

MDP-V9K

RMT-M45A

SERVICE MANUAL

E Model
Chinese Model

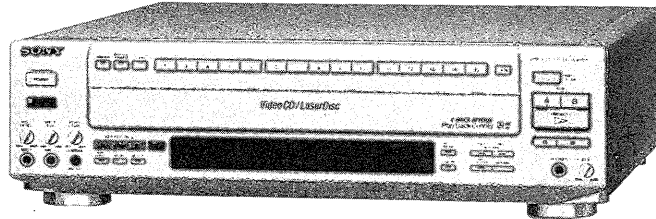


Photo : Chinese model. (GOLD)

Model Name Using Similar Mechanism	MDP-V1
Optical Pick-up Type	KHS-150A

SPECIFICATIONS

System

Type

VIDEO CD/CD/LD player

Signal readout

Optical (Laser beam reflection)

Signal format system

EIA standard, NTSC color system
CCIR standard, PAL color system (for VIDEO CDs only)

Playing time

See "Optical discs" on page 2.

Digital audio specifications

Signal-to-noise ratio

More than 115 dB (EIAJ)*

Dynamic range

More than 99 dB (EIAJ)

Wow and flutter

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

Video specification

Horizontal video resolution

425 lines (LD)

Signal-to-noise ratio

More than 50 dB

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

Input and Output

LINE OUT 1, 2

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

S VIDEO OUT 1, 2

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

OPTICAL DIGITAL OUT

-18 dBm, wavelength 660 nm

Dolby AC-3 RF OUT

Phono jack (1)
Output level: 400 m Vp-p
Output impedance: 75 ohms

HeadPHONES output

12 mW (8 ohms)

LINE IN

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

MIC 1/2 jacks

Standard jacks
1 mV
(Impedance below 1 kilohm)

General

Power requirements

110-240 V AC, 50/60 Hz

— Continued on next page —

VIDEO CD/CD/LD PLAYER
SONY®



Power consumption

45 W

Operating temperature

5°C to 35°C

Ambient humidity

5% to 90 %

Dimensions

Approx. 430 × 127.5 × 413.5 mm
(w/h/d)
including projecting parts and
controls

Mass

Approx. 6.8 kg





Supplied accessories

Remote Commander RMT-M45A (1)
R6 (size AA) batteries (2)
Audio/Video Cable
(phono plug 3 ↔ phono plug 3) (1)
AC plug adaptor (supplied with
models other than Hong Kong model)
(1)
Cushions (4)

Design and specifications are subject to
change without notice.

Optical discs

The MDP-V9K can play optical discs currently available for home
entertainment, laser discs (LD) and compact discs (CD and VIDEO CD).
The table below shows the discs available for this player.*

Disc class	Disc logo	Disc type	Size	Sides	Play time	
Laser Discs For movies, animation, operas, concerts, and karaoke	 	LD Single (NTSC)	8 in. (20 cm)	Single	CAV	14 min
					CLV	20 min
		8-inch LD (NTSC)	8 in. (20 cm)	Double	CAV	28 min
					CLV	40 min
		12-inch LD (NTSC)	12 in. (30 cm)	Double	CAV	1 hr
					CLV	2 hr
Compact Discs For music, movies, animation, karaoke, and photographs		CD Single	3 in. (8 cm)	Single	20 min (audio only)	
		CD	5 in. (12 cm)	Single	74 min (audio only)	
		VIDEO CD (NTSC and PAL)	3 in. (8 cm)	Single	20 min	
			5 in. (12 cm)	Single	74 min	

* The MDP-V9K cannot play discs other than those shown above.

Multi audio discs

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

VIDEO CD standards to which the player conforms

This player conforms to Ver. 1.0, Ver. 1.1, and Ver. 2.0 of the VIDEO CD
specifications. If you use a Ver. 2.0 CD, Play Back Control (PBC)
functions and high-resolution still pictures (the new part of Ver. 2.0 of
the VIDEO CD specifications) are available as well as normal playback
of moving pictures and sound.

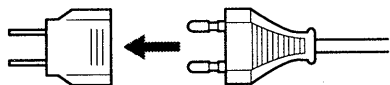
Discs conforming to the Dolby Surround AC-3 system

With this type of disc, the player outputs only the left channel signals as
monaural sound, muting the sound of the right channel when analog
audio is selected. Thus, you cannot alternate the right and left channels
of analog audio with the Audio Monitor function.

Operating voltage and AC plug

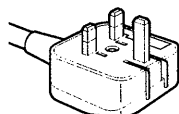
This unit does not have a voltage selector. You can operate the unit between 110 and 240 V AC, 50/60Hz.

If the AC plug of your unit does not fit into the wall outlet, attach the AC plug adaptor (supplied with models other than Hong Kong model).



Model for Hong Kong

The model for Hong Kong has an AC plug as shown below. The AC plug adaptor is not supplied with these units.



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

Thank you for purchasing the Sony Laser Disc Player. Before operating the unit, please read this manual thoroughly and retain it for future reference.

The MDP-V9K, an easy-to-operate laser disc player, allows you to:

- Play many types of optical discs, LDs, CDs and VIDEO CDs
- Play a double sided LD without turning it over
- Play VIDEO CDs which conform to Ver. 2.0 of VIDEO CD standards, using its Play Back Control (PBC) functions which allow you to:
 - Perform interactive playback using menu screens
 - View high-resolution still pictures
- Mark a point on a VIDEO CD where you want to resume playback—Book Mark
- The COLOR SYSTEM selector allows you to play PAL VIDEO CDs regardless of the TV system (PAL, NTSC or Multi Monitor system)
- Continue an LD/VIDEO CD from the exact point at which you stopped— Auto Resume
- Use enjoyable functions such as Program, Shuffle, Auto Program or Repeat play
- Play karaoke (sing along with a disc)

The player enters karaoke mode when a microphone is connected.

Features include:

- 9 song reservation from two discs for non-stop karaoke entertainment—Reserve
- Digital key controller to adjust backup key to your voice*
- Up to four microphones can be used by connecting to two microphone jacks on each front and rear panel
- Digital echo to create the ideal mood
- Singing along with the original vocals—Vocal Select*
- Automatic applause—Auto Effect*
- Getting help when you forget words or melody—Vocal Support
- Adding richness to your voice—Karaoke Star
- Playing karaoke with non-karaoke discs—Karaoke Pon*
- Playing karaoke with video tapes—LINE IN input *
- Pausing after a song is played—Auto Pause *

* These functions are also available in non-karaoke mode.

Conforming to Ver. 2.0 of VIDEO CD standards

This player conforms to Ver. 1.0, Ver. 1.1, and Ver. 2.0 of the VIDEO CD standards. If you use a Ver. 2.0 VIDEO CD, Play Back Control (PBC) functions (the new part of Ver. 2.0 of the VIDEO CD standards) enable you to play the disc interactively following menus on the screen. You can also enjoy high-resolution still pictures, as well as normal playback of moving pictures and sound.

Compatible color systems

This player plays LDs recorded in the NTSC color system, and VIDEO CDs in both the NTSC and PAL color systems.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

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

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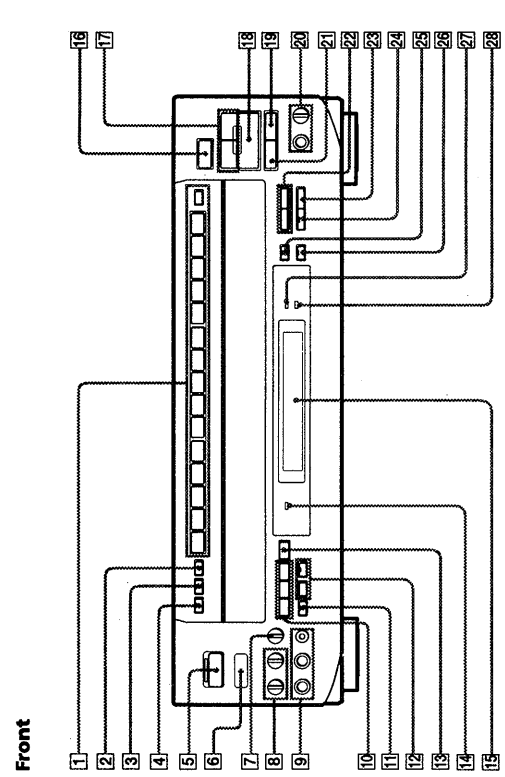
9. INSTRUCTION MANUAL FOR SPECIAL FUNCTIONS (For the contents of section 9, refer to page 9-1.)

SECTION 1
GENERAL

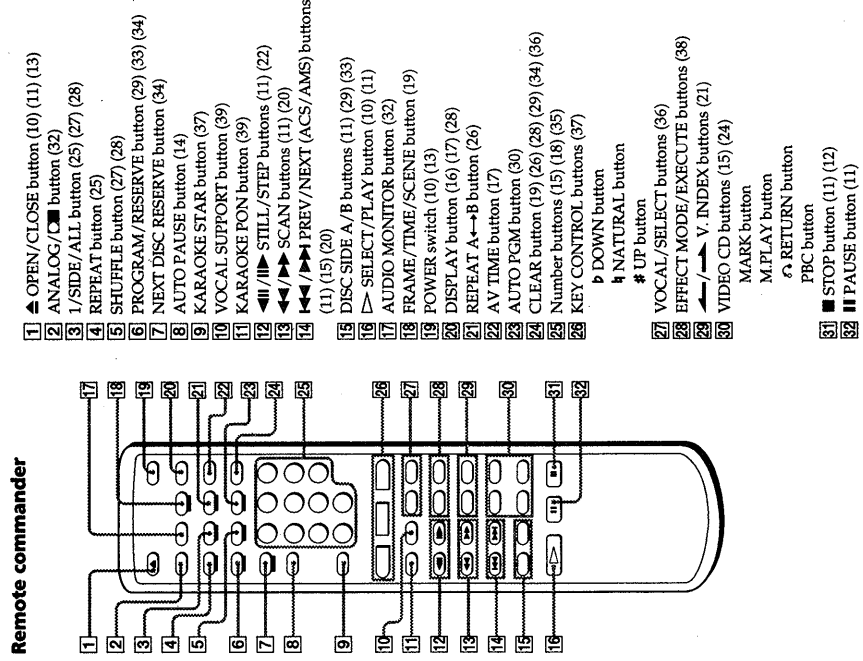
This section is extracted from instruction manual.

See the pages indicated in () for details.

Index to parts and controls



- 1 Number buttons (15) (18) (35)
- 2 CLEAR button (19) (26) (28) (29) (34) (36)
- 3 NEXT DISC RESERVE button and indicator (34)
- 4 RESERVE button and indicator (33) (35)
- 5 POWER switch and indicator (10) (13)
During STANDBY : Lights up red
While ON : Goes off
- 6 Remote sensor (42)
- 7 ECHO LEVEL control (14)
- 8 MIC LEVEL 1 and 2 controls (13) (14)
- 9 MIC 1, 2 and CONTROL (MIC 1/2) jacks (13)
- 10 KEY CONTROL b DOWN/NATURAL/# UP indicator-buttons (37)
- 11 EFFECT button and indicator (38)
- 12 VOCAL/SELECT buttons and indicator (36)
- 13 KARAOKE STAR indicator-button (37)
- 14 VOCAL SUPPORT indicator (39)
- 15 Display (12)
- 16 OPEN/CLOSE button (10) (11) (13)
- 17 SIDE A/B buttons (11) (29) (33)
- 18 SELECT (Play) button (10) (11)
- 19 (Stop) button (11) (12)
- 20 PHONES jack and control (11)
- 21 (Pause) button (11)
- 22 PREV/NEXT (ACS/AMS) buttons (11) (15) (20)
- 23 RETURN button (15) (24)
- 24 PBC ON/OFF button and indicator (15) (24)
- 25 AUTO PAUSE button and indicator (14)
- 26 LINE IN button and indicator (41)
- 27 VIDEO CD PAL OUT indicator (11)
- 28 AUTO RESUME indicator (23)

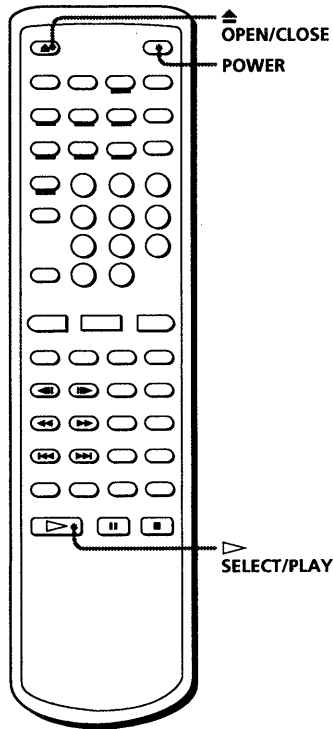


- 1 OPEN/CLOSE button (10) (11) (13)
- 2 ANALOG/ button (32)
- 3 1/SIDE/ALL button (25) (27) (28)
- 4 REPEAT button (25)
- 5 SHUFFLE button (27) (28)
- 6 PROGRAM/RESERVE button (29) (33) (34)
- 7 NEXT DISC RESERVE button (34)
- 8 AUTO PAUSE button (14)
- 9 KARAOKE STAR button (37)
- 10 VOCAL SUPPORT button (39)
- 11 KARAOKE FON button (39)
- 12 STILL/STEP buttons (11) (22)
- 13 SCAN buttons (11) (20)
- 14 PREV/NEXT (ACS/AMS) buttons (11) (15) (20)
- 15 DISC SIDE A/B buttons (11) (29) (33)
- 16 SELECT/PLAY button (10) (11)
- 17 AUDIO MONITOR button (32)
- 18 FRAME/TIME/SCENE button (19)
- 19 POWER switch (10) (13)
- 20 DISPLAY button (16) (17) (28)
- 21 REPEAT A→B button (26)
- 22 AV TIME button (17)
- 23 AUTO PGM button (30)
- 24 CLEAR button (19) (26) (28) (29) (34) (36)
- 25 Number buttons (15) (18) (35)
- 26 KEY CONTROL buttons (37)
- 27 DOWN button
- 28 NATURAL button
- 29 UP button
- 30 VOCAL/SELECT buttons (36)
- 31 EFFECT MODE/EXECUTE buttons (38)
- 32 V. INDEX buttons (21)
- 33 VIDEO CD buttons (15) (24)
- 34 MARK button
- 35 M. PLAY button
- 36 RETURN button
- 37 PBC button
- 38 STOP button (11) (12)
- 39 PAUSE button (11)

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

Basic Operations

Playing a disc



- You can also turn on the player by pressing \triangle OPEN/CLOSE on the player.

Notes

- If you place more than one disc on the tray, or if the disc is not seated properly, the disc may not start playing, and may cause damage to the disc or player.
- Do not transport the player while playing a disc as doing so may damage your disc or player.
- Do not use a CD stabilizer when playing a CD or VIDEO CD as doing so may damage your disc or player.

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

Before you start...

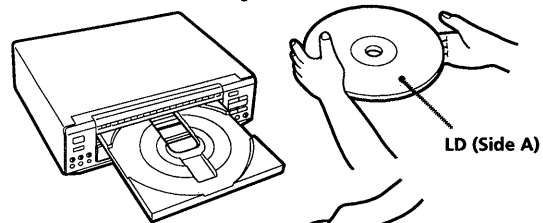
Connect the player to your TV and set the input selector on the TV to "Video" (see "Connecting the player" on page 6).

Loading and playing a disc

- 1 Press POWER to turn on the player.**
You can also directly turn on the player by pressing \triangleright SELECT/PLAY on the remote commander or player.

- 2 Press \triangle OPEN/CLOSE to open the disc tray.**
The front cover of the player automatically slides down and the disc tray comes out.

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



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

CD, VIDEO CD, or LD Single
(Label faces up)

- 4 Press \triangleright SELECT/PLAY.**
The disc tray closes and the disc starts playing. You can also start playing by pressing the disc tray to close it.

When you play a double-sided LD

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

To play a VIDEO CD with Play Back Control (PBC) functions (Ver. 2.0 VIDEO CD)

Ver. 2.0 VIDEO CDs have Play Back Control (PBC) functions, which allow you to play them interactively. When press \triangleright SELECT/PLAY or push in the disc tray in step 4, a menu appears on the screen and the player waits for you to play the disc using the PBC functions. To play a VIDEO CD using PBC functions, see "Playing a VIDEO CD using PBC functions" on page 15 for details.



- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.
- When playing side A of an LD, "SIDE A" appears on the front panel display. When playing side B of an LD, "SIDE B" appears on the front panel display.
- When playback of LD side B ends, the player stops.
- When playing a CD or VIDEO CD, the DISC SIDE B button does not function.

Note

- When you press **|| PAUSE**, the picture goes blank when playing a CLV LD, and the picture freezes when playing a CAV LD or VIDEO CD (see "Viewing frame-by-frame action" on page 22).

To view a PAL VIDEO CD

Set the COLOR SYSTEM selector on the rear panel to the appropriate position, according to your TV. See "COLOR SYSTEM selector setting (only for VIDEO CDs)" on page 7 for details.

AUTO setting; when a PAL VIDEO CD is played, the VIDEO CD PAL OUT indicator on the player lights up.

PAL setting; when a VIDEO CD is played, the VIDEO CD PAL OUT indicator on the player lights up.

The indicator also lights up even when an NTSC disc is played. However, the picture is not played properly.

To	Press
Stop play	■ STOP
Pause play	 PAUSE
Resume play after pause	 PAUSE or ▷ SELECT/PLAY
Scan forward or backward	◀◀/▶▶ SCAN
Skip chapters or tracks	◀◀/▶▶ PREV/NEXT (ACS/AMS)
Play step by step	◀ / ▶ STILL/STEP (CAV LDs only)
Go to a chapter/track	Number button During PBC VIDEO CD playback, press number buttons to select items in the on-screen menu (see page 15 for details).
Remove the disc	▲ OPEN/CLOSE

To start playing from the beginning of either LD side

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

To pause playing just before starting

Press **|| PAUSE** instead of pressing **▷ SELECT/PLAY** after you place the disc on the tray.

The disc tray closes and the player waits at the start of the disc until you press **▷ SELECT/PLAY** or **|| PAUSE**. If you want to start from side B of an LD, press **|| PAUSE**, then DISC SIDE B.

To stop playing and turn off the player

Press POWER.

You can resume playback of an LD from the point you stopped at by simply pressing **▷ SELECT/PLAY** (see "Resuming LD/VIDEO CD playback" on page 23).

To stop playing and remove the disc

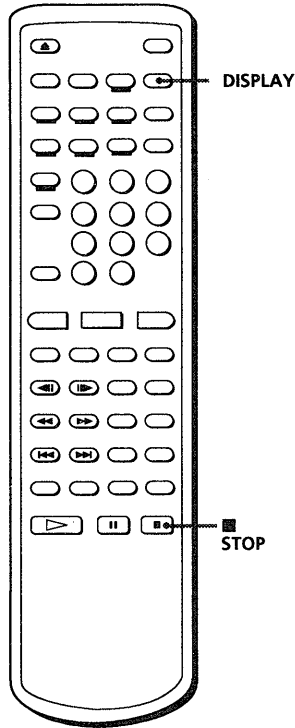
Press **▲ OPEN/CLOSE**.

Remove the disc and press **▲ OPEN/CLOSE** again to close the empty tray.

To listen with headphones

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

Playing a disc (continued)



- The AV calendar shows the chapters/tracks remaining on the disc. As chapters/tracks are played, the corresponding numbers on the calendar disappear.
- While playing a Ver. 2.0 VIDEO CD using PBC functions, the AV calendar shows the numbers you can use to select items from the menu.
- When there is no disc in the player, "NO DISC" appears on the front panel display.

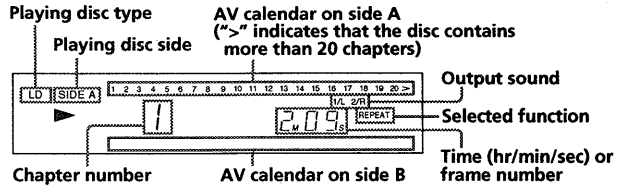
Notes

- The AV calendar is available for LDs containing TOC (Table of Contents) data, CDs, or VIDEO CDs.
- When you play a VCR or a similar equipment using LINE IN, the current key level always appears on the front panel instead of a chapter/track number (see "Playing karaoke using auxiliary equipment" on page 41).

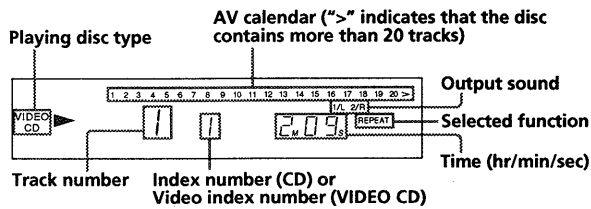
Reading the front panel display

The illustration below is an example of what is displayed on the front panel of the player.

When playing an LD

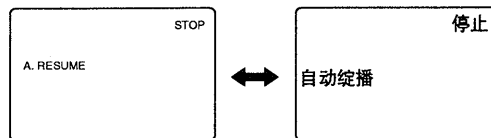


When playing a VIDEO CD or CD

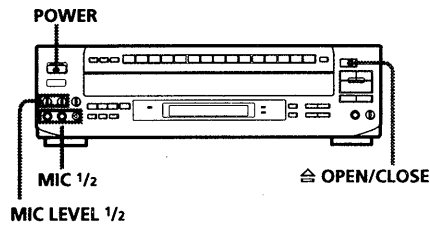


Viewing the on-screen display

Press DISPLAY. The on-screen display appears (see "Understanding on-screen indications" on page 16). You can select the language of the on-screen display, English or Chinese, by pressing the ■ STOP button on the player less than 10 seconds after you turn on the player. To return to the original display, press the ■ STOP button again less than 10 seconds after you first pressed it. Each time you press the ■ STOP button (within 10 seconds) the displays alternate.



Playing Karaoke



- The player has two MIC jacks on each front and rear panel. In addition, you can use infrared cordless microphones by connecting the infrared receiver to the MIC jacks (see "Using the infrared cordless microphone system (not supplied)" on page 40).
- To control the player from the karaoke microphone, plug the control plug into the CONTROL jack (see "Using the optional karaoke microphone" on page 40).
- You can enjoy karaoke using auxiliary equipment such as a VCR (see "Playing karaoke using auxiliary equipment" on page 41).

Notes

- If you insert more than one disc, or if the disc is not seated properly, the disc may not start playing, and may damage the disc or player.
- When playing a double-sided LD, the player determines that the upper side of the disc is side "A" and the other side is "B," regardless of the label "A" or "B" printed on the disc.

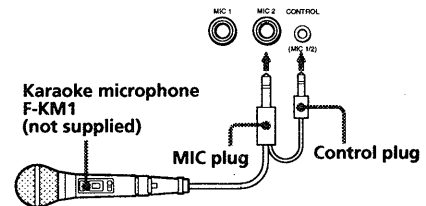
This section gives you short instructions for playing "karaoke" (singing along with a disc).

- 1 Set the MIC LEVEL 1 and 2 controls on the player to MIN.**



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

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



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

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

TV:

Set to "Video."

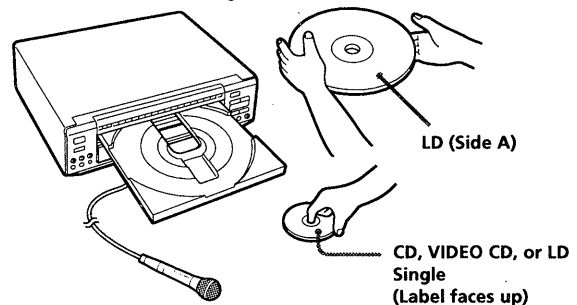
Stereo system:

Turn on the amplifier or receiver and select CD or AUX (the jacks to which you connected the player) for audio output.

- 5 Press ≡ OPEN/CLOSE.**

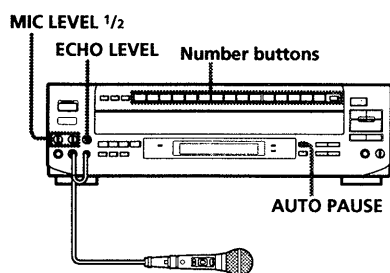
The disc tray comes out.

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



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

Playing Karaoke (continued)



- If you press ■ STOP, ⏏ OPEN/CLOSE or POWER while playing a song in karaoke mode (with microphones connected), the sound automatically fades out before playback stops (Auto Fade Out).
- If howling occurs
 - Move the microphone away from the speakers.
 - Lower the microphone volume or echo level.
 - Lower the overall volume.
- If the sound is distorted or the picture flickers when listening through your TV speakers, set the ATT switch at the rear of the player to ON to lower the output level.

Notes

- If you want to use the menu of a Ver. 2.0 karaoke VIDEO CD, make sure that the PBC ON/OFF button indicator on the player is lit and press ▷ SELECT/PLAY to display the menu before entering the song number. If the PBC ON/OFF button indicator is not lit, press ■ STOP to stop playing the disc, then press the PBC (ON/OFF) button to turn it on (see "Playing a VIDEO CD using PBC functions" on page 15 for details).
- To stop playing a song on a Ver. 2.0 karaoke VIDEO CD and return to the menu, press the RETURN button instead of ■ STOP.
- If you reserve several songs (see "Selecting karaoke song order" on page 33), the player plays them continuously, then pauses.
- You can also use the Auto Pause function in non-karaoke mode (without microphones connected). Each time you press the AUTO PAUSE button, the Auto Pause function is turned on/off.
- Auto Pause does not function during PBC playback on a Ver. 2.0 VIDEO CD (if the PBC ON/OFF button indicator on the player is lit). However, if the disc is a karaoke VIDEO CD with a menu for song selection, playback automatically pauses and returns to the menu each time a song is played.

7 Press one of the number buttons to enter the song number.

The song starts playing. To select a song on side B of an LD, press DISC SIDE B, then press the number button. To enter a song number greater than 15, see page 18.

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



9 Turn the ECHO LEVEL control to adjust the echo strength.

The same echo level is applied to both MIC 1 and MIC 2. Now you can enjoy playing karaoke. When the song finishes, the player pauses until you enter the next song number.



Pausing automatically in karaoke mode

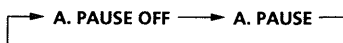
When you connect a microphone, the player automatically switches to karaoke mode. In karaoke mode, the player pauses every time a song is played (Auto Pause).

To play songs on the disc continuously in karaoke mode

Press AUTO PAUSE.

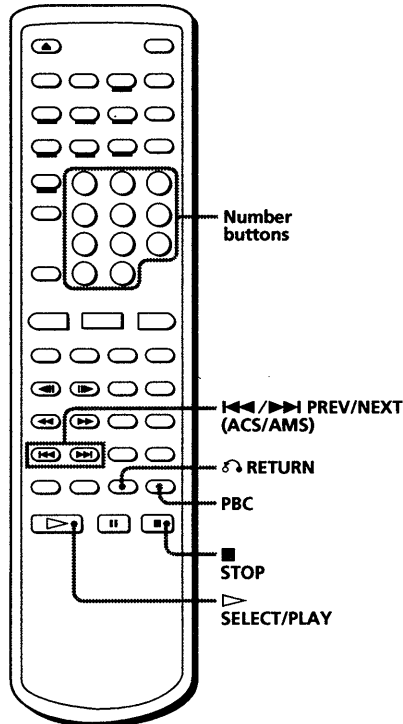
"A. PAUSE OFF" appears on the screen briefly and the AUTO PAUSE button indicator on the player goes off.

Each time you press AUTO PAUSE, the on-screen indication changes as follows and the AUTO PAUSE button indicator on the player turns off or on.



AUTO PAUSE button indicator	Songs are played
On	Pausing at end of each song
Off	Continuously

Playing a VIDEO CD using PBC functions (PBC Playback)



- To select a song over 10, Press >10, then press two number buttons, first the tens digit, then the ones digit (see page 18). To use the number buttons on the player, see page 18.
- You can view high-resolution still pictures on some Ver. 2.0 VIDEO CDs.

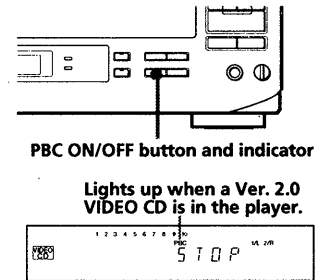
Note

- If no menus appear on the screen:
 - check that the disc is a Ver. 2.0 VIDEO CD ("PBC" is lit on the front panel display when a Ver. 2.0 VIDEO CD is in the player.)
 - turn on the PBC ON/OFF button indicator
 - press ▷ SELECT/PLAY to display a menu

VIDEO CDs conforming to Ver. 2.0 of the VIDEO CD standards have Play Back Control (PBC) functions, which enable you to play the VIDEO CD interactively, following menus on the screen. Operation methods may differ depending on the disc. For details, refer to the instructions supplied with the disc. Use the number buttons, ▷ SELECT/PLAY, ◀◀/▶▶ PREV/NEXT (ACS/AMS), and ↻ RETURN during PBC playback.

1 Place a Ver. 2.0 VIDEO CD (with PBC functions) on the disc tray, then press ▷ SELECT/PLAY to close the disc tray.

2 Check to see that the PBC ON/OFF button indicator on the player lights up.
A menu appears on the screen and the player waits for you to select a number on the menu. On some discs, moving pictures may play for a while before the menu appears.



3 Enter a number to select the item in the menu.

4 Play the VIDEO CD interactively, following the menus.

Playing a Ver. 2.0 VIDEO CD interactively

To	Press
Select an item in the menu	Number button
Jump to another scene when "SELECT" flashes on a moving picture	▷ SELECT/PLAY or a number button
Go back to the menu	↻ RETURN Operation methods may differ depending on the disc. For details, refer to the instructions supplied with the disc.
Scroll the menu	◀◀/▶▶ PREV/NEXT (ACS/AMS)

If "NOT VALID NOW" appears on the screen

You have pressed an unoperable button. Use the operable buttons, following the menu.

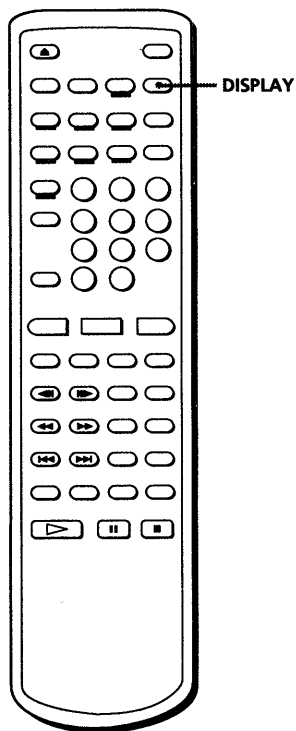
Canceling PBC playback

Press ■ STOP to stop playing the VIDEO CD, then press PBC on the remote commander, or PBC ON/OFF on the player to turn off the PBC ON/OFF button indicator. Now you can play the VIDEO CD continuously but menus for interactive playback are not displayed.

To turn on PBC playback again

The PBC ON/OFF button indicator must be lit to use PBC functions. If it is not lit, press ■ STOP to stop playing the disc, then press the PBC (ON/OFF) button to turn it on. Press ▷ SELECT/PLAY to display a menu.

Additional Operations Understanding on- screen indications



Notes

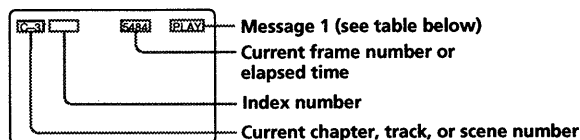
- The AV calendar for LDs (display of remaining chapter numbers) is only available for LDs with TOC data.
- When playing an LD without TOC data, total playing time of the disc does not appear.
- When playing an LD without chapters, the chapter number does not appear.
- When playing a CLV LD without time data to the second, a two-digit number such as "22:", meaning 22 minutes, appears.
- Messages concerning sound control functions such as "1/L, 2/R" or "♪ DIGITAL, ♪ ANALOG" appear only briefly when you press the AUDIO MONITOR or ANALOG/DIGITAL button.

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

Displaying on-screen indications

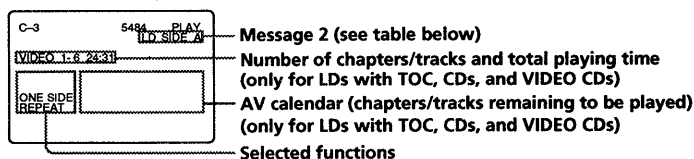
Press DISPLAY.

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



Press DISPLAY again.

Operating status and disc information are displayed on the screen.



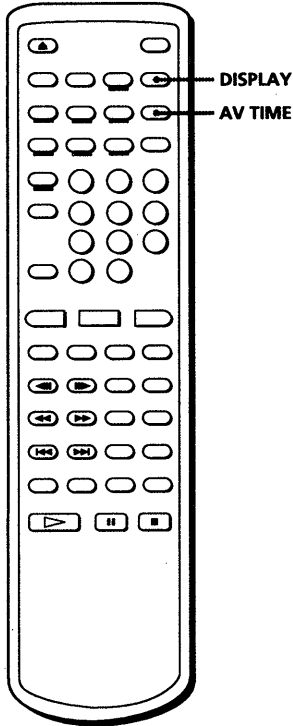
Press DISPLAY once again to turn off the indications.

Message 1

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

Message 2

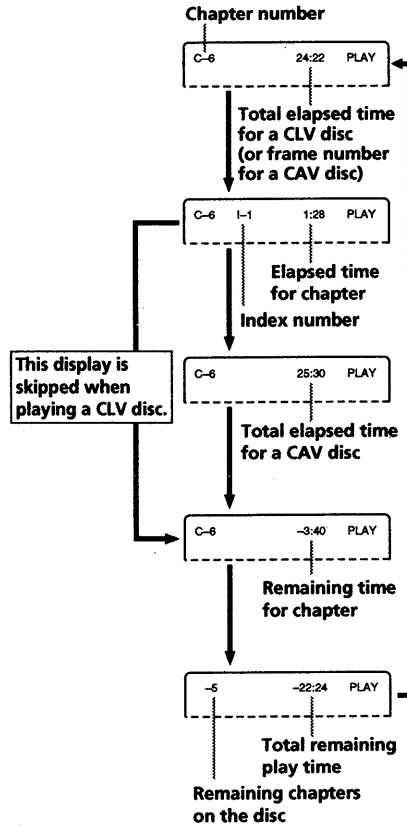
Display	Currently playing
LD SIDE A	Side A of LD
LD SIDE B	Side B of LD
CD	CD
VIDEO CD	VIDEO CD
1/L	First soundtrack/left channel
2/R	Second soundtrack/right channel
♪ DIGITAL	Digital sound
♪ ANALOG	Analog sound



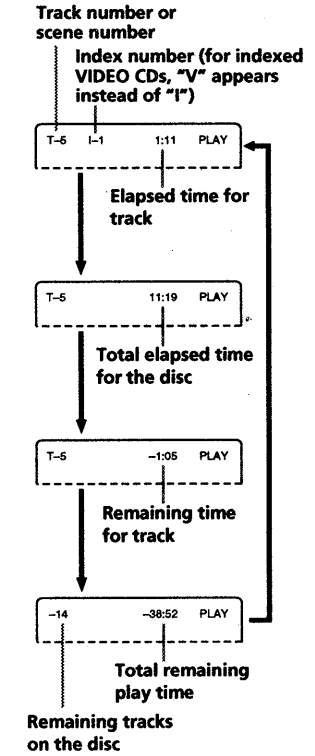
Checking the elapsed or remaining time of the disc

You can check the elapsed or remaining time on the TV screen. Press DISPLAY, then press AV TIME repeatedly. Each time you press AV TIME, the on-screen display changes as follows:

LDs with TOC



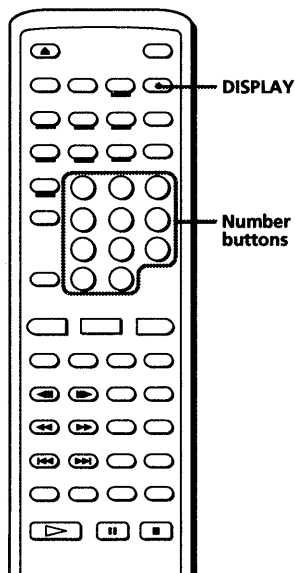
CDs/VIDEO CDs



Notes

- When playing an LD without TOC data, you can only view the total elapsed time (for a CLV disc) or current frame number (for a CAV disc).
- When playing a Ver. 2.0 VIDEO CD using PBC functions:
 - the scene number (such as "S-5") is displayed instead of the track number
 - you can only view the elapsed time for the current scene
- The display does not show remaining time for chapters or tracks that are 51 or more chapters or tracks away from the beginning of the disc.

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



- In addition to normal play mode, you can do Chapter/Track Search while in Freeze Frame (CAV LDs or VIDEO CDs), Repeat, or Pause mode. When the selected chapter or track is located after the search, playback continues in the same mode.
- When you do Chapter/Track search while a song is automatically paused in karaoke mode, the selected chapter or track starts playing immediately, without entering pause mode.
- You can enter 0 to select chapter 0 on LDs.
To enter 0, press >10 (or >15 on the player), then press 10/0 (or 10 on the player).

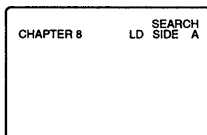
Notes

- Chapter Search does not function properly if the LD does not contain chapter numbers, or if the chapter number entered does not exist.
- You cannot use Track Search when you play a Ver. 2.0 VIDEO CD using PBC functions. Entering a number selects an item in the menu.
- If you do Track Search on a Ver. 2.0 VIDEO CD using the PBC functions before the AV calendar appears on the front panel display, the PBC function is turned off.

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

Locating a particular chapter/track

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



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

To enter a number greater than 10

Press >10 on the remote, then press two number buttons in sequence, first the tens digit, then the ones digit. If you press >10 by mistake, press <10 again, then enter the correct one digit number.

To	Press
Enter 10	>10
Enter 14	>10, then 1, then 4
Enter 20	>10, then 2, then >10
Enter 25	>10, then 2, then 5

To enter a number greater than 15 using the number buttons on the player

Press >15 first, then the corresponding number buttons. To enter "0", use 10.

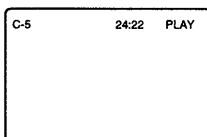
Example: To enter 30

Press >15 first, then 3 and 10.

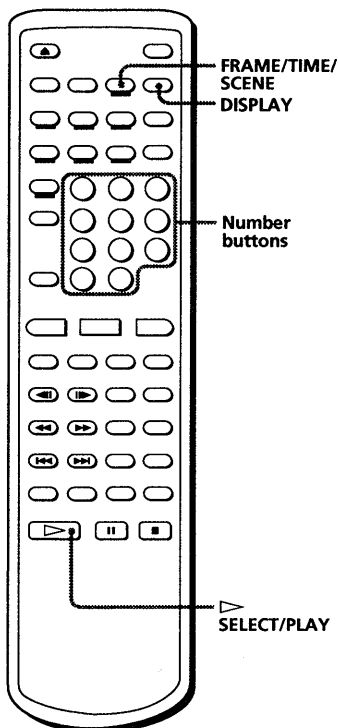
To check the current chapter/track number on the screen

Press DISPLAY to display the chapter/track number.

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



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



- In addition to normal play mode, you can do Frame/Time/Scene Search while in Freeze Frame, Repeat, or Pause mode. When the specified frame, time, or scene is located after the search, playback continues in the same mode.

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, allowing you to 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, allowing you to locate a particular point on the CLV LD by specifying the total elapsed time.

On Ver. 2.0 VIDEO CDs (with PBC functions), “scene numbers” are assigned to some points on moving pictures and to each still picture, allowing you to locate a scene you want to view on the VIDEO CD by specifying the scene number. This is only available during PBC playback (when the PBC ON/OFF button indicator on the player is lit). You can check the scene number by pressing the DISPLAY button during PBC playback (see “Checking the elapsed or remaining time of the disc” on page 17).

Entering the frame number, elapsed time, or scene number

1 Press FRAME/TIME/SCENE while playing the disc.

When playing	Indication
CAV LD	FRAME 00000
CLV LD	TIME 0:00:00
Ver. 2.0 VIDEO CD (with PBC functions)	SCENE 00000

FRAME 00000	LD SIDE A	TIME 0:00:00	LD SIDE A	SCENE 00000	VIDEO CD
-------------	-----------	--------------	-----------	-------------	----------

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

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

To locate the 12 minutes, 5 second point on the CLV LD, press ①, ②, ③ and ④.

To locate scene 123 on the VIDEO CD, press ①, ② and ③.

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

3 Press ▷ SELECT/PLAY.

Playback starts from the frame, time, or scene you entered.

To check the frame number or time

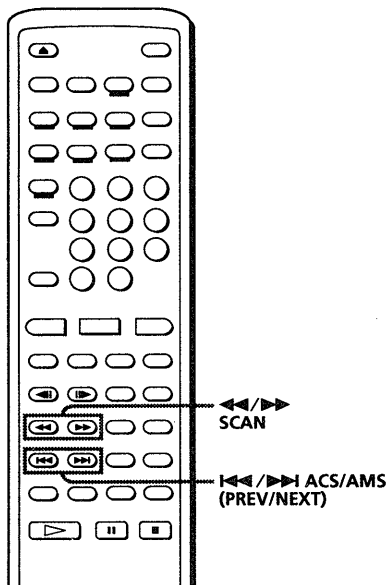
Press DISPLAY.

The current frame number, time, or scene number is displayed.

To cancel Frame/Time Search

Press CLEAR before pressing ▷ SELECT/PLAY.

Searching for a particular point on a disc



- ACS/AMS is the abbreviation for Automatic Chapter Sensor/Automatic Music Sensor.
- In addition to normal play mode, you can also do Speed Scan and Skip Search while in Freeze Frame (CAV LDs or VIDEO CDs), Repeat, or Pause mode. After the scan or search, playback continues in the same mode.
- If you hold down \leftarrow/\rightarrow SCAN after pressing || PAUSE while playing a VIDEO CD, the scanning speed increases. (When playing a Ver. 2.0 VIDEO CD using PBC functions, you can do this operation only while the picture is moving and the playing time is displayed.) The picture where you pressed || PAUSE freezes and remains on the screen. Navigate by using the time display. Release \leftarrow/\rightarrow SCAN to display the picture at the indicated time. The new picture freezes. Press \triangleright SELECT/PLAY to resume playback.

Notes

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

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

Scanning a disc quickly (Speed Scan)

Hold down \leftarrow/\rightarrow SCAN while playing the disc.

To	Hold down
Scan forward	\rightarrow SCAN
Scan backward	\leftarrow SCAN

To resume normal playback, release \leftarrow/\rightarrow SCAN.

Skipping chapters or tracks (Skip Search)

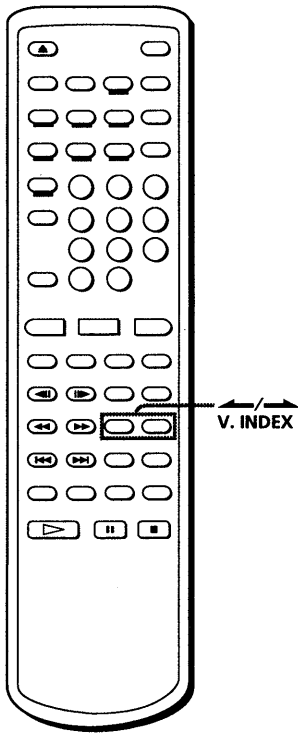
Press or hold down \leftarrow/\rightarrow ACS/AMS (PREV/NEXT).

To go to the beginning of	Press
Next chapter/track	\rightarrow ACS/AMS (NEXT) once
Current chapter/track	\leftarrow ACS/AMS (PREV) once
Previous chapter/track	\leftarrow ACS/AMS (PREV) twice before the picture or sound resumes

Hold down \rightarrow or \leftarrow to skip chapters/tracks continuously.

Skip Search on Ver.2.0 VIDEO CDs

If the PBC function is turned on, Skip Search may not be operated properly on some VIDEO CDs. The PBC function should be set to off (the PBC ON/OFF button indicator on the player is turned off) when operating Skip Search.



What is an index?

It is the division of a track or disc into numbered sections. It allows you to easily locate a desired point on the disc. To determine whether or not a disc has an index, look at the disc's packaging.

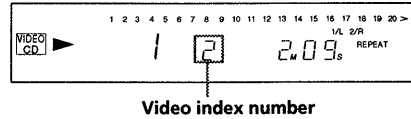
Locating a point using the index (Index Search)

There are two kinds of indexes: one is for audio CDs and the other is for VIDEO CDs. You can locate any point on the disc using the index. Note that this function is available only for indexed discs.

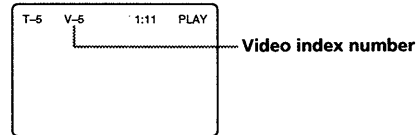
While playing a track, press ◀ V.INDEX or ▶ V.INDEX repeatedly.

- To locate the current or preceding index numbers, press ◀ V.INDEX.
- To locate the next or subsequent index numbers, press ▶ V.INDEX.

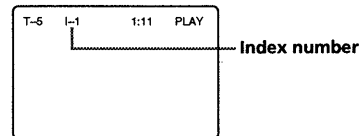
Front panel display



TV screen (while playing a VIDEO CD)



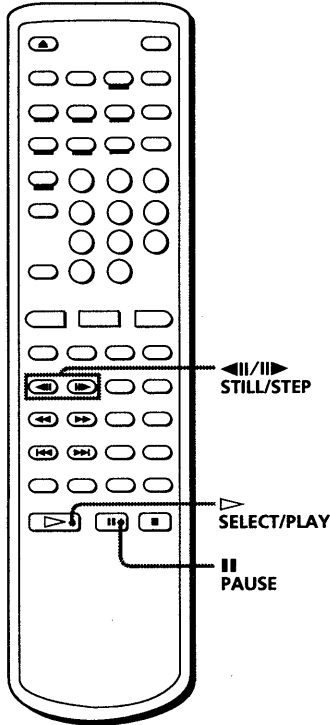
TV screen (while playing an audio CD)



Index Search on Ver. 2.0 VIDEO CDs

To operate Index Search on a VIDEO CD, the PBC ON/OFF button indicator on the player should not be lit. Press ■ STOP to stop playback, then press PBC on the remote, or PBC ON/OFF on the player to turn off the PBC ON/OFF button indicator.

Viewing frame-by-frame action



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

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

Freezing the action (Freeze Frame)

You can use this function for CAV LDs and VIDEO CDs. Press **|| PAUSE** while playing a CAV LD or VIDEO CD. The sound mutes and the picture freezes.

To resume normal playback

Press **▷ SELECT/PLAY**.

Playing frame-by-frame (Step Play)

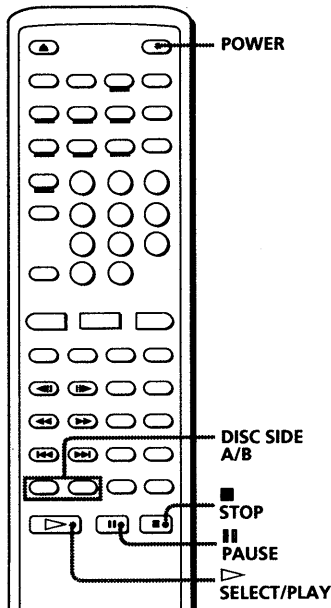
You can use this function only for CAV LDs.

- 1 Press **◀||/||▶ STILL/STEP** while playing a CAV LD.**
The sound mutes and the picture freezes.
- 2 Press **◀||/||▶** repeatedly to advance or reverse the action frame-by-frame.**
Hold down **◀||/||▶** to view continuous frame-by-frame action.

To resume normal playback

Press **▷ SELECT/PLAY**.

Resuming LD/VIDEO CD playback (Auto Resume)



- Each time you stop playing, the point at which you stopped last is memorized.
- The point at which you stopped playing is cleared when:
 - you press ▲ OPEN/CLOSE, DISC SIDE A/B or ⏮/⏭ PREVIOUS/NEXT (ACS/AMS)
 - you do a Chapter Search
 - you do a Frame/Time Search
 - you unplug the AC power cord of the player
- If an LD is in the player and you press ▲ OPEN/CLOSE to close the disc tray while it is opening, the point at which you stopped is retained.

Notes

- The point at which you stopped is not memorized if you stop playback during a Chapter Search or Frame/Time Search.
- If you press ▷ SELECT/PLAY when the power is off, the player turns on automatically. If a disc is loaded, playback resumes where you last stopped.
- For VIDEO CDs, the player memorizes the point at which you stopped regardless of the PBC ON/OFF setting.
- If you connect a microphone (switching the player to karaoke mode), Auto Resume is canceled. Although Auto Resume is not canceled if you switch the player's input mode to LINE IN, it is canceled if you connect a microphone.

This function operates automatically only for LDs or VIDEO CDs in non-karaoke mode (without microphones connected). Once you press ■ STOP or POWER to stop playing an LD or VIDEO CD, the player memorizes the point you stopped at so that you can continue viewing from the same point.

1 Press ■ STOP (or POWER) to stop playing an LD or VIDEO CD.

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

2 Press ▷ SELECT/PLAY.

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

To pause playing just before starting

If the player is turned on, press ■ PAUSE instead of ▷ SELECT/PLAY.

If the player is turned off, press POWER or ▷ SELECT/PLAY to turn on the player, then press ■ PAUSE.

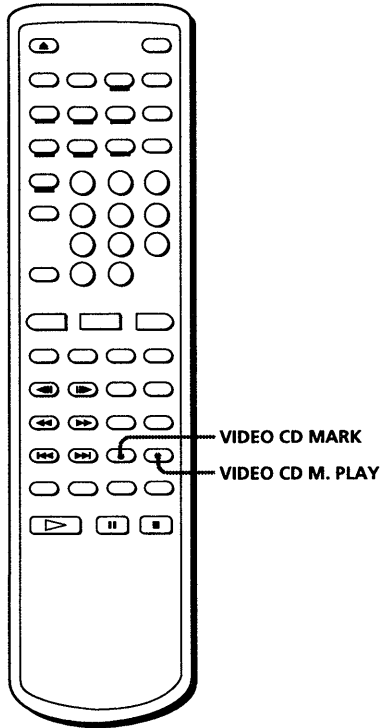
To view from the beginning of the disc

For LDs, 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.

For VIDEO CDs, press DISC SIDE A to start playing from the beginning of the disc.

The point at which you stopped is cleared.

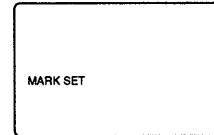
Resuming VIDEO CD playback from a point you like (Book Mark)



This is available for VIDEO CDs. You can mark any point you like on the disc with a "Book Mark" so that you can resume playback from that point. The player memorizes the point even after you remove the disc or turn off the player. You can make one Book Mark. Each time you make a new Book Mark, the old Book Mark is erased.

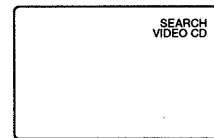
Making a Book Mark

Play the VIDEO CD on which you want to make a Book Mark, then press VIDEO CD MARK on the remote commander at a point you like.



Resuming playback using the Book Mark

Press VIDEO CD M.PLAY.
The player searches for the point you marked, then starts playing.

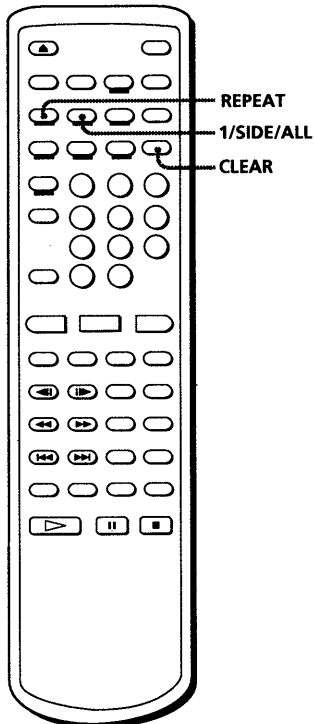


- Each time you press the VIDEO CD MARK button while playing a disc, the Book Mark moves (the old Book Mark is erased and a new Book Mark is made).
- You can use Book Marks on Ver. 1.0, Ver. 1.1, and Ver. 2.0 VIDEO CDs.
- The Book Mark remains even after you unplug the AC power cord of the player.

Note

- The PBC ON/OFF button indicator must be lit to use a Book Mark on a Ver. 2.0 VIDEO CD. If it is not lit, press ■ STOP to stop playing the disc, then press the PBC (ON/OFF) button to turn it on.

Playing a section repeatedly (Repeat Play)



Notes

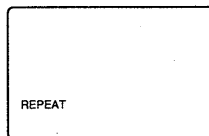
- You cannot use Repeat and Reserve at the same time.
- You cannot use Repeat while using PBC functions on a Ver. 2.0 VIDEO CD. To use Repeat on a Ver. 2.0 VIDEO CD, press ■ STOP to stop playing, then press the PBC (ON/OFF) button to turn off the PBC ON/OFF button indicator on the player.

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; a whole disc or a single track on a CD or VIDEO CD; or a selected portion of the disc.

Repeating the whole disc (All Disc Repeat)

Press REPEAT.

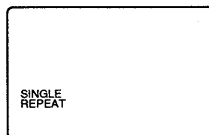
“REPEAT” appears on the screen briefly. “REPEAT” lights up on the front panel display. When playing an LD, the player plays through both sides of the LD repeatedly. When playing a CD or VIDEO CD, the player plays all the tracks on the disc repeatedly.



Repeating the selected chapter/track (Single Repeat)

Press 1/SIDE/ALL once, then press REPEAT.

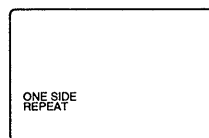
“SINGLE” and “REPEAT” appear on the screen briefly. “REPEAT 1” lights up on the front panel display. The player plays the selected chapter/track repeatedly.



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

Press 1/SIDE/ALL twice, then press REPEAT.

“ONE SIDE” and “REPEAT” appear on the screen briefly. “REPEAT 1 SIDE” lights up on the front panel display. The player plays the selected disc side repeatedly.



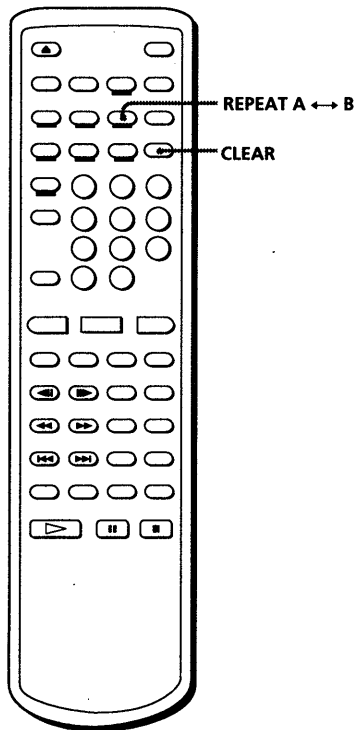
To check the repeat status

Press DISPLAY twice.

Canceling Repeat Play

Press CLEAR.

Playing a section repeatedly (continued)



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

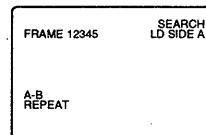
1 Press REPEAT A↔B at the beginning of the scene or phrase you want to repeat.

This tells the player where to start. "REPEAT" and "A-" appear, and "B" flashes.

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

3 Press REPEAT A↔B again.

This tells the player where to end. "REPEAT" and "A-B" appear. The player repeatedly plays the scenes or phrases between the two points you specified.



To repeat a different portion

Repeat steps 1 to 3 to reenter new start and end points.

To cancel Repeat A ↔ B

Press CLEAR.

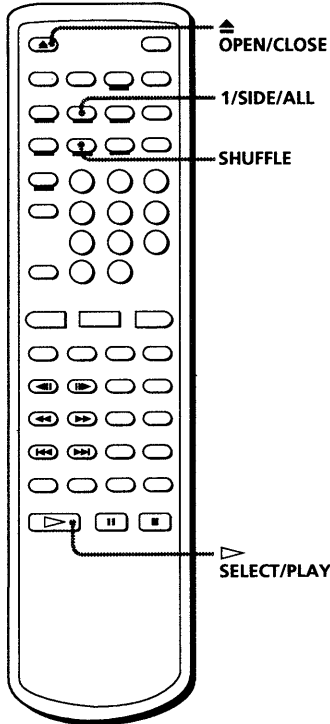


- You can scan the disc between points A and B by holding down ◀◀/▶▶ SCAN.

Note

- You can do Repeat A↔B only on the current side of an LD. You cannot do it on both sides of the LD.
- You cannot do Repeat A↔B while using PBC functions on a Ver. 2.0 VIDEO CD.

Playing songs in random order (Shuffle Play)



- You can skip the current song to the next song which will be randomly selected by pressing the **▶▶ NEXT (ACS/AMS)** button. The **◀◀ PREV (ACS/AMS)** button does not function during Shuffle or Delete Shuffle Play.

Notes

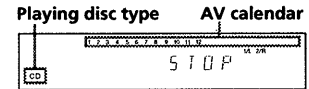
- If the LD does not contain TOC data, or if the player has not read the TOC data of the LD, "NO TOC" appears on the screen when you press SHUFFLE, and you cannot do Shuffle or Delete Shuffle Play.
- You cannot do Shuffle or Delete Shuffle Play while using PBC functions on a Ver. 2.0 VIDEO CD. To do Shuffle or Delete Shuffle, play on a Ver. 2.0 VIDEO CD, press **■ STOP** to stop playing, then press the **PBC (ON/OFF)** button to turn off the PBC ON/OFF button indicator on the player.

You can play the songs on a disc in random order, each song once (Shuffle Play). If you select the songs you want to play in advance, the player plays only selected songs in random order (Delete Shuffle). The player needs the TOC data of the disc to do Shuffle Play and Delete Shuffle Play, so these functions are available only on LDs containing TOC data, CDs, and VIDEO CDs.

Shuffle playing on one side of a disc (One Side Shuffle)

- Place a disc on the disc tray, then press **▲ OPEN/CLOSE** to close the tray.**

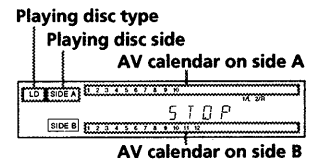
When you use a CD or VIDEO CD, the AV calendar appears on the front panel display, showing that TOC data was read.



- (This step is for an LD. Skip this step when playing a CD or VIDEO CD.)**

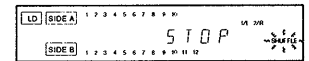
Press **▷ SELECT/PLAY** and wait for the AV calendar to appear on the front panel display, then press **■ STOP** to stop playing.

The player reads the TOC data of the LD.



- Press SHUFFLE.**

"SHUFFLE" flashes on the front panel display.



- Press **▷ SELECT/PLAY**.**

Songs start playing. All songs on the disc are played once in random order. To play side A of a double-sided LD, press **DISC SIDE A**, then press **▷ SELECT/PLAY**. To do Shuffle Play on side B, perform steps 3 and 4 in playback mode or pause mode while on side B.

Shuffle playing on both sides of a double-sided LD (Both Sides Shuffle)

- Follow steps 1 to 3 above to enter SHUFFLE mode.**

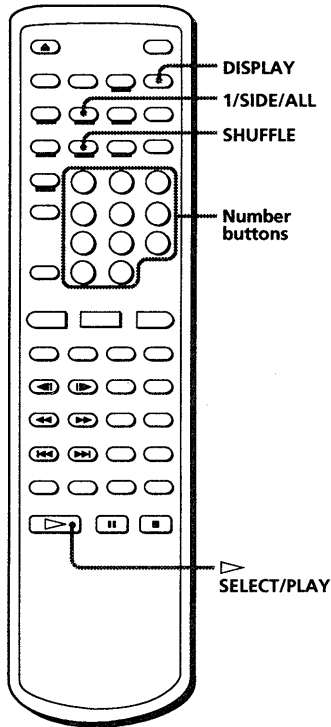
Make sure that both AV calendars for side A and side B appear, and "SHUFFLE" flashes on the front panel display.

- Press 1/SIDE/ALL to turn off "1 SIDE" on the front panel display.**

- Press **▷ SELECT/PLAY**.**

The songs on side A are played in random order, then the songs on side B are played in random order.

Playing songs in random order (continued)



- You can delete songs numbered up to 99. To delete a song over 10, press >10, then press two number buttons in sequence, first tens digit, then the ones digit (see page 18). To use the number buttons on the player, see page 18.
- You can repeat Shuffle and Delete Shuffle Play. Press REPEAT on the remote commander. Each time repeat finishes, the order of the songs is reshuffled.

Playing only your favorite songs in random order (One Side Delete Shuffle)

To select your favorite songs in random order, delete the songs you do not want to play from the disc. If you use an LD, make sure the AV calendars appear on the front panel display.

1 Press SHUFFLE to enter SHUFFLE mode.

"SHUFFLE" flashes on the front panel display.

2 Press DISPLAY twice to use the on-screen display.

3 Press the number buttons to delete songs you do not want to play.

The deleted song numbers are displayed on the screen.

VIDEO	1-12	52:07	SIDE A
DELETE SHUFFLE	2	7	...

If you enter a wrong number, press CLEAR. With each press, the last song you entered is restored (the number on the screen disappears).

4 Press ▷ SELECT/PLAY.

The remaining songs on the disc are played once in random order. To play the remaining songs on side A of a double-sided LD, press DISC SIDE A, then press ▷ SELECT/PLAY. To play with the Delete Shuffle function on side B, perform steps from 1 to 4 in playback mode or pause mode while on side B.

Delete shuffle playing on both sides of an LD (Both Sides Delete Shuffle)

Play side B and wait for the AV calendar to appear on the front panel display, then perform the following steps.

1 Follow steps 1 to 3 above to delete songs.

To delete songs on side B of a double-sided LD, press DISC SIDE B, then press the number buttons. The songs deleted from side B appear in squares.

2 Press 1/SIDE/ALL on the remote commander to turn off "1 SIDE" on the front panel display.

3 Press ▷ SELECT/PLAY.

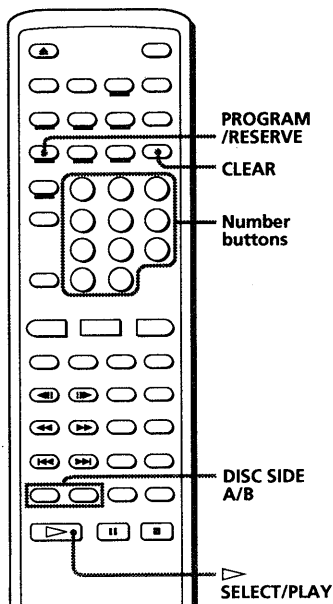
The remaining songs on side A are played in random order, then the remaining songs on side B are played in random order.

Canceling Shuffle Play or Delete Shuffle Play

Press CLEAR.

"SHUFFLE" on the front panel goes off. The player exits Shuffle mode. All the deleted songs are restored.

Playing songs in any order you like (Program Play)



- You can select songs numbered up to 99. To select a song over 10, Press >10, then press two number buttons, first the tens digit, then the ones digit (see page 18). To use the number buttons on the player, see page 18.
- You can skip to the previous or next song in the program by pressing the ◀◀/▶▶ PREV/NEXT (ACS/AMS) button.
- Even when the playback of the whole program is complete, the program is not cleared. The program is cleared when:
 - you press CLEAR (except while "PGM" on the front panel display is flashing) to exit Program mode.
 - you open the disc tray or turn off the player
- To repeat playing the program automatically, press REPEAT on the remote commander.

Notes

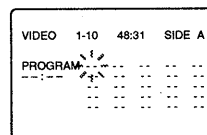
- You cannot use Program while using PBC functions on a Ver. 2.0 VIDEO CD. To use Program on a Ver. 2.0 VIDEO CD, press ■ STOP playing, then press the PBC (ON/OFF) button to turn off the PBC ON/OFF button indicator on the player.
- To check the total playing time of the program on an LD:
 - Use an LD with TOC data
 - Press ▷ SELECT/PLAY (and press SIDE B) make the player read the LD's TOC data, before you press PROGRAM/RESERVE.
- If you select songs numbered over 50, or if the total playing time exceeds 100 minutes, the time display changes to "--:--."

You can select up to 25 songs to be played in any order you like, regardless of disc side, even while a song is being played. The songs are played continuously in the order you specify. This is available in non-karaoke mode (without microphones connected). In karaoke mode, use Reserve instead of this function (see "Selecting karaoke song order" on page 33).

Selecting songs to make a program

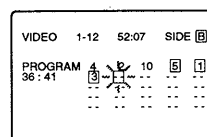
1 Press PROGRAM/RESERVE.

"PROGRAM" appears. "PGM" flashes on the front panel display.



2 Press the number buttons to select songs in the order you want them to play.

When you play a double-sided LD, select the disc side by pressing DISC SIDE A (or B), then press the number buttons to select songs in the order you want them to play. The songs selected from side B appear in squares.



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

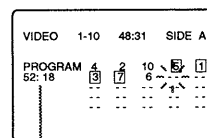
3 Repeat step 2 until you finish selecting songs.

4 Press ▷ SELECT/PLAY.

The selected songs are programmed and the on-screen display disappears. "PGM" lights up on the front panel display. The selected songs are played in order you selected them.

To make a program while checking the total playing time

You can check the total playing time of the program while selecting songs. The time is displayed both on the screen and front panel displays. Each time you select a song, its playing time is added.



Total playing time of the program

If you enter || PAUSE in the program

You can enter || PAUSES among songs you select, to make the player automatically pause during the program. If you enter a || PAUSE, the total playing time is re-counted from --:-- (zero).

To check the contents of the program

Press DISPLAY twice.

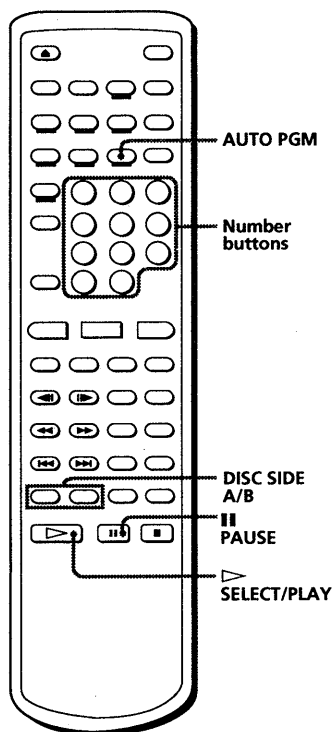
The numbers of the selected songs appear. If playing a song, its number flashes.

Canceling Program Play

Press CLEAR.

"CLEAR" appears briefly and "PGM" on the front panel display goes off. The player exits Program mode and all the programmed songs are cleared.

Playing a disc within a specified period of time (Auto Program Play)



- To use the number buttons on the player, see page 18.
- You can skip to the previous or next song in the program by pressing the **PREV/NEXT** (ACS/AMS) button.
- If an LD contains 51 or more chapters on the playing side, Auto Program may not operate correctly.

Note

- You cannot use Program while using PBC functions on a Ver. 2.0 VIDEO CD. To use Program on a Ver. 2.0 VIDEO CD, press **STOP** to stop playing and then press the **PBC (ON/OFF)** button to turn off the PBC ON/OFF button indicator on the player.

With Auto Program Play, the player divides the tracks on the disc into what it calls "Program A" and "Program B", playing both A and B for the amount of time entered. Since the player pauses between the two programs, this feature is useful for making tapes.

Decide how long you want the disc to play and then enter half that amount of time.

This function is available only on CDs, VIDEO CDs and LDs with TOC.

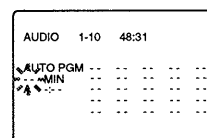
To ensure correct operation for LDs

When you play an LD with TOC, press **PAUSE**, and then press **DISC SIDE A** or **DISC SIDE B** to display the AV calendar before you press **AUTO PGM**. Make sure that you cannot make programs consisting of chapters from both sides of LD using Auto Program.

Programming the songs automatically

1 Press **AUTO PGM**.

"AUTO PGM" appears. "AUTO PGM" flashes on the front panel display.



2 Enter the desired playing time with the number buttons.

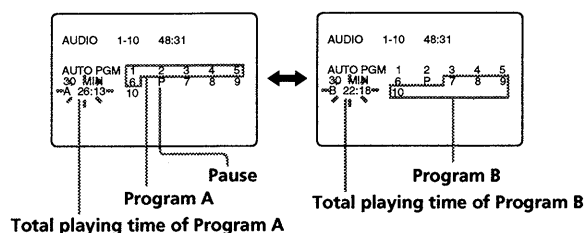
To enter 11 minutes or more

Press **>10** and then press two number buttons in sequence, first the tens digit, then the ones digit.

For example, to enter 30 minutes, press **>10**, **3** and then **0**.

Even if you enter the wrong time, you can enter the correct time by pressing the number buttons.

The player selects the songs for both Program A and B, and the total playing time of two programs appear alternately.



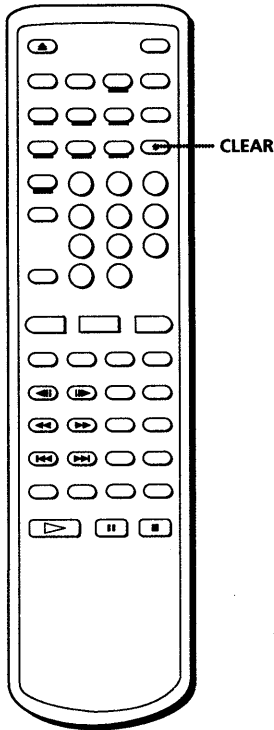
3 Press **>** **SELECT/PLAY**.

The contents of Program A start playing and the player pauses at the end of Program A. To play Program B, press **>** **SELECT/PLAY** again.

To check the contents of the program

Press **DISPLAY** twice.

The selected song numbers in program A and program B appear.



Assignment of the time to Program A and B

If you enter a playing time shorter than half the disc playing time, some songs on the disc may not fit into the specified time and may not be programmed. On the other hand, if you enter a playing time longer than the disc playing time, all songs will be stored only in Program A. This is because Program A always has priority over B. The table below shows how the player assigns the time in such cases.

Example for a 40-minute disc:

You enter	Program A plays	Program B plays	Total playing time
15 min	15 min (or less)	15 min (or less)	30 min (or less)
30 min	30 min (or less)	10 min (about)	40 min
45 min	40 min (all songs)	0 min	40 min

Canceling Auto Program Play

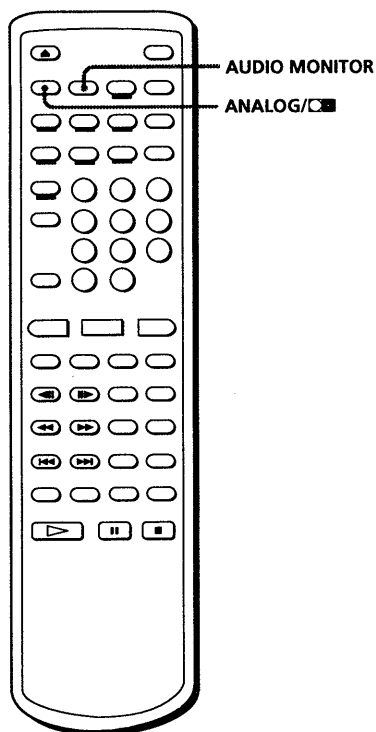
Press CLEAR.

"CLEAR" appears briefly and "AUTO PGM" on the front panel display goes off. The player exits Program mode and the program contents are cleared.



- Even when the playback of the whole program is completed, the program is not cleared. The program is cleared when:
 - you press CLEAR (except while "AUTO PGM" on the front panel display is flashing) to exit Program mode.
 - you open the disc tray or turn off the player.

Using the sound control functions



Notes

- If you select the analog sound during playback of the disc which conforms to the Dolby Surround AC-3 system, only the sound of the left channel is output from both speakers. With this type of disc, you cannot use AUDIO MONITOR to alternate the left and right channels of analog sound.
- The output level may differ between digital and analog sound.

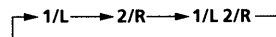
Playing a stereo disc or Second Audio Program (SAP) disc

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

To alternate the sound output

Press AUDIO MONITOR while playing the disc.

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



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 briefly on the screen and the analog sound is output.

To return to digital sound

Press ANALOG/CX repeatedly until “♪ DIGITAL” appears on the screen.

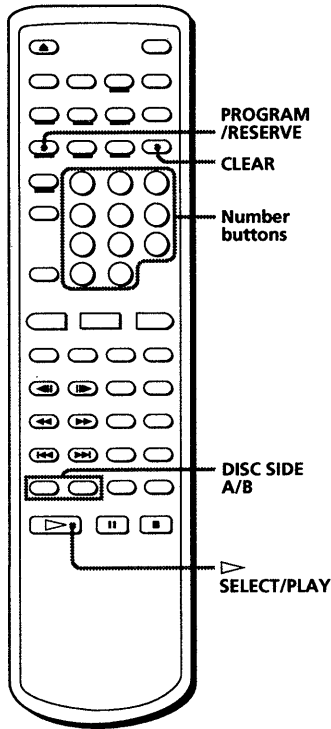
Playing discs with the CX (CX) logo

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

To activate the CX noise reduction system manually

Press ANALOG/CX repeatedly until “CX ON” appears. The CX noise reduction system is activated.

Selecting karaoke song order (Reserve)



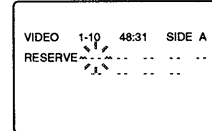
Note

- You cannot use Reserve while using PBC functions on a Ver. 2.0 VIDEO CD. To use Reserve on a Ver. 2.0 VIDEO CD, press ■ STOP playing, then press the PBC (ON/OFF) button to turn off the PBC ON/OFF button indicator on the player.

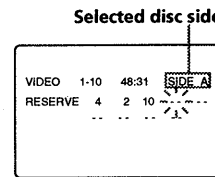
This is available in karaoke mode. You can select up to 9 songs to be played in any order you like, regardless of disc side, even while a song is being played. The songs are played continuously in the order you selected so that you can enjoy non-stop karaoke playing. You can also select songs on another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

Selecting songs on the current disc

- 1 Press PROGRAM/RESERVE.**
"RESERVE" appears. The RESERVE button indicator on the player flashes.

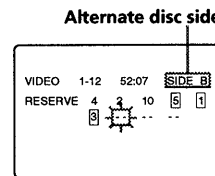


- 2 Press the number buttons to select songs in the order you want them to play.**
When you play a double-sided LD, select the disc side by pressing DISC SIDE A (or B), then press the number buttons to select songs.



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

- 3 To enter songs from the other side of the double-sided LD, press DISC SIDE B (or A), then press the number buttons to select the songs in the order you want them to play.**



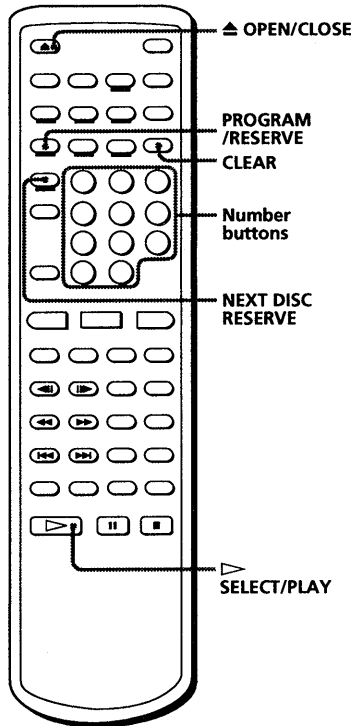
- 4 Repeat steps 2 and 3 until you finish selecting songs.**

- 5 Press PROGRAM/RESERVE.**
On-screen indications disappear. The RESERVE button indicator on the player lights up.

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

If you reserve songs while the player is stopped, press ▷ SELECT/PLAY. The reserved songs start playing.

Selecting karaoke song order (continued)



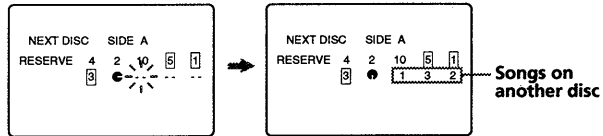
- You cannot use Next Disc Reserve in non-karaoke mode (without microphones connected). Instead, you can select up to 25 songs in non-karaoke mode (see "Playing songs in any order you like" on page 29).

Notes

- When you play songs using Reserve (and Next Disc Reserve), the songs are played continuously, and you cannot use Auto Pause. The player enters pause mode after playing all the reserved songs.
- You cannot use Reserve and Repeat at the same time.
- You cannot select tracks over 80 on a CD or VIDEO CD using Next Disc Reserve.

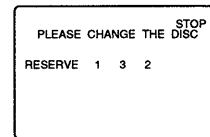
Selecting songs on another disc (Next Disc Reserve)

- Press **NEXT DISC RESERVE** after steps 1 to 4 on the previous page.
"●" appears on the screen, rotating. Now you can select songs on another disc. Follow steps 2 (and 3) on the previous page to select the songs.



- Press **PROGRAM/RESERVE** (then press ▶ **SELECT/PLAY**).

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



- Press ▲ **OPEN/CLOSE** to open the disc tray, then change the disc.

- Press ▶ **SELECT/PLAY** or push in the disc tray.

The selected songs on the new disc start playing automatically.

Canceling Reserve and Next Disc Reserve

Press **CLEAR**.

"CLEAR" appears briefly and the player exits Reserve mode. The RESERVE button indicator on the player goes off. All the reserved songs are cleared.



- You can enter 0 to select chapter 0 on LDs. To enter 0, press >10 (or >15 on the player); then press 10/0 (or 10 on the player).

To enter a number greater than 10

Press >10 on the remote, then press two number buttons in sequence, first the tens digit, then the ones digit.

If you press >10 by mistake, press >10 again to flash "--" on the screen, then enter the correct one digit number.

To	Press
Enter 10	>10
Enter 14	>10, then ①, then ④
Enter 20	>10, then ②, then >10
Enter 25	>10, then ②, then ⑤

To enter a number greater than 15 using the number buttons on the player

Press >15 first, then the corresponding number buttons. To enter "0", use 10.

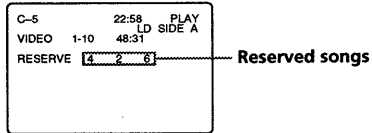
Example: To enter 30

Press >15 first, then 3 and 10.

To check the songs to be played

Press DISPLAY twice.

The numbers of the reserved songs appear. When a song has been played, its number disappears.

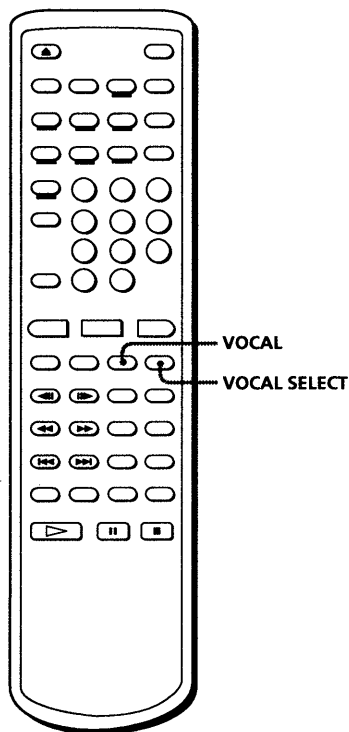


To skip the current song

Press ►►.

The next reserved song starts playing.

Using karaoke functions



- When you connect your VCR to the LINE IN input on the player and set the player to line in mode (see "Playing karaoke using auxiliary equipment" on page 41), you can also use Vocal Select for karaoke video tapes.

Note

- On some VIDEO CDs, original vocals are recorded on the left channel. If you play such a disc, the player outputs the vocals and backup sound. To listen to backup sound only, use the AUDIO MONITOR button to select "2/R" (see "Using the sound control functions" on page 32).

You can enjoy karaoke using various functions.

Singing along with the original vocals (Vocal Select)

You can listen to words or melody you forget by listening to the original vocals. This is available in karaoke mode for karaoke discs or tapes.

To listen to the original vocals on MULTI AUDIO LDs

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

- 1 Press VOCAL to turn on the VOCAL SELECT button indicator.
- 2 Press VOCAL SELECT repeatedly until the vocals are heard. With each press, the on-screen indication changes as follows:



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

To listen to the original vocals on karaoke CDs, VIDEO CDs, or tapes

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

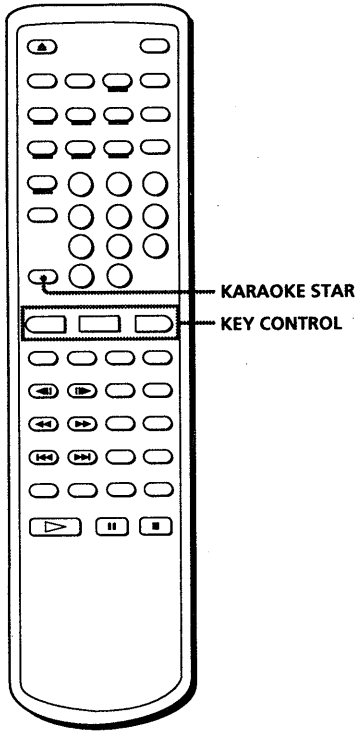
- 1 Press VOCAL to turn on the VOCAL SELECT button indicator.
- 2 Press VOCAL SELECT repeatedly to select the sound. With each press, the on-screen indication changes as follows:



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

To cancel Vocal Select

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



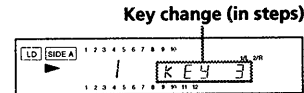
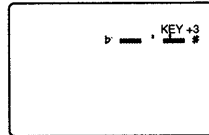
Changing the backup key (Key Control)

You can adjust the backup key to your voice.

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

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

The key is adjustable to one of 17 steps (8 steps higher, 8 steps lower than the original key, and the original key). Your setting appears on the screen briefly. In karaoke mode (with microphones connected), or when you use LINE IN, the key change (in steps) is always displayed on the front panel display.



- In karaoke mode, the key returns to the original key when playback pauses automatically at the end of a song. If Auto Pause is canceled, the key does not change at the end of a song.
- You can also adjust the key from the karaoke microphone (see "Using the optional karaoke microphone" on page 40).
- You can also use Key Control in non-karaoke mode (without microphones connected).

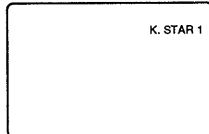
Note

- When you use KARAOKE STAR, the ECHO LEVEL control should be set to the appropriate level. If the control is set to MIN, the karaoke star function has no effect.

Adding richness to your voice (Karaoke Star)

If you feel that your voice lacks depth, use the karaoke star function.

Press KARAOKE STAR. The KARAOKE STAR indicator-button on the player lights green and "K. STAR 1" appears on the screen. Initially, the effect level is low.



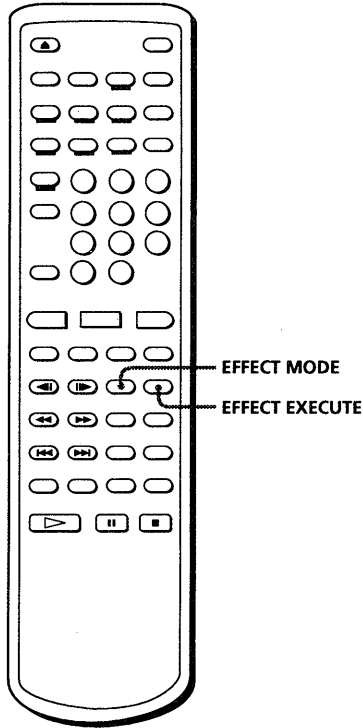
To increase the effect level, press KARAOKE STAR again. The KARAOKE STAR indicator-button on the player lights orange and "K. STAR 2" appears on the screen, and the effect level becomes high. With each press, the on-screen indication changes as follows:



To cancel Karaoke Star

Press KARAOKE STAR so that the KARAOKE STAR indicator-button goes off.

Using karaoke functions (continued)



- Even in non-karaoke mode, you can use the applause function.

Note

- The EFFECT EXECUTE button does not function during applause. To use the EFFECT EXECUTE button, press it after applause finishes.
- When playing karaoke using LINE IN, you can only use the applause function manually.
- You cannot use Applause while using PBC functions on a Ver. 2.0 VIDEO CD. To use the applause function, press ■ STOP to stop playback, then press the PBC (ON/OFF) button to turn off the PBC ON/OFF button indicator on the player.

Applauding the singer

The player can liven up karaoke entertainment by applauding the singer.

To select automatic applause

The player applauds at the beginning and end of each song automatically (except during PBC playback on a Ver. 2.0 VIDEO CD).

You can select two types of applause.

Press EFFECT MODE on the remote commander or EFFECT on the player to turn on the EFFECT button indicator. With each press, the on-screen indication changes as follows:



Indication	Select
EFFECT 1	Applause only
EFFECT 2	Applause and cheers
EFFECT OFF	Cancel (the indicator turns off)

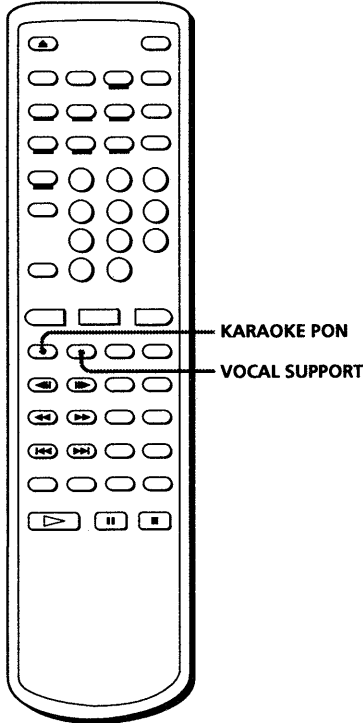
To applaud manually

You can applaud the singer any time you like.

Press EFFECT EXECUTE on the remote commander.

Each time you press EFFECT EXECUTE, the player applauds.

When you applaud manually, the player applauds according to the Auto Effect Applause setting. When the Auto Effect Applause is set to EFFECT 1, the player does "Applause" only. When the Auto Effect Applause is set to EFFECT 2 or EFFECT OFF, the player does "Applause and cheers".



- Using the Vocal Support function, you can sing a duet by yourself. You can sing the male part (or female part) and the other part comes in when you stop singing.
- You can also use Karaoke Pon in non-karaoke mode (without microphones connected).

Notes

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

Letting the vocals help you (Vocal Support)

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

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

“SUPPORT” appears on the screen briefly.

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

To turn off Vocal Support

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

“SUPPORT OFF” appears on the screen briefly.

Enjoying karaoke with non-karaoke discs (Karaoke Pon)

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

Press KARAOKE PON to turn on the KARAOKE PON function.

“KARAOKE PON” appears on the screen.

The volume of the singer’s voice is lowered.

To turn off Karaoke Pon

Press KARAOKE PON again to turn off the KARAOKE PON function.

“K. PON OFF” appears on the screen briefly.

Using karaoke functions (continued)



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

Note

- The MIC 1 LEVEL (or MIC 2 LEVEL) control adjusts the volume level of the MIC 1 (or MIC 2) jack on the front panel and that on the rear panel simultaneously.

Using the optional karaoke microphone

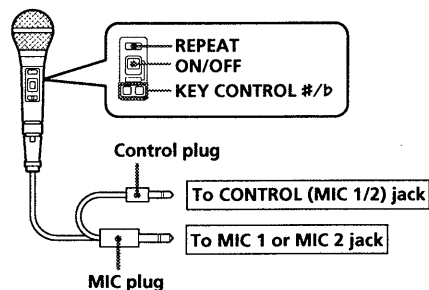
You can control the player from the karaoke microphone (F-KM1, not supplied) by connecting the control plug to the CONTROL jack on the player.

To sing repeatedly

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

To use Key Control

You can change the backup key by pressing KEY CONTROL #/b on the microphone. This is the same operation as KEY CONTROL on the player or remote commander (see "Changing the backup key" on page 37).

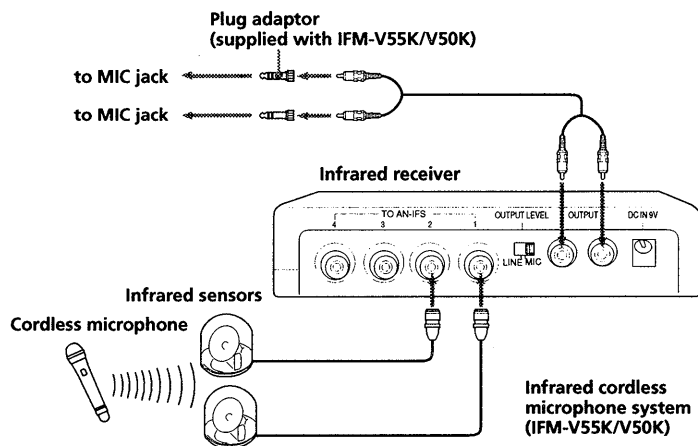


Using the infrared cordless microphone system (not supplied)

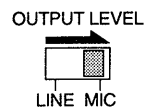
You can use infrared cordless microphones by connecting the infrared receiver to the MIC jacks on the player.

IFM-V55K/V50K

- 1 Connect the infrared receiver to the MIC 1/2 jacks.



- 2 Set the OUTPUT LEVEL selector on the infrared receiver to MIC.





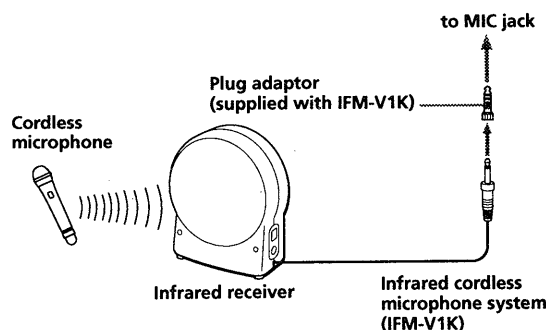
- When you use LINE IN, the left channel is output automatically, even if microphones are not connected. To listen to the right channel, or to listen to both channels in stereo, use Vocal Select. Vocal Select operates as it would do for CDs (VOCAL 1 and VOCAL 2). See "Singing along with the original vocals" on page 36 for details.
- When you use LINE IN, you can only use the applause function manually.

Note

- When you play karaoke using auxiliary equipment such as a VCR using LINE IN:
 - Always turn on the LD player.
 - Stop playing the disc by pressing ■ STOP. When playing a disc, you cannot use LINE IN.

IFM-V1K

Connect the infrared receiver to the MIC 1/2 jacks.

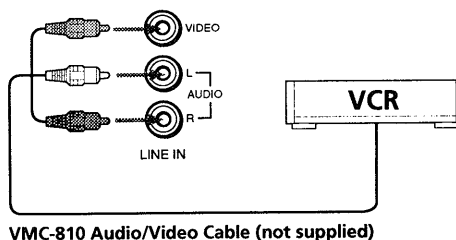


Playing karaoke using auxiliary equipment

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

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

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

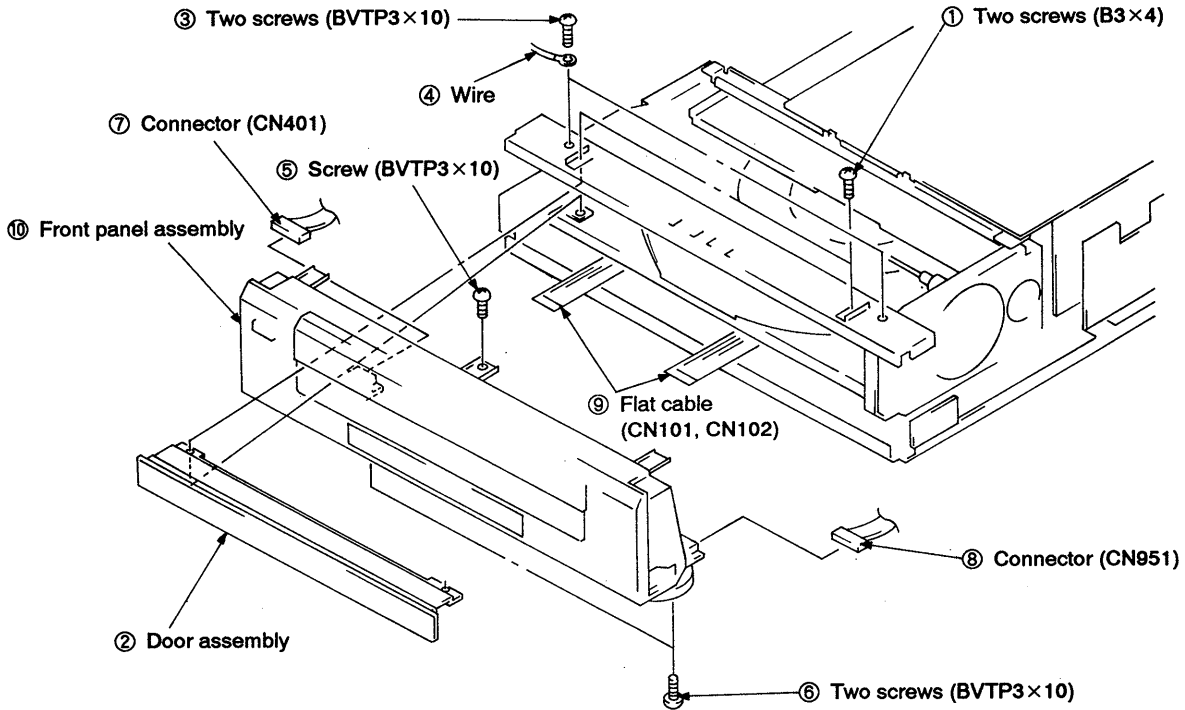


SECTION 2

DISASSEMBLY

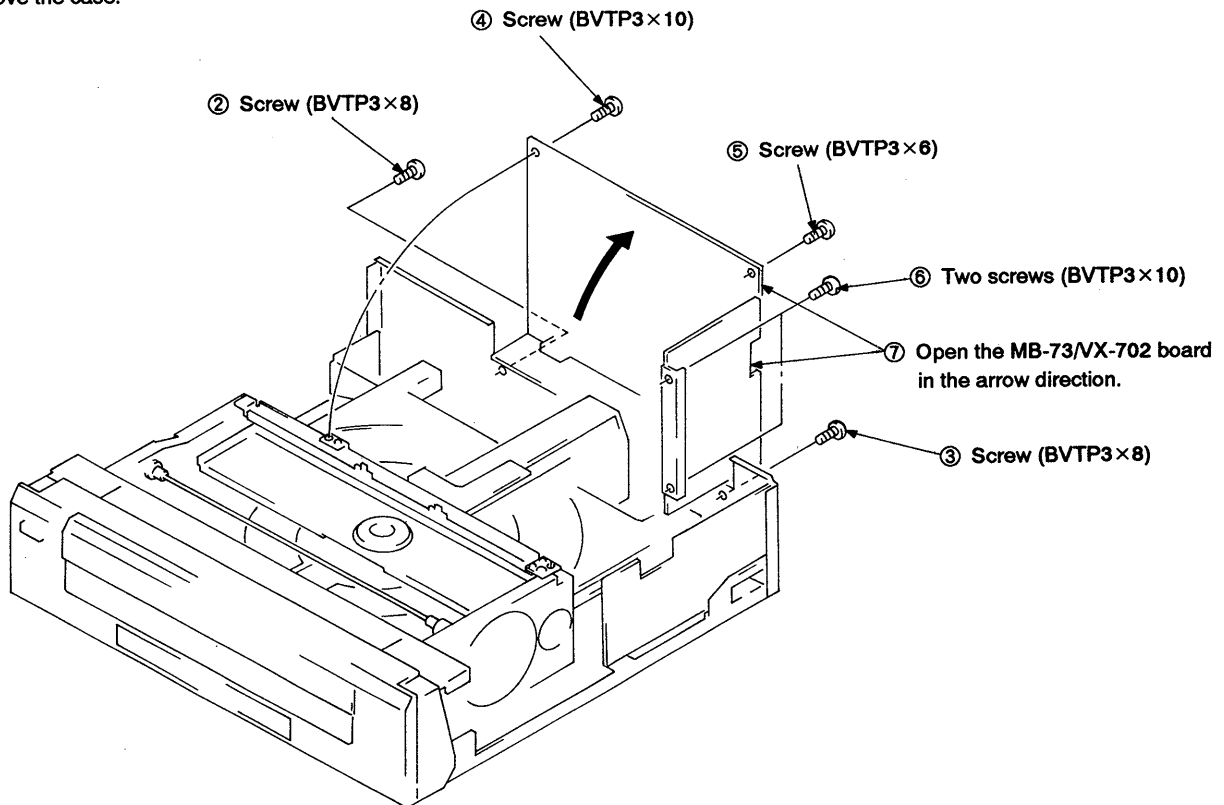
Note: Follow the disassembly procedure in the numerical order given.

2-1. FRONT PANEL ASSEMBLY



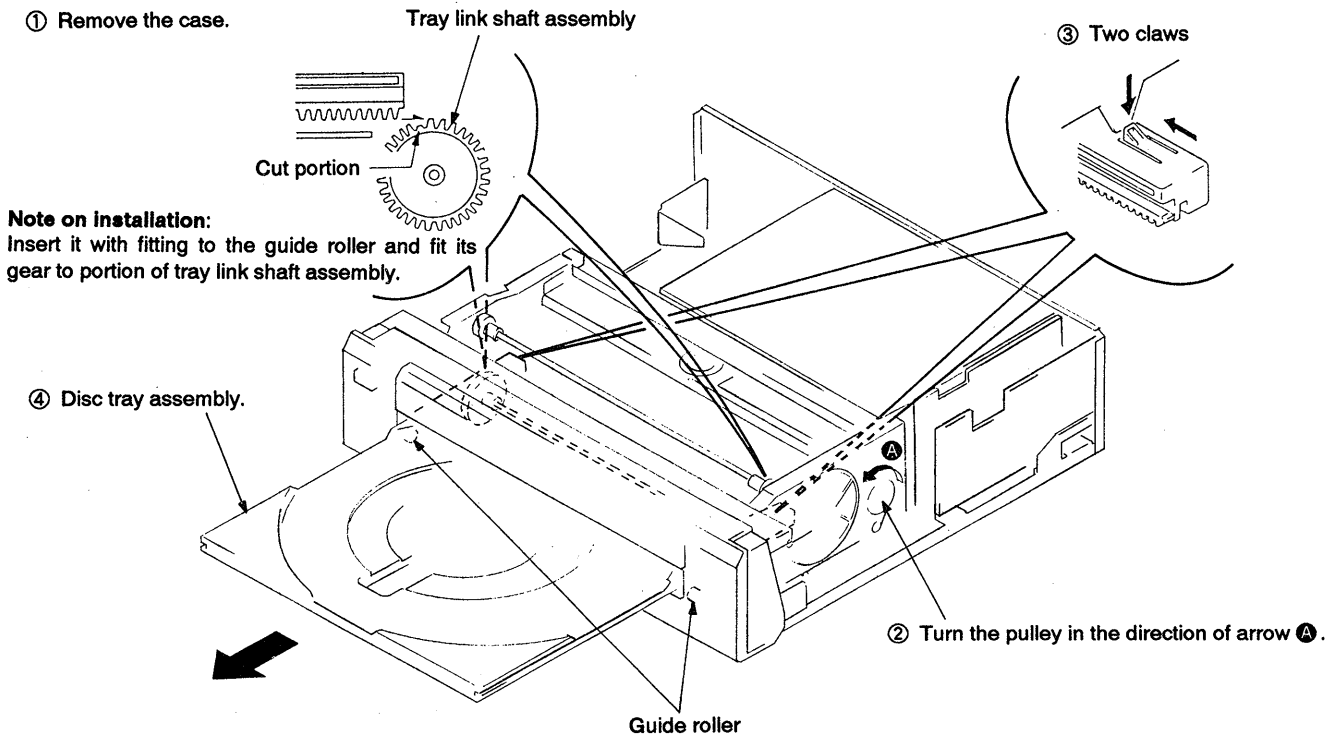
2-2. OPENING OF MB-73/VX-702 BOARD (SERVICE POSITION)

① Remove the case.



2-3. DISC TRAY ASSEMBLY

① Remove the case.



2-4. CHUCKING BLOCK ASSEMBLY


① Remove the case and front panel assembly.

② Opening of MB-73/VX-702 board.

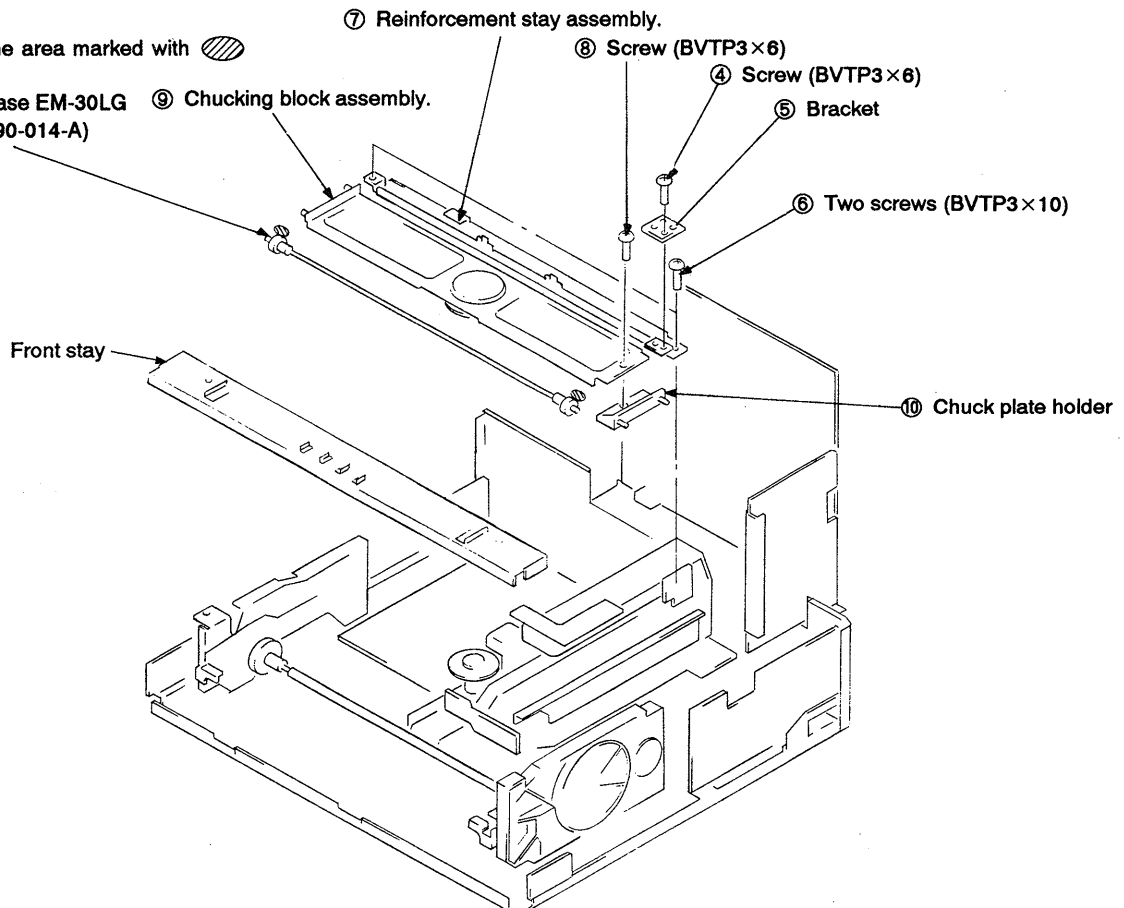
③ Remove the disc tray assembly.

④ Link shaft assembly

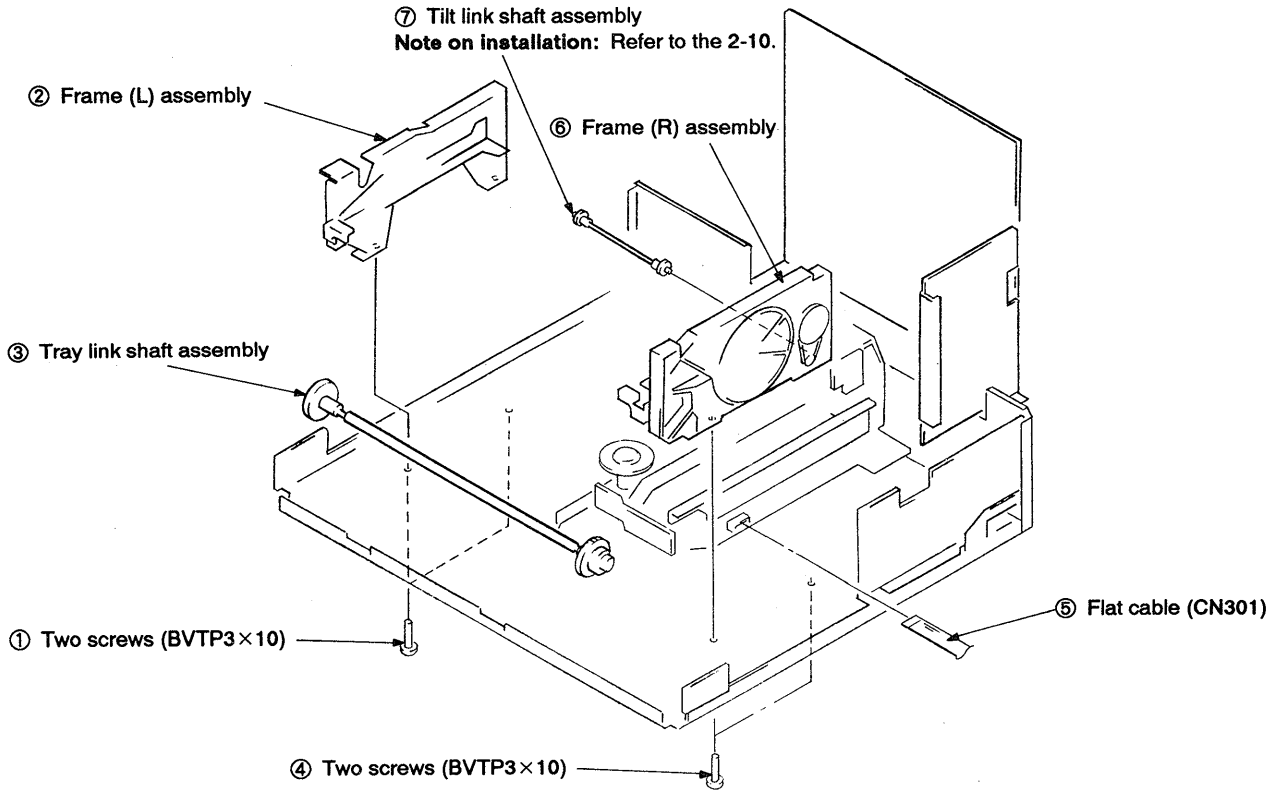
Note on installation:

Apply the grease on the area marked with  (2 portions).

(Grease: Molykote Grease EM-30LG Part No. J-6090-014-A) ⑤ Chucking block assembly.

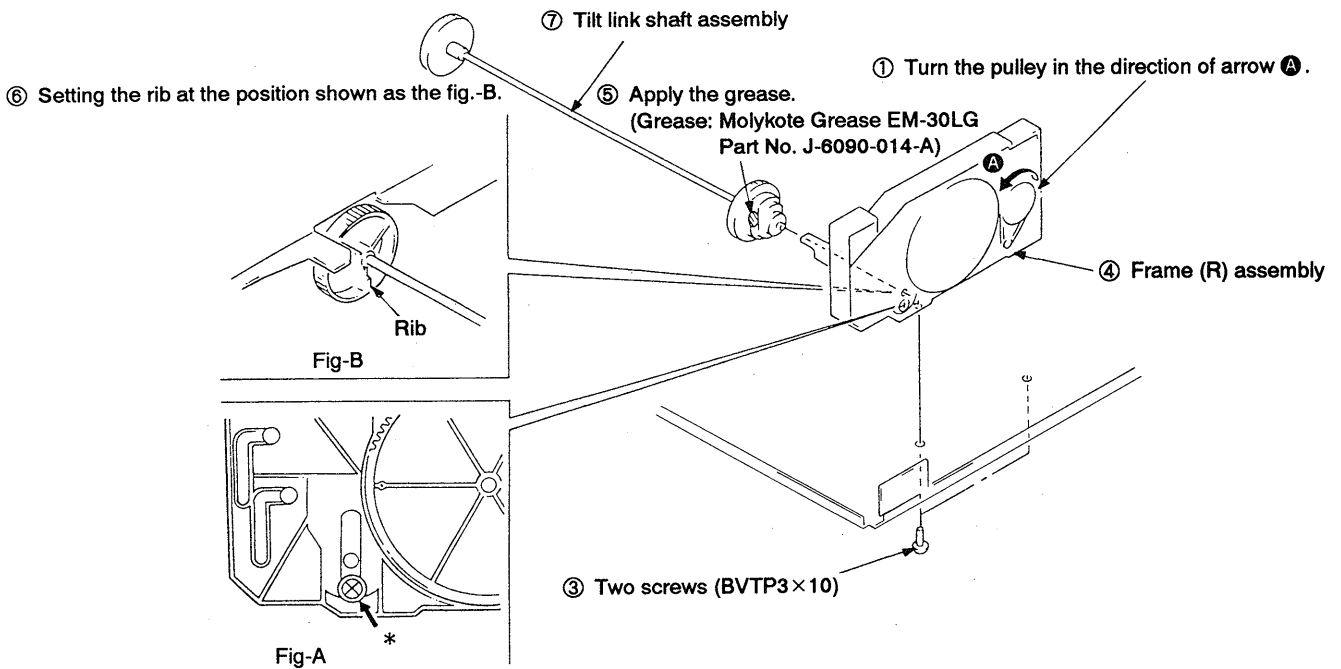


2-5. FRAME (L, R) ASSEMBLY



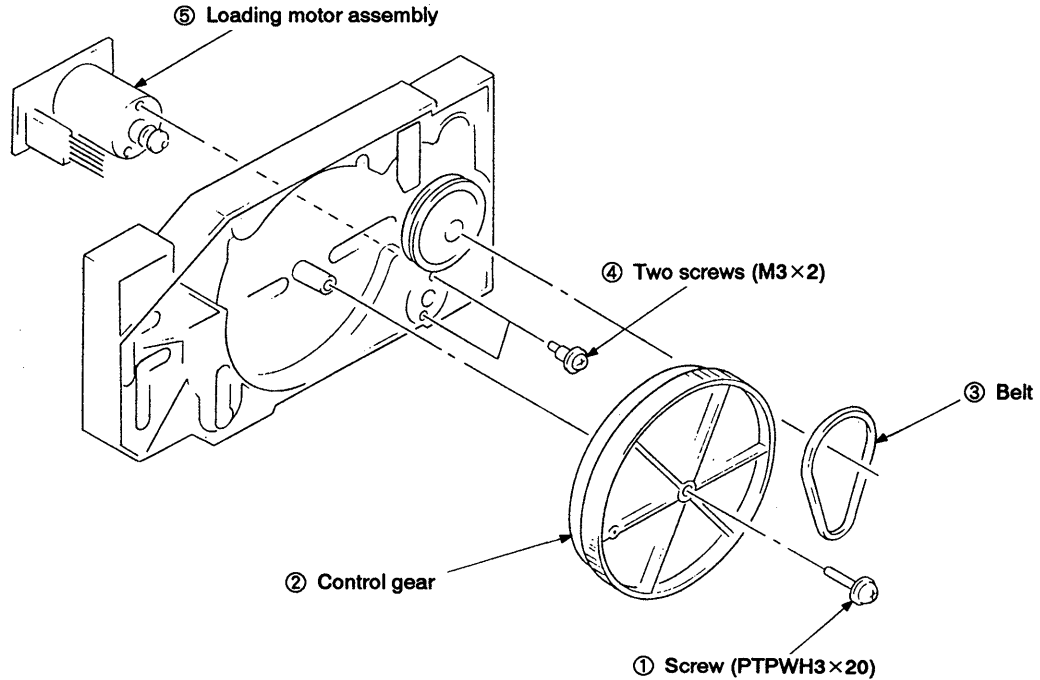
2-6. MOUNTING THE FRAME (R) ASSEMBLY

Note: Follow the assembly procedure in the numerical order given.



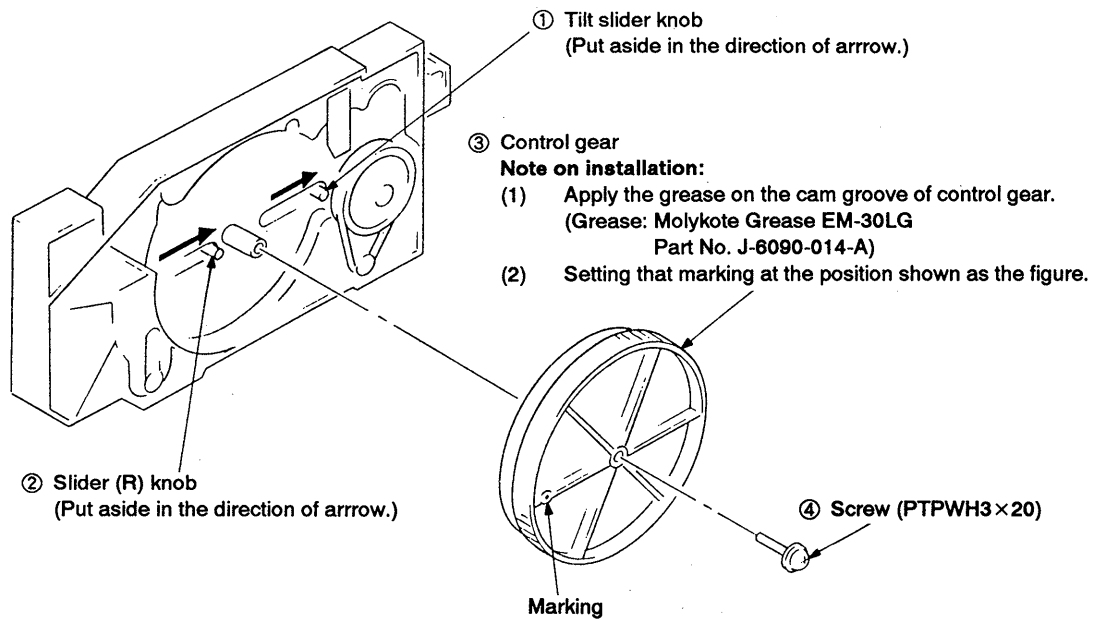
② Confirm that * screw is at the position shown as the fig-A.

2-7. CONTROL GEAR AND LOADING MOTOR ASSEMBLY



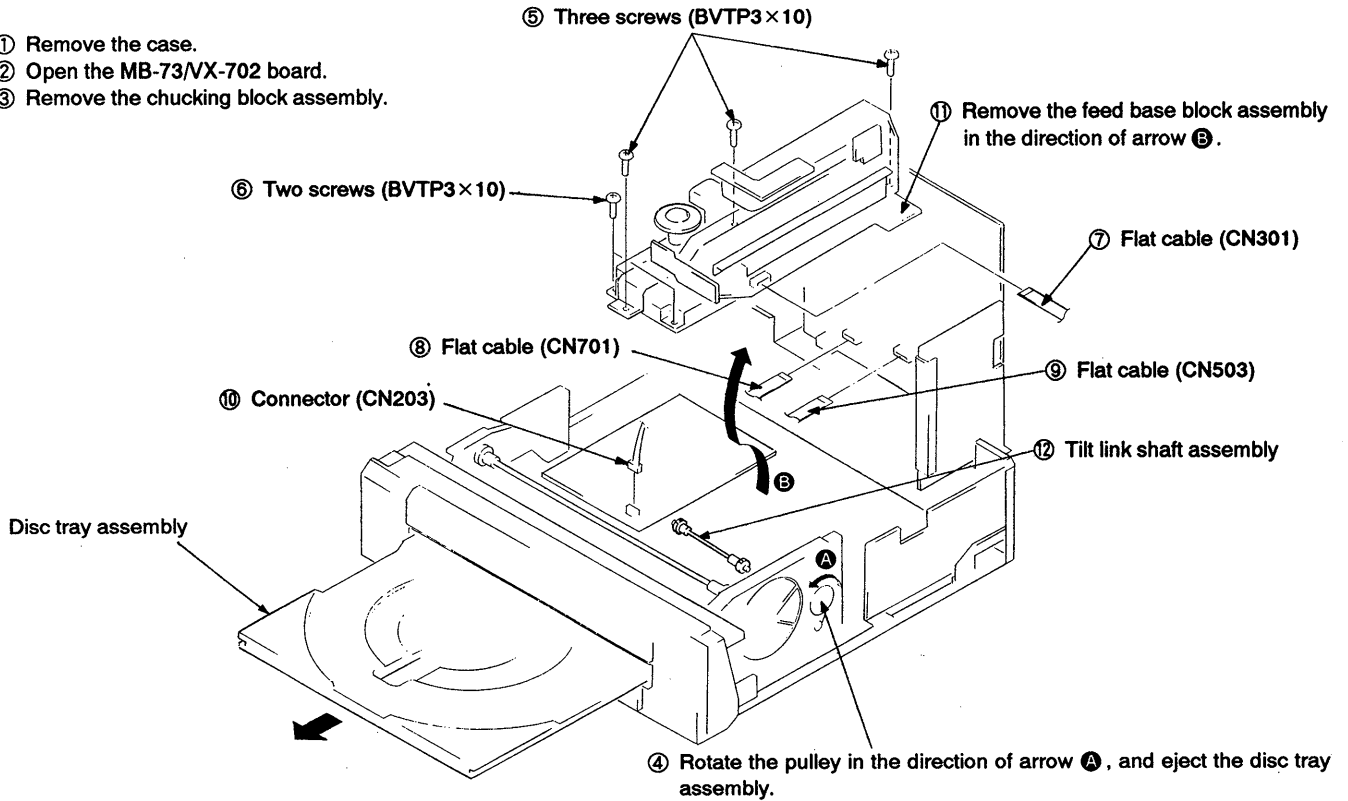
2-8. MOUNTING THE CONTROL GEAR

Note: Follow the assembly procedure in the numerical order given.



2-9. FEED BASE BLOCK ASSEMBLY

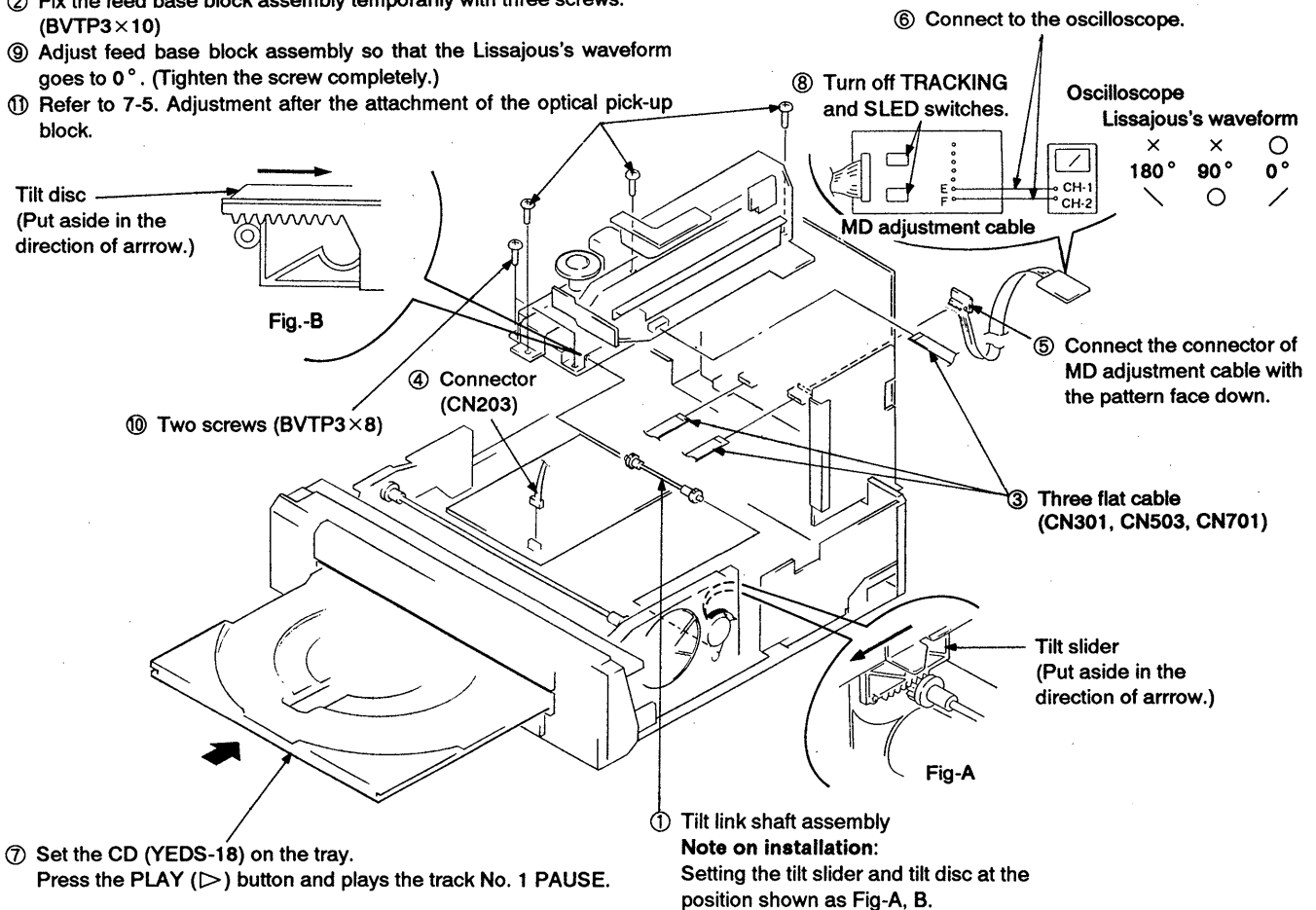
- ① Remove the case.
- ② Open the MB-73/VX-702 board.
- ③ Remove the chucking block assembly.



2-10. MOUNTING THE FEED BASE BLOCK ASSEMBLY

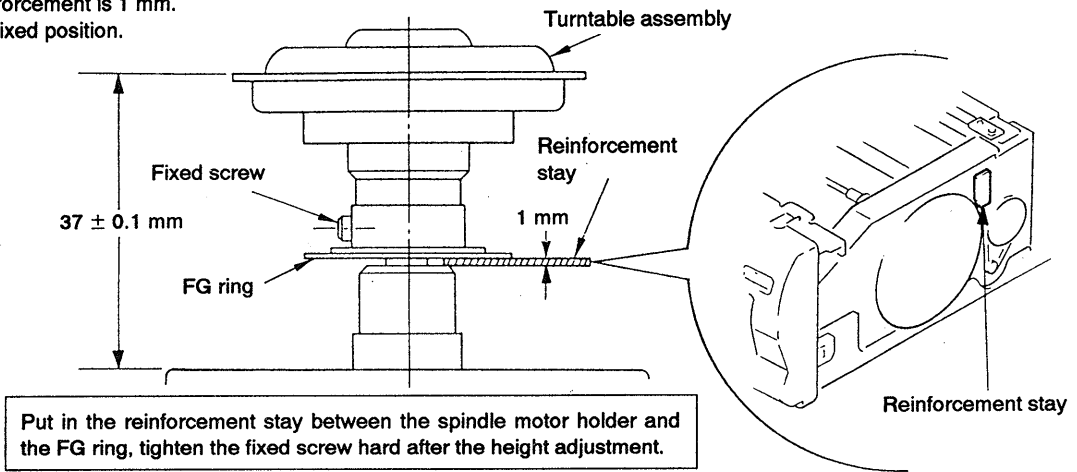
Note: Follow the assembly procedure in the numerical order given.

- ② Fix the feed base block assembly temporarily with three screws (BVTP3×10)
- ③ Adjust feed base block assembly so that the Lissajous's waveform goes to 0°. (Tighten the screw completely.)
- ⑪ Refer to 7-5. Adjustment after the attachment of the optical pick-up block.



2-11. HEIGHT ADJUSTMENT OF THE TURNTABLE ASSEMBLY

- ① Remove the case.
- ② Open the MB-73/VX-702 board.
- ③ Rotate the pulley on the right side of the set, and open the tray.
- ④ Remove the chucking block ass'y and reinforcement stay ass'y.
- ⑤ Change the turntable assembly.
Adjust the height and also the position putting in the reinforcement stay as below.
The thickness of the reinforcement is 1 mm.
- ⑥ Fix the reinforcement to fixed position.

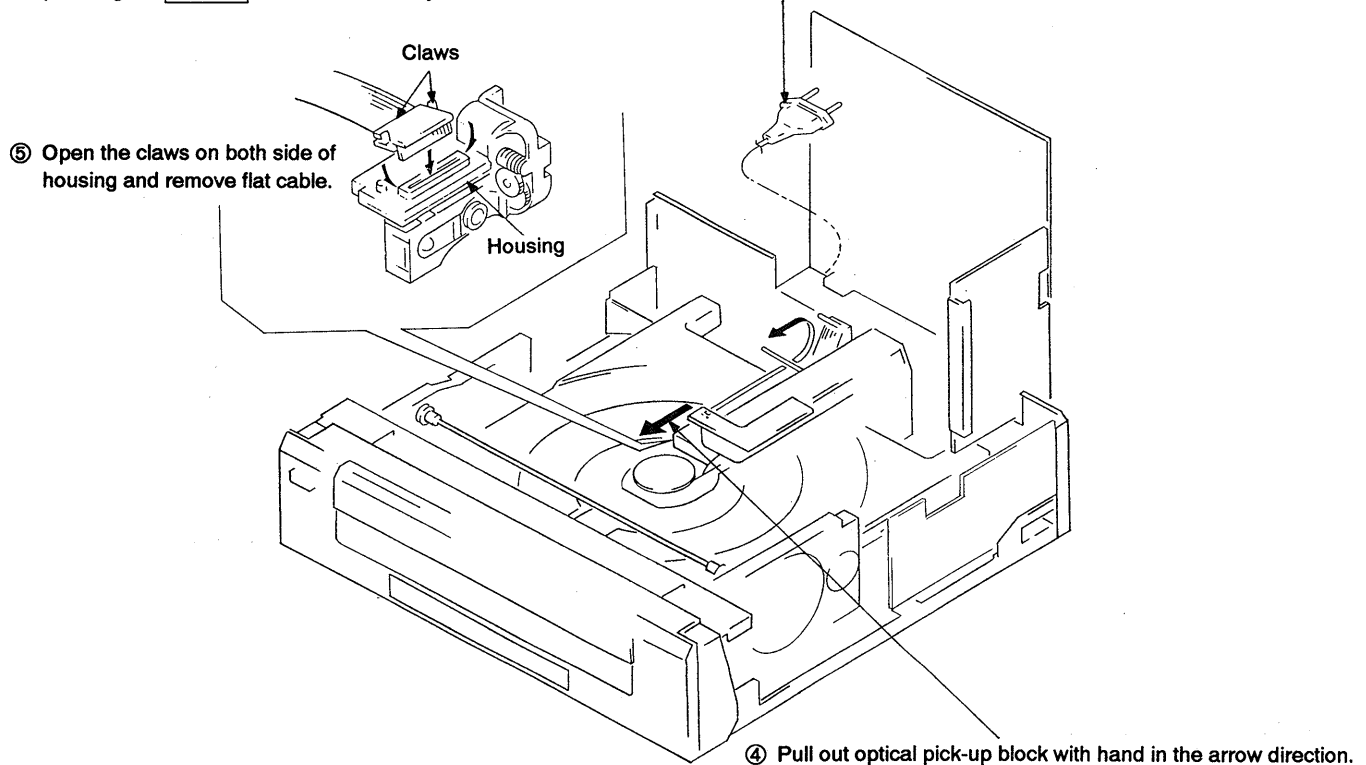


2-12. OPTICAL PICK-UP BLOCK (KHS-150A)

DISASSEMBLY I (OPTICAL PICK-UP BLOCK MOTOR OPERATES)

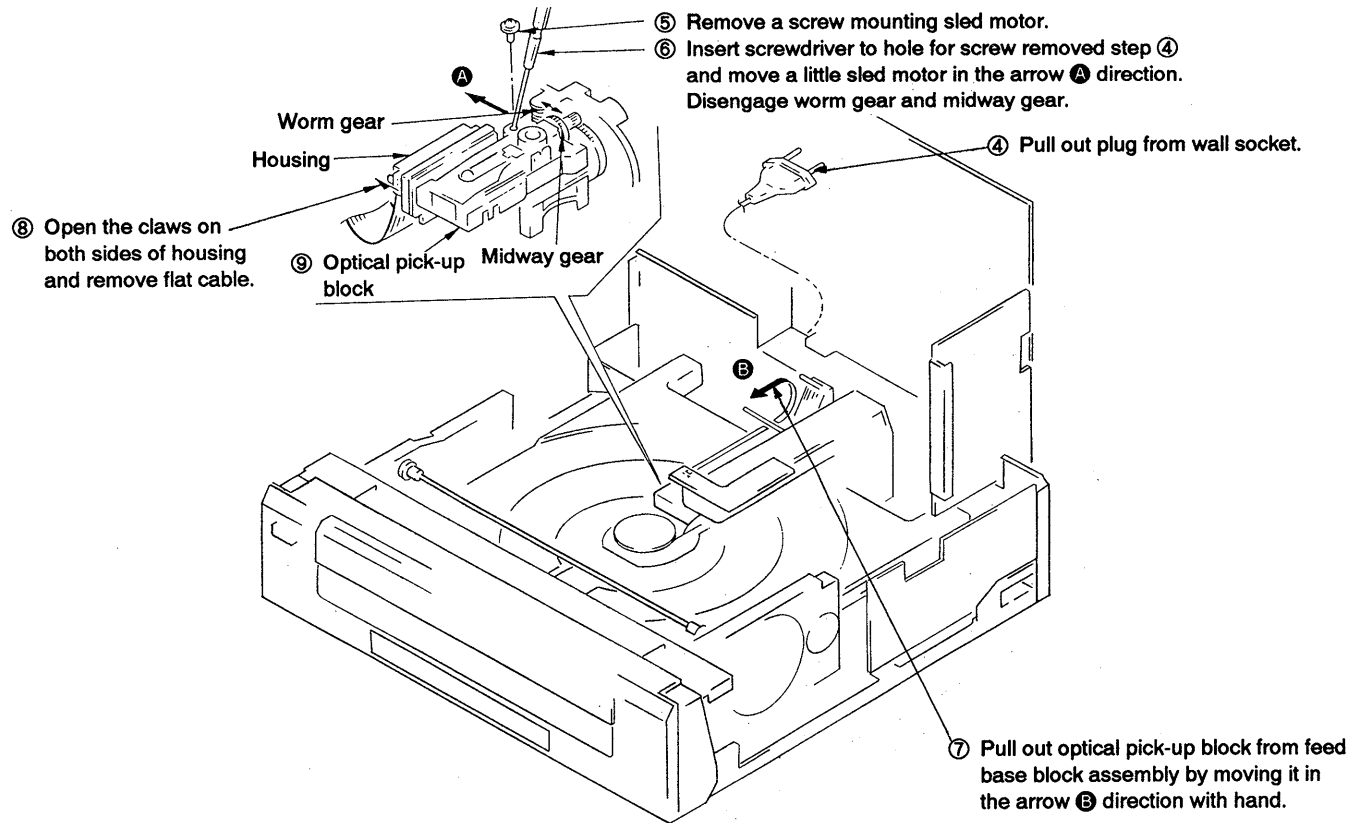
- ① Set the test mode.
 - (1) Press the POWER button while pressing STOP (■) button and **10** button on the unit.
 - (2) "No disc" will be appeared on the display board.
 - (3) Press **0** and **8** buttons in order while pressing STOP (■) button on the unit.
 - (4) The display will be disappeared on the display board, then enter the test mode.

Note: As for the test mode, refer to the test mode on page 9-10.
- ② Move the optical pick-up block to the upper front side (full of side B) pressing the **SIDE-B** button continuously.
- ③ Pull out plug from wall socket.



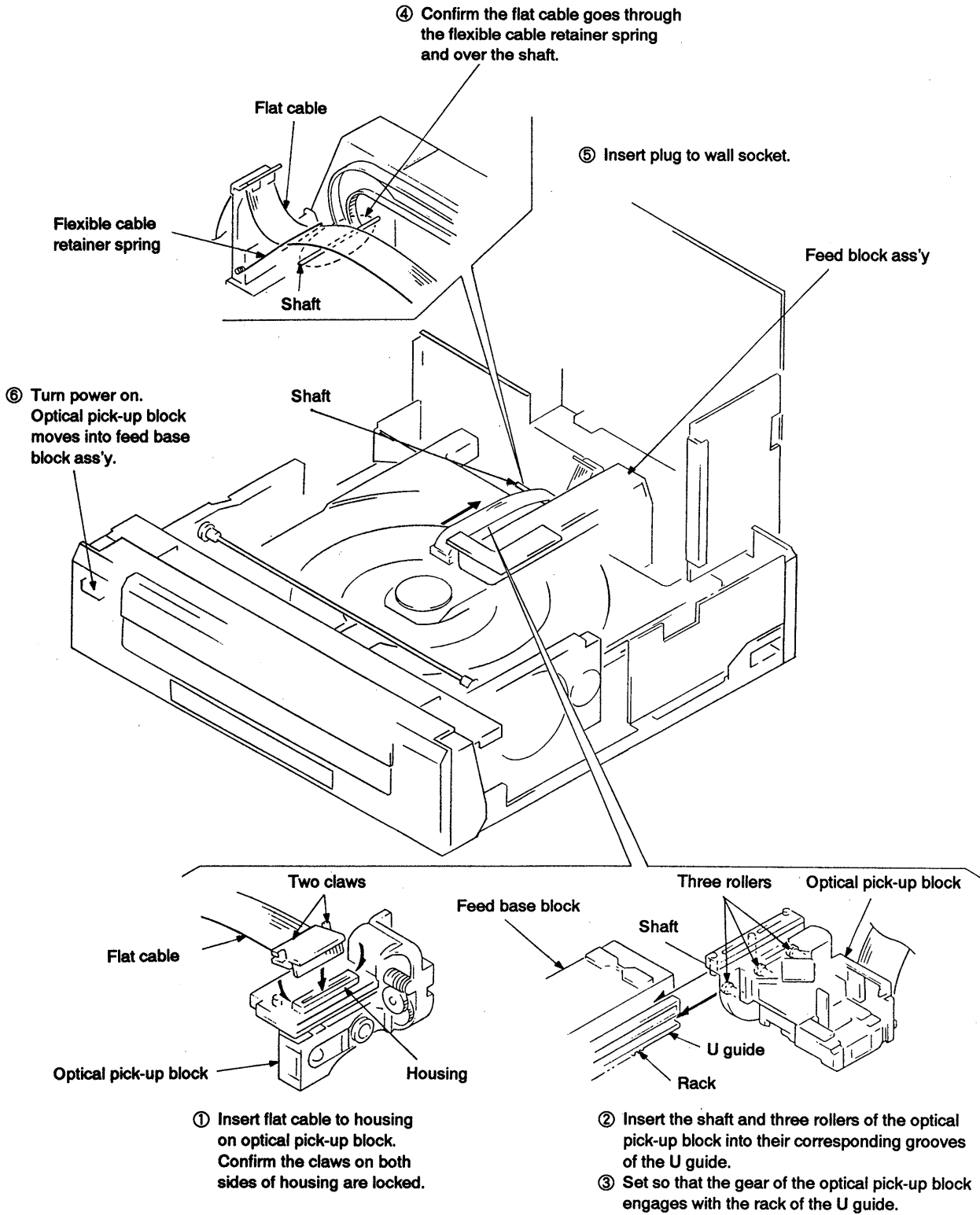
**DISASSEMBLY II
(OPTICAL PICK-UP BLOCK MOTOR DOESN'T OPERATE)**

- ① Remove the case.
- ② Open the MB-73/VX-702 board.
- ③ Remove the chucking block assy and reinforcement stay ass'y.

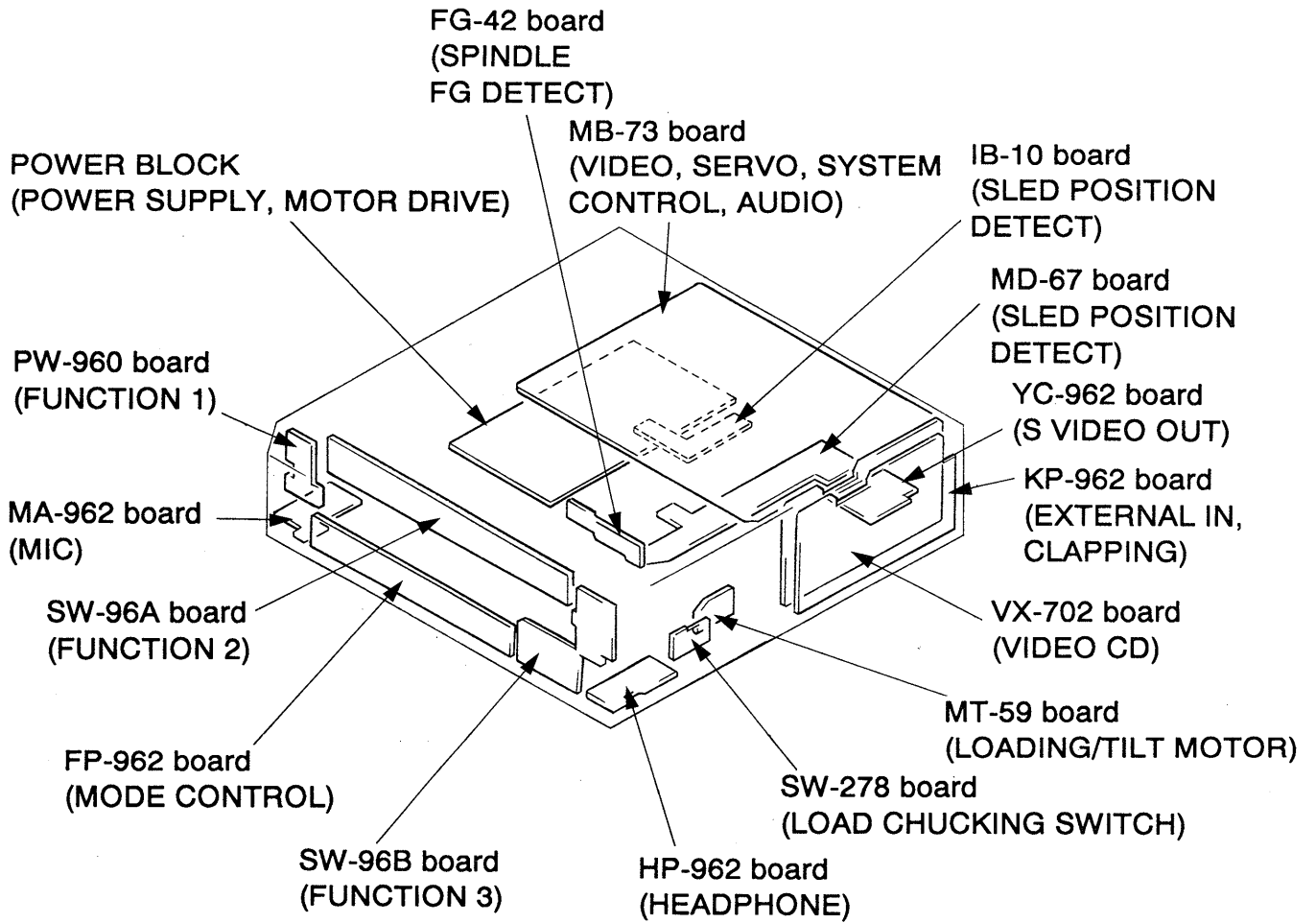


2-13. MOUNTING THE OPTICAL PICK-UP BLOCK ASSEMBLY

Note: Follow the assembly procedure in the numerical order given.

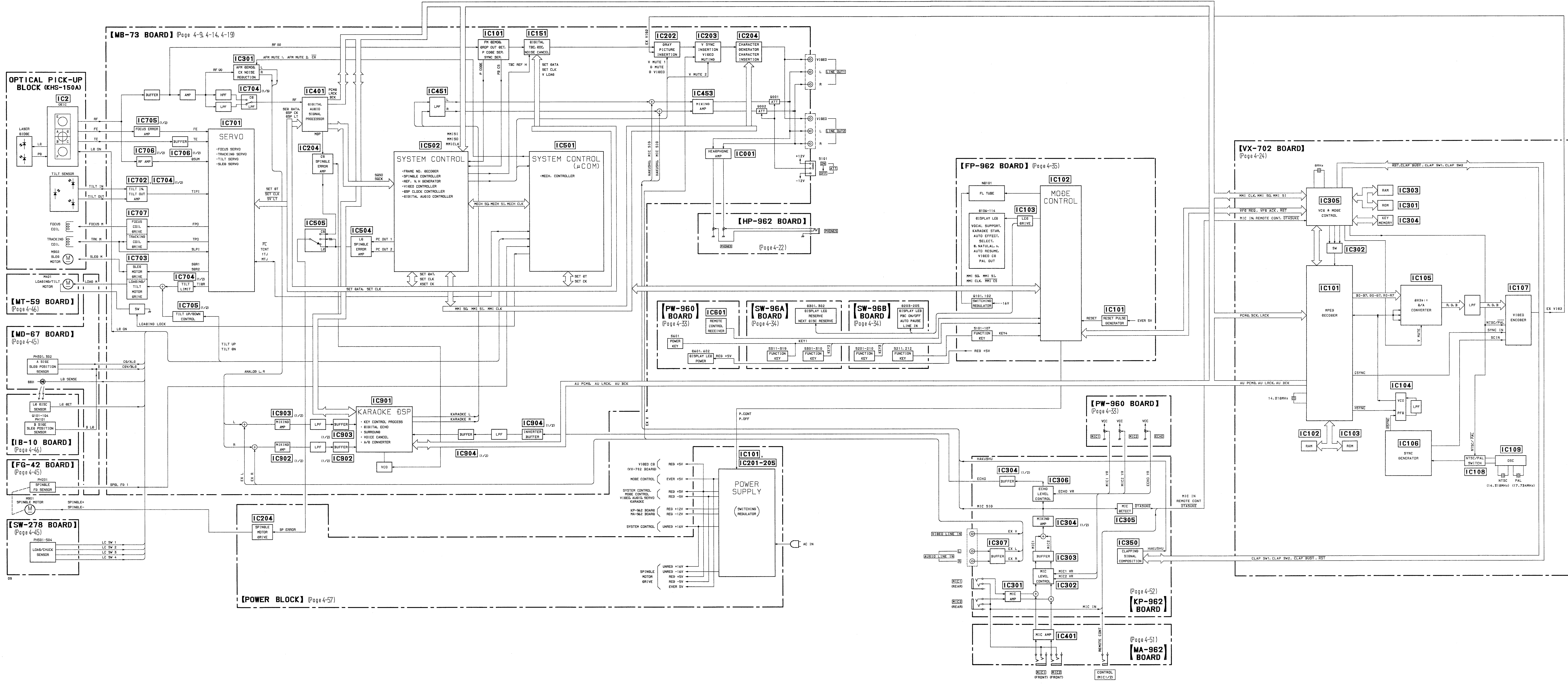


2-14. CIRCUIT BOARDS LOCATION

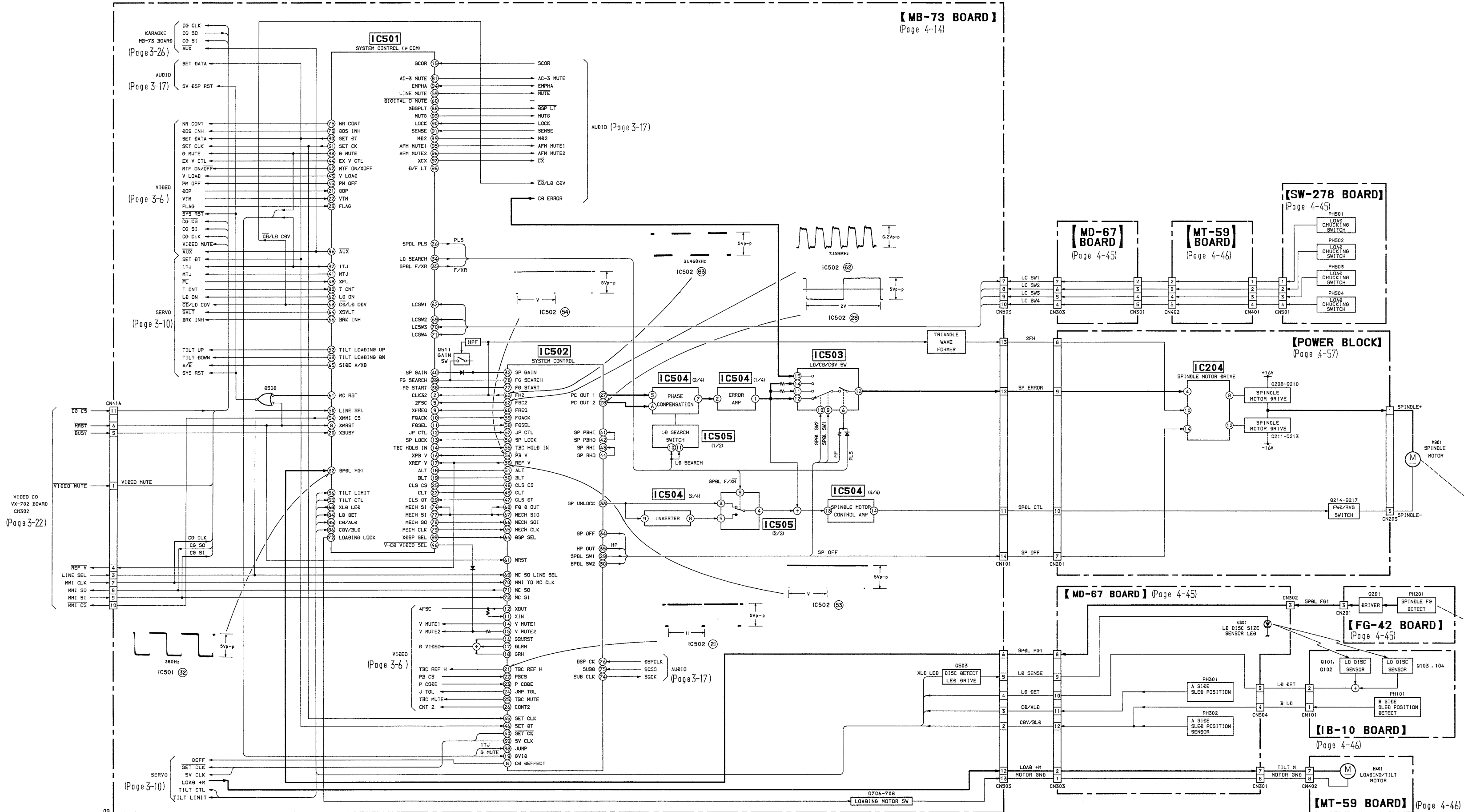


SECTION 3
BLOCK DIAGRAMS

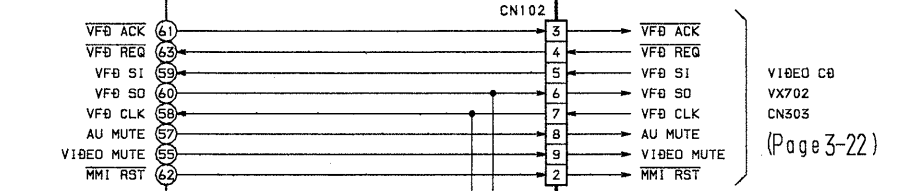
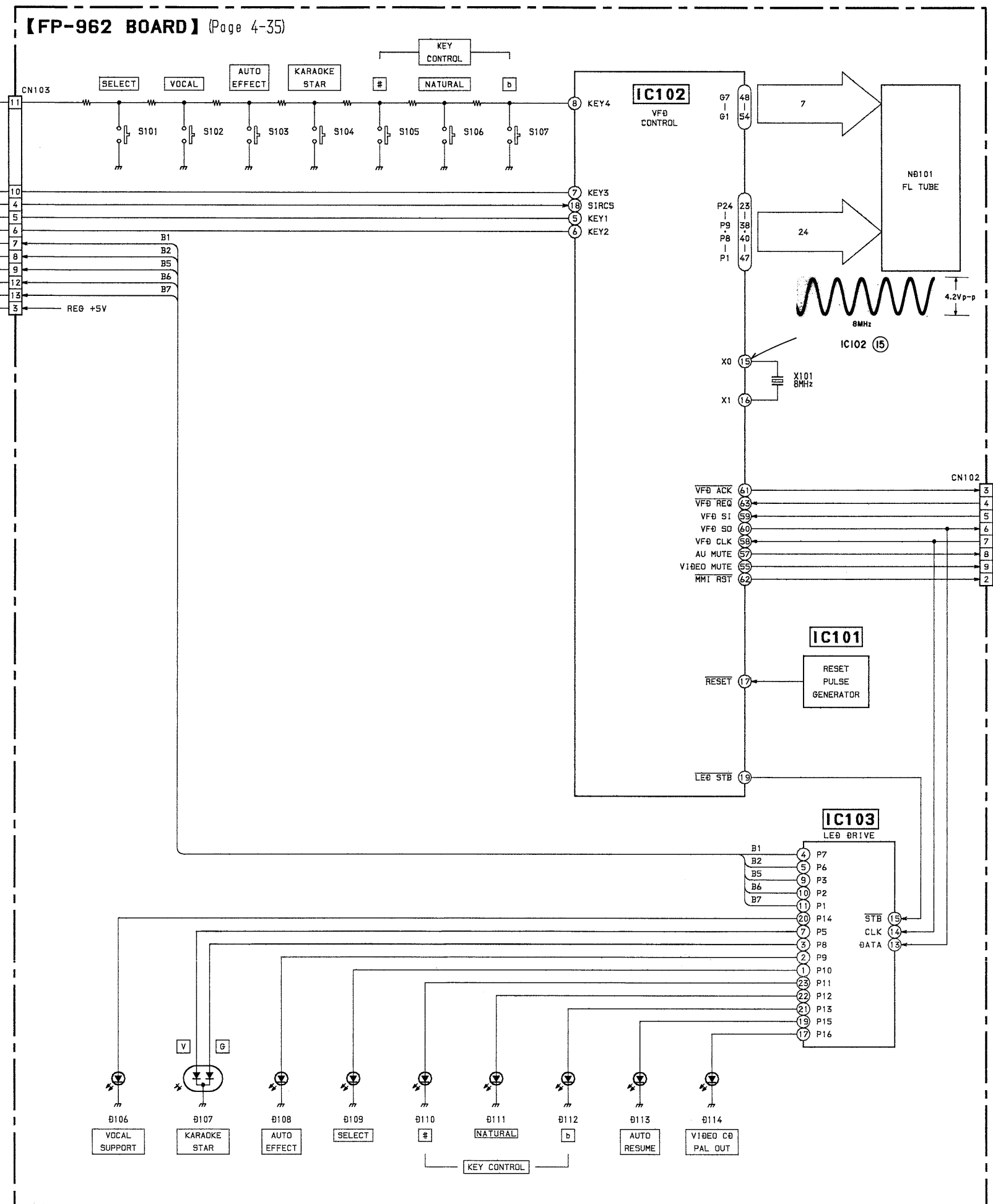
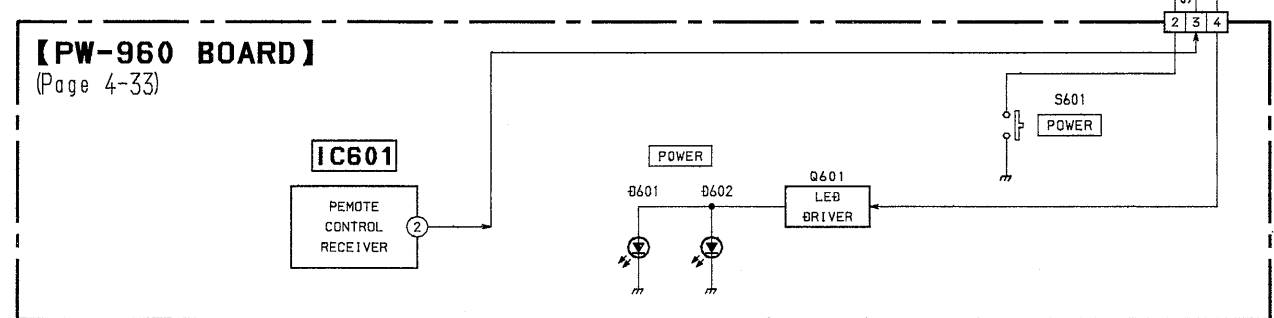
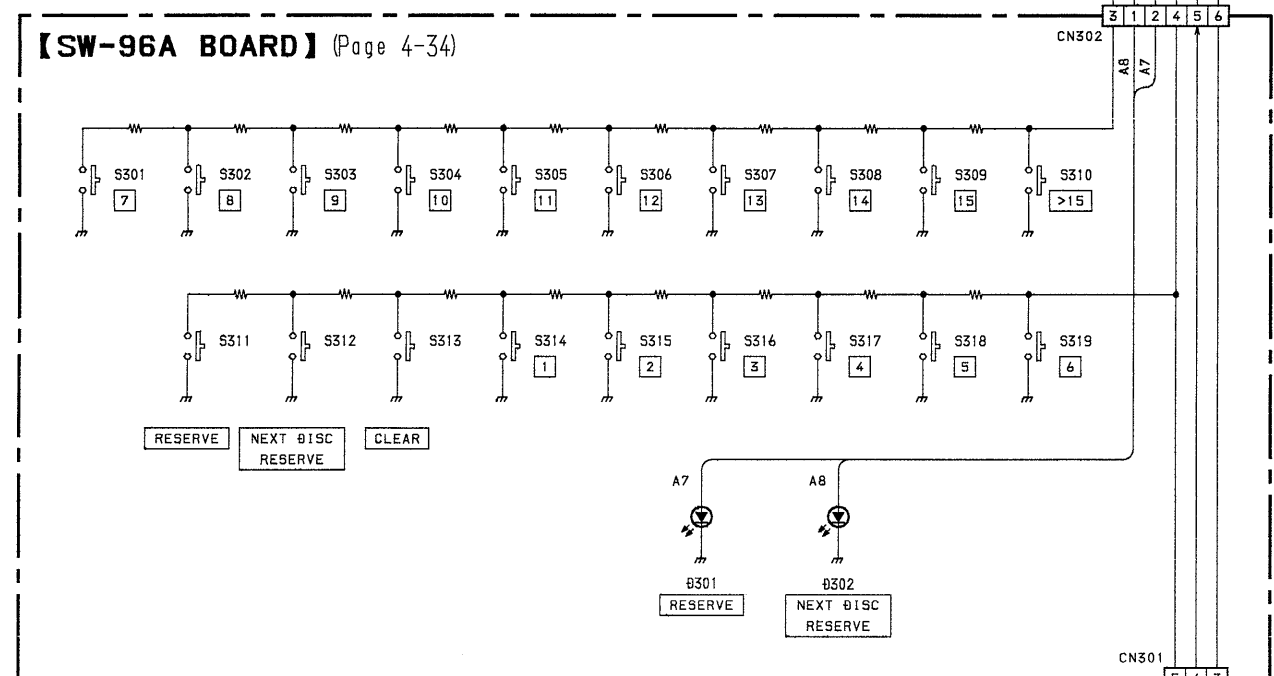
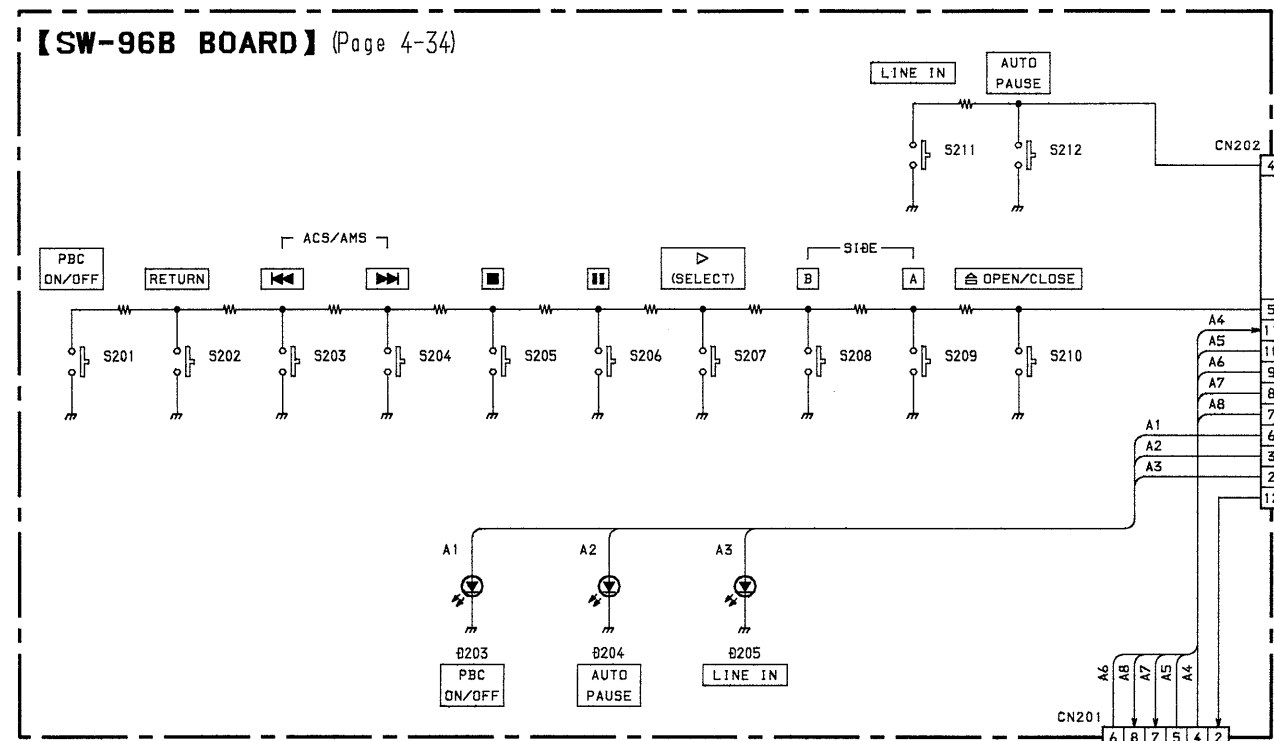
3-1. OVERALL BLOCK DIAGRAM



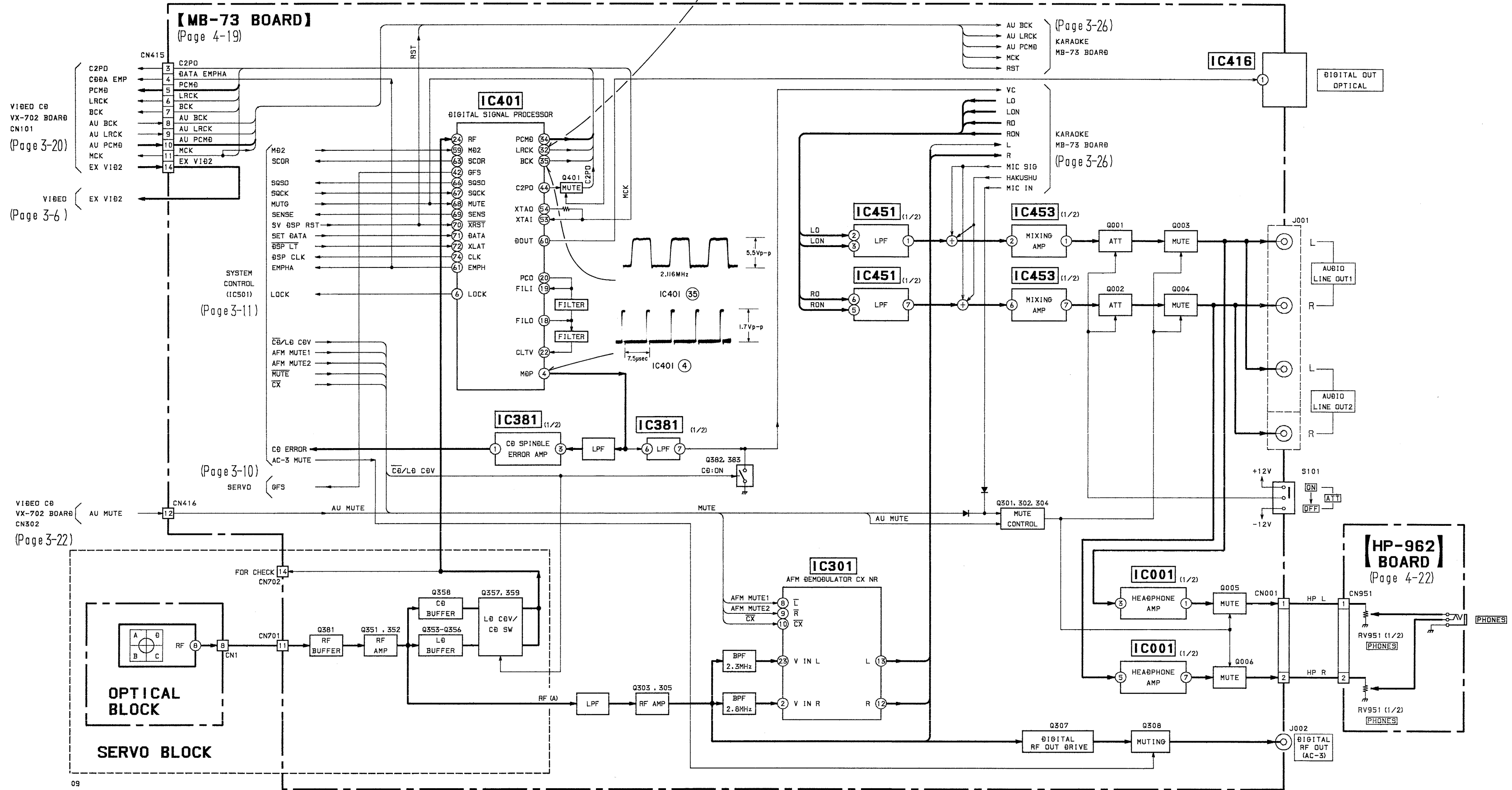
3-4. SYSTEM CONTROL BLOCK DIAGRAM



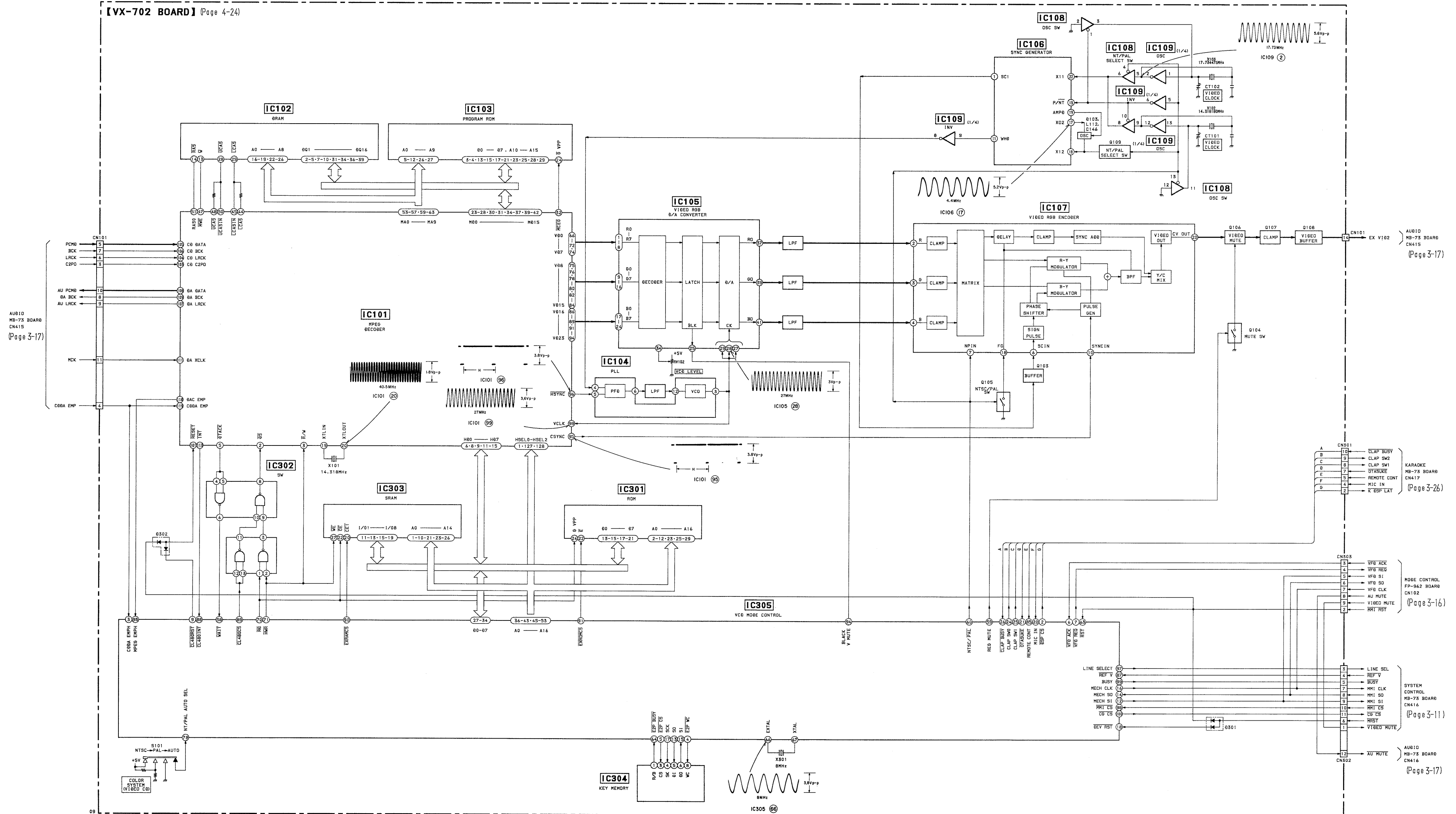
3-5. MODE CONTROL BLOCK DIAGRAM



3-6. AUDIO BLOCK DIAGRAM



3-7. VIDEO CD BLOCK DIAGRAM



[VX-702 BOARD] (Page 4-24)

AU10 MB-7S BOARD CN415 (Page 3-17)

AU10 MB-7S BOARD CN415 (Page 3-17)

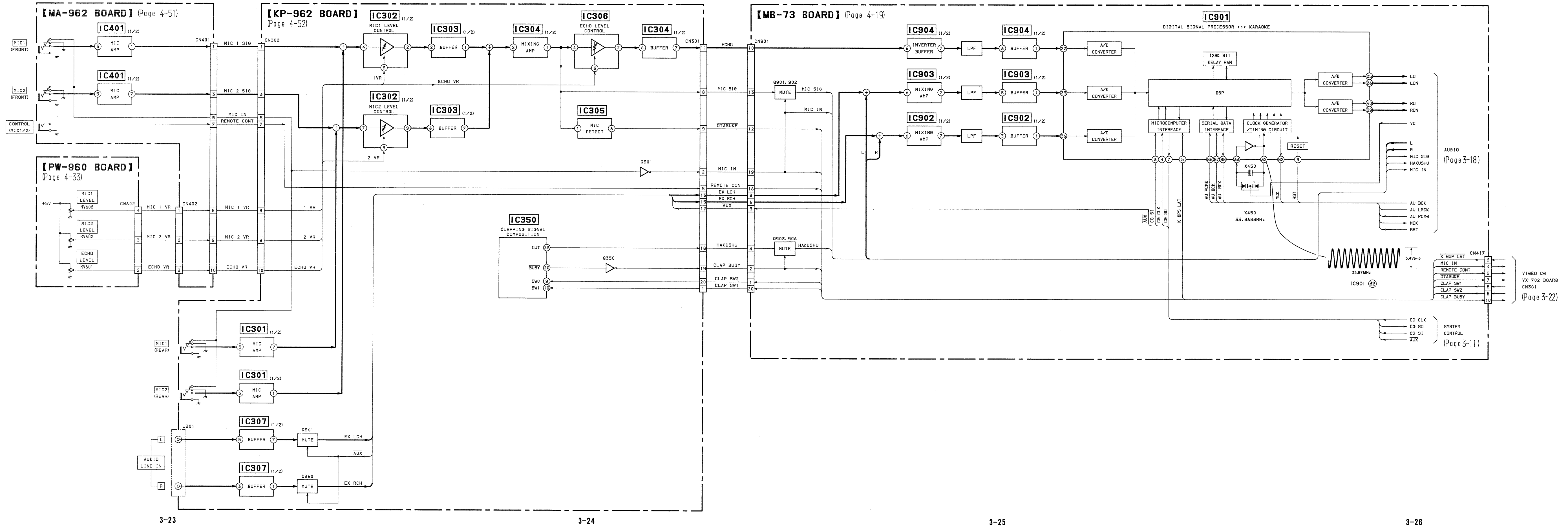
KARAOKE MB-7S BOARD CN417 (Page 3-26)

MODE CONTROL FB-82 BOARD CN102 (Page 3-16)

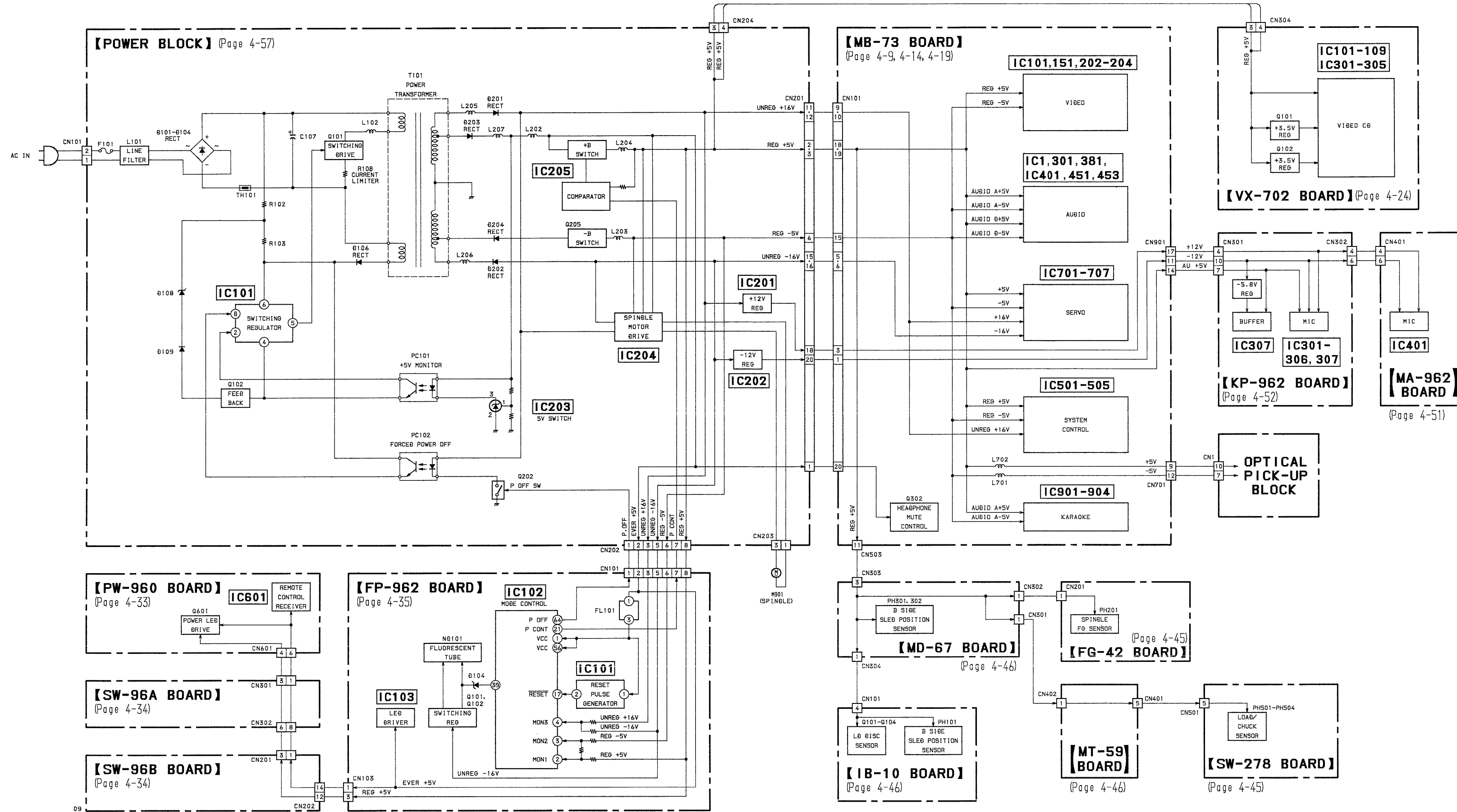
SYSTEM CONTROL MB-7S BOARD CN416 (Page 3-11)

AU10 MB-7S BOARD CN416 (Page 3-17)

3-8. KARAOKE BLOCK DIAGRAM



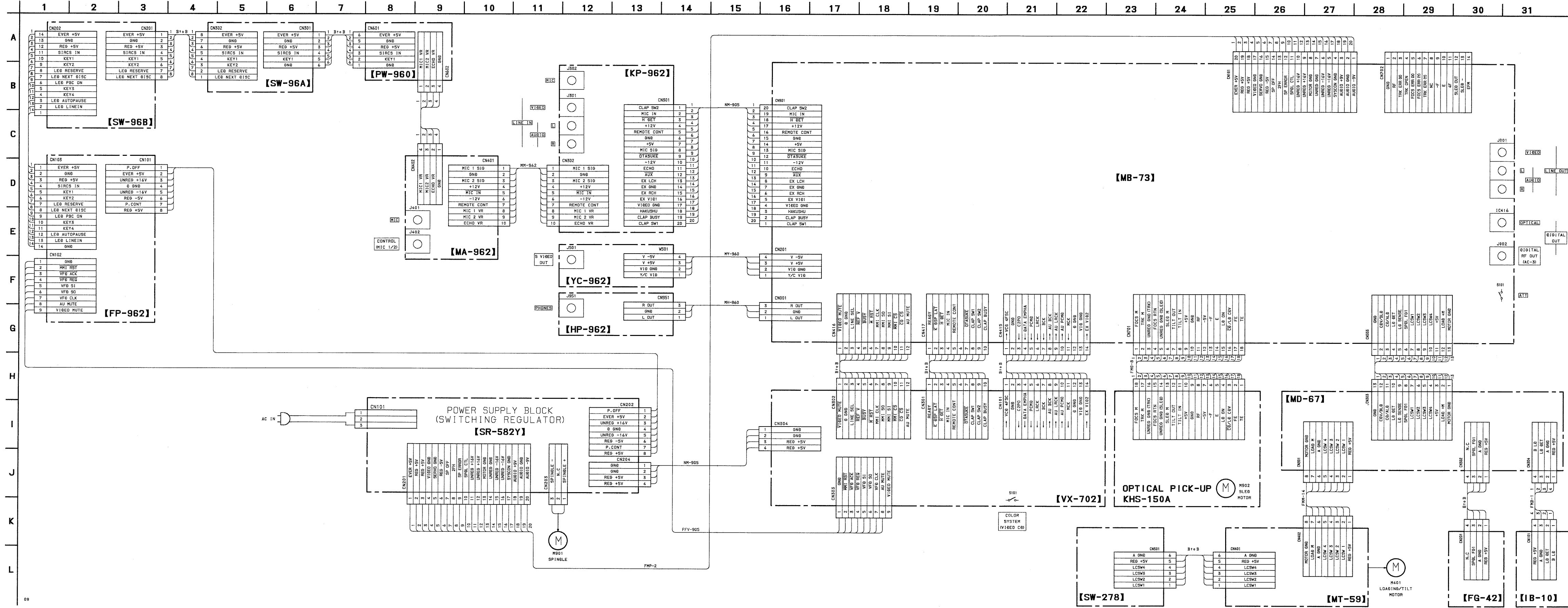
3-9. POWER BLOCK DIAGRAM



SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

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

- For printed wiring boards.
 - : indicated a lead wire mounted on the component side.
 - : Through hole.
 - : Parts mounted on the conductor side.
 - ▨ : Pattern from the side which enables seeing.
 - Circled numbers refer to waveforms.

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

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

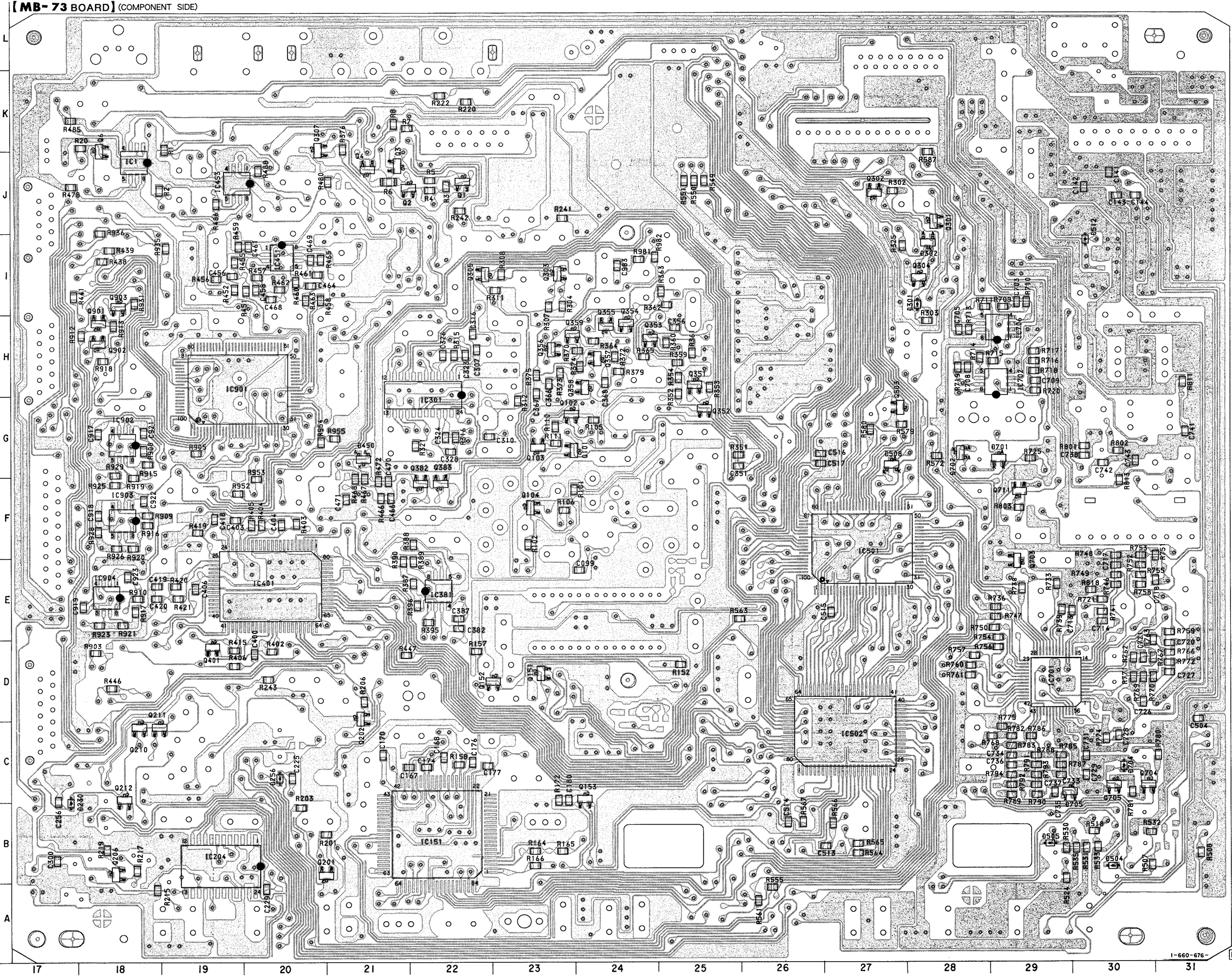
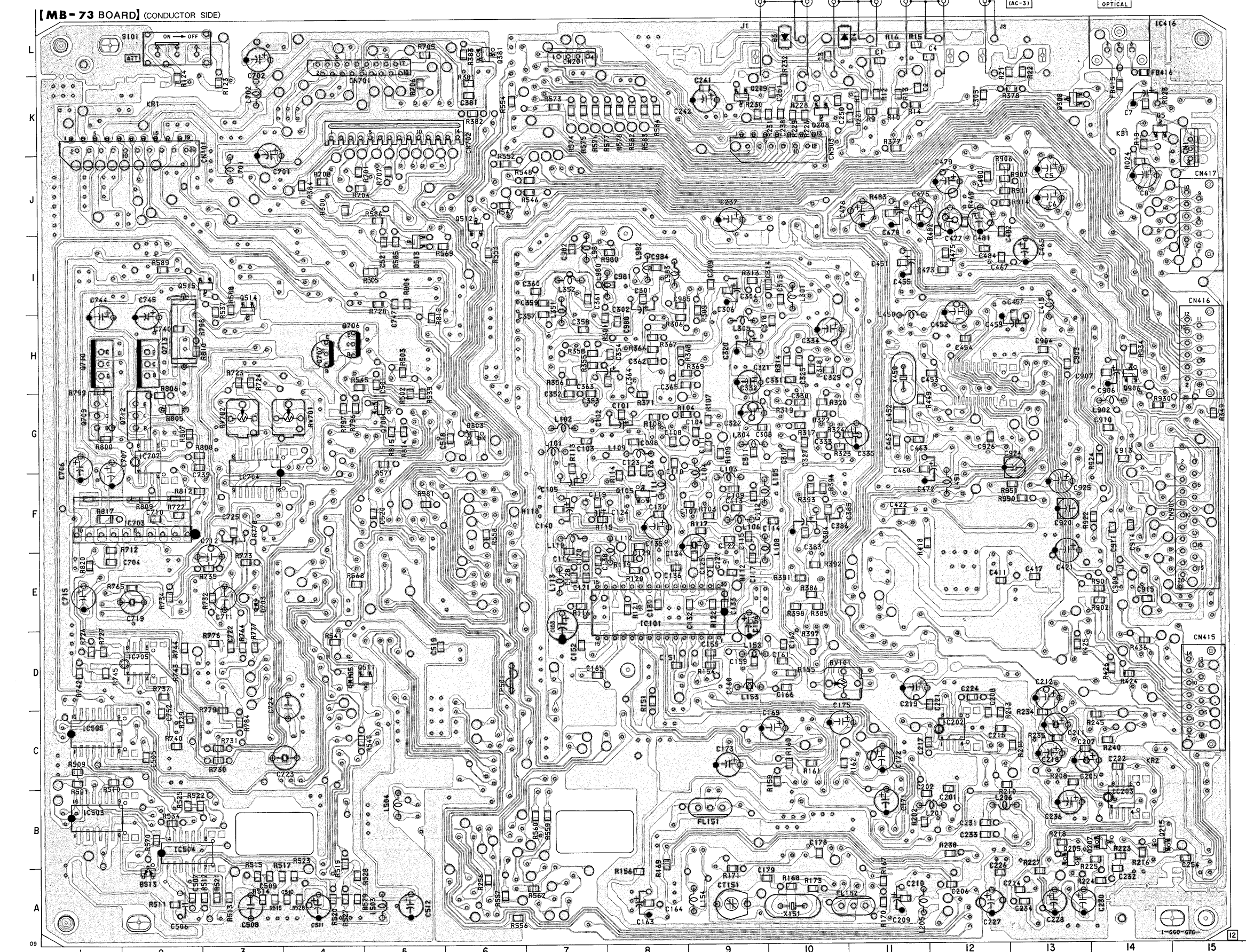
Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

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

MB-73 (VIDEO, SERVO, SYSTEM CONTROL, AUDIO) PRINTED WIRING BOARD

Ref. No. MB-73 BOARD: 1,000 series

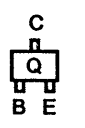
Refer to page 4-14, 4-19 for schematic diagram.



MB-73 BOARD

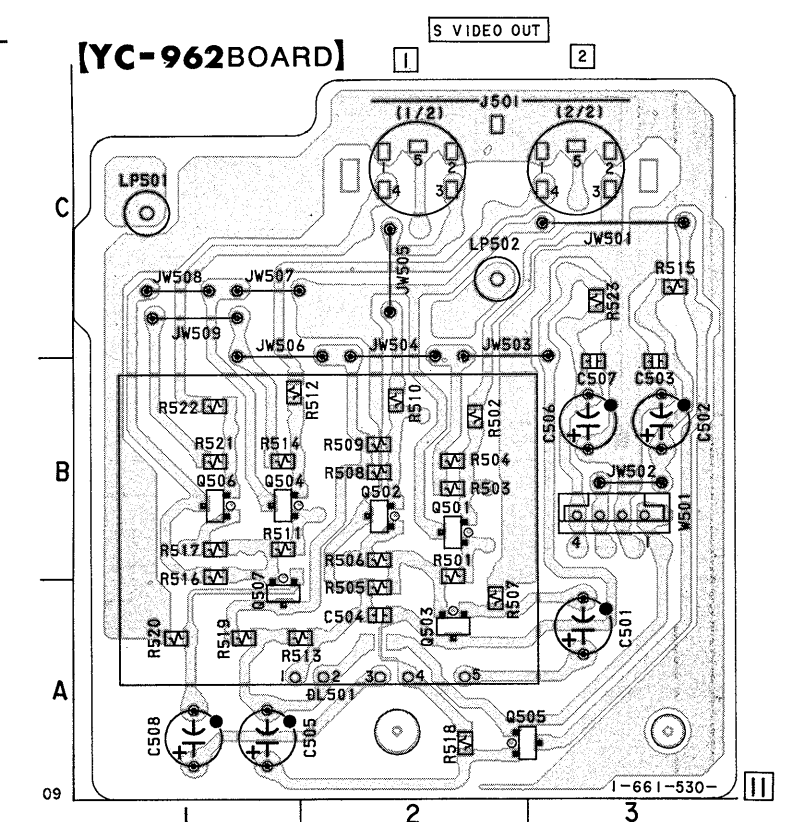
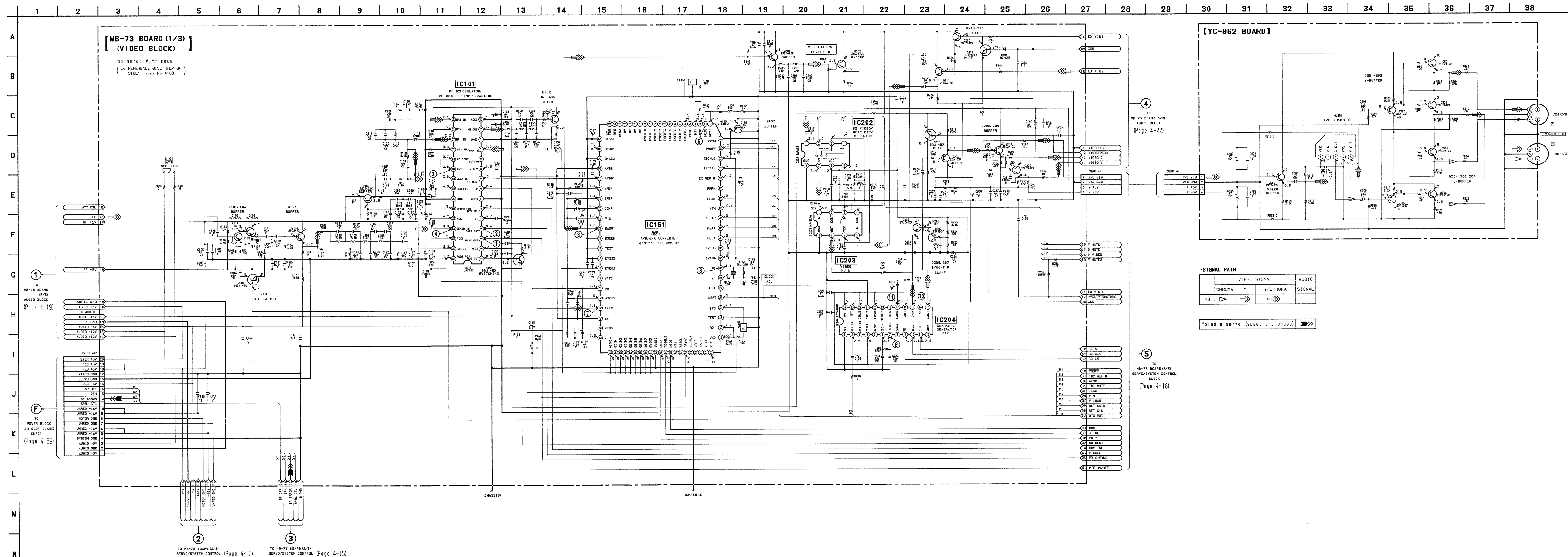
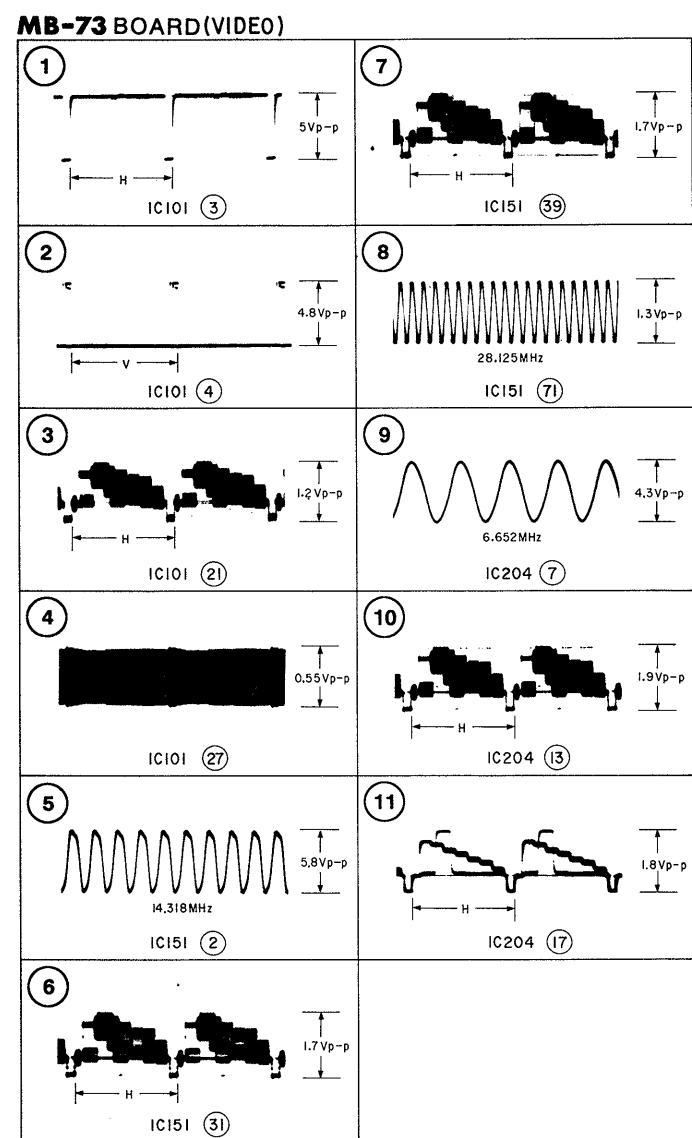
CN001	J-15	Q515	I-2
CN101	K-3	Q703	E-29
CN201	L-7	Q704	C-30
CN415	D-15	Q705	C-30
CN416	L-10	Q706	H-4
CN417	J-15	Q707	H-4
CN503	K-10	Q708	G-5
CN701	K-4	Q709	G-1
CN702	K-6	Q710	H-1
CN901	F-15	Q711	F-29
		Q712	G-2
		Q713	H-2
		Q801	I-18
		Q802	H-18
		Q903	I-18
		Q906	H-14
D003	L-10	RV101	D-10
D230	B-18	RV701	G-4
D303	G-6	RV702	G-3
D450	G-21		
D504	B-30		
D505	B-29		
D508	G-27		
D511	D-4		
D512	J-30		
D513	A-2		
D701	G-29		
D702	G-28		
D703	E-3		
D704	C-30		
D705	B-30		
IC001	J-18		
IC101	E-8		
IC151	C-12		
IC203	B-14		
IC204	B-19		
IC301	D-12		
IC381	E-22		
IC401	E-20		
IC416	R-16		
IC451	L-14		
IC453	J-19		
IC501	F-27		
IC502	F-3		
IC503	B-27		
IC504	B-2		
IC505	C-29		
IC701	H-29		
IC702	H-29		
IC703	F-2		
IC704	D-32		
IC706	H-29		
IC707	G-2		
IC901	H-19		
IC902	G-18		
IC903	F-18		
IC904	F-18		
Q001	J-22		
Q002	J-22		
Q003	J-21		
Q004	K-14		
Q005	K-14		
Q006	K-18		
Q101	G-24		
Q102	G-24		
Q103	G-23		
Q104	F-23		
Q105	D-23		
Q152	D-22		
Q153	C-24		
Q201	C-21		
Q202	C-21		
Q205	B-13		
Q206	B-18		
Q207	H-14		
Q208	K-10		
Q209	K-9		
Q210	C-18		
Q211	C-18		
Q212	C-18		
Q215	B-14		
Q216	J-29		
Q302	J-27		
Q303	I-23		
Q304	I-28		
Q305	H-22		
Q307	K-20		
Q308	K-13		
Q351	H-25		
Q352	H-24		
Q353	H-24		
Q354	H-24		
Q355	H-24		
Q356	H-24		
Q357	H-24		
Q358	H-24		
Q359	H-24		
Q381	L-6		
Q382	G-22		
Q383	G-22		
Q401	H-19		
Q503	H-27		
Q511	D-5		
Q512	I-5		
Q513	I-5		
Q514	I-3		

- For printed wiring boards.
- Chip transistor



MB-73 (VIDEO), YC-962 (S VIDEO OUT) SCHEMATIC DIAGRAMS
— Ref. No. MB-73 BOARD: 1,000 series, YC-962 BOARD: 2,000 series —

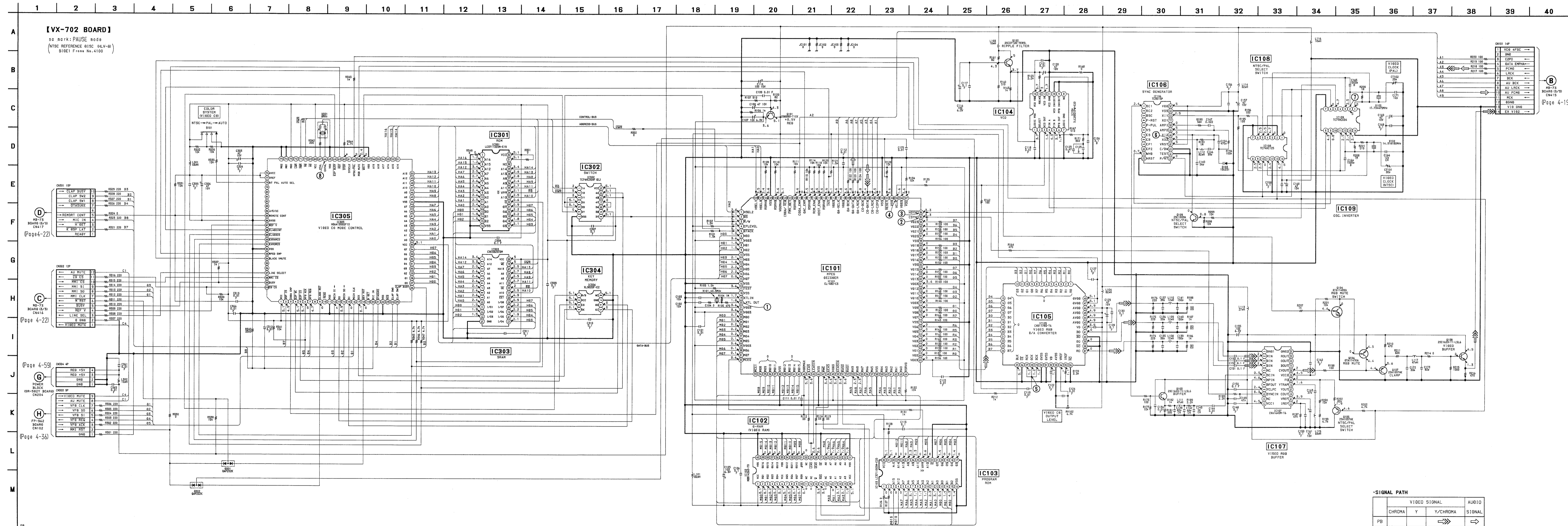
YC-962 (S VIDEO OUT) PRINTED WIRING BOARD
— Ref. No. YC-962 BOARD: 2,000 series —



- YC-962 BOARD
- Q501 B-2
 - Q502 B-2
 - Q503 A-2
 - Q504 B-1
 - Q505 A-2
 - Q506 B-1
 - Q507 A-1

- For printed wiring boards.
 - Chip transistor
-

VX-702 (VIDEO CD) SCHEMATIC DIAGRAM
— Ref. No. VX-702 BOARD: 3,000 series —



[VX-702 BOARD]
 NO MARK: PAUSE mode
 (NTSC REFERENCE BLS: 64V-B)
 SIDE FROM No.4100

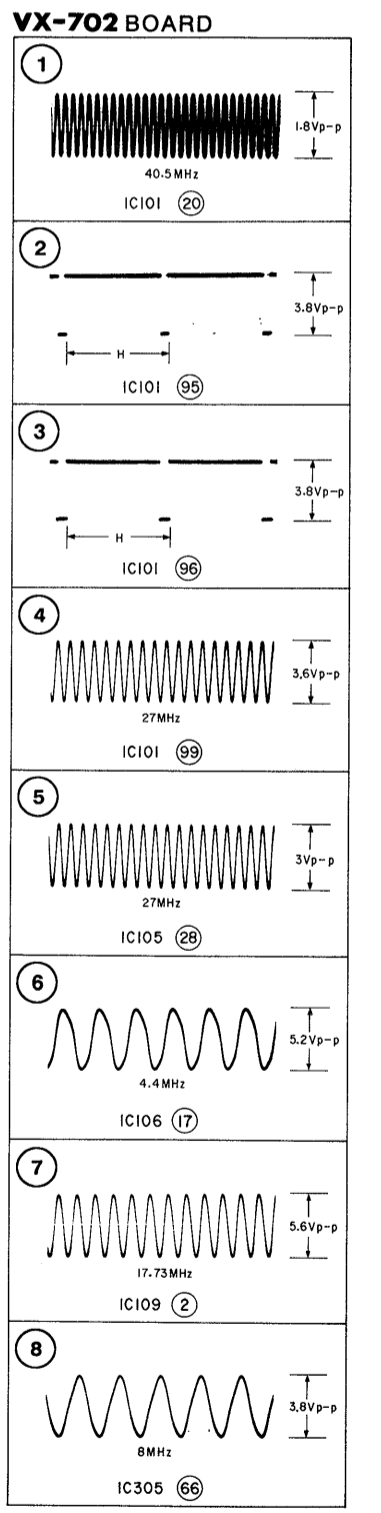
(D)
 BOARD (S/S)
 CN17
 (Page 4-22)

(C)
 BOARD (S/S)
 CN16
 (Page 4-22)

(G)
 BOARD (S/S)
 CN14
 (Page 4-53)

(H)
 BOARD (S/S)
 CN12
 (Page 4-34)

(B)
 BOARD (S/S)
 CN15
 (Page 4-19)



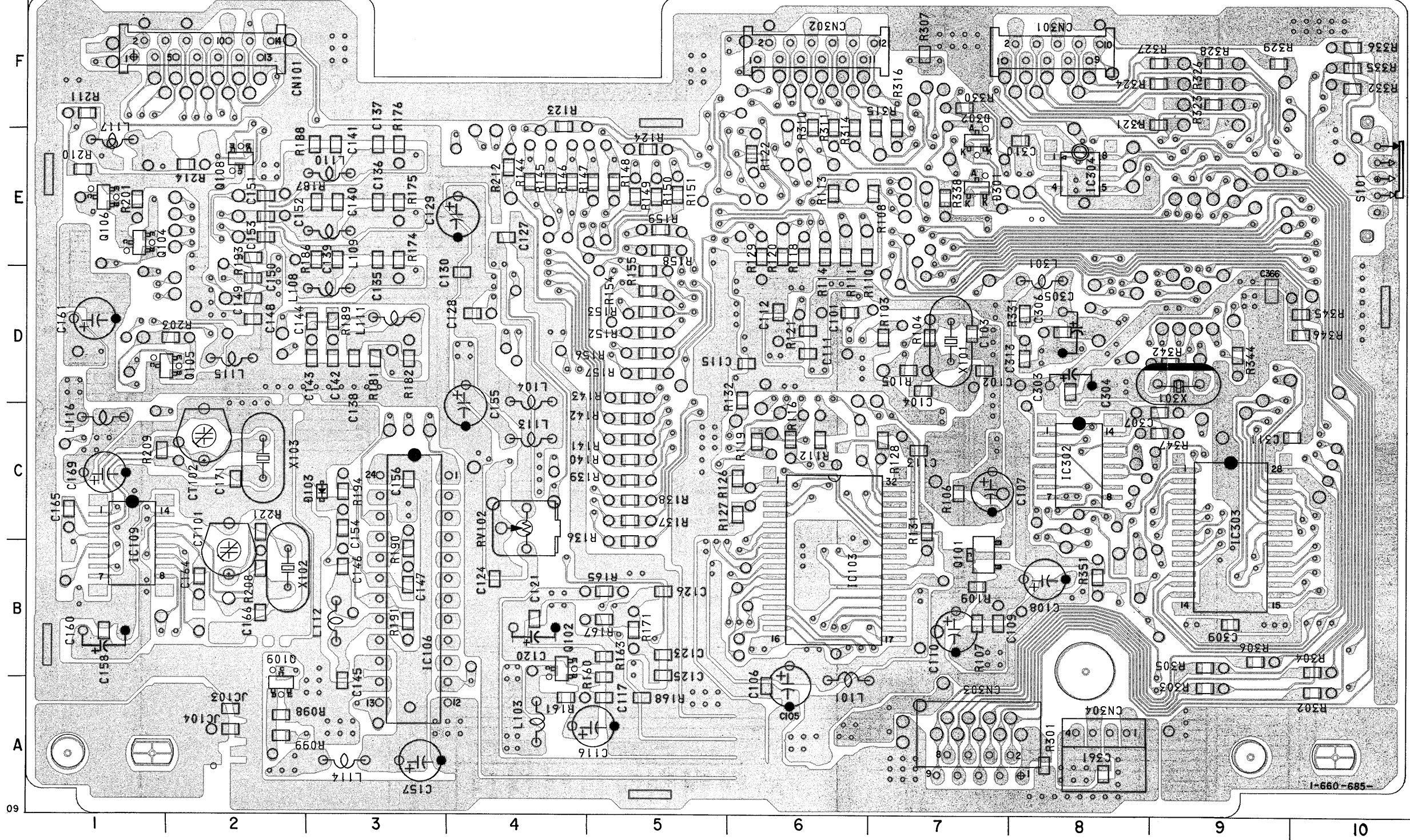
SIGNAL PATH

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

VX-702 (VIDEO CD) PRINTED WIRING BOARD

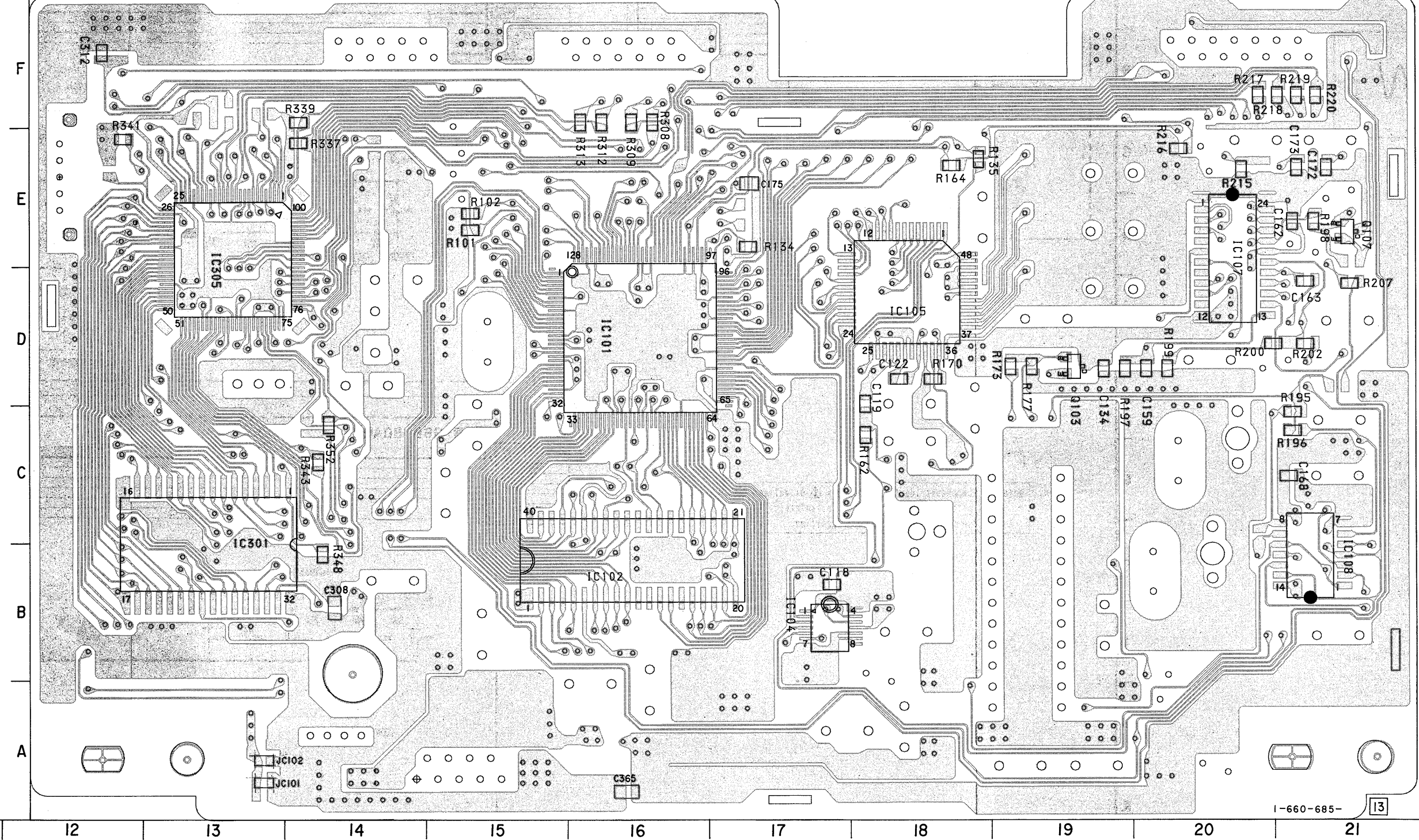
— Ref. No. VX-702 BOARD: 3,000 series —

[VX-702 BOARD] (CONDUCTOR SIDE)

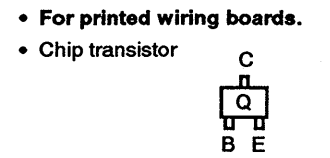


S101
COLOR
SYSTEM
(VIDEO CD)
AUTO
↑
PAL
↑
NTSC

[VX-702 BOARD] (COMPONENT SIDE)

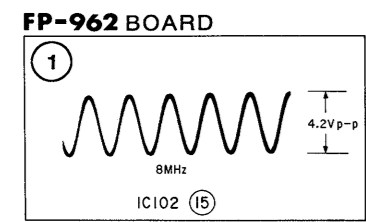
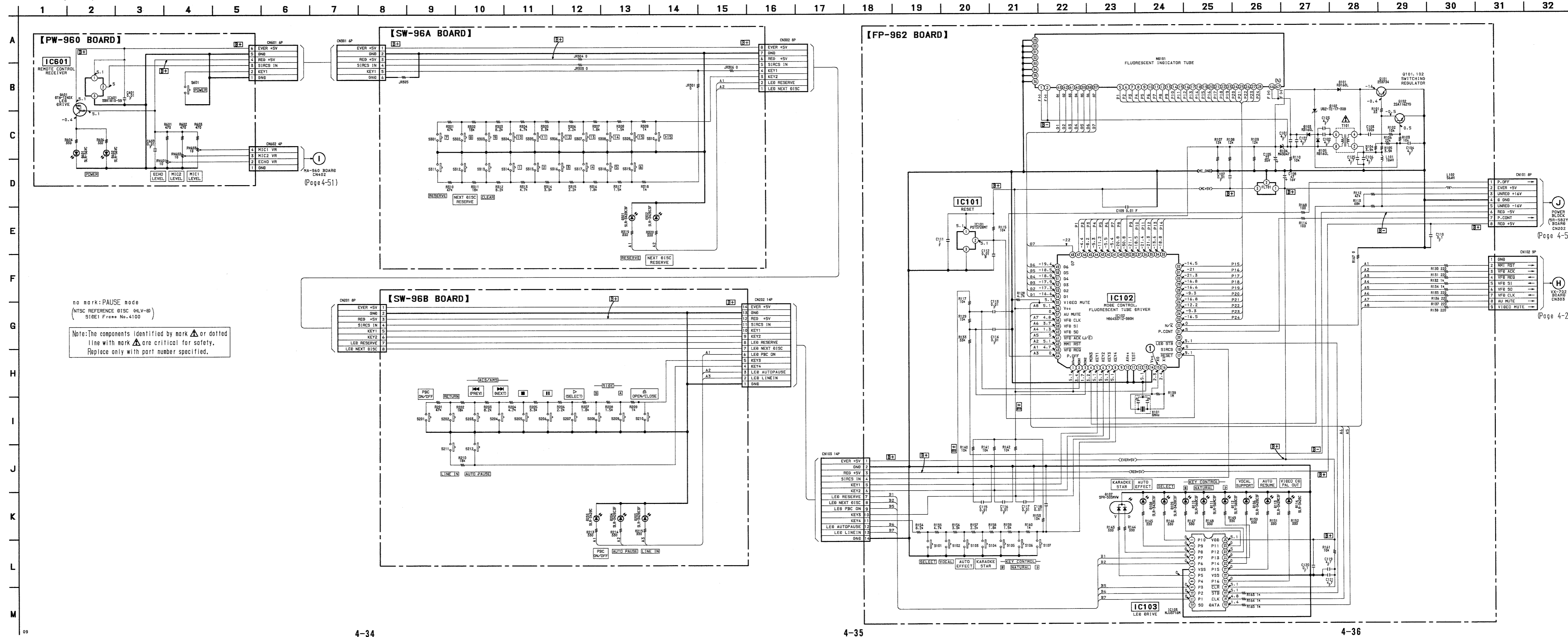


- VX-702 BOARD
- CN101 F-2
 - CN301 F-8
 - CN302 F-6
 - CN303 A-7
 - CN304 A-8
 - CT101 C-2
 - CT102 C-2
 - D103 C-3
 - D301 F-7
 - D302 F-7
 - IC101 D-16
 - IC102 9-16
 - IC103 B-6
 - IC104 B-17
 - IC105 D-18
 - IC106 B-3
 - IC107 D-20
 - IC108 B-21
 - IC109 9-1
 - IC301 C-13
 - IC302 C-8
 - IC303 C-8
 - IC304 8-8
 - IC305 D-13
 - I010 B-7
 - I012 B-4
 - I013 C-C-19
 - I014 F-1
 - I015 D-2
 - I016 F-1
 - I017 F-21
 - I018 F-21
 - F-21
 - RV102 C-4



FP-962 (MODE CONTROL), PW-960 (FUNCTION 1), SW-96A (FUNCTION 2), SW-96B (FUNCTION 3) SCHEMATIC DIAGRAMS

—Ref. No. FP-962, PW-960, SW-96A and SW-96B BOARDS: 4,000 series—



no mark: PAUSE mode
(NTSC REFERENCE DISC ONLY)
STBEL From No.4100

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

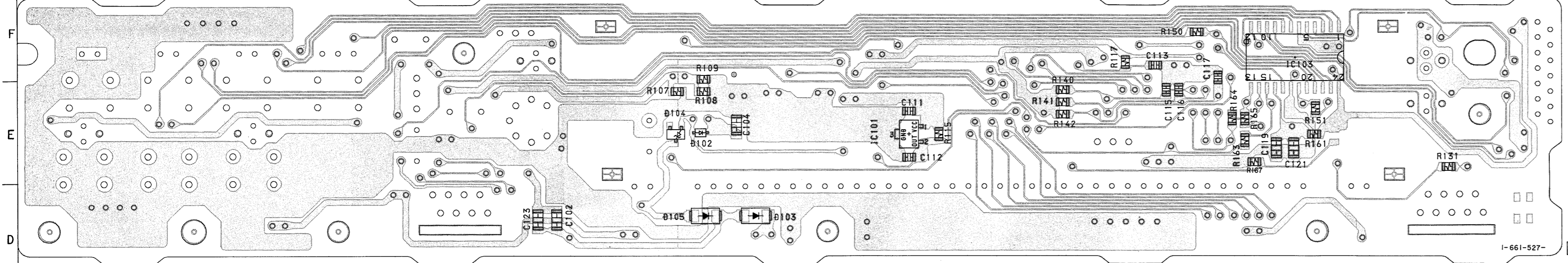
(Page 4-5)

(Page 4-24)

FP-962 (MODE CONTROL), PW-960 (FUNCTION 1), SW-96A (FUNCTION 2), SW-96B (FUNCTION 3) PRINTED WIRING BOARDS

— Ref. No. FP-962, PW-960, SW-96A and SW-96B BOARDS: 4,000 series —

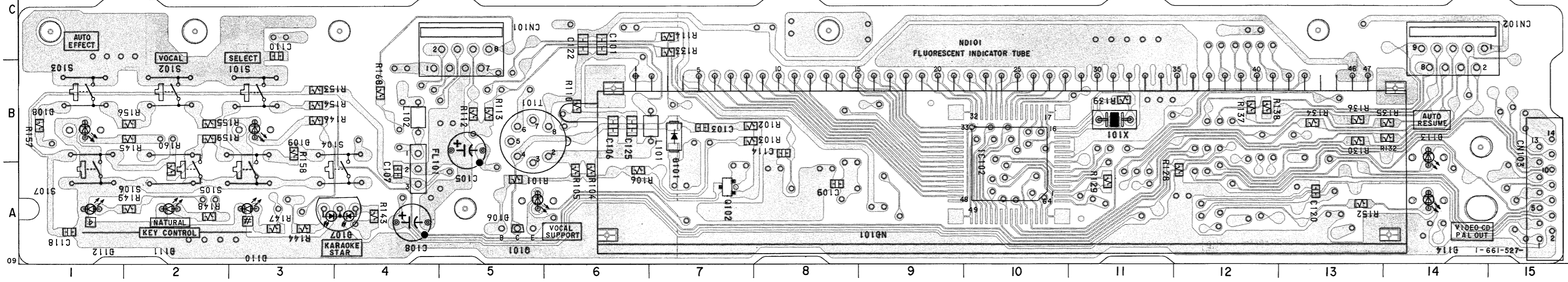
[FP-962 BOARD] (COMPONENT SIDE)



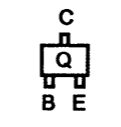
- FP-962 BOARD
- CN101 C-5
 - CN102 C-15
 - CN103 B-15
 - D101 A-7
 - D102 E-7
 - D103 E-7
 - D104 E-7
 - D105 D-7
 - D106 A-5
 - D107 A-4
 - D108 B-1
 - D109 B-3
 - D110 A-3
 - D111 A-2
 - D112 A-1
 - D113 B-14
 - D114 A-14
 - IC101 E-9
 - IC102 A-10
 - IC103 F-13
 - Q101 A-5
 - Q102 A-7

I-661-527-

[FP-962 BOARD] (CONDUCTOR SIDE)

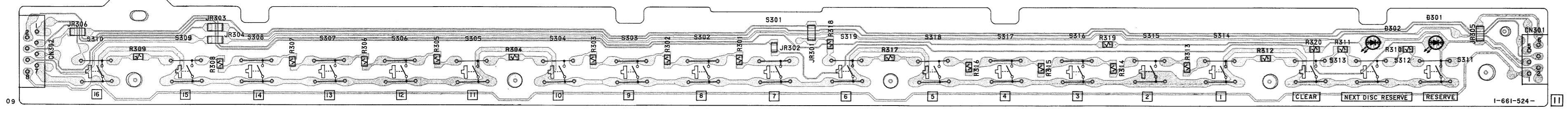


- For printed wiring boards.
- Chip transistor



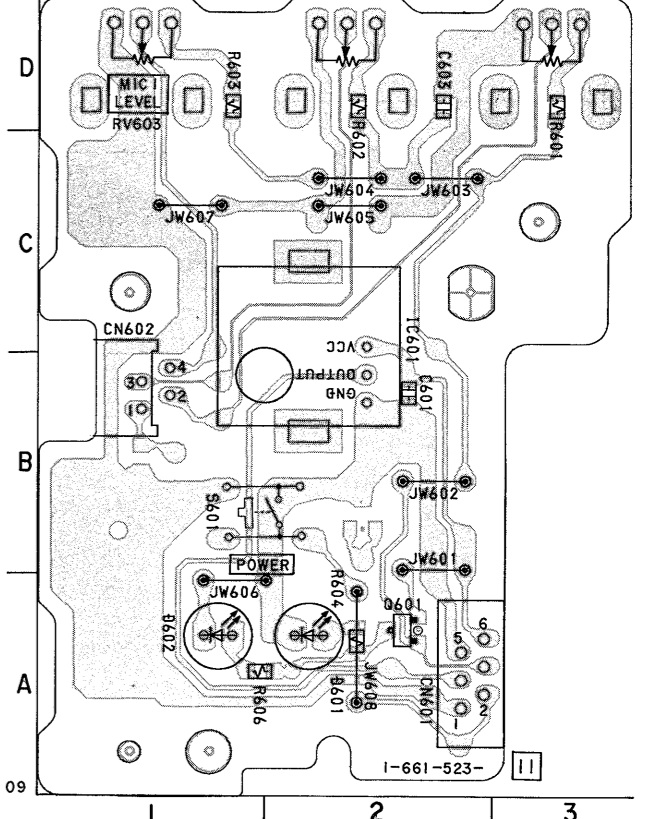
I-661-527-

[SW-96A BOARD]



I-661-524-

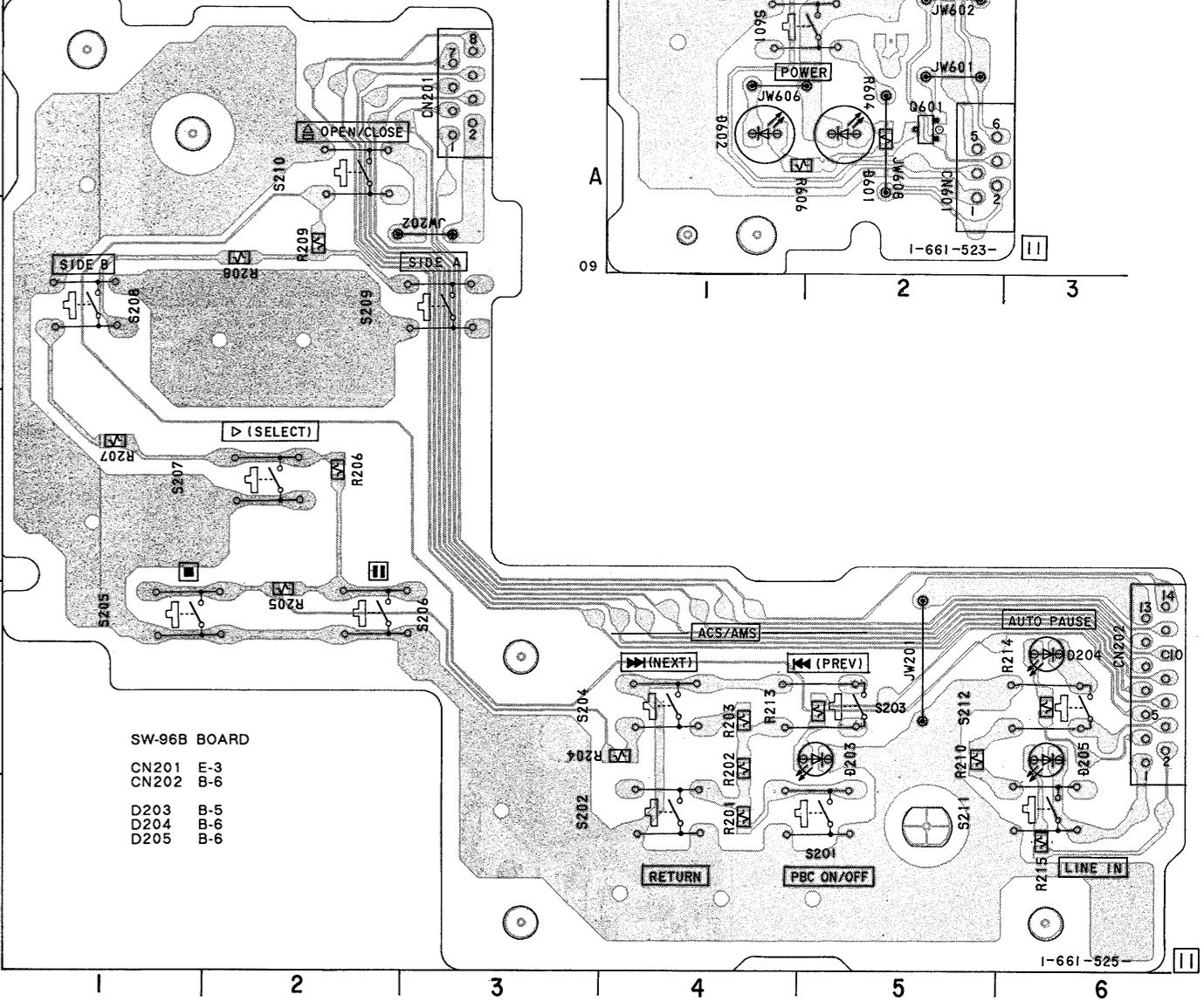
[PW-960 BOARD]



- PW-960 BOARD
- CN601 A-2
 - CN602 C-1
 - D601 A-2
 - D602 A-1
 - IC601 C-2
 - Q601 A-2
 - RV601 D-3
 - RV602 D-2
 - RV603 D-1

I-661-523-

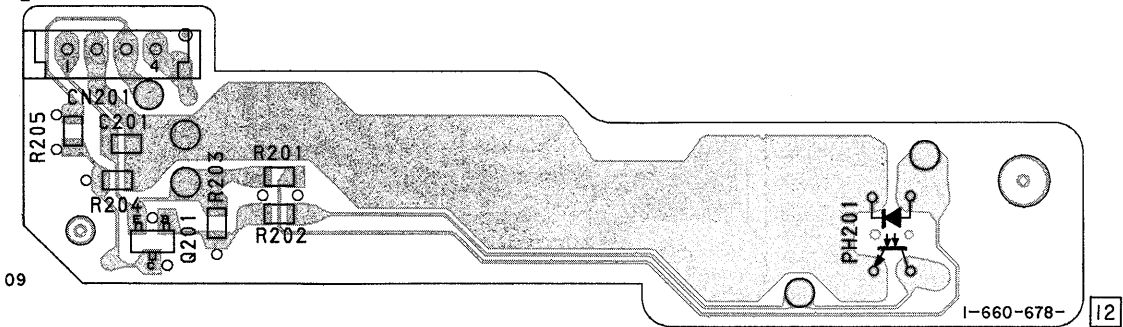
[SW-96B BOARD]



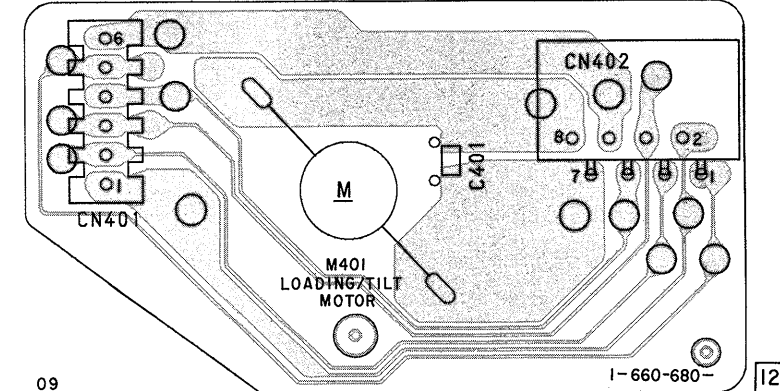
- SW-96B BOARD
- CN201 E-3
 - CN202 B-6
 - D203 B-6
 - D204 B-6
 - D205 B-6

I-661-525-

[FG-42 BOARD]



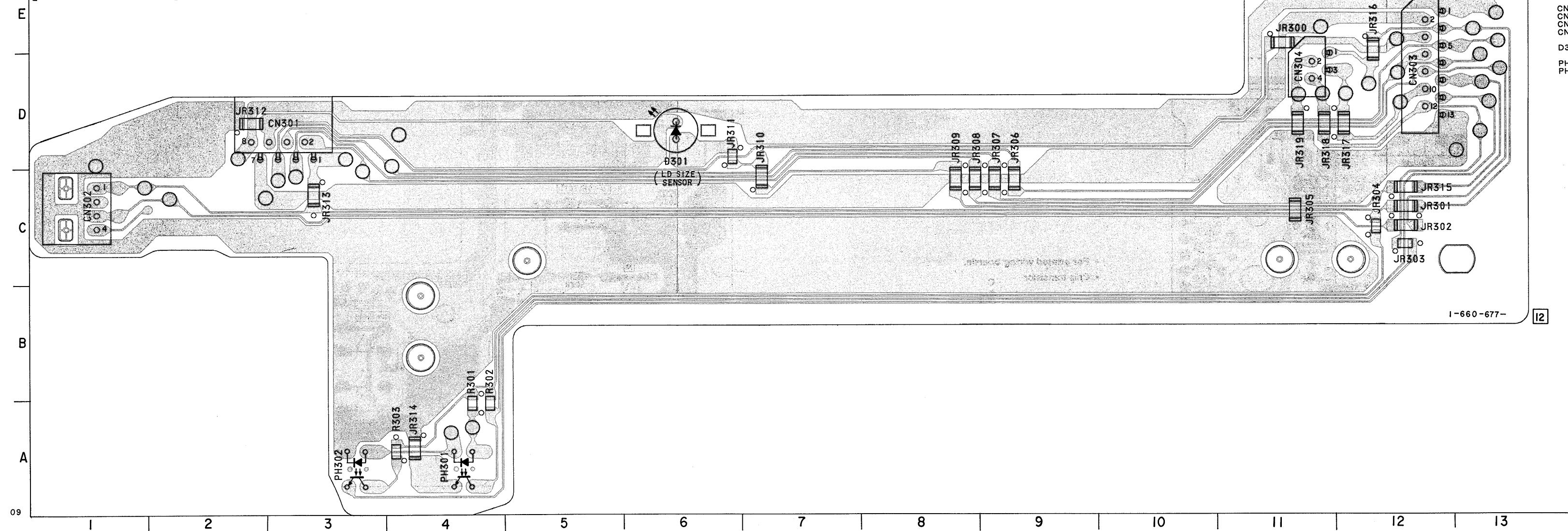
[MT-59 BOARD]



- For printed wiring boards.
- Chip transistor

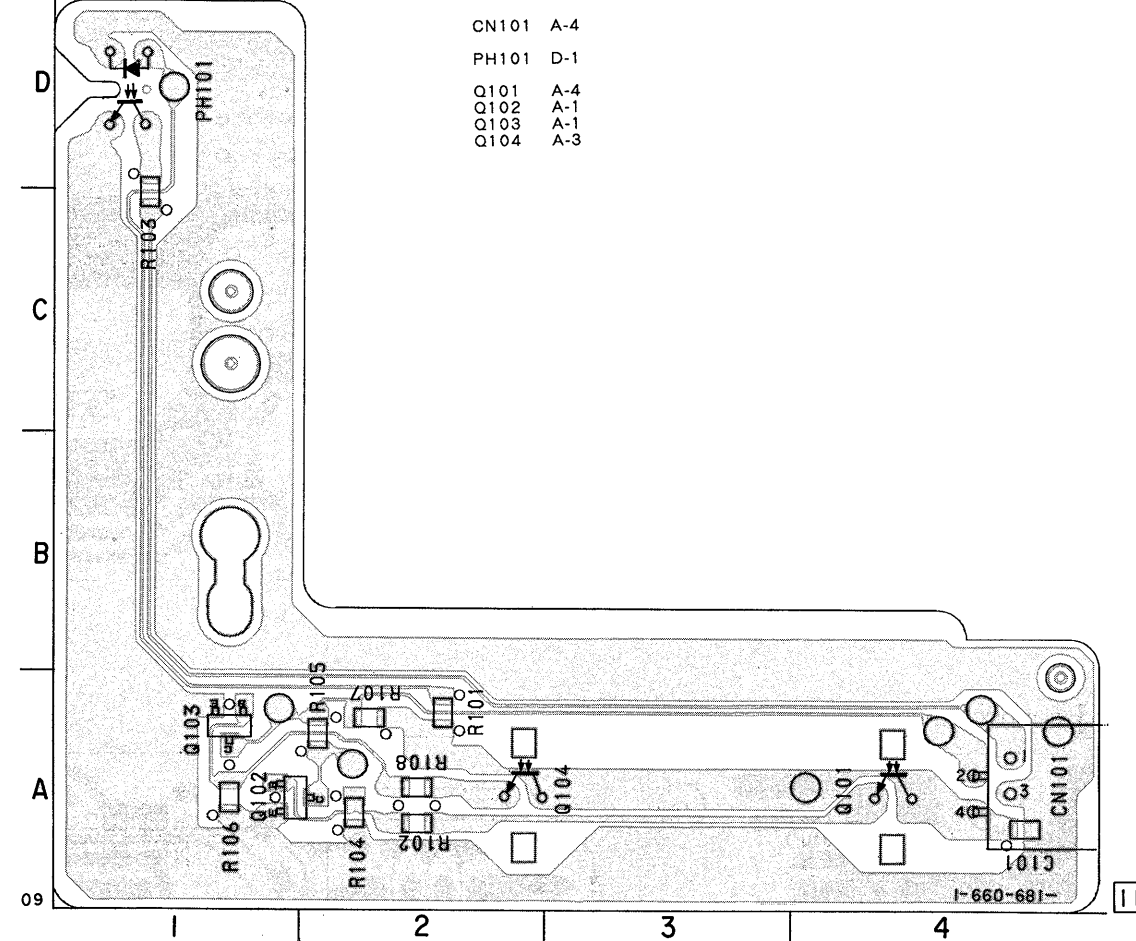


[MD-67 BOARD]



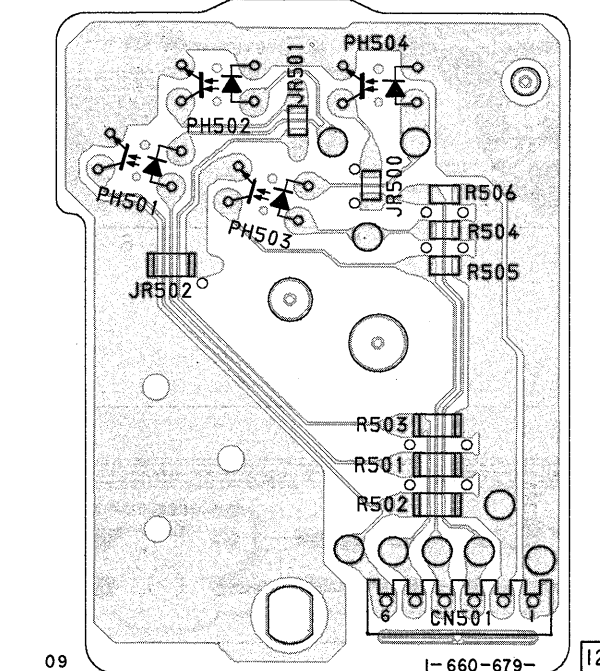
- MD-67 BOARD
- CN301 D-3
 - CN302 C-1
 - CN303 D-12
 - CN304 D-11
 - D301 D-6
 - PH301 A-4
 - PH302 A-3

[IB-10 BOARD]



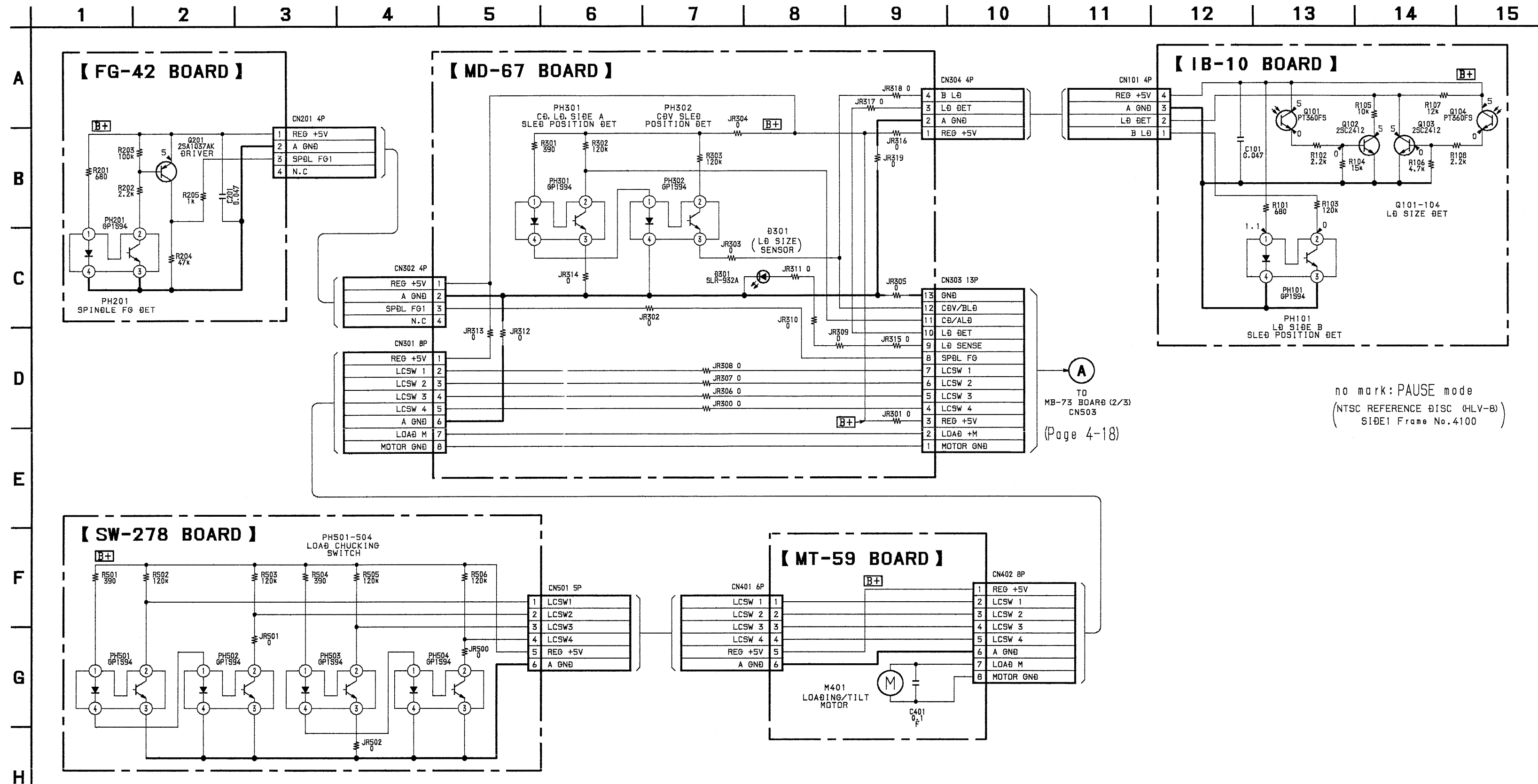
- IB-10 BOARD
- CN101 A-4
 - PH101 D-1
 - Q101 A-4
 - Q102 A-1
 - Q103 A-1
 - Q104 A-3

[SW-278 BOARD]



FG-42 (SPINDLE FG DETECT), IB-10 (SLED POSITION DETECT), MD-67 (SLED POSITION DETECT), MT-59 (LOADING/TILT MOTOR), SW-278 (LOAD CHUCKING SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. FG-42, IB-10, MD-67, MT-59 and SW-278 BOARDS: 5,000 series —



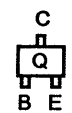
MDP-V9K

KP-962 (EXTERNAL IN, CLAPPING), MA-962 (MIC) PRINTED WIRING BOARDS

— Ref. No. KP-962 and MA-962 BOARDS: 6,000 series —

• For printed wiring boards.

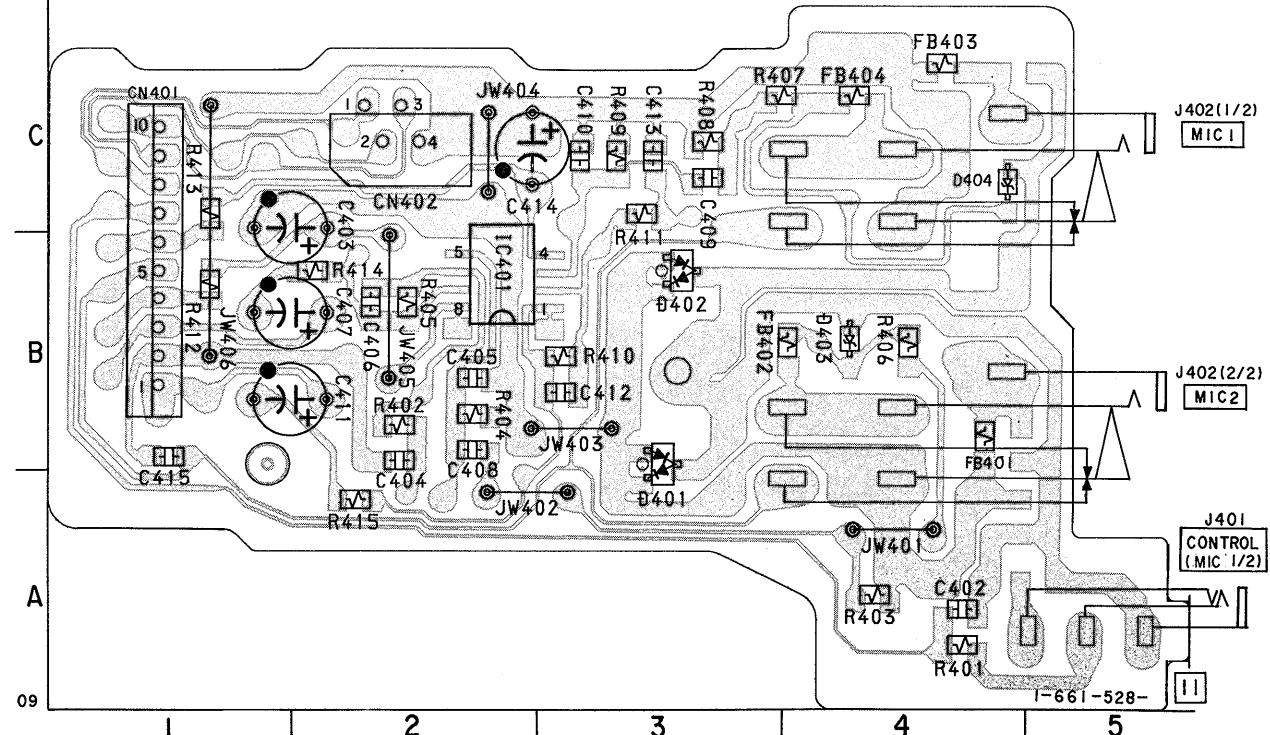
• Chip transistor



MA-962 BOARD

- CN401 C-1
- CN402 C-2
- D401 A-3
- D402 B-3
- D403 B-4
- D404 C-4
- IC401 B-2

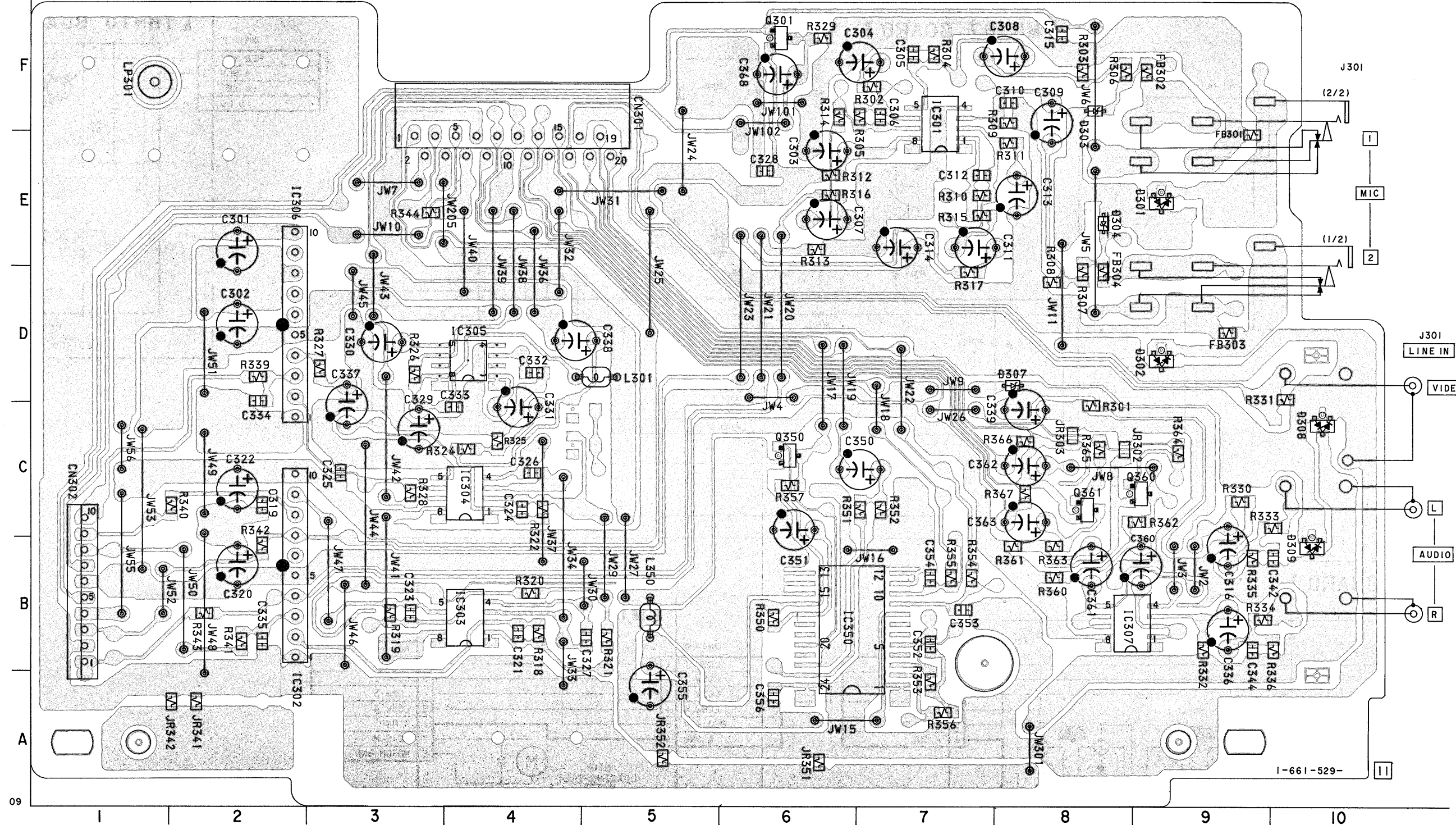
[MA-962 BOARD]



KP-962 BOARD

- CN301 F-5
- CN302 C-1
- D301 E-9
- D302 D-9
- D303 E-8
- D304 D-8
- D307 C-8
- D308 C-10
- D309 B-10
- IC301 F-7
- IC302 A-2
- IC303 B-4
- IC304 C-4
- IC305 D-4
- IC306 B-9
- IC307 B-9
- IC350 B-6
- Q301 F-6
- Q350 C-6
- Q351 C-6
- Q361 C-6

[KP-962 BOARD]

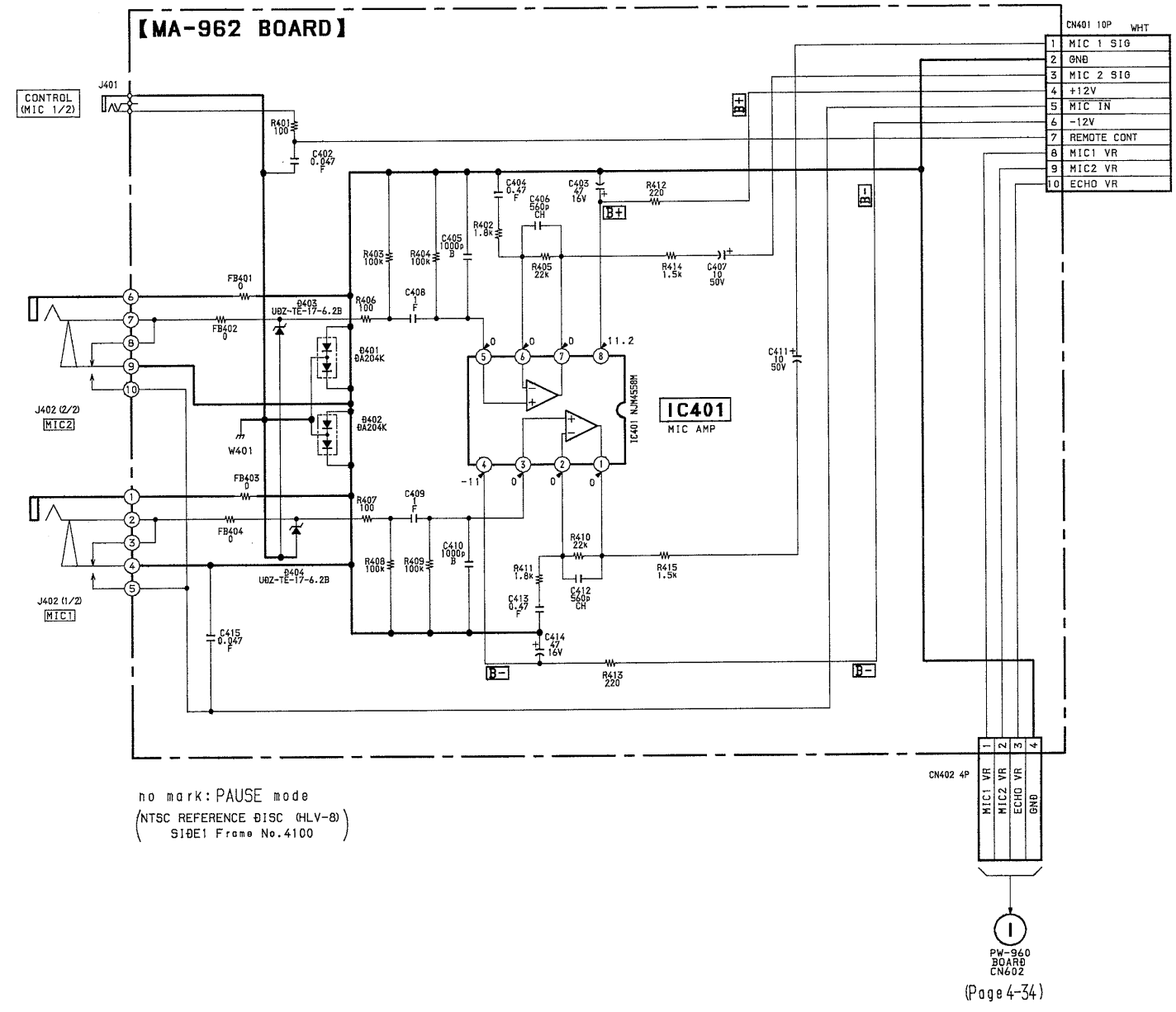


KP-962 (EXTERNAL IN, CLAPPING), MA-962 (MIC) SCHEMATIC DIAGRAMS

— Ref. No. KP-962 and MA-962 BOARDS: 6,000 series —

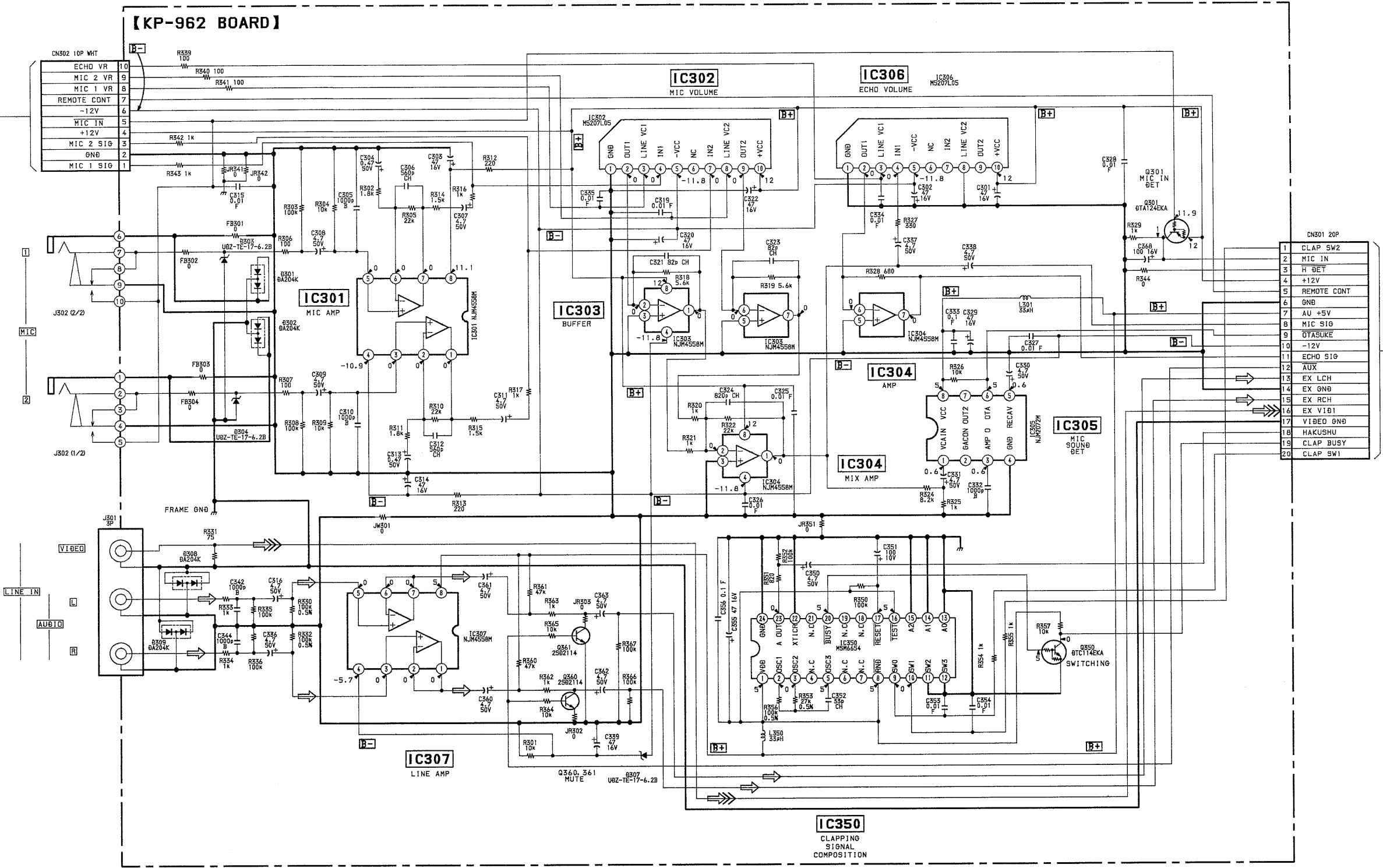
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

A
B
C
D
E
F
G
H
I
J
K



•SIGNAL PATH

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



(Page 4-22)

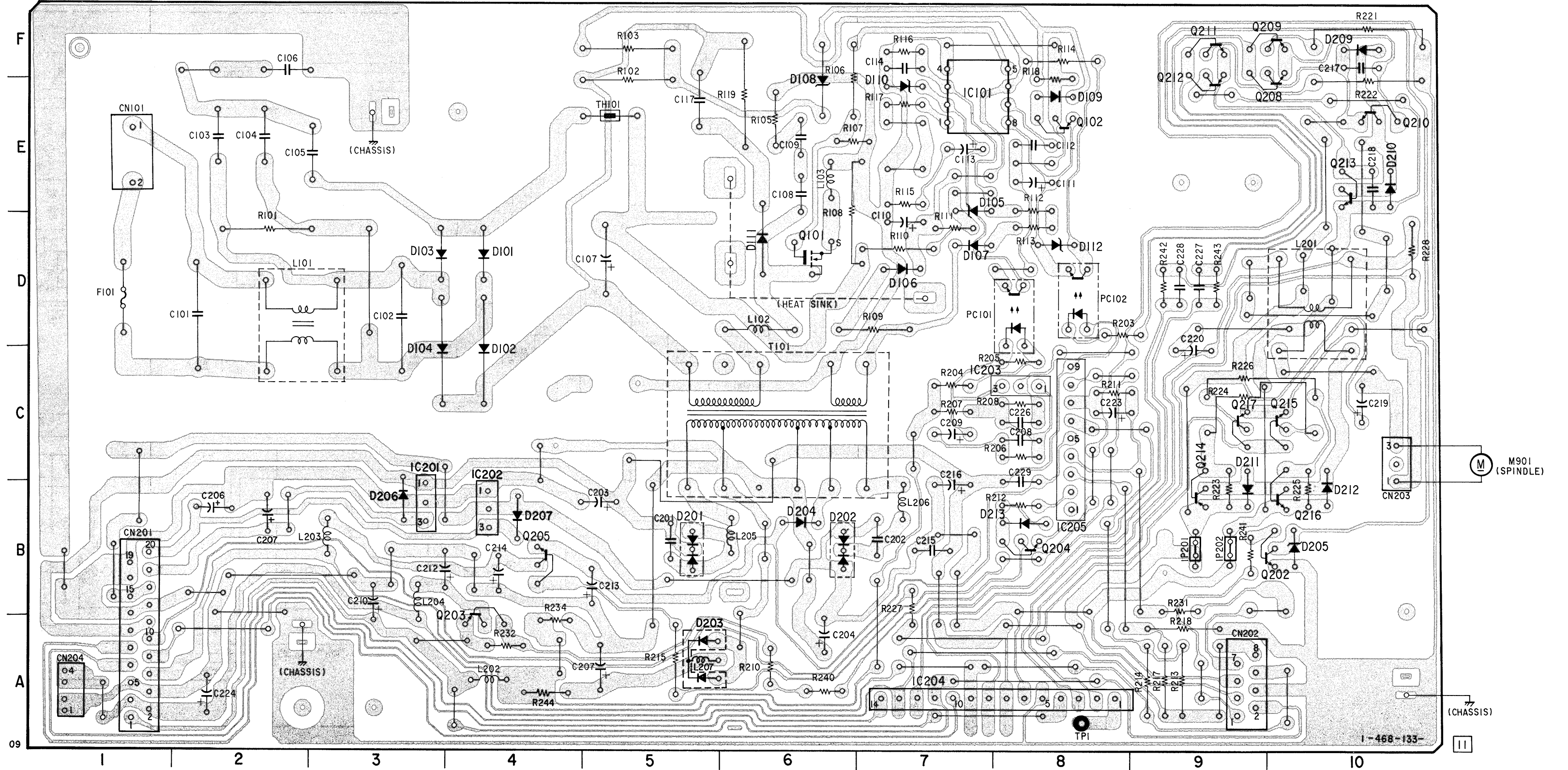
POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) PRINTED WIRING BOARD

— Ref. No. POWER BLOCK: 7,000 series —

POWER BLOCK

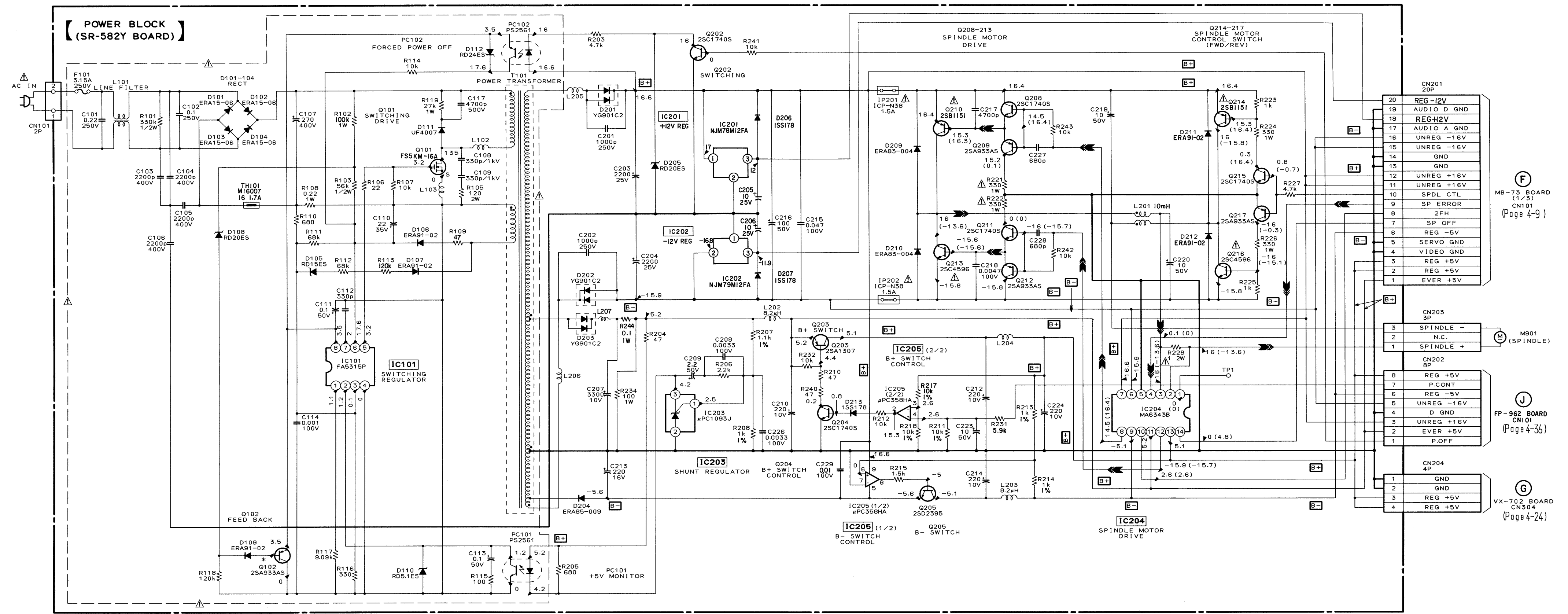
CN101	E-1
CN201	B-1
CN202	A-9
CN203	C-10
CN204	A-1
D101	D-4
D102	C-4
D103	C-3
D104	C-2
D105	D-7
D106	D-7
D107	D-7
D108	E-6
D109	E-8
D110	E-7
D111	D-6
D112	D-8
D201	B-5
D202	B-6
D203	A-5
D204	B-6
D205	B-10
D206	B-3
D207	B-4
D209	F-10
D210	F-10
D211	C-9
D212	B-10
D213	B-7
IC101	E-7
IC201	C-3
IC202	C-4
IC203	C-7
IC204	A-7
IC205	B-8
PC101	D-7
PC102	D-8
Q101	D-6
Q102	E-8
Q202	B-10
Q203	A-4
Q204	B-8
Q205	B-4
Q208	E-10
Q209	F-9
Q210	F-10
Q211	F-8
Q212	E-9
Q213	E-10
Q214	C-9
Q215	C-10
Q216	B-10
Q217	C-9

(POWER BLOCK) (SR-582Y)



POWER BLOCK (POWER SUPPLY, MOTOR DRIVE) SCHEMATIC DIAGRAM

— Ref. No. POWER BLOCK: 7,000 series —



CN201 20P

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

MB-73 BOARD (1/3) CN101 (Page 4-9)

CN203 3P

3	SPINDLE -
2	N.C.
1	SPINDLE +

M901 (SPINDLE)

CN202 8P

8	REG +5V
7	P.CONT
6	REG -5V
5	UNREG -16V
4	D GND
3	UNREG +16V
2	EVER +5V
1	P.OFF

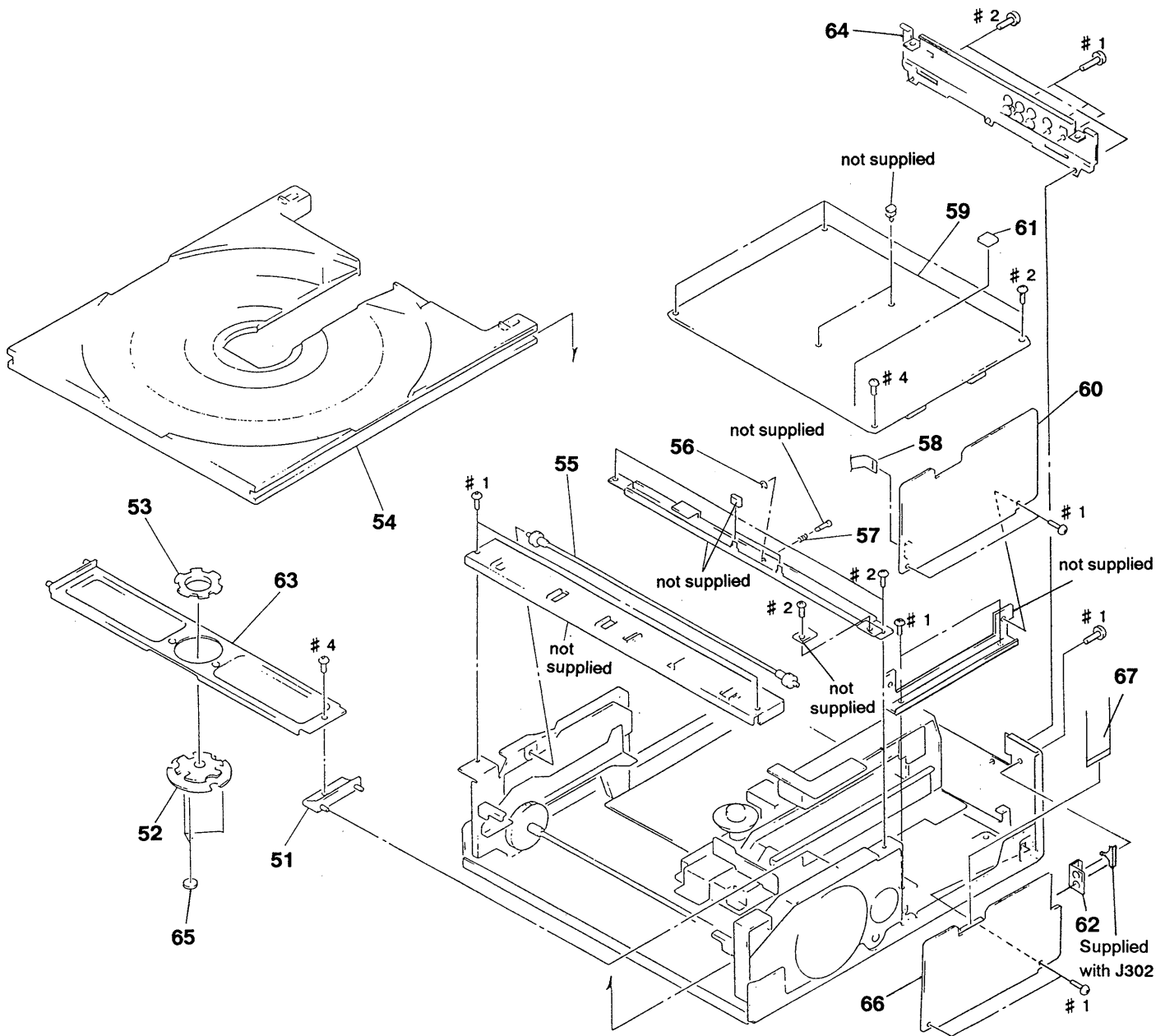
FP-962 BOARD CN101 (Page 4-36)

CN204 4P

1	GND
2	GND
3	REG +5V
4	REG +5V

VX-702 BOARD CN304 (Page 4-24)

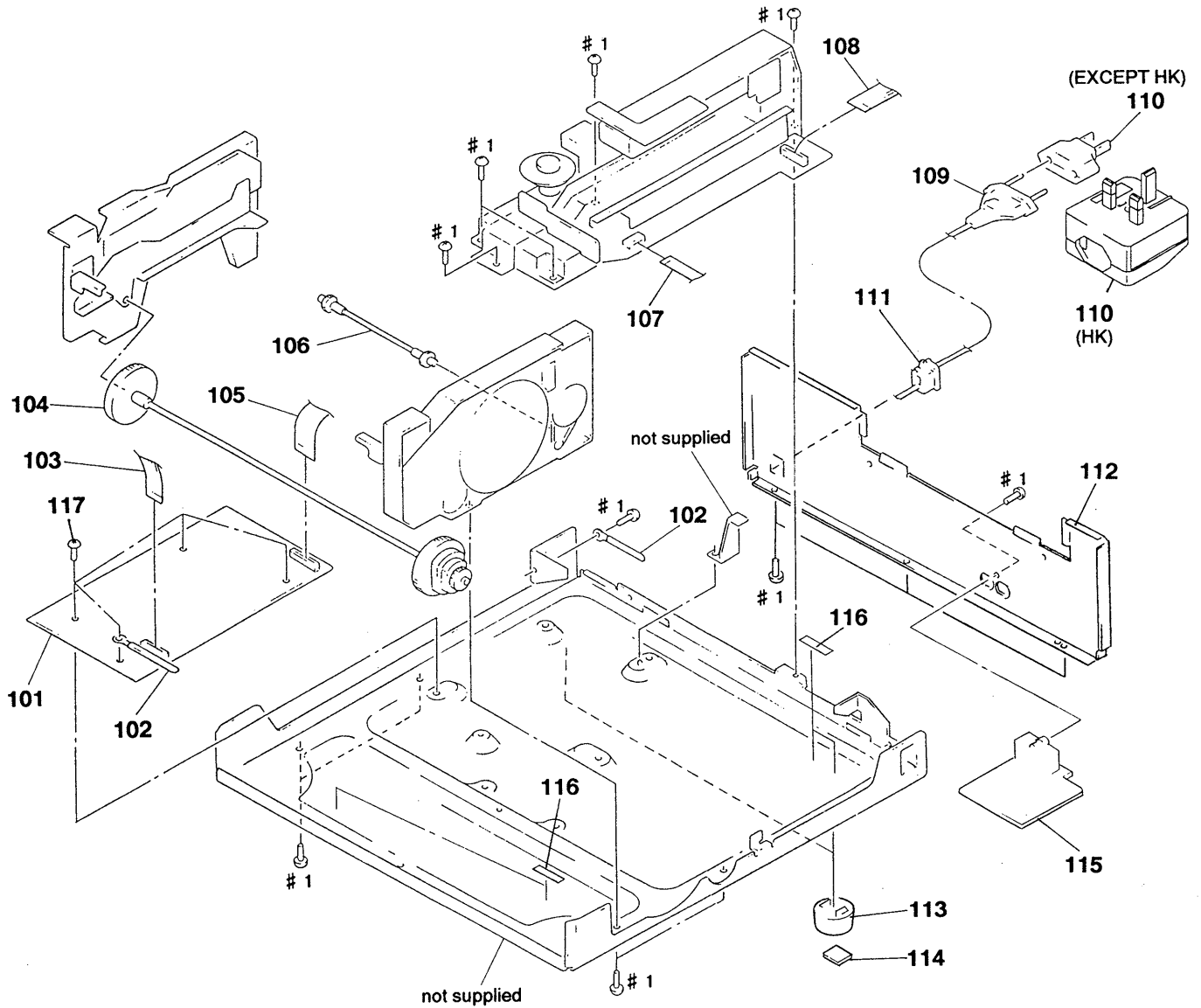
5-1-2. MAIN CHASSIS SECTION (1)



Ref. No.	Part No.	Description
51	3-968-304-01	HOLDER, CHUCK PLATE
52	A-6415-990-A	CHUCK BLOCK ASSY
53	3-968-317-01	PLATE, TOP
54	A-6415-988-A	TRAY (96) ASSY
55	X-3946-037-1	SHAFT ASSY, LINK
56	3-703-075-00	CAP 2, SHAFT
57	3-969-528-01	SPRING, COMPRESSION
58	1-777-013-11	CABLE, FLAT (9 CORE)
* 59	A-6423-434-A	MB-73 (62E) BOARD, COMPLETE

Remark	Ref. No.	Part No.	Description	Remark
	* 60	A-6423-433-A	VX-702 (62E) BOARD, COMPLETE	
	61	9-911-840-XX	RUBBER (B)	
	62	3-971-188-01	BRACKET, KP	
	* 63	X-3946-039-2	PLATE ASSY, CHUCK	
	64	3-971-184-01	PLATE, JACK	
	65	3-954-527-11	SHEET, STOPPER	
	* 66	A-6423-435-A	KP-962 BOARD, COMPLETE	
	67	1-777-263-11	WIRE, (FLAT TYPE) (20 CORE)	

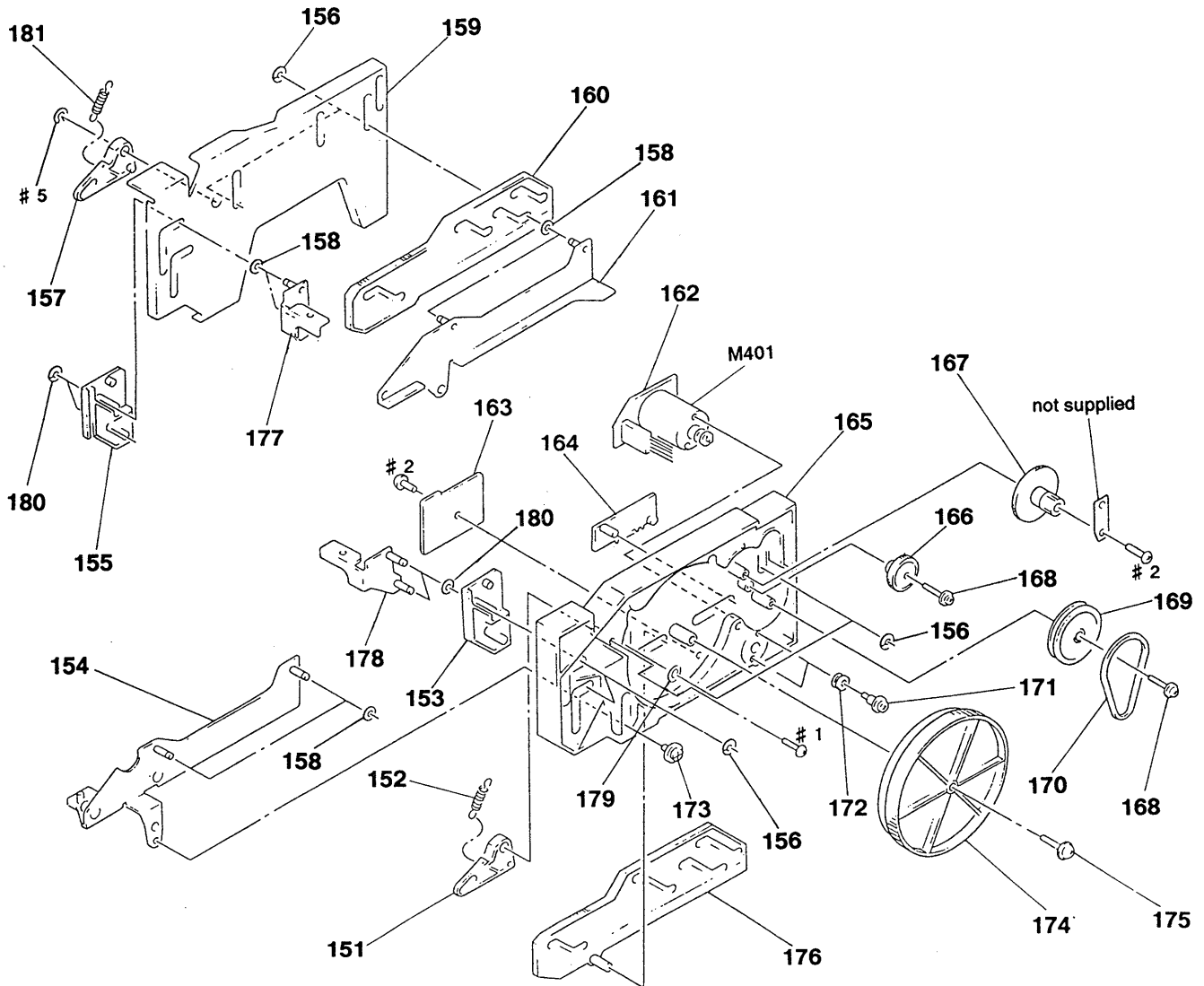
5-1-3. MAIN CHASSIS SECTION (2)



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

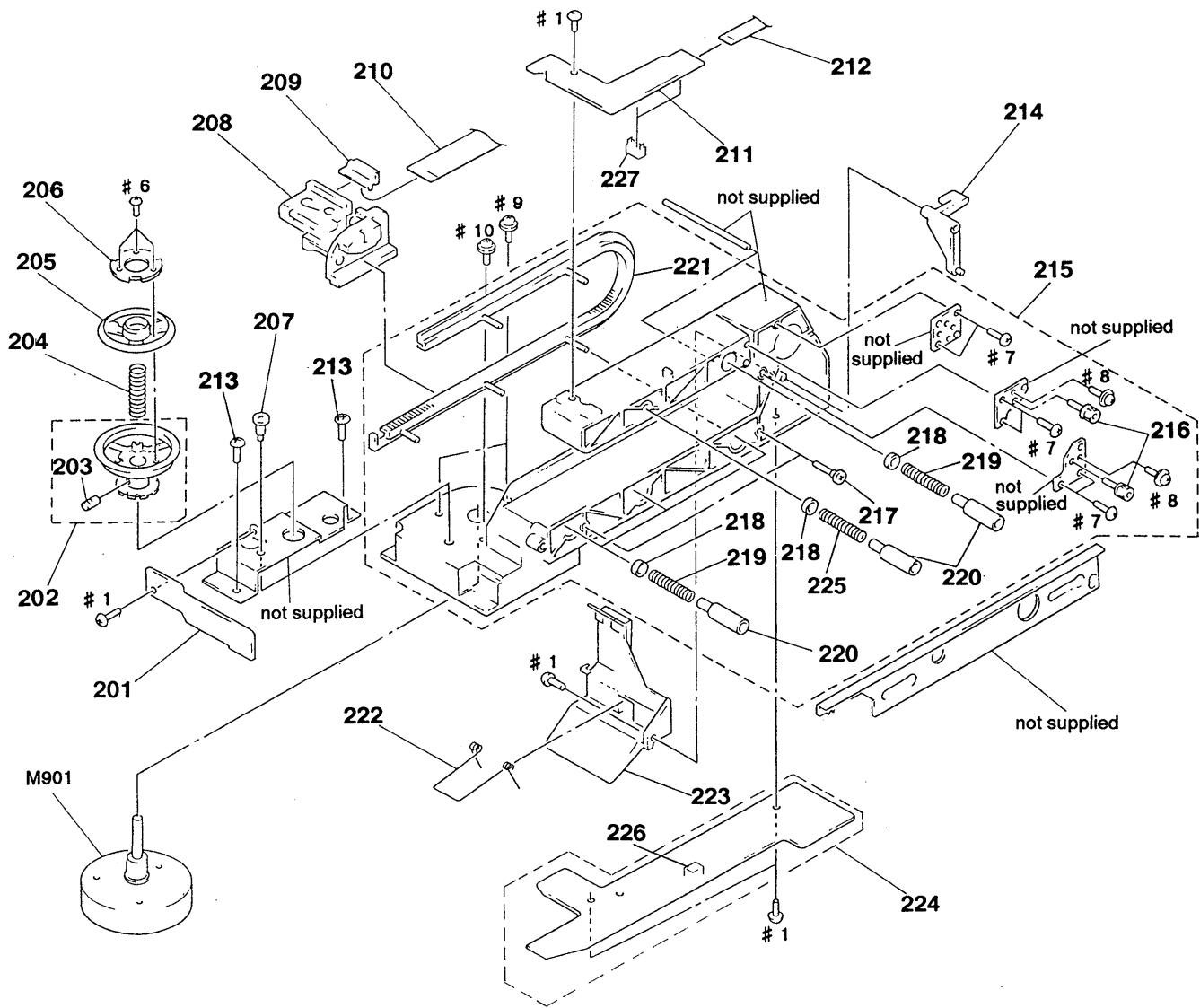
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
\triangle 101	1-468-133-11	POWER BLOCK (SR-582Y BOARD) (SWITCHING REGULATOR)		\triangle 110	1-569-008-11	ADAPTOR, CONVERSION 2P (EXCEPT HK)	
102	3-703-397-01	STOPPER, WIRING		\triangle 110	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
103	1-777-010-11	CABLE, FLAT (8 CORE)		* 111	3-703-571-11	BUSHING (S) (4516), CORD	
104	X-3946-036-1	SHAFT ASSY, TRAY LINK		* 112	3-971-070-11	PANEL, REAR	
105	1-777-005-11	CABLE, FLAT (20 CORE)		113	4-977-592-01	FOOT (F28145H)	
106	X-3946-038-1	SHAFT ASSY, TILT LINK		114	4-978-398-01	CUSHION	
107	1-777-007-11	CABLE, FLAT (8 CORE)		* 115	A-6423-420-A	YC-962 (60E) BOARD, COMPLETE	
108	1-777-006-11	CABLE, FLEXIBLE FLAT (13 CORE)		116	3-896-686-01	CUSHION	
\triangle 109	1-769-639-11	CORD, POWER		117	3-970-608-11	SUMITITE (B3) +BV	

5-1-4. FRAME (L, R) SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	3-968-302-01	ARM (R), DOOR		167	3-968-307-01	GEAR (A), MIDWAY	
152	3-968-283-01	SPRING, TENSION		168	3-669-480-11 + PTPWH 2		
153	3-968-301-01	SLIDER (R), DOOR		169	3-968-311-01	PULLEY	
* 154	X-3946-042-1	GUIDE (R) ASSY, TRAY		170	3-968-309-01	BELT	
155	3-968-280-01	SLIDER (L), DOOR		171	3-941-733-01	SCREW (M3X2)	
156	3-325-697-01	WASHER		172	3-570-118-00	CUSHION, MOTOR	
157	3-968-281-01	ARM (L), DOOR		173	3-969-353-01	SCREW, GUIDE CLAMP	
158	3-701-441-21	WASHER		174	3-968-310-01	GEAR, CONTROL	
* 159	X-3946-043-1	FRAME (L) ASSY		175	3-970-142-01	SCREW (3X20) (TYPE 2), +PTPWH	
160	3-968-276-01	SLIDER (L)		176	3-968-300-01	SLIDER (R)	
* 161	X-3946-044-1	GUIDE (L) ASSY, TRAY		* 177	X-3946-306-1	DISK (L) ASSY, DOOR	
* 162	1-660-680-11	MT-59 BOARD		178	X-3946-305-1	DISK (R) ASSY, DOOR	
* 163	1-660-679-11	SW-278 BOARD		179	3-533-073-01	WASHER	
164	3-968-305-01	SLIDER, TILT		180	3-972-273-01	WASHER, DOOR	
165	3-968-298-01	FRAME (R)		181	3-971-134-01	SPRING, TENSION	
166	3-968-308-01	GEAR (B), MIDWAY		M401	X-3946-431-1	MOTOR ASSY, LOADING (LOADING/TILT)	

5-1-5. MECHANISM DECK SECTION



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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 201	1-660-678-11	FG-42 BOARD		216	3-899-249-01	BOLT, HEXAGON SOCKET	
202	X-3942-779-1	TURNTABLE ASSY		217	3-968-297-01	SCREW, TILT	
203	3-701-507-00	SET SCREW, DOUBLE POINT, (M3X5)		218	3-953-830-01	WASHER, U	
204	3-953-289-01	SPRING (3), COMPRESSION		219	3-953-267-01	SPRING, COMPRESSION	
205	3-965-602-01	GUIDE, CENTER		220	3-953-255-03	HOLDER, U	
206	3-953-293-01	PLATE (C), YOKE		221	3-968-295-01	GUIDE (96), U	
207	3-968-279-01	SCREW, TRAY GUIDE		222	3-968-287-01	SPRING, FLEXIBLE RETAINER	
\triangle 208	8-848-286-11	OPTICAL PICK-UP BLOCK KHS-150A(S)		223	3-968-288-01	STAND, FLEXIBLE	
209	3-953-268-01	HOLDER (18P), FLEXIBLE		* 224	A-6423-384-A	MD-67 (06E) BOARD, COMPLETE	
210	1-777-011-11	CABLE, FLEXIBLE FLAT (18 CORE)		225	3-969-350-01	SPRING, COMPRESSION	
* 211	1-660-681-11	IB-10 BOARD		* 226	3-968-252-01	HOLDER, LED	
212	1-777-008-11	CABLE, FLAT (4 CORE)		* 227	3-968-253-01	HOLDER, PD	
213	3-970-608-11	SUMITITE (B3) +BV		M901	1-698-109-11	MOTOR, DD (SPINDLE)	
* 214	3-968-290-01	ARM, TILT DRIVING					
215	A-6403-023-A	BASE (96) ASSY, FEED					

5-2. ELECTRICAL PARTS LIST

NOTE:

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

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked “* ” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-660-678-11	FG-42 BOARD (Ref. No. 5, 000 Series) *****					
		< CAPACITOR >					
C201	1-163-035-00	CERAMIC CHIP 0.047uF	50V	C111	1-164-346-11	CERAMIC CHIP 1uF	16V
		< CONNECTOR >		C112	1-164-232-11	CERAMIC CHIP 0.01uF	50V
CN201	1-774-714-11	CONNECTOR, BOARD TO BOARD 4P		C113	1-163-031-11	CERAMIC CHIP 0.01uF	50V
		< PHOTO INTERRUPTER >		C114	1-163-031-11	CERAMIC CHIP 0.01uF	50V
PH201	8-749-012-33	PHOTO INTERRUPTER GP1S94		C115	1-163-031-11	CERAMIC CHIP 0.01uF	50V
		< TRANSISTOR >		C116	1-163-031-11	CERAMIC CHIP 0.01uF	50V
Q201	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R		C117	1-163-031-11	CERAMIC CHIP 0.01uF	50V
		< RESISTOR >		C118	1-163-031-11	CERAMIC CHIP 0.01uF	50V
R201	1-216-045-00	METAL CHIP 680 5% 1/10W		C119	1-115-566-91	CERAMIC CHIP 4.7uF	10% 6.3V
R202	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		C120	1-163-038-91	CERAMIC CHIP 0.1uF	25V
R203	1-216-097-91	METAL GLAZE 100K 5% 1/10W					
R204	1-216-089-91	METAL GLAZE 47K 5% 1/10W		C121	1-115-566-91	CERAMIC CHIP 4.7uF	10% 6.3V
R205	1-216-049-91	METAL GLAZE 1K 5% 1/10W		C122	1-164-506-11	CERAMIC CHIP 4.7uF	16V
*****				C123	1-164-506-11	CERAMIC CHIP 4.7uF	16V
				C125	1-164-506-11	CERAMIC CHIP 4.7uF	16V
*	A-6423-428-A	FP-962 (62E) BOARD, COMPLETE ***** (Ref. No. 4, 000 Series)				< CONNECTOR >	
				CN101	1-770-889-11	SOCKET, CONNECTOR 8P	
*	3-971-189-01	HOLDER, FL		CN102	1-691-645-11	SOCKET, CONNECTOR 9P	
*	3-971-190-01	HOLDER, LED		* CN103	1-750-197-11	CONNECTOR, BOARD TO BOARD 14P	
		< CAPACITOR >				< DIODE >	
C101	1-164-506-11	CERAMIC CHIP 4.7uF	16V	D101	8-719-048-98	DIODE RB160L-40TE25	
C102	1-164-506-11	CERAMIC CHIP 4.7uF	16V	D102	8-719-056-98	DIODE UDZ-TE-17-30B	
C103	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	D103	8-719-048-98	DIODE RB160L-40TE25	
C104	1-164-506-11	CERAMIC CHIP 4.7uF	16V	D104	8-719-105-73	DIODE RD4.7M-B2	
C105	1-124-248-00	ELECT 22uF 20%	35V	D105	8-719-048-98	DIODE RB160L-40TE25	
C106	1-164-506-11	CERAMIC CHIP 4.7uF	16V	D106	8-719-056-06	DIODE SLR-342DC3F (VOCAL SUPPORT)	
C107	1-163-031-11	CERAMIC CHIP 0.01uF	50V	D107	8-719-059-93	DIODE SPR-505MVWT31 (KARAOKE STAR)	
C108	1-124-589-11	ELECT 47uF 20%	16V	D108	8-719-056-06	DIODE SLR-342DC3F (AUTO EFFECT)	
C109	1-163-031-11	CERAMIC CHIP 0.01uF	50V	D109	8-719-056-06	DIODE SLR-342DC3F (SELECT)	
C110	1-163-038-91	CERAMIC CHIP 0.1uF	25V	D110	8-719-058-84	DIODE SLR-56DC3F (KEY CONTROL, #)	
				D111	8-719-046-66	DIODE SLR-56MC3F (KEY CONTROL, NATURAL)	
				D112	8-719-058-84	DIODE SLR-56DC3F (KEY CONTROL, b)	
				D113	8-719-056-07	DIODE SLR-342MC3F (AUTO RESUME)	
				D114	8-719-056-06	DIODE SLR-342DC3F (VIDEO CD PAL OUT)	
						< FILTER >	
				FL101	1-421-927-21	FILTER, NOISE	
						< IC >	
				IC101	8-759-074-40	IC PST572DMT-T1	
				IC102	8-759-421-54	IC HD6433712-B80H	

Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
IC103	8-759-342-19	IC NJU3716M-T2		R148	1-216-037-00	METAL CHIP 330 5%	1/10W
		< COIL >		R149	1-216-037-00	METAL CHIP 330 5%	1/10W
L101	1-410-526-11	MICRO INDUCTOR 10uH		R150	1-216-037-00	METAL CHIP 330 5%	1/10W
L102	1-408-979-21	INDUCTOR 56uH		R151	1-216-037-00	METAL CHIP 330 5%	1/10W
		< FLUORECENT INDICATOR >		R152	1-216-037-00	METAL CHIP 330 5%	1/10W
ND101	1-517-471-11	INDICATOR TUBE, FLUORESCENT		R153	1-216-073-00	METAL CHIP 10K 5%	1/10W
		< TRANSISTOR >		R154	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
Q101	8-729-140-97	TRANSISTOR 2SB734-34		R155	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
Q102	8-729-216-22	TRANSISTOR 2SA1162-G		R156	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
		< RESISTOR >		R157	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R101	1-216-009-00	METAL CHIP 22 5%	1/10W	R158	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R102	1-216-073-00	METAL CHIP 10K 5%	1/10W	R159	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R103	1-216-073-00	METAL CHIP 10K 5%	1/10W	R160	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R104	1-216-063-91	METAL GLAZE 3.9K 5%	1/10W	R161	1-216-073-00	METAL CHIP 10K 5%	1/10W
R105	1-216-063-91	METAL GLAZE 3.9K 5%	1/10W	R163	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R106	1-216-081-00	METAL CHIP 22K 5%	1/10W	R164	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R107	1-216-075-00	METAL CHIP 12K 5%	1/10W	R165	1-216-049-91	METAL GLAZE 1K 5%	1/10W
R108	1-216-075-00	METAL CHIP 12K 5%	1/10W	R167	1-216-295-91	CONDUCTOR, CHIP (2012)	
R109	1-216-075-00	METAL CHIP 12K 5%	1/10W	R168	1-216-025-91	METAL GLAZE 100 5%	1/10W
R110	1-216-073-00	METAL CHIP 10K 5%	1/10W			< SWITCH >	
R112	1-216-089-91	METAL GLAZE 47K 5%	1/10W	S101	1-762-777-11	SWITCH, KEY BOARD (SELECT)	
R113	1-216-093-00	METAL CHIP 68K 5%	1/10W	S102	1-762-777-11	SWITCH, KEY BOARD (VOCAL)	
R114	1-216-025-91	METAL GLAZE 100 5%	1/10W	S103	1-762-777-11	SWITCH, KEY BOARD (AUTO EFFECT)	
R115	1-216-073-00	METAL CHIP 10K 5%	1/10W	S104	1-762-777-11	SWITCH, KEY BOARD (KARAOKE STAR)	
R117	1-216-073-00	METAL CHIP 10K 5%	1/10W	S105	1-762-777-11	SWITCH, KEY BOARD (KEY CONTROL, #)	
R128	1-216-065-00	METAL CHIP 4.7K 5%	1/10W	S106	1-762-777-11	SWITCH, KEY BOARD (KEY CONTROL, NATURAL)	
R129	1-216-073-00	METAL CHIP 10K 5%	1/10W	S107	1-762-777-11	SWITCH, KEY BOARD (KEY CONTROL, b)	
R130	1-216-033-00	METAL CHIP 220 5%	1/10W			< TRANSFORMER >	
R131	1-216-033-00	METAL CHIP 220 5%	1/10W	T101	1-448-740-21	TRANSFORMER, DC-DC CONVERTER	
R132	1-216-049-91	METAL GLAZE 1K 5%	1/10W			< VIBRATOR >	
R133	1-216-085-00	METAL CHIP 33K 5%	1/10W	X101	1-579-952-21	VIBRATOR, CERAMIC (8MHz)	
R134	1-216-049-91	METAL GLAZE 1K 5%	1/10W	*****			
R135	1-216-033-00	METAL CHIP 220 5%	1/10W	*	1-661-526-11	HP-962 BOARD (Ref.No. 2,000 Series)	
R136	1-216-033-00	METAL CHIP 220 5%	1/10W			*****	
R137	1-216-033-00	METAL CHIP 220 5%	1/10W			< CAPACITOR >	
R138	1-216-033-00	METAL CHIP 220 5%	1/10W	C951	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
R139	1-216-121-91	METAL GLAZE 1M 5%	1/10W	C952	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
R140	1-216-073-00	METAL CHIP 10K 5%	1/10W	C953	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
R141	1-216-073-00	METAL CHIP 10K 5%	1/10W			< CONNECTOR >	
R142	1-216-073-00	METAL CHIP 10K 5%	1/10W	* CN951	1-568-941-11	PIN, CONNECTOR 3P	
R143	1-216-037-00	METAL CHIP 330 5%	1/10W			< DIODE >	
R144	1-216-037-00	METAL CHIP 330 5%	1/10W	D901	8-719-914-42	DIODE DA204K	
R145	1-216-037-00	METAL CHIP 330 5%	1/10W				
R146	1-216-037-00	METAL CHIP 330 5%	1/10W				
R147	1-216-037-00	METAL CHIP 330 5%	1/10W				

HP-962 **IB-10** **KP-962**

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< JACK >		*	A-6423-435-A	KP-962 BOARD, COMPLETE ***** (Ref. No. 6,000 Series)	
J951	1-507-796-71	JACK (PHONES)					
		< JUMPER RESISTOR >				< CAPACITOR >	
JC951	1-216-295-91	CONDUCTOR, CHIP (2012)		C301	1-104-664-11	ELECT 47uF 20% 16V	
		< RESISTOR >		C302	1-104-664-11	ELECT 47uF 20% 16V	
R951	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		C303	1-104-664-11	ELECT 47uF 20% 16V	
R952	1-216-013-00	METAL CHIP 33 5% 1/10W		C304	1-124-902-00	ELECT 0.47uF 20% 50V	
R953	1-216-013-00	METAL CHIP 33 5% 1/10W		C305	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
R954	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		C306	1-163-135-00	CERAMIC CHIP 560PF 5% 50V	
		< VARIABLE RESISTOR >		C307	1-126-963-11	ELECT 4.7uF 20% 50V	
RV951	1-225-308-11	RES, VAR 500X500 (PHONES LEVEL)		C308	1-126-963-11	ELECT 4.7uF 20% 50V	
*****				C309	1-126-963-11	ELECT 4.7uF 20% 50V	
*	1-660-681-11	IB-10 BOARD (Ref. No. 5,000 Series) *****		C310	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
*	3-968-253-01	HOLDER, PD		C311	1-126-963-11	ELECT 4.7uF 20% 50V	
		< CAPACITOR >		C312	1-163-135-00	CERAMIC CHIP 560PF 5% 50V	
C101	1-163-035-00	CERAMIC CHIP 0.047uF 50V		C313	1-124-902-00	ELECT 0.47uF 20% 50V	
		< CONNECTOR >		C314	1-104-664-11	ELECT 47uF 20% 16V	
CN101	1-568-847-11	PIN, CONNECTOR (PC BOARD) 4P		C315	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
		< PHOTO INTERRUPTER >		C316	1-126-963-11	ELECT 4.7uF 20% 50V	
PH101	8-749-012-33	PHOTO INTERRUPTER GP1S94		C319	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
		< TRANSISTOR >		C320	1-104-664-11	ELECT 47uF 20% 16V	
Q101	8-729-904-10	PHOTO TRANSISTOR PT-360FS		C321	1-163-249-11	CERAMIC CHIP 82PF 5% 50V	
Q102	8-729-120-28	TRANSISTOR 2SC1623-L5L6		C322	1-104-664-11	ELECT 47uF 20% 16V	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6		C323	1-163-249-11	CERAMIC CHIP 82PF 5% 50V	
Q104	8-729-904-10	PHOTO TRANSISTOR PT-360FS		C324	1-163-139-00	CERAMIC CHIP 820PF 5% 50V	
		< RESISTOR >		C325	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
R101	1-216-045-00	METAL CHIP 680 5% 1/10W		C326	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
R102	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		C327	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
R103	1-216-099-00	METAL CHIP 120K 5% 1/10W		C328	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
R104	1-216-077-00	METAL CHIP 15K 5% 1/10W		C329	1-104-664-11	ELECT 47uF 20% 16V	
R105	1-216-073-00	METAL CHIP 10K 5% 1/10W		C330	1-126-963-11	ELECT 4.7uF 20% 50V	
R106	1-216-065-00	METAL CHIP 4.7K 5% 1/10W		C331	1-126-963-11	ELECT 4.7uF 20% 50V	
R107	1-216-075-00	METAL CHIP 12K 5% 1/10W		C332	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
R108	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		C333	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
*****				C334	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
				C335	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
				C336	1-126-963-11	ELECT 4.7uF 20% 50V	
				C337	1-126-963-11	ELECT 4.7uF 20% 50V	
				C338	1-126-963-11	ELECT 4.7uF 20% 50V	
				C339	1-104-664-11	ELECT 47uF 20% 16V	
				C342	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
				C344	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
				C350	1-126-963-11	ELECT 4.7uF 20% 50V	
				C351	1-124-443-00	ELECT 100uF 20% 10V	
				C352	1-163-239-11	CERAMIC CHIP 33PF 5% 50V	
				C353	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
				C354	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
				C355	1-104-664-11	ELECT 47uF 20% 16V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C356	1-163-038-91	CERAMIC CHIP	0.1uF	25V			
C360	1-126-963-11	ELECT	4.7uF	20%	50V		
C361	1-126-963-11	ELECT	4.7uF	20%	50V		
C362	1-126-963-11	ELECT	4.7uF	20%	50V		
C363	1-126-963-11	ELECT	4.7uF	20%	50V		
C368	1-104-665-11	ELECT	100uF	20%	25V		
< CONNECTOR >							
CN301	1-569-913-11	SOCKET, CONNECTOR 20P					
* CN302	1-564-726-11	PIN, CONNECTOR (SMALL TYPE)10P					
< DIODE >							
D301	8-719-914-42	DIODE	DA204K				
D302	8-719-914-42	DIODE	DA204K				
D303	8-719-105-99	DIODE	RD6. 2M-B1				
D304	8-719-105-99	DIODE	RD6. 2M-B1				
D307	8-719-105-99	DIODE	RD6. 2M-B1				
D308	8-719-914-42	DIODE	DA204K				
D309	8-719-914-42	DIODE	DA204K				
< FERRITE BEAD >							
FB301	1-216-295-91	CONDUCTOR, CHIP (2012)					
FB302	1-216-295-91	CONDUCTOR, CHIP (2012)					
FB303	1-216-295-91	CONDUCTOR, CHIP (2012)					
FB304	1-216-295-91	CONDUCTOR, CHIP (2012)					
< IC >							
IC301	8-759-100-96	IC	uPC4558G2				
IC302	8-759-634-96	IC	M5207L05				
IC303	8-759-100-96	IC	uPC4558G2				
IC304	8-759-100-96	IC	uPC4558G2				
IC305	8-759-701-51	IC	NJM2072M				
IC306	8-759-634-96	IC	M5207L05				
IC307	8-759-100-96	IC	uPC4558G2				
IC350	8-759-363-77	IC	MSM6654A-454GS-KDR1				
< JACK >							
J301	1-764-592-11	JACK 3P (LINE IN, VIDEO, AUDIO)					
J302	1-507-797-21	JACK, LARGE TYPE (2 GANG)(MIC 1/2)					
< COIL >							
L301	1-412-505-11	INDUCTOR	33uH				
L350	1-412-505-11	INDUCTOR	33uH				
< JUMPER RESISTOR >							
JR341	1-216-295-91	CONDUCTOR, CHIP (2012)					
JR342	1-216-295-91	CONDUCTOR, CHIP (2012)					
JR351	1-216-295-91	CONDUCTOR, CHIP (2012)					
< TRANSISTOR >							
Q301	8-729-027-31	TRANSISTOR	DTA124EKA-T146				
Q350	8-729-900-53	TRANSISTOR	DTC114EK				
Q360	8-729-120-28	TRANSISTOR	2SC1623-L5L6				
Q361	8-729-120-28	TRANSISTOR	2SC1623-L5L6				
< RESISTOR >							
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W		
R302	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		
R303	1-216-097-91	METAL GLAZE	100K	5%	1/10W		
R304	1-216-073-00	METAL CHIP	10K	5%	1/10W		
R305	1-216-081-00	METAL CHIP	22K	5%	1/10W		
R306	1-216-025-91	METAL GLAZE	100	5%	1/10W		
R307	1-216-025-91	METAL GLAZE	100	5%	1/10W		
R308	1-216-097-91	METAL GLAZE	100K	5%	1/10W		
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W		
R310	1-216-081-00	METAL CHIP	22K	5%	1/10W		
R311	1-216-055-00	METAL CHIP	1.8K	5%	1/10W		
R312	1-216-033-00	METAL CHIP	220	5%	1/10W		
R313	1-216-033-00	METAL CHIP	220	5%	1/10W		
R314	1-216-053-00	METAL CHIP	1.5K	5%	1/10W		
R315	1-216-053-00	METAL CHIP	1.5K	5%	1/10W		
R316	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R317	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R318	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		
R319	1-216-067-00	METAL CHIP	5.6K	5%	1/10W		
R320	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R321	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R322	1-216-081-00	METAL CHIP	22K	5%	1/10W		
R324	1-216-071-00	METAL CHIP	8.2K	5%	1/10W		
R325	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R326	1-216-073-00	METAL CHIP	10K	5%	1/10W		
R327	1-216-037-00	METAL CHIP	330	5%	1/10W		
R328	1-216-045-00	METAL CHIP	680	5%	1/10W		
R329	1-216-049-91	METAL CHIP	1.0K	5%	1/10W		
R330	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W		
R331	1-216-022-00	METAL CHIP	75	5%	1/10W		
R332	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W		
R333	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R334	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R335	1-216-097-91	METAL GLAZE	100K	5%	1/10W		
R336	1-216-097-91	METAL GLAZE	100K	5%	1/10W		
R339	1-216-025-91	METAL GLAZE	100	5%	1/10W		
R340	1-216-025-91	METAL GLAZE	100	5%	1/10W		
R341	1-216-025-91	METAL GLAZE	100	5%	1/10W		
R342	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R343	1-216-049-91	METAL GLAZE	1K	5%	1/10W		
R344	1-216-295-91	CONDUCTOR, CHIP (2012)					
R350	1-216-097-91	METAL GLAZE	100K	5%	1/10W		
R351	1-216-047-91	METAL GLAZE	820	5%	1/10W		

KP-962

MA-962

MB-73

Ref. No.	Part No.	Description	Remark
R352	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R353	1-208-816-11	METAL GLAZE	27K 0.50% 1/10W
R354	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R355	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R356	1-208-830-11	METAL GLAZE	100K 0.50% 1/10W
R357	1-216-073-00	METAL CHIP	10K 5% 1/10W
R360	1-216-089-91	METAL CHIP	47K 5% 1/10W
R361	1-216-089-91	METAL CHIP	47K 5% 1/10W
R362	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R363	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R364	1-216-073-00	METAL CHIP	10K 5% 1/10W
R365	1-216-073-00	METAL CHIP	10K 5% 1/10W
R366	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R367	1-216-097-91	METAL GLAZE	100K 5% 1/10W

*	A-6423-432-A	MA-962 (62E) BOARD, COMPLETE	

		(Ref. No. 6,000 Series)	
		< CAPACITOR >	
C402	1-163-035-00	CERAMIC CHIP	0.047uF 50V
C403	1-104-664-11	ELECT	47uF 20% 16V
C404	1-164-005-11	CERAMIC CHIP	0.47uF 25V
C405	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C406	1-163-135-00	CERAMIC CHIP	560PF 5% 50V
C407	1-124-907-11	ELECT	10uF 20% 50V
C408	1-164-346-11	CERAMIC CHIP	1uF 16V
C409	1-164-346-11	CERAMIC CHIP	1uF 16V
C410	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C411	1-124-907-11	ELECT	10uF 20% 50V
C412	1-163-135-00	CERAMIC CHIP	560PF 5% 50V
C413	1-164-005-11	CERAMIC CHIP	0.47uF 25V
C414	1-104-664-11	ELECT	47uF 20% 16V
C415	1-163-035-00	CERAMIC CHIP	0.047uF 50V
		< CONNECTOR >	
* CN401	1-564-726-11	PIN, CONNECTOR (SMALL TYPE) 10P	
CN402	1-691-036-21	CONNECTOR, FFC/FPC 4P	
		< DIODE >	
D401	8-719-914-42	DIODE DA204K	
D402	8-719-914-42	DIODE DA204K	
D403	8-719-105-99	DIODE RD6. 2M-B1	
D404	8-719-105-99	DIODE RD6. 2M-B1	
		< FERRITE BEAD >	
FB401	1-216-295-91	CONDUCTOR, CHIP (2012)	
FB402	1-216-295-91	CONDUCTOR, CHIP (2012)	
FB403	1-216-295-91	CONDUCTOR, CHIP (2012)	

Ref. No.	Part No.	Description	Remark
FB404	1-216-295-91	CONDUCTOR, CHIP (2012)	
		< IC >	
IC401	8-759-100-96	IC uPC4558G2	
		< JACK >	
J401	1-507-678-00	JACK (CONTROL (MIC 1/2))	
J402	1-750-990-21	JACK (LARGE TYPE) 2P (MIC 1/2)	
		< RESISTOR >	
R401	1-216-025-91	METAL GLAZE	100 5% 1/10W
R402	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R403	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R404	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R405	1-216-081-00	METAL CHIP	22K 5% 1/10W
R406	1-216-025-91	METAL GLAZE	100 5% 1/10W
R407	1-216-025-91	METAL GLAZE	100 5% 1/10W
R408	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R409	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R410	1-216-081-00	METAL CHIP	22K 5% 1/10W
R411	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R412	1-216-033-00	METAL CHIP	220 5% 1/10W
R413	1-216-033-00	METAL CHIP	220 5% 1/10W
R414	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R415	1-216-053-00	METAL CHIP	1.5K 5% 1/10W

*	A-6423-434-A	MB-73 (62E) BOARD, COMPLETE	

		(Ref. No. 1,000 Series)	
		< CAPACITOR >	
C001	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C002	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C003	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C004	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C005	1-126-963-11	ELECT	4.7uF 20% 50V
C006	1-126-963-11	ELECT	4.7uF 20% 50V
C007	1-126-963-11	ELECT	4.7uF 20% 50V
C008	1-126-963-11	ELECT	4.7uF 20% 50V
C098	1-163-231-11	CERAMIC CHIP	15PF 5% 50V
C099	1-163-224-11	CERAMIC CHIP	7PF 0.25PF 50V
C101	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C102	1-124-589-11	ELECT	47uF 20% 16V
C103	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C104	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C105	1-124-589-11	ELECT	47uF 20% 16V
C107	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
C108	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C109	1-163-121-00	CERAMIC CHIP	150PF 5% 50V

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C110	1-163-231-11	CERAMIC CHIP	15PF 5% 50V	C172	1-104-664-11	ELECT	47uF 20% 10V
C111	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	C173	1-124-154-11	ELECT	47uF 20% 6.3V
C112	1-163-125-00	CERAMIC CHIP	220PF 5% 50V	C174	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C113	1-163-235-11	CERAMIC CHIP	22PF 5% 50V	C175	1-104-664-11	ELECT	47uF 20% 10V
C114	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	C176	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C115	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C177	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C116	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	C178	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C117	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C179	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V
C119	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C180	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V
C120	1-163-235-11	CERAMIC CHIP	22PF 5% 50V	C201	1-163-241-11	CERAMIC CHIP	39PF 5% 50V
C121	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	C202	1-163-121-00	CERAMIC CHIP	150PF 5% 50V
C122	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V	C205	1-104-664-11	ELECT	47uF 20% 10V
C123	1-163-229-11	CERAMIC CHIP	12PF 5% 50V	C206	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C124	1-124-589-11	ELECT	47uF 20% 16V	C207	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C125	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C208	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C126	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	C209	1-124-154-11	ELECT	47uF 20% 6.3V
C127	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C210	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C128	1-163-809-11	CERAMIC CHIP	0.047uF 10% 25V	C211	1-124-907-11	ELECT	10uF 20% 50V
C129	1-163-235-11	CERAMIC CHIP	22PF 5% 50V	C212	1-124-907-11	ELECT	10uF 20% 50V
C130	1-163-237-11	CERAMIC CHIP	27PF 5% 50V	C214	1-164-346-11	CERAMIC CHIP	1uF 16V
C132	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C215	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C133	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	C217	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C134	1-124-154-11	ELECT	47uF 20% 6.3V	C218	1-124-907-11	ELECT	10uF 20% 50V
C135	1-124-154-11	ELECT	47uF 20% 6.3V	C219	1-104-664-11	ELECT	47uF 20% 10V
C136	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C221	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C138	1-163-251-11	CERAMIC CHIP	100PF 5% 50V	C222	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C139	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C224	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C140	1-126-157-11	ELECT	10uF 20% 16V	C225	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C141	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C226	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C142	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C227	1-124-154-11	ELECT	47uF 20% 6.3V
C143	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C228	1-126-157-11	ELECT	10uF 20% 16V
C144	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C229	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C151	1-164-344-11	CERAMIC CHIP	0.068uF 10% 25V	C230	1-124-154-11	ELECT	47uF 20% 6.3V
C152	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C231	1-163-235-11	CERAMIC CHIP	22PF 5% 50V
C153	1-124-589-11	ELECT	47uF 20% 16V	C232	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C155	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C233	1-163-235-11	CERAMIC CHIP	22PF 5% 50V
C156	1-124-154-11	ELECT	47uF 20% 6.3V	C234	1-163-131-00	CERAMIC CHIP	390PF 5% 50V
C159	1-163-231-11	CERAMIC CHIP	15PF 5% 50V	C236	1-104-664-11	ELECT	47uF 20% 10V
C160	1-163-224-11	CERAMIC CHIP	7PF 0.25PF 50V	C237	1-124-589-11	ELECT	47uF 20% 16V
C161	1-163-231-11	CERAMIC CHIP	15PF 5% 50V	C238	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C162	1-163-243-11	CERAMIC CHIP	47PF 5% 50V	C241	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C163	1-124-154-11	ELECT	47uF 20% 6.3V	C242	1-124-589-11	ELECT	47uF 20% 16V
C164	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C250	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C165	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C251	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V
C166	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	C254	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C167	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C256	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C168	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C300	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C169	1-126-160-11	ELECT	1uF 20% 50V	C301	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C170	1-163-031-11	CERAMIC CHIP	0.01uF 50V	C302	1-124-589-11	ELECT	47uF 20% 16V
C171	1-104-664-11	ELECT	47uF 20% 10V	C304	1-163-038-91	CERAMIC CHIP	0.1uF 25V

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Ref. No.	Part No.	Description		Remark	Ref. No.	Part No.	Description		Remark
C305	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C386	1-107-714-11	ELECT	10uF	20% 16V
C306	1-124-589-11	ELECT	47uF	20% 16V	C387	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C307	1-163-134-00	CERAMIC CHIP	510PF	5% 50V	C400	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C308	1-163-122-00	CERAMIC CHIP	160PF	5% 50V	C403	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C309	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C404	1-164-005-11	CERAMIC CHIP	0.47uF	25V
C310	1-163-243-11	CERAMIC CHIP	47PF	5% 50V	C406	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C311	1-163-251-11	CERAMIC CHIP	100PF	5% 50V	C411	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C314	1-163-251-11	CERAMIC CHIP	100PF	5% 50V	C417	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C315	1-163-125-00	CERAMIC CHIP	220PF	5% 50V	C418	1-163-125-00	CERAMIC CHIP	220PF	5% 50V
C316	1-163-243-11	CERAMIC CHIP	47PF	5% 50V	C419	1-163-033-91	CERAMIC CHIP	0.022uF	50V
C317	1-163-113-00	CERAMIC CHIP	68PF	5% 50V	C420	1-164-232-11	CERAMIC CHIP	0.01uF	50V
C318	1-163-108-00	CERAMIC CHIP	43PF	5% 50V	C421	1-104-664-11	ELECT	47uF	20% 10V
C320	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C422	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C321	1-124-589-11	ELECT	47uF	20% 16V	C451	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C322	1-126-177-11	ELECT	100uF	20% 10V	C452	1-104-664-11	ELECT	47uF	20% 10V
C323	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C454	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C324	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C455	1-104-664-11	ELECT	47uF	20% 10V
C325	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C456	1-163-257-11	CERAMIC CHIP	180PF	5% 50V
C326	1-164-489-11	CERAMIC CHIP	0.22uF	10% 16V	C457	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C327	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C458	1-163-235-11	CERAMIC CHIP	22PF	5% 50V
C328	1-164-489-11	CERAMIC CHIP	0.22uF	10% 16V	C459	1-104-664-11	ELECT	47uF	20% 10V
C329	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C460	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C330	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	C461	1-163-235-11	CERAMIC CHIP	22PF	5% 50V
C331	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C462	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C332	1-124-589-11	ELECT	47uF	20% 16V	C463	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C333	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	C464	1-163-257-11	CERAMIC CHIP	180PF	5% 50V
C334	1-124-902-00	ELECT	0.47uF	20% 50V	C465	1-104-664-11	ELECT	47uF	20% 10V
C335	1-124-907-11	ELECT	10uF	20% 50V	C466	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C351	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C467	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C352	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C468	1-163-235-11	CERAMIC CHIP	22PF	5% 50V
C353	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C469	1-163-235-11	CERAMIC CHIP	22PF	5% 50V
C354	1-163-263-11	CERAMIC CHIP	330PF	5% 50V	C470	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C356	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	C471	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C357	1-163-227-11	CERAMIC CHIP	10PF	0.5PF 50V	C472	1-104-664-11	ELECT	47uF	20% 10V
C358	1-163-125-00	CERAMIC CHIP	220PF	5% 50V	C473	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C359	1-163-239-11	CERAMIC CHIP	33PF	5% 50V	C475	1-126-963-11	ELECT	4.7uF	20% 50V
C360	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	C476	1-126-963-11	ELECT	4.7uF	20% 50V
C361	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C477	1-126-963-11	ELECT	4.7uF	20% 50V
C362	1-163-263-11	CERAMIC CHIP	330PF	5% 50V	C478	1-126-963-11	ELECT	4.7uF	20% 50V
C363	1-124-589-11	ELECT	47uF	20% 16V	C479	1-104-664-11	ELECT	47uF	20% 16V
C364	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C480	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C365	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C481	1-104-664-11	ELECT	47uF	20% 16V
C366	1-163-038-91	CERAMIC CHIP	0.1uF	25V	C482	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C367	1-216-295-91	CONDUCTOR, CHIP (2012)			C484	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
C368	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C501	1-163-009-11	CERAMIC CHIP	0.001uF	10% 50V
C381	1-163-239-11	CERAMIC CHIP	33PF	5% 50V	C504	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C382	1-164-232-11	CERAMIC CHIP	0.01uF	50V	C505	1-163-038-91	CERAMIC CHIP	0.1uF	25V
C383	1-104-664-11	ELECT	47uF	20% 10V	C506	1-124-290-00	ELECT	47uF	20% 10V
C384	1-163-031-11	CERAMIC CHIP	0.01uF	50V	C507	1-163-251-11	CERAMIC CHIP	100PF	5% 50V
C385	1-164-346-11	CERAMIC CHIP	1uF	16V	C508	1-126-151-11	ELECT, NONPOLAR	4.7uF	20% 16V

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C509	1-163-245-11	CERAMIC CHIP	56PF 5% 50V	C741	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C510	1-164-182-11	CERAMIC CHIP	0.0033uF 10% 50V	C742	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C511	1-126-163-11	ELECT	4.7uF 20% 50V	C743	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C512	1-124-154-11	ELECT	47uF 20% 6.3V	C744	1-104-664-11	ELECT	47uF 20% 25V
C513	1-163-257-11	CERAMIC CHIP	180PF 5% 50V	C745	1-104-664-11	ELECT	47uF 20% 25V
C514	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C747	1-163-038-91	CERAMIC CHIP	0.1uF 25V
C515	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C752	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C516	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C903	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C517	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C904	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C518	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C906	1-104-664-11	ELECT	47uF 20% 10V
C519	1-163-038-91	CERAMIC CHIP	0.1uF 25V	C907	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C520	1-163-125-00	CERAMIC CHIP	220PF 5% 50V	C909	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C521	1-164-489-11	CERAMIC CHIP	0.22uF 10% 16V	C910	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C701	1-104-664-11	ELECT	47uF 20% 10V	C911	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C702	1-104-664-11	ELECT	47uF 20% 10V	C913	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C703	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C914	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C704	1-164-004-11	CERAMIC CHIP	0.1uF 10% 25V	C915	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C705	1-163-125-00	CERAMIC CHIP	220PF 5% 50V	C917	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C706	1-104-664-11	ELECT	47uF 20% 25V	C918	1-163-134-00	CERAMIC CHIP	510PF 5% 50V
C707	1-104-664-11	ELECT	47uF 20% 25V	C919	1-163-012-00	CERAMIC CHIP	0.0018uF 10% 50V
C708	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C920	1-126-603-11	ELECT CHIP	4.7uF 20% 35V
C709	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C921	1-163-009-91	CERAMIC CHIP	1000PF 10% 50V
C710	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V	C922	1-163-009-91	CERAMIC CHIP	1000PF 10% 50V
C711	1-107-712-11	ELECT	3.3uF 20% 50V	C923	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V
C712	1-107-714-11	ELECT	10uF 20% 16V	C924	1-126-603-11	ELECT CHIP	4.7uF 20% 35V
C713	1-163-809-11	CERAMIC CHIP	0.047uF 10% 25V	C925	1-126-963-11	ELECT	4.7uF 20% 50V
C714	1-164-004-11	CERAMIC CHIP	0.1uF 10% 25V	C926	1-163-031-11	CERAMIC CHIP	0.01uF 50V
C715	1-124-903-11	ELECT	1uF 20% 50V	C980	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
C717	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	C981	1-163-125-00	CERAMIC CHIP	220PF 5% 50V
C718	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C982	1-163-121-00	CERAMIC CHIP	150PF 5% 50V
C719	1-109-889-11	ELECT	1uF 20% 50V	C983	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C720	1-164-489-11	CERAMIC CHIP	0.22uF 10% 16V	C984	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
C721	1-163-024-00	CERAMIC CHIP	0.018uF 10% 50V	C985	1-163-113-00	CERAMIC CHIP	68PF 5% 50V
C722	1-163-809-11	CERAMIC CHIP	0.047uF 10% 25V	< CONNECTOR >			
C723	1-107-715-11	ELECT	22uF 20% 16V	CN001	1-506-468-11	PIN, CONNECTOR	3P
C724	1-109-953-11	ELECT	2.2uF 20% 50V	* CN101	1-695-343-41	PIN, CONNECTOR (PC BOARD)	20P
C725	1-109-953-11	ELECT	2.2uF 20% 50V	CN201	1-506-469-11	PIN, CONNECTOR	4P
C726	1-163-011-11	CERAMIC CHIP	0.0015uF 10% 50V	CN415	1-770-408-11	CONNECTOR, BOARD TO BOARD	14P
C727	1-163-014-00	CERAMIC CHIP	0.0027uF 10% 50V	CN416	1-770-407-11	CONNECTOR, BOARD TO BOARD	12P
C728	1-163-014-00	CERAMIC CHIP	0.0027uF 10% 50V	CN417	1-770-406-11	CONNECTOR, BOARD TO BOARD	10P
C729	1-163-038-91	CERAMIC CHIP	0.1uF 25V	CN503	1-695-336-11	PIN, CONNECTOR (PC BOARD)	13P
C731	1-163-038-91	CERAMIC CHIP	0.1uF 25V	* CN701	1-764-594-21	CONNECTOR, FPC	18P
C733	1-163-018-00	CERAMIC CHIP	0.0056uF 5% 50V	CN702	1-766-231-11	HOUSING, CONNECTOR(PC BOARD)	14P
C734	1-164-489-11	CERAMIC CHIP	0.22uF 10% 16V	CN901	1-770-527-31	CONNECTOR, FFC/FPC	20P
C735	1-163-016-00	CERAMIC CHIP	0.0039uF 10% 50V	< TRIMMER >			
C736	1-163-022-00	CERAMIC CHIP	0.012uF 10% 50V	CT151	1-141-227-00	CAP, TRIMMER	20PF
C737	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V				
C738	1-163-017-00	CERAMIC CHIP	0.0047uF 5% 50V				
C739	1-163-251-11	CERAMIC CHIP	100PF 5% 50V				
C740	1-163-038-91	CERAMIC CHIP	0.1uF 25V				

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<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
< DIODE >							
D003	8-719-048-98	DIODE RB160L-40TE25		IC704	8-759-300-71	IC HD14053BFP	
D004	8-719-048-98	DIODE RB160L-40TE25		IC705	8-759-100-96	IC uPC4558G2	
D230	8-719-105-99	DIODE RD6. 2M-B1		IC706	8-759-100-96	IC uPC4558G2	
D256	8-719-988-62	DIODE 1SS355		IC707	8-759-100-96	IC uPC4558G2	
D301	8-719-015-99	DIODE UZP-27BB-TP		IC901	8-752-377-43	IC CXD2720Q	
D302	8-719-914-43	DIODE DAN202K		IC902	8-759-100-96	IC uPC4558G2	
D303	8-719-914-43	DIODE DAN202K		IC903	8-759-100-96	IC uPC4558G2	
D450	8-719-032-80	DIODE KV1430-TL00		IC904	8-759-100-96	IC uPC4558G2	
D504	8-719-988-62	DIODE 1SS355		< JACK >			
D505	8-719-988-62	DIODE 1SS355		J001	1-774-946-11	JACK, PIN 6P (LINE OUT, AUDIO, VIDEO)	
D508	8-719-914-44	DIODE DAP202K		J002	1-774-785-11	JACK, PIN 1P (DIGITAL RF OUT (AC-3))	
D511	8-719-988-62	DIODE 1SS355		< COIL >			
D512	8-719-976-96	DIODE DTZ4. 7C		L101	1-410-526-11	INDUCTOR 10uH	
D513	8-719-914-42	DIODE DA204K		L102	1-410-526-11	INDUCTOR 10uH	
D701	8-719-914-44	DIODE DAP202K		L103	1-412-503-11	INDUCTOR 22uH	
D702	8-719-914-43	DIODE DAN202K		L104	1-410-527-11	INDUCTOR 100uH	
D703	8-719-988-62	DIODE 1SS355		L105	1-412-503-11	INDUCTOR 22uH	
D704	8-719-056-78	DIODE UDZ-TE-17-4. 3B		L106	1-410-526-11	INDUCTOR 10uH	
D705	8-719-914-42	DIODE DA204K		L108	1-410-526-11	INDUCTOR 10uH	
< FERRITE BEAD >				L109	1-412-506-11	INDUCTOR 39uH	
FB415	1-216-295-91	CONDUCTOR, CHIP (2012)		L110	1-412-503-11	INDUCTOR 22uH	
FB416	1-216-295-91	CONDUCTOR, CHIP (2012)		L111	1-412-506-11	INDUCTOR 39uH	
< FILTER >				L112	1-408-096-00	INDUCTOR 470uH	
FL151	1-577-543-11	FILTER, CERAMIC		L113	1-412-507-11	INDUCTOR 47uH	
FL152	1-577-543-11	FILTER, CERAMIC		L152	1-412-504-11	INDUCTOR 27uH	
< IC >				L153	1-412-504-11	INDUCTOR 27uH	
IC001	8-759-100-96	IC uPC4558G2		L154	1-410-526-11	INDUCTOR 10uH	
IC101	8-759-382-15	IC LA7133		L201	1-412-500-51	INDUCTOR 12uH	
IC151	8-759-290-65	IC MN8811		L205	1-410-526-11	INDUCTOR 10uH	
IC202	8-759-295-66	IC BA7653AF-E2		L206	1-412-505-11	INDUCTOR 33uH	
IC203	8-759-710-62	IC NJM2246M		L301	1-412-507-11	INDUCTOR 47uH	
IC204	8-759-382-17	IC LC74782M9136-TLM		L304	1-412-503-11	INDUCTOR 22uH	
IC301	8-759-253-26	IC CA0002AM-TP		L305	1-410-527-11	INDUCTOR 100uH	
IC381	8-759-100-96	IC uPC4558G2		L351	1-412-511-51	INDUCTOR 120uH	
IC401	8-752-351-78	IC CXD2500BQ		L352	1-412-511-51	INDUCTOR 120uH	
IC416	8-749-921-12	IC GP1F32T (DIGITAL OUT OPTICAL)		L415	1-410-741-21	INDUCTOR 10uH	
IC451	8-759-100-96	IC uPC4558G2		L450	1-410-526-11	INDUCTOR 10uH	
IC453	8-759-100-96	IC uPC4558G2		L451	1-410-526-11	INDUCTOR 10uH	
IC501	8-759-421-56	IC MB89094PF-G-153-BND		L452	1-410-740-31	INDUCTOR CHIP 0. 82uH	
IC502	8-759-385-58	IC LC21011B-X78		L503	1-410-526-11	INDUCTOR 10uH	
IC503	8-759-009-06	IC MC14052BF		L504	1-410-526-11	INDUCTOR 10uH	
IC504	8-759-058-50	IC XRA10324AF		L701	1-410-526-11	INDUCTOR 10uH	
IC505	8-759-300-71	IC HD14053BFP		L702	1-410-526-11	INDUCTOR 10uH	
IC701	8-759-280-89	IC HA11529F		L902	1-410-526-11	INDUCTOR 10uH	
IC702	8-759-100-96	IC uPC4558G2		L980	1-412-507-11	INDUCTOR 47uH	
IC703	8-759-822-38	IC LA6510		L981	1-412-507-11	INDUCTOR 47uH	
				L982	1-412-507-11	INDUCTOR 47uH	
				L983	1-412-507-11	INDUCTOR 47uH	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R109	1-216-017-91	METAL GLAZE	47 5% 1/10W	R220	1-216-025-91	METAL GLAZE	100 5% 1/10W
R110	1-216-077-00	METAL CHIP	15K 5% 1/10W	R221	1-216-025-91	METAL GLAZE	100 5% 1/10W
R111	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R222	1-216-025-91	METAL GLAZE	100 5% 1/10W
R112	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R223	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R113	1-216-017-91	METAL GLAZE	47 5% 1/10W	R224	1-216-045-00	METAL CHIP	680 5% 1/10W
R114	1-216-051-00	METAL CHIP	1.2K 5% 1/10W	R225	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R115	1-216-055-00	METAL CHIP	1.8K 5% 1/10W	R226	1-216-041-00	METAL CHIP	470 5% 1/10W
R116	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R227	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R117	1-216-045-00	METAL CHIP	680 5% 1/10W	R228	1-216-021-00	METAL CHIP	68 5% 1/10W
R118	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R229	1-216-041-00	METAL CHIP	470 5% 1/10W
R119	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R230	1-216-041-00	METAL CHIP	470 5% 1/10W
R120	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R231	1-216-041-00	METAL CHIP	470 5% 1/10W
R121	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	R232	1-216-021-00	METAL CHIP	68 5% 1/10W
R122	1-216-073-00	METAL CHIP	10K 5% 1/10W	R233	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R123	1-216-295-91	CONDUCTOR, CHIP (2012)		R234	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R124	1-216-295-91	CONDUCTOR, CHIP (2012)		R235	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
R151	1-216-033-00	METAL CHIP	220 5% 1/10W	R238	1-216-295-91	CONDUCTOR, CHIP (2012)	
R152	1-216-047-91	METAL GLAZE	820 5% 1/10W	R240	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R154	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R241	1-216-295-91	CONDUCTOR, CHIP (2012)	
R155	1-216-017-91	METAL GLAZE	47 5% 1/10W	R242	1-216-295-91	CONDUCTOR, CHIP (2012)	
R156	1-216-295-91	CONDUCTOR, CHIP (2012)		R243	1-216-295-91	CONDUCTOR, CHIP (2012)	
R157	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R245	1-216-295-91	CONDUCTOR, CHIP (2012)	
R158	1-216-059-00	METAL CHIP	2.7K 5% 1/10W	R256	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R159	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R300	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R160	1-216-043-91	METAL GLAZE	560 5% 1/10W	R301	1-216-041-00	METAL CHIP	470 5% 1/10W
R161	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R302	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R162	1-216-027-00	METAL CHIP	120 5% 1/10W	R303	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R164	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R304	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
R165	1-216-037-00	METAL CHIP	330 5% 1/10W	R305	1-216-097-91	METAL CHIP	100K 5% 1/10W
R166	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R306	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R167	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R307	1-216-041-00	METAL CHIP	470 5% 1/10W
R168	1-216-121-91	METAL GLAZE	1M 5% 1/10W	R308	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R169	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R309	1-216-021-00	METAL CHIP	68 5% 1/10W
R170	1-216-037-00	METAL CHIP	330 5% 1/10W	R311	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R171	1-216-073-00	METAL CHIP	10K 5% 1/10W	R312	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R172	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R313	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R173	1-216-033-00	METAL CHIP	220 5% 1/10W	R314	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R201	1-216-033-00	METAL CHIP	220 5% 1/10W	R315	1-216-077-00	METAL CHIP	15K 5% 1/10W
R202	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R316	1-216-077-00	METAL CHIP	15K 5% 1/10W
R203	1-216-033-00	METAL CHIP	220 5% 1/10W	R317	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
R206	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R318	1-216-093-00	METAL CHIP	68K 5% 1/10W
R208	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R319	1-216-093-00	METAL CHIP	68K 5% 1/10W
R210	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R320	1-216-069-00	METAL CHIP	6.8K 5% 1/10W
R211	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R321	1-216-101-00	METAL CHIP	150K 5% 1/10W
R213	1-216-029-00	METAL CHIP	150 5% 1/10W	R322	1-216-101-00	METAL CHIP	150K 5% 1/10W
R215	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R323	1-216-097-91	METAL CHIP	100K 0.5% 1/10W
R216	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R324	1-216-097-91	METAL CHIP	100K 0.5% 1/10W
R217	1-216-025-91	METAL GLAZE	100 5% 1/10W	R325	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R218	1-216-073-00	METAL CHIP	10K 5% 1/10W	R349	1-216-295-91	CONDUCTOR, CHIP (2012)	
R219	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R351	1-216-045-00	METAL CHIP	680 5% 1/10W
				R352	1-216-057-00	METAL CHIP	2.2K 5% 1/10W

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R353	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R418	1-216-037-00	METAL CHIP	330 5% 1/10W
R354	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R419	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R355	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R420	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R356	1-216-037-00	METAL CHIP	330 5% 1/10W	R421	1-216-074-00	METAL CHIP	11K 5% 1/10W
R358	1-216-037-00	METAL CHIP	330 5% 1/10W	R424	1-216-025-91	METAL GLAZE	100 5% 1/10W
R359	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R425	1-216-025-91	METAL GLAZE	100 5% 1/10W
R360	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R426	1-216-025-91	METAL GLAZE	100 5% 1/10W
R361	1-216-295-91	CONDUCTOR, CHIP (2012)		R436	1-216-025-91	METAL GLAZE	100 5% 1/10W
R362	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R438	1-216-295-91	CONDUCTOR, CHIP (2012)	
R363	1-216-295-91	CONDUCTOR, CHIP (2012)		R439	1-216-295-91	CONDUCTOR, CHIP (2012)	
R364	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R441	1-216-295-91	CONDUCTOR, CHIP (2012)	
R365	1-216-067-00	METAL CHIP	5.6K 5% 1/10W	R446	1-216-025-91	METAL GLAZE	100 5% 1/10W
R366	1-216-047-91	METAL GLAZE	820 5% 1/10W	R447	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R367	1-216-077-00	METAL CHIP	15K 5% 1/10W	R449	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R368	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R451	1-216-075-00	METAL CHIP	12K 5% 1/10W
R369	1-216-037-00	METAL CHIP	330 5% 1/10W	R452	1-216-075-00	METAL CHIP	12K 5% 1/10W
R370	1-216-025-91	METAL GLAZE	100 5% 1/10W	R455	1-216-081-00	METAL CHIP	22K 5% 1/10W
R371	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R456	1-216-081-00	METAL CHIP	22K 5% 1/10W
R372	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R457	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R373	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R458	1-216-075-00	METAL CHIP	12K 5% 1/10W
R374	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R459	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R375	1-216-037-00	METAL CHIP	330 5% 1/10W	R460	1-216-081-00	METAL CHIP	22K 5% 1/10W
R376	1-216-025-91	METAL GLAZE	100 5% 1/10W	R461	1-216-081-00	METAL CHIP	22K 5% 1/10W
R377	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R462	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R378	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R463	1-216-075-00	METAL CHIP	12K 5% 1/10W
R379	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R465	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R381	1-216-069-00	METAL CHIP	6.8K 5% 1/10W	R466	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R382	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R467	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R383	1-216-025-91	METAL GLAZE	100 5% 1/10W	R468	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R384	1-216-017-91	METAL GLAZE	47 5% 1/10W	R469	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R385	1-208-830-11	METAL GLAZE	100K 0.50% 1/10W	R472	1-216-073-00	METAL CHIP	10K 5% 1/10W
R386	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W	R475	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R387	1-208-806-11	METAL GLAZE	10K 0.50% 1/10W	R478	1-216-295-91	CONDUCTOR, CHIP (2012)	
R388	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R480	1-216-079-00	METAL CHIP	18K 5% 1/10W
R389	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R482	1-216-079-00	METAL CHIP	18K 5% 1/10W
R390	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R485	1-216-295-91	CONDUCTOR, CHIP (2012)	
R391	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R486	1-216-081-00	METAL CHIP	22K 5% 1/10W
R392	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R488	1-216-081-00	METAL CHIP	22K 5% 1/10W
R393	1-216-057-00	METAL CHIP	2.2K 5% 1/10W	R502	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R394	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R503	1-216-033-00	METAL CHIP	220 5% 1/10W
R395	1-208-829-11	METAL GLAZE	91K 0.50% 1/10W	R507	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R396	1-208-838-11	METAL GLAZE	220K 0.50% 1/10W	R508	1-216-109-00	METAL CHIP	330K 5% 1/10W
R397	1-208-837-11	METAL GLAZE	200K 0.50% 1/10W	R509	1-216-081-00	METAL CHIP	22K 5% 1/10W
R398	1-208-830-11	METAL GLAZE	100K 0.50% 1/10W	R510	1-216-085-00	METAL CHIP	33K 5% 1/10W
R402	1-216-121-91	METAL GLAZE	1M 5% 1/10W	R511	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R403	1-216-073-00	METAL CHIP	10K 5% 1/10W	R512	1-216-111-91	METAL GLAZE	390K 5% 1/10W
R404	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R513	1-216-113-00	METAL CHIP	470K 5% 1/10W
R405	1-216-061-00	METAL CHIP	3.3K 5% 1/10W	R514	1-216-035-00	METAL CHIP	270 5% 1/10W
R406	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R515	1-208-808-11	METAL GLAZE	12K 0.50% 1/10W
R415	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R516	1-208-810-11	METAL GLAZE	15K 0.50% 1/10W

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<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>				<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>				<u>Remark</u>
R517	1-208-844-11	METAL GLAZE	390K	0.50%	1/10W		R572	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R518	1-216-093-00	METAL CHIP	68K	5%	1/10W		R573	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R519	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R574	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R520	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W		R575	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R521	1-208-816-11	METAL GLAZE	27K	0.50%	1/10W		R576	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R522	1-216-105-91	METAL GLAZE	220K	5%	1/10W		R577	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R523	1-208-838-11	METAL GLAZE	220K	0.50%	1/10W		R578	1-216-021-00	METAL CHIP	68	5%	1/10W	
R524	1-216-097-91	METAL GLAZE	100K	5%	1/10W		R579	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R525	1-216-105-91	METAL GLAZE	220K	5%	1/10W		R580	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R526	1-216-077-00	METAL CHIP	15K	5%	1/10W		R581	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R527	1-208-830-11	METAL GLAZE	100K	0.50%	1/10W		R582	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R528	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W		R583	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R529	1-208-818-11	METAL GLAZE	33K	0.50%	1/10W		R584	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R530	1-216-045-00	METAL CHIP	680	5%	1/10W		R585	1-216-117-00	METAL CHIP	680K	5%	1/10W	
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W		R586	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R532	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R587	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R533	1-216-095-00	METAL CHIP	82K	5%	1/10W		R588	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R534	1-216-105-91	METAL GLAZE	220K	5%	1/10W		R589	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R535	1-216-073-00	METAL CHIP	10K	5%	1/10W		R591	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R537	1-216-097-91	METAL GLAZE	100K	5%	1/10W		R701	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R539	1-216-073-00	METAL CHIP	10K	5%	1/10W		R704	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R540	1-216-097-91	METAL GLAZE	100K	5%	1/10W		R705	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R541	1-216-089-91	METAL GLAZE	47K	5%	1/10W		R706	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R545	1-216-073-00	METAL CHIP	10K	5%	1/10W		R707	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R546	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R708	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R547	1-216-033-00	METAL CHIP	220	5%	1/10W		R709	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R548	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R710	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R549	1-216-033-00	METAL CHIP	220	5%	1/10W		R711	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R550	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R712	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R551	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R713	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R552	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R714	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R553	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R715	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R554	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R716	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R555	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R717	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R556	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R718	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R557	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R719	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R558	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R720	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R559	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R721	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R560	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R722	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R561	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R723	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R562	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R724	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R563	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R725	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R564	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R726	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R565	1-216-061-00	METAL CHIP	3.3K	5%	1/10W		R727	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R566	1-216-057-00	METAL CHIP	2.2K	5%	1/10W		R728	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R567	1-216-121-91	METAL GLAZE	1M	5%	1/10W		R729	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R568	1-216-065-00	METAL CHIP	4.7K	5%	1/10W		R730	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R569	1-216-085-00	METAL CHIP	33K	5%	1/10W		R731	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R570	1-216-037-00	METAL CHIP	330	5%	1/10W		R732	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R571	1-216-049-91	METAL GLAZE	1K	5%	1/10W		R733	1-216-085-00	METAL CHIP	33K	5%	1/10W	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R734	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R784	1-216-061-00	METAL CHIP	3. 3K 5% 1/10W
R735	1-216-081-00	METAL CHIP	22K 5% 1/10W	R785	1-216-093-00	METAL CHIP	68K 5% 1/10W
R736	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R786	1-216-101-00	METAL CHIP	150K 5% 1/10W
R737	1-216-107-00	METAL CHIP	270K 5% 1/10W	R787	1-216-075-00	METAL CHIP	12K 5% 1/10W
R738	1-216-073-00	METAL CHIP	10K 5% 1/10W	R788	1-216-075-00	METAL CHIP	12K 5% 1/10W
R739	1-216-073-00	METAL CHIP	10K 5% 1/10W	R789	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
R740	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R790	1-216-093-00	METAL CHIP	68K 5% 1/10W
R741	1-216-105-91	METAL GLAZE	220K 5% 1/10W	R791	1-216-083-00	METAL CHIP	27K 5% 1/10W
R742	1-216-073-00	METAL CHIP	10K 5% 1/10W	R792	1-216-063-91	METAL GLAZE	3. 9K 5% 1/10W
R743	1-216-081-00	METAL CHIP	22K 5% 1/10W	R793	1-216-091-00	METAL CHIP	56K 5% 1/10W
R744	1-216-081-00	METAL CHIP	22K 5% 1/10W	R794	1-216-101-00	METAL CHIP	150K 5% 1/10W
R745	1-216-071-00	METAL CHIP	8. 2K 5% 1/10W	R796	1-216-025-91	METAL GLAZE	100 5% 1/10W
R746	1-216-085-00	METAL CHIP	33K 5% 1/10W	R797	1-216-025-91	METAL GLAZE	100 5% 1/10W
R747	1-216-049-91	METAL GLAZE	1K 5% 1/10W	△R798	1-216-369-00	METAL OXIDE	1 5% 2W F
R748	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W	R799	1-216-081-00	METAL CHIP	22K 5% 1/10W
R749	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R800	1-216-003-11	METAL GLAZE	12 5% 1/10W
R750	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R801	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
R751	1-216-099-00	METAL CHIP	120K 5% 1/10W	R802	1-216-061-00	METAL CHIP	3. 3K 5% 1/10W
R752	1-216-099-00	METAL CHIP	120K 5% 1/10W	R803	1-216-113-00	METAL CHIP	470K 5% 1/10W
R753	1-216-081-00	METAL CHIP	22K 5% 1/10W	R804	1-216-081-00	METAL CHIP	22K 5% 1/10W
R754	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R805	1-249-387-11	CARBON	3. 3 5% 1/4W F
R755	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W	R806	1-216-051-00	METAL CHIP	1. 2K 5% 1/10W
R756	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R807	1-216-017-91	METAL GLAZE	47 5% 1/10W
R757	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R808	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R758	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W	R809	1-216-073-00	METAL CHIP	10K 5% 1/10W
R759	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W	R810	1-216-001-00	METAL CHIP	10 5% 1/10W
R760	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R811	1-216-001-00	METAL CHIP	10 5% 1/10W
R761	1-216-035-00	METAL CHIP	270 5% 1/10W	R812	1-216-001-00	METAL CHIP	10 5% 1/10W
R762	1-216-099-00	METAL CHIP	120K 5% 1/10W	R813	1-216-001-00	METAL CHIP	10 5% 1/10W
R763	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R814	1-216-057-00	METAL CHIP	2. 2K 5% 1/10W
R764	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R815	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R765	1-216-097-91	METAL GLAZE	100K 5% 1/10W	R817	1-216-140-00	METAL GLAZE	3. 9 5% 1/8W
R766	1-216-067-00	METAL CHIP	5. 6K 5% 1/10W	R818	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
R767	1-216-083-00	METAL CHIP	27K 5% 1/10W	R819	1-216-077-00	METAL CHIP	15K 5% 1/10W
R768	1-216-029-00	METAL CHIP	150 5% 1/10W	R820	1-216-055-00	METAL CHIP	1. 8K 5% 1/10W
R769	1-216-071-00	METAL CHIP	8. 2K 5% 1/10W	R901	1-216-025-91	METAL GLAZE	100 5% 1/10W
R770	1-216-077-00	METAL CHIP	15K 5% 1/10W	R902	1-216-025-91	METAL GLAZE	100 5% 1/10W
R771	1-216-103-00	METAL CHIP	180K 5% 1/10W	R903	1-216-025-91	METAL GLAZE	100 5% 1/10W
R772	1-216-105-91	METAL CHIP	220K 5% 1/10W	R905	1-216-073-00	METAL CHIP	10K 5% 1/10W
R773	1-216-083-00	METAL CHIP	27K 5% 1/10W	R906	1-216-081-00	METAL CHIP	22K 5% 1/10W
R774	1-216-085-00	METAL CHIP	33K 5% 1/10W	R907	1-216-081-00	METAL CHIP	22K 5% 1/10W
R775	1-216-089-91	METAL GLAZE	47K 5% 1/10W	R908	1-216-073-00	METAL CHIP	10K 5% 1/10W
R776	1-216-073-00	METAL CHIP	10K 5% 1/10W	R909	1-216-073-00	METAL CHIP	10K 5% 1/10W
R777	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W	R910	1-216-073-00	METAL CHIP	10K 5% 1/10W
R778	1-216-101-00	METAL CHIP	150K 5% 1/10W	R911	1-216-081-00	METAL CHIP	22K 5% 1/10W
R779	1-216-077-00	METAL CHIP	15K 5% 1/10W	R912	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R780	1-216-073-00	METAL CHIP	10K 5% 1/10W	R913	1-216-073-00	METAL CHIP	10K 5% 1/10W
R781	1-216-085-00	METAL CHIP	33K 5% 1/10W	R914	1-216-081-00	METAL CHIP	22K 5% 1/10W
R782	1-216-079-00	METAL CHIP	18K 5% 1/10W	R915	1-216-073-00	METAL CHIP	10K 5% 1/10W
R783	1-216-075-00	METAL CHIP	12K 5% 1/10W	R916	1-216-073-00	METAL CHIP	10K 5% 1/10W

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	Remark
R917	1-216-073-00	METAL CHIP	10K 5% 1/10W
R918	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R919	1-216-081-00	METAL CHIP	22K 5% 1/10W
R920	1-216-081-00	METAL CHIP	22K 5% 1/10W
R921	1-216-082-00	METAL GLAZE	24K 5% 1/10W
R922	1-216-081-00	METAL CHIP	22K 5% 1/10W
R923	1-216-689-11	METAL CHIP	39K 0.5% 1/10W
R924	1-216-079-00	METAL CHIP	18K 5% 1/10W
R925	1-216-081-00	METAL CHIP	22K 5% 1/10W
R926	1-216-079-00	METAL CHIP	18K 5% 1/10W
R928	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R929	1-216-105-91	METAL GLAZE	220K 5% 1/10W
R930	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R931	1-216-073-00	METAL CHIP	10K 5% 1/10W
R934	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R935	1-216-089-91	METAL GLAZE	47K 5% 1/10W
R936	1-216-091-00	METAL CHIP	56K 5% 1/10W
R950	1-216-081-00	METAL CHIP	22K 5% 1/10W
R951	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R952	1-216-081-00	METAL CHIP	22K 5% 1/10W
R953	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R954	1-216-081-00	METAL CHIP	22K 5% 1/10W
R955	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R980	1-216-037-00	METAL CHIP	330 5% 1/10W
R981	1-216-037-00	METAL CHIP	330 5% 1/10W
R982	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
< VARIABLE RESISTOR >			
RV101	1-223-236-11	RES, ADJ, CARBON 1K	
RV701	1-223-241-11	RES, ADJ, CARBON 47K	
RV702	1-223-241-11	RES, ADJ, CARBON 47K	
< SWITCH >			
S101	1-553-725-21	SWITCH, SLIDE (ATT)	
< VIBRATOR >			
X151	1-760-693-21	VIBRATOR, CRYSTAL (28.125MHz)	
X450	1-760-123-11	VIBRATOR, CRYSTAL (33.8688MHz)	

*	A-6423-384-A	MD-67 (06E) BOARD, COMPLETE	

(Ref. No. 5,000 Series)			
*	3-968-252-01	HOLDER, LED	
< CONNECTOR >			
CN301	1-770-516-31	PIN, CONNECTOR (PC BOARD) 8P	
CN302	1-774-715-11	CONNECTOR, BOARD TO BOARD 4P	
CN303	1-695-336-11	PIN, CONNECTOR (PC BOARD) 13P	

Ref. No.	Part No.	Description	Remark
CN304	1-691-036-21	PIN, CONNECTOR (PC BOARD) 4P	
< DIODE >			
D301	8-719-912-39	DIODE SLR932A (LD SIZE SENSOR)	
< JUMPER RESISTOR >			
JR300	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR301	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR302	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR303	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR304	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR305	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR306	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR307	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR308	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR309	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR310	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR311	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR312	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR313	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR314	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR315	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR316	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR317	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR318	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR319	1-216-296-91	CONDUCTOR, CHIP (3216)	
< PHOTO INTERRUPTER >			
PH301	8-749-012-33	PHOTO INTERRUPTER GP1S94	
PH302	8-749-012-33	PHOTO INTERRUPTER GP1S94	
< RESISTOR >			
R301	1-216-039-00	METAL CHIP	390 5% 1/10W
R302	1-216-099-00	METAL CHIP	120K 5% 1/10W
R303	1-216-099-00	METAL CHIP	120K 5% 1/10W

*	1-660-680-11	MT-59 BOARD (Ref. No. 5,000 Series)	

< CAPACITOR >			
C401	1-163-038-91	CERAMIC CHIP	0.1uF 25V
< CONNECTOR >			
* CN401	1-565-959-11	PIN, CONNECTOR (PC BOARD) 6P	
CN402	1-770-516-31	PIN, CONNECTOR (PC BOARD) 8P	
< MOTOR >			
M401	X-3946-431-1	MOTOR ASSY, LOADING (LOADING/TILT)	

POWER BLOCK

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*****				< CONNECTOR >			
△*	1-468-133-11	POWER BLOCK (SR-582Y BOARD) (SWITCHING REGULATOR)		△CN101	1-580-230-11	CONNECTOR 2P	
		***** (Ref. No. 7, 000 Series)		* CN201	1-569-936-11	CONNECTOR 20P	
	1-533-225-11	HOLDER, FUSE		* CN202	1-565-671-11	CONNECTOR 8P	
	9-939-266-01	LUG TERMINAL		CN203	1-564-506-11	CONNECTOR 3P	
		< CAPACITOR >		CN204	1-506-469-11	CONNECTOR 4P	
△C101	9-939-240-01	FILM 0.22uF	250V	< DIODE >			
△C102	9-939-241-01	FILM 0.1uF	250V	△D101	8-719-054-32	DIODE ERA15-06	
△C103	9-939-242-01	CERAMIC 2200PF	400V	△D102	8-719-054-32	DIODE ERA15-06	
△C104	9-939-242-01	CERAMIC 2200PF	400V	△D103	8-719-054-32	DIODE ERA15-06	
△C105	9-939-242-01	CERAMIC 2200PF	400V	△D104	8-719-054-32	DIODE ERA15-06	
△C106	9-939-242-01	CERAMIC 2200PF	400V	△D105	8-719-110-41	DIODE RD15ES-B2	
△C107	9-939-243-01	ELECT 270uF	400V	△D106	8-719-951-30	DIODE ERA91-02	
△C108	9-939-244-01	CERAMIC 330PF	1KV	△D107	8-719-951-30	DIODE ERA91-02	
△C109	9-939-244-01	CERAMIC 330PF	1KV	△D108	8-719-110-51	DIODE RD20ES-B	
△C110	1-107-907-11	ELECT 22uF	20% 50V	△D109	8-719-951-30	DIODE ERA91-02	
△C111	1-111-247-51	ELECT 0.1uF	20% 50V	△D110	8-719-109-85	DIODE RD5.1ES-B2	
△C112	9-939-245-01	CERAMIC 330PF	50V	△D111	8-719-053-19	DIODE UF4007G23	
△C113	1-111-247-51	ELECT 0.1uF	20% 50V	△D112	8-719-110-60	DIODE RD24ES-B	
△C114	1-137-387-11	FILM 0.001uF	5% 100V	D201	8-719-031-13	DIODE YG901C2	
△C117	9-939-246-01	CERAMIC 4700PF	500V	D202	8-719-031-13	DIODE YG901C2	
C201	9-939-247-01	CERAMIC 1000PF	250V	D203	8-719-031-13	DIODE YG901C2	
C202	9-939-247-01	CERAMIC 1000PF	250V	D204	8-719-987-87	DIODE ERA85-009	
C203	1-126-943-51	ELECT 2200uF	20% 25V	D205	8-719-110-51	DIODE RD20ESB	
C204	1-126-943-51	ELECT 2200uF	20% 25V	D207	8-719-821-30	DIODE 1SS178	
C205	1-107-929-11	ELECT 10uF	20% 100V	D208	8-719-821-30	DIODE 1SS178	
C206	1-107-929-11	ELECT 10uF	20% 100V	D209	8-719-023-56	DIODE ERA83-004	
C207	1-107-879-11	ELECT 3300uF	20% 10V	D210	8-719-023-56	DIODE ERA83-004	
C208	1-137-390-11	FILM 0.0033uF	5% 100V	D211	8-719-951-30	DIODE ERA91-02	
C209	1-107-903-11	ELECT 2.2uF	20% 50V	D212	8-719-951-30	DIODE ERA91-02	
C210	1-107-889-11	ELECT 220uF	20% 25V	D213	8-719-821-30	DIODE 1SS178	
C212	1-107-889-11	ELECT 220uF	20% 25V	< FUSE >			
C213	1-107-883-11	ELECT 330uF	20% 16V	△F101	1-576-230-11	FUSE (3.15A 250V)	
C214	1-107-889-11	ELECT 220uF	20% 25V	< IC >			
C215	1-137-397-51	FILM 0.047uF	5% 100V	△IC101	9-939-260-01	IC FA5315P	
C216	1-107-910-11	ELECT 100uF	20% 50V	IC201	8-759-231-58	IC TA7812S	
C217	9-939-248-01	CERAMIC 4700PF	50V	IC202	8-759-929-65	IC LM7912CT	
C218	1-137-391-11	FILM 0.0047uF	5% 100V	IC203	8-759-140-85	IC uPC1093J	
C219	1-126-964-51	ELECT 10uF	20% 50V	IC204	9-939-261-01	IC ZHMA6343B	
C220	1-126-964-51	ELECT 10uF	20% 50V	IC205	8-759-144-17	IC uPC358HA	
C223	1-126-964-51	ELECT 10uF	20% 50V	< IC LINK >			
C224	1-107-889-11	ELECT 220uF	20% 25V	△IP201	1-532-675-21	IC LINK (ICP-N38 1.5A)	
C226	1-137-390-11	FILM 0.0033uF	5% 100V	△IP202	1-532-675-21	IC LINK (ICP-N38 1.5A)	
C227	9-939-249-01	CERAMIC 680PF	50V				
C228	9-939-249-01	CERAMIC 680PF	50V				
C229	1-137-393-51	FILM 0.01uF	5% 100V				

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

POWER BLOCK PW-960

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< COIL >		△R117	9-939-252-01	METAL OXIDE FILM 9.09K	1/6W
△L101	1-427-841-11	LINE FILTER		△R118	9-939-253-01	CARBON 120K	1/4W
△L102	1-414-372-11	INDUCTOR, COIL		△R119	9-939-254-01	METAL OXIDE 27K	1W F
△L103	9-939-264-01	BEAD COIL		R203	1-249-425-11	CARBON 4.7K	5% 1/4W
L201	9-939-265-01	CHOKO COIL 10mH		R204	1-249-401-11	CARBON 47	5% 1/4W
L202	1-412-524-11	MICRO INDUCTOR 8.2uH		R205	1-249-415-11	CARBON 680	5% 1/4W
L203	1-412-524-11	MICRO INDUCTOR 8.2uH		R206	1-249-421-11	CARBON 2.2K	5% 1/4W
L204	9-939-264-01	BEAD COIL		R207	1-215-422-00	METAL OXIDE FILM 1.1K	5% 1/6W
L205	9-939-264-01	BEAD COIL		R208	1-215-421-00	METAL OXIDE FILM 1K	5% 1/6W
L206	9-939-264-01	BEAD COIL		R210	1-249-401-11	CARBON 47	5% 1/4W
L207	9-937-482-01	RING CORE		R211	1-215-445-00	METAL OXIDE FILM 10K	1% 1/6W
		< PHOTO COUPLER >		R212	1-249-429-11	CARBON 10K	5% 1/4W
△PC101	8-749-924-79	PHOTO COUPLER PS2561L1-1		R213	1-215-421-00	METAL OXIDE FILM 1K	5% 1/6W
△PC102	8-749-924-79	PHOTO COUPLER PS2561L1-1		R214	1-215-421-00	METAL OXIDE FILM 1K	5% 1/6W
		< TRANSISTOR >		R215	1-247-715-11	CARBON 1.5K	5% 1/4W
△Q101	8-939-481-01	TRANSISTOR FS7KM-16A		R217	1-215-445-00	METAL OXIDE FILM 10K	1% 1/6W
△Q102	8-729-026-38	TRANSISTOR 2SA933AS-QR		R218	1-215-445-00	METAL OXIDE FILM 10K	1% 1/6W
Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE		R221	1-215-866-11	METAL OXIDE 330	5% 1W F
Q203	8-729-112-61	TRANSISTOR 2SA1441-L		R222	1-215-866-11	METAL OXIDE 330	5% 1W F
Q204	8-729-119-78	TRANSISTOR 2SC2785-HFE		R223	1-249-417-11	CARBON 1K	5% 1/4W F
Q205	8-729-033-96	TRANSISTOR 2SD2395E		R224	1-215-866-11	METAL OXIDE 330	5% 1W F
Q208	8-729-119-78	TRANSISTOR 2SC2785-HFE		R225	1-249-417-11	CARBON 1K	5% 1/4W F
Q209	8-729-026-38	TRANSISTOR 2SA933AS-QR		R226	1-215-866-11	METAL OXIDE 330	5% 1W F
Q210	8-729-117-11	TRANSISTOR 2SB1151-L		R227	1-249-425-11	CARBON 4.7K	5% 1/4W
Q211	8-729-119-78	TRANSISTOR 2SC2785-HFE		R228	1-216-369-00	METAL OXIDE 1	5% 2W
Q212	8-729-026-38	TRANSISTOR 2SA933AS-QR		R231	9-939-387-01	METAL OXIDE FILM 5.9K	1/6W
Q213	8-729-019-32	TRANSISTOR 2SC4596F		R232	1-249-429-11	CARBON 10K	5% 1/4W
Q214	8-729-117-11	TRANSISTOR 2SB1151-L		R234	9-939-256-01	METAL OXIDE 100	1W
Q215	8-729-119-78	TRANSISTOR 2SC2785-HFE		R240	1-249-401-11	CARBON 47	5% 1/4W
Q216	8-729-019-32	TRANSISTOR 2SC4596F		R241	1-249-429-11	CARBON 10K	5% 1/4W
Q217	8-729-026-38	TRANSISTOR 2SA933AS-QR		R242	1-249-429-11	CARBON 10K	5% 1/4W
		< RESISTOR >		R243	1-249-429-11	CARBON 10K	5% 1/4W
△R101	9-939-250-01	CARBON 330K	1/2W	R244	9-939-480-01	RESISTOR 0.1	1W
△R102	9-939-479-01	RESISTOR 100K	1W			< TRANSFORMER >	
△R103	1-249-493-11	CARBON 56K	5% 1/2W	△T101	9-939-263-01	TRANSFORMER, CONVERTER	
△R105	1-216-451-11	METAL OXIDE 120	5% 2W			< THERMISTOR >	
△R106	1-247-692-11	CARBON 22	5% 1/4W	△TH101	9-939-262-01	THERMISTOR M16007T3C 16 1.7A	
△R107	1-249-429-11	CARBON 10K	5% 1/4W			*****	
△R108	1-212-352-61	METAL OXIDE 0.22	5% 1W	*	1-661-523-11	PW-960 BOARD (Ref. No. 4,000 Series)	
△R109	1-247-696-11	CARBON 0.22	5% 1/4W			*****	
△R110	1-249-415-11	CARBON 680	5% 1/4W			< CAPACITOR >	
△R111	1-249-439-11	CARBON 68K	5% 1/4W	C601	1-163-031-11	CERAMIC CHIP 0.01uF	50V
△R112	1-249-439-11	CARBON 68K	5% 1/4W	C603	1-163-031-11	CERAMIC CHIP 0.01uF	50V
△R113	9-939-253-01	CARBON 120K	1/4W				
△R114	1-249-429-11	CARBON 10K	5% 1/4W				
△R115	1-249-405-11	CARBON 100	5% 1/4W				
△R116	1-249-411-11	CARBON 330	5% 1/4W				

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

Ref. No.	Part No.	Description	Remark
< CONNECTOR >			
CN601	1-750-195-11	CONNECTOR, BOARD TO BOARD 6P	
CN602	1-568-847-11	PIN, CONNECTOR (PC BOARD) 4P	
< DIODE >			
D601	8-719-058-85	DIODE SLR-56VC3F (POWER)	
D602	8-719-058-85	DIODE SLR-56VC3F (POWER)	
< IC >			
IC601	8-741-810-59	IC ELEMENT, RAY-CATCHER SBX1810-59	
< TRANSISTOR >			
Q601	8-729-901-05	TRANSISTOR DTA124EK	
< RESISTOR >			
R601	1-216-041-00	METAL CHIP 470 5% 1/10W	
R602	1-216-041-00	METAL CHIP 470 5% 1/10W	
R603	1-216-041-00	METAL CHIP 470 5% 1/10W	
R604	1-216-037-00	METAL CHIP 330 5% 1/10W	
R606	1-216-037-00	METAL CHIP 330 5% 1/10W	
< VARIABLE RESISTOR >			
RV601	1-223-986-11	RES, VAR, CARBON 10 (ECHO LEVEL)	
RV602	1-223-986-11	RES, VAR, CARBON 10 (MIC 2 LEVEL)	
RV603	1-223-986-11	RES, VAR, CARBON 10 (MIC 1 LEVEL)	
< SWITCH >			
S601	1-762-777-11	SWITCH, KEY BOARD (POWER)	

*	1-661-524-11	SW-96A BOARD (Ref. No. 4, 000 Series)	

< CONNECTOR >			
CN301	1-750-186-11	CONNECTOR, BOARD TO BOARD 6P	
* CN302	1-695-823-11	CONNECTOR, BOARD TO BOARD 8P	
< DIODE >			
D301	8-719-056-06	DIODE SLR-342DC3F (RESERVE)	
D302	8-719-056-06	DIODE SLR-342DC3F (NEXT DISC RESERVE)	
< JUMPER RESISTOR >			
JR301	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR302	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR303	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR304	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR305	1-216-296-91	CONDUCTOR, CHIP (3216)	
JR306	1-216-296-91	CONDUCTOR, CHIP (3216)	

Ref. No.	Part No.	Description	Remark
< RESISTOR >			
R301	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R302	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R303	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R304	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R305	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R306	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R307	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R308	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R309	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R310	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R311	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R312	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R313	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R314	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R315	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R316	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R317	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R318	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R319	1-216-037-00	METAL CHIP 330 5% 1/10W	
R320	1-216-037-00	METAL CHIP 330 5% 1/10W	
< SWITCH >			
S301	1-762-777-11	SWITCH, KEY BOARD (7)	
S302	1-762-777-11	SWITCH, KEY BOARD (8)	
S303	1-762-777-11	SWITCH, KEY BOARD (9)	
S304	1-762-777-11	SWITCH, KEY BOARD (10)	
S305	1-762-777-11	SWITCH, KEY BOARD (11)	
S306	1-762-777-11	SWITCH, KEY BOARD (12)	
S307	1-762-777-11	SWITCH, KEY BOARD (13)	
S308	1-762-777-11	SWITCH, KEY BOARD (14)	
S309	1-762-777-11	SWITCH, KEY BOARD (15)	
S310	1-762-777-11	SWITCH, KEY BOARD (16)	
S311	1-762-777-11	SWITCH, KEY BOARD (RESERVE)	
S312	1-762-777-11	SWITCH, KEY BOARD (NEXT DISC RESERVE)	
S313	1-762-777-11	SWITCH, KEY BOARD (CLEAR)	
S314	1-762-777-11	SWITCH, KEY BOARD (1)	
S315	1-762-777-11	SWITCH, KEY BOARD (2)	
S316	1-762-777-11	SWITCH, KEY BOARD (3)	
S317	1-762-777-11	SWITCH, KEY BOARD (4)	
S318	1-762-777-11	SWITCH, KEY BOARD (5)	
S319	1-762-777-11	SWITCH, KEY BOARD (6)	

*	1-661-525-11	SW-96B BOARD (Ref. No. 4, 000 Series)	

< CONNECTOR >			
* CN201	1-695-822-11	CONNECTOR, BOARD TO BOARD 8P	
* CN202	1-750-188-11	CONNECTOR, BOARD TO BOARD 14P	

SW-96B

SW-278

VX-702

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D203	8-719-056-06	DIODE SLR-342DC3F (PBC ON/OFF)	
D204	8-719-056-06	DIODE SLR-342DC3F (AUTO PAUSE)	
D205	8-719-056-06	DIODE SLR-342DC3F (LINE IN)	
		< RESISTOR >	
R201	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R202	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R203	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R204	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R205	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R206	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R207	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R208	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R209	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R210	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R213	1-216-037-00	METAL CHIP 330 5% 1/10W	
R214	1-216-037-00	METAL CHIP 330 5% 1/10W	
R215	1-216-037-00	METAL CHIP 330 5% 1/10W	
		< SWITCH >	
S201	1-762-777-11	SWITCH, KEY BOARD (PBC ON/OFF)	
S202	1-762-777-11	SWITCH, KEY BOARD (RETURN)	
S203	1-762-777-11	SWITCH, KEY BOARD (ACS/AMS ◀◀ (PREV))	
S204	1-762-777-11	SWITCH, KEY BOARD (ACS/AMS ▶▶ (NEXT))	
S205	1-762-777-11	SWITCH, KEY BOARD (■)	
S206	1-762-777-11	SWITCH, KEY BOARD (■)	
S207	1-762-777-11	SWITCH, KEY BOARD (▷ (SELECT))	
S208	1-762-777-11	SWITCH, KEY BOARD (SIDE B)	
S209	1-762-777-11	SWITCH, KEY BOARD (SIDE A)	
S210	1-762-777-11	SWITCH, KEY BOARD (△ OPEN/CLOSE)	
S211	1-762-777-11	SWITCH, KEY BOARD (LINE IN)	
S212	1-762-777-11	SWITCH, KEY BOARD (AUTO PAUSE)	

*	1-660-679-11	SW-278 BOARD (Ref.No. 5,000 Series)	

		< CONNECTOR >	
* CN501	1-566-968-11	HOUSING, CONNECTOR(PC BOARD)6P	
		< JUMPER RESISTOR >	
JR500	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR501	1-216-295-91	CONDUCTOR, CHIP (2012)	
JR502	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< PHOTO INTERRUPTER >	
PH501	8-749-012-33	PHOTO INTERRUPTER GP1S94	
PH502	8-749-012-33	PHOTO INTERRUPTER GP1S94	

Ref. No.	Part No.	Description	Remark
PH503	8-749-012-33	PHOTO INTERRUPTER GP1S94	
PH504	8-749-012-33	PHOTO INTERRUPTER GP1S94	
		< RESISTOR >	
R501	1-216-188-00	METAL GLAZE 390 5% 1/8W	
R502	1-216-248-00	METAL GLAZE 120K 5% 1/8W	
R503	1-216-248-00	METAL GLAZE 120K 5% 1/8W	
R504	1-216-039-00	METAL CHIP 390 5% 1/10W	
R505	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R506	1-216-099-00	METAL CHIP 120K 5% 1/10W	

*	A-6423-433-A	VX-702 (62E) BOARD, COMPLETE	

		(Ref.No. 3,000 Series)	
		< CAPACITOR >	
C101	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C102	1-163-229-11	CERAMIC CHIP 12PF 5% 50V	
C103	1-163-229-11	CERAMIC CHIP 12PF 5% 50V	
C104	1-216-295-91	CONDUCTOR, CHIP (2012)	
C105	1-126-968-11	ELECT 100uF 20% 6.3V	
C106	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C107	1-126-968-11	ELECT 100uF 20% 6.3V	
C108	1-104-664-11	ELECT 47uF 20% 10V	
C109	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C110	1-104-664-11	ELECT 47uF 20% 10V	
C111	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C112	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C113	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C115	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C116	1-126-968-11	ELECT 100uF 20% 6.3V	
C117	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C118	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C119	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C120	1-104-664-11	ELECT 47uF 20% 10V	
C121	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C122	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C123	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C124	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C125	1-109-982-11	CERAMIC CHIP 1uF 10% 10V	
C126	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C127	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C128	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C129	1-104-664-11	ELECT 47uF 20% 10V	
C130	1-163-038-91	CERAMIC CHIP 0.1uF 25V	
C134	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C135	1-163-241-11	CERAMIC CHIP 39PF 5% 50V	
C136	1-163-241-11	CERAMIC CHIP 39PF 5% 50V	
C137	1-163-241-11	CERAMIC CHIP 39PF 5% 50V	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C138	1-163-249-11	CERAMIC CHIP	82PF 5% 50V			< CONNECTOR >	
C139	1-163-121-00	CERAMIC CHIP	150PF 5% 50V				
C140	1-163-121-00	CERAMIC CHIP	150PF 5% 50V	CN101	1-770-383-11	CONNECTOR, BOARD TO BOARD 14P	
C141	1-163-121-00	CERAMIC CHIP	150PF 5% 50V	CN301	1-770-381-11	CONNECTOR, BOARD TO BOARD 10P	
C142	1-163-113-00	CERAMIC CHIP	68PF 5% 50V	CN302	1-770-382-11	CONNECTOR, BOARD TO BOARD 12P	
C143	1-163-222-11	CERAMIC CHIP	5PF 0.25PF 50V	CN303	1-568-828-11	PIN, CONNECTOR (PC BOARD) 9P	
C144	1-163-031-11	CERAMIC CHIP	0.01uF 50V	CN304	1-506-469-11	PIN, CONNECTOR 4P	
						< TRIMMER >	
C145	1-163-245-11	CERAMIC CHIP	56PF 5% 50V				
C146	1-163-241-11	CERAMIC CHIP	39PF 5% 50V	CT101	1-141-245-00	CAP, TRIMMER 30PF	
C147	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V	CT102	1-141-227-00	CAP, TRIMMER 20PF	
C148	1-163-038-91	CERAMIC CHIP	0.1uF 25V			< DIODE >	
C149	1-163-243-11	CERAMIC CHIP	47PF 5% 50V				
C150	1-163-038-91	CERAMIC CHIP	0.1uF 25V	D103	8-719-027-74	DIODE 1SV231-TPH3	
C151	1-163-038-91	CERAMIC CHIP	0.1uF 25V	D301	8-719-914-44	DIODE DAP202K	
C152	1-163-038-91	CERAMIC CHIP	0.1uF 25V	D302	8-719-914-44	DIODE DAP202K	
C153	1-163-038-91	CERAMIC CHIP	0.1uF 25V			< IC >	
C154	1-163-133-00	CERAMIC CHIP	470PF 5% 50V	IC101	8-759-398-33	IC CL-480-C3	
C155	1-126-968-11	ELECT	100uF 20% 6.3V	IC102	8-759-342-01	IC MB814260-70PJER	
C156	1-163-038-91	CERAMIC CHIP	0.1uF 25V	IC103	8-759-432-14	IC LC371100SM-E20	
C157	1-104-664-11	ELECT	47uF 20% 10V	IC104	8-759-295-09	IC TLC2932IPW	
C158	1-163-038-91	CERAMIC CHIP	0.1uF 25V	IC105	8-752-338-46	IC CXD1178Q	
C159	1-163-038-91	CERAMIC CHIP	0.1uF 25V				
C160	1-124-589-11	ELECT	47uF 20% 16V	IC106	8-759-207-28	IC TC9015P	
C161	1-124-589-11	ELECT	47uF 20% 16V	IC107	8-752-068-43	IC CXA1645M	
C162	1-163-038-91	CERAMIC CHIP	0.1uF 25V	IC108	8-759-232-44	IC TC74HC125AF	
C163	1-163-237-11	CERAMIC CHIP	27PF 5% 50V	IC109	8-759-233-64	IC TC74HCU04AF	
C164	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	IC301	8-759-432-13	IC LC371100SM-E19	
C165	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	IC302	8-759-032-01	IC MC74HC00AF	
C166	1-163-229-11	CERAMIC CHIP	12PF 5% 50V	IC303	8-752-361-32	IC CXK58257BM-70LL-T6	
C168	1-163-038-91	CERAMIC CHIP	0.1uF 25V	IC304	8-759-276-29	IC XL9020F-S-E2	
C169	1-124-589-11	ELECT	47uF 20% 16V	IC305	8-759-283-49	IC HD6413002F10	
C171	1-163-227-11	CERAMIC CHIP	10PF 0.5PF 50V			< JUMPER RESISTOR >	
C172	1-163-239-11	CERAMIC CHIP	33PF 5% 50V	JC101	1-216-295-91	CONDUCTOR, CHIP (2012)	
C173	1-163-249-11	CERAMIC CHIP	82PF 5% 50V	JC102	1-216-295-91	CONDUCTOR, CHIP (2012)	
C175	1-163-031-91	CERAMIC CHIP	0.01uF 50V	JC103	1-216-295-91	CONDUCTOR, CHIP (2012)	
C303	1-104-664-11	ELECT	47uF 20% 10V	JC104	1-216-295-91	CONDUCTOR, CHIP (2012)	
C304	1-163-038-91	CERAMIC CHIP	0.1uF 25V			< COIL >	
C305	1-163-038-91	CERAMIC CHIP	0.1uF 25V	L101	1-412-510-51	INDUCTOR 82uH	
C306	1-104-664-11	ELECT	47uF 20% 10V	L103	1-410-526-11	INDUCTOR 10uH	
C307	1-163-038-91	CERAMIC CHIP	0.1uF 25V	L104	1-412-510-51	INDUCTOR 82uH	
C308	1-163-038-91	CERAMIC CHIP	0.1uF 25V	L108	1-412-500-51	INDUCTOR 12uH	
C309	1-163-038-91	CERAMIC CHIP	0.1uF 25V	L109	1-412-500-51	INDUCTOR 12uH	
C310	1-163-038-91	CERAMIC CHIP	0.1uF 25V				
C311	1-163-038-91	CERAMIC CHIP	0.1uF 25V	L110	1-412-500-51	INDUCTOR 12uH	
C312	1-163-031-11	CERAMIC CHIP	0.01uF 50V	L111	1-412-507-11	INDUCTOR 47uH	
C313	1-163-031-11	CERAMIC CHIP	0.01uF 50V	L112	1-412-510-51	INDUCTOR 82uH	
C361	1-163-031-11	CERAMIC CHIP	0.01uF 50V	L113	1-412-510-51	INDUCTOR 82uH	
				L114	1-412-510-51	INDUCTOR 82uH	
C365	1-163-031-11	CERAMIC CHIP	0.01uF 50V				
C366	1-163-031-11	CERAMIC CHIP	0.01uF 50V	L115	1-412-509-51	INDUCTOR 68uH	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
L116	1-410-526-11	INDUCTOR	10uH	R138	1-216-025-91	METAL GLAZE	100 5% 1/10W
L117	1-412-507-11	INDUCTOR	47uH	R139	1-216-025-91	METAL GLAZE	100 5% 1/10W
L301	1-412-509-51	INDUCTOR	68uH	R140	1-216-025-91	METAL GLAZE	100 5% 1/10W
L302	1-414-741-21	INDUCTOR	10uH	R141	1-216-025-91	METAL GLAZE	100 5% 1/10W
< TRANSISTOR >				R142	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q101	8-729-140-75	TRANSISTOR	2SD999-CLCK	R143	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q102	8-729-230-49	TRANSISTOR	2SC2712-YG	R144	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q103	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R145	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q104	8-729-900-53	TRANSISTOR	DTC114EK	R146	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q105	8-729-026-49	TRANSISTOR	2SA1037AK-T146-R	R147	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q106	8-729-027-24	TRANSISTOR	DTA114TKA-T146	R148	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q107	8-729-026-49	TRANSISTOR	2SA1037AK-T146-R	R149	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q108	8-729-120-28	TRANSISTOR	2SC1623-L5L6	R150	1-216-025-91	METAL GLAZE	100 5% 1/10W
Q109	8-729-101-25	TRANSISTOR	2SC1009A	R151	1-216-025-91	METAL GLAZE	100 5% 1/10W
< RESISTOR >				R152	1-216-025-91	METAL GLAZE	100 5% 1/10W
R098	1-216-073-00	METAL CHIP	10K 5% 1/10W	R153	1-216-025-91	METAL GLAZE	100 5% 1/10W
R099	1-216-073-00	METAL CHIP	10K 5% 1/10W	R154	1-216-025-91	METAL GLAZE	100 5% 1/10W
R101	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R155	1-216-025-91	METAL GLAZE	100 5% 1/10W
R102	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R156	1-216-025-91	METAL GLAZE	100 5% 1/10W
R103	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R157	1-216-025-91	METAL GLAZE	100 5% 1/10W
R104	1-216-121-91	METAL GLAZE	1M 5% 1/10W	R158	1-216-025-91	METAL GLAZE	100 5% 1/10W
R105	1-216-041-00	METAL GLAZE	470 5% 1/10W	R159	1-216-025-91	METAL GLAZE	100 5% 1/10W
R106	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R160	1-216-042-00	METAL CHIP	510 5% 1/10W
R107	1-216-042-00	METAL CHIP	510 5% 1/10W	R161	1-216-023-00	METAL CHIP	82 5% 1/10W
R108	1-216-073-00	METAL CHIP	10K 5% 1/10W	R162	1-216-025-91	METAL GLAZE	100 5% 1/10W
R109	1-216-023-00	METAL CHIP	82 5% 1/10W	R163	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R110	1-216-073-00	METAL CHIP	10K 5% 1/10W	R164	1-216-041-00	METAL CHIP	470 5% 1/10W
R111	1-216-073-00	METAL CHIP	10K 5% 1/10W	R165	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R112	1-216-013-00	METAL CHIP	33 5% 1/10W	R167	1-216-042-00	METAL CHIP	510 5% 1/10W
R113	1-216-073-00	METAL CHIP	10K 5% 1/10W	R168	1-216-295-91	CONDUCTOR, CHIP (2012)	
R114	1-216-073-00	METAL CHIP	10K 5% 1/10W	R170	1-216-061-00	METAL CHIP	3.3K 5% 1/10W
R116	1-216-013-00	METAL CHIP	33 5% 1/10W	R171	1-216-038-00	METAL CHIP	360 5% 1/10W
R118	1-216-073-00	METAL CHIP	10K 5% 1/10W	R173	1-216-025-91	METAL GLAZE	100 5% 1/10W
R119	1-216-013-00	METAL CHIP	33 5% 1/10W	R174	1-216-033-00	METAL CHIP	220 5% 1/10W
R120	1-216-073-00	METAL CHIP	10K 5% 1/10W	R175	1-216-033-00	METAL CHIP	220 5% 1/10W
R121	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	R176	1-216-033-00	METAL CHIP	220 5% 1/10W
R122	1-216-025-91	METAL GLAZE	100 5% 1/10W	R177	1-216-073-00	METAL CHIP	10K 5% 1/10W
R123	1-216-025-91	METAL GLAZE	100 5% 1/10W	R181	1-216-037-00	METAL CHIP	330 5% 1/10W
R124	1-216-025-91	METAL GLAZE	100 5% 1/10W	R182	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R126	1-216-295-91	CONDUCTOR, CHIP (2012)		R186	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R127	1-216-295-91	CONDUCTOR, CHIP (2012)		R187	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R128	1-216-295-91	CONDUCTOR, CHIP (2012)		R188	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R129	1-216-073-00	METAL CHIP	10K 5% 1/10W	R189	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R131	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R190	1-216-091-00	METAL CHIP	56K 5% 1/10W
R132	1-216-073-00	METAL CHIP	10K 5% 1/10W	R191	1-216-121-91	METAL GLAZE	1M 5% 1/10W
R134	1-216-073-00	METAL CHIP	10K 5% 1/10W	R193	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
R135	1-216-295-91	CONDUCTOR, CHIP (2012)		R194	1-216-097-91	METAL GLAZE	100K 5% 1/10W
R136	1-216-025-91	METAL GLAZE	100 5% 1/10W	R195	1-216-025-91	METAL GLAZE	100 5% 1/10W
R137	1-216-025-91	METAL GLAZE	100 5% 1/10W	R196	1-216-025-91	METAL GLAZE	100 5% 1/10W
				R197	1-216-089-91	METAL GLAZE	47K 5% 1/10W

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R198	1-216-025-91	METAL GLAZE	100 5% 1/10W	R339	1-216-073-00	METAL CHIP	10K 5% 1/10W
R199	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R341	1-216-073-00	METAL CHIP	10K 5% 1/10W
R200	1-216-077-00	METAL CHIP	15K 5% 1/10W	R342	1-216-032-00	METAL CHIP	200 5% 1/10W
R201	1-216-073-00	METAL CHIP	10K 5% 1/10W	R343	1-216-049-91	METAL GLAZE	1K 5% 1/10W
R202	1-216-095-00	METAL CHIP	82K 5% 1/10W	R344	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R203	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	R345	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R207	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R346	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R208	1-247-903-00	CARBON	1M 5% 1/4W	R347	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
R209	1-216-121-91	METAL GLAZE	1M 5% 1/10W	R348	1-216-295-91	CONDUCTOR, CHIP (2012)	
R210	1-216-041-00	METAL CHIP	470 5% 1/10W	R351	1-216-295-91	CONDUCTOR, CHIP (2012)	
R211	1-216-047-91	METAL GLAZE	820 5% 1/10W	R352	1-216-295-91	CONDUCTOR, CHIP (2012)	
R212	1-216-049-91	METAL GLAZE	1K 5% 1/10W			< VARIABLE RESISTOR >	
R214	1-216-295-91	CONDUCTOR, CHIP (2012)		RV102	1-223-238-11	RES, ADJ, CARBON 4.7K	
R215	1-216-049-91	METAL GLAZE	1K 5% 1/10W			< SWITCH >	
R216	1-216-041-00	METAL CHIP	470 5% 1/10W	S101	1-571-308-11	SWITCH, SLIDE (COLOR SYSTEM (VIDEO CD))	
R217	1-216-025-91	METAL GLAZE	100 5% 1/10W			< VIBRATOR >	
R218	1-216-025-91	METAL GLAZE	100 5% 1/10W	X101	1-767-270-11	VIBRATOR, CRYSTAL (40.5MHz)	
R219	1-216-025-91	METAL GLAZE	100 5% 1/10W	X102	1-577-381-11	VIBRATOR, CRYSTAL (14.31818MHz)	
R220	1-216-025-91	METAL GLAZE	100 5% 1/10W	X103	1-577-289-11	VIBRATOR, CRYSTAL (17.734475MHz)	
R221	1-249-442-11	CARBON	510 5% 1/4W	X301	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	
R301	1-216-033-00	METAL CHIP	220 5% 1/10W			*****	
R302	1-216-033-00	METAL CHIP	220 5% 1/10W			* A-6423-420-A YC-962 (60E) BOARD, COMPLETE	
R303	1-216-033-00	METAL CHIP	220 5% 1/10W			*****	
R304	1-216-033-00	METAL CHIP	220 5% 1/10W			(Ref. No. 2, 000 Series)	
R305	1-216-033-00	METAL CHIP	220 5% 1/10W			< CAPACITOR >	
R306	1-216-033-00	METAL CHIP	220 5% 1/10W	C501	1-126-963-11	ELECT	4.7uF 20% 50V
R307	1-216-033-00	METAL CHIP	220 5% 1/10W	C502	1-104-664-11	ELECT	47uF 20% 10V
R308	1-216-033-00	METAL CHIP	220 5% 1/10W	C503	1-163-031-11	CERAMIC CHIP	0.01uF 50V
R309	1-216-033-00	METAL CHIP	220 5% 1/10W	C504	1-163-031-11	CERAMIC CHIP	0.01uF 50V
R310	1-216-033-00	METAL CHIP	220 5% 1/10W	C505	1-104-664-11	ELECT	47uF 20% 10V
R311	1-216-033-00	METAL CHIP	220 5% 1/10W	C506	1-104-664-11	ELECT	47uF 20% 10V
R312	1-216-033-00	METAL CHIP	220 5% 1/10W	C507	1-163-031-11	CERAMIC CHIP	0.01uF 50V
R313	1-216-033-00	METAL CHIP	220 5% 1/10W	C508	1-126-963-11	ELECT	4.7uF 20% 50V
R314	1-216-033-00	METAL CHIP	220 5% 1/10W			< DELAY LINE >	
R315	1-216-033-00	METAL CHIP	220 5% 1/10W	DL501	1-466-870-11	FILTER BLOCK, COMB (HCF0200)	
R316	1-216-033-00	METAL CHIP	220 5% 1/10W			< JACK >	
R321	1-216-033-00	METAL CHIP	220 5% 1/10W	J501	1-764-676-11	CONNECTOR (ROUND TYPE)(S VIDEO OUT 1/2)	
R323	1-216-033-00	METAL CHIP	220 5% 1/10W			< TRANSISTOR >	
R324	1-216-295-91	CONDUCTOR, CHIP (2012)		Q501	8-729-120-28	TRANSISTOR	2SC1623-L5L6
R326	1-216-033-00	METAL CHIP	220 5% 1/10W	Q502	8-729-120-28	TRANSISTOR	2SC1623-L5L6
R327	1-216-033-00	METAL CHIP	220 5% 1/10W	Q503	8-729-026-49	TRANSISTOR	2SA1037AK-T146-R
R328	1-216-033-00	METAL CHIP	220 5% 1/10W				
R329	1-216-033-00	METAL CHIP	220 5% 1/10W				
R330	1-216-295-91	CONDUCTOR, CHIP (2012)					
R331	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R332	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R335	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R336	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R337	1-216-049-91	METAL GLAZE	1K 5% 1/10W				
R338	1-216-073-00	METAL CHIP	10K 5% 1/10W				

Ref. No.	Part No.	Description	Remark
Q504	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q505	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q506	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q507	8-729-026-49	TRANSISTOR 2SA1037AK-T146-R	
< RESISTOR >			
R501	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R502	1-216-021-00	METAL CHIP 68 5% 1/10W	
R503	1-216-041-00	METAL CHIP 470 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R506	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R507	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R508	1-216-041-00	METAL CHIP 470 5% 1/10W	
R509	1-216-041-00	METAL CHIP 470 5% 1/10W	
R510	1-216-021-00	METAL CHIP 68 5% 1/10W	
R511	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R512	1-216-021-00	METAL CHIP 68 5% 1/10W	
R513	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R514	1-216-041-00	METAL CHIP 470 5% 1/10W	
R515	1-216-295-91	CONDUCTOR, CHIP (2012)	
R516	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R517	1-216-017-91	METAL GLAZE 47 5% 1/10W	
R518	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R519	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R520	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R521	1-216-041-00	METAL CHIP 470 5% 1/10W	
R522	1-216-021-00	METAL CHIP 68 5% 1/10W	
R523	1-216-295-91	CONDUCTOR, CHIP (2012)	

MISCELLANEOUS			

23	1-777-264-11	WIRE, (FLAT TYPE) (4 CORE)	
58	1-777-013-11	CABLE, FLAT (9 CORE)	
67	1-777-263-11	WIRE, (FLAT TYPE) (20 CORE)	
△101	1-468-133-11	POWER BLOCK (SR-582Y BOARD) (SWITCHING REGULATOR)	
103	1-777-010-11	CABLE, FLAT (8 CORE)	
105	1-777-005-11	CABLE, FLAT (20 CORE)	
107	1-777-007-11	CABLE, FLAT (8 CORE)	
108	1-777-006-11	CABLE, FLEXIBLE FLAT (13 CORE)	
△109	1-769-639-11	CORD, POWER	
△110	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	
△208	8-848-286-11	OPTICAL PICK-UP BLOCK KHS-150A(S)	
210	1-777-011-11	CABLE, FLEXIBLE FLAT (18 CORE)	
212	1-777-008-11	CABLE, FLAT (4 CORE)	
M401	X-3946-431-1	MOTOR ASSY, LOADING (LOADING/TILT)	
M901	1-698-109-11	MOTOR, DD (SPINDLE)	

Ref. No.	Part No.	Description	Remark
ND101	1-517-471-11	INDICATOR TUBE, FLUORESCENT	

ACCESSORIES & PACKING MATERIALS			

	1-473-703-11	REMOTE COMMANDER (RMT-M45A)	
△	1-569-008-11	ADAPTOR, CONVERSION 2P (EXCEPT HK)	
	1-575-334-11	CORD, CONNECTION (AUDIO/VIDEO 1.5m)	
	3-708-885-01	COVER, BATTERY (for RMT-M45A)	
	3-856-640-11	MANUAL, INSTRUCTION (ENGLISH, CHINESE)	
*	3-971-197-01	CUSHION (UPPER)	
*	3-971-198-01	CUSHION (LOWER)	
*	3-971-199-01	INDIVIDUAL CARTON	
*	3-971-934-01	CUSHION (FOOT)	

HARDWARE LIST			

#1	7-685-647-79	SCREW, TAPPING	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#3	7-682-545-09	SCREW +B 3X4	
#4	7-685-645-79	SCREW +BVTP 3X6 TYPE2 IT-3	
#5	7-624-108-04	STOP RING 4.0, TYPE -E (E, HK)	
#6	7-685-104-21	SCREW +P 2X6 TYPE2 SLIT	
#7	7-685-648-79	SCREW +BVTP 3X12 TYPE2	
#8	7-621-759-35	+PSW, 2.6X5	
#9	7-682-946-09	SCREW +PSW 3X5	
#10	7-682-647-09	SCREW +PSW 3X6	
#11	7-685-133-19	SCREW +P 2.6X6 TYPE2	

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

SECTION 6
IC PIN DESCRIPTION

6-1. MODE CONTROL IC PIN DESCRIPTION
(FP-962 BOARD IC102 HD6433712-B80H)

Pin No.	Pin Name	I/O	Function
1	A _{VCC}	—	Power supply EVER +5V
2	MON1	I	+5V REC monitor
3	MON2	I	-5V REC monitor
4	MON3	I	± 16V monitor
5	KEY1	I	Unit key input
6	KEY2	I	Unit key input
7	KEY3	I	Unit key input
8	KEY4	I	Unit key input
9	—	—	Not used (Open)
10	A _{VSS}	—	Ground
11	TEST	I	Test terminal (Connected to ground)
12	—	O	Not used (Open)
13	—	I	Fixed at "H"
14	V _{CC}	—	Ground
15	X0	I	Crystal oscillator terminal (8 MHz)
16	X1	O	Crystal oscillator terminal (8 MHz)
17	RESET	I	VFD controller reset ("L": Reset)
18	SIRCS	I	SIRCS data input
19	LED STB	O	LED strobe signal output to LED driver
20	—	—	Not used (Open)
21	P. CONT	O	Unit power on/off control ("H": Power on)
22	N/K	I	Mode select terminal. "L": KARAOKE, "H": Normal. (Fixed at "L")
23	P1	O	FL segment output
24	P2	O	FL segment output
25	P3	O	FL segment output
26	P4	O	FL segment output
27	P5	O	FL segment output
28	P6	O	FL segment output
29	P7	O	FL segment output
30	P8	O	FL segment output
31	P9	O	FL segment output
32	P10	O	FL segment output
33	P11	O	FL segment output
34	P12	O	FL segment output
35	P13	O	FL segment output
36	P14	O	FL segment output
37	P15	O	FL segment output
38	P16	O	FL segment output
39	-30V	I	High-voltage proof pull-down power supply -30V
40	P17	O	FL segment output

Pin No.	Pin Name	I/O	Function
41	P18	O	FL segment output
42	P19	O	FL segment output
43	P20	O	FL segment output
44	P21	O	FL segment output
45	P22	O	FL segment output
46	P23	O	FL segment output
47	P24	O	FL segment output
48	G7	O	FL grid output
49	G6	O	FL grid output
50	G5	O	FL grid output
51	G4	O	FL grid output
52	G3	O	FL grid output
53	G2	O	FL grid output
54	G1	O	FL grid output
55	VIDEO MUTE	O	"L" when video mute
56	V _{CC}	—	Power supply EVER +5V
57	AU MUTE	O	"H" when audio mute
58	VFD CLK	O	Communication clock to the mode VCD controller
59	VFD SI	I	Data reception from the mode VCD controller
60	VFD SO	O	Data transfer to the mode VCD controller
61	VFD ACK	O	Transfer enable signal to the mode VCD controller from the VFD controller ("L": Communication enable)
62	MMI RST	O	Mode VCD controller reset ("L": Reset)
63	VFD REQ	I	Chip select for VFD controller from the mode VCD controller
64	P. OFF	O	Power reset output ("H": Reset)

6-2. VCD MODE CONTROL IC PIN DESCRIPTION (VX-702 BOARD IC305 HD6413002F10)

Pin No.	Pin Name	I/O	Function
1	Vcc	—	Power supply, REG +5V
2	DSP CS	0	Chip select for KARAOKE DSP ("L": Being communicated)
3	CDDA EMP	1	CDDA de-emphasis control input ("H": ON) Only when video CD is used, this pin is used due to CL480 bug.
4	EEP WC	0	EEPROM line control output
5	EEP CS	0	EEPROM chip select output
6	VFD ACK	1	Transfer enable signal to the mode controller from the VFD controller ("L": Communication enable)
7	VFD REQ	0	Transfer request signal to the VFD controller from the mode controller ("L": Communication request) Not used (Open)
8	—	—	Not used (Open)
9	CL480 RST	0	CL480 reset ("L": Reset)
10	RES0	0	Not used (Open)
11	Vss	—	Ground
12	MECH SI	0	Data output to the mechanism controller/CG
13	SO	0	Transfer data to the VFD controller/EEPROM/KARAOKE DSP
14	MECH SO	1	Data input from the mechanism controller
15	SI	1	Reception data from the VFD controller/EEPROM
16	MECH CLK	0	Communication clock output to the mechanism controller/CG
17	SCK	0	Communication clock to the VFD controller/EEPROM/KARAOKE DSP
18	DEV RST	0	Device reset ("L": Reset)
19	H DET	1	"L": Video input present (Not used) (Open)
20	MIC IN	1	"L": MIC IN
21	OTASUKE	1	"H": Microphone sound absent, "L": Microphone sound present
22	Vss	—	Ground
23	VCD	0	Not used (Open)
24	CLAP SW0	0	"H": Hand clapping 0 START
25	CLAP SW1	0	"H": Hand clapping 1 START
26	CLAP BUSY	1	"L": Hand clapping
27	D0	I/O	Data bus I/O
28	D1	I/O	Data bus I/O
29	D2	I/O	Data bus I/O
30	D3	I/O	Data bus I/O
31	D4	I/O	Data bus I/O
32	D5	I/O	Data bus I/O
33	D6	I/O	Data bus I/O
34	D7	I/O	Data bus I/O
35	Vcc	—	Power supply, REG +5V
36	A0	0	Address bus output
37	A1	0	Address bus output
38	A2	0	Address bus output
39	A3	0	Address bus output
40	A4	0	Address bus output

Pin No.	Pin Name	I/O	Function
41	A5	0	Address bus output
42	A6	0	Address bus output
43	A7	0	Address bus output
44	Vss	—	Ground
45	A8	0	Address bus output
46	A9	0	Address bus output
47	A10	0	Address bus output
48	A11	0	Address bus output
49	A12	0	Address bus output
50	A13	0	Address bus output
51	A14	0	Address bus output
52	A15	0	Address bus output
53	A16	0	Address bus output
54	A17	0	Not used (Open)
55	A18	0	Not used (Open)
56	A19	0	Not used (Open)
57	Vss	—	Ground
58	WAIT	1	Wait pin. Requests the insertion of wait state when accessing the external address space.
59	RGB MUTE	0	RGB encoder output mute control ("H": Mute. Sync is not muted.)
60	NTSC/PAL	0	RGB encoder mode selection ("H": NTSC output, "L": PAL output)
61	SYSCLK	0	System clock output (Not used) (Open)
62	STBY	1	Standby pin. When "L", the hardware standby mode is set. (Not used) (Fixed at "H")
63	RST	1	Mode controller reset ("L": Reset)
64	EEP BUSY	1	EEPROM write. "H": READY, "L": BUSY.
65	Vss	—	Ground
66	EXTAL	1	Connected to the crystal oscillator. Clock 8 MHz.
67	XTAL	1	Connected to the crystal oscillator. Clock 8 MHz.
68	Vcc	—	Power supply REG +5V
69	AS	0	Address strobe. When "L", an address on the address bus is valid. (Not used) (Open)
70	RD	0	Read pin. When "L", the external address space is in a read condition.
71	HWR	0	High write pin. When "L", the external address space is in a write condition, and the data bus is valid (bus width: 8-bit)
72	LWR	0	Not used (Open)
73	MD0	1	Mode pin (Fixed at "H")
74	MD1	1	Mode pin (Fixed at "L")
75	MD2	1	Mode pin (Fixed at "L")
76	AVcc	—	AD conversion power supply, REG +5V
77	VREF	—	AD conversion reference voltage input, REG +5V
78	NT PAL AUTO SEL	1	NTSC/PAL auto select (Video-CD output mode)
79	—	—	AD input (Not used) (open)
80	—	—	AD input (Not used) (open)

**6-3. SYSTEM CONTROL IC PIN DESCRIPTION
(MB-73 BOARD IC501 MB89094PF-G-153-BND)**

Pin No.	Pin Name	I/O	Function
81	—	I	AD input (Not used) (open)
82	—	I	AD input (Not used) (open)
83	—	I	AD input (Not used) (open)
84	J/E/UC	I	AD input, destination specification (Not used) (Open)
85	REMOTE CONT	I	AD input, microphone remote input
86	AV _{ss}	—	AD conversion Ground
87	REF V	I	Reference V sync signal input (Non-maskable interrupt. Requests a non-maskable interrupt.)
88	CL480INT	I	CL480 interrupt request signal input
89	CL480CS	O	CL480 chip select
90	EXRAMCS	O	External RAM chip select
91	EXROMCS	O	External ROM chip select
92	V _{ss}	—	Ground
93	MPEG EMP	I	De-emphasis control input of MPEG audio ("H": ON)
94	BLACK VMUTE	O	Complete mute control of RGB encoder ("H": Mute. Sync is also muted.)
95	—	—	Not used (Open) (Reserved for input capture.)
96	—	—	Not used (Open) (Reserved for input capture.)
97	LINE SELECT	O	"H": Communication with the mechanism controller, "L": Communication with CG
98	MMTCS	I	Chip select for the mode controller from the mechanism controller
99	BUSY	O	Transfer enable signal to the mechanism controller from the mode controller ("L": Communication enable)
100	CG CS	O	CG chip select ("L": Being communicated)

Pin No.	Pin Name	I/O	Function
1	—	O	Clock 32 kHz (Open)
2	CLK32K	I	Clock 32 kHz
3	GND	I	(Connected to Ground)
4	GND	I	(Connected to Ground)
5	2FSC	I	Clock 2 fsc (7.159 MHz)
6	—	O	Clock 2 fsc (Open)
7	—	I	Ground
8	XMRST	I	Mechanism controller reset ("L": Reset)
9	XFREQ	I	Phillips code (Frame No.) read enable
10	FOACK	O	Phillips code/SubQ (Subcode) data output control ("H": Data output)
11	FOSEL	O	Phillips code/SubQ data selection ("L": SubQ)
12	PCTL	O	One track jump (1T)/Multi track jump (MT) selection signal ("H": 1T)
13	SP LOCK	I	Spindle servo lock signal ("H": Spindle servo locked)
14	TBC HOLD IN	O	Chroma TBC control signal
15	SCOR	I	"H": when subcode sync is detected.
16	XPB V	I	Playback V sync signal input
17	XREF V	I	Reference V sync signal input
18	ALT	O	Latches internal register A of extension output port IC (MB-73 board IC502)
19	BLT	O	Latches internal register B of extension output port IC (MB-73 board IC502)
20	XBUSY	I	Communication enable signal from the mode controller ("L": Communication enable)
21	DOP	I	VIDEO dropout detection input
22	VTM	I	Servo processor V timing signal
23	FLAG	I	Reference line operation flag
24	CDG MODE	I	"H": when CDG (Desode IC disc discrimination)
25	CLS CS	O	Chip select of CLS DT (pin 29) signal
26	SPDL PLS	O	Spindle pulse drive signal ("H": Spindle free running)
27	CLT	O	CLD register latch
28	+5V	I	Input of the start mode selection after reset release (5V PULL UP)
29	CLS DT	I	CLV scanning V sync phase difference data input from IC502 (Data input when CLS CS is "H".)
30	SET DT	O	Serial data output to DSP/Extension output port IC
31	SET CK	O	Serial data transfer clock to DSP, IC502
32	SPDL FG1	I	Spindle FG input 1 (12 waves per one rotation)
33	G MUTE	O	Gray image mute control output when CLV scanning ("L": Playback image, "H": Gray image)
34	LD SEARCH	O	Spindle rotation direction signal ("H": During LD search)
35	SPDL FXR	O	Spindle rotation direction signal ("H": FWD)
36	AUX	O	"H": External input, "L": Others
37	ITJ	O	Track jump trigger pulse output
38	FG START	O	H sync measuring start
39	FG SEARCH	H	During LD search, H
40	SP GAIN	O	H sync measuring prohibition

Pin No.	Pin Name	I/O	Function
41	MTJ	I	MTJ tracking pulse output. Normally, input. Output when TJ is executed ("L": FWD).
42	MTF ON/OFF	O	MTF compression ON/OFF signal ("H": MTF ON)
43	V LOAD	O	VIDEO IC (MN8811) latch signal
44	EX V CTL	O	"H" when external input (VCD) is muted.
45	PM OFF	O	Read clock phase modulation. "H": OFF.
46	VCD VIDEO SEL	O	"L", when VCD mode
47	—	O	Not used (Open)
48	XFL	I	Focus lock signal ("L": Focus lock)
49	Vcc	—	Power supply REG +5V
50	LINE SEL	I	"H": MMI is connected to FSIO.
51	XCDG MUTE	O	Graphic data mute ("L": PB, "H": Others)
52	TILT LOADING UP	O	Forcibly moves to TILT UP.
53	TILT LOADING DN	O	Forcibly moves to TILT DOWN.
54	XMMI CS	O	Serial communication chip select signal to the mode controller
55	TILT CTL	O	Tilt center position switch input
56	TILT LIMIT	O	Tilt UP/DOWN limit switch input
57	XCDG RST	O	Not used (Open)
58	GND	—	Ground
59	LINE MUTE	O	Audio output mute signal ("L": Mute)
60	DIGITAL MUTE	I	Digital 0 mute information
61	MC RST	O	Servo DSP/DF reset signal ("L": Reset)
62	LD ON	O	Laser diode ON/OFF signal ("H": ON (emission))
63	XCDLD CDV	O	"L": CD or CDV audio part is played back, "H": Others
64	XSVLT	O	SERVO IC (HA11529) latch signal
65	SIDE A/XB	O	Tilt servo image selection ("H": A, "L": B)
66	BRK INH	O	SERVO brake mode control ("H": Prohibited)
67	LCSW1	I	Loading/chucking position sensor input 1
68	XLD LED	O	DISC discrimination LED emission signal ("L": Emission)
69	LCSW2	I	Loading/chucking position sensor input 2
70	LCSW3	I	Loading/chucking position sensor input 3
71	LCSW4	I	Loading/chucking position sensor input 4
72	LOADING LOCK	O	Loading motor break cancel
73	DOS INH	I	Input is fixed
74	MECH SI	I	32-byte serial transfer data input (For SCOR check)
75	NR CONT	I	Noise canceler
76	SCAN DOP CTL	O	"H" when CLV mode
77	MECH SO	I	32-byte serial transfer data input (Input from the mode controller, IC502)
78	MECH SO	O	32-byte serial transfer data output (Output to the mode controller)
79	MECH CLK	O	32-byte serial transfer clock
80	T CNT	I	Track jump number count signal input

Pin No.	Pin Name	I/O	Function
81	AC-3 MUTE	O	Digital RF out (AC-3) mute signal
82	—	—	Not used (Open)
83	GND	—	Ground
84	LD DET	I	LD input (Disc present/absent, 8/12 inch detection)
85	CD/ALD	I	AD input SLED position information (CDV)
86	CDV/BLD	I	AD input SLED position information (CD, ALD, BLD)
87	LOADING OFF	I	AD input loading off signal
88	XDSP LIT	O	DSP IC latch signal
89	MD2	O	Optical output mute ("L": Mute)
90	LOCK	I	Frame sync (EFM) lock signal ("H": Lock)
91	SENSE	I	Various SENSE signals input from DSP
92	Vcc	—	Power supply REG +5V
93	MUTE G	O	DSP mute signal ("H": Mute)
94	EMPHA	O	De-emphasis control ("H": ON)
95	A MUTE 1	O	Audio L output mode selection ("H": Analog audio R mute)
96	A MUTE 2	O	Audio R output mode selection ("H": Analog audio L mute)
97	XCX	O	CX ON/OFF control output ("L": CX ON)
98	D/FLT	O	Digital filter latch
99	XDSP SEL	O	Selection of communication with DSP ("L": Connection, "H": Disconnection)
100	Vcc	—	Power supply REG +5V

**6-4. SYSTEM CONTROL IC PIN DESCRIPTION
(MB-73 BOARD IC502 LC21011B-X78)**

Pin No.	Pin Name	I/O	Function
1	---	-	Not used (Open)
2	---	-	Not used (Open)
3	---	-	Not used (Open)
4	---	-	Not used (Open)
5	---	-	Not used (Open)
6	---	-	Not used (Open)
7	---	-	Not used (Open)
8	CD DEFECT	0	CD defect signal output
9	---	-	Not used (Open)
10	---	-	Not used (Open)
11	XIN	1	4 fsc 14.3 MHz input (Clock)
12	XOUT	0	4 fsc 14.3 MHz output (Clock)
13	Vss	-	Ground
14	V MUTE1	0	When CLV scanning: V sync delete signal
15	V MUTE2	0	When CLV scanning: REF V sync add signal
16	G BVRST	0	Gray image output
17	DLRH	0	Gray image output
18	GRH	0	Gray image output
19	GVID	1	When CLV scanning: Gray image input signal
20	DS GATE	0	Phillips code gate signal output (Not used)
21	TBC REF H	0	CAV disc track traverse signal
22	PBCS	1	Composite sync signal input
23	P CODE	1	Phillips code data input
24	JMP TOL	0	CAV disc track traverse signal
25	TBC MUTE	0	TBC mute signal
26	CON T2	0	TBC operation selection: "H" Line mode, "L" Burst mode
27	PC OUT1	0	Forcibly accelerates/decelerates the spindle servo
28	PC OUT2	0	Spindle servo H servo error output
29	SPDL SW1	0	Spindle gain selection control signal 1 output
30	SPDL SW2	0	Spindle gain selection control signal 2 output
31	VDD	-	+5V
32	SP GAIN	1	When "H" (Tracking off): PC OUT2 becomes hi-impedance
33	SP UNLOCK	0	When the spindle is not locked: Signal output set by the mechanical controller
34	SP OFF	0	Output for spindle motor stop
35	HP OUT	0	Spindle error signal hold pulse output (Outputs when track jump)
36	CDV	0	Spindle mode setting. CDV-V part "H" (Not used) (Open)
37	FGMD	0	Spindle mode setting. FG mode "H" (Not used) (Open)
38	JUMP	1	Track jump control signal (HP out gate)
39	SV CLK	0	Servo IC clock output 1/8 fsc
40	SETCK	0	Serial data transfer clock output to the servo IC

Pin No.	Pin Name	I/O	Function
41	SP PBHI	1	Spindle PBH input
42	SP PBHO	0	Spindle PBH output
43	SP RHI	1	Spindle REF H input
44	SP RHO	0	Spindle REF H output
45	SET CLK	1	Internal resistors A and B clock input
46	SET DT	1	Internal resistors A and B data input
47	CLS DT	0	CLV scanning V sync counter data output
48	CLS CS	1	CLV scanning V sync counter data read clock control input
49	CLT	1	Internal resistor C latch
50	BLT	1	Internal resistor B latch
51	ALT	1	Internal resistor A latch
52	Vss	-	Ground
53	REF V	0	REF V sync output
54	PBV	0	PB V sync output
55	TBC HOLT IN	1	TBC mute control
56	SP LOCK	0	Spindle lock detection signal
57	JP CTL	1	Track jump selection signal. "H" "TL" "L" MFI
58	FQSEL	1	Frame No./Sub-Q data selection signal
59	FOACK	1	Frame No./Sub-Q data output control. "H": Data output
60	FREQ	0	Frame No. read OK
61	MRST	1	Reset signal input
62	FSC2	0	Clock to the mechanism controller
63	FH2	0	Clock to the mechanism controller
64	DSP SEL	1	Selection of communication with DSP
65	MECH CLK	1	Serial transfer clock
66	MECH SOI	1	Serial transfer data input
67	MFCCK SOI	0	Serial transfer data output
68	FQD OUT	0	Frame No./Sub-Q data output
69	MC SO LINE SEL	1	When "H": Communication between the mode controller and the mechanism
70	MMI TO MC CLK	1	Communication clock from the mode controller
71	MC SO	0	Transfer data to the mode controller
72	MC SI	1	Reception data to the mode controller
73	VDD	-	+5V
74	SUB CLK	0	Sub-Q read out clock output
75	SUBQ	1	Sub-Q input
76	DSPCK	0	Serial data transfer clock output to DSP
77	FG START	1	FG count start signal input. When CLV disc starts to search
78	FG SEARCH	1	"H": When CLV disc search
79	---	-	Not used (Open)
80	---	-	Test pin. Normally "L"

SECTION 7

ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts on page from 7-8.

7-1. LIST OF SERVICING JIGS

- Oscilloscope
- Color monitor TV
- Digital voltmeter
- Frequency counter
- LD alignment disc HLV-8 (8-797-008-00) NTSC Ref. Disc 8
- Video CD test disc HLV-401 (4-978-510-01)

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 (\triangle)).
- When laying the unit down sideways, perform adjustment with the left side down and turn the power ON.
- When adjusting the servo system, be sure to set up the unit horizontally.

7-3. POWER BLOCK CHECK

7-3-1. Power Supply Check (Power Block (SR-582Y))

Mode	Stop
Measuring equipment	Digital voltmeter
UNREG +16V check	
Measurement point	Pin ⑪ of CN201 (Pin ⑬, GND)
Specified value	$15.7 \pm 1.5V$
UNREG -16V check	
Measurement point	Pin ⑮ of CN201 (Pin ⑬, GND)
Specified value	$-16.0 \pm 1.5V$
REG +5V check	
Measurement point	Pin ③ of CN201 (Pin ⑬, GND)
Specified value	$5 \pm 0.3V$
REG +12V check	
Measurement point	Pin ⑱ of CN201 (Pin ⑬, GND)
Specified value	$12 \pm 1.5V$
REG -12V check	
Measurement point	Pin ⑳ of CN201 (Pin ⑬, GND)
Specified value	$-12 \pm 1.5V$
REG -5 check	
Measurement point	Pin ⑥ of CN201 (Pin ⑬, GND)
Specified value	$-5 \pm 0.3V$
EVER +5V check	
Measurement point	Pin ① of CN201 (Pin ⑬, GND)
Specified value	$5 \pm 0.3V$

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

7-4. SYSTEM CONTROL SYSTEM ADJUSTMENT

7-4-1. Microprocessor Clock Adjustment (MB-73 board)

Mode	Stop
Measurement point	Emitter of Q153 (Pin ② of IC204)
Measuring equipment	Frequency counter
Adjusting element	CT151
Specified value	$14,318,180 \text{ Hz} \pm 40 \text{ Hz}$

Adjustment method:

- 1) Adjust CT151 to $14,318,180 \text{ Hz} \pm 40 \text{ Hz}$.

7-5. ADJUSTMENT AFTER THE ATTACHMENT OF THE OPTICAL PICK-UP BLOCK

7-5-1. 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
 - Eccentric screwdriver 4 ϕ (J-6095-029-A)
- ※ Insert the terminal of MD adjusting cable to CN702 on the MB-73 board.

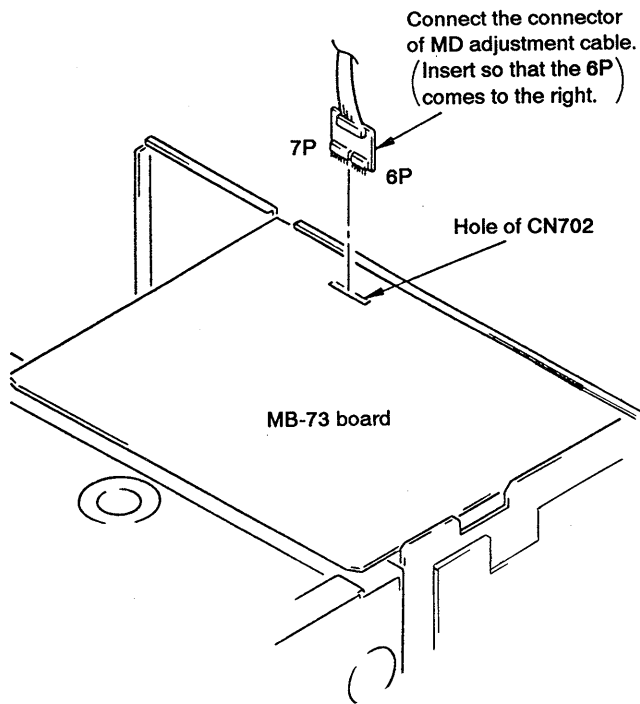


Fig. 7-1.

- ③ Press the STOP button (■) to stop the CD (YEDS-18).
- ④ Press the OPEN/CLOSE button (△) to draw out the disc tray.
- ⑤ Loosen three screws on the feed base block assembly.

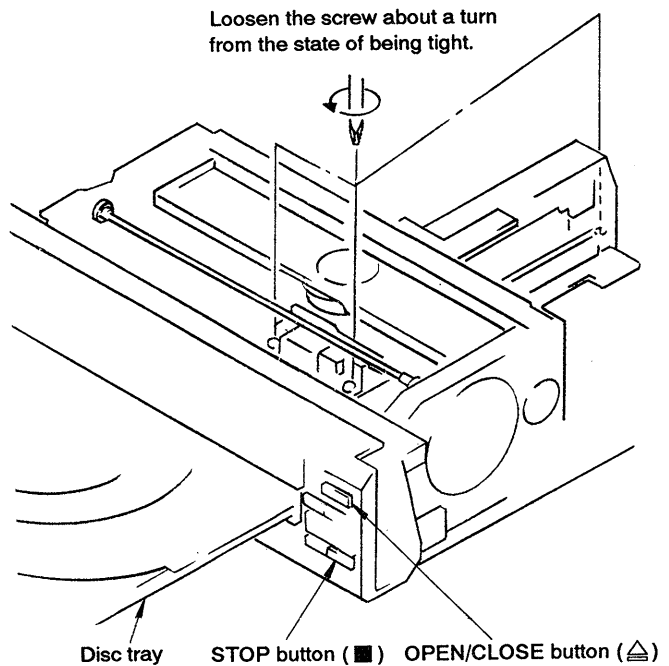


Fig. 7-3.

7-5-2. CD Adjustment

- ① Playback the CD alignment disc (YEDS-18) and press the Pause button (■) about three seconds later.
- ② Connect the oscilloscope to LD RF of the MD adjustment cable to see if the waveform shown below again.

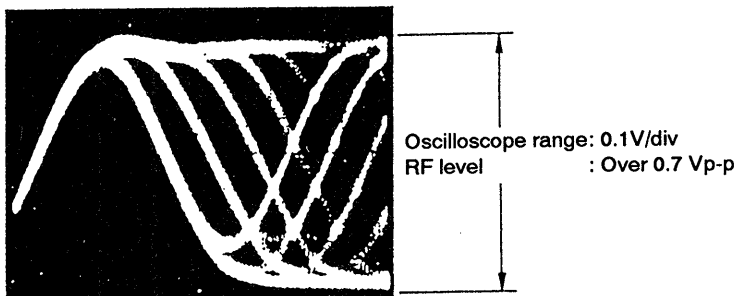


Fig. 7-2.

- ⑥ Loosen three screws on the spindle motor.

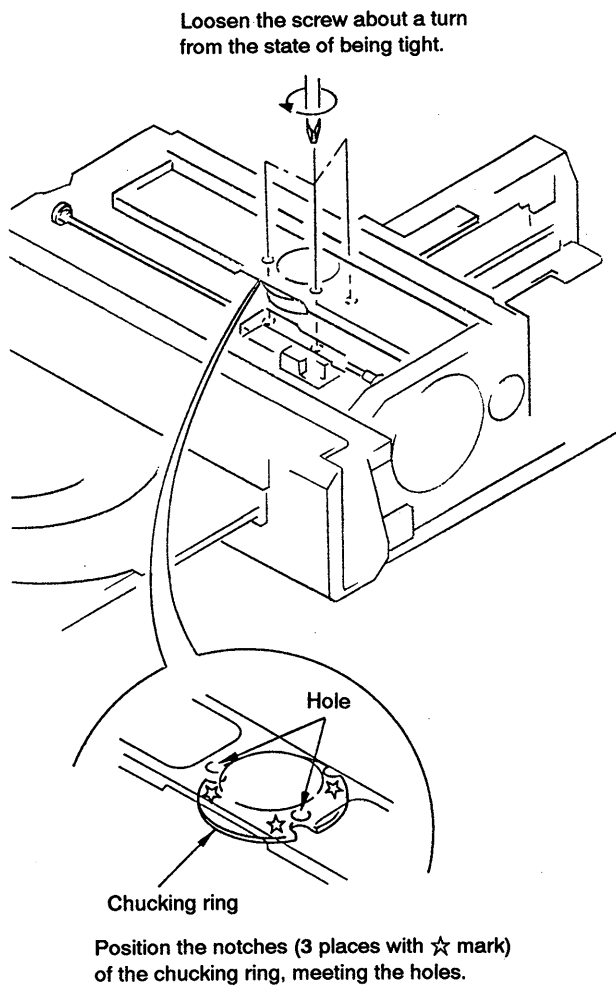
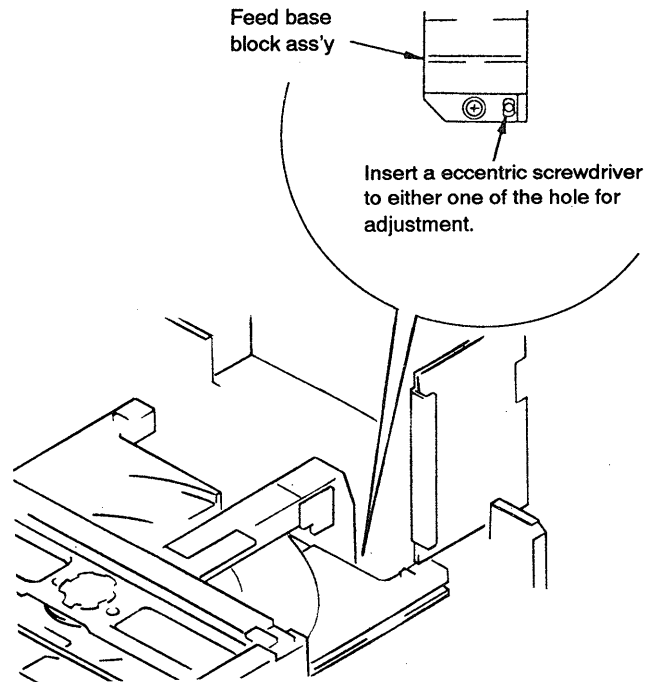


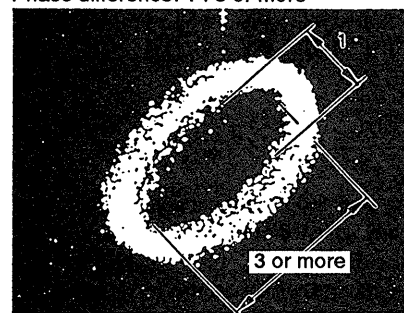
Fig. 7-4.

- ⑦ Again, plate the CD (YEDS-18) in the playback status.
- ⑧ Connect the oscilloscope to the terminals E and F of MD adjustment cable, and turn off the SLED and TRACKING switches.
- ⑨ Insert an eccentric screwdriver into the feed base block assembly for RD adjustment.
- ⑩ After adjustment, turn on the SLED and TRACKING switches.
- ⑪ Remove the CD (YEDS-18), and tighten three screws on the spindle motor, then three screws on the feed base block assembly.



Jig terminal : E, F
 Mode : TRACKING, SLED OFF
 Oscilloscope : X/Y Lissagous range
 (Each 20 mV/div.)
 Phase difference: 1 : 3 or more

Before adjustment



↓ Make the figure straight.

After adjustment

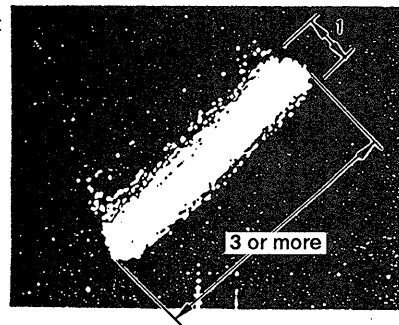


Fig. 7-5.

7-6. SERVO SYSTEM ADJUSTMENTS

TRACKING BAL check

7-6-1. LD Side A 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 RV701 so that the RF waveform goes maximum in the state the TRACKING and SLED are ON.

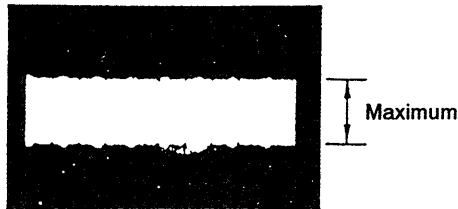


Fig. 7-6.

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

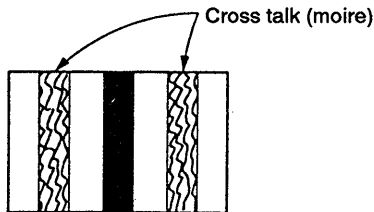
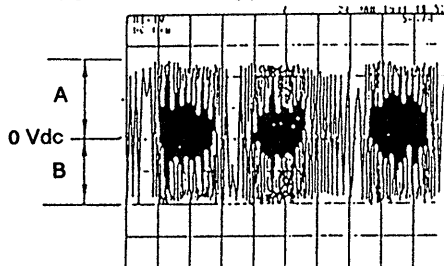


Fig. 7-7.

- ⑤ Tracking gain and focus gain adjustment 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

$$-6 \leq \frac{A - B}{2(A + B)} \times 100 (\%) \leq 9$$

Fig. 7-8.

Note: The last code-C of parts No. for MD adjustment cable will be assigned with TRK ERR Y1 and Y2 (⊖ part). In this case, use the Y1 terminal.

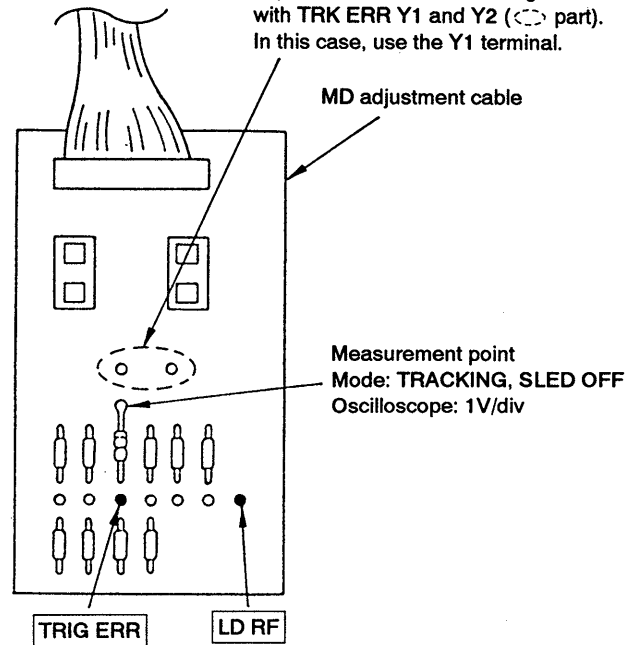
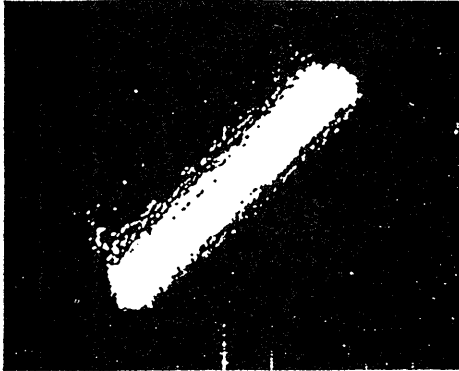


Fig. 7-9.

7-6-2. LD Side B 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, playback it and pause at the chapter 3 (#2201).
- ③ Turn off the SLED and TRACKING, and adjust inserting an eccentric screwdriver to B RD adjustment hole so that the Lissagous waveform meets standard.



Jig terminal : E, F
 Mode : TRACKING, SLED OFF
 Oscilloscope : X/Y Lissagous range
 (Each 20 mV/div.)
 Phase difference: 1 : 3 or more

Fig. 7-10.

- ④ Connect an oscilloscope to LD RF terminal on the MD adjustment cable and adjust RV702 so that the RF waveform goes maximum in the state the TRACKING and SLED are on.

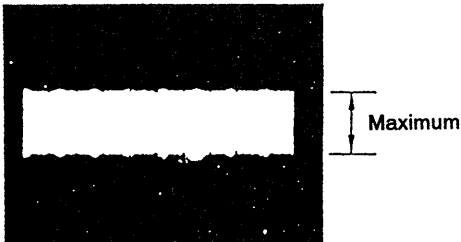


Fig. 7-11.

- ⑤ Insert an eccentric screwdriver to B TAN adjustment hole and adjust the RF waveform goes maximum similarly to the step 4.
- ⑥ Play #770 and pause.
 At this time in the same manner as the side A, check that the vertical bar appears on TV monitor and right and left crosstalks (moire) are the same level and maximum.
- ⑦ Take out the disc to tighten B TAN and RD screw.

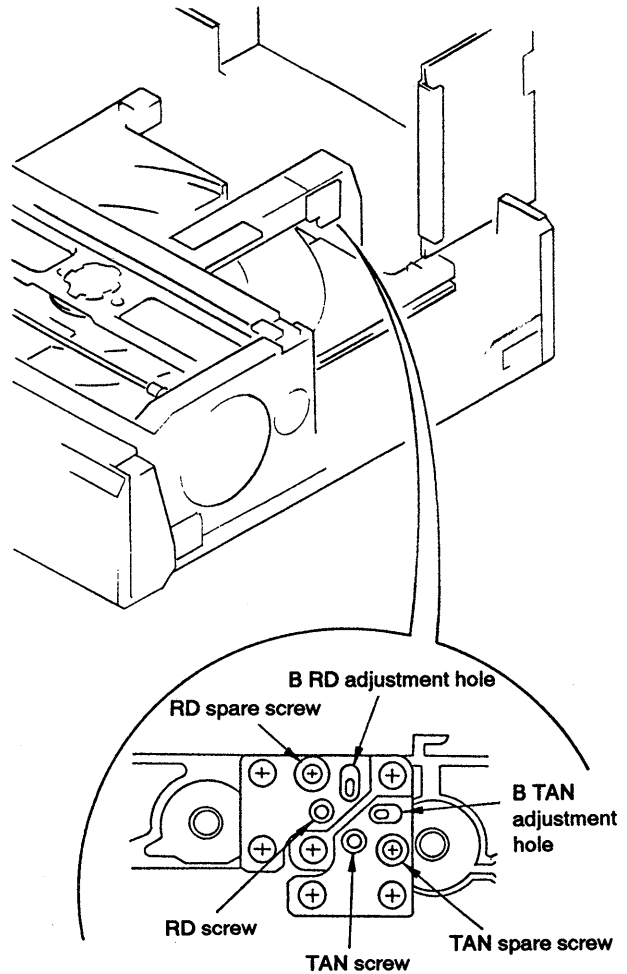


Fig. 7-12.

7-7. VIDEO SYSTEM ADJUSTMENTS

7-7-1. LD Output Level Adjustment (MB-73 board)

Mode	Still
Signal	LD alignment disc HLV-8 Frame No. 4100 (Color bar)
Measurement point	J001 (VIDEO OUT 1 terminal) (Be sure to terminate at 75 Ω)
Measuring equipment	Oscilloscope
Adjusting element	RV101
Specified value	1.00 ± 0.02 Vp-p

Adjusting method:

- 1) Press the still (STILL/STEP ◀ |||) button on remote commander.
- 2) Search the frame No. 4100 and apply a color bar signal.
- 3) Adjust RV101 to 1.00 ± 0.02 Vp-p.



Fig. 7-13.

7-7-3. Video CD Output Level Adjustment (VX-702 board)

Mode	Still
Signal	Video CD test disc (HLV-401) Track No. 41 (White 100%)
Measurement point	J001 (VIDEO OUT 1 terminal) (Be sure to terminate at 75 Ω)
Measuring equipment	Oscilloscope
Adjusting element	RV102
Specified value	1.00 ± 0.02 Vp-p

Adjusting method:

- 1) Press the still (STILL/STEP ◀ |||) button
- 2) Search the track No. 41 and apply a white 100% picture signal.
- 3) Adjust RV102 to be 1.00 ± 0.02 Vp-p.

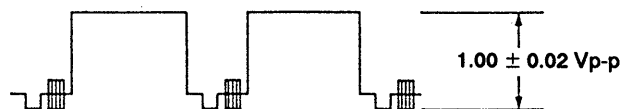


Fig. 7-14.

7-7-2. Video Clock Adjustment (VX-702 board)

Mode	Stop (State of the equipped video CD disc)
Measurement point	Pin ① of IC106
Measuring equipment	Frequency counter
Adjusting element	CT101 (NTSC) CT102 (PAL)
Specified value	NTSC : 3,579,545 Hz \pm 10 Hz PAL : 4,433,618 Hz \pm 10 Hz

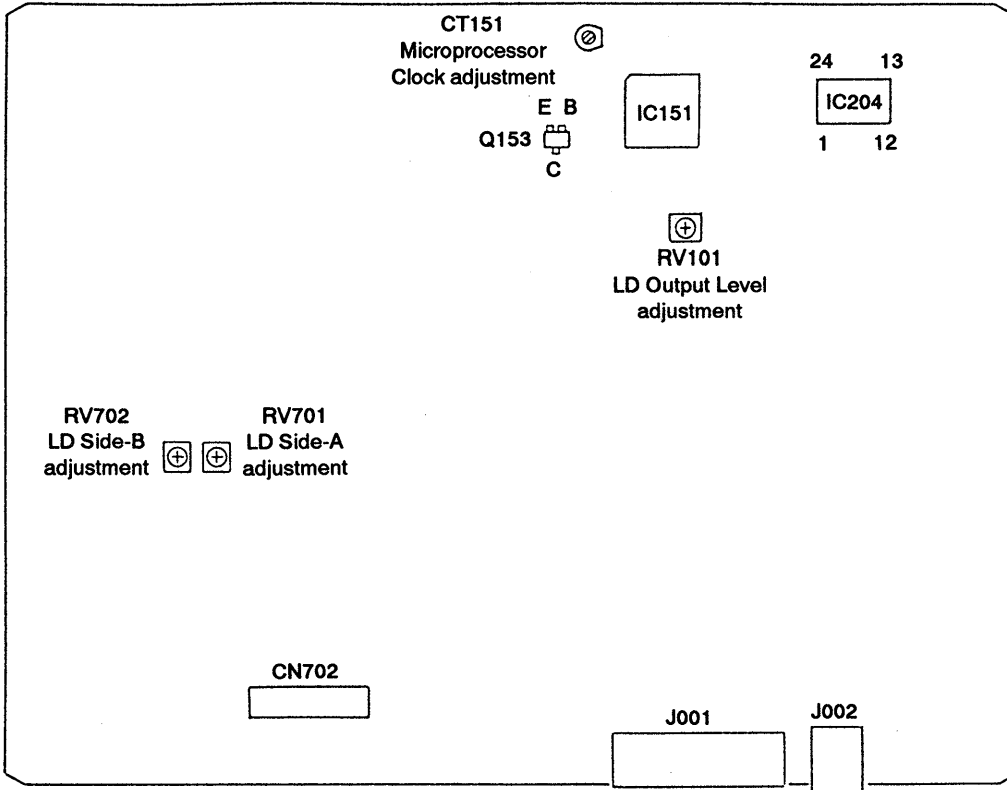
Adjusting method:

- 1) Put a video CD test disc (HLV-401) or a video CD disc on the market.
- 2) Set the COLOR SYSTEM switch (S101) to NTSC.
- 3) Adjust CT101 to be 3,579,545 Hz \pm 10 Hz.
- 4) Set the COLOR SYSTEM switch (S101) to PAL.
- 5) Adjust CT102 to be 4,433,618 Hz \pm 10 Hz.

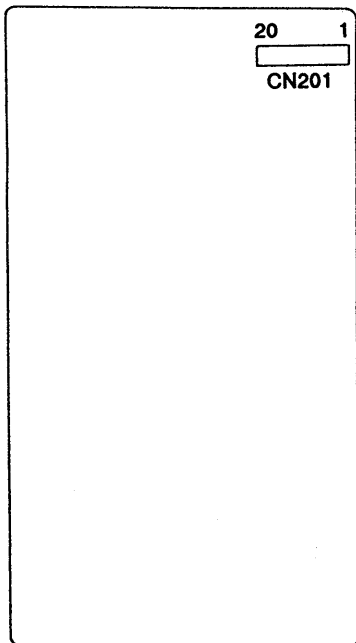
Note: This selector can be set only when the power is turned off.

7-8. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

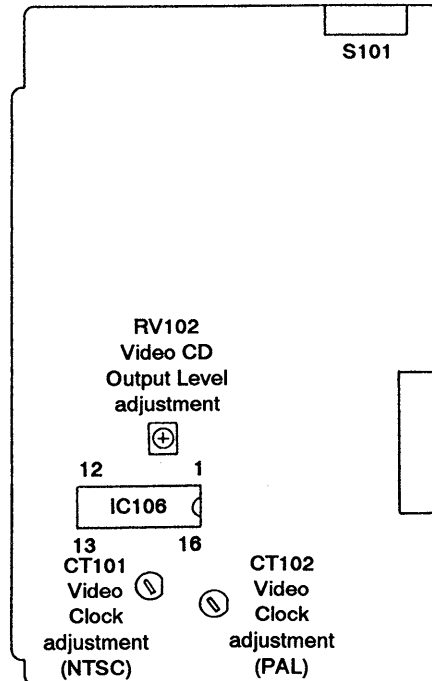
MB-73 BOARD (COMPONENT SIDE)



POWER BLOCK (COMPONENT SIDE)



VX-702 BOARD (COMPONENT SIDE)



第7章 调整方法

在调整时，请参阅7-8页调整元件的排列图。

7-1. 维修工具表

- 示波器
- 彩色监视电视
- 数字式电压表
- 频率计算器
- LD校正光碟HLV-8 (8-797-008-00) NTSC基准光碟8
- 视频CD测试光碟HLV-401 (4-978-510-01)

7-2. 调整时的预防措施

- 当维修机台时的位置为直立时，不可执行进碟/卸碟的操作，(切勿按下OPEN及CLOSE按钮(≡))。
- 当机台直立置放时，执行调整时左边应朝下，同时把电源接通。
- 调整伺服系统时，须确定机台为横向置放。

7-3. 电源组件的检查

7-3-1. 检查电源供应 (电源组件 (SR-582Y))

状态	停止
测试仪器	数字式电压表
检查 UNREG +16V	
测试点	CN201的脚 ⑪ (脚 ⑬, GND)
规定值	15.7 ± 1.5V
检查 UNREG -16V	
测试点	CN201的脚 ⑮ (脚 ⑬, GND)
规定值	-16.0 ± 1.5V
检查 REG +12V	
测试点	CN201的脚 ⑱ (脚 ⑬, GND)
规定值	12 ± 1.5V
检查 REG -12V	
测试点	CN201的脚 ⑳ (脚 ⑬, GND)
规定值	-12 ± 1.5V
检查 REG +5V	
测试点	CN201的脚 ③ (脚 ⑬, GND)
规定值	5 ± 0.3V
检查 REG -5V	
测试点	CN201的脚 ⑥ (脚 ⑬, GND)
规定值	-5 ± 0.3V
检查 EVER +5V	
测试点	CN201的脚 ① (脚 ⑬, GND)
规定值	5 ± 0.3V

- 确定电源电压符合各个规定值。

7-4. 系统控制的系统调整

7-4-1. 微处理器时钟的调整 (MB-73 电路板)

状态	搜寻
测试点	Q153的射极 (IC204的脚 ②)
测试仪器	频率计算器
调整元件	CT151
规定值	14,318,180 ± 40Hz

调整方法:

- 1) 调整CT151至14,318,180 Hz ± 40Hz。

7-5. 连接光拾音组件后的调整

7-5-1. 来具与工具

- 六角形板子 (切向螺丝起子: 7-700-766-04)
- 示波器
- MD调整电缆 (J-6082-059-B)
- 8号基准校正光碟 (HLV-8: 8-797-008-00)/LD YEDS-18 (3-702-101-01) 或相等的/CD
- 偏心螺丝起子 4φ (J-6095-029-A)
- * 把MD调整电缆插入MB-73电路板上的CN702插孔。

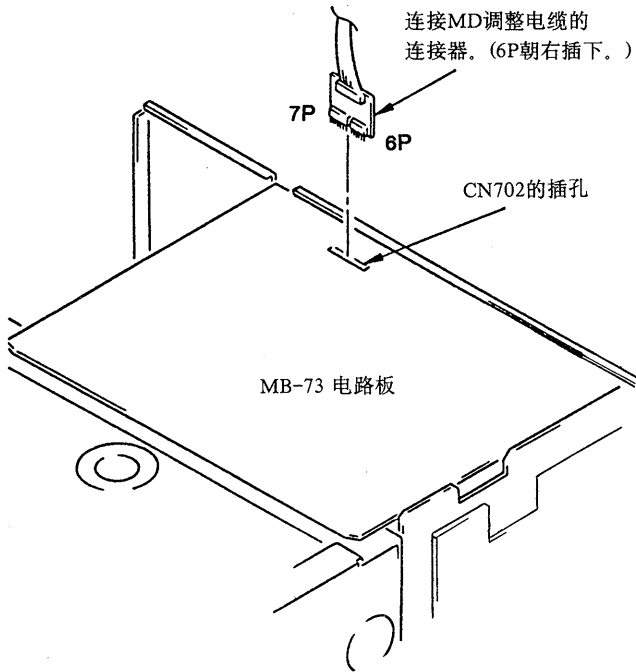


图 7-1.

- ③ 按STOP (■) 键使CD (YEDS-18) 停止播放。
- ④ 按OPEN/CLOSE (⊕) 键退出CD唱片托盘。
- ⑤ 松开馈电边组配件上的3根螺丝。

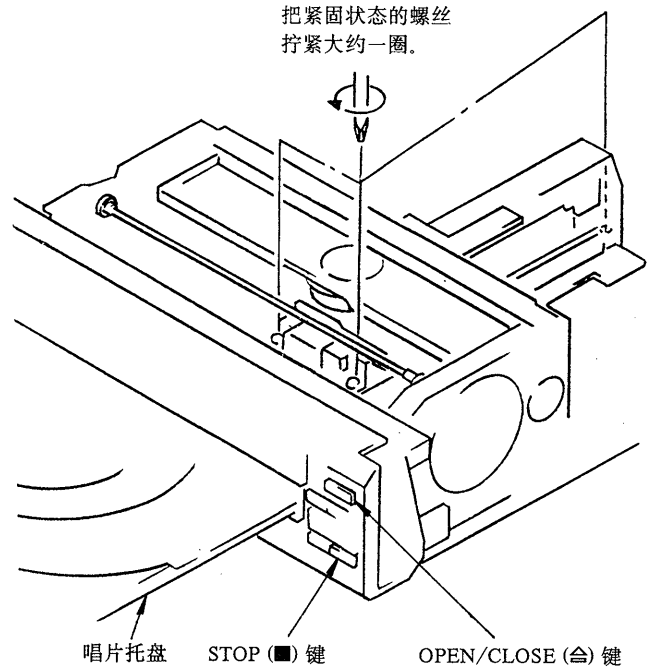


图 7-3.

7-5-2. CD的调整

- ① 重放CD校正光碟 (YEDS-18), 约3秒钟后按下 Pause (■) 按钮。
- ② 连接示波器至MD调整电缆的LD RF, 检查以下的波形是否再显现。



图 7-2.

⑥ 松开柱形马达上的3根螺丝。

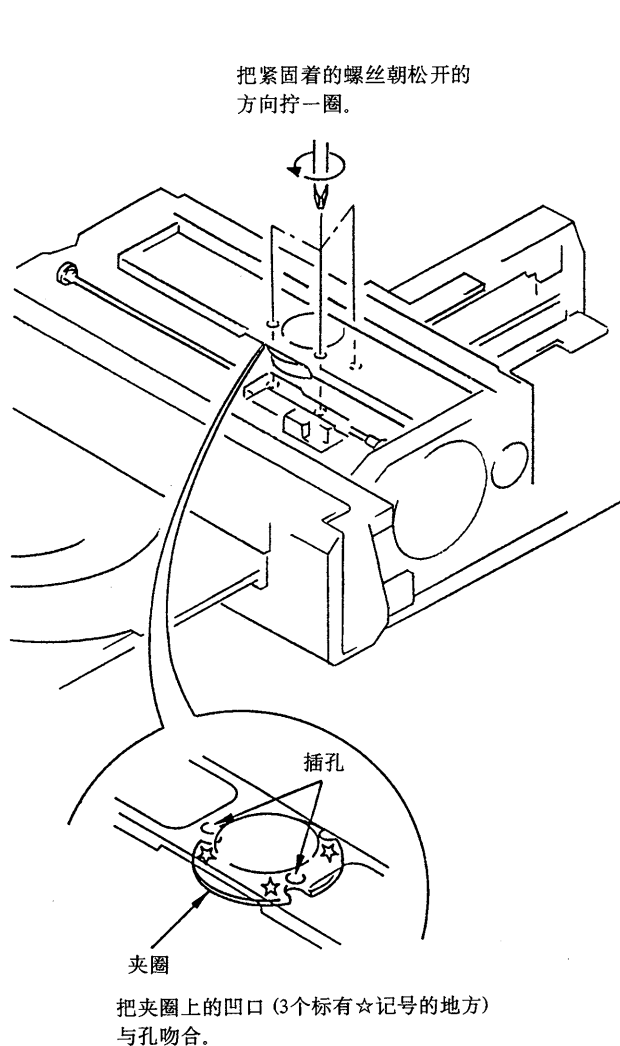
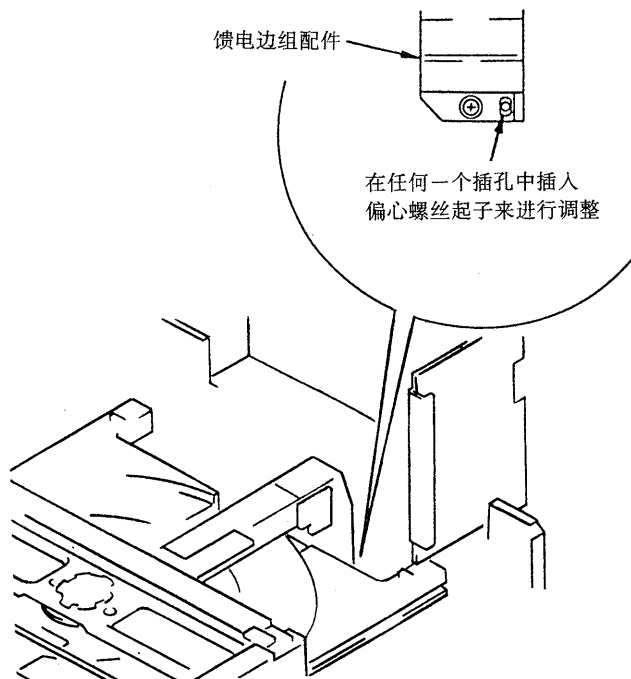


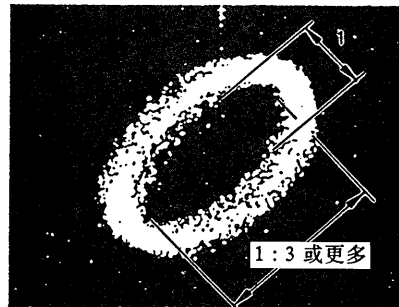
图 7-4.

- ⑦ 再播放CD (YEDS-18)。
- ⑧ 连接示波器至MD调整电缆的E和F端子，并关闭SLED和TRACKING开关。
- ⑨ 把偏心螺丝起子插入馈电边组配件进行RD调整。
- ⑩ 调整之后，打开SLED和TRACKING开关。
- ⑪ 取出CD (YEDS-18)，拧上柱形马达上的3根螺丝，再拧上馈电边组配件上的3根螺丝。



来具端 : E, F
 状态 : TRACKING, SLED OFF
 示波器 : X/Y 利萨如范围
 (个别为 20mV/div.)
 相位差 : 1:3 或更多

调整前



使图案成为竖直

调整后

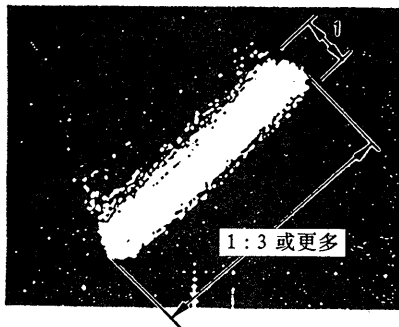


图 7-5.

7-6. 伺服系统的调整

TRACKING BAL的检查

7-6-1. LD的A面调整

- ① 把LD校正光碟HLV-8的CAV面放进机台的A面，然后播放开在第3章(#2201)时暂停播放。
- ② 连接示波器至MD调整电缆的LD RF端子，调整RV701使波形处于TRAKING及SLED ON (接通) 状态时为最大。

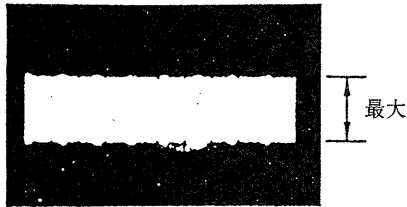


图 7-6.

- ③ 播放#770开暂停。
- ④ 检查显现在电视监视器上的垂直条及左右的串音(波动光栅)处于同电平开保持在最小。

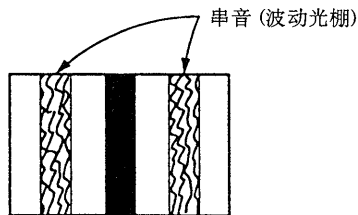
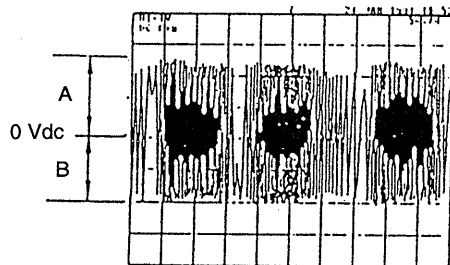


图 7-7.

- ⑤ 不需要调整跟踪增益及聚焦增益。
- 已在光拾音组件上调整 -
- ⑤ 检查跟踪平衡
用示波器的来具测量TRAKING ERR的Y端子的电阻。



检查是否符合

$$-6 \leq \frac{A - B}{2(A + B)} \times 100 (\%) \leq 9$$

图 7-8.

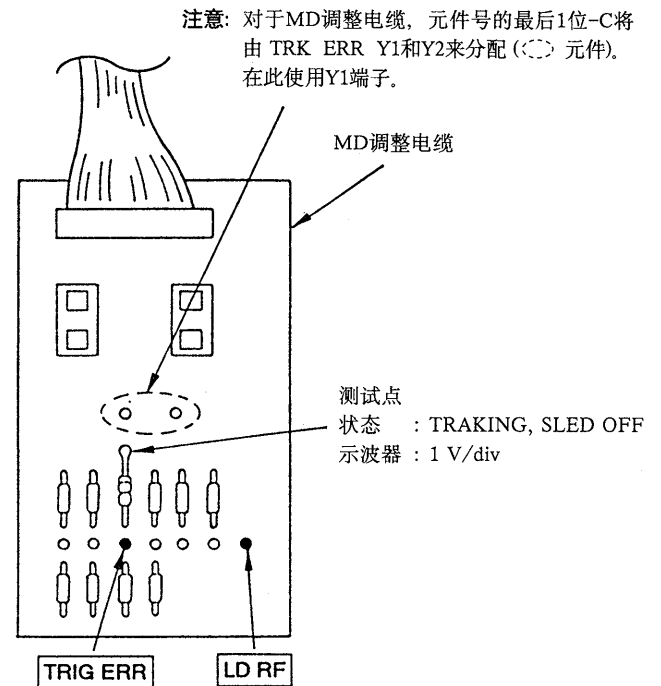
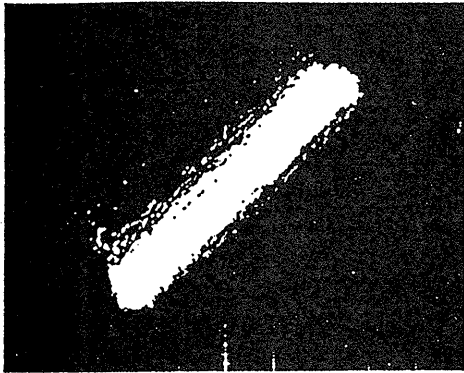


图 7-9.

7-6-2. LD的B面调整

- ① 松开馈电边的B面RD螺钉及TAN螺钉(六角形螺钉2.6)。
- ② 把LD校正光碟(HLV-8)的CAV面放进B面, 然后播放并在第3章(#2201)时暂停播放。
- ③ 把SLED及TRACKING断开, 插入偏心螺钉起子至B RD调整孔进行调整, 使利萨如波形达到标准。



夹具端 : E, F
 示波器 : X/Y 利萨如
 (个别为 20mV/div.)
 相位差 : 1:3 或更多

图 7-10.

- ④ 连接示波器至MD调整电缆的LD RF端子, 然后调整RV702, 使波形处于TRACKING及SLED ON状态时成为最大。

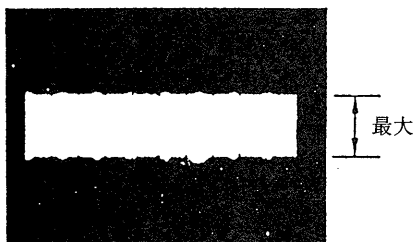


图 7-11.

- ⑤ 把偏心螺钉起子插入B TAN调整孔并调整RF波形至最大, 如步骤4所列。
- ⑥ 播放#770并暂停。
 这情况和 A 面相同, 检查显现在电视监视器上的垂直条及左右串音(波动光栅)处于同电平并保持在最大。
- ⑦ 取出光碟并拧紧B TAN及RD螺钉。

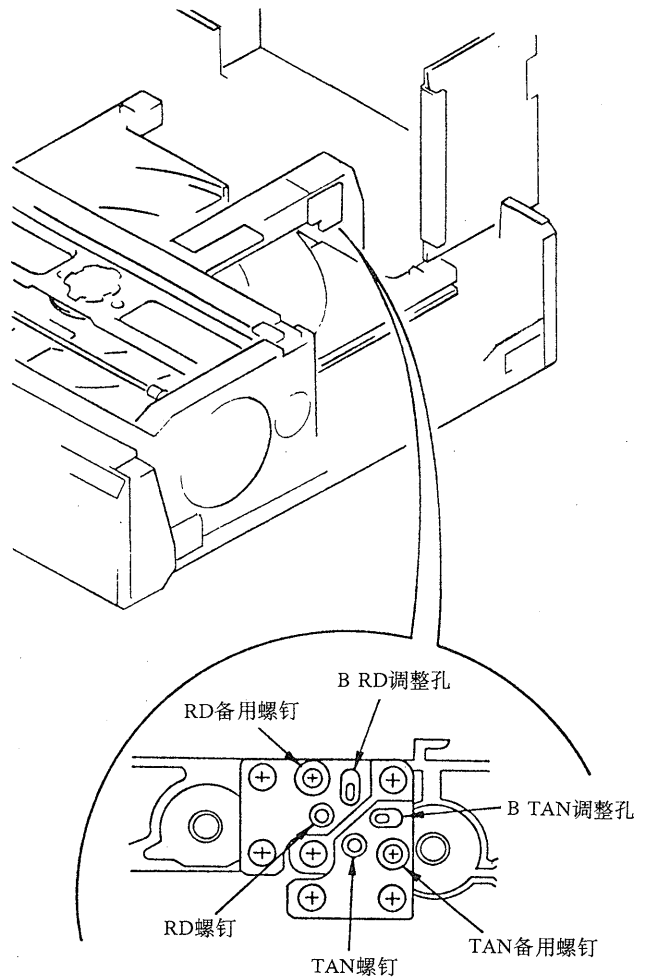


图 7-12.

7-7. 视频系统的调整

7-7-1. LD输出电平的调整 (MB-73电路板)

状态	静止
信号	LD标准光碟 HLV-8 帧4100 (彩条)
测试点	J001 (VIDEO LINE OUT 1 端子) (须确保终接在75 Ω)
测试仪器	示波器
调整元件	RV101
规定值	1.00 ± 0.02 Vp-p

调整方法:

- 1) 按下遥控器上的静止 (STILL: ◀|||) 键。
- 2) 搜寻帧4100并加上彩条信号。
- 3) 调整RV101至 1.00 ± 0.02 Vp-p。

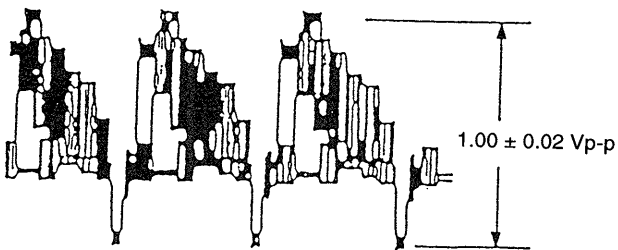


图 7-13.

7-7-3. 视频CD输出电平的调整 (VX-702电路板)

状态	静止
信号	视频CD测试光碟 (HLV-401) 轨道 No.41 (100% 白色)
测试点	J001 (VIDEO LINE OUT 1 端子) (须确保终接在 75 Ω)
测试仪器	示波器
调整元件	RV102
规定值	1.00 ± 0.02 Vp-p

调整方法:

- 1) 按下遥控器上的静止 (STILL: ◀|||) 键。
- 2) 搜寻轨道41并加上100%白色的图案信号。
- 3) 调整RV102至 1.00 ± 0.02 Vp-p。

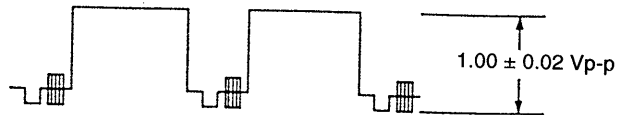


图 7-14.

7-7-2. 视频时钟的调整 (VX-702电路板)

状态	停止 (处于装配好视频CD光碟的状态)
测试点	IC106 的脚 ①
测试仪器	频率计算器
调整元件	CT101 (NTSC) CT102 (PAL)
规定值	NTSC : $3,579,545\text{Hz} \pm 10\text{Hz}$ PAL : $4,433,618\text{Hz} \pm 10\text{Hz}$

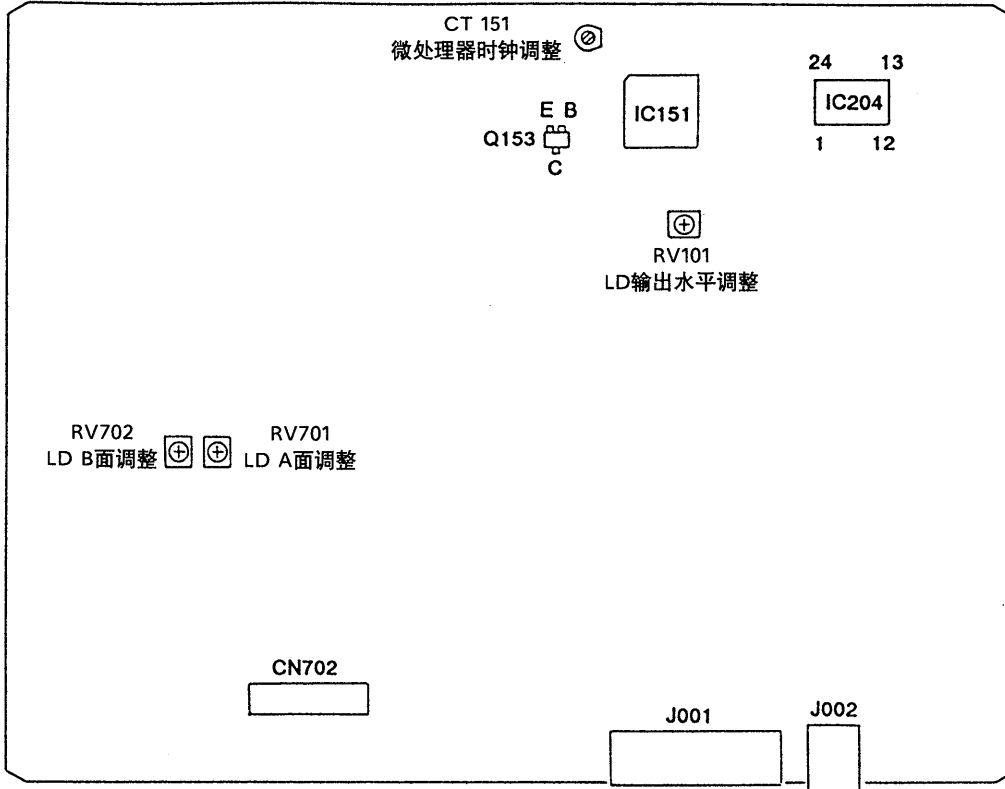
调整方法:

- 1) 放入视频CD测试光碟 (HLV-401) 或市场上购买的视频CD光碟。
- 2) 设置彩色系统 (COLOR SYSTEM) 开关 (S101) 至NTSC。(E型号)
- 3) 调整CT101为 $3,579,545 \pm 10\text{Hz}$ 。
- 4) 设置彩色系统 (COLOR SYSTEM) 开关 (S101) 至PAL。(E型号)
- 5) 调整CT102 $4,433,618 \pm 10\text{Hz}$ 。(E型号)

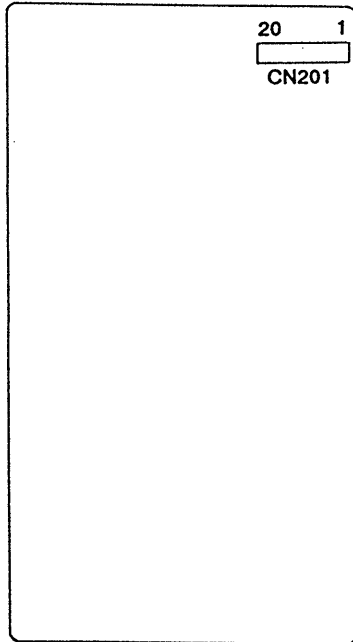
注意: 此选择开关只能在电源关闭时使用。

7-8. 调整元件的排列图

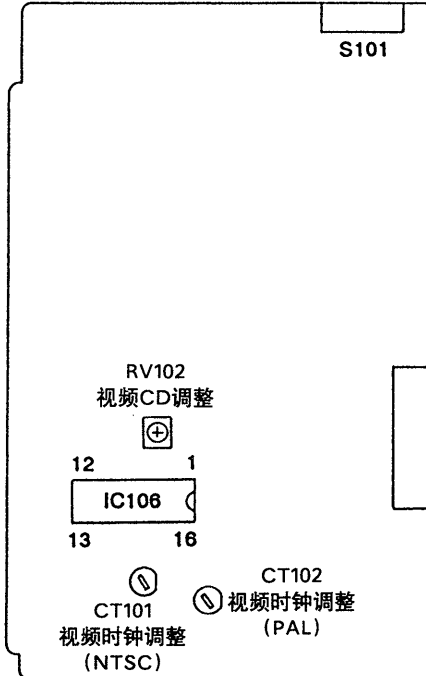
MB-73 电路图 (元件面)



电源板 (元件面)



VX-702 电路板 (元件面)



SECTION 8


EVALUATION OF OPTICAL PICK-UP BLOCK (KHS-150A)

- To evaluate whether the optical pick-up block (KHS-150A) is good or not good, perform as follows.


8-1. PREPARATION

Connect the jig (J-6082-059-B) to the CN702 on the MB-73 board. (For details of connection, see Fig. 7-1 on page 7-2, and for the jig, see Fig. 7-9 on page 7-4.)

8-2. RF LEVEL CHECK

- Connect an oscilloscope to the LD RF terminal of jig.
- Load the CD test disc (YEDS-18).
- Press the  button to activate the play mode.
- At this time, check if the RF waveform level is over 0.7V.
- When the RF waveform level is over 0.7V, go to "8-3. Tracking Level/Tracking Balance Check".
- If the RF waveform level is below 0.7V, clean the lens using the lens cleaning kit.
- After drying the lens completely, again check the RF waveform level. And if the RF level is still low, the laser diode in the optical pick-up block has deteriorated, or internal lens is dirty. Replace the optical pick-up block.

8-3. TRACKING LEVEL/TRACKING BALANCE CHECK

- Connect an oscilloscope to the TRK ERR Y terminal of jig.
- Unload the CD test disc (YEDS-18), and load the LD reference disc (HLV-8) instead.
- Press the  button to activate the play mode, and play the chapter 3.
- After playing, please set in the still status.
At this time, observe the tracking error waveform on the oscilloscope to check that both level and balance satisfy the specification given below.

Specification

Level: 3V or more

Balance: -6% to +9%

Note: For a calculation method of balance, see Fig. 7-8 on page 7-4.

8-4. CROSSTALK CHECK

- Play the CAV of the LD reference disc (HLV-8) to check the crosstalk at 770 frames.
(For details, see 7-3-1. LD Side A Adjustment on page 7-4.)
- Adjust the RV701 and RV702 on the MB-73 board so that the crosstalk becomes best condition (no moire observed).
- At this time, if the RV701 and RV702 rotated more than the angle shown in Fig. 8-1 (normally, the rotation angle is within $\pm 45^\circ$ from the center), the suspension (spring) of pick-up will be deformed. Playing the LD under this condition could cause the images to be disturbed in the vicinity of outside. Replace the optical pick-up.

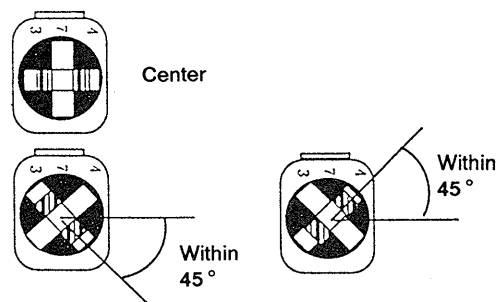


Fig. 8-1.

Notes:

- In executing the above operation, if no signal is output from each terminal of jig, the laser diode will be deteriorated. When red beam is not generated from the lens during the focus search, replace the optical pick-up block.
- The above checking uses basically the reference disc, and if no particular abnormality is found, a failure which occurs in the user's disc only may be present. Especially, in the case of LD, if a wavy tracking error as shown in Fig. 8-2 appears, the pick-up is resonating. Replace it with a new one.

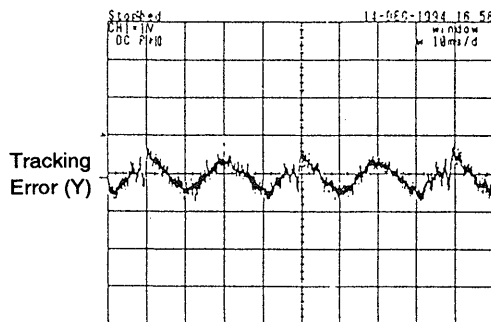


Fig. 8-2. Play Mode


第8章 光拾音组件 (KHS-150A) 的性能评估

- 为了确认光拾音组件 (KHS-150A) 是否良好, 请按下述内容进行检测。


8-1. 准备

把夹具 (J-6082-059-B) 接到 MB-73 电路板上的 CN702 上。(详细的连接方法请参照 7-2 页上的图 7-1, 有关夹具请参照 7-4 页上的图 7-9。)

8-2. RF水平检测

1. 连接示波器至夹具的 LD RF 端子。
2. 放入 CD 测试光碟 (YEDS-18)。
3. 按下  键起启动播放方式。
4. 此时请检查 RF 波形水平是否超过 0.7V。
5. 当 RF 波形水平超过 0.7V 时, 请进入 “8-3. 的跟踪水平和跟踪平衡的检测”。
6. 当 RF 波形水平低于 0.7V 时, 用镜片清洁用具清洁镜片。
7. 在镜片完全干燥之后, 再检查 RF 波形水平。如果 RF 的水平依然低于 0.7V 时, 说明光拾音组件中的激光二极管已经老化, 或者是内部镜片变脏。此种情况下, 请更换光拾音组件。

8-3. 跟踪水平/跟踪平衡检测

1. 连接示波器至夹具的 TRK ERR Y 端子。
2. 取出 CD 测试光碟 (YEDS-18), 放入 LD 校正光碟 (HLV-8)。
3. 按下  键起启动播放方式, 并播放第 3 段。
4. 播放之后, 设置光碟于静止状态。此时, 监视示波器上的跟踪出错波形以检测电平和平

特性指数

电平: 3V 以上

平衡: -6% 至 +9%

注意: 平衡的计算方法, 请参照 7-4 页上的图 7-8。

8-4. 串音检测

1. 播放 LD 校正光碟 (HLV-8) 的 CAV 面以检测在 770 幅的串音。
(详细说明请参照 7-4 页上的 7-3-1. 节 LD 的 A 面调整。)
2. 调整 MB-73 电路板是的 RV701 和 RV702 以使串音处于最佳状态 (不出现波动光栅)。
3. 此时, 如果 RV701 和 RV702 的调整角度大于图 8-1. 所示的角度时, (通常调整角度在以中心为基准的 $\pm 45^\circ$ 之内), 拾音组件的置 (弹簧) 已经变形。在此种情况下播放 LD 时, 附近可能会出现外沿部分有抖动情况的图象。请更换光拾音组件。

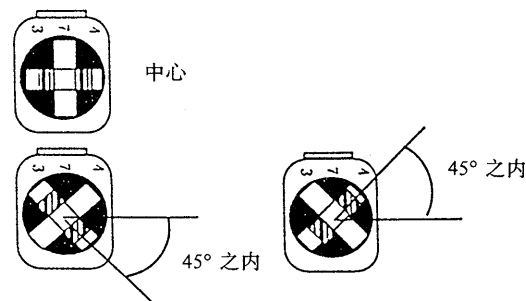


图 8-1.

注意:

- 在实行上述操作时, 如果夹具的每一个端子都没有输出信号的话, 激光二极管将被老化。如果在对焦时镜头中没有产生红色射线时, 请更换光拾音组件。
- 上述检测基本上使用校正光碟, 如果无特殊错误被发现, 只可能是使用者的光碟上有错。尤其是 LD 的情况, 如果图 8-2 所示的波动的跟踪出错出现时, 拾音组件产生了共振。请更换新的

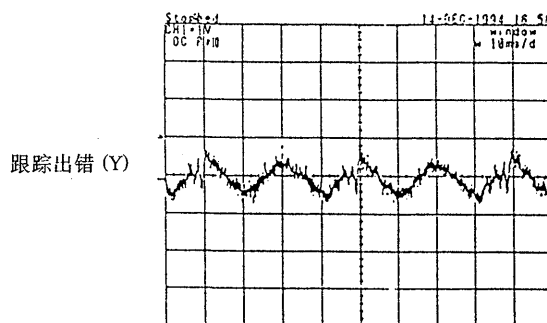


图 8-2. 播放方式

SECTION 9

INSTRUCTION MANUAL FOR SPECIAL FUNCTIONS




Introduction

The MDP-V9K is provided with special functions, in addition to its normal functions, for convenience and repair work.

In this manual, these functions are classified into three sections-“Debug Mode”, “Service Mode”, and “Expansion Key Mode” and explained.

The specifications given in this manual are subject to change without prior notice for upgrading, etc.

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1. OUTLINE

1-1. Debug Mode

The "Debug Mode" is a state in which the function (debug function) which displays microprocessor RAM information on the screen can be used.

This mode differs from the normal mode as follows.

- 1) The Fluorescent tube goes off when the commands of this mode are effective.
- 2) When the key of the remote control is pressed in the state of 1), debug information such as emergency history, etc., can be displayed. During this time, only some keys will be effective.

1-2. Service Mode

The "Service Mode" is a state in which the function (service function) which facilitates repairs and inspections can be used.

This mode differs from the normal mode as follows.

- 1) Special operations such as focus search, sled forwarding, etc. can be performed.
- 2) The power will not go off automatically even when emergencies which turn off the power occur.
- 3) When this mode is set, the debug mode will also be set automatically.

1-3. Expansion Key Function

The "Expansion Key Function" is the function which operates when several keys of the unit or remote control are pressed simultaneously for tests, etc. according to a set of procedures.

This function can be used in the service mode, debug mode, and in normal operations.

This function consists of the "Unit Key Simultaneous Pressing Function" used by pressing several keys of the unit simultaneously and the "Unit Key+Remote Control Key Simultaneous Pressing Function" used by pressing the unit key together with a key of the remote control twice.

2. DEBUG MODE

2-1. Setting the Debug Mode

To set the debug mode from the normal mode (normal state), press the [10/0] key and then the [STOP] key of the remote control while pressing the [STOP] key of the unit with the power on.

The following screen should be displayed.

This screen shows the microprocessor version. For details, refer to "2-4-1. Microprocessor Version".

So as to valid the debugging commands at the debugging mode, press the [10/0] key and then the [8] key of the remote control while pressing the [STOP] key of the unit. And the Fluorescent tube will be off while debug commands are effective.

So as to invalid the debugging commands at the debugging mode, press the [10/0] key and then [9] key of the remote control while pressing the [STOP] key of the unit. The Fluorescent tube will be on while debugging commands are not effective.

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	
1st line																									S T O P
2nd line	V	E	R																						
3rd line	M	M	I	-	9	6	2	A		0	4	/	1	5	A										
4th line																									
5th line	V	F	D	-	9	6	2	A		0	3	/	2	8	A										
6th line																									
7th line	M	C	M	-	9	6	2	A		9	6	0	4	1	2										
8th line																									
9th line	M	I	C	-	2	6	M	A	R	9	6	/													
10th line																									

Fig. 9-1. Debug Mode Initial Screen

2-2. Exiting the Debug Mode

To return to the normal mode from the debug mode, press the [CLEAR] key of the remote control at the screen shown in Fig. 9-2. (Microprocessor Version Screen).

Pressing this key as described in step 2-1 will also return the normal mode.

2-3. Switching the Screen Display

When the debug mode is set, the screen will display the "Debug Screen".

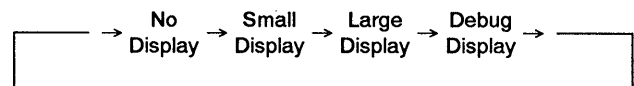
Press the [DISPLAY] key will switch it to the display format as in the normal mode.

In the debug mode, the display format can be selected from "No-Display" (normally nothing is displayed), "Small Display" (only the first line displayed)", "Large Display" (the whole screen is displayed constantly), and "Debug-Display".

When the [DISPLAY] key is pressed in the normal mode, the display will be switched as follows.



In the debug mode, it will be switched as follows



2-4. Reading the Debug Display

“Debug Display” shows information of the mode controller on the screen in dump list format.

The title is displayed at the left side of the screen at the second line, while the data is displayed from the third to the ninth lines.

The display format of the data is basically 4 hexadecimal characters (2 bytes) equals one set, and one line is composed of up to four sets (8 bytes).

When a certain key is pressed while the Fluorescent tube is off during “Debug Display”, the information to be displayed can be selected.

The information currently defined is as follows.

Table 9-1. Debug Display Key/Information Table

Key	Displayed Information
[FRAME/TIME]	Microprocessor version
[1]	Function mode history
[2]	Emergency history
[3]	Normal service mode information
[4]	Trap flag
[5]	Key/remote control data
[7]	Information on communication with mechanism controller
[REPEAT]	Operation information

2-4-1. [FRAME/TIME] Microprocessor Version

Displays the microprocessor version.

At the same time, displays the c-cube microprocessor cord version.

The third line displays the mode controller version, the fifth line displays the VFD controller version, and the seventh line displays the mechanism controller version.

The microprocessor cord version is displayed at the ninth line.

According to the example in Fig. 9-2, the mode controller version is “MMI-962A 04/15A”, the VFD controller version is “VFD-962A 03/28A”, the mechanism controller version is “MCM-962A 9604 12”, and the microprocessor cord version is “26MAR96”.

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
1st line																									S T O P
2nd line	V	E	R																						
3rd line	M	M	I	-	9	6	2	A		0	4	/	1	5	A										
4th line																									
5th line	V	F	D	-	9	6	2	A		0	3	/	2	8	A										
6th line																									
7th line	M	C	M	-	9	6	2	A		9	6	0	4		1	2									
8th line																									
9th line	M	I	C	-	2	6	M	A	R	9	6	/													
10th line																									

Fig. 9-2. Microprocessor Version

2-4-2. [1] Function Mode History

Displays the history of the function mode.

The function mode is the basic operation commands, such as STOP and PLAY, which are transmitted from the mode controller to the mechanism controller.

The function mode data is one byte each (hexadecimal 2 digits). 8 latest histories of the function mode can be stored at the one line, and up to 24 histories in three lines.

The data is stored byte by byte from left to right. The data [FF] is stored next to the last data stored. When the data reaches the right edge of the first line, it is stored from the left edge of the second line continuously. When it reaches the right edge of the third line, it returns to the left edge of the first line again.

The current (stored last) function mode is the data at the left side of the data [FF]. When this data [FF] is at the left edge of the first (second, third) line, the function mode will be the data at the right edge of the third (first, second) line.

The data [FE] indicates that an emergency has occurred there. To find out the type of emergency, refer to “2-4-3. Emergency History”.

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

Fig. 9-3. Function Mode History

In the case of Fig. 9-3;

- 01 (Power ON start-up)
- 20 (Stop)
- 30 (Side A start-up)
- FE (Emergency occurred)
- 50 (Chapter search)
- 60 (Playback)
- 70 (Normal direction low speed scan)
- 60 (playback)
- 20 (Stop) (Current function mode)

The function mode changed in the above order.

The following page shows the function mode list.

Table 9-2. Function Mode List

No.	State	Description	
00 01	Power OFF Power ON start-up	During initialization when power is turned on	
10 20	Open Stop	Opens the door and ejects the tray Draws in the tray and stops the spindle	
30 40	Side A playback standby Side B playback standby	From stop, etc. to immediately before side A search From stop, etc. to immediately before side B search	
50 51	Chapter search Frame/time search	Chapter search including disc top search CAV frame search/other time search	
60 61	Playback Instantaneous stop	PLAY PAUSE	
70 71 72 73	Normal direction low speed scan Normal direction high speed scan Reverse direction low speed scan Reverse direction high speed scan	> > > > > < < < < <	
80 81 82 83 84 85 86 87 88 89 8A 8B 8C	Normal direction still Normal direction step Normal direction 1/90 speed playback Normal direction 1/30 speed playback Normal direction 1/16 speed playback Normal direction 1/8 speed playback Normal direction 1/4 speed playback Normal direction 1/2 speed playback Normal direction × 1 speed playback Normal direction × 2 speed playback Normal direction × 3 speed playback Normal direction × 5 speed playback Normal direction × 10 speed playback	STILL Forwards one frame	Only CAV is effective from 80 (Normal direction still) to 9C (Reverse direction × 10 speed playback)
90 91 92 93 94 95 96 97 98 99 9A 9B 9C	Reverse direction still Reverse direction step Reverse direction 1/90 speed playback Reverse direction 1/30 speed playback Reverse direction 1/16 speed playback Reverse direction 1/8 speed playback Reverse direction 1/4 speed playback Reverse direction 1/2 speed playback Reverse direction × 1 speed playback Reverse direction × 2 speed playback Reverse direction × 3 speed playback Reverse direction × 5 speed playback Reverse direction × 10 speed playback	STILL Returns one frame	
FE FF	Emergency occurred Next to last data	Some kind of emergency occurred Last history data	

2-4-3. [2] Emergency History

Displays the history of emergency codes occurred. The emergency code is 1 byte data transmitted to the mode controller when problems occur in the mechanism controller. Like [64 (Minimum chapter detection)], some codes only indicate the state code level. Codes above [80] are generated in the mode controller itself and are not transmitted from the mechanism controller. If emergency has not occurred once since the power cord was inserted in the outlet, all the data will be [00]. The display format is the same as the function mode history. 16 sets are stored in 2 lines. The emergency code immediately before the data [FF] corresponds to the data [FE], which is closest to the data [FF] in the function mode history.

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

Fig. 9-4. Emergency History

According to the above example, as next to [FF] is the left edge 60, it can be seen that the emergency occurred in the following order.

- 60 (Read-in detection)
- 74 (Focus drop)
- 64 (Minimum chapter detection)
- 61 (Read-out detection)
- 64 (Minimum chapter detection)
- 64 (Minimum chapter detection)
- 74 (Focus drop) (Emergency immediately before).

The following page shows the emergency code list.

Table 9-3. Emergency Code List

No.	State	Operation After Occurring
01	Forced power OFF request	POWER OFF
02	Forced tray ejection request	EJECT
03	STOP request	STOP
04	STOP request during forced door open	STOP
05	PLAY request	PLAY
06	Power OFF shift finalization request	POWER OFF display fixed
07	Power OFF request after communication stop	POWER OFF
08	Front door does not move	POWER OFF
09	Door open when in tray open	POWER OFF
10	Tray push detection	PLAY
11	Tray does not move	POWER OFF
20	Sleder does not move	POWER OFF
30	TILT does not move	POWER OFF
31	TILT does not move and counter measure is executed	None
40	Spindle FG detection erasure	POWER OFF
41	Not transmitted from FG to H servo	STOP
42	When upper limit speed is exceeded	STOP
43	When lower limit speed is exceeded	STOP
44	Spindle STOP operation does not end	POWER OFF
45	Spindle control time-out	POWER OFF
50	Focus is not imposed	STOP
51	Focus is not imposed (Disc present)	STOP
52	Determined as not LD	None
53	8 inch LD focus not imposed	STOP
54	CD/CDC TOC not read	STOP
60	Read-in detection	PLAY, etc.
61	Read-out detection	STOP/PAUSE, etc.
62	CDV A part read-out detection	STOP/PAUSE, etc.
63	Picture stop detection	STILL
64	Minimum chapter detection	None
65	CD/CDV subcode not read	STOP
66	LD phillips code not read	STOP
67	Locked groove countermeasure is executed	None
70	Over-search detected	PLAY
71	Under search detected	PLAY
72	Search time-over	PLAY
74	Search focus drop	STOP
76	Retry executed after focus drop	None
80	(The following emergencies occurred inside the mode controller.) Emergency time-out	POWER OFF
81	Search time-out	PLAY
82	Mechanism controller communication time-out	POWER OFF
86	12V power supply error	Unplug the AC power cord

2-4-4. [3] Mechanism Controller Service Information

Displays the service information transmitted from the mechanism controller.

Currently, the information in Table 9-4 is defined.

The data number in the table correspond to the number of the third to fifth lines in Fig. 9-5.

Table 9-4. Mechanism Controller Service Information

Data No.	Data
(02)	Mechanism mode (Mechanism controller internal mode) For details, refer to the next page.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1st line																								S T O P
2nd line	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. 9-5. Mechanism Controller Service Information

Mechanism Mode

The mechanism mode is the basic operation mode in the mechanism controller. The codes are more or less the same as the function mode, but divided more in detail than the function mode.

The following is the mechanism mode list.

Table 9-5. Mechanism Mode List

No.	Function
00	POWER OFF
01	Mechanism controller initialization (No mechanism operations)
03	Processing from POWER ON to OFF
04	Processing from POWER OFF to ON
05	Mechanism and peripheral IC initialization
10	Tray, EJECT state
11	Ejecting tray
12	Loading tray
20	STOP state in chucked up state
21	Setting chuck up from side A chucking
22	Setting side A chuck up from chuck up
23	Side A chuck state
30	To side A focus lock
31	0 search and start up from focus lock
32	Moving from Side A/B to STOP
33	Reversing from side A to B
40	To side B focus lock
50	Chapter search
51	Frame/time search
60	Playback
61	Instantaneous stop
70	Normal direction low speed scan
71	Normal direction high speed scan
72	Reverse direction low speed scan
73	Reverse direction high speed scan
74	Scan completion process
80 to FF	(Same as function mode)

2-4-5. [4] Trap Flag

Displays the contents of the trap flag.
 The trap flag is data containing the reason why the power turned off abnormally other than when the POWER key was pressed. Trap flag is output from the VFD controller and mode controller. That flag from the VFD controller is the fourth digit from the left and that from the mode controller is the fourth digit from the right.
 The first byte of each from the right side (hexadecimal 2 digits) have meanings for each bit, and bit 1 corresponds to the reason why the power turned off abnormally the last time. The first byte from the left side is the same flag, and is the logic OR of the reasons why the power turned off abnormally in the past.

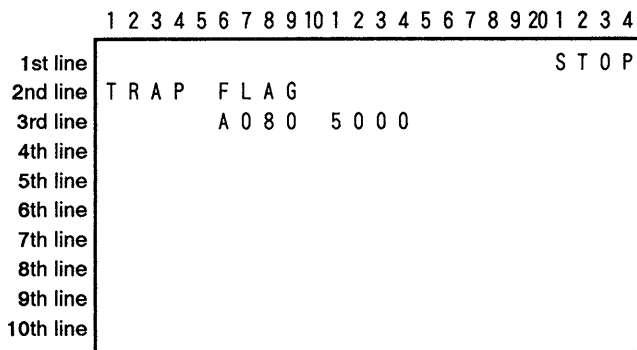


Fig. 9-6. Trap Flag

According to the above figure, it can be seen that in the past, 80 (power off due to abnormal voltage level) and 20 (power off due to mode controller communication error) occurred in the VFD controller, and 10 (power off due to mechanism controller communication error) and 40 (power off due to VFD controller communication error) occurred in the mode controller. The reason why the power turned off abnormally the last time is because 80 (power off due to abnormal voltage level) occurred in the VFD controller.

The bits of the flag have the following meanings.

Table 9-6. Trap Flag Bit/Reason Table

Bit No. (Pattern)	Reason
7 (80)	Power OFF due to abnormal voltage level
6 (40)	Power OFF due to VFD controller communication error
5 (20)	Power OFF due to mode controller communication error
4 (10)	Power OFF due to mechanism controller communication error
3 (08)	Power OFF due to emergency
2 (04)	Forced power OFF due to key operations
1 (02)	Reset due to mode controller self-diagnosis
0 (01)	Forced reset due to key operations

Note:

- The resetting of bits 0 and 1 means that the mode controller is initialized in the same state as when the power was turned on, except when the trap flag is stored. In this case, the function mode and emergency histories will be erased.
- Hexadecimal A is 2+8. In the same way, B=1+2+8, C=4+8. D=1+4+8, E=2+4+8, F=-1+2+4+8.

2-4-6. [5] Key/remote Control Data

Displays the data input using the keys of the unit and remote control as SIRCS codes.
 Only the remote control for MDP is effective.
 The first byte on the left side of the third line (hexadecimal 2 digits) in Fig. 9-7 is the SIRCS code in the key inputs, and the first byte from the right side is the SIRCS code in the remote control input.
 FF is set when nothing is pressed. When two keys are pressed together, the code of the one pressed faster will be shown. In current models, only the keys of the unit can be used and some keys have no SIRCS code. These are defined as internal codes for data above 80.

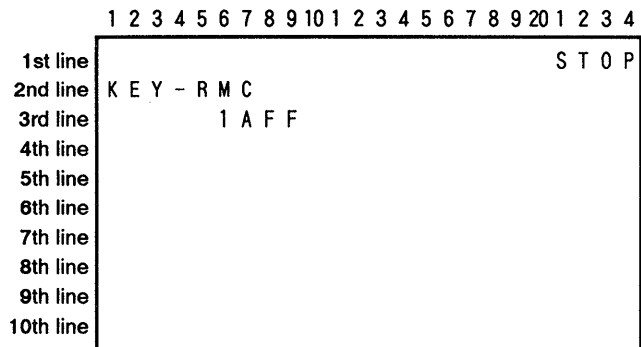


Fig. 9-7. Key/Remote Control Data

According to the above figure, it can be seen that the [1A (PLAY key)] of the unit is pressed, and the remote control is FF (nothing is pressed).

Take note for some remote controls, the code is generated instantaneously when the key is pressed.

The following next page shows a list of the SIRCS code used by MDP-V9K.

Table 9-7. List of MDP SIRCS Codes

No	Function
00	1
01	2
02	3
03	4
04	5
05	6
06	7
07	8
08	9
09	10/0
0C	Frame/time
0F	Clear
15	Power ON/OFF
16	Tray open/close (▲)
17	Audio monitor
18	Stop (■)
19	Pause (▨)
1A	Playback (▶)
1E	Reverse direction low speed scan (◀◀)
1F	Normal direction low speed scan (▶▶)
28	Time display (AV time)
29	Repeat
2B	Normal still/Frame forwarding (▨▶)
2C	Reverse still/Frame forwarding (◀▨)
30	Program
34	Normal direction ACS (▶▶▶)
35	Reverse direction ACS (◀◀◀)
38	Repeat AB
39	Number +10 (>10)
3A	Screen display (Display)
40	Analog/CX
41	Shuffle
45	Auto program
46	Auto pause
47	1/one side/both side
5D	Side A
5E	Side B
5F	Karaoke
60	Key control up
61	Key control standard
62	Key control down
65	11
66	12
67	13
77	14
79	15
7B	Next disc reservation (The following are expansion codes)
90	Vocal
92	Help vocal
94	Vocal select
95	External input
A7	Special effects mode selection
A8	Special effects mode execution
A9	Marker setting
AA	Marker call
AB	PBC return
AC	PBC selection
AD	Karaoke star
AE	Normal direction Video index search
AF	Reverse direction Video index search
FF	Not pressed

2-4-7. [7] Information on Communication with Mechanism Controller

Displays the communication data of normal text with the mechanism controller.
 The third to the fifth line is the text transmitted from the mode controller to the mechanism controller.
 The seventh to the ninth line is the text received from the mechanism controller by the mode controller.
 The [!] symbol at the head of the eighth and ninth line indicates that the text has been communicated normally.
 If the text was cut off halfway, the [?] is displayed. [■] is displayed when the communication was cut off after the communication for service, etc.

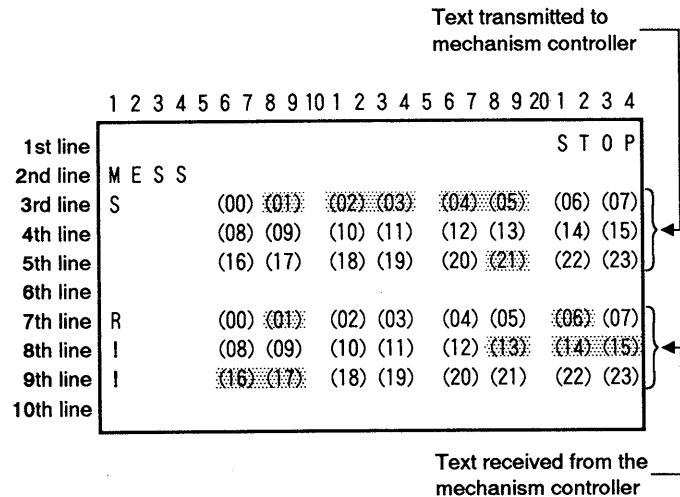


Fig. 9-8. Information Communicated with Mechanism Controller

The following is a part of the communicated text.

Table 9-8. Text Transmitted from Mode Controller to Mechanism Controller (Fig. 9-8. Top)

No.	Explanation
(01)	Current (Next) function mode
(02)	Last goal function mode
(03 to 05)	Search destination address (Time/frame)

Table 9-9. Text Received by Mode Controller from Mechanism Controller (Fig. 9-8. Bottom)

No.	Explanation
(01)	Current (Next) function mode
(06)	Completion flag of function mode shift (lowermost bit)
(13)	Current chapter/track number
(14)	Current index number
(15 to 17)	Current address (Time/frame)

2-4-8. [REPEAT] Operation Information

Displays the operation information

Displays the optical system operation time at the third line. The fourth to ninth lines show the number of SIRCS received in hexadecimal digits.

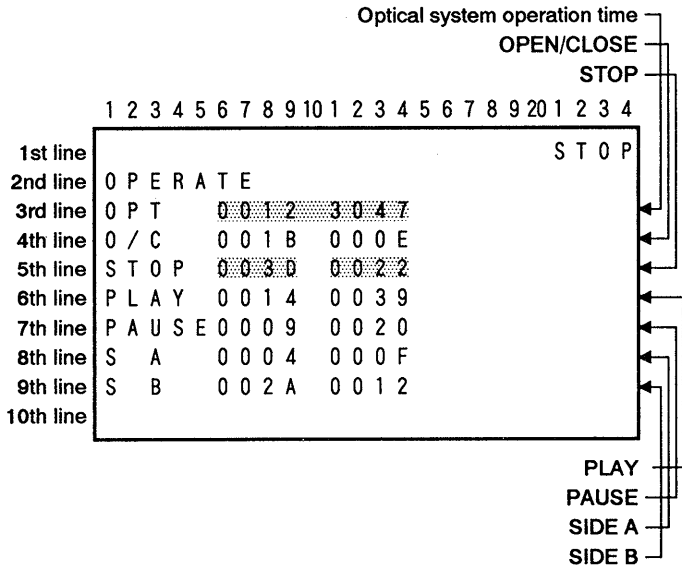


Fig. 9-9. Operation Information

According to the above example, the optical system operation time is 12 hours, 30 minutes, and 47 seconds.

The received SIRCS is counted separately for [key] and [remote control]. For example, STOP, the number of times received for [key] is 3Dh=61 times and that of [remote control] is 22h=34 times.

• Hexadecimal/Decimal Conversion Table

Hexadecimal	Decimal
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

Conversion Example

3Dh: $3 \times 16 + 13 = 61$... Decimal
 3 D ... Hexadecimal
 ACh: $10 \times 16 + 12 = 72$... Decimal
 A C ... Hexadecimal

3. SERVICE MODE

3-1. Setting the Service Mode

To set the service mode, perform the following process.

With the power off, press the following three keys of the unit simultaneously and start up the power.

[STOP]+[10] + [POWER]

If the microprocessor version is displayed on the screen, it indicates that the service mode is set.

If it is not displayed, it indicates that the mode is not set.

When the service mode is set, the debug mode will also be set at the same time from the beginning.

3-2. Exiting the Service Mode

To exit, press POWER and turn off the power.

If it cannot be turned off (when the mechanism has not been completed, etc.), press the [STOP] key and [POWER] key of the unit simultaneously and turn off the power forcibly.

3-3. Using Special Operations



For safety, the special operations in the service mode can only be performed in the [NO DISC] and [STOP] state. Check that the above message is not blinking but displayed on the screen. So as to valid the debugging commands at the debugging mode, press the [10/0] key and then the [8] key of the remote control while pressing the [STOP] key of the unit. And the Fluorescent tube will be off while debug commands are effective, and after the Fluorescent tube goes off, keys of the unit such as [PLAY] and [PAUSE] are pressed, the special functions in Table 9-10 can be performed.

Operations by other keys are continuously performed once the keys are pressed until the [STOP] key is pressed.

Several special operations cannot be performed at the same time even by pressing more than two keys together.

As some keys will not function while the Fluorescent tube is off, to stop special operations from being performed. So as to invalid the debugging commands at the debugging mode, press the [10/0] key and then [9] key of the remote control while pressing the [STOP] key of the unit. The Fluorescent tube will be on while debugging commands are not effective.

Table 9-10. List of Special Operations

Keys	Special Operations
[SIDE A]	Sled reverse direction (downwards) forwarding
[SIDE B]	Sled normal direction (upwards) forwarding
[PLAY]	Focus search start
[PAUSE]	Tilt servo ON start
[STILL/STEP 	Tray aging start
[STILL/STEP 	Sled aging start
[REPEAT A ↔ B]	Tilt aging start
[STOP]	Special operations are stopped

The following describe the special operations.

3-3-1. [SIDE A] Key . . . Sled Reverse Direction Forwarding

When the [SIDE A] key is pressed continuously, after the tilt initialization operations (the tilt is moved to the center position) are performed, the sled moves in the reverse direction (Side B inner circumference → Side B outer circumference → Side A outer circumference → Side A inner circumference). It stops when the key is released.

3-3-2. [SIDE B] Key . . . Sled Normal Direction Forwarding

Opposite to 3-3-1. Sled Reverse Direction Forwarding, the sled moves in the normal direction (Side A inner circumference → Side A outer circumference → Side B outer circumference → Side B inner circumference). Useful for replacing the optical parts. The sled stops when the key is released.


3-3-3. [PLAY] Key . . . Focus Search

When the [PLAY] key is pressed continuously, focus search operations are repeated. The pickup lens should move up and down. Execute focus search after confirming that the sled is at the correct position (center of side A). It stops when the [STOP] key is released.


3-3-4. [PAUSE] Key . . . Tilt Servo ON

When the [PAUSE] key is pressed, the tilt servo turns on. When the [PAUSE] key is pressed after moving the sled to the center of side A by [SIDE A]/[SIDE B] key and placing the CD, etc. on the tray so that it touches the skew sensor, the tilt should move. If the sled is moved using the [SIDE A]/[SIDE B] key, the tilt will return to the center. It will stop when the [STOP] key is pressed.

3-3-5. [STILL/STEP] Key . . . Tray Aging Start

When the [Still/STEP ] key is pressed, tray aging will start. As the tray will move in and out automatically, be careful of the surrounding area. It will stop when the [STOP] key is pressed.

3-3-6. [STILL/STEP] Key . . . Sled Aging Start

When the [Still/STEP ] key is pressed, sled aging will start. The sled will move to and for between sides A and B inner circumferences automatically. It will stop when the [STOP] key is pressed.

3-3-7. [REPEAT A ↔ B] Key . . . Tilt Aging Start

When the [REPEAT A ↔ B] key is pressed, tilt aging will start. The tilt will move up and down automatically. It will stop when the [STOP] key is pressed.

4. EXPANSION KEY FUNCTION

4-1. Using the Unit Simultaneous Key Pressing Function

The simultaneous key pressing function of the unit is effective when several keys of the unit are pressed simultaneously.

Used for functions to be executed promptly such as Forced Power OFF.

Currently defined simultaneous key pressing functions of the unit are as follows.

Table 9-11. Simultaneous Key Pressing Function of Unit

Function	Unit Key
<p>① <u>Forced power off</u> Turns off the power forcible. To turn off the power immediately when the mechanism overruns, etc. or when the power cannot be turned off by pressing the [POWER] key. As the power will be turned off without regard of the conditions of the mechanism, do not use it frequently.</p>	[PBC ON/OFF]+[POWER]
<p>② <u>Forced reset</u> In addition to the forced power off function, initializes the mode controller. When the mode controller is operating abnormally such as strange items are displayed on the screen, use this function to reset the mode controller. When this function is executed, take note that emergency histories, and all information will be deleted other than the trap flag information of the debug mode.</p>	[STOP]+[POWER]
<p>③ <u>MDP-V9K Fluorescent tube/all LEDs lighting up</u> When the power turns on automatically, all the segments of the Fluorescent tube and LEDs will light up. Normal operations will be performed until the power is turned off. In such cases, the Fluorescent tube and LED displays will remain lit.</p>	[STOP]+[> 10]+[POWER] (Only when the power is off.)

4-2. Using the Unit + Remote Control Simultaneous Key Pressing Function

The simultaneous key pressing function of the unit+remote control is effective while the unit key is pressed and a key of the remote control is pressed twice.

For users to execute it accidentally, it is necessary to press two remote commander keys within about 1 second.

The special key operations currently set are as follows.

Table 9-12. Simultaneous Key Pressing Function of Unit Key Remote Control

Function	Procedure	Unit key + Remote control key
<p>① <u>Debug mode ON/OFF selection</u> The debug mode is set if it has not been set, and is exited when it is set.</p>	1 2	[STOP]+[10/0] [STOP]+[STOP]
<p>④ <u>Mechanism controller time-out invalidation</u> Invalidates the function which cuts off the power supply when communication with the mechanism controller cannot be performed. Used when the mechanism controller may not be operating and the mode controller is to be moved.</p>	1 2	[STOP]+[10/0] [STOP]+[> 10]
<p>⑤ <u>Mechanism controller time-out validation</u> Validates the function which cuts off the power supply when communication with the mechanism controller cannot be performed. Used for exiting the ④ function.</p>	1 2	[STOP]+[10/0] [STOP]+[10/0]
<p>⑧ <u>EEPROM clear</u> All clears the data of the EEPROM debug mode. Valid only when the power is on.</p>	1 2	[STOP]+[10/0] [STOP]+[REPEAT]

第9章




特别功能的说明书

引言

为了方便保养及修理工作，MDP-V9K除了拥有一些特别功能外，还外加了一些特别功能，本说明书里，这些功能可分为三部分："调试状态"，"维修状态"及"扩展按键状态"并加以解释。

本说明书的规格若有变更之处，恕不另行通知。

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1. 概述

1-1. 调试状态

调试状态提供在显示屏上显示微处理器的只读记忆 (RAM) 的数据的功能 (调试功能)。

此状态与普通状态的不同点如下:

- 1) 当此状态的指令有效时, FL管关闭。
- 2) 在状态 1) 时, 按遥控器上的键, 调试资料如过去的紧急事故等都可以显示出来。在这时候, 只有一些键是有效的。

1-2. 维修状态

维修状态提供维修与检查的功能 (维修功能)。

此状态与普通状态的不同点如下:

- 1) 可以执行特别的操作功能如聚焦搜索, 滑板速进等。
- 2) 当发生会引起断开电源的紧急事故时, 电源将不会自动断开。
- 3) 当调整至此状态时, 会同时自动调整至调试状态。

1-3. 扩展按键功能

"扩展按键功能" 是根据一套程序, 同时按机台或者遥控器的几个键来操作测试等等。

此功能能够用在维修状态, 调试状态和普通操作。

此功能包括使用同时按下机台的几个键的 "电路板机台键功能" 和使用同时机台与遥控器上的一个键两次的 "同时按机台键+遥控器键的功能"。

2. 调试状态

2-1. 调试状态的设定

为了从普通方式 (通常状态) 设置到调试方式, 请在电源开状态下, 按下本机上的 [STOP] 键时, 按遥控器上的 [10/0] 键, 再按下遥控器上的 [STOP] 键。

下列屏幕将会被显示。

这屏幕显示微处理器的版本。详细说明请参阅 "2-4-1. 微处理器版本"。

为了要使调试命令在调试方式下生效时, 在按下本机上的 [STOP] 键的同时, 按下遥控器上的 [10/0] 键, 再按下遥控器上的 [8] 键。当调试命令有效时, FL管道将被关闭。

同样, 要使调试命令在调试方式下无效时, 在按下本机上的 [STOP] 键的同时, 按下遥控器上的 [10/0] 键, 再按下遥控器上的 [9] 键。当调试命令无效时, FL管道将被开放。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
第1行																									
第2行																									
第3行																									
第4行																									
第5行																									
第6行																									
第7行																									
第8行																									
第9行																									
第10行																									

图 9-1. 调试状态最初屏幕

2-2. 离开调试状态

要从调试状态回到普通状态, 请在如图9-2 (微处理器版本屏幕) 显示时, 按下遥控器的 [CLEAR] 键。

如步骤2-1所述, 按下此键也会回复到普通状态。

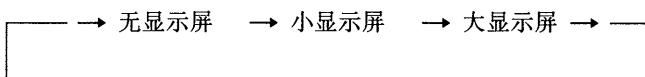
在普通状态时, 此键将只执行原来的功能。

2-3. 转换屏幕的显示

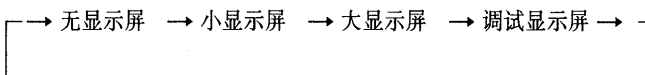
当调整至调试状态时, 屏幕将出现 "调试屏幕"。按下 [DISPLAY] 键将转换至普通状态的显示格式。

在调试状态时, 你可以选择 "无显示屏" (通常不显示任何东西), "小显示屏" (只显示第1行), "大显示屏" (显示整个屏幕) 和 "调试显示屏"。

在普通状态时, 按 [DISPLAY] 键, 显示屏将会转换如下:



在调试状态时, 它将会转换如下:



2-4. 阅读调试显示屏

"调试显示屏"从倾卸表格式 (dump list format) 展示状态控制器的资料。

显示屏左边第2行显示的是标题，而第3至第9行则显示数据。数据的展示格式基本上是四个十六进制数 (两个二进制组) (2bytes) 等于一组，而一行最多包括四组 (八个二进制组) (8bytes)。

当FL管在 "调试显示屏" 为关闭时，按下某些键将可以选择要展示的资料。

已被定义的资料如下：

表9-1. 调试显示屏键/资料表

键	展示资料
[FRAME/TIME]	微处理器版本
[1]	功能状态的过去事故
[2]	过去的紧急事故
[3]	普通维修状态的资料
[4]	陷阱标记
[5]	键/遥控数据
[7]	与机械装置控制器通讯的资料
[REPEAT]	操作资料

2-4-1. [FRAME/TIME]微处理器版本

展示微处理器的版本。

同时展示C-立方微处理器的组合版本。

第3行显示状态控制器的版本，第5行显示VFD控制器的版本，而第7行显示机械控制器的版本。

微处理器的组合版本显示在第9行。

根据图8-2的例子，状态控制器的版本是 "MMI-962A 04/15A"，VFD控制器的版本是 "VFD-962A 03/28A"，机械控制器的版本是 "MCM-962A 9604 12"，而微处理器的组合版本是 "26MAR 96/"。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
第1行																									S T O P
第2行	V	E	R																						
第3行	M	M	I	-	9	6	2	A		0	4	/	1	5	A										
第4行																									
第5行	V	F	D	-	9	6	2	A		0	3	/	2	8	A										
第6行																									
第7行	M	C	M	-	9	6	2	A		9	6	0	4		1	2									
第8行																									
第9行	M	I	C	-	2	6	M	A	R	9	6	/													
第10行																									

图 9-2. 微处理器版本

2-4-2. [1] 功能状态的过去事故

显示功能状态的过去事故。

功能状态是基本的操作指令，如STOP和PLAY，它们都是由状态控制器传送到机械控制器。

每个功能状态数据是一个二进制组 (两个十六进制数)

(1byte)。一行可以储存八个最近的过去事故，三行可储存最多24个过去事故。数据是以二进制组来储存，从左到右。数据 (FF) 储存在最后数据的下一位。当数据到达第1行的最右边，它就储存在第2行最左边。当数据到达第3行的最右边，它就会再回到第1行的最左边。

现在 (最后储存) 的功能状态是数据 [FF] 左边的数据。当这数据 [FF] 在第1 (第2, 第3) 行的最左边时，这功能状态将会是第3 (第1, 第2) 行最右边的数据。

数据 [FE] 代表曾发生过的紧急事故。请参阅 "2-4-3. 过去的紧急事故" 来找出紧急事故的种类。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	
第1行																									S T O P
第2行	F	M																							
第3行																									
第4行																									
第5行																									
第6行																									
第7行																									
第8行																									
第9行																									
第10行																									

图 9-3. 功能状态的过去事故

以图9-3为例：

- 01 (电源ON启动)
- 20 (停止)
- 30 (A面准备重播)
- FE (发生紧急事故)
- 50 (章节搜寻)
- 60 (重播)
- 70 (普通方向低速扫描)
- 60 (重播)
- 20 (停止) (现在的功能状态)

功能状态以上列的次序更换。

下一页显示功能状态表。

表9-2. 功能状态表

号码	状态	说明	
00 01	电源OFF 电源ON起动	当电源接通, 进行初始起动时	
10 20	开 停止	开门并且弹出托盘 收回托盘并且停止轴子	
30 40	A面准备重播 B面准备重播	从停止,等等到A面开始搜寻之前 从停止,等等到B面开始搜寻之前	
50 51	章节搜寻 帧/时间搜寻	章节搜寻, 包括碟开端搜寻 CAV帧搜寻/其他时间搜寻	
60 61	重播 即时停止	PLAY PAUSE	
70 71 72 73	普通方向低速扫描 普通方向高速扫描 反方向低速扫描 反方向高速扫描	>> >>> << <<<	
80 81 82 83 84 85 86 87 88 89 8A 8B 8C	普通方向静画 普通方向逐帧 普通方向1/90速度重播 普通方向1/30速度重播 普通方向1/16速度重播 普通方向1/8速度重播 普通方向1/4速度重播 普通方向1/2速度重播 普通方向×1速度重播 普通方向×2速度重播 普通方向×3速度重播 普通方向×5速度重播 普通方向×10速度重播	STILL 前进一帧	从80 (普通方向静止) 至 9C (反转方向×10 速度重放) 只适用于CAV
90 91 92 93 94 95 96 97 98 99 9A 9B 9C	反方向静画 反方向逐帧 反方向1/90速度重播 反方向1/30速度重播 反方向1/16速度重播 反方向1/8速度重播 反方向1/4速度重播 反方向1/2速度重播 反方向×1速度重播 反方向×2速度重播 反方向×3速度重播 反方向×5速度重播 反方向×10速度重播	STILL 返回一帧	
FE FF	发生紧急事故 紧接着最后数据	发生某些紧急事故 最后的过去事故数据	

2-4-3. [2] 过去的紧急事故

显示过去发生的紧急事故编码。

紧急事故编码是当机械控制器发生故障时，所传输至状态控制器的一个二进位组数据。

如[64(最低章节测定)], 一些编码只表示状态编码的电平，所有[80]以上的编码是由状态控制器本身所发出，并非由机械控制器所传送。

如果接通电源之后就不曾发生紧急事故，所有数据将会是 [00]。

显示的格式与功能状态的过去记录相同。十六组分别储存在两条线。在数据[FF]之前的紧急事故编码与数据[FE]对应，并且在功能状态的过去记录里与数据[FF]最为接近。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4		
第1行																							S T O P			
第2行	E M G		H I S T																							
第3行			6	0	7	4	6	4	6	1	6	4	6	4	7	4	F	F								
第4行			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
第5行																										
第6行																										
第7行																										
第8行																										
第9行																										
第10行																										

图 9-4. 紧急事故的过去记录

根据以上的例子，在[FF]之前是左边的60，并且紧急事故是以下列次序发生。

- 60 (读入测出)
- 74 (搜索聚焦下降)
- 64 (最低章节测定)
- 61 (读出测出)
- 64 (最低章节测定)
- 64 (最低章节测定)
- 74 (搜索聚焦下降) (最近的紧急事故)

下页显示紧急事故编码表。

表9-3. 紧急事故编码表

号码	状态	结果
01	强制切断电源	电源切断
02	强制托盘弹出	弹出
03	要求停止	停止
04	在强制开门后要求停止	停止
05	要求放像	放像
06	电源切断, 要求改变结束	电源切断显示固定
07	在通信停止后, 要求切断电源	电源切断
08	正门不移动	电源切断
09	门开当托盘打开	电源切断
10	托盘推进探测	放像
11	托盘不移动	电源切断
20	滑板不滑动	电源切断
30	TILT不移动	电源切断
31	TILT不移动, 计数器测量进行	无
40	FG轴探测删除	电源切断
41	由FG到H伺服无传送	停止
42	进行上限速度	停止
43	进行下限速度	停止
44	轴不终结停止运转	电源切断
45	轴控制暂停	电源切断
50	没有进行聚焦	停止
51	没有进行聚焦(碟存在)	停止
52	测定无LD	无
53	8寸LD聚焦没有进行	停止
54	CD/CDC TOC不读	停止
60	读入测出	放像等
61	读出测出	停止/暂停等
62	CVD A部分读出测出	停止/暂停等
63	图象停止测出	静止
64	最低章节测定	无
65	CD/CDV子码不读	停止
66	LC菲力编码不读	停止
67	反锁定常轨进行	无
70	超搜索测出	放像
71	搜索不足测出	放像
72	搜索时间结束	放像
74	搜索聚焦下降	停止
76	在搜索聚焦下降后再试进行	无
80	(下列事故发生在状态控制器内) 事故暂停	电源切断
81	搜索暂停	放像
82	机械控制器通信暂停	电源切断
86	12V电源供应误差	拨开AC电源电线

2-4-4. [3] 机械结构控制器服务资料

显示由机械结构控制器传达的服务资料。

目前，表9-4的资料已定义。

表的数据号码与图9-5的第3至5行的数字符合。

表 9-4. 机械结构控制器服务资料

数据号码	数据
(02)	机械结构状态 (机械结构控制器内部状态) 详情参考下页。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4		
第1行											S T O P															
第2行	S E R V I C E																									
第3行	(0 0) (0 1)		(0 2) (0 3)		(0 4) (0 5)		(0 6) (0 7)																			
第4行	(0 8) (0 9)		(1 0) (1 1)		(1 2) (1 3)		(1 4) (1 5)																			
第5行	(1 6) (1 7)		(1 8) (1 9)		(2 0) (2 1)		(2 2) (2 3)																			
第6行																										
第7行																										
第8行																										
第9行																										
第10行																										

图 9-5. 机械结构控制器服务资料

机械结构状态

机械结构状态在机械结构控制器内是基本的作业状态，编码大致上与功能状态一样，但比功能状态分得更详细。

下列是机械结构状态表。

表 9-5. 机械结构状态表

号码	功能
00	切断电源
01	机械结构控制器起始 (无机械操作)
03	由接通电源到切断的过程
04	由电源切断到接通的过程
05	机械装置和周边IC起始
10	托盘，弹出阶段
11	弹出托盘
12	装入托盘
20	停止阶段在卡紧阶段
21	由A面设定卡紧
22	由卡盘设定A面卡紧
23	A面卡紧阶段
30	A面焦点锁定
31	0搜索和由焦点锁定起动
33	由A面到B面的倒换
40	B面焦点锁定
50	章节搜索
51	画面/时间搜索
60	放像
61	瞬时停止
70	正常方向低速扫描
71	正常方向高速扫描
72	反向低速扫描
73	反向高速扫描
74	扫描完毕过程
80至FF	(与功能状态一样)

2-4-5. [4] 陷波标志

显示陷波标志 的内容。

陷波标志 是数据包涵电源在不按电源键的情况下不正常的切断的原因。

陷波标志 是VFD控制器和状态控制器的输出。

VFD控制器的标志是左边4位数字，状态控制器则是右边4位数字。第1位元是由右边（十六进制2位数）算起，每一比特都有其含义。比特一相对的是最后一次电源不正常的切断原因。左边的第1位元是同样的标志，是逻辑OR的过去电源不正常切断的原因。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4
第1行	STOP																							
第2行	TRAP FLAG																							
第3行	A080 5000																							
第4行																								
第5行																								
第6行																								
第7行																								
第8行																								
第9行																								
第10行																								

图 9-6. 陷波标志

根据上面的图表，可察觉到80（不正常电压水平导致电源切断）和20（状态控制器通信误差导致电源切断）发生在VFD控制器。10（机械控制器通信误差导致电源切断）和40（VFD控制器通信误差导致电源切断）发生在状态控制器。

上次电源不正常切断的原因是80（不正常电压水平导致电源切断），发生在VFD控制器。

标志的比特有下列的意义。

表 9-6. 陷波标志比特/因由表

比特号码(样式)	原因
7 (8)	不正常电压水平导致电源切断
6 (40)	VFD控制器通信误差导致电源切断
5 (20)	状态控制器通信误差导致电源切断
4 (10)	机械控制器通信误差导致电源切断
3 (08)	电源切断因事故发生
2 (04)	键操作强制电源切断
1 (02)	键状态控制器的自我诊断复位
0 (01)	键操作强制复位

注:

- 比特0和1的复位表示在电源接通的同时状态控制器起始，除了当陷波标志 被储存。
- 16位元A是2+8，B=1+2+8，C=4+8，D=1+4+8，E=2+4+8，F=1+2+4+8。

2-4-6. [5] 键/遥控数据

由机台的键和遥控器输入数据以SIRCS编码显示出来。

只有使用MDP的遥控器方为有效。

如图9-7所示，第3行（16位元，2位数）左边第1位元是机只键输入的SIRCS编码，右边第1位元是遥控器键输入的SIRCS编码。没有按键时是定位在 FF，同时按下两个键时，最先显示的是最早按下的。

现有的型号中，只能使用机台的键并且某些键并无SIRCS编码。数据在80以上的都定义为内码。

	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4
第1行	STOP																							
第2行	KEY - RMC																							
第3行	1AFF																							
第4行																								
第5行																								
第6行																								
第7行																								
第8行																								
第9行																								
第10行																								

图 9-7. 键/遥控数据

根据上面的图表，可看出从机只按下[1A(放像)]而遥控器则无FF（没有按键）。

注意，某些遥控器在按入键后瞬时间就会产生编码。

下页列出MDP-V9K所用的SIRCS编码。

表 9-7. MDP SIRCS编码

号码	功能
00	1
01	2
02	3
03	4
04	5
05	6
06	7
07	8
08	9
09	10/0
0C	画面/时间
0F	清除
15	电源接上/切断
16	托盘打开/闭 (▲)
17	音频监视器
18	停止 (■)
19	暂停 (▨)
1A	放像 (▶)
1E	反向低速扫描 (◀◀)
1F	常态低速扫描 (▶▶)
28	时间显示 (AV time)
29	重复
2B	常态固定/画面速进 (▨▶)
2C	反向固定/画面速进 (◀▨)
30	程序
34	正常方向ACS (▶▶)
35	反向ACS (◀◀)
38	重复AB
39	号码 + 10 (>10)
3A	光屏显示器 (Display)
40	模拟/CX
41	混合
45	自动编程
46	自动暂停
47	1/的情/双面
5D	A面
5E	B面
5F	卡拉OK
60	高音
61	标准音
62	低音
65	11
66	12
67	13
77	14
79	15
7B	予約
	(下列是扩展的编码)
90	音色
92	自唱
94	声音选择
95	外部输入
A7	模式选择
A8	模式执行
A9	指示器设定
AA	指示器呼叫
AB	PBC返回
AC	PBC选择
AD	伴唱
AE	正向搜索
AF	反向搜索
FF	无按键

2-4-7. [7] 与机械装置控制器通信的资料

显示与机械装置控制器的正文通信数据。
 第3行到5是由状态控制器传达到机械装置控制器的正文。
 第7行到9是状态控制器从机械装置控制器接收到的正文。
 在第8行和9最前头的符号[!]表示正文正常通信。
 显示[?]当正文半途被切断, [■]表示在通信服务后, 通信被切断等。

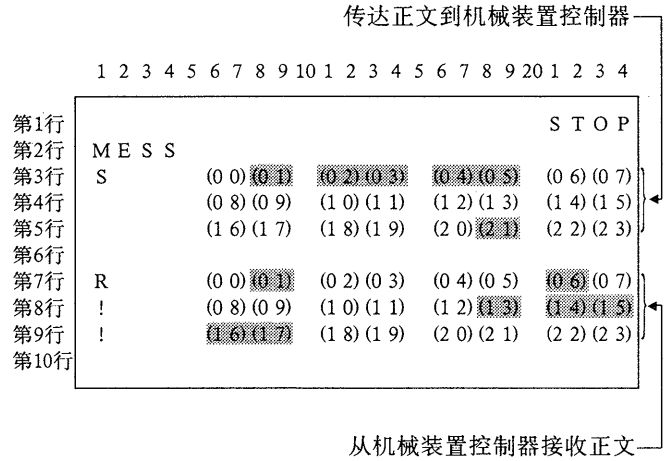


图 9-8. 与机械结构控制器的通信资料

下列是部分的通讯正文:

表 9-8. 正文由状态控制器传送到机械装置控制器 (图 9-8. (上))

号码	说明
(01)	当前(下次)的功能状态
(02)	最终目标功能状态
(03至05)	搜索目标位置(时间/画面)

表 9-9. 机械装置控制器接收由状态控制器传送的正文 (图 9-8. (下))

号码	说明
(01)	当前(下次)的功能状态
(06)	功能状态切换的完成标志 (最底下的比特)
(13)	当前章节/轨迹号码
(14)	当前索引号码
(15至17)	当前位置(时间/画面)

2-4-8. [重复]作业资料

显示作业资料

第3行显示光学系统的作业时间，第4行至第9行列出以十六进制接收的SIRCS的数目。

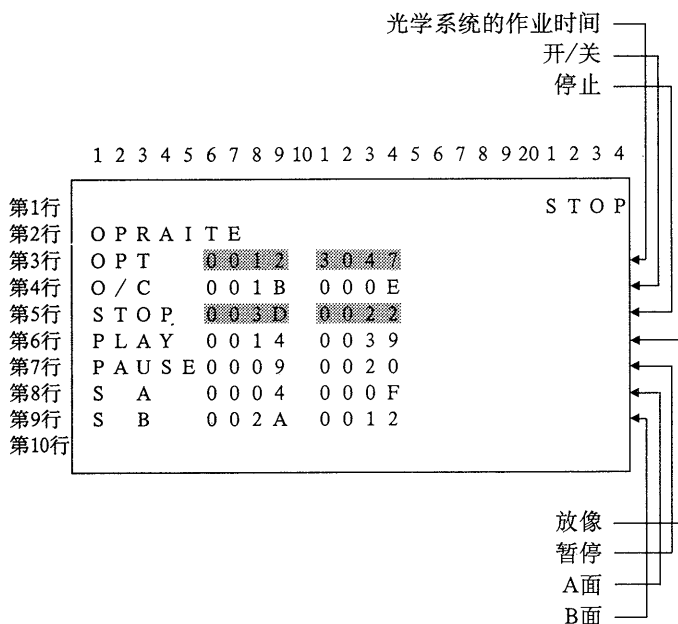


图 9-9. 作业资料

根据上述例子，光学系统的作业时间是12小时30分钟和47秒。由机台键和遥控器接收的SIRCS是分开来计算的。例如停止，由机台键入3Dh = 61次，由遥控器键入则有22h = 34次。

● 十六进制/十进制换算表

十六进制	十进制
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

换算例子

3Dh: $3 \times 16 + 13 = 61$ 十进制
 3 D 十六进制
 ACh: $10 \times 16 + 12 = 72$ 十进制
 A C 十六进制

3. 服务状态

3-1. 设定服务状态

进行下列过程以设定服务状态:

切断电源，同时按机台的下列3个键并开动电源:

[STOP] + [10] + [POWER]

若微处理机方案在屏幕上显示即表示服务状态已设定。

若不，即表示无服务状态设定。

当服务状态设定后，除误状态也同时设定。

3-2. 离开服务状态

按下POWER切断电源即可离开服务状态。

若不能离开服务状态(当机械装置等还未完成)，同时按下[STOP]键和[POWER]键强制切断电源。

3-3. 使用特别作业

为了安全起见，服务方式下的特别操作只能在[NO DISC]和[STOP]状态下进行。检查确保上述信息在光屏上显示而非闪烁。为了使调试命令在调试方式下有效时，请在按下本机上的[STOP]键的同时，按下遥控器上的[10/0]键，再按下遥控器上的[8]键。当调试命令有效时，FL管道将被关闭。

FL管道被关闭后，按下本机上的[PLAY]和[PAUSE]等键时，表9-10上的特别功能就能被执行了。

只有在按下[SIDE A]和[SIDE B]时才能进行滑板速进作业。

其他键作业会连续进行直到按下[STOP]键，在进行特别作业时，B面的LED会亮起。

就算同时按下两个以上的键，某些特别作业还是不能同时进行的。

由于某些功能在FL管道关闭时不能操作，因此要在执行中停止特殊操作。

可在按下本机上的[STOP]键的同时，按下遥控器上的[10/0]键，再按下遥控器上的[9]键，以使调试命令在调试方式下无效。当调试命令无效时，FL管道将被开放。

表 9-10. 特别作业表

键	特别作业
[SIDE A]	滑板反向（下降）速进
[SIDE B]	滑板正常方向（上升）速进
[PLAY]	开始焦点搜索
[PAUSE]	倾斜操纵伺服ON开始
[STILL/STEP ▶▶]	托盘时效开始
[STILL/STEP ◀◀]	滑板时效开始
[REPEAT A ↔ B]	倾斜时效开始
[停止]	特别作业停止

特别作业的描述如下所列:

3-3-1. [SIDE A]键.....滑板反向速进

当连续按下[SIDE A]键时, 在倾斜起始作业(倾斜移动中心位置)进行时, 滑板反向移动(B面内圆周 → B面外圆周 → A面外圆周 → A面内圆周)。停止按键后作业停止。

3-3-2. [SIDE B]键.....滑板正常方向速进

与3-3-1的滑板反向速进相反, 滑板向正常方向移动(A面内圆周 → A面外圆周 → B面外圆周 → B面内圆周)。在更换光学零件时非常有用。释放按键后作业停止。

3-3-3. [PLAY]键.....焦点搜索

当连续按下[PLAY]键时, 重复焦点搜索作业。拾音镜头应该上下移动。在确保滑板处在正确位置后(A面的中心)进行焦点搜索。按下[STOP]后作业停止。

3-3-4. [PAUSE]键.....倾斜操纵伺服ON

当按下[PAUSE]键时, 倾斜操纵伺服起动。在使用[A面]/[B面]键把滑板移至A面的中心并把CD等放置在托盘时, 在和倾斜感应器接触后, 倾斜应该移动。若使用[A面]/[B面]键移动滑板, 倾斜会回返中心。按下[STOP]后作业停止。

3-3-5. [STILL/STEP **▶▶**]键.....托盘时效开始

按下[STILL/STEP **▶▶**]键, 托盘时效开始。由于托盘会自动进出移动, 小心其周围。按下[STOP]后作业停止。

3-3-6. [STILL/STEP **◀◀**]键.....滑板时效开始

按下[STILL/STEP **◀◀**]键, 滑板时效开始。滑板在A面和B面的内圆周内自动往返。按下[STOP]后作业停止。

3-3-7. [REPEAT A **↔** B]键.....倾斜时效开始

[重复A↔B]键, 倾斜时效开始。倾斜会自动上下移动。按下[STOP]后作业停止。

4. 扩展按键功能

4-1. 应用同时按机台键的功能

只有当机台的数个按键同时被按下时，机台的“同时按键功能”方为有效。

这是用来即时执行的功能如强制断开电源。本机的“同时按键功能”的定义如下：

表 9-11. 同时按机台键的功能

功能	机台键
① 强行断开电源 强行断开电源。 当机台失控或按[POWER]键却不能断开电源时，将马上断开电源。 由于在任何机械情况下都会断开电源，请勿常用。	[PCB ON/OFF] + [POWER]
② 强行复原 除强行断开电源外，也能起始状态控制器。 当状态控制器操作不正常，如显示屏出现奇怪的项目时，使用这功能来复原状态控制器。 当执行这功能时，除了调试状态的陷波标记外，其他过去的紧急事故和所有资料都被清除掉。	[STOP] + [POWER]
③ MDP-V9K FL管道 点亮 当电源自动接通时，所有FL管和LED都会发光。 将执行普通操作，直到电源关闭，在这种情况下，FL管和LED保持发光。	[STOP] + [>10] + [POWER] (只限电源关闭时。)

4-2. 应用同时按机台 + 遥控器键的功能

只有在按下机台键并按下遥控键两次时，机台 + 遥控的“同时按键功能”方为有效。

用户若意外的执行这功能，则需在1秒钟内按下遥控的两按键。这特别按键操作的定义如下：

表 9-12. 同时按机台与遥控器键的功能

功能	程序	机台键 + 遥控键
① 调试状态ON/OFF选择 若非调试状态就设定调试状态，若已设定在调试状态就会离开这状态。	1 2	[STOP] + [10/0] [STOP] + [STOP]
④ 机械控制器超时无效 (time-out invalidation) 当与机械控制器的通讯不能执行时，取消切断电源的功能。 当机械控制器不能操作而状态控制器必须继续执行时使用。	1 2	[STOP] + [10/0] [STOP] + [>10]
⑤ 机械控制器超时有效 (time-out validation) 当与机械控制器的通讯不能执行时，使用切断电源的功能。 离开功能 ④ 时使用。	1 2	[STOP] + [10/0] [STOP] + [10/0]
⑧ EEPROM清除指令 在接通电源时，清除EEPROM调试状态的数据。	1 2	[STOP] + [10/0] [STOP] + [REPEAT]

MDP-V9K

RMT-M45A

SONY

E Model
Chinese Model

SERVICE MANUAL

SUPPLEMENT-1

File this supplement with the service manual.

Subject : 1. CORRECTION
2. BOARD & PARTS CHANGED
3. ADDITION OF COUNTERMEASURE BOARDS
(SS-962, MM-962 BOARDS)
4. ADDITION OF DAMPER

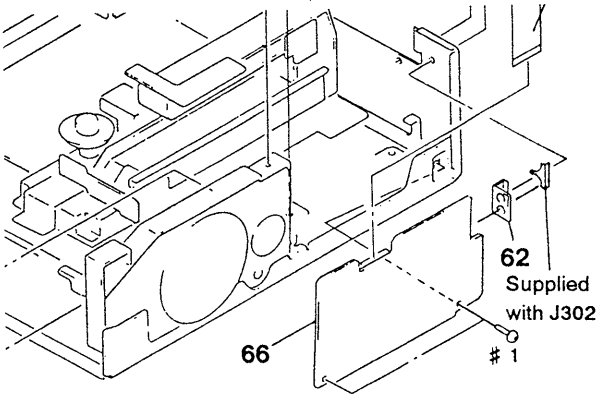
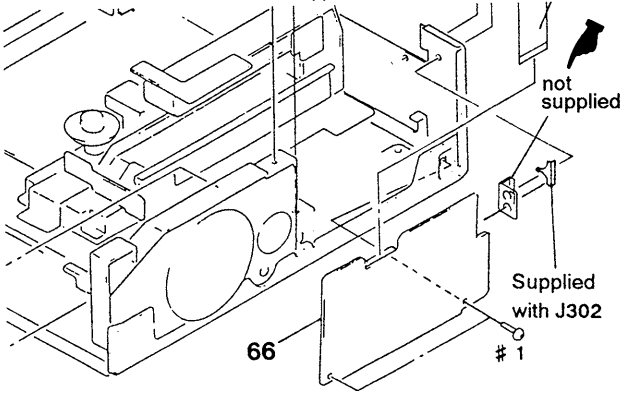
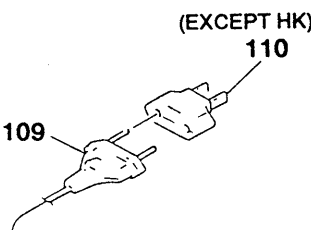
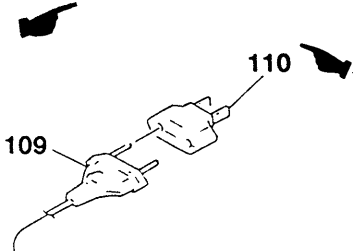
(ECN-LD600304)

1. CORRECTION


- Correct your service manual as shown below.

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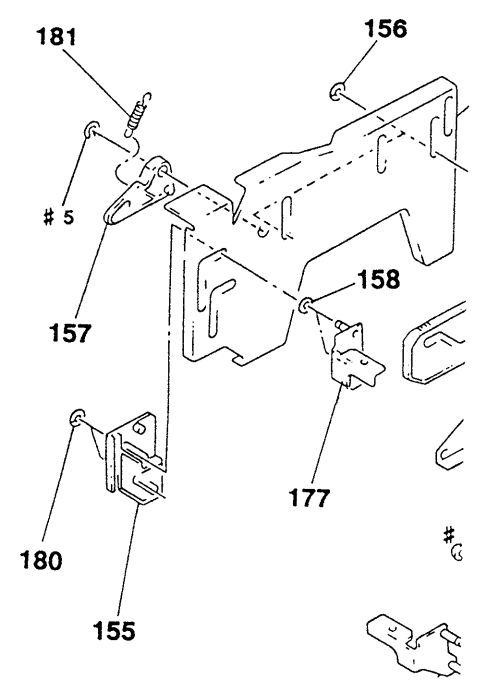
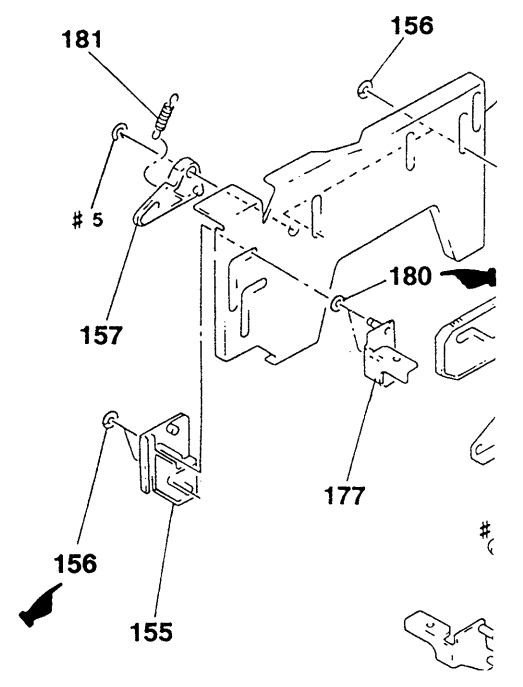
• Abbreviation
 HK : Hong Kong model

Page	INCORRECT				CORRECT			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
5-2	62	3-971-188-01	BRACKET, KP *** EXPLODED VIEWS ***				not supplied *** EXPLODED VIEWS ***	
								
5-3	△ 110	1-569-008-11	ADAPTOR, CONVERSION 2P (EXCEPT HK)		△ 110	1-569-008-11	ADAPTOR, CONVERSION 2P	
								

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


 : indicates corrected portion.

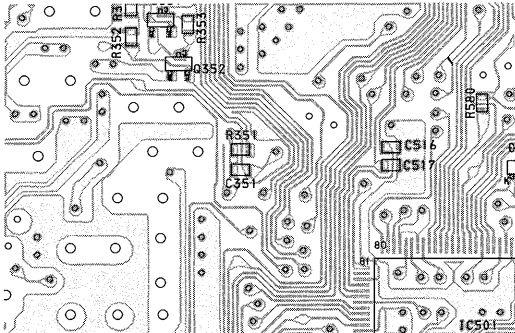
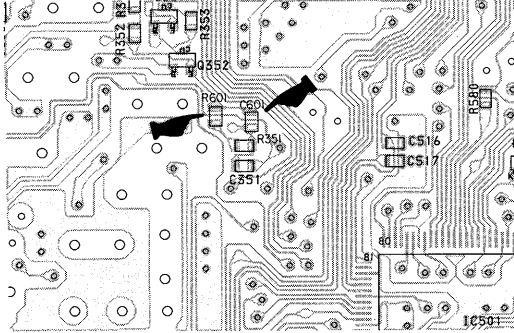
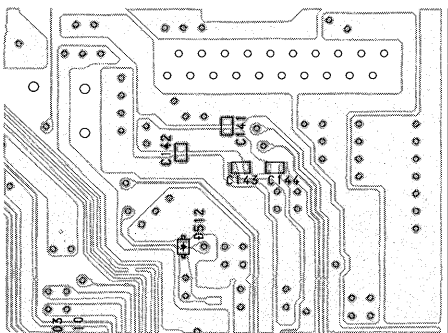
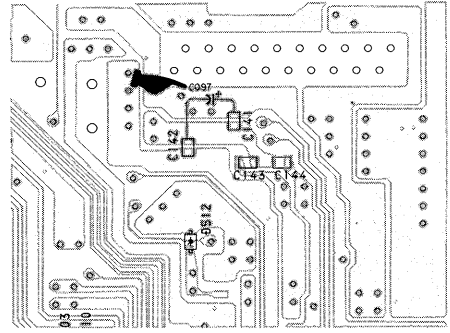
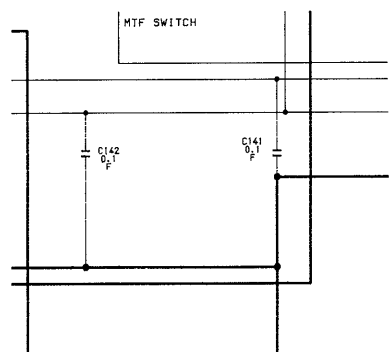
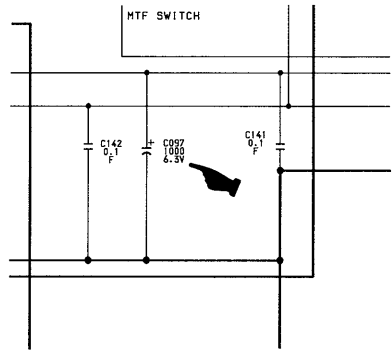
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Page	INCORRECT	CORRECT																																								
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5-9	<table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">*** ELECTRICAL PARTS LIST ***</td> </tr> <tr> <td colspan="4" style="text-align: center;">*** KP-962 BOARD ***</td> </tr> <tr> <td colspan="4" style="text-align: center;">=====</td> </tr> </tbody> </table>	Ref. No.	Part No.	Description	Remark	*** ELECTRICAL PARTS LIST ***				*** KP-962 BOARD ***				=====				<table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">*** ELECTRICAL PARTS LIST ***</td> </tr> <tr> <td colspan="4" style="text-align: center;">*** KP-962 BOARD ***</td> </tr> <tr> <td>JR302</td> <td>1-216-295-91</td> <td>CONDUCTOR, CHIP (2012)</td> <td></td> </tr> <tr> <td>JR303</td> <td>1-216-295-91</td> <td>CONDUCTOR, CHIP (2012)</td> <td></td> </tr> </tbody> </table>	Ref. No.	Part No.	Description	Remark	*** ELECTRICAL PARTS LIST ***				*** KP-962 BOARD ***				JR302	1-216-295-91	CONDUCTOR, CHIP (2012)		JR303	1-216-295-91	CONDUCTOR, CHIP (2012)					
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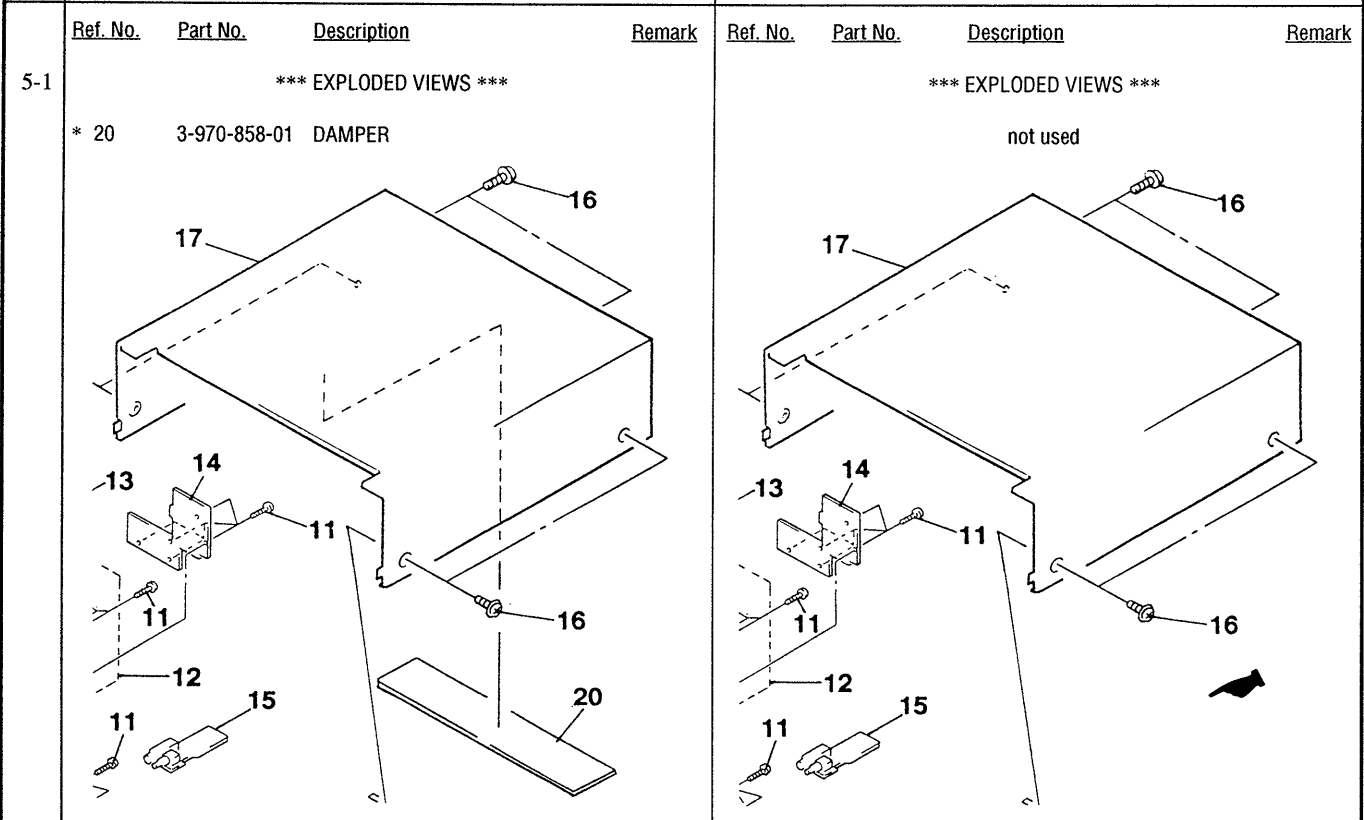
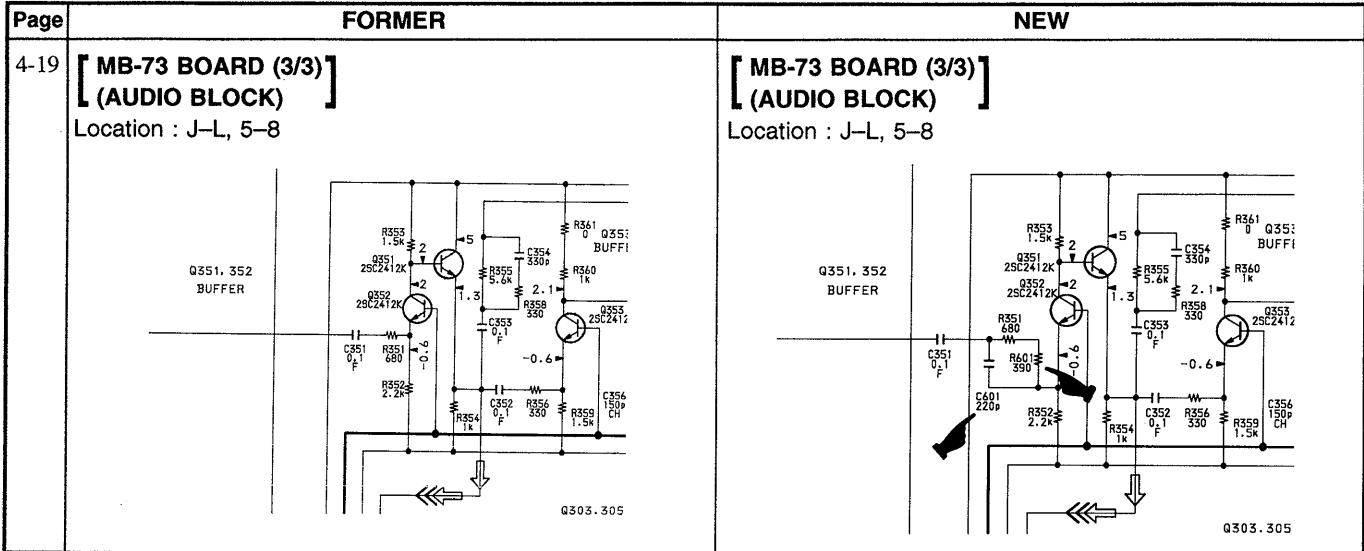
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

2. BOARD & PARTS CHANGED

 : indicates changed portion.

Page	FORMER	NEW
4-7	<p>[MB-73 BOARD] (COMPONENT SIDE) Location : H-F, 24-27</p>  <p style="text-align: right;">1-660-676- <u>12</u></p>	<p>[MB-73 BOARD] (COMPONENT SIDE) Location : H-F, 24-27</p>  <p style="text-align: right;">1-660-676- <u>13</u>, <u>14</u></p>
4-8	<p>[MB-73 BOARD] (COMPONENT SIDE) Location : I-K, 29-30</p>  <p style="text-align: right;">1-660-676- <u>12</u></p>	<p>[MB-73 BOARD] (COMPONENT SIDE) Location : I-K, 29-30</p>  <p style="text-align: right;">1-660-676- <u>13</u>, <u>14</u></p>
4-10	<p>[MB-73 BOARD (1/3)] [(VIDEO BLOCK)] Location : H-J, 6-8</p> 	<p>[MB-73 BOARD (1/3)] [(VIDEO BLOCK)] Location : H-J, 6-8</p> 

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Page	FORMER				NEW			
5-2	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
					* 68	1-664-891-11	MM-962 BOARD	
					69	3-970-608-11	SUMITITE (B3) +BV	
5-3	* 112	3-971-070-11	PANEL, REAR		* 112	3-971-070-11	PANEL, REAR (E,HK)	
	* 115	A-6423-420-A	YC-962 (60E) BOARD, COMPLETE		* 112	3-971-070-21	PANEL, REAR (CH)	
					* 115	A-6423-461-A	SS-962 BOARD, COMPLETE	

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Page	FORMER				NEW			
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
5-3					118	3-973-593-01	STAY (FR), TRAY	
					119	3-972-771-01	SPACER	
5-9	*** ELECTRICAL PARTS LIST ***				*** ELECTRICAL PARTS LIST ***			
	*** KP-962 BOARD ***				*** KP-962 BOARD ***			
	JR351	1-216-295-91	CONDUCTOR, CHIP (2012)					
	Q360	8-729-120-28	TRANSISTOR	2SC1623-L5L6	Q360	8-729-023-22	TRANSISTOR	2SD2114K
	Q361	8-729-120-28	TRANSISTOR	2SC1623-L5L6	Q361	8-729-023-22	TRANSISTOR	2SD2114K
5-10	R360	1-216-089-91	METAL CHIP	47K 5% 1/10W				
	R361	1-216-089-91	METAL CHIP	47K 5% 1/10W				
	R362	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R362	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
	R363	1-216-049-91	METAL GLAZE	1K 5% 1/10W	R363	1-216-055-00	METAL CHIP	1.8K 5% 1/10W
	***MA-962 BOARD ***				***MA-962 BOARD ***			
	D401	8-719-914-42	DIODE	DA204K				
	*** MB-73 BOARD ***				*** MB-73 BOARD ***			
					C097	1-124-471-00	ELECT	1000μF 20% 6.3V
5-11	C163	1-124-154-11	ELECT	47μF 20% 6.3V	C163	1-126-177-11	ELECT	100μF 20% 10V
	C175	1-104-664-11	ELECT	47μF 20% 10V	C175	1-104-656-11	ELECT	2200μF 20% 6.3V
	C209	1-124-154-11	ELECT	47μF 20% 6.3V	C209	1-126-177-11	ELECT	100μF 20% 10V
	C227	1-124-154-11	ELECT	47μF 20% 6.3V	C227	1-126-177-11	ELECT	100μF 20% 10V
5-12	C354	1-163-263-11	CERAMIC CHIP	330PF 5% 50V				
	C360	1-163-121-00	CERAMIC CHIP	150PF 5% 50V	C360	1-163-253-11	CERAMIC CHIP	120PF 5% 50V
5-13					C601	1-163-125-00	CERAMIC CHIP	220PF 5% 50V
5-14	D301	8-719-015-99	DIODE	UZP-27BB-TP	D301	8-719-988-62	DIODE	1SS355
	IC501	8-759-421-56	IC	MB89094PF-G-153-BND	IC501	8-759-444-96	IC	MB89094PF-G-154-BND

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Page	FORMER						NEW					
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5-15	Q906	8-729-027-23	TRANSISTOR	DTA114EKA-T146			Q906	8-729-027-38	TRANSISTOR	DTA144EKA-T146		
5-16	R309	1-216-021-00	METAL CHIP	68	5%	1/10W	R309	1-216-025-91	METAL GLAZE	100	5%	1/10W
5-17	R358	1-216-037-00	METAL CHIP	330	5%	1/10W	R508	1-216-111-91	METAL GLAZE	390K	5%	1/10W
	R508	1-216-109-00	METAL CHIP	330K	5%	1/10W						
5-18							R601	1-216-039-00	METAL CHIP	390	5%	1/10W
5-20	R921	1-216-082-00	METALGLAZE	24K	5%	1/10W	R921	1-216-081-00	METAL CHIP	22K	5%	1/10W
	R922	1-216-081-00	METAL CHIP	22K	5%	1/10W	R922	1-216-079-00	METAL CHIP	18K	5%	1/10W
	R923	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	R923	1-216-085-00	METAL CHIP	33K	5%	1/10W
	R926	1-216-079-00	METAL CHIP	18K	5%	1/10W	R926	1-216-081-00	METAL CHIP	22K	5%	1/10W
5-28	*** HARDWARE LIST ***						*** HARDWARE LIST ***					
	#5	7-624-108-04	STOP RING 4.0, TYPE-E (E, HK)				#5	7-624-108-04	STOP RING 4.0, TYPE-E			

3. ADDITION OF COUNTERMEASURE BOARDS (SS-962, MM-962 BOARDS)

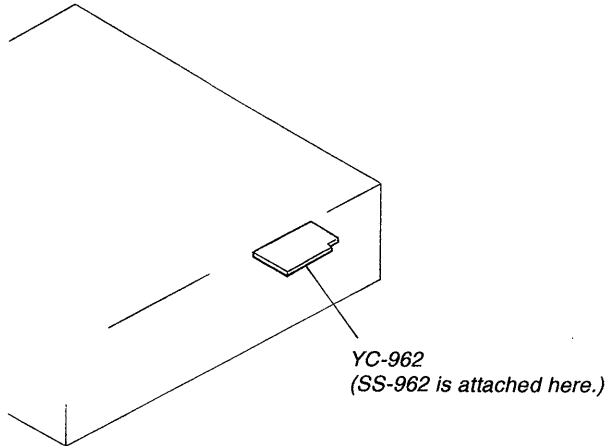
Countermeasure boards have been added because the PAL VIDEO CD DISC S VIDEO output reforms the S VIDEO output in the current unit. Consequently, the following changes have been made in boards and circuits.

• Addition of SS-962 board

This board is a replacement of the YC-962 board. Refer to the schematic diagram, printed wiring board, and parts table provided with this board.

Note : Do not use the YC-962 board after replacement.

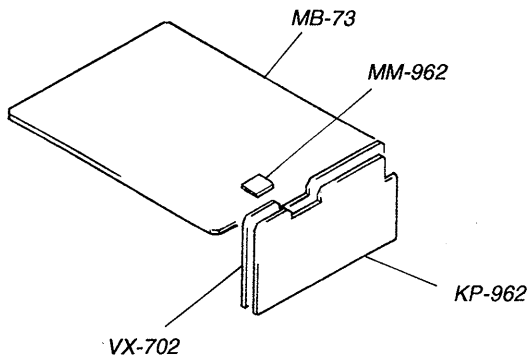
CIRCUIT BOARDS LOCATION



• Addition of MM-962 board

This board is attached on top of the MB-73 board. The SS-962, MB-73, and VX-702 boards are connected by lead wires. Refer to the schematic diagram, printed wiring board, and parts table provided with this board.

CIRCUIT BOARDS LOCATION



• Changes in VX-702 board


This board is attached with connectors and parts by hand to connect the SS-962 board. The method of attaching differs according to the suffix number of the board.

Refer to the Table of Differences below. For details of the parts, schematic diagram, and printed wiring board to be connected to the SS-962 board and MM-962 board, refer to this service manual supplement-1.

Table of Differences in Countermeasure Parts of VX-702 Board

Board suffix No.-Before 13						Board suffix No.-After 14					
R001	1-247-807-31	CARBON	100	5%	1/4W	R001	1-216-025-91	METAL GLAZE	100	5%	1/10W
R002	1-247-807-31	CARBON	100	5%	1/4W	R002	1-216-025-91	METAL GLAZE	100	5%	1/10W
R003	1-247-815-91	CARBON	220	5%	1/4W	R003	1-216-033-00	METAL GLAZE	220	5%	1/10W
R198	omitted					R198	omitted				

Note :

Board suffix numbers before 13 require the above parts to be attached by hand, and pattern cutting as well. The part to be pattern-cut is indicated by the  on the Mt.

• Changes in MB-73 Board

In this board, the harness (MS-1) for connecting it to the SS-962 board is attached at the C230 position.

Therefore C230 has been omitted.

For details of the parts, schematic diagram, and printed wiring board to be connected to the SS-962 board and MM-962 board, refer to this service manual supplement-1.

MB-73 (VIDEO, AUDIO), MM-962 (VIDEO SWITCH), SS-962 (S VIDEO OUT) PRINTED WIRING BOARD

- Ref No. MB-73 BOARD: 1,000 series, MM-962 BOARD: 9,000 series, SS-962 BOARD: 8,000 series -

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : indicated a lead wire mounted on the component side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ■ : Pattern from the side which enables seeing.

*** Caution:**

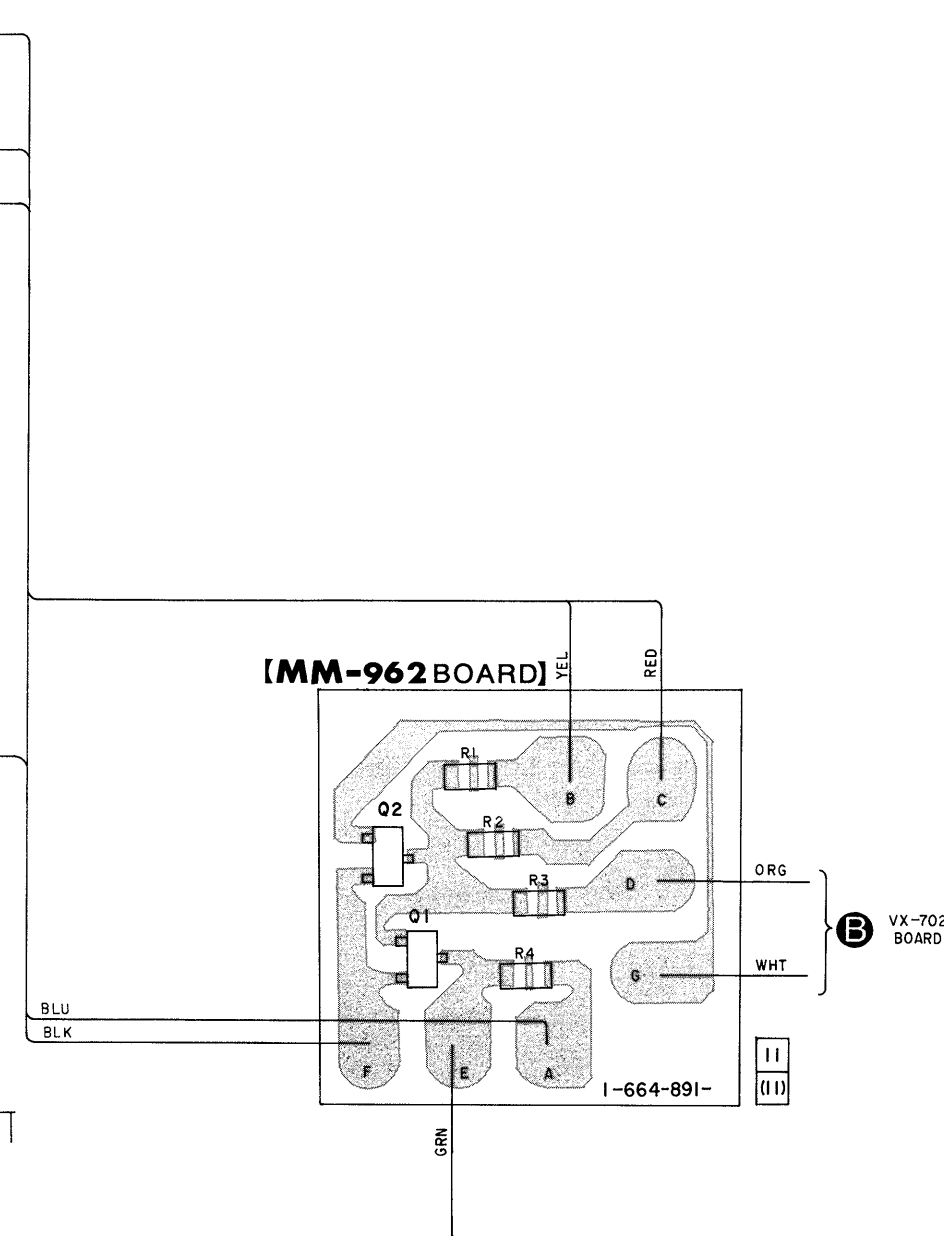
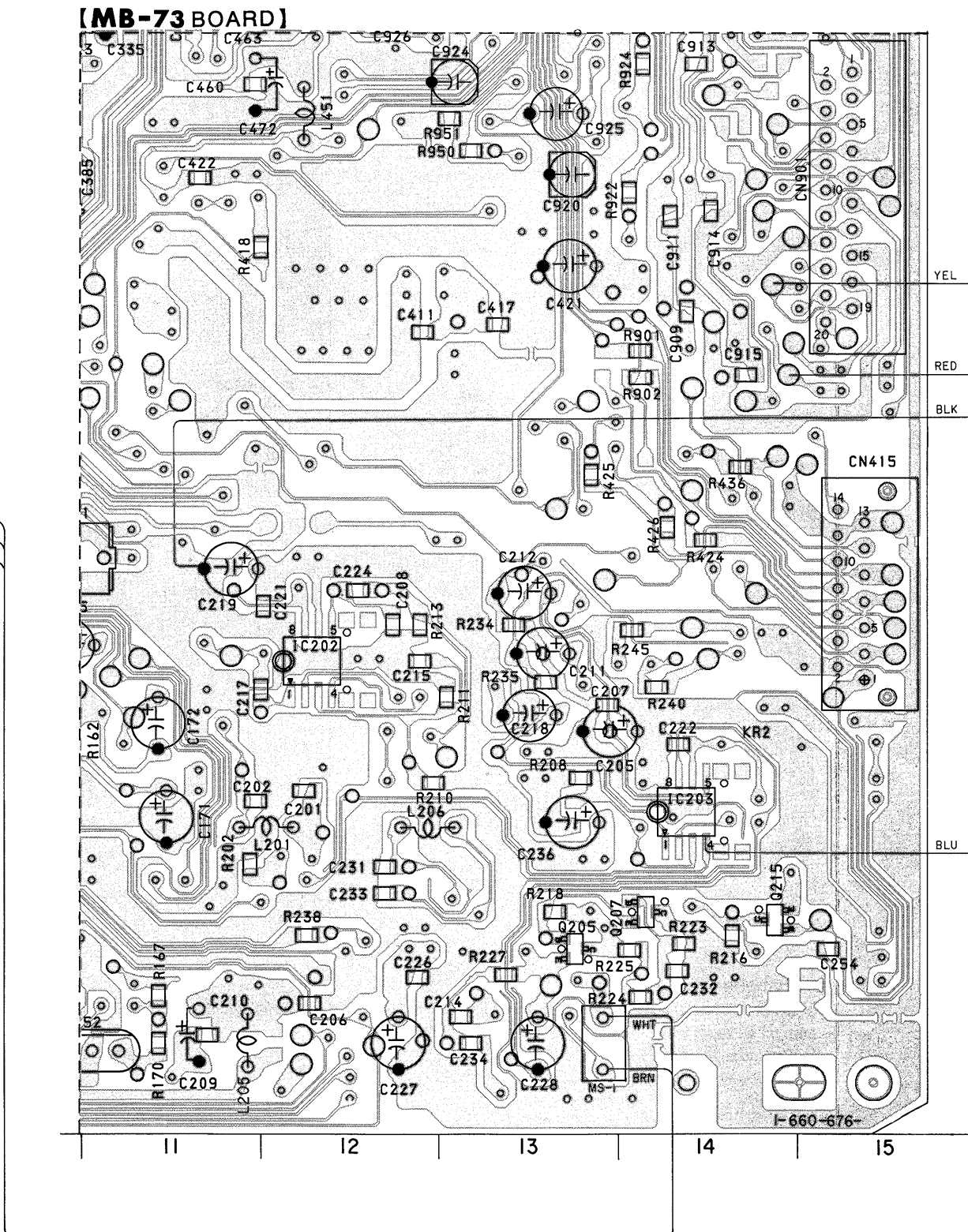
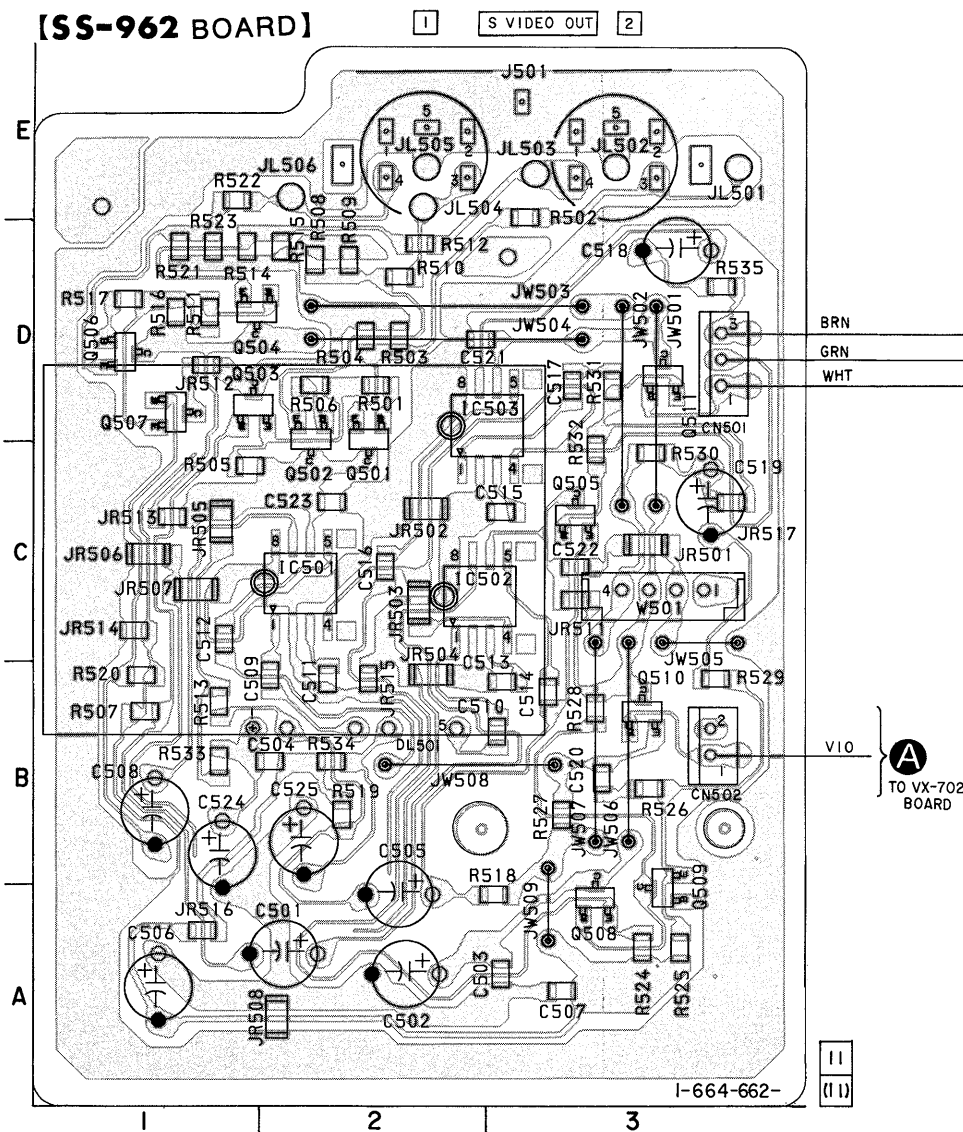
Pattern face side: Parts on the pattern face side seen from the (Conductor Side) the pattern face are indicated.

Parts face side: Parts on the parts face side seen from the (Component side) the parts face are indicated.

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

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

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



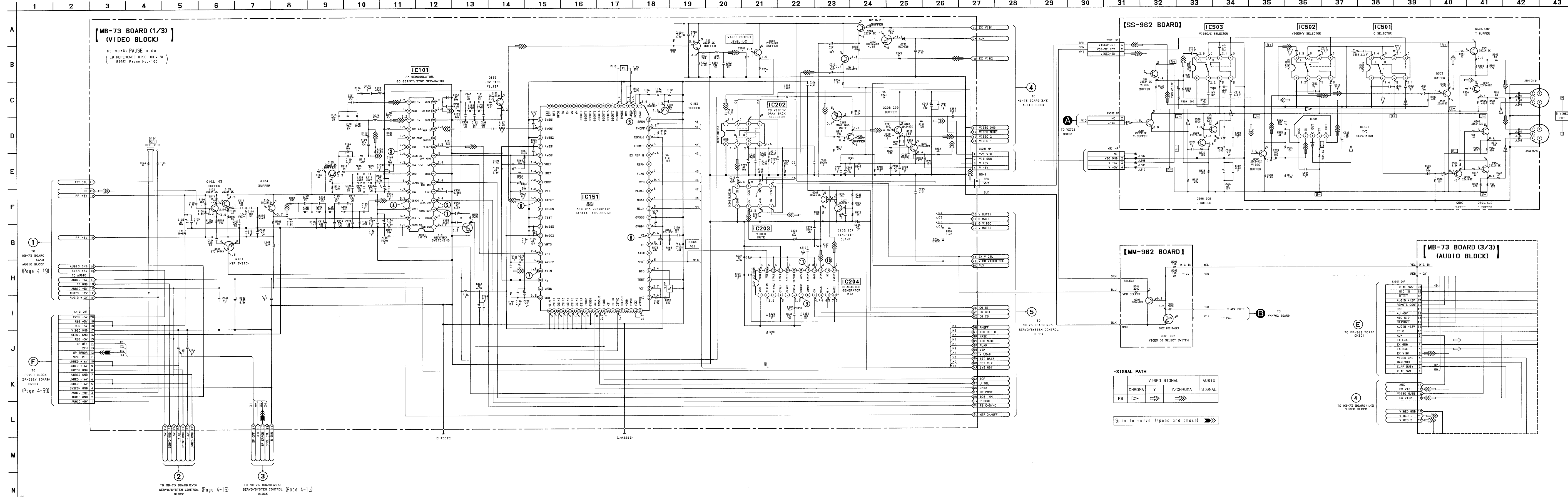
SS-962 BOARD

CN501	D-3
CN502	B-3
IC501	C-2
IC502	C-2
IC503	D-2
Q501	C-2
Q502	C-2
Q503	D-1
Q504	D-1
Q505	C-3
Q506	D-1
Q507	D-1
Q508	A-3
Q509	B-3
Q510	B-3
Q511	D-3

- **For Printed Wiring Boards.**
 - Chip transistor
-

MB-73 (VIDEO, AUDIO), MM-962 (VIDEO SWITCH), SS-962 (S VIDEO OUT) SCHEMATIC DIAGRAM

- Ref No. MB-73 BOARD: 1,000 series, MM-962 BOARD: 9,000 series, SS-962 BOARD: 8,000 series -



MB-73 BOARD (1/3)
(VIDEO BLOCK)

no mark: PAUSE mode
(LA REFERENCE DISC MLV-6)
SIDE1 Frame No. 4100

SS-962 BOARD

IC503
VIDEO/C SELECTOR

IC502
VIDEO/Y SELECTOR

IC501
C SELECTOR

IC500
Y/C SEPARATOR

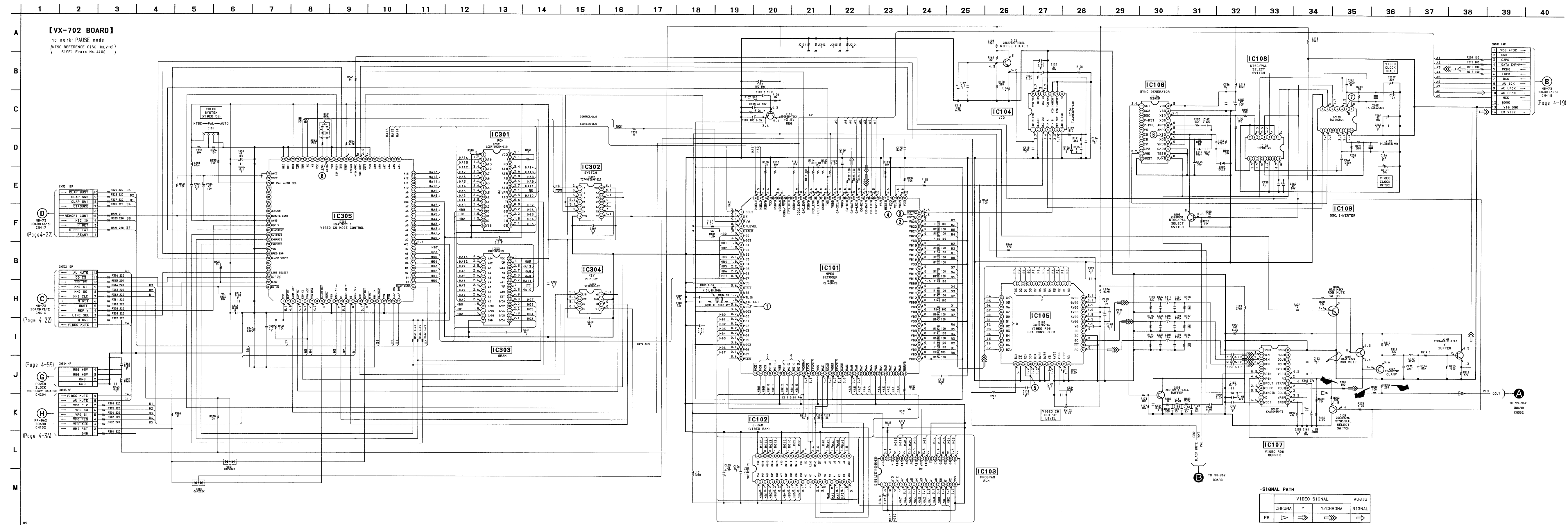
MM-962 BOARD

MB-73 BOARD (3/3)
(AUDIO BLOCK)

SIGNAL PATH

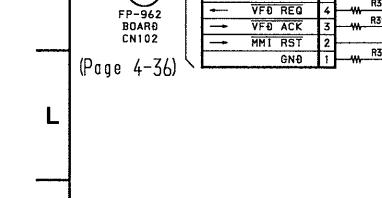
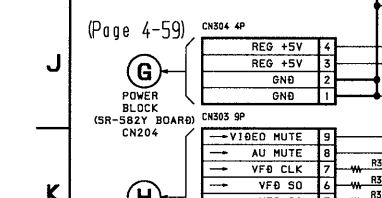
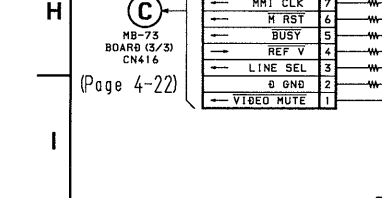
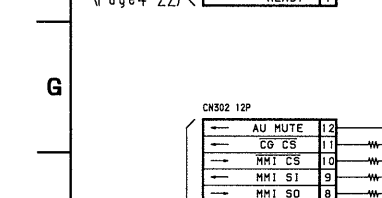
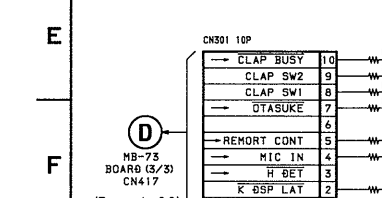
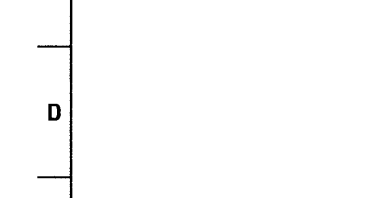
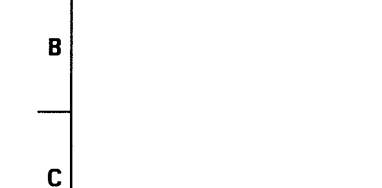
	VIDEO SIGNAL	AUDIO
CHROMA	Y	Y/CHROMA
PB	▶	⇨

Spindle servo (speed and phase) ⇨⇨



[VX-702 BOARD]

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



(Page 4-19)

TO 55-942 BOARD CN202

Added portion
Deleted portion

MM-962**SS-962****ELECTRICAL PARTS LIST****Note:**

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

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

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-664-891-11	MM-962 BOARD *****	(Ref. No. 9,000 series)	C524	1-124-443-00	ELECT 100uF 20% 10V	
				C525	1-124-443-00	ELECT 100uF 20% 10V	
						< CONNECTOR >	
						< DELAY LINE >	
						< IC >	
						< JACK >	
						< JUMPER RESISTOR >	
						< TRANSISTOR >	
Q001	8-729-120-28	TRANSISTOR 2SC1623-L5L6		Q501	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q002	8-729-900-53	TRANSISTOR DTC114EK		Q502	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
R001	1-216-077-00	METAL CHIP 15K 5% 1/10W		Q503	8-729-216-22	TRANSISTOR 2SA1162-G	
R002	1-216-077-00	METAL CHIP 15K 5% 1/10W		Q504	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
R003	1-216-069-00	METAL CHIP 6.8K 5% 1/10W		Q505	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
R004	1-216-057-00	METAL CHIP 2.2K 5% 1/10W		Q506	8-729-120-28	TRANSISTOR 2SC1623-L5L6	


*	A-6423-461-A	SS-962 BOARD, COMPLETE *****	(Ref. No. 8,000 series)				
C501	1-104-664-11	ELECT 47uF 20% 10V		JR501	1-216-296-91	CONDUCTOR, CHIP (3216)	
C502	1-104-664-11	ELECT 47uF 20% 10V		JR502	1-216-296-91	CONDUCTOR, CHIP (3216)	
C503	1-163-031-11	CERAMIC CHIP 0.01uF 50V		JR503	1-216-296-91	CONDUCTOR, CHIP (3216)	
C504	1-163-031-11	CERAMIC CHIP 0.01uF 50V		JR504	1-216-296-91	CONDUCTOR, CHIP (3216)	
C505	1-124-443-00	ELECT 100uF 20% 10V		JR505	1-216-296-91	CONDUCTOR, CHIP (3216)	
C506	1-104-664-11	ELECT 47uF 20% 10V		JR506	1-216-296-91	CONDUCTOR, CHIP (3216)	
C507	1-163-031-11	CERAMIC CHIP 0.01uF 50V		JR507	1-216-296-91	CONDUCTOR, CHIP (3216)	
C508	1-104-664-11	ELECT 47uF 20% 10V		JR508	1-216-296-91	CONDUCTOR, CHIP (3216)	
C509	1-164-505-11	CERAMIC CHIP 2.2uF 16V		JR511	1-216-295-91	CONDUCTOR, CHIP (2012)	
C510	1-164-505-11	CERAMIC CHIP 2.2uF 16V		JR512	1-216-295-91	CONDUCTOR, CHIP (2012)	
C511	1-163-038-91	CERAMIC CHIP 0.1uF 25V		JR513	1-216-295-91	CONDUCTOR, CHIP (2012)	
C512	1-164-505-11	CERAMIC CHIP 2.2uF 16V		JR514	1-216-295-91	CONDUCTOR, CHIP (2012)	
C513	1-163-038-91	CERAMIC CHIP 0.1uF 25V		JR515	1-216-295-91	CONDUCTOR, CHIP (2012)	
C514	1-164-505-11	CERAMIC CHIP 2.2uF 16V		JR516	1-216-295-91	CONDUCTOR, CHIP (2012)	
C515	1-163-038-91	CERAMIC CHIP 0.1uF 25V		JR517	1-216-295-91	CONDUCTOR, CHIP (2012)	
C516	1-164-505-11	CERAMIC CHIP 2.2uF 16V					
C517	1-164-505-11	CERAMIC CHIP 2.2uF 16V					
C518	1-107-714-11	ELECT 10uF 20% 16V					
C519	1-104-664-11	ELECT 47uF 20% 10V					
C520	1-163-038-91	CERAMIC CHIP 0.1uF 25V					
C521	1-163-038-91	CERAMIC CHIP 0.1uF 25V					
C522	1-163-038-91	CERAMIC CHIP 0.1uF 25V					
C523	1-163-038-91	CERAMIC CHIP 0.1uF 25V					

Ref. No.	Part No.	Description	Remark		
Q507	8-729-216-22	TRANSISTOR 2SA1162-G			
Q508	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q509	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q510	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
Q511	8-729-120-28	TRANSISTOR 2SC1623-L5L6			
< RESISTOR >					
R501	1-216-017-91	METAL GLAZE 47	5%		1/10W
R502	1-216-021-00	METAL CHIP 68	5%		1/10W
R503	1-216-041-00	METAL CHIP 470	5%		1/10W
R504	1-216-041-00	METAL CHIP 470	5%		1/10W
R505	1-216-057-00	METAL CHIP 2.2K	5%		1/10W
R506	1-216-017-91	METAL GLAZE 47	5%		1/10W
R507	1-216-089-91	METAL GLAZE 47K	5%		1/10W
R508	1-216-041-00	METAL CHIP 470	5%		1/10W
R509	1-216-041-00	METAL CHIP 470	5%		1/10W
R510	1-216-021-00	METAL CHIP 68	5%		1/10W
R511	1-216-017-91	METAL GLAZE 47	5%		1/10W
R512	1-216-021-00	METAL CHIP 68	5%		1/10W
R513	1-216-073-00	METAL CHIP 10K	5%		1/10W
R514	1-216-041-00	METAL CHIP 470	5%		1/10W
R515	1-216-041-00	METAL CHIP 470	5%		1/10W
R516	1-216-057-00	METAL CHIP 2.2K	5%		1/10W
R517	1-216-017-91	METAL GLAZE 47	5%		1/10W
R518	1-216-057-00	METAL CHIP 2.2K	5%		1/10W
R519	1-216-073-00	METAL CHIP 10K	5%		1/10W
R520	1-216-089-91	METAL GLAZE 47K	5%		1/10W
R521	1-216-041-00	METAL CHIP 470	5%		1/10W
R522	1-216-021-00	METAL CHIP 68	5%		1/10W
R523	1-216-041-00	METAL CHIP 470	5%		1/10W
R524	1-216-053-00	METAL CHIP 1.5K	5%		1/10W
R525	1-216-055-00	METAL CHIP 1.8K	5%		1/10W
R526	1-216-051-00	METAL CHIP 1.2K	5%		1/10W
R527	1-216-049-91	METAL GLAZE 1K	5%		1/10W
R528	1-216-053-00	METAL CHIP 1.5K	5%		1/10W
R529	1-216-053-00	METAL CHIP 1.5K	5%		1/10W
R530	1-216-049-91	METAL GLAZE 1K	5%		1/10W
R531	1-216-025-91	METAL GLAZE 100	5%		1/10W
R532	1-216-025-91	METAL GLAZE 100	5%		1/10W
R533	1-216-013-00	METAL CHIP 33	5%		1/10W
R534	1-216-013-00	METAL CHIP 33	5%		1/10W
R535	1-216-025-91	METAL GLAZE 100	5%		1/10W

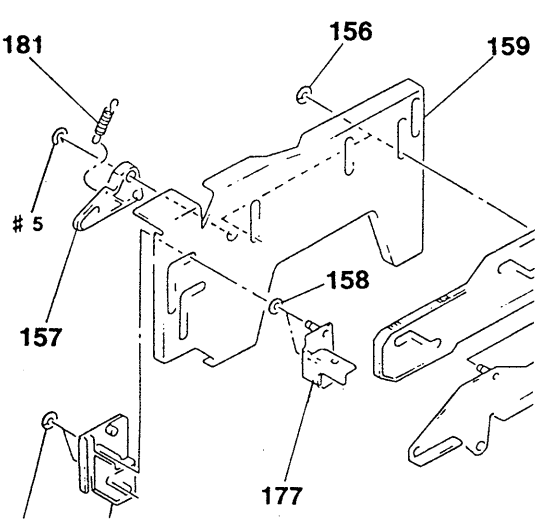
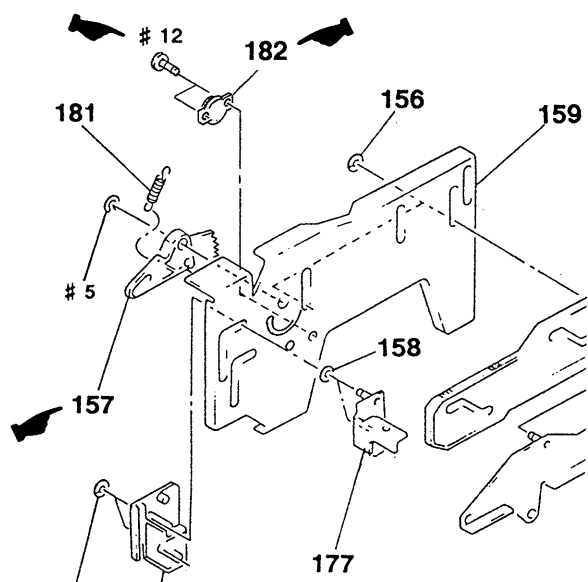
4. ADDITION OF DAMPER

The damper is added. There are some changes for other parts, refer to the following difference table in detail.

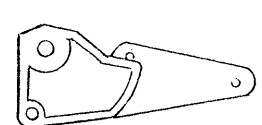
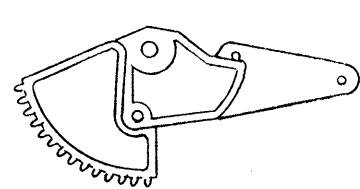
Difference Table

 : indicates changed portion.

FORMER		NEW	
157	3-968-281-01 ARM (L), DOOR	157	3-968-281-04 ARM (L), DOOR
		182	3-712-786-41 DAMPER, OIL
		#12	7-685-102-19 SCREW +P2x4 NON-SLIT TYPE 2

	
------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

How to discriminate (DOOR ARM (L))

FORMER (3-968-281-01)	NEW (3-968-281-04)
	

Note : The new parts for 157 DOOR ARM (L) can be used for the set which used former parts.

