

HCD-M40D/M60D/ M80D

SERVICE MANUAL

Ver. 1.0 2018.02



Photo: HCD-M80D

- HCD-M40D is the tuner, USB, DVD Player, Bluetooth and amplifier section in MHC-M40D.
- HCD-M60D is the tuner, USB, DVD Player, Bluetooth and amplifier section in MHC-M60D.
- HCD-M80D is the tuner, USB, DVD Player, Bluetooth and amplifier section in MHC-M80D.

Note:

Be sure to keep your PC used for service and checking of this unit always updated with the latest version of your anti-virus software.
In case a virus affected unit was found during service, contact your Service Headquarters.

AEP Model
HCD-M60D

Russian Model
E Model

Australian Model
HCD-M40D/M60D/M80D

Brazilian Model
HCD-M60D/M80D

DVD Section	Model Name Using Similar Mechanism	MHC-V50/V50D
	DVD Mechanism Type	CDM90-DVBU204//C
	Optical Pick-up Name	CMS-S76RFS7GP OR CMS-S76RFS7G1

SPECIFICATIONS

Inputs

AUDIO IN (TV) L/R:
Voltage 2 V, impedance
47 kilohms

TV (ARC):
Supported audio signal:
2-channel Linear PCM

MIC1:
Sensitivity 1 mV, impedance
10 kilohms

MIC2/GUITAR:
Sensitivity 1 mV, impedance
10 kilohms (When guitar mode is turned
off.)
Sensitivity 200 mV, impedance
250 kilohms (When guitar mode is
turned on.)

Outputs

HDMI OUT (TV) ARC:
Supported audio signal:
2-channel Linear PCM (up to
48 kHz), Dolby Digital

HDMI section

Connector:
Type A (19 pin)

Disc player section

System:
Compact disc and digital audio and
video system

Laser Diode Properties

Emission Duration: Continuous
Laser Output*: Less than 44.6 μ W
* This output is the value measurement
at a distance of 200 mm from the
objective lens surface on the Optical
Pick-up Block with 7 mm aperture.

Frequency response:
20 Hz – 20 kHz

Video color system format:
Latin American model:
NTSC
Other models:
NTSC and PAL

USB section

Supported USB device:
Mass Storage Class

Maximum current:

1 A
(USB) port:
Type A

FM tuner section

FM stereo, FM superheterodyne tuner
Antenna:

FM lead antenna

Tuning range:
76 MHz – 108 MHz (100 kHz step)
(Brazilian model)
87.5 MHz – 108.0 MHz (50 kHz step)
(except Brazilian model)

BLUETOOTH section

Communication system:

BLUETOOTH Standard version 4.2

Output:
BLUETOOTH Standard Power Class 2
Maximum output power:
< 9.5 dBm

Maximum communication range:
Line of sight approx. 10 m^{*1}

Maximum number of devices to be registered
8 devices
Maximum number of simultaneous connection
(Multipoint)
3 devices

Frequency band:
2.4 GHz band (2.4000 GHz –
2.4835 GHz)

Modulation method:
FHSS (Freq Hopping Spread Spectrum)

Compatible BLUETOOTH profiles^{*2}:
A2DP (Advanced Audio Distribution
Profile)
AVRCP (Audio Video Remote Control
Profile)
SPP (Serial Port Profile)

Supported codecs:

SBC (Subband Codec)
AAC (Advanced Audio Coding)
LDAC

^{*1} The actual range will vary depending on
factors such as obstacles between devices,
magnetic fields around a microwave oven,
static electricity, reception sensitivity,
antenna's performance, operating system,
software application, etc.

^{*2} BLUETOOTH standard profiles indicate the
purpose of BLUETOOTH communication
between devices.

Supported audio formats

Supported bit rate and sampling frequencies:

MP3:
32/44.1/48 kHz, 32 kbps – 320 kbps
(VBR)
AAC:
44.1 kHz, 48 kbps – 320 kbps
(CBR/VBR)
WMA:
44.1 kHz, 48 kbps – 192 kbps
(CBR/VBR)
WAV:
44.1/48 kHz (16 bit)

– Continued on next page –

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CD/DVD RECEIVER
SONY®

HCD-M40D/M60D/M80D

Supported video formats

- Xvid:
- Video codec: Xvid video
 - Bit rate: 4.854 Mbps (MAX)
 - Resolution/Frame rate:
720 × 480, 30 fps
720 × 576, 25 fps (except for Latin American model)
 - Audio codec: MP3
- MPEG4:
- File format: MP4 File Format
 - Video codec: MPEG4 Simple Profile (AVC is not compatible.)
 - Bit rate: 4 Mbps
 - Resolution/Frame rate:
720 × 480, 30 fps
720 × 576, 25 fps (except for Latin American model)
 - Audio codec: AAC-LC (HE-AAC is not compatible.)
 - DRM: Not compatible

General

- Power requirements:
- AC 120 V – 240 V, 50/60 Hz
- Power consumption:
- MHC-M80D: 390 W
 - MHC-M60D: 290 W
 - MHC-M40D: 120 W
- Power consumption (at the Power Saving mode):
- 0.5 W (When “BT STBY” is set to “OFF” and [CONTROL FOR HDMI] is set to [OFF].)
 - 2 W* (When “BT STBY” is set to “ON” and [CONTROL FOR HDMI] is set to [ON].)
- Dimensions (w/h/d) (excl. speakers) (Approx.):
- 335 mm × 172 mm × 310 mm
- Mass (excl. speakers) (Approx.):
- MHC-M80D: 4.0 kg
 - MHC-M60D: 3.8 kg
 - MHC-M40D: 2.9 kg
- Operating temperature:
- 5 °C to 35 °C



* The power consumption of the system will be less than 0.5 W when there is no HDMI connection and “BT STBY” is set to “OFF”.

Design and specifications are subject to change without notice.

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SAFETY-RELATED COMPONENT WARNING!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

NOTES ON CHIP COMPONENT REPLACEMENT

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

FLEXIBLE CIRCUIT BOARD REPAIRING

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

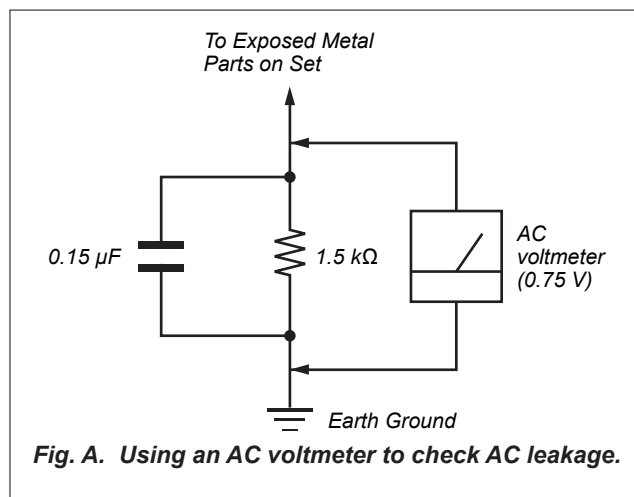


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SECTION 1 SERVICING NOTES

UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the leadfree mark (LF) indicating the solder contains no lead.

(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)

LF : LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 °C higher than ordinary solder.
Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
Soldering irons using a temperature regulator should be set to about 350 °C.
Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

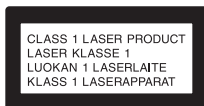
NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

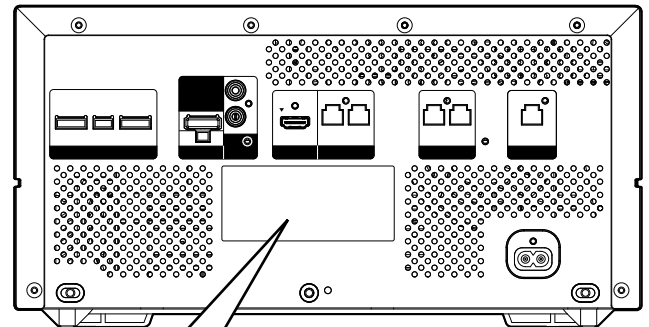
The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pickup block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.



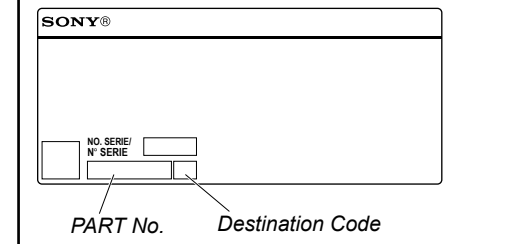
This appliance is classified as a CLASS 1 LASER product under IEC 60825-1:2007. This marking is located on the rear exterior of the unit.

MODEL IDENTIFICATION

- BACK PANEL -



- MODEL LABEL -



Model	Part No.
HCD-M80D: LA9	4-732-799-0□
HCD-M80D: AUS	4-732-799-3□
HCD-M80D: E4	4-732-799-4□
HCD-M80D: E93	4-732-799-6□
HCD-M80D: RU	4-732-799-7□
HCD-M60D: LA9	4-732-800-0□
HCD-M60D: AEP	4-732-800-1□
HCD-M60D: AUS	4-732-800-3□
HCD-M60D: RU	4-732-800-7□
HCD-M40D: LA9	4-732-801-0□
HCD-M40D: AUS	4-732-801-3□
HCD-M40D: E4	4-732-801-4□
HCD-M40D: E93	4-732-801-6□
HCD-M40D: RU	4-732-801-7□
HCD-M80D: BR	4-735-615-0□
HCD-M60D: BR	4-735-615-1□

DESTINATION ABBREVIATIONS

The following abbreviations for model destinations are used in this service manual.

- Abbreviation
 - AUS : Australian model
 - BR : Brazilian model
 - E4 : African model
 - E93 : 240 V AC area in E model
 - LA9 : Latin-American model
 - RU : Russian model

HCD-M40D/M60D/M80D

PLAYABLE DISCS

- DVD VIDEO
- DVD-R/DVD-RW in DVD VIDEO format or video mode
- DVD+R/DVD+RW in DVD VIDEO format
- VIDEO CD (Ver. 1.0, 1.1, and 2.0 discs)
- Super VCD
- CD-R/CD-RW/CD-ROM in VIDEO CD format or super VCD format
- AUDIO CD
- CD-R/CD-RW in AUDIO CD format

PLAYABLE FILES ON DISCS

- Music:
MP3 files (.mp3)^{*1*2}
- Video (HCD-M40D/M60D/M80D):
MPEG4 files (.mp4/.m4v)^{*2*3}, Xvid files (.avi)

PLAYABLE FILES ON USB DEVICE

- Music:
MP3 files (.mp3)^{*1*2}, WMA files (.wma)^{*2}, AAC files (.m4a/.mp4/.3gp)^{*2}, WAV files (.wav)^{*2}
- Video (HCD-M40D/M60D/M80D):
MPEG4 files (.mp4/.m4v)^{*2*3}, Xvid files (.avi)

Note

- ^{*1} MP3 (MPEG 1 Audio Layer 3) is a standard format defined by ISO/MPEG for compressed audio data. MP3 files must be in MPEG 1 Audio Layer 3 format.
- ^{*2} Files with copyright protection (Digital Rights Management) cannot be played back by the system.
- ^{*3} MPEG4 files must be recorded in MP4 file format. Supported video codec and audio codec are as follows:
– Video codec: MPEG4 Simple Profile (AVC is not supported.)
– Audio codec: AAC-LC (HE-AAC is not supported.)
- ^{*4} A logical format of files and folders on CD-ROMs, defined by ISO (International Organization for Standardization).

NOTE OF REPLACEMENT OF THE MS-476 BOARD

When the MS-476 board is defective, exchange the entire CDM90 ASSY.

RELEASING THE DISC TRAY LOCK

The disc tray lock function for the antitheft of sample disc in the shop is equipped.

It can release the lock function in the following procedure.

Releasing Procedure:

1. Press the [⏻] button to turn the power on.
2. Press the [FUNCTION] button to select the DVD/CD function.
3. Press the [MEGA BASS] button and [VOCAL FADER] button simultaneously for three seconds.
4. The message “UNLOCKED” is displayed on the screen display panel and the disc tray is unlocked.

Note: When “LOCKED” is displayed on the screen display panel, the disc tray lock is not released by turning the power on/off with the [⏻] button.

TEST DISCS

Use following TEST DISC when this unit confirms the operation and checks it.

- For DVD SL (Single Layer)

Part No.	Description
J-6090-069-A	DISC (HLX-503), TEST (NTSC)
J-6090-088-A	DISC (HLX-504), TEST (NTSC)
J-2501-305-A	DISC (HLX-513), TEST (NTSC)
J-6090-077-A	DISC (HLX-506), TEST (PAL)

- For DVD DL (Double Layer)

Part No.	Description
J-6090-071-A	DISC (HLX-501), TEST (NTSC)
J-6090-089-A	DISC (HLX-505), TEST (NTSC)
J-2501-306-A	DISC (HLX-514), TEST (NTSC)
J-6090-078-A	DISC (HLX-507), TEST (PAL)

If “PROTECTX” (X is a number) and “CHECK MANUAL” flashes on the display

Immediately unplug the AC power cord (mains lead), and check the following items.

- Are you using only the supplied speakers?
- Is anything blocking the ventilation holes of the unit?

After you have checked and found no problems, reconnect the AC power cord (mains lead), and turn on the system. If the issue persists, contact your nearest Sony dealer.

Protect Type Description:

Error Code	Description
3	Possibility of AMP IC Protection. - Over heat up of AMP IC. - Over current happen at speaker output. - No supply to AMP IC when power on. - Damage on AMP IC.

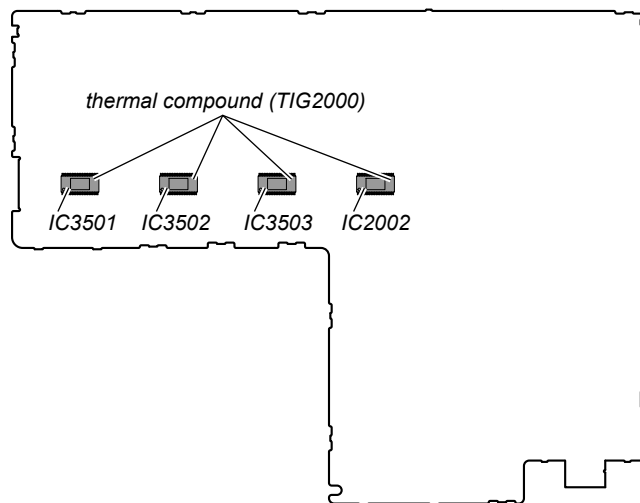
NOTE OF REPLACING THE IC3501 (M80D), IC3502, IC3503 (M60D, M80D) AND IC2002 ON THE MOTHERBOARD BOARD AND THE COMPLETE MOTHERBOARD BOARD

When IC3501 (M80D), IC3502, IC3503 (M60D, M80D) and IC2002 on the MOTHERBOARD board and the complete MOTHERBOARD board are replaced, it is necessary to spread the compound between parts and heat sink. After that, execute "IC and MOTHERBOARD Board after replace checking guide" in page 31.

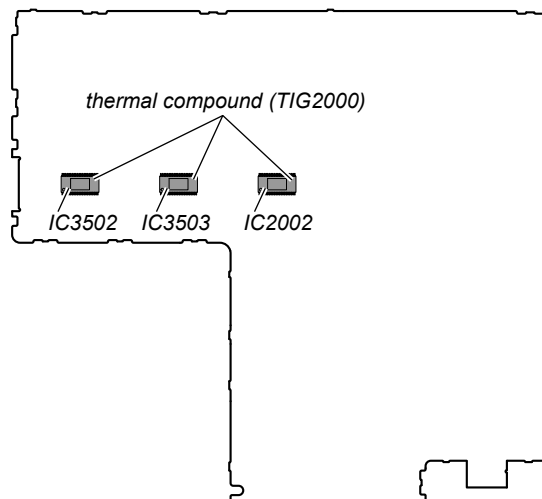
<u>Part No.</u>	<u>Description</u>
7-300-009-67	THERMAL COMPOUND (TIG2000)

Spread the compound referring to the figure below.

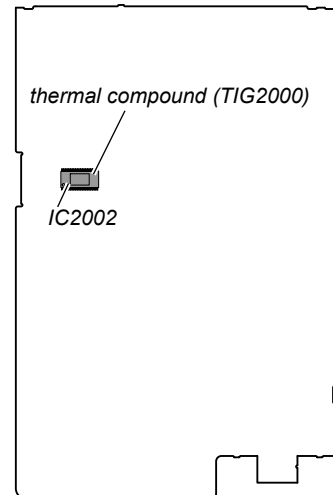
– MOTHERBOARD Board (M80D) (Component Side) –



– MOTHERBOARD Board (M60D) (Component Side) –



– MOTHERBOARD Board (M40D) (Component Side) –



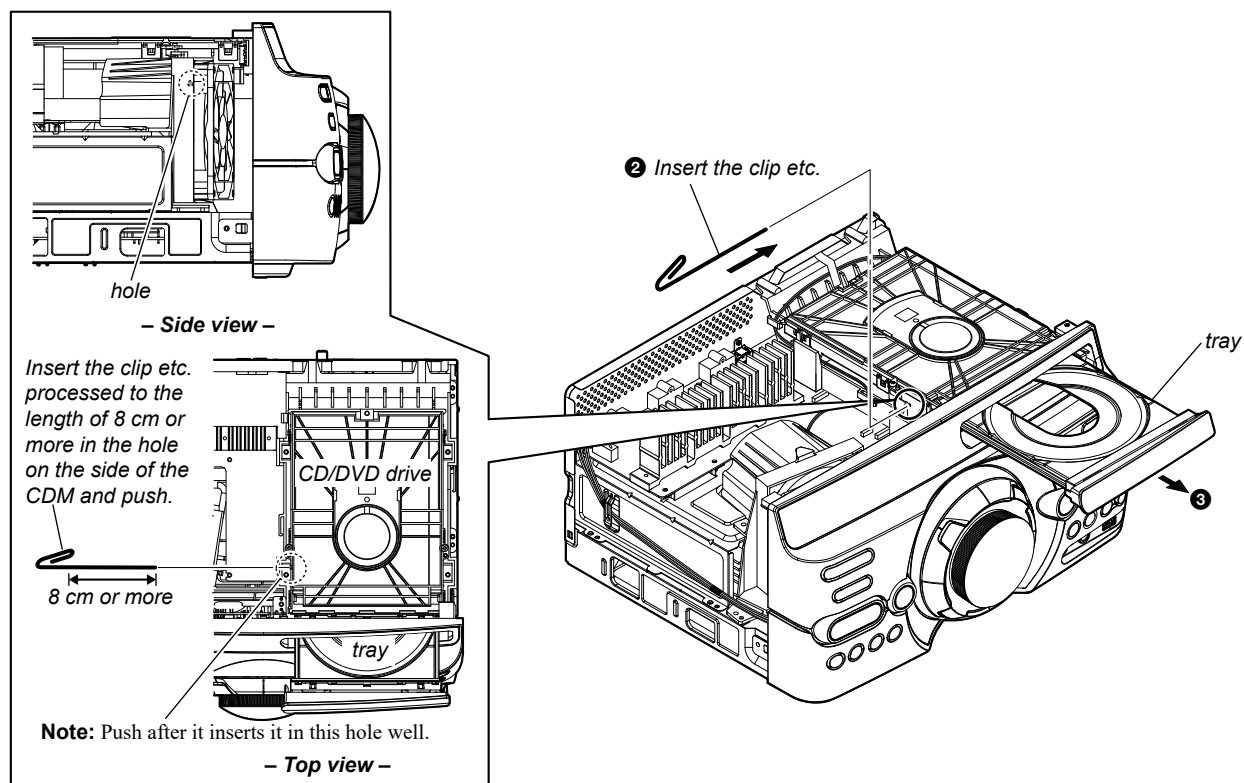
HCD-M40D/M60D/M80D

HOW TO OPEN THE TRAY WHEN POWER SWITCH TURN OFF

Note 1: After the cover, top is removed, this work is done.

Note 2: Please prepare the thin wire (clip etc. processed to the length of 8 cm or more).

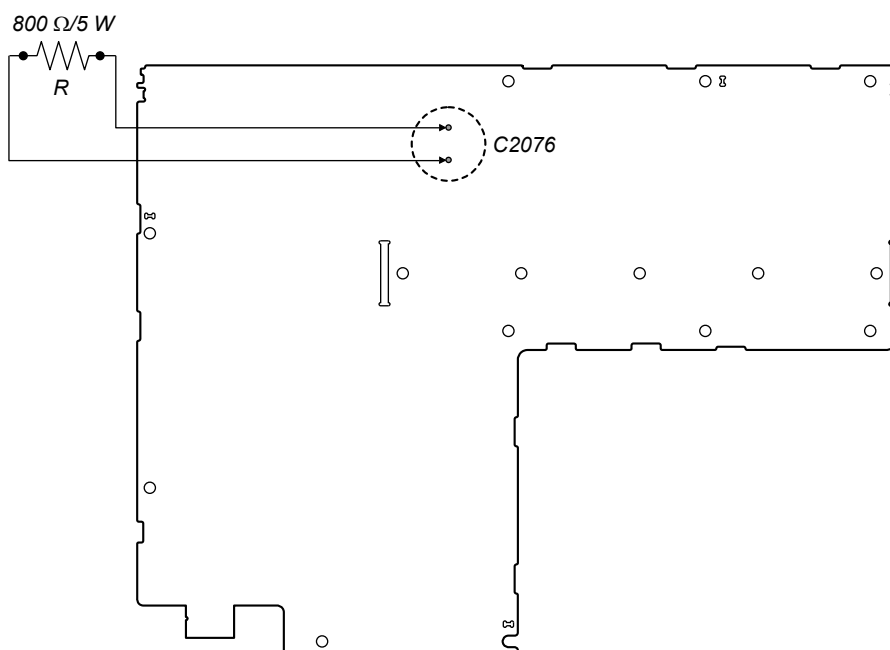
- ❶ Remove the cover, top.
(Illustration of disassembly is omitted.)



CAPACITOR DISCHARGE FOR ELECTRIC SHOCK PREVENTION

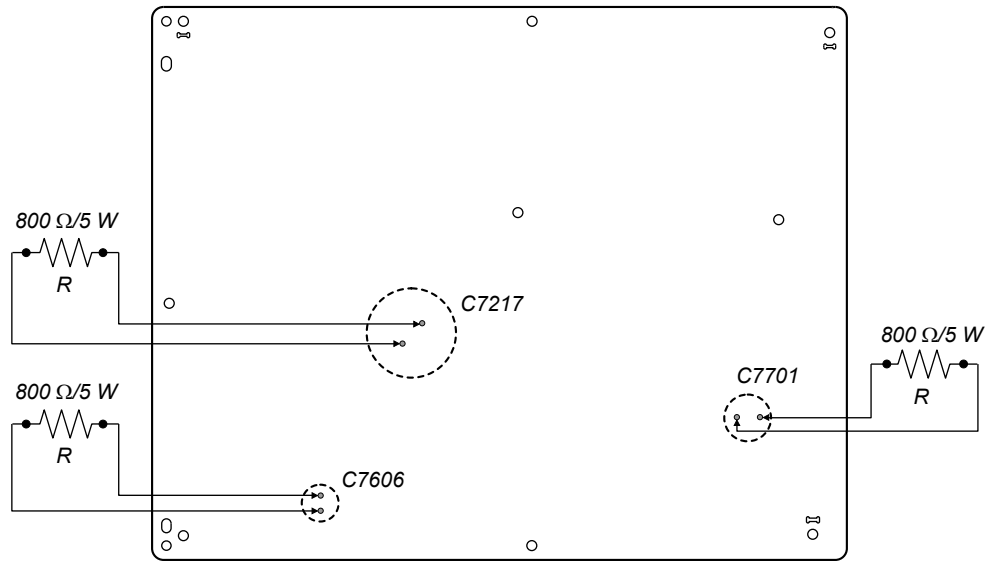
MOTHERBOARD Board (Conductor side view)

In checking the MOTHERBOARD board, make 1 capacitor discharge of C2076 for electrical shock prevention.



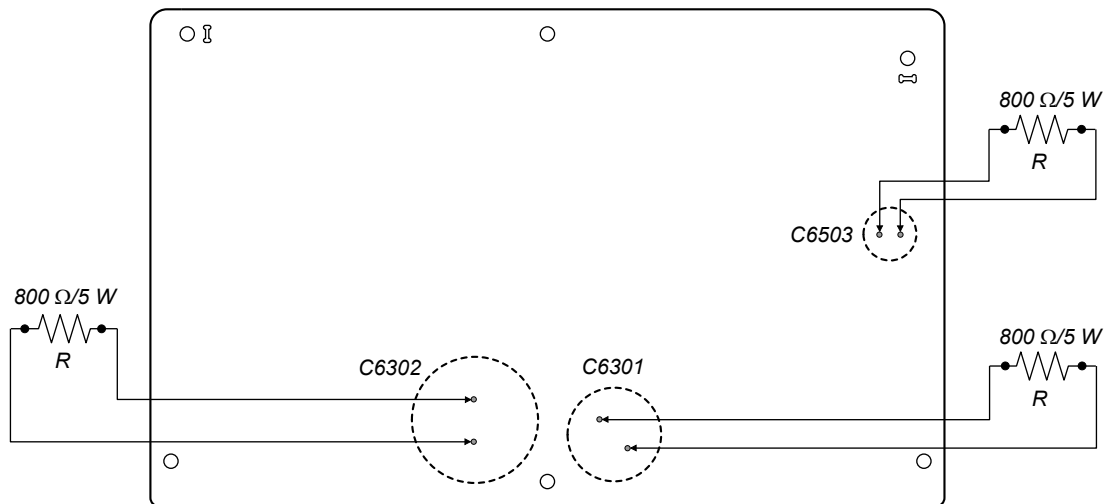
SMPS Board (Conductor side view) (HCD-M60D/M80D)

In checking the SMPS board, make 3 capacitors discharge of C7606, C7217 and C7701 for eletrical shock prevention.



SMPS Board (Conductor side view) (HCD-M40D)

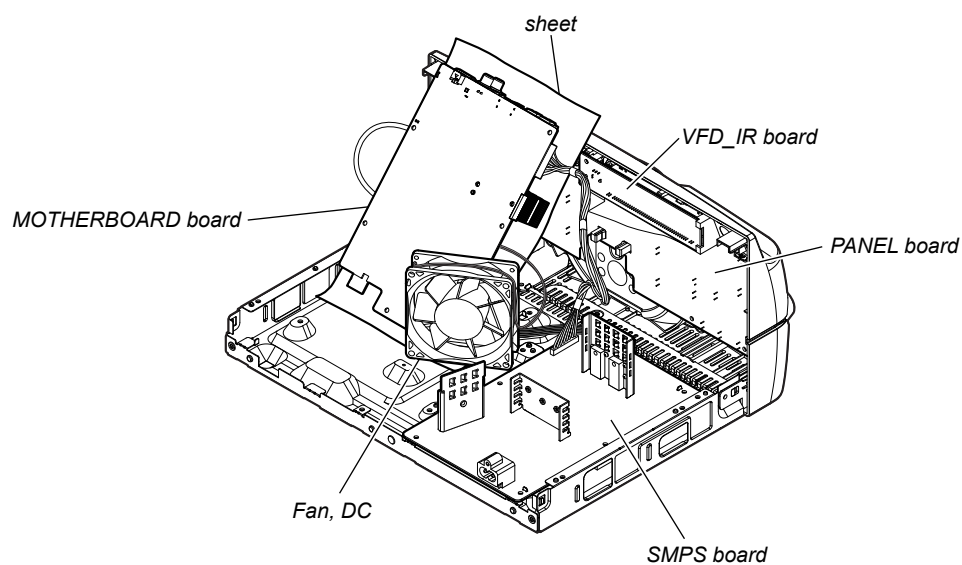
In checking the SMPS board, make 3 capacitors discharge of C6301, C6302 and C6503 for eletrical shock prevention.



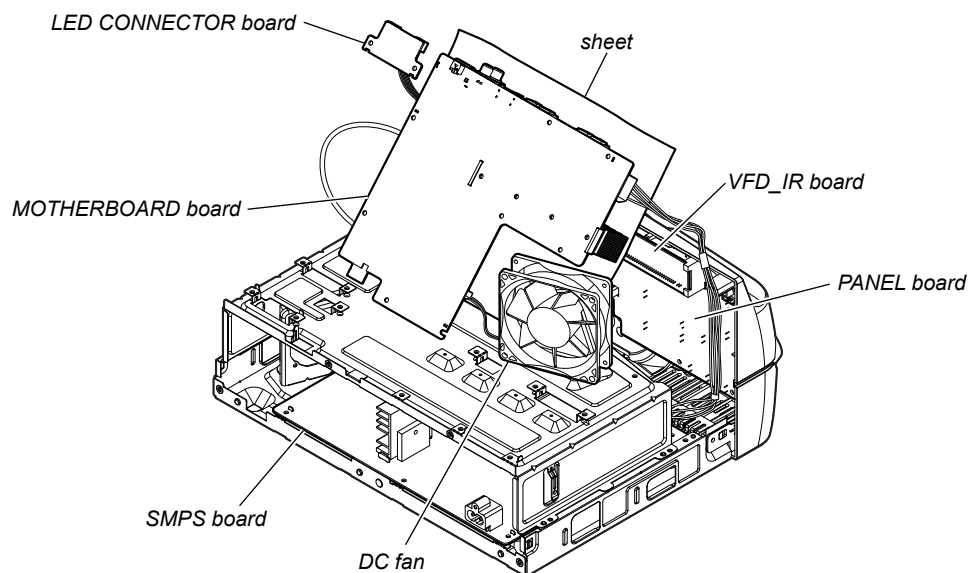
HCD-M40D/M60D/M80D

SERVICE POSITION

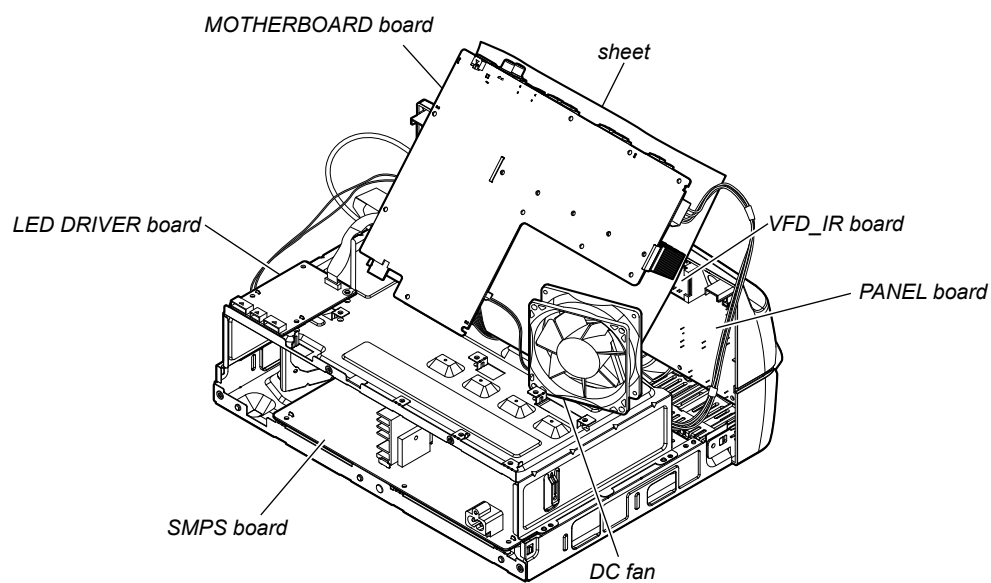
HCD-M40D



HCD-M60D



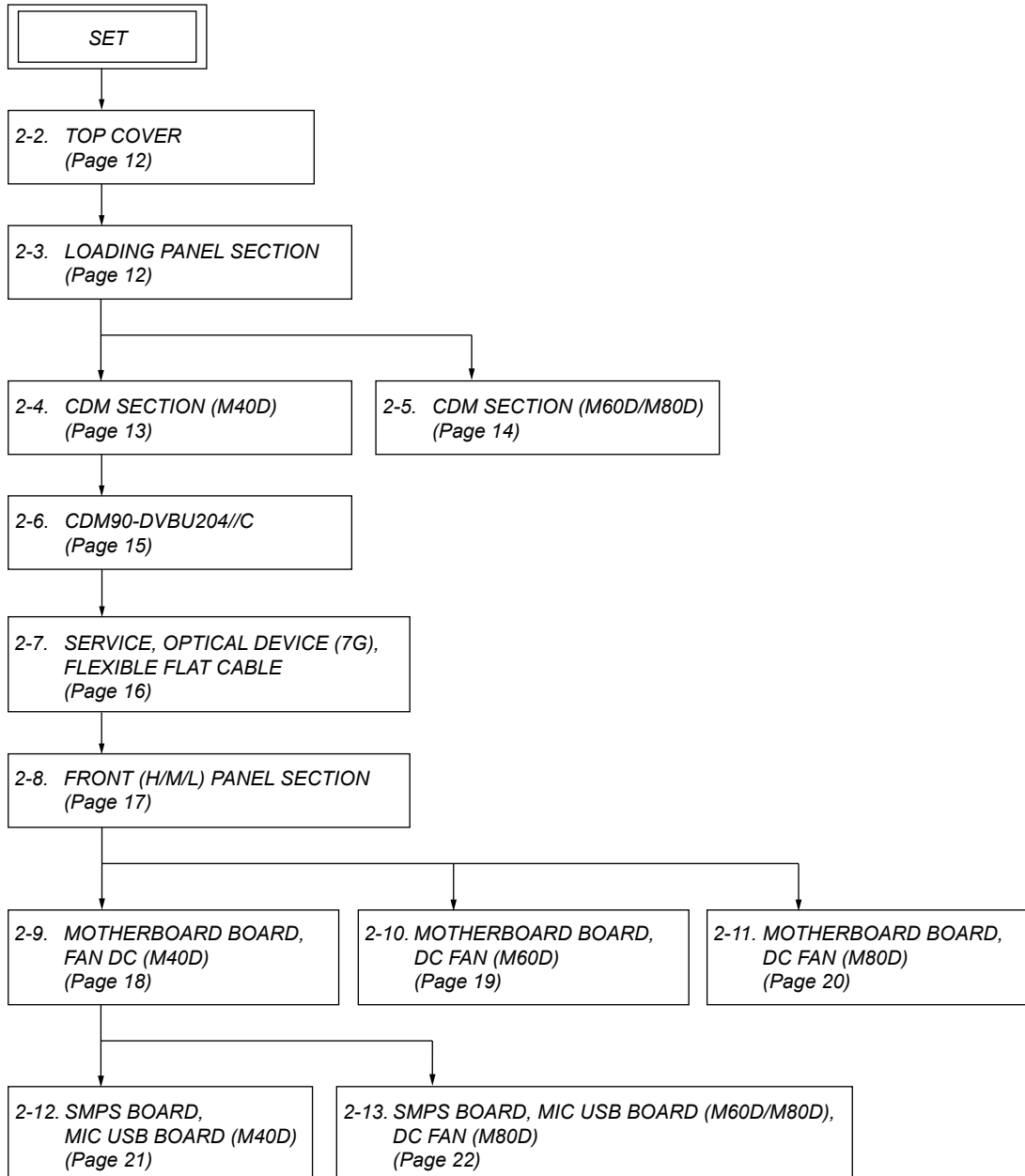
HCD-M80D



SECTION 2 DISASSEMBLY

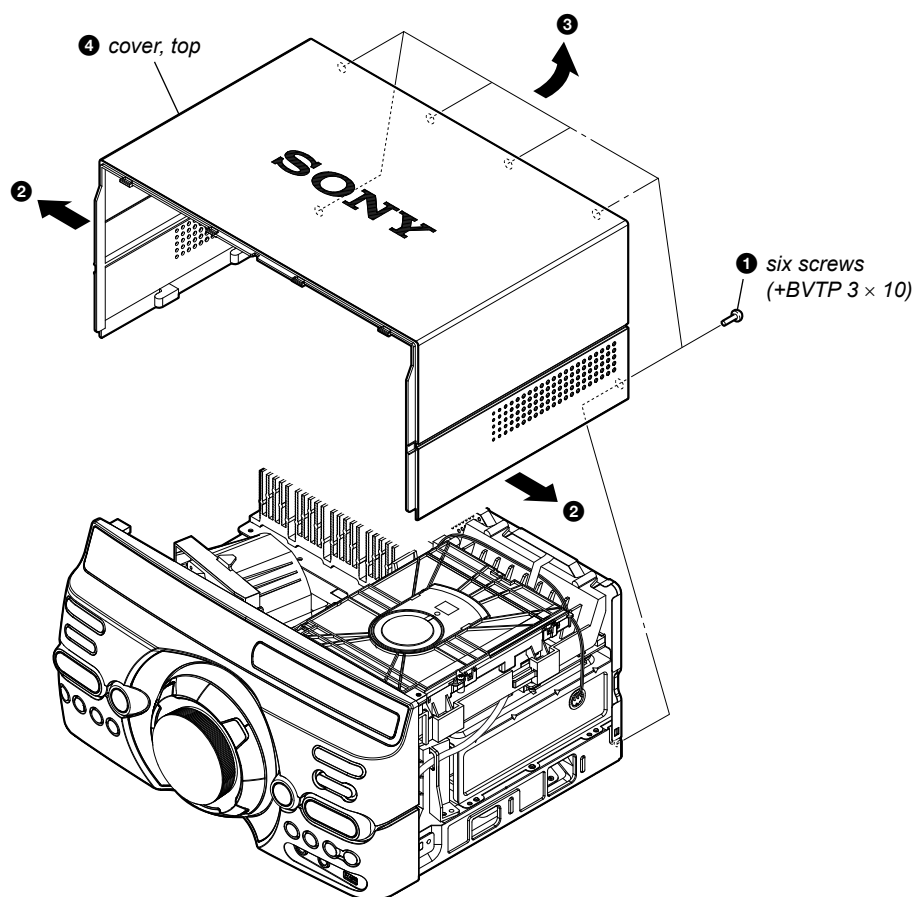
Note: Disassemble the unit in the order as shown below.

2-1. DISASSEMBLY FLOW

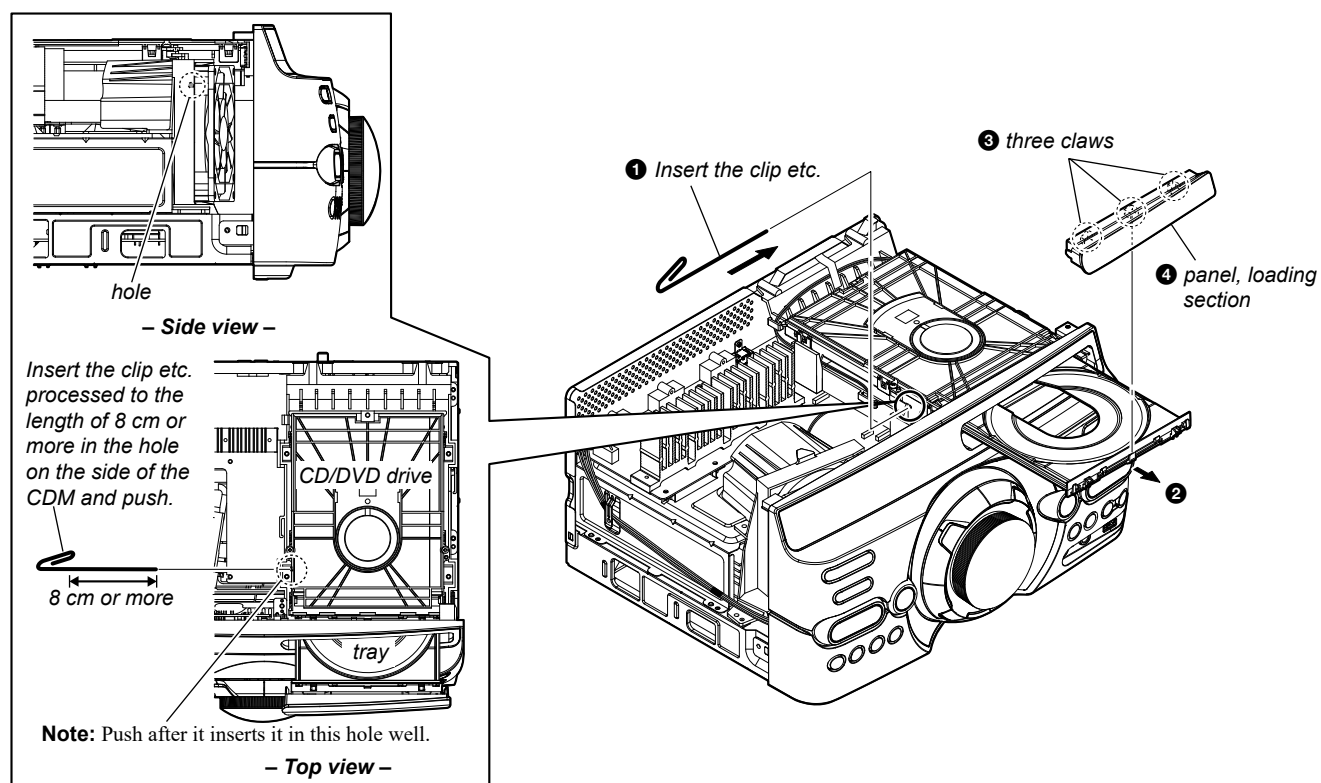


Note: Follow the disassembly procedure in the numerical order given.

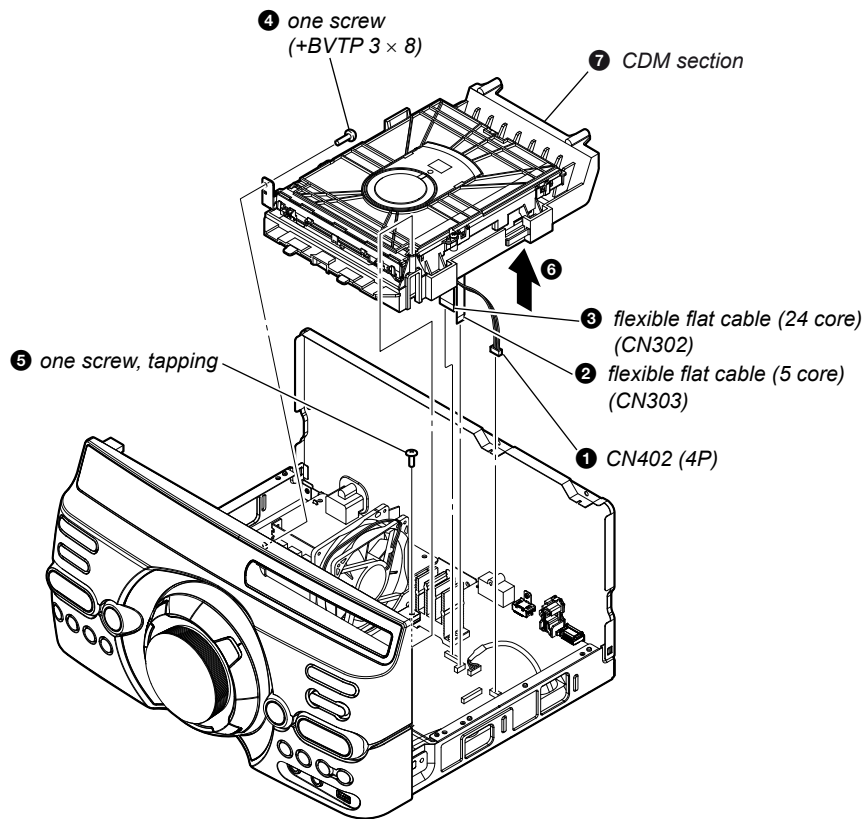
2-2. TOP COVER



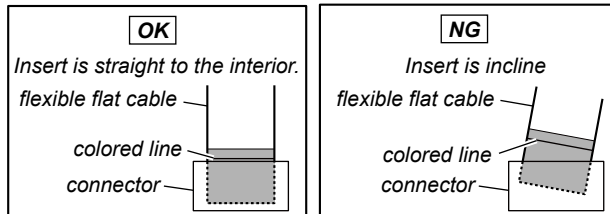
2-3. LOADING PANEL SECTION



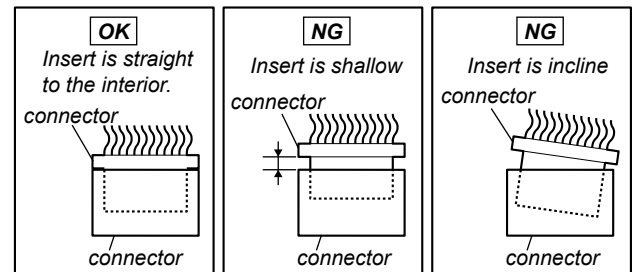
2-4. CDM SECTION (M40D)



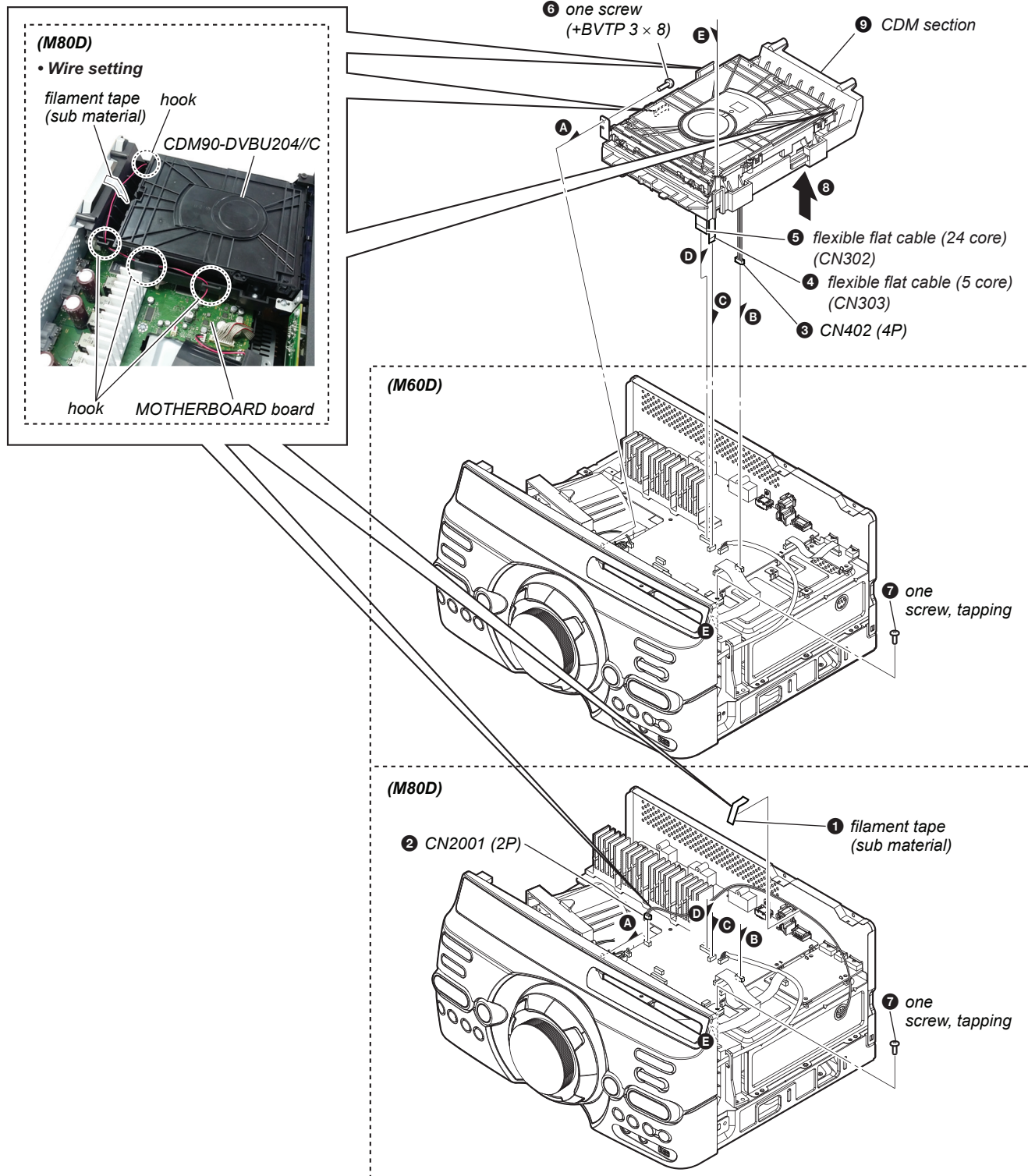
Note 1: When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.



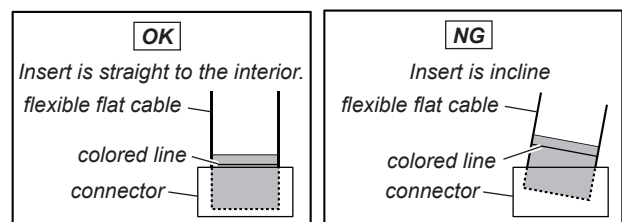
Note 2: When you install the connector, please install them correctly. There is a possibility that this machine damages when not correctly installing it.



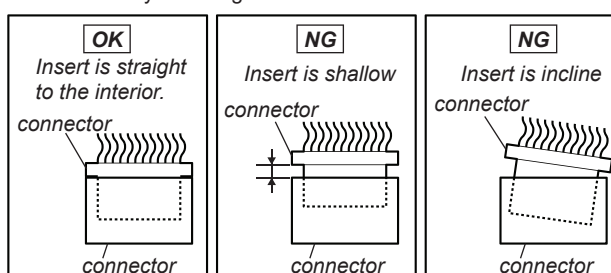
2-5. CDM SECTION (M60D/M80D)



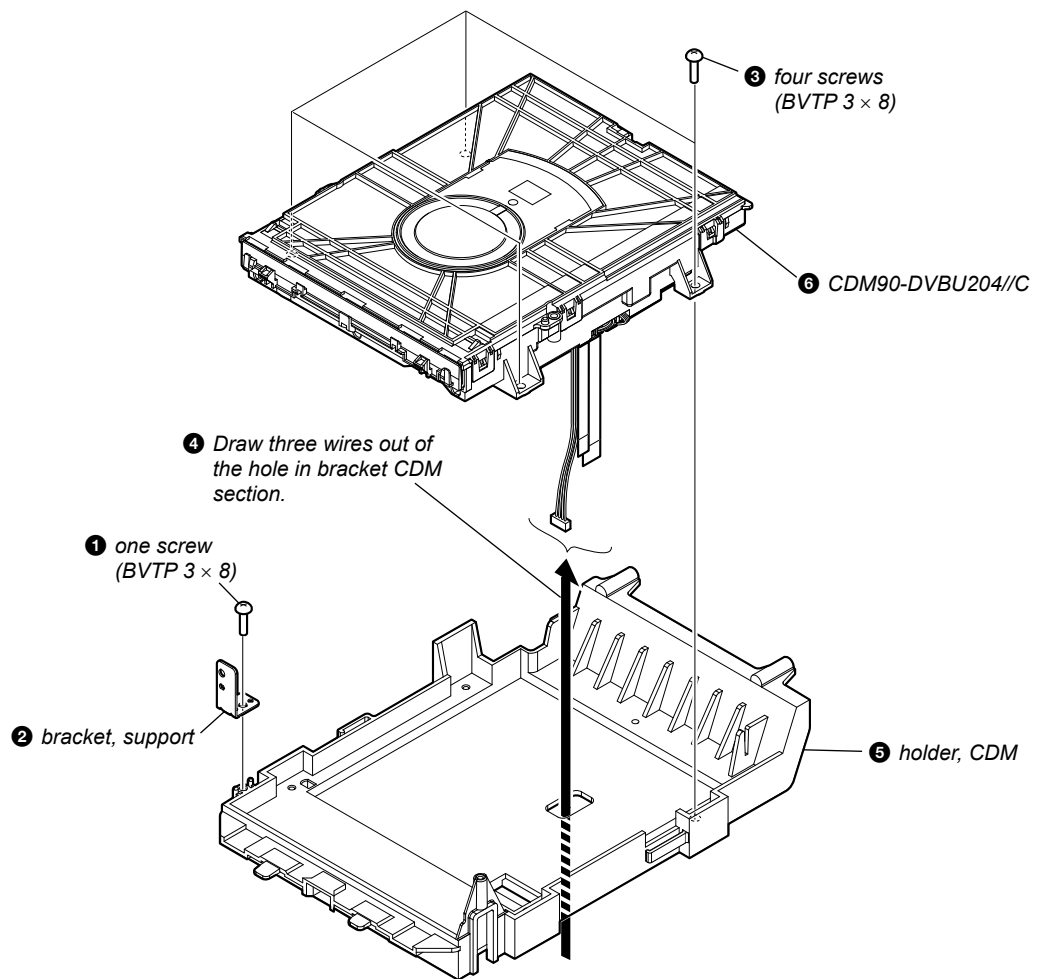
Note 1: When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.



Note 2: When you install the connector, please install them correctly. There is a possibility that this machine damages when not correctly installing it.

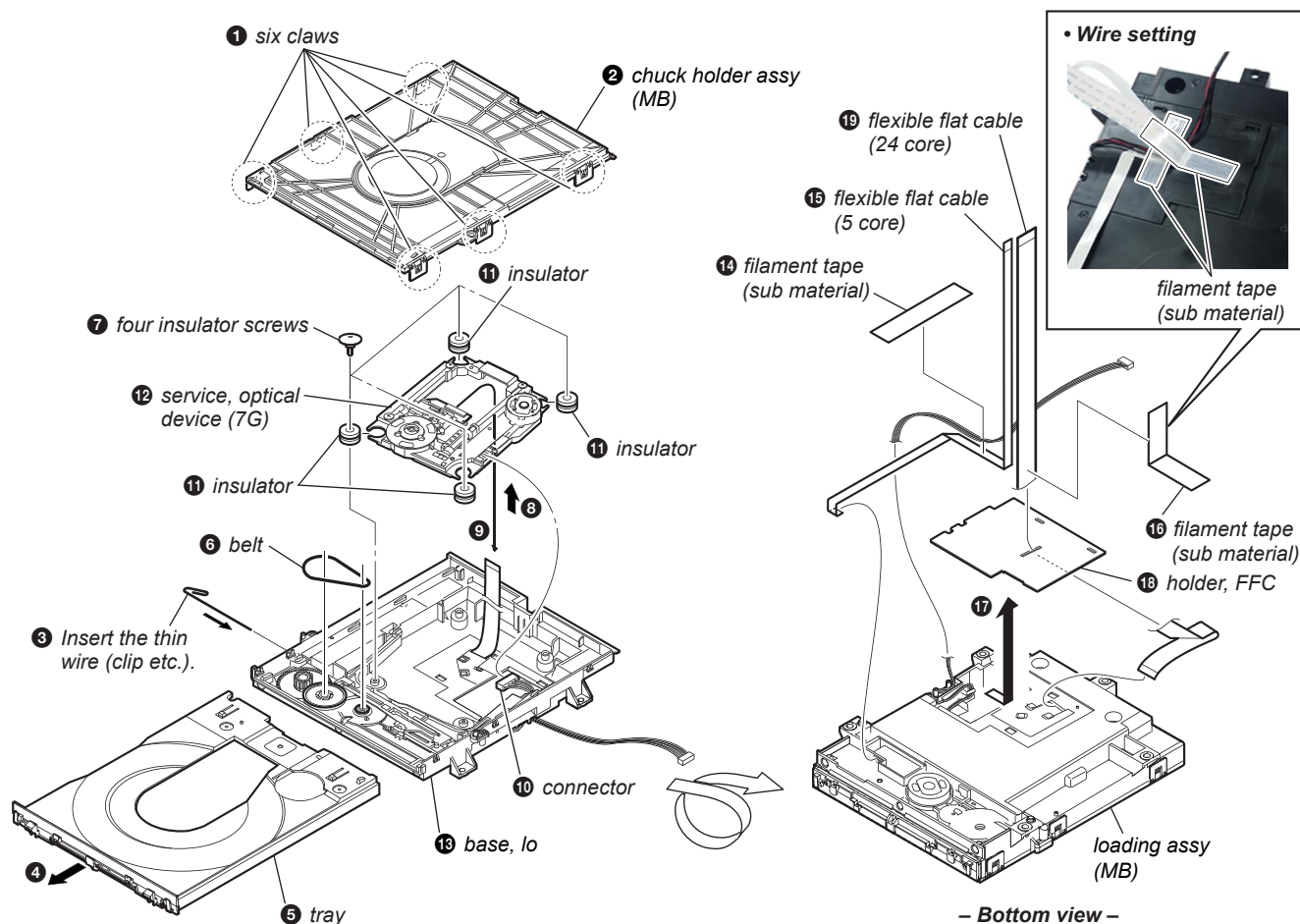


2-6. CDM90-DVBU204//C



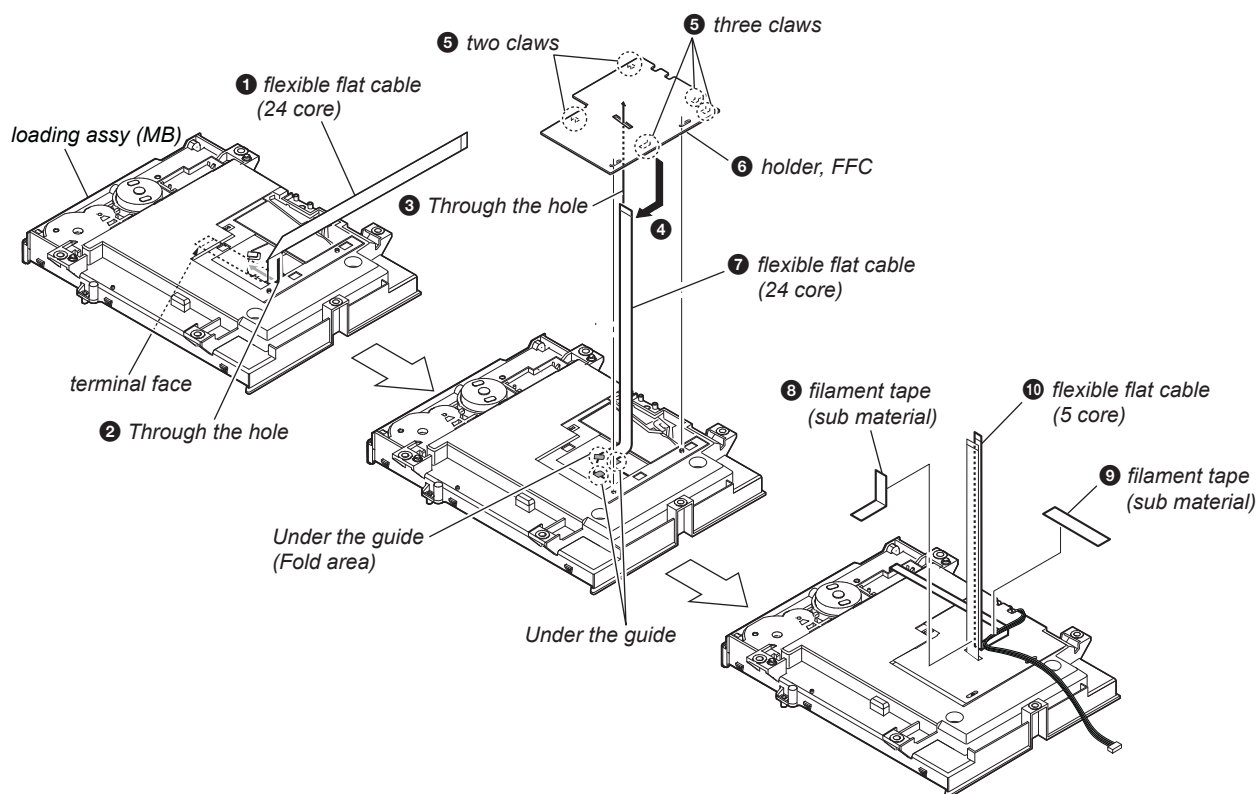
– CDM section front view –

2-7. SERVICE, OPTICAL DEVICE (7G), FLEXIBLE FLAT CABLE

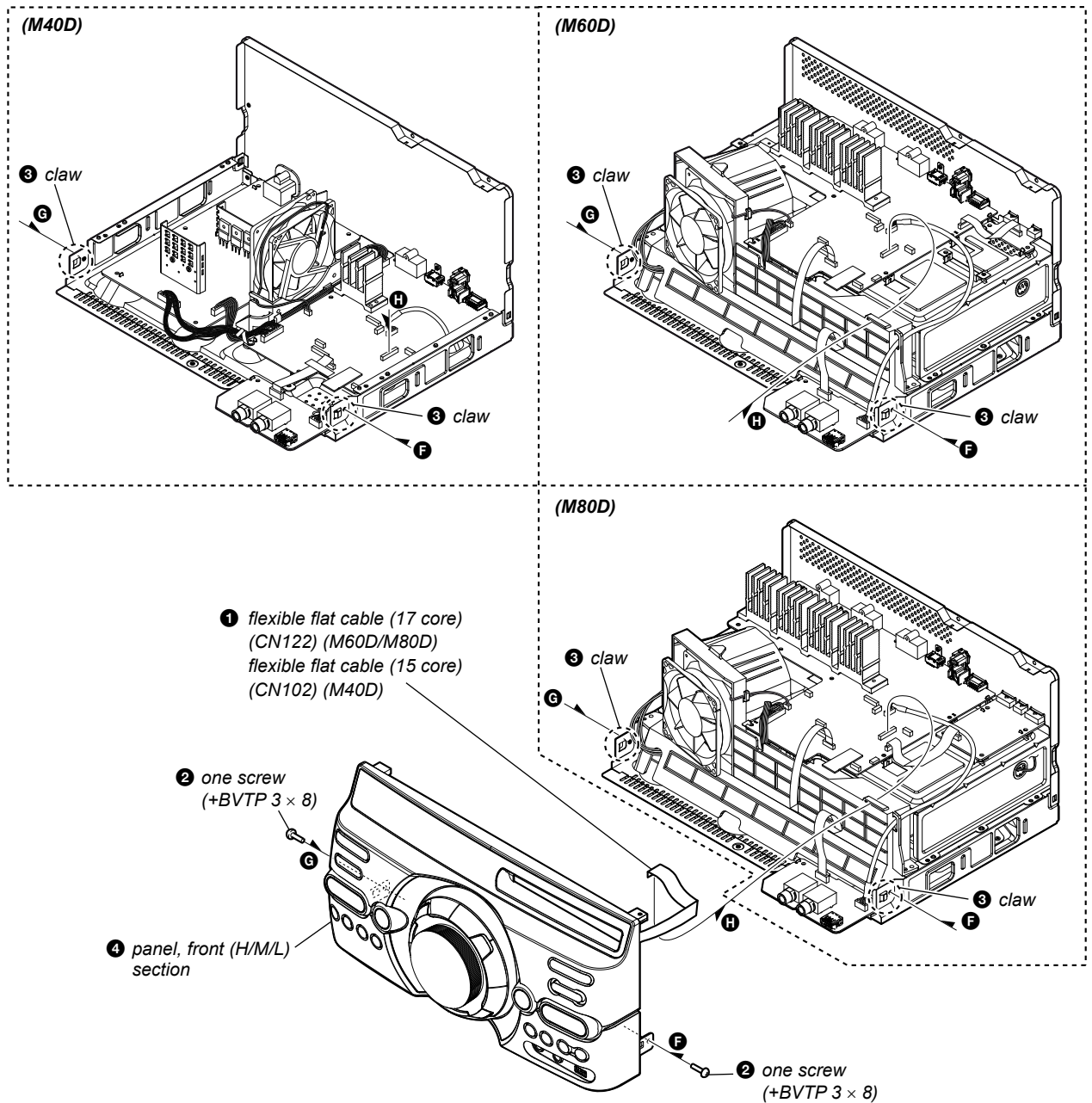


• Installation of flexible flat cable (24 core) and flexible flat cable (5 core)

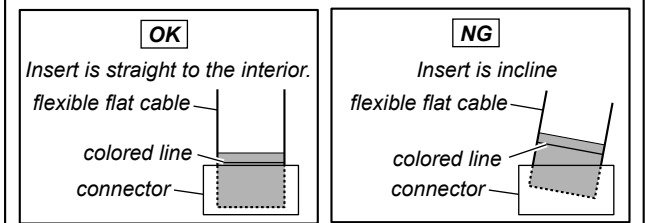
Note: This illustration sees the loading assy (MB) from bottom side.



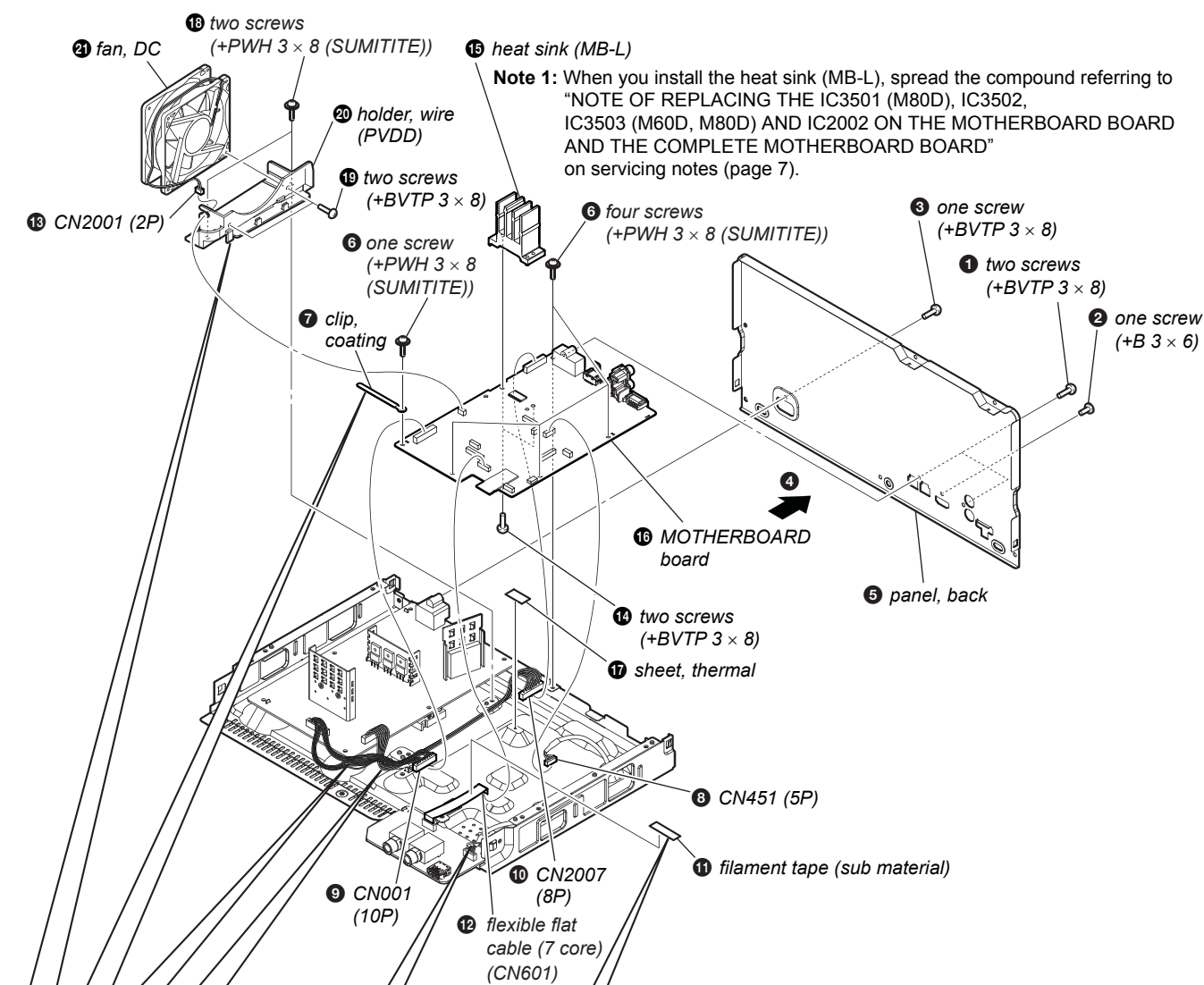
2-8. FRONT (H/M/L) PANEL SECTION



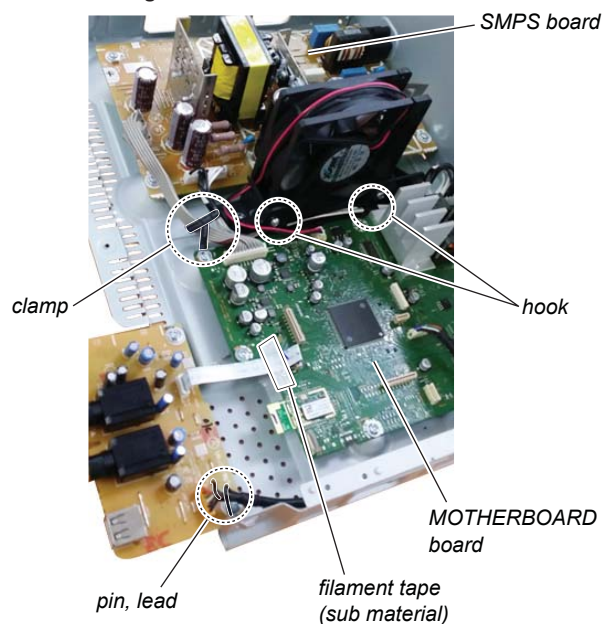
Note : When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.



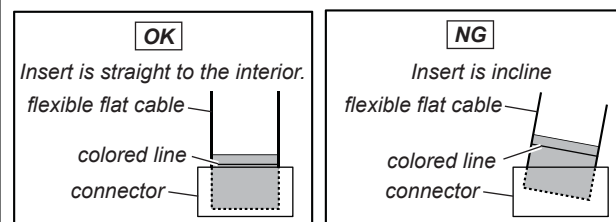
2-9. MOTHERBOARD BOARD, FAN DC (M40D)



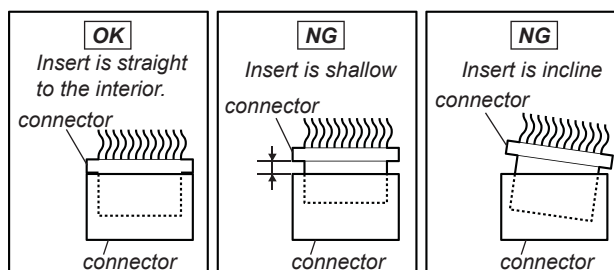
• Wire setting



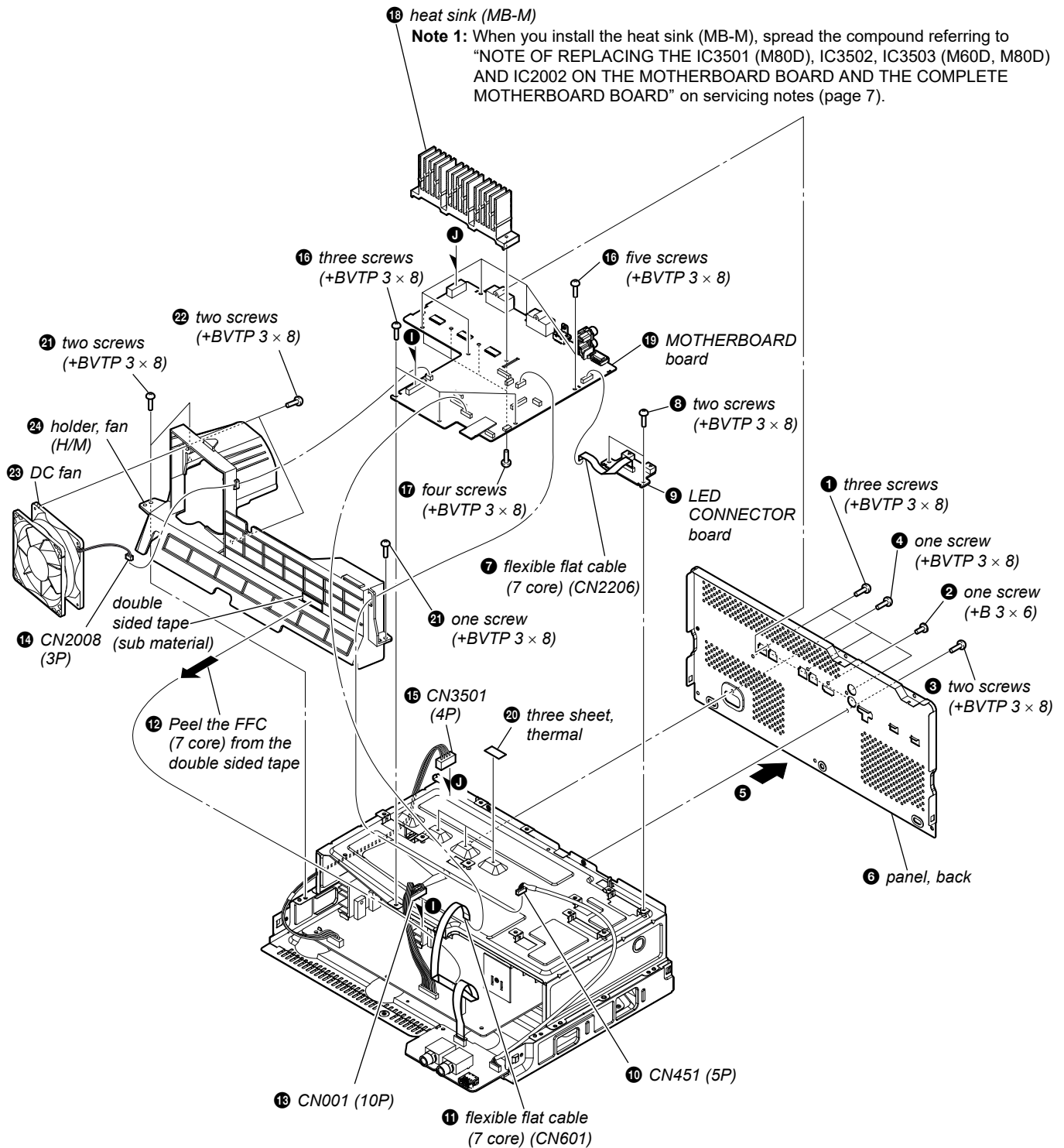
Note 2: When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.



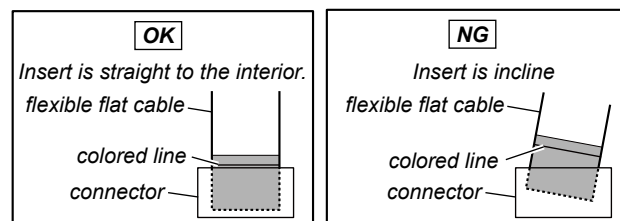
Note 3: When you install the connector, please install them correctly. There is a possibility that this machine damages when not correctly installing it.



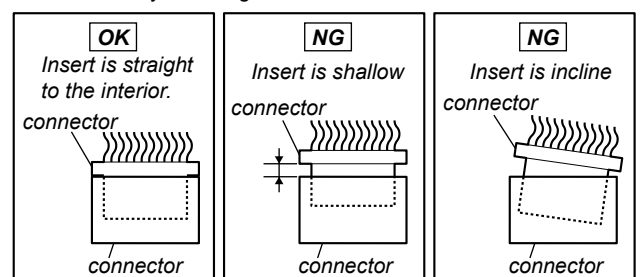
2-10. MOTHERBOARD BOARD, DC FAN (M60D)



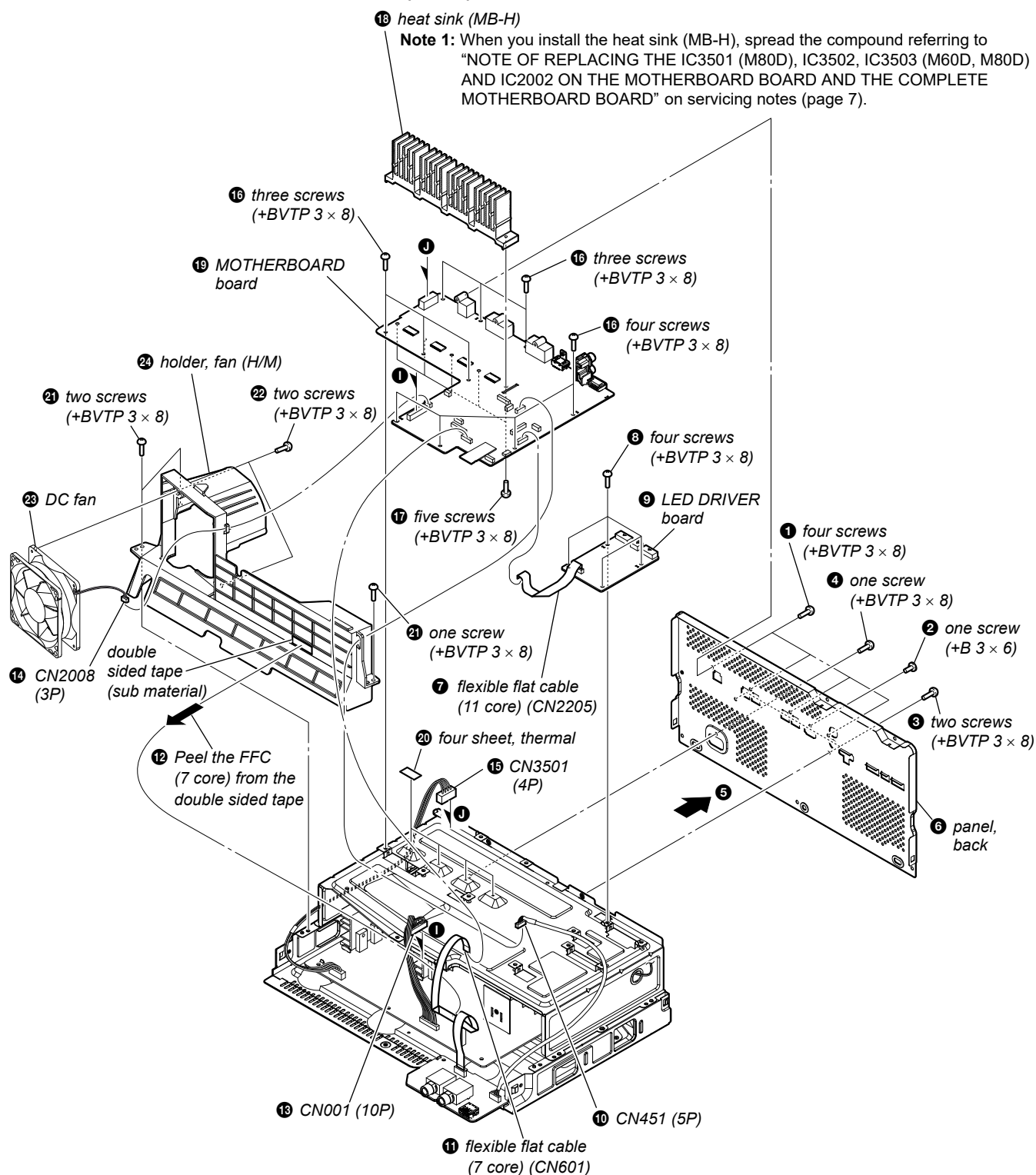
Note 2: When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.



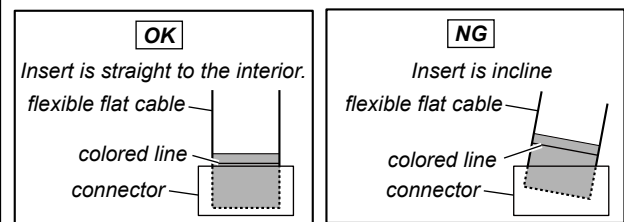
Note 3: When you install the connector, please install them correctly. There is a possibility that this machine damages when not correctly installing it.



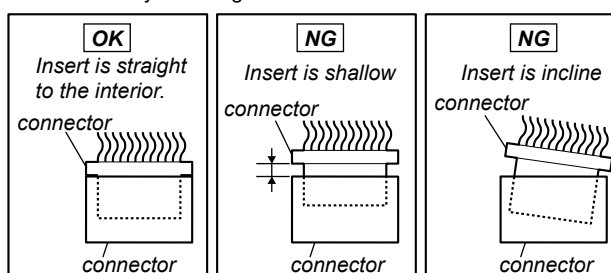
2-11. MOTHERBOARD BOARD, DC FAN (M80D)

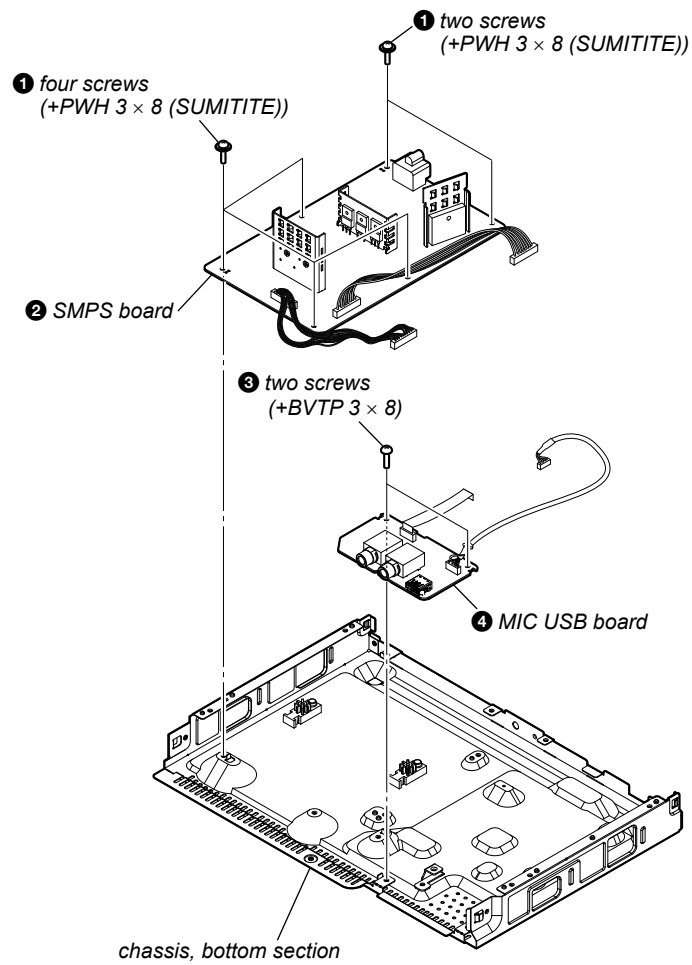


Note 2: When installing the flexible flat cable, ensure that the colored line is not slanted after insertion.

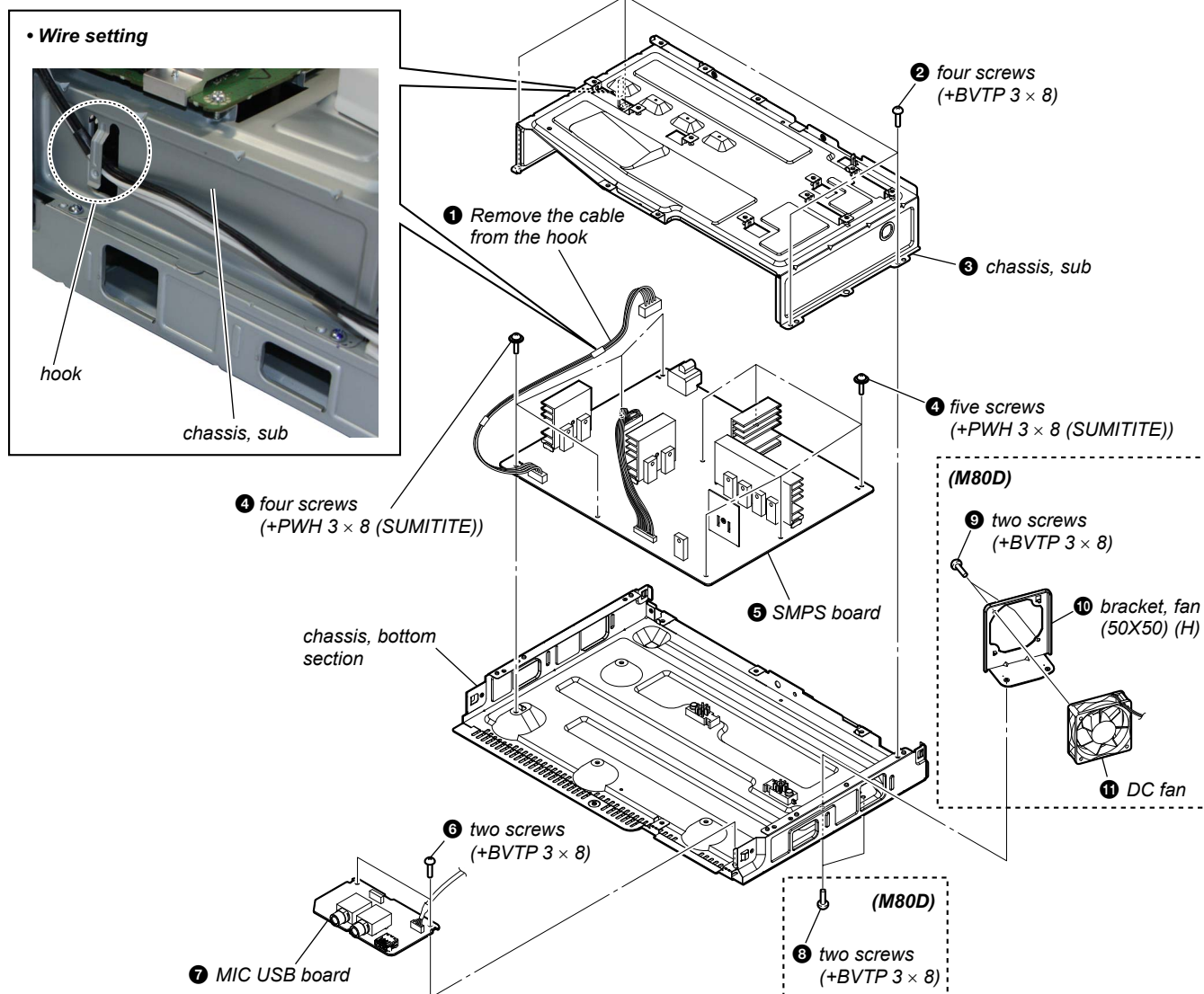


Note 3: When you install the connector, please install them correctly. There is a possibility that this machine damages when not correctly installing it.



2-12. SMPS BOARD, MIC USB BOARD (M40D)

2-13. SMPS BOARD, MIC USB BOARD (M60D/M80D), DC FAN (M80D)



SECTION 3

TEST MODE

PANEL TEST MODE

This mode is used to check the buttons, knobs, screen display panel and LEDs.

Procedure:

1. Press [⏻] button to turn on the system.
2. Press [■] button and [S3 TUNING – ◀◀] button simultaneously for 3 seconds.
3. All LEDs and segments in screen display panel are lighted up. This is the display check mode.
Press [▶] button repeatedly to toggle different display mode as below.
Segment on screen display panel and LEDs on main unit:
All On --> 1st Group On --> 2nd Group On --> All On --> All Off
Speaker Light multi color LEDs (SS-M60D/M80D and SS-WM80D):
White --> Red --> Green --> Blue --> Off
Party Light green & blue LEDs (SS-M80D):
Green & Blue --> Off --> Green --> Blue --> Off
4. Press [S1 □ -] button, the button and knob check mode is activated.
5. In the button and knob check mode, the screen display panel displays “K 0 V0”.
Each time a button is pressed, “K” value increases. However, once a button has been pressed, it is no longer taken into account. After all the buttons have been pressed, “K” value will toggle between “OK” and “K25”.
“V” value increases in the manner of 0, 1, 2, 3 ... if [VOLUME/DJ CONTROL] knob is turned clockwise, or it decreases in the manner of 0, 9, 8, 7 ... if [VOLUME/DJ CONTROL] knob is turned counterclockwise.
6. To release from this mode, press the buttons in the same manner as step 2, or disconnect the power cord.

MODEL, DESTINATION AND VERSION DISPLAY MODE

This mode is used to check the model, destination and version of the set.

Procedure:

1. Press [⏻] button to turn on the system.
2. Press [■] button and [S3 TUNING – ◀◀] button simultaneously for 3 seconds.
All segments in screen display panel are lighted up.
3. Press [S2 □ +] button. Model information appears on the screen display panel.
4. Press [S2 □ +] button. Destination information appears on the screen display panel.
5. Press [S2 □ +] button. Serial number appears on the screen display panel.
6. During the serial number display, press [S2 □ +] button. Each time [S2 □ +] button is pressed, the screen display panel shows the version of each category software in the following sequence: SC, MTK, BT, BTE PF, SUB, and return back to model information display.
7. Press [■] button and [S3 TUNING – ◀◀] button simultaneously for 3 seconds to exit.

USER RESET

The user reset clears all data including preset data stored in the data flash to initial conditions.

Procedure:

1. Press [⏻] button to turn on the system.
2. Press [VOCAL FADER] button and [MIC ECHO] button simultaneously for 3 seconds.
3. “RESET” appears on the screen display panel. After that, the screen display panel becomes blank for a while, and the system goes to demo mode.

COLD RESET

This mode is used to reset all the user settings to factory setting. Execute this mode when returning the unit to the customer.

Procedure:

1. Press [⏻] button to turn on the system.
2. Press [■] button and [S4 TUNING + ▶▶] button simultaneously for 3 seconds.
3. “COLD RST” appears on the screen display panel. After that, “SONY” appears on the screen display panel. The system automatically turn on and off once. Please be sure that the system stay at demo mode finally before switch off the power supply.

DISC TRAY LOCK

When the disc tray does not open and “LOCKED” appears on the screen display panel, disc tray lock mode has been activated by the shop front.

To release from Disc Tray Lock Mode

1. Press [⏻] button to turn on the system.
2. Press [FUNCTION] button repeatedly to select DVD/CD function.
3. Press [MEGA BASS] button and [VOCAL FADER] button simultaneously and hold down until “UNLOCKED” displayed on the screen display panel.

SHOP FRONT DEMO

The playback started automatically and the “* DEMO *” appears on the screen display panel.

This is the Shop Front Demo mode which is activated by the shop front.

To release from Shop Front Demo Mode

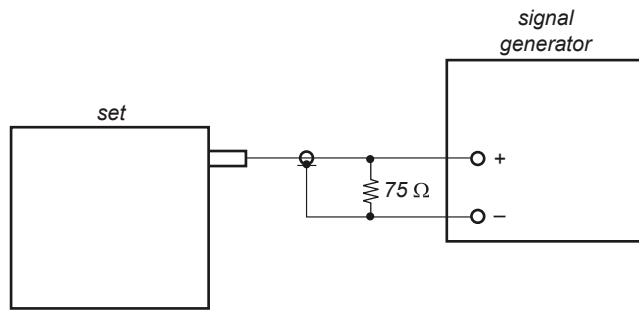
1. Press [■] button and [MIC ECHO] button simultaneously for 5 seconds.
2. The message “STANDBY” blinks for a few times and the system goes to demo mode.

SECTION 4 ELECTRICAL CHECK

TUNER SECTION

0 dB = 1 μ V

FM AUTO STOP CHECK



Procedure:

1. Turn the power on.
2. Input the following signal from Signal Generator to FM antenna input directly.

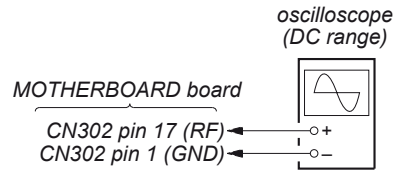
Carrier frequency : A = 87.5 MHz, B = 98 MHz, C = 108 MHz
 Deviation : 75 kHz
 Modulation : 1 kHz
 ANT input : 35 dBu (EMF)

Note: Please use 75 ohm "coaxial cable" to connect SG and the set. You cannot use video cable for checking.
 Please use SG whose output impedance is 75 ohm.

3. Set to FM tuner function and scan the input FM signal with automatic scanning.
4. Confirm that input Frequency of A, B and C detected and automatic scanning stops.

The stop of automatic scanning means "The station signal is received in good condition".

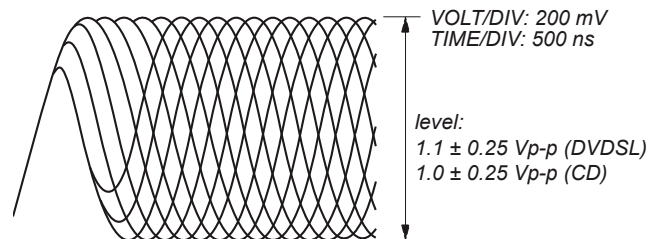
FOCUS BIAS CHECK



Procedure:

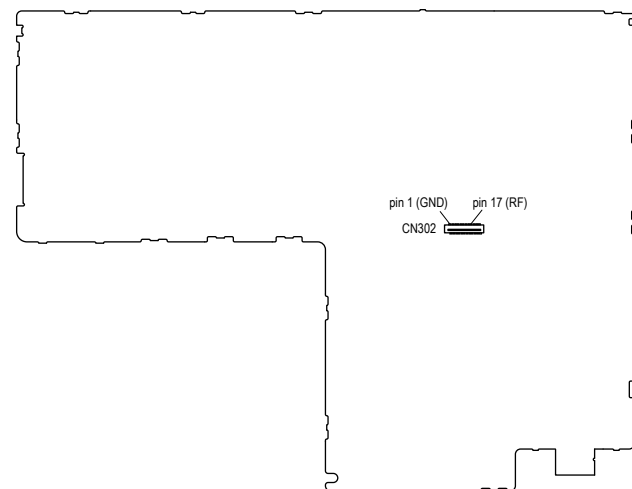
1. Connect the oscilloscope to CN302 pin 17 (RF) and CN302 pin 1 (GND) on the MOTHERBOARD board.
2. Press the [⏻] button to turn the power on, and press the [FUNCTION] button to select DVD/CD function.
3. Set the test disc (CD: YEDS-18), (DVD: HLX-503 (NTSC) or HLX-504 (PAL)) on the tray and press [▶] button to playback.
4. Confirm that oscilloscope waveform is as shown in the figure below (eye pattern).

A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.



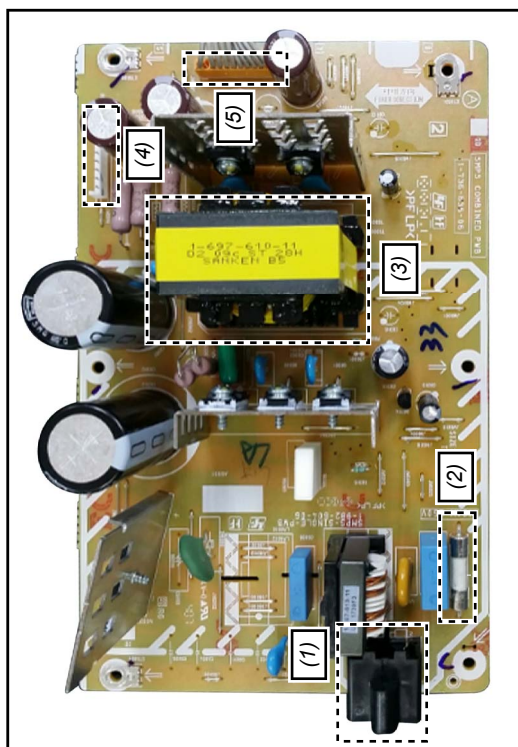
Checking Location:

-MOTHERBOARD Board (Component Side)-

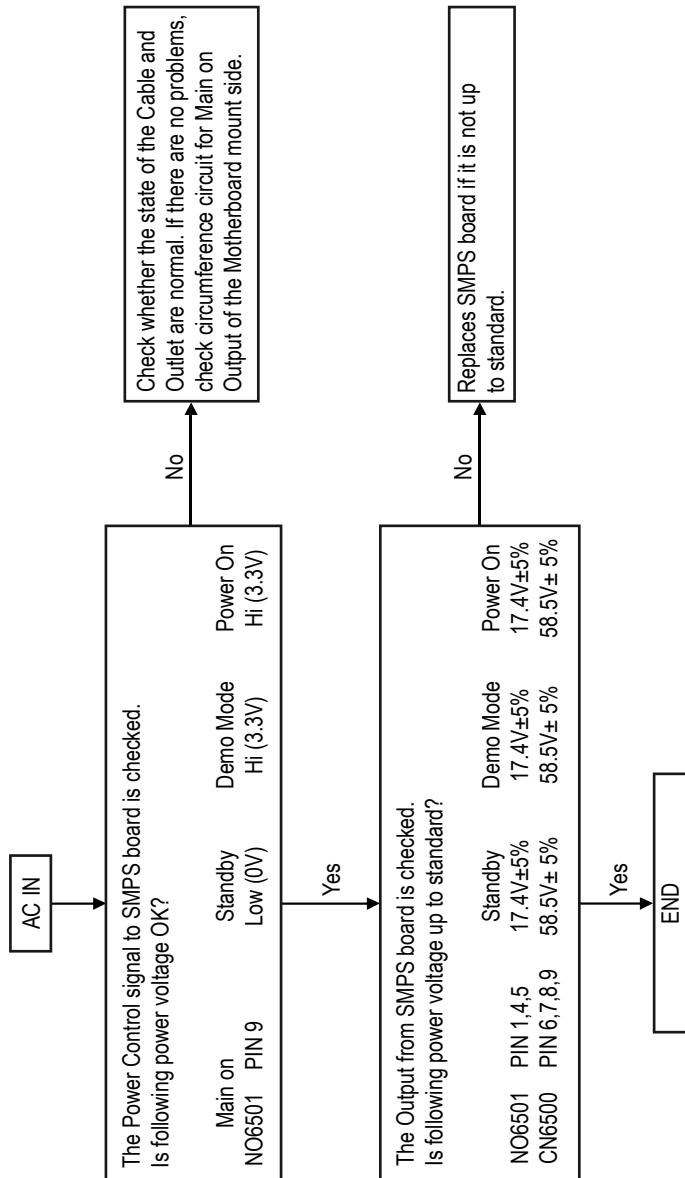


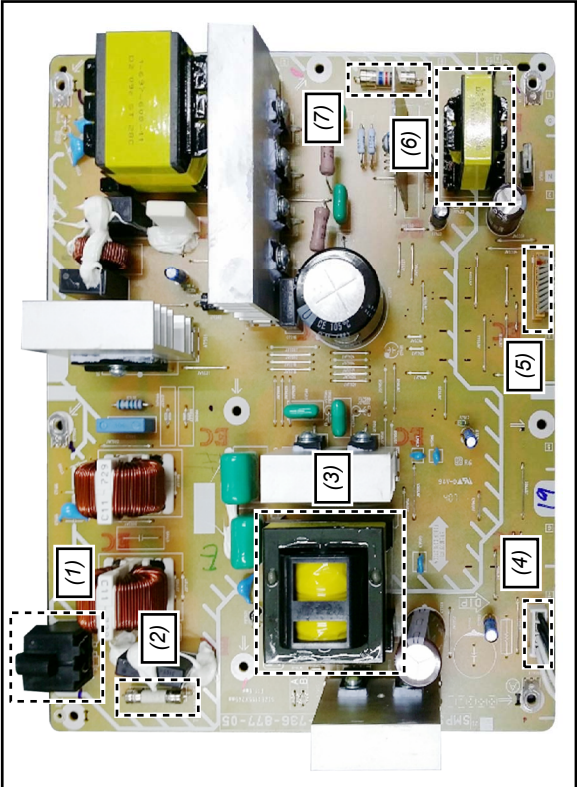
SECTION 5 TROUBLESHOOTING

SMPS Diagnosis Flow (HCD-M40D)

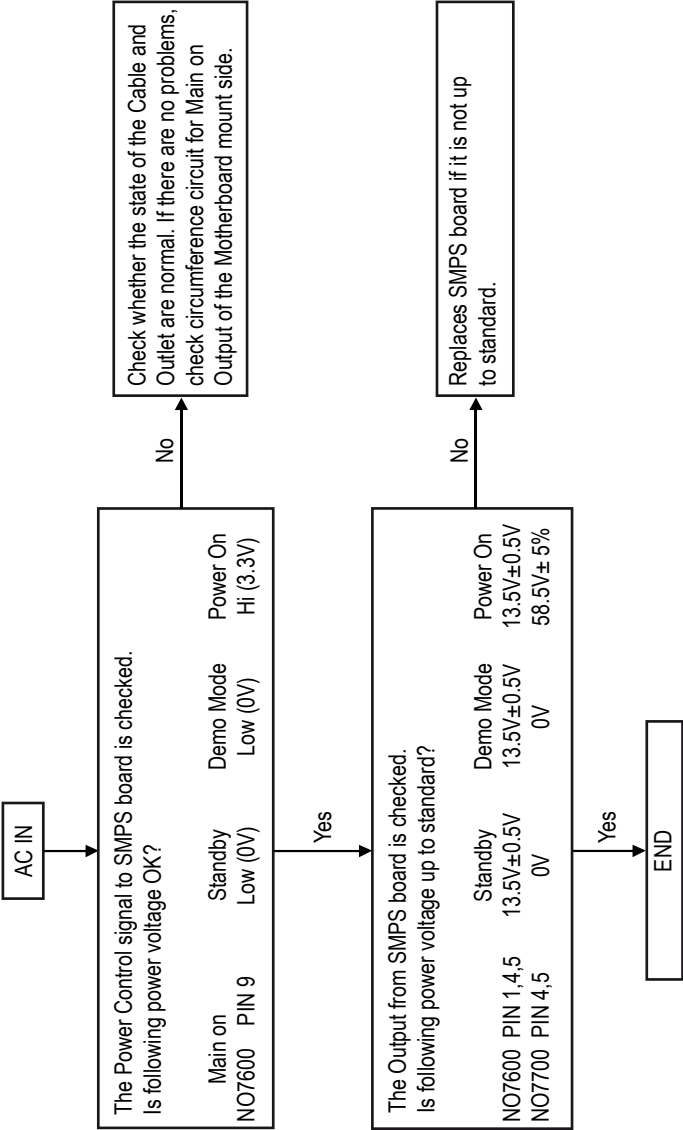


- (1) AC input
- (2) Fuse
- (3) MAIN power transformer
- (4) NO6501 connector
 - Pin 1 : Audio (+17V)
 - Pin 3 : Audio (GND)
 - Pin 4 : LED (+17V)
 - Pin 5 : LED (+17V)
 - Pin 6 : LED (GND)
 - Pin 7 : LED (GND)
 - Pin 8 : AC DET
 - Pin 9 : Main ON
 - Pin 10 : Network ON
 - Pin 11 : Latch ON
- (5) CN6500 connector
 - Pin 1 : PGND
 - Pin 3 : PGND
 - Pin 4 : PGND
 - Pin 5 : PGND
 - Pin 6 : PVDD (DC+58.5V)
 - Pin 7 : PVDD (DC+58.5V)
 - Pin 8 : PVDD (DC+58.5V)
 - Pin 9 : PVDD (DC+58.5V)

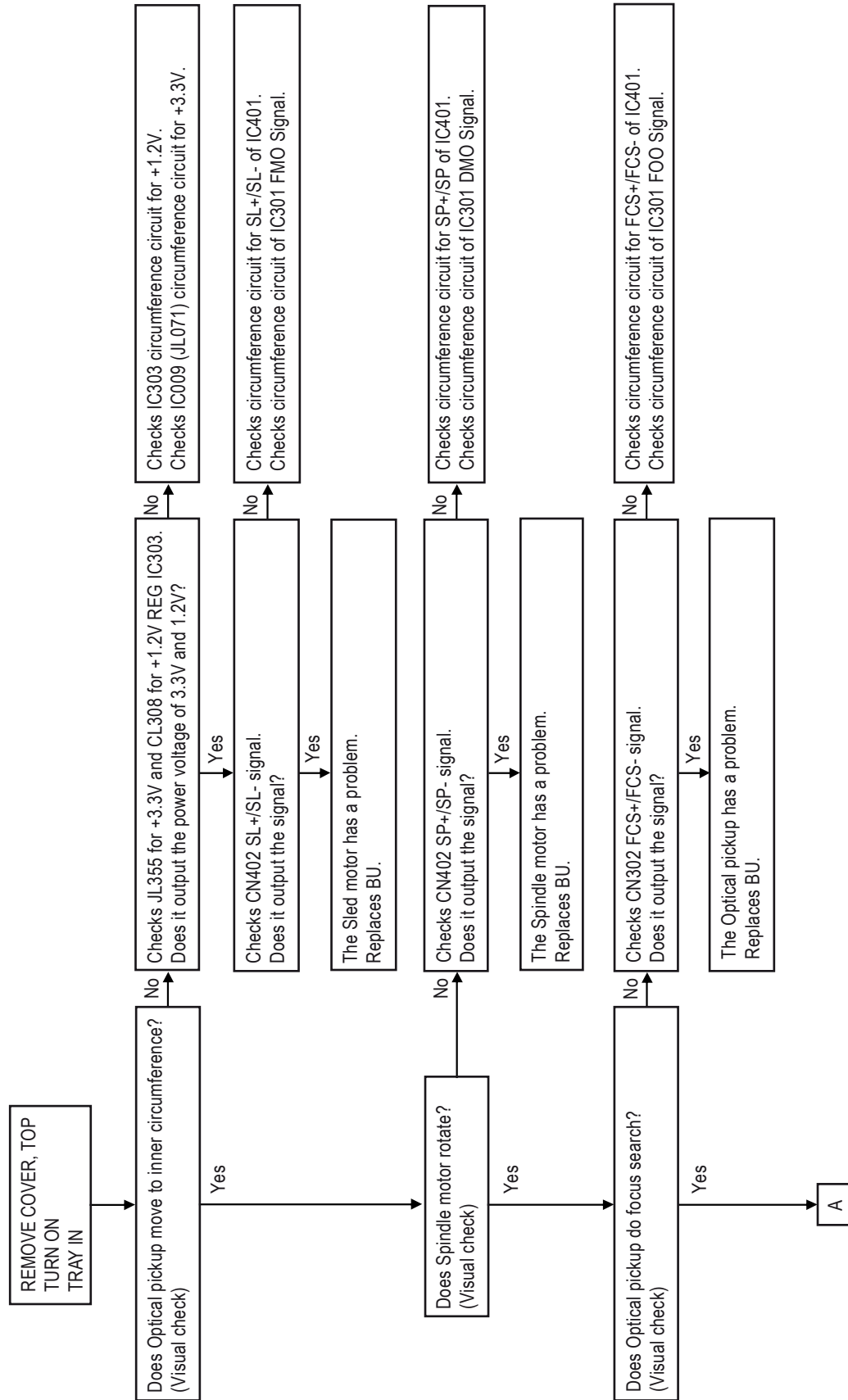


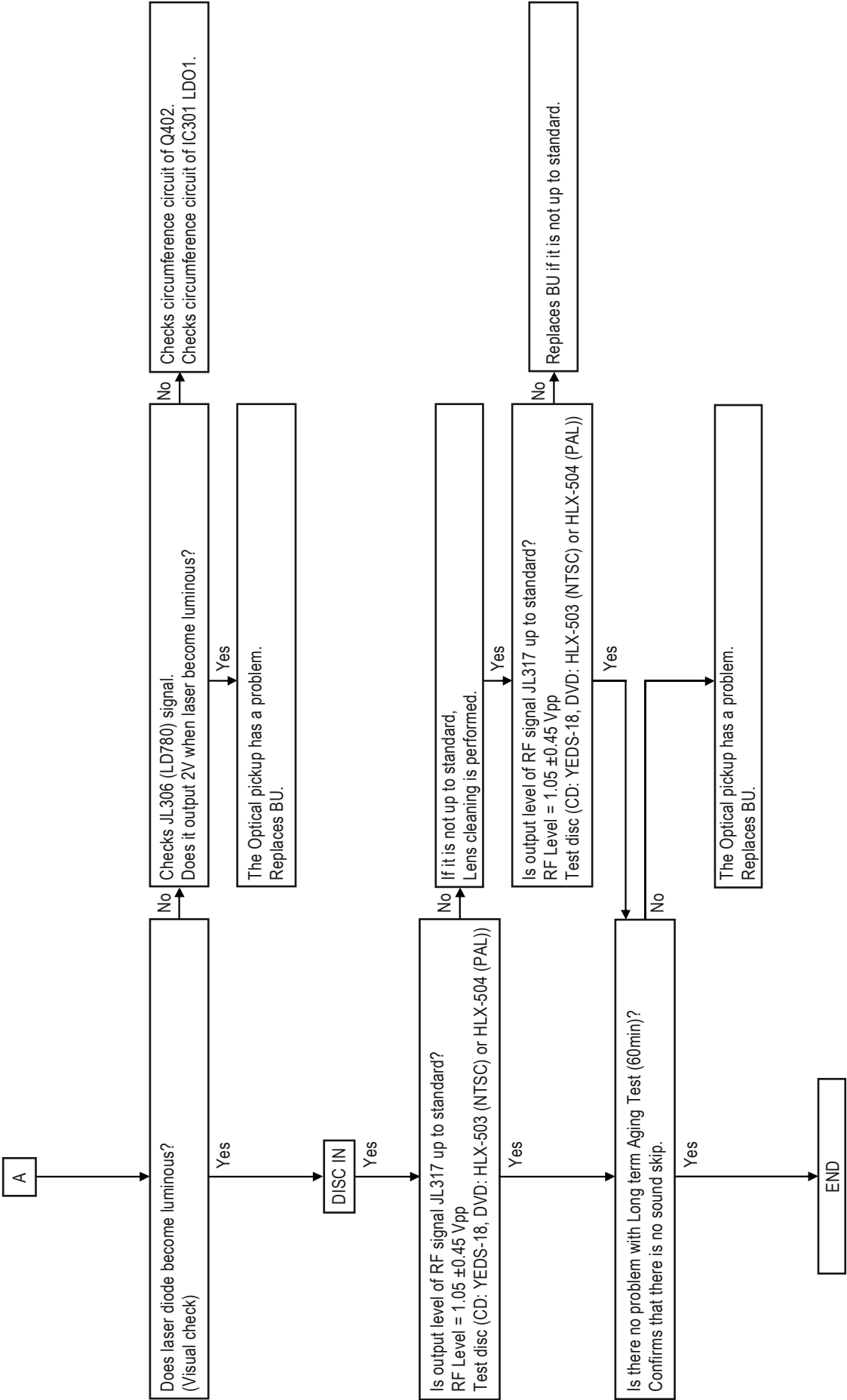


- (1) AC input
- (2) Fuse
- (3) MAIN power transformer
- (4) NO7700 connector
 - Pin 1 : PGND
 - Pin 3 : PGND
 - Pin 4 : PVDD (DC +58.5V)
 - Pin 5 : PVDD (DC +58.5V)
- (5) NO7600 connector
 - Pin 1 : Audio (+13.5V)
 - Pin 3 : Audio (GND)
 - Pin 4 : LED (+13.5V)
 - Pin 5 : LED (+13.5V)
 - Pin 6 : LED (GND)
 - Pin 7 : LED (GND)
 - Pin 8 : AC DET
 - Pin 9 : Main ON
 - Pin 10 : Network ON
 - Pin 11 : Latch ON
- (6) SUB power transformer
- (7) SUB Fuse



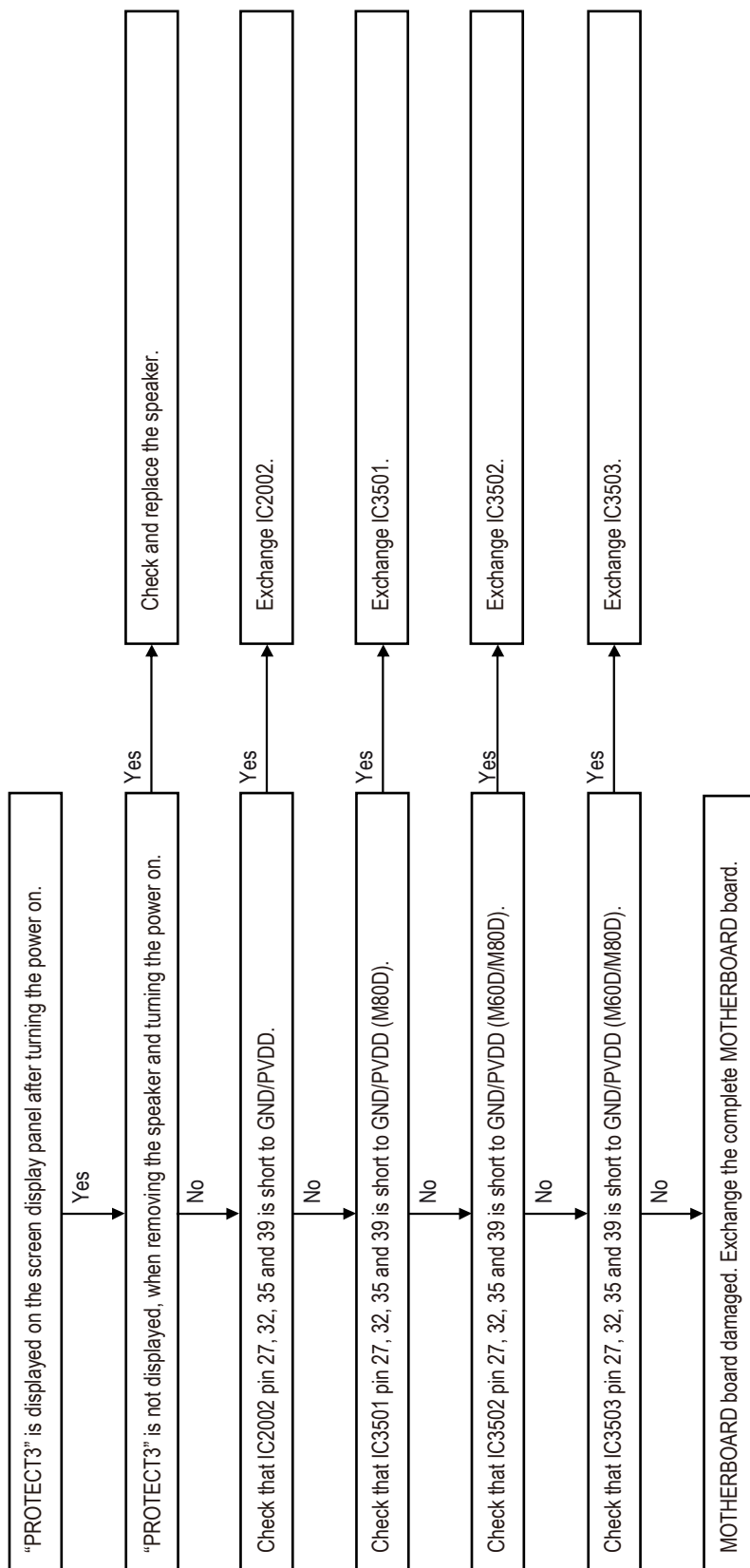
Optical Block Diagnosis Flow (1/2)





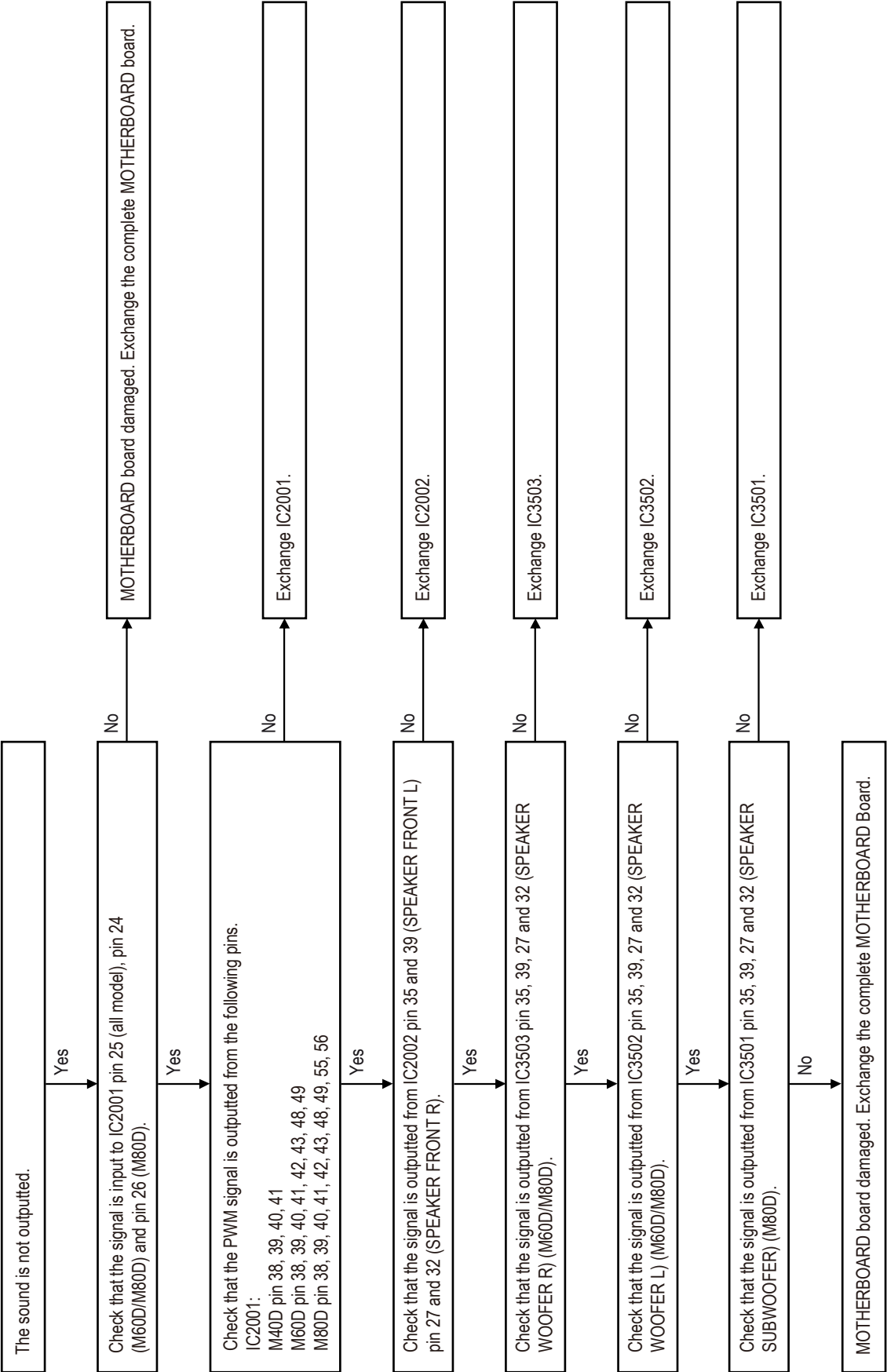
MOTHERBOARD Mount Amplifier Diagnosis Flow (1/3)

1. "PROTECT3" is displayed after turning the power on



MOTHERBOARD Mount Amplifier Diagnosis Flow (2/3)

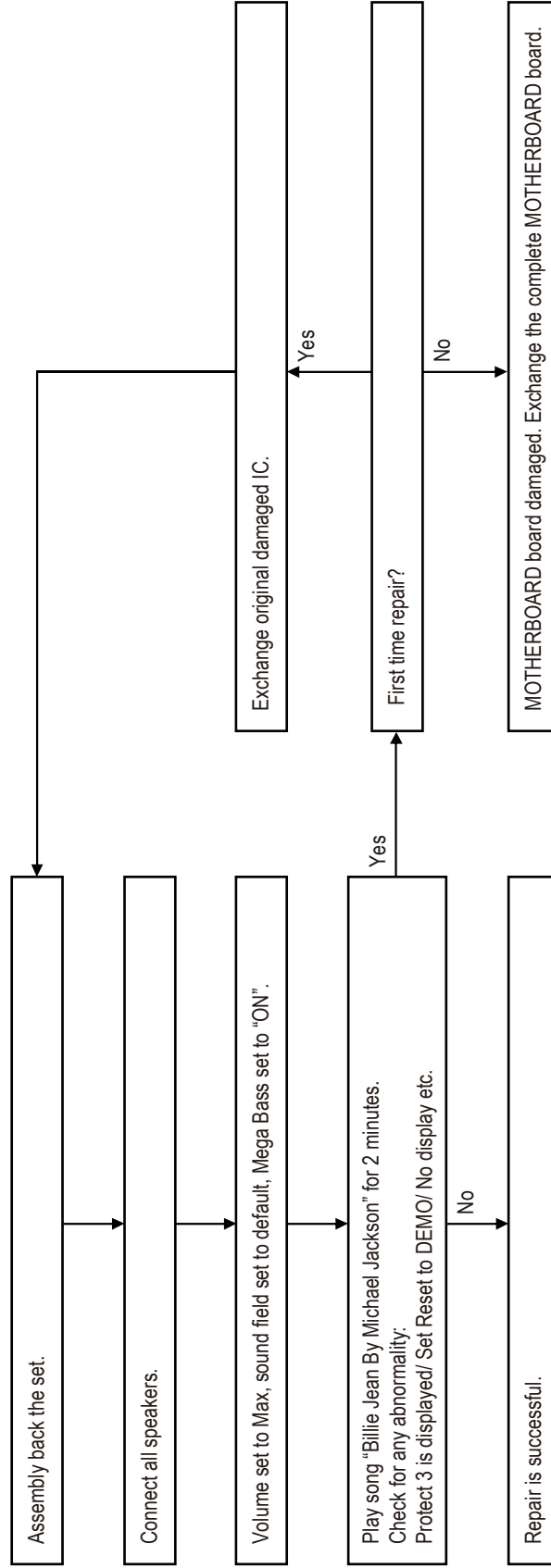
2. The sound is not outputted

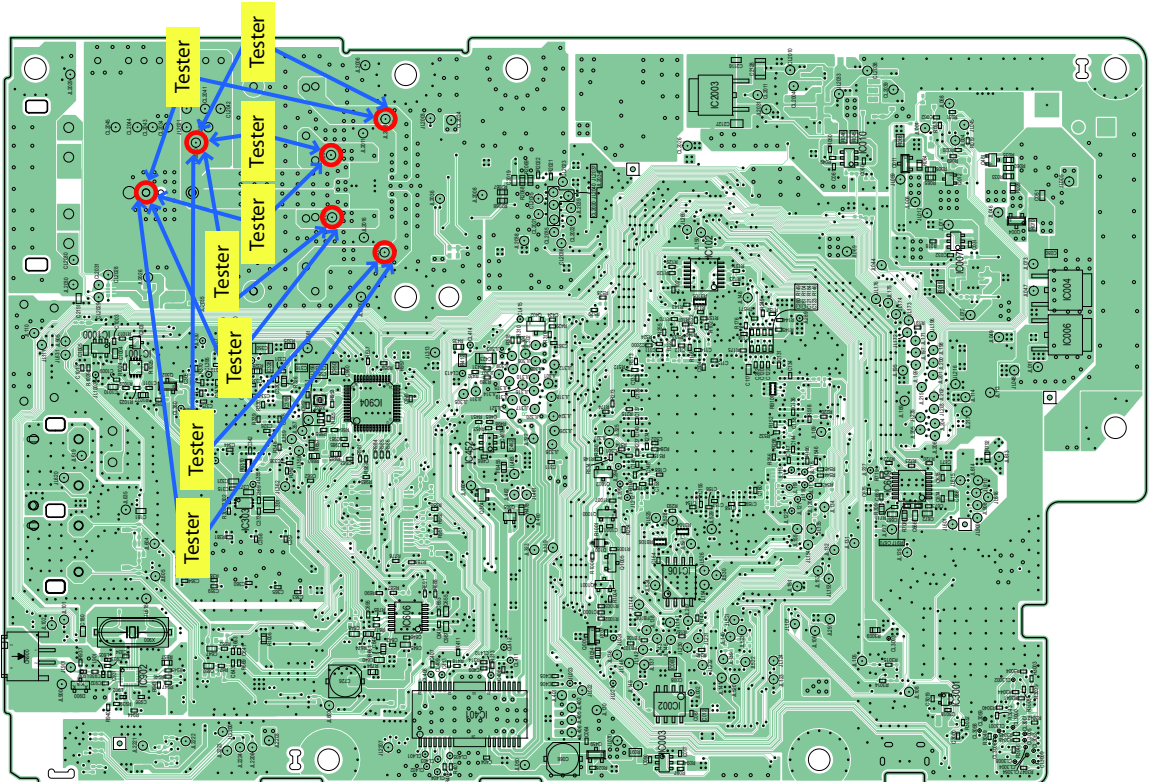


MOTHERBOARD Mount Amplifier Diagnosis Flow (3/3)

3. IC and MOTHERBOARD Board after replace checking guide

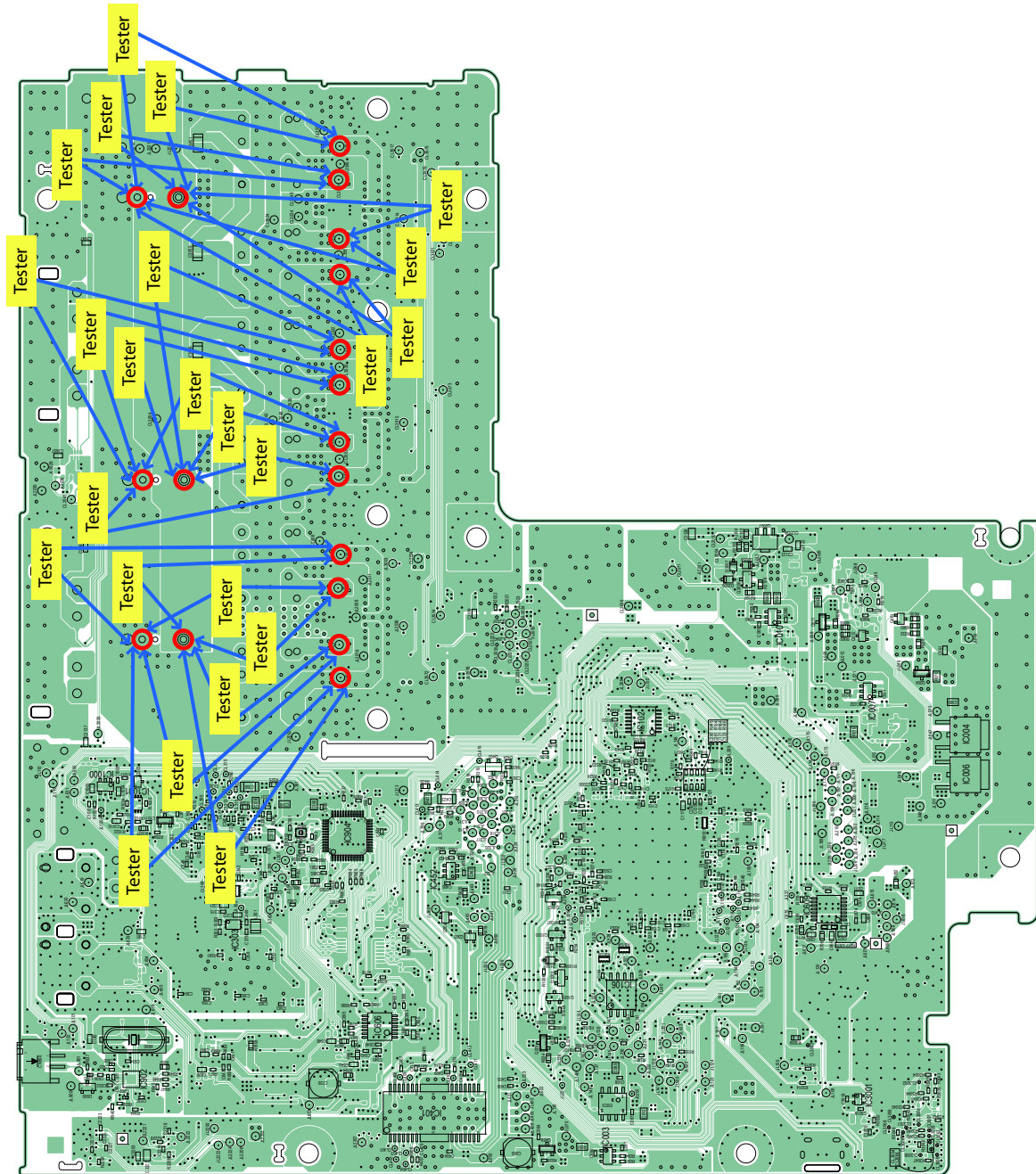
After IC3501 (M80D), IC3502, IC3503 (M60D, M80D), IC2002 and the complete MOTHERBOARD Board change, check as below:





<Note>
Please check each channel's resistance value for the Coil's terminal and Capacitor's + and - terminal.
These terminal's resistance value should not be near to 0Ω (short).

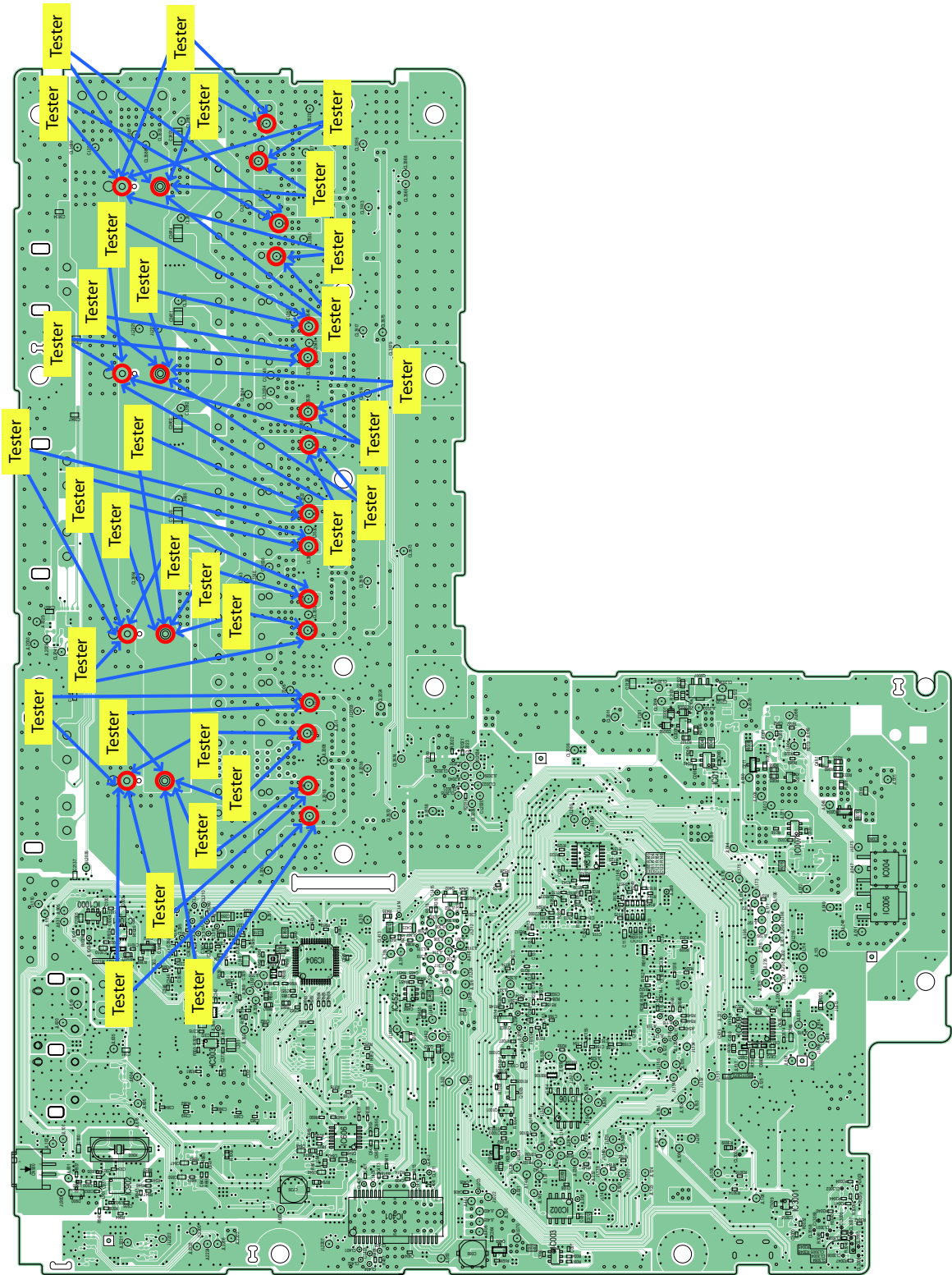
IC2002, IC3502 and IC3503 Confirmation for MOTHERBOARD Mount (HCD-M60D)



<Note>

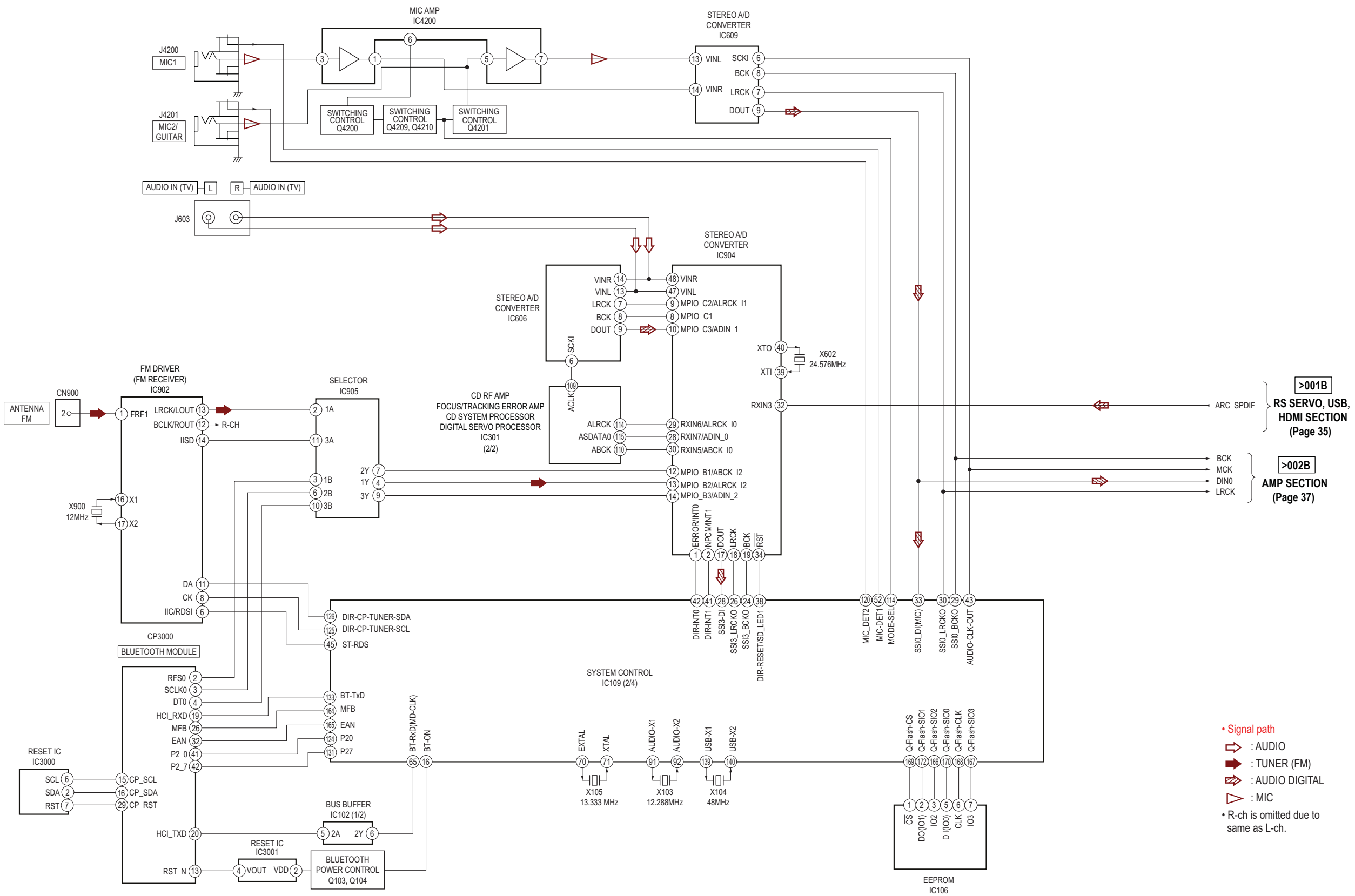
Please check each channel's resistance value for the Coil's terminal and Capacitor's + and – terminal.
These terminal's resistance value should not be near to 0Ω (short).

IC2002, IC3501, IC3502 and IC3503 Confirmation for MOTHERBOARD Mount (HCD-M80D)

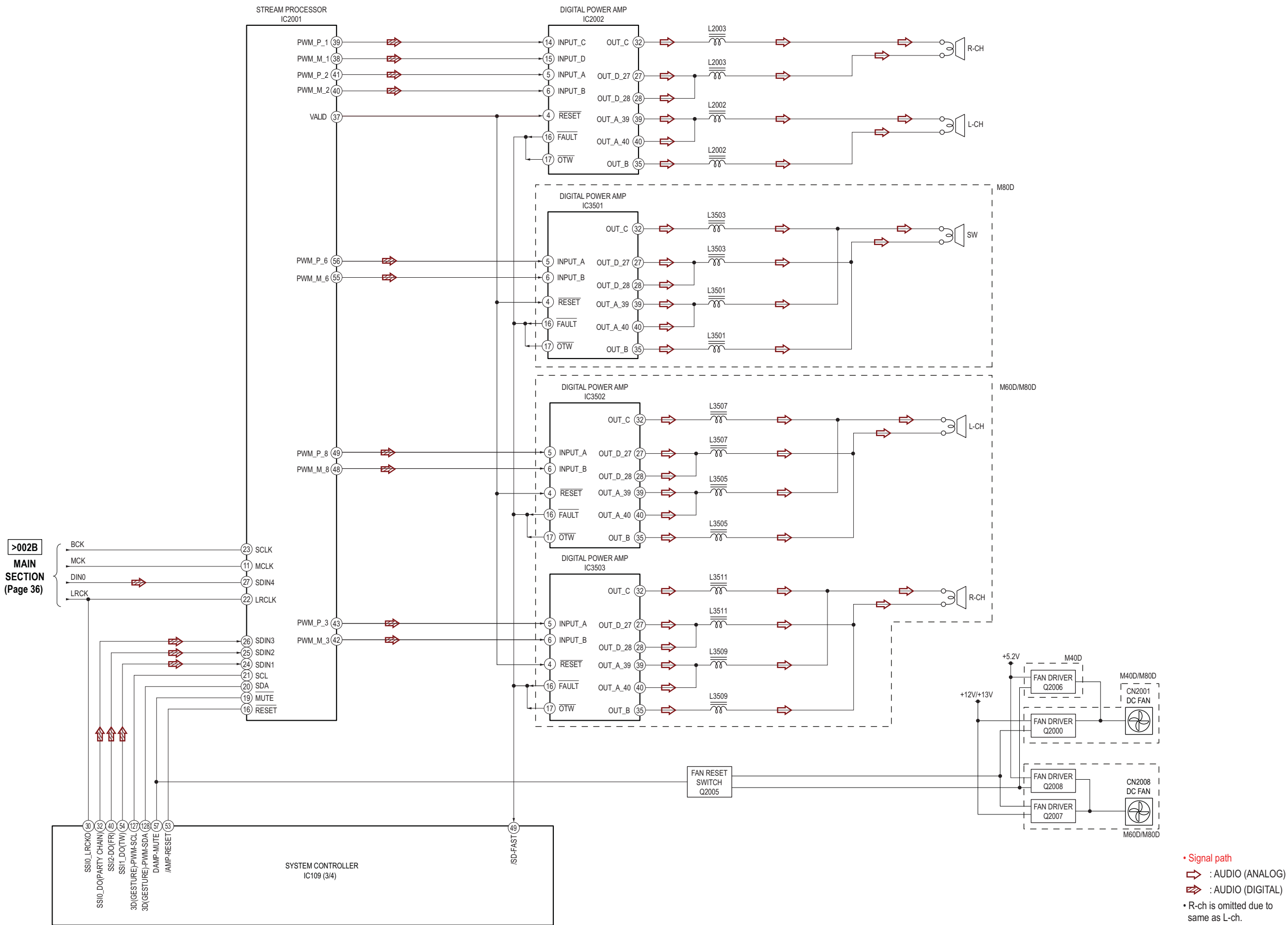


<Note>
Please check each channel's resistance value for the Coil's terminal and Capacitor's + and - terminal.
These terminal's resistance value should not be near to 0Ω (short).

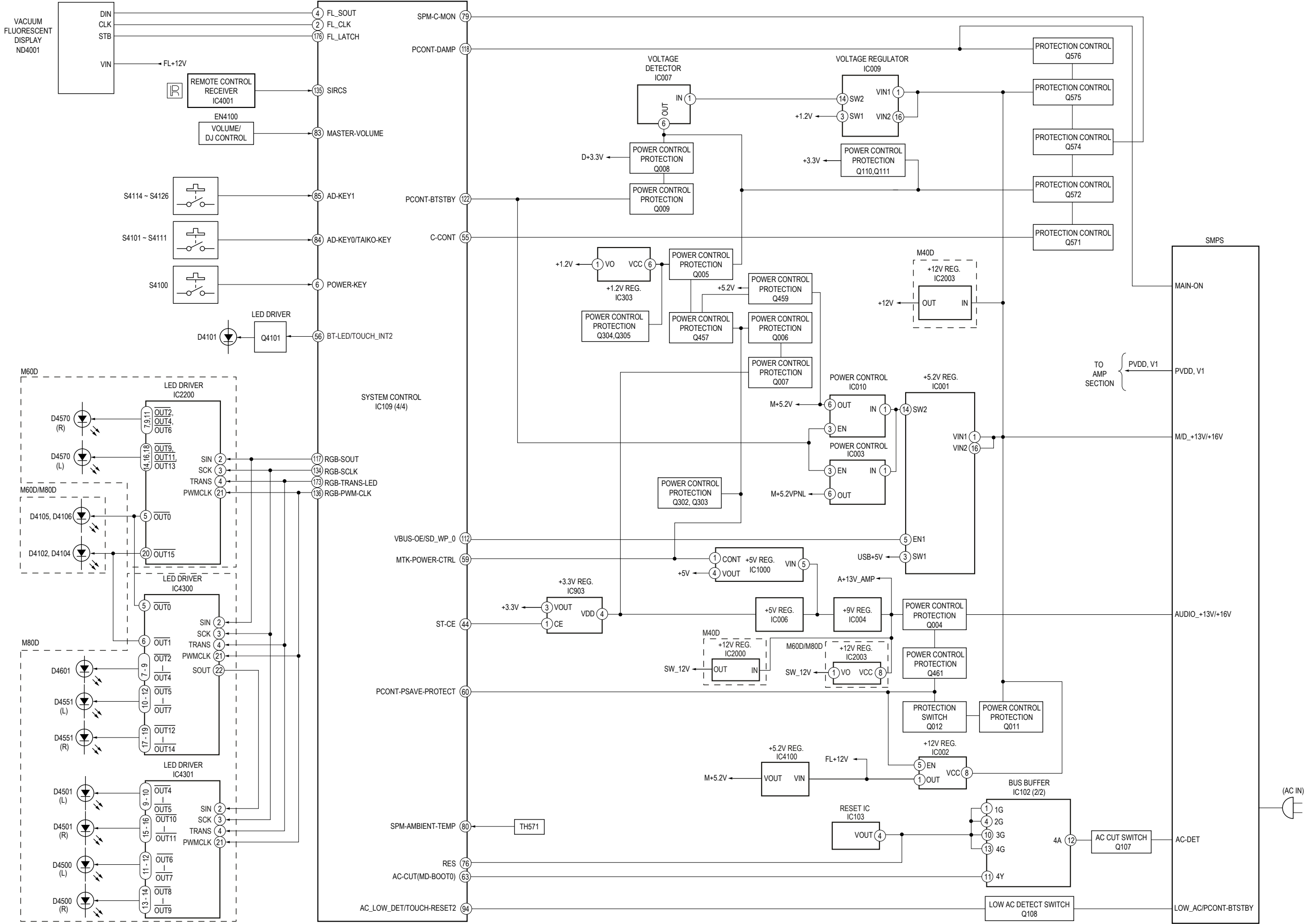
6-2. BLOCK DIAGRAM - MAIN Section -



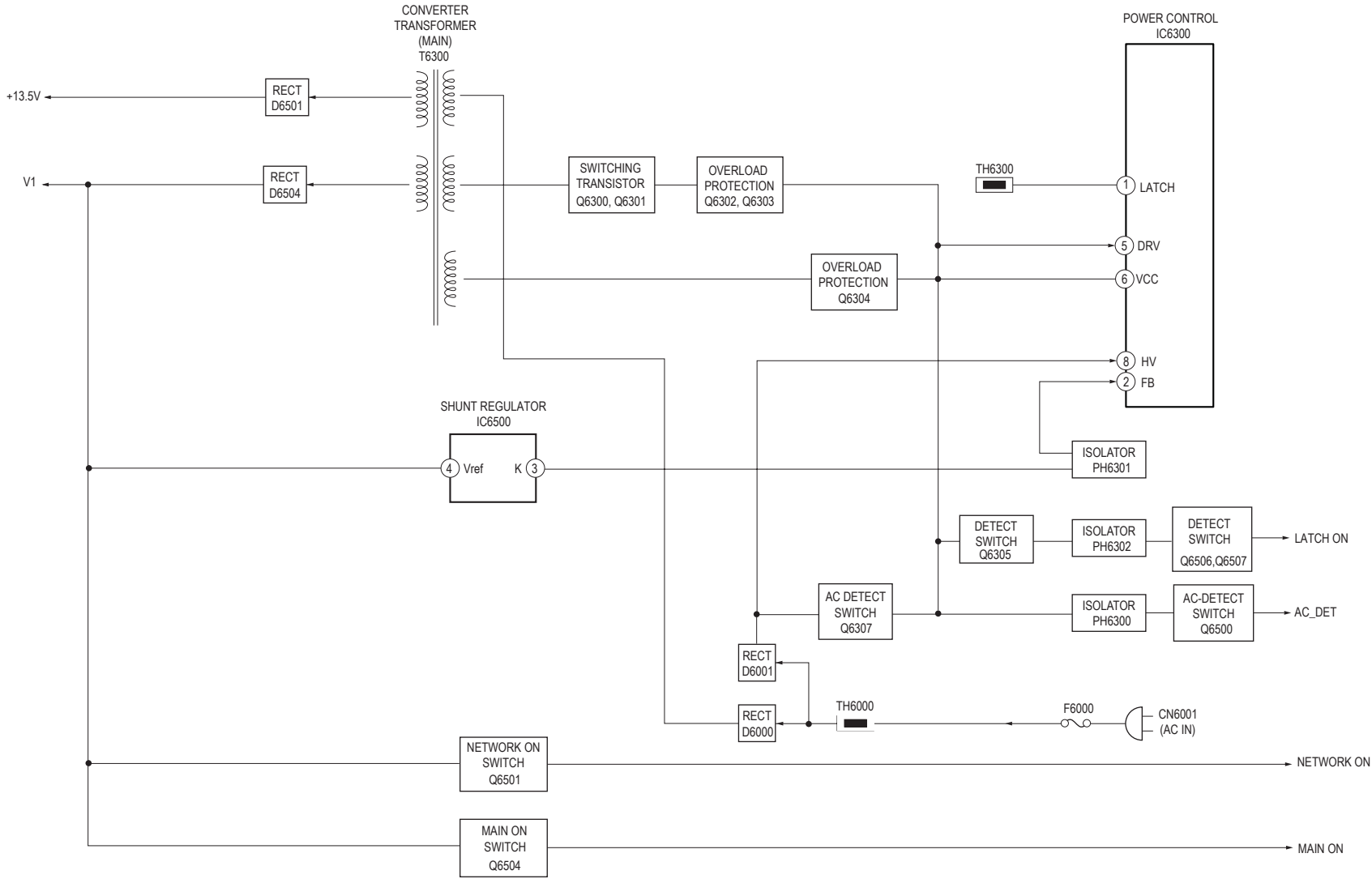
6-3. BLOCK DIAGRAM - AMP Section -



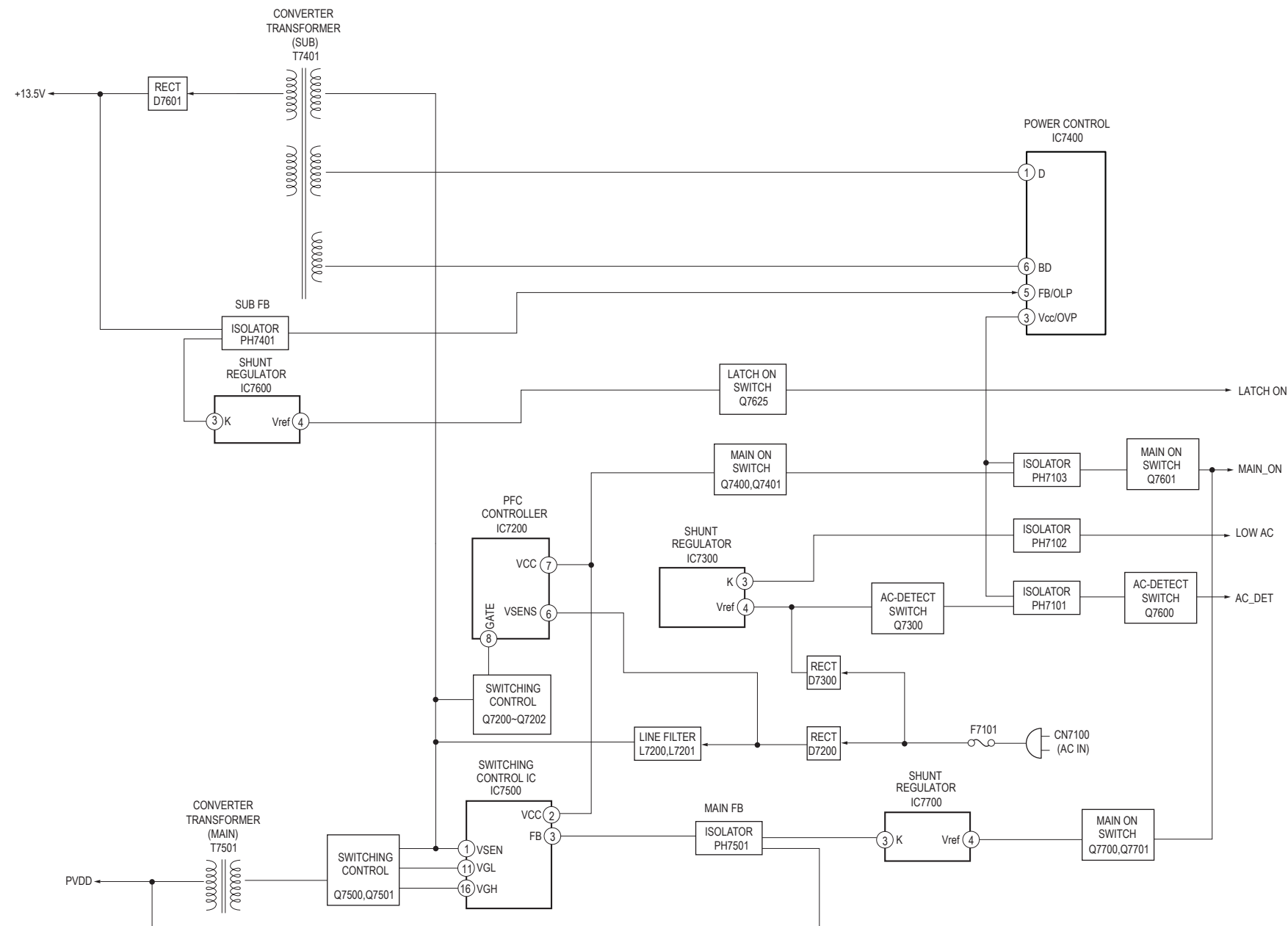
6-4. BLOCK DIAGRAM - PANEL, POWER SUPPLY Section -



6-5. BLOCK DIAGRAM - SMPS Section (M40D) -



40 40

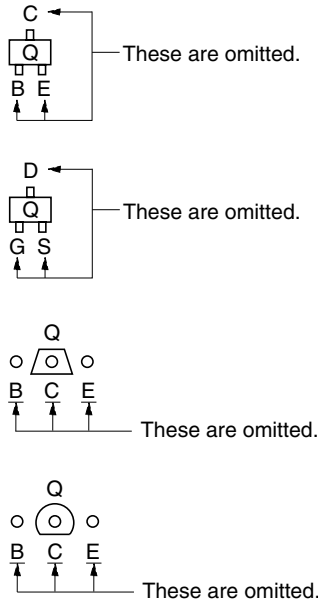


• Note for Printed Wiring Boards and Schematic Diagrams

- Note on Printed Wiring Board:**
- : parts extracted from the component side.
 - : parts extracted from the conductor side.
 - : Pattern from the side which enables seeing.
(The other layer's patterns are not indicated.)

Caution:
Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.
Parts face side: Parts on the parts face side seen from (Component Side) the parts face are indicated.

• Indication of transistor



- Note 1:** When the MS-476 board is defective, exchange the entire CDM90 ASSY.
- Note 2:** When the complete MOTHERBOARD board is replaced, spread the compound referring to "NOTE OF REPLACING THE IC3501 (M80D), IC3502, IC3503 (M60D, M80D) AND IC2002 ON THE MOTHERBOARD BOARD AND THE COMPLETE MOTHERBOARD BOARD" on servicing notes (page 7).

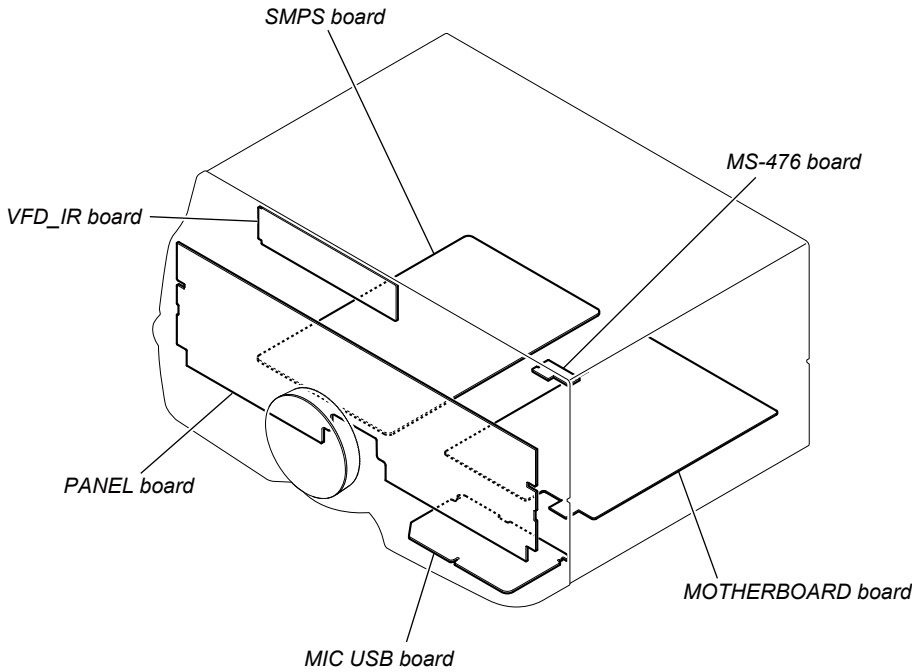
- Note on Schematic Diagram:**
- All capacitors are in μF unless otherwise noted. (p: pF) 50 V or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $1/4\text{ W}$ or less unless otherwise specified.
 - ⎓ : nonflammable resistor.
 - : panel designation.

Note: The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

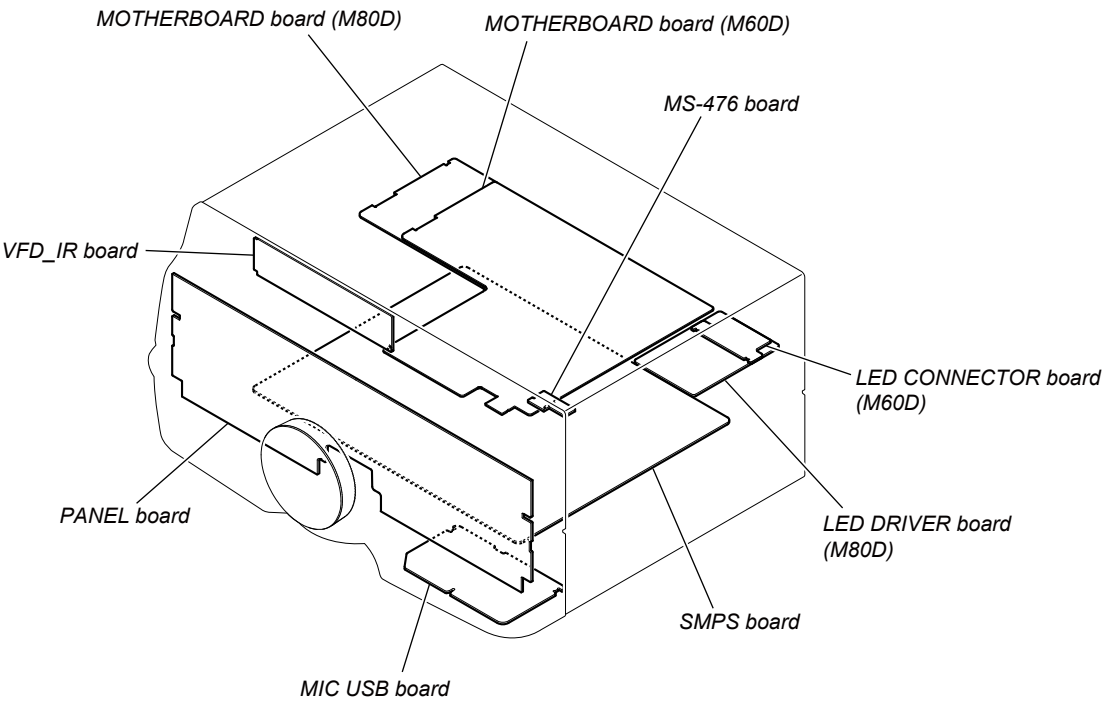
- : B+ Line.
- - - : B- Line.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : TUNER
< > : CD PLAY
* : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
⇒ : AUDIO
⇒ : TUNER (FM/AM)
▷ : MIC
⇒ : CD PLAY
▷ : USB

• Circuit Boards Location

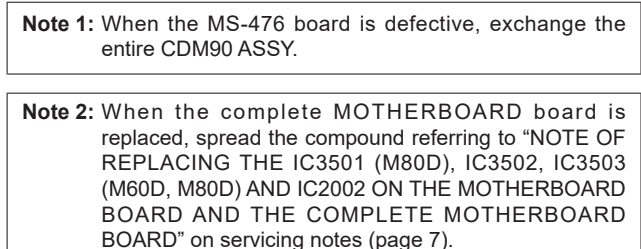
HCD-M40D



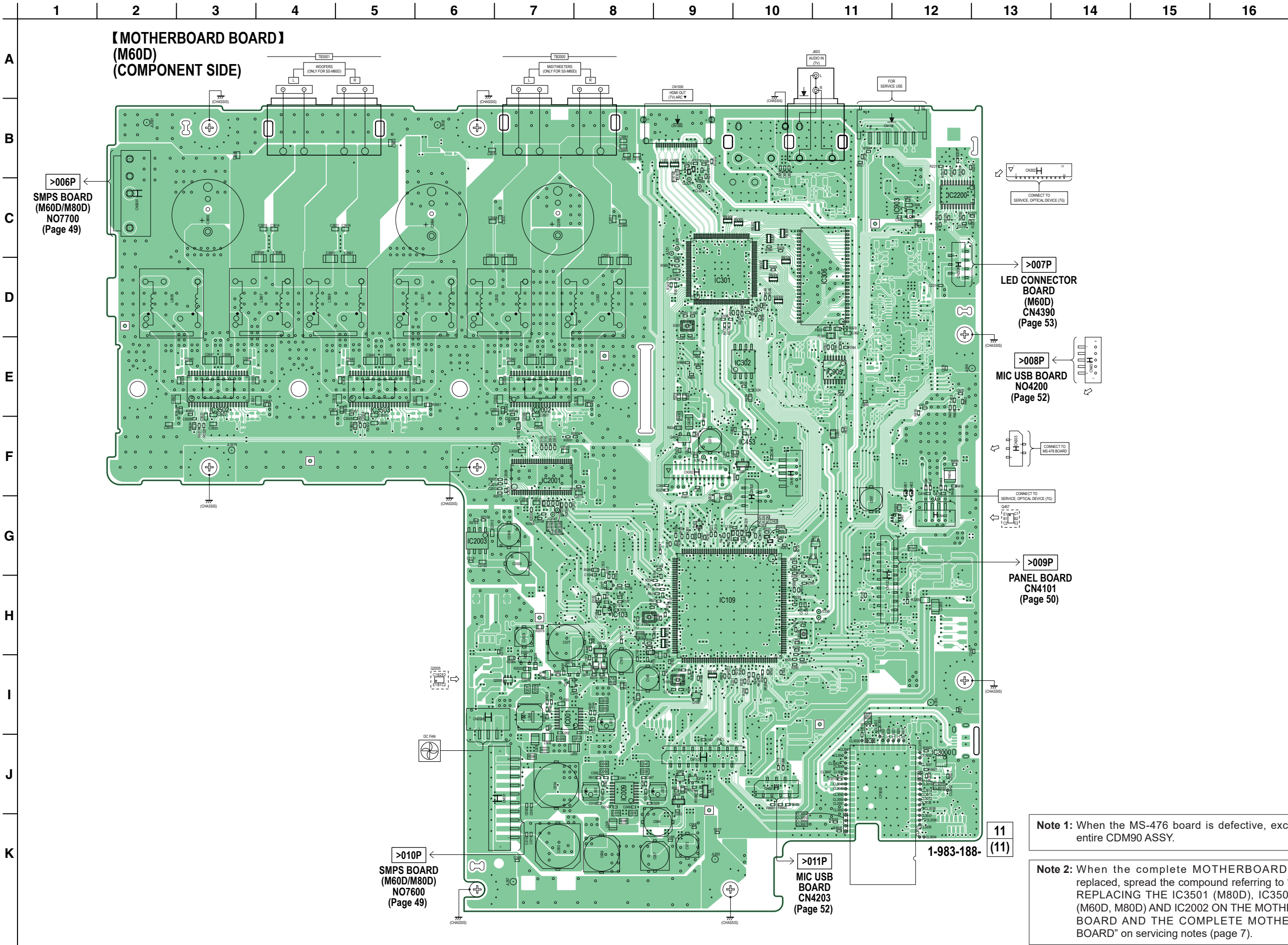
HCD-M60D/M80D



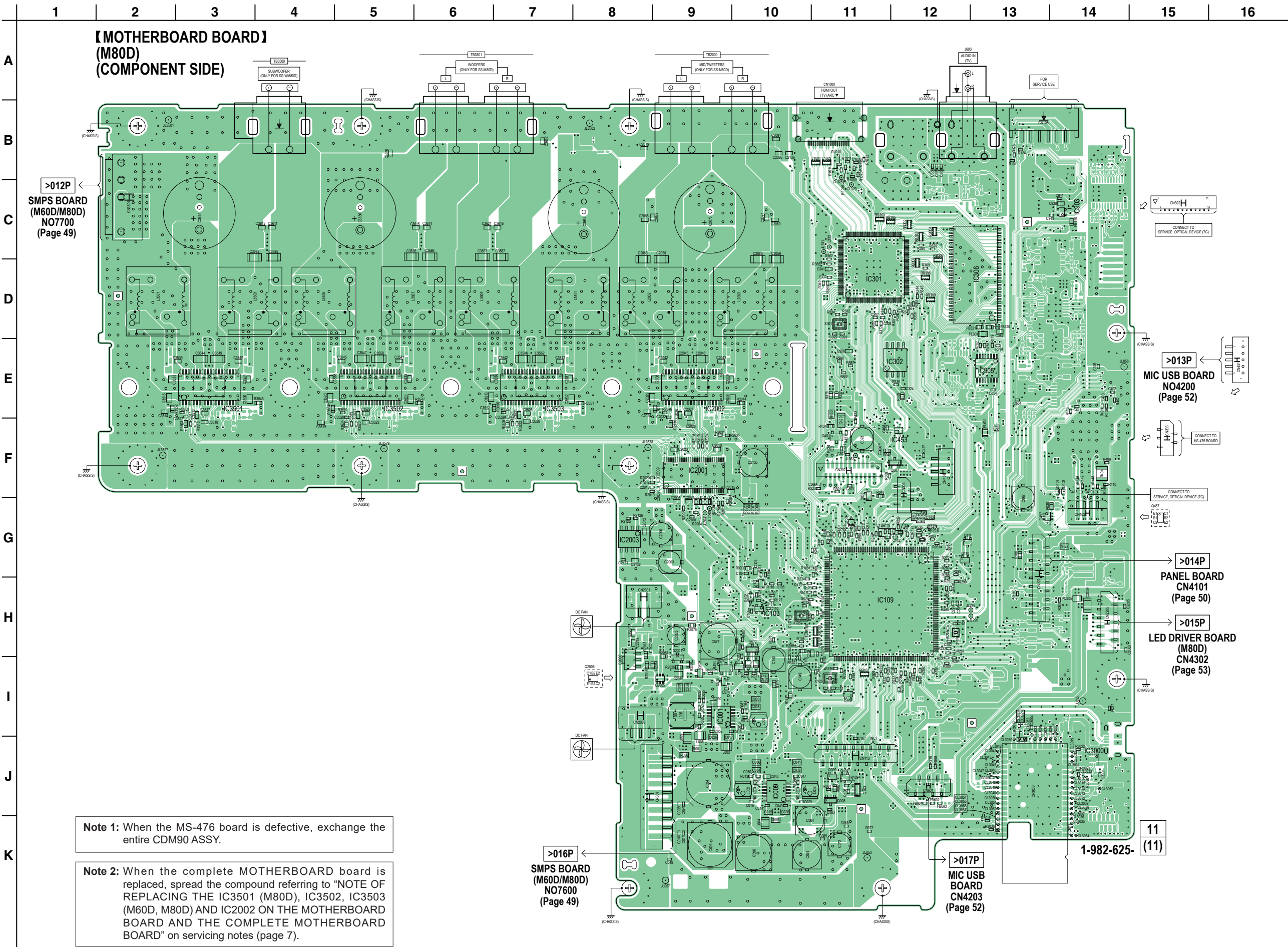
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----



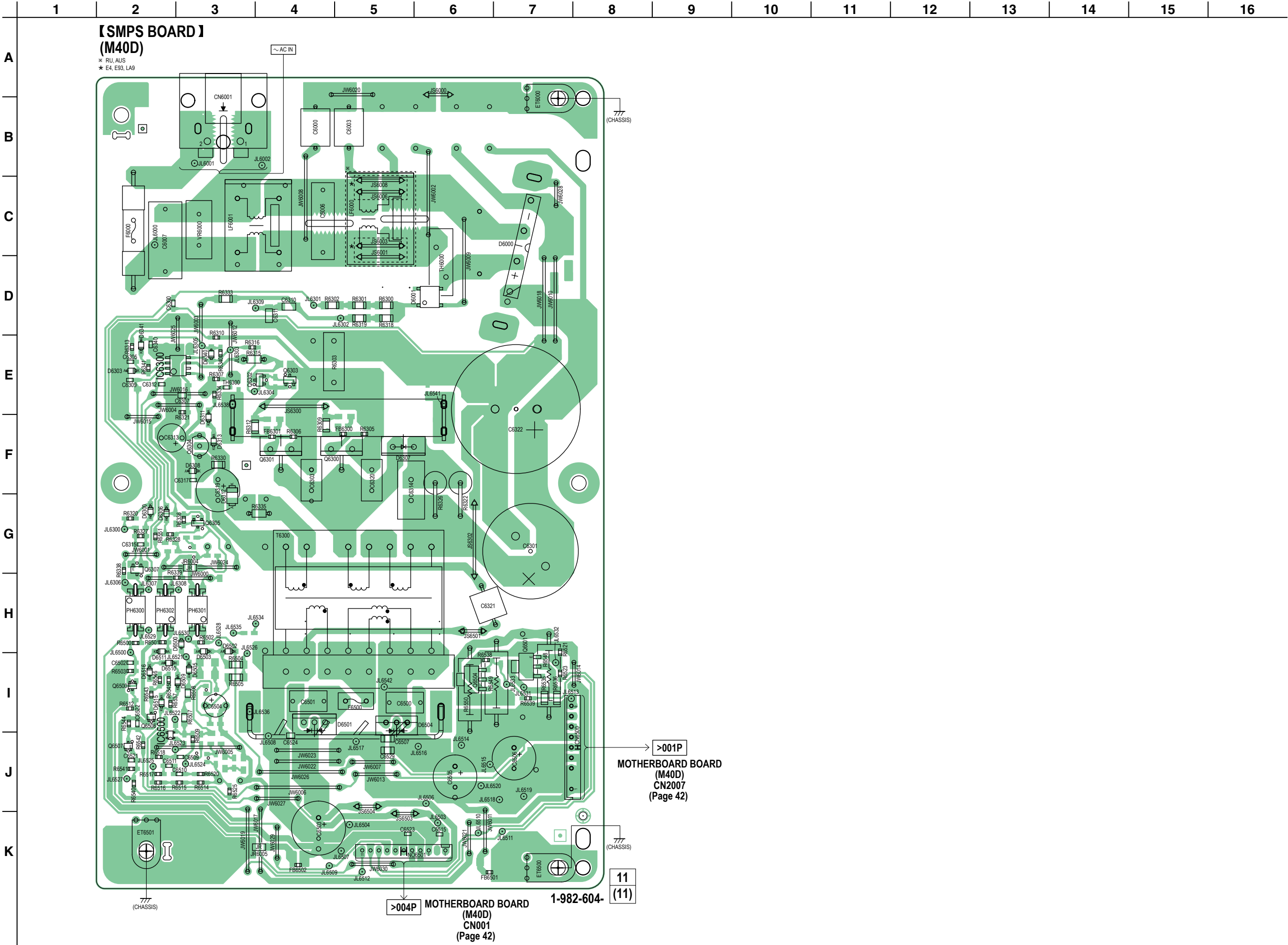
6-9. PRINTED WIRING BOARD - MOTHERBOARD Board (Component Side) (M60D) - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.



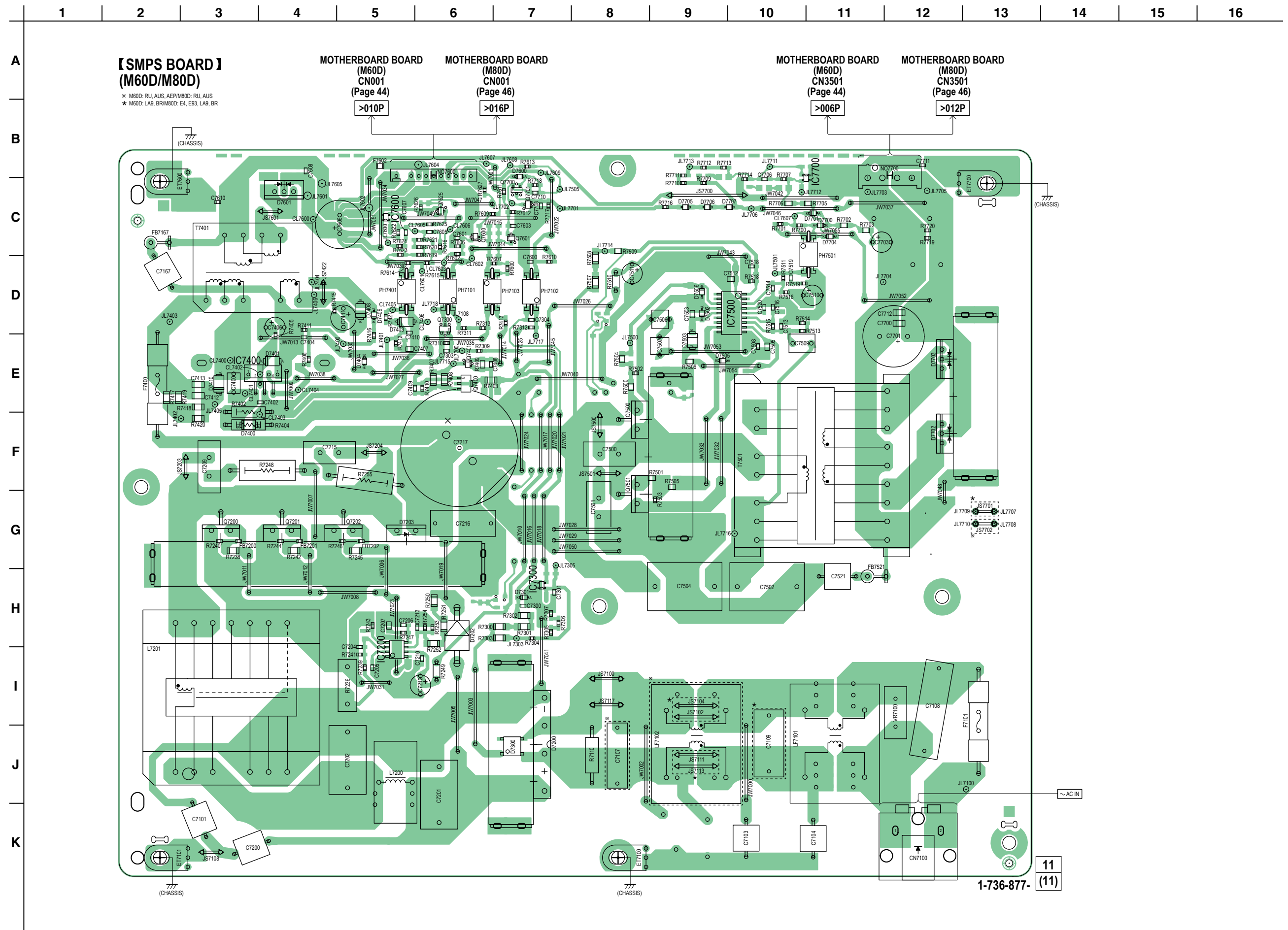
6-11. PRINTED WIRING BOARD - MOTHERBOARD Board (Component Side) (M80D) - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.



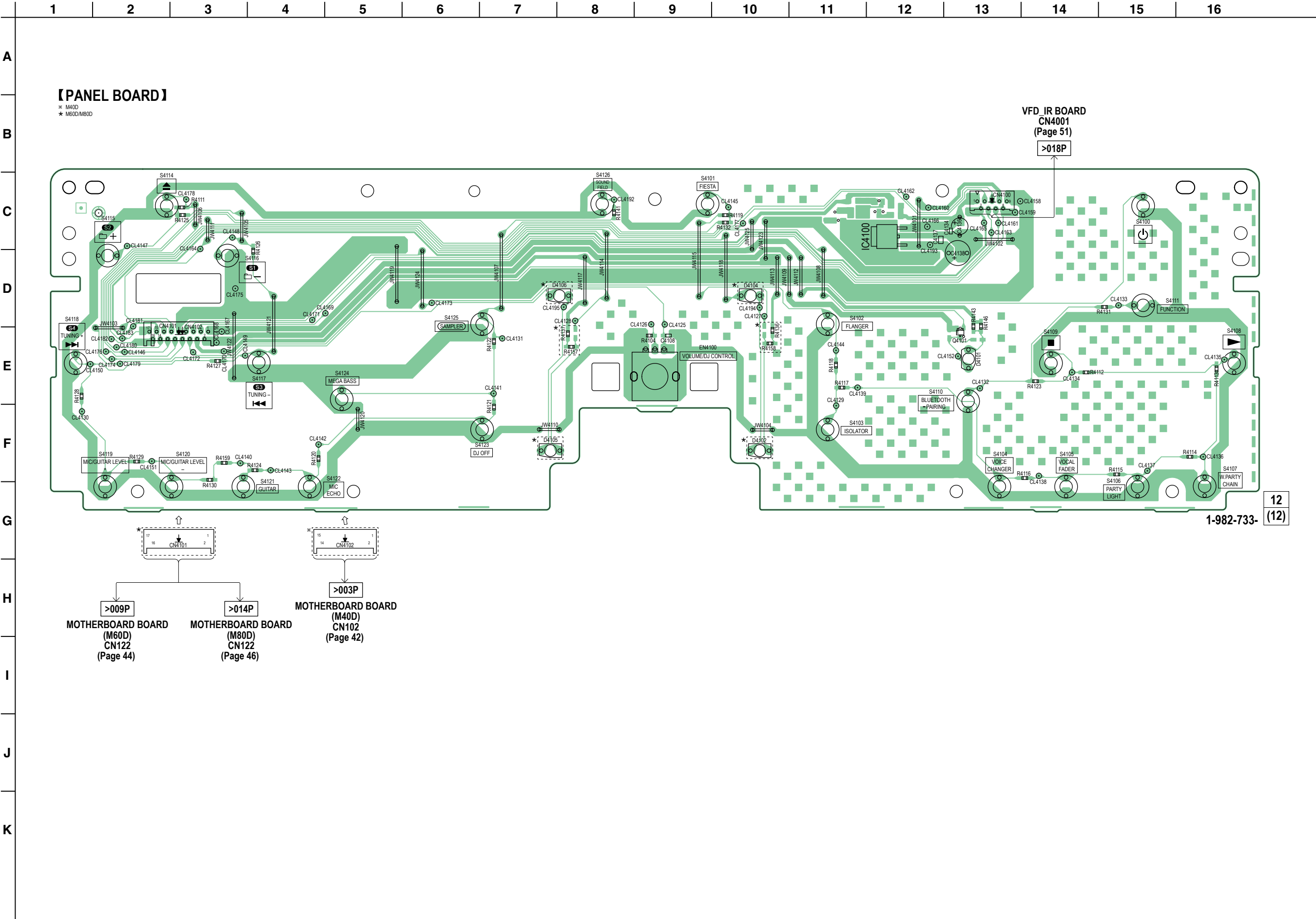
6-13. PRINTED WIRING BOARD - SMPS Board (M40D) - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.



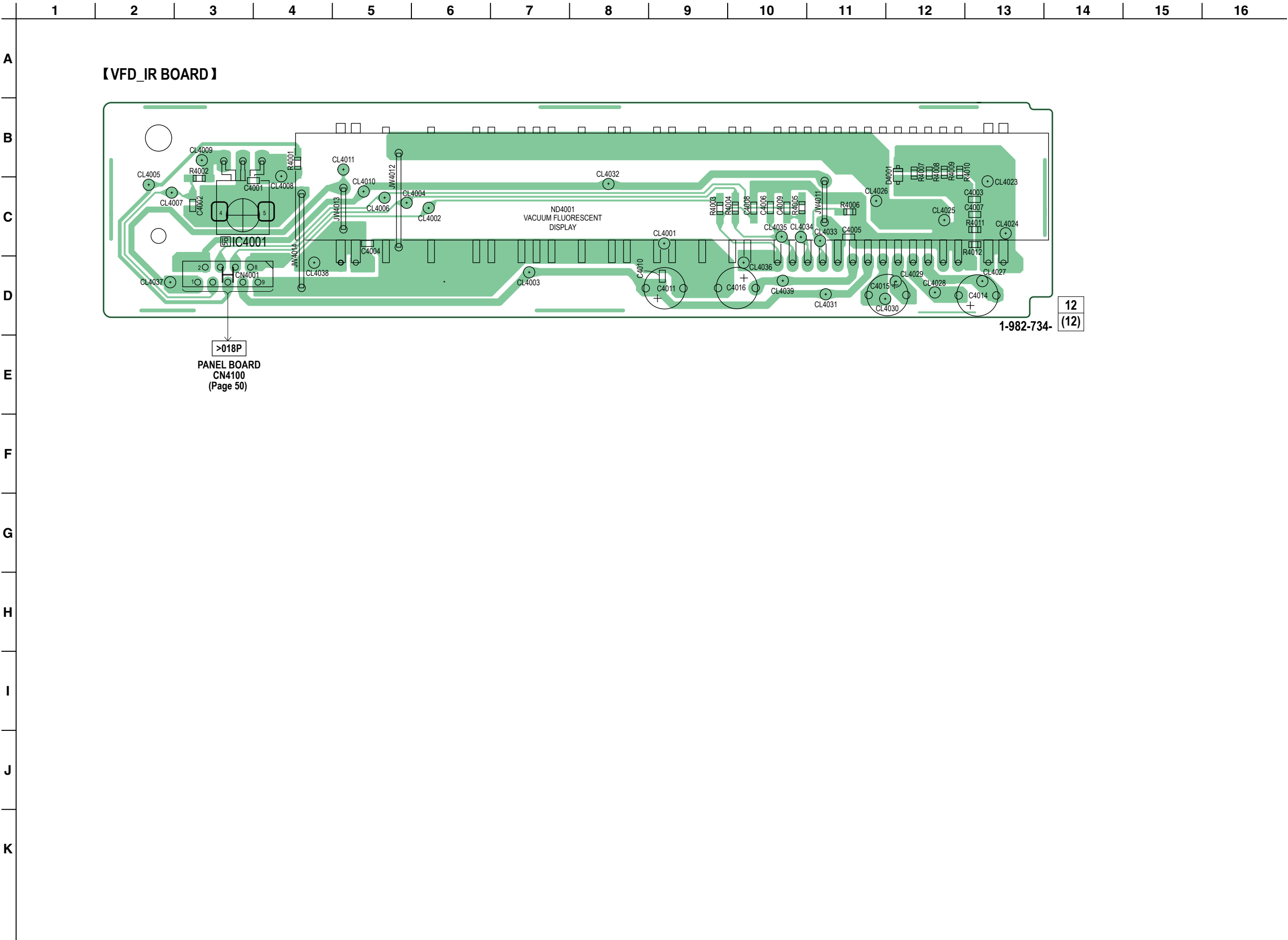
6-14. PRINTED WIRING BOARD - SMPS Board (M60D/M80D) - • See page 41 for Circuit Boards Location. • : Uses unleaded solder.



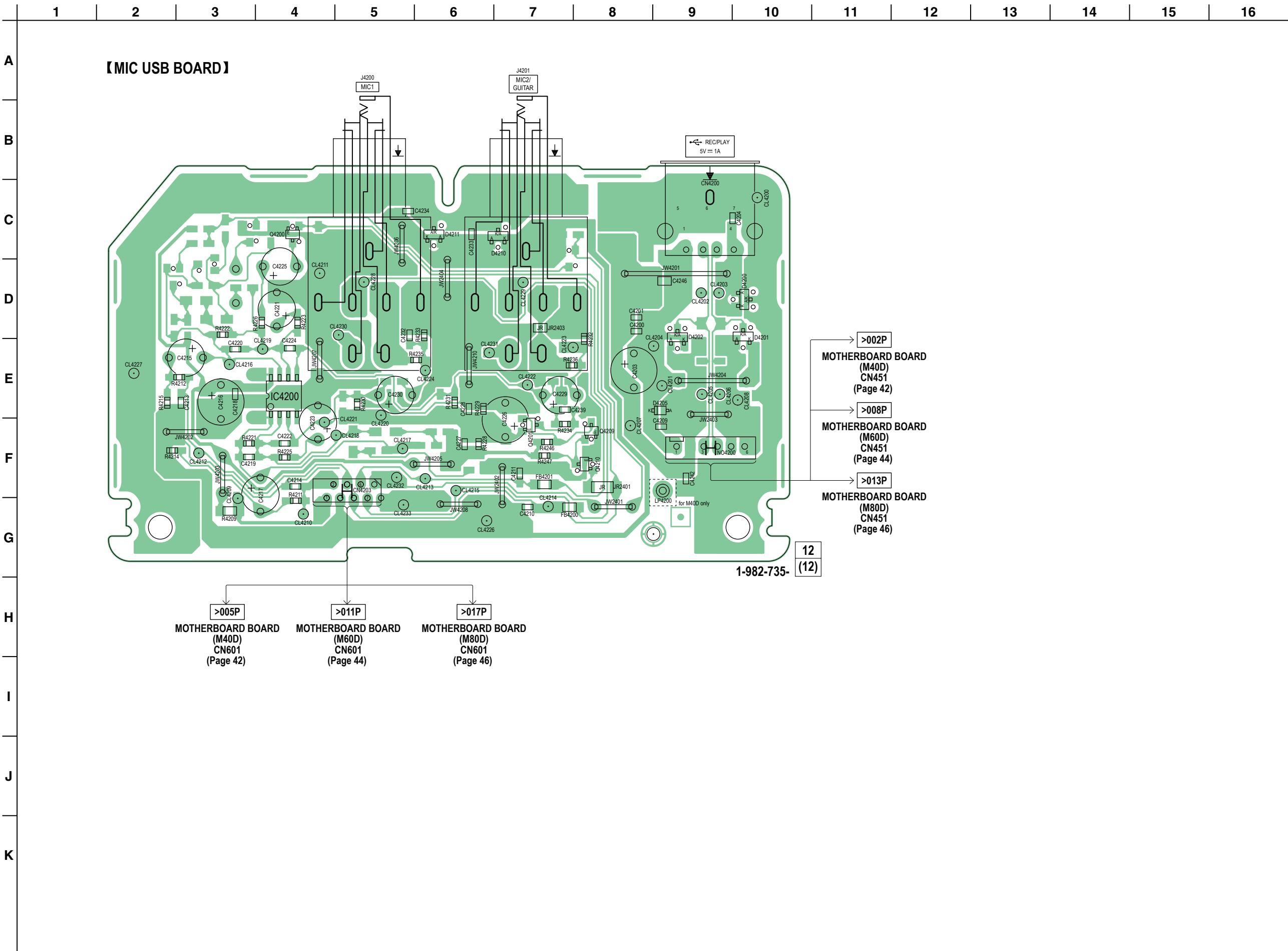
6-15. PRINTED WIRING BOARD - PANEL Board - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.




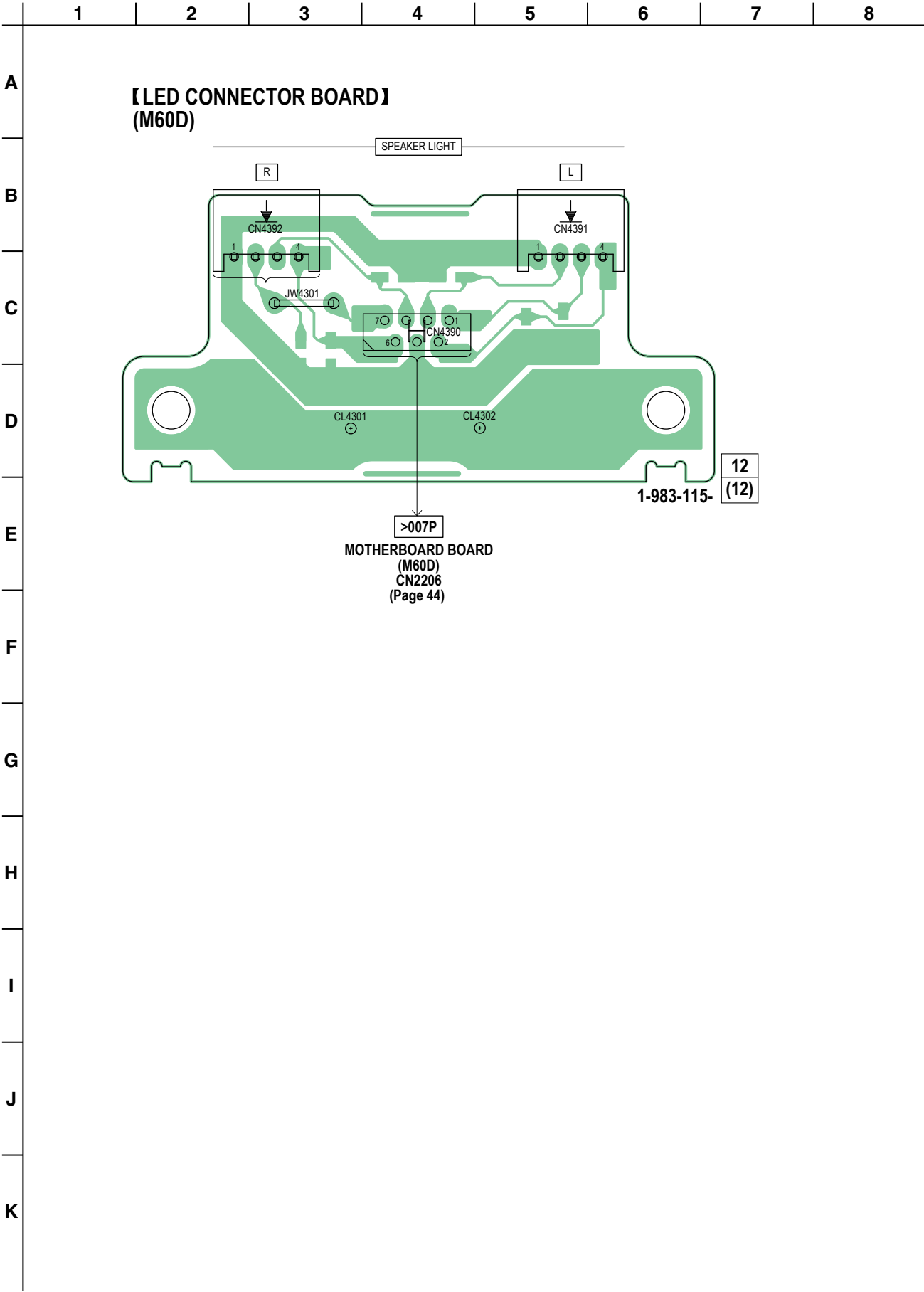
6-16. PRINTED WIRING BOARD - VFD_IR Board - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.



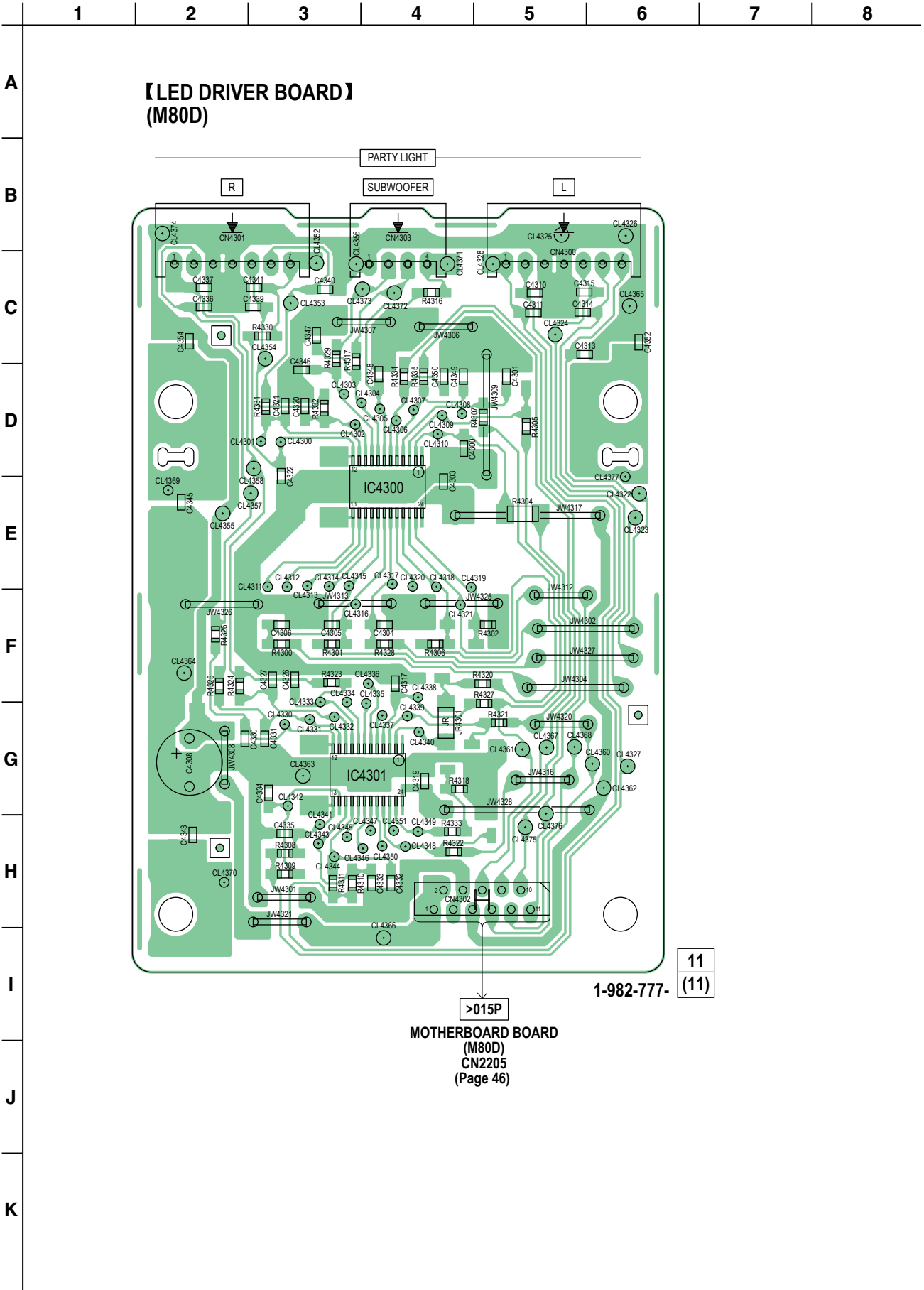
6-17. PRINTED WIRING BOARD - MIC USB Board - • See page 41 for Circuit Boards Location. •  : Uses unleaded solder.



6-18. PRINTED WIRING BOARD - LED CONNECTOR Board (M60D) -
• See page 41 for Circuit Boards Location. • : Uses unleaded solder.



6-19. PRINTED WIRING BOARD - LED DRIVER Board (M80D) -
• See page 41 for Circuit Boards Location. • : Uses unleaded solder.



SECTION 7



EXPLODED VIEWS


Note:

- The mechanical parts with no reference number in the exploded views are not supplied.
 - Items marked “*” are not stocked since they are seldom required for routine service.
- Some delay should be anticipated when ordering these items.

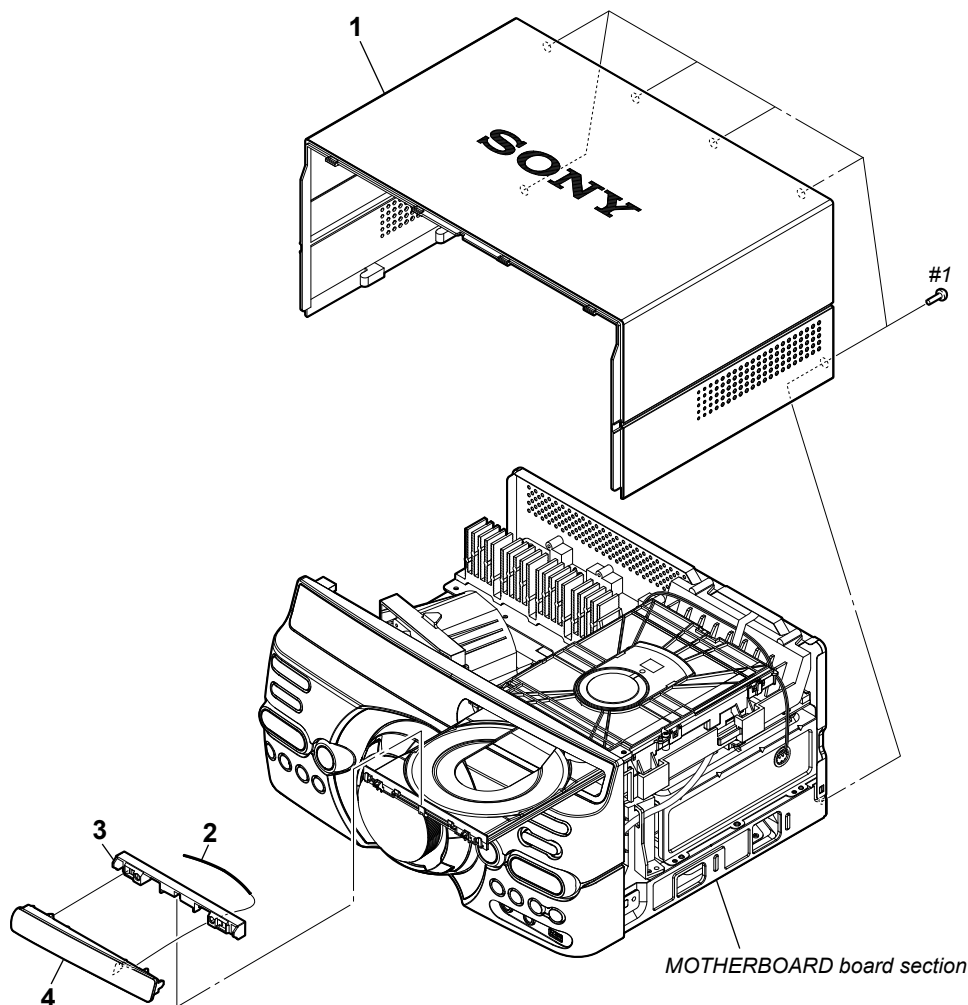
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) . . . (RED)

[illegible]

The components identified by mark  or dotted line with mark  are critical for safety.
Replace only with part number specified.

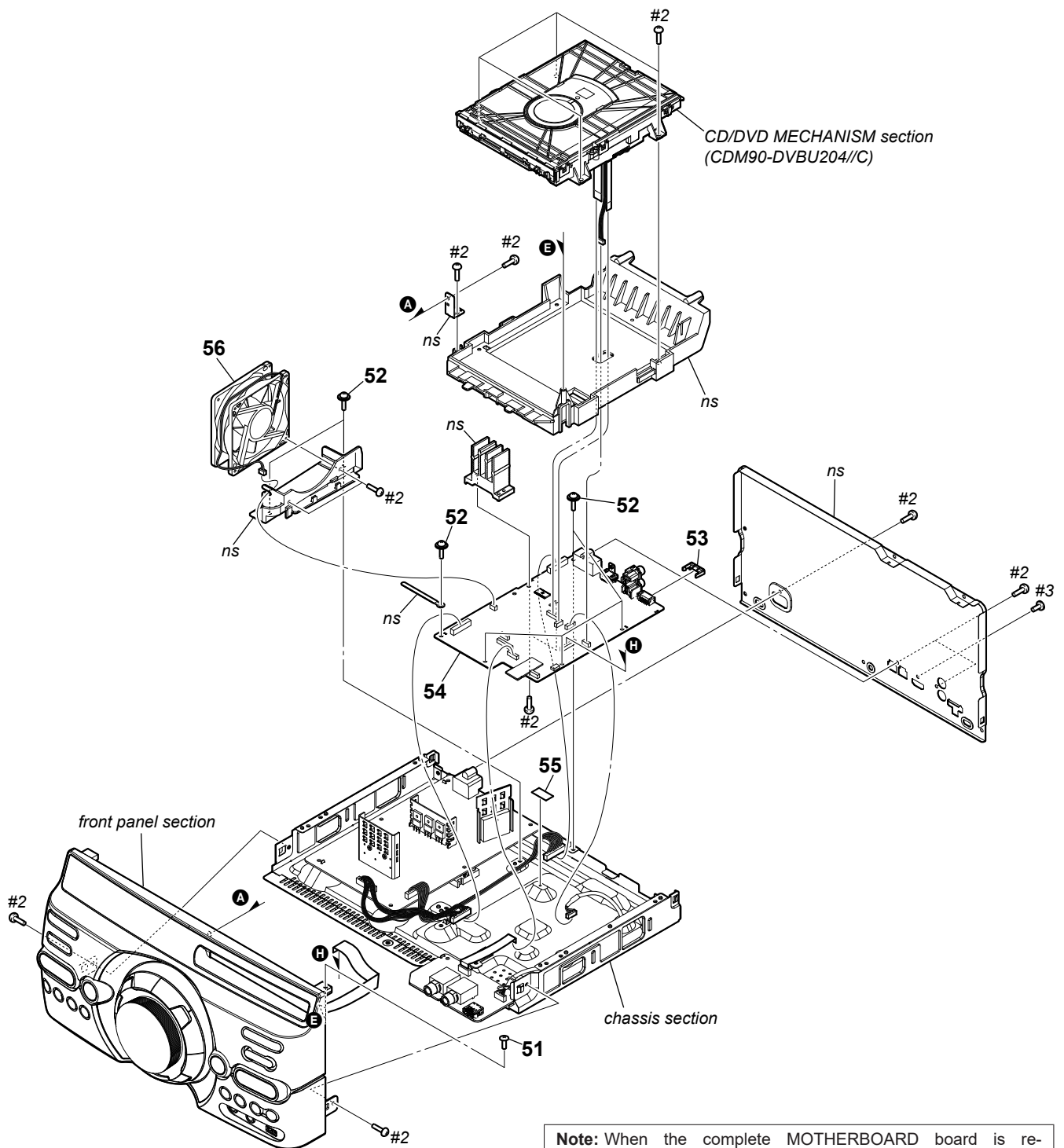
The components identified by mark  contain confidential information.
Strictly follow the instructions whenever the components are repaired and/or replaced.

7-1. TOP COVER SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-726-456-01	COVER, TOP		4	4-726-442-01	PANEL, LOADING	
2	4-569-030-01	SPRING (LP)		#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
3	4-588-651-01	LOADING, BASE					

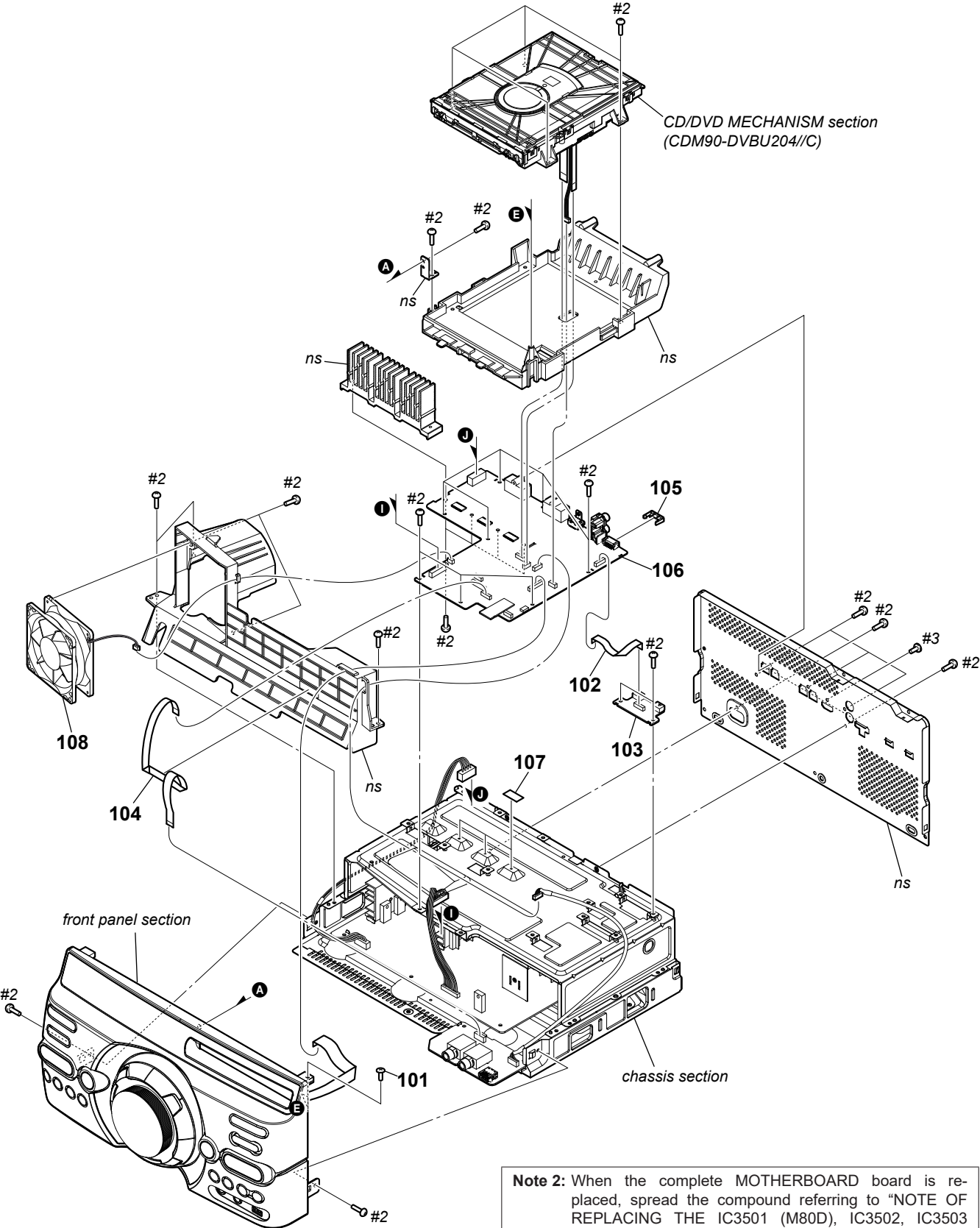
7-2. MOTHERBOARD BOARD SECTION (M40D)



Note: When the complete MOTHERBOARD board is replaced, spread the compound referring to "NOTE OF REPLACING THE IC3501 (M80D), IC3502, IC3503 (M60D, M80D) AND IC2002 ON THE MOTHERBOARD BOARD AND THE COMPLETE MOTHERBOARD BOARD" on servicing notes (page 7).

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	4-589-281-01	SCREW, TAPPING		56	1-855-006-41	FAN, DC	
52	2-677-839-01	+PWH 3X8 (SUMITITE)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
53	4-731-228-01	COVER, SERVICE		#3	7-682-547-04	SCREW +B 3X6	
△ 54	A-2197-507-A	MOTHERBOARD BOARD, COMPLETE		ns	not supplied		
		(for SERVICE)					
55	4-728-025-01	SHEET, THERMAL					

7-3. MOTHERBOARD BOARD SECTION (M60D)



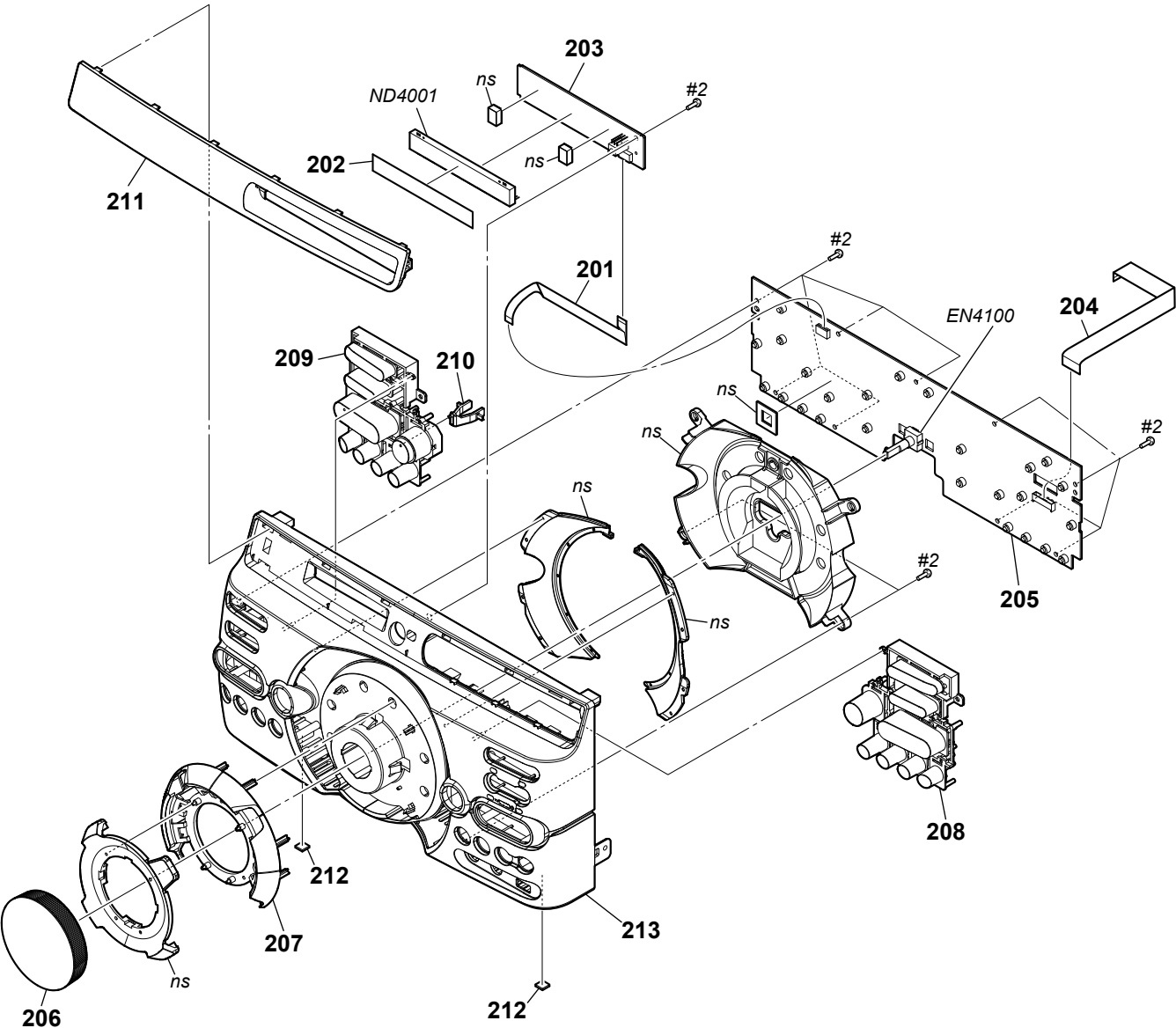
Note 1: If flexible flat cable is replaced, install it after bending it in the same form as that before replacement.

Note 2: When the complete MOTHERBOARD board is replaced, spread the compound referring to "NOTE OF REPLACING THE IC3501 (M80D), IC3502, IC3503 (M60D, M80D) AND IC2002 ON THE MOTHERBOARD BOARD AND THE COMPLETE MOTHERBOARD BOARD" on servicing notes (page 7).

Ref. No.	Part No.	Description	Remark
101	4-589-281-01	SCREW, TAPPING	
102	1-912-677-11	FLEXIBLE FLAT CABLE (7 CORE)	
103	A-2197-005-A	LED CONNECTOR BOARD, COMPLETE	
104	1-912-675-11	FLEXIBLE FLAT CABLE (7 CORE)	
105	4-731-228-01	COVER, SERVICE	
△ 106	A-2197-481-A	MOTHERBOARD BOARD, COMPLETE (for SERVICE)	

Ref. No.	Part No.	Description	Remark
107	4-728-025-01	SHEET, THERMAL	
△ 108	1-855-504-11	DC FAN	
#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
#3	7-682-547-04	SCREW +B 3X6	
ns		not supplied	

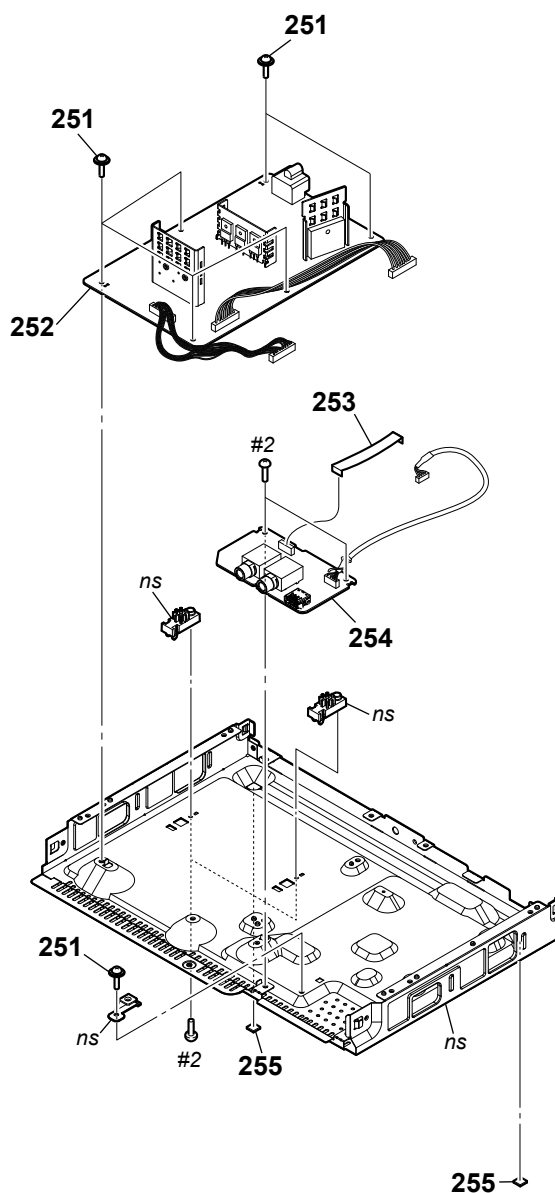
7-5. FRONT PANEL SECTION



Note: If flexible flat cable is replaced, install it after bending it in the same form as that before replacement.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	1-912-674-11	FLEXIBLE FLAT CABLE (9 CORE)		209	4-726-444-21	BUTTON, LEFT (H/M/L) (M40D)	
202	4-731-227-01	FILTER, FL		210	4-726-454-01	INDICATOR, BT	
203	A-2192-361-A	VFD_IR BOARD, COMPLETE		211	4-726-441-01	WINDOW	
204	1-912-672-11	FLEXIBLE FLAT CABLE (17 CORE) (M60D/M80D)		212	4-731-310-01	FOOT	
204	1-912-673-11	FLEXIBLE FLAT CABLE (15 CORE) (M40D)		213	4-726-439-01	PANEL, FRONT (H/M/L) (M80D)	
△ 205	A-2192-362-A	PANEL BOARD, COMPLETE (M60D/M80D)		213	4-726-439-11	PANEL, FRONT (H/M/L) (M60D)	
△ 205	A-2196-732-A	PANEL BOARD, COMPLETE (M40D)		213	4-726-439-21	PANEL, FRONT (H/M/L) (M40D)	
206	4-726-455-01	KNOB, VOLUME		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
207	4-726-448-01	BUTTON, CENTER		EN4100	1-493-463-11	ENCODER, ROTARY (VOLUME/DJ CONTROL)	
208	4-726-445-01	BUTTON, RIGHT (H/M/L)		ND4001	1-483-549-11	VACUUM FLUORESCENT DISPLAY	
209	4-726-444-01	BUTTON, LEFT (H/M/L) (M80D)		ns		not supplied	
209	4-726-444-11	BUTTON, LEFT (H/M/L) (M60D)					

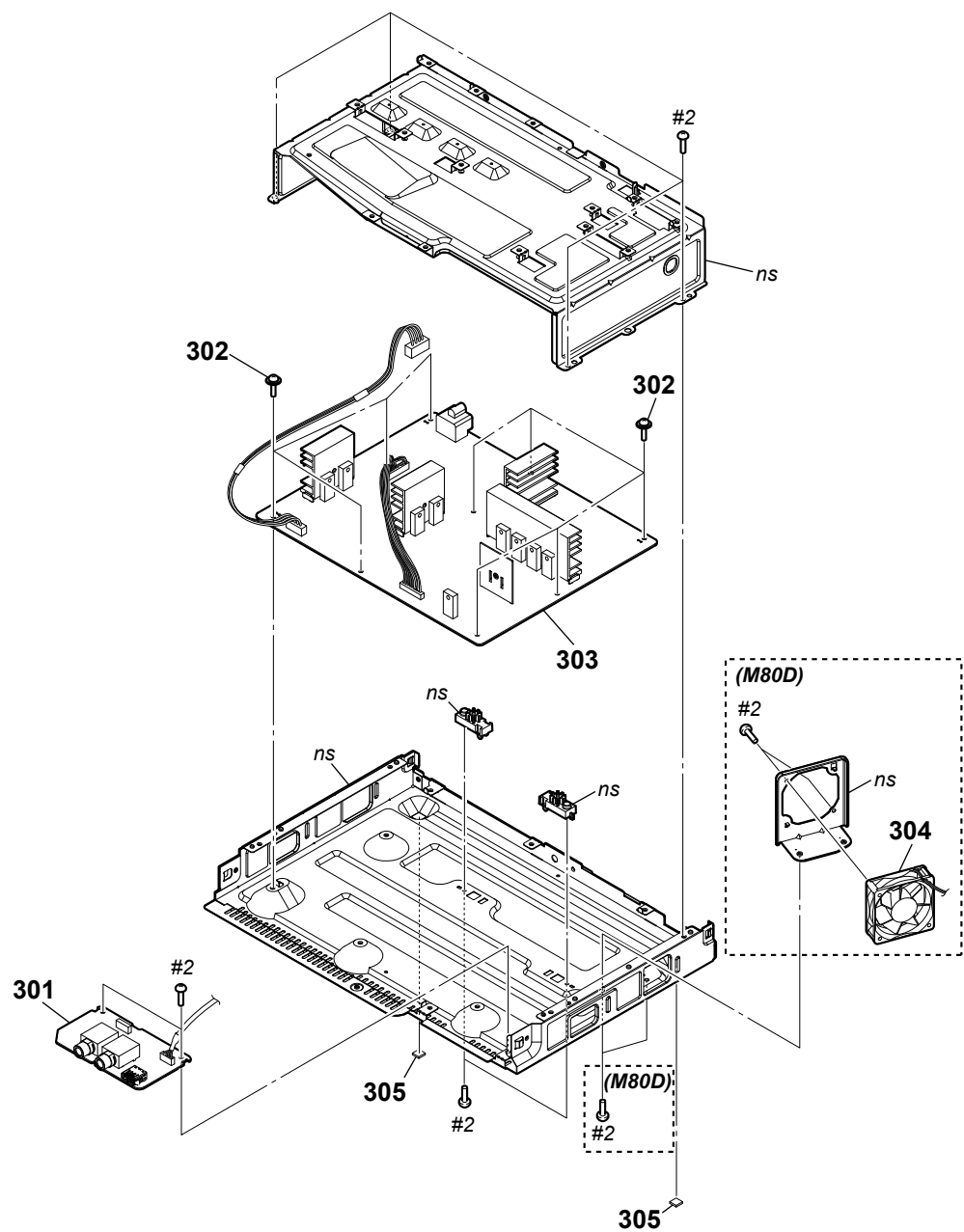
7-6. CHASSIS SECTION (M40D)



Note: If flexible flat cable is replaced, install it after bending it in the same form as that before replacement.

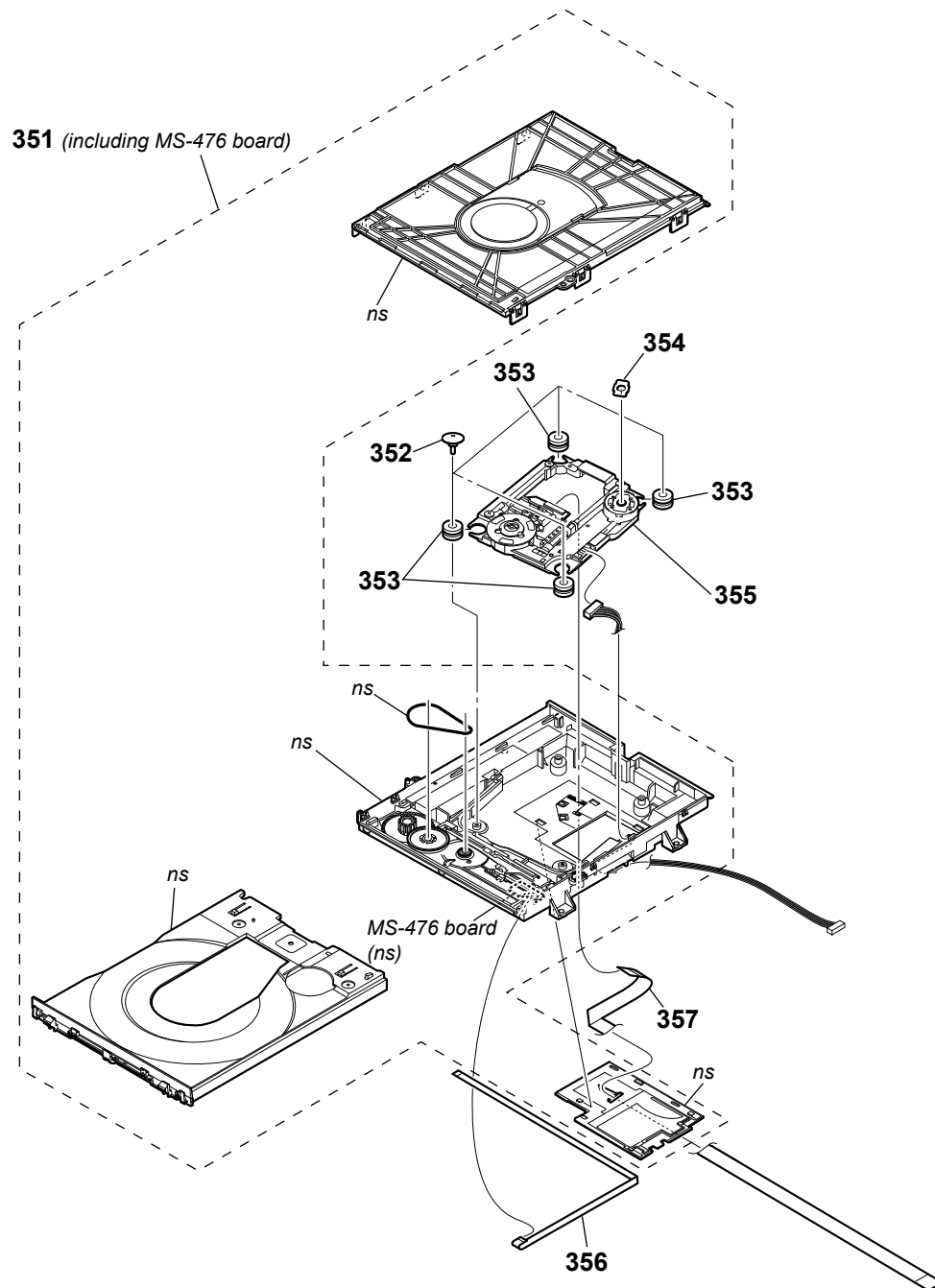
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
251	2-677-839-01	+PWH 3X8 (SUMITITE)		255	4-731-310-01	FOOT	
△ 252	A-2196-391-A	SMPS BOARD, COMPLETE (RU, AUS)		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
△ 252	A-2203-519-A	SMPS BOARD, COMPLETE (E4, E93, LA9)		ns		not supplied	
253	1-912-670-11	FLEXIBLE FLAT CABLE (7 CORE)					
254	A-2192-363-A	MIC USB BOARD, COMPLETE					

7-7. CHASSIS SECTION (M60D/M80D)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	A-2192-363-A	MIC USB BOARD, COMPLETE		△ 304	1-855-502-11	DC FAN (M80D)	
302	2-677-839-01	+PWH 3X8 (SUMITITE)		305	4-731-310-01	FOOT	
△ 303	A-2188-428-A	SMPS BOARD, COMPLETE		#2	7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3	
		(M60D: LA9, BR/M80D: E4, E93, LA9, BR)		ns		not supplied	
△ 303	A-2203-614-A	SMPS BOARD, COMPLETE					
		(M60D: RU, AUS, AEP/M80D: RU, AUS)					

7-8. CD/DVD MECHANISM SECTION (CDM90-DVBU204//C)



Note: If flexible flat cable is replaced, install it after bending it in the same form as that before replacement.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
351	A-1937-669-C	CDM90 ASSY (including MS-476 board)		356	1-912-676-11	FLEXIBLE FLAT CABLE (5 CORE)	
352	3-087-599-01	INSULATOR SCREW		357	1-912-662-11	FLEXIBLE FLAT CABLE (24 CORE)	
353	2-634-618-21	INSULATOR		ns	not supplied		
354	4-418-987-01	SHEET (S76)					
△ 355	A-2046-956-A	SERVICE, OPTICAL DEVICE (7G)					

SECTION 8
ELECTRICAL PARTS LIST

- LED CONNECTOR
- LED DRIVERMIC USB
- MOTHERBOARDMS-476
- PANELSMPSVFD_IR

Note:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS**
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service.
Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS**
In each case, u: μ , for example:
uA. . . : μ A. . . , uPA. . . , μ PA. . . ,
uPB. . . : μ PB. . . , uPC. . . , μ PC. . . ,
uPD. . . : μ PD. . .
- CAPACITORS**
uF: μ F
COILS
uH: μ H

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

The components identified by mark $\hat{\triangle}$ contain confidential information.
Strictly follow the instructions whenever the components are repaired and/or replaced.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remark
	A-2197-005-A	LED CONNECTOR BOARD, COMPLETE (M60D) *****	
	A-2192-364-A	LED DRIVER BOARD, COMPLETE (M80D) *****	
	A-2192-363-A	MIC USB BOARD, COMPLETE *****	
$\hat{\triangle}$	A-2197-453-A	MOTHERBOARD BOARD, COMPLETE (for SERVICE) (M80D)	
$\hat{\triangle}$	A-2197-481-A	MOTHERBOARD BOARD, COMPLETE (for SERVICE) (M60D)	
$\hat{\triangle}$	A-2197-507-A	MOTHERBOARD BOARD, COMPLETE (for SERVICE) (M40D) *****	
		< IC >	
IC2001	6-718-103-01	IC TAS5538DGGR (M80D)	
IC2001	6-723-247-01	IC TAS5534DGGR-S (M40D/M60D)	
IC2002	6-723-793-01	IC TAS5634	
IC3501	6-723-793-01	IC TAS5634 (M80D)	
IC3502	6-723-793-01	IC TAS5634 (M60D/M80D)	
IC3503	6-723-793-01	IC TAS5634 (M60D/M80D) *****	
		MS-476 BOARD *****	
When the MS-476 board is defective, exchange the entire CDM90 ASSY. *****			

Note 1: When the complete MOTHERBOARD board is replaced, spread the compound referring to “NOTE OF REPLACING THE IC3501 (M80D), IC3502, IC3503 (M60D, M80D) AND IC2002 ON THE MOTHERBOARD BOARD AND THE COMPLETE MOTHERBOARD BOARD” on servicing notes (page 7).

Ref. No.	Part No.	Description	Remark
\triangle	A-2192-362-A	PANEL BOARD, COMPLETE (M60D/M80D)	
\triangle	A-2196-732-A	PANEL BOARD, COMPLETE (M40D) *****	

\triangle	A-2188-428-A	SMPS BOARD, COMPLETE (M60D: LA9, BR/M80D: E4, E93, LA9, BR)	
\triangle	A-2196-391-A	SMPS BOARD, COMPLETE (M40D: RU, AUS)	
\triangle	A-2203-519-A	SMPS BOARD, COMPLETE (M40D: E4, E93, LA9)	
\triangle	A-2203-614-A	SMPS BOARD, COMPLETE (M60D: RU, AUS, AEP/M80D: RU, AUS) *****	

	A-2192-361-A	VFD_IR BOARD, COMPLETE *****	

		MISCELLANEOUS *****	
\triangle 56	1-855-006-41	FAN, DC	
102	1-912-677-11	FLEXIBLE FLAT CABLE (7 CORE)	
104	1-912-675-11	FLEXIBLE FLAT CABLE (7 CORE)	
\triangle 108	1-855-504-11	DC FAN	
152	1-912-678-11	FLEXIBLE FLAT CABLE (11 CORE)	
154	1-912-675-11	FLEXIBLE FLAT CABLE (7 CORE)	
\triangle 158	1-855-504-11	DC FAN	
201	1-912-674-11	FLEXIBLE FLAT CABLE (9 CORE)	
204	1-912-672-11	FLEXIBLE FLAT CABLE (17 CORE) (M60D/M80D)	
204	1-912-673-11	FLEXIBLE FLAT CABLE (15 CORE) (M40D)	
253	1-912-670-11	FLEXIBLE FLAT CABLE (7 CORE)	
\triangle 304	1-855-502-11	DC FAN (M80D)	
351	A-1937-669-C	CDM90 ASSY (including MS-476 board)	
\triangle 355	A-2046-956-A	SERVICE, OPTICAL DEVICE (7G)	
356	1-912-676-11	FLEXIBLE FLAT CABLE (5 CORE)	
357	1-912-662-11	FLEXIBLE FLAT CABLE (24 CORE)	

Note 2: If flexible flat cable is replaced, install it after bending it in the same form as that before replacement.

MEMO

REVISION HISTORY

[illegible]

How to search for a contact point of signal lines or the like in DIAGRAMS SECTION

If a contact point of a BLOCK DIAGRAM, PRINTED WIRING BOARD or SCHEMATIC DIAGRAM is shown in a different page, use the PDF file search function to find one.

e.g.) If a contact point is shown as 001Z, follow the procedure below.

Procedure:

1. Press the [F] key while pressing the [Ctrl] key.
2. Input ">001Z" in the search box and press the [Enter] key.
3. The relevant part (page), where the contact point is shown, appears.

Note: If you still see the original page, press the [Enter] key again.