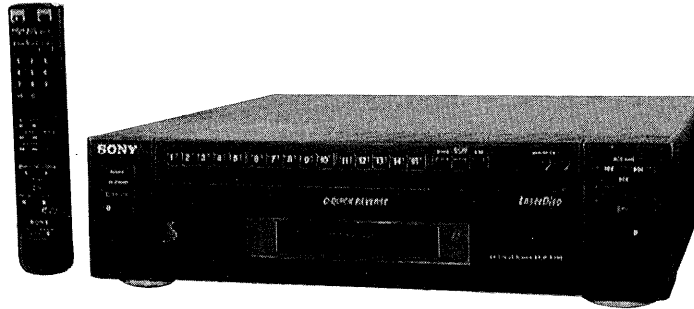


MDP-A550

RMT-M35A

SERVICE MANUAL

E Model
Chinese Model



SPECIFICATIONS

System

Type

CD/CDV/LD player

Signal readout

Optical (Laser beam reflection)

Signal format system

EIA standard, NTSC color system

Playing time

See "Optical discs" on page 22.

Digital audio specifications**Signal-to-noise ratio**

More than 115 dB (EIAJ)*

Dynamic range

More than 99 dB (EIAJ)

Wow and flutter

Below measurement limit
(+0.001 % W.PEAK)(EIAJ)

Video specification**Horizontal video resolution**

425 lines

Signal-to-noise ratio

More than 50 dB

* Measured according to EIAJ (Electric Industries Association of Japan) standards.

Input and Output

LINE OUT 1,2

VIDEO output, Phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced
AUDIO output, Phono jacks (2)
Stereo L, R
Analog: 200 mVrms
(1 kHz, 40 % modulation)
Digital: 200 mVrms
(1 kHz, -20 dB)

General

Power requirements

110-127/220-240 V AC,
adjustable, 50/60 Hz

Power consumption

40 W

Operating temperature

5°C to 35°C

Ambient humidity

5% to 90 %

Dimensions

Approx. 430 × 116 × 430 mm
(w/h/d)
including projecting parts and controls

Mass

Approx. 7.5 kg

Supplied accessories

Remote Commander RMT-M35A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 ↔ phono plug 3) (1)
AC plug adaptor (1)





CD/CDV/LD PLAYER
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. 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-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.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

This CD CDV LD Player is classified as a CLASS 1 LASER product.

CAUTION

The use of optical instruments with this product will increase eye hazard.

As the laser beam used in this player is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

Precautions

Safety

- If any liquid or solid object falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- The unit is not disconnected from the house current as long as it is connected to the AC outlet, even if the unit itself has been turned off.
- Unplug the unit from the wall outlet if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord itself.

Installing

- Allow adequate air circulation to prevent internal heat buildup.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the space under the unit.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- Do not place heavy objects on the unit.

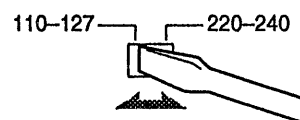
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the player. If this happens, playback may not start. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

Operating voltage

- Before operating the player, make sure that the operating voltage of your unit is identical with that of your local power supply. If necessary, reset the selector at the rear of the player to the voltage corresponding to your local power supply. The voltage selector of this unit is set to 220–240 V AC originally.

For	Set to
110–127 volts AC	110–127 V
200–240 volts AC	220–240 V

- To set the voltage selector, disconnect the AC power cord and set the selector to the appropriate position with a blade screwdriver.



Using the AC power plug adaptor (for models other than Hong Kong model)

- If the AC plug on your unit does not fit into the wall outlet, attach the supplied AC plug adaptor.

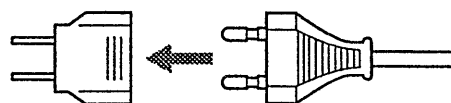


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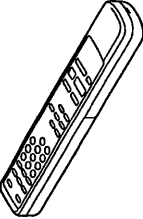



SECTION 1
GENERAL

This section is extracted from instruction manual.

Step 1

Unpacking

Check that you have the following items:

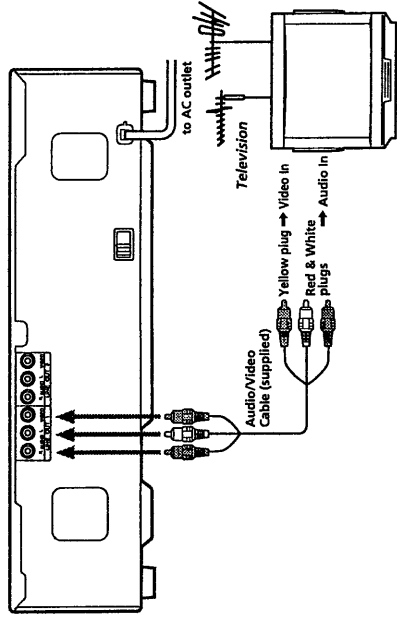
- Remote commander RMT-M35A 
- Audio/Video cable 
- Two R6 (size AA) batteries 
- AC plug adaptor 

Step 3

Connecting the player

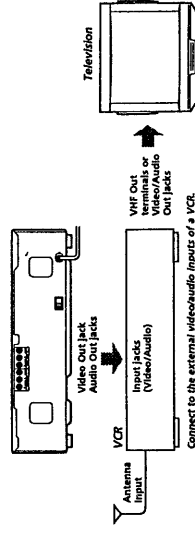
Television hook-up

To play LDs or CDVs, hook up a television to the LD Player. Take out the supplied audio/video connecting cable (yellow, red and white plugs). Use this to connect the player to the television. Once you have hooked up the television, set the input selector on the TV to "Video." Before connecting or disconnecting any of the cables, turn off all equipment.



Television/VCR hook-up

Connect the player to the VCR's inputs when:
- the video inputs of the TV are already used for the VCR or a similar machine.
- the TV has only an antenna input.



Notes

- Make sure all equipment is turned off before connecting or disconnecting any cables.
- Connection methods may differ; when in doubt about a connection, consult the TV or VCR manufacturer's manual.
- If the sound or picture is disturbed by noise, try moving the equipment farther apart.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- To prevent interference with TV broadcast reception, turn off all equipment connected but not currently in use.
- If the TV only has a monaural phono jack for audio input, use a YMC-910/915 Connecting Cable (not supplied).

Step 2

Inserting batteries into the remote commander



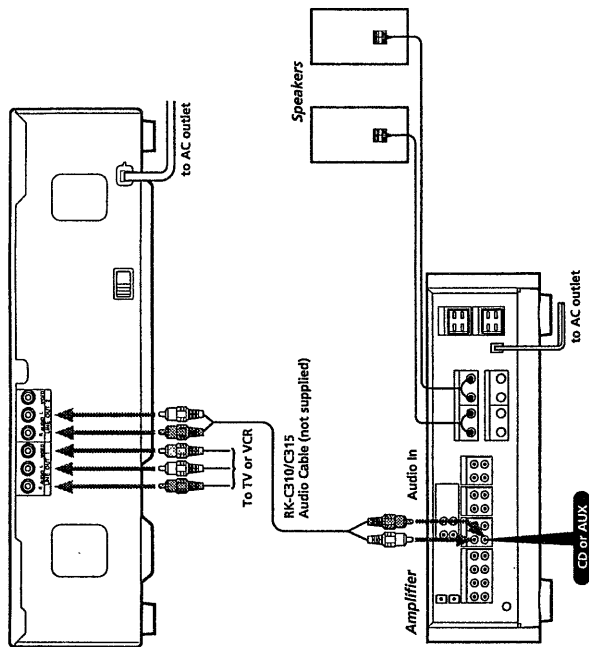
- 1 Turn the commander over, and remove the cover.
- 2 Check the polarities and position two R6 (size AA) batteries correctly.
- 3 Close the cover.

Notes

- With normal use, the batteries should last for approximately six months.
- If you are not going to use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not use different types of batteries together.

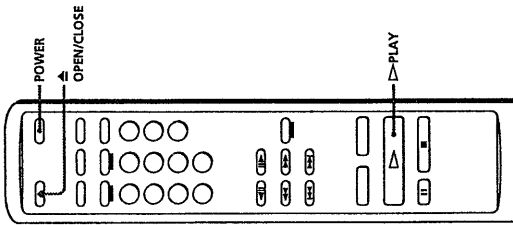
Audio equipment hook-up

To achieve full stereo sound from your LD Player, hook up a stereo system, following the diagram below. Use an RK-C310 (or RK-C315) Audio Connecting Cable (not supplied) to connect the LD Player to your amplifier or receiver. Before connecting or disconnecting any cables, turn off all equipment.



- Notes**
- Make sure all equipment is turned off before making any of the above connections.
 - Firmly insert plugs into the jacks. A loose connection may cause noise.
 - When listening to a radio broadcast, turn off the LD Player to get better reception.

Basic Operations Playing a disc



- Tip**
- You can also turn on the player by pressing **OPEN/CLOSE** on the player.

Notes

- If you place more than one disc on the tray, or if the disc is not seated properly, the disc may not start playing, and may cause damage to the disc or player.
- Do not transport the player while playing a disc as doing so may damage your disc or player.
- Do not use a CD stabilizer when playing a CD as doing so may damage your disc or player.
- When you press **PAUSE**, the picture goes blank when playing a CLV LD or CDV, and the picture freezes when playing a CAV LD (see "Viewing frame-by-frame action" on page 18).

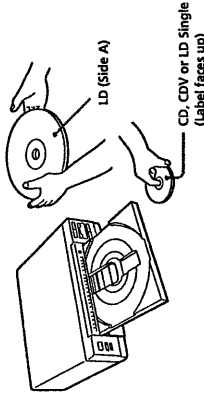
This section shows you how to play an LD, CD or CDV.

Before you start...

Connect the player to your TV and set the input selector on the TV to "Video" (see "Connecting the player" on page 6).

Loading and playing a disc

- 1 Press POWER to turn on the player.**
You can also directly turn on the player by pressing **PLAY** on the player or remote commander.
- 2 Press OPEN/CLOSE to open the disc tray.**
The front cover of the player automatically slides down and the disc tray comes out.
- 3 Place a disc on the disc tray.**



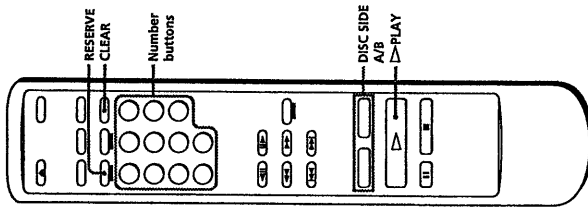
Place only one disc on the tray, carefully fitting it in the circle on the tray.

4 Press PLAY.

The disc tray closes and the upper side of the disc starts playing. You can also start playing by pressing the disc tray to close it. When playback of the upper side of an LD (side A) ends, the other side (side B) starts playing automatically.

To	Press
Stop play	STOP
Pause play	PAUSE
Resume play after pause	PAUSE or PLAY
Scan forward or backward	LEFT/RIGHT SCAN
Skip chapters or tracks	LEFT/RIGHT ACS/AMS
Go to a chapter or track	Number button
Remove the disc	OPEN/CLOSE

Specifying the next songs (Reserve)



To start playing from the beginning of each LD side
 Press DISC SIDE A to play the upper side of the LD from the beginning.
 Press DISC SIDE B to play the other side of the LD from the beginning.

To pause playing just before starting
 Press II PAUSE instead of pressing ▷ PLAY after you place the disc on the tray.
 The disc tray closes and the player waits at the start of the disc until you press ▷ PLAY or III PAUSE. If you want to start from side B of an LD, press II PAUSE, then DISC SIDE B.

To stop at the end of each song
 Press AUTO STOP on the player.
 "A, STOP" appears briefly on the screen and the AUTO STOP button indicator on the player lights up. The player automatically stops every time a song is played (Auto Stop). To cancel Auto Stop, press AUTO STOP again. "A, STOP OFF" appears briefly and the AUTO STOP button indicator on the player goes off. Auto Stop is canceled and songs on the disc are played continuously.

To stop playing and turn off the player
 Press POWER.
 You can resume playback from the point you stopped at by simply pressing ▷ PLAY (see "Resuming LD playback" on page 13).

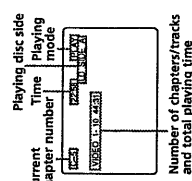
To stop playing and remove the disc
 Press ▲ OPEN/CLOSE.
 Remove the disc and press ▲ again to close the empty tray.

Chapter/Track number display on the front panel

Indication	Current status of the player
!?	Playing chapter/track 12
!?	Searching for chapter/track 12
..	Searching for the beginning of the disc
00	Playing chapter "0" of an LD
0	Stopped
Not lit	No disc is loaded or playing an LD which has no chapters

Viewing the on-screen display

Press DISPLAY twice. The on-screen display appears (see "Understanding on-screen indications" on page 14).

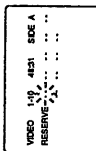


- Tips**
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B" regardless of the label "A" or "B" printed on the disc.
 - When playing side A of an LD, CD or CDV, or when the player is stopped, the SIDE A indicator on the player lights up. When playing side B of an LD, the SIDE B indicator lights up.
 - When playback of LD side B ends, the player stops.
 - When playing a CD or CDV, the DISC SIDE B button does not function.

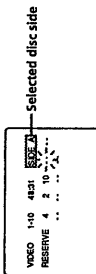
You can specify up to 9 songs to be played in any order you like, regardless of disc side, even while a song is being played. The songs are played continuously in the order you specify so that you can enjoy non-stop karaoke playing. The MDP-A550 also allows you to specify songs on another disc in advance (Next Disc Reserve).

Specifying songs on the current disc

- 1 Press RESERVE.
 "RESERVE" appears.

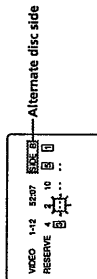


- 2 Select the disc side by pressing DISC SIDE A (or B), then press the number buttons to specify songs in the order you want them to play.

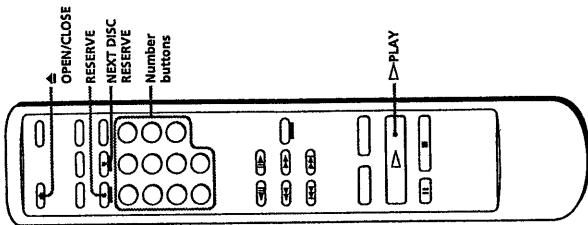


If you enter a wrong number, press CLEAR. With each press, the last song you entered is deleted.

- 3 To enter songs from the other disc side, press DISC SIDE B (or A), then press the number buttons to specify the songs in the order you want them to play.



- 4 Repeat steps 2 and 3 until you finish specifying songs.



Specifying the next songs (continued)

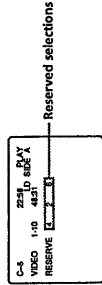
To enter a number greater than 10
Press **RESERVE** on the remote commander, then one of the number buttons. If you press **RESERVE** by mistake, press **RESERVE** repeatedly until “-” flashes, then enter the correct number.

To	Press
Enter 14	RESERVE , then 4 .
Enter 25	RESERVE , RESERVE , RESERVE , then 5 .
Enter 30	RESERVE , RESERVE , RESERVE , RESERVE , then 0 .

Tip

- You can enter numbers up to 15 using the number buttons on the player.

To check the songs to be played
Press **DISPLAY** twice. The song numbers to be played appear. When a song has been played, its number disappears.



To skip the current song
Press **▶▶**. The next reserved song starts playing.

Canceling Reserve

Press **CLEAR**. “CLEAR” appears briefly and the player exits Reserve mode. All the reserved songs are cleared.

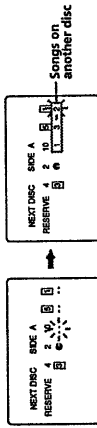
5 Press RESERVE.

On-screen indications disappear. If you have reserved songs while playing a song, the songs start playing, without pausing, after the current song.

If you have specified songs while the player is stopped, press **▶** **PLAY**. The songs start playing.

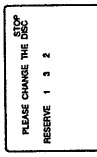
Specifying songs on another disc (Next Disc Reserve)

1 Press NEXT DISC RESERVE after steps 1 to 4 above. “CD” appears on the screen, rotating. Now you can specify songs on another disc. Follow steps 2 (and 3) above to specify the songs.



2 Press RESERVE (then ▶ PLAY).

The songs on the current disc are played, then the player stops automatically, and prompts you to change the disc.



3 Press ◀ OPEN/CLOSE to open the disc tray, then change the disc.

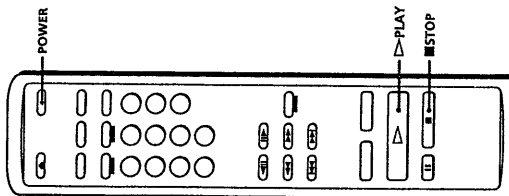
4 Press ▶ PLAY or push in the disc tray.

The specified songs on the new disc start playing automatically.

Notes

- Although you cannot use Auto Stop while you play songs using Reserve (and Next Disc Reserve), if you turn on Auto Stop before pressing **RESERVE** in step 1 on page 10, the player automatically stops after playing all the reserved songs continuously.
- You cannot use Reserve and Repeat at the same time.
- You cannot specify tracks over 80 on a CD using Next Disc Reserve.

Additional Operations Resuming LD playback (Auto Resume)



This function operates automatically only for LDs. When you stop playing an LD by pressing **STOP** or **POWER**, the player stores the point you stopped at so that you can continue viewing from the same point.

1 Press **STOP** (or **POWER**) to stop playback.

The AUTO RESUME indicator on the player lights up and the point you stopped at is stored (if you press **POWER**, the indicator lights up briefly, then goes off with the power).

2 Press **PLAY**.

The player searches for the scene at which you stopped playing, then playback starts.

To pause playing just before starting

If the player is turned on, press **PAUSE** instead of **PLAY**. If the player is turned off, press **POWER** or **PLAY** to turn on the player, then press **PAUSE**.

To view from the beginning of the LD

Press **DISC SIDE A** to start playing from the beginning of side A. Press **DISC SIDE B** to start playing from the beginning of side B. The point at which you stopped is cleared.

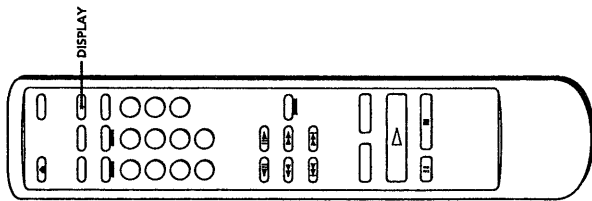
Tips

- Each time you stop playing, the point at which you stopped is stored.
- The point at which you stopped playing is cleared when:
 - you completely open the disc tray, **▶▶ ACS/AMS**.
 - you do a Chapter Search.
 - you unplug the player.
- If you press **OPEN/CLOSE** to close the disc tray when it is open halfway, the point at which you stopped is retained.

Notes

- The point at which you stopped is not stored if you stop playback during a Chapter Search.
- If you press **PLAY** when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.

Understanding on-screen indications

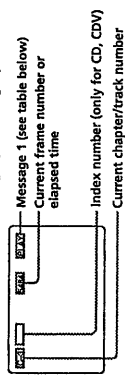


You can view the operating status of the player or disc information on the TV screen.

Displaying on-screen indications

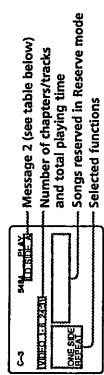
Press **DISPLAY**.

The operating status of the player is displayed on the screen.



Press **DISPLAY** again.

Operating status and disc information are displayed on the screen.



Press **DISPLAY** once again to turn off the indications.

Message 1

Display	Current status of the player
OPEN	Disc tray open
CLOSE	Disc tray closed
PLAY	Playing a disc
STOP	Operation stopped
PAUSE	Operation momentarily stopped
SEARCH / SEARCH	Speed scanning
SEARCH	Searching

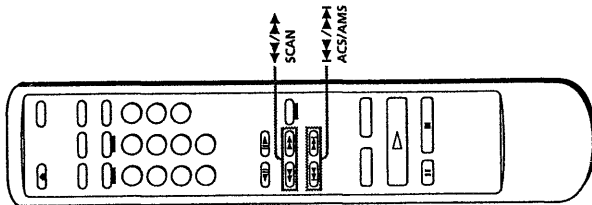
Message 2

Display	Currently playing
LD SIDE A	Side A of LD
LD SIDE B	Side B of LD
CD	CD
CDV	CDV
1/L	First soundtrack/left channel
2/R	Second soundtrack/right channel
DIGITAL	Digital sound
ANALOG	Analog sound

Notes

- When playing an LD which does not contain TOC data, total playing time of the disc does not appear.
- When playing an LD which does not contain chapters, the chapter number does not appear.
- When playing a CLV LD which does not contain time data to the second, a two-digit number such as "72", meaning 22 minutes, appears.
- Messages concerning sound control functions such as "1/L", "2/R" or "DIGITAL", "ANALOG" appear only briefly when you press the **AUDIO MONITOR** or **ANALOG/DIGITAL** button.

Searching for a particular point on the disc



You can locate a particular point on a disc by scanning scenes or skipping chapters/tracks.

Scanning a disc quickly (Speed Scan)

Hold down $\blacktriangleleft/\blacktriangleright$ SCAN while playing the disc.

To	Hold down
Scan forward	\blacktriangleright SCAN
Scan backward	\blacktriangleleft SCAN
To resume normal playback, release	$\blacktriangleleft/\blacktriangleright$ SCAN.

Skipping chapters or tracks (Skip Search)

Press or hold down $\blacktriangleleft/\blacktriangleright$ ACS/AMS.

To go to the beginning of	Press
Next chapter/track	\blacktriangleright ACS/AMS once
Current chapter/track	\blacktriangleleft ACS/AMS once
Previous chapter/track	\blacktriangleleft ACS/AMS twice before the picture or sound resumes
Hold down \blacktriangleright or \blacktriangleleft to skip chapters/tracks continuously.	

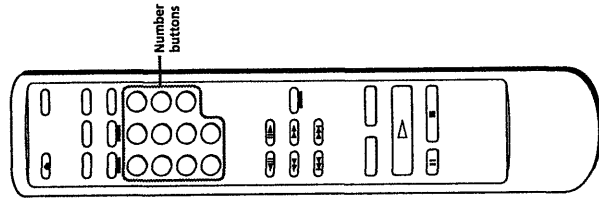
Note

- When scanning a CLV LD or CDV, frames are skipped.
- A certain amount of visual noise and instability is inevitable when scanning an LD.

Tips

- ACS/AMS is the abbreviation for Automatic Chapter Sensor/Automatic Music Sensor.
- In addition to normal play mode, you can do Speed Scan and Skip Search while in Freeze Frame (CAV LD), Repeat or Pause mode. After the scan or search, playback continues in the same mode.

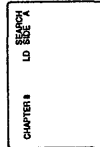
Specifying a chapter or track directly (Chapter/Track Search)



LDs are divided into sections called "chapters." CDs and CDVs are divided into sections called "tracks." Simply enter the desired chapter/track number to go to a chapter or track and start playing it immediately.

Locating a particular chapter/track

Press one of the number buttons to enter the chapter/track number.



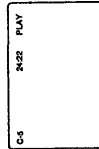
To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

To enter a number greater than 10 Press 10 , then one of the 0 - 9 buttons. If you press 0 by mistake, press CLEAR, then enter the correct number.

To	Press
Enter 14	10 , then 4
Enter 25	10 , 4 , then 5
Enter 30	10 , 3 , 0 , then 0

To check the current chapter/track number

Press DISPLAY to display the chapter track number. The number appears in the upper left-hand corner of the screen. If the LD does not contain chapter numbers, no number is displayed.



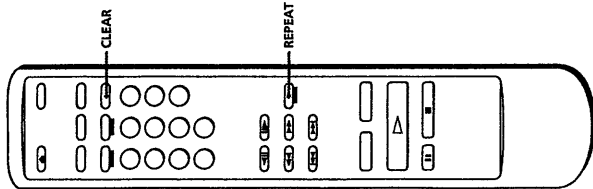
Tip

- In addition to normal play mode, you can do Chapter/Track Search while in Freeze Frame (CAV LD), Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.

Note

- Chapter Search does not function properly if the LD does not contain chapter numbers, or if the chapter number entered does not exist.

Playing a section repeatedly (Repeat Play)



Repeat play allows you to play the disc over and over. You can replay both sides, a single side or one chapter of an LD; and a whole disc or a single track on a CD.

Repeating chapters/tracks

Press REPEAT.
When playing an LD, the on-screen indication changes as follows each time you press REPEAT:



When playing a CD or CDV, the on-screen indication changes as follows each time you press REPEAT:



Indication

Indication	Repeated chapters/tracks
REPEAT (All Disc Repeat)	All chapters on both sides of the LD All tracks on the CD/CDV
SINGLE REPEAT	Current chapter/track
ONE SIDE REPEAT (LD only)	All chapters on the current side of the LD

To view the replaying status on the screen

Press DISPLAY twice.

Canceling Repeat Play

Press CLEAR.

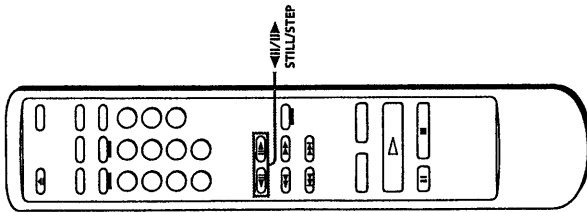
Tip

- When you play an LD in All Disc Repeat mode, the player plays through both sides of the LD repeatedly.

Note

- You cannot use Repeat and Reserve at the same time.

Viewing frame-by-frame action



You can use this function only for CAV LDs. During any scene, you can freeze play into a still picture, and then advance or reverse the action frame-by-frame.

Freezing the action (Freeze Frame)

Press PAUSE or one of the STILL/STEP buttons while playing a CAV LD.
The sound mutes and the picture freezes.

To resume normal playback
Press PLAY.

Playing frame-by-frame (Step Play)

1 Press one of the STILL/STEP buttons while playing a CAV LD.
The sound mutes and the picture freezes.

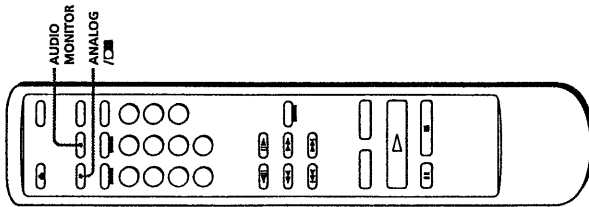
2 Press STILL or STEP repeatedly to advance or reverse the action frame-by-frame.
Hold down STILL or STEP to view continuous frame-by-frame action.

To resume normal playback
Press PLAY.

Tip

- When you play a CLV LD, Freeze Frame and Step Play are not available. When you press PAUSE, the screen goes blank. If you press STILL/STEP, "CLV SIDE A" appears briefly.

Using the sound control functions



Note

- The output level may differ between digital and analog sound.

Playing a stereo disc or Second Audio Program (SAP) disc

When playing SAP discs such as bilingual discs, you can alternate the sound output using AUDIO MONITOR.

To alternate the sound output

Press AUDIO MONITOR while playing the disc.

Each time you press AUDIO MONITOR, the on-screen indication changes as follows:

1/L → 2/R → 1/L 2/R

Indication	From stereo disc	From SAP disc
1/L	Left channel	Sound track 1 (Left channel)
2/R	Right channel	Sound track 2 (Right channel)
1/L 2/R	Stereo (Both channels)	Sound track 1 (Left channel) Sound track 2 (Right channel)

When you select 1/L (or 2/R), the sound of the left (or right) channel is output from both speakers.

Listening to analog sound on an LD

If your LD contains digital soundtracks, the player automatically outputs digital sound. To listen to sound recorded on analog soundtracks, use ANALOG/DIGITAL.

Press ANALOG/DIGITAL while playing the disc.

"h ANALOG" appears briefly on the screen and the analog sound is output.

To return to digital sound

Press ANALOG/DIGITAL repeatedly until "h DIGITAL" appears on the screen.

Playing discs with a CX (CX) logo

LDs bearing the CX logo are recorded with the CX noise reduction system, which gives lower noise level and higher dynamic range on analog sound. The player detects most CX discs and activates the CX noise reduction system automatically when outputting analog sound. If your CX LD does not contain a code to activate the CX noise reduction system, you can activate the CX noise reduction system manually while playing only analog sound.

To activate the CX noise reduction system manually




Press ANALOG/DIGITAL repeatedly until "CX ON" appears. The CX noise reduction system is activated.

Additional Information Troubleshooting

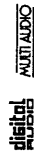
Symptom	Remedy
Power No Power	<ul style="list-style-type: none"> Connect the AC power cord securely.
Playback Playback does not start	<ul style="list-style-type: none"> Insert the disc correctly. When playing a CD, CDV or LD single, place it with the label facing up. Select the disc side on which signals are recorded. If there may be moisture condensation within the player, wait for about one hour before operating the player. Clean the disc.
Picture Playback stops every time a chapter/track ends	<ul style="list-style-type: none"> Press AUTO STOP on the player to turn off the AUTO STOP button indicator on the player.
Picture No picture, but the ► button indicator on the player lights up	<ul style="list-style-type: none"> Connect the TV correctly. Turn on the TV and set the input selector on the TV to "Video."
Picture Poor picture	<ul style="list-style-type: none"> Connect the TV correctly. Clean the disc.
Picture Visual noise while scanning a disc	<ul style="list-style-type: none"> A certain amount of visual noise and instability is inevitable while scanning a disc.
Picture Freeze Frame does not operate	<ul style="list-style-type: none"> Use a CAV disc. Freeze Frame does not operate on CLV LDs, CDVs or VSDs.
Sound No sound	<ul style="list-style-type: none"> Connect the TV or amplifier correctly. Turn up the volume on the TV or amplifier. Switch on the amplifier and set the input selector to "CD" or "AUX." Playback at normal speed. No sound is output while in pause mode.
Others Remote Commander does not operate	<ul style="list-style-type: none"> Turn on the player. Point the remote commander at the remote sensor on the player. Remove any obstacles between the remote commander and the sensor. Insert the batteries correctly. Replace both the batteries with new ones if they are weak.

Optical discs

The MDF-A550 can play all three types of optical discs currently available for home entertainment, laser discs (LD, recorded in NTSC standard), compact discs (CD) and compact disc videos (CDV). *

Disc class	Disc logo	Disc type	Size	Sides	Play time
Laser Discs For movies, operas, and concerts		LD Single	8 in. (20 cm)	Single	14 min CAV 20 min CLV
		8-inch LD	8 in. (20 cm)	Double	28 min CAV 40 min CLV
		12-inch LD	12 in. (30 cm)	Double	1 hr CAV 2 hr CLV
Compact Discs For music		CD Single	3 in. (8 cm)	Single	20 min
Compact Disc Videos For music videos and educational material (Digital Audio)		CD	5 in. (12 cm)	Single	74 min
		CDV	5 in. (12 cm)	Single	Video+Audio 5 min Audio 20 min
		VSD	5 in. (12 cm)	Single	Video+Audio 5 min

Multi audio discs



Discs with these logos contain separate analog and digital tracks which may differ in content.

- * The MDF-A550 cannot play the following discs or functions:
- CED, VHD discs or PAL video discs
 - CD-ROM, CD-Graphics, VIDEO CD, Photo CD, CD-I discs
 - Aluminum-lined discs or MD (MiniDisc) discs
 - Graphic functions of LD-G discs

Optical disc maintenance

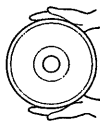
Holding CDs or CDVs

Hold CDs and CDVs by putting your index finger through the center hole and grasping the edge of the disc with the thumb and other fingers as pictured in the illustration.



Holding LDs

Hold LDs by grasping the outside edge with both hands as illustrated.



Light exposure

Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave the disc in a car parked in direct sunlight where there can be a considerable rise in temperature.

Cracked or damaged discs

Do not play cracked or damaged discs, or try to play discs that have been repaired with adhesive glues.

Keeping the disc surface clean

Clean the surface of the disc before playing, using a soft, dry, cleaning cloth. Wipe the disc from the center out. Do not use solvents such as benzene, paint thinner, commercially available cleaners, or anti-static spray intended for LP record discs.



To prevent marring, after playing, remove the disc and put it back into its jacket.

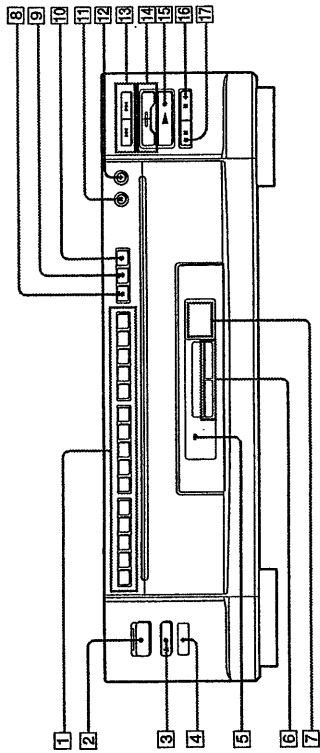


Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad, paper or adhesive tape, will deteriorate the quality of the playing surface, and thus the output quality.

Index to parts and controls

See the pages indicated in () for details.

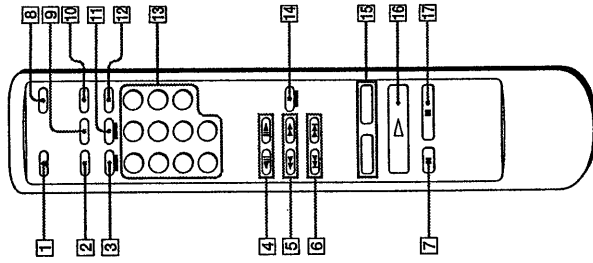
Front




- 1 Number buttons (10) (16)
- 2 POWER switch and indicator (8)
- ON: Green
- STANDBY: Red
- 3 OPEN/CLOSE button (8)
- 4 Remote sensor (20)
- 5 AUTO RESUME indicator (13)
- 6 SIDE A/B indicators (9)
- 7 Chapter/track number indicator (9)

- 8 RESERVE button and indicator (10)
- 9 NEXT DISC RESERVE button and indicator (11)
- 10 CLEAR button (10) (17)
- 11 ANALOG/CX button (19)
- 12 AUTO STOP button and indicator (9)
- 13 <</>/>>/>> ACS/AMS buttons (15)
- 14 SIDE A/B buttons and indicators (9)
- 15 (Play) button and indicator (8)
- 16 (Stop) button (8)
- 17 (Pause) button and indicator (8)

Remote commander

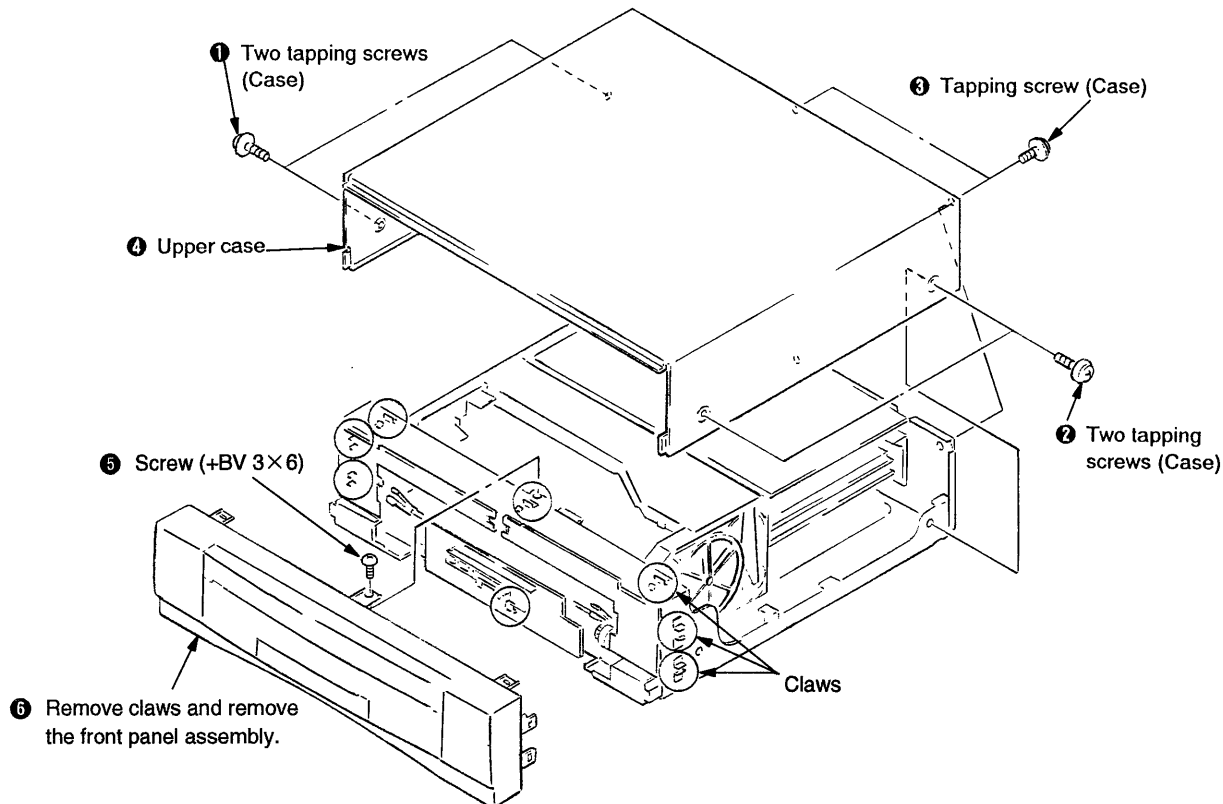


- 1 OPEN/CLOSE button (8)
- 2 ANALOG/CX button (19)
- 3 RESERVE button (10)
- 4 <||/||> STILL/STEP buttons (18)
- 5 <</>/>>/>> SCAN buttons (15)
- 6 <</>/>>/>> ACS/AMS buttons (15)
- 7 PAUSE button (8)
- 8 POWER switch (8)
- 9 AUDIO MONITOR button (19)
- 10 DISPLAY button (14)
- 11 NEXT DISC RESERVE button (11)
- 12 CLEAR button (10) (17)
- 13 Number buttons (10) (16)
- 14 REPEAT button (17)
- 15 DISC SIDE A/B buttons (9)
- 16 >> PLAY button (8)
- 17 ■ STOP button (8)

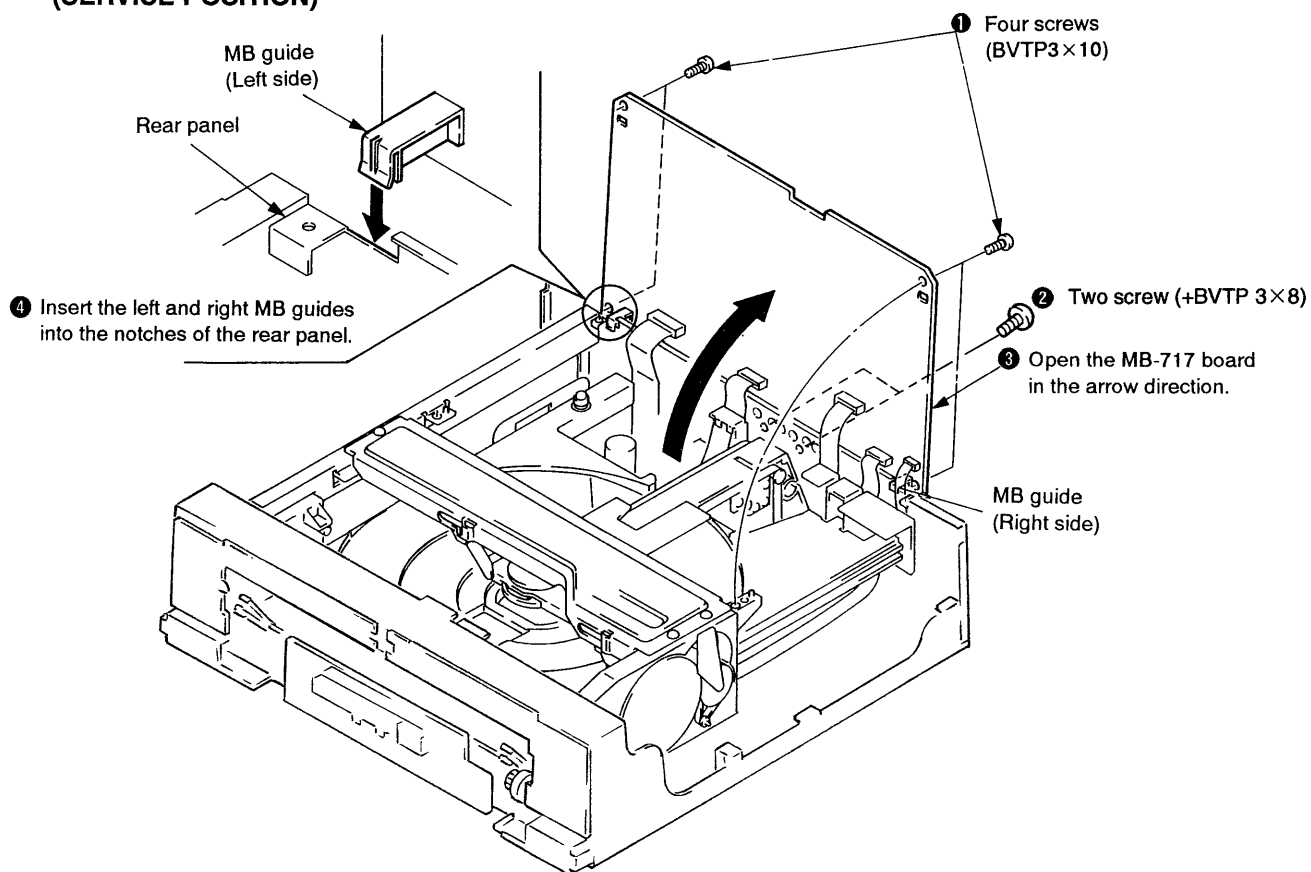
 A function activated by pressing a button with an orange mark can be canceled by pressing the CLEAR button.

SECTION 2 DISASSEMBLY

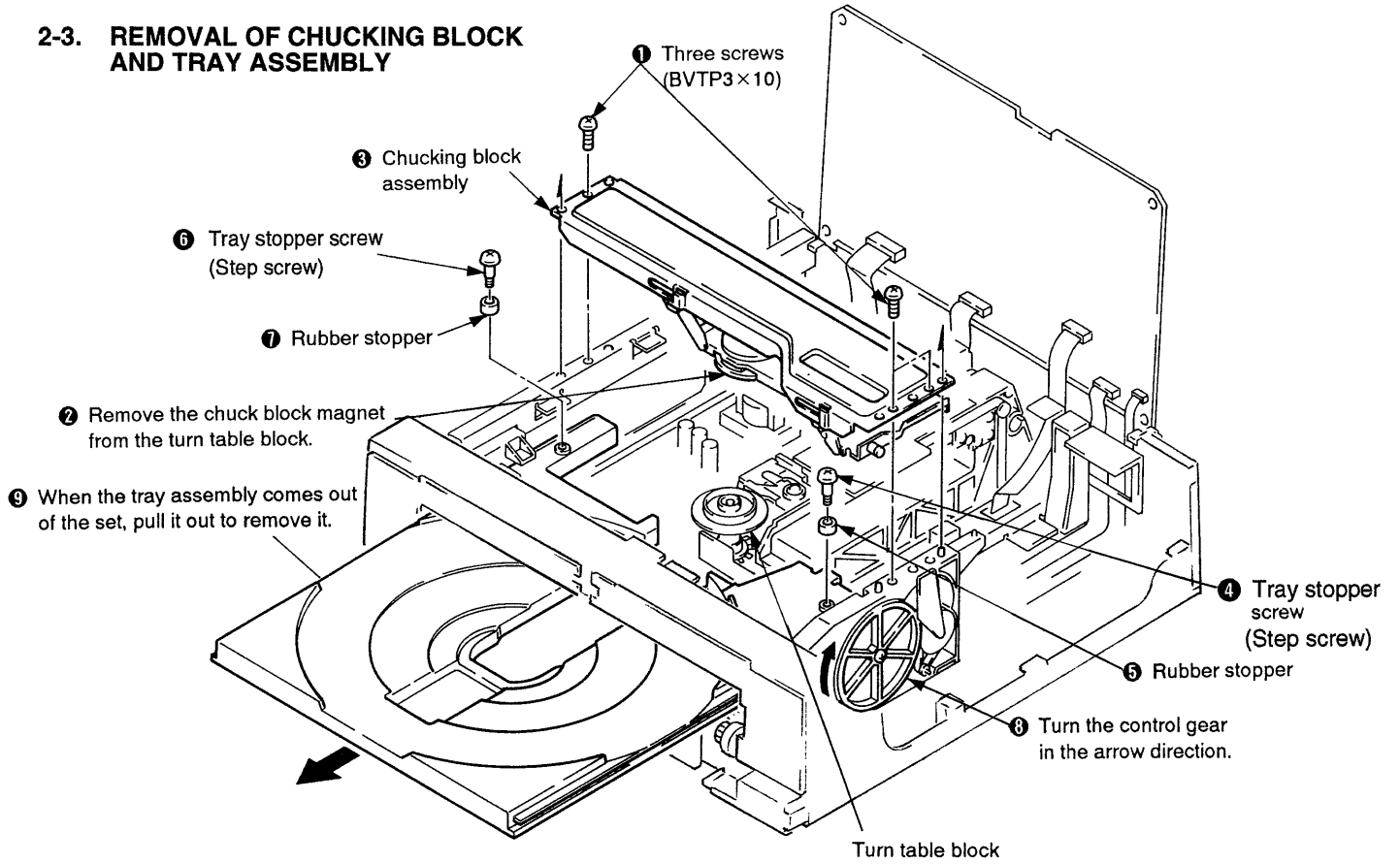
2-1. REMOVAL OF FRONT PANEL ASSEMBLY



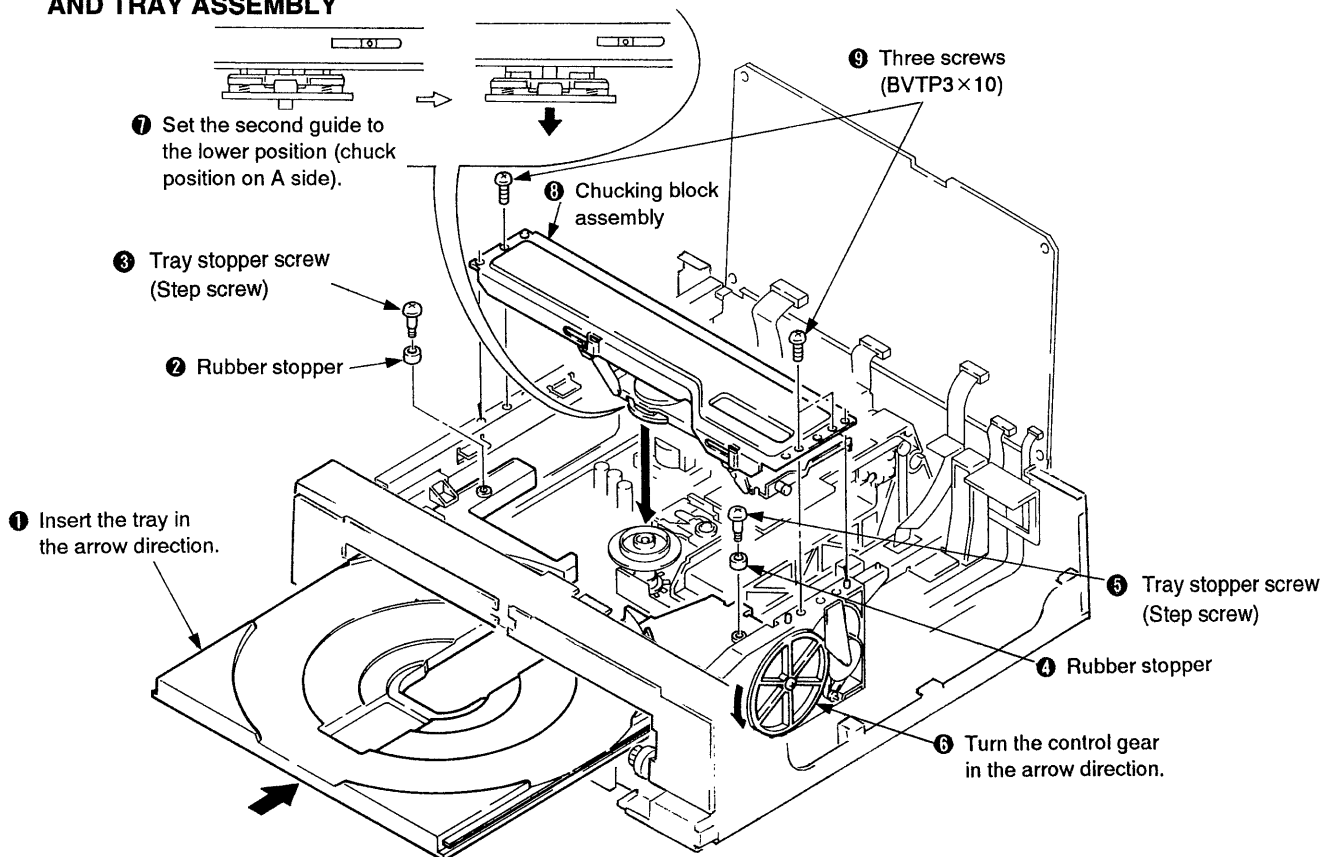
2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)



2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY

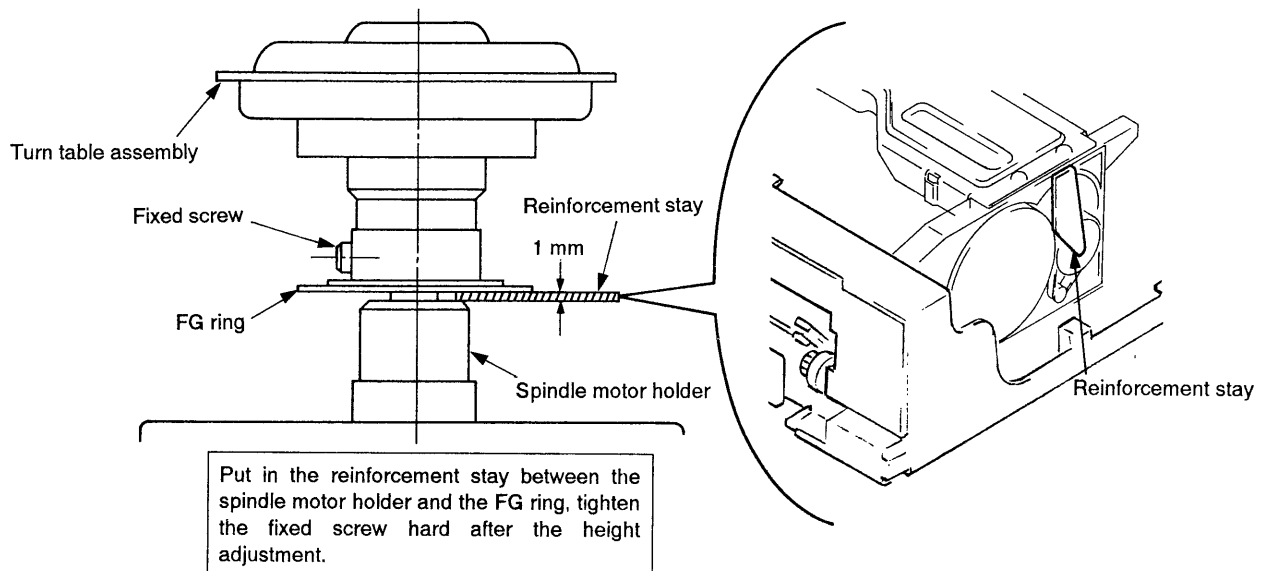


2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY

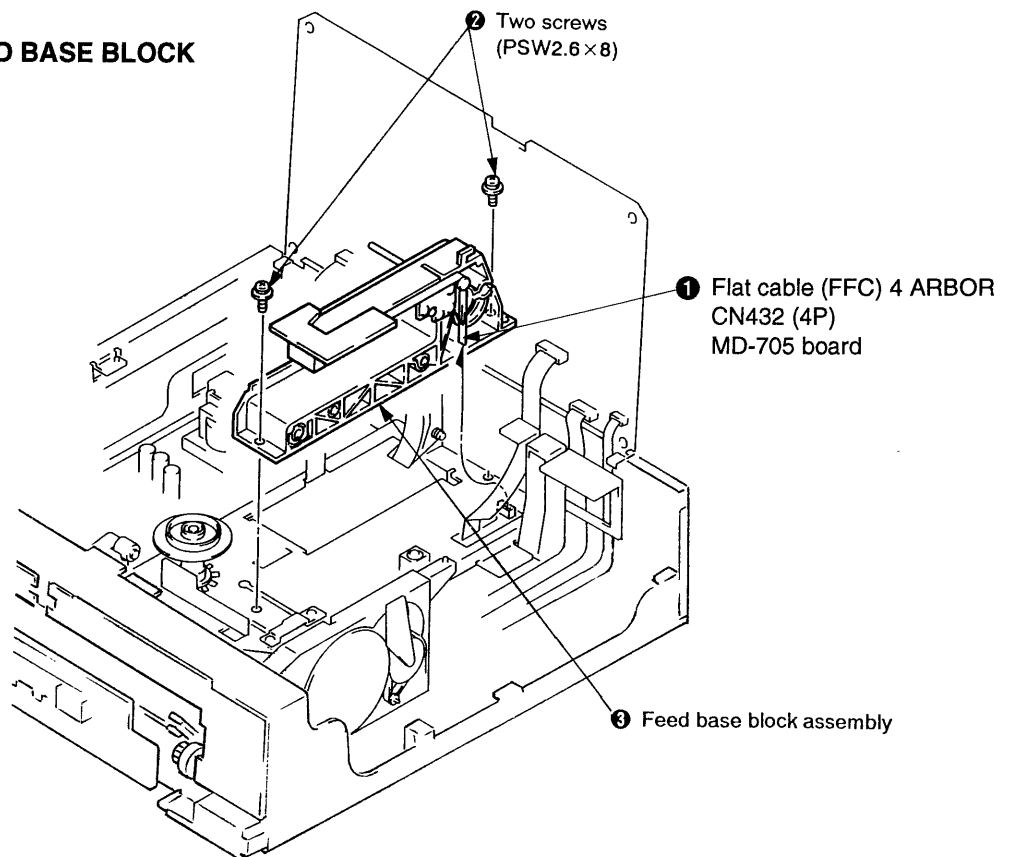


2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

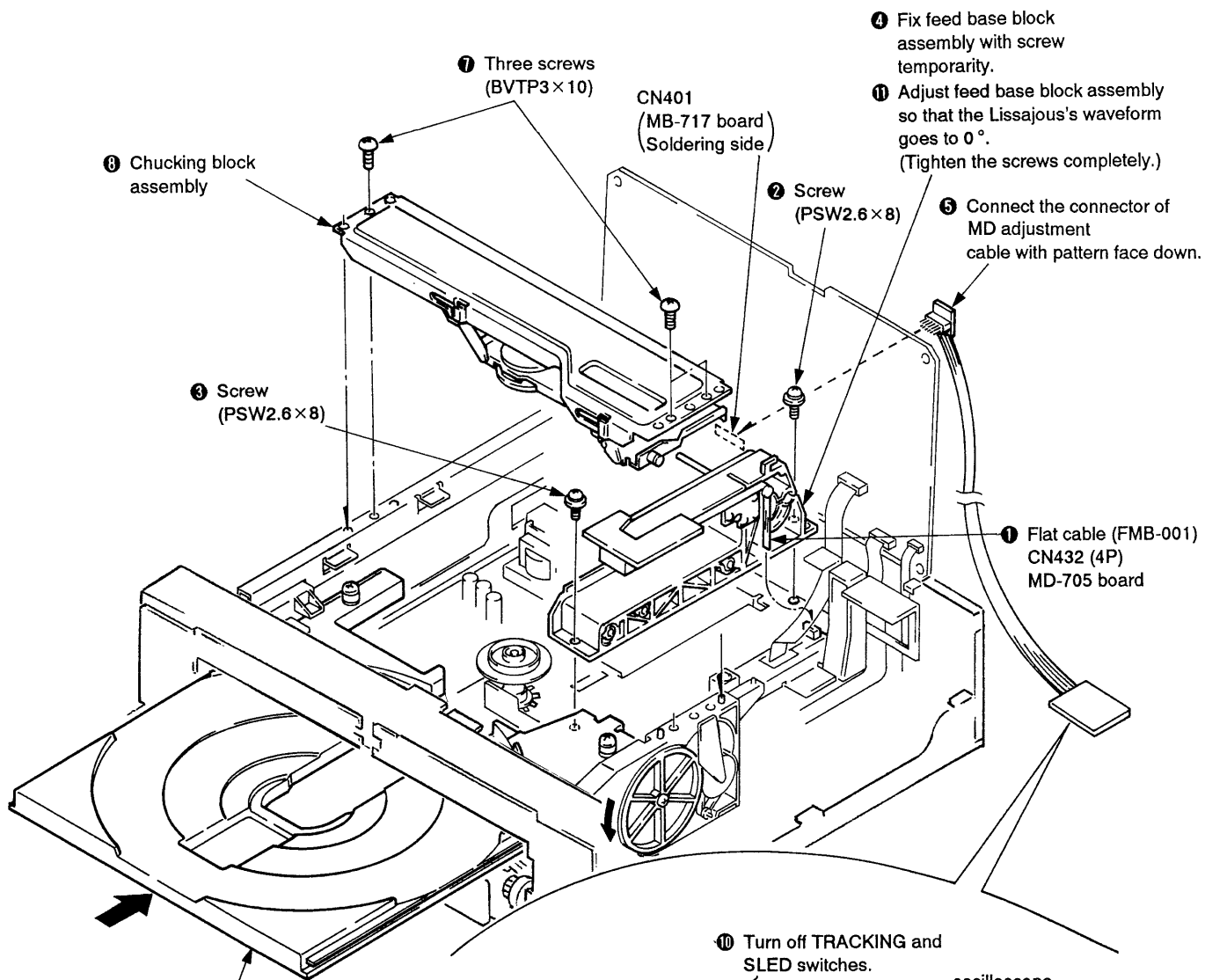
1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
Adjust the height and also the position putting in the reinforcement stay as below.
The thickness of the reinforcement is 1 mm.
5. Fix the reinforcement to fixed position.



2-6. REMOVAL OF FEED BASE BLOCK ASSEMBLY

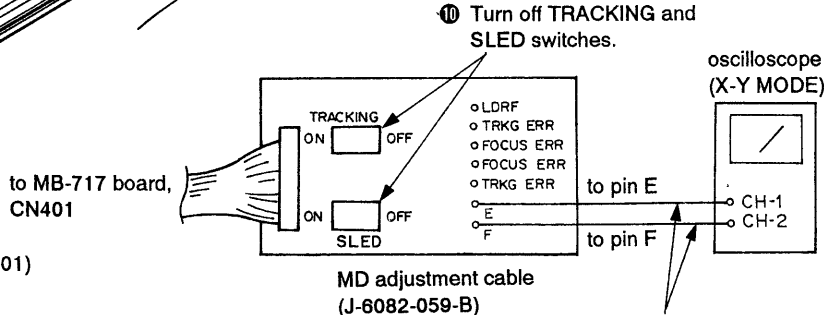


2-7. MOUNTING THE FEED BASE BLOCK ASSEMBLY



- ④ Fix feed base block assembly with screw temporarily.
- ① Adjust feed base block assembly so that the Lissajous's waveform goes to 0°. (Tighten the screws completely.)

- ③ Screw (PSW2.6 x 8)
- ⑧ Chucking block assembly
- ⑨ Set the CD (YEDS-18: 3-702-101-01) on the tray. Press the PLAY (▶) button and plays the track No. 1 set PAUSE.



- ⑩ Turn off TRACKING and SLED switches.
- ⑫ Refer to 7-10. Adjustment after the attachment of the optical pick-up block. (Page:7-14)

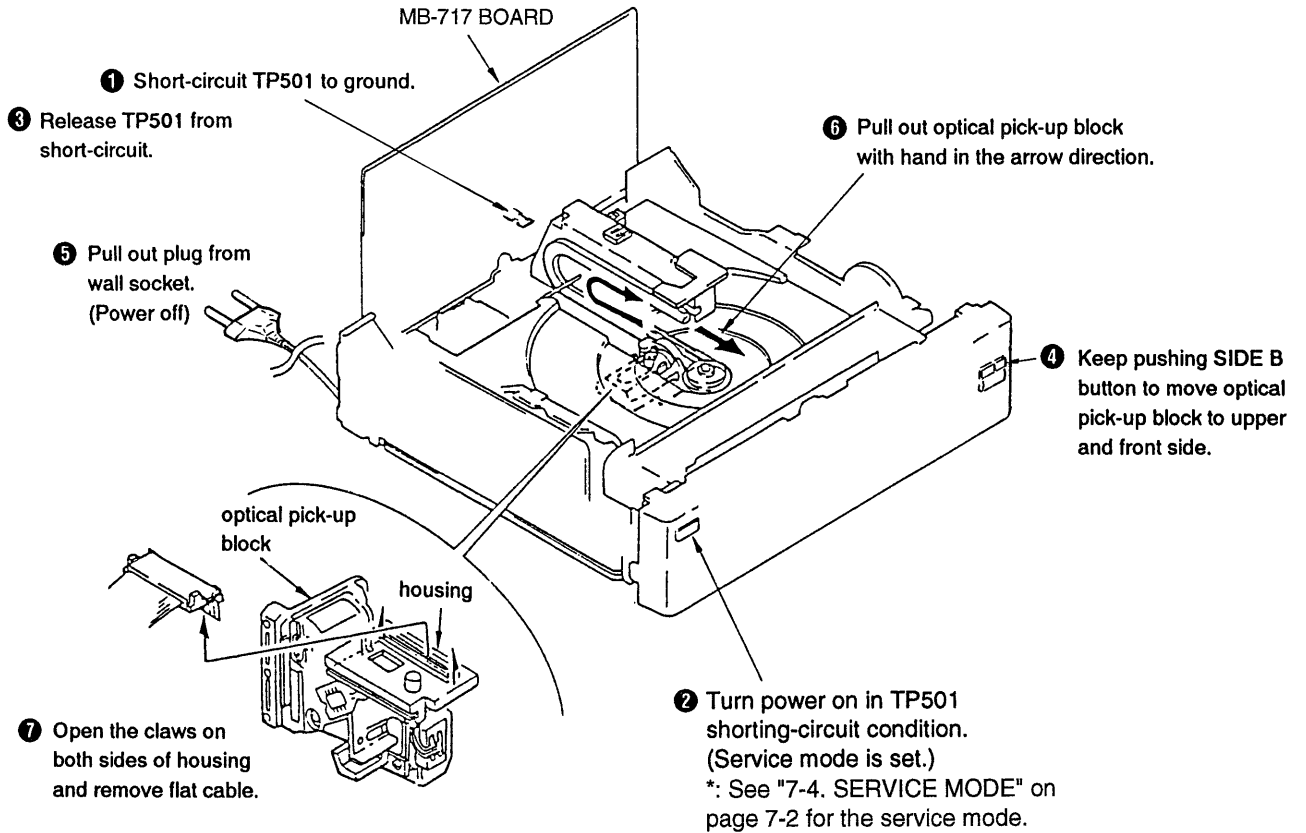
- ⑤ Connect the connector of MD adjustment cable with pattern face down.
- ⑥ Connect CH-1 to pin E and CH-2 to pin F.

Lissajous's waveform

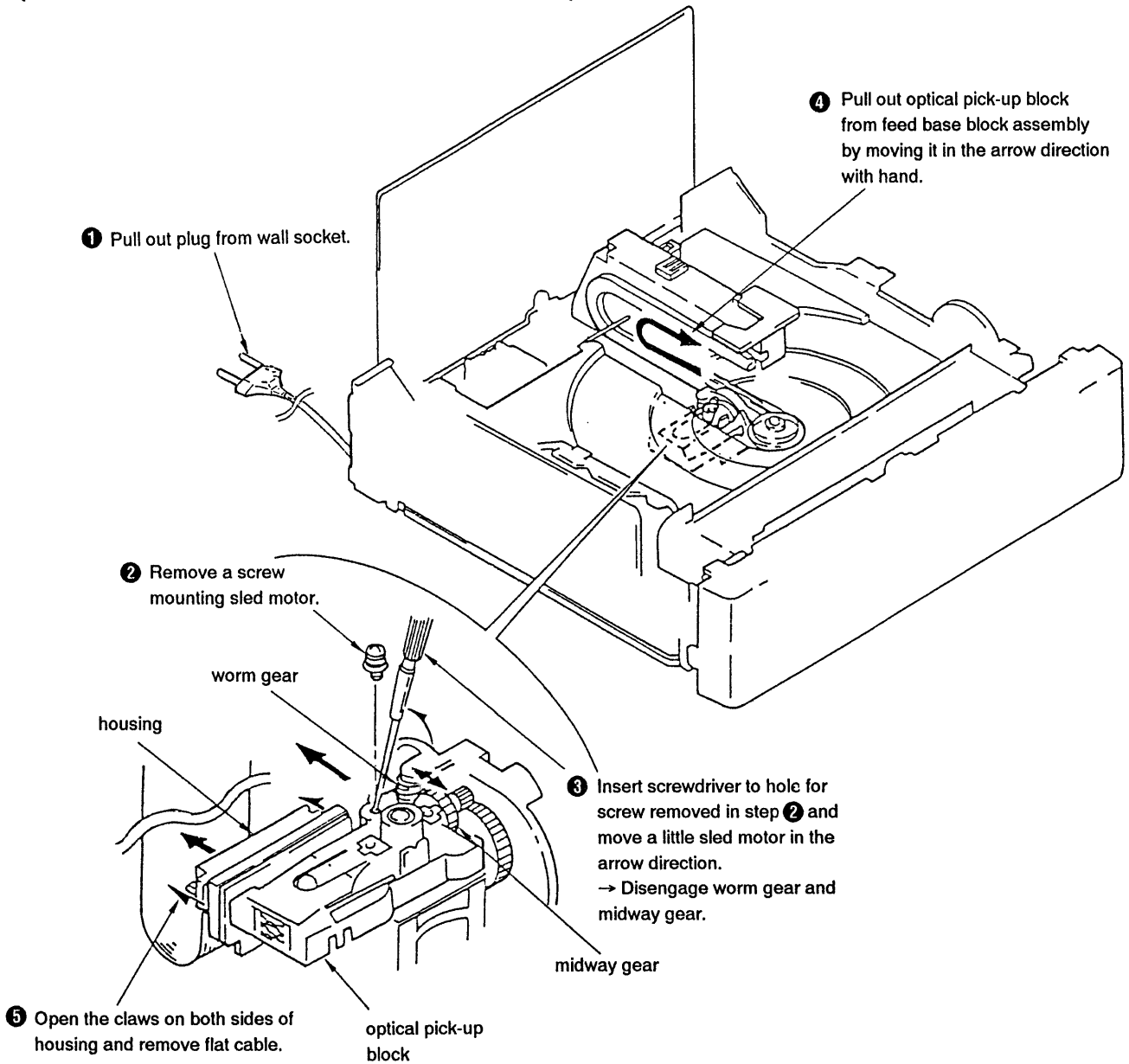
x	x	○
180°	90°	0°
∖	○	/

2-8. OPTICAL PICK-UP BLOCK

• DISASSEMBLE I (OPTICAL PICK-UP BLOCK MOTOR OPERATES)

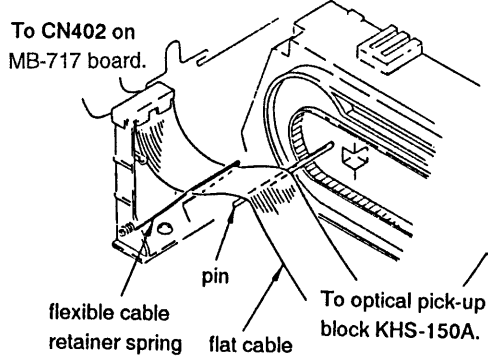


• **DISASSEMBLE II**
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)



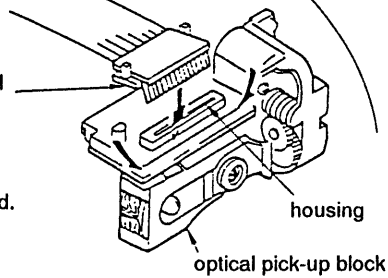
• ASSEMBLE

- ③ Confirm the flat cable goes through the flexible cable retainer spring and over the pin.

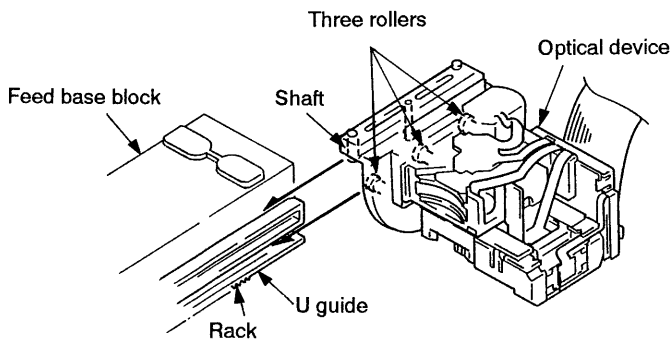


- ④ Insert plug to wall socket.

- ① Insert flat cable to housing on optical pick-up block. Confirm the claws on both sides of housing are locked.



- ⑤ Turn power on. → Optical pick-up block moves into feed base block assembly.



- ② Insert optical pick-up block to feed base block assembly.

- Mounting
- 1) Insert the shaft and three rollers of the optical device into their corresponding grooves of the U guide.
- 2) Set so that the gear of the optical device engages with the rack of the U guide.

2-9. REMOVAL OF CONTROL GEAR

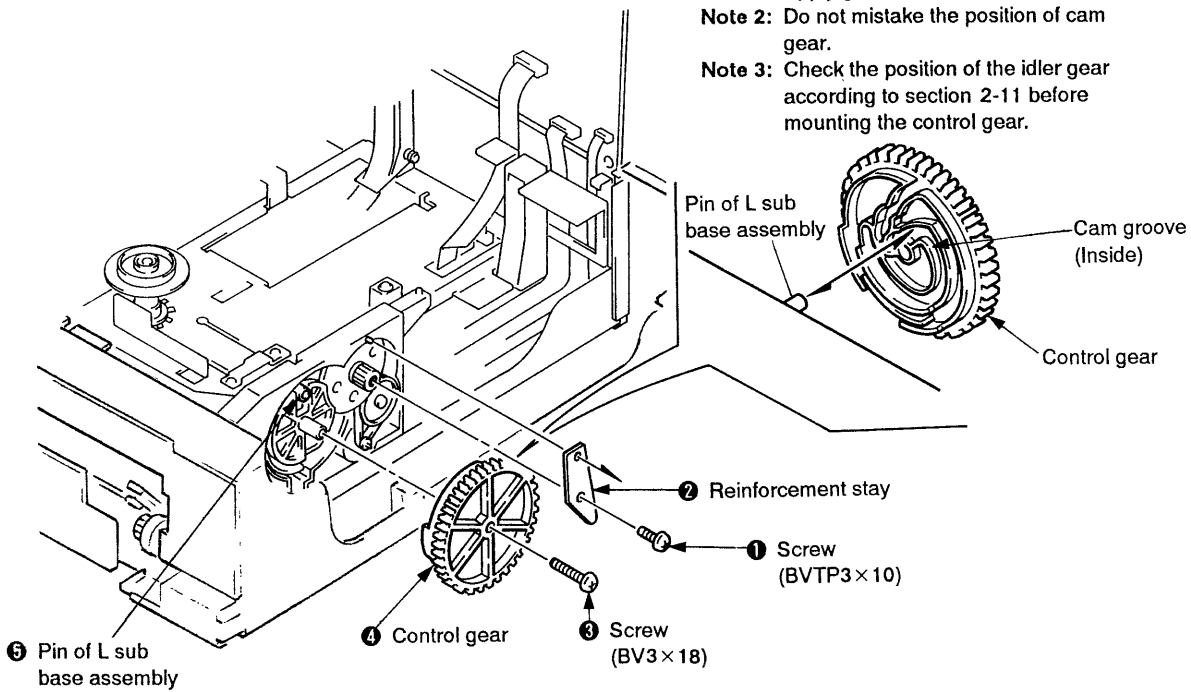
- Mounting the control gear

Lower the pin of the L sub base assembly completely and insert the pin into the cam groove (inside) of the control gear.

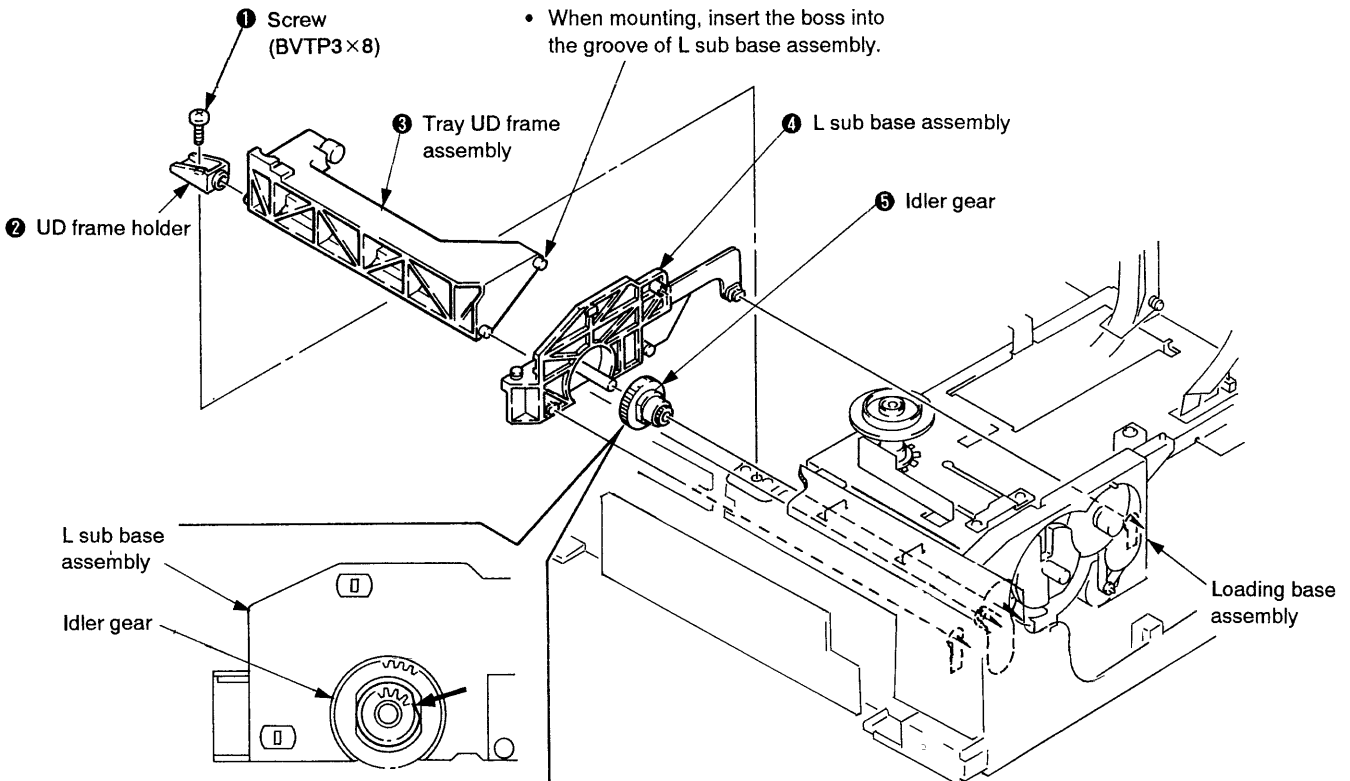
Note 1: Apply grease on the cam groove.

Note 2: Do not mistake the position of cam gear.

Note 3: Check the position of the idler gear according to section 2-11 before mounting the control gear.



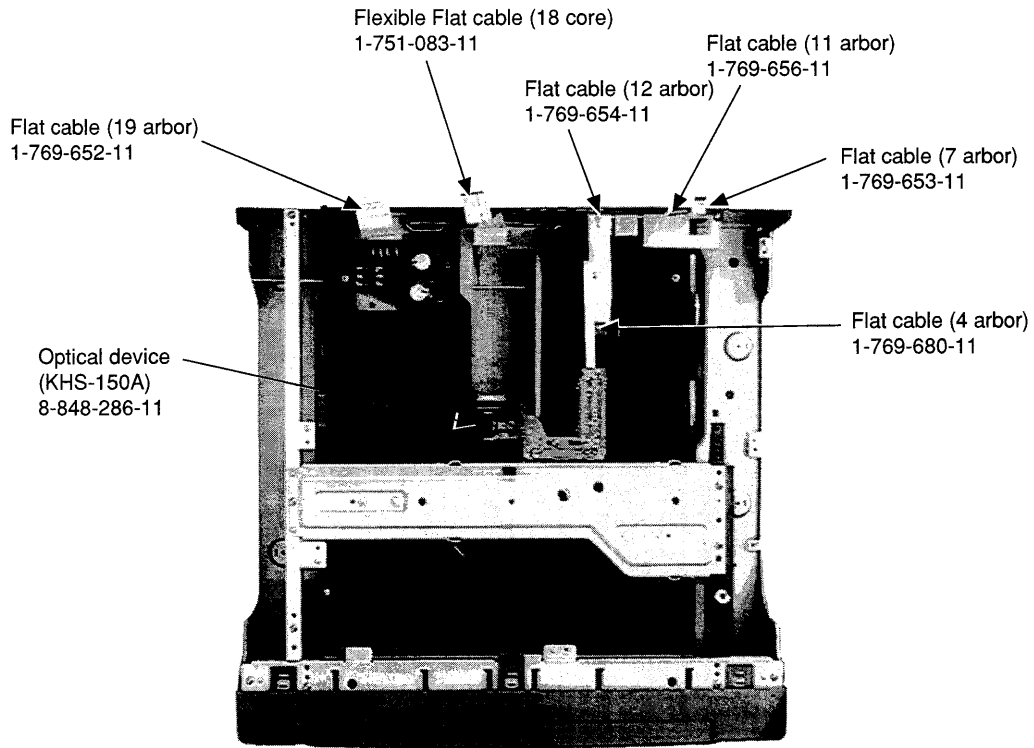
2-10. REMOVAL OF IDLER GEAR



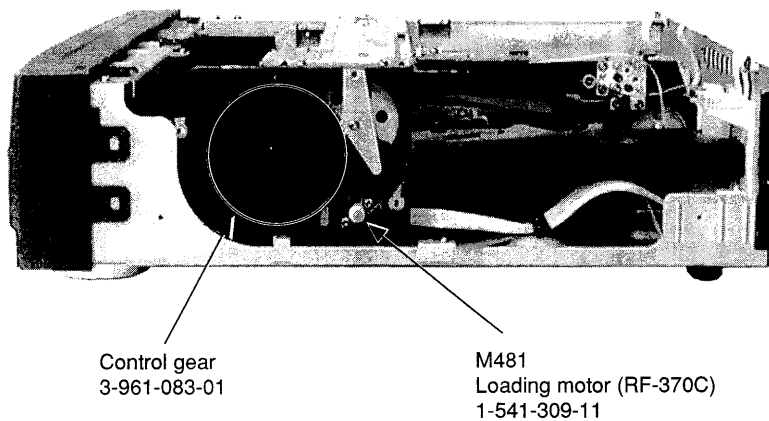
- Positioning the idler gear
Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-11. INTERNAL VIEWS

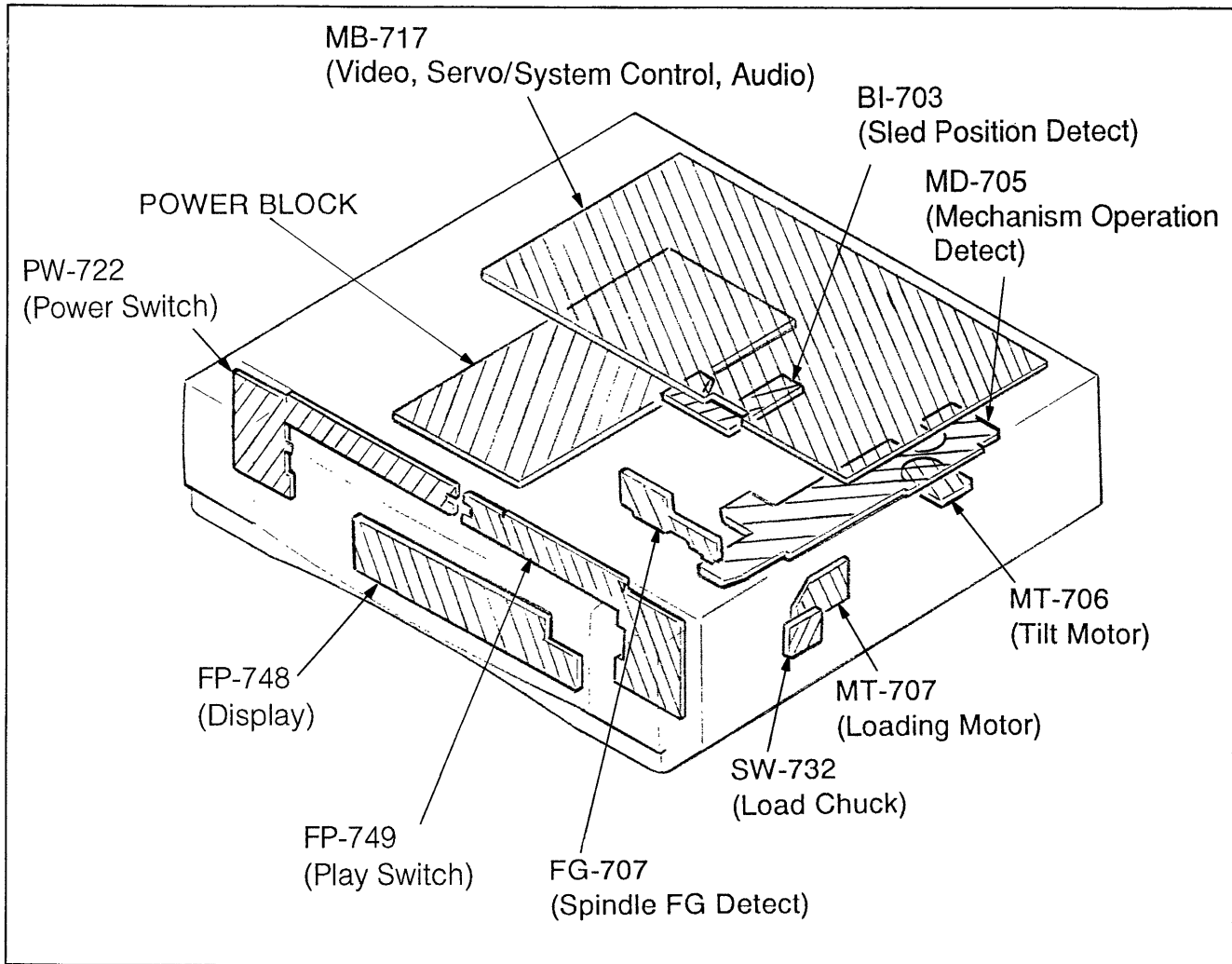
—Top View—



—Side View—

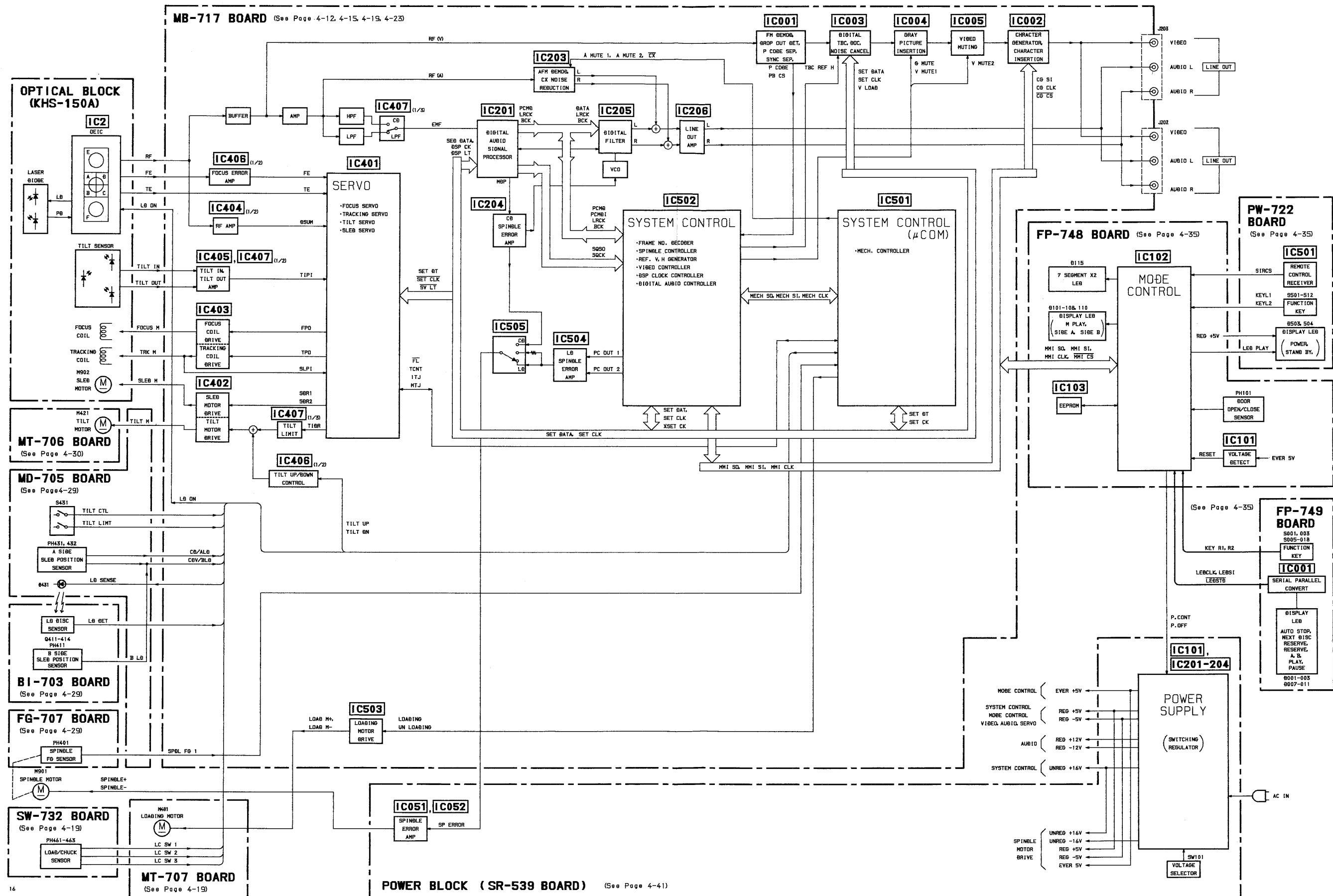


2-12. CIRCUIT BOARDS LOCATION

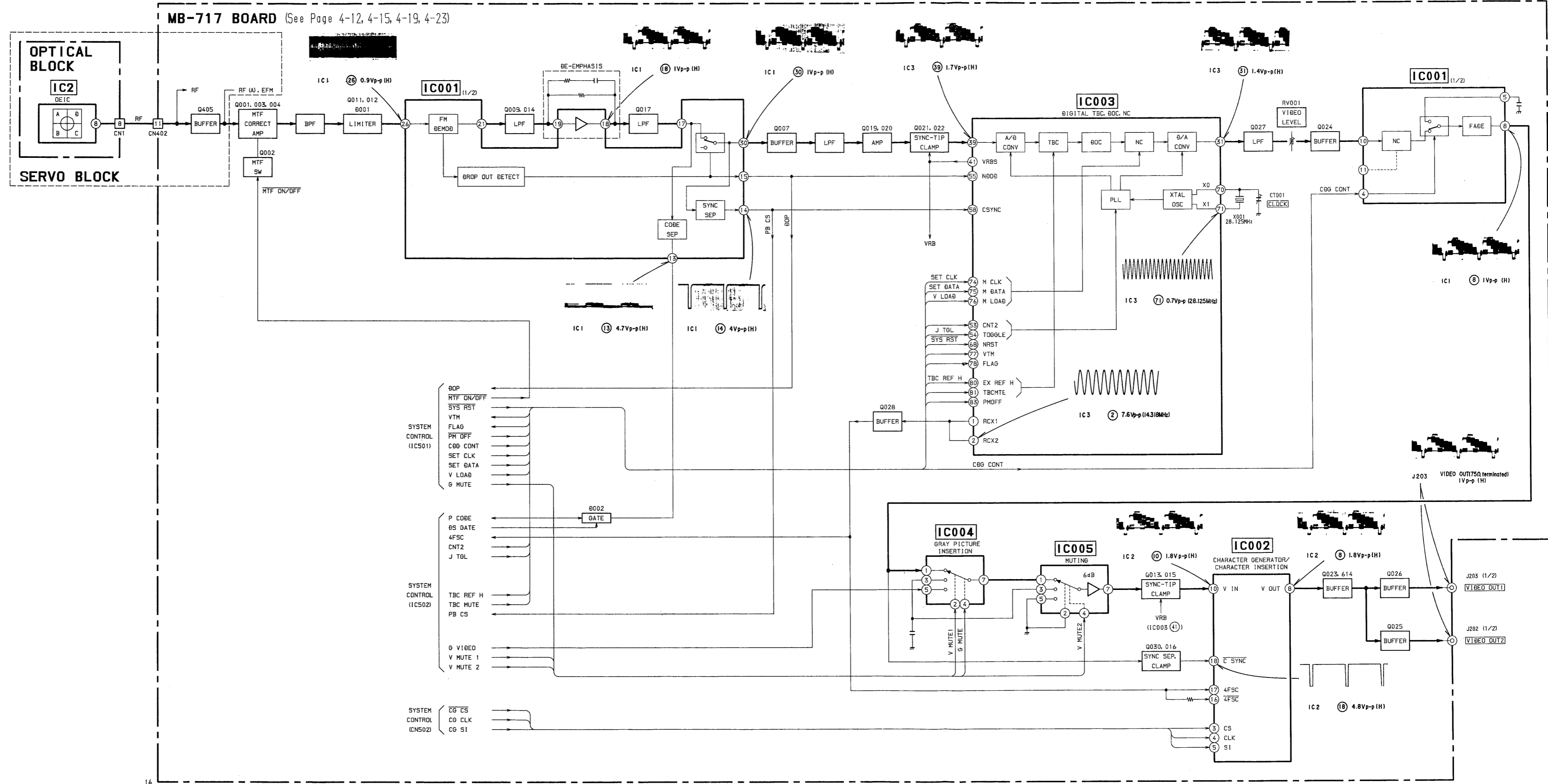


SECTION 3
BLOCK DIAGRAMS

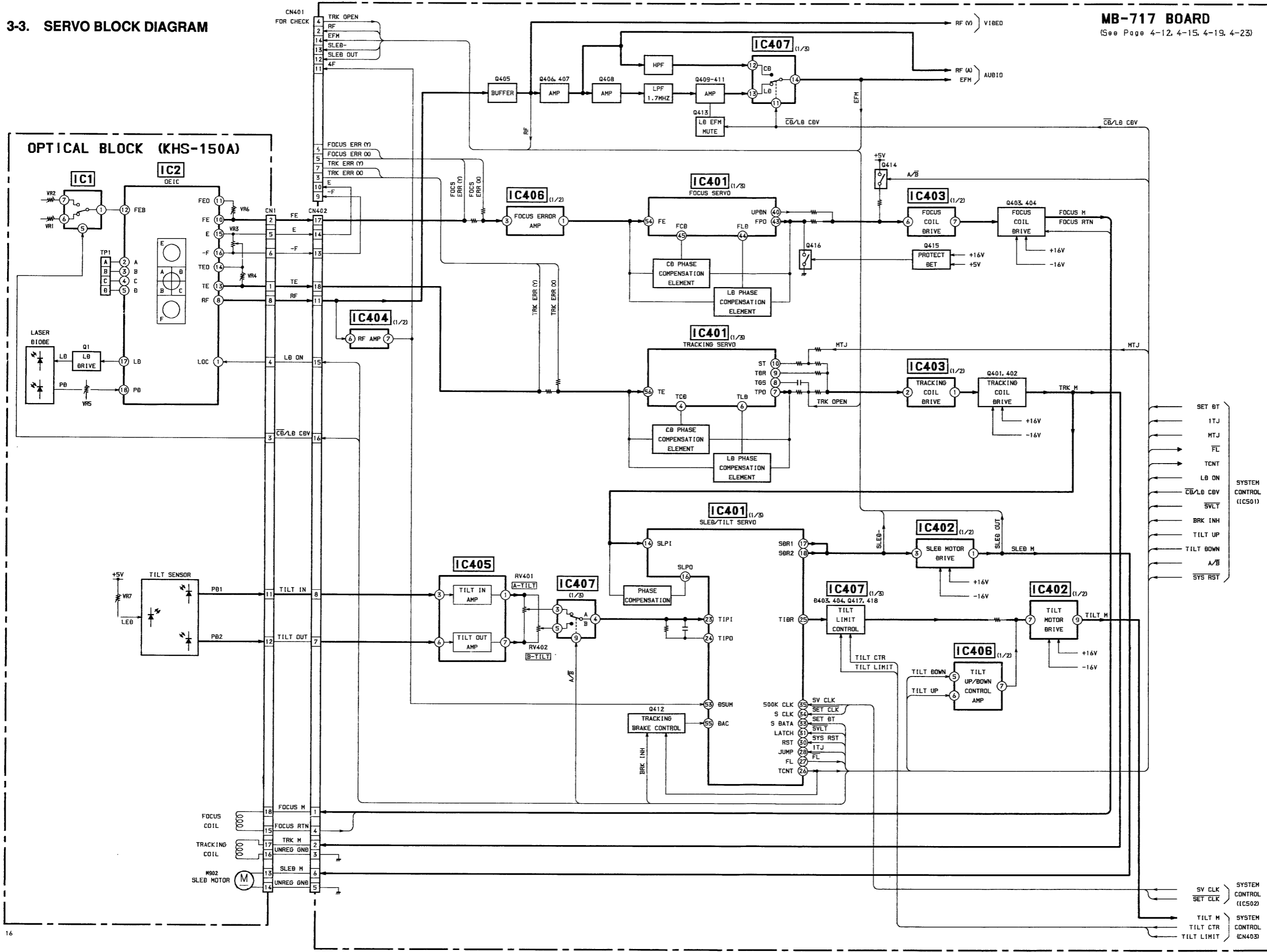
3-1. OVERALL BLOCK DIAGRAM



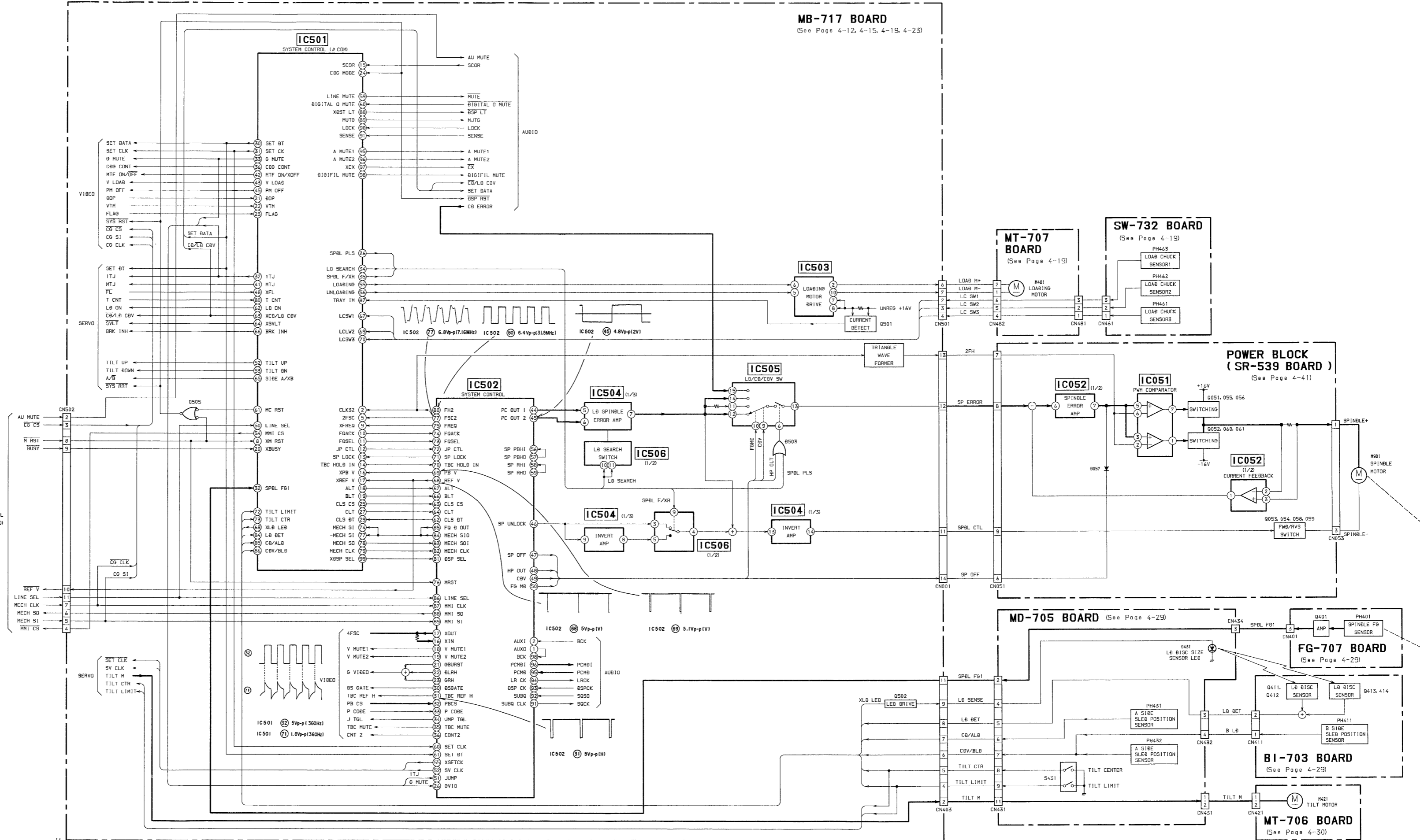
3-2. VIDEO BLOCK DIAGRAM



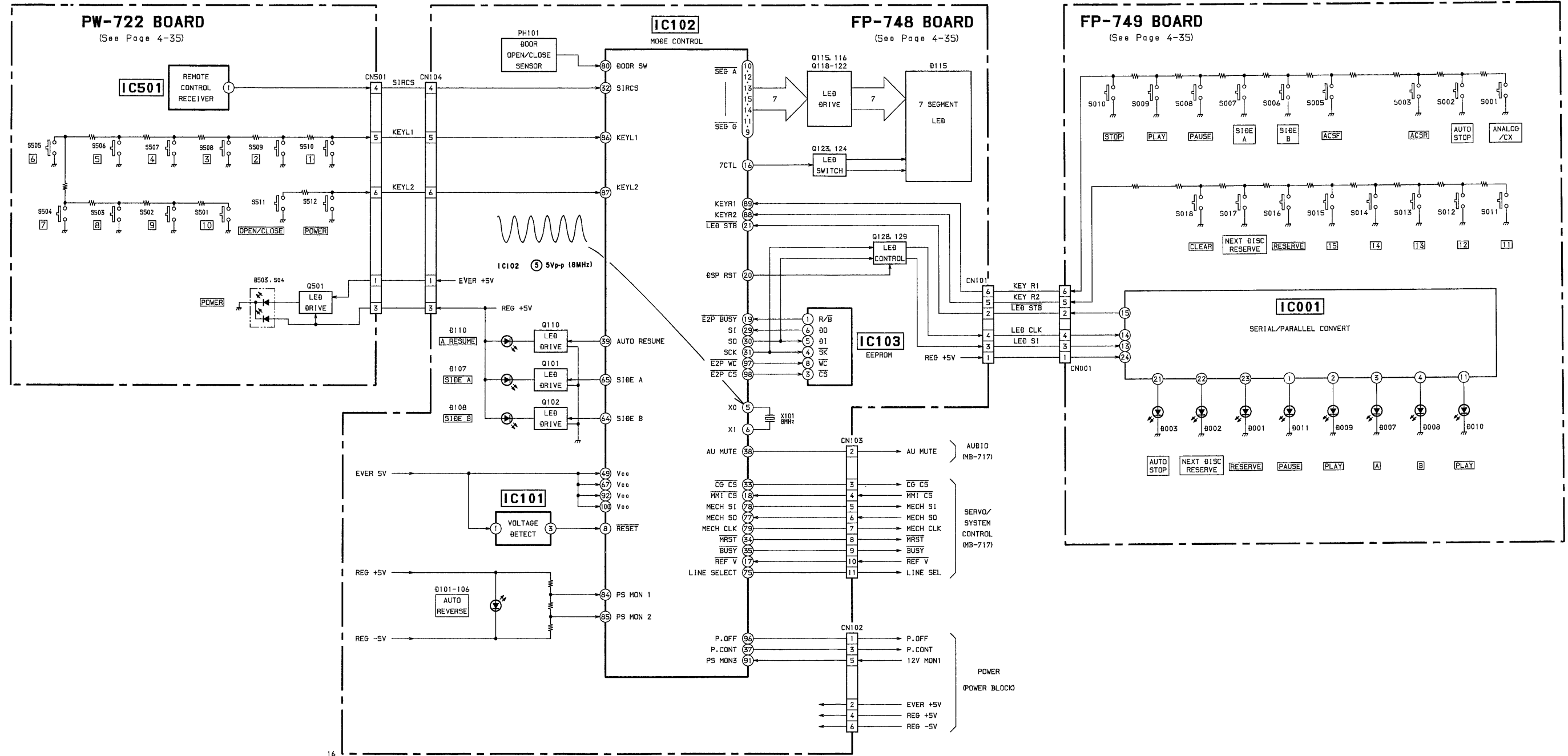
3-3. SERVO BLOCK DIAGRAM

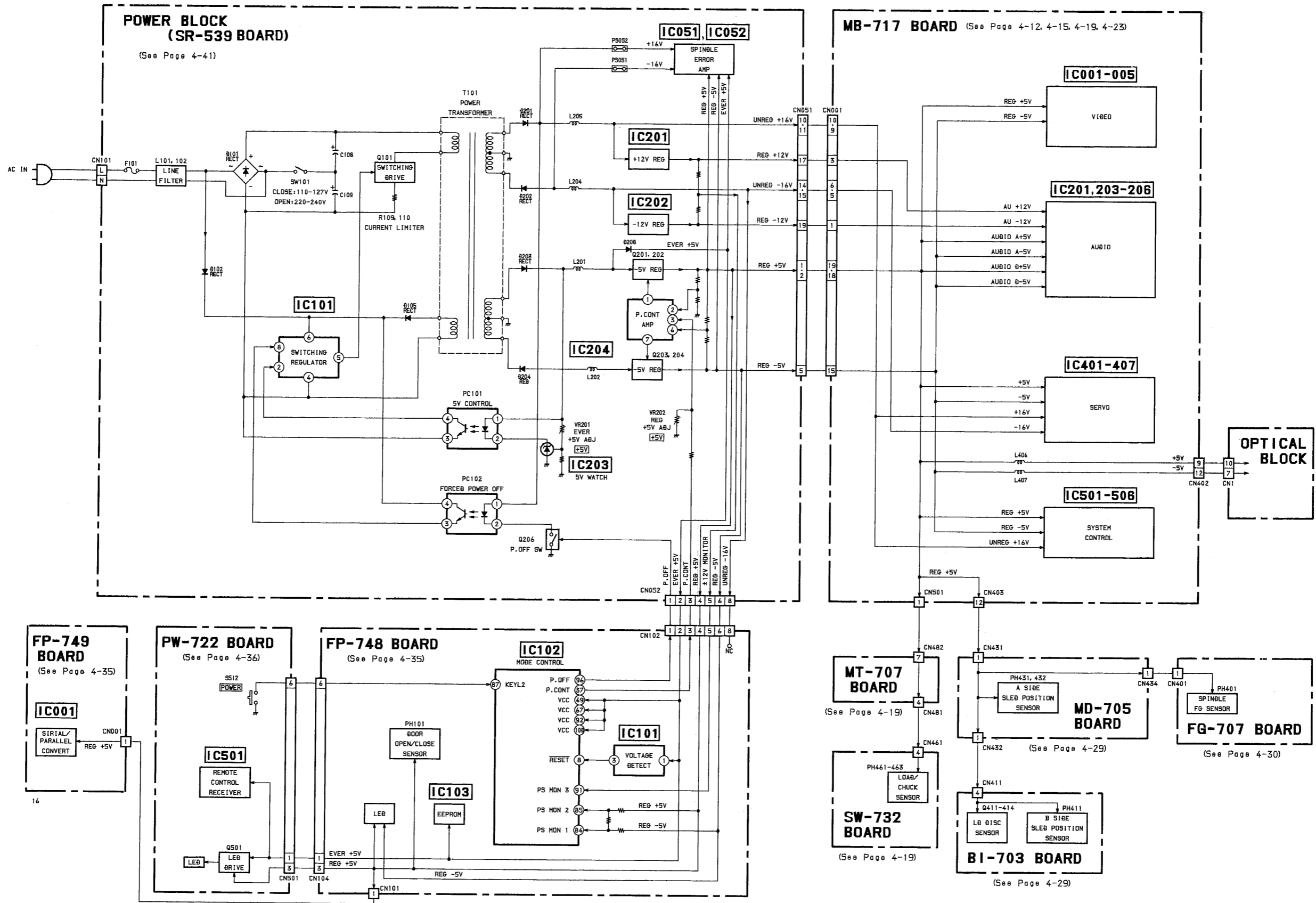


3-4. SYSTEM CONTROL BLOCK DIAGRAM



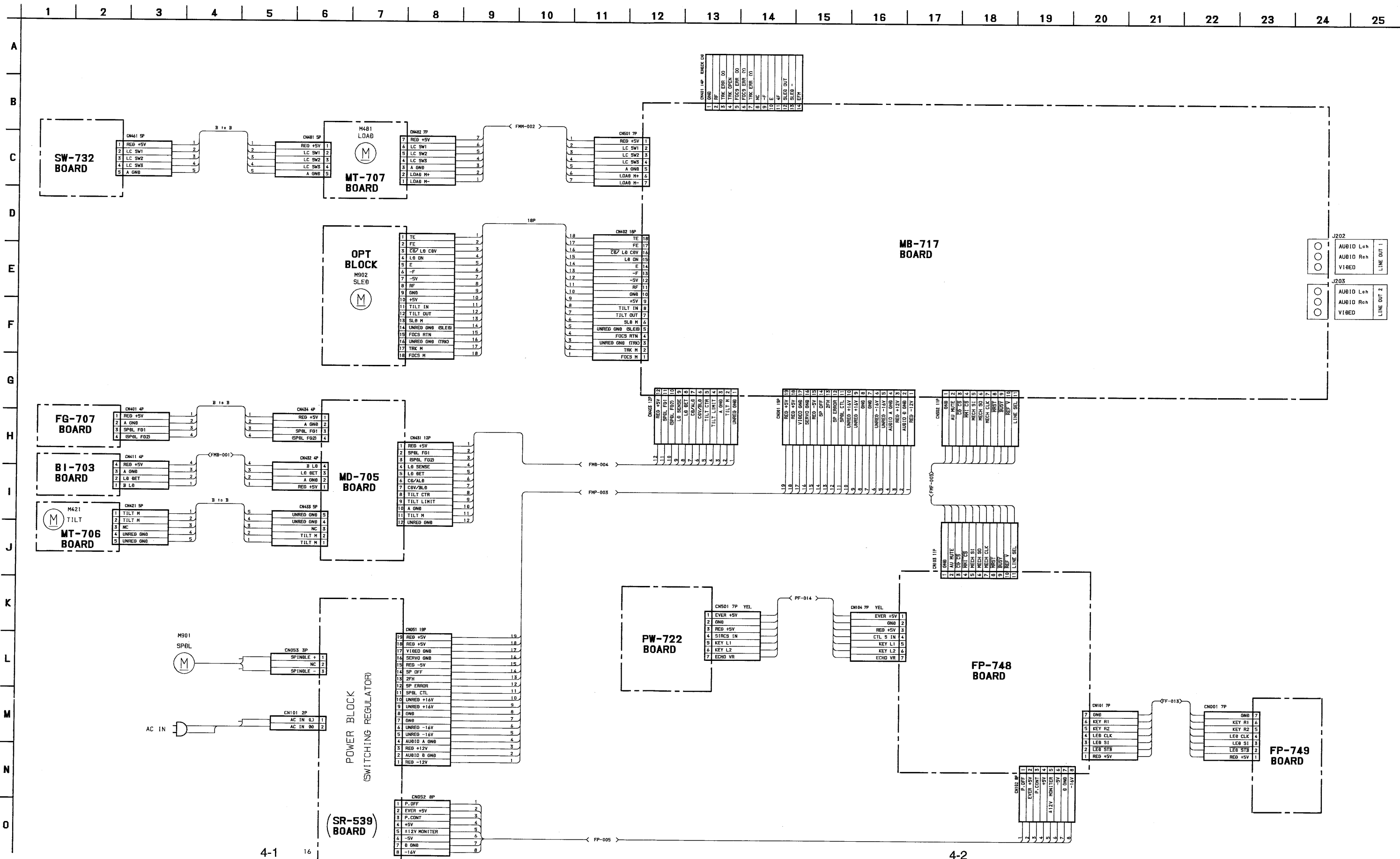
3-5. MODE CONTROL BLOCK DIAGRAM





SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-1 16

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- For printed wiring boards.
- ○ : indicated a lead wire mounted on the component side.
- ○ : Through hole is omitted.
- ◻ : Pattern from the side which enables seeing.
- ◻ : Pattern of the rear side.*

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

- Circled numbers refer to waveforms.
- For schematic diagrams.
- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.

- All resistors are in ohms, 1/4W unless otherwise noted.
Chip resistor are 1/10W unless otherwise noted.
kΩ : 1000Ω , MΩ : 1000kΩ .

- All capacitors are in μF unless otherwise noted. pF: μμF.
50V or less are not indicated except for electrolytics and tantalums.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

- ◻ : fusible resistor.
- ◻ : panel designation.
- ◻ : adjustment for repair.*
- — : B+ Line.*
- - - - : B- Line.*
- ◻ : IN/OUT direction of (+, -) B LINE.*
- Circled numbers refer to waveforms.
- Voltages are dc between ground and measurement points.*
- Readings are taken under pause mode.
(NTSC REF DISC HLV-8 SIDE 1 FRAME No. 4100)
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

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

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

*: indicated by the color red.

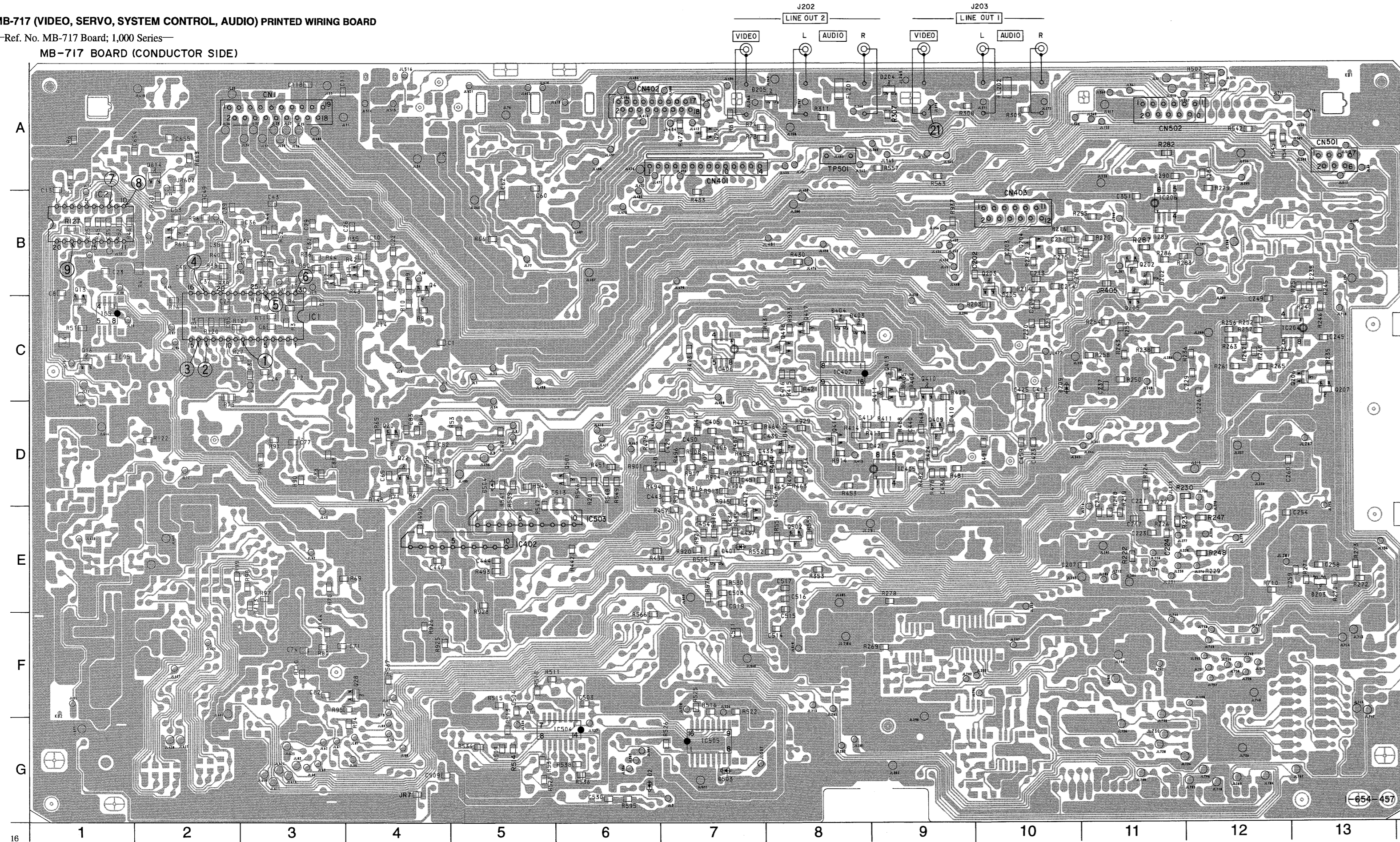
4-3

MDP-A550

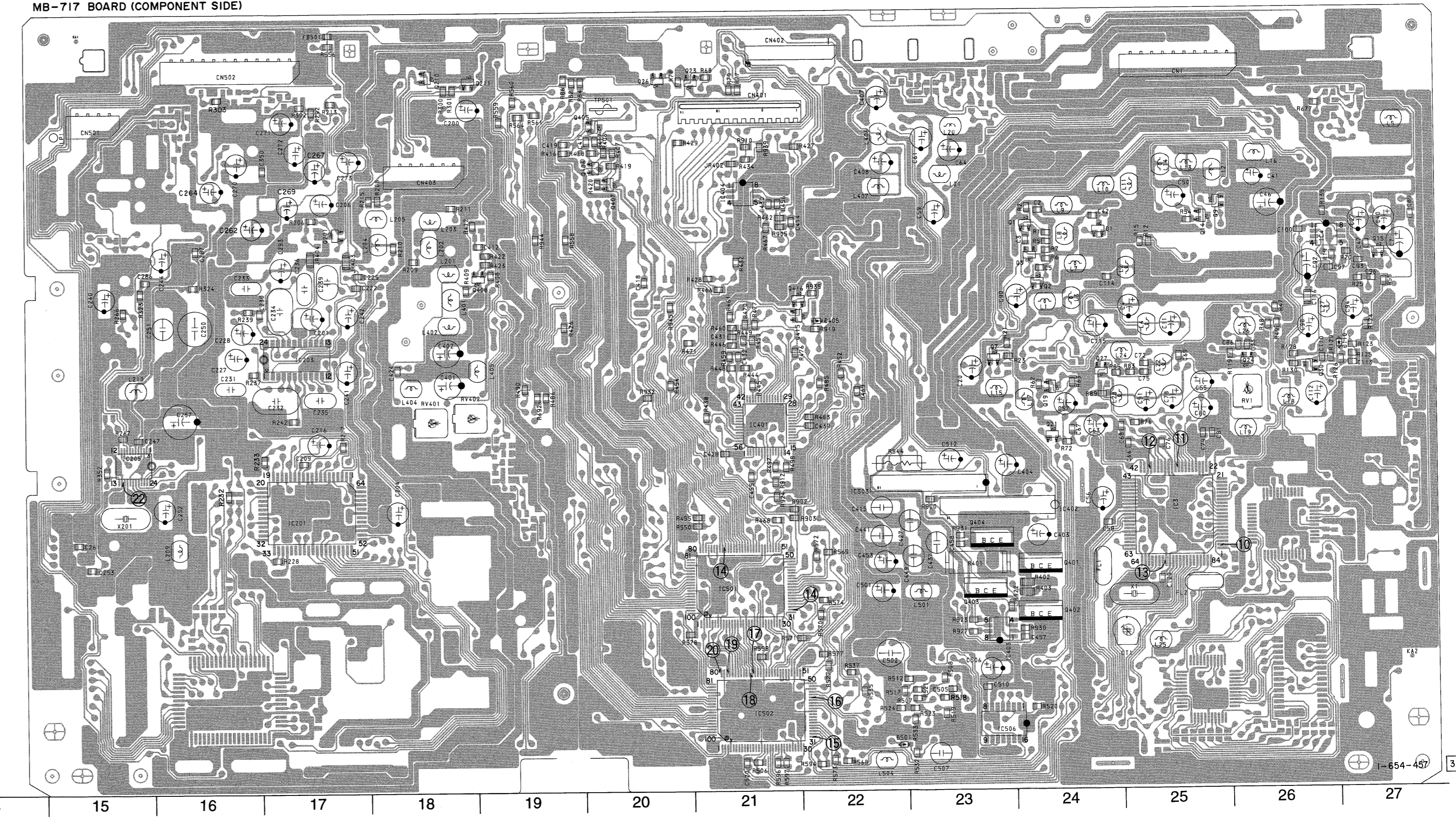
MB-717 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

—Ref. No. MB-717 Board: 1,000 Series—

MB-717 BOARD (CONDUCTOR SIDE)

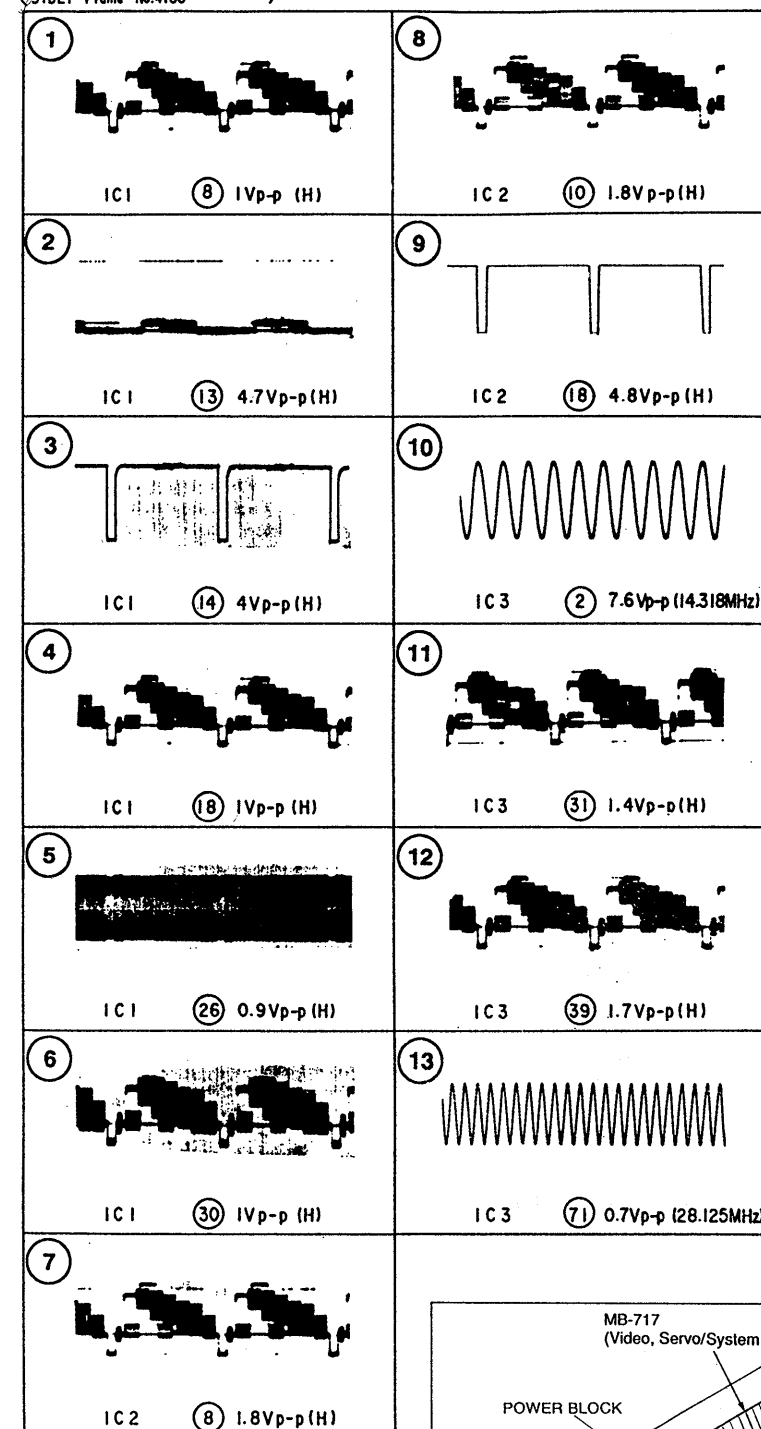


MB-717 BOARD (COMPONENT SIDE)



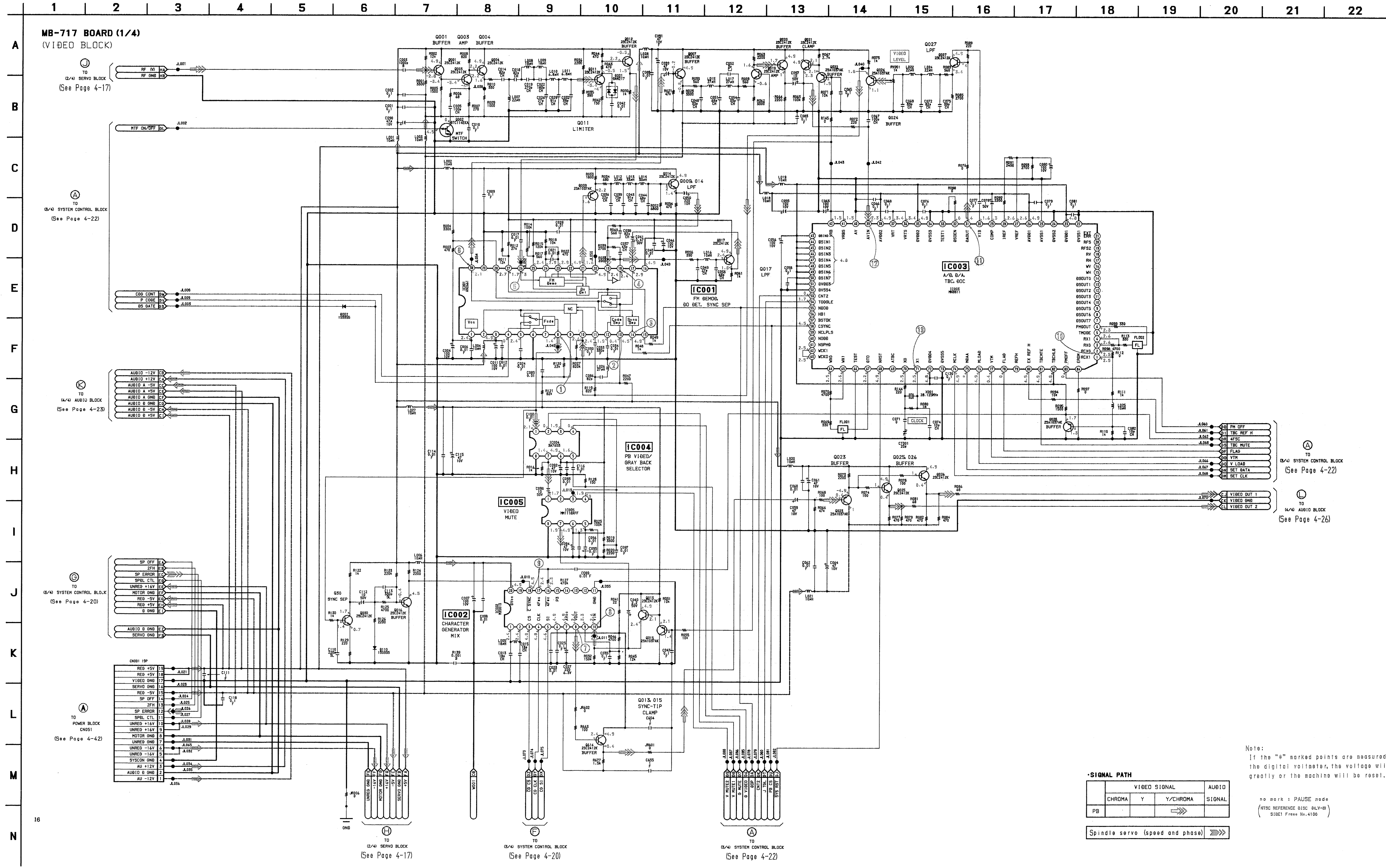
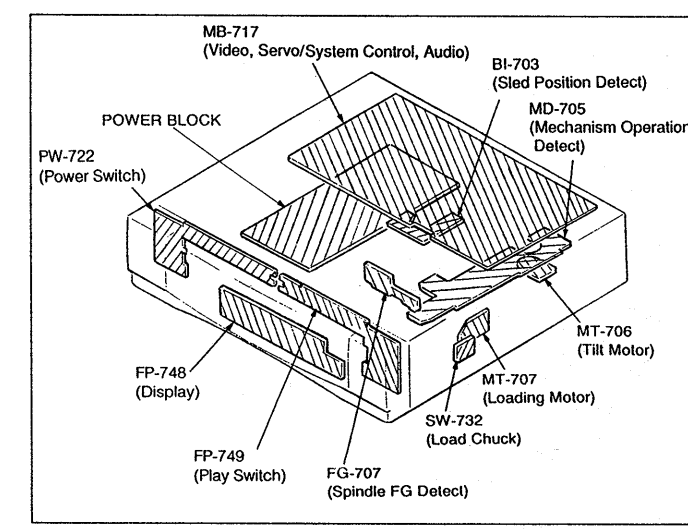
MB-717 (VIDEO) SCHEMATIC DIAGRAM
—Ref. No. MB-717 Board; 1,000 Series—

MB-717 BOARD (1/4)
no mark / PAUSE mode
NTSC REFERENCE DISC (HLV-B)
SIDE1 From No.4100



MB-717 BOARD

CM001 A-25	IC401 D-21	0030 D-26
CM401 A-21	IC402 E-24	0201 B-17
CM402 A-21	IC403 F-23	0202 B-11
CM403 B-18	IC404 B-21	0203 B-10
CM501 A-15	IC405 D-9	0204 B-10
CM502 A-16	IC406 C-7	0205 C-11
	IC407 C-8	0206 C-13
	IC501 F-21	0207 C-13
CT001 F-24	IC502 G-21	0210 A-18
	IC503 E-22	0211 A-18
D001 B-24	IC504 G-6	0401 E-24
D002 G-6	IC505 G-7	0402 F-24
D110 C-26	IC506 G-23	0403 F-23
D202 B-11		0404 E-23
D203 E-13	0001 B-24	0405 A-20
D204 A-9	0002 C-24	0406 B-20
D205 A-8	0003 C-24	0407 B-20
D209 C-10	0004 B-4	0408 C-19
D401 E-7	0007 C-23	0409 D-9
D402 D-8	0009 B-25	0410 C-9
D403 C-8	0011 B-4	0411 C-9
D404 C-8	0012 B-3	0412 E-7
D405 C-22	0013 C-1	0413 C-9
D501 G-22	0014 B-25	0414 D-8
D503 G-7	0015 B-27	0415 C-21
D504 D-5	0016 C-1	0416 C-21
D505 E-7	0017 B-2	0417 C-8
	0019 D-24	0418 C-8
IC001 C-3	0020 D-4	0501 D-6
IC002 B-1	0021 D-24	0502 E-8
IC003 E-25	0022 D-4	0614 A-2
IC004 B-26	0023 A-20	
IC005 C-1	0024 C-26	RW001 D-26
IC201 E-17	0025 A-7	RW401 D-18
IC203 C-17	0026 A-20	RW402 D-18
IC204 C-13	0027 D-24	
IC205 D-15	0028 F-4	
IC206 B-11		



SIGNAL PATH

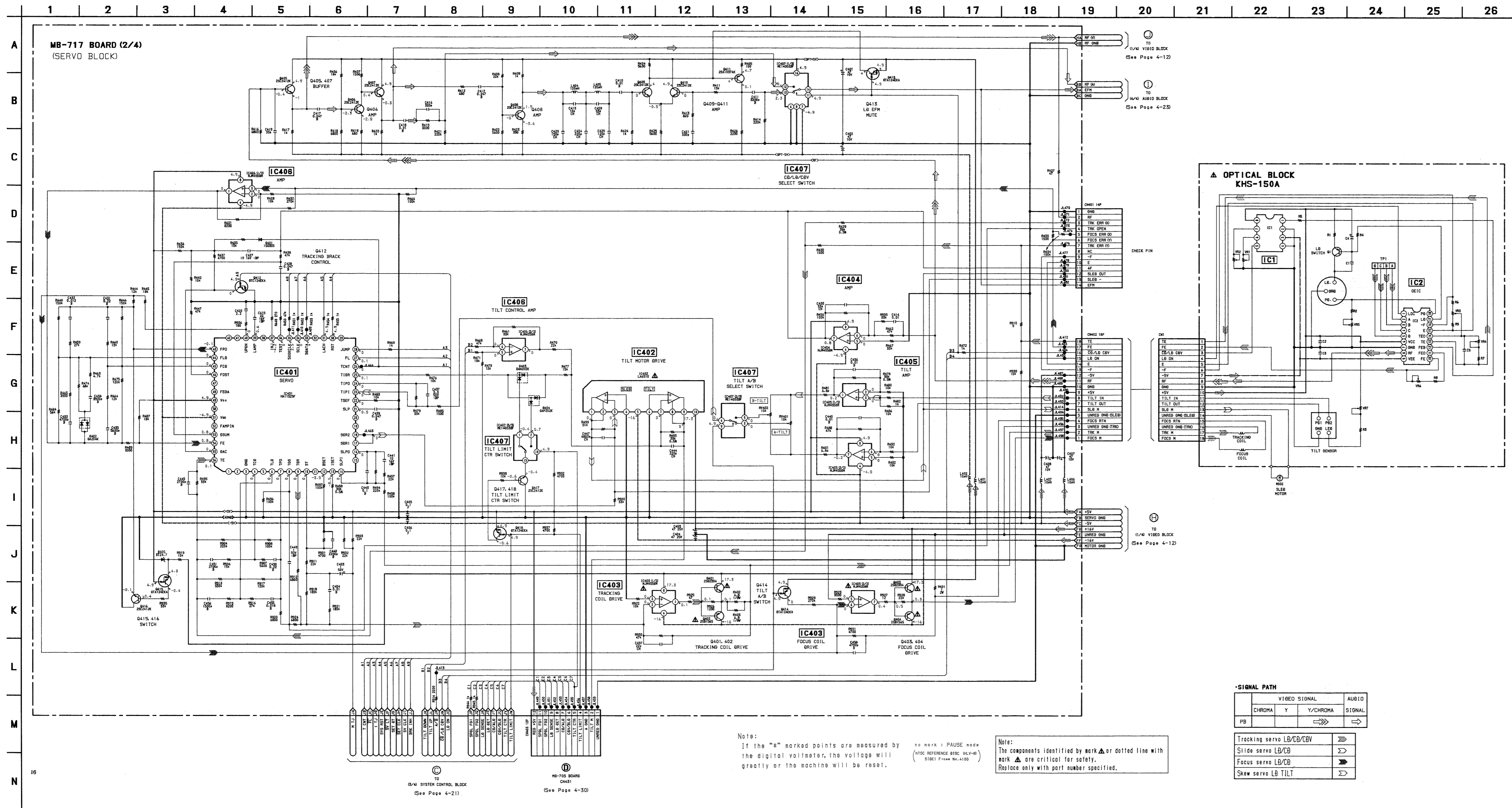
	VIDEO SIGNAL	AUDIO
CHROMA	Y	Y/CHROMA
PB		SIGNAL

Spindle servo (speed and phase) >>>>

Note: If the "x" marked points are measured by the digital voltmeter, the voltage will gradually or the machine will be reset.

no mark / PAUSE mode
(NTSC REFERENCE DISC ONLY-B)
SIDE1 From No.4100

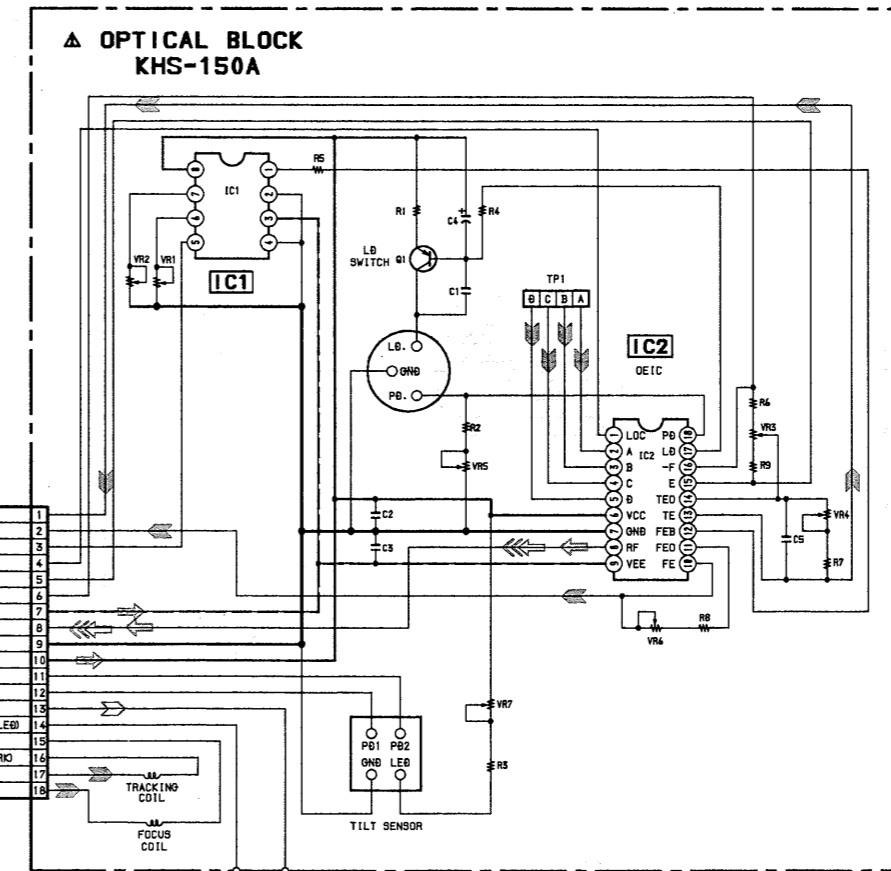
MB-717 (SERVO) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.
—Ref. No. MB-717 Board; 1,000 Series—



Note:
If the "s" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

no mark 1 PAUSE mode
(NTSC REFERENCE SYNC DCV=H) (SIGNAL FROM No. 4100)

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

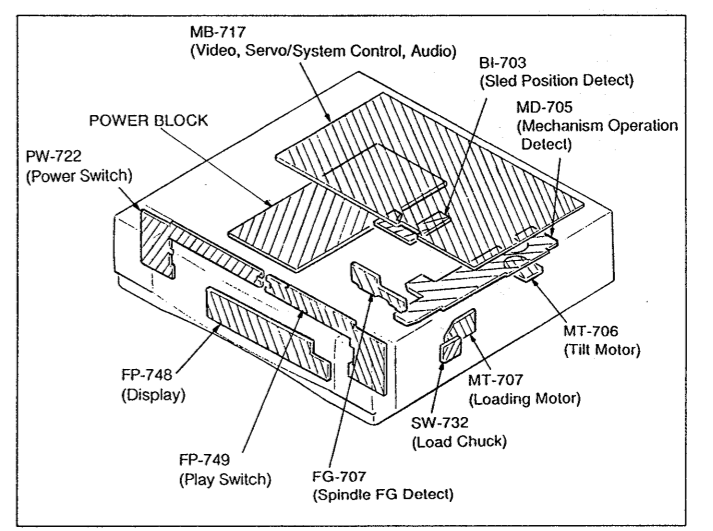
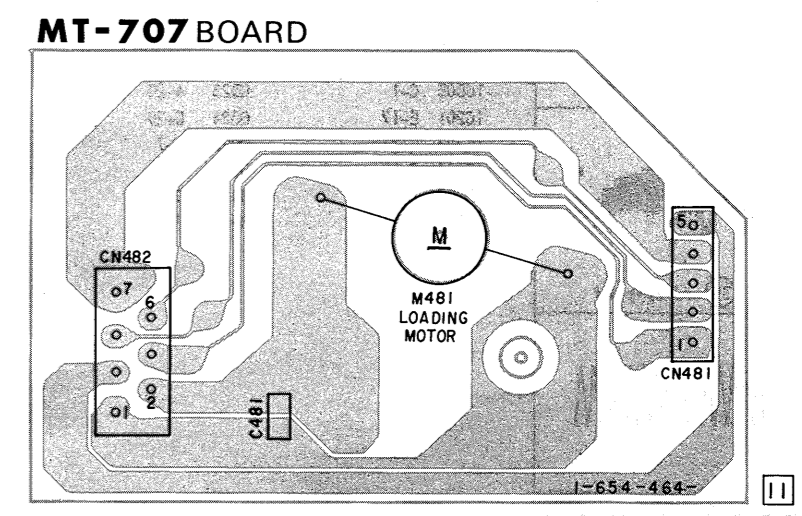
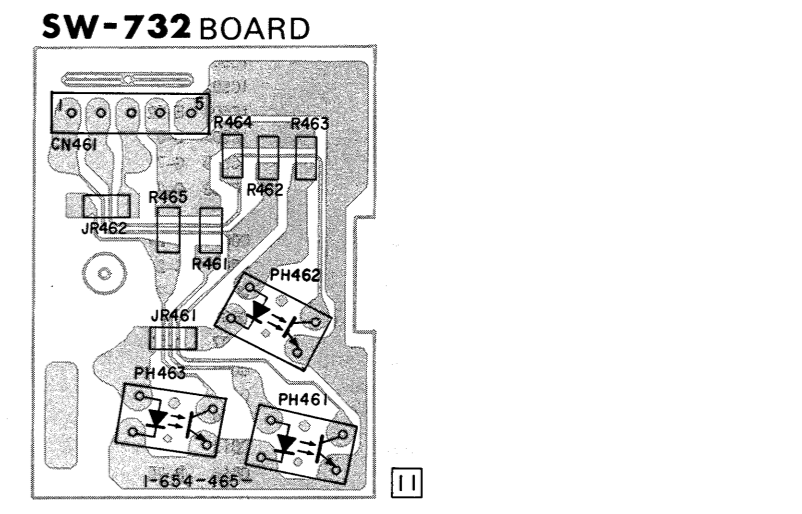


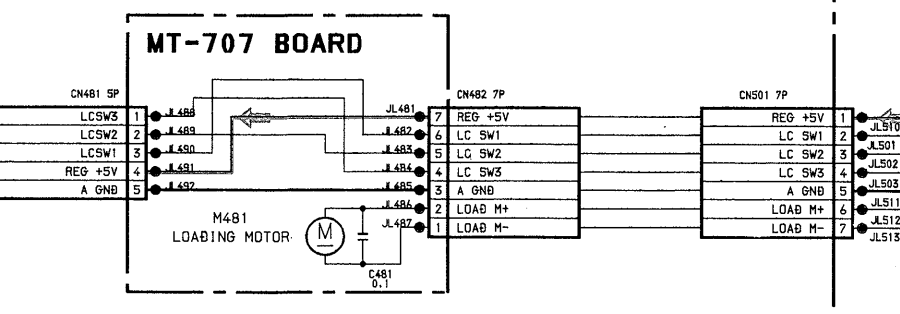
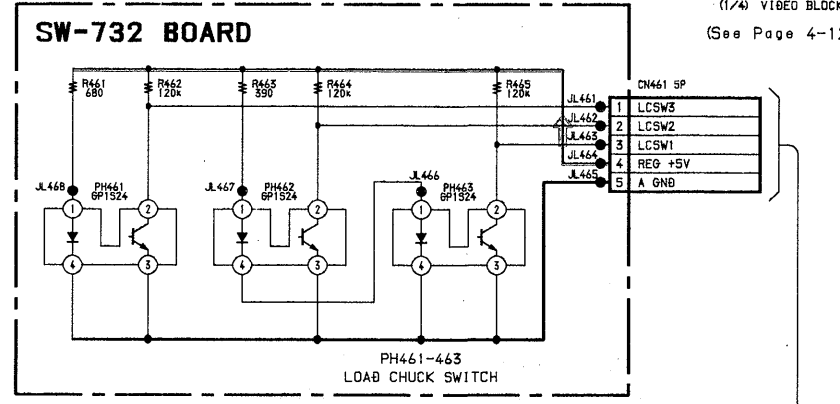
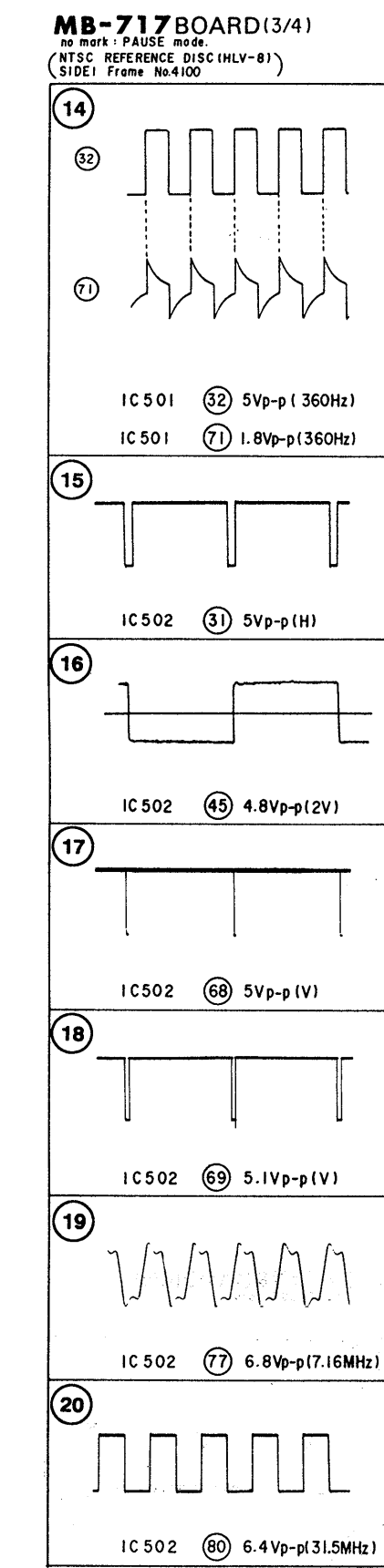
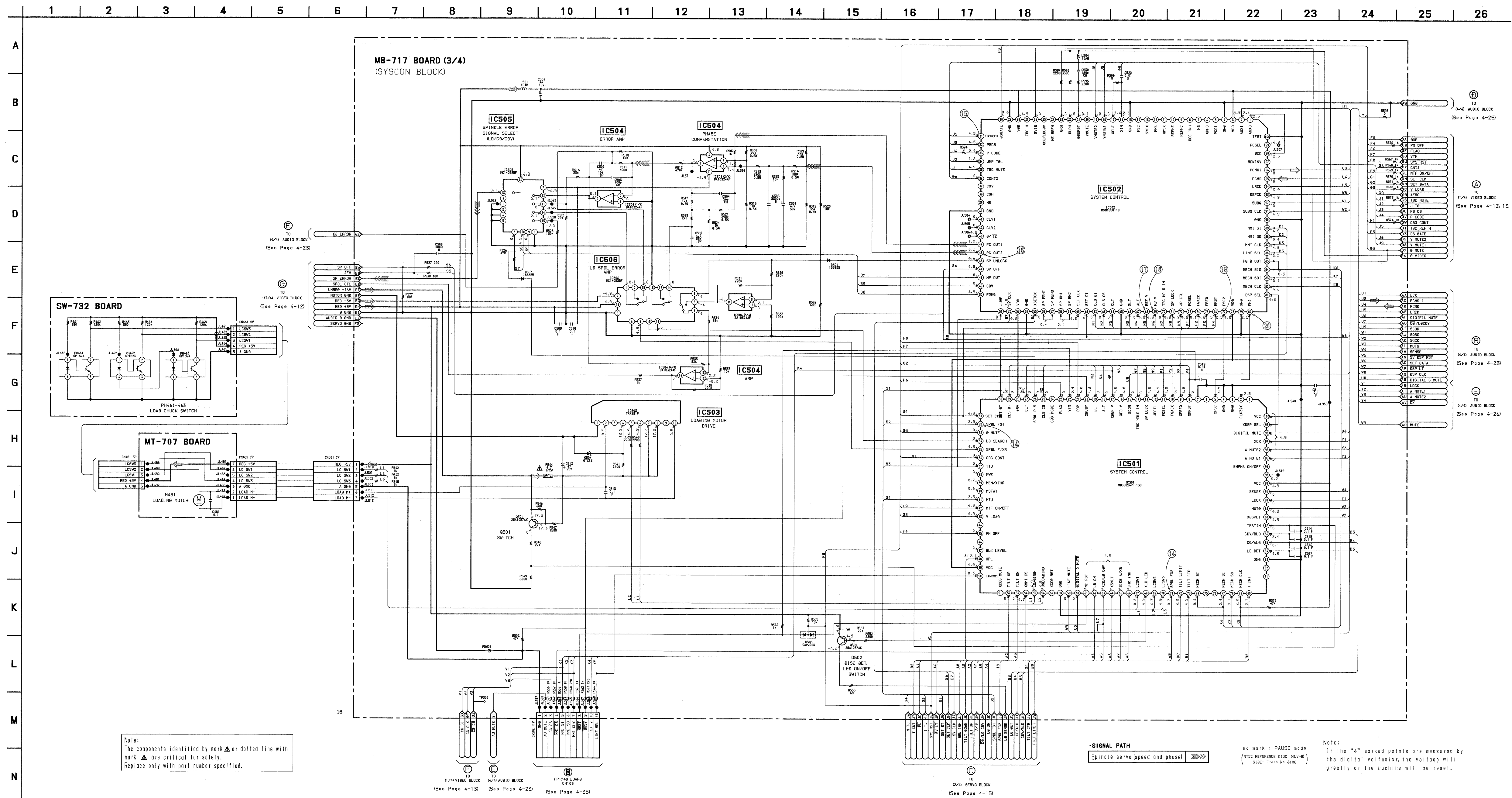
SIGNAL PATH

	VIDEO SIGNAL	AUDIO SIGNAL
CHROMA	Y	Y/CHROMA
PB		

Tracking servo LB/CD/CDV \Rightarrow
Slide servo LB/CD \Rightarrow
Focus servo LB/CD \Rightarrow
Skew servo LB TILT \Rightarrow

MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) PRINTED WIRING BOARDS
—Ref. No. MT-707 and SW-732 Boards; 4,000 Series—



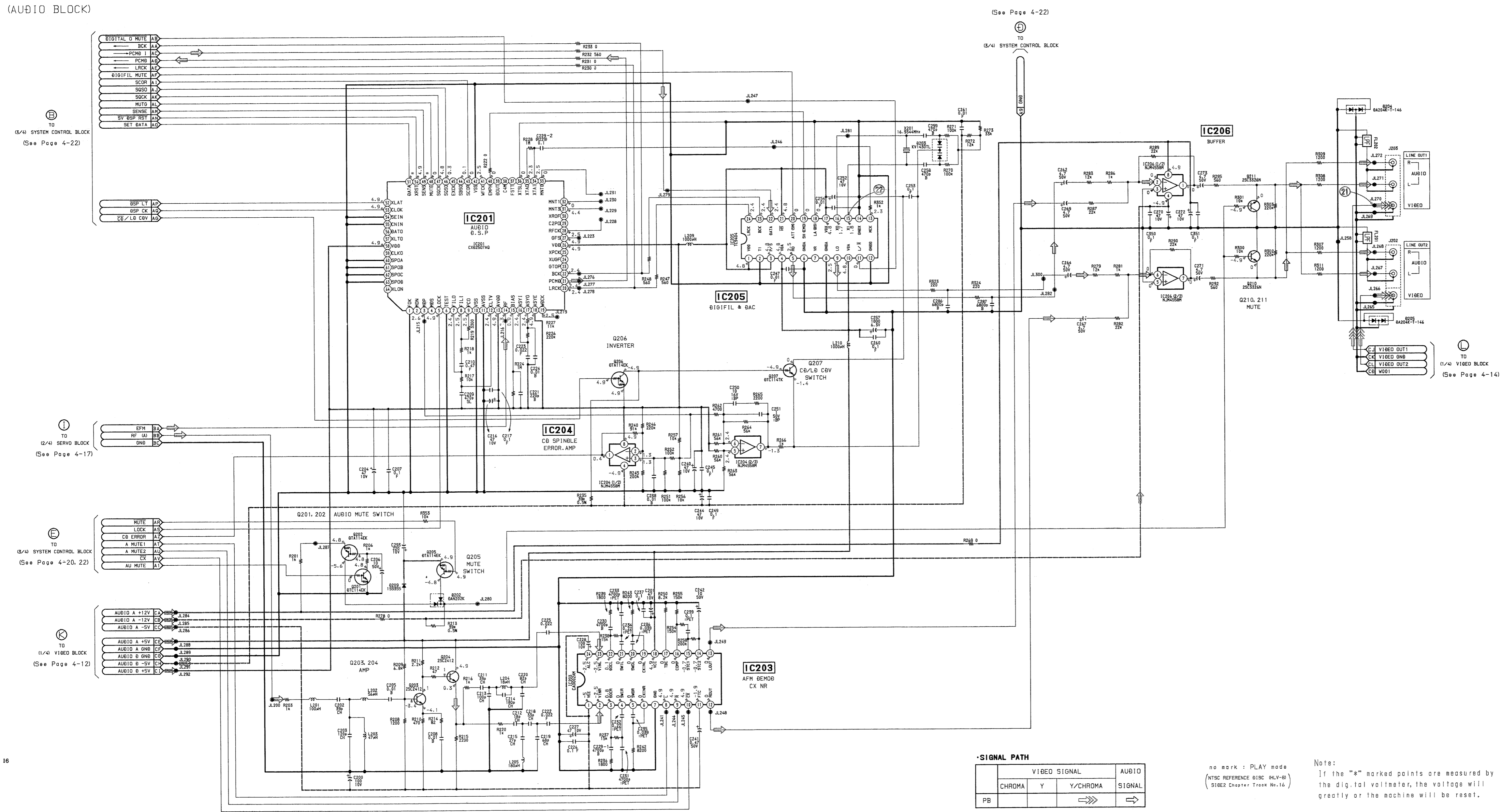


Note:
The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

-SIGNAL PATH
Spindle servo (speed and phase)

Note:
If the "s" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

MB-717 BOARD (4/4)
(AUDIO BLOCK)



SIGNAL PATH

	VIDEO SIGNAL		AUDIO
CHROMA	Y	Y/CHROMA	SIGNAL
PB			⇒

no mark : PLAY mode
(NTSC REFERENCE DISC ONLY-8)
(SIDE2 Chapter Track No.16)

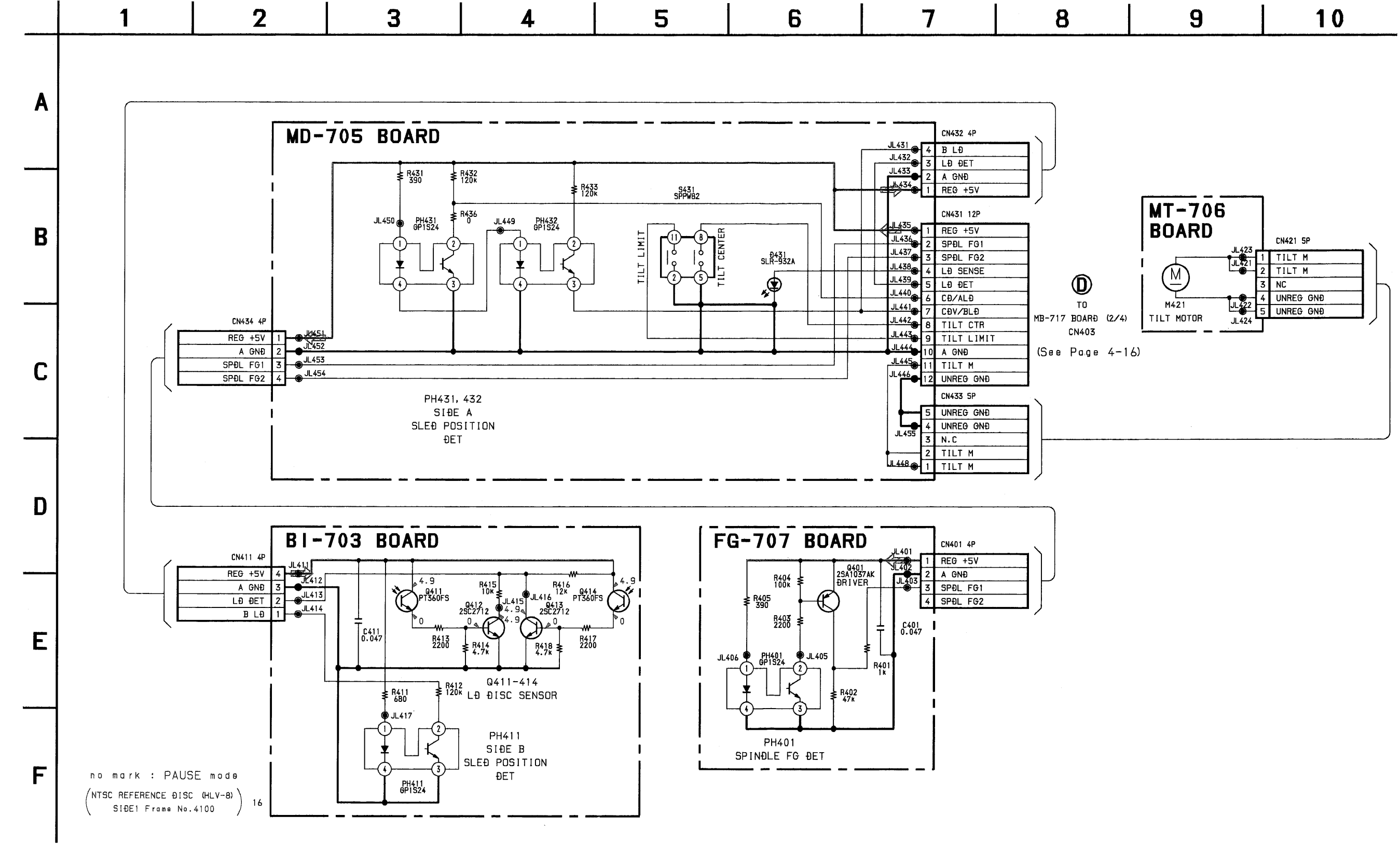
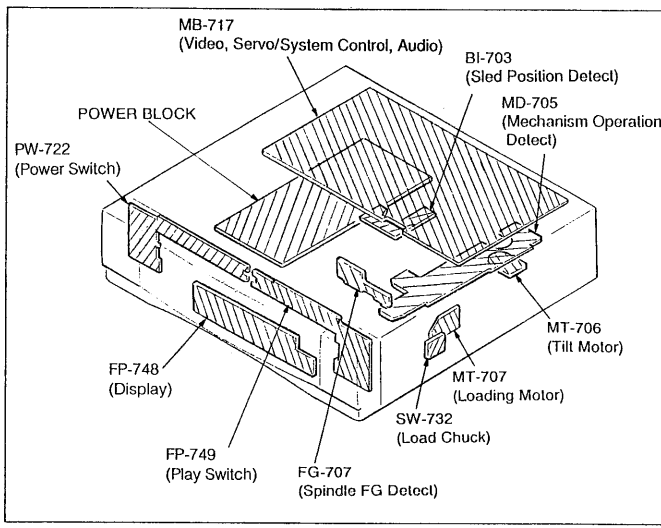
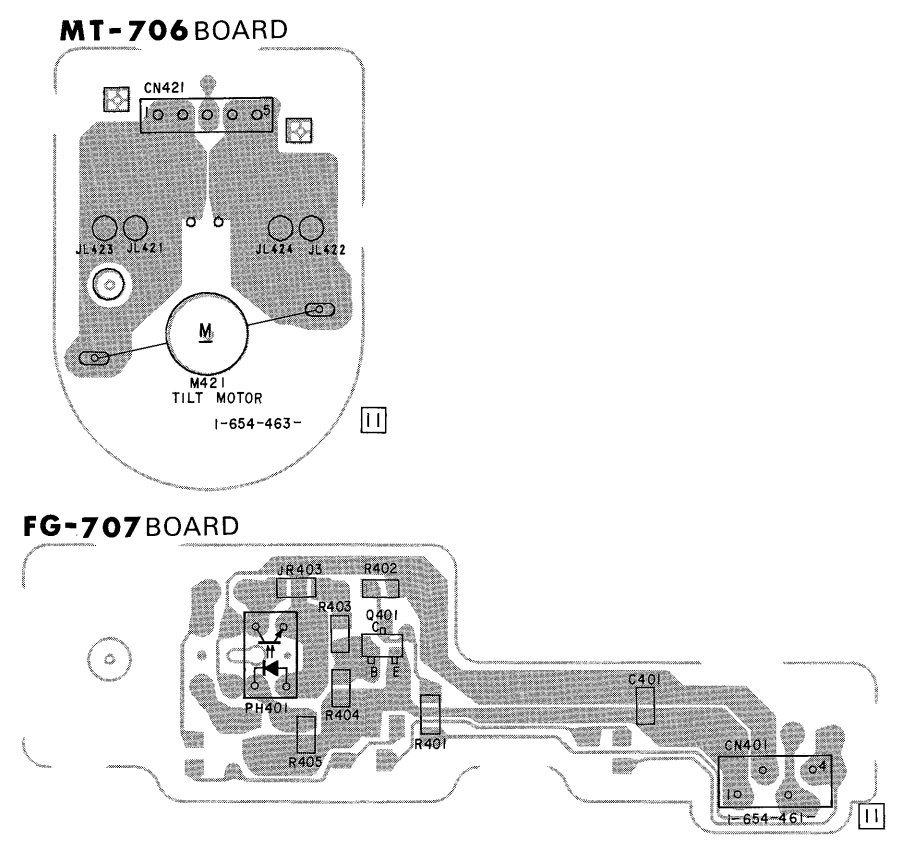
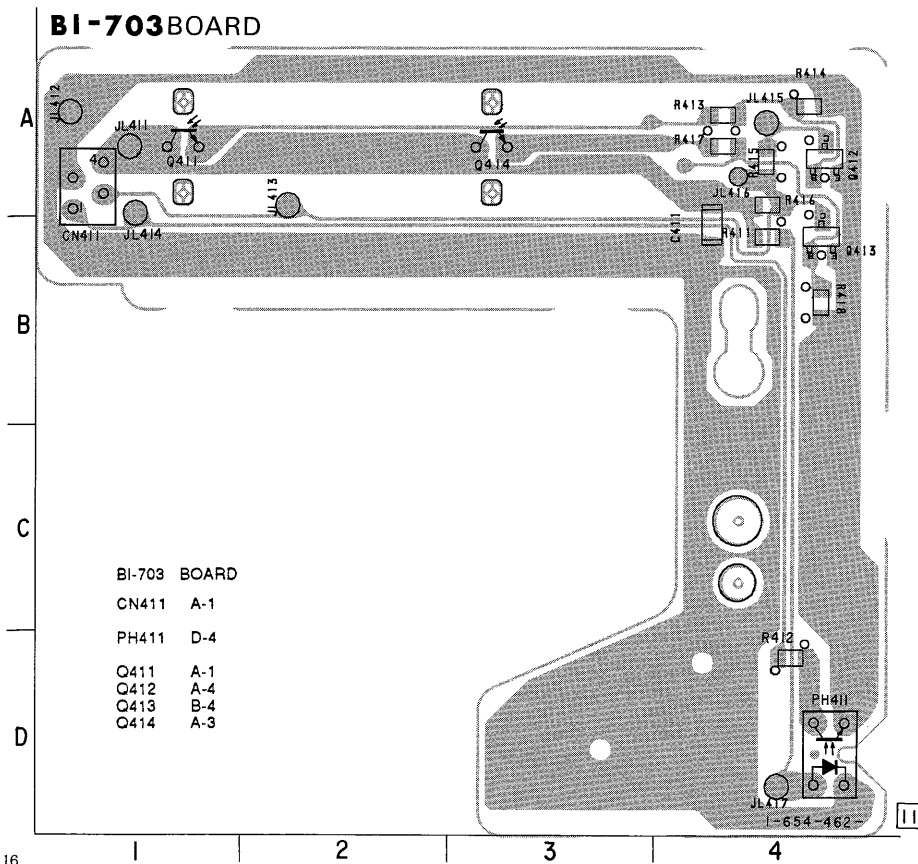
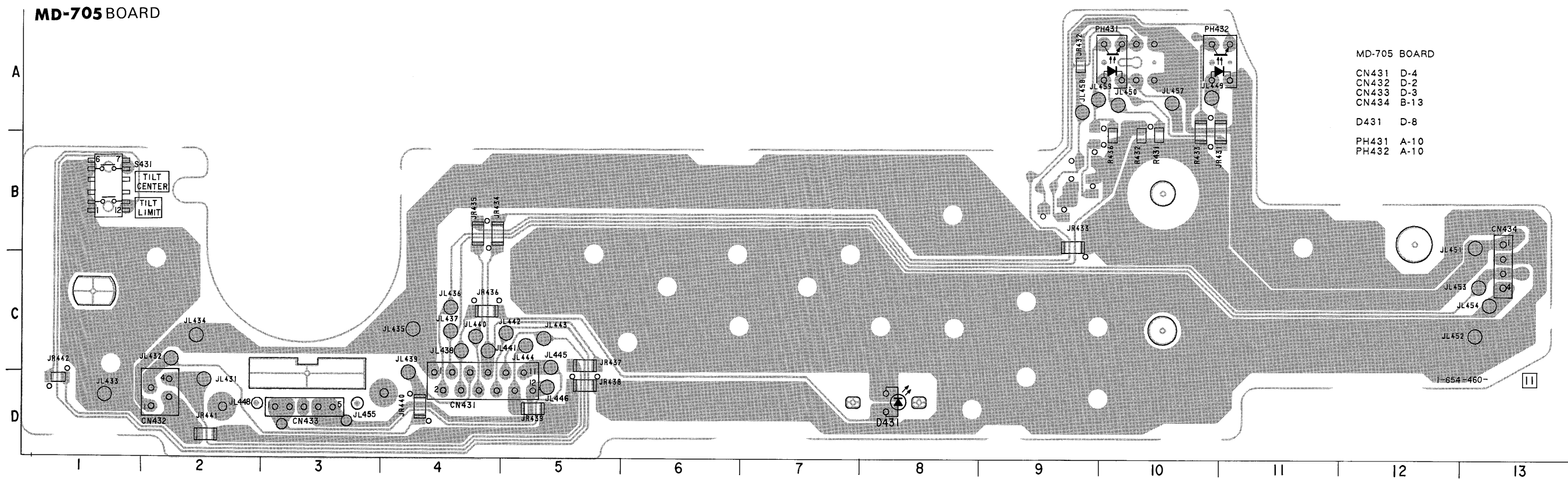
Note:
If the "*" marked points are measured by the digital voltmeter, the voltage will greatly or the machine will be reset.

MB-717BOARD(4/4)
no mark : PAUSE mode
(NTSC REFERENCE DISC ONLY-8)
(SIDE1 Frame No.400)

21
J203 VIDEO OUT(75Ω terminated) 1Vp-p (1H)

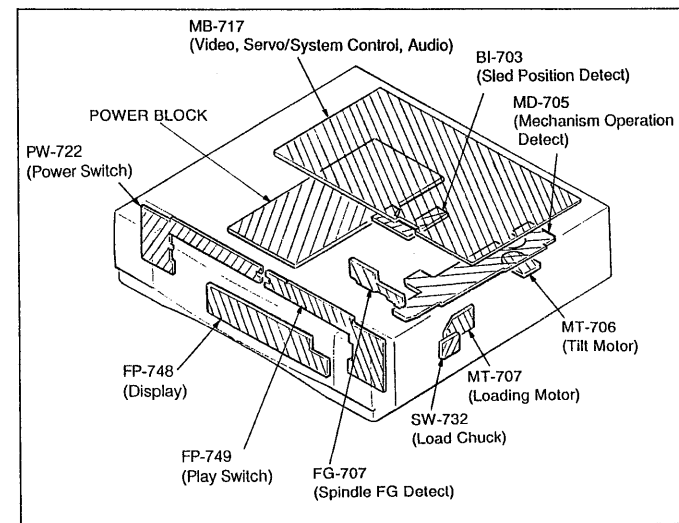
22
IC205 ⑤ 4Vp-p (16.934MHz)

16

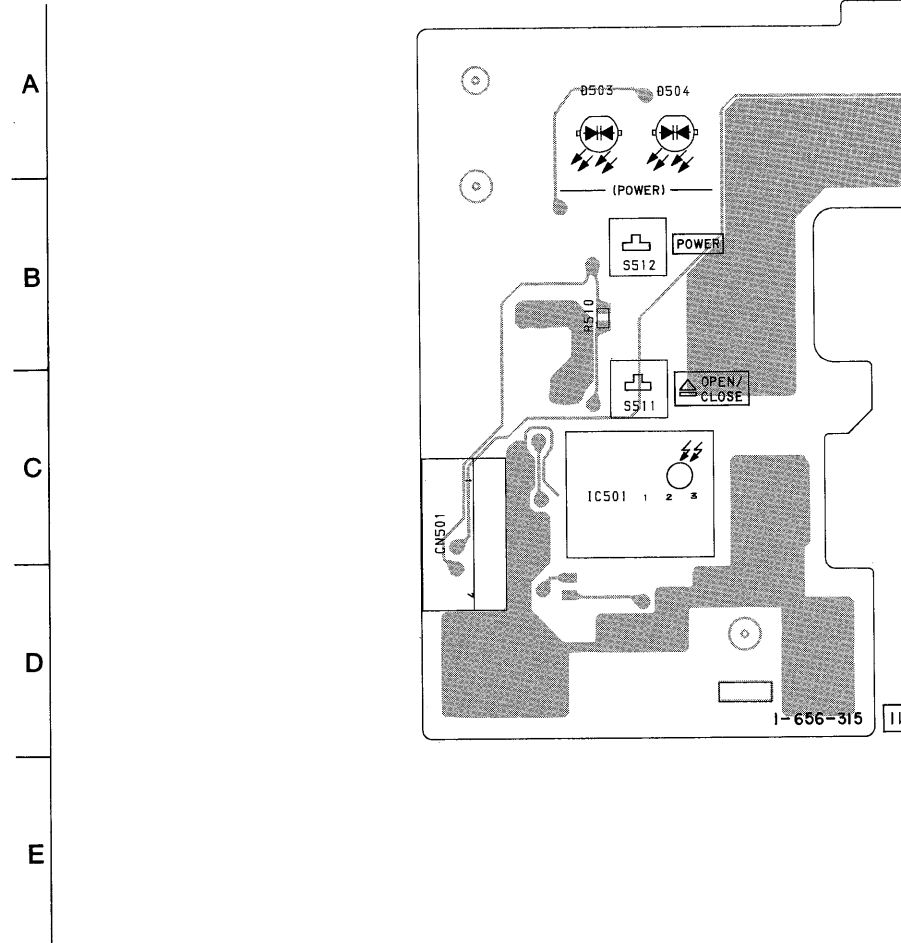


FP-748 BOARD **FP-749 BOARD** **PW-722 BOARD**

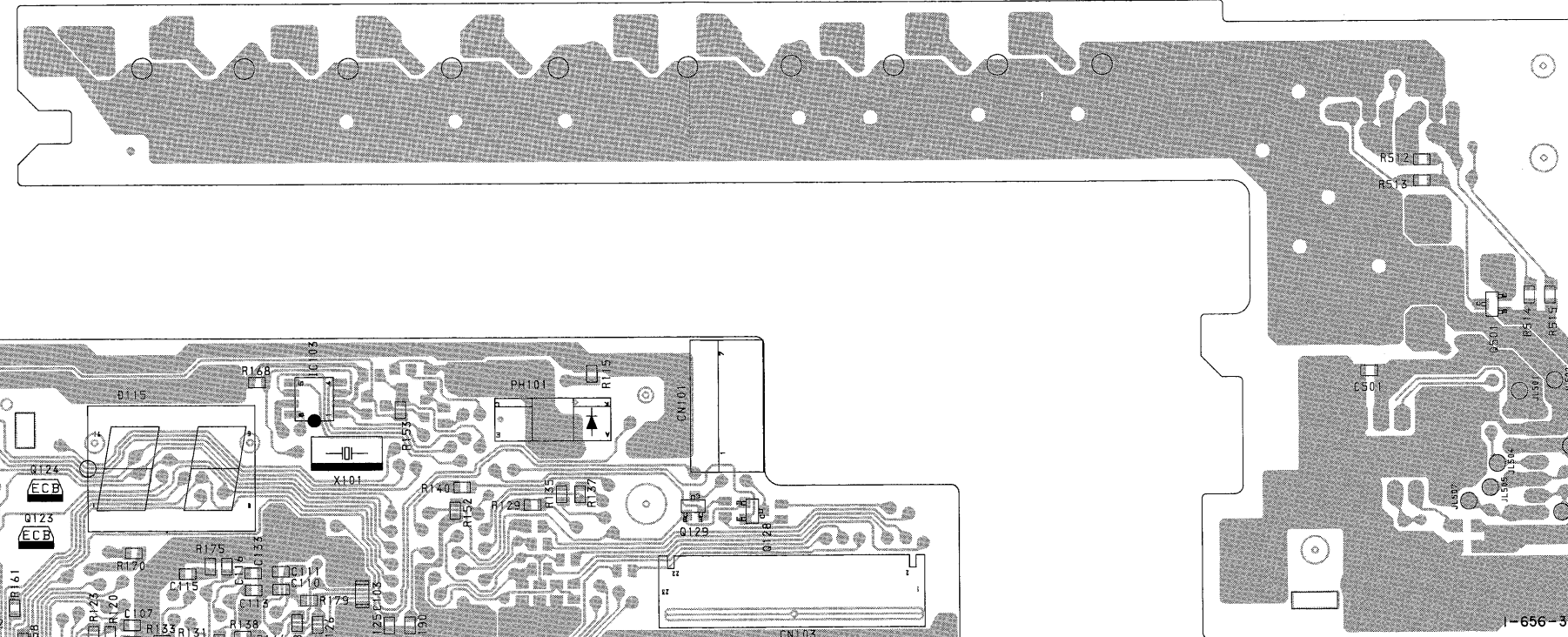
- | | | |
|------------|-----------|-----------|
| CN101 C-17 | CN001 I-1 | CN501 C-3 |
| CN102 E-7 | D001 I-8 | D503 A-3 |
| CN103 D-17 | D002 I-7 | D504 A-4 |
| CN104 D-7 | D003 I-4 | |
| | D007 H-2 | IC501 C-3 |
| D101 C-11 | D008 H-1 | |
| D102 C-11 | D009 H-2 | O501 B-21 |
| D103 C-10 | D010 H-2 | |
| D104 C-12 | D011 G-2 | |
| D105 C-12 | | |
| D106 C-12 | | |
| D107 D-11 | IC001 I-3 | |
| D108 D-12 | | |
| D110 C-9 | | |
| D115 C-13 | | |
| | | |
| IC101 D-10 | | |
| IC102 G-15 | | |
| IC103 C-14 | | |
| | | |
| Q101 D-11 | | |
| Q102 E-12 | | |
| Q110 C-9 | | |
| Q115 E-13 | | |
| Q116 E-12 | | |
| Q118 E-12 | | |
| Q119 D-12 | | |
| Q120 D-12 | | |
| Q121 D-12 | | |
| Q122 D-12 | | |
| Q123 D-13 | | |
| Q124 C-13 | | |
| Q128 D-17 | | |
| Q129 D-17 | | |



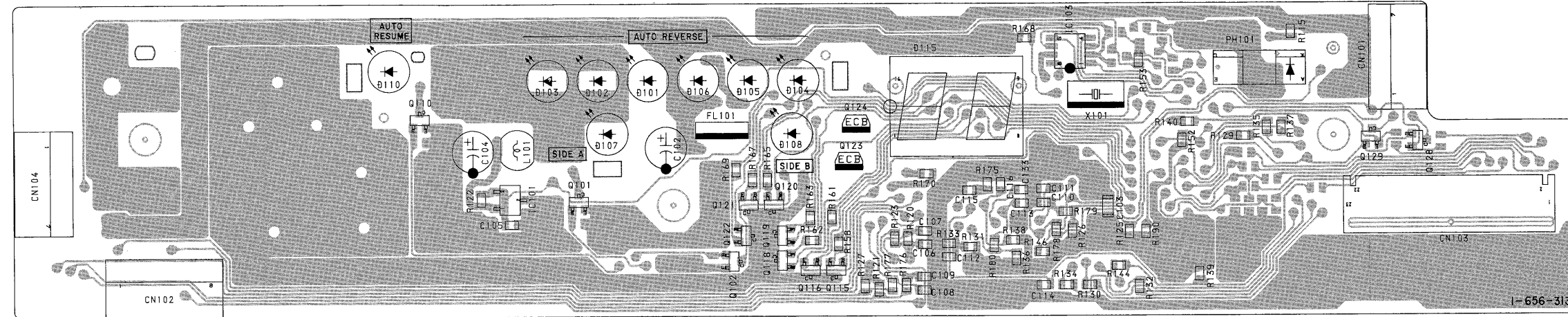
PW-722 BOARD (COMPONENT SIDE)



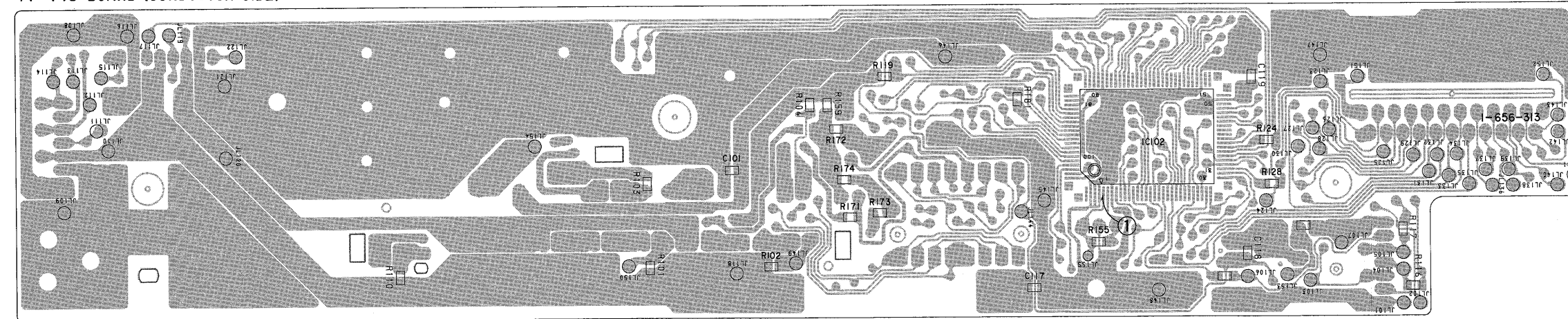
PW-722 BOARD (CONDUCTOR SIDE)



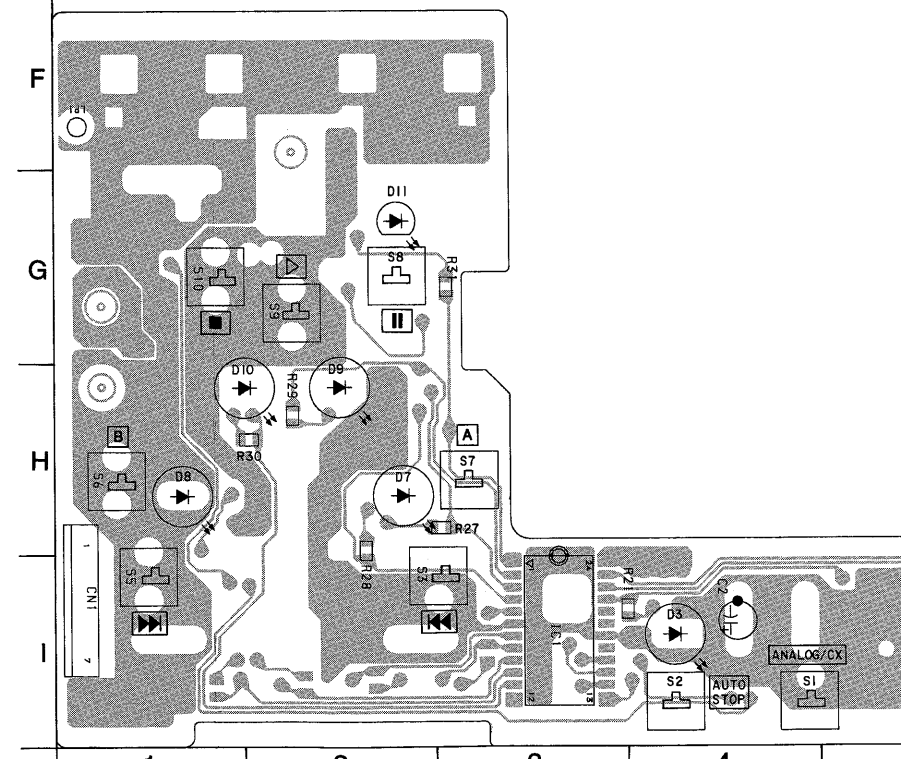
FP-748 BOARD (COMPONENT SIDE)



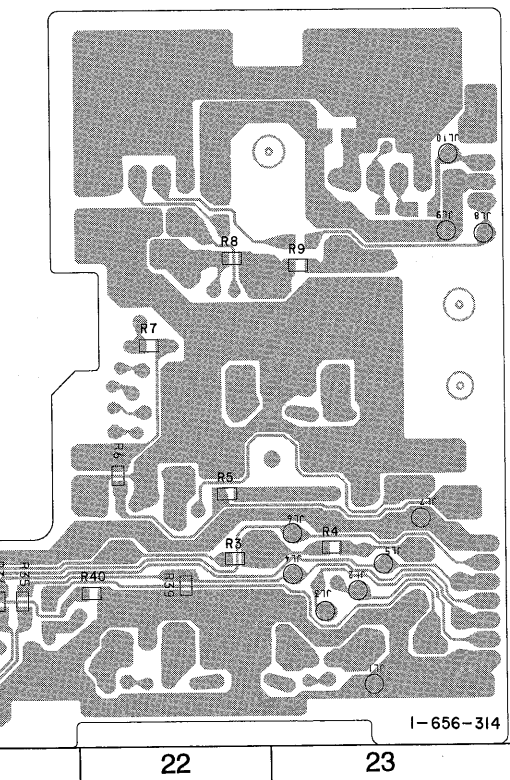
FP-748 BOARD (CONDUCTOR SIDE)

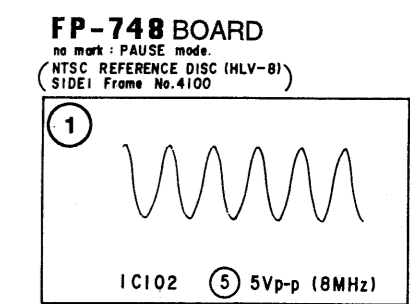
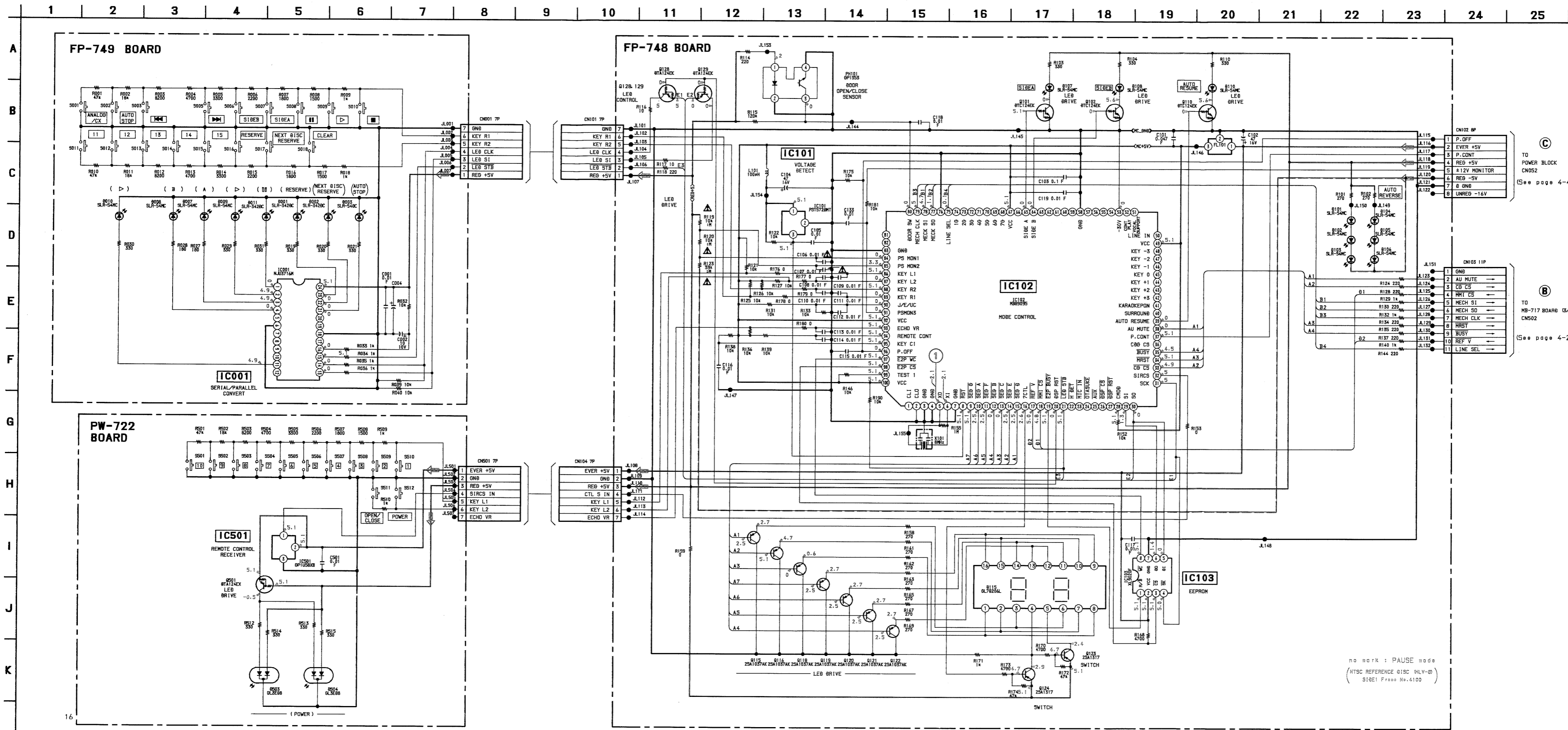


FP-749 BOARD (COMPONENT SIDE)



FP-749 BOARD (CONDUCTOR SIDE)





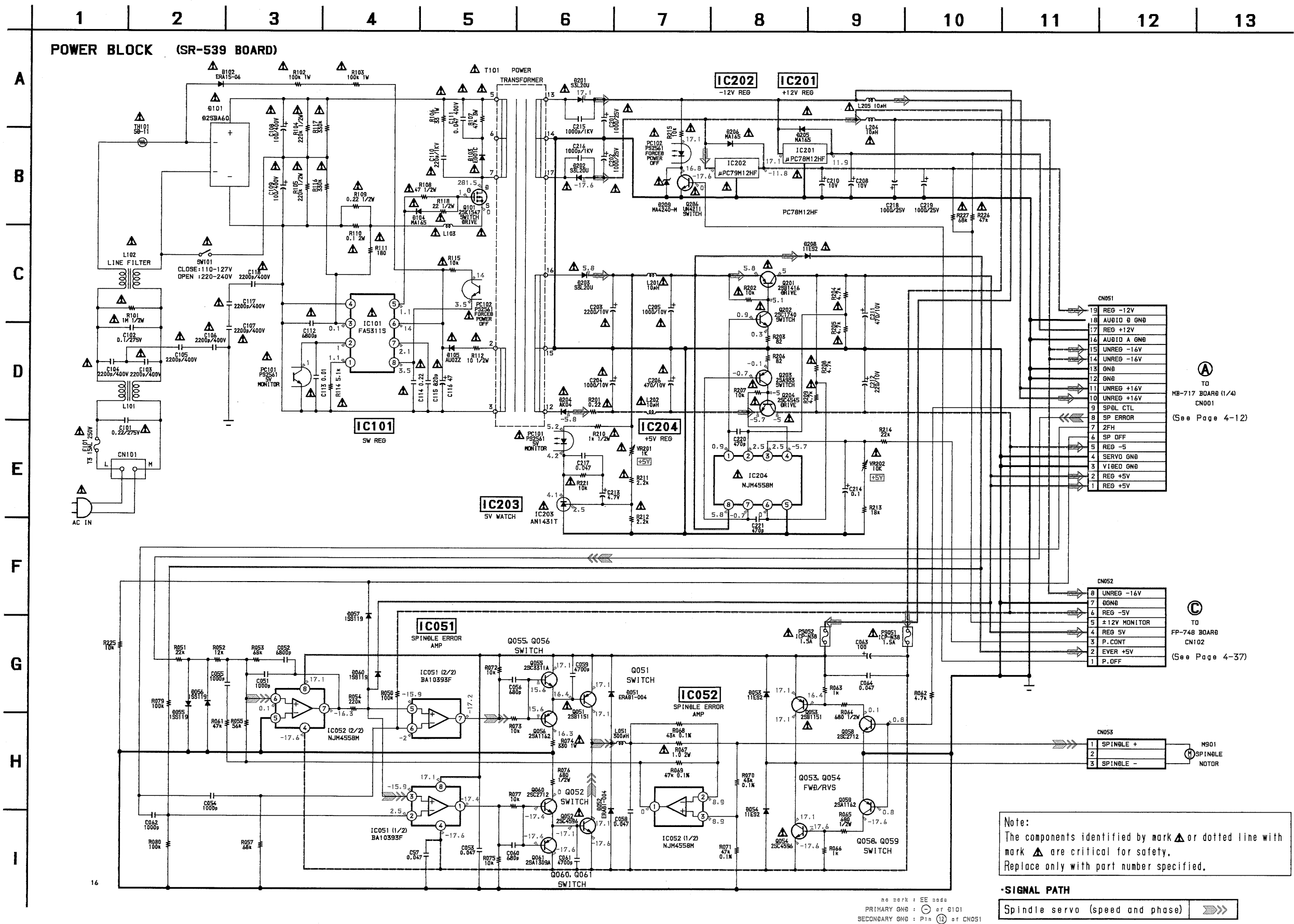
(C) TO POWER BLOCK
CN052
(See page 4-42)

(B) TO MB-717 BOARD (S/4)
CN502
(See page 4-20)

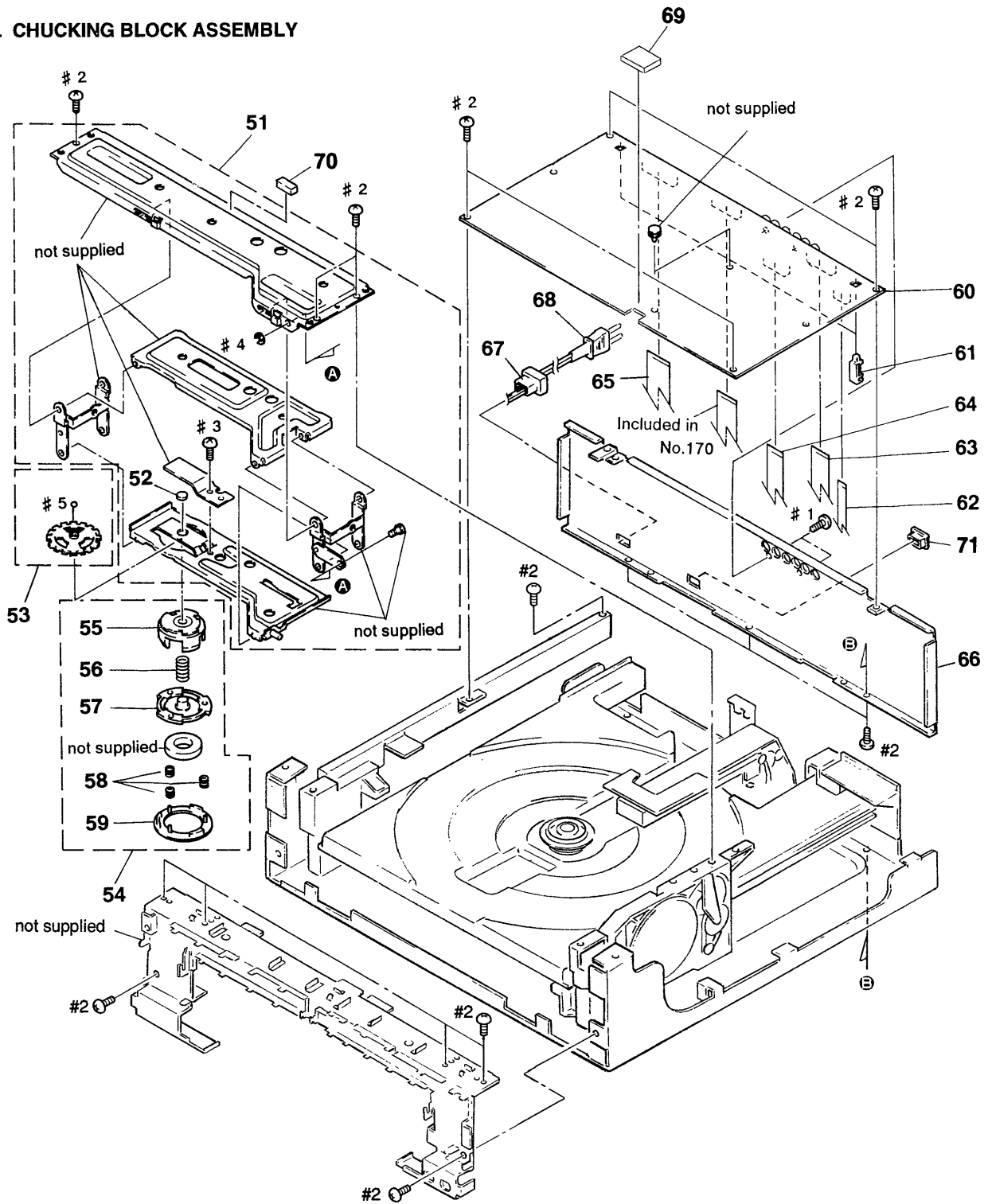
Note:
The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

POWER BLOCK SCHEMATIC DIAGRAMS

—Ref. No. POWER BLOCK; 5,000 Series—



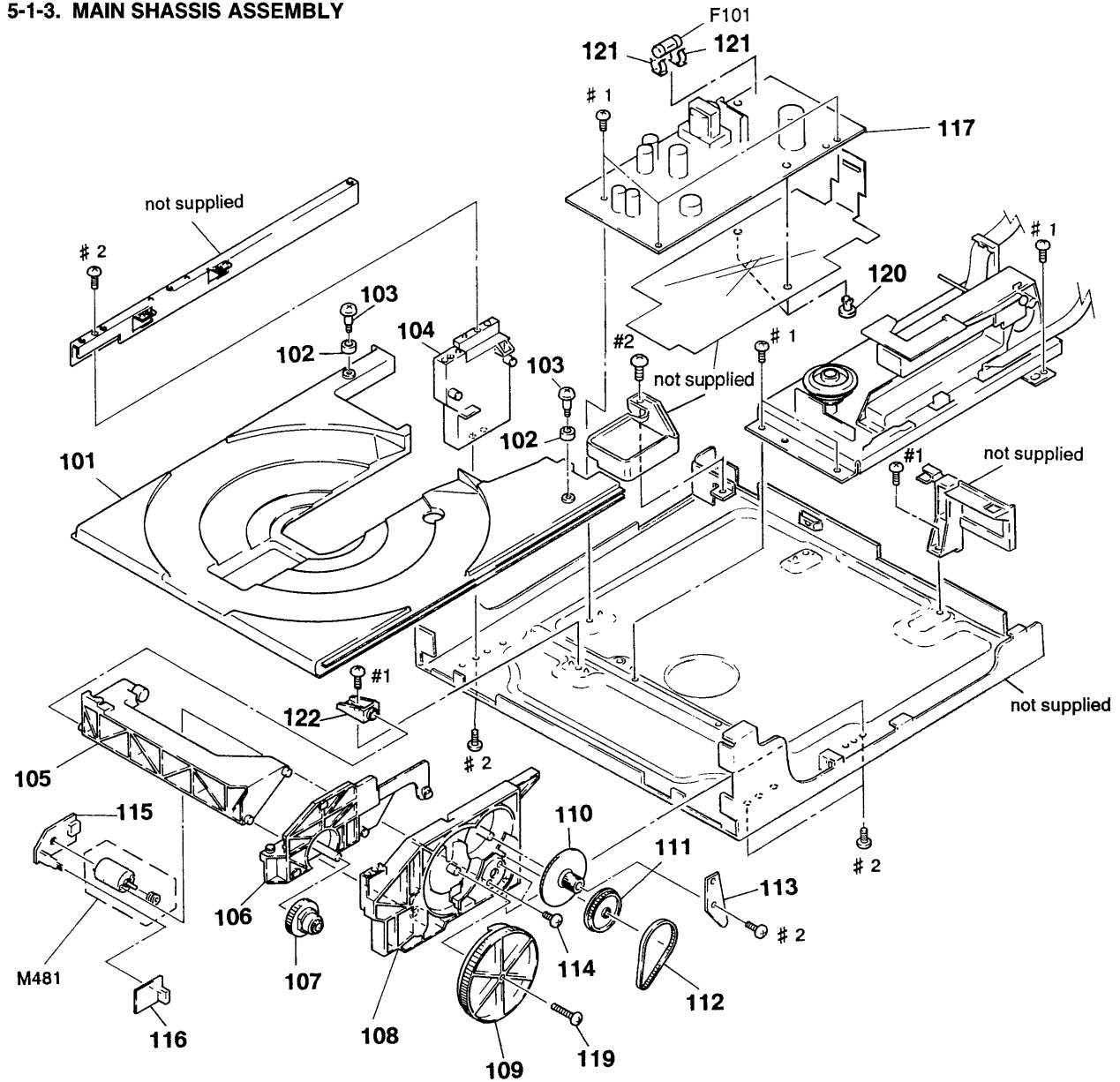
5-1-2. CHUCKING BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	A-6415-896-A	CHUCKING SUB BLOCK ASSY		62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
52	3-953-392-01	RETAINER, THRUST		63	1-769-656-11	CABLE, FLAT (FFC) 11 ARBOR	
53	X-3942-787-1	PLATE ASSY, TOP		64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
54	A-6415-644-G	CHUCK BLOCK ASSY		65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
55	3-953-288-01	PLATE, CHUCKING		* 66	3-961-786-51	PANEL, REAR	(E)
56	3-953-291-01	SPRING (1), COMPRESSION		* 66	3-964-736-01	PANEL, REAR	(Chinese)
57	X-3942-776-1	HOLDER ASSY, MAGNET		△67	3-703-244-00	BUSHING (2104), CORD	
58	3-953-290-01	SPRING (2), COMPRESSION		△68	1-575-912-21	CORD, POWER	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER		69	3-728-465-01	CUSHION, OPT	
* 60	A-6423-308-A	MB-717 BOARD, COMPLETE		70	9-911-840-XX	CUSHION (U)	
* 61	3-962-283-01	GUIDE, MB		* 71	3-961-821-01	SELECOVER, VOL	(E)

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

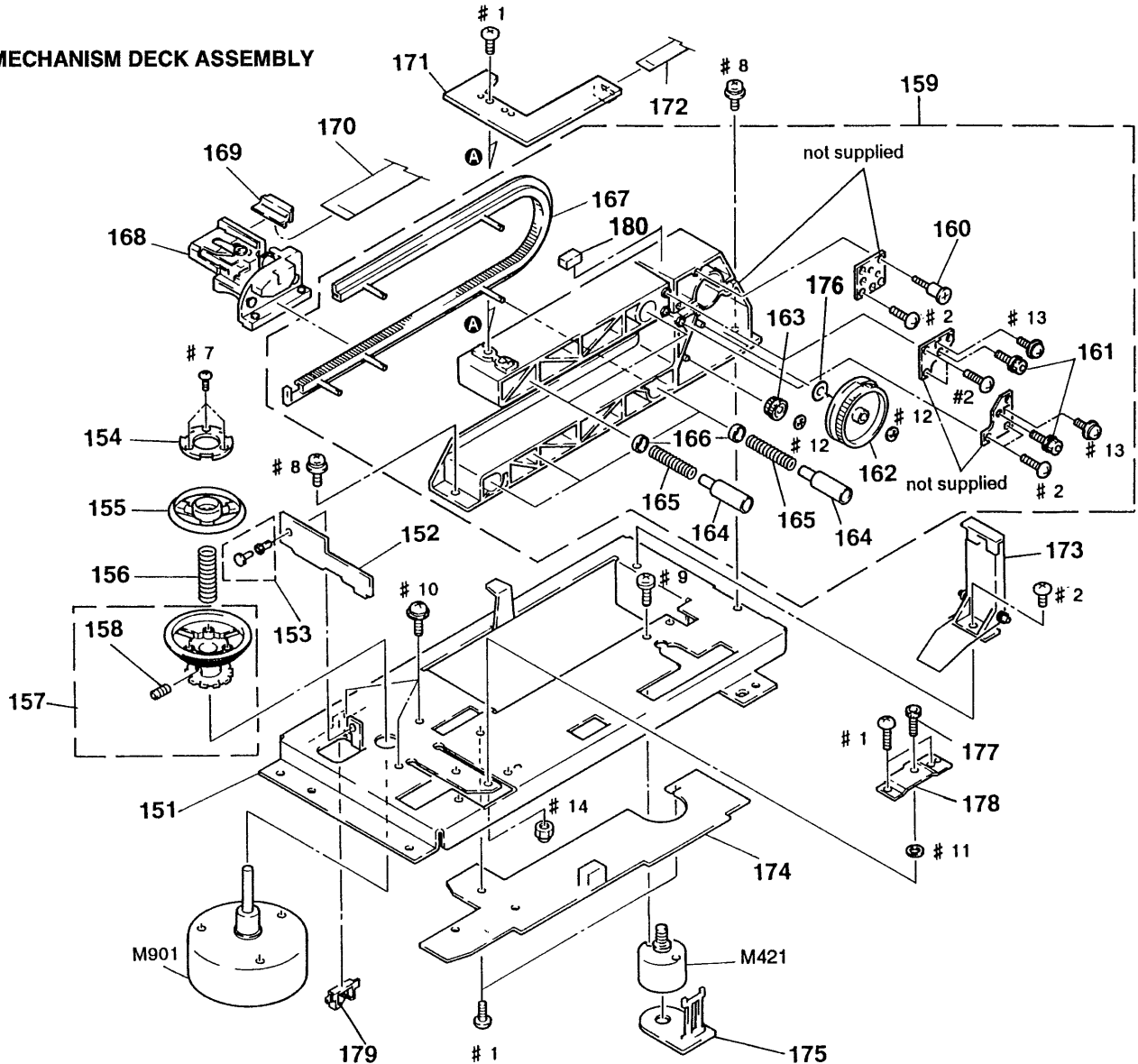
5-1-3. MAIN SHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
101	A-6415-895-A	TRAY (91U) ASSY		* 113	3-962-050-01	STAY, REINFORCEMENT	
* 102	4-914-248-01	STOPPER, RUBBER		114	3-962-049-01	SCREW, MOTOR STOPPER	
103	3-963-090-01	SCREW, TRAY STOPPER		* 115	1-654-464-11	MT-707 BOARD	
* 104	X-3944-730-1	STAY (L) ASSY, F		* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
* 105	X-3944-729-1	FRAME ASSY, TRAY UD		117	1-413-989-21	POWER BLOCK	
106	X-3944-514-1	BASE ASSY, L SUB		119	3-962-812-01	SCREW (+BV 3X18)	
107	3-961-085-01	GEAR, IDLER		120	3-531-576-11	RIVET	
108	X-3944-513-1	BASE ASSY, LOADING		△121	1-533-223-11	HOLDER, FUSE	(E)
109	3-961-083-01	GEAR, CONTROL		* 122	3-961-101-11	HOLDER, UD FRAME	
110	3-961-081-01	GEAR, MIDDLE		△F101	1-532-286-11	FUSE TIME LUG (T3.15AL 250V)	
111	3-961-084-01	PULLEY (A)		M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
112	3-961-082-01	BELT, TIMING					

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

5-1-4. MECHANISM DECK ASSEMBLY



Ref. No.	Part No.	Description	Remarks
* 151	3-961-112-01	PLATE, BASE	
* 152	A-6423-231-A	FG-707 BOARD, COMPLETE	
* 153	3-954-681-01	RIVET, NYLON	
154	3-953-293-01	PLATE (C), YOKE	
155	3-953-292-01	GUIDE, CENTER	
156	3-953-289-01	SPRING (3), COMPRESSION	
157	X-3942-779-1	TURNTABLE ASSY	
158	3-701-507-00	SET SCREW, DOUBLE POINT, (M3X5)	
* 159	A-6404-121-A	BASE BLOCK ASSY, FEED	
160	3-961-208-01	SCREW, FLEXIBLE DISPOSITION	
161	3-899-249-01	BOLT, HEXAGON SOCKET	
162	3-953-254-01	CAM, TILT DRIVING	
163	3-953-259-01	GEAR, TILT MIDWAY	
164	3-953-255-03	HOLDER, U	
165	3-953-267-01	SPRING, COMPRESSION	
166	3-953-830-01	WASHER, U	

Ref. No.	Part No.	Description	Remarks
167	3-961-126-01	GUIDE (900), U	
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
169	3-953-268-01	HOLDER (18P), FLEXIBLE	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
* 171	A-6423-232-A	BI-703 BOARD, COMPLETE	
172	1-769-680-11	CABLE, FLAT (FFC) 4 ARBOR	
* 173	A-6404-111-A	STAND ASSY, FLEXIBLE RETAINER	
* 174	A-6423-230-A	MD-705 BOARD, COMPLETE	
* 175	A-6423-229-A	MT-706 BOARD, COMPLETE	
176	3-701-439-21	WASHER	
177	3-953-829-01	BOLT	
* 178	3-953-258-11	PLATE, ADJUSTMENT, AT	
* 179	3-961-199-01	SADDLE, EDGE	
180	9-911-841-XX	CUSHION, RUBBER	
M421	X-3944-693-1	TILT MOTOR ASSY	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

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

5-2. ELECTRICAL PARTS LIST

NOTE:

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

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

- 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, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
uF: μ F
- RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- COILS
uH: μ H
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A... , uPA... , μ PA... ,
uPB... , μ PB... , uPC... , μ PC... ,
uPD... , μ PD...

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-6423-232-A	BI-703 BOARD, COMPLETE ***** (Ref.No.2,000 Series)		*	A-6423-231-A	FG-707 BOARD, COMPLETE ***** (Ref.No.2,000 Series)	
	3-953-261-01	HOLDER, PD < CAPACITOR >				< CAPACITOR >	
C411	1-163-075-00	CERAMIC CHIP 0.047uF	50V	C401	1-163-035-00	CERAMIC CHIP 0.047uF	50V
		< CONNECTOR >				< CONNECTOR >	
CN411	1-691-063-21	HOUSING, CONNECTOR 4P < PHOTO INTERRUPTER >		CN401	1-691-863-11	CONNECTOR, BOARD TO BOARD < JUMPER RESISTOR >	
PH411	8-729-020-74	DIODE GP1S24 < TRANSISTOR >		JR403	1-216-296-00	METAL CHIP 0 5% 1/8W < PHOTO INTERRUPTER >	
Q411	8-729-904-10	TRANSISTOR PT360FS		PH401	8-729-020-74	DIODE GP1S24 < TRANSISTOR >	
Q412	8-729-120-28	TRANSISTOR 2SC1623-L5L6		Q401	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR < RESISTOR >	
Q413	8-729-120-28	TRANSISTOR 2SC1623-L5L6					
Q414	8-729-904-10	TRANSISTOR PT360FS < RESISTOR >		R401	1-216-198-91	METAL GLAZE 1K 5% 1/8W	
R411	1-216-045-00	METAL CHIP 680 5% 1/10W		R402	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R412	1-216-099-00	METAL CHIP 120K 5% 1/10W		R403	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R413	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		R404	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R414	1-216-065-00	METAL CHIP 4.7K 5% 1/10W		R405	1-216-039-00	METAL CHIP 390 5% 1/10W	
R415	1-216-073-00	METAL CHIP 10K 5% 1/10W					
R416	1-216-075-00	METAL CHIP 12K 5% 1/10W					
R417	1-216-057-00	METAL CHIP 2.2K 5% 1/10W					
R418	1-216-065-00	METAL CHIP 4.7K 5% 1/10W					

FP-748

Ref. No.	Part No.	Description	Remarks
*	A-6423-309-A	FP-748 BOARD, COMPLETE ***** (Ref.No.3,000 Series)	
*	3-961-919-01	HOLDER, SEGMENT < CAPACITOR >	
C101	1-163-035-00	CERAMIC CHIP 0.047uF	50V
C102	1-124-589-11	ELECT 47uF	20% 16V
C103	1-163-077-91	CERAMIC CHIP 0.1uF	50V
C104	1-124-589-11	ELECT 47uF	20% 16V
C105	1-163-031-11	CERAMIC CHIP 0.01uF	50V
△C106	1-164-232-11	CERAMIC CHIP 0.01uF	50V
△C107	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C108	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C109	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C110	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C111	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C112	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C113	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C114	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C115	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C116	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C117	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C118	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C119	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C133	1-163-031-11	CERAMIC CHIP 0.01uF	50V
		< CONNECTOR >	
CN101	1-506-486-11	PIN, CONNECTOR 7P	
CN102	1-506-487-11	PIN, CONNECTOR 8P	
CN103	1-691-646-11	SOCKET, CONNECTOR 11P	
CN104	1-506-486-11	PIN, CONNECTOR 7P	
		< DIODE >	
D101	8-719-955-04	LED PY5504S-1	
D102	8-719-955-04	LED PY5504S-1	
D103	8-719-955-04	LED PY5504S-1	
D104	8-719-955-04	LED PY5504S-1	
D105	8-719-955-04	LED PY5504S-1	
D106	8-719-955-04	LED PY5504S-1	
D107	8-719-955-04	LED PY5504S-1	
D108	8-719-955-04	LED PY5504S-1	
D110	8-719-955-04	LED PY5504S-1	
D115	8-719-047-76	DIODE GL7D206L	
		< FILTER >	
FL101	1-424-031-11	FILTER, NOISE	
		< IC >	
IC101	8-759-074-40	IC PST572DMT-T1	
IC102	8-759-344-52	IC MB89095PF-G-169-BND	

Ref. No.	Part No.	Description	Remarks
IC103	8-759-276-29	IC XL9020F-S-E2	
		< COIL >	
L101	1-408-982-21	INDUCTOR 100uH	
		< PHOTO INTERRUPTER >	
PH101	8-749-010-69	PHOTO INTERRUPTER GP1S58V	
		< TRANSISTOR >	
Q101	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q102	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q110	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q115	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q116	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q118	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q119	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q120	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q121	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q122	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q123	8-729-820-16	TRANSISTOR 2SA1317-S	
Q124	8-729-820-16	TRANSISTOR 2SA1317-S	
Q128	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q129	8-729-027-31	TRANSISTOR DTA124EKA-T146	
		< RESISTOR >	
R101	1-216-035-00	METAL CHIP 270 5% 1/10W	
R102	1-216-035-00	METAL CHIP 270 5% 1/10W	
R103	1-216-037-00	METAL CHIP 330 5% 1/10W	
R104	1-216-037-00	METAL CHIP 330 5% 1/10W	
R110	1-216-037-00	METAL CHIP 330 5% 1/10W	
R114	1-216-033-00	METAL CHIP 220 5% 1/10W	
R115	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R116	1-216-001-00	METAL CHIP 10 5% 1/10W	
R117	1-216-001-00	METAL CHIP 10 5% 1/10W	
R118	1-216-033-00	METAL CHIP 220 5% 1/10W	
△R119	1-208-806-11	METAL CHIP 10K 0.50% 1/10W	
△R120	1-208-806-11	METAL CHIP 10K 0.50% 1/10W	
R121	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R122	1-216-073-00	METAL CHIP 10K 5% 1/10W	
△R123	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R124	1-216-033-00	METAL CHIP 220 5% 1/10W	
R125	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R126	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R127	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R128	1-216-033-00	METAL CHIP 220 5% 1/10W	
R129	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R130	1-216-033-00	METAL CHIP 220 5% 1/10W	
R131	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R132	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R133	1-216-073-00	METAL CHIP 10K 5% 1/10W	

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

Ref. No.	Part No.	Description	Remarks		
R134	1-216-033-00	METAL CHIP	220	5%	1/10W
R135	1-216-033-00	METAL CHIP	220	5%	1/10W
R136	1-216-073-00	METAL CHIP	10K	5%	1/10W
R137	1-216-033-00	METAL CHIP	220	5%	1/10W
R138	1-216-073-00	METAL CHIP	10K	5%	1/10W
R139	1-216-073-00	METAL CHIP	10K	5%	1/10W
R140	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R144	1-216-033-00	METAL CHIP	220	5%	1/10W
R146	1-216-073-00	METAL CHIP	10K	5%	1/10W
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R153	1-216-295-91	CONDUCTOR, CHIP (2012)			
R155	1-216-121-00	METAL CHIP	1M	5%	1/10W
R158	1-216-035-00	METAL CHIP	270	5%	1/10W
R159	1-216-295-91	CONDUCTOR, CHIP (2012)			
R161	1-216-035-00	METAL CHIP	270	5%	1/10W
R162	1-216-035-00	METAL CHIP	270	5%	1/10W
R163	1-216-035-00	METAL CHIP	270	5%	1/10W
R165	1-216-035-00	METAL CHIP	270	5%	1/10W
R167	1-216-035-00	METAL CHIP	270	5%	1/10W
R168	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R169	1-216-035-00	METAL CHIP	270	5%	1/10W
R170	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R171	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R172	1-216-089-00	METAL CHIP	47K	5%	1/10W
R173	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R174	1-216-089-00	METAL CHIP	47K	5%	1/10W
R175	1-216-073-00	METAL CHIP	10K	5%	1/10W
R176	1-216-295-91	CONDUCTOR, CHIP (2012)			
R177	1-216-295-91	CONDUCTOR, CHIP (2012)			
R178	1-216-295-91	CONDUCTOR, CHIP (2012)			
R179	1-216-295-91	CONDUCTOR, CHIP (2012)			
R180	1-216-295-91	CONDUCTOR, CHIP (2012)			
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
< VIBRATOR >					
X101	1-579-952-21	VIBRATOR, CERAMIC 8MHz			

*	A-6423-311-A	FP-749 BOARD, COMPLETE			

(Ref.No.3,000 Series)					
< CAPACITOR >					
C001	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C002	1-126-157-11	ELECT	10uF	20%	16V
< CONNECTOR >					
* CN001	1-568-784-21	PIN, CONNECTOR 7P			

Ref. No.	Part No.	Description	Remarks		
< DIODE >					
D001	8-719-051-17	DIODE SLR-342DCT31			(RESERVE)
D002	8-719-051-17	DIODE SLR-342DCT31			(NEXT DISC)
D003	8-719-302-07	LED SEL1810A			
D007	8-719-955-04	LED PY5504S-1 (A)			
D008	8-719-955-04	LED PY5504S-1 (B)			
D009	8-719-955-04	LED PY5504S-1 (▷)			
D010	8-719-955-04	LED PY5504S-1 (▷)			
D011	8-719-051-17	DIODE SLR-342DCT31			(■)
< IC >					
IC001	8-759-342-19	IC NJU3716M-T2			
< RESISTOR >					
R001	1-216-089-00	METAL CHIP	47K	5%	1/10W
R002	1-216-079-00	METAL CHIP	18K	5%	1/10W
R003	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R004	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R005	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R006	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R007	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R008	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R009	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R010	1-216-089-00	METAL CHIP	47K	5%	1/10W
R011	1-216-079-00	METAL CHIP	18K	5%	1/10W
R012	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R013	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R014	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R015	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R016	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R017	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R018	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R019	1-216-037-00	METAL CHIP	330	5%	1/10W
R020	1-216-037-00	METAL CHIP	330	5%	1/10W
R021	1-216-037-00	METAL CHIP	330	5%	1/10W
R027	1-216-031-00	METAL CHIP	180	5%	1/10W
R028	1-216-031-00	METAL CHIP	180	5%	1/10W
R029	1-216-037-00	METAL CHIP	330	5%	1/10W
R030	1-216-037-00	METAL CHIP	330	5%	1/10W
R031	1-216-037-00	METAL CHIP	330	5%	1/10W
R032	1-216-073-00	METAL CHIP	10K	5%	1/10W
R033	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R034	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R035	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R036	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R039	1-216-073-00	METAL CHIP	10K	5%	1/10W
R040	1-216-073-00	METAL CHIP	10K	5%	1/10W

FP-749**MB-717**

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S001	1-762-365-21	SWITCH, TACTILE (ANALOG/CX)	
S002	1-762-365-21	SWITCH, TACTILE (AUTO STOP)	
S003	1-762-365-21	SWITCH, TACTILE (◀◀)	
S005	1-762-365-21	SWITCH, TACTILE (▶▶)	
S006	1-762-365-21	SWITCH, TACTILE (B)	
S007	1-762-365-21	SWITCH, TACTILE (A)	
S008	1-762-365-21	SWITCH, TACTILE (■)	
S009	1-762-365-21	SWITCH, TACTILE (▷)	
S010	1-762-365-21	SWITCH, TACTILE (■)	
S011	1-762-365-21	SWITCH, TACTILE (11)	
S012	1-762-365-21	SWITCH, TACTILE (12)	
S013	1-762-365-21	SWITCH, TACTILE (13)	
S014	1-762-365-21	SWITCH, TACTILE (14)	
S015	1-762-365-21	SWITCH, TACTILE (15)	
S016	1-762-365-21	SWITCH, TACTILE (RESERVE)	
S017	1-762-365-21	SWITCH, TACTILE (NEXT DISC)	
S018	1-762-365-21	SWITCH, TACTILE (CLEAR)	

*	A-6423-308-A	MB-717 BOARD, COMPLETE	

		(Ref.No.1,000 Series)	
		< CAPACITOR >	
C001	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C002	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C003	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
C004	1-124-443-00	ELECT 100uF	20% 10V
C005	1-163-251-11	CERAMIC CHIP 100PF	5% 50V
C006	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C007	1-126-177-11	ELECT 100uF	20% 10V
C008	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C009	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C010	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C011	1-124-443-00	ELECT 100uF	20% 10V
C012	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C013	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C014	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C015	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C017	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C018	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C019	1-163-127-00	CERAMIC CHIP 270PF	5% 50V
C020	1-126-803-11	ELECT 47uF	20% 10V
C021	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C022	1-163-257-11	CERAMIC CHIP 180PF	5% 50V
C023	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C024	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C025	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C026	1-163-237-11	CERAMIC CHIP 27PF	5% 50V

Ref. No.	Part No.	Description	Remarks
C027	1-124-635-00	ELECT 220uF	20% 6.3V
C028	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C029	1-163-116-00	CERAMIC CHIP 91PF	5% 50V
C030	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C032	1-163-241-11	CERAMIC CHIP 39PF	5% 50V
C033	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C034	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C035	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C036	1-163-235-11	CERAMIC CHIP 22PF	5% 50V
C037	1-163-108-00	CERAMIC CHIP 43PF	5% 50V
C038	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C039	1-163-114-00	CERAMIC CHIP 75PF	5% 50V
C040	1-124-257-00	ELECT 2.2uF	20% 50V
C041	1-124-257-00	ELECT 2.2uF	20% 50V
C042	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C043	1-163-116-00	CERAMIC CHIP 91PF	5% 50V
C044	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C045	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C046	1-124-584-00	ELECT 100uF	20% 10V
C047	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C048	1-163-239-11	CERAMIC CHIP 33PF	5% 50V
C049	1-163-237-11	CERAMIC CHIP 27PF	5% 50V
C050	1-126-923-11	ELECT 220uF	20% 10V
C051	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C052	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C053	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C054	1-163-239-11	CERAMIC CHIP 33PF	5% 50V
C055	1-124-443-00	ELECT 100uF	20% 10V
C056	1-124-443-00	ELECT 100uF	20% 10V
C057	1-124-907-11	ELECT 10uF	20% 50V
C058	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C059	1-126-803-11	ELECT 47uF	20% 10V
C060	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C061	1-126-803-11	ELECT 47uF	20% 10V
C062	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C063	1-124-443-00	ELECT 100uF	20% 10V
C064	1-126-803-11	ELECT 47uF	20% 10V
C065	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C066	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C067	1-163-251-11	CERAMIC CHIP 100PF	5% 50V
C068	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C069	1-163-241-11	CERAMIC CHIP 39PF	5% 50V
C071	1-216-295-91	CONDCTOR, CHIP (2012)	
C072	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C074	1-163-227-11	CERAMIC CHIP 10PF	0.5PF 50V
C075	1-163-241-11	CERAMIC CHIP 39PF	5% 50V
C076	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C077	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C078	1-124-903-11	ELECT 1uF	20% 50V
C079	1-163-038-91	CERAMIC CHIP 0.1uF	25V

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C080	1-124-443-00	ELECT	100uF 20% 10V	C223	1-163-033-91	CERAMIC CHIP	0.022uF 50V
C081	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C224	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C082	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C225	1-163-033-91	CERAMIC CHIP	0.022uF 50V
C083	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C226	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C085	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C227	1-126-803-11	ELECT	47uF 20% 10V
C086	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C228	1-124-443-00	ELECT	100uF 20% 10V
C088	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C229	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C089	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C230	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C090	1-126-803-11	ELECT	47uF 20% 10V	C231	1-137-368-11	FILM	0.0047uF 5% 50V
C091	1-126-803-11	ELECT	47uF 20% 10V	C232	1-137-378-11	FILM	0.22uF 5% 50V
C092	1-124-589-11	ELECT	47uF 20% 16V	C233	1-137-368-11	FILM	0.0047uF 5% 50V
C093	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C234	1-137-378-11	FILM	0.22uF 5% 50V
C094	1-126-803-11	ELECT	47uF 20% 10V	C235	1-137-442-11	FILM	0.039uF 5% 50V
C095	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C236	1-137-442-11	FILM	0.039uF 5% 50V
C096	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C237	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C097	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C238	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C098	1-124-907-11	ELECT	10uF 20% 50V	C239	1-137-399-11	FILM	0.1uF 5% 50V
C100	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C240	1-126-803-11	ELECT	47uF 20% 10V
C110	1-163-125-00	CERAMIC CHIP	220PF 5% 50V	C241	1-124-902-00	ELECT	0.47uF 20% 50V
C111	1-164-346-11	CERAMIC CHIP	1uF 16V	C242	1-124-907-11	ELECT	10uF 20% 50V
C112	1-124-907-11	ELECT	10uF 20% 50V	C244	1-126-803-11	ELECT	47uF 20% 10V
C113	1-163-129-00	CERAMIC CHIP	330PF 5% 50V	C245	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C114	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C247	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C115	1-126-803-11	ELECT	47uF 20% 10V	C249	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C116	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V	C250	1-107-714-11	ELECT	10uF 20% 16V
C118	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C251	1-109-889-11	ELECT	1uF 20% 50V
C120	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C252	1-126-803-11	ELECT	47uF 20% 10V
C200	1-124-443-00	ELECT	100uF 20% 10V	C253	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C201	1-126-803-11	ELECT	47uF 20% 10V	C254	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C202	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C257	1-126-916-11	ELECT	1000uF 20% 6.3V
C203	1-163-253-11	CERAMIC CHIP	120PF 5% 50V	C258	1-163-005-11	CERAMIC CHIP	470PF 10% 50V
C204	1-126-803-11	ELECT	47uF 20% 10V	C259	1-163-005-11	CERAMIC CHIP	470PF 10% 50V
C205	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C260	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C206	1-124-907-11	ELECT	10uF 20% 50V	C261	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C262	1-124-927-11	ELECT	4.7uF 20% 100V
C208	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C264	1-124-927-11	ELECT	4.7uF 20% 100V
C209	1-163-133-00	CERAMIC CHIP	470PF 5% 50V	C267	1-124-927-11	ELECT	4.7uF 20% 100V
C210	1-164-005-11	CERAMIC CHIP	0.47uF 25V	C269	1-124-927-11	ELECT	4.7uF 20% 100V
C211	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C270	1-124-477-11	ELECT	47uF 20% 25V
C212	1-163-099-00	CERAMIC CHIP	18PF 5% 50V	C271	1-124-927-11	ELECT	4.7uF 20% 100V
C213	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	C272	1-124-477-11	ELECT	47uF 20% 25V
C214	1-163-257-11	CERAMIC CHIP	180PF 5% 50V	C273	1-124-927-11	ELECT	4.7uF 20% 100V
C215	1-163-237-11	CERAMIC CHIP	27PF 5% 50V	C286	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C216	1-126-803-11	ELECT	47uF 20% 10V	C287	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C217	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C293	1-126-923-11	ELECT	220uF 20% 10V
C218	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	C350	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C219	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	C351	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C220	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C401	1-124-589-11	ELECT	47uF 20% 16V
C221	1-163-001-11	CERAMIC CHIP	220PF 10% 50V	C402	1-124-589-11	ELECT	47uF 20% 16V
C222	1-163-033-91	CERAMIC CHIP	0.022uF 50V	C403	1-124-477-11	ELECT	47uF 20% 25V

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Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C404	1-124-477-11	ELECT	47uF 20%	25V	C503	1-163-251-11	CERAMIC CHIP 100PF 5% 50V
C405	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C504	1-163-245-11	CERAMIC CHIP 56PF 5% 50V
C406	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C505	1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V
C407	1-126-803-11	ELECT	47uF 20%	10V	C506	1-124-927-11	ELECT 4.7uF 20% 100V
C408	1-126-803-11	ELECT	47uF 20%	10V	C507	1-124-768-11	ELECT 4.7uF 20% 35V
C410	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C508	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V
C411	1-164-182-11	CERAMIC CHIP	0.0033uF 10%	50V	C509	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C412	1-104-760-11	CERAMIC CHIP	0.047uF 10%	50V	C510	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C413	1-163-227-11	CERAMIC CHIP	10PF 0.5PF	50V	C511	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C414	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C512	1-124-477-11	ELECT 47uF 20% 25V
C415	1-107-715-11	ELECT	22uF 20%	16V	C513	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C416	1-163-129-00	CERAMIC CHIP	330PF 5%	50V	C514	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C417	1-104-760-11	CERAMIC CHIP	0.047uF 10%	50V	C515	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C418	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C516	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C419	1-163-239-11	CERAMIC CHIP	33PF 5%	50V	C517	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C420	1-164-505-11	CERAMIC CHIP	2.2uF	16V	C519	1-164-232-11	CERAMIC CHIP 0.01uF 50V
C421	1-163-129-00	CERAMIC CHIP	330PF 5%	50V	C520	1-164-232-11	CERAMIC CHIP 0.01uF 50V
C423	1-163-121-00	CERAMIC CHIP	150PF 5%	50V	C530	1-163-257-11	CERAMIC CHIP 180PF 5% 50V
C424	1-163-125-00	CERAMIC CHIP	220PF 5%	50V	C654	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C425	1-163-253-11	CERAMIC CHIP	120PF 5%	50V	C655	1-163-038-91	CERAMIC CHIP 0.1uF 25V
C427	1-107-714-11	ELECT	10uF 20%	16V	< CONNECTOR >		
C428	1-163-809-11	CERAMIC CHIP	0.047uF 10%	25V	CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P
C430	1-163-239-11	CERAMIC CHIP	33PF 5%	50V	CN401	1-750-687-11	HOUSING, CONNECTOR (PC BOARD)
C431	1-164-489-11	CERAMIC CHIP	0.22uF 10%	16V	* CN402	1-764-594-21	CONNECTOR, FPC 18P
C432	1-163-022-00	CERAMIC CHIP	0.012uF 10%	50V	CN403	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P
C433	1-163-017-00	CERAMIC CHIP	0.0047uF 5%	50V	CN501	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P
C434	1-163-016-00	CERAMIC CHIP	0.0039uF 10%	50V	* CN502	1-695-334-11	PIN, CONNECTOR (PC BOARD) 11P
C435	1-163-018-00	CERAMIC CHIP	0.0056uF 5%	50V	< TRIMMER >		
C436	1-164-232-11	CERAMIC CHIP	0.01uF	50V	CT001	1-141-318-11	CAP, VAR, TRIMMER
C437	1-124-273-00	ELECT	3.3uF 20%	50V	< DIODE >		
C439	1-104-760-11	CERAMIC CHIP	0.047uF 10%	50V	D001	8-719-987-69	DIODE DAN217
C440	1-164-232-11	CERAMIC CHIP	0.01uF	50V	D002	8-719-988-62	DIODE 1SS355
C441	1-107-714-11	ELECT	10uF 20%	16V	D110	8-719-988-62	DIODE 1SS355
C443	1-164-004-11	CERAMIC CHIP	0.1uF 10%	25V	D202	8-719-914-43	DIODE DAN202K
C444	1-163-125-00	CERAMIC CHIP	220PF 5%	50V	D203	8-719-032-80	DIODE KV1430TLOO
C445	1-163-014-00	CERAMIC CHIP	0.0027uF 10%	50V	D204	8-719-914-42	DIODE DA204K
C447	1-163-019-00	CERAMIC CHIP	0.0068uF 10%	50V	D205	8-719-914-42	DIODE DA204K
C448	1-164-161-11	CERAMIC CHIP	0.0022uF 10%	100V	D209	8-719-988-62	DIODE 1SS355
C449	1-109-889-11	ELECT	1uF 20%	50V	D401	8-719-988-62	DIODE 1SS355
C450	1-164-489-11	CERAMIC CHIP	0.22uF 10%	16V	D402	8-719-914-42	DIODE DA204K
C451	1-163-014-00	CERAMIC CHIP	0.0027uF 10%	50V	D403	8-719-914-43	DIODE DAN202K
C453	1-124-903-11	ELECT	1uF 20%	50V	D404	8-719-914-44	DIODE DAP202K
C454	1-164-232-11	CERAMIC CHIP	0.01uF	50V	D405	8-719-976-94	DIODE DTZ4.7A
C455	1-163-024-00	CERAMIC CHIP	0.018uF 10%	50V	D501	8-719-988-62	DIODE 1SS355
C456	1-163-011-11	CERAMIC CHIP	0.0015uF 10%	50V	D503	8-719-988-62	DIODE 1SS355
C457	1-163-235-11	CERAMIC CHIP	22PF 5%	50V	D504	8-719-977-34	DIODE DTZ12
C458	1-163-017-00	CERAMIC CHIP	0.0047uF 5%	50V	D505	8-719-914-44	DIODE DAP202K
C459	1-163-239-11	CERAMIC CHIP	33PF 5%	50V			
C501	1-126-803-11	ELECT	47uF 20%	10V			
C502	1-107-701-11	ELECT	47uF 20%	16V			

Ref. No.	Part No.	Description	Remarks
		< FERRITE BEAD >	
FB501	1-414-135-11	INDUCTOR CHIP OUH	
		< FILTER >	
FL001	1-577-543-11	FILTER, CERAMIC	
FL002	1-577-543-11	FILTER, CERAMIC	
FL201	1-236-744-21	FILTER, EMI	
FL202	1-236-744-21	FILTER, EMI	
		< IC >	
IC001	8-759-299-92	IC AN2661NK	
IC002	8-759-294-46	IC M35014-053SP	
IC003	8-759-290-65	IC MN8811	
IC004	8-759-295-66	IC BA7653AF-E2	
IC005	8-759-324-99	IC MM1118XFBE	
IC201	8-752-372-94	IC CXD2507AQ	
IC203	8-759-253-26	IC CA0002AM-TP	
IC204	8-759-700-43	IC NJM4558M	
IC205	8-759-327-78	IC TC9404FN-EL	
IC206	8-759-700-43	IC NJM4558M	
IC401	8-759-280-89	IC HA11529F	
△IC402	8-759-822-38	IC LA6510	
△IC403	8-759-700-43	IC NJM4558M	
IC404	8-759-700-43	IC NJM4558M	
IC405	8-759-700-43	IC NJM4558M	
IC406	8-759-700-43	IC NJM4558M	
IC407	8-759-300-71	IC HD14053BFP	
IC501	8-759-336-57	IC MB89094PF-G-138-BND	
IC502	8-759-329-96	IC MSM10S0110-069GS-V1K	
IC503	8-759-231-92	IC TA7291P	
IC504	8-759-058-50	IC XRA10324AF	
IC505	8-759-009-06	IC MC14052BF	
IC506	8-759-300-71	IC HD14053BFP	
		< JACK >	
J202	1-764-592-11	JACK 3P (LINE OUT 2)	
J203	1-764-592-11	JACK 3P (LINE OUT 1)	
		< JUMPER RESISTOR >	
JR006	1-216-295-91	CONDCTOR, CHIP (2012)	
JR007	1-216-295-91	CONDCTOR, CHIP (2012)	
JR402	1-216-295-91	CONDCTOR, CHIP (2012)	
JR403	1-216-296-00	METAL CHIP 0 5%	1/8W
JR404	1-216-296-00	METAL CHIP 0 5%	1/8W
JR405	1-216-295-91	CONDCTOR, CHIP (2012)	
JR601	1-216-295-91	CONDCTOR, CHIP (2012)	
JR602	1-216-295-91	CONDCTOR, CHIP (2012)	

Ref. No.	Part No.	Description	Remarks
		< COIL >	
L001	1-408-970-21	INDUCTOR 10uH	
L002	1-408-970-21	INDUCTOR 10uH	
L003	1-408-970-21	INDUCTOR 10uH	
L004	1-408-970-21	INDUCTOR 10uH	
L005	1-408-973-21	INDUCTOR 18uH	
L006	1-410-381-11	INDUCTOR CHIP 10uH	
L007	1-408-974-21	INDUCTOR 22uH	
L008	1-410-512-61	INDUCTOR 18uH	
L009	1-410-512-61	INDUCTOR 18uH	
L010	1-410-507-11	INDUCTOR 6.8uH	
L011	1-410-507-11	INDUCTOR 6.8uH	
L012	1-408-974-21	INDUCTOR 22uH	
L013	1-408-976-21	INDUCTOR 33uH	
L014	1-408-976-21	INDUCTOR 33uH	
L015	1-408-975-21	INDUCTOR 27uH	
L016	1-408-970-21	INDUCTOR 10uH	
L017	1-408-975-21	INDUCTOR 27uH	
L018	1-408-970-21	INDUCTOR 10uH	
L019	1-408-970-21	INDUCTOR 10uH	
L020	1-408-970-21	INDUCTOR 10uH	
L021	1-408-970-21	INDUCTOR 10uH	
L022	1-408-974-21	INDUCTOR 22uH	
L024	1-408-974-21	INDUCTOR 22uH	
L025	1-408-970-21	INDUCTOR 10uH	
L026	1-408-975-21	INDUCTOR 27uH	
L027	1-408-970-21	INDUCTOR 10uH	
L028	1-408-970-21	INDUCTOR 10uH	
L201	1-408-982-21	INDUCTOR 100uH	
L202	1-408-979-21	INDUCTOR 56uH	
L203	1-408-978-21	INDUCTOR 47uH	
L204	1-408-973-21	INDUCTOR 18uH	
L205	1-408-985-21	INDUCTOR 180uH	
L209	1-414-161-21	INDUCTOR 1mH	
L210	1-414-161-21	INDUCTOR 1mH	
L401	1-408-970-21	INDUCTOR 10uH	
L402	1-408-970-21	INDUCTOR 10uH	
L404	1-408-983-21	INDUCTOR 120uH	
L405	1-408-983-21	INDUCTOR 120uH	
L406	1-408-970-21	INDUCTOR 10uH	
L407	1-408-970-21	INDUCTOR 10uH	
L501	1-408-970-21	INDUCTOR 10uH	
L504	1-408-970-21	INDUCTOR 10uH	
		< TRANSISTOR >	
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q003	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q004	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q007	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

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

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Ref. No.	Part No.	Description	Remarks
Q009	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q011	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q012	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q013	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q014	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q015	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q016	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q017	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q019	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q020	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q021	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q022	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q023	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q024	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q025	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q026	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q027	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q028	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q030	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q201	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q202	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q203	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q205	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q206	8-729-027-23	TRANSISTOR DTA114EKA-T146	
Q207	8-729-027-44	TRANSISTOR DTC114TKA-T146	
Q210	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q211	8-729-202-38	TRANSISTOR 2SC3326N-A	
△Q401	8-729-019-01	TRANSISTOR 2SD2394-EF	
△Q402	8-729-024-95	TRANSISTOR 2SB1565EF	
△Q403	8-729-019-01	TRANSISTOR 2SD2394-EF	
△Q404	8-729-024-95	TRANSISTOR 2SB1565EF	
Q405	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q406	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q407	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q408	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q409	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q410	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q411	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q412	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q413	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q414	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q415	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q416	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q417	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q418	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q501	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q502	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q614	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

Ref. No.	Part No.	Description	Remarks
< RESISTOR >			
R001	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R002	1-216-075-00	METAL CHIP 12K 5%	1/10W
R003	1-216-041-00	METAL CHIP 470 5%	1/10W
R004	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R005	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R006	1-216-021-00	METAL CHIP 68 5%	1/10W
R007	1-216-035-00	METAL CHIP 270 5%	1/10W
R008	1-216-047-00	METAL CHIP 820 5%	1/10W
R009	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R010	1-216-037-00	METAL CHIP 330 5%	1/10W
R011	1-216-075-00	METAL CHIP 12K 5%	1/10W
R012	1-216-083-00	METAL CHIP 27K 5%	1/10W
R014	1-216-097-00	METAL CHIP 100K 5%	1/10W
R015	1-216-099-00	METAL CHIP 120K 5%	1/10W
R016	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R017	1-216-043-91	METAL GLAZE 560 5%	1/10W
R018	1-216-073-00	METAL CHIP 10K 5%	1/10W
R019	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R020	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R021	1-216-089-00	METAL CHIP 47K 5%	1/10W
R022	1-216-041-00	METAL CHIP 470 5%	1/10W
R023	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R025	1-216-097-00	METAL CHIP 100K 5%	1/10W
R027	1-216-119-00	METAL CHIP 820K 5%	1/10W
R032	1-216-101-00	METAL CHIP 150K 5%	1/10W
R033	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R034	1-216-045-00	METAL CHIP 680 5%	1/10W
R035	1-216-039-00	METAL CHIP 390 5%	1/10W
R036	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R038	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R039	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R040	1-216-043-91	METAL GLAZE 560 5%	1/10W
R041	1-216-009-00	METAL CHIP 22 5%	1/10W
R042	1-216-029-00	METAL CHIP 150 5%	1/10W
R043	1-216-041-00	METAL CHIP 470 5%	1/10W
R044	1-216-041-00	METAL CHIP 470 5%	1/10W
R045	1-216-075-00	METAL CHIP 12K 5%	1/10W
R046	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R047	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R048	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R049	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R050	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R051	1-216-073-00	METAL CHIP 10K 5%	1/10W
R052	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R053	1-216-043-91	METAL GLAZE 560 5%	1/10W
R054	1-216-041-00	METAL CHIP 470 5%	1/10W
R055	1-216-073-00	METAL CHIP 10K 5%	1/10W
R056	1-216-039-00	METAL CHIP 390 5%	1/10W
R059	1-216-043-91	METAL GLAZE 560 5%	1/10W
R061	1-216-049-91	METAL GLAZE 1K 5%	1/10W

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

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R062	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R130	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R063	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R139	1-164-232-11	CERAMIC CHIP	0.01uF		50V
R064	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R144	1-216-033-00	METAL CHIP	220	5%	1/10W
R065	1-216-091-00	METAL CHIP	56K	5%	1/10W	R145	1-216-295-91	CONDUCTOR, CHIP (2012)			
R066	1-216-089-00	METAL CHIP	47K	5%	1/10W	R201	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R067	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R203	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R068	1-216-025-91	METAL GLAZE	100	5%	1/10W	R206	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R069	1-216-037-00	METAL CHIP	330	5%	1/10W	R208	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R070	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R209	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R071	1-216-073-00	METAL CHIP	10K	5%	1/10W	R210	1-216-041-00	METAL CHIP	470	5%	1/10W
R072	1-216-033-00	METAL CHIP	220	5%	1/10W	R211	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R073	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R212	1-216-017-00	METAL CHIP	47	5%	1/10W
R074	1-216-025-91	METAL GLAZE	100	5%	1/10W	R213	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R075	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R214	1-216-023-00	METAL CHIP	82	5%	1/10W
R076	1-216-295-91	CONDUCTOR, CHIP (2012)				R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R077	1-216-041-00	METAL CHIP	470	5%	1/10W	R216	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R078	1-216-025-91	METAL GLAZE	100	5%	1/10W	R217	1-216-073-00	METAL CHIP	10K	5%	1/10W
R079	1-216-041-00	METAL CHIP	470	5%	1/10W	R218	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R080	1-216-121-00	METAL CHIP	1M	5%	1/10W	R219	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R081	1-216-021-00	METAL CHIP	68	5%	1/10W	R220	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R082	1-216-041-00	METAL CHIP	470	5%	1/10W	R222	1-216-295-91	CONDUCTOR, CHIP (2012)			
R083	1-216-043-91	METAL GLAZE	560	5%	1/10W	R224	1-216-121-00	METAL CHIP	1M	5%	1/10W
R084	1-216-041-00	METAL CHIP	470	5%	1/10W	R226	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R085	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R227	1-216-074-00	METAL CHIP	11K	5%	1/10W
R086	1-216-021-00	METAL CHIP	68	5%	1/10W	R228	1-216-121-00	METAL CHIP	1M	5%	1/10W
R088	1-216-295-91	CONDUCTOR, CHIP (2012)				R229	1-163-031-11	CERAMIC CHIP	0.01MF		50V
R089	1-216-033-00	METAL CHIP	220	5%	1/10W	R230	1-216-295-91	CONDUCTOR, CHIP (2012)			
R090	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R231	1-216-295-91	CONDUCTOR, CHIP (2012)			
R091	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	R232	1-216-043-91	METAL GLAZE	560	5%	1/10W
R093	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R233	1-216-295-91	CONDUCTOR, CHIP (2012)			
R094	1-216-073-00	METAL CHIP	10K	5%	1/10W	R235	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R095	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R236	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R097	1-216-295-91	CONDUCTOR, CHIP (2012)				R237	1-216-077-00	METAL CHIP	15K	5%	1/10W
R098	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R238	1-216-077-00	METAL CHIP	15K	5%	1/10W
R099	1-216-037-00	METAL CHIP	330	5%	1/10W	R239	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R110	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R240	1-216-096-00	METAL GLAZE	91K	5%	1/10W
R111	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R242	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R112	1-216-295-91	CONDUCTOR, CHIP (2012)				R243	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R113	1-216-037-00	METAL CHIP	330	5%	1/10W	R245	1-216-104-00	METAL CHIP	200K	5%	1/10W
R119	1-216-047-00	METAL CHIP	820	5%	1/10W	R246	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R120	1-216-081-00	METAL CHIP	22K	5%	1/10W	R247	1-216-043-91	METAL GLAZE	560	5%	1/10W
R121	1-216-095-00	METAL CHIP	82K	5%	1/10W	R248	1-216-043-91	METAL GLAZE	560	5%	1/10W
R122	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R250	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R123	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R251	1-216-097-00	METAL CHIP	100K	5%	1/10W
R124	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R252	1-216-097-00	METAL CHIP	100K	5%	1/10W
R125	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R254	1-216-101-00	METAL CHIP	150K	5%	1/10W
R126	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R255	1-216-101-00	METAL CHIP	150K	5%	1/10W
R127	1-216-113-00	METAL CHIP	470K	5%	1/10W	R256	1-216-073-00	METAL CHIP	10K	5%	1/10W
R128	1-216-029-00	METAL CHIP	150	5%	1/10W	R257	1-216-073-00	METAL CHIP	10K	5%	1/10W
R129	1-216-033-00	METAL CHIP	220	5%	1/10W	R258	1-216-104-00	METAL CHIP	200K	5%	1/10W

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Ref. No.	Part No.	Description	Remarks		
R260	1-216-091-00	METAL CHIP	56K	5%	1/10W
R261	1-216-091-00	METAL CHIP	56K	5%	1/10W
R262	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R263	1-216-091-00	METAL CHIP	56K	5%	1/10W
R264	1-216-091-00	METAL CHIP	56K	5%	1/10W
R265	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R266	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R267	1-216-295-91	CONDCTOR, CHIP (2012)			
R269	1-216-295-91	CONDCTOR, CHIP (2012)			
R270	1-216-097-00	METAL CHIP	100K	5%	1/10W
R271	1-216-097-00	METAL CHIP	100K	5%	1/10W
R272	1-216-075-00	METAL CHIP	12K	5%	1/10W
R273	1-216-085-00	METAL CHIP	33K	5%	1/10W
R278	1-216-295-91	CONDCTOR, CHIP (2012)			
R279	1-216-075-00	METAL CHIP	12K	5%	1/10W
R281	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R282	1-216-081-00	METAL CHIP	22K	5%	1/10W
R283	1-216-075-00	METAL CHIP	12K	5%	1/10W
R286	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R287	1-216-081-00	METAL CHIP	22K	5%	1/10W
R289	1-216-081-00	METAL CHIP	22K	5%	1/10W
R290	1-216-081-00	METAL CHIP	22K	5%	1/10W
R292	1-216-043-91	METAL GLAZE	560	5%	1/10W
R295	1-216-043-91	METAL GLAZE	560	5%	1/10W
R300	1-216-073-00	METAL CHIP	10K	5%	1/10W
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W
R302	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R303	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R307	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R308	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R309	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R323	1-216-033-00	METAL CHIP	220	5%	1/10W
R324	1-216-033-00	METAL CHIP	220	5%	1/10W
R352	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R353	1-216-073-00	METAL CHIP	10K	5%	1/10W
R401	1-216-369-00	METAL OXIDE	1	5%	2W F
R402	1-216-146-00	METAL GLAZE	6.8	5%	1/8W
R403	1-216-146-00	METAL GLAZE	6.8	5%	1/8W
R404	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R405	1-216-025-91	METAL GLAZE	100	5%	1/10W
R406	1-216-079-00	METAL CHIP	18K	5%	1/10W
R407	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R408	1-216-081-00	METAL CHIP	22K	5%	1/10W
R409	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R411	1-216-077-00	METAL CHIP	15K	5%	1/10W
R412	1-216-045-00	METAL CHIP	680	5%	1/10W
R413	1-216-047-00	METAL CHIP	820	5%	1/10W
R414	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R415	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

Ref. No.	Part No.	Description	Remarks		
R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R417	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R418	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R419	1-216-045-00	METAL CHIP	680	5%	1/10W
R420	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R421	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R422	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R423	1-216-039-00	METAL CHIP	390	5%	1/10W
R424	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R425	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R426	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R427	1-216-017-00	METAL CHIP	47	5%	1/10W
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W
R429	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R430	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R431	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R432	1-216-107-00	METAL CHIP	270K	5%	1/10W
R433	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R434	1-216-097-00	METAL CHIP	100K	5%	1/10W
R435	1-216-077-00	METAL CHIP	15K	5%	1/10W
R436	1-216-101-00	METAL CHIP	150K	5%	1/10W
R437	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R438	1-216-089-00	METAL CHIP	47K	5%	1/10W
R442	1-216-073-00	METAL CHIP	10K	5%	1/10W
R444	1-216-075-00	METAL CHIP	12K	5%	1/10W
R445	1-216-079-00	METAL CHIP	18K	5%	1/10W
R446	1-216-101-00	METAL CHIP	150K	5%	1/10W
R447	1-216-089-00	METAL CHIP	47K	5%	1/10W
R448	1-216-101-00	METAL CHIP	150K	5%	1/10W
R449	1-216-035-00	METAL CHIP	270	5%	1/10W
R450	1-216-089-00	METAL CHIP	47K	5%	1/10W
R451	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R452	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R453	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R454	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R455	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R456	1-216-097-00	METAL CHIP	100K	5%	1/10W
R457	1-216-081-00	METAL CHIP	22K	5%	1/10W
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W
R459	1-216-083-00	METAL CHIP	27K	5%	1/10W
R460	1-216-075-00	METAL CHIP	12K	5%	1/10W
R461	1-216-085-00	METAL CHIP	33K	5%	1/10W
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W
R463	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R464	1-216-075-00	METAL CHIP	12K	5%	1/10W
R465	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R466	1-216-097-00	METAL CHIP	100K	5%	1/10W
R467	1-216-085-00	METAL CHIP	33K	5%	1/10W
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W
R469	1-216-049-91	METAL GLAZE	1K	5%	1/10W

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R470	1-216-081-00	METAL CHIP	22K	5%	1/10W	R525	1-216-101-00	METAL CHIP	150K	5%	1/10W
R471	1-216-079-00	METAL CHIP	18K	5%	1/10W	R526	1-216-089-00	METAL CHIP	47K	5%	1/10W
R472	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R527	1-216-033-00	METAL CHIP	220	5%	1/10W
R473	1-216-075-00	METAL CHIP	12K	5%	1/10W	R528	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R474	1-216-093-00	METAL CHIP	68K	5%	1/10W	R530	1-216-073-00	METAL CHIP	10K	5%	1/10W
R475	1-216-099-00	METAL CHIP	120K	5%	1/10W	R531	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R476	1-216-073-00	METAL CHIP	10K	5%	1/10W	R532	1-216-045-00	METAL CHIP	680	5%	1/10W
R477	1-216-077-00	METAL CHIP	15K	5%	1/10W	R533	1-216-097-00	METAL CHIP	100K	5%	1/10W
R478	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R534	1-216-093-00	METAL CHIP	68K	5%	1/10W
R479	1-216-085-00	METAL CHIP	33K	5%	1/10W	R535	1-216-095-00	METAL CHIP	82K	5%	1/10W
R480	1-216-073-00	METAL CHIP	10K	5%	1/10W	R536	1-216-073-00	METAL CHIP	10K	5%	1/10W
R481	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R537	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R482	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R538	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W	R539	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R484	1-216-091-00	METAL CHIP	56K	5%	1/10W	R540	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R485	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R541	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R486	1-216-073-00	METAL CHIP	10K	5%	1/10W	R542	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R487	1-216-079-00	METAL CHIP	18K	5%	1/10W	R543	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R488	1-216-089-00	METAL CHIP	47K	5%	1/10W	△R544	1-212-950-00	FUSIBLE	4.7	5%	1/2W F
R489	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R545	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R490	1-216-073-00	METAL CHIP	10K	5%	1/10W	R546	1-216-045-00	METAL CHIP	680	5%	1/10W
R491	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R547	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R492	1-216-073-00	METAL CHIP	10K	5%	1/10W	R548	1-216-081-00	METAL CHIP	22K	5%	1/10W
R493	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R549	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R494	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R550	1-216-073-00	METAL CHIP	10K	5%	1/10W
R495	1-216-085-00	METAL CHIP	33K	5%	1/10W	R551	1-216-081-00	METAL CHIP	22K	5%	1/10W
R496	1-216-097-00	METAL CHIP	100K	5%	1/10W	R552	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R497	1-216-097-00	METAL CHIP	100K	5%	1/10W	R555	1-216-021-00	METAL CHIP	68	5%	1/10W
R498	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R556	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R499	1-216-090-00	METAL CHIP	51K	5%	1/10W	R557	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R502	1-216-089-00	METAL CHIP	47K	5%	1/10W	R558	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R506	1-216-121-00	METAL CHIP	1M	5%	1/10W	R559	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R507	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R560	1-216-033-00	METAL CHIP	220	5%	1/10W
R508	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W	R561	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R509	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	R562	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R510	1-216-089-00	METAL CHIP	47K	5%	1/10W	R563	1-216-033-00	METAL CHIP	220	5%	1/10W
R511	1-216-111-00	METAL CHIP	390K	5%	1/10W	R564	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R512	1-216-113-00	METAL CHIP	470K	5%	1/10W	R566	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R513	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W	R567	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R514	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W	R568	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W	R569	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R516	1-216-085-00	METAL CHIP	33K	5%	1/10W	R570	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R517	1-208-808-11	METAL GLAZE	12K	0.50%	1/10W	R571	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R518	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	R572	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R519	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	R573	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R520	1-216-073-00	METAL CHIP	10K	5%	1/10W	R574	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R521	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W	R576	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R522	1-216-081-00	METAL CHIP	22K	5%	1/10W	R577	1-216-073-00	METAL CHIP	10K	5%	1/10W
R523	1-216-035-00	METAL CHIP	270	5%	1/10W	R578	1-216-089-00	METAL CHIP	47K	5%	1/10W
R524	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W	R594	1-216-295-91	CONDUCTOR, CHIP (2012)			

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

MB-717

MD-705

Ref. No.	Part No.	Description	Remarks
R595	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R596	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R597	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R598	1-216-295-91	CONDUCTOR, CHIP (2012)	
R663	1-216-025-91	METAL GLAZE 100 5%	1/10W
R677	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R689	1-216-295-91	CONDUCTOR, CHIP (2012)	
R900	1-216-085-00	METAL CHIP 33K 5%	1/10W
R901	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R902	1-216-081-00	METAL CHIP 22K 5%	1/10W
R903	1-216-081-00	METAL CHIP 22K 5%	1/10W
R904	1-216-105-91	METAL GLAZE 220K 5%	1/10W
R905	1-216-085-00	METAL CHIP 33K 5%	1/10W
R906	1-216-077-00	METAL CHIP 15K 5%	1/10W
R907	1-216-067-00	METAL CHIP 5.6K 5%	1/10W
R908	1-216-097-00	METAL CHIP 100K 5%	1/10W
R910	1-216-295-91	CONDUCTOR, CHIP (2012)	
R911	1-216-081-00	METAL CHIP 22K 5%	1/10W
R912	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R913	1-216-103-91	METAL GLAZE 180K 5%	1/10W
R914	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R915	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R916	1-216-083-00	METAL CHIP 27K 5%	1/10W
R917	1-216-099-00	METAL CHIP 120K 5%	1/10W
R918	1-216-103-91	METAL CHIP 180K 5%	1/10W
R919	1-216-073-00	METAL CHIP 10K 5%	1/10W
R920	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R921	1-216-103-91	METAL CHIP 180K 5%	1/10W
R922	1-216-073-00	METAL CHIP 10K 5%	1/10W
R923	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R924	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R925	1-216-017-00	METAL CHIP 47 5%	1/10W
R926	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
R927	1-216-003-11	METAL GLAZE 12 5%	1/10W
R928	1-216-081-00	METAL CHIP 22K 5%	1/10W
R929	1-216-107-00	METAL CHIP 270K 5%	1/10W
R930	1-216-089-00	METAL CHIP 47K 5%	1/10W
R931	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R932	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R933	1-216-073-00	METAL CHIP 10K 5%	1/10W
R935	1-216-085-00	METAL CHIP 33K 5%	1/10W
R936	1-216-031-00	METAL CHIP 180 5%	1/10W
R937	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R939	1-216-073-00	METAL CHIP 10K 5%	1/10W
R944	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R945	1-216-049-91	METAL GLAZE 1K 5%	1/10W
< VARIABLE RESISTOR >			
RV001	1-223-236-11	RES, ADJ, CARBON 1K	
RV401	1-223-241-11	RES, ADJ, CARBON 47K	

Ref. No.	Part No.	Description	Remarks
RV402	1-223-241-11	RES, ADJ, CARBON 47K	
< VIBRATOR >			
X001	1-760-693-21	VIBRATOR, CRYSTAL 28.12MHz	
X201	1-567-515-11	VIBRATOR, VARIABLE CRYSTAL 16.93MHz	

*	A-6423-230-A	MD-705 BOARD, COMPLETE	

(Ref.No.2,000 Series)			
3-953-262-01 HOLDER, LED			
< CONNECTOR >			
CN431	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
CN432	1-691-036-21	HOUSING, CONNECTOR 4P	
CN433	1-766-938-11	CONNECTOR, BOARD TO BOARD 5P	
* CN434	1-564-014-51	PIN, CONNECTOR 4P	
< DIODE >			
D431	8-719-912-39	LED SLR-932A	
< JUMPER RESISTOR >			
JR431	1-216-296-00	METAL CHIP 0 5%	1/8W
JR432	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR433	1-216-296-00	METAL CHIP 0 5%	1/8W
JR434	1-216-296-00	METAL CHIP 0 5%	1/8W
JR435	1-216-296-00	METAL CHIP 0 5%	1/8W
JR436	1-216-296-00	METAL CHIP 0 5%	1/8W
JR437	1-216-296-00	METAL CHIP 0 5%	1/8W
JR438	1-216-296-00	METAL CHIP 0 5%	1/8W
JR439	1-216-296-00	METAL CHIP 0 5%	1/8W
JR440	1-216-296-00	METAL CHIP 0 5%	1/8W
JR441	1-216-296-00	METAL CHIP 0 5%	1/8W
JR442	1-216-295-91	CONDUCTOR, CHIP (2012)	
< PHOTO INTERRUPTER >			
PH431	8-729-020-74	DIODE GP1S24	
PH432	8-729-020-74	DIODE GP1S24	
< RESISTOR >			
R431	1-216-039-00	METAL CHIP 390 5%	1/10W
R432	1-216-099-00	METAL CHIP 120K 5%	1/10W
R433	1-216-248-00	METAL GLAZE 120K 5%	1/8W
R436	1-216-295-91	CONDUCTOR, CHIP (2012)	
< SWITCH >			
S431	1-692-440-11	SWITCH, PUSH	

MT-706

MT-707

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
*	A-6423-229-A	MT-706 BOARD, COMPLETE ***** (Ref.No.2,000 Series)	
		< CONNECTOR >	
	CN421 1-766-937-11	CONNECTOR, BOARD TO BOARD 5P *****	
*	1-654-464-11	MT-707 BOARD ***** (Ref.No.4,000 Series)	
		< CAPACITOR >	
	C481 1-163-038-91	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
* CN481	1-569-666-11	PIN, CONNECTOR (PC BOARD) 5P	
CN482	1-695-368-31	PIN, CONNECTOR (PC BOARD) 7P *****	
	1-413-989-21	POWER BLOCK ***** (Ref.No.5,000 Series)	
△	1-533-223-11	HOLDER, FUSE < CAPACITOR >	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C052	1-163-019-11	MULTILAYER CERAMIC 6800PF 50V	
C053	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C057	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C058	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C059	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C061	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 50V	
C064	1-130-491-51	FILM 0.047uF 50V	
△C101	9-902-038-01	METALLIZED 0.22uF 250V	
△C102	9-900-521-01	METALLIZED 0.1uF 250V	
△C103	9-900-522-01	CERAMIC 2200PF 400V	
△C104	9-900-522-01	CERAMIC 2200PF 400V	
△C105	9-900-522-01	CERAMIC 2200PF 400V	
△C106	9-900-522-01	CERAMIC 2200PF 400V	
△C107	9-900-522-01	CERAMIC 2200PF 400V	
△C108	9-933-773-01	ALUMINUM ELECTIC 100uF 400V	
△C109	9-933-773-01	ALUMINUM ELECTIC 100uF 400V	
△C110	9-909-673-01	CERAMIC 220PF 1kV	
△C111	9-900-525-01	METALLIZED 0.047uF 400V	

Ref. No.	Part No.	Description	Remarks
△C112	1-106-363-00	FILM 0.0068uF 50V	
△C113	1-130-483-91	METALLIZED 0.01uF 50V	
△C114	1-107-355-51	METALLIZED 0.22uF 50V	
△C115	1-130-470-00	FILM 820PF 50V	
△C116	1-216-967-51	ALUMINUM ELECTRIC 47uF 50V	
△C117	9-900-522-01	CERAMIC 2200PF 400V	
△C118	9-900-522-01	CERAMIC 2200PF 400V	
△C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF 25V	
△C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF 25V	
△C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF 10V	
△C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF 10V	
△C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF 10V	
△C206	1-126-925-51	ALUMINUM ELECTRIC 470uF 10V	
C208	1-126-964-51	ALUMINUM ELECTRIC 10uF 50V	
C210	1-126-964-51	ALUMINUM ELECTRIC 10uF 50V	
C211	1-126-925-51	ALUMINUM ELECTRIC 470uF 10V	
C212	1-126-923-51	ALUMINUM ELECTRIC 220uF 10V	
C213	1-130-495-91	ALUMINUM ELECTRIC 4.7uF 50V	
C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF 50V	
C215	9-909-680-01	CERAMIC 1000PF 1kV	
C216	9-909-680-01	CERAMIC 1000PF 1kV	
C217	1-130-491-51	FILM 0.047uF 50V	
C218	1-126-942-11	ALUMINUM ELECTRIC 1000uF 25V	
C219	1-126-942-11	ALUMINUM ELECTRIC 1000uF 25V	
C220	1-130-467-11	FILM 470PF 50V	
C221	1-130-467-11	FILM 470PF 50V	
		< CONNECTOR >	
CN051	1-695-342-11	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	
		< DIODE >	
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
△D101	8-719-510-19	BRIDGE DIODE D2SBA60	
△D102	9-902-050-01	DIODE ERA15-06	
△D103	8-719-030-25	DIODE EG01C	
△D104	9-900-514-01	DIODE MA165	
△D105	9-900-535-01	DIODE AU02Z	
△D201	8-719-510-72	DIODE S3L20U	
△D202	8-719-510-72	DIODE S3L20U	

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

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
△D203	8-719-510-72	DIODE S3L20U	
△D204	8-719-043-74	DIODE AK04	
△D205	9-900-514-01	DIODE MA165	
△D206	9-900-514-01	DIODE MA165	
△D208	8-719-200-82	DIODE 11ES2	
△D209	8-719-035-04	ZENNER DIODE MA4240	
< FUSE >			
△F101	1-532-286-11	FUSE TIME LUG (T3.15AL 250V)	
< IC >			
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC NJM4558M	
△IC101	8-759-062-58	IC FA5311S	
△IC201	8-759-701-79	IC NJM78M12FA	
△IC202	8-759-929-65	IC LM7912CT	
△IC203	9-900-532-01	IC AN1431T	
△IC204	8-759-100-96	IC NJM4558M	
< COIL >			
L051	1-424-219-11	CHORKE COIL 300uH	
△L101	9-909-675-01	LINE FILTER	
△L102	9-909-675-01	LINE FILTER	
△L103	9-904-796-01	BEAD CORE	
△L201	9-909-681-01	CHORKE COIL 10uH	
△L202	9-909-681-01	CHORKE COIL 10uH	
△L204	9-909-681-01	CHORKE COIL 10uH	
△L205	9-909-681-01	CHORKE COIL 10uH	
< PHOTO COUPLER >			
△PC101	9-909-676-01	PHOTO COUPLER	
△PC102	9-909-677-01	PHOTO COUPLER	
< IC LINK >			
△PS051	1-532-675-91	IC LINK (ICP-N38 1.5A)	
△PS052	1-532-675-91	IC LINK	
< TRANSISTOR >			
△Q051	8-729-117-11	TRANSISTOR 2SB1151	
△Q052	8-729-019-31	TRANSISTOR 2SC4596	
△Q053	8-729-117-11	TRANSISTOR 2SB1151	
△Q054	8-729-019-31	TRANSISTOR 2SC4596	
Q055	8-729-119-78	TRANSISTOR 2SC3311	
Q056	8-729-230-46	TRANSISTOR 2SA1162	
Q058	8-729-230-49	TRANSISTOR 2SC2712	
Q059	8-729-230-46	TRANSISTOR 2SA1162	
Q060	8-729-230-49	TRANSISTOR 2SC2712	
Q061	8-729-119-76	TRANSISTOR 2SA1309	

Ref. No.	Part No.	Description	Remarks
△Q101	9-909-669-01	TRANSISTOR 2SK1547	
△Q201	8-729-021-99	TRANSISTOR 2SB1416	
△Q202	8-729-119-78	TRANSISTOR 2SC1740	
△Q203	8-729-119-76	TRANSISTOR 2SA933	
△Q204	9-909-678-01	TRANSISTOR 2SC4545	
△Q206	8-729-900-80	TRANSISTOR UN4211	
< RESISTOR >			
R050	1-216-097-11	THICK FILM 100K	1/10W
R051	1-216-081-11	THICK FILM 22K	1/10W
R052	1-216-075-11	THICK FILM 12K	1/10W
R053	1-216-093-11	THICK FILM 68K	1/10W
R054	1-216-105-11	THICK FILM 220K	1/10W
R055	1-216-091-11	THICK FILM 56K	1/10W
R057	1-216-093-11	THICK FILM 68K	1/10W
R061	1-216-089-11	THICK FILM 47K	1/10W
R062	1-216-065-11	THICK FILM 4.7K	1/10W
R063	1-216-049-11	THICK FILM 1K	1/10W
R064	1-247-750-11	CARBON 680 5%	1/2W
R065	1-247-750-11	CARBON 680 5%	1/2W
R066	1-216-049-11	THICK FILM 1K	1/10W
△R067	1-216-369-51	CARBON 1	2W
R068	1-219-387-11	THICK FILM 43K	0.1% 1/10W
R069	1-219-391-11	THICK FILM 47K	0.1% 1/10W
R070	1-219-387-11	THICK FILM 43K	0.1% 1/10W
R071	1-219-391-11	THICK FILM 47K	0.1% 1/10W
R072	1-216-073-11	THICK FILM 10K	1/10W
R073	1-216-073-11	THICK FILM 10K	1/10W
△R074	1-216-866-21	CARBON 330 5%	1W
R075	1-216-073-11	THICK FILM 10K	1/10W
R076	1-247-750-11	CARBON 680 5%	1/2W
R077	1-216-073-11	THICK FILM 10K	1/10W
R079	1-216-097-11	THICK FILM 100K	1/10W
R080	1-216-097-11	THICK FILM 100K	1/10W
△R101	9-900-394-01	NON-FLAMABLE CARBON 1M	1/2W
△R102	1-215-863-11	METAL OXIDE FILM 100K	1W
△R103	1-215-863-11	METAL OXIDE FILM 100K	1W
△R104	1-214-921-11	CARBON 220K	1/2W
△R105	1-214-921-11	CARBON 220K	1/2W
△R106	1-215-860-51	METAL OXIDE FILM 33K	1W
△R107	1-215-927-51	METAL OXIDE FILM 47K	3W
△R108	1-212-974-11	NON-FLAMABLE CARBON 47	1/2W
△R109	9-909-670-01	METAL FILM 0.22	1/2W
△R110	9-909-671-01	CEMENT 0.1	2W
△R111	1-249-408-11	CARBON 180	1/4W
△R112	1-212-958-11	NON-FLAMABLE CARBON 10	1/2W
△R114	1-247-848-31	CARBON 5.1K	1/4W
△R115	1-247-855-31	CARBON 10K	1/4W

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

POWER BLOCK

PW-722

SW-732

Ref. No.	Part No.	Description	Remarks
△R116	1-247-891-31	CARBON	330K 1/4W
△R117	1-247-891-31	CARBON	330K 1/4W
△R118	1-212-966-11	NON-FLAMABLE CARBON	22 1/2W
△R201	9-909-679-01	FUSE	0.22 1/4W
△R202	1-247-855-31	CARBON	10K 1/4W
R203	1-249-404-11	CARBON	82 1/4W
△R204	1-247-847-11	CARBON	4.7K 1/4W
△R205	1-247-847-11	CARBON	4.7K 1/4W
R206	1-249-404-11	CARBON	82 1/4W
△R207	1-247-855-31	CARBON	10K 1/4W
△R208	1-247-847-11	CARBON	4.7K 1/4W
△R209	1-247-847-11	CARBON	4.7K 1/4W
△R210	1-260-099-11	CARBON	1K 1/2W
△R211	1-247-839-31	CARBON	2.2K 5% 1/4W
△R212	1-247-839-31	CARBON	2.2K 5% 1/4W
R213	1-249-432-11	CARBON	18K 1/4W
R214	1-249-433-11	CARBON	22K 1/4W
△R215	1-247-855-31	CARBON	10K 1/4W
△R221	1-247-855-31	CARBON	10K 1/4W
R225	1-247-855-31	CARBON	10K 1/4W
△R226	1-247-871-11	CARBON	47K 1/4W
△R227	1-249-439-11	CARBON	68K 1/4W
< SWITCH >			
△SW101	1-572-675-11	POWER SWITCH	
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER	
< THERMISTOR >			
△TH101	9-904-783-01	POWER THERMISTOR	
< VARIABLE RESISTOR >			
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

*	A-6423-310-A PW-722 BOARD, COMPLETE		

	(Ref.No.3,000 Series)		
< CAPACITOR >			
C501	1-163-031-11	CERAMIC CHIP	0.01uF 50V
< CONNECTOR >			
CN501	1-506-486-11	PIN, CONNECTOR 7P	
< DIODE >			
D503	8-719-981-49	DIODE GL3ED8	

Ref. No.	Part No.	Description	Remarks
D504	8-719-981-49	DIODE GL3ED8	
< IC >			
IC501	8-749-923-11	IC GP1U58XB	
< TRANSISTOR >			
Q501	8-729-901-05	TRANSISTOR DTA124EK	
< RESISTOR >			
R501	1-216-089-00	METAL CHIP	47K 5% 1/10W
R502	1-216-079-00	METAL CHIP	18K 5% 1/10W
R503	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R504	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R505	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R506	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R507	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R508	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R509	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R510	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R512	1-216-037-00	METAL CHIP	330 5% 1/10W
R513	1-216-037-00	METAL CHIP	330 5% 1/10W
R514	1-216-037-00	METAL CHIP	330 5% 1/10W
R515	1-216-037-00	METAL CHIP	330 5% 1/10W
< SWITCH >			
S501	1-762-365-21	SWITCH, TACTILE (10)	
S502	1-762-365-21	SWITCH, TACTILE (9)	
S503	1-762-365-21	SWITCH, TACTILE (8)	
S504	1-762-365-21	SWITCH, TACTILE (7)	
S505	1-762-365-21	SWITCH, TACTILE (6)	
S506	1-762-365-21	SWITCH, TACTILE (5)	
S507	1-762-365-21	SWITCH, TACTILE (4)	
S508	1-762-365-21	SWITCH, TACTILE (3)	
S509	1-762-365-21	SWITCH, TACTILE (2)	
S510	1-762-365-21	SWITCH, TACTILE (1)	
S511	1-762-365-21	SWITCH, TACTILE (OPEN/CLOSE)	
S512	1-762-365-21	SWITCH, TACTILE (POWER)	

*	A-6423-303-A SW-732 BOARD, COMPLETE		

	(Ref.No.4,000 Series)		
< CONNECTOR >			
CN461	1-565-042-11	HOUSING, CONNECTOR (PC BOARD) 5P	
< JUMPER RESISTOR >			
JR461	1-216-296-00	METAL CHIP	0 5% 1/8W
JR462	1-216-296-00	METAL CHIP	0 5% 1/8W

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

SW-732

Ref. No.	Part No.	Description	Remarks
		< PHOTO INTERRUPTER >	

PH461	8-729-020-74	DIODE GP1S24	
PH462	8-729-020-74	DIODE GP1S24	
PH463	8-729-020-74	DIODE GP1S24	

< RESISTOR >

R461	1-216-194-00	METAL CHIP	680	5%	1/8W
R462	1-216-099-00	METAL CHIP	120K	5%	1/10W
R463	1-216-039-00	METAL CHIP	390	5%	1/10W
R464	1-216-099-00	METAL CHIP	120K	5%	1/10W
R465	1-216-248-00	METAL GLAZE	120K	5%	1/8W

MISCELLANEOUS

21	1-473-110-11	REMOTE COMMANDER (RMT-M35A)
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR
63	1-769-656-11	CABLE, FLAT (FFC) 11 ARBOR
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR

△68	1-575-912-21	CORD, POWER
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)
172	1-769-151-11	FLAT CABLE (FMB-001) (4 CORE)
M481	1-541-309-11	MOTOR, LOADING (RF-370C)

M421	X-3944-693-1	TILT MOTOR ASSY
M901	1-698-109-11	MOTOR, DD (SPINDLE)

ACCESSORIES & PACKING MATERIALS

	1-569-008-11	ADAPTER, CONVERSION 2P
	1-575-334-11	CORD, CONNECTION (1.5m)
	3-759-926-11	MANUAL, INSTRUCTION (ENGLISH/CHINESE) (E)
	3-759-926-41	MANUAL, INSTRUCTION (CHINESE/ENGLISH) (Chinese)
*	3-961-945-31	INDIVIDUAL CARTON (E)
*	3-961-945-41	INDIVIDUAL CARTON (Chinese)
*	3-961-946-01	CUSHION (UPPER)
*	3-961-947-01	CUSHION (LOWER)

Ref. No.	Part No.	Description	Remarks
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HARDWARE LIST

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#3	7-685-645-79	SCREW +BVTP 3X6 TYPE2 IT-3
#4	7-624-105-04	STOP RING 2.3, TYPE -E
#5	7-671-155-01	STEEL BALL 3.0
#7	7-685-103-19	SCREW +P 2X5 TYPE2 SLIT
#8	7-621-759-65	+PSW, 2.6X8
#9	7-628-253-05	SCREW +PS 2X4
#10	7-682-946-09	SCREW +PSW 3X5
#11	7-623-212-22	SW 5, TYPE 2
#12	7-624-190-81	STOP RING 2, TYPE-CS
#13	7-621-759-35	+PSW, 2.6X5
#14	7-684-220-02	NUT 3, HEXAGON CAP
#15	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT
#16	7-685-659-79	SCREW +P 4X8 TYPE2 NON-SLIT

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

SECTION 6
IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER
(IC501: MB89094PF-G-138-BND on the MB-717 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Open connection).
2	CL0	I	32 kHz clock.
3	MOD0	I	(Connected to GND).
4	MOD1	I	(Connected to GND).
5	X0	I	2 fsc clock (7.159 MHz).
6	X1	O	2 fsc clock (Open connection).
7	VSS	I	GND.
8	MRS \bar{T}	I	Mechanism controller reset signal (L: Reset).
9	FREQ \bar{O}	I	Philips code (frame number) read enable.
10	FQACK	O	Philips code/Sub Q (sub code) data output control signal (H: Data output).
11	FQSEL	O	Philips code/Sub Q data switch (L: Sub Q).
12	JPC \bar{T} RL	O	One track jump (JT)/Multi track jump (MTJ) switching signal (H: JT).
13	SPLOCK	I	Spindle servo lock signal (H: The spindle servo is being locked).
14	TBCHOLD	O	Chroma TBC control signal.
15	SCOR	I	H when the sub code sync. is detected.
16	PB V	I	Playback V sync signal input.
17	REF V	I	Reference V sync signal input.
18	ALT	O	Signal output to latch the register A inside the expansion output port IC (IC502 on the MB-712 board).
19	BLT	O	Signal output to latch the register B inside the expansion output port IC (IC502 on the MB-712 board).
20	BUSY	I	Communication enable signal sent from the mode controller (L: Communication enabled).
21	DOP	I	Input signal from the video dropout detector (Not used)
22	VIM	I	V timing signal input for servo processor (Not used)
23	FLAG	I	Flag input enabling operation of reference system (Not used)
24	CDGIN	I	H at CDG mode. (Disc discrimination output from decoder IC) (Not used)
25	CLSCS	O	Chip select of the CLS DT (pin 29).
26	SPDLPI S	O	Pulse output to drive the spindle servo (H: The spindle runs free).
27	CLT	O	Output signal to latch the CLD register
28	CMOD	I	Input signal to select the start mode after reset is released (+5 V pull-up).
29	CLSDT	I	V sync phase difference data input during CLV scan from IC502 (Data is input while the CLS CS is H).
30	SETCK	O	Serial data output to the DSP/expansion output port IC.
31	SETCK	O	Serial data transfer clock to the IC502, DSP.
32	SPDLFG1	I	Spindle FG input 1 (12 pulses per rotation).
33	GMUTE	O	Gray picture mute control output during CLV scan (L: playback picture, H: gray picture).
34	LD SEARCH	O	Spindle servo control signal output (H: LD search).
35	SPDL F/R	O	Spindle rotation direction signal (H: FWD).
36	AUXSEL	O	H when signal is externally input (including CD-G). (Not used)
37	JMP TRIG	O	Track jump trigger pulse output.
38	MWRQ	O	Output signal requesting to download the memory picture (Not used)
39	MEMORY	O	Output signal to switch between memory or through-out picture
40	MSTART	I	Memory picture downloading in progress
41	MTJ	I	MTJ tracking pulse output. This pin is normally set to input with Hi impedance. This pin is set to output when track jump (JT) is in progress (L: FWD).
42	MTF ON/OFF	O	MTF correction ON/OFF signal (H: MTF ON).
43	VLOAD	O	Output signal to latch the video IC (MN8811).
44	HSPD	O	Output signal to make easy to read H: P-code.
45	PMOFF	O	Output signal to phase-modulate the read-out clock H: OFF.
46		-	N. C.
47	BLK LEVEL	O	Theater mode (H: ON) (Not used)
48	XFL	I	Focus lock signal input (L: Focus is locked).
49	VCC	I	Power supply pin, REG + 5 V.
50	LINE_SEL	I	H: MMI is being connected to the FSIO.

Pin No.	Signal	I/O	Function
51	CDG MUTE	O	Graphic data and mute (L: PB, H: Others) (Not used).
52	TILT UP	O	Tilt is enforced to move up.
53	TILT DOWN	O	Tilt is enforced to move down.
54	MMICS	O	Serial communication chip select output signal to the mode controller.
55	LOADING	O	Output signal to activate the tray loading.
56	UN LOADING	O	Output signal to activate the tray ejecting.
57	CDG XRST	O	Output signal to reset the CDG IC (Not used)
58	VSS	I	GND.
59	XLINEMUTE	O	Audio output mute signal (L: Mute).
60	DIG_0MUTE	I	Digital 0 muting information.
61	SV DSP RST	O	Output signal to reset the servo, DSP and DF (L: Reset).
62	LD ON	O	Output signal to turn on or off laser diode (H: ON (lights)).
63	CD/LD CDV	O	L: white playing back the audio part of CD or CDV. H: Others.
64	XSVLT	O	Output signal to latch the servo IC (HA11529).
65	SIDE A/B	O	Output signal to switch the disc side of the tilt servo (A: H; B: L).
66	BRK_INH	O	Output signal to control the servo brake mode. (H: Inhibit)
67	LCSW1	I	Loading/shucking position sensor input-1.
68	LD LED	O	LED illuminating signal output used to discriminate the type of disk (L: illuminating).
69	LCSW2	I	Loading/shucking position sensor input-2.
70	LCSW3	I	Loading/shucking position sensor input-3.
71	SPDL FG2	I	Spindle FG input-2 (Not used).
72	TILT LIMIT	I	Tilt up/down limits switch input.
73	TILT CTR	I	Tilt center position switch input.
74	MECH SI	I	32-byte serial transfer data input (used to check SCOR).
75		-	N. C.
76		-	N. C.
77	MECH SI	I	32-byte serial transfer data input (Input from the mode controller and IC502).
78	MECH SO	O	32-byte serial transfer data output (Output to the mode controller).
79	MECH CLK	O	32-byte serial transfer clock.
80	T CNT	I	Track jump counted input signal.
81		-	N. C.
82		-	N. C.
83	AVSS	I	GND.
84	LD DET	I	A/D input (Detects whether a disk is present or not, and disk size (8- or 12-inch)).
85	SLED1	I	A/D input sled position information (CDV).
86	SLED2	I	A/D input sled position information (CD, ALD and BLD).
87	TRAY_IM	I	Input to A/D when abnormality is detected in the tray drive motor.
88	DSPLT	O	DSP IC latch signal.
89	MUTG	O	DSP mute signal (H: Mute).
90	EFM LOCK	I	Frame sync (EFM) lock signal (H: Locked).
91	SENSE	I	SENSE input signals from the DSPs.
92	AVCC	I	Power supply pin, Reg + 5 V.
93		-	N. C.
94	EMP ON	O	Emphasis control output (H: Emphasis ON).
95	A MUTE 1	O	Audio L-channel output mode switch (H: Analog audio R mute).
96	A MUTE 2	O	Audio R-channel output mode switch (H: Analog audio L mute).
97	CX	O	CX ON/OFF control signal output (L: CX ON).
98	DF_XMUTE	O	Digital filter: soft mute
99	DSFSEL	O	Output signal to select communication with the DSP (L: Connect. H: Disconnect).
100	VCC	I	Power supply pin, REG + 5 V.

**6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER
(IC102: MB89095PF-G-169-BND on the FP-748 Board)**

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Connected at open)
2	CL0	I	32 kHz clock (Connected to GND)
3	MOD0	I	(Connected to GND)
4	MOD1	I	(Connected to GND)
5	X0	I	8 MHz clock
6	X1	O	8 MHz clock
7	VSS	I	GND
8	RST	I	Mode controller reset. (L: Reset)
9	SEG G	O	Output to LED (L: illuminate)
10	SEG A	O	Output to LED (L: illuminate)
11	SEG F	O	Output to LED (L: illuminate)
12	SEG B	O	Output to LED (L: illuminate)
13	SEG C	O	Output to LED (L: illuminate)
14	SEG E	O	Output to LED (L: illuminate)
15	SEG D	O	Output to LED (L: illuminate)
16	7CTL	O	Select left or right 7-segment chip (H: lowest digit, L: 10th digit)
17	REFV	I	Reference V sync. signal input
18	MMICS	I	Chip select signal sent from the mechanical controller to the mode controller
19	E2P BUSY	I	EEPROM write signal. H: Ready, L: Busy
20	DSP RST	O	Inverted logic DSP RST (Controlling mute of SI DATA and SI CLK signals)
21	LED STB	O	Strobe output to the LED of FP-749 (open drain port)
22	H DET	I	L: Video signal is present (open drain port) (Not used)
23	MIC IN	I	L: MIC IN (open drain port) (Not used)
24	OTASUKE	I	H: Mic audio does not exist, L: Mic audio exists (open drain port) (Not used)
25	AUX	O	H: AUX switch OFF, L: AUX switch ON (Not used)
26	DSP CS	O	Chip select signal to the karaoke DSP (L: During transmission) (Not used)
27	DSP RST	O	Reset output to the karaoke DSP (Not used)
28	CMOD	I	Input selecting start mode after reset is released (+5 V pull-up)
29	SI	I	Received data from the EEPROM
30	SO	O	Send data to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
31	SCK	O	Communication clock to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
32	SIRCS	I	SIRCS input
33	CG CS	O	CG chip select (L: During communication)
34	MRSF	O	Reset output to mechanism controller (L: Reset)
35	BUSY	O	Transfer enable signal from mode controller to mechanism controller (L: Communication enabled)
36	CDG CS	-	N.C.
37	P. CONT	O	Control output to turn ON/OFF the main power of the machine (H: POWER ON)
38	AU MUTE	O	H: During audio mute
39	AUTO RESUME	O	Output to LED (H: illuminate) (Not used)
40	SURROUND	O	Output to LED (H: illuminate) (Not used)
41	KARAOKE PON	O	Output to LED (H: illuminate) (Not used)
42	KEY +3	O	Output to LED (H: illuminate) (Not used)
43	KEY +2	O	Output to LED (H: illuminate) (Not used)
44	KEY +1	O	Output to LED (H: illuminate) (Not used)
45	KEY 0	O	Output to LED (H: illuminate) (Not used)
46	KEY -1	O	Output to LED (H: illuminate) (Not used)
47	KEY -2	O	Output to LED (H: illuminate) (Not used)
48	KEY -3	O	Output to LED (H: illuminate) (Not used)
49	VCC	I	Power supply pin. EVER + 5 V
50	LINE IN	O	Output to LED (H: illuminate) (Not used)

Pin No.	Signal	I/O	Function
51	VOCAL SUPPORT	O	Output to LED (H: illuminate) (Not used)
52	CONT. PLAY	O	Output to LED (H: illuminate) (Not used)
53	VFD F	I	GND
54	-	-	N.C.
55	-	-	N.C.
56	-	-	N.C.
57	-	-	N.C.
58	VSS	I	GND.
59	-	-	N.C.
60	-	-	N.C.
61	-	-	N.C.
62	-	-	N.C.
63	-	-	N.C.
64	SIDE B	O	Output to LED (H: illuminate)
65	SIDE A	O	Output to LED (H: illuminate)
66	-	-	N.C.
67	VCC	I	Power supply pin. EVER + 5 V.
68	-	-	N.C.
69	-	-	N.C.
70	-	-	N.C.
71	-	-	N.C.
72	-	-	N.C.
73	-	-	N.C.
74	-	-	N.C.
75	LINE SELECT	O	H: Communication with the mechanical controller. L: Communication with the CG
76	-	-	N.C.
77	MECH SO	I	Data input from the mechanical controller
78	MECH SI	O	Data output to the mechanical controller and CG
79	MECH CLK	O	Communication clock output for the mechanical controller and CG.
80	DOOR SW	I	Door switch (H: Close, L: Open)
81	-	-	N.C.
82	-	-	N.C.
83	AVSS	I	GND.
84	PS MON1	I	Input to A/D converter. Monitoring -5 V Regulated power supply
85	PS MON2	I	Input to A/D converter. Monitoring +5 V Regulated power supply
86	KEY L1	I	Input to A/D converter. Monitoring PW-722 key input
87	KEY L2	I	Input to A/D converter. Monitoring PW-722 key input
88	KEY R2	I	Input to A/D converter. Monitoring FP-749 key input
89	KEY R1	I	Input to A/D converter. Monitoring FP-749 key input.
90	J/E/UC	I	Input to A/D converter. Specifying shipping destination
91	PS MON3	I	Input to A/D converter. Monitoring ±12 V
92	AVCC	I	Power supply pin. EVER + 5 V.
93	ECHO VR	I	Input to A/D converter. Monitoring echo control input signal
94	REMOTE CONT	I	Input to A/D converter. Monitoring mic remote input signal (Not used)
95	KEY C1	I	Input to A/D converter. Monitoring PP-748 key input (Not used)
96	P. OFF	O	Controlling to turn OFF forcibly the switching power supply (H: Forced OFF) (Not used)
97	E2P WC	O	EEPROM chip select output.
98	E2P CS	O	EEPROM line control output.
99	TEST 1	I	Test pin (All LEDs illuminate if this pin is L during reset)
100	VCC	I	Power supply pin. EVER + 5 V.

SECTION 7 ELECTRICAL ADJUSTMENTS

During the adjustments, see the parts alignment diagram for adjustment on page from 7-16.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M35A)
- LD alignment disc HLV-8 (8-797-008-00) NTSC Ref. Disc 8

7-2. CAUTIONS ON ADJUSTMENT

- Disc load/unload operation must not be performed when servicing with the unit laying down sideways. (Never press the OPEN and CLOSE buttons.)
- When laying the unit down sideways, perform adjustment with the left side down and turn the power on.
- When adjusting the servo system, be sure to set up the unit horizontally.

7-3. OPERATION OF THE MDP-A550 WITH HIDDEN KEY FUNCTIONS

1. Explanation of the hidden key functions

Special control functions to be used for the test or some other purposes of the MDP-A550 are available by pressing at the same time and in specific order the multiple function keys on the main unit and/or on the remote control unit. The control functions available in this way are called "special key functions".

The special key functions can be used in either of the following modes.

- the service mode
- the debugging mode
- the normal operation mode

The special key functions can be divided into two groups according to the key control operations as follows:

- Simultaneous main-unit-key-press functions
Some control functions can be used by pressing simultaneously multiple specific keys on the main unit.
- Simultaneous main-and-remote-control-units-key-press functions

Some other control functions can be used by pressing simultaneously two specific keys on the remote control unit while holding down a specific key on the main unit.

2. How to use "simultaneous main-unit-key-press functions"

The functions available by pressing simultaneously the multiple specific keys only on the main unit are called "simultaneous main-unit-key-press functions". These functions are to be used when a quick operation such as "forced power off" is required.

The following table lists the currently available simultaneous main-unit-key-press functions.

Table 7-1. List of simultaneous main-unit-key-press functions

Keys to be pressed on the main unit	Functions
1 key and POWER key	(1) Forced power off This function turns off power forcibly. It is to be used if you want to turn off the power in the following cases. <ul style="list-style-type: none"> • Operation of the mechanisms is out of control. • Power cannot be turned off by pressing the power key. Note that this function should be used with care because it may turn off the power in a half way of the operation of the mechanisms.
STOP key and POWER key	(2) Forced reset This function carries out initialization of the mode controller in addition to the forced power off function. It is to be used if you want to reset the mode controller in the following case. Something is wrong with the mode controller such that it operates with incorrect display. Note that once this function has been carried out, all information, including the history of emergency case, other than the trap-flag information in the debugging mode, will be deleted.
A side key, CLEAR key and POWER key (With power off only)	(3) Lighting up all the LEDs on the main unit This function turns on all the LEDs after turning on the power automatically. Until you switched off the power, normal operation is possible while all the LEDs are lit.

3. How to use “simultaneous main-and-remote-control-units-key-press functions”

The functions available by pressing the two specific keys on the remote control unit while holding down the specific key on the main unit are called “simultaneous main-and-remote-control-units-key-press functions”. It is necessary to press two keys on the remote control unit within about one second. This prevents an

accidental use of these functions by the user.

These functions are to be carried out by using the NEXT DISC RESERVE key so that the operation of the mechanisms is not affected. The following table lists the currently available simultaneous main-and-remote-control-units-key-press functions.

Table 7-2. List of simultaneous main-and-remote-control-units-key-press functions

Step	Keys to be pressed on the main unit and on the remote control unit	Functions
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and STOP key (remote control unit)	(1) Debugging mode ON/OFF This function puts the unit in the debugging mode from another mode, or puts the unit in the mode other than the debugging mode from the debugging mode. For details on the debugging mode, refer to 7-5. “OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE”.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and DISPLAY key (remote control unit)	(2) V mute forced ON/OFF If the forced V mute is ON, it is released. If the forced V mute is OFF, it is turned ON. This function is used to switch the video signal to blue background during playback, or to release the blue background.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and CLEAR key (remote control unit)	(3) Resetting the V mute to normal operating condition Resets the V mute to normal operating condition. This function is used to release the function of above described item (2).
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and +10 key (remote control unit)	(4) Make mechanism controller time out ineffective. Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn't operate, it used to hasten to operate mode controller.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and 0 key (remote control unit)	(5) Make mechanism controller time out effective. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and REPEAT key (remote control unit)	(6) EEPROM Clear It can be reserved that the EEPROM content is all cleared instead of storing the favorite program data or debug mode data when the main power is turned off. This operation is effective only when the main power is on.

7-4. OPERATION OF THE MDP-A550 IN THE SERVICE MODE

1. Explanation of the service mode

The functions for the use on reparation and maintenance (the service mode) are incorporated in the MDP-A550. The mode in which those functions are available is called “the service mode”. The following are the differences between the service mode and the normal operation mode.

- (1) Special operations such as focusing search and sledding can be carried out.
- (2) Power is not turned off automatically in an emergency condition of power off.
- (3) When entering the service mode, also the debugging mode is started automatically. (For details of the debugging mode, refer to 7-5. “OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE”.

2. Entering the service mode

The following procedure shows how to enter the service mode.

- (1) While the power is turned off, connect the test pin (TP501 for service mode setting : Pin ③ of CN502), on the MB board of the main unit, to the ground
- (2) Turn on the power by pressing the power key of the main unit. Nothing is displayed on the screen at this moment.
- (3) Disconnect the test pin (the connection was performed in step (1) above) from the ground.

The service mode can be started when the background color changes in purple. If the background color is blue or black, the service mode is not available yet. If so, restart the procedure from step (1) above.

When the unit is in the service mode, it is also put in the debugging mode (the functions those available in both the modes can be used). Therefore, the version No. of the microprocessor appears on the screen. For details of the debugging mode, refer to 7-5. “OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE”.

3. Quitting the service mode

To quit the service mode, press the power key and turn off the power. If you cannot turn off the power in this way (the operation of the mechanisms is not complete), carry out the forced power off function by pressing the reverse direction scan key and the power key on the main unit at the same time.

4. Operating with the special key functions

The special key functions in the service mode are available only under NO DISC and STOP conditions, for safety purposes. Check that the indication for those conditions is displayed without flashing on the screen. In order to carry out the special key functions listed in table 7-3, in the status above, turn off the 7 segments LED by pressing the NEXT DISC RESERVE key on the remote control unit while holding down the STOP key on the main unit. And then press the desired key such as PLAY or PAUSE on the main unit.

The sledding motion with the SIDE A or SIDE B key is effective only while holding the Key pressed. However, the operation started with the other keys continues, once it is pressed, until you press the STOP key. While the unit is carrying out the special key function, the LED of AUTO RESUME of the main unit is lit.

Note that multiple special key functions cannot be started even if you press multiple keys at the same time.

When the 7segments LED is turned off, some keys are not effective.

Be sure to turn on the 7 segments LED by pressing the NEXT DISC RESERVE key on the remote control unit, if you don't want to carry out the special key functions.

Table 7-3. List of the special key functions

Key	Special key functions
SIDE A	Sledding in reverse direction (downward)
SIDE B	Sledding in normal direction (upward)
PLAY	Focusing search
PAUSE	Tilt servo ON
STEP FWD	Tray aging starts
STEP REV	Sled aging starts
REPEAT A/B	Tilt aging starts
STOP	Stop special operations

The following are the details of the special key functions available with the MDP-A550

(1) SIDE A key for sledding in reverse direction

The sled can be moved in reverse direction (center of side B, to edge of side B, to edge of side A, and then to center of side A) after completing initialization of the tilt (the tilt is placed in neutral position) by holding down the SIDE A key. To stop the sledding in reverse direction, release the SIDE A key.

(2) SIDE B key for sledding in normal direction

As contrary to item (2) above, the sled can be moved in normal direction (center of side A, to edge of side A, to edge of side B, and then to center of side B). This movement of the sled is desired when replacing the optical part. To stop the sledding in normal direction, release the SIDE B key.

(3) PLAY key for focusing search

Focusing search operation can be carried out repeatedly by press the PLAY key. There is no fault with the unit if the pick-up lens moves up and down.

Be sure to start the focusing search operation after checking the condition that the sled is placed in appropriate position (at around the center of side A). To stop the focusing search operation, press the STOP key.

(4) PAUSE key for tilt servo ON

The tilt servo is activated while pressing the PAUSE key. Move the sled to around the center of side A with the SIDE A and SIDE B keys, and put a CD or equivalent on the tray so that it screens the skew sensor. Then, if the tilt moves by pressing the PAUSE key, operation is normal.

The tilt can be placed back in neutral position by moving the sled with the SIDE A and SIDE B keys. To deactivate the tilt servo, press the STOP key.

(5) STEP FWD --- Tray aging starts.

If STEP FWD key is pressed, tray aging starts. Tray will automatically moves out and in. Take care that the tray will not collapse with surrounding objects.

Press STOP key to terminate aging.

(6) STEP REV --- Sled aging starts.

If STEP REV key is pressed, sled aging starts. Sled will automatically travels between side A and side B.

Press STOP key to terminate aging.

(7) REPEAT A/B --- Tilt aging starts.

If REPEAT A/B key is pressed, tilt aging starts. Tilt will automatically moves up and down.

Press STOP key to terminate aging.

7-5 OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE

1. Explanation of the debugging mode

The contents in the RAM of the microprocessor can be displayed on the screen for the repair and maintenance purposes. The status of the MDP-A550 in which this debugging function is available is called "the debugging mode".

The following are the differences between the debugging mode and the normal operation mode.

- (1) The background color of the screen changes in green. (While the background color is displayed.)
- (2) Under the status described item (1) above, pressing the key on the remote control unit displays the history of emergency conditions or other debugging information. Some keys are not effective when the background color of the screen is green.

2. Entering the debugging mode

To enter the debugging mode from a normal operation mode (in a normal status of operation), turn on the unit, press the 0 key then the STOP key on the remote control unit while holding the NEXT DISC RESERVE key on the main unit. When the following display appears on the screen, the unit is in the debugging mode. This display shows the version No. of the microprocessor. For details, refer to section 7-5 5. (1) "[FRAME/TIME] key for displaying version No. of the microprocessor".

As long as the machine stays in the debug mode, the NEXT DISC RESERVE key has only the function to turn ON and OFF the debug command. While the debug command remains effective, the 7-segment display is not illuminated. If debug command is effective while the background color is displayed (for example, in STOP or PAUSE mode), the background color becomes green. (It becomes purple while in the service mode.)

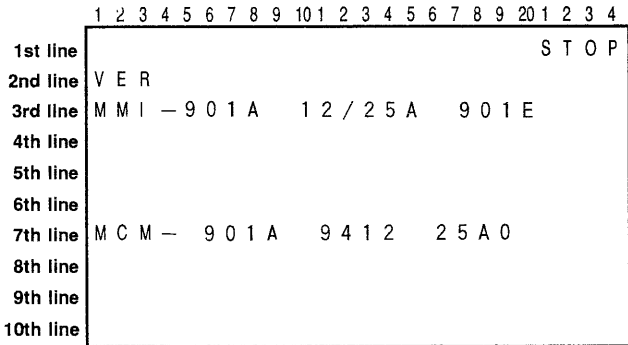


Fig. 7-1. Initial display in the debugging mode

3. Quitting the debugging mode

To quit the debugging mode, press the CLEAR key on the remote control unit when the menu (version No. of the microprocessor indication on the screen with green background) in figure (7-1) is displayed.

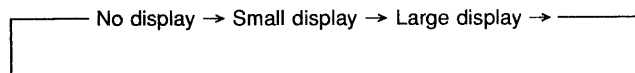
The same key operation as “2. Entering the debugging mode” also sets the mode back in the normal operation mode.

When the machine returns in the normal operation mode, the "NEXT DISC RESERVE" key has its natural own function only.

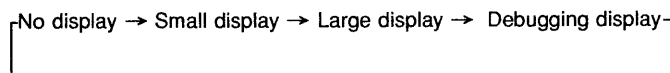
4. Changing the display on the screen

The display is set for “debugging display” immediately after entering the debugging mode. The display mode can be changed in the same manner as in the normal operation mode by pressing the DISPLAY key. In the debugging mode, however, “debugging display” mode can be selected as one of the display modes, in addition to “no display (displays nothing in most cases)”, “small display (displays only the 1st line in most cases)”, and “large display (displays full screen in most cases)” modes.

Pressing the DISPLAY key in the normal operation mode changes the display mode as follows:



Pressing the screen display key in the debugging mode changes the display mode as follows:



5. Explanation of the debugging display

In the debugging display mode, the information on the mode controller is displayed on the screen as a dump list. The title is displayed at the left on the 2nd line from the top. The data is displayed on the 3rd line through the 9th line.

The display of the data in one line consists of up to four sets (total of 8 bytes) of four character (2 bytes character each) sets in hexadecimal notation.

The information to be displayed can be selected in the debugging mode, by first turning off the 7-segment and pressing the desired key (as listed below).

The following table lists the information which are currently available and which can be displayed.

Table 7-4. List of the keys to be used in the debugging mode and corresponding information

Keys	Information to be displayed
[FRAME/TIME]	Version No. of the microprocessor
[1]	History of the function modes
[2]	History of the emergency occurrence
[3]	Information for repair service of normally
[4]	Trap-flag
[5]	Key/remote control data
[7]	Information on communication with the mechanism controller

- (1) [FRAME/TIME] key for displaying version No. of the microprocessor

Pressing this key displays the version No. of the microprocessor. The version No. of the mode controller appears on the 3rd line, and that of the mechanism controller appears on the 7th line. An example in figure 7-2 shows that the version No. of the mode controller is “MMI-901A 12/25A 901E” and that of the mechanism controller is “MCM-901A 94/12/25A”.

The last four letters “901E” of the version No. of the mode controller indicates destination of the machine. The letters “901E” indicates that the machine “901” is designed to be shipped to “E” area. They have the following types of destination.

901E -- Machine “901” with destination of “E” area
(English only)

901T -- Machine “901” with destination of “TW” area
(Traditional Chinese characters only)

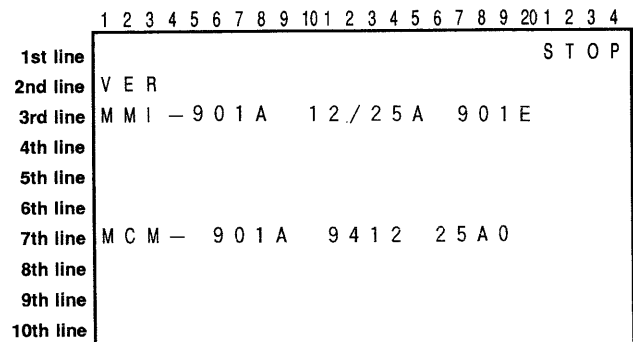


Fig. 7-2. Version No. of the microprocessor

- (2) [1] key for displaying the history of the function modes
Pressing this key displays the history of the principal operation commands (which represent function modes) sent from the mode controller to the mechanism controller.

Up to 8 histories of the function modes can be displayed on a line. A total of 16 histories of the function modes are available using two lines. Unless the unit is unplugged, the data are kept intact in memory even when the unit is turned off.

The data to be stored appears on the screen from left to right 1 byte by 1 byte, and "FF" appears to the right of the last data byte. The data byte continues from the right end on the 1st line to the left end on the 2nd line, and from the right end on the 2nd line to the left end on the 1st line. The last stored data of the function modes (which is the mode selected at present) appears on the left of "FF".

That is, when "FF" appears at the left end on the 1st (or 2nd, or 3rd) line, the last stored data appears at the right end on the 2nd (or 3rd or 1st) line.

"FE" means there has been an emergency case at the data point. To check the type of the emergency case, refer to 5. (3) "[2] key for displaying the history of the emergency occurrence".

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4		
1st line																							S	T	O	P
2nd line	F	M			H	I	S	T																		
3rd line					0	1	2	0			3	0	F	E			5	0	6	0			7	0	6	0
4th line					2	0	F	F			0	0	0	0			0	0	0	0			0	0	0	0
5th line					0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0
6th line																										
7th line																										
8th line																										
9th line																										
10th line																										

Fig. 7-3. History of the function modes

Figure 7-3 shows that the function modes have changed as follows:

- 01 (Power on start up)
- 20 (Stop)
- 30 (Start up of side A)
- FE (An emergency occurred.)
- 50 (Searching a chapter)
- 60 (Playback)
- 70 (Slow speed scanning in normal direction)
- 60 (Playback)
- 20 (Stop) [The last function mode]

Table 7-5 lists the function modes.

Table 7-5. List of the function modes

00	Power OFF
01	Power ON and start up
10	Open
20	Stop
30	Preparation for playback of side A
40	Preparation for playback of side B
50	Searching a chapter
51	Searching a frame/time
60	Playback
61	Pause
70	Slow speed scanning in normal direction
71	High speed scanning in normal direction
72	Slow speed scanning in reverse direction
73	High speed scanning in reverse direction
80	Still playback in normal direction
81	Step playback in normal direction
82	1/90 times speed playback in normal direction
83	1/30 times speed playback in normal direction
84	1/16 times speed playback in normal direction
85	1/8 times speed playback in normal direction
86	1/4 times speed playback in normal direction
87	1/2 times speed playback in normal direction
88	Normal (1 time) speed playback in normal direction
89	2 times speed playback in normal direction
8A	3 times speed playback in normal direction
8B	5 times speed playback in normal direction
8C	10 times speed playback in normal direction
90	Still playback in reverse direction
91	Step playback in reverse direction
92	1/90 times speed playback in reverse direction
93	1/30 times speed playback in reverse direction
94	1/16 times speed playback in reverse direction
95	1/8 times speed playback in reverse direction
96	1/4 times speed playback in reverse direction
97	1/2 times speed playback in reverse direction
98	Normal (1 time) speed playback in reverse direction
99	2 times speed playback in reverse direction
9A	3 times speed playback in reverse direction
9B	5 times speed playback in reverse direction
9C	10 times speed playback in reverse direction

FE Appears for indicating an occurrence of emergency
FF Appears next to the last data.

(3) [2] key for displaying the history of the emergency occurrence

Pressing this key displays the history of the emergency occurrence with the code which is an 8-byte code and is issued to the mode controller if an error occurs in the mechanism controller.

Some codes for example "64" (minimum chapter detected) have the meaning of status code only. The codes "80" and higher are generated by the mode controller itself, and are not supplied from the mechanism controller.

The data will be "00" if there has been no emergency case since when the unit has been plugged in.

The display type is the same as that for the history of the function modes. However, up to 16 histories using only two lines are available in this case. The emergency code which appears just before "FF" corresponds to the data of "FE" in the history of the function modes, which is the closest one to "FF".

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4			
1st line																								S	T	O	P
2nd line	E	M	G																								
3rd line					6	0	7	4			6	4	6	1			6	4	6	4			7	4	F	F	
4th line					0	0	0	0			0	0	0	0			0	0	0	0			0	0	0	0	
5th line																											
6th line																											
7th line																											
8th line																											
9th line																											
10th line																											

Fig. 7-4. History of emergency

Figure 7-4 shows that the emergency has occurred in the following order because the data next to "FF" is 60 on the left of the line.

- 60 (Detection of lead-in point)
- 74 (Focusing failed)
- 64 (Detection of minimum chapter)
- 61 (Detection of lead-out point)
- 64 (Detection of minimum chapter)
- 64 (Detection of minimum chapter)
- 74 (Focusing failed) [The last emergency]

Table 7-6 lists the emergency codes.

Table 7-6. List of the emergency codes

• For operation of forced modes condition		
		Operation after occurrence
01	Requirement of forced power off	Power off
02	Requirement of forced ejection of the tray	Eject
03	Requirement of stop	Stop
04	Requirement of stop when opening the door	Stop
05	Requirement of forced playback	Play
06	Requirement of determination for mode change when power off	Freezes power off display
07	Requirement of power off after communication stops.	Power off
• For operation of mechanisms		
10	Detection of movement for pushing in the tray	Play
11	Detection of no movement of the tray	Power off
20	Detection of no movement of the slider	Power off
30	Detection of no movement of the tilt	Power off
31	Avoidance treatment execution of no movement of the tilt.	None
• For operation of Spindle control		
40	No detection of the spindle FG	Power off
41	No achievement of continuous servo lock from FG servo to H servo	Stop
42	Above the high rotation limit	Stop
43	Below the low rotation limit	Stop
44	No complete stop operation for the spindle movement	Power off
45	Time over error for the spindle control operation	Power off
• For start up operation		
50	Focusing failed	Stop
51	Focusing failed (with a disc loaded)	Stop
52	Detected as if the disc was an LD	None
53	Focusing of 8 inches LD failed	Stop
54	Reading of TOC failed on a disc of CD or CDV	Stop
• For playback operation		
60	Detection of the lead-in code	Play or soon
61	Detection of the lead-out code	Stop/Pause or soon
62	Detection of the lead-out of part A on CDV	Stop/Pause or soon
63	Detection of a picture stop	Still
64	Detection of the minimum chapter	None
65	Reading of sub code failed on a disc of CD or CDV	Stop
66	Reading of philips code failed and disc of LD	Stop
67	Avoidance treatment execution of locked group	None
• For search operation		
70	Detection of over search	Play
71	Detection of under search	Play
72	Time over for the search operation	Play
74	Focusing failed during searching	Stop
76	Retry execution after focusing failed.	None
• The following emergency occurs in mode controller		
80	Emergency time out	Power off
81	Search time out	Play
82	Mechanism controller communication time out	Power off
86	Emergency of 12V power supply	Origin power off

- (4) [3] key for displaying the information for repair service, sent from the mechanism controller
 Pressing this key displays the information sent from the mechanism controller, which is necessary for repair service. At present, the information listed in table 7-7 is available. Data numbers in the table correspond to the numbers on the 3rd line through the 5th line in figure 7-5.

Table 7-7. Information for repair service, sent from the mechanism controller

Data number	Data
(02)	Mode of mechanisms (internal mode of the mechanism controller) See the following section for details.

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
1st line																									S T O P
2nd line	S	E	R	V	I	C	E																		
3rd line					(00)	(01)	(02)	(03)	(04)	(05)	(06)	(07)													
4th line					(08)	(09)	(10)	(11)	(12)	(13)	(14)	(15)													
5th line					(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)													
6th line																									
7th line																									
8th line																									
9th line																									
10th line																									

Fig. 7-5. Information for repair service sent from the mechanism controller

- About the operation modes of the mechanisms
 The operation modes of the mechanisms are the basic operation mode in the mechanism controller. Those almost the same as those available with the unit as the function modes. But, there are several supplemental modes for the mechanisms.
 The table below shows the operation modes of the mechanisms.

Table 7-8. Operation modes of the mechanisms

Modes of the mechanisms	Functions
00	Power off
01	Initialization of the mechanism controller (Without operating the mechanisms)
03	In the process from power ON to power OFF
04	In the process from power OFF to power ON
05	Initialization of the mechanisms and related ICs.
10	Ejected status of the tray
11	In the process of ejection of the tray
12	In the process of loading of the tray
20	In stop status with the disc chucking up
21	In the process of chucking up from chucking of side A
22	In the process of chucking of side A from chucking up
23	In chucking status of side A
30	Until focusing of side A has been achieved
31	From lock of focusing to start-up of 0 search
32	In operation from side A/B to stop
33	In process of reversing side B from side A
40	Until focusing of side B has been achieved
50	Chapter search
51	Frame/Time search
60	Play
61	Pause
70	Slow speed normal direction scanning
71	High speed normal direction scanning
72	Slow speed reverse direction scanning
73	High speed reverse direction scanning
74	In the process of scanning completion
80—FF	(The same as function mode)

(5) [4] key for displaying the trap-flags

Pressing this key displays the cause of “an abnormal power off” of the mode controller (this excludes when it is turned off with the power key).

The one byte at the right (2 digits of hexadecimal notation) is the flag which has specific meaning. The bit which corresponds to the cause of the last abnormal power off is set 1.

The one byte at the left is the flag for all (logic OR of) the causes of abnormal power off since when the unit has been plugged in.

Both the flags can be set cleared by pressing the clear key when the background color of the screen is green.

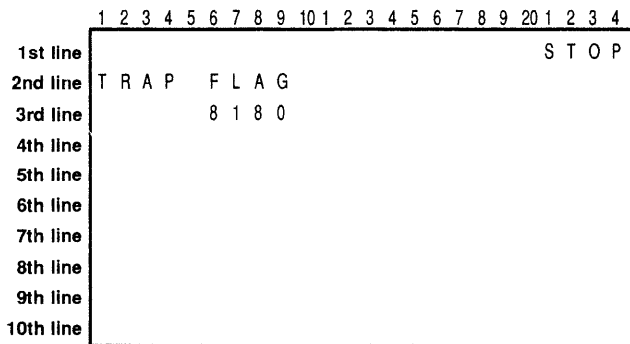


Fig. 7-6. Trap-flag

An example of the trap-flag shown in figure 7-6 shows that there have been two cases of abnormal power off before; 80 by abnormal voltage level and 01 by forced reset by the user (see the byte 81 in hexadecimal notation on the left). It also shows that the last abnormal power off has been caused by 80 (abnormal voltage level) (see the byte 80 in hexadecimal notation on the right).

Table 7-9. Trap-flag and bits and their meaning

Bit number (Pattern)	Causes
7 (80h)	Power off caused by abnormal voltage level
6 (40h)	Power off caused by abnormal communication with the mechanism controller
5 (20h)	Power off caused by an occurrence of emergency
4 (10h)	Forced power off by the key operation
3 (08h)	Resetting by self-check of the mode controller
2 (04h)	Resetting by self-check of the mode controller
1 (02h)	Resetting by self-check of the mode controller
0 (01h)	Forced resetting by the key operation

Note : Resetting, which is indicated with bits 0 to 3 in the table, means that setting the status of the mode controller back to the same status as that when the unit was plugged in, except for initialization of the trap-flag.

A of hexadecimal notation is 2+8. In the same manner, B=1+2+8, C=4+8, D=1+4+8, E=2+4+8, F=1+2+4+8.

(6) [5] key for displaying the key/remote control data

Pressing this key displays the key input data of the main unit and the input data by the remote control unit, using SIRCS codes. Note that this operation is effective on the remote control unit for MDPs only.

The one byte (2 digits in hexadecimal notation) on the left of the 3rd line in figure 7-7 is the SIRCS code of the key input data of the main unit, and that on the right is the SIRCS code of the input data by the remote control unit. When no key is pressed or there is no input, “FF” appears. When two keys are pressed almost at the same time, the SIRCS code of the input data by the first pressed key will appear.

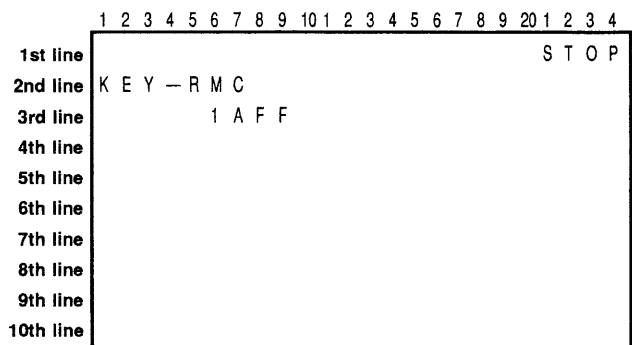


Fig. 7-7. Key and remote control data

An example in figure 7-7 shows that the playback key (1A in hexadecimal notation) on the main unit is pressed but there is no input (FF in hexadecimal notation) from the remote control unit.

However, note that, in some cases, the remote control unit generates SIRCS codes momentarily only at the moment when the key is pressed.

Table 7-10. List of SIFRCS codes for MDPs

00	Numeral 1
01	Numeral 2
02	Numeral 3
03	Numeral 4
04	Numeral 5
05	Numeral 6
06	Numeral 7
07	Numeral 8
08	Numeral 9
09	Numeral 0
0F	Clear
15	Power ON/OFF
16	Close/open of tray
17	Audio monitoring
18	Stop
19	Pause
1A	Playback
1E	Reverse direction scanning
1F	Normal direction scanning
29	Repeat
2B	Still/step in normal direction
2C	Still/step in reverse direction
30	Reserve
34	ACS in normal direction
35	ACS in reverse direction
38	REPEAT A · B
39	Numeral +10
3A	Screen display
40	Analog audio/CX
5D	side A
5E	side B
64	Numeral 10
65	Numeral 11
66	Numeral 12
67	Numeral 13
77	Numeral 14
79	Numeral 15
7B	Next disc reserve
7E	CONTINUOUS PLAY
FF	Appears when there is no input.

(7) [7] key for displaying the information on communication with the mechanism controller

Pressing this key displays the communication data with the mechanism controller.

The data transmitted from the mode controller to the mechanism controller appears on the 3rd line through the 5th line. The data transmitted from the mechanism controller to the mode controller appears on the 7th line through the 9th line. The exclamation marks [!] at the left on the 8th and the 9th lines indicate that the communication is carried out successfully. Question mark [?] appears if communication stops. A bracket mark [■] appears if communication stops after carrying out once the communication on the purpose of servicing.

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
1st line																									
2nd line	M	E	S	S																		S	T	O	P
3rd line					(00)	(01)	(02)	(03)	(04)	(05)	(06)	(07)													
4th line					(08)	(09)	(10)	(11)	(12)	(13)	(14)	(15)													
5th line					(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)													
6th line																									
7th line	R				(00)	(01)	(02)	(03)	(04)	(05)	(06)	(07)													
8th line	!				(08)	(09)	(10)	(11)	(12)	(13)	(14)	(15)													
9th line	!				(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)													
10th line																									

Fig. 7-8. Information on communication with the mechanism controller.

The table below shows some communication information.

Table 7-11. Principal communication information

Data from the mode controller to the mechanism	
(01)	The function mode at present (next)
(02)	The function mode of final purpose
(03—05)	Target address of search (Time/Frame)
(21)	KARAOKE Door Position
Data from the mechanism controller to the mode controller	
(01)	The function mode at present (next)
(06)	The flag for completion of function mode change (0 bit)
(13)	Current chapter/track number
(14)	Current index number
(15—17)	Current address (Time/Frame)

7-6. POWER SUPPLY ADJUSTMENT

7-6-1. EVER +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ② of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR201
Specified value	$5.0 \pm 0.3\text{Vdc}$

Adjustment method :

1) Adjust VR201 to $5.0 \pm 0.3\text{V}$

7-6-2. REG +5V Adjustment (POWER BLOCK)

Mode	Stop
Measurement point	Pin ④ of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR202
Specified value	$5.0 \pm 0.3\text{Vdc}$

Adjustment method :

1) Adjust VR202 to $5.0 \pm 0.3\text{V}$

7-6-3. Power Supply Check (POWER BLOCK)

Mode	Stop
Measuring equipment	Digital voltmeter
UNREG +16V check	
Measurement point	Pin ① of CN051 (Pin ⑫, GND)
Specified value	$16.4 \pm 1.5\text{Vdc}$
UNREG -16V check	
Measurement point	Pin ⑭ of CN051 (Pin ⑬, GND)
Specified value	$-15.3 \pm 1.5\text{Vdc}$
REG +12V check	
Measurement point	Pin ⑰, of CN051 (Pin ⑱, GND)
Specified value	$12.0 \pm 0.8\text{Vdc}$
REG -12V check	
Measurement point	Pin ⑲, of CN051 (Pin ⑱, GND)
Specified value	$-12.0 \pm 0.8\text{Vdc}$
REG -5V check	
Measurement point	Pin ⑥ of CN052 (Pin ⑦, GND)
Specified value	$-5.0 \pm 0.3\text{Vdc}$

- Confirm that the power supply voltages satisfy the respective specified values.

7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT

7-7-1. Microprocessor Clock Adjustment (MB-717 Board)

Mode	Stop
Measurement point	Emitter of Q028 (Pin ⑰ of IC002)
Measuring equipment	Frequency counter
Adjusting element	CT001
Specified value	$14318180 \pm 40\text{Hz}$

Adjustment method :

1) Adjust CT001 to $14318180 \pm 40\text{Hz}$.

7-8. SERVO SYSTEM ADJUSTMENT

7-8-1. LD Side A Tilt Balance Adjustment

- 1) Put the LD alignment disc HLV-8 in with the CAV side to the side A, play it and pause at the chapter 3 (#2201).
- 2) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV401 so that the RF waveform goes maximum in the state the tracking and the sled are on.

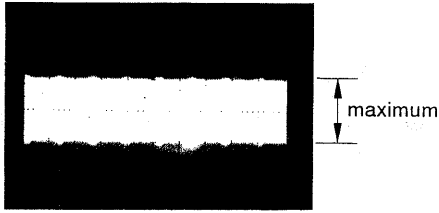


Fig. 7-10.

- 3) Play #770 and pause.
- 4) Check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and minimum.

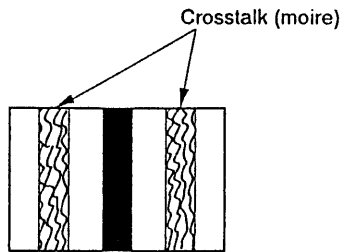


Fig. 7-11.

- 5) Tracking gain and focus gain adjustments are not necessary. — Already adjusted at the optical pick-up block side —
- 6) Check the tracking bal. Measure the registance at the Y terminal of TRACKING ERR on jig with oscilloscope.

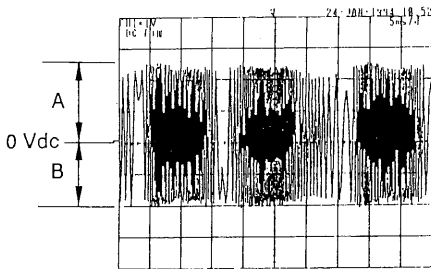


Fig. 7-12.

Check that it meets $-5 \leq \frac{A - B}{2(A+B)} \times 100 (\%) \leq 8$

- 7) Then turn on the TRACKING and SLED to check the waveform of 1 track jump in STILL.

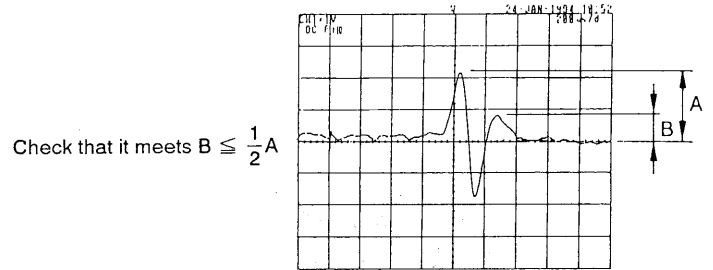


Fig. 7-13.

Check the TRACKING BALANCE.

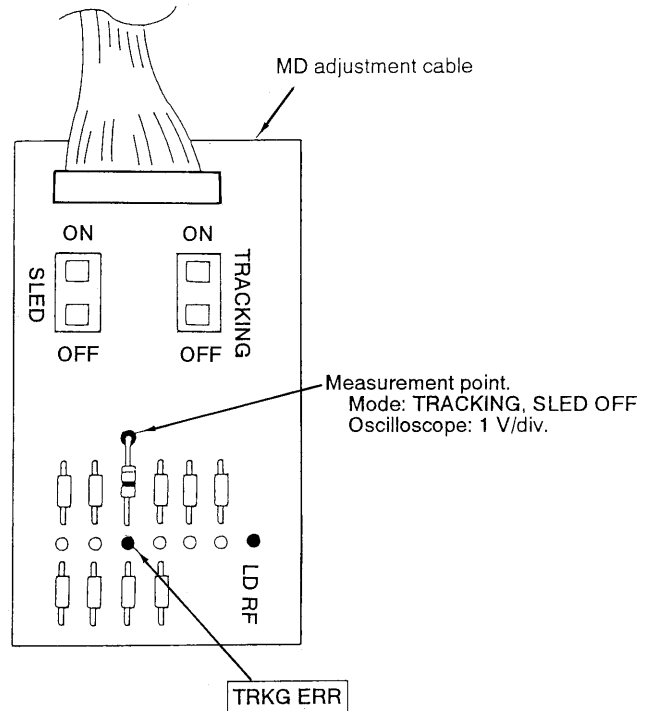


Fig. 7-14.

7-8-2. LD Side B Tilt Balance Adjustment

- 1) Loosen the side B RD screw and TAN screw (hexagonal screw 2.6) on the feed base.
- 2) Put the LD alignment disc HLV-8 in with the CAV side to the side B, play it and pause at the chapter 3 (#2201).
- 3) Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV402 so that the RF waveform goes maximum in the state the tracking and the sled are on.

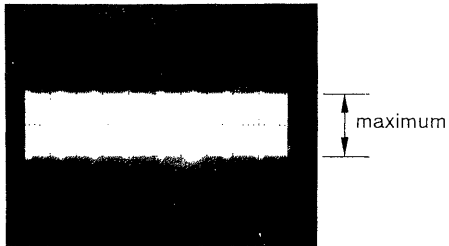
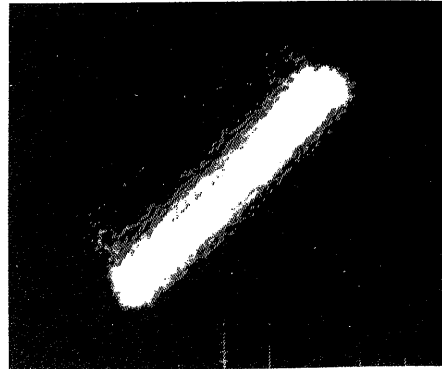


Fig. 7-15.

- 6) Turn off the SLED and tracking, and adjust inserting an eccentric screwdriver to B RD adjustment hole so that the Lissagous waveform meets standard.



Jig terminal : E, F
 Oscilloscope : X/Y lissagous 20 mV/div.
 Phase difference : Within 35°

Fig. 7-16.

- 4) Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the item 4).
- 5) Play #770 and pause.
 At this time in the same manner as the side A, check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and maximum.

- 7) Take out the disc to tighten B TAN and RD screw.

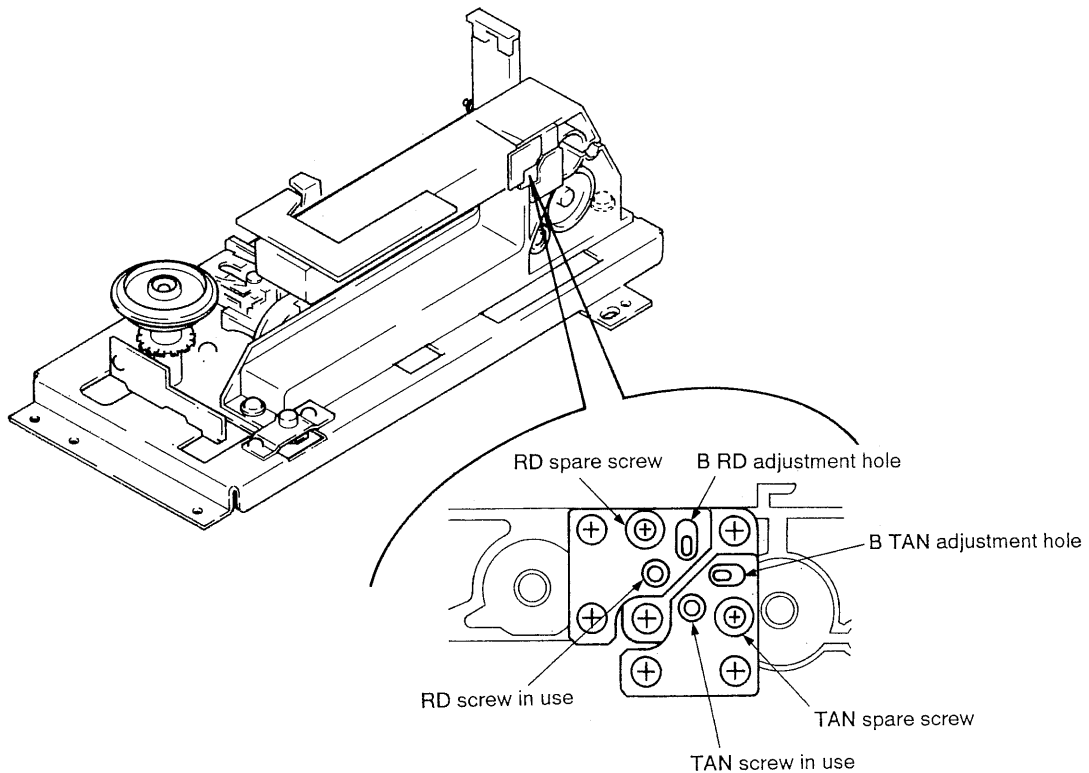


Fig. 7-17.

7-9. VIDEO SYSTEM ADJUSTMENT

7-9-1. Video Output Level Adjustment (MB-717 Board)

Mode	Still
Signal	Frame 4100 (Color bar)
Measurement point	J203 (VIDEO OUT terminal) (Terminated to 75Ω)
Measuring equipment	Oscilloscope
Adjusting element	RV001
Specified value	1.00 ± 0.02 Vp-p

Adjustment method :

- 1) Select STILL (▶◀) mode.
- 2) Search the frame 4100 and apply a color bar signal.
- 3) Adjust RV001 for 1.00 ± 0.02 Vp-p.



Fig. 7-18.

7-10. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK

7-10-1. Jigs and Tools

- Hexagonal wrench (Tangential screwdriver: 7-700-766-04)
 - Oscilloscope
 - MD adjustment cable (J-6082-059-B)
 - Alignment disc Ref. 8 (HLV-8: 8-797-008-00)/LD YEDS-18 (3-702-101-01) or an equivalent/CD
 - Decentering screwdriver 4 φ (J-6095-029-A)
- * Insert the terminal of the connector conversion jig to CN401 of the MB-717 Board.

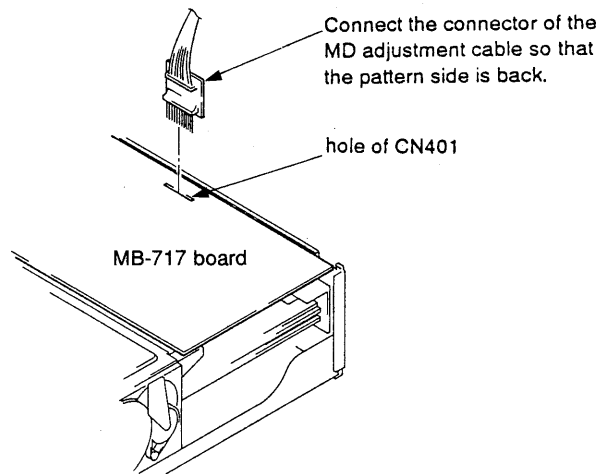


Fig. 7-19.

7-10-2. CD Adjustment

- 1) Loosen the screws of feed base block assembly.

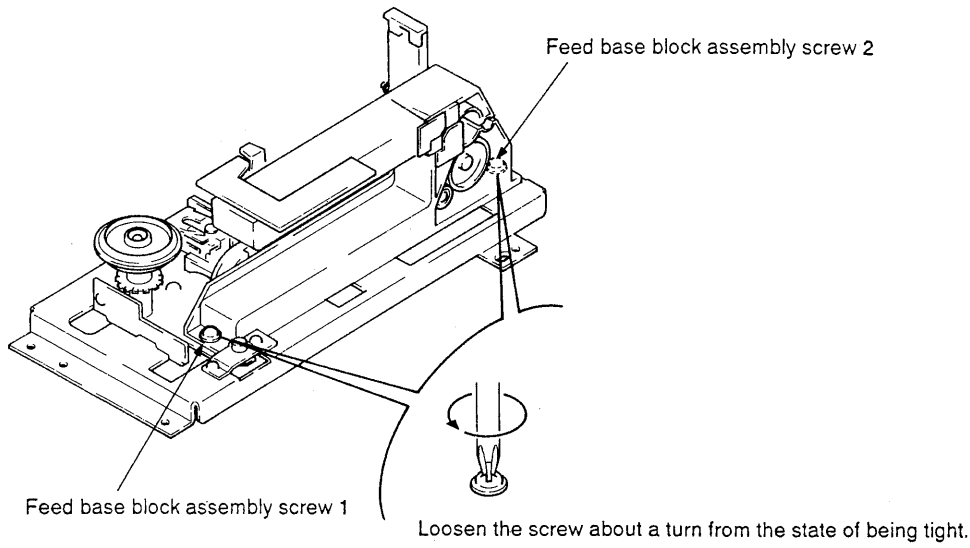


Fig. 7-20.

- 2) Playback the CD alignment disc (YEDS-18) to press the Pause button about 3 seconds later.
- 3) Connect the oscilloscope to LD RF of the MD adjustment cable to see if the waveform shown below appears.

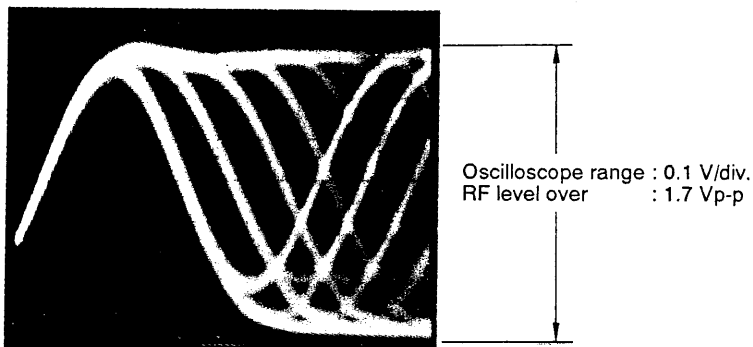


Fig. 7-21.

- 4) Insert the A TAN screw with hexagonal wrench 2.6 into the hole of top surface of chucking assembly to adjust so that RF Level is maximum. (Over 1.7 Vp-p)

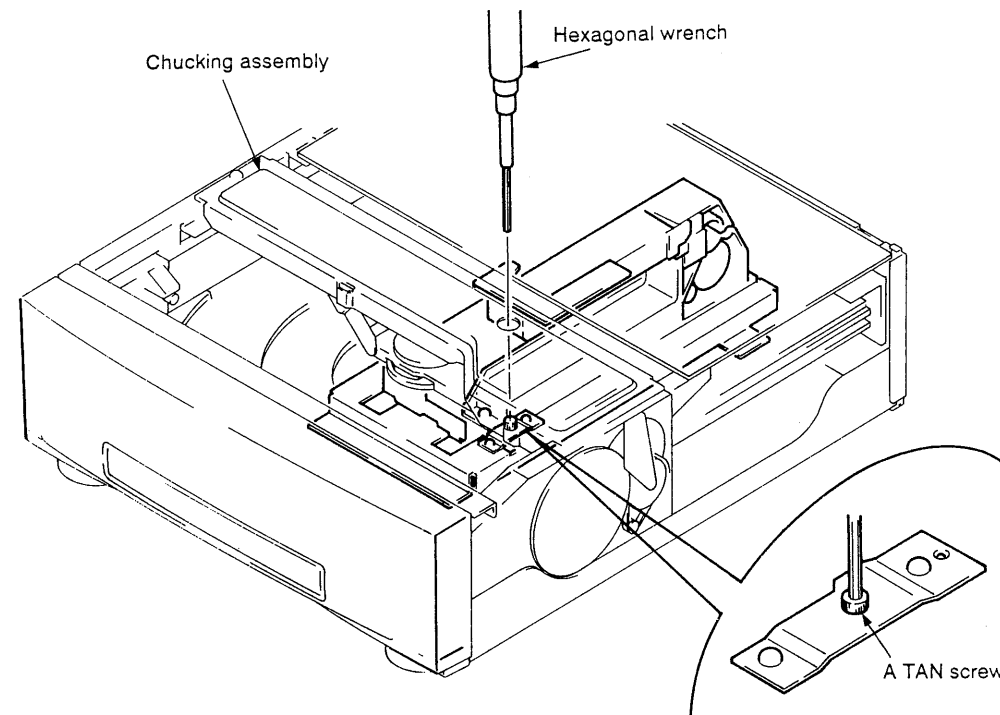


Fig. 7-22.

- 5) Insert decentering screwdriver into the feed base block assembly for RD adjustment.

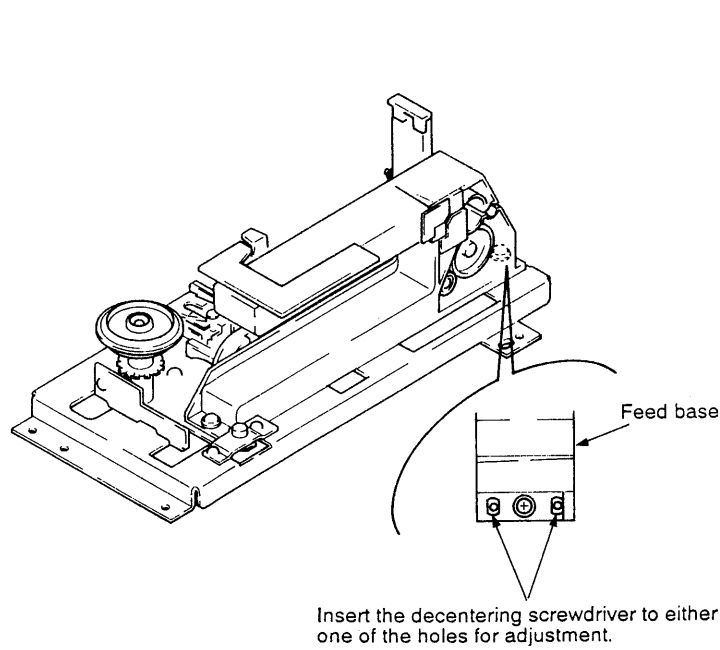
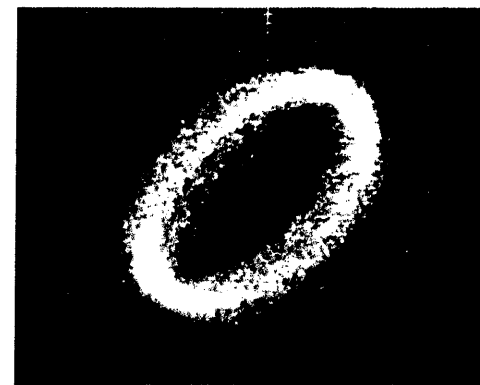


Fig. 7-23.

- 6) Take the DISC out to tighten the 2 screws of the feed base.
- 7) Apply suitable locking compound to A TAN screw.

Terminal E, F/TRK, SLED OFF
Oscilloscope X/Y Lissagous range
Difference within 35° with each 20 mV/div.

Before the adjustment.



↓ Make the figure straight.

After the adjustment.

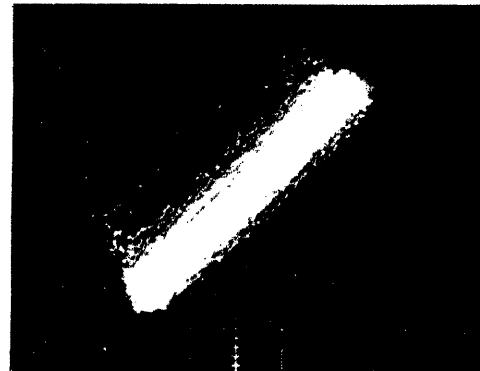
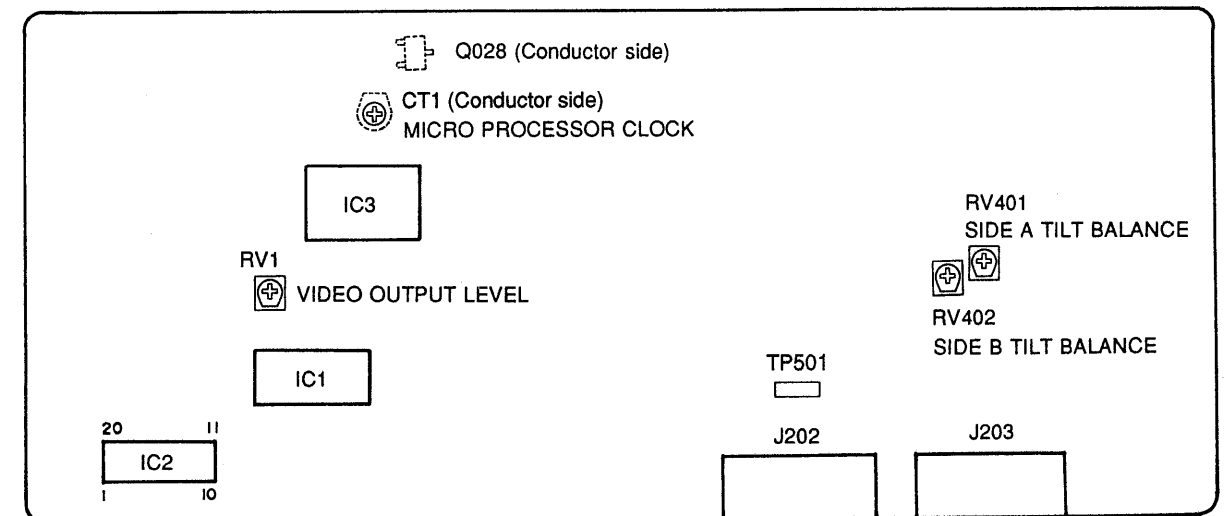


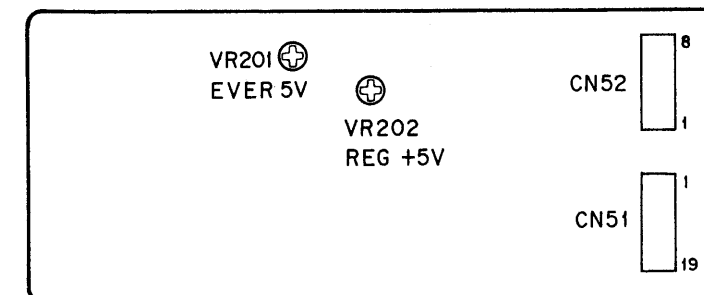
Fig. 7-24.

7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)



POWER BLOCK (Component side)



MDP-A550

RMT-M35A

SONY®

SERVICE MANUAL

E Model
Chinese Model

SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : Change of the POWER BLOCK Printed Wiring Board

- The parts number suffix of the POWER BLOCK printed wiring board is changed as follows.


E.....1-413-989- 21 → 22

Chinese1-413-989- 41 → 42

Note: Main differences between these parts number suffixes are the parts mounted/unmounted, and changes of the parts values.

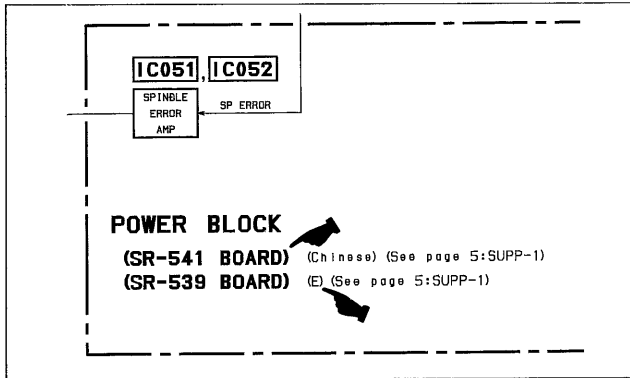
When repairing (or ordering repair parts) the POWER BLOCK, refer to this SUPPLEMENT-1 regardless of the parts number suffix of the printed wiring boards.

· As the parts number suffix of the POWER BLOCK printed wiring board is changed, the following portions are changed. Please correct the Service Manual (9-973-709-11). The full pages of the schematic diagrams, printed wiring boards and electrical parts lists to be corrected are attached from the next page. (Errors in the schematic diagrams and printed wiring boards are corrected.)

 : Indicates changed portion.

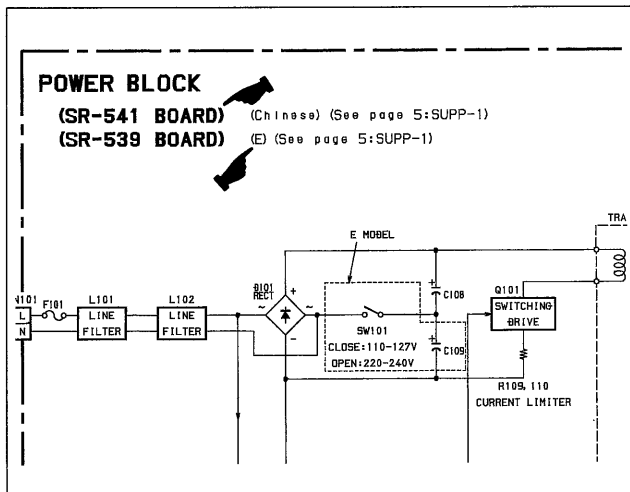
(Page 3-1.)

3-1.OVERALL BLOCK DIAGRAM



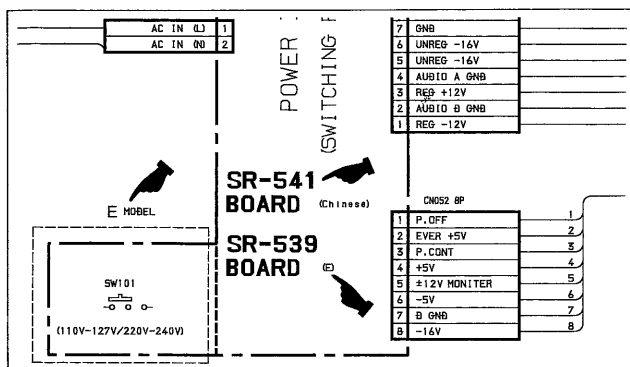
(Page 3-17.)

3-8.POWER BLOCK DIAGRAM



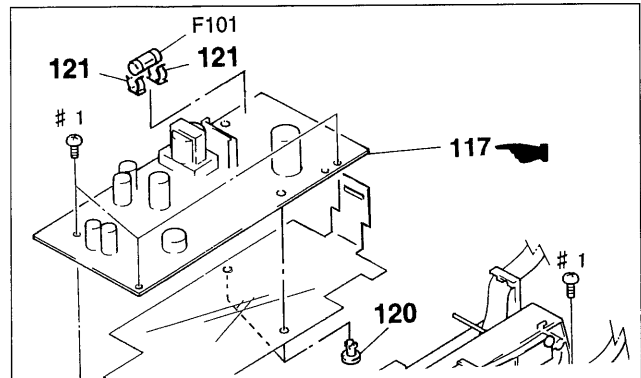
(Page 4-1.)




4-1.FRAME SCHEMATIC DIAGRAM



(Page 5-3.)

5-1-3.MAIN CHASSIS ASSEMBLY



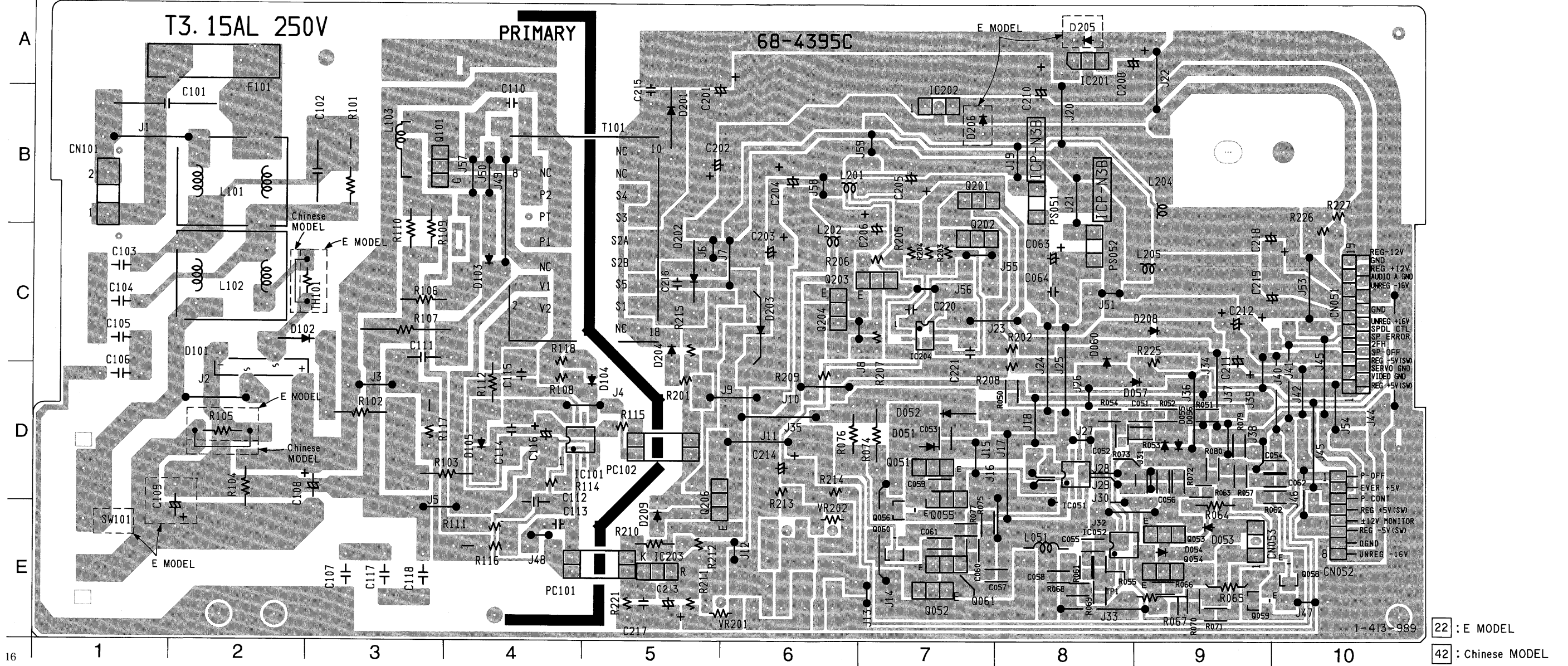
Ref. No.	Part No.	Description	Remarks
* 113	3-962-050-01	STAY, REINFORCEMENT	
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-22	POWER BLOCK (E)	
117	1-413-989-42	POWER BLOCK (Chinese)	
119	3-962-812-01	SCREW (+BV 3X18)	

MDP-A550

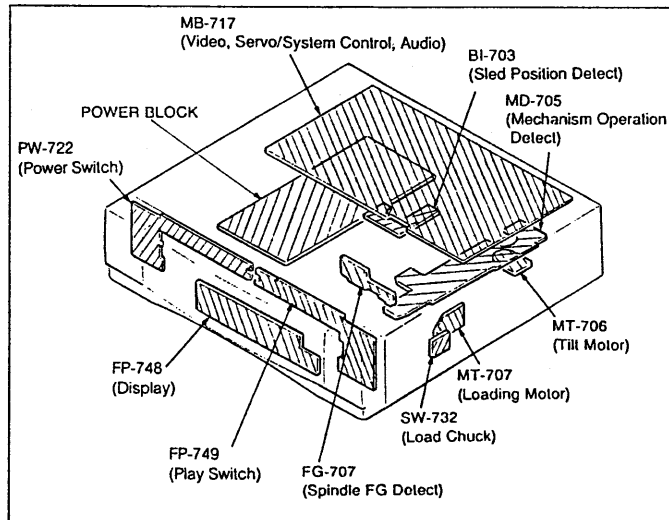
POWER BLOCK PRINTED BOARDS

— Ref. No. : POWER BLOCK; 5,000 Series —

POWER BLOCK (SR-539 BOARD: E MODEL, SR-541 BOARD: Chinese MODEL)



16



POWER BLOCK

CN051	C-10	D105	D-4	Q052	E-7
CN052	E-10	D201	B-5	Q053	E-9
CN053	E-9	D202	C-5	Q054	E-9
CN101	B-1	D203	C-6	Q055	D-7
		D204	C-5	Q056	E-7
D051	D-7	D205	A-8	Q058	E-10
D052	D-7	D206	B-7	Q059	E-9
D053	E-9	D208	C-9	Q060	E-7
D054	E-9	D209	E-5	Q061	E-7
D055	D-9	IC051	D-8	Q101	B-3
D056	D-9	IC052	E-8	Q201	B-7
D057	D-9	IC101	D-5	Q202	C-7
D060	C-8	IC201	A-8	Q203	C-7
D101	D-2	IC202	B-7	Q204	C-6
D102	C-2	IC203	E-5	Q206	D-5
D103	C-4	IC204	C-7	VR201	E-6
D104	D-5	Q051	D-7	VR202	E-6

POWER BLOCK

ELECTRICAL PARTS LIST

NOTE:

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

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

- 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, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
uF: μ F

- RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- COILS
uH: μ H
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	1-413-989-22	POWER BLOCK (SR-539) (E) *****		Δ C117	1-161-742-00	CERAMIC 2200PF 20% 400V	
	1-413-989-42	POWER BLOCK (SR-541) (Chinese) ***** (Ref.No.5,000 Series)		Δ C118	1-161-742-00	CERAMIC 2200PF 20% 400V	
Δ	1-533-223-11	HOLDER, FUSE < CAPACITOR >		Δ C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V		Δ C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF 20% 25V	
C052	1-163-019-00	MULTILAYER CERAMIC 6800PF 10% 50V		Δ C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF 20% 10V	
C053	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V		Δ C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V		Δ C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF 20% 10V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V		Δ C206	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 10% 50V		C208	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C057	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V		C210	1-126-964-51	ALUMINUM ELECTRIC 10uF 20% 50V	
C058	1-163-035-00	MULTILAYER CERAMIC 0.047uF 50V		C211	1-126-925-11	ALUMINUM ELECTRIC 470uF 20% 10V	
C059	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V		C212	1-126-923-11	ALUMINUM ELECTRIC 220uF 20% 10V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V		C213	1-126-963-11	ALUMINUM ELECTRIC 4.7uF 20% 50V	
C061	1-163-017-00	MULTILAYER CERAMIC 4700PF 10% 50V		C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 10% 50V		C215	9-909-680-01	CERAMIC 1000PF 1kV	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 20% 50V		C216	9-909-680-01	CERAMIC 1000PF 1kV	
C064	1-130-491-00	FILM 0.047uF 5% 50V		C217	1-130-491-00	FILM 0.047uF 5% 50V	
Δ C101	9-902-038-01	METALLIZED 0.22uF 250V		C218	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
Δ C102	9-900-521-01	METALLIZED 0.1uF 250V		C219	1-126-942-61	ALUMINUM ELECTRIC 1000uF 20% 25V	
Δ C103	1-161-742-00	CERAMIC 2200PF 20% 400V		C220	1-130-467-00	FILM 470PF 5% 50V	
Δ C104	1-161-742-00	CERAMIC 2200PF 20% 400V		C221	1-130-467-00	FILM 470PF 5% 50V	
Δ C105	1-161-742-00	CERAMIC 2200PF 20% 400V				< CONNECTOR >	
Δ C106	1-161-742-00	CERAMIC 2200PF 20% 400V		CN051	1-695-342-31	CONNECTOR 19P	
Δ C107	1-161-742-00	CERAMIC 2200PF 20% 400V		CN052	1-506-473-11	CONNECTOR 8P	
Δ C108	9-933-773-01	ALUMINUM ELECTRIC 100uF 400V		CN053	1-564-506-11	CONNECTOR 3P	
Δ C109	9-933-773-01	ALUMINUM ELECTRIC 100uF 400V (E)		CN101	1-564-419-11	CONNECTOR 2P	
Δ C110	9-909-673-01	CERAMIC 220PF 1kV				< DIODE >	
Δ C111	9-900-525-01	METALLIZED 0.047uF 400V		D051	9-902-064-01	DIODE ERA81-004	
Δ C112	1-106-363-00	FILM 0.0068uF 5% 50V		D052	9-902-064-01	DIODE ERA81-004	
Δ C113	1-130-483-00	METALLIZED 0.01uF 5% 50V		D053	8-719-200-82	DIODE 11ES2	
Δ C114	1-137-378-11	METALLIZED 0.22uF 5% 50V		D054	8-719-200-82	DIODE 11ES2	
Δ C115	1-130-470-00	FILM 820PF 5% 50V		D055	8-719-911-19	DIODE 1SS119	
Δ C116	1-216-967-11	ALUMINUM ELECTRIC 47uF 20% 50V		D056	8-719-911-19	DIODE 1SS119	
				D057	8-719-911-19	DIODE 1SS119	
				D060	8-719-911-19	DIODE 1SS119	
				Δ D101	8-719-510-19	BRIDGE DIODE D2SBA60	

POWER BLOCK

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
△D102	9-902-050-01	DIODE ERA15-06		△Q053	8-729-117-11	TRANSISTOR 2SB1151-L	
△D103	8-719-030-25	DIODE EG01C		△Q054	8-729-019-31	TRANSISTOR 2SC4596E	
△D104	9-900-514-01	DIODE MA165		Q055	8-729-119-78	TRANSISTOR 2SC2785-HFE	
△D105	9-900-535-01	DIODE AU02Z		Q056	8-729-230-46	TRANSISTOR 2SA1162-YG	
△D201	8-719-510-72	DIODE S3L20U		Q058	8-729-230-49	TRANSISTOR 2SC2712-YG	
△D202	8-719-510-72	DIODE S3L20U		Q059	8-729-230-46	TRANSISTOR 2SA1162-YG	
△D203	8-719-510-72	DIODE S3L20U		Q060	8-729-230-49	TRANSISTOR 2SC2712-YG	
△D204	8-719-043-74	DIODE AK04		Q061	8-729-119-76	TRANSISTOR 2SA1175-HFE	
△D205	9-900-514-01	DIODE MA165 (E)		△Q101	9-909-669-01	TRANSISTOR 2SK1547	
△D206	9-900-514-01	DIODE MA165 (E)		△Q201	8-729-021-99	TRANSISTOR 2SB1416-R	
△D208	8-719-200-82	DIODE 11ES2		△Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE	
△D209	8-719-035-04	ZENNER DIODE MA4240		△Q203	8-729-119-76	TRANSISTOR 2SA1175-HFE	
< FUSE >				△Q204	9-909-678-01	TRANSISTOR 2SC4545-R	
△F101	1-532-286-00	FUSE TIME LUG (3.15A 250V)		△Q206	8-729-900-80	TRANSISTOR DTC114ES	
< IC >				< RESISTOR >			
IC051	8-759-982-73	IC BA10393F		R050	1-216-097-00	THICK FILM 100K	1/10W
IC052	8-759-100-96	IC UPC4558G2		R051	1-216-081-00	THICK FILM 22K	1/10W
△IC101	8-759-062-58	IC FA5311S		R052	1-216-075-00	THICK FILM 12K	1/10W
△IC201	8-759-701-79	IC NJM78M12FA		R053	1-216-093-11	THICK FILM 68K	1/10W
△IC202	8-759-929-65	IC LM7912CT		R054	1-216-105-00	THICK FILM 220K	1/10W
△IC203	9-900-532-01	IC AN1431T		R055	1-216-091-00	THICK FILM 56K	1/10W
△IC204	8-759-100-96	IC UPC4558G2		R057	1-216-093-11	THICK FILM 68K	1/10W
< COIL >				R061	1-216-089-00	THICK FILM 47K	1/10W
L051	1-424-219-11	CHORKE COIL 300uH		R062	1-216-065-00	THICK FILM 4.7K	1/10W
△L101	9-909-675-01	LINE FILTER		R063	1-216-049-11	THICK FILM 1K	1/10W
△L102	9-909-675-01	LINE FILTER		R064	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
△L103	9-904-796-01	BEAD CORE		R065	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
△L201	9-909-681-01	CHORKE COIL 10uH		R066	1-216-049-11	THICK FILM 1K	1/10W
△L202	9-909-681-01	CHORKE COIL 10uH		△R067	1-216-369-00	CARBON 1	2W
△L204	9-909-681-01	CHORKE COIL 10uH		R068	1-219-387-11	THICK FILM 43K	0.1% 1/10W
△L205	9-909-681-01	CHORKE COIL 10uH		R069	1-219-391-11	THICK FILM 47K	0.1% 1/10W
< PHOTO COUPLER >				R070	1-219-387-11	THICK FILM 43K	0.1% 1/10W
△PC101	9-909-676-01	PHOTO COUPLER (A660K)		R071	1-219-391-11	THICK FILM 47K	0.1% 1/10W
△PC101	9-900-519-01	PHOTO COUPLER (K50)		R072	1-216-073-00	THICK FILM 10K	1/10W
△PC102	9-909-676-01	PHOTO COUPLER (A660K)		R073	1-216-073-00	THICK FILM 10K	1/10W
△PC102	9-900-519-01	PHOTO COUPLER (K50)		△R074	1-215-866-11	CARBON 330 5% 1W	
< IC LINK >				R075	1-216-073-00	THICK FILM 10K	1/10W
△PS051	1-532-675-21	IC LINK (ICP-N38 1.5A)		R076	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
△PS052	1-532-675-21	IC LINK (ICP-N38 1.5A)		R077	1-216-073-00	THICK FILM 10K	1/10W
< TRANSISTOR >				R079	1-216-097-00	THICK FILM 100K	1/10W
△Q051	8-729-117-11	TRANSISTOR 2SB1151-L		R080	1-216-097-00	THICK FILM 100K	1/10W
△Q052	8-729-019-31	TRANSISTOR 2SC4596E		△R101	9-900-394-01	NON-FLAMABLE CARBON 1M	1/2W
				△R102	1-218-642-11	METAL OXIDE FILM 100K	1W
				△R103	1-218-642-11	METAL OXIDE FILM 100K	1W
				△R104	1-214-921-00	CARBON 220K	1/2W (E)

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

POWER BLOCK

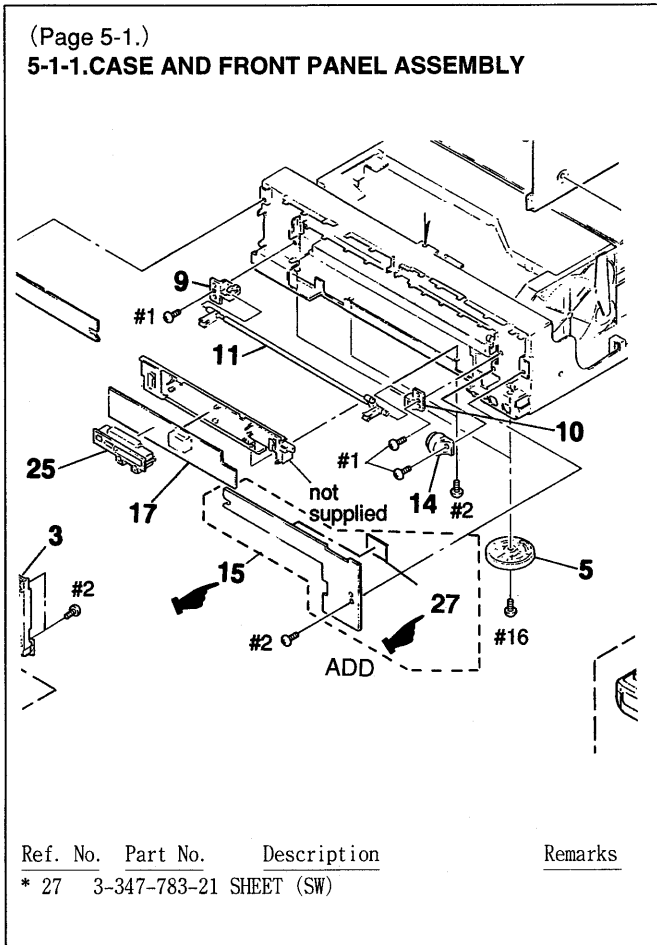
Ref. No.	Part No.	Description	Remarks
△R104	1-260-135-11	CARBON 1M 5%	1/2W (Chinese)
△R105	1-214-921-11	CARBON 220K	1/2W (E)
△R106	1-215-860-11	METAL OXIDE FILM	33 1W
△R107	1-215-927-00	METAL OXIDE FILM	47K 3W
△R108	1-212-974-00	NON-FLAMABLE CARBON	47 1/2W
△R109	9-909-670-01	METAL FILM	0.22 1/2W
△R110	9-909-671-01	CEMENT	0.1 2W
△R111	1-249-408-11	CARBON	180 1/4W
△R112	1-212-958-00	NON-FLAMABLE CARBON	10 1/2W
△R114	1-247-848-11	CARBON 5.1K	1/4W
△R115	1-247-855-31	CARBON 10K	1/4W
△R116	1-247-891-00	CARBON 330K	1/4W
△R117	1-247-891-00	CARBON 330K	1/4W
△R118	1-212-966-00	NON-FLAMABLE CARBON	22 1/2W
△R201	9-909-679-01	FUSE	0.22 1/4W
△R202	1-247-855-31	CARBON	10K 1/4W
R203	1-249-404-00	CARBON	82 1/4W
△R204	1-247-847-11	CARBON	4.7K 1/4W
△R205	1-247-847-11	CARBON	4.7K 1/4W
R206	1-249-404-00	CARBON	82 1/4W
△R207	1-247-855-31	CARBON	10K 1/4W
△R208	1-247-847-11	CARBON	4.7K 1/4W
△R209	1-247-847-11	CARBON	4.7K 1/4W
△R210	1-260-099-11	CARBON	1K 1/2W
△R211	1-247-839-31	CARBON	2.2K 5% 1/4W
△R212	1-247-839-31	CARBON	2.2K 5% 1/4W


Ref. No.	Part No.	Description	Remarks
R213	1-249-432-11	CARBON	18K 1/4W
R214	1-249-433-11	CARBON	22K 1/4W
△R215	1-247-855-31	CARBON	10K 1/4W
△R221	1-247-855-31	CARBON	10K 1/4W
R225	1-247-855-31	CARBON	10K 1/4W
△R226	1-247-871-11	CARBON	47K 1/4W
△R227	1-249-439-11	CARBON	68K 1/4W
< SWITCH >			
△SW101	1-572-675-11	POWER SWITCH (E)	
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER	
< THERMISTOR >			
△TH101	9-904-783-01	POWER THERMISTOR (E)	
< VARIABLE RESISTOR >			
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

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

MDP-A550

 : Indicates Changed portion.



 : Indicates corrected portion.

