

MDP-MR1

RMT-M23A

SERVICE MANUAL

*E Model
Chinese Model
Hong kong Model
Taiwan Model
ME Model*



We will inform of the printed wiring board, schematic diagram and repair parts list of power supply block in the future.

SPECIFICATIONS

System Type

CD/CDV/LD player

Signal readout

Optical (Laser beam reflection)

Signal format system

EIA standard, NTSC colour system

Playing time

See "Optical discs" on page 1-7.

Digital audio specifications

Frequency response

4 Hz to 20 kHz (± 1.0 dB)

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. 355 × 116 × 421.5 mm
(w/h/d)
including projecting parts and controls

Mass

Approx. 6.5 kg

Supplied accessories

Remote Commander RMT-M23A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 ↔ phono plug 3)(1)
AC plug adaptor (1)

Design and specifications are subject to change without notice.



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, though 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 the 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.

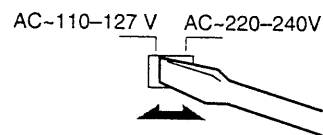
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the player. If this happens, playback may not start. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

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, set 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.

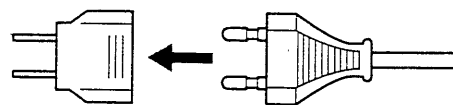
For	Set to
110, 120, or 127 volts AC	110–127 V
220 or 240 volts AC	220–240 V

- To set the voltage selector, disconnect the mains lead and set the selector to the appropriate position with a blade screwdriver.



Using the AC power plug adaptor

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



If you have any questions or problems concerning your unit, please contact your nearest Sony dealer.

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
1. GENERAL			4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS		
Unpacking		1-1	4-1. Frame Schematic Diagram		4-1
Inserting batteries into the remote commander		1-1	4-2. Printed Wiring Boards and Schematic Diagrams		4-3
Connecting the player		1-1	• MB-717 (Video, Servo, System Control, Audio) Board		4-6
Playing a disc		1-2	• MB-717 (Video) Board		4-12
Resuming LD playback (Auto Resume)		1-3	• MB-717 (Servo) Board		4-15
Understanding on-screen indications		1-4	• MT-707, SW-732 Boards		4-18
Searching for a particular point on the disc		1-4	• MB-717 (System Control), MT-707, SW-732 Boards		4-19
Specifying a chapter or track directly (Chapter/Track Search)		1-5	• MB-717 (Audio) Board		4-23
Playing repeatedly (Repeat Play)		1-5	• BI-703, MD-705, FG-707, MT-706 Boards		4-27
Searching by frame number or time (Frame/Time Search)		1-6	• FP-740, PW-717 Boards		4-32
Viewing frame-by-frame action		1-6			
Using the sound control functions		1-7	5. REPAIR PARTS LIST		
Optical discs		1-7	5-1. Exploded Views		5-1
Index to parts and controls		1-8	5-1-1. Case and Front Panel Assembly		5-1
2. DISASSEMBLY			5-1-2. Chucking Block Assembly		5-2
2-1. Removal of Front Panel Assembly		2-1	5-1-3. Main Chassis Assembly		5-3
2-2. Opening of MB-717 Board (Service Position)		2-1	5-1-4. Mechanism Deck Assembly		5-4
2-3. Removal of Chucking Block and Tray Assembly		2-2	5-2. Electrical Parts List		5-5
2-4. Mounting the Chucking Block and Tray Assembly		2-2	6. IC PIN DESCRIPTION		
2-5. Height Adjustment of the Turn Table Assembly		2-3	6-1. Terminal Function of System Control Microcomputer (IC501: MB89094 on the MB-717 Board)		6-1
2-6. Removal of Feed Base Block Assembly		2-3	6-2. Terminal Function of System Control IC (IC502: MBCG24692-4425 on the MB-717 Board)		6-2
2-7. Mounting the Feed Base Block Assembly		2-4	6-3. Terminal Function of Mode Control Microcomputer (IC102: MB89094 on the FP-740 Board)		6-4
2-8. Removal of Optical Device (KHS-150A (S)) (1)		2-5			
2-9. Removal of Optical Device (KHS-150A (S)) (2)		2-6			
2-10. Removal of Control Gear		2-7			
2-11. Removal of Idler Gear		2-7			
2-12. Internal Views		2-8			
2-13. Circuit Boards Location		2-9			
3. BLOCK DIAGRAMS					
3-1. Overall Block Diagram		3-1			
3-2. Video Block Diagram		3-4			
3-3. Servo Block Diagram		3-7			
3-4. System Control Block Diagram		3-10			
3-5. Mode Control Block Diagram		3-13			
3-6. Audio Block Diagram		3-15			
3-7. Power Supply Block Diagram		3-17			

<u>Section</u>	<u>Title</u>	<u>Page</u>
7.	ADJUSTMENTS	
7-1.	List of Servicing Jigs	7-1
7-2.	Cautions on Adjustment	7-1
7-3.	Operation of the MDP-MR1 with hidden Key Functions	7-1
1.	Explanation of the hidden key functions	7-1
2.	How to use "simultaneous main-unit-key-press functions"	7-1
3.	How to use "simultaneous main-and- remote-control-units-key-press functions"	7-2
7-4.	Operation of the MDP-MR1 in the Service Mode	7-2
1.	Explanation of the service mode	7-2
2.	Entering the service mode	7-2
3.	Quitting the service mode	7-2
4.	Operating with the special key functions	7-2
7-5.	Operation of the MDP-MR1 in the Debugging Mode	7-3
1.	Explanation of the debugging mode	7-3
2.	Entering the debugging mode	7-3
3.	Quitting the debugging mode	7-4
4.	Changing the display on the screen	7-4
5.	Explanation of the debugging display	7-4
7-6.	Power Supply Adjustment	7-10
7-6-1.	EVER 5V Adjustment (Power Supply Block)	7-10
7-6-2.	REG +5V Adjustment (Power Supply Block)	7-10
7-6-3.	Power Supply Check (Power Supply Block)	7-11
7-7.	System Control System Adjustment	7-11
7-7-1.	Microprocessor Clock Adjustment (MB-717 Board)	7-11
7-8.	Servo System Adjustment	7-12
7-8-1.	LD Side A Tilt Balance Adjustment	7-12
7-8-2.	LD Side B Tilt Balance Adjustment	7-13
7-9.	Video System Adjustment	7-14
7-9-1.	Video Output Level Adjustment (MB-717 Board)	7-14
7-10.	Adjustment after the Attachment of the Optical pick-up Block	7-14
7-10-1.	Jigs and Tools	7-14
7-10-2.	CD Adjustment	7-15
7-11.	Parts Arrangement Diagram for Adjustment	7-18

SUPPLEMENT-1

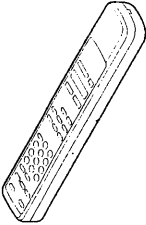



SECTION 1
GENERAL

This section is extracted from instruction manual.

Step 1

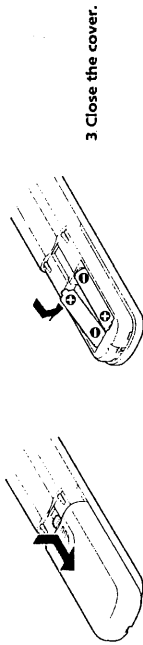
Unpacking

Check that you have the following items:

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

Step 2

Inserting batteries into the remote commander



Notes

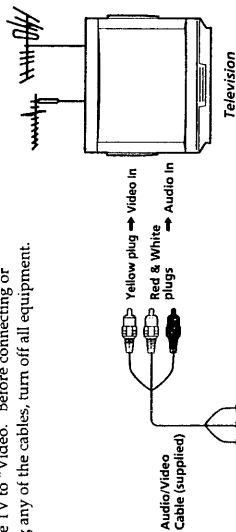
- With normal use, the batteries should last for approximately six months.
- If you are not going to use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not use different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

Step 3

Connecting the player

Television hook-up

To play LDs or DVDs, hook up a television to the LD Player. Take out the supplied audio/video 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.



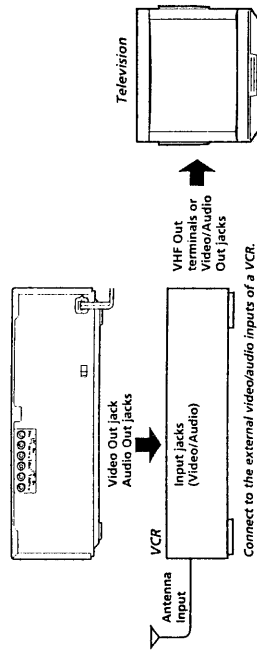
Notes

- 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 VMCA-910/915 Connecting Cable (not supplied).

Television/VCR hook-up

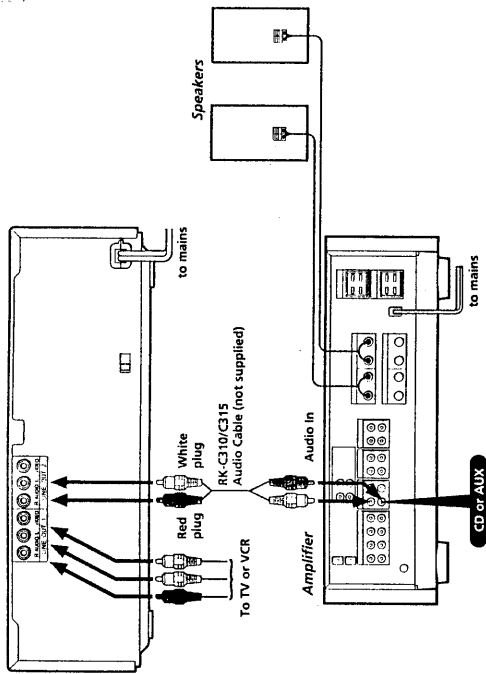
Connect the LD player to the VCR's inputs when:

- the video inputs of the TV are already used for the VCR or a similar machine.
- the TV has only an aerial input.



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 of the below cables, turn off all equipment.

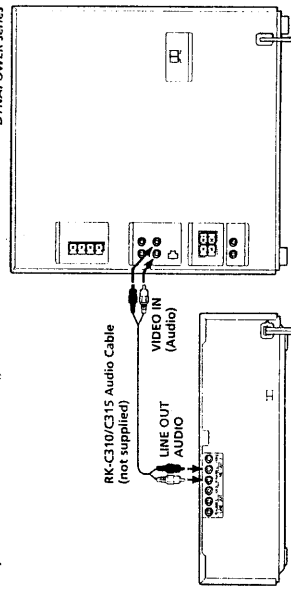


Notes

- 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.

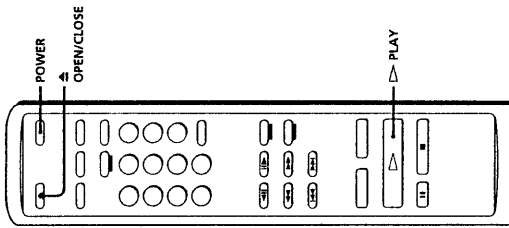
If you hook up the Sony Compact Hi-Fi Stereo System "DYNAPOWER" series

To enjoy stereo sound from the LD Player with the Sony Compact Hi-Fi Stereo System, hook up the player and the DYNAPOWER with an RK-C310 (or RK-C315) audio connecting cable (not supplied). You must also hook up the player and your TV with a video connecting cable.



Getting Started | 7-EN

Basic Operations Playing a disc



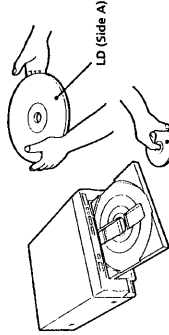
This section shows you how to play an LD, CD or CDV.

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.
- 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	Press
■ STOP	■ STOP
⏸ PAUSE	⏸ PAUSE
▶ PAUSE or ▶▶ PLAY	▶ PAUSE or ▶▶ PLAY
◀◀/▶▶ SCAN	◀◀/▶▶ SCAN
◀◀/▶▶ ACS/AMS	◀◀/▶▶ ACS/AMS
▶ OPEN/CLOSE	▶ OPEN/CLOSE

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 disc tray, or if the disc is not seated properly, the disc may not start playing, and may damage 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 if you are playing a CLV LD or CDV, and the picture freezes if you are playing a CAV LD (see "Viewing frame-by-frame action" on page 16).

8-EN | Basic Operations

To start playing from the beginning of either LD side

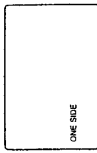
Press DISC SIDE A to play the upper side of the LD from the beginning. Press DISC SIDE B to play the other side of the LD from the beginning.

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 playback of LD side B ends, the player stops.
- When playing side A of an LD, CD or DVD, 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.

To play only one side of an LD.

Press 1/SIDE/ALL twice. "ONE SIDE" appears briefly. Press \blacktriangle (Play) or DISC SIDE A/B. The current side of the LD is played once.



To stop playing and turn off the player

Press POWER. You can resume playback from the point you stopped at by simply pressing \blacktriangle PLAY (See "Resuming LD playback" on page 10).

To stop playing and remove the disc

Press \blacktriangle OPEN/CLOSE. Remove the disc and press \blacktriangle again to close the empty tray.

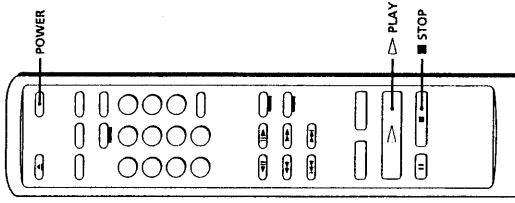
To pause playing just before starting

Press \blacksquare PAUSE instead of doing step 4 on page 8. The disc tray closes and the player waits at the start of the disc until you press \blacktriangle PLAY or \blacksquare PAUSE. If you want to start from side B of an LD, press \blacksquare PAUSE, then DISC SIDE B.

Chapter/Track number display on the front panel

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

Additional Operations Resuming LD playback (Auto Resume)



This function can only be used for LDs. Once you stop playing by pressing \blacksquare STOP or POWER, the player stores the point you stopped at so that you can continue viewing from the same point.

1 Press \blacksquare STOP (or POWER) to stop playback.

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

2 Press \blacktriangle PLAY.

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

To pause playing just before starting

When the player is turned on, press \blacksquare PAUSE instead of \blacktriangle PLAY. When the player is turned off, press POWER or \blacktriangle PLAY to turn on the player, then press \blacksquare 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 where you stopped is cleared.

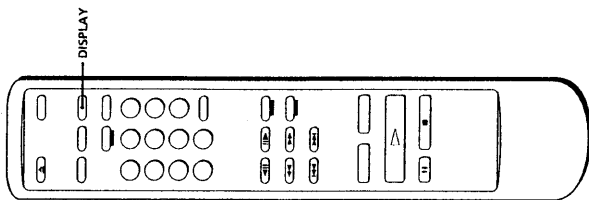
Tips

- Each time you stop playing, the point where you stopped is stored.
- The point where you stopped playing is cleared when you press \blacktriangle OPEN/CLOSE, DISC SIDE A/B or \blacktriangle / \blacktriangle .
- ACS/AMS.
- you carry out a Chapter Search or Frame/Time Search.

Note

- If you press \blacktriangle PLAY when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.

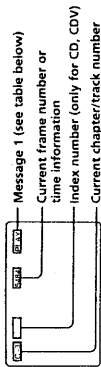
Understanding on-screen indications



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

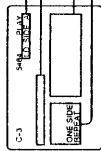
Displaying on-screen indications

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

Current status of the player

OPEN	Disc tray open
CLOSE	Disc tray closed
PLAY	Playing a disc
STOP	Playback stopped
PAUSE	Playback temporarily stopped
SEARCH	Speed scanning
SEARCH	Searching

Message 2

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
D DIGITAL	Digital sound
A ANALOG	Analog sound

- Notes**
- 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 "22", meaning 22 minutes, appears.

Searching for a particular point on the disc

The LD player has various "search" functions. You can locate a particular point on a disc by scanning scenes or skipping chapters/tracks. You can also specify a chapter/track number directly.

Scanning a disc quickly (Speed Scan)

Hold down **SCAN** while playing the disc.

To	Hold down
Scan forward	SCAN
Scan backward	SCAN

To resume normal playback, release **SCAN**.

Skipping chapters or tracks (Skip Search)

Press or hold down **ACS/AMS**.

To go to the beginning of	Press
Next chapter/track	ACS/AMS once
Current chapter/track	ACS/AMS once
Previous chapter/track	ACS/AMS twice before the picture or sound resumes

Hold down **SCAN** or **SCAN** to skip chapters/tracks continuously.

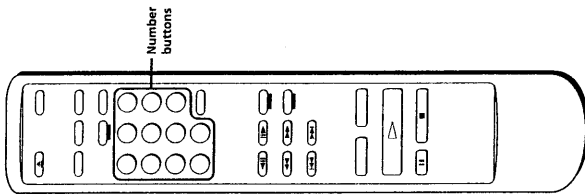
Note

- A certain amount of visual noise and instability is inevitable when scanning an LD.

Tips

- ACS/AMS stands for Automatic Chapter Search/Automatic Music Search.
- In addition to normal play mode, you can conduct 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.

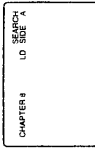
Specifying a chapter or track directly (Chapter/Track Search)



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.



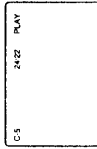
To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

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, 0, then 5.
Enter 30	0, 0, 0, then 0.

To check the current chapter/track number on the screen

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.



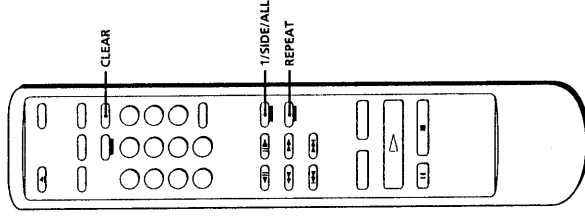
Tips

- In addition to normal play mode, you can conduct 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 disc does not contain chapter numbers, or if the chapter number entered does not exist.

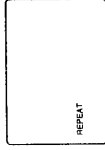
Playing repeatedly (Repeat Play)



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.

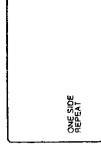
Repeating the whole disc (All Disc Repeat)

Press REPEAT while playing the disc. "REPEAT" appears on the screen briefly. When playing an LD, the player plays through both sides of the LD repeatedly. When playing a CD or CDV, the player plays all the tracks on the disc repeatedly.



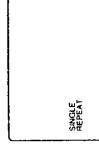
Repeating the current side of the LD (One Side Repeat)

Press 1/SIDE/ALL twice, then REPEAT while playing the disc. "ONE SIDE" and "REPEAT" appear briefly. The player plays the current disc side repeatedly.



Repeating the current chapter/track (Single Repeat)

Press 1/SIDE/ALL once, then REPEAT while playing the disc. "SINGLE" and "REPEAT" appear briefly. The player plays the current chapter/track repeatedly.



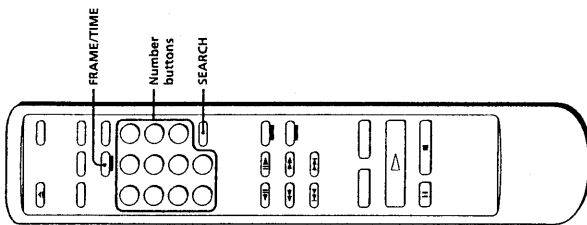
To check the replaying status

Press DISPLAY twice.

Cancelling Repeat Play

Press CLEAR.

Searching by frame number or time (Frame/Time Search)



Tip

- In addition to normal play mode, you can conduct Frame/Time Search while in Freeze Frame, Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.

Note

- If you enter a frame/time number which does not exist on the disc, the last scene on the current side of the LD is played.

Video scenes are counted as a series of still pictures or "frames." When playing a CAV (standard-play) LD, the player keeps track of the number of frames. So, you can locate a scene on the CAV disc by specifying the frame number. When playing a CLV (extended-play) LD, the player keeps track of the elapsed playing time. So, you can locate a particular point on the CLV LD by specifying the total elapsed time.

Entering the frame number or elapsed time

When playing	Indication				
CAV LD	FRAME 00000				
CLV LD	TIME 0:00:00				
	<table border="1"> <tr> <td>FRAME 00000</td> <td>LD SIDE A</td> <td>TIME 0:00:00</td> <td>LD SIDE A</td> </tr> </table>	FRAME 00000	LD SIDE A	TIME 0:00:00	LD SIDE A
FRAME 00000	LD SIDE A	TIME 0:00:00	LD SIDE A		

2 Enter the multi-digit number corresponding to the frame or time you want to locate.

To locate frame number 12340 on the CAV LD, press the number buttons in the order ①, ②, ③, ④ and ⑤.

To locate the 12 minutes, 5-second point on the CLV LD, press the number buttons in the order ①, ②, ③, ④ and ⑤.

If you enter the wrong number, press FRAME/TIME to clear the number, then enter the correct number.

3 Press SEARCH.

Playback starts from the frame or time you specified.

To check the frame number or time

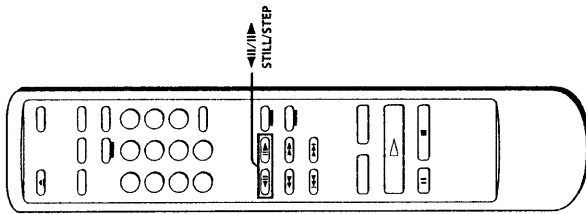
Press DISPLAY.

The current frame number or time is displayed on the screen.

To cancel Frame/Time Search

Press CLEAR before pressing SEARCH.

Viewing frame-by-frame action



Tip

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

This function can only be used for CAV LDs. On any scene, you can freeze an action into a still picture, or 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.

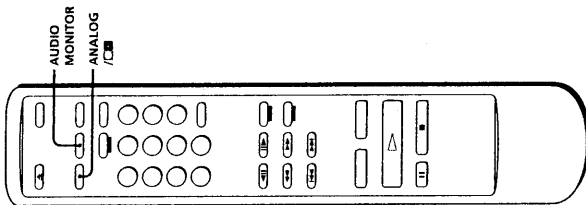
2 Press STILL or STEP repeatedly to advance or reverse the action frame-by-frame.

Hold down STILL or STEP to view continuous frame-by-frame action.

To resume normal playback

Press PLAY.

Using the sound control functions

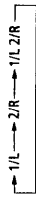


Playing a stereo disc or Second Audio Programme (SAP) disc

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:



The indication appears on the screen briefly, then disappears.

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/□.

Press ANALOG/□ while playing the disc.

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

To return to digital sound

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

Note

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

Optical discs

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

Multi audio discs

digital MULTIAUDIO

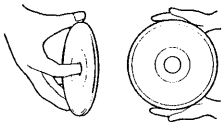
Discs with these logos contain separate analog and digital tracks which may differ in content.

- * The MDP-MRI 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

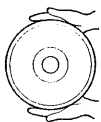
Holding CDs or CDVs

Hold CDs or CDVs by putting your index finger through the centre 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 in 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.

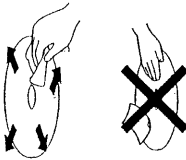
Cracked or Damaged Discs

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

Keeping the Disc Surface Clean

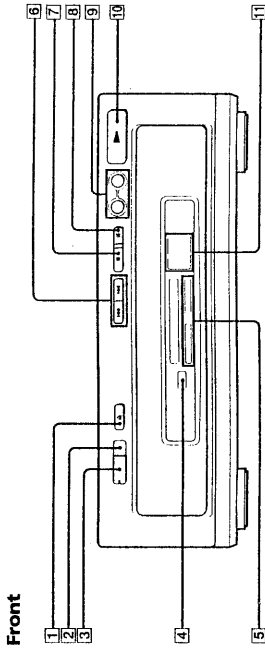
Clean the surface of the disc before playing, using a soft, dry, cleaning cloth. Wipe the disc from the centre out. Do not use solvents such as benzene, paint thinner, commercially available cleaners, or anti-static spray intended for LP record discs.

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.



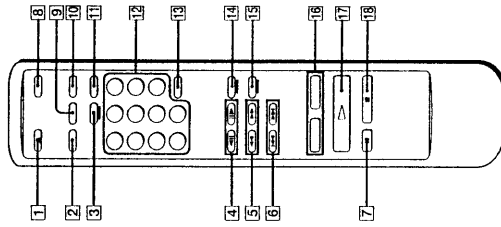
See the pages indicated in () for details.

Index to parts and controls




- 1 OPEN/CLOSE button (8)
- 2 Remote sensor (18)
- 3 POWER switch and indicator (8)
- ON: Green
- STANDBY: Red
- 4 AUTO RESUME indicator (10)
- 5 SIDE A/B indicators (9)
- 6 < (Left arrow) / > (Right arrow) ACS/AMS buttons (12)
- 7 ■ (Stop) button (8)
- 8 || (Pause) button (8)
- 9 SIDE A/B buttons (9)
- 10 ▶ (Play) button and indicator (8)
- 11 Chapter/track number indicator (9)

Remote commander

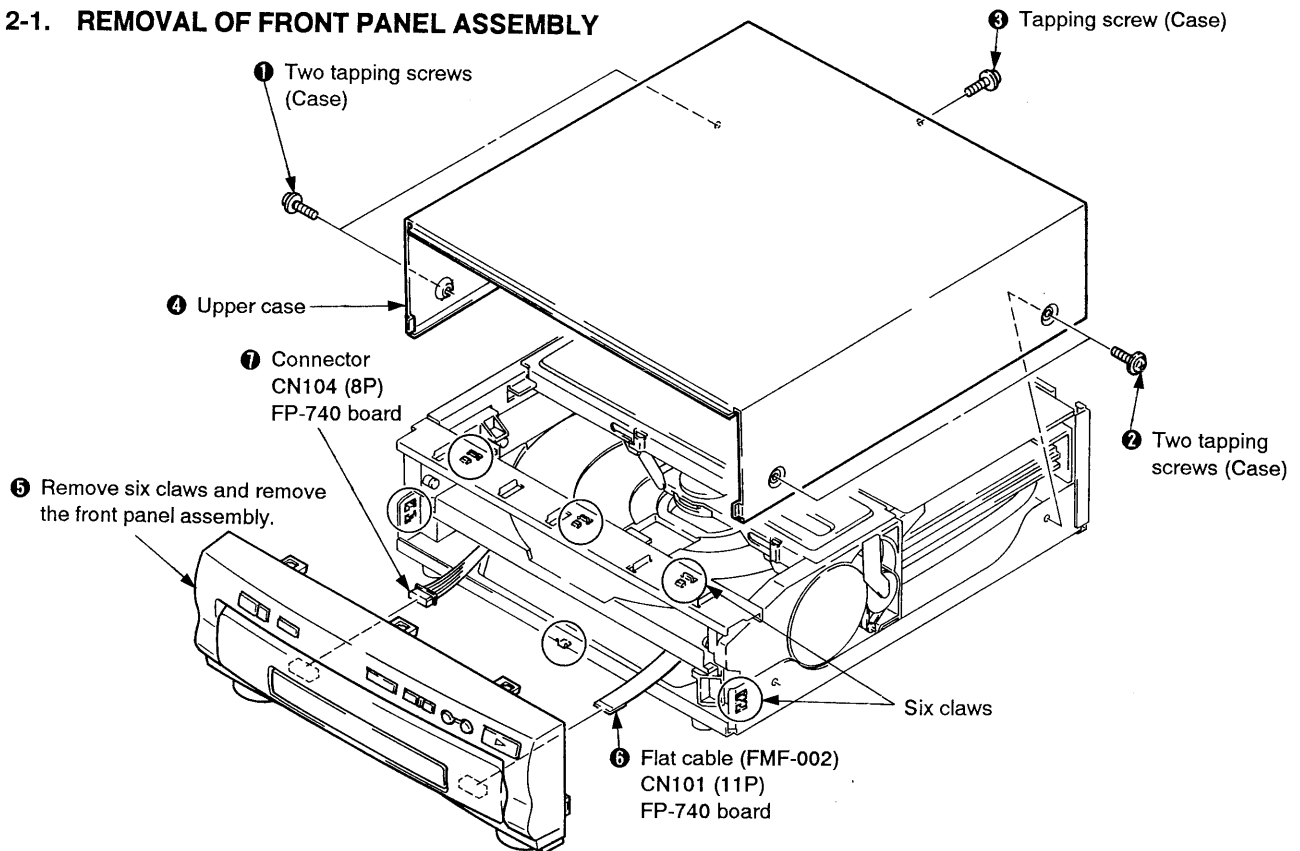


- 1 ▲ OPEN/CLOSE button (8)
- 2 ANALOG/CX button (17)
- 3 FRAME/TIME button (15)
- 4 ◀/||/▶ STILL/STEP buttons (16)
- 5 ◀◀/▶▶ SCAN buttons (12)
- 6 ◀◀/▶▶ ACS/AMS buttons (12)
- 7 || PAUSE button (8)
- 8 POWER switch (8)
- 9 AUDIO MONITOR button (17)
- 10 DISPLAY button (11)
- 11 CLEAR button (14) (15)
- 12 Number buttons (13) (15)
- 13 SEARCH button (15)
- 14 1/SIDE/ALL button (9) (13) (14)
- 15 REPEAT button (14)
- 16 DISC SIDE A/B buttons (9)
- 17 ▷ PLAY button (8)
- 18 ■ STOP button (8)

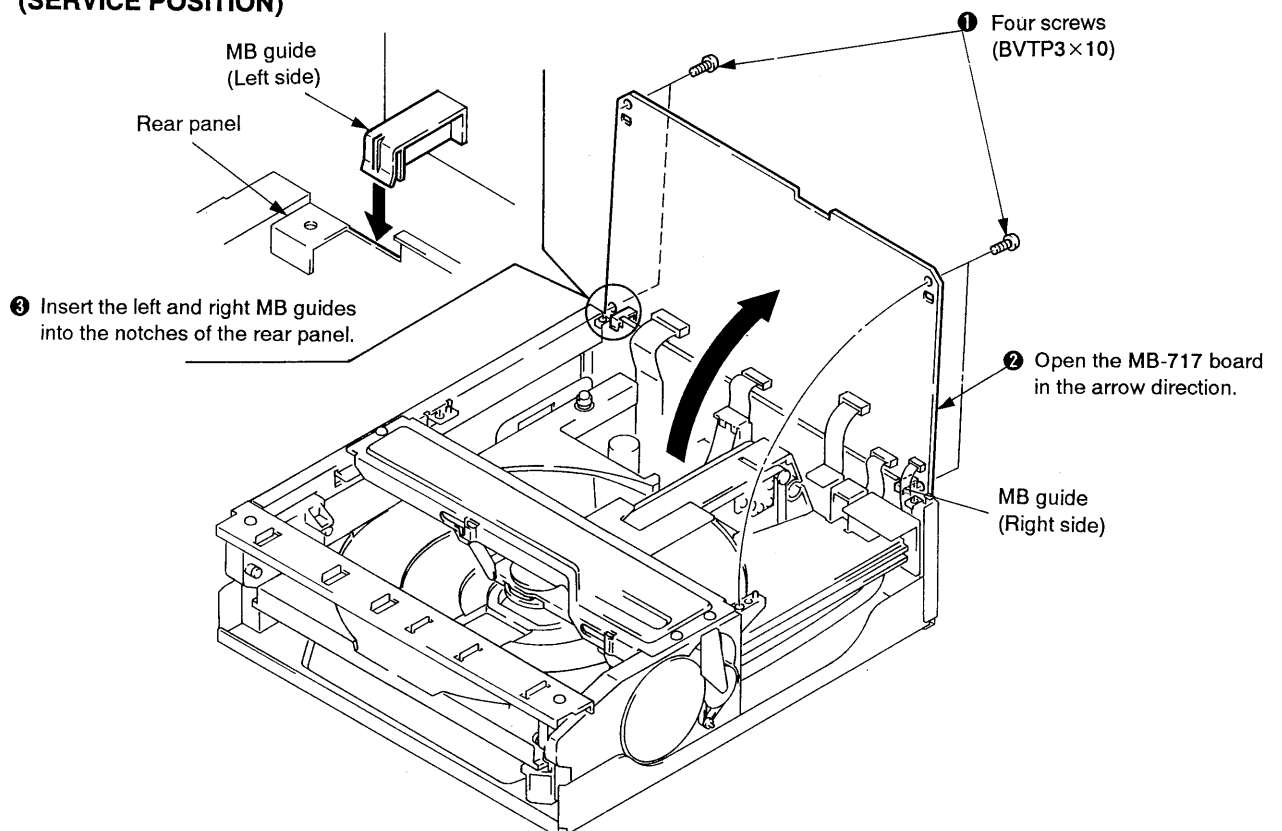
 A function activated by pressing a button with an orange mark can be cancelled by pressing the CLEAR button.

SECTION 2 DISASSEMBLY

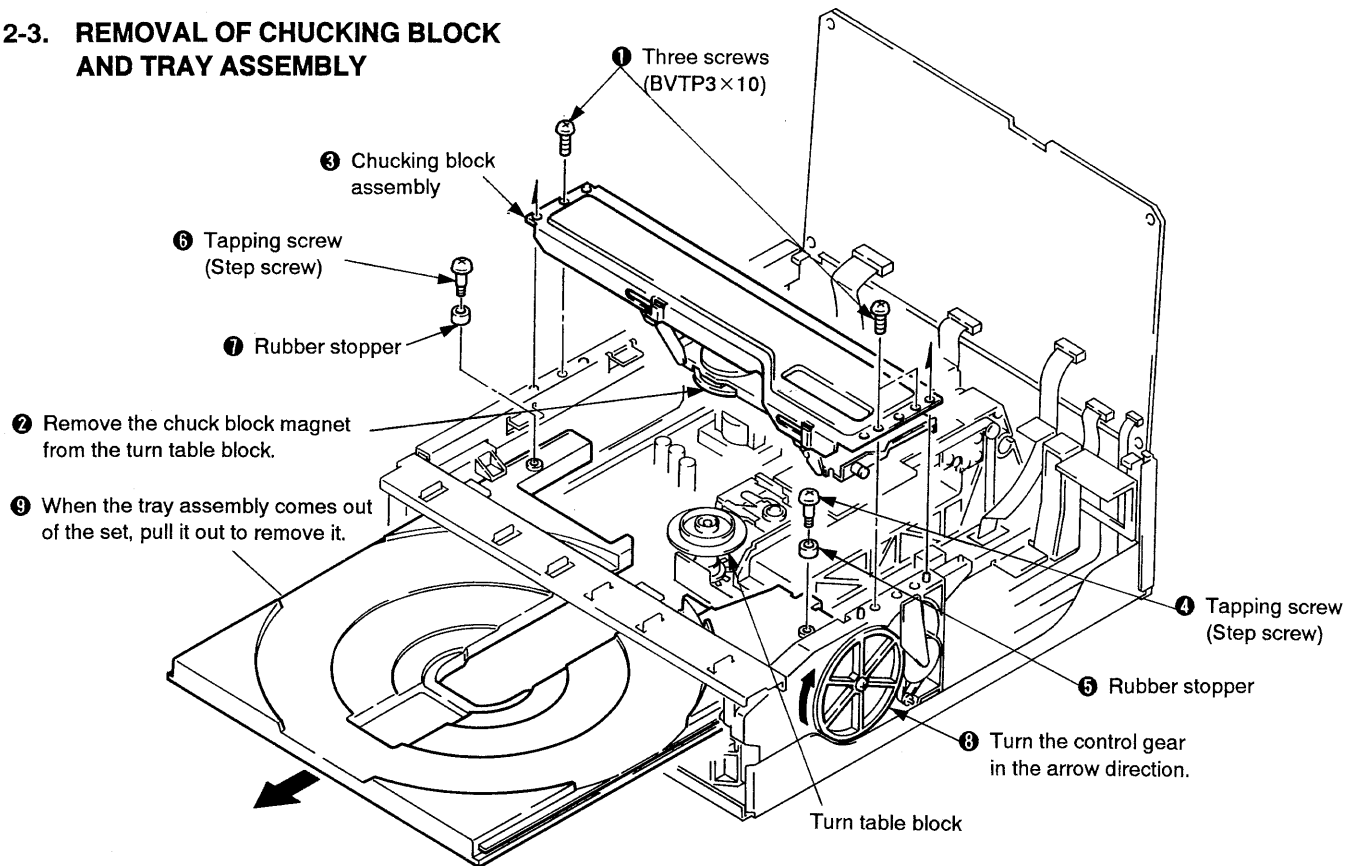
2-1. REMOVAL OF FRONT PANEL ASSEMBLY



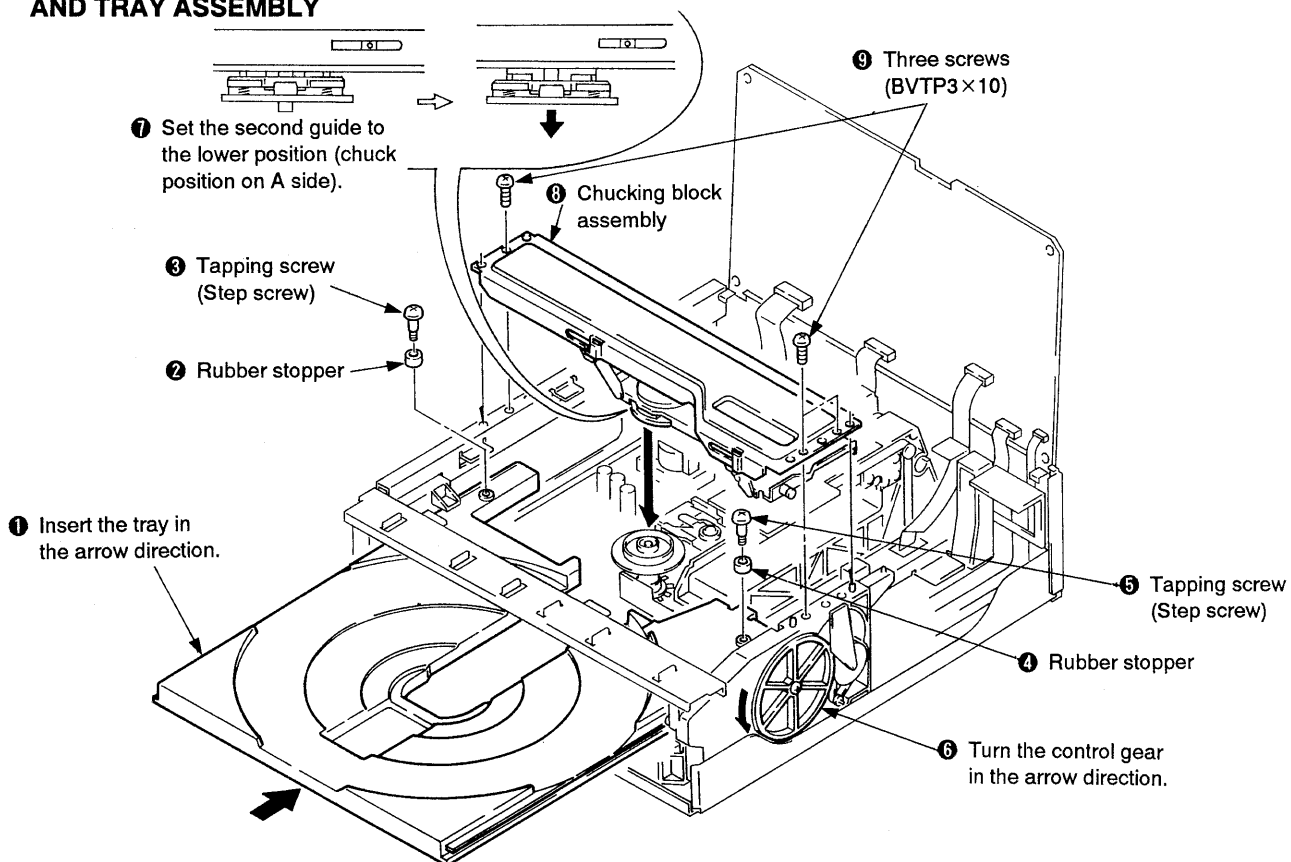
2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)



2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY

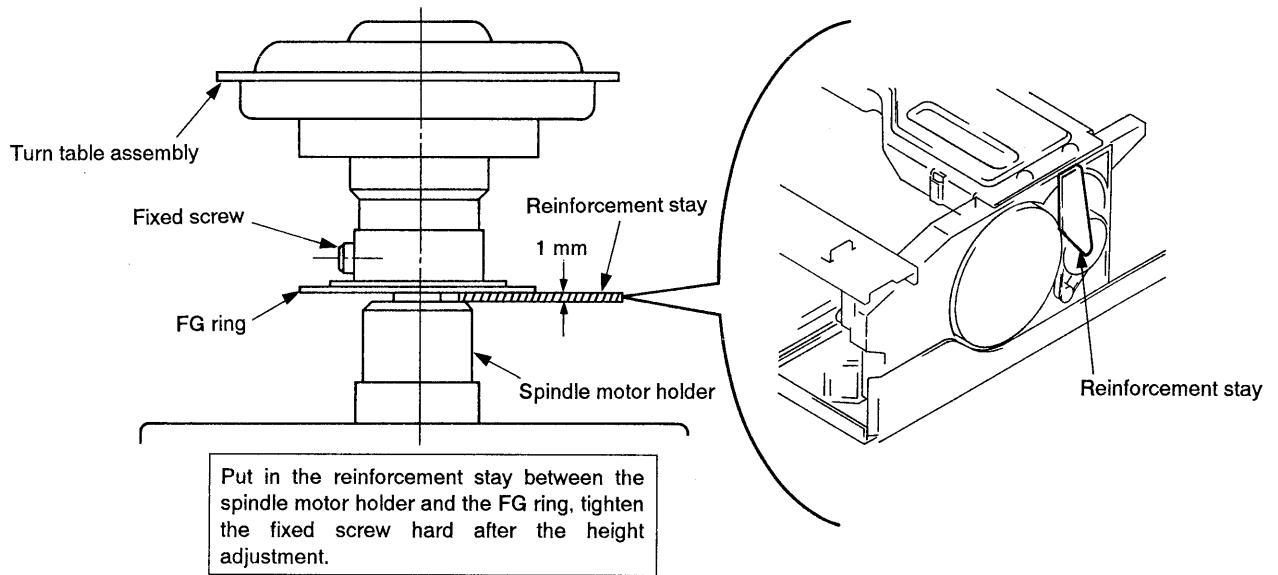


2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY

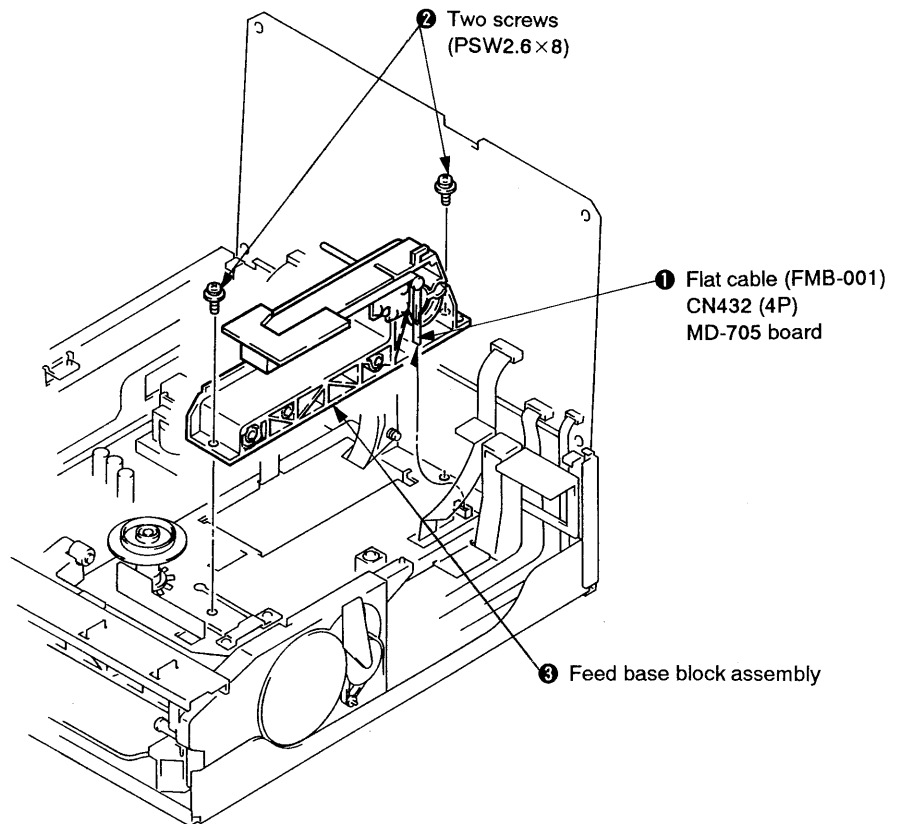


2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

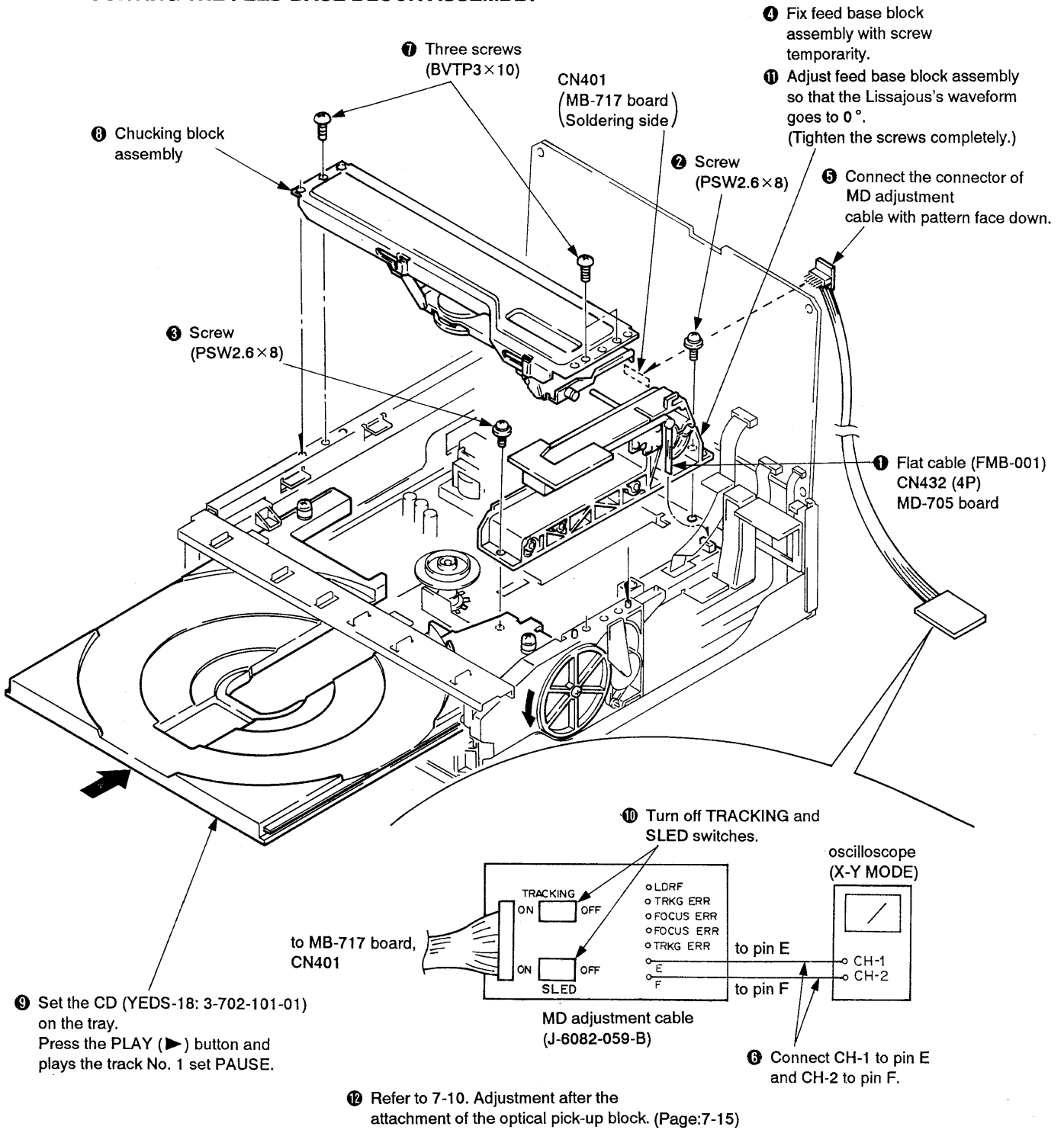
1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
Adjust the height and also the position putting in the reinforcement stay as below.
The thickness of the reinforcement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



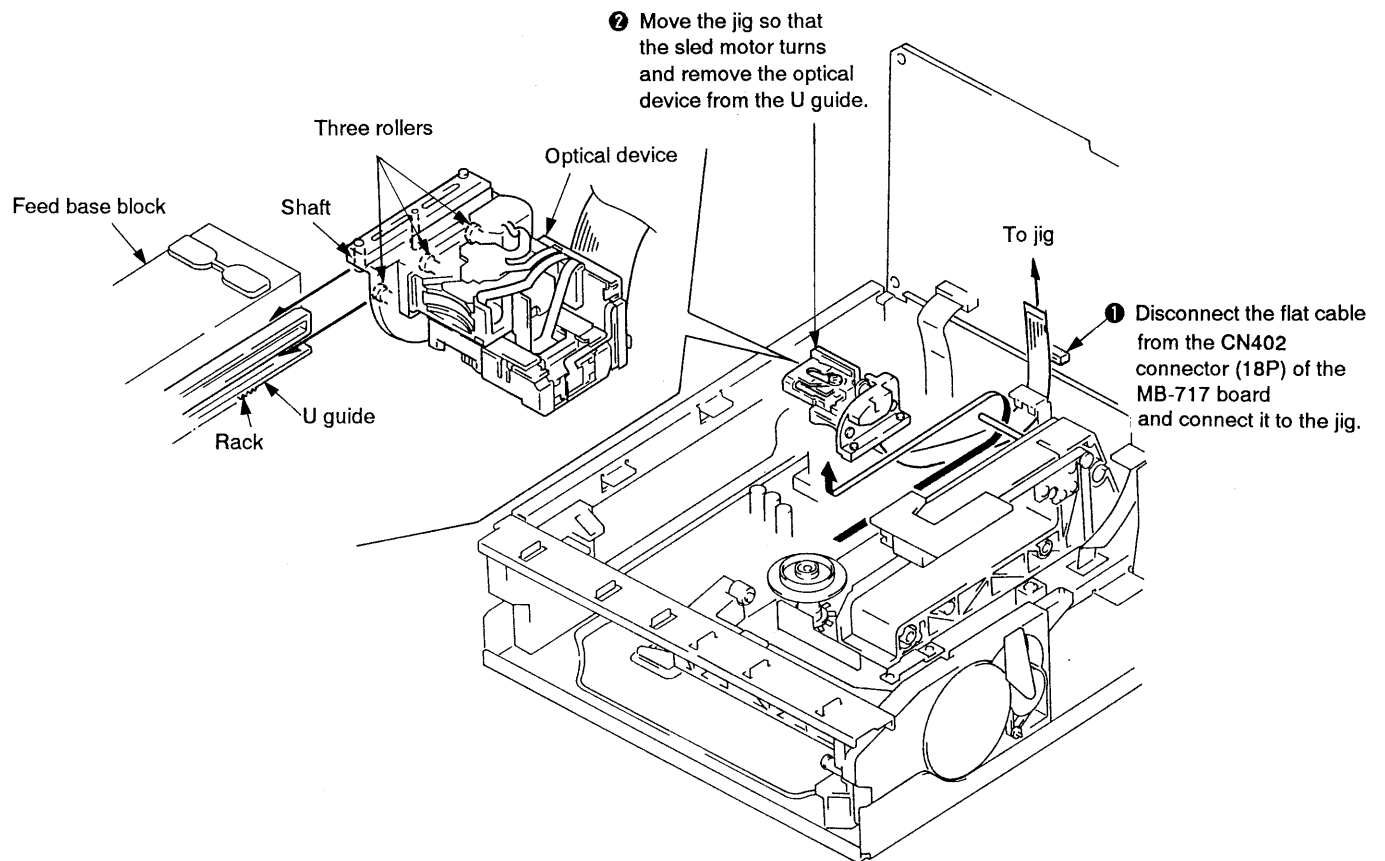
Lissajous's waveform

×	×	○
180°	90°	0°
∖	○	/

2-8. REMOVAL OF OPTICAL DEVICE (KHS-150A (S)) (1)

- 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.
- 3) Move the jig so that the sled motor turns (in the opposite direction of removal), and mount the optical device onto the feed base block.

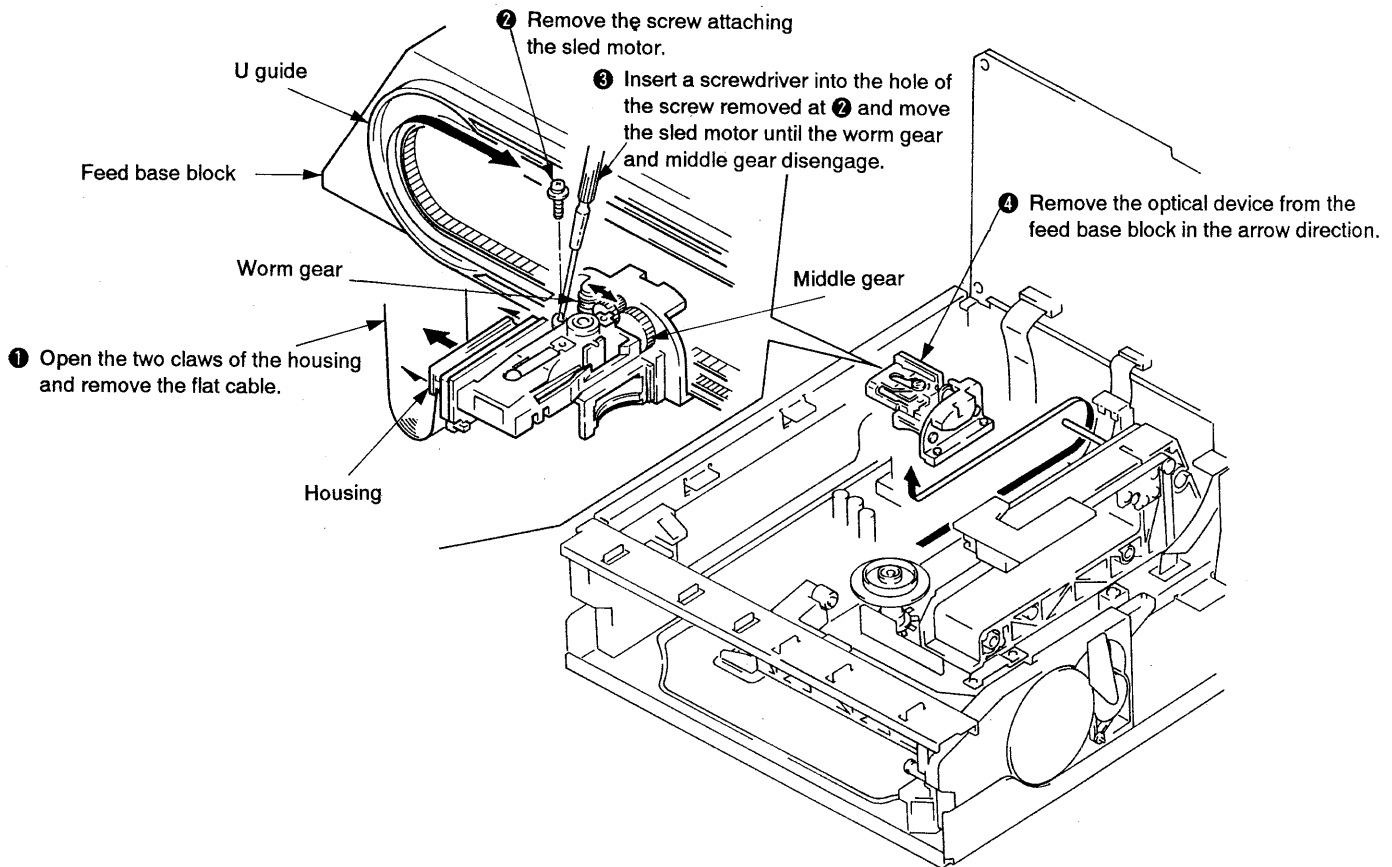


2-9. REMOVAL OF OPTICAL DEVICE (KHS-150A (S)) (2)

- Removal performed when the sled motor does not operate

Note:

Refer to section 2-8 to mount the optical device after replacing it.



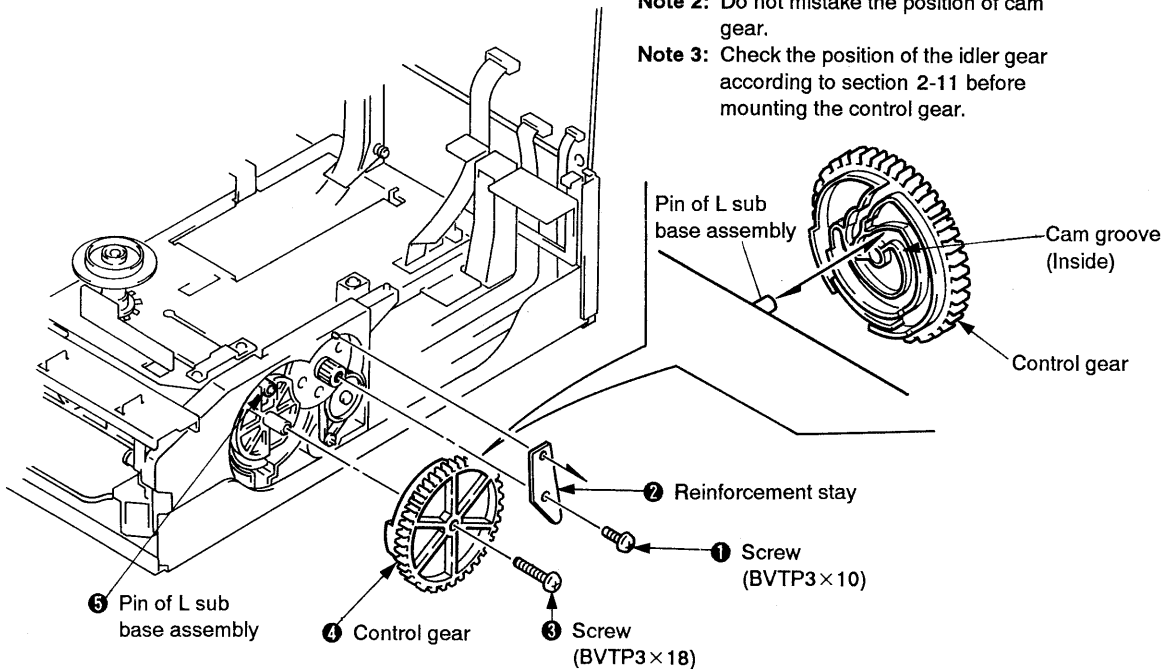
2-10. REMOVAL OF CONTROL GEAR

- 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.

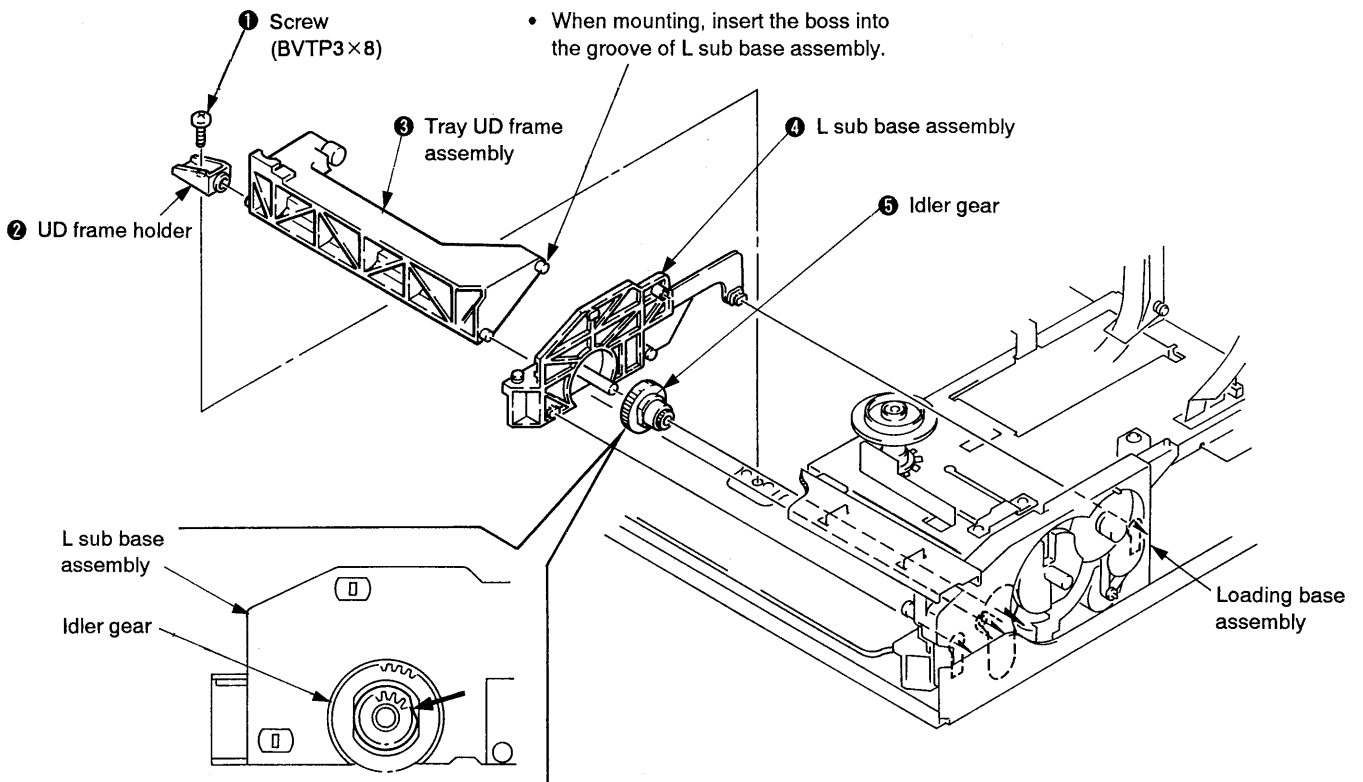
Note 2: Do not mistake the position of cam gear.

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



2-11. REMOVAL OF IDLER GEAR

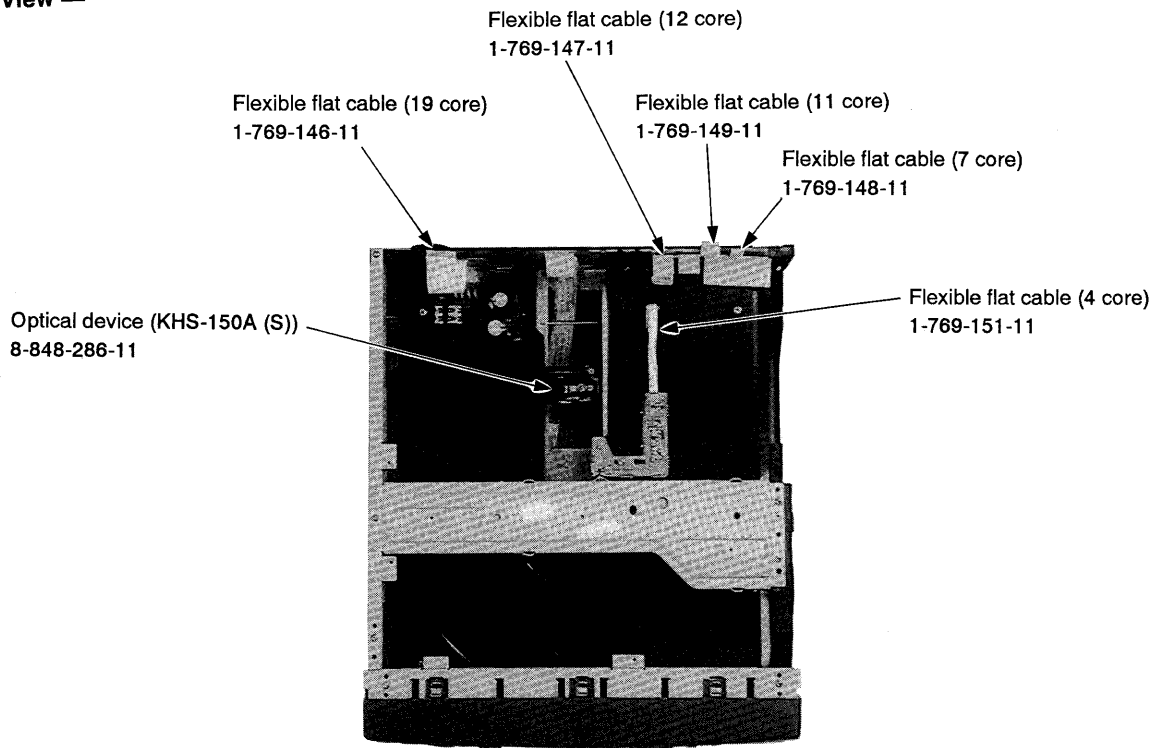
- When mounting, insert the boss into the groove of L sub base assembly.



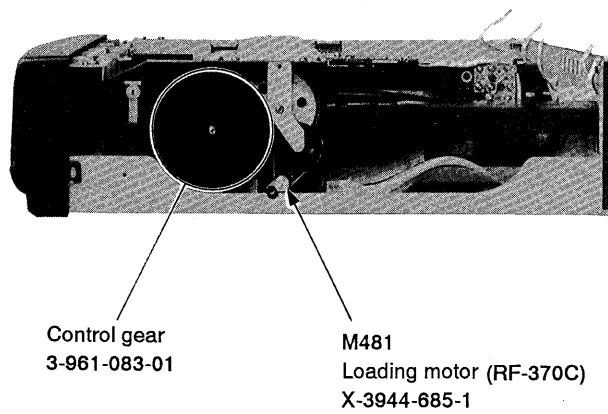
- Positioning the idler gear
Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-12. INTERNAL VIEWS

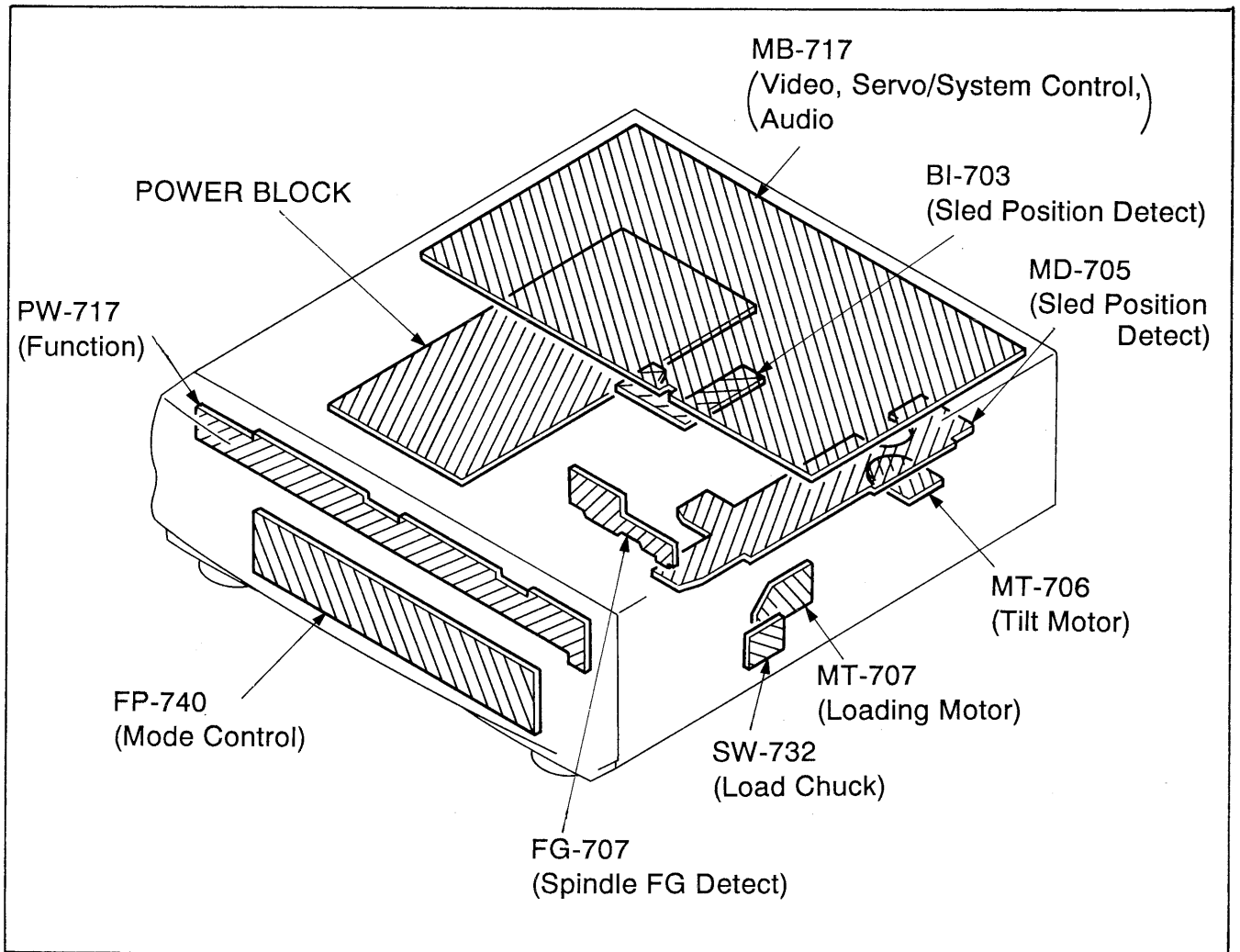
— Top View —



— Side View —

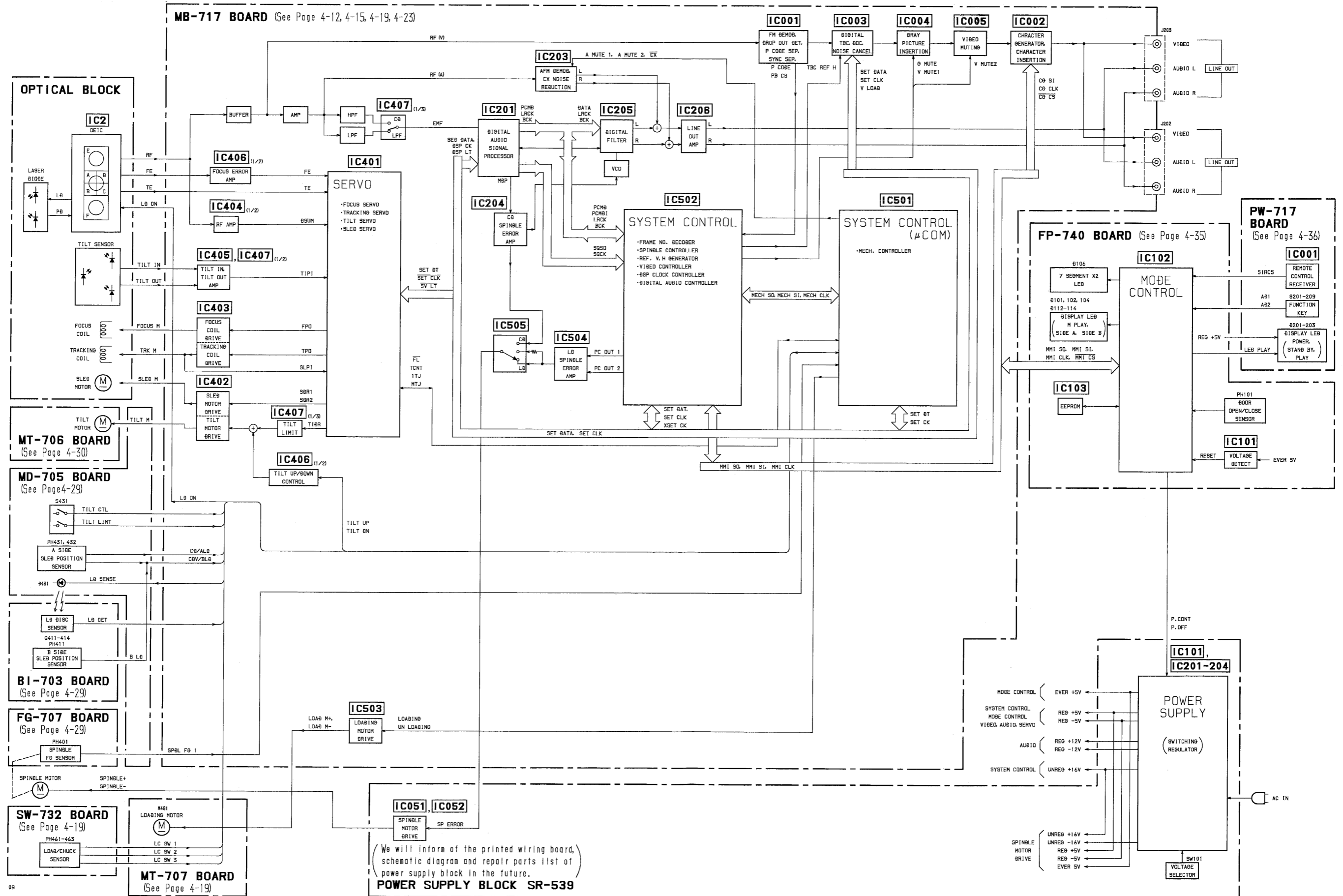


2-13. CIRCUIT BOARDS LOCATION



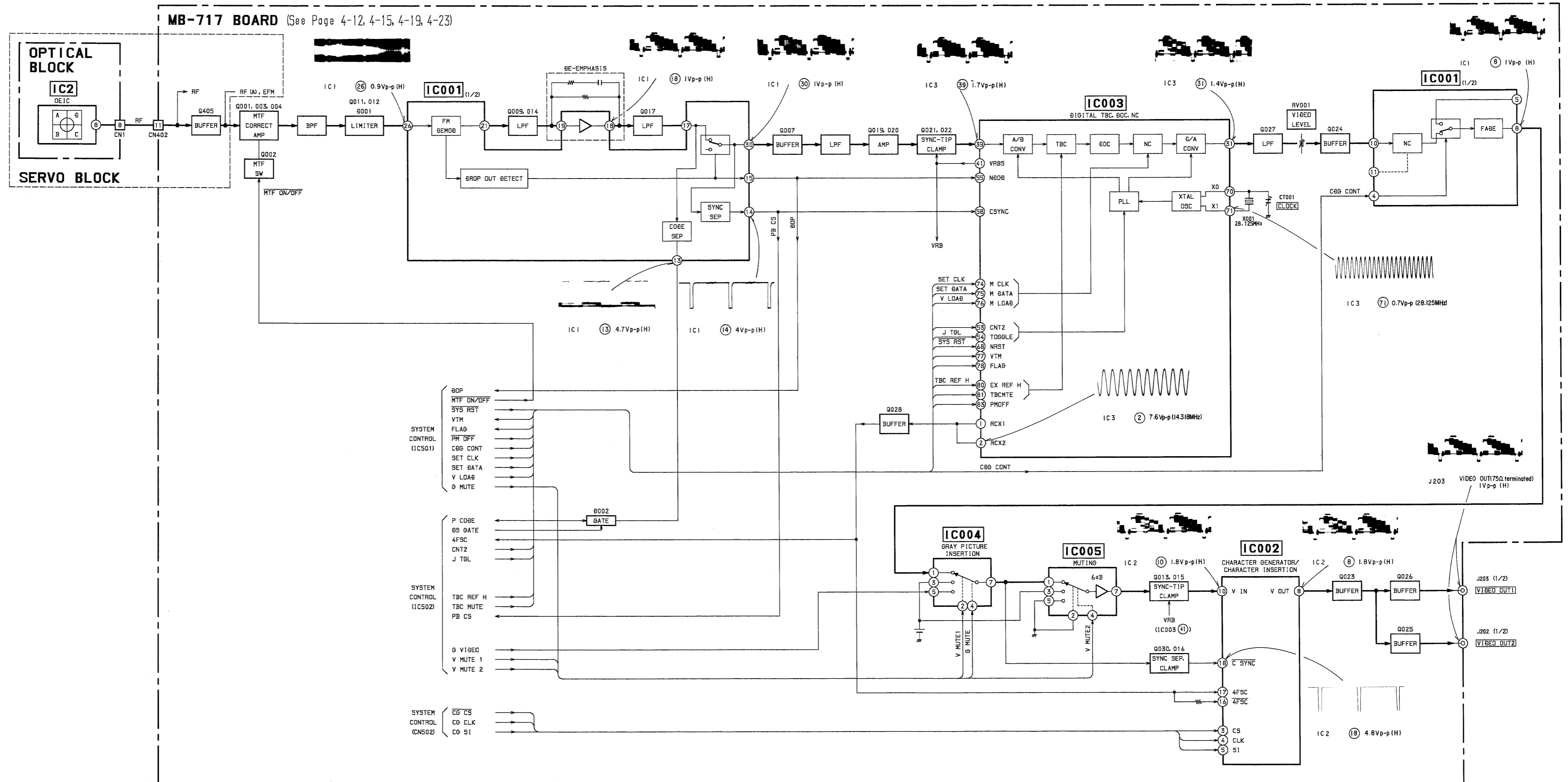
SECTION 3
BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM

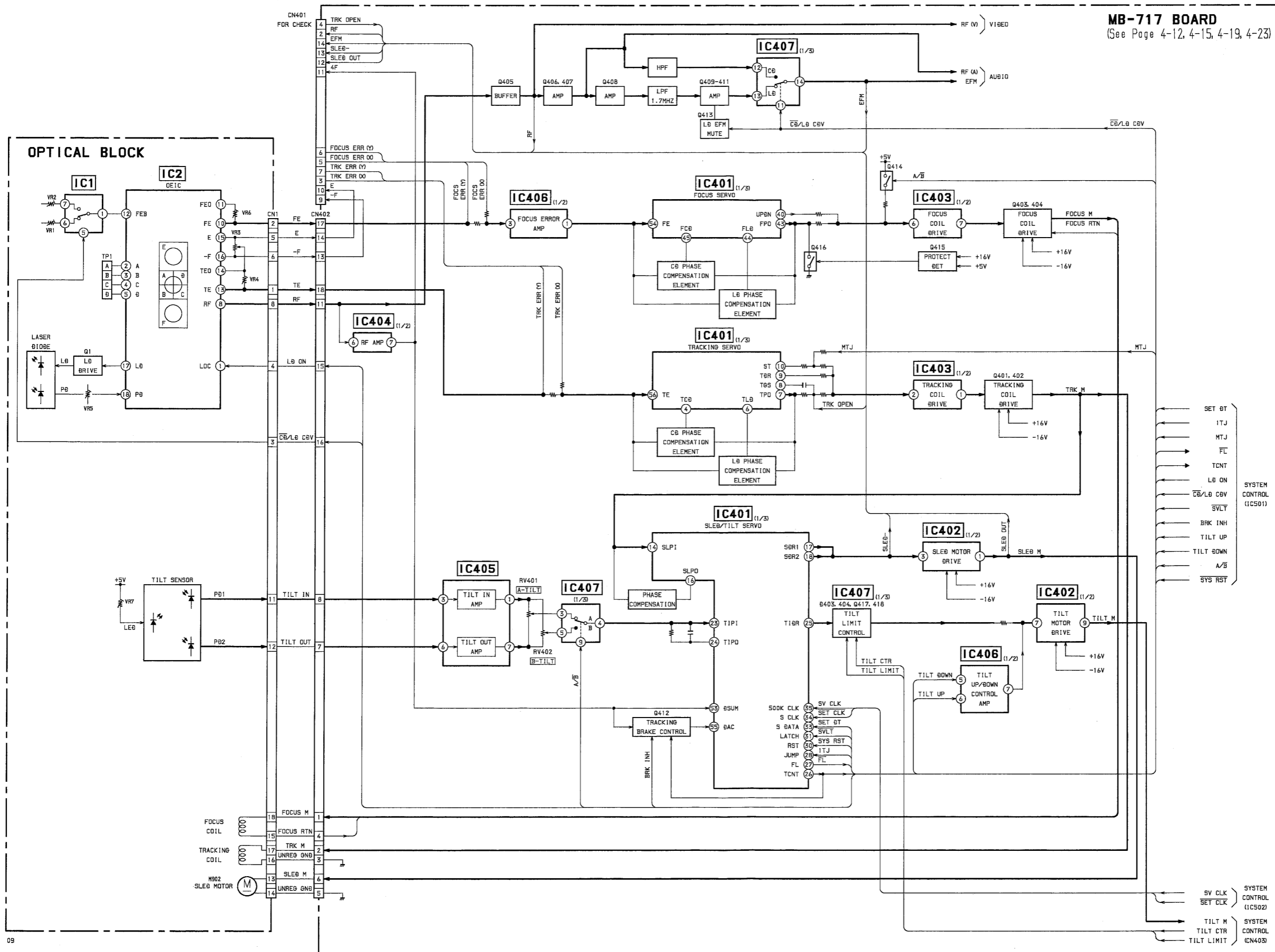


(We will inform of the printed wiring board, schematic diagram and repair parts list of power supply block in the future.)
POWER SUPPLY BLOCK SR-539

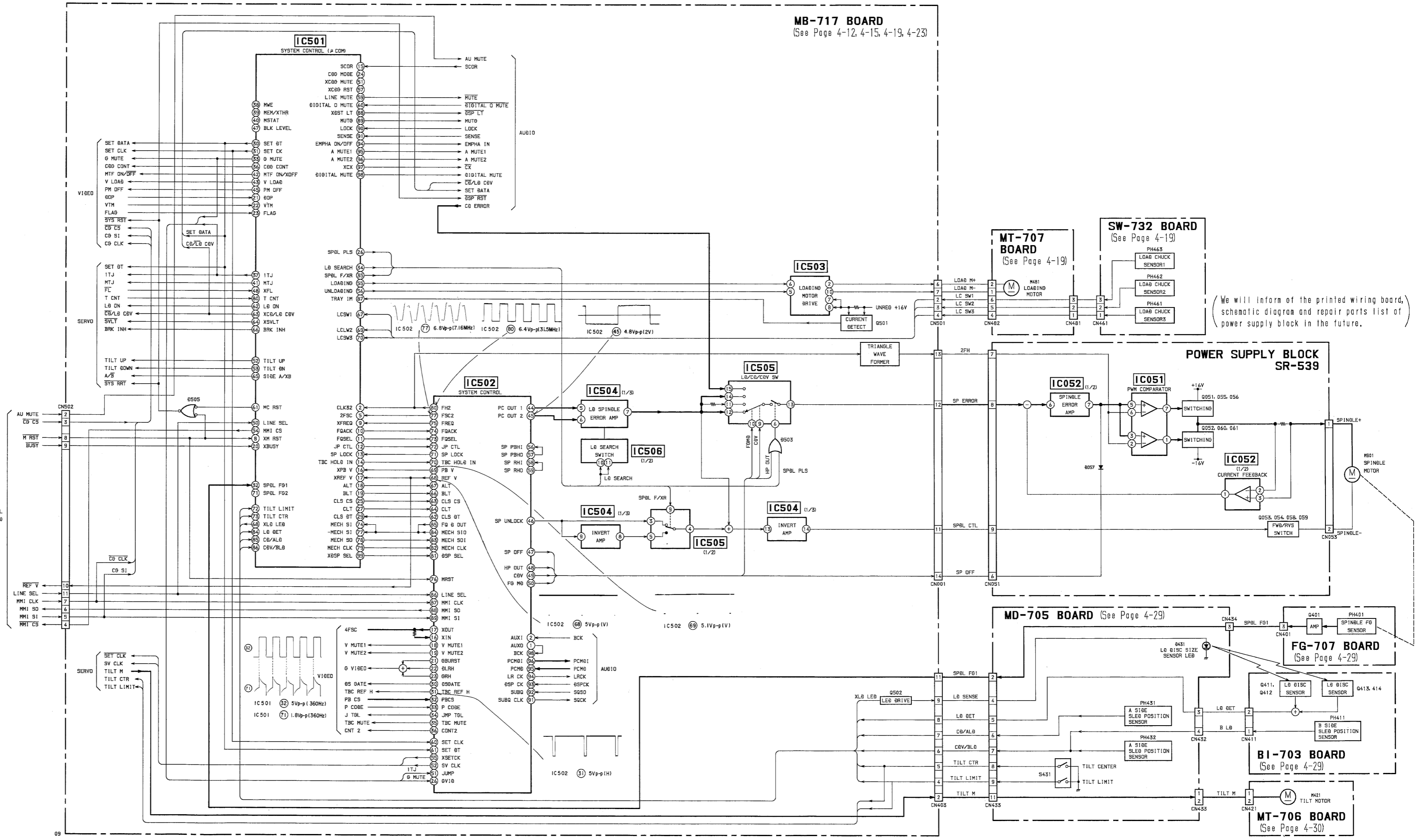
3-2. VIDEO BLOCK DIAGRAM



3-3. SERVO BLOCK DIAGRAM

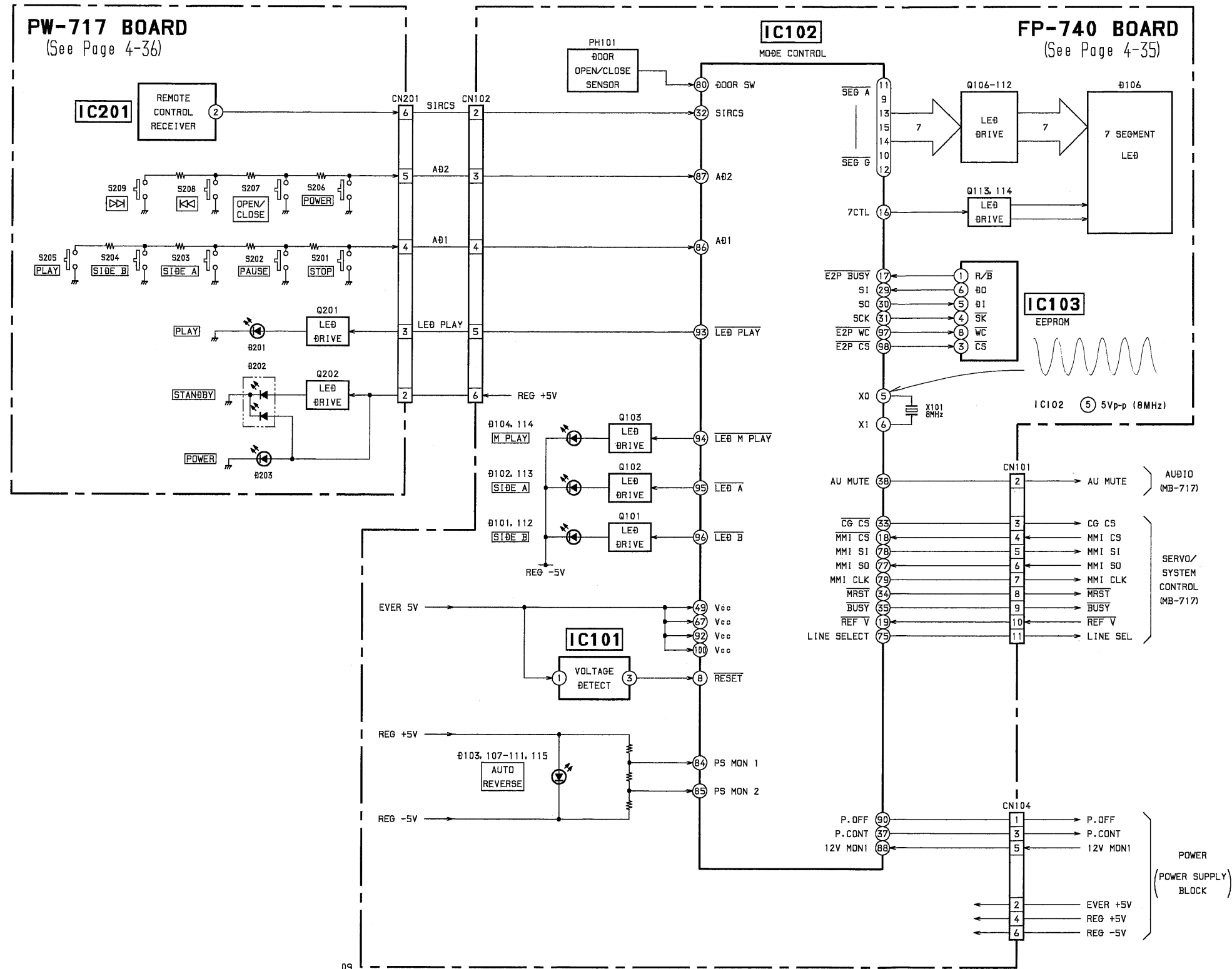


3-4. SYSTEM CONTROL BLOCK DIAGRAM

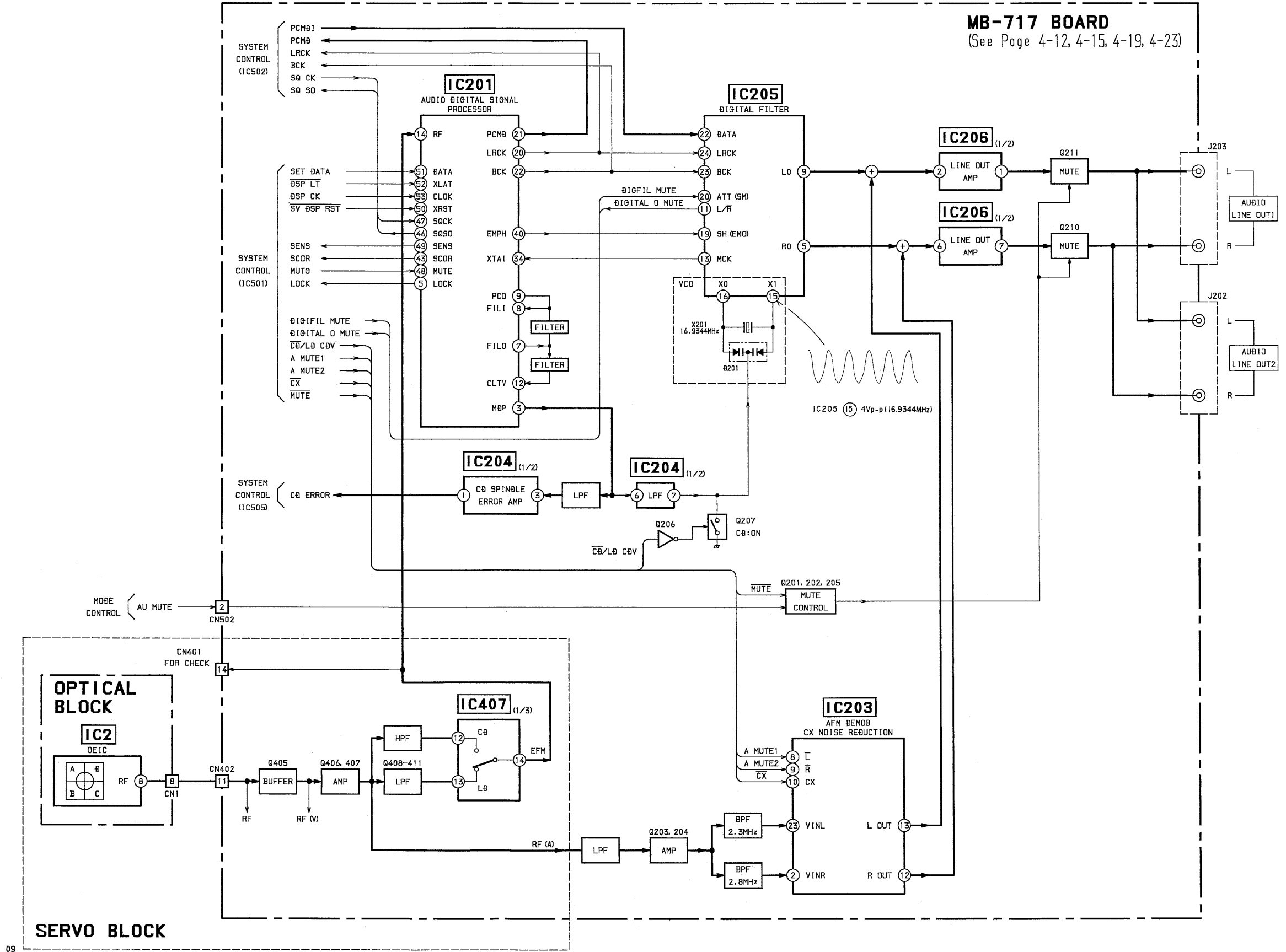


(We will inform of the printed wiring board, schematic diagram and repair parts list of power supply block in the future.)

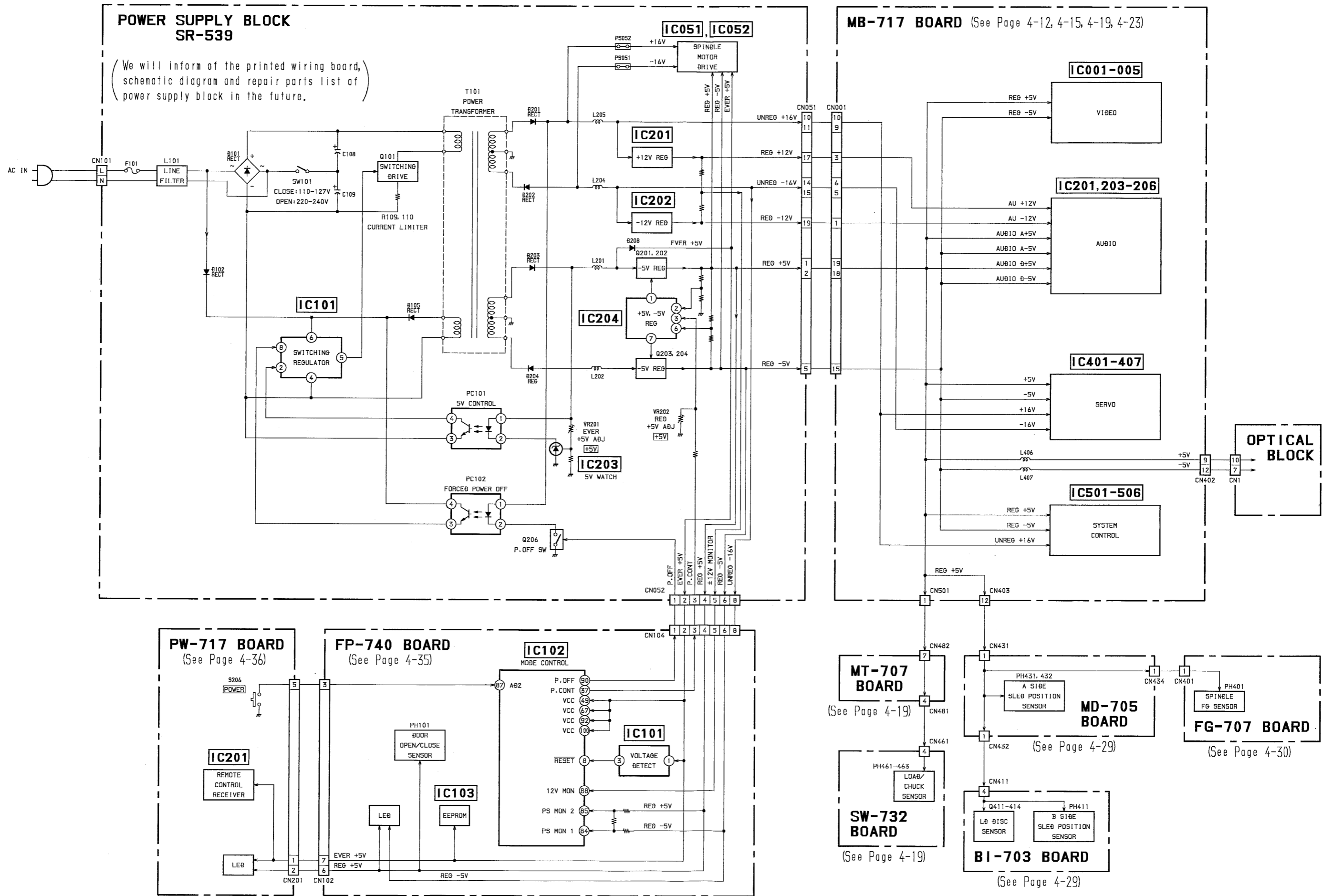
3-5. MODE CONTROL BLOCK DIAGRAM



3-6. AUDIO BLOCK DIAGRAM

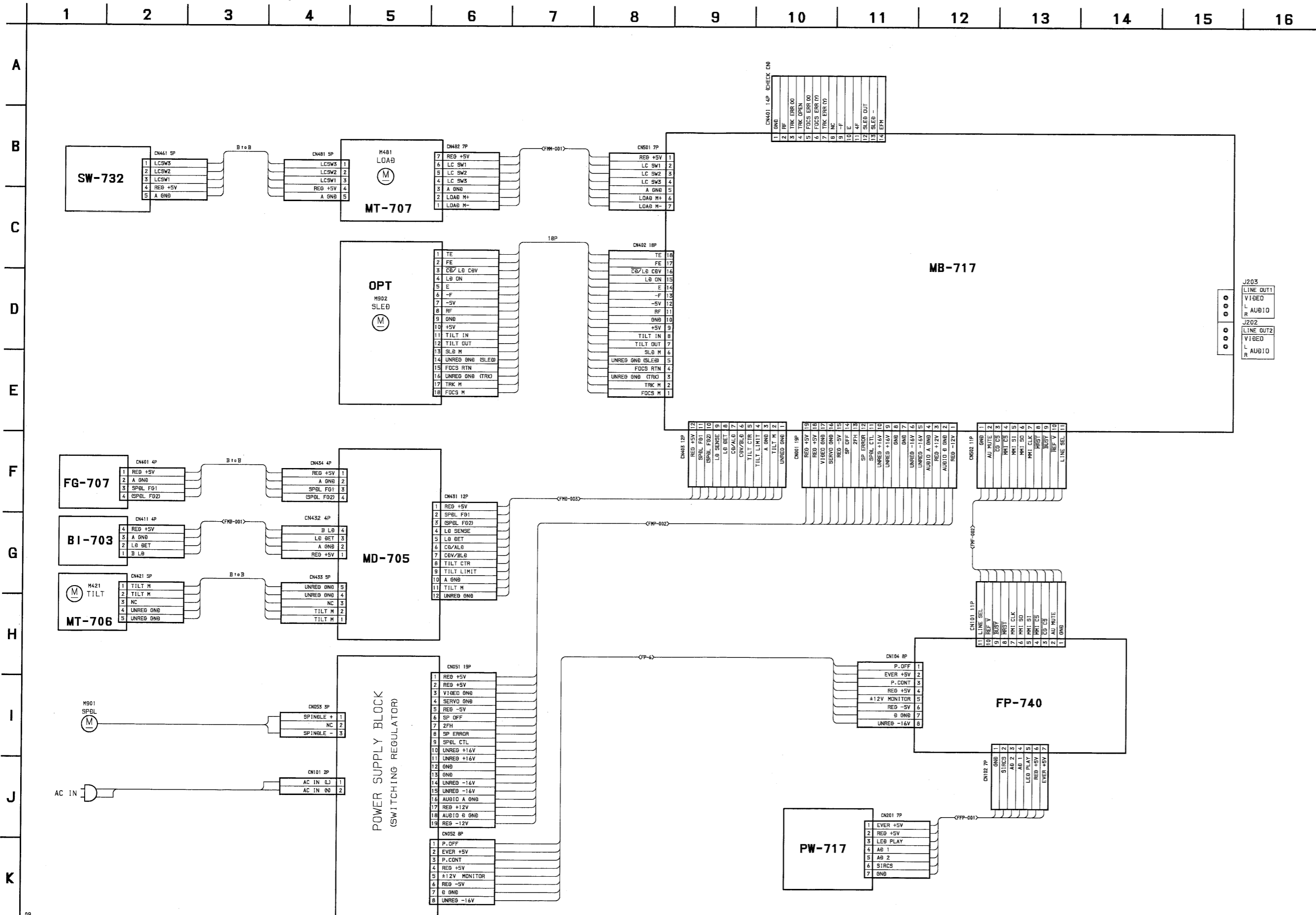


3-7. POWER SUPPLY BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



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.
 - ▨ : Pattern from the side which enables seeing.
 - : 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.
 - Voltagess 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.*

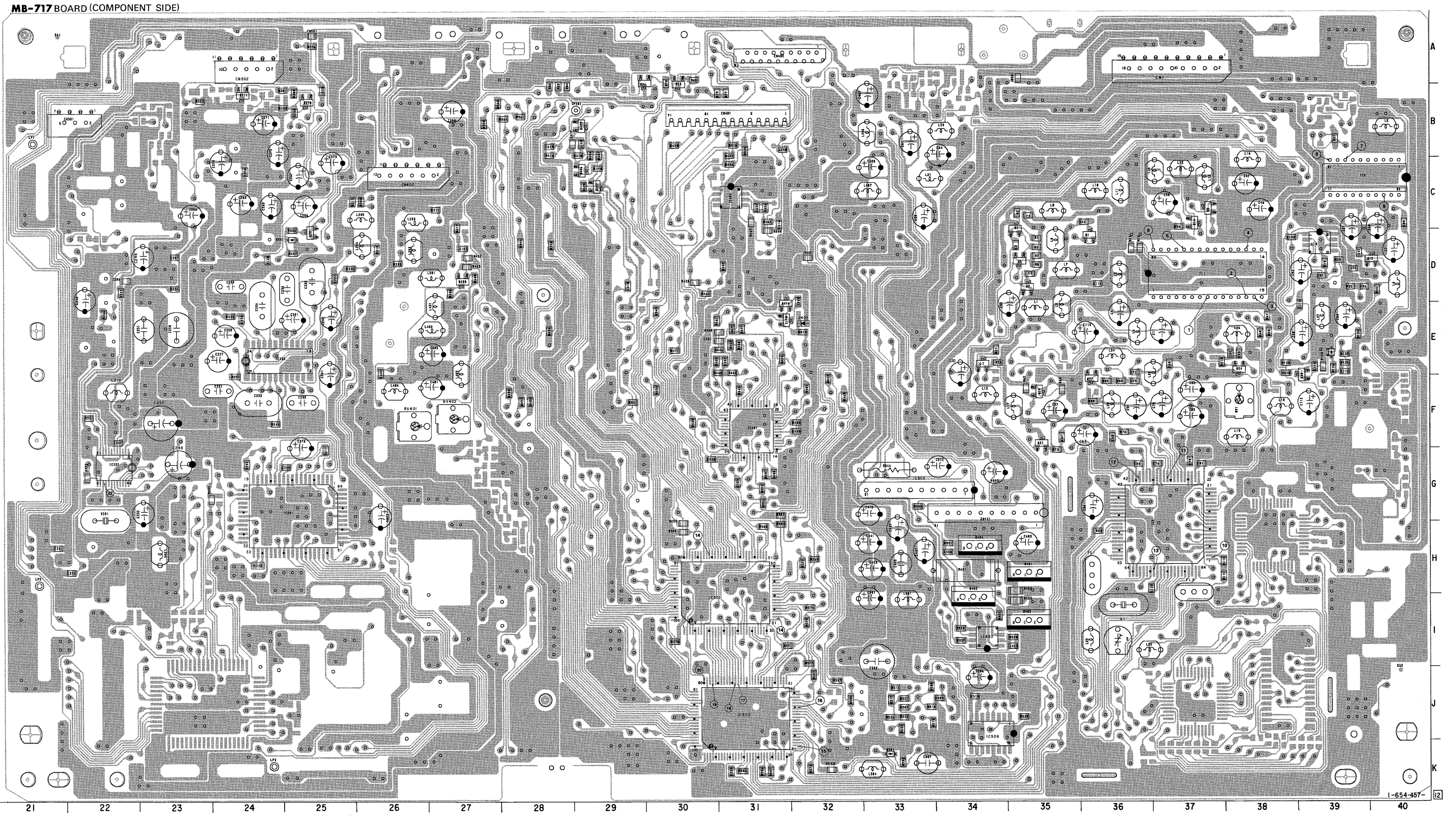
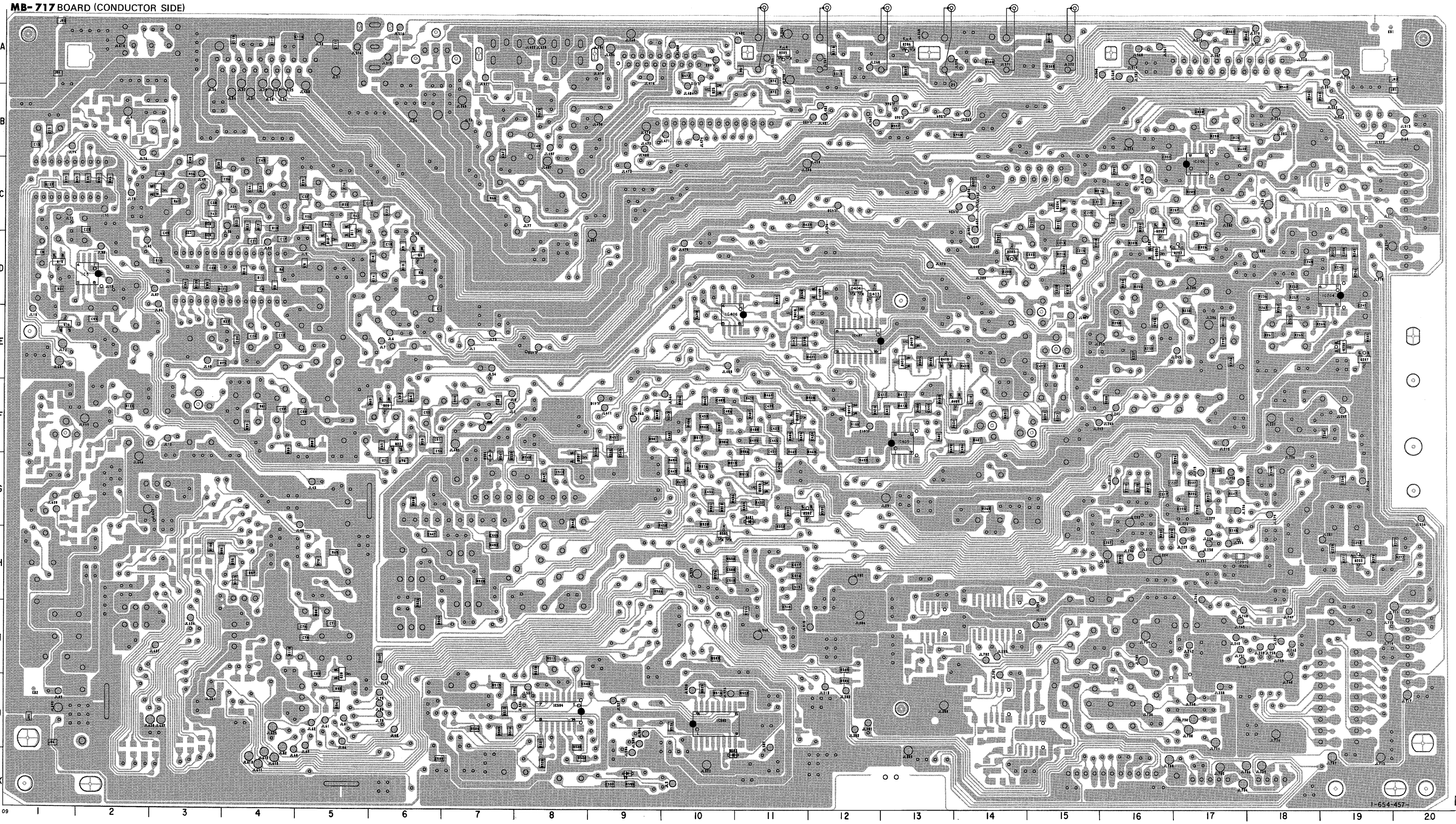
Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

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

*: indicated by the color red.

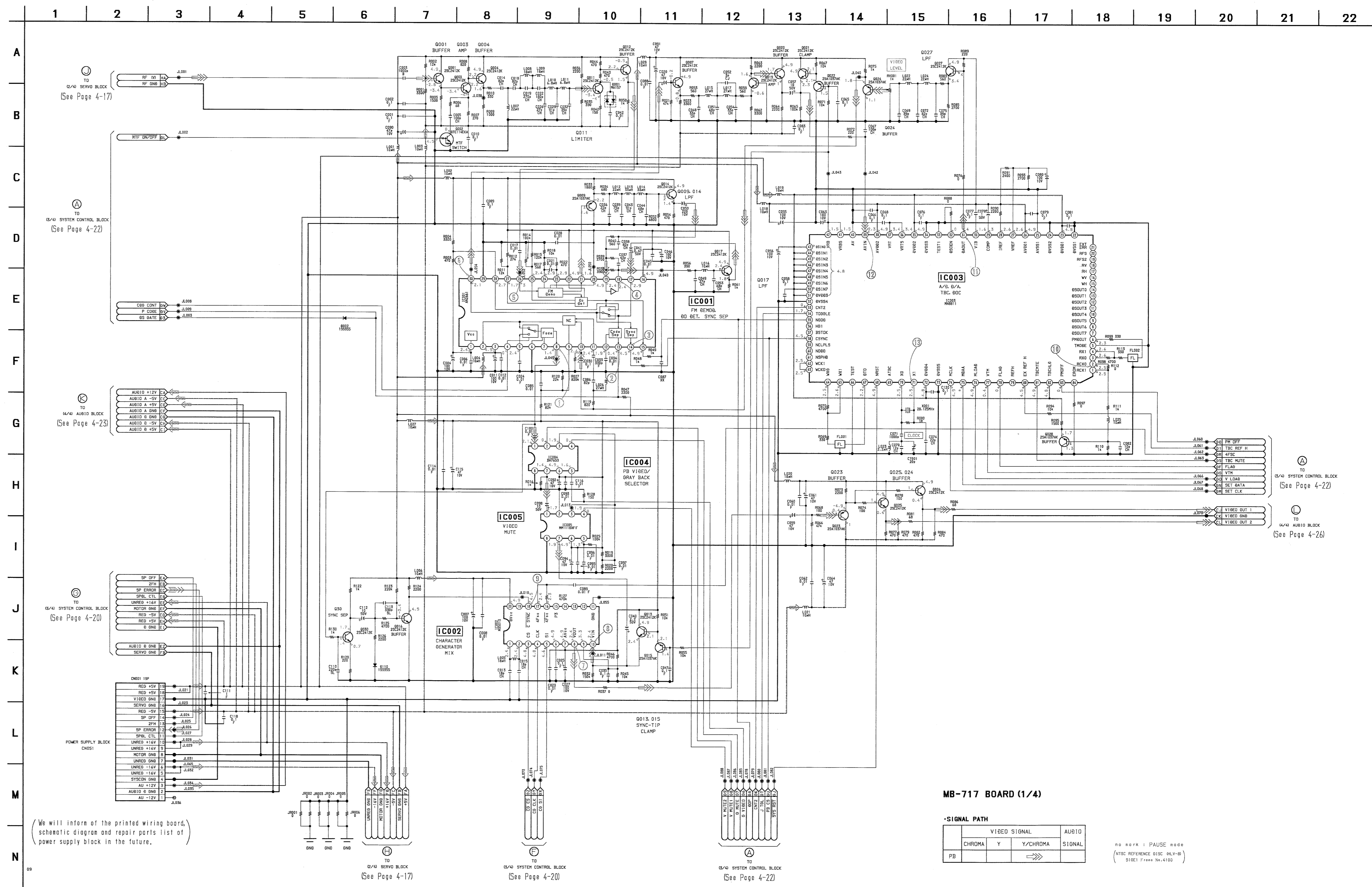
MB-717 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

— Ref. No. MB-717 BOARD: 1000 series —

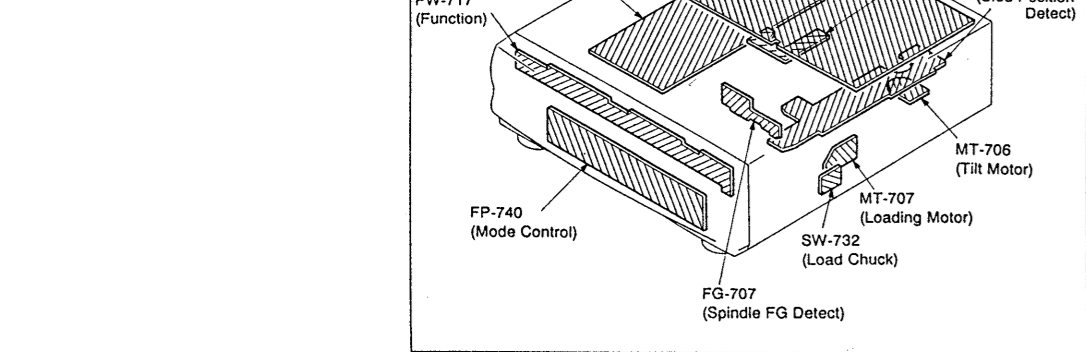
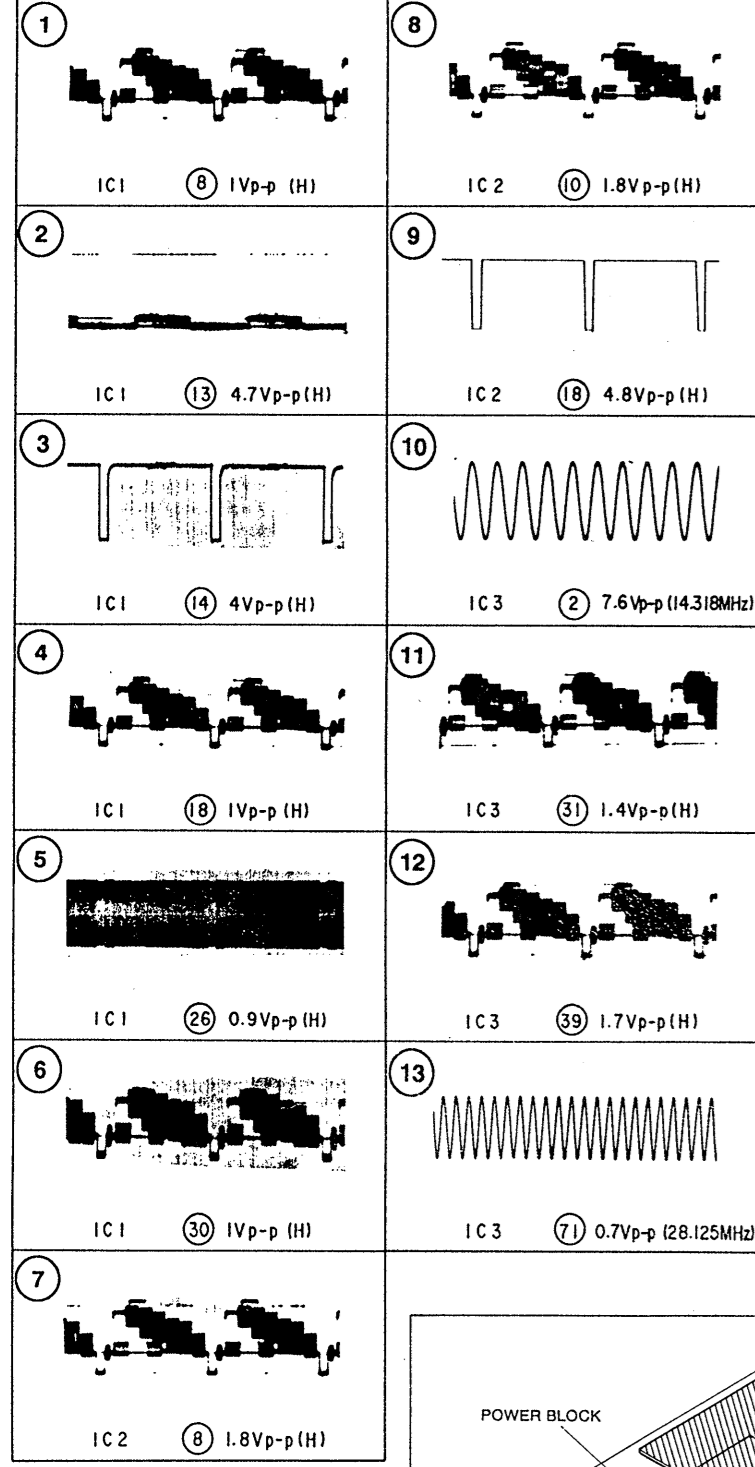


MB-717 (VIDEO) SCHEMATIC DIAGRAM

— Ref. No. MB-717 BOARD: 1000 series —



MB-717 BOARD (1/4)



- MB-717 BOARD
- CN001 A-37
 - CN401 B-31
 - CN402 A-31
 - CN403 C-28
 - CN501 K-22
 - CN502 A-24
 - D001 D-36
 - D002 K-9
 - D110 E-39
 - D201 D-25
 - D002 D-17
 - D203 H-19
 - D204 A-13
 - D205 A-11
 - D401 Q-11
 - D402 F-11
 - D403 D-12
 - D404 D-19
 - D405 E-32
 - D501 K-33
 - D503 K-11
 - D504 F-7
 - D505 H-10
 - IC001 D-37
 - IC002 C-29
 - IC003 H-37
 - IC004 D-39
 - IC005 D-2
 - IC201 G-26
 - IC203 E-25
 - IC204 D-19
 - IC205 C-22
 - IC206 C-17
 - IC401 F-31
 - IC402 G-34
 - IC403 I-34
 - IC404 C-31
 - IC405 F-13
 - IC406 E-10
 - IC407 E-12
 - IC501 J-31
 - IC502 J-31
 - IC503 G-33
 - IC504 I-8
 - IC505 J-10
 - IC506 J-34
 - Q001 C-35
 - Q002 D-35
 - Q003 D-35
 - Q004 D-6
 - Q007 E-34
 - Q009 C-37
 - Q011 C-5
 - Q012 D-5
 - Q013 D-1
 - Q014 C-37
 - Q015 D-40
 - Q016 E-1
 - Q017 C-3
 - Q019 F-35
 - Q020 F-6
 - Q021 F-35
 - Q022 F-6
 - Q023 A-30
 - Q024 E-38
 - Q025 B-10
 - Q026 A-30
 - Q027 F-36
 - Q028 I-5
 - Q030 F-39
 - Q201 P-25
 - Q202 C-16
 - Q203 C-14
 - Q204 C-15
 - Q205 D-16
 - Q206 E-19
 - Q207 E-19
 - Q210 E-25
 - Q211 B-24
 - Q401 B-35
 - Q402 I-35
 - Q403 H-34
 - Q404 H-34
 - Q405 B-29
 - Q406 E-29
 - Q407 C-29
 - Q408 E-27
 - Q409 F-14
 - Q410 E-13
 - Q411 E-13
 - Q412 O-11
 - Q413 I-13
 - Q414 F-12
 - Q415 E-32
 - Q416 E-32
 - Q417 E-12
 - Q418 E-11
 - Q501 G-8
 - Q502 O-12

(We will inform of the printed wiring board, schematic diagram and repair parts list of power supply block in the future.)

MB-717 BOARD (1/4)

SIGNAL PATH

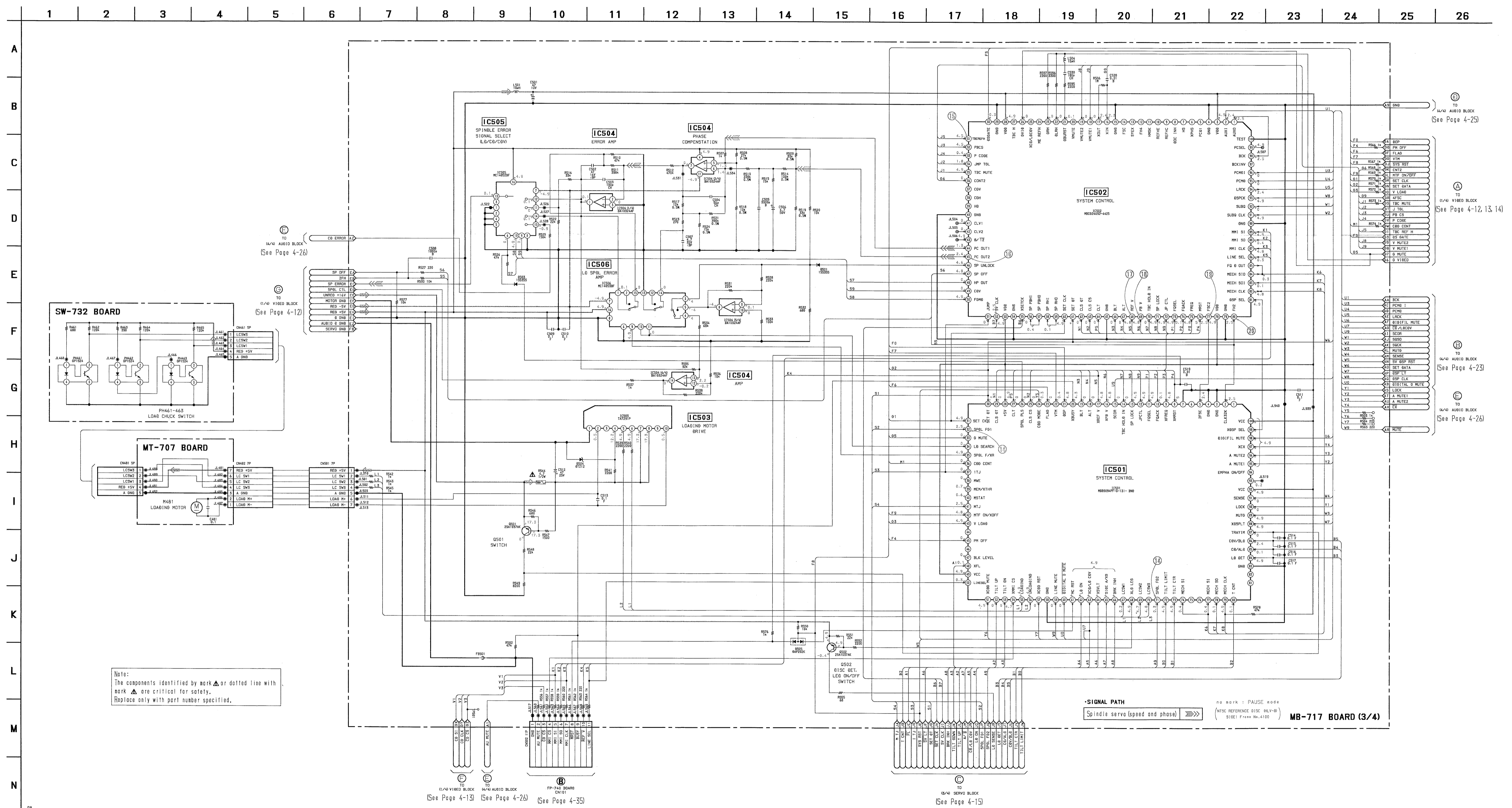
CHROMA	Y	Y/CHROMA	AUDIO
PB			SIGNAL

no mark : PAUSE mode
(NTSC REFERENCE DISC 04V-B)
SIDE1 Frame No.4100

MB-717 (SYSTEM CONTROL), MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) SCHEMATIC DIAGRAM

Refer to page 4-6 for printed wiring board of MB-717 BOARD.

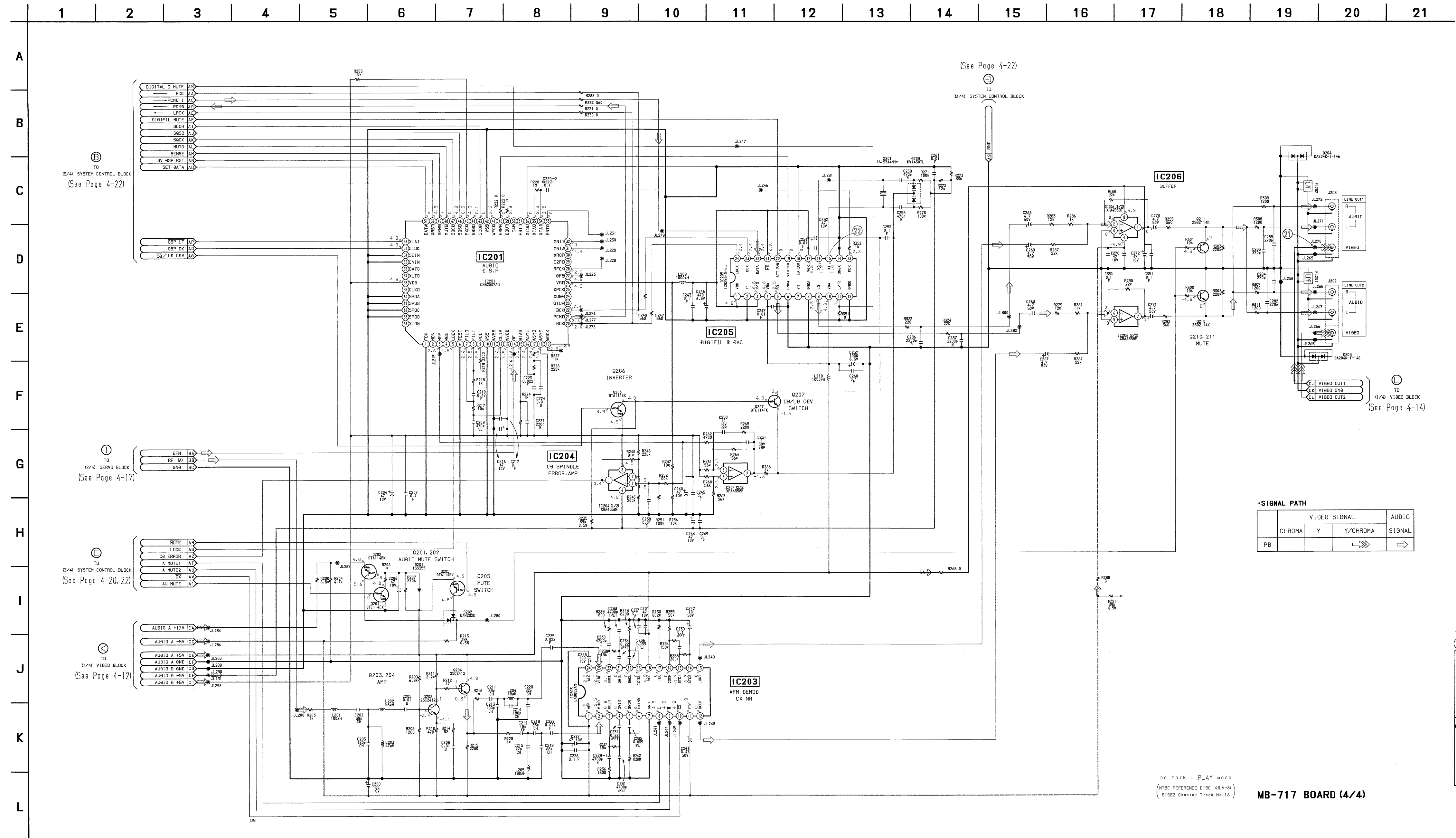
Ref. No. MB-717 BOARD: 1000 series, MT-707 and SW-732 BOARDS: 4000 series



MB-717 (AUDIO) SCHEMATIC DIAGRAM

• Refer to page 4-6 for printed wiring board.

— Ref. No. MB-717 BOARD: 1000 series —



SIGNAL PATH

	VIDEO SIGNAL		AUDIO
PB	CHROMA	Y	Y/CHROMA
			→

MB-717BOARD(4/4)
 50 MARK PAUSE MODE
 NTSC REFERENCE DISC (MLV-B)
 S1051 Frame No.4100

21 J203 VIDEO OUT1(75Ω terminated) 1Vp-p (H)

22

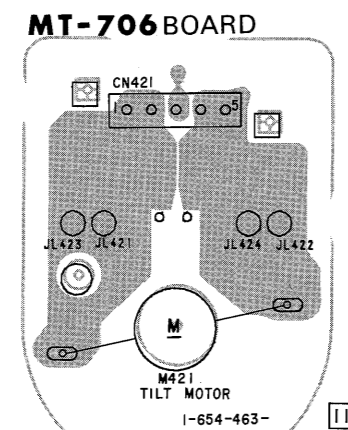
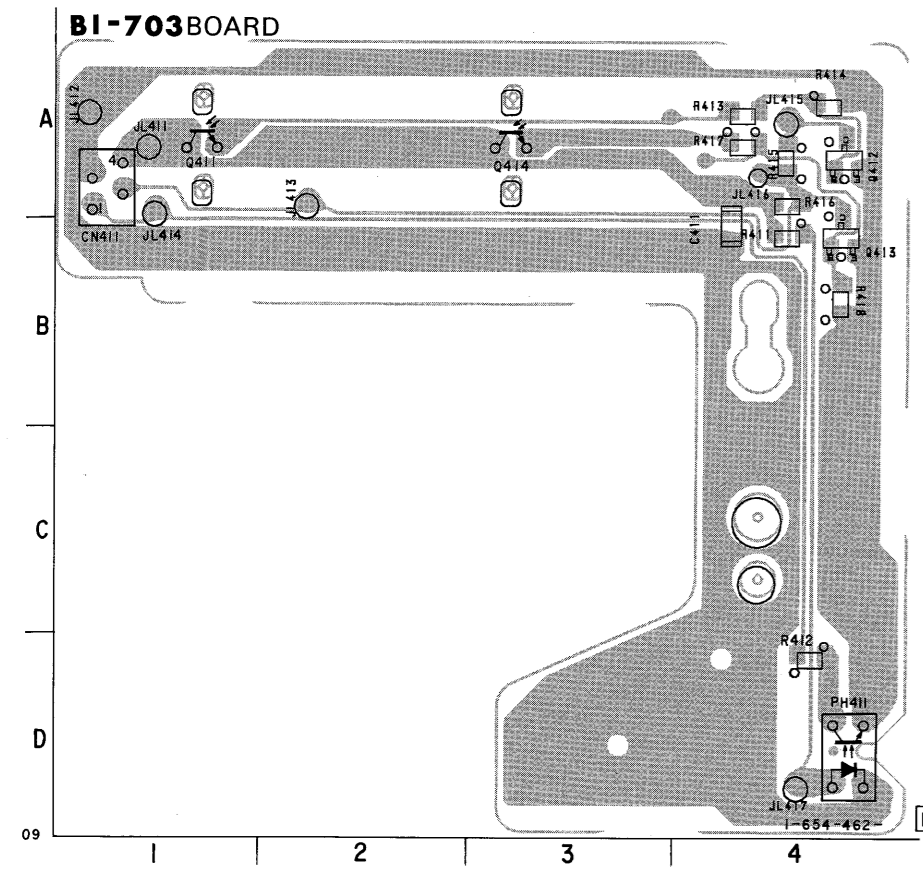
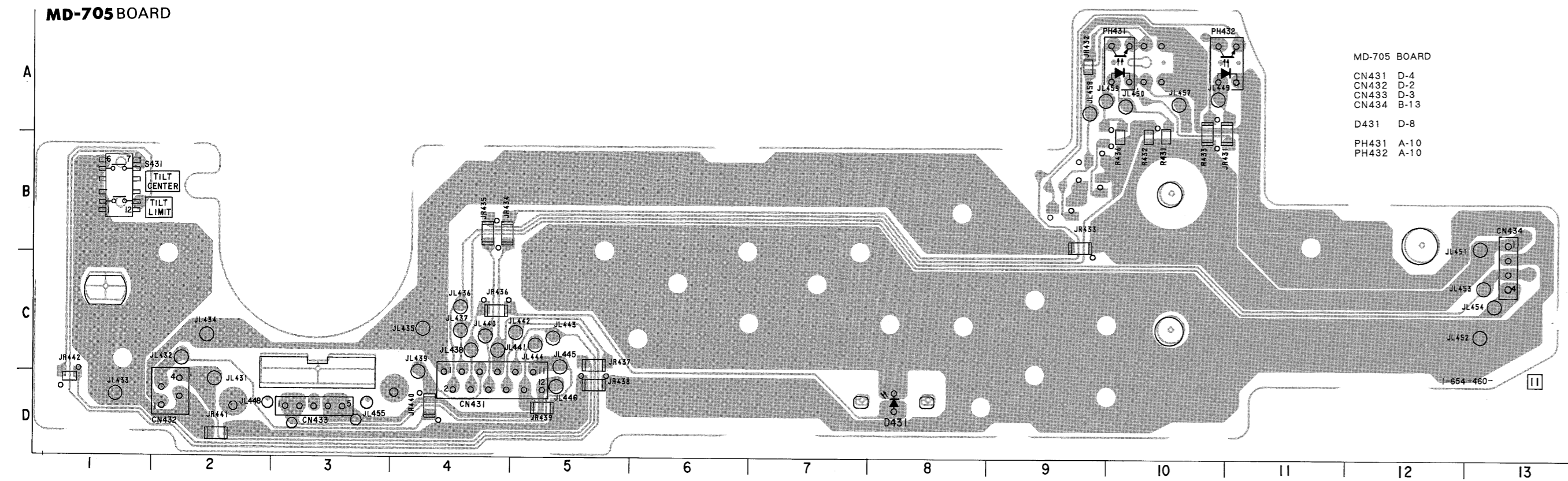
IC205 (5) 4Vp-p (16.934MHz)

no mark : PLAY mode
NTSC REFERENCE DISC (MLV-B)
S1052 Chapter Track No.16

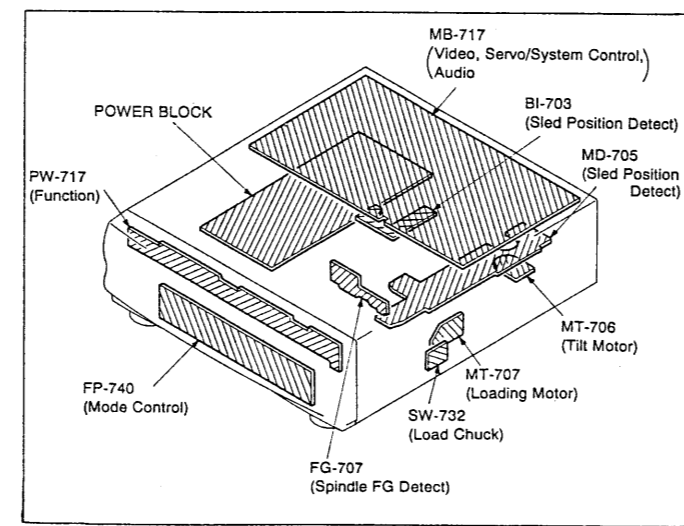
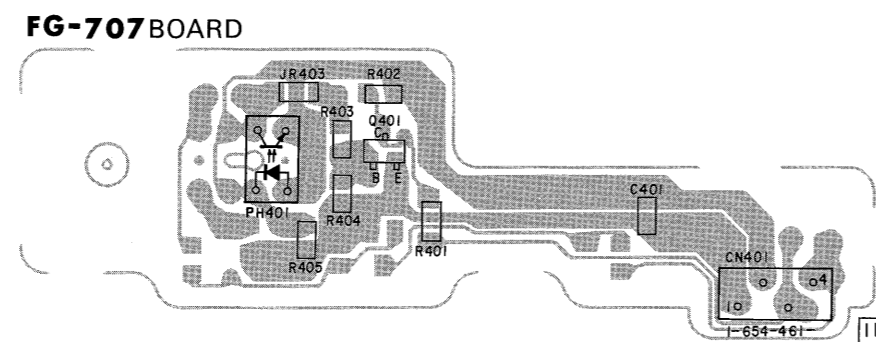
MB-717 BOARD (4/4)

BI-703, MD-705 (SLED POSITION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) PRINTED WIRING BOARDS

— Ref. No. BI-703, MD-705, FG-707 and MT-706 BOARDS: 2000 series —

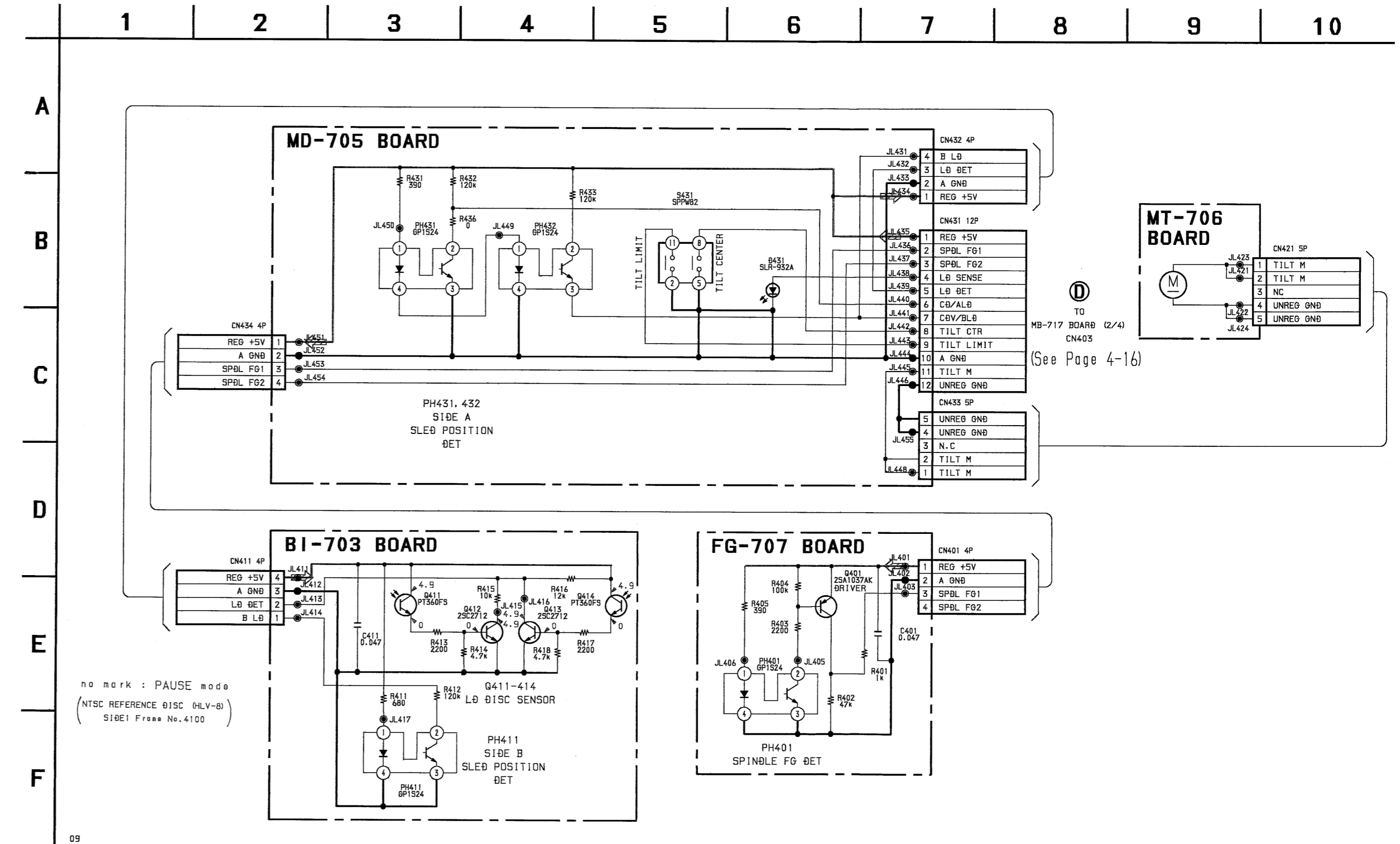


BI-703 BOARD
 CN411 A-1
 PH411 D-4
 Q411 A-1
 Q412 A-4
 Q413 B-4
 Q414 A-3



BI-703, MD-705 (SLED POSITION DETECT), FG-707 (SPINDLE FG DETECT), MT-706 (TILT MOTOR) SCHEMATIC DIAGRAM

— Ref. No. BI-703, MD-705, FG-707 and MT-706 BOARDS: 2000 series —



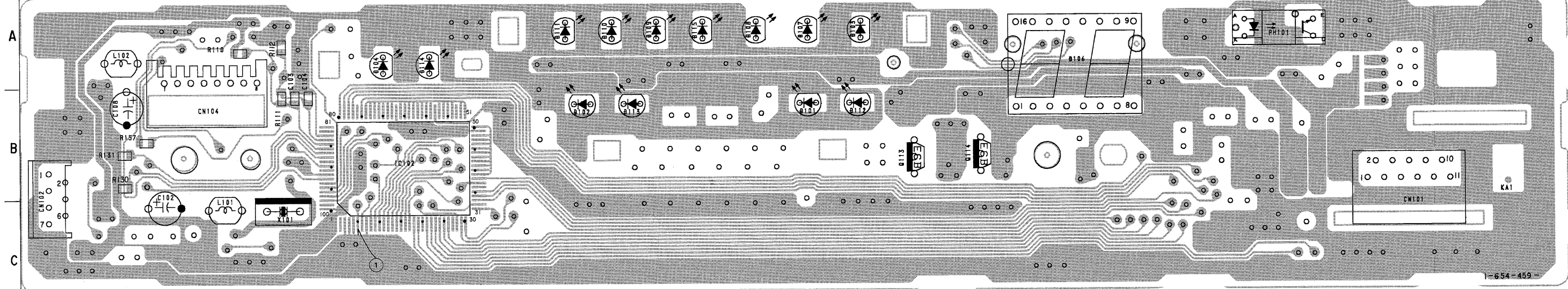
no mark : PAUSE mode
 (NTSC REFERENCE DISC (HLV-B))
 SIDE1 From No.4100

MDP-MR1

FP-740 (MODE CONTROL), PW-717 (FUNCTION) PRINTED WIRING BOARDS

— Ref. No. FP-740 and PW-717 BOARDS: 3000 series —

FP-740 BOARD (COMPONENT SIDE)



FP-740 BOARD

- CN101 B-13
- CN102 B-1
- CN104 B-2

- D101 B-8
- D102 B-6
- D103 A-8
- D104 A-4
- D106 A-10
- D107 A-8
- D108 A-7
- D109 A-6
- D110 A-6
- D111 A-5
- D112 B-8
- D113 B-6
- D114 A-4
- D115 A-7

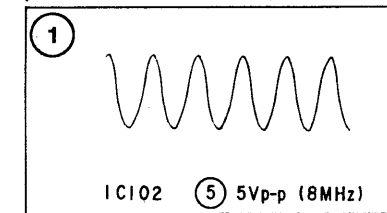
- IC101 D-2
- IC102 B-4
- IC103 D-5

- PH101 A-12

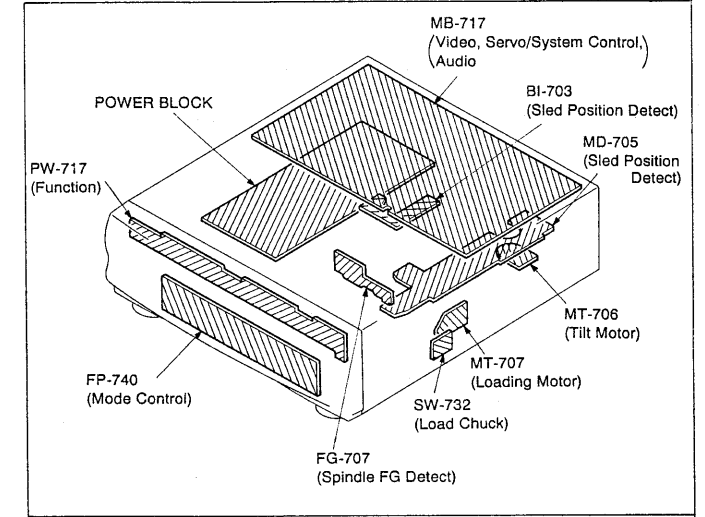
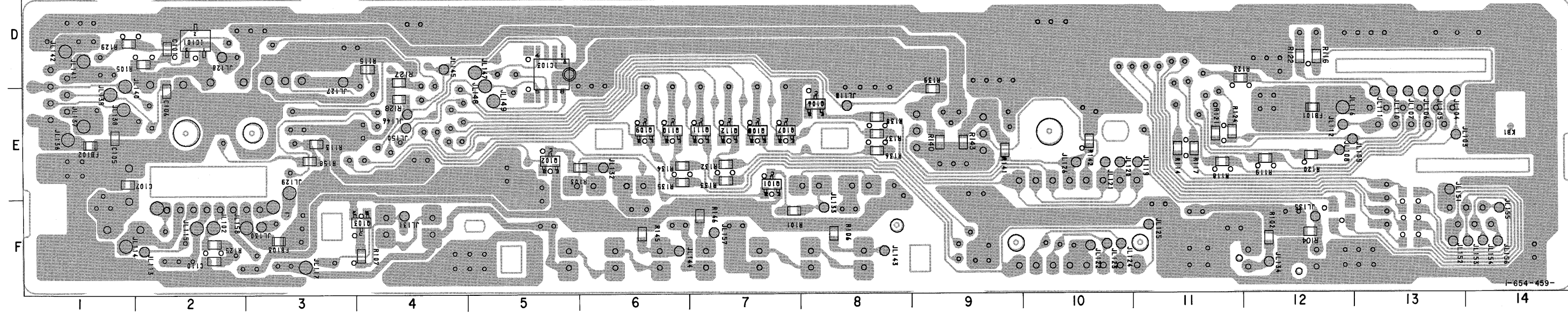
- O101 E-7
- O102 E-5
- O103 F-4
- O106 E-8
- O107 E-7
- O108 E-7
- O109 E-6
- O110 E-6
- O111 E-7
- O112 E-7
- O113 B-9
- O114 B-9

FP-740 BOARD

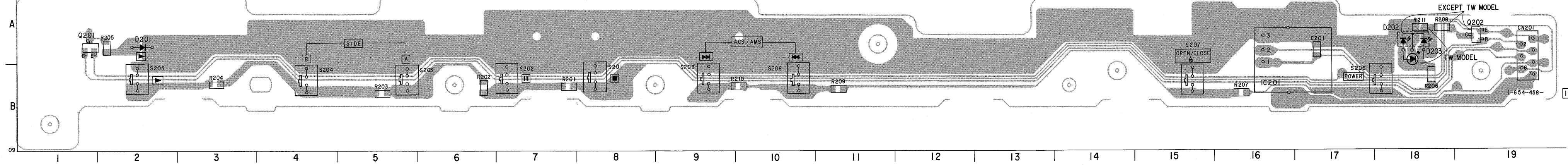
no mark: PAUSE mode.
NTSC REFERENCE DISC (HLV-B)
SIDE Frame No.4100



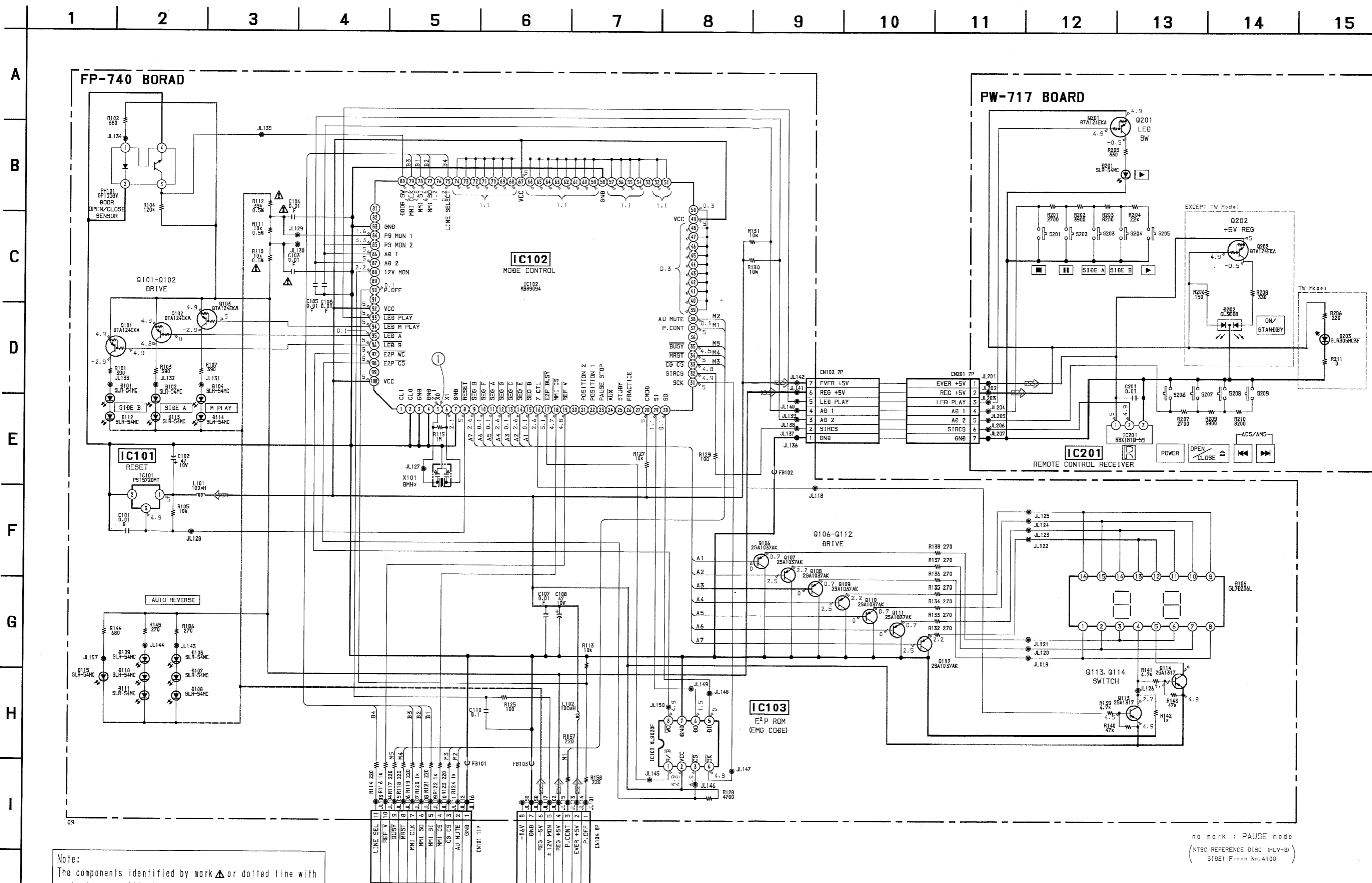
FP-740 BOARD (CONDUCTOR SIDE)



PW-717 BOARD



— Ref. No. FP-740 and PW-717 BOARDS: 3000 series —



no mark : PAUSE mode
 (NTSC REFERENCE DISC (HLV-B))
 SIDE1 Frame 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.

TO
 MB-717 BOARD (G/4)
 CNS02
 (See Page 4-20)

TO
 POWER SUPPLY BLOCK
 CN052
 (We will inform of the printed wiring board,
 schematic diagram and repair parts list of
 power supply block in the future.)

SECTION 5 REPAIR PARTS LIST

5-1. EXPLODED VIEWS

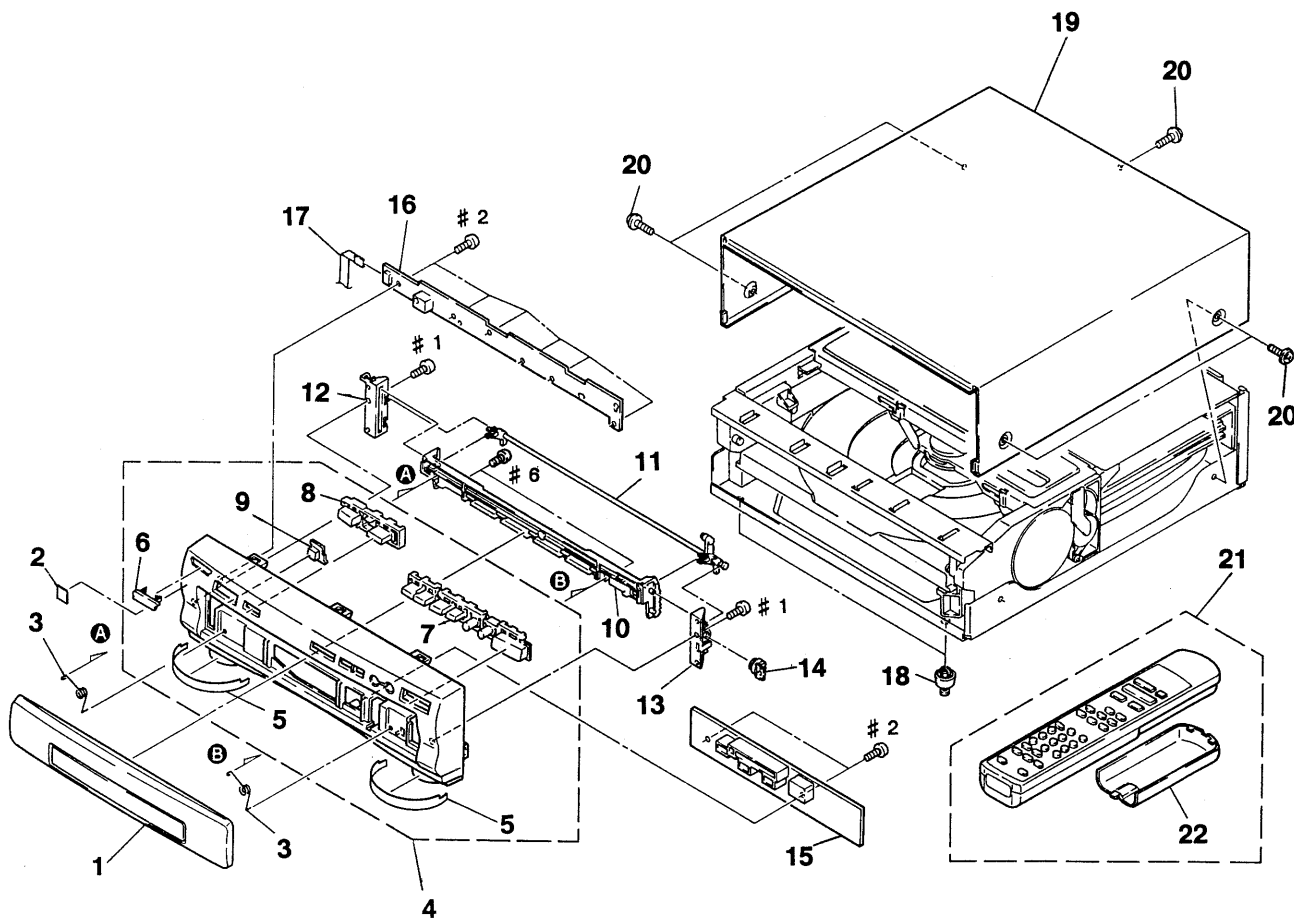
NOTE:

- -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.
- The mechanical parts with no reference number in the exploded views are not supplied.

- Hardware (# mark) list is given in the last of this parts list.
- Abbreviation
 CN: Chinese model
 HK: Hong Kong model
 C&SA: Central & South America model
 TW: Taiwan model

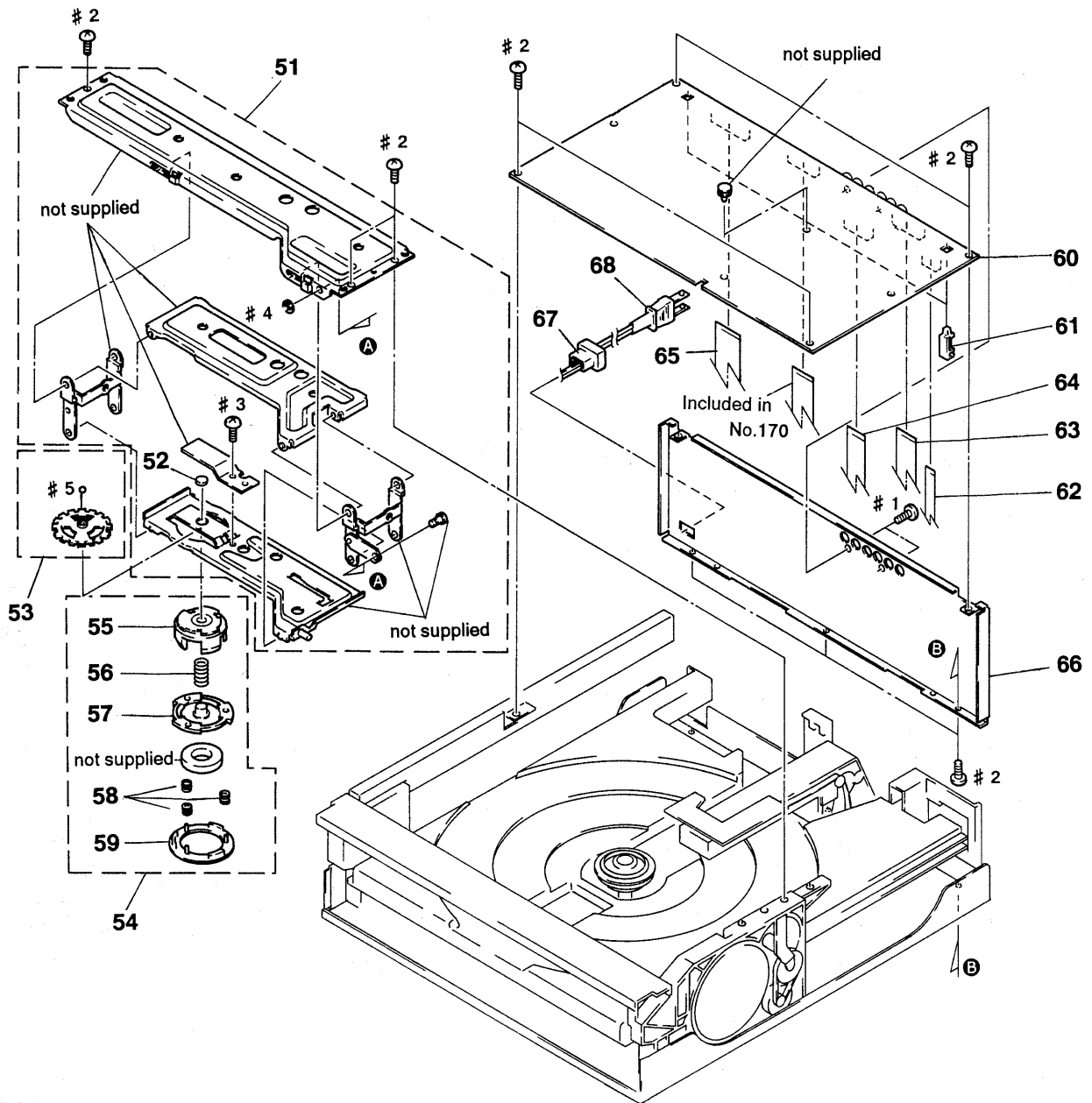
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

5-1-1. CASE AND FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-3944-515-1	DOOR (90E) ASSY (EXCEPT TW)		12	3-961-064-01	HOLDER (L), SLIDE	
* 1	X-3944-697-1	DOOR (90TW) ASSY (TW)		13	3-961-065-01	HOLDER (R), SLIDE	
2	3-703-710-41	STICKER, SONY SYMBOL (12)		14	4-919-393-01	DAMPER	
3	3-961-063-01	SPRING, TORSION		* 15	A-6423-234-A	FP-740 BOARD, COMPLETE (EXCEPT TW)	
4	X-3944-516-1	PANEL (90E) ASSY, FRONT (EXCEPT TW)		* 15	A-6423-271-A	FP-740 BOARD, COMPLETE (TW)	
* 4	X-3944-698-1	PANEL (90TW) ASSY, FRONT (TW)		* 16	A-6423-235-A	PW-717 BOARD, COMPLETE	
5	3-961-068-11	SEAL, FOOT		17	1-769-150-11	FLAT CABLE (FFP-001) (7 CORE)	
6	3-942-768-02	EMBLEM (NO. 5), SONY		18	3-961-156-01	FOOT	
7	X-3944-509-1	BUTTON (90J) ASSY, PLAY (TW)		* 19	3-961-111-01	CASE, UPPER (EXCEPT TW)	
7	X-3944-517-1	BUTTON (90E) ASSY, PLAY (EXCEPT TW)		* 19	3-961-111-11	CASE, UPPER (TW)	
8	X-3944-510-1	BUTTON (90J) ASSY, POWER (TW)		20	3-710-901-11	SCREW, TAPPING	
8	X-3944-518-1	BUTTON (90E) ASSY, POWER (EXCEPT TW)		21	A-6772-990-A	REMOTE CONTROL COMPLETE ASSY (EXCEPT TW)	
9	3-961-067-01	WINDOW, RAY CATCHER		* 21	A-6778-030-A	REMOTE CONTROL COMPLETE ASSY (TW)	
10	3-961-075-01	DISK, DOOR		* 22	3-959-554-01	COVER (ATW), BATTERY	
11	X-3944-519-1	LINK ASSY, DRIVING					

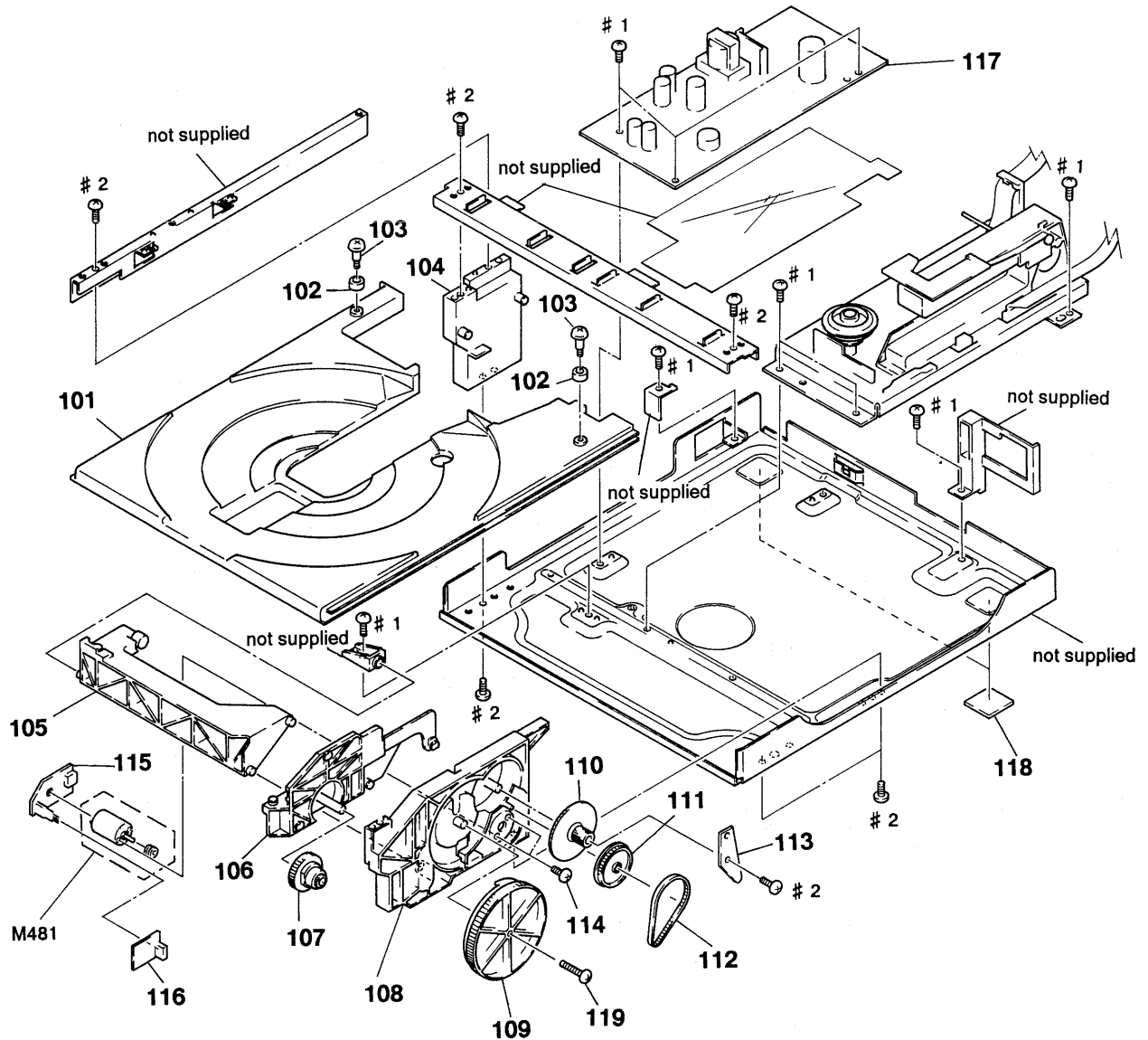
5-1-2. CHUCKING BLOCK ASSEMBLY



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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 51	A-6415-863-A	CHUCKING, SUB BLOCK ASSY		* 61	3-961-116-01	GUIDE, MB	
52	3-953-392-01	RETAINER, THRUST		62	1-769-148-11	FLAT CABLE (FMM-001) (7 CORE)	
53	X-3942-787-1	PLATE ASSY, TOP		63	1-769-149-11	FLAT CABLE (FUF-002) (11 CORE)	
54	A-6415-644-G	CHUCK BLOCK ASSY		64	1-769-147-11	FLAT CABLE (FMD-003) (12 CORE)	
55	X-3942-776-1	HOLDER ASSY, MAGNET		65	1-769-146-11	FLAT CABLE (FMP-002) (19 CORE)	
56	3-953-291-01	SPRING (1), COMPRESSION		* 66	3-961-079-01	PANEL, REAR (EXCEPT TW)	
57	3-953-288-01	PLATE, CHUCKING		* 66	3-961-079-21	PANEL, REAR (TW)	
58	3-953-290-01	SPRING (2), COMPRESSION		\triangle *67	3-703-244-00	BUSHING (2104), CORD (EXCEPT TW)	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER		\triangle *67	3-703-571-11	BUSHING (4516), CORD (TW)	
* 60	A-6423-233-A	MB-717 BOARD, COMPLETE (EXCEPT TW)		\triangle 68	1-575-912-21	CORD, POWER (EXCEPT TW)	
* 60	A-6423-270-A	MB-717 BOARD, COMPLETE (TW)		\triangle *68	1-769-500-11	CORD, POWER (TW)	

5-1-3. MAIN CHASSIS ASSEMBLY

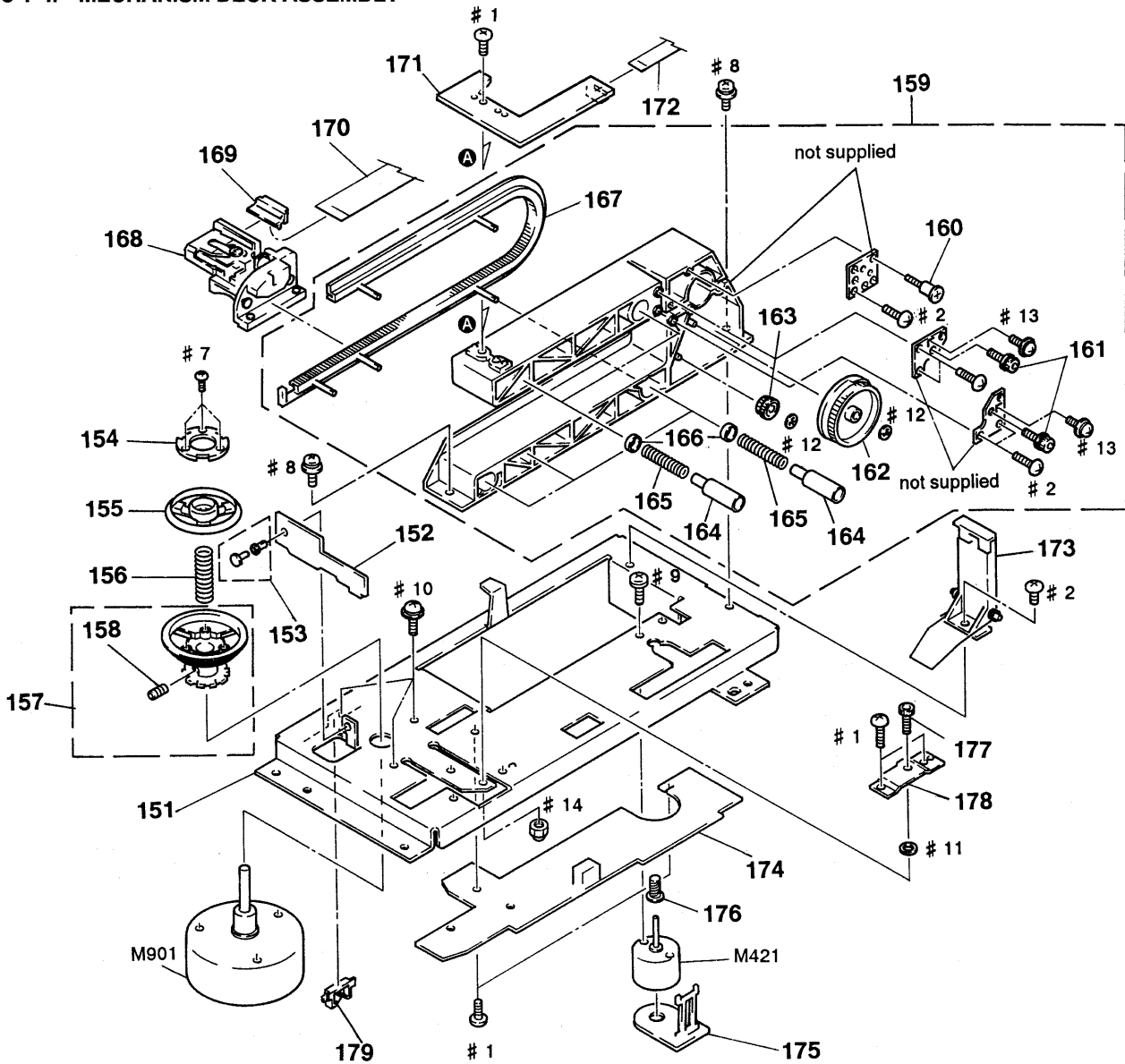


The components identified by mark ▲ or dotted line with mark ▲ are critical for safety. Replace only with part number specified.

Note: The parts No. of ref. No.117 is shown in the supplement.

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
101	A-6415-859-A	TRAY (90E) ASSY		112	3-961-082-01	BELT, TIMING	
* 102	4-914-248-01	STOPPER, RUBBER		* 113	3-962-050-01	STAY, REINFORCEMENT	
103	3-741-948-01	SCREW (3), SPECIAL (+) TAPPING		114	3-962-049-01	SCREW, MOTOR STOPPER	
* 104	X-3944-523-1	STAY (L) ASSY, F		* 115	1-654-464-11	MT-707 BOARD	
* 105	X-3944-520-1	FRAME ASSY, TRAY UD					
106	X-3944-514-1	BASE ASSY, L SUB		* 116	A-6423-236-A	SW-732 BOARD, COMPLETE	
107	3-961-085-01	GEAR, IDLER		▲117		POWER BLOCK (TW)	
108	X-3944-513-1	BASE ASSY, LOADING		▲117	1-413-989-11	POWER BLOCK (EXCEPT TW)	
109	3-961-083-01	GEAR, CONTROL		118	3-961-110-01	CUSHION, FOOT	
110	3-961-081-01	GEAR, MIDDLE		119	3-962-812-01	SCREW +BVTP 3X18 TYPE 2	
111	3-961-084-01	PULLEY (A)		M481	X-3944-685-1	MOTOR ASSY, LOADING (RF-370C)	

5-1-4. MECHANISM DECK ASSEMBLY



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

Ref.No.	Part No.	Description
* 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-6404-105-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

Remark	Ref.No.	Part No.	Description	Remark
	167	3-961-126-01	GUIDE (900), U	
	Δ 168	8-848-286-11	DEVICE, OPTICAL KHS-150A(S)	
	169	3-953-268-01	HOLDER (18P), FLEXIBLE	
	170	1-751-083-21	CABLE, FLEXIBLE FLAT (18 CORE)	
	* 171	A-6423-232-A	BI-703 BOARD, COMPLETE	
	172	1-769-151-11	FLAT CABLE (FMB-001) (4 CORE)	
	173	A-6404-107-A	STAND ASSY, FLEXIBLE RETAINER	
	* 174	A-6423-230-A	MD-705 BOARD, COMPLETE	
	* 175	A-6423-229-A	MT-706 BOARD, COMPLETE	
	176	3-961-973-01	GEAR, WORM	
	177	3-953-829-01	BOLT	
	* 178	3-953-258-11	PLATE, ADJUSTMENT, AT	
	* 179	3-961-199-01	SADDLE, EDGE	
	M421	1-541-930-11	MOTOR, DC (TILT)	
	M901	1-698-109-11	MOTOR, DD (SPINDLE)	

5-2. ELECTRICAL PARTS LIST

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.

- 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.
- Hardware (# mark) list is given in the last of this parts list.
- Abbreviation
 CN: Chinese model
 HK: Hong Kong model
 TW: Taiwan model
 C&SA: Central & South America model
- RESISTORS
 All resistors are in ohms
 METAL: Metal-film resistor
 METAL OXIDE: Metal Oxide-film resistor
 F : nonflammable
- SEMICONDUCTORS
 In each case, u: μ , for example:
 uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
 uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
 uF : μ F
- COILS
 uH : μ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-6423-232-A	BI-703 BOARD, COMPLETE ***** (Ref. No. 2, 000 Series)				< JUMPER RESISTOR >	
	3-953-261-01	HOLDER, PD		JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< CAPACITOR >				< PHOTO INTERRUPTER >	
C411	1-163-075-00	CERAMIC CHIP 0.047uF	50V	PH401	8-729-020-74	DIODE GP1S24	
		< CONNECTOR >				< TRANSISTOR >	
CN411	1-691-063-21	HOUSING, CONNECTOR 4P		Q401	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
		< PHOTO INTERRUPTER >				< RESISTOR >	
PH411	8-729-020-74	DIODE GP1S24		R401	1-216-198-91	METAL GLAZE 1K 5% 1/8W	
		< TRANSISTOR >		R402	1-216-089-00	METAL CHIP 47K 5% 1/10W	
Q411	8-729-904-10	TRANSISTOR PT360FS		R403	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
Q412	8-729-120-28	TRANSISTOR 2SC1623-L5L6		R404	1-216-097-00	METAL CHIP 100K 5% 1/10W	
Q413	8-729-120-28	TRANSISTOR 2SC1623-L5L6		R405	1-216-039-00	METAL CHIP 390 5% 1/10W	
Q414	8-729-904-10	TRANSISTOR PT360FS		*****			
		< RESISTOR >		*	A-6423-234-A	FP-740 BOARD, COMPLETE (EXCEPT TW) *****	
R411	1-216-045-00	METAL CHIP 680 5% 1/10W		*	A-6423-271-A	FP-740 BOARD, COMPLETE (TW) ***** (Ref. No. 3, 000 Series)	
R412	1-216-099-00	METAL CHIP 120K 5% 1/10W				< CAPACITOR >	
R413	1-216-057-00	METAL CHIP 2.2K 5% 1/10W				C101	1-164-232-11 CERAMIC CHIP 0.01uF 50V
R414	1-216-065-00	METAL CHIP 4.7K 5% 1/10W				C102	1-124-589-11 ELECT 47uF 20% 16V
R415	1-216-073-00	METAL CHIP 10K 5% 1/10W				Δ C103	1-163-031-11 CERAMIC CHIP 0.01uF 50V
R416	1-216-075-00	METAL CHIP 12K 5% 1/10W				Δ C104	1-163-031-11 CERAMIC CHIP 0.01uF 50V
R417	1-216-057-00	METAL CHIP 2.2K 5% 1/10W				C105	1-163-031-11 CERAMIC CHIP 0.01uF 50V
R418	1-216-065-00	METAL CHIP 4.7K 5% 1/10W				C106	1-163-031-11 CERAMIC CHIP 0.01uF 50V
*****						C107	1-163-031-11 CERAMIC CHIP 0.01uF 50V
*	A-6423-231-A	FG-707 BOARD, COMPLETE ***** (Ref. No. 2, 000 Series)				C108	1-124-589-11 ELECT 47uF 20% 16V
		< CAPACITOR >				C110	1-165-319-11 CERAMIC CHIP 0.1uF 50V
C401	1-163-035-00	CERAMIC CHIP 0.047uF	50V			< CONNECTOR >	
		< CONNECTOR >				CN101	1-770-120-11 CONNECTOR, FFC/FPC 11P
CN401	1-691-863-11	CONNECTOR, BOARD TO BOARD 4P				CN102	1-691-066-21 HOUSING, CONNECTOR 7P
				*	CN104	1-569-750-11 PIN, CONNECTOR (PC BOARD) 8P	

FP-740

Ref. No.	Part No.	Description	Remark
< DIODE >			
D101	8-719-955-04	DIODE PY5504S-1	
D102	8-719-955-04	DIODE PY5504S-1	
D103	8-719-955-04	DIODE PY5504S-1	
D104	8-719-955-04	DIODE PY5504S-1	
D106	8-719-047-76	DIODE GL7D206L	
D107	8-719-955-04	DIODE PY5504S-1	
D108	8-719-955-04	DIODE PY5504S-1	
D109	8-719-955-04	DIODE PY5504S-1	
D110	8-719-955-04	DIODE PY5504S-1	
D111	8-719-955-04	DIODE PY5504S-1	
D112	8-719-955-04	DIODE PY5504S-1	
D113	8-719-955-04	DIODE PY5504S-1	
D114	8-719-955-04	DIODE PY5504S-1	
D115	8-719-955-04	DIODE PY5504S-1	
< FERRITE BEAD >			
FB101	1-414-135-11	INDUCTOR CHIP OUH	
FB102	1-414-135-11	INDUCTOR CHIP OUH	
FB103	1-414-135-11	INDUCTOR CHIP OUH	
< IC >			
IC101	8-759-074-40	IC PST572DMT-T1 (RESET)	
IC102	8-759-293-57	IC MB89094PF-G-132-BND (MODE CONTROL) (EXCEPT TW)	
IC102	8-759-328-25	IC MB89094PF-G-134-BND (MODE CONTROL) (TW)	
IC103	8-759-276-29	IC XL9020F-S-E2 (E2P ROM)	
< COIL >			
L101	1-408-982-11	INDUCTOR 100uH	
L102	1-408-982-11	INDUCTOR 100uH	
< PHOTO INTERRUPTER >			
PH101	8-749-010-69	PHOTO INTARAPUTOR GP1S58V	
< TRANSISTOR >			
Q101	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q102	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q103	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q106	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q107	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q108	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q109	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q110	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q111	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q112	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q113	8-729-820-16	TRANSISTOR 2SA1317-S	
Q114	8-729-820-16	TRANSISTOR 2SA1317-S	

Ref. No.	Part No.	Description	Remark
< RESISTOR >			
R101	1-216-039-00	METAL CHIP 390 5% 1/10W	
R102	1-216-045-00	METAL CHIP 680 5% 1/10W	
R103	1-216-039-00	METAL CHIP 390 5% 1/10W	
R104	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R105	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R106	1-216-035-00	METAL CHIP 270 5% 1/10W	
R107	1-216-039-00	METAL CHIP 390 5% 1/10W	
△R110	1-208-806-11	METAL GLAZE 10K 0.50% 1/10W	
△R111	1-208-806-11	METAL GLAZE 10K 0.50% 1/10W	
△R112	1-208-820-11	METAL GLAZE 39K 0.50% 1/10W	
R113	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R114	1-216-033-00	METAL CHIP 220 5% 1/10W	
R115	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R116	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R117	1-216-033-00	METAL CHIP 220 5% 1/10W	
R118	1-216-033-00	METAL CHIP 220 5% 1/10W	
R119	1-216-033-00	METAL CHIP 220 5% 1/10W	
R120	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R121	1-216-033-00	METAL CHIP 220 5% 1/10W	
R122	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R123	1-216-033-00	METAL CHIP 220 5% 1/10W	
R124	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R125	1-216-025-00	METAL CHIP 100 5% 1/10W	
R127	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R128	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R129	1-216-025-00	METAL CHIP 100 5% 1/10W	
R130	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R131	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R132	1-216-035-00	METAL CHIP 270 5% 1/10W	
R133	1-216-035-00	METAL CHIP 270 5% 1/10W	
R134	1-216-035-00	METAL CHIP 270 5% 1/10W	
R135	1-216-035-00	METAL CHIP 270 5% 1/10W	
R136	1-216-035-00	METAL CHIP 270 5% 1/10W	
R137	1-216-035-00	METAL CHIP 270 5% 1/10W	
R138	1-216-035-00	METAL CHIP 270 5% 1/10W	
R139	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R140	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R141	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R142	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R143	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R145	1-216-035-00	METAL CHIP 270 5% 1/10W	
R146	1-216-045-00	METAL CHIP 680 5% 1/10W	
R157	1-216-033-00	METAL CHIP 220 5% 1/10W	
R158	1-216-033-00	METAL CHIP 220 5% 1/10W	
< VIBRATOR >			
X101	1-579-952-21	VIBRATOR, CERAMIC (8MHz)	

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

MB-717

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-6423-233-A	MB-717 BOARD, COMPLETE (EXCEPT TW) *****		C046	1-124-443-00	ELECT	100uF 20% 10V
*	A-6423-270-A	MB-717 BOARD, COMPLETE (TW) ***** (Ref. No. 1, 000 Series)		C047	1-163-038-91	CERAMIC CHIP	0.1uF 25V
		< CAPACITOR >		C048	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
C001	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C049	1-163-237-11	CERAMIC CHIP	27PF 5% 50V
C002	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C050	1-126-176-11	ELECT	220uF 20% 10V
C003	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	C051	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C004	1-124-443-00	ELECT	100uF 20% 10V	C052	1-163-220-11	CERAMIC CHIP	3PF 0.25PF 50V
C005	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	C053	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C006	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C054	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
C007	1-126-177-11	ELECT	100uF 20% 10V	C055	1-124-443-00	ELECT	100uF 20% 10V
C008	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C056	1-124-443-00	ELECT	100uF 20% 10V
C009	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C057	1-124-907-11	ELECT	10uF 20% 50V
C010	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C058	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C011	1-124-443-00	ELECT	100uF 20% 10V	C059	1-126-947-11	ELECT	47uF 20% 10V
C012	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C060	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C013	1-163-099-00	CERAMIC CHIP	18PF 5% 50V	C061	1-126-947-11	ELECT	47uF 20% 10V
C014	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C062	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C015	1-163-099-00	CERAMIC CHIP	18PF 5% 50V	C063	1-124-443-00	ELECT	100uF 20% 10V
C017	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C064	1-126-947-11	ELECT	47uF 20% 10V
C018	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C065	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C019	1-163-127-00	CERAMIC CHIP	270PF 5% 50V	C066	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C020	1-126-947-11	ELECT	47uF 20% 10V	C067	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C021	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C068	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C022	1-163-257-11	CERAMIC CHIP	180PF 5% 50V	C069	1-163-241-11	CERAMIC CHIP	39PF 5% 50V
C023	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C070	1-163-229-11	CERAMIC CHIP	12PF 5% 50V
C024	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C071	1-163-141-00	CERAMIC CHIP	0.001uF 5% 50V
C025	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C072	1-163-249-11	CERAMIC CHIP	82PF 5% 50V
C026	1-163-237-11	CERAMIC CHIP	27PF 5% 50V	C074	1-163-235-11	CERAMIC CHIP	22PF 5% 50V
C027	1-124-443-00	ELECT	100uF 20% 10V	C075	1-163-241-11	CERAMIC CHIP	39PF 5% 50V
C028	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C076	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C029	1-163-116-00	CERAMIC CHIP	91PF 5% 50V	C077	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C030	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C078	1-124-903-11	ELECT	1uF 20% 50V
C032	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C079	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C033	1-163-129-00	CERAMIC CHIP	330PF 5% 50V	C080	1-124-443-00	ELECT	100uF 20% 10V
C034	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C081	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C035	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C082	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V
C036	1-163-235-11	CERAMIC CHIP	22PF 5% 50V	C083	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C037	1-163-108-00	CERAMIC CHIP	43PF 5% 50V	C085	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C038	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C086	1-163-249-11	CERAMIC CHIP	82PF 5% 50V
C039	1-163-114-00	CERAMIC CHIP	75PF 5% 50V	C088	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C040	1-124-257-00	ELECT	2.2uF 20% 50V	C089	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C041	1-124-925-11	ELECT	2.2uF 20% 100V	C090	1-126-947-11	ELECT	47uF 20% 10V
C042	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C091	1-126-947-11	ELECT	47uF 20% 10V
C043	1-163-116-00	CERAMIC CHIP	91PF 5% 50V	C092	1-126-947-11	ELECT	47uF 20% 10V
C044	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	C093	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C045	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C094	1-126-947-11	ELECT	47uF 20% 10V
				C095	1-163-031-11	CERAMIC CHIP	0.01uF 50V
				C096	1-163-031-11	CERAMIC CHIP	0.01uF 50V
				C097	1-163-031-11	CERAMIC CHIP	0.01uF 50V
				C098	1-124-907-11	ELECT	10uF 20% 50V

MB-717

Ref. No.	Part No.	Description		Remark	Ref. No.	Part No.	Description		Remark		
C100	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C239	1-137-399-11	FILM	0.1uF	5%	50V	
C110	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	C240	1-126-947-11	ELECT	47uF	20%	10V
C111	1-164-346-11	CERAMIC CHIP	1uF	16V	C241	1-124-902-00	ELECT	0.47uF	20%	50V	
C112	1-124-907-11	ELECT	10uF	20%	50V	C242	1-124-907-11	ELECT	10uF	20%	50V
C113	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C243	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C114	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C244	1-126-947-11	ELECT	47uF	20%	10V	
C115	1-126-947-11	ELECT	47uF	20%	10V	C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C116	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C246	1-126-935-11	ELECT	470uF	20%	6.3V	
C118	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C247	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C120	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C249	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C200	1-124-443-00	ELECT	100uF	20%	10V	C250	1-126-320-11	ELECT, NONPOLAR	10uF	20%	16V
C201	1-126-947-11	ELECT	47uF	20%	10V	C251	1-109-889-11	ELECT	1uF	20%	50V
C202	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	C252	1-126-947-11	ELECT	47uF	20%	10V
C203	1-163-253-11	CERAMIC CHIP	120PF	5%	50V	C253	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C204	1-126-947-11	ELECT	47uF	20%	10V	C254	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C205	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C257	1-126-916-11	ELECT	1000uF	20%	6.3V	
C206	1-126-947-11	ELECT	47uF	20%	10V	C258	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C207	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C259	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	
C208	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C260	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C209	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C261	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C210	1-164-005-11	CERAMIC CHIP	0.47uF	25V	C263	1-124-927-11	ELECT	4.7uF	20%	100V	
C211	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	C266	1-124-927-11	ELECT	4.7uF	20%	100V
C212	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	C267	1-124-927-11	ELECT	4.7uF	20%	100V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C269	1-124-927-11	ELECT	4.7uF	20%	100V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	C270	1-126-947-11	ELECT	47uF	20%	10V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	C271	1-124-927-11	ELECT	4.7uF	20%	100V
C216	1-126-947-11	ELECT	47uF	20%	10V	C272	1-126-947-11	ELECT	47uF	20%	10V
C217	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C273	1-124-927-11	ELECT	4.7uF	20%	100V	
C218	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C282	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C219	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	C283	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C220	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	C284	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C221	1-163-001-11	CERAMIC CHIP	220PF	10%	50V	C285	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C222	1-163-033-91	CERAMIC CHIP	0.022uF	50V	C286	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C223	1-163-033-91	CERAMIC CHIP	0.022uF	50V	C287	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
C224	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C225	1-163-033-91	CERAMIC CHIP	0.022uF	50V	C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C226	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C401	1-124-589-11	ELECT	47uF	20%	16V	
C227	1-126-947-11	ELECT	47uF	20%	10V	C402	1-124-589-11	ELECT	47uF	20%	16V
C228	1-124-443-00	ELECT	100uF	20%	10V	C403	1-124-477-11	ELECT	47uF	20%	25V
C229-1	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	C404	1-124-477-11	ELECT	47uF	20%	25V
C229-2	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C405	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C230	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	C406	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C231	1-137-368-11	FILM	0.0047uF	5%	50V	C407	1-126-947-11	ELECT	47uF	20%	10V
C232	1-137-378-11	FILM	0.22uF	5%	50V	C408	1-126-947-11	ELECT	47uF	20%	10V
C233	1-137-368-11	FILM	0.0047uF	5%	50V	C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C234	1-137-378-11	FILM	0.22uF	5%	50V	C411	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C235	1-137-442-11	FILM	0.039uF	5%	50V	C412	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C236	1-137-442-11	FILM	0.039uF	5%	50V	C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C237	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C414	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C238	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C415	1-124-282-00	ELECT	22uF	20%	16V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
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	< CONNECTOR >		
C425	1-163-253-11	CERAMIC CHIP	120PF 5%	50V	CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD) 19P
C427	1-126-320-11	ELECT, NONPOLAR	10uF 20%	16V	CN401	1-750-687-11	HOUSING, CONNECTOR (PC BOARD) 14P
C428	1-163-809-11	CERAMIC CHIP	0.047uF 10%	25V	* CN402	1-764-594-21	CONNECTOR, FPC 18P
C430	1-163-239-11	CERAMIC CHIP	33PF 5%	50V	CN403	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P
C431	1-164-489-11	CERAMIC CHIP	0.22uF 10%	16V	CN501	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P
C432	1-163-022-00	CERAMIC CHIP	0.012uF 10%	50V	* CN502	1-695-334-11	PIN, CONNECTOR (PC BOARD) 11P
C433	1-163-017-00	CERAMIC CHIP	0.0047uF 5%	50V	< TRIMMER >		
C434	1-163-016-00	CERAMIC CHIP	0.0039uF 10%	50V	CT001	1-141-442-91	TRIMMER, CERAMIC 20P
C435	1-163-018-00	CERAMIC CHIP	0.0056uF 5%	50V	< DIODE >		
C436	1-164-232-11	CERAMIC CHIP	0.01uF	50V	D001	8-719-800-76	DIODE 1SS226
C437	1-124-273-00	ELECT	3.3uF 20%	50V	D002	8-719-988-62	DIODE 1SS355
C439	1-104-760-11	CERAMIC CHIP	0.047uF 10%	50V	D110	8-719-988-62	DIODE 1SS355
C440	1-164-232-11	CERAMIC CHIP	0.01uF	50V	D201	8-719-988-62	DIODE 1SS355
C441	1-126-320-11	ELECT, NONPOLAR	10uF 20%	16V	D202	8-719-914-43	DIODE DAN202K
C443	1-164-004-11	CERAMIC CHIP	0.1uF 10%	25V	D203	8-719-032-80	DIODE KV1430TL00
C444	1-163-125-00	CERAMIC CHIP	220PF 5%	50V	D204	8-719-914-42	DIODE DA204K
C445	1-163-014-00	CERAMIC CHIP	0.0027uF 10%	50V	D205	8-719-914-42	DIODE DA204K
C447	1-163-249-11	CERAMIC CHIP	82PF 5%	50V	D401	8-719-988-62	DIODE 1SS355
C448	1-164-161-11	CERAMIC CHIP	0.0022uF 10%	100V	D402	8-719-914-42	DIODE DA204K
C449	1-109-889-11	ELECT	1uF 20%	50V	D403	8-719-914-43	DIODE DAN202K
C450	1-164-489-11	CERAMIC CHIP	0.22uF 10%	16V	D404	8-719-914-44	DIODE DAP202K
C451	1-163-014-00	CERAMIC CHIP	0.0027uF 10%	50V	D405	8-719-976-91	DIODE DTZ4.3B
C453	1-124-903-11	ELECT	1uF 20%	50V	D501	8-719-988-62	DIODE 1SS355
C454	1-164-232-11	CERAMIC CHIP	0.01uF	50V	D503	8-719-988-62	DIODE 1SS355
C455	1-163-024-00	CERAMIC CHIP	0.018uF 10%	50V	D504	8-719-977-34	DIODE DTZ12
C456	1-163-011-11	CERAMIC CHIP	0.0015uF 10%	50V	D505	8-719-914-44	DIODE DAP202K
C457	1-163-235-11	CERAMIC CHIP	22PF 5%	50V	< FERRITE BEAD >		
C458	1-163-017-00	CERAMIC CHIP	0.0047uF 5%	50V	FB501	1-414-135-11	INDUCTOR CHIP 0uH
C459	1-163-239-11	CERAMIC CHIP	33PF 5%	50V	< FILTER >		
C501	1-126-947-11	ELECT	47uF 20%	10V	FL001	1-577-543-11	FILTER, CERAMIC
C502	1-107-701-11	ELECT	47uF 20%	16V	FL002	1-577-543-11	FILTER, CERAMIC
C503	1-163-251-11	CERAMIC CHIP	100PF 5%	50V	FL201	1-236-744-21	EMI FILTER
C504	1-163-245-11	CERAMIC CHIP	56PF 5%	50V	FL202	1-236-744-21	EMI FILTER
C505	1-164-182-11	CERAMIC CHIP	0.0033uF 10%	50V			
C506	1-124-927-11	ELECT	4.7uF 20%	100V			
C507	1-124-768-11	ELECT	4.7uF 20%	35V			
C508	1-163-009-11	CERAMIC CHIP	0.001uF 10%	50V			
C509	1-163-038-91	CERAMIC CHIP	0.1uF	25V			
C510	1-163-038-91	CERAMIC CHIP	0.1uF	25V			
C511	1-163-038-91	CERAMIC CHIP	0.1uF	25V			
C512	1-124-477-11	ELECT	47uF 20%	25V			
C513	1-163-038-91	CERAMIC CHIP	0.1uF	25V			

MB-717

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< IC >				< COIL >			
IC001	8-759-299-92	IC AN2661NK (FM DEMOD, DO DET, SYNC SEP)		L001	1-408-970-21	INDUCTOR 10uH	
IC002	8-759-299-91	IC M35012-092SP (CHARACTER GENERATOR MIX) (EXCEPT TW)		L002	1-408-970-21	INDUCTOR 10uH	
IC002	8-759-327-19	IC M35012-095SP (CHARACTER GENERATOR MIX) (TW)		L003	1-408-970-21	INDUCTOR 10uH	
IC003	8-759-290-65	IC MN8811 (A/D, D/A, TBC, DOC)		L004	1-408-970-21	INDUCTOR 10uH	
IC004	8-759-295-66	IC BA7653AF-E2 (PB VIDEO/GRAY BACK SELECTOR)		L005	1-408-973-21	INDUCTOR 18uH	
IC005	8-759-164-18	IC MM1118XFF (VIDEO MUTE)		L006	1-408-970-21	INDUCTOR 10uH	
IC201	8-752-372-94	IC CXD2507AQ (AUDIO D. S. P)		L007	1-408-974-21	INDUCTOR 22uH	
IC203	8-759-253-26	IC CA0002AM-TP (AFM DEMOD CX NR)		L008	1-408-973-21	INDUCTOR 18uH	
IC204	8-759-100-96	IC XRA4558F-E2 (CD SPINDLE ERROR AMP)		L009	1-408-973-21	INDUCTOR 18uH	
IC205	8-759-263-31	IC TC9293FN-EL (DIGIFIL & DAC)		L010	1-408-968-21	INDUCTOR 6.8uH	
IC206	8-759-100-96	IC XRA4558F-E2 (BUFFER)		L011	1-408-968-21	INDUCTOR 6.8uH	
IC401	8-759-280-89	IC HA11529F (SERVO)		L012	1-408-974-21	INDUCTOR 22uH	
△IC402	8-759-822-38	IC LA6510 (TILT MOTOR DRIVE)		L013	1-408-976-21	INDUCTOR 33uH	
△IC403	8-759-100-96	IC XRA4558F-E2 (TRACKING COIL DRIVE/FOCUS COIL DRIVE)		L014	1-408-976-21	INDUCTOR 33uH	
IC404	8-759-100-96	IC XRA4558F-E2 (AMP)		L015	1-408-975-21	INDUCTOR 27uH	
IC405	8-759-100-96	IC XRA4558F-E2 (TILT AMP)		L016	1-408-970-21	INDUCTOR 10uH	
IC406	8-759-100-96	IC XRA4558F-E2 (AMP/TILT CONTROL AMP)		L017	1-408-975-21	INDUCTOR 27uH	
IC407	8-759-932-67	IC BU4053BCF (TILT LIMIT CTR SWITCH, TILT A/B SELECT SWITCH, CD/LD/CDV SELECT SWITCH)		L018	1-408-970-21	INDUCTOR 10uH	
IC501	8-759-293-56	IC MB89094PF-G-131-BND (SYSTEM CONTROL)		L019	1-408-970-21	INDUCTOR 10uH	
IC502	8-759-294-47	IC MBCG24692-4425 (SYSTEM CONTROL)		L020	1-408-970-21	INDUCTOR 10uH	
IC503	8-759-231-92	IC TA7291P (LOADING MOTOR DRIVE)		L021	1-408-970-21	INDUCTOR 10uH	
IC504	8-759-060-00	IC BA10324AF-E2 (ERROR AMP, PHASE COMPENSTATION, AMP)		L022	1-408-974-21	INDUCTOR 22uH	
IC505	8-759-932-65	IC BU4052BCF (SPINDLE ERROR SIGNAL SELECT (LC/CD/CDV))		L023	1-408-962-21	INDUCTOR 2.2uH	
IC506	8-759-932-67	IC BU4053BCF (LD SPDL ERROR AMP)		L024	1-408-974-21	INDUCTOR 22uH	
				L025	1-408-970-21	INDUCTOR 10uH	
< JACK >				L026	1-408-975-21	INDUCTOR 27uH	
J202	1-764-592-11	JACK 3P		L027	1-408-970-21	INDUCTOR 10uH	
J203	1-764-592-11	JACK 3P		L028	1-408-970-21	INDUCTOR 10uH	
< JUMPER RESISTOR >				L201	1-408-982-11	INDUCTOR 100uH	
JR001	1-216-295-00	METAL CHIP 0 5% 1/10W		L202	1-408-979-21	INDUCTOR 56uH	
JR002	1-216-295-00	METAL CHIP 0 5% 1/10W		L203	1-408-978-21	INDUCTOR 47uH	
JR003	1-216-295-00	METAL CHIP 0 5% 1/10W		L204	1-408-973-21	INDUCTOR 18uH	
JR004	1-216-295-00	METAL CHIP 0 5% 1/10W		L205	1-408-985-21	INDUCTOR 180uH	
JR005	1-216-295-00	METAL CHIP 0 5% 1/10W		L209	1-414-161-21	INDUCTOR 1mH	
JR006	1-216-295-00	METAL CHIP 0 5% 1/10W		L210	1-414-161-21	INDUCTOR 1mH	
JR007	1-216-295-00	METAL CHIP 0 5% 1/10W		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	

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q007	8-729-120-28	TRANSISTOR	2SC1623-L5L6			< RESISTOR >	
Q009	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R001	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
Q011	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R002	1-216-075-00	METAL CHIP	12K 5% 1/10W
Q012	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R003	1-216-041-00	METAL CHIP	470 5% 1/10W
Q013	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R004	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
Q014	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R005	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
Q015	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R006	1-216-021-00	METAL CHIP	68 5% 1/10W
Q016	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R007	1-216-035-00	METAL CHIP	270 5% 1/10W
Q017	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R008	1-216-047-00	METAL CHIP	820 5% 1/10W
Q019	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R009	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q020	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R010	1-216-037-00	METAL CHIP	330 5% 1/10W
Q021	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R011	1-216-075-00	METAL CHIP	12K 5% 1/10W
Q022	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R012	1-216-083-00	METAL CHIP	27K 5% 1/10W
Q023	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R014	1-216-097-00	METAL CHIP	100K 5% 1/10W
Q024	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R015	1-216-099-00	METAL CHIP	120K 5% 1/10W
Q025	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R016	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q026	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R017	1-216-043-00	METAL CHIP	560 5% 1/10W
Q027	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R018	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q028	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R019	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
Q030	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R020	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
Q201	8-729-027-43	TRANSISTOR	DTC114EKA-T146	R021	1-216-089-00	METAL CHIP	47K 5% 1/10W
Q202	8-729-027-23	TRANSISTOR	DTA114EKA-T146	R022	1-216-041-00	METAL CHIP	470 5% 1/10W
Q203	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R023	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
Q204	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R025	1-216-097-00	METAL CHIP	100K 5% 1/10W
Q205	8-729-027-23	TRANSISTOR	DTA114EKA-T146	R027	1-216-119-00	METAL CHIP	820K 5% 1/10W
Q206	8-729-027-23	TRANSISTOR	DTA114EKA-T146	R032	1-216-101-00	METAL CHIP	150K 5% 1/10W
Q207	8-729-027-44	TRANSISTOR	DTC114TKA-T146	R033	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
Q210	8-729-023-22	TRANSISTOR	2SD2114K	R034	1-216-045-00	METAL CHIP	680 5% 1/10W
Q211	8-729-023-22	TRANSISTOR	2SD2114K	R035	1-216-039-00	METAL CHIP	390 5% 1/10W
△Q401	8-729-209-15	TRANSISTOR	2SD2012	R036	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
△Q402	8-729-024-95	TRANSISTOR	2SB1565EF	R037	1-216-295-00	METAL CHIP	0 5% 1/10W
△Q403	8-729-209-15	TRANSISTOR	2SD2012	R038	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
△Q404	8-729-024-95	TRANSISTOR	2SB1565EF	R039	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
Q405	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R040	1-216-043-00	METAL CHIP	560 5% 1/10W
Q406	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R042	1-216-029-00	METAL CHIP	150 5% 1/10W
Q407	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R043	1-216-041-00	METAL CHIP	470 5% 1/10W
Q408	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R044	1-216-041-00	METAL CHIP	470 5% 1/10W
Q409	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R045	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q410	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R046	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
Q411	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R047	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
Q412	8-729-027-52	TRANSISTOR	DTC124EKA-T146	R048	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q413	8-729-027-31	TRANSISTOR	DTA124EKA-T146	R049	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q414	8-729-027-31	TRANSISTOR	DTA124EKA-T146	R050	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q415	8-729-027-31	TRANSISTOR	DTA124EKA-T146	R051	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q416	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R052	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
Q417	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R053	1-216-043-00	METAL CHIP	560 5% 1/10W
Q418	8-729-027-31	TRANSISTOR	DTA124EKA-T146	R054	1-216-041-00	METAL CHIP	470 5% 1/10W
Q501	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R055	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q502	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR	R056	1-216-039-00	METAL CHIP	390 5% 1/10W
				R059	1-216-043-00	METAL CHIP	560 5% 1/10W

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

MB-717

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R061	1-216-049-00	METAL CHIP	1K	5%	1/10W	R129	1-216-033-00	METAL CHIP	220	5%	1/10W
R062	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R130	1-216-049-00	METAL CHIP	1K	5%	1/10W
R063	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R200	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R064	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R203	1-216-049-00	METAL CHIP	1K	5%	1/10W
R065	1-216-097-00	METAL CHIP	100K	5%	1/10W	R204	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R066	1-216-089-00	METAL CHIP	47K	5%	1/10W	R205	1-216-073-00	METAL CHIP	10K	5%	1/10W
R067	1-216-073-00	METAL CHIP	10K	5%	1/10W	R206	1-216-049-00	METAL CHIP	1K	5%	1/10W
R068	1-216-025-00	METAL CHIP	100	5%	1/10W	R207	1-216-105-00	METAL CHIP	220K	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	1-216-025-00	METAL CHIP	100	5%	1/10W	R213	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R075	1-216-049-00	METAL CHIP	1K	5%	1/10W	R214	1-216-023-00	METAL CHIP	82	5%	1/10W
R076	1-216-295-00	METAL CHIP	0	5%	1/10W	R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R077	1-216-041-00	METAL CHIP	470	5%	1/10W	R216	1-216-049-00	METAL CHIP	1K	5%	1/10W
R078	1-216-025-00	METAL CHIP	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	1-216-049-00	METAL CHIP	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	1-216-049-00	METAL CHIP	1K	5%	1/10W
R082	1-216-041-00	METAL CHIP	470	5%	1/10W	R222	1-216-295-00	METAL CHIP	0	5%	1/10W
R083	1-216-043-00	METAL CHIP	560	5%	1/10W	R223	1-216-295-00	METAL CHIP	0	5%	1/10W
R084	1-216-041-00	METAL CHIP	470	5%	1/10W	R224	1-216-121-00	METAL CHIP	1M	5%	1/10W
R085	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R226	1-216-105-00	METAL CHIP	220K	5%	1/10W
R086	1-216-021-00	METAL CHIP	68	5%	1/10W	R227	1-216-074-00	METAL CHIP	11K	5%	1/10W
R088	1-216-295-00	METAL CHIP	0	5%	1/10W	R228	1-216-121-00	METAL CHIP	1M	5%	1/10W
R089	1-216-033-00	METAL CHIP	220	5%	1/10W	R230	1-216-295-00	METAL CHIP	0	5%	1/10W
R090	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R231	1-216-295-00	METAL CHIP	0	5%	1/10W
R091	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	R232	1-216-043-00	METAL CHIP	560	5%	1/10W
R093	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R233	1-216-295-00	METAL CHIP	0	5%	1/10W
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	1-216-295-00	METAL CHIP	0	5%	1/10W	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	1-216-049-00	METAL CHIP	1K	5%	1/10W	R240	1-216-096-00	METAL GLAZE	91K	5%	1/10W
R111	1-216-049-00	METAL CHIP	1K	5%	1/10W	R242	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R112	1-216-295-00	METAL CHIP	0	5%	1/10W	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	1-216-105-00	METAL CHIP	220K	5%	1/10W
R120	1-216-081-00	METAL CHIP	22K	5%	1/10W	R247	1-216-043-00	METAL CHIP	560	5%	1/10W
R121	1-216-095-00	METAL CHIP	82K	5%	1/10W	R248	1-216-043-00	METAL CHIP	560	5%	1/10W
R122	1-216-049-00	METAL CHIP	1K	5%	1/10W	R250	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R123	1-216-105-00	METAL CHIP	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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R258	1-216-104-00	METAL CHIP	200K 5% 1/10W	R415	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R260	1-216-091-00	METAL CHIP	56K 5% 1/10W	R416	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R261	1-216-091-00	METAL CHIP	56K 5% 1/10W	R417	1-216-049-00	METAL CHIP	1K 5% 1/10W
R262	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R418	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R263	1-216-091-00	METAL CHIP	56K 5% 1/10W	R419	1-216-045-00	METAL CHIP	680 5% 1/10W
R264	1-216-091-00	METAL CHIP	56K 5% 1/10W	R420	1-216-049-00	METAL CHIP	1K 5% 1/10W
R265	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R421	1-216-105-00	METAL CHIP	220K 5% 1/10W
R266	1-216-049-00	METAL CHIP	1K 5% 1/10W	R422	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R268	1-216-295-00	METAL CHIP	0 5% 1/10W	R423	1-216-039-00	METAL CHIP	390 5% 1/10W
R270	1-216-097-00	METAL CHIP	100K 5% 1/10W	R424	1-216-049-00	METAL CHIP	1K 5% 1/10W
R271	1-216-097-00	METAL CHIP	100K 5% 1/10W	R425	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R272	1-216-075-00	METAL CHIP	12K 5% 1/10W	R426	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R273	1-216-085-00	METAL CHIP	33K 5% 1/10W	R427	1-216-017-00	METAL CHIP	47 5% 1/10W
R279	1-216-075-00	METAL CHIP	12K 5% 1/10W	R428	1-216-073-00	METAL CHIP	10K 5% 1/10W
R281	1-216-049-00	METAL CHIP	1K 5% 1/10W	R429	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R282	1-216-081-00	METAL CHIP	22K 5% 1/10W	R430	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R283	1-216-075-00	METAL CHIP	12K 5% 1/10W	R431	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R286	1-216-049-00	METAL CHIP	1K 5% 1/10W	R432	1-216-107-00	METAL CHIP	270K 5% 1/10W
R287	1-216-081-00	METAL CHIP	22K 5% 1/10W	R433	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R288	1-216-295-00	METAL CHIP	0 5% 1/10W	R434	1-216-097-00	METAL CHIP	100K 5% 1/10W
R289	1-216-081-00	METAL CHIP	22K 5% 1/10W	R435	1-216-077-00	METAL CHIP	15K 5% 1/10W
R290	1-216-081-00	METAL CHIP	22K 5% 1/10W	R436	1-216-101-00	METAL CHIP	150K 5% 1/10W
R291	1-216-689-11	METAL CHIP	39K 0.5% 1/10W	R437	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R292	1-216-043-00	METAL CHIP	560 5% 1/10W	R438	1-216-089-00	METAL CHIP	47K 5% 1/10W
R295	1-216-043-00	METAL CHIP	560 5% 1/10W	R442	1-216-073-00	METAL CHIP	10K 5% 1/10W
R300	1-216-073-00	METAL CHIP	10K 5% 1/10W	R444	1-216-075-00	METAL CHIP	12K 5% 1/10W
R301	1-216-073-00	METAL CHIP	10K 5% 1/10W	R445	1-216-079-00	METAL CHIP	18K 5% 1/10W
R302	1-216-105-00	METAL CHIP	220K 5% 1/10W	R446	1-216-101-00	METAL CHIP	150K 5% 1/10W
R303	1-216-105-00	METAL CHIP	220K 5% 1/10W	R447	1-216-089-00	METAL CHIP	47K 5% 1/10W
R307	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R448	1-216-101-00	METAL CHIP	150K 5% 1/10W
R308	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R449	1-216-035-00	METAL CHIP	270 5% 1/10W
R309	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R450	1-216-089-00	METAL CHIP	47K 5% 1/10W
R311	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R451	1-216-049-00	METAL CHIP	1K 5% 1/10W
R323	1-216-033-00	METAL CHIP	220 5% 1/10W	R452	1-216-049-00	METAL CHIP	1K 5% 1/10W
R324	1-216-033-00	METAL CHIP	220 5% 1/10W	R453	1-216-049-00	METAL CHIP	1K 5% 1/10W
R351	1-216-295-00	METAL CHIP	0 5% 1/10W	R454	1-216-049-00	METAL CHIP	1K 5% 1/10W
R352	1-216-049-00	METAL CHIP	1K 5% 1/10W	R455	1-216-049-00	METAL CHIP	1K 5% 1/10W
R401	1-216-369-00	METAL OXIDE	1 5% 2W F	R456	1-216-097-00	METAL CHIP	100K 5% 1/10W
R402	1-216-146-00	METAL GLAZE	6.8 5% 1/8W	R457	1-216-081-00	METAL CHIP	22K 5% 1/10W
R403	1-216-146-00	METAL GLAZE	6.8 5% 1/8W	R458	1-216-097-00	METAL CHIP	100K 5% 1/10W
R404	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R459	1-216-083-00	METAL CHIP	27K 5% 1/10W
R405	1-216-025-00	METAL CHIP	100 5% 1/10W	R460	1-216-075-00	METAL CHIP	12K 5% 1/10W
R406	1-216-079-00	METAL CHIP	18K 5% 1/10W	R461	1-216-085-00	METAL CHIP	33K 5% 1/10W
R407	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R462	1-216-089-00	METAL CHIP	47K 5% 1/10W
R408	1-216-081-00	METAL CHIP	22K 5% 1/10W	R463	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R409	1-216-049-00	METAL CHIP	1K 5% 1/10W	R464	1-216-075-00	METAL CHIP	12K 5% 1/10W
R411	1-216-077-00	METAL CHIP	15K 5% 1/10W	R465	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R412	1-216-045-00	METAL CHIP	680 5% 1/10W	R466	1-216-097-00	METAL CHIP	100K 5% 1/10W
R413	1-216-047-00	METAL CHIP	820 5% 1/10W	R467	1-216-085-00	METAL CHIP	33K 5% 1/10W
R414	1-216-105-00	METAL CHIP	220K 5% 1/10W	R468	1-216-089-00	METAL CHIP	47K 5% 1/10W

MB-717

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
R469	1-216-049-00	METAL CHIP	1K	5%	1/10W	R522	1-216-081-00	METAL CHIP	22K	5%	1/10W
R470	1-216-081-00	METAL CHIP	22K	5%	1/10W	R523	1-216-035-00	METAL CHIP	270	5%	1/10W
R471	1-216-079-00	METAL CHIP	18K	5%	1/10W	R524	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W
R472	1-216-049-00	METAL CHIP	1K	5%	1/10W	R525	1-216-101-00	METAL CHIP	150K	5%	1/10W
R473	1-216-075-00	METAL CHIP	12K	5%	1/10W	R526	1-216-089-00	METAL CHIP	47K	5%	1/10W
R474	1-216-093-00	METAL CHIP	68K	5%	1/10W	R527	1-216-033-00	METAL CHIP	220	5%	1/10W
R475	1-216-099-00	METAL CHIP	120K	5%	1/10W	R528	1-216-105-00	METAL CHIP	220K	5%	1/10W
R476	1-216-073-00	METAL CHIP	10K	5%	1/10W	R530	1-216-073-00	METAL CHIP	10K	5%	1/10W
R477	1-216-077-00	METAL CHIP	15K	5%	1/10W	R531	1-216-105-00	METAL CHIP	220K	5%	1/10W
R478	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R532	1-216-045-00	METAL CHIP	680	5%	1/10W
R479	1-216-085-00	METAL CHIP	33K	5%	1/10W	R533	1-216-097-00	METAL CHIP	100K	5%	1/10W
R480	1-216-073-00	METAL CHIP	10K	5%	1/10W	R534	1-216-093-00	METAL CHIP	68K	5%	1/10W
R481	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R535	1-216-095-00	METAL CHIP	82K	5%	1/10W
R482	1-216-049-00	METAL CHIP	1K	5%	1/10W	R536	1-216-073-00	METAL CHIP	10K	5%	1/10W
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W	R537	1-216-049-00	METAL CHIP	1K	5%	1/10W
R484	1-216-091-00	METAL CHIP	56K	5%	1/10W	R538	1-216-105-00	METAL CHIP	220K	5%	1/10W
R485	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R539	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R486	1-216-073-00	METAL CHIP	10K	5%	1/10W	R540	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R487	1-216-079-00	METAL CHIP	18K	5%	1/10W	R541	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R488	1-216-089-00	METAL CHIP	47K	5%	1/10W	R542	1-216-049-00	METAL CHIP	1K	5%	1/10W
R489	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R543	1-216-049-00	METAL CHIP	1K	5%	1/10W
R490	1-216-073-00	METAL CHIP	10K	5%	1/10W	△R544	1-212-950-00	FUSIBLE	4.7	5%	1/2W F
R491	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R545	1-216-049-00	METAL CHIP	1K	5%	1/10W
R492	1-216-073-00	METAL CHIP	10K	5%	1/10W	R546	1-216-045-00	METAL CHIP	680	5%	1/10W
R493	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R547	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R494	1-216-105-00	METAL CHIP	220K	5%	1/10W	R548	1-216-081-00	METAL CHIP	22K	5%	1/10W
R495	1-216-085-00	METAL CHIP	33K	5%	1/10W	R549	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R496	1-216-097-00	METAL CHIP	100K	5%	1/10W	R550	1-216-073-00	METAL CHIP	10K	5%	1/10W
R497	1-216-085-00	METAL CHIP	33K	5%	1/10W	R551	1-216-081-00	METAL CHIP	22K	5%	1/10W
R498	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R552	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R499	1-216-093-00	METAL CHIP	68K	5%	1/10W	R555	1-216-021-00	METAL CHIP	68	5%	1/10W
R502	1-216-089-00	METAL CHIP	47K	5%	1/10W	R556	1-216-049-00	METAL CHIP	1K	5%	1/10W
R503	1-216-049-00	METAL CHIP	1K	5%	1/10W	R557	1-216-049-00	METAL CHIP	1K	5%	1/10W
R504	1-216-033-00	METAL CHIP	220	5%	1/10W	R558	1-216-049-00	METAL CHIP	1K	5%	1/10W
R506	1-216-121-00	METAL CHIP	1M	5%	1/10W	R559	1-216-049-00	METAL CHIP	1K	5%	1/10W
R507	1-216-049-00	METAL CHIP	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	1-216-049-00	METAL CHIP	1K	5%	1/10W
R509	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	R562	1-216-049-00	METAL CHIP	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	1-216-049-00	METAL CHIP	1K	5%	1/10W
R512	1-216-113-00	METAL CHIP	470K	5%	1/10W	R565	1-216-033-00	METAL CHIP	220	5%	1/10W
R513	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W	R566	1-216-049-00	METAL CHIP	1K	5%	1/10W
R514	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W	R567	1-216-049-00	METAL CHIP	1K	5%	1/10W
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W	R568	1-216-049-00	METAL CHIP	1K	5%	1/10W
R516	1-216-085-00	METAL CHIP	33K	5%	1/10W	R569	1-216-049-00	METAL CHIP	1K	5%	1/10W
R517	1-208-808-11	METAL GLAZE	12K	0.50%	1/10W	R570	1-216-049-00	METAL CHIP	1K	5%	1/10W
R518	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	R571	1-216-049-00	METAL CHIP	1K	5%	1/10W
R519	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W	R572	1-216-049-00	METAL CHIP	1K	5%	1/10W
R520	1-216-073-00	METAL CHIP	10K	5%	1/10W	R573	1-216-049-00	METAL CHIP	1K	5%	1/10W
R521	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W	R574	1-216-049-00	METAL CHIP	1K	5%	1/10W

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R576	1-216-049-00	METAL CHIP	1K 5% 1/10W			< VIBRATOR >	
R577	1-216-073-00	METAL CHIP	10K 5% 1/10W	X001	1-760-541-21	VIBRATOR, CRYSTAL (28.125MHz)	
R578	1-216-089-00	METAL CHIP	47K 5% 1/10W	X201	1-567-515-11	VIBRATOR, VARIABLE CRYSTAL (16.9344MHz)	
R595	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	*****			
R596	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	*	A-6423-230-A	MD-705 BOARD, COMPLETE	
R597	1-216-057-00	METAL CHIP	2.2K 5% 1/10W			*****	(Ref. No. 2,000 Series)
R900	1-216-085-00	METAL CHIP	33K 5% 1/10W		3-953-262-01	HOLDER, LED	
R901	1-216-065-00	METAL CHIP	4.7K 5% 1/10W			< CONNECTOR >	
R902	1-216-081-00	METAL CHIP	22K 5% 1/10W	CN431	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P	
R903	1-216-081-00	METAL CHIP	22K 5% 1/10W	CN432	1-691-036-21	HOUSING, CONNECTOR 4P	
R904	1-216-105-00	METAL CHIP	220K 5% 1/10W	CN433	1-766-938-11	CONNECTOR, BOARD TO BOARD 5P	
R905	1-216-085-00	METAL CHIP	33K 5% 1/10W	* CN434	1-564-014-51	PIN, CONNECTOR 4P	
R906	1-216-077-00	METAL CHIP	15K 5% 1/10W			< DIODE >	
R907	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	D431	8-719-912-39	LED SLR932A	
R908	1-216-097-00	METAL CHIP	100K 5% 1/10W			< JUMPER RESISTOR >	
R910	1-216-295-00	METAL CHIP	0 5% 1/10W	JR431	1-216-296-00	METAL CHIP	0 5% 1/8W
R911	1-216-081-00	METAL CHIP	22K 5% 1/10W	JR432	1-216-295-00	METAL CHIP	0 5% 1/10W
R912	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	JR433	1-216-296-00	METAL CHIP	0 5% 1/8W
R913	1-216-109-00	METAL CHIP	330K 5% 1/10W	JR434	1-216-296-00	METAL CHIP	0 5% 1/8W
R914	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	JR435	1-216-296-00	METAL CHIP	0 5% 1/8W
R915	1-216-071-00	METAL CHIP	8.2K 5% 1/10W	JR436	1-216-296-00	METAL CHIP	0 5% 1/8W
R916	1-216-083-00	METAL CHIP	27K 5% 1/10W	JR437	1-216-296-00	METAL CHIP	0 5% 1/8W
R917	1-216-099-00	METAL CHIP	120K 5% 1/10W	JR438	1-216-296-00	METAL CHIP	0 5% 1/8W
R918	1-216-099-00	METAL CHIP	120K 5% 1/10W	JR439	1-216-296-00	METAL CHIP	0 5% 1/8W
R919	1-216-073-00	METAL CHIP	10K 5% 1/10W	JR440	1-216-296-00	METAL CHIP	0 5% 1/8W
R920	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	JR441	1-216-296-00	METAL CHIP	0 5% 1/8W
R921	1-216-099-00	METAL CHIP	120K 5% 1/10W	JR442	1-216-295-00	METAL CHIP	0 5% 1/10W
R922	1-216-073-00	METAL CHIP	10K 5% 1/10W			< PHOTO INTERRUPTER >	
R923	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	PH431	8-729-020-74	DIODE GP1S24	
R924	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	PH432	8-729-020-74	DIODE GP1S24	
R925	1-216-017-00	METAL CHIP	47 5% 1/10W			< RESISTOR >	
R926	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R431	1-216-039-00	METAL CHIP	390 5% 1/10W
R927	1-216-003-11	METAL GLAZE	12 5% 1/10W	R432	1-216-099-00	METAL CHIP	120K 5% 1/10W
R928	1-216-081-00	METAL CHIP	22K 5% 1/10W	R433	1-216-248-00	METAL GLAZE	120K 5% 1/8W
R929	1-216-113-00	METAL CHIP	470K 5% 1/10W	R436	1-216-295-00	METAL CHIP	0 5% 1/10W
R930	1-216-089-00	METAL CHIP	47K 5% 1/10W			< SWITCH >	
R931	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	S431	1-692-440-11	SWITCH, PUSH (TILT LIMIT/TILT CENTER)	
R932	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	*****			
R933	1-216-073-00	METAL CHIP	10K 5% 1/10W			< VARIABLE RESISTOR >	
R935	1-216-085-00	METAL CHIP	33K 5% 1/10W	RV001	1-223-236-11	RES, ADJ, CARBON 1K	
R936	1-216-031-00	METAL CHIP	180 5% 1/10W	RV401	1-223-241-11	RES, ADJ, CARBON 47K	
R937	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	RV402	1-223-241-11	RES, ADJ, CARBON 47K	
R939	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R944	1-216-049-00	METAL CHIP	1K 5% 1/10W				
R945	1-216-049-00	METAL CHIP	1K 5% 1/10W				

MT-706**MT-707****PW-717****SW-732**

Ref.No.	Part No.	Description	Remark
*	A-6423-229-A	MT-706 BOARD, COMPLETE ***** (Ref.No. 2,000 Series)	
		< CONNECTOR >	
CN421	1-766-937-11	CONNECTOR, BOARD TO BOARD 5P	
		< MOTOR >	
M421	1-541-930-11	MOTOR, DC (TILT)	

*	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	
		< MOTOR >	
M481	1-541-309-11	MOTOR, L (RF-370C) (LOADING)	

*	A-6423-235-A	PW-717 BOARD, COMPLETE ***** (Ref.No. 3,000 Series)	
		< CAPACITOR >	
C201	1-164-232-11	CERAMIC CHIP 0.01uF	50V
		< CONNECTOR >	
CN201	1-691-066-21	HOUSING, CONNECTOR 7P	
		< DIODE >	
D201	8-719-955-04	DIODE PY5504S-1 (▶)	
D202	8-719-981-49	DIODE GL3ED8 (EXCEPT TW)	
D203	8-719-992-30	LED SLR305MC3F (TW)	
		< IC >	
IC201	8-741-810-59	IC ELEMENT, RAY-CATCHER SBX1810-59 (REMOTE CONTROL RECEIVER)	
		< TRANSISTOR >	
Q201	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q202	8-729-027-31	TRANSISTOR DTA124EKA-T146 (EXCEPT TW)	

Ref.No.	Part No.	Description	Remark
		< RESISTOR >	
R201	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R202	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R203	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R204	1-216-081-00	METAL CHIP 22K 5%	1/10W
R205	1-216-037-00	METAL CHIP 330 5%	1/10W
R206	1-216-178-00	METAL GLAZE 150 5%	1/8W (EXCEPT TW)
R206	1-216-182-00	METAL GLAZE 220 5%	1/8W (TW)
R207	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R208	1-216-186-00	METAL GLAZE 330 5%	1/8W (EXCEPT TW)
R209	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R210	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R211	1-216-295-00	METAL CHIP 0 5%	1/10W (TW)
		< SWITCH >	
S201	1-572-946-31	SWITCH, TACTIL (■)	
S202	1-572-946-31	SWITCH, TACTIL (▣)	
S203	1-572-946-31	SWITCH, TACTIL (SIDE A)	
S204	1-572-946-31	SWITCH, TACTIL (SIDE B)	
S205	1-572-946-31	SWITCH, TACTIL (▶)	
S206	1-572-946-31	SWITCH, TACTIL (POWER)	
S207	1-572-946-31	SWITCH, TACTIL (OPEN/CLOSE △)	
S208	1-572-946-31	SWITCH, TACTIL (ACS/AMS ◀▶)	
S209	1-572-946-31	SWITCH, TACTIL (ACS/AMS ▶▶)	

*	A-6423-236-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
		< PHOTO INTERRUPTER >	
PH461	8-729-020-74	DIODE GPIS24	
PH462	8-729-020-74	DIODE GPIS24	
PH463	8-729-020-74	DIODE GPIS24	
		< 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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*****				#11	7-623-210-22	SW 4, TYPE 2	
		MISCELLANEOUS		#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	
17	1-769-150-11	FLAT CABLE (FFP-001) (7 CORE)					
62	1-769-148-11	FLAT CABLE (FMM-001) (7 CORE)					
63	1-769-149-11	FLAT CABLE (FUF-002) (11 CORE)					
64	1-769-147-11	FLAT CABLE (FMD-003) (12 CORE)					
65	1-769-146-11	FLAT CABLE (FMP-002) (19 CORE)					
△*68	1-769-500-11	CORD, POWER (TW)					
△68	1-575-912-21	CORD, POWER (EXCEPT TW)					
△117	1-413-989-11	POWER BLOCK (EXCEPT TW)					
△117		POWER BLOCK (TW)					
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A(S)					
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)					
172	1-769-151-11	FLAT CABLE (FMB-001) (4 CORE)					
M421	1-541-930-11	MOTOR, DC (TILT)					
M481	X-3944-685-1	MOTOR ASSY, LOADING (RF-370C)					
M901	1-698-109-11	MOTOR, DD (SPINDLE)					
Note:The parts No. of ref. No.117 is shown in the supplement.							

		ACCESSORIES & PACKING MATERIALS					

	1-569-008-11	ADAPTER, CONVERSION 2P(EXCEPT TW)					
	1-575-334-11	CORD, CONNECTION (A/V connecting cable (Stereo) 1.5M)					
	3-759-585-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH, CHINESE) (EXCEPT TW)					
	3-759-585-41	MANUAL, INSTRUCTION (CHINESE) (TW)					
*	3-961-118-01	CUSHION (UPPER)					
*	3-961-119-01	CUSHION (LOWER)					
*	3-962-293-01	INDIVIDUAL CARTON (TW)					
	A-6772-990-A	REMOTE CONTROL COMPLETE ASSY (EXCEPT TW)					
*	A-6778-030-A	REMOTE CONTROL COMPLETE ASSY (TW)					
*	X-3944-710-1	INDIVIDUAL CARTON ASSY (EXCEPT TW)					

		HARDWARE LIST					

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3					
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3					
#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					
#6	7-685-133-19	+PTP 2. 6X6					
#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					

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 : MB89094 on the MB-717 Board)

Pin No.	Pin Name	I/O	Function
1	—	0	Not used. (Open)
2	CLK32	1	Check input (2FH 31.5kHz).
3	GND	—	GND.
4	GND	—	GND.
5	2FSC	1	Clock input (2FSC 7.16MHz).
6	—	0	Not used. (Open)
7	V _{SS}	—	GND.
8	XMRST	1	Reset signal input. Reset: "L".
9	XFREQ	1	Frame No. data Reading availability information.
10	FQ ACK	0	Frame No. and sub Q data output control signal.
11	FQ SEL	0	Frame No. / Sub Q data change signal.
12	JPC _{TL}	0	Track jump change signal. (TJ: "H", MTJ: "L".
13	SP LOCK	1	Spindle lock detection.
14	TBC HOLD IN	0	TBC Mute control.
15	SCOR	1	Sub code SYNC detection.
16	XPBV	1	PB V-sync.
17	XREFV	1	REF V-sync.
18	A LT	0	System control IC internal A-register latch.
19	B LT	0	System control IC internal B-register latch.
20	XBUSY	1	Communication control of the mode control microcomputer.
21	DOP	1	Not used.
22	VTM	1	Not used.
23	FLAG	1	Not used.
24	CDG MODE	1	Not used.
25	CLS CS	0	Clear scan data reading clock control.
26	SPDL PLS	0	Acceleration-deceleration control of the spindle.
27	CLT	0	System control IC C-register latch.
28	CMOD	1	+5V pull up.
29	CLS DT	1	Interval data between PB V and REF V.
30	SET DT	0	Serial data.
31	SET CK	0	Serial clock.
32	SPDL FGI	1	Spindle FGI.
33	G MUTE	1	Gray picture control when CLV scanning.
34	LD SEARCH	0	Spindle control when LD searching.
35	SPDL F/R	0	Spindle control.
36	CDG CONT	0	Video switching control. always "L".
37	I TJ	0	Trigger of 1 track jumping.
38	MWE	0	Not used.
39	MEM/XTHR	0	Not used.
40	MSTAT	0	Not used.

Pin No.	Pin Name	I/O	Function
41	MTJ	0	Multi track jumping control.
42	MTE ON/OFF	0	MTE correction ON/OFF control.
43	V LOAD	0	Video IC data load.
44	—	—	Not used. (Open)
45	PM OFF	0	Velocity error ON/OFF
46	—	—	Not used. (Open)
47	BLK LEVEL	0	Not used.
48	XFL	1	Focus lock. Lock: "L".
49	V _{CC}	—	+5v power supply.
50	LINE SEL	1	Communication control of the mode control microcomputer.
51	XCDG MUTE	0	Not used.
52	TILT UP	0	Tilt drive control.
53	TILT DOWN	0	Tilt drive control.
54	XMMI CS	0	Communication control of mode control microcomputer.
55	LOADING	0	Tray and chucking drive control.
56	UN LOADING	0	Tray and chucking drive control.
57	XCDG RST	0	Not used.
58	V _{SS}	—	GND.
59	LINE MUTE	0	Audio line output mute. MUTE: "L".
60	DIGITAL O MUTE	1	Digital O mute detection.
61	MC RST	0	Reset output of the system control microcomputer.
62	LD ON	0	Laser diode ON/OFF control of optical pickup. Lighted: "H".
63	XCD/LDCDV	0	Disc mode change. CD: "L", LD/CDV: "H".
64	XSV LT	0	Servo IC data latch.
65	SIDE A/XB	0	Disc side change. Side B: "L".
66	BRK INH	0	Tracking servo brake control.
67	LC SW1	1	Loading cam sensor 1.
68	XLD LED	0	LED lighted control for the disc sensor. Lighted: "L".
69	LC SW2	1	Loading cam sensor 2.
70	LC SW3	1	Loading cam sensor 3.
71	(SPDL FG2)	1	Not used.
72	TILT LIMIT	1	Tilt switch. Limit position detection.
73	TILT CTR	1	Tilt switch. Center position detection.
74	MECH SI	1	Communication data input with the mode control microcomputer.
75	—	—	Not used. (Open)
76	—	—	Not used. (Open)
77	MECH SI	1	Communication data input with mode control microcomputer.
78	MECH SO	0	Communication data output with mode control microcomputer.
79	MECH CLK	I/O	System control microcomputer communication clock.
80	T CNT	1	Traverse count.

**6-2. Terminal Function of System Control IC
(IC502: MBCG24692-4425 on the MB-717 Board)**

Pin No.	Pin Name	I/O	Function
81	—	—	Not used. (Open)
82	—	—	Not used. (Open)
83	V _{SS}	—	GND.
84	LD DET	I	LD disc size detection. 1.2inch LD: 3V when the disc detected, 8inch LD: 2.5V when the disc detected, CD or no disc: 0V when the disc detected.
85	CD/ALD	I	Thread position detection.
86	CDV/BLD	I	Thread position detection.
87	TRAY IM	I	Tray motor current detection.
88	XDSP LT	O	Audio DSP data latch.
89	MUTG	O	Audio DSP mute.
90	LOCK	I	Frame sync lock detection.
91	SENSE	I	Audio DSP sense information.
92	V _{CC}	—	+5V power supply.
93	—	—	Not used.
94	EMPHA ON/OFF	O	Emphasis ON/OFF control. Emphasis ON: "L".
95	A MUTE1	O	AFM audio output mode control.
96	A MUTE2	O	AFM audio output mode control.
97	XCX	O	CX noise reduction control. CX ON: "L".
98	DIGFIL MUTE	O	Digital filter mute. MUTE: "H".
99	XDSP SEL	O	Communication check control to audio DSP.
100	V _{CC}	—	+5V power supply.

Pin No.	Pin Name	I/O	Function
1	AUXO	O	Audio BIT CLOCK reverse output.
2	AUXI	I	Audio BIT CLOCK input.
3	V _{DD}	—	+5V power supply.
4	GND	—	GND.
5	PCDI	O	
6	XPFS	O	
7	HS	O	
8	DOC INH	O	
9	REF HC	O	Not used. (Open)
10	REF HE	O	
11	HMSK	O	
12	FH4	O	
13	SYEX	O	
14	FSC	O	
15	GND	I	GND.
16	XIN	I	Clock input. 4 Fsc=14.13MHz.
17	XOUT	O	Clock output.
18	VMUTE1	O	Playback V-sync delete signal when CLV scanning.
19	VMUTE2	O	Reference V-sync additional signal when CLV scanning.
20	VMUTE	O	Not used. (Open)
21	GBURST	O	
22	DLRH	O	Gray picture signal when CLV scanning.
23	GRH	O	
24	ME REFH	O	Not used. (Open)
25	XCD/LD CDV	O	
26	GVID	I	CLV scan gray picture control signal.
27	TBCH	I	Not used. (Open)
28	V _{DD}	—	+5V power supply.
29	GND	—	GND.
30	DS GATE	O	Philips code gate signal.
31	TBC REFH	O	Standard H-sync signal for TBC.
32	PBCS	I	Playback composite sync signal.
33	P CODE	I	Philips code input.
34	JMP TGL	O	Jump toggle signal.
35	TBC MUTE	O	TBC mute signal.
36	CONT2	O	TBC control signal. "H": line, "L": burst channel.
37	CGV	O	
38	CGH	O	Not used. (Open)
39	HD	I	
40	GND	—	GND.

Pin No.	Pin Name	I/O	Function
41	CLV1	O	
42	CLV2	O	Not used.
43	8T2	O	
44	PC OUT1	O	Spindle servo compulsory acceleration-deceleration output.
45	PC OUT2	O	Spindle servo H-sync mode error output.
46	SP UNLOCK	O	Mechanism control setting signal when the spindle is non-lock.
47	SP OFF	O	Output for spindle motor stop. Stop: "L".
48	HP OUT	O	Hold pulse output (for spindle servo).
49	CDY	O	Spindle mode setting. CDY-V part: "H".
50	FGMD	O	Spindle mode setting. FG mode: "H".
51	JUMP	O	Track jump control signal.
52	SV CLK	O	Clock output for servo IC.
53	V _{DD}	—	+5V power supply.
54	GND	—	GND.
55	X SET CK	O	Serial communication clock reverse output.
56	SP PBH1	I	Playback H-sync input for the spindle.
57	SP PBH0	O	Playback H-sync output for the spindle.
58	SP RHI	I	Standard H-sync input for spindle.
59	SP RHO	O	Standard H-sync output for spindle.
60	SET CLK	I	Serial communication clock input.
61	SET DT	I	Serial communication data input.
62	CLS DT	O	CLV scan V-sync counter data.
63	CLS CS	I	CLV scan data reading clock control.
64	CLT	I	Internal C-register latch.
65	GND	—	GND.
66	BLT	I	Internal B-register latch.
67	ALT	I	Internal A-register latch.
68	REFV	O	Reference V-sync signal.
69	PBV	O	Playback V-sync signal.
70	TBC HOLD IN	I	TBC mute control.
71	SP LOCK	O	Spindle servo lock detection.
72	JP CTL	I	Track jump change signal.
73	FQ SEL	I	Philips code / Sub Q data switching.
74	FQ ACK	I	Philips code / Sub Q data output control.
75	F REQ	O	Frame No. data reading possibility.
76	M RST	I	System reset.
77	FSC 2	O	2 Fsc=7.16MHz.
78	V _{DD}	—	+5V power supply.
79	GND	—	GND.
80	FH2	O	2 Fh=31.5kHz.

Pin No.	Pin Name	I/O	Function
81	DSP SEL	I	Clock control signal for audio DSP.
82	MECH CLK	I/O	Mode control microcomputer / System control microcomputer communication clock.
83	MECH S01	I	System control microcomputer to mode control microcomputer communication data.
84	MECH S10	O	Mode control microcomputer to system control microcomputer communication data.
85	FQ D OUT	O	Frame No. / Sub Q data output.
86	LINE SEL	I	Between mode control microcomputer and system control microcomputer communication control.
87	MMI CLK	I	System control microcomputer to mode control microcomputer communication clock.
88	MMI S0	O	System control microcomputer to mode control microcomputer communication data.
89	MMI S1	I	Mode control microcomputer to system control microcomputer communication data.
90	GND	—	GND.
91	SUBQ CLK	O	Sub Q clock output.
92	SUB Q	I	Sub Q data input.
93	DSP CK	O	Clock output to audio DSP.
94	L RCK	I	Digital sound L/R clock input.
95	PC MD	I	Digital sound data input.
96	PC MDI	O	Digital sound data reverse output.
97	BCK INV	O	Digital sound bit clock reverse output.
98	BCK	I	Digital sound bit clock input.
99	PC SEL	I	Internal C-register select. (Open)
100	TEST	I	Test mode setting. Fixedly "L".

6-3. Terminal Function of Mode Control Microcomputer (IC102: MB89094 on the FP-740 Board)

Pin No.	Pin Name	I/O	Function
1	CL1	0	Not used. (Open)
2	CL0	1	Not used. Connected to GND.
3	GND	1	GND.
4	GND	1	GND.
5	XO	1	Terminal for the crystal oscillator (8MHz).
6	XI	0	GND. terminal of power supply.
7	GND	—	Reset input terminal. "L": reset.
8	RESET	1	Segment B. "L": light. 7 segments LED drive output.
9	SEG B	0	Segment F. "L": light. 7 segments LED drive output.
10	SEG F	0	Segment A. "L": light. 7 segments LED drive output.
11	SEG A	0	Segment G. "L": light. 7 segments LED drive output.
12	SEG G	0	Segment C. "L": light. 7 segments LED drive output.
13	SEG C	0	Segment E. "L": light. 7 segments LED drive output.
14	SEG E	0	Segment D. "L": light. 7 segments LED drive output.
15	SEG D	0	Segment control. 7 segments LED drive output.
16	7 CTR	0	EEPROM writing busy. "L": on writing.
17	EPBUSY	1	Tip select of communication with the system control microcomputer. "L": under communication.
18	MMT CS	1	Reference V-sync signal input.
19	REFV	1	
20	N.C	—	
21	N.C	—	
22	N.C	—	
23	N.C	—	
24	N.C	—	Not used. (Open)
25	N.C	—	
26	N.C	—	
27	N.C	—	
28	CMOD	1	Start mode select input after reset release. Fixedly "H".
29	SI	1	EEPROM serial transfer data input.
30	SO	0	EEPROM serial transfer data output.
31	SCK	0	EEPROM serial transfer clock output.
32	SIRCS IN	1	Sires data input.
33	CG CS	0	Character generator serial transfer chip select. "L": under communication.
34	MRSI	0	Reset output of system control microcomputer. "L": reset.
35	BUSY	0	Busy signal for serial communication.
36	N.C	—	Not used. (Open)
37	P. CONT	0	Power ON/OFF control of the main unit. "H": power on.
38	AU MUTTE	0	Audio mute. "H": mute.
39	P1	—	
40	P2	—	Not used. Connected with P1 through P11.

Pin No.	Pin Name	I/O	Function
41	P3	—	
42	P4	—	
43	P5	—	
44	P6	—	Not used. Connected with P1 through P11.
45	P7	—	
46	P8	—	
47	P9	—	
48	P10	—	
49	Vcc	—	EVER +5V power supply
50	P11	—	Not used. connected with P1 through P11
51	P12	—	Not used. connected with P12 through P32
52	P13	—	
53	N.C	—	Not used. (open)
54	P14	—	
55	P15	—	Not used. connected with P12 through P32
56	P16	—	
57	P17	—	
58	Vss	—	GND
59	P18	—	
60	P19	—	
61	P20	—	Not used. connected with P12 through P32
62	P21	—	
63	P22	—	
64	P23	—	
65	P24	—	
66	P25	—	
67	Vcc	—	EVER +5V power supply
68	P26	—	
69	P27	—	
70	P28	—	
71	P29	—	Not used. connected with P12 through P32
72	P30	—	
73	P31	—	
74	P32	—	
75	LINE SEL	0	Switch SLC and OSD communication (H: communicate with SLC)
76	N.C	—	Not used. (open)
77	MECH SO	1	32 bites serial transfer data input
78	MECH SI	0	32 bites serial transfer data output
79	MECH CLK	0	32 bites serial transfer clock
80	DOOR SW	1	Door switch input

Pin No.	Pin Name	I/O	Function
81	N.C	—	
82	N.C	—	Not used. (open)
83	AVss	—	GND
84	PSMON 1	I	Power monitor 1
85	PSMON 2	I	Power monitor 2
86	AD1	I	Unit key input
87	AD2	I	Unit key input
88	PSMON 3	I	Power monitor 3
89	N.C	—	Not used. (open)
90	POWER OFF	O	Power reset output (H: reset)
91	N.C	—	Not used. (open)
92	AVcc	—	EVER +5V power supply
93	PLAY LED	O	Play LED output (L: lighting)
94	AR LED	O	Auto resume LED output (L: lighting)
95	SA LED	O	Side A LED output (L: lighting)
96	SB LED	O	Side B LED output (L: lighting)
97	EP_WCTR	O	EP2ROM write control (L: writing communication is going)
98	EP2_CS	O	EP2ROM CHIP select (L: communication is going)
99	N.C	—	Not used. (open)
100	Vcc	—	EVER +5V power supply

SECTION 7

ELECTRICAL ADJUSTMENTS

During the adjustment, see the parts arrangement diagram for adjustments on page from 7-18.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M23A)
- 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-MR1 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-MR1 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
PAUSE 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.
B side 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 stop key or the play 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	STOP key (main unit) and 0 key (remote control unit) STOP 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-MR1 IN THE DEBUGGING MODE".
1 2	STOP key (main unit) and 0 key (remote control unit) STOP key (main unit) and +10 key (remote control unit)	(2) 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	STOP key (main unit) and 0 key (remote control unit) STOP key (main unit) and 0 key (remote control unit)	(3) Make mechanism controller time out effective. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	STOP key (main unit) and 0 key (remote control unit) STOP key (main unit) and REPEAT key (remote control unit)	(4) EEPROM Clear The contents of the EEPROM's debugging mode data, etc. are all cleared. This is effective only turned the power on.

7-4. OPERATION OF THE MDP-MR1 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-MR1. 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-MR1 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 violet. 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-MR1 IN THE DEBUGGING MODE".

3. Quitting the service mode

To quits 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 pause 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 0 key and the 8 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 PLAY or PAUSE key 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 7 segments LED is turned off, some keys are not effective.

Be sure to turn on the 7 segments LED by pressing the 0 key and then the 9 key on the remote control unit while holding down the STOP key on the main 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
STOP	Stop special operations

The following are the details of the special key functions available with the MDP-MR1

(1) PLAY key for focusing search

Focusing search operation can be carried out repeatedly by holding down 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.

(2) 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.

(3) 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.

(4) PAUSE key for tilt servo ON

The tilt servo is activated while holding down 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.

7-5 OPERATION OF THE MDP-MR1 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-MR1 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.
- (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 and then the STOP key on the remote control unit while holding down the STOP key or the PLAY 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 5. (1) "[FRAME/TIME] key for displaying version No. of the microprocessor".

So as to valid the debugging command at the debugging mode, while pressing the STOP key or the PLAY key on the main unit, press the 0 key and the 8 key on the remote control unit to appear the green background on the picture.

So as to invalid the debugging command, while pressing the STOP key or the PLAY key on the main unit, press the 0 key and the 9 key on the remote control unit.

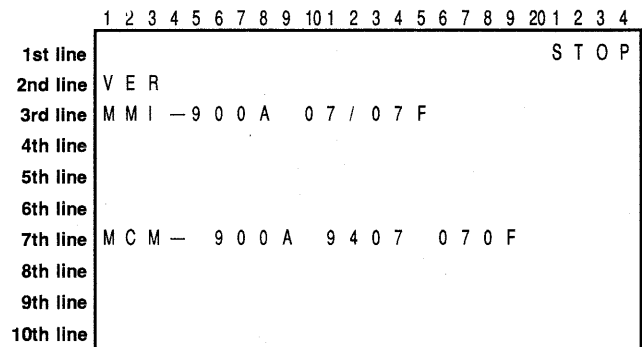


Fig. 7-1. Initial display in the debugging mode

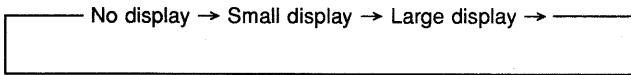
3. Quitting the debugging mode

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.

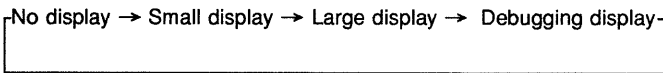
The same key operation as “2. Entering the debugging mode” also sets the mode back in the normal operation mode.

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 screen 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 screen 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 changing the screen background color to green 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
[PROGRAM]	Information of operation
[REPEAT]	

(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-900A 07/07F” and that of the mechanism controller is “MCM-900A 94/0707F”.

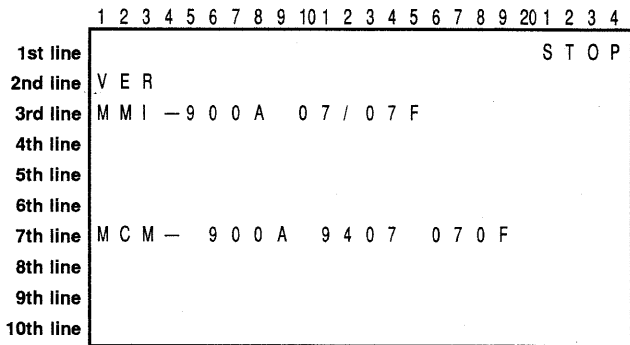


Fig. 7-2. Version No. of the microprocessor

(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 the 2nd) line, the last stored data appears at the right end on the 2nd (or the 1st respectively) 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																										
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 codes sent from the mechanism controller to the mode 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 8 histories using only one line 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".

1st line	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2nd line	E	M	G		H	I	S	T													S	T	O	P
3rd line					6	0	7	4		6	4	6	1		6	4	6	4		7	4	F	F	
4th line																								
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
08	No movement of the front door.	Power off
09	The door opens without the tray opens.	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.

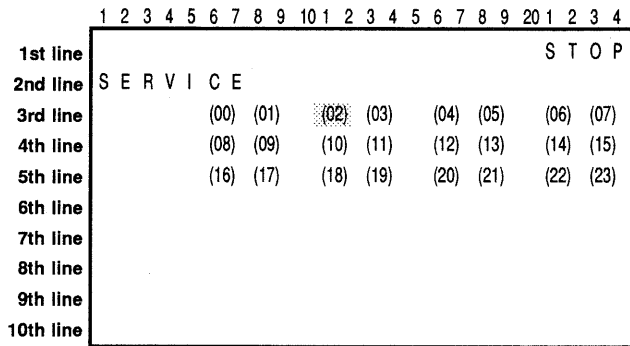


Fig. 7-5. Information for repair service sent from the mechanism controller

- 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.

```

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 T R A P   F L A G
3rd line           8 1 8 0
4th line
5th line
6th line
7th line
8th line
9th line
10th line
  
```

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.

```

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 K E Y - R M C
3rd line           1 A F F
4th line
5th line
6th line
7th line
8th line
9th line
10th line
  
```

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
0B	Search/sledding
0C	Frame/time
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	Program
34	ACS in normal direction
35	ACS in reverse direction
39	Numeral +10
3A	Screen display
40	Analog audio/CX
44	Return
47	l/one side/double side
5D	side A
5E	side B
64	Numeral 10
65	Numeral 11
66	Numeral 12
67	Numeral 13
77	Numeral 14
79	Numeral 15
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	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1st line																							S	T	O	P
2nd line	M	E	S	S																						
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)
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)

(8) [PROGRAM] key and [REPEAT] key for displaying the information of operation

While indicating the microcomputer version number, to press in order the PROGRAM key and the REPEAT key of the remote control unit, the information of operation is displayed on the screen.

On the third line, that number indicates the optical operating time. From the fourth line to the ninth line, that number indicates the number of times which are received SIRCS command at hexadecimal digit.

	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	O	P	E	R	A	T	E																				
3rd line	O	P	T		0	0	1	2		3	0	4	7														
4th line	O	/	C		0	0	1	B		0	0	0	E														
5th line	S	T	O	P		0	0	3	D		0	0	2	2													
6th line	P	L	A	Y		0	0	1	4		0	0	3	9													
7th line	P	A	U	S	E		0	0	0	9		0	0	2	0												
8th line	S	A				0	0	0	4		0	0	0	F													
9th line	S	B				0	0	2	A		0	0	1	2													
10th line																											

Fig. 7-9. Information of Operation

In the case of Fig. 7-9, the optical operating time was shown 12 hours 30 minutes 47 seconds.

And, the received SIRCS command is counted the main unit key and the remote control key separately.

In the case STOP key, the number of received times is 3Dh = 61 times from the main unit key and is 22h = 34 times from the remote control unit key.

7-6. POWER SUPPLY ADJUSTMENT

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

Mode	Stop
Measurement point	Pin ② of CN052 (Pin ⑦, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR201
Specified value	5.0 ± 0.3Vdc

Adjustment method :

- 1) Adjust VR201 to 5.0 ± 0.3V

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

Mode	Stop
Measurement point	Pin ④ of CN052 (Pin ③, GND)
Measuring equipment	Digital voltmeter
Adjusting element	VR202
Specified value	5.0 ± 0.3Vdc

Adjustment method :

- 1) Adjust VR202 to 5.0 ± 0.3V

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

Mode	Stop
Measuring equipment	Digital voltmeter
UNREG +16V check	
Measurement point	Pin ⑪ 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 ⑰ 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.

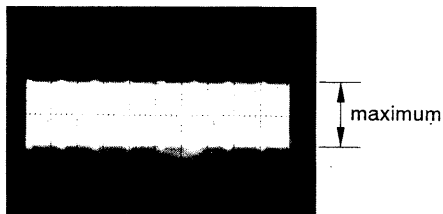


Fig. 7-10.

- 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.

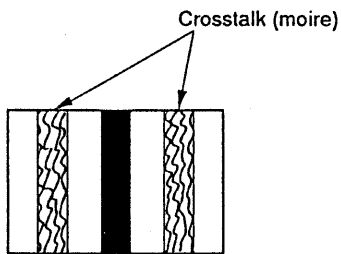


Fig. 7-11.

- 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.

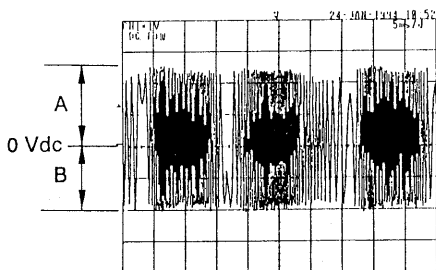


Fig. 7-12.

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.

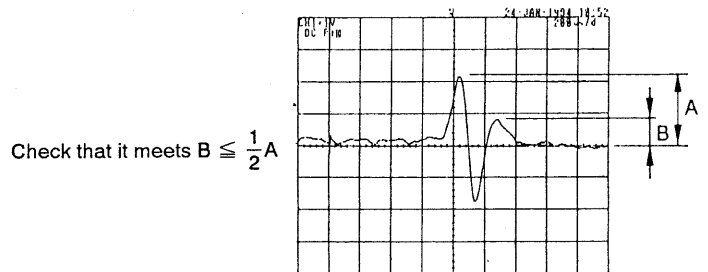


Fig. 7-13.

Check the TRACKING BALANCE.

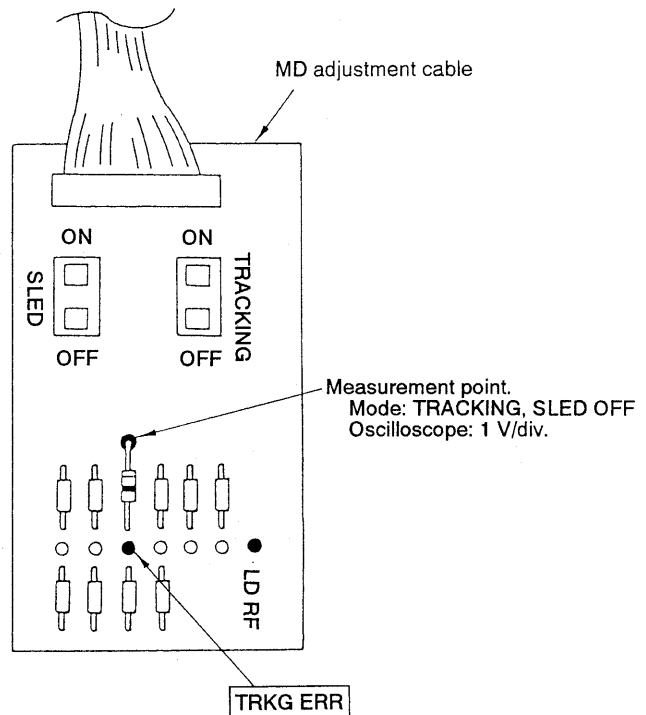
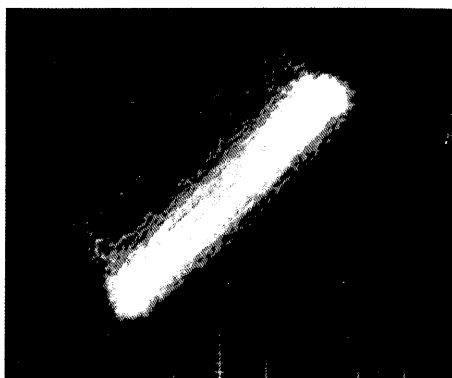


Fig. 7-14.

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) 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. 7-15.

- 4) 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.

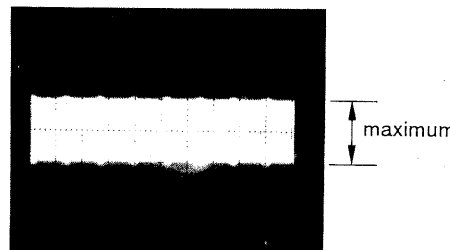


Fig. 7-16.

- 5) Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the item 4).
- 6) 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.

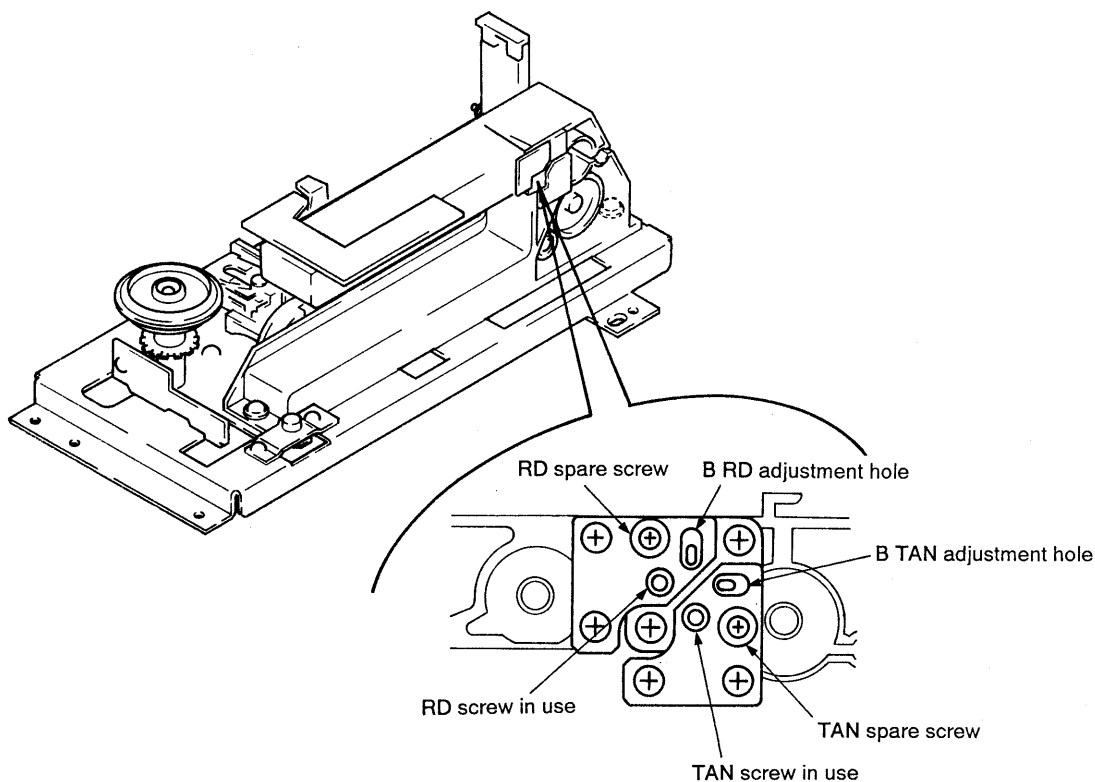


Fig. 7-17.

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.

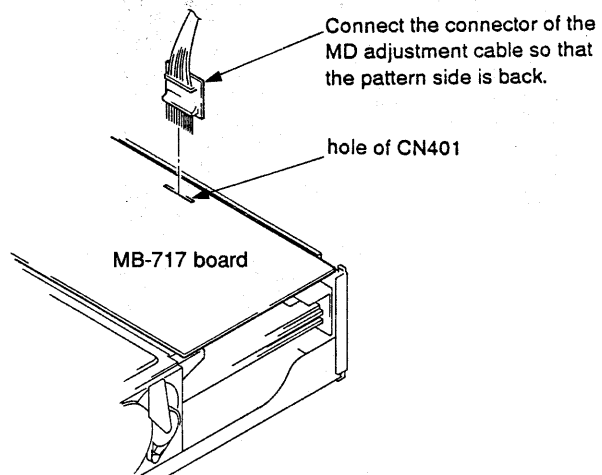


Fig. 7-19.

7-10-2. CD Adjustment

1) Loosen the screws of feed base block assembly.

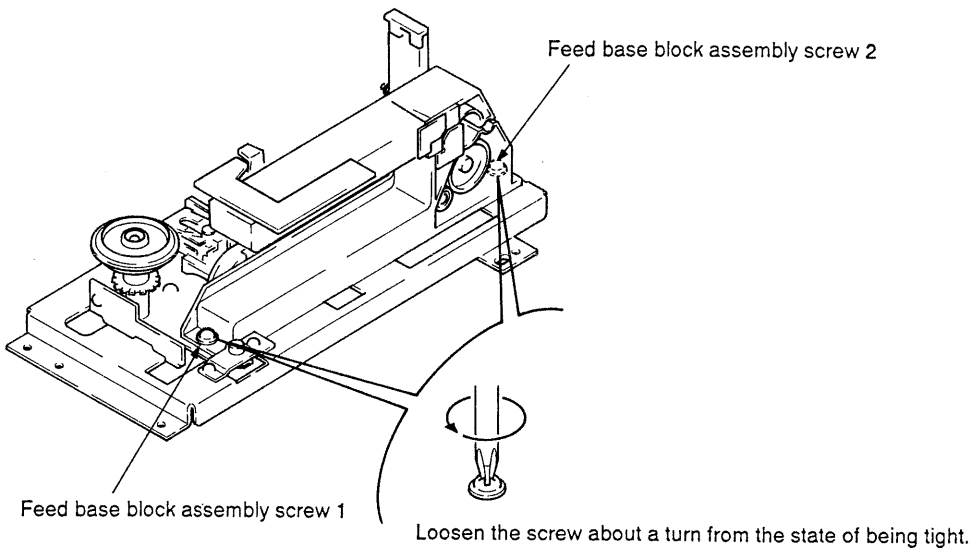


Fig. 7-20.

- 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.

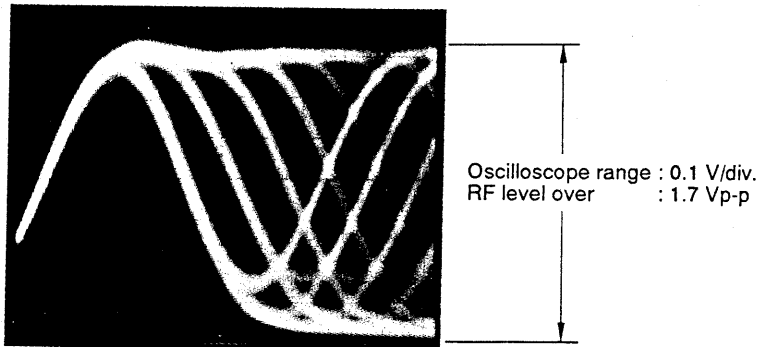


Fig. 7-21.

- 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)

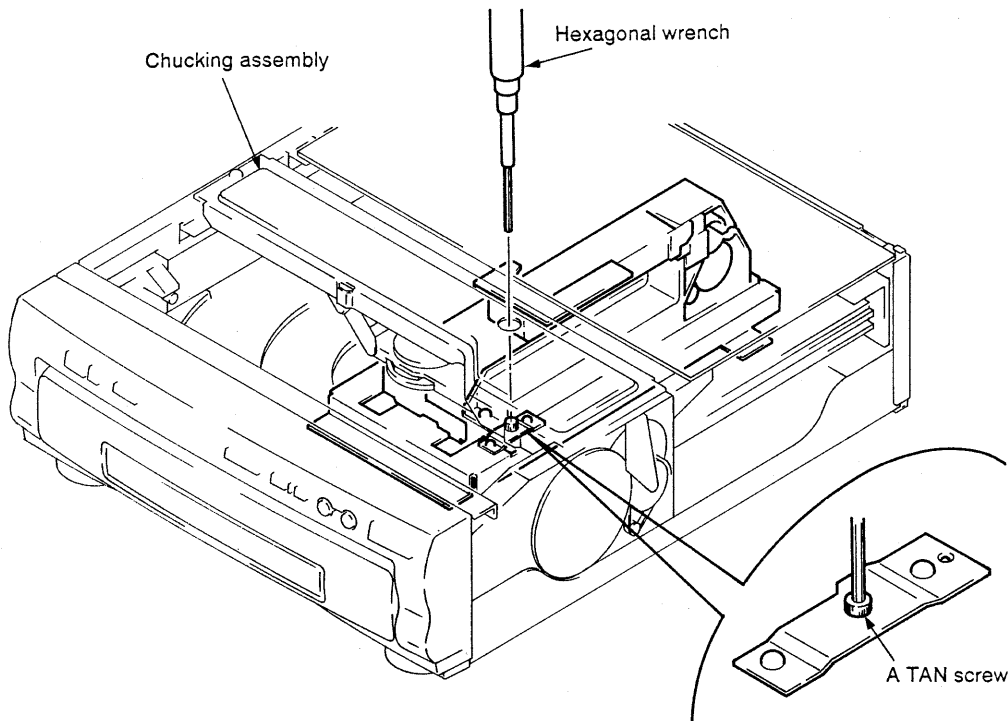


Fig. 7-22.

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

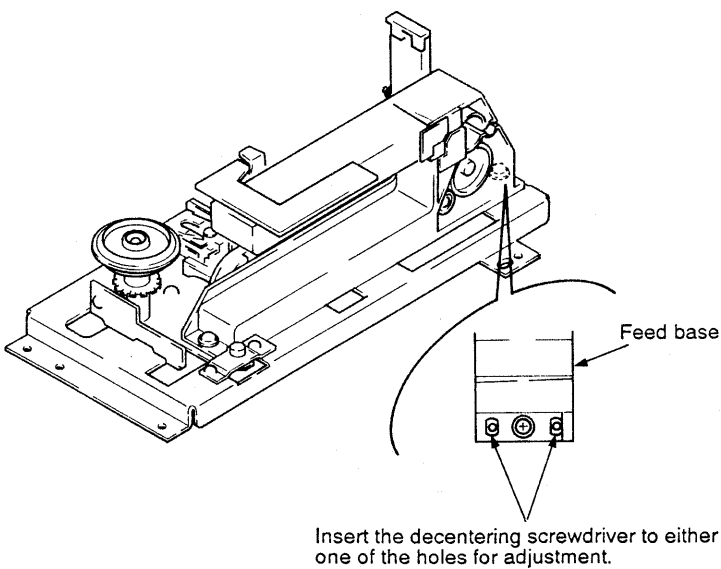
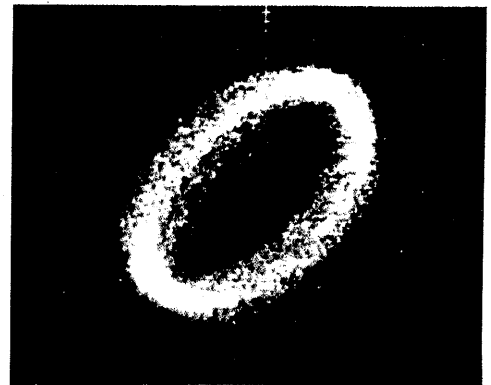


Fig. 7-23.

- 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.

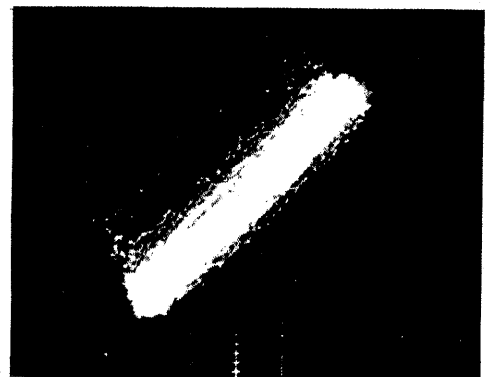
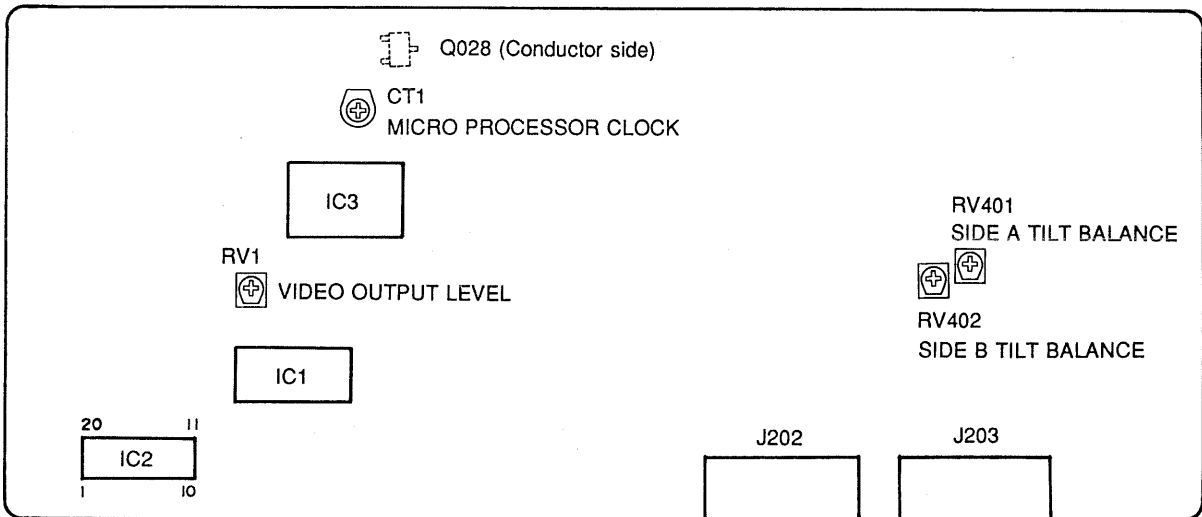


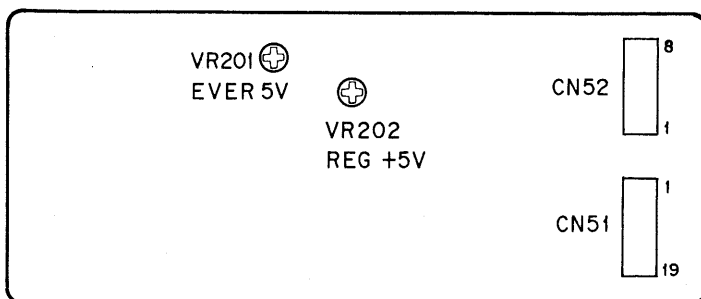
Fig. 7-24.

7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)



POWER SUPPLY BLOCK (Component side)



MDP-MR1

RMT-M23A/M23B

SONY[®]

SERVICE MANUAL

E Model
Hong Kong Model
Taiwan Model
Chinese Model
ME Model

SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : POWER BLOCK addition
Board change

- A schematic diagram, a printed wiring board and a parts list of POWER BLOCK are added.
- As the end of number of FP-740 board is changed from -12 to -13, a printed wiring board diagram is added.
- Change in some parts of the MB-717 board.

● PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS

✂ : indicates corrected portion

INCORRECT	CORRECT												
<p>FP-740 BOARD (Page 4-35) Location: I-6</p>	<p>FP-740 BOARD (Page 4-35) Location: I-6</p>												
<p>FP-740 BOARD (CONDUCTOR SIDE) (Page 4-32)</p>	<p>FP-740 BOARD (CONDUCTOR SIDE) (Page 4-32)</p>												
<table border="1"> <thead> <tr> <th>Ref.No.</th> <th>Part No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>FB103</td> <td>1-414-135-11</td> <td>INDUCTOR CHIP 0uH</td> </tr> </tbody> </table>	Ref.No.	Part No.	Description	FB103	1-414-135-11	INDUCTOR CHIP 0uH	<table border="1"> <thead> <tr> <th>Ref.No.</th> <th>Part No.</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>JR101</td> <td>1-216-295-91</td> <td>CONDUCTOR CHIP (2012)</td> </tr> </tbody> </table>	Ref.No.	Part No.	Description	JR101	1-216-295-91	CONDUCTOR CHIP (2012)
Ref.No.	Part No.	Description											
FB103	1-414-135-11	INDUCTOR CHIP 0uH											
Ref.No.	Part No.	Description											
JR101	1-216-295-91	CONDUCTOR CHIP (2012)											

MDP-MR1

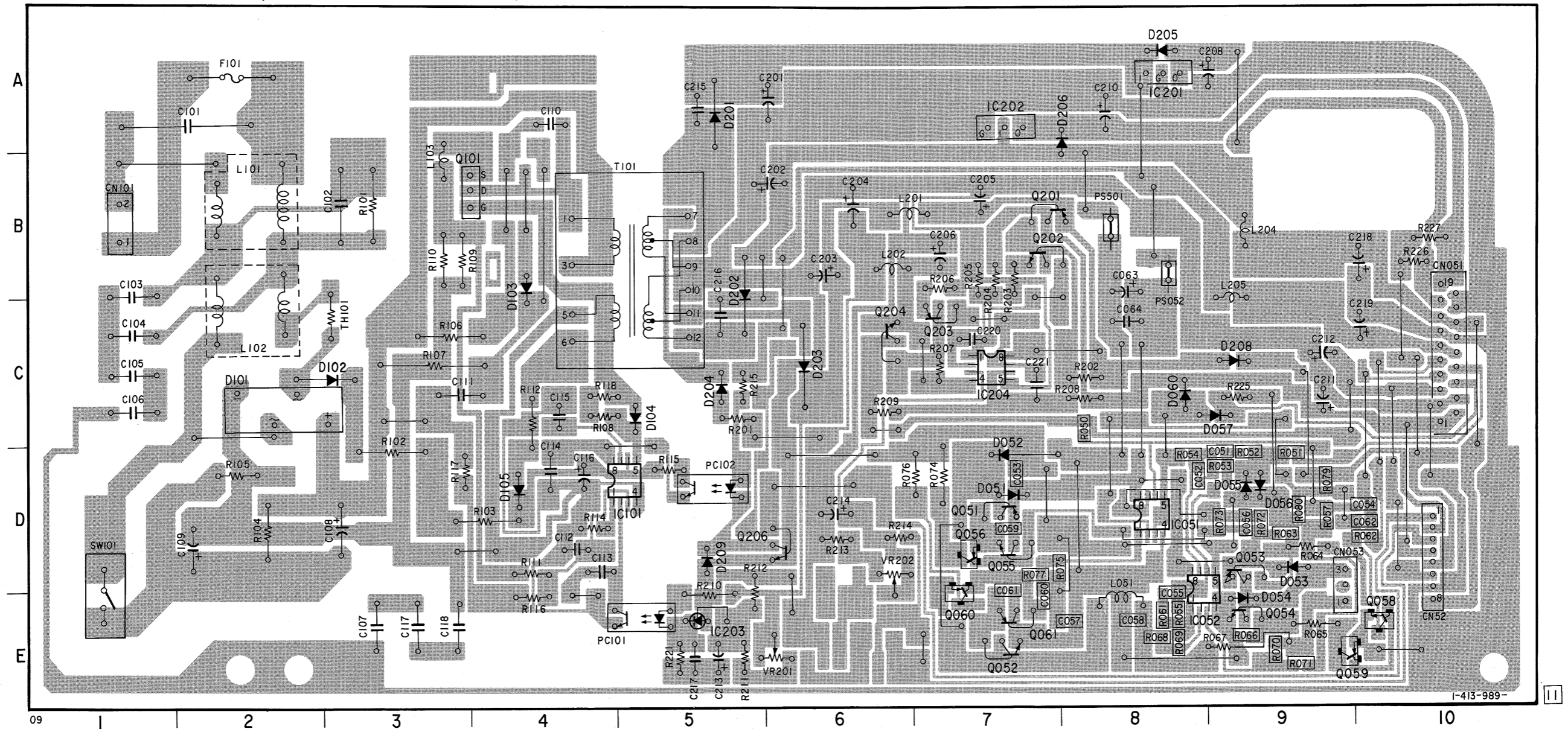
POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) PRINTED WIRING BOARD

— Ref. No. POWER BLOCK: 5000 series —

POWER BLOCK (E, Taiwan, ME MODEL) (SR-539 BOARD)

POWER BLOCK

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

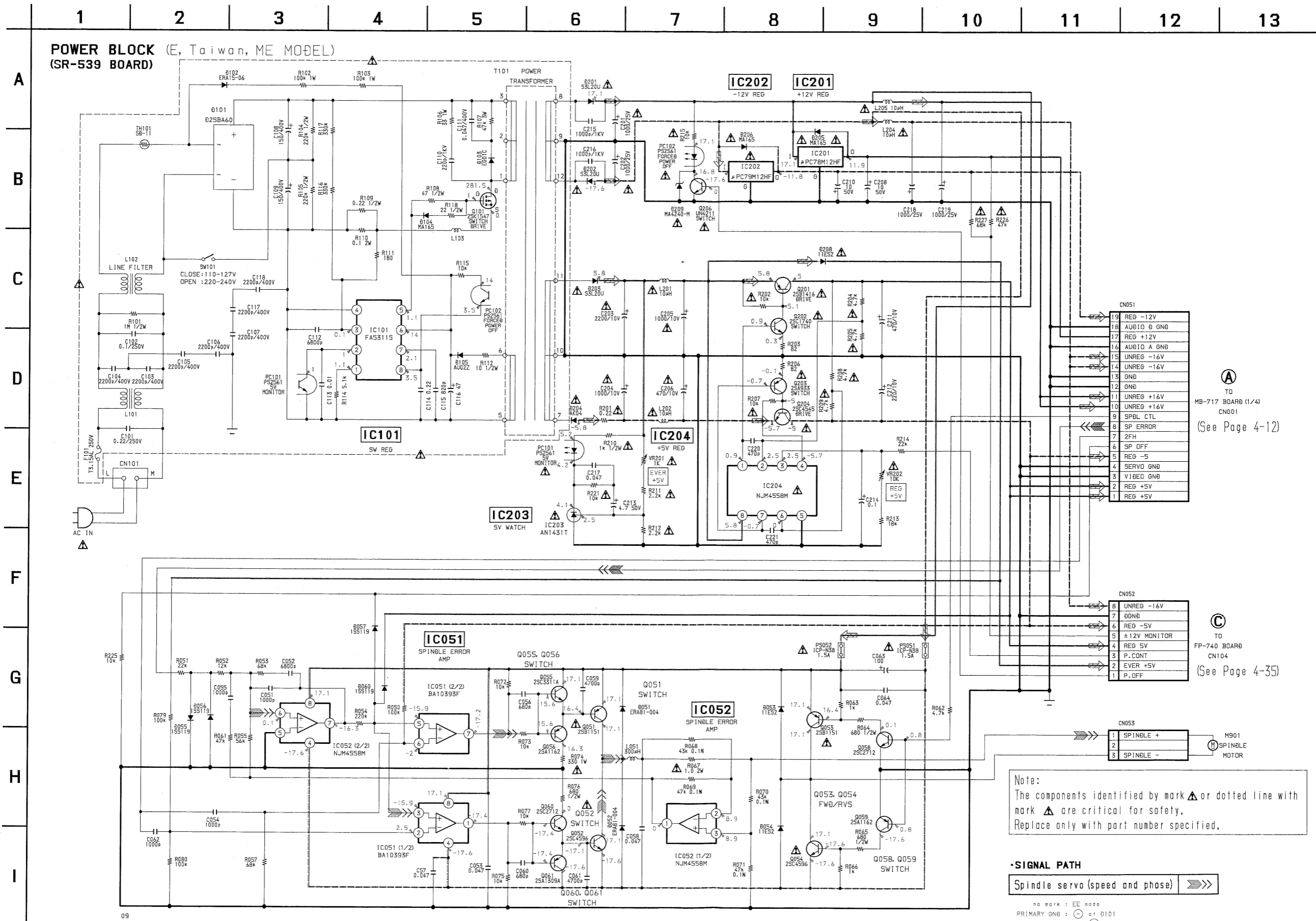


I-413-989-

11

POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) SCHEMATIC DIAGRAM

— Ref. No. POWER BLOCK: 5000 series —



CN051

19	REG -12V
18	AUDIO B GND
17	REG +12V
16	AUDIO A GND
15	UNREG -16V
14	UNREG -16V
13	GND
12	GND
11	UNREG +16V
10	UNREG +16V
9	SPBL CTL
8	SP ERROR
7	2FH
6	SP OFF
5	REG -5V
4	SERVO GND
3	VIDED GND
2	REG +5V
1	REG +5V

TO MB-717 BOARD (1/4) CN001 (See Page 4-12)

CN052

8	UNREG -16V
7	DGND
6	REG -5V
5	±12V MONITOR
4	REG 5V
3	P.CONT
2	EVER +5V
1	P.OFF

TO FP-740 BOARD CN104 (See Page 4-35)

CN053

1	SPINDLE +
2	SPINDLE
3	SPINDLE -

M901 SPINDLE MOTOR

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

•SIGNAL PATH
Spindle servo (speed and phase) **➡➡➡**

no mark : EE mode
PRIMARY GND : **⊙** of D101
SECONDARY GND : Pin **Ⓜ** of CN051

MDP-MR1

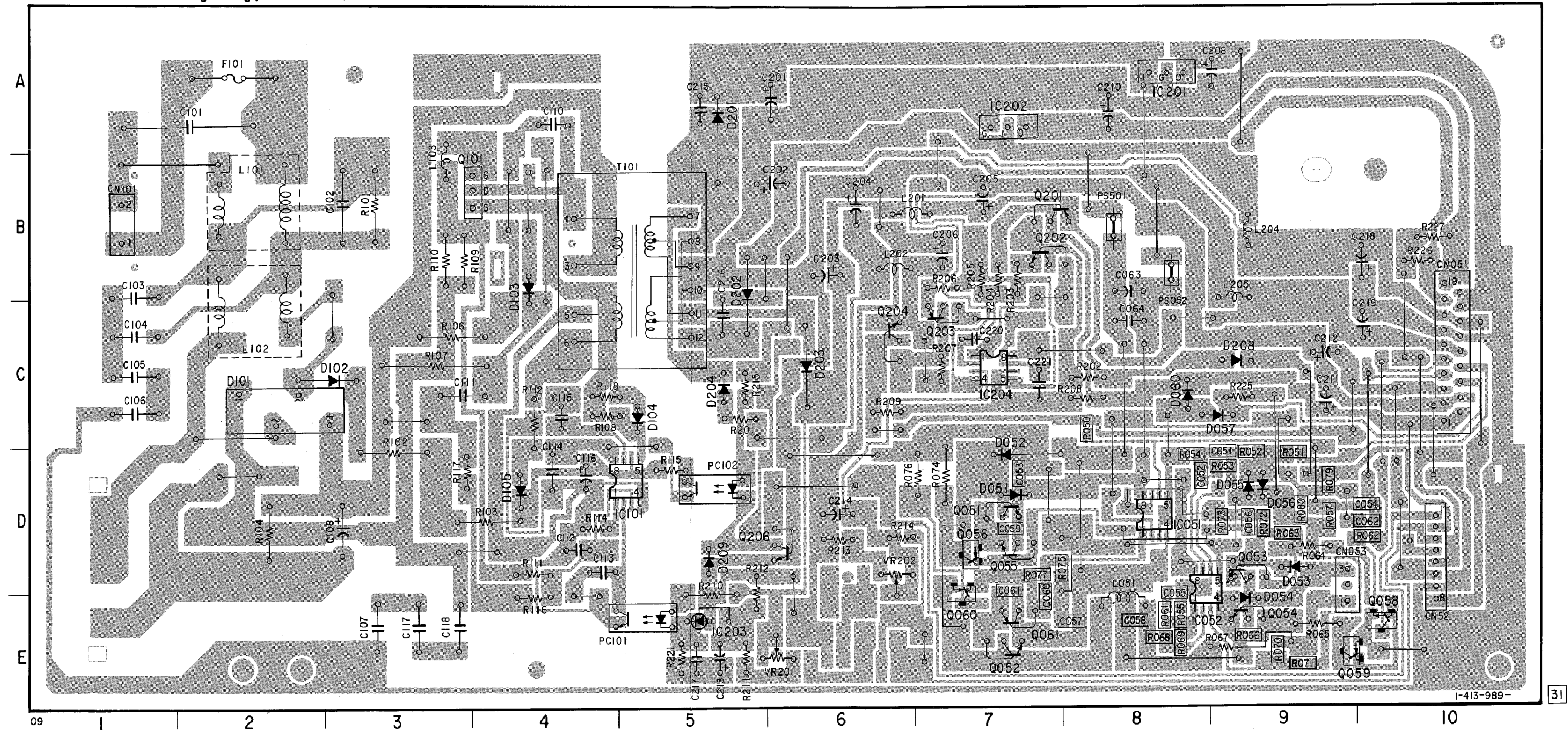
POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) PRINTED WIRING BOARD

— Ref. No. POWER BLOCK: 5000 series —

POWER BLOCK (Hong Kong, Chinese MODEL) (SR-54I BOARD)

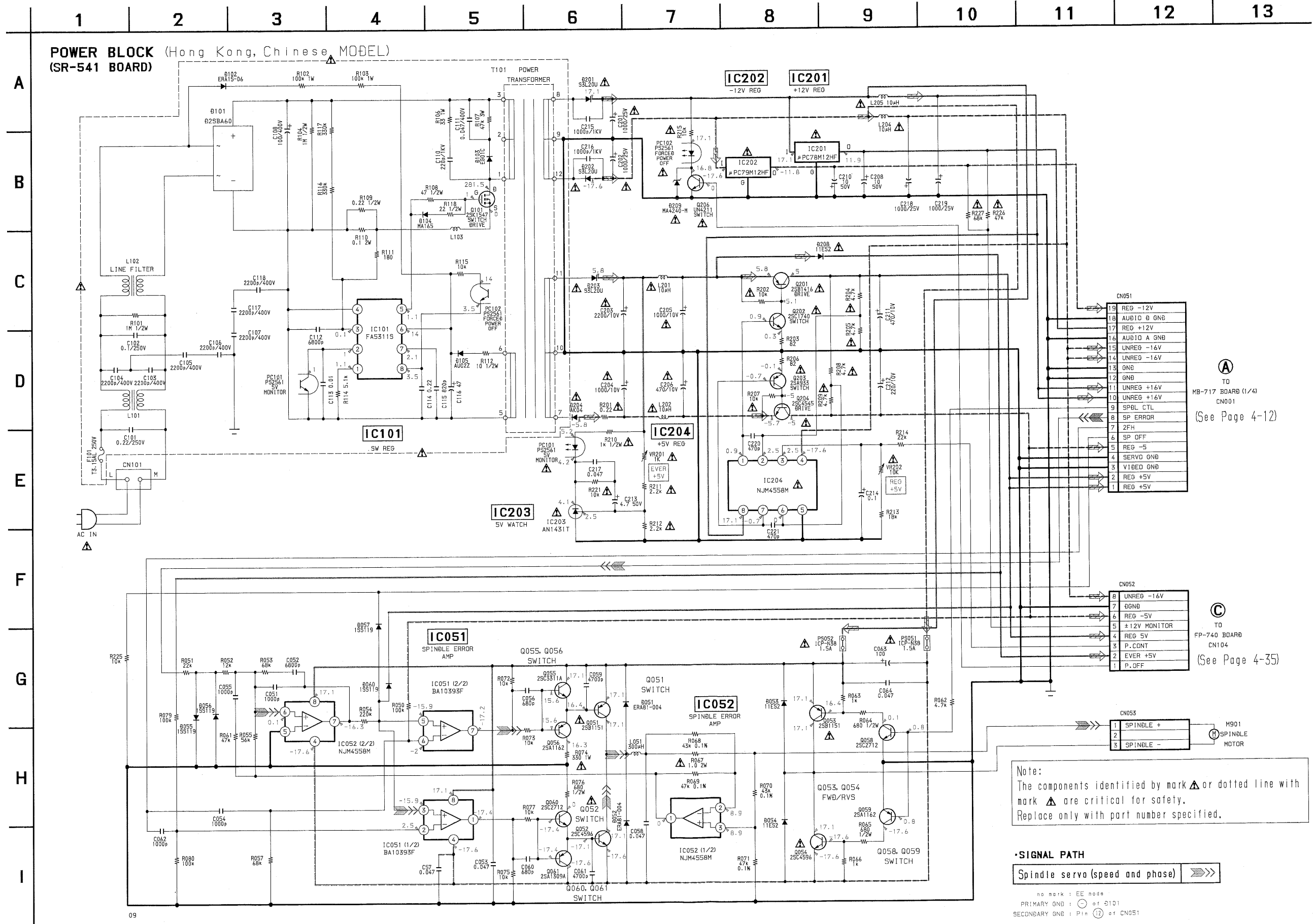
POWER BLOCK

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



POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) SCHEMATIC DIAGRAM

— Ref. No. POWER BLOCK: 5000 series —



Only the following parts are different for the MB-717 board

Ref. No.	Former						New					
	Part No.	Description					Part No.	Description				
C033	1-163-129-00	CERAMIC CHIP	330PF	5%	50V		1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C447	1-163-249-11	CERAMIC CHIP	82PF	5%	50V		1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	
IC501	8-759-293-56	IC	MB89094PF-G-131-BND				8-759-336-04	IC	MB89094PF-G-135-BND			
R063	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R065	1-216-097-00	METAL CHIP	100K	5%	1/10W		1-216-091-00	METAL CHIP	56K	5%	1/10W	
R067	1-216-073-00	METAL CHIP	10K	5%	1/10W		1-216-059-00	METAL CHIP	2.7K	5%	1/10W	
R497	1-216-085-00	METAL CHIP	33K	5%	1/10W		1-216-097-00	METAL CHIP	100K	5%	1/10W	
R499	1-216-093-00	METAL CHIP	68K	5%	1/10W		1-216-090-00	METAL CHIP	51K	5%	1/10W	
R913	1-216-109-00	METAL CHIP	330K	5%	1/10W		1-216-103-91	METAL CHIP	180K	5%	1/10W	
R918	1-216-099-00	METAL CHIP	120K	5%	1/10W		1-216-103-91	METAL CHIP	180K	5%	1/10W	
R921	1-216-099-00	METAL CHIP	120K	5%	1/10W		1-216-103-91	METAL CHIP	180K	5%	1/10W	

SECTION 5 REPAIR PARTS LIST

5-1. EXPLODED VIEWS

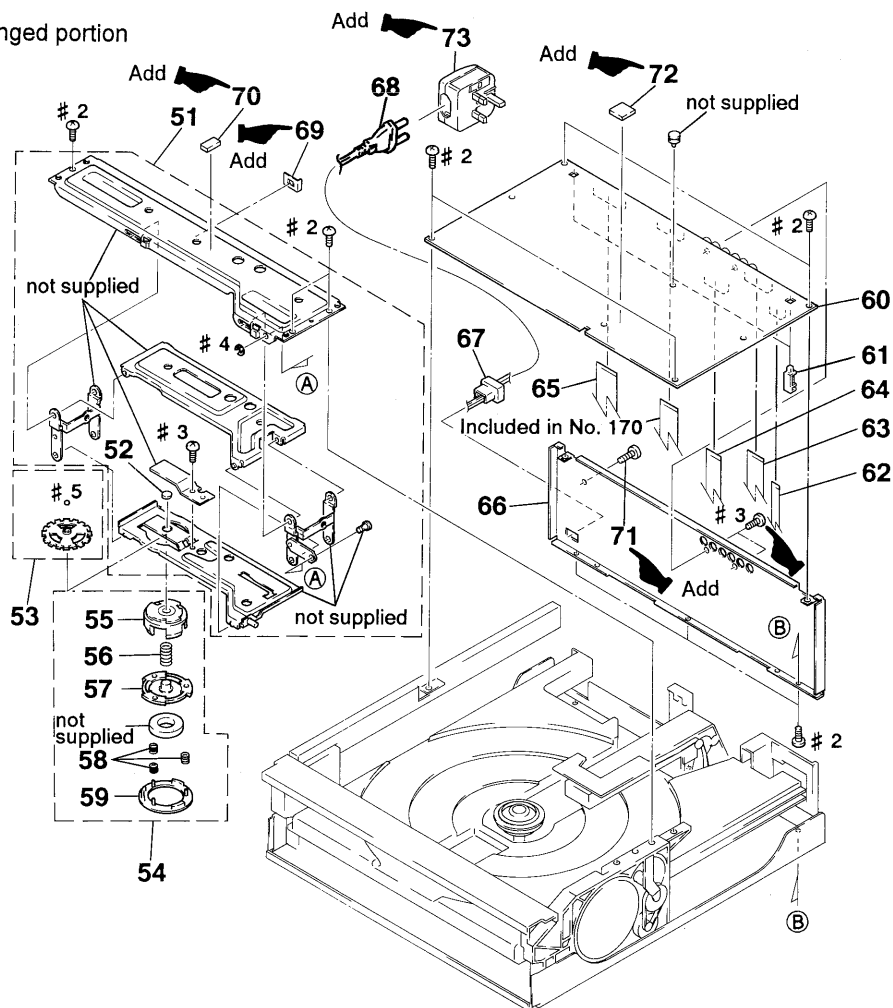
NOTE:

- -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.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.
- Abbreviation
HK : Hong Kong model
TW : Taiwan model

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

5-1-2. CHUCKING BLOCK ASSEMBLY

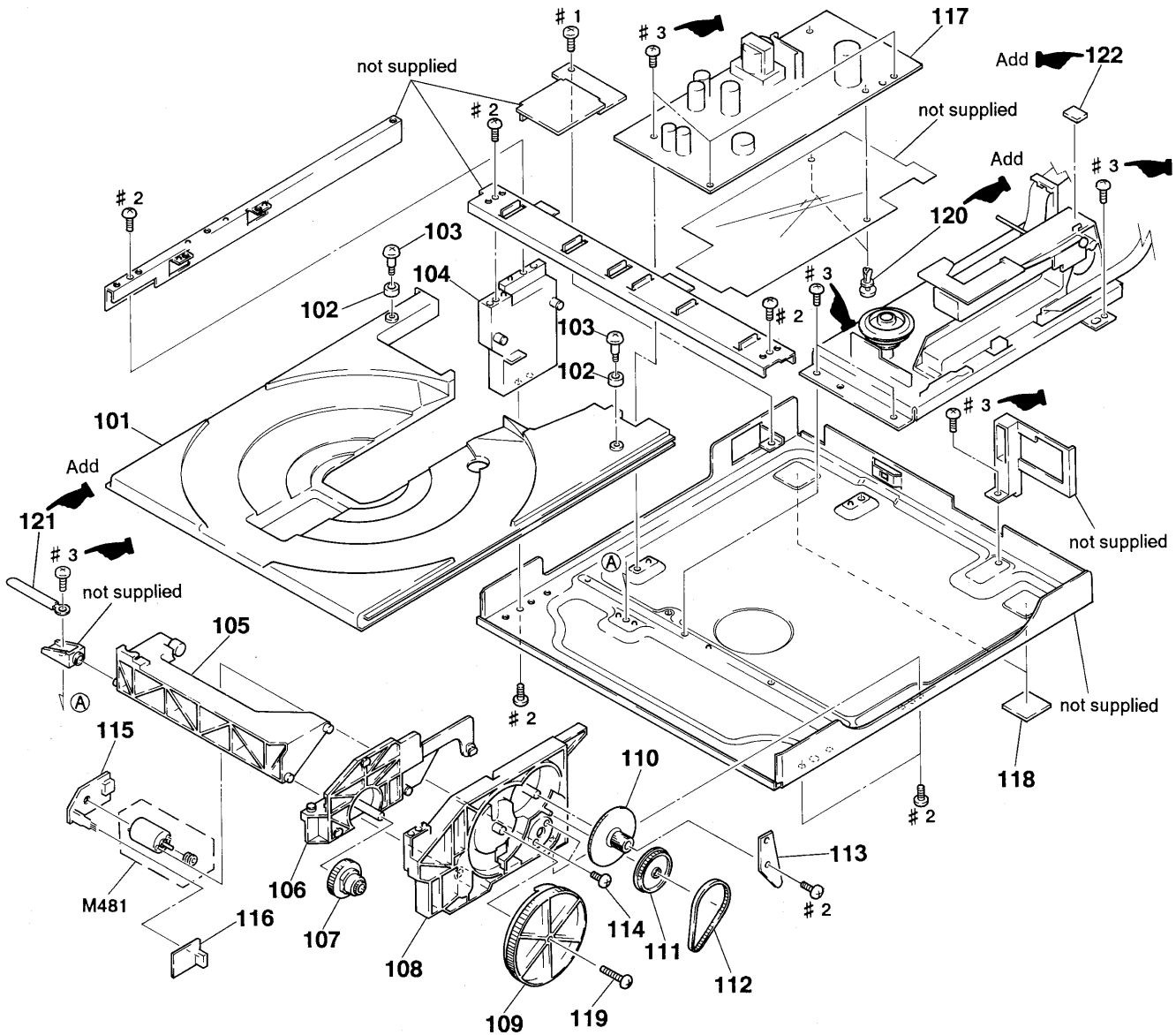
: Indicates changed portion



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 51	A-6415-863-A	CHUCKING, SUB BLOCK ASSY		64	1-769-147-11	FLAT CABLE (FMD-003) (12 CORE)	
52	3-953-392-01	RETAINER, THRUST		65	1-769-146-11	FLAT CABLE (FMP-002) (19 CORE)	
53	X-3942-787-1	PLATE ASSY, TOP		* 66	3-961-079-01	PANEL, REAR (EXCEPT TW)	
54	A-6415-644-G	CHUCK BLOCK ASSY		* 66	3-961-079-21	PANEL, REAR (TW)	
55	X-3942-776-1	HOLDER ASSY, MAGNET		*67	3-703-244-00	BUSHING (2104), CORD (EXCEPT TW)	
56	3-953-291-01	SPRING (1), COMPRESSION		*67	3-703-571-11	BUSHING (4516), CORD (TW)	
57	3-953-288-01	PLATE, CHUCKING		68	1-575-912-21	CORD, POWER (EXCEPT TW)	
58	3-953-290-01	SPRING (2), COMPRESSION		*68	1-751-555-11	CORD, POWER (TW)	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER		*69	3-962-802-01	HOLDER, STOPPER	
* 60	A-6423-233-A	MB-717 BOARD, COMPLETE (EXCEPT TW)		70	9-911-840-XX	CUSHION (U)	
* 60	A-6423-270-A	MB-717 BOARD, COMPLETE (TW)		71	3-710-901-11	SCREW, TAPPING	
* 61	3-961-116-01	GUIDE, MB		72	3-728-465-01	CUSHION, OPT	
62	1-769-148-11	FLAT CABLE (FMM-001) (7 CORE)		73	1-770-019-11	ADAPTOR, CONVERSION 3P (HK)	
63	1-769-149-11	FLAT CABLE (FUF-002) (11 CORE)					

5-1-3. MAIN CHASSIS ASSEMBLY

: Indicates changed portion



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	Remark	Ref. No.	Part No.	Description	Remark
101	A-6415-859-A	TRAY (90E) 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-3944-523-1	STAY (L) ASSY, F		* 116	A-6423-236-A	SW-732 BOARD, COMPLETE	CORRECT
* 105	X-3944-520-1	FRAME ASSY, TRAY UD		△117	1-413-989-11	POWER BLOCK (E, TW, ME)	CORRECT
106	X-3944-514-1	BASE ASSY, L SUB		△117	1-413-989-31	POWER BLOCK (HK, Chinese)	CORRECT
107	3-961-085-01	GEAR, IDLER		118	3-961-110-01	CUSHION, FOOT	
108	X-3944-513-1	BASE ASSY, LOADING		119	3-962-812-01	SCREW +BVTP 3X18 TYPE 2	
109	3-961-083-01	GEAR, CONTROL		120	3-531-576-21	RIVET	
110	3-961-081-01	GEAR, MIDDLE		* 121	3-703-150-11	CLAMP	
111	3-961-084-01	PULLEY (A)		122	9-911-841-XX	CUSHION, RUBBER	
112	3-961-082-01	BELT, TIMING		M481	X-3944-685-1	MOTOR ASSY, LOADING (RF-370C)	

5-2. ELECTRICAL PARTS LIST

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.

- 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.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μA ..., uPA...: μPA ..., uPB...: μPB ...,
uPC...: μPC ..., uPD...: μPD ...
- CAPACITORS
uF: μF
- COILS
uH: μH
- Abbreviation
HK : Hong Kong model
TW : Taiwan model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Δ	1-413-989-11	POWER BLOCK (Ref. No. 5, 000 Series) *****		Δ C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF	20% 25V
Δ	1-533-223-11	HOLDER, FUSE < CAPACITOR >		Δ C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF	20% 10V
	C051	1-163-009-11 MULTILAYER CERAMIC	1000PF 10% 50V	Δ C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF	20% 10V
	C052	1-163-019-00 MULTILAYER CERAMIC	6800PF 10% 50V	Δ C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF	20% 10V
	C053	1-163-035-00 MULTILAYER CERAMIC	0.047uF 50V	Δ C206	1-126-925-11	ALUMINUM ELECTRIC 470uF	20% 10V
	C054	1-163-009-11 MULTILAYER CERAMIC	1000PF 10% 50V	C208	1-126-964-51	ALUMINUM ELECTRIC 10uF	20% 50V
	C055	1-163-009-11 MULTILAYER CERAMIC	1000PF 10% 50V	C210	1-126-964-51	ALUMINUM ELECTRIC 10uF	20% 50V
	C056	1-163-007-11 MULTILAYER CERAMIC	680PF 10% 50V	C211	1-126-925-11	ALUMINUM ELECTRIC 470uF	20% 10V
	C057	1-163-035-00 MULTILAYER CERAMIC	0.047uF 50V	C212	1-126-923-11	ALUMINUM ELECTRIC 220uF	20% 10V
	C058	1-163-035-00 MULTILAYER CERAMIC	0.047uF 50V	C213	1-130-495-91	ALUMINUM ELECTRIC 4.7uF	5% 50V
	C059	1-163-017-00 MULTILAYER CERAMIC	4700PF 10% 50V	C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF	50V
	C060	1-163-007-11 MULTILAYER CERAMIC	680PF 50V	C215	9-909-680-01	CERAMIC 1000PF	1000V
	C061	1-163-017-00 MULTILAYER CERAMIC	4700PF 10% 50V	C216	9-909-680-01	CERAMIC 1000PF	1000V
	C062	1-163-009-11 MULTILAYER CERAMIC	1000PF 10% 50V	C217	1-130-491-00	FILM 0.047uF	5% 50V
	C063	1-124-122-11 ALUMINUM ELECTRIC	100uF 20% 50V	C218	1-126-942-61	ALUMINUM ELECTRIC 1000uF	20% 25V
	C064	1-130-491-00 FILM	0.047uF 5% 50V	C219	1-126-942-61	ALUMINUM ELECTRIC 1000uF	20% 25V
Δ C101	9-902-038-01	METALLIZED	0.22uF 250V	C220	1-130-467-00	FILM 470PF	5% 50V
Δ C102	9-900-521-01	METALLIZED	0.1uF 250V	C221	1-130-467-00	FILM 470PF	5% 50V
Δ C103	1-161-742-00	CERAMIC	2200PF 400V	< CONNECTOR >			
Δ C104	1-161-742-00	CERAMIC	2200PF 400V	CN051	1-695-342-31	CONNECTOR 19P	
Δ C105	1-161-742-00	CERAMIC	2200PF 400V	* CN052	1-506-473-11	CONNECTOR 8P	
Δ C106	1-161-742-00	CERAMIC	2200PF 400V	CN053	1-564-506-11	CONNECTOR 3P	
Δ C107	1-161-742-00	CERAMIC	2200PF 400V	* CN101	1-564-419-11	HEADER, SPRING (POWER) 2P	
Δ C108	9-909-672-01	ALUMINUM ELECTRIC	150uF 400V (E, TW, ME)	< DIODE >			
Δ C108	9-933-733-01	ALUMINUM ELECTRIC	100uF 400V (HK, Chinese)	D051	9-902-064-01	DIODE ERA81-004	
Δ C109	9-909-672-01	ALUMINUM ELECTRIC	150uF 400V (E, TW, ME)	D052	9-902-064-01	DIODE ERA81-004	
Δ C110	9-909-673-01	CERAMIC	220PF 1000V	D053	8-719-200-82	DIODE 11ES2	
Δ C111	9-900-525-01	METALLIZED	0.047uF 400V	D054	8-719-200-82	DIODE 11ES2	
Δ C112	1-106-363-00	FILM	0.0068uF 5% 200V	D055	8-719-911-19	DIODE 1SS119-25	
Δ C113	1-130-483-00	METALLIZED	0.01uF 5% 50V	D056	8-719-911-19	DIODE 1SS119-25	
Δ C114	1-107-355-51	METALLIZED	0.22uF 5% 200V	D057	8-719-911-19	DIODE 1SS119-25	
Δ C115	1-130-470-00	FILM	820PF 5% 50V	D060	8-719-911-19	DIODE 1SS119-25	
Δ C116	1-126-967-11	ALUMINUM ELECTRIC	47uF 20% 50V	Δ D101	8-719-510-19	BRIDGE DIODE D2SBA60	
Δ C117	1-161-742-00	CERAMIC	2200PF 400V	Δ D102	9-902-050-01	DIODE ERA15-06	
Δ C118	1-161-742-00	CERAMIC	2200PF 400V	Δ D103	8-719-030-25	DIODE EG01CVO	
Δ C201	1-124-525-11	ALUMINUM ELECTRIC	1000uF 20% 25V	Δ D104	9-900-514-01	DIODE MA165	
				Δ D105	9-900-535-01	DIODE AU02Z	
				Δ D201	8-719-510-72	DIODE S3L20UF1	
				Δ D202	8-719-510-72	DIODE S3L20UF1	

POWER BLOCK

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
△D203	8-719-510-72	DIODE S3L20UF1		△Q201	8-729-021-99	TRANSISTOR 2SB1416-R	
△D204	8-719-043-74	DIODE AK04		△Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE	
△D205	9-900-514-01	DIODE MA165 (E, TW, ME)		△Q203	8-729-119-76	TRANSISTOR 2SA1175-HFE	
△D206	9-900-514-01	DIODE MA165 (E, TW, ME)		△Q204	9-909-678-01	TRANSISTOR 2SC4545	
△D208	8-719-200-82	DIODE 11ES2					
△D209	8-719-035-04	ZENNER DIODE MA4240		△Q206	8-729-900-80	TRANSISTOR DTC114ES	
		< FUSE >				< RESISTOR >	
△F101	1-532-286-00	FUSE TIME LUG (T3. 15AL 250V)		R050	1-216-097-00	THICK FILM 100K 5% 1/10W	
		< IC >		R051	1-216-081-00	THICK FILM 22K 5% 1/10W	
IC051	8-759-982-73	IC BA10393F		R052	1-216-075-00	THICK FILM 12K 5% 1/10W	
IC052	8-759-100-96	IC uPC4558G2		R053	1-216-093-11	THICK FILM 68K 5% 1/10W	
△IC101	8-759-062-58	IC FA5311S		R054	1-216-105-00	THICK FILM 220K 5% 1/10W	
△IC201	8-759-701-79	IC NJM78M12FA		R055	1-216-091-00	THICK FILM 56K 5% 1/10W	
△IC202	8-759-929-65	IC LM7912CT		R057	1-216-093-11	THICK FILM 68K 5% 1/10W	
△IC203	9-900-532-01	IC AN1431T		R061	1-216-089-00	THICK FILM 47K 5% 1/10W	
△IC204	8-759-100-96	IC uPC4558G2		R062	1-216-065-00	THICK FILM 4.7K 5% 1/10W	
		< COIL >		R063	1-216-049-11	THICK FILM 1K 5% 1/10W	
L051	1-424-219-11	CHORKE COIL 300uH		R064	1-247-750-11	CARBON 680 5% 1/2W	
△L101	9-909-675-01	LINE FILTER		R065	1-247-750-11	CARBON 680 5% 1/2W	
△L102	9-909-675-01	LINE FILTER		R066	1-216-049-11	THICK FILM 1K 5% 1/10W	
△L103	9-904-796-01	BEAD CORE		△R067	1-216-369-00	CARBON 1 5% 2W	
△L201	9-909-681-01	CHORKE COIL 10uH		R068	1-219-387-11	THICK FILM 43K 0.1% 1/16W	
△L202	9-909-681-01	CHORKE COIL 10uH		R069	1-219-391-11	THICK FILM 47K 0.1% 1/16W	
△L204	9-909-681-01	CHORKE COIL 10uH		R070	1-219-387-11	THICK FILM 43K 0.1% 1/16W	
△L205	9-909-681-01	CHORKE COIL 10uH		R071	1-219-391-11	THICK FILM 47K 0.1% 1/16W	
		< PHOTO COUPLER >		R072	1-216-073-00	THICK FILM 10K 5% 1/10W	
△PC101	9-909-676-01	PHOTO COUPLER		R073	1-216-073-00	THICK FILM 10K 5% 1/10W	
△PC102	9-909-677-01	PHOTO COUPLER		△R074	1-215-866-11	CARBON 330 5% 1W	
		< IC LINK >		R075	1-216-073-00	THICK FILM 10K 5% 1/10W	
△PS051	1-532-675-00	IC LINK (ICP-N38 1.5A)		R076	1-247-750-11	CARBON 680 5% 1/2W	
△PS052	1-532-675-00	IC LINK (ICP-N38 1.5A)		R077	1-216-073-00	THICK FILM 10K 5% 1/10W	
		< TRANSISTOR >		R079	1-216-097-00	THICK FILM 100K 5% 1/10W	
△Q051	8-729-117-11	TRANSISTOR 2SB1151-L		R080	1-216-097-00	THICK FILM 100K 5% 1/10W	
△Q052	8-729-019-31	TRANSISTOR 2SC4596E		△R101	9-900-394-01	NON-FLAMABLE CARBON 1M 1/2W	
△Q053	8-729-117-11	TRANSISTOR 2SB1151-L		△R102	1-218-642-11	METAL OXIDE FILM 100K 5% 1W	
△Q054	8-729-019-31	TRANSISTOR 2SC4596E		△R103	1-218-642-11	METAL OXIDE FILM 100K 5% 1W	
Q055	8-729-119-78	TRANSISTOR 2SC2785-HFE		△R104	1-214-921-00	CARBON 220K 1% 1/2W	(E, TW, ME)
Q056	8-729-230-46	TRANSISTOR 2SA1162-YG		△R104	1-260-135-11	CARBON 1M 5% 1/2W	(HK, Chinese)
Q058	8-729-230-49	TRANSISTOR 2SC2712-YG		△R105	1-214-921-00	CARBON 220K 1% 1/2W	(E, TW, ME)
Q059	8-729-230-46	TRANSISTOR 2SA1162-YG		△R106	1-215-860-11	METAL OXIDE FILM 33 5% 1W	
Q060	8-729-230-49	TRANSISTOR 2SC2712-YG		△R107	1-215-927-00	METAL OXIDE FILM 47K 5% 3W	
Q061	8-729-119-76	TRANSISTOR 2SA1175-HFE		△R108	1-212-974-00	NON-FLAMABLE CARBON 47 5% 1/2W	
△Q101	9-909-669-01	TRANSISTOR 2SK1547		△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 5% 1/4W	
				△R112	1-212-958-00	NON-FLAMABLE CARBON 10 5% 1/2W	
				△R114	1-247-848-11	CARBON 5.1K 5% 1/4W	

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

☛ : Indicates changed portion

POWER BLOCK

Ref.No.	Part No.	Description	Remark
△R115	1-247-855-31	CARBON	10K 5% 1/4W
△R116	1-247-891-00	CARBON	330K 5% 1/4W
△R117	1-247-891-00	CARBON	330K 5% 1/4W
△R118	1-212-966-00	NON-FLAMABLE CARBON	22 5% 1/2W
△R201	9-909-679-01	FUSE	0.22 1/4W
△R202	1-247-855-31	CARBON	10K 5% 1/4W
R203	1-249-404-00	CARBON	82 5% 1/4W
△R204	1-247-847-11	CARBON	4.7K 5% 1/4W
△R205	1-247-847-11	CARBON	4.7K 5% 1/4W
R206	1-249-404-00	CARBON	82 5% 1/4W
△R207	1-247-855-31	CARBON	10K 5% 1/4W
△R208	1-247-847-11	CARBON	4.7K 5% 1/4W
△R209	1-247-847-11	CARBON	4.7K 5% 1/4W
△R210	1-260-099-11	CARBON	1K 5% 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 5% 1/4W
R214	1-249-433-11	CARBON	22K 5% 1/4W
△R215	1-247-855-31	CARBON	10K 5% 1/4W
△R221	1-247-855-31	CARBON	10K 5% 1/4W
R225	1-247-855-31	CARBON	10K 5% 1/4W
△R226	1-247-871-11	CARBON	47K 5% 1/4W
△R227	1-249-439-11	CARBON	68K 5% 1/4W
< SWITCH >			
△SW101	1-572-675-11	POWER VOLTAGE CHANGE SWITCH (E, TW, ME)	
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER	
< THERMISTOR >			
△TH101	9-904-783-01	POWER THERMISTOR (E, TW, ME)	
< TRIMMER >			
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

MISCELLANEOUS			

17	1-769-150-11	FLAT CABLE (FFP-001) (7 CORE)	
62	1-769-148-11	FLAT CABLE (FMM-001) (7 CORE)	
63	1-769-149-11	FLAT CABLE (FUF-002) (11 CORE)	
64	1-769-147-11	FLAT CABLE (FMD-003) (12 CORE)	
65	1-769-146-11	FLAT CABLE (FMP-002) (19 CORE)	
△*68	1-769-500-11	CORD, POWER (TW)	
△68	1-575-912-21	CORD, POWER (EXCEPT TW)	
73	1-770-019-11	ADAPTER CONVERSION 3P (HK) ☛	
△117	1-413-989-11	POWER BLOCK (E, TW, ME) ☛ CORRECT	
△117	1-413-989-31	POWER BLOCK (HK, Chinese) ☛ CORRECT	

Ref.No.	Part No.	Description	Remark
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A(S)	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
172	1-769-151-11	FLAT CABLE (FMB-001) (4 CORE)	
M421	1-541-930-11	MOTOR, DC (TILT)	
M481	X-3944-685-1	MOTOR ASSY, LOADING (RF-370C)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

ACCESSORIES & PACKING MATERIALS			

1-569-008-11	ADAPTER, CONVERSION 2P (EXCEPT TW, HK) ☛		
1-575-334-11	CORD, CONNECTION (A/V connecting cable (Stereo) 1.5M)		
3-759-585-11	MANUAL, INSTRUCTION (ENGLISH, SPANISH, CHINESE) (EXCEPT TW)		
3-759-585-41	MANUAL, INSTRUCTION (CHINESE) (TW)		
* 3-798-308-41	CARD, HANDLING EXPLANATION (HK) ☛		
* 3-961-118-01	CUSHION (UPPER)		
* 3-961-119-01	CUSHION (LOWER)		
* A-6772-990-A	REMOTE CONTROL (RMT-M23A) (EXCEPT TW)		
* A-6778-030-A	REMOTE CONTROL (RMT-M23B) (TW)		
* X-3944-710-1	INDIVIDUAL CARTON ASSY (EXCEPT TW, HK)		
* X-3944-905-1	INDIVIDUAL CARTON ASSY (TW) ☛		
* X-3945-044-1	INDIVIDUAL CARTON ASSY (HK) ☛		

HARDWARE LIST			

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
#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	
#6	7-685-133-19	+PTP 2.6X6	
#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	

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

MDP-MR1

9-973-634-12
(with
9-973-634-81)

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

— 148 —

Published by Home A&V Products Div.
Quality Engineering Dept.