

MDX-C5960R/C5970/C5970R

SERVICE MANUAL

Ver 1.1 2001.03



Photo: MDX-C5960R

German Model
MDX-C5960R

US Model
Canadian Model

E Model
MDX-C5970

AEP Model
UK Model
MDX-C5970R

| | |
|------------------------------------|------------------|
| Model Name Using Similar Mechanism | MDX-C7900/C7900R |
| Base Mechanism Type | MG-164N-138 |
| Optical Pick-Up Name | KMS-241B/J1NP |

SPECIFICATIONS

Specifications

AUDIO POWER SPECIFICATIONS (US models)

POWER OUTPUT AND TOTAL HARMONIC DISTORTION
17 watts per channel minimum continuous average power into 4 ohms, 4 channels driven from 20 Hz to 20 kHz with no more than 1% total harmonic distortion.

Other specifications

MD player section

| | |
|------------------------|------------------------|
| Signal-to-noise ratio | 90 dB |
| Frequency response | 10 – 20,000 Hz |
| Wow and flutter | Below measurable limit |
| Laser Diode Properties | |
| Material | GaAlAs |
| Wavelength | 780 nm |
| Emission Duration | Continuous |
| Laser output power | Less than 44.6 W* |

* This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block.

Tuner section

| | |
|------------------------------|--|
| FM | |
| Tuning range | 87.5 – 107.9 MHz (C5970) 87.5 – 108.0 MHz (C5960R/C5970R) |
| Antenna terminal | External antenna connector |
| Intermediate frequency | 10.7 MHz |
| Usable sensitivity | 9 dBf |
| Selectivity | 75 dB at 400 kHz |
| Signal-to-noise ratio | 65 dB (stereo), 68 dB (mono) |
| Harmonic distortion at 1 kHz | 0.7 % (stereo), 0.4 % (mono) |
| Separation | 35 dB at 1 kHz |
| Frequency response | 30 – 15,000 Hz |

AM (C5970)

| | |
|------------------------|----------------------------|
| Tuning range | 530 – 1,710 kHz |
| Antenna terminal | External antenna connector |
| Intermediate frequency | 10.7 MHz/450 kHz |
| Sensitivity | 30 μ V |

MW/LW (C5960R/C5970R)

| | |
|------------------------|--|
| Tuning range | MW: 531 – 1,602 kHz LW: 153 – 281 kHz |
| Aerial terminal | External aerial connector |
| Intermediate frequency | 10.7 MHz/450 kHz |
| Sensitivity | MW: 30 μ V LW: 50 μ V |

– Continued on next page –

FM/AM (MW/LW) MINIDISC PLAYER

9-926-428-12 Sony Corporation
2001C0500-1 Audio Entertainment Group
© 2001.3 General Engineering Dept.

SONY®

Power amplifier section

| | |
|----------------------|---|
| Outputs | Speaker outputs (sure seal connectors) |
| Speaker impedance | 4 – 8 ohms |
| Maximum power output | 35 W × 4 (at 4 ohms) |

General

| | |
|----------------------|--|
| Outputs | Line outputs (1) (C5960R) Line outputs (2) (C5970/C5970R) Power antenna relay control lead Power amplifier control lead Telephone ATT control lead (C5970/C5970R) Illumination control lead |
| Tone controls | Bass ±8 dB at 100 Hz Treble ±8 dB at 10 kHz |
| Power requirements | 12 V DC car battery (negative ground) |
| Dimensions | Approx. 178 × 50 × 184 mm (7 ¹ / ₈ × 2 × 7 ¹ / ₄) (w/h/d) |
| Mounting dimensions | Approx. 182 × 53 × 162 mm (7 ¹ / ₄ × 2 ¹ / ₈ × 6 ¹ / ₂) (w/h/d) |
| Mass | Approx. 1.2 kg (2 lb 10 oz) |
| Supplied accessories | Parts for installation and connections (1 set) Front panel case (1) |

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Design and specifications are subject to change without notice.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic break-down and also use the procedure in the printed matter which is included in the repair parts.

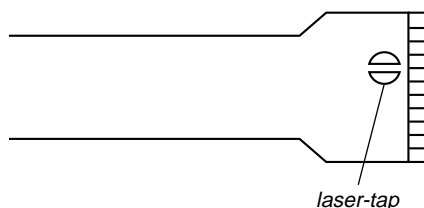
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

Never look into the laser diode emission from right above when checking it for adjustment. It is feared that you will lose your sight.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK (KMS-241B/J1NP).

The laser diode in the optical pick-up block may suffer electrostatic break-down easily. When handling it, perform soldering bridge to the laser-tap on the flexible board. Also perform measures against electrostatic break-down sufficiently before the operation. The flexible board is easily damaged and should be handled with care.



OPTICAL PICK-UP FLEXIBLE BOARD

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.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

CAUTION

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

SAFETY-RELATED COMPONENT WARNING!!

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

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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

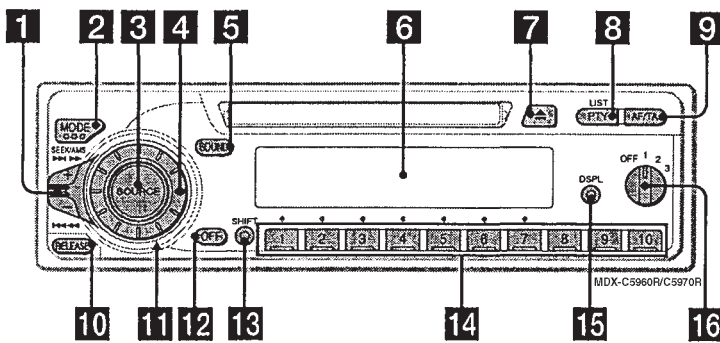
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SECTION 1 GENERAL

This section is extracted from instruction manual.

Location of controls



Refer to the pages for details.

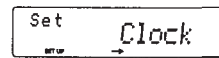
- 1** SEEK/AMS (seek/Automatic Music Sensor/manual search) control 8, 10, 12, 15, 20, 22
- 2** MODE (band/unit select) button 9, 10, 19, 21
- 3** SOURCE (source select) button 7, 8, 9, 10, 13, 19, 21
- 4** Dial (volume/bass/treble/left-right/front-rear) 7, 17, 21
- 5** SOUND button 17
- 6** Display window
- 7** ▲ (eject) button 7
- 8** PTY/LIST button (C5960R/C5970R) LIST button (C5970)
Disc Memo 21
List-up 22
RDS Programme 15
- 9** AF/TA button 12, 13, 14 (C5960R/C5970R) DSPL (display mode change) button (C5970)
- 10** RELEASE (front panel release) button 6, 24
- 11** Reset button (located on the front side of the unit behind by the front panel) 6
- 12** OFF button 6, 7
- 13** SHIFT button
PLAY MODE 9, 10, 11, 12, 14, 22, 23
REP 9, 20
SET UP 7, 8, 15, 18, 19
SHUF 9, 20
- 14** During radio reception:
Number buttons 10, 13, 14
During CD/MD playback:
Direct disc selection buttons 20
- 15** DSPL (display mode change) button 8, 11, 19, 21, 22 (C5960R/C5970R)
- 16** D-BASS control 18

Setting the clock

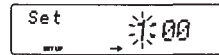
The clock uses a 24-hour digital indication.

Example: Set the clock to 10:08

- 1** Press (SHIFT), then press (2) (SET UP) repeatedly until "Clock" appears.

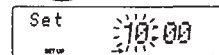


- 1** Press (4) (→).

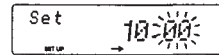


The hour indication flashes.

- 2** Set the hour.

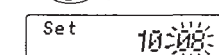


- 3** Press (4) (→).

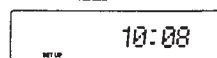


The minute indication flashes.

- 4** Set the minute.



- 2** Press (SHIFT).



The clock starts.

- 3** Press (SHIFT).
After the mode setting is complete, the display goes back to normal playback mode.

Getting Started

Resetting the unit

Before operating the unit for the first time or after replacing the car battery, you must reset the unit.
Remove the front panel and press the reset button with a pointed object, such as a ballpoint pen.

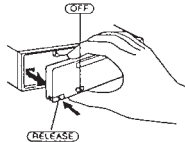


Reset button
Pressing the reset button will erase the clock setting and some memorized functions.

Detaching the front panel

You can detach the front panel of this unit to prevent the unit from being stolen.

- 1 Press **OFF**.
- 2 Press **RELEASE**, then slide the front panel a little to the left, and pull it off towards you.

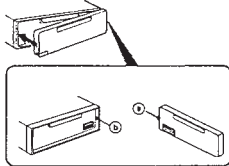


Note

- Be sure not to drop the panel when detaching it from the unit.
- If you detach the panel while the unit is still turned on, the power will turn off automatically to prevent the speakers from being damaged.
- When carrying the front panel with you, use the supplied front panel case.

Attaching the front panel

Attach part ① of the front panel to part ② of the unit as illustrated and push the left side into position until it clicks.



Notes

- Be sure not to attach the front panel upside down.
- Do not press the front panel too hard against the unit when attaching it.
- Do not press too hard or put excessive pressure on the display windows of the front panel.
- Do not expose the front panel to direct sunlight or heat sources such as hot air ducts, and do not leave it in a humid place. Never leave it on the dashboard of a car parked in direct sunlight or where there may be a considerable rise in temperature.

Caution alarm

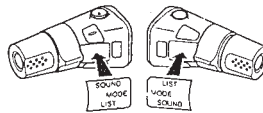
If you turn the ignition key switch to the OFF position without removing the front panel, the caution alarm will beep for a few seconds.

Other Functions

You can also control this unit with an optional rotary commander.

Labelling the rotary commander

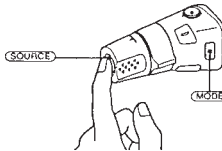
Depending on how you mount the rotary commander, attach the appropriate label as shown in the illustration below.



Using the rotary commander

The rotary commander works by pressing buttons and/or rotating controls. You can control an optional CD or MD unit with the rotary commander.

By pressing buttons (the SOURCE and MODE buttons)



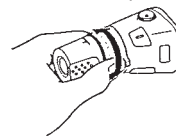
Each time you press **SOURCE**, the source changes as follows:
Tuner — CD* — MD

Pressing **MODE** changes the operation in the following ways:

- Tuner: FM1 — FM2 — MW — LW
- CD unit: CD1 — CD2 — ...
- MD unit: MD1 — MD2 — ...

* If the corresponding optional equipment is not connected, this item will not appear.

By rotating the control (the SEEK/AMS control)



Rotate the control and release it to:

- Locate a specific track on a disc. Rotate and hold the control until you locate the specific point in a track, then release it to start playback.
- Tune in stations automatically. Rotate and hold the control to find a specific station.

By pushing in and rotating the control (the PRESET/DISC control)

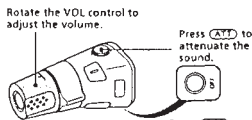


Push in and rotate the control to:

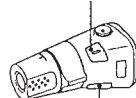
- Receive the stations memorised on the number buttons.
- Change the disc.

6

Other operations



* Press **SOUND** to adjust the volume and sound menu.

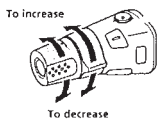


Press **LIST** to:

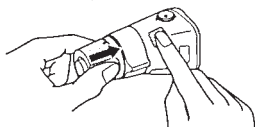
- Display the memorised names.
- Display the programme type.

Changing the operative direction

The operative direction of controls is factory-set as in the illustration below.



If you need to mount the rotary commander on the right hand side of the steering column, you can reverse the operative direction.



Press **SOUND** for two seconds while pushing the VOL control.

Tip
You can also change the operative direction of these controls with the unit (page 18).

Adjusting the sound characteristics

You can adjust the bass, treble, balance and fader. Each source can store the bass and treble levels respectively.

- 1 Select the item you want to adjust by pressing **SOUND** repeatedly.

VOL (volume) —> BAS (bass) —> TRE (treble) —> BAL (left-right) —> FAD (front-rear)

- 2 Adjust the selected item by rotating the dial. Adjust within three seconds after selecting the item. (After three seconds, the dial functions reverts to the volume control.)

Attenuating the sound

Press **ATT** on the optional rotary commander.
"ATT on" flashes momentarily.

To restore the previous volume level, press **ATT** again.

Tip
The unit decreases the volume automatically when a telephone call comes in (Telephone-ATT function).

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Changing the sound and display settings

You can set:

- Clock (page 7).
- CT (Clock Time) (page 15).
- D.Info (Dual Information) — to display the clock and the play mode at the same time (on) or to display the information alternately (off).
- Dimmer — to change the brightness of the display.
 - Select "Auto" to dim the display only when you turn the lights on.
 - Select "on" to dim the display.
 - Select "off" to deactivate Dimmer.
- Contrast — to adjust the contrast if the indications in the display are not recognizable because of the unit's installed position.
- Beep — to turn on or off the beeps.
- RM (Rotary Commander) — to change the operative direction of the controls of the rotary commander.
 - Select "norm" to use the rotary commander in the factory-set position.
 - Select "rev" when you mount the rotary commander on the right side of the steering column.
- M.dspl (Motion display) — to turn the motion display 1, 2, or off.
- A.Scr1 (Auto Scroll) (page 8, 19).

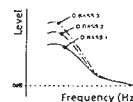
- 1 Press **SHIFT**.
- 2 Press **SET UP** repeatedly until the desired item appears. Each time you press **SET UP**, the item changes as follows:
Clock —> CT —> D.Info* —> Dimmer —> Contrast —> Beep —> RM —> M.dspl —> A.Scr1*
* When no MD or CD is playing, this item will not appear.

Note
The displayed item will differ depending on the source.

- 3 Press **←** to select the desired setting (Example: on or off). For the "Contrast" setting, pressing **↔** makes the contrast higher, and pressing **→** makes the contrast lower.
- 4 Press **SHIFT**. After the mode setting is complete, the display returns to normal playback mode.

Boosting the bass sound — D.bass

You can enjoy a clear and powerful bass sound. The D-bass function boosts the low frequency signal with a sharper curve than conventional bass boost. You can hear the bass line more clearly even while the vocal volume remains the same. You can emphasize and adjust the bass sound easily with the D-bass control.



Adjusting the bass curve

Turn the D-BASS control to adjust the bass level (1, 2 or 3). "D-BASS" appears in the display.

To cancel, turn the dial to the OFF position.

Note
If the bass sound becomes distorted, adjust the D-bass control or volume.

17

18

Installation

Precautions

- Do not tamper with the four holes on the upper surface of the unit. They are for tuner adjustments to be made only by service technicians.
- Choose the installation location carefully so the unit will not hamper the driver during driving.
- Avoid installing the unit in areas subject to dust, dirt, excessive vibration, or high temperatures, such as in direct sunlight or near heater ducts.
- Use only the supplied mounting hardware for a safe and secure installation.

Mounting angle adjustment

Adjust the mounting angle to less than 20°.

Instalación

Precauciones

- No toque los cuatro orificios de la superficie superior de la unidad. Estos orificios son para ajustes del sintonizador que solamente deberán realizar técnicos de reparación.
- Elija cuidadosamente el lugar de instalación de forma que la unidad no interfiera en las funciones normales de conducción.
- Evite instalar la unidad donde pueda quedar sometida a altas temperaturas, como a la luz solar directa o al aire de calefacción, o a polvo, suciedad, o vibraciones excesivas.
- Para realizar una instalación segura y firme, utilice solamente la ferretería de montaje suministrada.

Ajuste del ángulo de montaje

Ajuste el ángulo de montaje a menos de 20°.

Montering

Säkerhetsföreskrifter

- Låt de fyra hålen på bilstereons ovansida vara. De är till för radiojusteringar som endast får utföras av fackkunniga tekniker.
- Var noga när du väljer var i bilen du monterar bilstereon, så att den inte sitter i vägen när du kör.
- Montera inte bilstereon där den utsätts för värme, t.ex. solsken eller varmluft, eller där den utsätts för damm, smuts och/eller vibrationer.
- Använd endast de medföljande monteringsföremålen för att vara säker på att bilstereon monteras på ett säkert och korrekt sätt.

Tillåten monteringsvinkel

Monteringsvinkeln får inte vara större än 20 grader.

Instalação

Precações

- Não altere indevidamente os quatro orifícios da superfície da parte superior do aparelho. Estes servem para regulações do sintonizador que devem ser efectuadas somente por técnicos qualificados.
- Escolha com cuidado um local apropriado para a montagem do aparelho, para que este não interfira com as manobras necessárias à condução do veículo.
- Evite instalar o aparelho onde possa estar sujeito a altas temperaturas, como em locais expostos directamente à luz do sol, ao ar quente dos aquecimentos, ou sujeitos a pó, sujidade ou vibração excessiva.
- Para efectuar uma instalação segura utilize unicamente o material de montagem fornecido.

Ajuste do ângulo de montagem

Ajuste o ângulo de montagem a menos de 20°.

How to detach and attach the front panel

Before installing the unit, detach the front panel.

A To detach

Before detaching the front panel, be sure to press **OFF**. Press **RELEASE**, then slide the front panel a little to the left, and pull it off towards you.

B To attach

Attach part **Ⓐ** of the front panel to part **Ⓑ** of the unit as illustrated and push the left side into position until it clicks.

Forma de extraer e instalar el panel frontal

Antes de instalar la unidad, extraiga el panel frontal.

A Para extraerlo

Antes de extraer el panel frontal, asegúrese de pulsar **OFF**. Pulse **RELEASE**, deslice el panel ligeramente hacia la izquierda y tire de él hacia fuera.

B Para instalarlo

Fije la parte **Ⓐ** del panel frontal a la parte **Ⓑ** de la unidad tal como muestra la ilustración y ejerza presión sobre el lado izquierdo hasta oír un chasquido.

Ta loss/fästa frontpanelen

Ta loss frontpanelen innan du monterar bilstereon.

A Ta loss frontpanelen

Se till att enheten är avstängd innan du tar bort frontpanelen. Tryck på **OFF**. Tryck sedan på **RELEASE** och skjut frontpanelen lite åt vänster medan du drar den mot dig.

B Fästa frontpanelen

Sätt fast del **Ⓐ** på frontpanelen på del **Ⓑ** på enheten enligt bilden och tryck på den vänstra sidan tills det klickar till.

Para retirar e colocar o painel frontal

Retire o painel frontal antes de iniciar a instalação do aparelho.

A Para retirar

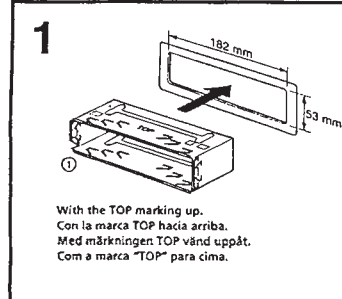
Antes de retirar o painel frontal, tem de carregar em **OFF**. Carregue em **RELEASE**, faça deslizar o painel um pouco para a esquerda e puxe-o para si.

B Para colocar

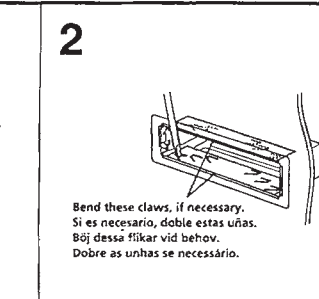
Encaixe a parte **Ⓐ** do painel frontal na parte **Ⓑ** do aparelho, como se mostra na figura, fazendo pressão sobre o painel até ouvir um estalido.



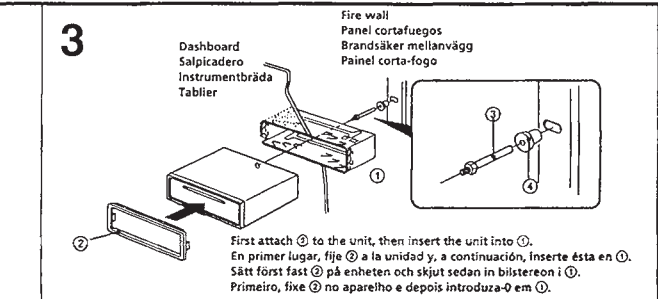
Installation in the dashboard



Instalación en el salpicadero



Montera på instrumentbrädan



Connection diagram

For connecting two or more changers, the source selector XA-C30 (optional) is necessary.

Diagrama de conexiones

Si desea conectar dos o más cambiadores, necesitará el selector de fuente XA-C30 (opcional).

Kopplingschema

För anslutning av två eller flera växlare krävs växlaren XA-C30 (tillval).

Diagrama de ligações

Para ligar um ou mais permutadores, é necessário o selector de fonte XA-C30 (opcional).

Equipment used in illustrations (not supplied)

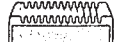
Equipo utilizado en las ilustraciones (no suministrado)

Utrustning som visas i illustrationer (medföljer inte)

Equipamento utilizado nas ilustrações (não fornecido)



Front speakers
Altavoces delanteros
Framre högtalare
Altifalantes dianteiros



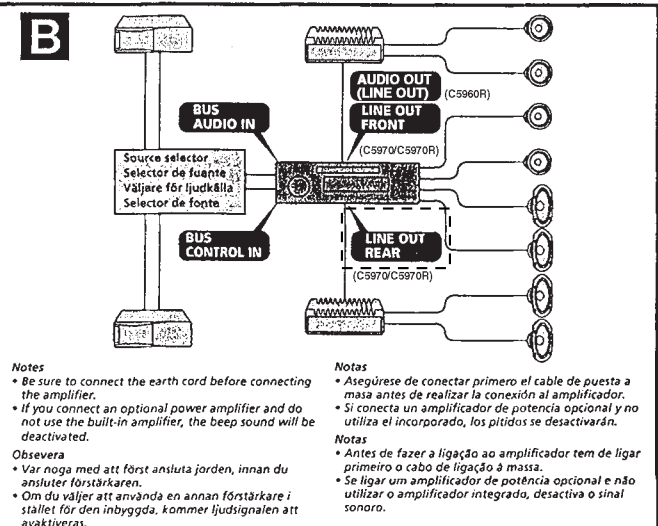
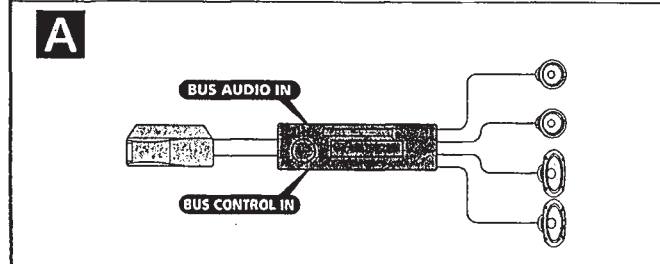
Power amplifier
Amplificador de potencia
Effektförstärkare
Amplificador de potência



Rear speakers
Altavoces traseros
Bakre högtalare
Altifalantes traseiros



CD/MD changer
Cambiador de CD/MD
CD/MD-skivväxlare
Permutador CD/MD



Connections

Caution

- This unit is designed for negative earth 12 V DC operation only.
- Be careful not to pinch any wires between a screw and the body of the car or this unit or between any moving parts such as the seat ralling, etc.
- Connect the power connecting cord (C) to the unit and speakers before connecting it to the auxiliary power connector.
- Run all earth wires to a common earth point.
- Connect the yellow cord to a free car circuit rated higher than the unit's fuse rating. If you connect this unit in series with other stereo components, the car circuit they are connected to must be rated higher than the sum of the individual component's fuse rating. If there are no car circuits rated as high as the unit's fuse rating, connect the unit directly to the battery. If no car circuits are available for connecting this unit, connect the unit to a car circuit rated higher than the unit's fuse rating in such a way that if the unit blows its fuse, no other circuits will be cut off.
- Connecting this unit may cause some car battery wear when your car has no ACC (accessory) position on the ignition key switch. In this case, please consult your nearest Sony dealer.

Notes of connection example

Note on the control leads

- The power aerial control lead (blue) supplies +12 V DC when you turn on the tuner or when you activate the AF (Alternative Frequency) or the TA (Traffic Announcement) functions.
- A power aerial without a relay box cannot be used with this unit.

Warning

If you have a power aerial without a relay box, connecting this unit with the supplied power connecting cord (C) may damage the aerial.

Memory hold connection

When the yellow power input lead is connected, power will always be supplied to the memory circuit even when the ignition switch is turned off.

Notes on speaker connection

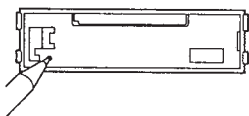
- Before connecting the speakers, turn the unit off.
- Use speakers with an impedance of 4 to 8 ohms, and with adequate power handling capacities. Otherwise, the speakers may be damaged.
- Do not connect the terminals of the speaker system to the car chassis, and do not connect the terminals of the right speaker with those of the left speaker.
- Do not attempt to connect the speakers in parallel.
- Do not connect any active speakers (with built-in amplifiers) to the speaker terminals of the unit. Doing so may damage the active speakers. Be sure to connect passive speakers to these terminals.

Reset button

When the installation and connections are complete, be sure to press the reset button with a ballpoint pen etc.

Återställningsknappen

Kom ihåg att använda en penna eller något annat spetsigt föremål för att trycka på återställningsknappen när anslutningen och monteringen är klar.



Conexiones

Precauciones

- Esta unidad ha sido diseñada para alimentación solamente con 12 V CC, negativo a masa.
- Tenga cuidado de no atrapar ningún cable entre algún tornillo y la carrocería del automóvil o esta unidad o entre las partes móviles, como por ejemplo los railes del asiento, etc.
- Conecte el cable de conexión de alimentación (C) a la unidad y a los altavoces antes de hacerlo al conector de alimentación auxiliar.
- Conecte todos los conductores de puesta a masa a un punto común.
- Conecte el cable amarillo a un circuito libre del automóvil que tenga una capacidad superior a la del fusible de la unidad. Si conecta esta unidad en serie con otros componentes estereofónicos, el circuito del automóvil al que se encuentren conectados debe tener una capacidad superior a la de la suma de las capacidades de los fusibles de cada componente. Si ningún circuito del automóvil tiene una capacidad tan alta como la del fusible de la unidad, conecte ésta directamente a la batería. Si el automóvil no dispone de ningún circuito para conectar esta unidad, conéctela a un circuito del mismo con capacidad superior a la del fusible de la unidad, de forma que si se funde el fusible de ésta, no se interrumpa ningún otro circuito.
- La conexión de esta unidad puede producir cierta descarga de la batería si el automóvil no dispone de posición ACC (accesorios) en el interruptor de la llave de encendido. En este caso, consulte con el proveedor Sony más próximo.

Notas de ejemplo de conexiones

Nota sobre conductores de control

- El conductor de control de la antena motorizada (azul) suministrará +12 V CC cuando conecte la alimentación del sintonizador, o cuando active la función de frecuencia alternativa (AF) o la de anuncios de tráfico (TA).
- Con esta unidad no podrá utilizarse una antena motorizada sin caja de relés.

Advertencia

Si dispone de una antena motorizada sin dispositivo de relé, la conexión de esta unidad con el cable de conexión de alimentación (C) suministrado puede dañar la antena.

Conexión para protección de la memoria

Si conecta el conductor de entrada de alimentación amarillo, el circuito de la memoria recibirá siempre alimentación, incluso aunque ponga la llave de encendido en la posición de apagado.

Notas sobre la conexión de los altavoces

- Antes de conectar los altavoces, desconecte la alimentación de la unidad.
- Utilice altavoces con una impedancia de 4 a 8 ohmios, y con la potencia máxima admisible adecuada, ya que de lo contrario podría dañarlos.
- No conecte los terminales del sistema de altavoces al chasis del automóvil, ni los del altavoz izquierdo a los del derecho.
- No intente conectar los altavoces en paralelo.
- No conecte altavoces activos (con amplificadores incorporados) a los terminales de altavoces de la unidad. Si lo hiciera, podría dañar tales altavoces. Por lo tanto, cerciórese de conectar altavoces pasivos a estos terminales.

Botón de reposición

Cuando finalice la instalación y las conexiones, cerciórese de pulsar el botón de reposición con un bolígrafo, etc.

Botão de reinicialização

Quando terminar a instalação e as ligações, não se esqueça de carregar no botão de reinicialização com a ponta de uma caneta esferográfica etc.

Anslutning

Säkerhetsföreskrifter

- Denna bilstereo är endast avsedd för anslutning till ett negativt jordat, 12 V bilbatteri.
- Var noga med att inga kablar kläms mellan någon skruv eller att de blir klämda mellan rörliga delar som Lex. bilsätet.
- Anslut strömkabeln (C) till enheten och högtalarna innan du ansluter den till den yttre strömanslutningen.
- Dra samtliga jordledningar till en och samma jordningspunkt.
- Anslut den gula kabeln till en ledig bilkrets som har en säkring med ett högre amperetal än vad enheten kräver. Om du seriekopplar denna enhet med andra stereokomponenter, måste den bilkrets de är kopplade till ha en säkring med en högre amperetal än summan av de enskilda komponenternas strömförbrukning. Om det inte finns någon bilkrets som har en säkring med ett lika högt amperetal som enheten kräver, ska du ansluta enheten direkt till batteriet. Om det inte finns några bilkretsar att ansluta denna enhet till ska du ansluta enheten till en strömkrets som har en säkring med ett högre amperetal än enhetens säkring på ett sätt som gör att det inte blir avbrott i några andra kretsar om enhetens säkring smälter.
- När du ansluter den här enheten kan det hända att bilbatteriet laddas ur snabbare om bilens tändlås saknar det speciella läget för tillbehör, ACC.
- I så fall bör du ta kontakt med din närmaste Sony-återförsäljare.

Att observera angående anslutningsexemplet

Att observera angående olika styrkablar

- Motorantennens styrkabel ANT REM (blå) leder 12 V likström när bilradion slås på eller när du aktiverar alternativ frekvenser (AF) eller trafikmeddelanden (TA).
- En motorantenn utan styrreläddosa kan inte anslutas till denna bilstereo.

Varning

När du ansluter den gula, ingående strömkabeln antennen skadas om du ansluter enheten med den medföljande strömkabeln (C).

Anslutning för minnesstöd

När du ansluter den gula, ingående strömkabeln försörjs minneskretsen med ström hela tiden, även när tändlåset slås ifrån.

Att observera angående högtalarnas anslutning

- Slå av bilstereon innan du ansluter högtalarna.
- Anslut endast högtalare, vars impedans varierar från 4 till 8 ohm och som har tillräcklig effekthanteringskapacitet för att skydda högtalarna mot skador.
- Anslut inte något av högtalaruttagen till bilens chassi. Anslut inte heller uttagen på höger högtalare till uttagen på vänster högtalare.
- Anslut inte högtalarna parallellt.
- Anslut inte aktiva högtalare (med inbyggda slutsteg) till bilstereons högtalaruttag, eftersom de kan skada de aktiva högtalarna. Var noga med att bara ansluta passiva högtalare till dessa uttag.

Ligações

Advertência

- Este aparelho foi projectado para funcionar somente com corrente contínua de 12 V com negativo à massa.
- Tenha cuidado para que os fios não fiquem entalados entre os parafusos e a carroceria do automóvel ou a caixa do aparelho nem entre as peças móveis, por exemplo, as calhas dos bancos, etc.
- Ligue o cabo de alimentação de corrente (C) ao aparelho e aos altifalantes antes de o ligar ao conector de corrente auxiliar.
- Ligue todos os cabos de massa num ponto de massa comum.
- Ligue o cabo amarelo a um circuito livre do automóvel com uma capacidade nominal superior à do fusível do aparelho. Se ligar este aparelho em série com outros componentes estéreo, o circuito do automóvel a que estão ligados deve ter uma capacidade nominal superior à soma da capacidade dos fusíveis de cada componente. Se nenhum circuito do automóvel tiver uma capacidade tão alta como a do fusível do aparelho, ligue o aparelho directamente à bateria. Se o automóvel não tiver nenhum circuito disponível para ligação do aparelho, ligue-o a um circuito com uma capacidade superior à do fusível do aparelho para que se o fusível se fundir, nenhum dos outros circuitos seja cortado.
- A ligação deste aparelho pode provocar o desgaste da bateria se a chave de ignição do automóvel não tiver a posição ACC (acessórios). Nesse caso, entre em contacto com o agente da Sony mais próximo.

Notas sobre o exemplo de ligação

Nota sobre os fios de controlo

- O fio de controlo da antena eléctrica (azul) fornece uma corrente contínua (CC) de +12 V quando se liga o sintonizador ou se activa a função AF (Frequência Alternativa) ou TA (Informações de Tráfego).
- Não pode utilizar uma antena eléctrica sem caixa de relé com este aparelho.

Atenção

Se a antena eléctrica não tiver uma caixa de relé, o facto de ligar este aparelho com o cabo de alimentação (C) fornecido, pode provocar danos na antena.

Ligação para alimentação contínua da memória Quando, o fio amarelo de entrada de alimentação for ligado, os circuitos de memória ficarão com alimentação contínua, mesmo se a chave de ignição estiver desligada.

Notas sobre a ligação dos altifalantes

- Antes de ligar os altifalantes, desligue o aparelho.
- Utilize altifalantes com impedância de 4 a 8 ohm, e com capacidade admissível de potência adequada. Caso contrário, os altifalantes poderão sofrer avarias.
- Não ligue os terminais do sistema de altifalantes ao chassi do automóvel, e não ligue os terminais do altifalante direito aos terminais do altifalante esquerdo.
- Não tente ligar os altifalantes em paralelo.
- Não ligue nenhum sistema de altifalantes activos (com amplificadores incorporados) aos terminais dos altifalantes do aparelho. Caso o faça, poderá avariar o sistema de altifalantes activos. Portanto, não se esqueça de ligar altifalantes passivos a estes terminais.

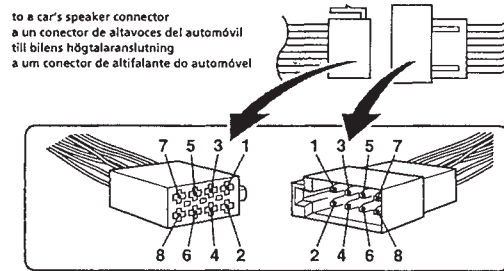
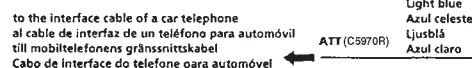
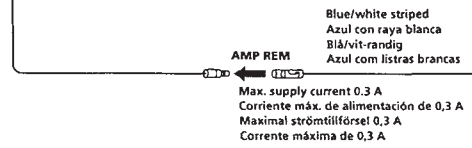
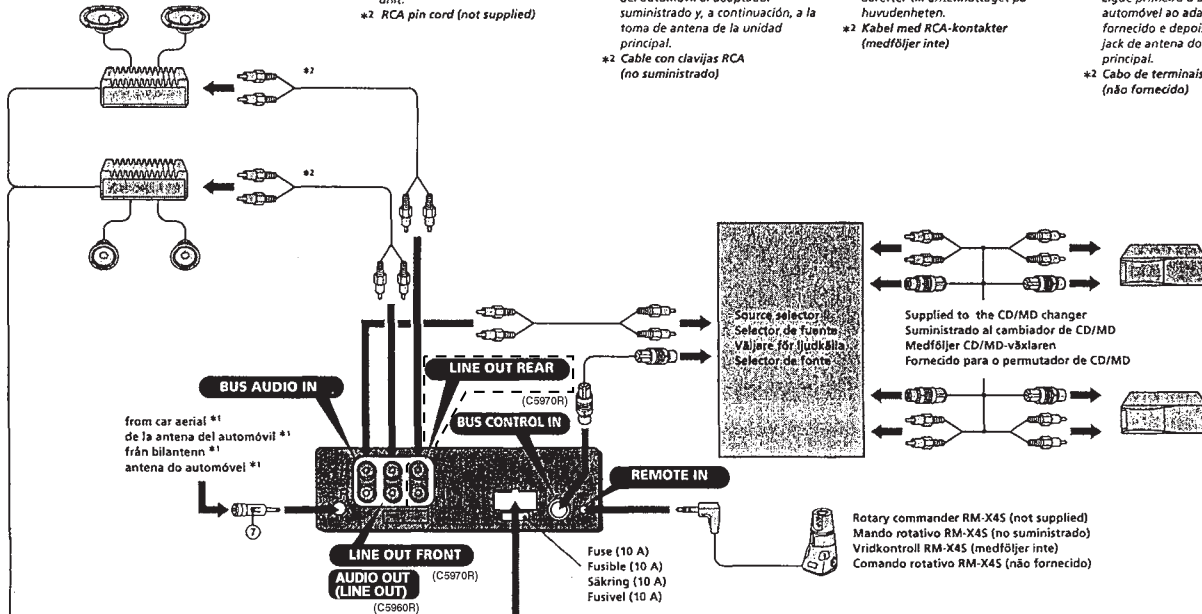
Connection example
Ejemplo de conexiones
Anslutningarna enligt exemplet
Exemplo de ligações
(C5960R/C5970R)

*1 Note for the aerial connecting
 If your car aerial is an ISO
 (International Organization for
 Standardization) type, use the
 supplied adapter (A) to connect it.
 First connect the car aerial to the
 supplied adapter, then connect it
 to the aerial jack of the master
 unit.
 *2 RCA pin cord (not supplied)

*1 Nota sobre la conexión de la
 antena
 Si la antena del automóvil es del
 tipo ISO (International
 Organization for Standardization),
 emplee el adaptador suministrado
 (A) para conectarla.
 En primer lugar, conecte la antena
 del automóvil al adaptador
 suministrado y, a continuación, a la
 toma de antena de la unidad
 principal.
 *2 Cable con clavijas RCA
 (no suministrado)

*1 Angående antennanslutning
 Om bilantennen är av ISO-typ
 (International Organization for
 Standardization), använd den
 medföljande adapter (A) för att
 ansluta den.
 Anslut först bilantennen till
 medföljande adapter och
 därefter till antennuttaget på
 huvudenheten.
 *2 Kabel med RCA-kontakter
 (medföljer inte)

*1 Nota referente à ligação da
 antena
 Se a antena do automóvel for
 uma antena de tipo ISO
 (International Organization for
 Standardization), utilize o
 adaptador fornecido (A) para fazer
 a ligação respectiva.
 Ligue primeiro a antena do
 automóvel ao adaptador
 fornecido e depois à ficha tipo
 jack de antena do sistema
 principal.
 *2 Cabo de terminais RCA
 (não fornecido)

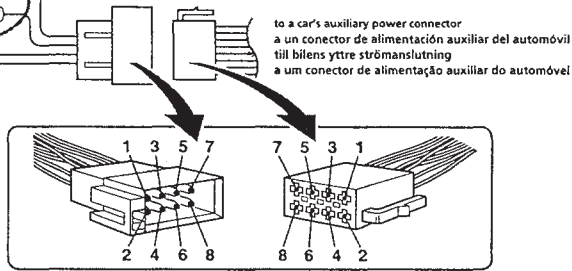


WARNING
 Auxiliary power connectors may vary depending on the car. Be sure to check the power connection sheet supplied with the unit. Improper connections may damage your car. If the supplied power connecting cord can not be used with your car, consult your nearest Sony dealer.

ADVERTENCIA
 Los conectores de alimentación auxiliar pueden variar en función del automóvil. Asegúrese de consultar el diagrama de conexión de alimentación suministrado con la unidad. Las conexiones incorrectas pueden dañar el automóvil. Si no es posible utilizar con el automóvil el cable de conexión de alimentación suministrado, póngase en contacto con el proveedor Sony más próximo.

WARNING
 Typen av yttre strömanslutning varierar från bil till bil. Kontrollera kopplingskemat som medföljer enheten så att du ansluter på rätt sätt. Felaktig anslutning kan skada bilen. Kontakta närmaste Sony-återförsäljare om den medföljande strömkabeln inte passar till din bil.

ATENÇÃO
 Os conectores de corrente auxiliares podem variar de carro para carro. Não se esqueça de verificar o diagrama de ligação de corrente fornecido com o aparelho. As ligações mal executadas podem danificar o seu carro. Se não puder utilizar o cabo de alimentação fornecido com o seu carro, contacte o agente Sony da sua zona.



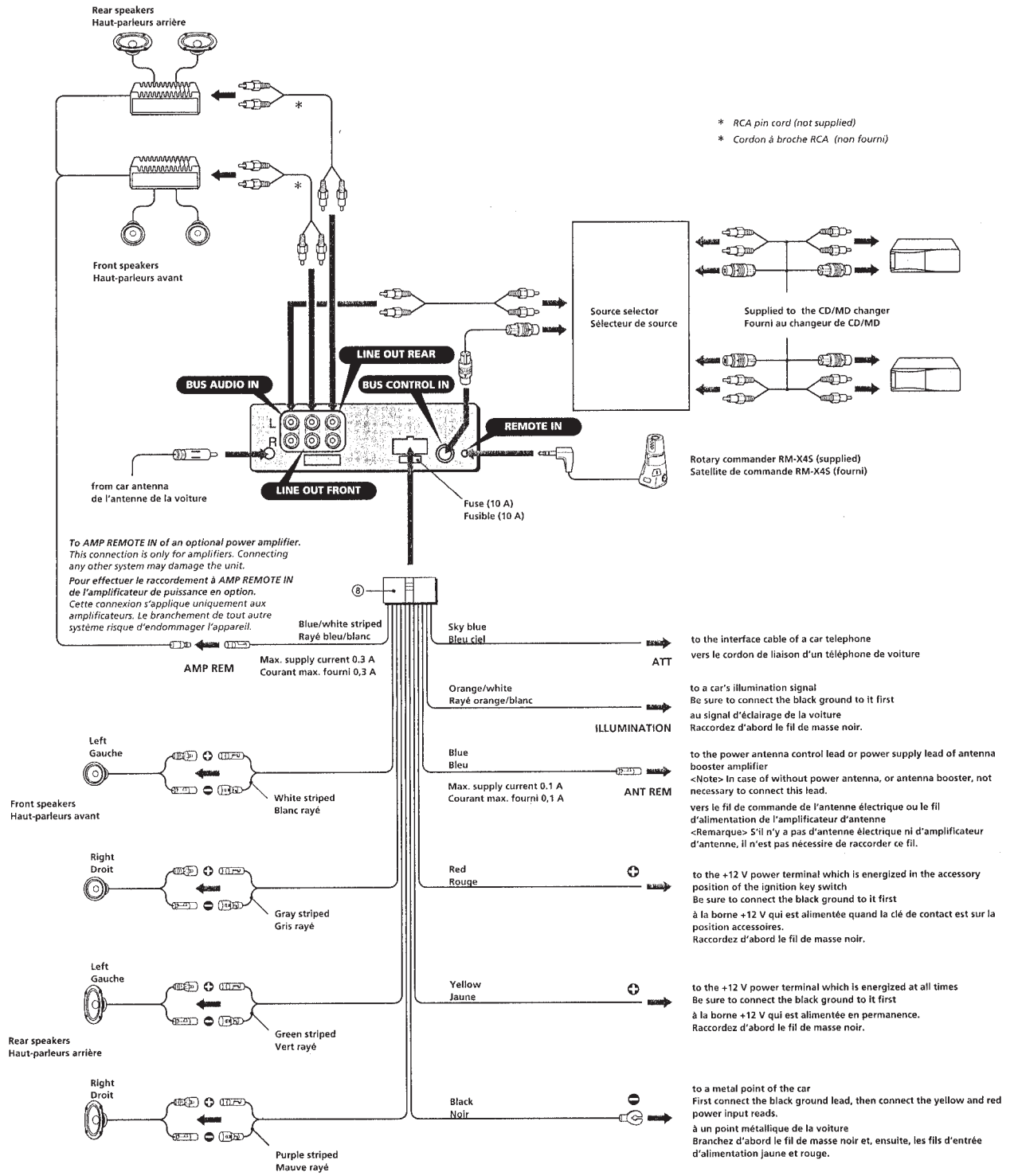
| | | | | | |
|---|--|---|---|----------------------------------|---|
| 1 | Purple Púrpura Violetto Violeta | Speaker, Rear, Right Altavoz, parte posterior, derecho Högtalare, bakre, höger Altifalante, Parte de trás, Direito | 5 | White Blanco Vit Branco | Speaker, Front, Left Altavoz, parte frontal, izquierdo Högtalare, främre, vänster Altifalante, Parte da frente, Esquerdo |
| 2 | | Speaker, Rear, Right Altavoz, parte posterior, derecho Högtalare, bakre, höger Altifalante, Parte de trás, Direito | 6 | | Speaker, Front, Left Altavoz, parte frontal, izquierdo Högtalare, främre, vänster Altifalante, Parte da frente, Esquerdo |
| 3 | Grey Gris Griå Cinza | Speaker, Front, Right Altavoz, parte frontal, derecho Högtalare, främre, höger Altifalante, Parte da frente, Direito | 7 | Green Verde Grön Verde | Speaker, Rear, Left Altavoz, parte posterior, izquierdo Högtalare, bakre, vänster Altifalante, Parte de trás, Esquerdo |
| 4 | | Speaker, Front, Right Altavoz, parte frontal, derecho Högtalare, främre, höger Altifalante, Parte da frente, Direito | 8 | | Speaker, Rear, Left Altavoz, parte posterior, izquierdo Högtalare, bakre, vänster Altifalante, Parte de trás, Esquerdo |

| | | | | | |
|---|--------------------------------------|---|---|----------------------------------|--|
| 4 | Yellow Amarillo Gul Amarelo | continuous power supply suministro de alimentación continua kontinuerlig strömförsörjning alimentação de corrente contínua | 6 | Red Rojo Röd Vermelho | switched power supply suministro conmutado de alimentación switchad strömförsörjning alimentação de corrente comutada |
| 5 | Blue Azul Blå Azul | power aerial control control de antena motorizada motorantenn antena eléctrica | 8 | Black Negro Svart Preto | earth toma de tierra jord Terra |

Negative polarity positions 2, 4, 6, and 8 have striped cords.
 Las posiciones de polaridad negativa 2, 4, 6 y 8 tienen cables con raya.
 De negativa polpositionerna 2, 4, 6 och 8 har randiga kablar.
 As posições 2, 4, 6 e 8 (polaridade negativa) têm cabos às riscas.

Positions 1, 2, 3, and 6 do not have pins.
 Las posiciones 1, 2, 3 y 6 no disponen de pines.
 Positionerna 1, 2, 3 och 6 saknar stift.
 As posições 1, 2, 3 e 6 não têm pinos.

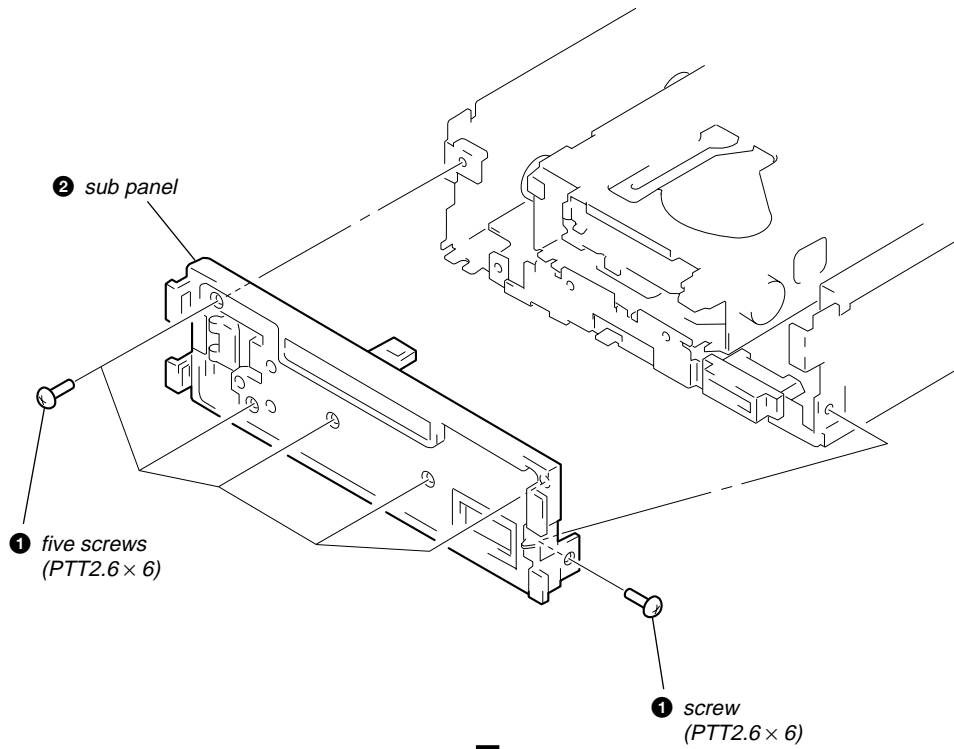
Connection Example
Exemple de connexion
(C5970)



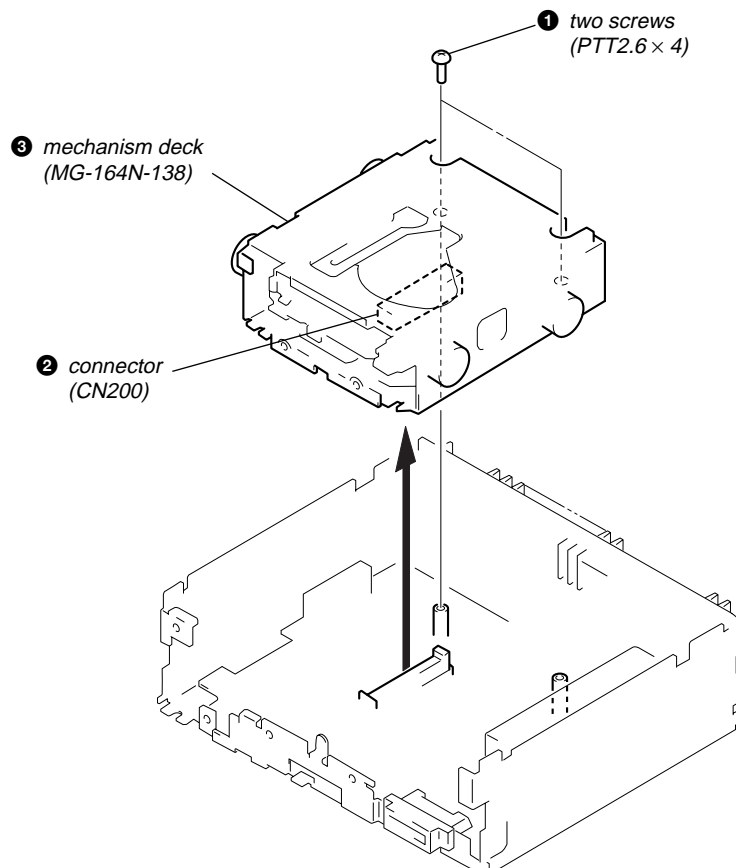
SECTION 2 DISASSEMBLY

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

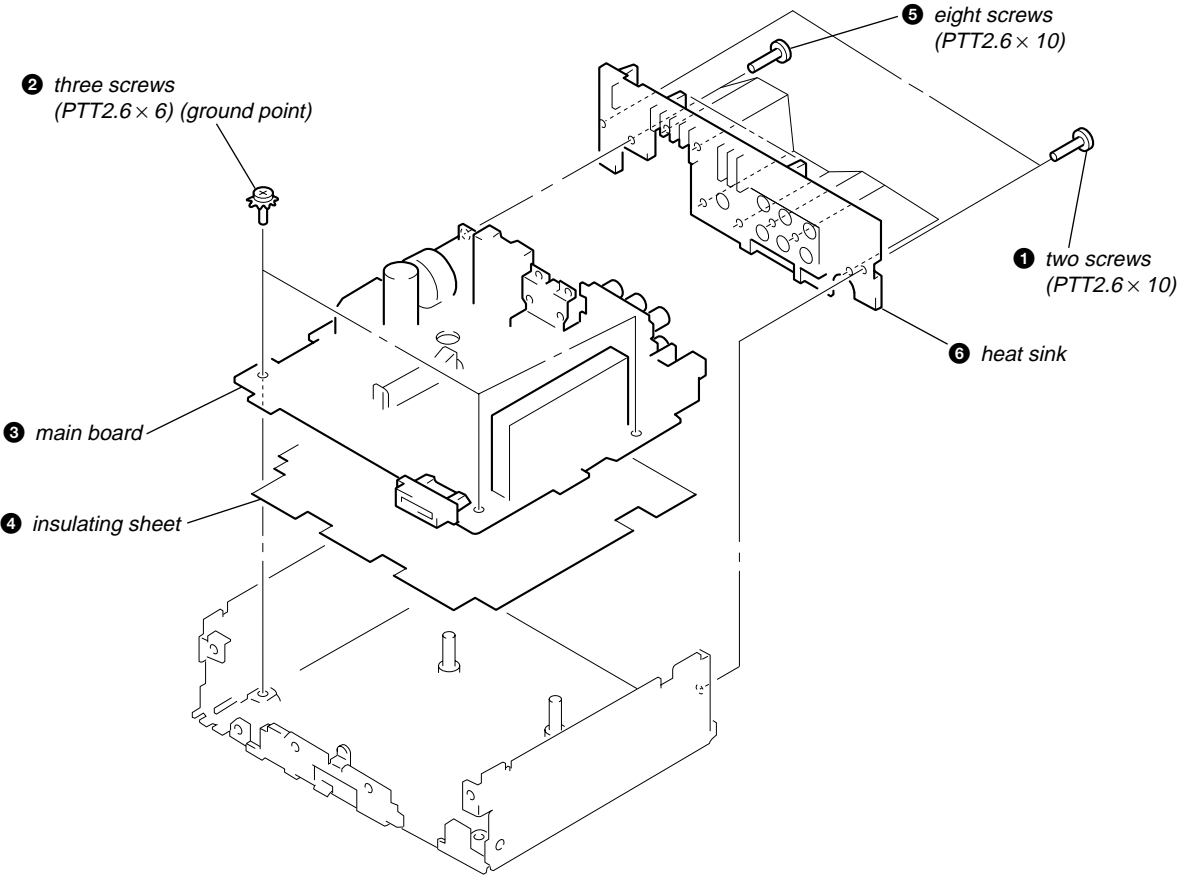
SUB PANEL



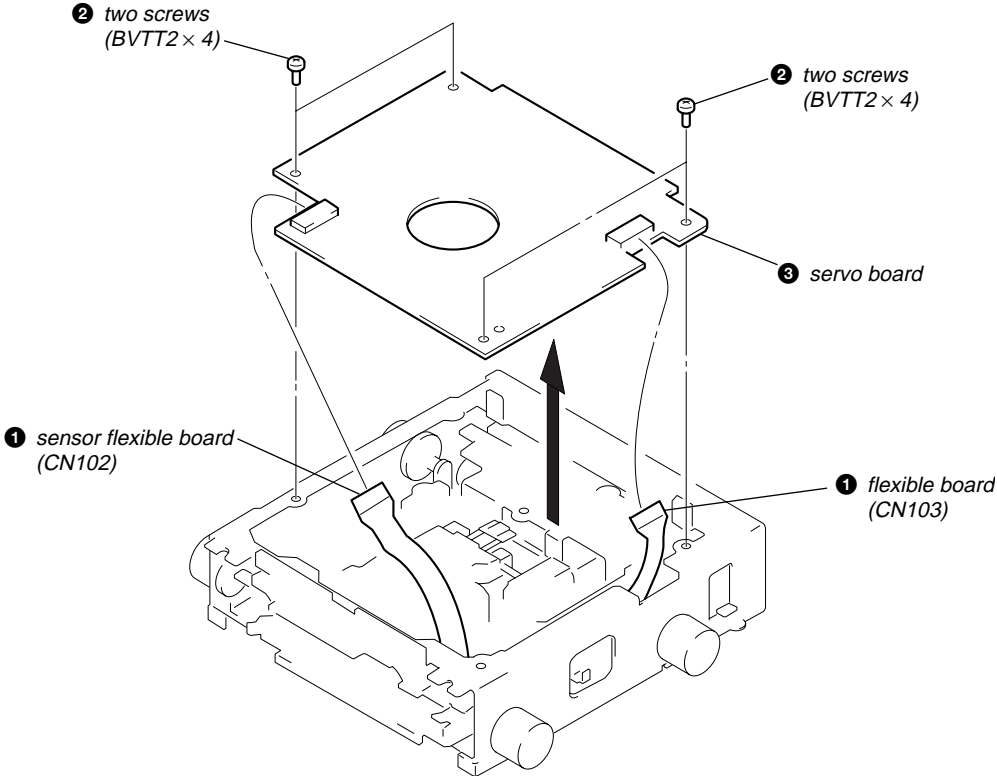
MECHANISM DECK (MG-164N-138)



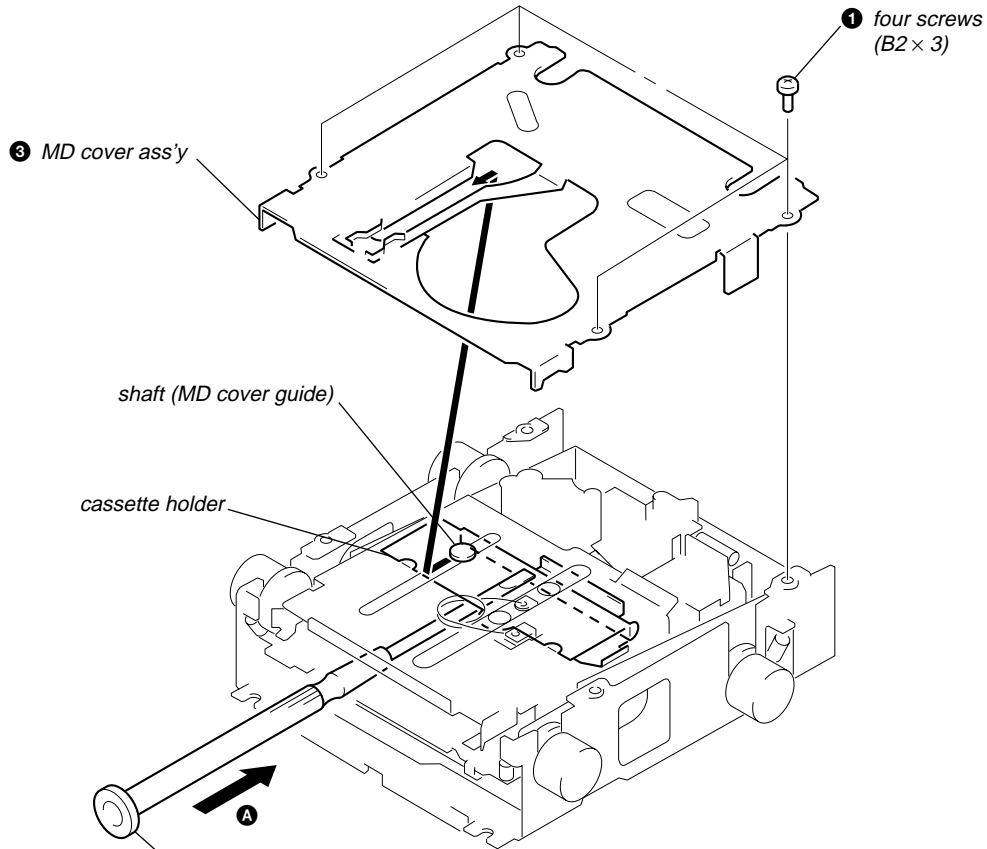
MAIN BOARD, HEAT SINK



SERVO BOARD



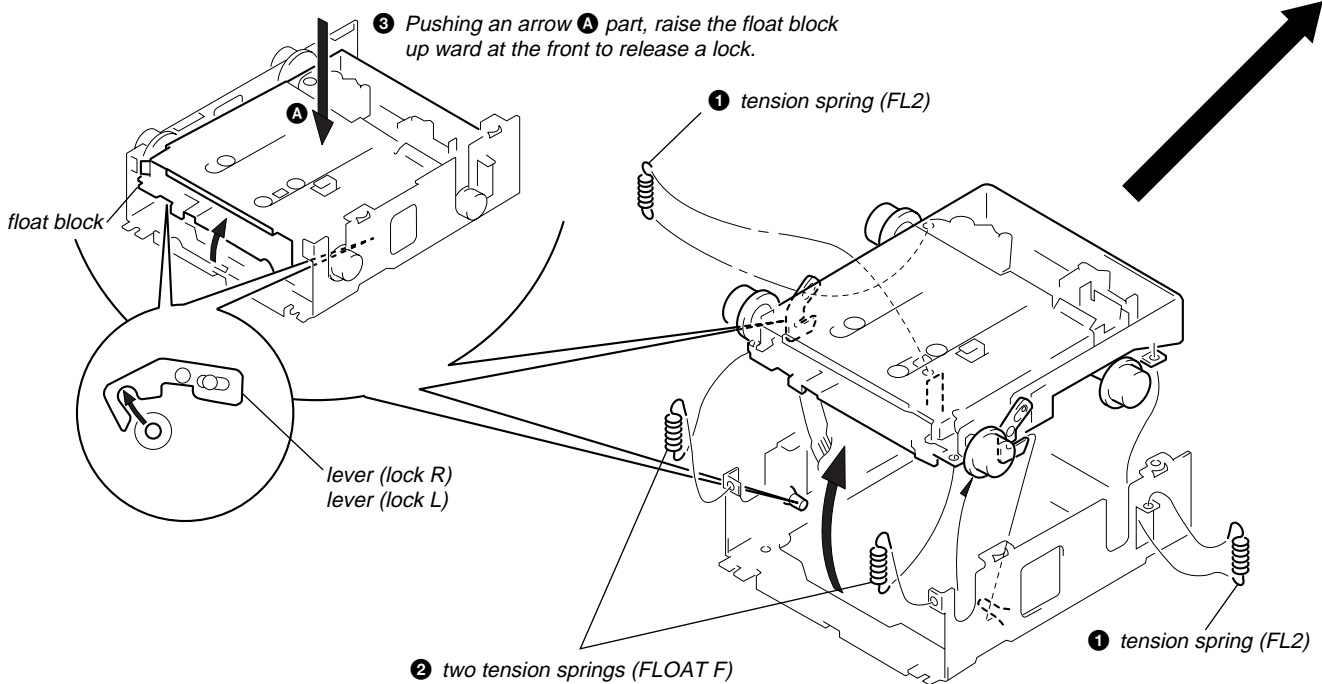
MD COVER ASS'Y



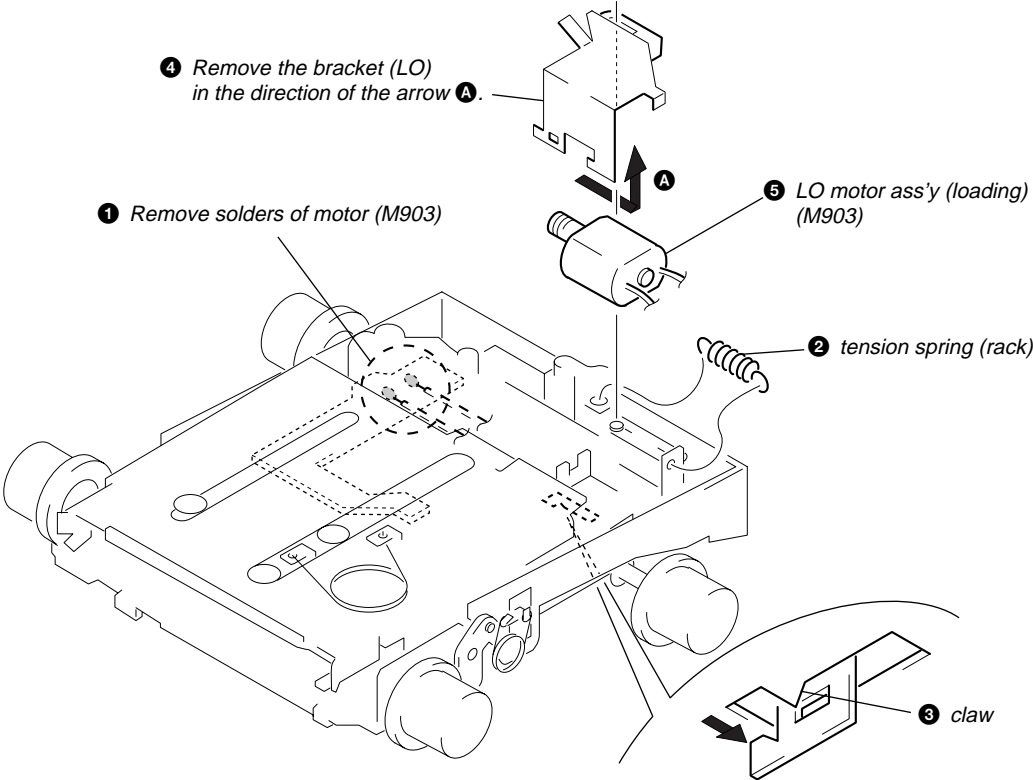
- ② Pushing the Cassette Holder toward the direction A with a screwdriver, etc., disengage the Shaft (MD Cover Guide) from the slot in the MD Cover Assy.
- Note:** Take care not to scratch the optical Pick-up when pushing the Cassette Holder with a screwdriver, etc.



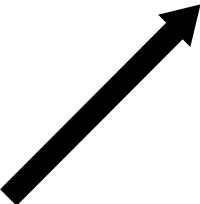
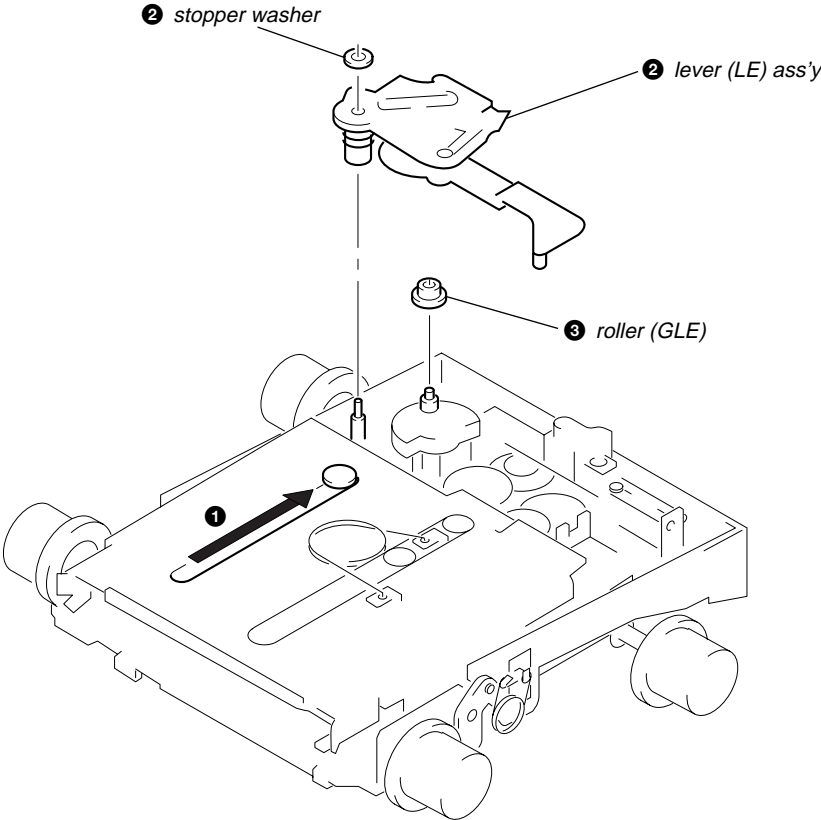
FLOAT BLOCK



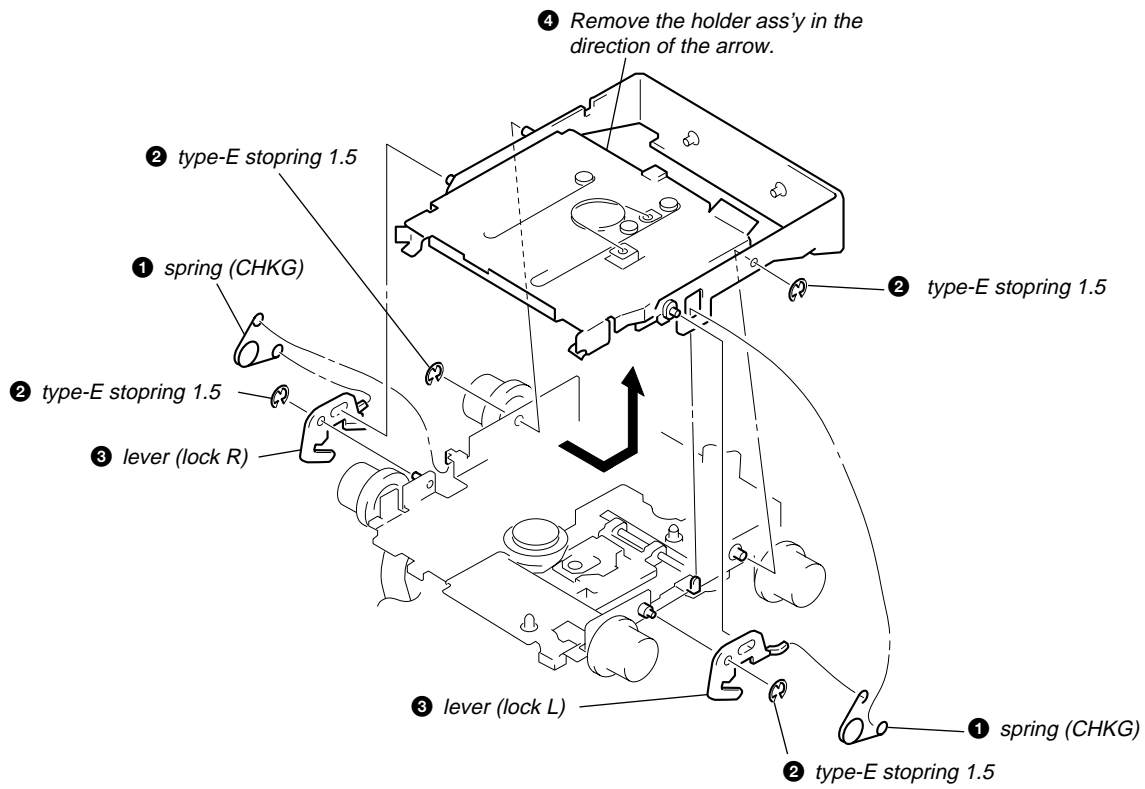
LO MOTOR ASS'Y (LOADING) (M903)



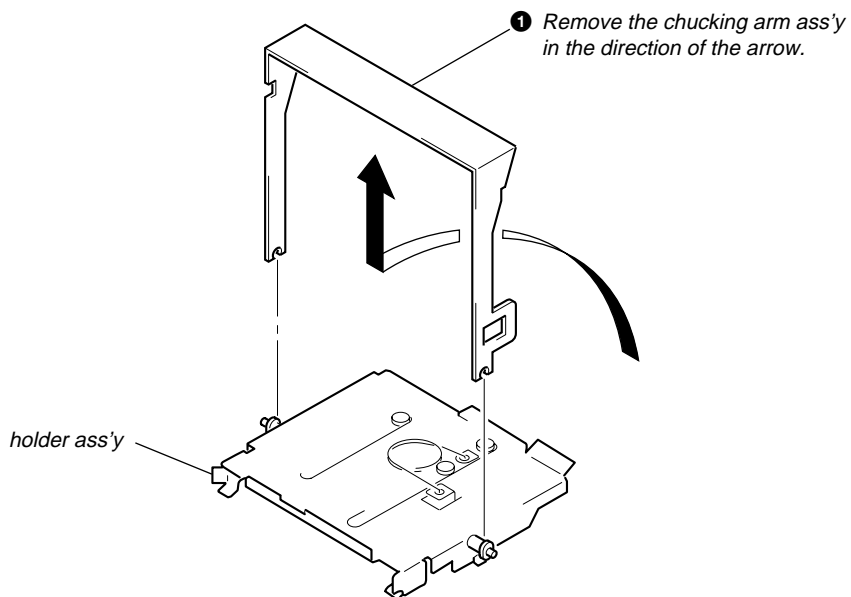
LEVER (LE) ASS'Y



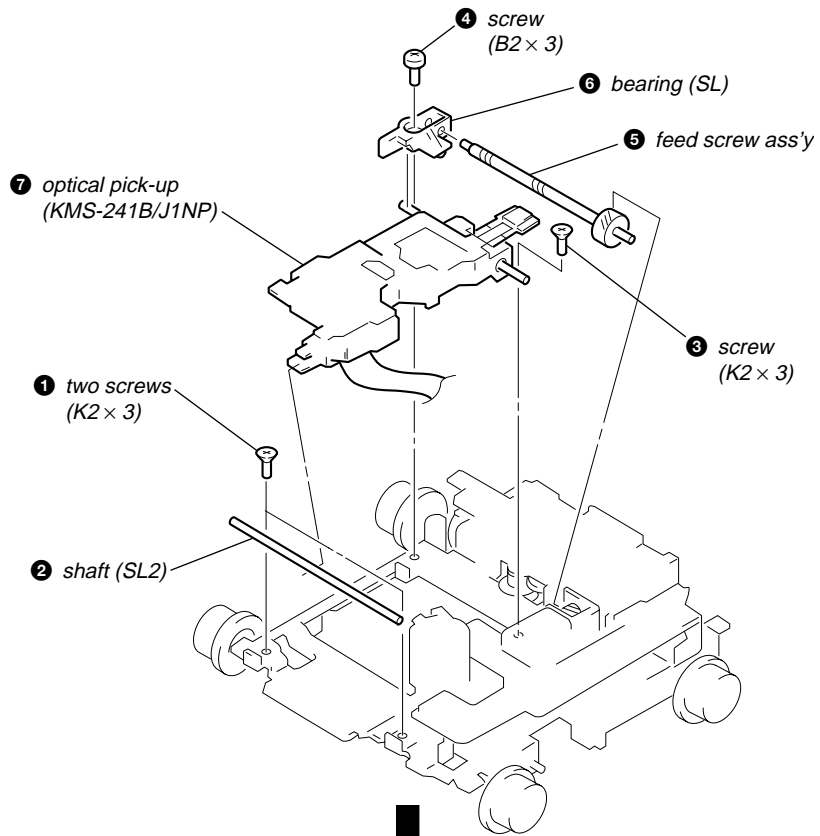
HOLDER ASS'Y



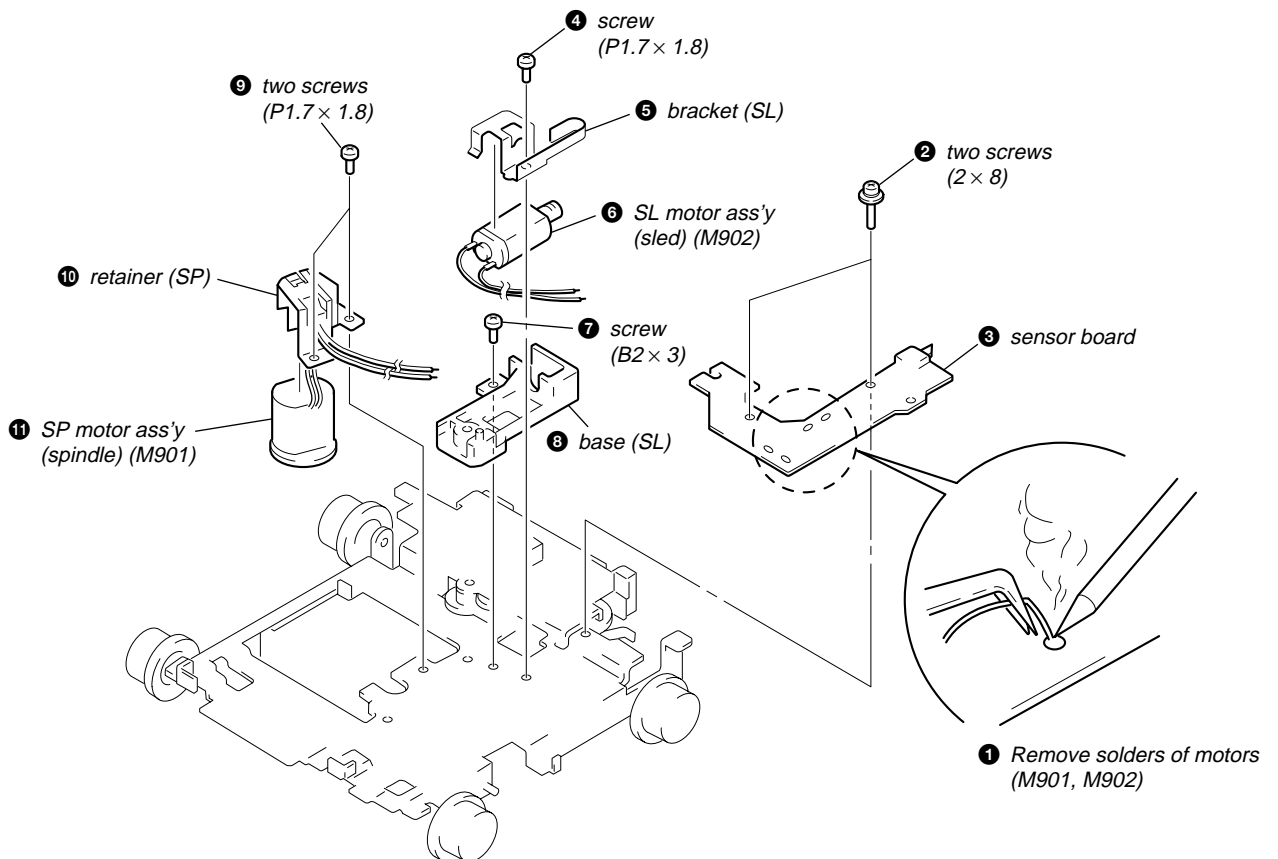
CHUCKING ARM ASS'Y



OPTICAL PICK-UP (KMS-241B/J1NP)



SL MOTOR ASS'Y (SLED) (M902), SP MOTOR ASS'Y (SPINDLE) (M901)



SECTION 3 ELECTRICAL ADJUSTMENTS

TEST MODE

This set have the test mode function. In the test mode, FM Auto Scan/Stop Level and AM (MW) Auto Scan/Stop Level adjustments can be performed easier than it in ordinary procedure.

<Set the Test Mode>

1. Turn ON the regulated power supply. (The clock is displayed)
Note: Press the **[OFF]** button, if the clock is not displayed.
2. Push the preset **[4]** button.
3. Push the preset **[5]** button.
4. Press the preset **[1]** button for more than two seconds.
5. Then the display indicates all lights, the test mode is set.

<Release the Test mode>

1. Push the **[OFF]** button.

See the adjustment location from on page 18 for the adjustment.

MD SECTION

MD section adjustments are done automatically in this set.

TUNER SECTION

0 dB=1 μ V

Cautions during repair

When the tuner unit is defective, replace it by a new one because its internal block is difficult to repair.

Note:

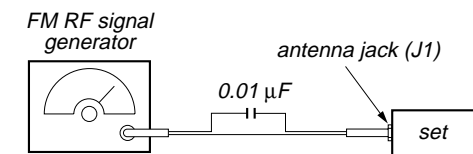
Adjust the tuner section in the sequence shown below.

1. FM Auto Scan/Stop Level Adjustment.
2. FM Stereo Separation Adjustmnet.
3. AM (MW) Auto Scan/Stop Level Adjustment.
4. RDS S-Meter Adjustment. (MDX-C5960R/5970R)

FM Auto Scan/Stop Level Adjustment

Setting:

[SOURCE] button: FM
FREQUENCY SELECT switch: FM 200 k (E model)

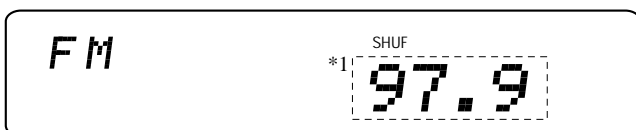


Carrier frequency: 97.9 MHz (MDX-C5970)
98.0 MHz (MDX-C5960R/C5970R)
Output level : 22 dB (12.6 μ V)
Mode : mono
Modulation : 1 kHz, 22.5 kHz deviation (30%)

Procedure:

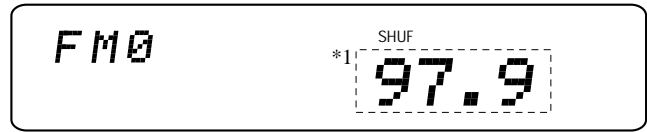
1. Set to the test mode.
2. Push the **[SOURCE]** button and set to FM.

Display



3. Adjust with the volume RV2 on TU1 so that the "FM" indication turns to "FM0" indication on the display window.
But, in case of already indicated "FM0", turn the RV2 so that put out light "0" indication and adjustment.

Display



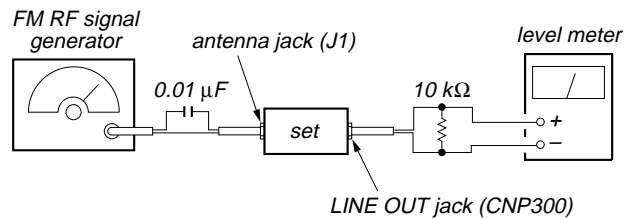
*1: MDX-C5960R/C5970R indicate "98.00".

Adjustment Location: See page 18.

FM Stereo Separation Adjustment

Setting:

[SOURCE] button: FM
FREQUENCY SELECT switch: FM 200 k (E model)



| | | MDX-C5970 | MDX-C5960R/ C5970R |
|-------------------|--------------|----------------------------------|------------------------------------|
| Carrier frequency | | 97.9 MHz | 98.0 MHz |
| Output level | | 60 dB (1 mV) | 70 dB (3.2 mV) |
| Mode | | stereo | stereo |
| Modulation | main | 1 kHz, 33.75 kHz deviation (45%) | 1 kHz, 16.25 kHz deviation (21.7%) |
| | sub | 1 kHz, 33.75 kHz deviation (45%) | 1 kHz, 16.25 kHz deviation (21.7%) |
| | 19 kHz pilot | 7.5 kHz deviation (10%) | 7.5 kHz deviation (10%) |

Procedure:

| FM Stereo signal generator output channel | Level meter connection | Level meter reading (dB) |
|---|------------------------|---|
| L-CH | L-CH | Ⓐ |
| R-CH | L-CH | Ⓑ Adjust RV4 on TU1 for minimum reading. |
| R-CH | R-CH | Ⓒ |
| L-CH | R-CH | Ⓓ Adjust RV4 on TU1 for minimum reading. |

L-CH Stereo separation: Ⓐ-Ⓑ

R-CH Stereo separation: Ⓒ-Ⓓ

The separations of both channels should be equal.

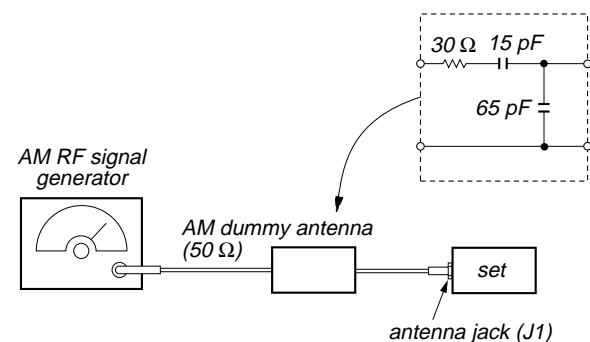
Specification: Separation more than 30 dB

Adjustment Location: See page 18.

AM (MW) Auto Scan/Stop Level Adjustment

Setting:

- [MODE] button (MDX-C5970): AM
- [MODE] button (MDX-C5960R/C5970R): MW
- FREQUENCY SELECT switch: AM 10 k (E model)

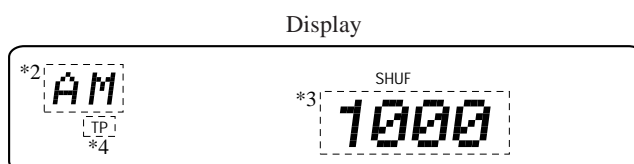


Carrier frequency: 1000 kHz (MDX-C5970)
999 kHz (MDX-C5960R/5970R)

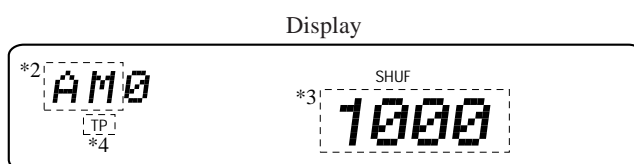
30% amplitude modulation by 1 kHz signal
Output level : 33 dB (44.7 μV)

Procedure:

1. Set to the test mode. (See page 16)
2. Push the [SOURCE] button and set to FM.
3. Push the [MODE] button and set to AM (MDX-C5970) or MW (MDX-C5960R/C5970R).



4. Adjust with the volume RV1 on TU1 so that the "AM" or "MW" indication turns to "AM0" or "MW0" indication on the display window.
But, in case of already indicated "AM0" or "MW0", turn the RV1 so that put out light "0" indication and adjustment.



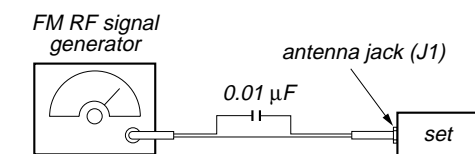
- *2: MDX-C5960R/C5970R indicate "MW".
- *3: MDX-C5960R/C5970R indicate "999".
- *4: Only MDX-C5960R/C5970R indicate.

Adjustment Location: See page 18.

RDS S-Meter Adjustment (MDX-C5960R/C5970R)

Setting:

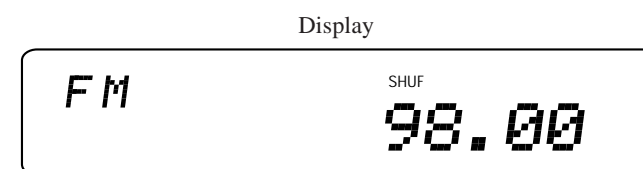
- [SOURCE] button: FM



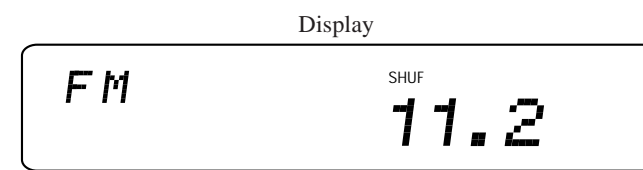
Carrier frequency: 98.0 MHz
Output level : 35 dB (56.2 μV)
Mode : mono
Modulation : no modulation

Procedure:

1. Set to the test mode. (See page 16)
2. Push the [SOURCE] button and set to FM.



3. Push the preset [10] button.
4. Adjust RV1 on MAIN board so that the display indication is "11.2".

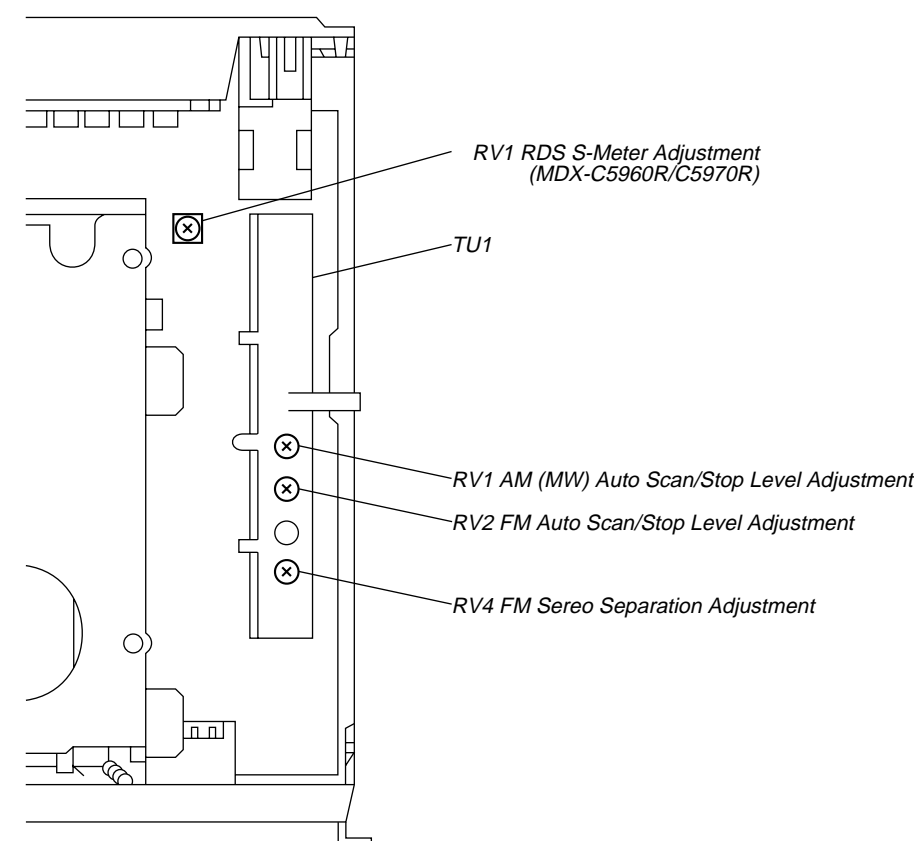


Specification: Display indication : 10.8 to 11.6

Adjustment Location: See page 18.

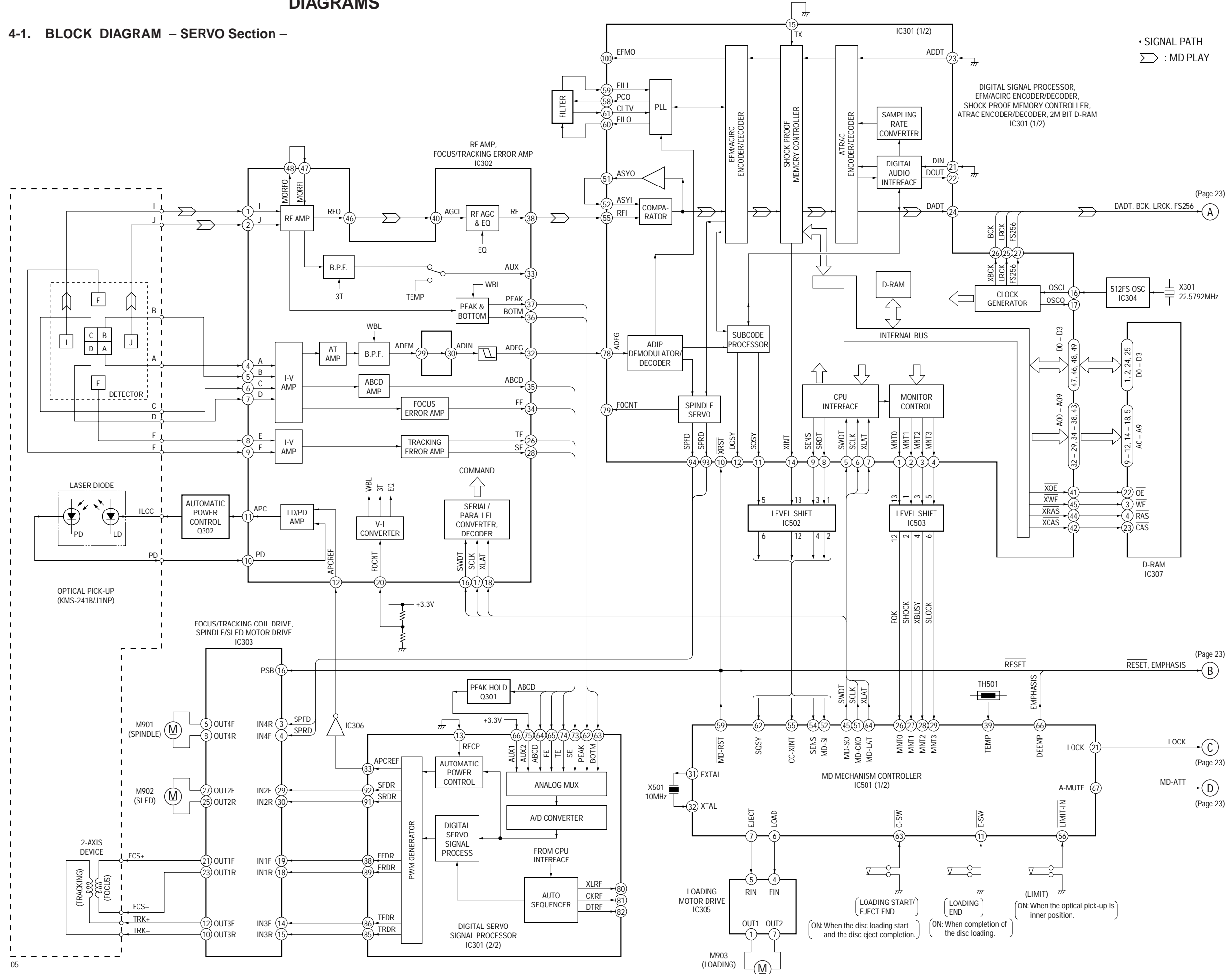
Adjustment Location:

– SET UPPER VIEW –

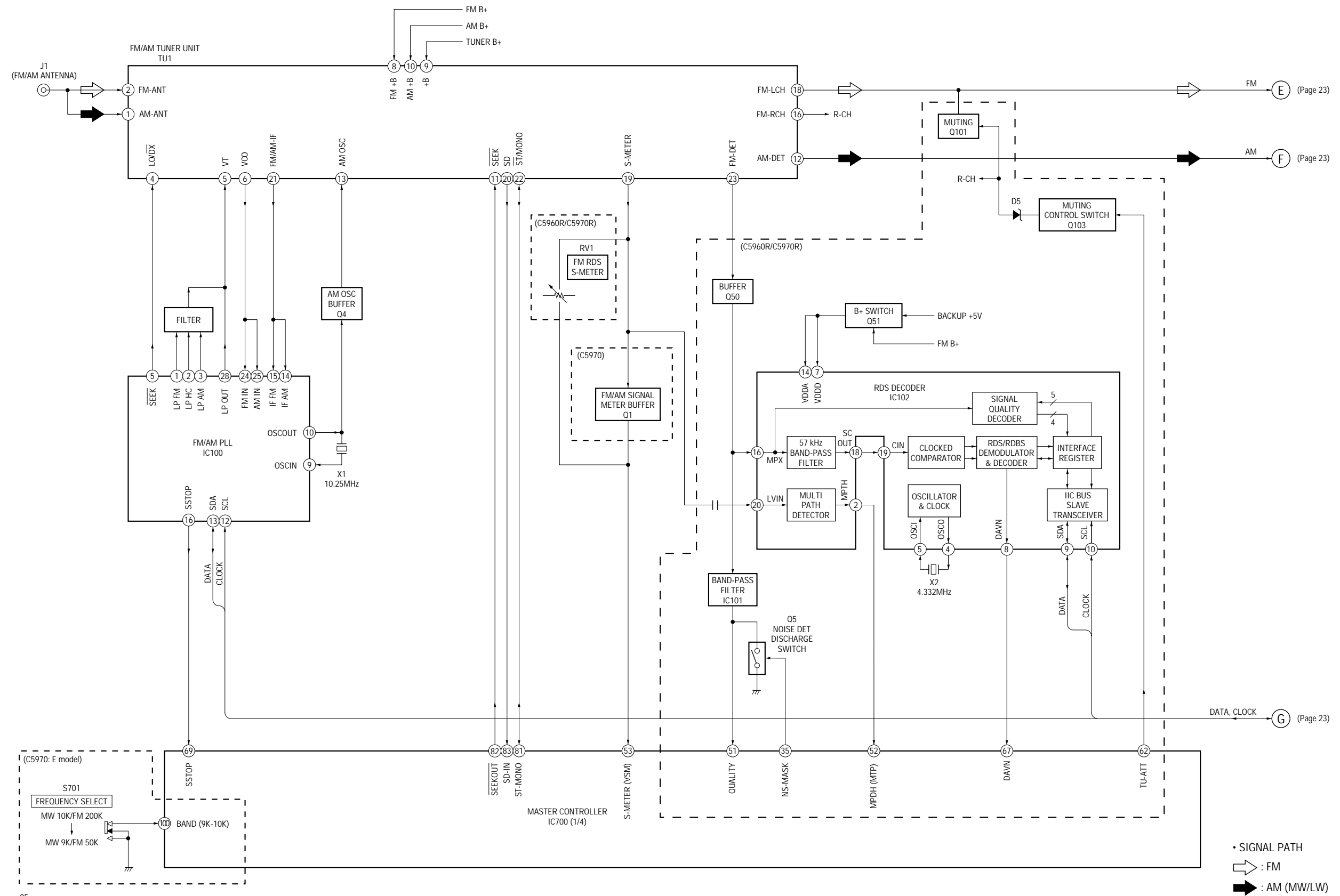


SECTION 4
DIAGRAMS

4-1. BLOCK DIAGRAM - SERVO Section -

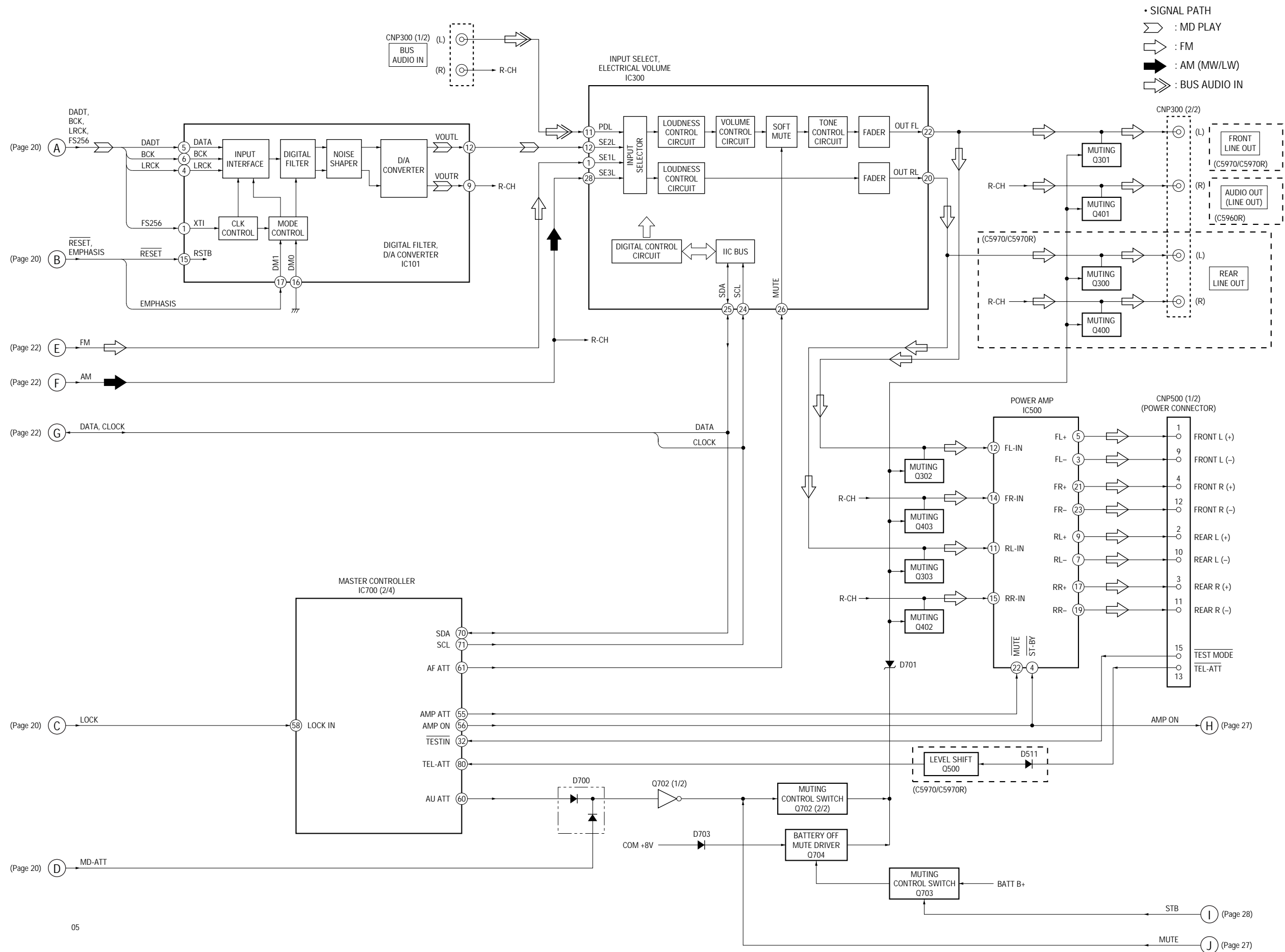


4-2. BLOCK DIAGRAM – TUNER Section –

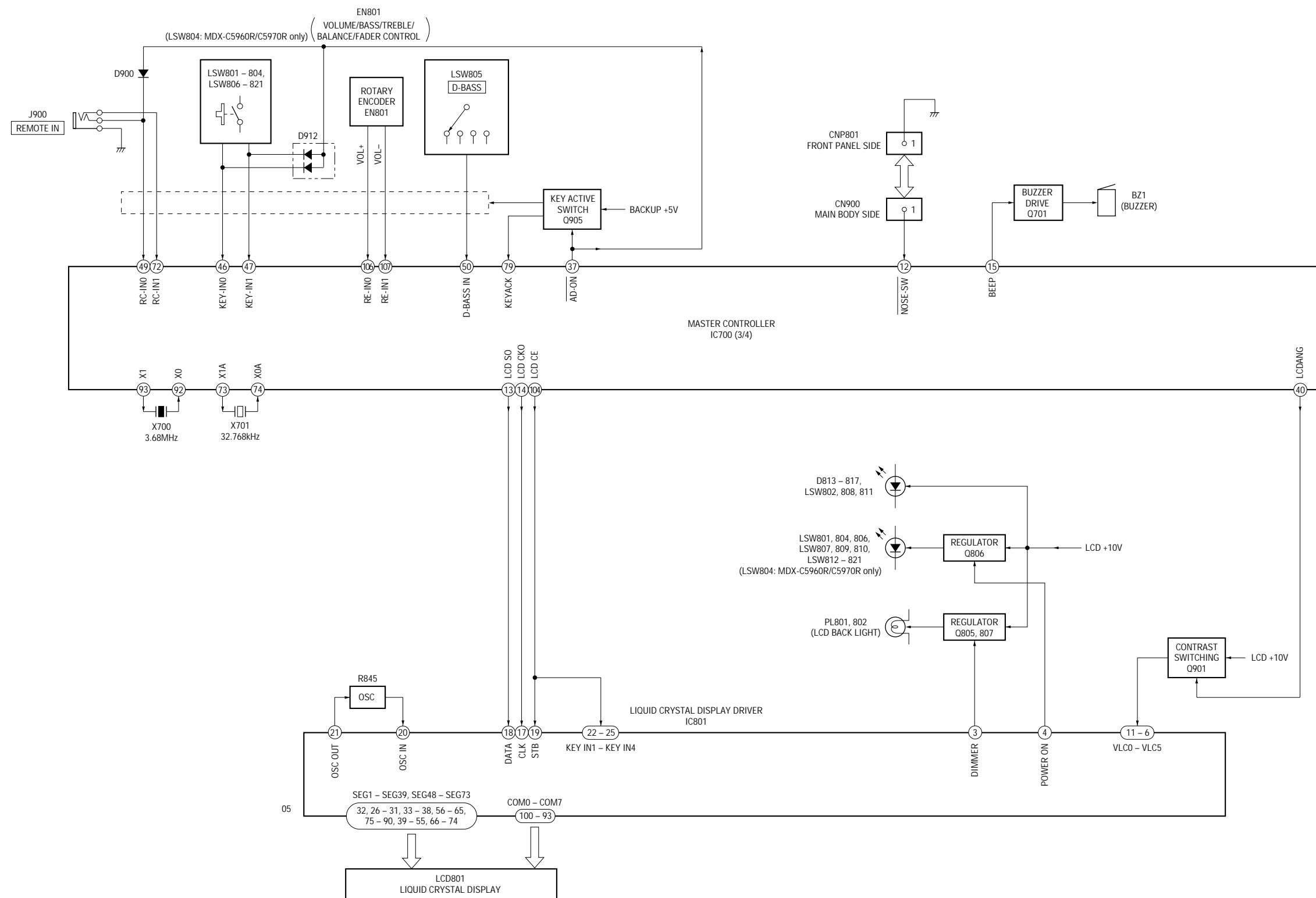


05

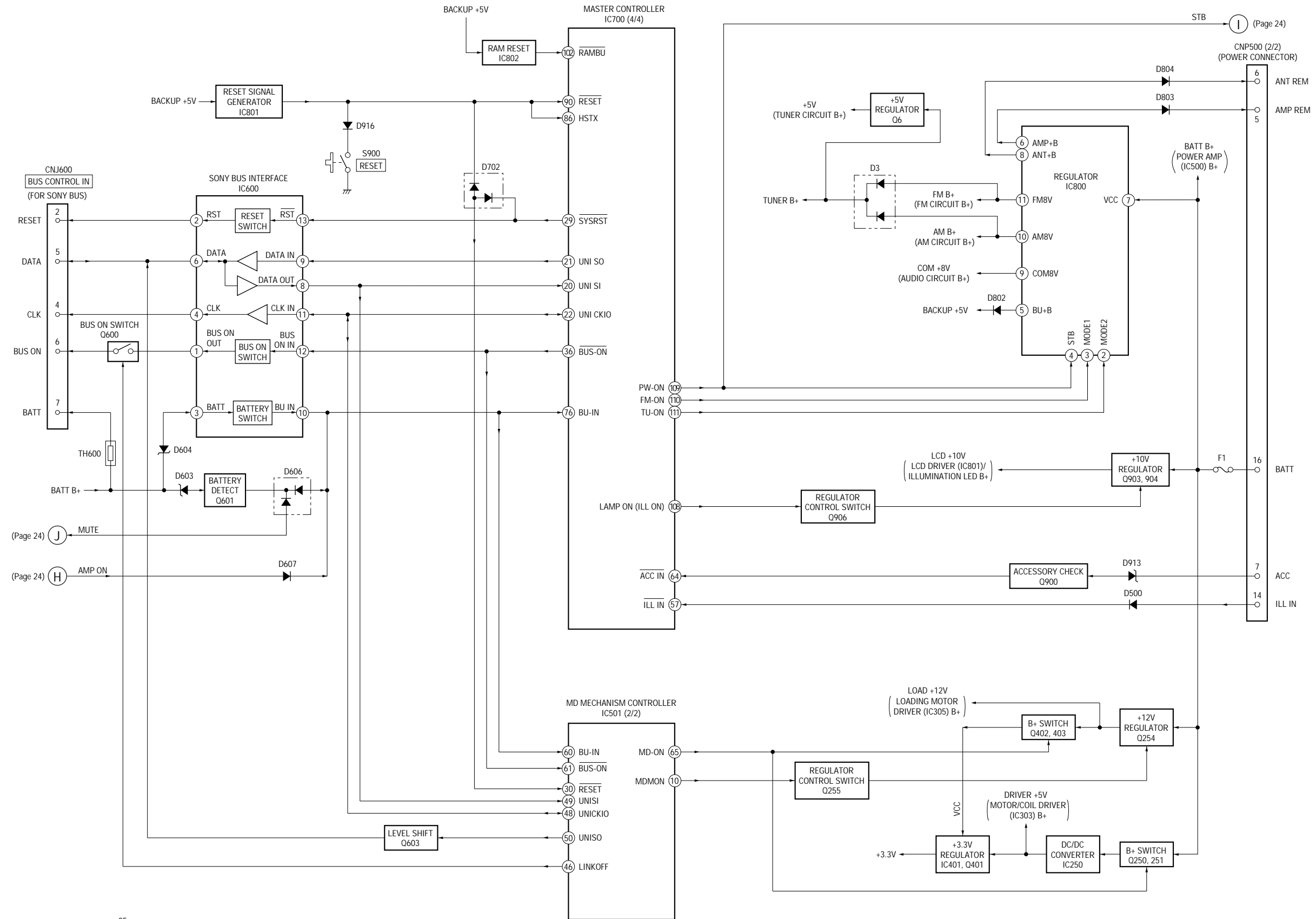
4-3. BLOCK DIAGRAM – MAIN Section –



4-4. BLOCK DIAGRAM – DISPLAY/KEY CONTROL Section –








4-5. BLOCK DIAGRAM – BUS CONTROL/POWER SUPPLY Section –



05

4-6. NOTES FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS



Note on Printed Wiring Board:




-  : parts extracted from the component side.
-  : parts extracted from the conductor side.
-  : Through hole.
-  : internal component.
-  : Pattern from the side which enables seeing.







(The other layers' patterns are not indicated.)

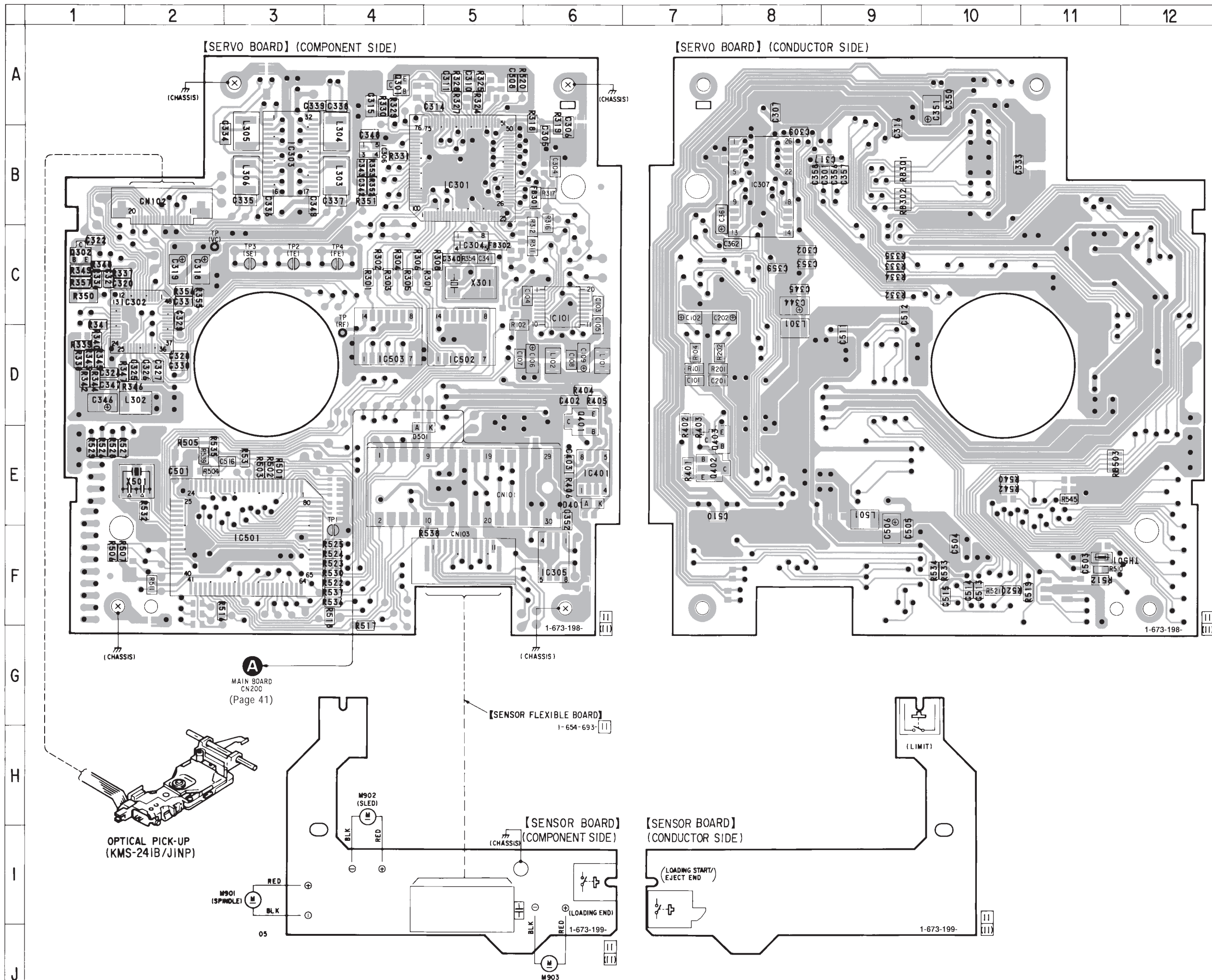
| | |
|--|--|
| Caution: | |
| Pattern face side: (Conductor Side) | Parts on the pattern face side seen from the pattern face are indicated. |
| Parts face side: (Component Side) | Parts on the parts face side seen from the parts face are indicated. |

Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: $\mu\mu\text{F}$ 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
-  : internal component.
-  : panel designation.

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

-  : B+ Line.
-  : adjustment for repair.
- Power voltage is dc 14.4V and fed with regulated dc power supply from ACC and BATT cords.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
 -  : FM
 -  : AM (MW/LW)
 -  : BUS AUDIO IN
 -  : MD PLAY
- Abbreviation
 - CND : Canadian model.
 - G : German model.



• Semiconductor Location

| Ref. No. | Location |
|----------|----------|
| D401 | E-6 |
| D501 | E-4 |
| IC301 | B-5 |
| IC302 | C-2 |
| IC303 | B-3 |
| IC304 | C-5 |
| IC305 | F-6 |
| IC306 | B-4 |
| IC307 | B-8 |
| IC401 | E-6 |
| IC501 | F-3 |
| IC502 | D-5 |
| IC503 | D-4 |
| Q301 | A-4 |
| Q302 | C-1 |
| Q401 | D-6 |
| Q402 | E-7 |
| Q403 | E-7 |

4-8. SCHEMATIC DIAGRAM – SERVO Board (1/3) –

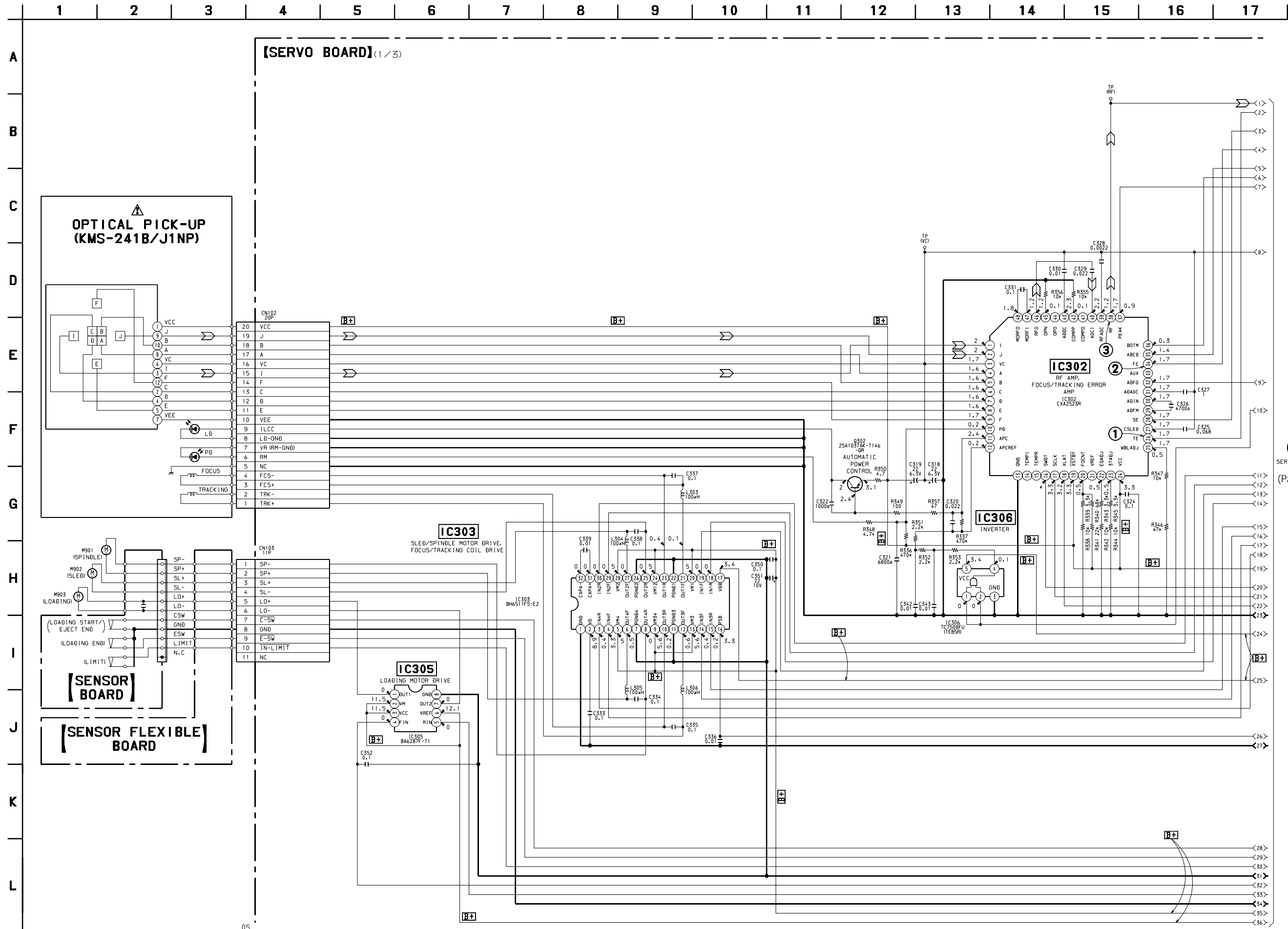
• See page 55 for Waveforms. • See page 58 for IC Block Diagrams.

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

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

• Voltages and waveforms are dc with respect to ground under no-signal conditions.
no mark : MD PLAY

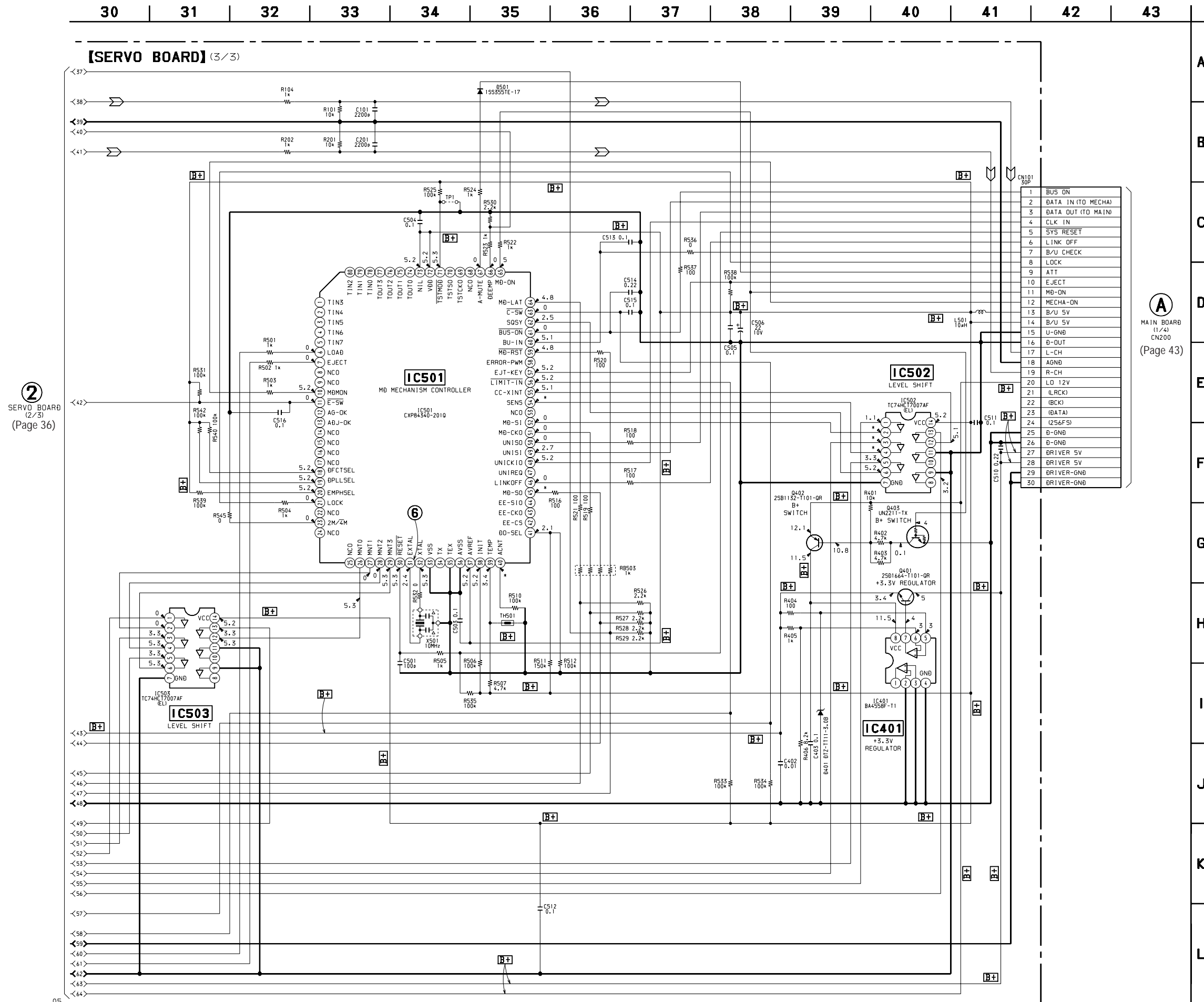
* : Impossible to measure



1 SERVO BOARD (2/3) (Page 35)

4-10. SCHEMATIC DIAGRAM – SERVO Board (3/3) – • See page 55 for Waveforms.

- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- no mark : MD PLAY
- * : Impossible to measure

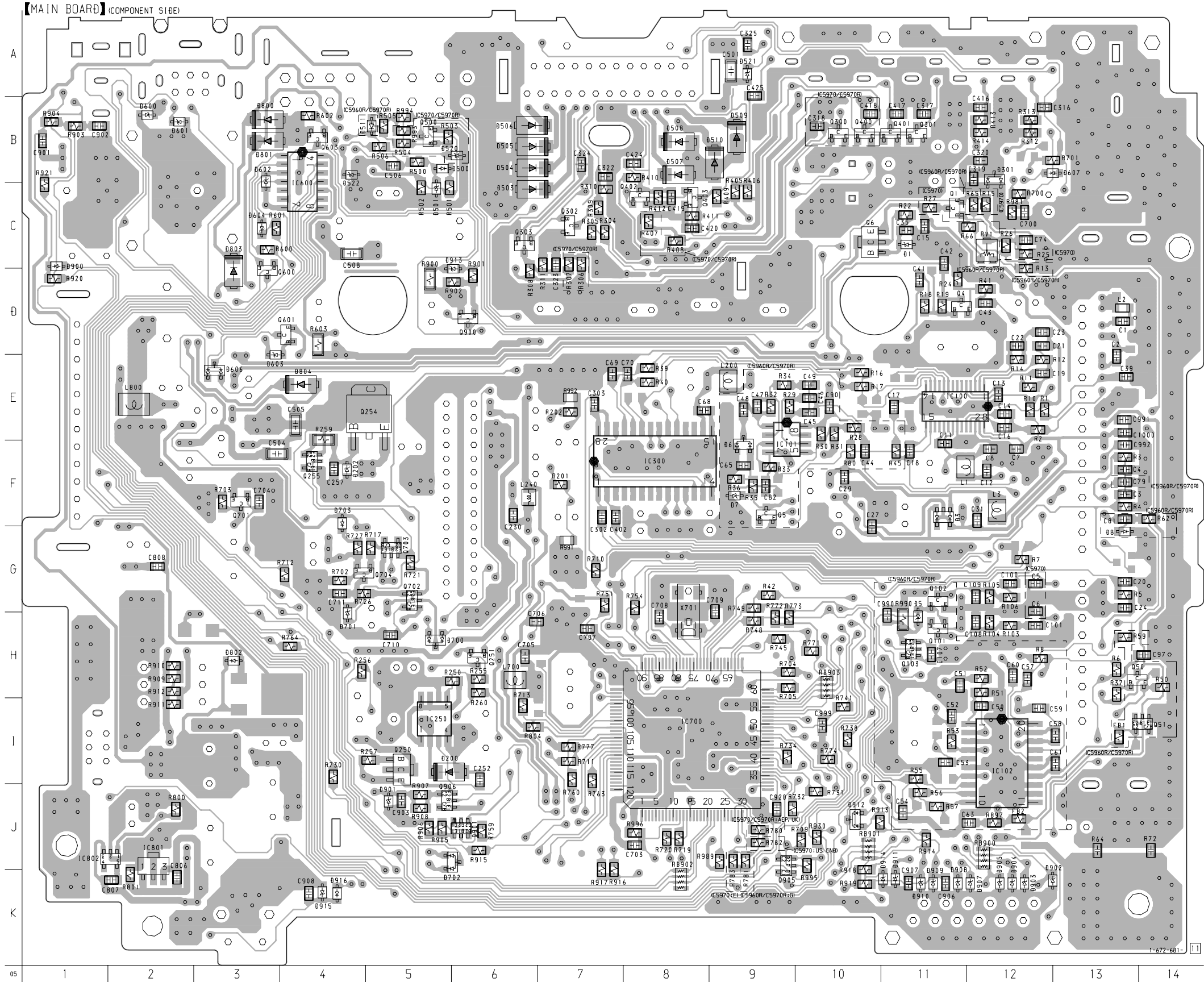


2 SERVO BOARD (2/3) (Page 36)

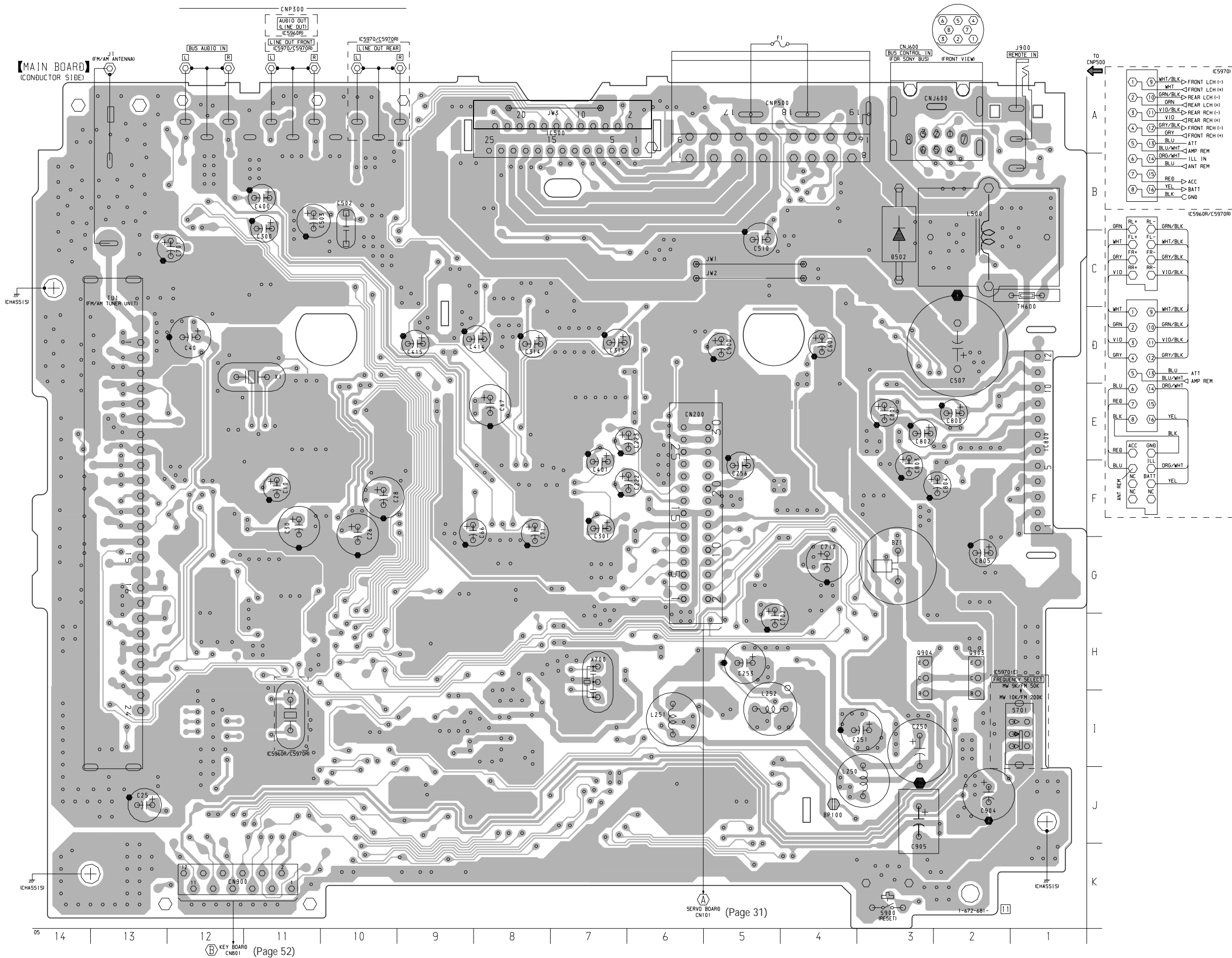
4-11. PRINTED WIRING BOARD – MAIN Board (Component Side) –

• Semiconductor Location (Component Side)

| Ref. No. | Location | Ref. No. | Location |
|----------|----------|----------|----------|
| D1 | C-11 | D912 | J-10 |
| D3 | F-11 | D913 | C-6 |
| D5 | H-11 | D914 | K-11 |
| D6 | F-9 | D915 | K-4 |
| D7 | F-9 | D916 | K-4 |
| D8 | G-13 | | |
| D200 | I-5 | IC100 | E-11 |
| D202 | F-4 | IC101 | E-9 |
| D301 | B-12 | IC102 | I-12 |
| D500 | B-5 | IC250 | I-5 |
| D501 | C-5 | IC300 | F-8 |
| D503 | C-6 | IC600 | B-4 |
| D504 | B-6 | IC700 | I-8 |
| D505 | B-6 | IC800 | J-2 |
| D506 | B-6 | IC802 | J-2 |
| D507 | B-8 | | |
| D508 | B-8 | Q1 | C-11 |
| D509 | B-9 | Q4 | D-11 |
| D510 | B-9 | Q5 | F-9 |
| D511 | B-5 | Q6 | C-10 |
| D520 | B-6 | Q50 | H-13 |
| D521 | A-9 | Q51 | I-14 |
| D522 | B-4 | Q101 | H-11 |
| D600 | B-2 | Q102 | G-11 |
| D601 | B-2 | Q103 | H-11 |
| D602 | B-3 | Q250 | I-5 |
| D603 | E-3 | Q251 | H-6 |
| D604 | E-3 | Q254 | E-5 |
| D606 | E-3 | Q255 | F-4 |
| D607 | B-13 | Q300 | B-10 |
| D700 | H-5 | Q301 | B-11 |
| D701 | H-4 | Q302 | C-7 |
| D702 | J-6 | Q303 | C-6 |
| D703 | F-4 | Q400 | B-10 |
| D800 | B-3 | Q401 | B-11 |
| D801 | B-3 | Q402 | C-8 |
| D802 | H-3 | Q403 | C-8 |
| D803 | D-3 | Q500 | B-5 |
| D804 | E-4 | Q600 | D-3 |
| D900 | C-1 | Q601 | D-4 |
| D901 | J-5 | Q603 | B-4 |
| D902 | K-12 | Q701 | F-3 |
| D903 | K-12 | Q702 | G-5 |
| D904 | K-12 | Q703 | G-5 |
| D905 | K-12 | Q704 | G-4 |
| D907 | K-12 | Q900 | D-6 |
| D908 | K-11 | Q901 | J-6 |
| D909 | K-11 | Q905 | J-9 |
| D910 | K-11 | Q906 | J-5 |
| D911 | K-11 | | |

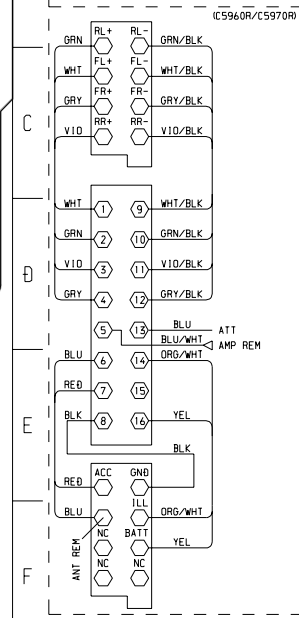
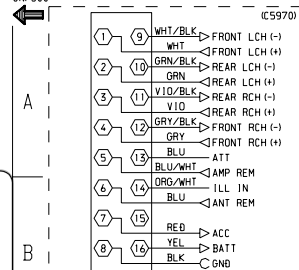


4-12. PRINTED WIRING BOARD – MAIN Board (Conductor Side) –



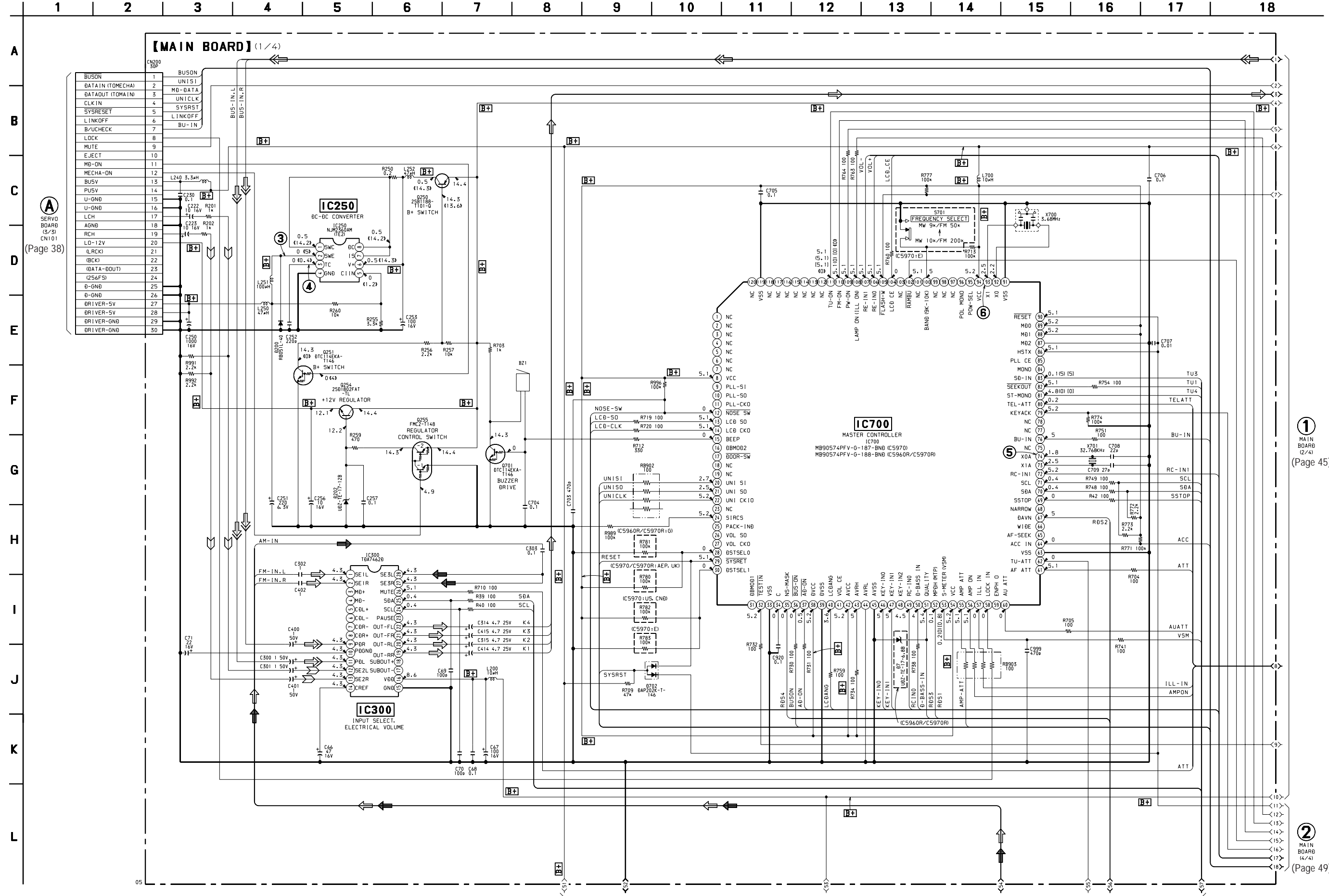
• Semiconductor Location (Conductor Side)

| Ref. No. | Location |
|----------|----------|
| D502 | C-3 |
| IC500 | A-7 |
| IC800 | E-1 |
| Q903 | H-2 |
| Q904 | H-3 |



• Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : FM
() : AM (MW)
[] : LW
<< >> : MD PLAY

4-13. SCHEMATIC DIAGRAM – MAIN Board (1/4) – • See page 55 for Waveforms. • See page 60 for IC Block Diagrams.



A
B
C
D
E
F
G
H
I
J
K
L

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

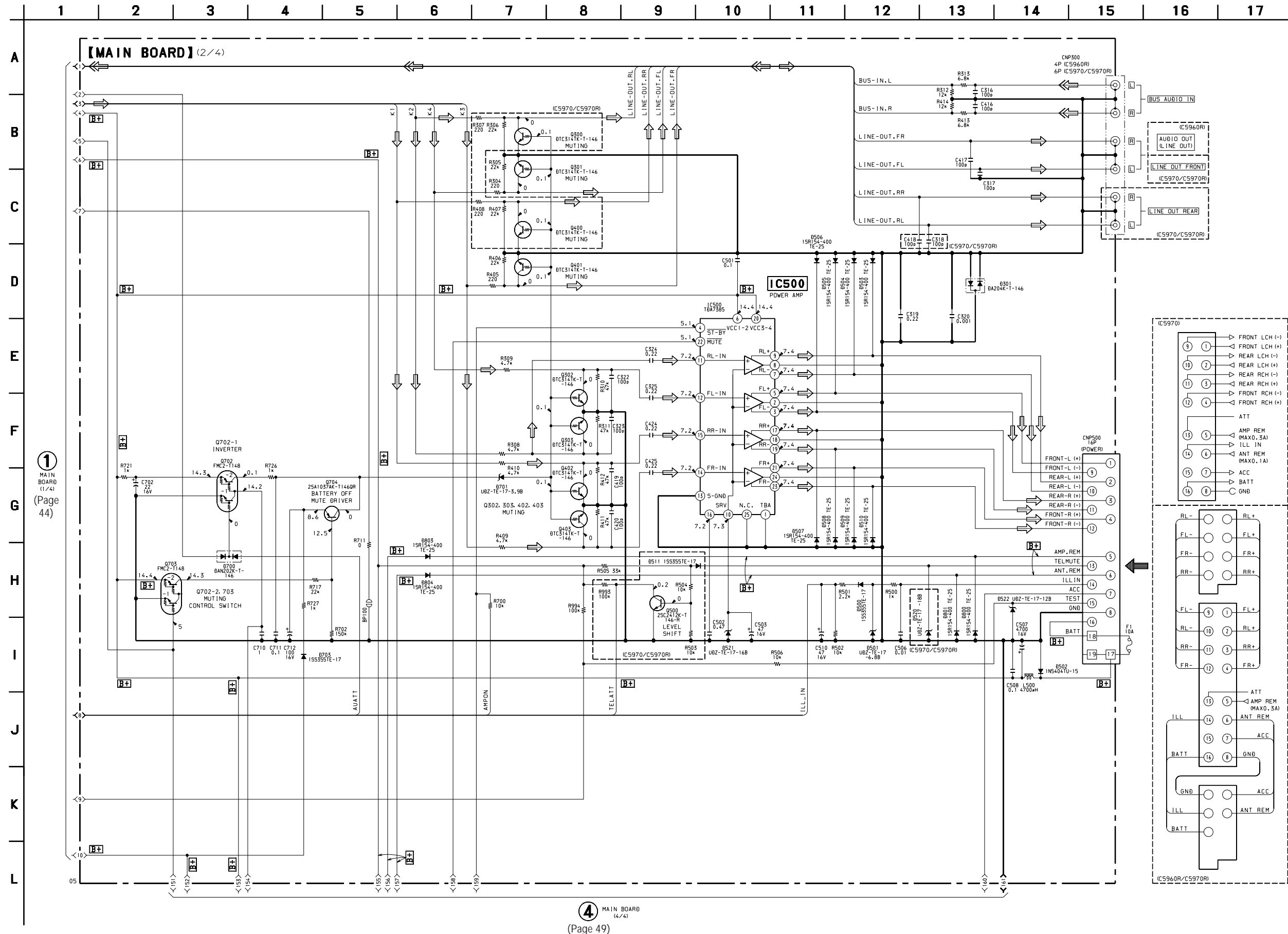
(Page 38)

1 MAIN BOARD (2/4) (Page 45)

2 MAIN BOARD (3/4) (Page 49)

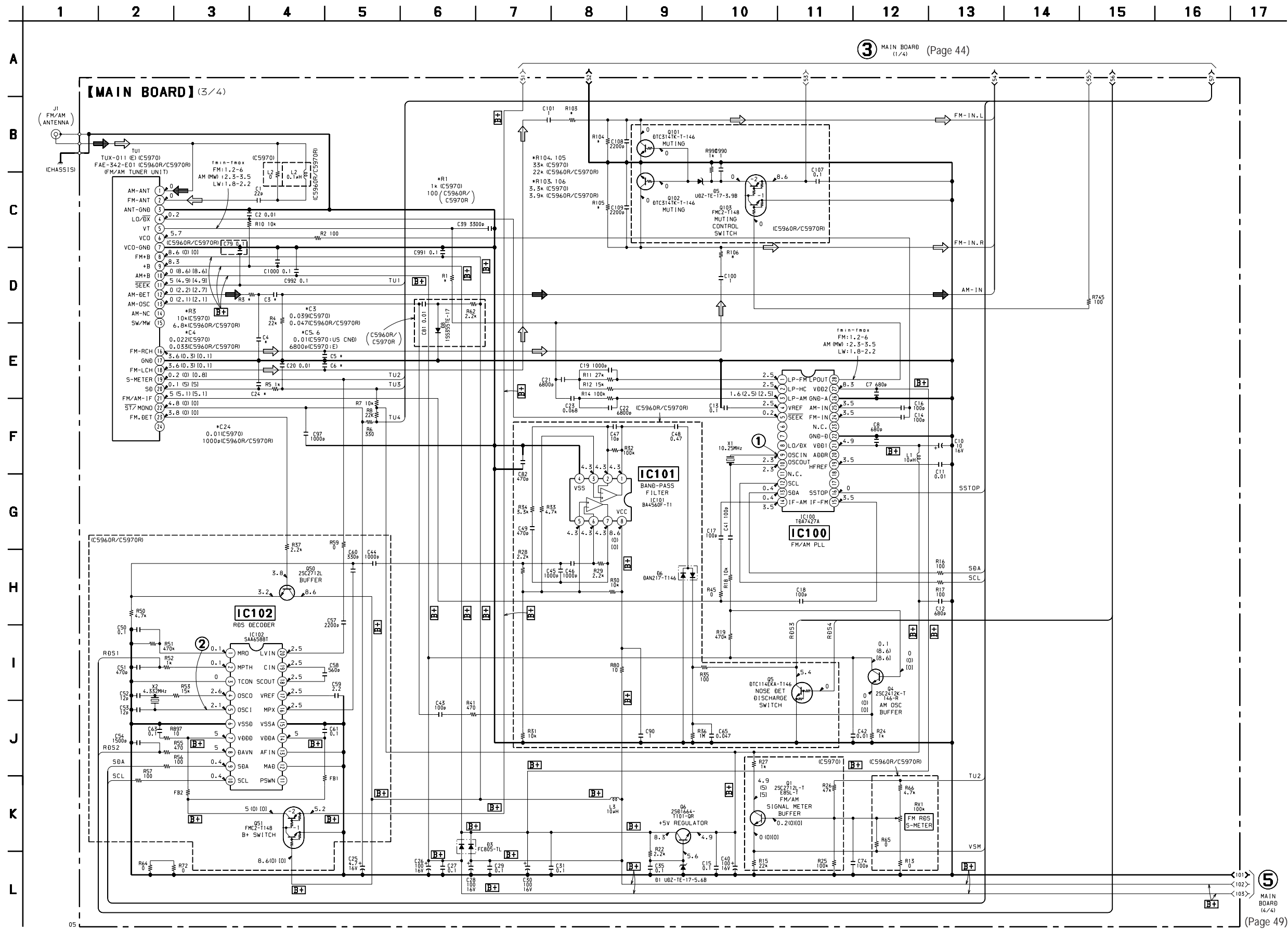
3 MAIN BOARD (3/4) (Page 48)

4-14. SCHEMATIC DIAGRAM – MAIN Board (2/4) –



• Voltages are dc with respect to ground under no-signal (detuned) conditions.
no mark : FM

4-15. SCHEMATIC DIAGRAM – MAIN Board (3/4) – • See page 55 for Waveforms. • See page 60 for IC Block Diagrams.

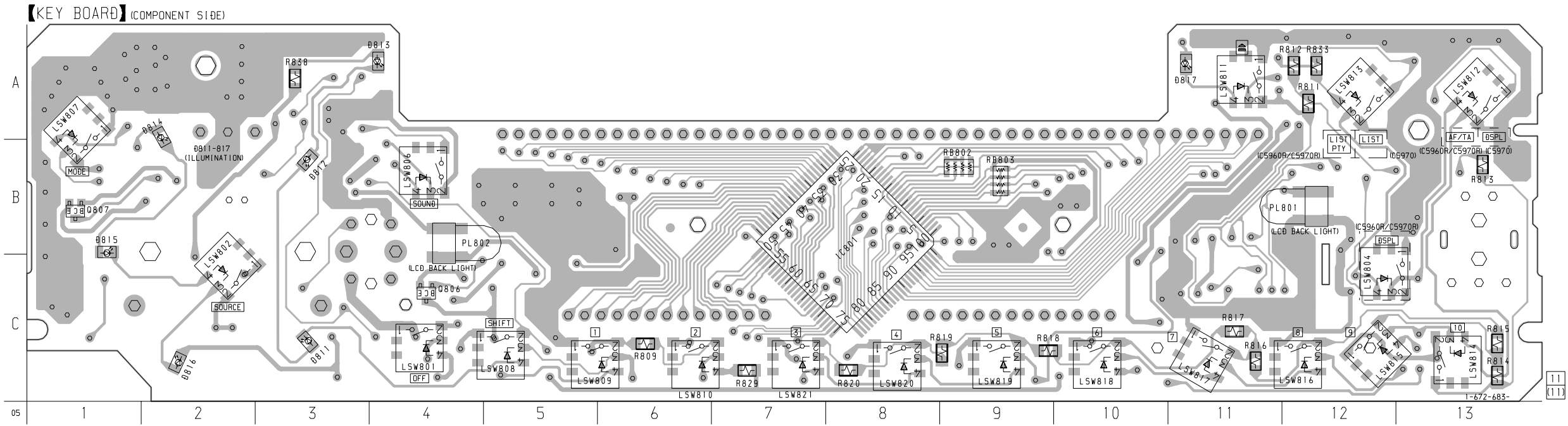


• Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
 no mark : FM
 () : AM (MW)
 [] : LW

4-17. PRINTED WIRING BOARD – KEY Board –

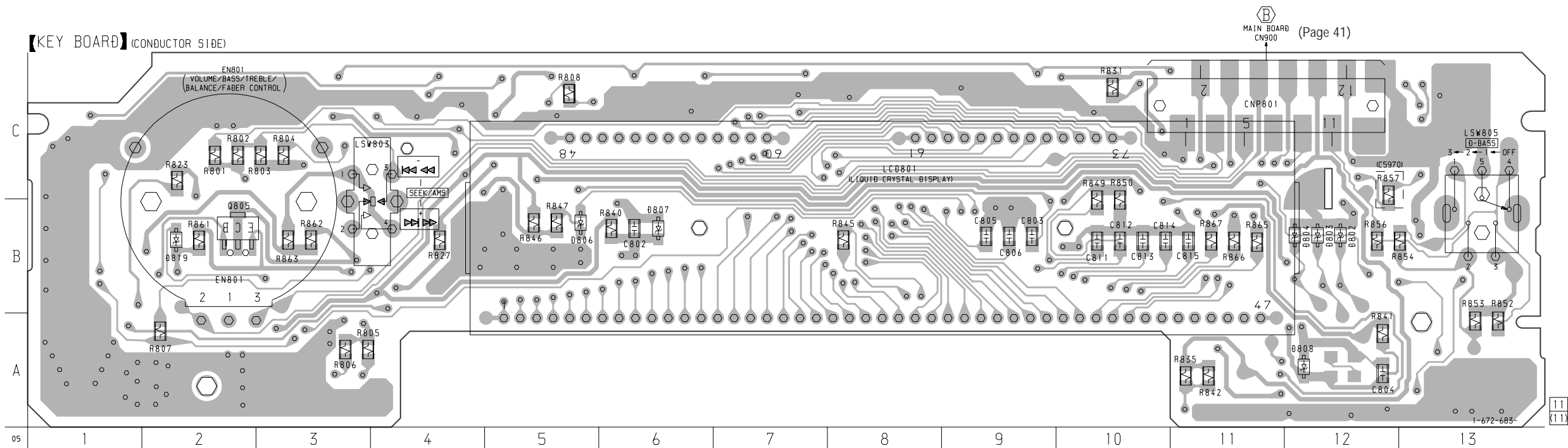
• Semiconductor Location (Component Side)

| Ref. No. | Location |
|----------|----------|
| D811 | C-3 |
| D812 | B-3 |
| D813 | A-4 |
| D814 | A-2 |
| D815 | B-1 |
| D816 | C-2 |
| D817 | A-11 |
| IC801 | B-8 |
| Q806 | C-4 |
| Q807 | B-1 |

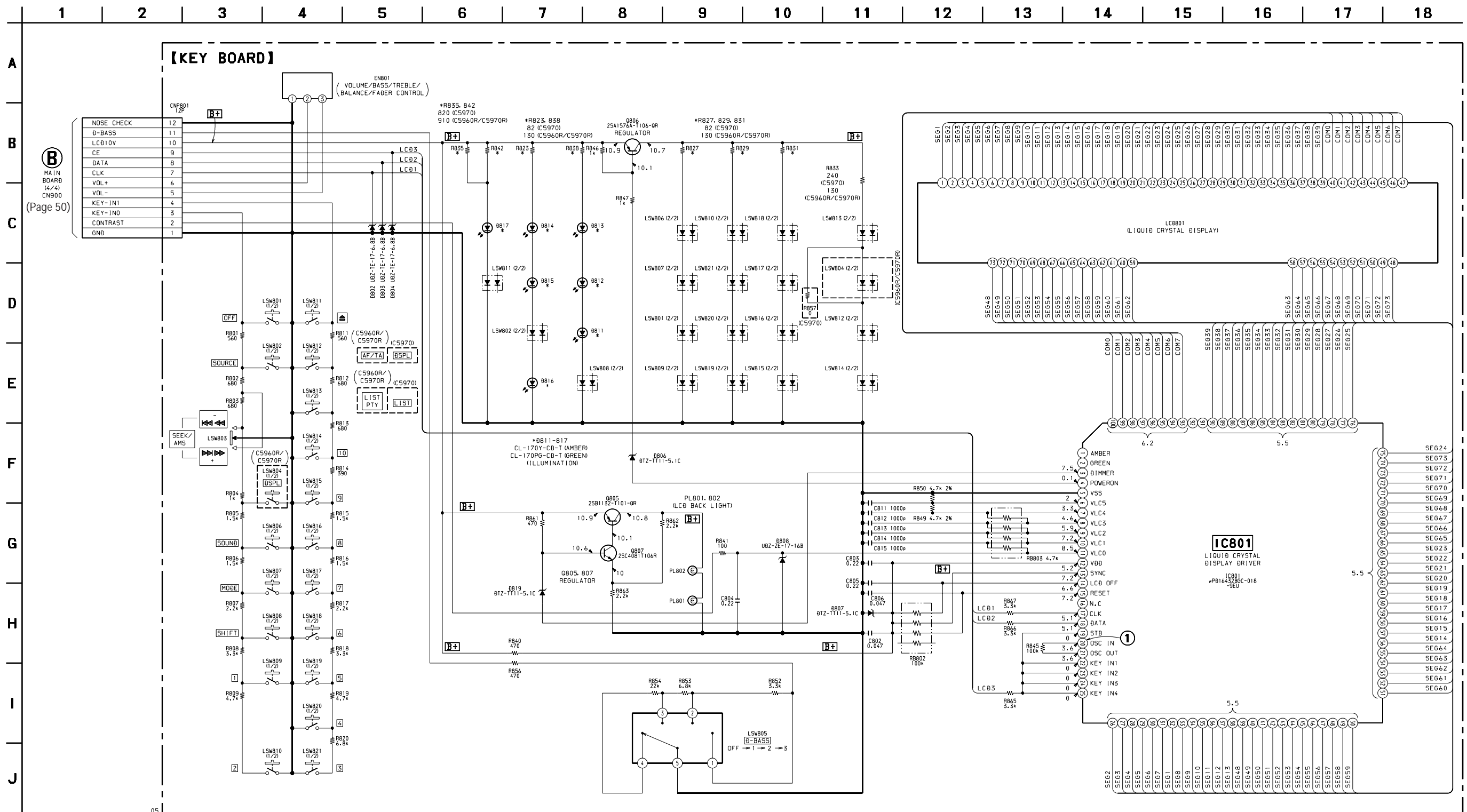


• Semiconductor Location (Conductor Side)

| Ref. No. | Location |
|----------|----------|
| D802 | B-12 |
| D803 | B-12 |
| D804 | B-12 |
| D806 | B-5 |
| D807 | B-6 |
| D808 | A-12 |
| D819 | B-2 |
| Q805 | B-2 |



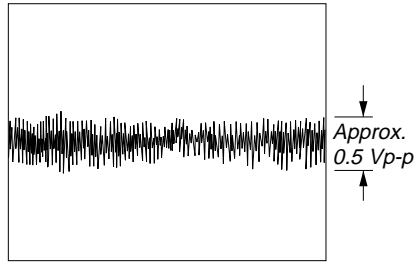
4-18. SCHEMATIC DIAGRAM – KEY Board – • See page 56 for Waveforms.



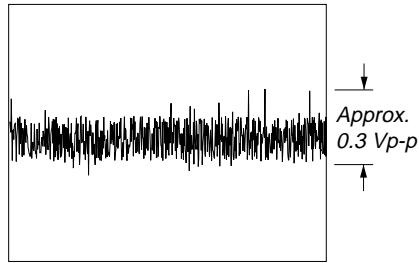
• Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : FM

• Waveforms
– SERVO Board –

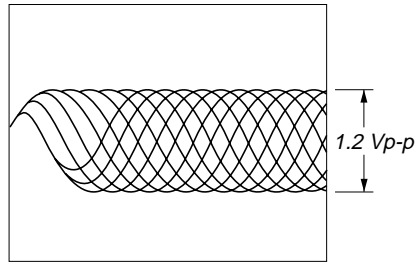
① IC302 ⑳ (TE) (MD PLAY Mode)



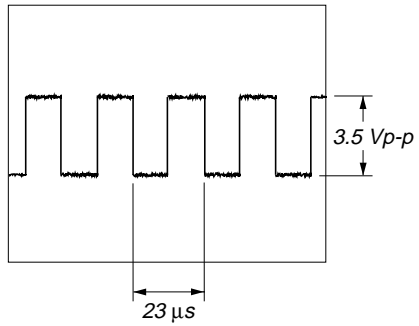
② IC302 ㉔ (FE) (MD PLAY Mode)



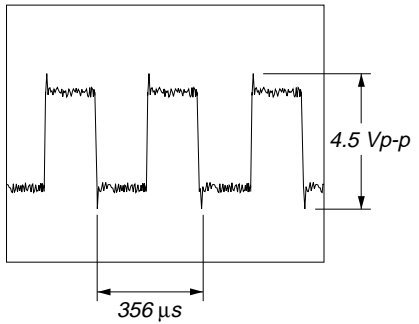
③ IC302 ㉞ (RF) (MD PLAY Mode)



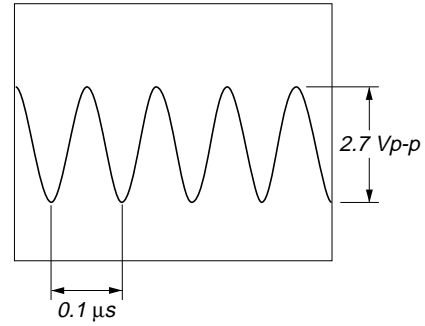
④ IC301 ㉞ (LRCK) (MD PLAY Mode)



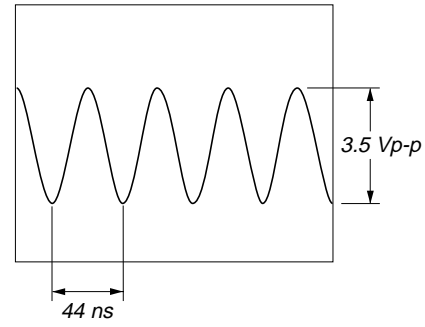
⑤ IC301 ㉞ (XBCK) (MD PLAY Mode)



⑥ IC501 ㉞ (EXTAL) (MD PLAY Mode)

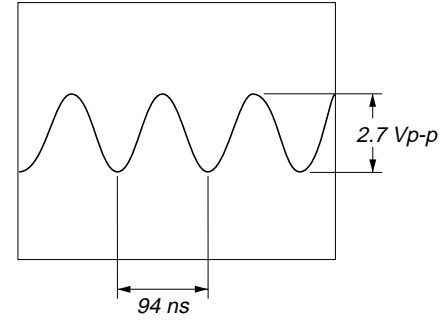


⑦ IC304 ③ (IN) (MD PLAY Mode)

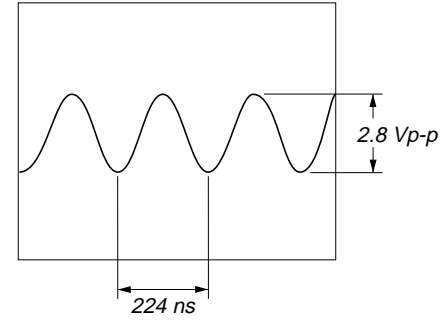


– MAIN Board –

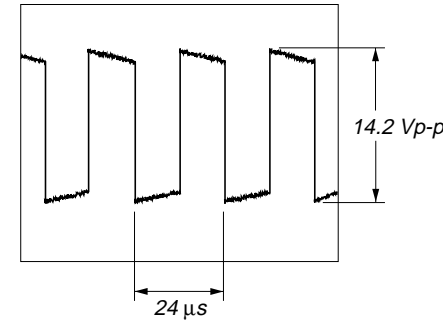
① IC100 ⑨ (OSC IN) (FM/AM (MW) Mode)



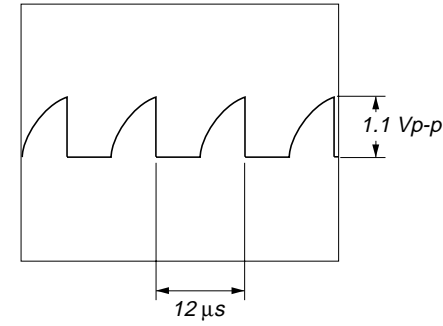
② IC102 ⑤ (OSC1) (FM Mode)



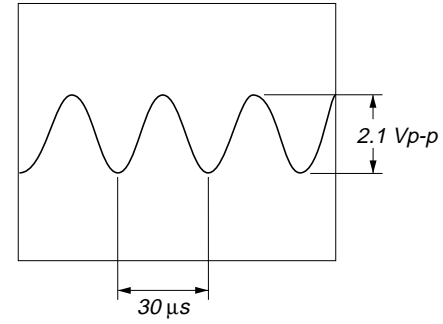
③ IC250 ② (SWE) (MD PLAY Mode)



④ IC250 ③ (TC) (MD PLAY Mode)

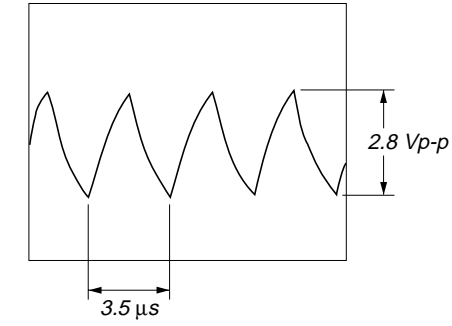


⑤ IC700 ㉞ (XOA)

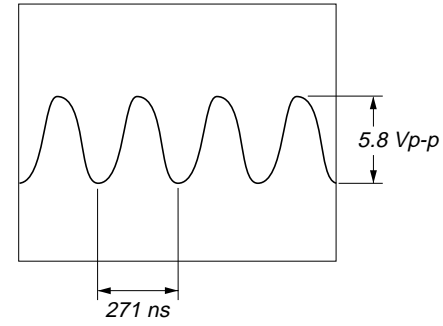


– KEY Board –

① IC801 ㉞ (OSC IN)

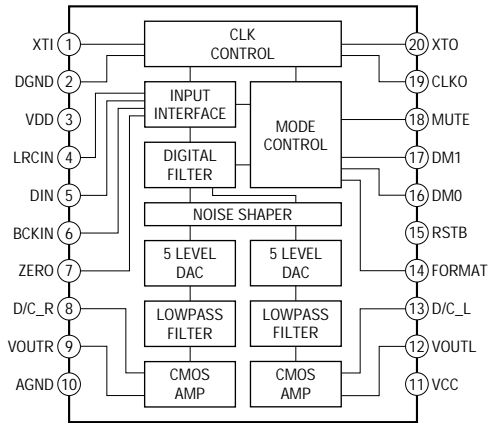


⑥ IC700 ㉞ (X1)

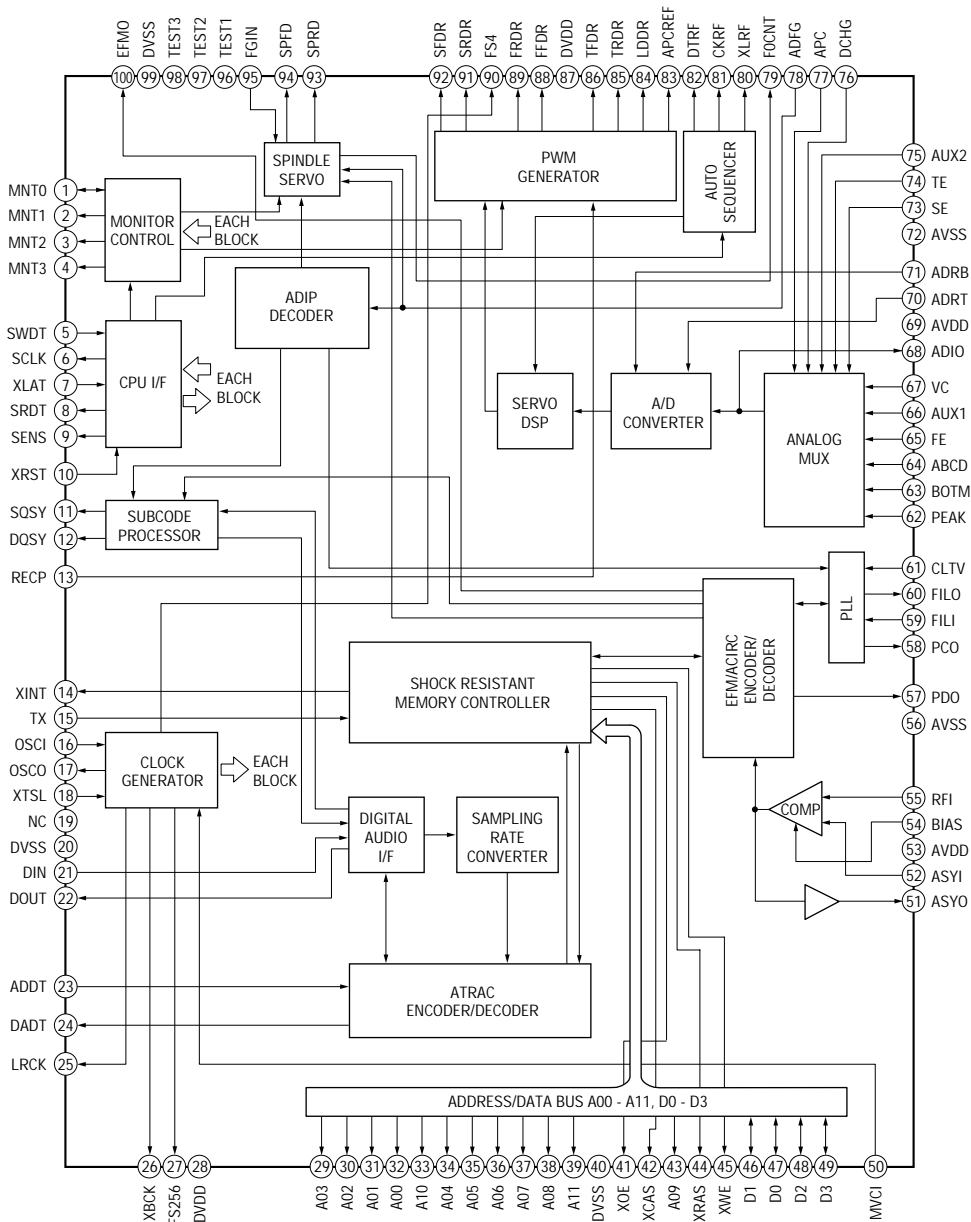


• IC Block Diagrams
– SERVO Board –

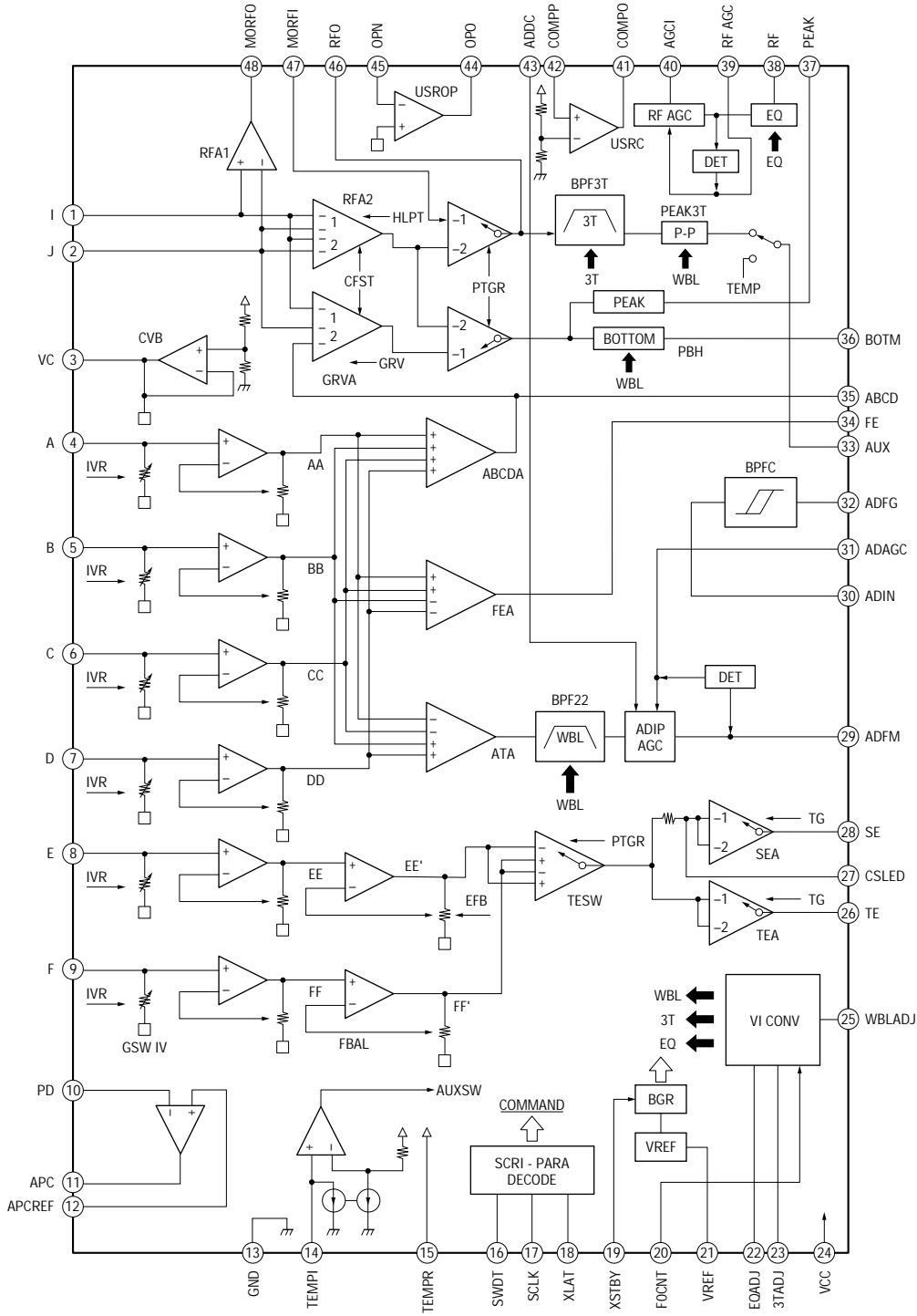
IC101 PCM1718E/2K



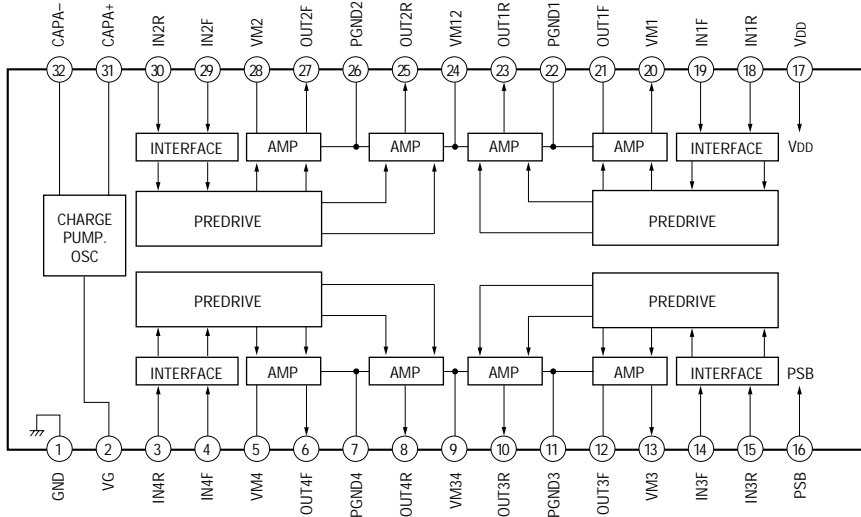
IC301 CXD2652AR



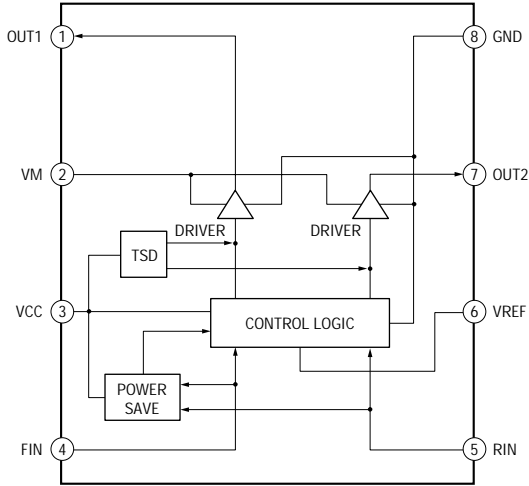
IC302 CXA2523R



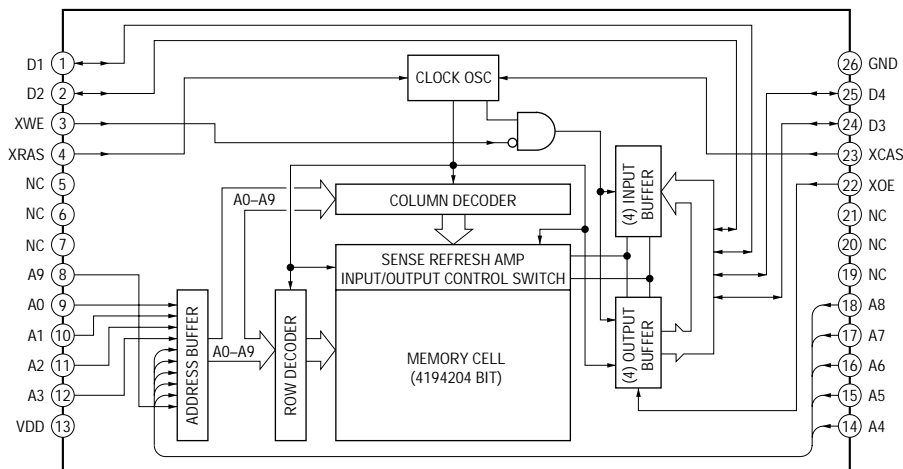
IC303 BH6511FS-E2



IC305 BA6287F

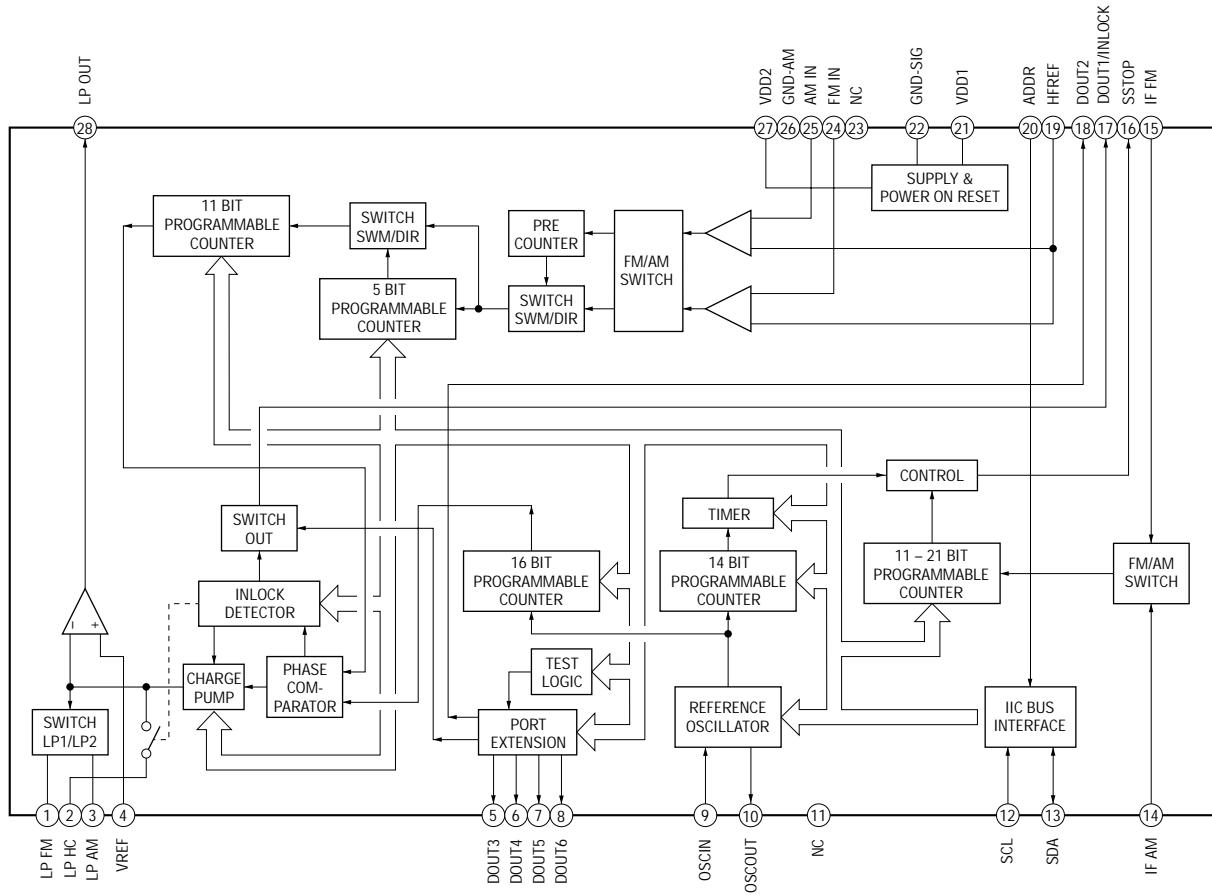


IC307 MN41V4400TT-08S

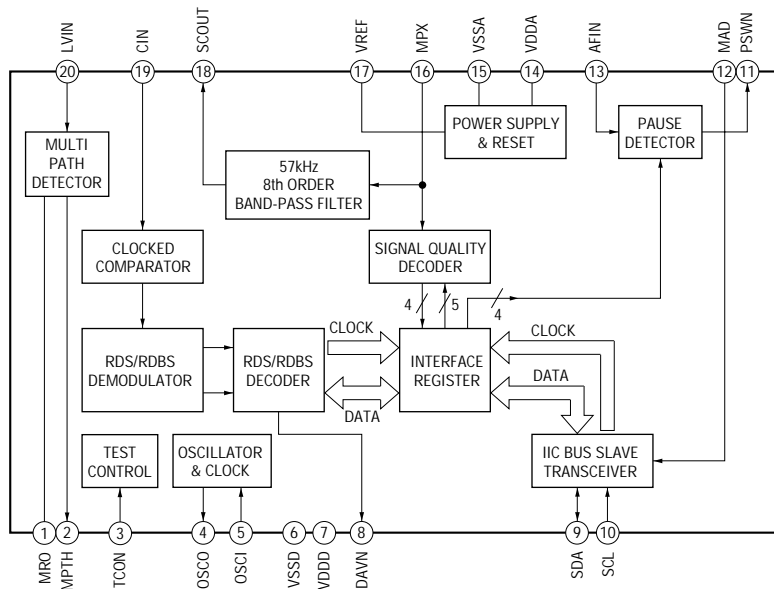


– MAIN Board –

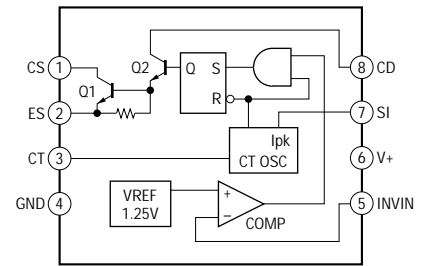
IC100 TDA7427AD



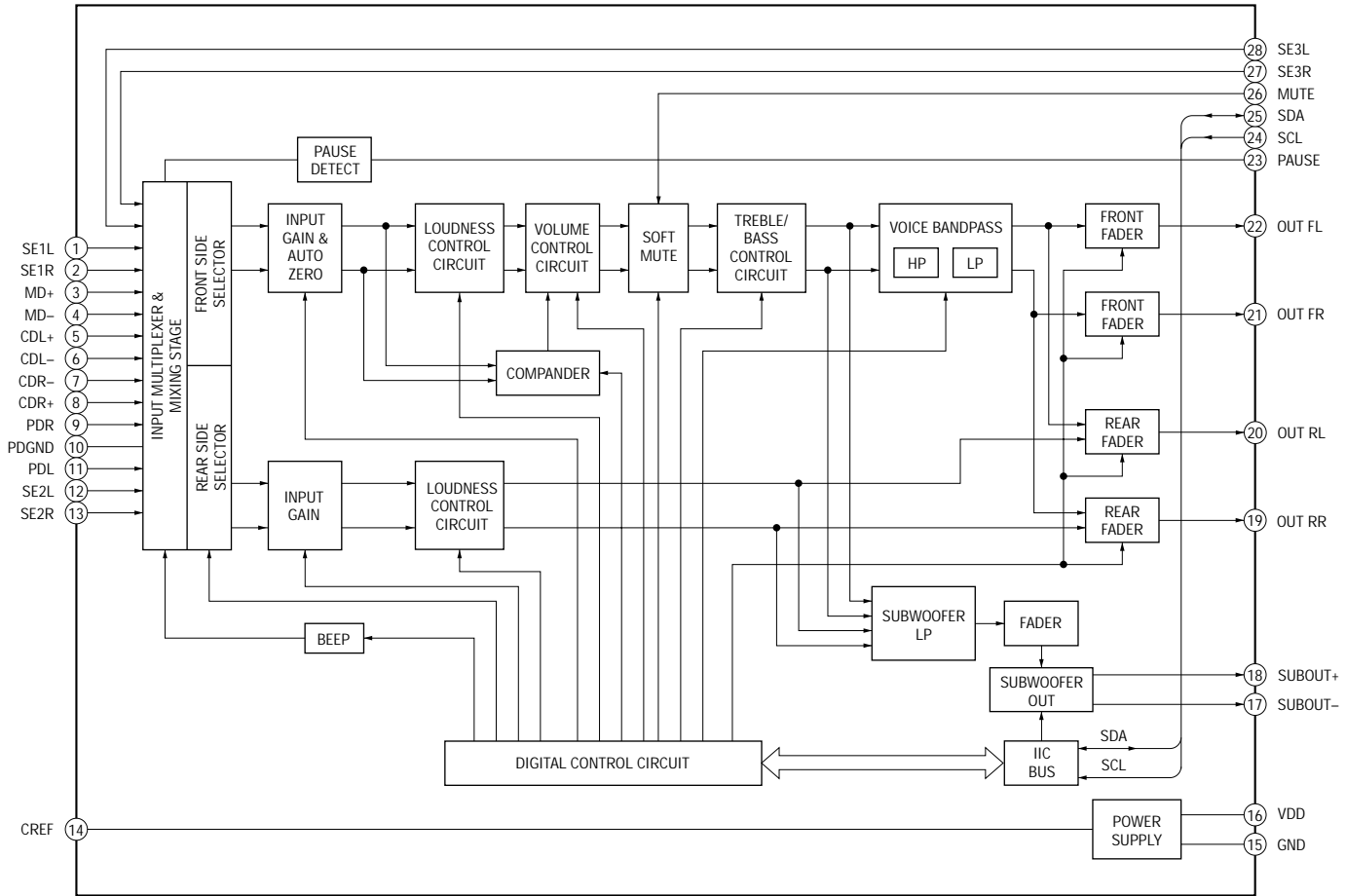
IC102 SAA6588T-118 (MDX-C5960R/C5970R)



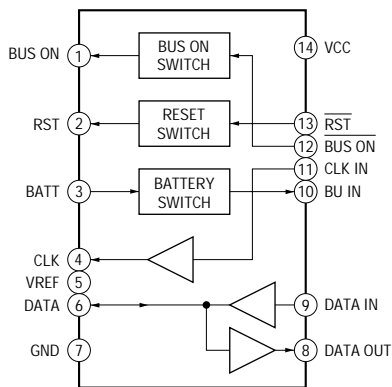
IC250 NJM2360AM (TE2)



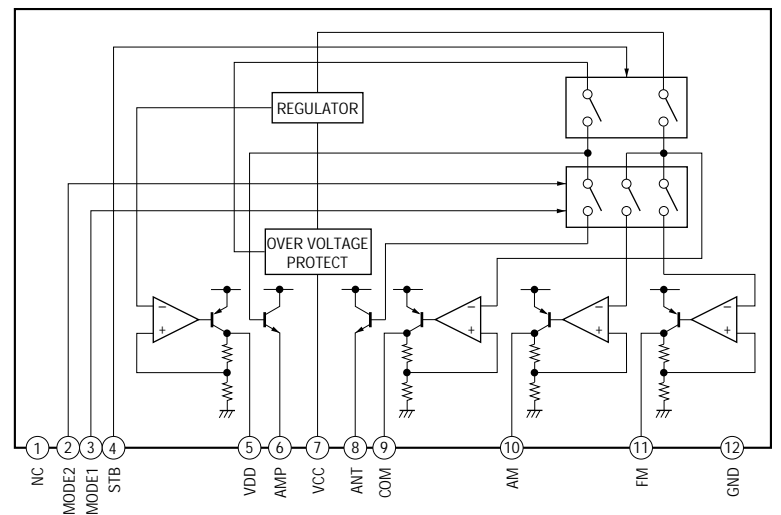
IC300 TDA7462D013TR



IC600 BA8270F-E2



IC800 BA3918-V3



4-19. IC PIN FUNCTION DESCRIPTION

• SERVO BOARD IC301 CXD2652AR

(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO PROCESSOR, EFM/ACIRC ENCODER/DECODER, SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER, 2M BIT D-RAM)

| Pin No. | Pin Name | I/O | Function |
|----------|--------------------------|-------|--|
| 1 | MNT0 | O | Focus OK signal output to the MD mechanism controller (IC501) “H” is output when focus is on (“L”: NG) |
| 2 | MNT1 | O | Track jump detection signal output to the MD mechanism controller (IC501) |
| 3 | MNT2 | O | Busy monitor signal output to the MD mechanism controller (IC501) |
| 4 | MNT3 | O | Spindle servo lock status monitor signal output to the MD mechanism controller (IC501) |
| 5 | SWDT | I | Writing serial data signal input from the MD mechanism controller (IC501) |
| 6 | SCLK | I | Serial data transfer clock signal input from the MD mechanism controller (IC501) |
| 7 | XLAT | I | Serial data latch pulse signal input from the MD mechanism controller (IC501) |
| 8 | SRDT | O (3) | Reading serial data signal output to the MD mechanism controller (IC501) |
| 9 | SENS | O (3) | Internal status (SENSE) output to the MD mechanism controller (IC501) |
| 10 | $\overline{\text{XRST}}$ | I | Reset signal input from the MD mechanism controller (IC501) “L”: reset |
| 11 | SQSY | O | Subcode Q sync (SCOR) output to the MD mechanism controller (IC501) “L” is output every 13.3 msec Almost all, “H” is output |
| 12 | DQSY | O | Digital In U-bit CD format subcode Q sync (SCOR) output terminal “L” is output every 13.3 msec Almost all, “H” is output Not used (open) |
| 13 | RECP | I | Laser power selection signal input terminal “L”: playback mode, “H”: recording mode (fixed at “L” in this set) |
| 14 | XINT | O | Interrupt status output to the MD mechanism controller (IC501) |
| 15 | TX | I | Recording data output enable signal input terminal Writing data transmission timing input (Also serves as the magnetic head on/off output) Not used (fixed at “L”) |
| 16 | OSCI | I | System clock signal (512Fs=22.5792 MHz) input from the oscillator circuit |
| 17 | OSCO | O | System clock signal (512Fs=22.5792 MHz) output terminal Not used (open) |
| 18 | XTSL | I | Input terminal for the system clock frequency setting “L”: 45.1584 MHz, “H”: 22.5792 MHz (fixed at “H” in this set) |
| 19 | RVDD | — | Power supply terminal (+3.3V) (digital system) |
| 20 | RVSS | — | Ground terminal (digital system) |
| 21 | DIN | I | Digital audio signal input terminal when recording mode Not used (fixed at “L”) |
| 22 | DOU | O | Digital audio signal output terminal when playback mode Not used (open) |
| 23 | ADDT | I | Recording data input terminal Not used (fixed at “L”) |
| 24 | DADT | O | Playback data output to the PCM1718E (IC101) |
| 25 | LRCK | O | L/R sampling clock signal (44.1 kHz) output to the PCM1718E (IC101) |
| 26 | XBCK | O | Bit clock signal (2.8224 MHz) output to the PCM1718E (IC101) |
| 27 | FS256 | O | Clock signal (11.2896 MHz) output to the PCM1718E (IC101) |
| 28 | DVDD | — | Power supply terminal (+3.3V) (digital system) |
| 29 to 32 | A03 to A00 | O | Address signal output to the D-RAM (IC307) |
| 33 | A10 | O | Address signal output to the external D-RAM Not used (open) |
| 34 to 38 | A04 to A08 | O | Address signal output to the D-RAM (IC307) |
| 39 | A11 | O | Address signal output to the external D-RAM Not used (open) |
| 40 | DVSS | — | Ground terminal (digital system) |
| 41 | $\overline{\text{XOE}}$ | O | Output enable signal output to the D-RAM (IC307) “L” active |
| 42 | $\overline{\text{XCAS}}$ | O | Column address strobe signal output to the D-RAM (IC307) “L” active |
| 43 | A09 | O | Address signal output to the D-RAM (IC307) |
| 44 | $\overline{\text{XRAS}}$ | O | Row address strobe signal output to the D-RAM (IC307) “L” active |
| 45 | $\overline{\text{XWE}}$ | O | Write enable signal output to the D-RAM (IC307) “L” active |

| Pin No. | Pin Name | I/O | Function |
|---------|----------|-------|--|
| 46 | D1 | I/O | Two-way data bus with the D-RAM (IC307) |
| 47 | D0 | I/O | |
| 48 | D2 | I/O | |
| 49 | D3 | I/O | |
| 50 | MVCI | I | Digital in PLL oscillation input from the external VCO Not used (fixed at "L") |
| 51 | ASYO | O | Playback EFM full-swing output terminal |
| 52 | ASYI | I (A) | Playback EFM asymmetry comparator voltage input terminal |
| 53 | AVDD | — | Power supply terminal (+3.3V) (analog system) |
| 54 | BIAS | I (A) | Playback EFM asymmetry circuit constant current input terminal |
| 55 | RFI | I (A) | Playback EFM RF signal input from the CXA2523R (IC302) |
| 56 | AVSS | — | Ground terminal (analog system) |
| 57 | PDO | O (3) | Phase comparison output for clock playback analog PLL of the playback EFM Not used (open) |
| 58 | PCO | O (3) | Phase comparison output for master clock of the recording/playback EFM master PLL |
| 59 | FILI | I (A) | Filter input for master clock of the recording/playback master PLL |
| 60 | FILO | O (A) | Filter output for master clock of the recording/playback master PLL |
| 61 | CLTV | I (A) | Internal VCO control voltage input of the recording/playback master PLL |
| 62 | PEAK | I (A) | Light amount signal (RF/ABCD) peak hold input from the CXA2523R (IC302) |
| 63 | BOTM | I (A) | Light amount signal (RF/ABCD) bottom hold input from the CXA2523R (IC302) |
| 64 | ABCD | I (A) | Light amount signal (ABCD) input from the CXA2523R (IC302) |
| 65 | FE | I (A) | Focus error signal input from the CXA2523R (IC302) |
| 66 | AUX1 | I (A) | Auxiliary signal (I ₃ signal/temperature signal) input terminal Not used (fixed at "H") |
| 67 | VC | I (A) | Middle point voltage (+1.65V) input from the CXA2523R (IC302) |
| 68 | ADIO | O (A) | Monitor output of the A/D converter input signal Not used (open) |
| 69 | AVDD | — | Power supply terminal (+3.3V) (analog system) |
| 70 | ADRT | I (A) | A/D converter operational range upper limit voltage input terminal (fixed at "H" in this set) |
| 71 | ADRB | I (A) | A/D converter operational range lower limit voltage input terminal (fixed at "L" in this set) |
| 72 | AVSS | — | Ground terminal (analog system) |
| 73 | SE | I (A) | Sled error signal input from the CXA2523R (IC302) |
| 74 | TE | I (A) | Tracking error signal input from the CXA2523R (IC302) |
| 75 | AUX2 | I (A) | Auxiliary signal input terminal Light amount signal input from the CXA2523R (IC302) |
| 76 | DCHG | I (A) | Connected to the +3.3V power supply |
| 77 | APC | I (A) | Error signal input for the laser automatic power control Not used (fixed at "L") |
| 78 | ADFG | I | ADIP duplex FM signal (22.05 kHz ± 1 kHz) input from the CXA2523R (IC302) |
| 79 | F0CNT | O | Filter f0 control signal output terminal Not used (open) |
| 80 | XLRF | O | Serial data latch pulse signal output terminal Not used (open) |
| 81 | CKRF | O | Serial data transfer clock signal output terminal Not used (open) |
| 82 | DTRF | O | Writing serial data output terminal Not used (open) |
| 83 | APCREF | O | Control signal output to the reference voltage generator circuit for the laser automatic power control |
| 84 | LDDR | O | PWM signal output for the laser automatic power control Not used (open) |
| 85 | TRDR | O | Tracking servo drive PWM signal (-) output to the BH6511FS (IC303) |
| 86 | TFDR | O | Tracking servo drive PWM signal (+) output to the BH6511FS (IC303) |
| 87 | DVDD | — | Power supply terminal (+3.3V) (digital system) |
| 88 | FFDR | O | Focus servo drive PWM signal (+) output to the BH6511FS (IC303) |
| 89 | FRDR | O | Focus servo drive PWM signal (-) output to the BH6511FS (IC303) |
| 90 | FS4 | O | Clock signal (176.4 kHz) output terminal (X'tal system) Not used (open) |
| 91 | SRDR | O | Sled servo drive PWM signal (-) output to the BH6511FS (IC303) |

| Pin No. | Pin Name | I/O | Function |
|---------|----------|-----|---|
| 92 | SFDR | O | Sled servo drive PWM signal (+) output to the BH6511FS (IC303) |
| 93 | SPRD | O | Spindle servo drive PWM signal (-) output to the BH6511FS (IC303) |
| 94 | SPFD | O | Spindle servo drive PWM signal (+) output to the BH6511FS (IC303) |
| 95 | FGIN | I | Not used (fixed at "L") |
| 96 | TEST1 | I | Input terminal for the test (fixed at "L") |
| 97 | TEST2 | I | |
| 98 | TEST3 | I | |
| 99 | DVSS | — | Ground terminal (digital system) |
| 100 | EFMO | O | EFM signal output terminal when recording mode Not used (open) |

* I (A) for analog input, O (3) for 3-state output, and O (A) for analog output in the column I/O.

• SERVO BOARD IC302 CXA2523R (RF AMP, FOCUS/TRACKING ERROR AMP)

| Pin No. | Pin Name | I/O | Function |
|---------|--------------|-----|---|
| 1 | I | I | I-V converted RF signal I input from the optical pick-up block detector |
| 2 | J | I | I-V converted RF signal J input from the optical pick-up block detector |
| 3 | VC | O | Middle point voltage (+1.65V) generation output terminal |
| 4 to 9 | A to F | I | Signal input from the optical pick-up detector |
| 10 | PD | I | Light amount monitor input from the optical pick-up block laser diode |
| 11 | APC | O | Laser amplifier output terminal to the automatic power control circuit |
| 12 | APCREF | I | Reference voltage input terminal for setting laser power |
| 13 | GND | — | Ground terminal |
| 14 | TEMPI | I | Connected to the temperature sensor Not used (open) |
| 15 | TEMPR | O | Output terminal for a temperature sensor reference voltage Not used (open) |
| 16 | SWDT | I | Writing serial data input from the MD mechanism controller (IC501) |
| 17 | SCLK | I | Serial data transfer clock signal input from the MD mechanism controller (IC501) |
| 18 | XLAT | I | Serial data latch pulse signal input from the MD mechanism controller (IC501) |
| 19 | <u>XSTBY</u> | I | Standby signal input terminal “L”: standby (fixed at “H” in this set) |
| 20 | FOCNT | I | Center frequency control voltage input terminal of internal circuit (BPF22, BPF3T, EQ) input terminal |
| 21 | VREF | O | Reference voltage output terminal Not used (open) |
| 22 | EQADJ | I | Center frequency setting terminal for the internal circuit (EQ) |
| 23 | 3TADJ | I | Center frequency setting terminal for the internal circuit (BPF3T) |
| 24 | VCC | — | Power supply terminal (+3.3V) |
| 25 | WBLADJ | I | Center frequency setting terminal for the internal circuit (BPF22) |
| 26 | TE | O | Tracking error signal output to the CXD2652AR (IC301) |
| 27 | CSLED | I | Connected to the external capacitor for low-pass filter of the sled error signal |
| 28 | SE | O | Sled error signal output to the CXD2652AR (IC301) |
| 29 | ADFM | O | FM signal output of the ADIP |
| 30 | ADIN | I | Receives a ADIP FM signal in AC coupling |
| 31 | ADAGC | I | Connected to the external capacitor for ADIP AGC |
| 32 | ADFG | O | ADIP duplex signal (22.05 kHz \pm 1 kHz) output to the CXD2652AR (IC301) |
| 33 | AUX | O | Auxiliary signal (I ₃ signal/temperature signal) output terminal Not used (open) |
| 34 | FE | O | Focus error signal output to the CXD2652AR (IC301) |
| 35 | ABCD | O | Light amount signal (ABCD) output to the CXD2652AR (IC301) |
| 36 | BOTM | O | Light amount signal (RF/ABCD) bottom hold output to the CXD2652AR (IC301) |
| 37 | PEAK | O | Light amount signal (RF/ABCD) peak hold output to the CXD2652AR (IC301) |
| 38 | RF | O | Playback EFM RF signal output to the CXD2652AR (IC301) |
| 39 | RFAGC | I | Connected to the external capacitor for RF auto gain control circuit |
| 40 | AGCI | I | Receives a RF signal in AC coupling |
| 41 | COMPO | O | User comparator output terminal Not used (open) |
| 42 | COMPP | I | User comparator input terminal Not used (fixed at “L”) |
| 43 | ADDC | I | Connected to the external capacitor for cutting the low band of the ADIP amplifier |
| 44 | OPO | O | User operational amplifier output terminal Not used (open) |
| 45 | OPN | I | User operational amplifier inversion input terminal Not used (fixed at “L”) |
| 46 | RFO | O | RF signal output terminal |
| 47 | MORFI | I | Receives a MO RF signal in AC coupling |
| 48 | MORFO | O | MO RF signal output terminal |

• SERVO BOARD IC501 CXP84340-201Q (MD MECHANISM CONTROLLER)

| Pin No. | Pin Name | I/O | Function |
|----------|---------------------------|-----|---|
| 1 to 5 | TIN3 to TIN7 | I/O | Input of the 4×8 matrix test keys (“L” is always output, except in test mode) Not used (open) |
| 6 | LOAD | O | Loading motor control signal output to the motor driver (IC305) “H” active *1 |
| 7 | EJECT | O | Loading motor control signal output to the motor driver (IC305) “H” active *1 |
| 8, 9 | NCO | O | Not used (open) |
| 10 | MDMON | O | Power supply on/off control signal output of the MD mechanism deck section main power supply and loading motor drive (IC305) power supply “H”: power on |
| 11 | $\overline{\text{E-SW}}$ | I | Inputs the disc loading completion detect switch detection signal “L”: When completed of the disc loading operation |
| 12 | AG-OK | O | Output of aging status in test mode “L”: under aging, “H”: aging completed Not used (open) |
| 13 | ADJ-OK | O | Output of status when aging completed in test mode “L”: aging NG, “H”: aging OK Not used (open) |
| 14 to 17 | NCO | O | Not used (open) |
| 18 | DFCTSEL | I | Select whether defect function is used for the CXD2652AR (IC301) “L”: used this function, “H”: not used this function (fixed at “H” in this set) |
| 19 | DPLLSEL | I | Select whether digital PLL function is used for the CXD2652AR (IC301) “L”: used this function, “H”: not used this function (fixed at “H” in this set) |
| 20 | EMPHSEL | I | Select whether emphasis signal output from pin or unilink data “L”: outputs from both pin and unilink data, “H”: output from pin only (fixed at “H” in this set) |
| 21 | LOCK | O | Mini-disc lock detection signal output to the master controller (IC700) “H”: lock |
| 22 | NCO | O | Not used (open) |
| 23 | 2M/4M | I | Select whether D-RAM capacitance 2M bit or 4M bit “L”: 4M bit (external D-RAM), “H”: 2M bit (internal D-RAM of CXD2652AR) (fixed at “L” in this set) |
| 24, 25 | NCO | O | Not used (open) |
| 26 | MNT0 | I | Focus OK signal input from the CXD2652AR (IC301) “H” is input when focus is on (“L”: NG) |
| 27 | MNT1 | I | Track jump detection signal input from the CXD2652AR (IC301) |
| 28 | MNT2 | I | Busy monitor signal input from the CXD2652AR (IC301) |
| 29 | MNT3 | I | Spindle servo lock status monitor signal input from the CXD2652AR (IC301) |
| 30 | $\overline{\text{RESET}}$ | I | System reset signal input from the master controller (IC700), reset signal generator (IC801) and reset switch (S900) “L”: reset For several hundreds msec. after the power supply rises, “L” is input, then it changes to “H” |
| 31 | EXTAL | O | Main system clock output terminal (10 MHz) |
| 32 | XTAL | I | Main system clock input terminal (10 MHz) |
| 33 | VSS | — | Ground terminal |
| 34 | TX | O | Sub system clock output terminal (32.768 kHz) Not used (open) |
| 35 | TEX | I | Sub system clock input terminal (32.768 kHz) Not used (fixed at “L”) |
| 36 | AVSS | — | Ground terminal (for A/D converter) |
| 37 | AVREF | I | Reference voltage input terminal (+5V) (for A/D converter) |
| 38 | INIT | I | Initial reset signal input terminal (A/D input) (fixed at “H”) |
| 39 | TEMP | I | Temperature sensor (TH501) input terminal (A/D input) |
| 40 | ACNT | I | Select the number of load/eject aging times (A/D input) 0H – 54H (30 times), 55H – 0A9H (20 times), 0AAH – 0FFH (10 times) |
| 41 | DO-SEL | I | Select the digital output bits (A/D input) |
| 42 | EE-CS | O | Chip select signal output to the external EEPROM device Not used (open) |
| 43 | EE-CKO | O | Serial data transfer clock signal output to the external EEPROM device Not used (open) |
| 44 | EE-SIO | I/O | Two way data bus with the external EEPROM device Not used (open) |
| 45 | MD-SO | O | Writing serial data signal output to the CXD2652AR (IC301) and CXA2523R (IC302) |
| 46 | LINKOFF | O | Unilink on/off control signal output for the SONY bus “L”: link on, “H”: link off |

| Pin No. | Pin Name | I/O | Function |
|----------|------------------------------|-----|---|
| 47 | UNIREQ | O | Data request signal output terminal (for SONY bus) “H”: request on Not used (open) |
| 48 | UNICKIO | I/O | Serial clock signal input from the master controller (IC700) or serial clock signal output to the SONY bus interface (IC600) and master controller (IC700) (for SONY bus) |
| 49 | UNISI | I | Serial data input from the SONY bus interface (IC600) |
| 50 | UNISO | O | Serial data output to the SONY bus interface (IC600) |
| 51 | MD-CKO | O | Serial data transfer clock signal output to the CXD2652AR (IC301) and CXA2523R (IC302) |
| 52 | MD-SI | I | Reading serial data signal input from the CXD2652AR (IC301) |
| 53 | NCO | O | Not used (open) |
| 54 | SENS | I | Internal status (SENSE) input from the CXD2652AR (IC301) |
| 55 | CC-XINT | I | Interrupt status input from the CXD2652AR (IC301) |
| 56 | $\overline{\text{LIMIT-IN}}$ | I | Detection input from the sled limit-in detect switch The optical pick-up is inner position when “L” |
| 57 | EJT-KEY | I | Eject request signal input terminal “L”: eject on Not used (fixed at “H”) |
| 58 | ERROR-PWM | O | PWM error monitor output terminal (C1 and ATER is output when test mode) Not used (open) |
| 59 | $\overline{\text{MD-RST}}$ | O | Reset signal output to the PCM1718E (IC101), CXD2652AR (IC301) and BH6511FS (IC303) “L”: reset |
| 60 | BU-IN | I | Battery detect signal input from the SONY bus interface (IC600) and battery check circuit “H”: battery on |
| 61 | $\overline{\text{BUS-ON}}$ | I | SONY bus on/off control signal input from the master controller (IC700) “L”: bus on |
| 62 | SQSY | I | Subcode Q sync (SCOR) input from the CXD2652AR (IC301) “L” is input every 13.3 msec Almost all, “H” is input |
| 63 | $\overline{\text{C-SW}}$ | I | Inputs the disc loading start or disc eject completion detect switch detection signal “L”: When start or eject completed of the disc loading operation |
| 64 | MD-LAT | O | Serial data latch pulse signal output to the CXD2652AR (IC301) and CXA2523R (IC302) |
| 65 | MD-ON | O | Power supply on/off control signal output of the MD mechanism deck section main power supply “H”: power on |
| 66 | DEEMP | O | Emphasis on/off control signal output to the PCM1718E (IC101) “H”: emphasis on |
| 67 | A-MUTE | O | Audio muting on/off control signal output terminal |
| 68 | NCO | O | Not used (open) |
| 69 | TSTCKO | O | Output of clock signal for the test mode display Not used (open) |
| 70 | TSTSO | O | Output of data for the test mode display Not used (open) |
| 71 | $\overline{\text{TSTMOD}}$ | I | Setting terminal for the test mode “L”: test mode, “H”: normal mode |
| 72 | VCC | — | Power supply terminal (+5V) |
| 73 | NIL | I | Not used (fixed at “H”) |
| 74 to 77 | TOUT0 to TOUT3 | O | Output of the 4×8 matrix test keys Not used (open) |
| 78 to 80 | TIN0 to TIN2 | I/O | Input of the 4×8 matrix test keys (“L” is always output, except in test mode) Not used (open) |

*1 Loading motor (M903) control

| Terminal \ Operation | IN | OUT | BRAKE | STOP |
|----------------------|-----|-----|-------|------|
| LOAD (pin ⑥) | “H” | “L” | “H” | “L” |
| EJECT (pin ⑦) | “L” | “H” | “H” | “L” |

● MAIN BOARD IC700 (MASTER CONTROLLER)
 MB90574PFV-G-188-BND (MDX-C5960R/C5970R) MB90574PFV-G-187-BND (MDX-C5970)

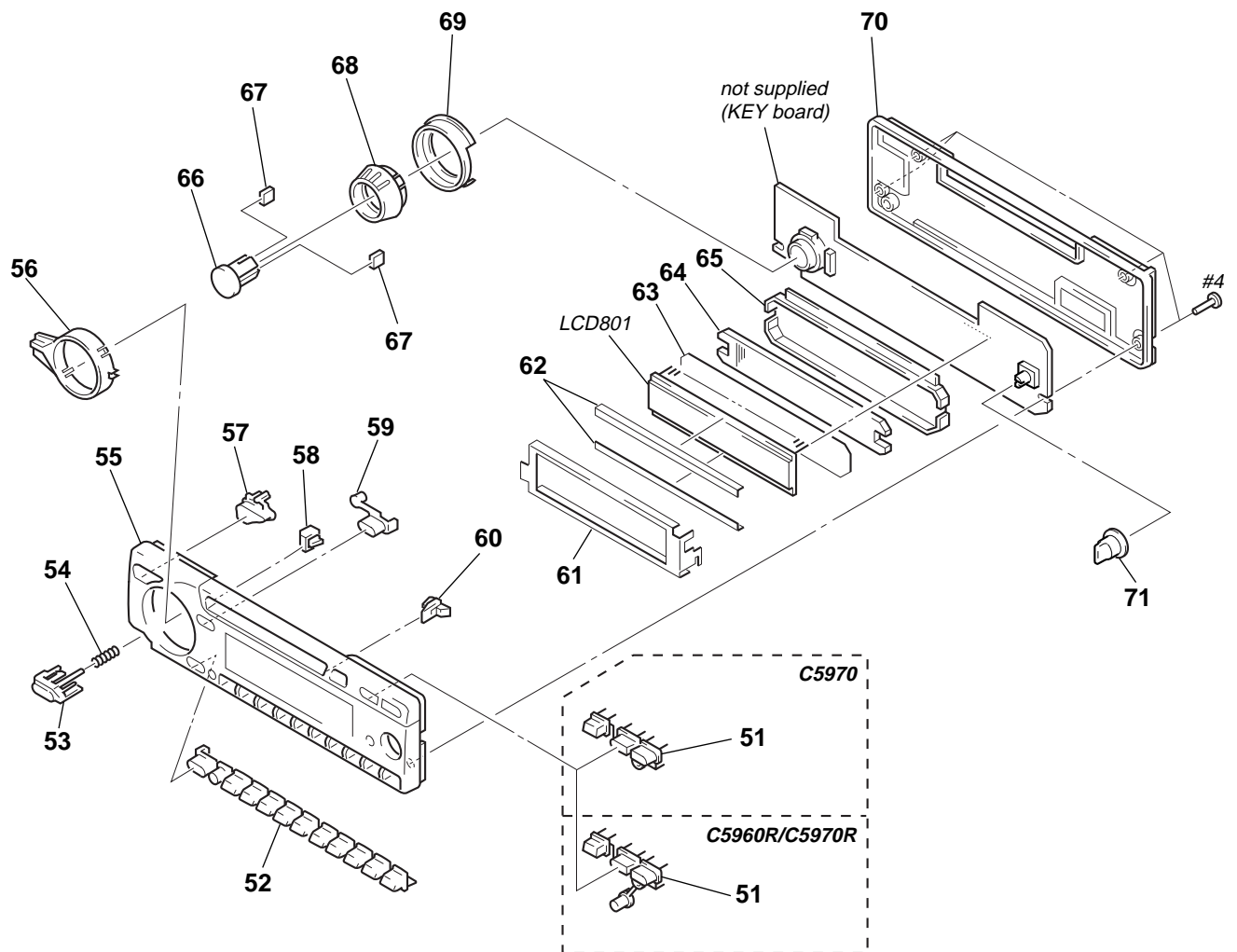
| Pin No. | Pin Name | I/O | Function |
|---------|----------------|-----|---|
| 1 to 7 | NC | O | Not used (open) |
| 8 | VCC | — | Power supply terminal (+5V) |
| 9 | PLL SI | I | PLL serial data input terminal Not used (open) |
| 10 | PLL SO | O | PLL serial data output terminal Not used (open) |
| 11 | PLL CKO | O | PLL serial data transfer clock signal output terminal Not used (open) |
| 12 | <u>NOSE-SW</u> | I | Front panel block remove/attach detection signal input terminal “L”: front panel is attached |
| 13 | LCD SO | O | Serial data output to the liquid crystal display driver (IC801) |
| 14 | LCD CKO | O | Serial data transfer clock signal output to the liquid crystal display driver (IC801) |
| 15 | BEEP | O | Beep sound drive signal output terminal |
| 16 | DBMOD2 | O | D-BASS mode control signal output terminal Not used (open) |
| 17 | <u>DOOR-SW</u> | I | Front panel open/close detection signal input “L” is input when the front panel is closed Not used (open) |
| 18, 19 | NC | O | Not used (open) |
| 20 | UNI SI | I | Serial data input from the SONY bus interface (IC600) |
| 21 | UNI SO | O | Serial data output to the SONY bus interface (IC600) |
| 22 | UNI CKIO | I/O | Serial clock signal output to the MD mechanism controller (IC501) and SONY bus interface (IC600) or serial clock signal input from the MD mechanism controller (IC501) (for SONY bus) |
| 23 | NC | O | Not used (open) |
| 24 | SIRCS | I | Sircs remote control signal input terminal Not used (fixed at “L”) |
| 25 | PACK-IND | O | LED drive signal output of the MD disc slot illumination and ▲ indicator “H”: LED on “H” is output to turn on LED when front panel is opened Not used (open) |
| 26 | VOL SO | O | Serial data output for the electrical volume Not used (open) |
| 27 | VOL CKO | O | Serial data transfer clock signal output for the electrical volume Not used (open) |
| 28 | DSTSEL0 | I | Destination setting terminal (Except German models: fixed at “H”, German model: fixed at “L”) |
| 29 | <u>SYRST</u> | O | System reset signal output to the MD mechanism controller (IC501) and SONY bus interface (IC600) “L”: reset |
| 30 | DSTSEL1 | I | Destination setting terminal (US, Canadian models: fixed at “H”, E model: fixed at “L”) |
| 31 | DBMOD1 | O | D-BASS mode control signal output terminal Not used (open) |
| 32 | <u>TESTIN</u> | I | Setting terminal for the test mode “L”: test mode, Normally: fixed at “H” |
| 33 | VSS | — | Ground terminal |
| 34 | C | — | Connected to coupling capacitor for the power supply |
| 35 | NS-MASK | O | Discharge control signal output for the noise detection circuit “H”: discharge Used for the MDX-C5960R/C5970R only (MDX-C5970: Not used (open)) |
| 36 | <u>BUS-ON</u> | O | Bus on/off control signal output to the MD mechanism controller (IC501) and SONY bus interface (IC600) “L”: bus on |
| 37 | <u>AD-ON</u> | O | A/D converter power control signal output terminal When the KEYACK (pin 79) that controls reference voltage power for key A/D conversion input is active, “L” is output from this terminal to enable the input |
| 38 | DVCC | — | Power supply terminal (+5V) (for D/A converter) |
| 39 | DVSS | — | Ground terminal (for D/A converter) |
| 40 | LCDANG | O | View field angle control signal is output when front panel is fully opened “H”: front panel is fully opened |
| 41 | VOL CE | O | Chip enable signal output for the electrical volume Not used (open) |
| 42 | AVCC | — | Power supply terminal (+5V) (for A/D converter) |

| Pin No. | Pin Name | I/O | Function |
|---------|----------------------------|-----|---|
| 43 | AVRH | I | Reference voltage (+5V) input terminal (for A/D converter) |
| 44 | AVRL | I | Reference voltage (0V) input terminal (for A/D converter) |
| 45 | AVSS | — | Ground terminal (for A/D converter) |
| 46 | KEY-IN0 | I | Key input terminal (A/D input) (LSW801 to LSW804, LSW806 to LSW810) OFF, SOURCE, SEEK/AMS $\blacktriangleright\blacktriangleright\blacktriangleright + \blacktriangleleft\blacktriangleleft\blacktriangleleft$ -, DSPL, SOUND, MODE, SHIFT, 1, 2 keys input (LSW804 DSPL: MDX-C5960R/C5970R only) |
| 47 | KEY-IN1 | I | Key input terminal (A/D input) (LSW811 to LSW821) \blacktriangle , AF/TA (MDX-C5960R/C5970R) DSPL (MDX-C5970), LIST PTY (MDX-C5960R/ C5970R) LIST (MDX-C5970), 10 to 3 keys input |
| 48 | KEY-IN2 | I | Key input terminal (A/D input) Not used (open) |
| 49 | RC-IN0 | I | Rotary remote commander key input terminal (A/D input) |
| 50 | D-BASS IN | I | D-BASS switch (LSW805) input terminal (A/D input) |
| 51 | QUALITY | I | Noise level detection signal input at SEEK mode (A/D input) Used for the MDX-C5960R/C5970R only (MDX-C5970: Not used (open)) |
| 52 | MPDH (MTP) | I | Multi-path detection signal input from the RDS decoder (IC102) (A/D input) Used for the MDX-C5960R/C5970R only (MDX-C5970: Not used (open)) |
| 53 | S-METER (VSM) | I | FM and AM signal meter voltage detection input from the FM/AM tuner unit (TU1) (A/D input) |
| 54 | VCC | — | Power supply terminal (+5V) |
| 55 | AMP ATT | O | Power amp muting on/off control signal output to the power amplifier (IC500) “L”: muting on |
| 56 | AMP ON | O | Standby on/off control signal output to the power amplifier (IC500) “L”: standby mode, “H”: amp on |
| 57 | $\overline{\text{ILL IN}}$ | I | Auto dimmer control illumination line detection signal input terminal “L” is input at dimmer detection |
| 58 | LOCK IN | I | Mini-disc lock detection signal input from the MD mechanism controller (IC501) “H”: lock |
| 59 | EMPH ON | O | Emphasis control signal output terminal Not used (open) |
| 60 | AU ATT | O | Audio line muting on/off control signal output terminal “H”: muting on |
| 61 | AF ATT | O | Preamp muting on/off control signal output to the electrical volume (IC300) “H”: muting on |
| 62 | TU-ATT | O | Muting on/off control signal output of the FM tuner signal “H”: muting on Used for the MDX-C5960R/C5970R only (MDX-C5970: Not used (open)) |
| 63 | VSS | — | Ground terminal |
| 64 | $\overline{\text{ACC IN}}$ | I | Accessory detect signal input terminal “L”: accessory on |
| 65 | AF-SEEK | O | PLL low-pass filter time constant selection signal output at AF SEEK “H” is output when AF SEEK Not used (open) |
| 66 | WIDE | O | IF band select signal output terminal “H”: wide mode In receiving FM signals, interference noise from adjacent stations is removed by narrowing the IF band automatically in the tuner unit so as to raise the selectivity, but in this case, the distortion may increase and accordingly, the IF band is widened forcibly Not used (open) |
| 67 | DAVN | I | Data transmit completed detect signal input from the RDS decoder (IC102) “H” active Used for the MDX-C5960R/C5970R only (MDX-C5970: Not used (open)) |
| 68 | NARROW | O | Narrow select signal output terminal “H” active Not used (open) |
| 69 | SSTOP | I | IF counter request signal input from the FM/AM PLL (IC100) |
| 70 | SDA | I/O | Two-way data bus with the FM/AM PLL (IC100), RDS decoder (IC102) and electrical volume (IC300) (RDS decoder is MDX-C5960R/C5970R only) |
| 71 | SCL | O | Bus clock signal output to the FM/AM PLL (IC100), RDS decoder (IC102) and electrical volume (IC300) (RDS decoder is MDX-C5960R/C5970R only) |
| 72 | RC-IN1 | I | Rotary remote commander shift key input terminal “L”: shift |
| 73 | X1A | O | Sub system clock output terminal (32.768 kHz) |
| 74 | X0A | I | Sub system clock input terminal (32.768 kHz) |

| Pin No. | Pin Name | I/O | Function |
|----------|---------------------|-----|---|
| 75 | NC | O | Not used (open) |
| 76 | BU-IN | I | Battery detect signal input from the SONY bus interface (IC600) and battery detect circuit “L” is input at low voltage |
| 77, 78 | NC | O | Not used (open) |
| 79 | KEYACK | I | Input of acknowledge signal for the key entry Acknowledge signal is input to accept function and eject keys in the power off status On at input of “H” |
| 80 | TEL-ATT | I | Telephone muting signal input terminal At input of “H”, the signal is attenuated by –20 dB Used for the MDX-C5970/C5970R only (MDX-C5960R: fixed at “H”) |
| 81 | ST-MONO | I/O | FM stereo broadcasting detection signal input from the FM/AM tuner unit (TU1), or forced monaural control signal output to the FM/AM tuner unit (TU1) “L” is input in the FM stereo mode, or “L” is output in the forced monaural mode |
| 82 | <u>SEEKOUT</u> | O | Seek control signal output to the FM/AM tuner unit (TU1) AM mode: Used for IF count output/SD output request/AGC cut at SEEK or BTM FM mode: Used for SD speed up at SEEK, BTM, or AF “L” is output at tuner off |
| 83 | SD-IN | I | Station detector detect input from the FM/AM tuner unit (TU1) Stop level for SEEK, BTM, etc. is determined SD is present at input of “H” |
| 84 | MONO | O | Not used (open) |
| 85 | PLL CE | O | PLL serial chip enable signal output terminal Not used (open) |
| 86 | HSTX | I | Hardware standby input terminal “L”: hardware standby mode Reset signal input in this set |
| 87 | MD2 | I | Setting terminal for the CPU operational mode (fixed at “L” in this set) |
| 88 | MD1 | I | Setting terminal for the CPU operational mode (fixed at “H” in this set) |
| 89 | MD0 | I | Setting terminal for the CPU operational mode (fixed at “H” in this set) |
| 90 | <u>RESET</u> | I | System reset signal input from the reset signal generator (IC801) and reset switch (S900) “L”: reset “L” is input for several 100 msec after power on, then it changes to “H” |
| 91 | VSS | — | Ground terminal |
| 92 | X0 | I | Main system clock input terminal (3.68 MHz) |
| 93 | X1 | O | Main system clock output terminal (3.68 MHz) |
| 94 | VCC | — | Power supply terminal (+5V) |
| 95 | POW-SEL | I | Power select switch input terminal “L”: off (halt mode), “H”: on (operation mode) Not used (open) |
| 96 | POL MONO | I | Polar monaural detection signal input terminal Not used (open) |
| 97 to 99 | NC | O | Not used (open) |
| 100 | BAND (9K-10K) | I | Frequency select switch (S701) input terminal “L”: MW10k step/FM 200k step, “H”: MW 9k step/FM 50k step Used for the E model only (Except E models: fixed at “H”) |
| 101 | NC | O | Not used (open) |
| 102 | <u>RAMBU</u> | I | Internal RAM reset detection signal input from the RN5VD23AA (IC802) Input terminal to check that RAM data are not destroyed due to low voltage This checking is made within 100 msec after reset |
| 103 | NC | O | Not used (open) |
| 104 | LCD CE | O | Chip enable signal output to the liquid crystal display driver (IC801) “H” active |
| 105 | <u>FLASH-W</u> | I | Internal flash memory data write mode detection signal input terminal “L”: data write mode Not used (fixed at “H” in this set) |
| 106 | RE-IN0 | I | Dial pulse input of the rotary encoder (EN801) |
| 107 | RE-IN1 | I | (for VOLUME/BASS/TREBLE/BALANCE/FADER control) |
| 108 | LAMP ON (ILL ON) | O | Power on/off control signal output of the illumination LED and liquid crystal display driver (IC801) “H”: power on |
| 109 | PW-ON | O | Main system power supply on/off control signal output to the BA3918 (IC800) “H”: power on |
| 110 | FM-ON | O | FM system power supply on/off control signal output to the BA3918 (IC800) “L”: AM power on, “H”: FM power on |

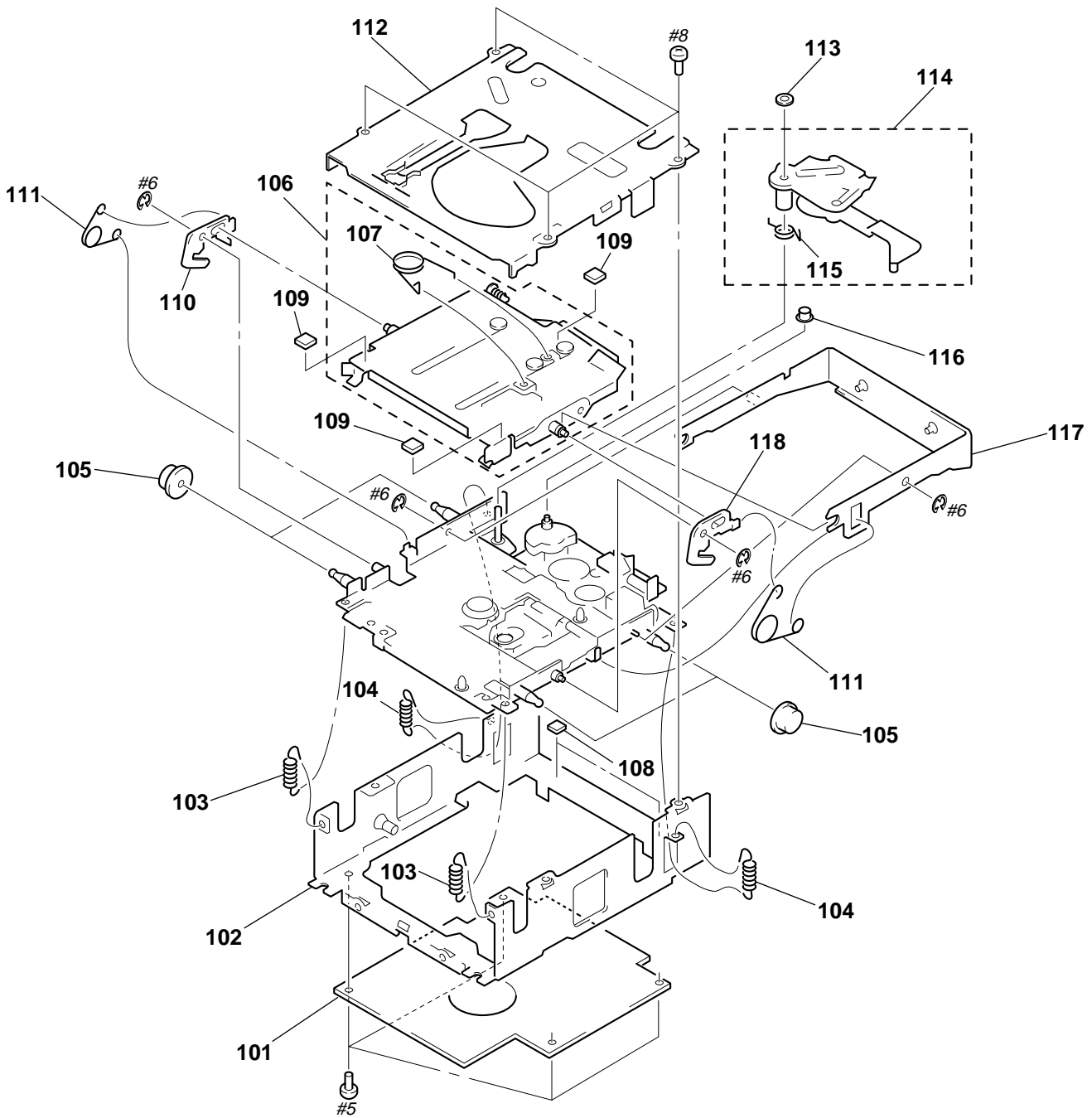
| Pin No. | Pin Name | I/O | Function |
|------------|----------|-----|---|
| 111 | TU-ON | O | Tuner system power supply on/off control signal output to the BA3918 (IC800) “H”: tuner power on |
| 112 to 118 | NC | O | Not used (open) |
| 119 | VSS | — | Ground terminal |
| 120 | NC | O | Not used (open) |

(2) FRONT PANEL SECTION



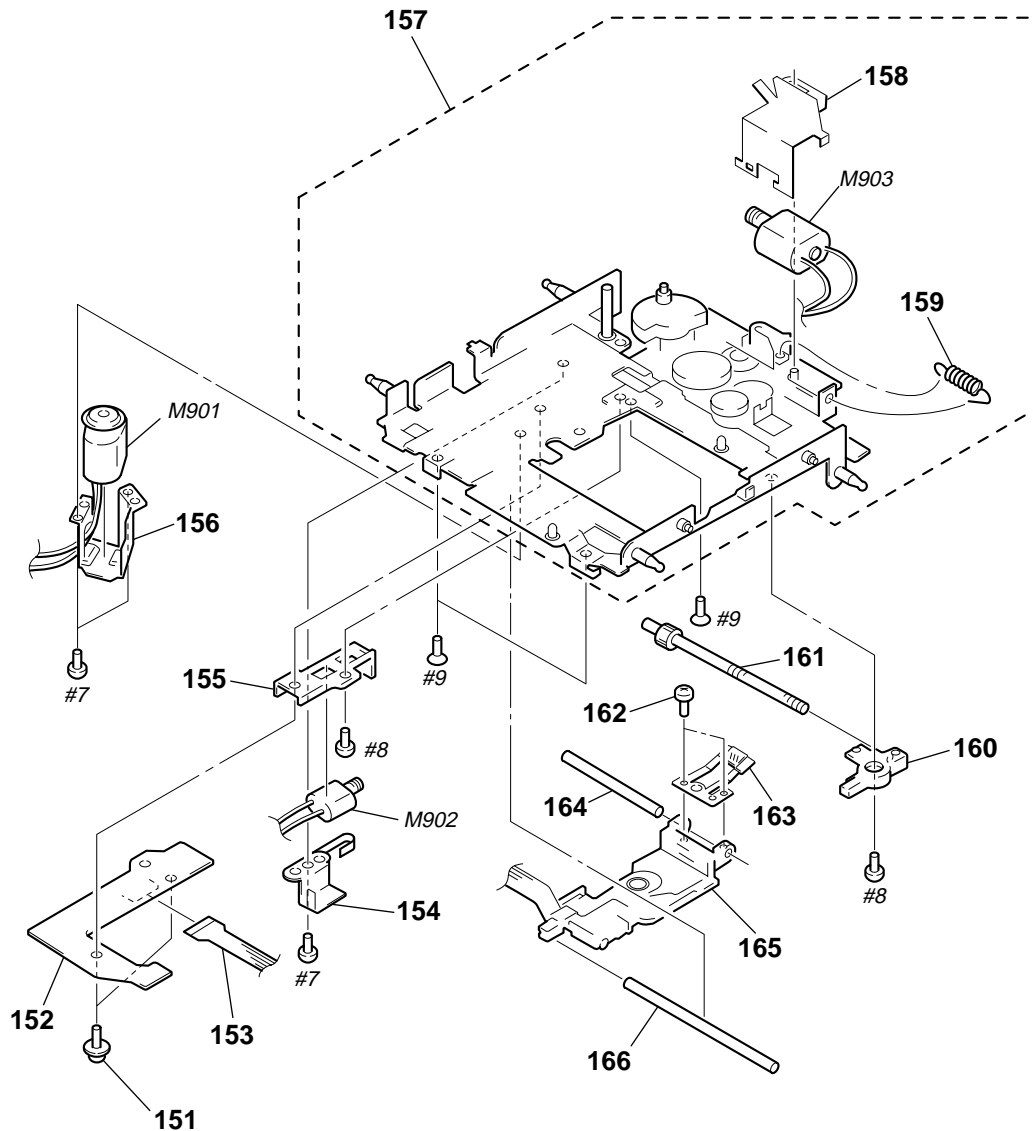
| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---|--------|----------|--------------|-------------------------------|--------|
| 51 | 3-033-694-01 | BUTTON (EJ) (▲. LIST. DSPL) (C5970) | | 59 | 3-023-616-11 | BUTTON (SOUND) | |
| 51 | 3-033-714-01 | BUTTON (EJ) (▲. PTY. AF/TA. DSPL) (C5960R/C5970R) | | 60 | 3-033-705-01 | PLATE (R), LIGHT GUIDE | |
| 52 | 3-023-611-03 | BUTTON (10KEY) (OFF. SHIFT. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10) | | * 61 | 3-033-706-01 | PLATE (LCD), GROUND | |
| 53 | 3-023-617-31 | BUTTON (RELEASE) (C5970/C5970R) | | * 62 | 3-023-621-02 | SHEET (LCD) | |
| 53 | 3-023-617-41 | BUTTON (RELEASE) (C5960R) | | * 63 | 3-033-696-01 | SHEET (LCD), DIFFUSION | |
| 54 | 3-008-667-01 | SPRING (RELEASE) | | * 64 | 3-023-609-01 | PLATE (LCD), LIGHT GUIDE | |
| 55 | X-3376-943-1 | PANEL ASSY, FRONT (C5970) | | * 65 | 3-033-707-01 | HOLDER (LCD) | |
| 55 | X-3377-403-1 | PANEL ASSY, FRONT (C5970R) | | 66 | 3-023-626-21 | BUTTON (SOURCE) | |
| 55 | X-3377-404-1 | PANEL ASSY, FRONT (C5960R) | | * 67 | 3-026-158-01 | SPACER (SOURCE) | |
| 56 | 3-033-695-01 | KNOB (AMS) (+. -) (C5970/C5970R) | | 68 | 3-023-612-21 | KNOB (VOL) | |
| 56 | 3-033-695-11 | KNOB (AMS) (+. -) (C5960R) | | 69 | 3-033-715-01 | RING, LIGHT GUIDE | |
| 57 | 3-023-629-01 | BUTTON (MODE) | | 70 | 3-033-697-01 | PANEL, BACK | |
| 58 | 3-033-704-01 | PLATE (L), LIGHT GUIDE | | 71 | 3-023-625-11 | KNOB (D) (C5970/C5970R) | |
| | | | | 71 | 3-023-625-21 | KNOB (D) (C5960R) | |
| | | | | LCD801 | 1-803-502-21 | DISPLAY PANEL, LIQUID CRYSTAL | |

**(3) MECHANISM DECK SECTION-1
(MG-164N-138)**



| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---------------------------|--------|----------|--------------|--------------------|--------|
| * 101 | A-3317-459-A | SERVO BOARD, COMPLETE | | * 110 | 3-032-712-01 | LEVER (LOCK R) | |
| * 102 | X-3376-799-1 | CHASSIS ASSY, MD | | 111 | 3-919-281-01 | SPRING (CHUCKING) | |
| 103 | 3-032-714-01 | SPRING (FLOAT F), TENSION | | * 112 | X-3376-800-1 | COVER ASSY, MD | |
| 104 | 3-921-111-01 | SPRING (FL 2), TENSION | | 113 | 3-035-932-01 | WASHER, STOPPER | |
| 105 | 3-919-273-01 | DAMPER, OIL | | * 114 | X-3376-797-1 | LEVER (LE) ASSY | |
| * 106 | X-3376-796-1 | HOLDER ASSY | | 115 | 3-032-707-01 | SPRING (LEVER LE) | |
| 107 | 3-032-682-01 | SPRING (HOLDER) | | 116 | 3-925-034-01 | ROLLER (GLE) | |
| * 108 | 3-034-301-01 | CUSHION (EJ2) | | * 117 | X-3376-798-1 | ARM ASSY, CHUCKING | |
| * 109 | 3-034-302-01 | CUSHION (EJ3) | | * 118 | 3-032-711-01 | LEVER (LOCK L) | |

**(4) MECHANISM DECK SECTION-2
(MG-164N-138)**



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

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|------------------------|--------|-----------------|--------------|--------------------------------|--------|
| 151 | 2-626-617-01 | SCREW (2X8) | | 161 | X-3373-213-1 | SCREW ASSY, FEED | |
| 152 | A-3317-457-A | SENSOR BOARD, COMPLETE | | 162 | 3-703-816-32 | SCREW (M1.4X1.6), SPECIAL HEAD | |
| 153 | 1-654-693-11 | SENSOR FLEXIBLE BOARD | | 163 | 3-010-091-01 | SPRING (SL FEED) | |
| 154 | 3-919-283-01 | BRACKET (SL) | | 164 | 3-919-293-01 | SHAFT (SL) | |
| * 155 | 3-032-704-01 | BASE (SL) | | \triangle 165 | 8-583-046-05 | OPTICAL PICK-UP KMS-241B/J1RP | |
| 156 | 3-919-297-01 | RETAINER (SP) | | 166 | 3-920-537-01 | SHAFT (SL 2) | |
| 157 | A-3301-750-A | CHASSIS (OP) ASSY | | M901 | A-3301-407-A | MOTOR ASSY, SP (SPINDLE) | |
| 158 | 3-032-660-01 | BRACKET (LO) | | M902 | A-3291-190-A | MOTOR ASSY, SL (SLED) | |
| 159 | 3-032-669-01 | SPRING (RACK), TENSION | | M903 | A-3291-191-A | MOTOR ASSY, LO (LOADING) | |
| * 160 | 3-032-705-01 | BEARING (SL) | | | | | |

KEY

**SECTION 6
ELECTRICAL PARTS LIST**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- **RESISTORS**
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **SEMICONDUCTORS**
In each case, u: μ , for example:
uA. . : μ A. . uPA. . : μ PA. .
uPB. . : μ PB. . uPC. . : μ PC. .
uPD. . : μ PD. .
- **CAPACITORS**
uF: μ F
- **COILS**
uH: μ H

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

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

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

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---|--------|----------|--------------|--|--------|
| | | KEY BOARD ***** | | D814 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | |
| * | 3-023-609-01 | PLATE (LCD), LIGHT GUIDE | | D815 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | |
| * | 3-023-621-02 | SHEET (LCD) | | | | | |
| * | 3-033-696-01 | SHEET (LCD), DIFFUSION | | D815 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | |
| * | 3-033-706-01 | PLATE (LCD), GROUND | | D816 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | |
| * | 3-033-707-01 | HOLDER (LCD) | | D816 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | |
| | | < CAPACITOR > | | D816 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | |
| C802 | 1-163-809-11 | CERAMIC CHIP 0.047uF 10% | 25V | D817 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | |
| C803 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% | 16V | D817 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | |
| C804 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% | 16V | | | | |
| C805 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% | 16V | D819 | 8-719-977-00 | DIODE DTZ5.1C | |
| C806 | 1-163-809-11 | CERAMIC CHIP 0.047uF 10% | 25V | | | < ROTARY ENCODER > | |
| C811 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | EN801 | 1-475-014-11 | ENCODER, ROTARY (VOLUME/BASS/TREBLE/ BALANCE/FADER CONTROL) | |
| C812 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | | | < IC > | |
| C813 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | IC801 | 8-759-496-75 | IC uPD16432BGC-018-9EU | |
| C814 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | | | < LIQUID CRYSTAL DISPLAY > | |
| C815 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% | 50V | LCD801 | 1-803-502-21 | DISPLAY PANEL, LIQUID CRYSTAL | |
| | | < CONNECTOR > | | | | < SWITCH > | |
| CNP801 | 1-764-423-11 | PIN, CONNECTOR 12P | | LSW801 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (OFF) | |
| | | < DIODE > | | LSW801 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (OFF) | |
| D802 | 8-719-056-83 | DIODE UDZ-TE-17-6.8B | | LSW802 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (SOURCE) | |
| D803 | 8-719-056-83 | DIODE UDZ-TE-17-6.8B | | LSW802 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (SOURCE) | |
| D804 | 8-719-056-83 | DIODE UDZ-TE-17-6.8B | | LSW803 | 1-771-290-11 | SWITCH, SLIDE (- ◀◀◀ ◀◀ ◀▶▶ ▶▶▶ +: SEEK/AMS) | |
| D806 | 8-719-977-00 | DIODE DTZ5.1C | | LSW804 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (DSPL) (C5960R/C5970R) | |
| D807 | 8-719-977-00 | DIODE DTZ5.1C | | LSW804 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (DSPL) (C5970R) | |
| D808 | 8-719-978-69 | DIODE DTZ-TT11-16B | | LSW805 | 1-762-937-11 | SWITCH, ROTARY (D-BASS) | |
| D811 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | | LSW806 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (SOUND) | |
| D811 | 8-719-033-14 | LED CL-170PG-CD-T(GREEN) (ILLUMINATION) | | | | | |
| D812 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | | | | | |
| D812 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | | | | | |
| D813 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | | | | | |
| D813 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) (ILLUMINATION) | | | | | |
| D814 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) (ILLUMINATION) | | | | | |

KEY

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|--------------------------------------|-----------------------------|----------|--------------|--------------------------------------|--------------------------|
| LSW806 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (SOUND) | LSW821 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (3) |
| LSW807 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (MODE) | LSW821 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (3) |
| LSW807 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (MODE) | | | < PILOT LAMP > | |
| LSW808 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (SHIFT) | PL801 | 1-517-630-31 | LAMP, PILOT (LCD BACK LIGHT) | |
| LSW808 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (SHIFT) | PL802 | 1-517-630-31 | LAMP, PILOT (LCD BACK LIGHT) | |
| LSW809 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (1) | | | < TRANSISTOR > | |
| LSW809 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (1) | Q805 | 8-729-106-60 | TRANSISTOR 2SB1115A-YQ | |
| | | | | Q806 | 8-729-026-53 | TRANSISTOR 2SA1576A-T106-QR | |
| | | | | Q807 | 8-729-905-35 | TRANSISTOR 2SC4081T106R | |
| LSW810 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (2) | | | < RESISTOR > | |
| LSW810 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (2) | R801 | 1-208-431-11 | RES, CHIP 560 | 2% 1/10W |
| LSW811 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (▲) | R802 | 1-216-647-11 | METAL CHIP 680 | 0.5% 1/10W |
| LSW811 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (▲) | R803 | 1-216-647-11 | METAL CHIP 680 | 0.5% 1/10W |
| | | | | R804 | 1-216-651-11 | METAL CHIP 1K | 0.5% 1/10W |
| | | | | R805 | 1-216-655-11 | METAL CHIP 1.5K | 0.5% 1/10W |
| LSW812 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (AF/TA) (C5960R/C5970R) | R806 | 1-216-655-11 | METAL CHIP 1.5K | 0.5% 1/10W |
| | | | | R807 | 1-216-659-11 | METAL CHIP 2.2K | 0.5% 1/10W |
| LSW812 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (AF/TA) (C5970R) | R808 | 1-216-663-11 | METAL CHIP 3.3K | 0.5% 1/10W |
| | | | | R809 | 1-216-667-11 | METAL CHIP 4.7K | 0.5% 1/10W |
| LSW812 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (DSPL) (C5970) | R811 | 1-208-431-11 | RES, CHIP 560 | 2% 1/10W |
| | | | | | | | |
| LSW813 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (LIST, PTY) (C5960R/C5970R) | R812 | 1-216-647-11 | METAL CHIP 680 | 0.5% 1/10W |
| | | | | R813 | 1-216-647-11 | METAL CHIP 680 | 0.5% 1/10W |
| LSW813 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (LIST, PTY) (C5970R) | R814 | 1-208-427-11 | RES, CHIP 390 | 2% 1/10W |
| | | | | R815 | 1-208-441-11 | RES, CHIP 1.5K | 2% 1/10W |
| LSW813 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (LIST) (C5970R) | R816 | 1-216-655-11 | METAL CHIP 1.5K | 0.5% 1/10W |
| | | | | | | | |
| | | | | R817 | 1-208-445-11 | RES, CHIP 2.2K | 2% 1/10W |
| LSW814 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (10) | R818 | 1-208-449-11 | RES, CHIP 3.3K | 2% 1/10W |
| | | | | R819 | 1-208-453-11 | RES, CHIP 4.7K | 2% 1/10W |
| LSW814 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (10) | R820 | 1-208-458-11 | RES, CHIP 6.8K | 2% 1/10W |
| | | | | R823 | 1-216-023-00 | RES, CHIP 82 | 5% 1/10W (C5970) |
| LSW815 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (9) | | | | |
| | | | | R823 | 1-216-028-00 | METAL CHIP 130 | 5% 1/10W (C5960R/C5970R) |
| LSW815 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (9) | | | | |
| | | | | R827 | 1-216-023-00 | RES, CHIP 82 | 5% 1/10W (C5970) |
| LSW816 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (8) | | | | |
| | | | | R827 | 1-216-028-00 | METAL CHIP 130 | 5% 1/10W (C5960R/C5970R) |
| LSW816 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (8) | | | | |
| | | | | R829 | 1-216-023-00 | RES, CHIP 82 | 5% 1/10W (C5970) |
| LSW817 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (7) | | | | |
| | | | | R829 | 1-216-028-00 | METAL CHIP 130 | 5% 1/10W (C5960R/C5970R) |
| LSW817 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (7) | | | | |
| | | | | | | | |
| LSW818 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (6) | R831 | 1-216-023-00 | RES, CHIP 82 | 5% 1/10W (C5970) |
| | | | | | | | |
| LSW818 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (6) | R831 | 1-216-028-00 | METAL CHIP 130 | 5% 1/10W (C5960R/C5970R) |
| | | | | | | | |
| | | | | R833 | 1-216-028-00 | METAL CHIP 130 | 5% 1/10W (C5960R/C5970R) |
| LSW819 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (5) | | | | |
| | | | | R833 | 1-216-034-00 | RES, CHIP 240 | 5% 1/10W (C5970) |
| LSW819 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (5) | | | | |
| | | | | R835 | 1-216-047-00 | RES, CHIP 820 | 5% 1/10W (C5970) |
| LSW820 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (4) | | | | |
| | | | | | | | |
| LSW820 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (4) | R835 | 1-216-048-00 | METAL CHIP 910 | 5% 1/10W (C5960R/C5970R) |

KEY

MAIN

| Ref. No. | Part No. | Description | Remark |
|-------------------------------|--------------|----------------------|---------------------------------|
| R838 | 1-216-023-00 | RES, CHIP | 82 5% 1/10W (C5970) |
| R838 | 1-216-028-00 | METAL CHIP | 130 5% 1/10W (C5960R/C5970R) |
| R840 | 1-216-041-00 | METAL CHIP | 470 5% 1/10W |
| R841 | 1-216-025-00 | RES, CHIP | 100 5% 1/10W |
| R842 | 1-216-047-00 | RES, CHIP | 820 5% 1/10W (C5970) |
| R842 | 1-216-048-00 | METAL CHIP | 910 5% 1/10W (C5960R/C5970R) |
| R845 | 1-216-699-11 | METAL CHIP | 100K 0.5% 1/10W |
| R846 | 1-216-651-11 | METAL CHIP | 1K 0.5% 1/10W |
| R847 | 1-216-651-11 | METAL CHIP | 1K 0.5% 1/10W |
| R849 | 1-216-667-11 | METAL CHIP | 4.7K 0.5% 1/10W |
| R850 | 1-216-667-11 | METAL CHIP | 4.7K 0.5% 1/10W |
| R852 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W |
| R853 | 1-216-069-00 | METAL CHIP | 6.8K 5% 1/10W |
| R854 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W |
| R856 | 1-216-041-00 | METAL CHIP | 470 5% 1/10W |
| R857 | 1-216-295-00 | SHORT | 0 (C5970) |
| R861 | 1-216-041-00 | METAL CHIP | 470 5% 1/10W |
| R862 | 1-216-659-11 | METAL CHIP | 2.2K 0.5% 1/10W |
| R863 | 1-208-445-11 | RES, CHIP | 2.2K 10% 1/10W |
| R865 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W |
| R866 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W |
| R867 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W |
| < CONPOSITION CIRCUIT BLOCK > | | | |
| RB802 | 1-233-810-21 | RES, NETWORK | 100K (3216) |
| RB803 | 1-233-414-11 | RES, CHIP NETWORK | 4.7K (3216) |
| ***** | | | |
| * | A-3294-572-A | MAIN BOARD, COMPLETE | (C5970: US, Canadian) |
| * | A-3294-654-A | MAIN BOARD, COMPLETE | (C5970: E) |
| * | A-3294-670-A | MAIN BOARD, COMPLETE | (C5970R: AEP, UK) |
| * | A-3294-680-A | MAIN BOARD, COMPLETE | (C5970R: German) |
| * | A-3294-681-A | MAIN BOARD, COMPLETE | (C5960R) |
| ***** | | | |
| * | 3-011-078-01 | BRACKET (POWER IC) | |
| * | 3-022-317-01 | BRACKET (AMP) | |
| * | 3-023-604-01 | HEAT SINK | (C5970/C5970R) |
| * | 3-023-604-11 | HEAT SINK | (C5960R) |
| | 7-685-794-09 | SCREW +PTT | 2.6X10 (S) |
| < BUZZER > | | | |
| BZ1 | 1-504-920-11 | BUZZER | |
| < CAPACITOR/RESISTOR > | | | |
| C1 | 1-163-235-11 | CERAMIC CHIP | 22PF 5% 50V |
| C2 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C3 | 1-162-587-11 | CERAMIC CHIP | 0.039uF 10% 25V (C5970) |
| C3 | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V (C5960R/C5970R) |
| C4 | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10% 25V (C5970) |
| C4 | 1-163-989-11 | CERAMIC CHIP | 0.033uF 10% 25V (C5960R/C5970R) |

| Ref. No. | Part No. | Description | Remark |
|----------|--------------|--------------|--------------------------------------|
| C5 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V (C5970: E) |
| C5 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V (C5970: US, Canadian) |
| C6 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V (C5970: E) |
| C6 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V (C5970: US, Canadian) |
| C7 | 1-163-137-00 | CERAMIC CHIP | 680PF 5% 50V |
| C8 | 1-163-137-00 | CERAMIC CHIP | 680PF 5% 50V |
| C10 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| C11 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C12 | 1-163-137-00 | CERAMIC CHIP | 680PF 5% 50V |
| C13 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C14 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C15 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C16 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C17 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C18 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C19 | 1-163-275-11 | CERAMIC CHIP | 0.001uF 5% 50V |
| C20 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C21 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V |
| C22 | 1-163-019-00 | CERAMIC CHIP | 0.0068uF 10% 50V |
| C23 | 1-164-344-11 | CERAMIC CHIP | 0.068uF 10% 25V |
| C24 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V (C5960R/C5970R) |
| C24 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V (C5970) |
| C25 | 1-126-794-11 | ELECT | 4.7uF 20% 25V |
| C26 | 1-126-382-11 | ELECT | 100uF 20% 16V |
| C27 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C28 | 1-126-382-11 | ELECT | 100uF 20% 16V |
| C29 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C30 | 1-126-382-11 | ELECT | 100uF 20% 16V |
| C31 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C35 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C39 | 1-163-015-11 | CERAMIC CHIP | 0.0033uF 10% 50V |
| C40 | 1-126-382-11 | ELECT | 100uF 20% 16V |
| C41 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C42 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C43 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C44 | 1-163-275-11 | CERAMIC CHIP | 0.001uF 5% 50V (C5960R/C5970R) |
| C45 | 1-163-275-11 | CERAMIC CHIP | 0.001uF 5% 50V (C5960R/C5970R) |
| C46 | 1-163-275-11 | CERAMIC CHIP | 0.001uF 5% 50V (C5960R/C5970R) |
| C47 | 1-163-227-11 | CERAMIC CHIP | 10PF 0.5PF 50V (C5960R/C5970R) |
| C48 | 1-107-823-11 | CERAMIC CHIP | 0.47uF 10% 16V (C5960R/C5970R) |
| C49 | 1-163-133-11 | CERAMIC CHIP | 470PF 5% 50V (C5960R/C5970R) |
| C50 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V (C5960R/C5970R) |
| C51 | 1-163-133-00 | CERAMIC CHIP | 470PF 5% 50V (C5960R/C5970R) |
| C52 | 1-163-229-11 | CERAMIC CHIP | 12PF 5% 50V (C5960R/C5970R) |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|--------------|-------------------------------------|----------|--------------|--------------|--------------------------------|
| C53 | 1-163-229-11 | CERAMIC CHIP | 12PF 5% 50V (C5960R/C5970R) | C318 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V (C5970/C5970R) |
| C54 | 1-163-145-00 | CERAMIC CHIP | 0.0015uF 5% 50V (C5960R/C5970R) | C319 | 1-164-489-11 | CERAMIC CHIP | 0.22uF 10% 16V |
| C57 | 1-164-695-11 | CERAMIC CHIP | 0.0022uF 5% 50V (C5960R/C5970R) | C320 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V |
| C58 | 1-163-135-00 | CERAMIC CHIP | 560PF 5% 50V (C5960R/C5970R) | C322 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C59 | 1-164-505-11 | CERAMIC CHIP | 2.2uF 16V (C5960R/C5970R) | C323 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C60 | 1-163-263-11 | CERAMIC CHIP | 330PF 5% 50V (C5960R/C5970R) | C324 | 1-164-489-11 | CERAMIC CHIP | 0.22uF 10% 16V |
| C61 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V (C5960R/C5970R) | C325 | 1-164-489-11 | CERAMIC CHIP | 0.22uF 10% 16V |
| C63 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V (C5960R/C5970R) | C400 | 1-115-871-11 | ELECT | 1uF 20% 50V |
| C65 | 1-163-809-11 | CERAMIC CHIP | 0.047uF 10% 25V (C5960R/C5970R) | C401 | 1-115-871-11 | ELECT | 1uF 20% 50V |
| C66 | 1-126-786-11 | ELECT | 47uF 20% 16V | C402 | 1-109-982-11 | CERAMIC CHIP | 1uF 10% 10V |
| C67 | 1-126-382-11 | ELECT | 100uF 20% 16V | C414 | 1-126-794-11 | ELECT | 4.7uF 20% 25V |
| C68 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V | C415 | 1-126-794-11 | ELECT | 4.7uF 20% 25V |
| C69 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V | C416 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C70 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V | C417 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C71 | 1-126-514-11 | ELECT | 22uF 20% 16V | C418 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V (C5970/C5970R) |
| C74 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V | C419 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C79 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V (C5960R/C5970R) | C420 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V |
| C81 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V (C5960R/C5970R) | C424 | 1-164-489-11 | CERAMIC CHIP | 0.22uF 10% 16V |
| C82 | 1-163-137-00 | CERAMIC CHIP | 680PF 5% 50V (C5960R/C5970R) | C425 | 1-164-489-11 | CERAMIC CHIP | 0.22uF 10% 16V |
| C90 | 1-164-346-11 | CERAMIC CHIP | 1uF 16V (C5960R/C5970R) | C501 | 1-104-329-11 | CERAMIC CHIP | 0.1uF 10% 50V |
| C97 | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10% 50V | C502 | 1-115-334-11 | FILM | 0.47uF 5% 50V |
| C100 | 1-109-982-11 | CERAMIC CHIP | 1uF 10% 10V | C503 | 1-126-786-11 | ELECT | 47uF 20% 16V |
| C101 | 1-109-982-11 | CERAMIC CHIP | 1uF 10% 10V | C504 | 1-104-329-11 | CERAMIC CHIP | 0.1uF 10% 50V |
| C107 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V (C5960R/C5970R) | C505 | 1-104-329-11 | CERAMIC CHIP | 0.1uF 10% 50V |
| C108 | 1-163-013-11 | CERAMIC CHIP | 0.0022uF 10% 50V (C5960R/C5970R) | C506 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C109 | 1-163-013-11 | CERAMIC CHIP | 0.0022uF 10% 50V (C5960R/C5970R) | C507 | 1-126-016-11 | ELECT | 4700uF 20% 16V |
| C222 | 1-126-791-11 | ELECT | 10uF 20% 16V | C508 | 1-104-329-11 | CERAMIC CHIP | 0.1uF 10% 50V |
| C223 | 1-126-791-11 | ELECT | 10uF 20% 16V | C510 | 1-126-786-11 | ELECT | 47uF 20% 16V |
| C230 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V | C601 | 1-126-794-11 | ELECT | 4.7uF 20% 25V |
| C250 | 1-126-767-11 | ELECT | 1000uF 20% 16V | C700 | 1-164-346-11 | CERAMIC CHIP | 1uF 16V |
| C251 | 1-124-635-00 | ELECT | 220uF 20% 6.3V | C701 | 1-126-794-11 | ELECT | 4.7uF 20% 25V |
| C252 | 1-163-125-00 | CERAMIC CHIP | 220PF 5% 50V | C702 | 1-126-514-11 | ELECT | 22uF 20% 16V |
| C253 | 1-126-382-11 | ELECT | 100uF 20% 16V | C703 | 1-163-133-00 | CERAMIC CHIP | 470PF 5% 50V |
| C256 | 1-126-791-11 | ELECT | 10uF 20% 16V | C704 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C257 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V | C705 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C300 | 1-115-871-11 | ELECT | 1uF 20% 50V | C706 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C301 | 1-115-871-11 | ELECT | 1uF 20% 50V | C707 | 1-163-021-11 | CERAMIC CHIP | 0.01uF 10% 50V |
| C302 | 1-109-982-11 | CERAMIC CHIP | 1uF 10% 10V | C708 | 1-163-235-11 | CERAMIC CHIP | 22PF 5% 50V |
| C303 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V | C709 | 1-163-237-11 | CERAMIC CHIP | 27PF 5% 50V |
| C314 | 1-126-794-11 | ELECT | 4.7uF 20% 25V | C710 | 1-164-346-11 | CERAMIC CHIP | 1uF 16V |
| C315 | 1-126-794-11 | ELECT | 4.7uF 20% 25V | C711 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| C316 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V | C712 | 1-126-382-11 | ELECT | 100uF 20% 16V |
| C317 | 1-163-251-11 | CERAMIC CHIP | 100PF 5% 50V | C800 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C801 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C802 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C803 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C804 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C805 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C806 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| | | | | C807 | 1-164-505-11 | CERAMIC CHIP | 2.2uF 16V |
| | | | | C808 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| | | | | C900 | 1-126-791-11 | ELECT | 10uF 20% 16V |
| | | | | C901 | 1-163-133-00 | CERAMIC CHIP | 470PF 5% 50V |
| | | | | C902 | 1-163-133-00 | CERAMIC CHIP | 470PF 5% 50V |
| | | | | C903 | 1-164-004-11 | CERAMIC CHIP | 0.1uF 10% 25V |
| | | | | C904 | 1-124-635-00 | ELECT | 220uF 20% 6.3V |

MAIN

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|--------------------|--------------|--|------------------------|------------------|--------------|--|--------|
| C905 | 1-125-710-11 | DOUBLE LAYER 0.1F | 5.5V | D702 | 8-719-914-44 | DIODE DAP202K | |
| C906 | 1-164-489-11 | CERAMIC CHIP 0.22uF | 10% 16V | D703 | 8-719-988-61 | DIODE 1SS355TE-17 | |
| C907 | 1-164-489-11 | CERAMIC CHIP 0.22uF | 10% 16V | D800 | 8-719-053-18 | DIODE 1SR154-400TE-25 | |
| C908 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V | D802 | 8-719-988-61 | DIODE 1SS355TE-17 | |
| C920 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V | D801 | 8-719-053-18 | DIODE 1SR154-400TE-25 | |
| C990 | 1-164-346-11 | CERAMIC CHIP 1uF | 16V (C5960R/C5970R) | D803 | 8-719-053-18 | DIODE 1SR154-400TE-25 | |
| C991 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V | D804 | 8-719-053-18 | DIODE 1SR154-400TE-25 | |
| C992 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V | D900 | 8-719-988-61 | DIODE 1SS355TE-17 | |
| C999 | 1-163-133-00 | CERAMIC CHIP 470PF | 5% 50V | D901 | 8-719-056-88 | DIODE UDZ-TE-17-11B | |
| C1000 | 1-164-004-11 | CERAMIC CHIP 0.1uF | 10% 25V | D902 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| < CONNECTOR > | | | | D903 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CN200 | 1-764-617-12 | PIN, CONNECTOR (PC BOARD) 30P | | D904 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CN900 | 1-764-422-11 | PLUG, CONNECTOR 12P | | D905 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CNJ600 | 1-580-907-31 | PLUG, CONNECTOR (BUS CONTROL IN) | | D907 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| < JACK/CONNECTOR > | | | | D908 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CNP300 | 1-774-699-12 | JACK, PIN 4P (BUS AUDIO IN, AUDIO OUT) (C5960R) | | D909 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CNP300 | 1-774-700-11 | JACK, PIN 6P (BUS AUDIO IN, LINE OUT FRONT, LINE OUT REAR) (C5970/C5970R) | | D910 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| CNP500 | 1-774-701-11 | PIN, CONNECTOR 16P | | D911 | 8-719-158-49 | DIODE RD12SB2 | |
| < DIODE > | | | | D912 | 8-719-914-44 | DIODE DAP202K | |
| D1 | 8-719-158-15 | DIODE RD5.6S-B | | D913 | 8-719-056-85 | DIODE UDZ-TE-17-8.2B | |
| D3 | 8-719-981-59 | DIODE FC805 | | D914 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| D5 | 8-719-422-12 | DIODE MA8039 (C5960R/C5970R) | | D915 | 8-719-056-84 | DIODE UDZ-TE-17-7.5B | |
| D6 | 8-719-987-69 | DIODE DAN217 (C5960R/C5970R) | | D916 | 8-719-988-61 | DIODE 1SS355TE-17 | |
| D7 | 8-719-056-83 | DIODE UDZ-TE-17-6.8B (C5960R/C5970R) | | < FUSE > | | | |
| D8 | 8-719-988-61 | DIODE 1SS355TE-17 (C5960R/C5970R) | | F1 | 1-532-877-11 | FUSE (BLADE TYPE) (AUTO FUSE) 10A | |
| D200 | 8-719-066-98 | DIODE RB051L-40TE25 | | < FERRITE BEAD > | | | |
| D202 | 8-719-158-49 | DIODE RD12SB2 | | FB1 | 1-414-233-22 | INDUCTOR CHIP 0uH (C5960R/C5970R) | |
| D301 | 8-719-914-42 | DIODE DA204K | | FB2 | 1-414-233-22 | INDUCTOR CHIP 0uH (C5960R/C5970R) | |
| D500 | 8-719-988-61 | DIODE 1SS355TE-17 | | < IC > | | | |
| D501 | 8-719-056-83 | DIODE UDZ-TE-17-6.8B | | IC100 | 8-759-586-54 | IC TDA7427AD | |
| D502 | 8-719-052-59 | DIODE 1N5404TU-15 | | IC101 | 8-759-924-46 | IC BA4560F (C5960R/C5970R) | |
| D503 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC102 | 8-759-492-59 | IC SAA6588T-118 (C5960R/C5970R) | |
| D504 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC250 | 8-759-337-67 | IC NJM2360AM (TE2) | |
| D505 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC300 | 8-759-572-10 | IC TDA7462D013TR | |
| D506 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC500 | 8-759-572-08 | IC TDA7385 | |
| D507 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC600 | 8-759-449-89 | IC BA8270F-E2 | |
| D508 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC700 | 8-759-581-72 | IC MB90574PFV-G-187-BND (C5970) | |
| D509 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC700 | 8-759-581-74 | IC MB90574PFV-G-188-BND (C5960R/C5970R) | |
| D510 | 8-719-053-18 | DIODE 1SR154-400TE-25 | | IC800 | 8-759-347-50 | IC BA3918-V3 | |
| D511 | 8-719-988-61 | DIODE 1SS355TE-17 (C5970/C5970R) | | IC801 | 8-759-363-81 | IC XC61AN4002PR | |
| D520 | 8-719-056-93 | DIODE UDZ-TE-17-18B (C5970/C5970R) | | IC802 | 8-759-495-76 | IC RN5VD33AA-TL | |
| D521 | 8-719-978-69 | DIODE DTZ-TT11-16B | | < JACK > | | | |
| D522 | 8-719-158-49 | DIODE RD12SB2 | | J1 | 1-785-503-11 | JACK (ANT) (FM/AM ANTENNA) | |
| D600 | 8-719-056-93 | DIODE UDZ-TE-17-18B | | J900 | 1-566-822-41 | JACK (REMOTE IN) | |
| D601 | 8-719-056-93 | DIODE UDZ-TE-17-18B | | < COIL/SHORT > | | | |
| D602 | 8-719-017-62 | DIODE MA8068-L-TX | | L1 | 1-412-058-11 | INDUCTOR CHIP 10uH | |
| D603 | 8-719-978-69 | DIODE DTZ-TT11-16B | | L2 | 1-216-295-00 | SHORT 0 (C5970) | |
| D604 | 8-719-017-62 | DIODE MA8068-L-TX | | L2 | 1-410-981-31 | INDUCTOR CHIP 0.1uH (C5960R/5970R) | |
| D606 | 8-719-914-43 | DIODE DAN202K | | L3 | 1-412-058-11 | INDUCTOR CHIP 10uH | |
| D607 | 8-719-988-61 | DIODE 1SS355TE-17 | | L200 | 1-412-058-11 | INDUCTOR CHIP 10uH | |
| D700 | 8-719-914-43 | DIODE DAN202K | | L240 | 1-412-945-11 | INDUCTOR 3.3uH | |
| D701 | 8-719-422-12 | DIODE MA8039 | | | | | |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---|-----------------------------|----------|--------------|-----------------|-----------------------------|
| L250 | 1-412-533-21 | INDUCTOR 47uH | | R4 | 1-216-081-00 | METAL CHIP 22K | 5% 1/10W |
| L251 | 1-412-537-31 | INDUCTOR 100uH | | R5 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W |
| L252 | 1-412-533-21 | INDUCTOR 47uH | | R6 | 1-216-037-00 | METAL CHIP 330 | 5% 1/10W |
| L500 | 1-416-712-21 | COIL, CHOKE 0.5A | | R7 | 1-216-073-00 | METAL CHIP 10K | 5% 1/10W |
| L700 | 1-412-058-11 | INDUCTOR CHIP 10uH | | R8 | 1-216-081-00 | METAL CHIP 22K | 5% 1/10W (C5960R/C5970R) |
| L800 | 1-469-086-21 | INDUCTOR 22uH | | R10 | 1-216-073-00 | METAL CHIP 10K | 5% 1/10W |
| | | < TRANSISTOR > | | R11 | 1-216-083-00 | METAL CHIP 27K | 5% 1/10W |
| Q1 | 8-729-230-49 | TRANSISTOR 2SC2712-YG (C5970) | | R12 | 1-216-077-00 | METAL CHIP 15K | 5% 1/10W |
| Q4 | 8-729-620-06 | TRANSISTOR 2SC3052-EF | | R13 | 1-216-295-00 | SHORT 0 | (C5960R/C5970R) |
| Q5 | 8-729-900-53 | TRANSISTOR DTC114EK (C5960R/C5970R) | | R14 | 1-216-097-00 | RES,CHIP 100K | 5% 1/10W |
| Q6 | 8-729-920-85 | TRANSISTOR 2SD1664-QR | | R15 | 1-216-081-00 | METAL CHIP 22K | 5% 1/10W (C5970) |
| Q50 | 8-729-230-49 | TRANSISTOR 2SC2712-YG (C5960R/C5970R) | | R16 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W |
| Q51 | 8-729-921-25 | TRANSISTOR FMC2 (C5960R/C5970R) | | R17 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W |
| Q101 | 8-729-920-21 | TRANSISTOR DTC314TKH04 (C5960R/C5970R) | | R18 | 1-216-073-00 | METAL CHIP 10K | 5% 1/10W |
| Q102 | 8-729-920-21 | TRANSISTOR DTC314TKH04 (C5960R/C5970R) | | R19 | 1-216-113-00 | METAL CHIP 470K | 5% 1/10W |
| Q103 | 8-729-921-25 | TRANSISTOR FMC2 (C5960R/C5970R) | | R22 | 1-216-057-00 | METAL CHIP 2.2K | 5% 1/10W |
| Q250 | 8-729-903-95 | TRANSISTOR 2SB1188-T101-Q | | R24 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W |
| Q251 | 8-729-900-53 | TRANSISTOR DTC114EK | | R25 | 1-216-097-00 | RES,CHIP 100K | 5% 1/10W (C5970) |
| Q254 | 8-729-807-12 | TRANSISTOR 2SD1802-S | | R26 | 1-216-089-00 | RES,CHIP 47K | 5% 1/10W (C5970) |
| Q255 | 8-729-921-25 | TRANSISTOR FMC2 | | R27 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W (C5970) |
| Q300 | 8-729-920-21 | TRANSISTOR DTC314TKH04 (C5970/C5970R) | | R28 | 1-216-057-00 | METAL CHIP 2.2K | 5% 1/10W (C5960R/C5970R) |
| Q301 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R29 | 1-216-057-00 | METAL CHIP 2.2K | 5% 1/10W (C5960R/C5970R) |
| Q302 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R30 | 1-216-073-00 | METAL CHIP 10K | 5% 1/10W (C5960R/C5970R) |
| Q303 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R31 | 1-216-073-00 | METAL CHIP 10K | 5% 1/10W (C5960R/C5970R) |
| Q400 | 8-729-920-21 | TRANSISTOR DTC314TKH04 (C5970/C5970R) | | R32 | 1-216-097-00 | RES,CHIP 100K | 5% 1/10W (C5960R/C5970R) |
| Q401 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R33 | 1-216-065-00 | RES,CHIP 4.7K | 5% 1/10W (C5960R/C5970R) |
| Q402 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R34 | 1-216-061-00 | METAL CHIP 3.3K | 5% 1/10W (C5960R/C5970R) |
| Q403 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R35 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W (C5960R/C5970R) |
| Q500 | 8-729-620-06 | TRANSISTOR 2SC3052-EF (C5970/C5970R) | | R36 | 1-216-121-00 | RES,CHIP 1M | 5% 1/10W (C5960R/C5970R) |
| Q600 | 8-729-027-23 | TRANSISTOR DTA114EKA-T146 | | R37 | 1-216-057-00 | METAL CHIP 2.2K | 5% 1/10W (C5960R/C5970R) |
| Q601 | 8-729-900-53 | TRANSISTOR DTC114EK | | R39 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W |
| Q603 | 8-729-920-21 | TRANSISTOR DTC314TKH04 | | R40 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W |
| Q701 | 8-729-900-53 | TRANSISTOR DTC114EK | | R41 | 1-216-041-00 | METAL CHIP 470 | 5% 1/10W |
| Q702 | 8-729-921-25 | TRANSISTOR FMC2 | | R42 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W |
| Q703 | 8-729-921-25 | TRANSISTOR FMC2 | | R45 | 1-216-295-00 | SHORT 0 | |
| Q704 | 8-729-026-49 | TRANSISTOR 2SA1037AK-T146-R | | R50 | 1-216-065-00 | RES,CHIP 4.7K | 5% 1/10W (C5960R/C5970R) |
| Q900 | 8-729-620-06 | TRANSISTOR 2SC3052-EF | | R51 | 1-216-113-00 | METAL CHIP 470K | 5% 1/10W (C5960R/C5970R) |
| Q901 | 8-729-907-46 | TRANSISTOR IMZ1 | | R52 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W (C5960R/C5970R) |
| Q903 | 8-729-026-68 | TRANSISTOR 2SD2525 (TP) | | R53 | 1-216-077-00 | METAL CHIP 15K | 5% 1/10W (C5960R/C5970R) |
| Q904 | 8-729-026-68 | TRANSISTOR 2SD2525 (TP) | | R55 | 1-216-041-00 | METAL CHIP 470 | 5% 1/10W (C5960R/C5970R) |
| Q905 | 8-729-924-73 | TRANSISTOR FMA9 | | | | | |
| Q906 | 8-729-921-25 | TRANSISTOR FMC2 | | | | | |
| | | < RESISTOR > | | | | | |
| R1 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W (C5960R/C5970R) | R51 | 1-216-113-00 | METAL CHIP 470K | 5% 1/10W (C5960R/C5970R) |
| R1 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W (C5970) | R52 | 1-216-049-11 | RES,CHIP 1K | 5% 1/10W (C5960R/C5970R) |
| R2 | 1-216-025-00 | RES,CHIP 100 | 5% 1/10W | R53 | 1-216-077-00 | METAL CHIP 15K | 5% 1/10W (C5960R/C5970R) |
| R3 | 1-216-073-11 | METAL CHIP 10K | 5% 1/10W (C5970) | R55 | 1-216-041-00 | METAL CHIP 470 | 5% 1/10W (C5960R/C5970R) |
| R3 | 1-216-069-11 | METAL CHIP 6.8K | 5% 1/10W (C5960R/C5970R) | | | | |

MAIN

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------|----------------------------------|----------|--------------|-------------|--|
| R56 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W (C5960R/C5970R) | R414 | 1-216-075-00 | METAL CHIP | 12K 5% 1/10W |
| R57 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W (C5960R/C5970R) | R500 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W |
| R59 | 1-216-295-00 | SHORT | 0 (C5960R/C5970R) | R501 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W |
| R62 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W (C5960R/C5970R) | R502 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| R64 | 1-216-295-00 | SHORT | 0 | R503 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W (C5970/C5970R) |
| R65 | 1-216-295-00 | SHORT | 0 (C5960R/C5970R) | R504 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W (C5970/C5970R) |
| R66 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W (C5960R/C5970R) | R505 | 1-216-085-00 | METAL CHIP | 33K 5% 1/10W |
| R72 | 1-216-295-00 | SHORT | 0 | R506 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| R80 | 1-216-001-00 | METAL CHIP | 10 5% 1/10W (C5960R/C5970R) | R600 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R103 | 1-216-061-11 | METAL CHIP | 3.3K 5% 1/10W (C5970) | R601 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| R103 | 1-216-063-11 | RES,CHIP | 3.9K 5% 1/10W (C5960R/C5970R) | R602 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W |
| R104 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W (C5960R/C5970R) | R603 | 1-216-150-00 | RES,CHIP | 10 5% 1/8W |
| R104 | 1-216-085-00 | METAL CHIP | 33K 5% 1/10W (C5970) | R700 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W |
| R105 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W (C5960R/C5970R) | R701 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W |
| R105 | 1-216-085-00 | METAL CHIP | 33K 5% 1/10W (C5970) | R702 | 1-216-101-00 | METAL CHIP | 150K 5% 1/10W |
| R106 | 1-216-061-00 | METAL CHIP | 3.3K 5% 1/10W (C5970) | R703 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W |
| R106 | 1-216-063-11 | RES,CHIP | 3.9K 5% 1/10W (C5960R/C5970R) | R704 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R201 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W | R705 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R202 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W | R709 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W |
| R250 | 1-219-986-11 | RES,CHIP | 0.2 1% 1/4W | R710 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R255 | 1-216-663-11 | METAL CHIP | 3.3K 0.5% 1/10W | R711 | 1-216-295-00 | SHORT | 0 |
| R256 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W | R712 | 1-216-037-00 | METAL CHIP | 330 5% 1/10W |
| R257 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W | R713 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W |
| R259 | 1-216-190-00 | RES,CHIP | 470 5% 1/8W | R717 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W |
| R260 | 1-216-675-11 | METAL CHIP | 10K 0.5% 1/10W | R719 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R304 | 1-216-033-00 | METAL CHIP | 220 5% 1/10W | R720 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R305 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W | R721 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W |
| R306 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W (C5970/C5970R) | R726 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W |
| R307 | 1-216-033-00 | METAL CHIP | 220 5% 1/10W (C5970/C5970R) | R727 | 1-216-049-11 | RES,CHIP | 1K 5% 1/10W |
| R308 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | R730 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R309 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | R731 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R310 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | R732 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R311 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | R734 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R312 | 1-216-075-00 | METAL CHIP | 12K 5% 1/10W | R738 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R313 | 1-216-069-11 | RES,CHIP | 6.8K 5% 1/10W | R741 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R405 | 1-216-033-00 | METAL CHIP | 220 5% 1/10W | R745 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R406 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W | R748 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R407 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W (C5970/C5970R) | R749 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R408 | 1-216-033-00 | METAL CHIP | 220 5% 1/10W (C5970/C5970R) | R751 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R409 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | R754 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R410 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | R759 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R411 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | R760 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R412 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | R763 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| R413 | 1-216-069-11 | RES,CHIP | 6.8K 5% 1/10W | R764 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W |
| | | | | R771 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W |
| | | | | R772 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W |
| | | | | R773 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W |
| | | | | R774 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W |
| | | | | R777 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W |
| | | | | R780 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W (C5970/C5970R: AEP, UK) |
| | | | | R781 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W (C5960R/C5970R: German) |
| | | | | R782 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W (C5970: US, Canadian) |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|--|---------------------------------|---|--------------|---|--------|
| R783 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W (C5970: E) | | | < TUNER > | |
| R800 | 1-216-113-00 | METAL CHIP | 470K 5% 1/10W | TU1 | A-3220-693-A | TUNER UNIT TUX-011(E) (FM/AM) (C5970) | |
| R801 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | TU1 | 1-693-440-11 | TUNER UNIT FAE342-E01 (FM/MW/LW) (C5960R/C5970R) | |
| R897 | 1-216-001-00 | METAL CHIP | 10 5% 1/10W (C5960R/C5970R) | | | < VIBRATOR > | |
| R900 | 1-216-222-00 | RES,CHIP | 10K 5% 1/8W | | | | |
| R901 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | X1 | 1-781-258-11 | VIBRATOR, CRYSTAL (10.25MHz) | |
| R902 | 1-216-089-00 | RES,CHIP | 47K 5% 1/10W | X2 | 1-579-242-11 | VIBRATOR, CRYSTAL (4.332MHz) (C5960R/C5970R) | |
| R903 | 1-216-675-11 | METAL CHIP | 10K 0.5% 1/10W | X700 | 1-767-833-21 | VIBRATOR, CERAMIC (3.68MHz) | |
| R904 | 1-216-675-11 | METAL CHIP | 10K 0.5% 1/10W | X701 | 1-579-886-21 | VIBRATOR, CRYSTAL (32.768kHz) | |
| R905 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W | ***** | | | |
| R906 | 1-216-067-00 | METAL CHIP | 5.6K 5% 1/10W | | A-3317-457-A | SENSOR BOARD, COMPLETE ***** | |
| R907 | 1-216-037-00 | METAL CHIP | 330 5% 1/10W | For the parts on the SENSOR board, replace the entire mounted board. ***** | | | |
| R908 | 1-216-037-00 | METAL CHIP | 330 5% 1/10W | * | A-3317-459-A | SERVO BOARD, COMPLETE ***** | |
| R909 | 1-216-298-00 | METAL CHIP | 2.2 5% 1/10W | | | < CAPACITOR > | |
| R910 | 1-216-298-00 | METAL CHIP | 2.2 5% 1/10W | | | | |
| R911 | 1-216-298-00 | METAL CHIP | 2.2 5% 1/10W | | | | |
| R912 | 1-216-298-00 | METAL CHIP | 2.2 5% 1/10W | | | | |
| R913 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | | | | |
| R914 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | | | | |
| R915 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | | | | |
| R916 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | C101 | 1-104-543-11 | FILM CHIP 0.0022uF 5% 50V | |
| R917 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | C102 | 1-135-259-11 | TANTAL. CHIP 10uF 20% 6.3V | |
| R918 | 1-216-675-11 | METAL CHIP | 10K 0.5% 1/10W | C103 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| R919 | 1-216-675-11 | METAL CHIP | 10K 0.5% 1/10W | C104 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| R920 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | C105 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| R921 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | C106 | 1-135-181-21 | TANTALUM CHIP 4.7uF 20% 6.3V | |
| R930 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W | C107 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| R981 | 1-216-121-00 | RES,CHIP | 1M 5% 1/10W | C108 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| R989 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | C109 | 1-135-181-21 | TANTALUM CHIP 4.7uF 20% 6.3V | |
| R990 | 1-216-198-00 | RES,CHIP | 1K 5% 1/8W (C5960R/C5970R) | C201 | 1-104-543-11 | FILM CHIP 0.0022uF 5% 50V | |
| R991 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W | C202 | 1-135-259-11 | TANTAL. CHIP 10uF 20% 6.3V | |
| R992 | 1-216-081-00 | METAL CHIP | 22K 5% 1/10W | C301 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| R993 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W (C5970/C5970R) | C302 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| R994 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | C304 | 1-162-927-11 | CERAMIC CHIP 100PF 5% 50V | |
| R995 | 1-216-057-00 | METAL CHIP | 2.2K 5% 1/10W | C305 | 1-162-970-11 | CERAMIC CHIP 0.01uF 10% 25V | |
| R996 | 1-216-097-00 | RES,CHIP | 100K 5% 1/10W | C306 | 1-107-823-11 | CERAMIC CHIP 0.47uF 10% 16V | |
| | | | | C307 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| | | | | C308 | 1-162-927-11 | CERAMIC CHIP 100PF 5% 50V | |
| | | | | C309 | 1-162-968-11 | CERAMIC CHIP 0.0047uF 10% 50V | |
| | | | | C310 | 1-107-823-11 | CERAMIC CHIP 0.47uF 10% 16V | |
| | | | | C311 | 1-164-245-11 | CERAMIC CHIP 0.015uF 10% 25V | |
| | | | | C314 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| | | | | C315 | 1-109-982-11 | CERAMIC CHIP 1uF 10% 10V | |
| | | | | C316 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| | | | | C317 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| | | | | C318 | 1-104-852-11 | TANTAL. CHIP 22uF 20% 6.3V | |
| | | | | C319 | 1-104-852-11 | TANTAL. CHIP 22uF 20% 6.3V | |
| | | | | C320 | 1-164-227-11 | CERAMIC CHIP 0.022uF 10% 25V | |
| | | | | C321 | 1-162-969-11 | CERAMIC CHIP 0.0068uF 10% 25V | |
| | | | | C322 | 1-162-964-11 | CERAMIC CHIP 0.001uF 10% 50V | |
| | | | | C324 | 1-107-826-11 | CERAMIC CHIP 0.1uF 10% 16V | |
| | | | | C325 | 1-110-563-11 | CERAMIC CHIP 0.068uF 10% 16V | |
| | | | | C326 | 1-162-968-11 | CERAMIC CHIP 0.0047uF 10% 50V | |
| | | | | C327 | 1-109-982-11 | CERAMIC CHIP 1uF 10% 10V | |
| | | | | C328 | 1-162-966-11 | CERAMIC CHIP 0.0022uF 10% 50V | |
| | | | | C329 | 1-164-227-11 | CERAMIC CHIP 0.022uF 10% 25V | |
| | | | | | | < COMPOSITION CIRCUIT BLOCK > | |
| RB900 | 1-233-412-11 | RES, CHIP NETWORK 1K (3216) | | | | | |
| RB901 | 1-233-412-11 | RES, CHIP NETWORK 1K (3216) | | | | | |
| RB902 | 1-233-576-11 | RES, CHIP NETWORK 100 | | | | | |
| RB903 | 1-233-576-11 | RES, CHIP NETWORK 100 | | | | | |
| | | | | | | < VARIABLE RESISTOR > | |
| RV1 | 1-223-589-11 | RES, ADJ, CARBON 100K (C5960R/C5970R) | | | | | |
| | | | | | | < SWITCH > | |
| S701 | 1-572-552-21 | SWITCH, SLIDE (FREQUENCY SELECT) (C5970: E) | | | | | |
| S900 | 1-692-431-21 | SWITCH, TACTILE (RESET) | | | | | |
| | | | | | | < THERMISTOR > | |
| TH600 | 1-801-792-21 | THERMISTOR, POSITIVE | | | | | |

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------|-----------------|-------------------------------|--------------|--|---------------|
| R330 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | R530 | 1-216-825-11 | METAL CHIP | 2.2K 5% 1/16W |
| R331 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | R531 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R332 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | R532 | 1-216-864-11 | METAL CHIP | 0 5% 1/16W |
| R333 | 1-216-819-11 | METAL CHIP | 680 5% 1/16W | R533 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R334 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | R534 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R335 | 1-216-815-11 | METAL CHIP | 330 5% 1/16W | R535 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R336 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | R536 | 1-216-864-11 | METAL CHIP | 0 5% 1/16W |
| R337 | 1-216-853-11 | METAL CHIP | 470K 5% 1/16W | R537 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W |
| R338 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | R538 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R339 | 1-216-827-11 | METAL CHIP | 3.3K 5% 1/16W | R539 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R340 | 1-216-843-11 | METAL CHIP | 68K 5% 1/16W | R540 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R341 | 1-216-837-11 | METAL CHIP | 22K 5% 1/16W | R542 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W |
| R342 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | R545 | 1-216-864-11 | METAL CHIP | 0 5% 1/16W |
| R343 | 1-216-827-11 | METAL CHIP | 3.3K 5% 1/16W | < CONPOSITION CIRCUIT BLOCK > | | | |
| R344 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | RB301 | 1-233-576-11 | RES, CHIP NETWORK 100 | |
| R345 | 1-216-827-11 | METAL CHIP | 3.3K 5% 1/16W | RB302 | 1-233-576-11 | RES, CHIP NETWORK 100 | |
| R346 | 1-216-841-11 | METAL CHIP | 47K 5% 1/16W | RB503 | 1-233-412-11 | RES, CHIP NETWORK 1K (3216) | |
| R347 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | < THERMISTOR > | | | |
| R348 | 1-218-708-11 | METAL CHIP | 4.7K 0.5% 1/16W | TH501 | 1-810-421-11 | THERMISTOR NTH5G36B103K01TE | |
| R349 | 1-216-025-00 | RES,CHIP | 100 5% 1/10W | < VIBRATOR > | | | |
| R350 | 1-216-142-00 | RES,CHIP | 4.7 5% 1/8W | X301 | 1-767-429-21 | VIBRATOR, CRYSTAL (22.5792MHz) | |
| R351 | 1-218-700-11 | METAL CHIP | 2.2K 0.5% 1/16W | X501 | 1-760-365-11 | VIBRATOR, CERAMIC (10MHz) | |
| R352 | 1-218-700-11 | METAL CHIP | 2.2K 0.5% 1/16W | ***** | | | |
| R353 | 1-218-700-11 | METAL CHIP | 2.2K 0.5% 1/16W | MISCELLANEOUS | | | |
| R354 | 1-216-857-11 | METAL CHIP | 1M 5% 1/16W | ***** | | | |
| R355 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | 16 | 1-776-207-72 | CORD (WITH CONNECTOR) (POWER) (C5970) | |
| R356 | 1-216-833-11 | METAL CHIP | 10K 5% 1/16W | 16 | 1-776-527-71 | CORD (WITH CONNECTOR) (ISO) (POWER) (C5970R) | |
| R357 | 1-216-017-00 | RES,CHIP | 47 5% 1/10W | 16 | 1-776-527-91 | CORD (WITH CONNECTOR) (ISO) (POWER) (C5960R) | |
| R401 | 1-216-073-00 | METAL CHIP | 10K 5% 1/10W | 153 | 1-654-693-11 | SENSOR FLEXIBLE BOARD | |
| R402 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | △165 | 8-583-046-05 | OPTICAL PICK-UP KMS-241B/J1RP | |
| R403 | 1-216-065-00 | RES,CHIP | 4.7K 5% 1/10W | LCD801 | 1-803-502-21 | DISPLAY PANEL, LIQUID CRYSTAL | |
| R404 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | M901 | A-3301-407-A | MOTOR ASSY, SP (SPINDLE) | |
| R405 | 1-218-692-11 | METAL CHIP | 1K 0.5% 1/16W | M902 | A-3291-190-A | MOTOR ASSY, SL (SLED) | |
| R406 | 1-218-714-11 | METAL CHIP | 8.2K 0.5% 1/16W | M903 | A-3291-191-A | MOTOR ASSY, LO (LOADING) | |
| R501 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R502 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R503 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | HARDWARE LIST | | | |
| R505 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R506 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | #1 | 7-621-772-10 | SCREW +B 2X4 | |
| R507 | 1-218-708-11 | METAL CHIP | 4.7K 0.5% 1/16W | #2 | 7-685-792-09 | SCREW +PTT 2.6X6 (S) | |
| R510 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | #3 | 7-685-794-09 | SCREW +PTT 2.6X10 (S) | |
| R511 | 1-216-847-11 | METAL CHIP | 150K 5% 1/16W | #4 | 7-685-106-19 | SCREW +P 2X10 TYPE2 NON-SLIT | |
| R512 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | #5 | 7-685-851-04 | SCREW +BVTT 2X4 (S) | |
| R516 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | #6 | 7-624-102-04 | STOP RING 1.5, TYPE-E | |
| R517 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | #7 | 7-627-852-37 | PRECISION SCREW +P 1.7X1.8 TYPE3 | |
| R518 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | #8 | 7-621-772-08 | SCREW +B 2X3 | |
| R519 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | #9 | 7-621-555-10 | SCREW +K 2X3 | |
| R520 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | ***** | | | |
| R521 | 1-216-809-11 | METAL CHIP | 100 5% 1/16W | ***** | | | |
| R522 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R523 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R524 | 1-216-821-11 | METAL CHIP | 1K 5% 1/16W | ***** | | | |
| R525 | 1-216-845-11 | METAL CHIP | 100K 5% 1/16W | ***** | | | |
| R526 | 1-216-825-11 | METAL CHIP | 2.2K 5% 1/16W | ***** | | | |
| R527 | 1-216-825-11 | METAL CHIP | 2.2K 5% 1/16W | ***** | | | |
| R528 | 1-216-825-11 | METAL CHIP | 2.2K 5% 1/16W | ***** | | | |
| R529 | 1-216-825-11 | METAL CHIP | 2.2K 5% 1/16W | ***** | | | |

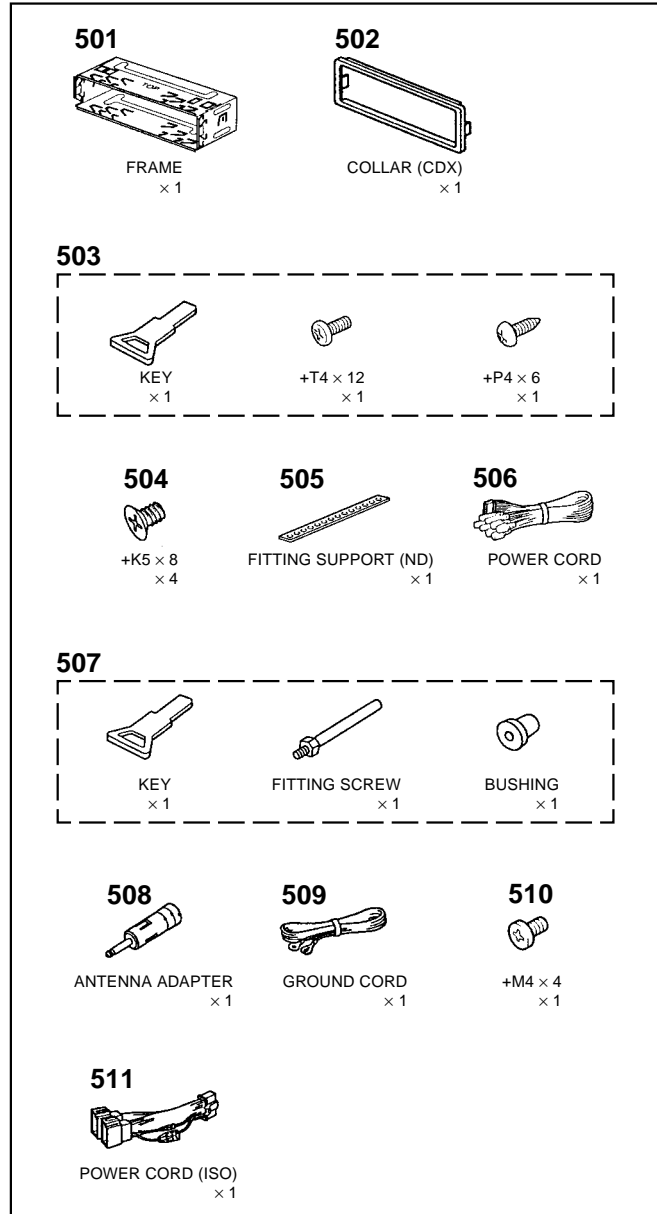
| | |
|---|---|
| <p>The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.</p> | <p>Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>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

MDX-C5960R/C5970/C5970R

| Ref. No. | Part No. | Description | Remark |
|--|------------------------------|--|--------|
| ACCESSORIES & PACKING MATERIALS | | | |
| ***** | | | |
| 3-865-831-11 | MANUAL, INSTRUCTION | (ENGLISH) (C5970: US, Canadian) | |
| 3-865-831-21 | MANUAL, INSTRUCTION | (FRENCH) (C5970: Canadian) | |
| 3-865-831-31 | MANUAL, INSTRUCTION | (ENGLISH, SPANISH, CHINESE) (C5970: E) | |
| 3-865-832-11 | MANUAL, INSTRUCTION, INSTALL | (ENGLISH, FRENCH) (C5970: US, Canadian) | |
| 3-865-832-21 | MANUAL, INSTRUCTION, INSTALL | (ENGLISH, SPANISH, CHINESE) (C5970: E) | |
| 3-865-833-11 | MANUAL, INSTRUCTION | (ENGLISH, SPANISH, SWEDISH, PORTUGUESE) (C5970R: AEP, UK) | |
| 3-865-833-21 | MANUAL, INSTRUCTION | (GERMAN, RUSSIAN) (C5970R: German) | |
| 3-865-833-31 | MANUAL, INSTRUCTION | (FRENCH, GERMAN, DUTCH, ITALIAN) (C5960R/C5970R: AEP) | |
| 3-865-834-11 | MANUAL, INSTRUCTION, INSTALL | (ENGLISH, SPANISH, SWEDISH, PORTUGUESE) (C5970R: AEP, UK) | |
| 3-865-834-21 | MANUAL, INSTRUCTION, INSTALL | (FRENCH, GERMAN, DUTCH, ITALIAN, RUSSIAN) (C5960R/C5970R: AEP, German) | |

X-3373-926-1 CASE ASSY (XR)

| Ref. No. | Part No. | Description | Remark |
|--|--------------|-------------------------------------|--------------------------|
| PARTS FOR INSTALLATION AND CONNECTION | | | |
| ***** | | | |
| 501 | 3-009-613-21 | FRAME | |
| 502 | 3-932-910-11 | COLLAR (CDX) | |
| 503 | X-3370-076-1 | SCREW ASSY (U. KEY), FITTING | (C5970: US, Canadian) |
| 504 | 3-934-325-01 | SCREW, +K (5X8) TAPPING | (C5970) |
| 505 | 3-924-961-01 | SUPPORT (ND), FITTING | (C5970) |
| 506 | 1-776-207-72 | CORD (WITH CONNECTOR) (POWER) | (C5970) |
| 507 | X-3370-077-1 | SCREW ASSY (AE. KEY), FITTING | (C5960R/C5970: E/C5970R) |
| 508 | 1-465-459-21 | ADAPTER, ANTENNA | (C5960R/C5970R) |
| 509 | 1-775-543-31 | CORD, GROUND | |
| 510 | 3-344-561-21 | SCREW (M4X4) | |
| 511 | 1-776-527-71 | CORD (WITH CONNECTOR) (ISO) (POWER) | (C5970R) |
| 511 | 1-776-527-91 | CORD (WITH CONNECTOR) (ISO) (POWER) | (C5960R) |



MDX-C5960R/C5970/C5970R

KEY

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA. . . : μ A. . . uPA. . . : μ PA. . .
uPB. . . : μ PB. . . uPC. . . : μ PC. . .
uPD. . . : μ PD. . .
- CAPACITORS
uF: μ F
- COILS
uH: μ H
- Abbreviation
GREEN : Illumination color
AMBER : Illumination color

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

SONY

SERVICE MANUAL

German Model
MDX-C5960R
US Model
Canadian Model
E Model
MDX-C5970
AEP Model
UK Model
MDX-C5970R

SUPPLEMENT-1

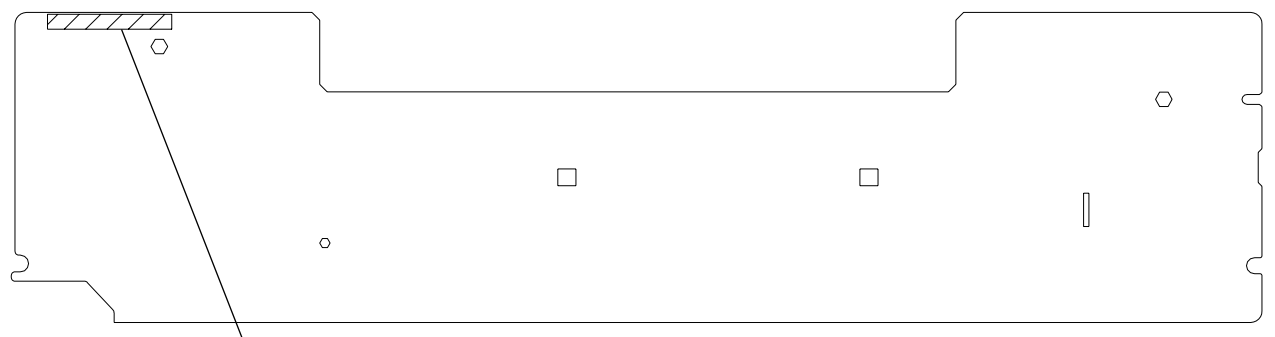
File this supplement with the service manual.

Subject: Key board Modification

(ECN-CSB00612)

NEW/FORMER DISCRIMINATION

[KEY BOARD] – Component Side –



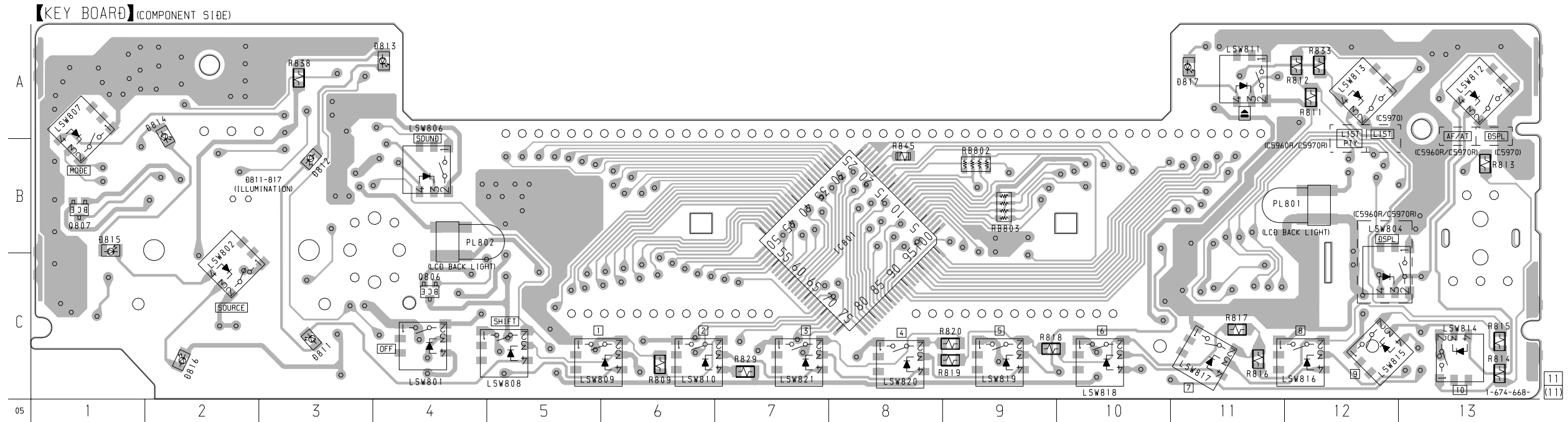
Former: 1-672-683-11
New : 1-674-668-11

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|--|----------------|----------|--------------|--|----------------------------|
| | | KEY BOARD ***** | | D814 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) |
| | | | | D814 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) |
| * | 3-023-609-01 | PLATE (LCD), LIGHT GUIDE | | D815 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) |
| * | 3-023-621-02 | SHEET (LCD) | | | | | |
| * | 3-033-721-03 | SHEET (LCD), DIFFUSION (C5960R/C5970R) | | D815 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) |
| * | 3-033-721-11 | SHEET (LCD), DIFFUSION (C5970) | | D816 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) |
| * | 3-033-706-01 | PLATE (LCD), GROUND | | | | | |
| * | 3-033-707-01 | HOLDER (LCD) | | D816 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) |
| | | < CAPACITOR > | | D816 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) |
| C802 | 1-163-809-11 | CERAMIC CHIP 0.047uF 10% 25V | | D817 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) |
| C803 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% 16V | | D817 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) |
| C804 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% 16V | | | | | |
| C805 | 1-164-489-11 | CERAMIC CHIP 0.22uF 10% 16V | | D819 | 8-719-977-00 | DIODE DTZ5.1C | |
| C806 | 1-163-809-11 | CERAMIC CHIP 0.047uF 10% 25V | | | | < ROTARY ENCODER > | |
| C811 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V | | EN801 | 1-475-014-11 | ENCODER, ROTARY (VOLUME/BASS/TREBLE/BALANCE/FADER CONTROL) | |
| C812 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V | | | | < IC > | |
| C813 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V | | IC801 | 8-759-496-75 | IC uPD16432BGC-018-9EU | < LIQUID CRYSTAL DISPLAY > |
| C814 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V | | LCD801 | 1-803-502-21 | DISPLAY PANEL, LIQUID CRYSTAL | |
| C815 | 1-163-009-11 | CERAMIC CHIP 0.001uF 10% 50V | | | | < SWITCH > | |
| | | < CONNECTOR > | | LSW801 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (OFF) |
| CNP801 | 1-764-423-11 | PIN, CONNECTOR 12P | | LSW801 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (OFF) |
| | | < DIODE > | | LSW802 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (SOURCE) |
| D802 | 8-719-069-57 | DIODE UDZS-TE17-6.8B | | LSW802 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (SOURCE) |
| D803 | 8-719-069-57 | DIODE UDZS-TE17-6.8B | | LSW803 | 1-771-290-11 | SWITCH, SLIDE | (- <<<< >>>> +: SEEK/AMS) |
| D804 | 8-719-069-57 | DIODE UDZS-TE17-6.8B | | LSW804 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) | (DSPL) (C5960R/C5970R) |
| D806 | 8-719-977-00 | DIODE DTZ5.1C | | LSW804 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) | (DSPL) (C5970) |
| D807 | 8-719-977-00 | DIODE DTZ5.1C | | LSW805 | 1-762-937-11 | SWITCH, ROTARY (D-BASS) | |
| D808 | 8-719-978-69 | DIODE DTZ-TT11-16B | | | | | |
| D811 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) | | | | |
| D811 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) | | | | |
| D812 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) | | | | |
| D812 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) | | | | |
| D813 | 8-719-033-13 | LED CL-170Y-CD-T (AMBER) | (ILLUMINATION) | | | | |
| D813 | 8-719-033-14 | LED CL-170PG-CD-T (GREEN) | (ILLUMINATION) | | | | |

PRINTED WIRING BOARD – KEY Board –

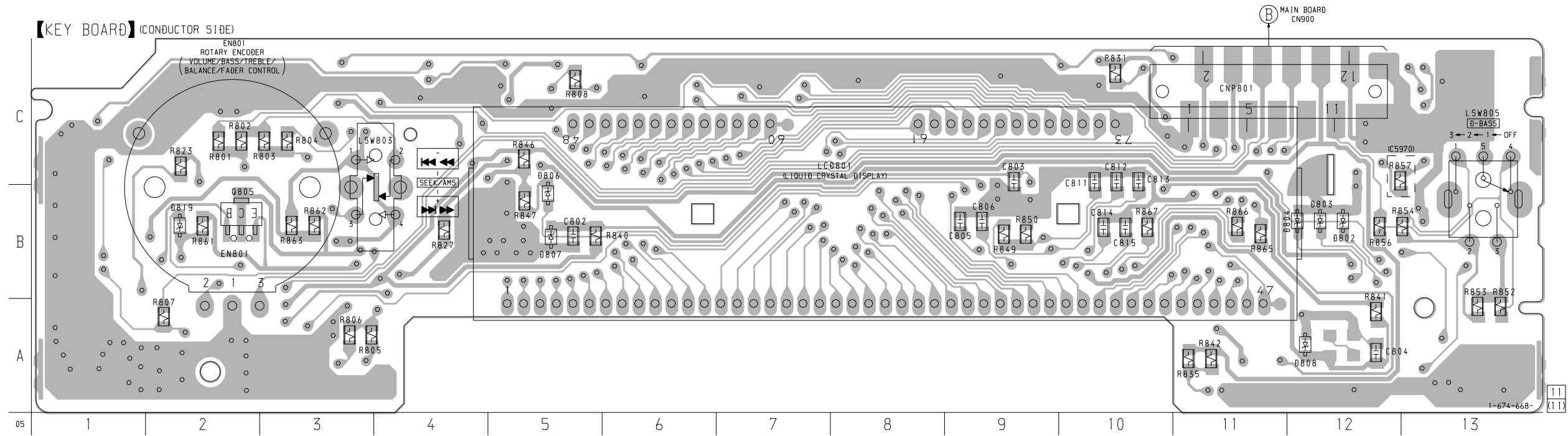
• Semiconductor Location (Component Side)

| Ref. No. | Location |
|----------|----------|
| D811 | C-3 |
| D812 | B-3 |
| D813 | A-4 |
| D814 | A-2 |
| D815 | B-1 |
| D816 | C-2 |
| D817 | A-11 |
| IC801 | B-8 |
| Q806 | C-4 |
| Q807 | B-1 |



• Semiconductor Location (Conductor Side)

| Ref. No. | Location |
|----------|----------|
| D802 | B-12 |
| D803 | B-12 |
| D804 | B-12 |
| D806 | B-5 |
| D807 | B-5 |
| D808 | A-12 |
| D819 | B-2 |
| Q805 | B-2 |

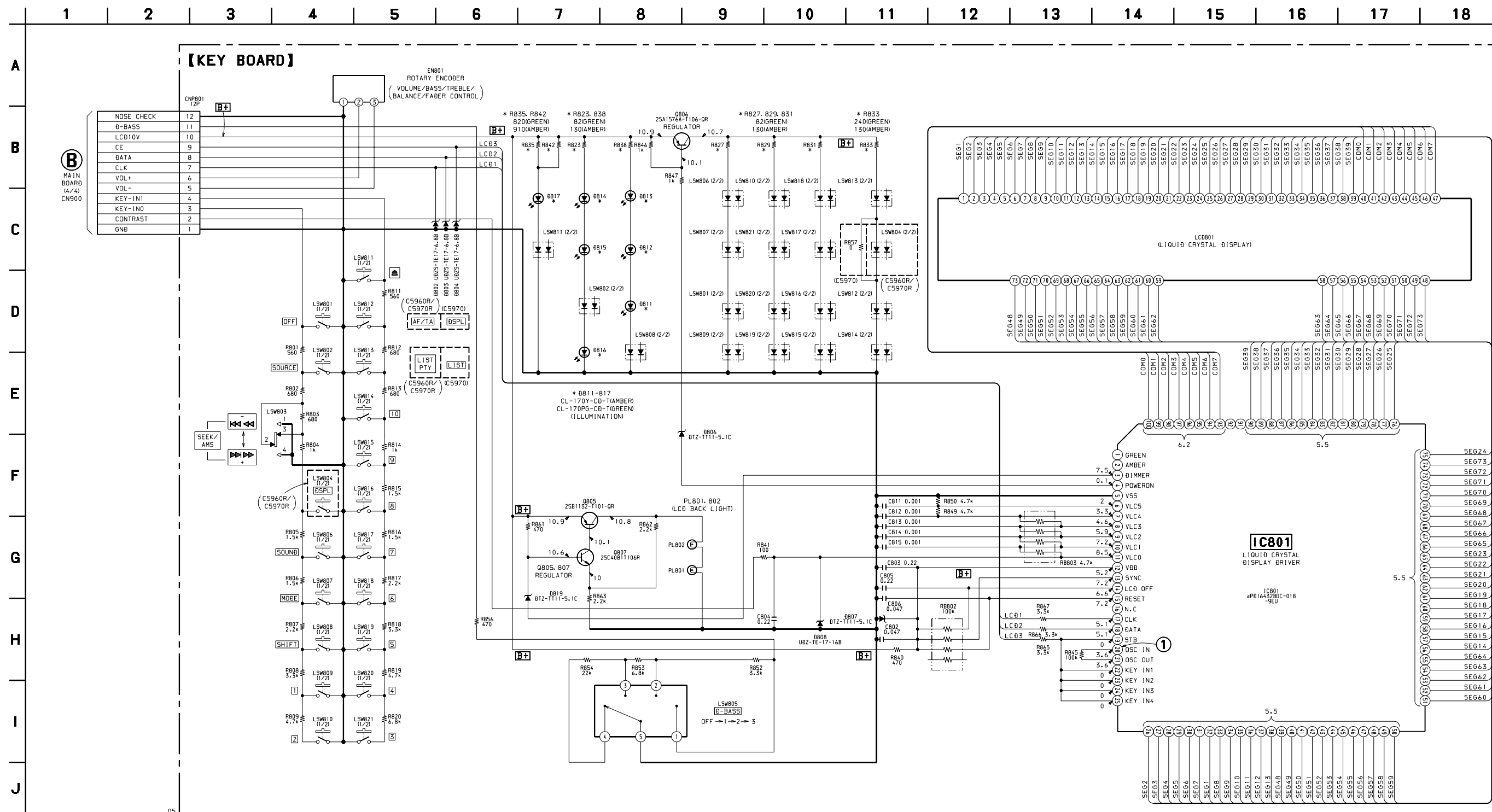


Note on Printed Wiring Board:

- : parts extracted from the component side.
- : Pattern from the side which enables seeing. (The other layers' patterns are not indicated)

Caution:
 Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.
 Parts face side: Parts on the parts face side seen from the parts face are indicated.

SCHEMATIC DIAGRAM – KEY Board –



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- [] : panel designation.
- [B+] : B+ Line.
- Power voltage is dc 14.4V and fed with regulated dc power supply from ACC and BATT cords.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.

- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions. no mark : FM
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Abbreviation
GREEN : Illumination color
AMBER : Illumination color

MDX-C5960R/C5970/C5970R

KEY

KEY

Continued from page 1.

| Ref. No. | Part No. | Description | Remark | Ref. No. | Part No. | Description | Remark |
|----------|--------------|---|--------|----------|--------------|---|--------|
| LSW806 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (SOUND) | | LSW821 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (3) | |
| LSW806 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (SOUND) | | | | < PILOT LAMP > | |
| LSW807 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (MODE) | | PL801 | 1-517-630-31 | LAMP, PILOT (LCD BACK LIGHT) | |
| LSW807 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (MODE) | | PL802 | 1-517-630-31 | LAMP, PILOT (LCD BACK LIGHT) | |
| LSW808 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (SHIFT) | | | | < TRANSISTOR > | |
| LSW808 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (SHIFT) | | Q805 | 8-729-106-60 | TRANSISTOR 2SB1115A-YQ | |
| LSW809 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (1) | | Q806 | 8-729-026-53 | TRANSISTOR 2SA1576A-T106-QR | |
| LSW809 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (1) | | Q807 | 8-729-905-35 | TRANSISTOR 2SC4081T106R | |
| | | | | | | < RESISTOR > | |
| LSW810 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (2) | | R801 | 1-208-776-11 | RES, CHIP 560 0.5% 1/10W | |
| LSW810 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (2) | | R802 | 1-216-647-11 | METAL CHIP 680 0.5% 1/10W | |
| LSW811 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (▲) | | R803 | 1-216-647-11 | METAL CHIP 680 0.5% 1/10W | |
| LSW811 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (▲) | | R804 | 1-216-651-11 | METAL CHIP 1K 0.5% 1/10W | |
| LSW812 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (AF/TA) (C5960R/C5970R) | | R805 | 1-216-655-11 | METAL CHIP 1.5K 0.5% 1/10W | |
| LSW812 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (AF/TA) (C5970R) | | R806 | 1-216-655-11 | METAL CHIP 1.5K 0.5% 1/10W | |
| LSW812 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (DSPL) (C5970) | | R807 | 1-216-659-11 | METAL CHIP 2.2K 0.5% 1/10W | |
| LSW813 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (LIST, PTY) (C5960R/C5970R) | | R808 | 1-216-663-11 | METAL CHIP 3.3K 0.5% 1/10W | |
| LSW813 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (LIST, PTY) (C5970R) | | R809 | 1-216-667-11 | METAL CHIP 4.7K 0.5% 1/10W | |
| LSW813 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (LIST) (C5970) | | R810 | 1-216-667-11 | RES, CHIP 4.7K 0.5% 1/10W | |
| LSW814 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (10) | | R811 | 1-208-776-11 | RES, CHIP 560 0.5% 1/10W | |
| LSW814 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (10) | | R812 | 1-216-647-11 | METAL CHIP 680 0.5% 1/10W | |
| LSW815 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (9) | | R813 | 1-216-647-11 | METAL CHIP 680 0.5% 1/10W | |
| LSW815 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (9) | | R814 | 1-216-651-11 | METAL CHIP 1K 0.5% 1/10W | |
| LSW816 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (8) | | R815 | 1-216-655-11 | METAL CHIP 1.5K 0.5% 1/10W | |
| LSW816 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (8) | | R816 | 1-216-655-11 | METAL CHIP 1.5K 0.5% 1/10W | |
| LSW817 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (7) | | R817 | 1-216-659-11 | RES, CHIP 2.2K 0.5% 1/10W | |
| LSW817 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (7) | | R818 | 1-216-663-11 | RES, CHIP 3.3K 0.5% 1/10W | |
| LSW818 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (6) | | R819 | 1-216-667-11 | RES, CHIP 4.7K 0.5% 1/10W | |
| LSW818 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (6) | | R820 | 1-216-671-11 | RES, CHIP 6.8K 0.5% 1/10W | |
| LSW819 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (5) | | R821 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| LSW819 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (5) | | R822 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| LSW820 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (4) | | R823 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| LSW820 | 1-762-619-21 | SWITCH, KEY BOARD (WITH LED) (GREEN) (4) | | R824 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| LSW821 | 1-762-617-21 | SWITCH, KEY BOARD (WITH LED) (AMBER) (3) | | R825 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R826 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R827 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R828 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R829 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R830 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R831 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R832 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R833 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R834 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R835 | 1-216-047-00 | RES, CHIP 820 5% 1/10W (GREEN) | |
| | | | | R836 | 1-216-048-00 | METAL CHIP 910 5% 1/10W (AMBER) | |
| | | | | R837 | 1-216-023-00 | RES, CHIP 82 5% 1/10W (GREEN) | |
| | | | | R838 | 1-216-028-00 | METAL CHIP 130 5% 1/10W (AMBER) | |
| | | | | R839 | 1-216-041-00 | METAL CHIP 470 5% 1/10W | |
| | | | | R840 | 1-216-025-00 | RES, CHIP 100 5% 1/10W | |

| Ref. No. | Part No. | Description | Remark |
|----------|--------------|-------------------------------|---------------|
| R842 | 1-216-047-00 | RES, CHIP 820 5% | 1/10W (GREEN) |
| R842 | 1-216-048-00 | METAL CHIP 910 5% | 1/10W (AMBER) |
| R845 | 1-218-895-11 | METAL CHIP 100K 0.5% | 1/16W |
| R846 | 1-216-651-11 | METAL CHIP 1K 0.5% | 1/10W |
| R847 | 1-216-651-11 | METAL CHIP 1K 0.5% | 1/10W |
| R849 | 1-216-667-11 | METAL CHIP 4.7K 0.5% | 1/10W |
| R850 | 1-216-667-11 | METAL CHIP 4.7K 0.5% | 1/10W |
| R852 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R853 | 1-216-069-00 | METAL CHIP 6.8K 5% | 1/10W |
| R854 | 1-216-081-00 | METAL CHIP 22K 5% | 1/10W |
| R856 | 1-216-041-00 | METAL CHIP 470 5% | 1/10W |
| R857 | 1-216-295-00 | SHORT 0 (GREEN) | |
| R861 | 1-216-041-00 | METAL CHIP 470 5% | 1/10W |
| R862 | 1-216-659-11 | METAL CHIP 2.2K 0.5% | 1/10W |
| R863 | 1-216-659-11 | METAL CHIP 2.2K 0.5% | 1/10W |
| R865 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R866 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| R867 | 1-216-061-00 | METAL CHIP 3.3K 5% | 1/10W |
| | | < COMPOSITION CIRCUIT BLOCK > | |
| RB802 | 1-233-810-21 | RES, NETWORK 100K (3216) | |
| RB803 | 1-233-414-11 | RES, CHIP NETWORK 4.7K (3216) | |

EXPLODED VIEWS

| Page | FORMER | NEW | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|----------|-------------|--------|------|--------------|------------------------|--|---|----------|----------|-------------|--------|------|--------------|---|--|------|--------------|--------------------------------|--|------|--------------|-------------|--|
| 73 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>* 63</td> <td>3-033-696-01</td> <td>SHEET (LCD), DIFFUSION</td> <td></td> </tr> </tbody> </table> | Ref. No. | Part No. | Description | Remark | * 63 | 3-033-696-01 | SHEET (LCD), DIFFUSION | | <table border="1"> <thead> <tr> <th>Ref. No.</th> <th>Part No.</th> <th>Description</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>* 63</td> <td>3-033-721-03</td> <td>SHEET, DIFFUSION (LCD) (C5960R/C5970R)</td> <td></td> </tr> <tr> <td>* 63</td> <td>3-033-721-11</td> <td>SHEET, DIFFUSION (LCD) (C5970)</td> <td></td> </tr> <tr> <td>* 72</td> <td>3-037-916-01</td> <td>SHEET (LCD)</td> <td></td> </tr> </tbody> </table> | Ref. No. | Part No. | Description | Remark | * 63 | 3-033-721-03 | SHEET, DIFFUSION (LCD) (C5960R/C5970R) | | * 63 | 3-033-721-11 | SHEET, DIFFUSION (LCD) (C5970) | | * 72 | 3-037-916-01 | SHEET (LCD) | |
| Ref. No. | Part No. | Description | Remark | | | | | | | | | | | | | | | | | | | | | | | |
| * 63 | 3-033-696-01 | SHEET (LCD), DIFFUSION | | | | | | | | | | | | | | | | | | | | | | | | |
| Ref. No. | Part No. | Description | Remark | | | | | | | | | | | | | | | | | | | | | | | |
| * 63 | 3-033-721-03 | SHEET, DIFFUSION (LCD) (C5960R/C5970R) | | | | | | | | | | | | | | | | | | | | | | | | |
| * 63 | 3-033-721-11 | SHEET, DIFFUSION (LCD) (C5970) | | | | | | | | | | | | | | | | | | | | | | | | |
| * 72 | 3-037-916-01 | SHEET (LCD) | | | | | | | | | | | | | | | | | | | | | | | | |

• Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

MEMO

