

MDP-A660K/K50

RMT-M36A

SERVICE MANUAL

US Model
Canadian Model
MDP-K50
E Model
Chinese Model
Hongkong Model
MDP-A660K

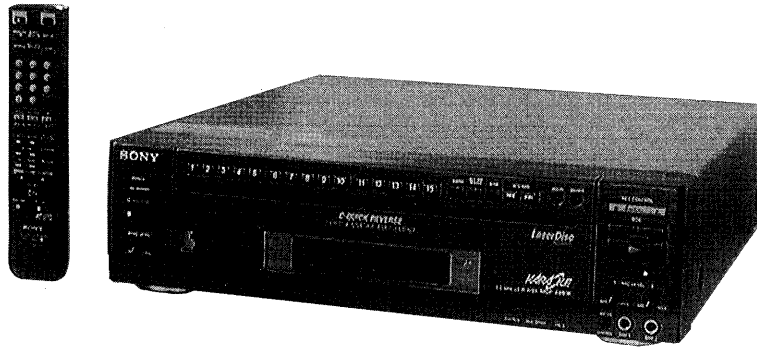


PHOTO : MDP-A660K

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 28.

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

More than 115 dB (EIAJ)*

Dynamic range

More than 99 dB (EIAJ)

Wow and flutter

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

Video specification**Horizontal video resolution**

425 lines

Signal-to-noise ratio

More than 50 dB

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

Input and Output**LINE OUT 1,2**

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

LINE IN

VIDEO input, Phono jack (1)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO input, Phono jacks (2)
Stereo L, R
Max. input level: 200 mVrms (-20 dB)
Input impedance:
more than 47 kilohms

MIC 1/2 jacks

Standard jacks
1 mV
(Impedance below 1 kilohm)

General**Power requirements**

110-127/220-240 V AC,
adjustable, 50/60 Hz (A660K)
120 V AC, 60Hz (K50)

Power consumption

45 W

Operating temperature

5°C to 35°C

Ambient humidity

5% to 90 %

Dimensions

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

Mass

Approx. 7.5 kg

— Continued on next page —



CD/CDV/LD PLAYER
SONY®

Supplied accessories

Remote Commander RMT-M36A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 ↔ phono plug 3) (1)
AC plug adaptor (supplied with
models other than Hong Kong model)
(1)

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.

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 microamperes). 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)

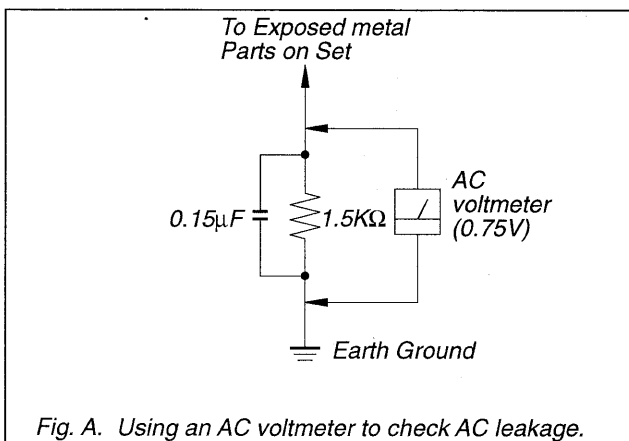


Fig. A. Using an AC voltmeter to check AC leakage.

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.

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

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

CAUTION

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

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

Precautions

Safety

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

Installing

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

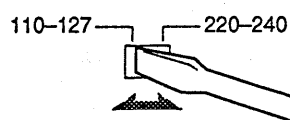
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the player. If this happens, playback may not start. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

Operating voltage

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

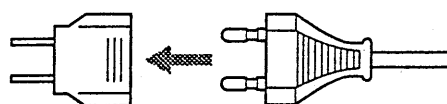
For	Set to
110–127 volts AC	110–127 V
200–240 volts AC	220–240 V

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



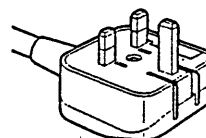
Using the AC power plug adaptor (for models other than Hong Kong model)

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



AC plug of Hong Kong model

- The players for Hong Kong have an AC plug as shown below. The AC plug adaptor is not supplied with these units.



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

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SECTION 1
GENERAL

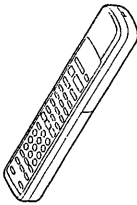
This section is extracted from instruction manual (MDP-A660K).

Step 1

Unpacking

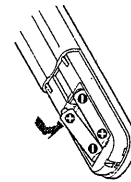
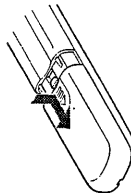
Check that you have the following items:

- Remote commander RMT-M36A
- Audio/Video cable
- Two R6 (size AA) batteries
- AC plug adaptor (supplied with models other than Hong Kong model)



Step 2

Inserting batteries into the remote commander



3 Close the cover.

1 Turn the commander over, and remove the cover.

2 Check the polarities and position two R6 (size AA) batteries correctly.

Notes

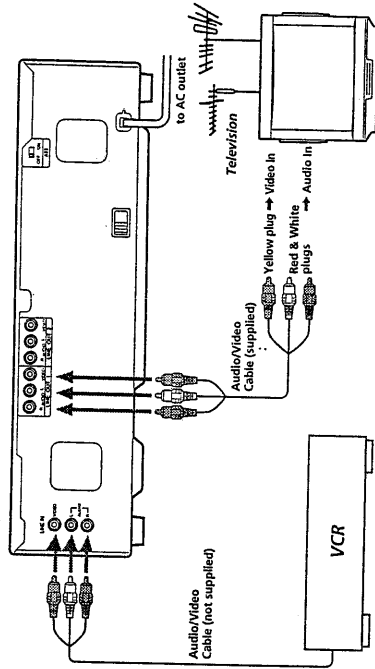
- With normal use, the batteries should last for approximately six months.
- If you are not going to use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not use different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

Step 3

Connecting the player

Television hook-up

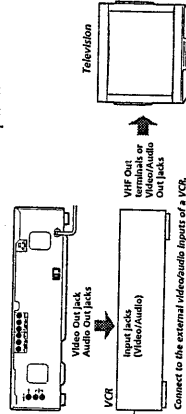
To play LDs or CDVs, hook up a television to the LD Player. Take out the supplied audio/video connecting cable (yellow, red and white plugs). Use this to connect the player to the television. Once you have hooked-up the television, set the input selector on the TV to "Video." Before connecting or disconnecting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



Television/VCR hook-up

Connect the player to the VCR's inputs when:

- the video inputs of the TV are already used for the VCR or a similar machine.
 - the TV has only an antenna input.
- When you connect this player using the VCR's inputs, do not use the LINE IN jacks of the player to connect the VCR because doing so will cause interference with the sound or picture.



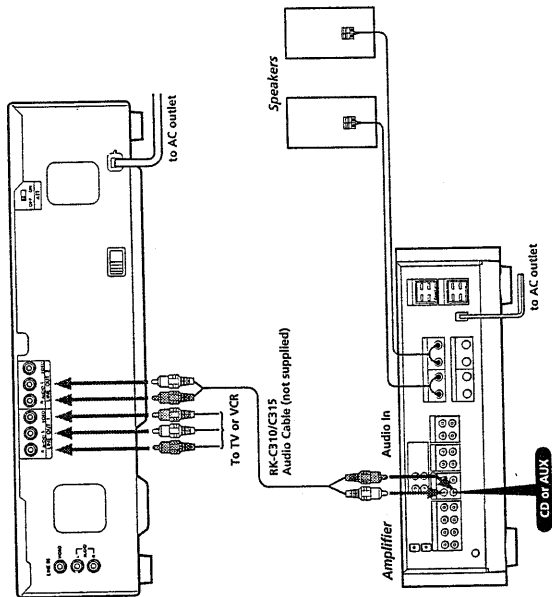
Notes

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

Getting Started

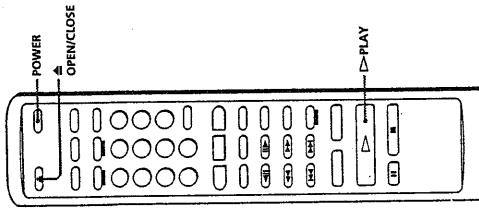
Audio equipment hook-up

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.

Basic Operations Playing a disc



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

Notes

- If you place more than one disc on the tray, or if the disc is not seated properly, the disc may not start playing, and may cause damage to the disc or player.
- Do not transport the player while playing a disc as doing so may damage your disc or player.
- Do not use a CD stabilizer when playing a CD as doing so may damage your disc or player.
- When you press **PAUSE**, the picture goes blank when playing a CLV LD or CDV, and the picture freezes when playing a CAV LD (see "Viewing frame-by-frame action", on page 24).

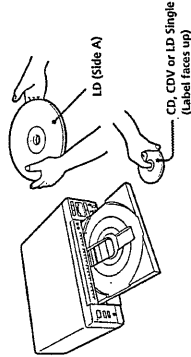
This section shows you how to play an LD, CD or CDV.

Before you start...

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

Loading and playing a disc

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



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

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

To

Press

■ STOP

▢ PAUSE

▢ PAUSE or ▶ PLAY

Resume play after pause

Scan forward or backward

Skip chapters or tracks

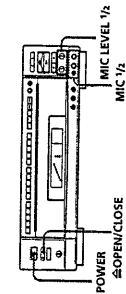
Go to a chapter/track

Remove the disc

Getting Started

Playing Karaoke

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

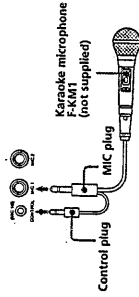


1 Set the MIC LEVEL 1/2 controls on the player to MIN.



2 Plug a microphone into the MIC 1 or 2 jack on the player.

When using the karaoke microphone F-KM1 (not supplied), plug the CONTROL plug into the CONTROL (MIC 1/2) jack.



Tips

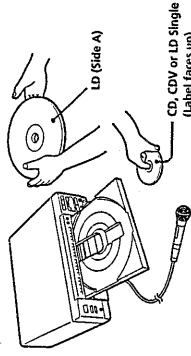
- You can plug in two microphones.
- To control the player from the microphone, plug the control plug into the CONTROL jack (see "Using the optional karaoke microphone" on page 18).
- You can enjoy karaoke using auxiliary equipment such as a VCR (see "Playing karaoke using auxiliary equipment" on page 18).

3 Press POWER to turn on the player.

4 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.

5 Press OPEN/CLOSE.
 The disc tray comes out.

6 Place a disc on the disc tray.



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

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

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

To stop playing and turn off the player
 Press POWER.
 You can resume playback from the point you stopped at by simply pressing PLAY (see "Resuming LD playback" on page 19).

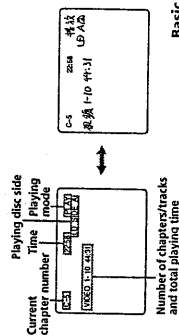
To stop playing and remove the disc
 Press OPEN/CLOSE.
 Remove the disc and press OPEN/CLOSE again to close the empty tray.

Chapter/track number display on the front panel

Indication	Current status of the player
12	Playing or pausing in chapter/track 12
12 (flashes)	Searching for chapter/track 12
-- (flashes)	Searching for the beginning of the disc
00	Playing chapter "0" of an LD
0	Stopped
-4	Modulated key level (appears briefly)
Not lit	No disc is loaded or playing an LD which has no chapters

Viewing the on-screen display

Press DISPLAY twice. The on-screen display appears (see "Understanding on-screen indications" on page 20). You can select the language of on-screen display, English or Chinese, by pressing the STOP button on the player less than 10 seconds after you turn on the player. To return to the original display, press the STOP button again less than 10 seconds after you first pressed it. Each time you press the STOP button (within 10 seconds) the displays alternate.

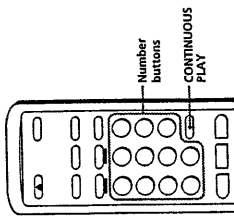
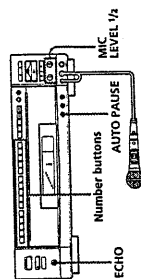


Tips

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

Note

- When you play a VCR, etc. using LINE IN, the current key and display appears on the front panel instead of a chapter/track number (see "Playing karaoke using auxiliary equipment" on page 18).



Tips

- If you press ■ STOP, ■ OPEN/CLOSE or POWER while playing a song in karaoke mode (video), the sound automatically fades out before playback stops (Back Out).
- If howling occurs
 - Move the microphone away from the speakers.
 - Lower the microphone volume or echo level.
- 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.

Note

- If you reserve the next songs to be played (see "Specifying the next songs" on page 12), the player plays them continuously, then pauses. In non-karaoke mode (without microphones connected), the CONTINUOUS PLAY button on the remote commander does not function. To turn on/off the Auto Pause function in non-karaoke mode, use the AUTO PAUSE button on the player. Each time you press the AUTO PAUSE button, the Auto Pause function is turned on/off.

7 Press one of the number buttons to enter 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.

8 Set the ON/OFF switch on the microphone to ON and turn the MIC LEVEL 1 or 2 control to adjust each microphone volume.



9 Turn the ECHO LEVEL control to adjust the strength of echo.
The same echo level is applied to both MIC 1 and MIC 2.



Now you can enjoy playing karaoke. After the song is played, the player pauses and waits until you enter the number of the next song.

Pausing automatically in karaoke mode

When you connect a microphone, the MDP-A660K automatically switches to karaoke mode. In karaoke mode, the player pauses every time a song is played (Auto Pause).

To play songs on the disc continuously in karaoke mode
Press CONTINUOUS PLAY on the remote commander or press AUTO PAUSE on the player.

"A. PAUSE OFF" appears on the screen briefly and the AUTO PAUSE button indicator on the player goes off. Each time you press CONTINUOUS PLAY or AUTO PAUSE, the on-screen indication changes as follows and the AUTO PAUSE button indicator on the player turns off/on.

→ A. PAUSE OFF → A. PAUSE

AUTO PAUSE button indicator

Songs are played

On Pausing at end of each song

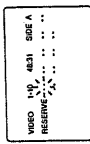
Off Continuously

Specifying the next songs (Reserve)

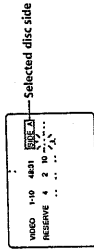
You can specify up to 9 songs to be played in any order you like, regardless of disc side, even while a song is being played. The songs are played continuously in the order you specify so that you can enjoy non-stop karaoke playing. The MDP-A660K also allows you to specify songs on another disc in advance (Next Disc Reserve).

Specifying songs on the current disc

1 Press RESERVE.
"RESERVE" appears.

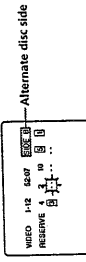


2 Select the disc side by pressing DISC SIDE A (or B), then press the number buttons to specify songs in the order you want them to play.

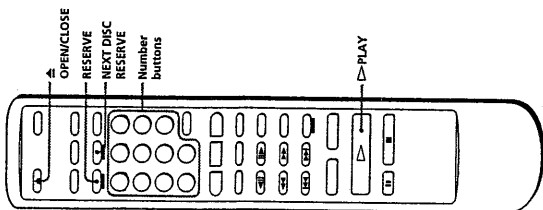


If you enter a wrong number, press CLEAR. With each press, the last song you have entered is deleted.

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



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



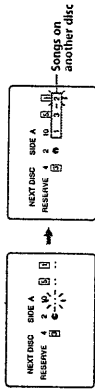
5 Press RESERVE.
On-screen indications disappear.

If you have reserved songs while playing a song, the songs start playing, without pausing after the current song.

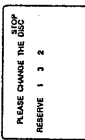
If you have specified songs while the player is stopped, press Δ PLAY. The songs start playing.

Specifying songs on another disc (Next Disc Reserve)

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



2 Press RESERVE (then Δ PLAY).
The songs on the current disc are played, then the player stops automatically, and prompts you to change the disc.



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

4 Press Δ PLAY or push in the disc tray.
The specified songs on the new disc start playing automatically.

Tip
• You can also use Reserve (and Next Disc Reserve) in non-karaoke mode (without microphones connected).

Notes
• When you play songs using Reserve (and Next Disc Reserve), the songs are played continuously, and you cannot use Auto Pause. In karaoke mode (with microphones connected), the player enters pause mode after playing all the reserved songs.
• You cannot use Reserve and Repeat at the same time.
• You cannot specify tracks over 80 on a CD using Next Disc Reserve.

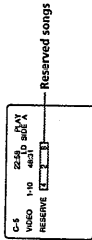
Specifying the next songs (continued)

To enter a number greater than 10
Press Δ on the remote commander, then one of the number buttons. If you press Δ by mistake, press Δ repeatedly until "—" flashes, then enter the correct number.

To	Press
Enter 14	Δ , then Δ .
Enter 25	Δ , Δ , then Δ .
Enter 30	Δ , Δ , Δ , then Δ .

To check the songs to be played

Press DISPLAY twice.
The song numbers to be played appear. When a song has been played, its number disappears.



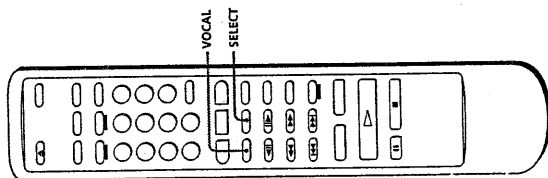
To skip the current song
Press Δ .

The next reserved song starts playing.

Canceling Reserve

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

Using karaoke functions



- Tip**
- When you connect your VCR to the LINE IN input on the player and set the player to line in mode (see "Playing karaoke using auxiliary equipment" on page 18), you can also use Vocal Select for karaoke video tapes.
- Note**
- When playing multiplex CDVs or non-multi audio (analog or digital) LDs, you can only use VOCAL 1.

You can enjoy karaoke using various functions.

Singing along with the original vocals (Vocal Select)
You can listen to words or melody you forget by listening to the original vocals. This is available in karaoke mode for karaoke discs or tapes.

To listen to the original vocals on MULTI AUDIO LDs
On MULTI AUDIO karaoke LDs, vocals are recorded on an analog track. When playing MULTI AUDIO karaoke LDs, the player automatically outputs the backup sound recorded on digital tracks in stereo. To listen to the vocals, use Vocal Select. You can easily select the analog track on which the vocals are recorded.

- Press VOCAL to turn on the SELECT button indicator.
- Press SELECT repeatedly until the vocals are heard.

With each press, the on-screen indication changes as follows:

Output sound recorded on	
VOCAL 1	Right analog track
VOCAL 2	Left analog track
VOCAL 3	Right analog track (with stereo sound on digital tracks)

To listen to the original vocals on karaoke CDs, CDVs, or tapes
When playing karaoke CDs (or CDVs) or karaoke tapes in karaoke mode (with microphones connected), the player automatically outputs backup sound recorded on the left channel. To listen to the vocals, use Vocal Select to also output the original vocals recorded on another track.

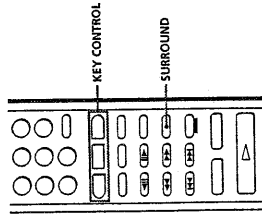
- Press VOCAL to turn on the SELECT button indicator.
- Press SELECT repeatedly to select the sound.

With each press, the on-screen indication changes as follows:

Output	
VOCAL 1	Vocals with backup sound from both speakers
VOCAL 2	Stereo (Backup sound from left speaker and vocals from right speaker)

To cancel Vocal Select
Press VOCAL to turn off the SELECT button indicator.
"VOCALSEL OFF" appears on the screen briefly.

Using karaoke functions (continued)



- Tip**
- There are seven KEY CONTROL indicators on the front panel of the player, which approximately display backup key adjustment level (17 steps available). There are three for # UP adjustment, three for # DOWN adjustment, and one for # NATURAL.
 - only 7 indicators for 17 steps). When a higher or lower key is selected, the # UP or # DOWN button on the player lights up amber.
 - In karaoke mode, the key returns to the original key when playback pauses automatically at the end of a song. If Auto Pause is canceled, the key does not change at the end of a song. However, when playing in single repeat mode, the key returns to the original key at the end of the song even if Auto Pause is canceled.
 - You can also adjust the key from the Karaoke menu. ("Using the optional karaoke microphone" on page 18).
 - You can also use Key Control and Surround in non-karaoke mode (without microphones connected).
- Note**
- You cannot use Surround with any of the following functions:
 - Vocal Select
 - Vocal Support
 - Karaoke Fun

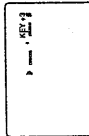
Changing the backup key (Key Control)

You can adjust the backup key to your voice.

Press # UP or # DOWN repeatedly to find the backup key that suits your voice.

To	Press
Raise the key	# UP
Lower the key	# DOWN
Return to the original key	# NATURAL

The key is adjustable to one of 17 steps (8 steps higher, 8 steps lower than the original key, and the original key). Your setting appears on the screen briefly.



Playing a disc with sound effect (Surround Sound)

You can play a disc in one of three acoustic atmospheres: SIMULATED, KARAOKE BAR or MOVIE.

Press SURROUND repeatedly to select the effect.

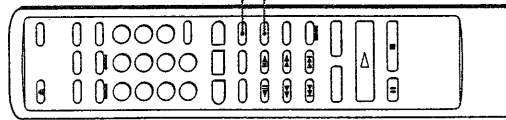
With each press, the on-screen indication changes as follows:

→ SIMULATED → KARAOKE BAR → MOVIE → SURROUND OFF

The SURROUND MODE indicator on the player lights up.

Indication	Atmosphere
SIMULATED	Good for playing software recorded in monaural. Enhances the dynamic range for monaural programmes like old movies and news programmes.
KARAOKE BAR	Creates the effect of singing in a bar. Gives your song a rich carrying tone.
MOVIE	Suitable for movie software. Emphasizes the bass and extends the dynamic mid range.

To cancel the surround effect
Press SURROUND repeatedly until "SURROUND OFF" appears. The SURROUND MODE indicator goes off.



Letting the vocals help you (Vocal Support)

You can let the original vocals come in when you forget the words or melody. This is available for MULTI AUDIO discs, or multiplex discs or tapes.

Press VOCAL SUPPORT to turn on the VOCAL SUPPORT button indicator on the player.

"SUPPORT" appears on the screen briefly.

While you are singing into the microphone, the player outputs the backup sound, but when you are not, it also outputs the singer's voice to help you.

To turn off Vocal Support

Press VOCAL SUPPORT again to turn off the VOCAL SUPPORT button indicator on the player.

"SUPPORT Off" appears on the screen briefly.

Enjoying karaoke with non-karaoke discs (Karaoke Pon)

With a disc recorded in stereo, you can enjoy karaoke even if it is a non-karaoke disc.

Press KARAOKE PON to turn on the KARAOKE PON indicator on the player.

"KARAOKE PON" appears on the screen.

The volume of the singer's voice is lowered.

To turn off Karaoke Pon

Press KARAOKE PON again to turn off the KARAOKE PON indicator on the player.

"K. PON OFF" appears on the screen briefly.

Tips

- Using the Vocal Support function, you can sing a duet by yourself. You can sing the male part for female party and the female part for male party when the two of you sing together. You can also use Karaoke Pon in non-karaoke mode (without microphones connected).

Notes

- You cannot use Vocal Support in non-karaoke mode (without microphones connected).
- Karaoke Pon is only available for discs recorded in stereo. With monaural discs, the backup level is also lowered.
- You cannot completely shut off the vocals by using Karaoke Pon. Even with stereo discs, if the voice deviates from the center, its level may not be lowered well.
- When using Karaoke Pon, stereo effect is reduced.

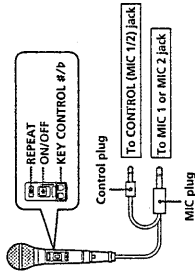
Using karaoke functions (continued)

To sing Repeatedly

You can go back to any point of a song using the REPEAT button on the microphone. Hold down REPEAT and release it at the desired point. Playback continues again from the point at which the button is released.

To use Key Control

You can change the backup key by pressing KEY CONTROL #/b on the microphone. This is the same operation as KEY CONTROL on the player or remote commander (see "Changing the backup key" on page 16).

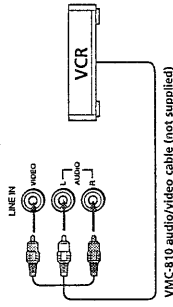


Playing karaoke using auxiliary equipment

You can also enjoy karaoke by connecting auxiliary equipment such as a VCR to the LINE IN AUDIO/VIDEO inputs on the player. The karaoke functions (Vocal Select, Key Control, Surround Effect, Vocal Support and Karaoke Pon) are available as they would be for discs.

- Connect the VCR to the LINE IN AUDIO/VIDEO inputs on the rear.
- Press LINE IN on the player. The LINE IN button indicator on the player lights up.

If a disc is being played, press STOP to stop playing it. Now you can enjoy playing karaoke with your video tape. To return to playing a disc, press PLAY.



Tip

- When using two microphones, Repeat Singing and Key Control are only operable on the microphone connected to the CONTROL (MIC 1/2) jack.

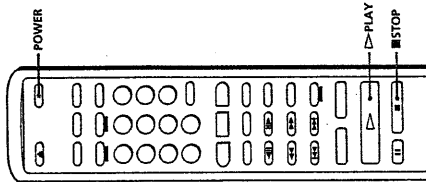
Note

- When you play a VCR etc. using LINE IN:
 - Play always turn on the LD
 - Stop playing the disc by playing STOP. When playing a disc, you cannot use LINE IN.

Tip

- When you use LINE IN, Vocal Select operates as it would do for CDs (VOCAL 1 and VOCAL 2).

Additional Operations Resuming LD playback (Auto Resume)



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

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

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

- 2 Press **PLAY**.
The player searches for the scene at which you stopped playing, then playback starts.

To pause playing just before starting

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

To view from the beginning of the LD

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

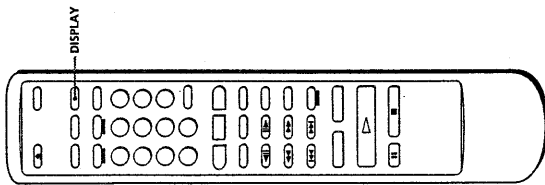
Tips

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

Notes

- The point at which you stopped is not stored if you stop playback during a Chapter Search.
- If you press **PLAY** when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.
- If you connect a microphone (switching the player to karaoke mode), Auto Resume is canceled. Although Auto Resume is not canceled if you set the player to **LINE IN**, it is canceled if you connect a microphone.

Understanding on-screen indications

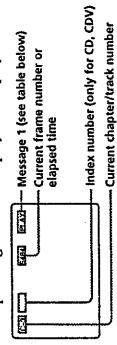


You can view the operating status of the player or disc information on the TV screen.

Displaying on-screen indications

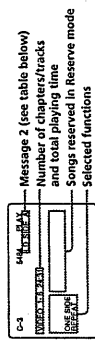
Press **DISPLAY**.

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



Press **DISPLAY** again.

Operating status and disc information are displayed on the screen.



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

Message 1

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

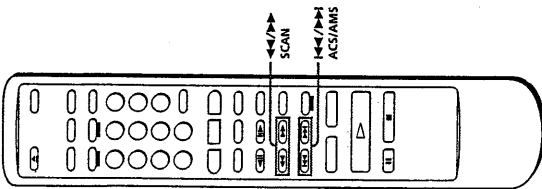
Message 2

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

Notes

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

Searching for a particular point on the disc



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

Scanning a disc quickly (Speed Scan)

Hold down **◀/▶/▶▶** SCAN while playing the disc.

To	Hold down
Scan forward	▶▶ SCAN
Scan backward	◀◀ SCAN
To resume normal playback, release	◀/▶/▶▶ SCAN.

Skipping chapters or tracks (Skip Search)

Press or hold down **◀◀/▶▶** ACS/AMS.

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

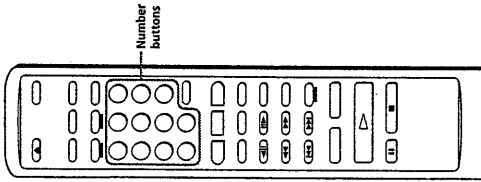
Note

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

Tips

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

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



Tips

- In addition to normal play mode, you can do Chapter/Track Search while in Freeze Frame (CAV LD), Repeat or Pause mode. When the specified chapter or track is located after the search, playback continues in the same mode.
- When you do Chapter/Track search while a song is automatically paused in karaoke mode, the selected chapter or track starts playing immediately, without entering pause mode.

Note

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

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

Locating a particular chapter/track

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



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

To enter a number greater than 10

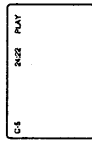
Press **⓪**, then one of the **① - ⑩** buttons. If you press **⓪** by mistake, press CLEAR, then enter the correct number.

To	Press
Enter 14	⓪ , then ④
Enter 25	⓪ , ② , then ⑤
Enter 30	⓪ , ③ , ⑩ , then ⑩

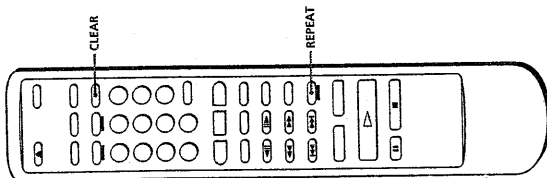
To check the current chapter/track number

Press DISPLAY to display the chapter track number.

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



Playing a section repeatedly (Repeat Play)



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

Repeating chapters/tracks

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



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



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

To view the replaying status on the screen
Press DISPLAY twice.

Canceling Repeat Play

Press CLEAR.

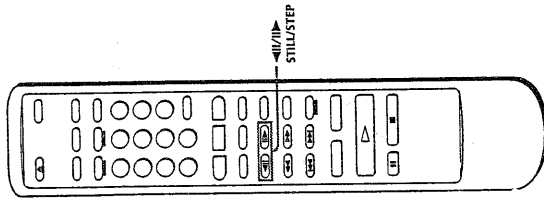
Tip

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

Note

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

Viewing frame-by-frame action



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

Freezing the action (Freeze Frame)

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

To resume normal playback
Press ▷ PLAY.

Playing frame-by-frame (Step Play)

1 Press one of the ◀II/II▶ STILL/STEP buttons while playing a CAV LD. 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.

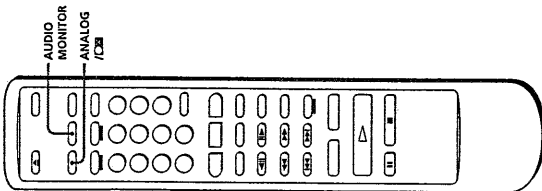
To resume normal playback

Press ▷ PLAY.

Tip

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

Using the sound control functions



Note

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

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

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

To alternate the sound output

Press AUDIO MONITOR while playing the disc.

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

1/L → 2/R → 1/L 2/R

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

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

Listening to analog sound on an LD

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

Press ANALOG/DIGITAL while playing the disc.

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

To return to digital sound

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

Playing discs with a CX (CX) logo

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

To activate the CX noise reduction system manually




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

Additional Information Troubleshooting

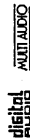
Symptom	Remedy
Power	No Power <ul style="list-style-type: none"> Connect the AC power cord securely.
Karaoke	No sound from microphone <ul style="list-style-type: none"> Switch the microphone on. Turn up the MIC LEVEL 1 or 2 control on the player.
	Distorted sound <ul style="list-style-type: none"> Set the ATT switch at the rear of the player to ON.
	Howling occurs <ul style="list-style-type: none"> Move the microphone away from the speakers. Lower the volume. Lower the microphone volume or echo level.
Playback	Playback does not start <ul style="list-style-type: none"> Insert the disc correctly. When playing a CD, CDV or LD single, place it with the label facing up. Select the disc side on which signals are recorded. If there may be moisture condensation within the player, wait for about one hour before operating the player. Clean the disc.
	Playback stops every time a chapter/track ends <ul style="list-style-type: none"> Press CONTINUOUS PLAY on the remote commander or AUTO PAUSE on the player to turn off the AUTO PAUSE button indicator on the player.
Picture	No picture, but the button indicator on the player lights up <ul style="list-style-type: none"> Connect the TV correctly. Turn on the TV and set the input selector on the TV to "Video."
	Poor picture <ul style="list-style-type: none"> Connect the TV correctly. Clean the disc.
	Visual noise while scanning a disc <ul style="list-style-type: none"> A certain amount of visual noise and instability is inevitable while scanning a disc.
	Freeze Frame does not operate <ul style="list-style-type: none"> Use a CAV disc. Freeze Frame does not operate on CLV LDs, CDVs or VSDs.
Sound	No sound <ul style="list-style-type: none"> Connect the TV or amplifier correctly. Turn up the volume on the TV or amplifier. Switch on the amplifier and set the input selector to "CD" or "AUX." Playback at normal speed. No sound is output while in pause mode.
Others	Remote Commander does not operate <ul style="list-style-type: none"> Turn on the player. Point the remote commander at the remote sensor on the player. Reset any obstacles between the remote commander and the sensor. Insert the batteries correctly. Replace both the batteries with new ones if they are weak.

Optical discs

The MDP-A660K 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	CAV 14 min CLV 20 min
		8-inch LD	8 in. (20 cm)	Double	CAV 28 min CLV 40 min
		12-inch LD	12 in. (30 cm)	Double	CAV 1 hr CLV 2 hr
Compact Discs For music		CD Single CD	3 in. (8 cm) 5 in. (12 cm)	Single Single	20 min 74 min
Compact Disc Videos For music videos and educational material (Digital Audio)		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-A660K cannot play the following discs or functions:
- CED, VHD discs or PAL video discs
 - CD-ROM, CD-GRAPHICS, VIDEO CD, Photo CD, CD-I discs
 - Aluminum-lined discs or MD (MiniDisc) discs
 - Graphic functions of LD-G discs

Optical Disc Maintenance

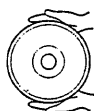
Holding CDs or CDVs

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



Holding LDs

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



Light exposure

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

Cracked or damaged discs

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

Keeping the disc surface clean

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



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

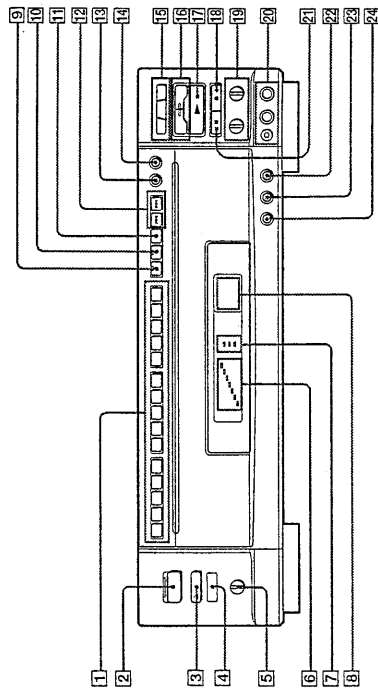


Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad paper or adhesive tape, will deteriorate the quality of the playing surface, and thus the output quality.

See the pages indicated in () for details.

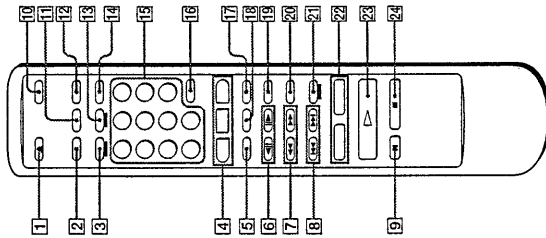
Index to parts and controls

Front




- 1 Number buttons (11) (12) (22)
- 2 POWER switch and indicator (8)
- ON: Green
- STANDBY: Red
- 3 OPEN/CLOSE button (8)
- 4 Remote sensor (26)
- 5 ECHO LEVEL control (11)
- 6 KEY CONTROL indicators (16)
- 7 AUTO RESUME indicator (19)
SURROUND indicator (16)
KARAOKE PON indicator (17)
- 8 Chapter/track number indicator (9)
- 9 RESERVE button and indicator (12)
- 10 NEXT DISC RESERVE button and indicator (13)
- 11 CLEAR button (12) (23)
- 12 LEFT/RIGHT/STOP/STEP buttons (24)
- 13 VOCAL button (15)
- 14 SELECT button and indicator (15)
- 15 KEY CONTROL DOWN/NATURAL/# UP indicators-buttons (16)
- 16 SIDE A/B buttons and indicators (9)
- 17 (Play) button (8)
- 18 (Stop) button (8)
- 19 MIC LEVEL 1/2 controls (10)
- 20 MIC 1/2 and CONTROL (MIC 1/2) jacks (10)
- 21 (Pause) button and indicator (8)
- 22 LINE IN button and indicator (18)
- 23 VOCAL SUPPORT button and indicator (17)
- 24 AUTO PAUSE button and indicator (11)

Remote commander

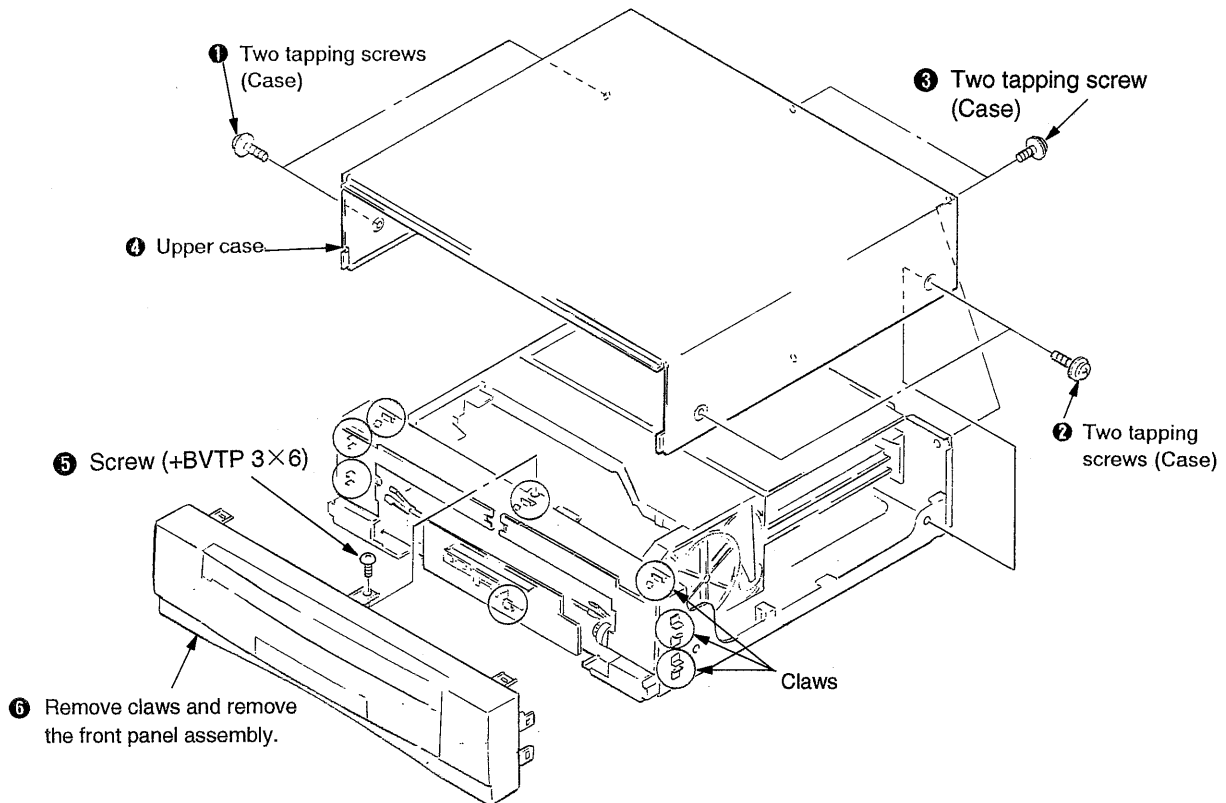


- 1 OPEN/CLOSE button (8)
- 2 ANALOG/CLOSE button (25)
- 3 RESERVE button (12)
- 4 KEY CONTROL buttons (16)
- # UP
- # NATURAL
- # DOWN
- 5 VOCAL button (15)
- 6 LEFT/RIGHT/STOP/STEP buttons (24)
- 7 LEFT/RIGHT/STOP/STEP buttons (21)
- 8 PAUSE button (8)
- 9 LEFT/RIGHT/STOP/STEP buttons (21)
- 10 POWER switch (8)
- 11 AUDIO MONITOR button (25)
- 12 DISPLAY button (20)
- 13 NEXT DISC RESERVE button (13)
- 14 CLEAR button (12) (23)
- 15 Number buttons (11) (12) (22)
- 16 CONTINUOUS PLAY button (11)
- 17 KARAOKE PON button (17)
- 18 SELECT button (15)
- 19 VOCAL SUPPORT button (17)
- 20 SURROUND button (16)
- 21 REPEAT button (23)
- 22 DISC SIDE A/B buttons (9)
- 23 PLAY button (8)
- 24 STOP button (8)

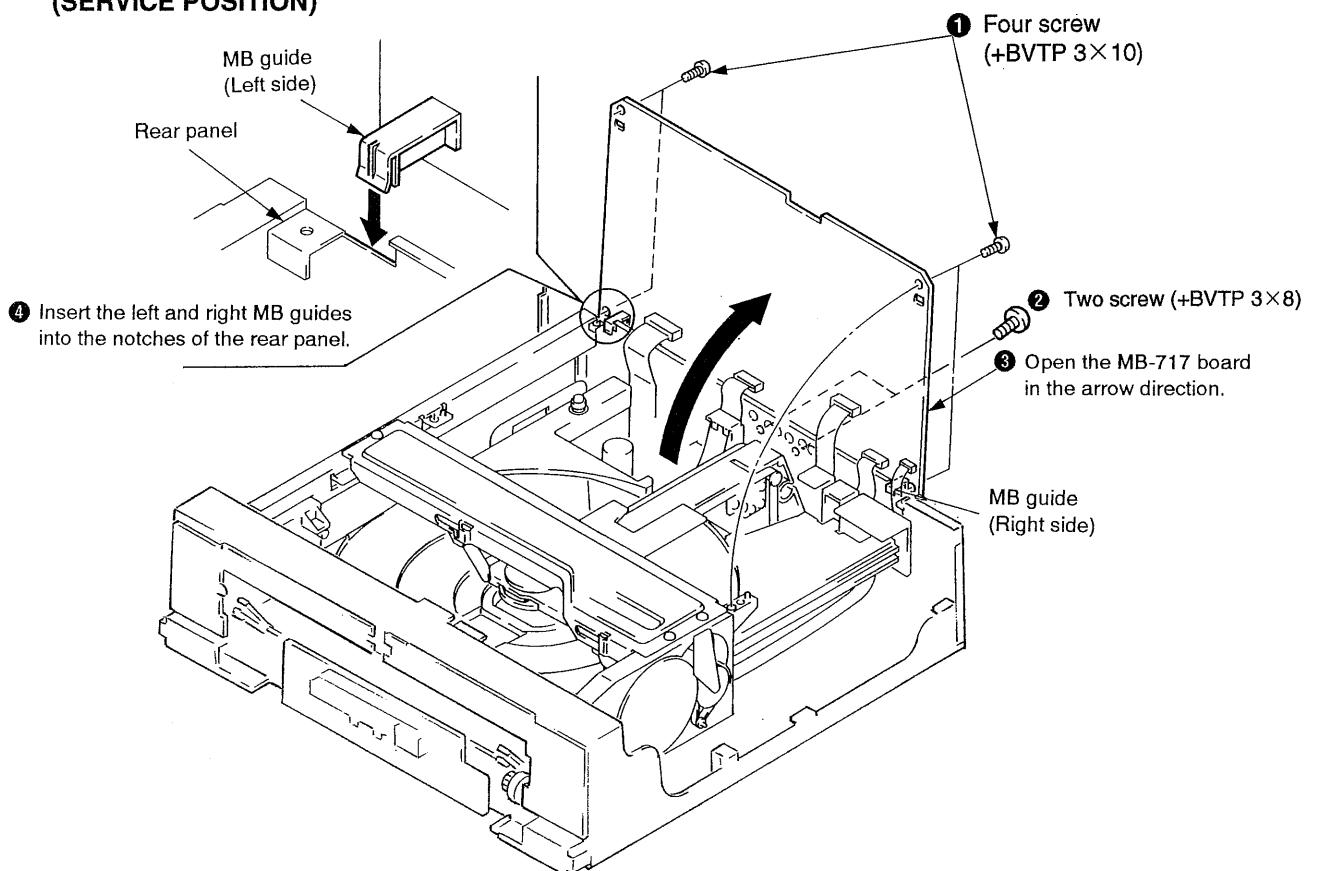
 A function activated by pressing a button with an orange mark can be canceled by pressing the CLEAR button.

**SECTION 2
DISASSEMBLY**

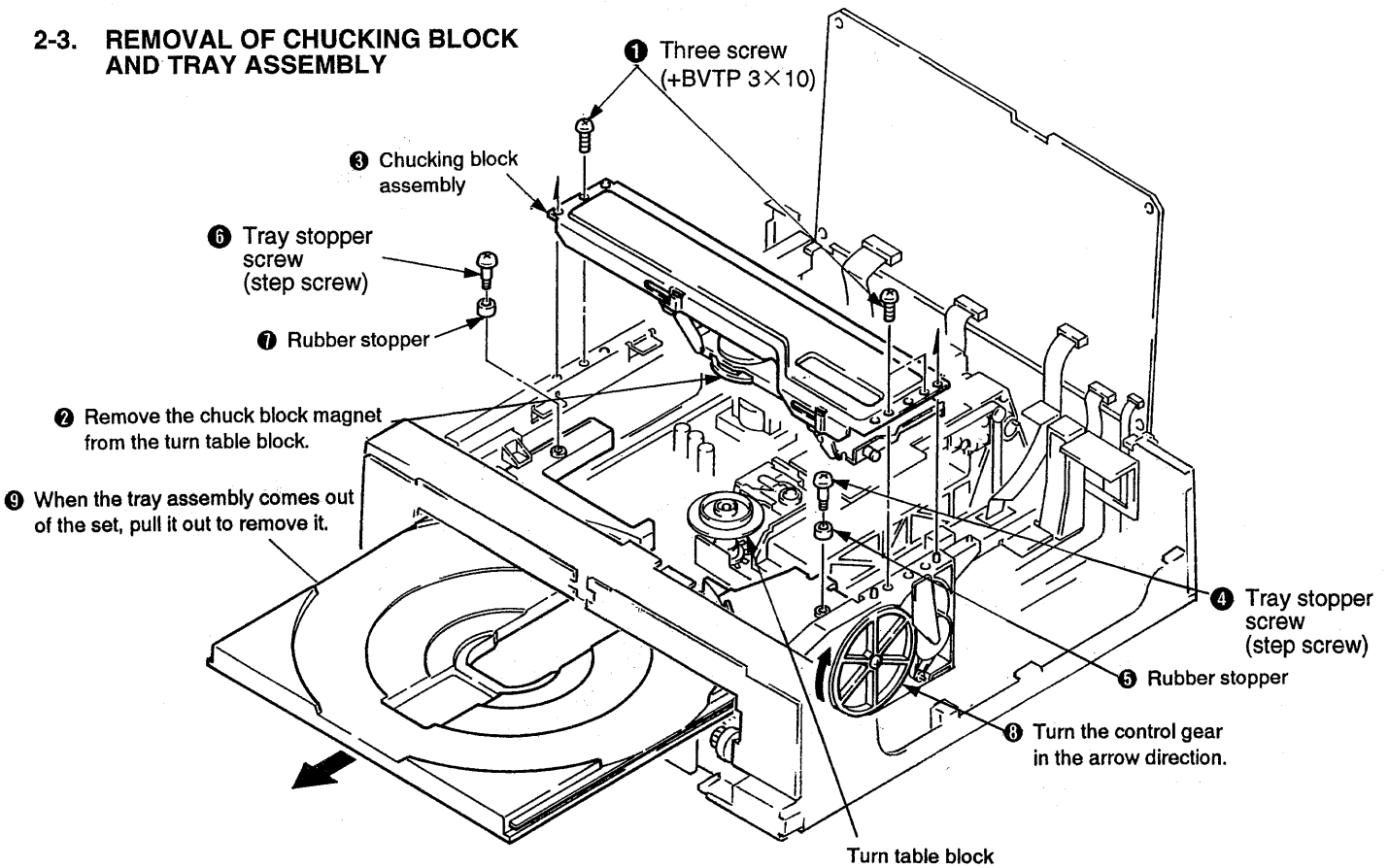
2-1. REMOVAL OF FRONT PANEL ASSEMBLY



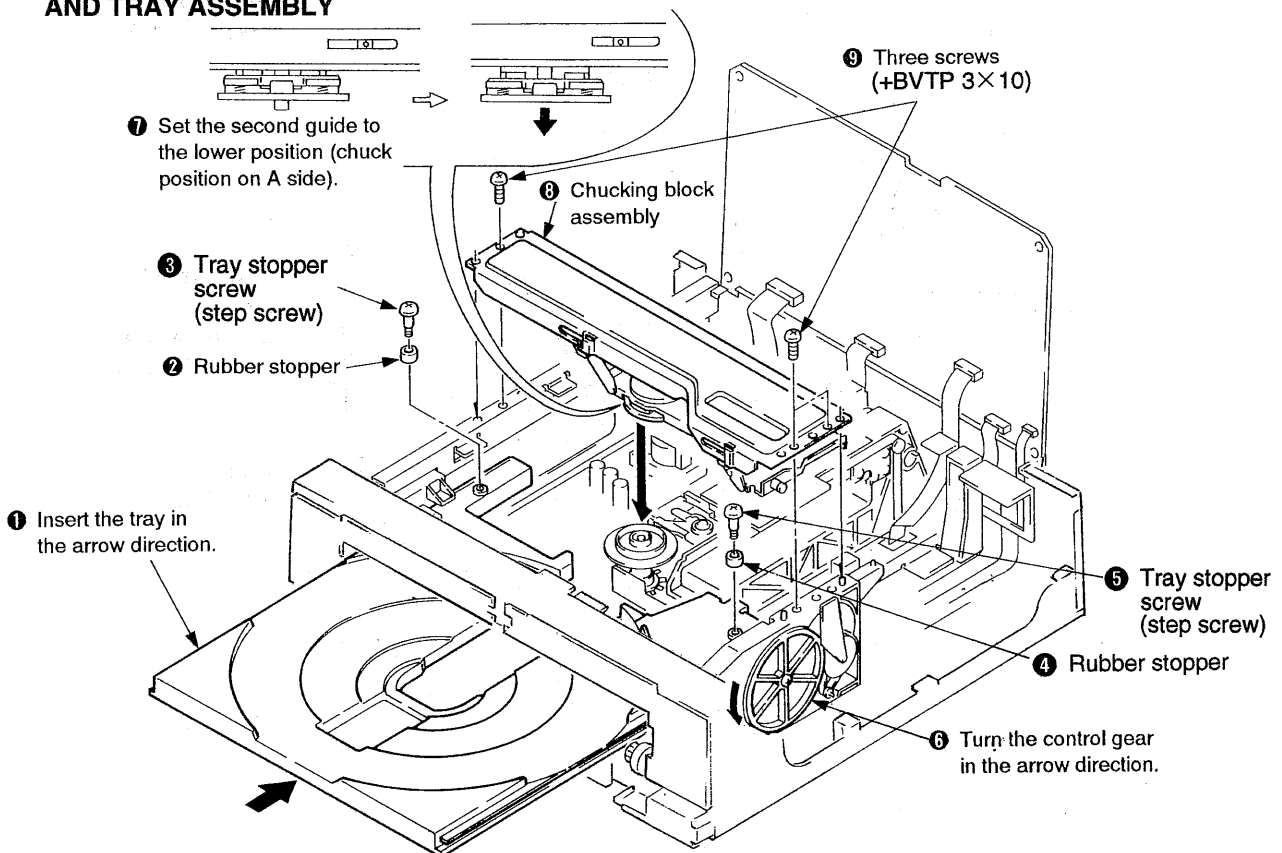
2-2. OPENING OF MB-717 BOARD (SERVICE POSITION)



2-3. REMOVAL OF CHUCKING BLOCK AND TRAY ASSEMBLY

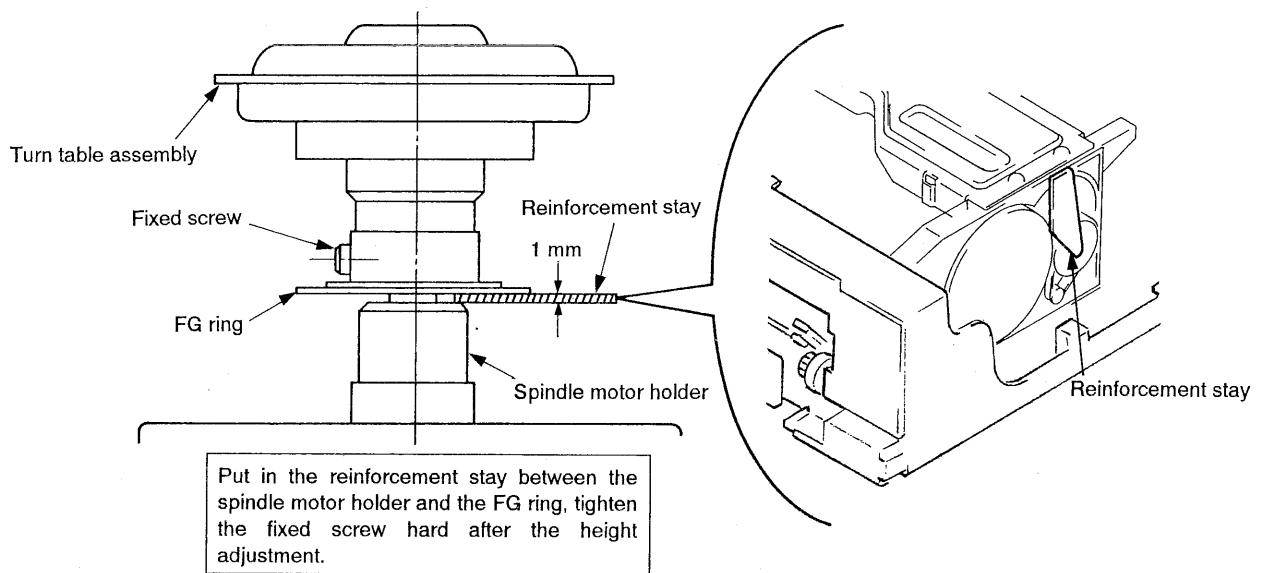


2-4. MOUNTING THE CHUCKING BLOCK AND TRAY ASSEMBLY

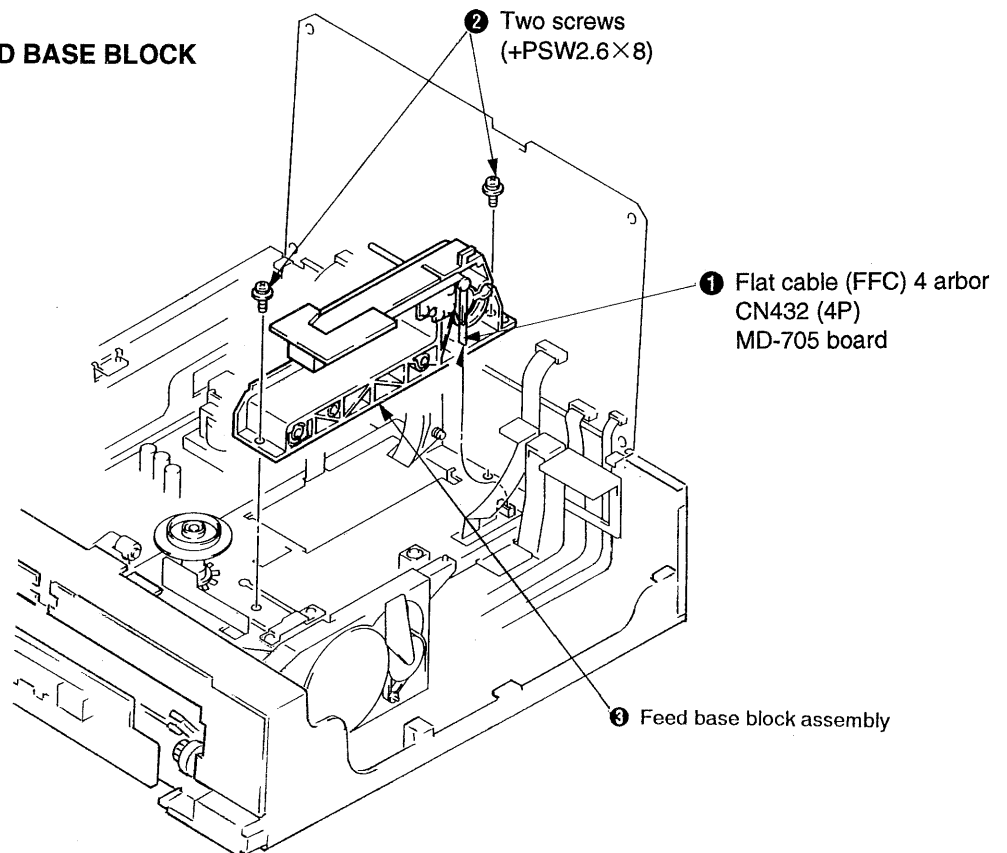


2-5. HEIGHT ADJUSTMENT OF THE TURN TABLE ASSEMBLY

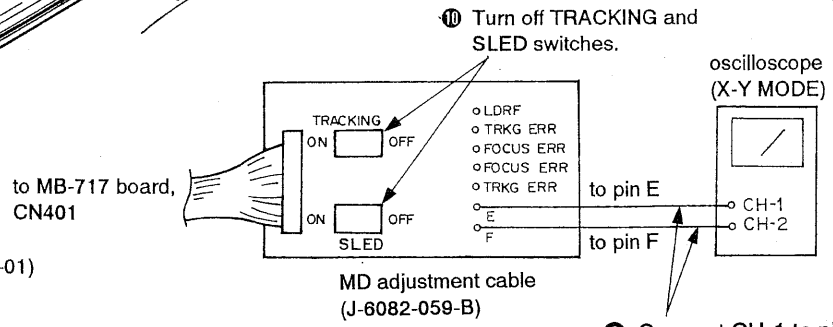
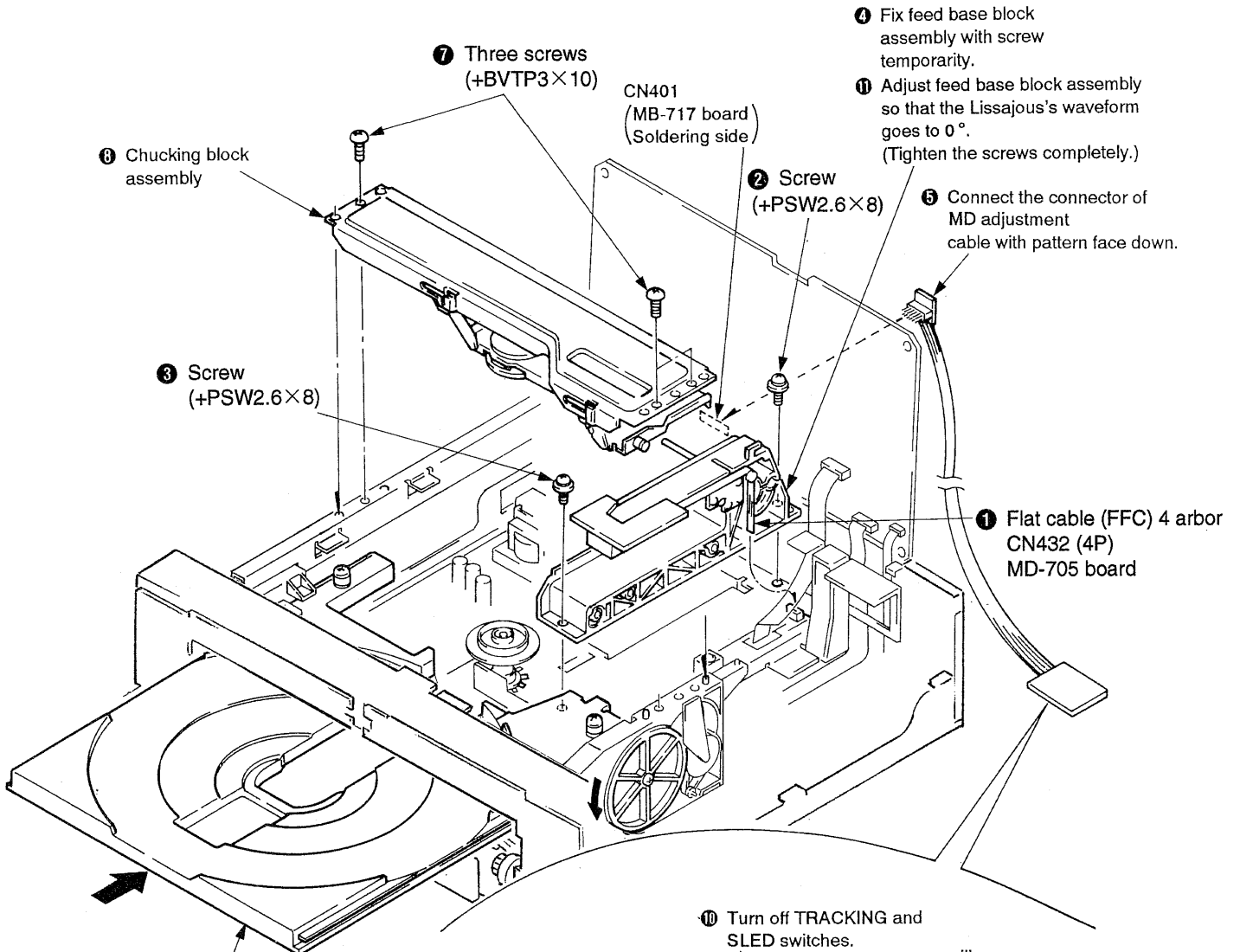
1. Rotate the control gear on the right side of the set, and open the tray.
2. Remove the chucking block assembly.
3. Remove the reinforcement stay.
4. Change the turn table assembly.
Adjust the height and also the position putting in the reinforcement stay as below.
The thickness of the reinforcement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



2-6. REMOVAL OF FEED BASE BLOCK ASSEMBLY



2-7. MOUNTING THE FEED BASE BLOCK ASSEMBLY

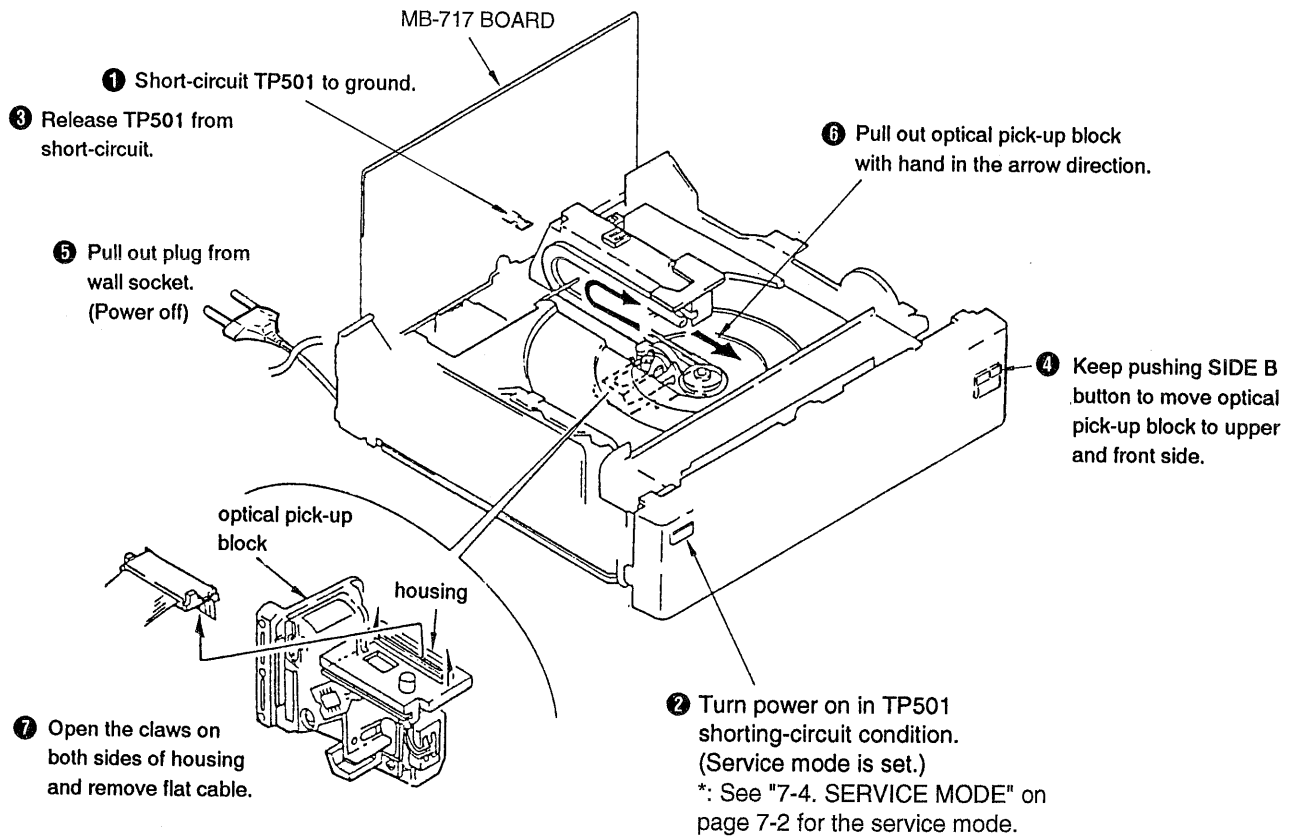


Lissajous's waveform

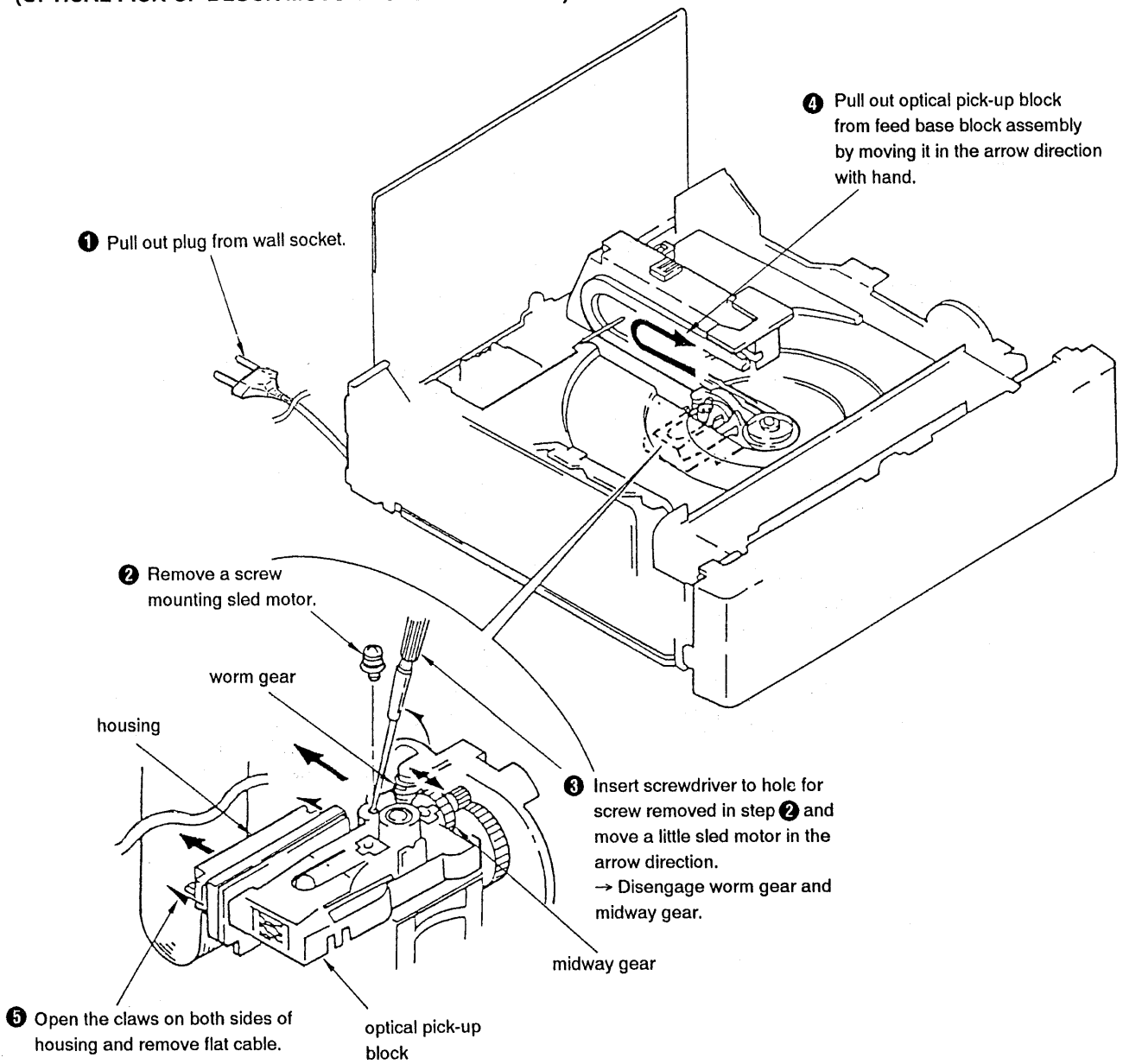
x	x	o
180°	90°	0°
∖	o	/

2-8. OPTICAL PICK-UP BLOCK

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

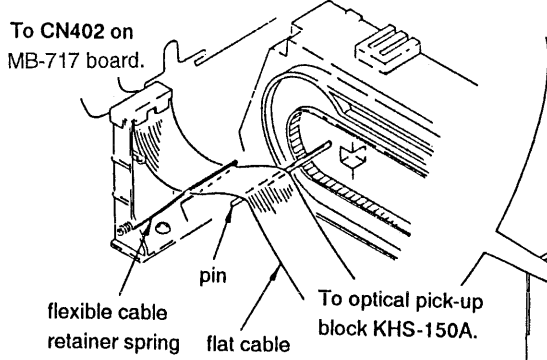


• DISASSEMBLE II
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)

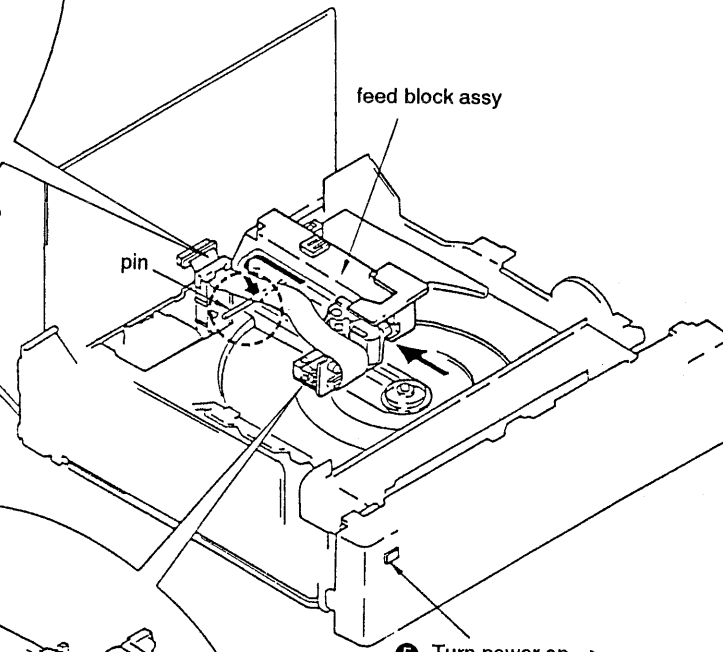


• ASSEMBLE

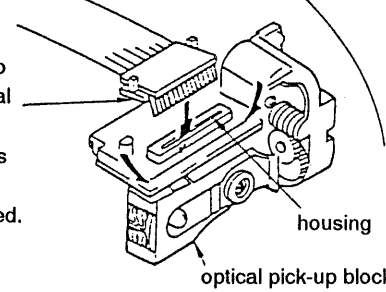
- ③ Confirm the flat cable goes through the flexible cable retainer spring and over the pin.



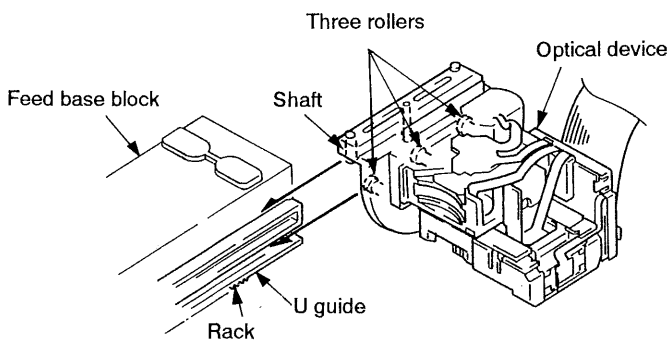
- ④ Insert plug to wall socket.



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



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



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

• Mounting

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

2-9. REMOVAL OF CONTROL GEAR

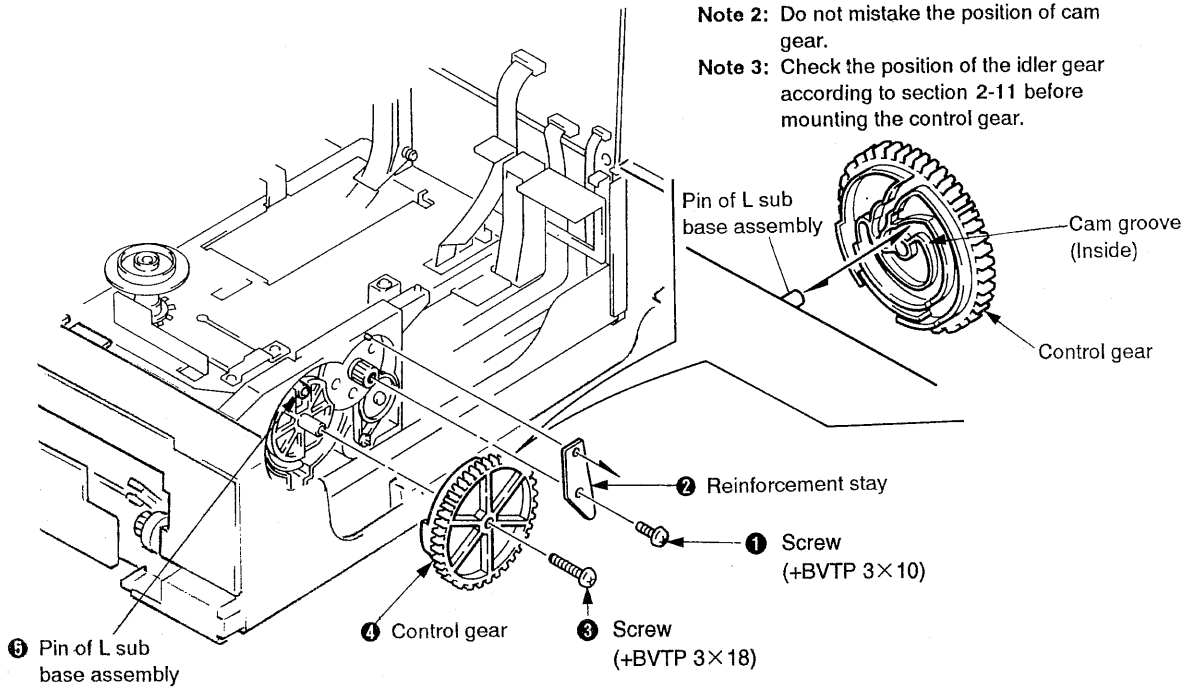
- Mounting the control gear

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

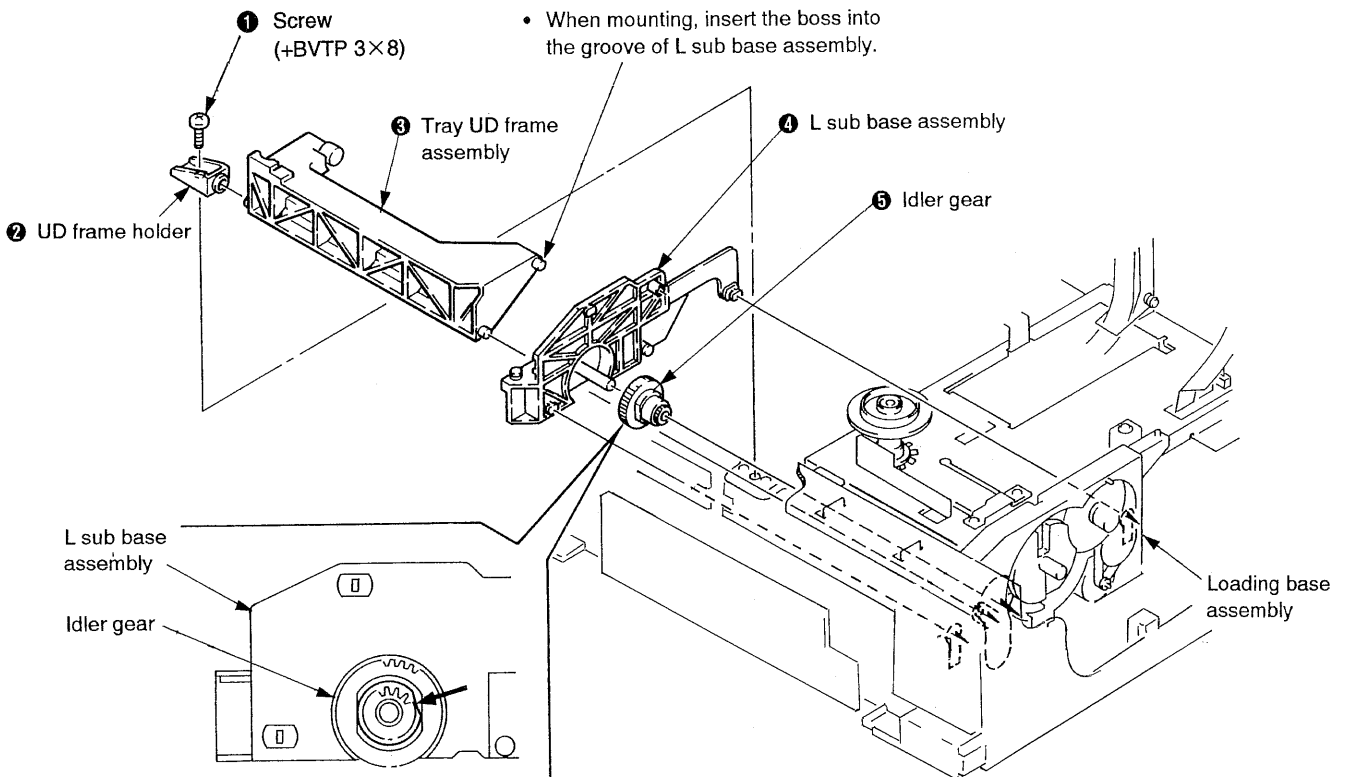
Note 1: Apply grease on the cam groove.

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

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



2-10. REMOVAL OF IDLER GEAR

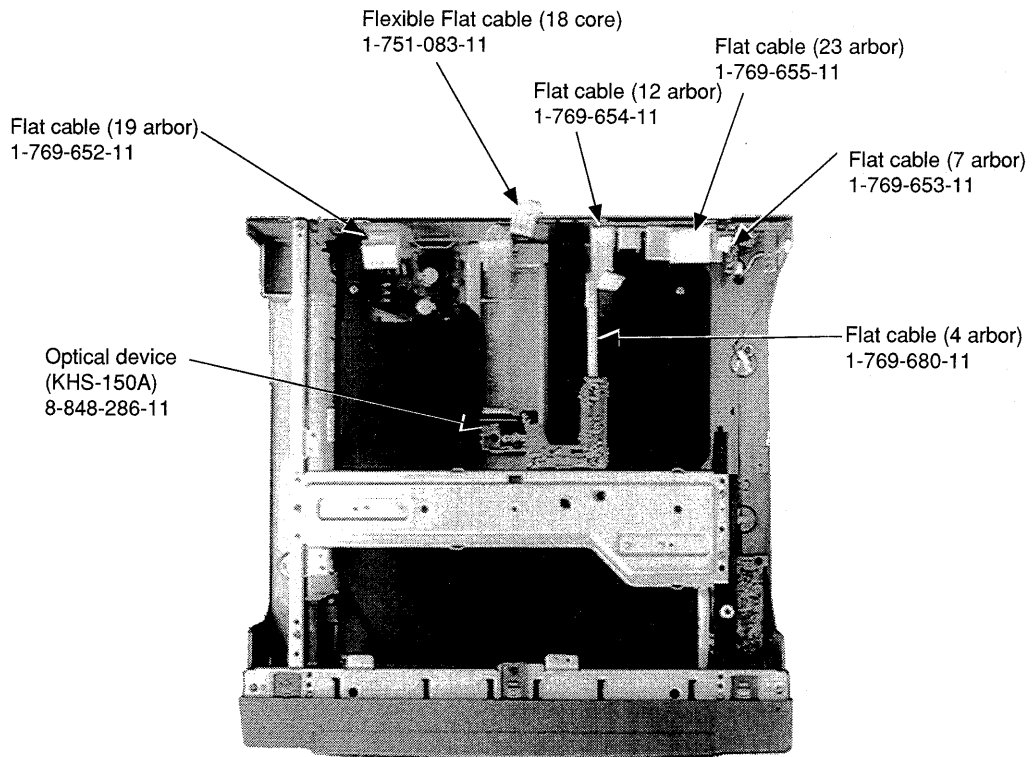


- When mounting, insert the boss into the groove of L sub base assembly.

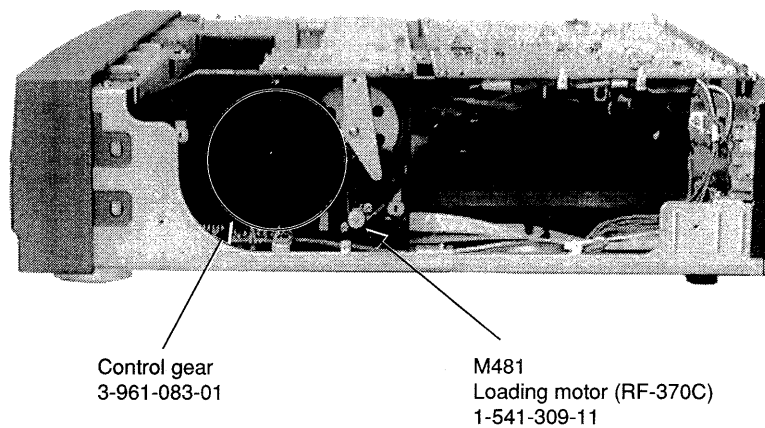
- Positioning the idler gear
Mount the idler gear with its notch faced upper right (indicated by the arrow).

2-11. INTERNAL VIEWS

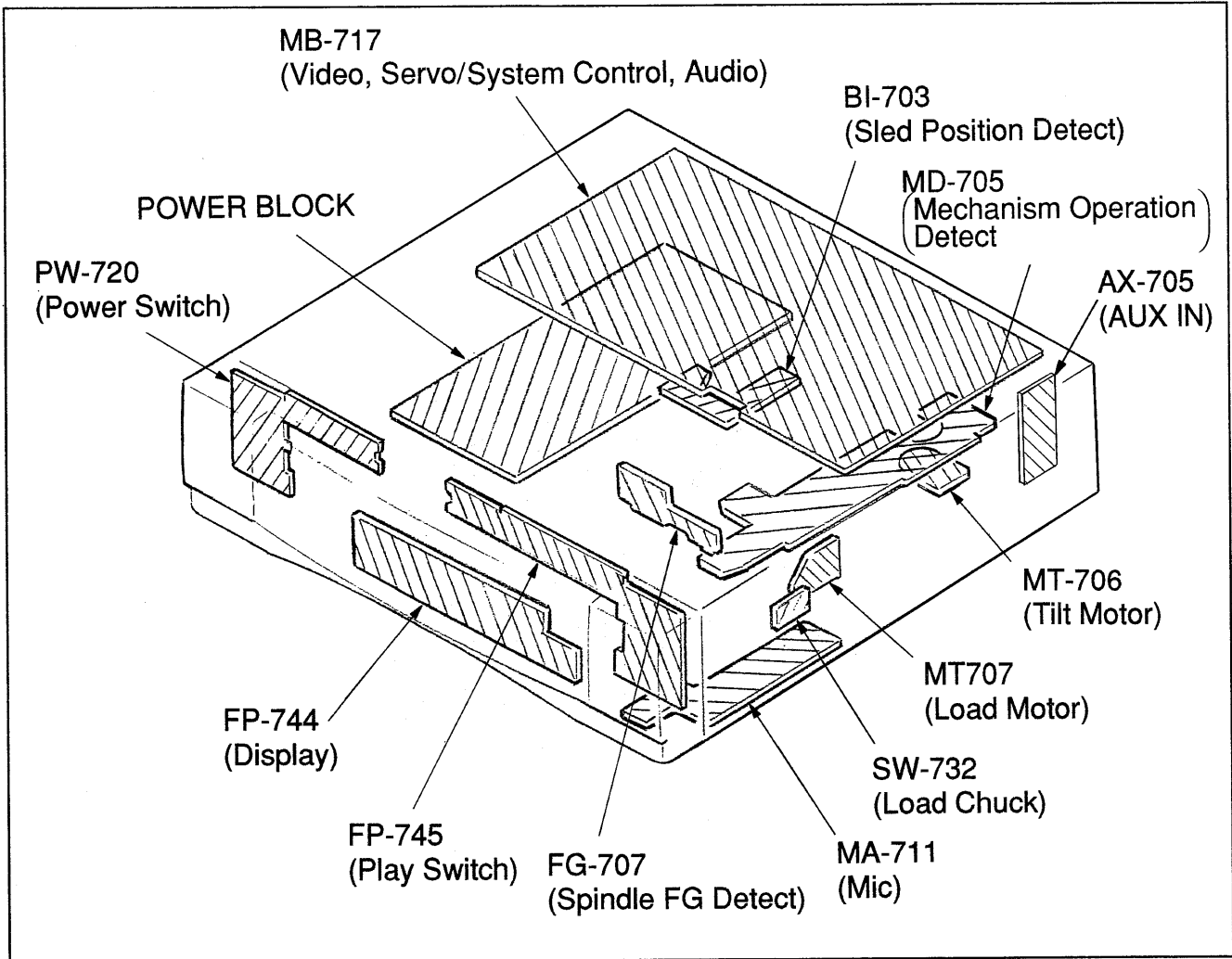
—Top View—



—Side View—

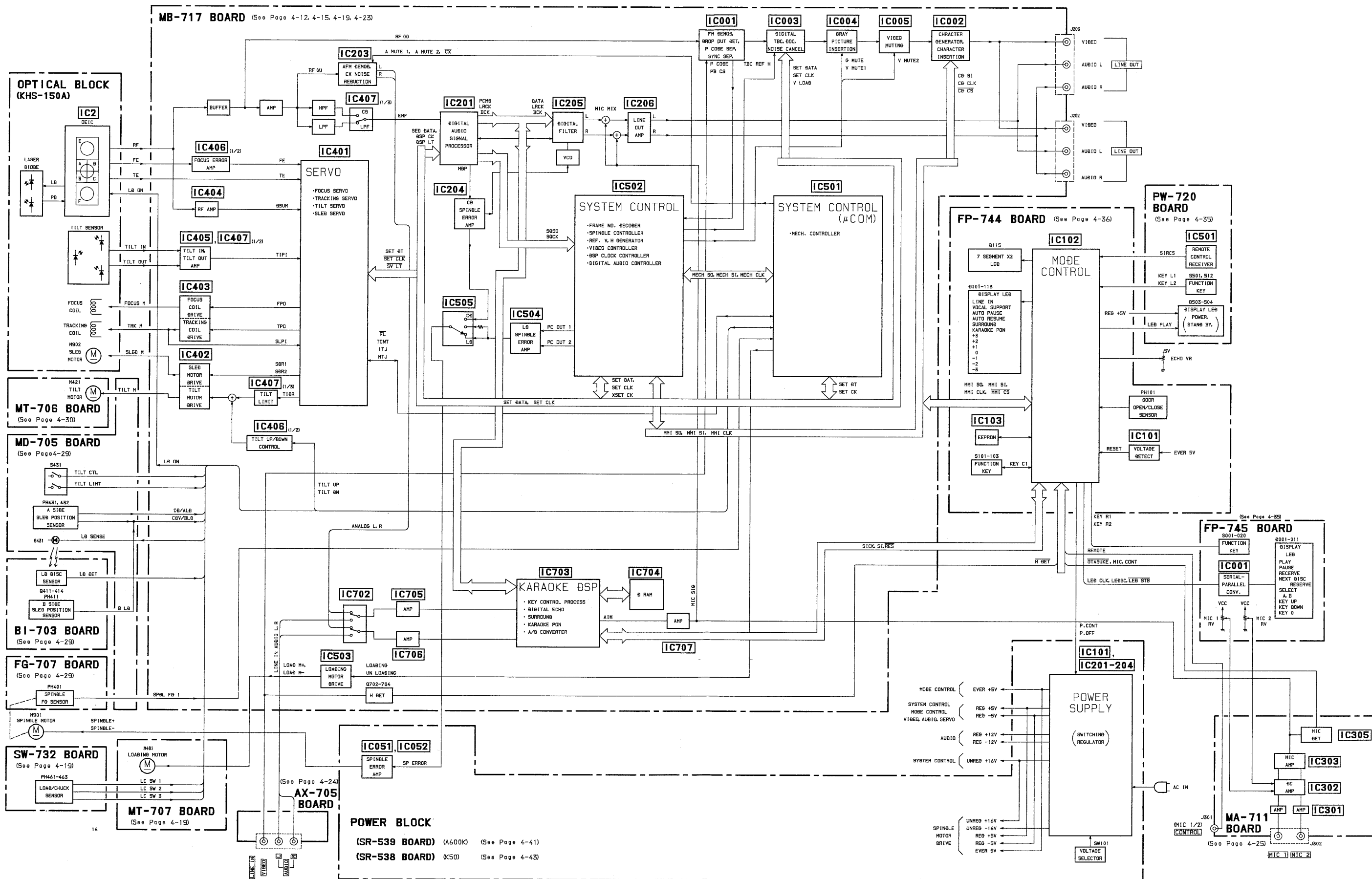


2-12. CIRCUIT BOARDS LOCATION

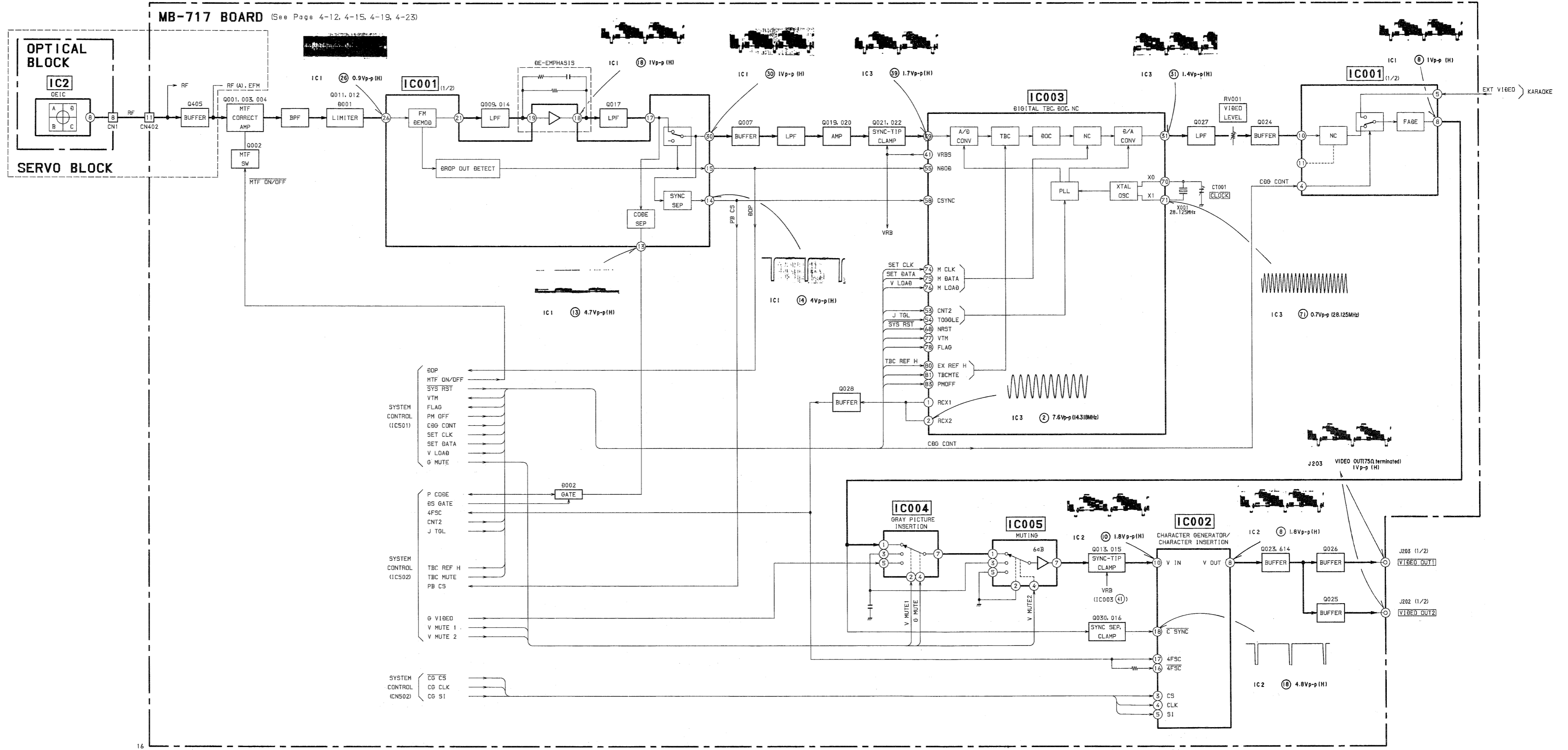


SECTION 3
BLOCK DIAGRAMS

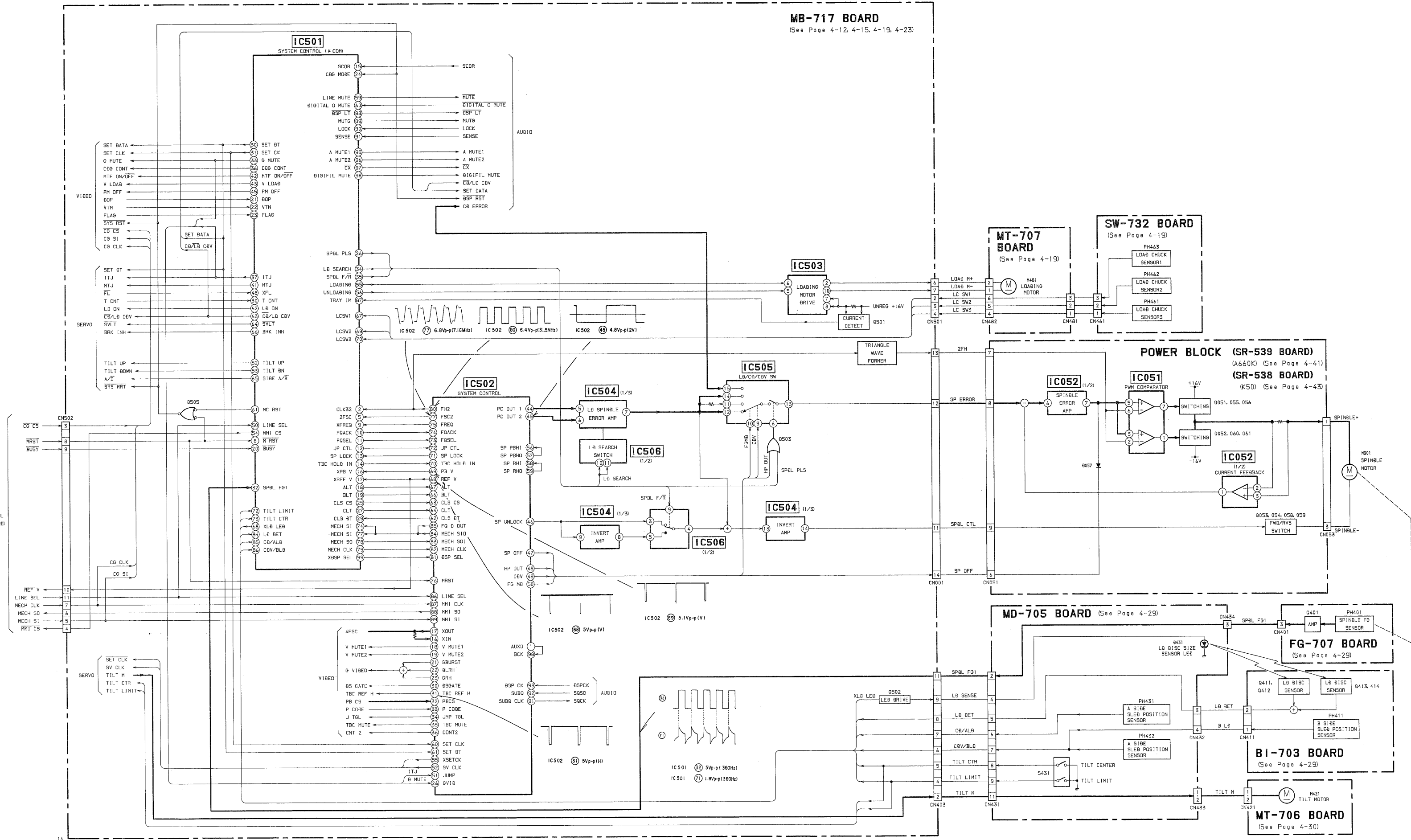
3-1. OVERALL BLOCK DIAGRAM



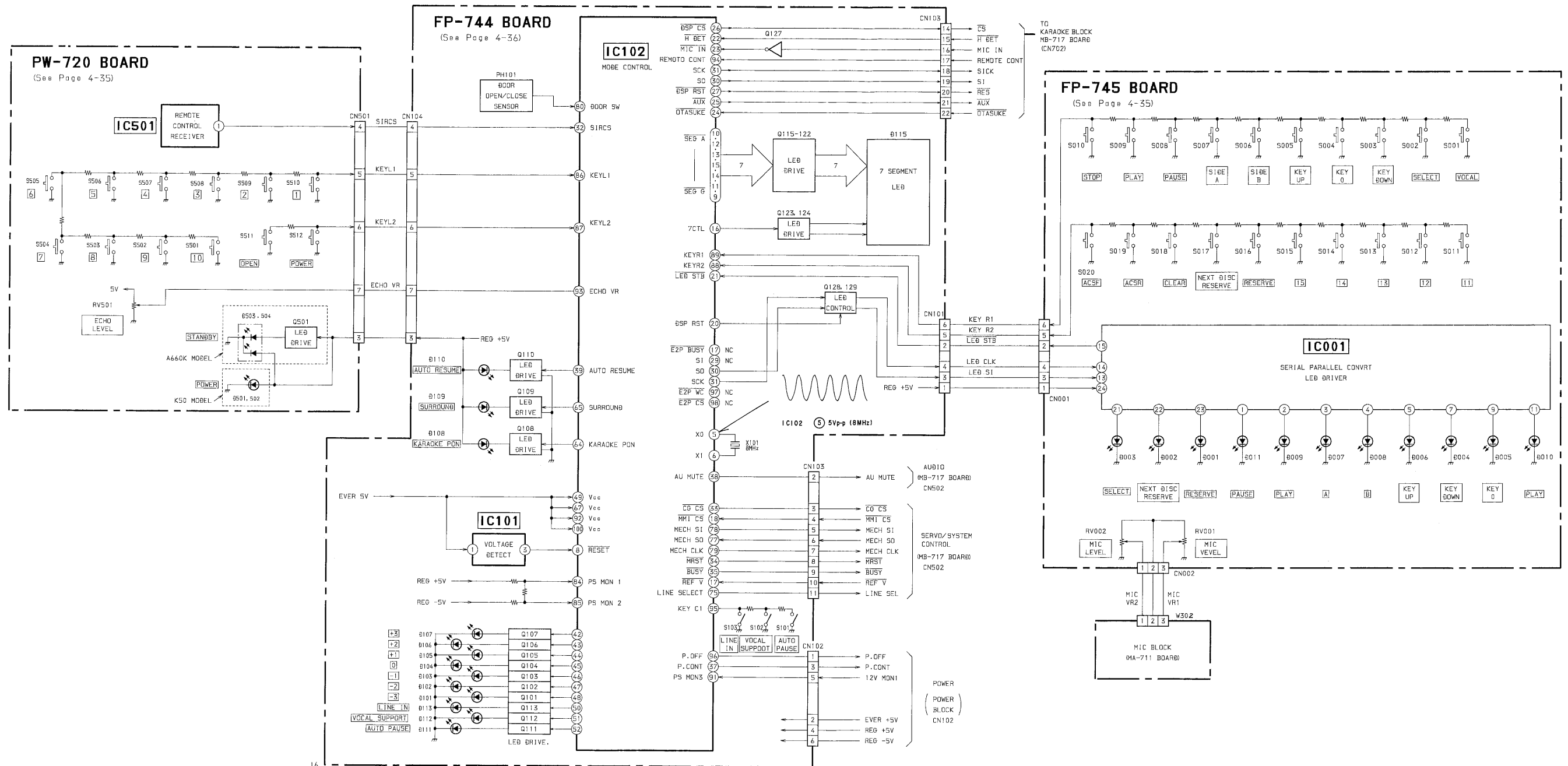
3-2. VIDEO BLOCK DIAGRAM

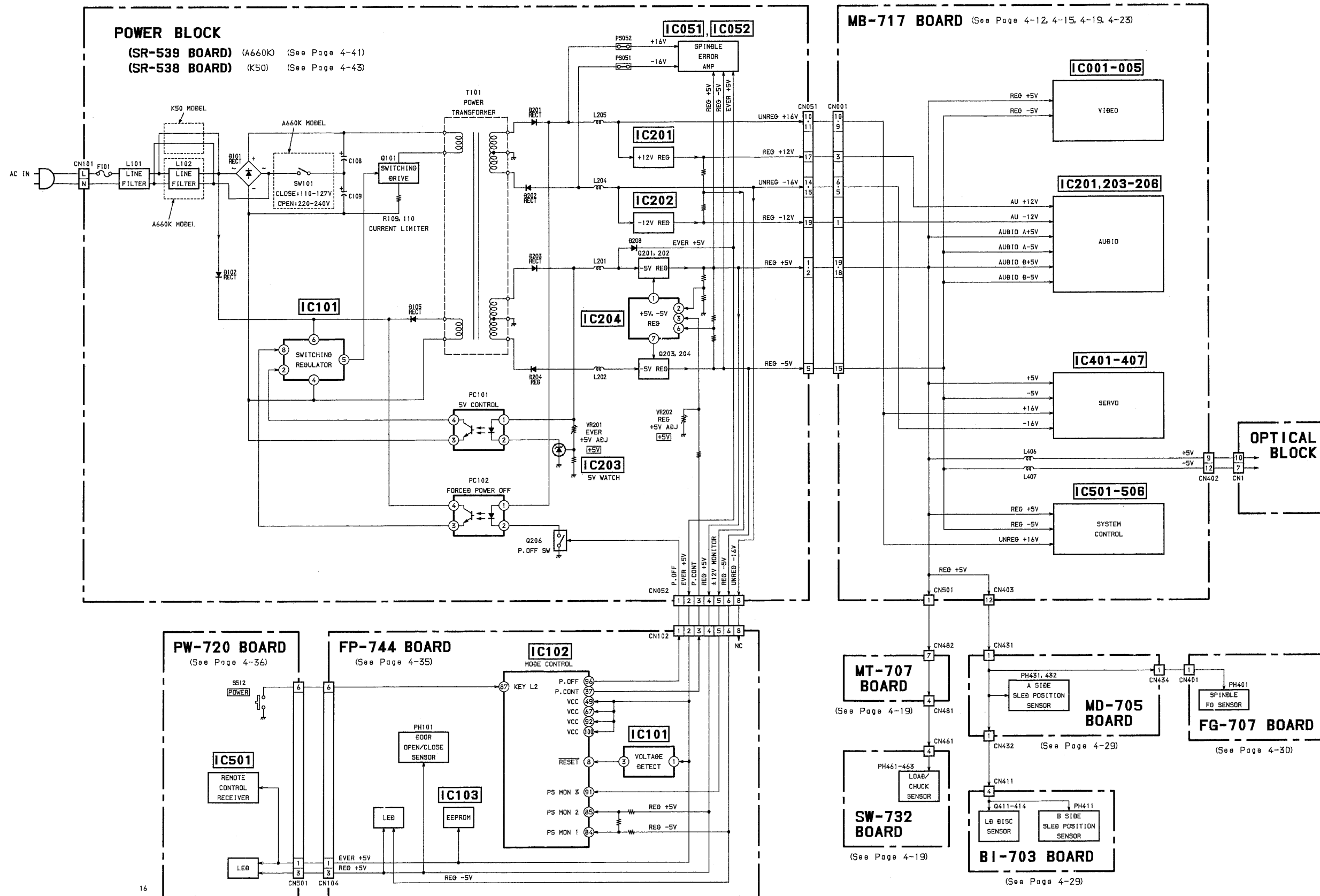


3-5. SYSTEM CONTROL BLOCK DIAGRAM



3-6. MODE CONTROL BLOCK DIAGRAM

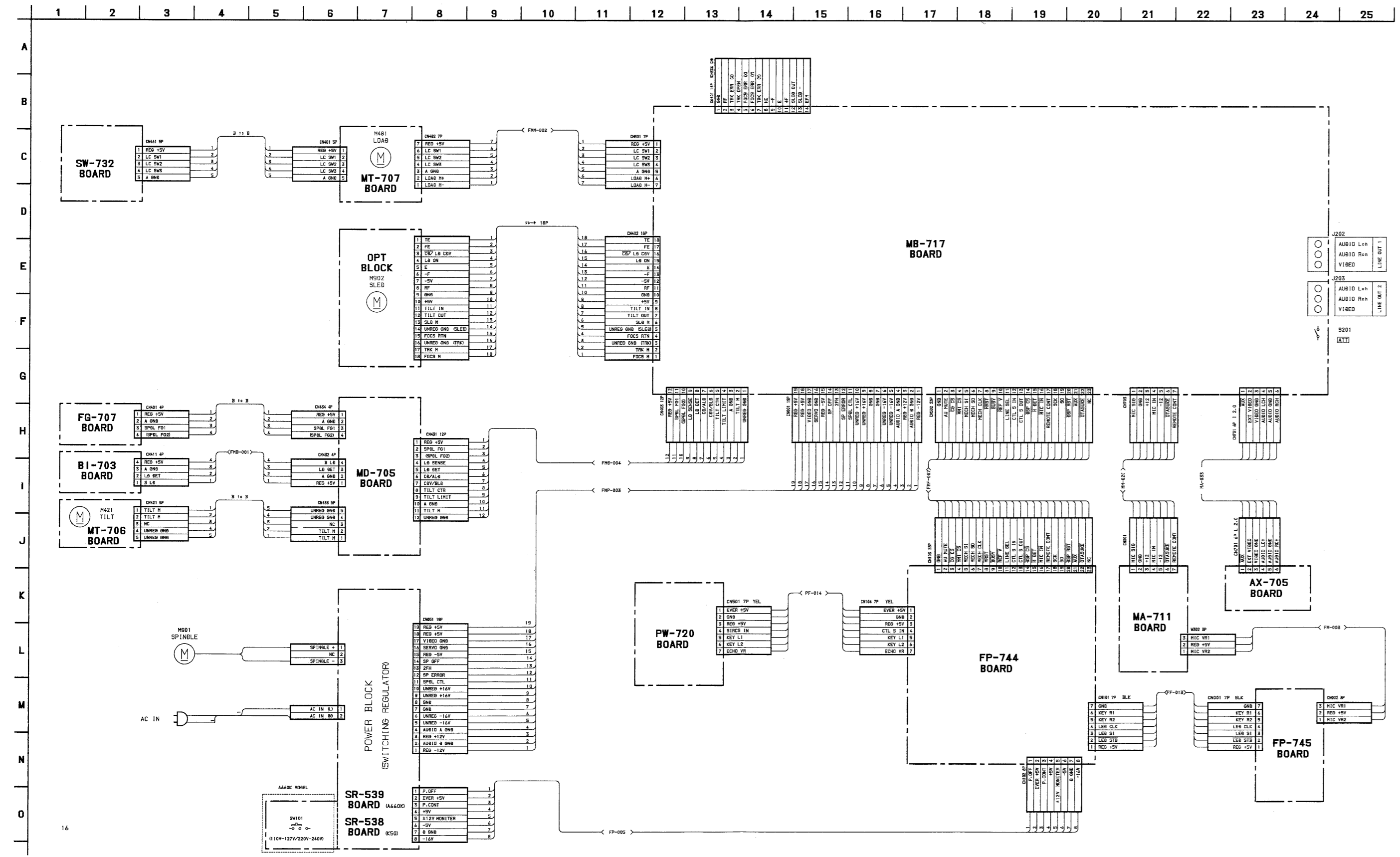




SECTION 4

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: μ μF. 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 △ 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.

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

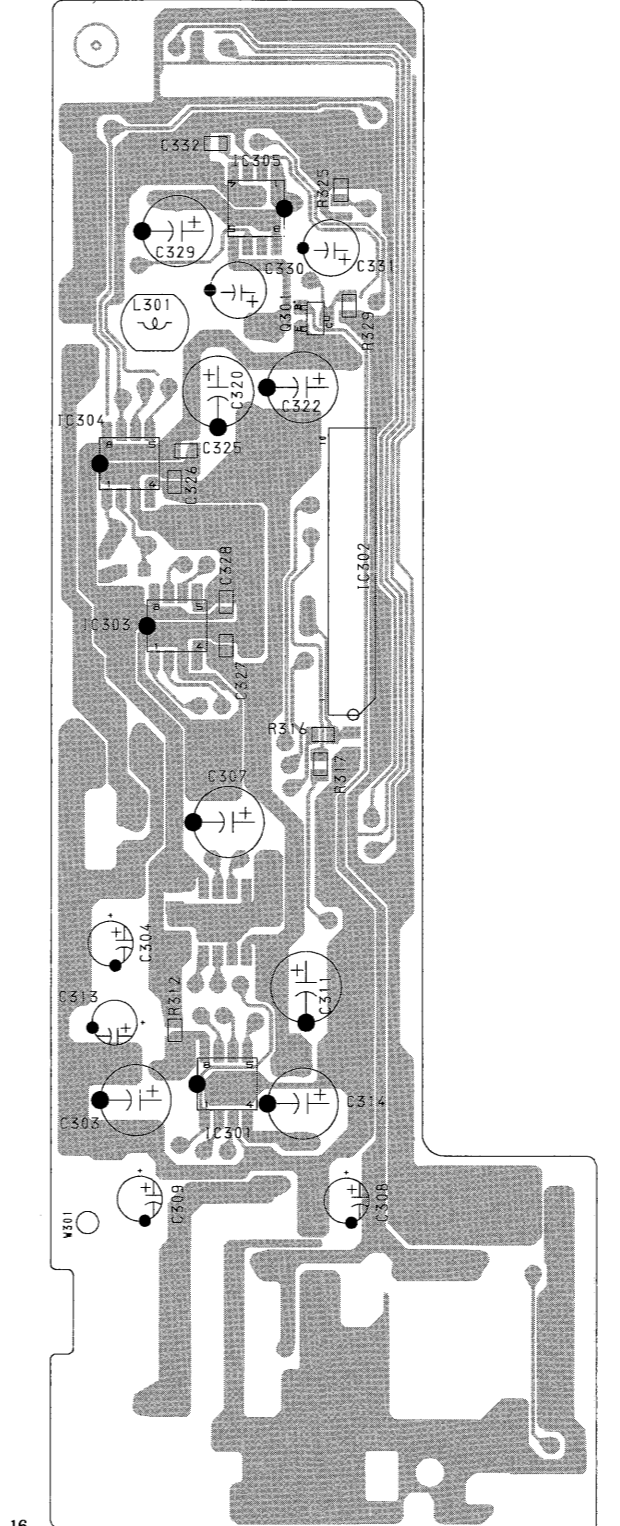
*: indicated by the color red.

4-3

MA-711 (MIC), AX-705(AUX IN) PRINTED WIRING BOARD

—Ref. No. MA-711 and AX-705 Boards; 3,000 Series—

MA-711 BOARD (COMPONENT SIDE)

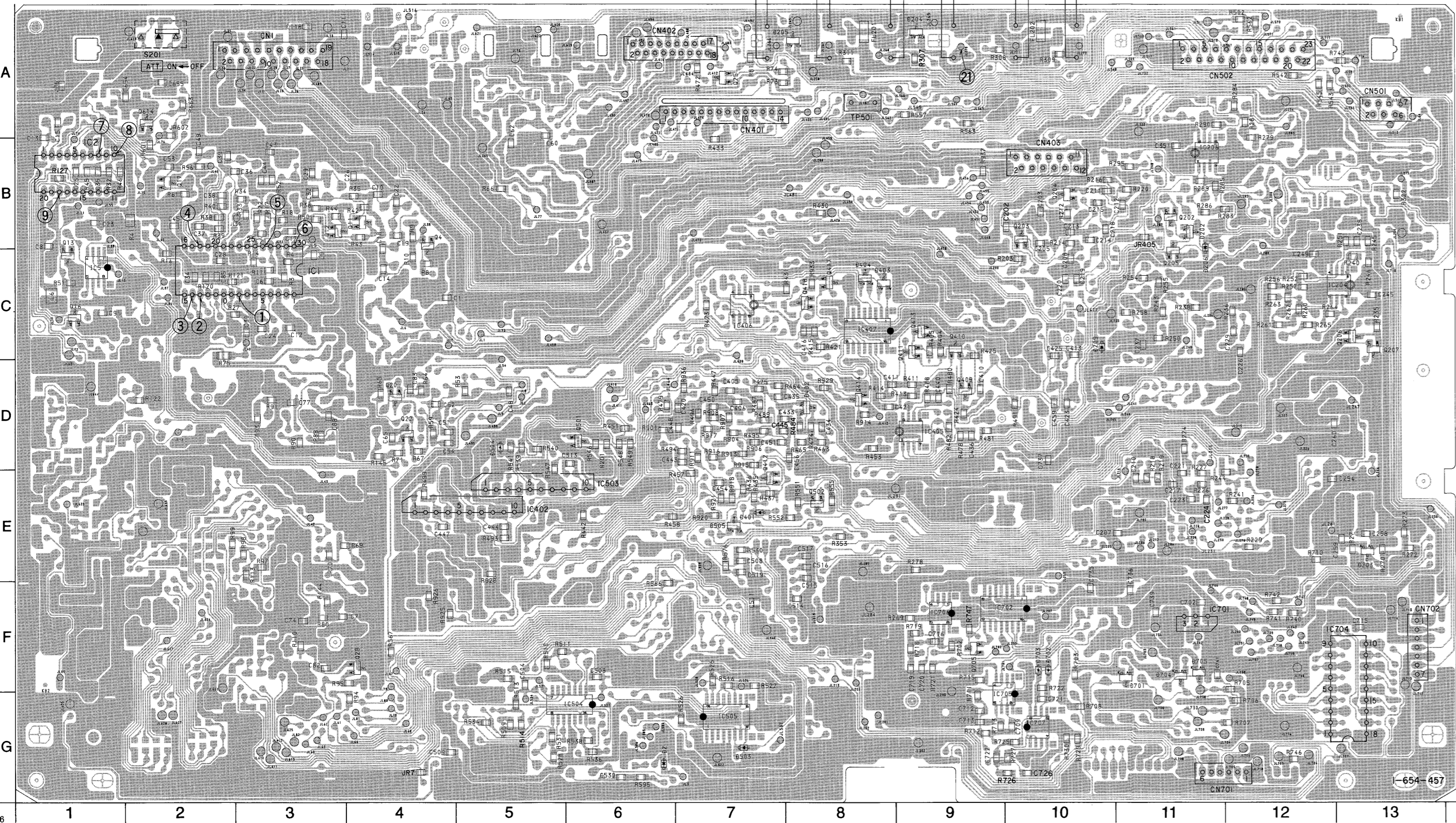


MDP-A660K/K50

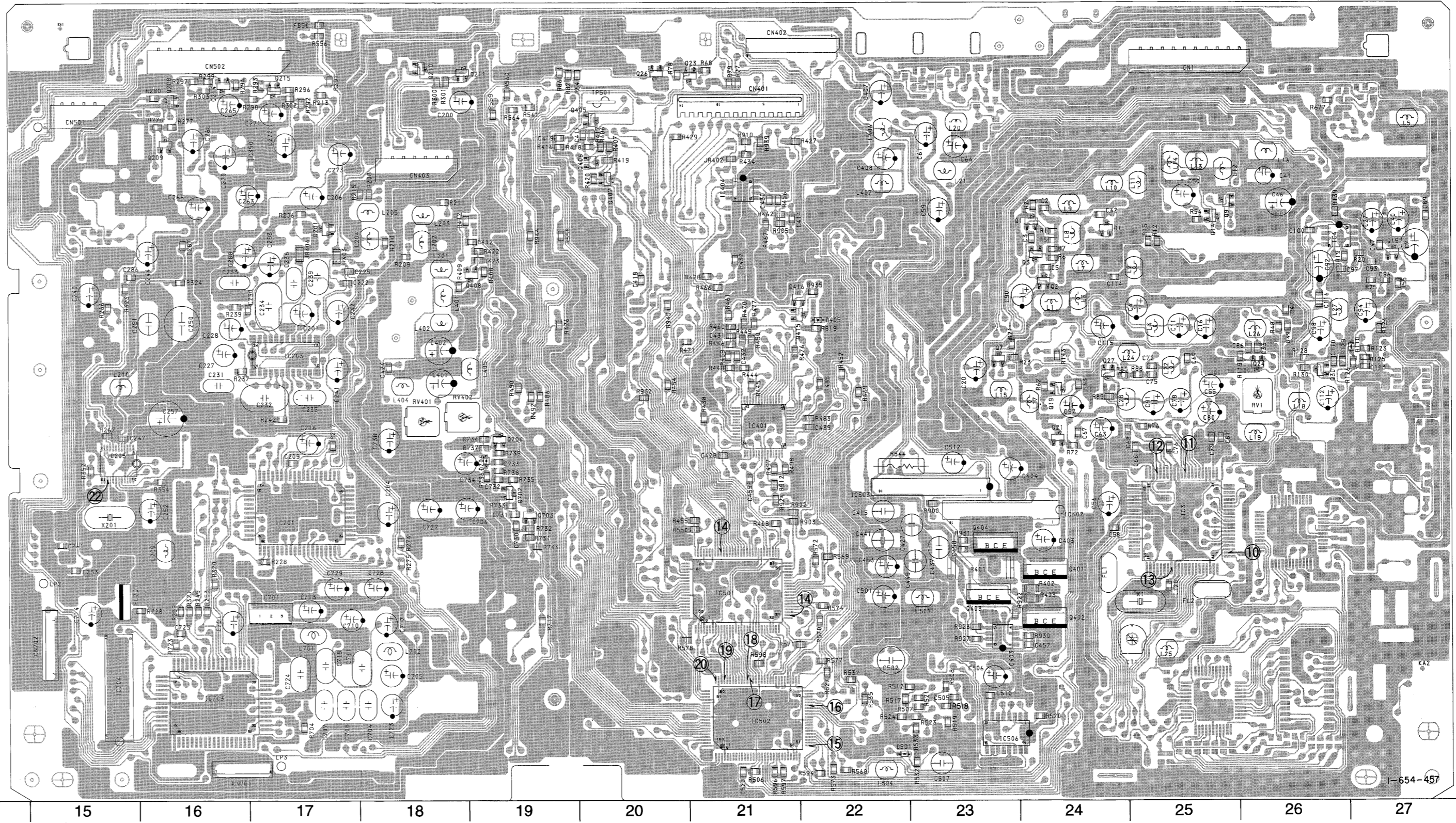
MB-717 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

—Ref. No. MB-717 Board; 1,000 Series—

MB-717 BOARD (CONDUCTOR SIDE)

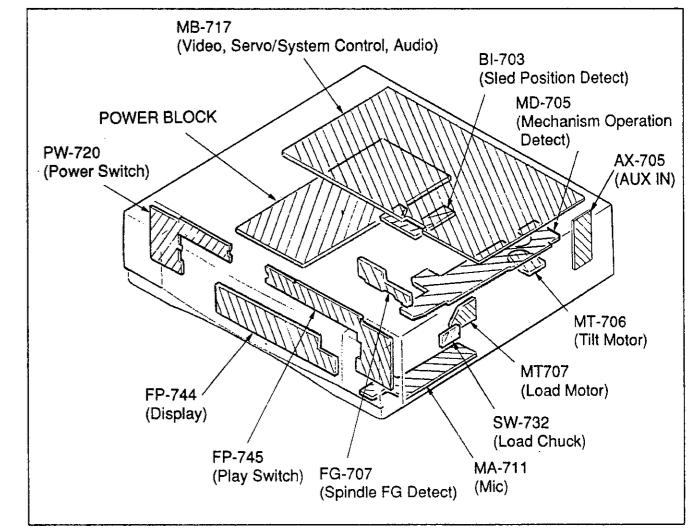


MB-717 BOARD (COMPONENT SIDE)

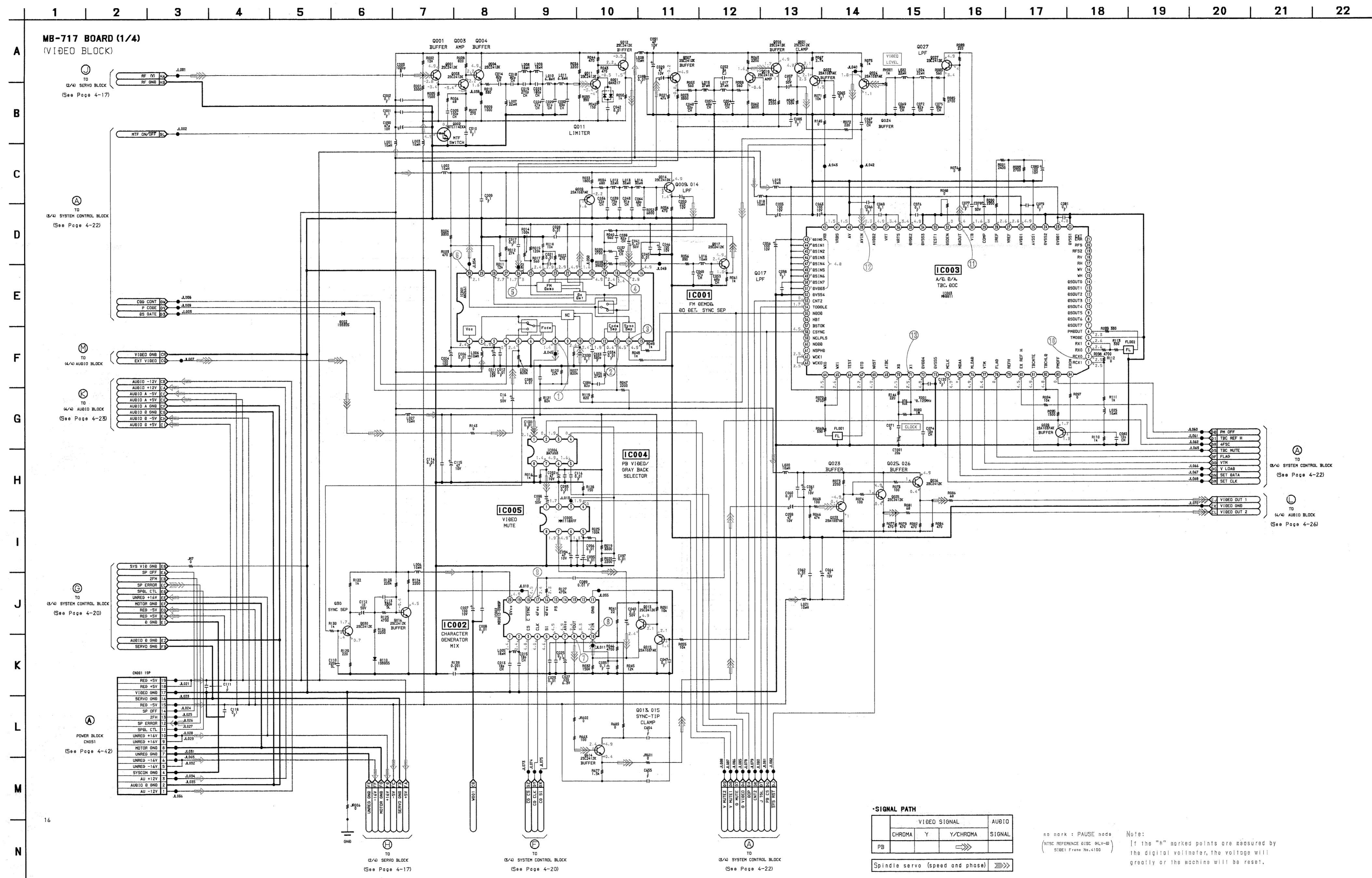


MB-717 BOARD

CN001 A-25	IC402 E-24	Q205 C-11
CN401 A-21	IC403 F-23	Q206 C-13
CN402 A-21	IC404 B-21	Q207 C-13
CN403 B-18	IC405 D-9	Q208 A-16
CN501 A-15	IC406 C-7	Q209 B-16
CN502 A-16	IC407 C-8	Q210 A-18
CN701 G-16	IC501 F-21	Q211 A-18
CN702 F-15	IC502 G-21	Q214 A-16
	IC503 E-22	Q215 A-17
CT001 F-24	IC504 G-6	Q401 E-24
	IC505 G-7	Q402 F-24
D001 B-24	IC506 G-23	Q403 F-23
D002 G-6	IC701 F-17	Q404 E-23
D110 C-26	IC702 F-9	Q405 A-20
D202 B-11	IC703 G-16	Q406 B-20
D203 E-13	IC704 G-15	Q407 B-20
D204 A-9	IC705 G-9	Q408 C-19
D205 A-8	IC706 F-9	Q409 D-9
D206 C-11	IC707 G-10	Q410 C-9
D209 C-10		Q411 C-9
D401 E-7	0001 B-24	Q412 E-7
D402 D-8	0002 C-24	Q413 C-9
D403 C-8	0003 C-24	Q414 D-8
D404 C-8	0004 B-4	Q415 C-21
D405 C-22	0007 C-23	Q416 C-21
D501 G-22	0009 B-25	Q417 C-8
D503 G-7	0011 B-4	Q418 C-8
D504 D-5	0012 B-3	Q501 D-6
D505 E-7	0013 C-1	Q502 E-8
D701 F-11	0014 B-25	Q614 A-2
D702 F-11	0015 B-27	Q702 E-19
D702 F-10	0016 C-1	Q703 E-19
D703 F-10	0017 B-2	Q704 D-19
D704 F-11	0019 D-24	Q705 F-9
D705 F-11	0020 D-4	
D706 D-19	0021 D-24	RW001 D-26
	0022 D-4	RW401 D-18
	0023 A-20	RW402 D-18
IC001 C-3	0024 C-26	
IC002 B-1	0025 A-7	
IC003 E-25	0026 A-20	
IC004 B-26	0027 D-24	
IC005 C-1	0028 F-4	
IC201 E-17	0028 F-4	
IC203 C-17	0030 D-26	
IC204 C-13	Q201 B-17	
IC205 D-15	Q202 B-11	
IC206 B-11	Q203 B-10	
IC401 D-21	Q204 B-10	



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



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

1	IC1 (8) 1Vp-p (H)	9	IC2 (10) 1.8Vp-p (H)
2	IC1 (13) 4.7Vp-p (H)	10	IC2 (18) 4.8Vp-p (H)
3	IC1 (4) 4Vp-p (H)	11	IC3 (2) 7.6Vp-p (14318MHz)
4	IC1 (8) 1Vp-p (H)	12	IC3 (3) 1.4Vp-p (H)
5	IC1 (26) 0.9Vp-p (H)	13	IC3 (39) 1.7Vp-p (H)
6	IC1 (30) 1Vp-p (H)	7	IC3 (7) 0.7Vp-p (28.125MHz)
7	IC2 (8) 1.8Vp-p (H)		

SIGNAL PATH

	VIDEO SIGNAL	AUDIO SIGNAL
CHROMA	Y	Y/CHROMA
PB	←→	
Spindle servo (speed and phase)	→→→	

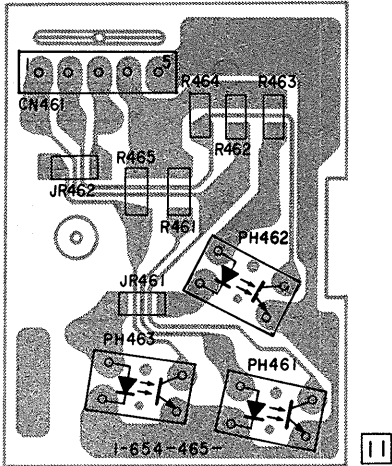
no mark - PAUSE mode
NTSC REFERENCE DISC (HLV-B)
SIDE1 Form No.4100

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

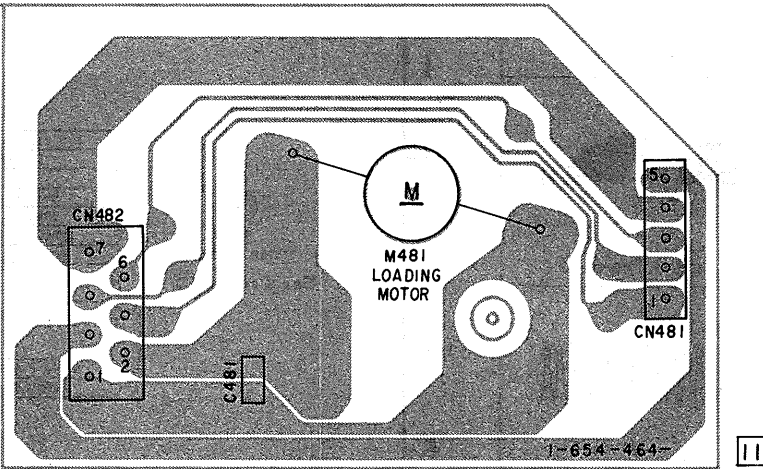
MT-707 (LOADING MOTOR), SW-732 (LOAD CHUCK) PRINTED WIRING BOARDS

—Ref. No. MT-707 and SW-732 Boards; 4,000 Series—

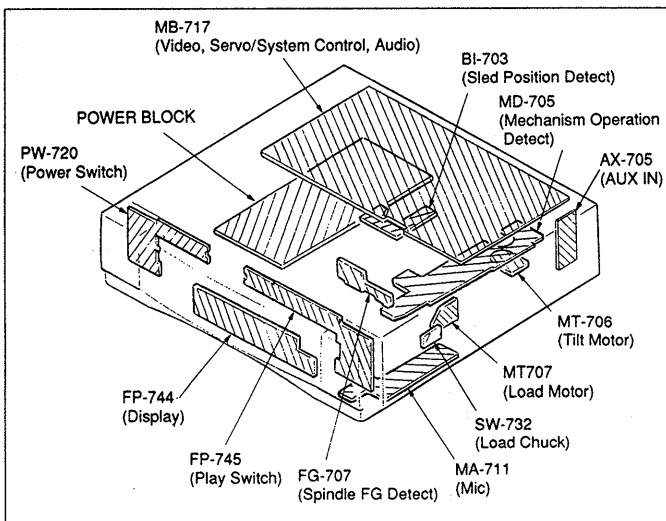
SW-732 BOARD

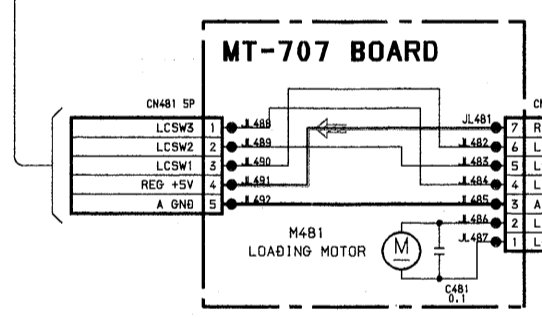
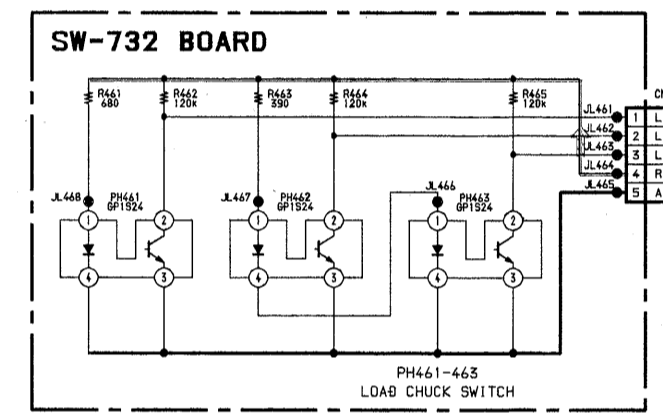
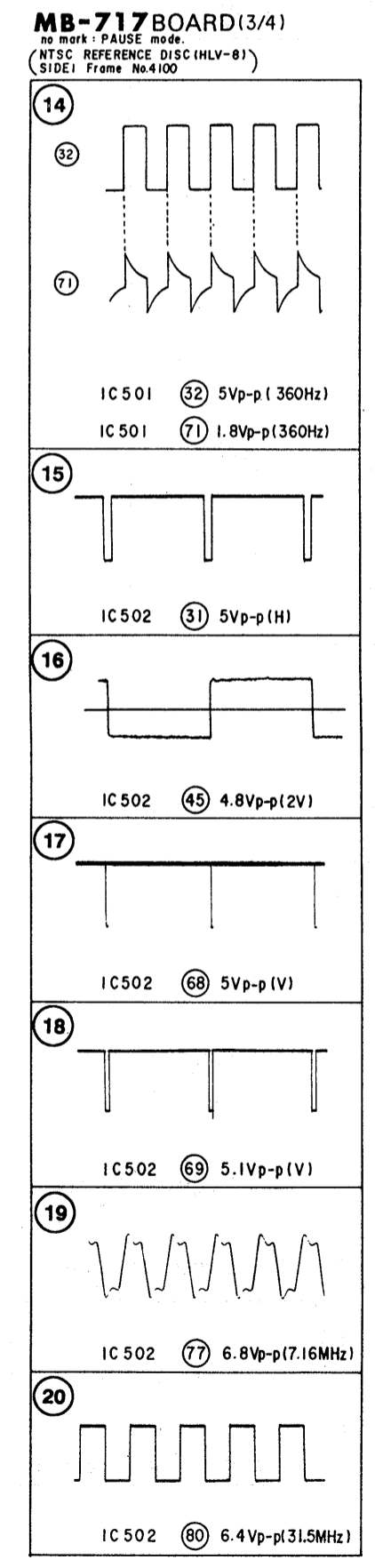
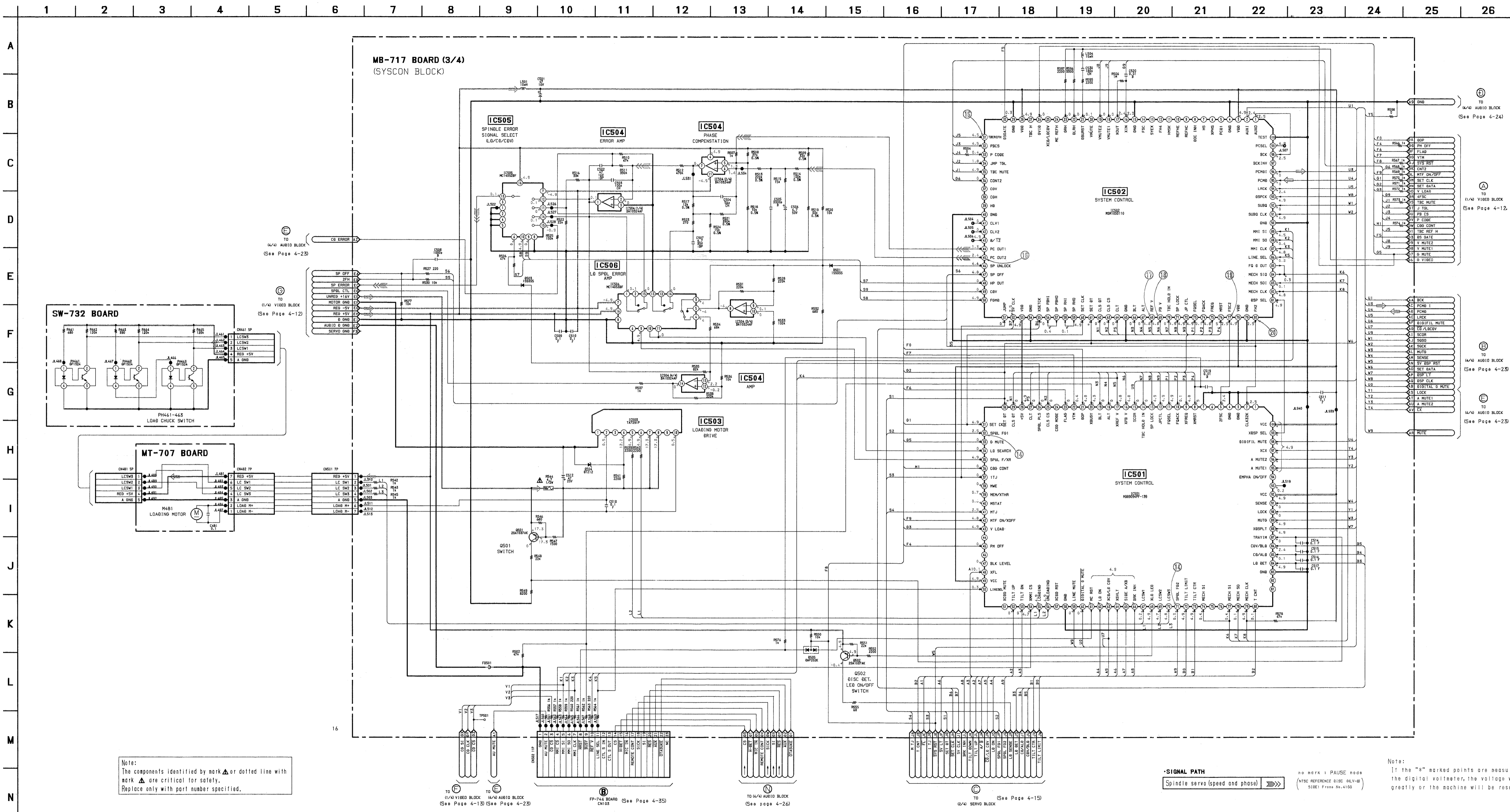


MT-707 BOARD



16

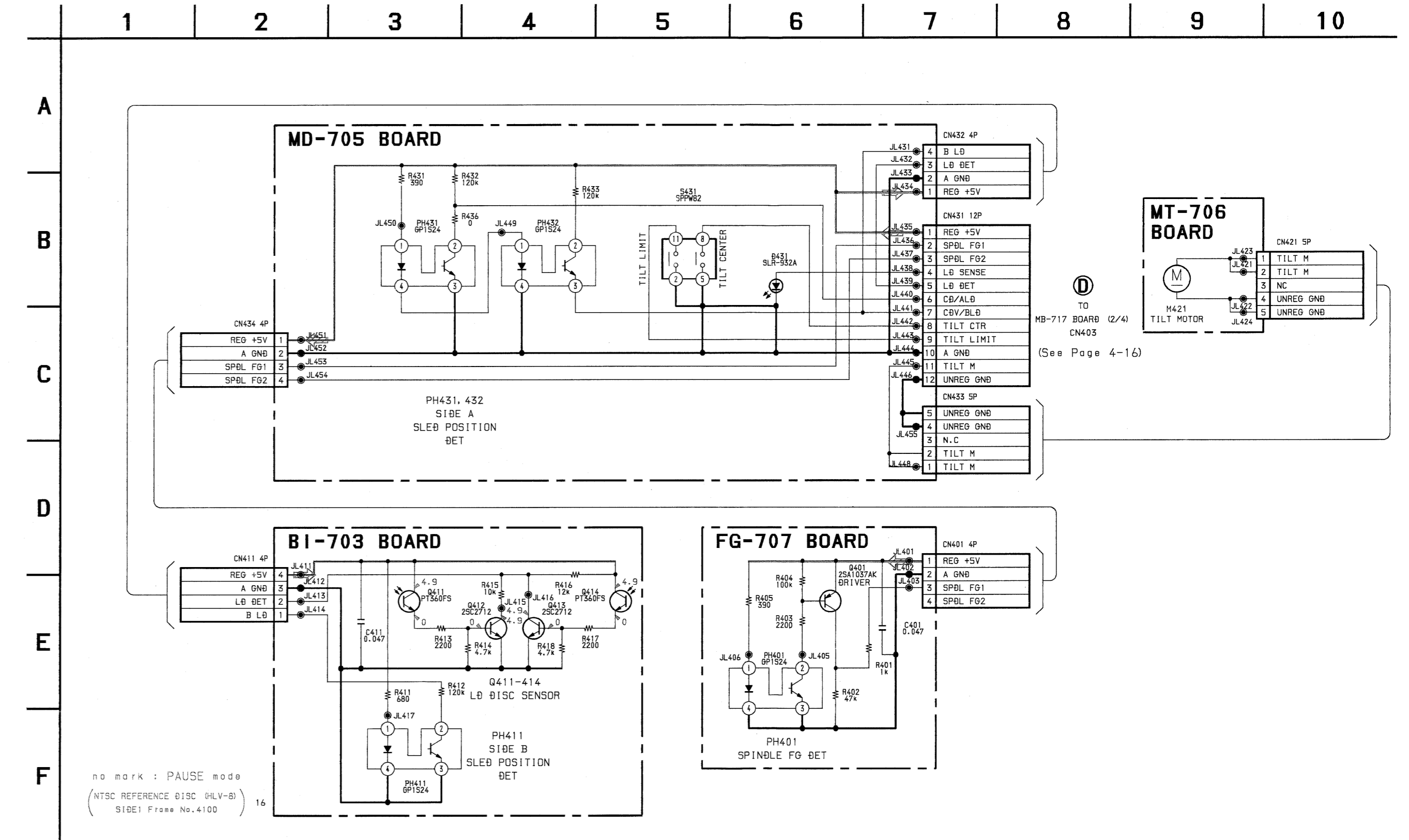
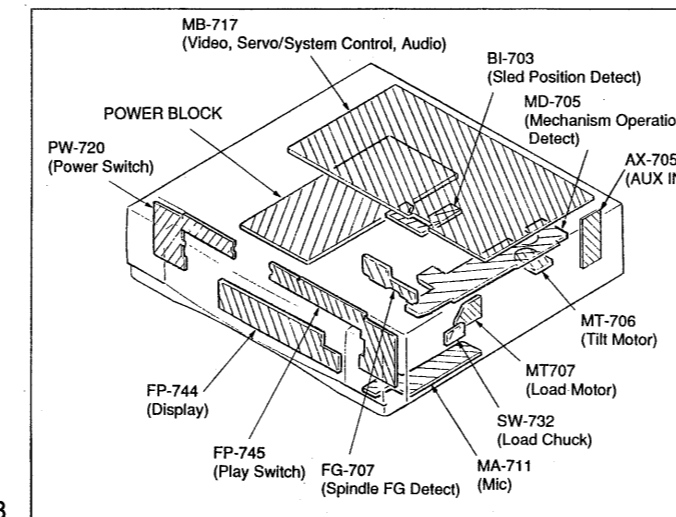
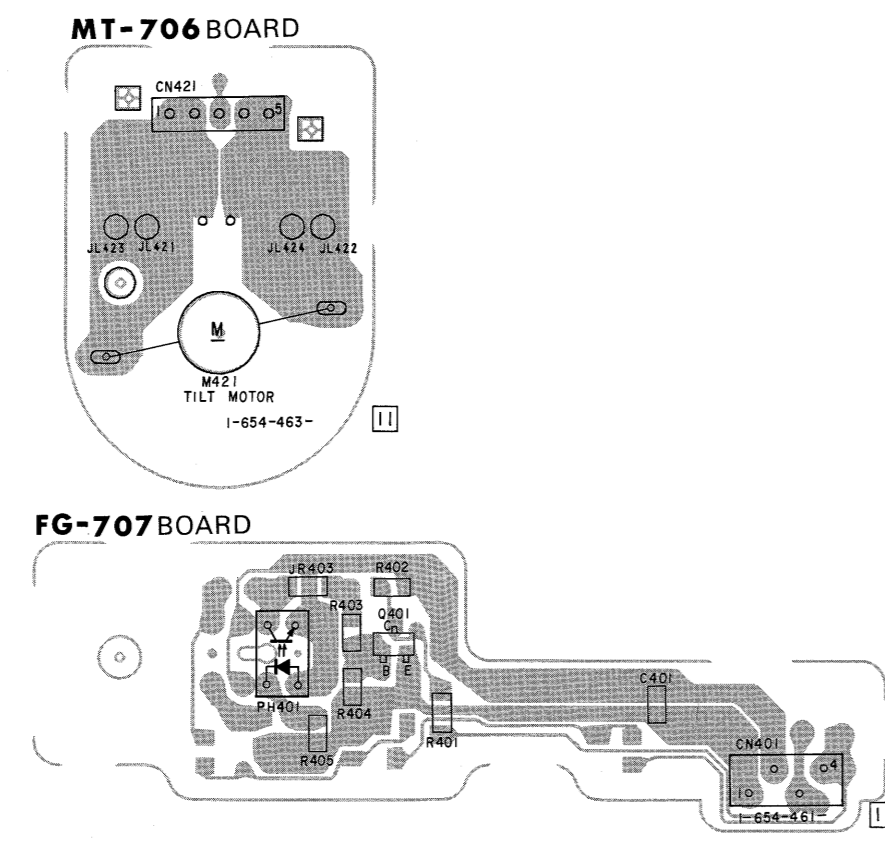
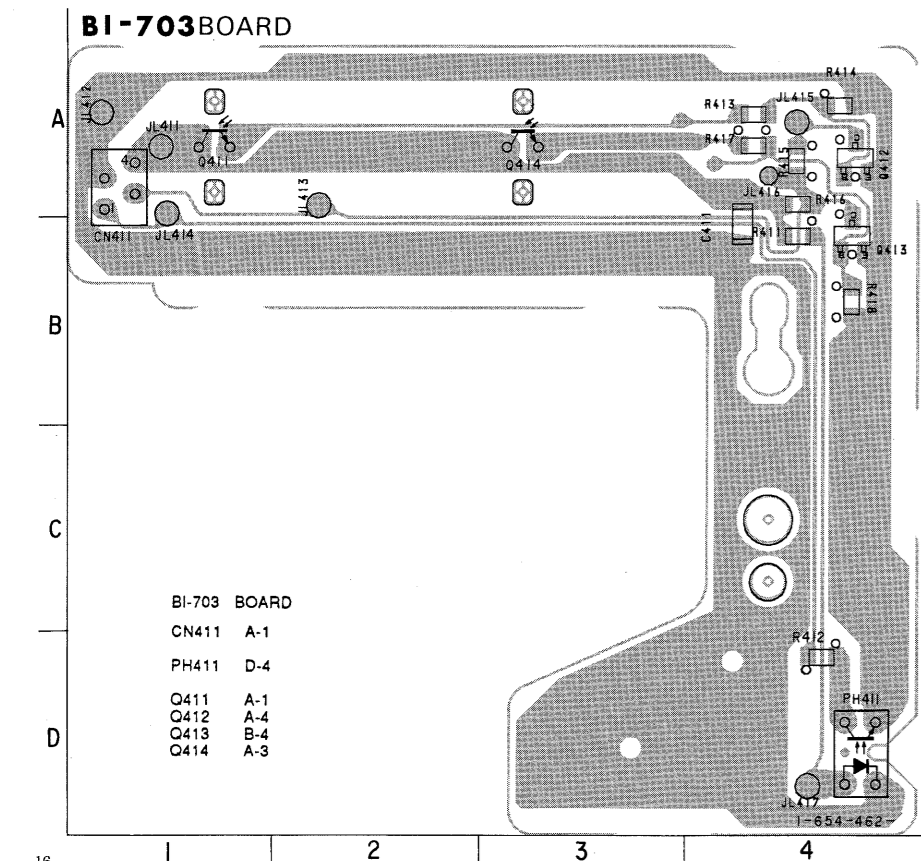
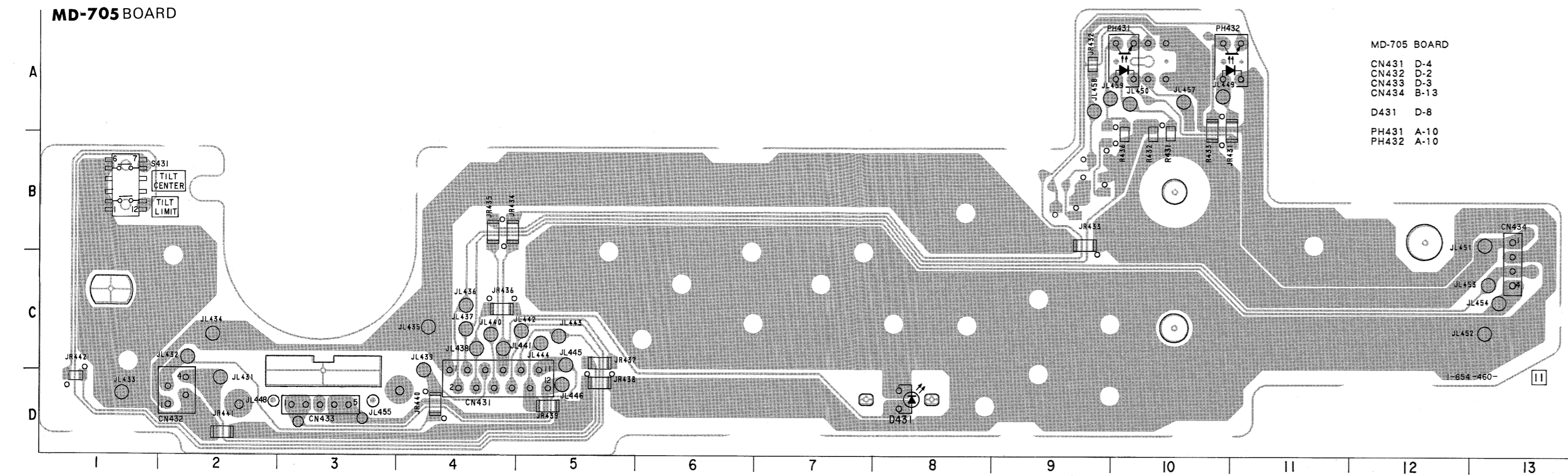




Note:
The components identified by mark Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

•SIGNAL PATH
Spindle servo (speed and phase)

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

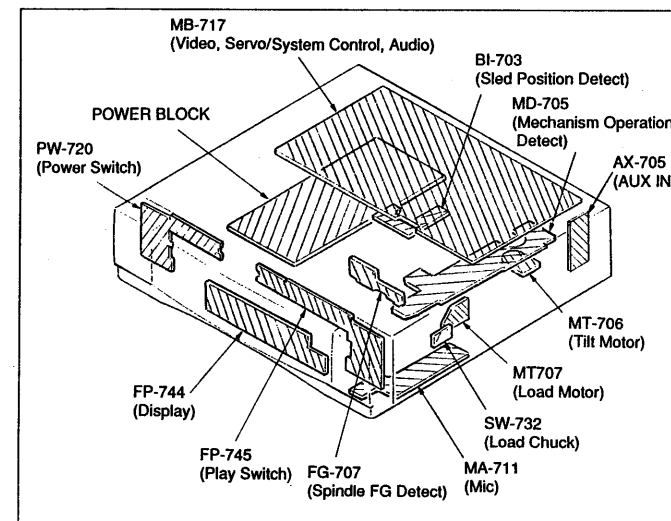


FP-744 (DISPLAY), FP-745 (PLAY SWITCH), PW-720 (POWER SWITCH) PRINTED WIRING BOARDS

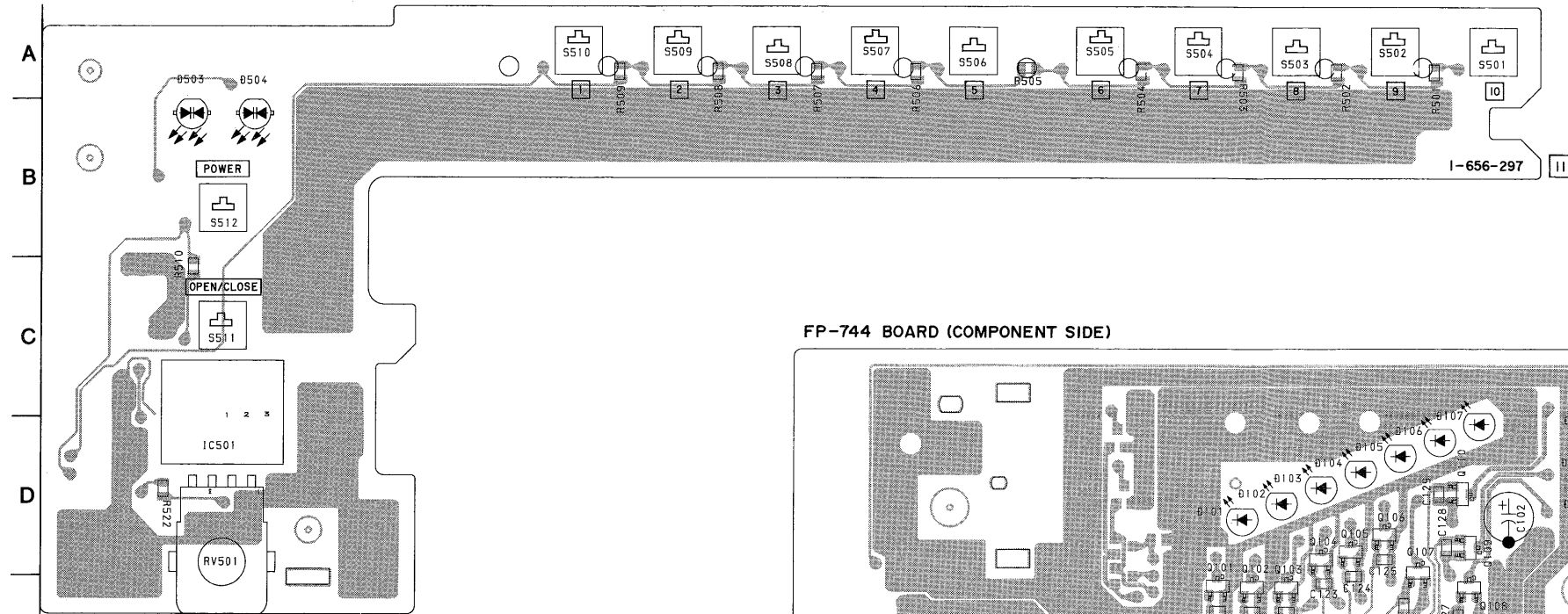
—Ref. No. FP-744, FP-745 and PW-720 Board; 3,000 Series—

FP-744 BOARD FP-745 BOARD PW-720 BOARD

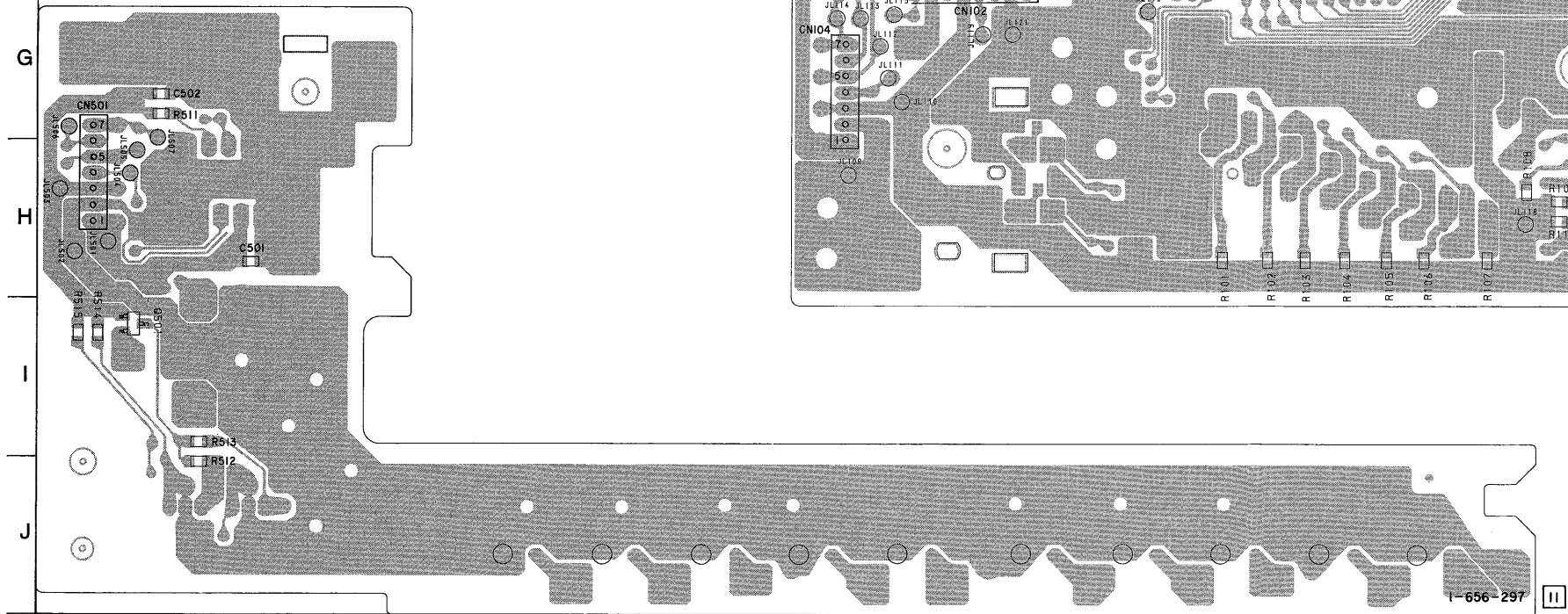
CN101 H-16	CN001 I-22	CN501 G-1
CN102 G-6	CN002 G-22	
CN103 G-16		
CN104 G-6		
D101 D-8	D001 A-15	D503 A-1
D102 D-8	D002 A-15	D504 A-2
D103 D-8	D003 B-19	
D104 D-9	D004 B-20	
D105 D-9	D005 B-21	IC501 D-2
D106 D-9	D006 B-21	Q501 I-1
D107 D-9	D007 B-20	
D108 D-10	D008 B-21	
D109 D-10	D009 C-21	
D110 D-10	D010 C-21	
D111 E-15	D011 D-20	
D112 E-16		
D113 E-17		
D115 D-12	IC001 B-19	
IC101 D-12		
IC102 G-14		
IC103 C-13		
Q101 E-8		
Q102 E-8		
Q103 E-8		
Q104 D-9		
Q105 D-9		
Q106 D-9		
Q107 D-9		
Q108 E-10		
Q109 D-10		
Q110 D-9		
Q111 E-15		
Q112 E-16		
Q113 E-17		
Q115 E-11		
Q116 E-11		
Q118 E-11		
Q119 E-11		
Q120 E-10		
Q121 E-10		
Q122 E-10		
Q123 D-11		
Q124 D-11		
Q127 E-15		
Q128 D-16		
Q129 D-16		



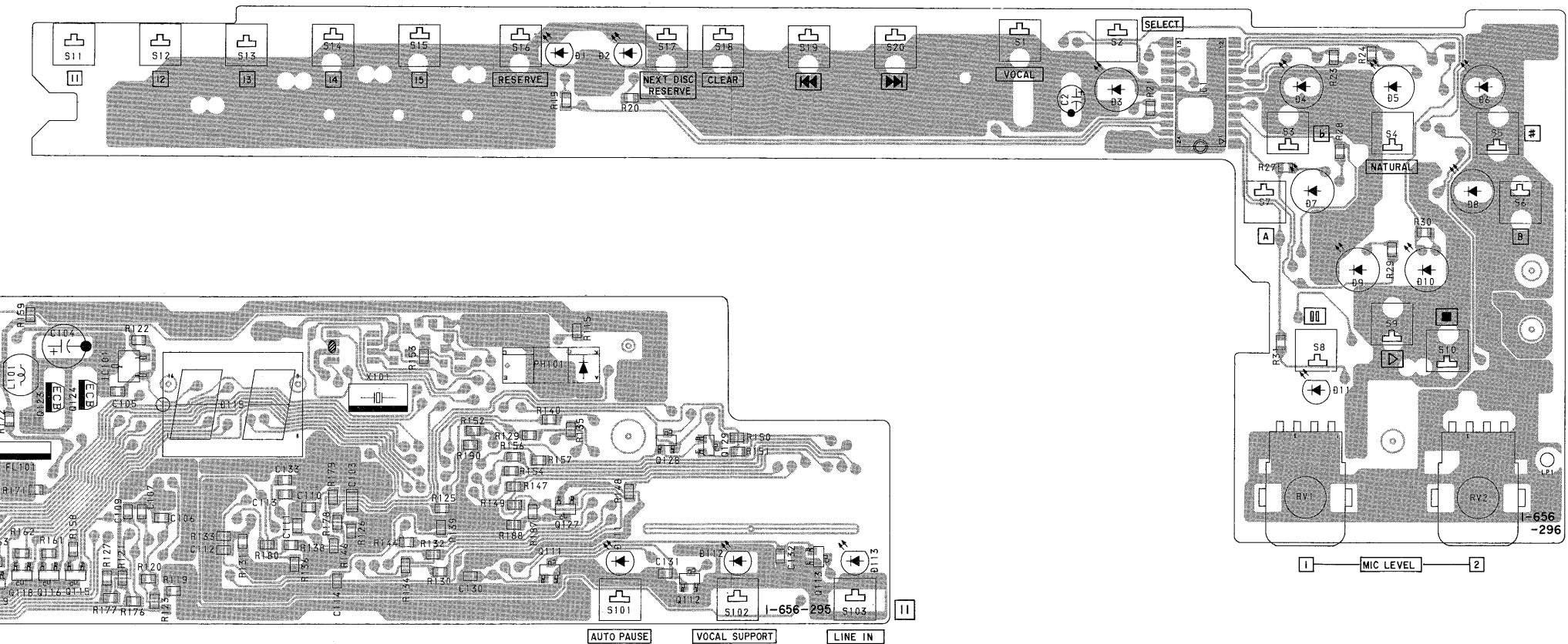
PW-720 BOARD (COMPONENT SIDE)



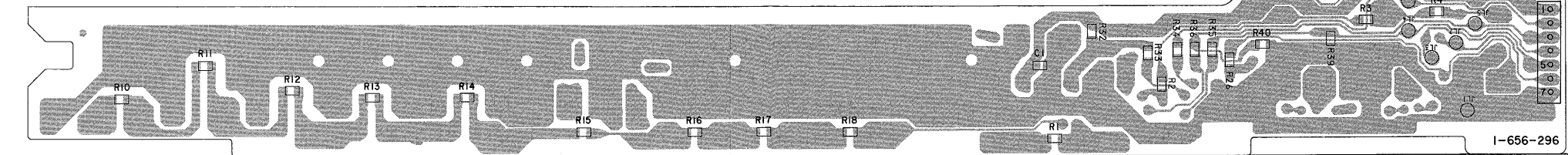
PW-720 BOARD (CONDUCTOR SIDE)



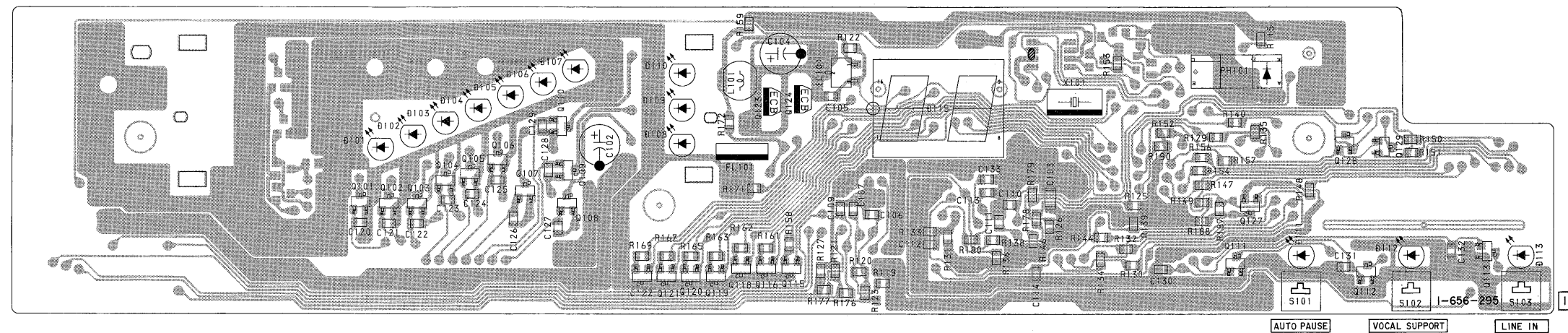
FP-745 BOARD (COMPONENT SIDE)



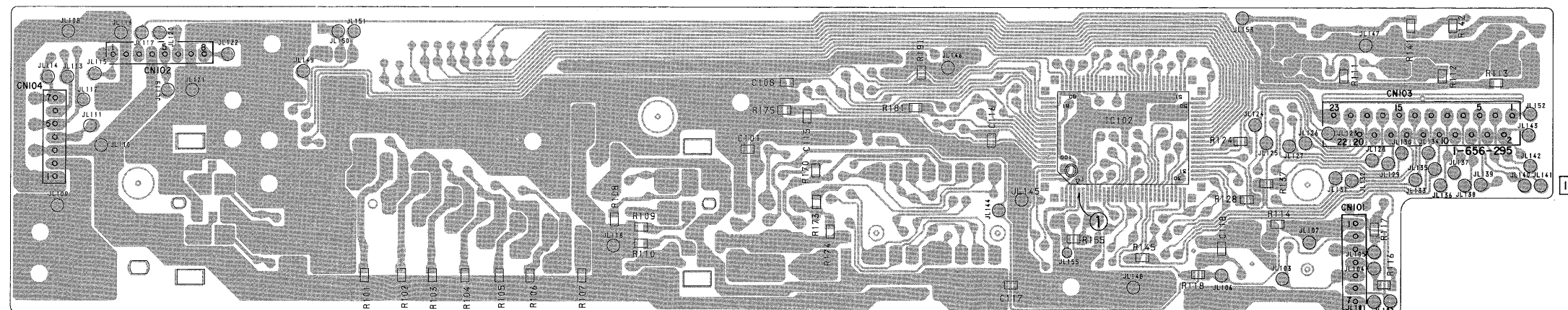
FP-745 BOARD (CONDUCTOR SIDE)



FP-744 BOARD (COMPONENT SIDE)



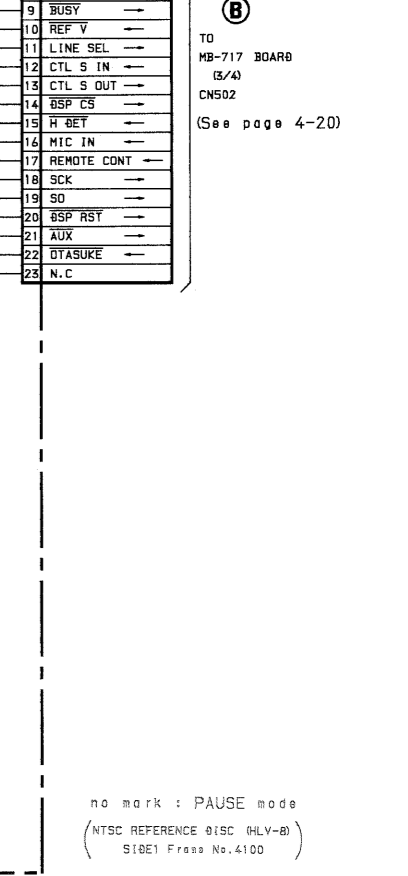
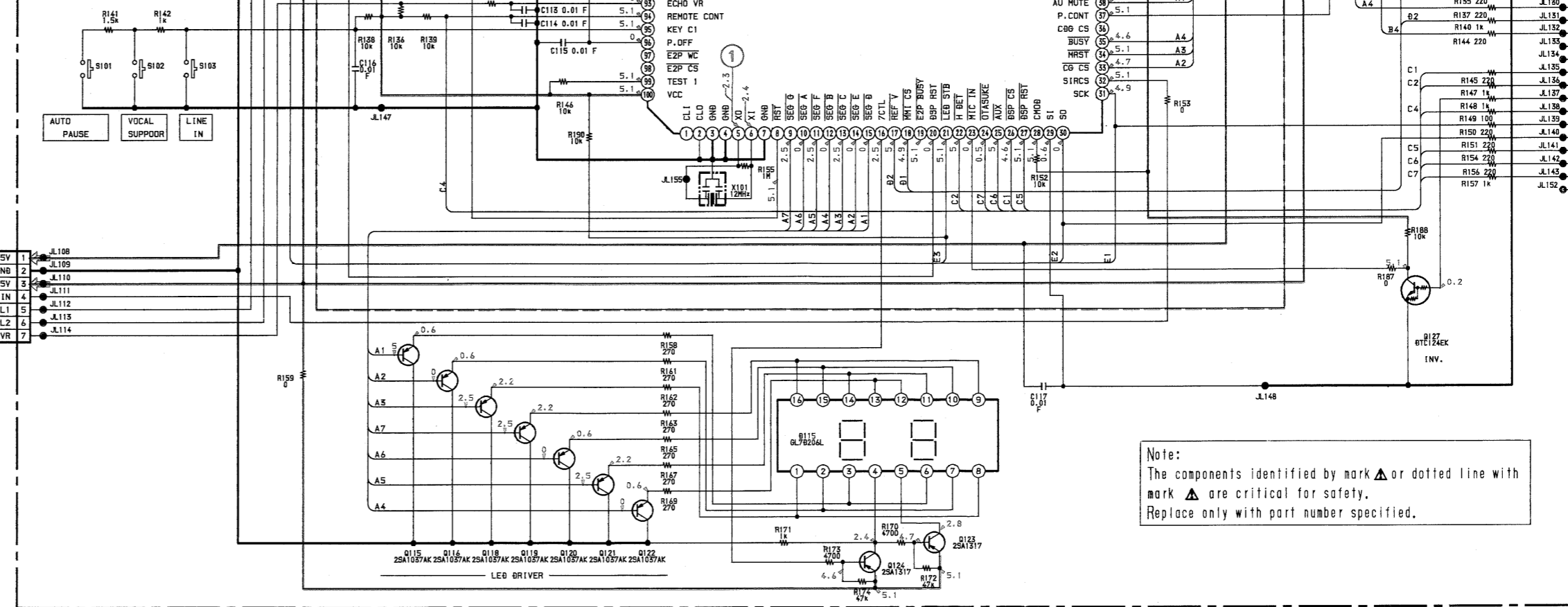
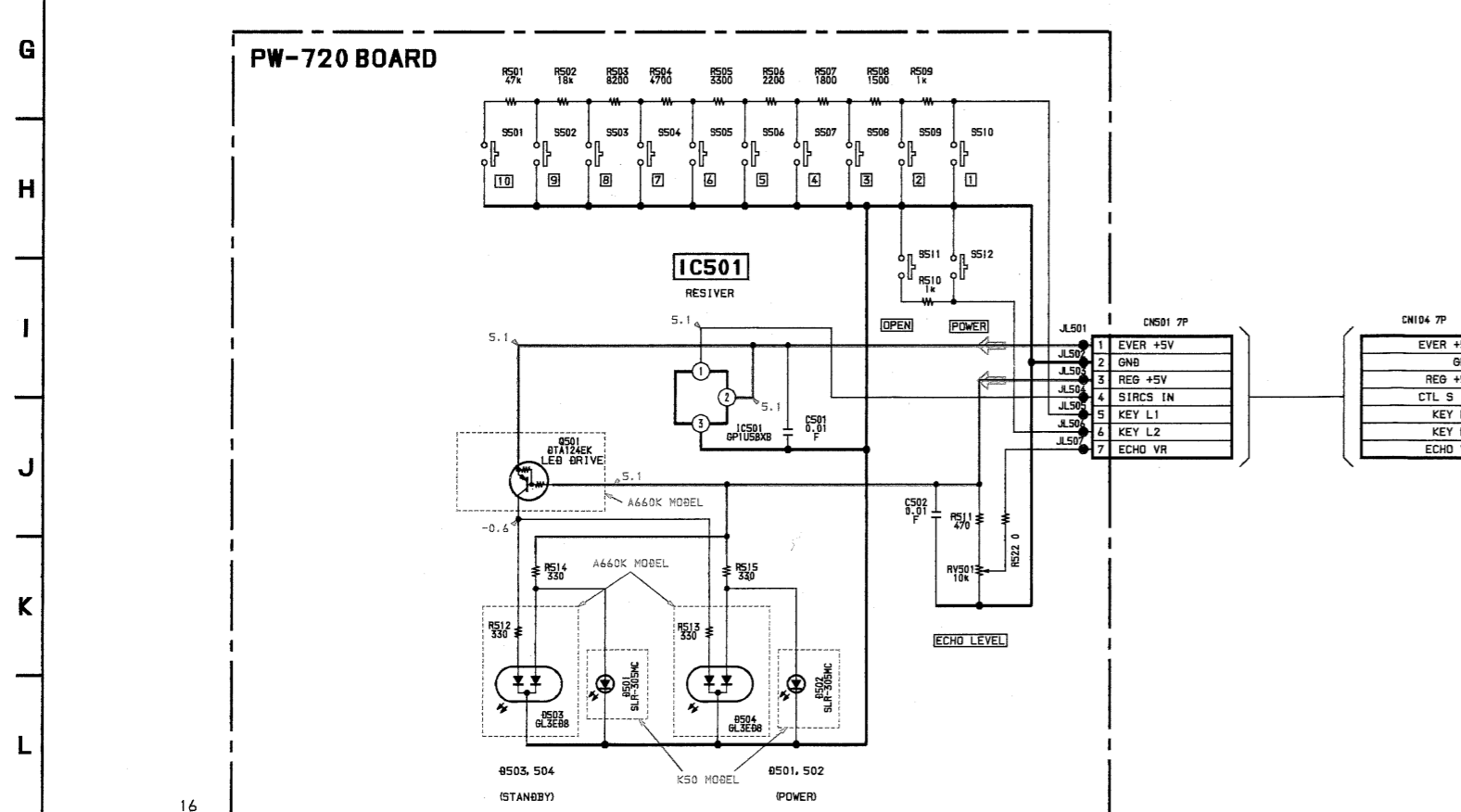
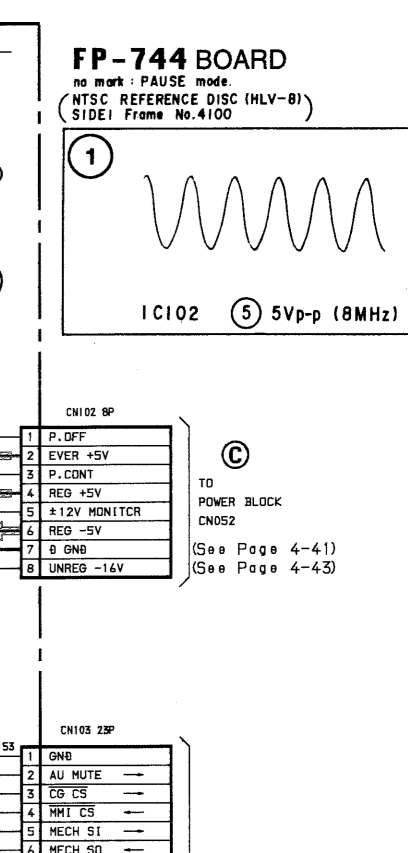
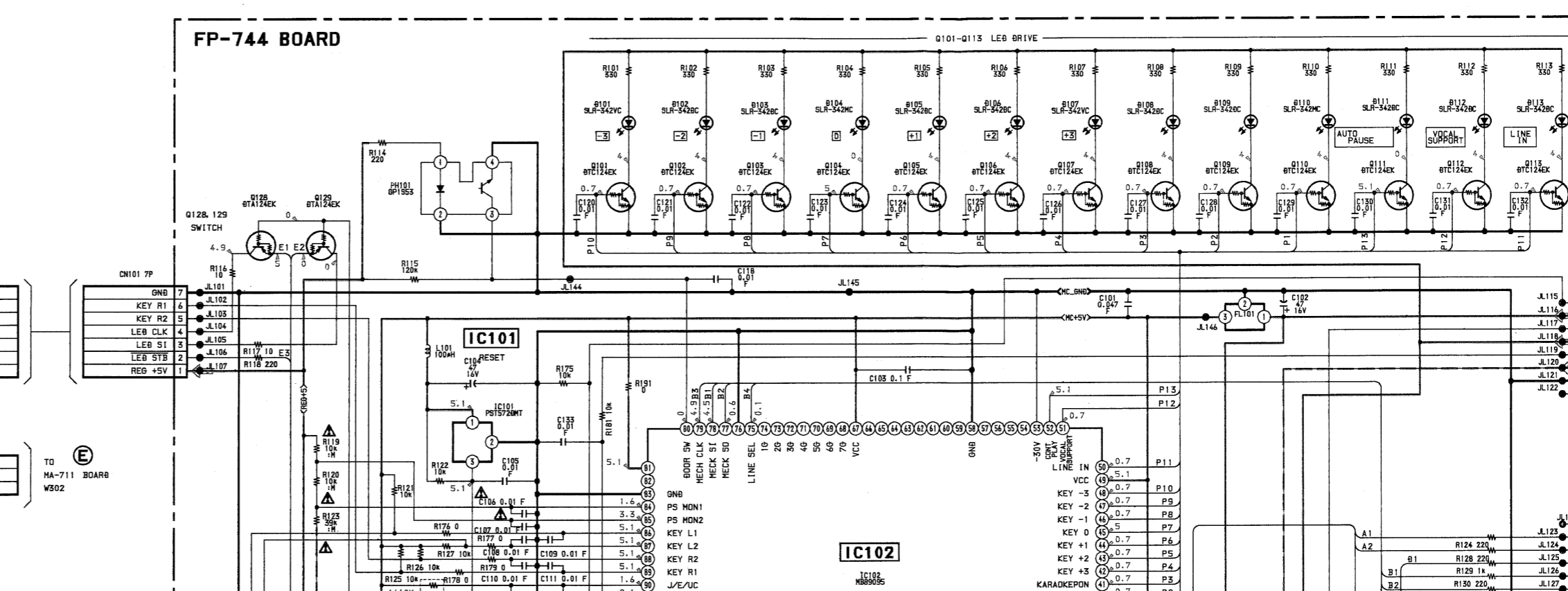
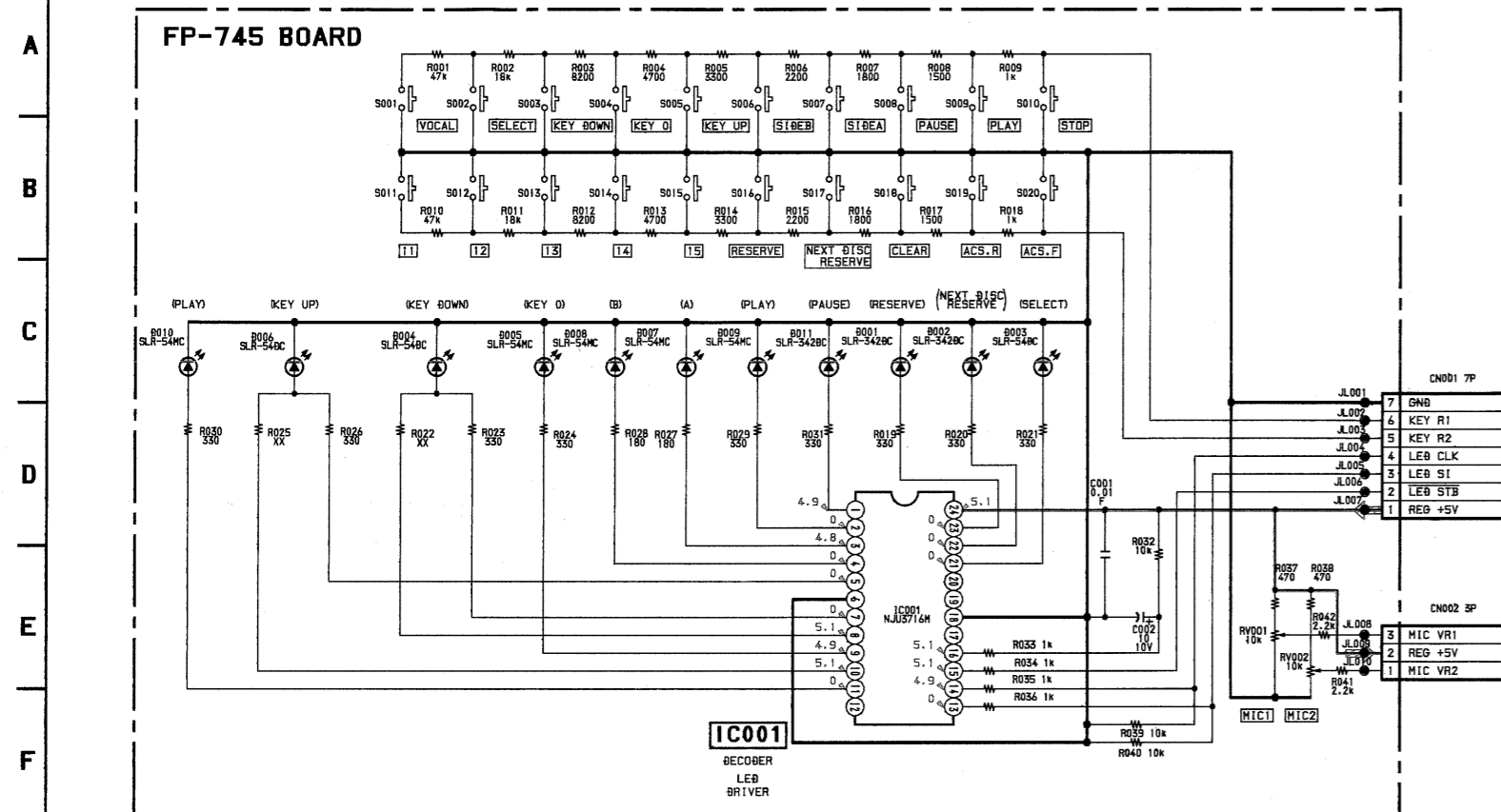
FP-744 BOARD (CONDUCTOR SIDE)



FP-744 (DISPLAY), FP-745 (PLAY SWITCH), PW-720 (POWER SWITCH) SCHEMATIC DIAGRAMS

—Ref. No. FP-744, FP-745 and PW-720 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 24 25 26 27 28



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

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

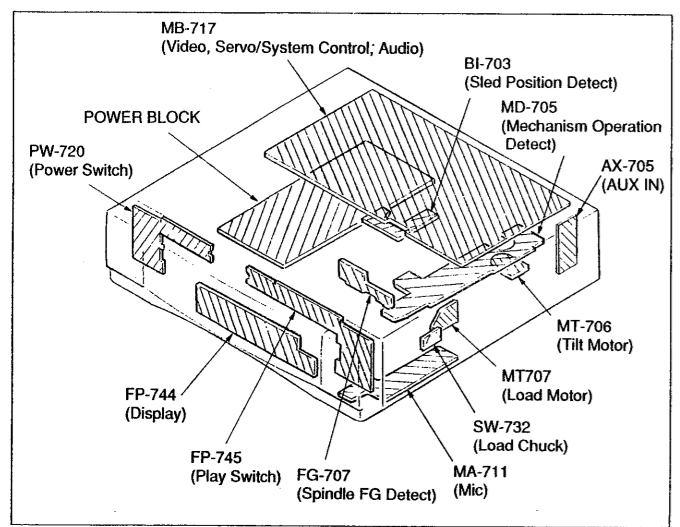
MDP-A660K/K50

POWER BLOCK PRINTED WIRING BOARDS (MDP-A660K MODEL)

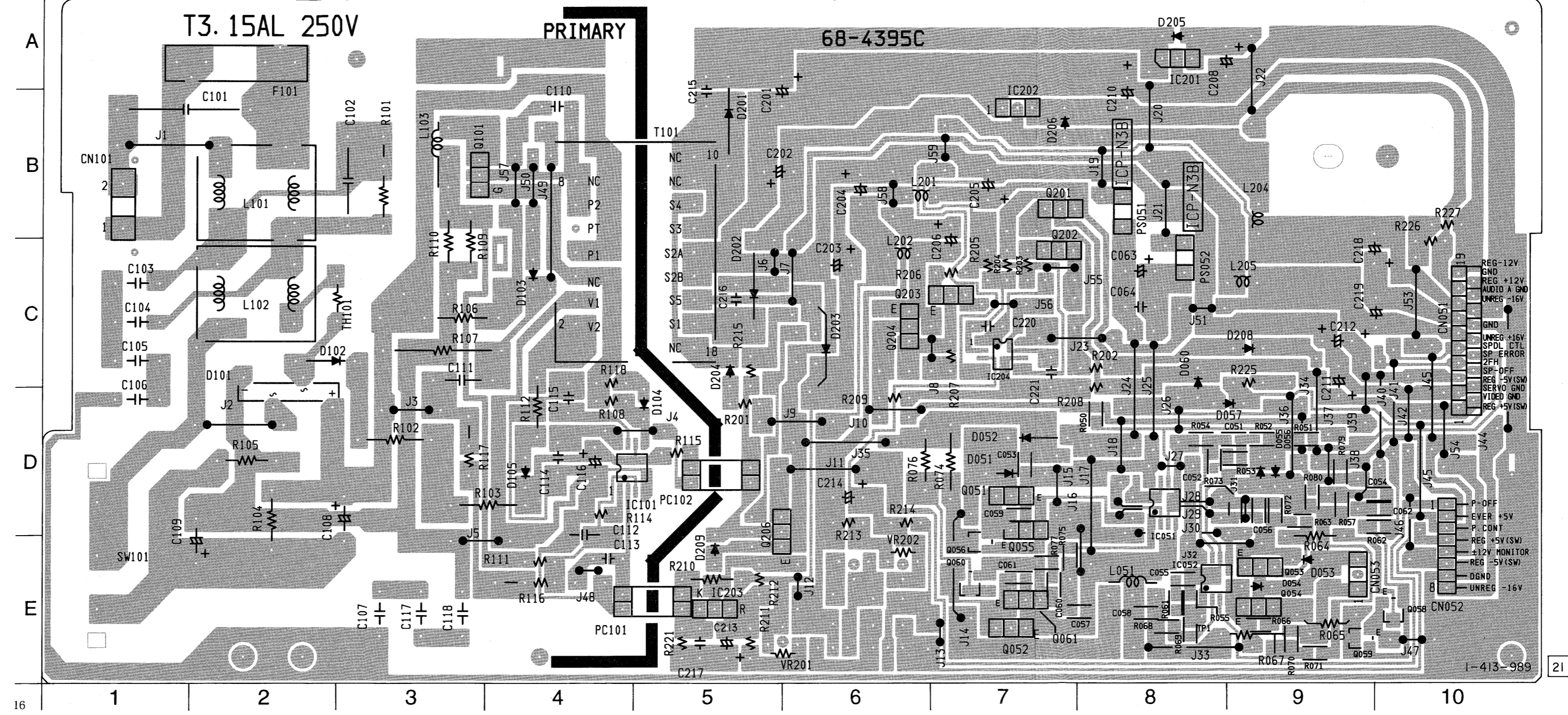
—Ref. No. POWER BLOCK; 5,000 Series—

POWER BLOCK

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



POWER BLOCK (A660K MODEL) (SR-539 BOARD)



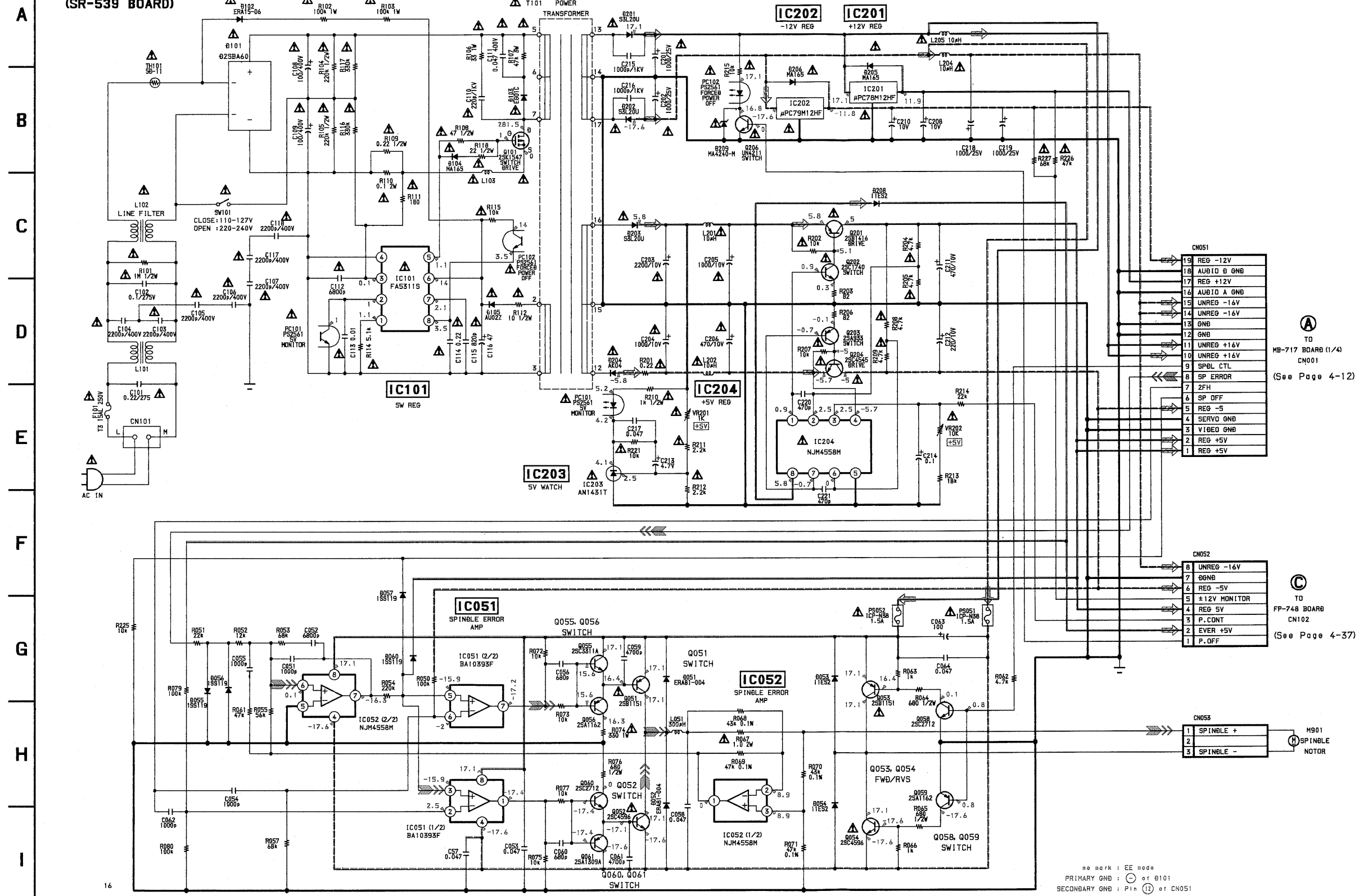
1-413-989 [21]

POWER BLOCK SCHEMATIC DIAGRAMS (MDP-A660K MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—

1 2 3 4 5 6 7 8 9 10 11 12 13

POWER BLOCK (MDP-A660K MODEL)
(SR-539 BOARD)



CN051

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

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

CN052

8	UNREG -16V
7	0GND
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)

CN053

1	SPINBLE +
2	SPINBLE
3	SPINBLE -

M901
SPINBLE
NOTOR

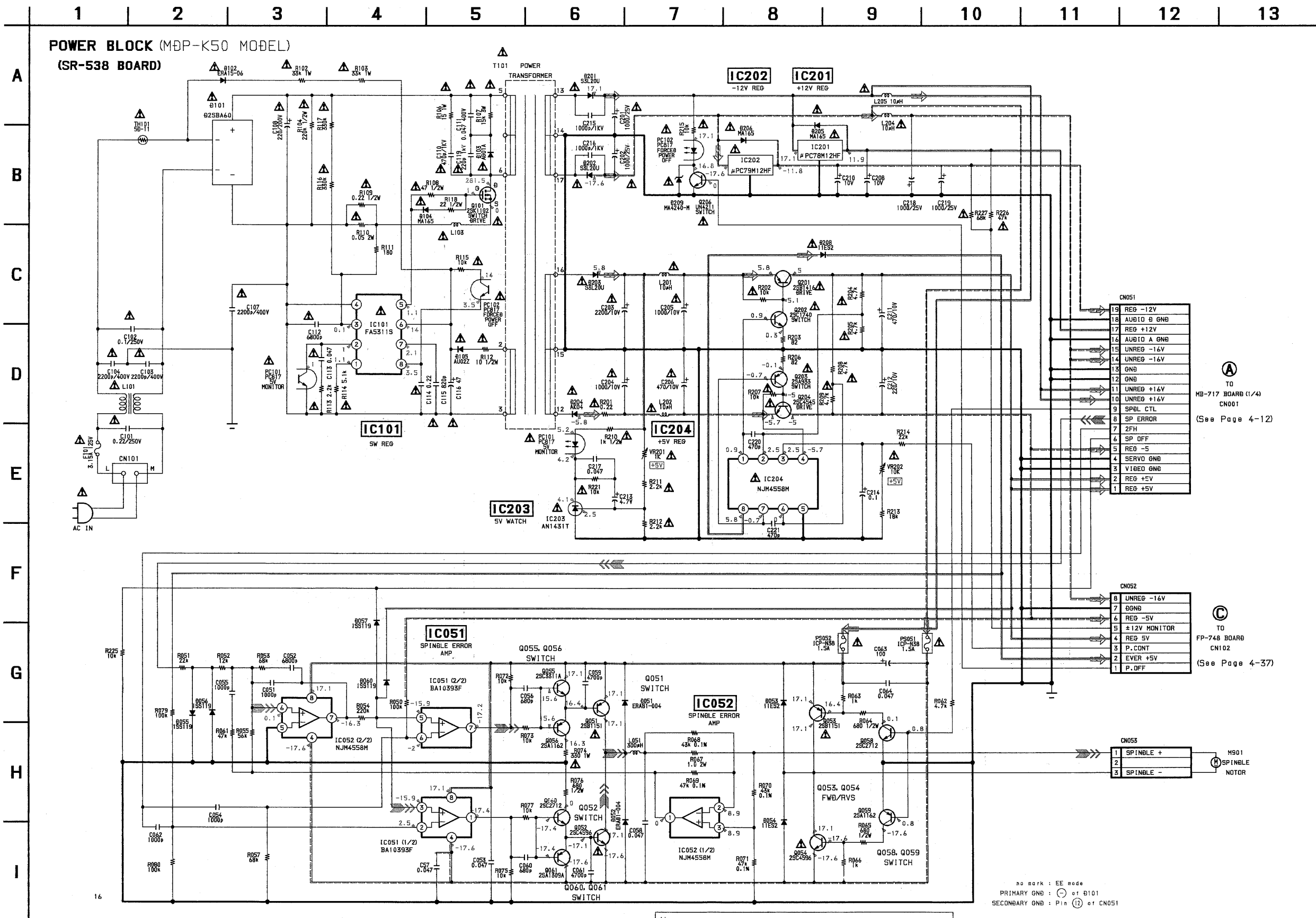
Note:
The components identified by mark **▲** or dotted line with mark **△** are critical for safety.
Replace only with part number specified.

-SIGNAL PATH
Spindle servo (speed and phase) **▶▶▶**

MDP-A660K/K50

POWER BLOCK PRINTED WIRING BOARDS (MDP-K50 MODEL)

—Ref. No. POWER BLOCK; 5,000 Series—



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

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

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

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

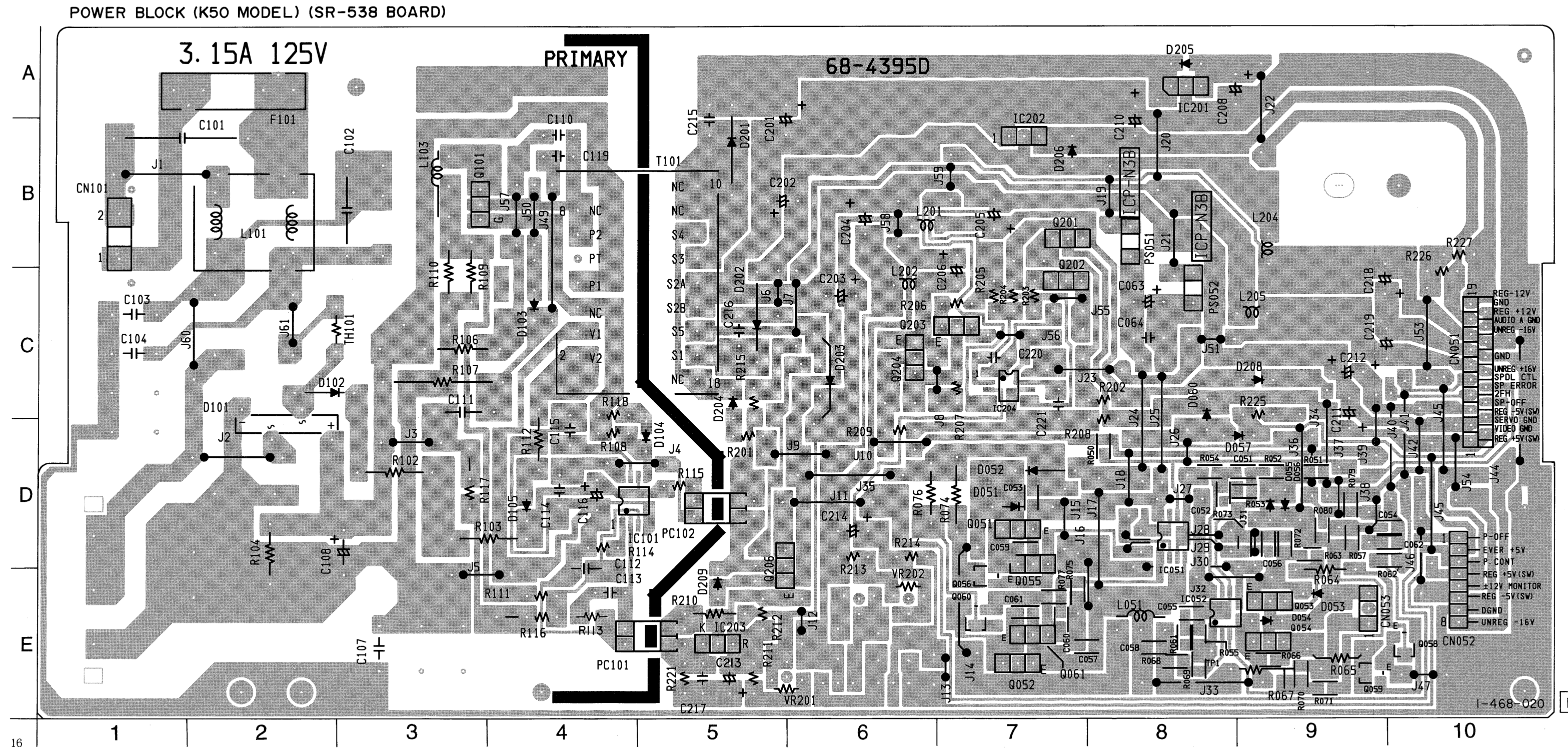
M901 SPINDLE MOTOR

1	SPINDLE +
2	
3	SPINDLE -

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

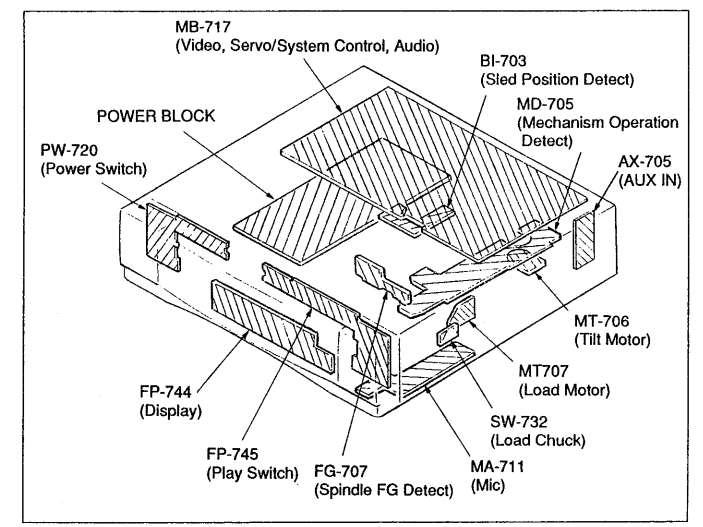
no mark : EE mode
PRIMARY GND : ⊖ of B101
SECONDARY GND : Pin ⑫ of CN051

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



POWER BLOCK

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
D051	D-7	IC203	E-5
D052	D-7	IC204	C-7
D053	E-9		
D054	E-9	Q051	D-7
D055	D-9	Q052	E-7
D056	D-9	Q053	E-9
D057	D-9	Q054	E-9
D060	C-8	Q055	D-7
D101	D-2	Q056	E-7
D102	C-2	Q058	E-10
D103	C-4	Q059	E-9
D104	D-5	Q060	E-7
D105	D-4	Q061	E-7
D201	B-5	O101	B-3
D202	C-5	Q201	B-7
D203	C-6	Q202	C-7
D204	C-5	Q203	C-7
D205	A-8	Q204	C-6
D206	B-7	Q206	D-5
D208	C-9		
D209	E-5	VR201	E-6
		VR202	E-6





SECTION 5
REPAIR PARTS LIST


5-1. EXPLODED VIEWS

NOTE:

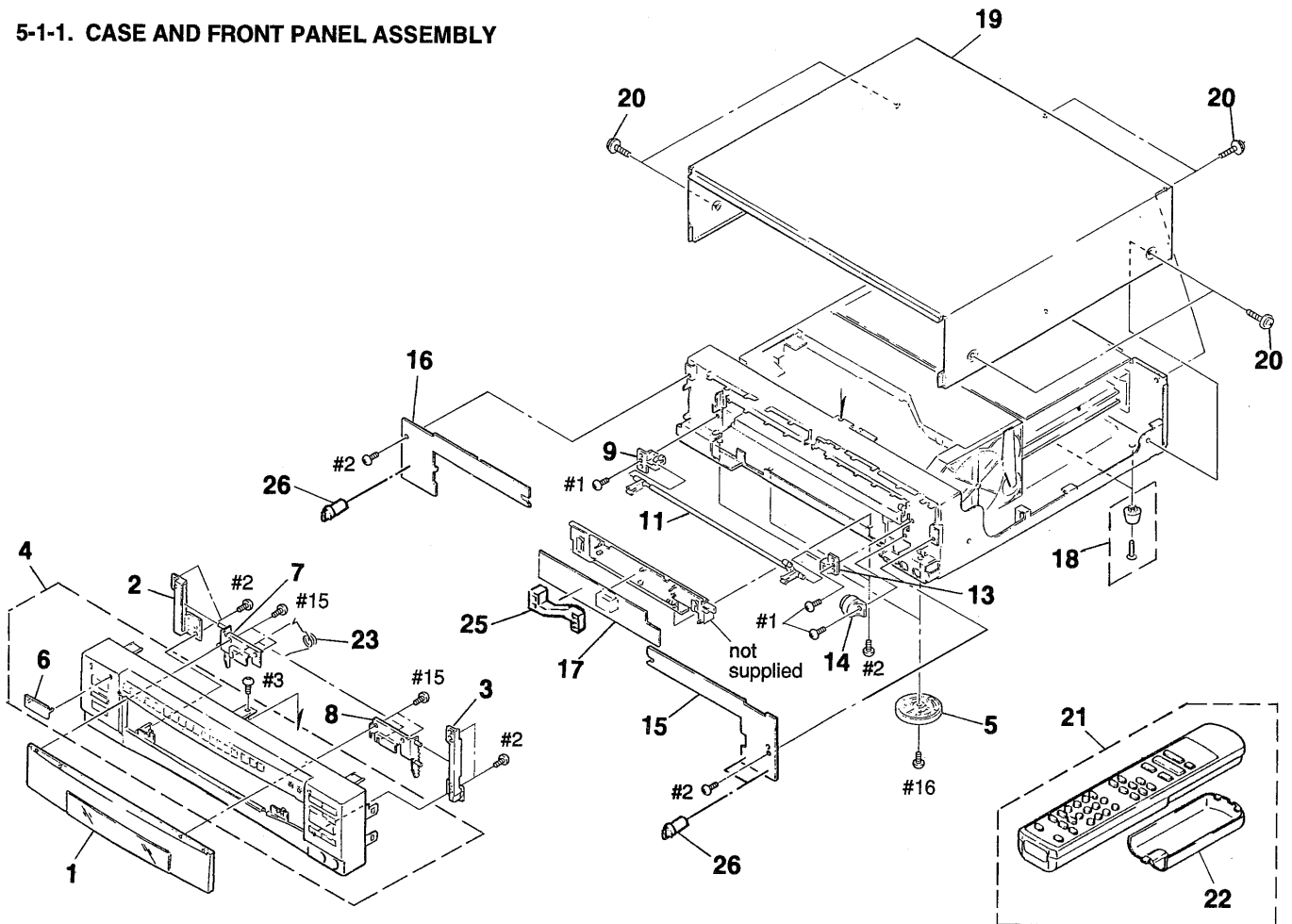
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) ... (RED)
↑ ↑
Parts color Cabinet's color

- 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.

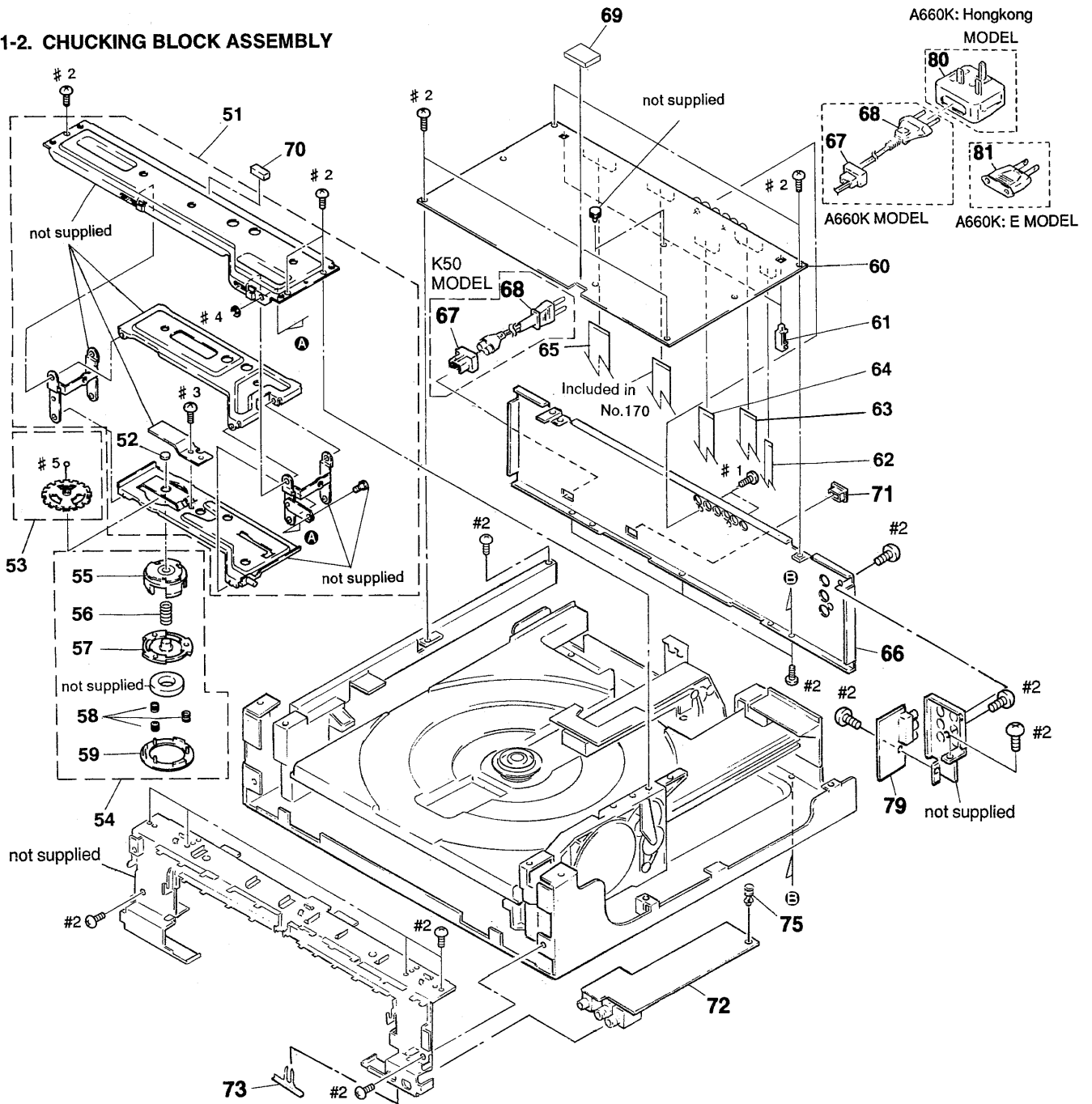
Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1-1. CASE AND FRONT PANEL ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-3944-677-1	DOOR ASSY		14	4-919-393-01	DAMPER	
2	3-961-801-01	HOLDER (L), SLIDE		* 15	A-6423-313-A	FP-745 BOARD, COMPLETE	
3	3-961-802-01	HOLDER (R), SLIDE		* 16	A-6423-320-A	PW-720 BOARD, COMPLETE	
4	X-3944-672-1	PANEL ASSY, FRONT (K50)		* 17	A-6423-319-A	FP-744 BOARD, COMPLETE	
4	X-3944-675-1	PANEL ASSY, FRONT (A660K)		18	3-961-156-11	FOOT	
5	X-3942-810-1	FOOT ASSY		* 19	3-961-785-01	CASE, UPPER	
6	3-942-768-02	EMBLEM (NO.5), SONY		20	3-710-901-41	SCREW, TAPPING	
7	3-961-818-01	DISK (L), DOOR		21	1-473-110-21	REMOTE COMMANDER (RMT-M36A)	
8	3-961-819-01	DISK (R), DOOR		22	3-959-554-01	COVER BATTERY	
9	3-961-800-01	GUIDE, LINK		23	3-961-931-01	SPRING, DOOR	
11	X-3944-955-1	LINK ASSY		* 25	3-961-916-01	REFLECTOR (A)	
13	3-963-178-01	HOLDER, LINK		26	3-962-010-11	KNOB, VOL	

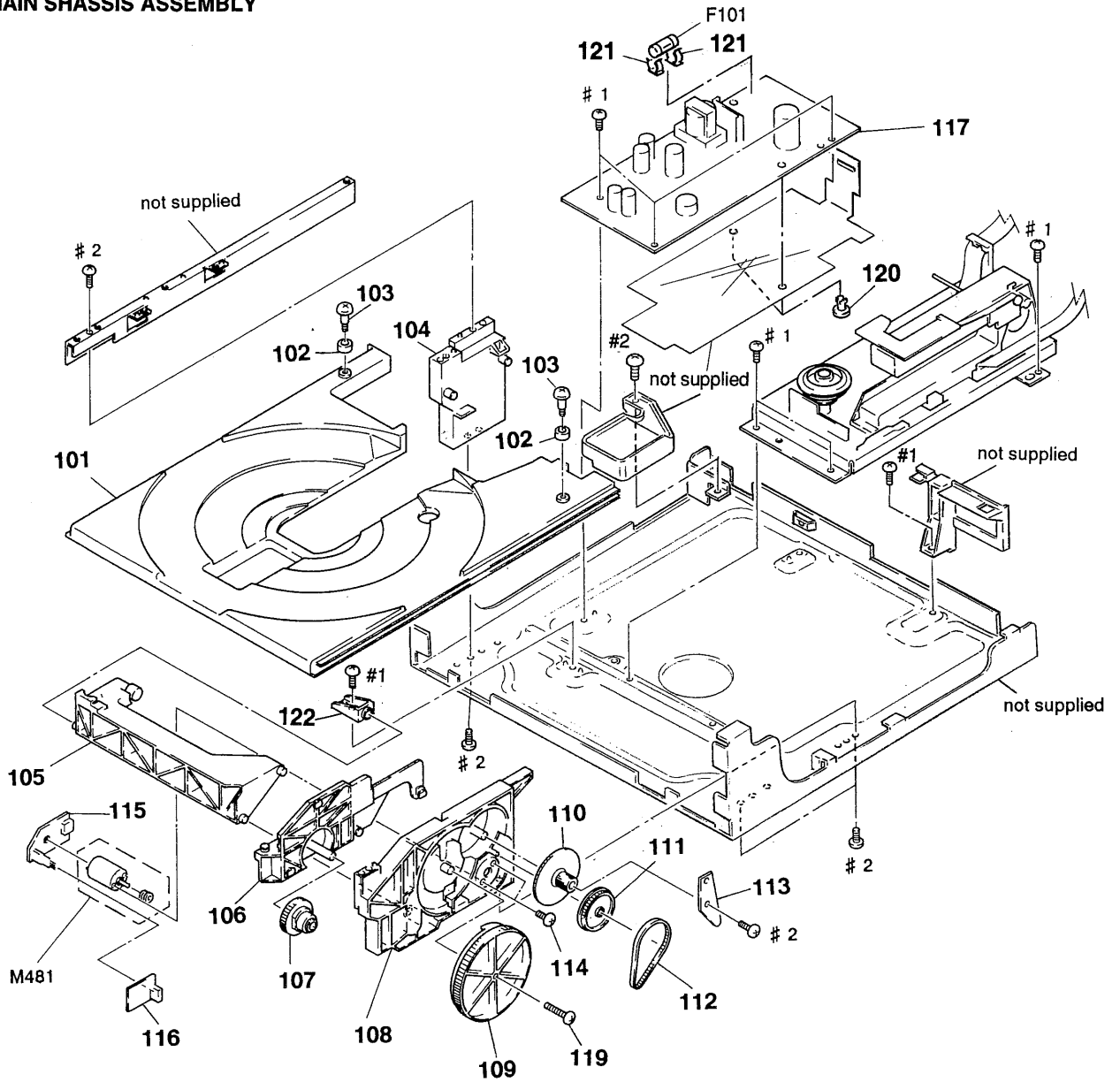
5-1-2. CHUCKING BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	A-6415-896-A	CHUCKING SUB BLOCK ASSY		* 66	3-961-786-71	PANEL, REAR(K50)	
52	3-953-392-01	RETAINER, THRUST		* 66	3-961-786-91	PANEL, REAR(A660K:Chinese, Hongkong)	
53	X-3942-787-1	PLATE ASSY, TOP		▲67	1-526-985-11	AC INLET (K50)	
54	A-6415-644-G	CHUCK BLOCK ASSY		▲67	3-703-244-00	BUSHING (2104), CORD (A660K)	
55	3-953-288-01	PLATE, CHUCKING		▲68	1-574-085-11	CORD, POWER (K50)	
56	3-953-291-01	SPRING (1), COMPRESSION		▲68	1-575-912-21	CORD, POWER (A660K)	
57	X-3942-776-1	HOLDER ASSY, MAGNET		69	3-728-465-01	CUSHION, OPT	
58	3-953-290-01	SPRING (2), COMPRESSION		70	9-911-840-XX	CUSHION (U)	
59	X-3943-043-1	GUIDE (B) ASSY, CENTER		* 71	3-961-821-01	SELECOVER, VOL (A660K:E)	
* 60	A-6423-318-A	MB-717 BOARD, COMPLETE		* 72	A-6423-316-A	MA-711 BOARD, COMPLETE	
* 61	3-962-283-01	GUIDE, MB		73	3-955-377-01	PLATE (2GANG), MOUNT	
62	1-769-653-11	CABLE, FLAT (FFC) 7 ARBOR		75	3-531-576-11	RIVET	
63	1-769-655-11	CABLE, FLAT (FFC) 23 ARBOR		* 79	A-6423-317-A	AX-705 BOARD, COMPLETE	
64	1-769-654-11	CABLE, FLAT (FFC) 12 ARBOR		80	1-770-019-11	ADAPTOR, CONVERSION(A660K:Hongkong)	
65	1-769-652-11	CABLE, FLAT (FFC) 19 ARBOR		81	1-569-008-11	ADAPTOR, CONVERSION 2P(A660K:E)	
* 66	3-961-786-61	PANEL, REAR(A660K:E)					

<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>
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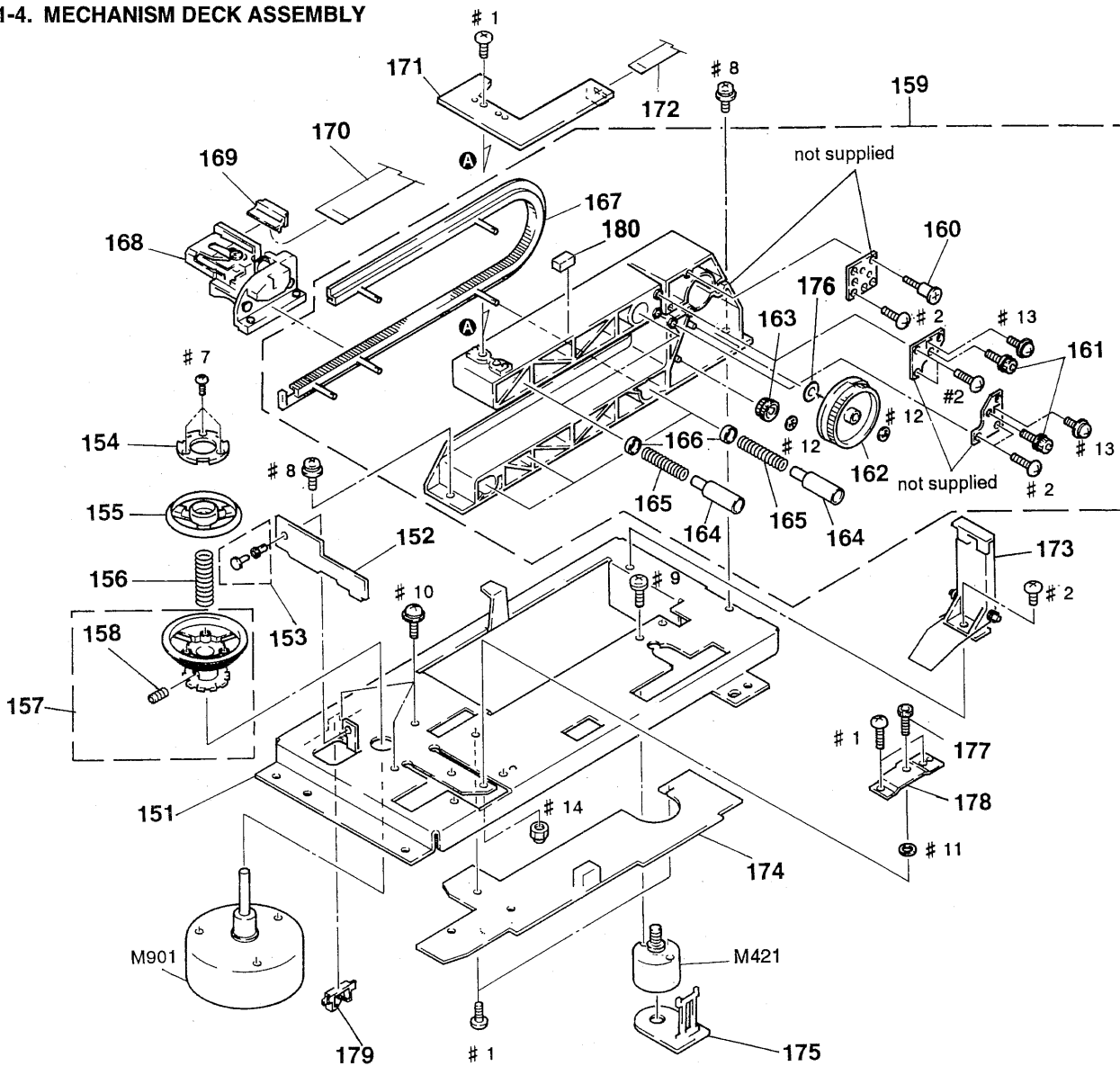
5-1-3. MAIN SHASSIS ASSEMBLY



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 (A660K)	
* 105	X-3944-729-1	FRAME ASSY, TRAY UD		117	1-468-020-11	POWER BLOCK (K50)	
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		Δ121	1-533-223-11	HOLDER, FUSE	
109	3-961-083-01	GEAR, CONTROL		* 122	3-961-101-11	HOLDER, UD FRAME	
110	3-961-081-01	GEAR, MIDDLE		ΔF101	1-532-286-11	FUSE TIMELUG (3.15A 250V) (A660K)	
111	3-961-084-01	PULLEY (A)		ΔF101	1-532-745-11	FUSE TIMELUG (3.15A 125V) (K50)	
112	3-961-082-01	BELT, TIMING		M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
* 113	3-962-050-01	STAY, REINFORCEMENT					

<p>Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified</p>	<p>Note: Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifique.</p>
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5-1-4. MECHANISM DECK ASSEMBLY



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

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

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

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

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 spécifique.

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...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...
- CAPACITORS:
uF: μ F
- COILS
uH: μ H

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
*	A-6423-317-A	AX-705 BOARD, COMPLETE				< RESISTOR >	

		(Ref.No.2,000 Series)					
		< CAPACITOR >					
C701	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	R702	1-216-049-91	METAL GLAZE	1K 5% 1/10W
C702	1-124-927-11	ELECT	4.7uF 20% 100V	R703	1-216-097-00	METAL CHIP	100K 5% 1/10W
C703	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	R704	1-216-097-00	METAL CHIP	100K 5% 1/10W
C704	1-124-927-11	ELECT	4.7uF 20% 100V	R705	1-216-097-00	METAL CHIP	100K 5% 1/10W
C706	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	R706	1-216-097-00	METAL CHIP	100K 5% 1/10W
		< CONNECTOR >					
CN701	1-506-485-11	PIN, CONNECTOR 6P		R707	1-216-049-91	METAL GLAZE	1K 5% 1/10W
		< DIODE >		R709	1-216-022-00	METAL CHIP	75 5% 1/10W
D701	8-719-800-76	DIODE 1SS226		R710	1-216-073-00	METAL CHIP	10K 5% 1/10W
D702	8-719-800-76	DIODE 1SS226				*****	
		< FILTER >		*	A-6423-232-A	BI-703 BOARD, COMPLETE	
FL701	1-424-031-11	FILTER, NOISE				*****	
FL702	1-424-031-11	FILTER, NOISE				(Ref.No.2,000 Series)	
		< JACK >					
J701	1-764-592-31	JACK 3P (LINE IN)				3-953-261-01	HOLDER, PD
		< JUMPER RESISTOR >				< CAPACITOR >	
JR701	1-216-295-91	CONDCTOR, CHIP (2012)					
		< PIN >					
L LP701	4-352-844-01	PIN, LEAD, COATING		C411	1-163-075-00	CERAMIC CHIP	0.047uF 50V
		< TRANSISTOR >				< CONNECTOR >	
Q701	8-729-231-55	TRANSISTOR 2SC2878-AB		CN411	1-691-063-21	HOUSING, CONNECTOR 4P	
						< PHOTO INTERRUPTER >	
				PH411	8-729-020-74	DIODE GP1S24	
						< TRANSISTOR >	
				Q411	8-729-904-10	TRANSISTOR PT360FS	
				Q412	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
				Q413	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
				Q414	8-729-904-10	TRANSISTOR PT360FS	
						< RESISTOR >	
				R411	1-216-045-00	METAL CHIP	680 5% 1/10W
				R412	1-216-099-00	METAL CHIP	120K 5% 1/10W
				R413	1-216-057-00	METAL CHIP	2.2K 5% 1/10W

BI-703

FG-707

FP-744

Ref. No.	Part No.	Description	Remarks		
R414	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-075-00	METAL CHIP	12K	5%	1/10W
R417	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R418	1-216-065-00	METAL CHIP	4.7K	5%	1/10W

*	A-6423-231-A FG-707 BOARD, COMPLETE ***** (Ref.No.2,000 Series)				
	< CAPACITOR >				
C401	1-163-035-00	CERAMIC CHIP	0.047uF		50V
	< CONNECTOR >				
CN401	1-691-863-11	CONNECTOR, BOARD TO BOARD			
	< JUMPER RESISTOR >				
JR403	1-216-296-00	METAL CHIP	0	5%	1/8W
	< PHOTO INTERRUPTER >				
PH401	8-729-020-74	DIODE GP1S24			
	< TRANSISTOR >				
Q401	8-729-026-50	TRANSISTOR 2SA1037AK-T146-QR			
	< RESISTOR >				
R401	1-216-198-91	METAL GLAZE	1K	5%	1/8W
R402	1-216-089-00	METAL CHIP	47K	5%	1/10W
R403	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R404	1-216-097-00	METAL CHIP	100K	5%	1/10W
R405	1-216-039-00	METAL CHIP	390	5%	1/10W

*	A-6423-319-A FP-744 BOARD, COMPLETE ***** (Ref.No.3,000 Series)				
*	3-961-919-01 HOLDER, SEGMENT				
	< CAPACITOR >				
C101	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C102	1-124-589-11	ELECT	47uF	20%	16V
C103	1-163-077-91	CERAMIC CHIP	0.1uF		50V
C104	1-124-589-11	ELECT	47uF	20%	16V
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
△C106	1-164-232-11	CERAMIC CHIP	0.01uF		50V
△C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description	Remarks		
C109	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C110	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C111	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C112	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C113	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C114	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C115	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C116	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C117	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C118	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C120	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C121	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C122	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C123	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C124	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C125	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C126	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C127	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C128	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C129	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C130	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C131	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C132	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
C133	1-163-031-11	CERAMIC CHIP	0.01uF	50V	
	< CONNECTOR >				
CN101	1-506-486-11	PIN, CONNECTOR 7P			
CN102	1-506-487-11	PIN, CONNECTOR 8P			
CN103	1-691-652-11	SOCKET, CONNECTOR 23P			
CN104	1-506-486-11	PIN, CONNECTOR 7P			
	< DIODE >				
D101	8-719-045-62	DIODE SLR-342VC-A-47			
D102	8-719-051-17	DIODE SLR-342DCT31			
D103	8-719-051-17	DIODE SLR-342DCT31			
D104	8-719-045-64	DIODE SLR-342MC-A-47			
D105	8-719-051-17	DIODE SLR-342DCT31			
D106	8-719-051-17	DIODE SLR-342DCT31			
D107	8-719-045-62	DIODE SLR-342VC-A-47			
D108	8-719-051-17	DIODE SLR-342DCT31			
D109	8-719-051-17	DIODE SLR-342DCT31			
D110	8-719-045-64	DIODE SLR-342MC-A-47			
D111	8-719-051-17	DIODE SLR-342DCT31			
D112	8-719-051-17	DIODE SLR-342DCT31			
D113	8-719-051-17	DIODE SLR-342DCT31			
D115	8-719-047-76	DIODE GL7D206L			

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

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

Ref. No.	Part No.	Description	Remarks
		< FILTER >	
FL101	1-424-031-11	FILTER, NOISE	
		< IC >	
IC101	8-759-074-40	IC PST572DMT-T1	
IC102	8-759-336-62	IC MB89096PF-G-172-BND	
IC103	8-759-276-29	IC XL9020F-S-E2	
		< COIL >	
L101	1-408-982-21	INDUCTOR 100uH	
		< PHOTO INTERRUPTER >	
PH101	8-749-010-69	PHOTO INTERRUPTER GP158V	
		< TRANSISTOR >	
Q101	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q102	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q103	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q104	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q105	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q106	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q107	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q108	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q109	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q110	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q111	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q112	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q113	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q115	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q116	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q118	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q119	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q120	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q121	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q122	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
Q123	8-729-820-16	TRANSISTOR 2SA1317-S	
Q124	8-729-820-16	TRANSISTOR 2SA1317-S	
Q127	8-729-027-52	TRANSISTOR DTC124EKA-T146	
Q128	8-729-027-31	TRANSISTOR DTA124EKA-T146	
Q129	8-729-027-31	TRANSISTOR DTA124EKA-T146	
		< RESISTOR >	
R101	1-216-037-00	METAL CHIP 330 5%	1/10W
R102	1-216-037-00	METAL CHIP 330 5%	1/10W
R103	1-216-037-00	METAL CHIP 330 5%	1/10W
R104	1-216-037-00	METAL CHIP 330 5%	1/10W
R105	1-216-037-00	METAL CHIP 330 5%	1/10W

Ref. No.	Part No.	Description	Remarks
R106	1-216-037-00	METAL CHIP 330 5%	1/10W
R107	1-216-037-00	METAL CHIP 330 5%	1/10W
R108	1-216-037-00	METAL CHIP 330 5%	1/10W
R109	1-216-037-00	METAL CHIP 330 5%	1/10W
R110	1-216-037-00	METAL CHIP 330 5%	1/10W
R111	1-216-037-00	METAL CHIP 330 5%	1/10W
R112	1-216-037-00	METAL CHIP 330 5%	1/10W
R113	1-216-037-00	METAL CHIP 330 5%	1/10W
R114	1-216-033-00	METAL CHIP 220 5%	1/10W
R115	1-216-099-00	METAL CHIP 120K 5%	1/10W
R116	1-216-001-00	METAL CHIP 10 5%	1/10W
R117	1-216-001-00	METAL CHIP 10 5%	1/10W
R118	1-216-033-00	METAL CHIP 220 5%	1/10W
△R119	1-208-806-11	METAL CHIP 10K 0.50%	1/10W
△R120	1-208-806-11	METAL CHIP 10K 0.50%	1/10W
R121	1-216-073-00	METAL CHIP 10K 5%	1/10W
R122	1-216-073-00	METAL CHIP 10K 5%	1/10W
△R123	1-216-689-11	METAL CHIP 39K 0.5%	1/10W
R124	1-216-033-00	METAL CHIP 220 5%	1/10W
R125	1-216-073-00	METAL CHIP 10K 5%	1/10W
R126	1-216-073-00	METAL CHIP 10K 5%	1/10W
R127	1-216-073-00	METAL CHIP 10K 5%	1/10W
R128	1-216-033-00	METAL CHIP 220 5%	1/10W
R129	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R130	1-216-033-00	METAL CHIP 220 5%	1/10W
R131	1-216-081-00	METAL CHIP 22K 5%	1/10W
R132	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R133	1-216-073-00	METAL CHIP 10K 5%	1/10W
R134	1-216-033-00	METAL CHIP 220 5%	1/10W
R135	1-216-033-00	METAL CHIP 220 5%	1/10W
R136	1-216-073-00	METAL CHIP 10K 5%	1/10W
R137	1-216-033-00	METAL CHIP 220 5%	1/10W
R138	1-216-073-00	METAL CHIP 10K 5%	1/10W
R139	1-216-073-00	METAL CHIP 10K 5%	1/10W
R140	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R141	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R142	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R144	1-216-033-00	METAL CHIP 220 5%	1/10W
R145	1-216-033-00	METAL CHIP 220 5%	1/10W
R146	1-216-073-00	METAL CHIP 10K 5%	1/10W
R147	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R148	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R149	1-216-025-91	METAL GLAZE 100 5%	1/10W
R150	1-216-033-00	METAL CHIP 220 5%	1/10W
R151	1-216-033-00	METAL CHIP 220 5%	1/10W
R152	1-216-073-00	METAL CHIP 10K 5%	1/10W
R153	1-216-295-91	CONDCTOR, CHIP (2012)	

<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 spécifiée.</p>
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FP-744

FP-745

Ref. No.	Part No.	Description	Remarks		
R154	1-216-033-00	METAL CHIP	220	5%	1/10W
R155	1-216-121-00	METAL CHIP	1M	5%	1/10W
R156	1-216-033-00	METAL CHIP	220	5%	1/10W
R157	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R158	1-216-035-00	METAL CHIP	270	5%	1/10W
R159	1-216-295-91	CONDUCTOR, CHIP (2012)			
R161	1-216-035-00	METAL CHIP	270	5%	1/10W
R162	1-216-035-00	METAL CHIP	270	5%	1/10W
R163	1-216-035-00	METAL CHIP	270	5%	1/10W
R165	1-216-035-00	METAL CHIP	270	5%	1/10W
R167	1-216-035-00	METAL CHIP	270	5%	1/10W
	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R169	1-216-035-00	METAL CHIP	270	5%	1/10W
R170	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R171	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R172	1-216-089-00	METAL CHIP	47K	5%	1/10W
R173	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R174	1-216-089-00	METAL CHIP	47K	5%	1/10W
R175	1-216-073-00	METAL CHIP	10K	5%	1/10W
R176	1-216-295-91	CONDUCTOR, CHIP (2012)			
R177	1-216-295-91	CONDUCTOR, CHIP (2012)			
R178	1-216-295-91	CONDUCTOR, CHIP (2012)			
R179	1-216-295-91	CONDUCTOR, CHIP (2012)			
R180	1-216-295-91	CONDUCTOR, CHIP (2012)			
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R187	1-216-295-91	CONDUCTOR, CHIP (2012)			
R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R191	1-216-295-91	CONDUCTOR, CHIP (2012)			
< SWITCH >					
S101	1-762-365-21	SWITCH, TACTILE (AUTO PAUSE)			
S102	1-762-365-21	SWITCH, TACTILE (VOCAL SUPPORT)			
S103	1-762-365-21	SWITCH, TACTILE (LINE IN)			
< VIBRATOR >					
X101	1-579-952-21	VIBRATOR, CERAMIC 8MHz			

*	A-6423-313-A	FP-745 BOARD, COMPLETE			

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

Ref. No.	Part No.	Description	Remarks		
CN002	1-506-468-11	PIN, CONNECTOR 3P			
< DIODE >					
D001	8-719-051-17	DIODE SLR-342DCT31			
D002	8-719-051-17	DIODE SLR-342DCT31			
D003	8-719-302-07	LED SEL1810A			
D004	8-719-302-07	LED SEL1810A			
D005	8-719-955-04	LED PY5504S-1			
D006	8-719-302-07	LED SEL1810A			
D007	8-719-955-04	LED PY5504S-1			
D008	8-719-955-04	LED PY5504S-1			
D009	8-719-955-04	LED PY5504S-1			
D010	8-719-955-04	LED PY5504S-1			
D011	8-719-051-17	DIODE SLR-342DCT31			
< IC >					
IC001	8-759-342-19	IC NJU3716M-T2			
< RESISTOR >					
R001	1-216-089-00	METAL CHIP	47K	5%	1/10W
R002	1-216-079-00	METAL CHIP	18K	5%	1/10W
R003	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R004	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R005	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R006	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R007	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R008	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R009	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R010	1-216-089-00	METAL CHIP	47K	5%	1/10W
R011	1-216-079-00	METAL CHIP	18K	5%	1/10W
R012	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R013	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R014	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R015	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R016	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R017	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R018	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R019	1-216-037-00	METAL CHIP	330	5%	1/10W
R020	1-216-037-00	METAL CHIP	330	5%	1/10W
R021	1-216-037-00	METAL CHIP	330	5%	1/10W
R023	1-216-037-00	METAL CHIP	330	5%	1/10W
R024	1-216-037-00	METAL CHIP	330	5%	1/10W
R026	1-216-037-00	METAL CHIP	330	5%	1/10W
R027	1-216-031-00	METAL CHIP	180	5%	1/10W
R028	1-216-031-00	METAL CHIP	180	5%	1/10W
R029	1-216-037-00	METAL CHIP	330	5%	1/10W
R030	1-216-037-00	METAL CHIP	330	5%	1/10W
R031	1-216-037-00	METAL CHIP	330	5%	1/10W
R032	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description	Remarks
R033	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R034	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R035	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R036	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R037	1-216-041-00	METAL CHIP	470 5% 1/10W
R038	1-216-041-00	METAL CHIP	470 5% 1/10W
R039	1-216-073-00	METAL CHIP	10K 5% 1/10W
R040	1-216-073-00	METAL CHIP	10K 5% 1/10W
R041	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R042	1-216-057-00	METAL CHIP	2.2K 5% 1/10W

< VARIABLE RESISTOR >

RV001	1-241-646-11	RES, VAR, CARBON 10K (MIC 1)
RV002	1-241-646-11	RES, VAR, CARBON 10K (MIC 2)

< SWITCH >

S001	1-762-365-21	SWITCH, TACTILE (VOCAL)
S002	1-762-365-21	SWITCH, TACTILE (SELECT)
S003	1-762-365-21	SWITCH, TACTILE (b)
S004	1-762-365-21	SWITCH, TACTILE (NATURAL)
S005	1-762-365-21	SWITCH, TACTILE (#)
S006	1-762-365-21	SWITCH, TACTILE (B)
S007	1-762-365-21	SWITCH, TACTILE (A)
S008	1-762-365-21	SWITCH, TACTILE (■)
S009	1-762-365-21	SWITCH, TACTILE (>)
S010	1-762-365-21	SWITCH, TACTILE (■)
S011	1-762-365-21	SWITCH, TACTILE (11)
S012	1-762-365-21	SWITCH, TACTILE (12)
S013	1-762-365-21	SWITCH, TACTILE (13)
S014	1-762-365-21	SWITCH, TACTILE (14)
S015	1-762-365-21	SWITCH, TACTILE (15)
S016	1-762-365-21	SWITCH, TACTILE (RESERVE)
S017	1-762-365-21	SWITCH, TACTILE (NEXT DISC)
S018	1-762-365-21	SWITCH, TACTILE (CLEAR)
S019	1-762-365-21	SWITCH, TACTILE (◀)
S020	1-762-365-21	SWITCH, TACTILE (▶)

* A-6423-316-A MA-711 BOARD, COMPLETE

 (Ref.No. 3,000 Series)

< CAPACITOR >

C302	1-163-035-00	CERAMIC CHIP	0.047uF	50V
C303	1-124-589-11	ELECT	47uF	20% 16V
C304	1-124-465-00	ELECT	0.47uF	20% 50V
C305	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V
C306	1-163-135-00	CERAMIC CHIP	560PF	5% 50V

Ref. No.	Part No.	Description	Remarks
C307	1-124-261-00	ELECT	10uF 20% 50V
C308	1-126-160-11	ELECT	1uF 20% 50V
C309	1-126-160-11	ELECT	1uF 20% 50V
C310	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C311	1-124-261-00	ELECT	10uF 20% 50V
C312	1-163-135-00	CERAMIC CHIP	560PF 5% 50V
C313	1-124-465-00	ELECT	0.47uF 20% 50V
C314	1-124-589-11	ELECT	47uF 20% 16V
C319	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C320	1-124-589-11	ELECT	47uF 20% 16V

C321	1-163-115-00	CERAMIC CHIP	82PF 5% 50V
C322	1-124-589-11	ELECT	47uF 20% 16V
C323	1-163-115-00	CERAMIC CHIP	82PF 5% 50V
C324	1-163-141-00	CERAMIC CHIP	0.001uF 5% 50V
C325	1-163-031-11	CERAMIC CHIP	0.01uF 50V

C326	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C327	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C328	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C329	1-124-589-11	ELECT	47uF 20% 16V
C330	1-126-163-11	ELECT	4.7uF 20% 50V
C331	1-126-163-11	ELECT	4.7uF 20% 50V
C332	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C333	1-165-319-11	CERAMIC CHIP	0.1uF 50V
C335	1-163-031-11	CERAMIC CHIP	0.01uF 50V

< CONNECTOR >

CN301	1-506-486-11	PIN, CONNECTOR 7P
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< DIODE >

D301	8-719-800-76	DIODE 1SS226
D302	8-719-800-76	DIODE 1SS226
D303	8-719-157-33	DIODE RD6.2M-B
D304	8-719-157-33	DIODE RD6.2M-B

< FERRITE BEAD >

FB301	1-412-390-21	INDUCTOR CHIP 0uH
FB302	1-412-390-21	INDUCTOR CHIP 0uH
FB303	1-412-390-21	INDUCTOR CHIP 0uH
FB304	1-412-390-21	INDUCTOR CHIP 0uH

< IC >

IC301	8-759-099-06	IC M5218AFP-TE1
IC302	8-759-634-96	IC M5207L05
IC303	8-759-099-06	IC M5218AFP-TE1
IC304	8-759-099-06	IC M5218AFP-TE1
IC305	8-759-701-51	IC NJM2072M

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Ref. No.	Part No.	Description	Remarks
		< JACK >	
J301	1-507-678-00	JACK (CONTROL)	
J302	1-750-990-11	JACK (LARGE TYPE) 2P (MIC)	
		< JUMPER RESISTOR >	
JR301	1-216-295-91	CONDCTOR, CHIP (2012)	
JR302	1-216-295-91	CONDCTOR, CHIP (2012)	
JR303	1-216-295-91	CONDCTOR, CHIP (2012)	
		< COIL >	
L301	1-408-976-21	INDUCTOR 33uH	
		< TRANSISTOR >	
Q301	8-729-027-31	TRANSISTOR DTA124EKA-T146	
		< RESISTOR >	
R301	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R302	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R303	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R304	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R305	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R306	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R307	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R308	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R309	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R310	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R311	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R312	1-216-033-00	METAL CHIP 220 5% 1/10W	
R313	1-216-033-00	METAL CHIP 220 5% 1/10W	
R314	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R315	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R316	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R317	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R318	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R319	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R320	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R321	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R322	1-208-813-11	METAL GLAZE 20K 0.50% 1/10W	
R323	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R324	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R325	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R326	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R327	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R328	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R329	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R332	1-216-295-91	CONDCTOR, CHIP (2012)	
R333	1-216-295-91	CONDCTOR, CHIP (2012)	
R335	1-216-295-91	CONDCTOR, CHIP (2012)	

Ref. No.	Part No.	Description	Remarks
*	A-6423-318-A	MB-717 BOARD, COMPLETE ***** (Ref.No.1,000 Series)	
		< CAPACITOR >	
C001	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C002	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C003	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
C004	1-124-443-00	ELECT 100uF	20% 10V
C005	1-163-251-11	CERAMIC CHIP 100PF	5% 50V
C006	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C007	1-126-177-11	ELECT 100uF	20% 10V
C008	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C009	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C010	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C011	1-124-443-00	ELECT 100uF	20% 10V
C012	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C013	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C014	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C015	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C016	1-124-903-11	ELECT 1uF	20% 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	1-216-119-00	METAL CHIP 820K 5%	1/10W
C025	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C026	1-163-237-11	CERAMIC CHIP 27PF	5% 50V
C027	1-124-635-00	ELECT 220uF	20% 6.3V
C028	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C029	1-163-116-00	CERAMIC CHIP 91PF	5% 50V
C030	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C032	1-163-241-11	CERAMIC CHIP 39PF	5% 50V
C033	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C034	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C035	1-163-038-91	CERAMIC CHIP 0.1uF	25V
C036	1-163-235-11	CERAMIC CHIP 22PF	5% 50V
C037	1-163-108-00	CERAMIC CHIP 43PF	5% 50V
C038	1-163-249-11	CERAMIC CHIP 82PF	5% 50V
C039	1-163-114-00	CERAMIC CHIP 75PF	5% 50V
C040	1-124-257-00	ELECT 2.2uF	20% 50V
C041	1-124-257-00	ELECT 2.2uF	20% 50V
C042	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C043	1-163-116-00	CERAMIC CHIP 91PF	5% 50V
C044	1-163-113-00	CERAMIC CHIP 68PF	5% 50V
C045	1-163-031-11	CERAMIC CHIP 0.01uF	50V
C046	1-124-584-00	ELECT 100uF	20% 10V

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C047	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C111	1-164-346-11	CERAMIC CHIP	1uF 16V
C048	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	C112	1-124-907-11	ELECT	10uF 20% 50V
C049	1-163-237-11	CERAMIC CHIP	27PF 5% 50V	C113	1-163-129-00	CERAMIC CHIP	330PF 5% 50V
C050	1-126-923-11	ELECT	220uF 20% 10V	C114	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C051	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	C115	1-126-803-11	ELECT	47uF 20% 10V
C052	1-163-220-11	CERAMIC CHIP	3PF 0.25PF 50V	C116	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V
C053	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	C118	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C054	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	C120	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C055	1-124-443-00	ELECT	100uF 20% 10V	C200	1-124-443-00	ELECT	100uF 20% 10V
C056	1-124-443-00	ELECT	100uF 20% 10V	C201	1-126-803-11	ELECT	47uF 20% 10V
C057	1-124-907-11	ELECT	10uF 20% 50V	C202	1-163-241-11	CERAMIC CHIP	39PF 5% 50V
C058	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C203	1-163-253-11	CERAMIC CHIP	120PF 5% 50V
C059	1-126-803-11	ELECT	47uF 20% 10V	C204	1-126-803-11	ELECT	47uF 20% 10V
C060	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C205	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C061	1-126-803-11	ELECT	47uF 20% 10V	C206	1-124-907-11	ELECT	10uF 20% 50V
C062	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C207	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C063	1-124-443-00	ELECT	100uF 20% 10V	C208	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C064	1-126-803-11	ELECT	47uF 20% 10V	C209	1-163-133-00	CERAMIC CHIP	470PF 5% 50V
C065	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C210	1-164-005-11	CERAMIC CHIP	0.47uF 25V
C066	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C211	1-163-241-11	CERAMIC CHIP	39PF 5% 50V
C067	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	C212	1-163-099-00	CERAMIC CHIP	18PF 5% 50V
C068	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C213	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C069	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C214	1-163-257-11	CERAMIC CHIP	180PF 5% 50V
C071	1-216-295-91	CONDCTOR, CHIP (2012)		C215	1-163-237-11	CERAMIC CHIP	27PF 5% 50V
C072	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C216	1-126-803-11	ELECT	47uF 20% 10V
C074	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C217	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C075	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C218	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
C076	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C219	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C077	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C220	1-163-249-11	CERAMIC CHIP	82PF 5% 50V
C078	1-124-903-11	ELECT	1uF 20% 50V	C221	1-163-001-11	CERAMIC CHIP	220PF 10% 50V
C079	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C222	1-163-033-91	CERAMIC CHIP	0.022uF 50V
C080	1-124-443-00	ELECT	100uF 20% 10V	C223	1-163-033-91	CERAMIC CHIP	0.022uF 50V
C081	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C224	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C082	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C225	1-163-033-91	CERAMIC CHIP	0.022uF 50V
C083	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C226	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C085	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C227	1-126-803-11	ELECT	47uF 20% 10V
C086	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C228	1-124-443-00	ELECT	100uF 20% 10V
C088	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C229	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C089	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C230	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C090	1-126-803-11	ELECT	47uF 20% 10V	C231	1-137-368-11	FILM	0.0047uF 5% 50V
C091	1-126-803-11	ELECT	47uF 20% 10V	C232	1-137-378-11	FILM	0.22uF 5% 50V
C092	1-124-589-11	ELECT	47uF 20% 16V	C233	1-137-368-11	FILM	0.0047uF 5% 50V
C093	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C234	1-137-378-11	FILM	0.22uF 5% 50V
C094	1-126-803-11	ELECT	47uF 20% 10V	C235	1-137-442-11	FILM	0.039uF 5% 50V
C095	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C236	1-137-442-11	FILM	0.039uF 5% 50V
C096	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C237	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C097	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C238	1-164-232-11	CERAMIC CHIP	0.01uF 50V
C098	1-124-907-11	ELECT	10uF 20% 50V	C239	1-137-399-11	FILM	0.1uF 5% 50V
C100	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C240	1-126-803-11	ELECT	47uF 20% 10V
C110	1-163-125-00	CERAMIC CHIP	220PF 5% 50V	C241	1-124-902-00	ELECT	0.47uF 20% 50V

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Ref. No.	Part No.	Description		Remarks		Ref. No.	Part No.	Description		Remarks
C242	1-124-907-11	ELECT	10uF	20%	50V	C424	1-163-125-00	CERAMIC CHIP	220PF	5% 50V
C244	1-126-803-11	ELECT	47uF	20%	10V	C425	1-163-253-11	CERAMIC CHIP	120PF	5% 50V
C245	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C427	1-107-714-11	ELECT	10uF	20% 16V
C247	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C428	1-163-809-11	CERAMIC CHIP	0.047uF	10% 25V
C249	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C430	1-163-239-11	CERAMIC CHIP	33PF	5% 50V
C250	1-107-714-11	ELECT	10uF	20%	16V	C431	1-164-489-11	CERAMIC CHIP	0.22uF	10% 16V
C251	1-109-889-11	ELECT	1uF	20%	50V	C432	1-163-022-00	CERAMIC CHIP	0.012uF	10% 50V
C252	1-126-803-11	ELECT	47uF	20%	10V	C433	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V
C253	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C434	1-163-016-00	CERAMIC CHIP	0.0039uF	10% 50V
C254	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C435	1-163-018-00	CERAMIC CHIP	0.0056uF	5% 50V
C257	1-126-916-11	ELECT	1000uF	20%	6.3V	C436	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C258	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	C437	1-124-273-00	ELECT	3.3uF	20% 50V
C259	1-163-005-11	CERAMIC CHIP	470PF	10%	50V	C439	1-104-760-11	CERAMIC CHIP	0.047uF	10% 50V
C260	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C440	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C261	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C441	1-107-714-11	ELECT	10uF	20% 16V
C263	1-124-927-11	ELECT	4.7uF	20%	100V	C443	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V
C265	1-124-927-11	ELECT	4.7uF	20%	100V	C444	1-163-125-00	CERAMIC CHIP	220PF	5% 50V
C266	1-124-927-11	ELECT	4.7uF	20%	100V	C445	1-163-014-00	CERAMIC CHIP	0.0027uF	10% 50V
C268	1-124-927-11	ELECT	4.7uF	20%	100V	C447	1-163-019-00	CERAMIC CHIP	6800PF	5% 50V
C270	1-124-477-11	ELECT	47uF	20%	25V	C448	1-164-161-11	CERAMIC CHIP	0.0022uF	10% 100V
C271	1-124-927-11	ELECT	4.7uF	20%	100V	C449	1-109-889-11	ELECT	1uF	20% 50V
C272	1-124-477-11	ELECT	47uF	20%	25V	C450	1-164-489-11	CERAMIC CHIP	0.22uF	10% 16V
C273	1-124-927-11	ELECT	4.7uF	20%	100V	C451	1-163-014-00	CERAMIC CHIP	0.0027uF	10% 50V
C286	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	C453	1-124-903-11	ELECT	1uF	20% 50V
C287	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V	C454	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C288	1-124-477-11	ELECT	47uF	20%	25V	C455	1-163-024-00	CERAMIC CHIP	0.018uF	10% 50V
C293	1-126-923-11	ELECT	220uF	20%	10V	C456	1-163-011-11	CERAMIC CHIP	0.0015uF	10% 50V
C350	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C457	1-163-235-11	CERAMIC CHIP	22PF	5% 50V
C351	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C458	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V
C401	1-124-589-11	ELECT	47uF	20%	16V	C459	1-163-239-11	CERAMIC CHIP	33PF	5% 50V
C402	1-124-589-11	ELECT	47uF	20%	16V	C501	1-126-803-11	ELECT	47uF	20% 10V
C403	1-124-477-11	ELECT	47uF	20%	25V	C502	1-107-701-11	ELECT	47uF	20% 16V
C404	1-124-477-11	ELECT	47uF	20%	25V	C503	1-163-251-11	CERAMIC CHIP	100PF	5% 50V
C405	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C504	1-163-245-11	CERAMIC CHIP	56PF	5% 50V
C406	1-163-038-91	CERAMIC CHIP	0.1uF		25V	C505	1-164-182-11	CERAMIC CHIP	0.0033uF	10% 50V
C407	1-126-803-11	ELECT	47uF	20%	10V	C506	1-124-927-11	ELECT	4.7uF	20% 100V
C408	1-126-803-11	ELECT	47uF	20%	10V	C507	1-124-768-11	ELECT	4.7uF	20% 35V
C410	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C508	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V
C411	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V	C509	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C412	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C510	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	C511	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C414	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C512	1-124-477-11	ELECT	47uF	20% 25V
C415	1-107-715-11	ELECT	22uF	20%	16V	C513	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C416	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C514	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C417	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	C515	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C418	1-164-232-11	CERAMIC CHIP	0.01uF		50V	C516	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C419	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C517	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C420	1-164-505-11	CERAMIC CHIP	2.2uF		16V	C519	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C421	1-163-129-00	CERAMIC CHIP	330PF	5%	50V	C520	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C423	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	C530	1-163-257-11	CERAMIC CHIP	180PF	5% 50V

Ref. No.	Part No.	Description	Remarks
C654	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C655	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C701	1-124-477-11	ELECT	47uF 20% 25V
C702	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C703	1-126-803-11	ELECT	47uF 20% 10V
C704	1-130-477-00	MYLAR	0.0033uF 5% 50V
C705	1-126-803-11	ELECT	47uF 20% 10V
C706	1-124-589-11	ELECT	47uF 20% 16V
C707	1-130-477-00	MYLAR	0.0033uF 5% 50V
C708	1-130-477-00	MYLAR	0.0033uF 5% 50V
C709	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C710	1-124-927-11	ELECT	4.7uF 20% 100V
C711	1-137-399-11	FILM	0.1uF 5% 50V
C712	1-164-693-11	CERAMIC CHIP	0.0018uF 5% 50V
C713	1-163-127-00	CERAMIC CHIP	270PF 5% 50V
C714	1-126-803-11	ELECT	47uF 20% 10V
C715	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C716	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C717	1-124-927-11	ELECT	4.7uF 20% 100V
C718	1-137-399-11	FILM	0.1uF 5% 50V
C719	1-164-693-11	CERAMIC CHIP	0.0018uF 5% 50V
C720	1-163-127-00	CERAMIC CHIP	270PF 5% 50V
C721	1-163-143-00	CERAMIC CHIP	0.0012uF 5% 50V
C722	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C723	1-124-927-11	ELECT	4.7uF 20% 100V
C724	1-137-399-11	FILM	0.1uF 5% 50V
C725	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C726	1-163-012-00	CERAMIC CHIP	0.0018uF 10% 50V
C727	1-124-589-11	ELECT	47uF 20% 16V
C728	1-107-701-11	ELECT	47uF 20% 16V
C729	1-107-701-11	ELECT	47uF 20% 16V
C730	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C731	1-163-087-00	CERAMIC CHIP	4PF 50V
C732	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V
C733	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C734	1-126-163-11	ELECT	4.7uF 20% 50V
C735	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C736	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C737	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C738	1-126-803-11	ELECT	47uF 20% 10V
C739	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C741	1-163-038-91	CERAMIC CHIP	0.1uF 25V
< CONNECTOR >			
CN001	1-695-342-31	PIN, CONNECTOR (PC BOARD)	19P
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

Ref. No.	Part No.	Description	Remarks
CN502	1-695-346-21	PIN, CONNECTOR (PC BOARD)	23P
* CN701	1-564-005-11	PIN, CONNECTOR	6P
CN702	1-506-472-11	PIN, CONNECTOR	7P
< 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
D202	8-719-914-43	DIODE	DAN202K-T-146
D203	8-719-032-80	DIODE	KV1430TL00
D204	8-719-914-42	DIODE	DA204K-T-146
D205	8-719-914-42	DIODE	DA204K-T-146
D206	8-719-988-62	DIODE	1SS355
D209	8-719-988-62	DIODE	1SS355
D401	8-719-988-62	DIODE	1SS355
D402	8-719-914-42	DIODE	DA204K-T-146
D403	8-719-914-43	DIODE	DAN202K-T-146
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
D701	8-719-914-42	DIODE	DA204K-T-146
D702	8-719-976-91	DIODE	DTZ4.3B
D703	8-719-976-91	DIODE	DTZ4.3B
D704	8-719-914-42	DIODE	DA204K-T-146
D705	8-719-914-42	DIODE	DA204K-T-146
D706	8-719-988-62	DIODE	1SS355
< FERRITE BEAD >			
FB501	1-414-135-11	INDUCTOR CHIP	OUH
< FILTER >			
FL001	1-577-543-11	FILTER, CERAMIC	
FL002	1-577-543-11	FILTER, CERAMIC	
FL201	1-236-744-21	FILTER, EMI	
FL202	1-236-744-21	FILTER, EMI	
FL701	1-424-031-11	FILTER, NOISE	
< IC >			
IC001	8-759-299-92	IC	AN2661NK
IC002	8-759-327-20	IC	M35012-098SP
IC003	8-759-290-65	IC	MN8811
IC004	8-759-295-66	IC	BA7653AF-E2
IC005	8-759-324-99	IC	MM1118XFBE

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Ref. No.	Part No.	Description	Remarks
IC201	8-752-372-94	IC CXD2507AQ	
IC203	8-759-253-26	IC CA0002AM-TP	
IC204	8-759-700-43	IC NJM4558M	
IC205	8-759-327-78	IC TC9404FN-EL	
IC206	8-759-700-43	IC NJM4558M	
IC401	8-759-280-89	IC HA11529F	
△IC402	8-759-822-38	IC LA6510	
△IC403	8-759-700-43	IC NJM4558M	
IC404	8-759-700-43	IC NJM4558M	
IC405	8-759-700-43	IC NJM4558M	
IC406	8-759-700-43	IC NJM4558M	
IC407	8-759-300-71	IC HD14053BFP	
IC501	8-759-336-58	IC MB89094PF-G-139-BND	
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	
IC701	8-759-604-35	IC M5F78M05	
IC702	8-759-300-71	IC HD14053BFP	
IC703	8-759-258-80	IC YSS216B-F	
IC704	8-759-177-12	IC MSM51C464A-80RS	
IC705	8-759-700-43	IC NJM4558M	
IC706	8-759-700-43	IC NJM4558M	
IC707	8-759-700-43	IC NJM4558M	
< JACK >			
J202	1-764-592-11	JACK 3P (LINE OUT2)	
J203	1-764-592-11	JACK 3P (LINE OUT1)	
< JUMPER RESISTOR >			
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)	
JR601	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR602	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	

Ref. No.	Part No.	Description	Remarks
L008	1-410-512-61	INDUCTOR 18uH	
L009	1-410-512-61	INDUCTOR 18uH	
L010	1-410-507-11	INDUCTOR 6.8uH	
L011	1-410-507-11	INDUCTOR 6.8uH	
L012	1-408-974-21	INDUCTOR 22uH	
L013	1-408-976-21	INDUCTOR 33uH	
L014	1-408-976-21	INDUCTOR 33uH	
L015	1-408-975-21	INDUCTOR 27uH	
L016	1-408-970-21	INDUCTOR 10uH	
L017	1-408-975-21	INDUCTOR 27uH	
L018	1-408-970-21	INDUCTOR 10uH	
L019	1-408-970-21	INDUCTOR 10uH	
L020	1-408-970-21	INDUCTOR 10uH	
L021	1-408-970-21	INDUCTOR 10uH	
L022	1-408-974-21	INDUCTOR 22uH	
L024	1-408-974-21	INDUCTOR 22uH	
L025	1-408-970-21	INDUCTOR 10uH	
L026	1-408-975-21	INDUCTOR 27uH	
L027	1-408-970-21	INDUCTOR 10uH	
L028	1-408-970-21	INDUCTOR 10uH	
L201	1-408-982-21	INDUCTOR 100uH	
L202	1-408-979-21	INDUCTOR 56uH	
L203	1-408-978-21	INDUCTOR 47uH	
L204	1-408-973-21	INDUCTOR 18uH	
L205	1-408-985-21	INDUCTOR 180uH	
L209	1-414-161-21	INDUCTOR 1mH	
L210	1-414-161-21	INDUCTOR 1mH	
L401	1-408-970-21	INDUCTOR 10uH	
L402	1-408-970-21	INDUCTOR 10uH	
L404	1-408-983-21	INDUCTOR 120uH	
L405	1-408-983-21	INDUCTOR 120uH	
L406	1-408-970-21	INDUCTOR 10uH	
L407	1-408-970-21	INDUCTOR 10uH	
L501	1-408-970-21	INDUCTOR 10uH	
L504	1-408-970-21	INDUCTOR 10uH	
L701	1-408-958-21	INDUCTOR 1uH	
L702	1-408-958-21	INDUCTOR 1uH	
< TRANSISTOR >			
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-027-43	TRANSISTOR DTC114EKA-T146	
Q003	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q004	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q007	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

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

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
Q009	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q011	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q012	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q013	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q014	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q015	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q016	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q017	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q019	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q020	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q021	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q022	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q023	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q024	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q025	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q026	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q027	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q028	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q030	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q031	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
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

Ref. No.	Part No.	Description	Remarks
Q501	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q502	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q614	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q702	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q703	8-729-026-50	TRANSISTOR	2SA1037AK-T146-QR
Q704	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q705	8-729-027-52	TRANSISTOR	DTC124EKA-T146
< RESISTOR >			
R001	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R002	1-216-075-00	METAL CHIP	12K 5% 1/10W
R003	1-216-041-00	METAL CHIP	470 5% 1/10W
R004	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R005	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R006	1-216-021-00	METAL CHIP	68 5% 1/10W
R007	1-216-035-00	METAL CHIP	270 5% 1/10W
R008	1-216-047-00	METAL CHIP	820 5% 1/10W
R009	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R010	1-216-037-00	METAL CHIP	330 5% 1/10W
R011	1-216-075-00	METAL CHIP	12K 5% 1/10W
R012	1-216-083-00	METAL CHIP	27K 5% 1/10W
R014	1-216-097-00	METAL CHIP	100K 5% 1/10W
R015	1-216-099-00	METAL CHIP	120K 5% 1/10W
R016	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R017	1-216-043-91	METAL GLAZE	560 5% 1/10W
R018	1-216-073-00	METAL CHIP	10K 5% 1/10W
R019	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R020	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R021	1-216-089-00	METAL CHIP	47K 5% 1/10W
R022	1-216-041-00	METAL CHIP	470 5% 1/10W
R023	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R025	1-216-097-00	METAL CHIP	100K 5% 1/10W
R027	1-216-119-00	METAL CHIP	820K 5% 1/10W
R032	1-216-101-00	METAL CHIP	150K 5% 1/10W
R033	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R034	1-216-045-00	METAL CHIP	680 5% 1/10W
R035	1-216-039-00	METAL CHIP	390 5% 1/10W
R036	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R038	1-216-063-00	METAL CHIP	3.9K 5% 1/10W
R039	1-216-059-00	METAL CHIP	2.7K 5% 1/10W
R040	1-216-043-91	METAL GLAZE	560 5% 1/10W
R041	1-216-009-00	METAL CHIP	22 5% 1/10W
R042	1-216-029-00	METAL CHIP	150 5% 1/10W
R043	1-216-041-00	METAL CHIP	470 5% 1/10W
R044	1-216-041-00	METAL CHIP	470 5% 1/10W
R045	1-216-075-00	METAL CHIP	12K 5% 1/10W
R046	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R047	1-216-057-00	METAL CHIP	2.2K 5% 1/10W

Note:
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Ref. No.	Part No.	Description			Remarks
R048	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R049	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R050	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R051	1-216-073-00	METAL CHIP	10K	5%	1/10W
R052	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R053	1-216-043-91	METAL GLAZE	560	5%	1/10W
R054	1-216-041-00	METAL CHIP	470	5%	1/10W
R055	1-216-073-00	METAL CHIP	10K	5%	1/10W
R056	1-216-039-00	METAL CHIP	390	5%	1/10W
R059	1-216-043-91	METAL GLAZE	560	5%	1/10W
R061	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R062	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R063	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R064	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R065	1-216-091-00	METAL CHIP	56K	5%	1/10W
R066	1-216-089-00	METAL CHIP	47K	5%	1/10W
R067	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R068	1-216-025-91	METAL GLAZE	100	5%	1/10W
R069	1-216-037-00	METAL CHIP	330	5%	1/10W
R070	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R071	1-216-073-00	METAL CHIP	10K	5%	1/10W
R072	1-216-033-00	METAL CHIP	220	5%	1/10W
R073	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R074	1-216-025-91	METAL GLAZE	100	5%	1/10W
R075	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R076	1-216-295-91	CONDUCTOR, CHIP (2012)			
R077	1-216-041-00	METAL CHIP	470	5%	1/10W
R078	1-216-025-91	METAL GLAZE	100	5%	1/10W
R079	1-216-041-00	METAL CHIP	470	5%	1/10W
R080	1-216-121-00	METAL CHIP	1M	5%	1/10W
R081	1-216-021-00	METAL CHIP	68	5%	1/10W
R082	1-216-041-00	METAL CHIP	470	5%	1/10W
R083	1-216-043-91	METAL GLAZE	560	5%	1/10W
R084	1-216-041-00	METAL CHIP	470	5%	1/10W
R085	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R086	1-216-021-00	METAL CHIP	68	5%	1/10W
R088	1-216-295-91	CONDUCTOR, CHIP (2012)			
R089	1-216-033-00	METAL CHIP	220	5%	1/10W
R090	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R091	1-216-058-00	METAL GLAZE	2.4K	5%	1/10W
R093	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R094	1-216-073-00	METAL CHIP	10K	5%	1/10W
R095	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R097	1-216-295-91	CONDUCTOR, CHIP (2012)			
R098	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R099	1-216-037-00	METAL CHIP	330	5%	1/10W
R110	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R111	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R112	1-216-295-91	CONDUCTOR, CHIP (2012)			
R113	1-216-037-00	METAL CHIP	330	5%	1/10W
R119	1-216-047-00	METAL CHIP	820	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R120	1-216-081-00	METAL CHIP	22K	5%	1/10W
R121	1-216-095-00	METAL CHIP	82K	5%	1/10W
R122	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R123	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R124	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R125	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R126	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R127	1-216-113-00	METAL CHIP	470K	5%	1/10W
R128	1-216-029-00	METAL CHIP	150	5%	1/10W
R129	1-216-033-00	METAL CHIP	220	5%	1/10W
R130	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R139	1-164-232-11	CERAMIC CHIP	0.01uF		50V
R143	1-216-295-91	CONDUCTOR, CHIP (2012)			
R144	1-216-033-00	METAL CHIP	220	5%	1/10W
R145	1-216-295-91	CONDUCTOR, CHIP (2012)			
R201	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R203	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R206	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R208	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R209	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R210	1-216-041-00	METAL CHIP	470	5%	1/10W
R211	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R212	1-216-017-00	METAL CHIP	47	5%	1/10W
R213	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R214	1-216-023-00	METAL CHIP	82	5%	1/10W
R215	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R216	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R217	1-216-073-00	METAL CHIP	10K	5%	1/10W
R218	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R219	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R220	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R224	1-216-121-00	METAL CHIP	1M	5%	1/10W
R226	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R227	1-216-074-00	METAL CHIP	11K	5%	1/10W
R228	1-216-121-00	METAL CHIP	1M	5%	1/10W
R229	1-163-031-11	CERAMIC CHIP	0.01MF		50V
R235	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R236	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R237	1-216-077-00	METAL CHIP	15K	5%	1/10W
R238	1-216-077-00	METAL CHIP	15K	5%	1/10W
R239	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R240	1-216-096-00	METAL GLAZE	91K	5%	1/10W
R241	1-216-295-91	CONDUCTOR, CHIP (2012)			
R242	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R243	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R244	1-216-295-91	CONDUCTOR, CHIP (2012)			
R245	1-216-104-00	METAL CHIP	200K	5%	1/10W
R246	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R249	1-216-295-91	CONDUCTOR, CHIP (2012)			
R250	1-216-071-00	METAL CHIP	8.2K	5%	1/10W

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Ref. No.	Part No.	Description	Quantity	Material	Remarks	Ref. No.	Part No.	Description	Quantity	Material	Remarks
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
R253	1-216-295-91	CONDUCTOR, CHIP (2012)				R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R254	1-216-101-00	METAL CHIP	150K	5%	1/10W	R320	1-216-295-91	CONDUCTOR, CHIP (2012)			
R255	1-216-101-00	METAL CHIP	150K	5%	1/10W	R321	1-216-295-91	CONDUCTOR, CHIP (2012)			
R256	1-216-073-00	METAL CHIP	10K	5%	1/10W	R322	1-216-073-00	METAL CHIP	10K	5%	1/10W
R257	1-216-073-00	METAL CHIP	10K	5%	1/10W	R323	1-216-033-00	METAL CHIP	220	5%	1/10W
R258	1-216-104-00	METAL CHIP	200K	5%	1/10W	R324	1-216-033-00	METAL CHIP	220	5%	1/10W
R259	1-216-295-91	CONDUCTOR, CHIP (2012)				R352	1-216-037-00	METAL CHIP	330	5%	1/10W
R260	1-216-091-00	METAL CHIP	56K	5%	1/10W	R353	1-216-073-00	METAL CHIP	10K	5%	1/10W
R261	1-216-091-00	METAL CHIP	56K	5%	1/10W	R354	1-216-295-91	CONDUCTOR, CHIP (2012)			
R262	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	R401	1-216-369-00	METAL OXIDE	1	5%	2W F
R263	1-216-091-00	METAL CHIP	56K	5%	1/10W	R402	1-216-146-00	METAL GLAZE	6.8	5%	1/8W
R264	1-216-091-00	METAL CHIP	56K	5%	1/10W	R403	1-216-146-00	METAL GLAZE	6.8	5%	1/8W
R265	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R404	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R266	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R405	1-216-025-91	METAL GLAZE	100	5%	1/10W
R267	1-216-295-91	CONDUCTOR, CHIP (2012)				R406	1-216-079-00	METAL CHIP	18K	5%	1/10W
R269	1-216-295-91	CONDUCTOR, CHIP (2012)				R407	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R270	1-216-097-00	METAL CHIP	100K	5%	1/10W	R408	1-216-081-00	METAL CHIP	22K	5%	1/10W
R271	1-216-097-00	METAL CHIP	100K	5%	1/10W	R409	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R272	1-216-075-00	METAL CHIP	12K	5%	1/10W	R411	1-216-077-00	METAL CHIP	15K	5%	1/10W
R273	1-216-085-00	METAL CHIP	33K	5%	1/10W	R412	1-216-045-00	METAL CHIP	680	5%	1/10W
R274	1-216-295-91	CONDUCTOR, CHIP (2012)				R413	1-216-047-00	METAL CHIP	820	5%	1/10W
R275	1-216-295-91	CONDUCTOR, CHIP (2012)				R414	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R276	1-216-073-00	METAL CHIP	10K	5%	1/10W	R415	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R277	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R278	1-216-295-91	CONDUCTOR, CHIP (2012)				R417	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R279	1-216-075-00	METAL CHIP	12K	5%	1/10W	R418	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R280	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R419	1-216-045-00	METAL CHIP	680	5%	1/10W
R281	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R420	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R283	1-216-075-00	METAL CHIP	12K	5%	1/10W	R421	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R284	1-216-081-00	METAL CHIP	22K	5%	1/10W	R422	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R285	1-216-081-00	METAL CHIP	22K	5%	1/10W	R423	1-216-039-00	METAL CHIP	390	5%	1/10W
R286	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R424	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R289	1-216-081-00	METAL CHIP	22K	5%	1/10W	R425	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R290	1-216-081-00	METAL CHIP	22K	5%	1/10W	R426	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R291	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R427	1-216-017-00	METAL CHIP	47	5%	1/10W
R292	1-216-043-91	METAL GLAZE	560	5%	1/10W	R428	1-216-073-00	METAL CHIP	10K	5%	1/10W
R293	1-216-073-00	METAL CHIP	10K	5%	1/10W	R429	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R294	1-216-073-00	METAL CHIP	10K	5%	1/10W	R430	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R295	1-216-043-91	METAL GLAZE	560	5%	1/10W	R431	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R296	1-216-035-00	METAL CHIP	270	5%	1/10W	R432	1-216-107-00	METAL CHIP	270K	5%	1/10W
R297	1-216-035-00	METAL CHIP	270	5%	1/10W	R433	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R298	1-216-097-00	METAL CHIP	100K	5%	1/10W	R434	1-216-097-00	METAL CHIP	100K	5%	1/10W
R299	1-216-097-00	METAL CHIP	100K	5%	1/10W	R435	1-216-077-00	METAL CHIP	15K	5%	1/10W
R300	1-216-073-00	METAL CHIP	10K	5%	1/10W	R436	1-216-101-00	METAL CHIP	150K	5%	1/10W
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W	R437	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R302	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R438	1-216-089-00	METAL CHIP	47K	5%	1/10W
R303	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R442	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	R444	1-216-075-00	METAL CHIP	12K	5%	1/10W

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Ref. No.	Part No.	Description	Quantity	Percentage	Remarks
R445	1-216-079-00	METAL CHIP	18K	5%	1/10W
R446	1-216-101-00	METAL CHIP	150K	5%	1/10W
R447	1-216-089-00	METAL CHIP	47K	5%	1/10W
R448	1-216-101-00	METAL CHIP	150K	5%	1/10W
R449	1-216-035-00	METAL CHIP	270	5%	1/10W
R450	1-216-089-00	METAL CHIP	47K	5%	1/10W
R451	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R452	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R453	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R454	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R455	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R456	1-216-097-00	METAL CHIP	100K	5%	1/10W
R457	1-216-081-00	METAL CHIP	22K	5%	1/10W
R458	1-216-097-00	METAL CHIP	100K	5%	1/10W
R459	1-216-083-00	METAL CHIP	27K	5%	1/10W
R460	1-216-075-00	METAL CHIP	12K	5%	1/10W
R461	1-216-085-00	METAL CHIP	33K	5%	1/10W
R462	1-216-089-00	METAL CHIP	47K	5%	1/10W
R463	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R464	1-216-075-00	METAL CHIP	12K	5%	1/10W
R465	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R466	1-216-097-00	METAL CHIP	100K	5%	1/10W
R467	1-216-085-00	METAL CHIP	33K	5%	1/10W
R468	1-216-089-00	METAL CHIP	47K	5%	1/10W
R469	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R470	1-216-081-00	METAL CHIP	22K	5%	1/10W
R471	1-216-079-00	METAL CHIP	18K	5%	1/10W
R472	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R473	1-216-075-00	METAL CHIP	12K	5%	1/10W
R474	1-216-093-00	METAL CHIP	68K	5%	1/10W
R475	1-216-099-00	METAL CHIP	120K	5%	1/10W
R476	1-216-073-00	METAL CHIP	10K	5%	1/10W
R477	1-216-077-00	METAL CHIP	15K	5%	1/10W
R478	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R479	1-216-085-00	METAL CHIP	33K	5%	1/10W
R480	1-216-073-00	METAL CHIP	10K	5%	1/10W
R481	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R482	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W
R484	1-216-091-00	METAL CHIP	56K	5%	1/10W
R485	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R486	1-216-073-00	METAL CHIP	10K	5%	1/10W
R487	1-216-079-00	METAL CHIP	18K	5%	1/10W
R488	1-216-089-00	METAL CHIP	47K	5%	1/10W
R489	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R490	1-216-073-00	METAL CHIP	10K	5%	1/10W
R491	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R492	1-216-073-00	METAL CHIP	10K	5%	1/10W
R493	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R494	1-216-105-91	METAL GLAZE	220K	5%	1/10W

Ref. No.	Part No.	Description	Quantity	Percentage	Remarks
R495	1-216-085-00	METAL CHIP	33K	5%	1/10W
R496	1-216-097-00	METAL CHIP	100K	5%	1/10W
R497	1-216-097-00	METAL CHIP	100K	5%	1/10W
R498	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R499	1-216-090-00	METAL CHIP	51K	5%	1/10W
R502	1-216-089-00	METAL CHIP	47K	5%	1/10W
R506	1-216-121-00	METAL CHIP	1M	5%	1/10W
R507	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R508	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W
R509	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R510	1-216-089-00	METAL CHIP	47K	5%	1/10W
R511	1-216-111-00	METAL CHIP	390K	5%	1/10W
R512	1-216-113-00	METAL CHIP	470K	5%	1/10W
R513	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W
R514	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W
R516	1-216-085-00	METAL CHIP	33K	5%	1/10W
R517	1-208-808-11	METAL GLAZE	12K	0.50%	1/10W
R518	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W
R519	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W
R520	1-216-073-00	METAL CHIP	10K	5%	1/10W
R521	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W
R522	1-216-081-00	METAL CHIP	22K	5%	1/10W
R523	1-216-035-00	METAL CHIP	270	5%	1/10W
R524	1-208-810-11	METAL GLAZE	15K	0.50%	1/10W
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
△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

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		
R548	1-216-081-00	METAL CHIP	22K	5%	1/10W	R719	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R549	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	R721	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R550	1-216-073-00	METAL CHIP	10K	5%	1/10W	R722	1-208-815-11	METAL GLAZE	24K	0.50%	1/10W
R551	1-216-081-00	METAL CHIP	22K	5%	1/10W	R723	1-216-121-00	METAL CHIP	1M	5%	1/10W
R552	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R725	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R555	1-216-021-00	METAL CHIP	68	5%	1/10W	R726	1-216-073-00	METAL CHIP	10K	5%	1/10W
R556	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R727	1-216-073-00	METAL CHIP	10K	5%	1/10W
R557	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R728	1-216-295-91	CONDUCTOR, CHIP (2012)			
R558	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R729	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R559	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R730	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R560	1-216-033-00	METAL CHIP	220	5%	1/10W	R731	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R561	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R732	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R562	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R733	1-216-121-00	METAL CHIP	1M	5%	1/10W
R563	1-216-033-00	METAL CHIP	220	5%	1/10W	R734	1-216-073-00	METAL CHIP	10K	5%	1/10W
R564	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R735	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R566	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R736	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R567	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R737	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R568	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R738	1-216-073-00	METAL CHIP	10K	5%	1/10W
R569	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R739	1-216-085-00	METAL CHIP	33K	5%	1/10W
R570	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R740	1-216-025-91	METAL GLAZE	100	5%	1/10W
R571	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R741	1-216-025-91	METAL GLAZE	100	5%	1/10W
R572	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R742	1-216-025-91	METAL GLAZE	100	5%	1/10W
R573	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R743	1-216-025-91	METAL GLAZE	100	5%	1/10W
R574	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R744	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R576	1-216-049-91	METAL GLAZE	1K	5%	1/10W	R746	1-216-295-91	CONDUCTOR, CHIP (2012)			
R577	1-216-073-00	METAL CHIP	10K	5%	1/10W	R747	1-216-073-00	METAL CHIP	10K	5%	1/10W
R578	1-216-089-00	METAL CHIP	47K	5%	1/10W	R900	1-216-085-00	METAL CHIP	33K	5%	1/10W
R594	1-216-295-91	CONDUCTOR, CHIP (2012)				R901	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R595	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R902	1-216-081-00	METAL CHIP	22K	5%	1/10W
R596	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	R903	1-216-081-00	METAL CHIP	22K	5%	1/10W
R597	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R904	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R598	1-216-295-91	CONDUCTOR, CHIP (2012)				R905	1-216-085-00	METAL CHIP	33K	5%	1/10W
R663	1-216-025-91	METAL GLAZE	100	5%	1/10W	R906	1-216-077-00	METAL CHIP	15K	5%	1/10W
R677	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	R907	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R689	1-216-295-91	CONDUCTOR, CHIP (2012)				R908	1-216-097-00	METAL CHIP	100K	5%	1/10W
R702	1-216-025-91	METAL GLAZE	100	5%	1/10W	R910	1-216-295-91	CONDUCTOR, CHIP (2012)			
R703	1-216-073-00	METAL CHIP	10K	5%	1/10W	R911	1-216-081-00	METAL CHIP	22K	5%	1/10W
R704	1-216-295-91	CONDUCTOR, CHIP (2012)				R912	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R705	1-216-097-00	METAL CHIP	100K	5%	1/10W	R913	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R706	1-216-097-00	METAL CHIP	100K	5%	1/10W	R914	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R707	1-216-097-00	METAL CHIP	100K	5%	1/10W	R915	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W	R916	1-216-083-00	METAL CHIP	27K	5%	1/10W
R710	1-216-295-91	CONDUCTOR, CHIP (2012)				R917	1-216-099-00	METAL CHIP	120K	5%	1/10W
R711	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R918	1-216-103-91	METAL CHIP	180K	5%	1/10W
R712	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R919	1-216-073-00	METAL CHIP	10K	5%	1/10W
R713	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R920	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R715	1-216-105-91	METAL GLAZE	220K	5%	1/10W	R921	1-216-103-91	METAL CHIP	180K	5%	1/10W
R717	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R922	1-216-073-00	METAL CHIP	10K	5%	1/10W
R718	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	R923	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

MB-717 **MD-705** **MT-706** **MT-707**

Ref. No.	Part No.	Description	Remarks
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	
< 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

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

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
	1-413-989-21	POWER BLOCK (A660K) *****	
	1-468-020-11	POWER BLOCK (K50) *****	
		(Ref.No.5,000 Series)	
△	1-533-223-11	HOLDER, FUSE < CAPACITOR >	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C052	1-163-019-11	MULTILAYER CERAMIC 6800PF	50V
C053	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C056	1-163-007-11	MULTILAYER CERAMIC 680PF	50V
C057	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C058	1-163-035-11	MULTILAYER CERAMIC 0.047uF	50V
C059	1-163-017-11	MULTILAYER CERAMIC 4700PF	50V
C060	1-163-007-11	MULTILAYER CERAMIC 680PF	50V
C061	1-163-017-11	MULTILAYER CERAMIC 4700PF	50V
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF	50V
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF	50V
C064	1-130-491-51	FILM 0.047uF	50V
△C101	9-902-038-01	METALLIZED 0.22uF	250V
△C102	9-900-521-01	METALLIZED 0.1uF	250V
△C103	9-900-522-01	CERAMIC 2200PF	400V
△C104	9-900-522-01	CERAMIC 2200PF	400V
△C105	9-900-522-01	CERAMIC 2200PF	400V (A660K)
△C106	9-900-522-01	CERAMIC 2200PF	400V (A660K)
△C107	9-900-522-01	CERAMIC 2200PF	400V
△C108	9-909-672-01	ALUMINUM ELECTIC 150uF	400V (A660K)
△C108	9-900-523-01	ALUMINUM ELECTIC 220uF	200V (K50)
△C109	9-909-672-01	ALUMINUM ELECTIC 150uF	400V (A660K)
△C110	9-909-673-01	CERAMIC 220PF	1kV (A660K)
△C110	9-933-752-01	CERAMIC 470PF	1kV (K50)
△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 (A660K)
△C113	1-130-491-51	METALLIZED 0.047uF	50V (K50)
△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 (A660K)
△C118	9-900-522-01	CERAMIC 2200PF	400V (A660K)
△C119	9-909-673-01	CERAMIC 220PF	1kV (K50)
△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

Ref. No.	Part No.	Description	Remarks
△C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF	10V
△C206	1-126-925-51	ALUMINUM ELECTRIC 470uF	10V
C208	1-126-964-51	ALUMINUM ELECTRIC 10uF	50V
C210	1-126-964-51	ALUMINUM ELECTRIC 10uF	50V
C211	1-126-925-51	ALUMINUM ELECTRIC 470uF	10V
C212	1-126-923-51	ALUMINUM ELECTRIC 220uF	10V
C213	1-130-495-91	ALUMINUM ELECTRIC 4.7uF	50V
C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF	50V
C215	9-909-680-01	CERAMIC 1000PF	1kV
C216	9-909-680-01	CERAMIC 1000PF	1kV
C217	1-130-491-51	FILM 0.047uF	50V
C218	1-126-942-11	ALUMINUM ELECTRIC 1000uF	25V
C219	1-126-942-11	ALUMINUM ELECTRIC 1000uF	25V
C220	1-130-467-11	FILM 470PF	50V
C221	1-130-467-11	FILM 470PF	50V
		< CONNECTOR >	
CN051	1-695-342-11	CONNECTOR 19P	
CN052	1-506-473-11	CONNECTOR 8P	
CN053	1-564-506-11	CONNECTOR 3P	
CN101	1-564-419-11	CONNECTOR 2P	
		< DIODE >	
D051	9-902-064-01	DIODE ERA81-004	
D052	9-902-064-01	DIODE ERA81-004	
D053	8-719-200-82	DIODE 11ES2	
D054	8-719-200-82	DIODE 11ES2	
D055	8-719-911-19	DIODE 1SS119	
D056	8-719-911-19	DIODE 1SS119	
D057	8-719-911-19	DIODE 1SS119	
D060	8-719-911-19	DIODE 1SS119	
△D101	8-719-510-19	BRIDGE DIODE D2SBA60	
△D102	9-902-050-01	DIODE ERA15-06	
△D103	8-719-030-25	DIODE EGO1C (A660K)	
△D103	9-900-512-01	DIODE AG01A (K50)	
△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	

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 spécifiée.

POWER BLOCK

Ref. No.	Part No.	Description	Remarks
< FUSE >			
△F101	1-532-286-11	FUSE TIME LUG (3.15A 250V) (A660K)	
△F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (K50)	
< 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 (A660K)	
△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 (A660K)	
△PC101	9-900-519-01	PHOTO COUPLER (K50)	
△PC102	9-909-676-01	PHOTO COUPLER (A660K)	
△PC102	9-900-519-01	PHOTO COUPLER (K50)	
< IC LINK >			
△PS051	1-532-675-91	IC LINK (ICP-N38 1.5A)	
△PS052	1-532-675-91	IC LINK	
< TRANSISTOR >			
△Q051	8-729-117-11	TRANSISTOR 2SB1151	
△Q052	8-729-019-31	TRANSISTOR 2SC4596	
△Q053	8-729-117-11	TRANSISTOR 2SB1151	
△Q054	8-729-019-31	TRANSISTOR 2SC4596	
Q055	8-729-119-78	TRANSISTOR 2SC3311	
Q056	8-729-230-46	TRANSISTOR 2SA1162	
Q058	8-729-230-49	TRANSISTOR 2SC2712	
Q059	8-729-230-46	TRANSISTOR 2SA1162	
Q060	8-729-230-49	TRANSISTOR 2SC2712	
Q061	8-729-119-76	TRANSISTOR 2SA1309	
△Q101	9-909-669-01	TRANSISTOR 2SK1547 (A660K)	
△Q101	9-933-750-01	TRANSISTOR 2SK1102 (K50)	
△Q201	8-729-021-99	TRANSISTOR 2SB1416	
△Q202	8-729-119-78	TRANSISTOR 2SC1740	
△Q203	8-729-119-76	TRANSISTOR 2SA933	

Ref. No.	Part No.	Description	Remarks
△Q204	9-909-678-01	TRANSISTOR 2SC4545	
△Q206	8-729-900-80	TRANSISTOR UN4211	
< RESISTOR >			
R050	1-216-097-11	THICK FILM	100K 1/10W
R051	1-216-081-11	THICK FILM	22K 1/10W
R052	1-216-075-11	THICK FILM	12K 1/10W
R053	1-216-093-11	THICK FILM	68K 1/10W
R054	1-216-105-11	THICK FILM	220K 1/10W
R055	1-216-091-11	THICK FILM	56K 1/10W
R057	1-216-093-11	THICK FILM	68K 1/10W
R061	1-216-089-11	THICK FILM	47K 1/10W
R062	1-216-065-11	THICK FILM	4.7K 1/10W
R063	1-216-049-11	THICK FILM	1K 1/10W
R064	1-247-750-11	CARBON	680 5% 1/2W
R065	1-247-750-11	CARBON	680 5% 1/2W
R066	1-216-049-11	THICK FILM	1K 1/10W
△R067	1-216-369-51	CARBON	1 2W
R068	1-219-387-11	THICK FILM	43K 0.1% 1/10W
R069	1-219-391-11	THICK FILM	47K 0.1% 1/10W
R070	1-219-387-11	THICK FILM	43K 0.1% 1/10W
R071	1-219-391-11	THICK FILM	47K 0.1% 1/10W
R072	1-216-073-11	THICK FILM	10K 1/10W
R073	1-216-073-11	THICK FILM	10K 1/10W
△R074	1-215-866-11	CARBON	330 5% 1W
R075	1-216-073-11	THICK FILM	10K 1/10W
R076	1-247-750-11	CARBON	680 5% 1/2W
R077	1-216-073-11	THICK FILM	10K 1/10W
R079	1-216-097-11	THICK FILM	100K 1/10W
R080	1-216-097-11	THICK FILM	100K 1/10W
△R101	9-900-394-01	NON-FLAMABLE CARBON	1M 1/2W (A660K)
△R102	1-215-863-11	METAL OXIDE FILM	100K 1W (A660K)
△R102	1-215-878-11	METAL OXIDE FILM	33K 1W (K50)
△R103	1-215-863-11	METAL OXIDE FILM	100K 1W (A660K)
△R103	1-215-878-11	METAL OXIDE FILM	33K 1W (K50)
△R104	1-214-921-11	CARBON	220K 1/2W
△R105	1-214-921-11	CARBON	220K 1/2W (A660K)
△R106	1-215-860-51	METAL OXIDE FILM	33 1W (A660K)
△R106	1-215-858-11	METAL OXIDE FILM	15 1W (K50)
△R107	1-215-927-51	METAL OXIDE FILM	47K 3W (A660K)
△R107	1-215-924-11	METAL OXIDE FILM	15K 3W (K50)
△R108	1-212-974-11	NON-FLAMABLE CARBON	47 1/2W
△R109	9-909-670-01	METAL FILM	0.22 1/2W
△R110	9-909-671-01	CEMENT	0.1 2W (A660K)

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

PW-720

Ref. No.	Part No.	Description	Remarks
△R110	9-933-751-01	CEMENT	0.05 2W (K50)
△R111	1-249-408-11	CARBON	180 1/4W
△R112	1-212-958-11	NON-FLAMABLE CARBON	10 1/2W
△R113	1-247-831-31	CARBON	2.2K 1/4W (K50)
△R114	1-247-848-31	CARBON	5.1K 1/4W
△R115	1-247-855-31	CARBON	10K 1/4W
△R116	1-247-891-31	CARBON	330K 1/4W
△R117	1-247-891-31	CARBON	330K 1/4W
△R118	1-212-966-11	NON-FLAMABLE CARBON	22 1/2W
△R201	9-909-679-01	FUSE	0.22 1/4W
△R202	1-247-855-31	CARBON	10K 1/4W
R203	1-249-404-11	CARBON	82 1/4W
△R204	1-247-847-11	CARBON	4.7K 1/4W
△R205	1-247-847-11	CARBON	4.7K 1/4W
R206	1-249-404-11	CARBON	82 1/4W
△R207	1-247-855-31	CARBON	10K 1/4W
△R208	1-247-847-11	CARBON	4.7K 1/4W
△R209	1-247-847-11	CARBON	4.7K 1/4W
△R210	1-260-099-11	CARBON	1K 1/2W
△R211	1-247-839-31	CARBON	2.2K 5% 1/4W
△R212	1-247-839-31	CARBON	2.2K 5% 1/4W
R213	1-249-432-11	CARBON	18K 1/4W
R214	1-249-433-11	CARBON	22K 1/4W
△R215	1-247-855-31	CARBON	10K 1/4W
△R221	1-247-855-31	CARBON	10K 1/4W
R225	1-247-855-31	CARBON	10K 1/4W
△R226	1-247-871-11	CARBON	47K 1/4W
△R227	1-249-439-11	CARBON	68K 1/4W
< SWITCH >			
△SW101	1-572-675-11	POWER SWITCH	(A660K)
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER	(A660K)
△T101	9-933-753-01	SWITCHING TRANSFORMER	(K50)
< 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

Ref. No.	Part No.	Description	Remarks
*	A-6423-320-A	PW-720 BOARD, COMPLETE	

(Ref.No.3,000 Series)			
< CAPACITOR >			
C501	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C502	1-163-031-11	CERAMIC CHIP	0.01uF 50V
< CONNECTOR >			
CN501	1-506-486-11	PIN, CONNECTOR	7P
< DIODE >			
D503	8-719-981-49	DIODE	GL3ED8
D504	8-719-981-49	DIODE	GL3ED8
< IC >			
IC501	8-749-923-11	IC	GP1U58XB
< TRANSISTOR >			
Q501	8-729-901-05	TRANSISTOR	DTA124EK
< RESISTOR >			
R501	1-216-089-00	METAL CHIP	47K 5% 1/10W
R502	1-216-079-00	METAL CHIP	18K 5% 1/10W
R503	1-216-071-00	METAL CHIP	8.2K 5% 1/10W
R504	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R505	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R506	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R507	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R508	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R509	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R510	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R511	1-216-041-00	METAL CHIP	470 5% 1/10W
R512	1-216-037-00	METAL CHIP	330 5% 1/10W
R513	1-216-037-00	METAL CHIP	330 5% 1/10W
R514	1-216-037-00	METAL CHIP	330 5% 1/10W
R515	1-216-037-00	METAL CHIP	330 5% 1/10W
R522	1-216-295-91	CONDUCTOR, CHIP	(2012)
< VARIABLE RESISTOR >			
RV501	1-241-646-11	RES, VAR, CARBON	10K
< SWITCH >			
S501	1-762-365-21	SWITCH, TACTILE	(10)
S502	1-762-365-21	SWITCH, TACTILE	(9)
S503	1-762-365-21	SWITCH, TACTILE	(8)

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.

PW-720	SW-732
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Ref. No.	Part No.	Description	Remarks
S504	1-762-365-21	SWITCH, TACTILE (7)	
S505	1-762-365-21	SWITCH, TACTILE (6)	
S506	1-762-365-21	SWITCH, TACTILE (5)	
S507	1-762-365-21	SWITCH, TACTILE (4)	
S508	1-762-365-21	SWITCH, TACTILE (3)	
S509	1-762-365-21	SWITCH, TACTILE (2)	
S510	1-762-365-21	SWITCH, TACTILE (1)	
S511	1-762-365-21	SWITCH, TACTILE (OPEN/CLOSE)	
S512	1-762-365-21	SWITCH, TACTILE (POWER)	

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

		(Ref.No.4,000 Series)	
		< CONNECTOR >	
* CN461	1-565-042-11	HOUSING, CONNECTOR (PC BOARD) 5P	
		< JUMPER RESISTOR >	
JR461	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR462	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< 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	1-769-655-11	CABLE, FLAT (FFC) 23 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 (K50)	
△68	1-575-912-21	CORD, POWER (A660K)	
△168	8-848-286-11	DEVICE, OPTICAL KHS-150A	
170	1-751-083-11	CABLE, FLEXIBLE FLAT (18 CORE)	
172	1-769-680-11	CABLE, FLAT (FFC) 4 ARBOR	
M421	X-3944-693-1	TILT MOTOR ASSY	
M481	1-541-309-11	MOTOR, LOADING (RF-370C)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

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

	1-473-110-21	REMOTE COMMANDER (RMT-M36A)	
	1-569-008-11	ADAPTER, CONVERSION 2P (A660K:E)	
	1-574-085-11	CORD, POWER (K50)	
	1-575-334-11	CORD, CONNECTION (A/V CABLE) (1.5m)	
	3-759-925-11	MANUAL, INSTRUCTION	
		(ENGLISH/CHINESE/SPANISH)	
		(A660K:E, Hongkong)	
	3-759-925-41	MANUAL, INSTRUCTION (ENGLISH/CHINESE)	
		(A660K:Chinese)	
	3-759-925-21	MANUAL, INSTRUCTION (ENGLISH/FRENCH)	
		(K50)	
*	3-961-945-11	INDIVIDUAL CARTON (A660K:E)	
*	3-961-945-21	INDIVIDUAL CARTON (A660K:Chinese)	
*	3-961-946-01	CUSHION (UPPER)	
*	3-961-947-01	CUSHION (LOWER)	

		HARDWARE LIST	

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

SECTION 6
IC PIN DESCRIPTION

6-1. TERMINAL FUNCTION OF SYSTEM CONTROL MICROCOMPUTER
(IC501: MB89094PF-G-139-BND on the MB-717 Board)

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Open connection).
2	CL0	I	32 kHz clock.
3	MOD0	I	(Connected to GND).
4	MOD1	I	(Connected to GND).
5	X0	I	2 fsc clock (7.159 MHz).
6	X1	O	2 fsc clock (Open connection).
7	VSS	I	GND.
8	MRST	I	Mechanism controller reset signal (L: Reset).
9	PREQ	I	Philips code (frame number) read enable.
10	FOACK	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	JPTRL	O	One track jump (1T)/Multi track jump (MT) switching signal (H: 1T).
13	SPLCK	I	Spindle servo lock signal (H: The spindle servo is being locked).
14	TBCHOLD	O	Chroma TBC control signal.
15	SCOR	I	H when the sub code sync. is detected.
16	PRV	I	Playback V sync signal input.
17	REFV	I	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	I	Communication enable signal sent from the mode controller (L: Communication enabled).
21	DOP	I	Input signal from the video dropout detector (Not used)
22	VTM	I	V timing signal input for servo processor (Not used)
23	FLAG	I	Flag input enabling operation of reference system (Not used)
24	CDGIN	I	H at CDG mode. (Disc discrimination output from decoder IC) (Not used)
25	GLSCS	O	Chip select of the CLS DT (pin 29).
26	SPDPLS	O	Pulse output to drive the spindle servo (H: The spindle runs free).
27	CLT	O	Output signal to latch the CLD register.
28	CMOD	I	Input signal to select the start mode after reset is released (+ 5 V pull-up).
29	CLSDT	I	V sync. phase difference data input during CLV scan from IC502 (Data is input while the CLS CS is H).
30	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	I	Spindle FG input 1 (12 pulses per rotation).
33	GMUTE	O	Gray picture mute control output during CLV scan (L: playback picture, H: gray picture).
34	LDSEARCH	O	Spindle servo control signal output (H: LD search).
35	SPDLFR	O	Spindle rotation direction signal (H: FWD).
36	AUXSEL	O	H when signal is externally input (including CD-G).
37	JMP TRIG	O	Track jump trigger pulse output.
38	MWRQ	O	Output signal requesting to download the memory picture (Not used)
39	MEMORY	O	Output signal to switch between memory or through-out picture.
40	MSTART	I	Memory picture downloading in progress
41	MTJ	I	MTJ tracking pulse output. This pin is normally set to input with Hi impedance. This pin is set to output when track jump (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) (Not used)
48	XFL	I	Focus lock signal input (L: Focus is locked).
49	VCC	I	Power supply pin. REG + 5 V.
50	LINE_SEL	I	H: MMI is being connected to the FSIO.

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

**6-2. TERMINAL FUNCTION OF MODE CONTROL MICROCOMPUTER
(IC102: MB89096 PF-G-172-BND on the FP-744 Board)**

Pin No.	Signal	I/O	Function
1	CL1	O	32 kHz clock (Connected at open)
2	CL0	I	32 kHz clock (Connected to GND)
3	MOD0	I	(Connected to GND)
4	MOD1	I	(Connected to GND)
5	X0	I	8 MHz clock
6	X1	O	8 MHz clock
7	VSS	I	GND
8	RST	I	Mode controller reset. (L: Reset)
9	SEG G	O	Output to LED (L: Illuminate)
10	SEG A	O	Output to LED (L: Illuminate)
11	SEG F	O	Output to LED (L: Illuminate)
12	SEG B	O	Output to LED (L: Illuminate)
13	SEG C	O	Output to LED (L: Illuminate)
14	SEG E	O	Output to LED (L: Illuminate)
15	SEG D	O	Output to LED (L: Illuminate)
16	7CTL	O	Select left or right 7-segment chip (H: lowest digit, L: 10th digit)
17	REFV	I	Reference V sync. signal input
18	MMI CS	I	Chip select signal sent from the mechanical controller to the mode controller
19	EPP BUSY	I	EEPROM write signal. H: Ready, L: Busy
20	DSP RST	O	Inverted logic DSP RST (Controlling mute of SI DATA and SI CLK signals)
21	LED STB	O	Strobe output to the LED of FP-745 (open drain port)
22	H DET	I	L: Video signal is present (open drain port)
23	MIC IN	I	L: MIC IN (open drain port)
24	OTASUKE	I	H: Mic audio does not exist, L: Mic audio exists (open drain port)
25	AUX	O	H: AUX switch OFF, L: AUX switch ON
26	DSP CS	O	Chip select signal to the karaoke DSP (L: During transmission)
27	DSP RST	O	Reset output to the karaoke DSP
28	CMOD	I	Input selecting start mode after reset is released (+ 5 V pull-up)
29	SI	I	Received data from the EEPROM
30	SO	O	Send data to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
31	SCK	O	Communication clock to the EEPROM/karaoke DSP/serial & parallel IC for the LEDs
32	SIRCS	I	SIRCS input
33	CG CS	O	CG chip select (L: During communication)
34	MRSST	O	Reset output to mechanism controller (L: Reset)
35	BUSY	O	Transfer enable signal from mode controller to mechanism controller (L: Communication enabled)
36	CDG CS	-	N.C.
37	P. CONT	O	Control output to turn ON/OFF the main power of the machine(H:Power on)
38	AU MUTE	O	H: During audio mute
39	AUTO RESUME	O	Output to LED (H: Illuminate)
40	SURROUND	O	Output to LED (H: Illuminate)
41	KARAOKE PON	O	Output to LED (H: Illuminate)
42	KEY +3	O	Output to LED (H: Illuminate)
43	KEY +2	O	Output to LED (H: Illuminate)
44	KEY +1	O	Output to LED (H: Illuminate)
45	KEY 0	O	Output to LED (H: Illuminate)
46	KEY -1	O	Output to LED (H: Illuminate)
47	KEY -2	O	Output to LED (H: Illuminate)
48	KEY -3	O	Output to LED (H: Illuminate)
49	VCC	I	Power supply pin. EVER + 5 V
50	LINE_SEL	O	Output to LED (H: Illuminate)

Pin No.	Signal	I/O	Function
51	VOCAL SUPPORT	O	Output to LED (H: Illuminate)
52	CONT. PLAY	O	Output to LED (H: Illuminate)
53	VPDF	I	GND
54		-	N.C.
55		-	N.C.
56		-	N.C.
57		-	N.C.
58	VSS	I	GND
59		-	N.C.
60		-	N.C.
61		-	N.C.
62		-	N.C.
63		-	N.C.
64	SIDE B	O	Output to LED (H: Illuminate) (Not used)
65	SIDE A	O	Output to LED (H: Illuminate) (Not used)
66		-	N.C.
67	VCC	I	Power supply pin. EVER + 5 V.
68		-	N.C.
69		-	N.C.
70		-	N.C.
71		-	N.C.
72		-	N.C.
73		-	N.C.
74		-	N.C.
75	LINE SELECT	O	H: Communication with the mechanical controller, L: Communication with the CG
76		-	N.C.
77	MECH SO	I	Data input from the mechanical controller
78	MECH SI	O	Data output to the mechanical controller and CG
79	MECH CLK	O	Communication clock output for the mechanical controller and CG.
80	DOOR SW	I	Door switch (H: Close, L: Open)
81		-	N.C.
82		-	N.C.
83	AVSS	I	GND
84	PS MON1	I	Input to A/D converter. Monitoring -5 V Regulated power supply
85	PS MON2	I	Input to A/D converter. Monitoring -5 V Regulated power supply
86	KEY L1	I	Input to A/D converter. Monitoring PW-720 key input
87	KEY L2	I	Input to A/D converter. Monitoring PW-720 key input
88	KEY R2	I	Input to A/D converter. Monitoring FP-745 key input
89	KEY R1	I	Input to A/D converter. Monitoring FP-745 key input.
90	J/E/UC	I	Input to A/D converter. Specifying shipping destination
91	PS MON3	I	Input to A/D converter. Monitoring ±12 V
92	AVCC	I	Power supply pin. EVER + 5 V.
93	ECHO VR	I	Input to A/D converter. Monitoring echo control input signal
94	REMOTTE CONT	I	Input to A/D converter. Monitoring mic remote input signal
95	KEY C1	I	Input to A/D converter. Monitoring FP-744 key input
96	P. OFF	O	Controlling to turn OFF forcibly the switching power supply(H: Forced OFF)
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-M36A)
- 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-A660K/K50 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-A660K/K50 are available by pressing at the same time and in specific order the multiple function keys on the main unit and/or on the remote control unit. The control functions available in this way are called "special key functions".

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

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

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

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

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

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

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

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

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

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

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

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

accidental use of these functions by the user.

These functions are to be carried out by using the NEXT DISC RESERVE key NATURAL 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.

The NATURAL key can be used instead of NEXT DISC RESERVE key.

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

Step	Keys to be pressed on the main unit and on the remote control unit	Functions
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and DISPLAY 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-A660K/K50 IN THE DEBUGGING MODE”.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and STOP key (remote control unit)	(2) V mute forced ON/OFF If the forced V mute is ON, it is released. If the forced V mute is OFF, it is turned ON. This function is used to switch the video signal to blue background during playback, or to release the blue background.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and CLEAR key (remote control unit)	(3) Resetting the V mute to normal operating condition Resets the V mute to normal operating condition. This function is used to release the function of above described item (2).
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and +10 key (remote control unit)	(4) Make mechanism controller time out ineffective. Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn't operate, it used to hasten to operate mode controller.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and 0 key (remote control unit)	(5) Make mechanism controller time out effective. Make the function turning power off effective when communication with mechanism controller cannot be done.
1 2	NEXT DISC RESERVE key (main unit) and 0 key (remote control unit) NEXT DISC RESERVE key (main unit) and REPEAT key (remote control unit)	(6) EEPROM Clear It can be reserved that the EEPROM content is all cleared instead of storing the favorite program data or debug mode data when the main power is turned off. This operation is effective only when the main power is on.

7-4. OPERATION OF THE MDP-A660K/K50 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-A660K/K50. 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-A660K/K50 IN THE DEBUGGING MODE”.

2. Entering the service mode

The following procedure shows how to enter the service mode.

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

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

If a microphone has already connected, and KARAOKE mode has been selected, the back ground is also violet color. Take care not to confuse.

When the unit is in the service mode, it is also put in the debugging mode (the functions those available in both the modes can be used). Therefore, the version No. of the microprocessor appears on the screen. For details of the debugging mode, refer to 7-5. “OPERATION OF THE MDP-A660K/K50 IN THE DEBUGGING MODE”.

3. Quitting the service mode

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

4. Operating with the special key functions

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

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

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

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

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

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

Table 7-3. List of the special key functions

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

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

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

- (3) PLAY key for focusing search

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

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

- (4) PAUSE key for tilt servo ON

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

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

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

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

Press STOP key to terminate aging.

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

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

Press STOP key to terminate aging.

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

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

Press STOP key to terminate aging.

7-5 OPERATION OF THE MDP-A660K/K50 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-A660K/K50 in which this debugging function is available is called "the debugging mode".

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

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

2. Entering the debugging mode

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

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

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

The data to be stored appears on the screen from left to right 1 byte by 1 byte, and "FF" appears to the right of the last data byte. The data byte continues from the right end on the 1st line to the left end on the 2nd line, and from the right end on the 2nd line to the left end on the 1st line.

The last stored data of the function modes (which is the mode selected at present) appears on the left of "FF".

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

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

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
1st line																						S	T	O	P
2nd line	F	M																							
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.

Note: If AC power cord is removed while the machine is operating, the emergency data is all deleted.

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

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

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

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

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

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

Fig. 7-4. History of emergency

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

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

Table 7-6 lists the emergency codes.

Table 7-6. List of the emergency codes

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

(4) [3] key for displaying the information for repair service, sent from the mechanism controller

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

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

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

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

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

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

Table 7-8. Operation modes of the mechanisms

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

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

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

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

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

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

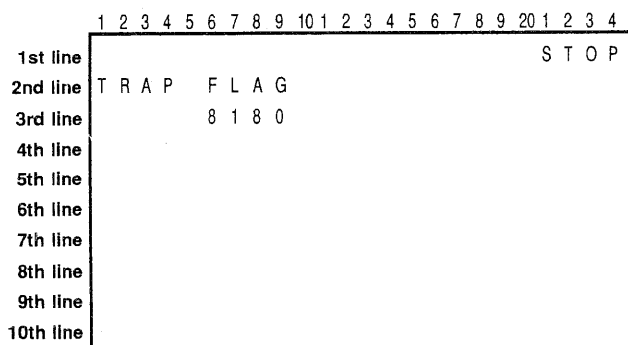


Fig. 7-6. Trap-flag

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

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.

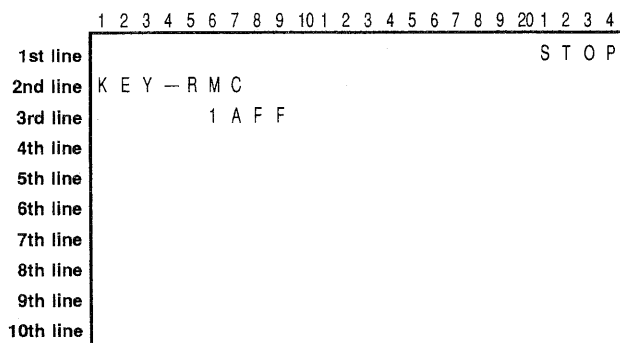


Fig. 7-7. Key and remote control data

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

Table 7-10. List of SIFRCS codes for MDPs

00	Numeral 1
01	Numeral 2
02	Numeral 3
03	Numeral 4
04	Numeral 5
05	Numeral 6
06	Numeral 7
07	Numeral 8
08	Numeral 9
09	Numeral 0
0F	Clear
15	Power ON/OFF
16	Close/open of tray
17	Audio monitoring
18	Stop
19	Pause
1A	Playback
1E	Reverse direction scanning
1F	Normal direction scanning
29	Repeat
2B	Still/step in normal direction
2C	Still/step in reverse direction
30	Reserve
34	ACS in normal direction
35	ACS in reverse direction
38	REPEAT A · B
39	Numeral +10
3A	Screen display
40	Analog audio/CX
46	AUTO PAUSE
5D	side A
5E	side B
5F	KARAOKE PON
60	KEY CONTROL up
61	KEY CONTROL natural
62	KEY CONTROL down
63	SURROUND
64	Numeral 10
65	Numeral 11
66	Numeral 12
67	Numeral 13
77	Numeral 14
79	Numeral 15
7B	Next disc reserve
7E	CONTINUOUS PLAY
(Followings are the extended codes.)	
90	VOCAL
92	VOCAL SUPPORT
94	SELECT
95	AUX IN
FF	Appears when there is no input.

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

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

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

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

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

The table below shows some communication information.

Table 7-11. Principal communication information

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

7-6. POWER SUPPLY ADJUSTMENT

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

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

Adjustment method :

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

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

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

Adjustment method :

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

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

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

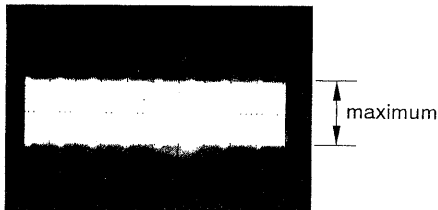


Fig. 7-10.

- 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.

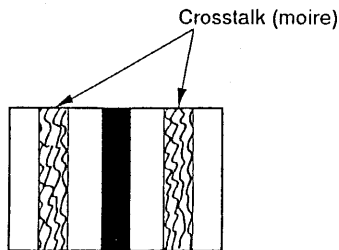


Fig. 7-11.

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

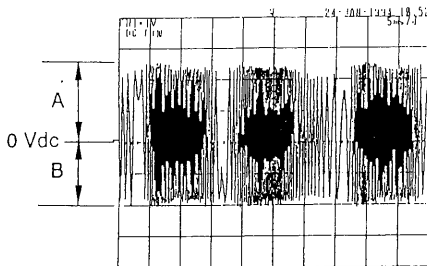
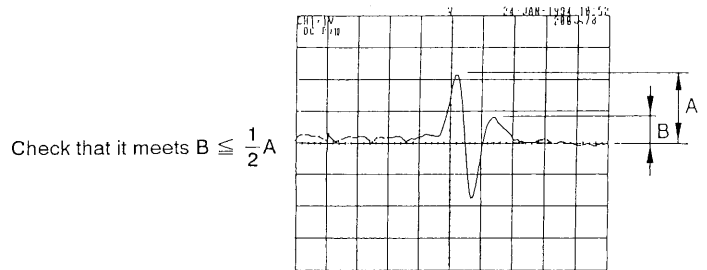


Fig. 7-12.

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

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



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

Fig. 7-13.

Check the TRACKING BALANCE.

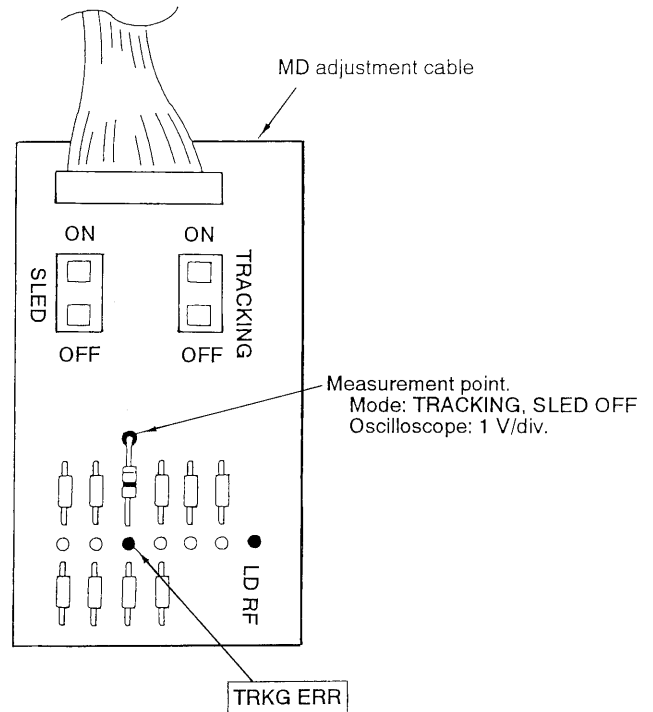


Fig. 7-14.

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

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

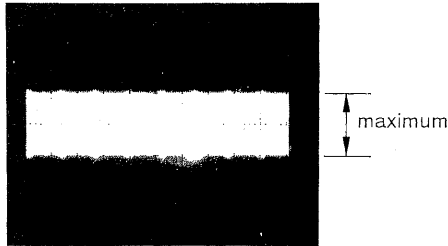
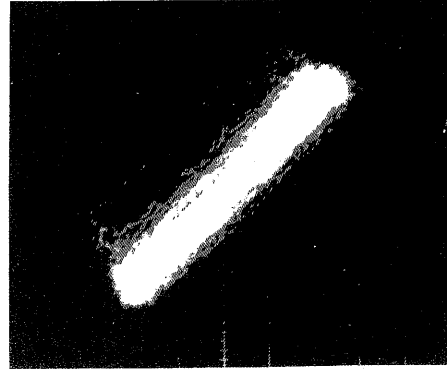


Fig. 7-15.

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



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

Fig. 7-16.

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

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

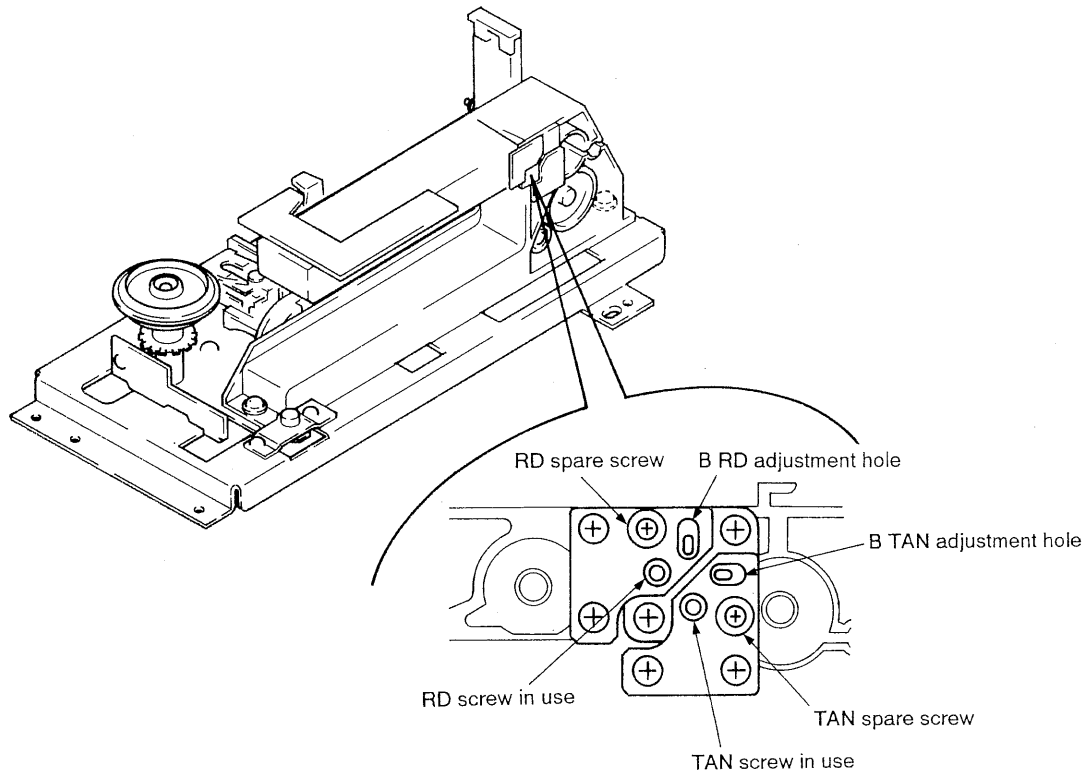


Fig. 7-17.

7-9. VIDEO SYSTEM ADJUSTMENT

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

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

Adjustment method :

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



Fig. 7-18.

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

7-10-1. Jigs and Tools

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

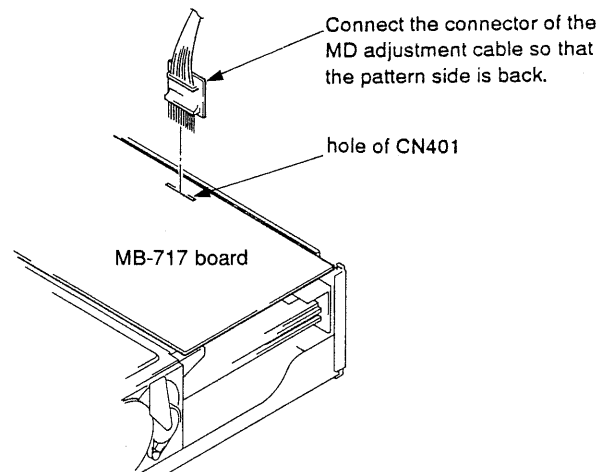


Fig. 7-19.

7-10-2. CD Adjustment

1) Loosen the screws of feed base block assembly.

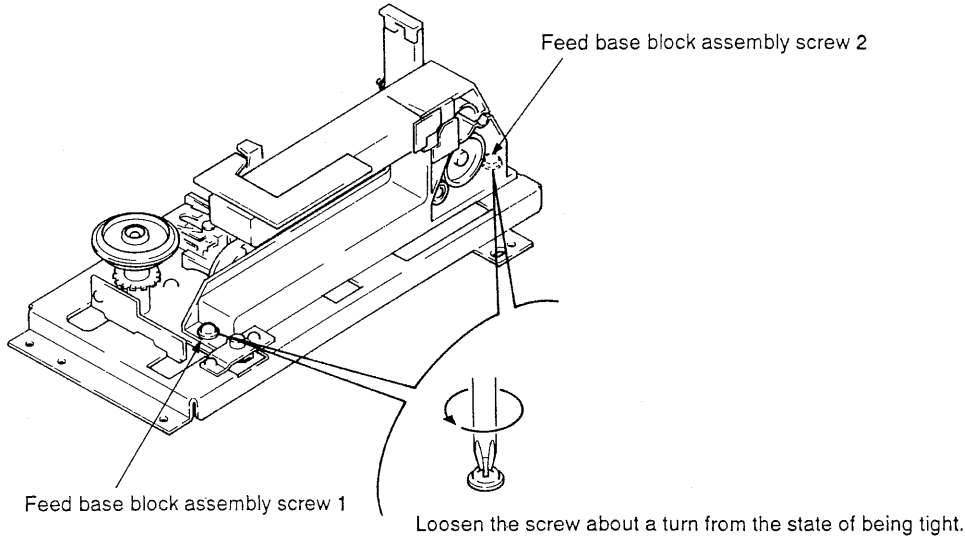


Fig.7-20.

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

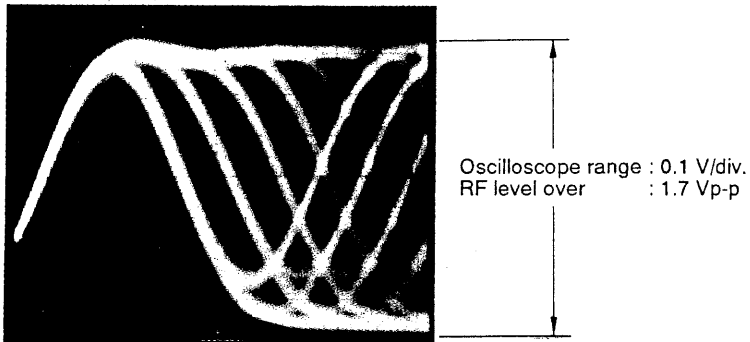


Fig. 7-21.

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

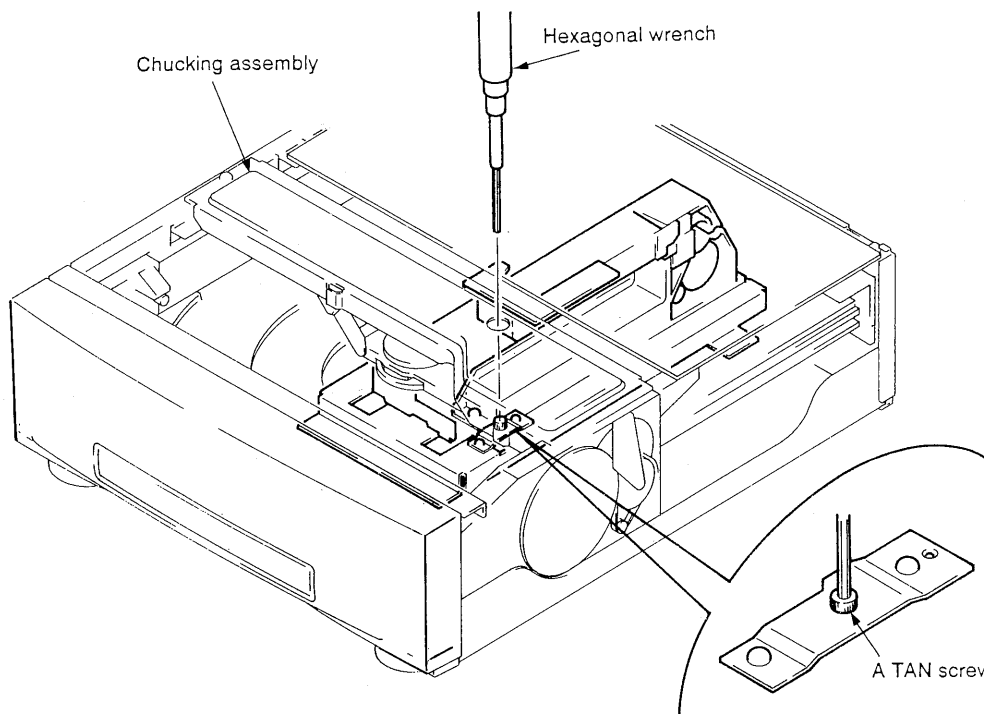


Fig. 7-22.

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

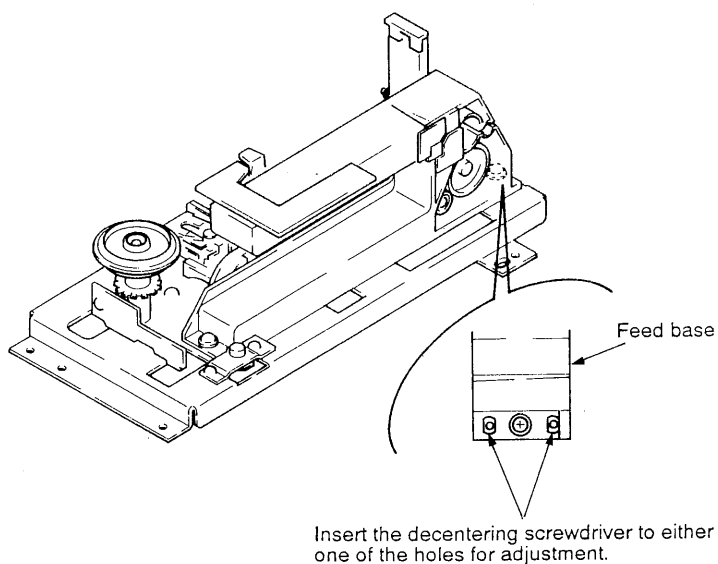
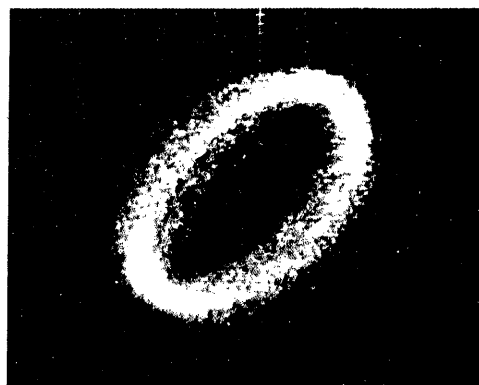


Fig. 7-23.

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

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

Before the adjustment.



↓ Make the figure straight.

After the adjustment.

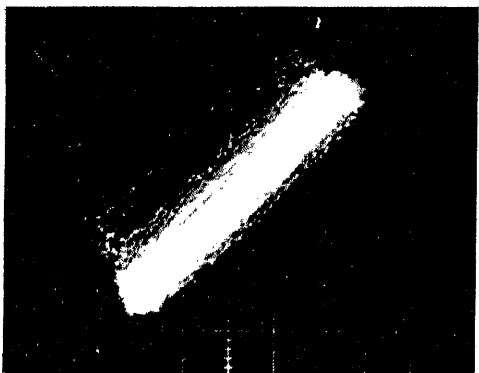
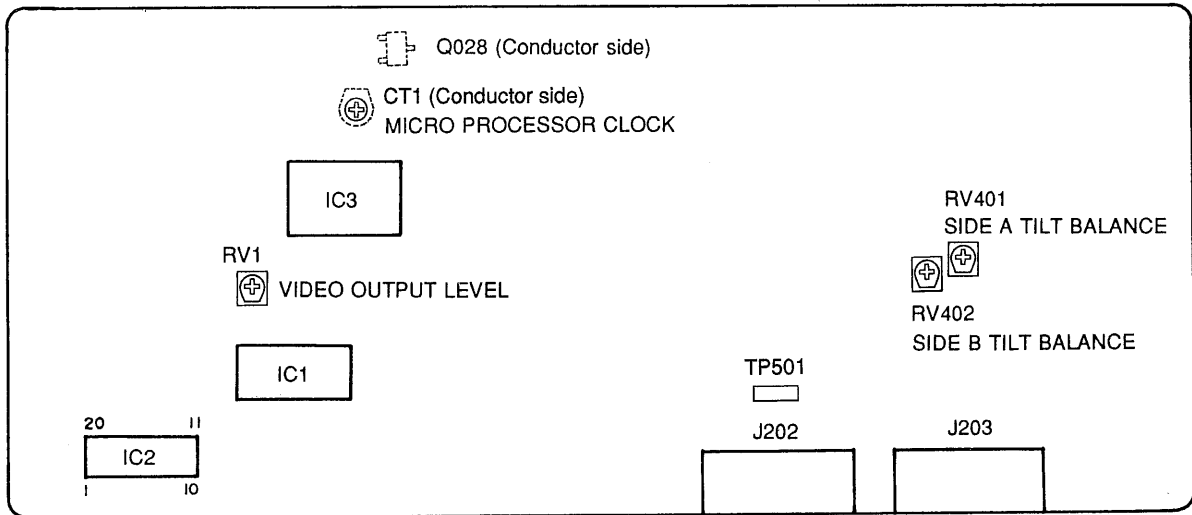


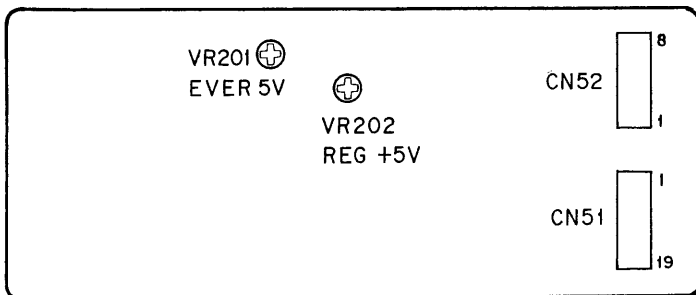
Fig. 7-24.

7-11. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

MB-717 Board (Component Side)



POWER BLOCK (Component side)



MDP-A660K/K50

RMT-M36A

SONY® SERVICE MANUAL

US Model
Canadian Model
MDP-K50
E Model
Chinese Model
HongKong Model
MDP-A660K

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.


A660K: E.....1-413-989- 21 → 22

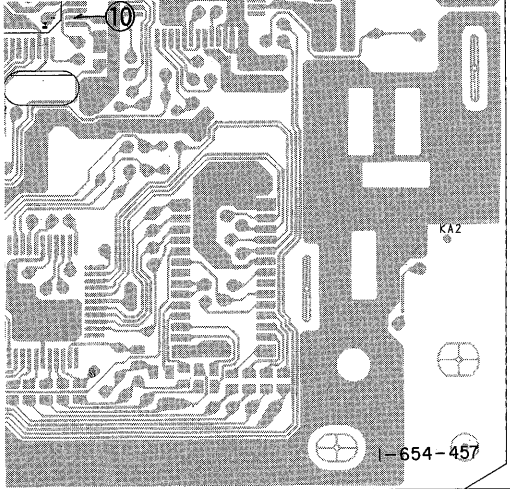
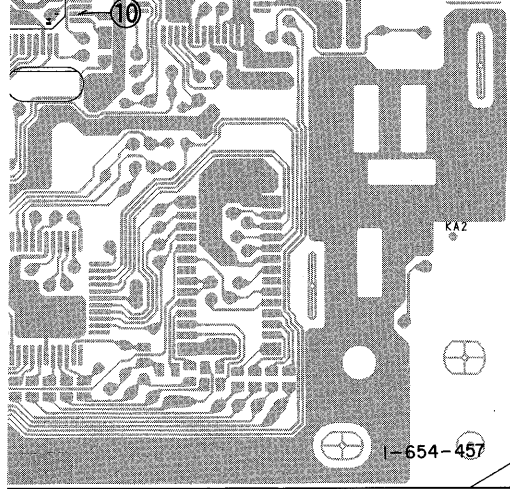
A660K: Chinese, HongKong1-413-989- 41 → 42

K501-468-020- 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 corrected portion.

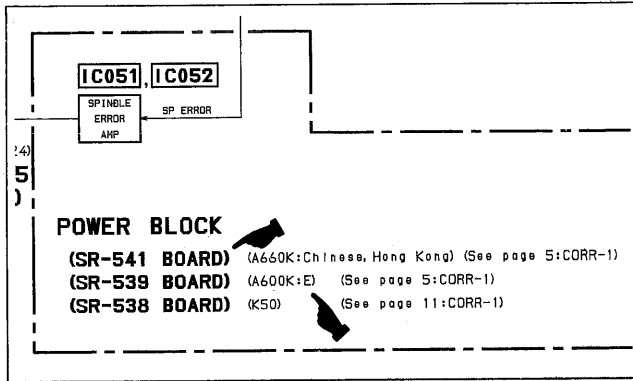
page	INCORRECT	CORRECT
4-10	<p>MB-717 BOARD</p>  <p>26 27</p>	<p>MB-717 BOARD</p>  <p>26 27</p>

· As the parts number suffix of the POWER BLOCK printed wiring board is changed, the following portions are changed.
Please correct the Service Manual (9-973-708-11). 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.

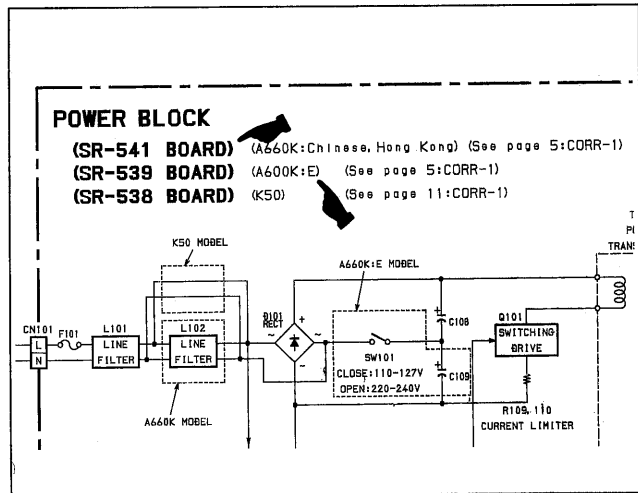
(Page 3-1.)

3-1.OVERALL BLOCK DIAGRAM



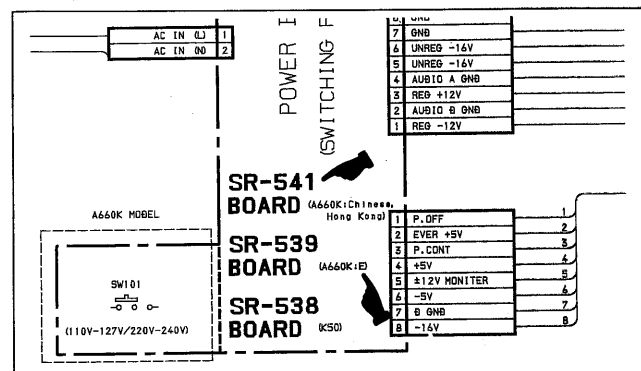
(Page 3-17.)

3-8.POWER BLOCK DIAGRAM



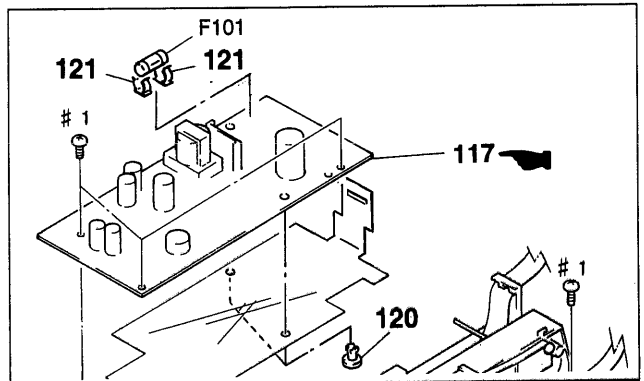
(Page 4-1.)




4-1.FRAME SCHEMATIC DIAGRAM



(Page 5-3.)

5-1-3.MAIN CHASSIS ASSEMBLY



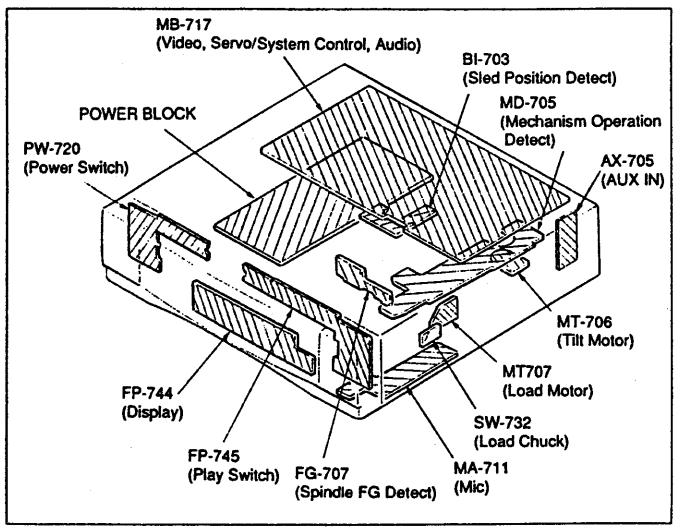
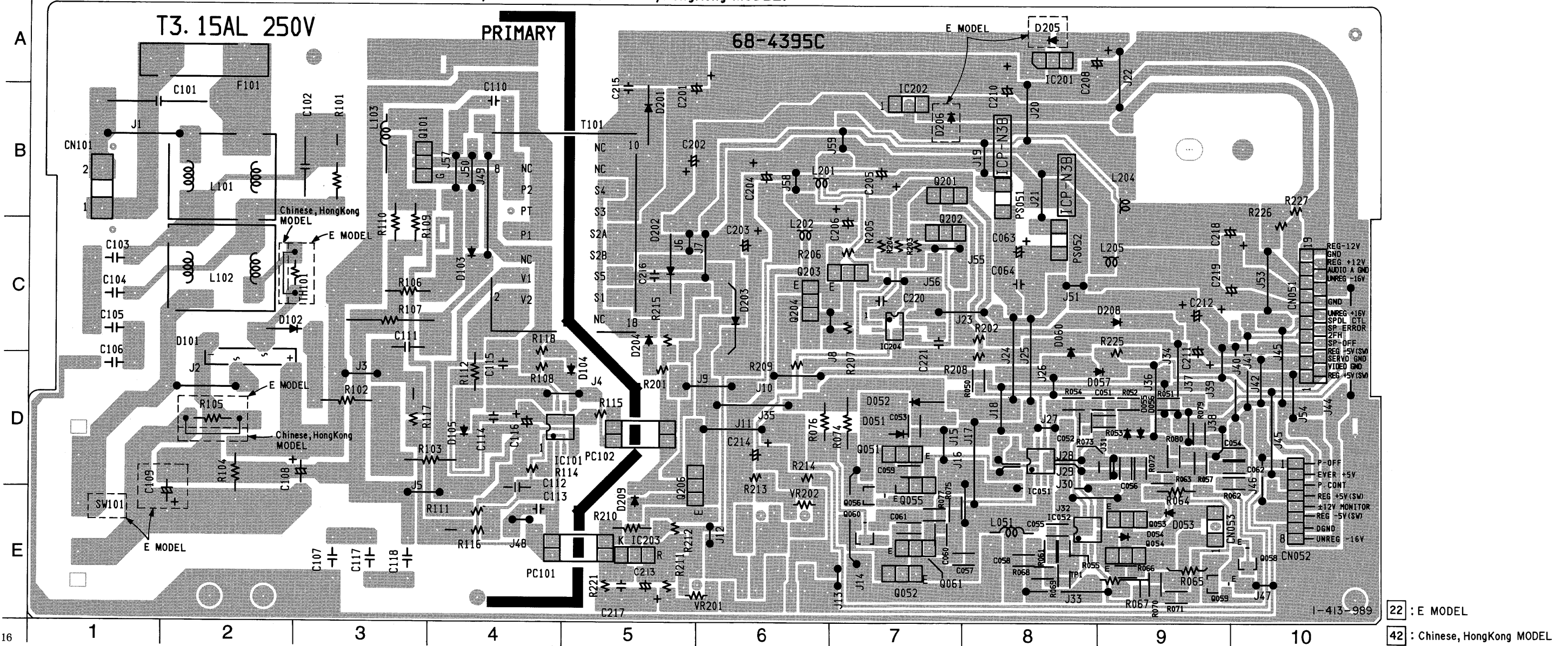
Ref. No.	Part No.	Description	Remarks
114	3-962-049-01	SCREW, MOTOR STOPPER	
* 115	1-654-464-11	MT-707 BOARD	
* 116	A-6423-303-A	SW-732 BOARD, COMPLETE	
117	1-413-989-22	POWER BLOCK (A660K:E)	
117	1-413-989-42	POWER BLOCK (A660K:Chinese, HongKong)	
117	1-468-020-12	POWER BLOCK (K50)	
119	3-962-812-01	SCREW (+BV 3X18)	

MDP-A660K/K50

POWER BLOCK PRINTED BOARDS (MDP-A660K MODEL)

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

POWER BLOCK (A660K MODEL) (SR-539 BOARD: E MODEL, SR-541 BOARD: Chinese, HongKong MODEL)

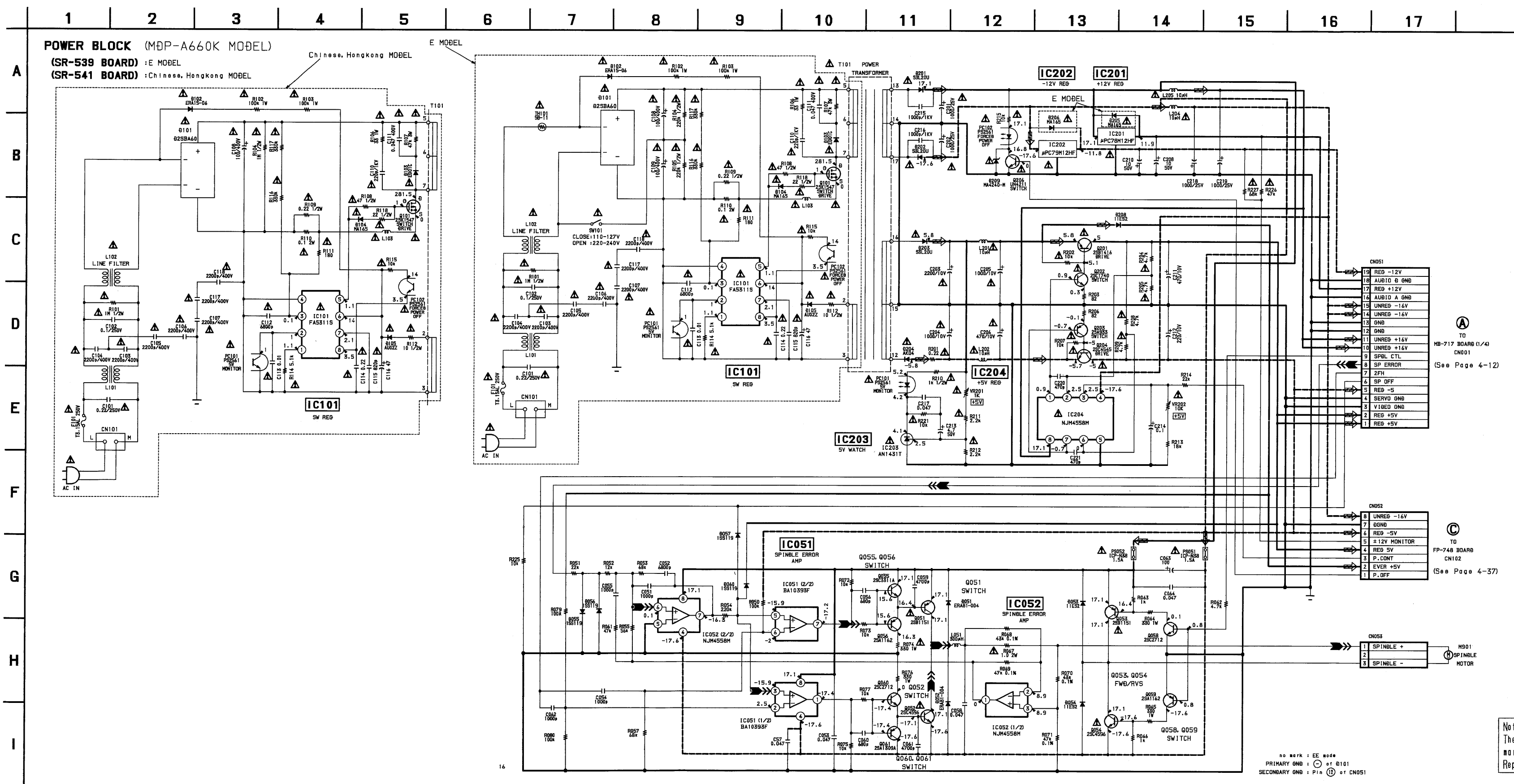


POWER BLOCK

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-A660K MODEL)

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



- TO HB-717 BOARD (1/4) CN001 (See Page 4-12)
- 19 REG -12V
 - 18 AUBIO B GND
 - 17 REG +12V
 - 16 UNREG A GND
 - 15 UNREG -16V
 - 14 UNREG -16V
 - 13 GND
 - 12 GND
 - 11 UNREG +16V
 - 10 UNREG +16V
 - 9 SPDL CTL
 - 8 SP ERROR
 - 7 2FH
 - 6 SP OFF
 - 5 REG -5
 - 4 SERVO GND
 - 3 VIDEO GND
 - 2 REG +5V
 - 1 REG +5V

- TO FP-748 BOARD CN102 (See Page 4-37)
- 8 UNREG -16V
 - 7 GND
 - 6 REG -5V
 - 5 ±12V MONITOR
 - 4 REG 5V
 - 3 P.CONT
 - 2 EVER +5V
 - 1 P.OFF

• SIGNAL PATH
Spindle servo (speed and phase)

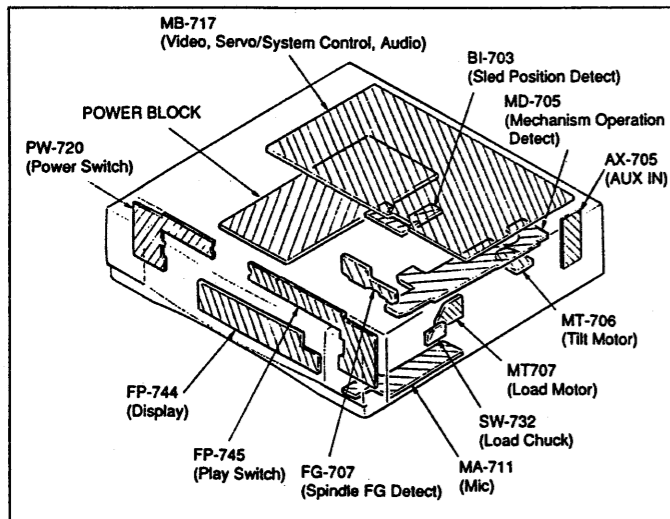
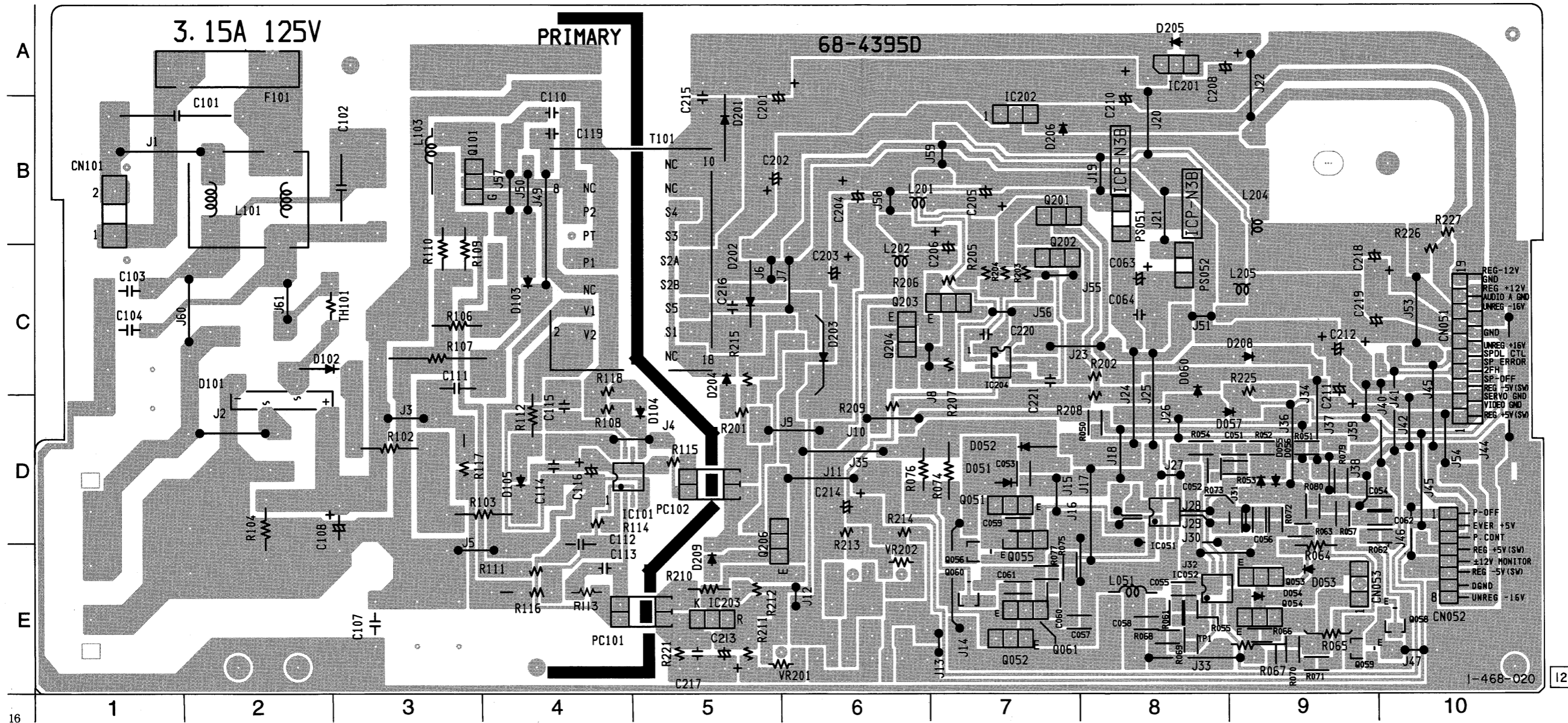
Note:
The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

MDP-A660K/K50

POWER BLOCK PRINTED WRITING BOARDS (MDP-K50 MODEL)

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

POWER BLOCK (K50 MODEL) (SR-538 BOARD)

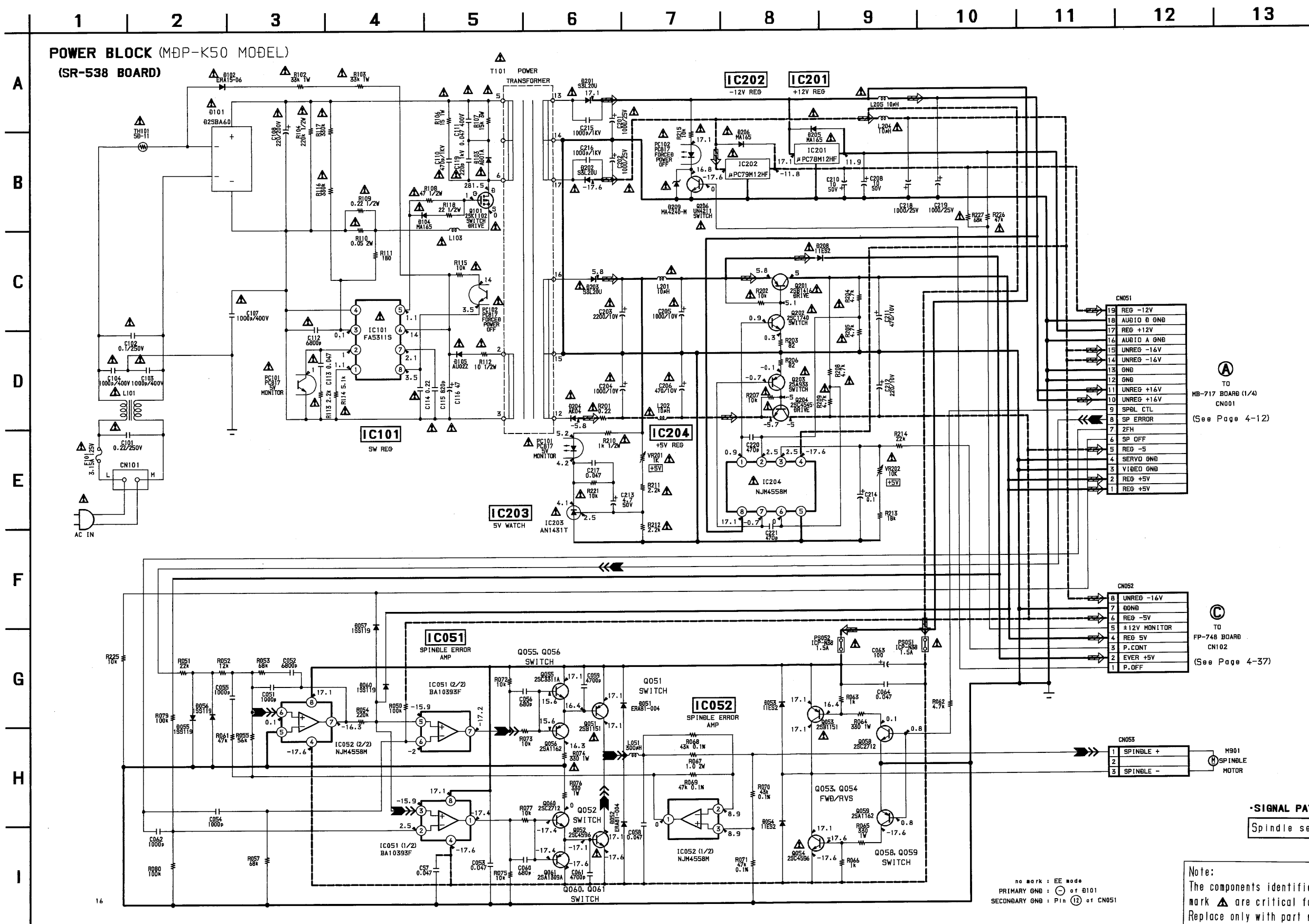


POWER BLOCK

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
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	O101	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-K50 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 (A660K:E)	*****	Δ C109	9-933-773-01	ALUMINUM ELECTIC 100uF	400V (A660K:E)
	1-413-989-42	POWER BLOCK (A660K:Chinese, Hongkong)	*****	Δ C110	9-909-673-01	CERAMIC 220PF 1kV	(A660K)
	1-468-020-12	POWER BLOCK (K50)	*****	Δ C110	9-933-752-01	CERAMIC 470PF 1kV	(K50)
				Δ C111	9-900-525-01	METALLIZED 0.047uF	400V
		(Ref.No.5,000 Series)		Δ C112	1-106-363-00	FILM 0.0068uF 5% 50V	
Δ	1-533-223-11	HOLDER, FUSE		Δ C113	1-130-483-00	METALLIZED 0.01uF 5% 50V	(A660K)
		< CAPACITOR >		Δ C113	1-130-491-00	METALLIZED 0.047uF 5% 50V	(K50)
				Δ C114	1-137-378-11	METALLIZED 0.22uF 5% 50V	
				Δ C115	1-130-470-00	FILM 820PF 5% 50V	
C051	1-163-009-11	MULTILAYER CERAMIC 1000PF	10% 50V	Δ C116	1-216-967-11	ALUMINUM ELECTRIC 47uF	20% 50V
C052	1-163-019-00	MULTILAYER CERAMIC 6800PF	10% 50V	Δ C117	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)
C053	1-163-035-00	MULTILAYER CERAMIC 0.047uF	50V	Δ C118	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)
C054	1-163-009-11	MULTILAYER CERAMIC 1000PF	10% 50V	Δ C119	9-909-673-01	CERAMIC 220PF	1kV (K50)
C055	1-163-009-11	MULTILAYER CERAMIC 1000PF	10% 50V	Δ C201	1-124-525-11	ALUMINUM ELECTRIC 1000uF	20% 25V
C056	1-163-007-11	MULTILAYER CERAMIC 680PF	10% 50V	Δ C202	1-124-525-11	ALUMINUM ELECTRIC 1000uF	20% 25V
C057	1-163-035-00	MULTILAYER CERAMIC 0.047uF	50V	Δ C203	1-124-760-11	ALUMINUM ELECTRIC 2200uF	20% 10V
C058	1-163-035-00	MULTILAYER CERAMIC 0.047uF	50V	Δ C204	1-126-926-11	ALUMINUM ELECTRIC 1000uF	20% 10V
C059	1-163-017-00	MULTILAYER CERAMIC 4700PF	10% 50V	Δ C205	1-126-926-11	ALUMINUM ELECTRIC 1000uF	20% 10V
C060	1-163-007-11	MULTILAYER CERAMIC 680PF	50V	Δ C206	1-126-925-11	ALUMINUM ELECTRIC 470uF	20% 10V
C061	1-163-017-00	MULTILAYER CERAMIC 4700PF	10% 50V	C208	1-126-964-51	ALUMINUM ELECTRIC 10uF	20% 50V
C062	1-163-009-11	MULTILAYER CERAMIC 1000PF	10% 50V	C210	1-126-964-51	ALUMINUM ELECTRIC 10uF	20% 50V
C063	1-124-122-11	ALUMINUM ELECTRIC 100uF	20% 50V	C211	1-126-925-11	ALUMINUM ELECTRIC 470uF	20% 10V
C064	1-130-491-00	FILM 0.047uF	5% 50V	C212	1-126-923-11	ALUMINUM ELECTRIC 220uF	20% 10V
Δ C101	9-902-038-01	METALLIZED 0.22uF	250V	C213	1-126-963-11	ALUMINUM ELECTRIC 4.7uF	20% 50V
Δ C102	9-900-521-01	METALLIZED 0.1uF	250V	C214	1-124-463-11	ALUMINUM ELECTRIC 0.1uF	50V
Δ C103	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)	C215	9-909-680-01	CERAMIC 1000PF	1kV
Δ C103	1-161-741-00	CERAMIC 1000PF	10% 400V (K50)	C216	9-909-680-01	CERAMIC 1000PF	1kV
Δ C104	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)	C217	1-130-491-00	FILM 0.047uF	5% 50V
Δ C104	1-161-741-00	CERAMIC 1000PF	10% 400V (K50)	C218	1-126-942-61	ALUMINUM ELECTRIC 1000uF	20% 25V
Δ C105	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)	C219	1-126-942-61	ALUMINUM ELECTRIC 1000uF	20% 25V
Δ C106	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)	C220	1-130-467-00	FILM 470PF	5% 50V
Δ C107	1-161-742-00	CERAMIC 2200PF	20% 400V (A660K)	C221	1-130-467-00	FILM 470PF	5% 50V
Δ C107	1-161-741-00	CERAMIC 1000PF	10% 400V (K50)				
Δ C108	9-933-773-01	ALUMINUM ELECTIC 100uF	400V (A660K)				
Δ C108	9-900-523-01	ALUMINUM ELECTIC 220uF	200V (K50)				

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 (A660K)	
△D103	9-900-512-01	DIODE AG01A (K50)	
△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 (A660K:E, K50)	
△D206	9-900-514-01	DIODE MA165 (A660K:E, K50)	
△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) (A660K)	
△F101	1-532-745-11	FUSE TIME LUG (3.15A 125V) (K50)	
< 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	(A660K)
△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 (A660K)	
△PC101	9-900-519-01	PHOTO COUPLER (K50)	
△PC102	9-909-676-01	PHOTO COUPLER (A660K)	
△PC102	9-900-519-01	PHOTO COUPLER (K50)	
< 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 (A660K)	
△Q052	8-729-019-32	TRANSISTOR 2SC4596F (K50)	
△Q053	8-729-117-11	TRANSISTOR 2SB1151-L	
△Q054	8-729-019-31	TRANSISTOR 2SC4596E (A660K)	
△Q054	8-729-019-32	TRANSISTOR 2SC4596F (K50)	
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 (A660K)	
△Q101	9-933-750-01	TRANSISTOR 2SK1102 (K50)	
△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

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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 (A660K)
△R102	1-218-642-11	METAL OXIDE FILM 100K	1W (A660K)
△R102	1-215-878-00	METAL OXIDE FILM 33K	1W (K50)
△R103	1-218-642-11	METAL OXIDE FILM 100K	1W (A660K)
△R103	1-215-878-00	METAL OXIDE FILM 33K	1W (K50)
△R104	1-214-921-00	CARBON 220K	1/2W (A660K:E, K50)
△R104	1-260-135-11	CARBON 1M 5%	1/2W (A660K:Chinese, Hongkong)
△R105	1-214-921-11	CARBON 220K	1/2W (A660K:E)
△R106	1-215-860-11	METAL OXIDE FILM 33	1W (A660K)
△R106	1-215-858-00	METAL OXIDE FILM 15	1W (K50)
△R107	1-215-927-00	METAL OXIDE FILM 47K	3W (A660K)
△R107	1-215-924-00	METAL OXIDE FILM 15K	3W (K50)
△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 (A660K)
△R110	9-933-751-01	CEMENT 0.05	2W (K50)
△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 (K50)
△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

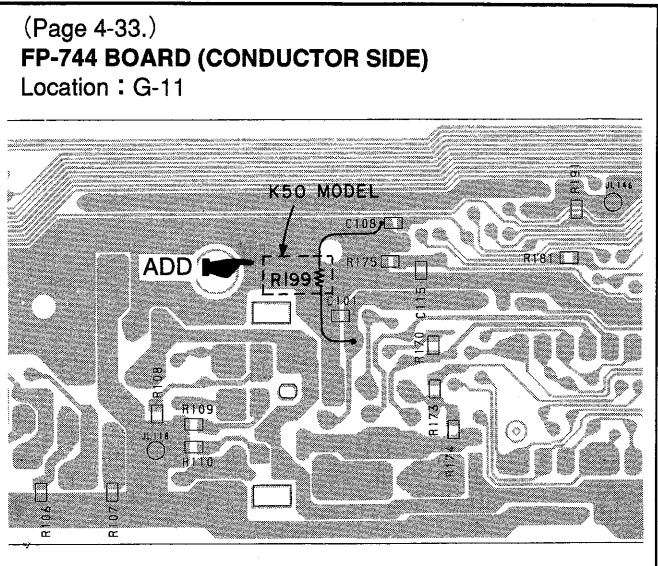
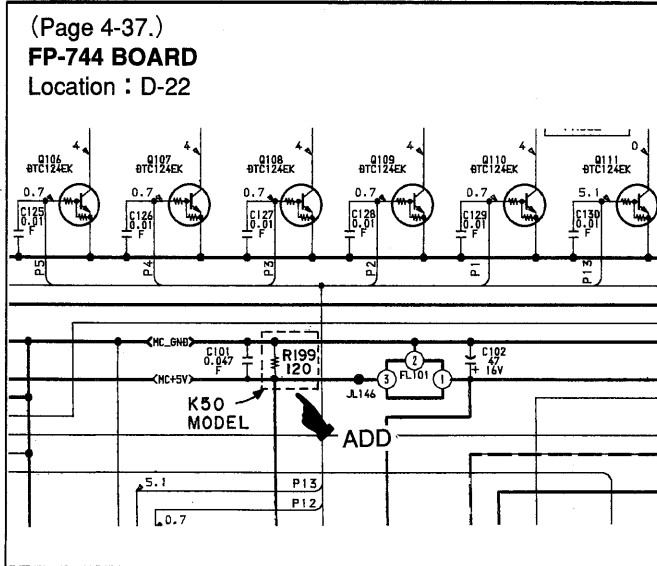
Ref. No.	Part No.	Description	Remarks
△R209	1-247-847-11	CARBON 4.7K	1/4W
△R210	1-260-099-11	CARBON 1K	1/2W
△R211	1-247-839-31	CARBON 2.2K 5%	1/4W
△R212	1-247-839-31	CARBON 2.2K 5%	1/4W
R213	1-249-432-11	CARBON 18K	1/4W
R214	1-249-433-11	CARBON 22K	1/4W
△R215	1-247-855-31	CARBON 10K	1/4W
△R221	1-247-855-31	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	(A660K:E)
< TRANSFORMER >			
△T101	9-909-674-01	SWITCHING TRANSFORMER	(A660K)
△T101	9-933-753-01	SWITCHING TRANSFORMER	(K50)
< THERMISTOR >			
△TH101	9-904-783-01	POWER THERMISTOR	(A660K:E, K50)
< VARIABLE RESISTOR >			
△VR201	1-223-236-11	CARBON TRIMMER POTENTIOMETER	1K
△VR202	1-223-239-11	CARBON TRIMMER POTENTIOMETER	10K

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MDP-A660K/K50

 : Indicates Changed portion.



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FP-744 BOARD, COMPLETE

	R163	1-216-035-00	METAL CHIP	270	5%	1/10W
	R165	1-216-035-00	METAL CHIP	270	5%	1/10W
	R167	1-216-035-00	METAL CHIP	270	5%	1/10W
Delet		R168	1-216-065-00	METAL CHIP	4.7K	5% 1/10W
	R169	1-216-035-00	METAL CHIP	270	5%	1/10W
	R170	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
	R171	1-216-049-91	METAL GLAZE	1K	5%	1/10W
	R172	1-216-089-00	METAL CHIP	47K	5%	1/10W
	R173	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
	R174	1-216-089-00	METAL CHIP	47K	5%	1/10W
	R175	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R176	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R177	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R178	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R179	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R180	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R187	1-216-295-91	CONDUCTOR, CHIP (2012)			
	R188	1-216-073-00	METAL CHIP	10K	5%	1/10W
	R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
ADD		R191	1-216-295-91	CONDUCTOR, CHIP (2012)		
		R199	1-249-406-11	CARBON	120	5% 1/4W

< SWITCH >

