

MDP-550/650/A3

RMT-M33A(550)/M37A(650)/M37B(A3)

SERVICE MANUAL

US Model
Canadian Model
MDP-550/650
E Model
Hongkong Model
MDP-A3



(Photo: MDP-550)

SPECIFICATIONS

System

Type

CD/CDV/LD player

Signal readout

Optical (Laser beam reflection)

Signal format system

EIA standard, NTSC color system

Playing time

See "Optical discs" on page 30.

Digital audio specifications

Signal-to-noise ratio

More than 115 dB (EIAJ)*

Dynamic range

More than 99 dB (EIAJ)

Wow and flutter

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

Video specifications

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)

S VIDEO OUT 1,2

Luminance: 1 Vp-p, 75 ohms, unbalanced, sync negative
Chrominance: 0.286 Vp-p, 75 ohms, unbalanced

DIGITAL OUT (OPTICAL)

-18 dBm, wavelength 660 nm

Headphone output

12 mW (Impedance = 8 ohms)

Mic jack

Standard jack
1 mV
(Impedance below 1 kilohm)

General

Power requirements

120 V AC, 60 Hz (550/650)
110-127/220-240 V AC, 50/60 Hz (A3)

Power consumption

45 W

Operating temperature

5 °C to 35 °C (41 °F to 95 °F)

Ambient humidity

5 % to 90 %

Dimensions

Approx. 430 × 116 × 433 mm
(17 × 4 5/8 × 17 inches)
(w/h/d)
including projecting parts and controls

Mass

Approx. 7.5 kg (16 lb 8oz)

Supplied accessories

Remote Commander RMT-M37A(1)(650)
RMT-M33A(1)(550)
RMT-M37B(1)(A3)
size AA (R6) batteries (2)
Audio/Video Cable
(phono plug 3 ↔ phono plug 3) (1)
AC power cord (1)

CD/CDV/LD PLAYER

SONY®



SAFETY CHECK-OUT

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

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

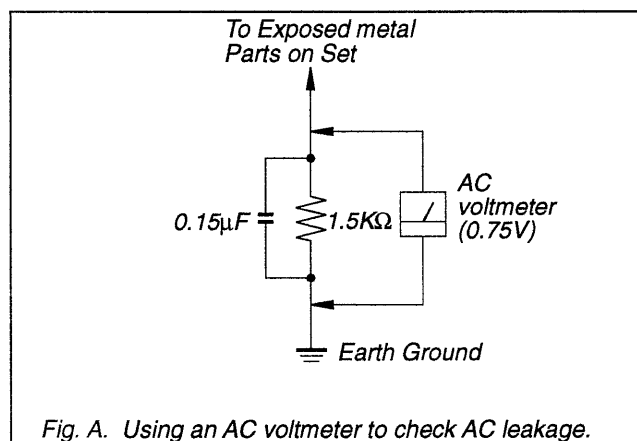


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

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

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

SAFETY-RELATED COMPONENT WARNING!!

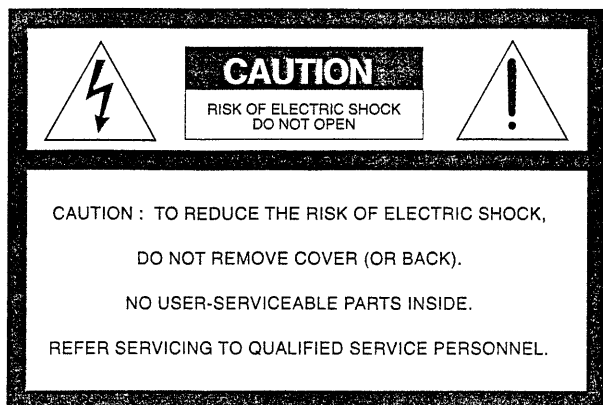
COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

WARNING

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



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CAUTION

To prevent electric shock, do not use this polarized AC plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

CAUTION

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

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

TABLE OF CONTENTS

1. GENERAL

Unpacking	1-1
Inserting batteries into the remote commander	1-1
Connecting the player	1-1
Playing a disc	1-2
Resuming LD playback (Auto Resume)	1-3
Quick-starting LD playback (Quick Start)	1-4
Using enjoyable functions for viewing movies	1-4
Searching for a particular point on the disc	1-5
Using the sound control functions	1-5
Understanding on-screen indications	1-6
Specifying a chapter or track directly (Chapter/Track Search)	1-7
Searching by frame number or time (Frame/Time Search)	1-7
Viewing frame-by-frame action	1-8
Viewing at varying speeds (Variable Speed Play)	1-8
Playing in a specified order (Program Play)	1-9
Playing a section repeatedly (Repeat Play)	1-10
Playing karaoke	1-11
Optical discs	1-12
Index to parts and controls	1-13

2. DISASSEMBLY

2-1. REMOVAL OF FRONT PANEL ASSEMBLY	2-1
2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)	2-1
2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY	2-2
2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY	2-2
2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY	2-3
2-6. REMOVAL OF FEED BASE BLOCK ASSEMBLY	2-3
2-7. MOUNTING THE FEED BASE BLOCK ASSEMBLY	2-4
2-8. OPTICAL PICK-UP BLOCK	2-5
2-9. REMOVAL OF CONTROL GEAR	2-8
2-10. REMOVAL OF IDLER GEAR	2-8
2-11. INTERNAL VIEWS	2-9
2-12. CIRCUIT BOARDS LOCATION	2-10

3. 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

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM	4-1
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS	4-3
· MA-712 (Mic), HP-718 (Headphone) Boards	4-3
· MB-717 board (Video, Servo, System Control, Audio) Board	4-6
· MB-717 (Video) Board	4-12
· MB-717 (Servo) Board	4-15
· MT-707, SW-732 boards	4-18
· MB-717 (System Control) MT-707, SW-732 Board	4-19
· MB-717 (Audio), MA-712 (Mic), HP-718 (Headphone) Boards	4-23
· BI-703, FG-705, FG-707, MT-706 Boards	4-27
· FP-746 (Display), FP-747 (Play Switch), PW-721 (Power Switch) Boards	4-31
· POWER BLOCK SR-539 (MDP-A3 Model)	4-38
· POWER BLOCK SR-538 (MDP-550/650 Model)	4-43

5. REPAIR PARTS LIST

5-1. EXPLODED VIEWS	
5-1-1. CASE AND FRONT PANEL ASSEMBLY	5-1
5-1-2. CHUCKING BLOCK ASSEMBLY	5-2
5-1-3. MAIN CHASSIS ASSEMBLY	5-3
5-1-4. MECHANISM DECK ASSEMBLY	5-4
5-2. ELECTRICAL PARTS LIST	5-5

6. IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER (IC501: MB89094PF-G-141-BND on the FP-717 Board)	6-1
6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER (IC102: MB89095 on the FP-746 Board)	6-2

7. ELECTRICAL ADJUSTMENTS

7-1. LIST OF SERVICING JIGS	7-1
7-2. CAUTIONS ON ADJUSTMENT	7-1
7-3. OPERATION OF THE MDP-550/650/A3 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-550/650/A3 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	7-3
4. Operating with the special key functions	7-3

7-5. OPERATION OF THE MDP-550/650/A3 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 BLOCK)	7-10
7-6-2. REG +5V Adjustment (POWER BLOCK)	7-10
7-6-3. Power Supply Check (POWER BLOCK)	7-10
7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT	7-10
7-7-1. Microprocessor Clock Adjustment (MB-717 Board)	7-10
7-8. SERVO SYSTEM ADJUSTMENT	7-11
7-8-1. LD Side A Tilt Balance Adjustment	7-11
7-8-2. LD Side B Tilt Balance Adjustment	7-12
7-9. VIDEO SYSTEM ADJUSTMENT	7-13
7-9-1. Video Output Level Adjustment (MB-717 Board)	7-13
7-10. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK	7-13
7-10-1. Jigs and Tools	7-13
7-10-2. CD Adjustment	7-14
7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT	7-16

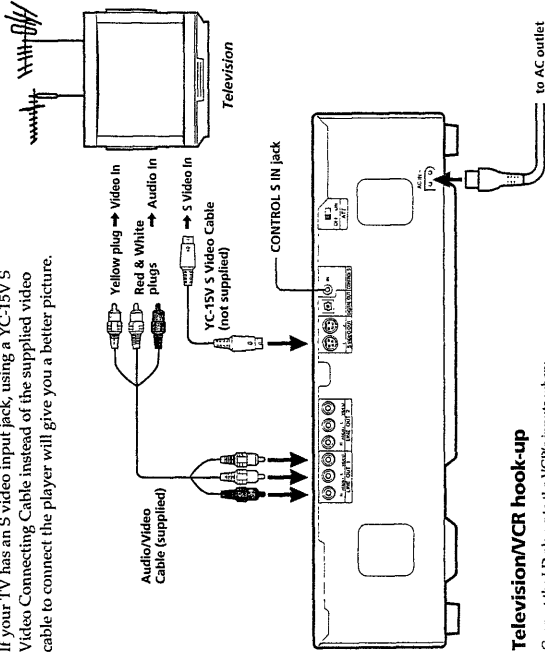
This section is extracted from instruction manual (MDP-650).

**SECTION 1
GENERAL**

**Step 3
Connecting the player**

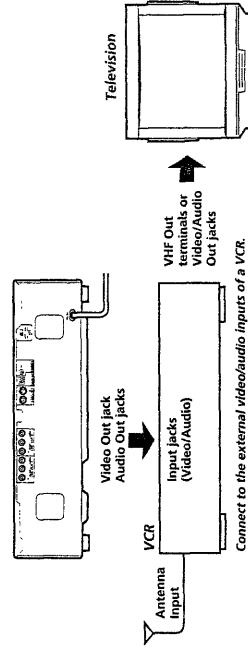
Television hook-up

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. If your TV has an S video input jack, using a YC-15V S Video Connecting Cable instead of the supplied video cable to connect the player will give you a better picture.



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 antenna input.



Notes

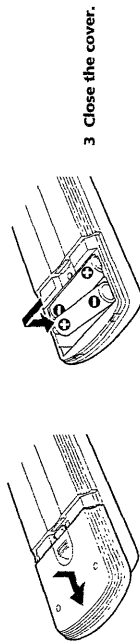
- Make sure all equipment is turned off before connecting or disconnecting any cables.
- Connection methods may differ; when in doubt about a connection, consult the TV or VCR manufacturer's manual.
- If the sound or picture is disturbed by noise, try moving the equipment farther apart.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- To prevent interference with TV broadcast reception, turn off all equipment connected but not currently in use.
- If your TV only has a monaural phono jack for audio input, use a VMC-910/915 Connecting Cable (not supplied).
- If you connect the CONTROL 5 IN jack to the CONTROL 5 output jack on your TV, etc. using an RKC69 Connecting Cable (not supplied), you can control this player with the remote commander pointed at the TV, etc.
- If you plug one end of the cable into the CONTROL 5 IN jack on the player and leave the other end unplugged, the remote commander cannot control the player.

**Step 1
Unpacking**

Check that you have the following items:

- Remote commander RMT-M37A
- Audio/Video cable
- AC power cord
- Two size AA (R6) batteries

**Step 2
Inserting batteries into the remote commander**



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

Notes

- With normal use, the batteries should last for approximately six months.
- Use two size AA (R6) batteries.
- If you use the batteries incorrectly, they may leak or explode. See notes below for correct usage.
 - Do not use a new battery together with an old one.
 - Do not use different types of batteries together.
 - Do not recharge the batteries.
 - 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.
 - If battery leakage should occur, wipe off the leakage from the battery compartment, then insert new batteries.
- Do not let direct sunlight or powerful artificial light such as spot light fall directly on the remote sensor on the front panel of the player. Such light interferes with the signals from the remote commander, causing the remote commander to fail to operate correctly.

Getting Started

Audio equipment hook-up

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

Notes

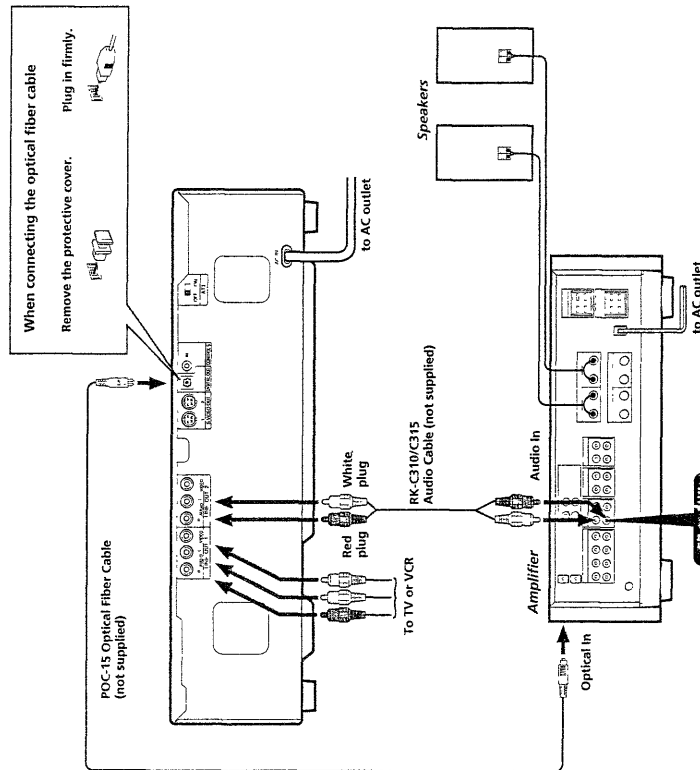
- Make sure all equipment is turned off before making any of the above connections.
- Firmly insert plugs into the jacks. A loose connection may cause noise.
- When listening to a radio broadcast, turn off the LD Player to get better reception.

Getting Started

To achieve digital sound

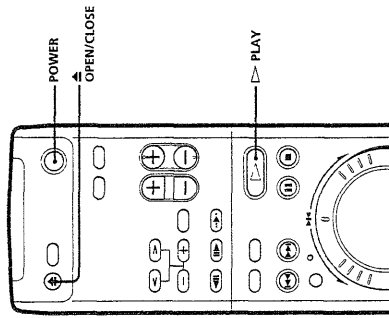
Optical fiber digital audio output enables a high quality sound reproduction. If your amplifier has an optical input connector, or if you have a D/A converter unit with optical input, connect the player to the amplifier or D/A converter using an Optical Fiber Audio Cable POC-15 (not supplied).

- You can get digital audio output from CDs, CDMs, and most LDs. When you play an LD which does not have digital sound tracks, you cannot get any sound from the DIGITAL OUT (OPTICAL) connector.
- Sound from a microphone is not output from the DIGITAL OUT (OPTICAL) connector. When you play karaoke with a microphone, connect the player using an Audio Cable (red & white plugs).



Basic Operations

Playing a disc



Tip

- You can also turn on the player by pressing the 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 lift up or transport the player while a disc is loaded as doing so may damage your disc or player.
- Do not use a CD-sublizer when playing a CD as doing so may damage your disc or player.
- When you press PAUSE, the picture freezes, even while playing a CLV LD or CDV.
- When you press STOP to stop playing an LD, the picture freezes and remains on the TV screen. If you want to clear it, press the FL DISPLAY button on the player. The screen turns to a blank, blue screen. Each time you press the FL DISPLAY button, the stored picture and the blue screen alternate.

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).
- If you use a stereo system, turn on the amplifier and set its input selector to an external input such as "CD" or "AUX" to listen to the sound of the player.

Loading and playing a disc

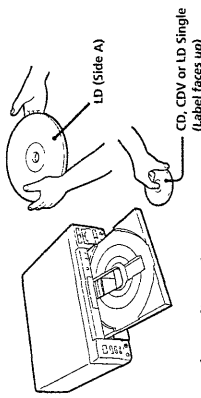
1 Press POWER to turn on the player.

You can also directly turn on the player by pressing the PLAY on the player or remote commander.

2 Press OPEN/CLOSE to open the disc tray.

The front cover of the player automatically slides down and the disc tray comes out.

3 Place a disc on the disc tray.



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

4 Press PLAY (or DISC SIDE A).

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

Stop play ■ STOP

Pause play || PAUSE

Resume play after pause || PAUSE or ▷ PLAY

Scan forward or backward ◀◀/▶▶ SCAN on the player or rotate the SHUTTLE ring

Skip chapters or tracks ◀◀/▶▶ ACS/AMIS

Remove the disc ▷ OPEN/CLOSE

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.

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 selected side of the LD is played once.



To pause playing just before starting

Press \mathbb{H} PAUSE instead of pressing \blacktriangle PLAY, after you place the disc on the tray.

The disc tray closes and the player waits at the start of the disc until you press \blacktriangle PLAY or \mathbb{H} PAUSE. If you want to start from side B of an LD, press \mathbb{H} PAUSE, then DISC SIDE B.

To stop playing and turn off the player

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

To stop playing and remove the disc

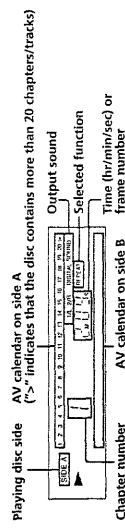
Press \blacktriangle OPEN/CLOSE. Remove the disc and press \blacktriangle again to close the empty tray.

To listen with headphones

Plug headphones into the PHONES jack on the front panel and adjust the volume with the LEVEL control beside the jack.

Reading the front panel display

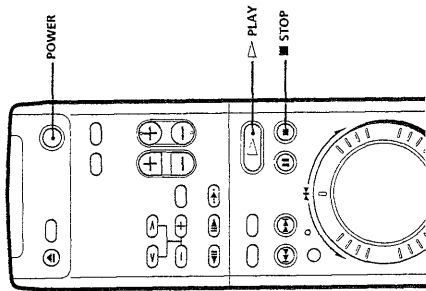
The illustration below is an example of what is displayed on the front panel of the player. For more information about the AV calendar, see the tips and note on the left hand of this page and "Quick-starting LD playback" on page 11.



Turning off and on the front panel display

You can turn off the front panel display if you feel the display glaring while you view a movie in a dark room. Each time you press the FL DISPLAY button on the player, the display turns off/on.

Resuming LD playback (Auto Resume)



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

1 Press \mathbb{H} STOP (or POWER) to stop playback.

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

2 Press \blacktriangle PLAY.

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

To pause playing just before starting

If the player is turned on, press \mathbb{H} PAUSE instead of \blacktriangle PLAY. If the player is turned off, press POWER or \blacktriangle PLAY to turn on the player, then press \mathbb{H} PAUSE.

To view from the beginning of the LD

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

Tips

- Each time you stop playing, the point at which you stopped is stored.
- The point at which you stopped playing is cleared when:
 - you completely open the disc tray, press DISC SIDE A/B or \mathbb{H} PAUSE/ALL/AMS, Frame/Time Search, or you do a Chapter Search or Frame/Time Search.
 - you press PROGRAM.
 - you unplug the player.
 - If you press \blacktriangle OPEN/CLOSE to close the disc tray when it is open halfway, the point at which you stopped is retained.

Notes

- Playback may resume at a point slightly different from the point at which you stopped playback.
- The point at which you stopped is not stored if you stop playback during a Chapter Search or Frame/Time Search, or while in program mode.
- 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.

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 reads, the player stops.
- When playing a CD or CDV, the DISC SIDE B button does not function.

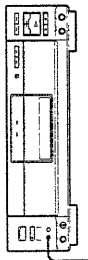
Tips

- The AV calendar shows the chapters/tracks remaining on the disc. As chapters/tracks are played, the corresponding numbers on the calendar disappear.
- When there is no disc in the player, "NO DISC" appears on the front panel display.

Note

- The AV calendar is available when you play LDs containing TOC (Table of Contents) data, CDs or CDVs. When you use the AV calendar with these LDs, press the QUICK START button to turn off the button indicator before you start playing (see "Quick-starting LD playback" on page 11 for details). When you play CDs or CDVs, the QUICK START indicator goes off automatically and the AV calendar always appears.

Quick-starting LD playback (Quick Start)



QUICK START

Notes

- Once the player has read TOC data on an LD after you turn off the Quick Start function, you cannot turn on the Quick Start function until you open the disc tray or turn off the player.
- When you play a CD or CDV, the Quick Start function is automatically turned off.

Tip

- TOC data contains some information on the disc including amount of chapters, total playing time, and information about each chapter.

The Quick Start function remarkably shortens the starting time of an LD by skipping the TOC data read procedure. When the QUICK START button indicator on the player is lit, the Quick Start function is active and you can start playing the LD very quickly.

Selecting Quick Start on/off

When you turn on the player, the QUICK START button indicator always lights up and the Quick Start function is turned on.

If you turn off the Quick Start function, the player reads TOC data on the current side of the LD when the disc starts playing, allowing you to use several functions (see table below).

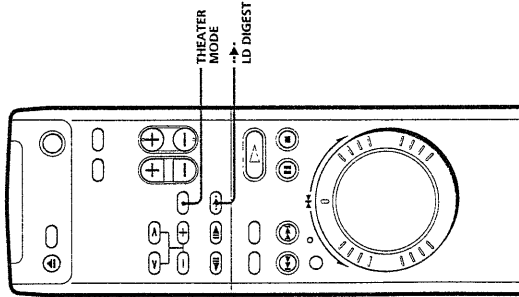
To turn off (or, then on) the Quick Start function

Press QUICK START on the player while the player is stopped. Each time you press the button, the QUICK START button indicator is turned off/on.

Indicator The player starts playing an LD

On	Without reading TOC data, to save time
Off	Reading TOC data, so that you can use the functions shown below: <ul style="list-style-type: none"> AV calendar Remaining time of the current chapter Total remaining time on the current disc side Total elapsed time for CAV discs Total playing time of chapters you programmed

Using enjoyable functions for viewing movies



Notes

- The sound is also skipped as the scene skips.
- You can use LD Digest only when you play an LD in normal play mode.
- You cannot use LD Digest or Theater mode when playing CDA.
- The effect of Theater mode depends on the quantity of the blackness in the picture. If there is little blackness, Theater mode may not be effective.

Tip

- You can turn on/off the front panel display by pressing the FL DISPLAY button on the player while in theater mode. However, when you exit theater mode, the front panel display always lights up.

Shortening the viewing time for an LD (LD Digest)

You can quickly view an LD, in about two thirds or a half of its original playing time. In LD Digest mode, the player skips scenes at regular intervals to save one third or half of the playing time. You hear the normal speed sound as the scenes progress so that you can understand the plot of a movie, etc.

To start quick viewing

Press **LD DIGEST 1** while playing an LD. The LD DIGEST indicator on the player lights up and the player starts skipping scenes. Each time you press **LD DIGEST 2**, the on-screen indication changes as follows:



If you select "LD DIGEST 1," about one third of the playing time is saved.

If you select "LD DIGEST 2," about a half of the playing time is saved.

To resume normal playback

Press **PLAY**. The LD DIGEST indicator goes off and normal playback resumes.

Getting a theater-like picture (Theater mode)

In theater mode (LDs only), the player emphasizes the black color on the recording to give the picture you see some of the depth and clarity of a movie in a movie theater. This is especially effective if you view movies in a dark room.

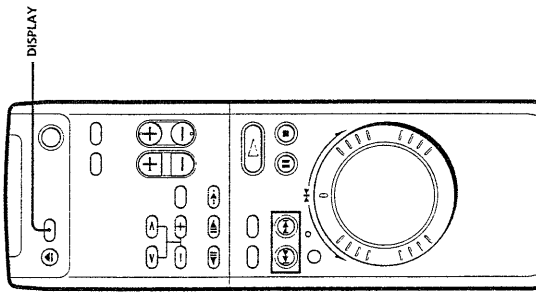
To enter theater mode

Press THEATER MODE while playing an LD. "THEATER" appears on the screen briefly, the THEATER MODE indicator lights up and the front panel display turns off. The picture's black color becomes more black.

To exit theater mode

Press THEATER MODE again. The THEATER MODE indicator goes off, the front panel display lights up and the player exits the theater mode.

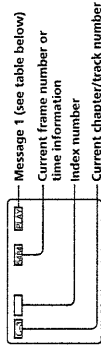
Understanding on-screen indications



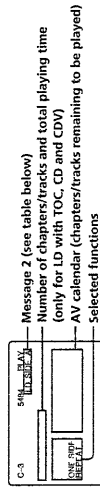
You can view the operating status of the player or disc information on the TV screen.

Displaying on-screen indications

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



Press DISPLAY again. Operating status and disc information are displayed on the screen.



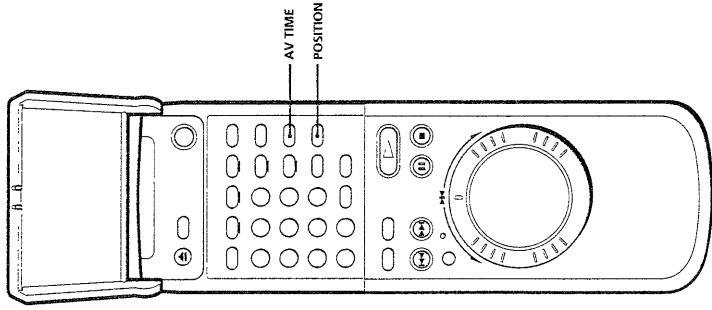
Press DISPLAY once again to turn off the indications.

Message 1	
Display	Current status of the player
OPEN	Disc tray open
CLOSE	Disc tray closed
PLAY	Playing a disc
STOP	Playback stopped
PAUSE	Playback temporarily stopped
	Speed scanning (slow)
	Speed scanning (fast)
SEARCH	Searching
Message 2	
Display	Currently playing
LD SIDE A	Side A of LD
LD SIDE B	Side B of LD
CD	CD
CDV	CDV
1/L	First soundtrack/left channel
2/R	Second soundtrack/right channel
D DIGITAL	Digital sound
A ANALOG	Analog sound
THEATER	With real black color

Notes

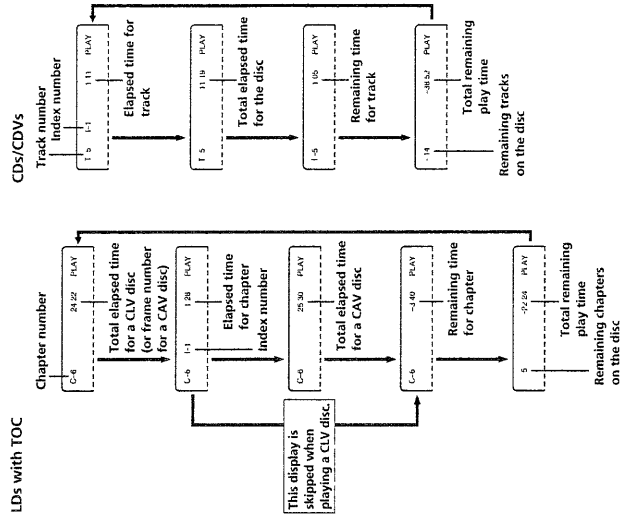
- The AV calendar (display of remaining chapter numbers) for LDs is only available when:
 - the LD contains TOC data, you have turned off the QUICK START button indicator on the player.
- When playing an LD which does not contain chapters, the chapter number does not appear.
- When playing a CLV LD which does not contain time data to the second, a two-digit number such as "22", meaning 22 minutes, appears.
- Messages concerning sound control functions such as "1/L 2/R" or "D DIGITAL, A ANALOG" appear only briefly when you press the AUDIO MONITOR or ANALOG/CB button.

Understanding on-screen indications (continued)



Checking the elapsed or remaining time of the disc

You can check the elapsed or remaining time on the TV screen. Press DISPLAY, then press AV TIME repeatedly. Each time you press AV TIME, the on-screen display changes as follows. To use AV TIME while playing an LD containing TOC data, press QUICK START on the player to turn off the Quick Start function (see "Quick-starting LD playback" on page 11).



Changing the position of the on-screen indications

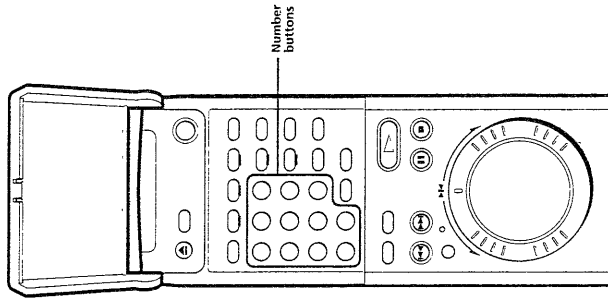
You can select the position of the on-screen indications. If you use a wide-screen TV and some indications on the top or bottom of the screen are invisible, change the position of the on-screen indications using the POSITION button so that you can view the indications.

Each time you press the POSITION button on the remote commander, the position of the on-screen indications changes. There are three other positions.

Notes

- When playing an LD which does not contain TOC data, or playing with the QUICK START button indicator on the player lit, you can only view the total elapsed time (for CLV disc) or current frame number (for CAV disc).
- The display does not show remaining time for chapters or tracks numbered 51 or greater.
- When playing a CDV, these figures refer only to the current section (audio or video) being played.

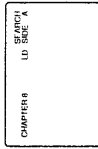
Additional Operations Specifying a chapter or track directly (Chapter/Track Search)



LDs are divided into sections called "chapters," CDs and DVDs 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. The picture freezes and the player goes to the chapter/track you entered, then playback starts.



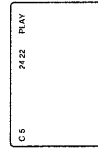
To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

To enter a number greater than 10, press (40), then one of the (0)-(9) buttons. If you press (40) by mistake, press CLEAR, then enter the correct number.

To	Press
Enter 14	(40), then (4)
Enter 25	(40) (40), then (5)
Enter 30	(40) (40) (40), 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.



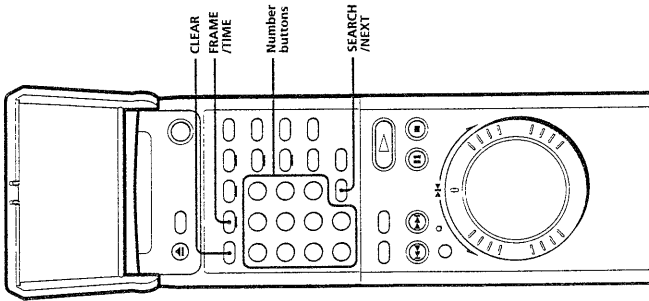
Tip

- In addition to normal play mode, you can do Chapter/Track Search while in Multi Speed, Freeze Frame, 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 correctly if the LD does not contain chapter numbers, or if the chapter number entered does not exist.

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



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

1 Press FRAME/TIME.

When playing	Indication
CAV LD	FRAME 00000
CLV LD	TIME 00:00:00

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

To locate frame number 12340 on a CAV LD, press the number buttons in the order, (1), (2), (3), (4) and (0).

To locate the 12 minutes, 5 second point on a CLV LD, press the number buttons in the order, (1), (2), (0), and (5).

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

3 Press SEARCH/NEXT.

The picture freezes and the player searches for the frame or time you entered, then playback starts.

To check the frame number or time on the screen

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

To cancel Frame/Time Search

Press CLEAR before pressing SEARCH/NEXT.

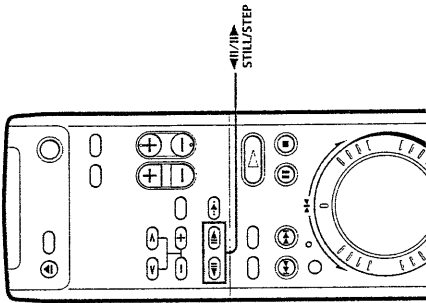
Tip

- In addition to normal play mode, you can do Frame/Time Search while in Multi Speed, 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.

Viewing frame-by-frame action



During any scene, you can freeze play into a still picture, and then advance or reverse the action frame-by-frame.

Freezing the action (Freeze Frame)

Press **II PAUSE** or one of the **◀II/II▶ STILL/STEP** buttons while playing an LD or CDV.
The sound mutes and the picture freezes.

To resume normal playback
Press **▷ PLAY**.

Playing frame-by-frame (Step Play)

1 Press one of the ◀II/II▶ STILL/STEP buttons while playing an LD or CDV.
The sound mutes and the picture freezes.

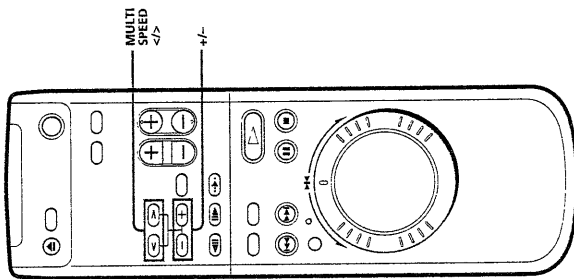
2 Press ◀II or II▶ repeatedly to advance or reverse the action frame-by-frame.
Hold down **◀II** or **II▶** to view continuous frame-by-frame action.

To resume normal playback
Press **▷ PLAY**.

Tips

- When playing a CDV, press **II PAUSE** instead of **II STOP** to store the picture.
- The player automatically stores the last picture viewed just before you do any of the following operations:
 - You press **II STOP** while playing an LD.
 - You press **II PAUSE** while playing a CLV LD or CDV.
 - You use search functions such as Chapter Search or Frame/Time Search.
 - You do a Scan.
 - You exit Multi Speed or Still/Step mode on a CLV LD or CDV.
 - You exit Multi Speed at x10 normal speed while playing a CA VLD.
 - You press **DISC SIDE A/B** or the player automatically changes the disc side.
 Each time you do any of these operations, a new picture is over-written in the digital memory.
- The stored picture is cleared when you turn off the player.

Viewing at varying speeds (Variable Speed Play)



You can find a scene by playing a disc forward or in reverse at varying speeds. There are two ways: using the MULTI SPEED </> and +/- buttons, or using the JOC/SHUTTLE ring.

Using the MULTI SPEED </> and +/- buttons

1 Press MULTI SPEED </> or > while playing an LD or CDV to select the direction.

Reverse: <

Forward: >

The playing speed and direction appear on the screen.

2 Press + or - to select the speed.

To reduce speed: -

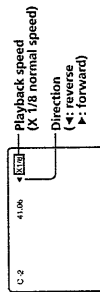
To increase speed: +

To resume normal playback

Press **▷ PLAY**.

To check the direction and speed of playback

Press **DISPLAY**.



Notes

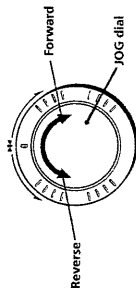
- The sound mutes except when playing at normal (x1) speed.
- If an automatic picture stop code (found on educational discs) is encountered during x1 or less variable speed play, the unit automatically stops at that frame. To resume playback, press **▷ PLAY**, MULTI SPEED (< or >), or rotate the SHUTTLE ring.

Using the JOG/SHUTTLE ring

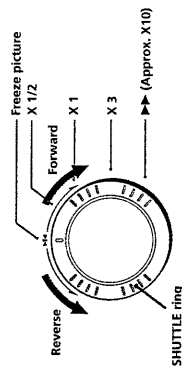
- 1 **Press the JOG/SHUTTLE button.**
The indicator beside the button lights up and the frame freezes.

- 2 **Rotate the JOG dial or the SHUTTLE ring.**

When rotating the JOG dial, frames go forward or in reverse as you rotate the JOG dial. Playing speed varies from frame-by-frame to normal speed corresponding to the speed you rotate the dial.



When rotating the SHUTTLE ring, the direction and speed of playback corresponds to the degree you rotate the SHUTTLE ring. The illustration below shows you the approximate positions of each speed (positions are the same for both directions).



Notes

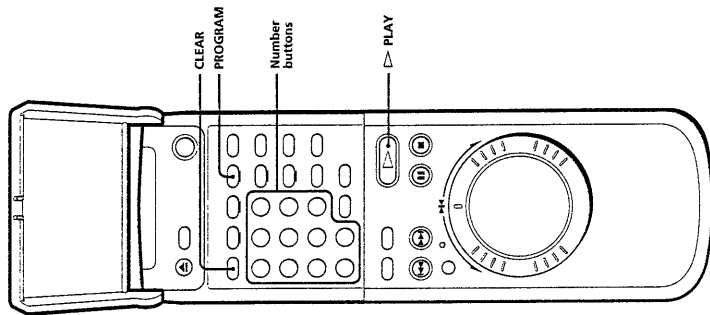
- When the JOG/SHUTTLE indicator is not lit, the JOG dial does not operate.
- If you rotate the SHUTTLE ring when the JOG/SHUTTLE indicator is not lit, the disc is scanned at about x10 or x30 the normal speed.

To resume normal playback

Press Δ PLAY.
Press the JOG/SHUTTLE button to turn off the JOG/SHUTTLE indicator.

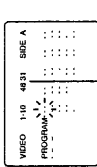
You can specify up to 25 chapters or tracks on a disc to be played in any order you like, regardless of disc side, even while the disc is being played. The chapters/tracks are played continuously in the order you specify.

Playing in a specified order (Program Play)



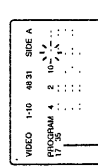
Specifying chapters/tracks

- 1 **Press PROGRAM.**
"PROGRAM" appears on the screen.
"PCM" flashes in the front panel display.



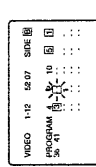
Total playing time of the disc (see note on the left)

- 2 **Press the number buttons to specify chapters on the current disc side, or tracks on a CD or DVD, in the order you want them to play.**
If you enter a wrong number, press CLEAR. With each press, the last chapter/track you entered is deleted.



Total playing time of the program (see next page)

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



- 4 **Repeat steps 2 (and 3) until you finish specifying chapters/tracks.**

- 5 **Press Δ PLAY.**

On-screen indications disappear and the program you made starts playing.
"PCM" on the front panel display stops flashing and lights up.

To change an entry (while "PCM" is flashing in the front panel)

Press SEARCH/NEXT or BACK repeatedly until the number you want to change flashes on the screen, then enter the correct number. If "PCM" is not flashing in the front panel display, press PCM to make the sign "PCM" flash, then use SEARCH/NEXT or BACK.

To clear all the entries together

Press CLEAR while "PCM" is flashing in the front panel display. If "PCM" is not flashing in the front panel display, press PROGRAM to make the sign "PCM" flash, then press CLEAR.

To make a new program

Clear all the entries, then press PROGRAM and specify chapters/tracks from the beginning.

Note

- Total playing time of the disc appears when the player has read TOC data of the disc. To make the player read TOC data of an LD, see "Checking the total playing time of the program" on page 23.

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

To	Press
Enter 15	Ⓜ , then 5
Enter 30	Ⓜ , Ⓜ , Ⓜ , then 0

Checking the total playing time of the program

When you make a program on a CD or CDV, the total playing time of the program is always displayed on the screen and front panel display. If you want to check the total playing time while specifying chapters on an LD, you must make the player read TOC data of the LD following the procedures below before you start programming.

- 1 Press **QUICK START** on the player to turn off the indicator while the player is stopped.
- 2 Press **▶▶▶ PLAY**.
The player starts playing the disc and reads TOC data from side A. The AV calendar on side A appears on the front panel display. If you also want to select chapters on side B, press **DISC SIDE B**. The player starts playing side B and reads TOC data from side B. The AV calendar on side B appears on the front panel display. Now you can make a program while viewing its total playing time.

If you enter II PAUSES in the program

You can enter **II PAUSES** among chapter/tracks you specify, to make the player automatically pause during playback of the program. If you enter a **II PAUSE**, the total playing time is re-counted from --:-- (zero).

To check the contents of the program

Press **DISPLAY** twice while playing the program. The numbers of programmed chapters/tracks appear on the screen. The flashing number indicates the chapter/track currently being played.

To skip chapters/tracks while playing the program

Press **⏪ / ⏩ / ⏴ / ⏵** ACS/AMS. The player skips one chapter/track within the program.

To play the program repeatedly

Press **REPEAT**.
“REPEAT” appears on the screen briefly and the player plays the program repeatedly.

Canceling program play

Press **CLEAR**.
The player resumes normal playback from the current chapter/track.

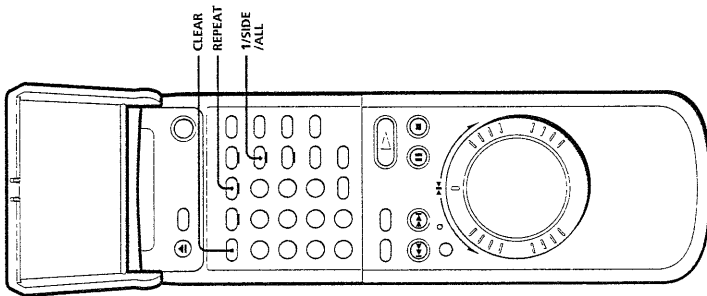
Note

- The total playing time of the program is not available with LDs not containing TOC data, even if you turn off the Quick Start function.

Tips

- You can advance to forward chapters/tracks in the program by rotating the SHUTTLE ring clockwise. However, you can not go back to previous chapters/tracks by rotating the SHUTTLE ring counterclockwise.
- The program you made is not cleared even after canceling program play. Press **PROGRAM** to enter the program mode, then press **▶▶▶ PLAY**. You can play the same program again.
- The program is cleared when:
 - you press clear while “TCM” is flashing in the front panel display.
 - you press **▶ OPEN / CLOSE**.
 - you turn off the player.

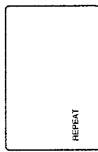
Playing a section repeatedly (Repeat Play)



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

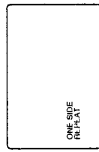
Repeating the whole disc (All Disc Repeat)

Press **REPEAT**.
“REPEAT” appears on the screen briefly. “REPEAT” lights up on the front panel display. 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.



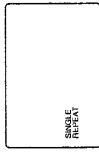
Repeating the selected side of the LD (One Side Repeat)

Press **1/SIDE/ALL** twice, then press **REPEAT**.
“ONE SIDE” and “REPEAT” appear on the screen briefly. “REPEAT 1 SIDE” lights up on the front panel display. The player plays the selected disc side repeatedly.



Repeating the selected chapter/track (Single Repeat)

Press **1/SIDE/ALL** once, then press **REPEAT**.
“SINGLE” and “REPEAT” appear on the screen briefly. “REPEAT 1” lights up on the front panel display. The player plays the selected chapter/track repeatedly.

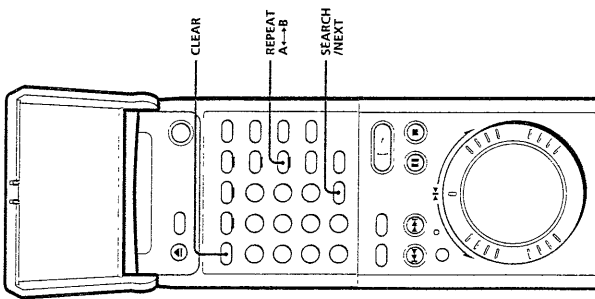


To check the repeat status

Press **DISPLAY** twice.

Canceling Repeat Play

Press **CLEAR**.



Notes

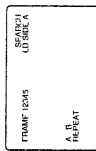
- When you play an LD, you can do Repeat A->B only on the current side of the LD. You cannot do it on both sides of the LD.
- Memory Search is canceled when:
 - you open the disc tray.
 - you turn off the player.
 - you do a Frame/Time Search.

Tips

- You can scan the disc between points A and B by rotating the SHUTTLE ring or holding down <<A/>> SCAN.
- Even if you press ■ STOP (but not POWER or ▲ OPEN/CLOSE), the player remembers the "return to" point for Memory Search. If you resume playing by pressing SEARCH/NEXT instead of ▷ PLAY, you can continue to repeatedly return to the point you have selected.

Repeating a specific portion on the disc (Repeat A ↔ B)

- 1 Press REPEAT A->B at the beginning of the scene or phrase you want to repeat.**
This tells the player where repeat is to start. "REPEAT" and "A-" appear, "B" flashes on the screen.
- 2 Let the player run to the end of the scene or phrase.**
- 3 Press REPEAT A->B again.**
This tells the player where repeat is to end. "REPEAT" and "A-B" appear. The player repeatedly plays the scenes or phrases between the two points you specified.

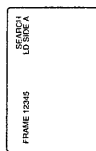


To repeat a different portion
Repeat steps 1 to 3 to reenter new start and end points.

To cancel Repeat A->B
Press CLEAR.

Repeatedly returning to a specific point on the disc (Memory Search)

- 1 Press REPEAT A->B at the point where you want to return to.**
This tells the player where to start. "REPEAT" and "A-" appear, and "B" flashes on the screen.
- 2 Press CLEAR to turn off the indication "A-B REPEAT" on the screen.**
(Thus not setting an end point of "Repeat A->B".)
- 3 Press SEARCH/NEXT at any point you like on the disc.**
The player returns to the point you specified and starts playing.

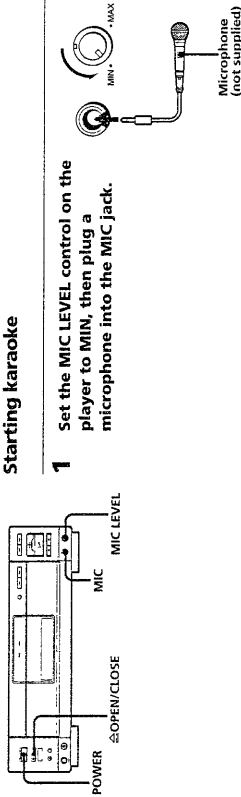


Playing karaoke

This section gives you short instructions for playing "karaoke" (singing along with a disc).

Starting karaoke

- 1 Set the MIC LEVEL control on the player to MIN, then plug a microphone into the MIC jack.**



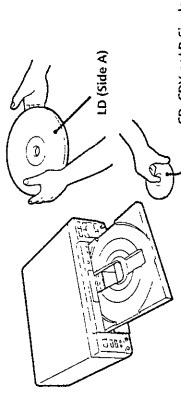
- 2 Press POWER to turn on the player.**

- 3 Turn on the TV and stereo system.**

TV:
Set to "Video."
Stereo system:
Turn on the amplifier or receiver and select CD or AUX for audio output.

- 4 Press ▲ OPEN/CLOSE.**
The disc tray comes out.

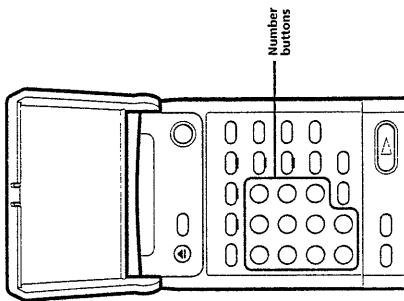
- 5 Place a disc on the disc tray.**



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

Notes

- If you insert more than one disc, or if the disc is not seated properly, the disc may not start playing, and may damage the disc or player.
- 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.



6 Press one of the number buttons on the remote commander to choose the song you want to play.

The disc tray automatically closes and the song starts playing. To choose a song on side B of the LD, press DISC SIDE B, then press the number button.

7 Set the ON/OFF switch on the microphone to ON and turn the MIC LEVEL control to adjust the microphone volume.



(Inner knob)

8 Turn the ECHO control to adjust the strength of echo.



(Outer knob)

Now you can enjoy playing karaoke.

To enter a number greater than 10

To Press

Enter 14 (4) , then (4)

Enter 25 (4) , (4) , then (5)

Enter 30 (4) , (4) , (4) , then (0)

Tips

- If howling occurs
 - Move the microphone away from the speakers.
 - Lower the microphone volume or echo level.
 - Lower the volume.
- If the sound is distorted or the picture flickers when listening through your TV speakers, set the ATT switch at the rear of the player to ON to lower the output level.
- Program Play gives you non-stop karaoke entertainment (see "Playing in a specified order" on page 22).

Note

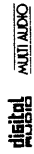
- Use the ANALOG/CB or AUDIO MONITOR button to select the sound.
- When you play MULTI AUDIO Karaoke LDs, the player automatically outputs the backup sound without vocals. Use the ANALOG/CB button to listen to the original vocals recorded in analog tracks. If you use other types of discs such as multiplex Karaoke CDs, use the AUDIO MONITOR button to select whether to output only the backup sound or sound with the original vocals (see "Using the sound control functions" on page 14).

Optical discs

The MDP-650 can play all three types of optical discs currently available for home entertainment, laser discs (LD), recorded in NTSC standard), compact discs (CD) and compact disc videos (CDV).*

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

Multi audio discs



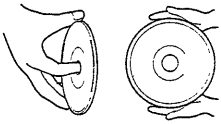
Discs with these logos contain separate analog and digital tracks which may differ in content.

- * The MDP-650 cannot play the following discs or functions:
 - CED, VID 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 DVDs

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



Holding LDs

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



Light exposure

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

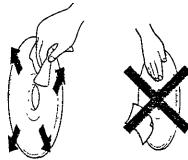
Cracked or damaged discs

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

Keeping the disc surface clean

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

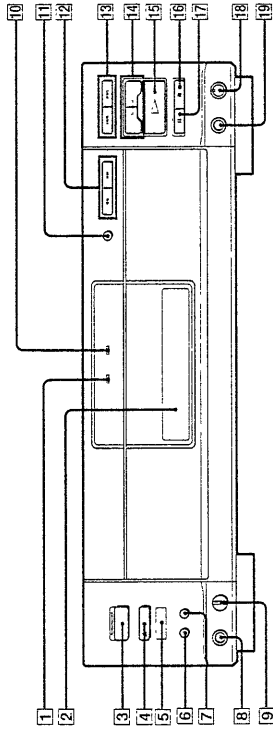
To prevent marring, after playing, remove the disc and put it back into its jacket. Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad paper or adhesive tape will deteriorate the quality of the playing surface, and thus the output quality.



See the pages indicated in () for details.

Index to parts and controls

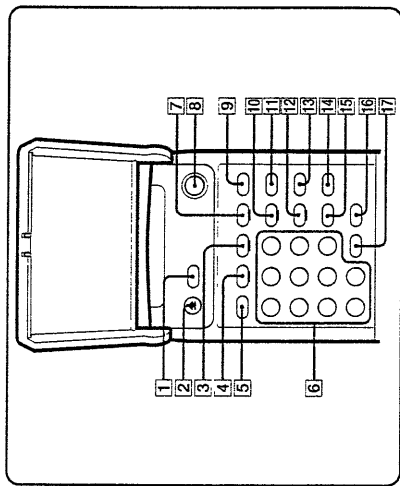
Front



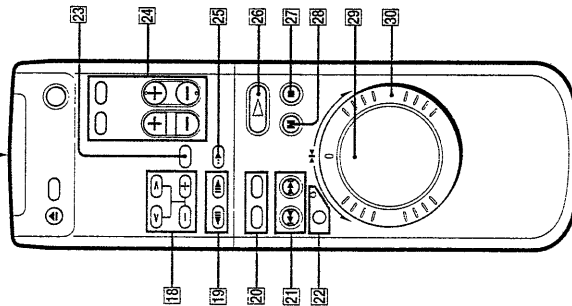
- 1 LD DIGEST indicator (12)
- 2 Front panel display (9)
- 3 POWER switch and indicator (8)
 - ON: Green
 - OFF: Off
- 4 OPEN/CLOSE button (8)
- 5 Remote sensor (28)
- 6 QUICK START button and indicator (11)
- 7 FL DISPLAY button (9)
- 8 PHONES jack (9)
- 9 LEVEL control (9)

- 10 AUTO RESUME indicator (10)
- 11 THEATER MODE button and indicator (12)
- 12 <</> SCAN buttons (13)
- 13 <</>/> ACS/AMS buttons (13)
- 14 SIDE A/B buttons and indicators (9)
- 15 > (Play) button (8)
- 16 ■ (Stop) button (8)
- 17 || (Pause) button (8)
- 18 ECHO/MIC LEVEL controls (26)
- 19 MIC jack (26)

Remote commander



- 1 DISPLAY button (15)
- 2 OPEN/CLOSE button (8)
- 3 REPEAT button (24)
- 4 FRAME/TIME button (18)
- 5 CLEAR button (18) (22) (24)
- 6 Number buttons (17) (18) (22) (27)
- 7 PROGRAM button (22)
- 8 POWER switch (8)
- 9 ANALOG/ button (14)
- 10 1/SIDE/ALL button (9) (17) (24)
- 11 AUDIO MONITOR button (14)
- 12 REPEAT A → B button (25)
- 13 AV TIME button (16)
- 14 POSITION button (16)
- 15 PICTURE CALL button (19)
- 16 BACK button (22)
- 17 SEARCH/NEXT button (18) (22) (25)
- 18 MULTI SPEED </> +/- buttons (20)
- 19 STILL/STEP buttons (19)
- 20 DISC SIDE A/B buttons (9)
- 21 JOG/SI button and indicator (21)
- 22 THEATER MODE button (12)

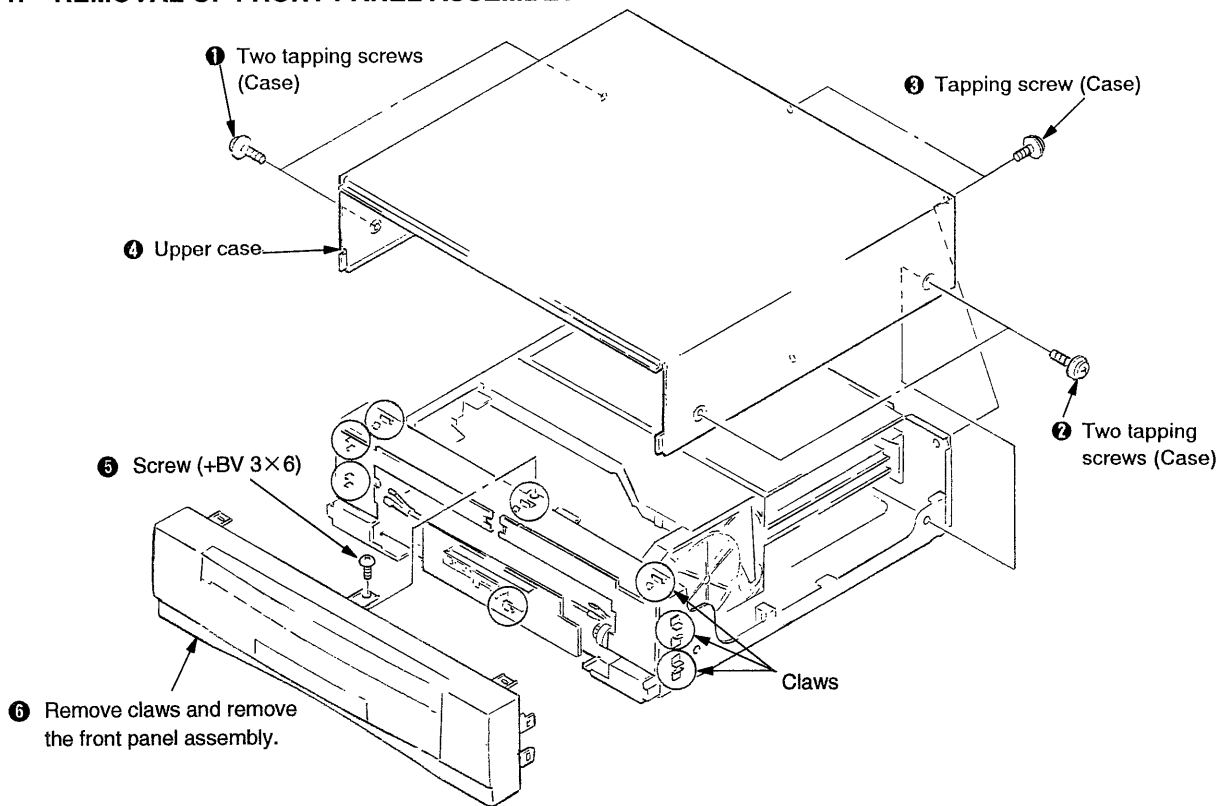


- 23 TV control buttons (available for TVs which have mark)
- 24 TV control buttons (available for TVs which have mark)
- 25 LD DIGEST button (12)
- 26 PLAY button (8)
- 27 STOP button (8)
- 28 PAUSE button (8)
- 29 JOG dial (21)
- 30 SHUTTLE ring (13) (21)

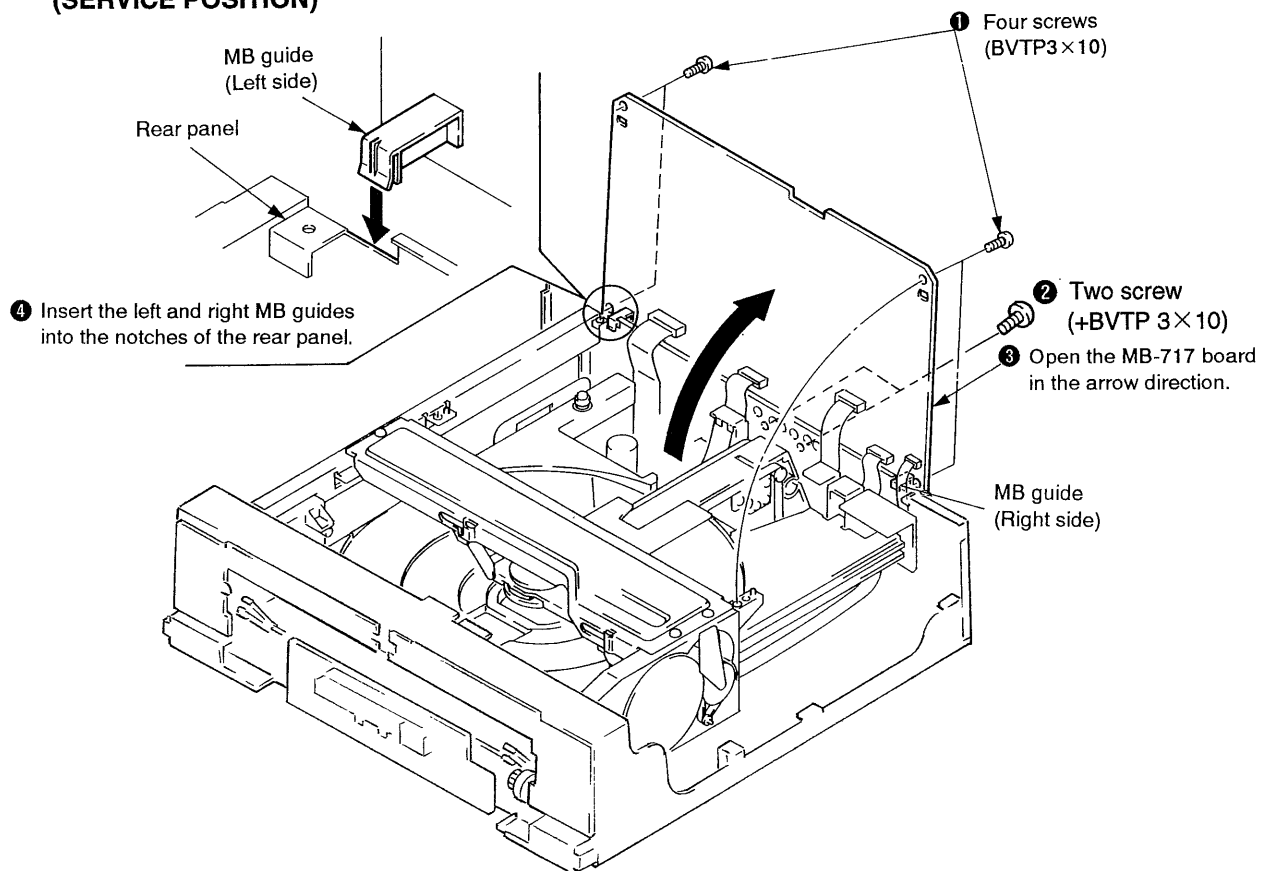
- A function activated by pressing a button with an orange mark (illustrated as "C") can be cancelled by pressing the CLEAR button.
- Buttons illustrated as "C" are "illuminated buttons," which are easy to locate under poor light conditions.

**SECTION 2
DISASSEMBLY**

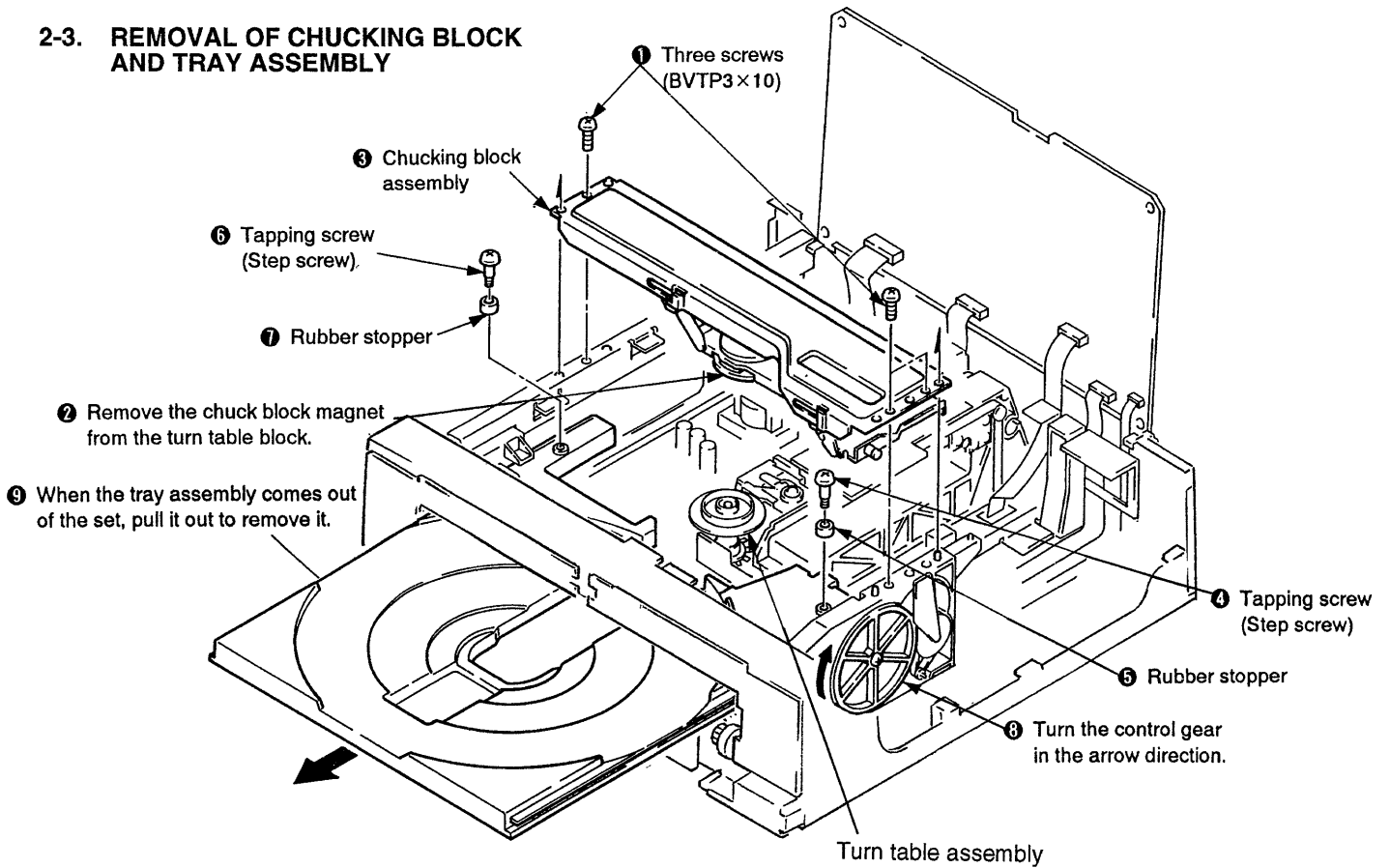
2-1. REMOVAL OF FRONT PANEL ASSEMBLY



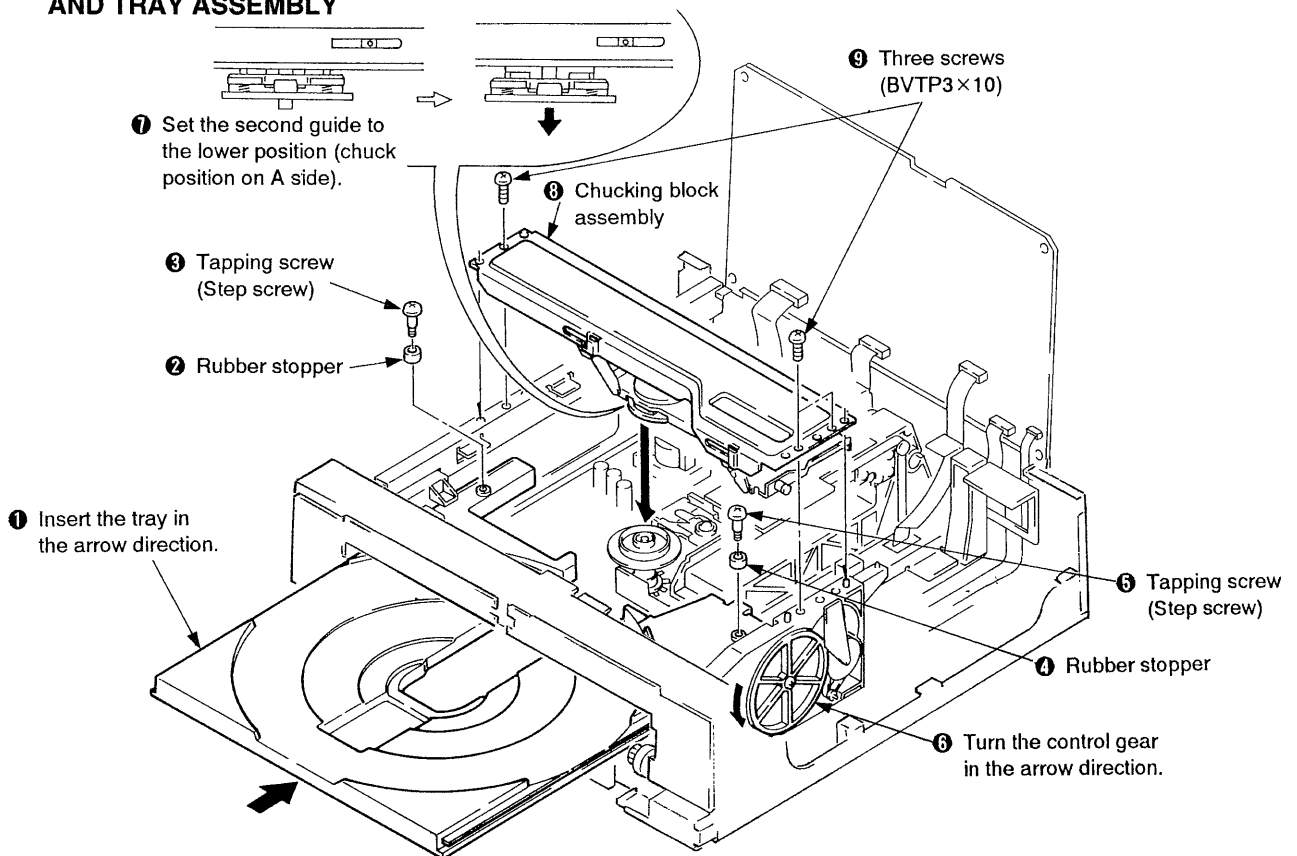
2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)



2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY

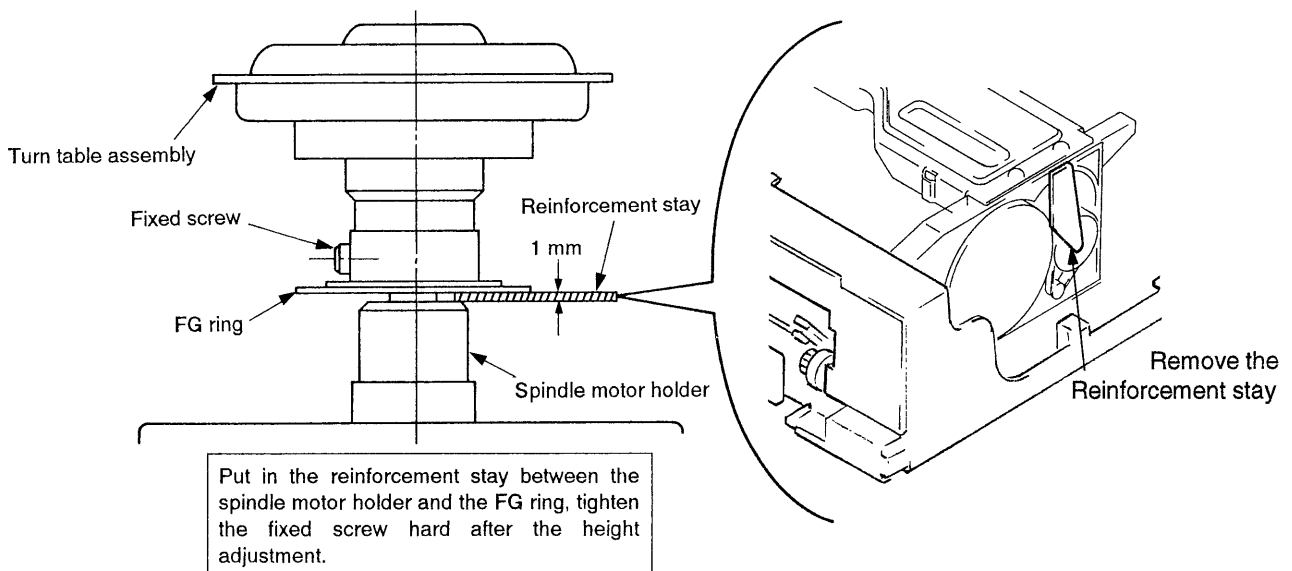


2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY

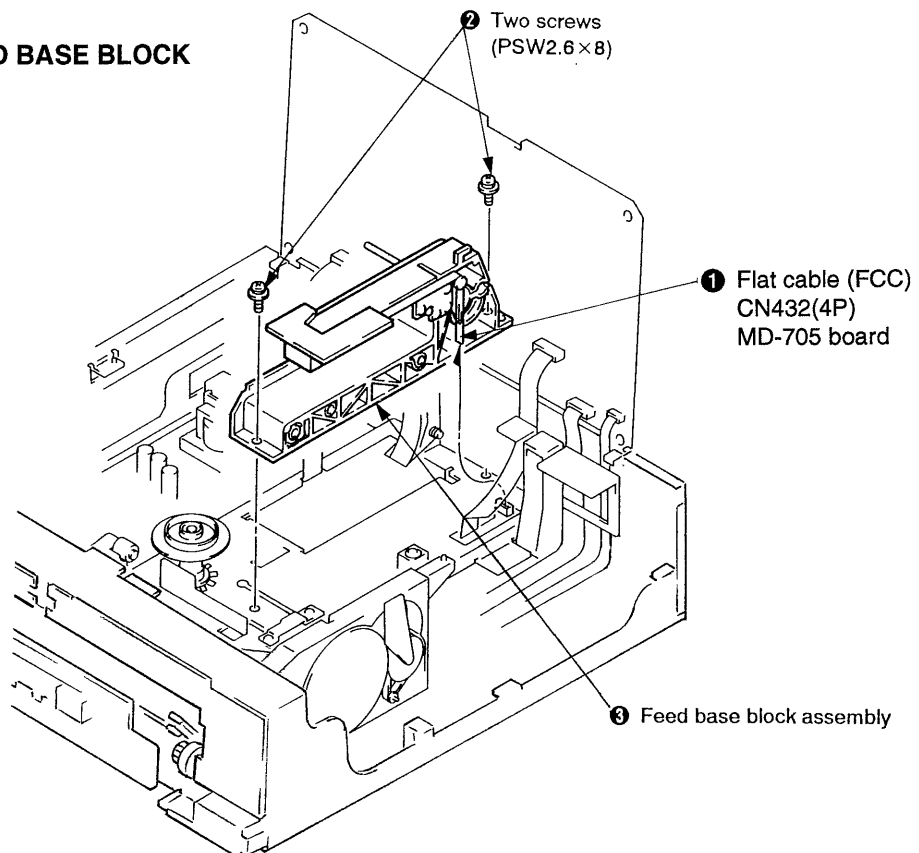


2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

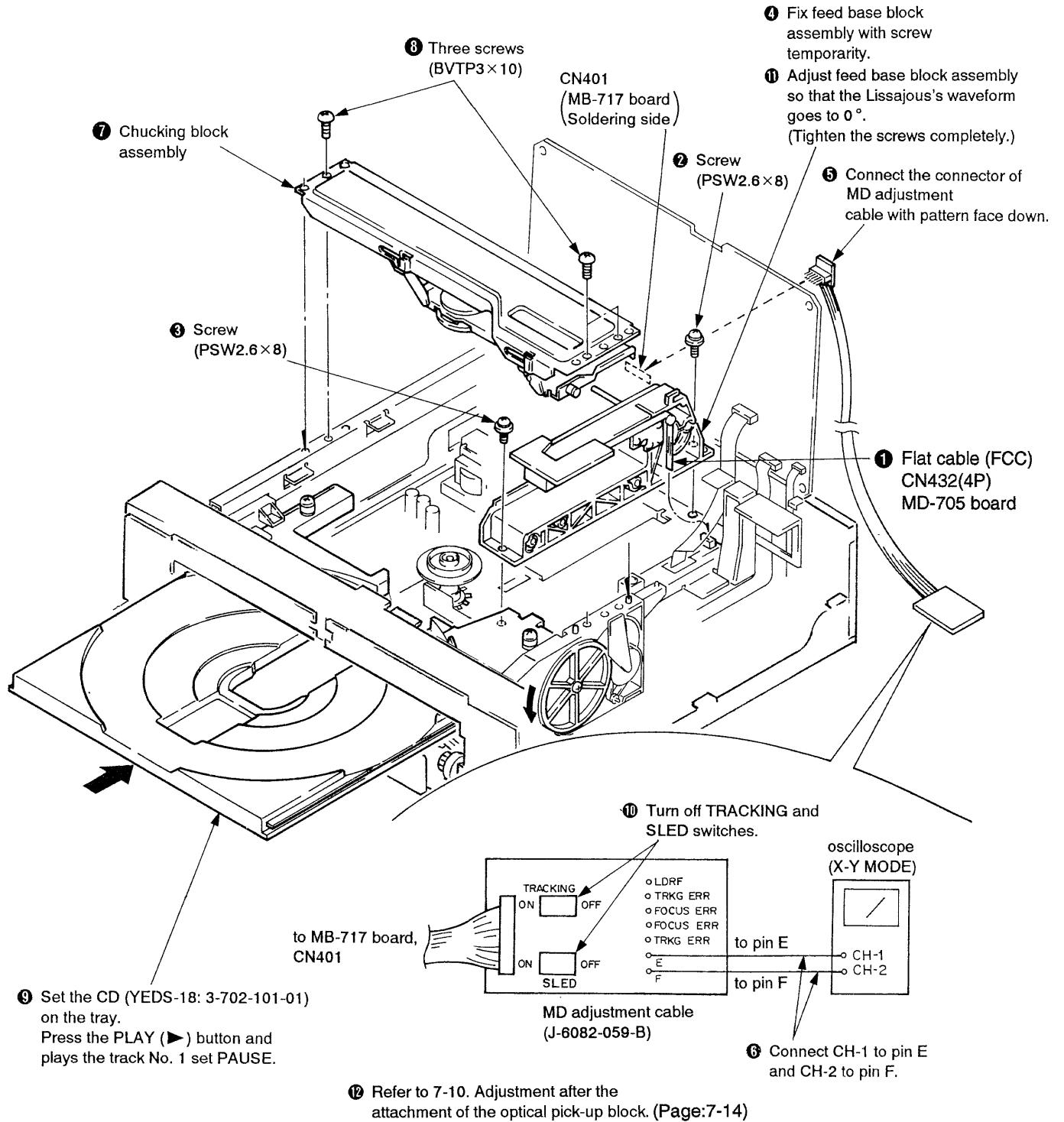
1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
Adjust the height and also the position putting in the reinforcement stay as below.
The thickness of the reinforcement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

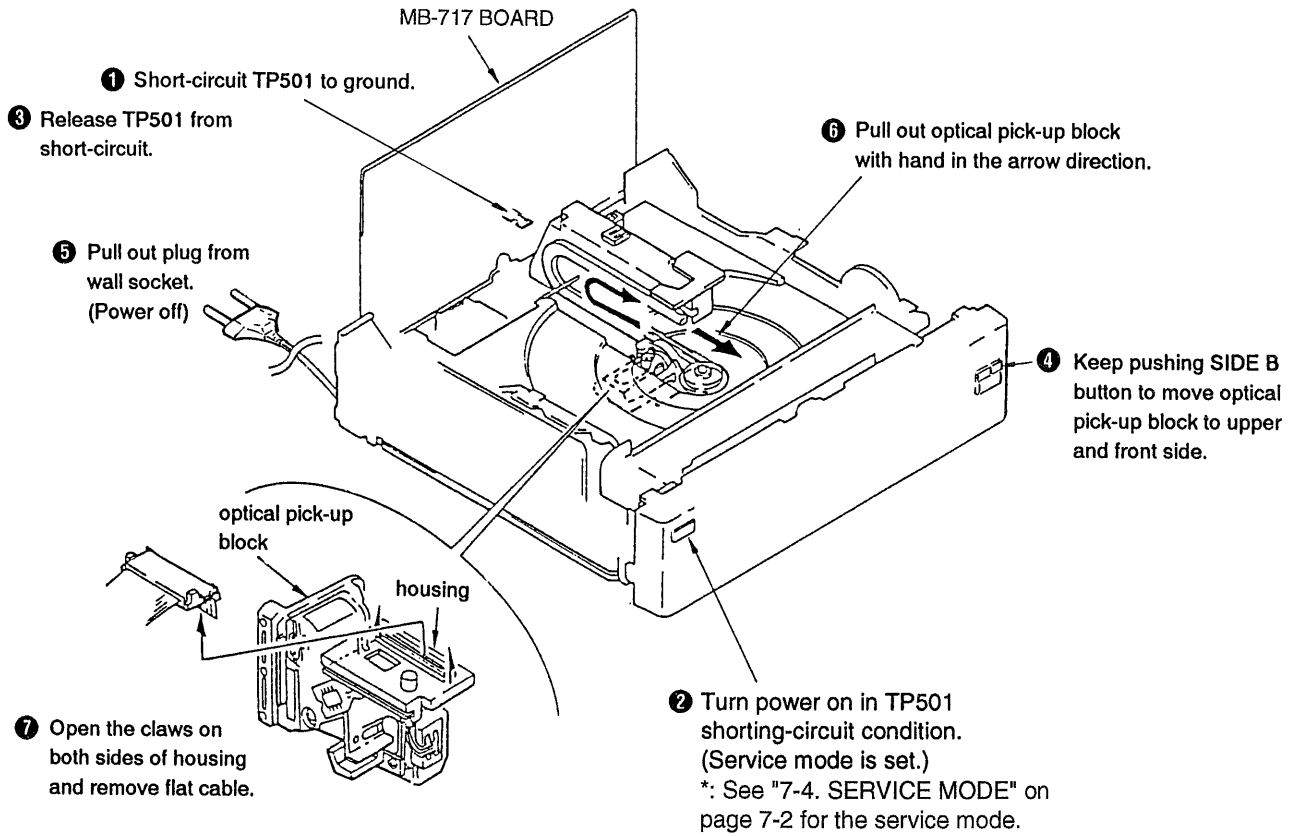


Lissajous's waveform

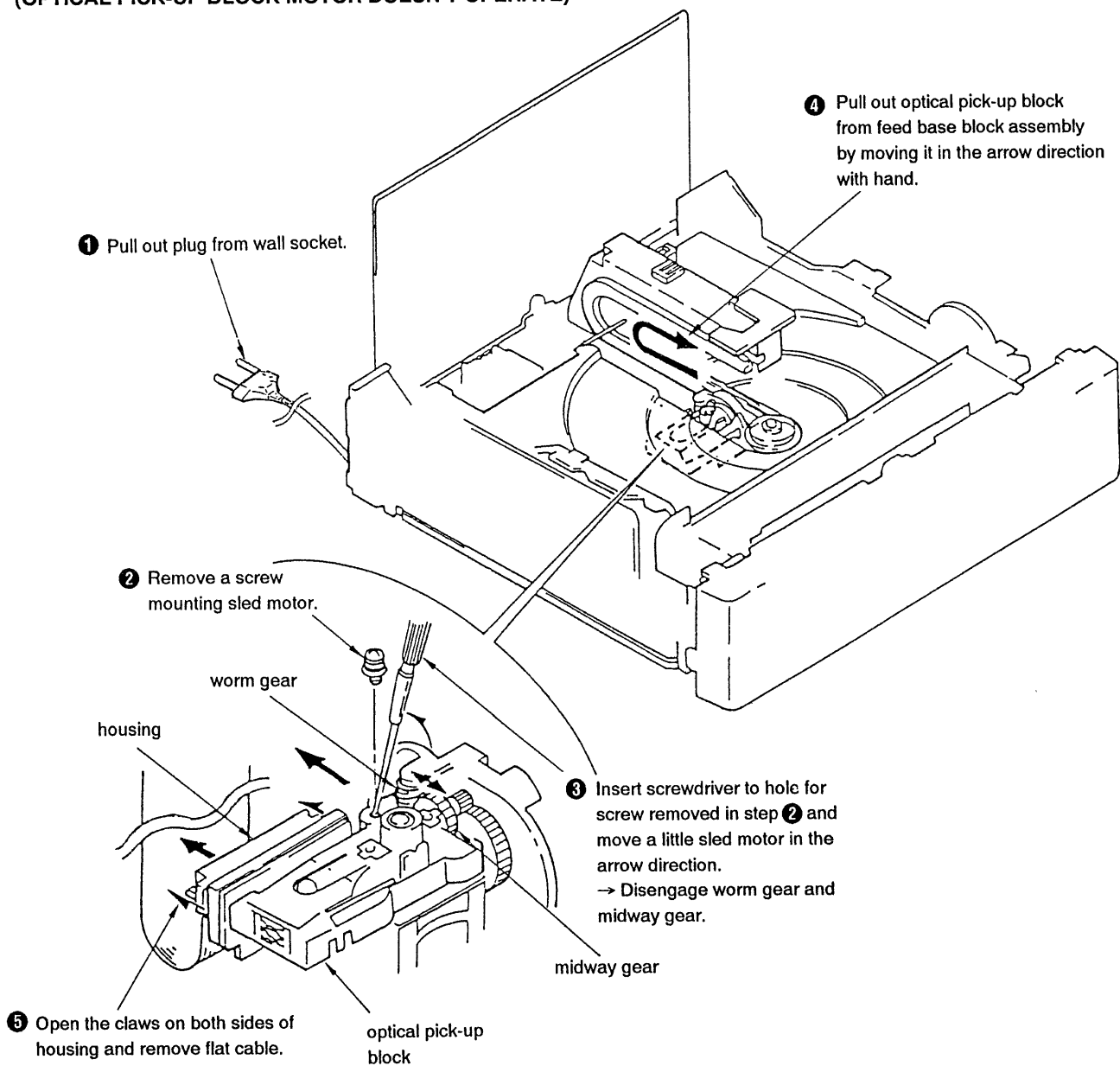
×	×	○
180°	90°	0°
∖	○	/

2-8. OPTICAL PICK-UP BLOCK

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



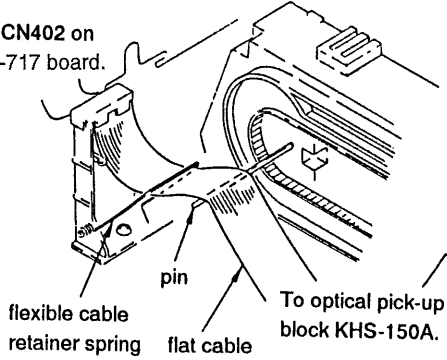
• **DISASSEMBLE II**
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)



• ASSEMBLE

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

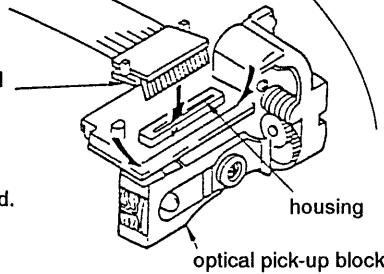
To CN402 on MB-717 board.



To optical pick-up block KHS-150A.

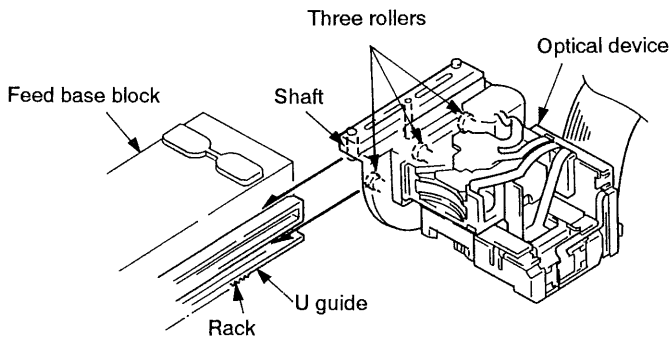
- ④ Insert plug to wall socket.

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



feed block assy

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



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

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

2-9. REMOVAL OF CONTROL GEAR

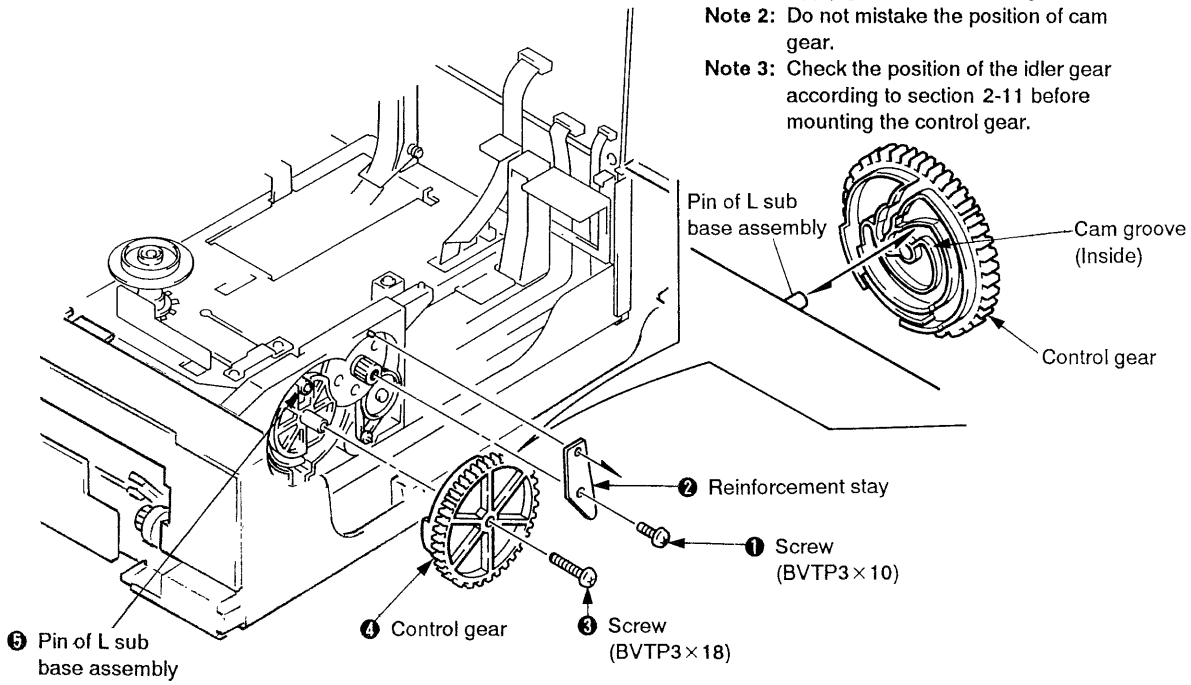
- Mounting the control gear

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

Note 1: Apply grease on the cam groove.

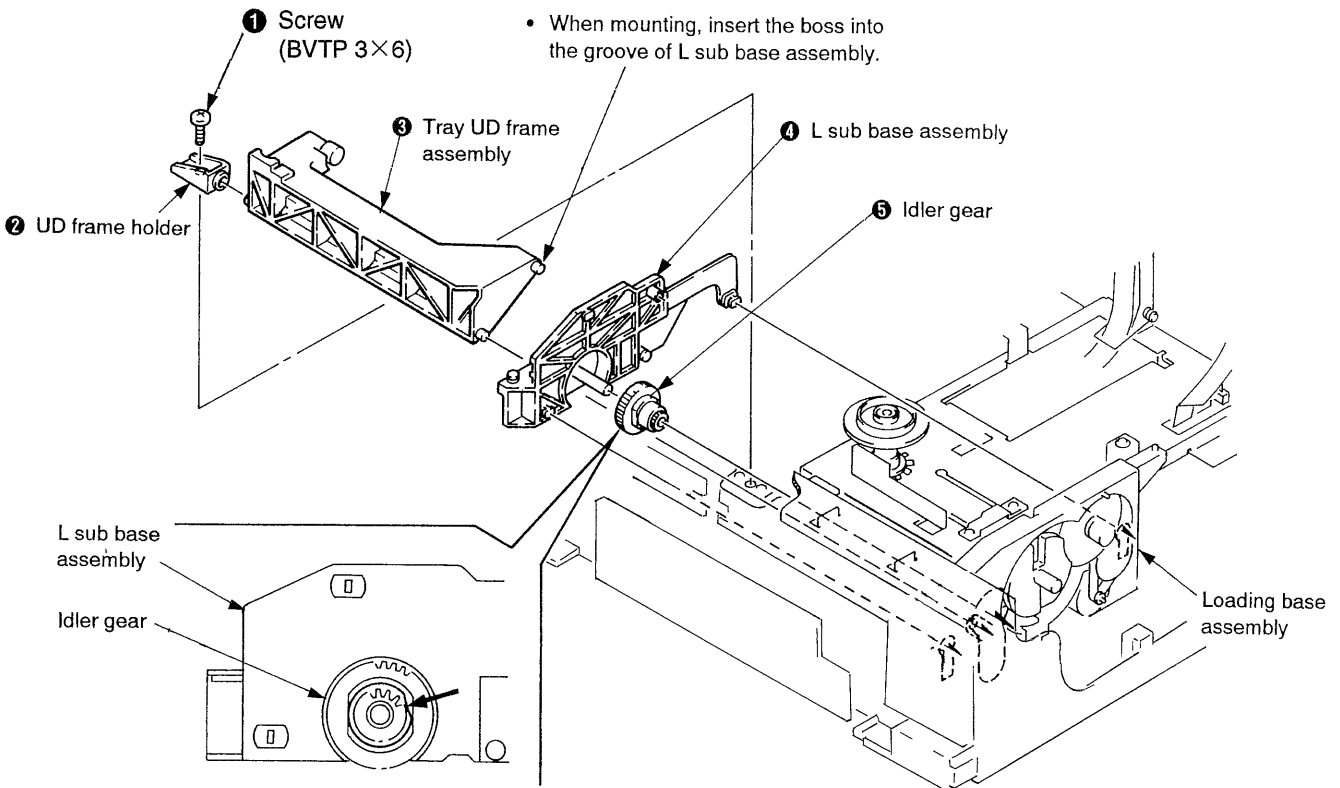
Note 2: Do not mistake the position of cam gear.

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



2-10. REMOVAL OF IDLER GEAR

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

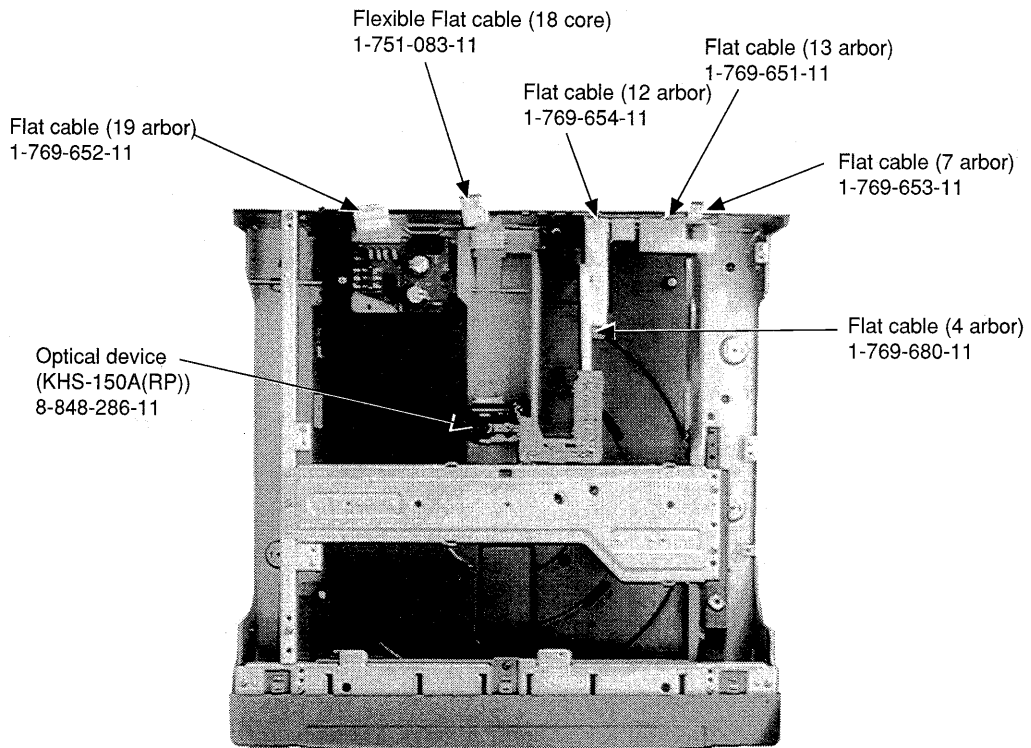


- Positioning the idler gear

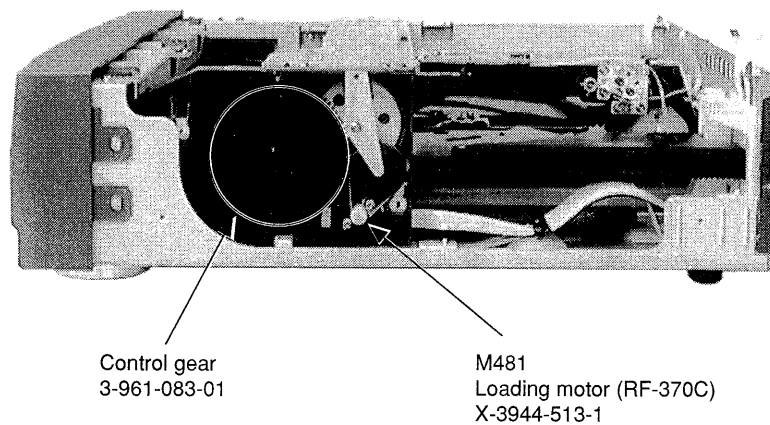
Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-11. INTERNAL VIEWS

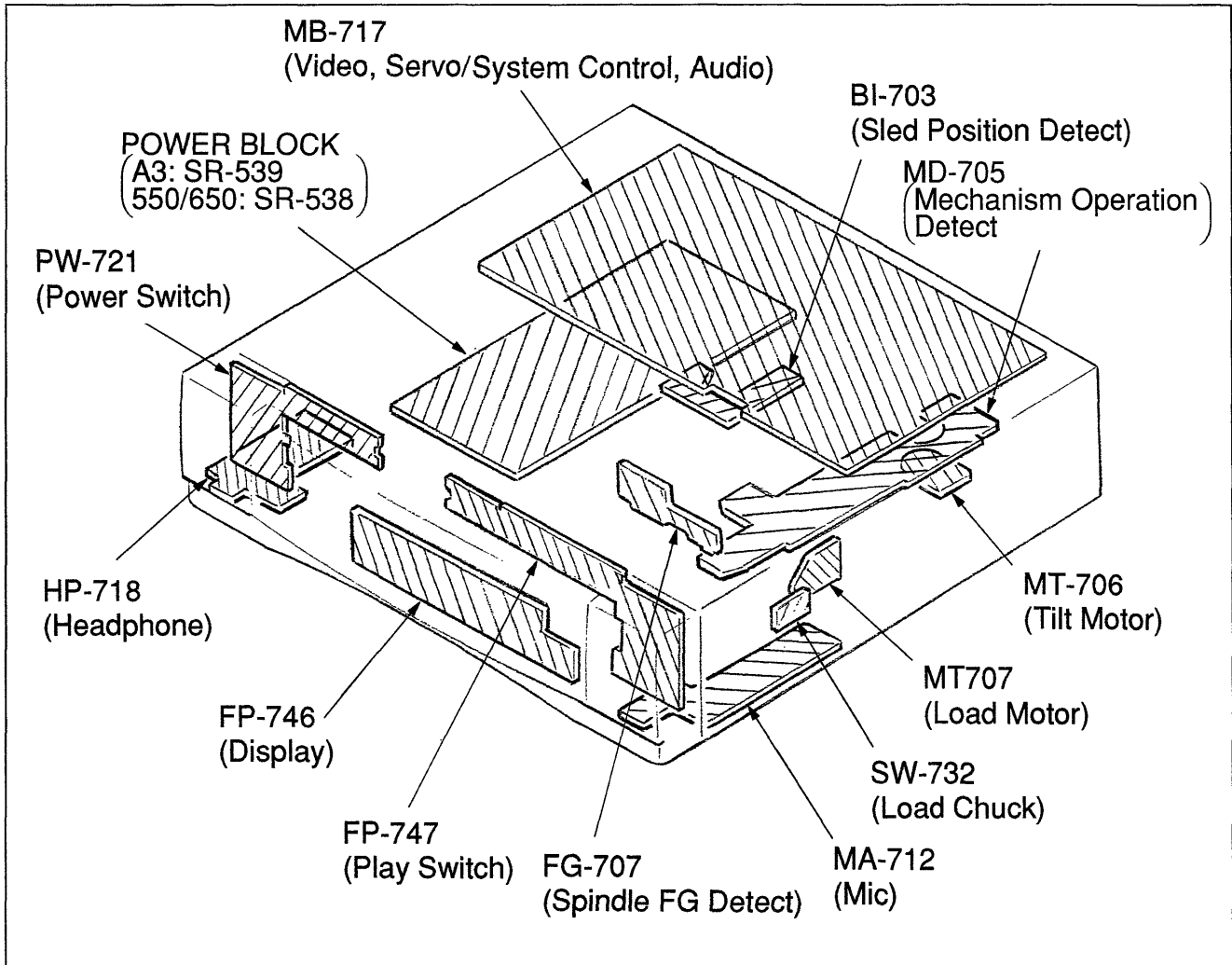
—Top View—



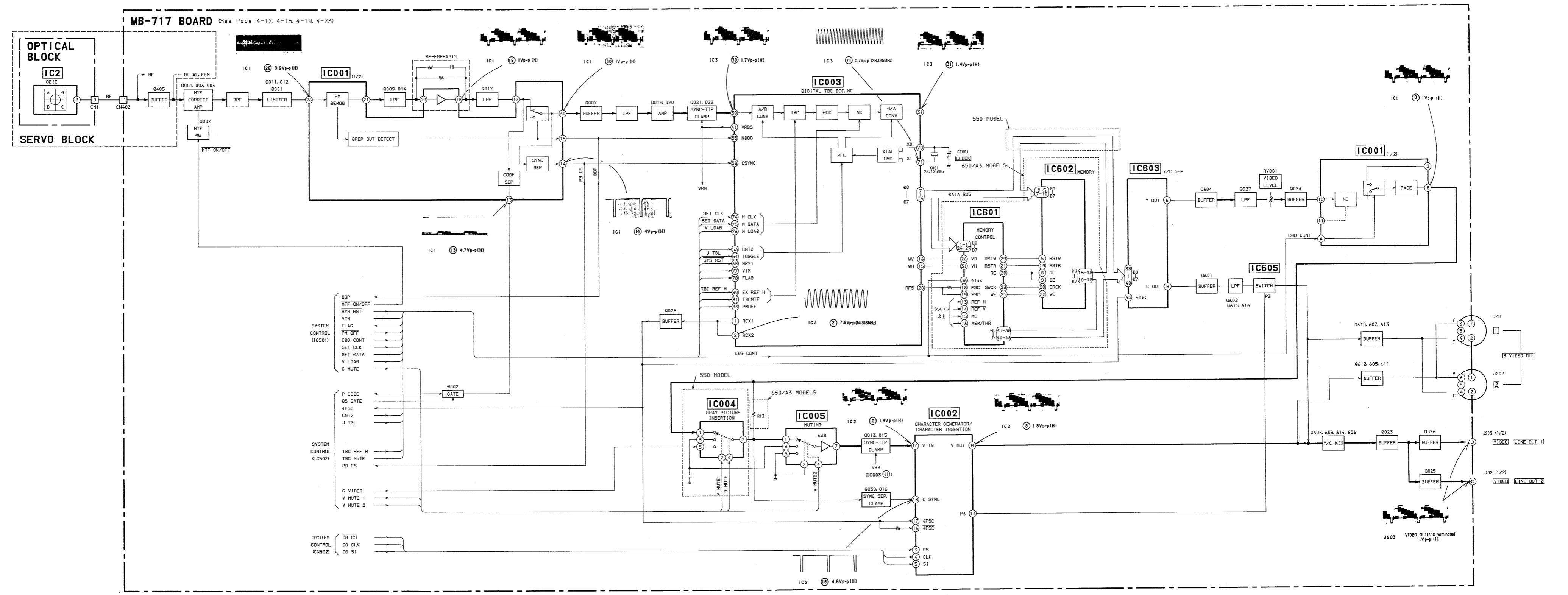
—Side View—



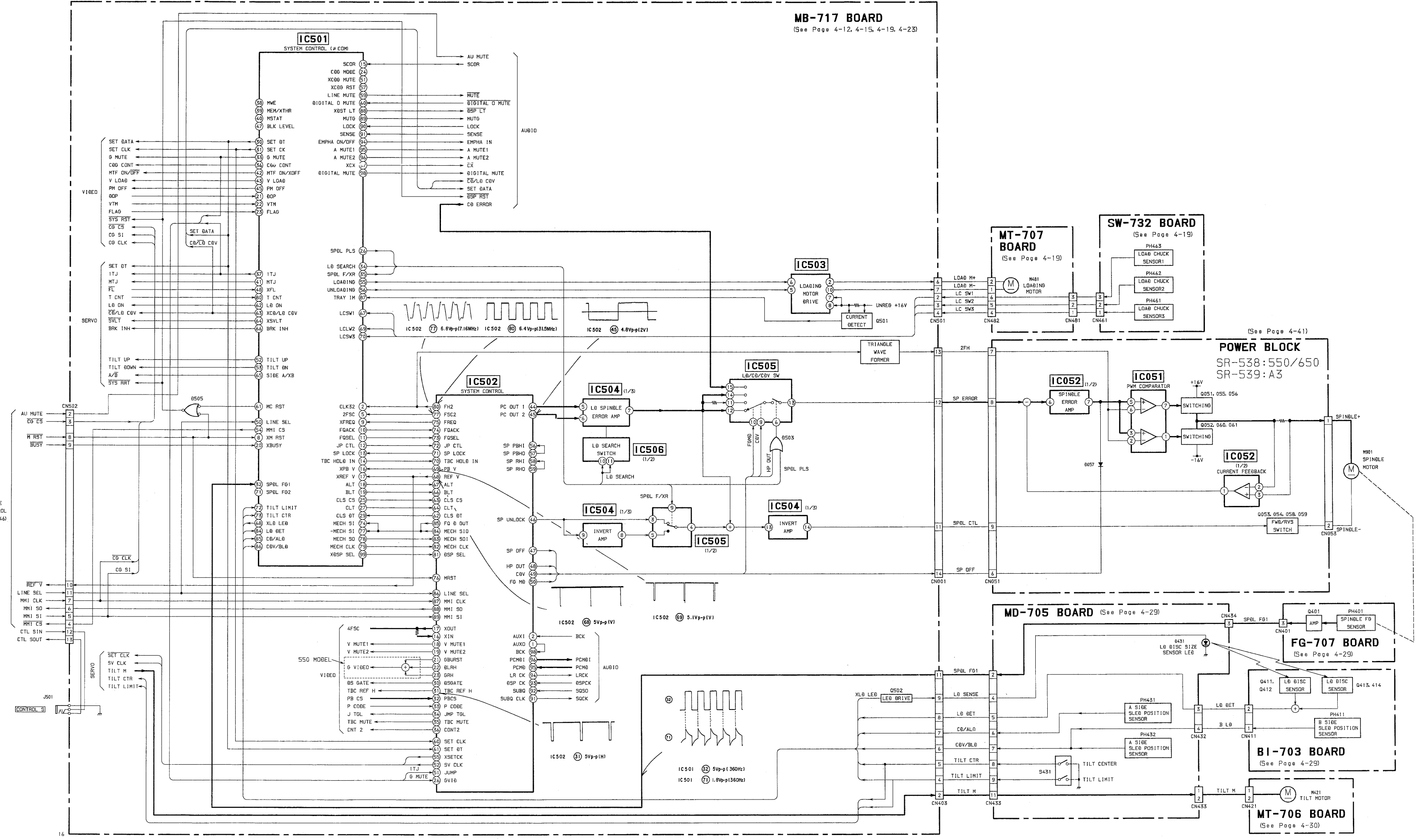
2-12. CIRCUIT BOARDS LOCATION



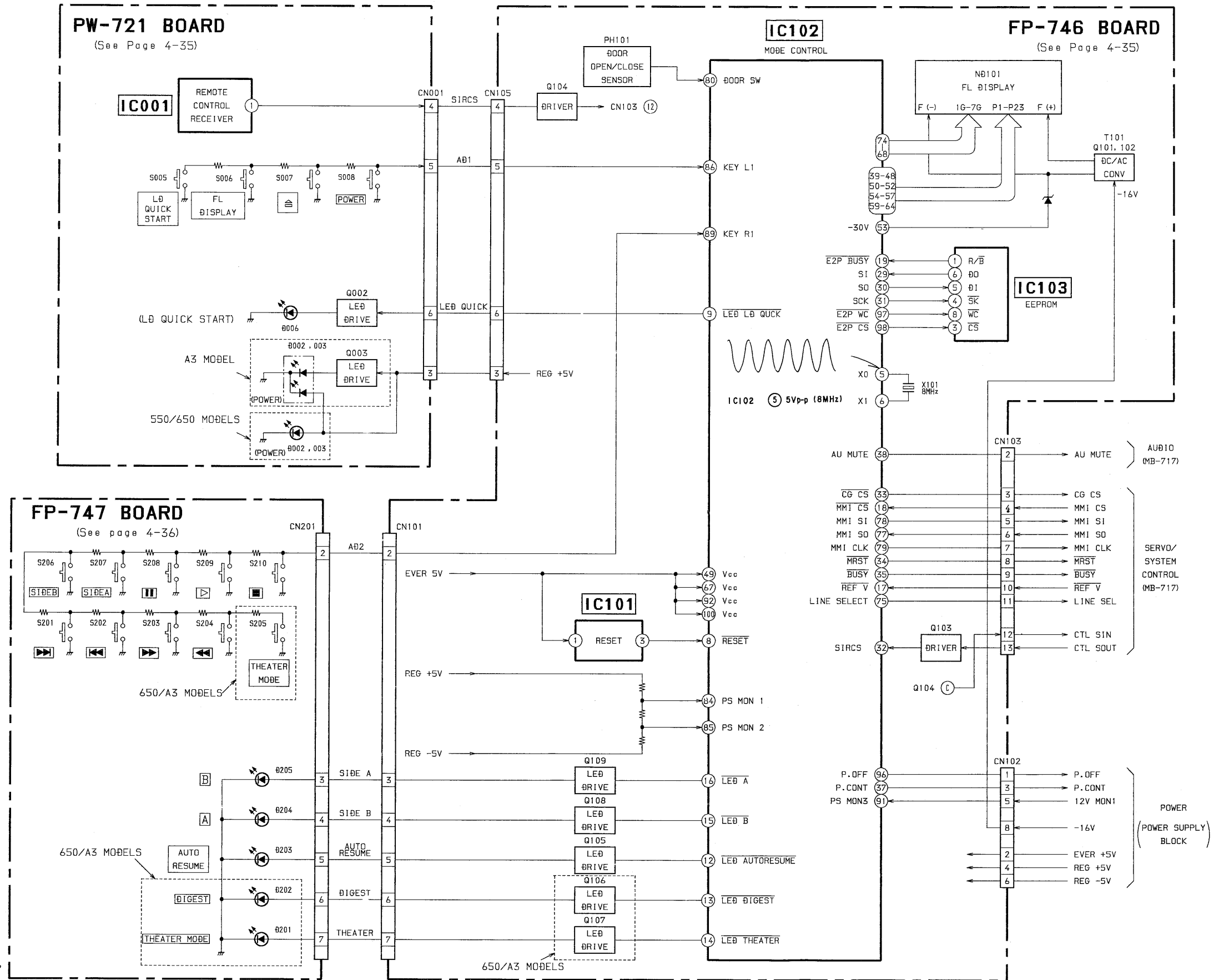
3-2. VIDEO BLOCK DIAGRAM



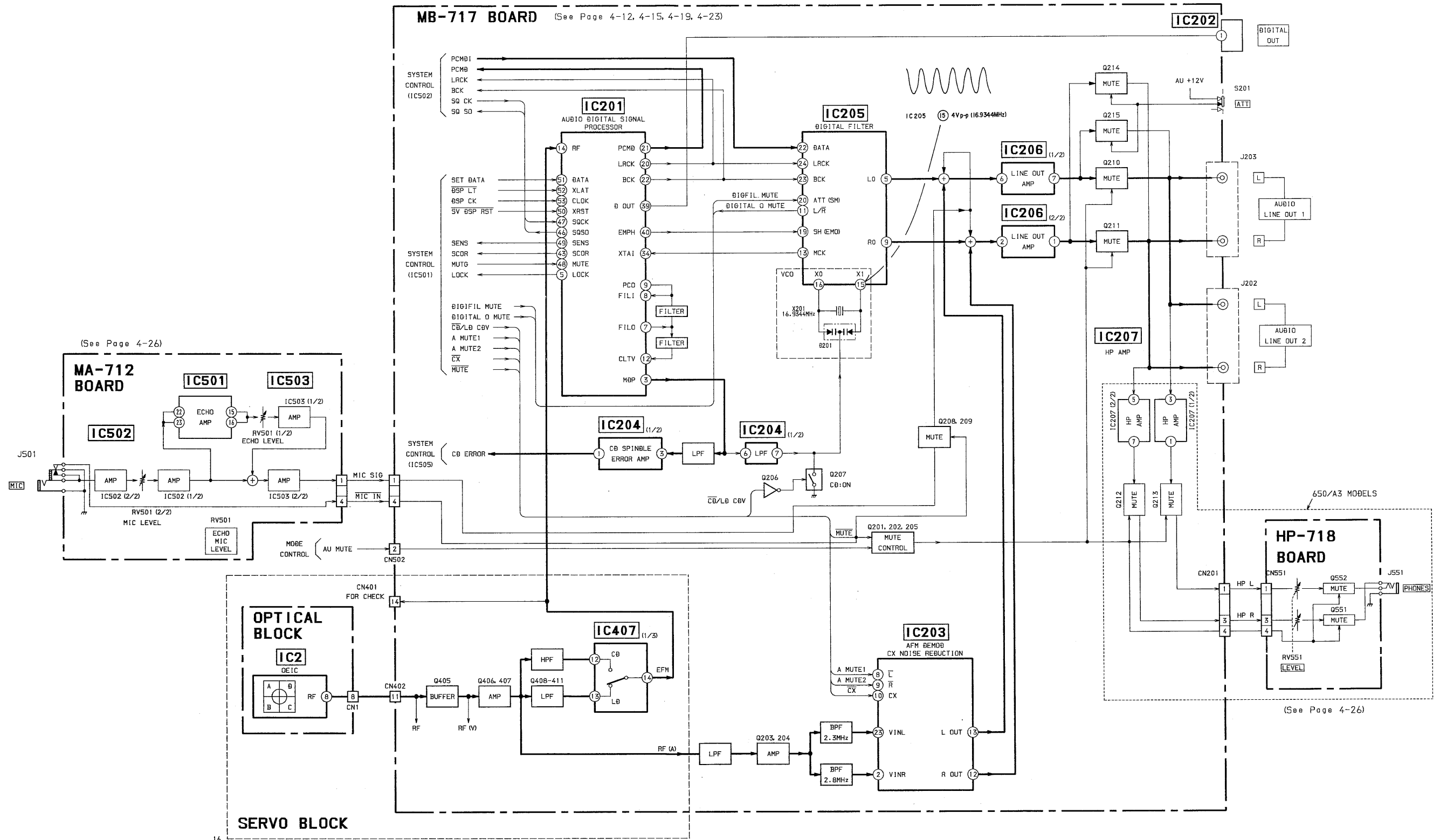
3-4. SYSTEM CONTROL BLOCK DIAGRAM



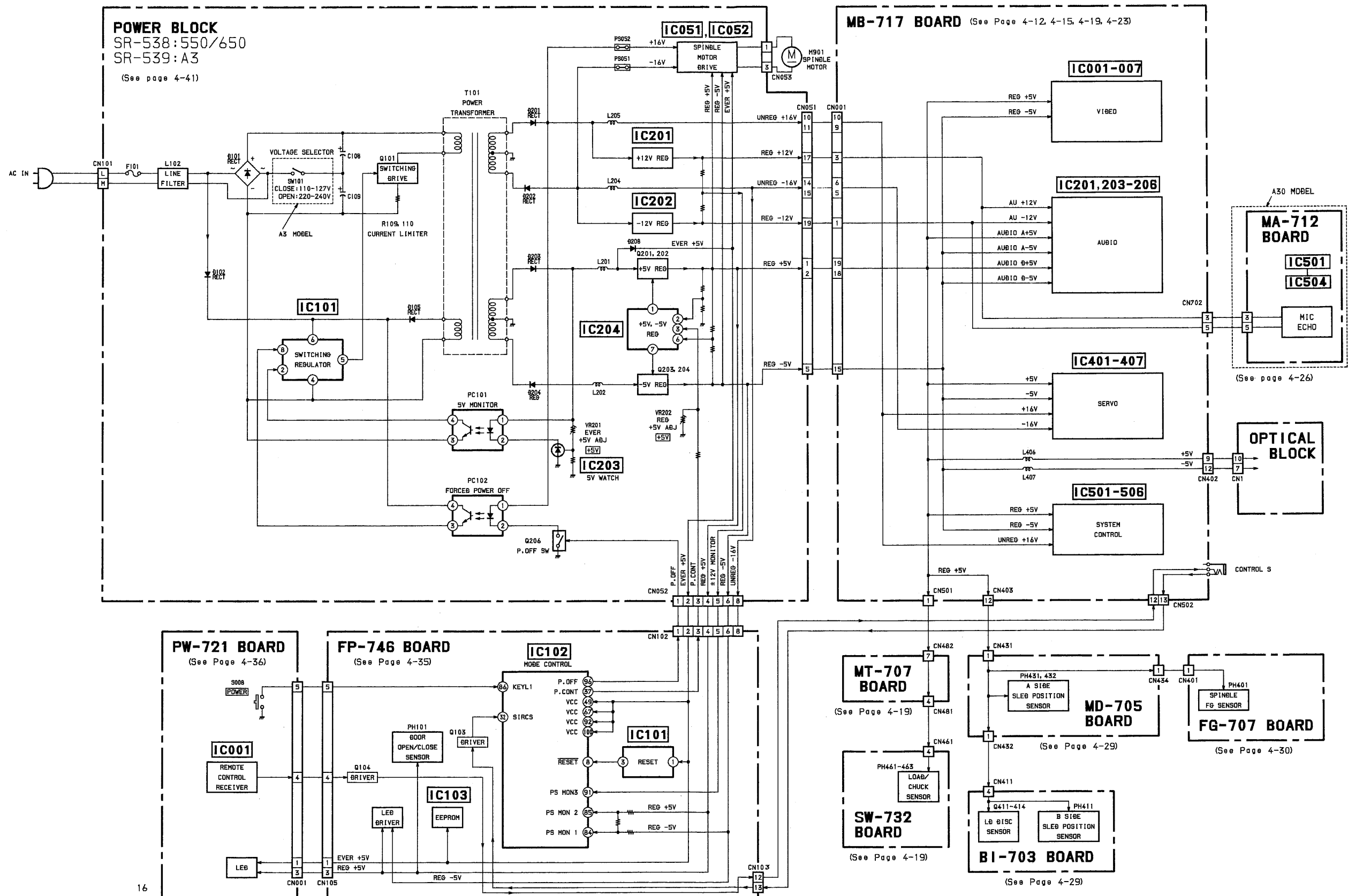
3-5. MODE CONTROL BLOCK DIAGRAM



3-6. AUDIO BLOCK DIAGRAM

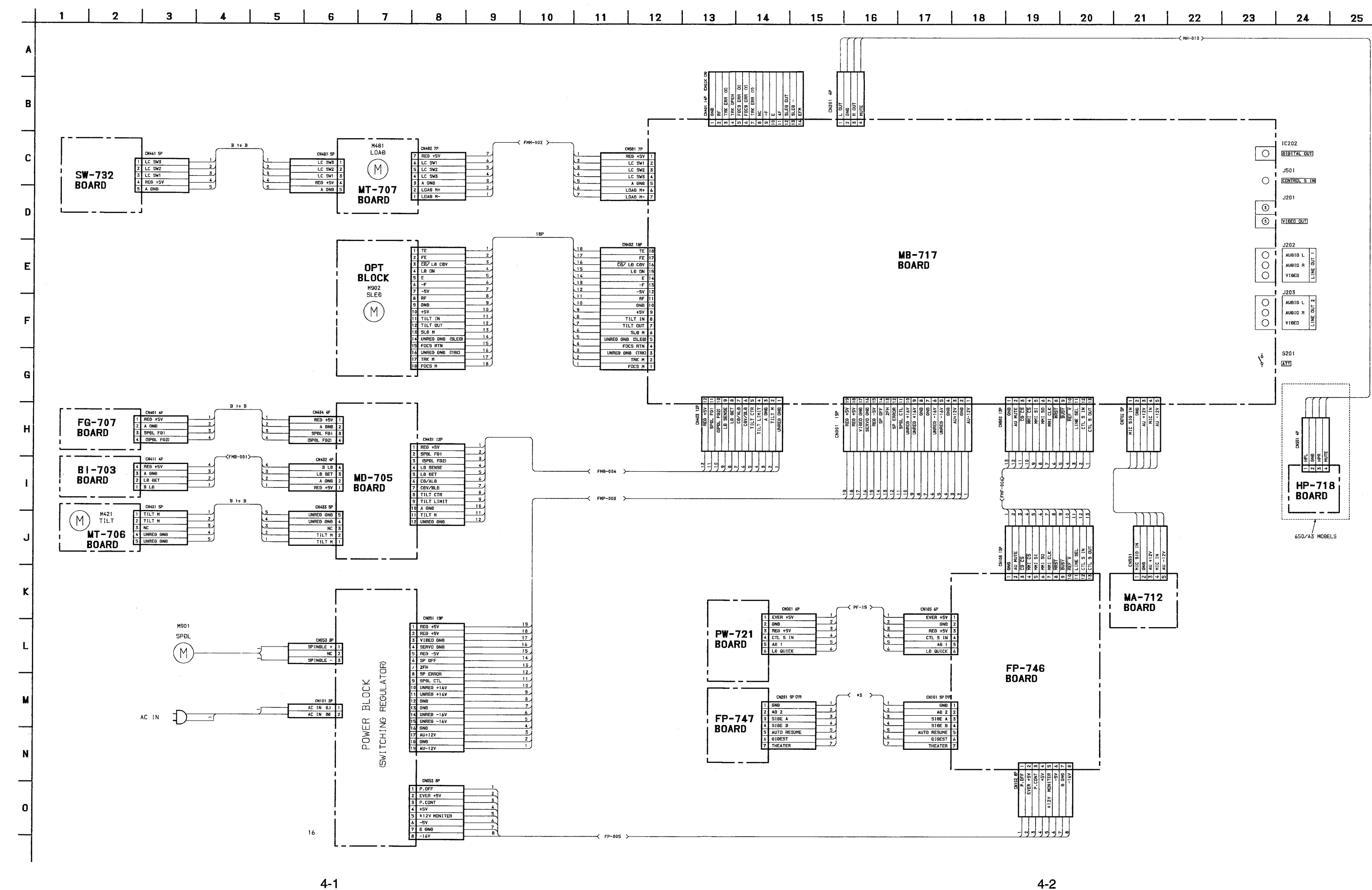


16



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-1

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

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

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

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

- Circled numbers refer to waveforms.
- For schematic diagrams.
 - Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
 - All resistors are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ.
 - All capacitors are in μF unless otherwise noted. pF: μμF. 50V or less are not indicated except for electrolytics and tantalums.
 - All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
 - ⎓ : fusible resistor.
 - : panel designation.
 - : adjustment for repair.*
 - : B+ Line.*
 - - - : B- Line.*
 - ↔ : IN/OUT direction of (+, -) B LINE.*
 - Circled numbers refer to waveforms.
 - Voltages are dc between ground and measurement points.*
 - Readings are taken under pause mode. (NTSC REF DISC HLV-8 SIDE 1 FRAME No. 4100)
 - Readings are taken with a digital multimeter (DC10MΩ).*
 - Voltage variations may be noted due to normal production tolerances.*

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

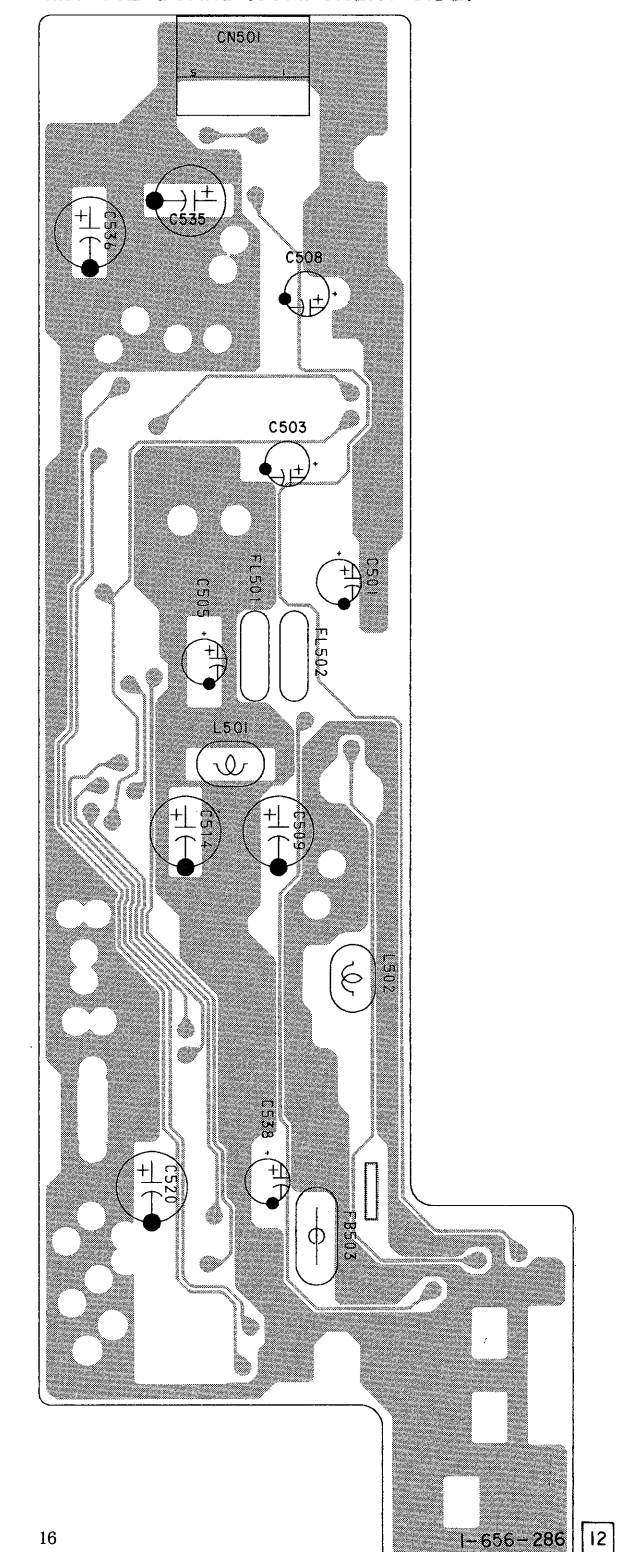
When indicating parts by reference number, please include the board name.

*: indicated by the color red.

MA-712 (MIC), HP-718(HEADPHONE) PRINTED WIRING BOARD

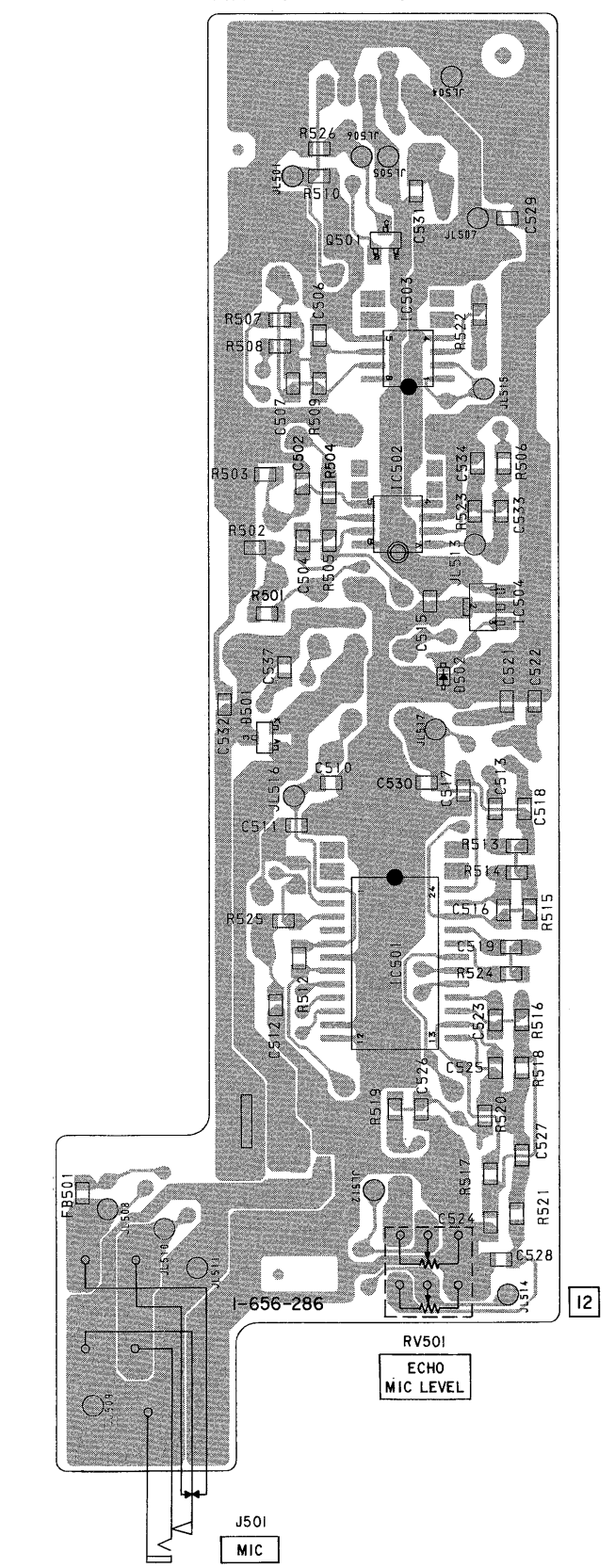
—Ref. No. MA-712 and HP-718 Boards; 3,000 Series—

MA-712 BOARD (COMPONENT SIDE)



16

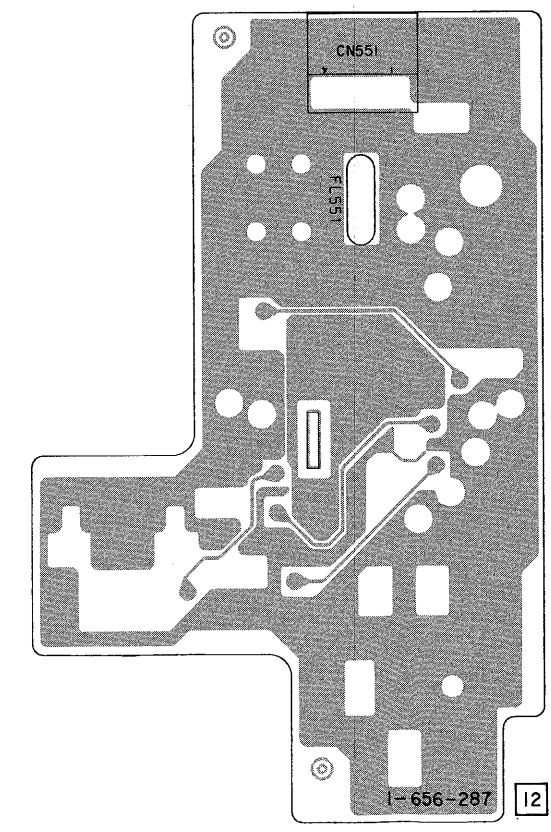
MA-712 BOARD (CONDUCTOR SIDE)



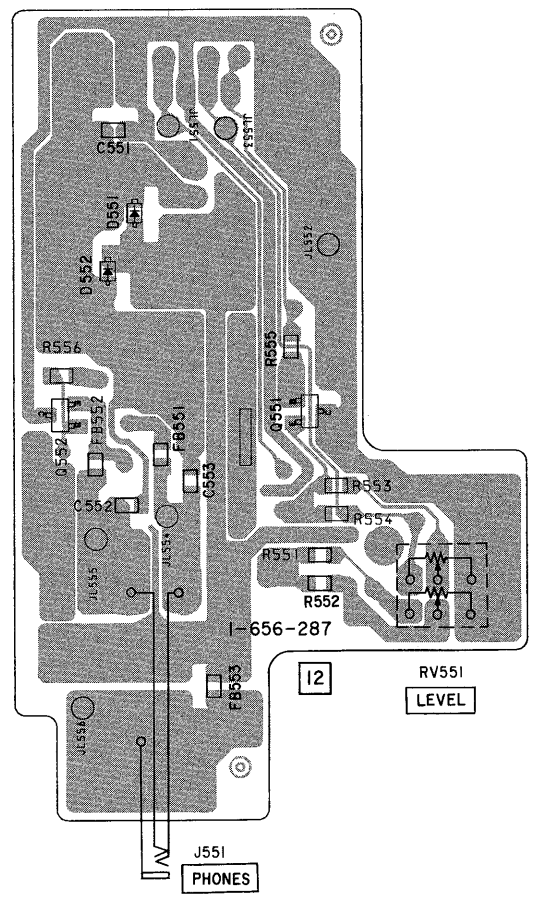
RV501 ECHO MIC LEVEL

4-4

(650/A3 MODELS)
HP-718 BOARD (COMPONENT SIDE)

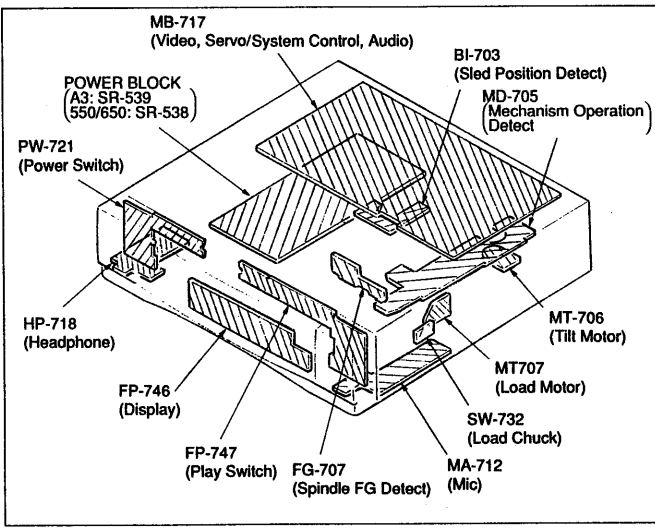


(650/A3 MODELS)
HP-718 BOARD (CONDUCTOR SIDE)



RV551 LEVEL

4-5

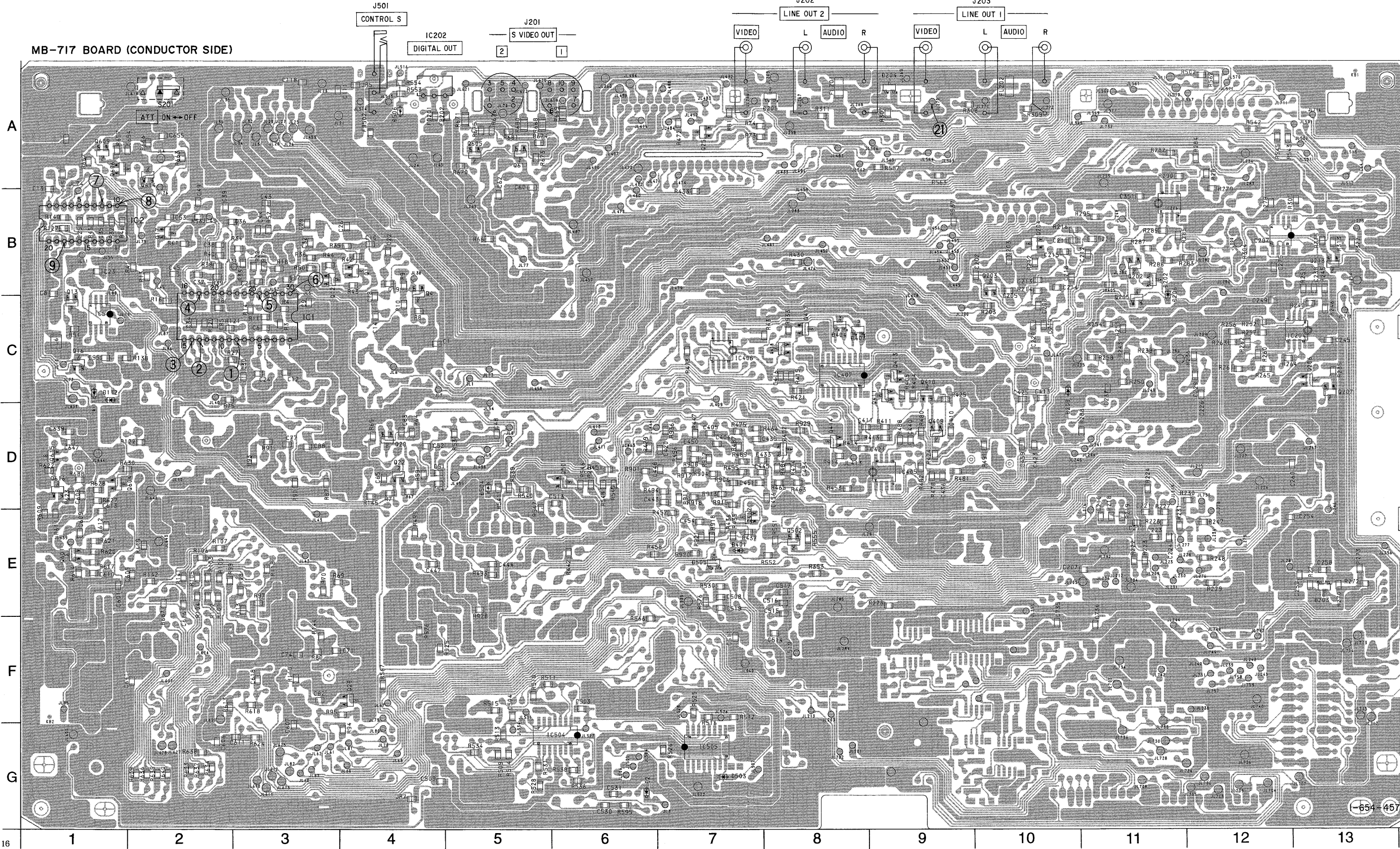


MB-717 BOARD

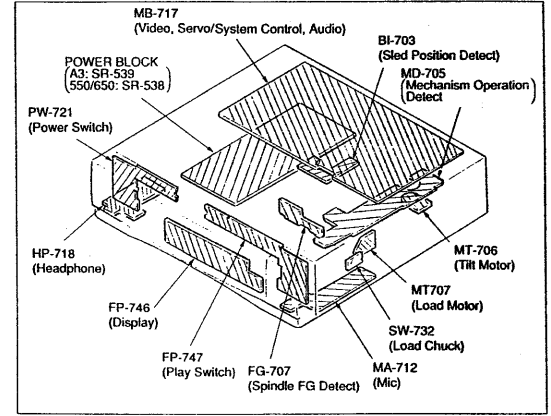
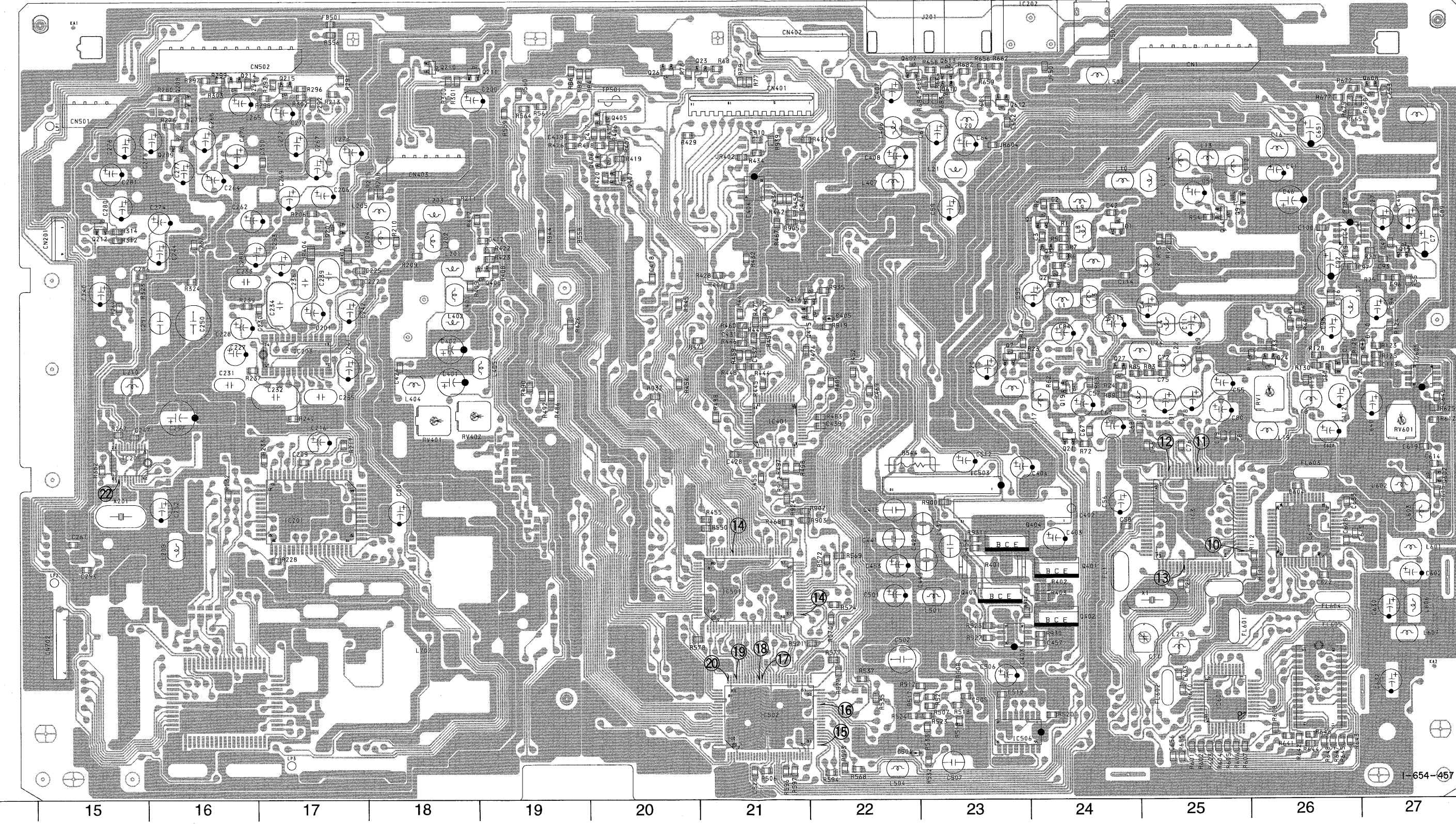
CN001 A-25	IC406 C-7	Q212 B-15
CN201 B-15	IC407 C-8	Q213 B-13
CN401 A-21	IC501 F-21	Q214 A-16
CN402 A-21	IC502 G-21	Q215 A-17
CN403 B-18	IC503 E-23	Q401 E-24
CN501 A-15	IC504 G-6	Q402 F-24
CN502 A-16	IC505 G-7	Q403 F-23
CN702 F-15	IC506 G-23	Q404 E-23
	IC601 G-25	Q405 A-20
D001 B-24	IC602 F-26	Q406 B-20
D002 G-6	IC603 E-26	Q407 B-20
D110 C-27	IC605 D-27	Q408 C-19
D111 C-1		Q409 D-9
D112 C-1	0001 B-24	Q410 C-9
D202 D-11	0002 C-24	Q411 C-9
D203 E-13	0003 C-24	Q412 E-7
D204 A-9	0004 B-4	Q413 C-9
D205 A-8	0007 C-23	Q414 D-8
D206 C-11	0009 B-25	Q415 C-22
D209 C-10	0011 B-4	Q416 C-22
D401 E-7	0012 B-3	Q417 C-8
D402 D-8	0013 C-1	Q418 C-8
D403 C-8	0014 B-25	Q501 D-6
D404 C-8	0015 C-27	Q502 E-8
D405 C-22	0016 C-1	Q601 E-1
D501 G-22	0017 B-2	Q602 E-27
D503 G-7	0019 D-24	Q604 D-1
D504 D-5	0020 D-4	Q605 A-5
D505 E-7	0021 D-24	Q606 A-1
D506 A-4	0022 D-4	Q607 A-22
	0023 A-21	Q608 A-27
IC001 C-3	0024 D-26	Q609 A-1
IC002 B-1	0025 A-7	Q610 A-23
IC003 E-25	0026 A-20	Q611 A-5
IC004 B-26	0027 D-24	Q612 A-23
IC005 C-1	0028 F-4	Q613 A-23
IC201 E-17	0030 D-26	Q614 A-2
IC202 A-24	0201 B-17	Q615 D-1
IC203 C-17	0202 B-11	Q616 D-1
IC204 C-13	0203 B-10	
IC205 D-15	0204 B-10	RW001 D-26
IC206 B-11	0205 C-11	RW401 D-28
IC207 B-12	0206 C-13	RW402 D-18
IC401 D-21	0207 C-13	RW601 D-27
IC402 E-23	0208 A-16	
IC403 F-23	0209 B-16	
IC404 B-21	0210 A-18	
IC405 D-9	0211 A-18	

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

—Ref. No. MB-717 Board; 1,000 Series—



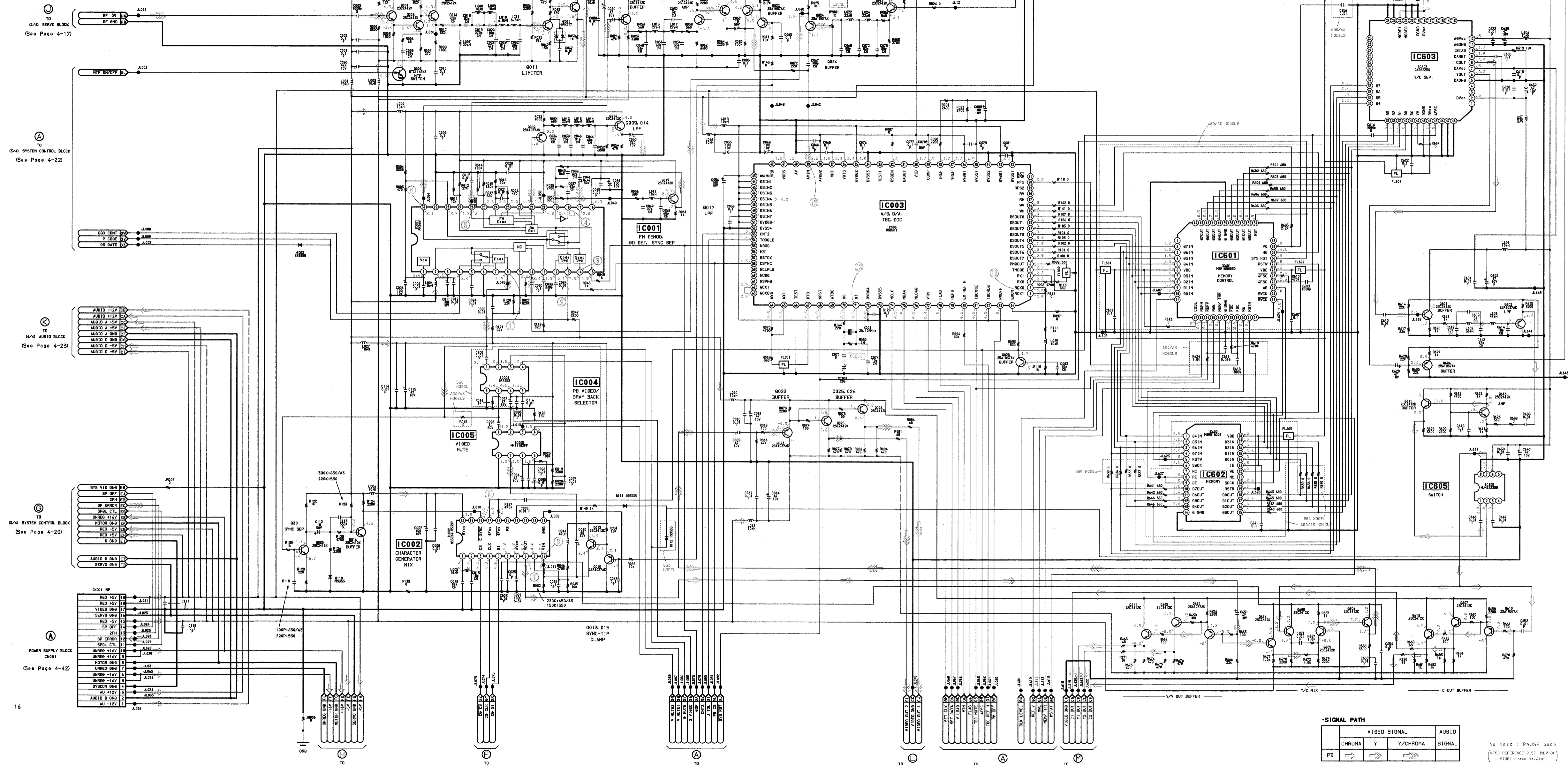
MB-717 BOARD (COMPONENT SIDE)



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

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

MB-717 BOARD (1/4)
(VIDEO BLOCK)



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

1	IC1	8	1Vp-p (H)
2	IC1	10	1.8Vp-p (H)
3	IC1	13	4.7Vp-p (H)
4	IC1	16	4.8Vp-p (H)
5	IC1	14	4Vp-p (H)
6	IC1	18	7.6Vp-p (14318MHz)
7	IC1	21	1.4Vp-p (H)
8	IC1	24	1.4Vp-p (H)
9	IC1	26	0.9Vp-p (H)
10	IC1	29	1.7Vp-p (H)
11	IC1	30	1Vp-p (H)
12	IC3	7	0.7Vp-p (28.125MHz)
13	IC2	9	1.8Vp-p (H)

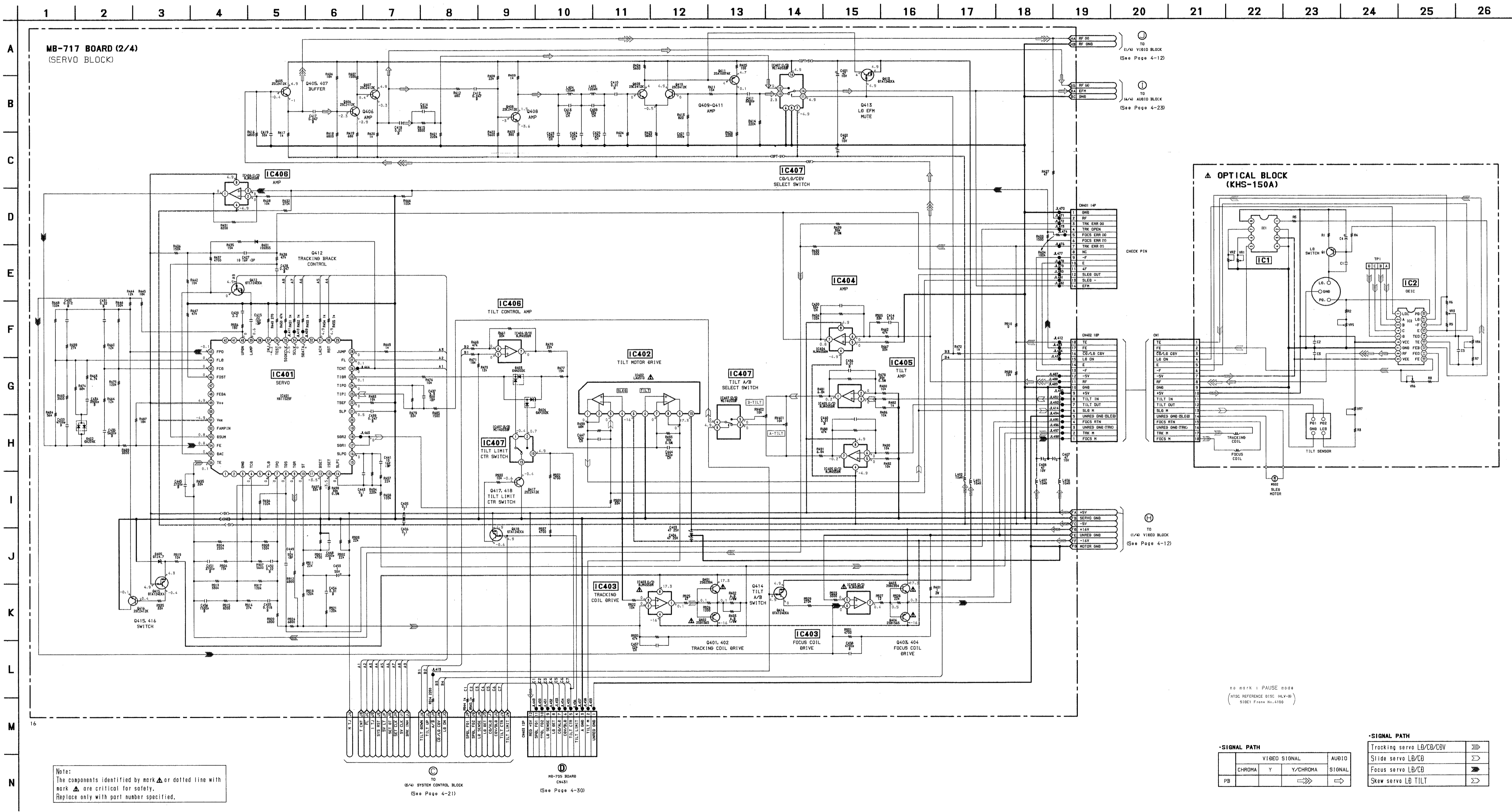
SIGNAL PATH

	VIDEO SIGNAL	AUDIO
CHROMA	→	→
Y	→	→
Y/CHROMA	→	→
PB	→	→

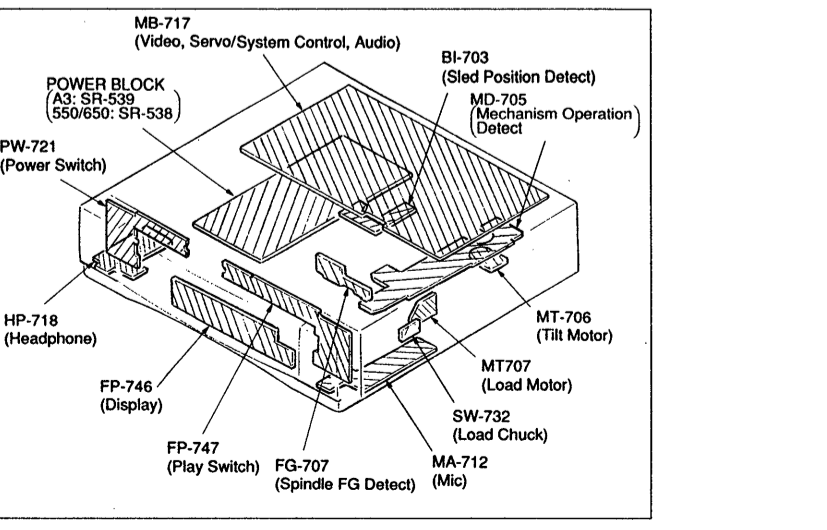
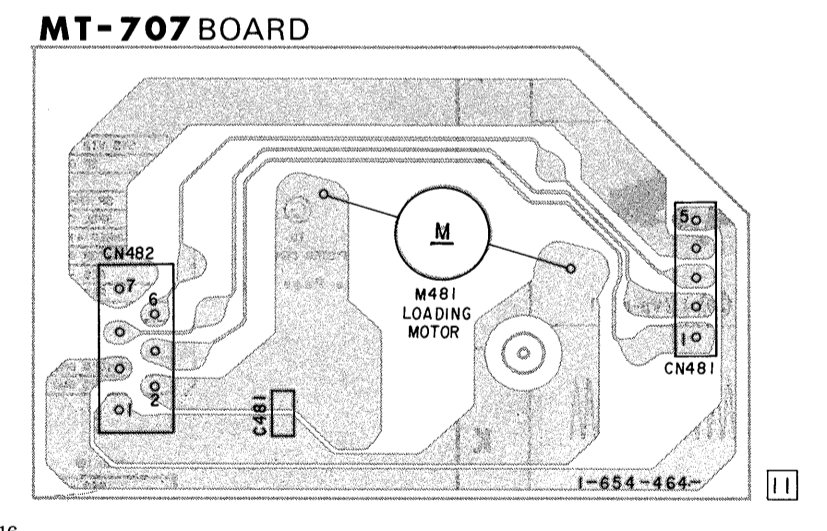
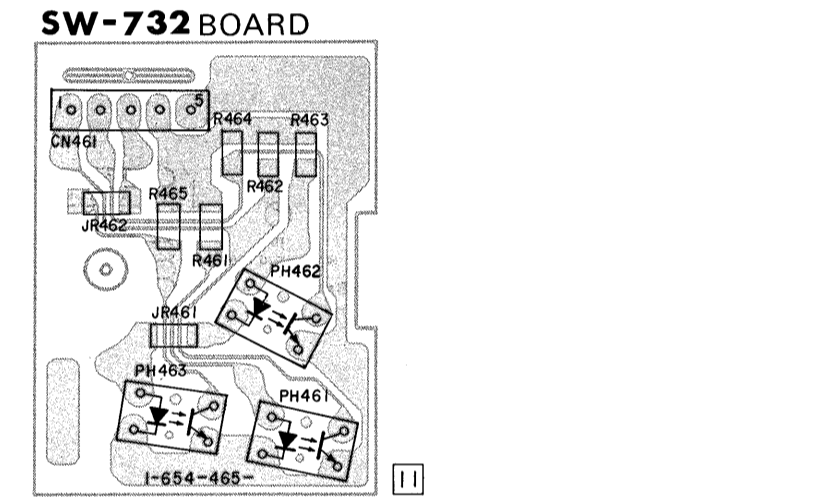
no PAUSE - PAUSE MODE
(NTSC REFERENCE DISC (HLV-B))
SIDE1 From No.4100

Spindle servo (speed and phase) →

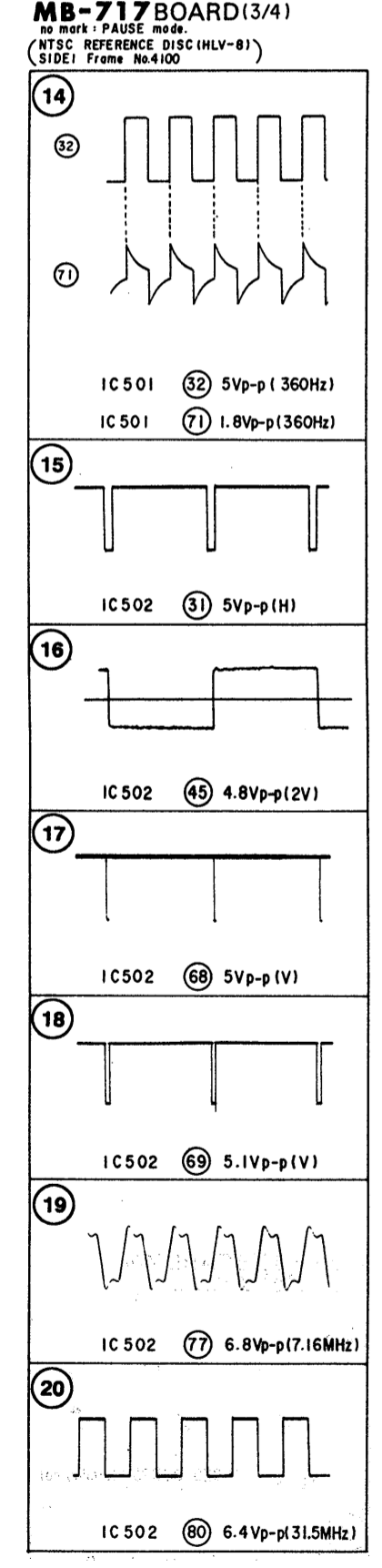
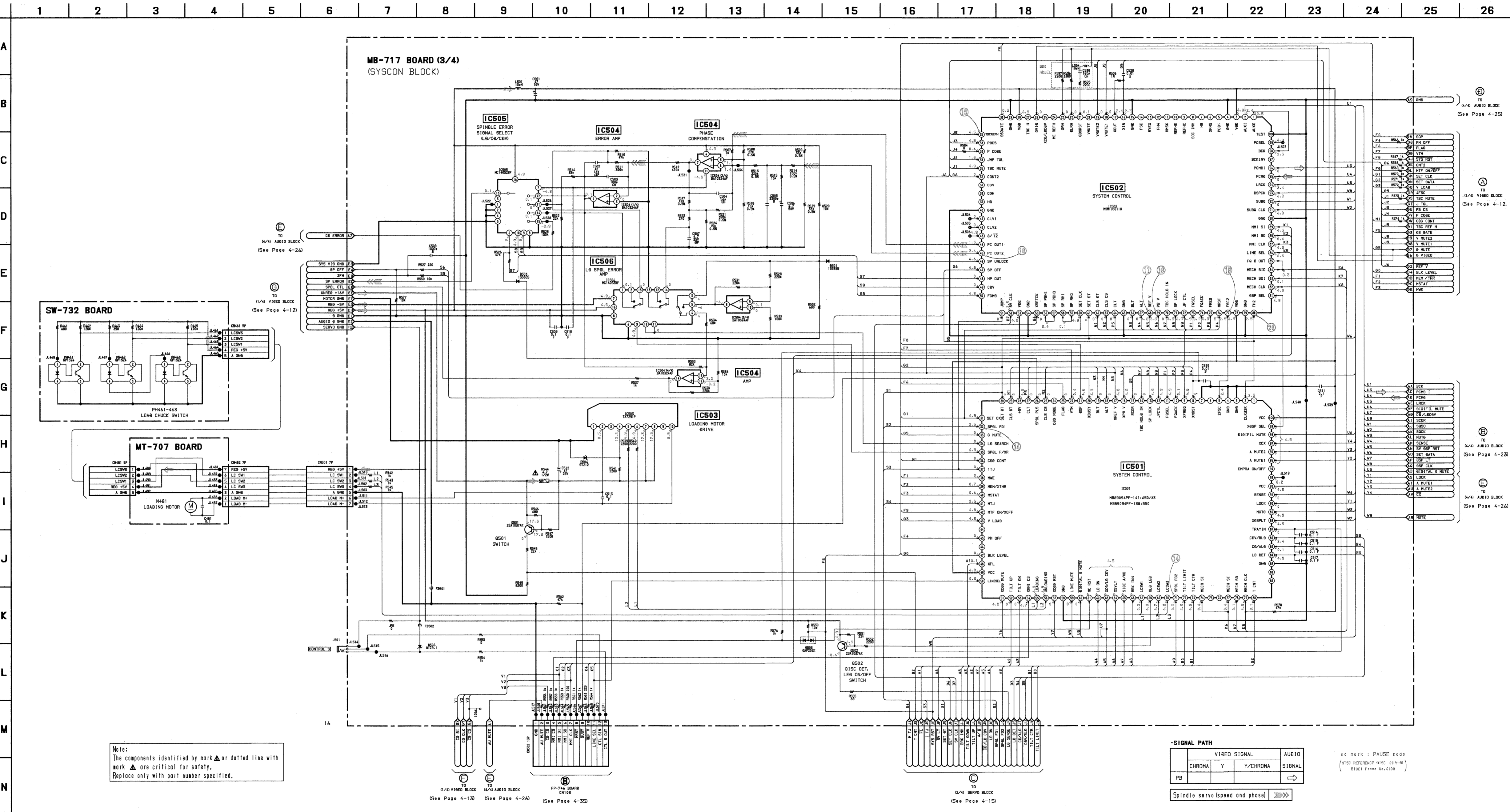
MB-717 (SERVO) SCHEMATIC DIAGRAM •Refer to page 4-6 for printed wiring board of MB-717 BOARD.
 —Ref. No. MB-717 Board; 1,000 Series—



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



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; 1,000 Series, MT-707 and SW-732 Boards; 4,000 Series—



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

SIGNAL PATH

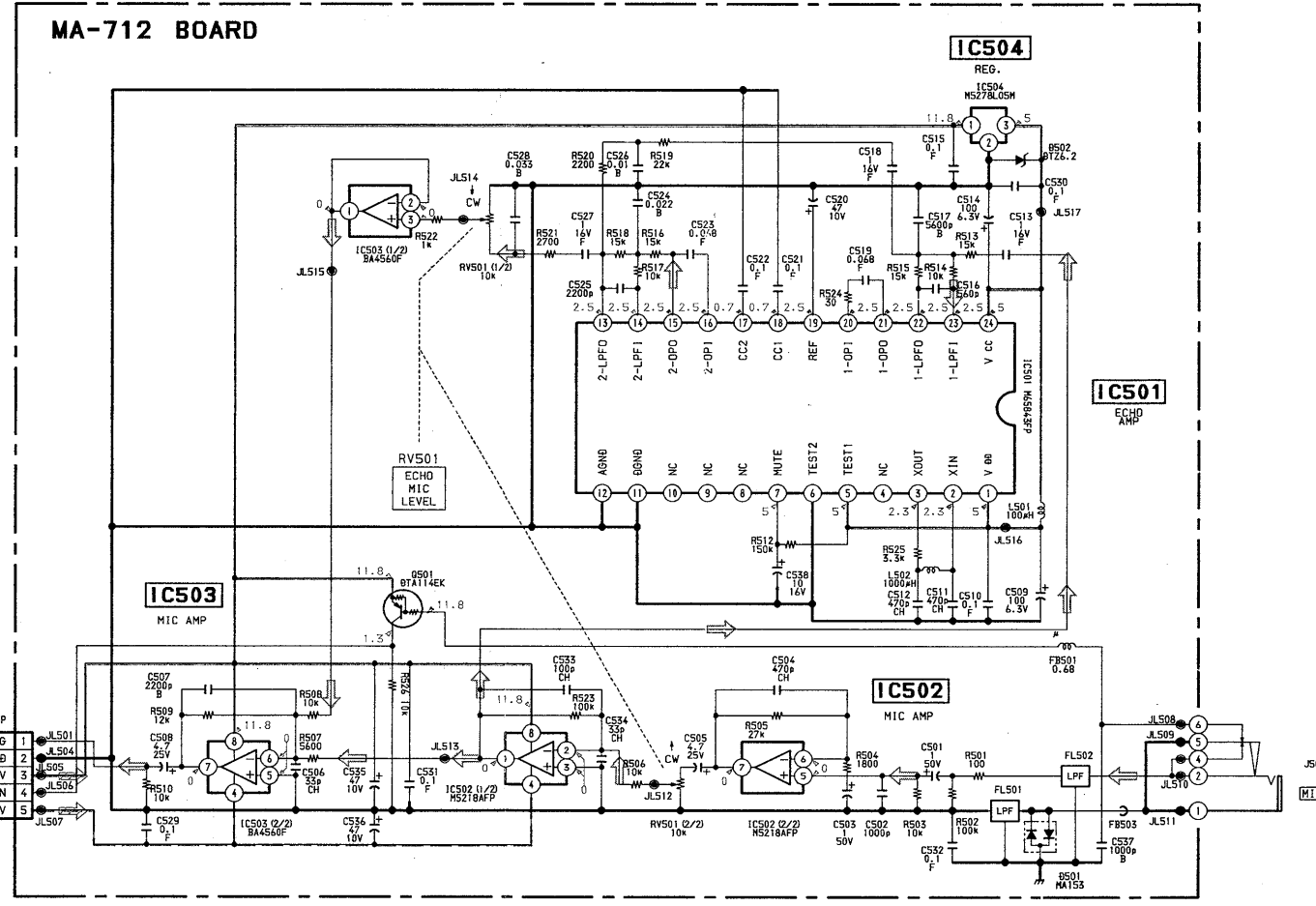
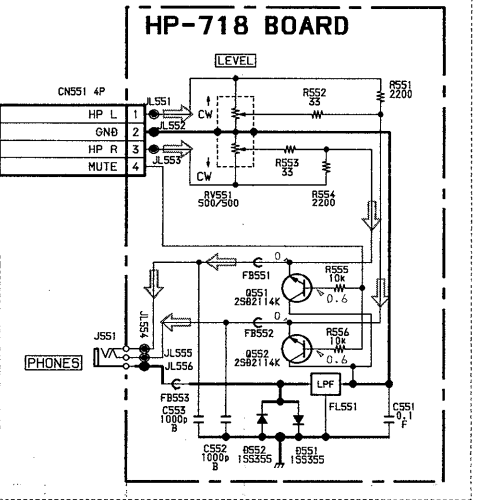
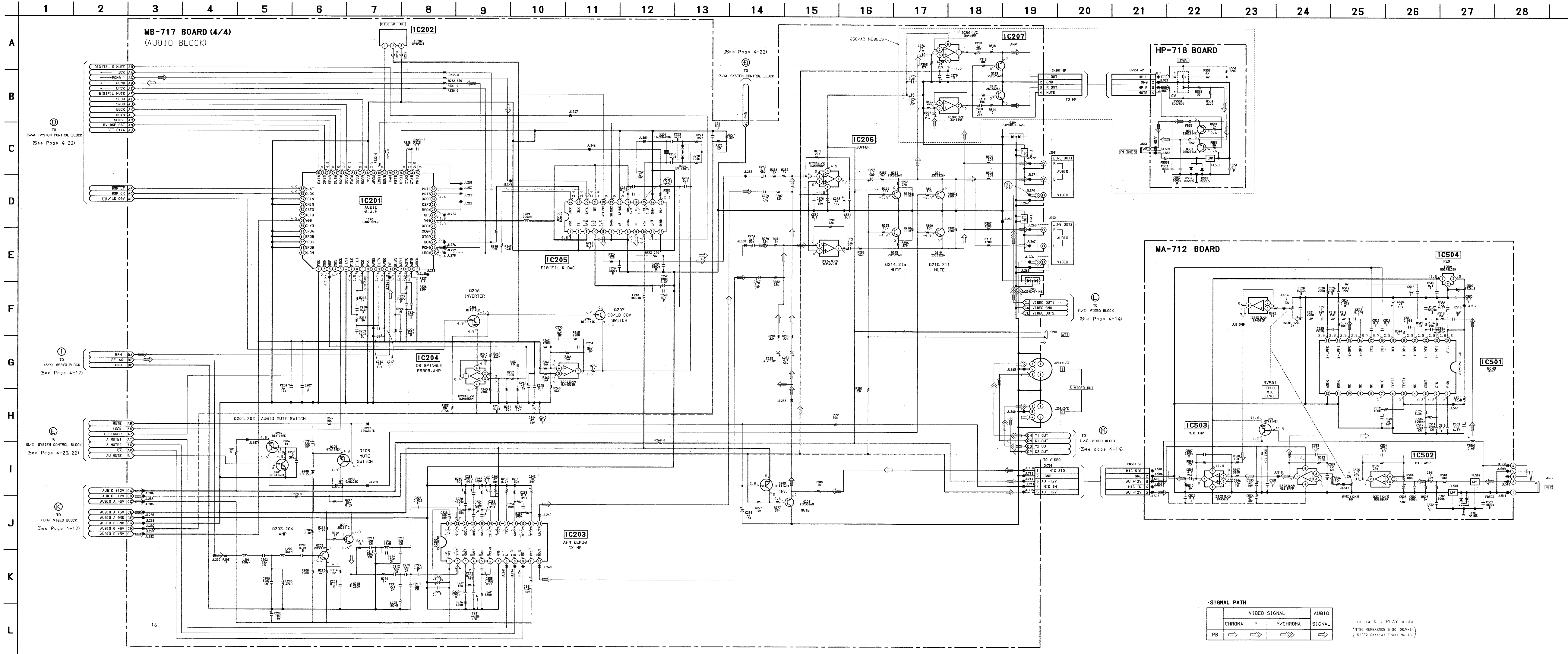
VIDEO SIGNAL		AUDIO SIGNAL	
CHROMA	Y	Y/CHROMA	SIGNAL
PB			

Spindle servo (speed and phase) \Rightarrow

no mark : PAUSE mode
(NTSC REFERENCE DISC 6LV-8)
(SIDE) Form No.4100

MB-717 (AUDIO), MA-712 (MIC), HP-718(HEADPHONE) SCHEMATIC DIAGRAM *Refer to page 4-6 for MB-717 board printed wiring board. *Refer to page 4-4 for MA-712/HP-718 boards printed wiring board.

—Ref. No. MB-717 Board; 1,000 Series, MA-712 and HP-718 Boards; 3,000 Series —



SIGNAL PATH

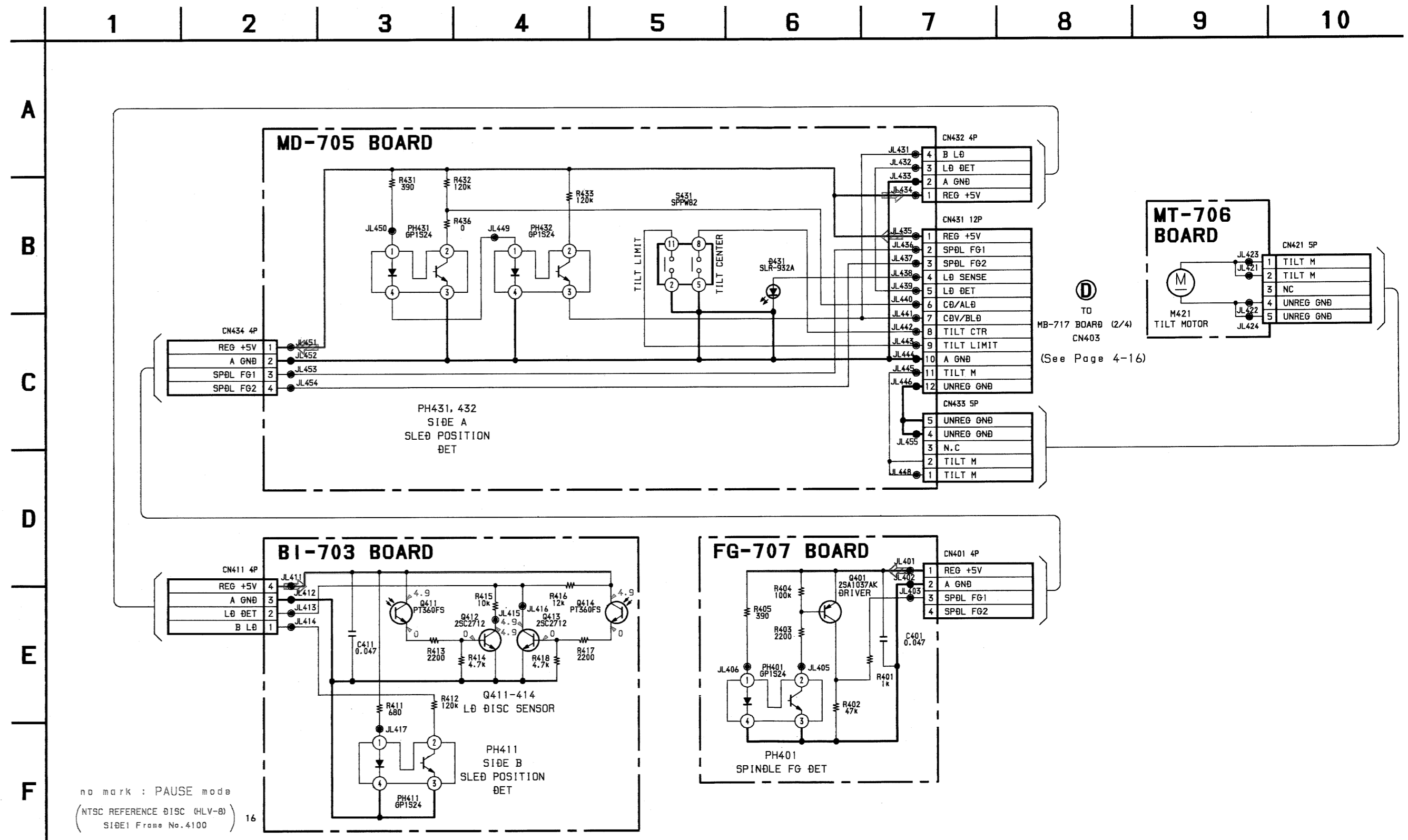
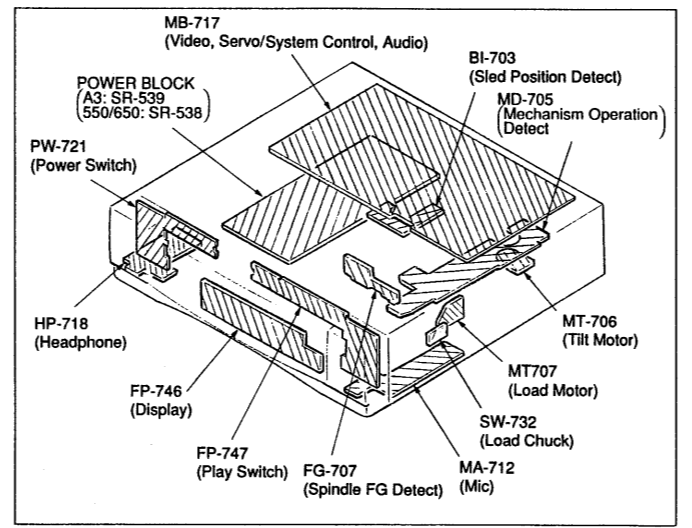
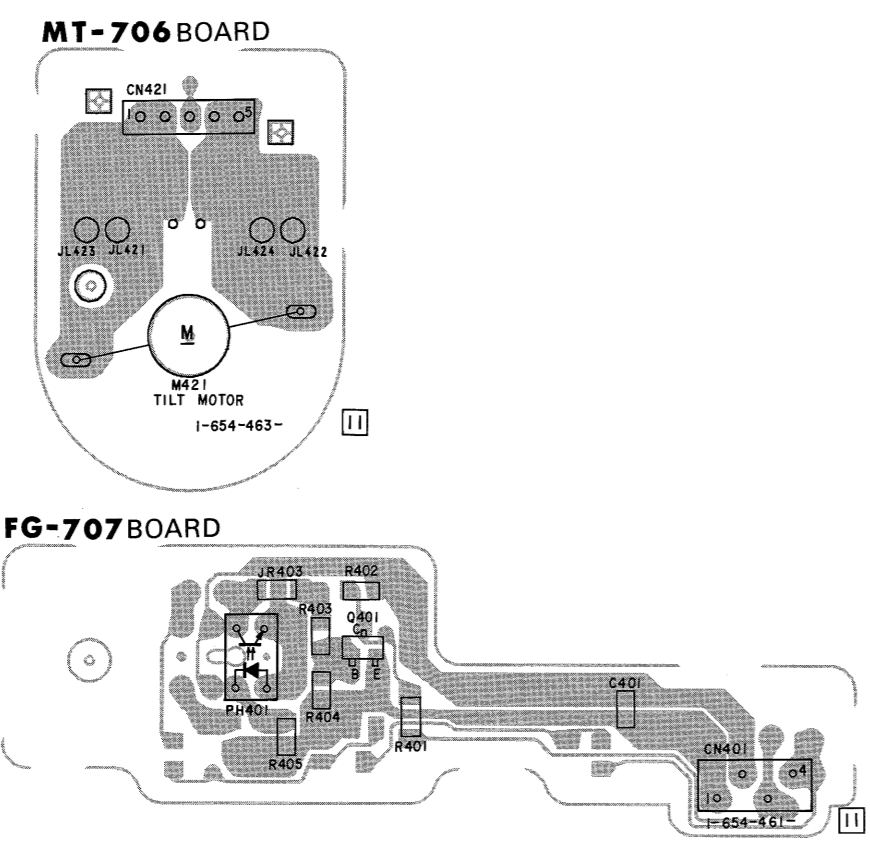
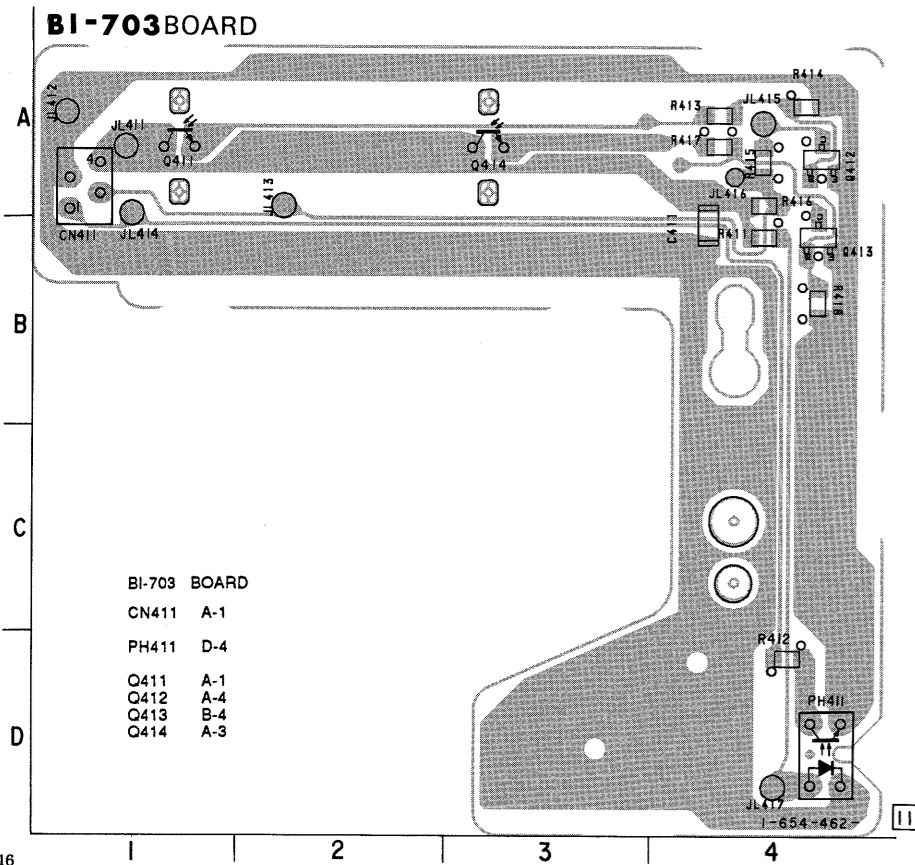
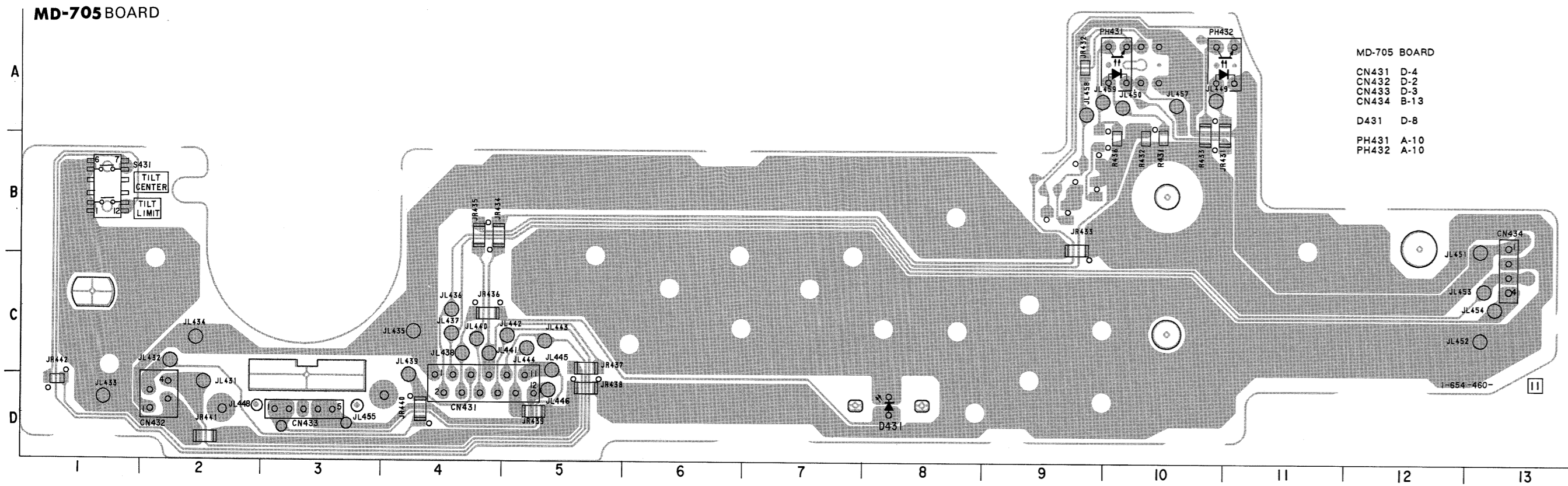
	VIDEO SIGNAL	AUDIO
CHROMA	Y	Y/CHROMA
PB	⇒	⇒⇒

no mark : PLAY mode
 (NTSC REFERENCE DISC ONLY-B)
 (SIDE1 Channel Track No.16)

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

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

22 IC205 ⑤ 4Vp-p (16.934MHz)

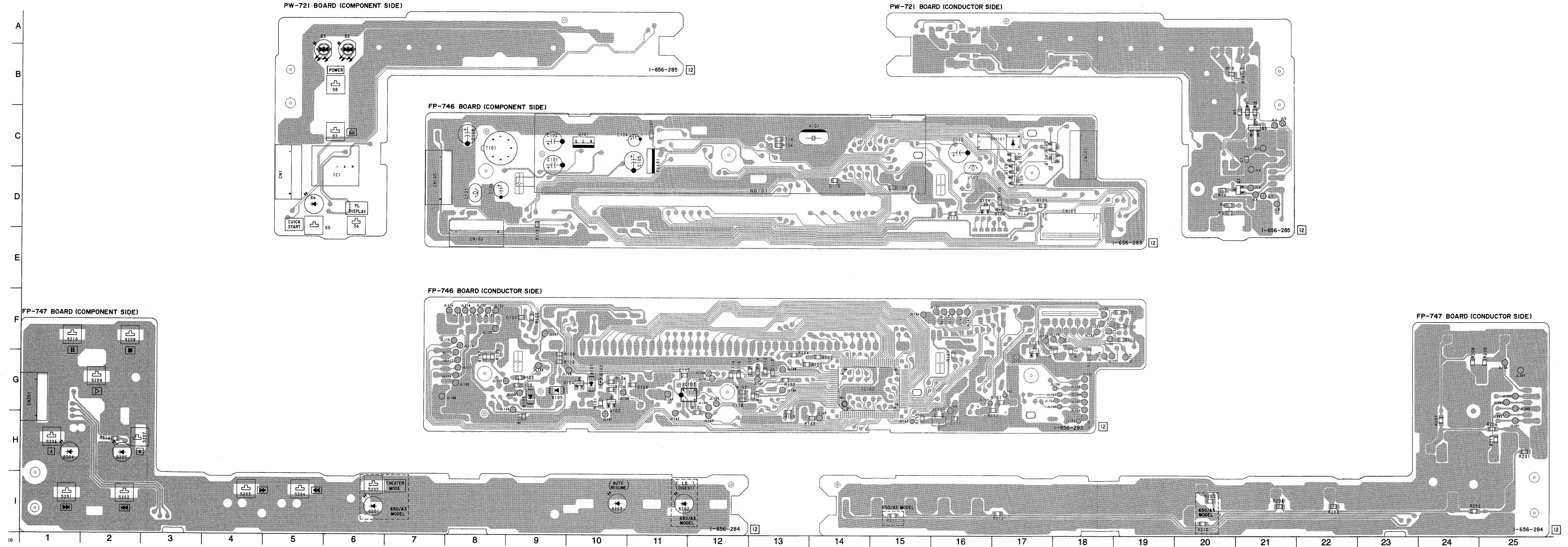
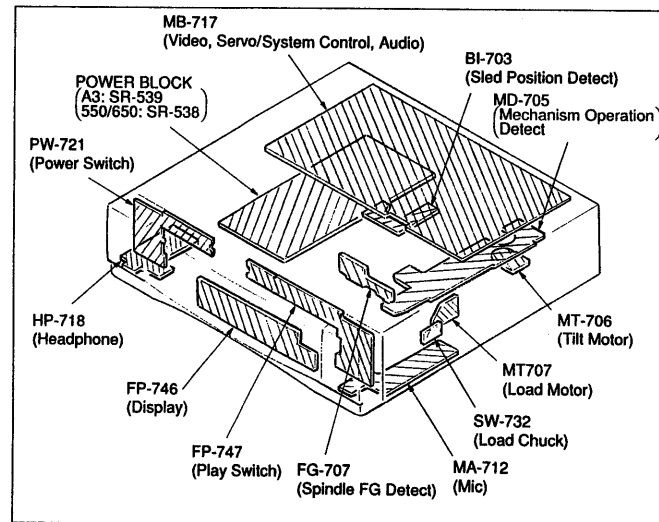


FP-746 (DISPLAY), FP-747 (PLAY SWITCH), PW-721 (POWER SWITCH) PRINTED WIRING BOARDS

—Ref. No. FP-746, FP-747 and PW-721 Board; 3,000 Series—

FP-746 BOARD FP-747 BOARD PW-721 BOARD

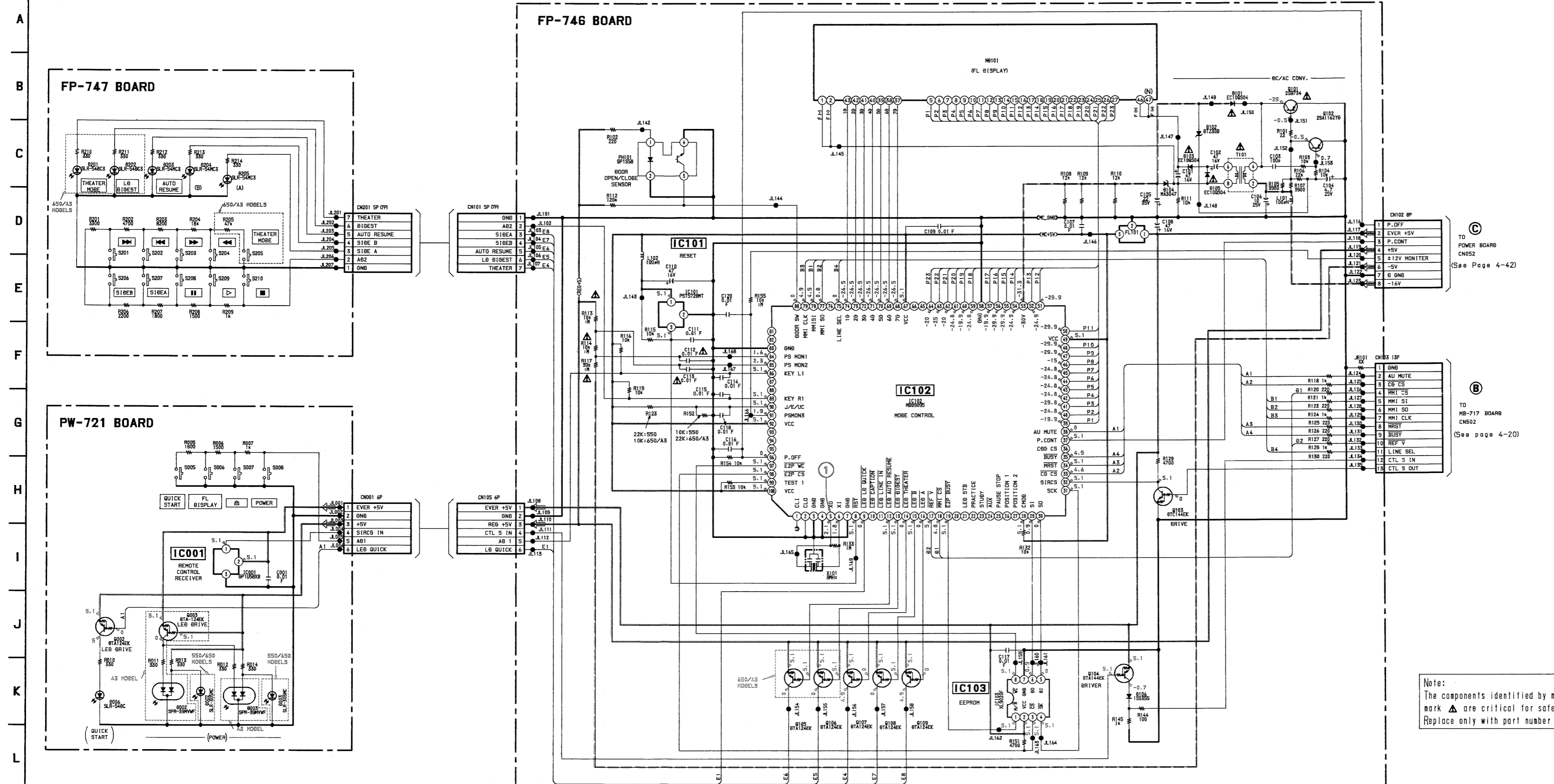
CN101 C-18	CN201 G-1	CN001 D-5
CN101 G-18		
CN102 E-8	D201 I-6	D002 B-6
CN103 A-18	D202 I-11	D003 B-5
CN105 A-7	D203 I-10	D006 D-5
	D204 H-1	
	D205 H-2	
D101 G-10		IC001 C-6
D102 G-10		
D103 G-9		0002 D-21
D104 G-10		0003 C-21
D105 G-9		
D106 D-17		
IC101 H-16		
IC102 G-14		
IC103 G-12		
O101 C-10		
O102 G-10		
O103 F-17		
O104 D-16		
O105 C-17		
O106 C-17		
O107 C-17		
O108 C-17		
O109 D-17		



FP-746 (DISPLAY), FP-747 (PLAY SWITCH), PW-721 (POWER SWITCH) SCHEMATIC DIAGRAMS

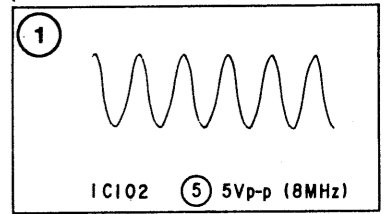
—Ref. No. FP-746, FP-747 and PW-721 Board; 3,000 Series—

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23



FP-746 BOARD

no mark : PAUSE mode.
(NTSC REFERENCE DISC (HLV-8))
SIDE1 Frame No.4100



TO POWER BOARD
CN052
(See Page 4-42)

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

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

no mark : PAUSE mode
(NTSC REFERENCE DISC (HLV-8))
SIDE1 Frame No.4100

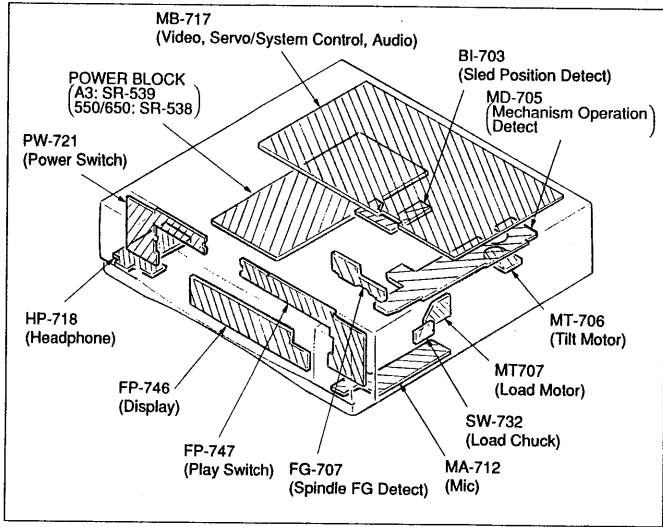
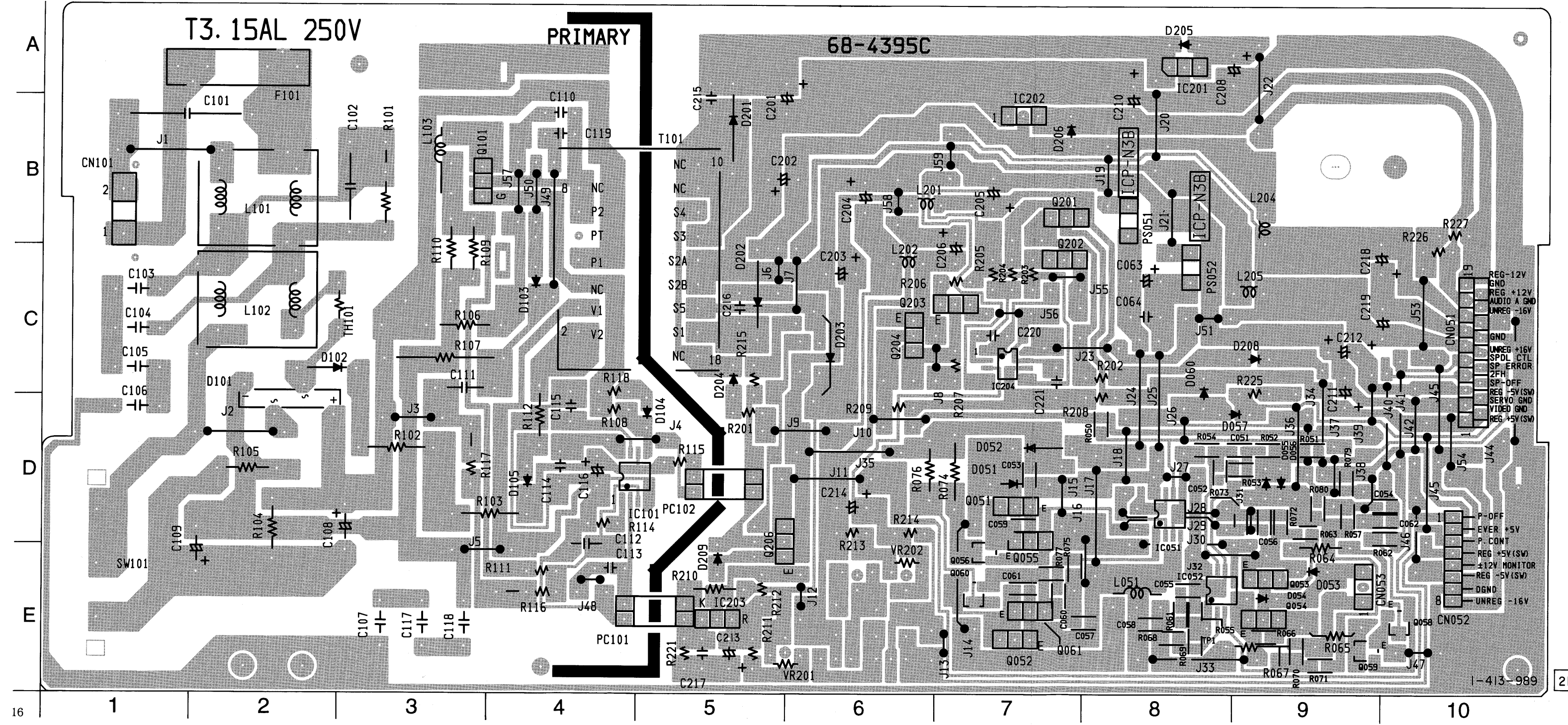
POWER BLOCK SR-539 PRINTED WIRING BOARDS (MDP-A3 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK (A3 MODEL)

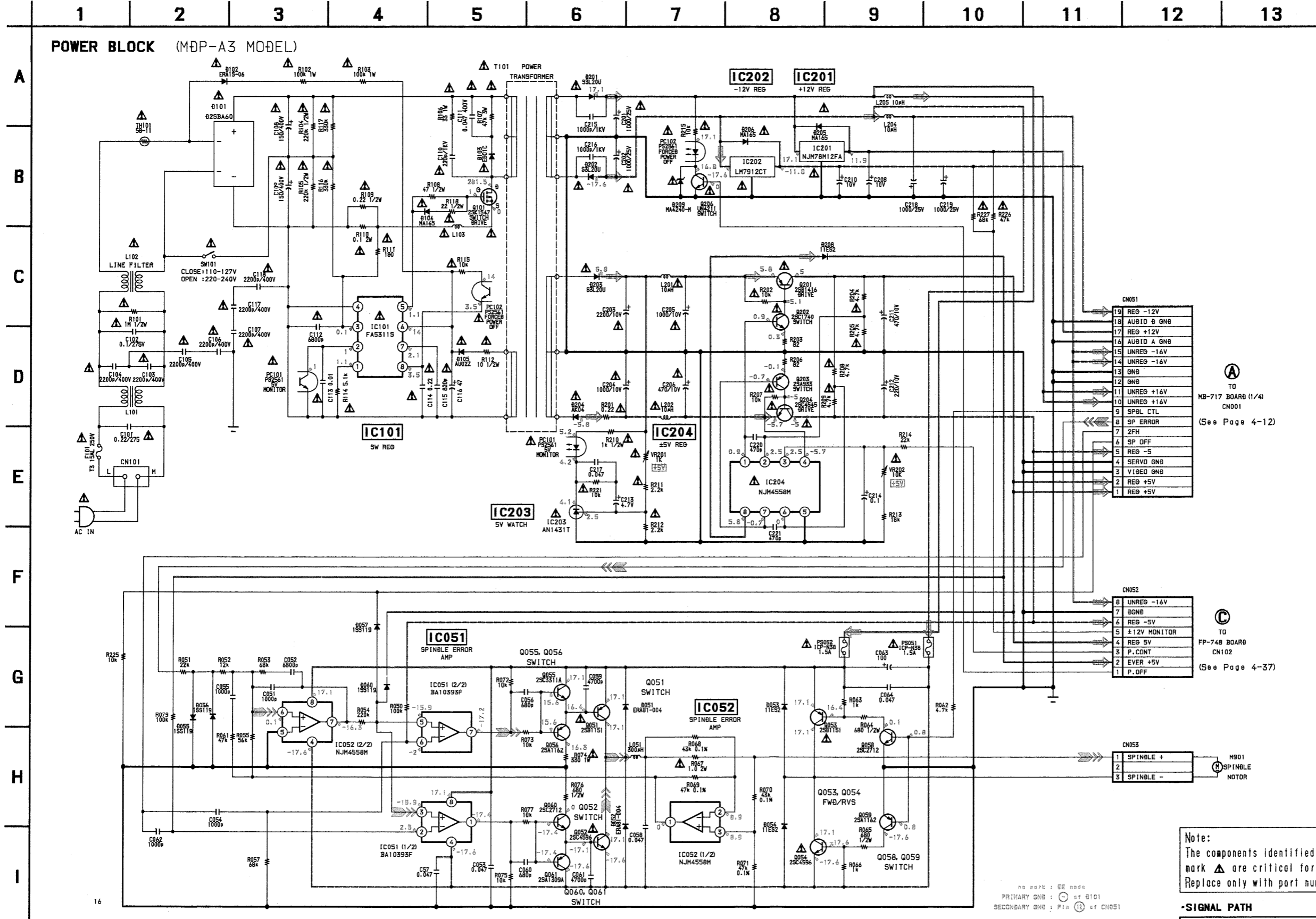
POWER BLOCK (A3)

CN051 C-10	IC051 D-8
CN052 E-10	IC052 E-8
CN053 E-9	IC101 D-5
CN101 B-1	IC201 A-8
	IC202 B-7
	IC203 E-5
	IC204 C-7
D051 D-7	0051 D-7
D052 D-7	0052 E-7
D053 E-9	0053 E-9
D054 E-9	0054 E-9
D055 D-9	0055 D-7
D056 D-9	0056 E-7
D057 D-9	0058 E-10
D060 C-8	0059 E-9
D101 D-2	0060 E-7
D102 C-2	0061 E-7
D103 C-4	0101 B-3
D104 D-5	0201 B-7
D105 D-4	0202 C-7
D201 B-5	0101 B-3
D202 C-5	0201 B-7
D203 C-6	0202 C-7
D204 C-5	0203 C-7
D205 A-8	0204 C-6
D206 B-7	0206 D-5
D208 C-9	
D209 E-5	VR201 E-6
	VR202 E-6



POWER BLOCK SR-539 SCHEMATIC DIAGRAMS (MDP-A3 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—



CN001

19	REG -12V
18	AUBID B GND
17	REG +12V
16	AUBID 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 -5
4	SERVO GND
3	VIBEO GND
2	REG +5V
1	REG +5V

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

CN002

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

TO FP-748 BOARD
CN102
(See Page 4-37)

CN003

1	SPINBLE +
2	SPINBLE
3	SPINBLE -

H901
SPINBLE
NOTOR

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

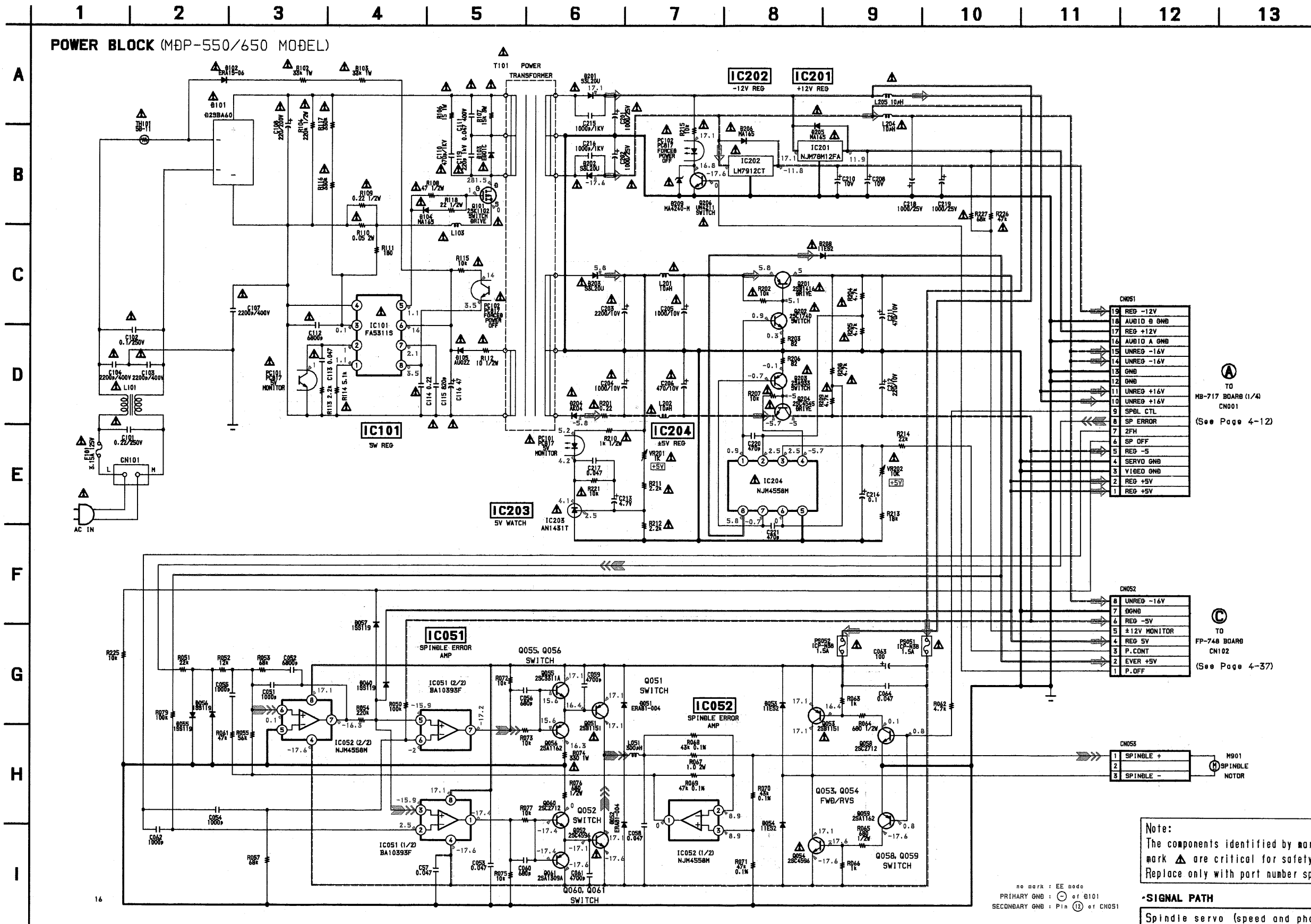
no mark : EE 0000
PRIMARY GND : \odot of 0101
SECONDARY GND : Pin $\textcircled{1}$ of CN051

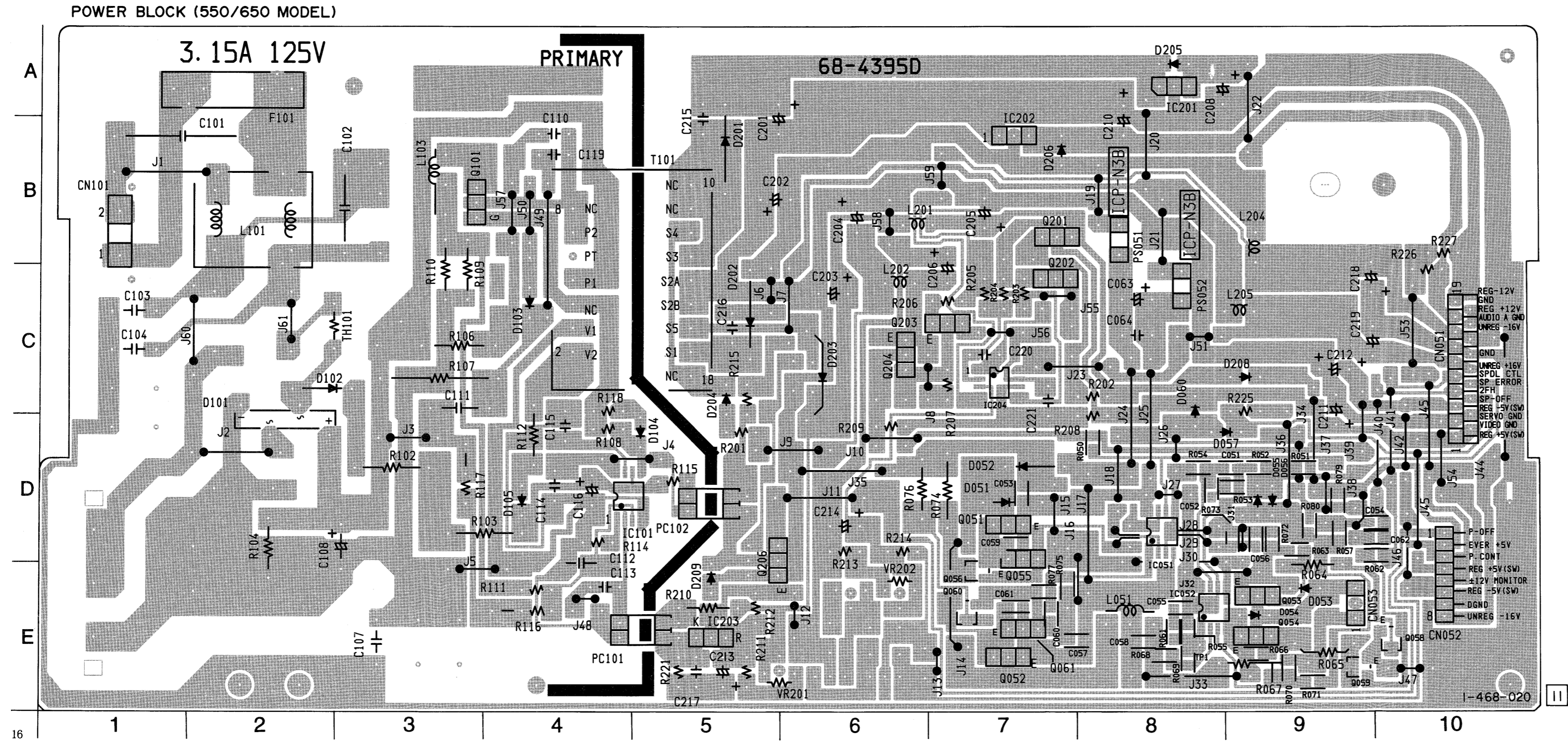
•SIGNAL PATH
Spindle servo (speed and phase)

MDP-550/650/A3

POWER BLOCK SR-538 SCHEMATIC DIAGRAMS (MDP-550/650 MODEL)

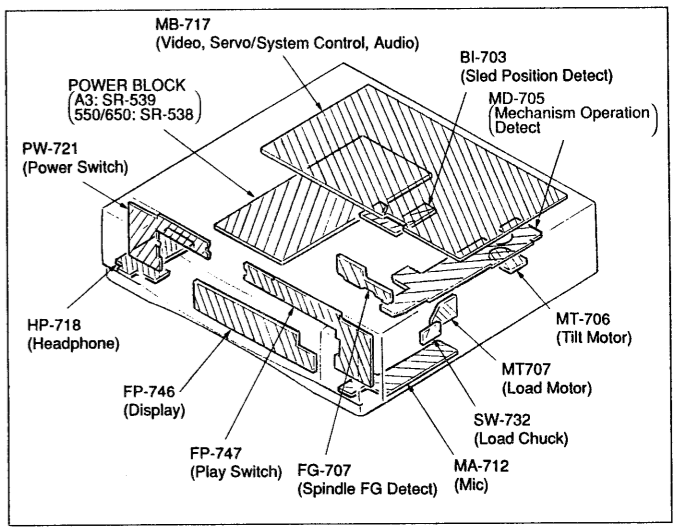
—Ref. No. POWER BLOCK; 5,000 Series—





POWER BLOCK (550/650)

CN051	C-10	IC051	D-8
CN052	E-10	IC052	E-8
CN053	E-9	IC101	D-5
CN101	B-1	IC201	A-8
		IC202	B-7
		IC203	E-5
		IC204	C-7
D051	D-7		
D052	D-7	0051	D-7
D053	F-9	0052	E-7
D054	F-9	0053	E-9
D055	D-9	0054	E-9
D056	D-9	0055	D-7
D057	D-9	0056	E-7
D060	C-8	0058	E-10
D101	D-2	0059	E-9
D102	C-2	0060	E-7
D103	C-4	0061	E-7
D104	D-5	0101	B-3
D105	D-4	Q201	B-7
D201	B-5	Q202	C-7
D202	C-5	Q203	C-7
D203	C-6	Q204	C-6
D204	C-5	Q206	D-5
D205	A-8		
D206	B-7	VR201	E-6
D208	C-9	VR202	E-6
D209	F-5		



SECTION 5 REPAIR PARTS LIST

5-1. EXPLODED VIEWS

NOTE:

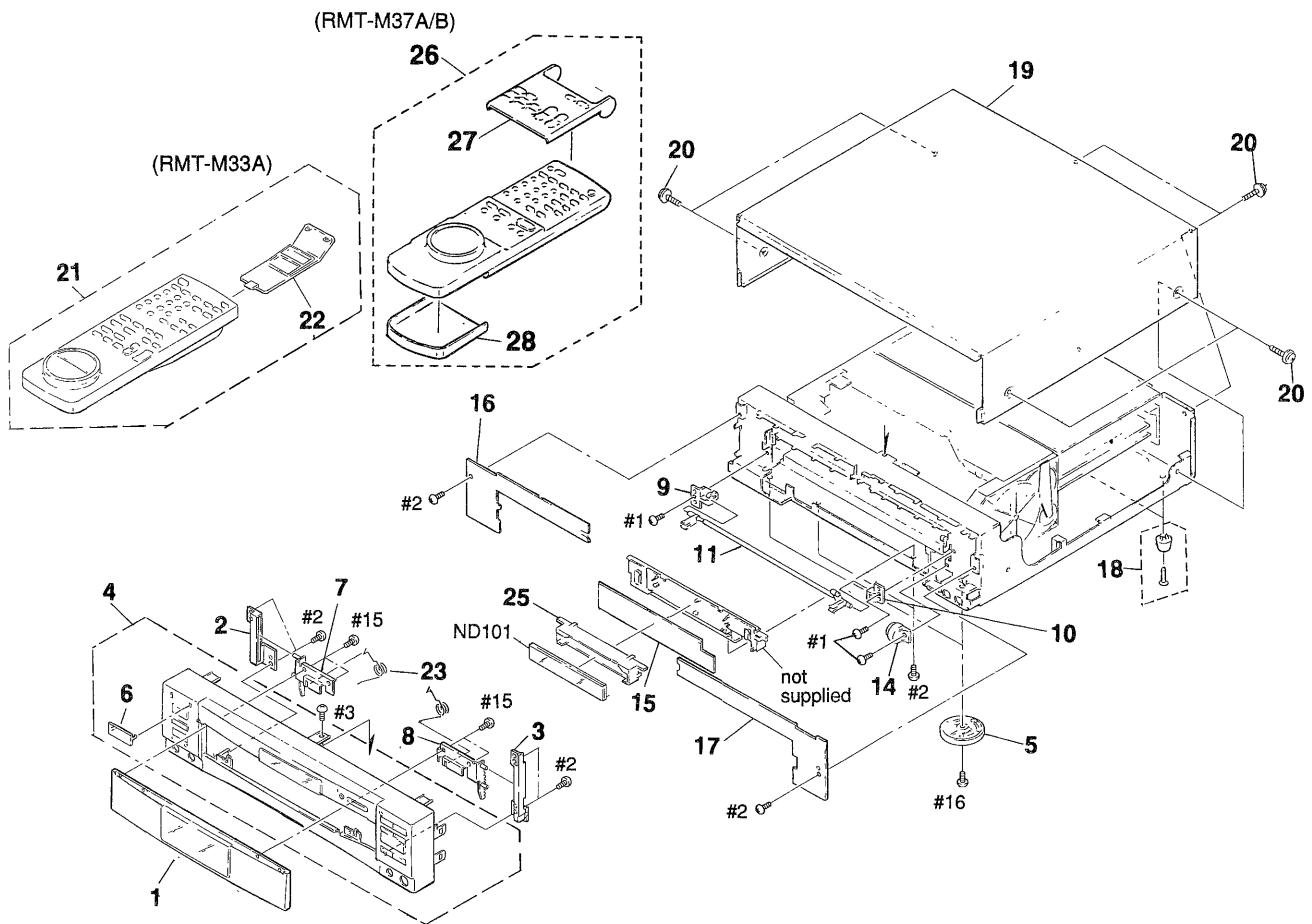
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) ... (RED)
 ↑ ↑
 Parts color Cabinet's color

- 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.

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

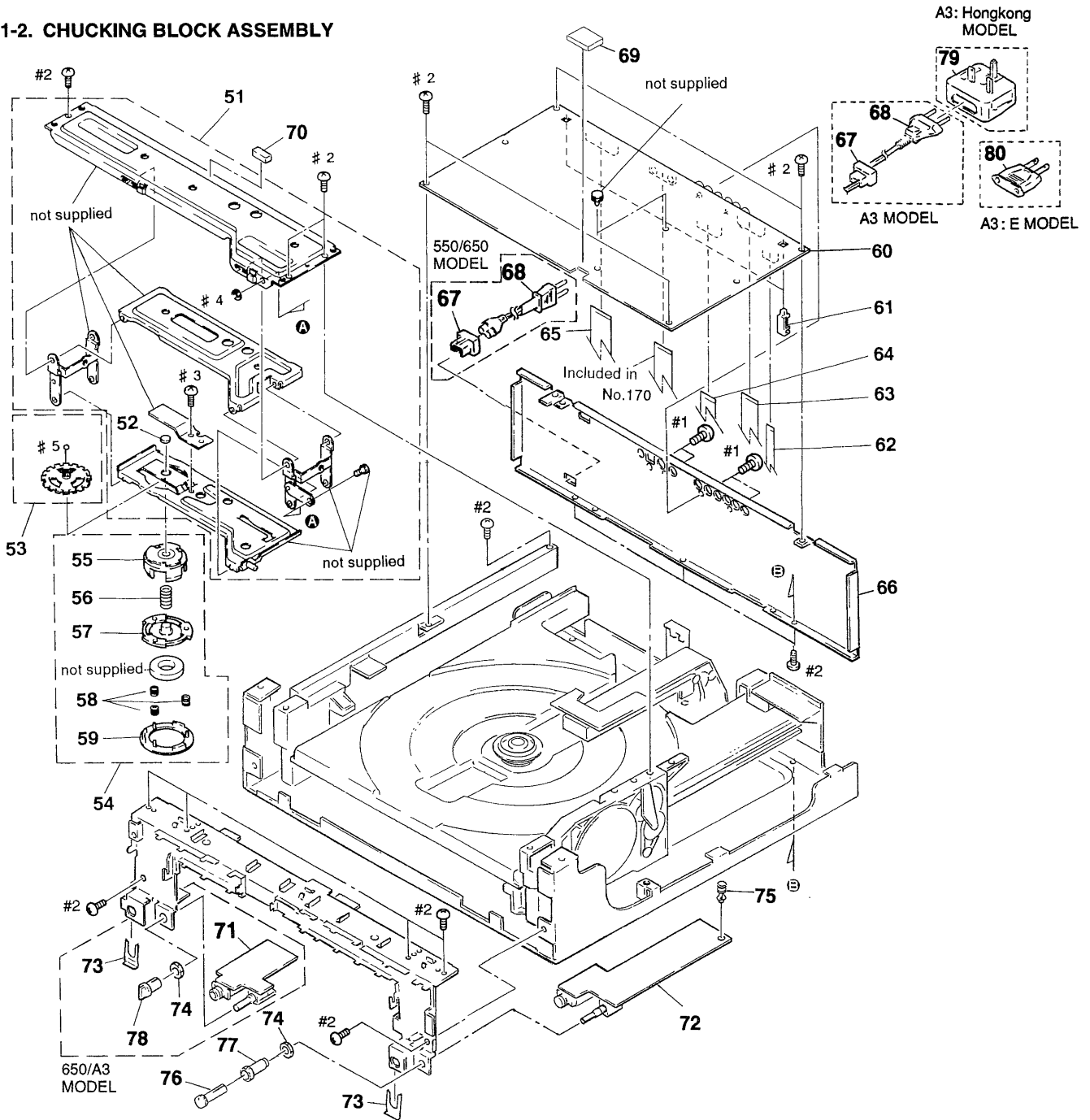
Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1-1. CASE AND FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-3944-656-1	DOOR ASSY (550)		* 16	A-6423-300-A	PW-721 BOARD, COMPLETE (A3)	
1	X-3944-663-1	DOOR ASSY (650)		* 16	A-6423-307-A	PW-721 BOARD, COMPLETE (550/650)	
1	X-3944-666-1	DOOR ASSY (A3)		* 17	A-6423-296-A	FP-747 BOARD, COMPLETE (650/A3)	
2	3-961-801-01	HOLDER (L), SLIDE		* 17	A-6423-306-A	FP-747 BOARD, COMPLETE (550)	
3	3-961-802-01	HOLDER (R), SLIDE		18	3-961-156-11	FOOT	
4	X-3944-655-1	PANEL ASSY, FRONT (550)		* 19	3-961-785-11	CASE, UPPER (550/650)	
4	X-3944-662-1	PANEL ASSY, FRONT (650)		* 19	3-961-785-21	CASE, UPPER (A3)	
4	X-3944-665-1	PANEL ASSY, FRONT (A3)		20	3-710-901-41	SCREW, TAPPING	
5	X-3942-810-1	FOOT ASSY		21	1-467-380-31	REMOTE COMMANDER (RMT-M33A) (550)	
6	3-942-768-02	EMBLEM (NO.5), SONY		22	3-943-535-01	COVER, BATTERY (RMT-M33A) (550)	
7	3-961-818-01	DISK (L), DOOR		23	3-961-822-01	SPRING, DOOR	
8	3-961-819-01	DISK (R), DOOR		* 25	3-961-813-01	HOLDER, FL	
9	3-961-800-01	GUIDE, LINK		26	1-473-008-31	REMOTE COMMANDER (RMT-M37A) (650)	
10	3-963-178-01	HOLDER, LINK		26	1-473-008-41	REMOTE COMMANDER (RMT-M37B) (A3)	
11	X-3944-955-1	LINK ASSY		27	3-709-008-01	COVER ASSY M37A	
14	4-919-393-01	DAMPER		27	3-709-009-01	COVER ASSY M37B	
* 15	A-6423-292-A	FP-746 BOARD, COMPLETE (550)		28	3-708-977-01	COVER, BATTERY	
* 15	A-6423-295-A	FP-746 BOARD, COMPLETE (650)		ND101	1-517-396-11	TUBE, FLUORESCENT INDICATOR	
* 15	A-6423-302-A	FP-746 BOARD, COMPLETE (A3)					

5-1-2. CHUCKING BLOCK ASSEMBLY

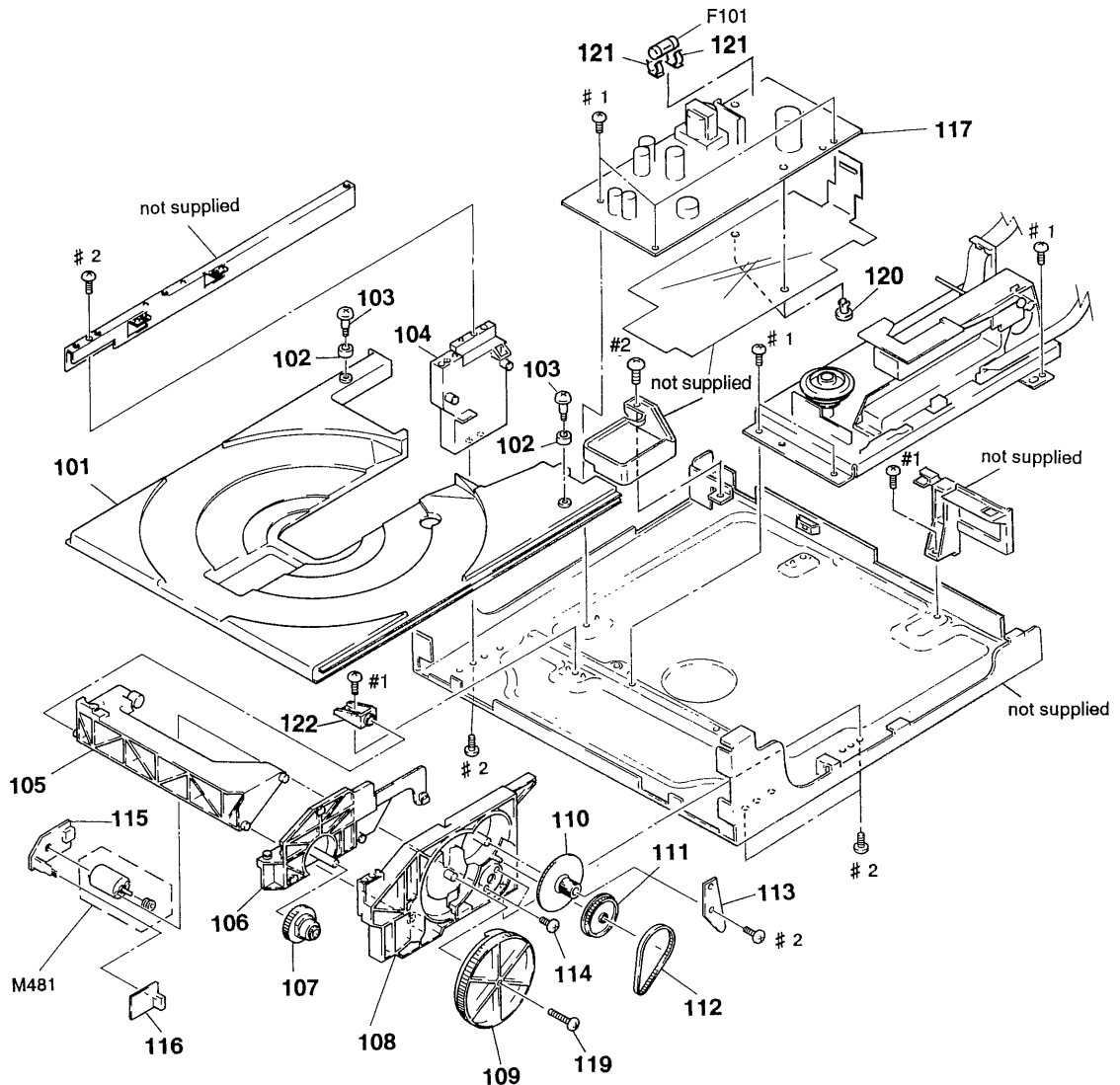


Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	A-6415-896-A	CHUCKING SUB BLOCK ASSY		▲67	1-526-985-11	INLET 2P (550/650)	
52	3-953-392-01	RETAINER, THRUST		▲67	3-703-244-00	BUSHING (2104), CORD (A3)	
53	X-3942-787-1	PLATE ASSY, TOP		▲68	1-574-085-11	CORD, POWER (550/650)	
54	A-6415-644-G	CHUCK BLOCK ASSY		▲68	1-575-912-21	CORD, POWER (A3)	
55	3-953-288-01	PLATE, CHUCKING		69	3-728-465-01	CUSHION, OPT	
56	3-953-291-01	SPRING (1), COMPRESSION		70	9-911-840-XX	CUSHION (U)	
57	X-3942-776-1	HOLDER ASSY, MAGNET		* 71	A-6423-297-A	HP-718 BOARD, COMPLETE (650/A3)	
58	3-953-290-01	SPRING (2), COMPRESSION		* 72	A-6423-293-A	MA-712 BOARD, COMPLETE	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER		* 73	3-684-436-01	PLATE, MOUNT	
* 60	A-6423-291-A	MB-717 BOARD, COMPLETE (550)		74	3-950-989-01	NUT (M7), HEXAGON	
* 60	A-6423-294-A	MB-717 BOARD, COMPLETE (650)		75	3-531-576-11	RIVET	
* 60	A-6423-301-A	MB-717 BOARD, COMPLETE (A3)		76	3-953-318-11	KNOB, MICROPHONE (550/650)	
* 61	3-962-283-01	GUIDE, MB		76	3-953-318-21	KNOB, MICROPHONE (A3)	
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR		77	3-953-319-11	KNOB, ECHO (550/650)	
63	1-769-651-11	CABLE, FLAT (FFC) 13 ARBOR		77	3-953-319-21	KNOB, ECHO (A3)	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR		78	3-962-745-01	KNOB (A2 TYPE), VOL (650)	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR		78	3-962-745-11	KNOB (A2 TYPE), VOL (A3)	
* 66	3-961-786-11	PANEL, REAR (550)		79	1-770-019-11	ADAPTOR, CONVERSION (A3:Hongkong)	
* 66	3-961-786-21	PANEL, REAR (650)		80	1-569-008-11	ADAPTOR, CONVERSION 2P (A3:E)	
* 66	3-961-786-31	PANEL, REAR (A3)					

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

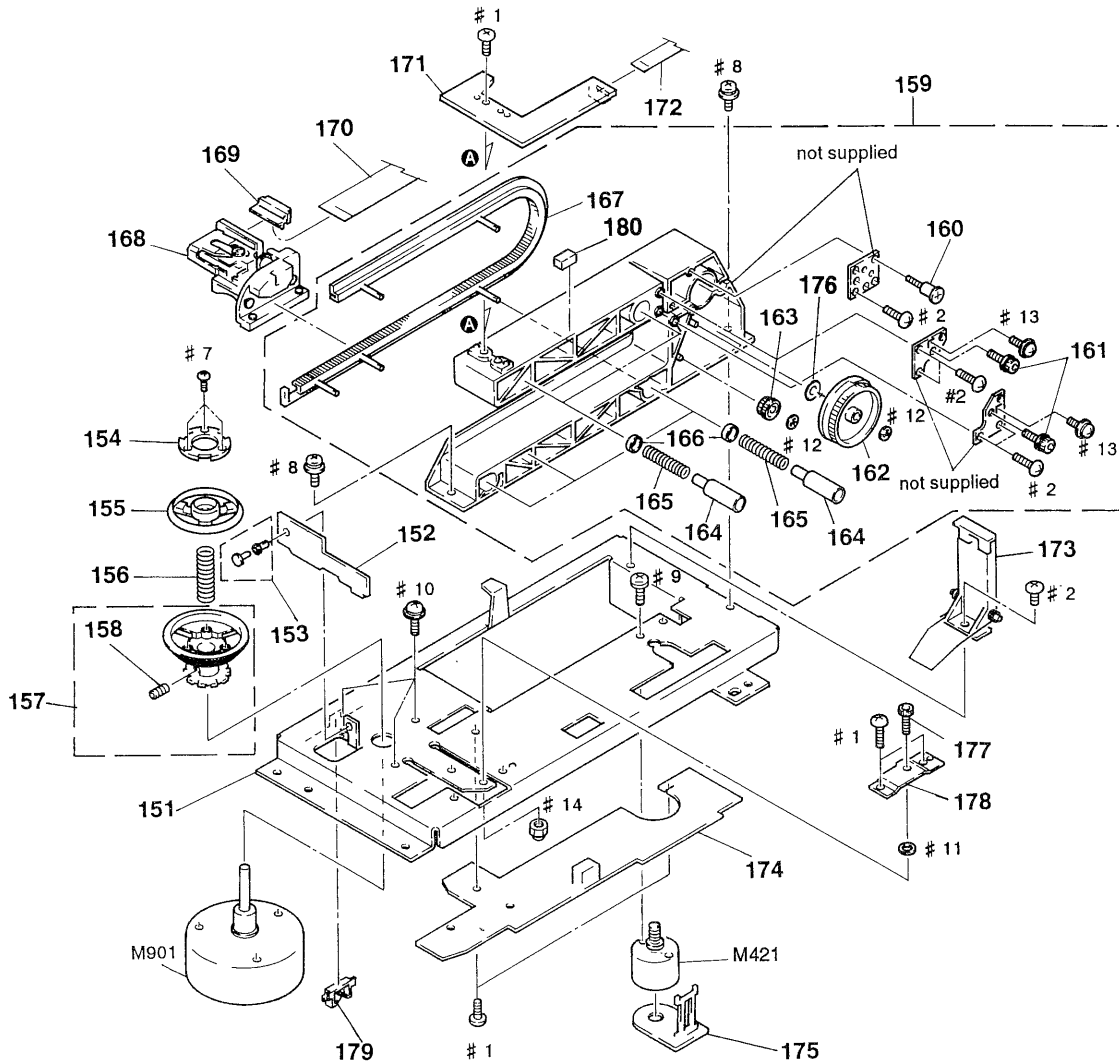
Note:
Les composants identifiés par une marque ▲ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

5-1-3. MAIN SHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
101	A-6415-895-A	TRAY (91U) ASSY		114	3-962-049-01	SCREW, MOTOR STOPPER	
* 102	4-914-248-01	STOPPER, RUBBER		* 115	1-654-464-11	MT-707 BOARD	
103	3-963-090-01	SCREW, TRAY STOPPER		* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
* 104	X-3944-730-1	STAY (L) ASSY, F		117	1-413-989-21	POWER BLOCK (A3)	
* 105	X-3944-729-1	FRAME ASSY, TRAY UD		117	1-468-020-11	POWER BLOCK (550/650)	
106	X-3944-514-1	BASE ASSY, L SUB		119	3-962-812-01	SCREW (+BV 3X18)	
107	3-961-085-01	GEAR, IDLER		120	3-531-576-11	RIVET	
108	X-3944-513-1	BASE ASSY, LOADING		121	1-533-233-11	HOLDER, FUSE	
109	3-961-083-01	GEAR, CONTROL		* 122	3-961-101-11	HOLDER, UD FRAME	
110	3-961-081-01	GEAR, MIDDLE		F101	1-532-286-11	FUSE TIME LUG (3.15A 250V) (A3)	
111	3-961-084-01	PULLEY (A)		F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	
112	3-961-082-01	BELT, TIMING		M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
* 113	3-962-050-01	STAY, REINFORCEMENT					

5-1-4. MECHANISM DECK ASSEMBLY



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

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

<p>Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified</p>	<p>Note: Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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.
• RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
• SEMICONDUCTORS
In each case, u: μ, for example:
uA...: μA..., uPA..., μPA...,
uPB..., μPB..., uPC..., μPC...,
uPD..., μPD...
• CAPACITORS:
uF: μF
• COILS
uH: μH

Table with columns: Ref. No., Part No., Description, Remarks. Includes entries for BI-703 BOARD, COMPLETE and FG-707 BOARD, COMPLETE.

Table with columns: Ref. No., Part No., Description, Remarks. Includes entries for FP-746 BOARD, COMPLETE (A3), FP-746 BOARD, COMPLETE (550), FP-746 BOARD, COMPLETE (650) and various components like CN401, JR403, PH401, Q401, R401-405, C101-105.

FP-746

Ref. No.	Part No.	Description	Remarks
C106	1-126-096-11	ELECT 10uF	20% 35V
C107	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C108	1-124-589-11	ELECT 47uF	20% 16V
C109	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C110	1-124-589-11	ELECT 47uF	20% 16V
C111	1-163-031-11	CERAMIC CHIP 0.01uF	50V
△C112	1-164-232-11	CERAMIC CHIP 0.01uF	50V
△C113	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C114	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C115	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C116	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C117	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C118	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C120	1-164-232-11	CERAMIC CHIP 0.01uF	50V
< CONNECTOR >			
CN101	1-506-484-11	PIN, CONNECTOR 5P (550)	
CN101	1-506-486-11	PIN, CONNECTOR 7P (650/A3)	
CN102	1-506-487-11	PIN, CONNECTOR 8P	
CN103	1-691-647-11	SOCKET, CONNECTOR 13P	
CN105	1-506-485-11	PIN, CONNECTOR 6P	
< DIODE >			
△D101	8-719-210-39	DIODE EC10QS-04	
D102	8-719-978-93	DIODE DTZ-TT11-30B	
△D103	8-719-210-39	DIODE EC10QS-04	
D104	8-719-105-73	DIODE RD4.7M-B2	
△D105	8-719-210-39	DIODE EC10QS-04	
D106	8-719-988-62	DIODE 1SS355	
< FILTER >			
FL101	1-421-927-21	FILTER, NOISE	
< IC >			
IC101	8-759-074-40	IC PST572DMT-T1	
IC102	8-759-336-60	IC MB89095PF-G-167-BND	
IC103	8-759-276-29	IC XL9020F-S-E2	
< COIL >			
L101	1-414-189-31	INDUCTOR 100uH	
L102	1-414-189-31	INDUCTOR 100uH	
< FLUORECENT INDICATOR >			
ND101	1-517-396-11	TUBE, FLUORESCENT INDICATOR	
< PHOTO INTERRUPTER >			
PH101	8-749-010-69	PHOTO INTERRUPTER GP158V	

Ref. No.	Part No.	Description	Remarks
< TRANSISTOR >			
△Q101	8-729-140-97	TRANSISTOR KSA708	
Q102	8-729-216-22	TRANSISTOR 2SA1162	
Q103	8-729-901-01	TRANSISTOR DTC144EK	
Q104	8-729-901-06	TRANSISTOR DTA144EK	
Q105	8-729-901-05	TRANSISTOR DTA124EK	(650/A3)
Q106	8-729-901-05	TRANSISTOR DTA124EK	(650/A3)
Q107	8-729-901-05	TRANSISTOR DTA124EK	
Q108	8-729-901-05	TRANSISTOR DTA124EK	
Q109	8-729-901-05	TRANSISTOR DTA124EK	
< RESISTOR >			
R101	1-216-009-00	METAL CHIP 22 5%	1/10W
R102	1-216-033-00	METAL CHIP 220 5%	1/10W
R103	1-216-073-00	METAL CHIP 10K 5%	1/10W
R104	1-216-073-00	METAL CHIP 10K 5%	1/10W
R105	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R106	1-216-081-00	METAL CHIP 22K 5%	1/10W
R107	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R108	1-216-075-00	METAL CHIP 12K 5%	1/10W
R109	1-216-075-00	METAL CHIP 12K 5%	1/10W
R110	1-216-075-00	METAL CHIP 12K 5%	1/10W
R111	1-216-073-00	METAL CHIP 10K 5%	1/10W
R112	1-216-099-00	METAL CHIP 120K 5%	1/10W
△R113	1-208-806-11	METAL CHIP 10K 0.50%	1/10W
△R114	1-208-806-11	METAL CHIP 10K 0.50%	1/10W
R115	1-216-073-00	METAL CHIP 10K 5%	1/10W
R116	1-216-073-00	METAL CHIP 10K 5%	1/10W
△R117	1-216-689-11	METAL CHIP 39K 0.5%	1/10W
R118	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R119	1-216-073-00	METAL CHIP 10K 5%	1/10W
R120	1-216-033-00	METAL CHIP 220 5%	1/10W
R121	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R122	1-216-033-00	METAL CHIP 220 5%	1/10W
R123	1-216-081-00	METAL CHIP 22K 5%	1/10W (550)
R123	1-216-073-00	METAL CHIP 10K 5%	1/10W (650/A3)
R124	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R125	1-216-033-00	METAL CHIP 220 5%	1/10W
R126	1-216-033-00	METAL CHIP 220 5%	1/10W
R127	1-216-033-00	METAL CHIP 220 5%	1/10W
R128	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R129	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R130	1-216-033-00	METAL CHIP 220 5%	1/10W
R132	1-216-073-00	METAL CHIP 10K 5%	1/10W
R133	1-216-121-00	METAL CHIP 1M 5%	1/10W
R144	1-216-025-91	METAL GLAZE 100 5%	1/10W
R145	1-216-049-91	METAL GLAZE 1K 5%	1/10W

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

FP-746**FP-747****HP-718**

Ref. No.	Part No.	Description	Remarks
R151	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R152	1-216-073-00	METAL CHIP	10K 5% 1/10W (550)
R152	1-216-081-00	METAL CHIP	22K 5% 1/10W (650/A3)
R153	1-216-073-00	METAL CHIP	10K 5% 1/10W
R154	1-216-073-00	METAL CHIP	10K 5% 1/10W
R155	1-208-806-11	METAL CHIP	10K 0.50% 1/10W
< TRANSFORMER >			
△T101	1-448-740-21	TRANSFORMER, DC-DC CONVERTER	
< VIBRATOR >			
X101	1-579-125-11	VIBRATOR, CERAMIC 8MHz	

*	A-6423-306-A	FP-747 BOARD, COMPLETE (550)	

*	A-6423-296-A	FP-747 BOARD, COMPLETE (650/A3)	

(Ref.No.3,000 Series)			
< CONNECTOR >			
CN201	1-506-484-11	PIN, CONNECTOR 5P	(550)
CN201	1-506-486-11	PIN, CONNECTOR 7P	(650/A3)
< DIODE >			
D201	8-719-302-07	LED SEL1810A (THEATER MODE)	(650/A3)
D202	8-719-955-04	LED PY5504S-1 (LD DIGEST)	(650/A3)
D203	8-719-955-04	LED PY5504S-1 (AUTO RESUME)	
D204	8-719-955-04	LED PY5504S-1 (B)	
D205	8-719-955-04	LED PY5504S-1 (A)	
< RESISTOR >			
R201	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R202	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R203	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R204	1-216-079-00	METAL CHIP	18K 5% 1/10W
R205	1-216-089-00	METAL CHIP	47K 5% 1/10W
R206	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R207	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R208	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R209	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R210	1-216-037-00	METAL CHIP	330 5% 1/10W
(650/A3)			
R211	1-216-031-00	METAL CHIP	180 5% 1/10W
(650/A3)			
R212	1-216-031-00	METAL CHIP	180 5% 1/10W
R213	1-216-031-00	METAL CHIP	180 5% 1/10W
R214	1-216-031-00	METAL CHIP	180 5% 1/10W
< SWITCH >			
S201	1-762-365-21	SWITCH, TACTILE (▶▶)	
S202	1-762-365-21	SWITCH, TACTILE (◀◀)	

Ref. No.	Part No.	Description	Remarks
S203	1-762-365-21	SWITCH, TACTILE (▶▶)	
S204	1-762-365-21	SWITCH, TACTILE (◀◀)	
S205	1-762-365-21	SWITCH, TACTILE (THEATER MODE)	(650/A3)
S206	1-762-365-21	SWITCH, TACTILE (B)	
S207	1-762-365-21	SWITCH, TACTILE (A)	
S208	1-762-365-21	SWITCH, TACTILE (■)	
S209	1-762-365-21	SWITCH, TACTILE (▷)	
S210	1-762-365-21	SWITCH, TACTILE (■)	

* A-6423-297-A HP-718 BOARD, COMPLETE (650/A3)

(Ref.No.3,000 Series)

< CAPACITOR >

C551	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C552	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C553	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V

< CONNECTOR >

CN551	1-506-483-21	PIN, CONNECTOR 4P	
-------	--------------	-------------------	--

< DIODE >

D551	8-719-988-62	DIODE	1SS355
D552	8-719-988-62	DIODE	1SS355

< FERRITE BEAD >

FB551	1-410-989-11	INDUCTOR CHIP	0.47UH
FB552	1-410-989-11	INDUCTOR CHIP	0.47UH
FB553	1-410-989-11	INDUCTOR CHIP	0.47UH

< FILTER >

FL551	1-236-071-11	ENCAPSULATED COMPONENT	
-------	--------------	------------------------	--

< JACK >

J551	1-568-151-21	JACK, LARGE TYPE (PHONES)	
------	--------------	---------------------------	--

< TRANSISTOR >

Q551	8-729-023-22	TRANSISTOR	2SD2114KT146
Q552	8-729-023-22	TRANSISTOR	2SD2114KT146

< RESISTOR >

R551	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R552	1-216-013-00	METAL CHIP	33 5% 1/10W
R553	1-216-013-00	METAL CHIP	33 5% 1/10W
R554	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R555	1-216-073-00	METAL CHIP	10K 5% 1/10W

Note:

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

Note:

Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

HP-718**MA-712**

Ref. No.	Part No.	Description	Remarks		
R556	1-216-073-00	METAL CHIP	10K	5%	1/10W
< VARIABLE RESISTOR >					
RV551	1-223-894-11	RES, VAR, CARBON 500/500 (LEVEL)			

*	A-6423-293-A	MA-712 BOARD, COMPLETE			

(Ref.No.3,000 Series)					
< CAPACITOR >					
C501	1-126-160-11	ELECT	1uF	20%	50V
C502	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C503	1-126-160-11	ELECT	1uF	20%	50V
C504	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C505	1-126-163-11	ELECT	4.7uF	20%	50V
C506	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C507	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C508	1-126-163-11	ELECT	4.7uF	20%	50V
C509	1-124-584-00	ELECT	100uF	20%	10V
C510	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C511	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C512	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C513	1-164-346-11	CERAMIC CHIP	1uF		16V
C514	1-124-584-00	ELECT	100uF	20%	10V
C515	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C516	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C517	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C518	1-164-346-11	CERAMIC CHIP	1uF		16V
C519	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C520	1-124-589-11	ELECT	47uF	20%	16V
C521	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C522	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C523	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C524	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C525	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C526	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C527	1-164-346-11	CERAMIC CHIP	1uF		16V
C528	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C529	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C530	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C531	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C532	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C533	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C534	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C535	1-124-589-11	ELECT	47uF	20%	16V
C536	1-124-589-11	ELECT	47uF	20%	16V
C537	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C538	1-126-157-11	ELECT	10uF	20%	16V

Ref. No.	Part No.	Description	Remarks		
< CONNECTOR >					
CN501	1-506-484-11	PIN, CONNECTOR 5P			
< DIODE >					
D501	8-719-800-76	DIODE	1SS226		
D502	8-719-977-05	DIODE	DTZ-TT11-6.2		
D505	8-719-911-19	DIODE	1SS119		
D506	8-719-911-19	DIODE	1SS119		
< FERRITE BEAD >					
FB501	1-410-991-11	INDUCTOR CHIP	0.68UH		
FB503	1-410-396-41	FERRITE BEAD INDUCTOR	0.45uH		
< FILTER >					
FL501	1-236-728-11	ENCAPSULATED COMPONENT			
FL502	1-236-728-11	ENCAPSULATED COMPONENT			
< IC >					
IC501	8-759-265-83	IC	M65843FP-T1		
IC502	8-759-099-06	IC	M5218AFP-TE1		
IC503	8-759-924-46	IC	BA4560F		
IC504	8-759-630-34	IC	M5278L05M		
< JACK >					
J501	1-569-112-31	JACK, LARGE TYPE (MIC)			
< COIL >					
L501	1-414-189-31	INDUCTOR	100uH		
L502	1-414-167-11	INDUCTOR	1mH		
< TRANSISTOR >					
Q501	8-729-901-04	TRANSISTOR	DTA114EK		
< RESISTOR >					
R501	1-216-025-91	METAL GLAZE	100	5%	1/10W
R502	1-216-097-00	METAL CHIP	100K	5%	1/10W
R503	1-216-073-00	METAL CHIP	10K	5%	1/10W
R504	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R505	1-216-083-00	METAL CHIP	27K	5%	1/10W
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W
R507	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W
R509	1-216-075-00	METAL CHIP	12K	5%	1/10W
R510	1-216-073-00	METAL CHIP	10K	5%	1/10W
R512	1-216-101-00	METAL CHIP	150K	5%	1/10W
R513	1-216-077-00	METAL CHIP	15K	5%	1/10W
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W
R516	1-216-077-00	METAL CHIP	15K	5%	1/10W

MA-712

MB-717

Ref. No.	Part No.	Description	Remarks		
R517	1-216-073-00	METAL CHIP	10K	5%	1/10W
R518	1-216-077-00	METAL CHIP	15K	5%	1/10W
R519	1-216-081-00	METAL CHIP	22K	5%	1/10W
R520	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R521	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R522	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R523	1-216-097-00	METAL CHIP	100K	5%	1/10W
R524	1-216-012-00	METAL GLAZE	30	5%	1/10W
R525	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R526	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV501	1-223-895-11	RES, VAR, CARBON 10K/10K (LEVEL)	*****		
*	A-6423-301-A	MB-717 BOARD, COMPLETE (A3)	*****		
*	A-6423-291-A	MB-717 BOARD, COMPLETE (550)	*****		
*	A-6423-294-A	MB-717 BOARD, COMPLETE (650)	*****		
(Ref. No. 1,000 Series)					

? 3-964-859-01 PLATE, GROUND (A3)

< CAPACITOR >

C001	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C002	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C003	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C004	1-124-443-00	ELECT	100uF	20%	10V
C005	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C006	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C007	1-126-177-11	ELECT	100uF	20%	10V
C008	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C009	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C010	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C110	1-163-251-11	CERAMIC CHIP	100PF	5%	50V(650/A3)
C011	1-124-443-00	ELECT	100uF	20%	10V
C012	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C014	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C015	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C017	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C018	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C019	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C020	1-126-803-11	ELECT	47uF	20%	10V
C021	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C022	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C023	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C024	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C025	1-163-038-91	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description	Remarks		
C026	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C027	1-126-916-11	ELECT	1000uF	20%	6.3V
C028	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C029	1-163-116-00	CERAMIC CHIP	91PF	5%	50V
C030	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C032	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C033	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C034	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C035	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C036	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C037	1-163-108-00	CERAMIC CHIP	43PF	5%	50V
C038	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C039	1-163-114-00	CERAMIC CHIP	75PF	5%	50V
C040	1-124-239-00	ELECT	6.9uF	20%	10V
C041	1-124-257-00	ELECT	2.2uF	20%	50V
C042	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C043	1-163-116-00	CERAMIC CHIP	91PF	5%	50V
C044	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C045	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C046	1-124-584-00	ELECT	100uF	20%	10V
C047	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C048	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C049	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C050	1-126-923-11	ELECT	220uF	20%	10V
C051	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C052	1-163-220-11	CERAMIC CHIP	3PF	0.25PF	50V
C053	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C054	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C055	1-124-443-00	ELECT	100uF	20%	10V
C056	1-124-443-00	ELECT	100uF	20%	10V
C057	1-124-907-11	ELECT	10uF	20%	50V
C058	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C059	1-126-803-11	ELECT	47uF	20%	10V
C060	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C061	1-126-803-11	ELECT	47uF	20%	10V
C062	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C063	1-124-443-00	ELECT	100uF	20%	10V
C064	1-126-803-11	ELECT	47uF	20%	10V
C065	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C066	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C067	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C068	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C069	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C071	1-216-295-91	CONDCTOR, CHIP (2012)			
C072	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C074	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C075	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C076	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C077	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C078	1-124-903-11	ELECT	1uF	20%	50V

MB-717

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks				
C079	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C223	1-163-033-91	CERAMIC CHIP	0.022uF	50V		
C080	1-124-443-00	ELECT	100uF	20%	10V	C224	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C081	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C225	1-163-033-91	CERAMIC CHIP	0.022uF	50V		
C082	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C226	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C083	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C227	1-126-803-11	ELECT	47uF	20%	10V	
C085	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C228	1-124-443-00	ELECT	100uF	20%	10V	
C088	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C229	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C089	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C230	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
C090	1-126-803-11	ELECT	47uF	20%	10V	C231	1-137-368-11	FILM	0.0047uF	5%	50V
C091	1-126-803-11	ELECT	47uF	20%	10V	C232	1-137-378-11	FILM	0.22uF	5%	50V
C092	1-124-589-11	ELECT	47uF	20%	16V (550)	C233	1-137-368-11	FILM	0.0047uF	5%	50V
C093	1-163-031-11	CERAMIC CHIP	0.01uF	50V (550)	C234	1-137-378-11	FILM	0.22uF	5%	50V	
C094	1-126-803-11	ELECT	47uF	20%	10V	C235	1-137-442-11	FILM	0.039uF	5%	50V
C095	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C236	1-137-442-11	FILM	0.039uF	5%	50V	
C096	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C237	1-163-038-91	CERAMIC CHIP	0.1uF	25V		
C097	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C238	1-164-232-11	CERAMIC CHIP	0.01uF	50V		
C098	1-124-907-11	ELECT	10uF	20%	50V	C239	1-137-399-11	FILM	0.1uF	5%	50V
C100	1-163-031-11	CERAMIC CHIP	0.01uF	50V (550)	C240	1-126-803-11	ELECT	47uF	20%	10V	
C110	1-163-125-00	CERAMIC CHIP	220PF	5%	50V (550)	C241	1-124-902-00	ELECT	0.47uF	20%	50V
C111	1-164-346-11	CERAMIC CHIP	1uF	16V	C242	1-124-907-11	ELECT	10uF	20%	50V	
C112	1-124-907-11	ELECT	10uF	20%	50V	C244	1-126-803-11	ELECT	47uF	20%	10V
C113	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C245	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C114	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C247	1-163-031-11	CERAMIC CHIP	0.01uF	50V		
C115	1-126-803-11	ELECT	47uF	20%	10V	C249	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C116	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V (550)	C250	1-107-714-11	ELECT	10uF	20%	16V
C118	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C251	1-109-889-11	ELECT	1uF	20%	50V	
C120	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C252	1-126-803-11	ELECT	47uF	20%	10V	
C200	1-124-443-00	ELECT	100uF	20%	10V	C253	1-163-038-91	CERAMIC CHIP	0.1uF	25V	
C201	1-126-803-11	ELECT	47uF	20%	10V	C254	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C202	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	C257	1-126-916-11	ELECT	1000uF	20%	6.3V
C203	1-163-253-11	CERAMIC CHIP	120PF	5%	50V	C258	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C204	1-126-803-11	ELECT	47uF	20%	10V	C259	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C205	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C260	1-163-038-91	CERAMIC CHIP	0.1uF	25V		
C206	1-124-907-11	ELECT	10uF	20%	50V	C261	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C207	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C262	1-124-927-11	ELECT	4.7uF	20%	100V	
C208	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C264	1-124-927-11	ELECT	4.7uF	20%	100V	
C209	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C265	1-124-927-11	ELECT	4.7uF	20%	100V
C210	1-164-005-11	CERAMIC CHIP	0.47uF	25V	C267	1-124-927-11	ELECT	4.7uF	20%	100V	
C211	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	C268	1-124-927-11	ELECT	4.7uF	20%	100V
C212	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	C269	1-124-927-11	ELECT	4.7uF	20%	100V
C213	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C270	1-124-477-11	ELECT	47uF	20%	25V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	C271	1-124-927-11	ELECT	4.7uF	20%	100V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	C272	1-124-477-11	ELECT	47uF	20%	25V
C216	1-126-803-11	ELECT	47uF	20%	10V	C273	1-124-927-11	ELECT	4.7uF	20%	100V
C217	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C274	1-124-477-11	ELECT	47uF	20%	25V (650/A3)	
C218	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C275	1-163-031-11	CERAMIC CHIP	0.01uF	50V (650/A3)	
C219	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	C276	1-124-477-11	ELECT	47uF	20%	25V (650/A3)
C220	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	C277	1-124-477-11	ELECT	47uF	20%	25V (650/A3)
C221	1-163-001-11	CERAMIC CHIP	220PF	10%	50V						
C222	1-163-033-91	CERAMIC CHIP	0.022uF	50V							

MB-717

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
C278	1-124-477-11	ELECT	47uF	20%	25V (650/A3)	C444	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C279	1-163-031-11	CERAMIC CHIP	0.01uF		50V (650/A3)	C445	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C280	1-124-477-11	ELECT	47uF	20%	25V (650/A3)	C447	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C281	1-124-477-11	ELECT	47uF	20%	25V (650/A3)	C448	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C286	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	C449	1-109-889-11	ELECT	1uF	20%	50V
C287	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	C450	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C288	1-124-477-11	ELECT	47uF	20%	25V	C451	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C293	1-126-923-11	ELECT	220uF	20%	10V	C453	1-124-903-11	ELECT	1uF	20%	50V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C454	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C455	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C401	1-124-589-11	ELECT	47uF	20%	16V	C456	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C402	1-124-589-11	ELECT	47uF	20%	16V	C457	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C403	1-124-477-11	ELECT	47uF	20%	25V	C458	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C404	1-124-477-11	ELECT	47uF	20%	25V	C459	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C405	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C501	1-126-803-11	ELECT	47uF	20%	10V
C406	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C502	1-107-701-11	ELECT	47uF	20%	16V
C407	1-126-803-11	ELECT	47uF	20%	10V	C503	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C408	1-126-803-11	ELECT	47uF	20%	10V	C504	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C505	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C411	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V	C506	1-124-927-11	ELECT	4.7uF	20%	100V
C412	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C507	1-124-768-11	ELECT	4.7uF	20%	35V
C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C508	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C414	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C509	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C415	1-107-715-11	ELECT	22uF	20%	16V	C510	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C416	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C511	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C417	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C512	1-124-477-11	ELECT	47uF	20%	25V
C418	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C513	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C419	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C514	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C420	1-164-505-11	CERAMIC CHIP	2.2uF		16V	C515	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C421	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C516	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C423	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	C517	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C424	1-163-125-00	CERAMIC CHIP	220PF	5%	50V	C519	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C425	1-163-253-11	CERAMIC CHIP	120PF	5%	50V	C520	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C427	1-107-714-11	ELECT	10uF	20%	16V	C530	1-163-257-11	CERAMIC CHIP	180PF	5%	50V (550)
C428	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	C601	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C430	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C602	1-126-803-11	ELECT	47uF	20%	10V
C431	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	C603	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V (650/A3)
C432	1-163-022-00	CERAMIC CHIP	0.012uF	10%	50V	C604	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C433	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	C605	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C434	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	C606	1-163-038-91	CERAMIC CHIP	0.1uF		25V (650/A3)
C435	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V	C607	1-163-038-91	CERAMIC CHIP	0.1uF		25V (650/A3)
C436	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C608	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C437	1-124-273-00	ELECT	3.3uF	20%	50V	C609	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C439	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C610	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C440	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C611	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V (650/A3)
C441	1-107-714-11	ELECT	10uF	20%	16V						
C443	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V						

MB-717

Ref. No.	Part No.	Description	Remarks
C612	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V
C613	1-163-243-11	CERAMIC CHIP	47PF 5% 50V
C614	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V
C615	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C616	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C618	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V(650/A3)
C619	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C620	1-126-803-11	ELECT	47uF 20% 10V
C622	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C628	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C630	1-126-803-11	ELECT	47uF 20% 10V
C632	1-126-803-11	ELECT	47uF 20% 10V
C633	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C639	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C640	1-126-803-11	ELECT	47uF 20% 10V
C641	1-163-038-91	CERAMIC CHIP	0.1uF 25V(650/A3)
C646	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C647	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C651	1-124-589-11	ELECT	47uF 20% 16V
C652	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C653	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C654	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C655	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C656	1-164-232-11	CERAMIC CHIP	0.01uF 50V(650/A3)
< CONNECTOR >			
CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD)	19P
CN201	1-506-469-11	PIN, CONNECTOR	4P (650/A3)
CN401	1-750-687-11	HOUSING, CONNECTOR (PC BOARD)	
* CN402	1-764-594-21	CONNECTOR, FPC	18P
CN403	1-695-335-11	PIN, CONNECTOR (PC BOARD)	12P
CN501	1-695-330-31	PIN, CONNECTOR (PC BOARD)	7P
CN502	1-695-336-11	PIN, CONNECTOR (PC BOARD)	13P
* CN702	1-564-004-11	PIN, CONNECTOR	5P
< TRIMMER >			
CT001	1-141-318-11	CAP, VAR, TRIMMER	
< DIODE >			
D001	8-719-987-69	DIODE	DAN217
D002	8-719-988-62	DIODE	1SS355
D110	8-719-988-62	DIODE	1SS355
D111	8-719-988-62	DIODE	1SS355
D112	8-719-988-62	DIODE	1SS355 (550)
D202	8-719-914-43	DIODE	DAN202K
D203	8-719-032-80	DIODE	KV1430TLOO
D204	8-719-914-42	DIODE	DA204K
D205	8-719-914-42	DIODE	DA204K
D206	8-719-988-62	DIODE	1SS355

Ref. No.	Part No.	Description	Remarks
D209	8-719-988-62	DIODE	1SS355
D401	8-719-988-62	DIODE	1SS355
D402	8-719-914-42	DIODE	DA204K
D403	8-719-914-43	DIODE	DAN202K
D404	8-719-914-44	DIODE	DAP202K
D405	8-719-976-94	DIODE	DTZ4.7A
D501	8-719-988-62	DIODE	1SS355
D503	8-719-988-62	DIODE	1SS355
D504	8-719-977-34	DIODE	DTZ12
D505	8-719-914-44	DIODE	DAP202K
D506	8-719-977-22	DIODE	DTZ9.1
< FERRITE BEAD >			
FB201	1-414-135-11	INDUCTOR CHIP	OUH
FB202	1-414-135-11	INDUCTOR CHIP	OUH
FB501	1-414-135-11	INDUCTOR CHIP	OUH
FB502	1-414-135-11	INDUCTOR CHIP	OUH
< FILTER >			
FL001	1-577-543-11	FILTER, CERAMIC	
FL002	1-577-543-11	FILTER, CERAMIC	
FL201	1-236-744-21	FILTER, EMI	
FL202	1-236-744-21	FILTER, EMI	
FL601	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
FL602	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
FL603	1-236-071-11	ENCAPSULATED COMPONENT	
FL604	1-236-071-11	ENCAPSULATED COMPONENT	
FL605	1-236-071-11	ENCAPSULATED COMPONENT	(650/A3)
< IC >			
IC001	8-759-299-92	IC	AN2661NK
IC002	8-759-294-46	IC	M35014-053SP
IC003	8-759-290-65	IC	MN8811
IC004	8-759-295-66	IC	BA7653AF-E2 (550)
IC005	8-759-324-99	IC	MM1118XFBE
IC201	8-752-372-94	IC	CXD2507AQ
IC202	8-749-921-12	IC	GP1F32T (DIGITAL OUT)
IC203	8-759-253-26	IC	CA0002AM-TP
IC204	8-759-700-43	IC	NJM4558M
IC205	8-759-327-78	IC	TC9404FN-EL
IC206	8-759-700-43	IC	NJM4558M
IC207	8-759-924-46	IC	BA4560F (650/A3)
IC401	8-759-280-89	IC	HA11529F
△IC402	8-759-822-38	IC	LA6510
△IC403	8-759-700-43	IC	NJM4558M

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

Ref. No.	Part No.	Description	Remarks
IC404	8-759-700-43	IC NJM4558M	
IC405	8-759-700-43	IC NJM4558M	
IC406	8-759-700-43	IC NJM4558M	
IC407	8-759-300-71	IC HD14053BFP	
IC501	8-759-336-57	IC MB89094PF-G-138-BND	(550)
IC501	8-759-344	51 IC MB89094PF-G-141-BND	(650/A3)
IC502	8-759-329-96	IC MSM10S0110-069GS-V1K	
IC503	8-759-231-92	IC TA7291P	
IC504	8-759-058-50	IC XRA10324AF-E2	
IC505	8-759-009-06	IC MC14052BF	
IC506	8-759-300-71	IC HD14053BFP	
IC601	8-759-334-47	IC MSM10S0050-025GS-K	(650/A3)
IC602	8-759-172-96	IC MSM518221-30JS-R1	(650/A3)
IC603	8-759-334-48	IC CXD8535Q	
IC605	8-759-710-86	IC NJM2233BM	
< JACK >			
J201	1-750-503-11	CONNECTOR, ROUND TYPE (S VIDEO)	
J202	1-764-592-11	JACK 3P (LINE OUT 2)	
J203	1-764-592-11	JACK 3P (LINE OUT 1)	
* J501	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5)	(CONTROL S)
< JUMPER RESISTOR >			
JR005	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR006	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR007	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR402	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR404	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR405	1-216-295-91	CONDUCTOR, CHIP (2012)	
< COIL >			
L001	1-408-970-21	INDUCTOR 10uH	
L002	1-408-970-21	INDUCTOR 10uH	
L003	1-408-970-21	INDUCTOR 10uH	
L004	1-408-970-21	INDUCTOR 10uH	
L005	1-408-973-21	INDUCTOR 18uH	
L006	1-410-381-11	INDUCTOR CHIP 10uH	
L007	1-408-974-21	INDUCTOR 22uH	
L008	1-410-512-61	INDUCTOR 18uH	
L009	1-410-512-61	INDUCTOR 18uH	
L010	1-410-507-11	INDUCTOR 6.8uH	
L011	1-410-507-11	INDUCTOR 6.8uH	
L012	1-408-974-21	INDUCTOR 22uH	
L013	1-408-976-21	INDUCTOR 33uH	
L014	1-408-976-21	INDUCTOR 33uH	
L015	1-408-975-21	INDUCTOR 27uH	

Ref. No.	Part No.	Description	Remarks
L016	1-408-970-21	INDUCTOR 10uH	
L017	1-408-975-21	INDUCTOR 27uH	
L018	1-408-970-21	INDUCTOR 10uH	
L019	1-408-970-21	INDUCTOR 10uH	
L020	1-408-970-21	INDUCTOR 10uH	
L021	1-408-970-21	INDUCTOR 10uH	
L022	1-408-974-21	INDUCTOR 22uH	
L024	1-408-974-21	INDUCTOR 22uH	
L025	1-408-970-21	INDUCTOR 10uH	
L027	1-408-970-21	INDUCTOR 10uH	
L028	1-408-970-21	INDUCTOR 10uH	
L201	1-408-982-21	INDUCTOR 100uH	
L202	1-408-979-21	INDUCTOR 56uH	
L203	1-408-978-21	INDUCTOR 47uH	
L204	1-408-973-21	INDUCTOR 18uH	
L205	1-408-985-21	INDUCTOR 180uH	
L209	1-414-161-21	INDUCTOR 1mH	
L210	1-414-161-21	INDUCTOR 1mH	
L401	1-408-970-21	INDUCTOR 10uH	
L402	1-408-970-21	INDUCTOR 10uH	
L404	1-408-983-21	INDUCTOR 120uH	
L405	1-408-983-21	INDUCTOR 120uH	
L406	1-408-970-21	INDUCTOR 10uH	
L407	1-408-970-21	INDUCTOR 10uH	
L501	1-408-970-21	INDUCTOR 10uH	
L504	1-408-970-21	INDUCTOR 10uH	(550)
L601	1-408-970-21	INDUCTOR 10uH	
L602	1-408-976-21	INDUCTOR 33uH	
L603	1-408-978-21	INDUCTOR 47uH	
L606	1-408-970-21	INDUCTOR 10uH	
L607	1-408-970-21	INDUCTOR 10uH	
< TRANSISTOR >			
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q003	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q004	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q007	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q009	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q011	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q012	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q013	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q014	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q015	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR	
Q016	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q017	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q019	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q020	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

MB-717

Ref. No.	Part No.	Description	Remarks
Q021	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q022	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q023	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q024	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q025	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q026	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q027	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q028	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q030	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q201	8-729-027-43	TRANSISTOR	DTC114EKA-T146
Q202	8-729-027-23	TRANSISTOR	DTA114EKA-T146
Q203	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q204	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q205	8-729-027-23	TRANSISTOR	DTA114EKA-T146
Q206	8-729-027-23	TRANSISTOR	DTA114EKA-T146
Q207	8-729-027-44	TRANSISTOR	DTC114TKA-T146
Q208	8-729-202-38	TRANSISTOR	2SC3326N-A
Q209	8-729-027-23	TRANSISTOR	DTA114EKA-T146
Q210	8-729-202-38	TRANSISTOR	2SC3326N-A
Q211	8-729-202-38	TRANSISTOR	2SC3326N-A
Q212	8-729-202-38	TRANSISTOR	2SC3326N-A (650/A3)
Q213	8-729-202-38	TRANSISTOR	2SC3326N-A (650/A3)
Q214	8-729-202-38	TRANSISTOR	2SC3326N-A
Q215	8-729-202-38	TRANSISTOR	2SC3326N-A
△Q401	8-729-019-01	TRANSISTOR	2SD2394-EF
△Q402	8-729-024-95	TRANSISTOR	2SB1565EF
△Q403	8-729-019-01	TRANSISTOR	2SD2394-EF
△Q404	8-729-024-95	TRANSISTOR	2SB1565EF
Q405	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q406	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q407	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q408	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q409	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q410	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q411	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q412	8-729-027-52	TRANSISTOR	DTC124EKA-T146
Q413	8-729-027-31	TRANSISTOR	DTA124EKA-T146
Q414	8-729-027-31	TRANSISTOR	DTA124EKA-T146
Q415	8-729-027-31	TRANSISTOR	DTA124EKA-T146
Q416	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q417	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q418	8-729-027-31	TRANSISTOR	DTA124EKA-T146
Q501	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q502	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q601	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q602	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q604	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q605	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q606	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q607	8-729-120-28	TRANSISTOR	2SC1623-L5L6

Ref. No.	Part No.	Description	Remarks
Q608	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q609	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q610	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q611	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q612	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q613	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q614	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q615	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q616	8-729-120-28	TRANSISTOR	2SC1623-L5L6
< RESISTOR >			
R001	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R002	1-216-075-00	METAL CHIP	12K 5% 1/10W
R003	1-216-041-00	METAL CHIP	470 5% 1/10W
R004	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R005	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R006	1-216-021-00	METAL CHIP	68 5% 1/10W
R007	1-216-035-00	METAL CHIP	270 5% 1/10W
R008	1-216-047-00	METAL CHIP	820 5% 1/10W
R009	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R010	1-216-037-00	METAL CHIP	330 5% 1/10W
R011	1-216-075-00	METAL CHIP	12K 5% 1/10W
R012	1-216-083-00	METAL CHIP	27K 5% 1/10W
R013	1-216-295-91	CONDUCTOR, CHIP (2012)	(650/A3)
R014	1-216-097-00	METAL CHIP	100K 5% 1/10W
R015	1-216-099-00	METAL CHIP	120K 5% 1/10W
R016	1-216-049-91	METAL GLAZE	1K 5% 1/10W (550)
R017	1-216-043-91	METAL GLAZE	560 5% 1/10W
R018	1-216-073-00	METAL CHIP	10K 5% 1/10W
R019	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R020	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R021	1-216-089-00	METAL CHIP	47K 5% 1/10W
R022	1-216-041-00	METAL CHIP	470 5% 1/10W
R023	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R024	1-216-295-91	CONDUCTOR, CHIP (2012)	
R025	1-216-097-00	METAL CHIP	100K 5% 1/10W
R027	1-216-119-00	METAL CHIP	820K 5% 1/10W
R032	1-216-101-00	METAL CHIP	150K 5% 1/10W (550)
R032	1-216-105-91	METAL GLAZE	220K 5% 1/10W (650/A3)
R033	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R034	1-216-045-00	METAL CHIP	680 5% 1/10W
R035	1-216-039-00	METAL CHIP	390 5% 1/10W
R036	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R038	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R039	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R040	1-216-043-91	METAL GLAZE	560 5% 1/10W

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R041	1-412-959-11	INDUCTOR 47uH				R098	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R042	1-216-029-00	METAL CHIP	150	5%	1/10W	R099	1-216-037-00	METAL CHIP	330	5%	1/10W
R043	1-216-041-00	METAL CHIP	470	5%	1/10W	R100	1-216-295-91	CONDUCTOR, CHIP (2012)			
R044	1-216-041-00	METAL CHIP	470	5%	1/10W	R101	1-216-295-91	CONDUCTOR, CHIP (2012)			
R045	1-216-073-00	METAL CHIP	10K	5%	1/10W	R102	1-216-295-91	CONDUCTOR, CHIP (2012)			
R046	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R103	1-216-295-91	CONDUCTOR, CHIP (2012)			
R047	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R104	1-216-295-91	CONDUCTOR, CHIP (2012)			
R048	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R105	1-216-295-91	CONDUCTOR, CHIP (2012)			
R049	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R106	1-216-295-91	CONDUCTOR, CHIP (2012)			
R050	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R107	1-216-295-91	CONDUCTOR, CHIP (2012)			
R051	1-216-073-00	METAL CHIP	10K	5%	1/10W	R110	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R052	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R111	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R053	1-216-043-91	METAL GLAZE	560	5%	1/10W	R112	1-216-295-91	CONDUCTOR, CHIP (2012)			
R054	1-216-041-00	METAL CHIP	470	5%	1/10W	R113	1-216-037-00	METAL CHIP	330	5%	1/10W
R055	1-216-073-00	METAL CHIP	10K	5%	1/10W	R118	1-216-295-91	CONDUCTOR, CHIP (2012)			
R056	1-216-039-00	METAL CHIP	390	5%	1/10W	R119	1-216-047-00	METAL CHIP	820	5%	1/10W
R059	1-216-043-91	METAL GLAZE	560	5%	1/10W	R120	1-216-081-00	METAL CHIP	22K	5%	1/10W
R061	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R121	1-216-095-00	METAL CHIP	82K	5%	1/10W
R062	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R122	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R063	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R123	1-216-105-91	METAL GLAZE	220K	5%	1/10W (550)
R064	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R123	1-216-111-00	METAL CHIP	390K	5%	1/10W (650/A3)
R065	1-216-091-00	METAL CHIP	56K	5%	1/10W	R124	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R066	1-216-089-00	METAL CHIP	47K	5%	1/10W	R125	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R067	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R126	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R068	1-216-025-91	METAL GLAZE	100	5%	1/10W	R127	1-216-113-00	METAL CHIP	470K	5%	1/10W
R069	1-216-037-00	METAL CHIP	330	5%	1/10W	R128	1-216-029-00	METAL CHIP	150	5%	1/10W (550)
R070	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R129	1-216-033-00	METAL CHIP	220	5%	1/10W
R071	1-216-073-00	METAL CHIP	10K	5%	1/10W	R130	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R072	1-216-033-00	METAL CHIP	220	5%	1/10W	R139	1-216-295-91	CONDUCTOR, CHIP (2012)			
R073	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R140	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R074	1-216-025-91	METAL GLAZE	100	5%	1/10W	R141	1-216-295-91	CONDUCTOR, CHIP (2012)			
R075	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R142	1-216-295-91	CONDUCTOR, CHIP (2012)			
R077	1-216-041-00	METAL CHIP	470	5%	1/10W	R144	1-216-033-00	METAL CHIP	220	5%	1/10W
R078	1-216-025-91	METAL GLAZE	100	5%	1/10W	R145	1-216-295-91	CONDUCTOR, CHIP (2012)			
R079	1-216-041-00	METAL CHIP	470	5%	1/10W	R201	1-216-295-91	CONDUCTOR, CHIP (2012)			
R080	1-216-121-00	METAL CHIP	1M	5%	1/10W	R203	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R081	1-216-021-00	METAL CHIP	68	5%	1/10W	R206	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R082	1-216-041-00	METAL CHIP	470	5%	1/10W	R208	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R083	1-216-043-91	METAL GLAZE	560	5%	1/10W	R209	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R084	1-216-041-00	METAL CHIP	470	5%	1/10W	R210	1-216-041-00	METAL CHIP	470	5%	1/10W
R085	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R211	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R086	1-216-021-00	METAL CHIP	68	5%	1/10W	R212	1-216-017-00	METAL CHIP	47	5%	1/10W
R087	1-216-295-91	CONDUCTOR, CHIP (2012)				R213	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R089	1-216-033-00	METAL CHIP	220	5%	1/10W	R214	1-216-023-00	METAL CHIP	82	5%	1/10W
R090	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R091	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W	R216	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R093	1-216-059-00	METAL CHIP	2.7K	5%	1/10W	R217	1-216-073-00	METAL CHIP	10K	5%	1/10W
R094	1-216-073-00	METAL CHIP	10K	5%	1/10W	R218	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R095	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R219	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R097	1-216-295-91	CONDUCTOR, CHIP (2012)				R220	1-216-049-91	METAL GLAZE	1K	5%	1/10W

MB-717

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
R222	1-216-295-91	CONDCTOR, CHIP (2012)		R282	1-216-081-00	METAL CHIP	22K 5% 1/10W
R223	1-216-295-91	CONDCTOR, CHIP (2012)		R283	1-216-075-00	METAL CHIP	12K 5% 1/10W
R224	1-216-121-00	METAL CHIP	1M 5% 1/10W	R284	1-216-081-00	METAL CHIP	22K 5% 1/10W
R226	1-216-105-91	METAL GLAZE	220K 5% 1/10W	R285	1-216-081-00	METAL CHIP	22K 5% 1/10W
R227	1-216-074-00	METAL CHIP	11K 5% 1/10W	R286	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R228	1-216-121-00	METAL CHIP	1M 5% 1/10W	R287	1-216-081-00	METAL CHIP	22K 5% 1/10W
R229	1-163-031-11	CERAMIC CHIP	0.01MF 50V	R289	1-216-081-00	METAL CHIP	22K 5% 1/10W
R230	1-216-295-91	CONDCTOR, CHIP (2012)		R290	1-216-081-00	METAL CHIP	22K 5% 1/10W
R231	1-216-295-91	CONDCTOR, CHIP (2012)		R291	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R232	1-216-043-91	METAL GLAZE	560 5% 1/10W	R292	1-216-043-91	METAL GLAZE	560 5% 1/10W
R233	1-216-295-91	CONDCTOR, CHIP (2012)		R293	1-216-073-00	METAL CHIP	10K 5% 1/10W
R235	1-216-689-11	METAL CHIP	39K 0.5% 1/10W	R294	1-216-073-00	METAL CHIP	10K 5% 1/10W
R236	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R295	1-216-043-91	METAL GLAZE	560 5% 1/10W
R237	1-216-077-00	METAL CHIP	15K 5% 1/10W	R296	1-216-035-00	METAL CHIP	270 5% 1/10W
R238	1-216-077-00	METAL CHIP	15K 5% 1/10W	R297	1-216-035-00	METAL CHIP	270 5% 1/10W
R239	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R298	1-216-097-00	METAL CHIP	100K 5% 1/10W
R240	1-216-096-00	METAL GLAZE	91K 5% 1/10W	R299	1-216-097-00	METAL CHIP	100K 5% 1/10W
R242	1-216-071-00	METAL CHIP	8.2K 5% 1/10W	R300	1-216-073-00	METAL CHIP	10K 5% 1/10W
R243	1-216-071-00	METAL CHIP	8.2K 5% 1/10W	R301	1-216-073-00	METAL CHIP	10K 5% 1/10W
R245	1-216-104-00	METAL CHIP	200K 5% 1/10W	R302	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R246	1-216-105-91	METAL GLAZE	220K 5% 1/10W	R303	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R247	1-216-043-91	METAL GLAZE	560 5% 1/10W	R304	1-216-089-00	METAL CHIP	47K 5% 1/10W (650/A3)
R248	1-216-043-91	METAL GLAZE	560 5% 1/10W	R305	1-216-089-00	METAL CHIP	47K 5% 1/10W (650/A3)
R250	1-216-071-00	METAL CHIP	8.2K 5% 1/10W	R307	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R251	1-216-097-00	METAL CHIP	100K 5% 1/10W	R308	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R252	1-216-097-00	METAL CHIP	100K 5% 1/10W	R309	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R254	1-216-101-00	METAL CHIP	150K 5% 1/10W	R311	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R255	1-216-101-00	METAL CHIP	150K 5% 1/10W	R312	1-216-073-00	METAL CHIP	10K 5% 1/10W (650/A3)
R256	1-216-073-00	METAL CHIP	10K 5% 1/10W	R313	1-216-073-00	METAL CHIP	10K 5% 1/10W (650/A3)
R257	1-216-073-00	METAL CHIP	10K 5% 1/10W	R314	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R258	1-216-104-00	METAL CHIP	200K 5% 1/10W	R315	1-216-295-91	CONDCTOR, CHIP (2012)	(650/A3)
R260	1-216-091-00	METAL CHIP	56K 5% 1/10W	R322	1-216-073-00	METAL CHIP	10K 5% 1/10W
R261	1-216-091-00	METAL CHIP	56K 5% 1/10W	R323	1-216-033-00	METAL CHIP	220 5% 1/10W
R262	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R324	1-216-033-00	METAL CHIP	220 5% 1/10W
R263	1-216-091-00	METAL CHIP	56K 5% 1/10W	R352	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R264	1-216-091-00	METAL CHIP	56K 5% 1/10W	R353	1-216-073-00	METAL CHIP	10K 5% 1/10W
R265	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R401	1-216-369-00	METAL OXIDE	1 5% 2W F
R266	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R402	1-216-146-00	METAL GLAZE	6.8 5% 1/8W
R267	1-216-295-91	CONDCTOR, CHIP (2012)		R403	1-216-146-00	METAL GLAZE	6.8 5% 1/8W
R269	1-216-295-91	CONDCTOR, CHIP (2012)		R404	1-216-067-00	METAL CHIP	5.6K 5% 1/10W
R270	1-216-097-00	METAL CHIP	100K 5% 1/10W	R405	1-216-025-91	METAL GLAZE	100 5% 1/10W
R271	1-216-097-00	METAL CHIP	100K 5% 1/10W	R406	1-216-079-00	METAL CHIP	18K 5% 1/10W
R272	1-216-075-00	METAL CHIP	12K 5% 1/10W	R407	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R273	1-216-085-00	METAL CHIP	33K 5% 1/10W	R408	1-216-081-00	METAL CHIP	22K 5% 1/10W
R276	1-216-073-00	METAL CHIP	10K 5% 1/10W	R409	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R277	1-216-689-11	METAL CHIP	39K 0.5% 1/10W	R411	1-216-077-00	METAL CHIP	15K 5% 1/10W
R278	1-216-295-91	CONDCTOR, CHIP (2012)		R412	1-216-045-00	METAL CHIP	680 5% 1/10W
R279	1-216-075-00	METAL CHIP	12K 5% 1/10W	R413	1-216-047-00	METAL CHIP	820 5% 1/10W
R280	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R414	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R281	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R415	1-216-061-00	METAL CHIP	3.3K 5% 1/10W

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R470	1-216-081-00	METAL CHIP	22K	5%	1/10W
R417	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R471	1-216-079-00	METAL CHIP	18K	5%	1/10W
R418	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R472	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R419	1-216-045-00	METAL CHIP	680	5%	1/10W	R473	1-216-075-00	METAL CHIP	12K	5%	1/10W
R420	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R474	1-216-093-00	METAL CHIP	68K	5%	1/10W
R421	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R475	1-216-099-00	METAL CHIP	120K	5%	1/10W
R422	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R476	1-216-073-00	METAL CHIP	10K	5%	1/10W
R423	1-216-039-00	METAL CHIP	390	5%	1/10W	R477	1-216-077-00	METAL CHIP	15K	5%	1/10W
R424	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R478	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R425	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R479	1-216-085-00	METAL CHIP	33K	5%	1/10W
R426	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R480	1-216-073-00	METAL CHIP	10K	5%	1/10W
R427	1-216-017-00	METAL CHIP	47	5%	1/10W	R481	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R428	1-216-073-00	METAL CHIP	10K	5%	1/10W	R482	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R429	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R483	1-216-073-00	METAL CHIP	10K	5%	1/10W
R430	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R484	1-216-091-00	METAL CHIP	56K	5%	1/10W
R431	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	R485	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R432	1-216-107-00	METAL CHIP	270K	5%	1/10W	R486	1-216-073-00	METAL CHIP	10K	5%	1/10W
R433	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R487	1-216-079-00	METAL CHIP	18K	5%	1/10W
R434	1-216-097-00	METAL CHIP	100K	5%	1/10W	R488	1-216-089-00	METAL CHIP	47K	5%	1/10W
R435	1-216-077-00	METAL CHIP	15K	5%	1/10W	R489	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R436	1-216-101-00	METAL CHIP	150K	5%	1/10W	R490	1-216-073-00	METAL CHIP	10K	5%	1/10W
R437	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R491	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R438	1-216-089-00	METAL CHIP	47K	5%	1/10W	R492	1-216-073-00	METAL CHIP	10K	5%	1/10W
R442	1-216-073-00	METAL CHIP	10K	5%	1/10W	R493	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R444	1-216-075-00	METAL CHIP	12K	5%	1/10W	R494	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R445	1-216-079-00	METAL CHIP	18K	5%	1/10W	R495	1-216-085-00	METAL CHIP	33K	5%	1/10W
R446	1-216-101-00	METAL CHIP	150K	5%	1/10W	R496	1-216-097-00	METAL CHIP	100K	5%	1/10W
R447	1-216-089-00	METAL CHIP	47K	5%	1/10W	R497	1-216-097-00	METAL CHIP	100K	5%	1/10W
R448	1-216-101-00	METAL CHIP	150K	5%	1/10W	R498	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R449	1-216-035-00	METAL CHIP	270	5%	1/10W	R499	1-216-090-00	METAL CHIP	51K	5%	1/10W
R450	1-216-089-00	METAL CHIP	47K	5%	1/10W	R502	1-216-089-00	METAL CHIP	47K	5%	1/10W
R451	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R506	1-216-121-00	METAL CHIP	1M	5%	1/10W
R452	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R507	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R453	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R508	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W
R454	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R509	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R455	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R510	1-216-089-00	METAL CHIP	47K	5%	1/10W
R456	1-216-097-00	METAL CHIP	100K	5%	1/10W	R511	1-216-111-00	METAL CHIP	390K	5%	1/10W
R457	1-216-081-00	METAL CHIP	22K	5%	1/10W	R512	1-216-113-00	METAL CHIP	470K	5%	1/10W
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W	R513	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W
R459	1-216-083-00	METAL CHIP	27K	5%	1/10W	R514	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R460	1-216-075-00	METAL CHIP	12K	5%	1/10W	R515	1-216-077-00	METAL CHIP	15K	5%	1/10W
R461	1-216-085-00	METAL CHIP	33K	5%	1/10W	R516	1-216-085-00	METAL CHIP	33K	5%	1/10W
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W	R517	1-208-808-11	METAL GLAZE	12K	0.50%	1/10W
R463	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R518	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W
R464	1-216-075-00	METAL CHIP	12K	5%	1/10W	R519	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R465	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	R520	1-216-073-00	METAL CHIP	10K	5%	1/10W
R466	1-216-097-00	METAL CHIP	100K	5%	1/10W	R521	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W
R467	1-216-085-00	METAL CHIP	33K	5%	1/10W	R522	1-216-081-00	METAL CHIP	22K	5%	1/10W
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W	R523	1-216-035-00	METAL CHIP	270	5%	1/10W
R469	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R524	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W

MB-717

Ref. No.	Part No.	Description	Remarks		
R525	1-216-101-00	METAL CHIP	150K	5%	1/10W
R526	1-216-089-00	METAL CHIP	47K	5%	1/10W
R527	1-216-033-00	METAL CHIP	220	5%	1/10W
R528	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R530	1-216-073-00	METAL CHIP	10K	5%	1/10W
R531	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R532	1-216-045-00	METAL CHIP	680	5%	1/10W
R533	1-216-097-00	METAL CHIP	100K	5%	1/10W
R534	1-216-093-00	METAL CHIP	68K	5%	1/10W
R535	1-216-095-00	METAL CHIP	82K	5%	1/10W
R536	1-216-073-00	METAL CHIP	10K	5%	1/10W
R537	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R538	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R539	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R540	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R541	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R542	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R543	1-216-049-91	METAL GLAZE	1K	5%	1/10W
<u>A</u> R544	1-212-950-00	FUSIBLE	4.7	5%	1/2W F
R545	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R546	1-216-045-00	METAL CHIP	680	5%	1/10W
R547	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R548	1-216-081-00	METAL CHIP	22K	5%	1/10W
R549	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R550	1-216-073-00	METAL CHIP	10K	5%	1/10W
R551	1-216-081-00	METAL CHIP	22K	5%	1/10W
R552	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R553	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R554	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R555	1-216-021-00	METAL CHIP	68	5%	1/10W
R556	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R557	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R558	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R559	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R560	1-216-033-00	METAL CHIP	220	5%	1/10W
R561	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R562	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R563	1-216-033-00	METAL CHIP	220	5%	1/10W
R564	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R566	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R567	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R568	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R569	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R570	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R571	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R572	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R573	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R574	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R576	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R577	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description	Remarks		
R578	1-216-089-00	METAL CHIP	47K	5%	1/10W
R594	1-216-295-91	CONDUCTOR, CHIP (2012)			
R595	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (550)
R596	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (550)
R597	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (550)
R601	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R602	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R603	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R604	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R605	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R606	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R607	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R608	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R609	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R610	1-216-113-00	METAL CHIP	470K	5%	1/10W (650/A3)
R611	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R612	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R613	1-216-295-91	CONDUCTOR, CHIP (2012)			(650/A3)
R614	1-216-081-00	METAL CHIP	22K	5%	1/10W
R615	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R617	1-216-081-00	METAL CHIP	22K	5%	1/10W
R618	1-216-113-00	METAL CHIP	470K	5%	1/10W (650/A3)
R619	1-216-073-00	METAL CHIP	10K	5%	1/10W
R620	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R621	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R622	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R623	1-216-038-00	METAL CHIP	360	5%	1/10W
R624	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (650/A3)
R625	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R627	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R628	1-216-081-00	METAL CHIP	22K	5%	1/10W
R630	1-216-081-00	METAL CHIP	22K	5%	1/10W
R633	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R634	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R635	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R636	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R637	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R638	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R639	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R640	1-216-295-91	CONDUCTOR, CHIP (2012)			(550)
R641	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R642	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R643	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R644	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R645	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)

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

Note:
Les composants identifiés par une marque A sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MB-717**MD-705**

Ref. No.	Part No.	Description	Remarks		
R646	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R647	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R648	1-216-045-00	METAL CHIP	680	5%	1/10W (650/A3)
R656	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R657	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R658	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R659	1-216-025-91	METAL GLAZE	100	5%	1/10W
R660	1-216-025-91	METAL GLAZE	100	5%	1/10W
R661	1-216-025-91	METAL GLAZE	100	5%	1/10W
R662	1-216-025-91	METAL GLAZE	100	5%	1/10W
R663	1-216-025-91	METAL GLAZE	100	5%	1/10W
R664	1-216-025-91	METAL GLAZE	100	5%	1/10W
R665	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R666	1-216-081-00	METAL CHIP	22K	5%	1/10W
R667	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R668	1-216-170-00	METAL GLAZE	68	5%	1/8W
R669	1-216-170-00	METAL GLAZE	68	5%	1/8W
R670	1-216-089-00	METAL CHIP	47K	5%	1/10W
R671	1-216-170-00	METAL GLAZE	68	5%	1/8W
R672	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R673	1-216-041-00	METAL CHIP	470	5%	1/10W
R674	1-216-041-00	METAL CHIP	470	5%	1/10W
R675	1-216-041-00	METAL CHIP	470	5%	1/10W
R676	1-216-041-00	METAL CHIP	470	5%	1/10W
R677	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R678	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R679	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R680	1-216-170-00	METAL GLAZE	68	5%	1/8W
R681	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R682	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R683	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R684	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R685	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (650/A3)
R687	1-216-295-91	CONDUCTOR, CHIP (2012)			
R688	1-216-295-91	CONDUCTOR, CHIP (2012)			
R900	1-216-085-00	METAL CHIP	33K	5%	1/10W
R901	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R902	1-216-081-00	METAL CHIP	22K	5%	1/10W
R903	1-216-081-00	METAL CHIP	22K	5%	1/10W
R904	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R905	1-216-085-00	METAL CHIP	33K	5%	1/10W
R906	1-216-077-00	METAL CHIP	15K	5%	1/10W
R907	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R908	1-216-097-00	METAL CHIP	100K	5%	1/10W
R910	1-216-295-91	CONDUCTOR, CHIP (2012)			
R911	1-216-081-00	METAL CHIP	22K	5%	1/10W
R912	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R913	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R914	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R915	1-216-071-00	METAL CHIP	8.2K	5%	1/10W

Ref. No.	Part No.	Description	Remarks		
R916	1-216-083-00	METAL CHIP	27K	5%	1/10W
R917	1-216-099-00	METAL CHIP	120K	5%	1/10W
R918	1-216-103-00	METAL CHIP	180K	5%	1/10W
R919	1-216-073-00	METAL CHIP	10K	5%	1/10W
R920	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R921	1-216-103-00	METAL CHIP	180K	5%	1/10W
R922	1-216-073-00	METAL CHIP	10K	5%	1/10W
R923	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R924	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R925	1-216-017-00	METAL CHIP	47	5%	1/10W
R926	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R927	1-216-003-11	METAL GLAZE	12	5%	1/10W
R928	1-216-081-00	METAL CHIP	22K	5%	1/10W
R929	1-216-107-00	METAL CHIP	270K	5%	1/10W
R930	1-216-089-00	METAL CHIP	47K	5%	1/10W
R931	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R932	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R933	1-216-073-00	METAL CHIP	10K	5%	1/10W
R935	1-216-085-00	METAL CHIP	33K	5%	1/10W
R936	1-216-031-00	METAL CHIP	180	5%	1/10W
R937	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R939	1-216-073-00	METAL CHIP	10K	5%	1/10W
R944	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R945	1-216-049-91	METAL GLAZE	1K	5%	1/10W

< VARIABLE RESISTOR >

RV001	1-223-236-11	RES, ADJ, CARBON 1K
RV401	1-223-241-11	RES, ADJ, CARBON 47K
RV402	1-223-241-11	RES, ADJ, CARBON 47K

< SWITCH >

S201	1-553-725-21	SWITCH, SLIDE (ATT)
------	--------------	---------------------

< VIBRATOR >

X001	1-760-693-21	VIBRATOR, CRYSTAL 28.12MHz
X201	1-567-515-11	VIBRATOR, VARIABLE CRYSTAL 16.93MHz

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

(Ref.No.2,000 Series)

3-953-262-01 HOLDER, LED

< CONNECTOR >

CN431	1-695-335-11	PIN, CONNECTOR (PC BOARD) 12P
CN432	1-691-036-21	HOUSING, CONNECTOR 4P
CN433	1-766-938-11	CONNECTOR, BOARD TO BOARD 5P
* CN434	1-564-014-51	PIN, CONNECTOR 4P

MD-705

MT-706

MT-707

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
< DIODE >			
D431	8-719-912-39	LED SLR-932A	
< JUMPER RESISTOR >			
JR431	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR432	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR433	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR434	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR435	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR436	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR437	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR438	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR439	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR440	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR441	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR442	1-216-295-91	CONDUCTOR, CHIP (2012)	
< PHOTO INTERRUPTER >			
PH431	8-729-020-74	DIODE GP1S24	
PH432	8-729-020-74	DIODE GP1S24	
< RESISTOR >			
R431	1-216-039-00	METAL CHIP 390 5% 1/10W	
R432	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R433	1-216-248-00	METAL GLAZE 120K 5% 1/8W	
R436	1-216-295-91	CONDUCTOR, CHIP (2012)	
< SWITCH >			
S431	1-692-440-11	SWITCH, PUSH	

*	A-6423-229-A	MT-706 BOARD, COMPLETE	(Ref.No. 2,000 Series)

< CONNECTOR >			
CN421	1-766-937-11	CONNECTOR, BOARD TO BOARD 5P	

MT-707 BOARD, COMPLETE			

(Ref.No. 4,000 Series)			
*	1-654-464-11	MT-707 BOARD	
< CAPACITOR >			
C481	1-163-038-91	CERAMIC CHIP 0.1uF 25V	

Ref. No.	Part No.	Description	Remarks
< CONNECTOR >			
* CN481	1-569-666-11	PIN, CONNECTOR (PC BOARD) 5P	
CN482	1-695-368-31	PIN, CONNECTOR (PC BOARD) 7P	

	1-413-989-21	SR539 POWER BLOCK (A3)	

	1-468-020-11	SR538 POWER BLOCK (550/650)	

(Ref.No. 5,000 Series)			
△	1-533-223-11	HOLDER, FUSE	
< CAPACITOR >			
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C052	1-163-019-11	MULTILAYER CERAMIC 6800PF 50V	
C053	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C056	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C057	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C058	1-163-035-11	MULTILAYER CERAMIC 0.047uF 50V	
C059	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C060	1-163-007-11	MULTILAYER CERAMIC 680PF 50V	
C061	1-163-017-11	MULTILAYER CERAMIC 4700PF 50V	
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF 50V	
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF 50V	
C064	1-130-491-51	FILM 0.047uF 50V	
△C101	9-902-038-01	METALLIZED 0.22uF 250V	
△C102	9-900-521-01	METALLIZED 0.1uF 250V	
△C103	9-900-522-01	CERAMIC 2200PF 400V (A3)	
△C103	1-161-741-00	CERAMIC 1000PF 400V (550/650)	
△C104	9-900-522-01	CERAMIC 2200PF 400V (A3)	
△C104	1-161-741-00	CERAMIC 1000PF 400V (550/650)	
△C105	9-900-522-01	CERAMIC 2200PF 400V (A3)	
△C106	9-900-522-01	CERAMIC 2200PF 400V (A3)	
△C107	9-900-522-01	CERAMIC 2200PF 400V (A3)	
△C107	1-161-741-00	CERAMIC 1000PF 400V (550/650)	
△C108	9-909-672-01	ALUMINUM ELECTIC 150uF 400V (A3)	
△C108	9-900-523-01	ALUMINUM ELECTIC 220uF 200V (550/650)	

<p>Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified</p>	<p>Note: Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

POWER BLOCK

Ref. No.	Part No.	Description		Remarks
△C109	9-909-672-01	ALUMINUM ELECTRIC	150uF	400V (A3)
△C110	9-909-673-01	CERAMIC	220PF	1kV (A3)
△C110	9-933-752-01	CERAMIC	470PF	1kV (550/650)
△C111	9-900-525-01	METALLIZED	0.047uF	400V
△C112	1-106-363-00	FILM	0.0068uF	50V
△C113	1-130-483-91	METALLIZED	0.01uF	50V (A3)
△C113	1-130-491-51	METALLIZED	0.047uF	50V (550/650)
△C114	1-107-355-51	METALLIZED	0.22uF	50V
△C115	1-130-470-00	FILM	820PF	50V
△C116	1-216-967-51	ALUMINUM ELECTRIC	47uF	50V
△C117	9-900-522-01	CERAMIC	2200PF	400V (A3)
△C118	9-900-522-01	CERAMIC	2200PF	400V (A3)
△C119	9-909-673-01	CERAMIC	220PF	1kV
△C201	1-124-525-11	ALUMINUM ELECTRIC	1000uF	25V
△C202	1-124-525-11	ALUMINUM ELECTRIC	1000uF	25V
△C203	1-124-760-11	ALUMINUM ELECTRIC	2200uF	10V
△C204	1-126-926-11	ALUMINUM ELECTRIC	1000uF	10V
△C205	1-126-926-11	ALUMINUM ELECTRIC	1000uF	10V
△C206	1-126-925-51	ALUMINUM ELECTRIC	470uF	10V
C208	1-126-964-51	ALUMINUM ELECTRIC	10uF	50V
C210	1-126-964-51	ALUMINUM ELECTRIC	10uF	50V
C211	1-126-925-51	ALUMINUM ELECTRIC	470uF	10V
C212	1-126-923-51	ALUMINUM ELECTRIC	220uF	10V
C213	1-130-495-91	ALUMINUM ELECTRIC	4.7uF	50V
C214	1-124-463-11	ALUMINUM ELECTRIC	0.1uF	50V
C215	9-909-680-01	CERAMIC	1000PF	1kV
C216	9-909-680-01	CERAMIC	1000PF	1kV
C217	1-130-491-51	FILM	0.047uF	50V
C218	1-126-942-11	ALUMINUM ELECTRIC	1000uF	25V
C219	1-126-942-11	ALUMINUM ELECTRIC	1000uF	25V
C220	1-130-467-11	FILM	470PF	50V
C221	1-130-467-11	FILM	470PF	50V
< CONNECTOR >				
CN051	1-695-342-11	CONNECTOR 19P		
CN052	1-506-473-11	CONNECTOR 8P		
CN053	1-564-506-11	CONNECTOR 3P		
CN101	1-564-419-11	CONNECTOR 2P		
< DIODE >				
D051	9-902-064-01	DIODE ERA81-004		
D052	9-902-064-01	DIODE ERA81-004		
D053	8-719-200-82	DIODE 11ES2		
D054	8-719-200-82	DIODE 11ES2		
D055	8-719-911-19	DIODE 1SS119		

Ref. No.	Part No.	Description	Remarks
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
△D101	8-719-510-19	BRIDGE DIODE D2SBA60	
△D102	9-902-050-01	DIODE ERA15-06	
△D103	8-719-030-25	DIODE EG01C (A3)	
△D103	9-900-512-01	DIODE AG01A (550/650)	
△D104	9-900-514-01	DIODE MA165	
△D105	9-900-535-01	DIODE AU02Z	
△D201	8-719-510-72	DIODE S3L20U	
△D202	8-719-510-72	DIODE S3L20U	
△D203	8-719-510-72	DIODE S3L20U	
△D204	8-719-043-74	DIODE AK04	
△D205	9-900-514-01	DIODE MA165	
△D206	9-900-514-01	DIODE MA165	
△D208	8-719-200-82	DIODE 11ES2	
△D209	8-719-035-04	ZENNER DIODE MA4240	
< FUSE >			
△F101	1-532-286-11	FUSE TIME LUG (3.15A 250V) (A3)	
△F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	
< IC >			
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC NJM4558M	
△IC101	8-759-062-58	IC FA5311S	
△IC201	8-759-701-79	IC NJM78M12FA	
△IC202	8-759-929-65	IC LM7912CT	
△IC203	9-900-532-01	IC AN1431T	
△IC204	8-759-100-96	IC NJM4558M	
< COIL >			
L051	1-424-219-11	CHORKE COIL 300uH	
△L101	9-909-675-01	LINE FILTER	
△L102	9-909-675-01	LINE FILTER (A3)	
△L103	9-904-796-01	BEAD CORE	
△L201	9-909-681-01	CHORKE COIL 10uH	
△L202	9-909-681-01	CHORKE COIL 10uH	
△L204	9-909-681-01	CHORKE COIL 10uH	
△L205	9-909-681-01	CHORKE COIL 10uH	
< PHOTO COUPLER >			
△PC101	9-909-676-01	PHOTO COUPLER (A3)	
△PC101	9-900-519-01	PHOTO COUPLER (550/650)	
△PC102	9-909-677-01	PHOTO COUPLER (A3)	
△PC102	9-900-519-01	PHOTO COUPLER (550/650)	

Note:

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

Note:

Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks	
< IC LINK >								
△PS051	1-532-675-91	IC LINK (ICP-N38 1.5A)		R080	1-216-097-11	THICK FILM	100K 1/10W	
△PS052	1-532-675-91	IC LINK		△R101	9-900-394-01	NON-FLAMABLE CARBON	1M 1/2W (A3)	
< TRANSISTOR >								
△Q051	8-729-117-11	TRANSISTOR	2SB1151	△R102	1-215-863-11	METAL OXIDE FILM	100K 1W (A3)	
△Q052	8-729-019-31	TRANSISTOR	2SC4596	△R102	1-215-878-11	METAL OXIDE FILM	33K 1W (550/650)	
△Q053	8-729-117-11	TRANSISTOR	2SB1151	△R103	1-215-863-11	METAL OXIDE FILM	100K 1W (A3)	
△Q054	8-729-019-31	TRANSISTOR	2SC4596	△R103	1-215-878-11	METAL OXIDE FILM	33K 1W (550/650)	
Q055	8-729-119-78	TRANSISTOR	2SC3311	△R104	1-214-921-11	CARBON	220K 1/2W	
Q056	8-729-230-46	TRANSISTOR	2SA1162	△R105	1-214-921-11	CARBON	220K 1/2W (A3)	
Q058	8-729-230-49	TRANSISTOR	2SC2712	△R106	1-215-860-51	METAL OXIDE FILM	33K 1W (A3)	
Q059	8-729-230-46	TRANSISTOR	2SA1162	△R106	1-215-858-11	METAL OXIDE FILM	15 1W (550/650)	
Q060	8-729-230-49	TRANSISTOR	2SC2712	△R107	1-215-927-51	METAL OXIDE FILM	47K 3W (A3)	
Q061	8-729-119-76	TRANSISTOR	2SA1309	△R107	1-215-924-11	METAL OXIDE FILM	15K 3W (550/650)	
△Q101	9-909-669-01	TRANSISTOR	2SK1547 (A3)	△R108	1-212-974-11	NON-FLAMABLE CARBON	47 1/2W	
△Q101	9-933-750-01	TRANSISTOR	2SK1102 (550/650)	△R109	9-909-670-01	METAL FILM	0.22 1/2W	
△Q201	8-729-021-99	TRANSISTOR	2SB1416	△R110	9-909-671-01	CEMENT	0.1 2W (A3)	
△Q202	8-729-119-78	TRANSISTOR	2SC1740	△R110	9-933-751-01	CEMENT	0.05 2W (550/650)	
△Q203	8-729-119-76	TRANSISTOR	2SA933	△R111	1-249-408-11	CARBON	180 1/4W	
△Q204	9-909-678-01	TRANSISTOR	2SC4545	△R112	1-212-958-11	NON-FLAMABLE CARBON	10 1/2W	
△Q206	8-729-900-80	TRANSISTOR	UN4211	△R113	1-247-831-31	CARBON	2.2K 1/4W (550/650)	
< RESISTOR >								
R050	1-216-097-11	THICK FILM	100K	1/10W	△R114	1-247-848-31	CARBON	5.1K 1/4W
R051	1-216-081-11	THICK FILM	22K	1/10W	△R115	1-247-855-31	CARBON	10K 1/4W
R052	1-216-075-11	THICK FILM	12K	1/10W	△R116	1-247-891-31	CARBON	330K 1/4W
R053	1-216-093-11	THICK FILM	68K	1/10W	△R117	1-247-891-31	CARBON	330K 1/4W
R054	1-216-105-11	THICK FILM	220K	1/10W	△R118	1-212-966-11	NON-FLAMABLE CARBON	22 1/2W
R055	1-216-091-11	THICK FILM	56K	1/10W	△R201	9-909-679-01	FUSE	0.22 1/4W
R057	1-216-093-11	THICK FILM	68K	1/10W	△R202	1-247-855-31	CARBON	10K 1/4W
R061	1-216-089-11	THICK FILM	47K	1/10W	R203	1-249-404-11	CARBON	82 1/4W
R062	1-216-065-11	THICK FILM	4.7K	1/10W	△R204	1-247-847-11	CARBON	4.7K 1/4W
R063	1-216-049-11	THICK FILM	1K	1/10W	△R205	1-247-847-11	CARBON	4.7K 1/4W
R064	1-247-750-11	CARBON	680	5% 1/2W	R206	1-249-404-11	CARBON	82 1/4W
R065	1-247-750-11	CARBON	680	5% 1/2W	△R207	1-247-855-31	CARBON	10K 1/4W
R066	1-216-049-11	THICK FILM	1K	1/10W	△R208	1-247-847-11	CARBON	4.7K 1/4W
△R067	1-216-369-51	METAL OXIDE FILM	1	2W	△R209	1-247-847-11	CARBON	4.7K 1/4W
R068	1-219-387-11	THICK FILM	43K	0.1% 1/10W	△R210	1-260-099-11	CARBON	1K 1/2W
R069	1-219-391-11	THICK FILM	47K	0.1% 1/10W	△R211	1-247-839-31	CARBON	2.2K 5% 1/4W
R070	1-219-387-11	THICK FILM	43K	0.1% 1/10W	△R212	1-247-839-31	CARBON	2.2K 5% 1/4W
R071	1-219-391-11	THICK FILM	47K	0.1% 1/10W	R213	1-249-432-11	CARBON	18K 1/4W
R072	1-216-073-11	THICK FILM	10K	1/10W	R214	1-249-433-11	CARBON	22K 1/4W
R073	1-216-073-11	THICK FILM	10K	1/10W	△R215	1-247-855-31	CARBON	10K 1/4W
△R074	1-215-866-11	CARBON	330	5% 1W	△R221	1-247-855-31	CARBON	10K 1/4W
R075	1-216-073-11	THICK FILM	10K	1/10W	R225	1-247-855-31	CARBON	10K 1/4W
R076	1-247-750-11	CARBON	680	5% 1/2W	△R226	1-247-871-11	CARBON	47K 1/4W
R077	1-216-073-11	THICK FILM	10K	1/10W	△R227	1-249-439-11	CARBON	68K 1/4W
R079	1-216-097-11	THICK FILM	100K	1/10W	< SWITCH >			
				△SW101	1-572-675-11	POWER SWITCH	(A3)	

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

POWER BLOCK

PW-721

SW-732

Ref. No.	Part No.	Description	Remarks
		< TRANSFORMER >	
△T101	9-909-674-01	SWITCHING TRANSFORMER (A3)	
△T101	9-933-753-01	SWITCHING TRANSFORMER (550/650)	
		< THERMISTOR >	
△TH101	9-904-783-01	POWER THERMISTOR	
		< VARIABLE RESISTOR >	
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

*	A-6423-300-A	PW-721 BOARD, COMPLETE (A3)	

*	A-6423-307-A	PW-721 BOARD, COMPLETE (550/650)	

		(Ref.No.3,000 Series)	
		< CAPACITOR >	
C001	1-163-031-11	CERAMIC CHIP 0.01uF	50V
		< CONNECTOR >	
CN001	1-506-485-11	PIN, CONNECTOR 6P	
		< DIODE >	
D002	8-719-992-30	LED SLR305MC3F (POWER)	(550/650)
D002	8-719-981-49	DIODE GL3ED8 (POWER)	(A3)
D003	8-719-992-30	LED SLR305MC3F (POWER)	(550/650)
D003	8-719-981-49	DIODE GL3ED8 (POWER)	(A3)
D006	8-719-302-07	LED SEL1810A (QUICK START)	
		< IC >	
IC001	8-749-923-11	IC GP1U58XB	
		< TRANSISTOR >	
Q002	8-729-901-05	TRANSISTOR DTA124EK	
Q003	8-729-901-05	TRANSISTOR DTA124EK (A3)	
		< RESISTOR >	
R005	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R006	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R007	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R010	1-216-037-00	METAL CHIP 330 5%	1/10W
R011	1-216-037-00	METAL CHIP 330 5%	1/10W (A3)
R012	1-216-037-00	METAL CHIP 330 5%	1/10W (A3)
R013	1-216-037-00	METAL CHIP 330 5%	1/10W
R014	1-216-037-00	METAL CHIP 330 5%	1/10W

Ref. No.	Part No.	Description	Remarks
		< SWITCH >	
S005	1-762-365-21	SWITCH, TACTILE (QUICK START)	
S006	1-762-365-21	SWITCH, TACTILE (FL DISPLAY)	
S007	1-762-365-21	SWITCH, TACTILE (OPEN/CLOSE)	
S008	1-762-365-21	SWITCH, TACTILE (POWER)	

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

		(Ref.No.4,000 Series)	
		< CONNECTOR >	
* CN461	1-565-042-11	HOUSING, CONNECTOR (PC BOARD) 5P	
		< JUMPER RESISTOR >	
JR461	1-216-296-00	METAL CHIP 0 5%	1/8W
JR462	1-216-296-00	METAL CHIP 0 5%	1/8W
		< PHOTO INTERRUPTER >	
PH461	8-729-020-74	DIODE GP1S24	
PH462	8-729-020-74	DIODE GP1S24	
PH463	8-729-020-74	DIODE GP1S24	
		< RESISTOR >	
R461	1-216-194-00	METAL CHIP 680 5%	1/8W
R462	1-216-099-00	METAL CHIP 120K 5%	1/10W
R463	1-216-039-00	METAL CHIP 390 5%	1/10W
R464	1-216-099-00	METAL CHIP 120K 5%	1/10W
R465	1-216-248-00	METAL GLAZE 120K 5%	1/8W

MISCELLANEOUS			

62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR	
63	1-769-651-11	CABLE, FLAT (FFC) 13 ARBOR	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR	
△68	1-574-085-11	CORD, POWER (550/650)	
△68	1-575-912-21	CORD, POWER (A3)	
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
172	1-769-680-11	FLAT CABLE (FCC) (4 CORE)	
M421	X-3944-693-1	MOTOR ASSY, TILT	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

<p>Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified</p>	<p>Note: Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	

	1-569-008-11	ADAPTER, CONVERSION 2P (A3:E)	
	1-575-334-11	CORD, CONNECTION (A/V CABLE) (1.5m)	
	1-770-019-11	ADAPTOR, CONVERSION (A3:Hongkong)	
	3-759-916-21	MANUAL, INSTRUCTION (ENGLISH) (550)	
	3-759-916-31	MANUAL, INSTRUCTION (FRENCH) (550)	
	3-759-918-11	MANUAL, INSTRUCTION (ENGLISH, CHINESE) (A3)	
	3-759-918-21	MANUAL, INSTRUCTION (ENGLISH) (650)	
	3-759-918-31	MANUAL, INSTRUCTION (FRENCH) (650)	
*	3-961-937-01	INDIVIDUAL CARTON (550)	
*	3-961-937-11	INDIVIDUAL CARTON (650)	
*	3-961-937-21	INDIVIDUAL CARTON (A3)	
*	3-963-326-01	CUSHION (UPPER)	
*	3-963-327-01	CUSHION (LOWER)	

Ref. No.	Part No.	Description	Remarks

		HARDWARE LIST	

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

SECTION 6
IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER
(IC501: MB89094PF-G-141-BND on the MB-717 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Open connection).
2	CL0	I	32 kHz clock.
3	MOD0	1	(Connected to GND).
4	MOD1	1	(Connected to GND).
5	X0	1	2 fsc clock (7.159 MHz).
6	X1	1	2 fsc clock (Open connection).
7	VSS	1	GND.
8	MRST	1	Mechanism controller reset signal (L: Reset).
9	FREQ	1	Philips code (frame number) read enable.
10	FQACK	O	Philips code/Sub-Q (sub code) data output control signal (H: Data output).
11	FQSEL	O	Philips code/Sub-Q data switch (L: Sub Q).
12	JPCTRL	O	One track jump (1T)/Multi track jump (MT) switching signal (H: 1T).
13	SPILOCK	1	Spindle servo lock signal (H: The spindle servo is being locked).
14	TBCHOLD	1	Chroma TBC control signal.
15	SCOR	1	H when the sub code sync. is detected.
16	PBV	1	Playback V sync signal input.
17	REFV	1	Reference V sync signal input.
18	ALT	O	Signal output to latch the register A inside the expansion output port IC (CS02 on the MB-712 board).
19	BLT	O	Signal output to latch the register B inside the expansion output port IC (CS02 on the MB-712 board).
20	BUSY	1	Communication enable signal sent from the mode controller (L: Communication enabled).
21	DOP	1	Input signal from the video dropout detector (Not used)
22	VTM	1	V timing signal input for servo processor (Not used)
23	FLAG	1	Flag input enabling operation of reference system (Not used)
24	CDGIN	1	H at CDC mode. (Disc discrimination output from decoder IC) (Not used)
25	CLSCS	O	Chip select of the CLS DT (pin 29).
26	SPDLPLS	O	Pulse output to drive the spindle servo (H: The spindle runs free).
27	CLT	O	Output signal to latch the CLD register
28	CMOD	1	Input signal to select the start mode after reset is released (+5 V pull-up).
29	CLSDT	1	V sync. phase difference data input during CLV scan from IC502 (Data is input while the CLS CS is H).
30	SETDT	O	Serial data output to the DSP/expansion output port IC.
31	SETCK	O	Serial data transfer clock to the IC502, DSP.
32	SPDLFG1	1	Spindle FG input 1 (12 pulses per rotation).
33	GMUTE	O	Gray picture mute control output during CLV scan (L: playback picture, H: gray picture).
34	LD SEARCH	O	Spindle servo control signal output (H: LD search).
35	SPDL F/R	O	Spindle rotation direction signal (H: FWD).
36	AUXSEL	O	H when signal is externally input (including CD-G). (Not used)
37	JMP TRIG	O	Track jump trigger pulse output.
38	MWRQ	O	Output signal requesting to download the memory picture (MDP-A3/650)
39	MEMORY	O	Output signal to switch between memory or through-out picture (MDP-A3/650)
40	MSTART	1	Memory picture downloading in progress (MDP-A3/650)
41	MTJ	1	MTJ tracking pulse output. This pin is normally set to input with Hi impedance. This pin is set to output when track jump (TJ) is in progress (L: FWD).
42	MTF ON/OFF	O	MTF correction ON/OFF signal (H: MTF ON).
43	VLOAD	O	Output signal to latch the video IC (MN8811).
44	HSPD	O	Output signal to make easy to read H: p-code.
45	PMOFF	O	Output signal to phase-modulate the read-out clock H: OFF.
46		-	N. C.
47	BLK_LEVEL	O	Theater mode (H: ON) (MDP-A3/650)
48	XFL	1	Focus lock signal input (L: Focus is locked).
49	VCC	1	Power supply pin. REG + 5 V.
50	LINE_SEL	1	H: MMI is being connected to the FSIO.

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

6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER (IC102: MB89095 on the FP-746 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Connected at open)
2	CL0	I	32 kHz clock (Connected to GND)
3	MOD0	I	(Connected to GND)
4	MOD1	I	(Connected to GND)
5	X0	I	8 MHz clock
6	X1	I	8 MHz clock
7	VSS	I	GND
8	RST	I	Mode controller reset. (L: Reset)
9	LED LD QUICK	O	Output to LED (L: Illuminate)
10	LED CAPTION	O	Output to LED (L: Illuminate) (Not used)
11	LED LINE IN	O	Output to LED (L: Illuminate) (Not used)
12	LED AUTORESUME	O	Output to LED (L: Illuminate)
13	LED DIGEST	O	Output to LED (L: Illuminate)
14	LED THEATER	O	Output to LED (L: Illuminate)
15	LED B	O	Output to LED (L: Illuminate)
16	LED A	O	Output to LED (L: Illuminate)
17	REF V	I	Reference V sync. signal input
18	MMI CS	I	Chip select signal sent from the mechanical controller to the mode controller
19	E2P BUSY	I	EEPROM write signal. H: Ready, L: Busy
20		-	N. C.
21	LED STB	O	(Not used)
22	PRACTICE	I	(Not used)
23	STUDY	I	(Not used)
24	AUX	I	(Not used)
25	POUSE STOP	O	(Not used)
26	POSITION 1	O	(Not used)
27	POSITION 2	O	(Not used)
28	CMOD	I	Input selecting start mode after reset is released (+ 5 V pull-up)
29	SI	I	Received data from the EEPROM
30	SO	O	Send data to the EEPROM
31	SCK	O	Communication clock to the EEPROM
32	SIRCS	I	SIRCS input
33	CG CS	O	CG chip select (L: During communication)
34	MRST	O	Reset output to mechanism controller (L: Reset)
35	BUSY	O	Transfer enable signal from mode controller to mechanism controller (L: Communication enabled)
36	GDG CS	-	N. C.
37	P. CONT	O	Control output to turn ON/OFF the main power of the machine
38	AU MUTE	O	H: During audio mute
39	P1	O	Output to FL segment
40	P2	O	Output to FL segment
41	P3	O	Output to FL segment
42	P4	O	Output to FL segment
43	P5	O	Output to FL segment
44	P6	O	Output to FL segment
45	P7	O	Output to FL segment
46	P8	O	Output to FL segment
47	P9	O	Output to FL segment
48	P10	O	Output to FL segment
49	VCC	I	Power supply pin. EVER + 5 V
50	P11	O	Output to FL segment

Pin No.	Signal	I/O	Function
51	P12	O	Output to FL Segment
52	P13	O	Output to FL Segment
53	VDFD	I	High durability pull-down power supply terminal. - 30V
54	P14	O	Output to FL Segment
55	P15	O	Output to FL Segment
56	P16	O	Output to FL Segment
57	P17	O	Output to FL Segment
58	VSS	I	GND.
59	P18	O	Output to FL Segment
60	P19	O	Output to FL Segment
61	P20	O	Output to FL Segment
62	P21	O	Output to FL Segment
63	P22	O	Output to FL Segment
64	P23	O	Output to FL Segment
65		O	N. C.
66		-	N. C.
67	VCC	I	Power supply pin. EVER + 5 V.
68	7G	O	Output to FL degite
69	6G	O	Output to FL degite
70	5G	O	Output to FL degite
71	4G	O	Output to FL degite
72	3G	O	Output to FL degite
73	2G	O	Output to FL degite
74	1G	O	Output to FL degite
75	LINE SELECT	O	H: Communication with the mechanical controller; L: Communication with the CG
76		-	N. C.
77	MECH SO	I	Data input from the mechanical controller
78	MECH SI	O	Data output to the mechanical controller and CG
79	MECH CLK	O	Communication clock output for the mechanical controller and CG.
80	DOOR SW	O	Door switch (H: Close, L: Open)
81		-	N. C.
82		-	N. C.
83	AVSS	I	GND.
84	PS MON1	I	Input to A/D converter. Monitoring -5 V Regulated power supply
85	PS MON2	I	Input to A/D converter. Monitoring +5 V Regulated power supply
86	KEY L1	I	Input to A/D converter. Monitoring PW-721 key input
87		-	N. C.
88		-	N. C.
89	KEY R1	I	Input to A/D converter. Monitoring PW-747 key input.
90	J/E/UC	I	Input to A/D converter. Specifying shipping destination
91	PS MON3	I	Input to A/D converter. Monitoring ±12 V
92	AVCC	I	Power supply pin. EVER + 5 V.
93		-	N. C.
94		-	N. C.
95		-	N. C.
96	P. OFF	O	Controlling to turn OFF forcibly the switching power supply (H: Forecast OFF) (Not used)
97	E2P WC	O	EEPROM line control output.
98	E2P CS	O	EEPROM chip select output.
99	TEST 1	I	Test pin (All LEDs illuminate if this pin is L during reset)
100	VCC	I	Power supply pin. EVER + 5 V.

SECTION 7 ELECTRICAL ADJUSTMENTS

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

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M33A/M37A/M37B)
- 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-550/650/A3 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-550/650/A3 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
I 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 CLEAR key (With power off only)	(3) Lighting up all the FL tubes and LEDs on the main unit. This function turns on all the FL tubes and LEDs after turning on the power automatically. Until you switched off the power, normal operation is possible while all the FL tubes 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 FL DISPLAY 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	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and STOP key (remote control unit)	(1) Debugging mode ON/OFF This function puts the unit in the debugging mode from another mode, or puts the unit in the mode other than the debugging mode from the debugging mode. For details on the debugging mode, refer to 7-5. “OPERATION OF THE MDP-A550 IN THE DEBUGGING MODE”.
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and +10 key (remote control unit)	(4) Make mechanism controller time out ineffective. Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn't operate, it used to hasten to operate mode controller.
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and 0 key (remote control unit)	(5) Make mechanism controller time out effective. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	FL DISPLAY key (main unit) and 0 key (remote control unit) FL DISPLAY key (main unit) and REPEAT key (remote control unit)	(6) EEPROM Clear It can be reserved that the EEPROM content is all cleared instead of storing the favorite program data or debug mode data when the main power is turned off. This operation is effective only when the main power is on.

7-4. OPERATION OF THE MDP-550/650/A3 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-550/650/A3. 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-550/650/A3 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.

If the version number of microprocessor appears on the screen, the unit has already entered into the service mode. If it is not displayed, the unit has not entered in the service mode. 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). For details of the debugging mode, refer to 7-5. “OPERATION OF THE MDP-550/650/A3 IN THE DEBUGGING MODE”.

3. Quitting the service mode

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

4. Operating with the special key functions

The special key functions in the service mode are available only under NO DISC and STOP conditions, for safety purposes.

Check that the indication for those conditions is displayed without flashing on FL display or on the screen. In order to carry out the special key functions listed in table 7-3, in the status above, turn off the FL display by pressing the FL DISPLAY key on the remote control unit. And then press the desired key such as PLAY or PAUSE on the main unit.

The sledding motion with the SIDE A or SIDE B key is effective only while holding the Key pressed. However, the operation started with the other keys continues, once it is pressed, until you press the STOP key. While the unit is carrying out the special key function, the side-B LED 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 FL display is turned off, some keys are not effective.

Be sure to turn on the FL display by pressing the FL DISPLAY key on the remote control unit, if you don't want to carry out the special key functions.

Table 7-3. List of the special key functions

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

The following are the details of the special key functions available with the MDP-550/650/A3.

- (1) **SIDE A key for sledding in reverse direction**
The sled can be moved in reverse direction (center of side B, to edge of side B, to edge of side A, and then to center of side A) after completing initialization of the tilt (the tilt is placed in neutral position) by holding down the SIDE A key. To stop the sledding in reverse direction, release the SIDE A key.
- (2) **SIDE B key for sledding in normal direction**
As contrary to item (2) above, the sled can be moved in normal direction (center of side A, to edge of side A, to edge of side B, and then to center of side B). This movement of the sled is desired when replacing the optical part. To stop the sledding in normal direction, release the SIDE B key.

- (3) **PLAY key for focusing search**
Focusing search operation can be carried out repeatedly by keeping pressing the PLAY key. There is no fault with the unit if the pick-up lens moves up and down.
Be sure to start the focusing search operation after checking the condition that the sled is placed in appropriate position (at around the center of side A). To stop the focusing search operation, press the STOP key.
- (4) **PAUSE key for tilt servo ON**
The tilt servo is activated while pressing the PAUSE key. Move the sled to around the center of side A with the SIDE A and SIDE B keys, and put a CD or equivalent on the tray so that it screens the skew sensor. Then, if the tilt moves by pressing the PAUSE key, operation is normal. The tilt can be placed back in neutral position by moving the sled with the SIDE A and SIDE B keys. To deactivate the tilt servo, press the STOP key.
- (5) **STEP FWD --- Tray aging starts.**
If STEP FWD key is pressed, tray aging starts. Tray will automatically moves out and in. Take care that the tray will not collapse with surrounding objects.
Press STOP key to terminate aging.
- (6) **STEP REV --- Sled aging starts.**
If STEP REV key is pressed, sled aging starts. Sled will automatically travels between side A and side B.
Press STOP key to terminate aging.
- (7) **REPEAT A/B --- Tilt aging starts.**
If REPEAT A/B key is pressed, tilt aging starts. Tilt will automatically moves up and down.
Press STOP key to terminate aging.

7-5 OPERATION OF THE MDP-550/650/A3 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-550/650/A3 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) If the debug key is effective, background color of the screen becomes abnormal. (Cross-pattern will appear in same cases.)
- (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 and STOP keys on the remote control unit while holding down the FL DISPLAY 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".

As long as the machine stays in the debug mode, the FL DISPLAY key has only the function to turn ON and OFF the debug command. While the debug command remains effective, the 7-segment display is not illuminated.

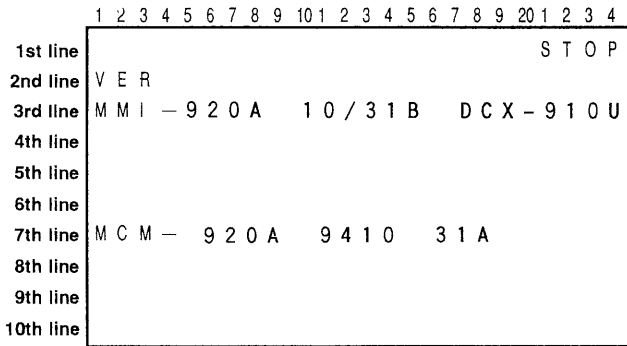


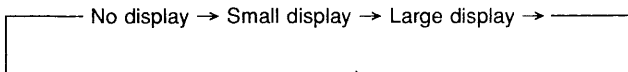
Fig. 7-1. Initial display in the debugging mode

3. Quitting the debugging mode

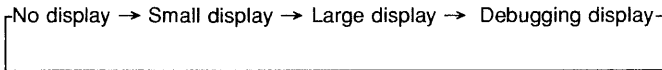
To quit the debugging mode, press the CLEAR key on the remote control unit when the menu (version No. of the microprocessor indication on the screen with abnormal background color in figure (7-1) is displayed.

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 first turning off the FL displays and pressing the desired key (as listed below).

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

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

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

- (1) [FRAME/TIME] key for displaying version No. of the microprocessor
 Pressing this key displays the version No. of the microprocessor. The version No. of the mode controller appears on the 3rd line, and that of the mechanism controller appears on the 7th line. An example in figure 7-2 shows that the version No. of the mode controller is “MMI-920A 10/31B” and that of the mechanism controller is “MCM-920A 94/10/31A”.

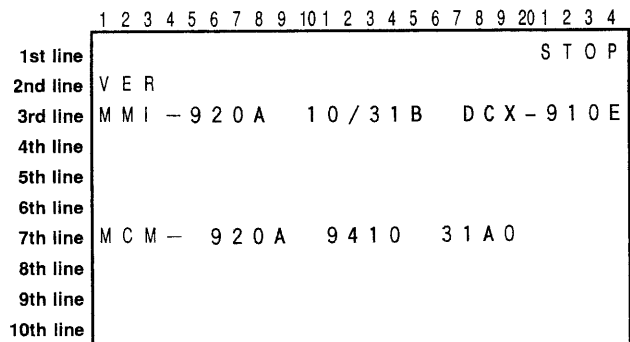


Fig. 7-2. Version No. of the microprocessor

- (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 3rd line to the left end on the 1st line. The last stored data of the function modes (which is the mode selected at present) appears on the left of “FF”.

That is, when “FF” appears at the left end on the 1st (or 2nd, or 3rd) line, the last stored data appears at the right end on the 3rd (or 1st or 2nd) line.
 “FE” means there has been an emergency case at the data point. To check the type of the emergency case, refer to 5. (3) “[2] key for displaying the history of the emergency occurrence”.

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

Fig. 7-3. History of the function modes

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

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

Table 7-5 lists the function modes.

Table 7-5. List of the function modes

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

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

Pressing this key displays the history of the emergency occurrence with the 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 16 histories using only two lines are available in this case. The emergency code which appears just before "FF" corresponds to the data of "FE" in the history of the function modes, which is the closest one to "FF".

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

Fig. 7-4. History of emergency

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

- 60 (Detection of lead-in point)
 - 74 (Focusing failed)
 - 64 (Detection of minimum chapter)
 - 61 (Detection of lead-out point)
 - 64 (Detection of minimum chapter)
 - 64 (Detection of minimum chapter)
 - 74 (Focusing failed) [The last emergency]
- Table 7-6 lists the emergency codes.

Table 7-6. List of the emergency codes

• For operation of forced modes condition		Operation after occurrence
01	Requirement of forced power off	Power off
02	Requirement of forced ejection of the tray	Eject
03	Requirement of stop	Stop
04	Requirement of stop when opening the door	Stop
05	Requirement of forced playback	Play
06	Requirement of determination for mode change when power off	Freezes power off display
07	Requirement of power off after communication stops.	Power off
08 Front door does not open.		
09 Door opens in the mode other than tray open.		
• 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 form the mechanism controller

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

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

Fig. 7-5. Information for repair service sent form 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 form 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 form 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 debug command remains effective.

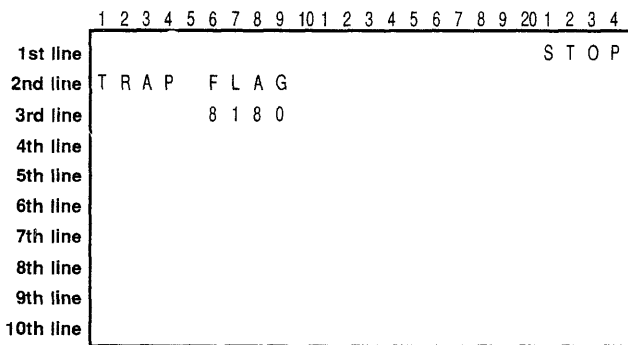


Fig. 7-6. Trap-flag

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

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

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

Note : Resetting, which is indicated with bits 0 to 3 in the table, means that setting the status of the mode controller back to the same status as that when the unit was plugged in, except for initialization of the trap-flag.
 A of hexadecimal notation is 2+8. In the same manner, B=1+2+8, C=4+8, D=1+4+8, E=2+4+8, F=1+2+4+8.

- (6) [5] key for displaying the key/remote control data
 Pressing this key displays the key input data of the main unit and the input data by the remote control unit, using SIRCS codes. Note that this operation is effective on the remote control unit for MDPs only.
 The one byte (2 digits in hexadecimal notation) on the left of the 3rd line in figure 7-7 is the SIRCS code of the key input data of the main unit, and that on the right is the SIRCS code of the input data by the remote control unit.
 When no key is pressed or there is no input, “FF” appears.
 When two keys are pressed almost at the same time, the SIRCS code of the input data by the first pressed key will appear.

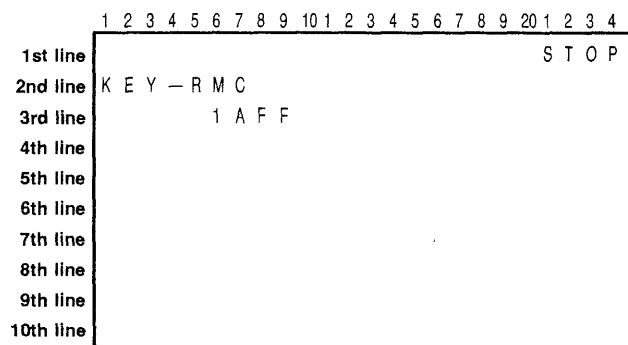


Fig. 7-7. Key and remote control data

An example in figure 7-7 shows that the playback key (1A in hexadecimal notation) on the main unit is pressed but there is no input (FF in hexadecimal notation) from the remote control unit.
 However, note that, in some cases, the remote control unit generates SIRCS codes momentarily only at the moment when the key is pressed.

Table 7-10. List of SIFRCS codes for MDPs

- 00 Numeral 1
- 01 Numeral 2
- 02 Numeral 3
- 03 Numeral 4
- 04 Numeral 5
- 05 Numeral 6
- 06 Numeral 7
- 07 Numeral 8
- 08 Numeral 9
- 09 Numeral 0
- 0B Search/advance
- 0C Frame/time
- 0F Clear
- 15 Power ON/OFF
- 16 Close/open of tray
- 17 Audio monitoring
- 18 Stop
- 19 Pause
- 1A Playback
- 1B Rev. high speed scan
- 1C Fwd. high speed scan
- 1E Reverse direction scanning
- 1F Normal direction scanning
- 20 Still
- 21 Speed up
- 22 Speed down
- 23 Forward variable playback
- 24 Reverse variable playback
- 28 Time display
- 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
- 38 REPEAT A · B
- 39 Numeral +10
- 3A Screen display
- 40 Analog audio/CX
- 44 Return
- 47 1/single side/Both sides
- 4F Forward middle speed playback
- 50 Forward middle/low speed playback
- 51 Forward low/low speed playback
- 52 Forward JOG step
- 55 Reverse JOG step
- 56 Reverse low speed playback
- 57 Reverse middle/low speed playback
- 58 Reverse middle/low speed playback
- 5D side A
- 5E side B
- 72 Picture call
- (Followings are the extended codes.)
- 81 FL display ON/OFF
- 82 LD quick start
- 9A Quick viewing playback
- A5 Hollywood mode selection
- A6 Display position selection
- FF Appears when there is no input.

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

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
1st line																									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)
(21)	KARAOKE Door Position
Data from the mechanism controller to the mode controller	
(01)	The function mode at present (next)
(06)	The flag for completion of function mode change (0 bit)
(13)	Current chapter/track number
(14)	Current index number
(15—17)	Current address (Time/Frame)

7-6. POWER SUPPLY ADJUSTMENT

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

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

Adjustment method :

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

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

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

Adjustment method :

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

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

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

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

7-7. SYSTEM CONTROL SYSTEM ADJUSTMENT

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

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

Adjustment method :

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

7-8. SERVO SYSTEM ADJUSTMENT

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

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

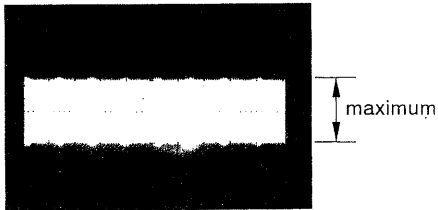


Fig. 7-10.

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

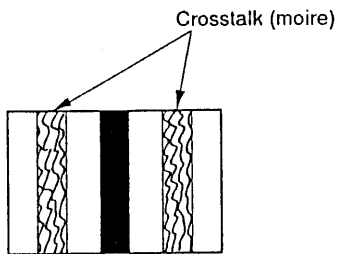


Fig. 7-11.

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

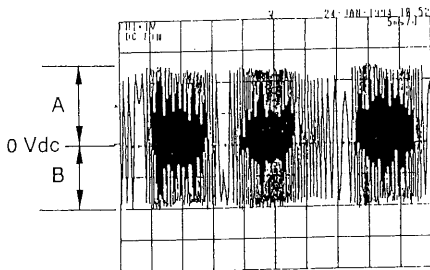


Fig. 7-12.

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

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

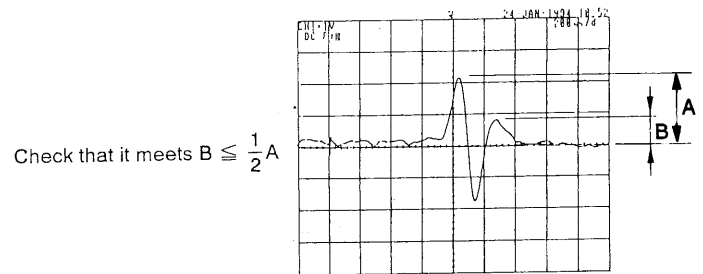


Fig. 7-13.

Check that it meets $B \leq \frac{1}{2}A$

Check the TRACKING BALANCE.

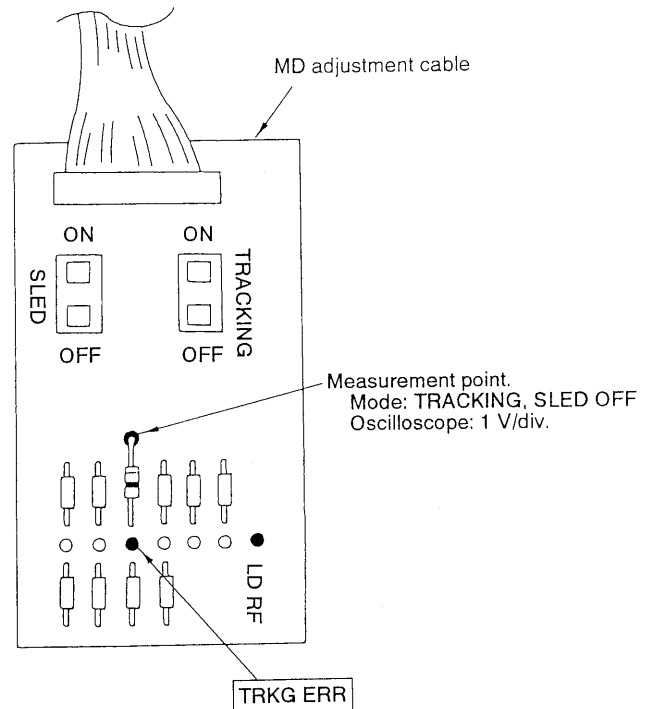


Fig. 7-14.

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

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

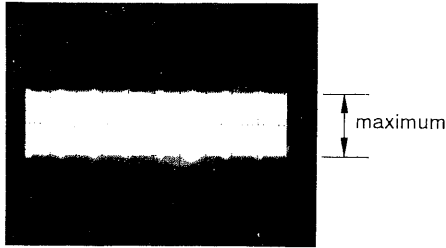
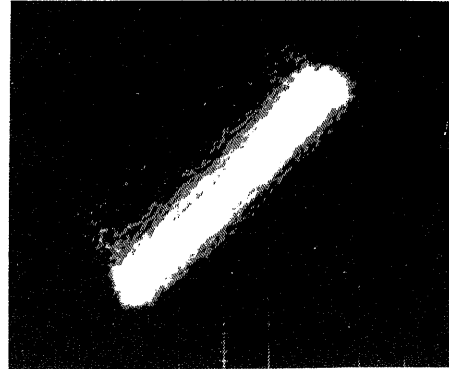


Fig. 7-15.

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



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

Fig. 7-16.

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

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

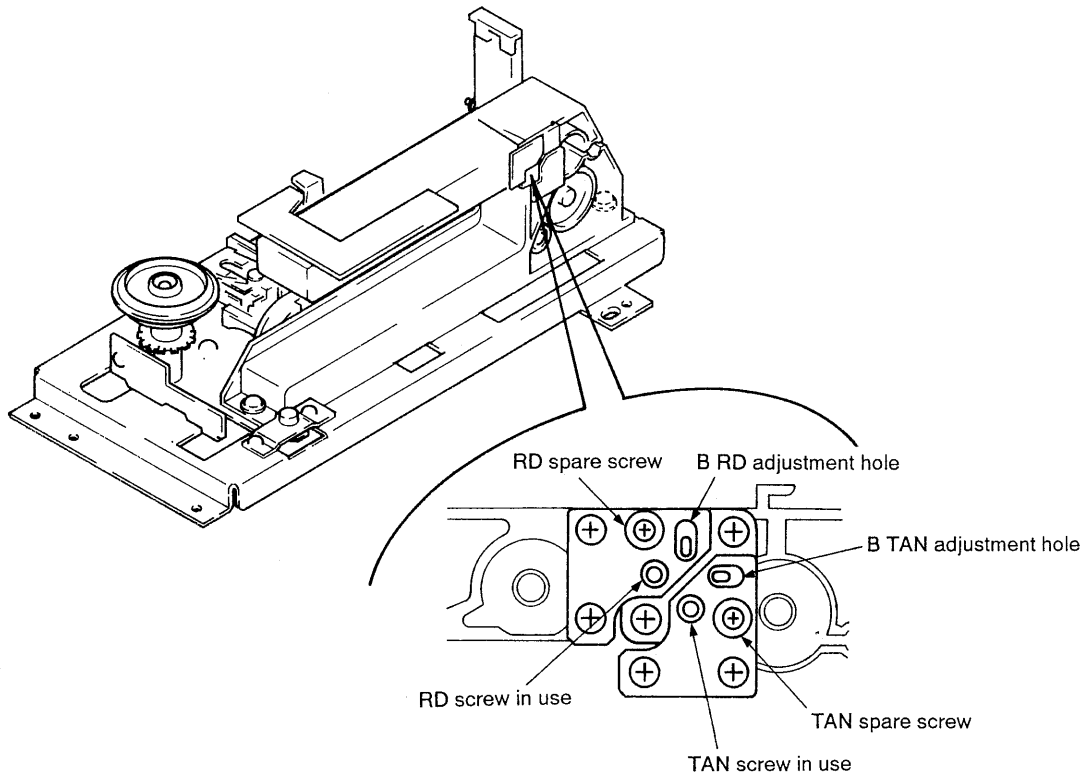


Fig. 7-17.

7-9. VIDEO SYSTEM ADJUSTMENT

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

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

Adjustment method :

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



Fig. 7-18.

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

7-10-1. Jigs and Tools

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

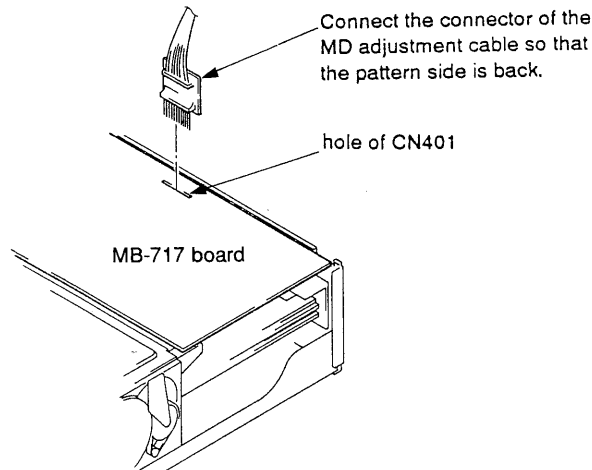


Fig. 7-19.

7-10-2. CD Adjustment

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

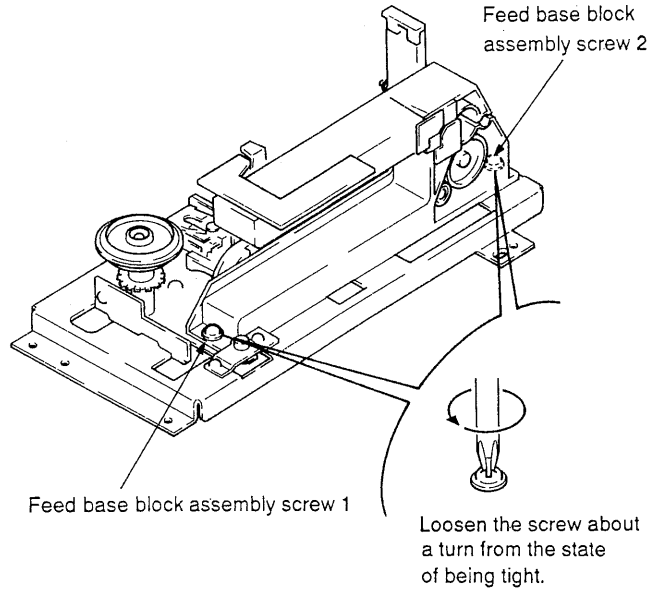


Fig. 7-20.

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

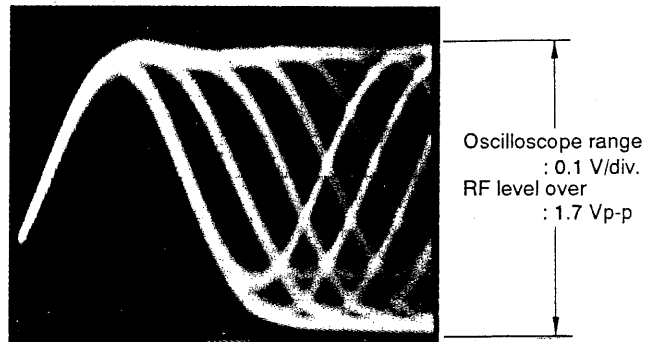


Fig. 7-21.

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

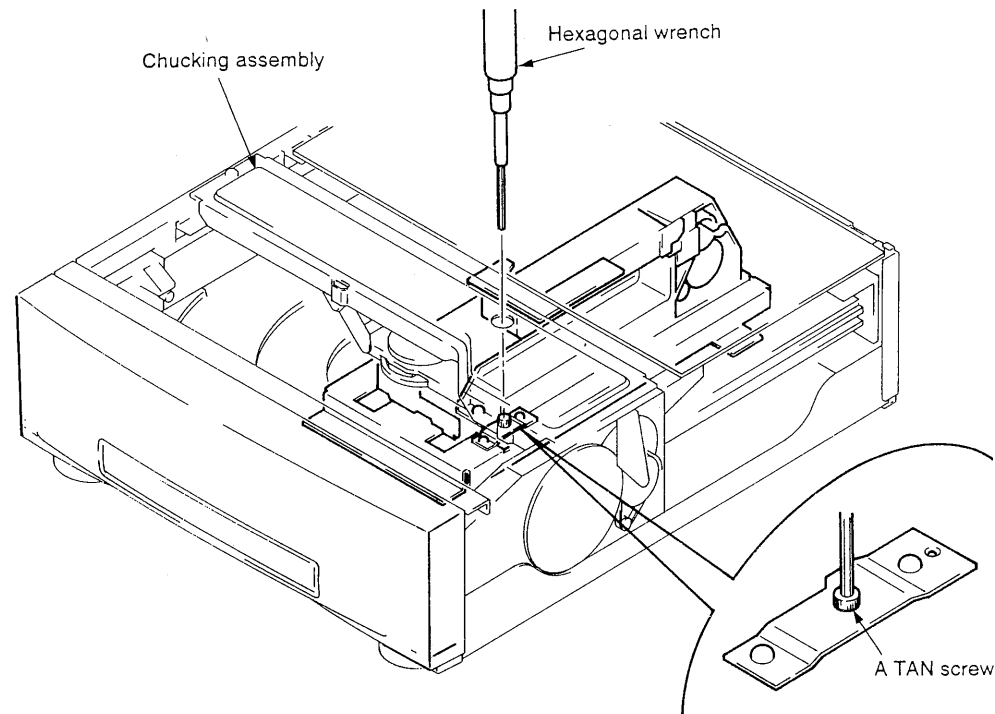


Fig. 7-22.

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

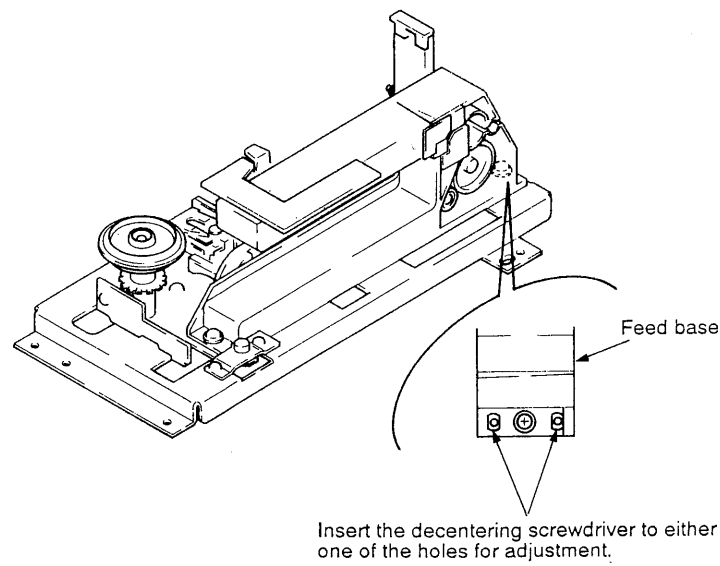
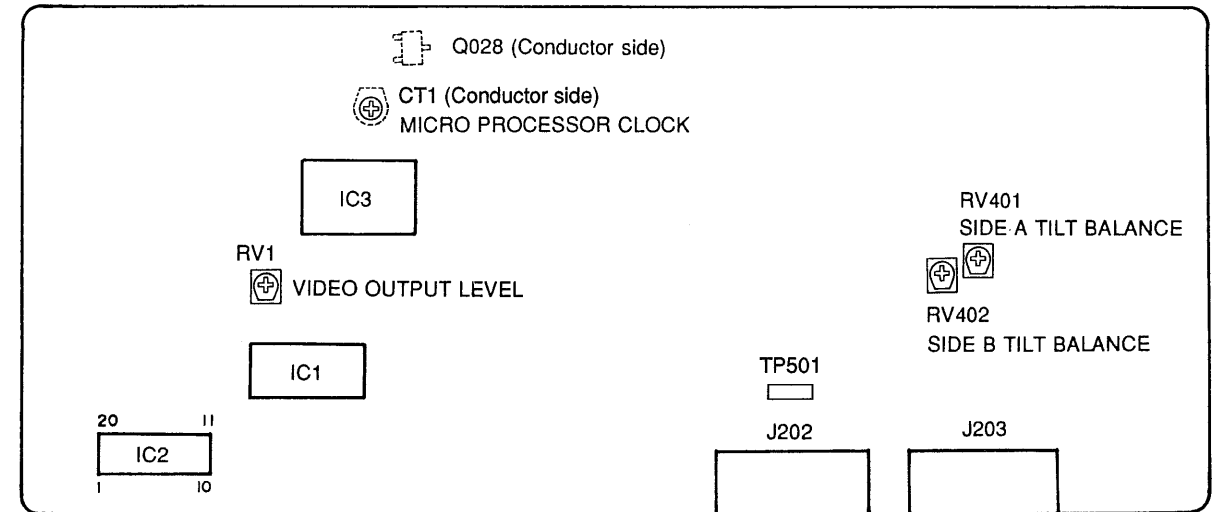


Fig. 7-23.

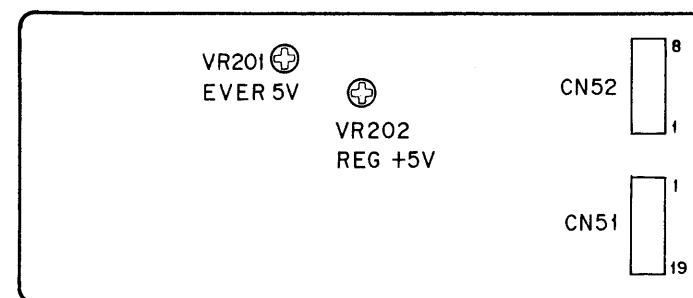
- 6) Take the DISC out to tighten the 2 screws of the feed base.
7) Apply suitable locking compound to A TAN screw.

7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)

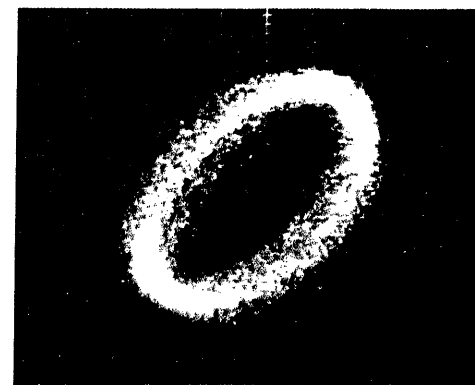


POWER SUPPLY BLOCK (Component side)



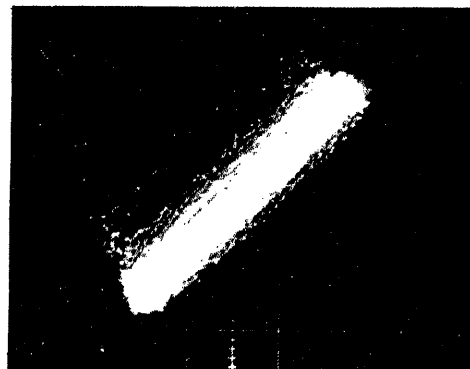
Terminal E, F/TRK, SLED OFF
Oscilloscope X/Y Lissagous range
Difference within 35° with each 20 mV/div.

Before the adjustment.



↓ Make the figure straight

After the adjustment.



MDP-550/650/A3

RMT-M33A(550)/M37A(650)/M37B(A3)

SONY SERVICE MANUAL

US Model
Canadian Model
MDP-550/650
E Model
Hongkong Model
MDP-A3

SUPPLEMENT-1

File this supplement with the Service Manual.

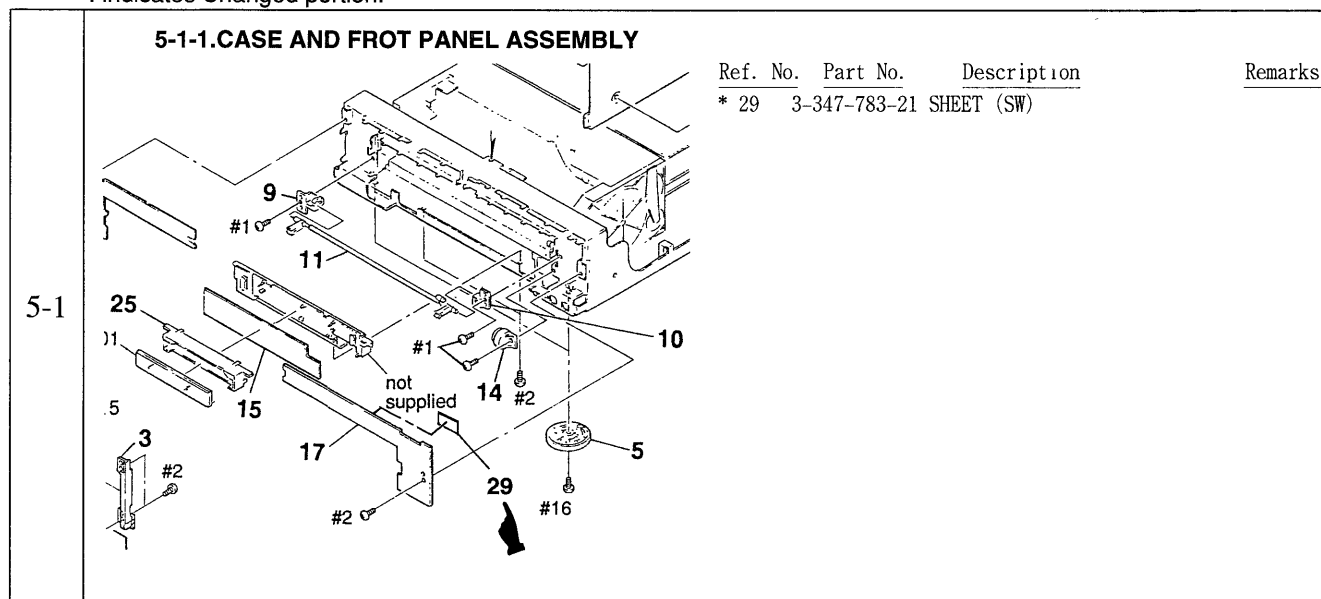
Subject : Change of the POWER BLOCK Printed Wiring Board

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

A3: E.....	1-413-989- 21	→	22
A3: Hong Kong.....	1-413-989- 41	→	42
550/650.....	1-468-020- 11	→	12

Note: Main differences between these parts number suffixes are the parts mounted/unmounted, and changes of the parts values.
When repairing (or ordering repair parts) the POWER BLOCK, refer to this SUPPLEMENT-1 regardless of the parts number suffix of the printed wiring boards.

☛ : Indicates Changed portion.

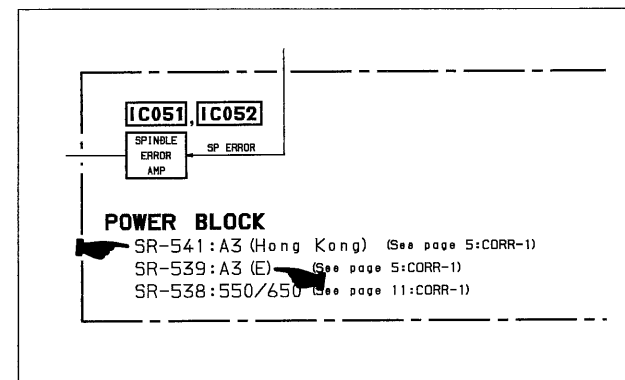


As the parts number suffix of the POWER BLOCK printed wiring board is changed, the following portions are changed. Please correct the Service Manual (9-973-702-11). The full pages of the schematic diagrams, printed wiring boards and electrical parts lists to be corrected are attached from the next page. (Errors in the schematic diagrams and printed wiring boards are corrected.)

☛ : Indicates changed portion.

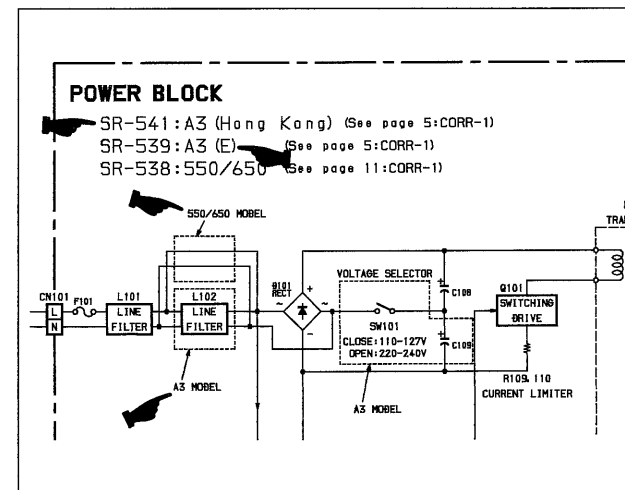
(Page 3-1.)

3-1.OVERALL BLOCK DIAGRAM



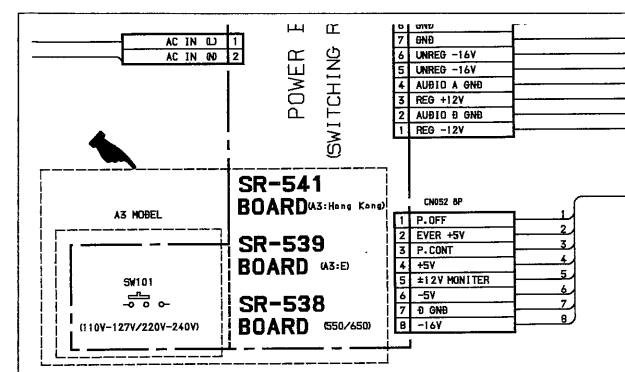
(Page 3-17.)

3-8.POWER BLOCK DIAGRAM



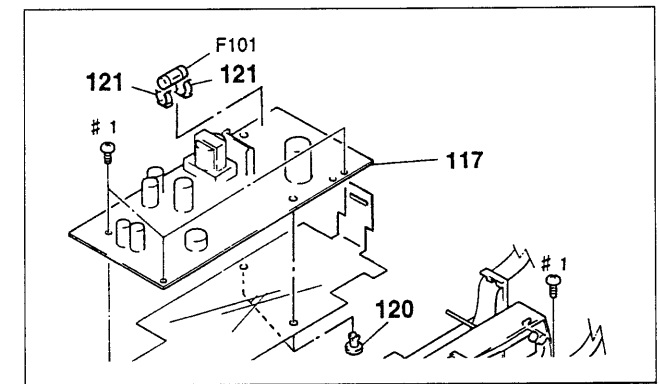
(Page 4-1.)

4-1.FRAME SCHEMATIC DIAGRAM



(Page 5-3.)

5-1-3.MAIN CHASSIS ASSEMBLY



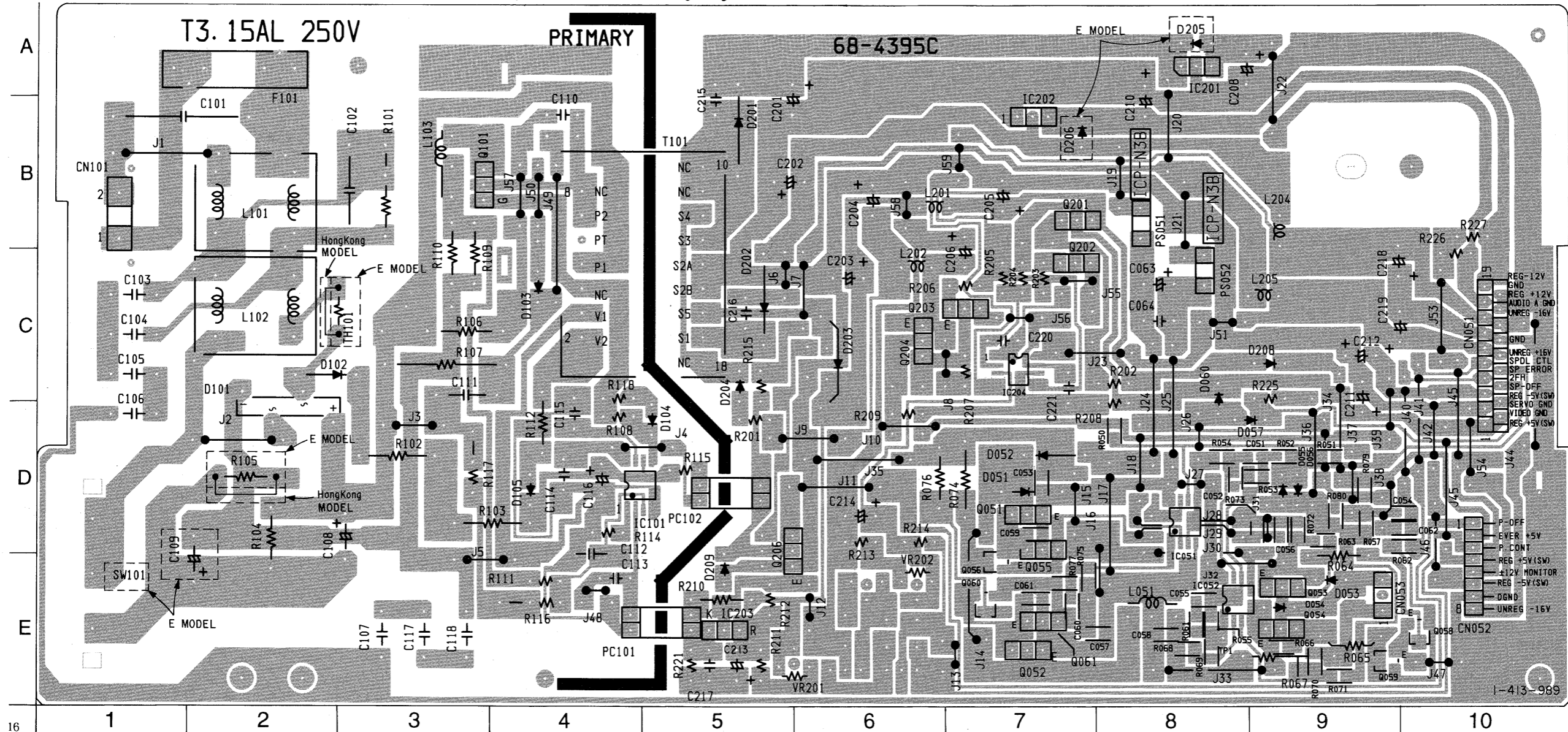
Ref. No.	Part No.	Description	Remarks
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-22	POWER BLOCK (A3:E)	☛
117	1-413-989-42	POWER BLOCK (A3:HongKong)	☛
117	1-468-020-12	POWER BLOCK (550/650)	☛
119	3-962-812-01	SCREW (+BV 3X18)	

MDP-550/650/A3

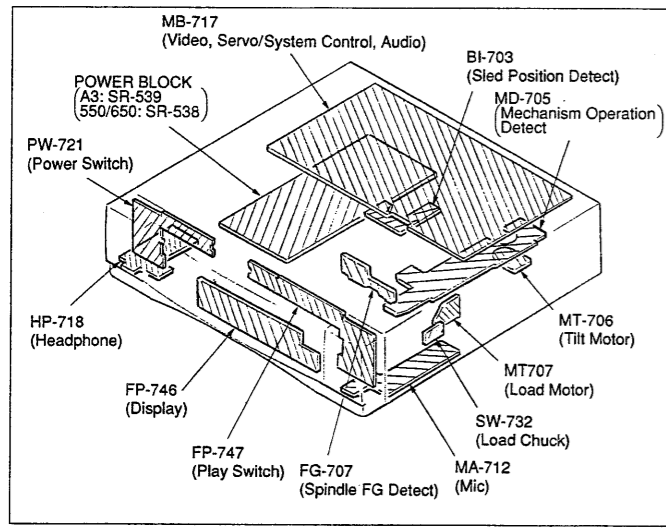
POWER BLOCK PRINTED BOARDS (MDP-A3 MODEL)

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

POWER BLOCK (A3 MODEL) (SR-539 BOARD: E MODEL, SR-541 BOARD: HongKong MODEL)



□ : E MODEL
○ : HongKong MODEL

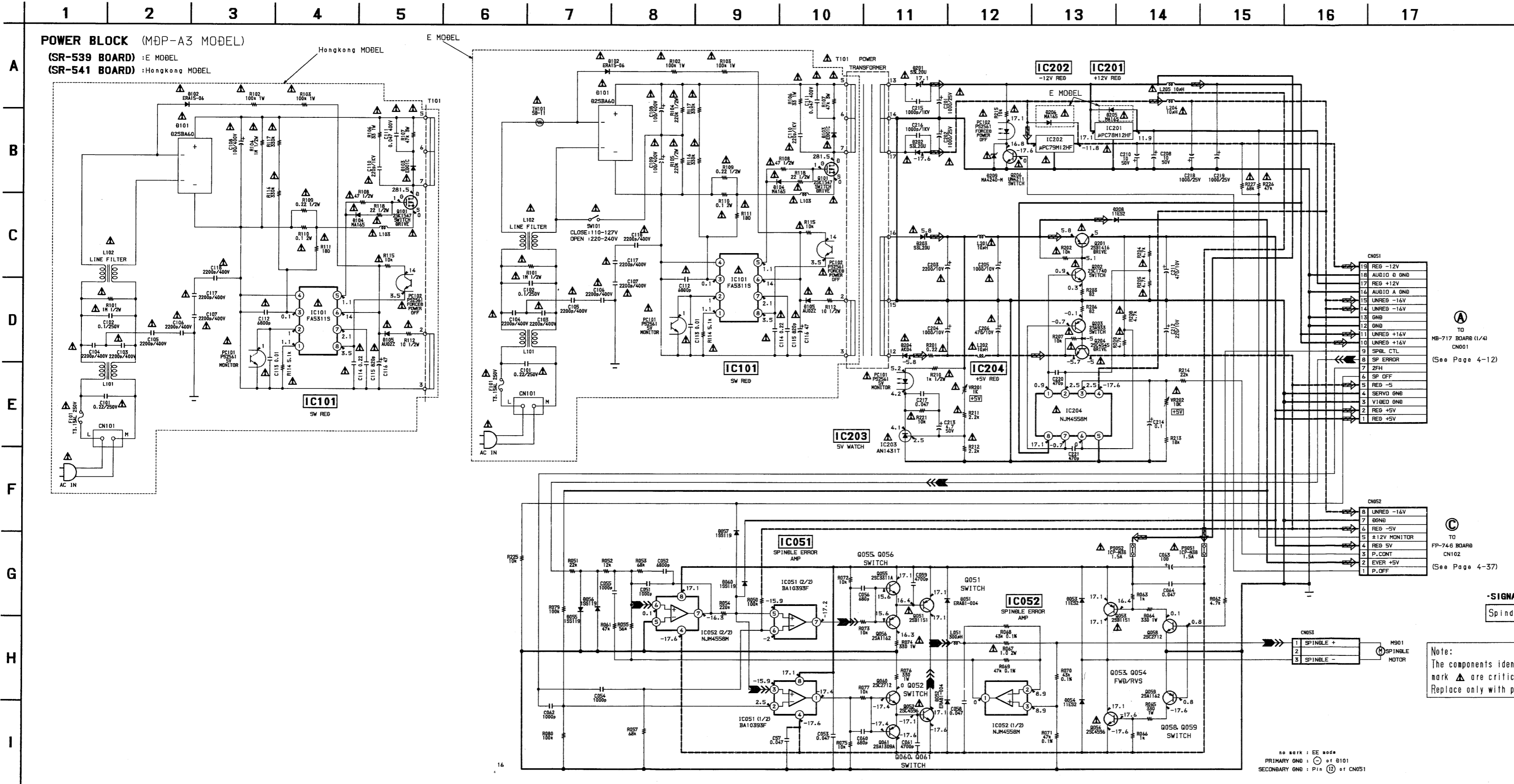


POWER BLOCK

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

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-A3 MODEL)

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



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

TO FP-746 BOARD CN102 (See Page 4-37)

-SIGNAL PATH
Spindle servo (speed and phase)

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

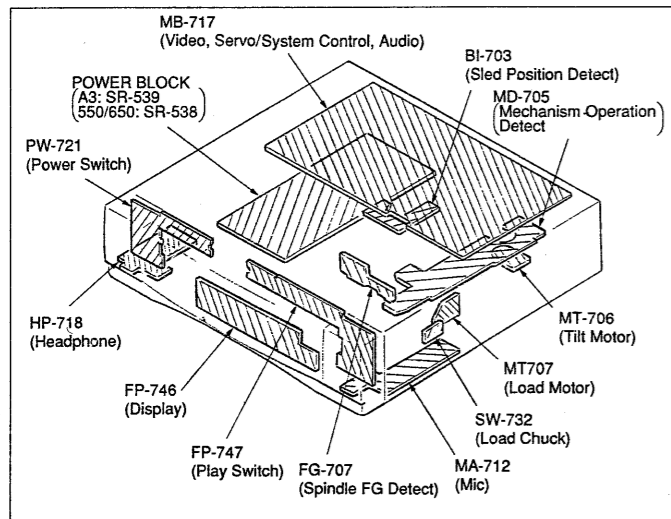
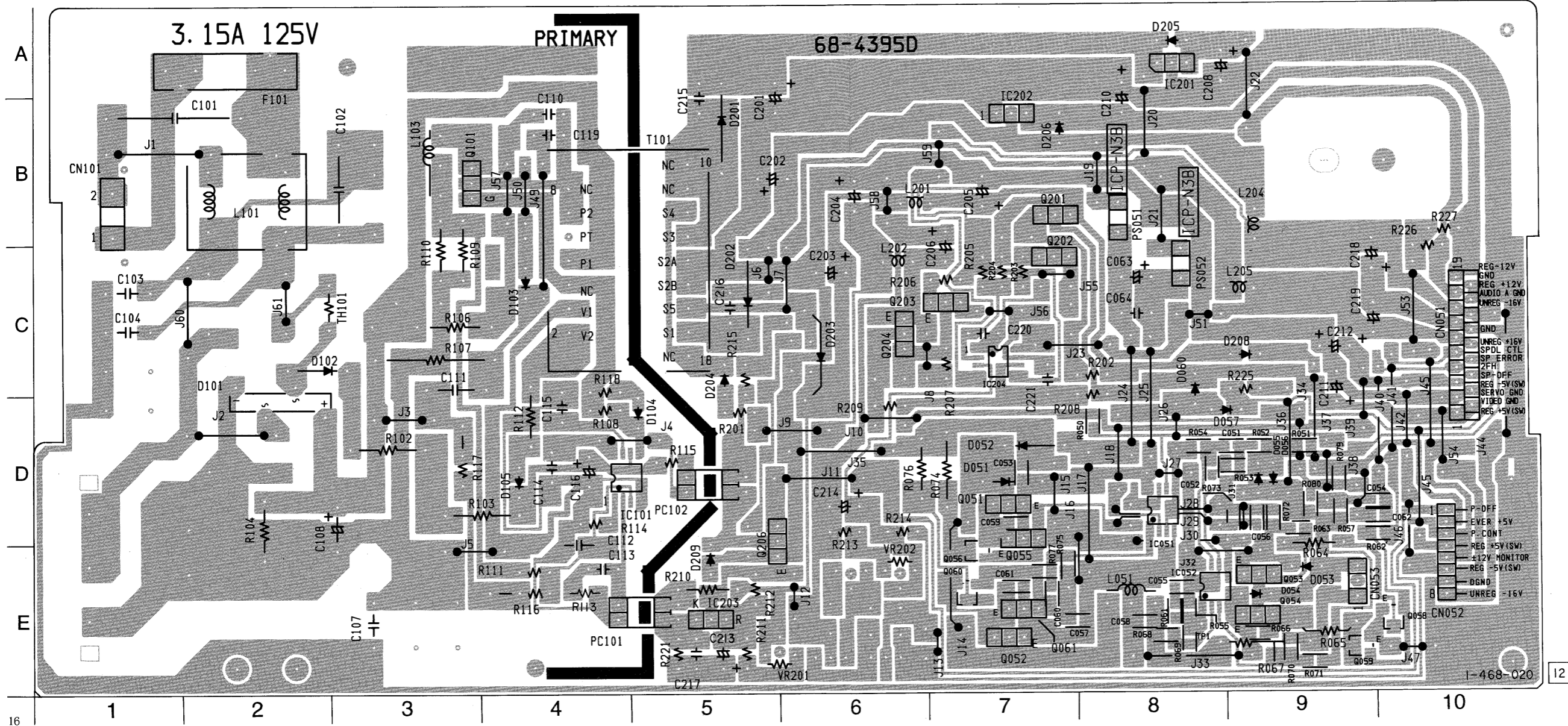
no mark : EE code
PRIMARY GND : \odot of B101
SECONDARY GND : Pin $\textcircled{1}$ of CN051

MDP-550/650/A3

POWER BLOCK PRINTED WRITING BOARDS (MDP-550/650 MODEL)

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

POWER BLOCK (550/650 MODEL (SR-538 BOARD))

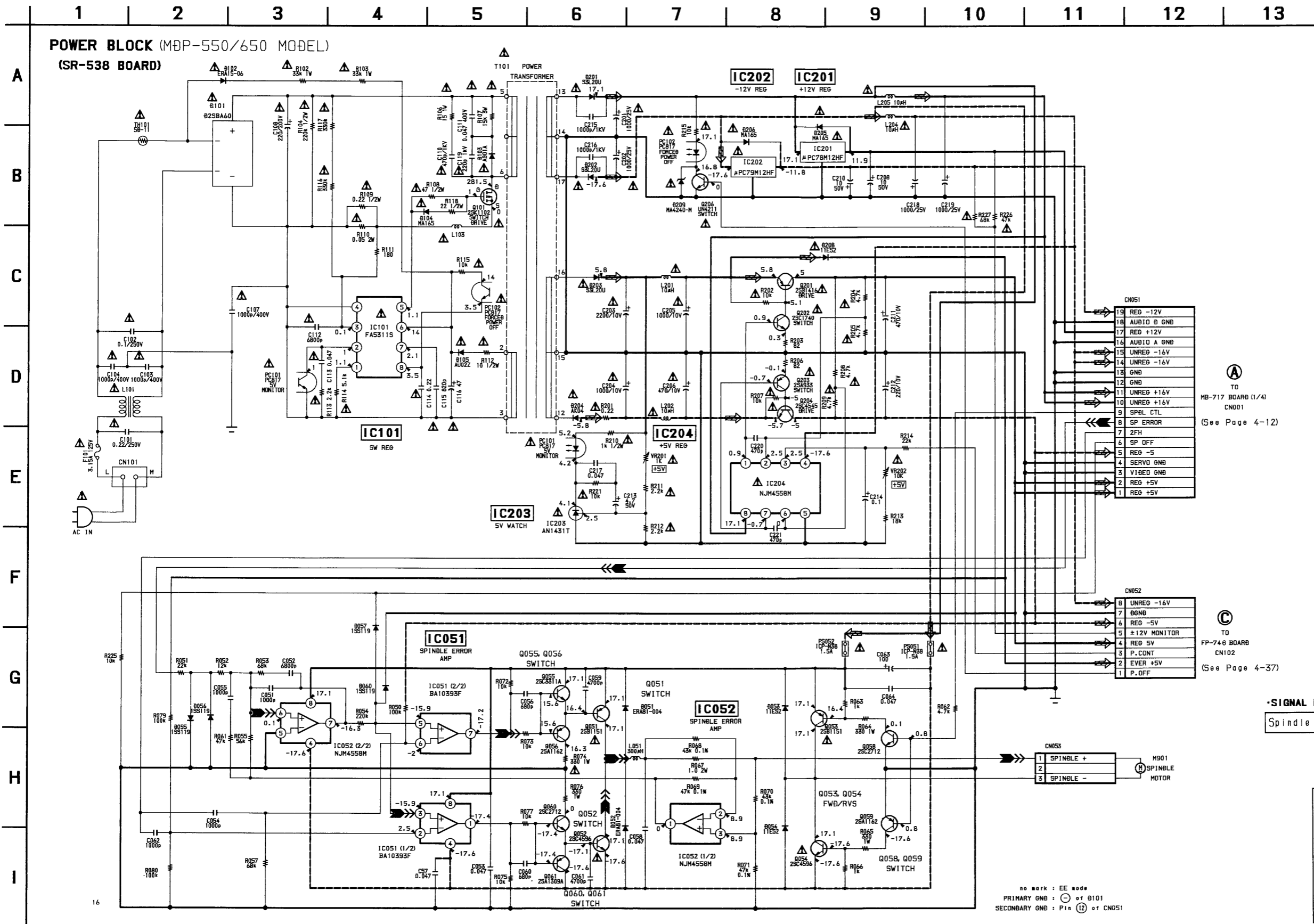


POWER BLOCK

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

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-550/650 MODEL)

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



POWER BLOCK

ELECTRICAL PARTS LIST

NOTE:

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

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

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
uF: μ F

RESISTORS

All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

COILS

uH: μ H

SEMICONDUCTORS

In each case, u: μ , for example:
uA...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	1-413-989-22	POWER BLOCK (A3:E) *****		Δ C109	9-933-773-01	ALUMINUM ELECTIC 100uF	400V (A3:E)
	1-413-989-42	POWER BLOCK (A3:Hong Kong) *****		Δ C110	9-909-673-01	CERAMIC 220PF	1kV (A3)
	1-468-020-12	POWER BLOCK (550/650) *****		Δ C110	9-933-752-01	CERAMIC 470PF	1kV (550/650)
		(Ref.No. 5,000 Series)		Δ C111	9-900-525-01	METALLIZED	0.047uF 400V
Δ	1-533-223-11	HOLDER, FUSE < CAPACITOR >		Δ C112	1-106-363-00	FILM	0.0068uF 5% 50V
	C051	1-163-009-11 MULTILAYER CERAMIC 1000PF	10% 50V	Δ C113	1-130-483-00	METALLIZED	0.01uF 5% 50V (A3)
	C052	1-163-019-00 MULTILAYER CERAMIC 6800PF	10% 50V	Δ C113	1-130-491-00	METALLIZED	0.047uF 5% 50V (550/650)
	C053	1-163-035-00 MULTILAYER CERAMIC 0.047uF	50V	Δ C114	1-137-378-11	METALLIZED	0.22uF 5% 50V
	C054	1-163-009-11 MULTILAYER CERAMIC 1000PF	10% 50V	Δ C115	1-130-470-00	FILM	820PF 5% 50V
	C055	1-163-009-11 MULTILAYER CERAMIC 1000PF	10% 50V	Δ C116	1-216-967-11	ALUMINUM ELECTRIC	47uF 20% 50V
	C056	1-163-007-11 MULTILAYER CERAMIC 680PF	10% 50V	Δ C117	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)
	C057	1-163-035-00 MULTILAYER CERAMIC 0.047uF	50V	Δ C118	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)
	C058	1-163-035-00 MULTILAYER CERAMIC 0.047uF	50V	Δ C119	9-909-673-01	CERAMIC	220PF 1kV (550/650)
	C059	1-163-017-00 MULTILAYER CERAMIC 4700PF	10% 50V	Δ C201	1-124-525-11	ALUMINUM ELECTRIC	1000uF 20% 25V
	C060	1-163-007-11 MULTILAYER CERAMIC 680PF	50V	Δ C202	1-124-525-11	ALUMINUM ELECTRIC	1000uF 20% 25V
	C061	1-163-017-00 MULTILAYER CERAMIC 4700PF	10% 50V	Δ C203	1-124-760-11	ALUMINUM ELECTRIC	2200uF 20% 10V
	C062	1-163-009-11 MULTILAYER CERAMIC 1000PF	10% 50V	Δ C204	1-126-926-11	ALUMINUM ELECTRIC	1000uF 20% 10V
	C063	1-124-122-11 ALUMINUM ELECTRIC 100uF	20% 50V	Δ C205	1-126-926-11	ALUMINUM ELECTRIC	1000uF 20% 10V
	C064	1-130-491-00 FILM	0.047uF 5% 50V	Δ C206	1-126-925-11	ALUMINUM ELECTRIC	470uF 20% 10V
Δ C101	9-902-038-01	METALLIZED	0.22uF 250V	C208	1-126-964-51	ALUMINUM ELECTRIC	10uF 20% 50V
Δ C102	9-900-521-01	METALLIZED	0.1uF 250V	C210	1-126-964-51	ALUMINUM ELECTRIC	10uF 20% 50V
Δ C103	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)	C211	1-126-925-11	ALUMINUM ELECTRIC	470uF 20% 10V
Δ C103	1-161-741-00	CERAMIC	1000PF 10% 400V(550/650)	C212	1-126-923-11	ALUMINUM ELECTRIC	220uF 20% 10V
Δ C104	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)	C213	1-126-963-11	ALUMINUM ELECTRIC	4.7uF 20% 50V
Δ C104	1-161-741-00	CERAMIC	1000PF 10% 400V(550/650)	C214	1-124-463-11	ALUMINUM ELECTRIC	0.1uF 50V
Δ C105	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)	C215	9-909-680-01	CERAMIC	1000PF 1kV
Δ C106	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)	C216	9-909-680-01	CERAMIC	1000PF 1kV
Δ C107	1-161-742-00	CERAMIC	2200PF 20% 400V (A3)	C217	1-130-491-00	FILM	0.047uF 5% 50V
Δ C107	1-161-741-00	CERAMIC	1000PF 10% 400V(550/650)	C218	1-126-942-61	ALUMINUM ELECTRIC	1000uF 20% 25V
Δ C108	9-933-773-01	ALUMINUM ELECTIC	100uF 400V (A3)	C219	1-126-942-61	ALUMINUM ELECTRIC	1000uF 20% 25V
Δ C108	9-900-523-01	ALUMINUM ELECTIC	220uF 200V (550/650)	C220	1-130-467-00	FILM	470PF 5% 50V
				C221	1-130-467-00	FILM	470PF 5% 50V

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
< CONNECTOR >			
CN051	1-695-342-31	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	
< DIODE >			
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
△D101	8-719-510-19	BRIDGE DIODE D2SBA60	
△D102	9-902-050-01	DIODE ERA15-06	
△D103	8-719-030-25	DIODE EG01C (A3)	
△D103	9-900-512-01	DIODE AG01A (550/650)	
△D104	9-900-514-01	DIODE MA165	
△D105	9-900-535-01	DIODE AU02Z	
△D201	8-719-510-72	DIODE S3L20U	
△D202	8-719-510-72	DIODE S3L20U	
△D203	8-719-510-72	DIODE S3L20U	
△D204	8-719-043-74	DIODE AK04	
△D205	9-900-514-01	DIODE MA165 (A3:E, 550/650)	
△D206	9-900-514-01	DIODE MA165 (A3:E, 550/650)	
△D208	8-719-200-82	DIODE 11ES2	
△D209	8-719-035-04	ZENNER DIODE MA4240	
< FUSE >			
△F101	1-532-286-00	FUSE TIME LUG (3.15A 250V) (A3)	
△F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (550/650)	
< IC >			
IC051	8-759-982-73	IC BA10393F	
IC052	8-759-100-96	IC UPC4558G2	
△IC101	8-759-062-58	IC FA5311S	
△IC201	8-759-701-79	IC NJM78M12FA	
△IC202	8-759-929-65	IC LM7912CT	
△IC203	9-900-532-01	IC AN1431T	
△IC204	8-759-100-96	IC UPC4558G2	
< COIL >			
L051	1-424-219-11	CHORKE COIL 300uH	
△L101	9-909-675-01	LINE FILTER	

Ref. No.	Part No.	Description	Remarks
△L102	9-909-675-01	LINE FILTER	(A3)
△L103	9-904-796-01	BEAD CORE	
△L201	9-909-681-01	CHORKE COIL 10uH	
△L202	9-909-681-01	CHORKE COIL 10uH	
△L204	9-909-681-01	CHORKE COIL 10uH	
△L205	9-909-681-01	CHORKE COIL 10uH	
< PHOTO COUPLER >			
△PC101	9-909-676-01	PHOTO COUPLER (A3)	
△PC101	9-900-519-01	PHOTO COUPLER (550/650)	
△PC102	9-909-676-01	PHOTO COUPLER (A3)	
△PC102	9-900-519-01	PHOTO COUPLER (550/650)	
< IC LINK >			
△PS051	1-532-675-21	IC LINK (ICP-N38 1.5A)	
△PS052	1-532-675-21	IC LINK (ICP-N38 1.5A)	
< TRANSISTOR >			
△Q051	8-729-117-11	TRANSISTOR 2SB1151-L	
△Q052	8-729-019-31	TRANSISTOR 2SC4596E (A3)	
△Q052	8-729-019-32	TRANSISTOR 2SC4596F (550/650)	
△Q053	8-729-117-11	TRANSISTOR 2SB1151-L	
△Q054	8-729-019-31	TRANSISTOR 2SC4596E (A3)	
△Q054	8-729-019-32	TRANSISTOR 2SC4596F (550/650)	
Q055	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q056	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q058	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q059	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q060	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q061	8-729-119-76	TRANSISTOR 2SA1175-HFE	
△Q101	9-909-669-01	TRANSISTOR 2SK1547 (A3)	
△Q101	9-933-750-01	TRANSISTOR 2SK1102 (550/650)	
△Q201	8-729-021-99	TRANSISTOR 2SB1416-R	
△Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE	
△Q203	8-729-119-76	TRANSISTOR 2SA1175-HFE	
△Q204	9-909-678-01	TRANSISTOR 2SC4545-R	
△Q206	8-729-900-80	TRANSISTOR DTC114ES	
< RESISTOR >			
R050	1-216-097-00	THICK FILM 100K	1/10W
R051	1-216-081-00	THICK FILM 22K	1/10W
R052	1-216-075-00	THICK FILM 12K	1/10W
R053	1-216-093-11	THICK FILM 68K	1/10W
R054	1-216-105-00	THICK FILM 220K	1/10W
R055	1-216-091-00	THICK FILM 56K	1/10W
R057	1-216-093-11	THICK FILM 68K	1/10W
R061	1-216-089-00	THICK FILM 47K	1/10W
R062	1-216-065-00	THICK FILM 4.7K	1/10W

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifique.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
R063	1-216-049-11	THICK FILM 1K	1/10W
R064	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R065	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R066	1-216-049-11	THICK FILM 1K	1/10W
△R067	1-216-369-00	CARBON 1	2W
R068	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R069	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R070	1-219-387-11	THICK FILM 43K 0.1% 1/10W	
R071	1-219-391-11	THICK FILM 47K 0.1% 1/10W	
R072	1-216-073-00	THICK FILM 10K	1/10W
R073	1-216-073-00	THICK FILM 10K	1/10W
△R074	1-215-866-11	CARBON 330 5% 1W	
R075	1-216-073-00	THICK FILM 10K	1/10W
R076	1-215-866-11	METAL OXIDE FILM 330 5% 1W	
R077	1-216-073-00	THICK FILM 10K	1/10W
R079	1-216-097-00	THICK FILM 100K	1/10W
R080	1-216-097-00	THICK FILM 100K	1/10W
△R101	9-900-394-01	NON-FLAMABLE CARBON 1M	1/2W (A3)
△R102	1-218-642-11	METAL OXIDE FILM 100K	1W (A3)
△R102	1-215-878-00	METAL OXIDE FILM 33K	1W(550/650)
△R103	1-218-642-11	METAL OXIDE FILM 100K	1W (A3)
△R103	1-215-878-00	METAL OXIDE FILM 33K	1W(550/650)
△R104	1-214-921-00	CARBON 220K	1/2W (A3:E, 550/650)
△R104	1-260-135-11	CARBON 1M 5%	1/2W (A3:Hong Kong)
△R105	1-214-921-11	CARBON 220K	1/2W (A3:E)
△R106	1-215-860-11	METAL OXIDE FILM 33	1W (A3)
△R106	1-215-858-00	METAL OXIDE FILM 15	1W(550/650)
△R107	1-215-927-00	METAL OXIDE FILM 47K	3W (A3)
△R107	1-215-924-00	METAL OXIDE FILM 15K	3W(550/650)
△R108	1-212-974-00	NON-FLAMABLE CARBON 47	1/2W
△R109	9-909-670-01	METAL FILM 0.22	1/2W
△R110	9-909-671-01	CEMENT 0.1	2W (A3)
△R110	9-933-751-01	CEMENT 0.05	2W(550/650)
△R111	1-249-408-11	CARBON 180	1/4W
△R112	1-212-958-00	NON-FLAMABLE CARBON 10	1/2W
△R113	1-247-839-31	CARBON 2.2K 5%	1/4W (550/650)
△R114	1-247-848-11	CARBON 5.1K	1/4W
△R115	1-247-855-31	CARBON 10K	1/4W
△R116	1-247-891-00	CARBON 330K	1/4W
△R117	1-247-891-00	CARBON 330K	1/4W
△R118	1-212-966-00	NON-FLAMABLE CARBON 22	1/2W
△R201	9-909-679-01	FUSE 0.22	1/4W
△R202	1-247-855-31	CARBON 10K	1/4W
R203	1-249-404-00	CARBON 82	1/4W
△R204	1-247-847-11	CARBON 4.7K	1/4W
△R205	1-247-847-11	CARBON 4.7K	1/4W
R206	1-249-404-00	CARBON 82	1/4W
△R207	1-247-855-31	CARBON 10K	1/4W
△R208	1-247-847-11	CARBON 4.7K	1/4W

Ref. No.	Part No.	Description	Remarks
△R209	1-247-847-11	CARBON 4.7K	1/4W
△R210	1-260-099-11	CARBON 1K	1/2W
△R211	1-247-839-31	CARBON 2.2K 5%	1/4W
△R212	1-247-839-31	CARBON 2.2K 5%	1/4W
R213	1-249-432-11	CARBON 18K	1/4W
R214	1-249-433-11	CARBON 22K	1/4W
△R215	1-247-855-31	CARBON 10K	1/4W
△R221	1-247-855-31	CARBON 10K	1/4W
R225	1-247-855-31	CARBON 10K	1/4W
△R226	1-247-871-11	CARBON 47K	1/4W
△R227	1-249-439-11	CARBON 68K	1/4W
< SWITCH >			
△SW101	1-572-675-11	POWER SWITCH	(A3:E)
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER (A3)	
△T101	9-933-753-01	SWITCHING TRANSFORMER (550/650)	
< THERMISTOR >			
△TH101	9-904-783-01	POWER THERMISTOR (A3:E, 550/650)	
< VARIABLE RESISTOR >			
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER 1K	
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER 10K	

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

Note:
Les composants identifiés par une marque △ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifiée.

