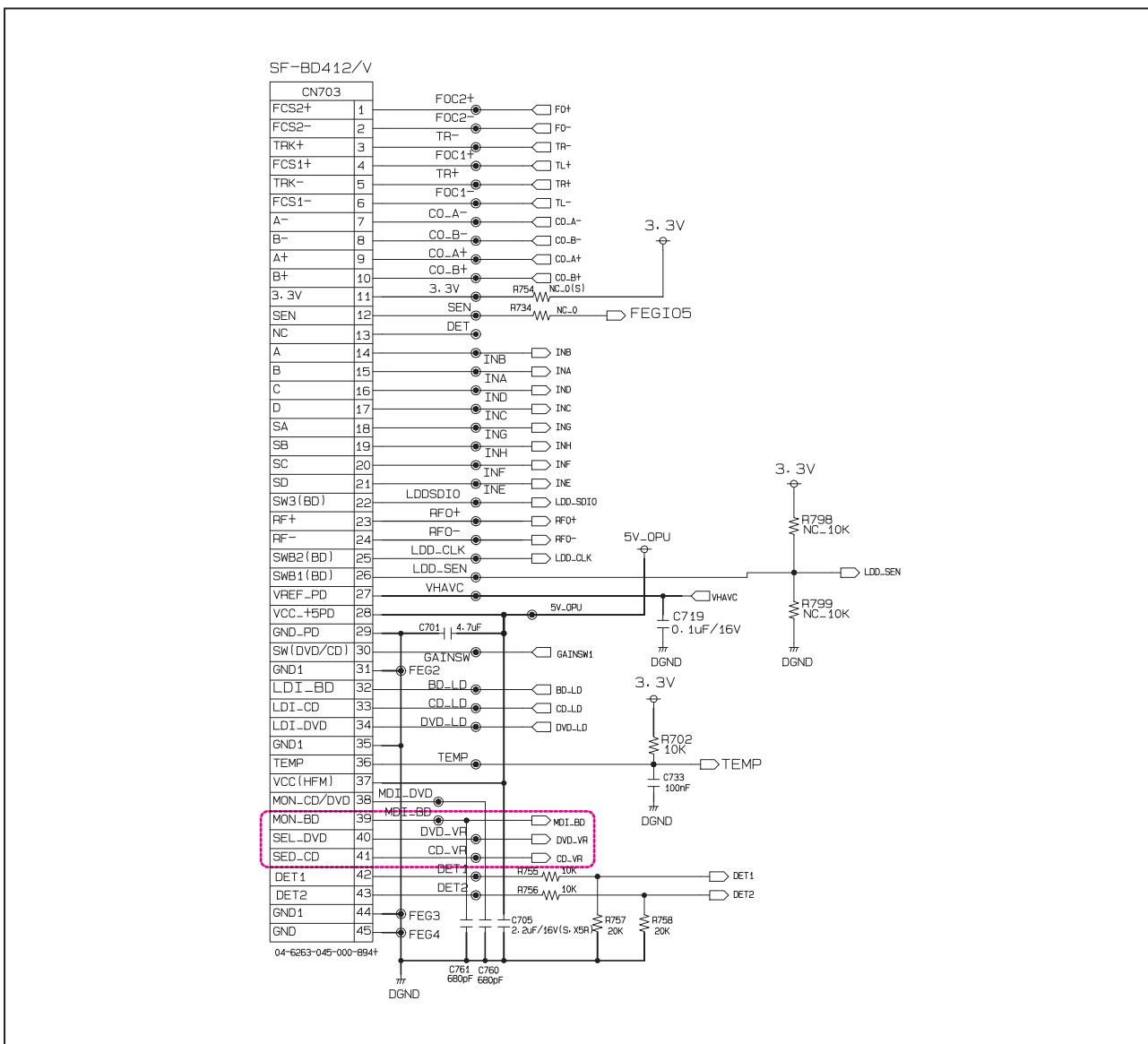
3-1. Component

- 1) MD (Traverse Assembly)
- 2) IC701 (TPIC2050), CN703

3-2. How to troubleshoot (Countermeasure)

- 1) Check MD's cable's status. (Pick-up/ Sled-Spindle/ Tray Cable)
- 2) Check power source of IC701. (Pin42 \Rightarrow 12 V, pin24 \Rightarrow 9.5 V, pin34 \Rightarrow 5 V)
- 3) Check pin41 (SEL_CD) of CN703 during CD playback.
(pin41 = 180 mV)

3-3. Service hint (Any picture / Remark)



HOW TO USE THE SA RESET FUNCTION

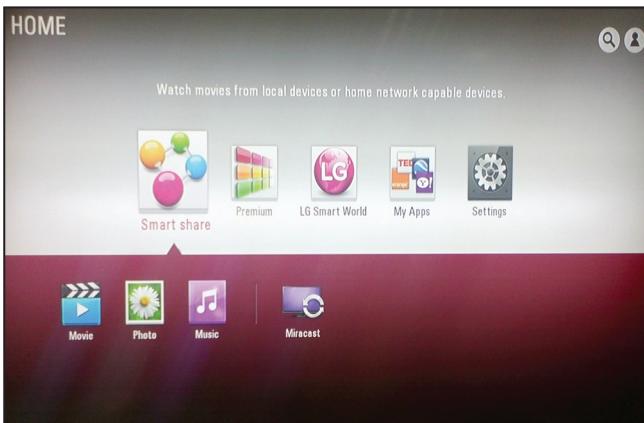
1. PURPOSE

In order to insert the new SA adjustment values, it need clearing SA initial values of the flash memory.

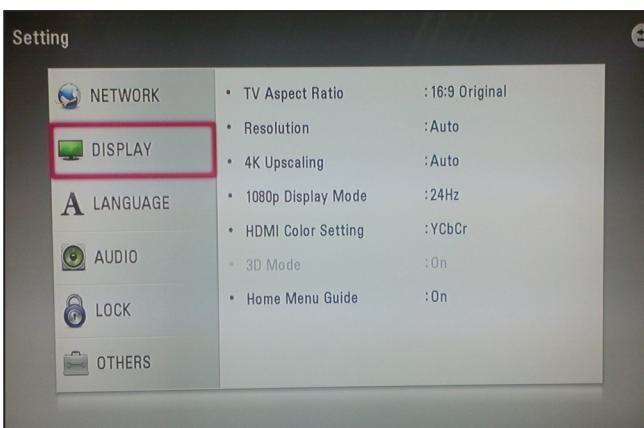
2. REQUIRED SA RESET

- After changing Traverse.
- After changing Main Board Assembly.
- After changing Main Board Flash IC.

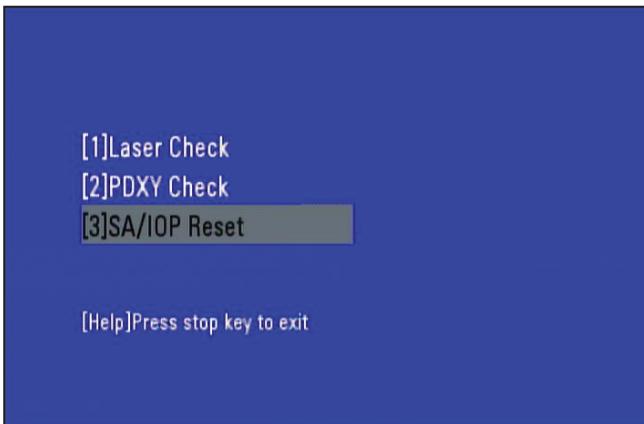
3. SA RESET PROCEDURE



1) Power on the set (then, mode is in home menu).



2) Press Setup.



3) Under DISPLAY highlighted condition,
press '5' -> '1' -> '7' -> '7' -> '7' -> '7' -> 'Enter'
on the remote controller to display special mode.
Move to the SA/IOP Reset and click.

SA/IOP Result:
Please insert BD SL disc.....

[Help]Press stop key to exit

- 4) Insert BD-ROM SL Disc.
(Tray is opened automatically.)

SA/IOP Result:
Wait...

[Help]Press stop key to exit

- 5) If the disc is inserted, you will see "Wait...".

SA/IOP Result:
Default SA: 0x0082 Means SA: 0x0084
BD LD Means: 0x3e61
DVD LD Means: 0x4075
CD LD Means: 0x3e60

PASS

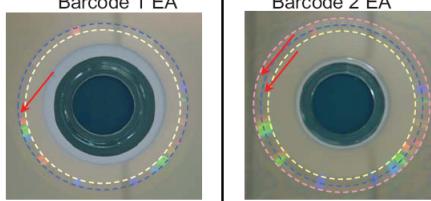
[Help]Press stop key to exit

- 6) If SA Adjustment is finished,
tray is opened automatically.

- 7) Press stop key twice to escape this special mode.

Reference:

How to check the BD Single Layer and Double Layer Disc	
BD Single Layer Disc	BD Double Layer Disc
Barcode 1 EA	Barcode 2 EA



MAJOR IC INTERNAL BLOCK DIAGRAM AND PIN DESCRIPTION

1. IC501 (MT8560C)

1-1. Pin Function

PIN NO.	SYMBOL	TYPE	DESCRIPTION
F6	AGND33_1	Analog Ground	Analog Ground
K7	AGND33_2	Analog Ground	Analog Ground
F7	AGND33_3	Analog Ground	Analog Ground
H5	AGND12_1	Analog Ground	Analog Ground
H7	AGND12_2	Analog Ground	Analog Ground
F5	AUX1	Analog I/O	Auxiliary Input. Alternateive Function : Signal Monitoring
K5	AVDD12_1	Analog Power(1.2V)	Power Pin
J4	AVDD12_2	Analog Power(1.2V)	Power Pin
E3	AVDD33_1	Analog Power(3.3V)	Power Pin
J6	AVDD33_3	Analog Power(3.3V)	Power Pin
L4	FECFREQ	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8 mA PDR, 75K pull-up (3.3 V)	Frequency selection signal output, or LDD serial interface data or 12C SDA. The pin is spike-free at power-on stage.
L3	FECKMOD	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8 mA PDR, 75K pull-up (0 V)	High frequency modulation mode selection signal output, or LDO serial interface command enable. The pin is spike-free at power-on stage.
P3	FEDMO	Analog Output	Disk motor control output. DAC output.
T1	FEEJECT_	3.3V LVTTL I/O, 5V-tolerance, 6 mA driving, 75K pull-up (3.3 V)	Eject/stop key input, active low. The pin is spike-free at power-on stage. Alternate function : General IO.
R1	FEFG	3.3V LVTTL I/O, 5V-tolerance, 6 mA PDR, 75K pull-up (3.3 V)	Motor Hall sensor input. The pin is spike-free at power-on stage.
N1	FEFMO	Analog Output	Feed motor 1 control. DAC output.
M2	FEFMO2	Analog Output	Feed motor 2 control. DAC output.
N3	FEFMO3	Analog I/O	Feed motor 3 control. DAC output. Alternative Function : Auxiliary servo input.
M3	FEFMO4	Analog I/O	Feed motor 4 control. DAC output. Alternative Function : Auxiliary servo input.
H4	FOO	Analog Output	Focus servo output. PDM output of focus servo compensator.
A3	FPDOCD	Analog Input	Laser Power Monitor Input for CD APC / Differential negative input
C4	FPDODVD	Analog Input	Laser Power Monitor Input for DVD APC / Differential positive input
L2	FEGAINSW1	Analog Output	Read gain switch 1.
M2	FEGAINSW2	Analog Output	Read gain switch 2.
L1	FEGAINSW3	Analog Output	Read gain switch 3.
R2	FEGIO0	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8mA PDR, 75K pull-down (0 V)	LDD serial interface data. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout. Alternate function : 1. Internal monitored signal output 2. General IO

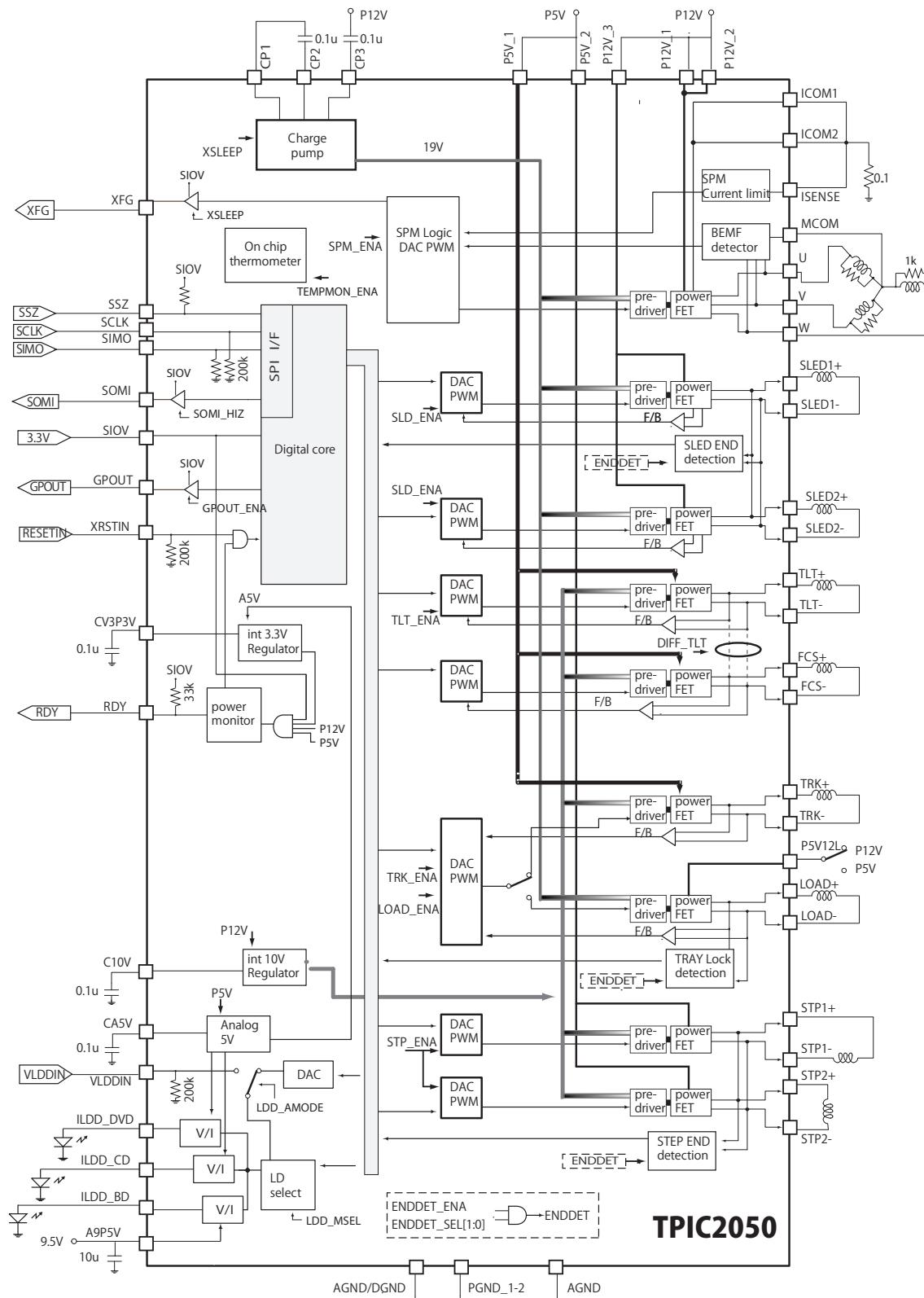
PIN NO.	SYMBOL	TYPE	DESCRIPTION
R3	FEGIO1	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8 mA PDR, 75K pull-down (0 V)	LDD serial interface CLK. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout. Alternate function : 1. Internal monitored signal output 2. General IO
T3	FEGIO10	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8 mA PDR, 75K pull-down (3.3 V)	PC RS232 serial receive data. The pin is spike-free at power-on stage. Alternate function : 1. High speed serial output port. (CLOCK) 2. Internal monitored signal output 3. LED Control Output. Initial "0" Output 4. General IO
U1	FEGIO11	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8mA PDR, 75K pull-down (3.3 V)	PC RS232 serial transmit data. The pin is spike-free at power-on stage. Alternate function : 1. High speed serial output port. (Data) 2. Internal monitored signal output 3. General IO
U2	FEGIO3	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8mA PDR, 75K pull-down (0 V)	LED Control Output. Initial 0 Output. The pin is spike-free at power-on stage. Alternate function : 1. Internal monitored signal output 2. General IO
R6	FEGIO4	Analog Output	Read gain switch 4 Alternate function : 1. LCD serial interface command enable. 2. LCD_DRV: Square wave output for LCD control. 3. Internal monitored signal output 4. General IO.
N5	FEGIO5	Analog Output	Read gain switch 6 Alternate function : 1. SIDM 2. LCD serial interface command enable. 3. Internal monitored signal output 4. General IO.
N7	FEGIO6	Analog Output	Read gain switch 6. The pin is not allowed to pull-up in circuit layout Alternate function : 1. SIDM 2. LCD serial interface command enable. 3. Internal monitored signal output 4. General IO.
N6	FEGIO7	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8 mA PDR, 75K pull-down (0 V)	General IO. The pin is spike-free at power-on stage. The pin is not allowed to pull-up in circuit layout.
R5	FEGIO9	3.3V LVTTL I/O, 5V-tolerance, 2, 4, 6, 8 mA PDR, 75K pull-down (0 V)	General IO. The pin is spike-free at power-on stage. Alternate function : 1. Internal monitored signal output 2. Spoke input 3. Power on reset input, high active. 4. General IO.
E4	HAVC	Analog Output	Decoupling Pin for Reference Voltage of Main and Sub Beams
C3	INA	Analog Input	Input of Main Beam Signal (A)
B1	INB	Analog Input	Input of Main Beam Signal (B)
C2	INC	Analog Input	Input of Main Beam Signal (C)
C1	IND	Analog Input	Input of Main Beam Signal (D)

PIN NO.	SYMBOL	TYPE	DESCRIPTION
E2	INE	Analog Input	Input of Sub-Beam Signal (E)
E1	INF	Analog Input	Input of Sub-Beam Signal (F)
D1	ING	Analog Input	Input of Sub-Beam Signal (G)
D2	INH	Analog Input	Input of Sub-Beam Signal (H)
F4	MPXOUT1	Analog Output	Multiplexer Output 1 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function : Internal monitored signal output / General output.
F2	MPXOUT2	Analog Output	Multiplexer Output 2 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function : Internal monitored signal output / General output.
F1	MPXOUT3	Analog Output	Multiplexer Output 3 for Signal Monitoring. The pin is not allowed to pull-up in circuit layout. Alternate function : Internal monitored signal output / General output.
K3	FEOSCEN	3.3V LVTTL I/O, 5V-tolerance, Slow slew, 2, 4, 6, 8 mA PDR, 75K pull-up (3.3 V)	High frequency modulation enable signal output, or LDD serial interface CLK or 12C SCL. The pin is spike-free at power-on stage.
G2	RFIN	Analog Input	Differential Input of AC Coupling RF SUM Signal (Negative)
H2	RFIN2	Analog Input	Differential Input of AC Coupling RF SUM Signal (Negative)
G1	RFIP	Analog Input	Differential Input of AC Coupling RF SUM Signal (Positive)
H1	RFIP2	Analog Input	Differential Input of AC Coupling RF SUM Signal (Positive)
J3	TLO	Analog Output	Tilt servo output
T2	FETRAYIN_	3.3V LVTTL I/O, 5V-tolerance, 6 mA, 75K pull-up (3.3 V)	Tray_is_in Input. A Logical Low Indicates the Tray is IN. Feed-back Flag is from Tray Connector. The pin is spike-free at power-on stage. Alternate function : General IO.
U4	FETRAYOUT_	3.3V LVTTL I/O, 5V-tolerance, 6 mA, 75K pull-up (3.3 V)	Tray_is_out Input. A Logical Low Indicates the Tray is OUT. Feedback Flag is from Tray Connector. The pin is spike-free at power-on stage. Alternate function : General IO.
P2	FETRAYPWM	Analog Output	Tray DAC / PWM control output. Controlled by microP
A2	TRINA	Analog Input	Input of Tracking Signal (A)
B3	TRINB	Analog Input	Input of Tracking Signal (B)
A1	TRINC	Analog Input	Input of Tracking Signal (C)
B2	TRIND	Analog Input	Input of Tracking Signal (D)
J2	TRO	Analog Output	Tracking servo output. PDM output of tracking servo compensator.
H3	V14	Analog Output	Output of voltage eference (1.4V)
E5	VDAC0	Analog Output	Output of General DAC
B4	FVREF	Analog Output	Output of Voltage Reference
C6	VWDC2O	Analog Output	Output Voltage 2 of Laser Diode Control in APC
A4	VWDC3O	Analog Output	Output Voltage 3 of Laser Diode Control in APC

2. IC701 (TPIC2050)

: 9ch motor drive with 3 beam laser diode driver

2-1. Block Diagram



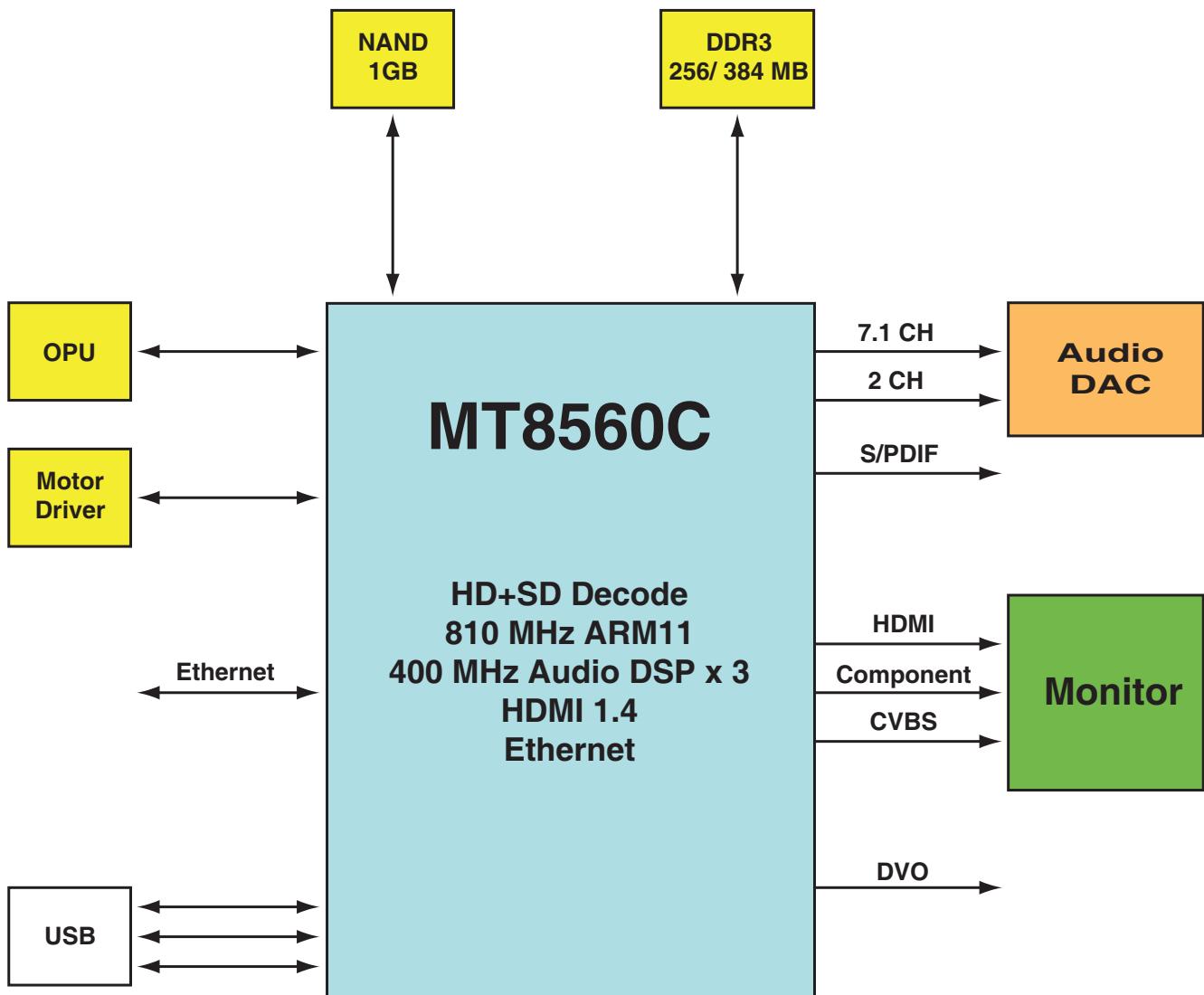
2-2. Pin Function

No.	Name	I/O	Description
1	SLED1_P	OUT	Sled1 positive output terminal
2	SLED1_N	OUT	Sled1 negative output terminal
3	P12V_3	PS	Power supply terminal for 12V drivers output
4	SLED2_P	OUT	Sled2 positive output terminal
5	SLED2_N	OUT	Sled2 negative output terminal
6	PGND_2	PS	GND terminal for 12V drivers
7	C10V	MISC	The capacitance connection terminal for internal regulator
8	CP1	MISC	Capacitance connection for Charge Pump
9	CP2	MISC	Capacitance connection for Charge Pump
10	CP3	MISC	Capacitance connection for Charge Pump
11	GPOUT	OUT	General Purpose Output (Test monitor)
12	XFG	OUT	Motor speed signal output
13	RDY	OUT	Device ready signal Internally pulled up to SIOV
14	SSZ	IN	SIO Slave Select Low active input terminal
15	SCLK	IN	SIO Serial clock input terminal
16	SIMO	IN	SIO Slave Input Master Output terminal
17	SOMI	OUT	SIO Slave Input Master Input terminal
18	SIOV	PS	Power supply terminal for Serial Port 3.3V typical
19	XRSTIN	IN	RESET input terminal to disable the driver IC
20	TEST1	MISC	Test pin. Should be open
21	VLDDIN	IN	Laser diode control analog signal input 0 to 3V terminal Required to set register when use VLDDIN input. Open in case of non use analog input.
22	CV3P3	MISC	Capacitance terminal for internal 3.3V core (typ 0.uF)
23	AGND/DGND	PS	Ground terminal for digital and analog
24	A9P5V	PS	Power supply terminal 9.5V Laser diode for BD
25	ILDD_BD	OUT	Laser diode for BD output terminal
26	ILDD_DVD	OUT	Laser diode for DVD output terminal
27	ILDD_CD	OUT	Laser diode for CD output terminal
28	CP5V	MISC	The capacitance connection terminal for control system power supply 0.1uF or lager decoupling capacitor should be connected
29	LOAD_P	OUT	Load positive output terminal
30	LOAD_N	OUT	Load negative output terminal
31	P5V12L	PS	The power supply terminal (5V or 12V) for Load driver output stages.
32	TEST2	MISC	Test pin. Should be open
33	TEST3	MISC	Test pin. Should be connected to P5V
34	P5V_1	PS	Power supply terminal for Tilt/Fcs/Trk drivers
35	TLT_N	OUT	Tilt negative output terminal
36	TLT_P	OUT	Tilt positive output terminal
37	TRK_P	OUT	Tracking positive output terminal
38	TRK_N	OUT	Tracking negative output terminal
39	FCS_P	OUT	Focus positive output terminal
40	FCS_N	OUT	Focus negative output terminal
41	PGND_1	PS	GND terminal for Tilt/Fcs/Trk channel drivers
42	P12V_1	PS	Power supply terminal for 12V driver output stage
43	U	OUT	U phase output terminal for spindle motor
44	ICOM1	MISC	Current sense resister terminal for spindle driver
45	V	OUT	V Phase output terminal for spindle motor
46	P12V_2	PS	Power supply terminal for 12V driver output stage
47	W	OUT	W phase output terminal for spindle motor
48	ICOM2	MISC	Current sense resister terminal for spindle driver
49	MICOM	IN	Motor center tap connection
50	ISENCE	IN	Current sense resister terminal for spindle driver
51	AGND	PS	Ground terminal for internal analog
52	STP1_P	OUT	STP1 positive output terminal for collimator
53	STP1_N	OUT	STP1 negative output terminal for collimator
54	STP2_P	OUT	STP2 positive output terminal for collimator
55	STP2_N	OUT	STP2 negative output terminal for collimator
56	P5V_2	PS	Power supply terminal for 5V driver output

3. PICK-UP CONNECTOR TERMINAL PIN ASSIGNMENTS

PIN NO.	PIN NAME	FUNCTION	BLOCK
1	F2+	Outer Focus (+)	Actuator
2	F2-	Outer Focus (-)	
3	T+	Tracking (+)	
4	F1+	Inner Focus (+)	
5	T-	Tracking (-)	
6	F1-	Inner Focus (-)	
7	MOTOR_A-	Step Motor A-	CLD MOTOR
8	MOTOR_B-	Step Motor B-	
9	MOTOR_A+	Step Motor A+	
10	MOTOR_B+	Step Motor B+	
11	NC	NC	NC
12	NC	NC	
13	GND	GND	PDIC PART
14	A	Servo signal part	
15	B	Servo signal part	
16	C	Servo signal part	
17	D	Servo signal part	
18	E	Servo signal part	
19	F	Servo signal part	
20	G	Servo signal part	
21	H	Servo signal part	
22	SW3	BD PD Sleep Selection	
23	RF+	BD/DVD/CD RF+	
24	RF-	BD/DVD/CD RF-	
25	SW2(GAIN)	BD PDIC Gain selection	
26	SW1(GAIN)	BD PDIC Gain selection	
27	VREF_PD(2.1V)	PDIC Reference 2.1V	
28	VCC_PD(5V)	PDIC Power 5V	
29	GND_PD	PDIC GND	
30	SW(MODE)	DVD/CD/Sleep Selection	
31	GND_LD	LD Ground	LD/ VR PART
32	BD_LD	LD Control BD	
33	CD_LD	LD Control CD	
34	DVD_LD	LD Control DVD	
35	GND_LD	LD GND	
36	TEMP	Thermistor	
37	HFM_VCC(5V)	5V(NC)	
38	CD/DVD_MP	Monitor output DVD/CD	
39	BD_MP	Monitor output BD	
40	DVD_VR	DVD Level adjust	
41	CD_VR	CD Level adjust	
42	NC	NC	
43	HIGH_OUTPUT(5V)	OPU Detection 5V	
44	GND_LD	LD GND	
45	BD_VR	BD Level adjust	

BLOCK DIAGRAM



MEMO
