

# CDP-70

## SERVICE MANUAL

*US Model  
Canadian Model  
AEP Model  
UK Model  
E Model*



### SPECIFICATIONS

#### COMPACT DISC PLAYER

|                                                                                                                                 |                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| System                                                                                                                          | Compact disc digital audio system                                                                                 |
| Disc                                                                                                                            | Compact disc                                                                                                      |
| Laser diode properties                                                                                                          | Material : GaAlAs<br>Wavelength : 780 nm<br>Emission duration : Continuous<br>Laser output : Max. 0.6 mW*         |
| * This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the optical pick-up block. |                                                                                                                   |
| Spindle speed                                                                                                                   | 200 r.p.m. to 500 r.p.m. (CLV)                                                                                    |
| Scan velocity                                                                                                                   | 1.2 - 1.4 m/sec.                                                                                                  |
| Error correction                                                                                                                | Sony Super Strategy Cross Interleave<br>Read Solomon Code                                                         |
| Number of channels                                                                                                              | 2                                                                                                                 |
| D-A conversion                                                                                                                  | 16-bit linear                                                                                                     |
| Frequency response                                                                                                              | 2 - 20,000 Hz $\pm 0.5$ dB (US, Canadian model)<br>2 - 20,000 Hz $+0.5$ dB / $-1.0$ dB (AEP, UK, E model)         |
| Harmonic distortion                                                                                                             | Less than 0.004 % (1 kHz)                                                                                         |
| Dynamic range                                                                                                                   | More than 90 dB                                                                                                   |
| Channel separation                                                                                                              | More than 90 dB                                                                                                   |
| Wow and flutter                                                                                                                 | Below measurable limit                                                                                            |
| Outputs                                                                                                                         | Line outputs<br>Output level 2 V rms (at MSB)<br>Load impedance over 10 kilohms<br>Headphones<br>28 mW at 32 ohms |
| Disc                                                                                                                            |                                                                                                                   |
| Track pitch                                                                                                                     | 1.6 $\mu$ m                                                                                                       |
| Sampling frequency                                                                                                              | 44.1 kHz                                                                                                          |
| Quantization                                                                                                                    | 16 bit linear quantizing/channel                                                                                  |
| Modulation system                                                                                                               | EFM                                                                                                               |
| Transfer rate                                                                                                                   | 2.03 Mbit/sec. (before modulation)                                                                                |

#### General

|                    |                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power requirements | AEP model: 220 V ac, 50/60 Hz<br>UK model: 240 V ac, 50/60 Hz<br>US, Canadian model: 120 V ac, 60 Hz<br>E model: 110, 120, 220 or 240 V ac adjustable, 50/60 Hz |
| AC outlet          | 1 unswitched, 100 watts max.                                                                                                                                    |
| Power consumption  | 13 W                                                                                                                                                            |
| Dimensions         | Approx. 430 x 70 x 280 mm (w/h/d)<br>(17 x 2 <sup>7</sup> / <sub>8</sub> x 11 <sup>1</sup> / <sub>8</sub> in.)<br>including projecting parts and controls       |
| Weight             | Approx. 4.1 kg (9 lbs 1 oz)                                                                                                                                     |

#### SAFETY-RELATED COMPONENT WARNING!!

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

#### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  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.

COMPACT DISC PLAYER  
**SONY**





## PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

### WARNING !!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

### 1. Laser Diode Properties

- Material: GaAlAs
- Wavelength: 780 nm
- Emission Duration: continuous
- Laser Output: max. 0.6 mW\*

\* This output is the value measured at a distance of about 1.6 mm from the objective lens surface on the Optical Pick-up Block.

- Classification: Class IIIb

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

## LASER WARNING LABELS

The labels shown below are affixed.

### 1. Protective Housing Label

DHHS Interlocked Label . (US, Canadian model)

**DANGER**  
INVISIBLE LASER RADIATION  
WHEN OPEN AND INTERLOCK  
FAILED OR DEFEATED.  
AVOID DIRECT EXPOSURE TO  
BEAM.  
3-323-294-01

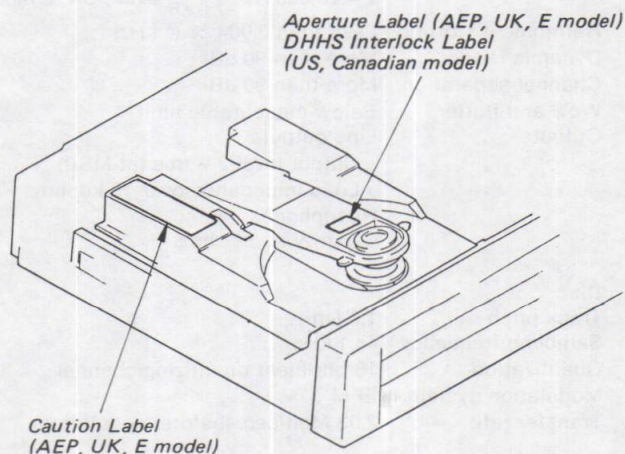
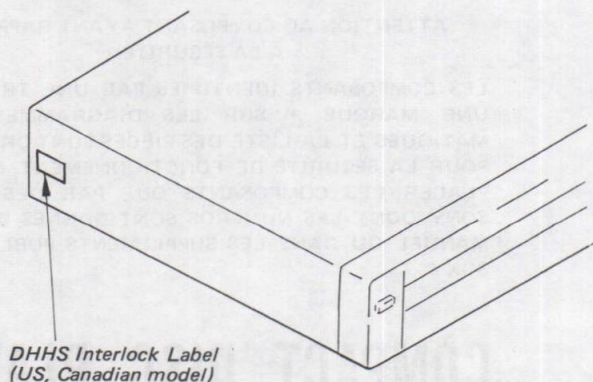
### 2. Aperture Label . . . . . (AEP, UK, E model)

**AVOID EXPOSURE**  
INVISIBLE LASER  
RADIATION IS EMITTED  
FROM THIS APERTURE.  
4-908-404-01

- See figure on next page for location of label.

### 3. Caution Label . . . . . (AEP, UK, E model)

**CAUTION** : INVISIBLE LASER RADIATION WHEN OPEN  
AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.  
**ADVARSEL** : USYNLIG LASERSTRÅLING VED ÅBNING  
NÅR SIKKERHEDSÅFBRYDERE ER UDE AF FUNKTION UDGÅ  
UDSÆTTELSE FOR STRÅLING.





## BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

### ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 30 cm fra den optiske pick-up.

#### 1. Data for Laser Diode

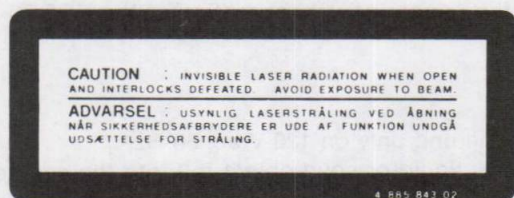
- Materiale: GaAlAs
- Bølgelængde: 780 nm
- Udstråling: Kontinuerlig
- Laser Output: max. 0.6 mW\*
  - \* målt i 1.6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.
- Klassifikation: Svarende til klasse IIIb

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laser-dioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

## LASER ADVARSEL MÆRKNING (AEP model)

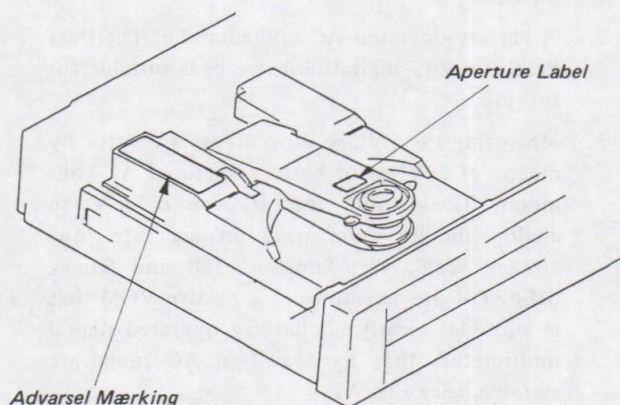
Følgende mærkning findes indvendig i apparatet:

#### 1. Advarsel Mærkning



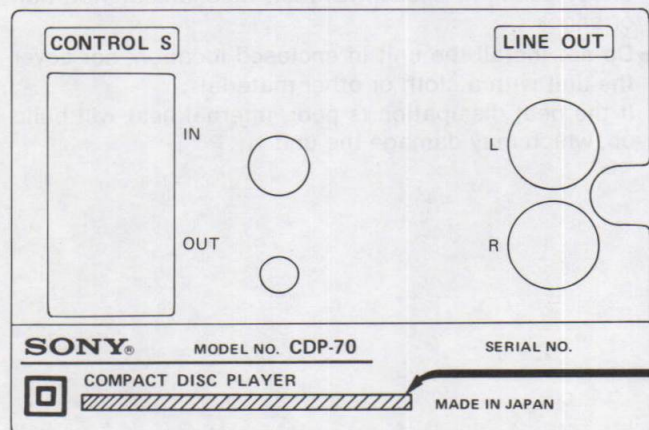
#### ● AEP, UK model

#### 2. Aperture Label



## MODEL IDENTIFICATION

— Specification Label —



- AEP model: AC: 220 V ~ 50/60 Hz 13 W
- UK model: AC: 240 V ~ 50/60 Hz 13 W
- US, Canadian model: AC: 120 V ~ 60 Hz 13 W
- E model: AC: 110, 120, 220, 240 V ~ 50/60 Hz 13 W



## SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

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

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

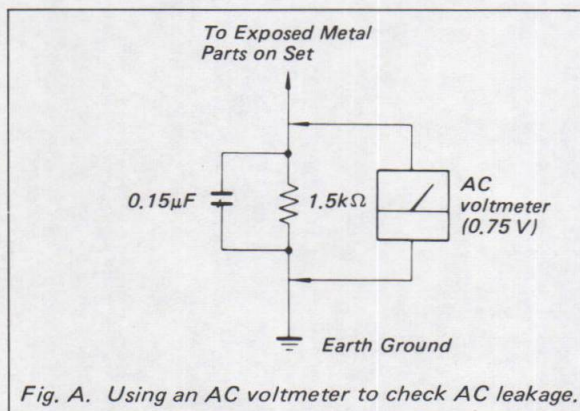


Fig. A. Using an AC voltmeter to check AC leakage.

## FEATURES

With the CDP-70, flat frequency response (2 - 20,000 Hz), low wow and flutter (lower than the measurable limit), wide dynamic range (more than 90 dB), minimal distortion (0.004%) and high channel separation (more than 90 dB) are achieved. Listening to the sound reproduction of your CDP-70 is just like being in the concert hall.

### Quick operation

Feather-touch function keys for direct mode change.

### Various functions

- AMS (Automatic Music Sensor) for quick selection location.
- RMS (Random Music Sensor) for listening order preference.
- Repeat functions for one selection and the whole disc.
- Large and clear digital display for elapsed playing time and remaining playing time.
- The optional Sony ST-JX520 FM stereo/FM-AM tuner can be connected for total control of your audio system.
- Using the optional Sony RM-D1K wireless remote control kit, the remote control operation of the CDP-70 is possible.

### On safety

- Operate the unit only on 120 V ac, 60 Hz.
- Should any liquid or solid object fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.
- As the laser beam used in this Compact Disc player is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.

### On installation

- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in enclosed location, nor cover the unit with a cloth or other material. If the heat dissipation is poor, internal heat will build up, which may damage the unit.



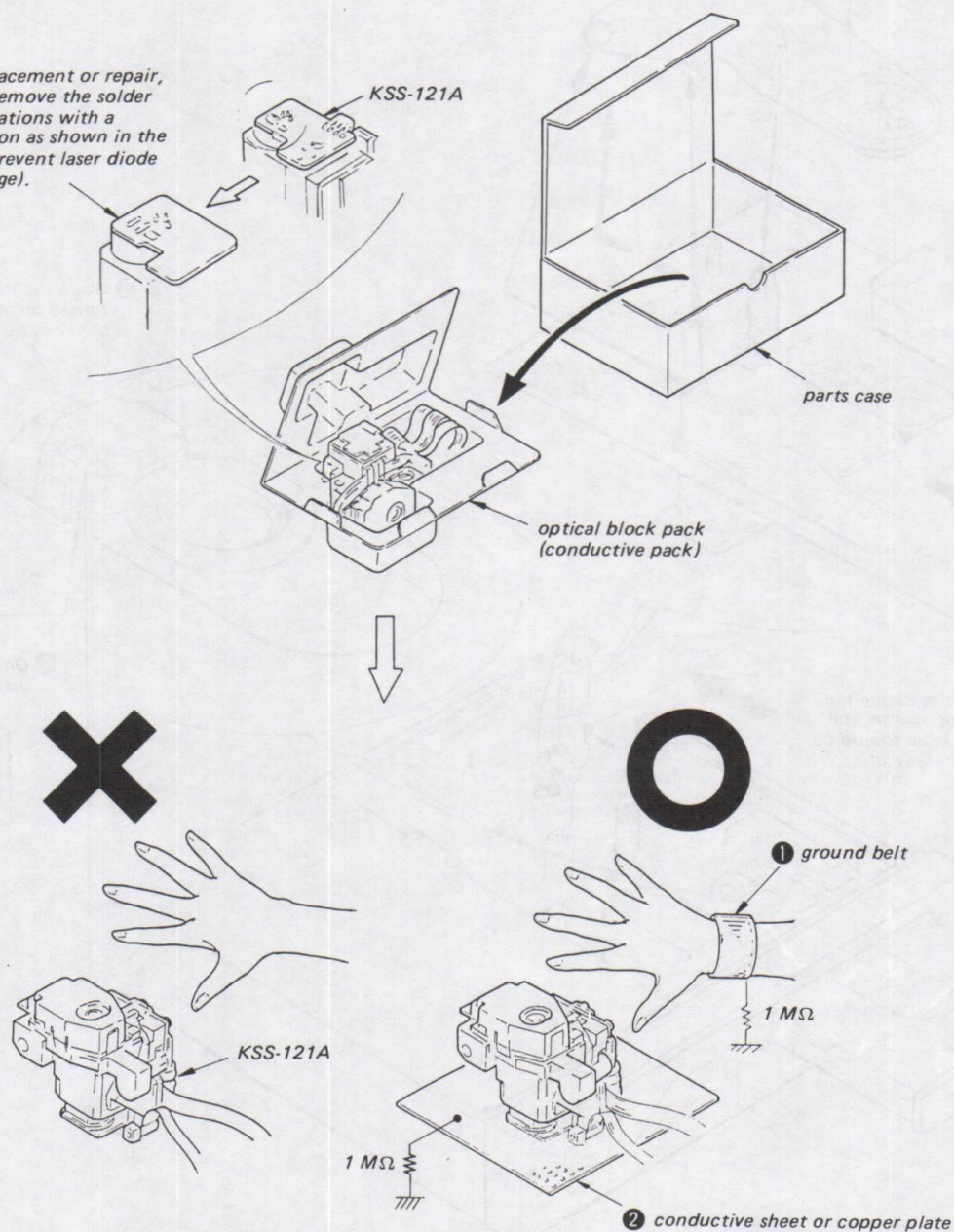
## NOTES ON HANDLING THE OPTICAL BLOCK (KSS-121A)

The laser diode inside the optical block may be damaged by static electricity in clothes or the human body.

The following procedures are required when unpacking and repairing KSS-121A in order to avoid static electricity damage.

1. Body grounding  
Be sure to wear a ground belt (less than  $10^8 \Omega$ ) in order to release the static electricity stored in the body.
2. Workbench grounding  
Place a conductive sheet (less than  $10^9 \Omega$ ) or copper plate on the bench where KSS-121A is to be placed to ground it.
3. Static electricity in the clothing will not be released by the ground belt, so be careful not to let KSS-121A touch clothing.

During replacement or repair, be sure to remove the solder at these locations with a soldering iron as shown in the figure (to prevent laser diode static damage).

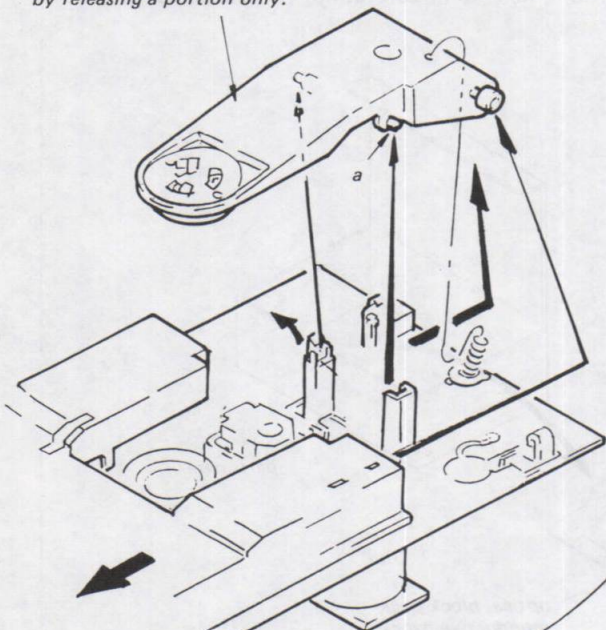




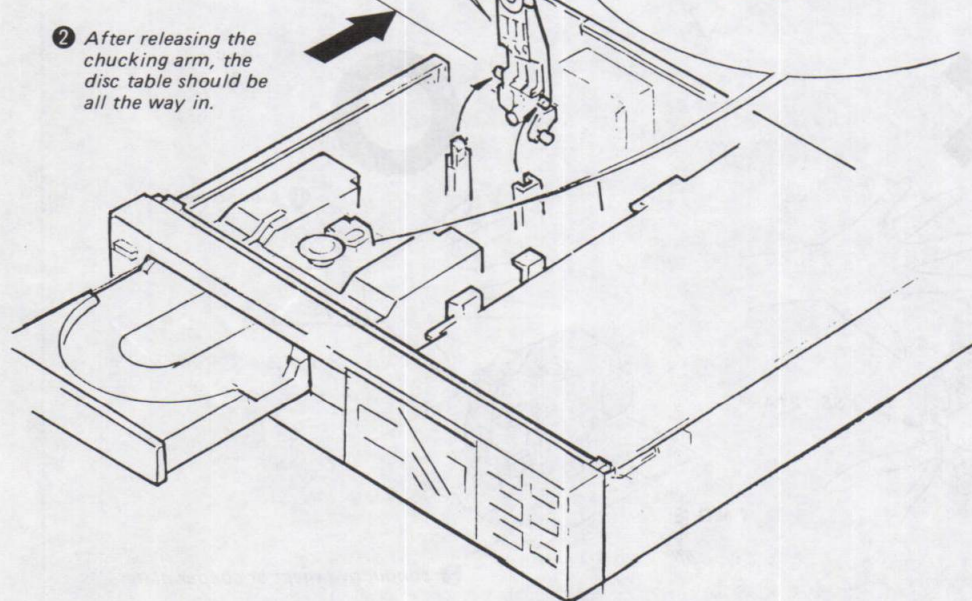
## NOTES ON CHECKING LASER DIODE LIGHT EMISSION

The laser beam on this set is converged by the objective lens in the optical block so that it focuses on the disc reflective surface. Therefore, when checking light emission of the laser diode, be sure to keep the eyes more than 30 cm away from the objective lens.

- 1 Release chucking arm.  
This figure shows the entire chucking arm released, but checking can be done by releasing a portion only.



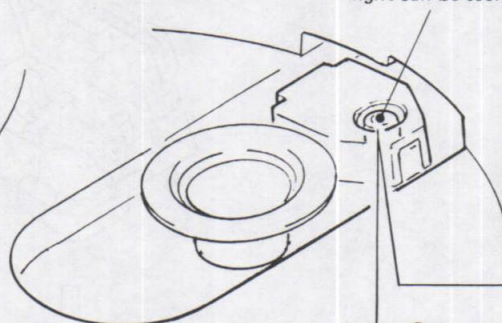
- 2 After releasing the chucking arm, the disc table should be all the way in.



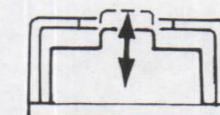
## CHECKING LASER DIODE AND FOCUS SEARCH OPERATION

Check if the following operation is performed by looking at the objective lens after releasing the chucking arm and turning the POWER switch on. (Optical block should be at the innermost circumference when checking.)

- 3 When the POWER switch is turned on, diffused laser light can be seen.



- 4 Objective lens moves up and down (2 - 3 times)

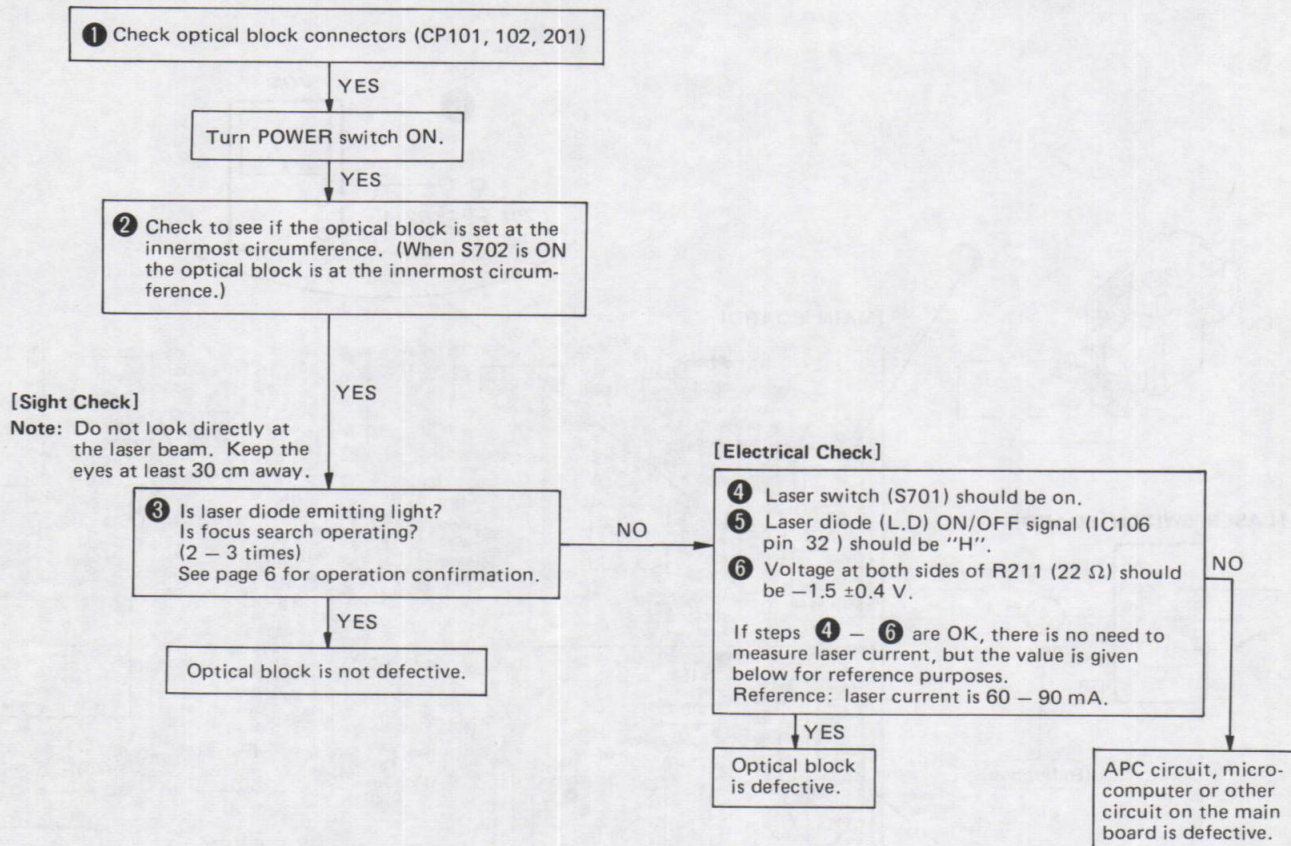


objective lens side view

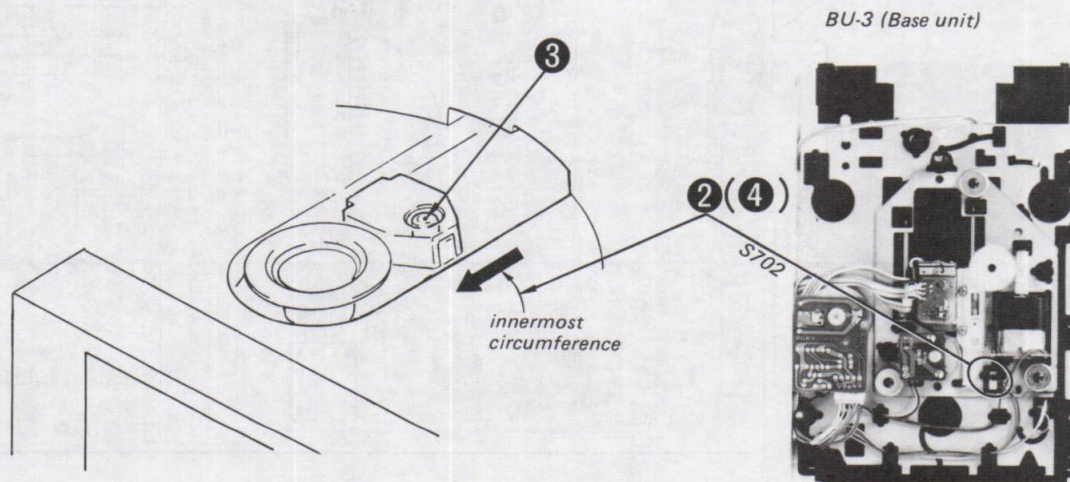


## DIAGNOSIS OF OPTICAL BLOCK (KSS-121A) BREAKDOWN

1. Follow the procedure below to determine if the optical block has broken down.



2. The checking locations listed above are shown here.





KSS121A  
OPTICAL PICK-UP BLOCK

[LASER SWITCH BOARD]

S701  
LASER  
ON/OFF

Reference

oscilloscope

IC106

[MAIN BOARD]

VOM

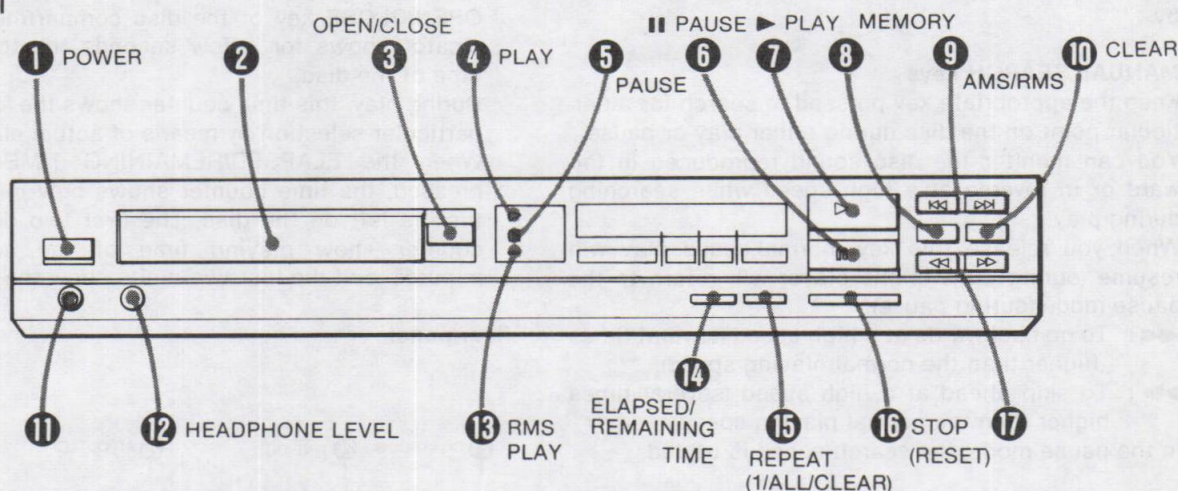
L201

R211



## LOCATION AND FUNCTION OF CONTROLS

### Front panel



#### 1 POWER switch

Depress to turn on the power (ON). To turn the power off, press the switch again (OFF).

#### 2 Disc compartment

To open the disc compartment, press the OPEN/CLOSE key. Place a compact disc in the compartment. To close the disc compartment, press the compartment itself, the OPEN/CLOSE key or the ► PLAY key.

#### 3 OPEN/CLOSE key

With one touch of this key, the disc compartment opens for disc loading. The DISC indicator will flicker while the compartment is opening. With another touch the compartment closes.

#### 4 ►PLAY indicator

When the ► PLAY key is pressed, this indicator illuminates.

This indicator blinks while memorizing selections for RMS play.

#### 5 || PAUSE indicator

When the || PAUSE key during disc playing is pressed, this indicator illuminates.

#### 6 || PAUSE key

Press to pause during play. The || indicator will illuminate. To release the pause mode, press this key again. The indicator will go off and disc play will resume.

#### 7 ► PLAY key

Press to start normal disc play or RMS play. The ► indicator will illuminate.

#### 8 MEMORY key

Press this key to memorize the track number of the displayed selection for the RMS play.

#### 9 AMS/RMS keys

◀◀ (back selection): Press to go back to a **previous selection**.

▶▶ (forward selection): Press to skip ahead to a **later selection**.

#### 10 CLEAR key

While memorizing the track numbers for the RMS play, press this key to clear the track number of the selection which was memorized last.

#### 11 Headphones jack (stereo phone jack)

Accepts any low or high impedance stereo headphones.

#### 12 HEADPHONE LEVEL control

This control adjusts the volume at the headphones. At the minimum position, the sound is just audible.

#### 13 RMS PLAY indicator

This indicator lights during RMS play.

#### 14 ELAPSED/REMAINING TIME button

The time counter normally indicates elapsed time. When this button is pressed, the time counter shows the time remaining before the end of the last selection, preceded by a minus sign.

When this button is pressed the second time, the time counter reverts to the elapsed time.

#### 15 REPEAT (1/ALL/CLEAR) button

To repeat the selection currently being played, press this button once. To repeat all the selections on the disc, press the button again (ALL).

To release repeat play, press the button again (CLEAR).

The selected repeat mode is displayed in the display window.



# **16 STOP (RESET) key**

When this key is pressed, disc play is reset to the very beginning of the first selection and the player stands by.

# **17 MANUAL SEARCH keys**

Keep the appropriate key pressed to search for a particular point on the disc during either play or pause. You can monitor the disc sound reproduced in forward or in reverse at a high speed while searching during play.

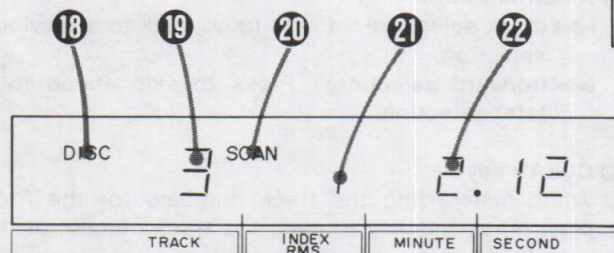
When you release this key, normal-speed play will resume (during play) or the player will return to the pause mode (during pause).

◀◀: To go backwards at a high speed (several times higher than the normal playing speed).

▶▶: To skip ahead at a high speed (several times higher than the normal playing speed).

In the pause mode, the search speed is tripled.

## **Display window**



# **18 DISC indicator**

The indicator flickers when the disc compartment is moving.

The indicator illuminates steadily when the disc compartment is open, when the disc compartment is closed with a disc in place (in the standby mode), or when the disc is playing.

# **19 TRACK indicator**

When the disc is placed in the disc compartment and the disc compartment is closed by pressing the OPEN/CLOSE key or the disc compartment, this indicator shows for a few seconds the total number of the selections recorded on the disc.

During play, this indicator shows the track number of the selection being played.

# **20 SCAN indicator**

This indicator illuminates while the player is searching for the point on the disc you have programmed.

# **21 INDEX/RMS indicator**

If index signals are recorded on the disc being played, the index numbers are shown here.

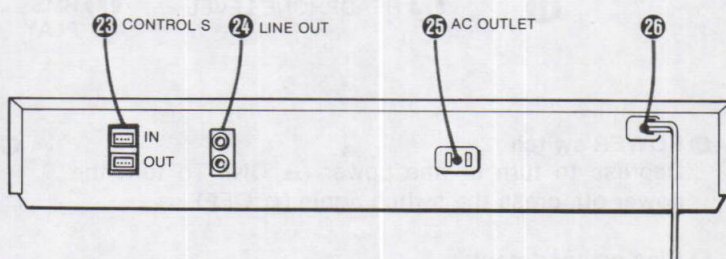
While memorizing selections for the RMS play, this indicator shows the order of memory.

# **22 Time counter**

When the disc is placed in the disc compartment and the disc compartment is closed by pressing the OPEN/CLOSE key or the disc compartment, this indicator shows for a few seconds the total playing time of the disc.

During play, this time counter shows the location in a particular selection by means of actual elapsed time. When the ELAPSED/REMAINING TIME button is pressed, the time counter shows how much playing time is left on the disc. The first two digits of the counter show playing time of the selection in minutes, and the last two digits show the seconds.

## **Rear panel**



# **23 CONTROL S connectors (4-pin)**

**OUT:** Connect to the CONTROL S IN or **R** REMOTE IN connector of other Sony audio equipment with the supplied flat 4-pin remote control cord for the remote control of the total audio system.

**IN:** Connect to the CONTROL S OUT or **R** REMOTE OUT connector of an optional Sony system control tuner or receiver for the remote control of the total audio system.

The optional Sony RM-D1K remote control kit can also be connected here to remotely operate the CDP-70. For details, read the instruction manual of the RM-D1K.

# **24 LINE OUT jacks (phono jacks)**

These jacks can be connected to the CD or auxiliary input jacks of an amplifier using the supplied connecting cord.

# **25 AC OUTLET**

An audio component whose power consumption is under 100 watts can be connected to this outlet. This outlet is not controlled by the front panel POWER switch.

Do not connect an electrical home appliance, such as an electric iron, fan, TV or any other high-wattage equipment, to this ac outlet.

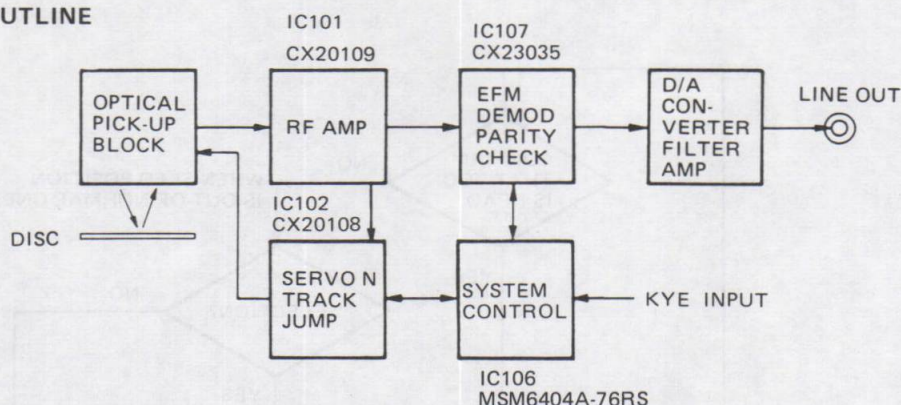
# **26 AC power cord**



## SECTION 1 OUTLINE

### CIRCUIT DESCRIPTION

#### 1-1. OUTLINE



Above block diagram shows configuration of this set. Master control IC106 serves as the center of all operation. System control IC assumes interface between man and machine like key input and remote control input.

For example, if PLAY button is pressed from key input, system control IC works in routine operation to make PLAY mode. It gives every kind of commands for IC102, 107 and they are in PLAY mode.

Through IC102 and IC107 use common data bus,

they distinguish a command for IC102 or IC107 by a higher rank 4 bit value of each command from system control IC106.

Command for IC102: higher rank 4 bit 0000-0011 (0-3 with hexadecimal number system) are used.

Command for IC107: higher rank 4 bit 1010-1110 (A-E with hexadecimal number system) are used.

IC102 controls servo (focus, tracking, sled) mainly. IC107 checks EFM demodulation and CRC.

#### 1-2. SIGNAL FLOW

The compact disc player applies a laser beam to the pits on the compact disc, which represent recorded music information, and extracts the changes in the reflected light and converts them into analog signals.

The following is an explanation of the signal flow on this model.

The changes in laser light reflection are extracted as current changes by the pick-up section photodiode. (The current flow changes according to the amount of light hitting the photodiode.) This signal is applied to IC101 RF amp. At the same time, tracking error and focus error detection is done by the photodiode, and those signals are also applied to the RF amp.

The signal is amplified at IC101 and output from pin ②⑨. This signal is called the EFM signal, and besides music data, includes time and location data called the sync signal and Q data, as well as CRC check signal and others.

This signal is applied to IC107, and these signals are written in to the RAM all at once. Next the signals are read out from this RAM and divided into the different types of data mentioned above.

Then CRC check is done and if there are any errors they are corrected.

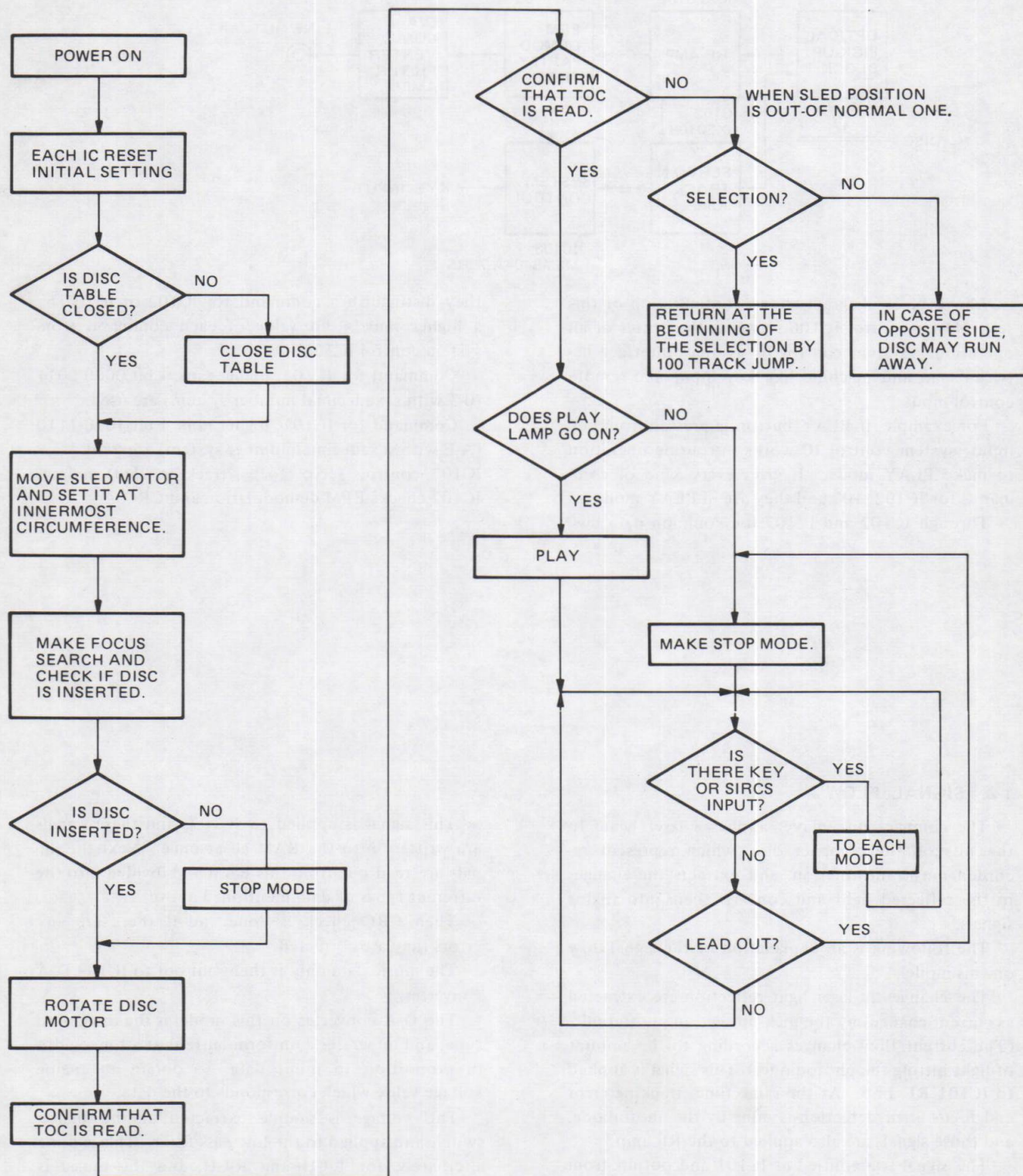
The music data only is then sent out to IC109 D/A converter.

The D/A converter on this model is the integrated type, and integrates a uniform current at a time width in proportion to input data, to obtain an analog voltage value which corresponds to the data.

This voltage is sample extracted at the analog switch and applied to the low pass filter. This is done alternately for L-CH and R-CH, and the music is played.



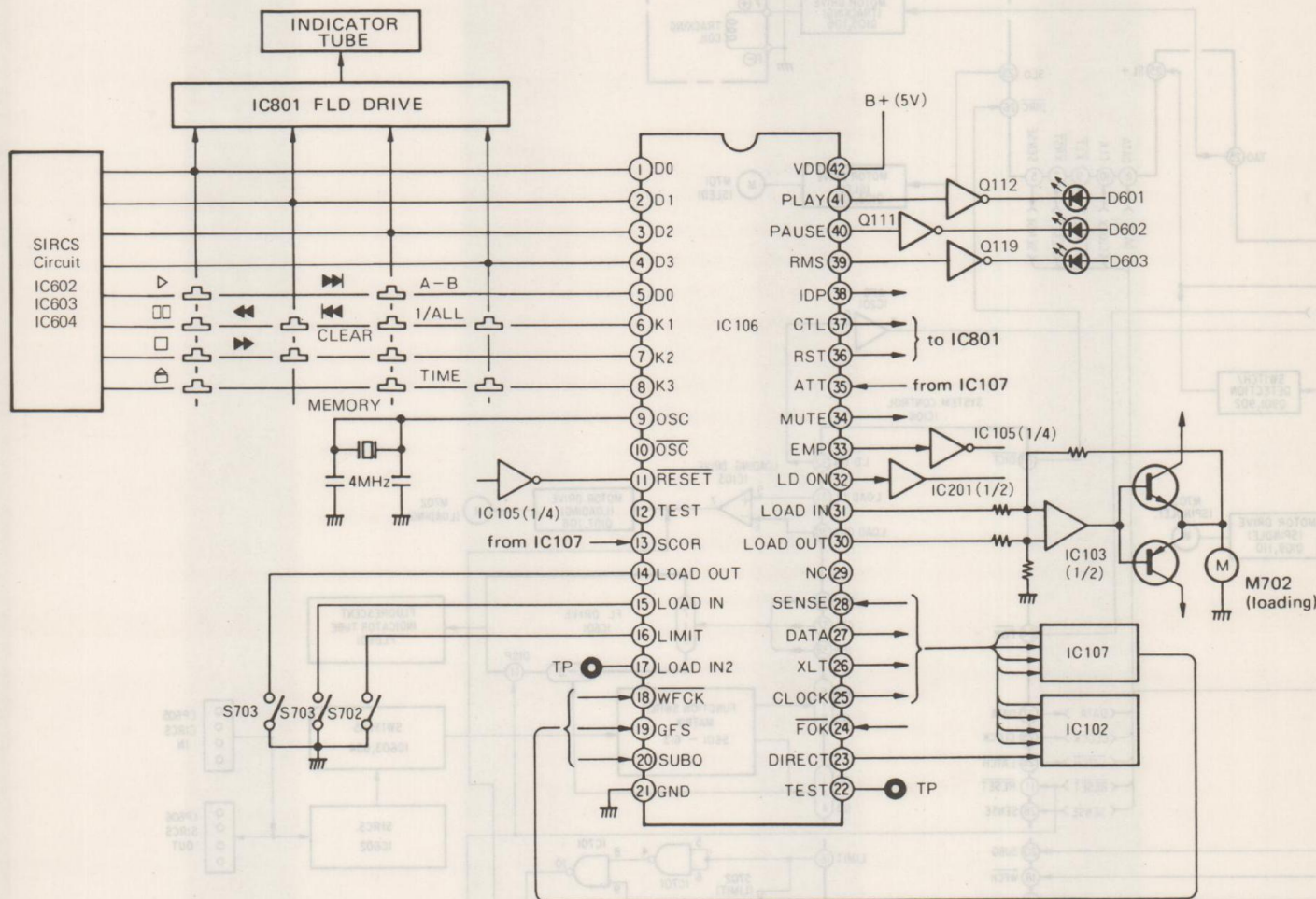
The illustration below shows flow chart of simple operation after power is ON.





### 1-3. IC106

IC106 (MSM6406A-76RS) is a 4 bit system controller, and performs digit signal output to the function keys, SUBQ signal take-in and processing, display tube and servo system control, etc. The pin functions are shown in the diagram below.



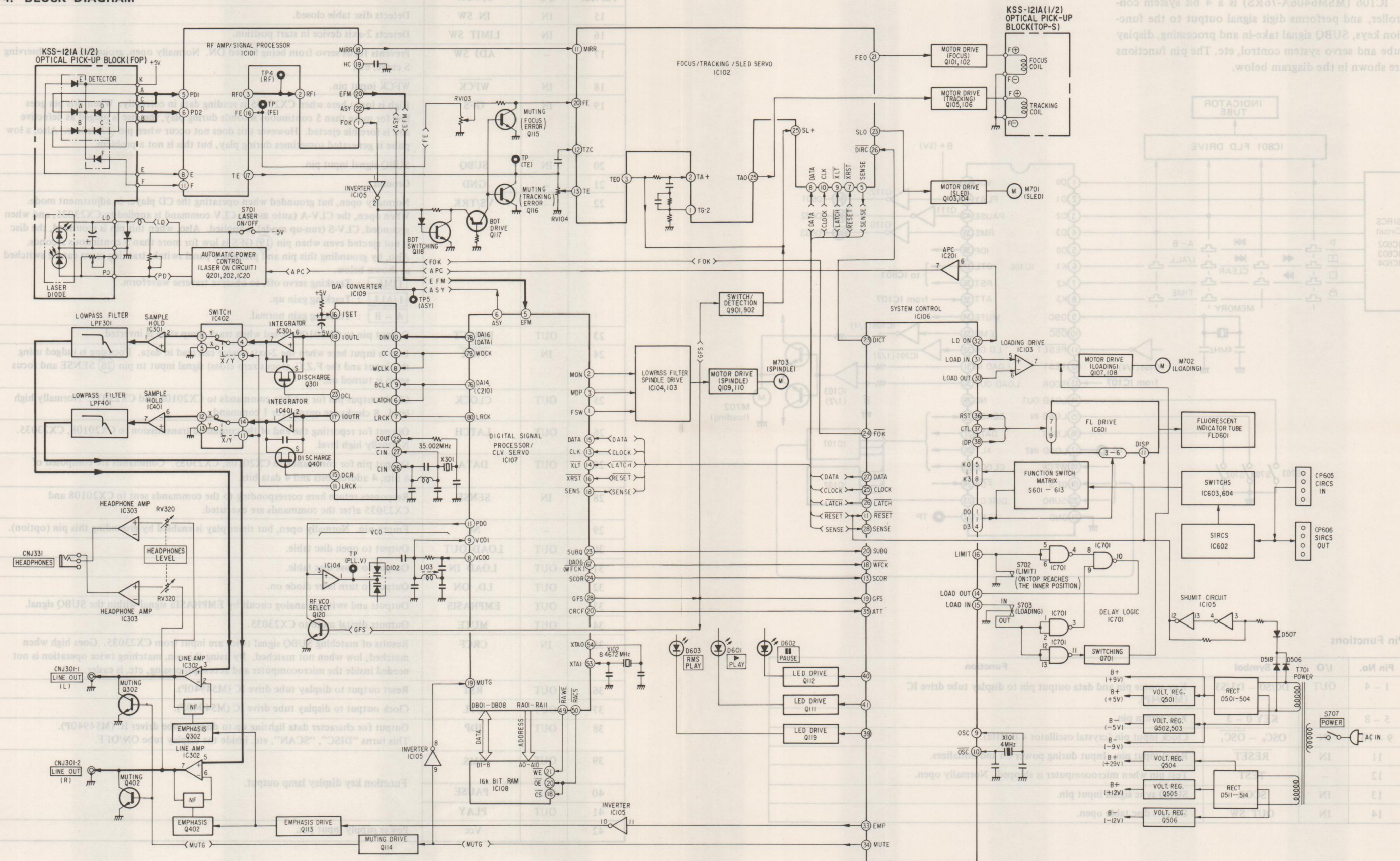
#### Pin Functions

| Pin No. | I/O | Symbol                              | Function                                                              |
|---------|-----|-------------------------------------|-----------------------------------------------------------------------|
| 1 - 4   | OUT | D0/S0 - D3/S3                       | Key source pin and data output pin to display tube drive IC (M5494P). |
| 5 - 8   | IN  | KEY 0 - 3                           | Key return pin.                                                       |
| 9 - 10  | IN  | OSC <sub>0</sub> - OSC <sub>1</sub> | Clock input pin (crystal oscillator 4.0 MHz).                         |
| 11      | IN  | RESET                               | Reset input pin. Input during power on and initializes.               |
| 12      | -   | TEST                                | Test pin when microcomputer is shipped. Normally open.                |
| 13      | IN  | SCOR                                | SUBQ sync signal input pin.                                           |
| 14      | IN  | OUT SW                              | Detects disc table open.                                              |

| Pin No. | I/O | Symbol   | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------|-----|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15      | IN  | IN SW    | Detects disc table closed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 16      | IN  | LIMIT SW | Detects 2-axis device in start position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 17      | -   | ADJ SW   | Prevents focus servo from being forced ON. Normally open, grounded when observing S curve, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 18      | IN  | WFCK     | WFCK input pin.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 19      | IN  | GFS      | High is input here when CX23035 is reading data in correctly. When this pin goes low for more than 5 continuous seconds during play, the disc is judged as defective and is forcible ejected. However this does not occur when pin 22 is low. Also, a low pulse is generated sometimes during play, but this is not a problem.                                                                                                                                                                                                                                 |
| 20      | IN  | SUBQ     | SUBQ signal input pin.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 21      | -   | GND      | Ground.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 22      | -   | VS/TRK   | Normally open, but grounded when operating the CD player in adjustment mode. When open, the CLV-A (auto mode) CLV command is applied to CX23035, and when grounded, CLV-S (run-up mode) is applied. Also, when this pin is grounded, the disc is not ejected even when pin 19 GFS is low for more than 5 continuous seconds. Also, by grounding this pin and pressing a panel switch, tracking servo can be switched as shown below.<br>TIME : Tracking servo off, to observe traverse waveform.<br>1/ALL : Tracking gain up.<br>A - B : Tracking gain normal. |
| 23      | OUT | DIRECT   | Output pin to CX20108. Used when track jump state is inverted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 24      | IN  | F.OK     | Low is input here when the 2-axis device can read in data. Focusing is judged using this input and the F.Z.C. (focus zero cross) signal input to pin 28 SENSE and focus servo is turned on.                                                                                                                                                                                                                                                                                                                                                                    |
| 25      | OUT | CLOCK    | Clock output pin for sending commands to CX20108 and CX23035. Normally high level. 8 clocks are output for 1 command.                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 26      | OUT | LATCH    | Output for reporting the end of the command transmission to CX20108, CX23035. Normally high level.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 27      | OUT | DATA     | Output pin for commands to CX20108, CX23035. Commands are composed of 8 bits, 4 address bits and 4 data bits.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 28      | IN  | SENSE    | Responses return here corresponding to the commands sent to CX20108 and CX23035 after the commands are executed.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 29      | -   | NC       | Empty pin. Normally open, but timer play is enabled by grounding this pin (option).                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 30      | OUT | LOAD OUT | Output to open disc table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 31      | OUT | LOAD IN  | Output to close disc table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 32      | OUT | LD. ON   | Output to turn laser diode on.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 33      | OUT | EMPHASIS | Outputs and switches analog circuit by EMPHASIS signal within the SUBQ signal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 34      | OUT | MUTE     | Outputs digital mute to CX23035.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 35      | IN  | CRCF     | Results of matching SUBQ signal twice are input from CX23035. Goes high when matched, low when not matched. By using this pin, matching twice operation is not needed inside the microcomputer and access processing, etc. is easier.                                                                                                                                                                                                                                                                                                                          |
| 36      | OUT | RST      | Reset output to display tube drive IC (M54940P).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 37      | OUT | CTL      | Clock output to display tube drive IC (M54940P).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 38      | OUT | IDP      | Output for character data lighting up to display tube driver IC (M54940P). This turns "DISC", "SCAN", etc. inside the display tube ON/OFF.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 39      | OUT | RMS.     | Function key display lamp output.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 40      | OUT | PAUSE    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 41      | OUT | PLAY     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 42      | -   | Vcc      | Power supply input pin.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



## 1-4. BLOCK DIAGRAM

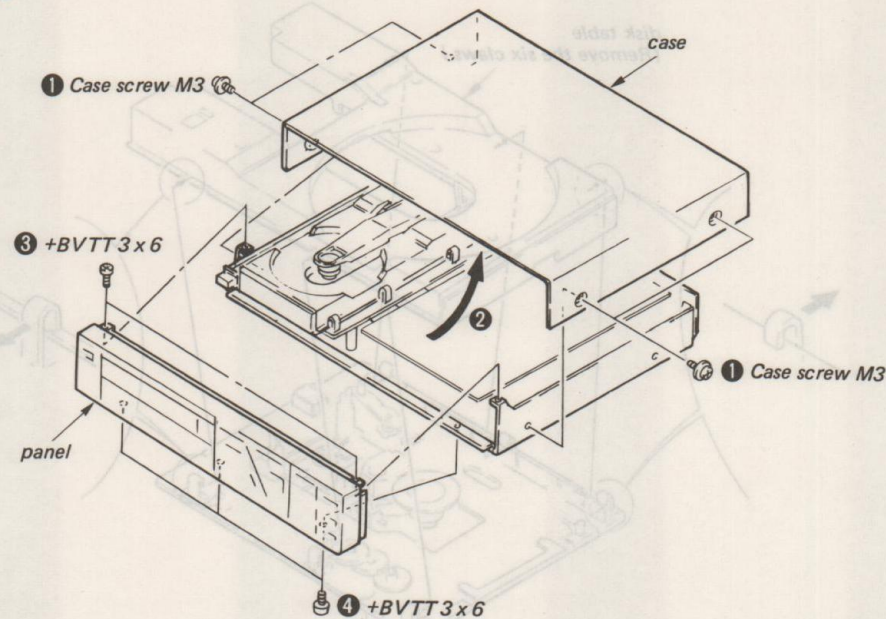




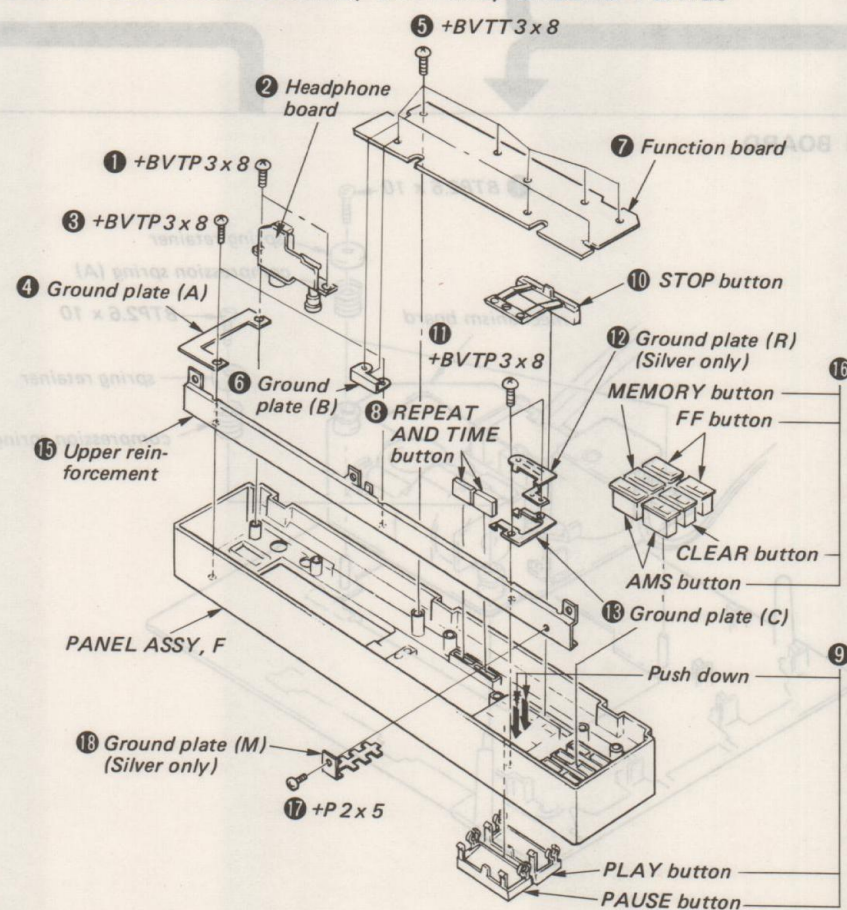
## SECTION 2 DISASSEMBLY

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

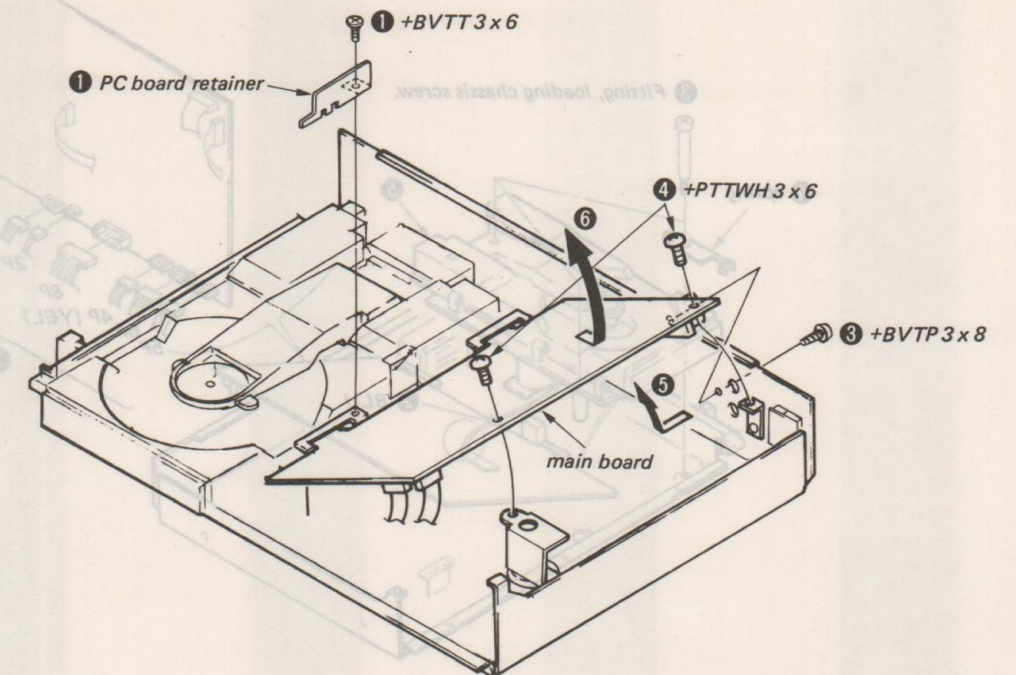
### CASE AND PANEL



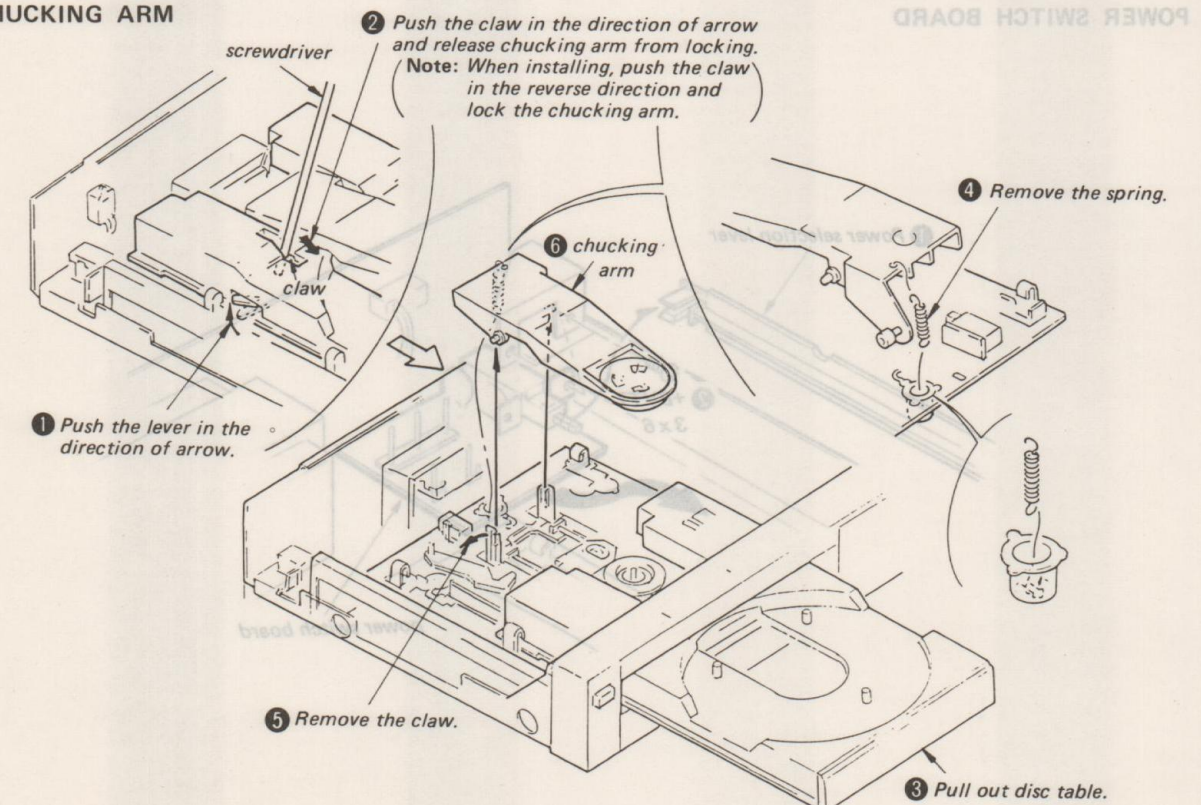
### FUNCTION BOARD, HEADPHONE BOARD, BUTTONS, GROUND PLATES



### MAIN BOARD

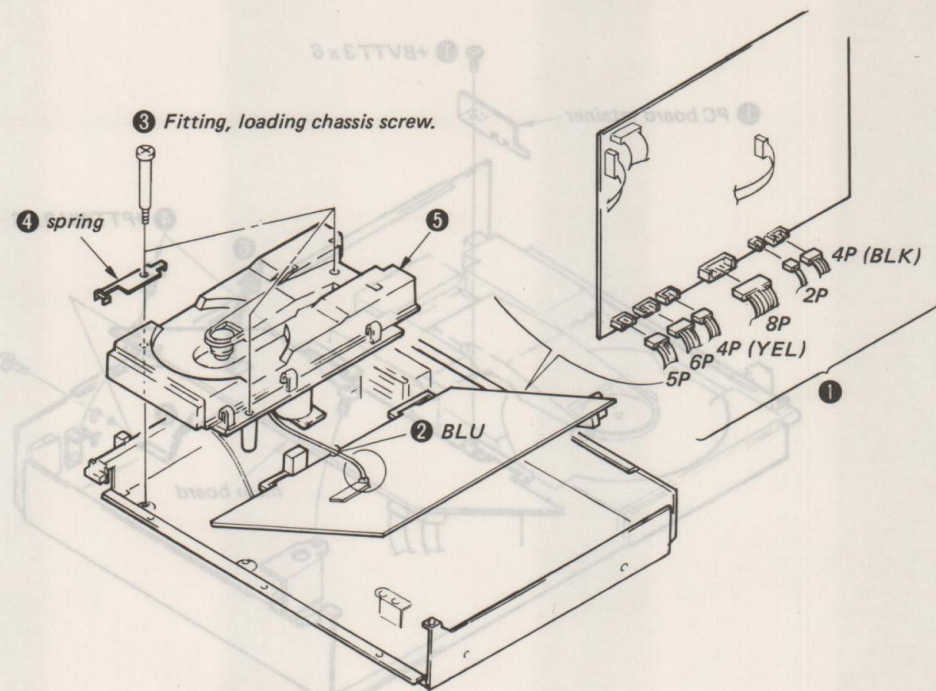


### CHUCKING ARM

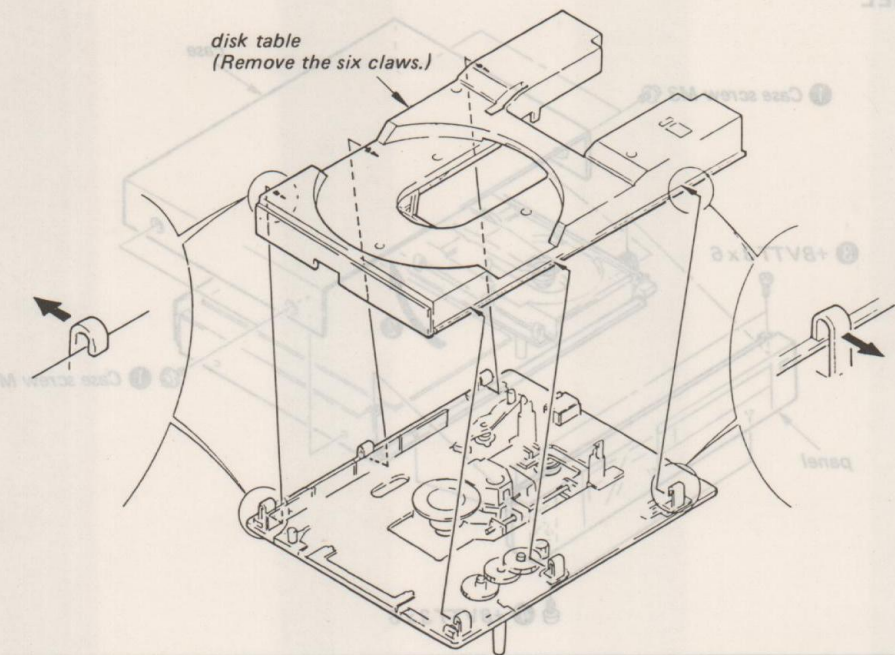




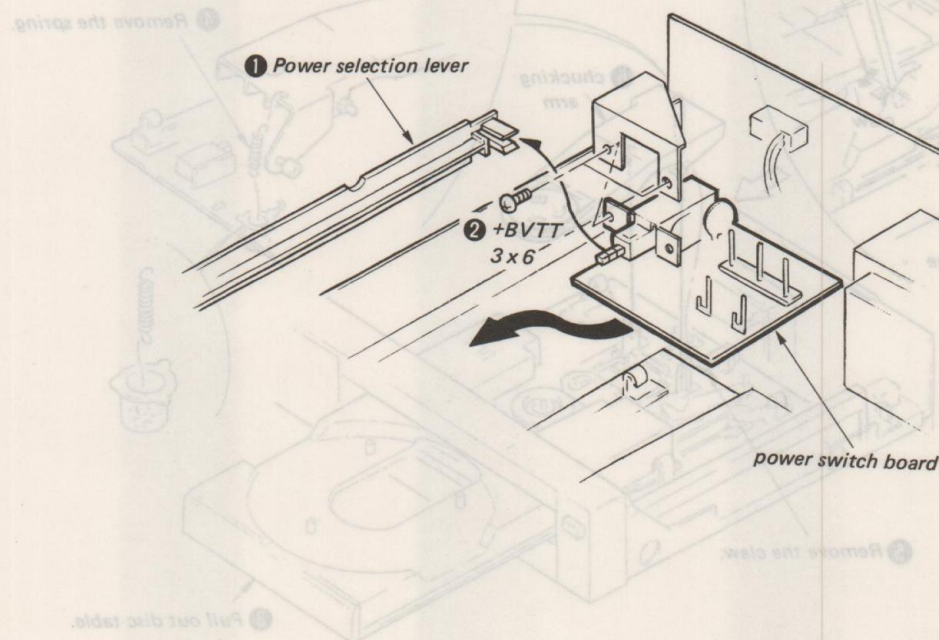
# MECHANISM BLOCK



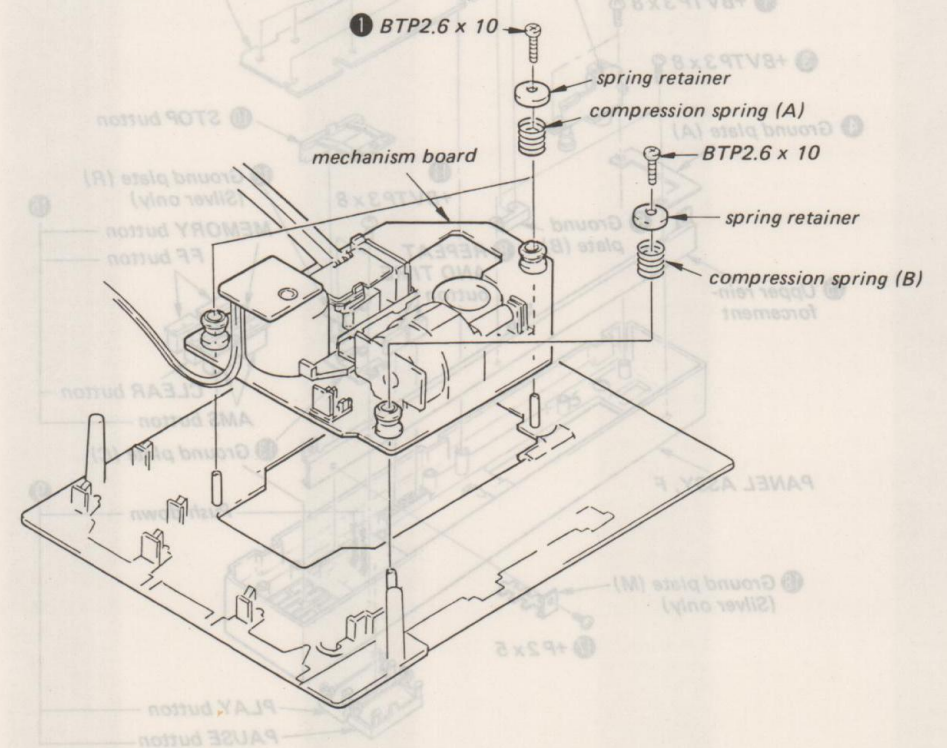
# DISK TABLE



# POWER SWITCH BOARD

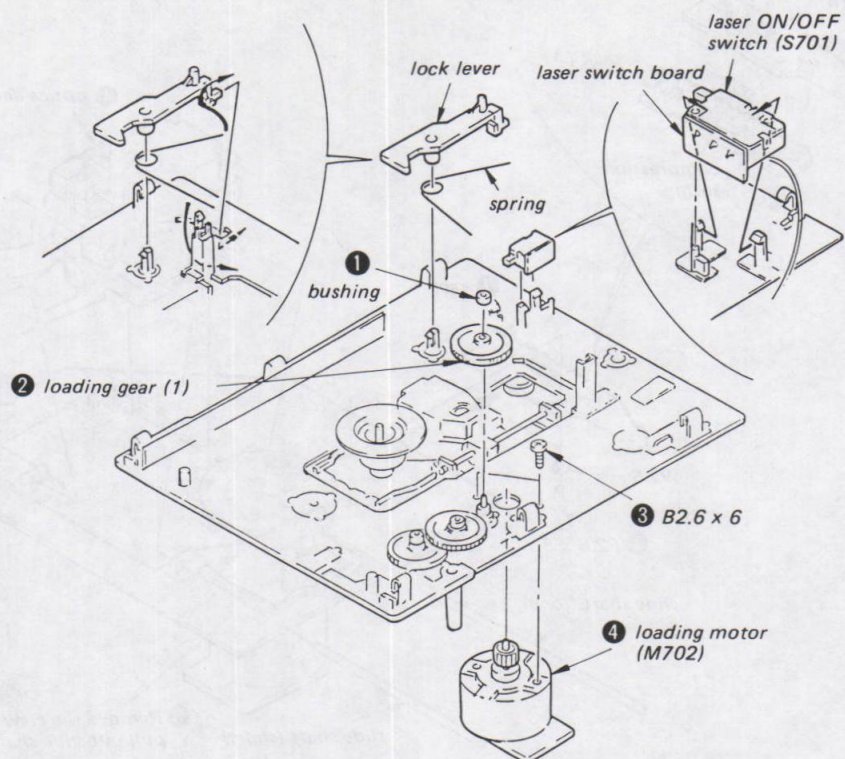


# MECHANISM BOARD

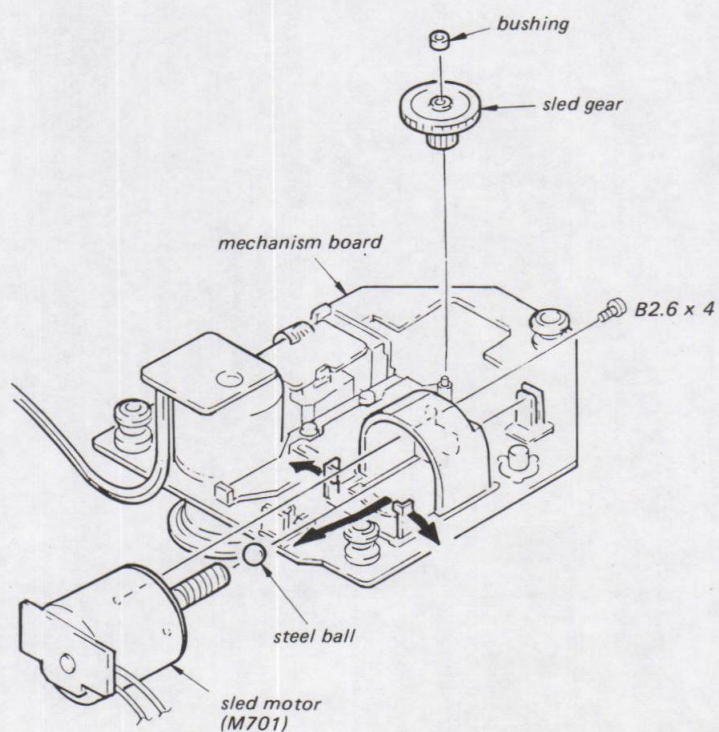




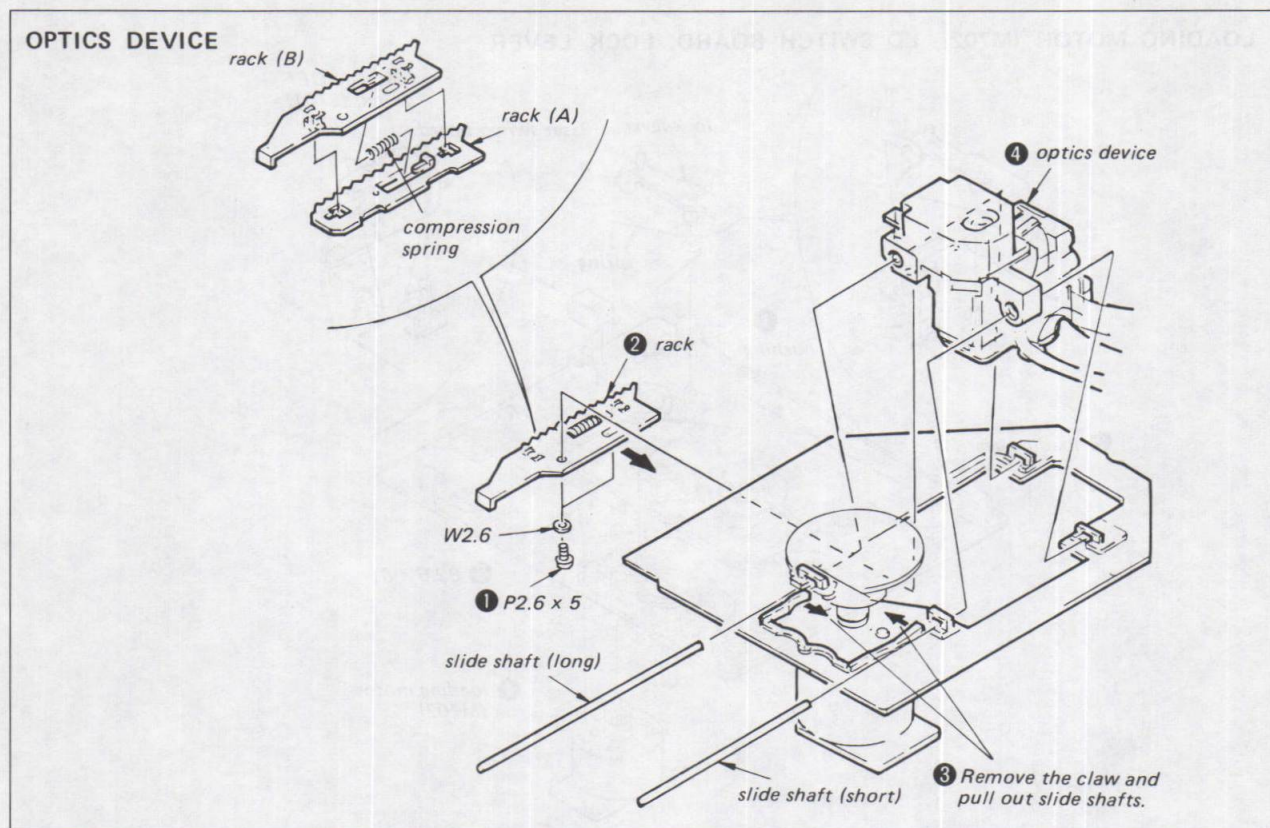
## LOADING MOTOR (M702), LD SWITCH BOARD, LOCK LEVER



## SLED MOTOR









## SECTION 3

### ADJUSTMENTS

#### ELECTRICAL ADJUSTMENTS

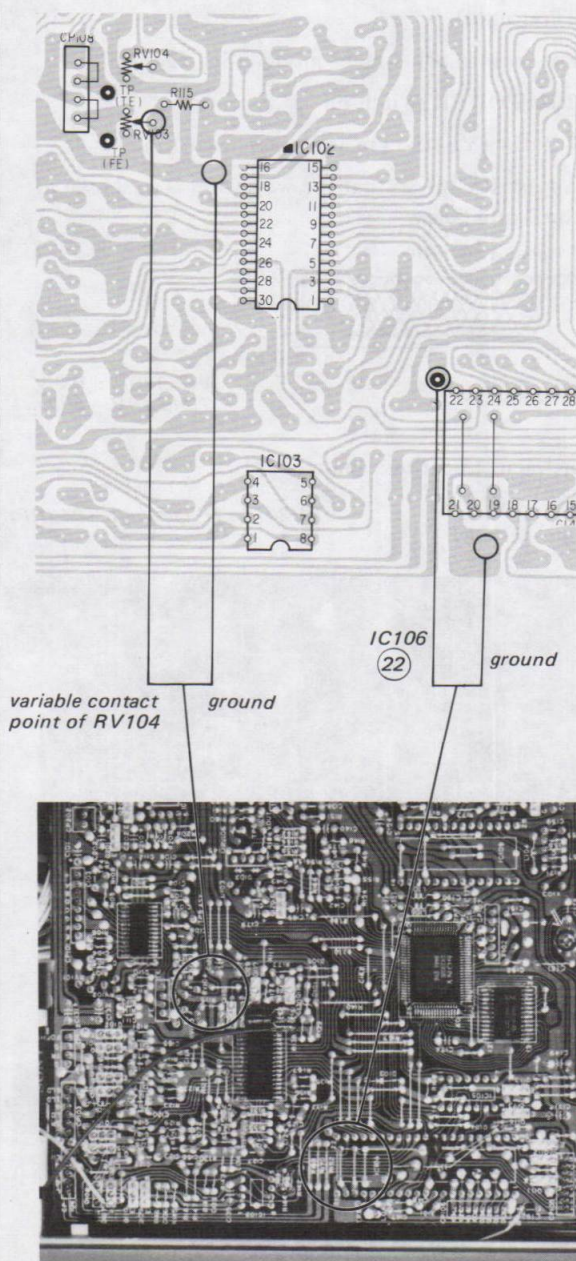
1. Perform adjustments in the order given.
2. Use YEDS-1 disc unless otherwise indicated.
3. Use the oscilloscope with more than 10 M $\Omega$  impedance.

#### Adjustment Mode

- Laser power adjustment (1), (3) and focus bias adjustment  
 . . . . Ground IC106 pin 22 (TEST) on main board.
- E-F balance adjustment  
 . . . . Ground IC106 pin 22 (TEST) and the variable contact point of RV104 (T.E) on main board.

**Note:** After adjustment, be sure to remove the lead wires connected above.

**Adjustment Location:** main board



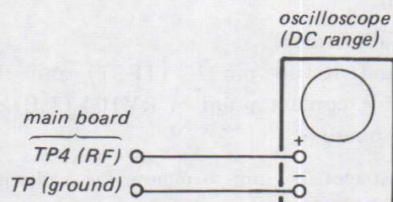


- Adjustment should be made in order of Laser power (1), Focus bias and Laser power (2).

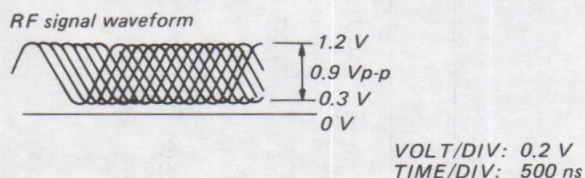
### Laser Power Adjustment (1)

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

#### Procedure:

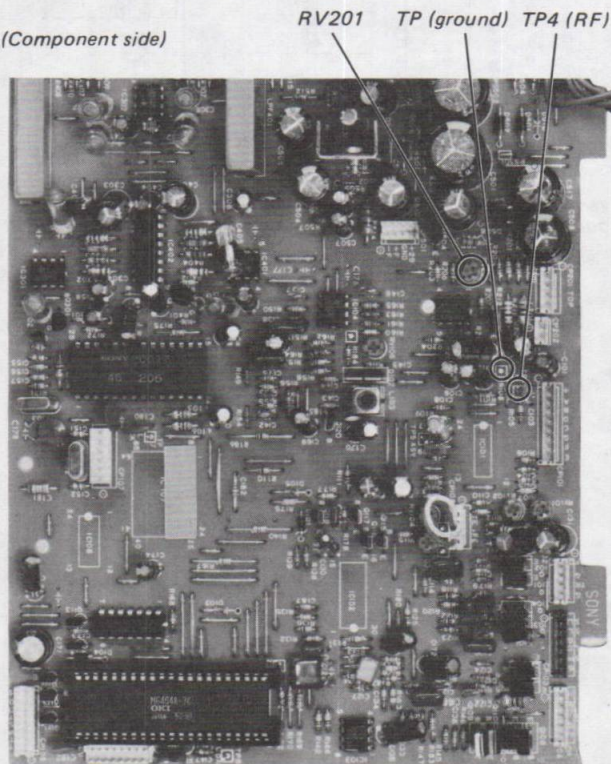


1. Connect oscilloscope to test points TP4 (RF) and TP(ground).
2. Put set into adjustment mode. (See page 23.)
3. Turn POWER switch on.
4. Put disc (YEDS-1) in and press ▷ button.
5. Adjust RV201 so that the waveform is as shown in the figure below.



Adjustment Location: main board

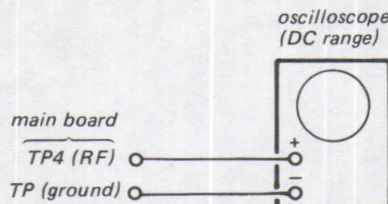
(Component side)



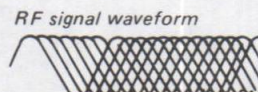
### Focus Bias Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

#### Procedure:

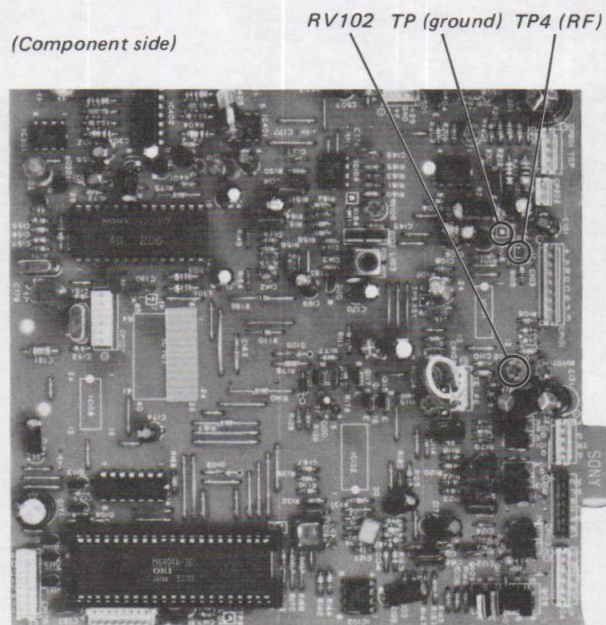


1. Connect oscilloscope to test points TP4 (RF) and TP (ground).
2. Put set into adjustment mode. (See page 23.)
3. Turn POWER switch on.
4. Put disc (YEDS-1) in and press ▷ button.
5. Adjust RV102 for an optimum waveform eye pattern or so that the peak is maximum. Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.



Adjustment Location: main board

(Component side)





### Laser Power Adjustment (2)

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

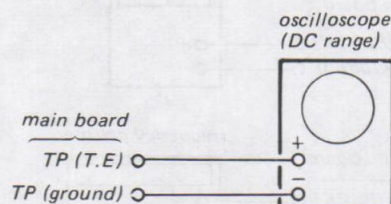
After laser power adjustment (1) and focus bias adjustment (2), check laser power again.

1. Check the waveform by the same procedure of laser power adjustment (1) on page 24.
2. If it is out of specification, adjust RV201 again.
3. After check or adjustment, cancel the adjustment mode. (See page 23.)

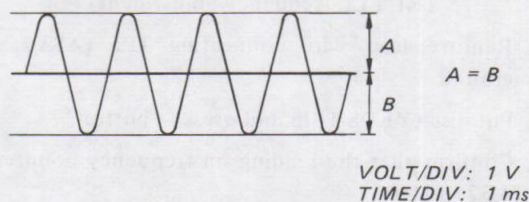
### E-F Balance Adjustment

This adjustment should be made when replacing TOP (T-type Optical Pick-up).

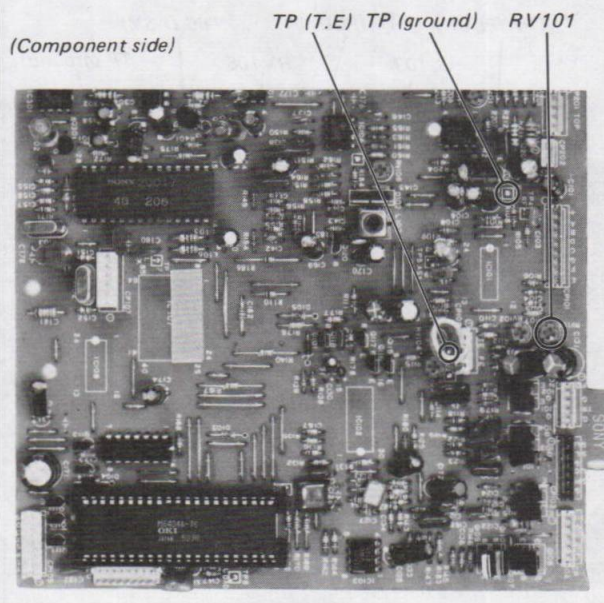
#### Procedure:



1. Connect oscilloscope to test point TP (T.E) and TP (ground).
2. Put set into adjustment mode. (See page 23.)
3. Turn POWER switch on.
4. Put disc (YEDS-1) in and press  $\triangleright$  button.
5. Adjust RV101 so that the traverse waveform is symmetrical above and below.
6. After adjustment, cancel the adjustment mode. (See page 23.)



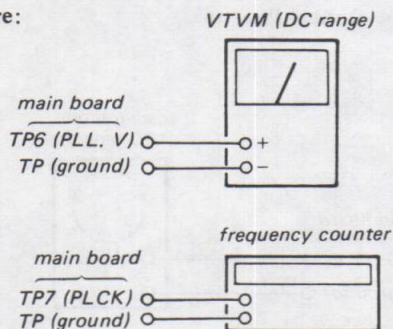
Adjustment Location: main board





## RF PLL Frequency Adjustment /Lock Frequency Check

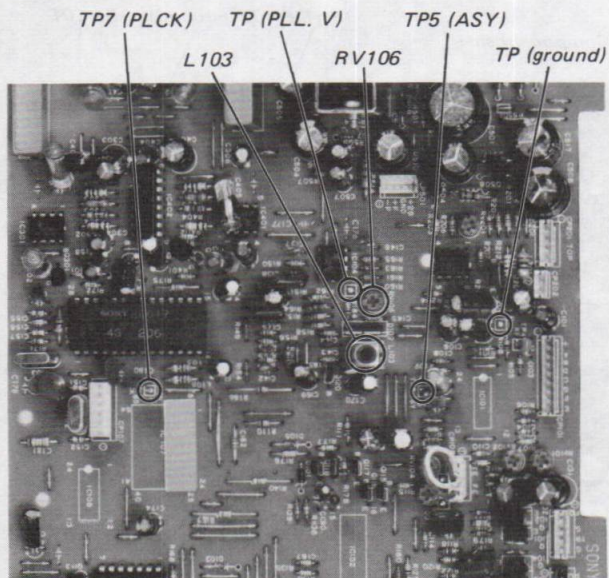
### Procedure:



1. Ground test point TP5 (ASY).
2. Connect VTVM to test points TP6 (PLL.V) and TP (ground).
3. Turn POWER switch on.
4. Adjust RV106 so that the reading on VTVM is  $0 \pm 50$  mV.
5. Connect the frequency counter to test points TP7 (PLCK) and TP (ground).
6. Adjust L103 so that the reading on frequency counter is 4.2818 MHz.  
... (RF PLL frequency adjustment)
7. Remove lead wire connecting TP5 (ASY) and ground.
8. Put disc (YEDS-1) in and press  $\triangleright$  button.
9. Confirm that the reading on frequency counter is 4.3218 MHz.

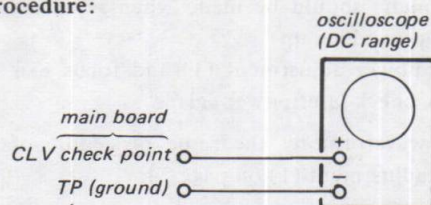
### Adjustment Location: main board

(Component side)

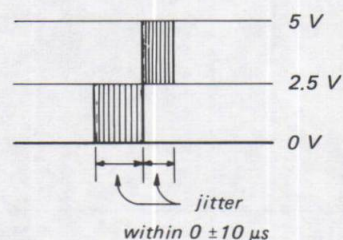


## CLV Phase Lock Check

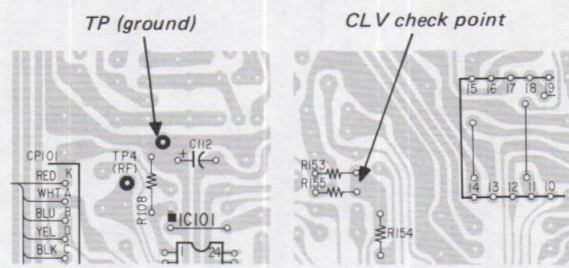
### Procedure:



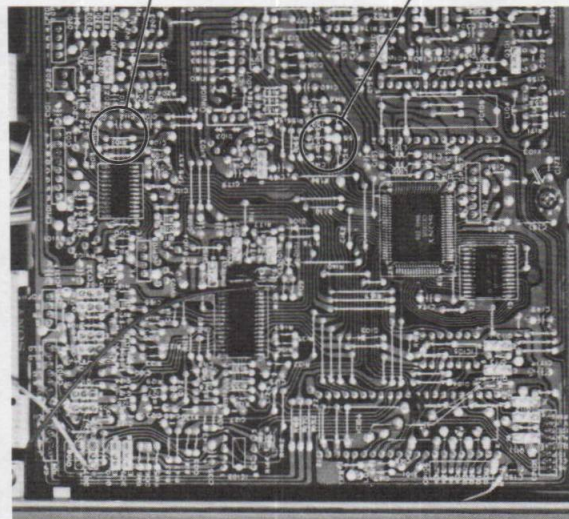
1. Connect oscilloscope to CLV check point (the point between IC107 pin ③ and R154) and TP (ground).
2. Turn POWER switch on.
3. Put disc (YEDS-1) in and press  $\triangleright$  button.
4. Check the waveform is as shown in the figure below.



### Adjustment Location: main board



(Conductor side)

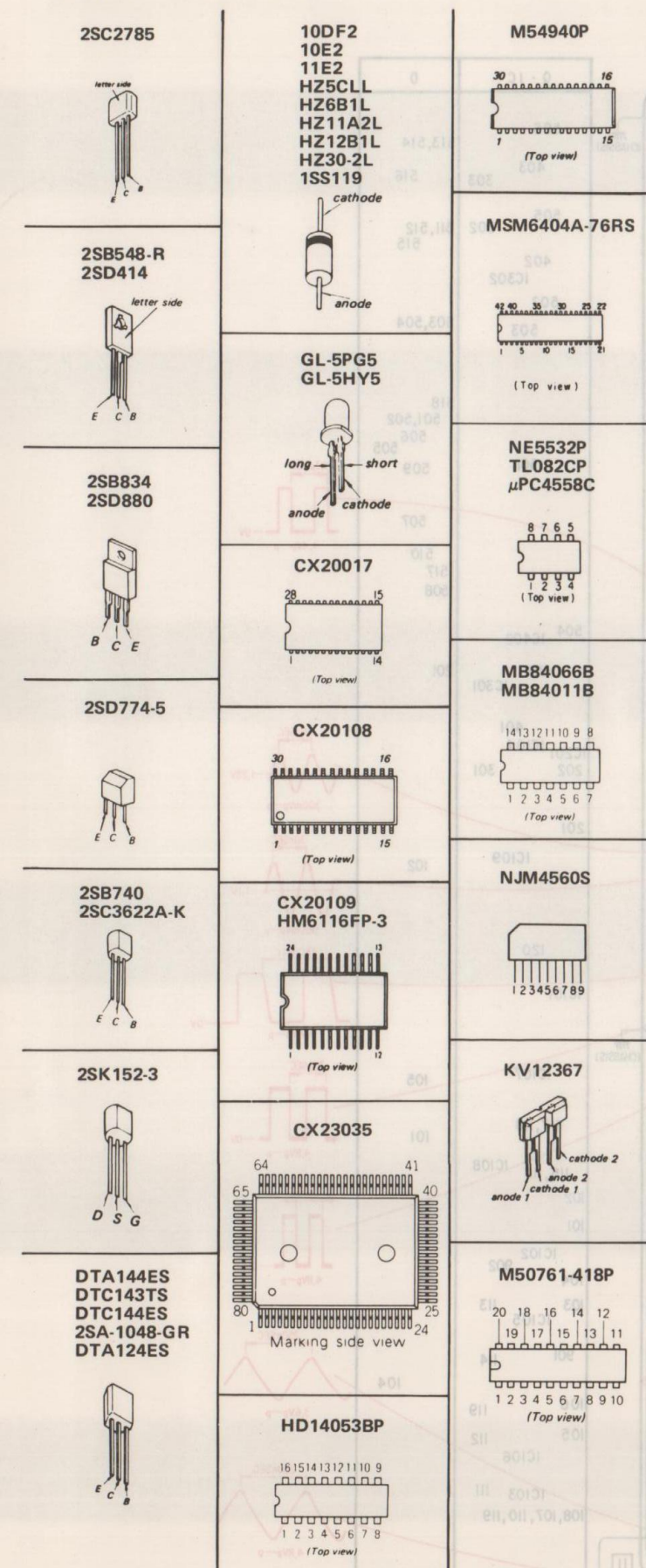








Semiconductor Lead Layouts



Note on Schematic Diagram.

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $1/4\text{W}$  or less unless otherwise specified.
- $\rightarrow$ : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- $\triangle$ : internal component.
- 1% shows tolerance.
- $\text{---}$ : B+ bus.
- $\text{---}$ : B- bus.
- $\square$ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 k $\Omega$ /V).
- no mark: STOP
- ( ) : PLAY
- Waveforms are taken to ground in Adjustment mode by using oscilloscope.
- Voltage variations may be noted due to normal production tolerances.

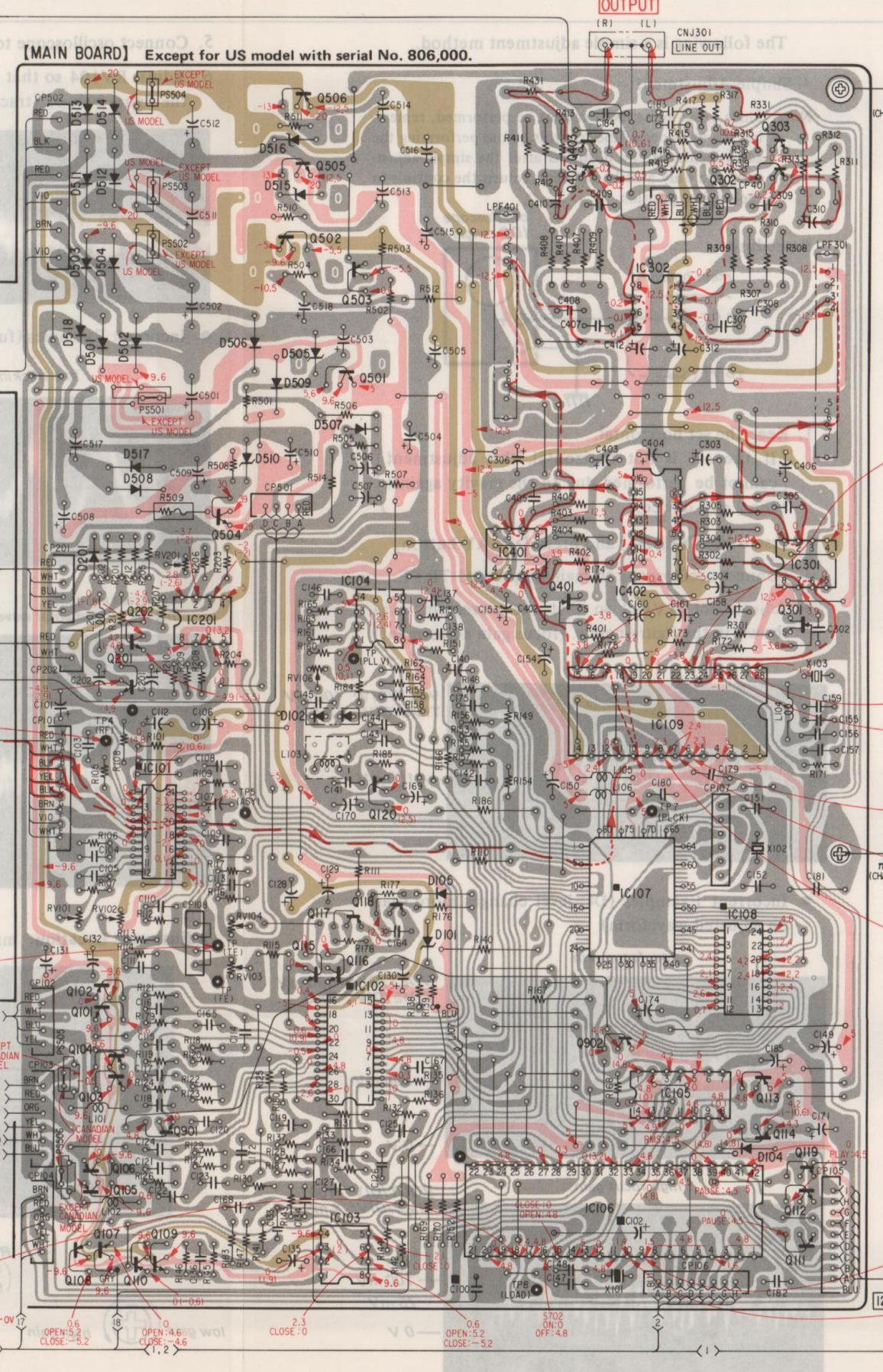
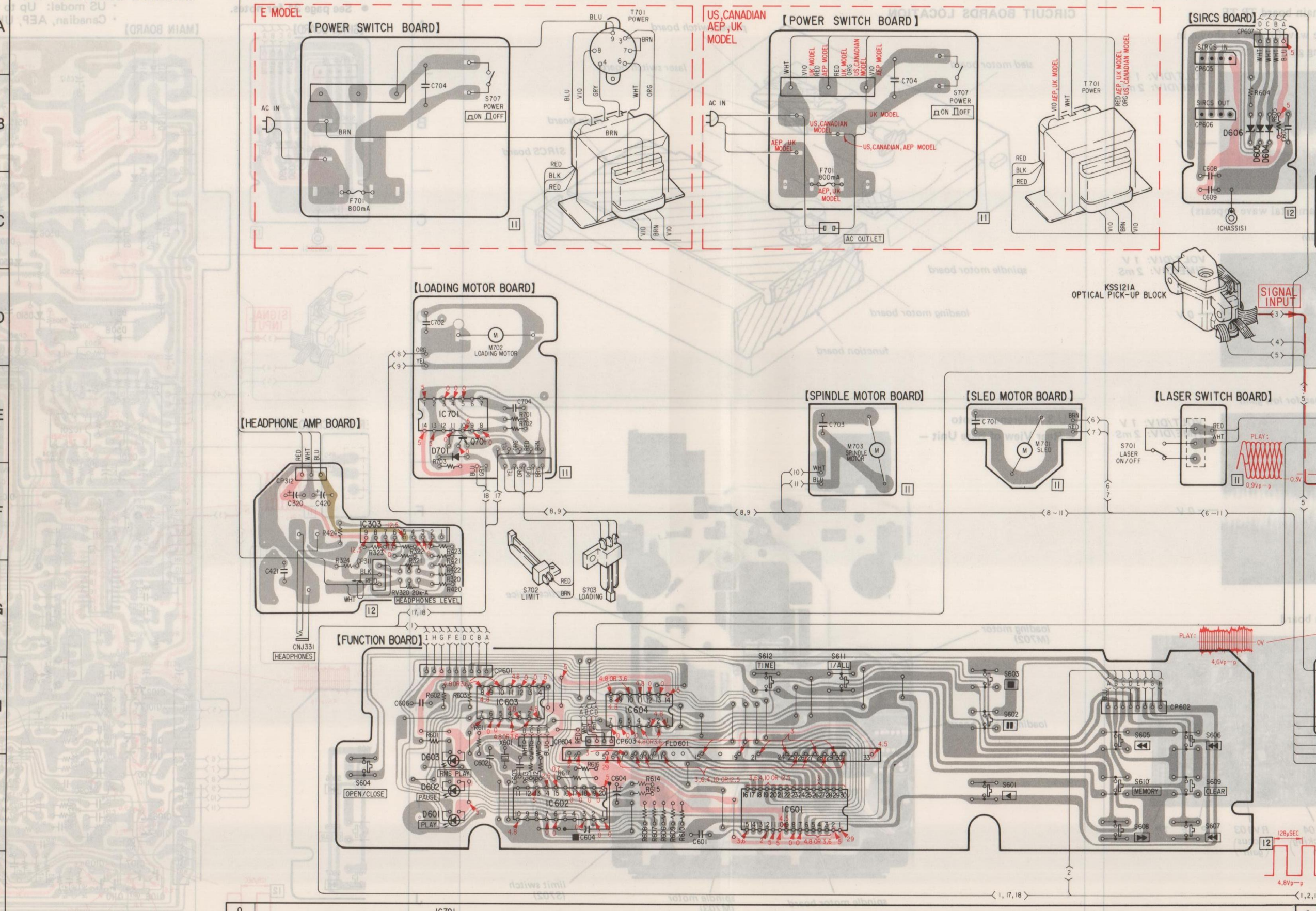
Note: The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note on Mounting Diagram.

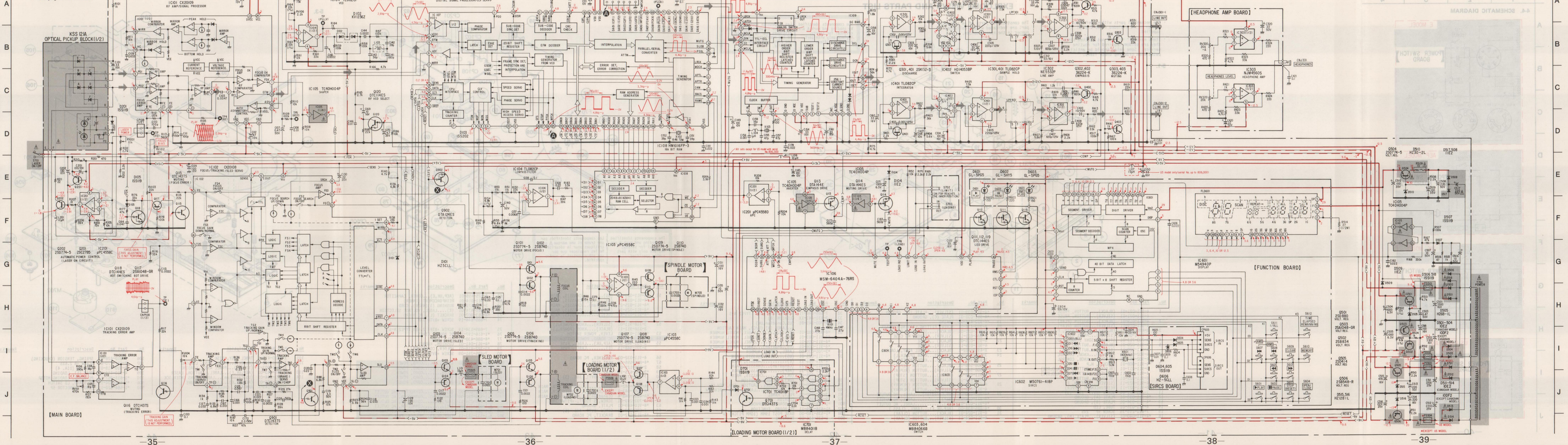
- $\bullet$ : parts extracted from the conductor side.
- $\blacksquare$ : part mounted on the conductor side.
- $\rightarrow$ : signal path
- $\text{---}$ : B+ pattern
- $\text{---}$ : B- pattern

4-2. MOUNTING DIAGRAM



| Q · IC          | D       |
|-----------------|---------|
| 506             | 513,514 |
| 403             | 303     |
| 505             | 302     |
| 402             | IC302   |
| 502             | 501,512 |
| 503             | 503,504 |
| 501             | 501,502 |
| 509             | 509     |
| 507             | 510     |
| 517             | 508     |
| 504             | IC402   |
| IC401           | IC301   |
| 201             | 201     |
| IC201           | IC104   |
| 202             | 301     |
| 201             | IC109   |
| 102             | 102     |
| IC101           | 105     |
| IC107           | 101     |
| 117,118         | 101     |
| 115,116         | IC108   |
| 102             | 902     |
| 104             | IC105   |
| 103             | 113     |
| 901             | 114     |
| 106             | 119     |
| 105             | 112     |
| IC106           | 111     |
| IC103           | 111     |
| 108,107,110,119 | 111     |
| Q · IC          | D       |



[illegible][illegible]

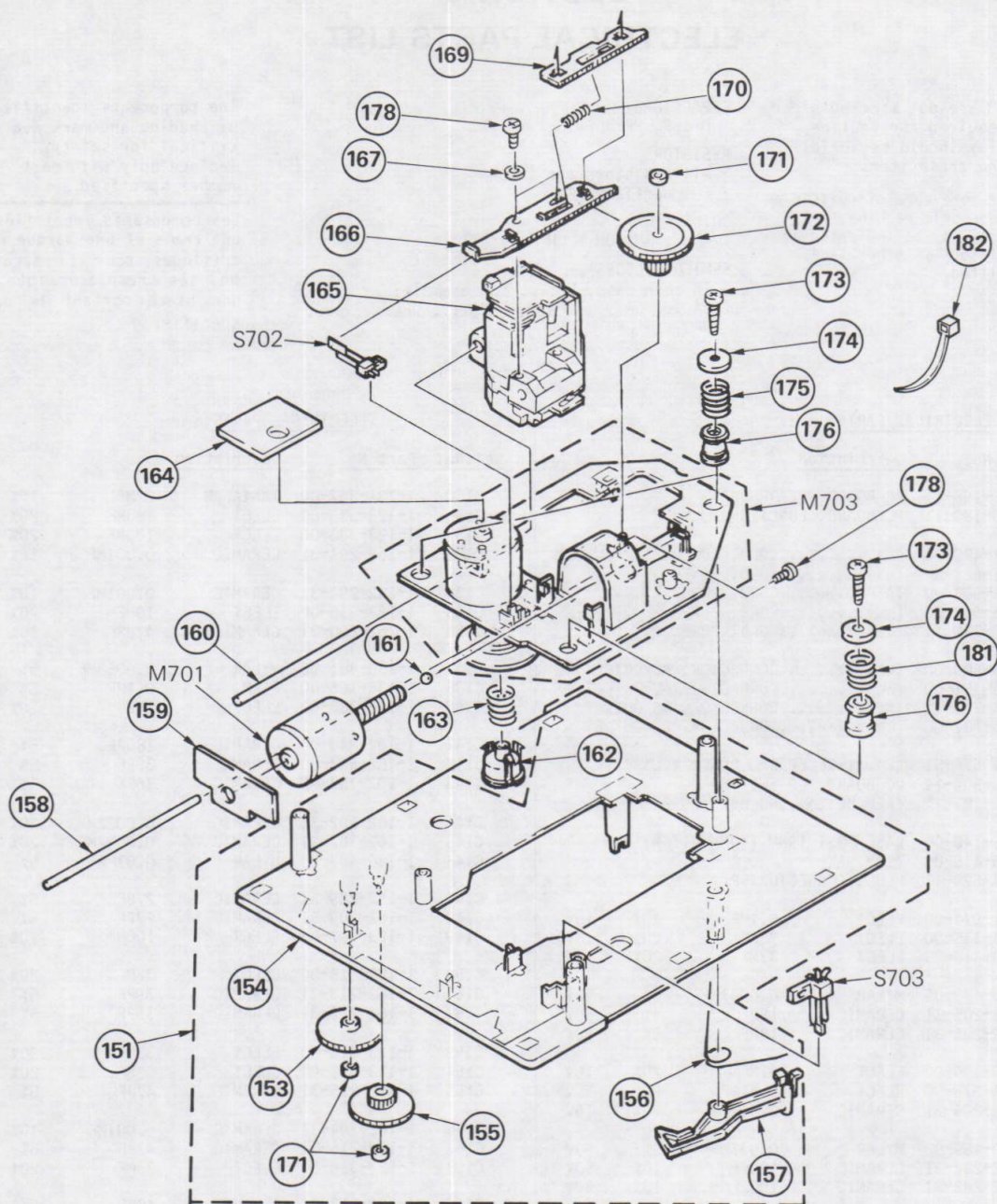


5-3.





5-4.



| No. | Part No.       | Description                | Remarks |
|-----|----------------|----------------------------|---------|
| 151 | *X-4910-405-1  | CHASSIS ASSY, LOADING      |         |
| 153 | 4-910-403-01   | GEAR (3), LOADING          |         |
| 154 | 4-910-448-01   | CHASSIS (OUTSERT), LOADING |         |
| 155 | 4-910-402-01   | GEAR (2), LOADING          |         |
| 156 | 4-910-412-01   | SPRING                     |         |
| 157 | *4-910-434-01  | LEVER, LOCK                |         |
| 158 | *4-910-431-01  | SHAFT, SLIDE               |         |
| 159 | *1-615-507-11  | PC BOARD, SL MOTOR         |         |
| 160 | *4-910-431-11  | SHAFT, SLIDE               |         |
| 161 | 7-671-112-11   | BALL, STEEL                |         |
| 162 | 4-910-437-01   | CAP, CENTERING             |         |
| 163 | 4-910-427-01   | SPRING, COMPRESSION        |         |
| 164 | *1-615-505-11  | PC BOARD, SP MOTOR         |         |
| 165 | A.8-848-016-01 | DEVICE, OPTICS (KSS-121A)  |         |

| No. | Part No.      | Description                      | Remarks |
|-----|---------------|----------------------------------|---------|
| 166 | 4-910-425-01  | RACK (A)                         |         |
| 167 | 7-688-002-01  | W 2.6, SMALL                     |         |
| 169 | 4-910-442-01  | RACK (B)                         |         |
| 170 | 4-910-462-01  | SPRING, COMPRESSION (RACK)       |         |
| 171 | 4-910-418-01  | BUSHING (DIA. 4)                 |         |
| 172 | 4-910-432-01  | GEAR, SLED                       |         |
| 173 | 7-687-605-29  | SCREW, TOTSU BTP 2.6X10 TYPE2    |         |
| 174 | 4-910-414-01  | RETAINER, SPRING                 |         |
| 175 | 4-910-423-01  | SPRING (FLOATING A), COMPRESSION |         |
| 176 | 4-910-413-01  | RUBBER, FLOATING                 |         |
| 178 | 7-621-775-15  | SCREW +B 2.6X4                   |         |
| 181 | 4-910-463-01  | SPRING, COMPRESSION (FLOATING B) |         |
| 182 | *3-701-748-00 | CLAMP                            |         |

The components identified by shading and mark A are critical for safety. Replace only with part number specified.

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



## SECTION 6

### ELECTRICAL PARTS LIST

## NOTE:

- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

## CAPACITORS:

MF:μF, PF:μμF.

## RESISTORS

All resistors are in ohms.

F: nonflammable

## COILS

MMH: mH, UH: μH

## SEMICONDUCTORS

In each case, U: μ, for example:

UA...: μA..., UP...: μPA..., UPC...: μPC,

UPD...: μPD...

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

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

## ELECTRICAL PARTS

| Ref.No. | Part No.                                                                                       | Description                        |
|---------|------------------------------------------------------------------------------------------------|------------------------------------|
| 901     | *1-616-196-11                                                                                  | PC BOARD, HEADPHONE                |
| 902     | *1-616-199-11                                                                                  | PC BOARD, FUNCTION                 |
| 903     |  1-551-472-00 | (E).....CORD, POWER                |
|         |  1-551-506-XX | (US).....CORD, POWER               |
|         |  1-551-908-00 | (AEP).....CORD, POWER              |
|         |  1-556-562-00 | (UK).....CORD, POWER               |
|         |  1-557-579-11 | (Canadian)....CORD, POWER          |
| 904     |  1-526-609-00 | (US).....CONNECTOR, AC OUTLET      |
|         |  1-526-751-00 | (UK).....CONNECTOR, AC OUTLET      |
|         |  1-526-794-11 | (AEP).....CONNECTOR, AC OUTLET     |
|         |  1-526-882-00 | (Canadian)....CONNECTOR, AC OUTLET |
| 905     |  1-526-576-51 | (E)....SELECTOR, POWER VOLTAGE     |
| 906     | *1-615-504-11                                                                                  | PC BOARD, LD SWITCH                |
| 907     |  1-533-183-11 | (AEP,UK,E)...HOLDER, FUSE          |
| 908     | *1-535-140-00                                                                                  | BASE POST 19MM (10MM PITCH) 3P     |
| 909     | 1-535-416-00                                                                                   | TERMINAL                           |
| 910     | *1-564-520-11                                                                                  | PLUG, CONNECTOR 5P                 |
| C100    | 1-161-974-00                                                                                   | ELECT 0.1MF 20% 16V                |
| C101    | 1-123-318-00                                                                                   | ELECT 33MF 20% 16V                 |
| C102    | 1-123-318-00                                                                                   | ELECT 33MF 20% 16V                 |
| C103    | 1-130-479-00                                                                                   | MYLAR 0.0047MF 5% 50V              |
| C104    | 1-162-205-31                                                                                   | CERAMIC 18PF 5% 50V                |
| C105    | 1-162-205-31                                                                                   | CERAMIC 18PF 5% 50V                |
| C106    | 1-123-306-00                                                                                   | ELECT 47MF 20% 10V                 |
| C107    | 1-123-379-00                                                                                   | ELECT 0.47MF 20% 50V               |
| C108    | 1-162-306-31                                                                                   | CERAMIC 0.01MF 20% 16V             |
| C109    | 1-130-489-00                                                                                   | MYLAR 0.033MF 5% 50V               |
| C110    | 1-162-282-31                                                                                   | CERAMIC 100PF 10% 50V              |
| C111    | 1-162-282-31                                                                                   | CERAMIC 100PF 10% 50V              |
| C112    | 1-123-306-00                                                                                   | ELECT 47MF 20% 10V                 |
| C113    | 1-162-302-31                                                                                   | CERAMIC 0.0022MF 20% 16V           |
| C114    | 1-162-302-31                                                                                   | CERAMIC 0.0022MF 20% 16V           |
| C115    | 1-136-165-00                                                                                   | FILM 0.1MF 5% 50V                  |
| C116    | 1-162-290-31                                                                                   | MYLAR 470PF 10% 50V                |
| C117    | 1-162-302-31                                                                                   | CERAMIC 0.0022MF 20% 16V           |
| C118    | 1-130-489-00                                                                                   | MYLAR 0.033MF 5% 50V               |
| C119    | 1-124-184-00                                                                                   | ELECT 3.3MF 20% 50V                |
| C120    | 1-136-169-00                                                                                   | FILM 0.22MF 5% 50V                 |
| C121    | 1-162-302-31                                                                                   | CERAMIC 0.0022MF 20% 16V           |
| C122    | 1-130-475-00                                                                                   | MYLAR 0.0022MF 5% 50V              |
| C123    | 1-130-487-00                                                                                   | MYLAR 0.022MF 5% 50V               |
| C124    | 1-162-291-31                                                                                   | CERAMIC 560PF 10% 50V              |
| C125    | 1-136-161-00                                                                                   | FILM 0.047MF 5% 50V                |
| C126    | 1-136-169-00                                                                                   | FILM 0.22MF 5% 50V                 |
| C127    | 1-130-489-00                                                                                   | MYLAR 0.033MF 5% 50V               |
| C128    | 1-123-307-00                                                                                   | ELECT 100MF 20% 10V                |
| C129    | 1-123-307-00                                                                                   | ELECT 100MF 20% 10V                |

## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description              |
|---------|--------------|--------------------------|
| C130    | 1-131-367-00 | TANTALUM 22MF 10% 20V    |
| C131    | 1-123-333-00 | ELECT 100MF 20% 16V      |
| C132    | 1-123-333-00 | ELECT 100MF 20% 16V      |
| C133    | 1-162-294-31 | CERAMIC 0.001MF 10% 50V  |
| C134    | 1-162-294-31 | CERAMIC 0.001MF 10% 50V  |
| C135    | 1-123-356-00 | ELECT 10MF 20% 50V       |
| C136    | 1-162-290-31 | CERAMIC 470PF 10% 50V    |
| C137    | 1-130-481-00 | MYLAR 0.0068MF 5% 50V    |
| C138    | 1-136-165-00 | FILM 0.1MF 5% 50V        |
| C140    | 1-123-380-00 | ELECT 1MF 20% 50V        |
| C141    | 1-102-848-00 | CERAMIC 180PF 5% 50V     |
| C142    | 1-102-647-00 | CERAMIC 39PF 5% 50V      |
| C143    | 1-102-753-00 | CERAMIC 36PF 5% 50V      |
| C144    | 1-162-302-31 | CERAMIC 0.0022MF 20% 16V |
| C145    | 1-162-302-31 | CERAMIC 0.0022MF 20% 16V |
| C146    | 1-130-483-00 | MYLAR 0.01MF 5% 50V      |
| C147    | 1-162-209-31 | CERAMIC 27PF 5% 50V      |
| C148    | 1-162-209-31 | CERAMIC 27PF 5% 50V      |
| C149    | 1-123-307-00 | ELECT 100MF 20% 10V      |
| C150    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C151    | 1-162-213-31 | CERAMIC 39PF 5% 50V      |
| C152    | 1-162-213-31 | CERAMIC 39PF 5% 50V      |
| C153    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C154    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C155    | 1-162-215-31 | CERAMIC 47PF 5% 50V      |
| C156    | 1-162-294-31 | CERAMIC 0.001MF 10% 50V  |
| C157    | 1-162-215-31 | CERAMIC 47PF 5% 50V      |
| C158    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C159    | 1-102-513-00 | CERAMIC 18PF 5% 50V      |
| C160    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C161    | 1-123-318-00 | ELECT 33MF 20% 16V       |
| C164    | 1-136-161-00 | FILM 0.047MF 5% 50V      |
| C165    | 1-136-169-00 | FILM 0.22MF 5% 50V       |
| C166    | 1-162-294-31 | CERAMIC 0.001MF 10% 50V  |
| C167    | 1-162-294-31 | CERAMIC 0.001MF 10% 50V  |
| C168    | 1-136-169-00 | FILM 0.22MF 5% 50V       |
| C169    | 1-123-356-00 | ELECT 10MF 20% 50V       |
| C170    | 1-123-369-00 | ELECT 4.7MF 20% 25V      |
| C171    | 1-124-471-00 | ELECT 1000MF 20% 6.3V    |
| C172    | 1-124-183-00 | ELECT 2.2MF 20% 50V      |
| C173    | 1-162-291-31 | CERAMIC 560PF 10% 50V    |
| C174    | 1-123-308-00 | ELECT 220MF 20% 10V      |
| C175    | 1-136-165-00 | FILM 0.1MF 5% 50V        |
| C178    | 1-101-005-00 | CERAMIC 0.022MF 50V      |
| C179    | 1-161-974-00 | CERAMIC 0.1MF 20% 16V    |
| C180    | 1-161-974-00 | CERAMIC 0.1MF 20% 16V    |



## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description |          |     |      |
|---------|--------------|-------------|----------|-----|------|
| C181    | 1-161-494-00 | CERAMIC     | 0.022MF  | 30% | 25V  |
| C182    | 1-101-005-00 | CERAMIC     | 0.022MF  |     | 50V  |
| C183    | 1-162-291-31 | CERAMIC     | 560PF    | 10% | 50V  |
| C184    | 1-162-300-11 | CERAMIC     | 0.01MF   | 30% | 16V  |
| C185    | 1-123-307-00 | ELECT       | 100MF    | 20% | 10V  |
| C201    | 1-123-307-00 | ELECT       | 100MF    | 20% | 10V  |
| C202    | 1-123-307-00 | ELECT       | 100MF    | 20% | 10V  |
| C302    | 1-104-240-00 | POLYSTYRENE | 0.001MF  | 5%  | 125V |
| C303    | 1-123-308-00 | ELECT       | 220MF    | 20% | 10V  |
| C304    | 1-123-333-00 | ELECT       | 100MF    | 20% | 16V  |
| C305    | 1-104-233-00 | POLYSTYRENE | 220PF    | 5%  | 125V |
| C306    | 1-123-318-00 | ELECT       | 33MF     | 20% | 16V  |
| C307    | 1-104-235-00 | POLYSTYRENE | 820PF    | 5%  | 125V |
| C308    | 1-104-235-00 | POLYSTYRENE | 820PF    | 5%  | 125V |
| C309    | 1-130-289-00 | FILM        | 0.0047MF | 5%  | 100V |
| C310    | 1-123-384-00 | ELECT       | 10MF     | 20% | 50V  |
| C312    | 1-123-318-00 | ELECT       | 33MF     | 20% | 16V  |
| C320    | 1-123-330-00 | ELECT       | 22MF     | 20% | 25V  |
| C402    | 1-104-240-00 | POLYSTYRENE | 0.001MF  | 5%  | 125V |
| C403    | 1-123-308-00 | ELECT       | 220MF    | 20% | 10V  |
| C404    | 1-123-307-00 | ELECT       | 100MF    | 20% | 10V  |
| C405    | 1-104-233-00 | POLYSTYRENE | 220PF    | 5%  | 125V |
| C406    | 1-123-318-00 | ELECT       | 33MF     | 20% | 16V  |
| C407    | 1-104-235-00 | POLYSTYRENE | 820PF    | 5%  | 125V |
| C408    | 1-104-235-00 | POLYSTYRENE | 820PF    | 5%  | 125V |
| C409    | 1-130-289-00 | FILM        | 0.0047MF | 5%  | 100V |
| C410    | 1-123-384-00 | ELECT       | 10MF     | 20% | 50V  |
| C412    | 1-123-318-00 | ELECT       | 33MF     | 20% | 16V  |
| C420    | 1-123-330-00 | ELECT       | 22MF     | 20% | 25V  |
| C421    | 1-161-974-00 | CERAMIC     | 0.1MF    | 20% | 16V  |
| C501    | 1-123-326-00 | ELECT       | 3300MF   | 20% | 16V  |
| C502    | 1-123-326-00 | ELECT       | 3300MF   | 20% | 16V  |
| C503    | 1-123-379-00 | ELECT       | 0.47MF   | 20% | 50V  |
| C504    | 1-123-299-00 | ELECT       | 1000MF   | 20% | 6.3V |
| C505    | 1-123-299-00 | ELECT       | 1000MF   | 20% | 6.3V |
| C506    | 1-123-356-00 | ELECT       | 10MF     | 20% | 50V  |
| C507    | 1-123-356-00 | ELECT       | 10MF     | 20% | 50V  |
| C508    | 1-123-361-00 | ELECT       | 220MF    | 20% | 50V  |
| C509    | 1-123-345-00 | ELECT       | 100MF    | 20% | 35V  |
| C510    | 1-123-345-00 | ELECT       | 100MF    | 20% | 35V  |
| C511    | 1-123-338-00 | ELECT       | 2200MF   | 20% | 25V  |
| C512    | 1-123-338-00 | ELECT       | 2200MF   | 20% | 25V  |
| C513    | 1-123-321-00 | ELECT       | 220MF    | 20% | 16V  |
| C514    | 1-123-321-00 | ELECT       | 220MF    | 20% | 16V  |
| C515    | 1-123-323-00 | ELECT       | 470MF    | 20% | 16V  |
| C516    | 1-123-334-00 | ELECT       | 220MF    | 20% | 25V  |
| C517    | 1-123-361-00 | ELECT       | 220MF    | 20% | 50V  |
| C518    | 1-123-333-00 | ELECT       | 100MF    | 20% | 16V  |
| C601    | 1-162-294-31 | CERAMIC     | 0.001MF  | 10% | 50V  |
| C602    | 1-162-284-31 | CERAMIC     | 150PF    | 10% | 50V  |
| C603    | 1-162-284-31 | CERAMIC     | 150PF    | 10% | 50V  |
| C604    | 1-131-380-00 | TANTALUM    | 33MF     | 20% | 10V  |
| C606    | 1-101-005-00 | CERAMIC     | 0.022MF  |     | 50V  |
| C607    | 1-162-113-00 | CERAMIC     | 0.01MF   | 30% | 16V  |
| C608    | 1-161-974-00 | CERAMIC     | 0.1MF    | 20% | 16V  |
| C609    | 1-161-974-00 | CERAMIC     | 0.1MF    | 20% | 16V  |

## ELECTRICAL PARTS

| Ref.No. | Part No.      | Description                   |          |     |      |
|---------|---------------|-------------------------------|----------|-----|------|
| C701    | 1-102-121-00  | CERAMIC                       | 0.0022MF | 10% | 50V  |
| C702    | 1-102-121-00  | CERAMIC                       | 0.0022MF | 10% | 50V  |
| C703    | 1-102-121-00  | CERAMIC                       | 0.0022MF | 10% | 50V  |
| C704    | 1-161-744-00  | CERAMIC                       | 0.01MF   |     | 400V |
| CNJ301  | 1-562-830-11  | JACK, PIN 2P (LINE OUT)       |          |     |      |
| CNJ331  | 1-507-863-21  | JACK, LARGE TYPE (HEADPHONES) |          |     |      |
| CP101   | *1-564-511-41 | PLUG, CONNECTOR 8P            |          |     |      |
| CP102   | *1-564-507-41 | PLUG, CONNECTOR 4P            |          |     |      |
| CP103   | *1-564-509-11 | PLUG, CONNECTOR 6P            |          |     |      |
| CP104   | *1-564-508-11 | PLUG, CONNECTOR 5P            |          |     |      |
| CP105   | *1-506-503-11 | PIN, CONNECTOR 9P             |          |     |      |
| CP106   | *1-564-342-11 | PIN, CONNECTOR 8P             |          |     |      |
| CP107   | *1-560-064-00 | PIN, CONNECTOR 6P             |          |     |      |
| CP108   | *1-564-507-11 | PLUG, CONNECTOR 4P            |          |     |      |
| CP201   | *1-564-507-21 | PLUG, CONNECTOR 4P            |          |     |      |
| CP202   | *1-564-505-11 | PLUG, CONNECTOR 2P            |          |     |      |
| CP310   | *1-564-506-11 | PLUG, CONNECTOR 3P            |          |     |      |
| CP311   | *1-564-506-11 | PLUG, CONNECTOR 3P            |          |     |      |
| CP401   | *1-564-509-11 | PLUG, CONNECTOR 6P            |          |     |      |
| CP501   | *1-564-338-00 | PIN, CONNECTOR 4P             |          |     |      |
| CP502   | *1-535-119-00 | TERMINAL                      |          |     |      |
| CP605   | *1-560-039-00 | PIN, CONNECTOR                |          |     |      |
| CP606   | *1-560-039-00 | PIN, CONNECTOR                |          |     |      |
| CP607   | *1-564-497-11 | PIN, CONNECTOR 4P             |          |     |      |
| D101    | 8-719-951-13  | DIODE HZ5CLL                  |          |     |      |
| D102    | 8-719-902-79  | DIODE KV1236Z                 |          |     |      |
| D104    | 8-719-200-23  | DIODE 11E2                    |          |     |      |
| D105    | 8-719-911-19  | DIODE 1SS119                  |          |     |      |
| D201    | 8-719-911-19  | DIODE 1SS119                  |          |     |      |
| D501    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D501    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D502    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D502    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D503    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D503    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D504    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D504    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D505    | 8-719-910-64  | DIODE HZ6B1L                  |          |     |      |
| D506    | 8-719-911-19  | DIODE 1SS119                  |          |     |      |
| D507    | 8-719-911-19  | DIODE 1SS119                  |          |     |      |
| D508    | 8-719-200-23  | DIODE 11E2                    |          |     |      |
| D509    | 8-719-200-23  | DIODE 11E2                    |          |     |      |
| D510    | 8-719-913-02  | DIODE HZ30-2L                 |          |     |      |
| D511    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D511    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D512    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D512    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D513    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D513    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D514    | 8-719-210-12  | (US,AEP,UK,E)...DIODE 10DF2   |          |     |      |
| D514    | 8-719-200-02  | (Canadian).....DIODE 10E-2    |          |     |      |
| D515    | 8-719-910-24  | DIODE HZ12B1L                 |          |     |      |
| D516    | 8-719-910-24  | DIODE HZ12B1L                 |          |     |      |
| D517    | 8-719-200-23  | DIODE 11E2                    |          |     |      |
| D518    | 8-719-911-19  | DIODE 1SS119                  |          |     |      |
| D519    | 8-719-910-12  | DIODE HZ11A2L                 |          |     |      |
| D601    | 8-719-900-65  | DIODE GL-5PG5                 |          |     |      |
| D602    | 8-719-900-57  | DIODE GL-5HY5                 |          |     |      |
| D603    | 8-719-900-65  | DIODE GL-5PG5                 |          |     |      |

The components identified by shading and mark A are critical for safety. Replace only with part number specified.

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



## ELECTRICAL PARTS

| Ref.No. | Part No.       | Description                        |
|---------|----------------|------------------------------------|
| D604    | 8-719-911-19   | DIODE 1SS119                       |
| D605    | 8-719-911-19   | DIODE 1SS119                       |
| D606    | 8-719-951-13   | DIODE HZ5CLL                       |
| D701    | 8-719-911-19   | DIODE 1SS119                       |
| F701    | △.1-532-215-00 | (AEP,UK)...FUSE, TIME-LAG (0.800A) |
| F701    | △.1-532-285-00 | (E).....FUSE, TIME-LAG (1.250A)    |
| FLD601  | 1-519-349-11   | INDICATOR TUBE, FLUORESCENT        |
| IC101   | 8-752-010-90   | IC CX20109                         |
| IC102   | 8-752-010-80   | IC CX20108                         |
| IC103   | 8-759-145-58   | IC UPC4558C                        |
| IC104   | 8-759-990-82   | IC TL082CP                         |
| △.IC105 | 8-759-220-04   | IC TC40H004P                       |
| IC106   | 8-759-920-05   | IC MSM6404A-76RS                   |
| IC107   | 8-759-912-52   | IC CX23035                         |
| IC108   | 8-759-302-69   | IC HM6116FP-3                      |
| IC109   | 8-752-001-70   | IC CX20017                         |
| IC201   | 8-759-145-58   | IC UPC4558C                        |
| IC301   | 8-759-990-82   | IC TL082CP                         |
| IC302   | 8-759-900-72   | IC NE5532P                         |
| IC303   | 8-759-700-40   | IC NJM4560S                        |
| IC401   | 8-759-990-82   | IC TL082CP                         |
| IC402   | 8-759-340-53   | IC HD14053BP                       |
| IC601   | 8-759-600-35   | IC M54940P                         |
| IC602   | 8-759-602-71   | IC M50761-418P                     |
| IC603   | 8-759-984-66   | IC MB84066B                        |
| IC604   | 8-759-984-66   | IC MB84066B                        |
| IC701   | 8-759-984-11   | IC MB84011B                        |
| L101    | 1-408-117-00   | MICRO INDUCTOR 10UH                |
| L102    | 1-408-117-00   | MICRO INDUCTOR 10UH                |
| L103    | 1-426-212-11   | COIL (RF)                          |
| L104    | 1-408-551-00   | MICRO INDUCTOR 1UH                 |
| L105    | 1-408-563-00   | MICRO INDUCTOR 10UH                |
| L106    | 1-408-563-00   | MICRO INDUCTOR 10UH                |
| L107    | 1-408-563-00   | MICRO INDUCTOR 10UH                |
| L201    | 1-408-117-00   | MICRO INDUCTOR 10UH                |
| LPF301  | 1-464-273-00   | FILTER UNIT, LOW PASS              |
| LPF401  | 1-464-273-00   | FILTER UNIT, LOW PASS              |
| M701    | A-4608-308-A   | MOTOR ASSY, THREAD                 |
| M702    | A-4608-307-A   | MOTOR ASSY, LOADING                |
| M703    | X-4910-411-1   | MOTOR ASSY, SPINDLE                |
| △.PS501 | 1-532-675-00   | (EXCEPT US) LINK, IC               |
| △.PS502 | 1-532-675-00   | (EXCEPT US) LINK, IC               |
| △.PS503 | 1-532-685-00   | (EXCEPT US) LINK, IC               |
| △.PS504 | 1-532-685-00   | (EXCEPT US) LINK, IC               |
| △.PS505 | 1-532-685-00   | (CANADIAN) LINK, IC                |
| △.PS506 | 1-532-685-00   | (CANADIAN) LINK, IC                |
| Q101    | 8-729-177-44   | TRANSISTOR 2SD774-5                |
| Q102    | 8-729-374-02   | TRANSISTOR 2SB740                  |
| Q103    | 8-729-177-44   | TRANSISTOR 2SD774-5                |
| Q104    | 8-729-374-02   | TRANSISTOR 2SB740                  |
| Q105    | 8-729-177-44   | TRANSISTOR 2SD774-5                |
| Q106    | 8-729-374-02   | TRANSISTOR 2SB740                  |
| Q107    | 8-729-177-44   | TRANSISTOR 2SD774-5                |
| Q108    | 8-729-374-02   | TRANSISTOR 2SB740                  |
| Q109    | 8-729-177-44   | TRANSISTOR 2SD774-5                |
| Q110    | 8-729-374-02   | TRANSISTOR 2SB740                  |
| Q111    | 8-729-900-89   | TRANSISTOR DTC144ES                |

## ELECTRICAL PARTS

| Ref.No. | Part No.       | Description           |
|---------|----------------|-----------------------|
| Q112    | 8-729-900-89   | TRANSISTOR DTC144ES   |
| Q113    | 8-729-900-65   | TRANSISTOR DTA144ES   |
| Q114    | 8-729-900-65   | TRANSISTOR DTA144ES   |
| Q115    | 8-729-900-74   | TRANSISTOR DTC143TS   |
| Q116    | 8-729-900-74   | TRANSISTOR DTC143TS   |
| Q117    | 8-729-204-83   | TRANSISTOR 2SA1048-GR |
| Q118    | 8-729-900-89   | TRANSISTOR DTC144ES   |
| Q119    | 8-729-900-89   | TRANSISTOR DTC144ES   |
| Q120    | 8-729-900-80   | TRANSISTOR DTC114ES   |
| Q201    | 8-729-178-54   | TRANSISTOR 2SC2785    |
| Q202    | 8-729-177-44   | TRANSISTOR 2SD774-5   |
| Q301    | 8-729-800-43   | TRANSISTOR 2SK152-3   |
| Q302    | 8-729-107-99   | TRANSISTOR 2SC3622A-K |
| Q303    | 8-729-107-99   | TRANSISTOR 2SC3622A-K |
| Q401    | 8-729-800-43   | TRANSISTOR 2SK152-3   |
| Q402    | 8-729-107-99   | TRANSISTOR 2SC3622A-K |
| Q403    | 8-729-107-99   | TRANSISTOR 2SC3622A-K |
| Q501    | △.8-729-288-02 | TRANSISTOR 2SD880     |
| Q502    | △.8-729-283-42 | TRANSISTOR 2SB834     |
| Q503    | △.8-729-204-83 | TRANSISTOR 2SA1048-GR |
| Q504    | △.8-729-177-44 | TRANSISTOR 2SD774-5   |
| Q505    | △.8-729-141-43 | TRANSISTOR 2SD414     |
| Q506    | △.8-729-154-82 | TRANSISTOR 2SB548-R   |
| Q701    | 8-729-900-74   | TRANSISTOR DTC143TS   |
| Q901    | 8-729-900-74   | TRANSISTOR DTC143TS   |
| Q902    | 8-729-900-63   | TRANSISTOR TTA124ES   |
| R101    | 1-247-831-00   | CARBON 1K 5% 1/6W     |
| R105    | 1-247-861-00   | CARBON 18K 5% 1/6W    |
| R106    | 1-247-893-00   | CARBON 390K 5% 1/6W   |
| R107    | 1-247-883-00   | CARBON 150K 5% 1/6W   |
| R108    | 1-247-855-00   | CARBON 10K 5% 1/6W    |
| R109    | 1-247-879-00   | CARBON 100K 5% 1/6W   |
| R110    | 1-247-855-00   | CARBON 10K 5% 1/6W    |
| R111    | 1-247-855-00   | CARBON 10K 5% 1/6W    |
| R112    | 1-247-881-00   | CARBON 120K 5% 1/6W   |
| R113    | 1-247-897-00   | CARBON 560K 5% 1/6W   |
| R114    | 1-247-883-00   | CARBON 150K 5% 1/6W   |
| R115    | 1-247-863-00   | CARBON 22K 5% 1/6W    |
| R116    | 1-247-867-00   | CARBON 33K 5% 1/6W    |
| R117    | 1-247-863-00   | CARBON 22K 5% 1/6W    |
| R118    | 1-247-807-00   | CARBON 100 5% 1/6W    |
| R119    | 1-247-847-00   | CARBON 4.7K 5% 1/6W   |
| R120    | 1-247-819-00   | CARBON 330 5% 1/6W    |
| R121    | 1-247-865-00   | CARBON 27K 5% 1/6W    |
| R122    | 1-247-807-00   | CARBON 100 5% 1/6W    |
| R123    | 1-247-845-00   | CARBON 3.9K 5% 1/6W   |
| R124    | 1-247-873-00   | CARBON 56K 5% 1/6W    |
| R125    | 1-247-855-00   | CARBON 10K 5% 1/6W    |
| R126    | 1-247-807-00   | CARBON 100 5% 1/6W    |
| R127    | 1-247-831-00   | CARBON 1K 5% 1/6W     |
| R128    | 1-247-869-00   | CARBON 39K 5% 1/6W    |
| R129    | 1-247-865-00   | CARBON 27K 5% 1/6W    |
| R130    | 1-247-903-00   | CARBON 1M 5% 1/6W     |
| R131    | 1-247-879-00   | CARBON 100K 5% 1/6W   |
| R132    | 1-247-837-00   | CARBON 1.8K 5% 1/6W   |
| R133    | 1-247-851-00   | CARBON 6.8K 5% 1/6W   |
| R134    | 1-247-831-00   | CARBON 1K 5% 1/6W     |
| R135    | 1-247-859-00   | CARBON 15K 5% 1/6W    |
| R136    | 1-247-855-00   | CARBON 10K 5% 1/6W    |

The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

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



## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description |      |    |      |
|---------|--------------|-------------|------|----|------|
| R137    | 1-247-871-00 | CARBON      | 47K  | 5% | 1/6W |
| R138    | 1-247-864-00 | CARBON      | 24K  | 5% | 1/6W |
| R139    | 1-247-851-00 | CARBON      | 6.8K | 5% | 1/6W |
| R140    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R141    | 1-247-878-00 | CARBON      | 91K  | 5% | 1/6W |
| R142    | 1-247-877-00 | CARBON      | 82K  | 5% | 1/6W |
| R143    | 1-247-878-00 | CARBON      | 91K  | 5% | 1/6W |
| R144    | 1-247-877-00 | CARBON      | 82K  | 5% | 1/6W |
| R145    | 1-247-815-00 | CARBON      | 220  | 5% | 1/6W |
| R146    | 1-247-887-00 | CARBON      | 220K | 5% | 1/6W |
| R147    | 1-247-869-00 | CARBON      | 39K  | 5% | 1/6W |
| R148    | 1-215-449-00 | METAL       | 15K  | 1% | 1/6W |
| R149    | 1-215-453-00 | METAL       | 22K  | 1% | 1/6W |
| R150    | 1-247-863-00 | CARBON      | 22K  | 5% | 1/6W |
| R151    | 1-247-856-00 | CARBON      | 11K  | 5% | 1/6W |
| R152    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |
| R153    | 1-247-856-00 | CARBON      | 11K  | 5% | 1/6W |
| R154    | 1-215-441-00 | METAL       | 6.8K | 1% | 1/6W |
| R155    | 1-215-441-00 | METAL       | 6.8K | 1% | 1/6W |
| R156    | 1-247-903-00 | CARBON      | 1M   | 5% | 1/6W |
| R157    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R158    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R159    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R160    | 1-247-867-00 | CARBON      | 33K  | 5% | 1/6W |
| R161    | 1-247-857-00 | CARBON      | 12K  | 5% | 1/6W |
| R162    | 1-247-852-00 | CARBON      | 7.5K | 5% | 1/6W |
| R163    | 1-215-453-00 | METAL       | 22K  | 1% | 1/6W |
| R164    | 1-215-453-00 | METAL       | 22K  | 1% | 1/6W |
| R165    | 1-247-841-00 | CARBON      | 2.7K | 5% | 1/6W |
| R166    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R167    | 1-247-871-00 | CARBON      | 47K  | 5% | 1/6W |
| R168    | 1-247-891-00 | CARBON      | 330K | 5% | 1/6W |
| R169    | 1-249-421-11 | CARBON      | 2.2K | 5% | 1/6W |
| R170    | 1-249-421-11 | CARBON      | 2.2K | 5% | 1/6W |
| R171    | 1-247-807-00 | CARBON      | 100  | 5% | 1/6W |
| R172    | 1-247-837-00 | CARBON      | 1.8K | 5% | 1/6W |
| R173    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R174    | 1-247-873-00 | CARBON      | 56K  | 5% | 1/6W |
| R175    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R176    | 1-247-867-00 | CARBON      | 33K  | 5% | 1/6W |
| R177    | 1-247-871-00 | CARBON      | 47K  | 5% | 1/6W |
| R178    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R179    | 1-247-851-00 | CARBON      | 6.8K | 5% | 1/6W |
| R180    | 1-247-851-00 | CARBON      | 6.8K | 5% | 1/6W |
| R183    | 1-247-843-00 | CARBON      | 3.3K | 5% | 1/6W |
| R184    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R185    | 1-247-863-00 | CARBON      | 22K  | 5% | 1/6W |
| R186    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |
| R187    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |
| R201    | 1-247-823-00 | CARBON      | 470  | 5% | 1/6W |
| R202    | 1-249-421-11 | CARBON      | 2.2K | 5% | 1/6W |
| R203    | 1-247-859-00 | CARBON      | 15K  | 5% | 1/6W |
| R204    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |
| R205    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |

## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description |      |    |      |
|---------|--------------|-------------|------|----|------|
| R206    | 1-247-873-00 | CARBON      | 56K  | 5% | 1/6W |
| R207    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R208    | 1-247-855-00 | CARBON      | 10K  | 5% | 1/6W |
| R209    | 1-247-845-00 | CARBON      | 3.9K | 5% | 1/6W |
| R210    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R211    | 1-214-092-00 | METAL       | 22   | 1% | 1/4W |
| R212    | 1-247-841-00 | CARBON      | 2.7K | 5% | 1/6W |
| R301    | 1-249-421-11 | CARBON      | 2.2K | 5% | 1/6W |
| R302    | 1-247-159-00 | CARBON      | 15K  | 5% | 1/4W |
| R303    | 1-247-168-00 | CARBON      | 36K  | 5% | 1/4W |
| R304    | 1-247-149-00 | CARBON      | 5.6K | 5% | 1/4W |
| R305    | 1-247-152-00 | CARBON      | 7.5K | 5% | 1/4W |
| R307    | 1-247-149-00 | CARBON      | 5.6K | 5% | 1/4W |
| R308    | 1-247-717-11 | CARBON      | 2.2K | 5% | 1/4W |
| R309    | 1-249-459-11 | CARBON      | 12K  | 5% | 1/4W |
| R310    | 1-247-133-00 | CARBON      | 1.2K | 5% | 1/4W |
| R311    | 1-246-543-00 | CARBON      | 820K | 5% | 1/4W |
| R312    | 1-247-167-00 | CARBON      | 33K  | 5% | 1/4W |
| R313    | 1-247-129-00 | CARBON      | 820  | 5% | 1/4W |
| R315    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R316    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R317    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R319    | 1-247-863-00 | CARBON      | 22K  | 5% | 1/6W |
| R320    | 1-247-823-00 | CARBON      | 470  | 5% | 1/6W |
| R321    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R322    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R323    | 1-247-867-00 | CARBON      | 33K  | 5% | 1/6W |
| R324    | 1-247-815-00 | CARBON      | 220  | 5% | 1/6W |
| R331    | 1-247-129-00 | CARBON      | 820  | 5% | 1/4W |
| R401    | 1-249-421-11 | CARBON      | 2.2K | 5% | 1/6W |
| R402    | 1-247-159-00 | CARBON      | 15K  | 5% | 1/4W |
| R403    | 1-247-168-00 | CARBON      | 36K  | 5% | 1/4W |
| R404    | 1-247-149-00 | CARBON      | 5.6K | 5% | 1/4W |
| R405    | 1-247-152-00 | CARBON      | 7.5K | 5% | 1/4W |
| R407    | 1-247-149-00 | CARBON      | 5.6K | 5% | 1/4W |
| R408    | 1-247-717-11 | CARBON      | 2.2K | 5% | 1/4W |
| R409    | 1-249-459-11 | CARBON      | 12K  | 5% | 1/4W |
| R410    | 1-247-133-00 | CARBON      | 1.2K | 5% | 1/4W |
| R411    | 1-246-543-00 | CARBON      | 820K | 5% | 1/4W |
| R412    | 1-247-167-00 | CARBON      | 33K  | 5% | 1/4W |
| R413    | 1-247-129-00 | CARBON      | 820  | 5% | 1/4W |
| R415    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R416    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R417    | 1-247-879-00 | CARBON      | 100K | 5% | 1/6W |
| R419    | 1-247-863-00 | CARBON      | 22K  | 5% | 1/6W |
| R420    | 1-247-823-00 | CARBON      | 470  | 5% | 1/6W |
| R421    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R422    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R423    | 1-247-867-00 | CARBON      | 33K  | 5% | 1/6W |
| R424    | 1-247-815-00 | CARBON      | 220  | 5% | 1/6W |
| R431    | 1-247-129-00 | CARBON      | 820  | 5% | 1/4W |
| R501    | 1-247-847-00 | CARBON      | 4.7K | 5% | 1/6W |
| R502    | 1-215-447-00 | METAL       | 12K  | 1% | 1/6W |
| R503    | 1-215-444-00 | METAL       | 9.1K | 1% | 1/6W |
| R504    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R505    | 1-247-831-00 | CARBON      | 1K   | 5% | 1/6W |
| R506    | 1-247-799-00 | CARBON      | 47   | 5% | 1/6W |



## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description                                    |      |    |        |
|---------|--------------|------------------------------------------------|------|----|--------|
| R507    | 1-247-879-00 | CARBON                                         | 100K | 5% | 1/6W   |
| R508    | 1-249-421-11 | CARBON                                         | 2.2K | 5% | 1/6W   |
| R509    | 1-217-387-00 | FUSIBLE                                        | 10   | 5% | 1/4W F |
| R510    | 1-249-421-11 | CARBON                                         | 2.2K | 5% | 1/6W   |
| R511    | 1-249-421-11 | CARBON                                         | 2.2K | 5% | 1/6W   |
| R512    | 1-247-831-00 | CARBON                                         | 1K   | 5% | 1/6W   |
| R514    | 1-247-202-00 | CARBON                                         | 27   | 5% | 1/2W   |
| R601    | 1-247-811-00 | CARBON                                         | 150  | 5% | 1/6W   |
| R602    | 1-247-811-00 | CARBON                                         | 150  | 5% | 1/6W   |
| R603    | 1-247-815-00 | CARBON                                         | 220  | 5% | 1/6W   |
| R604    | 1-247-783-00 | CARBON                                         | 10   | 5% | 1/6W   |
| R605    | 1-247-807-00 | CARBON                                         | 100  | 5% | 1/6W   |
| R606    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R607    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R608    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R609    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R610    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R611    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R612    | 1-247-903-00 | CARBON                                         | 1M   | 5% | 1/6W   |
| R613    | 1-247-843-00 | CARBON                                         | 3.3K | 5% | 1/6W   |
| R614    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R615    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R616    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R617    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R701    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R702    | 1-247-855-00 | CARBON                                         | 10K  | 5% | 1/6W   |
| R703    | 1-249-421-11 | CARBON                                         | 2.2K | 5% | 1/6W   |
| RV101   | 1-226-704-00 | RES, ADJ, METAL GLAZE 470K (E.F BALANCE)       |      |    |        |
| RV102   | 1-226-773-00 | RES, ADJ, METAL GLAZE 22K (FOCUS BIAS)         |      |    |        |
| RV103   | 1-226-773-00 | RES, ADJ, METAL GLAZE 22K (FOCUS GAIN)         |      |    |        |
| RV104   | 1-226-703-00 | RES, ADJ, METAL GLAZE 10K (TRACKING GAIN)      |      |    |        |
| RV106   | 1-226-702-00 | RES, ADJ, METAL GLAZE 2.2K (VCO)               |      |    |        |
| RV201   | 1-226-703-00 | RES, ADJ, METAL GLAZE 10K (LASER POWER)        |      |    |        |
| RV320   | 1-230-313-00 | RES, VAR, CARBON 20K/20K<br>(HEADPHONES LEVEL) |      |    |        |
| S601    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S602    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S603    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S604    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S605    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S606    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S607    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S608    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S609    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S610    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S611    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |
| S612    | 1-554-303-00 | SWITCH, KEY BOARD                              |      |    |        |

S701 1-554-205-00 SWITCH, PUSH (LASER ON/OFF)  
 S702 1-570-202-11 (LIMIT)...SWITCH, LEAF  
 S703 1-570-203-11 (LOAD)...SWITCH, LEAF  
 S707 1-553-318-00 SWITCH, PUSH (AC POWER)(1 KEY)

## ELECTRICAL PARTS

| Ref.No. | Part No.     | Description                        |
|---------|--------------|------------------------------------|
| T701    | 1-448-148-11 | (US,Canadian)...TRANSFORMER, POWER |
| T701    | 1-448-149-11 | (AEP,UK).....TRANSFORMER, POWER    |
| T701    | 1-448-150-11 | (E).....TRANSFORMER, POWER         |
| X101    | 1-527-822-00 | OSCILLATOR, CERAMIC                |
| X102    | 1-567-301-11 | OSCILLATOR, CRYSTAL                |
| X103    | 1-527-948-00 | VIBRATOR, CRYSTAL                  |
| X601    | 1-527-532-00 | OSCILLATOR, CERAMIC                |

## ACCESSORY &amp; PACKING MATERIAL

| Part No.     | Description                         |
|--------------|-------------------------------------|
| 1-526-565-00 | (E)...AC PLUG ADAPTOR               |
| 1-551-734-11 | CORD, CONNECTION (RK-74A)           |
| 3-312-970-00 | SHEET, PROTECTION                   |
| 3-701-630-00 | BAG, POLYETHYLENE                   |
| 3-703-390-01 | (US,Canadian)...INSTRUCTION         |
| 3-795-629-11 | (AEP)....INSTRUCTION                |
| 3-760-548-11 | (AEP,UK).....MANUAL, INSTRUCTION    |
| 3-760-548-21 | (US,Canadian)...MANUAL, INSTRUCTION |
| 3-760-548-31 | (Canadian,E)....MANUAL, INSTRUCTION |
| 3-760-548-41 | (AEP,UK).....MANUAL, INSTRUCTION    |
| 4-910-455-01 | CUSHION (RIGHT), LOWER              |
| 4-910-456-01 | CUSHION (LEFT), LOWER               |
| 4-910-457-01 | CUSHION (LEFT), UPPER               |
| 4-910-458-01 | CUSHION (RIGHT), UPPER              |
| 4-911-030-01 | INDIVIDUAL CARTON                   |

The components identified by shading and mark  $\Delta$  are critical for safety. Replace only with part number specified.

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



## CDP-70

CDP-70

SERVICE MANUAL  
SUPPLEMENT

File this supplement with the service manual.

Subject: CIRCUIT CHANGE

- WOBBLING
- OPTICAL PICK-UP
- FOCUS SRCH
- SYSTEM CONTROL

US Model  
Canadian Model  
AEP Model  
UK Model  
E Model

No. 1  
September, 1985

## CHANGE 1 ... WOBBLING CIRCUIT

Applicable Serial No.:

|        | US        | Canadian  | AEP          | UK | E |
|--------|-----------|-----------|--------------|----|---|
| SILVER | 805,001 ~ | —         | For all sets |    |   |
| BLACK  | 810,001 ~ | 701,001 ~ |              |    |   |

|      | Description        | Former Part No. | New Part No. | Remarks        |
|------|--------------------|-----------------|--------------|----------------|
| Q951 | TRANSISTOR         | —               | 8-729-900-65 | DTA144ES       |
| Q952 | TRANSISTOR         | —               | 8-729-900-74 | DTC143TS       |
| Q953 | TRANSISTOR         | —               | 8-729-900-74 | DTC143TS       |
| D951 | DIODE              | —               | 8-719-911-19 | 1SS119         |
| R119 | RES, CARBON        | 1-247-847-00    | —            | 4.7k 5% 1/6 W  |
| R128 | RES, CARBON        | 1-247-869-00    | —            | 39k 5% 1/6 W   |
| R951 | RES, CARBON        | —               | 1-247-863-00 | 22k 5% 1/6 W   |
| R952 | RES, CARBON        | —               | 1-247-831-00 | 1k 5% 1/6 W    |
| R953 | RES, CARBON        | —               | 1-247-869-00 | 39k 5% 1/6 W   |
| R954 | RES, CARBON        | —               | 1-247-847-00 | 4.7k 5% 1/6 W  |
| R955 | RES, CARBON        | —               | 1-247-827-00 | 680 5% 1/6 W   |
| R956 | RES, CARBON        | —               | 1-247-827-00 | 680 5% 1/6 W   |
| C951 | CAP, ELECT         | —               | 1-123-611-00 | 1μF 20% 50V    |
| C952 | CAP, ELECT         | —               | 1-123-610-00 | 0.47μF 20% 50V |
|      |                    | 1-123-353-11    | —            | 2.2μF 20% 50V  |
| C953 | CAP, ELECT         | —               | 1-123-608-00 | 0.22μF 20% 50V |
|      | PC BOARD, WOBBLING | —               | 1-616-877-11 |                |

## CHANGE 2 ... OPTICAL PICK-UP CIRCUIT

Applicable Serial No.:

|        | US        | Canadian  | AEP          | UK           | E |
|--------|-----------|-----------|--------------|--------------|---|
| SILVER | 805,001 ~ | —         | For all sets | For all sets |   |
| BLACK  | 814,001 ~ | 702,001 ~ | 503,001 ~    |              |   |

|      | Description           | Former Part No. | New Part No.   | Remarks          |
|------|-----------------------|-----------------|----------------|------------------|
|      | OPTICAL PICK-UP BLOCK | △ X-4910-424-1  | —              | KSS121A          |
|      |                       | —               | △ X-4910-441-1 | KSS120C          |
| Q201 | TRANSISTOR            | 8-729-108-54    | —              | 2SC2785          |
|      |                       | —               | 8-729-177-54   | 2SA1175          |
| Q202 | TRANSISTOR            | 8-729-177-44    | —              | 2SD774-5         |
|      |                       | —               | 8-729-103-43   | 2SB734           |
|      | MOUNTED PCB, MAIN     | *A-4651-042-A   | *A-4651-059-A  | US Model         |
|      | MOUNTED PCB, MAIN     | *A-4651-043-A   | *A-4651-062-A  | AEP, UK, E Model |
|      | MOUNTED PCB, MAIN     | *A-4651-048-A   | *A-4651-060-A  | Canadian Model   |
| R208 | RES, CARBON           | 1-249-429-11    | —              | 10k 5% 1/6 W     |

Combination of optical pick-up and main board should be as table below.

| Main Board | OPTICAL PICK-UP |
|------------|-----------------|
| Former     | KSS121A         |
| New        | KSS120C         |

## CHANGE 3 ... FOCUS SRCH CIRCUIT

Applicable Serial No.:

|        | US           | Canadian | AEP          | UK           | E |
|--------|--------------|----------|--------------|--------------|---|
| SILVER | For all sets | —        | For all sets | For all sets |   |
| BLACK  | 801,001 ~    | ALL      | 500,901 ~    |              |   |

|      | Description | Former Part No. | New Part No. | Remarks          |
|------|-------------|-----------------|--------------|------------------|
| R191 | RES, CARBON | —               | 1-247-889-00 | 270k 5% 1/6 W *1 |
| R192 | RES, CARBON | —               | 1-247-863-00 | 22k 5% 1/6 W *2  |
| C195 | CAP, ELECT  | —               | 1-123-318-00 | 33μF 20% 16V     |

\*1: The resistance value of R191 is 680kΩ in some sets.  
Some sets have diode (1SS106) in place of R 192.

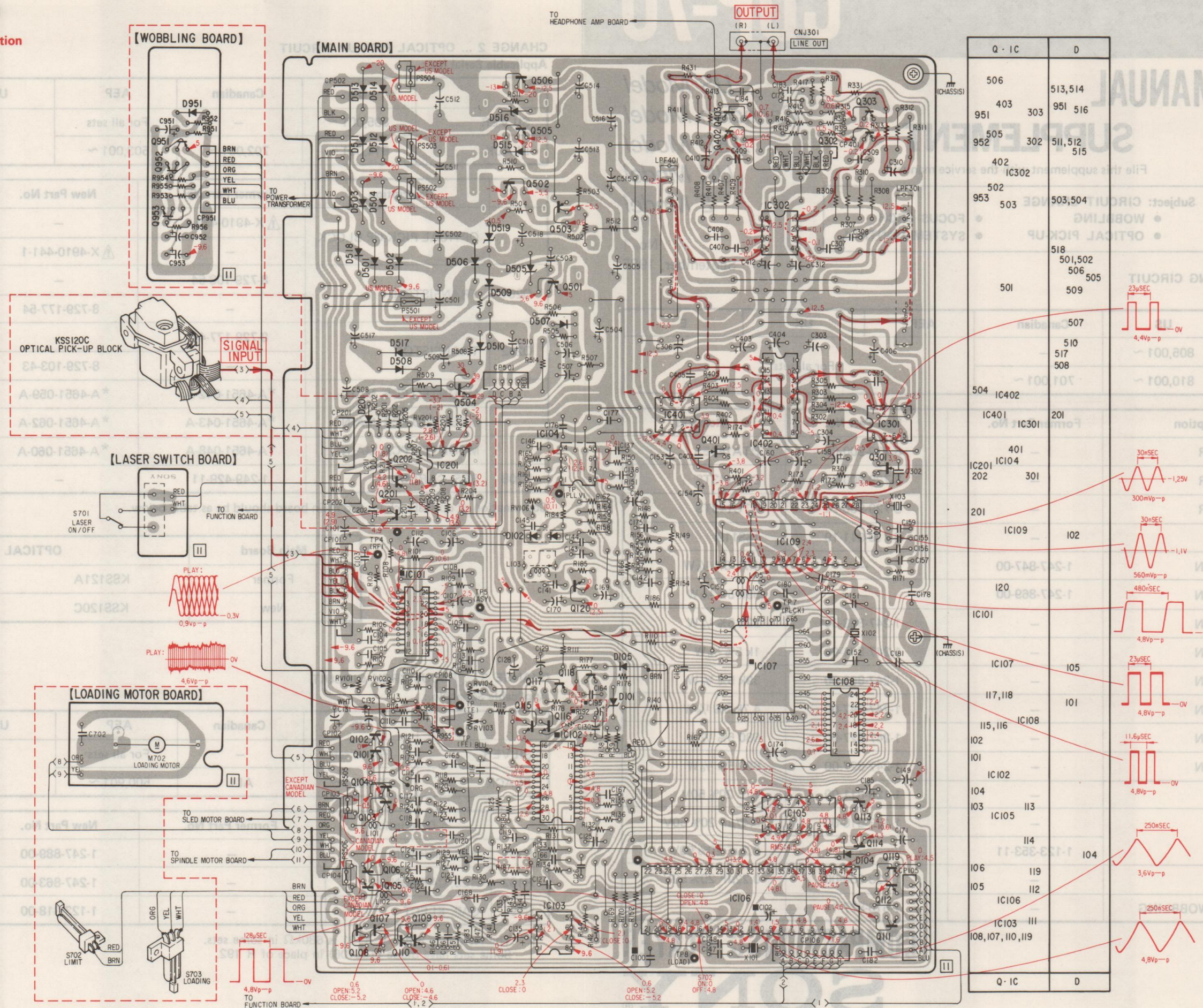
COMPACT DISC PLAYER  
**SONY**

AUD





**: Changed portion**

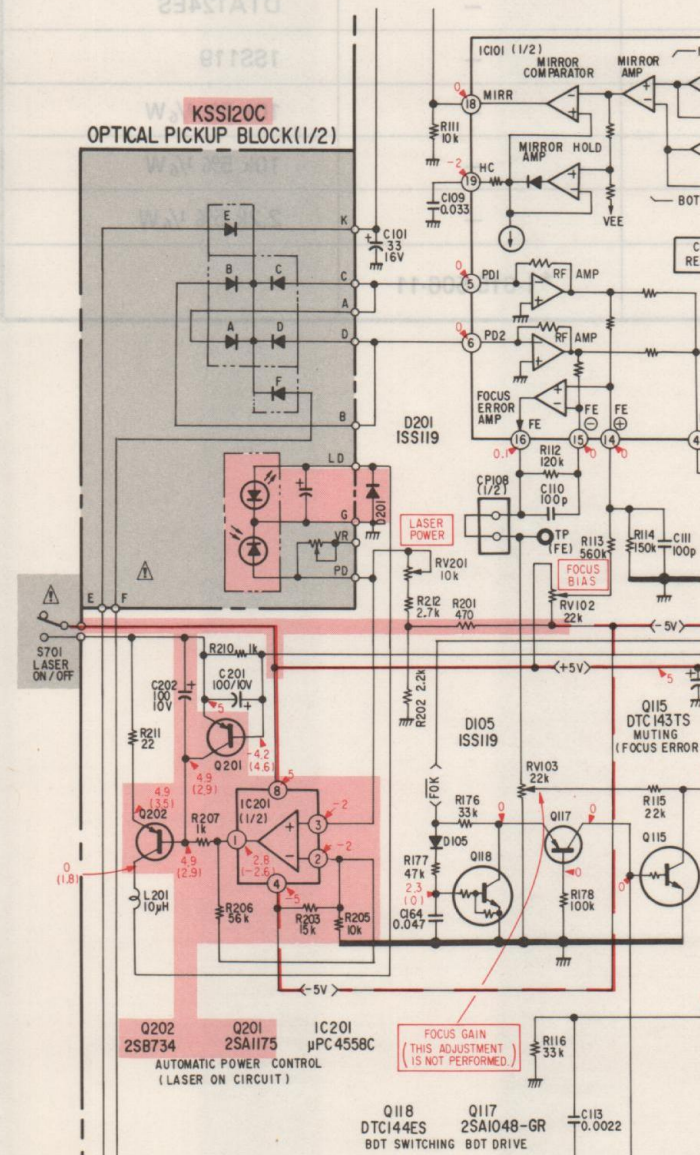




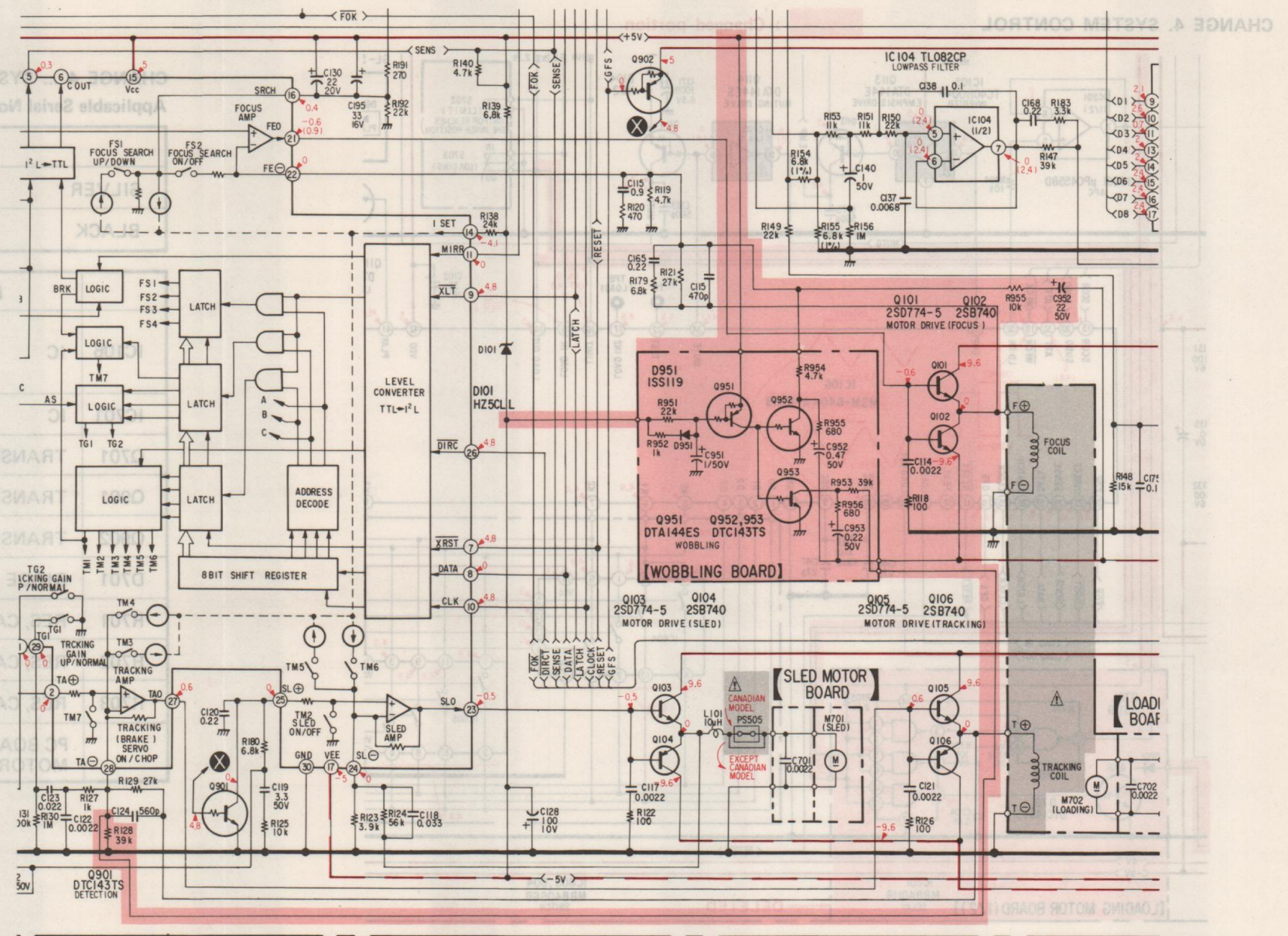
## SCHEMATIC DIAGRAM

: Changed portion

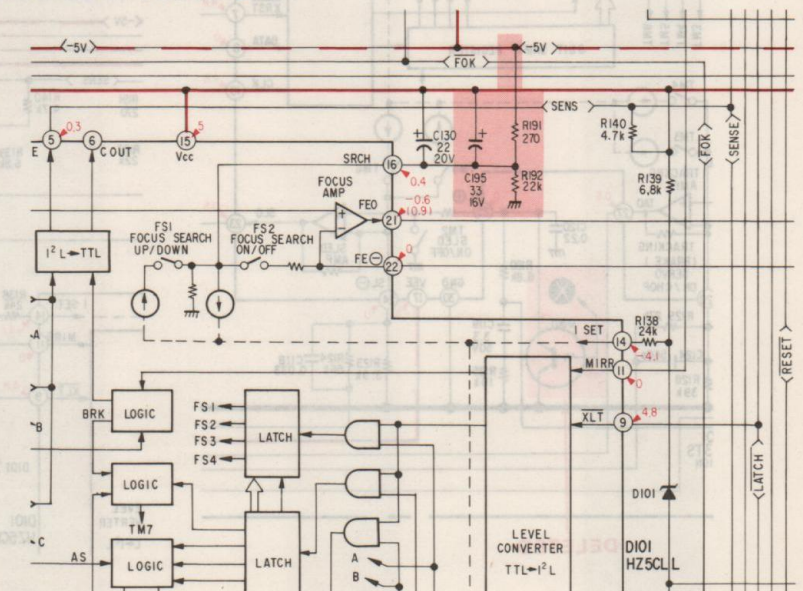
## CHANGE 2. OPTICAL PICK-UP



## CHANGE 1. WOBBLING



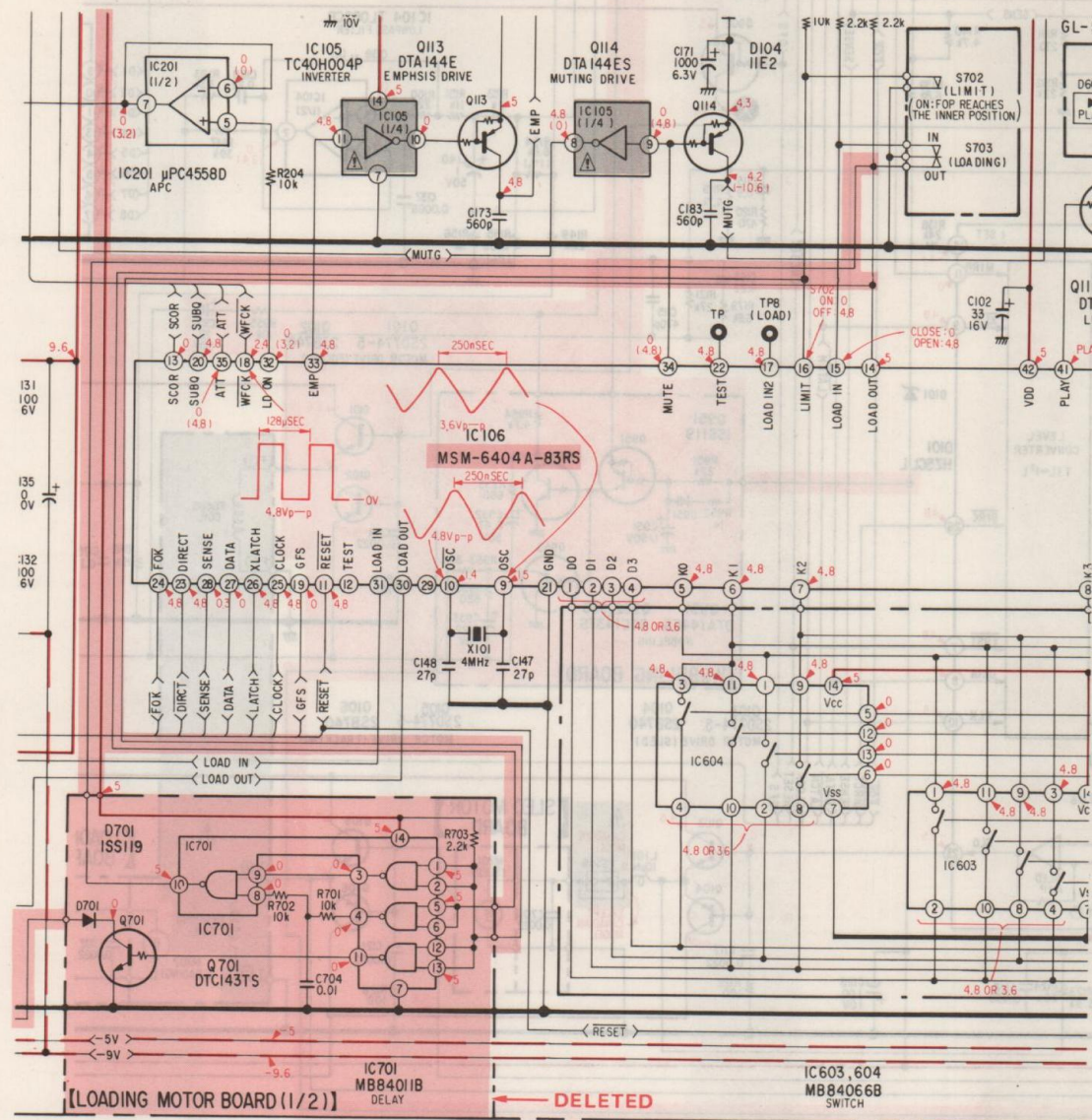
## CHANGE 3. FOCUS SRCH





## CHANGE 4. SYSTEM CONTROL

: Changed portion

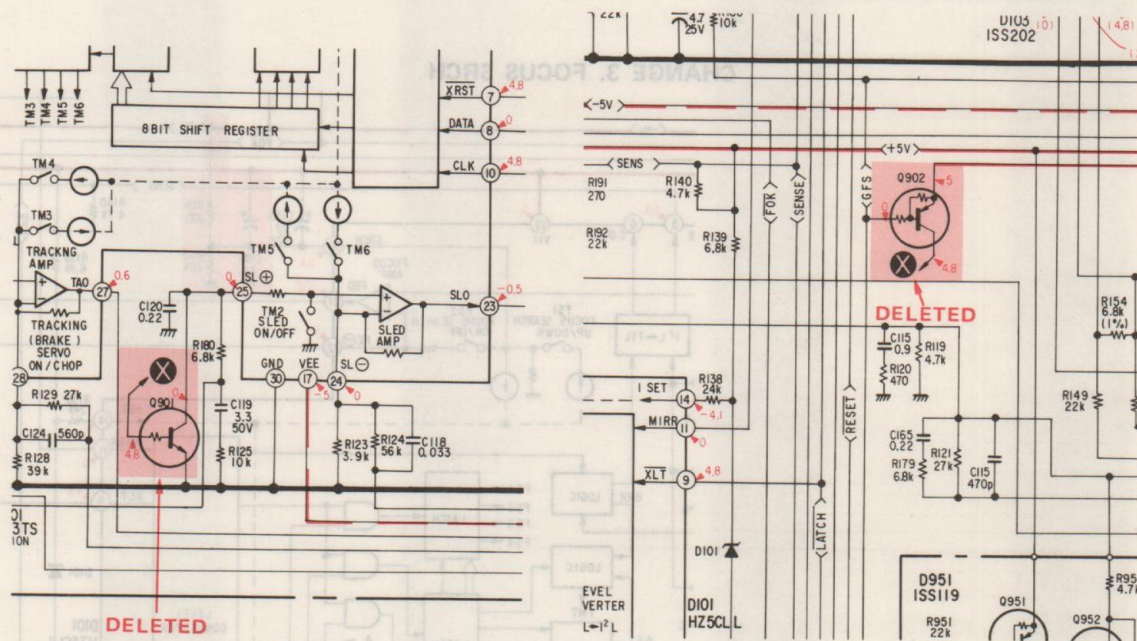


## CHANGE 4 ... SYSTEM CONTROL CIRCUIT

Applicable Serial No.:

|        | US         | Canadian  | AEP       | UK           | E |
|--------|------------|-----------|-----------|--------------|---|
| SILVER | 800,501 ~  | —         | 501,101 ~ | For all sets |   |
| BLACK  | 8014,001 ~ | 702,001 ~ | 503,001 ~ |              |   |

|       | Description             | Former Part No. | New Part No.  | Remarks        |
|-------|-------------------------|-----------------|---------------|----------------|
| IC106 | IC                      | 8-759-920-05    | —             | MSM-6404A-76RS |
|       |                         | —               | 8-759-921-76  | MSM-6404A-83RS |
| IC701 | IC                      | 8-759-984-11    | —             | MB84011B       |
| Q701  | TRANSISTOR              | 8-729-900-74    | —             | DTC143TS       |
| Q901  | TRANSISTOR              | 8-729-900-74    | —             | DTC143TS       |
| Q902  | TRANSISTOR              | 8-729-900-63    | —             | DTA124ES       |
| D701  | DIODE                   | 8-719-911-19    | —             | 1SS119         |
| R701  | RES, CARBON             | 1-249-429-11    | —             | 10k 5% 1/6 W   |
| R702  | RES, CARBON             | 1-249-429-11    | —             | 10k 5% 1/6 W   |
| R703  | RES, CARBON             | 1-249-421-11    | —             | 2.2k 5% 1/6 W  |
|       | PC BOARD, LOADING MOTOR | *1-615-957-11   | *1-615-506-11 |                |



Sony Corporation