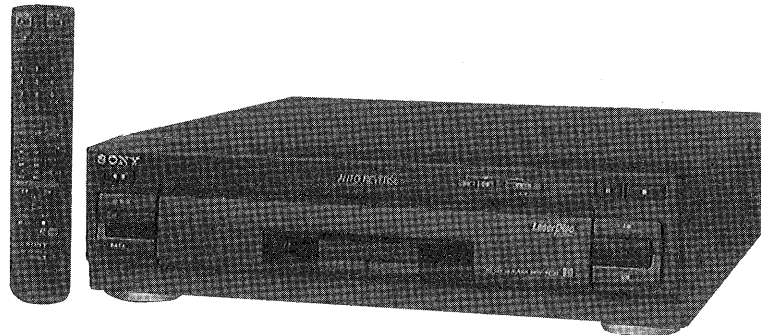


MDP-RC20

RMT-M26A

SERVICE MANUAL

E Model



SPECIFICATIONS

System

Type

CD/CDV/LD player

Signal readout

Optical (Laser beam reflection)

Signal format system

EIA standard, NTSC colour system

Playing time

See "Optical discs" on page 23.

Digital audio specifications**Frequency response**

4 Hz to 20 kHz (± 0.5 dB)

Signal-to-noise ratio

More than 115 dB (EIAJ)*

Dynamic range

More than 99 dB (EIAJ)

Wow and flutter

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

Video specification**Horizontal video resolution**

425 lines

Signal-to-noise ratio

More than 49 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
Input signal: 200 mVrms

General

Power requirements

120/220/240 V AC, adjustable, 50/60 Hz

Power consumption

40 W

Operating temperature

5°C to 35°C

Ambient humidity

5% to 90 %

Dimensions

Approx. 430 × 117 × 429 mm
(w/h/d)
including projecting parts and controls

Mass

Approx. 10 kg

Supplied accessories

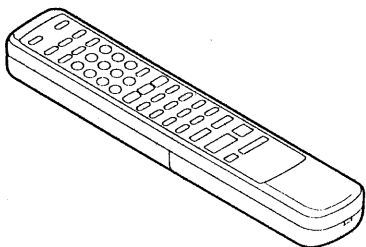
Remote Commander RMT-M26A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 \leftrightarrow phono plug 3)(1)
AC plug adaptor (1)

Design and specifications are subject to change without notice.

CD/CDV/LD PLAYER
SONY[®]

Check that you have the following items:

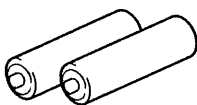
- Remote commander



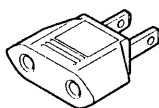
- Audio/Video cable



- Two R6 (size AA) batteries



- AC plug adaptor



WARNING

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

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

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

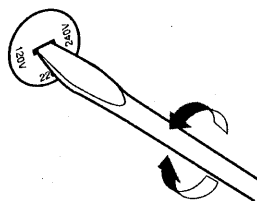
CAUTION

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



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

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 (120, 220 or 240 volts AC). The voltage selector of this unit is set to 220 V AC originally. When using in Malaysia, reset the selector to 240 V AC.
- To reset the voltage selector, disconnect the mains lead and turn the selector with a blade screwdriver so that the arrow on the rear panel points to the appropriate voltage.



SAFETY-RELATED COMPONENT WARNING!!

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

SAFETY CHECK-OUT

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

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
 - Keep the temperature of the soldering iron around 270 °C during repairing.
 - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
 - Be careful not to apply force on the conductor when soldering or unsoldering.

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|--|---|

SECTION 1
GENERAL

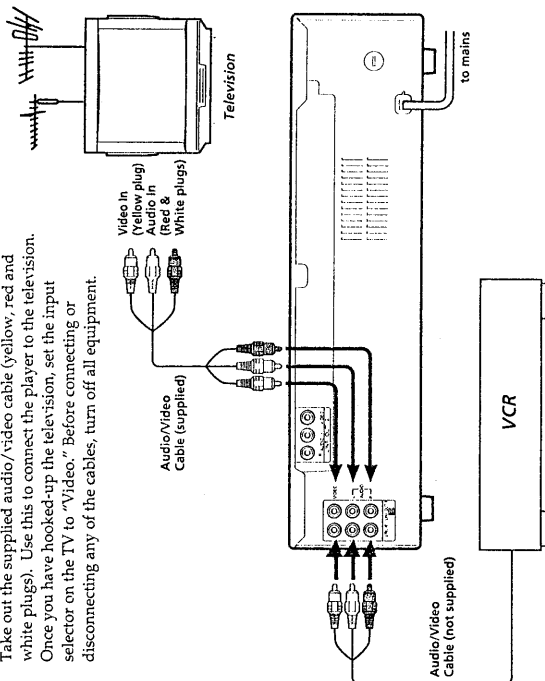
This section is extracted from instruction manual.

Step 3

Connecting the player

Television/VCR hook-up

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



When using the Closed Caption feature

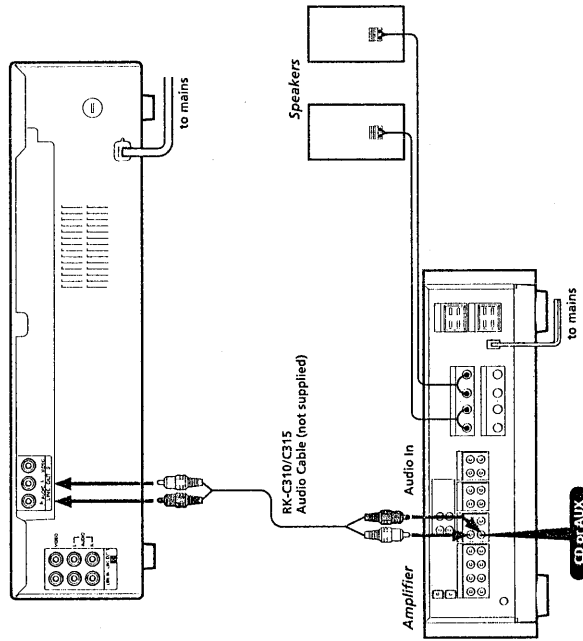
Connect the audio/video cable to the LINE OUT 1 jacks. To view a video tape which has the CC label using the Closed Caption feature, connect your VCR to the LINE IN jacks. (If your VCR's audio output is monaural, connect it to the LINE IN L (left) jack.)

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).
- Connect the player to the VCR's inputs when:
 - the video inputs of the TV are already used for the VCR etc.
 - the TV has only an aerial 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.

Audio equipment hook-up

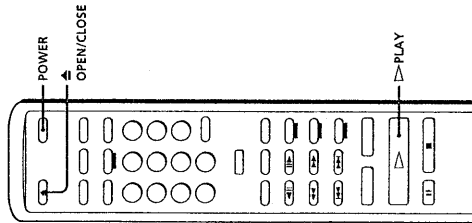
To achieve full stereo sound from your LD Player, hook up a stereo system following the diagram below. Use an RK-C310 (or RK-C315) audio connecting cable (not supplied) to connect the LD Player to your amplifier or receiver. Before connecting or disconnecting any of the below cables, turn off all equipment.



Notes

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

Basic Operations Playing a disc



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

Loading and playing a disc

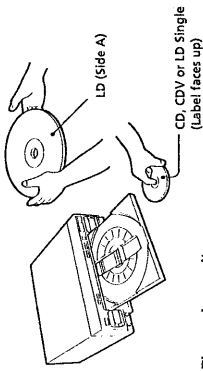
1 Press POWER to switch on the player.

You can also directly switch on the player by pressing **OPEN/CLOSE** or **PLAY** on the player.

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, 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 manually.

When playback of the upper side of an LD (side A) ends, the other side (side B) starts playing automatically.

Additional features

| To | Press |
|--------------------------|--------------------------------------|
| Stop play | STOP |
| Pause play | II PAUSE |
| Resume play after pause | II PAUSE or ▷ PLAY |
| Scan forward or backward | ◀◀ / ▶▶ SCAN |
| Skip chapters or tracks | ◀◀ / ▶▶ ACS/AMS |
| Remove the disc | ◀ OPEN/CLOSE |

Notes

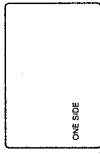
- You cannot switch on the player by pressing **OPEN/CLOSE** or **PLAY** on the remote commander.
- If you place more than one disc, or if the disc is not seated properly, the disc may not start playing. It may cause damage to the disc or the player.
- Do not transport the player while playing a disc as it may cause damage to your disc or the player.
- Do not use a CD stabilizer when playing a CD as it may cause damage to your disc or the player.
- When you press **II 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 19).

To start playing from the beginning of either LD side

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

To play only one side of an LD.

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



To stop playing and turn off the player

Press **POWER**. You can resume playback from the point you stopped at by simply pressing **▷ (Play)** on the player (Not operable on the remote commander. See "Resuming LD playback" on page 12).

To stop playing and remove the disc

Press **◀ OPEN/CLOSE**. Remove the disc and press **▶** again to close the empty tray.

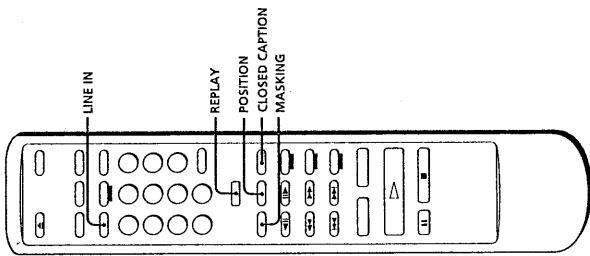
To pause playing just before starting

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

Chapter/Track number display on the front panel

| Indication | Current status of the player |
|---------------|---|
| 12 | Playing chapter/track 12 |
| - - (flashes) | Searching for the beginning of the disc side |
| 00 | Playing chapter "0" of an LD |
| 0 | Stopped |
| Not lit | Loading no disc or playing a disc without chapter numbers |

Viewing with closed captions



Notes

- The closed caption feature is not available when playing discs and video software without the [CC] label.
- When displaying closed captions, connect the player to your TV using the LINE OUT 1 [CC] jacks (see page 6). If you use LINE OUT 2, closed captions will not appear.

You can display closed captions when playing discs and video software with the [CC] label.

Before you start...

See page 6 for cable connections necessary for the closed caption feature.

Displaying closed captions

Press CLOSED CAPTION while playing. The CLOSED CAPTION indicator lights up and the closed caption appears, on the top of the subtitle (if any).



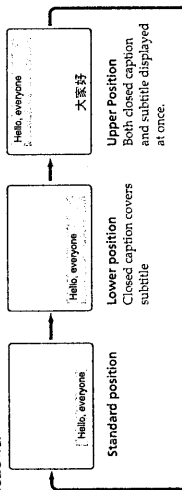
To turn off the closed caption

Press CLOSED CAPTION again to turn off the CLOSED CAPTION indicator.

Changing the position of the closed caption on the screen

You can change the position of the closed caption on the screen. The selected position is stored and the caption appears in the same position next time you use the closed caption.

Press POSITION with the closed caption displayed on the screen. Each time you press the button, the position of the closed caption changes as follows:



Hiding the subtitle

If you wish to practice listening, you can hide the subtitle. The closed caption will also not appear. This function is also available with LDs which do not have [CC] label.

Press MASKING with the closed caption displayed.



The subtitle is not visible.

To reveal the subtitle

Press MASKING again.

Reviewing what you have just seen

If you want to review what you have seen just a moment ago, you can move 7 seconds back.

Press REPLAY while playing. Each time you press REPLAY, you move 7 seconds back.

Displaying closed captions on video software input from a VCR

Closed caption information is also recorded on video software with the [CC] label. If you connect your VCR to the LINE IN input jacks, you can use the closed caption feature of this player with video software that has the [CC] label.

- 1 Connect the video deck to the LINE IN input jacks on the back of this player.
- 2 Press LINE IN to turn on the LINE IN indicator.
- 3 Play the video tape.
- 4 Press CLOSED CAPTION.

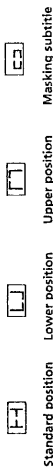
If you want to read the closed caption at your own pace

Press PAUSE.

The player pauses and the closed caption remains on the screen so that you can read it at your own pace. (The screen will turn blue when playing a CLV disc.) Press PLAY, or press PAUSE again to continue viewing from where you stopped.

Closed caption mode indicator on the player

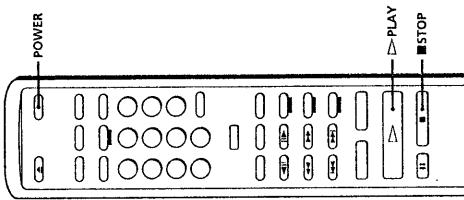
When using the closed caption feature, the position of the closed captions that you have selected is briefly indicated on the front panel as follows:



Notes

- Closed caption may not appear while the player is reading closed caption data.
- Depending on the software you are using, the following problems may occur:
 - If you set to the lower position or press the MASKING button, subtitles may not be hidden.
 - Closed captions may appear anywhere on the screen, and may move around the screen.
 - Closed captions may appear only in capitals.
- If there are errors in the closed caption data on the disc, closed captions may not be correct and [marks] will appear instead of letters. If there are many errors, closed captions may not appear at all.
- If you turn off this player while you are viewing video software:
 - You will still be able to watch the software, but closed captions will not appear.
 - The picture may be momentarily disturbed.

Additional Operations Resuming LD playback (Auto Resume)



This function can only be used for LDs. Once you stop playing 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. (When you press POWER, the indicator lights up briefly, then goes off with the power.)

2 Press ▷ PLAY.

The player searches for the scene where you stopped playing, then playback starts. If you want to pause playing just before starting, press ■ PAUSE instead of ▷ PLAY.

To view from the beginning of the LD

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

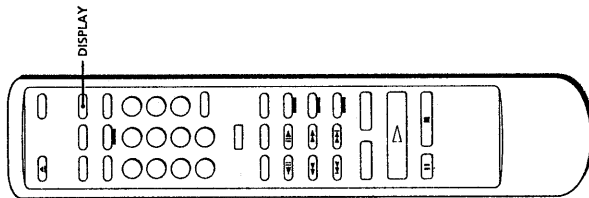
Tips

- Each time you stop playing, the point where you stopped is stored.
- The point where you stopped playing is cleared when:
 - you press ▲ OPEN/CLOSE, DISC SIDE A/B or ◀▶/▶▶
 - you carry out a Chapter Search or Frame/Time Search.
 - you unplug the player.

Note

- If the power is off, press ▷ (Play) on the player. The player turns on automatically. If a disc is loaded, playback resumes. If you use the remote commander, press POWER, then ▷ PLAY.

Understanding on-screen indications

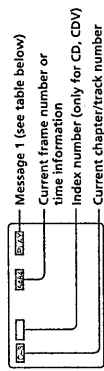


You can check operating status of the player or disc information on the TV screen.

Displaying on-screen indications

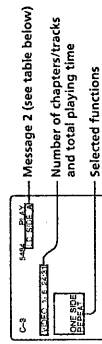
Press DISPLAY.

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

OPEN Disc tray open

CLOSE Disc tray closed

PLAY Playing a disc

STOP Operation stopped

PAUSE Operation temporarily stopped

◀/▶ Speed scanning

SEARCH Searching

Message 2

Display

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

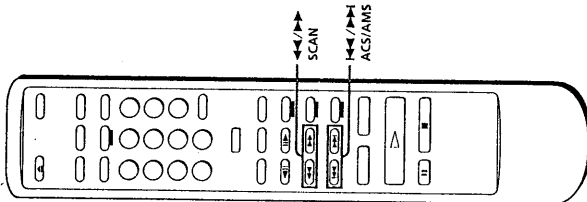
∫ ANALOG Analog sound

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.

Searching for a particular point on the disc

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



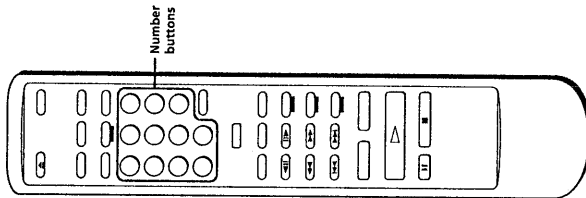
Notes

- 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 conduct Speed Scan and Skip Search while in Freeze Frame (CAV LD). After the scan or search, playback continues in the same mode.

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



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.

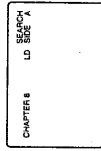
| To go to the beginning of | Press |
|---------------------------|--|
| Next chapter/track | ▶▶▶ ACS/AMS once |
| Current chapter/track | ◀◀◀ ACS/AMS once |
| Previous chapter/track | ◀◀◀ ACS/AMS twice before the picture or sound resumes |

Hold down **▶▶▶** or **◀◀◀** to skip chapters/tracks continuously.

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.



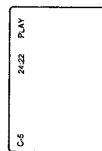
To play a chapter on the opposite side of the LD, press DISC SIDE B (or A), then enter the chapter number.

To enter a number greater than 10, press **◀**, then one of the **①-⑨** buttons. If you press **◀** by mistake, press CLEAR, then enter the correct number.

| To | Press |
|----------|--|
| Enter 14 | ◀ , then ④ |
| Enter 25 | ◀ , ◀ , then ⑤ |
| Enter 30 | ◀ , ◀ , ◀ , then ① |

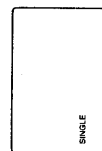
To check the current chapter/track number on the screen

Press DISPLAY to display the chapter track number. The number appears in the upper left-hand corner of the screen. If the LD does not contain chapter numbers, the number is not displayed.



To play only one chapter/track

Press 1/SIDE/ALL once. "SINGLE" appears briefly. Enter the chapter/track number using the number buttons. The chapter or track is played once.



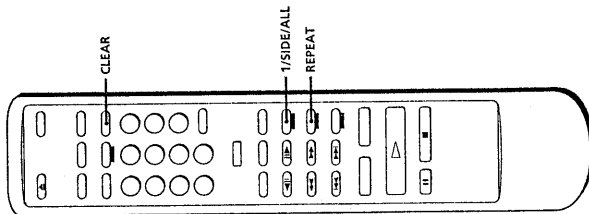
Tip

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

Note

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

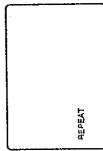
Playing repeatedly (Repeat Play)



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

Repeating the whole disc (All Disc Repeat)

Press REPEAT while playing the disc. "REPEAT" appears on the screen briefly. When playing an LD, the player repeats playing both disc sides, side A to B. When playing a CD or DVD, the player repeats playing all the tracks on the disc.



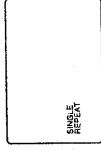
Repeating the current side of the LD (One Side Repeat)

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



Repeating the current chapter/track (Single Repeat)

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



To check the replaying status

Press DISPLAY twice.

Cancelling Repeat Play

Press CLEAR.

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

1 Press REPEAT A ↔ B at the beginning of the scenes or phrases you want to replay.
This marks where replay is to start. "REPEAT" and "A-" appear, "B" flashes on the screen.

2 Let the player run to the end of the scene or phrases.

3 Press REPEAT A ↔ B again.
This marks where replay is to end. "REPEAT" and "A-B" appear. The player repeatedly plays the scenes or phrases between the two points you specified.

To replay a different portion

Repeat steps 1 to 3 to reenter the new starting and ending points.

To cancel Repeat A ↔ B
Press CLEAR.

Replaying from a specific point on the disc (Memory Search)

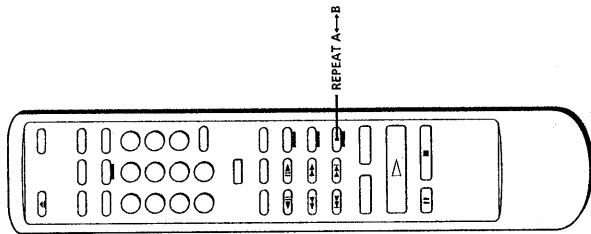
1 Press REPEAT A ↔ B at the point you want to start replaying.
This marks the starting point.

2 Press CLEAR to turn off "A-B REPEAT."
Thus not setting an ending point.

3 Press SEARCH at any point on the disc.
The player goes to the starting point you specified and starts playing.

To replay from a different point

Repeat steps 1 to 3 to re-enter the new starting point.



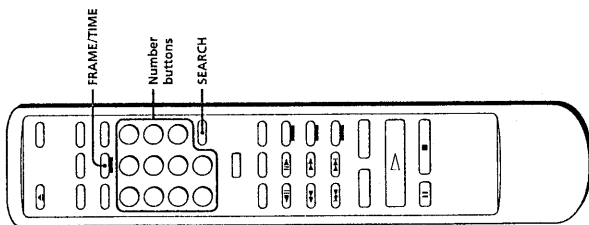
Note

- When you play an LD, you can conduct Repeat A ↔ B only on the current side of the LD. You cannot do it on both sides of the LD.

Tips

- Once you have marked the starting point, you can also carry out Memory Search while the player is stopped. The starting point is cleared when you stop playing, open the disc tray, turn off the player, or carry out a Frame/Time Search or Chapter Search.

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



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

Entering the frame number or elapsed time

- 1 Press **FRAME/TIME** while playing the disc.

| When playing | Indication |
|--------------|--------------|
| CAV LD | FRAME 0000 |
| CLV LD | TIME 0:00:00 |
| FRAME 0000 | CAV SIDE A |
| TIME 0:00:00 | CLV SIDE A |

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

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

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

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

- 3 Press **SEARCH**.

Playback starts from the frame or time you specified.

To check the frame number or time

Press **DISPLAY**.

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

To cancel Frame/Time Search

Press **CLEAR** before pressing the **SEARCH** button.

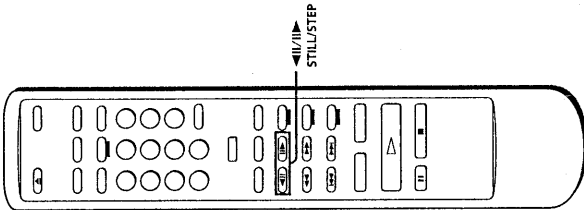
Tip

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

Note

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

Viewing frame-by-frame action



This function can only be used for CAV LDs. On any scene, you can freeze an action into a still picture, or advance or reverse the action frame-by-frame.

Freezing the action (Freeze Frame)

Press **II PAUSE** or one of the **◀/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/▶** **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.

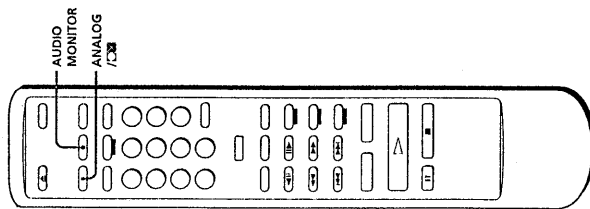
To resume normal playback

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/▶** **STILL/STEP**, "CLV SIDE A" appears briefly.

Using the sound quality functions

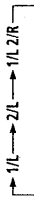


Playing a stereo disc or Second Audio Programme (SAP) disc

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

To alternate the sound output

Press AUDIO MONITOR while playing the disc. Each time you press AUDIO MONITOR, the on-screen indication changes as follows:



The indication appears on the screen briefly, then disappears.

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

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

Listening to analog sound on an LD

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

Press ANALOG/CX while playing the disc.

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

To return to digital sound

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

Note

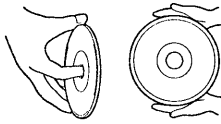
- The output level may differ between digital and analog sound.

Optical discs (continued)

Optical Disc Maintenance

Holding CDs or CDVs

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



Holding LDs

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

Light Exposure

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

Cracked or Damaged Discs

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

Keeping the Disc Surface Clean

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



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

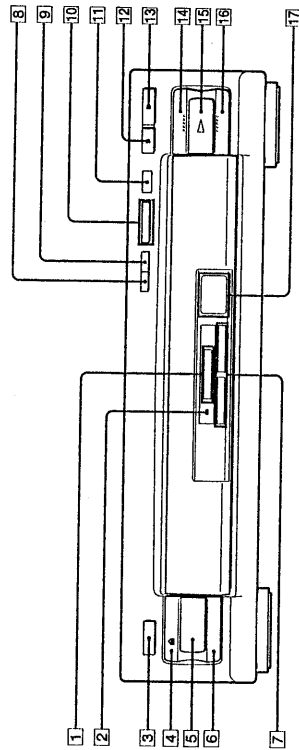
Putting your fingers on, or adhering anything to the surface of the disc such as sticky note pad paper or adhesive tape will deteriorate the quality of the playing surface, and thus the output quality.



See the pages indicated in () for details.

Index to parts and controls

Front

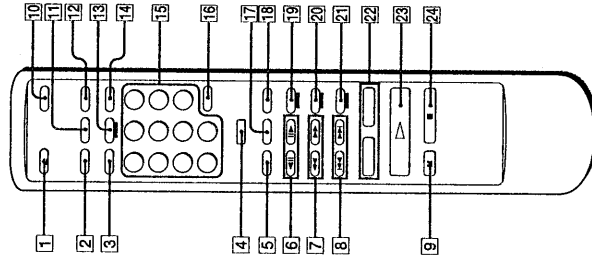


- 1 CLOSED CAPTION indicator (10)
- 2 LINE IN indicator (11)
- 3 POWER switch and indicator (8)
 - ON: Green
 - STANDBY: Red
- 4 OPEN/CLOSE button (8)
- 5 Remote sensor (21)
- 6 LINE IN button (11)
- 7 SIDE A/B indicators (9)


- 8 MASKING button (11)
- 9 POSITION button (10)
- 10 CLOSED CAPTION button (10)
- 11 AUTO RESUME indicator (12)
- 12 (Pause) button (8)
- 13 (Stop) button (8)
- 14 SIDE A button (9)
- 15 (Play) button (8)
- 16 SIDE B button (9)
- 17 Chapter/track number indicator (9)

Index to parts and controls (continued)

Remote commander



- 1 OPEN/CLOSE button (8)
- 2 ANALOG/ button (20)
- 3 LINE IN button (11)
- 4 REPLAY button (11)
- 5 MASKING button (11)
- 6 STILL/STEP buttons (19)
- 7 LEFT/RIGHT SCAN buttons (14)
- 8 LEFT/RIGHT ACS/AMS buttons (14)
- 9 PAUSE button (8)
- 10 POWER switch (8)
- 11 AUDIO MONITOR button (20)
- 12 DISPLAY button (13)
- 13 FRAME/TIME button (18)
- 14 CLEAR button (16) (18)
- 15 Number buttons (15) (18)
- 16 SEARCH button (18)
- 17 POSITION button (10)
- 18 CLOSED CAPTION button (10)
- 19 1/SIDE/ALL button (16)
- 20 REPEAT button (16)
- 21 REPEAT A↔B button (17)
- 22 DISC SIDE A/B buttons (9)
- 23 PLAY button (8)
- 24 STOP button (8)

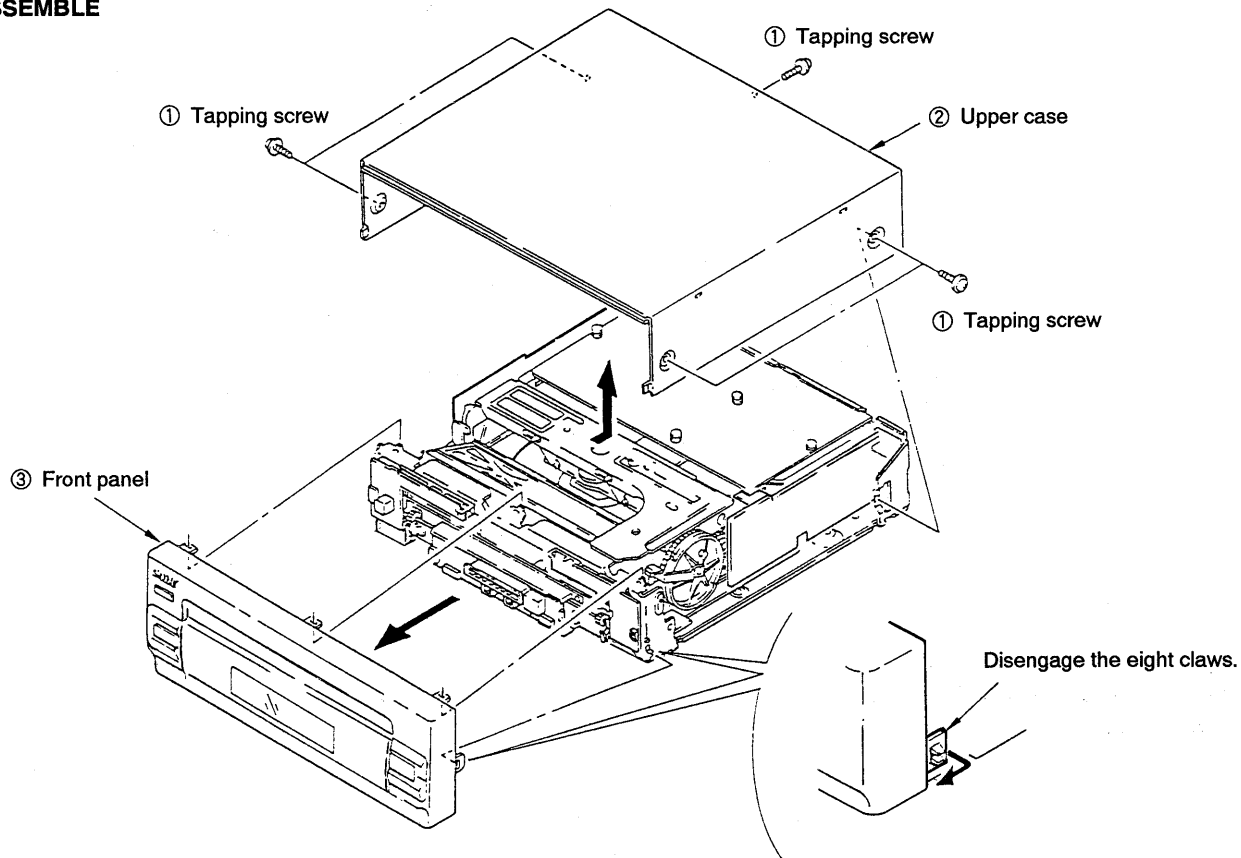
 A function activated by pressing a button with an orange mark can be cancelled by pressing the CLEAR button.

**SECTION 2
DISASSEMBLY**

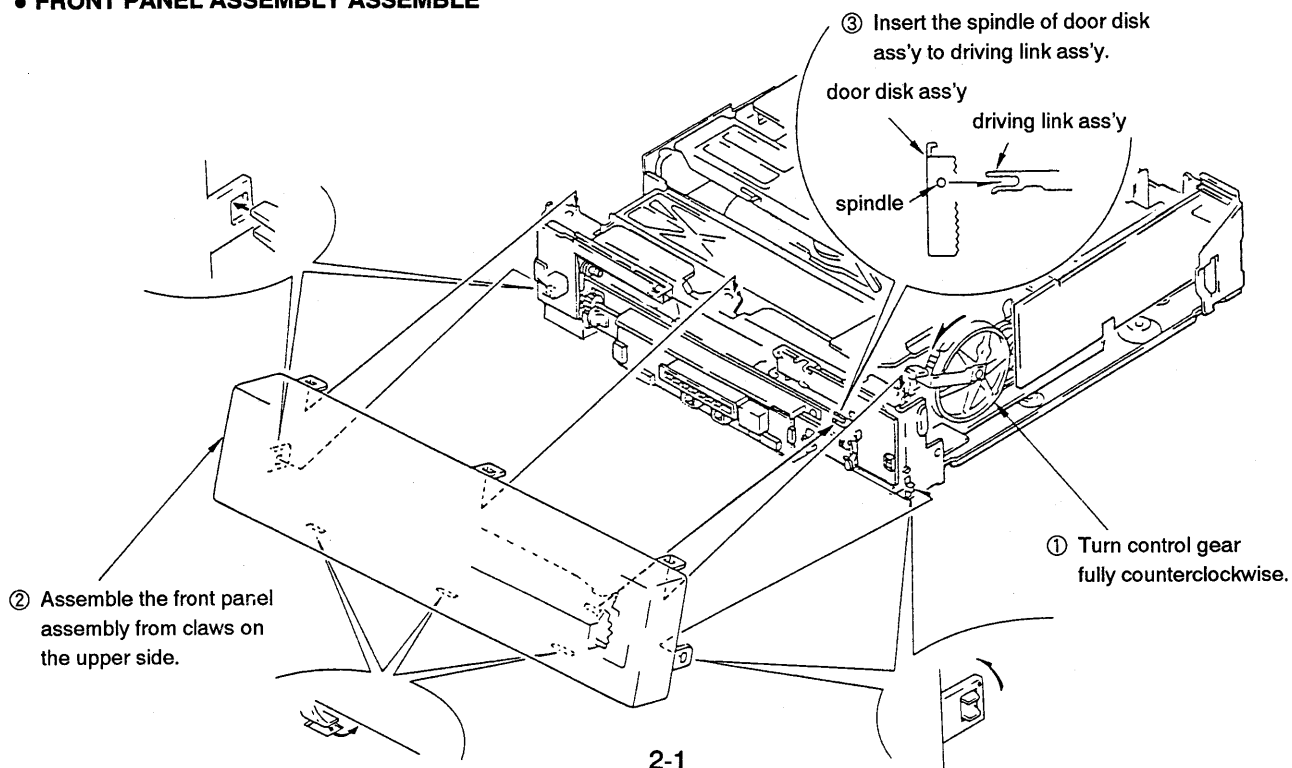
NOTE: Follow the disassembly procedure in the numerical order given.

2-1. UPPER CASE, FRONT PANEL ASSEMBLY

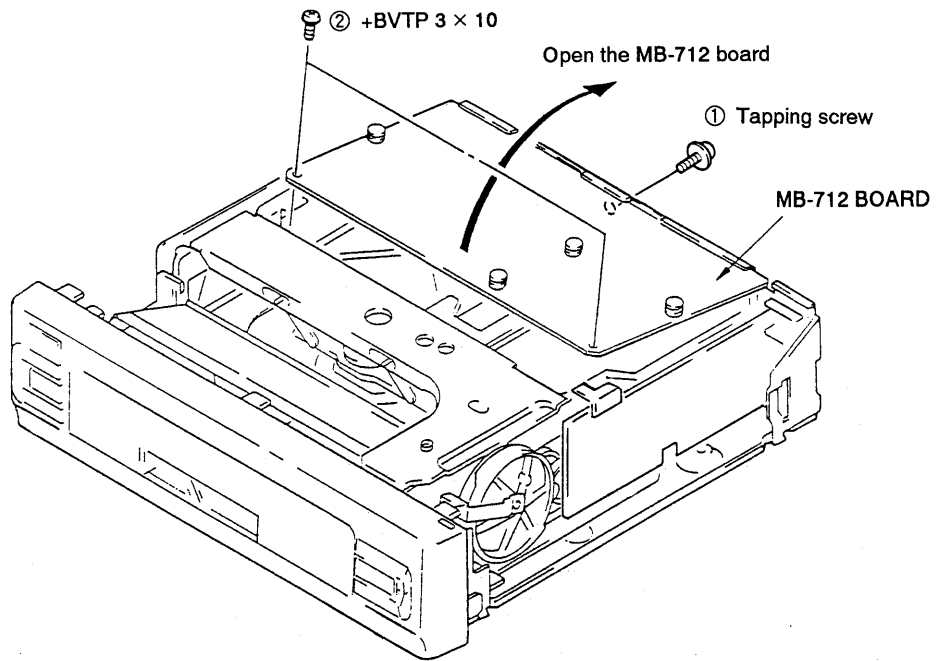
• **DISASSEMBLE**



• **FRONT PANEL ASSEMBLY ASSEMBLE**

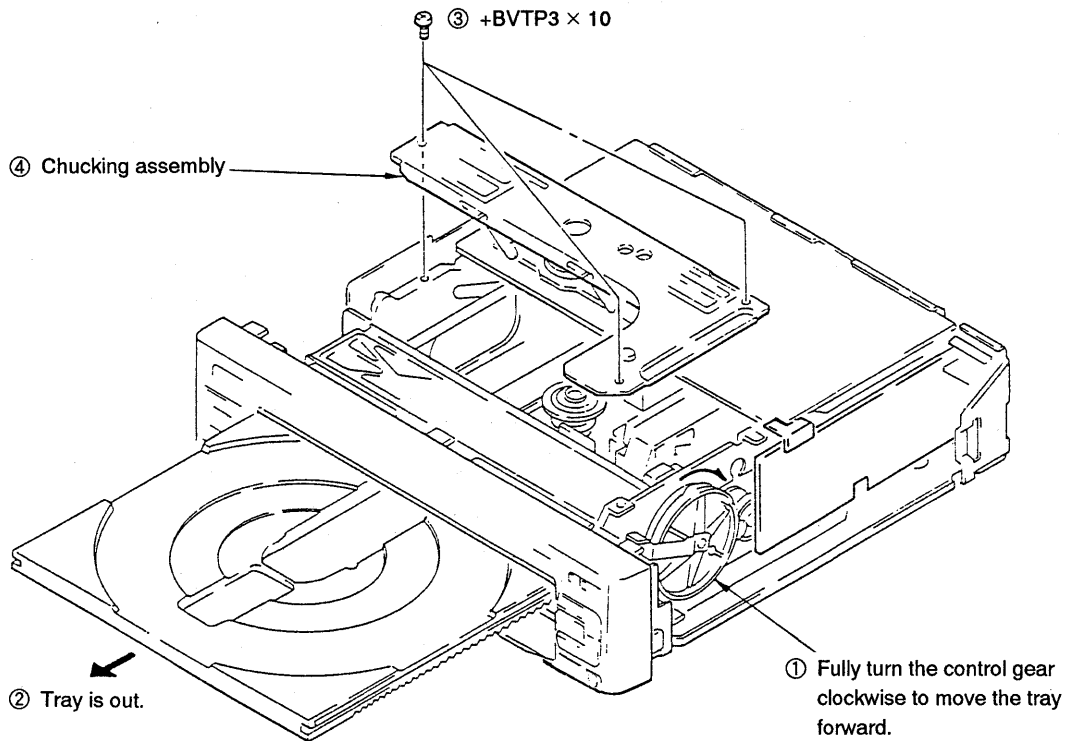


2-2. MB-712 BOARD

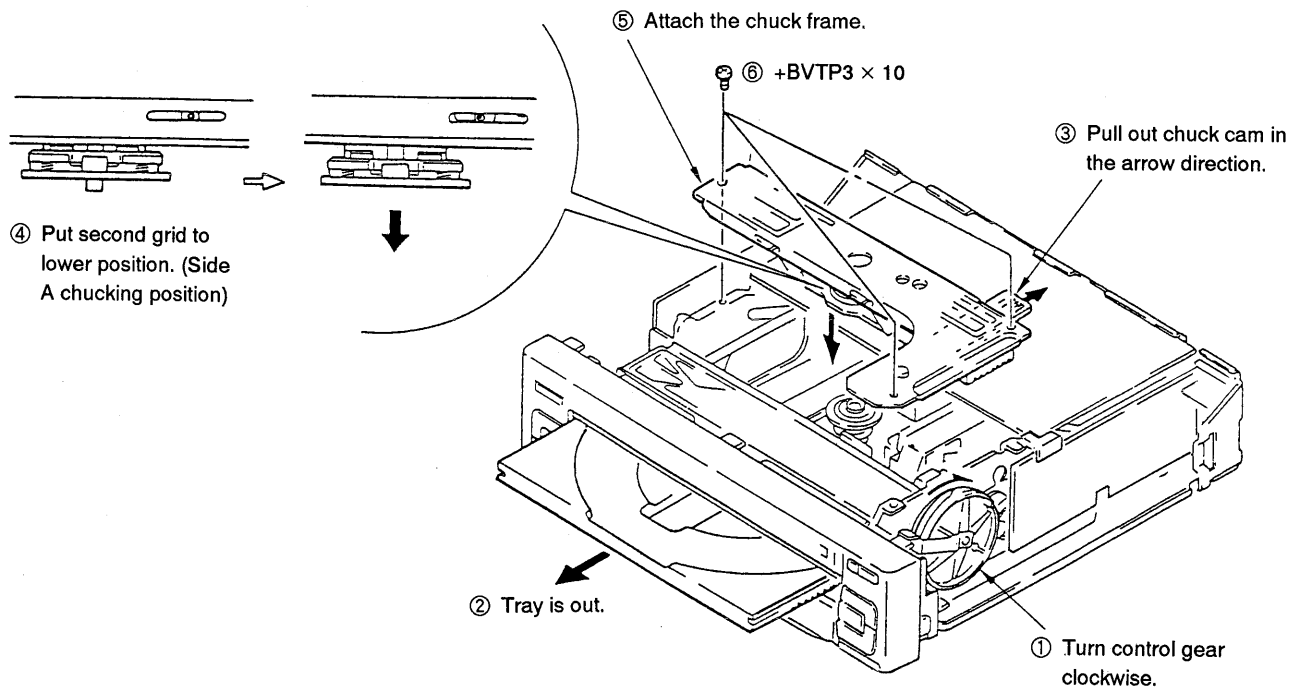


2-3. CHUCKING ASSEMBLY

• DISASSEMBLE

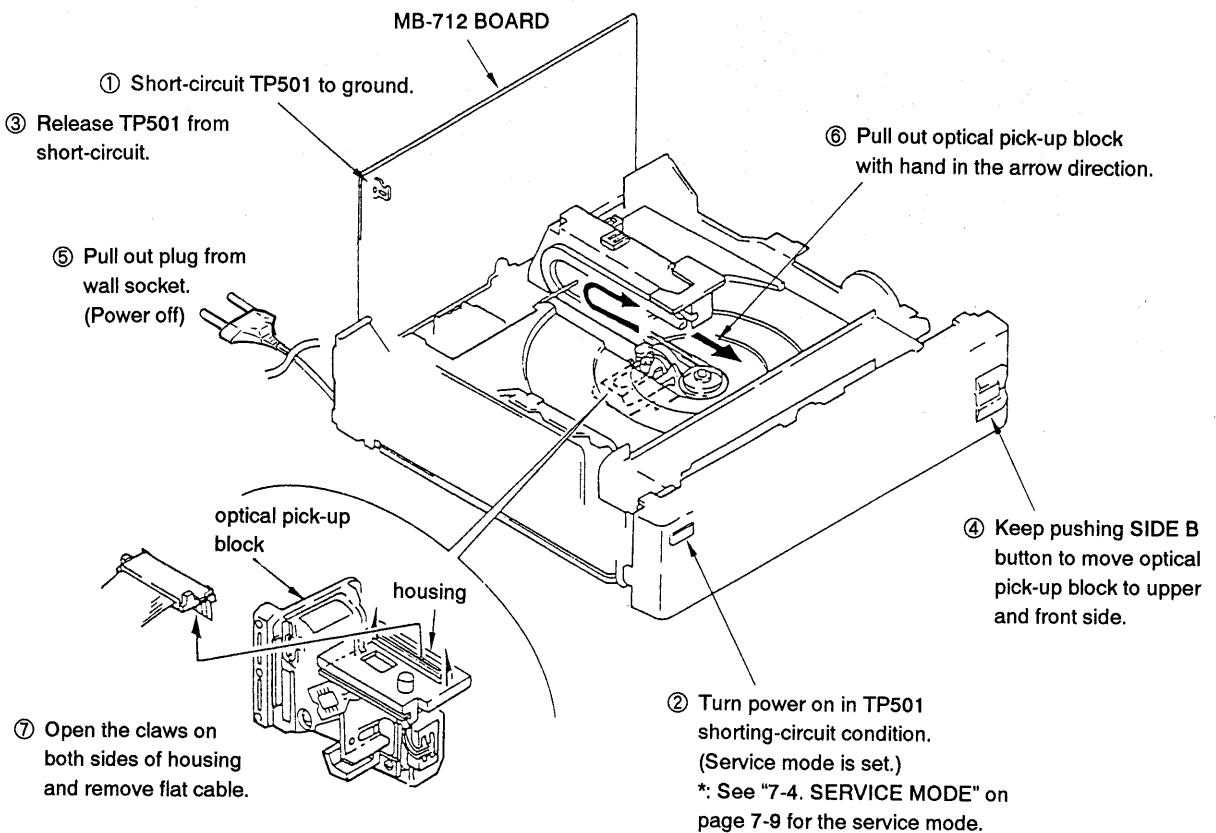


• ASSEMBLE

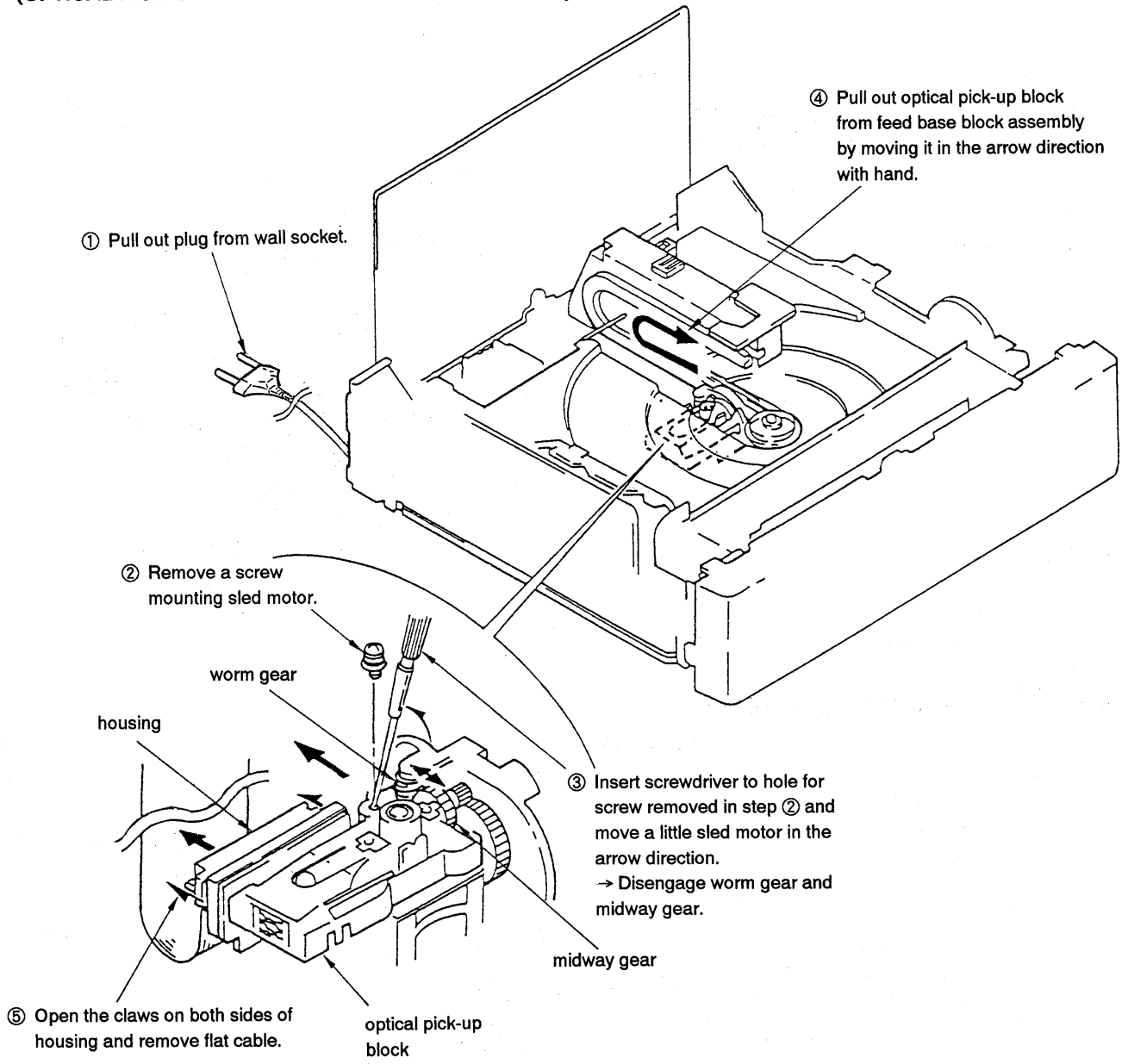


2-4. OPTICAL PICK-UP BLOCK

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



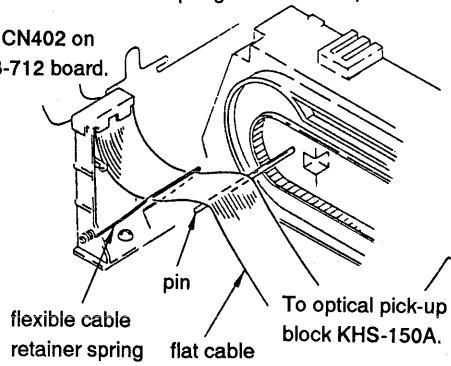
● **DISASSEMBLE II**
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)



• ASSEMBLE

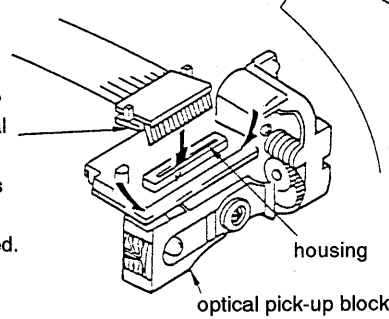
- ③ Confirm the flat cable goes through the flexible cable retainer spring and over the pin.

To CN402 on MB-712 board.



- 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.



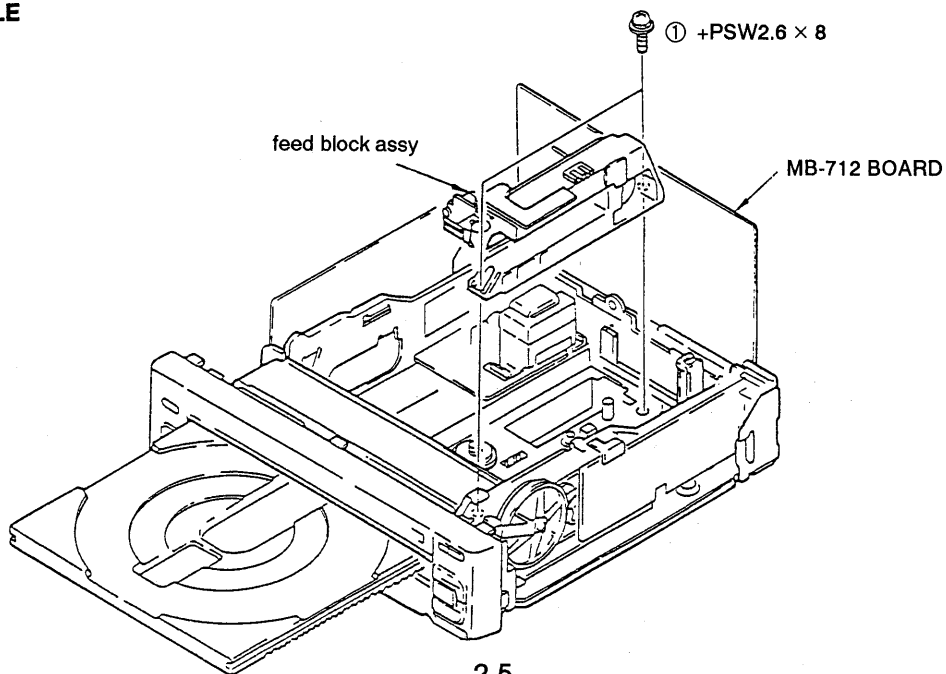
feed block assy

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

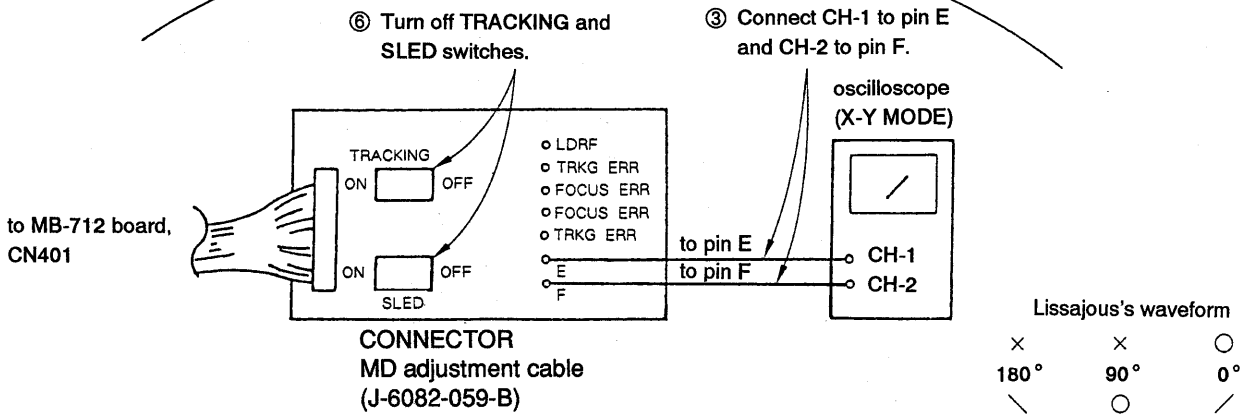
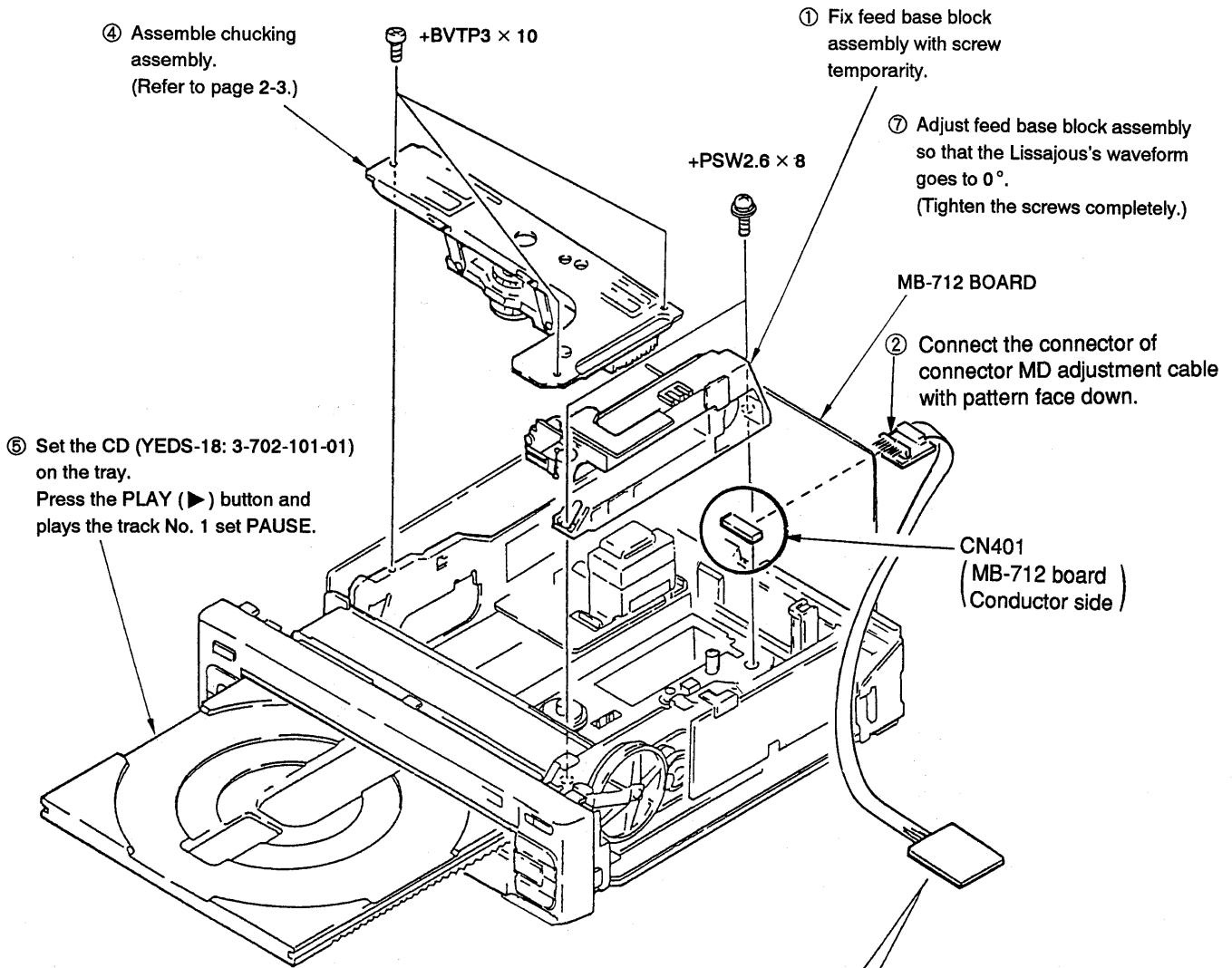
- ⑤ Turn power on. → Optical pick-up block moves into feed base block assembly.

2-5. MD CHASSIS ASSEMBLY

• DISASSEMBLE

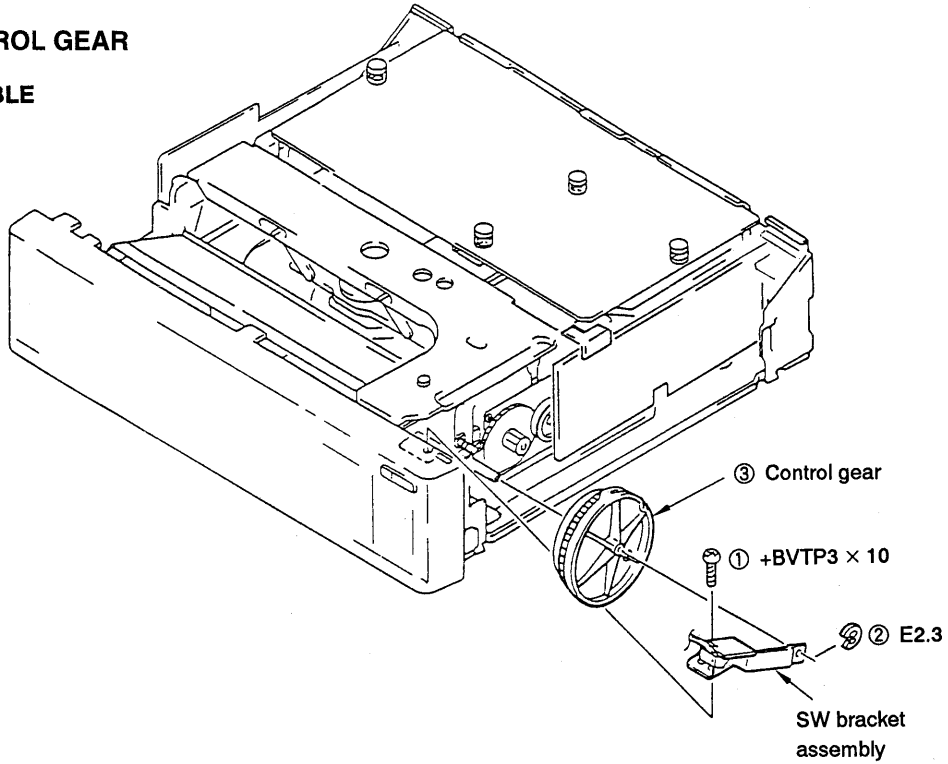


• ASSEMBLE



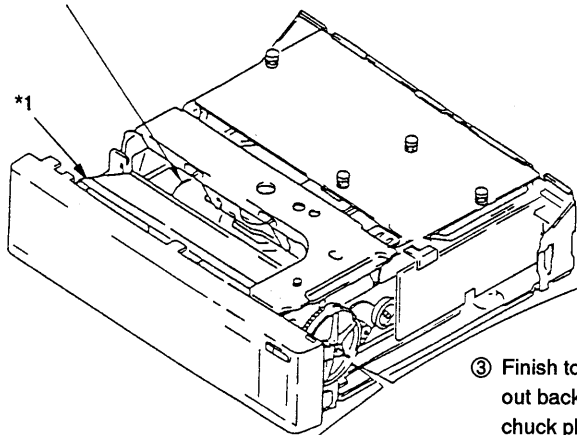
2-6. CONTROL GEAR

• DISASSEMBLE



• ASSEMBLE

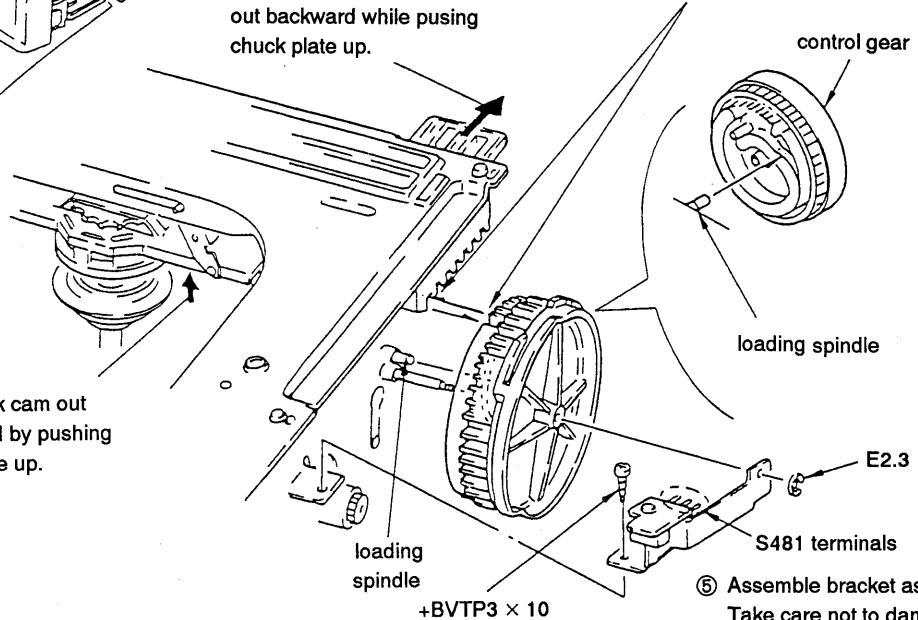
- ① Make tray holding in the set.



- ④ Attach the control gear so that its left end tooth on the inner side engages the left end groove on the chuck plate gear. Insert the loading spindle to the loading groove of the control gear while slightly moving the part marked with *1 up and down.

- ③ Finish to put chuck cam out backward while pushing chuck plate up.

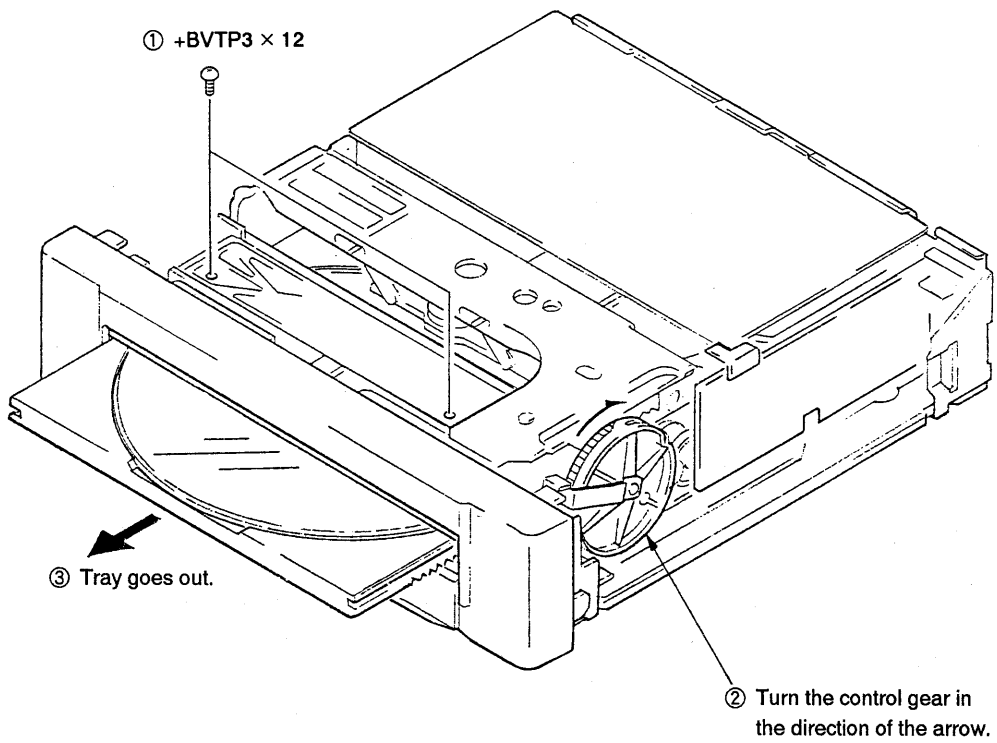
- ② Put chuck cam out backward by pushing chuck plate up.



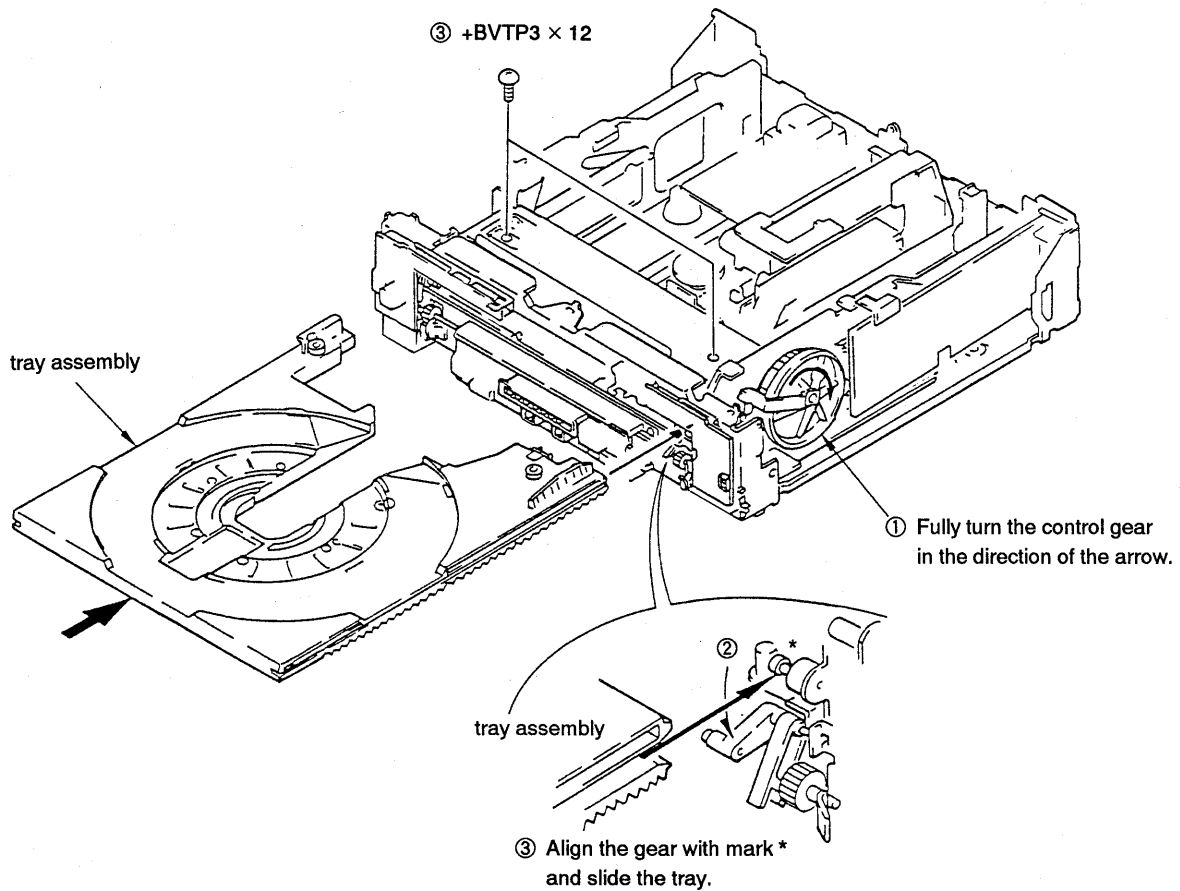
- ⑤ Assemble bracket assembly. Take care not to damage the terminals of S481.

2-7. TRAY ASSEMBLY

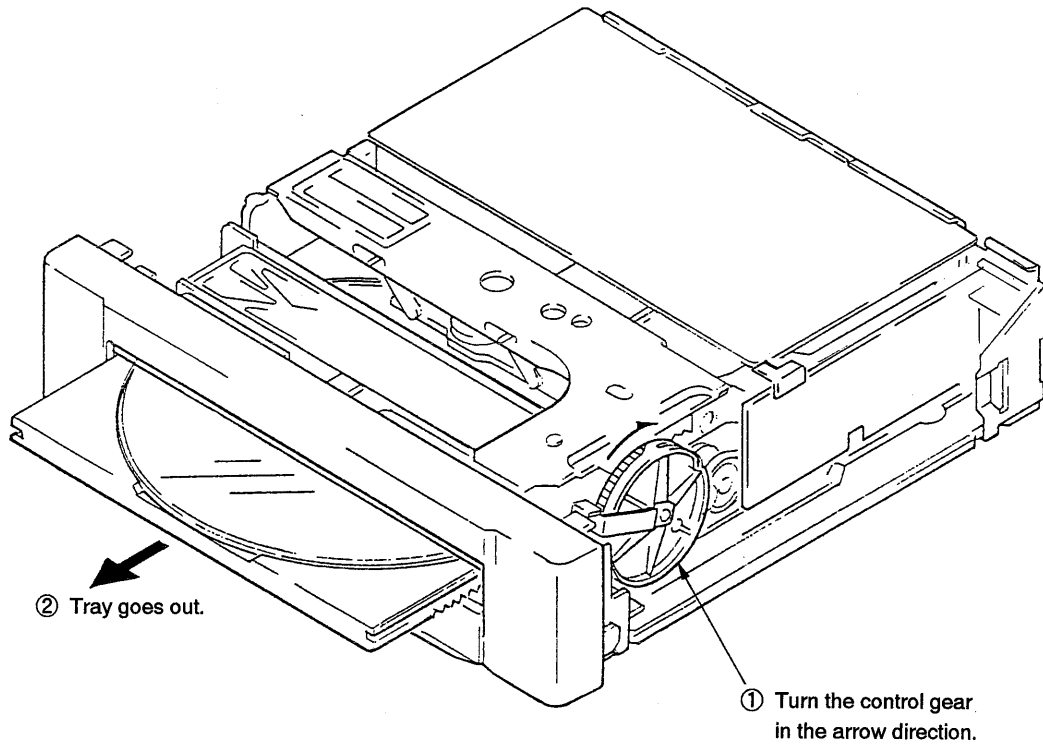
• DISASSEMBLE



• ASSEMBLE



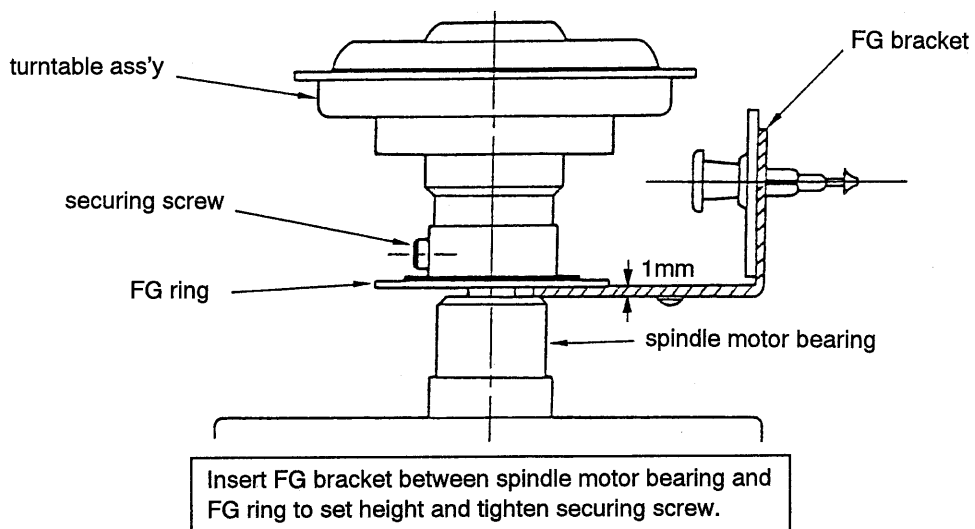
2-8. PUTTING OUT DISC WHEN A TROUBLE HAS OCURRED WITH THE DISC LOADED



2-9. TURNTABLE ASSEMBLY HEIGHT ADJUSTMENT

1. Open the tray by turning the control gear recured on the right side of the set clockwise.
2. Remove chucking assembly. (Refer to page 2-3.)
3. Remove FG bracket with FG board.
4. Replace turntable assembly.

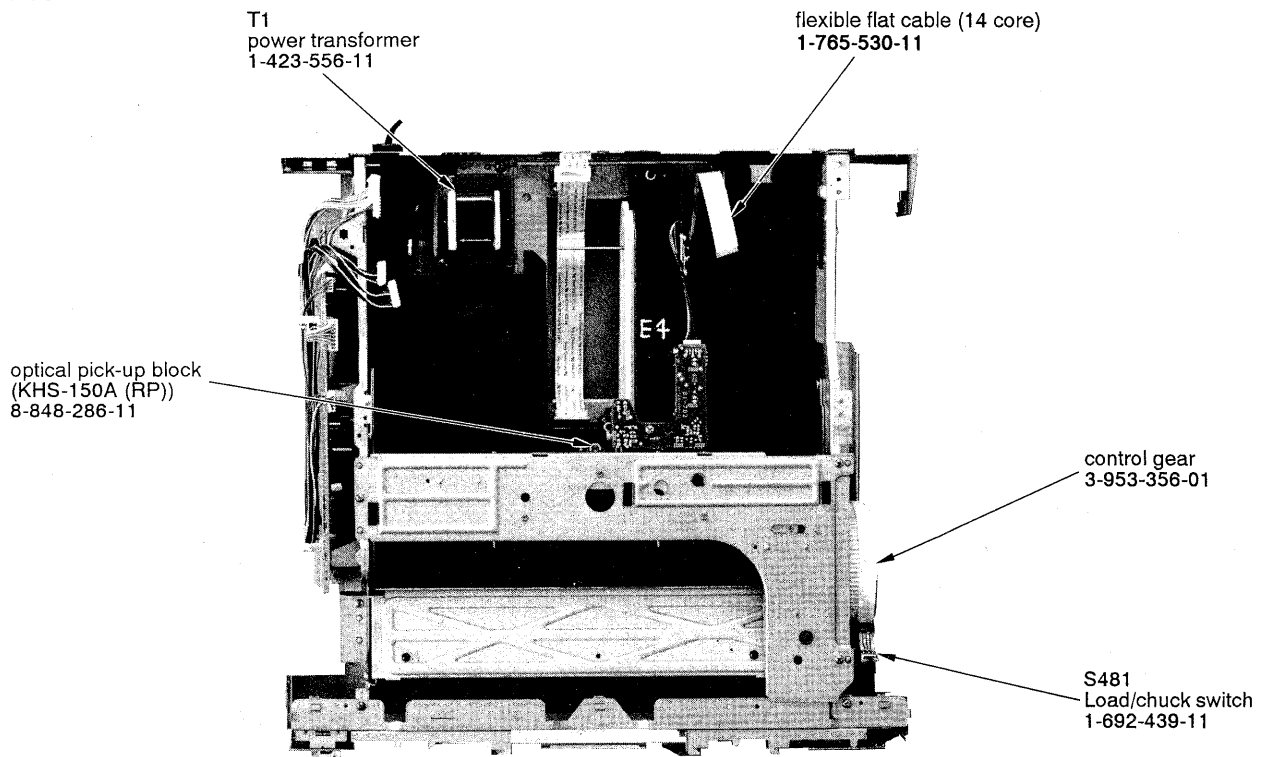
Adjust turntable assembly height using FG bracket(1 mm thickness)as followings.



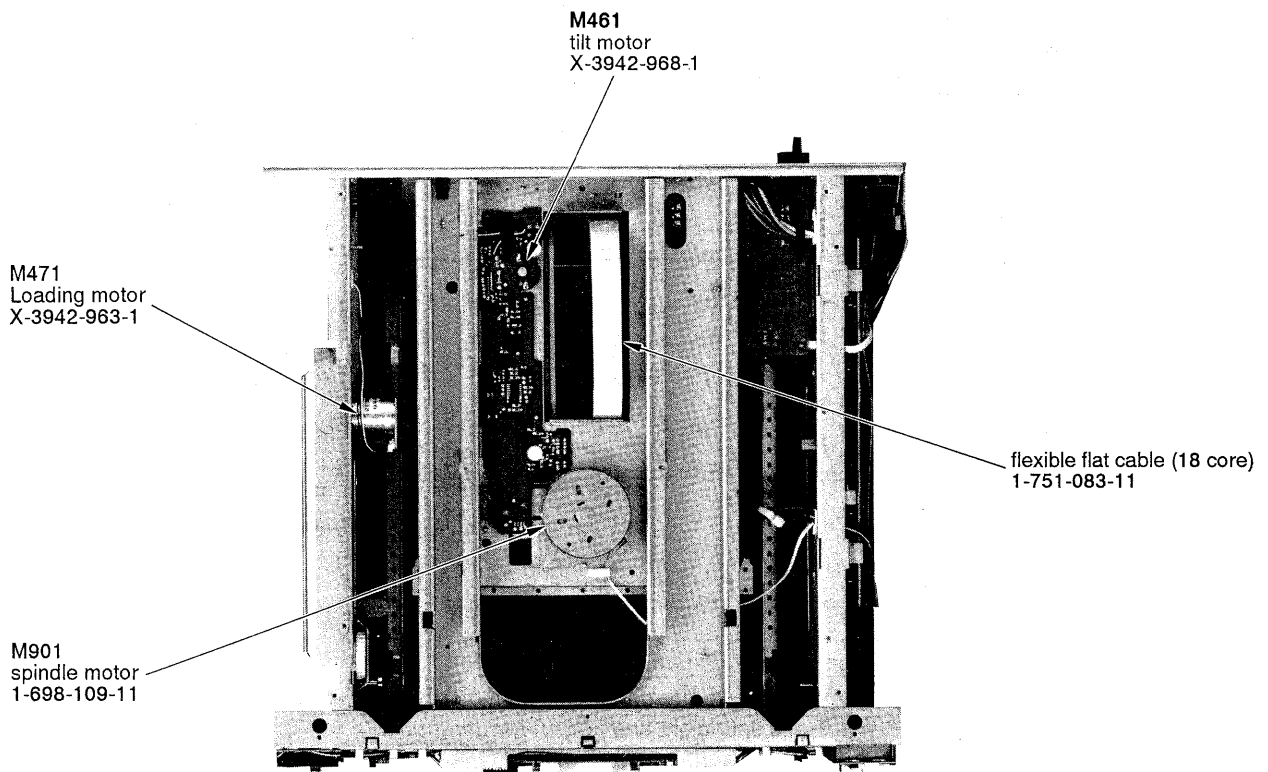
5. Fit FG bracket with FG board in its original position.

2-10. INTERNAL VIEWS

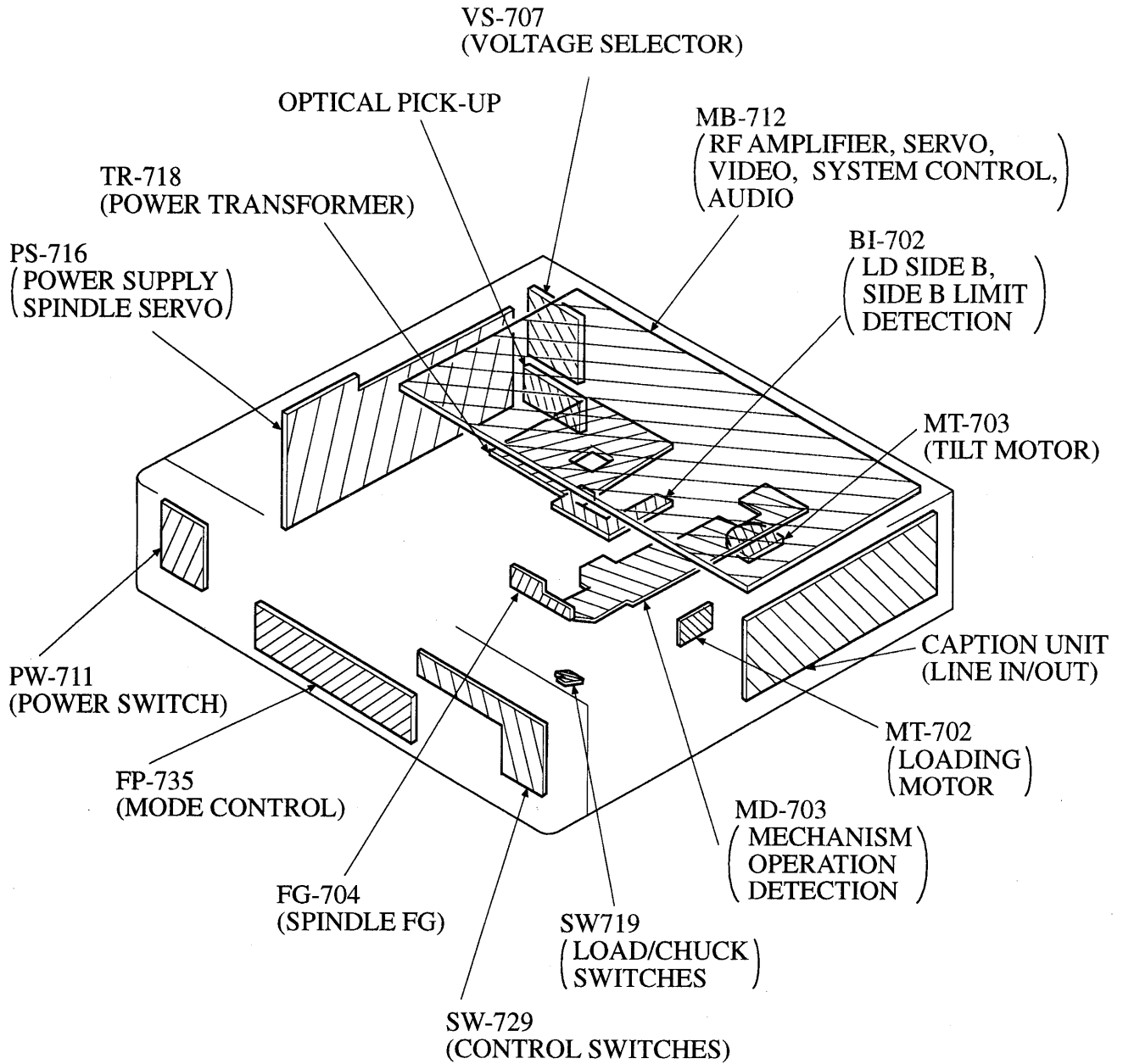
– Top Side –



– Bottom Side –

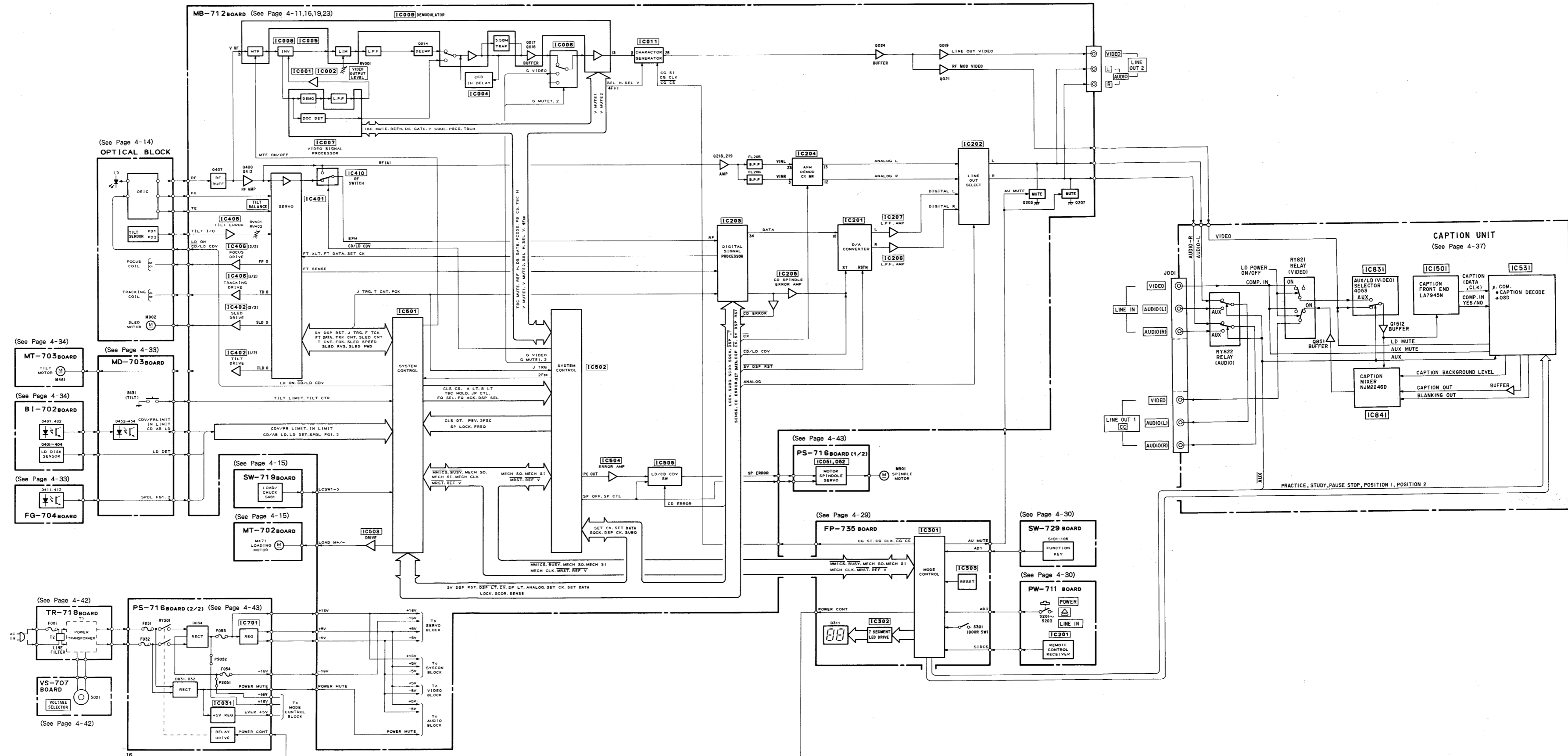


2-11. CIRCUIT BOARDS LOCATION

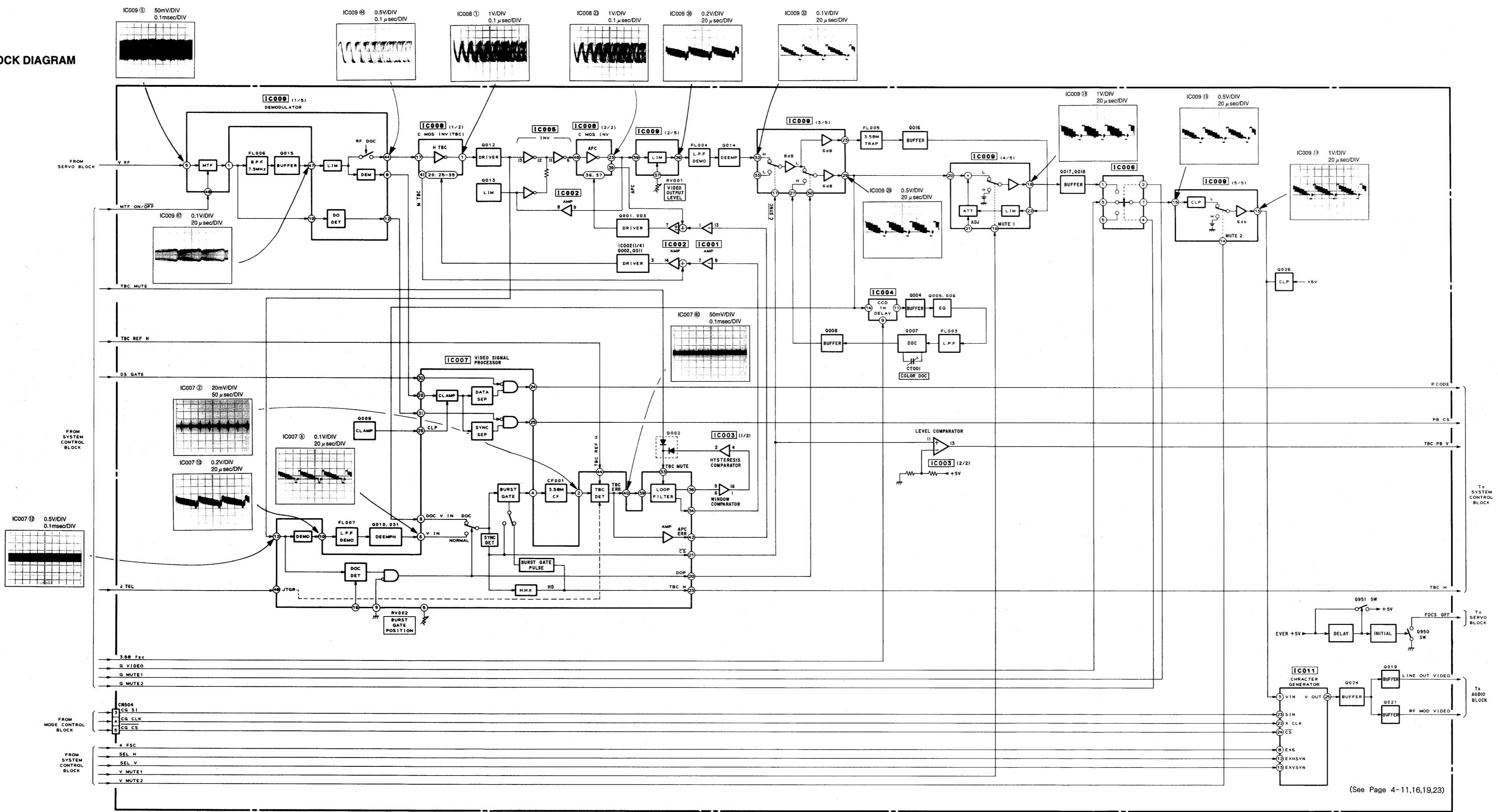


SECTION 3
DIAGRAMS

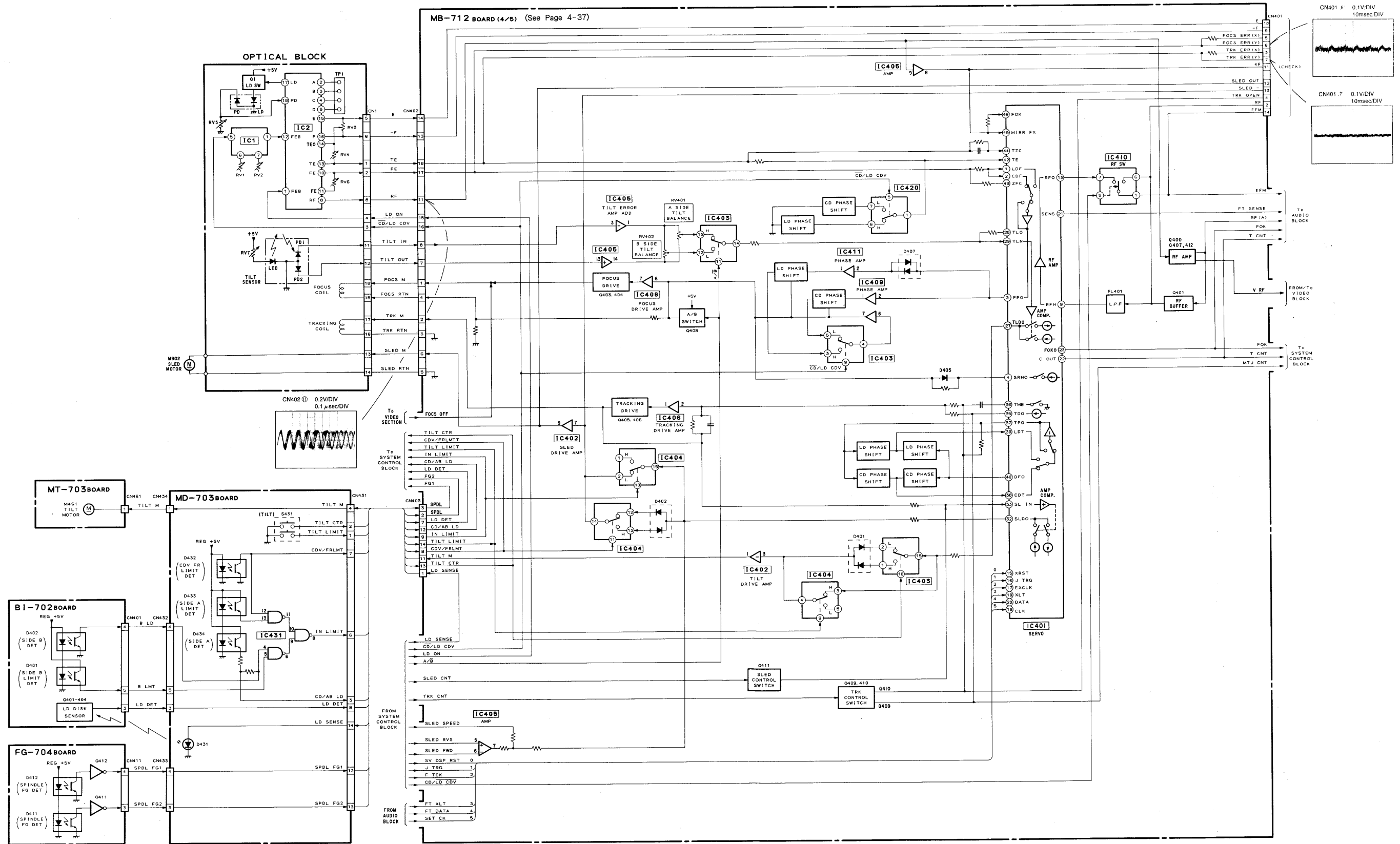
3-1. OVERALL BLOCK DIAGRAM



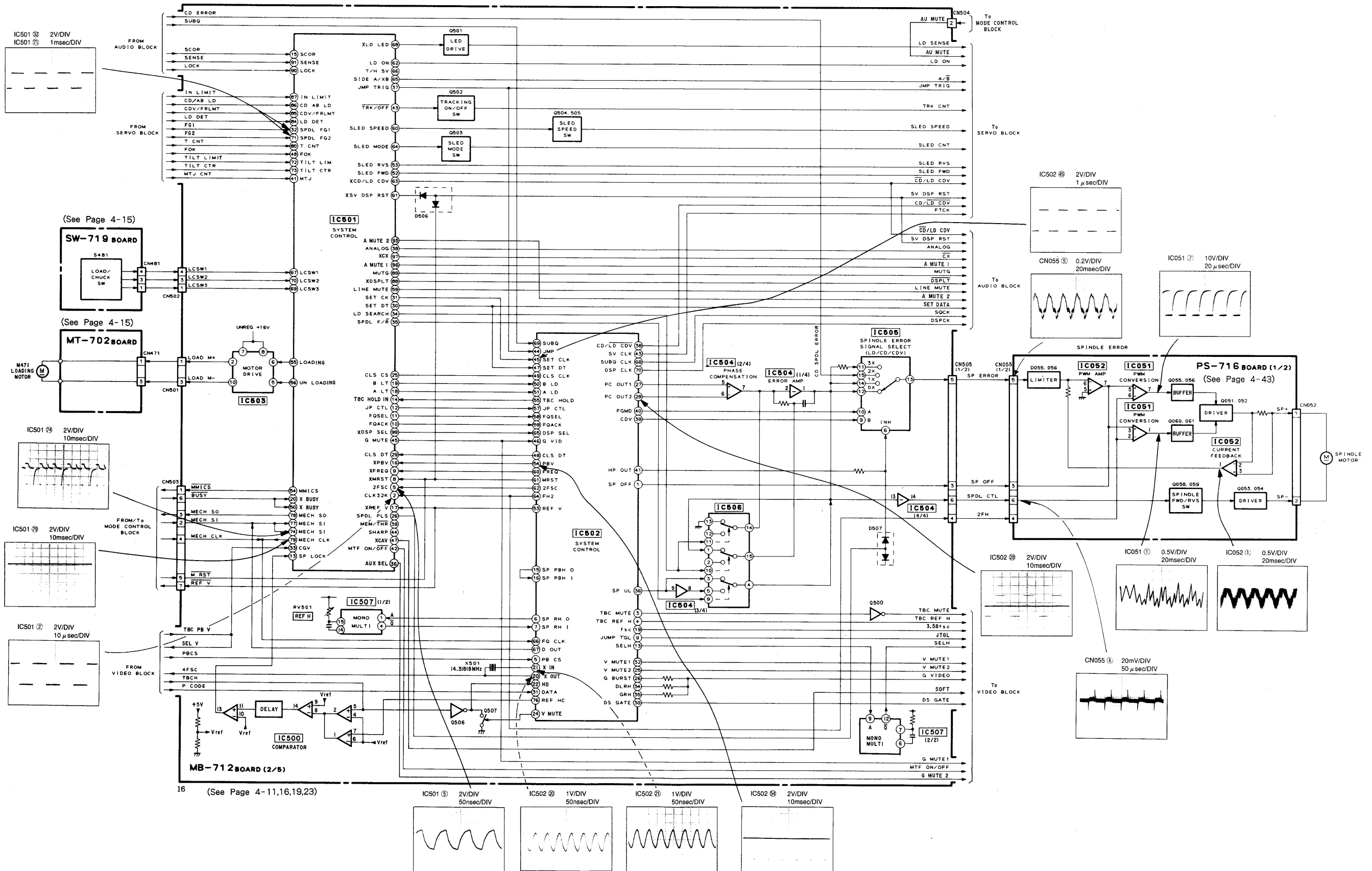
3-2. VIDEO BLOCK DIAGRAM



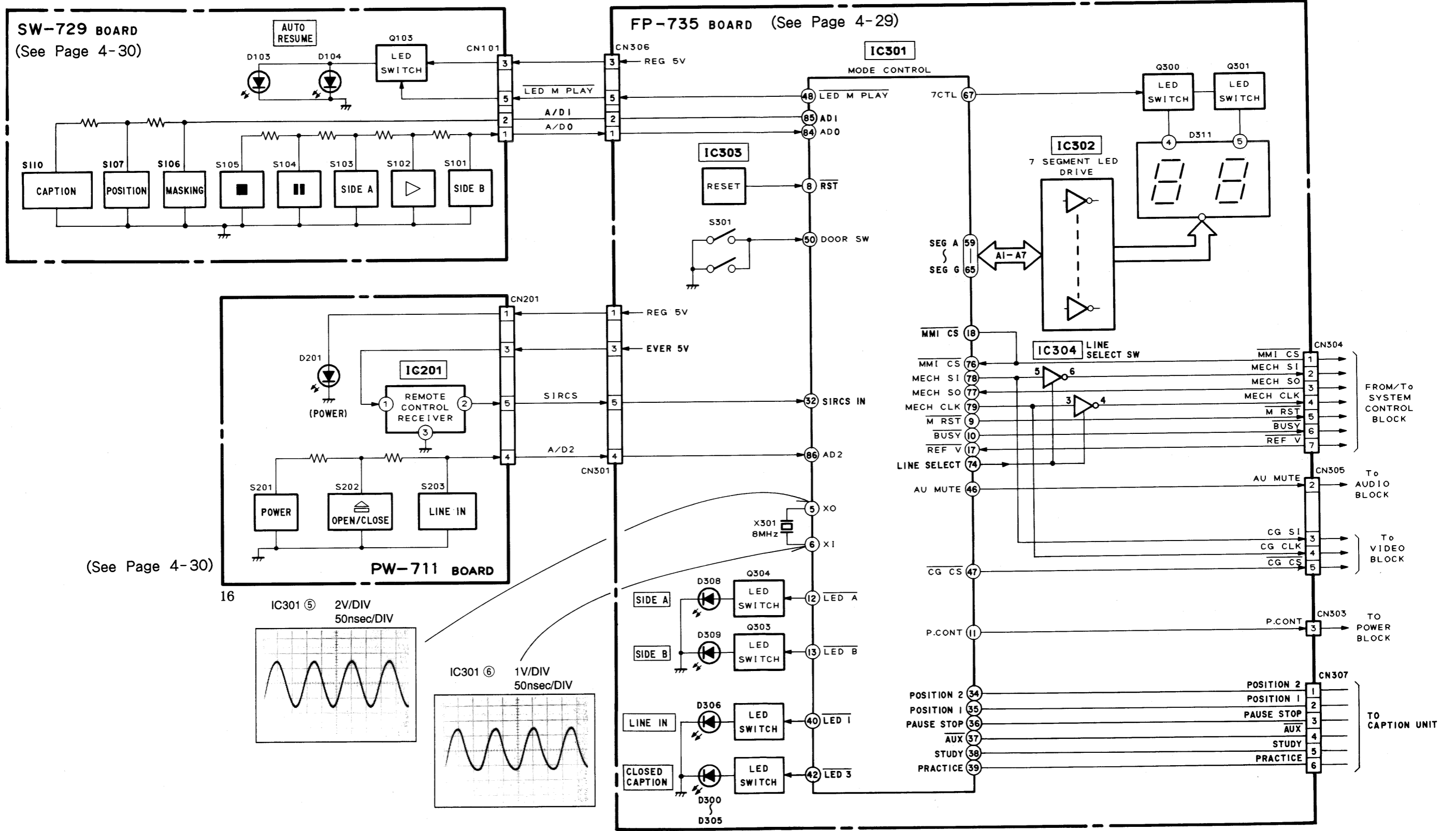
3-3. SERVO BLOCK DIAGRAM



3-4. SYSTEM CONTROL BLOCK DIAGRAM

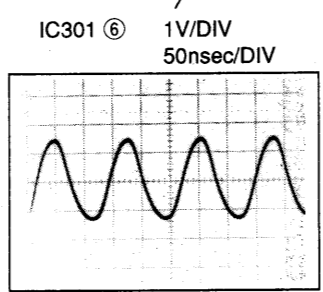
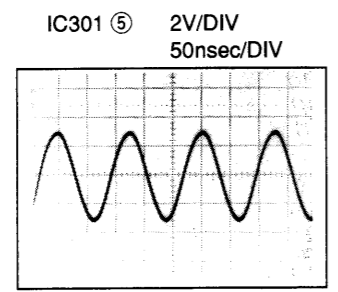


3-5. MODE CONTROL BLOCK DIAGRAM

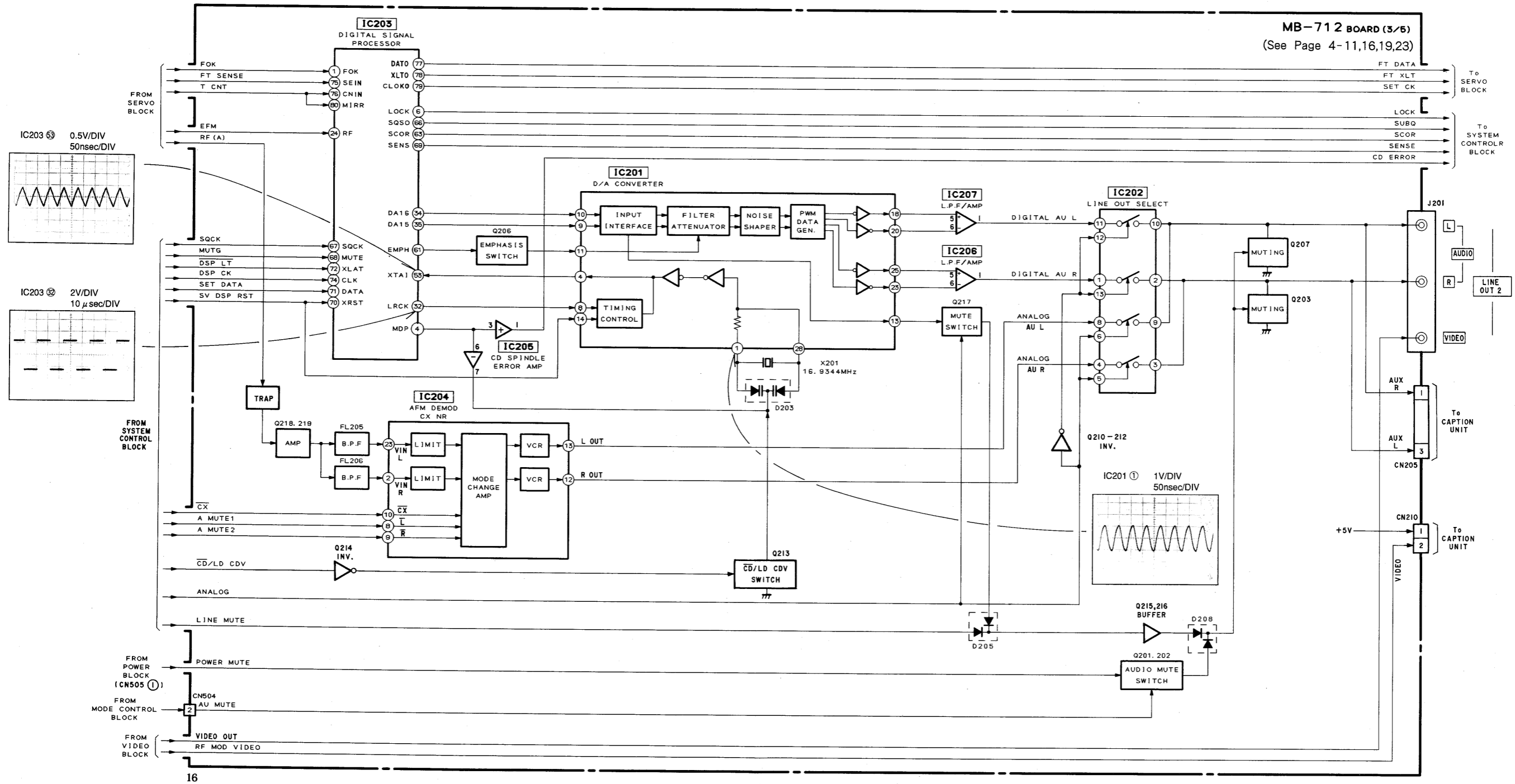


(See Page 4-30)

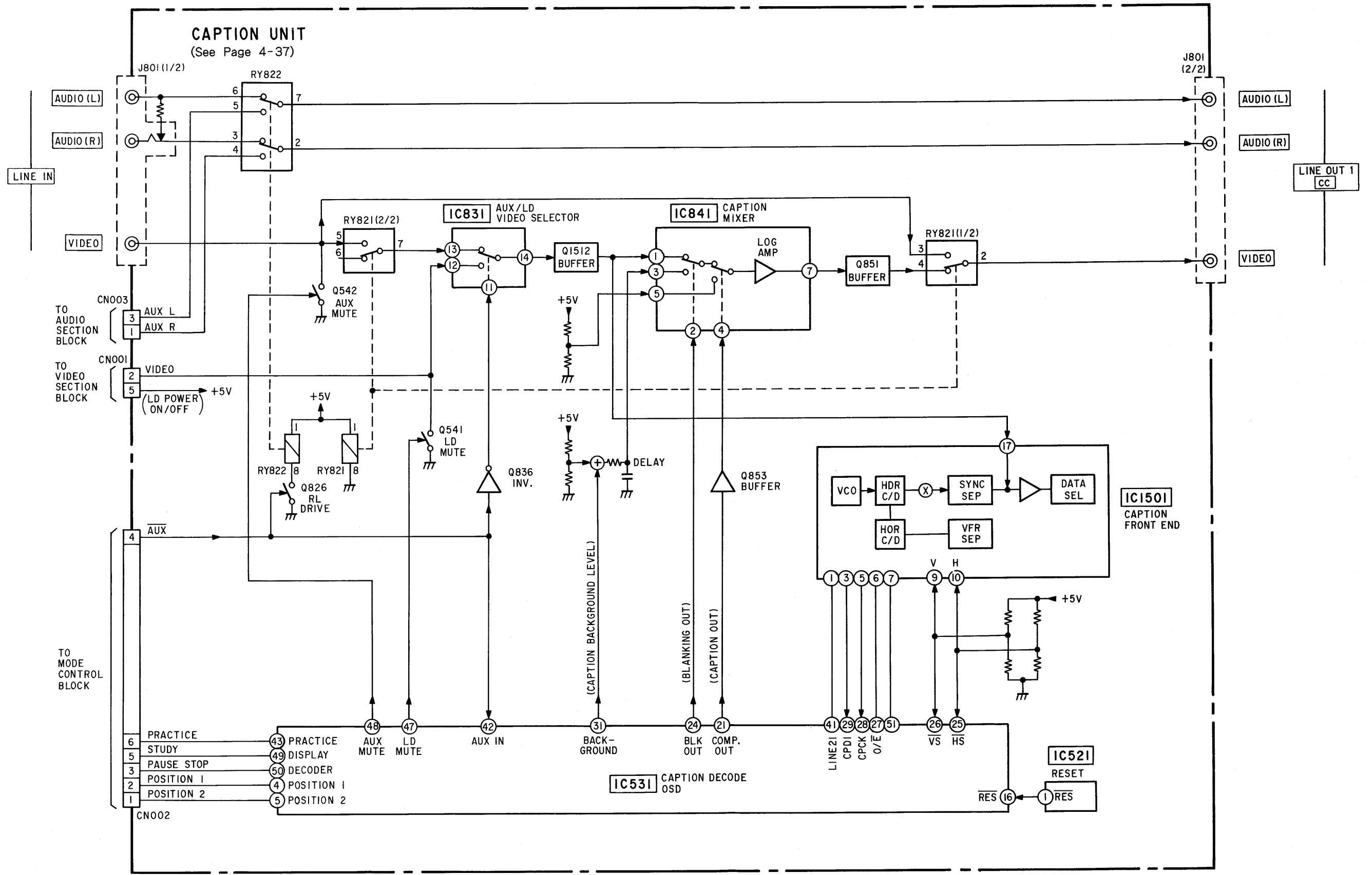
16



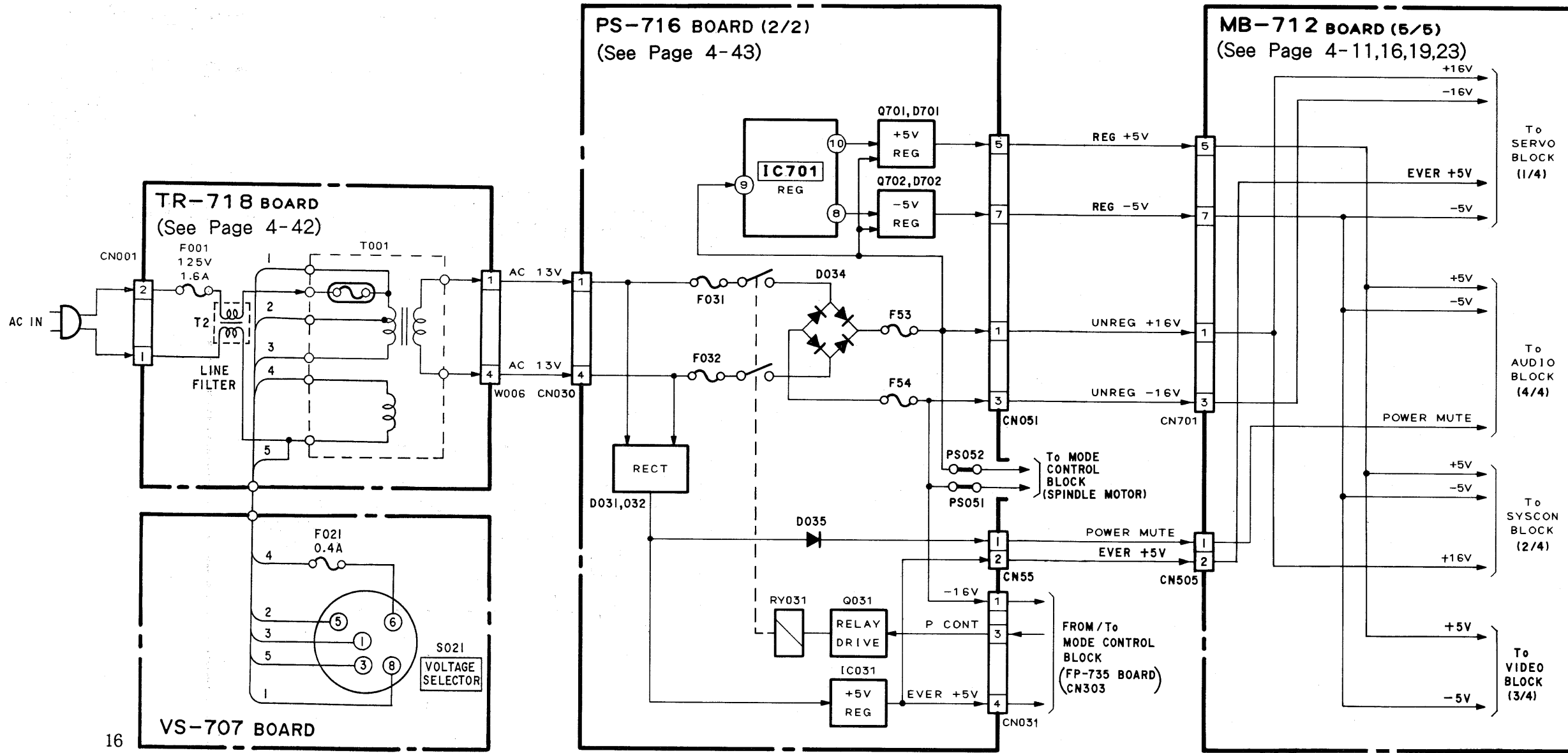
3-6. AUDIO BLOCK DIAGRAM



3-7. CAPTION UNIT BLOCK DIAGRAM



3-8. POWER SUPPLY BLOCK DIAGRAM

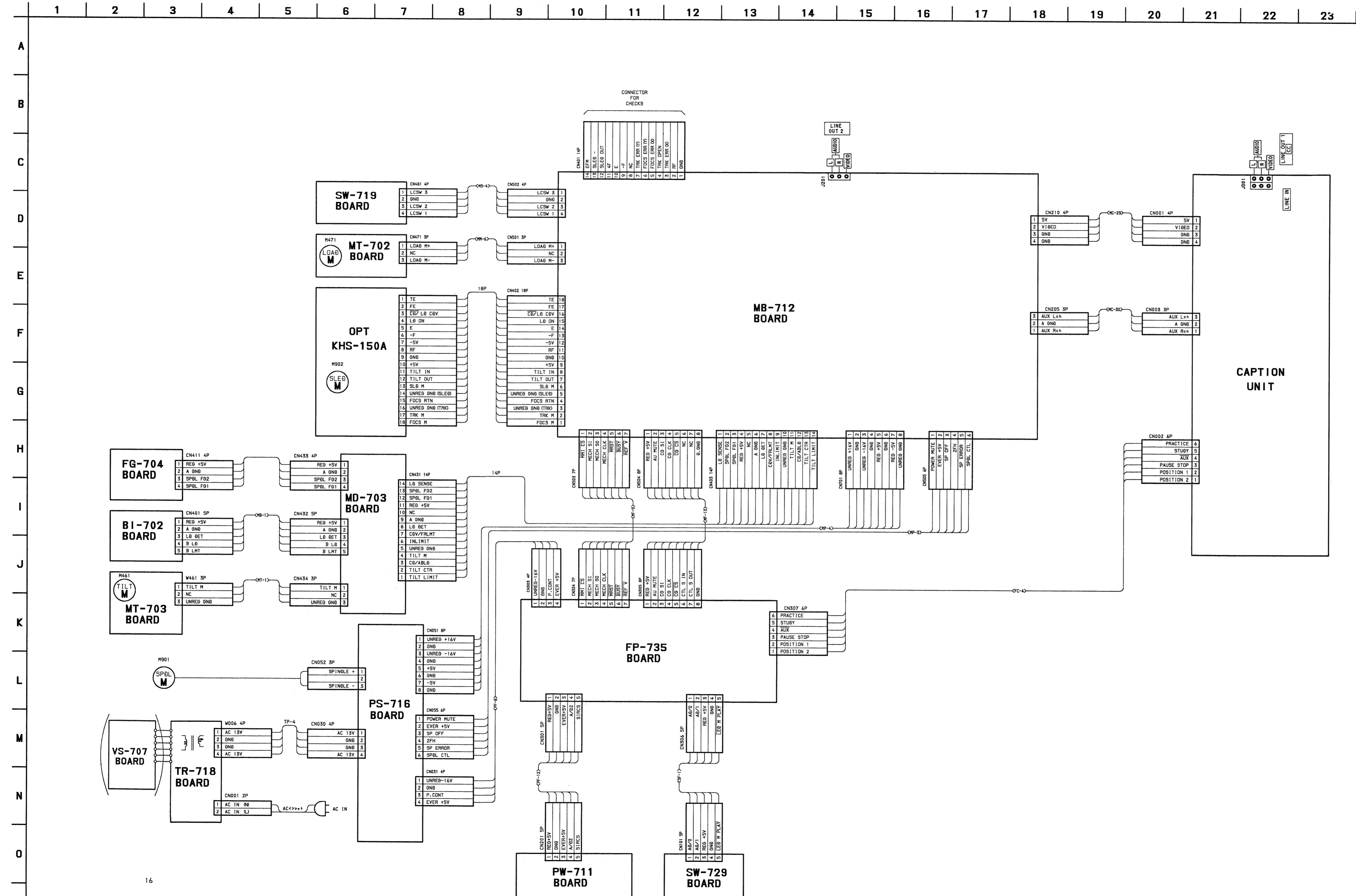


(See Page 4-42)

| AC VOLTAGE | PIN CONNECTION |
|------------|----------------|
| 100V | 3-5 |
| 120V | 1-3, 6-8 |
| 220V | 5-6 |
| 240V | 1-6 |

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-1

4-2

4-3

4-4

4-5

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.
- : indicated a lead wire mounted on the conductor side.
- ▨ : 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.

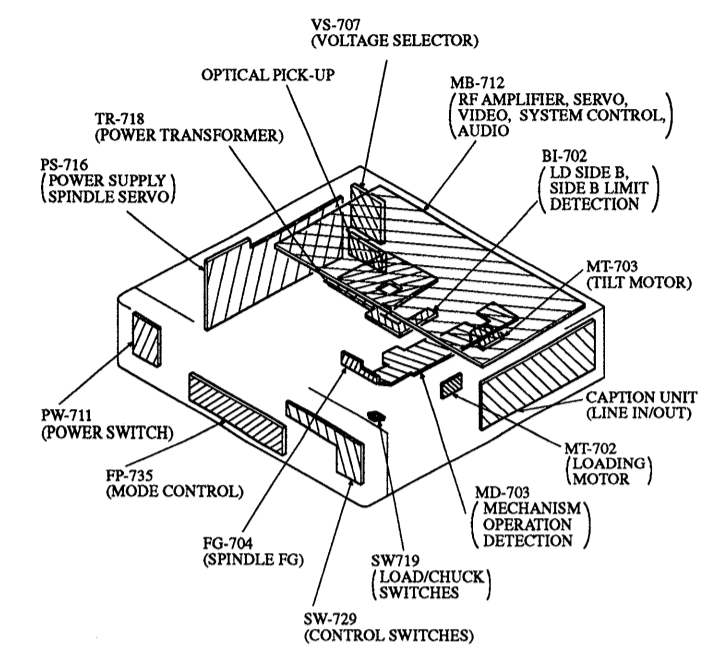
For schematic diagram:

- 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, 1/4 W unless otherwise noted. Chip resistors: 1/10 W unless otherwise noted. k Ω : 1000 Ω, M Ω : 1000k Ω.
- 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.
- ▨ : nonflammable resistor.
- ▩ : fusible resistor.
- ▩ : panel designation.
- ▨ : internal component.
- △ : adjustment for repair.*
- ▨ : B + Line.*
- ▩ : B - Line.*
- Voltage are dc between measurement points and ground when playing back the reference disc (HLV-8) color bar segment.*
- Readings are taken with a digital multimeter (DC10 MΩ).
- Voltage variations may be noted due to normal production tolerances.
- ⇒ : IN/OUT direction of B line (+, -).*
- : Circled numbers refer to waveforms.*

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

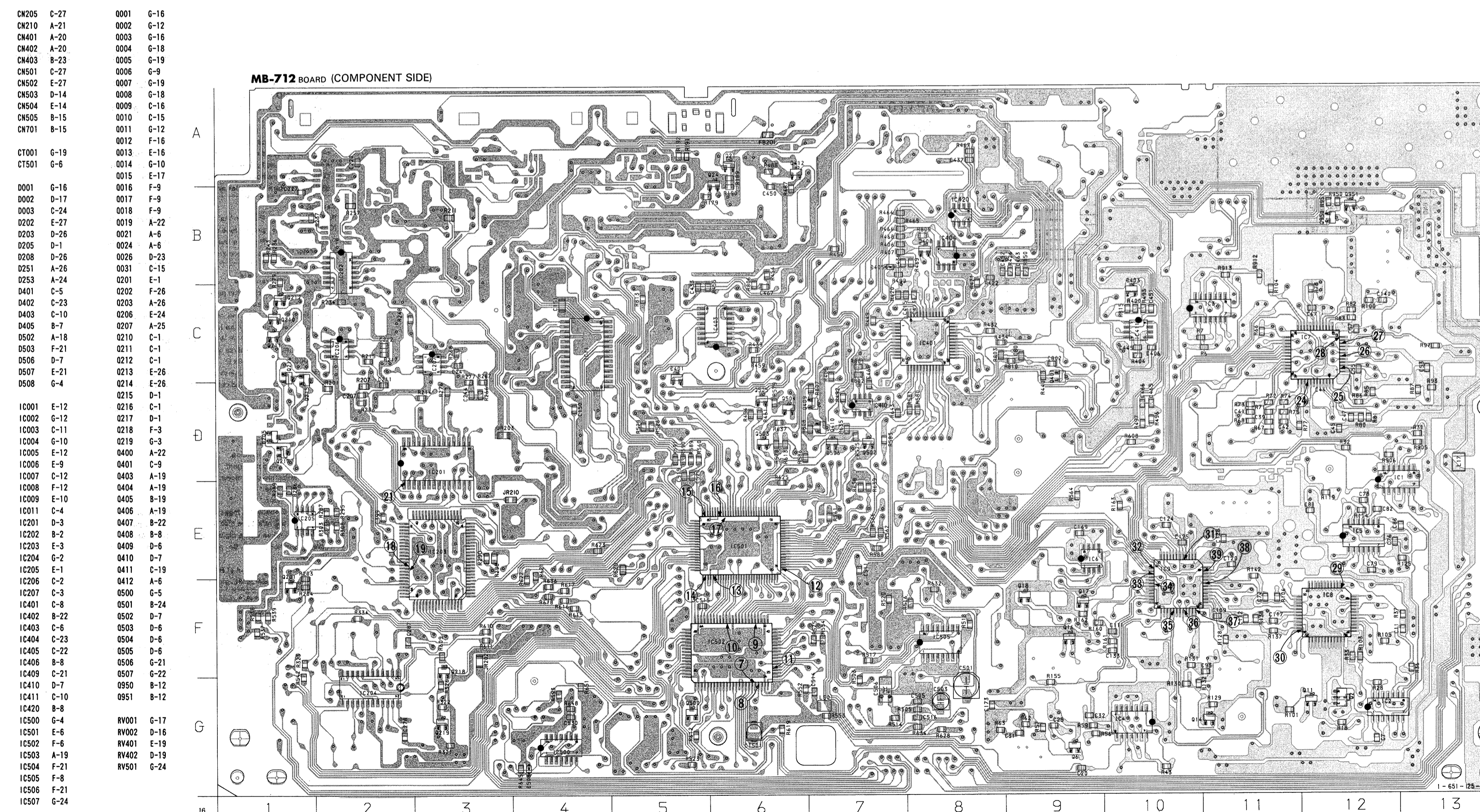
Note : The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

* : indicated by the color red.



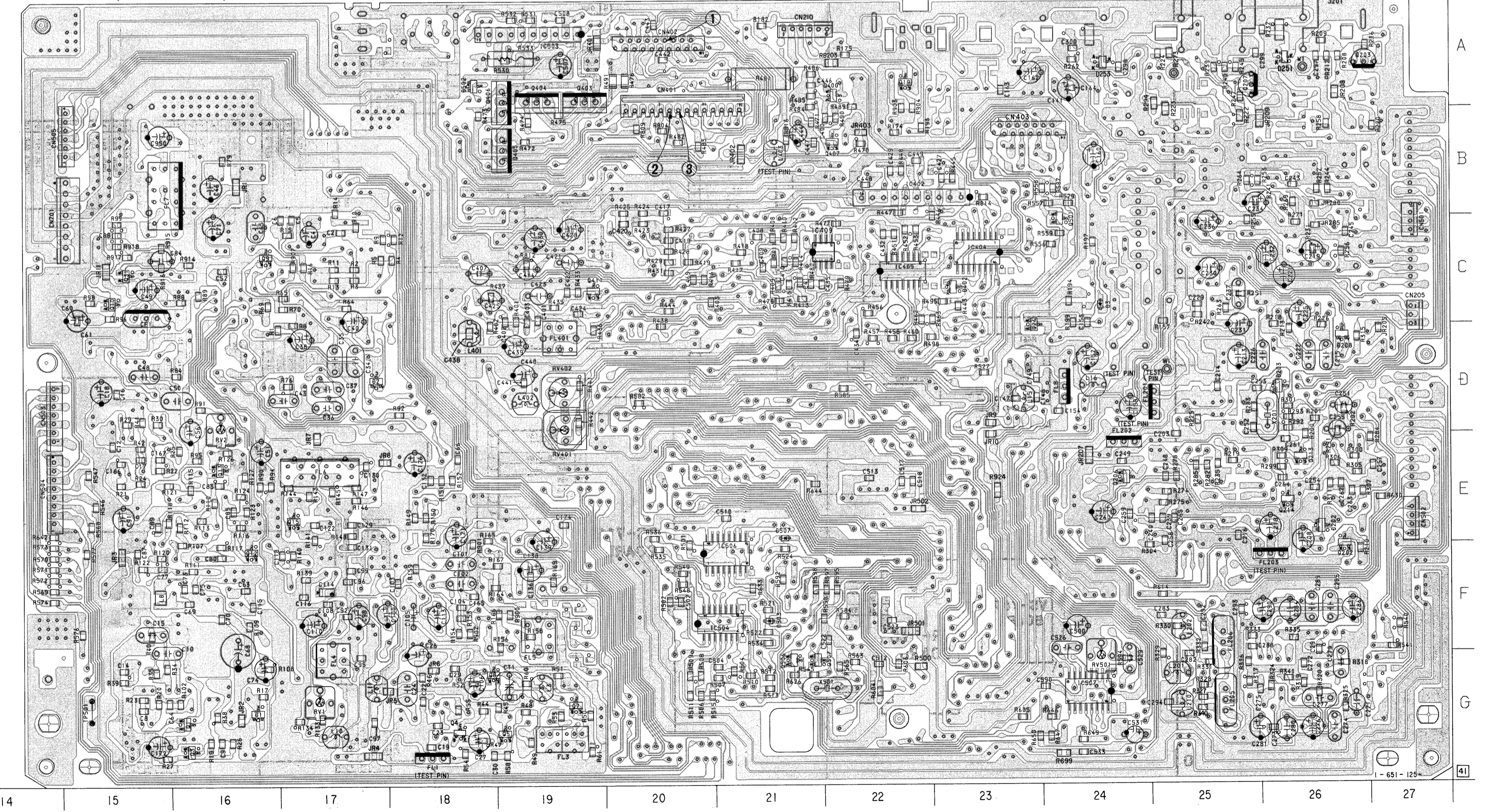
MB-712 (VIDEO, RF AMPLIFIER, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD
 —Ref. No. MB-712 Board: 1,000 Series—

MB-712 BOARD

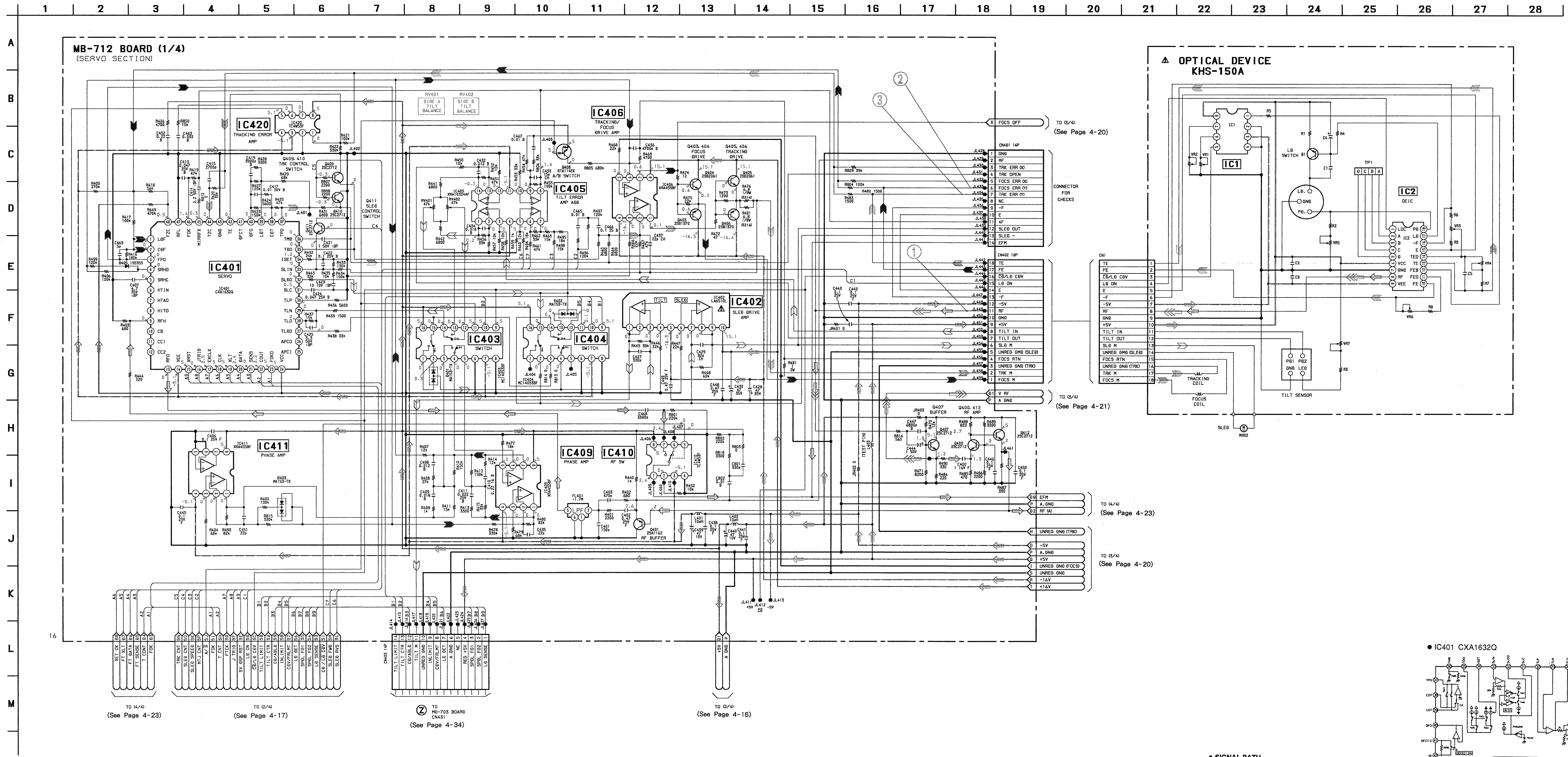


| | | | |
|-------|------|-------|------|
| CM205 | C-27 | 0001 | G-16 |
| CM210 | A-21 | 0002 | G-12 |
| CM401 | A-20 | 0003 | G-16 |
| CM402 | A-20 | 0004 | G-18 |
| CM501 | B-23 | 0005 | G-19 |
| CM501 | C-27 | 0006 | G-9 |
| CM502 | E-27 | 0007 | G-19 |
| CM503 | D-14 | 0008 | G-18 |
| CM504 | E-14 | 0009 | C-16 |
| CM505 | B-15 | 0010 | C-15 |
| CM701 | B-15 | 0011 | G-12 |
| | | 0012 | F-16 |
| CT001 | G-19 | 0013 | E-16 |
| CT501 | C-6 | 0014 | G-10 |
| | | 0015 | E-17 |
| D001 | G-16 | 0016 | F-9 |
| D002 | D-17 | 0017 | F-9 |
| D003 | C-24 | 0018 | F-9 |
| D002 | E-27 | 0019 | A-22 |
| D203 | D-26 | 0021 | A-6 |
| D205 | D-1 | 0024 | A-6 |
| D208 | D-26 | 0026 | D-23 |
| D251 | A-26 | 0031 | C-15 |
| D253 | A-24 | 0201 | F-1 |
| DA001 | C-5 | 0202 | F-26 |
| DA02 | C-23 | 0203 | A-26 |
| DA03 | C-10 | 0206 | E-24 |
| DA05 | B-7 | 0207 | A-25 |
| DA02 | A-18 | 0210 | C-1 |
| DA03 | F-21 | 0211 | C-1 |
| DA06 | D-7 | 0212 | C-1 |
| DA07 | F-21 | 0213 | F-26 |
| DA08 | G-4 | 0214 | E-26 |
| | | 0215 | D-1 |
| IC001 | E-12 | 0216 | C-1 |
| IC002 | G-12 | 0217 | D-1 |
| IC003 | C-11 | 0218 | F-3 |
| IC004 | G-10 | 0219 | G-3 |
| IC005 | E-12 | 0400 | A-22 |
| IC006 | C-9 | 0401 | C-9 |
| IC007 | C-12 | 0403 | A-19 |
| IC008 | F-12 | 0404 | A-19 |
| IC009 | E-10 | 0405 | B-19 |
| IC011 | C-4 | 0406 | A-19 |
| IC201 | D-3 | 0407 | B-22 |
| IC202 | B-2 | 0408 | B-8 |
| IC203 | F-3 | 0409 | D-6 |
| IC204 | G-2 | 0410 | D-7 |
| IC205 | E-1 | 0411 | C-19 |
| IC206 | C-2 | 0412 | A-6 |
| IC207 | C-3 | 0500 | G-5 |
| IC401 | C-8 | 0501 | B-24 |
| IC402 | B-22 | 0502 | D-7 |
| IC403 | C-6 | 0503 | D-6 |
| IC404 | C-23 | 0504 | D-6 |
| IC405 | C-22 | 0505 | D-6 |
| IC406 | B-8 | 0506 | G-21 |
| IC409 | C-21 | 0507 | G-22 |
| IC410 | D-7 | 0550 | B-12 |
| IC411 | C-10 | 0551 | B-12 |
| IC420 | B-8 | | |
| IC500 | G-4 | RV001 | G-17 |
| IC501 | E-5 | RV002 | D-16 |
| IC502 | F-6 | RV401 | F-19 |
| IC503 | A-19 | RV402 | D-19 |
| IC504 | F-21 | RV501 | G-24 |
| IC505 | F-8 | | |
| IC506 | F-21 | | |
| IC507 | G-24 | | |

MB-712 BOARD (CONDUCTOR SIDE)

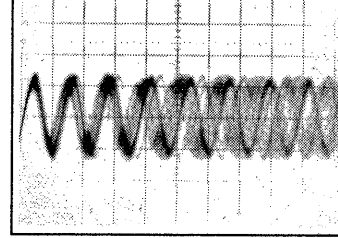


• O : Through hole.

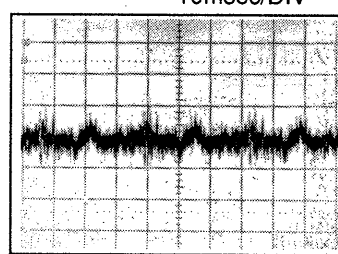


MB-712 BOARD

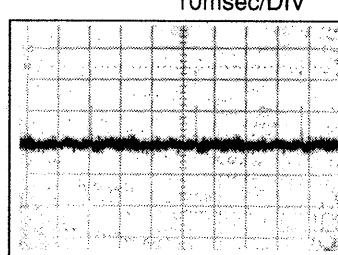
● CN402 ① 0.2V/DIV
0.1 μsec/DIV



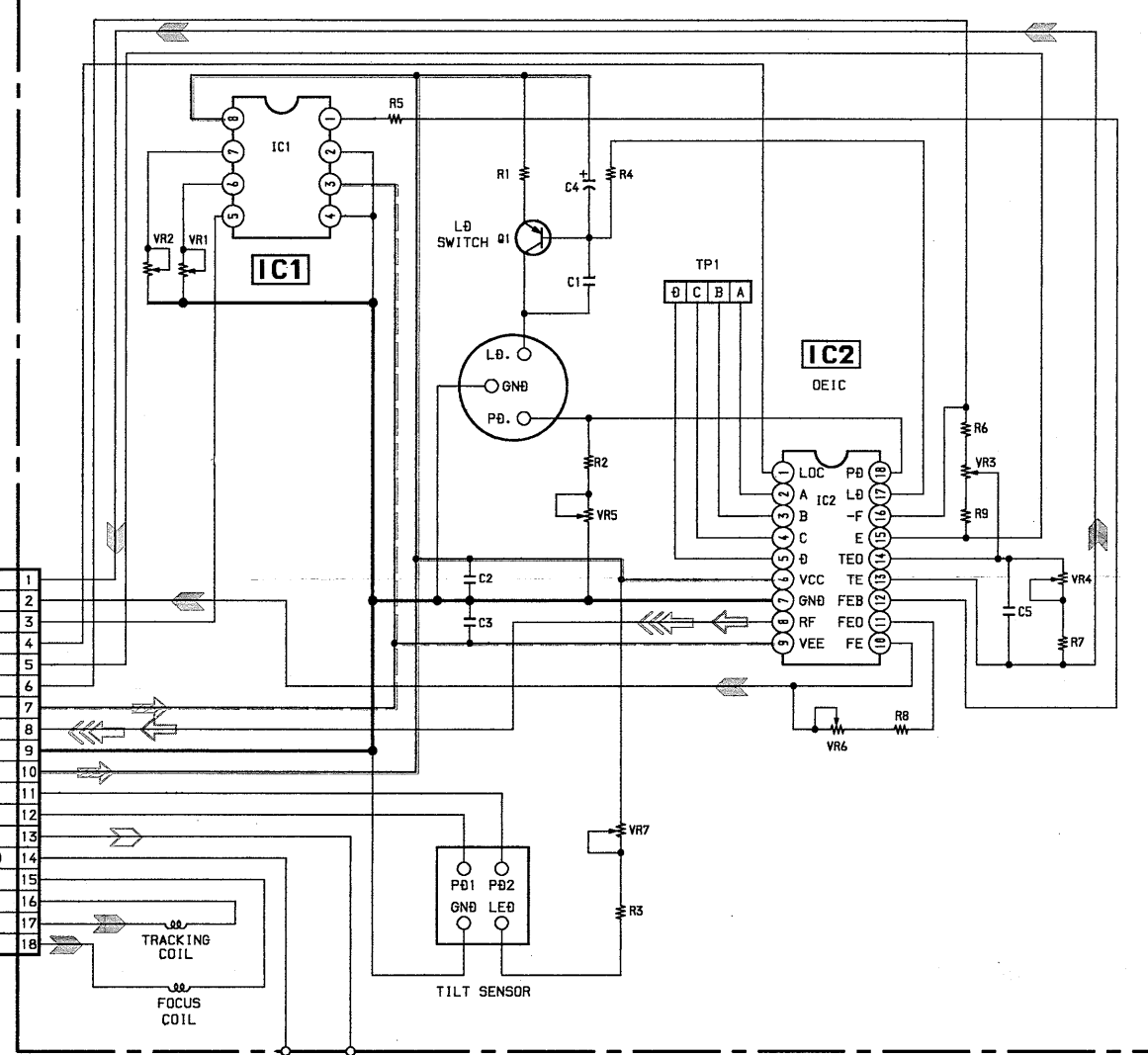
● CN401 ⑥ 0.1V/DIV
10msec/DIV



● CN401 ⑦ 0.1V/DIV
10msec/DIV



▲ OPTICAL DEVICE KHS-150A



CONNECTOR FOR CHECKS

- 1 GND
- 2 TRK ERR 00
- 3 TRK OPEN
- 4 FOCUS ERR 00
- 5 FOCUS ERR 01
- 6 FOCUS ERR 02
- 7 TRK ERR 01
- 8 NC
- 9 -
- 10 E
- 11 4F
- 12 SLED OUT
- 13 SLED -
- 14 EPM

TO G/4 (See Page 4-21)

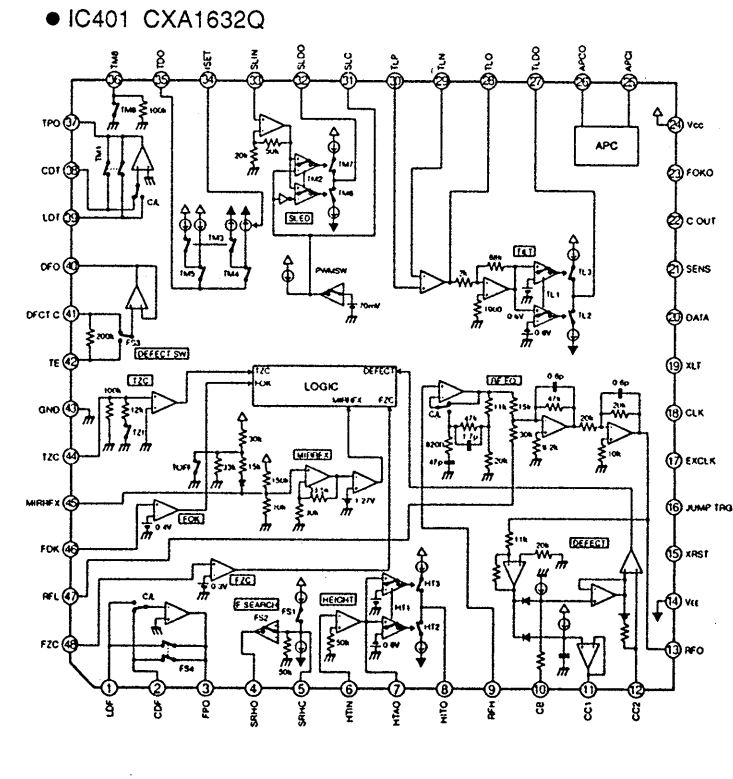
TO G/4 (See Page 4-23)

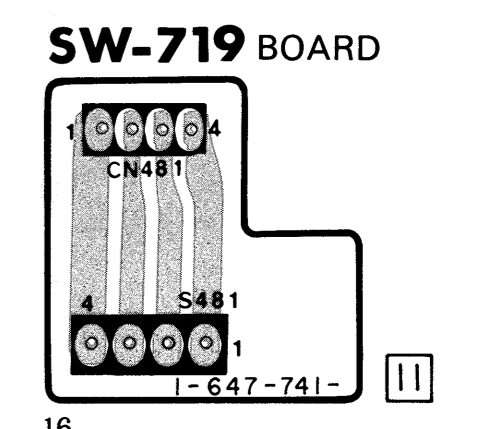
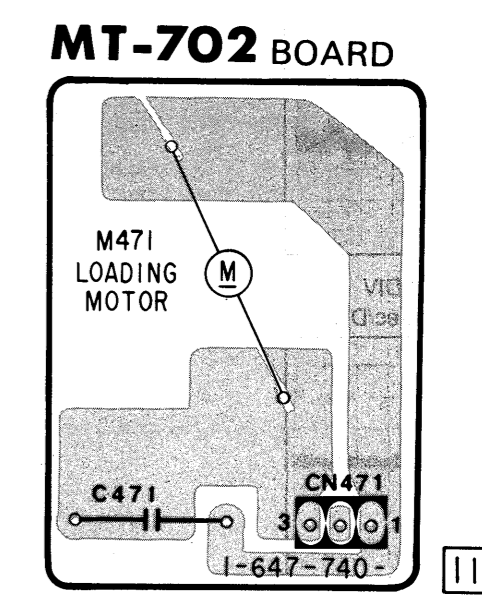
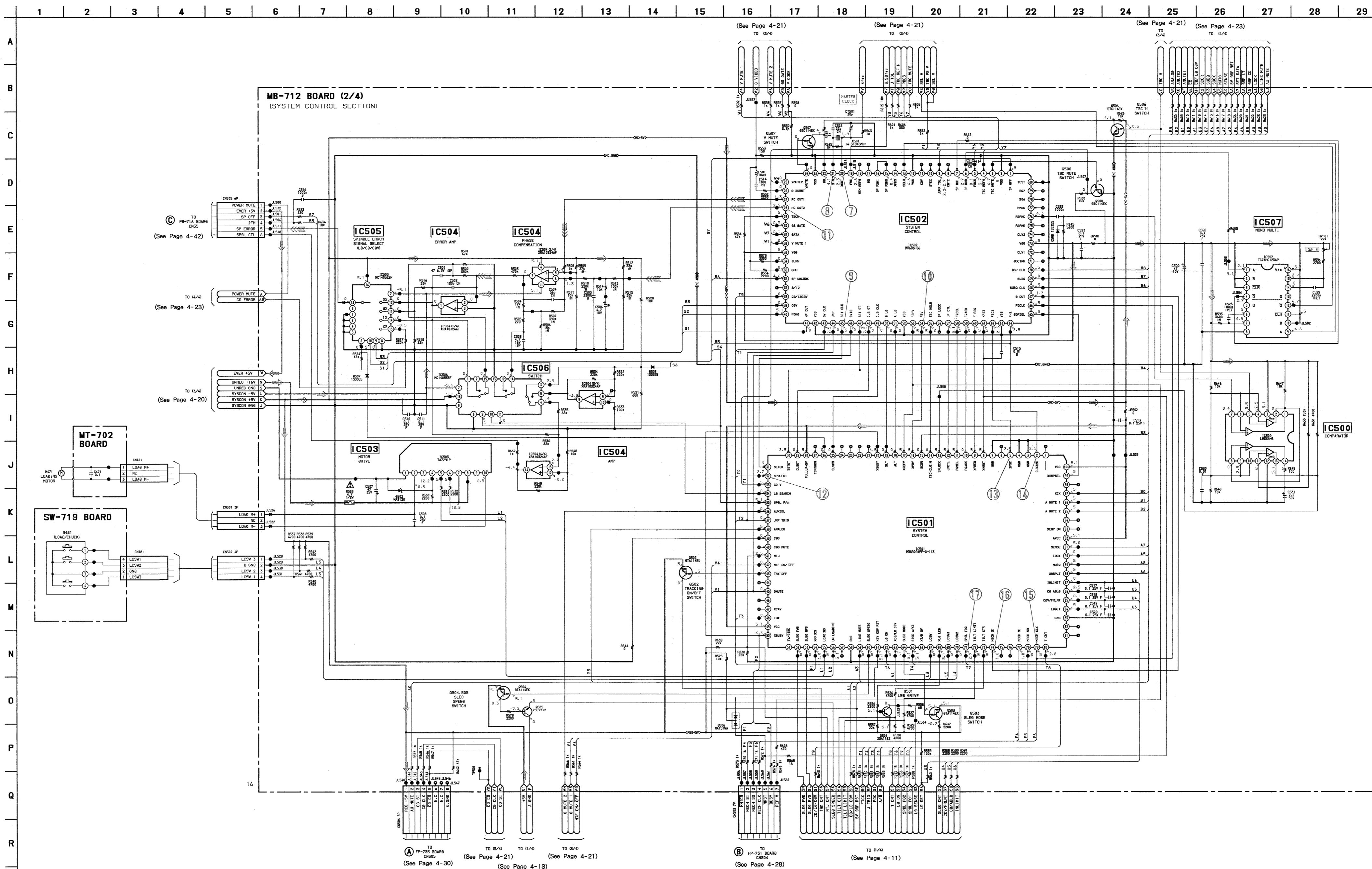
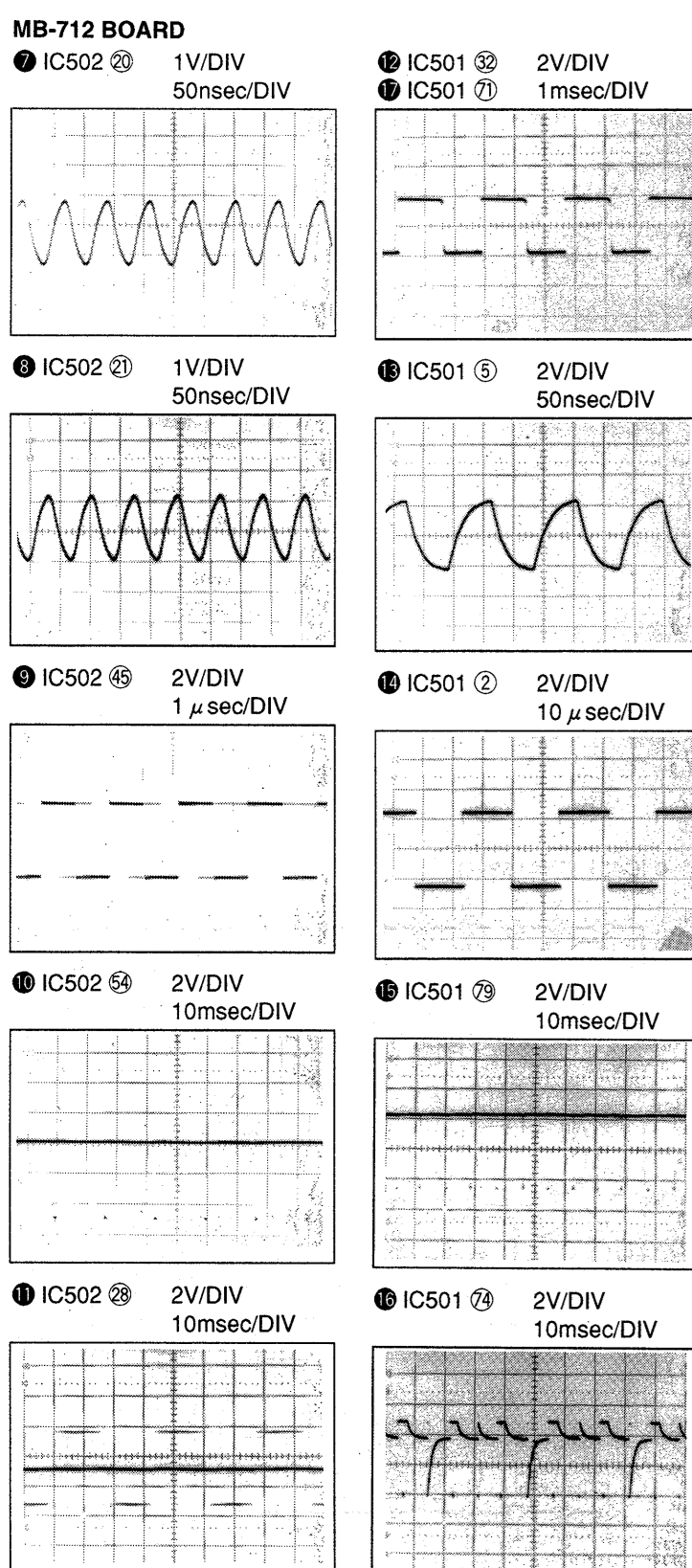
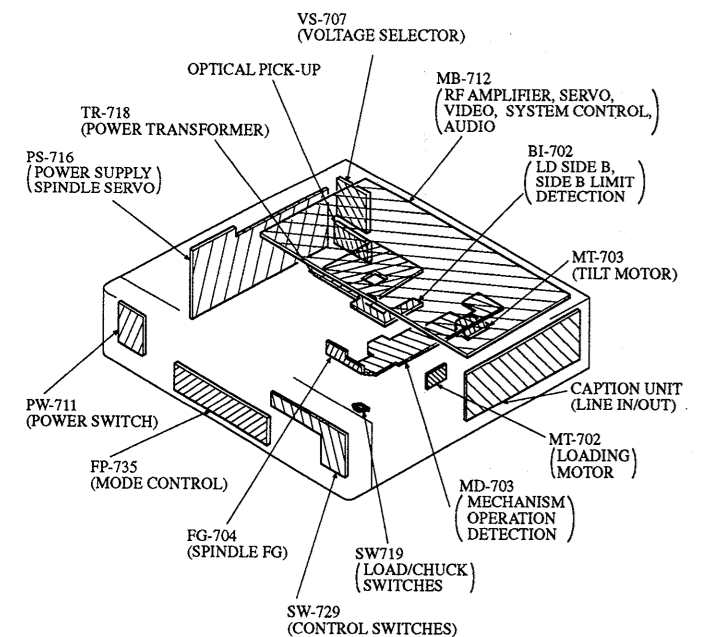
TO G/4 (See Page 4-20)

● SIGNAL PATH

| PB | VIDEO SIGNAL | | AUDIO SIGNAL |
|----|--------------|---|--------------|
| | CHROMA | Y | |
| | → | → | → |

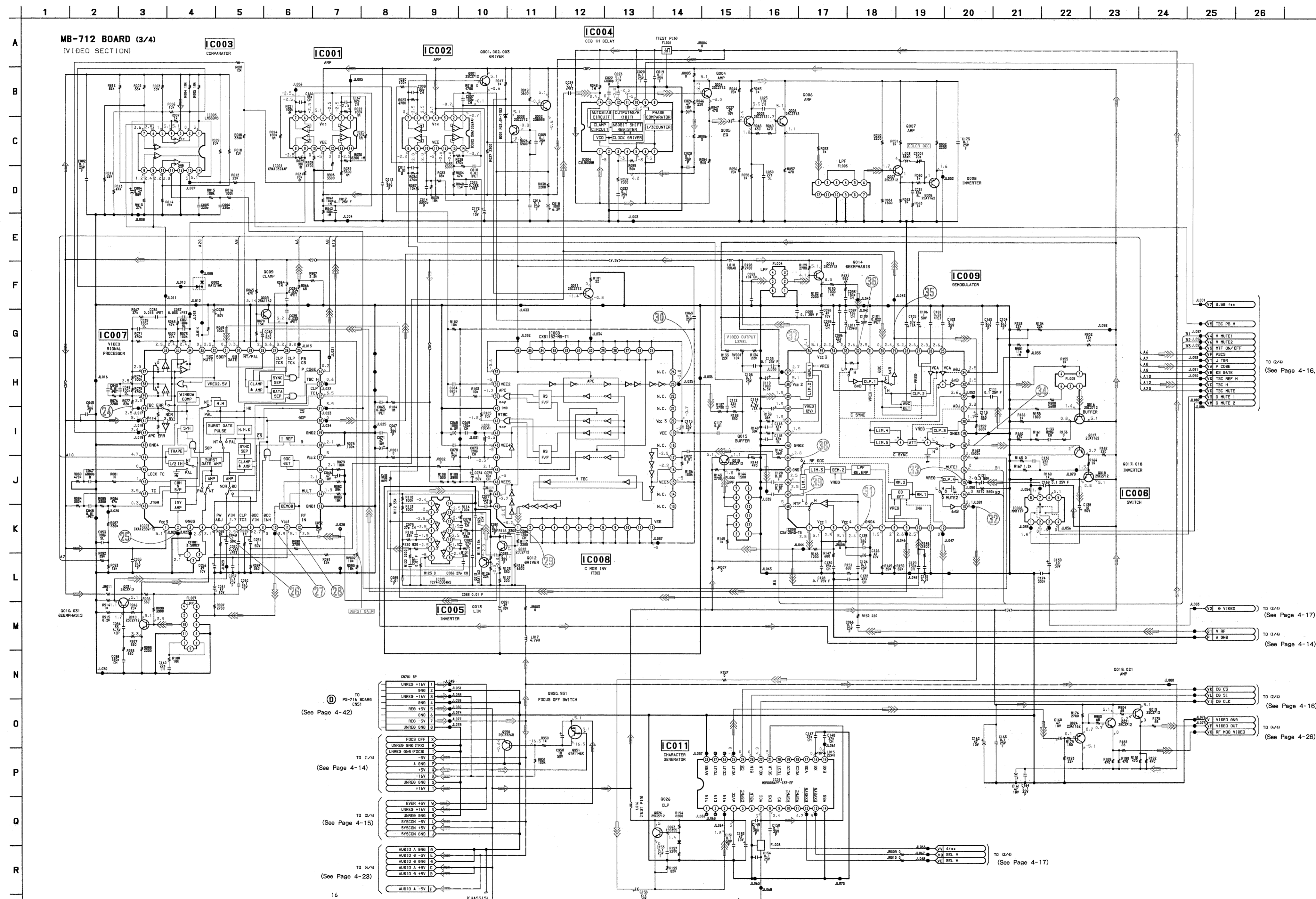
- Spindle phase servo
- Spindle servo (Speed and phase)
- Tracking servo
- Sled servo
- Focus servo
- Skew servo



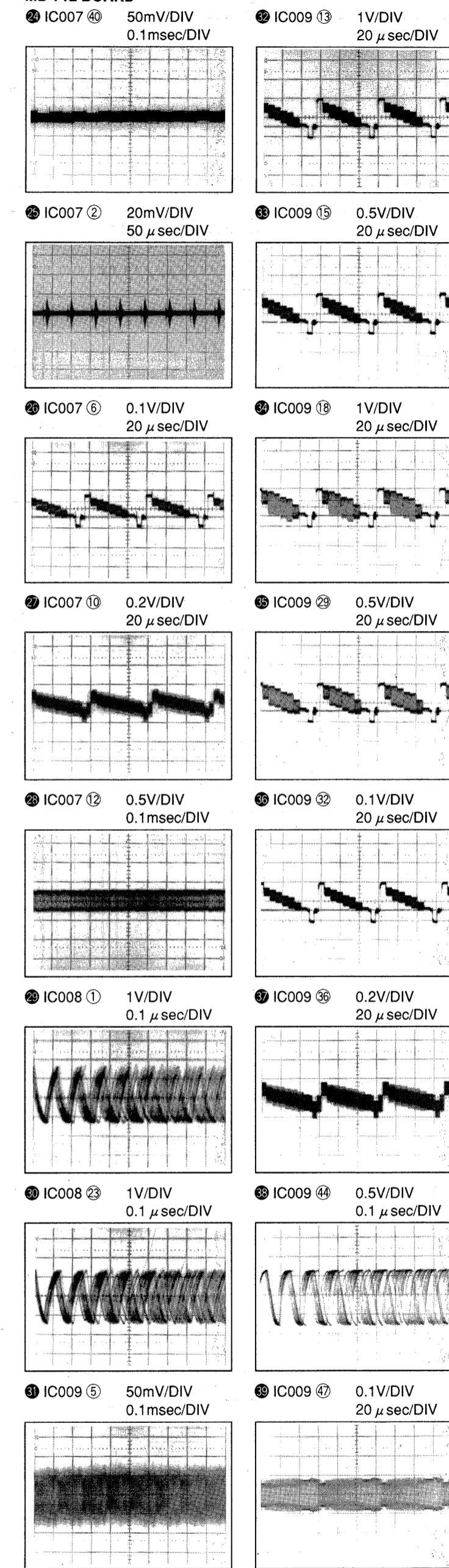


• SIGNAL PATH

| | |
|---------------------------------|---|
| Spindle phase servo | |
| Spindle servo (Speed and phase) | → |
| Tracking servo | |
| Sled servo | |



MB-712 BOARD

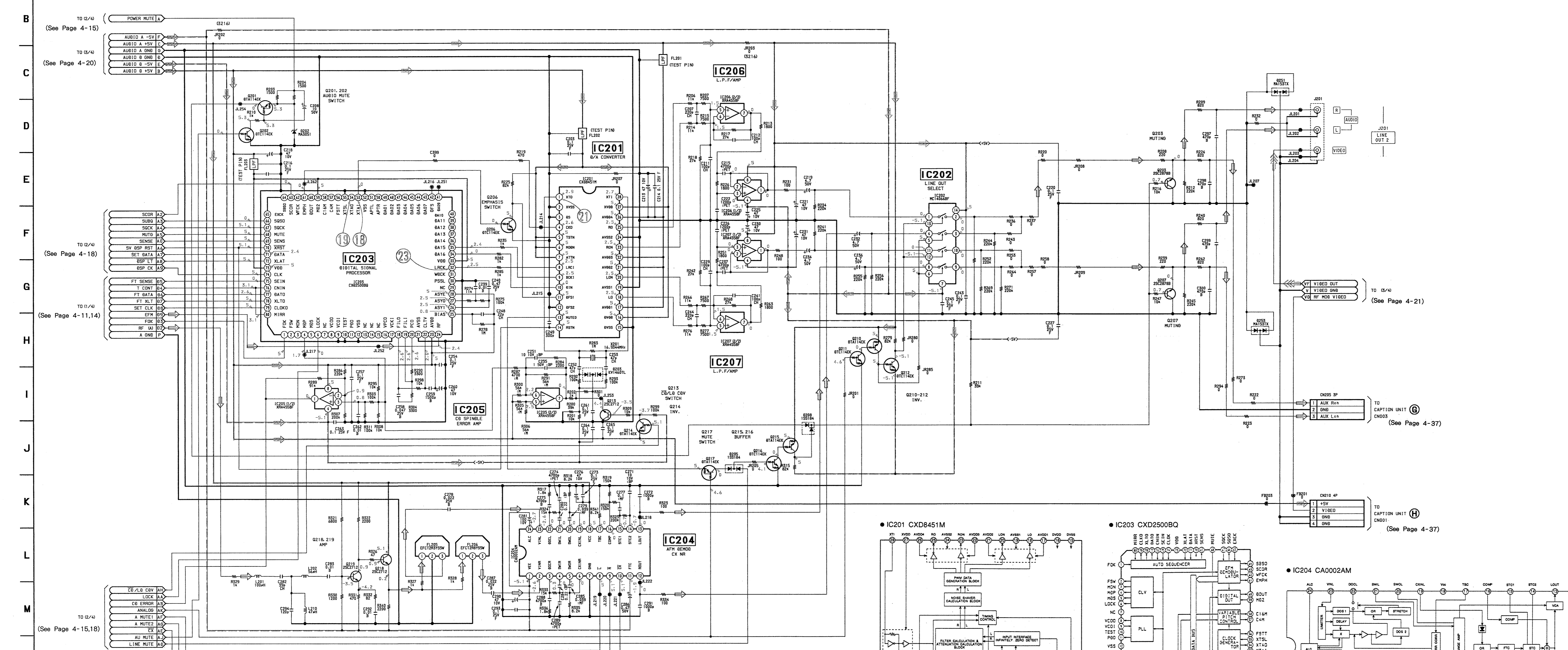


• SIGNAL PATH

| PB | VIDEO SIGNAL | | |
|----|--------------|---|----------|
| | CHROMA | Y | Y/CHROMA |
| | | | |

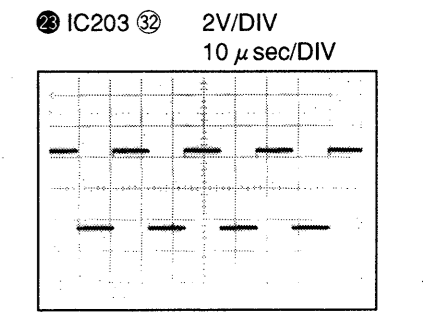
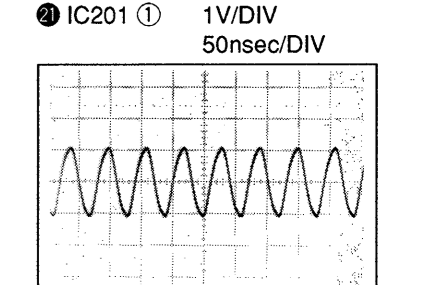
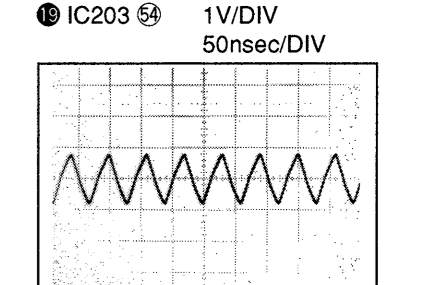
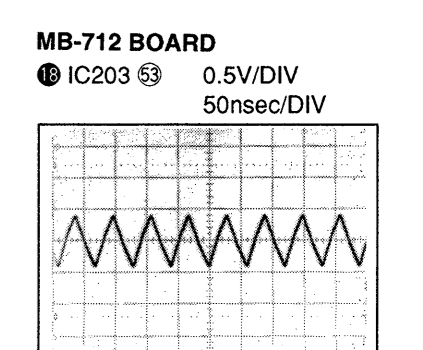
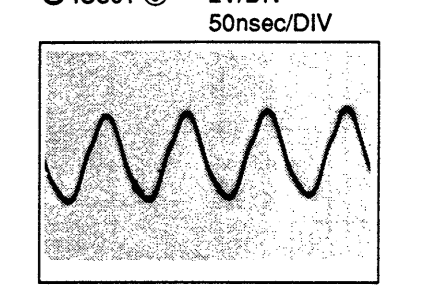
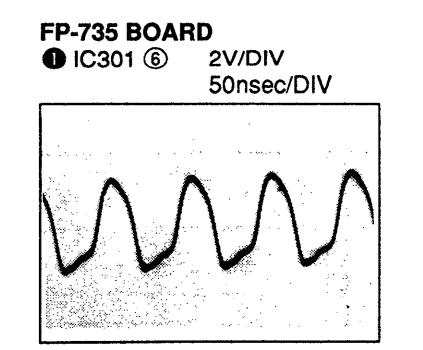
MB-712 (AUDIO) SCHEMATIC DIAGRAM • For the printed wiring diagram of the MB-712 board, refer to page 4-6.
 —Ref. No. MB-712 Board; 1,000 Series—

MB-712 BOARD (4/4)
 (AUDIO SECTION)



• SIGNAL PATH

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



FP-735 (MODE CONTROL), PW-711 (POWER SWITCH), SW-729 (CONTROL SWITCHES) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
 —Ref. No. FP-735 Board; 3,000 Series, PW-711 and SW-729 Boards; 7,000 Series—

FP-735 BOARD

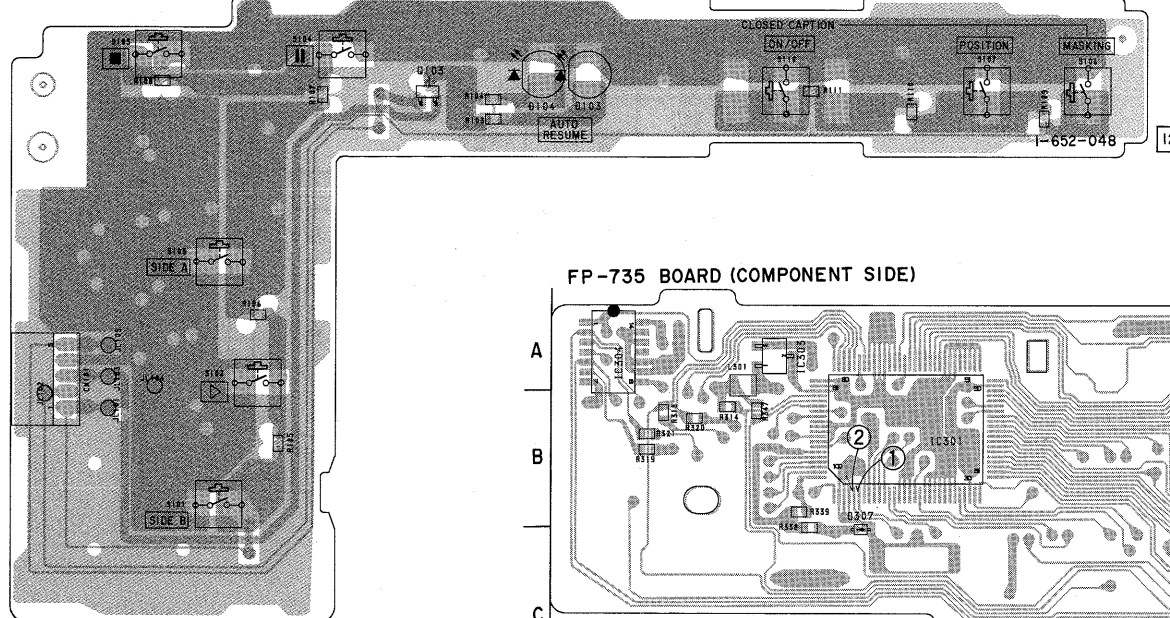
- CN301 E-9
- CN303 F-8
- CN304 F-9
- CN305 F-1
- CN306 E-1
- CN307 F-3

- D300 E-4
- D301 E-5
- D302 E-5
- D303 E-5
- D304 E-6
- D305 E-4
- D306 E-6
- D307 B-2
- D308 E-6
- D309 E-4
- D311 E-2

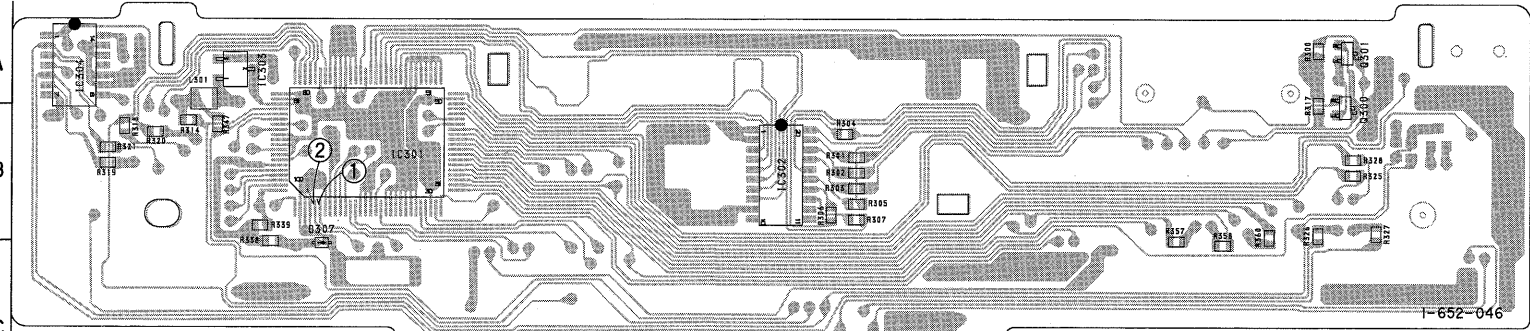
- IC301 B-3
- IC302 B-5
- IC303 A-2
- IC304 A-1

- Q300 B-9
- Q301 A-9
- Q303 F-4
- Q304 E-5
- Q307 E-5
- Q309 E-6

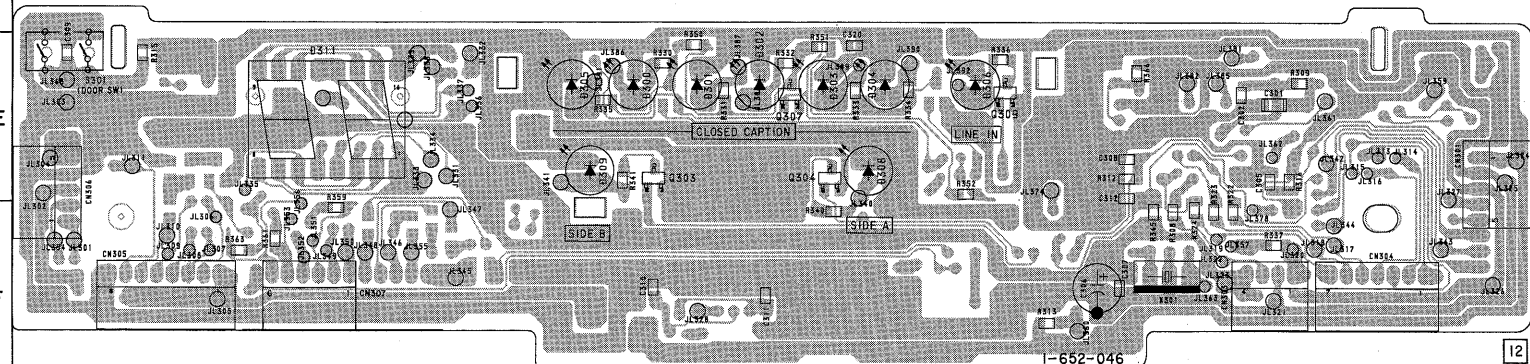
SW-729 BOARD



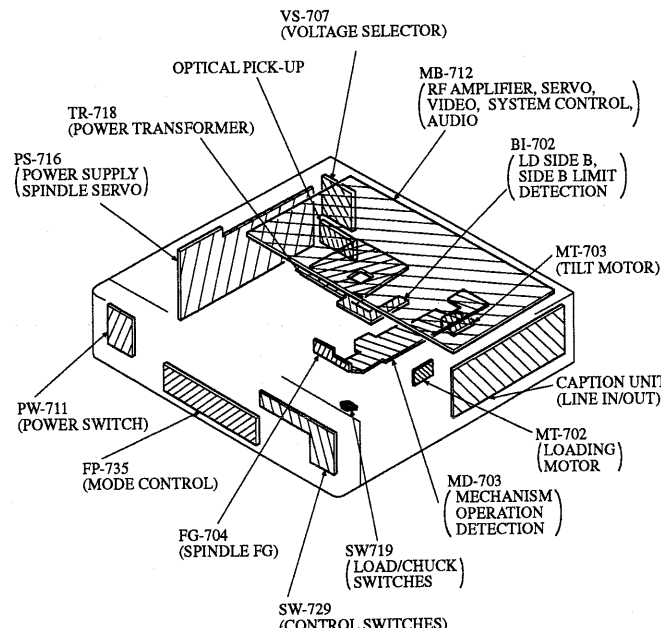
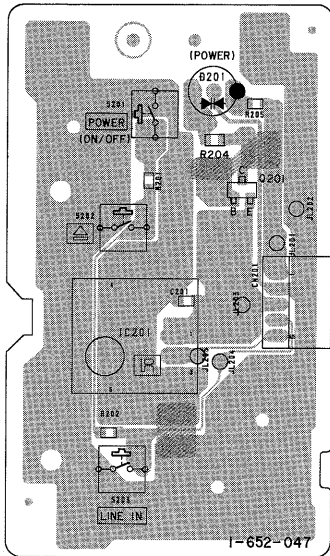
FP-735 BOARD (COMPONENT SIDE)



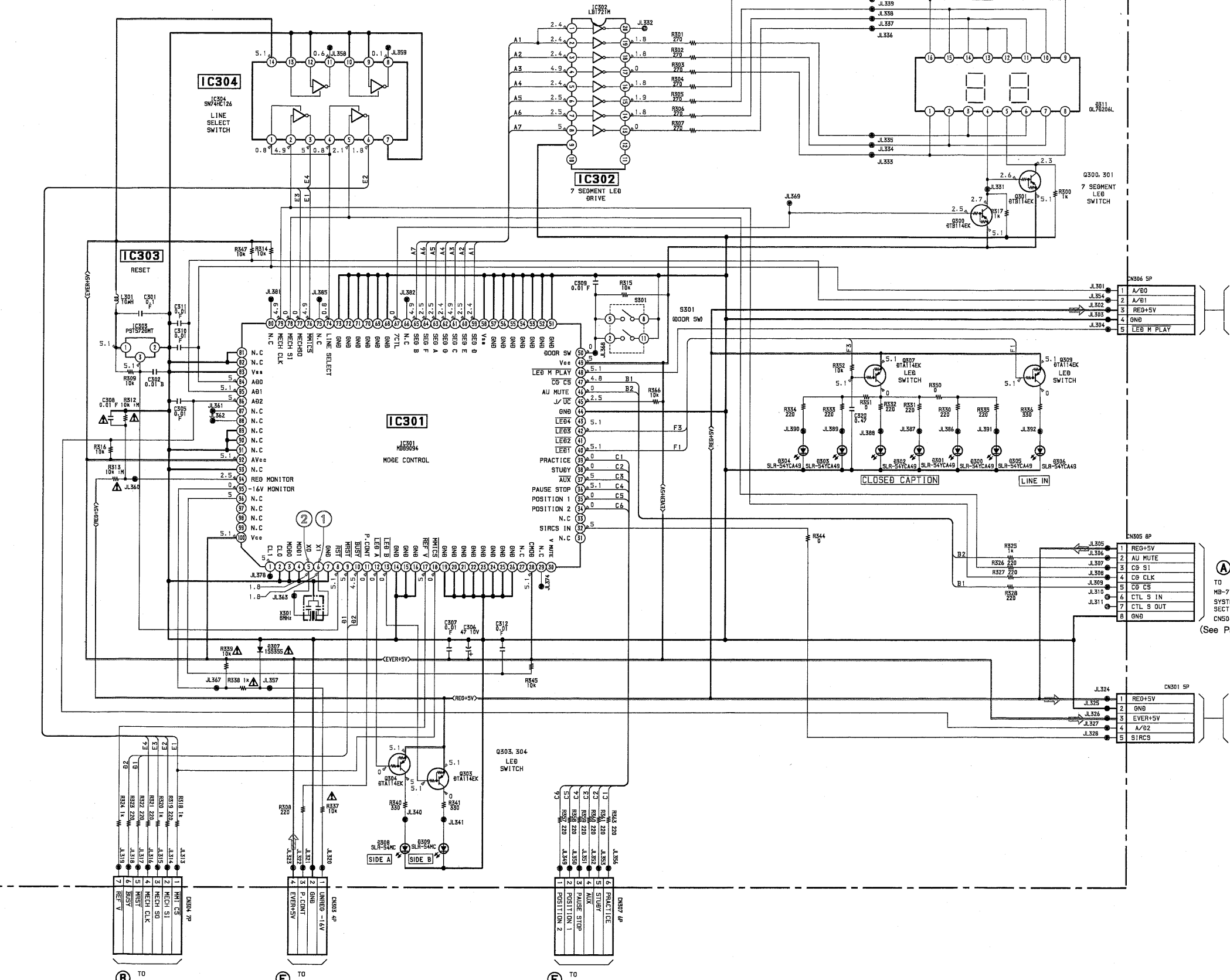
FP-735 BOARD (CONDUCTOR SIDE)



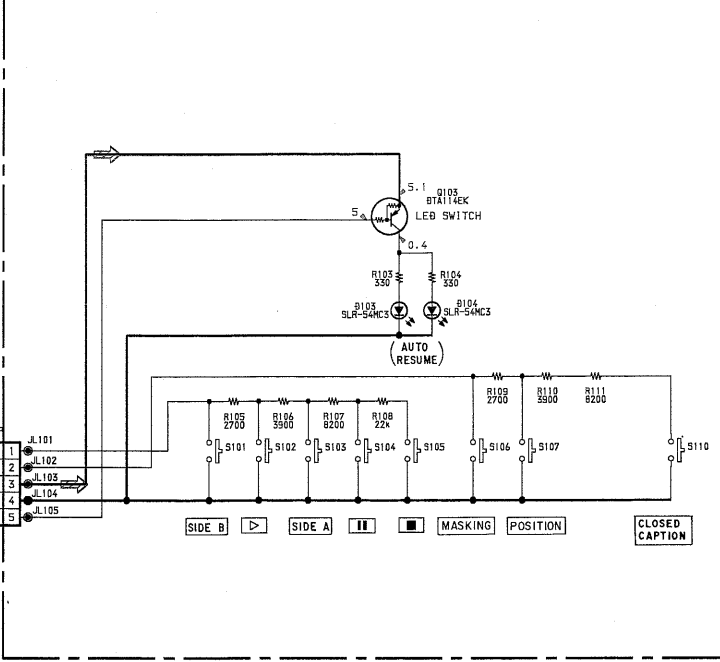
PW-711 BOARD



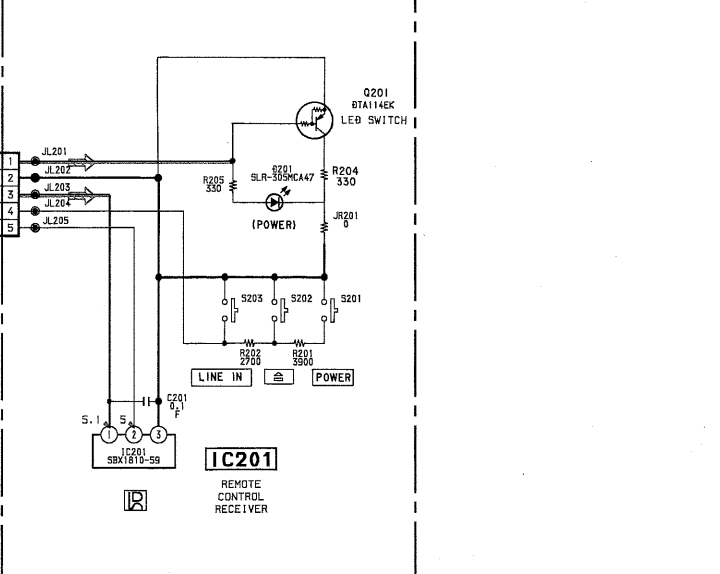
FP-735 BOARD



SW-729 BOARD



PW-711 BOARD



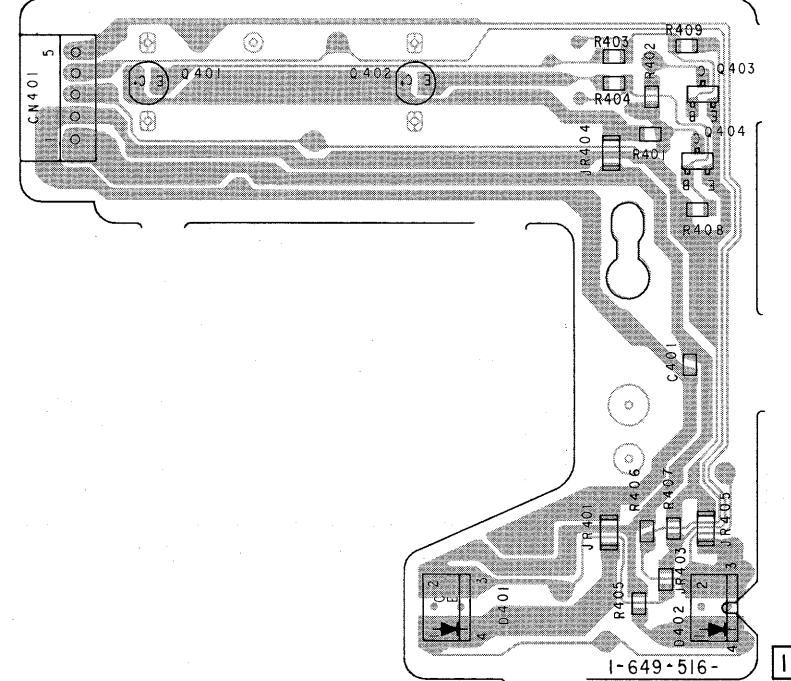
• ○ : Through hole is omitted.

MDP-RC20

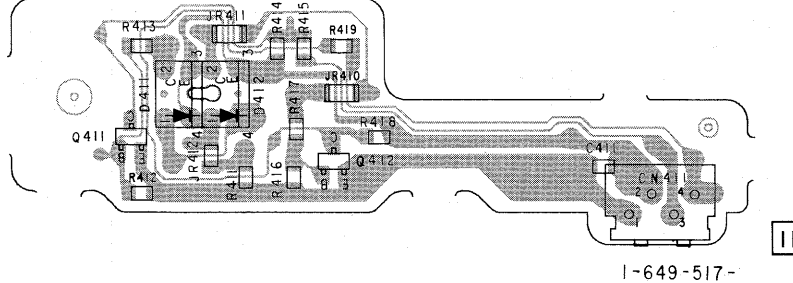
BI-702 (LD SIDE B, LIMIT DETECTION), FG-704 (SPINDLE FG), MD-703 (MECHANISM OPERATION DETECTION), MT-703 (TILT MOTOR) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

—Ref. No. BI-702, FG-704, MD-703 and MT-703 Boards; 2,000 Series—

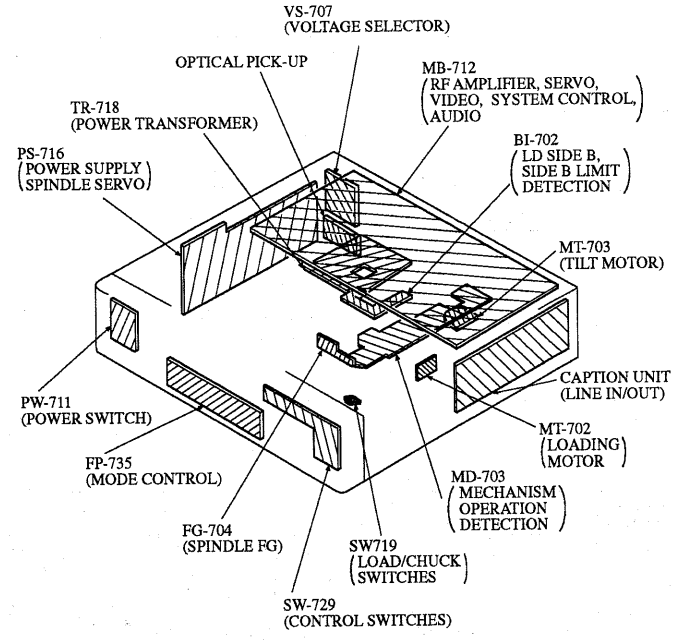
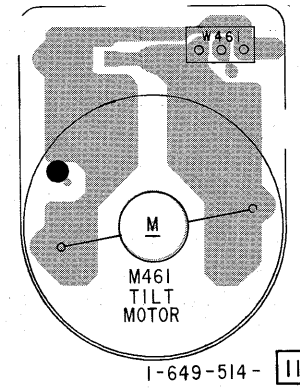
BI-702 BOARD



FG-704 BOARD

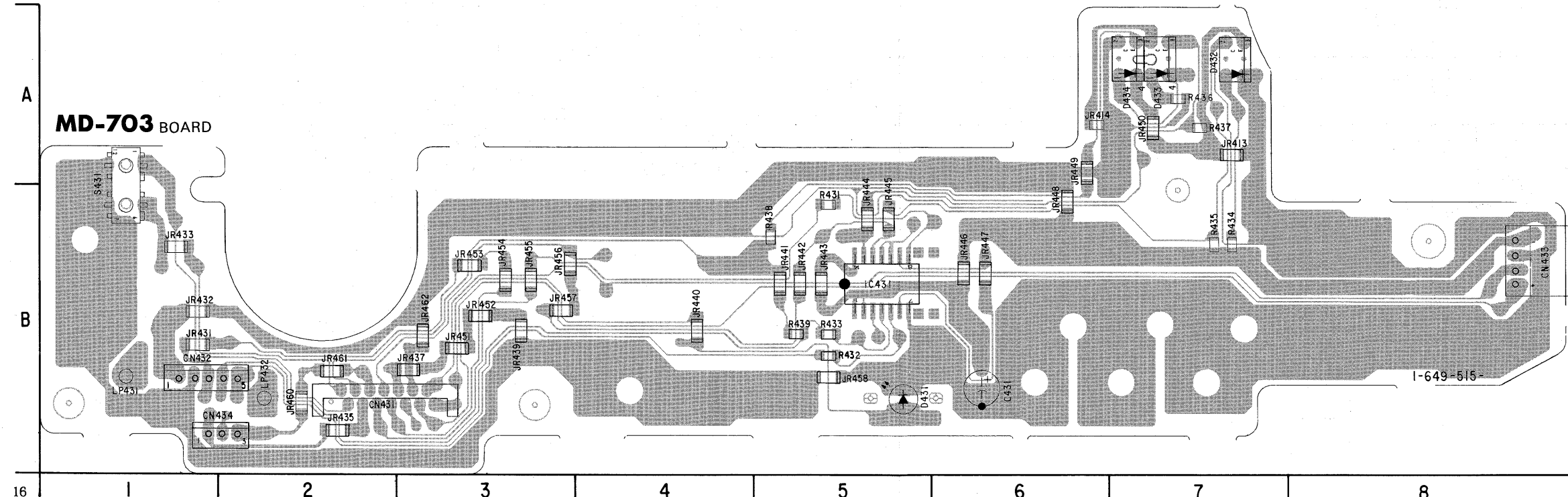


MT-703 BOARD



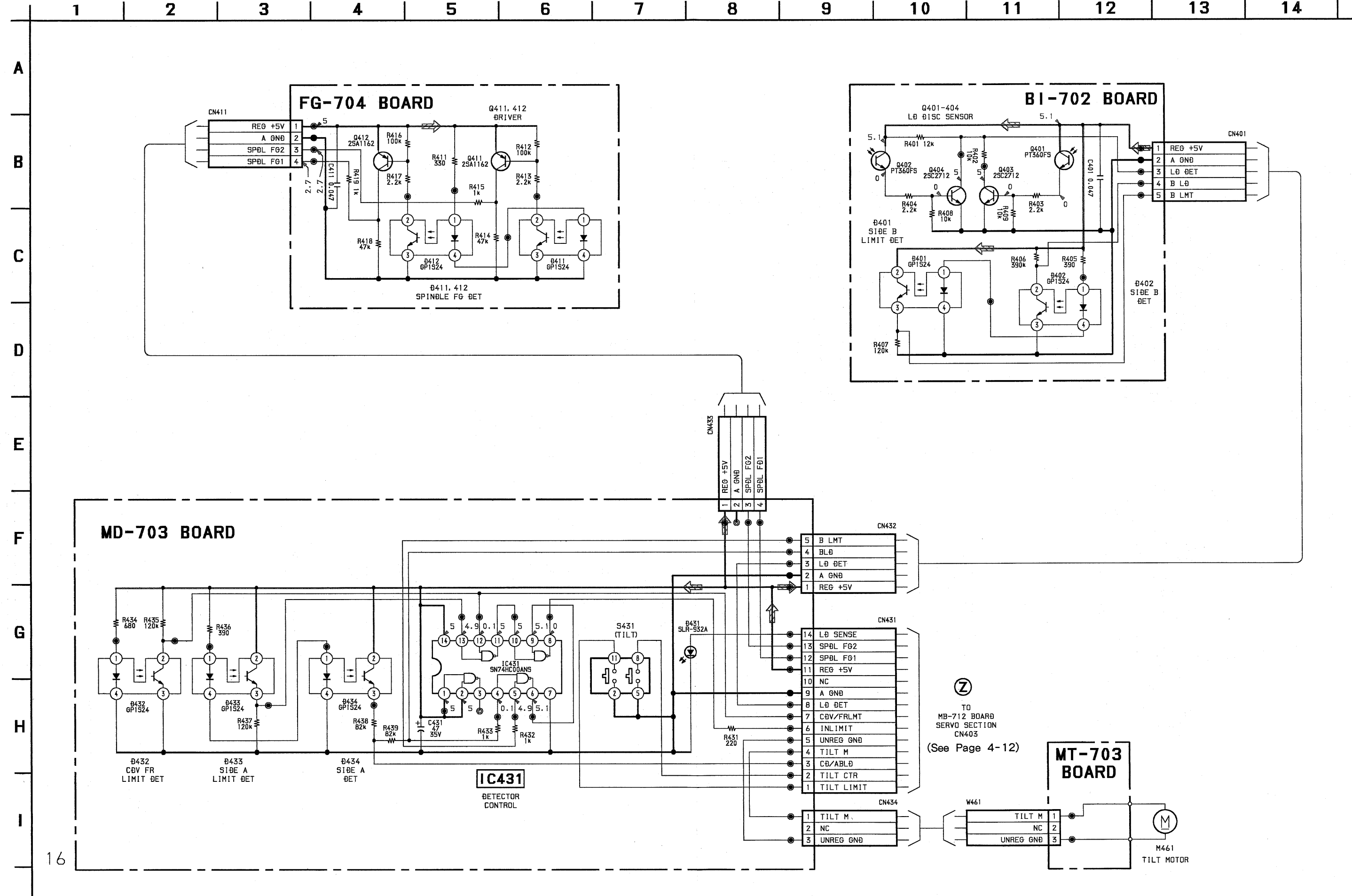
MD-703 BOARD

- CN431 B-2
- CN432 B-1
- CN433 B-8
- CN434 B-1
- D431 B-5
- D432 A-7
- D433 A-7
- D434 A-7
- IC431 B-5



4-31

4-32

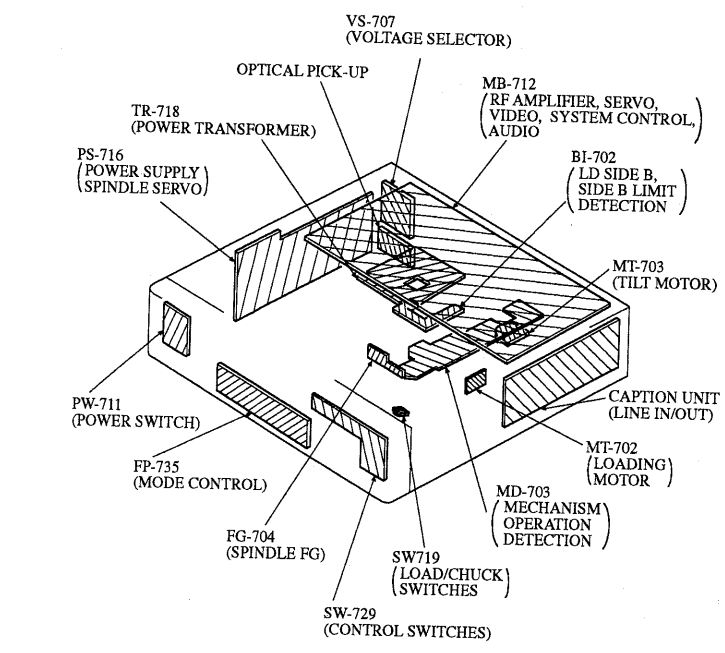
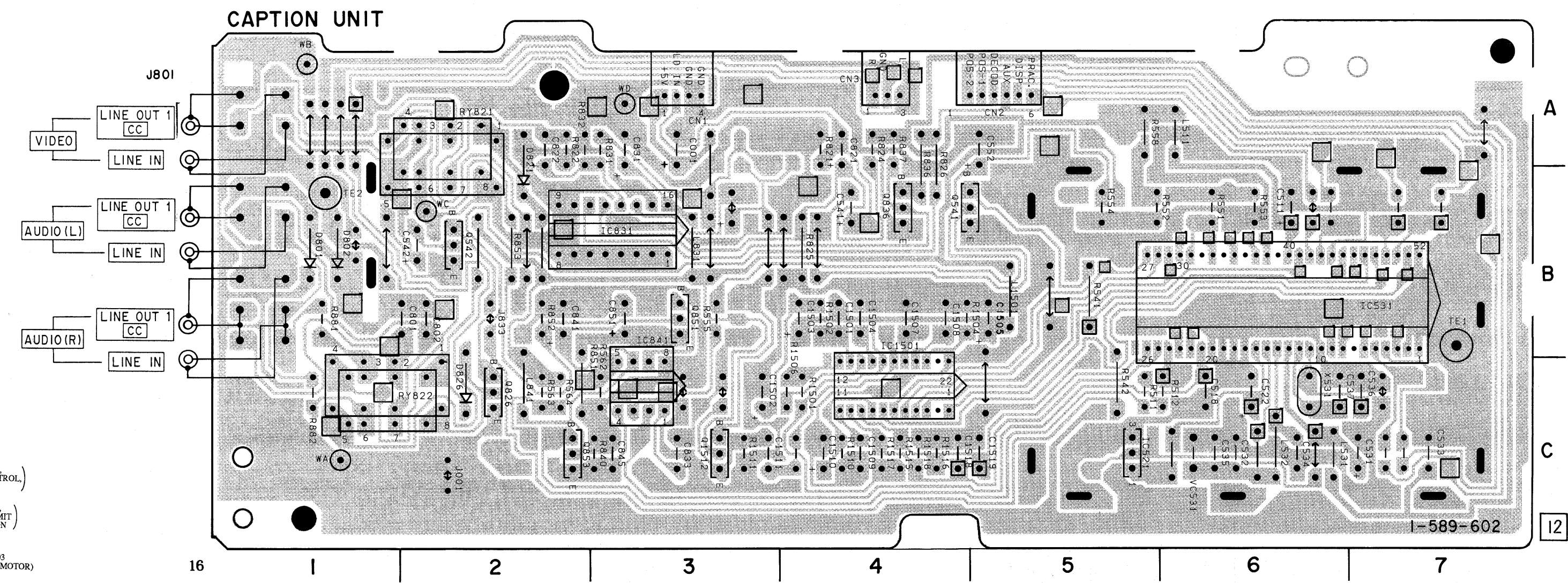


4-33

4-34

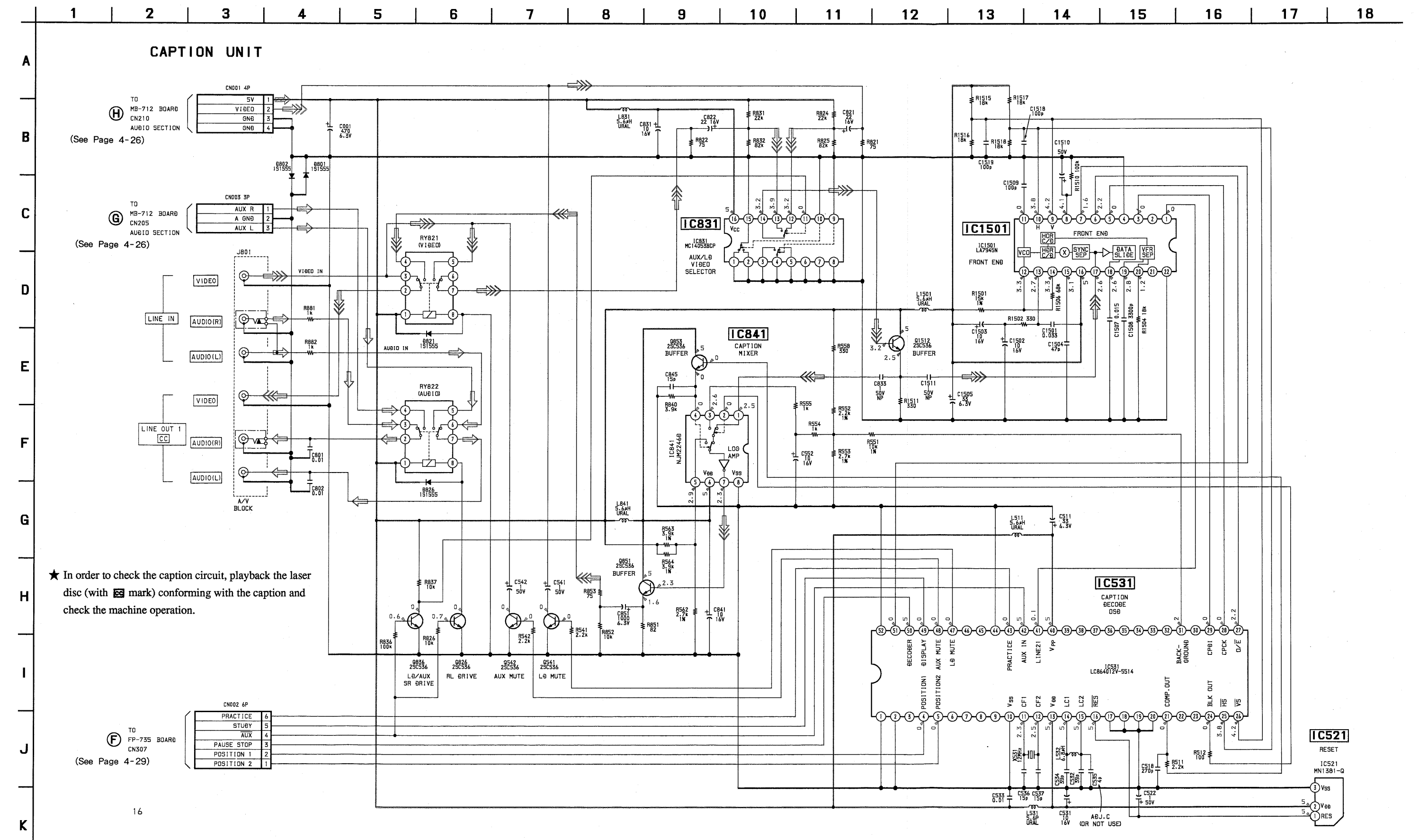
CAPTION UNIT (LINE IN/OUT) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
 —Ref. No. CAPTION UNIT; 8,000 Series—

- CAPTION UNIT
- CK001 A-3
 - CK002 A-5
 - CK003 A-4
 - D801 B-1
 - D802 B-1
 - D821 A-2
 - D826 C-2
 - IC521 C-5
 - IC531 B-7
 - IC831 B-3
 - IC841 B-3
 - IC1501 B-4
 - 0541 B-4
 - 0542 B-2
 - 0826 C-2
 - 0836 B-4
 - 0851 B-3
 - 0853 C-2
 - 01512 C-3



• SIGNAL PATH

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



★ In order to check the caption circuit, playback the laser disc (with mark) conforming with the caption and check the machine operation.

TO FP-735 BOARD CN307 (See Page 4-29)

| CN307 4P | 1 | 2 | 3 | 4 |
|------------|----|----|----|----|
| PRACTICE | 0 | 1 | 2 | 3 |
| STORY | 4 | 5 | 6 | 7 |
| AUX | 8 | 9 | 10 | 11 |
| PAUSE STOP | 12 | 13 | 14 | 15 |
| POSITION 1 | 16 | 17 | 18 | 19 |
| POSITION 2 | 20 | 21 | 22 | 23 |

MDP-RC20

PS-716 (POWER SUPPLY, SPINDLE SERVO), TR-718 (POWER TRANSFORMER), VS-707 (VOLTAGE SELECTOR) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

—Ref. No. PS-716 Board; 6,000 Series, TR-718 Board; 5,000 Series, VS-707 Board; 9,000 Series —

PS-716 BOARD

- CN030 A-1
- CN031 A-2
- CN051 A-3
- CN052 D-7
- CN055 A-5

- D031 C-2
- D032 C-2
- D033 B-2
- D034 C-3
- D035 B-3
- D051 C-9
- D052 D-9
- D053 C-8
- D054 C-8
- D055 A-8
- D056 A-8
- D057 A-8
- D058 B-9
- D059 A-8
- D060 A-8
- D061 C-7
- D701 A-7
- D702 B-7

- IC031 C-2
- IC051 A-9
- IC052 A-9
- IC701 A-8

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

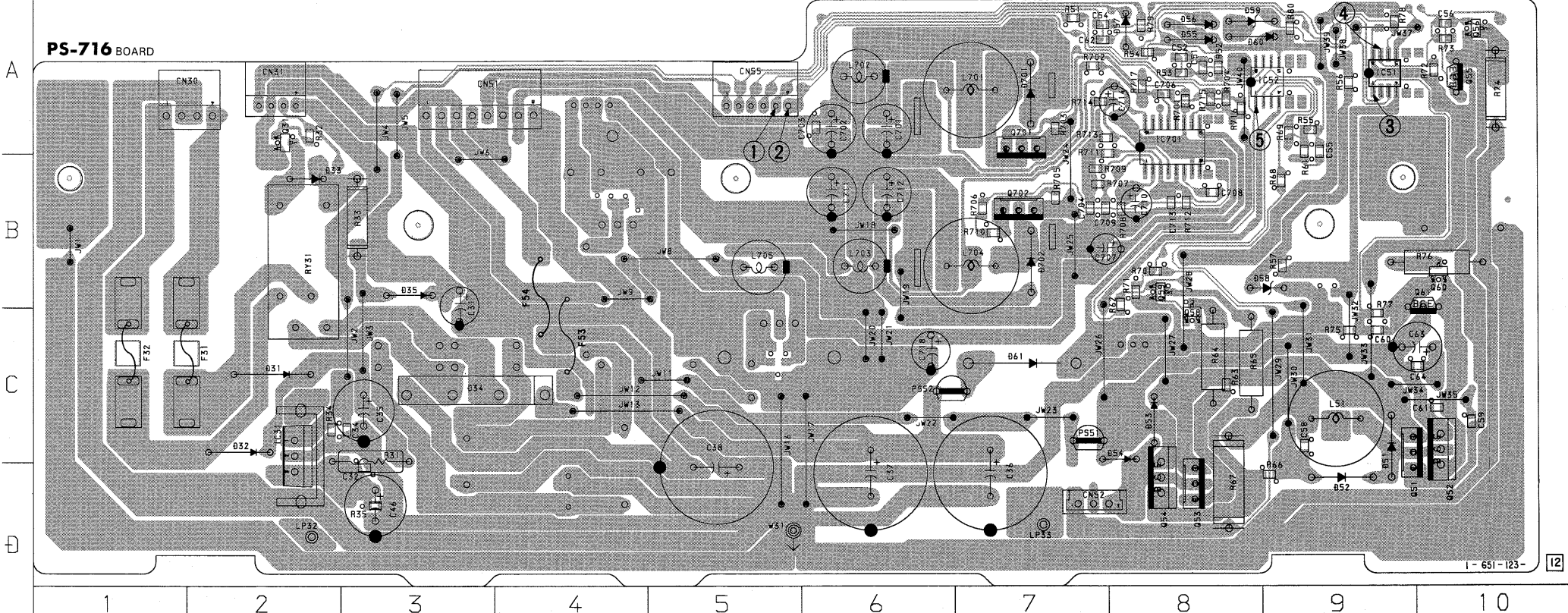
- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

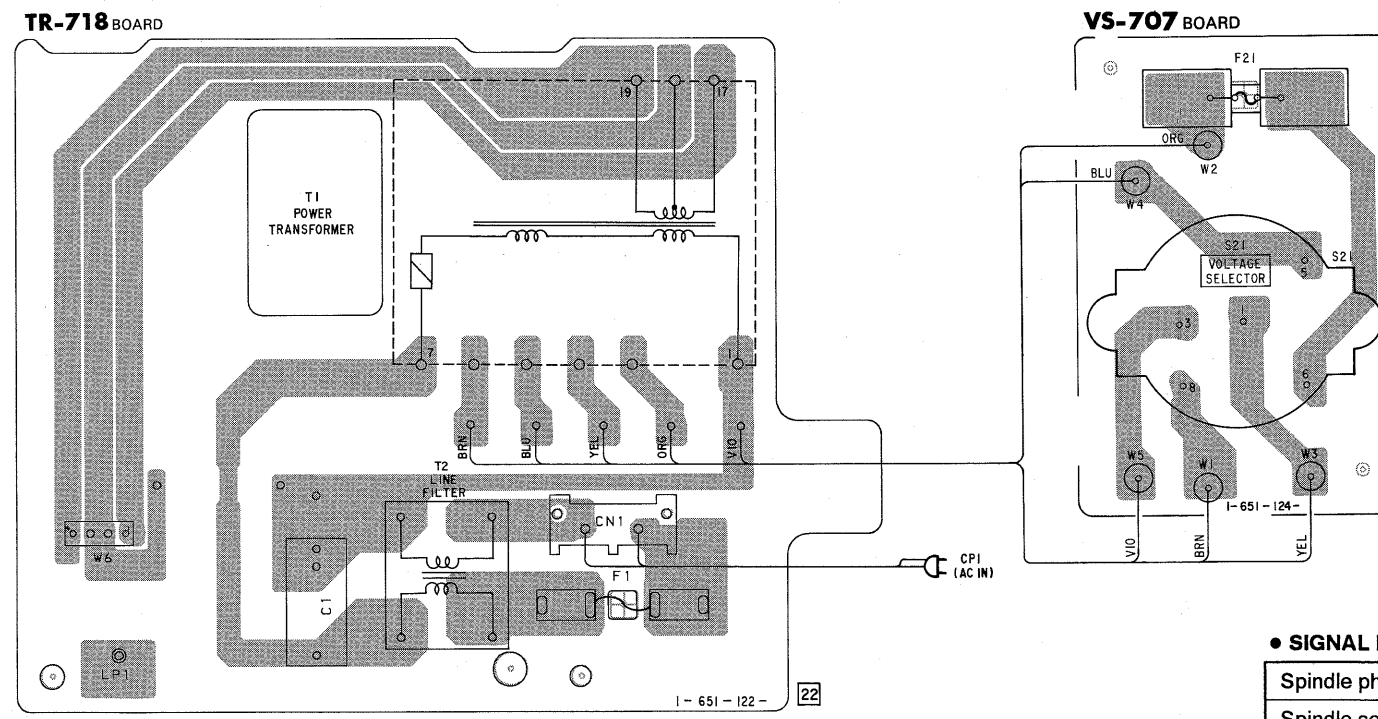
- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

- O031 A-2
- O051 D-9
- O052 D-10
- O053 D-8
- O054 D-8
- O055 A-10
- O056 A-10
- O058 C-8
- O059 B-8
- O060 B-10
- O061 B-10
- O701 A-7
- O702 B-7

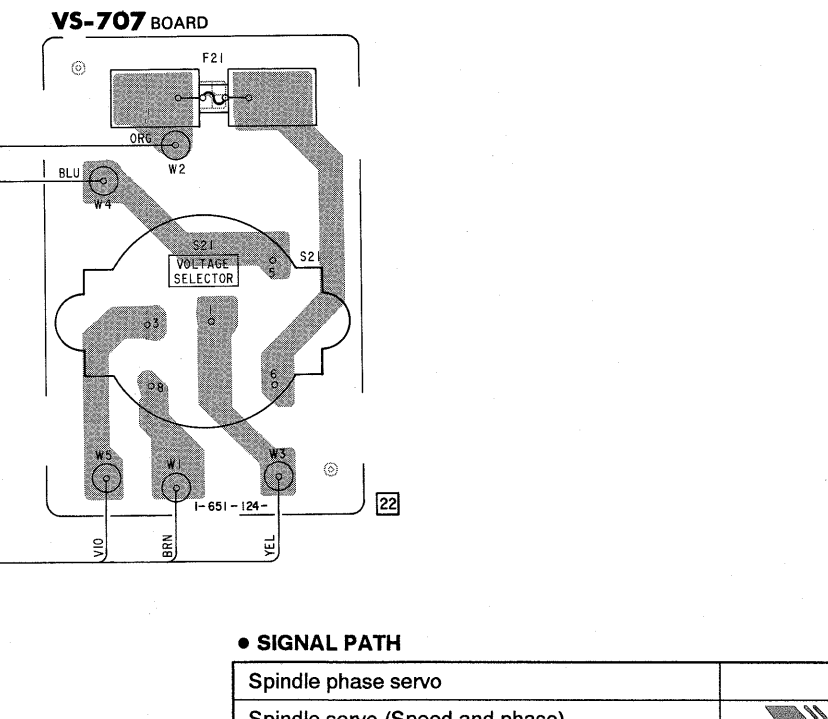


POWER SUPPLY

4-40



4-41

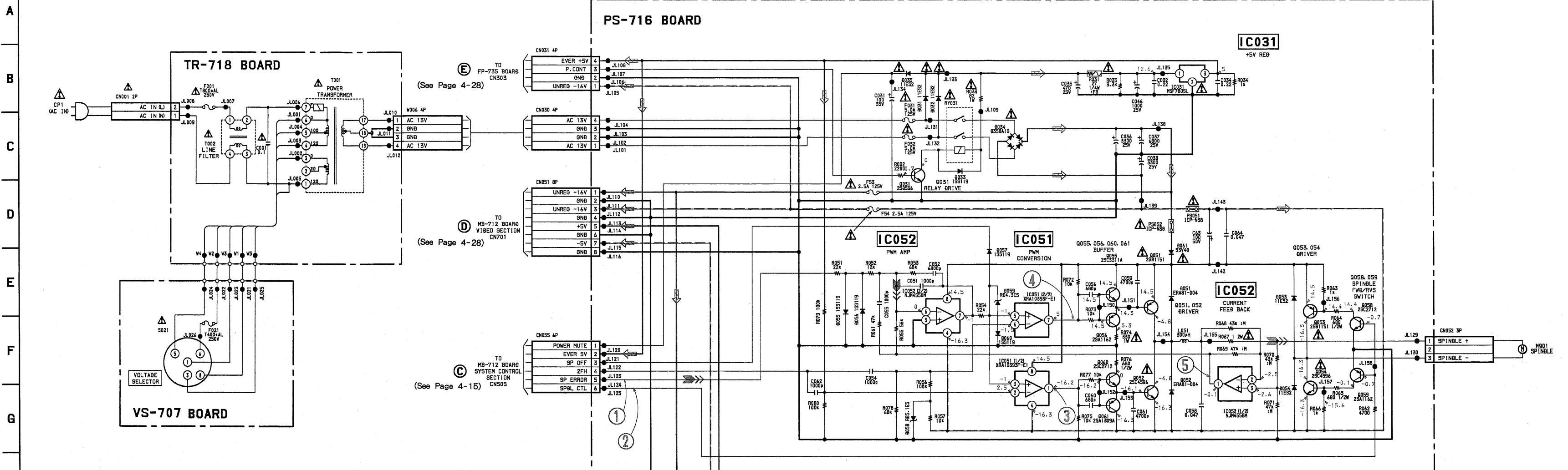


• SIGNAL PATH

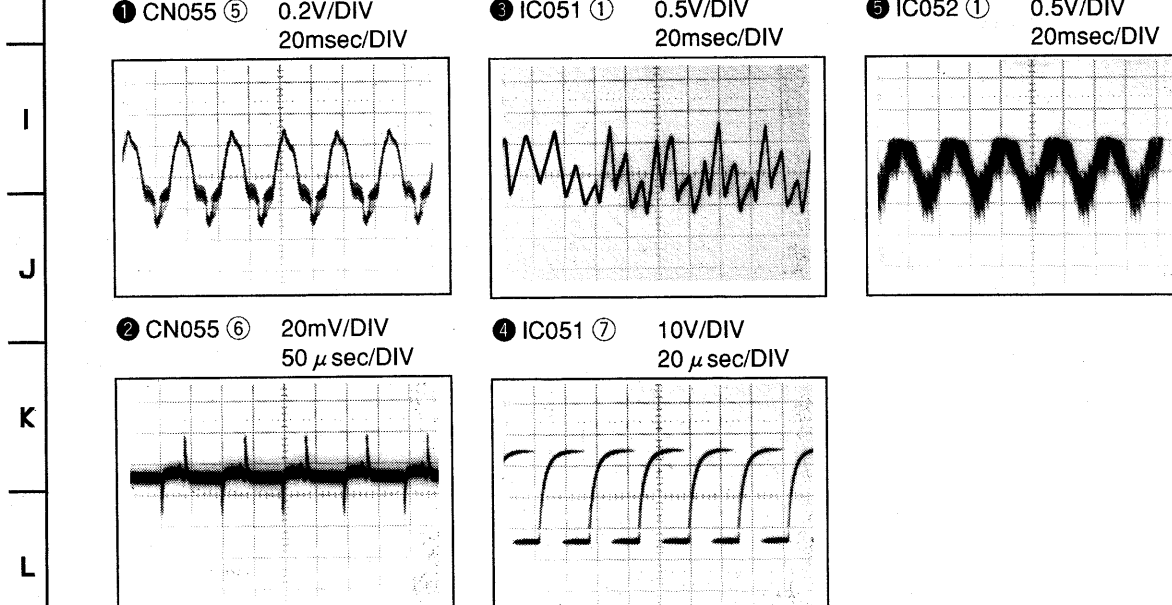
| | |
|---------------------------------|-----|
| Spindle phase servo | |
| Spindle servo (Speed and phase) | ➔➔➔ |
| Tracking servo | |
| Sled servo | |

4-42

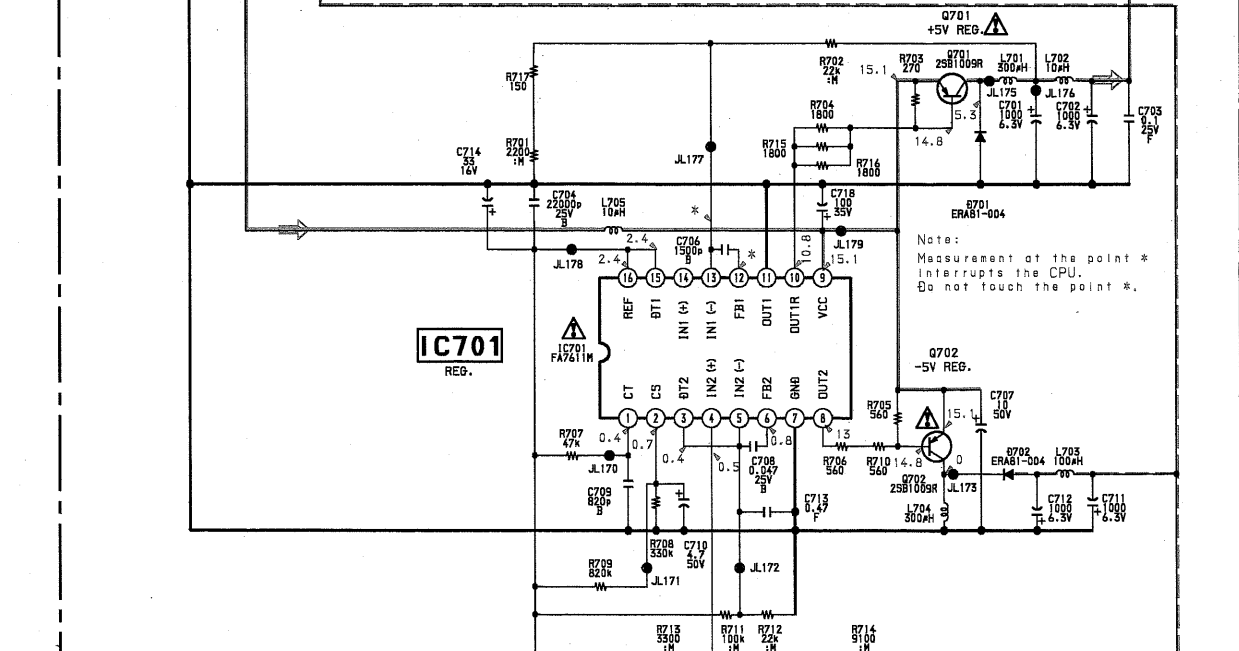
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23



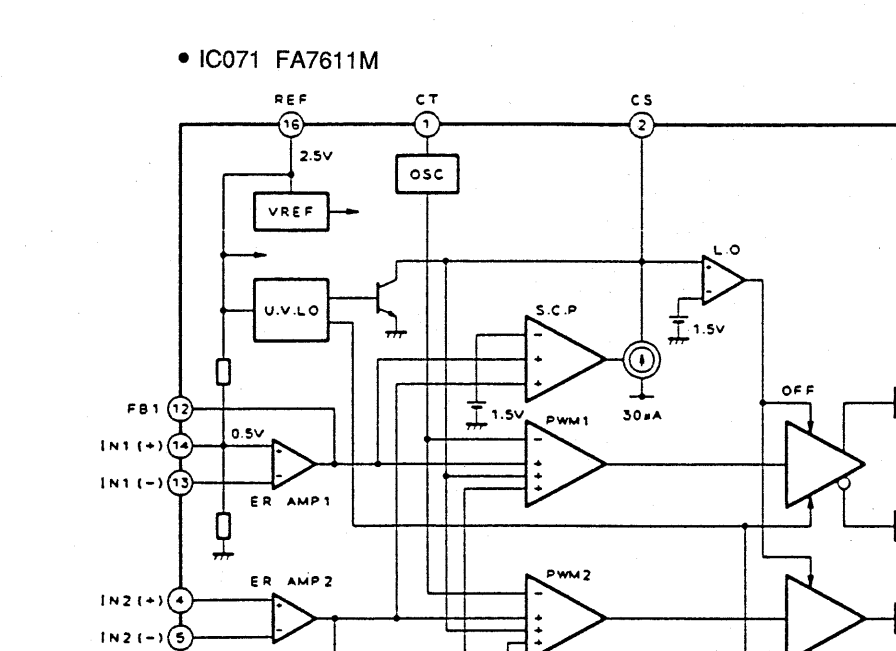
PS-716 BOARD



4-42



4-43



4-44 E

SECTION 5 REPAIRE PARTS LIST

5-1. EXPLODED VIEWS

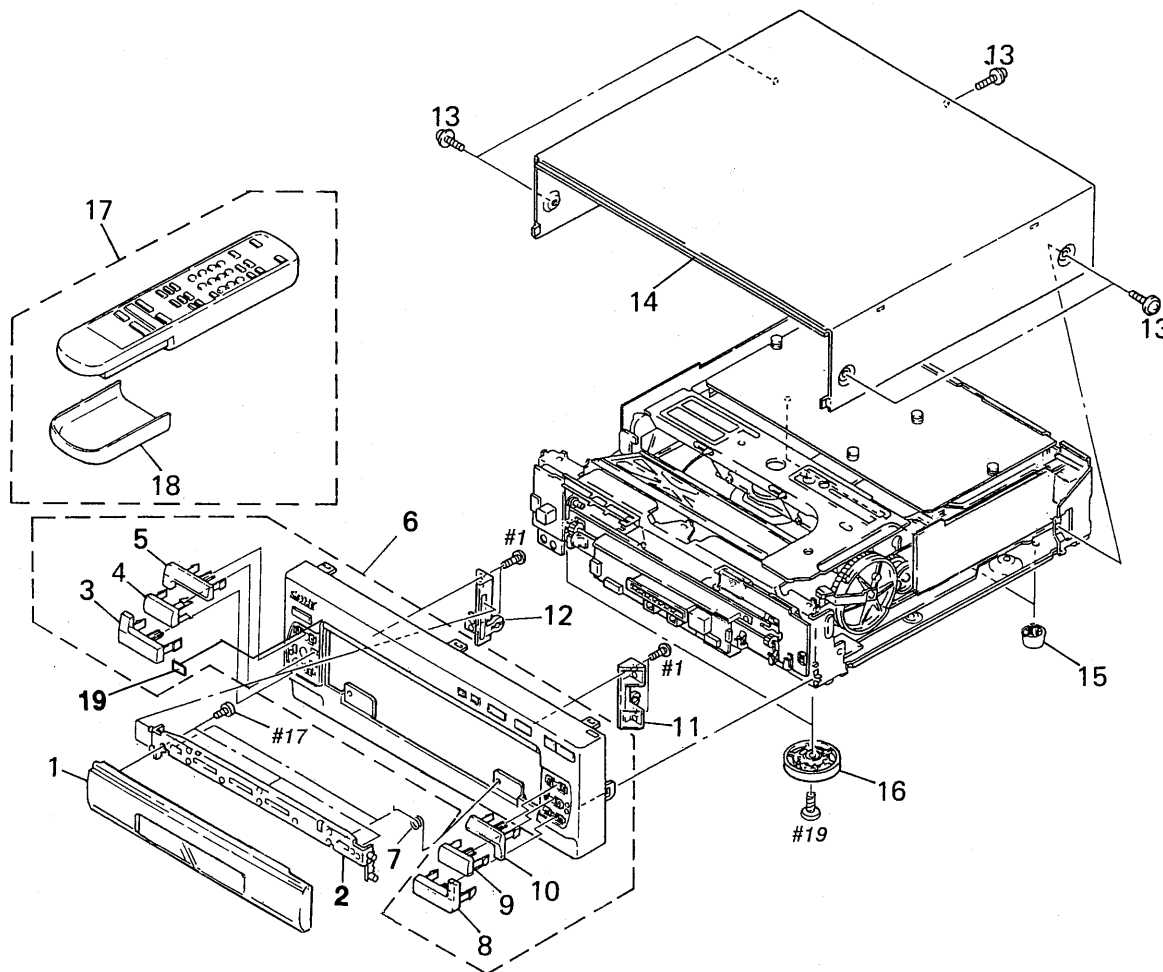
NOTE:

- -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.

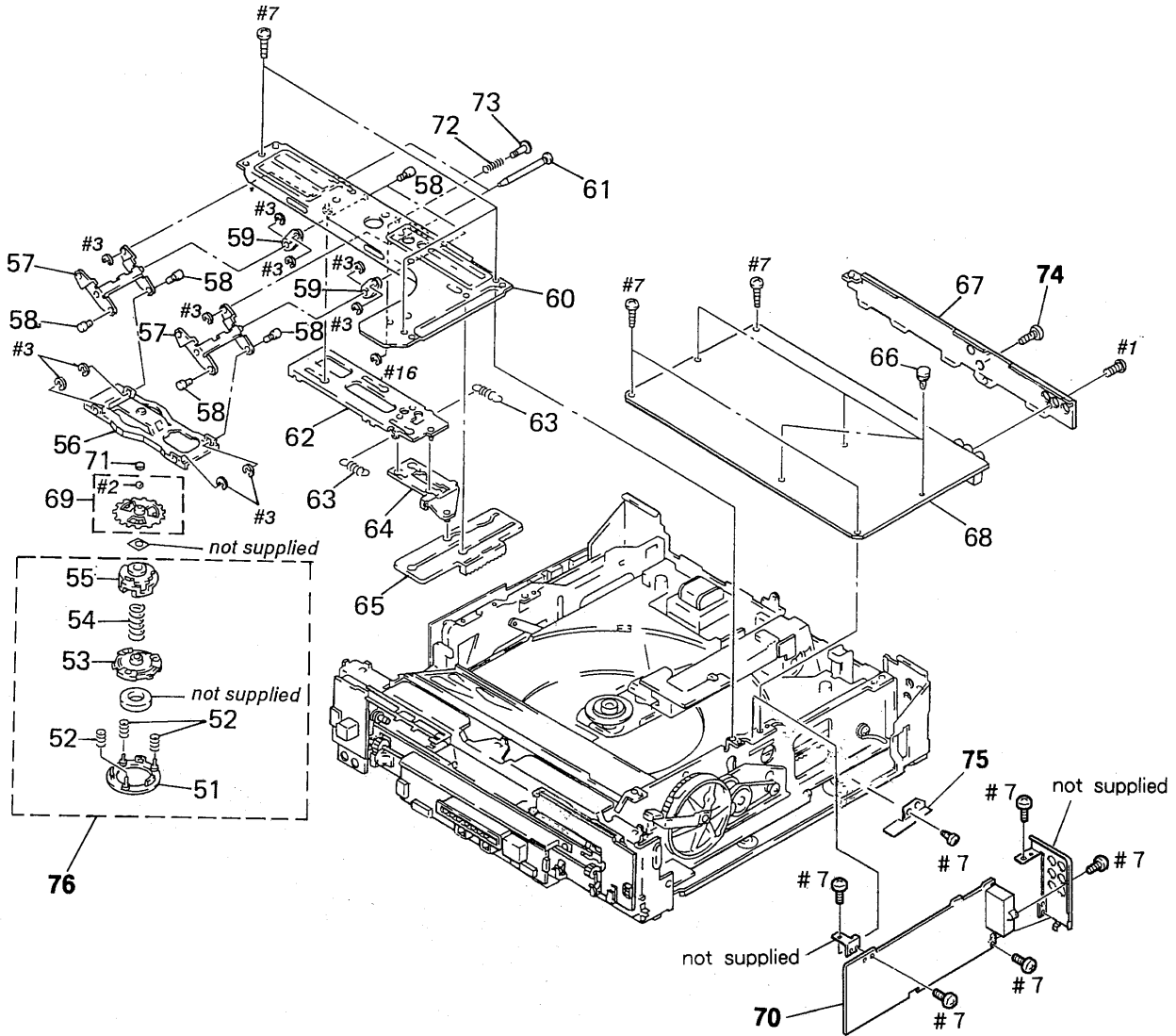
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

5-1-1. UPPER CASE, FRONT PANEL ASSEMBLY



| Ref. No. | Part No. | Description | Remarks | Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---------------------------|---------|----------|--------------|---|---------|
| 1 | X-3944-322-1 | DOOR ASSY | | * 11 | 3-956-073-01 | HOLDER (R), SLIDE | |
| 2 | X-3942-785-1 | DISK ASSY, DOOR | | * 12 | 3-956-074-01 | HOLDER (L), SLIDE | |
| 3 | 3-956-061-61 | BUTTON, DISPLAY (LINE IN) | | 13 | 3-710-901-41 | SCREW, TAPPING | |
| 4 | 3-956-062-01 | WINDOW, REMOTE CONTROL | | * 14 | X-3943-911-1 | CASE ASSY (J81), UPPER | |
| 5 | 3-956-060-01 | BUTTON, OPEN (OPEN/CLOSE) | | * 15 | 3-957-819-01 | FOOT | |
| 6 | X-3944-321-1 | PANEL ASSY, FRONT | | 16 | X-3943-312-1 | FOOT ASSY (2.5) | |
| 7 | 3-957-697-01 | SPRING, TORSION | | 17 | A-6778-023-A | REMOTE CONTROL COMPLETE ASSY (RMT-M26A) | |
| 8 | 3-956-065-01 | BUTTON, SIDE B (SIDE B) | | 18 | 3-959-545-01 | COVER, BATTERY | |
| 9 | 3-956-066-01 | BUTTON, PLAY (▶) | | 19 | 3-703-710-41 | STICKER, SONY SYMBOL (12) | |
| 10 | 3-956-064-01 | BUTTON, SIDE A (SIDE A) | | | | | |

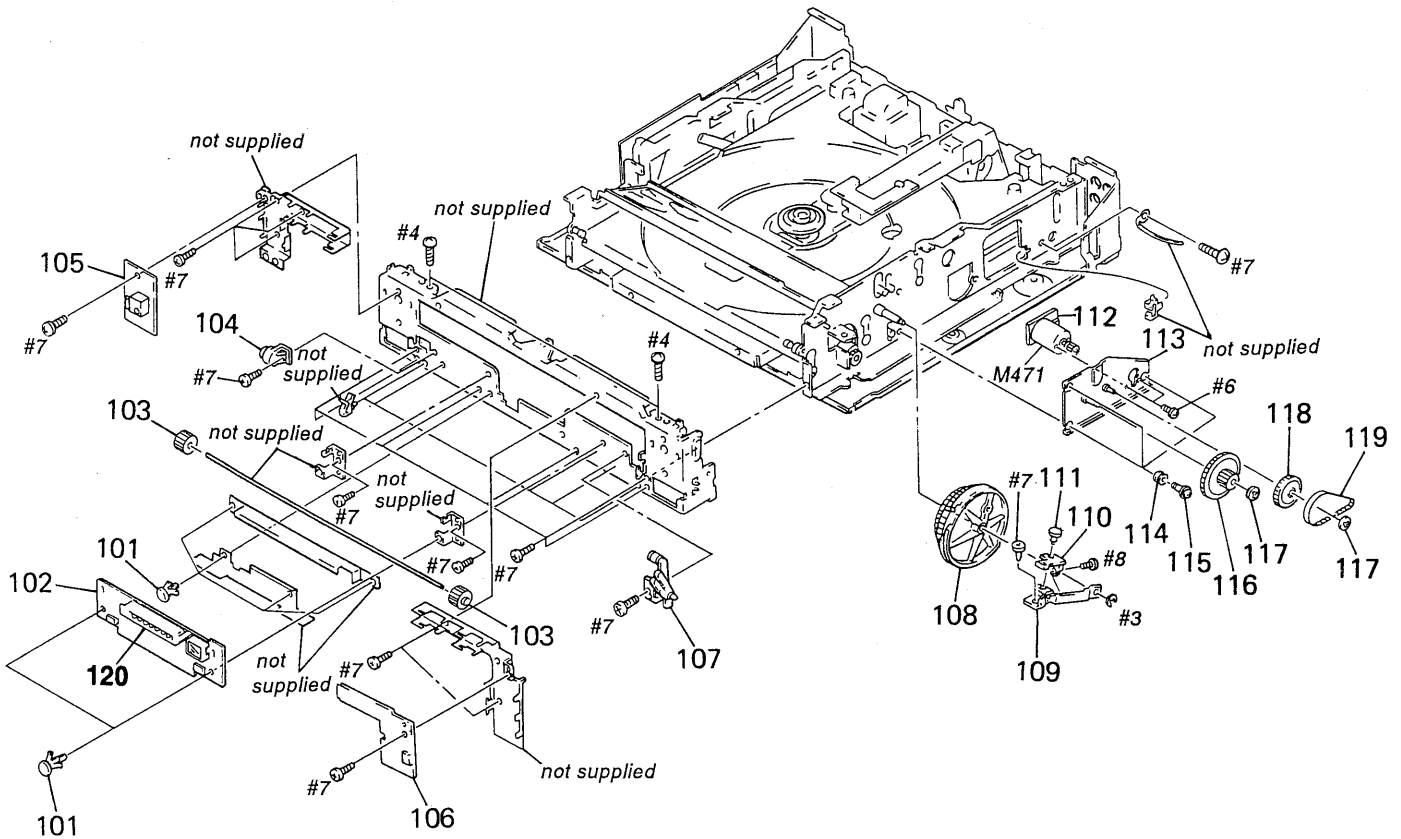
5-1-2. CHUCK FRAME ASSEMBLY



| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|-------------------------|---------|
| 51 | X-3943-043-1 | GUIDE (B) ASSY, CENTER | |
| 52 | 3-953-290-01 | SPRING (2), COMPRESSION | |
| 53 | X-3942-776-1 | HOLDER ASSY, MAGNET | |
| 54 | 3-953-291-01 | SPRING (1), COMPRESSION | |
| 55 | 3-953-288-01 | PLATE, CHUCKING | |
| * 56 | 3-953-354-01 | PLATE, CHUCK | |
| 57 | X-3942-801-1 | ARM (L) ASSY | |
| * 58 | 3-953-345-01 | SHAFT, ARM (S) | |
| * 59 | 3-953-352-01 | ARM (S) | |
| 60 | X-3942-798-1 | FRAME ASSY, CHUCK | |
| * 61 | 3-953-355-01 | SHAFT, SLIDE | |
| 62 | X-3942-799-1 | PLATE ASSY, SLIDE | |
| 63 | 3-486-135-XX | SPRING, TENSION | |

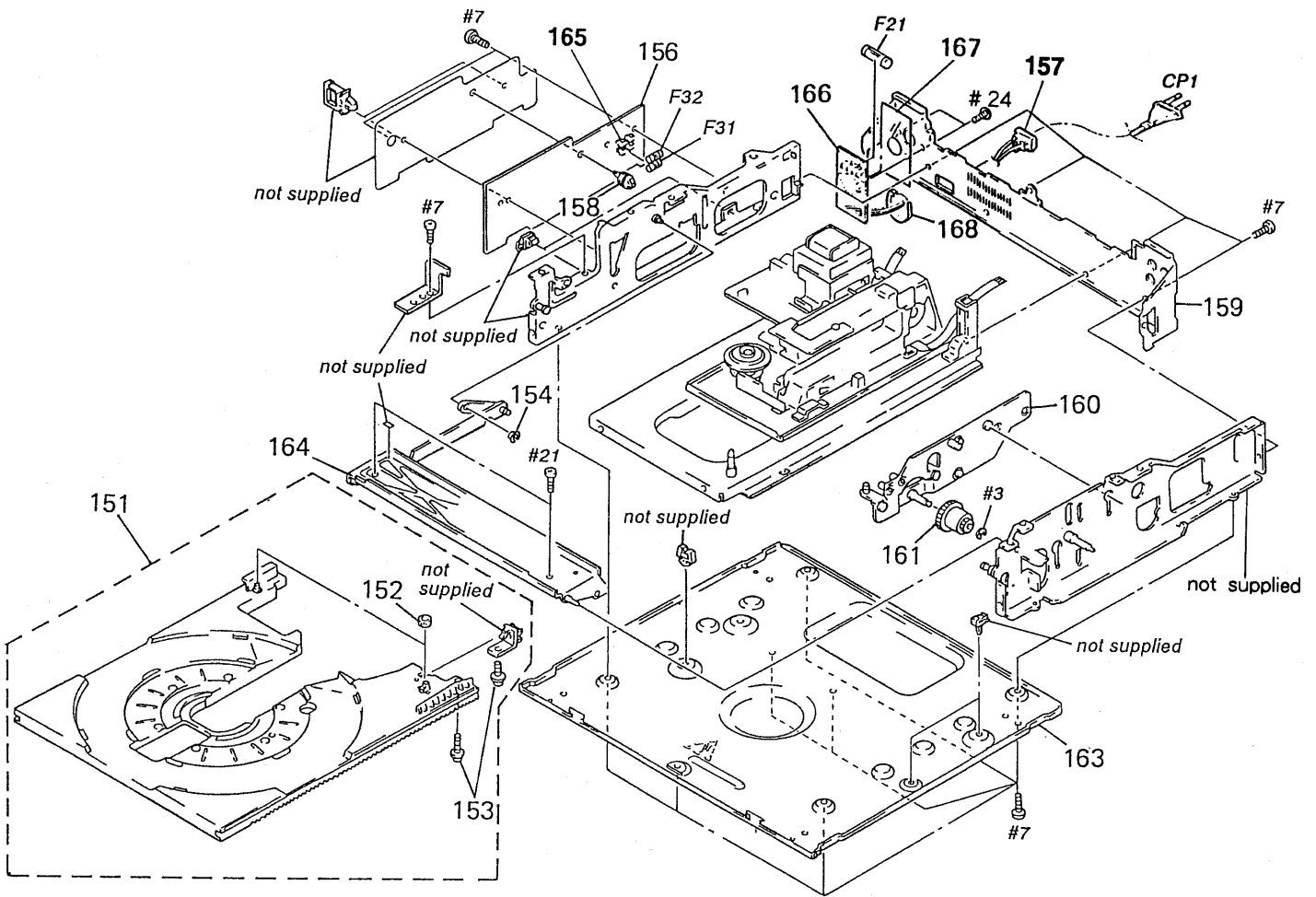
| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|------------------------|---------|
| 64 | X-3942-800-1 | LIMITER ASSY | |
| 65 | 3-953-348-01 | CAM, CHUCK | |
| * 66 | 4-386-173-01 | SPACER | |
| * 67 | 3-956-077-81 | PLATE, JACK | |
| * 68 | A-6423-217-A | MB-712 BOARD, COMPLETE | |
| 69 | X-3942-787-1 | PLATE ASSY, TOP | |
| 70 | 1-589-602-12 | CAPTION UNIT BLOCK | |
| 71 | 3-953-392-01 | RETAINER, THRUST | |
| 72 | 3-353-241-01 | SPRING, COMPRESSION | |
| * 73 | 3-953-831-01 | STOPPER, OPT | |
| 74 | 3-710-901-41 | SCREW, TAPPING | |
| 75 | 3-955-673-01 | SPRING, LEAF | |
| 76 | A-6415-644-G | CHUCK BLOCK ASSY | |

5-1-3. SUB FRONT PANEL ASSEMBLY



| Ref. No. | Part No. | Description | Remarks | Ref. No. | Part No. | Description | Remarks |
|----------|--------------|------------------------|---------|----------|--------------|----------------------------|---------|
| 101 | 4-812-134-11 | RIVET NYLON, 3.5 | | 111 | 3-531-576-11 | RIVET | |
| * 102 | A-6423-219-A | FP-735 BOARD, COMPLETE | | 112 | A-6421-953-A | MT-702 BOARD, COMPLETE | |
| 103 | 3-953-325-01 | GEAR, PHASE | | 113 | X-3942-805-1 | BRACKET ASSY, GEAR | |
| 104 | 4-919-393-01 | DAMPER | | 114 | 3-570-118-00 | CUSHION, MOTOR | |
| * 105 | A-6423-218-A | PW-711 BOARD, COMPLETE | | 115 | 3-570-027-00 | SCREW, MOTOR | |
| * 106 | A-6423-166-A | SW-729 BOARD, COMPLETE | | 116 | 3-953-358-01 | GEAR, MIDWAY | |
| 107 | X-3942-786-1 | LINK ASSY, DRIVING | | 117 | 3-669-595-00 | WASHER (2), STOPPER | |
| 108 | 3-953-356-01 | GEAR, CONTROL | | 118 | 3-953-394-01 | PULLEY (A) | |
| * 109 | 3-953-357-01 | BRACKET, SW | | 119 | 3-953-393-01 | BELT, TIMING | |
| 110 | A-6421-954-A | SW-719 BOARD, COMPLETE | | * 120 | 3-957-924-11 | REFLECTOR | |
| | | | | M471 | X-3942-963-1 | MOTOR ASSY (LOADING MOTOR) | |

5-1-4. CHASSIS ASSEMBLY

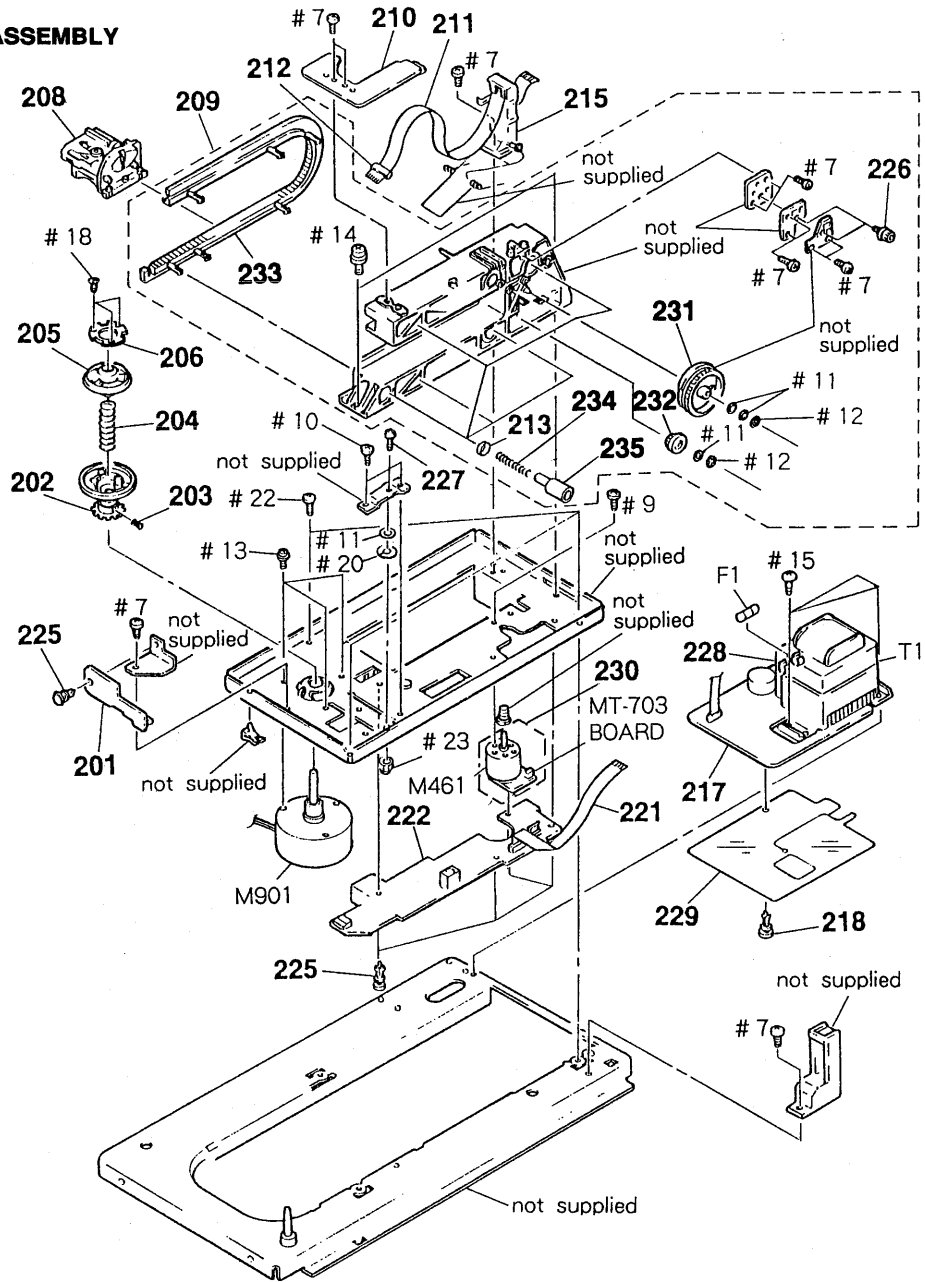


| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|--------------------------|---------|
| 151 | X-3942-781-1 | TRAY ASSY | |
| * 152 | 4-914-248-01 | STOPPER, RUBBER | |
| 153 | 3-710-901-11 | SCREW, TAPPING | |
| 154 | 3-703-074-01 | CAP 3, SHAFT | |
| * 156 | A-6423-216-A | PS-716 BOARD, COMPLETE | |
| △157 | 3-703-244-00 | BUSHING (2104), CORD | |
| * 158 | 4-884-834-00 | SUPPORT, PC | |
| * 159 | 3-955-881-81 | PANEL, REAR | |
| 160 | X-3942-802-1 | PLATE ASSY, LOADING BASE | |
| 161 | 3-953-361-01 | GEAR, IDLER | |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|----------------------------|---------|
| * 163 | 3-953-383-01 | PLATE, BOTTOM | |
| 164 | X-3942-796-1 | FRAME ASSY, TRAY (T) | |
| 165 | 1-533-223-11 | HOLDER, FUSE | |
| * 166 | A-6423-173-A | VS-707 BOARD, COMPLETE | |
| * 167 | 3-953-821-03 | SHEET, INSULATING | |
| * 168 | 3-703-150-11 | CLAMP | |
| △CP1 | 1-575-912-21 | CORD, POWER | |
| △F21 | 1-532-066-00 | FUSE, TIME-LAG (0.4A/250V) | |
| △F31 | 1-532-299-00 | FUSE, TIME-LAG (5A/250V) | |
| △F32 | 1-532-299-00 | FUSE, TIME-LAG (5A/250V) | |

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

5-1-5. MD CHASSIS ASSEMBLY



| Ref. No. | Part No. | Description | Remarks | Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---------------------------------|---------|----------|--------------|----------------------------|---------|
| 201 | A-6421-957-A | FG-704 BOARD, COMPLETE | | 222 | A-6421-956-A | MD-703 BOARD, COMPLETE | |
| 202 | X-3942-779-1 | TURNTABLE ASSY | | 225 | 3-703-356-00 | RIVET, T TYPE | |
| 203 | 3-701-507-00 | SET SCREW, DOUBLE POINT, (M3X5) | | 226 | 3-899-249-01 | BOLT, HEXAGON SOCKET | |
| 204 | 3-953-289-01 | SPRING (3), COMPRESSION | | 227 | 3-953-829-01 | BOLT | |
| 205 | 3-953-292-01 | GUIDE, CENTER | | △228 | 1-533-223-11 | HOLDER, FUSE | |
| 206 | 3-953-293-01 | PLATE (C), YOKE | | △229 | 3-953-377-02 | SHEET, INSULATING, TR | |
| △208 | 8-848-286-11 | DEVICE, OPTICAL KHS-150A | | 230 | X-3942-968-1 | MOTOR BLOCK ASSY, TILT | |
| 209 | A-6404-082-A | BASE BLOCK ASSY, FEED | | 231 | 3-953-254-01 | CAM, TILT DRIVING | |
| 210 | A-6421-958-A | BI-702 BOARD, COMPLETE | | 232 | 3-953-259-01 | GEAR, TILT MIDWAY | |
| 211 | 1-751-083-11 | CABLE, FLEXIBLE FLAT (18 CORE) | | 233 | 3-953-253-01 | GUIDE, U | |
| 212 | 3-953-268-01 | HOLDER (18P), FLEXIBLE | | 234 | 3-953-267-01 | SPRING, COMPRESSION | |
| 213 | 3-953-830-01 | WASHER, U | | 235 | 3-953-255-03 | HOLDER, U | |
| 215 | A-6404-076-A | STAND ASSY, FLEXIBLE RETAINER | | △F1 | 1-532-215-00 | FUSE, TIME-LAG (0.8A/250V) | |
| * 217 | A-6423-170-A | TR-718 BOARD, COMPLETE | | △T1 | 1-423-556-11 | TRANSFORMER, POWER | |
| 218 | 3-531-576-11 | RIVET | | M461 | 1-541-930-11 | MOTOR, DC (TILT) | |
| 221 | 1-765-530-11 | CABLE, FLEXIBLE FLAT (14 CORE) | | 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.

BI-702

CAPTION UNIT

5-2. ELECTRICAL PARTS LIST

NOTE:

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

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

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

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---|---------|
| | A-6421-958-A | BI-702 BOARD, COMPLETE ***** (Ref.No.2,000 Serie) | |
| | 3-953-261-01 | HOLDER, PD | |
| | | < CAPACITOR > | |
| C401 | 1-163-035-00 | CERAMIC CHIP 0.047uF | 50V |
| | | < CONNECTOR > | |
| CN401 | 1-506-484-11 | PIN, CONNECTOR 5P | |
| | | < DIODE > | |
| D401 | 8-729-020-74 | DIODE GP1S24 | |
| D402 | 8-729-020-74 | DIODE GP1S24 | |
| | | < JUMPER RESISTOR > | |
| JR401 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR403 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR404 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR405 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| | | < TRANSISTOR > | |
| Q401 | 8-729-904-10 | TRANSISTOR PT-360FS | |
| Q402 | 8-729-904-10 | TRANSISTOR PT-360FS | |
| Q403 | 8-729-230-49 | TRANSISTOR 2SC2712-YG | |
| Q404 | 8-729-230-49 | TRANSISTOR 2SC2712-YG | |
| | | < RESISTOR > | |
| R401 | 1-216-075-00 | METAL CHIP 12K 5% 1/10W | |
| R402 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R403 | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W | |
| R404 | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W | |
| R405 | 1-216-039-00 | METAL CHIP 390 5% 1/10W | |
| R406 | 1-216-111-00 | METAL CHIP 390K 5% 1/10W | |
| R407 | 1-216-099-00 | METAL CHIP 120K 5% 1/10W | |
| R408 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R409 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---|----------|
| | 1-589-602-12 | CAPTION UNIT BLOCK ***** (Ref.No.8,000 Serie) | |
| | | < CAPACITOR > | |
| C001 | 1-124-470-91 | ELECT 470uF | 20% 6.3V |
| C511 | 1-124-896-91 | ELECT 33uF | 20% 6.3V |
| C518 | 1-102-111-91 | CERAMIC CHIP 270PF | 10% 50V |
| C522 | 1-124-903-91 | ELECT 1uF | 20% 50V |
| C531 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C532 | 1-102-520-91 | CERAMIC CHIP 39PF | 5% 50V |
| C533 | 1-102-129-91 | CERAMIC CHIP 0.01uF | 20% 50V |
| C534 | 1-102-520-91 | CERAMIC CHIP 39PF | 5% 50V |
| C535 | 1-102-937-91 | CERAMIC CHIP 4PF | 0.25%50V |
| C536 | 1-102-951-91 | CERAMIC CHIP 15PF | 5% 50V |
| C537 | 1-102-951-91 | CERAMIC CHIP 15PF | 5% 50V |
| C541 | 1-124-903-91 | ELECT 1uF | 20% 50V |
| C542 | 1-124-903-91 | ELECT 1uF | 20% 50V |
| C552 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C801 | 1-102-114-91 | CERAMIC CHIP 470F | 50V |
| C802 | 1-102-114-91 | CERAMIC CHIP 470F | 50V |
| C821 | 1-124-899-91 | ELECT 22uF | 20% 16V |
| C822 | 1-124-899-91 | ELECT 22uF | 20% 16V |
| C831 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C833 | 1-124-002-91 | ELECT 1uF | 20% 50V |
| C841 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C845 | 1-102-951-91 | CERAMIC CHIP 15PF | 5% 50V |
| C851 | 1-124-471-91 | ELECT 1000uF | 20% 6.3V |
| C1501 | 1-130-489-91 | FILM 0.033uF | 5% 50V |
| C1502 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C1503 | 1-124-907-91 | ELECT 10uF | 20% 16V |
| C1504 | 1-101-880-91 | CERAMIC CHIP 47PF | 5% 50V |
| C1505 | 1-124-896-91 | ELECT 33uF | 20% 6.3V |
| C1507 | 1-130-485-91 | FILM 0.015uF | 5% 50V |
| C1508 | 1-102-123-91 | CERAMIC CHIP 3300PF | 10% 50V |

CAPTION UNIT

| Ref. No. | Part No. | Description | Remarks | | Ref. No. | Part No. | Description | Remarks |
|----------------|--------------|---------------------------|------------------------------------|--|--------------|--------------|---------------------------|---------|
| C1509 | 1-102-973-91 | CERAMIC CHIP | 100PF 5% 50V | | | | < RESISTOR > | |
| C1510 | 1-124-903-91 | ELECT | 1uF 20% 50V | | R511 | 1-247-839-81 | CARBON 2.2K 5% 1/6W | |
| C1511 | 1-124-002-91 | ELECT | 1uF 20% 50V | | R512 | 1-247-807-81 | CARBON 100 5% 1/6W | |
| C1518 | 1-102-973-91 | CERAMIC CHIP | 100PF 5% 50V | | R541 | 1-247-839-81 | CARBON 2.2K 5% 1/6W | |
| C1519 | 1-102-973-91 | CERAMIC CHIP | 100PF 5% 50V | | R542 | 1-247-839-81 | CARBON 2.2K 5% 1/6W | |
| < CONNECTOR > | | | | | R551 | 1-215-445-81 | CARBON 10K 1% 1/6W | |
| CN001 | 1-564-014-61 | PIN, CONNECTOR | 4P | | R552 | 1-215-429-81 | CARBON 2.2K 1% 1/6W | |
| CN002 | 1-564-016-61 | PIN, CONNECTOR | 6P | | R553 | 1-215-431-81 | CARBON 2.7K 1% 1/6W | |
| CN003 | 1-564-013-61 | PIN, CONNECTOR | 3P | | R554 | 1-247-831-81 | CARBON 1K 5% 1/6W | |
| < DIODE > | | | | | R555 | 1-247-831-81 | CARBON 1K 5% 1/6W | |
| D801 | 8-719-815-55 | DIODE | 1S1555 | | R558 | 1-247-819-81 | CARBON 330 5% 1/6W | |
| D802 | 8-719-815-55 | DIODE | 1S1555 | | R562 | 1-215-431-81 | CARBON 2.7K 1% 1/6W | |
| D821 | 8-719-815-55 | DIODE | 1S1555 | | R563 | 1-215-435-81 | CARBON 3.9K 1% 1/6W | |
| D826 | 8-719-815-55 | DIODE | 1S1555 | | R564 | 1-215-435-81 | CARBON 3.9K 1% 1/6W | |
| < IC > | | | | | R821 | 1-247-804-81 | CARBON 75 5% 1/6W | |
| IC521 | 8-759-421-24 | IC | MN1381-Q (RESET) | | R822 | 1-247-804-81 | CARBON 75 5% 1/6W | |
| IC531 | 9-907-546-01 | IC | LC864012V-5514 (CAPTION DECODE OS) | | R824 | 1-247-863-81 | CARBON 22K 5% 1/6W | |
| IC831 | 8-759-340-53 | IC | HD14053BP (AUX/LD VIDEO SELECTOR) | | R825 | 1-247-877-81 | CARBON 82K 5% 1/6W | |
| IC831 | 8-759-040-53 | IC | MC14053BCP (AUX/LD VIDEO SELECTOR) | | R826 | 1-247-855-81 | CARBON 10K 5% 1/6W | |
| IC831 | 8-759-240-53 | IC | TC4053BP (AUX/LD VIDEO SELECTOR) | | R831 | 1-247-863-81 | CARBON 22K 5% 1/6W | |
| IC841 | 8-759-711-14 | IC | NJM2246D (CAPTION MIXER) | | R832 | 1-247-877-81 | CARBON 82K 5% 1/6W | |
| IC1501 | 8-759-084-12 | IC | LA7945N (CAPTION FRONT END) | | R836 | 1-247-879-81 | CARBON 100K 5% 1/6W | |
| < JACK > | | | | | R837 | 1-247-855-81 | CARBON 10K 5% 1/6W | |
| J801 | 1-695-583-11 | JACK (LINE IN/LINE OUT 1) | | | R840 | 1-247-845-81 | CARBON 3.9K 1% 1/6W | |
| < COIL > | | | | | R851 | 1-247-805-81 | CARBON 82 5% 1/4W | |
| L511 | 1-408-560-21 | COIL | 5.6uH | | R852 | 1-247-855-81 | CARBON 10K 5% 1/6W | |
| L531 | 1-408-560-21 | COIL | 5.6uH | | R853 | 1-247-804-81 | CARBON 75 5% 1/6W | |
| L532 | 1-408-561-21 | COIL | 6.8uH | | R881 | 1-247-831-81 | CARBON 1K 5% 1/6W | |
| L831 | 1-408-560-21 | COIL | 5.6uH | | R882 | 1-247-831-81 | CARBON 1K 5% 1/6W | |
| L841 | 1-408-560-21 | COIL | 5.6uH | | R1501 | 1-215-449-81 | CARBON 15K 1% 1/6W | |
| L1501 | 1-408-560-21 | COIL | 5.6uH | | R1502 | 1-247-819-81 | CARBON 330 5% 1/6W | |
| < TRANSISTOR > | | | | | R1504 | 1-247-861-81 | CARBON 18K 5% 1/6W | |
| Q541 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1506 | 1-247-875-81 | CARBON 68K 5% 1/6W | |
| Q542 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1510 | 1-247-879-81 | CARBON 100K 5% 1/6W | |
| Q826 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1511 | 1-247-819-81 | CARBON 330 5% 1/6W | |
| Q836 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1515 | 1-247-861-81 | CARBON 18K 5% 1/6W | |
| Q851 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1516 | 1-247-861-81 | CARBON 18K 5% 1/6W | |
| Q853 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1517 | 1-247-861-81 | CARBON 18K 5% 1/6W | |
| Q1512 | 8-729-800-23 | TRANSISTOR | 2SC536 | | R1518 | 1-247-861-81 | CARBON 18K 5% 1/6W | |
| < RELAY > | | | | | < VIBRATOR > | | | |
| RY821 | 1-515-608-11 | RELAY | | | Y531 | 9-907-547-01 | VIBRATOR, CRYSTAL (12MHz) | |
| RY822 | 1-515-608-11 | RELAY | | | ***** | | | |

FG-704

FP-735

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---|---------|
| | A-6421-957-A | FG-704 BOARD, COMPLETE ***** (Ref.No.2,000 Serie) | |
| | | < CAPACITOR > | |
| C411 | 1-163-035-00 | CERAMIC CHIP 0.047uF | 50V |
| | | < CONNECTOR > | |
| CN411 | 1-691-863-11 | CONNECTOR, BOARD TO BOARD | |
| | | < DIODE > | |
| D411 | 8-729-020-74 | DIODE GP1S24 | |
| D412 | 8-729-020-74 | DIODE GP1S24 | |
| | | < JUMPER RESISTOR > | |
| JR410 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR411 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR412 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| | | < TRANSISTOR > | |
| Q411 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| Q412 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| | | < RESISTOR > | |
| R411 | 1-216-037-00 | METAL CHIP 330 5% 1/10W | |
| R412 | 1-216-097-00 | METAL CHIP 100K 5% 1/10W | |
| R413 | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W | |
| R414 | 1-216-089-00 | METAL CHIP 47K 5% 1/10W | |
| R415 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| R416 | 1-216-097-00 | METAL CHIP 100K 5% 1/10W | |
| R417 | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W | |
| R418 | 1-216-089-00 | METAL CHIP 47K 5% 1/10W | |
| R419 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| ***** | | | |
| * | A-6423-219-A | FP-735 BOARD, COMPLETE ***** (Ref.No.3,000 Serie) | |
| * | 3-956-076-01 | HOLDER, SEGMENT | |
| | | < CAPACITOR > | |
| C301 | 1-163-077-91 | CERAMIC CHIP 0.1uF | 50V |
| C302 | 1-164-232-11 | CERAMIC CHIP 0.01uF | 50V |
| C305 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| C306 | 1-126-154-11 | ELECT 47uF 20% | 6.3V |
| C307 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| △C308 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| C309 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| C310 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| C311 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---------------------------------------|---------|
| C312 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |
| C320 | 1-164-005-11 | CERAMIC CHIP 0.47uF | 25V |
| | | < CONNECTOR > | |
| CN301 | 1-506-484-11 | PIN, CONNECTOR 5P | |
| CN303 | 1-506-483-21 | PIN, CONNECTOR 4P | |
| CN304 | 1-506-486-11 | PIN, CONNECTOR 7P | |
| CN305 | 1-506-487-11 | PIN, CONNECTOR 8P | |
| CN306 | 1-506-484-11 | PIN, CONNECTOR 5P | |
| CN307 | 1-506-485-11 | PIN, CONNECTOR 6P | |
| | | < DIODE > | |
| D300 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D301 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D302 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D303 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D304 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D305 | 8-719-970-66 | DIODE SLR-54YCA49 (CLOSED CAPTION) | |
| D306 | 8-719-302-07 | LED SEL1810A (LINE IN) | |
| △D307 | 8-719-988-62 | DIODE 1SS355 | |
| D308 | 8-719-955-04 | LED PY5504S-1 (SIDE A) | |
| D309 | 8-719-955-04 | LED PY5504S-1 (SIDE B) | |
| D311 | 8-719-047-76 | DIODE GL7D206L | |
| | | < IC > | |
| △IC301 | 8-759-290-38 | IC MB89094PF-G-128-BND (MODE CONTROL) | |
| IC302 | 8-759-043-33 | IC LB1721M (LED DRIVE) | |
| IC303 | 8-759-074-40 | IC PST572DMT-T1 (RESET) | |
| IC304 | 8-759-032-29 | IC MC74HC126AF (LINE SELECT SWITCH) | |
| | | < COIL > | |
| L301 | 1-410-381-11 | INDUCTOR CHIP 10uH | |
| | | < TRANSISTOR > | |
| Q300 | 8-729-904-57 | TRANSISTOR DTB114EK | |
| Q301 | 8-729-904-57 | TRANSISTOR DTB114EK | |
| Q303 | 8-729-901-04 | TRANSISTOR DTA114EK | |
| Q304 | 8-729-901-04 | TRANSISTOR DTA114EK | |
| Q307 | 8-729-901-04 | TRANSISTOR DTA114EK | |
| Q309 | 8-729-901-04 | TRANSISTOR DTA114EK | |
| | | < RESISTOR > | |
| R300 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| R301 | 1-216-035-00 | METAL CHIP 270 5% 1/10W | |
| R302 | 1-216-035-00 | METAL CHIP 270 5% 1/10W | |
| R303 | 1-216-035-00 | METAL CHIP 270 5% 1/10W | |
| R304 | 1-216-035-00 | METAL CHIP 270 5% 1/10W | |

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

| Ref. No. | Part No. | Description | Remarks | | |
|------------|--------------|------------------------|---------|-------|-------|
| R305 | 1-216-035-00 | METAL CHIP | 270 | 5% | 1/10W |
| R306 | 1-216-035-00 | METAL CHIP | 270 | 5% | 1/10W |
| R307 | 1-216-035-00 | METAL CHIP | 270 | 5% | 1/10W |
| R308 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R309 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| △R312 | 1-208-806-11 | METAL GLAZE | 10K | 0.50% | 1/10W |
| △R313 | 1-208-806-11 | METAL GLAZE | 10K | 0.50% | 1/10W |
| R314 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R315 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R316 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R317 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R318 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R319 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R320 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R321 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R322 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R323 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R324 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R325 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R326 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R327 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R328 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R330 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R331 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R332 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R333 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R334 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R335 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R336 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| △R337 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| △R338 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| △R339 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R340 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R341 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R344 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R345 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R347 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R350 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R351 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R352 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R357 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R358 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R359 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R360 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R361 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R363 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R365 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| < SWITCH > | | | | | |
| S301 | 1-692-440-11 | SWITCH, PUSH (DOOR SW) | | | |

| Ref. No. | Part No. | Description | Remarks | | |
|----------------------|--------------|------------------------|----------|-------|------|
| < VIBRATOR > | | | | | |
| X301 | 1-579-952-21 | VIBRATOR, CERAMIC 8MHz | | | |
| ***** | | | | | |
| * | A-6423-217-A | MB-712 BOARD, COMPLETE | | | |
| ***** | | | | | |
| (Ref.No.1,000 Serie) | | | | | |
| < CAPACITOR > | | | | | |
| C002 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C004 | 1-124-465-00 | ELECT | 0.47uF | 20% | 50V |
| C005 | 1-163-125-00 | CERAMIC CHIP | 220PF | 5% | 50V |
| C006 | 1-163-125-00 | CERAMIC CHIP | 220PF | 5% | 50V |
| C007 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V |
| C008 | 1-163-239-11 | CERAMIC CHIP | 33PF | 5% | 50V |
| C009 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C010 | 1-137-370-11 | FILM | 0.01uF | 5% | 50V |
| C011 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V |
| C012 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C014 | 1-164-182-11 | CERAMIC CHIP | 0.0033uF | 10% | 50V |
| C015 | 1-130-489-00 | MYLAR | 0.033uF | 5% | 50V |
| C016 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C017 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C018 | 1-126-916-11 | ELECT | 1000uF | 20% | 6.3V |
| C019 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C020 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C022 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF | 10% | 50V |
| C023 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C024 | 1-137-399-11 | FILM | 0.1uF | 5% | 50V |
| C025 | 1-163-227-11 | CERAMIC CHIP | 10PF | 0.5PF | 50V |
| C026 | 1-126-947-11 | ELECT | 47uF | 20% | 10V |
| C027 | 1-126-947-11 | ELECT | 47uF | 20% | 10V |
| C029 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C030 | 1-163-103-00 | CERAMIC CHIP | 27PF | 5% | 50V |
| C031 | 1-163-107-00 | CERAMIC CHIP | 39PF | 5% | 50V |
| C032 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C034 | 1-137-374-11 | FILM | 0.047uF | 5% | 50V |
| C035 | 1-130-489-00 | MYLAR | 0.033uF | 5% | 50V |
| C036 | 1-137-440-11 | FILM | 0.018uF | 5% | 50V |
| C037 | 1-130-489-00 | MYLAR | 0.033uF | 5% | 50V |
| C038 | 1-124-903-11 | ELECT | 1uF | 20% | 50V |
| C039 | 1-163-117-00 | CERAMIC CHIP | 100PF | 5% | 50V |
| C040 | 1-124-925-11 | ELECT | 2.2uF | 20% | 100V |
| C041 | 1-163-117-00 | CERAMIC CHIP | 100PF | 5% | 50V |
| C042 | 1-163-117-00 | CERAMIC CHIP | 100PF | 5% | 50V |
| C043 | 1-137-370-11 | FILM | 0.01uF | 5% | 50V |
| C045 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V |
| C046 | 1-126-947-11 | ELECT | 47uF | 20% | 10V |
| C047 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF | 10% | 50V |

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

MB-712

| Ref. No. | Part No. | Description | | Remarks | | Ref. No. | Part No. | Description | | Remarks |
|----------|--------------|--------------|---------|---------|------|----------|--------------|---------------|--------|----------|
| C048 | 1-137-370-11 | FILM | 0.01uF | 5% | 50V | C104 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C049 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | C105 | 1-131-347-00 | TANTALUM | 1uF | 10% 35V |
| C050 | 1-137-374-11 | FILM | 0.047uF | 5% | 50V | C106 | 1-124-903-11 | ELECT | 1uF | 20% 50V |
| C051 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | C108 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C052 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C109 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C053 | 1-163-117-00 | CERAMIC CHIP | 100PF | 5% | 50V | C110 | 1-126-916-11 | ELECT | 1000uF | 20% 6.3V |
| C055 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C111 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C056 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C112 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% 50V |
| C057 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C113 | 1-124-925-11 | ELECT | 2.2uF | 20% 100V |
| C060 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C114 | 1-135-181-21 | TANTALUM CHIP | 4.7uF | 20% 6.3V |
| C061 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C115 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C063 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C116 | 1-163-109-00 | CERAMIC CHIP | 47PF | 5% 50V |
| C064 | 1-163-139-00 | CERAMIC CHIP | 820PF | 5% | 50V | C117 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | 50V |
| C065 | 1-137-374-11 | FILM | 0.047uF | 5% | 50V | C118 | 1-163-109-00 | CERAMIC CHIP | 47PF | 5% 50V |
| C066 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C120 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | 50V |
| C067 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C121 | 1-124-925-11 | ELECT | 2.2uF | 20% 100V |
| C068 | 1-126-916-11 | ELECT | 1000uF | 20% | 6.3V | C122 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | 50V |
| C069 | 1-163-253-11 | CERAMIC CHIP | 120PF | 5% | 50V | C124 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C070 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C125 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C071 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C126 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C072 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | | 50V | C128 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C073 | 1-163-253-11 | CERAMIC CHIP | 120PF | 5% | 50V | C129 | 1-163-121-00 | CERAMIC CHIP | 150PF | 5% 50V |
| C074 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | C130 | 1-163-097-00 | CERAMIC CHIP | 15PF | 5% 50V |
| C075 | 1-163-227-11 | CERAMIC CHIP | 10PF | 0.5PF | 50V | C131 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | 50V |
| C076 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C132 | 1-163-243-11 | CERAMIC CHIP | 47PF | 5% 50V |
| C077 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | C133 | 1-163-139-00 | CERAMIC CHIP | 820PF | 5% 50V |
| C078 | 1-163-237-11 | CERAMIC CHIP | 27PF | 5% | 50V | C136 | 1-163-116-00 | CERAMIC CHIP | 91PF | 5% 50V |
| C079 | 1-163-237-11 | CERAMIC CHIP | 27PF | 5% | 50V | C138 | 1-126-964-11 | ELECT | 10uF | 20% 50V |
| C080 | 1-163-253-11 | CERAMIC CHIP | 120PF | 5% | 50V | C139 | 1-126-964-11 | ELECT | 10uF | 20% 50V |
| C081 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C140 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% 50V |
| C082 | 1-163-103-00 | CERAMIC CHIP | 27PF | 5% | 50V | C141 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C083 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | | 50V | C147 | 1-163-237-11 | CERAMIC CHIP | 27PF | 5% 50V |
| C084 | 1-124-292-00 | ELECT | 33uF | 20% | 6.3V | C148 | 1-163-237-11 | CERAMIC CHIP | 27PF | 5% 50V |
| C085 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C149 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C086 | 1-163-237-11 | CERAMIC CHIP | 27PF | 5% | 50V | C150 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C087 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | | 50V | C151 | 1-163-077-91 | CERAMIC CHIP | 0.1uF | 50V |
| C088 | 1-163-257-11 | CERAMIC CHIP | 180PF | 5% | 50V | C152 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C089 | 1-163-031-11 | CERAMIC CHIP | 0.01uF | | 50V | C153 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C091 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C154 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C092 | 1-163-227-11 | CERAMIC CHIP | 10PF | 0.5PF | 50V | C158 | 1-124-925-11 | ELECT | 2.2uF | 20% 100V |
| C093 | 1-163-257-11 | CERAMIC CHIP | 180PF | 5% | 50V | C160 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C095 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C162 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C096 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | C163 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C097 | 1-163-099-00 | CERAMIC CHIP | 18PF | 5% | 50V | C164 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C098 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C165 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C099 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | C166 | 1-163-097-00 | CERAMIC CHIP | 15PF | 5% 50V |
| C100 | 1-124-903-11 | ELECT | 1uF | 20% | 50V | C167 | 1-163-249-11 | CERAMIC CHIP | 82PF | 5% 50V |
| C101 | 1-137-372-11 | FILM | 0.022uF | 5% | 50V | C169 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C102 | 1-137-370-11 | FILM | 0.01uF | 5% | 50V | C172 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C103 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C173 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |

| Ref. No. | Part No. | Description | | Remarks | | Ref. No. | Part No. | Description | | Remarks |
|----------|--------------|-----------------|----------|---------|------|----------|--------------|-----------------------|----------|---------|
| C174 | 1-163-129-00 | CERAMIC CHIP | 330PF | 5% | 50V | C275 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF | 5% 50V |
| C203 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C276 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C207 | 1-163-125-00 | CERAMIC CHIP | 220PF | 5% | 50V | C277 | 1-137-399-11 | FILM | 0.1uF | 5% 50V |
| C208 | 1-126-964-11 | ELECT | 10uF | 20% | 50V | C278 | 1-163-037-11 | CERAMIC CHIP | 0.022uF | 10% 25V |
| C211 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V | C279 | 1-137-442-11 | FILM | 0.039uF | 5% 50V |
| C212 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V | C280 | 1-136-169-00 | FILM | 0.22uF | 5% 50V |
| C213 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C281 | 1-126-933-11 | ELECT | 100uF | 20% 10V |
| C214 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C282 | 1-163-241-11 | CERAMIC CHIP | 39PF | 5% 50V |
| C215 | 1-137-368-11 | FILM | 0.0047uF | 5% | 50V | C283 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | 50V |
| C216 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C284 | 1-136-169-00 | FILM | 0.22uF | 5% 50V |
| C218 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C285 | 1-137-442-11 | FILM | 0.039uF | 5% 50V |
| C219 | 1-124-927-11 | ELECT | 4.7uF | 20% | 100V | C286 | 1-124-902-00 | ELECT | 0.47uF | 20% 50V |
| C221 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C287 | 1-163-037-11 | CERAMIC CHIP | 0.022uF | 10% 25V |
| C222 | 1-137-433-11 | FILM | 0.0012uF | 5% | 50V | C288 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF | 5% 50V |
| C225 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C289 | 1-137-368-11 | FILM | 0.0047uF | 5% 50V |
| C226 | 1-137-433-11 | FILM | 0.0012uF | 5% | 50V | C290 | 1-126-947-11 | ELECT | 47uF | 20% 10V |
| C229 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V | C291 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% 50V |
| C230 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C292 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | 50V |
| C231 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C293 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C232 | 1-124-927-11 | ELECT | 4.7uF | 20% | 100V | C294 | 1-163-119-00 | CERAMIC CHIP | 120PF | 5% 50V |
| C234 | 1-124-927-11 | ELECT | 4.7uF | 20% | 100V | C297 | 1-163-005-11 | CERAMIC CHIP | 470PF | 10% 50V |
| C236 | 1-124-927-11 | ELECT | 4.7uF | 20% | 100V | C299 | 1-163-005-11 | CERAMIC CHIP | 470PF | 10% 50V |
| C237 | 1-137-368-11 | FILM | 0.0047uF | 5% | 50V | C399 | 1-216-295-91 | CONDCTOR, CHIP (2012) | | |
| C239 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | C400 | 1-164-346-11 | CERAMIC CHIP | 1uF | 16V |
| C240 | 1-164-005-11 | CERAMIC CHIP | 0.47uF | | 25V | C401 | 1-163-121-00 | CERAMIC CHIP | 150PF | 5% 50V |
| C241 | 1-163-251-11 | CERAMIC CHIP | 100PF | 5% | 50V | C402 | 1-164-005-11 | CERAMIC CHIP | 0.47uF | 25V |
| C243 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C403 | 1-163-133-00 | CERAMIC CHIP | 470PF | 5% 50V |
| C244 | 1-163-125-00 | CERAMIC CHIP | 220PF | 5% | 50V | C406 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | 25V |
| C245 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C407 | 1-124-277-11 | ELECT | 4.7uF | 20% 35V |
| C248 | 1-163-235-11 | CERAMIC CHIP | 22PF | 5% | 50V | C408 | 1-163-022-00 | CERAMIC CHIP | 0.012uF | 10% 50V |
| C249 | 1-163-128-00 | CERAMIC CHIP | 300PF | 5% | 50V | C409 | 1-163-024-00 | CERAMIC CHIP | 0.018uF | 10% 50V |
| C251 | 1-124-287-00 | ELECT | 10uF | 20% | 10V | C410 | 1-164-489-11 | CERAMIC CHIP | 0.22uF | 10% 16V |
| C252 | 1-163-243-11 | CERAMIC CHIP | 47PF | 5% | 50V | C411 | 1-163-037-11 | CERAMIC CHIP | 0.022uF | 10% 25V |
| C253 | 1-163-243-11 | CERAMIC CHIP | 47PF | 5% | 50V | C413 | 1-163-809-11 | CERAMIC CHIP | 0.047uF | 10% 25V |
| C254 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C414 | 1-124-767-00 | ELECT | 2.2uF | 20% 50V |
| C255 | 1-124-499-11 | ELECT, NONPOLAR | 1uF | 20% | 50V | C415 | 1-163-014-00 | CERAMIC CHIP | 0.0027uF | 5% 50V |
| C257 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C417 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | 50V |
| C258 | 1-163-809-11 | CERAMIC CHIP | 0.047uF | 10% | 25V | C419 | 1-163-016-00 | CERAMIC CHIP | 0.0039uF | 10% 50V |
| C259 | 1-163-011-11 | CERAMIC CHIP | 0.0015uF | 10% | 50V | C420 | 1-163-245-11 | CERAMIC CHIP | 56PF | 5% 50V |
| C260 | 1-126-947-11 | ELECT | 47uF | 20% | 10V | C421 | 1-124-499-11 | ELECT, NONPOLAR | 1uF | 20% 50V |
| C261 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C422 | 1-164-004-11 | CERAMIC CHIP | 0.1uF | 10% 25V |
| C262 | 1-164-232-11 | CERAMIC CHIP | 0.01uF | | 50V | C423 | 1-124-287-00 | ELECT | 10uF | 20% 10V |
| C263 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C424 | 1-163-809-11 | CERAMIC CHIP | 0.047uF | 10% 25V |
| C264 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C425 | 1-124-273-00 | ELECT | 3.3uF | 20% 50V |
| C265 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C427 | 1-163-129-00 | CERAMIC CHIP | 330PF | 5% 50V |
| C266 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C428 | 1-126-947-11 | ELECT | 47uF | 20% 35V |
| C271 | 1-124-287-00 | ELECT | 10uF | 20% | 10V | C429 | 1-163-249-11 | CERAMIC CHIP | 82PF | 5% 50V |
| C272 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10% | 50V | C430 | 1-126-947-11 | ELECT | 47uF | 20% 35V |
| C273 | 1-163-038-00 | CERAMIC CHIP | 0.1uF | | 25V | C432 | 1-163-022-00 | CERAMIC CHIP | 0.012uF | 10% 50V |
| C274 | 1-137-368-11 | FILM | 0.0047uF | 5% | 50V | C433 | 1-163-097-00 | CERAMIC CHIP | 15PF | 5% 50V |

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| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|-----------------------|----------|
| C434 | 1-163-024-00 | CERAMIC CHIP 0.018uF | 10% 50V |
| C435 | 1-163-101-00 | CERAMIC CHIP 22PF | 5% 50V |
| C436 | 1-163-017-00 | CERAMIC CHIP 0.0047uF | 5% 50V |
| C437 | 1-163-235-11 | CERAMIC CHIP 22PF | 5% 50V |
| C438 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C439 | 1-126-947-11 | ELECT 47uF | 20% 10V |
| C440 | 1-126-947-11 | ELECT 47uF | 20% 10V |
| C441 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C442 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C443 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C444 | 1-126-160-11 | ELECT 1uF | 20% 50V |
| C445 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C446 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C447 | 1-163-019-00 | CERAMIC CHIP 0.0068uF | 10% 50V |
| C448 | 1-164-005-11 | CERAMIC CHIP 0.47uF | 25V |
| C449 | 1-164-005-11 | CERAMIC CHIP 0.47uF | 25V |
| C450 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C451 | 1-163-101-00 | CERAMIC CHIP 22PF | 5% 50V |
| C452 | 1-164-489-11 | CERAMIC CHIP 0.22uF | 10% 16V |
| C463 | 1-163-989-11 | CERAMIC CHIP 0.033uF | 10% 25V |
| C465 | 1-164-232-11 | CERAMIC CHIP 0.01uF | 50V |
| C466 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V |
| C467 | 1-164-232-11 | CERAMIC CHIP 0.01uF | 50V |
| C468 | 1-164-699-11 | CERAMIC CHIP 0.0033uF | 5% 50V |
| C469 | 1-163-088-00 | CERAMIC CHIP 5PF | 50V |
| C500 | 1-126-947-11 | ELECT 47uF | 20% 10V |
| C501 | 1-128-453-21 | ELECT CHIP 47uF | 20% 6.3V |
| C502 | 1-163-251-11 | CERAMIC CHIP 100PF | 5% 50V |
| C503 | 1-126-603-11 | ELECT CHIP 4.7uF | 20% 35V |
| C504 | 1-163-245-11 | CERAMIC CHIP 56PF | 5% 50V |
| C505 | 1-164-182-11 | CERAMIC CHIP 0.0033uF | 10% 50V |
| C506 | 1-128-024-11 | ELECT CHIP 4.7uF | 0 10V |
| C507 | 1-126-947-11 | ELECT 47uF | 20% 35V |
| C508 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C510 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C511 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C512 | 1-163-257-11 | CERAMIC CHIP 180PF | 5% 50V |
| C513 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C514 | 1-163-257-11 | CERAMIC CHIP 180PF | 5% 50V |
| C515 | 1-164-232-11 | CERAMIC CHIP 0.01uF | 50V |
| C516 | 1-163-009-11 | CERAMIC CHIP 0.001uF | 10% 50V |
| C517 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C518 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C519 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C520 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C522 | 1-163-235-11 | CERAMIC CHIP 22PF | 5% 50V |
| C523 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C526 | 1-137-364-11 | FILM 0.001uF | 5% 50V |
| C529 | 1-137-366-11 | FILM 0.0022uF | 5% 50V |
| C530 | 1-163-031-11 | CERAMIC CHIP 0.01uF | 50V |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|-------------------------------|----------|
| C531 | 1-124-925-11 | ELECT 2.2uF | 20% 100V |
| C533 | 1-163-141-00 | CERAMIC CHIP 0.001uF | 5% 50V |
| C590 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| C801 | 1-163-129-00 | CERAMIC CHIP 330PF | 5% 50V |
| C802 | 1-164-232-11 | CERAMIC CHIP 0.01uF | 50V |
| C950 | 1-126-964-11 | ELECT 10uF | 20% 50V |
| CF001 | 1-527-831-00 | FILTER, CERAMIC | |
| | | < FILTER > | |
| | | < CONNECTOR > | |
| CN205 | 1-506-468-11 | PIN, CONNECTOR 3P | |
| CN210 | 1-506-469-11 | PIN, CONNECTOR 4P | |
| CN401 | 1-750-687-11 | HOUSING, CONNECTOR (PC BOARD) | |
| * CN402 | 1-764-594-21 | CONNECTOR, FPC 18P | |
| * CN403 | 1-764-595-21 | CONNECTOR, FPC 14P | |
| CN501 | 1-506-468-11 | PIN, CONNECTOR 3P | |
| CN502 | 1-506-469-11 | PIN, CONNECTOR 4P | |
| CN503 | 1-506-472-11 | PIN, CONNECTOR 7P | |
| CN504 | 1-506-473-11 | PIN, CONNECTOR 8P | |
| * CN505 | 1-568-783-11 | PIN, CONNECTOR 6P | |
| CN701 | 1-506-473-11 | PIN, CONNECTOR 8P | |
| | | < TRIMMER > | |
| CT001 | 1-141-442-91 | TRIMMER, CERAMIC 20PF | |
| CT501 | 1-141-424-11 | CAP, ADJ 30PF | |
| | | < DIODE > | |
| D001 | 8-719-105-52 | DIODE RD3.6M-B2 | |
| D002 | 8-719-801-78 | DIODE 1SS184 | |
| D003 | 8-719-988-62 | DIODE 1SS355 | |
| D202 | 8-719-105-82 | DIODE RD5.1M-B2 | |
| D203 | 8-719-032-05 | DIODE KV1460TL00 | |
| D205 | 8-719-801-78 | DIODE 1SS184 | |
| D208 | 8-719-801-78 | DIODE 1SS184 | |
| D251 | 8-719-800-76 | DIODE 1SS226 | |
| D253 | 8-719-800-76 | DIODE 1SS226 | |
| D401 | 8-719-800-76 | DIODE 1SS226 | |
| D402 | 8-719-800-76 | DIODE 1SS226 | |
| D403 | 8-719-800-76 | DIODE 1SS226 | |
| D405 | 8-719-988-62 | DIODE 1SS355 | |
| D502 | 8-719-402-34 | DIODE MA3120-TX | |
| D503 | 8-719-988-62 | DIODE 1SS355 | |
| D506 | 8-719-104-34 | DIODE 1S2836 | |
| D507 | 8-719-988-62 | DIODE 1SS355 | |
| D508 | 8-719-988-62 | DIODE 1SS355 | |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|--|---------|
| | | < FERRITE BEAD > | |
| FB201 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| FB203 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| | | < FILTER > | |
| FL003 | 1-409-810-11 | FILTER, LOW PASS | |
| FL004 | 1-236-478-11 | FILTER, LOW PASS | |
| FL005 | 1-239-823-11 | FILTER, CHROMA TRAP | |
| FL006 | 1-235-943-11 | BPF | |
| FL007 | 1-239-824-11 | LPF (3MHz) | |
| FL008 | 1-408-409-00 | INDUCTOR 10uH | |
| FL205 | 1-760-185-11 | FILTER, CERAMIC | |
| FL206 | 1-760-186-11 | FILTER, CERAMIC | |
| FL401 | 1-235-922-11 | FILTER, LOW PASS (1.7MHz) | |
| | | < IC > | |
| IC001 | 8-759-058-52 | IC XRA10324AF-E2 (AMP) | |
| IC002 | 8-759-058-52 | IC XRA10324AF-E2 (AMP) | |
| IC003 | 8-759-100-97 | IC uPC339G2 (HYSTERESIS COMPARATOR) | |
| IC004 | 8-752-353-92 | IC CXL5005M-T4 (CCD 1H DELAY) | |
| IC005 | 8-759-233-64 | IC TC74HC04AF (INVERTER) | |
| IC006 | 8-759-257-87 | IC MM1117XFBE (SWITCH) | |
| IC007 | 8-752-055-37 | IC CXA1255Q (VIDEO SIGNAL PROCESSOR) | |
| IC008 | 8-759-296-96 | IC CXD1152-MS (C MOS INV) | |
| IC009 | 8-752-055-36 | IC CXA1254Q (DEMODULATOR) | |
| IC011 | 8-759-098-80 | IC MB90085-123-EF (CHARACTOR GENERATOR) | |
| IC201 | 8-759-093-98 | IC CXD8451M (D/A CONVERTER) | |
| IC202 | 8-759-008-67 | IC MC14066BF (LINE OUT SELECTOR) | |
| IC203 | 8-752-351-78 | IC CXD2500BQ (DIGITAL SIGNAL PROCESSOR) | |
| IC204 | 8-759-253-26 | IC CA0002AM-TP (AFM DEMOD CX NR) | |
| IC205 | 8-759-700-43 | IC NJM4558M (CD SPINDLE ERROR AMP) | |
| IC206 | 8-759-700-43 | IC NJM4558M (L. P. F AMP) | |
| IC207 | 8-759-700-43 | IC NJM4558M (L. P. F AMP) | |
| IC401 | 8-752-056-79 | IC CXA1632Q (SERVO) | |
| △IC402 | 8-759-048-30 | IC LA6510L (SLED DRIVE AMP) | |
| IC403 | 8-759-300-71 | IC HD14053BFP (SWITCH) | |
| IC404 | 8-759-300-71 | IC HD14053BFP (SWITCH) | |
| IC405 | 8-759-058-52 | IC XRA10324AF-E2 (TILT ERROR AMP ADD) | |
| IC406 | 8-759-700-43 | IC NJM4558M (DRIVE AMP) | |
| IC409 | 8-759-700-43 | IC NJM4558M (PHASE AMP) | |
| IC410 | 8-759-242-64 | IC TC4W53F (RF AMP) | |
| IC411 | 8-759-700-43 | IC NJM4558M (PHASE AMP) | |
| IC420 | 8-759-242-64 | IC TC4W53F (TRACKING ERROR AMP) | |
| IC500 | 8-759-100-97 | IC uPC339G2 (COMPARATOR) | |
| IC501 | 8-759-275-12 | IC MB89094PF-G-117 (SYSTEM CONTROL) | |
| IC502 | 8-759-098-78 | IC MB606F06 (SYSTEM CONTROL) | |
| IC503 | 8-759-231-92 | IC TA7291P (MOTOR DRIVE) | |
| IC504 | 8-759-058-52 | IC XRA10324AF-E2 (AMP) | |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|------------------------------|---------|
| IC505 | 8-759-009-06 | IC MC14052BF (SIGNAL SELECT) | |
| IC506 | 8-759-300-71 | IC HD14053BFP (SWITCH) | |
| IC507 | 8-759-206-28 | IC MC74HC123F (MONO MULTI) | |
| | | < JACK > | |
| J201 | 1-764-592-11 | JACK 3P (LINE OUT 2) | |
| | | < JUMPER RESISTOR > | |
| JR001 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR002 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR003 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR004 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR005 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR006 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR007 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR008 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR009 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR010 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR011 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR201 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR202 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR203 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR205 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR207 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR208 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR209 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR210 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR280 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR285 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR401 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR402 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR403 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| JR501 | 1-216-296-00 | METAL CHIP 0 5% 1/8W | |
| JR502 | 1-216-295-91 | CONDCTOR, CHIP (2012) | |
| | | < COIL > | |
| L003 | 1-408-419-00 | INDUCTOR 68uH | |
| L008 | 1-410-657-21 | INDUCTOR CHIP 180uH | |
| L010 | 1-408-421-00 | INDUCTOR 100uH | |
| L011 | 1-408-422-00 | INDUCTOR 120uH | |
| L015 | 1-410-385-11 | INDUCTOR CHIP 22uH | |
| L016 | 1-408-609-41 | INDUCTOR 33uH | |
| L017 | 1-408-773-31 | INDUCTOR CHIP 4.7uH | |
| L201 | 1-408-421-00 | INDUCTOR 100uH | |
| L202 | 1-408-418-00 | INDUCTOR 56uH | |
| L210 | 1-408-417-00 | INDUCTOR 47uH | |
| L401 | 1-408-409-00 | INDUCTOR 10uH | |
| L402 | 1-408-409-00 | INDUCTOR 10uH | |
| L501 | 1-410-381-11 | INDUCTOR CHIP 10uH | |

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

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| Ref. No. | Part No. | Description | Remarks | Ref. No. | Part No. | Description | Remarks |
|----------------|--------------|-------------|-------------|--------------|--------------|-------------|------------------|
| < TRANSISTOR > | | | | | | | |
| Q001 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q412 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG |
| Q002 | 8-729-140-75 | TRANSISTOR | 2SD999-CLCK | Q500 | 8-729-900-53 | TRANSISTOR | DTC114EK |
| Q003 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q501 | 8-729-216-22 | TRANSISTOR | 2SA1162-G |
| Q004 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q502 | 8-729-901-04 | TRANSISTOR | DTA114EK |
| Q005 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q503 | 8-729-901-04 | TRANSISTOR | DTA114EK |
| Q006 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q504 | 8-729-901-04 | TRANSISTOR | DTA114EK |
| Q007 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q505 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG |
| Q008 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | Q506 | 8-729-900-53 | TRANSISTOR | DTC114EK |
| Q009 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | Q507 | 8-729-900-53 | TRANSISTOR | DTC114EK |
| Q010 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q950 | 8-729-202-38 | TRANSISTOR | 2SC3326N-A |
| Q011 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | Q951 | 8-729-901-04 | TRANSISTOR | DTA114EK |
| Q012 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | < RESISTOR > | | | |
| Q013 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | R001 | 1-216-075-00 | METAL CHIP | 12K 5% 1/10W |
| Q014 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R002 | 1-216-085-00 | METAL CHIP | 33K 5% 1/10W |
| Q015 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R003 | 1-216-085-00 | METAL CHIP | 33K 5% 1/10W |
| Q016 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R004 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| Q017 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | R005 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| Q018 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R006 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| Q019 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R007 | 1-216-049-00 | METAL CHIP | 1K 5% 1/10W |
| Q021 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R008 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W |
| Q024 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | R009 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| Q026 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R010 | 1-208-810-11 | METAL GLAZE | 15K 0.50% 1/10W |
| Q031 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R011 | 1-216-095-00 | METAL CHIP | 82K 5% 1/10W |
| Q201 | 8-729-901-04 | TRANSISTOR | DTA114EK | R012 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W |
| Q202 | 8-729-900-53 | TRANSISTOR | DTC114EK | R013 | 1-216-089-00 | METAL CHIP | 47K 5% 1/10W |
| Q203 | 8-729-231-55 | TRANSISTOR | 2SC2878-AB | R014 | 1-208-810-11 | METAL GLAZE | 15K 0.50% 1/10W |
| Q206 | 8-729-900-53 | TRANSISTOR | DTC114EK | R015 | 1-216-097-00 | METAL CHIP | 100K 5% 1/10W |
| Q207 | 8-729-231-55 | TRANSISTOR | 2SC2878-AB | R016 | 1-216-097-00 | METAL CHIP | 100K 5% 1/10W |
| Q210 | 8-729-901-04 | TRANSISTOR | DTA114EK | R017 | 1-216-049-00 | METAL CHIP | 1K 5% 1/10W |
| Q211 | 8-729-900-53 | TRANSISTOR | DTC114EK | R018 | 1-216-065-00 | METAL CHIP | 4.7K 5% 1/10W |
| Q212 | 8-729-900-53 | TRANSISTOR | DTC114EK | R019 | 1-216-067-00 | METAL CHIP | 5.6K 5% 1/10W |
| Q213 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R020 | 1-216-097-00 | METAL CHIP | 100K 5% 1/10W |
| Q214 | 8-729-901-04 | TRANSISTOR | DTA114EK | R021 | 1-208-830-11 | METAL GLAZE | 100K 0.50% 1/10W |
| Q215 | 8-729-901-04 | TRANSISTOR | DTA114EK | R022 | 1-208-830-11 | METAL GLAZE | 100K 0.50% 1/10W |
| Q216 | 8-729-900-53 | TRANSISTOR | DTC114EK | R023 | 1-216-113-00 | METAL CHIP | 470K 5% 1/10W |
| Q217 | 8-729-901-04 | TRANSISTOR | DTA114EK | R024 | 1-208-830-11 | METAL GLAZE | 100K 0.50% 1/10W |
| Q218 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R025 | 1-208-830-11 | METAL GLAZE | 100K 0.50% 1/10W |
| Q219 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R026 | 1-216-063-00 | METAL CHIP | 3.9K 5% 1/10W |
| Q400 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R027 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W |
| Q401 | 8-729-216-22 | TRANSISTOR | 2SA1162-G | R028 | 1-216-113-00 | METAL CHIP | 470K 5% 1/10W |
| Q403 | 8-729-024-95 | TRANSISTOR | 2SB1565EF | R029 | 1-208-806-11 | METAL GLAZE | 10K 0.50% 1/10W |
| Q404 | 8-729-019-01 | TRANSISTOR | 2SD2394-EF | R030 | 1-208-804-11 | METAL GLAZE | 8.2K 0.50% 1/10W |
| Q405 | 8-729-019-01 | TRANSISTOR | 2SD2394-EF | R031 | 1-208-806-11 | METAL GLAZE | 10K 0.50% 1/10W |
| Q406 | 8-729-024-95 | TRANSISTOR | 2SB1565EF | R032 | 1-208-800-11 | METAL GLAZE | 5.6K 0.50% 1/10W |
| Q407 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R033 | 1-216-079-00 | METAL CHIP | 18K 5% 1/10W |
| Q408 | 8-729-901-04 | TRANSISTOR | DTA114EK | R034 | 1-216-089-00 | METAL CHIP | 47K 5% 1/10W |
| Q409 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R035 | 1-216-063-00 | METAL CHIP | 3.9K 5% 1/10W |
| Q410 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R036 | 1-216-113-00 | METAL CHIP | 470K 5% 1/10W |
| Q411 | 8-729-230-49 | TRANSISTOR | 2SC2712-YG | R037 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |

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| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|-------------|---------|-------|-------|
| R038 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R039 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R040 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R041 | 1-208-830-11 | METAL GLAZE | 100K | 0.50% | 1/10W |
| R042 | 1-208-830-11 | METAL GLAZE | 100K | 0.50% | 1/10W |
| R043 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R044 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R045 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R046 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R047 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R048 | 1-216-040-00 | METAL GLAZE | 430 | 5% | 1/10W |
| R049 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R050 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R051 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R052 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R053 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R054 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R055 | 1-216-091-00 | METAL CHIP | 56K | 5% | 1/10W |
| R056 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R057 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R058 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R059 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R060 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R061 | 1-216-055-00 | METAL CHIP | 1.8K | 5% | 1/10W |
| R062 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R063 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R064 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R065 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R066 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R067 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W |
| R068 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R069 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R070 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R071 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W |
| R072 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W |
| R073 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R074 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R075 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W |
| R076 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R077 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R078 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R079 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R080 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W |
| R081 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R082 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R083 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R084 | 1-216-109-00 | METAL CHIP | 330K | 5% | 1/10W |
| R085 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R086 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R087 | 1-216-109-00 | METAL CHIP | 330K | 5% | 1/10W |

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|------------------------|---------|-------|-------|
| R088 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R089 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R090 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R091 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R092 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R093 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W |
| R094 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R095 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R096 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R097 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R098 | 1-216-063-00 | METAL CHIP | 3.9K | 5% | 1/10W |
| R099 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R100 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R101 | 1-216-009-00 | METAL CHIP | 22 | 5% | 1/10W |
| R102 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R103 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R104 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R105 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R106 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R107 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R108 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R109 | 1-216-063-00 | METAL CHIP | 3.9K | 5% | 1/10W |
| R110 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R111 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R112 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R113 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R114 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R115 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R116 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R117 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R118 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R119 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R120 | 1-216-047-00 | METAL CHIP | 820 | 5% | 1/10W |
| R121 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R122 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R123 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R124 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R125 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R126 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R127 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R128 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R129 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R130 | 1-208-782-11 | METAL GLAZE | 1K | 0.50% | 1/10W |
| R131 | 1-208-781-11 | METAL GLAZE | 910 | 0.50% | 1/10W |
| R132 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R133 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R134 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R137 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R138 | 1-216-039-00 | METAL CHIP | 390 | 5% | 1/10W |
| R139 | 1-216-091-00 | METAL CHIP | 56K | 5% | 1/10W |

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| Ref. No. | Part No. | Description | Quantity | Percentage | Remarks |
|----------|--------------|------------------------|----------|------------|---------|
| R140 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R141 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R142 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R143 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R144 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R145 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R146 | 1-216-051-00 | METAL CHIP | 1.2K | 5% | 1/10W |
| R147 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R148 | 1-216-055-00 | METAL CHIP | 1.8K | 5% | 1/10W |
| R149 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R150 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R151 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R152 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R153 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R154 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R155 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R156 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R157 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R158 | 1-216-055-00 | METAL CHIP | 1.8K | 5% | 1/10W |
| R159 | 1-216-117-00 | METAL CHIP | 680K | 5% | 1/10W |
| R160 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R161 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R162 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R163 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R164 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R165 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R166 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R167 | 1-216-051-00 | METAL CHIP | 1.2K | 5% | 1/10W |
| R169 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R170 | 1-216-115-00 | METAL CHIP | 560K | 5% | 1/10W |
| R174 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R175 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R179 | 1-216-031-00 | METAL CHIP | 180 | 5% | 1/10W |
| R182 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R189 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R190 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R191 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R192 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R193 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R194 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |
| R197 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R199 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R200 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R201 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R202 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R203 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R204 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R206 | 1-216-676-11 | METAL CHIP | 11K | 0.5% | 1/10W |
| R207 | 1-208-803-11 | METAL GLAZE | 7.5K | 2% | 1/10W |
| R208 | 1-216-635-11 | METAL CHIP | 220 | 0.5% | 1/10W |

| Ref. No. | Part No. | Description | Quantity | Percentage | Remarks |
|----------|--------------|------------------------|----------|------------|---------|
| R209 | 1-216-649-11 | METAL CHIP | 820 | 0.5% | 1/10W |
| R210 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R211 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R212 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R213 | 1-216-657-11 | METAL CHIP | 1.8K | 0.5% | 1/10W |
| R214 | 1-216-676-11 | METAL CHIP | 11K | 0.5% | 1/10W |
| R215 | 1-208-803-11 | METAL GLAZE | 7.5K | 2% | 1/10W |
| R216 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R217 | 1-216-685-11 | METAL CHIP | 27K | 0.5% | 1/10W |
| R218 | 1-216-685-11 | METAL CHIP | 27K | 0.5% | 1/10W |
| R219 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R220 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R222 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R223 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R224 | 1-216-649-11 | METAL CHIP | 820 | 0.5% | 1/10W |
| R225 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R226 | 1-216-657-11 | METAL CHIP | 1.8K | 0.5% | 1/10W |
| R231 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R232 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R233 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R234 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R235 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R236 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R237 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R239 | 1-216-635-11 | METAL CHIP | 220 | 0.5% | 1/10W |
| R240 | 1-216-649-11 | METAL CHIP | 820 | 0.5% | 1/10W |
| R241 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R242 | 1-216-685-11 | METAL CHIP | 27K | 0.5% | 1/10W |
| R243 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R244 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R245 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R247 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R248 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R251 | 1-216-657-11 | METAL CHIP | 1.8K | 0.5% | 1/10W |
| R252 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R253 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R255 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R256 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R257 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R258 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R262 | 1-216-649-11 | METAL CHIP | 820 | 0.5% | 1/10W |
| R263 | 1-216-657-11 | METAL CHIP | 1.8K | 0.5% | 1/10W |
| R264 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R266 | 1-216-676-11 | METAL CHIP | 11K | 0.5% | 1/10W |
| R267 | 1-208-803-11 | METAL GLAZE | 7.5K | 2% | 1/10W |
| R268 | 1-216-685-11 | METAL CHIP | 27K | 0.5% | 1/10W |
| R269 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R271 | 1-218-760-11 | METAL GLAZE | 220K | 2% | 1/10W |
| R273 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R274 | 1-216-074-00 | METAL CHIP | 11K | 5% | 1/10W |

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|------------------------|---------|-------|-------|
| R275 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R276 | 1-216-676-11 | METAL CHIP | 11K | 0.5% | 1/10W |
| R277 | 1-208-803-11 | METAL GLAZE | 7.5K | 2% | 1/10W |
| R278 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R279 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R282 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R283 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R284 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R285 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R286 | 1-208-838-11 | METAL GLAZE | 220K | 0.50% | 1/10W |
| R287 | 1-208-798-11 | METAL GLAZE | 4.7K | 0.50% | 1/10W |
| R289 | 1-208-829-11 | METAL GLAZE | 91K | 0.50% | 1/10W |
| R290 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R291 | 1-208-824-11 | METAL GLAZE | 56K | 0.50% | 1/10W |
| R292 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R293 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R294 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R295 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R298 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R299 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R300 | 1-208-824-11 | METAL GLAZE | 56K | 0.50% | 1/10W |
| R301 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R303 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R304 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R305 | 1-208-824-11 | METAL GLAZE | 56K | 0.50% | 1/10W |
| R306 | 1-208-824-11 | METAL GLAZE | 56K | 0.50% | 1/10W |
| R307 | 1-208-837-11 | METAL GLAZE | 200K | 0.50% | 1/10W |
| R308 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R309 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R311 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R315 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R317 | 1-216-055-00 | METAL CHIP | 1.8K | 5% | 1/10W |
| R318 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |
| R319 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R320 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R321 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R322 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R323 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R324 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R325 | 1-216-104-00 | METAL CHIP | 200K | 5% | 1/10W |
| R326 | 1-216-017-00 | METAL CHIP | 47 | 5% | 1/10W |
| R327 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R328 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R329 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R330 | 1-216-051-00 | METAL CHIP | 1.2K | 5% | 1/10W |
| R331 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R332 | 1-216-023-00 | METAL CHIP | 82 | 5% | 1/10W |
| R333 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R334 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R335 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|-------------|---------|------|-------|
| R336 | 1-216-055-00 | METAL CHIP | 1.8K | 5% | 1/10W |
| R340 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R341 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |
| R400 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R401 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R402 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R403 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R404 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W |
| R405 | 1-216-107-00 | METAL CHIP | 270K | 5% | 1/10W |
| R406 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| R407 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W |
| R408 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W |
| R409 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R410 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R411 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R412 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R413 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R414 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W |
| R415 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R416 | 1-216-103-91 | METAL GLAZE | 180K | 5% | 1/10W |
| R417 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R418 | 1-216-091-00 | METAL CHIP | 56K | 5% | 1/10W |
| R419 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R420 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R421 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R422 | 1-216-109-00 | METAL CHIP | 330K | 5% | 1/10W |
| R423 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R424 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| R425 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R426 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R427 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| R428 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R429 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W |
| R431 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R432 | 1-216-082-00 | METAL GLAZE | 24K | 5% | 1/10W |
| R433 | 1-216-100-00 | METAL GLAZE | 130K | 5% | 1/10W |
| R434 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R435 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R436 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| R437 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R438 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R439 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R440 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R441 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R442 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R443 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R444 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R445 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R446 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R447 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |

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| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|-------------|---------|------|-------|
| R448 | 1-216-092-00 | METAL GLAZE | 62K | 5% | 1/10W |
| R449 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W |
| R450 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R451 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R452 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R453 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R454 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R455 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R456 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R457 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R458 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R459 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R460 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W |
| R461 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R462 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R463 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R464 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R465 | 1-216-069-00 | METAL CHIP | 6.8K | 5% | 1/10W |
| R466 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R467 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R468 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R469 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R470 | 1-216-075-00 | METAL CHIP | 12K | 5% | 1/10W |
| R471 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |
| R472 | 1-216-017-00 | METAL CHIP | 47 | 5% | 1/10W |
| R473 | 1-216-051-00 | METAL CHIP | 1.2K | 5% | 1/10W |
| R474 | 1-216-003-11 | METAL GLAZE | 12 | 5% | 1/10W |
| R475 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R476 | 1-216-146-00 | METAL GLAZE | 6.8 | 5% | 1/8W |
| R477 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R478 | 1-216-109-00 | METAL CHIP | 330K | 5% | 1/10W |
| R479 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W |
| R480 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R481 | 1-216-369-00 | METAL OXIDE | 1 | 5% | 2W F |
| R482 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R483 | 1-216-053-00 | METAL CHIP | 1.5K | 5% | 1/10W |
| R484 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R485 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R486 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R487 | 1-216-039-00 | METAL CHIP | 390 | 5% | 1/10W |
| R488 | 1-216-047-00 | METAL CHIP | 820 | 5% | 1/10W |
| R489 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R490 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R491 | 1-216-146-00 | METAL GLAZE | 6.8 | 5% | 1/8W |
| R492 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R493 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R494 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R495 | 1-216-079-00 | METAL CHIP | 18K | 5% | 1/10W |
| R496 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| R497 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|-------------|---------|-------|--------|
| R498 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R499 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| R500 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R501 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R502 | 1-216-111-00 | METAL CHIP | 390K | 5% | 1/10W |
| R503 | 1-216-113-00 | METAL CHIP | 470K | 5% | 1/10W |
| R504 | 1-208-808-11 | METAL GLAZE | 12K | 0.50% | 1/10W |
| R505 | 1-216-035-00 | METAL CHIP | 270 | 5% | 1/10W |
| R506 | 1-208-810-11 | METAL GLAZE | 15K | 0.50% | 1/10W |
| R507 | 1-208-844-11 | METAL GLAZE | 390K | 0.50% | 1/10W |
| R508 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R509 | 1-208-816-11 | METAL GLAZE | 27K | 0.50% | 1/10W |
| R510 | 1-208-838-11 | METAL GLAZE | 220K | 0.50% | 1/10W |
| R511 | 1-208-806-11 | METAL GLAZE | 10K | 0.50% | 1/10W |
| R512 | 1-208-818-11 | METAL GLAZE | 33K | 0.50% | 1/10W |
| R513 | 1-208-830-11 | METAL GLAZE | 100K | 0.50% | 1/10W |
| R514 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R515 | 1-208-818-11 | METAL GLAZE | 33K | 0.50% | 1/10W |
| R516 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R517 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R518 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R520 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R521 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R522 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R523 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R524 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R525 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R526 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R527 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R528 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R529 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R530 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R531 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R532 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| △R533 | 1-212-950-00 | FUSIBLE | 4.7 | 5% | 1/2W F |
| R534 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R535 | 1-216-093-00 | METAL CHIP | 68K | 5% | 1/10W |
| R536 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R537 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R538 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R539 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R540 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R541 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R542 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R545 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R546 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R547 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R548 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R549 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R550 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |

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

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|------------------------|---------|-------|-------|
| R552 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R553 | 1-216-029-00 | METAL CHIP | 150 | 5% | 1/10W |
| R554 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R556 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R557 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R558 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R559 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R560 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R561 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R562 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R563 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R564 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R565 | 1-216-121-00 | METAL CHIP | 1M | 5% | 1/10W |
| R566 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R568 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R569 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R570 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R571 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R572 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R573 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R574 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R575 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R576 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R577 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R578 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R579 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R580 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R581 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R582 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R583 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R584 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R585 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R586 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R587 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R588 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R589 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R590 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R591 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R592 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R593 | 1-208-795-11 | METAL GLAZE | 3.6K | 0.50% | 1/10W |
| R594 | 1-216-059-00 | METAL CHIP | 2.7K | 5% | 1/10W |
| R595 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R597 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R598 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R604 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R605 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R606 | 1-216-037-00 | METAL CHIP | 330 | 5% | 1/10W |
| R608 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R609 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R610 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |

| Ref. No. | Part No. | Description | Remarks | | |
|----------|--------------|------------------------|---------|------|-------|
| R611 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R612 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R613 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R614 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R615 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R616 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R617 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R618 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R619 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R620 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R621 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R622 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R623 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R625 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R626 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R628 | 1-216-041-00 | METAL CHIP | 470 | 5% | 1/10W |
| R630 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R632 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R633 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R634 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R635 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R636 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R637 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R638 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R639 | 1-216-081-00 | METAL CHIP | 22K | 5% | 1/10W |
| R642 | 1-216-089-00 | METAL CHIP | 47K | 5% | 1/10W |
| R643 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R644 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R645 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| R646 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R647 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R648 | 1-216-073-00 | METAL CHIP | 10K | 5% | 1/10W |
| R649 | 1-216-025-00 | METAL CHIP | 100 | 5% | 1/10W |
| R650 | 1-216-101-00 | METAL CHIP | 150K | 5% | 1/10W |
| R651 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| R699 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R801 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R802 | 1-216-105-00 | METAL CHIP | 220K | 5% | 1/10W |
| R803 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R804 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| R805 | 1-216-117-00 | METAL CHIP | 680K | 5% | 1/10W |
| R806 | 1-216-085-00 | METAL CHIP | 33K | 5% | 1/10W |
| R807 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R808 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |
| R809 | 1-216-689-11 | METAL CHIP | 39K | 0.5% | 1/10W |
| R810 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R812 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R813 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R814 | 1-216-295-91 | CONDUCTOR, CHIP (2012) | | | |
| R815 | 1-216-109-00 | METAL CHIP | 330K | 5% | 1/10W |

MB-712 **MD-703**

| Ref. No. | Part No. | Description | Remarks | | |
|-------------------------------------|--------------|-----------------------------------|---------|-------|-------|
| R816 | 1-216-043-00 | METAL CHIP | 560 | 5% | 1/10W |
| R850 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R900 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| | | | | | |
| R901 | 1-208-807-11 | METAL GLAZE | 11K | 0.50% | 1/10W |
| R902 | 1-208-808-11 | METAL GLAZE | 12K | 0.50% | 1/10W |
| R903 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R904 | 1-216-021-00 | METAL CHIP | 68 | 5% | 1/10W |
| R905 | 1-216-065-00 | METAL CHIP | 4.7K | 5% | 1/10W |
| | | | | | |
| R906 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R907 | 1-216-061-00 | METAL CHIP | 3.3K | 5% | 1/10W |
| R912 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R913 | 1-216-083-00 | METAL CHIP | 27K | 5% | 1/10W |
| R914 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| | | | | | |
| R915 | 1-216-071-00 | METAL CHIP | 8.2K | 5% | 1/10W |
| R916 | 1-216-077-00 | METAL CHIP | 15K | 5% | 1/10W |
| R917 | 1-216-047-00 | METAL CHIP | 820 | 5% | 1/10W |
| R918 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R924 | 1-216-295-91 | CONDCTOR, CHIP (2012) | | | |
| | | | | | |
| R950 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R951 | 1-216-097-00 | METAL CHIP | 100K | 5% | 1/10W |
| | | | | | |
| < VARIABLE RESISTOR > | | | | | |
| | | | | | |
| RV001 | 1-223-239-11 | RES, ADJ, CARBON 10K | | | |
| RV002 | 1-223-239-11 | RES, ADJ, CARBON 10K | | | |
| RV401 | 1-238-602-11 | RES, ADJ, CARBON 47K | | | |
| RV402 | 1-238-602-11 | RES, ADJ, CARBON 47K | | | |
| RV501 | 1-223-240-11 | RES, ADJ, CARBON 22K | | | |
| | | | | | |
| < VIBRATOR > | | | | | |
| | | | | | |
| X201 | 1-567-908-11 | VIBRATOR, CRYSTAL (16.934MHz) | | | |
| X501 | 1-567-900-11 | OSCILLATOR, CRYSTAL (14.31818MHz) | | | |
| ***** | | | | | |
| A-6421-956-A MD-703 BOARD, COMPLETE | | | | | |
| ***** | | | | | |
| (Ref.No.2,000 Serieese) | | | | | |
| | | | | | |
| 3-953-262-01 HOLDER, LED | | | | | |
| | | | | | |
| < CAPACITOR > | | | | | |
| | | | | | |
| C431 | 1-126-947-11 | ELECT | 47uF | 20% | 35V |
| | | | | | |
| < CONNECTOR > | | | | | |
| | | | | | |
| * CN431 | 1-764-595-21 | CONNECTOR, FPC 14P | | | |
| CN432 | 1-506-470-11 | PIN, CONNECTOR 5P | | | |
| CN433 | 1-564-014-11 | PIN, CONNECTOR 4P | | | |
| CN434 | 1-506-468-11 | PIN, CONNECTOR 3P | | | |
| | | | | | |
| < DIODE > | | | | | |
| | | | | | |
| D431 | 8-719-912-39 | LED SLR932A | | | |
| D432 | 8-729-020-74 | DIODE GP1S24 | | | |

| Ref. No. | Part No. | Description | Remarks | | |
|---------------------|--------------|-----------------------------------|---------|----|-------|
| D433 | 8-729-020-74 | DIODE GP1S24 | | | |
| D434 | 8-729-020-74 | DIODE GP1S24 | | | |
| | | | | | |
| < IC > | | | | | |
| | | | | | |
| IC431 | 8-759-256-59 | IC SN74HC00ANS (DETECTOR CONTROL) | | | |
| | | | | | |
| < JUMPER RESISTOR > | | | | | |
| | | | | | |
| JR413 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR414 | 1-216-295-91 | CONDCTOR, CHIP (2012) | | | |
| JR431 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR432 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR433 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | | | | |
| JR435 | 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 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR443 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR444 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR445 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | | | | |
| JR446 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR447 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR448 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR449 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR450 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | | | | |
| JR451 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR452 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR453 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR454 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR455 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | | | | |
| JR456 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR457 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR458 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR460 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| JR461 | 1-216-296-00 | METAL CHIP | 0 | 5% | 1/8W |
| | | | | | |
| < RESISTOR > | | | | | |
| | | | | | |
| R431 | 1-216-033-00 | METAL CHIP | 220 | 5% | 1/10W |
| R432 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R433 | 1-216-049-00 | METAL CHIP | 1K | 5% | 1/10W |
| R434 | 1-216-045-00 | METAL CHIP | 680 | 5% | 1/10W |
| R435 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| | | | | | |
| R436 | 1-216-039-00 | METAL CHIP | 390 | 5% | 1/10W |
| R437 | 1-216-099-00 | METAL CHIP | 120K | 5% | 1/10W |
| R438 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |
| R439 | 1-216-095-00 | METAL CHIP | 82K | 5% | 1/10W |

MD-703

MT-702

PS-716

| Ref. No. | Part No. | Description | Remarks |
|----------------|--------------|------------------------------------|------------------|
| | | < SWITCH > | |
| S431 | 1-692-440-11 | SWITCH, PUSH (TILT) | |
| ***** | | | |
| | A-6421-953-A | MT-702 BOARD, COMPLETE | |
| | | ***** | |
| | | (Ref.No.4,000 Serie) | |
| | | < CAPACITOR > | |
| C471 | 1-161-063-00 | CERAMIC 0.1uF | 10% 50V |
| | | < CONNECTOR > | |
| * CN471 | 1-695-105-11 | PIN, CONNECTOR (PC BOARD) 3P BOARD | |
| ***** | | | |
| * A-6423-216-A | | PS-716 BOARD, COMPLETE | |
| | | ***** | |
| | | (Ref.No.6,000 Serie) | |
| | 1-533-223-11 | HOLDER, FUSE | |
| | | < CAPACITOR > | |
| C031 | 1-126-948-11 | ELECT | 100uF 20% 35V |
| C032 | 1-164-222-11 | CERAMIC CHIP | 0.22uF 25V |
| C034 | 1-164-222-11 | CERAMIC CHIP | 0.22uF 25V |
| C035 | 1-126-941-11 | ELECT | 470uF 20% 25V |
| C036 | 1-126-944-11 | ELECT | 3300uF 20% 25V |
| C037 | 1-126-946-11 | ELECT | 6800uF 20% 25V |
| C038 | 1-126-944-11 | ELECT | 3300uF 20% 25V |
| C046 | 1-124-557-11 | ELECT | 1000uF 20% 25V |
| C051 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V |
| C052 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V |
| C054 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V |
| C055 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V |
| C056 | 1-163-007-11 | CERAMIC CHIP | 680PF 10% 50V |
| C058 | 1-163-035-00 | CERAMIC CHIP | 0.047uF 50V |
| C059 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF 5% 50V |
| C060 | 1-163-007-11 | CERAMIC CHIP | 680PF 10% 50V |
| C061 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF 5% 50V |
| C062 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V |
| C063 | 1-124-122-11 | ELECT | 100uF 20% 50V |
| C064 | 1-163-035-00 | CERAMIC CHIP | 0.047uF 50V |
| C701 | 1-126-916-11 | ELECT | 1000uF 20% 6.3V |
| C702 | 1-126-916-11 | ELECT | 1000uF 20% 6.3V |
| C703 | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V |
| C704 | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V |
| C706 | 1-163-011-11 | CERAMIC CHIP | 0.0015uF 10% 50V |
| C707 | 1-126-964-11 | ELECT | 10uF 20% 50V |
| C708 | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V |
| C709 | 1-163-139-00 | CERAMIC CHIP | 820PF 5% 50V |
| C710 | 1-124-927-11 | ELECT | 4.7uF 20% 100V |

| Ref. No. | Part No. | Description | Remarks |
|----------|--------------|---|-----------------|
| C711 | 1-126-916-11 | ELECT | 1000uF 20% 6.3V |
| C712 | 1-126-916-11 | ELECT | 1000uF 20% 6.3V |
| C713 | 1-164-005-11 | CERAMIC CHIP | 0.47uF 25V |
| C714 | 1-126-966-11 | ELECT | 33uF 20% 16V |
| C718 | 1-126-948-11 | ELECT | 100uF 20% 35V |
| | | < CONNECTOR > | |
| * CN030 | 1-564-029-00 | PIN, CONNECTOR 4P | |
| CN031 | 1-506-483-21 | PIN, CONNECTOR 4P | |
| CN051 | 1-506-487-11 | PIN, CONNECTOR 8P | |
| CN052 | 1-564-506-11 | PLUG, CONNECTOR 3P | |
| CN055 | 1-506-485-11 | PIN, CONNECTOR 6P | |
| | | < DIODE > | |
| △D031 | 8-719-200-82 | DIODE 11ES2 | |
| △D032 | 8-719-200-82 | DIODE 11ES2 | |
| D033 | 8-719-911-19 | DIODE 1SS119 | |
| △D034 | 8-719-025-17 | DIODE D3SBA10-4100 | |
| D035 | 8-719-911-19 | DIODE 1SS119 | |
| D051 | 8-719-980-78 | DIODE ERA81-006 | |
| D052 | 8-719-980-78 | DIODE ERA81-006 | |
| 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 | |
| D058 | 8-719-109-85 | DIODE RD5.1ES-B2 | |
| D059 | 8-719-109-75 | DIODE RD4.3ES-B2 | |
| D060 | 8-719-911-19 | DIODE 1SS119 | |
| △D061 | 8-719-503-40 | DIODE S3V40 | |
| D701 | 8-719-980-78 | DIODE ERA81-006 | |
| D702 | 8-719-980-78 | DIODE ERA81-006 | |
| | | < IC > | |
| △IC031 | 8-759-231-53 | IC M5F7805 (+5V REG) | |
| IC051 | 8-759-509-91 | IC XRA10393F (PWM CONVERSION) | |
| IC052 | 8-759-700-43 | IC NJM4558M (PWM AMP/CURRENT FEED BACK) | |
| △IC701 | 8-759-946-09 | IC FA7611M (REG) | |
| | | < COIL > | |
| L051 | 1-424-219-11 | COIL, CHOKE 300uH | |
| L701 | 1-424-219-11 | COIL, CHOKE 300uH | |
| L702 | 1-412-525-21 | INDUCTOR 10uH | |
| L703 | 1-412-537-31 | INDUCTOR 100uH | |
| L704 | 1-424-219-11 | COIL, CHOKE 300uH | |
| L705 | 1-412-525-21 | INDUCTOR 10uH | |

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

PS-716

PW-711

| Ref. No. | Part No. | Description | Remarks |
|----------------|--------------|----------------------------|---------|
| < IC LINK > | | | |
| △PS051 | 1-532-675-00 | LINK, IC 1.5A | |
| △PS052 | 1-532-675-00 | LINK, IC 1.5A | |
| △PS053 | 1-532-843-21 | LINK, IC | |
| △PS054 | 1-532-843-21 | LINK, IC | |
| < TRANSISTOR > | | | |
| Q031 | 8-729-141-75 | TRANSISTOR 2SD596DV345 | |
| △Q051 | 8-729-117-11 | TRANSISTOR 2SB1151 | |
| △Q052 | 8-729-019-31 | TRANSISTOR 2SC4596E | |
| △Q053 | 8-729-117-11 | TRANSISTOR 2SB1151 | |
| △Q054 | 8-729-019-31 | TRANSISTOR 2SC4596E | |
| Q055 | 8-729-119-78 | TRANSISTOR 2SC2785-HFE | |
| Q056 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| Q058 | 8-729-230-49 | TRANSISTOR 2SC2712-YG | |
| Q059 | 8-729-216-22 | TRANSISTOR 2SA1162-G | |
| Q060 | 8-729-230-49 | TRANSISTOR 2SC2712-YG | |
| Q061 | 8-729-119-76 | TRANSISTOR 2SA1175-HFE | |
| △Q701 | 8-729-925-37 | TRANSISTOR 2SB891 | |
| △Q702 | 8-729-925-37 | TRANSISTOR 2SB891 | |
| < RESISTOR > | | | |
| △R031 | 1-212-867-00 | FUSIBLE 27 5% 1/4W F | |
| R032 | 1-216-057-00 | METAL CHIP 2.2K 5% 1/10W | |
| △R033 | 1-216-426-11 | METAL OXIDE 82 5% 1W F | |
| R034 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| R035 | 1-216-061-00 | METAL CHIP 3.3K 5% 1/10W | |
| R051 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R052 | 1-216-075-00 | METAL CHIP 12K 5% 1/10W | |
| R053 | 1-216-093-00 | METAL CHIP 68K 5% 1/10W | |
| R054 | 1-216-081-00 | METAL CHIP 22K 5% 1/10W | |
| R055 | 1-216-091-00 | METAL CHIP 56K 5% 1/10W | |
| R056 | 1-216-097-00 | METAL CHIP 100K 5% 1/10W | |
| R057 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R061 | 1-216-089-00 | METAL CHIP 47K 5% 1/10W | |
| R062 | 1-216-065-00 | METAL CHIP 4.7K 5% 1/10W | |
| R063 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| R064 | 1-247-750-11 | CARBON 680 5% 1/2W F | |
| R065 | 1-247-750-11 | CARBON 680 5% 1/2W F | |
| R066 | 1-216-049-00 | METAL CHIP 1K 5% 1/10W | |
| △R067 | 1-216-369-00 | METAL OXIDE 1 5% 2W F | |
| R068 | 1-219-387-21 | METAL CHIP 43K 0.10% 1/16W | |
| R069 | 1-219-391-21 | METAL CHIP 47K 0.10% 1/16W | |
| R070 | 1-219-387-21 | METAL CHIP 43K 0.10% 1/16W | |
| R071 | 1-219-391-21 | METAL CHIP 47K 0.10% 1/16W | |
| R072 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R073 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |

| Ref. No. | Part No. | Description | Remarks |
|------------------------|--------------|--------------------------------|---------|
| △R074 | 1-215-866-11 | METAL OXIDE 330 5% 1W F | |
| R075 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R076 | 1-247-750-11 | CARBON 680 5% 1/2W F | |
| R077 | 1-216-073-00 | METAL CHIP 10K 5% 1/10W | |
| R078 | 1-216-093-00 | METAL CHIP 68K 5% 1/10W | |
| R079 | 1-216-097-00 | METAL CHIP 100K 5% 1/10W | |
| R080 | 1-216-097-00 | METAL CHIP 100K 5% 1/10W | |
| R701 | 1-208-790-11 | METAL GLAZE 2.2K 0.50% 1/10W | |
| R702 | 1-208-814-11 | METAL GLAZE 22K 0.50% 1/10W | |
| R703 | 1-216-035-00 | METAL CHIP 270 5% 1/10W | |
| R704 | 1-216-055-00 | METAL CHIP 1.8K 5% 1/10W | |
| R705 | 1-216-043-00 | METAL CHIP 560 5% 1/10W | |
| R706 | 1-216-043-00 | METAL CHIP 560 5% 1/10W | |
| R707 | 1-208-822-11 | METAL GLAZE 47K 0.50% 1/10W | |
| R708 | 1-216-109-00 | METAL CHIP 330K 5% 1/10W | |
| R709 | 1-216-119-00 | METAL CHIP 820K 5% 1/10W | |
| R710 | 1-216-043-00 | METAL CHIP 560 5% 1/10W | |
| R711 | 1-208-830-11 | METAL GLAZE 100K 0.50% 1/10W | |
| R712 | 1-208-814-11 | METAL GLAZE 22K 0.50% 1/10W | |
| R713 | 1-208-794-11 | METAL GLAZE 3.3K 0.50% 1/10W | |
| R714 | 1-208-805-11 | METAL GLAZE 9.1K 0.50% 1/10W | |
| R715 | 1-216-055-00 | METAL CHIP 1.8K 5% 1/10W | |
| R716 | 1-216-055-00 | METAL CHIP 1.8K 5% 1/10W | |
| R717 | 1-216-029-00 | METAL CHIP 150 5% 1/10W | |
| < RELAY > | | | |
| △RY031 | 1-515-833-11 | RELAY | |
| ***** | | | |
| * | A-6423-218-A | PW-711 BOARD, COMPLETE | |
| ***** | | | |
| (Ref.No.7,000 Seriese) | | | |
| < CAPACITOR > | | | |
| C201 | 1-163-038-00 | CERAMIC CHIP 0.1uF | 25V |
| < CONNECTOR > | | | |
| CN201 | 1-506-484-11 | PIN, CONNECTOR 5P | |
| < DIODE > | | | |
| D201 | 8-719-046-97 | DIODE GL8ED5 (POWER) | |
| < IC > | | | |
| IC201 | 8-741-810-59 | IC SBX1810-59 (REMOTE CONTROL) | |
| < TRANSISTOR > | | | |
| Q201 | 8-729-901-04 | TRANSISTOR DTA114EK | |

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

PW-711

SW-719

SW-729

TR-718

VS-707

| Ref. No. | Part No. | Description | Remarks |
|---------------------------------------|--------------|------------------------------------|---------|
| < RESISTOR > | | | |
| R201 | 1-216-063-00 | METAL CHIP 3.9K 5% | 1/10W |
| R202 | 1-216-059-00 | METAL CHIP 2.7K 5% | 1/10W |
| R204 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| R205 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| < SWITCH > | | | |
| S201 | 1-572-946-11 | SWITCH, TACTIL (POWER) | |
| S202 | 1-572-946-11 | SWITCH, TACTIL (▲) | |
| S203 | 1-572-946-11 | SWITCH, TACTIL (LINE IN) | |
| ***** | | | |
| A-6421-954-A SW-719 BOARD, COMPLETE | | | |
| ***** | | | |
| (Ref.No.4,000 Serie)se | | | |
| < CONNECTOR > | | | |
| * CN481 | 1-566-779-11 | PIN, CONNECTOR (PC BOARD) 4P BOARD | |
| < SWITCH > | | | |
| S481 | 1-692-439-11 | SWITCH, PUSH (LOAD/CHUCK) | |
| ***** | | | |
| * A-6423-166-A SW-729 BOARD, COMPLETE | | | |
| ***** | | | |
| (Ref.No.7,000 Serie)se | | | |
| < CONNECTOR > | | | |
| CN101 | 1-506-484-11 | PIN, CONNECTOR 5P | |
| < DIODE > | | | |
| D103 | 8-719-992-30 | LED SLR305MC3F (AUTO RESUME) | |
| D104 | 8-719-992-30 | LED SLR305MC3F (AUTO RESUME) | |
| < TRANSISTOR > | | | |
| Q103 | 8-729-901-04 | TRANSISTOR DTA114EK | |
| < RESISTOR > | | | |
| R103 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| R104 | 1-216-037-00 | METAL CHIP 330 5% | 1/10W |
| R105 | 1-216-059-00 | METAL CHIP 2.7K 5% | 1/10W |
| R106 | 1-216-063-00 | METAL CHIP 3.9K 5% | 1/10W |
| R107 | 1-216-071-00 | METAL CHIP 8.2K 5% | 1/10W |
| R108 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R109 | 1-216-059-00 | METAL CHIP 2.7K 5% | 1/10W |
| R110 | 1-216-063-00 | METAL CHIP 3.9K 5% | 1/10W |
| R111 | 1-216-071-00 | METAL CHIP 8.2K 5% | 1/10W |
| < SWITCH > | | | |
| S101 | 1-572-946-11 | SWITCH, TACTIL (SIDE B) | |

| Ref. No. | Part No. | Description | Remarks |
|---------------------------------------|--------------|---------------------------------|----------|
| S102 | 1-572-946-11 | SWITCH, TACTIL (▷) | |
| S103 | 1-572-946-11 | SWITCH, TACTIL (SIDE A) | |
| S104 | 1-572-946-11 | SWITCH, TACTIL (■) | |
| S105 | 1-572-946-11 | SWITCH, TACTIL (■) | |
| S106 | 1-572-946-11 | SWITCH, TACTIL (MASKING) | |
| S107 | 1-572-946-11 | SWITCH, TACTIL (POSITION) | |
| S110 | 1-572-946-11 | SWITCH, TACTIL (CLOSED CAPTION) | |
| ***** | | | |
| * A-6423-170-A TR-718 BOARD, COMPLETE | | | |
| ***** | | | |
| (Ref.No.5,000 Serie)se | | | |
| ▲ | 1-533-223-11 | HOLDER, FUSE | |
| < CAPACITOR > | | | |
| ▲C001 | 1-104-705-11 | FILM 0.1uF | 20% 250V |
| < CONNECTOR > | | | |
| ▲CN001 | 1-564-419-11 | HEADER, SPRING (POWER) 2P | |
| < TRANSFORMER > | | | |
| ▲T002 | 1-406-884-11 | FILTER, LINE | |
| ***** | | | |
| * A-6423-173-A VS-707 BOARD, COMPLETE | | | |
| ***** | | | |
| (Ref.No.9,000 Serie)se | | | |
| ▲ | 1-533-223-11 | HOLDER, FUSE | |
| < SWITCH > | | | |
| ▲S021 | 1-570-615-11 | SELECTOR, POWER VOLTAGE | |
| ***** | | | |
| MISCELLANEOUS | | | |
| ***** | | | |
| ▲208 | 8-848-286-11 | DEVICE, OPTICAL KHS-150A | |
| 211 | 1-751-083-11 | CABLE, FLEXIBLE FLAT (18 CORE) | |
| 221 | 1-765-530-11 | CABLE, FLEXIBLE FLAT (14 CORE) | |
| ▲CP1 | 1-575-912-21 | CORD, POWER | |
| ▲F1 | 1-532-215-00 | FUSE, TIME-LAG (0.8A/250V) | |
| ▲F21 | 1-532-066-00 | FUSE, TIME-LAG (0.4A/250V) | |
| ▲F31 | 1-532-299-00 | FUSE, TIME-LAG (5A/250V) | |
| ▲F32 | 1-532-299-00 | FUSE, TIME-LAG (5A/250V) | |
| M461 | 1-541-930-11 | MOTOR, DC (TILT) | |
| M471 | X-3942-963-1 | MOTOR ASSY (LOADING MOTOR) | |
| M901 | 1-698-109-11 | MOTOR, DD (SPINDLE) | |
| ▲T1 | 1-423-556-11 | TRANSFORMER, POWER | |
| ***** | | | |

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

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u> | <u>Remarks</u> |
|-----------------|-----------------|---|----------------|
| | | ACCESSORIES & PACKING MATERIALS ***** | |
| | | 1-569-008-11 ADAPTER, CONVERSION 2P | |
| | | 1-575-334-11 CORD, CONNECTION | |
| | | 1-751-271-12 CORD, CONNECTION (A/V CABLE) (1.5m) | |
| | | 3-758-632-11 MANUAL, INSTRUCTION (ENGLISH/CHINESE/SPANISH) | |
| * | | 3-958-652-11 INDIVIDUAL CARTON | |
| * | | 3-958-653-01 CUSHION (UPPER) | |
| * | | 3-958-654-01 CUSHION (LOWER) | |

HARDWARE LIST

- #1 7-685-646-79 SCREW +BVTP 3X8 TYPE2 N-S
- #2 7-671-155-01 STEEL BALL 3.0
- #3 7-624-105-04 STOP RING 2.3, TYPE -E
- #4 7-685-144-11 +P 3X5 TYPE2 N-S
- #6 7-682-645-01 SCREW +PS 3X4

- #7 7-685-647-79 SCREW +BVTP 3X10 TYPE2
- #8 7-627-553-48 SCREW, PRECISION +P 2X4
- #9 7-628-253-05 SCREW +PS 2X4
- #10 7-621-759-35 +PSW, 2.6X5
- #11 7-688-003-11 W3, MIDDLE

- #12 7-624-190-81 STOP RING 2, TYPE-CS
- #13 7-682-946-09 SCREW +PSW 3X5
- #14 7-621-759-65 +PSW, 2.6X8
- #15 7-685-661-14 SCREW +BVTP 4X12 TYPE2 IT-3
- #16 7-624-102-04 STOP RING 1.5, TYPE -E

- #17 7-685-131-19 SCREW +P 2.6X4 TYPE2 NON-SLIT
- #18 7-685-103-19 SCREW +P 2X5 TYPE2 SLIT
- #19 7-685-158-19 SCREW +P 4X6 TYPE2 NON-SLIT
- #20 7-623-210-22 SW 4, TYPE 2
- #21 7-685-648-79 SCREW +BVTP 3X12 TYPE2

- #22 7-685-646-81 SCREW +BVTP 3X8 TYPE2
- #23 7-684-220-02 NUT 3, HEXAGON CAP
- #24 7-621-775-20 +B 2.6X5

SECTION 6

INTERFACE · IC PIN FUNCTION

6-1. SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION
(MB-712 BOARD IC501 MB89094PF-G-117)

| PIN NO. | PIN NAME | I/O | FUNCTION |
|---------|-----------------|-----|--|
| 1 | N/C | | NOT USED. OPEN |
| 2 | CLK32 | 1 | CRYSTAL OSCILLATOR (32 KHZ) INPUT |
| 3 | GND | 1 | GND |
| 4 | GND | 1 | GND |
| 5 | 2F5C | 1 | 2 fsc (7.159 MHz) INPUT |
| 6 | N/C | | NOT USED. OPEN |
| 7 | V _{SS} | 1 | GND |
| 8 | MRST | 1 | RESET INPUT TERMINAL (L: RESET) |
| 9 | PREQ | 1 | PHILLIPS CODE (FRAME NO.) READ OUT ENABLE INPUT |
| 10 | FOACK | 0 | PHILLIPS CODE, SUBQ (SUB CODE) DATA OUTPUT CONTROL (H: DATA OUTPUT) |
| 11 | FOSEL | 0 | PHILLIPS CODE/SUBQ DATA SELECT (L: SUBQ) |
| 12 | JPCTRL | 0 | I TRACK JUMP (TI)/MULTI TRACK JUMP (MTJ) SELECT SIGNAL OUTPUT (H: TI) |
| 13 | SPLOCK | 0 | SPINDLE SERVO LOCK SIGNAL (H: DURING SPINDLE SERVO IS LOCKING) |
| 14 | TBCHOLDIN | 0 | CHROMA TBC CONTROL SIGNAL OUTPUT |
| 15 | SCOR | 1 | H WHEN SUB CODE SYNC IS DETECTED |
| 16 | PR V | 1 | PLAYBACK V SYNC SIGNAL INPUT |
| 17 | REF V | 1 | REFERENCE V SYNC SIGNAL |
| 18 | ALT | 0 | INTERNAL A REGISTER LATCH OF EXPANSION OUTPUT PORT IC (IC502 ON MB-712 BOARD) OUTPUT |
| 19 | BLT | 0 | INTERNAL B REGISTER LATCH OF EXPANSION OUTPUT PORT IC (IC502 ON MB-712 BOARD) OUTPUT |
| 20 | BUSY | 1 | COMMUNICATION ENABLE SIGNAL FROM MODE CONTROL MICROPROCESSOR (H: COMMUNICATION ENABLE) |
| 21-24 | N/C | | NOT USED. OPEN |
| 25 | CLSCS | 0 | CHIP SELECT SIGNAL OUTPUT FOR CLS DT (PIN ②) SIGNAL |
| 26 | SPDPLPS | 0 | SPINDLE PULSE DRIVE SIGNAL OUTPUT (H: SPINDLE FREE-RUN) |
| 27 | TBRKMON | 0 | SERVO IC BRAKE MONITOR (H: BRAKE ON). NOT USED |
| 28 | PULL UP +5V | 1 | +5 V |
| 29 | CLSDT | 1 | CLV SCAN V SYNC COUNTER SERIAL DATA FROM IC502 INPUT. NORMALLY L. WHEN CLS CS (PIN ②) IS H, DATA IS IN CLOCK IS SET CK (PIN ④) |
| 30 | SETDT | 0 | SERIAL DATA OUTPUT TO DSP (DIGITAL SIGNAL PROCESSOR) IC (IC203 ON MB-712 BOARD) AND EXPANSION OUTPUT PORT IC |
| 31 | SETCK | 0 | SERIAL TRANSFERRING CLOCK TO DSP IC AND IC502 |
| 32 | SPDLFG1 | 0 | SPINDLE FG INPUT 1 (1 ROTATION: 12 WAVES) |
| 33 | CG V | 1 | CGV SYNC SIGNAL |
| 34 | LD SEARCH | 0 | SPINDLE SERVO CONTROL OUTPUT (H: DURING LD SEARCHING) |
| 35 | SPDL FIR | 0 | SPINDLE ROTATING DIRECTION SIGNAL OUTPUT (H: FWD) |
| 36 | AUX SEL | 0 | H WHEN THERE IS AUXILIARY INPUT. NOT USED. FIXED TO L |
| 37 | JMP TRIG | 0 | TRACK JUMP TRIGGER PULSE OUTPUT |
| 38 | ANALOG | 0 | AUDIO ANALOGUE/DIGITAL SELECT (H: ANALOGUE, L: DIGITAL) |
| 39 | CDG | 1 | NOT USED. CONNECTED TO GND |
| 40 | CDG MUTE | 0 | NOT USED. OPEN |
| 41 | MTJ | 1 | TRACKING PULSE OUTPUT FOR MTJ. NORMALLY INPUT. OUTPUT DURING JUMPING TRACKS (L: FWD) |
| 42 | MTF ON/OFF | 0 | MTF CORRECTION ON/OFF SIGNAL (H: MTF ON) |
| 43 | TRK OFF | 0 | PUT OFF SERVO IC TRACKING CONTROL (L: TRACKING OFF) |
| 44 | N/C | | NOT USED. OPEN |
| 45 | GMUTE | 0 | ON CLV SCAN, GRAY PICTURE MUTE CONTROL OUTPUT (L: PLAYBACK PICTURE) (H: GRAY PICTURE) |
| 46 | N/C | | NOT USED. OPEN |
| 47 | X CAV | 0 | H: CAV DISC. L: OTHERS OR UNIDENTIFIED (H: COMMUNICATION ENABLE) |
| 48 | FOK | 1 | FOCUS LOCK SIGNAL INPUT (H: FOCUS LOCK) |
| 49 | V _{CC} | 1 | +5 V POWER SUPPLY |
| 50 | BUSY | 1 | COMMUNICATION ENABLE SIGNAL FROM MODE CONTROL MICROPROCESSOR (H: COMMUNICATION ENABLE) |
| 51 | TV/DISC | 0 | RF TV/DISC SELECT (H: TV, L: DISC). NOT USED. OPEN |
| 52 | SLED FWD | 0 | SLED FWD FORCED MOVE SIGNAL OUTPUT FROM PORT (H: FWD MOVE) |
| 53 | SLED REV | 0 | SLED REV FORCED MOVE SIGNAL OUTPUT FROM PORT (H: REV MOVE) |
| 54 | MMICS | 0 | SERIAL COMMUNICATION CHIP SELECT SIGNAL OUTPUT TO MODE CONTROL MICROPROCESSOR |
| 55 | LOADING | 0 | TRAY LOADING DRIVE |
| 56 | UN LOADING | 0 | TRAY EJECT DRIVE |
| 57 | N/C | | NOT USED. OPEN |

| PIN NO. | PIN NAME | I/O | FUNCTION |
|---------|-------------------|-----|---|
| 58 | V _{SS} | 1 | GND |
| 59 | LINE MUTE | 0 | AUDIO OUTPUT MUTE SIGNAL OUTPUT (H: MUTE) |
| 60 | SLED SPEED | 0 | SLED DRIVE SPEED CHANGE (L: SLOW) |
| 61 | SV DSP RST | 0 | RESET OUTPUT TO (L: RESET) SERVO IC (IC401 ON MB-712 BOARD), DSP IC AND D/A CONVERTER (IC201 ON MB-712 BOARD) |
| 62 | LD ON | 0 | LASER DIODE ON/OFF SIGNAL (H: ON EMITTING) |
| 63 | CD/LD CDV | 0 | L: PLAYING CD OR AUDIO PART OF CDV. H: OTHERS |
| 64 | SLED MODE | 0 | SLED CONTROL OUTPUT |
| 65 | SIDE A/B | 0 | TILT SERVO SIDE SELECT (A: H, B: L) |
| 66 | 1/4 SV | 0 | TILT/HIGH SELECT (L: TILT) |
| 67 | LCSV1 | 1 | LOADING/CHUCKING POSITION SENSOR INPUT 1 |
| 68 | LD LED | 0 | LED EMITTING SIGNAL FOR DISC DISCRIMINATION |
| 69 | LCSV3 | 1 | LOADING/CHUCKING POSITION SENSOR INPUT 2 |
| 70 | LCSV2 | 1 | LOADING/CHUCKING POSITION SENSOR INPUT 3 |
| 71 | SPDL FG2 | 1 | SPINDLE FG INPUT 2 |
| 72 | TILT LIMIT | 1 | TILT UP/DOWN LIMIT SW INPUT |
| 73 | TILT CTR | 1 | TILT CENTER POSITION SW INPUT |
| 74 | MECH SI | 1 | 32 BYTE SERIAL TRANSFERRING DATA INPUT |
| 75, 76 | N/C | | NOT USED. OPEN |
| 77 | MECH SI | 1 | 32 BYTE SERIAL TRANSFERRING DATA OUTPUT. SERIAL DATA INPUT FROM MODE CONTROL MICROPROCESSOR |
| 78 | MECH SO | 0 | 32 BYTE SERIAL TRANSFERRING DATA INPUT. SERIAL DATA OUTPUT TO MODE CONTROL MICROPROCESSOR |
| 79 | MECH CLK | 0 | 32 BYTE SERIAL TRANSFERRING CLOCK |
| 80 | T CNT | 1 | JUMPING TRACKS COUNTING SIGNAL INPUT. NOT USED |
| 81, 82 | N/C | | NOT USED. OPEN |
| 83 | A V _{SS} | 1 | GND |
| 84 | LDDET | 1 | A/D INPUT. THERE IS DISC OR NOT. 8/12 INCH DETECTION |
| 85 | CDV/RLMT | 1 | A/D INPUT. SLED POSITION INFORMATION (CDV) |
| 86 | CD ABLD | 1 | A/D INPUT. SLED POSITION INFORMATION (CD, A/D, BLD) |
| 87 | INLIMIT | 1 | A/D INPUT. SLED POSITION INFORMATION (INLIMIT) |
| 88 | DSPLT | 0 | LATCH SIGNAL FOR DSP IC OUTPUT |
| 89 | MUTG | 0 | DSP MUTE SIGNAL (H: MUTE) |
| 90 | LOCK | 1 | FRAME SYNC (FPM) LOCK SIGNAL (H: LOCK) |
| 91 | SENSE | 1 | VARIOUS SENSE INPUT SIGNAL FROM DSP |
| 92 | A V _{CC} | 1 | +5 V POWER SUPPLY |
| 93 | EMP ON | 0 | EMPHASIS SELECT SIGNAL OUTPUT (L: EMPHASIS ON) |
| 94 | N/C | | NOT USED. OPEN |
| 95 | A MUTE 2 | 0 | L CH AUDIO OUTPUT MODE SELECT * |
| 96 | A MUTE 1 | 0 | R CH AUDIO OUTPUT MODE SELECT * |
| 97 | CX | 0 | CX ON/OFF CONTROL OUTPUT (L: CX ON) |
| 98 | N/C | | NOT USED. OPEN |
| 99 | DSPSEL | 0 | SELECTS COMMUNICATION WITH DSP (L: CONNECT, H: SEPARATE) |
| 100 | V _{CC} | 1 | POWER SUPPLY TERMINAL (+5 V) |

* AUDIO OUTPUT MODE SELECT

| A MUTE 1 | A MUTE 2 | MODE | AUDIO OUTPUT |
|----------|----------|----------|--------------|
| L | L | STEREO | L |
| L | L | STEREO | R |
| L | H | MONO (L) | L/CH1 |
| L | H | MONO (R) | R/CH2 |
| L | L | MUTE | MUTE |
| L | H | MUTE | MUTE |

6-2. EXPANSION OUTPUT PORT IC PIN FUNCTION (MB-712 BOARD IC502 MB606F06)

| PIN NO. | PIN NAME | I/O | FUNCTION |
|---------|-----------------|-----|--|
| 1 | SP OFF | 0 | SPINDLE MOTOR ON/OFF SIGNAL OUTPUT (H: SPINDLE MOTOR ON) |
| 2 | V _{SS} | | GND |
| 3 | TBC MUTE | 0 | TBC MUTE SIGNAL OUTPUT |
| 4 | TBC REFH | 0 | REFERENCE HORIZONTAL SYNC. SIGNAL FOR TBC OUTPUT |
| 5 | PBCS | 1 | PB COMPOSITE V. H SYNC. SIGNAL INPUT |
| 6 | SP RHO | 0 | REFERENCE H SYNC. SIGNAL FOR SPINDLE SERVO OUTPUT |
| 7 | SP RHI | 1 | REFERENCE H SYNC. SIGNAL FOR SPINDLE SERVO INPUT |
| 8 | GN2 | 0 | TBC CONTROL OUTPUT (H: LINE SYSTEM, L: BURST SYSTEM) |
| 9 | JUMP TGL | 0 | JUMP TOGGLE OUTPUT |
| 10 | SYEX | 0 | SYNC. SIGNAL FOR CHARACTER GENERATOR SELECT. NOT USED |
| 11 | COV | 0 | V SYNC. GENERAL FOR CHARACTER GENERATOR OUTPUT. NOT USED |
| 12 | V _{SS} | | GND |
| 13 | SELH | 0 | H SYNC. SIGNAL FOR CHARACTER GENERATOR (IC011 ON MB-712 BOARD) OUTPUT |
| 14 | XPHS | 0 | PB H SYNC. SIGNAL OUTPUT. NOT USED |
| 15 | SP PBHO | 0 | PB H SYNC. SIGNAL FOR SPINDLE SERVO OUTPUT |
| 16 | SP PBHI | 1 | PB H SYNC. SIGNAL FOR SPINDLE SERVO INPUT |
| 17 | HS | 0 | CENTER OF ECCENTRICITY OUTPUT. NOT USED |
| 18 | MEM REFH | 0 | REF H OUTPUT FOR THE SET WITH MEMORY (NOT RESET). NOT USED |
| 19 | FSC | 0 | fsc (0.579545 MHz) OUTPUT |
| 20 | XOUT | 0 | 4 fsc (14.31818 MHz) OUTPUT |
| 21 | XIN | 1 | 4 fsc (14.31818 MHz) INPUT (CLOCK) |
| 22 | HD | 1 | H SYNC. SIGNAL FOR DIGITAL TBC INPUT |
| 23 | V _{SS} | | GND |
| 24 | V MUTE | 0 | VIDEO MUTE SIGNAL OUTPUT |
| 25 | V MUTE2 | 0 | SIGNAL FOR ADDING REF. V SYNC. SIGNAL TO PLAYBACK VIDEO SIGNAL DURING CLV SCANNING |
| 26 | G BURST | 0 | BURST SIGNAL (3.58 MHz) FOR GRAY PICTURE GENERATION DURING CLV SCANNING |
| 27 | PC OUT1 | 0 | SPINDLE SERVO FORCED ACCELERATION/DECELERATION SIGNAL OUTPUT. (H: ACCELERATION, L: DECELERATION, Hz: OTHERS) |
| 28 | PC OUT2 | 0 | SPINDLE SERVO H SERVO ERROR OUTPUT |
| 29 | TBC H | 1 | H SYNC. SIGNAL AFTER TBC CORRECTION FOR CHARACTER GENERATOR INPUT |
| 30 | DS GATE | 0 | GATE SIGNAL FOR READING OUT PHILLIPS CODE (FRAME NO.) |
| 31 | DATA | 1 | PHILLIPS CODE DATA INPUT |
| 32 | V MUTE1 | 0 | BLANKING V SYNC. SIGNAL OF PLAYBACK VIDEO SIGNAL DURING CLV SCANNING |
| 33 | V _{DD} | | +3 V |
| 34 | DLRH | 0 | H SYNC. SIGNAL FOR GENERATING GRAY PICTURE DURING CLV SCANNING |
| 35 | -GRH | 0 | H SYNC. SIGNAL FOR GENERATING GRAY PICTURE DURING CLV SCANNING |
| 36 | SP UNLOCK | 0 | SIGNAL FOR SETTING BY MECHANISM CONTROLLER OUTPUT WHEN SPINDLE IS UNLOCKED |
| 37 | 8/12 | 0 | LD DISC SIZE SET OUTPUT. (H: 8 INCHES, L: 12 INCHES) NOT USED |
| 38 | CD/LDCDV | 0 | DISC TYPE SET OUTPUT H: PLAYBACK CD OR AUDIO PART OF CDV L: PLAYBACK LD OR VIDEO PART OF CDV |
| 39 | CDV | 0 | SPINDLE SERVO MODE SET (H: VIDEO PART OF CDV) |
| 40 | FGND | 0 | SPINDLE SERVO MODE SET (H: FG MODE (WHILE COUNTING SPINDLE FG. FORCING TO ACCELERATE/DECELERATE SPINDLE MOTION)) |

| PIN NO. | PIN NAME | I/O | FUNCTION |
|---------|-----------------|-----|--|
| 41 | HP OUT | 0 | HOLD PULSE OUTPUT. NORMALLY OUT. PULSE OUTPUT DURING JUMPING TRACKS |
| 42 | V _{SS} | | GND |
| 43 | SV CLK | 0 | CLOCK FOR SERVO IC (IC401 ON MB-712 BOARD). 1/8 fsc (APPROX. 490 kHz) |
| 44 | JMP | 1 | TRACK JUMP CONTROL SIGNAL INPUT. (GATE FOR HP OUT) |
| 45 | SET CLK | 1 | INTERNAL A, B REGISTER CLOCK INPUT FROM SYSTEM CONTROL MICROPROCESSOR (IC901 ON MB-712 BOARD) |
| 46 | GVID | 1 | GRAY PICTURE CONTROL SIGNAL INPUT DURING CLV SCANNING (H: GRAY PICTURE, L: PLAYBACK PICTURE) |
| 47 | SET DT | 1 | INTERNAL A, B REGISTER SERIAL DATA INPUT FROM SYSTEM CONTROLLER |
| 48 | CLS DT | 0 | CLV SCAN V SYNC. COUNTER DATA OUTPUT TO SYSTEM CONTROLLER. NORMALLY L. DATA OUTPUT WHEN CLS CLK (PIN 49) IS H. CLOCK IS SET CLK (PIN 49) |
| 49 | CLS CLK | 1 | CLOCK FOR READING OUT CLV SCAN V SYNC COUNTER DATA CONTROL SIGNAL INPUT |
| 50 | B LD | 1 | INTERNAL B REGISTER LATCH INPUT |
| 51 | A LD | 1 | INTERNAL A REGISTER LATCH INPUT |
| 52 | V _{SS} | | GND |
| 53 | REF V | 0 | REFERENCE V SYNC. SIGNAL OUTPUT |
| 54 | PB V | 0 | PLAYBACK V SYNC. SIGNAL OUTPUT |
| 55 | TBC HOLD | 1 | CHROMA TBC CONTROL SIGNAL INPUT |
| 56 | SP LOCK | 0 | SPINDLE SERVO LOCK SIGNAL OUTPUT (H: DURING LOCKING). NOT USED |
| 57 | JP CTL | 1 | TRACK JUMP SELECT SIGNAL INPUT (H: 1 TRACK JUMP, L: MULTI TRACK JUMP) |
| 58 | FOSEL | 1 | PHILLIPS CODE/SUBQ (SUB CODE) SELECT SIGNAL INPUT (L: SUBQ) |
| 59 | FOACK | 1 | PHILLIPS CODE, SUBQ DATA OUTPUT CONTROL (H: DATA OUTPUT) |
| 60 | F REQ | 0 | PHILLIPS CODE READING OUT ENABLE SIGNAL OUTPUT |
| 61 | MIRST | 1 | SYSTEM RESET INPUT (L: RESET) |
| 62 | FSC2 | 0 | 2 fsc (7.159 MHz) OUTPUT |
| 63 | V _{SS} | | GND |
| 64 | PH2 | 0 | 2 Hz (3.15 kHz). CARRIER FOR SPINDLE MOTOR PWM DRIVE CIRCUIT (L: CONNECTED TO DSP) |
| 65 | DSPSEL | 1 | CLOCK CONTROL SIGNAL FOR DSP IC (IC203 ON MB-712 BOARD) |
| 66 | POCLK | 1 | CLOCK FOR READING OUT PHILLIPS CODE, SUBQ DATA INPUT |
| 67 | D OUT | 0 | PHILLIPS CODE, SUBQ CODE SERIAL DATA OUTPUT |
| 68 | SUBQ CLK | 0 | SUBQ TRANSFERRING CLOCK |
| 69 | SUBQ | 1 | SUBQ DATA INPUT |
| 70 | DSP CLK | 0 | CLOCK FOR DSP IC OUTPUT |
| 71 | DOCINH | 0 | DROP OUT CORRECTION INHIBITION OUTPUT. NOT USED |
| 72 | CLV1 | 0 | SPINDLE SERVO GAIN MONITOR OUTPUT. NOT USED |
| 73 | V _{DD} | | +5 V |
| 74 | CLV2 | 0 | SPINDLE SERVO GAIN MONITOR OUTPUT. NOT USED |
| 75 | REF HE | 0 | REF HE MONITOR OUTPUT. NOT USED |
| 76 | REF HC | 0 | REF HC MONITOR OUTPUT |
| 77 | HMSK | 0 | PHILLIPS CODE MASKING SIGNAL MONITOR OUTPUT |
| 78 | BO6 | 0 | B REGISTER D6 OUTPUT. NOT USED |
| 79 | BO7 | 0 | B REGISTER D7 OUTPUT. NOT USED |
| 80 | TEST | 1 | TEST MODE INPUT (H: TEST) |

**6-3. MODE CONTROL MICROPROCESSOR PIN FUNCTION
(FP-735 BOARD IC301 MB89094PG-G-119)**

| Pin No. | Pin Name | I/O | Description |
|---------|------------|-----|--|
| 1 | CL1 | O | N.C |
| 2 | CL0 | I | GND |
| 3 | MOD0 | I | GND |
| 4 | MOD1 | I | GND |
| 5 | X0 | I | 8MHz in |
| 6 | X1 | I | 8MHz out |
| 7 | GND | I | GND |
| 8 | RST | I | X RST |
| 9 | MRST | O | Resetting mechanism control microprocessor. |
| 10 | BUSY | O | Mechanism control microprocessor communication busy. |
| 11 | P.CONT | O | Power supply control. |
| 12 | LED A | O | A-side LED |
| 13 | LED B | O | B-side LED |
| 14 | GND | I | GND |
| 15 | GND | I | GND |
| 16 | GND | I | GND |
| 17 | REF V | I | V. sync signal |
| 18 | MMICS | I | Mechanism control microprocessor chip select |
| 19 | GND | I | GND |
| 20 | GND | I | GND |
| 21 | GND | I | GND |
| 22 | GND | I | GND |
| 23 | GND | I | GND |
| 24 | GND | I | GND |
| 25 | GND | I | GND |
| 26 | GND | I | GND |
| 27 | N.C | I | |
| 28 | CMOD | I | PULL UP |
| 29 | N.C | I | |
| 30 | V MUTE | O | CAPTION V MUTE |
| 31 | N.C | I | |
| 32 | SIRCS IN | I | SIRCS data input |
| 33 | N.C | I | |
| 34 | POSITION 2 | I | CAPTION POSITION 2 |
| 35 | POSITION 1 | O | CAPTION POSITION 1 |
| 36 | PAUSE STOP | O | CAPTION PAUSE STOP |
| 37 | AUX | O | LINE IN |
| 38 | STUDY | O | CAPTION |
| 39 | PRACTICE | O | CAPTION MASKING |
| 40 | LED1 | O | LINE IN LED |
| 41 | LED2 | O | N.C |
| 42 | LED3 | O | CAPTION LED |
| 43 | LED4 | O | N.C |
| 44 | GND | I | GND |
| 45 | I/O S | I | |
| 46 | AU MUTE | O | Audio mute |
| 47 | CG CS | O | OSD chip select |
| 48 | LED M PLAY | O | Continuous play LED |
| 49 | Vcc | I | EVER+5V |
| 50 | DOOR SW | I | Door switch |

| Pin No. | Pin Name | I/O | Description |
|---------|--------------|-----|--|
| 51 | GND | I | GND |
| 52 | GND | I | GND |
| 53 | GND | I | GND |
| 54 | GND | I | GND |
| 55 | GND | I | GND |
| 56 | GND | I | GND |
| 57 | GND | I | GND |
| 58 | Vss | I | GND |
| 59 | SEG D | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 60 | SEG E | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 61 | SEG C | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 62 | SEG G | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 63 | SEG A | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 64 | SEG F | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 65 | SEG B | O | 7-Segment ON/OFF signal, output (H: Turns on) |
| 66 | N.C | I | |
| 67 | 7CTL | O | 7-Segment control |
| 68 | GND | I | GND |
| 69 | GND | I | GND |
| 70 | GND | I | GND |
| 71 | GND | I | GND |
| 72 | GND | I | GND |
| 73 | GND | I | GND |
| 74 | LINE SELECT | O | Serial communication path switching |
| 75 | N.C | I | |
| 76 | MMICS | I | Mechanism control microprocessor chip select |
| 77 | MECH SO | I | Mechanism control microprocessor received data |
| 78 | MECH SI | O | Mechanism control microprocessor/OSD send data |
| 79 | MECH CLK | O | Communication clock |
| 80 | N.C | I | |
| 81 | N.C | I | GND |
| 82 | N.C | I | GND |
| 83 | Vss | I | GND |
| 84 | AD0 | I | Key input |
| 85 | AD1 | I | Key input |
| 86 | AD2 | I | Key input |
| 87 | N.C | I | |
| 88 | N.C | I | |
| 89 | N.C | I | GND |
| 90 | N.C | I | GND |
| 91 | N.C | I | GND |
| 92 | AVcc | I | EVER+5V |
| 93 | N.C | I | GND |
| 94 | REG MONITOR | I | REG5V power supply voltage monitoring |
| 95 | -16V MONITOR | I | UNREG -16V power supply voltage monitoring |
| 96 | N.C | I | N.C |
| 97 | N.C | O | N.C |
| 98 | N.C | O | N.C |
| 99 | N.C | O | N.C |
| 100 | Vcc | I | EVER+5V |

SECTION 7

ELECTRICAL ADJUSTMENTS

During the adjustments, see the parts alignment diagram for adjustment starting from page 7-21.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- Remote commander (RMT-M26A)
- LD alignment disc HVL-8 (8-797-008-00)
NTSC Reference Disc (Reference 7 can also be used.)

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 with the power on.
- When adjusting the servo system, be sure to set up the unit horizontally.

7-3. DEBUGGING MODE

- What is 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-RC20 in which this debugging function is available is called "the debugging mode".

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

- (1) The background color of the screen changes in green when the debugging commands are effective. (When the background color is set to display.)
- (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 is green.

1. How to enter the debugging mode

To enter the debugging mode from a normal operation mode (in a normal status of operation), turn on the unit, press the 0 key and then the STOP key on the remote control unit while holding down the CAPTION 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 number of the microprocessor. For details, refer to 4-1. "[FRAME/TIME] key for displaying version number of the microprocessor".

The SELECT key functions as the debug command ON/OFF switch key when the main unit is in the debugging mode.

When the background color is displayed (in the STOP, PAUSE or some other modes), and if the debug command is effective, the background color changes in green.

(Note that it is violet in the service mode.)

| | | | | | | | | | | | | | | |
|-----------|-------------------------------|---|---|---|---|---|---|---|---|----|---|---|---|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 |
| 1st line | | | | | | | | | | | | | | STOP |
| 2nd line | VER | | | | | | | | | | | | | |
| 3rd line | MMI - 8 1 5 A 1 2 / 2 5 A | | | | | | | | | | | | | |
| 4th line | | | | | | | | | | | | | | |
| 5th line | | | | | | | | | | | | | | |
| 6th line | | | | | | | | | | | | | | |
| 7th line | MCM - 8 1 5 A 9 4 1 2 2 5 0 A | | | | | | | | | | | | | |
| 8th line | | | | | | | | | | | | | | |
| 9th line | | | | | | | | | | | | | | |
| 10th line | | | | | | | | | | | | | | |

Fig. 7-1 Debugging mode initial display

2. How to exit the debugging mode

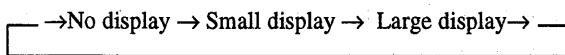
To exit the debugging mode, press the CLEAR key on the remote control unit when the menu (version number of the microprocessor indication in the green background color) in Fig. 7-1 is displayed.

The same key operation as step (1) also sets the mode back in the normal operation mode. The CAPTION will have its normal key function after the machine exists the debugging mode.

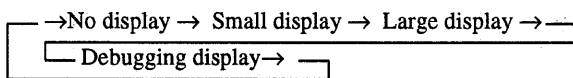
3. Switching the screen display

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

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



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



4. Explanation of the debugging display

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

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

The information to be displayed can be selected in the "debugging mode", by setting the back ground color to green and pressing the desired key (as listed below).

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

Table 7-1 List of the keys to be used in the debugging mode and corresponding information

| Keys | Information to be displayed |
|--------------|--|
| [FRAME/TIME] | Version number of the microprocessor |
| [1] | History of the function modes |
| [2] | History of the emergency occurrence |
| [3] | Information for repair service in normal mode |
| [4] | Trap-flag |
| [5] | Key/remote control data |
| [7] | Information on communication with the mechanism controller |

4-1. [FRAME/TIME] Version number of the microprocessor

[FRAME/TIME] key for displaying version number of the microprocessor

Pressing this key displays the version number of the microprocessor. The version number of the mode controller appears on the 3rd line, and that of the mechanism controller appears on the 7th line. An example in Fig. 7-2 shows that the version number of the mode controller is "MMI-815A 12/25A" and that of the mechanism controller is "MCM-815A 9412 250A".

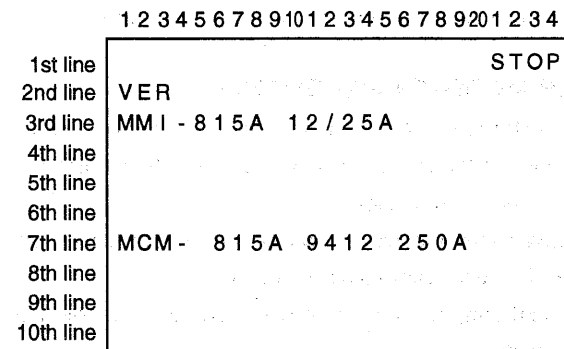


Fig. 7-2 Version number of the microprocessor

4-2. [1] History of the function modes

[1] key for displaying the history of the function modes

Pressing this key displays the history of the principal operation commands such as STOP and PLAY (which represent function modes) sent from the mode controller to the mechanism controller.

The function mode data is the one-byte (two digits in hexadecimal notation) data. 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 of the 2nd line, and from the right end on the 2nd line to the left end on the 1st of 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 of the 1st (or the 2nd) line, the last stored data appears at the right end on the 2nd (or the 1st respectively) line.

"FE" means there has been an emergency case at the data point. To check the type of the emergency case, refer to 4-3 "The [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 | | | | | | | | | | | | | | | | | | | | | | | | STOP | |
| 2nd line | FM | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd line | | | | | | | | | | | 0 | 1 | 2 | 0 | 3 | 0 | FE | 5 | 0 | 6 | 0 | 7 | 0 | 6 | 0 |
| 4th line | | | | | | | | | | | 2 | 0 | FF | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th line | | | | | | | | | | | | | | | | | | | | | | | | | |

Fig. 7-3 History of the function modes

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

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

Table 7-2 lists the function modes.

All the function modes available are listed and shown in Table 7-2. Please refer to page 7-5 for Table 7-2.

4-3. [2] History of the emergency occurrence

Some emergency codes simply have the meanings of the status codes such as "64 (Detection of minimum chapter)". The emergency codes "80" and higher are generated by the mode controller itself, not input from the mechanism controller.

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

The display type is the same as that for the history of the function modes. However, up to 8 histories using only one 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 | | | | | | | | | | | | | | | | | | | | | | | | STOP | |
| 2nd line | EMG | | | | | | | | | | | | | | | | | | | | | | | | |
| 3rd line | | | | | | | | | | | 6 | 0 | 7 | 4 | 6 | 4 | 6 | 1 | 6 | 4 | 6 | 4 | 7 | 4 | FF |
| 4th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9th line | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10th line | | | | | | | | | | | | | | | | | | | | | | | | | |

Fig. 7-4. History of emergency occurrence

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 function mode]

Table 7-3. lists the emergency code.

All the emergency codes available are listed and shown in Table 7-3. Please refer to page 7-6 for Table 7-3.

4-4. [3] 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 7-4 is available. Data numbers in the table correspond to the numbers on the 3rd line through the 5th line in Figure 7-5.

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

Table 7-4. Information for repair service, sent from the mechanism controller

| | 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 | | | | | | | | | | | | | | | | | | | | | | | | | STOP |
| 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 mod 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.

| No. | 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 focus servo of side A has been locked. |
| 31 | From lock of focus servo 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 focus servo of side B has been locked. |
| 50 | Chapter search |
| 51 | Frame/Time search |
| 60 | Playback |
| 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) |

Table 7-5. Operation modes of the mechanisms

Table 7-2. List of the function modes

| Number | State | Description |
|--------|---|--|
| 00 | Power OFF | |
| 01 | Power ON and start up | Initializes when power is turned ON. |
| 10 | Open | Opens the door and ejects the tray. |
| 20 | Stop | Closes the tray and stops. |
| 30 | Preparation for side A playback | From stop up to immediately before side A search |
| 40 | Preparation for side B playback | From stop up to immediately before side B search |
| 50 | Chapter search | Searches a chapter, including disc top search. |
| 51 | Frame/time search | Searches a frame and time in CAV. |
| 60 | Playback | Plays back. |
| 61 | Pause | Pauses. |
| 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 | Plays back in STILL mode. (Only in CAV mode) |
| 81 | Step playback in normal direction | Plays back one frame after frame. (Only in CAV mode) |
| 82 | 1/90 times speed playback in normal direction | (Only in CAV mode) |
| 83 | 1/30 times speed playback in normal direction | (Only in CAV mode) |
| 84 | 1/16 times speed playback in normal direction | (Only in CAV mode) |
| 85 | 1/8 times speed playback in normal direction | (Only in CAV mode) |
| 86 | 1/4 times speed playback in normal direction | (Only in CAV mode) |
| 87 | 1/2 times speed playback in normal direction | (Only in CAV mode) |
| 88 | Normal (1 time) speed playback in normal direction | (Only in CAV mode) |
| 89 | 2 times speed playback in normal direction | (Only in CAV mode) |
| 8A | 3 times speed playback in normal direction | (Only in CAV mode) |
| 8B | 5 times speed playback in normal direction | (Only in CAV mode) |
| 8C | 10 times speed playback in normal direction | (Only in CAV mode) |
| 90 | Still playback in reverse direction | Plays back in STILL mode. (Only in CAV mode) |
| 91 | Step playback in reverse direction | Plays back one frame after frame. (Only in CAV mode) |
| 92 | 1/90 times speed playback in reverse direction | (Only in CAV mode) |
| 93 | 1/30 times speed playback in reverse direction | (Only in CAV mode) |
| 94 | 1/16 times speed playback in reverse direction | (Only in CAV mode) |
| 95 | 1/8 times speed playback in reverse direction | (Only in CAV mode) |
| 96 | 1/4 times speed playback in reverse direction | (Only in CAV mode) |
| 97 | 1/2 times speed playback in reverse direction | (Only in CAV mode) |
| 98 | Normal (1 time) speed playback in reverse direction | (Only in CAV mode) |
| 99 | 2 times speed playback in reverse direction | (Only in CAV mode) |
| 9A | 3 times speed playback in reverse direction | (Only in CAV mode) |
| 9B | 5 times speed playback in reverse direction | (Only in CAV mode) |
| 9C | 10 times speed playback in reverse direction | (Only in CAV mode) |
| FE | Appears for indicating an occurrence of emergency. | An emergency occurred. |
| FF | Appears next to the last data. | (The last function mode) |

Table 7-3. List of the emergency codes

| Number | State | Description |
|--------|--|---------------------------|
| 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 |
| 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 sledder | Power off |
| 30 | Detection of no movement of the tilt | Power off |
| 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 |
| 50 | Focusing failed | Stop |
| 51 | Focusing failed (with a disc loaded) | Stop |
| 52 | Detected as if the disc was an LD | Stop |
| 53 | Focusing of LD8 failed | Stop |
| 54 | Reading of TOC failed on a disc of CD or CDV | Stop |
| 60 | Detection of the lead-in code | Play or so |
| 61 | Detection of the lead-out code | Stop/Pause or so |
| 62 | Detection of the lead-out of part A on CDV | Stop/Pause or so |
| 63 | Detection of a picture stop | Still |
| 64 | Detection of the minimum chapter | None |
| 65 | Reading of subcode failed on a disc of CD or CDV | Stop |
| 66 | Reading of Philips code failed on a disc of LD | Stop |
| 67 | The locked groove processing was executed. | None |
| 70 | Detection of over search | Play |
| 71 | Detection of under search | Play |
| 72 | Time over for the search operation | Play |
| 74 | Focusing failed during search | Stop |
| 76 | Focus servo unlocked and retry was executed. | None |
| 80 | Emergency time out | Power off |
| 81 | Search time out | Play |
| 82 | Mechanism controller communication time out | Power off |

4-5. [4] Trap-flag

[4] key for displaying the trap-flags

Pressing this key displays the cause of the trap-flag. The trap-flag is “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 cleared by setting the background color in green and pressing the [clear] key.

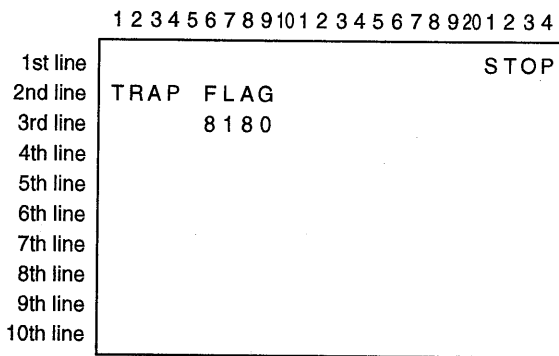


Fig. 7-6. Trap-flag

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

Table 7-6 shows meaning and causes of the trap-flag.

Table 7-6. 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 by the mode controller |
| 2(04h) | Resetting by self-check by the mode controller |
| 1(02h) | Resetting by self-check by the mode controller |
| 0(01h) | Forced resetting by the key operation |

Note 1: 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 the when the unit was plugged in, except for initialization of the trap-flag.

Note 2: 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.

4-6. [5] Key/remote control data

[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.

The keys to which SIRCS codes are not assigned are defined as internal keys, using the data of 80 or higher in hexadecimal notation.

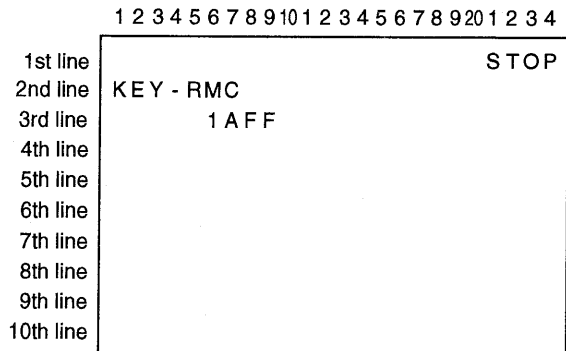


Fig. 7-7. Key and remote control data

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

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

Table 7-7 lists the SIRCS codes used in the MDP-RC20.

Table 7-7. List of SIRCS codes for MDPs

| No. | Functions |
|--|--|
| 00 | Numeral 1 |
| 01 | Numeral 2 |
| 02 | Numeral 3 |
| 03 | Numeral 4 |
| 04 | Numeral 5 |
| 05 | Numeral 6 |
| 06 | Numeral 7 |
| 07 | Numeral 8 |
| 08 | Numeral 9 |
| 09 | Numeral 0 |
| 0B | Search |
| 0C | Frame/Time |
| 0F | Clear |
| 15 | Power ON/OFF |
| 16 | Close/open of tray |
| 17 | Audio monitoring |
| 18 | Stop |
| 19 | Pause |
| 1A | Playback |
| 1E | Reverse direction scanning |
| 1F | Normal direction scanning |
| 29 | Repeat |
| 2B | Step in normal direction |
| 2C | Step in reverse direction |
| 30 | Program |
| 34 | ACS in normal direction |
| 35 | ACS in reverse direction |
| 38 | Repeat A-B |
| 39 | Numeral + 10 |
| 3A | Screen display |
| 40 | Analog audio/CX |
| 47 | 1/one side/double side |
| 4F | Medium speed normal direction playback |
| 5D | Side A |
| 5E | Side B |
| (The followings are the expended codes.) | |
| 95 | LINE IN |
| 96 | Caption |
| 97 | Caption Position |
| 98 | Caption Masking |
| 99 | Replay |
| FF | No keys are pressed. |

FF Appears when there is no input.

4-7. [7] Information on communication with the mechanism controller

[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.



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

The table below shows some communication information.

Table 7-8. Data from the mode controller to the mechanism (Upper block in Figure 7-8)

| No. | Description |
|---------|---------------------------------------|
| (01) | The function mode at present (next) |
| (02) | The function mode of final purpose |
| (03-05) | Target address of search (Time/Frame) |

Table 7-9. Data from the mechanism controller to the mode controller (Lower block in Figure 7-8)

| No. | Description |
|---------|---|
| (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) |

7-4. SERVICE MODE

- What is the service mode?

1. How to enter 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) on the MB board of the main unit, to the ground.
- (2) Turn on the power by pressing the power key of the main unit. Nothing is displayed on the screen at this moment.
- (3) Disconnect the test pin (the connection was performed in step (1) above) from the ground.

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

When the unit enters the service mode, the unit is also entered in the debugging mode (the functions those available in both modes can be used). Therefore, the version number of the microprocessor appears on the screen.

2. How to exit the service mode

To exit the service mode, press the power key to 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 scanning key and the power key on the main unit at the same time.

3. How to use 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, press CAPTION key to turn off the 7-segment display, then press the desired key such as PLAY or PAUSE on the main unit.

The sledding motion with the SIDE A or SIDE B key is effective only while holding the key pressed. However, the operation started with the PLAY or PAUSE key continues, once it is pressed, until you press the STOP key. While the unit is carrying out the special key function, the LED of side B 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-segment display is turned off, some keys are not effective. Be sure to press CAPTION key to turn on the 7-segment display if you don't want to carry out the special key functions.

Table 7-10. List of the special key functions

| Key | Special key functions |
|--------|--|
| SIDE A | Sledding in reverse direction (downward) |
| SIDE B | Sledding in normal direction (upward) |
| PLAY | Focusing search |
| PAUSE | Tilt servo ON |
| STOP | Stop special operations |

The followings are the details of the special key functions available with the MD-RC20.

3-1. PLAY key ••••• Focusing search

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

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

3-2. SIDE A key ••••• Sledding in reverse direction

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

3-3. SIDE B key 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.

3-4. PAUSE key Tilt servo ON

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

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

7-5. OPERATING THE MDP-RC20 WITH HIDDEN KEY FUNCTION

1. How to use the "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 7-11. List of simultaneous main-unit-key-press functions.

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

The following functions remain the same as those of the remote control unit under the same names.

| Functions | Keys to be pressed on the main unit |
|--|-------------------------------------|
| ④ High speed scanning in reverse direction | “Position” key and “play” key |
| ⑤ Low speed scanning in reverse direction | “Position” key and “pause” key |
| ⑥ Low speed scanning in forward direction | “Position” key and “stop” key |
| ⑦ High speed scanning in forward direction | “Position” key and “side A” key |
| ⑧ Replay | “Position” + side B |
| ⑨ Audio monitor | “Masking” + side B |
| ⑩ Analog/CX | “Masking” + play |
| ⑪ Message display | “Masking” + side A |
| ⑫ Scanning in reverse direction ACS | “Masking” + pause |
| ⑬ Scanning in forward direction ACS | “Masking” + stop |

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

The functions available by pressing the two specific keys only on 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 seconds. This prevents an accidental use of these functions by the user.

These functions are to be carried out by using the CAPTION key of the main unit so that the operation of the mechanisms should not be affected.

The following table lists the currently available simultaneous main-and-remote-control-units-key-press functions.

Table. 7-12. List of simultaneous main-and-remote-control-units-key-press functions.

| Functions | Step | Keys to be pressed on the main unit and on the remote control unit |
|---|------|--|
| ① <u>Debugging mode ON/OFF</u> This function puts the unit in the debugging mode from another mode, or puts the unit in any mode other than the debugging mode from the debugging mode. | 1 | “CAPTION” key and “0” key |
| | 2 | “CAPTION” key and “STOP” key |
| ② <u>Forced V muting ON/OFF</u> This function releases the unit from the forced V muting condition if it is in the forced V muting condition, or puts the unit in the forced V muting condition if it is not in the forced V muting condition. It can be used to obtain a blue background during playback, or removing the blue background while the unit is in the stop mode. | 1 | “CAPTION” key and “0” key |
| | 2 | “CAPTION” key and “screen display” key |
| ③ <u>Resetting of V muting</u> This function resets the unit in the V muting condition to normal condition. This is, it releases the unit from condition ≠ above. | 1 | “CAPTION” key and “0” key |
| | 2 | “CAPTION” key and “clear” key |
| ④ <u>Make mechanism controller time out ineffective.</u> Make the function turning power off ineffective when communication with mechanism controller cannot be done. When mechanism controller doesn’t operate, it is used to hasten to operate mode controller. | 1 | “CAPTION” key and “0” key |
| | 2 | “CAPTION” key and “+10” key |
| ⑤ <u>Make mechanism controller time out effective.</u> Make the function turning power off effective when communication with mechanism controller cannot be done. | 1 | “CAPTION” key and “0” key |
| | 2 | “CAPTION” key and “0” key |

7-6. 7-SEGMENT-DISPLAY-DURING-STANDBY FUNCTION

- What is the 7-SEGMENT-DISPLAY-DURING-STANDBY FUNCTION?

Special control function to display information on the 7-segment display device during STANDBY mode is called "7-segment-display-during-standby" function. When the unit power is turned off forcibly by the forced power off function due to an emergency occurrence so forth, the cause of the emergency or the trap-flag is displayed on the 7-segment display.

1. How to use the "7-segment-display-during-standby"

When the unit power is turned off forcibly by the forced power off function or by an emergency, the cause of the emergency is displayed for several seconds on the 7-segment display of the main unit at the moment of power off.

If the power off is caused by an emergency, the emergency code is displayed on the 7-segment while it is blinking. If it is caused by any other reason, the trap-flag is displayed on the 7-segment while it is blinking.

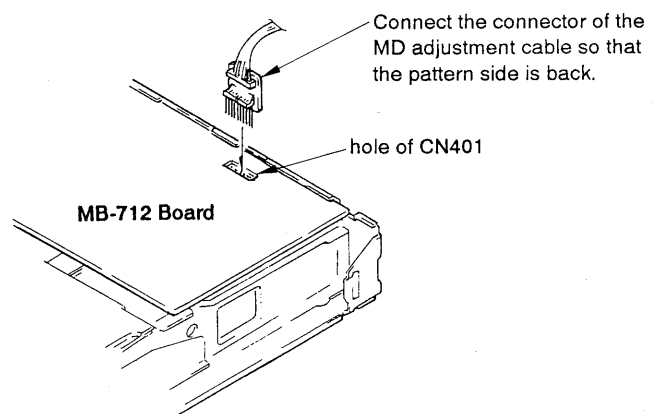
If the unit power has already been turned, the same content is displayed by pressing STOP key.

See chapter 7-3. DEBUGGING MODE for the emergency codes and the trap-flag.

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

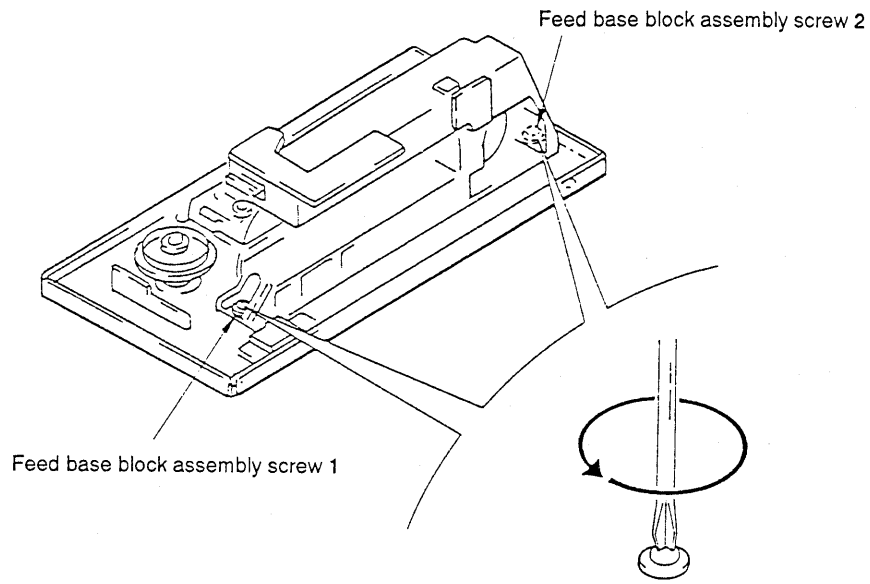
7-7-1. JIGS AND TOOLS

- Hexagonal wrench (Tangential screwdriver: 7-700-766-04)
 - Oscilloscope
 - MD adjustment cable (J-6082-059-B)
 - Alignment disc Ref. 8 (HVL8: 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-712 Board.



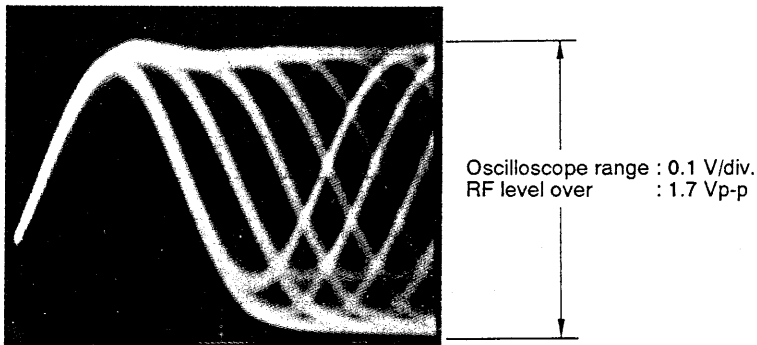
7-7-2. CD ADJUSTMENT

- ① Loosen the screws of feed base block assembly.

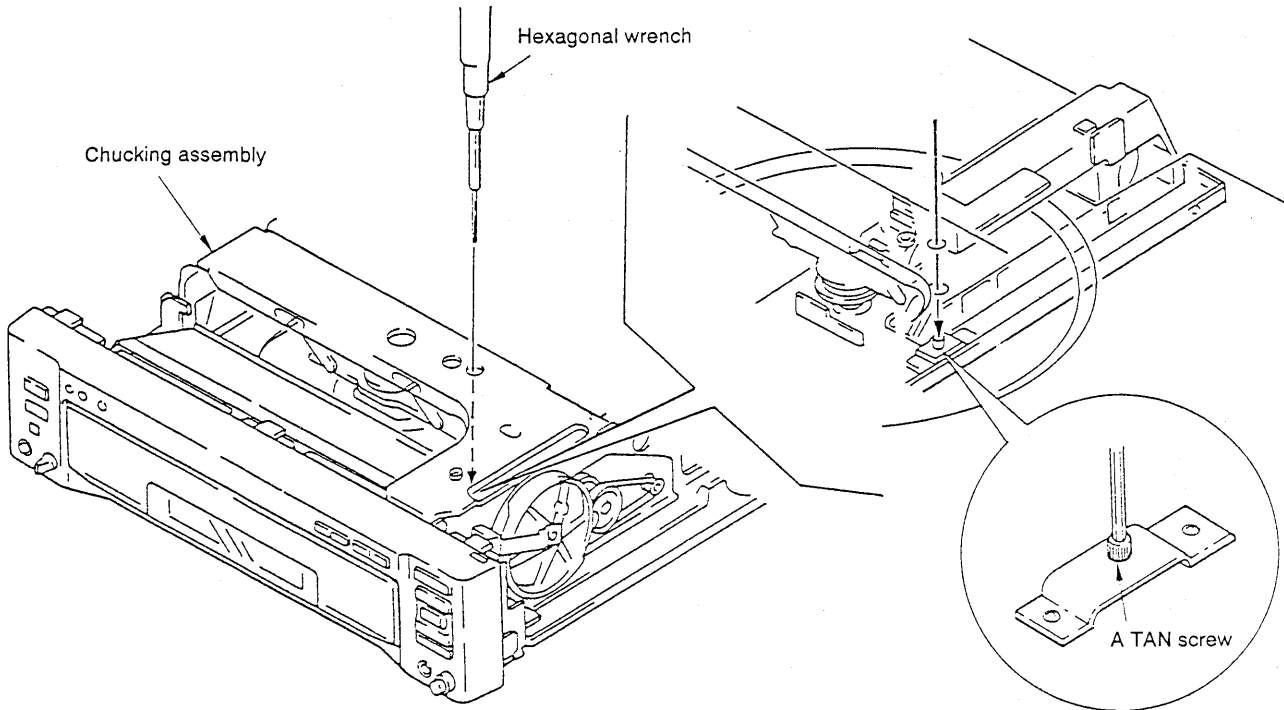


Loosen the screw about a turn from the state of being tight.

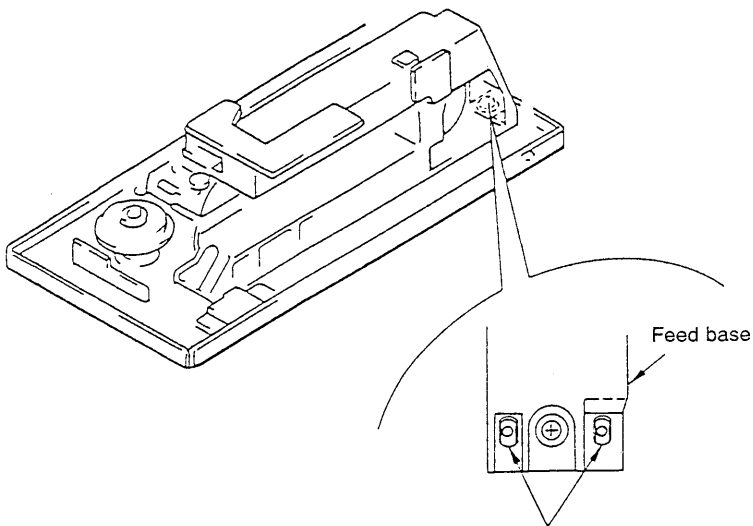
- ② Playback the CD alignment disc (YEDS-18) to press the Pause button about 3 seconds later.
- ③ Connect the oscilloscope to LD RF of the connector conversion jig to see if the waveform shown below appears.



- 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)



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



Insert the decentering screwdriver to either one of the holes for adjustment.

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

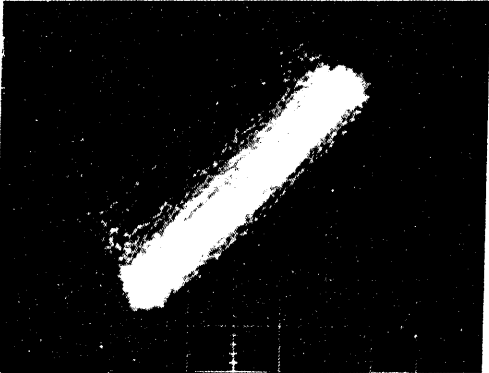
Terminal E,F/TRK, SLED OFF
 Oscilloscope X/Y Lissagous range
 Difference within 35° with each 20 mV/div.

Before the adjustment.



↓ Make the figure straight.

After the adjustment.



**7-8. POWER SUPPLY CHECK
(PS-716 BOARD)**

| | |
|---------------------|---|
| Mode | Stop |
| Measuring equipment | Digital voltmeter |
| UNREG +16 V check | |
| Measurement point | Pin ① of CN051 (Pin ②, GND) |
| Specified value | 15.5 ± 1.0 V |
| UNREG -16 V check | |
| Measurement point | Pin ③ of CN051 (Pin ③, GND) |
| Specified value | -16.5 ± 1.0 V |
| REG +5 V check | |
| Measurement point | Pin ⑤ of CN051 (Pin ④, GND) |
| Specified value | 5.1 ± 0.5 V |
| REG -5 V check | |
| Measurement point | Pin ⑦ of CN051 (Pin ④, GND) |
| Specified value | -5.1 ± 0.5 V |
| POWER MUTE check | |
| Measurement point | Pin ① of CN055 (Pin ② of CN051, GND) |
| Specified value | 15.7 ± 1.0 V |
| EVER 5 V check | |
| Measurement point | Pin ④ of CN031 (Pin ②, GND) |
| Specified value | 5.0 ± 0.3 V |

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

**7-9. SYSTEM CONTROL SYSTEM
ADJUSTMENT**

7-9-1. Master Clock Adjustment (MB-712 Board)

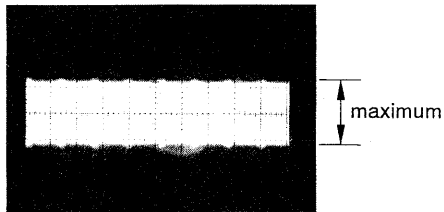
| | |
|---------------------|-------------------|
| Mode | Stop |
| Measurement point | Pin ⑱ of IC502 |
| Measuring equipment | Frequency counter |
| Adjusting element | CT501 |
| Specified value | 3,579,545 ± 10 Hz |

Adjustment method:

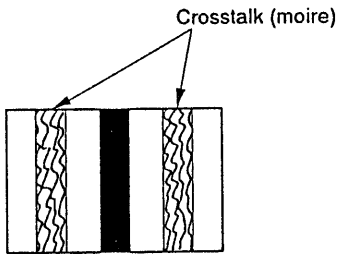
- 1) Adjust CT501 to 3,579,545 ± 10 Hz.

7-10. LD SIDE A TILT BALANCE ADJUSTMENT

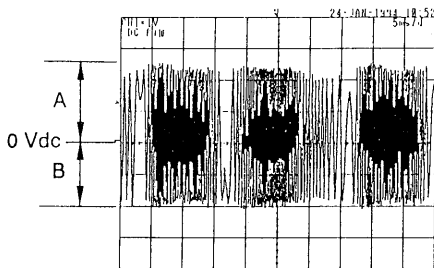
- ① Put the LD alignment disc HLV-8 in with the CAV side to the side A, play it and pause at the chapter 3 (#2201).
- ② Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV401 so that the RF waveform goes maximum in the state the tracking and the sled are on.



- 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.

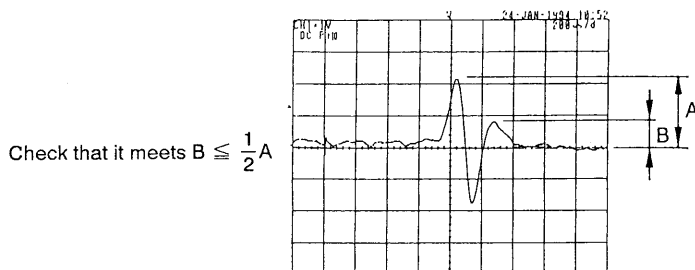


- ⑤ Tracking gain and focus gain adjustments are not necessary. —Already adjusted at the optical pick-up block side—
- ⑥ Check the tracking bal.
Measure the resistance at the Y terminal of TRACKING ERR on jig with oscilloscope.

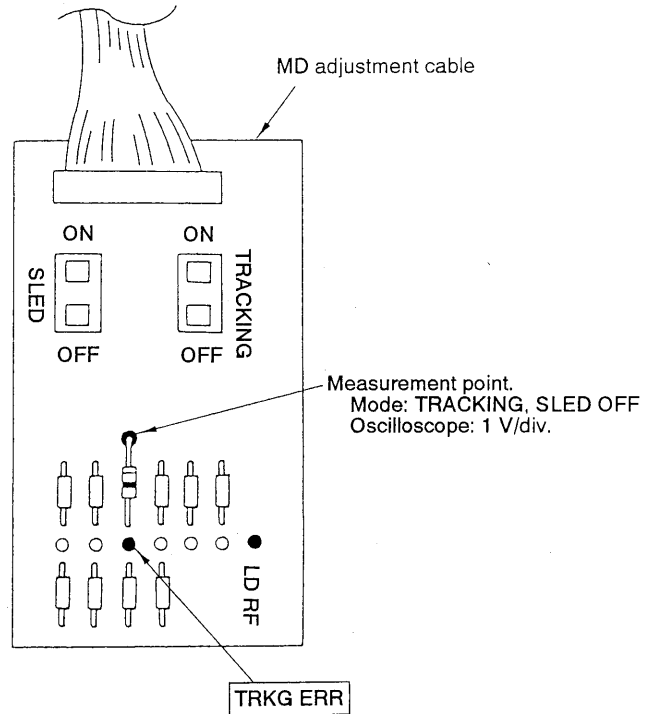


Check that it meets $-5 \leq \frac{A - B}{2(A+B)} \times 100 (\%) \leq 8$

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

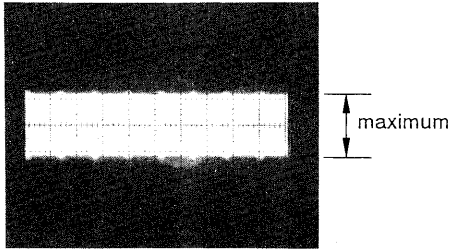


Check the TRACKING BALANCE.



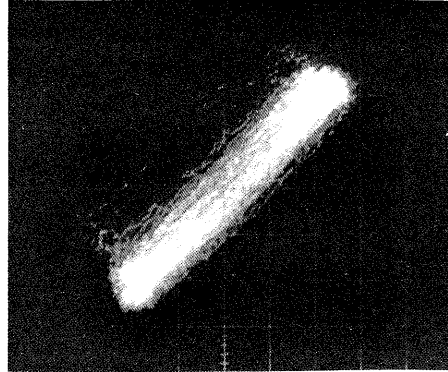
7-11. LD SIDE B TILT BALANCE ADJUSTMENT

- 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.



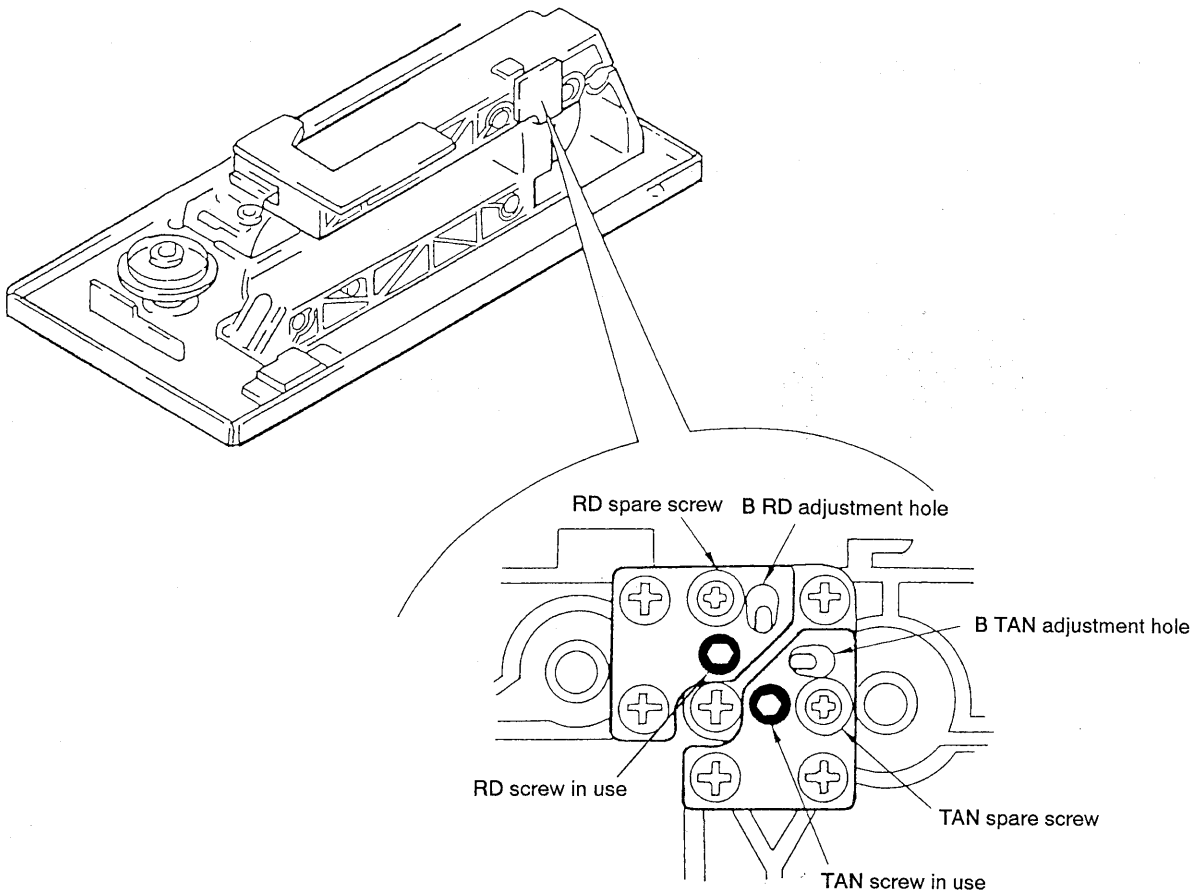
- ④ Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the item ③.
- ⑤ Play #770 and pause.
At this time in the same manner as the side A, check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and maximum.
- ⑥ Forward the chapter 3 (#2201) and pause.

- ⑦ Turn off the SLED and tracking, and adjust inserting an eccentric screwdriver to B RD adjustment hole so that the Lissagous waveform meets the standard.



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

- ⑧ Take out the disc to tighten B TAN and RD screw.



7-12. VIDEO SYSTEM ADJUSTMENT

7-12-1. Burst Gate Position Adjustment (MB-712 Board)

| | |
|-------------------|------------------------------|
| Mode | Pause |
| Signal | Frame 4100 (Color bar) |
| Measurement point | Pin ⑳ of IC007 |
| Adjusting element | RV002 |
| Specified value | $8.5 \pm 0.1 \mu \text{sec}$ |

Adjustment method:

- 1) Press PAUSE (||) button.
- 2) Search the frame 4100.
- 3) Adjust RV002 so that t_w is $8.5 \pm 0.1 \mu \text{sec}$.

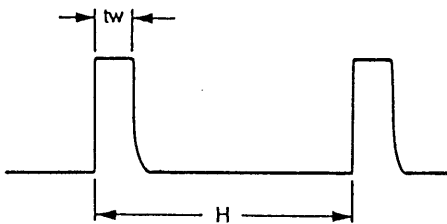


Fig. 7-9.

7-12-2. REF H Adjustment (MB-712 Board)

| | |
|----------------------|---------------------------|
| Mode | Pause |
| Signal | Frame 4100 (Color bar) |
| Measurement point | CH1: Pin ㉕ of IC008 |
| | CH2: Pin ② of IC008 |
| Measuring instrument | Oscilloscope (DC range) |
| Adjusting element | RV501 |
| Specified value | Potential difference: |
| | $4.2 \pm 0.1 \text{ Vdc}$ |

Adjustment method:

- 1) Press PAUSE (||) button.
- 2) Search the frame 4100.
- 3) Adjust RV501 so that the electric difference between the center value of the TBC voltage (Pin ㉕ of IC008) and the VEE (Pin ② of IC008) is $4.2 \pm 0.1 \text{ Vdc}$.

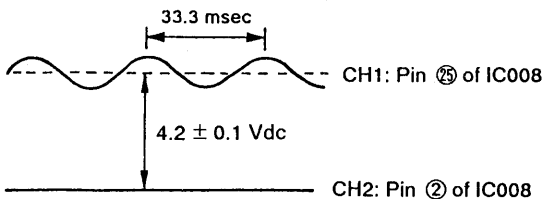


Fig. 7-10.

7-12-3. Color DOC Adjustment (MB-712 Board)

| | |
|----------------------|---|
| Mode | Pause |
| Signal | Frame 23500 (Yellow Green) |
| Measuring instrument | Monitor screen |
| Adjusting element | CT001 |
| Specified value | Dropout section and surrounding section are of the same colors. |

Preparations:

- 1) Paste a black tape onto the 1H interval of the outer most circumference of the LD reference disc CAV recording side (The side where the radial can be seen).
(Length: Approx. 10 mm)

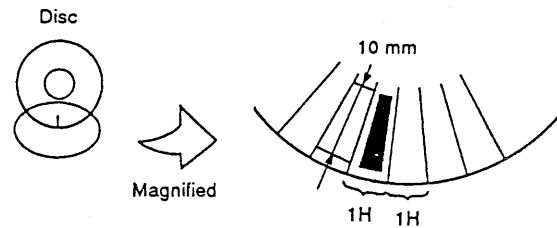


Fig. 7-11.

Adjustment method:

- 1) Press PAUSE (||) button.
- 2) Search the frame 23500.
- 3) Adjust the color of the dropout section of CT001 to that of the surrounding section.

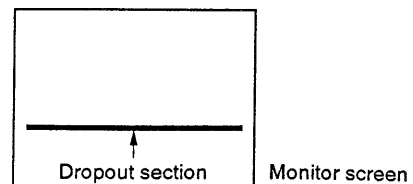


Fig. 7-12.

7-12-4. Video Output Level Adjustment (MB-712 Board)

| | |
|----------------------|--|
| Mode | Pause |
| Signal | Frame 4100 (Color bar) |
| Measurement point | J201 (VIDEO OUT terminal) (Terminated to 75Ω) |
| Measuring instrument | Oscilloscope |
| Adjusting element | RV001 |
| Specified value | 1.00 ± 0.03 Vp-p |

Adjustment method:

- 1) Press PAUSE (■) button.
- 2) Search the frame 4100 and apply a vertical bar signal.
- 3) Adjust RV001 for 1.00 ± 0.03 Vp-p.

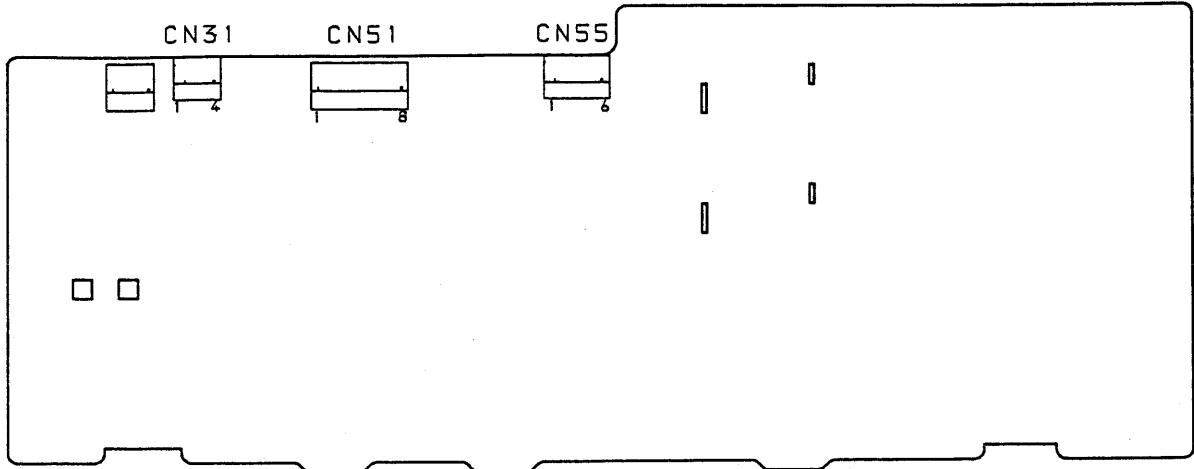


Fig. 7-13.

7-13. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENT

PS-716 BOARD (CONDUCTOR SIDE)

NOTE: CN31/51/55 ARE MOUNTED COMPONENT SIDE.



MB-712 BOARD (COMPONENT SIDE)

