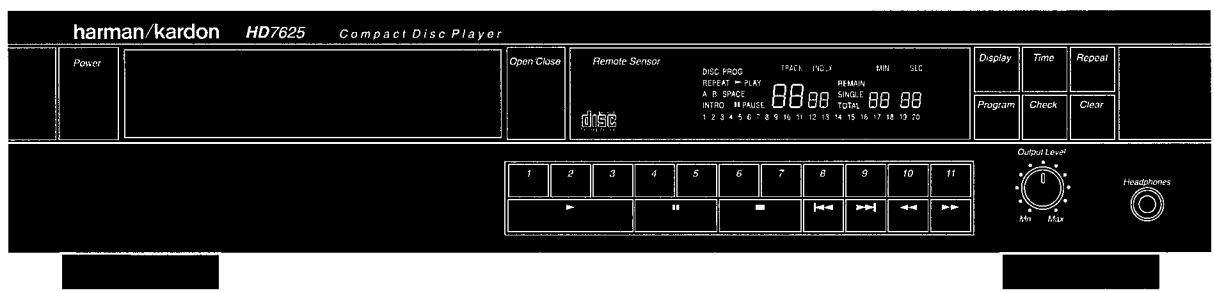


The Harman Kardon Model HD7625 COMPACT DISC PLAYER

Manual A

Technical Manual



The following marks found in the parts list of this manual identify the models as follows:

- Ⓚ** : North America area model Black version
- Ⓜ** : International model Black version
- Ⓞ** : General Model
- Ⓞ** : General Model Black version

harman/kardon

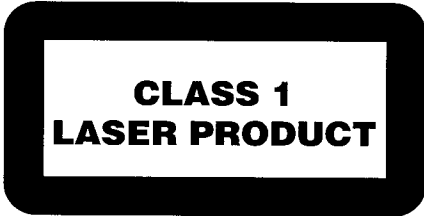
240 Crossways Park West, Woodbury, N. Y. 11797
1112-HD7625-A P9307 1200 Printed in USA

CLASS 1 LASER PRODUCT

Product complies with DHHS rules CFR subchapter J part 1040:10 at date of manufacture.

DANGER - invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to the beam.

CAUTION - use of all controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Be careful of the Laser Pickup.

Although you cannot see it from the outside, a laser pickup is located under the disc tray and a precision lens is built in it.

Since the laser pickup, including the lense element, is especially sensitive to dust, keep the disc tray closed when not in use. Also do not put your hand inside the unit.

ADVARSEL:

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

VAROITUS!

Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä.

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SPECIFICATIONS

| | Nominal | Limit |
|---------------------------------|---|----------------------------------|
| System | : Compact Disc Digital Audio | |
| D/A Converter | : Dual 18 Bit Linear D/A Converters, 8Fs Digital Filter, RLS (Real-time Linear Smoothing) | |
| Signal Detection | : 3-Beam Semiconductor Optical Laser Pickup | |
| Error Correction | : CIRC System | |
| Low Level Linearity | : +/-0.5dB @ -90dB | |
| Frequency Response | 0dB | 0.5dB |
| (20Hz to 20kHz) | | ± |
| Total Harmonic Distortion (THD) | 0.0025% | <0.006% |
| Dynamic Range | 98dB | ≥93dB |
| Signal to Noise Ratio | 104dB | ≥100dB |
| Channel Separation | 98dB | ≥90dB |
| Line Output Level/Impedance | 2.0V | ±0.0V 0.5V @ 10k |
| Digital Output Level/Impedance | 0.5Vp-p | 0.5Vp [±] p 0.1Vp-p @75 |
| Power Supply | : AC230/240V, 50/60Hz ± Ω | |
| Power Consumption | : 22 Watts | |
| Dimensions | : 17 3/8" x 4" x 13" | |
| | : 443mm x 103mm x 326mm | |
| Weight | : 12.3lbs/5.6kg | |

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

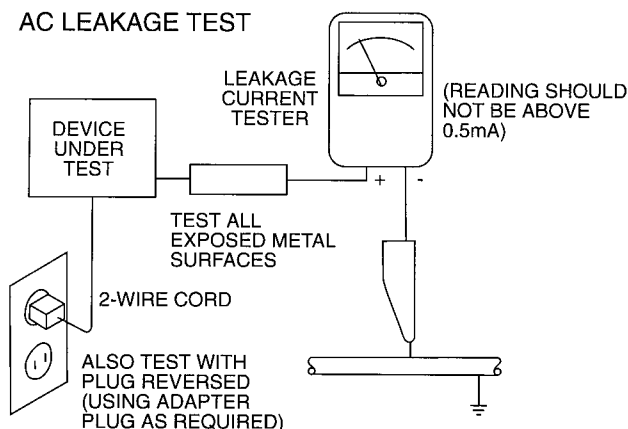
SAFETY PRECAUTIONS

Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

- a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing.
 - (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
 - (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks.
- Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.**
- b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

- c. **Leakage Current Hot Check** - With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer during this test). Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 "Leakage Current for Appliances" and Underwriters Laboratories (UL) 1270, (34.6). With the instrument AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test. **ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER.**

AC LEAKAGE TEST

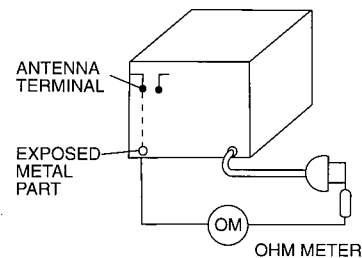


d. Insulation Resistance Test

- (1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug.
- (2) Turn on the power switch of the instrument.
- (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each **exposed metallic** cabinet part on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. The reading should be as shown below. If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.

e. Insulation Resistance Test Cold Check

- (1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug.
- (2) Turn on the power switch of the instrument.
- (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each **exposed metallic cabinet** part on the instrument, such as screw heads, antenna, control shafts, handle brackets, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 Megohm. When there is no return path to the chassis, the reading must be "infinite". If it is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer.



PRODUCT SAFETY NOTICE

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, by (Δ) on schematics and parts list. Use of a substitute replacement that does not have the same safety characteristics and parts listed. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. Products Safety is under review continuously and new instructions are issued whenever appropriate.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this manual and its supplements, read and follow the SAFETY PRECAUTIONS on this page.

NOTE: If unforeseen circumstances created conflict between the following servicing precautions and any of the safety precautions, **always follow the safety precautions.**

Remember: Safety First.

General Servicing Precautions

- a. Always unplug the instrument's AC power cord from the AC power source before:
 - (1) Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
 - (2) Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
 - (3) Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
- b. Do **not** defeat any plug/socket B+ voltage interlocks with which instruments covered by this manual might be equipped.
- c. Do **not** apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
- d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

NOTE: Refer to Safety Precautions on Page 2.

- (1) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.
- (2) The Components used in the unit has a specified conflammability and dielectric strength. When replacing any components, use components which has the same ratings. Components marked (Δ) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace with the appointed components.
- (3) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install them as they were.
- (4) After servicing, always check that the removed screws, components and wiring have been installed correctly and that the portion around the service part have not been damaged and so on. Further check the insulation between the blades of attachment plug and accessible conductive parts.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

NOTE: Accessible Conductive Parts including Metal panels, Output jacks, etc.

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

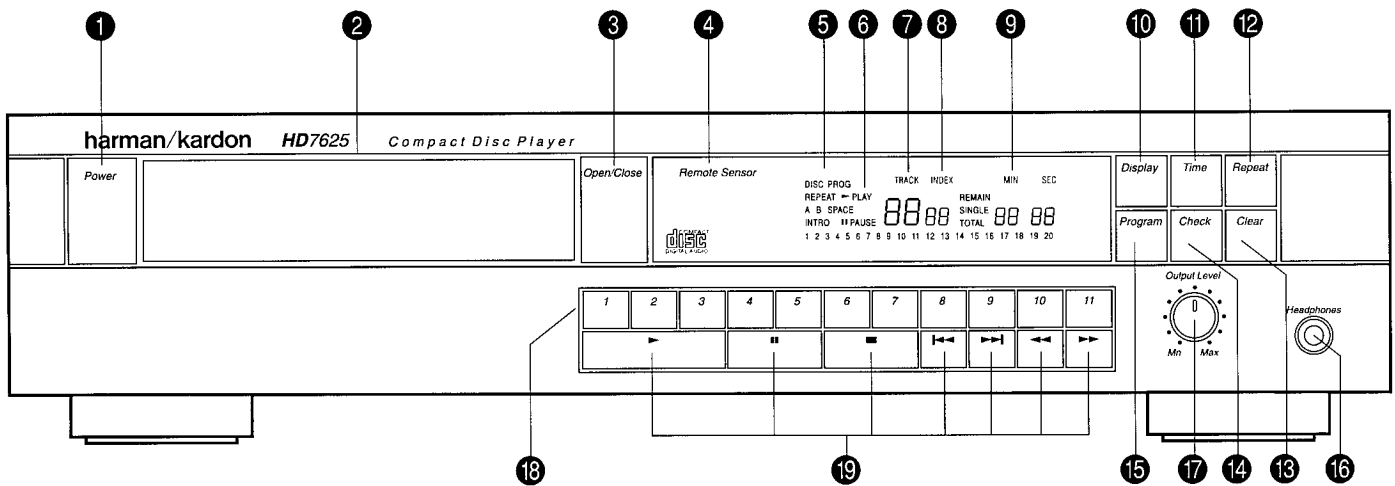
Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together or your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

CONTROLS AND FUNCTIONS



1 POWER switch

The POWER switch turns the unit on and off.

2 Compact disc drawer

Load a disc (full-size or 3-inch/8cm) into your compact disc player by placing it in this drawer with the label side up. Open and close the drawer using the OPEN/CLOSE button (3).

3 OPEN/CLOSE button

Press this button to open or close the compact disc drawer. The drawer will also close if you press the play button or push the drawer gently toward the chassis of the player; however, we recommend that you do not push the drawer.

4 REMOTE sensor

This area receives the signal from the remote control unit. Make sure this area of the front panel is kept free from dirt or other obstructions that might prevent proper reception of the infrared signal from the remote control.

5 FUNCTION indicator

DISC - This indicator lights when the disc drawer is open, and when a disc is loaded. It does not light when there is no disc.

REPEAT - When this indicator is lit, the unit is in REPEAT mode and will continuously repeat either the entire disc or the programmed sequence.

A-B - When this indicator is lit steadily, the unit is set to repeat a specified section of the disc (from A to B). When REPEAT indicator is lit, you have already programmed the starting point (point A) of a section, and the unit is waiting for you to program the ending point of the section (point B).

INTRO - When this indicator is lit, the unit is in INTRO SCAN mode and will play only the first 15 seconds of each selection on the disc or in the selected program.

PROG - When this indicator is lit, the unit is in PROGRAM mode, in which you can program a sequence of tracks in the order you'd like to hear them, then play back you programmed sequence.

SPACE - When this indicator is lit, the unit is in SPACE mode and will insert 4 seconds of space between tracks.

6 PLAYBACK mode

PLAY - This indicator is lit when the unit is playing a track.

PAUSE - This indicator is lit when the unit is in PAUSE mode (i.e., you have pressed PAUSE to temporarily stop playback).

7 TRACK indicator

When a disc is loaded but not playing, the TRACK indicator displays the total number of tracks on that disc. During playback, the indicator displays the number of the track currently being played. During programming, it displays the number of the track most recently selected.

8 INDEX indicator

Some discs that contain very long tracks may have those tracks subdivided into shorter section. For example, a long classical piece may be divided into movement, each of which may have an index number. The INDEX indicator displays the number of the subdivision of a track currently being played. If the track has no subdivisions, the INDEX indicator will display a 1 during playback. During programming, the INDEX light goes out and the indicator displays the total number of tracks selected in the programmed sequence.

9 TIME indicator

When a disc is loaded but not playing, the TIME indicator displays the total amount of playback time on that disc. During playback, depending on the state of the TIME button (11), the indicator displays one of the following:

- The time that has elapsed since the beginning of the current track.
- The time that remains on the currently selected track. The words REMAIN SINGLE will be displayed if the indicator is in this mode.
- The time that remains on either the entire disc or on the programmed selections. The words REMAIN TOTAL will be displayed if the indicator is in this mode. Note that if you have programmed more than 99 minutes in your selection, only dashes will appear in this mode.

10 DISPLAY button

This button turns the display on and off. When you turn the display off in PLAY mode, the entire display goes off. In PAUSE mode, most of the display goes off, but the track number is still displayed. In STOP mode, most of the display goes off, but the total number of tracks on the disc is still displayed. In some systems, turning the fluorescent display off may provide the purest possible sound quality during playback.

11 TIME button

During playback or programming, the button cycles through the three TIME display modes:

- The time that has elapsed since the beginning of the current track.
- The time that remains on the currently selected track.
- The time that remains on either the entire disc or the programmed sequence.

12 REPEAT button

This button puts your compact disc player in and out of REPEAT mode. In REPEAT mode, the unit will continually play back either the entire disc or the programmed sequence of tracks. Press the button once to turn on REPEAT mode; press again to turn off REPEAT mode. When the unit is in REPEAT mode, the FUNCTION indicator (5) will display the word REPEAT.

13 CLEAR button

The CLEAR button removes tracks from your programmed sequence one by one starting with the last track entered. Each time you clear a track from the programmed sequence, that track's time is deleted from the total time displayed. This button is used only in PROGRAM mode.

14 CHECK button

When a disc is loaded but not playing (STOP mode), you can press the CHECK button to see the playback time of each track on the disc. Each time you press the CHECK button, the next track is displayed along with its playback time. When you have stepped sequentially through all the tracks on the disc, another press of the CHECK button displays the total playback time of the entire disc. In PROGRAM mode, the CHECK button displays the cumulative time of the tracks in the programmed sequence. That is, the first press displays the time of the first programmed track, the second press displays the cumulative playback time of the first and second tracks, and so on.

15 PROGRAM button

This button puts your compact disc player in and out of PROGRAM mode. Press the button once to turn on PROGRAM mode; press again to turn it off. In PROGRAM mode, you can program a set of tracks to play in any sequence. (For instructions on programming a sequence of tracks, see the Operations section of this manual.) When the unit is in PROGRAM MODE, the function indicator (5) will display the word PROG in red.

16 HEADPHONES jack

Stereo headphone with a standard 1/4" (6.5 mm) plug can be connected to this jack.

17 OUTPUT LEVEL control

This knob controls the volume of the variable output jacks on the rear panel as well as the headphone volume. You can use this output volume control to match the volume of your compact disc player with the volume of your turntable or tuner. In systems where the compact disc player is connected directly to the power amplifier, the OUTPUT LEVEL control provides the volume control for the system.

18 Track selection buttons

This set of buttons (numbered 1 through 10 and +10) enables you to directly select the track you want to play. To select a

track with a number higher than 10, press the +10 button, then press the button that will add up to the number of the track you want. For example, to select track 14, press +10, then press 4. If you select a track number that does not exist on your disc, the TRACK indicator will continue to display the number of the last track on the disc. When PROGRAM mode is off, pressing a track button plays the track you select. When PROGRAM mode is on, pressing a track button programs that track into your sequence.

19 Playback controls

PLAY -- The PLAY button starts playback of a track.

PAUSE -- Pressing the PAUSE button temporarily stops playback. Pressing the PAUSE button again, or pressing PLAY, resumes playback at the precise point where playback left off.

STOP -- The STOP button stops playback. When you press PLAY, playback will start either at the beginning of the disc or programmed sequence, or at any track you select.

SKIP BACK -- Pressing this button once skips back to the beginning of the present track. If you are in PLAY mode, playback will resume. Holding the button down skips backward to the beginning of each preceding track until the first track on the disc is reached.

SKIP FORWARD -- Pressing this button once skips forward to the beginning of the next track. If you are in PLAY mode, playback will resume. Holding the button down skips forward to the beginning of each subsequent track until the last track on the disc is reached.

SEARCH BACK -- Holding down this button during playback reverses rapidly through the disc. This function is similar to the "rewind" function on a tape deck.

SEARCH FORWARD -- Holding down this button during playback speeds rapidly forward through the disc. This function is similar to the "fast forward" function on a tape deck.

REMOTE CONTROL

The remote control for the HD7625 provides the same functions found on the front panel of the compact disc player itself. In addition, the remote control provides some functions that are not found on the front panel.

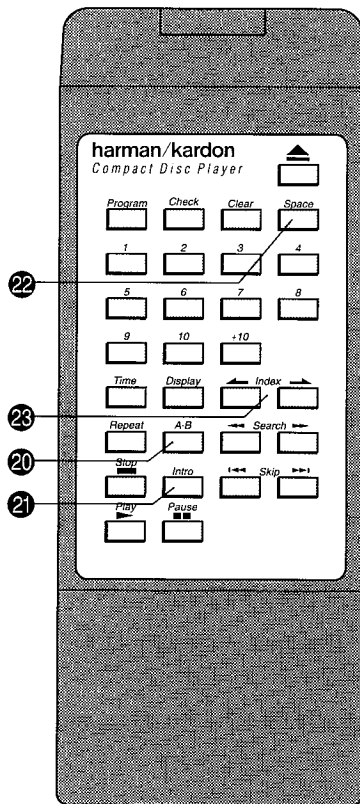
For the HD7625, the functions found on the remote control that are not found on the front panel are INTRO, A-B, INDEX, and SPACE. These four functions are described below (for other functions, see the descriptions above).

20 A-B button

This button puts your compact disc player in and out of A-B mode. In A-B mode, the unit will continually play back a "Phrase" or section of your disc beginning at point A and ending at point B. (For instructions on repeating a section of a disc, see the Operations section of this manual.) When the unit is in A-B mode, the FUNCTION indicator (5) will display REPEAT A-B. This feature is available on the HD7625 only through the A-B button on the remote control.

21 INTRO button

This button puts your compact disc player in and out of INTRO SCAN mode. When INTRO SCAN is on and you press PLAY, the unit plays only the first 15 seconds of each track before moving on to the next. Press the button once to turn on INTRO



DISASSEMBLY PROCEDURES

[1] CABINET TOP (124) REMOVAL

Remove 7 screws (A) and then remove the Cabinet Top (124).

[2] FRONT PANEL ASSEMBLY (AA) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Disconnect the connector with lead wires (JL401) from connectors (CN201) on the Main P. C. Board (PCB-1).
3. Remove lead wire (W401) from the Main P. C. Board (PCB-1).
4. Disconnect the wires (W-510 and W-511) from the chassis, by removing two nuts (208 and 209).
5. Remove 6 screws (B) and then remove the Front Panel Assembly (AA) with the Front P. C. Board (PCB-2) and the Output Level & Jack P. C. Board (PCB-3).
6. Pull off output level Knob (134). Remove nut (D) and then remove the Output Level and Jack P. C. Board (PCB-3) from the Front Panel Assembly (AA).
7. Remove 9 screws (C) and then remove the Front P. C. Board (PCB-2) from the Front Panel Assembly (AA).

[3] MAIN P. C. BOARD (PCB-1) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Disconnect the connector with lead wires (LCN113, LCN114, LCN115 and LCN117) from connectors (CN113, CN114, CN115 and CN117) on the Main P. C. Board (PCB-1).
3. Open the lid of connectors (CN501, CN502 and CN503) on the Main P. C. Board (PCB-1), then disconnect the lead wires (W501, W502 and W503). Also Open the lid of connectors (CN1 and CN2) on the Main P. C. Board (PCB-1), then disconnect the lead wires (JL1 and JL2).
4. Remove 11 screws (E), then remove the Main P. C. Board (PCB-1)

[4] POWER SUPPLY P. C. BOARD (PCB-5) REMOVAL

1. Remove 6 screws (G) and four washers (212).
2. Disconnect lead wires (TM1 and TM2) on the Power Supply P. C. Board (PCB-5).
3. Open the lid of connectors (CN1 and CN2) on the Main P. C. Board (PCB-1), then disconnect the lead wires (JL1 and JL2).
4. Slide back the Power Supply P. C. Board (PCB-5) to disconnect power switch shaft from the Front Panel Assembly (AA) and remove.

[5] CD PLAYER MECHANICAL ASSEMBLY (104) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].

SCAN mode; press again to turn it off and stop the scanning. When the unit is in INTRO SCAN mode, the FUNCTION indicator (5) will display the word INTRO. This feature is available on the HD7625 only through the INTRO button on the remote control.

22 SPACE button

This button puts you compact disc player in and out of SPACE mode. Press the button once to turn on SPACE mode; press again to turn it off. In SPACE mode, the unit inserts 4 seconds of blank space between tracks. This is particularly useful if you are recording music from a compact disc onto a tape. Tape decks with a Music Search feature will be able to use the 4 seconds of space to correctly identify the beginning of each selection on the tape. When the unit is in SPACE mode, the FUNCTION indicator (5) will display the word SPACE.

23 INDEX buttons

Some discs contain long selections that may be subdivided into shorter section (for example, operas). Just as the tracks are marked by the track number, these shorter sections may be marked by index numbers. When you have started playback of the desired track, you can use the INDEX UP and INDEX DOWN buttons to jump to a desired index selection. Each time you press an INDEX button, the INDEX indicator displays the next higher or lower index number. If you continue pressing the button until the indicated index number is higher than the actual number of index selections on the disc, playback will start from the nearest index selection.

2. Disconnect the connector with lead wires (LCN113, LCN114, LCN115 and LCN117) from connectors (CN113, CN114, CN115 and CN117) on the Main P. C. Board (PCB-1).
3. Remove 3 screws (F) and then remove the CD Player Mechanical Assembly (104) backward.

DISASSEMBLING THE CD PLAYER MECHANICAL ASSEMBLY

[6] DISC TRAY (1) REMOVAL

1. Remove the Cabinet Top (124), referring to the previous step [1].
2. Connect the Power cord and turn on the power by pressing the Power switch.
3. Open the Disc Tray (1) by pressing the Open/Close button.
4. With the Disc Tray (1) opened as it is, pull out the power plug.
5. Push the Disc Tray (1) by hand to slide it in once.
6. Loosen the 2 screws (H) and then slide out the Disc Tray (16) by hand.

[7] OPTICAL PICK-UP (57) REMOVAL

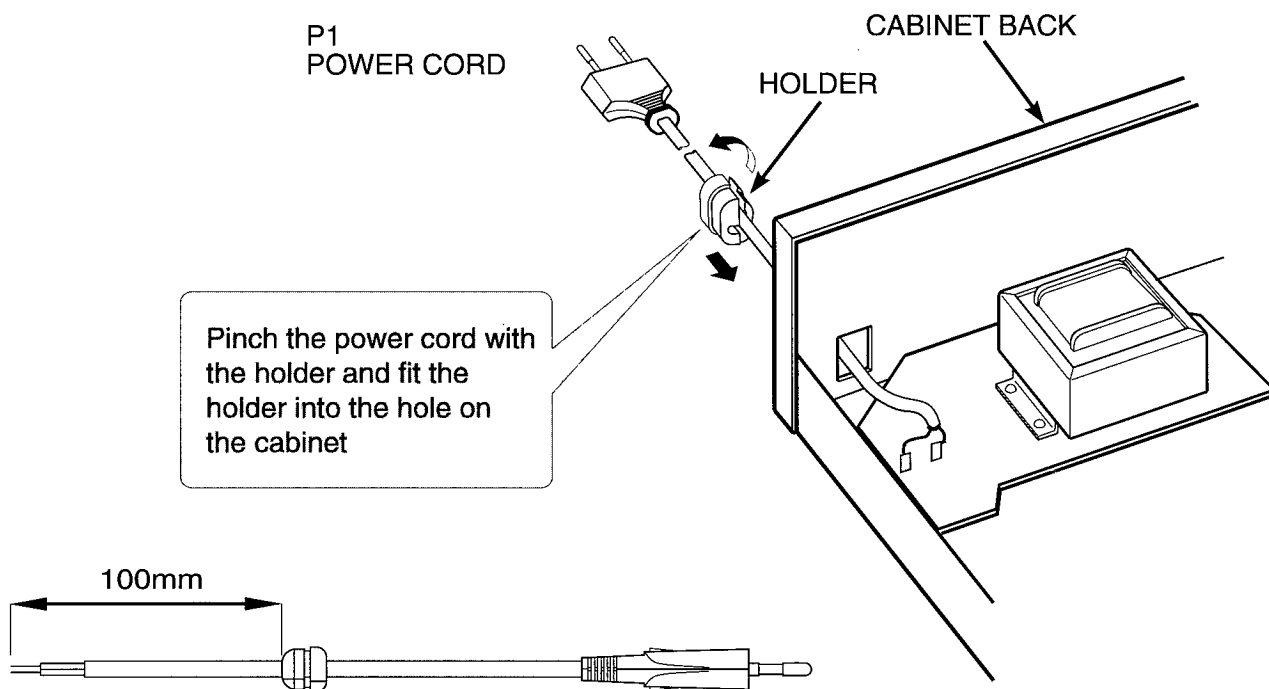
1. Remove the CD Player Mechanical Assembly (104), referring to the previous step [5].
2. Remove 4 screws (I) and then remove the Disc Motor, Pick-up and Slide Motor Assembly (13) from the CD Player Mechanical Assembly (104).
3. Remove gear (58) by gently pressing at its base, to release it and pull it out of the Disc Motor, Pick-up and Slide Motor Assembly (13).
4. Slide the sled shaft (51) towards the disc motor and at the same time open sled shaft stop (J). Gently slide the sled shaft (51) out of the Disc Motor, Pick-up and Slide Motor Assembly (13).
5. Remove the Optical Pick-Up (57) from the Disc Motor, Pick-up and Slide Motor Assembly (13).

[8] SLIDE MOTOR (60) REMOVAL

1. Unsolder the terminals of the Disc and Slide Motors, then remove the Motor P. C. Board (61).
2. Remove 2 screws (k) and then remove the Slide Motor (60).

POWER CORD REPLACEMENT (FOR SERVICE ENGINEERS OTHER THAN NORTH AMERICA)

In order to prevent fire or shock hazard when replacing the power cord, follow the procedure below to replace the part with the standard supply parts.



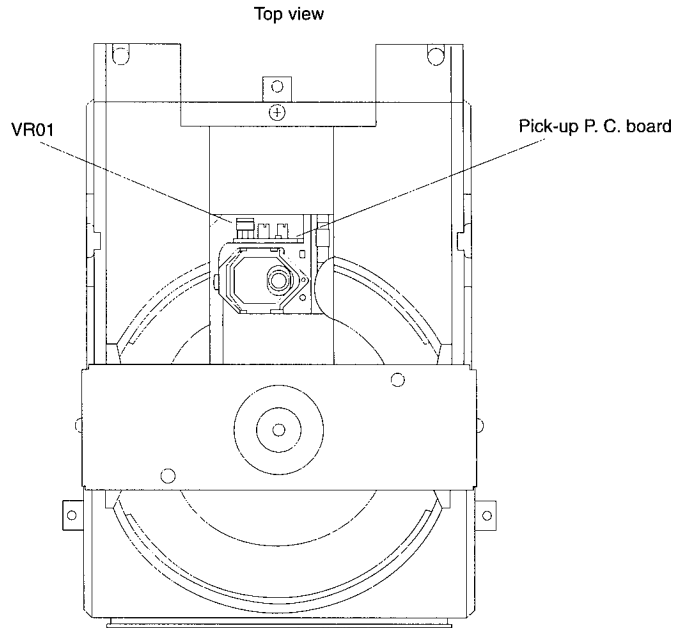
ADJUSTMENT PROCEDURE

1. Instruments required

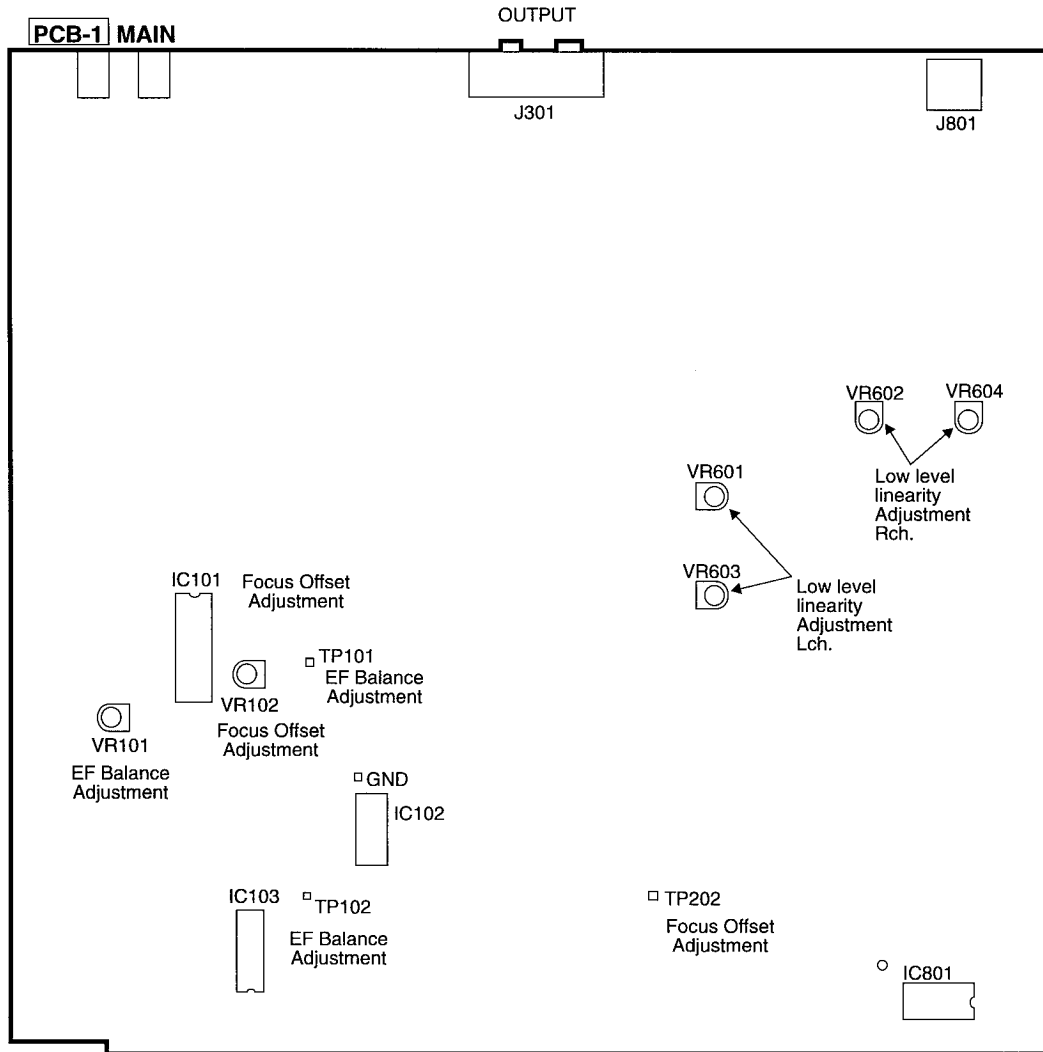
- DC voltmeter
- Oscilloscope (3 or more modes, 100MHz, input select DC range)
- Jitter meter
- Test disc: EIAJ CD-1

2. Adjustment points

2-1 Adjusting screw layout for CD player mechanical assembly.



2-2 VR and test point layout for main P.C. board.

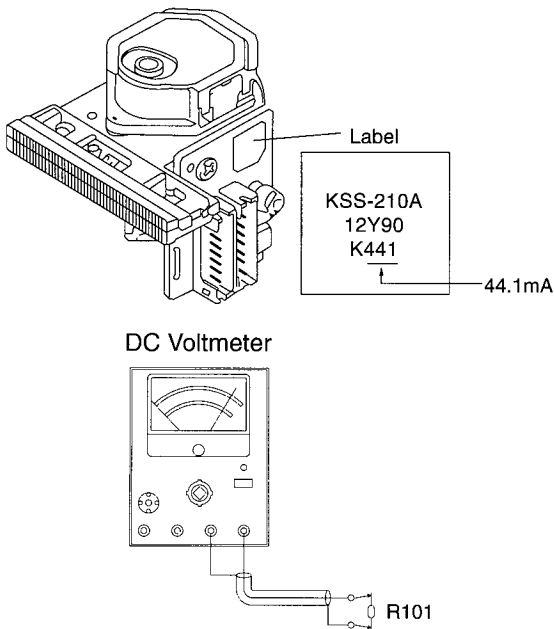


ADJUSTMENT POINT

3. Optical Pick-up Laser Power Adjustment

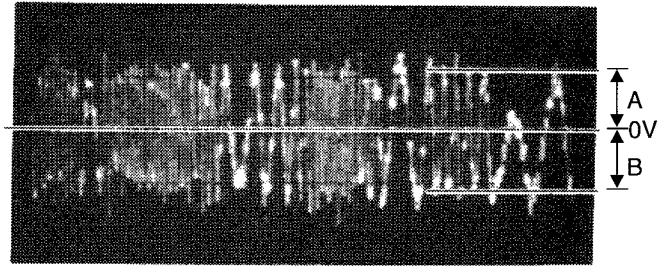
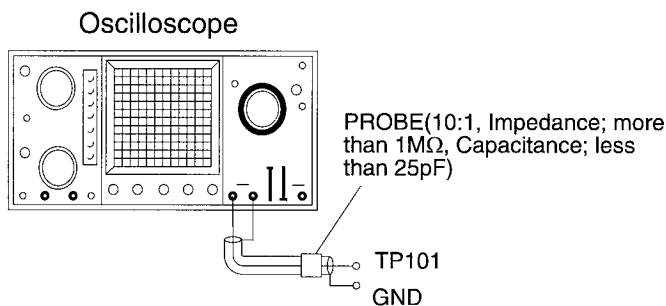
The specified value for adjustment varies with the type of the pick-up in use. Obtain the voltage value according to the following procedure.

- (a) Read the current value on the label of the pick-up P.C. board.
- (b) Using the amperage of the current and the following equation, calculate the voltage value. When the current is 44.1mA; $V=0.0441A \times 22=0.9702V$.
- (1) Connect the DC voltmeter to both ends of R101.
- (2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.
- (3) Adjust VR01 in the pick-up P.C. board to the voltage obtained in step (b) above.



4. EF Balance Adjustment

- (1) Connect the oscilloscope (0.5V/div, 5msec./div, DC mode) to TP101 and GND. Short-circuit TP401 and GND.
- (2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.
- (3) Adjust VR101 so that the amplitude above and below the zero DC line becomes equal (Amplitude A = Amplitude B).

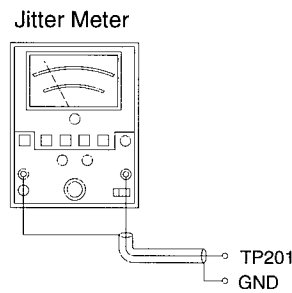


A=B

(approx. 1.5Vp-p)

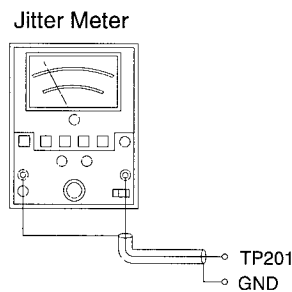
5. Focus Offset Adjustment

- (1) Connect the Jitter meter to TP201 and GND.
- (2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.
- (3) Adjust VR102 until the jitter for optimum sensitivity.



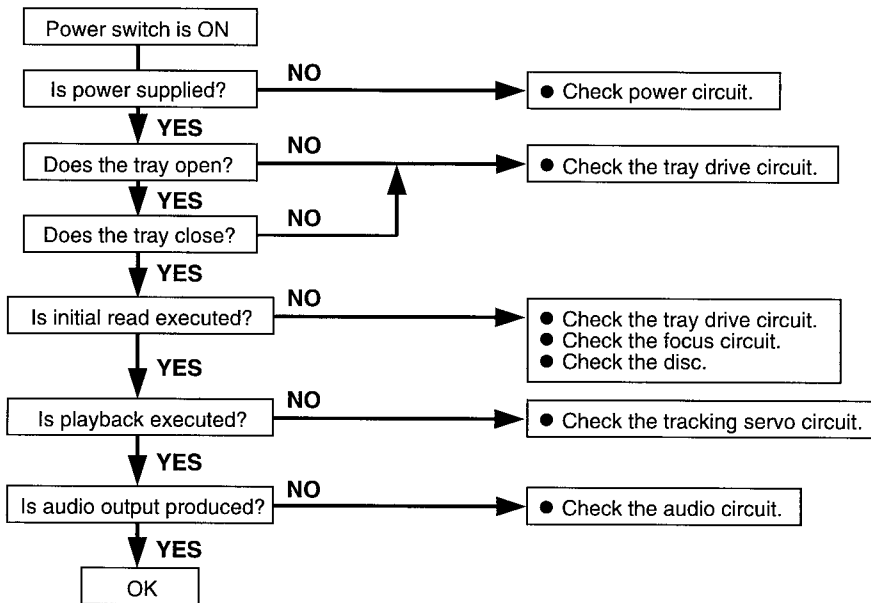
6. Jitter Inclination Confirmation

- (1) Connect the Jitter meter (sigma range) to TP201 and GND.
- (2) Insert EIAJ CD-1 test disc and place the unit in the Play mode.
- (3) Confirm the jitter meter reading is less than 30ns.

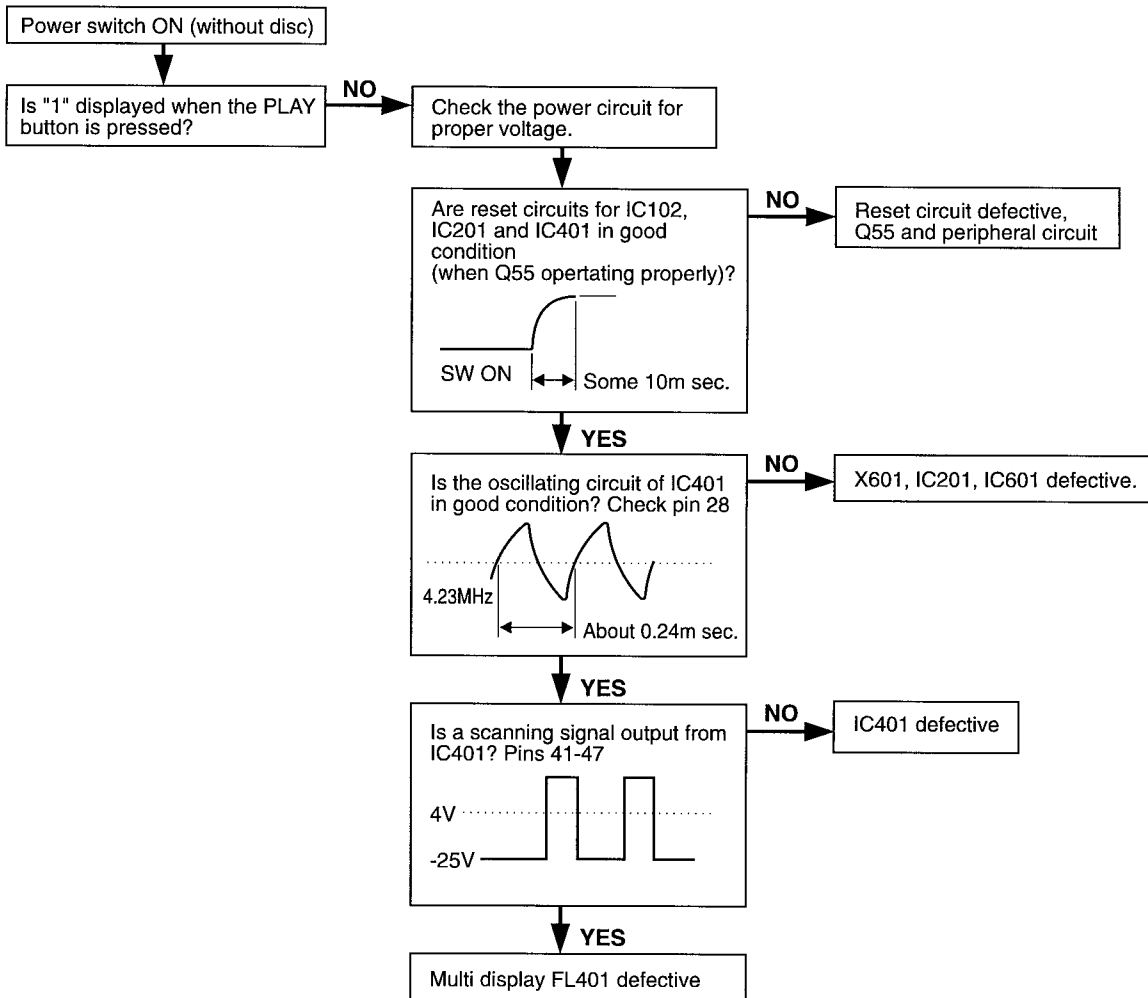


Troubleshooting

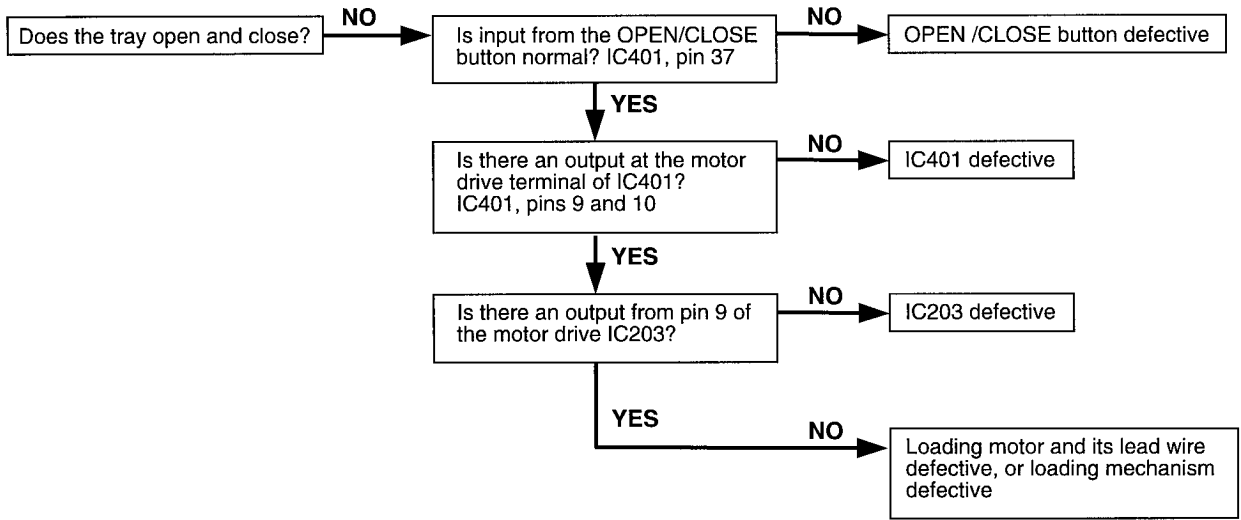
When a problem occurs, first check the pick-up lens for dirt and each connector for tight and secure connection. If the problem persists after checking both of these items, use the following check procedures.



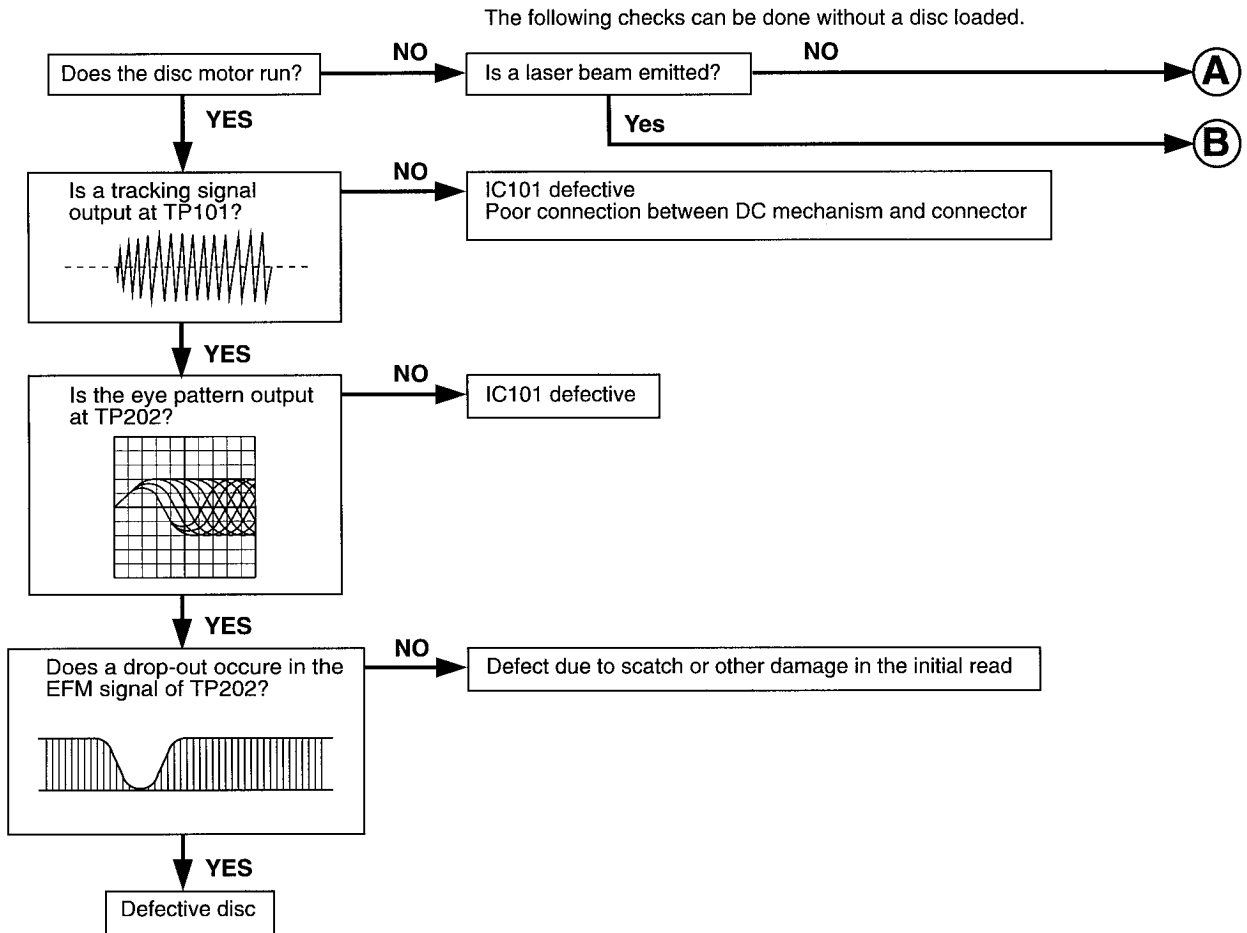
(1) When Multi Display fails to light properly.



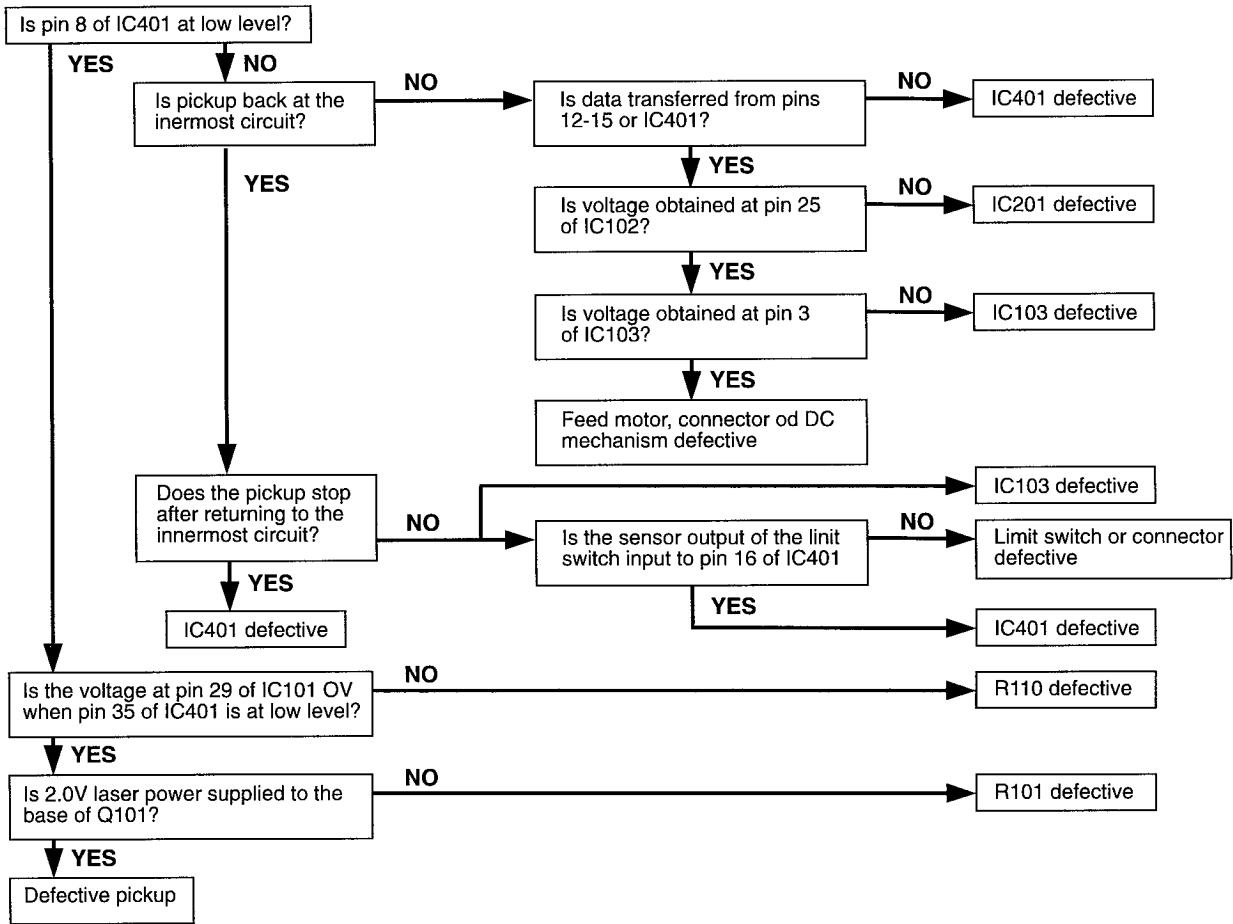
When a problem occurs, first check the pick-up lens for dirt and each connector for tight and secure connection. If the problem persists after checking both of these items, use the following check procedures.



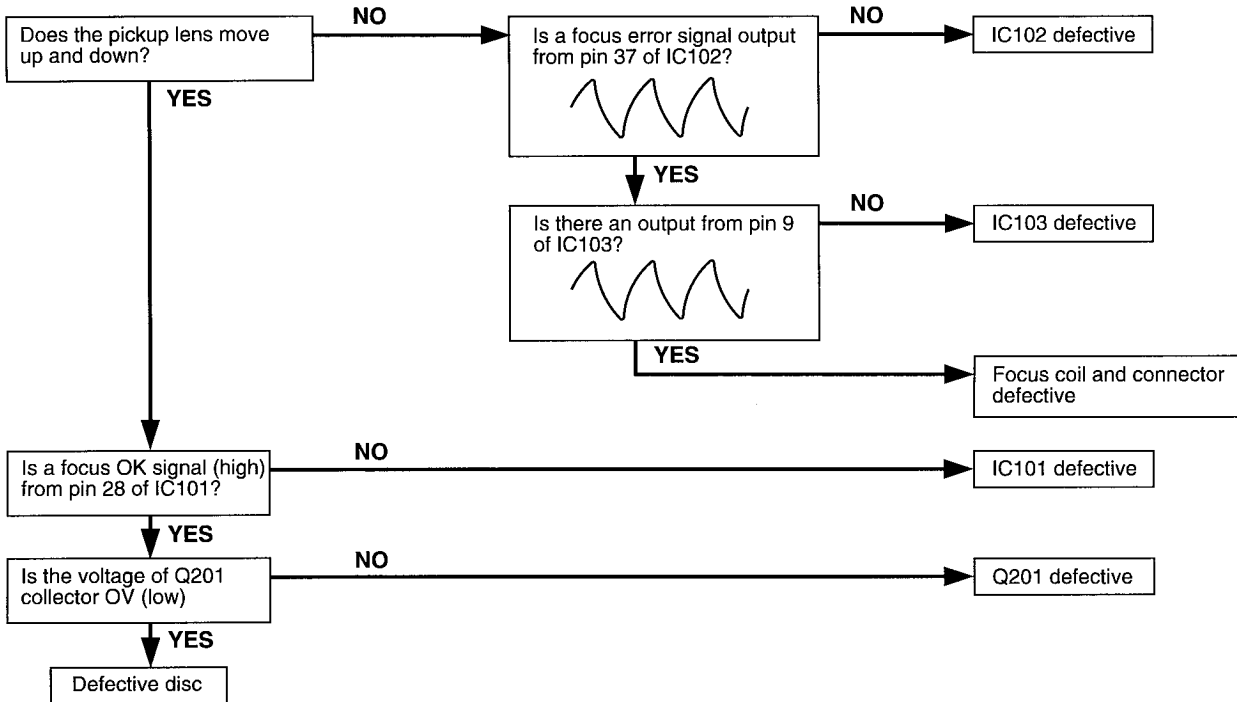
(3) When initial read cannot be executed.



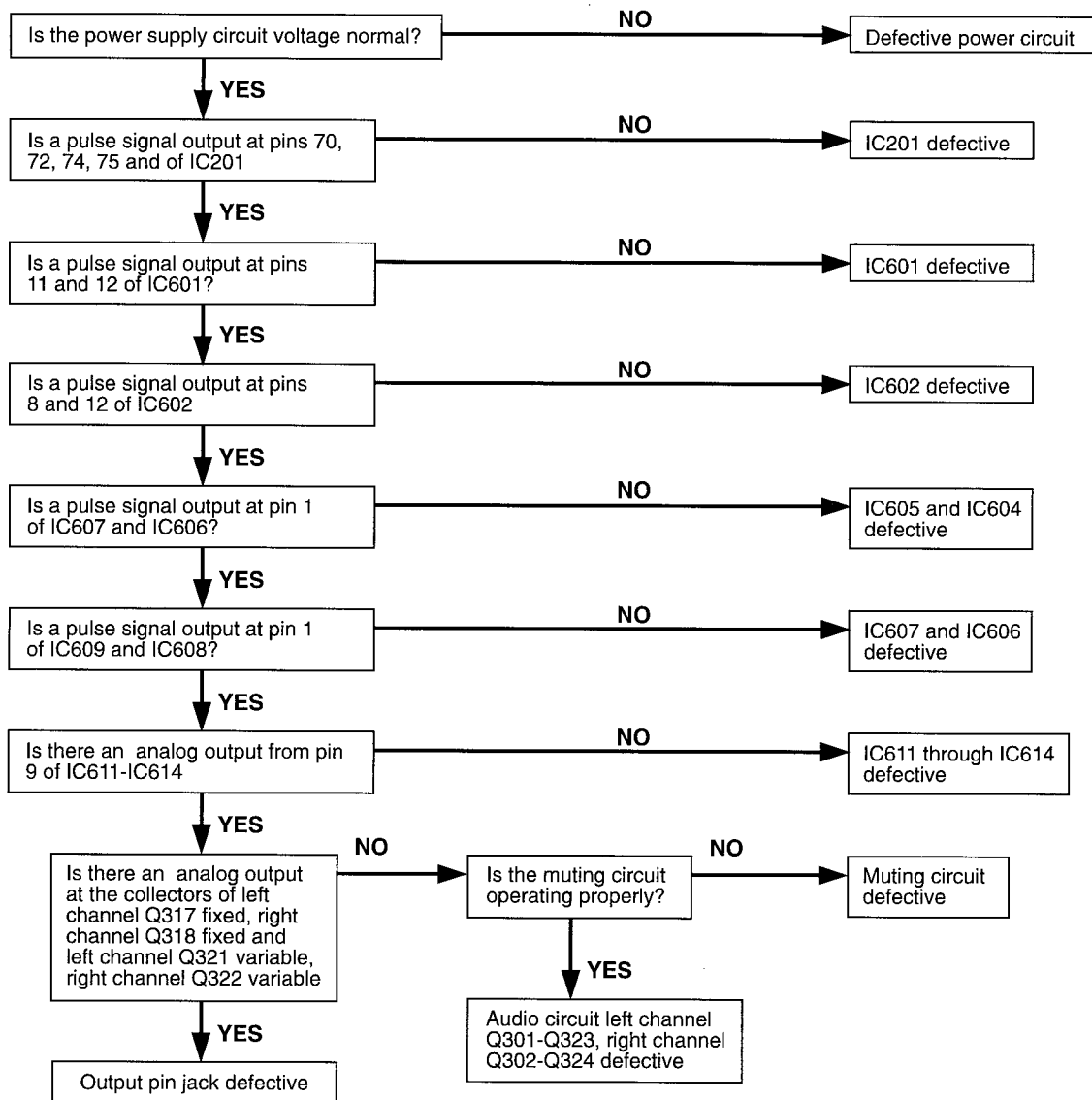
(A) When Laser not emitted.



(B) When Laser is emitted.



When there is no audio output



| IC NUMBER | TERMINAL NUMBER | PORT NAME | TERMINAL CODE | I/O | OUTLINE OF FUNCTIONS |
|-----------|-----------------|---------------|----------------|--|--|
| IC101 | 1 | RFI | | I | RF summing amp. input terminal. |
| | 2 | RFO | | O | RF summing amp. output terminal. |
| | 3 | RF- | | I | RF summing amp. return input terminal. |
| | 4 | P/N | | I | Laser diode P/N select terminal. |
| | 5 | LD | | O | APC LD amp. output terminal. |
| | 6 | PD | | I | APC PD amp. input terminal. |
| | 7 | PD1 | | I | RF I-V amp. (1) invert input terminal. |
| | 8 | PD2 | | I | RF I-V amp. (2) invert input terminal. |
| | 9 | VC | | - | GND terminal. |
| | 10 | F | | I | F I-V amp. invert input terminal. |
| | 11 | E | | I | E I-V amp. invert input terminal. |
| | 12 | EO | | O | E I-V amp. output terminal. |
| | 13 | EI | | I | E I-V amp. return input terminal. |
| | 14 | VR | | O | DC voltage output terminal. |
| | 15 | CC2 | | I | DEFECT signal input terminal. |
| | 16 | CC1 | | O | DEFECT signal output terminal. |
| | 17 | VEE | | - | Negative power terminal. |
| | 18 | FE BIAS | | I | Focus error amp. bias terminal. |
| | 19 | FE | | O | Focus error amp. output terminal. |
| | 20 | TE | | O | Tracking error amp. output terminal. |
| | 21 | DEFECT | | O | DEFECT comparator output terminal. |
| | 22 | MIRR | | O | MIRR comparator output terminal. |
| | 23 | CP | | I | MIRR hold capacitor connect terminal. |
| | 24 | CB | | I | DEFECT hold capacitor connect terminal. |
| | 25 | DGND | | - | GND terminal. |
| | 26 | ASY | | I | Auto asymmetry control input terminal. |
| | 27 | EFM | | O | EFM comparator output terminal. |
| | 28 | FOK | | O | Focus OK comparator output terminal. |
| | 29 | LD ON | | I | Laser diode on/off select terminal. |
| | 30 | VCC | | - | Positive power terminal |
| IC102 | 3 | TE IN | Pre amp. input | I | Tracking error signal input terminal. |
| | 4 | TC IN | Pre amp. input | I | Track cross signal input terminal. |
| | 5 | MR | Pre amp. input | I | Mirror detected signal input terminal. |
| | 6 | Jump Flag | Mi-com I/O | O | Outputs "H" under jump function. |
| | 8 | HF OK | Pre amp. input | I | HF OK signal input terminal. |
| | 9 | HFD | Mi-com I/O | O | "1" indicates that MR input is "1" and track servo loop is off (TS OFF, JF, JR). |
| | 10 | DATA OUT | Mi-com I/O | O | Inner condition output changed by command modes. |
| | 11 | JP1 | Mi-com I/O | I | 1 track jump control signal. Usually "H". |
| | 12 | MSD | Mi-com I/O | I | Serial data input terminal (LSB first, 8-bit data). |
| | 13 | MLA | Mi-com I/O | I | Latch signal of serial data from mi-com to servo IC. |
| | 14 | MCK | Mi-com I/O | I | Clock signal of serial data from mi-com to servo IC. Receives data on leading edge. |
| | 15 | ACL \bar{R} | Mi-com I/O | I | All clear input (clear inner registers and flip-flops by "L" signal). |
| | 18 | Bias | Power supply | O | Vcc/2 bias power supply output when single-pole power supply is used. |
| | 19 | COM | Power supply | I | Common terminal. Connect to GND when double-pole power supply is used and to BIAS when single-pole power supply is used. |
| | 20 | GND | Power supply | I | GND terminal. |
| | 21 | VEE | Power supply | I | Negative power terminal. Connect to GND when single-pole power supply is used. |
| | 22 | C•FSR | Focus supply | - | Connect capacitor which determines time constant of focus search waveform. |
| | 23 | I-Ref | Power supply | I | Terminal for connecting resistor for setting current value of reference current source. |
| | 24 | Vcc | Power supply | I | Positive power terminal. |
| | 25 | SS OUT | Slide servo | O | Operation amplifier SS output. |
| | 26 | SS - | Slide servo | I | Operation amplifier SS reverse input. |
| | 27 | SS + | Slide servo | I | Operation amplifier SS non-reverse input. |
| | 28 | TS OUT | Track servo | O | Operation amplifier TA output. |
| | 29 | TS - | Track servo | I | Operation amplifier TA reverse input. |
| | 30 | TG2 | Track servo | - | Track gain select switch TG2 output. Set to open or common level. |
| | 31 | TS + | Track servo | I | Operation amplifier TA non-reverse input. |
| | 32 | TG1 | Track servo | - | Track gain select switch TG1 output. Set to open or common level. |
| | 33 | TE OUT | Track servo | O | Operation amplifier TE output. |
| | 34 | TE - | Track servo | I | Operation amplifier TE reverse input. |
| 35 | FSR IN | Focus servo | I | Focus search voltage level detector input. | |
| 36 | FG | Focus servo | - | Focus gain select switch FG output. Set to open or common level. | |
| 37 | FS OUT | Focus servo | O | Operation amplifier FA output. | |
| 38 | FS - | Focus servo | I | Operation amplifier FA reverse input. | |
| 39 | FS + | Focus servo | I | Operation amplifier FA non-reverse input. | |

| IC NUMBER | TERMINAL NUMBER | PORT NAME | TERMINAL CODE | I/O | OUTLINE OF FUNCTIONS |
|-----------|-----------------|-----------|---------------|-----|--|
| IC103 | 1 | +VIN 1 | | I | Positive input terminal 1 for amp. 1. |
| | 2 | -VIN 1 | | I | Negative input terminal 1 for amp. 1. |
| | 3 | OUT 1 | | O | Output terminal 1. |
| | 4 | OUT 2 | | O | Output terminal 2. |
| | 5 | -VIN 2 | | I | Negative input terminal 2 for amp. 2. |
| | 6 | +VIN 2 | | I | Positive input terminal 2 for amp. 2. |
| | 7 | +VIN 3 | | I | Positive input terminal 3 for amp. 3. |
| | 8 | -VIN 3 | | I | Negative input terminal 3 for amp. 3. |
| | 9 | OUT 3 | | O | Output terminal 3. |
| | 10 | NC | | - | |
| | 11 | NC | | - | |
| | 12 | Vcc | | - | Positive power supply. |
| IC201 | 1 | EMP | | O | Emphasis code output. Emphasis = "1" |
| | 2 | PWM1 | | O | Disc motor drive PWM output 1. - |
| | 3 | PWM2 | | O | Disc motor drive PWM output 2. + |
| | 4 | DOTX | | O | Digital output. |
| | 5 | ACRCY | | I | Channel status clock input. |
| | 6 | TEST1 | | I | Test mode select input. |
| | 7 | DOBSSEL | | I | Output data bit select. |
| | 8 | DASEL1 | | I | D/A converter interface select input 1. |
| | 9 | DASEL2 | | I | D/A converter interface select input 2. |
| | 10 | DASEL3 | | I | D/A converter interface select input 3. |
| | 11 | DASEL4 | | I | D/A converter interface select input 4. |
| | 12 | MSD | | I | Microcomputer interface serial data input. |
| | 13 | MCK | | I | Microcomputer interface shift clock input. |
| | 14 | MLA | | I | Microcomputer interface data latch clock input. |
| | 15 | ACLR | | I | Microcomputer interface register clear input. |
| | 16 | HFD | | I | Play signal absence signal input. |
| | 17 | HF | | I | Play signal input. |
| | 18 | IREF | | I | Detection/PLL circuit reference current input. |
| | 19 | TLC | | O | Slice level control output. |
| | 20 | LPF | | I/O | PLL loop filter connection terminal. |
| | 21 | LOCK/DRD | | O | Synchronous/low disc rotate status output. |
| | 22 | SYCLK | | O | Frame synchronous status output. |
| | 23 | VDD2 | | I | 5V power supply used for Detection/PLL circuit analog area only. |
| | 24 | DRD | | O | Low disc rotate status output. |
| | 25 | EFFK | | O | EFM frame clock output. |
| | 26 | SCINT | | O | Subcode Q interrupted signal output. |
| | 27 | SQRO | | O | Subcode Q register output. |
| | 28 | SQRCK | | I | Subcode Q register data shift clock input. |
| | 29 | SCOR | | O | Subcode synchronous signal output. |
| | 30 | CRCF | | O | Subcode Q CRC check result output. |
| | 31 | SCCK | | I | Shift clock input for serial subcode data output. |
| | 32 | VSS2 | | I | GND terminal. |
| | 33 | SCOE2 | | I | Subcode parallel output channel P to S enable input. |
| | 34 | SCOE1 | | I | Subcode parallel output channel T to W enable input. |
| | 35 | SBCW | | O | Subcode channel W output. |
| | 36 | SBCV | | O | Subcode channel V output. |
| | 37 | SBCU | | O | Subcode channel U output. |
| | 38 | SBCT | | O | Subcode channel T output. |
| | 39 | SBCS | | O | Subcode channel S output. |
| | 40 | SBCR | | O | Subcode channel R output. |
| | 41 | SBCQ | | O | Subcode channel Q output. |
| | 42 | SBCP | | O | Subcode channel P output. |
| | 43 | RAS | RT1 | O | Row address strobe signal output. |
| | 44 | TEST 2 | TEST 2 | I | Test mode select input. |
| | 45 | RDB2 | RT2 | I/O | External memory data I/O 2. |
| | 46 | NC | | - | |
| | 47 | | RT3 | I/O | External memory data I/O 1. |
| | 48 | | RT4 | I/O | External memory data I/O 4. |
| | 49 | | RT5 | O | Column address strobe signal output. |
| | 50 | | RT6 | I/O | External memory data I/O 3. |
| | 51 | | RT7 | O | Write enable signal output. |
| | 52 | | RT8 | I | External memory address output 7. |
| | 53 | | RT9 | O | External memory address output 1. |
| | 54 | | RT10 | O | External memory address output 2. |

| IC NUMBER | TERMINAL NUMBER | PORT NAME | TERMINAL CODE | I/O | OUTLINE OF FUNCTIONS |
|-----------|-----------------|-----------|---------------|--|---|
| IC201 | 55 | | RT11 | O | External memory address output 3. |
| | 56 | NC | | - | |
| | 57 | | RT12 | O | External memory address output 4. |
| | 58 | | RT13 | O | External memory address output 5. |
| | 59 | | RT14 | O | External memory address output 6. |
| | 60 | RT15 | RT15 | O | External memory address output 0. |
| | 61 | EST2 | | O | Error status 2. |
| | 62 | EST1 | | O | Error status 1. |
| | 63 | VDD1 | | I | 5V power supply. |
| | 64 | DOFK | | O | OSC frame clock output. |
| | 65 | F5CK | | O | Clock output 44.1kHz. |
| | 66 | C846 | | O | Clock output 8.4672MHz. |
| | 67 | C423 | | O | Clock output 4.2336MHz. |
| | 68 | CKSEL | | I | 1/2 divider input. |
| | 69 | DFSEL | | O | 1/2 divider output. |
| | 70 | XI | | I | Crystal oscillator input. |
| | 71 | XO | | O | Crystal oscillator output. |
| | 72 | DO1 | | O | D/A converter serial data output. |
| | 73 | VSS1 | | I | GND terminal. |
| | 74 | DSCK | | O | D/A converter data shift clock output. |
| 75 | LRCK | | O | D/A converter left/right clock output. | |
| 76 | DO2 | | O | Dual D/A converter serial data output. | |
| 77 | WDCK | | O | D/A converter word clock. | |
| 78 | DLRCK | | O | D/A converter left/right clock output. | |
| 79 | APTL | | O | D/A converter deglitch clock L. | |
| 80 | APTR | | O | D/A converter deglitch clock R. | |
| IC203 | 1 | VSENCE1 | | | |
| | 2 | OUT1 | | O | Output terminal 1. |
| | 3 | -VIN1 | | I | Negative input 1. |
| | 4 | +VIN1 | | I | Positive input 1. |
| | 5 | VEE | | | Negative power supply. |
| | 6 | +VIN2 | | I | Positive input 2. |
| | 7 | -VIN2 | | I | Negative input 2. |
| | 8 | OUT2 | | O | Output terminal 2. |
| | 9 | VSENCE2 | | | |
| | 10 | Vcc | | | Positive power supply. |
| IC401 | 1 | VCC | | | Positive power supply. |
| | 2 | P65 | | I/O | |
| | 3 | P64 | | I/O | |
| | 4 | P63 | | I/O | |
| | 5 | P62 | | I/O | |
| | 6 | P61 | | I/O | |
| | 7 | P60 | | I/O | |
| | 8 | P27 | I/O port | I/O | Disc tray open direction driving output. |
| | 9 | P26 | I/O port | I/O | Disc tray close direction driving output. |
| | 10 | P25 | I/O port | I/O | |
| | 11 | P24 | I/O port | I/O | Serial data output. |
| | 12 | P23 | I/O port | I/O | Serial data output. |
| | 13 | P22 | I/O port | I/O | Data latch clock output. |
| | 14 | P21 | I/O port | I/O | |
| | 15 | P20 | I/O port | O | |
| | 16 | P37 | OUT PORT | O | Display output i. |
| | 17 | P36 | OUT PORT | O | Display output g. |
| | 18 | P35 | OUT PORT | O | Display output f. |
| | 19 | P34 | OUT PORT | O | Display output e. |
| | 20 | P33 | OUT PORT | O | Display output d. |
| | 21 | P32 | OUT PORT | O | Display output c. |
| | 22 | P31 | OUT PORT | O | Display output b. |
| | 23 | P30 | OUT PORT | O | Display output a. |
| | 24 | P53 | | | |
| | 25 | P52 | | | |
| | 26 | CNVSS | | | Usually connected to VSS. |
| | 27 | RESET | | I | Reset input. |
| | 28 | XIN | CLOCK IN | I | Clock input. |
| | 29 | XOUT | CLOCK OUT | O | Clock output. |
| | 30 | XCIN | CLOCK IN | I | Serial data input. |

| IC NUMBER | TERMINAL NUMBER | PORT NAME | TERMINAL CODE | I/O | OUTLINE OF FUNCTIONS |
|-----------|-----------------|-----------|---------------|-----|---|
| IC401 | 31 | XCOU | CLOCK OUT | O | Clock output. |
| | 32 | VSS | | | Power supply. |
| | 33 | ∅ | | O | Timing output. |
| | 34 | P57 | | | |
| | 35 | P56 | | | |
| | 36 | P55 | | | |
| | 37 | P54 | | | |
| | 38 | VP | | I | Pull down voltage input. |
| | 39 | P51 | | | |
| | 40 | P50 | | | |
| | 41 | P17 | OUT PORT | O | Laser diode control output. |
| | 42 | P16 | OUT PORT | O | Display output 7. |
| | 43 | P15 | OUT PORT | O | Display output 6. |
| | 45 | P13 | OUT PORT | O | Display output 4. |
| | 46 | P12 | OUT PORT | O | Display output 3. |
| | 47 | P11 | OUT PORT | O | Display output 2. |
| | 48 | P10 | OUT PORT | O | Display output 1. |
| | 49 | P07 | I/O PORT | I/O | Serial data input. |
| | 50 | P06 | I/O PORT | I/O | Frame synchronous state output. |
| | 51 | P05 | I/O PORT | I/O | Low disc rotate state output. |
| | 52 | P04 | I/O PORT | I/O | Sub-code synchronous signal output. |
| | 53 | P03 | I/O PORT | I/O | Sub-code Q check. |
| | 54 | P02 | I/O PORT | I/O | Sub-code channel Q output. |
| | 55 | P01 | I/O PORT | I/O | Interrupt input. |
| | 56 | P00 | I/O PORT | I/O | |
| | 57 | P47 | | | |
| | 58 | P46 | | | |
| | 59 | P45 | | | |
| | 60 | P44 | | | |
| | 61 | P43 | | | |
| | 62 | P42 | | | |
| | 63 | P41 | | | |
| 64 | P40 | | | | |
| IC501 | 1 | OUT1 | | O | Output terminal 1. |
| | 2 | II1 | | I | Negative input terminal 1 for amp. 1. |
| | 3 | IN1 | | I | Positive input terminal 1 for amp. 1. |
| | 4 | V- | | | Negative power supply. |
| | 5 | IN2 | | I | Positive input terminal 2 for amp. 2. |
| | 6 | II2 | | I | Negative input terminal 2 for amp. 2. |
| | 7 | OUT2 | | O | Output terminal 2. |
| | 8 | V+ | | | Positive power supply. |
| IC601 | 1 | | | | Not used. |
| | 2 | XTI | | I | Crystal oscillator connection (CD system 16.9344MHz) |
| | 3 | XTO | | O | Crystal oscillator connection. |
| | 4 | CKO | | O | Oscillator output clock. The frequency at this pin is the same as the frequency on the XTI pin. |
| | 5 | Vss | | - | Ground. |
| | 6 | NC | | - | |
| | 7 | DEEM | | I | Mode set bit clock (used to set the mode flags and the attenuator register). |
| | 8 | MUTE | | I | Mode set latch enable (used to set the mode flags and the attenuator register). |
| | 9 | RST | | I | Device reset. |
| | 11 | DOR | | O | Right channel data output (OMOD flag = Low : 8fs data output; OMOD flag = High : 4fs data output). |
| | 12 | DOL | | O | Left channel data output (OMOD flag = Low : 8fs data output; OMOD flag = High : 4fs data output). |
| | 13 | WCKO | | O | Output word clock. |
| | 14 | VDD | | - | Positive supply (5V). |
| | 15 | BCKO | | O | Output data bit clock. |
| | 16 | LRCI | | I | Input data word clock. LR input data multiplexed clock. CD system at normal : 44.1kHz, at high speed : 88.2kHz. |
| | 17 | BCKI | | I | Input data bit clock. |
| | 18 | DIN | | I | Input data. |
| | IC602 | 1 | 1A | | |
| 2 | | 1Y | | | Out. |
| 3 | | 2A | | | In. |
| 4 | | 2Y | | | Out. |
| 5 | | 3A | | | In. |

| IC NUMBER | TERMINAL NUMBER | PORT NAME | TERMINAL CODE | I/O | OUTLINE OF FUNCTIONS |
|---------------------|-----------------|------------------|------------------|-----|-------------------------------|
| IC602 | 6 | 3Y | | | Output. |
| | 7 | GND | | | Ground. |
| | 8 | 4Y | | | Out. |
| | 9 | RA | | | In. |
| | 10 | 5Y | | | Out. |
| | 11 | 5A | | | In. |
| | 12 | 6Y | | | Out. |
| | 13 | 6A | | | In. |
| | 14 | V _{CC} | | | Supply voltage. |
| IC603 | 1 | A | | | Serial input. |
| | 2 | B | | | Serial input. |
| | 3 | QA | | | Output. |
| | 4 | QB | | | Output. |
| | 5 | QC | | | Output. |
| | 6 | QD | | | Output. |
| | 7 | GND | | | Ground. |
| | 8 | CP | | | Clock pulse. |
| | 9 | MR | | | Master reset clear. |
| | 10 | QE | | | Output. |
| | 11 | QF | | | Output. |
| | 12 | QG | | | Output. |
| | 13 | QH | | | Output. |
| | | 14 | V _{CC} | | |
| IC611 through IC614 | 1 | -V _S | | - | Negative analog power supply. |
| | 2 | DIG GND | | - | Digital ground. |
| | 3 | +V _I | | - | Positive logic power supply. |
| | 4 | NC | | - | |
| | 5 | CLK | | I | Clock input. |
| | 6 | LEC | | I | Latch enable control input. |
| | 7 | DATA | | I | Data input. |
| | 8 | -V _I | | - | Negative logic power supply. |
| | 9 | VO _{UT} | | O | Voltage output. |
| | 10 | RF | | I | Feedback resistor. |
| | 11 | SJ | | I | Summing junction. |
| | 12 | ANA GND | | - | Analog ground. |
| | 13 | I _{OUT} | | O | Current output. |
| | 14 | MSB ADJ | | - | MSB adjustment terminal. |
| | 15 | V POT | | - | Potentiometer terminal. |
| | | 16 | +V _{CC} | | - |
| IC801 | 1 | 1Y | | O | Output terminal 1. |
| | 2 | 1A | | I | Input terminal 1. |
| | 3 | 1B | | I | Input terminal 1. |
| | 4 | 2Y | | O | Output terminal 2. |
| | 5 | 2A | | I | Input terminal 2. |
| | 6 | 2B | | I | Input terminal 2. |
| | 7 | GND | | | Ground terminal. |
| | 8 | 3A | | I | Input terminal 3. |
| | 9 | 3B | | I | Input terminal 3. |
| | 10 | 3Y | | O | Output terminal 3. |
| | 11 | 4A | | I | Input terminal 4. |
| | 12 | 4B | | I | Input terminal 4. |
| | 13 | 4Y | | O | Output terminal 4. |
| | | 14 | V _{CC} | | |

CIRCUIT DESCRIPTION

1. APC CIRCUIT

A semiconductor laser is used as the light source for the optical pickup. As the output from the semiconductor laser changes radically with changes in temperature, a circuit must be provided to stabilize this output. For this purpose, a monitor diode which detects the optical output of the laser diode is used in the semiconductor laser.

As the laser diode emits light from its bonded surface, light is emitted both in front and behind. The light emitted behind is monitored with the monitor diode installed on its rear surface, and the optical output is thus controlled. The light emitted in front becomes the light source for the pickup.

Fig. 1 shows the APC circuit.

When the temperature rises and the optical output decreases, the monitor diode current (I_S) decreases, the electric potential of IC101 pin 5 rises, the base current of the driving transistor increases, and the laser diode current increases. This causes the reduced optical output to return to its former level.

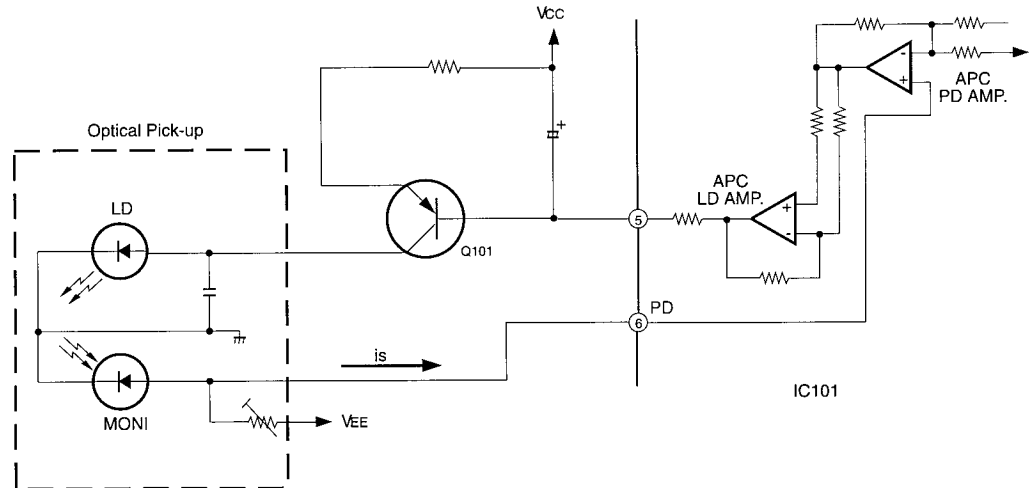


Fig. 1

2. FOCUS SERVO

2-1. Optical Pickup

This set employs a three-beam optical pickup comprised of six division photodiodes, A through F as shown in Fig. 2. The four photodiodes (A through D) at the center provide focus error detection by using their property to allow the beam to focus into a round image only at a certain point.

The sums of outputs from diagonal two elements of four division photodiodes (A+C and B+D) are compared by the differential amplifier in IC101 to detect the shape of the beam image.

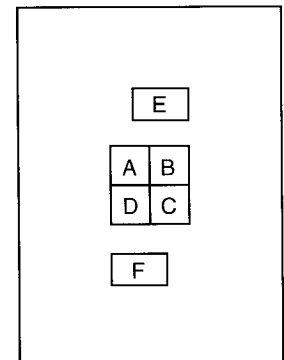
The remaining two diodes (E and F) provide tracking error detection by means of sub-beam spots.

2-2. Focus error detecting operation

The reflected laser beam from a disc is polarized 90 with the beam-splitter and sent to the cylindrical lens. The beam passed through this cylindrical lens is then sent to the four division photodiodes and focuses into an image whose shape varies with the distance between the disc and the objective lens. Such change in the beam shape causes the current flowing from photodiodes to vary.

Shown in Fig. 3 is the principle of the focus error detection.

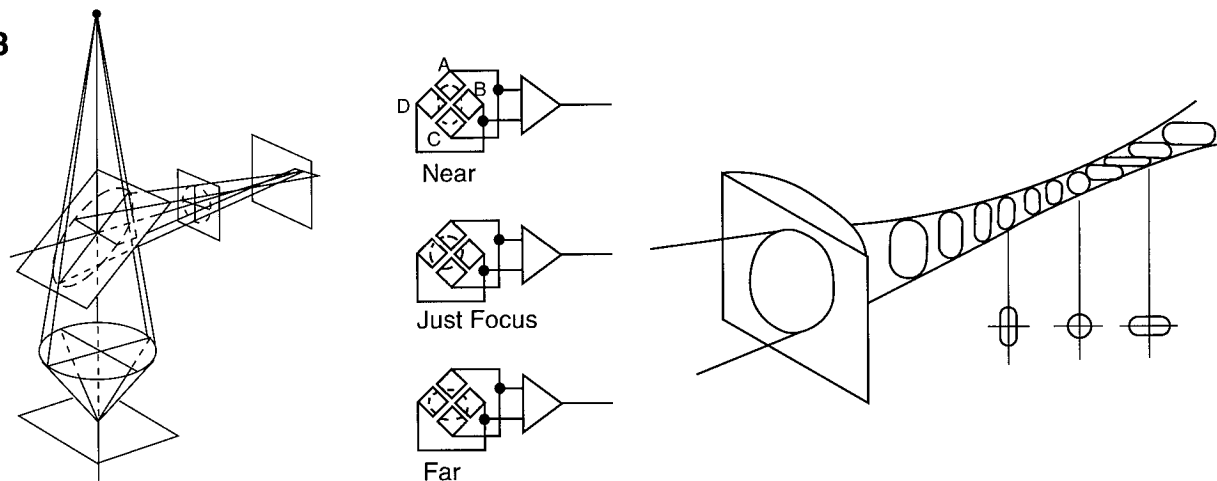
The currents from the photodiodes (A+C and B+D) are applied to pins 7 and 8 of IC101 and converted to voltage by RF 1-V amplifiers (1) and (2) included in IC101.



Three spotted (six-division) photo diodes

Fig. 2

Fig. 3

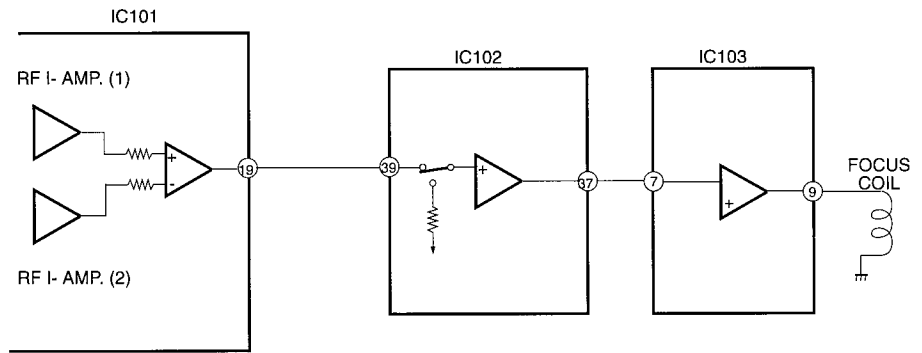


2-3. Focus servo control operation

The focus error signal, after being converted to voltage by the RF 1-V amplifier, is transmitted to the operation amplifier in the IC and output from pin 19. When the disc to objective lens distance is in just focus, the beam forms a true round. In this state, the beams applied to four elements in four division photodiodes become equal and thus the output provided then is 0 (zero). When the disc to objective lens distance is too close (near focus), the beam is reflected divergently to form an oval in crosswise direction. In this state the outputs provided from photodiodes A and C are higher than those from B and D, resulting in negative (-) output voltage. On the other hand, when the distance is too far (far focus), the beam is reflected convergently to form an oval in longitudinal direction. Then the outputs from photodiodes B and D are higher, resulting in positive (+) output.

The output voltage (focus error signal) from pin 19 of IC-101 passes through IC-102, in from pin 39 and out from pin 37, and IC103, in from pin 7 out from pin 9 as shown in Fig. 4. It is amplified in each IC and fed to the focus coil which then drives the objective lens of the pickup.

Fig. 4



2-4. Tracking error detection

Fig. 5 shows the principle of the tracking error detection system which employs the three beam system.

The laser beam is divided into the main beam and two sub-beams by diffraction grating and they are arranged on one line. The center line connecting these three beams has a slight offset angle against the main beam. The main beam is received by photodiodes A, B, C and D and two sub-beams by E and F respectively.

Fig. F-A shows the on-track state. As both auxiliary beams 1 and 2 are slightly on the track in this state, the outputs of photodiodes E and F are equal and the tracking signal is 0 (zero). When the track is shifted to the left (Fig. 5-B), the auxiliary beam 1 is off the pit. This allows more light to be received by photodiode E, resulting in positive (+) tracking signal output. On the other hand, when the track is shifted to the right (Fig. 5-C), the amount of light received by the photodiode F increases, resulting in negative (-) tracking signal output. And these extreme signals are detected as tracking error signals.

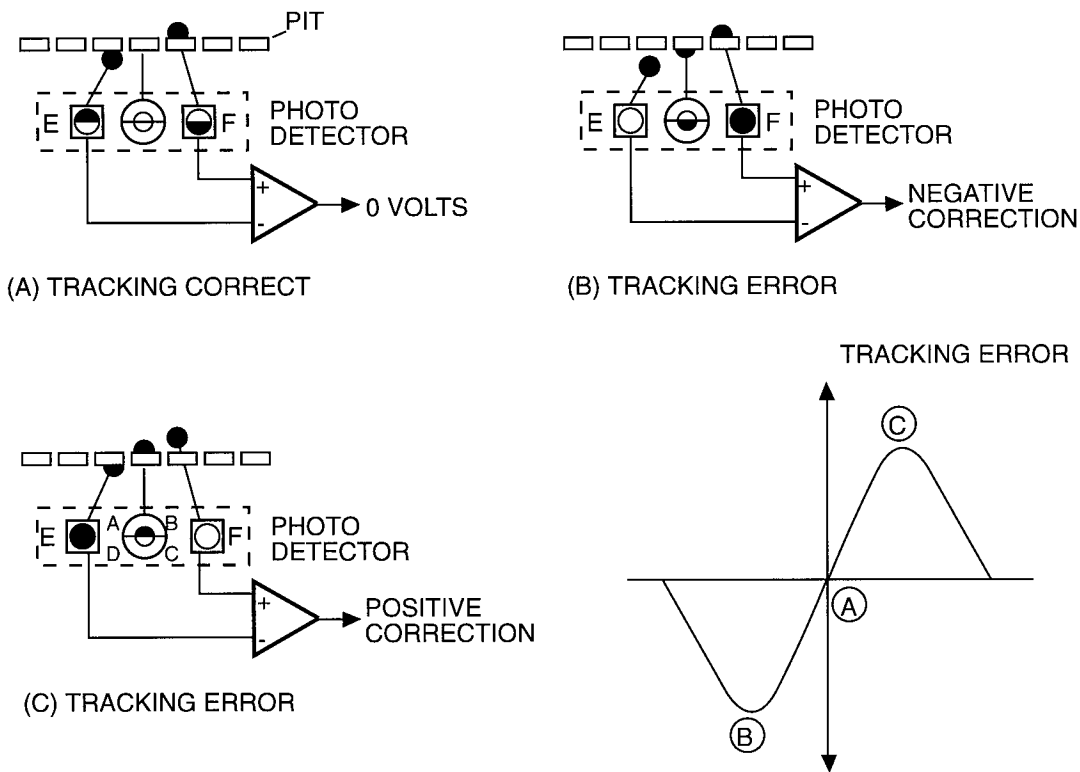
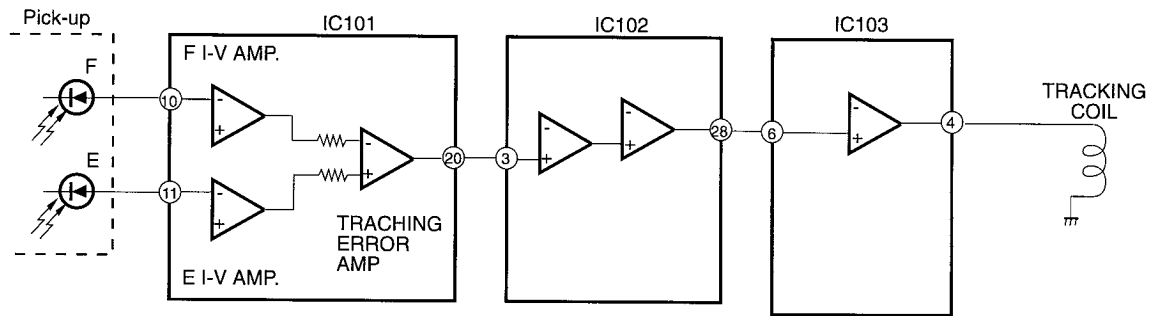


Fig. 5

2-5. Tracking servo control operation

When a tracking error signal is detected by photodiodes E and F, it is fed to pins 11 and 10 of IC101 respectively as shown in Fig. 6. In IC101, the signal is converted into voltage by the E I-V amplifier and F I-V amplifier, transmitted to the tracking error amplifier and output through pin 20. While it passes through IC102, in from pin 3 and out from pin 28, and IC103, in from pin 6 and out from 4, it is amplified in each IC and sent to the tracking coil to adjust pickup so that the amount of track shift is reduced as closely to none as possible.

Fig. 6

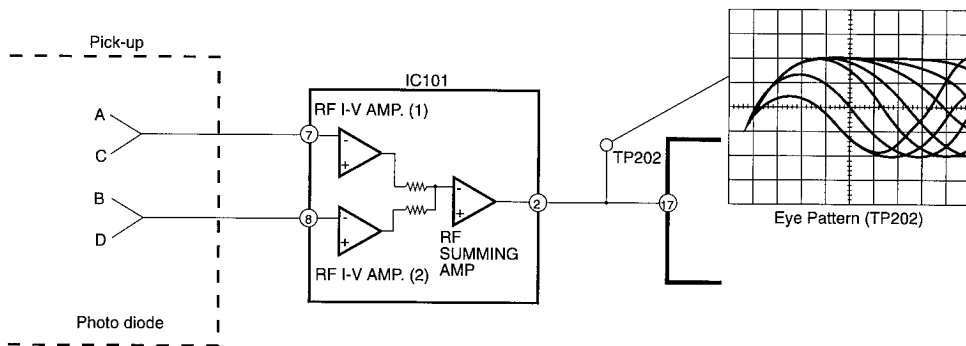


3. REGENERATIVE CIRCUIT

3-1. RF circuit

The currents from photodiodes (a, b, c and d) are fed to IC101 through pins 7 and 8 and converted to voltage by RF I-V amplifiers (1) and (2) respectively there, added by the RF summing amplifier and output from pin 2 as a signal. As it is sent to pin 17 of IC201, it can be checked at the test point (TP202) provided on its way by means of the eye pattern check (as shown by Fig. 7).

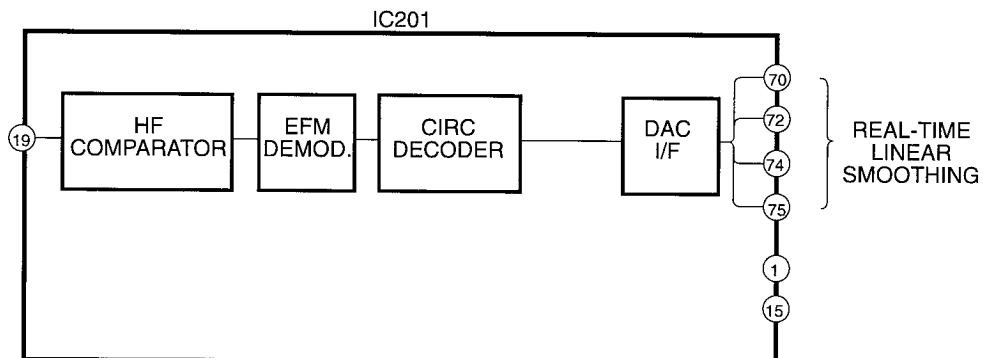
Fig. 7



3-2. EFM demodulation, error correction, serial/parallel conversion

EFM demodulation, error correction, and serial/parallel conversion are performed by the internal circuitry of IC201. The eye-pattern signals from pin 2 of IC101 are sent to pin 17 of IC201, then demodulated from 14 bits to 8 bits by EFM readjustment. At the same time any error, if found, is corrected (CIRC) and the signals are sent to the D/A converter interface. After that, they are output from pins 1, 15, 70, 72, 74 and 75 of IC201 and fed to the RLS (Real -Time Linear Smoothing) module (as shown by Fig. 8).

Fig. 8

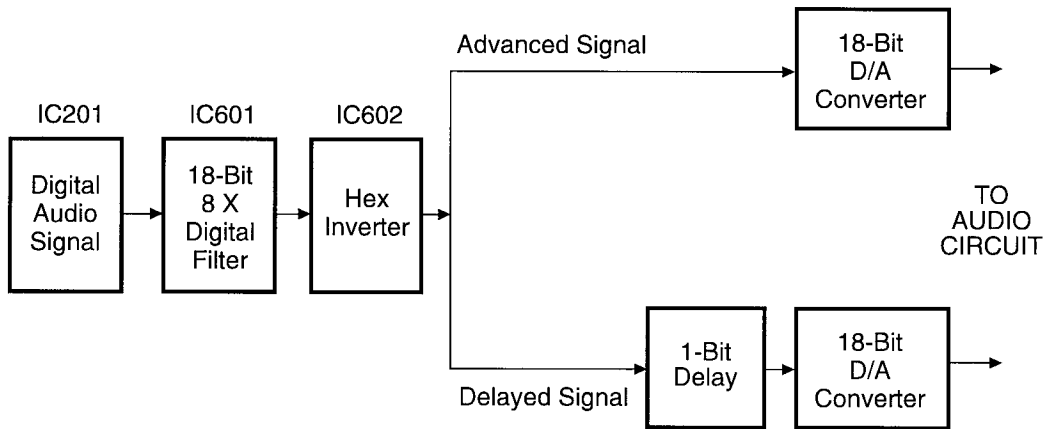


4. REAL-TIME SMOOTHING MODULE

The first stage in the RLS module is the 8 fs digital filter, IC601 (SM5840CP). IC601 also provides the de-emphasis characteristics when needed. The output of IC601 drives the IC602 Hex Inverter and the IC603 8-bit shift register. IC602 and IC603 drives IC605, IC607 and IC609 (for the left chan) and IC604, IC606 and IC608 (for the right chan) .The signals from IC605 drives IC611 directly, and passes through IC607 and IC609 before driving IC613. This results in the timing of the signal to pin 7 of IC611 being ahead of the signal to pin 7 of IC613. In the same way, the timing of the signal to pin 7 of IC612 is ahead of the signal to pin 7 of IC614. IC611, IC612, IC613 and IC614 are 18 bit linear D/A converters operating on the R-2 R, or ResistorLadder, Principle. The signals from pin 10 of IC611, IC612, IC613 and IC614 are sent to the Comparator/Integrator and Summing Amplifier (as shown in Fig. 9).

THE RLS SYSTEM (BLOCK DIAGRAM)

Fig. 9



5. AUDIO CIRCUIT

5-1. Comparator/Integrator and Summing Amplifier.

Dual-Differential circuits comprising of Q301, Q303, Q305, Q307, Q309 and Q311 with capacitor C309 ,smoothes out the time difference between IC611 and IC613. The signal is then fed through R329 to the final buffer circuit, Q313 and Q315 (for the left channel). Also Dual-Differential circuits comprising of Q302, Q304, Q306, Q308, Q310 ,and Q312 with capacitor C310, smoothes out the time difference between IC612 and IC614. The signal is then fed through R330 to the final buffer circuit,Q314 and Q316 (for the right channel).

5-2. Output Amplifier

The fixed left output jacks are driven by an amplifier comprised of Q317 and Q319. The variable left output jacks are driven by an amplifier comprised of Q321 and Q323. Also Muting is provided by Q331, Q332, Q333 and Q334. The fixed right output jacks are driven by an amplifier comprised of Q318 and Q320. The variable right output jacks are driven by an amplifier comprised of Q322 and Q324. Also Muting is provided by Q335, Q336, Q337 and Q338 (as shown by Fig. 10).

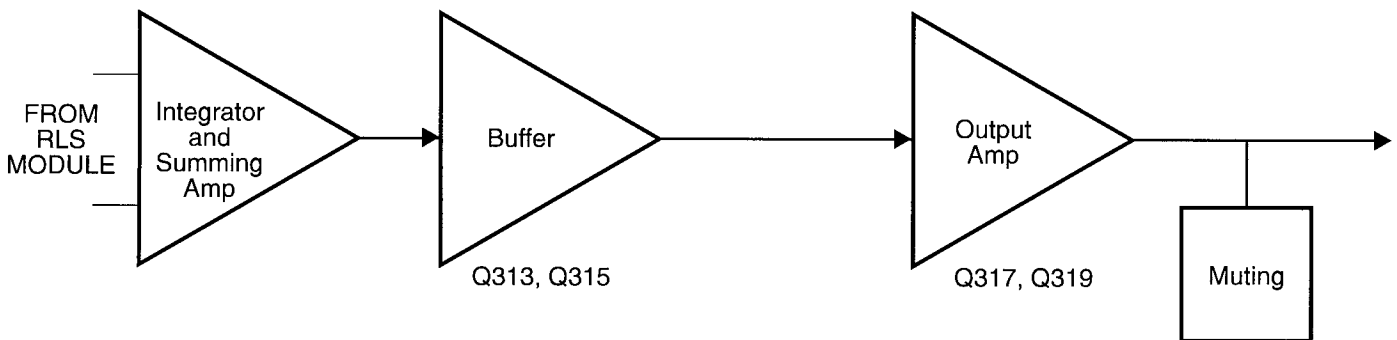
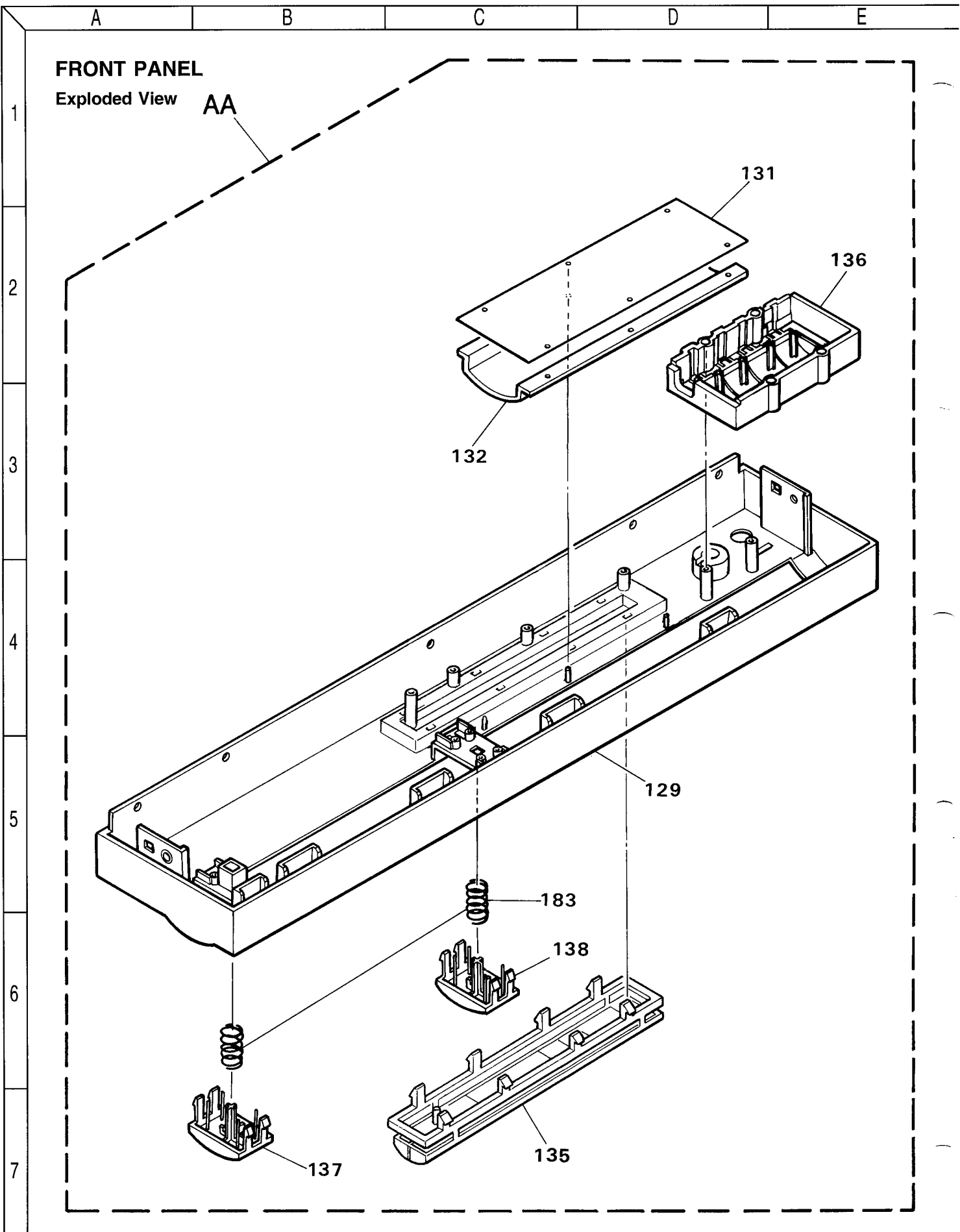


Fig. 10



A

B

C

D

E

GENERAL UNIT

Exploded View

1

2

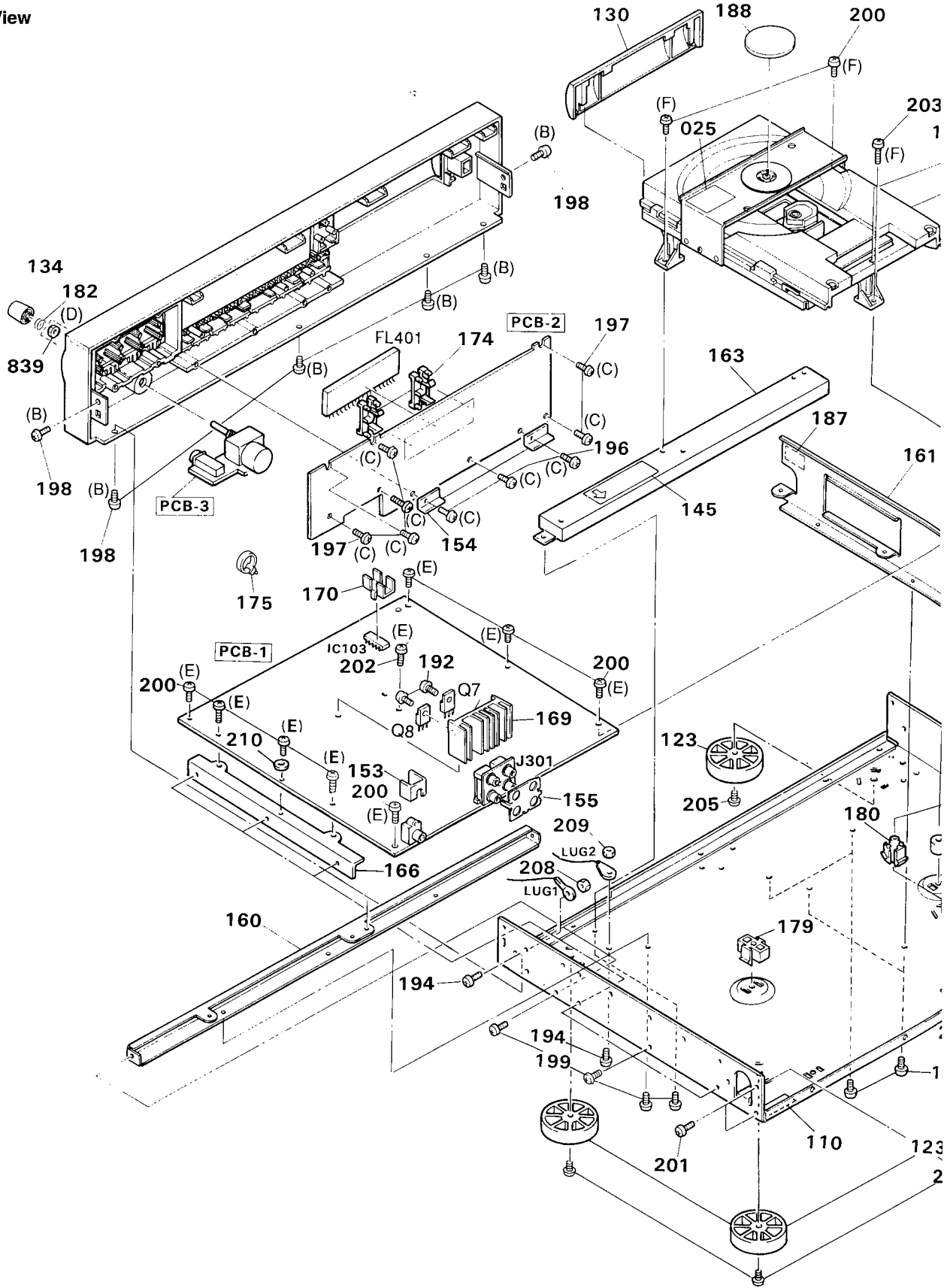
3

4

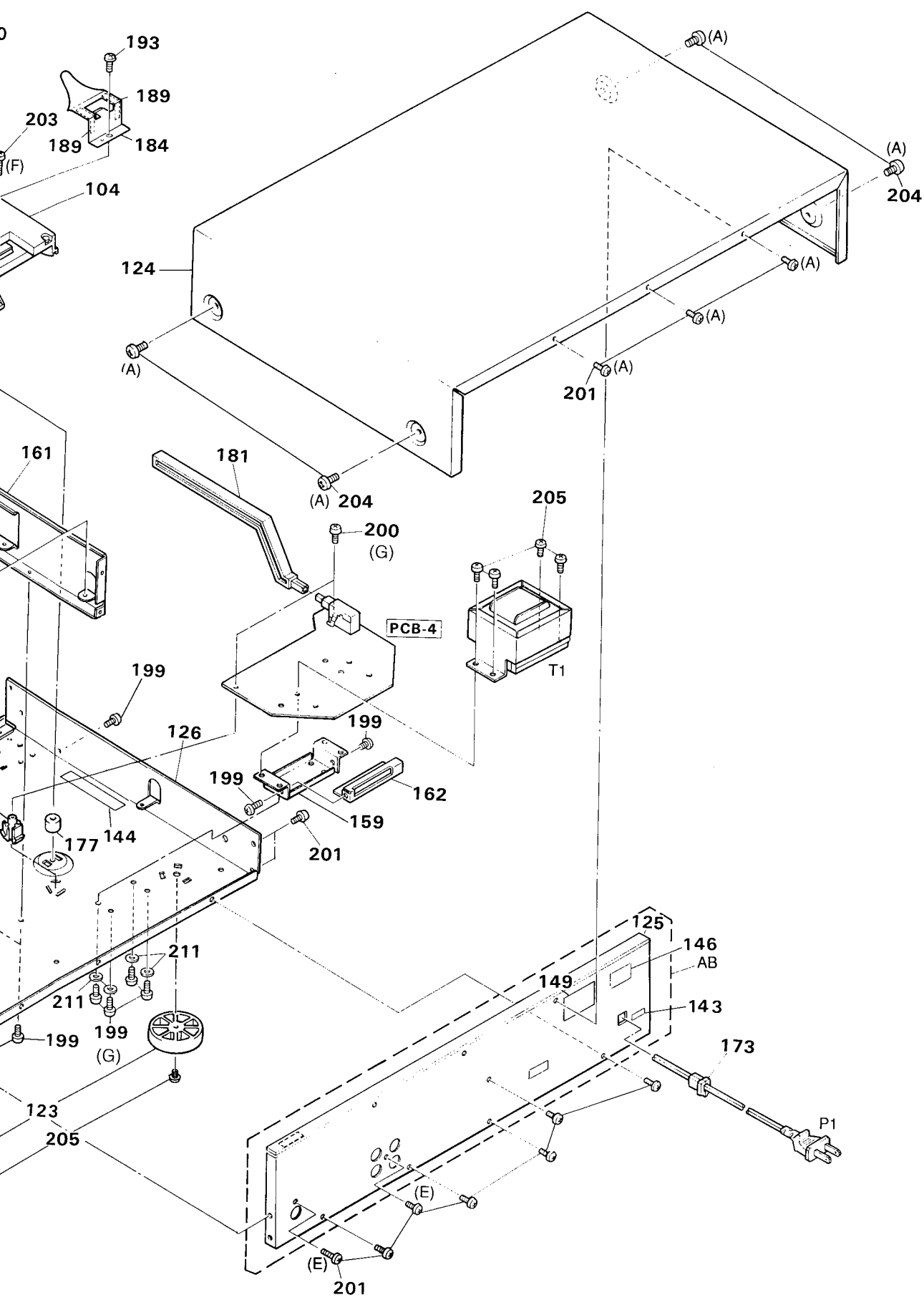
5

6

7



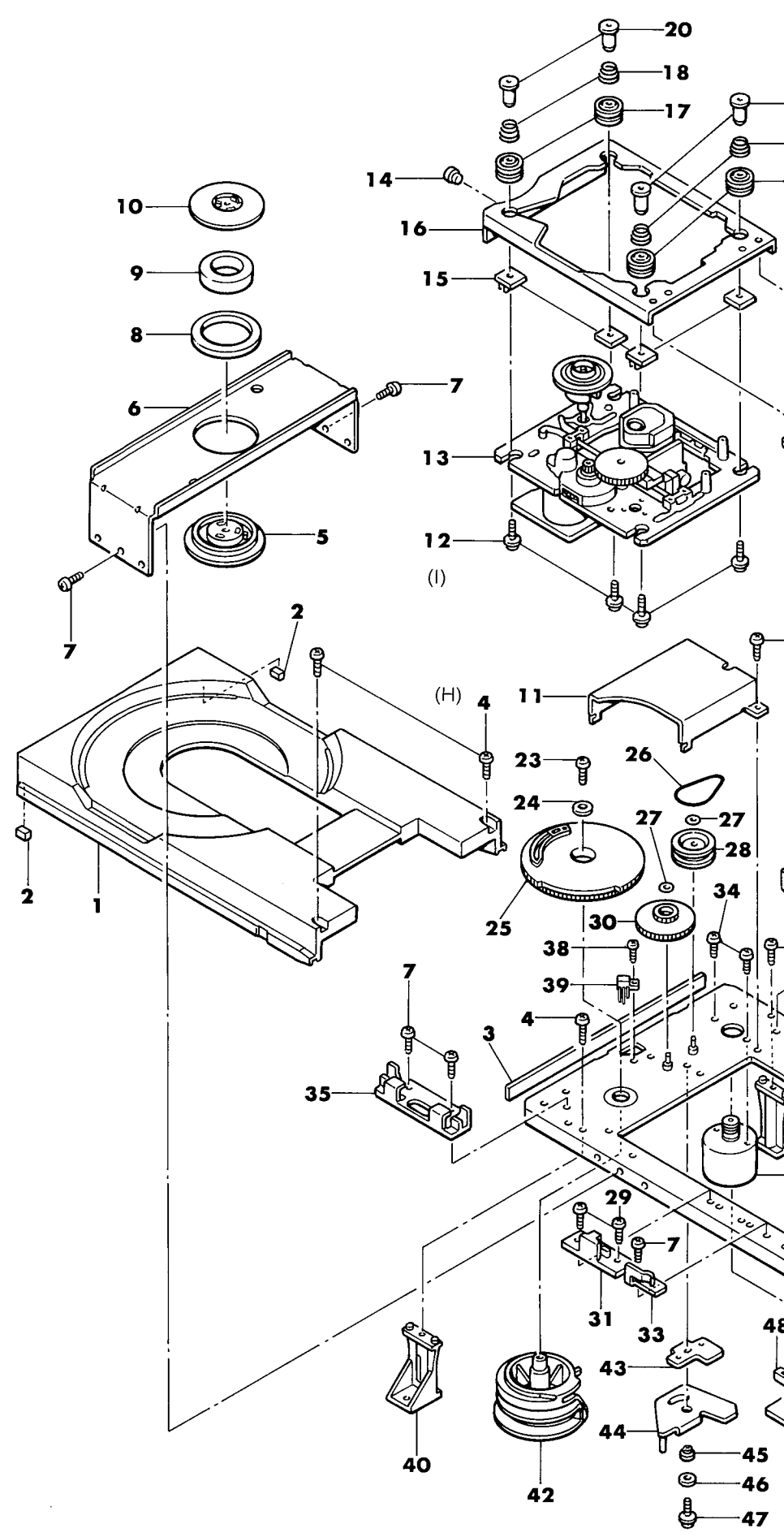
F G H I J

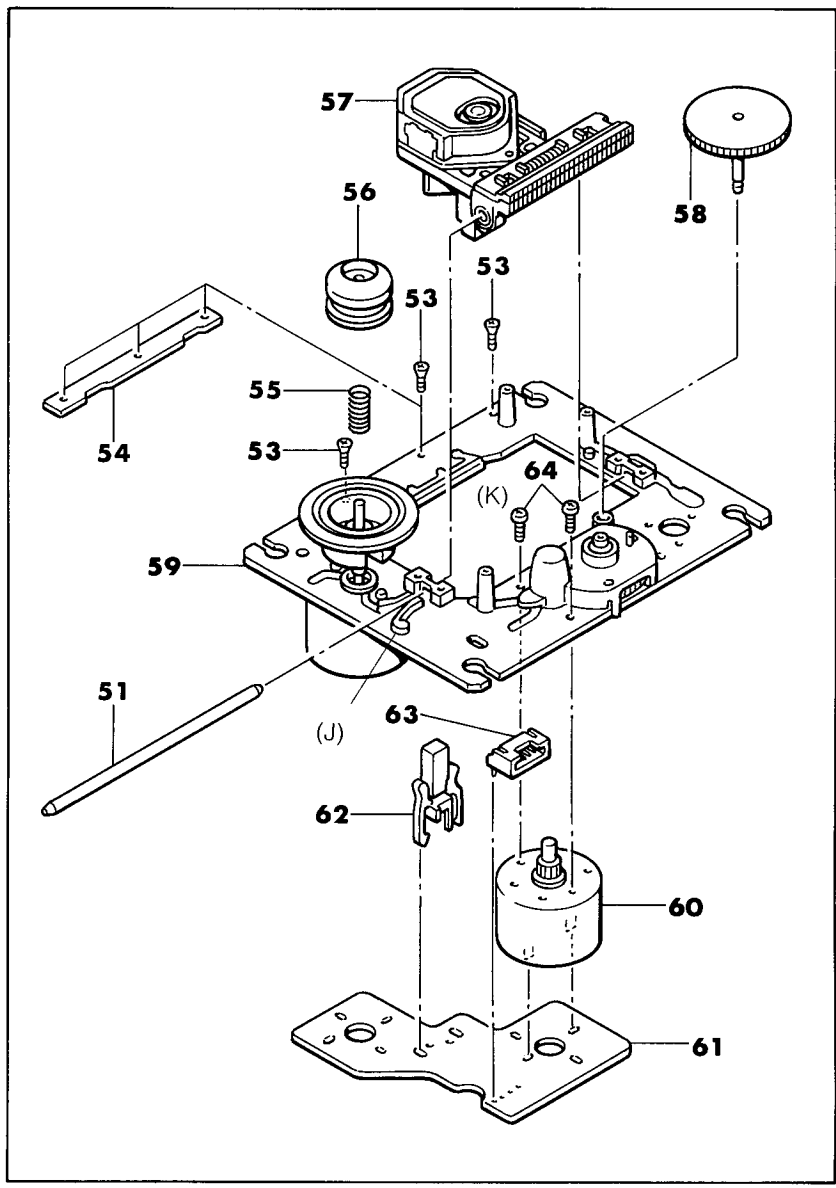
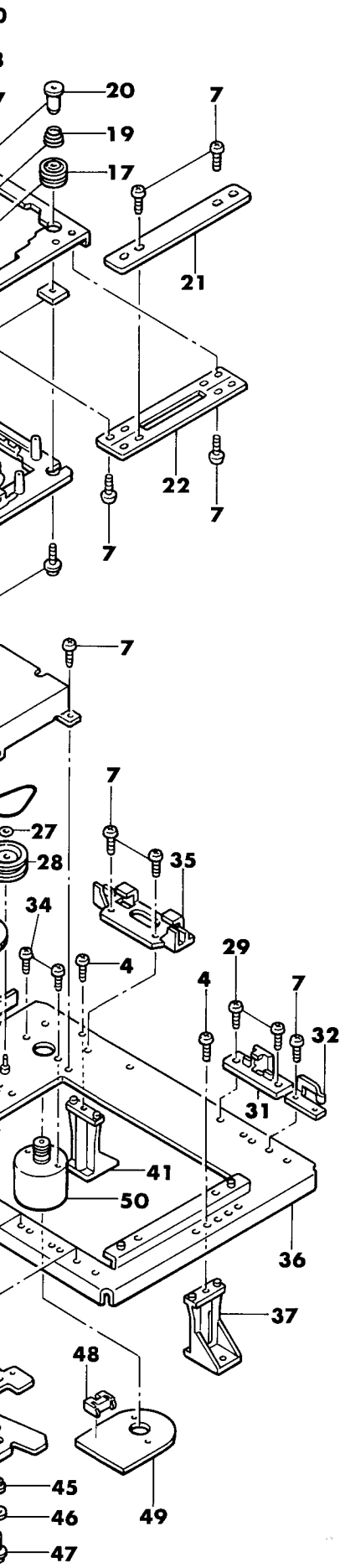


A B C D E

CD MECHANISM
Exploded View

1
2
3
4
5
6
7





GENERAL UNIT PARTS LIST

| Ref. No. Part No. | | Description | REF. NO. | PART NO. | DESCRIPTION |
|-------------------|--------------|--|----------|---------------|--------------------------------|
| AA | A442-HD7625A | FRONT PANEL ASSEMBLY G | 179 | 2360-7018 | SPECIAL BOSS, MAIN PCB |
| AA | A442-HD7625C | FRONT PANEL ASSEMBLY GB | 180 | 2360-7022 | SPECIAL BOSS, POWER SUPPLY PCB |
| AB | A424-HD7625B | CABINET BACK ASSEMBLY | 181 | 2601-7187 | SHAFT, POWER SWITCH |
| 025 | 1756-11802 | LABEL | 182 | 2651-110541 | SPRING, VOLUME KNOB |
| 104 | △ 3119-02401 | CD MECHA ASSEMBLY | 183 | 2651-2101732 | SPRING, PUSH BUTTON (X2) |
| 110 | 1117-78 | SERIAL LABEL, SET | 184 | 2652-124 | LEAF SPRING, MECHA REAR |
| 123 | 1319-02301 | LEG (X4) | 187 | 2111-1197 | FELT, CD MECHA SIDE |
| 124 | 1414-14601 | CABINET TOP | 188 | 2111-1422 | FELT, MECHA |
| 125 | 1424-33024 | COBINET BACK | 189 | 2111-11771 | FELT, LEAF SPRING (X2) |
| 126 | 1424-29603 | CABINET BOTTOM | 192 | 2327-R0130082 | SCREW, BND+ (3x8 mm) (X2) |
| 129 | 1442-28703 | FRONT PANEL G | 193 | 2342-301046 | SCREW, PAN T+(3x10 mm) |
| 129 | 1442-28704 | FRONT PANEL GB | 194 | 2327-R0130062 | SCREW, BND+ (3x6 mm) (X2) |
| 130 | 1452-08302 | LID G | 196 | 2343-301021 | SCREW, CSK T+ (3x10 mm) (X3) |
| 130 | 1452-08301 | LID GB | 197 | 2347-R0126082 | SCREW, BND T+ (2.6x8 mm) (X6) |
| 131 | 1511-19803 | PLATE, FL FILTER | 198 | 2347-R0130064 | SCREW, BND T+ (3x6 mm) (X6) |
| 132 | 1532-17502 | WINDOW, FRONT | 199 | 2347-R0130082 | SCREW, BND T+ (3x8 mm) (X18) |
| 134 | 1632-19803 | ROTARY KNOB, VOLUME G | 200 | 2347-R0130082 | SCREW, BND T+ (3x8 mm) (X12) |
| 134 | 1632-19801 | ROTARY KNOB, VOLUME GB | 201 | 2347-R0130084 | SCREW, BND T+ (3x8 mm) (X14) |
| 135 | 1662-68301 | PUSH BUTTON, CONTROL/TRACK/ SELECTION G | 202 | 2347-R0130142 | SCREW, BND T+ (3x14 mm) |
| 135 | 1662-68302 | PUSH BUTTON, CONTROL/TRACK/ SELECTION GB | 203 | 2347-R0130162 | SCREW, BND T+ (3x16 mm) |
| 136 | 1662-52202 | PUSH BUTTON, FUNCTION G | 204 | 2347-R0140084 | SCREW, BND T+ (4x8 mm) (X4) |
| 136 | 1662-52201 | PUSH BUTTON, FUNCTION GB | 205 | 2347-R0140102 | SCREW, BND T+ (4x10 mm) (X8) |
| 137 | 1662-52003 | PUSH BUTTON, POWER G | 208 | 2446-301Z9 | NUT, HET |
| 137 | 1662-52001 | PUSH BUTTON, POWER GB | 209 | 2440-7016 | SPECIAL NUT, EARTH |
| 138 | 1662-52004 | PUSH BUTTON, OPEN/CLOSE G | 210 | 2411-3021 | PLAIN WASHER |
| 138 | 1662-52002 | PUSH BUTTON, OPEN/CLOSE GB | 211 | 2401-035 | METAL WASHER (X4) |
| 143 | 1341-568 | NAME PLATE, PRODUCTION DATE GR | 839 | 2440-62 | SPECIAL NUT |
| 144 | 1756-03305 | LABEL, LASER CAUTION | | | |
| 145 | 1756-12101 | LABEL, LASER CAUTION | | | |
| 149 | 1756-11801 | LABEL, LASER WARNING LABEL | | | |
| 153 | 2216-7203 | SHIELD PLATE, COAXIAL JACK | | | |
| 154 | 2216-7187 | SHIELD PLATE, FRONT PCB (X2) | | | |
| 155 | 2216-7189 | SHIELD PLATE, RCA PIN JACK | | | |
| 159 | 2219-8262 | METAL FITTG, TRANS | | | |
| 160 | 2219-8263 | METAL FITTG, CHASSIS SIDE | | | |
| 161 | 2219-8264 | METAL FITTG, CHASSIS TOP | | | |
| 162 | 2219-8282 | METAL FITTG, TRANS | | | |
| 163 | 2219-8290 | METAL FITTG, MECHA | | | |
| 166 | 2219-8377 | METAL FITTG, MAIN PCB | | | |
| 169 | 2222-7215 | HEAT SINK, Q7, 8 | | | |
| 170 | 2222-7264 | HEAT SINK, IC103 | | | |
| 173 | 2240-364 | HOLDER, AC CORD | | | |
| 174 | 2240-7387 | HOLDER, FL REAR (X2) | | | |
| 175 | 2240-R0101 | HOLDER, WIRING (X9) | | | |
| 177 | 2363-501725 | PIPE BOSS, MECHA | | | |

CD MECHANISM PARTS LIST

REF. NO. PART NO.

DESCRIPTION

| Ref. No. | Part No. | Description | Ref. No. | Part No. | Description |
|----------|----------------|--------------------------------|----------|----------------|---------------------------------|
| 1 | 2-642-156-(02) | TRAY (SP) | 49 | 1-624-793-(21) | PC BOARD, MOTOR |
| 2 | 2-642-125-(01) | DAMPER (X2) | 50 | X-2641-336-(1) | MOTOR ASSY (RP) |
| 3 | 2-642-157-(03) | TAPE, FRONT | 51 | 4-917-565-(01) | SHAFT (S), SLED |
| 4 | 7-685-547-(19) | SCREW +BTP (3X10mm) (X5) | 53 | 2-641-386-(01) | SCREW (2x5mm), TAPPING (S) (X3) |
| 5 | 2-642-181-(02) | PULLEY (AU), CHUCKING | 54 | 2-625-625-(01) | REINFORCEMENT (S) |
| 6 | 2-642-165-(01) | CHASSIS (S), CHUCK | 55 | 2-625-191-(01) | SPRING (S), COMPRESSION |
| 7 | 7-685-862-(01) | SCREW +BVTT (2.6x6mm) (X13) | 56 | 2-625-187-(01) | RING (LO) (S), CENTER |
| 8 | 2-642-439-(01) | DAMPER, YOKE | 57 | 8-848-127-(31) | PICK UP KSS-210A (S) (RP) |
| 9 | 1-452-493-(21) | MAGNET | 58 | 2-625-188-(02) | gear (a) (s) |
| 10 | 2-642-175-(01) | YOKE (SP), CHUCKING | 59 | X-2625-317-(1) | CHASSIS ASSY (MT) N, TT |
| 11 | 2-642-149-(02) | COVER (SP), GEAR | 60 | X-2625-365-(1) | GEAR ASSY (MT), MOTOR |
| 12 | 2-642-142-(01) | SCREW, WASHER (X4) | 61 | 1-636-788-(13) | PC BOARD, MOTOR (4P) (S) |
| 13 | KSM-2101AAM | DRIVE UNIT | 62 | 1-572-085-(12) | SWITCH, LEAF |
| 14 | 2-642-169-(02) | ROLLER (SP) | 63 | 1-564-720-(11) | PIN, CONNECTOR 4P |
| 15 | 2-642-159-(01) | PLATE (T) (SP) (X4) | 64 | 7-621-255-(15) | SCREW +P(2x3mm) (X2) |
| 16 | X-2642-105-(2) | CHASSIS ASSY (SP), SUB | | | |
| 17 | 2-642-158-(01) | INSULATOR (C) (X4) | | | |
| 18 | 2-642-139-(02) | SPRING (A) (X2) | | | |
| 19 | 2-642-137-(02) | SPRING (B) (X2) | | | |
| 20 | 2-642-160-(02) | SHAFT (T) (SP) (X4) | | | |
| 21 | 2-642-170-(01) | RETAINER (SP), HINGE | | | |
| 22 | 2-642-164-(01) | HINGE (SP) | | | |
| 23 | 7-685-535-(19) | SCREW +BTP (2.6x10mm) | | | |
| 24 | 4-812-554-(01) | WASHER | | | |
| 25 | 2-642-154-(03) | GEAR(SP), DRIVE | | | |
| 26 | 3-653-387-(01) | BELT, LM | | | |
| 27 | 3-558-708-(21) | WASHER, STOPPER (X2) | | | |
| 28 | 4-913-731-(01) | PULLEY, LOADING | | | |
| 29 | 7-685-781-(01) | SCREW +PTT (2X4mm) (X4) | | | |
| 30 | 2-642-148-(01) | GEAR (SP), MIDWAY | | | |
| 31 | 2-642-162-(03) | HOLDER (REAR) (SP), TRAY (X2) | | | |
| 32 | 2-642-147-(02) | GUIDE (LEFT) (SP), TRAY | | | |
| 33 | 2-642-146-(02) | GUIDE (RIGHT) (SP), TRAY | | | |
| 34 | 7-621-775-(00) | SCREW +B (2.6x3mm) (X2) | | | |
| 35 | 2-642-161-(01) | HOLDER (FRONT) (SP), TRAY (X2) | | | |
| 36 | X-2642-106-(2) | CHASSIS ASSY (SP), MAIN | | | |
| 37 | 2-642-512-(01) | BOSS (REAR) | | | |
| 38 | 7-685-851-(01) | SCREW +BVTT (2x4mm) | | | |
| 39 | 1-572-052-(11) | SWITCH, LEAF | | | |
| 40 | 2-642-510-(01) | BOSS (RIGHT) | | | |
| 41 | 2-642-511-(01) | BOSS (LEFT) | | | |
| 42 | 2-642-153-(01) | CAM (SP), CONTROL | | | |
| 43 | 2-643-173-(01) | PLATE (SP), LINK | | | |
| 44 | X-2642-109-(1) | LINK ASSY (AU), STOPPER | | | |
| 45 | 2-642-133-(02) | BOSS | | | |
| 46 | 2-642-172-(01) | SPACER (SP) | | | |
| 47 | 7-682-902-(31) | SCREW (2.6x8mm) STPWH | | | |
| 48 | 1-564-721-(11) | PIN, CONNECTOR 5P | | | |

ELECTRICAL PARTS LIST

PCB-1 MAIN P.C. BOARD

CAPACITORS

| | | | | Ser. No. | Ref. No. | Part No. | Description |
|-----|------|---------------|-------------------------|----------|----------|---------------|------------------------|
| | | | | 661 | C215 | 5345-107D0962 | CAP, MINI ELE 100μ/25V |
| | | | | 566 | C301 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| | | | | 566 | C302 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 511 | C12 | 5345-477C0962 | CAP, MINI ELE 470μ/16V | 566 | C303 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 511 | C13 | 5345-477C0962 | CAP, MINI ELE 470μ/16V | 566 | C304 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 509 | C14 | 5345-228D0962 | CAP, MINI ELE 2200μ/25V | 566 | C305 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 509 | C15 | 5345-228D0962 | CAP, MINI ELE 2200μ/25V | 566 | C306 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 512 | C18 | 5345-227C0962 | CAP, MINI ELE 220μ/16V | 566 | C307 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 512 | C19 | 5345-227C0962 | CAP, MINI ELE 220μ/16V | 566 | C308 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 510 | C20 | 5345-108C0962 | CAP, MINI ELE 1000μ/16V | 569 | C309 | 5359-1025851 | CAP, PPP 1000P |
| 510 | C21 | 5345-108C0962 | CAP, MINI ELE 1000μ/16V | 569 | C310 | 5359-1025851 | CAP, PPP 1000P |
| 513 | C22 | 5345-107D0962 | CAP, MINI ELE 100μ/25V | 568 | C311 | 5359-1035851 | CAP, PPP .01μ |
| 513 | C23 | 5345-107D0962 | CAP, MINI ELE 100μ/25V | 568 | C312 | 5359-1035851 | CAP, PPP .01μ |
| 514 | C24 | 5345-226F0962 | CAP, MINI ELE 22μ/50V | 570 | C313 | 5359-8215851 | CAP, PPP 820P |
| 514 | C25 | 5345-226F0962 | CAP, MINI ELE 22μ/50V | 570 | C314 | 5359-8215851 | CAP, PPP 820P |
| 538 | C31 | 5354-104593 | CAP, MYL .1μ | 570 | C315 | 5359-8215851 | CAP, PPP 820P |
| 779 | C52 | 5345-226D0962 | CAP, MINI ELE 22μ/25V | 570 | C316 | 5359-8215851 | CAP, PPP 820P |
| 778 | C53 | 5345-107B0962 | CAP, MINI ELE 100μ/10V | 567 | C317 | 5345-S06DM227 | CAP, MINI ELE 220μ/25V |
| 780 | C54 | 5345-106F0962 | CAP, MINI ELE 10μ/50V | 567 | C318 | 5345-S06DM227 | CAP, MINI ELE 220μ/25V |
| 780 | C55 | 5345-106F0962 | CAP, MINI ELE 10μ/50V | 567 | C319 | 5345-S06DM227 | CAP, MINI ELE 220μ/25V |
| 782 | C56 | 5354-104593 | CAP, MYL .1μ | 567 | C320 | 5345-S06DM227 | CAP, MINI ELE 220μ/25V |
| 781 | C58 | 5345-105F0962 | CAP, MINI ELE 1μ/50V | 803 | C501 | 5345-476D0962 | CAP, MINI ELE 47μ/25V |
| 780 | C59 | 5345-106F0962 | CAP, MINI ELE 10μ/50V | 803 | C502 | 5345-476D0962 | CAP, MINI ELE 47μ/25V |
| 663 | C101 | 5345-107B0962 | CAP, MINI ELE 100μ/10V | 600 | C601 | 5353-300534 | CAP, MCA 30P |
| 684 | C102 | 5361-100DCH | CAP, CER 10P | 600 | C602 | 5353-300534 | CAP, MCA 30P |
| 684 | C103 | 5361-100DCH | CAP, CER 10P | 596 | C603 | 5345-476B0951 | CAP, MINI ELE 47μ/10V |
| 684 | C104 | 5361-100DCH | CAP, CER 10P | 601 | C604 | 5354-104593 | CAP, MYL .01μ |
| 678 | C105 | 5354-332J1HM | CAP, MYL 3300P | 601 | C606 | 5354-104593 | CAP, MYL .01μ |
| 673 | C106 | 5354-333J1HM | CAP, MYL .033μ | 601 | C608 | 5354-104593 | CAP, MYL .01μ |
| 673 | C107 | 5354-333J1HM | CAP, MYL .033μ | 597 | C610 | 5345-477C0962 | CAP, MINI ELE 470μ/16V |
| 674 | C108 | 5354-103J1HM | CAP, MYL .01μ | 597 | C611 | 5345-477C0962 | CAP, MINI ELE 470μ/16V |
| 662 | C109 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | 597 | C612 | 5345-477C0962 | CAP, MINI ELE 470μ/16V |
| 662 | C110 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | 597 | C613 | 5345-477C0962 | CAP, MINI ELE 470μ/16V |
| 662 | C111 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | 598 | C614 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 666 | C112 | 5345-474F0962 | CAP, MINI ELE 47μ/50V | 598 | C615 | 5345-227C0962 | CAP, MINI ELE 220μ/16V |
| 664 | C113 | 5345-226D0962 | CAP, MINI ELE 22μ/25V | 599 | C617 | 5353-030534 | CAP, MCA 3P |
| 671 | C114 | 5354-823593 | CAP, MYL .082μ | 599 | C618 | 5353-030504 | CAP, MCA 3P |
| 680 | C115 | 5359-S010J681 | CAP, PPP 680P | 599 | C619 | 5353-030504 | CAP, MCA 3P |
| 669 | C116 | 5354-274593 | CAP, MYL .27μ | 599 | C620 | 5353-030504 | CAP, MCA 3P |
| 667 | C117 | 5342-105F0951 | CAP, ELE BP 1μ/50V | 602 | C621 | 5354-104593 | CAP, MYL .1μ |
| 670 | C118 | 5354-104593 | CAP, MYL .1μ | 602 | C622 | 5354-104593 | CAP, MYL .1μ |
| 675 | C119 | 5354-472J1HM | CAP, MYL 4700P | 602 | C623 | 5354-104593 | CAP, MYL .1μ |
| 686 | C121 | 5354-183J1HM | CAP, MYL .018μ | 602 | C624 | 5354-104593 | CAP, MYL .1μ |
| 668 | C122 | 5354-184593 | CAP, MYL .18μ | 896 | C801 | 5345-476C0962 | CAP, MINI ELE 47μ/16V |
| 677 | C123 | 5354-123J1HM | CAP, MYL .012μ | 898 | C803 | 5353-560534 | CAP, MCA 56P |
| 683 | C124 | 5359-S010J391 | CAP, PPP 390P | 895 | C804 | 5345-336C0962 | CAP, MINI ELE 33μ/16V |
| 665 | C125 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | 897 | C806 | 5354-104593 | CAP, MYL .1μ |
| 666 | C126 | 5345-474F0962 | CAP, MINI ELE .47μ/50V | 899 | C807 | 5353-470534 | CAP, MCA 47P |
| 672 | C127 | 5354-563593 | CAP, MYL .056μ | 818 | C910 | 5345-226D0962 | CAP, MINI ELE 22μ/25V |
| 662 | C128 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | | | | |
| 662 | C129 | 5345-476D0962 | CAP, MINI ELE 47μ/25V | | | | |
| 670 | C130 | 5354-104593 | CAP, MYL .1μ | | | | |
| 670 | C131 | 5354-104593 | CAP, MYL .1μ | | | | |
| 670 | C132 | 5354-104593 | CAP, MYL .1μ | | | | |
| 660 | C133 | 5345-477C0962 | CAP, MINI ELE 470μ/16V | 520 | R3 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 660 | C134 | 5345-477C0962 | CAP, MINI ELE 470μ/16V | 520 | R4 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 682 | C141 | 5354-102J1HM | CAP, MYL 1000P | 518 | R5 | 5134-471J25P | RES, CBN 1/4P 470 |
| 628 | C201 | 5354-222J1HM | CAP, MYL 2200P | 518 | R6 | 5134-471J25P | RES, CBN 1/4P 470 |
| 626 | C202 | 5354-223J1HM | CAP, MYL .022μ | 517 | R7 | 5134-101J25P | RES, CBN 1/4P 100 |
| 627 | C203 | 5350-S010J471 | CAP, PPP 470P | 517 | R8 | 5134-101J25P | RES, CBN 1/4P 100 |
| 625 | C204 | 5354-154593 | CAP, MYL .15μ | 516 | R9 | 5134-4R7J25P | RES, CBN 1/4P 4.7 |
| 624 | C206 | 5345-476B0951 | CAP, MINI ELE 47μ/10V | 516 | R10 | 5134-4R7J25P | RES, CBN 1/4P 4.7 |
| 681 | C209 | 5359-S010J471 | CAP, PPP 470P | 521 | R12 | 5232-101J16P | RES, CBN 1/6P 100 |
| 681 | C210 | 5359-S010J471 | CAP, PPP 470P | 519 | R13 | 5134-102J25P | RES, CBN 1/4P 1K |
| 670 | C211 | 5354-104593 | CAP, MYL .1μ | 519 | R14 | 5134-102J25P | RES, CBN 1/4P 1K |
| 685 | C212 | 5361-220JCH | CAP, CER 22P | 518 | R15 | 5134-471J25P | RES, CBN 1/4P 470 |
| 670 | C213 | 5354-104593 | CAP, MYL .1μ | 518 | R16 | 5134-471J25P | RES, CBN 1/4P 470 |
| 661 | C214 | 5345-107D0962 | CAP, MINI ELE 100μ/25V | 521 | R18 | 5232-101J16P | RES, CBN 1/6P 100 |
| | | | | 515 | R19 | 5134-1R5J25P | RES, CBN 1/4P 1.5 |
| | | | | 515 | R20 | 5134-1R5J25P | RES, CBN 1/4P 1.5 |
| | | | | 788 | R24 | 5232-223J16P | RES, CBN 1/6P 22K |
| | | | | 790 | R52 | 5232-224J16P | RES, CBN 1/6P 220K |

RESISTORS

| Ser. No. | Ref. No. | Part No. | Description | Ser. No. | Ref. No. | Part No. | Description |
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| 788 | R53 | 5232-223J16P | RES, CBN 1/6P 22K | 714 | R215 | 5232-104J16P | RES, CBN 1/6P 100K |
| 787 | R54 | 5232-103J16P | RES, CBN 1/6P 10K | 714 | R216 | 5232-104J16P | RES, CBN 1/6P 100K |
| 784 | R55 | 5232-101J16P | RES, CBN 1/6P 100 | 714 | R217 | 5232-104J16P | RES, CBN 1/6P 100K |
| 794 | R59 | 5232-224J16P | RES, CBN 1/6P 220K | 697 | R218 | 5232-100J16P | RES, CBN 1/6P 10 |
| 793 | R60 | 5232-104J16P | RES, CBN 1/6P 100K | 638 | R219 | 5134-102J25P | RES, CBN 1/4P 1K |
| 792 | R61 | 5232-103J16P | RES, CBN 1/6P 10K | 717 | !R220 | 5102-4R75116 | RES, FUSE 4.7 |
| 791 | R65 | 5232-392J16P | RES, CBN 1/6P 3.9K | 717 | !R221 | 5102-4R75116 | RES, FUSE 4.7 |
| 785 | R66 | 5232-221J16P | RES, CBN 1/6P 220 | 630 | R222 | 5134-100J25P | RES, CBN 1/4P 10 |
| 690 | R101 | 5134-220J25P | RES, CBN 1/4P 22 | 716 | R223 | 5232-275J16P | RES, CBN 1/6P 2.7M |
| 693 | R102 | 5134-222J25P | RES, CBN 1/4P 2.2K | 632 | R224 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 707 | R103 | 5232-163J16P | RES, CBN 1/6P 16K | 632 | R225 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 704 | R104 | 5232-822J16P | RES, CBN 1/6P 8.2K | 632 | R226 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 695 | R105 | 5134-223J25P | RES, CBN 1/4P 22K | 635 | R227 | 5232-222J16P | RES, CBN 1/6P 2.2K |
| 692 | R106 | 5134-102J25P | RES, CBN 1/4P 1K | 635 | R228 | 5232-222J16P | RES, CBN 1/6P 2.2K |
| 691 | R107 | 5134-910J25P | RES, CBN 1/4P 91 | 635 | R229 | 5232-222J16P | RES, CBN 1/6P 2.2K |
| 708 | R108 | 5232-183J16P | RES, CBN 1/6P 18K | 705 | R251 | 5232-103J16P | RES, CBN 1/6P 10K |
| 708 | R109 | 5232-183J16P | RES, CBN 1/6P 18K | 705 | R252 | 5232-103J16P | RES, CBN 1/6P 10K |
| 692 | R110 | 5134-102J25P | RES, CBN 1/4P 1K | 705 | R253 | 5232-103J16P | RES, CBN 1/6P 10K |
| 705 | R111 | 5232-103J16P | RES, CBN 1/6P 10K | 705 | R254 | 5232-103J16P | RES, CBN 1/6P 10K |
| 714 | R112 | 5232-104J16P | RES, CBN 1/6P 100K | 705 | R255 | 5232-103J16P | RES, CBN 1/6P 10K |
| 694 | R113 | 5134-103J25P | RES, CBN 1/4P 10K | 631 | R257 | 5134-102J25P | RES, CBN 1/4P 1K |
| 695 | R114 | 5134-223J25P | RES, CBN 1/4P 22K | 582 | R301 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 713 | R115 | 5232-683J16P | RES, CBN 1/6P 68K | 582 | R302 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 706 | R116 | 5232-153J16P | RES, CBN 1/6P 15K | 582 | R303 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 703 | R117 | 5232-682J16P | RES, CBN 1/6P 6.8K | 582 | R304 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 698 | R118 | 5232-221J16P | RES, CBN 1/6P 220 | 583 | R305 | 5134-562J25P | RES, CBN 1/4P 5.6K |
| 712 | R119 | 5232-473J16P | RES, CBN 1/6P 47K | 583 | R306 | 5134-562J25P | RES, CBN 1/4P 5.6K |
| 694 | R120 | 5134-103J25P | RES, CBN 1/4P 10K | 583 | R307 | 5134-562J25P | RES, CBN 1/4P 5.6K |
| 705 | R121 | 5232-103J16P | RES, CBN 1/6P 10K | 583 | R308 | 5134-562J25P | RES, CBN 1/4P 5.6K |
| 710 | R122 | 5232-273J16P | RES, CBN 1/6P 27K | 579 | R309 | 5134-102J25P | RES, CBN 1/4P 1K |
| 705 | R124 | 5232-103J16P | RES, CBN 1/6P 10K | 579 | R310 | 5134-102J25P | RES, CBN 1/4P 1K |
| 714 | R126 | 5232-104J16P | RES, CBN 1/6P 100K | 579 | R311 | 5134-102J25P | RES, CBN 1/4P 1K |
| 714 | R127 | 5232-104J16P | RES, CBN 1/6P 100K | 579 | R312 | 5134-102J25P | RES, CBN 1/4P 1K |
| 705 | R128 | 5232-103J16P | RES, CBN 1/6P 10K | 579 | R313 | 5134-102J25P | RES, CBN 1/4P 1K |
| 705 | R129 | 5232-103J16P | RES, CBN 1/6P 10K | 579 | R314 | 5134-102J25P | RES, CBN 1/4P 1K |
| 721 | R130 | 5232-224J16P | RES, CBN 1/6P 220K | 579 | R315 | 5134-102J25P | RES, CBN 1/4P 1K |
| 714 | R131 | 5232-104J16P | RES, CBN 1/6P 100K | 579 | R316 | 5134-102J25P | RES, CBN 1/4P 1K |
| 702 | R132 | 5232-562J16P | RES, CBN 1/6P 5.6K | 573 | R317 | 5134-390J25P | RES, CBN 1/4P 39 |
| 699 | R133 | 5232-102J16P | RES, CBN 1/6P 1K | 573 | R318 | 5134-390J25P | RES, CBN 1/4P 39 |
| 700 | R134 | 5134-563J25P | RES, CBN 1/4P 56K | 573 | R319 | 5134-390J25P | RES, CBN 1/4P 39 |
| 706 | R135 | 5232-153J16P | RES, CBN 1/6P 15K | 573 | R320 | 5134-390J25P | RES, CBN 1/4P 39 |
| 706 | R136 | 5232-153J16P | RES, CBN 1/6P 15K | 575 | R321 | 5134-101J25P | RES, CBN 1/4P 100 |
| 711 | R137 | 5232-393J16P | RES, CBN 1/6P 39K | 575 | R322 | 5134-101J25P | RES, CBN 1/4P 100 |
| 709 | R138 | 5232-223J16P | RES, CBN 1/6P 22K | 575 | R323 | 5134-101J25P | RES, CBN 1/4P 100 |
| 701 | R139 | 5232-332J16P | RES, CBN 1/6P 3.3K | 575 | R324 | 5134-101J25P | RES, CBN 1/4P 100 |
| 710 | R140 | 5232-273J16P | RES, CBN 1/6P 27K | 575 | R325 | 5134-101J25P | RES, CBN 1/4P 100 |
| 697 | R141 | 5232-100J16P | RES, CBN 1/6P 10 | 575 | R326 | 5134-101J25P | RES, CBN 1/4P 100 |
| 697 | R142 | 5232-100J16P | RES, CBN 1/6P 10 | 575 | R327 | 5134-101J25P | RES, CBN 1/4P 100 |
| 697 | R143 | 5232-100J16P | RES, CBN 1/6P 10 | 575 | R328 | 5134-101J25P | RES, CBN 1/4P 100 |
| 705 | R145 | 5232-103J16P | RES, CBN 1/6P 10K | 577 | R329 | 5134-221J25P | RES, CBN 1/4P 220 |
| 689 | R150 | 5134-4R7J25P | RES, CBN 1/4P 4.7 | 577 | R330 | 5134-221J25P | RES, CBN 1/4P 220 |
| 689 | R151 | 5134-4R7J25P | RES, CBN 1/4P 4.7 | 575 | R331 | 5134-101J25P | RES, CBN 1/4P 100 |
| 696 | R152 | 5232-4R7J16P | RES, CBN 1/6P 4.7 | 575 | R332 | 5134-101J25P | RES, CBN 1/4P 100 |
| 689 | R153 | 5134-4R7J25P | RES, CBN 1/4P 4.7 | 578 | R333 | 5134-471J25P | RES, CBN 1/4P 470 |
| 720 | !R154 | 5102-4R75116 | RES, FUSE 4.7 | 578 | R334 | 5134-471J25P | RES, CBN 1/4P 470 |
| 720 | !R155 | 5102-4R75116 | RES, FUSE 4.7 | 575 | R335 | 5134-101J25P | RES, CBN 1/4P 100 |
| 718 | R156 | 5232-105J16P | RES, CBN 1/6P 1M | 575 | R336 | 5134-101J25P | RES, CBN 1/4P 100 |
| 636 | R201 | 5232-333J16P | RES, CBN 1/6P 33K | 572 | R337 | 5134-100J25P | RES, CBN 1/4P 10 |
| 635 | R202 | 5232-222J16P | RES, CBN 1/6P 2.2K | 572 | R338 | 5134-100J25P | RES, CBN 1/4P 10 |
| 634 | R203 | 5134-104J25P | RES, CBN 1/4P 100K | 572 | R339 | 5134-100J25P | RES, CBN 1/4P 10 |
| 633 | R204 | 5134-103J25P | RES, CBN 1/4P 10K | 572 | R340 | 5134-100J25P | RES, CBN 1/4P 10 |
| 637 | R205 | 5232-104J16P | RES, CBN 1/6P 100K | 580 | R341 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 695 | R207 | 5134-223J25P | RES, CBN 1/4P 22K | 580 | R342 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 714 | R209 | 5232-104J16P | RES, CBN 1/6P 100K | 575 | R343 | 5134-101J25P | RES, CBN 1/4P 100 |
| 714 | R210 | 5232-104J16P | RES, CBN 1/6P 100K | 575 | R344 | 5134-101J25P | RES, CBN 1/4P 100 |
| 715 | R211 | 5232-334J16P | RES, CBN 1/6P 330K | 578 | R345 | 5134-471J25P | RES, CBN 1/4P 470 |
| 715 | R212 | 5232-334J16P | RES, CBN 1/6P 330K | 578 | R346 | 5134-471J25P | RES, CBN 1/4P 470 |
| 697 | R213 | 5232-100J16P | RES, CBN 1/6P 10 | 575 | R347 | 5134-101J25P | RES, CBN 1/4P 100 |
| 714 | R214 | 5232-104J16P | RES, CBN 1/6P 100K | 575 | R348 | 5134-101J25P | RES, CBN 1/4P 100 |

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| 580 | R349 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 580 | R350 | 5134-222J25P | RES, CBN 1/4P 2.2K |
| 576 | R351 | 5134-101J25P | RES, CBN 1/4P 100 |
| 576 | R352 | 5134-101J25P | RES, CBN 1/4P 100 |
| 578 | R353 | 5134-471J25P | RES, CBN 1/4P 470 |
| 578 | R354 | 5134-471J25P | RES, CBN 1/4P 470 |
| 576 | R355 | 5134-101J25P | RES, CBN 1/4P 100 |
| 576 | R356 | 5134-101J25P | RES, CBN 1/4P 100 |
| 572 | R357 | 5134-100J25P | RES, CBN 1/4P 10 |
| 572 | R358 | 5134-100J25P | RES, CBN 1/4P 10 |
| 572 | R359 | 5134-100J25P | RES, CBN 1/4P 10 |
| 572 | R360 | 5134-100J25P | RES, CBN 1/4P 10 |
| 576 | R361 | 5134-101J25P | RES, CBN 1/4P 100 |
| 576 | R362 | 5134-101J25P | RES, CBN 1/4P 100 |
| 574 | R363 | 5134-470J25P | RES, CBN 1/4P 47 |
| 574 | R364 | 5134-470J25P | RES, CBN 1/4P 47 |
| 577 | R365 | 5134-221J25P | RES, CBN 1/4P 220 |
| 577 | R366 | 5134-221J25P | RES, CBN 1/4P 220 |
| 574 | R367 | 5134-470J25P | RES, CBN 1/4P 47 |
| 574 | R368 | 5134-470J25P | RES, CBN 1/4P 47 |
| 786 | R369 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R370 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R371 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R372 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R373 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R374 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R375 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 786 | R376 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 581 | R377 | 5134-392J25P | RES, CBN 1/4P 3.9K |
| 581 | R378 | 5134-392J25P | RES, CBN 1/4P 3.9K |
| 582 | R379 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 582 | R380 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 572 | R381 | 5134-100J25P | RES, CBN 1/4P 10 |
| 572 | R382 | 5134-100J25P | RES, CBN 1/4P 10 |
| 582 | R383 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 582 | R384 | 5134-512J25P | RES, CBN 1/4P 5.1K |
| 584 | R393 | 5134-104J25P | RES, CBN 1/4P 100K |
| 584 | R394 | 5134-104J25P | RES, CBN 1/4P 100K |
| 789 | R399 | 5232-154J16P | RES, CBN 1/6P 150K |
| 806 | R501 | 5134-100J25P | RES, CBN 1/4P 10 |
| 806 | R502 | 5134-100J25P | RES, CBN 1/4P 10 |
| 808 | R503 | 5134-103J25P | RES, CBN 1/4P 10K |
| 808 | R504 | 5134-103J25P | RES, CBN 1/4P 10K |
| 807 | R505 | 5134-510J25P | RES, CBN 1/4P 51 |
| 807 | R506 | 5134-510J25P | RES, CBN 1/4P 51 |
| 610 | R601 | 5232-105J16P | RES, CBN 1/6P 1M |
| 603 | R602 | 5134-3R3J25P | RES, CBN 1/4P 3.3 |
| 603 | R603 | 5134-3R3J25P | RES, CBN 1/4P 3.3 |
| 603 | R604 | 5134-3R3J25P | RES, CBN 1/4P 3.3 |
| 603 | R605 | 5134-3R3J25P | RES, CBN 1/4P 3.3 |
| 609 | R606 | 5232-474J16P | RES, CBN 1/6P 470K |
| 609 | R607 | 5232-474J16P | RES, CBN 1/6P 470K |
| 606 | R608 | 5134-224J25P | RES, CBN 1/4P 220K |
| 608 | R609 | 5232-224J16P | RES, CBN 1/6P 220K |
| 610 | R610 | 5232-105J16P | RES, CBN 1/6P 1M |
| 610 | R611 | 5232-105J16P | RES, CBN 1/6P 1M |
| 609 | R6112 | 5232-474J16P | RES, CBN 1/6P 470K |
| 609 | R613 | 5232-474J16P | RES, CBN 1/6P 470K |
| 616 | R614 | 5232-184J16P | RES, CBN 1/6P 180K |
| 608 | R615 | 5232-184J16P | RES, CBN 1/6P 180K |
| 610 | R616 | 5232-105J16P | RES, CBN 1/6P 1M |
| 610 | R617 | 5232-105J16P | RES, CBN 1/6P 1M |
| 607 | 618 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | 619 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | 620 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | 621 | 5232-221J16P | RES, CBN 1/6P 220 |
| 605 | 622 | 5134-221J25P | RES, CBN 1/4P 220 |
| 607 | R623 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | R624 | 5232-221J16P | RES, CBN 1/6P 220 |

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| 605 | R625 | 5134-221J25P | RES, CBN 1/4P 220 |
| 604 | R626 | 5134-100J25P | RES, CBN 1/4P 10 |
| 604 | R627 | 5134-100J25P | RES, CBN 1/4P 10 |
| 613 | R631 | 5134-331J25P | RES, CBN 1/4P 330 |
| 613 | R632 | 5134-331J25P | RES, CBN 1/4P 330 |
| 615 | R633 | 5232-331J16P | RES, CBN 1/6P 330 |
| 613 | R634 | 5134-331J25P | RES, CBN 1/4P 330 |
| 607 | R635 | 5232-221J16P | RES, CBN 1/6P 220 |
| 612 | R636 | 5134-221J25P | RES, CBN 1/4P 220 |
| 607 | R637 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | R638 | 5232-221J16P | RES, CBN 1/6P 220 |
| 611 | R639 | 5232-101J16P | RES, CBN 1/6P 100 |
| 611 | R640 | 5232-101J16P | RES, CBN 1/6P 100 |
| 607 | R641 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | R642 | 5232-221J16P | RES, CBN 1/6P 220 |
| 607 | R643 | 5232-221J16P | RES, CBN 1/6P 220 |
| 904 | R801 | 5232-750J16P | RES, CBN 1/6P 75 |
| 900 | R805 | 5134-331J25P | RES, CBN 1/4P 330 |
| 901 | R807 | 5134-221J25P | RES, CBN 1/4P 220 |
| 903 | R809 | 5232-101J16P | RES, CBN 1/6P 100 |
| 902 | R810 | 5134-101J25P | RES, CBN 1/4P 100 |
| 822 | R910 | 5232-473J16P | RES, CBN 1/6P 47K |
| 821 | R911 | 5134-470J25P | RES, CBN 1/4P 47 |
| 823 | R912 | 5232-271J16P | RES, CBN 1/6P 270 |
| 824 | R913 | 5232-392J16P | RES, CBN 1/6P 3.9K |

INTEGRATED CIRCUITS

| | | | |
|-----|-------|---------------|-------------|
| 652 | IC101 | 5653-CXA1081S | IC, LINEAR |
| 651 | IC102 | 5654-M51594FP | IC, DIGITAL |
| 653 | IC103 | 5653-LA6520 | IC, LINEAR |
| 621 | IC201 | 5654-M65820FP | IC, DIGITAL |
| 654 | IC203 | 5653-LA6515 | IC, LINEAR |
| 801 | IC501 | 5653-NJM4565D | IC, LINEAR |
| 591 | IC601 | 5654-SM5840CP | IC, DIGITAL |
| 592 | IC602 | 5654-H74H04P | IC, DIGITAL |
| 593 | IC603 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC604 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC605 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC606 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC607 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC608 | 5654-H74H164P | IC, DIGITAL |
| 593 | IC609 | 5654-H74H164P | IC, DIGITAL |
| 594 | IC611 | 5654-PCM61P | IC, DIGITAL |
| 594 | IC612 | 5654-PCM61P | IC, DIGITAL |
| 594 | IC613 | 5654-PCM61P | IC, DIGITAL |
| 594 | IC614 | 5654-PCM61P | IC, DIGITAL |
| 891 | IC801 | 5654-H74H02P | IC, DIGITAL |

TRANSISTORS

| | | | |
|-----|------|---------------|---------------|
| 502 | △ Q1 | 5614-2012 | XISTOR, NPN A |
| 501 | △ Q2 | 5612-1375 | XISTOR, PNP A |
| 504 | Q3 | 5611-1015(GR) | XISTOR, PNP R |
| 503 | Q4 | 5613-1815(GR) | XISTOR, NPN R |
| 504 | Q5 | 5611-1015(GR) | XISTOR, PNP R |
| 503 | Q6 | 5613-1815(GR) | XISTOR, NPN R |
| 502 | △ Q7 | 5614-2012 | XISTOR, NPN A |
| 501 | △ Q8 | 5612-1375 | XISTOR, PNP A |
| 504 | Q9 | 5611-1015(GR) | XISTOR, PNP R |
| 503 | Q10 | 5613-1815(GR) | XISTOR, NPN R |
| 504 | Q11 | 5611-1015(GR) | XISTOR, PNP R |
| 503 | Q12 | 5613-1815(GR) | XISTOR, NPN R |
| 771 | Q51 | 5611-1015(GR) | XISTOR, PNP R |
| 771 | Q54 | 5611-1015(GR) | XISTOR, PNP R |
| 774 | Q55 | 5613-RN1202 | XISTOR, NPN R |
| 772 | Q56 | 5613-1815(GR) | XISTOR, NPN R |
| 656 | Q101 | 5612-647(C) | XISTOR, PNP A |
| 655 | Q102 | 5613-1815(GR) | XISTOR, NPN R |
| 655 | Q103 | 5613-1815(GR) | XISTOR, NPN R |
| 655 | Q104 | 5613-1815(GR) | XISTOR, NPN R |
| 622 | Q201 | 5613-1815(GR) | XISTOR, NPN R |

| Ser. No. | Ref. No. | Part No. | Description | Ser. No. | Ref. No. | Part No. | Description |
|----------|----------|----------------|---------------|----------|----------|---------------|--------------------------------------|
| 563 | Q301 | 5611-1015L(GR) | XISTOR, PNP R | 849 | CN113 | 4443-0501140 | CONNECTOR |
| 563 | Q302 | 5611-1015L(GR) | XISTOR, PNP R | 848 | CN114 | 4443-0801140 | CONNECTOR |
| 561 | Q303 | 5613-1815L(GR) | XISTOR, NPN R | 848 | CN115 | 4443-0801140 | CONNECTOR |
| 561 | Q304 | 5613-1815L(GR) | XISTOR, NPN R | 850 | CN117 | 4443-0401140 | CONNECTOR |
| 561 | Q305 | 5613-1815L(GR) | XISTOR, NPN R | 856 | CN201 | 4443-05501030 | CONNECTOR |
| 561 | Q306 | 5613-1815L(GR) | XISTOR, NPN R | 855 | CN501 | 4443-030185 | CONNECTOR |
| 563 | Q307 | 5611-1015L(GR) | XISTOR, PNP R | 855 | CN502 | 4443-030185 | CONNECTOR |
| 563 | Q308 | 5611-1015L(GR) | XISTOR, PNP R | 855 | CN503 | 4443-030185 | CONNECTOR |
| 561 | Q309 | 5613-1815L(GR) | XISTOR, NPN R | 841 | △ J301 | 4489-02601004 | 4 PIN JACK, FIXED/VARIABLE OUTPUT |
| 561 | Q310 | 5613-1815L(GR) | XISTOR, NPN R | | | | |
| 563 | Q311 | 5611-1015L(GR) | XISTOR, PNP R | 844 | △ J801 | 4481-00501 | 1 PIN JACK, DIGITAL OUTPUT (COAXIAL) |
| 563 | Q312 | 5611-1015L(GR) | XISTOR, PNP R | | | | |
| 562 | Q313 | 5611-950 (Y) | XISTOR, PNP R | 846 | J910 | 4451-00184 | 1 PIN JACK, REMOTE INPUT |
| 562 | Q314 | 5611-950 (Y) | XISTOR, PNP R | 846 | J911 | 4451-00184 | 1 PIN JACK, REMOTE OUTPUT |
| 561 | Q315 | 5613-1815L(GR) | XISTOR, NPN R | 870 | △ JL101 | 4242-R0107111 | JUMPER LEAD |
| 561 | Q316 | 5613-1815L(GR) | XISTOR, NPN R | 816 | PH911 | 5624-ON3131 | PHOTO COUPLR |
| 562 | Q317 | 5611-950 (Y) | XISTOR, PNP R | 641 | RC250 | 5212-S0305103 | R COMPOSITE, 10 K X5 |
| 562 | Q318 | 5611-950 (Y) | XISTOR, PNP R | 719 | TP101 | 4214-132 | TERMINAL |
| 561 | Q319 | 5613-1815L(GR) | XISTOR, NPN R | 719 | TP102 | 4214-132 | TERMINAL |
| 561 | Q320 | 5613-1815L(GR) | XISTOR, NPN R | 719 | TP103 | 4214-132 | TERMINAL |
| 562 | Q321 | 5611-950 (Y) | XISTOR, PNP R | 719 | TP104 | 4214-132 | TERMINAL |
| 562 | Q322 | 5611-950 (Y) | XISTOR, PNP R | 639 | TP201 | 4214-132 | TERMINAL |
| 561 | Q323 | 5613-1815L(GR) | XISTOR, NPN R | 639 | TP202 | 4214-132 | TERMINAL |
| 561 | Q324 | 5613-1815L(GR) | XISTOR, NPN R | 639 | TP203 | 4214-132 | TERMINAL |
| 564 | Q325 | 5616-SK246GR2 | FET, N-CH | 639 | TP204 | 4214-132 | TERMINAL |
| 564 | Q326 | 5616-SK246GR2 | FET, N-CH | 639 | TP205 | 4214-132 | TERMINAL |
| 564 | Q327 | 5616-SK246GR2 | FET, N-CH | 586 | TP301 | 4214-132 | TERMINAL |
| 564 | Q328 | 5616-SK246GR2 | FET, N-CH | 876 | TP302 | 4214-132 | TERMINAL |
| 565 | Q329 | 5616-2SK246BL | FET, N-CH | 906 | TP801 | 4214-132 | TERMINAL |
| 565 | Q330 | 5616-2SK246BL | FET, N-CH | 595 | X601 | 5691-S1701173 | XTAL, OSC, 16.9344 MHz |
| 773 | Q331 | 5613-2878 (B) | XISTOR, NPN R | | | | |
| 773 | Q332 | 5613-2878 (B) | XISTOR, NPN R | | | | |
| 773 | Q333 | 5613-2878 (B) | XISTOR, NPN R | | | | |
| 773 | Q334 | 5613-2878 (B) | XISTOR, NPN R | | | | |
| 773 | Q335 | 5613-2878 (B) | XISTOR, NPN R | | | | |
| 773 | Q336 | 5613-2878 (B) | XISTOR, NPN R | 727 | C401 | 5345-476B0951 | CAP, MINI ELE 47μ/10V |
| 773 | Q337 | 5613-2878 (B) | XISTOR, NPN R | 728 | C402 | 5354-104593 | CAP, MYL .1μ |
| 773 | Q338 | 5613-2878 (B) | XISTOR, NPN R | 728 | C402 | 5354-104593 | CAP, MYL .1μ |
| 815 | Q910 | 5611-RN2201 | XISTOR, PNP R | 750 | C404 | 5345-476B0951 | CAP, MINI ELE 47μ/10V |

PCB-2 FRONT P.C. BOARD

CAPACITORS

| | | | |
|-----|------|---------------|-----------------------|
| 727 | C401 | 5345-476B0951 | CAP, MINI ELE 47μ/10V |
| 728 | C402 | 5354-104593 | CAP, MYL .1μ |
| 728 | C402 | 5354-104593 | CAP, MYL .1μ |
| 750 | C404 | 5345-476B0951 | CAP, MINI ELE 47μ/10V |

RESISTORS

| | | | |
|-----|------|--------------|-------------------|
| 730 | R401 | 5134-4R7J25P | RES, CBN 1/4P 4.7 |
| 753 | R402 | 5134-102J25P | RES, CBN 1/4P 1K |
| 751 | R403 | 5134-100J25P | RES, CBN 1/4P 10 |
| 754 | R404 | 5134-103J25P | RES, CBN 1/4P 10K |
| 754 | R405 | 5134-103J25P | RES, CBN 1/4P 10K |
| 754 | R406 | 5134-103J25P | RES, CBN 1/4P 10K |
| 754 | R407 | 5134-103J25P | RES, CBN 1/4P 10K |
| 752 | R408 | 5134-101J25P | RES, CBN 1/4P 100 |
| 755 | R409 | 5134-221J25P | RES, CBN 1/4P 220 |

INTEGRATED CIRCUIT

| | | | |
|-----|-------|---------------|-------------|
| 725 | IC401 | 5654-M957-243 | IC, DIGITAL |
|-----|-------|---------------|-------------|

DIODES

| | | | |
|-----|------|-------------|------------|
| 747 | D401 | 5631-1S2473 | DIODE, DET |
| 747 | D402 | 5631-1S2473 | DIODE, DET |
| 747 | D403 | 5631-1S2473 | DIODE, DET |
| 747 | D404 | 5631-1S2473 | DIODE, DET |
| 747 | D405 | 5631-1S2473 | DIODE, DET |
| 747 | D406 | 5631-1S2473 | DIODE, DET |
| 747 | D407 | 5631-1S2473 | DIODE, DET |
| 747 | D408 | 5631-1S2473 | DIODE, DET |
| 747 | D409 | 5631-1S2473 | DIODE, DET |
| 747 | D410 | 5631-1S2473 | DIODE, DET |
| 747 | D411 | 5631-1S2473 | DIODE, DET |
| 747 | D412 | 5631-1S2473 | DIODE, DET |
| 748 | D413 | 5631-1SS133 | DIODE, DET |
| 748 | D414 | 5631-1SS133 | DIODE, DET |

DIODES

| | | | |
|-----|------|--------------|--------------|
| 507 | D13 | 5635-HZ12B2L | DIODE, ZENER |
| 507 | D14 | 5635-HZ12B2L | DIODE, ZENER |
| 506 | D15 | 5635-HZ6B2L | DIODE, ZENER |
| 506 | D16 | 5635-HZ6B2L | DIODE, ZENER |
| 775 | D17 | 5631-1S2473 | DIODE, DET |
| 776 | D53 | 5631-1SS133 | DIODE, DET |
| 777 | D54 | 5635-HZ6A2L | DIODE, ZENER |
| 776 | D55 | 5631-1SS133 | DIODE, DET |
| 657 | D103 | 5631-1SS133 | DIODE, DET |
| 658 | D106 | 5631-1SS133 | DIODE, DET |

CONTROLS

| | | | |
|-----|-------|---------------|---|
| 688 | VR101 | 5101-22301934 | RES, SEMI FIX 22K, EF BALANCE |
| 687 | VR102 | 5101-50201934 | RES, SEMI FIX 5K, FOCUS OFFSET |
| 614 | VR601 | 5101-10401934 | RES, SEMI FIX 100K, LOW LEVEL LINEARITY |
| 614 | VR602 | 5101-10401934 | RES, SEMI FIX 100K, LOW LEVEL LINEARITY |
| 614 | VR603 | 5101-10401934 | RES, SEMI FIX 100K, LOW LEVEL LINEARITY |
| 614 | VR604 | 5101-10401934 | RES, SEMI FIX 100K, LOW LEVEL LINEARITY |

COILS

| | | | |
|-----|------|--------------|---------------|
| 642 | L201 | 5995-1R5J107 | COIL W/CORE |
| 893 | T801 | 5933-S0801 | COIL CASE, 10 |

MISCELLANEOUS

| | | | |
|-----|-----|-------------|-----------|
| 854 | CN1 | 4443-050185 | CONNECTOR |
| 853 | CN2 | 4443-070185 | CONNECTOR |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|-------------------------------|
| MISCELLANEOUS | | | |
| 857 | CN410 | 4443-05401030 | CONNECTOR |
| 741 | FL401 | 5722-046 | TUBE DISPLAY |
| 745 | SW401 | 4437-01202 | SWITCH, PU-TC, 8 |
| 745 | SW402 | 4437-01202 | SWITCH, PU-TC, 9 |
| 745 | SW403 | 4437-01202 | SWITCH, PU-TC, 10 |
| 743 | SW406 | 4437-01201 | SWITCH, PU-TC, DISPLAY |
| 745 | SW409 | 4437-01202 | SWITCH, PU-TC, +10 |
| 745 | SW410 | 4437-01202 | SWITCH, PU-TC, 1 |
| 745 | SW411 | 4437-01202 | SWITCH, PU-TC, 2 |
| 745 | SW412 | 4437-01202 | SWITCH, PU-TC, 3 |
| 745 | SW413 | 4437-01202 | SWITCH, PU-TC, 4 |
| 745 | SW414 | 4437-01202 | SWITCH, PU-TC, 5 |
| 745 | SW415 | 4437-01202 | SWITCH, PU-TC, 6 |
| 745 | SW416 | 4437-01202 | SWITCH, PU-TC, 7 |
| 743 | SW418 | 4437-01201 | SWITCH, PU-TC, TIME |
| 743 | SW419 | 4437-01201 | SWITCH, PU-TC, REPEAT |
| 743 | SW422 | 4437-01201 | SWITCH, PU-TC, CLEAR |
| 743 | SW423 | 4437-01201 | SWITCH, PU-TC, PROGRAM |
| 743 | SW424 | 4437-01201 | SWITCH, PU-TC, CHECK |
| 743 | SW425 | 4437-01201 | SWITCH, PU-TC, OPEN/CLOSE |
| 745 | SW426 | 4437-01202 | SWITCH, PU-TC, STOP |
| 745 | SW427 | 4437-01202 | SWITCH, PU-TC, PLAY |
| 745 | SW428 | 4437-01202 | SWITCH, PU-TC, PAUSE |
| 745 | SW429 | 4437-01202 | SWITCH, PU-TC, SKIP FORWARD |
| 745 | SW430 | 4437-01202 | SWITCH, PU-TC, SKIP REVERSE |
| 745 | SW431 | 4437-01202 | SWITCH, PU-TC, FORWARD SEARCH |
| 745 | SW432 | 4437-01202 | SWITCH, PU-TC, REVERSE SEARCH |
| 742 | RC401 | 6143-00802 | RECEIV BLOCK, REMOTE SENSOR |
| 865 | W-401 | 4163-0120020 | CONNECTOR W/W |

PCB-3 VOLUME P.C. BOARD

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|-----------|---------------|--------------------------------|
| CAPACITOR | | | |
| 804 | C505 | 5354-104593 | CAP, MYL .1μ |
| CONTROLS | | | |
| 838 | VR301/302 | 5113-S0202502 | RES, V CBN 16 5K, OUTPUT LEVEL |
| COIL | | | |
| 810 | L501 | 5995-1R0J107 | COIL W/CORE |
| MISCELLANEOUS | | | |
| 845 | J501 | 4451-51501 | 1 PIN JACK, HEADPHONES |
| 878 | LUG1 | 4162-00601500 | LUG W/WIRE, W-511 |
| 866 | W-510 | 4163-0108020 | CONNECTOR W/W |
| 873 | | 2240-Z031 | HOLDER (X3) |

PCB-4 POWER SUPPLY P. C. BOARD

| Ser. No. | Ref. No. | Part No. | Description |
|-------------------|----------|---------------|-------------------------|
| CAPACITORS | | | |
| 836B | △ C1 | 5352-1030958 | CAP, MTL .01μ |
| 537 | C2 | 5354-104593 | CAP, MYL .1μ |
| 537 | C3 | 5354-104593 | CAP, MYL .1μ |
| 537 | C4 | 5354-104593 | CAP, MYL .1μ |
| 537 | C5 | 5354-104593 | CAP, MYL .1μ |
| 537 | C6 | 5354-104593 | CAP, MYL .1μ |
| 535 | C7 | 5345-226F0962 | CAP, MINI ELE 22μ/50V |
| 534 | C9 | 5345-477E0962 | CAP, MINI ELE 470μ/35V |
| 531 | C10 | 5345-228D0962 | CAP, MINI ELE 2200μ/25V |
| 531 | C11 | 5345-228D0962 | CAP, MINI ELE 2200μ/25V |
| 532 | C16 | 5345-478C0962 | CAP, MINI ELE 4700μ/16V |
| 532 | C17 | 5345-478C0962 | CAP, MINI ELE 4700μ/16V |
| 539 | C30 | 5359-S010J471 | CAP, PPP 470P |
| 544 | C32 | 5345-107B0962 | CAP, MINI ELE 100μ/10V |
| 546 | C33 | 5359-S010J101 | CAP, PPP 100P |
| 536 | C51 | 5345-226D0962 | CAP, MINI ELE 22μ/25V |
| 533 | C57 | 5345-108D0962 | CAP, MINI ELE 1000μ/25V |

| Ser. No. | Ref. No. | Part No. | Description |
|------------------|----------|--------------|--------------------|
| RESISTORS | | | |
| 022B | △ R1 | 5135-335J50P | RES, CBN 1/2P 3.3M |
| 542 | R29 | 5134-223J25P | RES, CBN 1/4P 22K |
| 541 | R51 | 5134-182J25P | RES, CBN 1/4P 1.8K |
| 540 | R56 | 5135-471J50P | RES, CBN 1/2P 470 |

| Ser. No. | Ref. No. | Part No. | Description |
|---------------|----------|-------------|--------------|
| DIODES | | | |
| 525 | △ D1 | 5632-S5566B | DIODE, RECT |
| 525 | △ D2 | 5632-S5566B | DIODE, RECT |
| 525 | △ D3 | 5632-S5566B | DIODE, RECT |
| 525 | △ D4 | 5632-S5566B | DIODE, RECT |
| 526 | △ D5 | 5632-S5566B | DIODE, RECT |
| 526 | △ D6 | 5632-S5566B | DIODE, RECT |
| 526 | △ D7 | 5632-S5566B | DIODE, RECT |
| 526 | △ D8 | 5632-S5566B | DIODE, RECT |
| 525 | △ D9 | 5632-S5566B | DIODE, RECT |
| 525 | △ D10 | 5632-S5566B | DIODE, RECT |
| 522 | D11 | 5635-HZ5B2 | DIODE, ZENER |
| 523 | D12 | 5635-HZ27-2 | DIODE, ZENER |
| 526 | △ D19 | 5632-S5566B | DIODE, RECT |
| 526 | △ D20 | 5632-S5566B | DIODE, RECT |
| 525 | △ D51 | 5632-S5566B | DIODE, RECT |
| 525 | △ D52 | 5632-S5566B | DIODE, RECT |
| 525 | △ D56 | 5632-S5566B | DIODE, RECT |
| 524 | D57 | 5635-HZ9B2L | DIODE, ZENER |

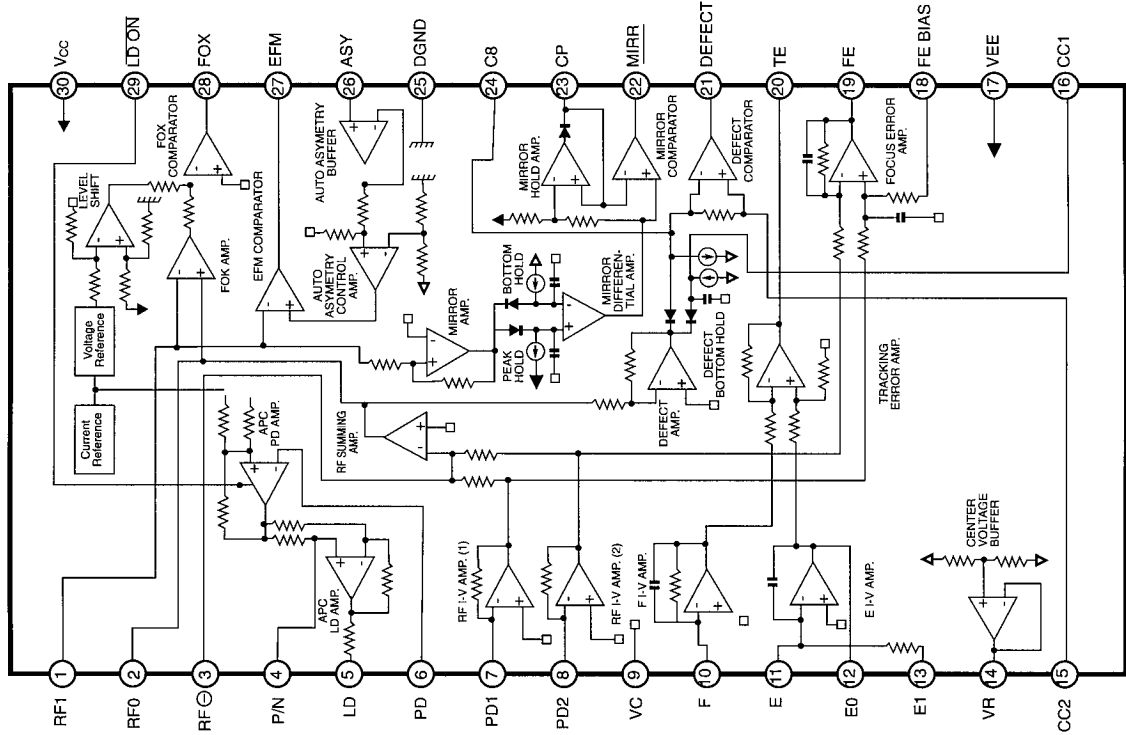
| Ser. No. | Ref. No. | Part No. | Description |
|--------------------|----------|------------|----------------|
| TRANSFORMER | | | |
| 831B | △ T1 | 5584-T1502 | XFORMER, POWER |

| Ser. No. | Ref. No. | Part No. | Description |
|----------------------|----------|---------------|--------------------|
| MISCELLANEOUS | | | |
| 868 | JL1 | 4242-R0505181 | JUMPER LEAD |
| 869 | JL2 | 4242-R0507181 | JUMPER LEAD |
| 840 | △ SW1 | 4433-01301 | PUSH SWITCH, POWER |
| 877 | △ TM1 | 4214-122 | TERMINAL |
| 877 | △ TM2 | 4214-122 | TERMINAL |
| 874 | | 2240-Z072 | HOLDER, JL2 |
| 875 | | 2240-Z052 | HOLDER, JL1 |

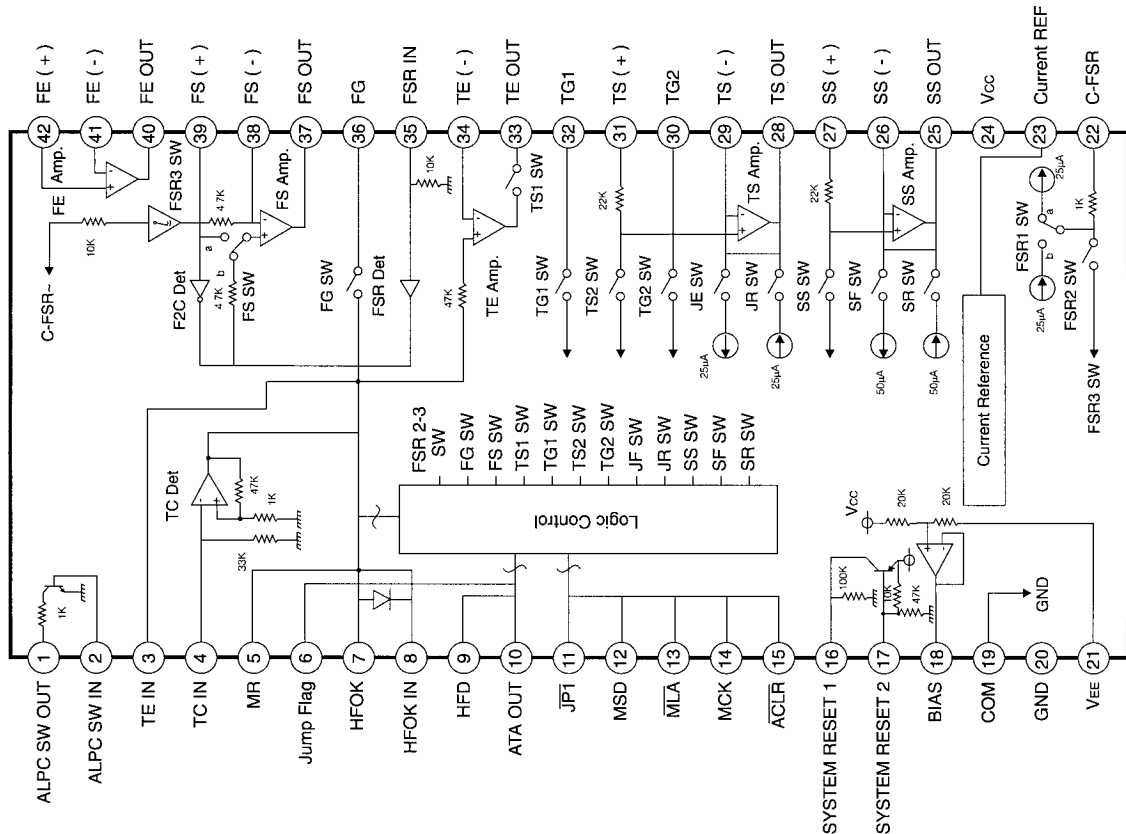
| Ser. No. | Ref. No. | Part No. | Description |
|------------------------------|----------|---------------|----------------|
| CHASSIS MISCELLANEOUS | | | |
| 871 | JL401 | 4242-S0330181 | JUMPER LEAD |
| 863 | LCN113 | 4163-03212005 | CONNECTOR W/W |
| 861 | LCN114 | 4163-03211008 | CONNECTOR W/W |
| 862 | LCN115 | 4163-03210008 | CONNECTOR W/W |
| 864 | LCN117 | 4163-03207004 | CONNECTOR W/W |
| 879 | LUG2 | 4211-4 | LUG |
| 833 | △ P1 | 4161-03701220 | AC CORD W/PLUG |

| Ser. No. | Ref. No. | Part No. | Description |
|---------------------------|----------|---------------|---------------------------|
| PACKAGE PARTS LIST | | | |
| 023 | | 1756-03108 | LABEL, (I) LABEL (X2) |
| 026 | | 1111-M30253 | OWNER GUIDE, SAFETY GUIDE |
| 105 | | 1111-0640M152 | OWNER GUIDE, IB |
| 114 | | 1221-28130 | CARTON BOX G |
| 114 | | 1221-28131 | CARTON BOX GB |
| 115 | | 1222-7366 | CUSHION, R |
| 116 | | 1222-7367 | CUSHION, L |
| 117 | | 1223-R0420055 | SOFT SHEET, FRONT PANEL |
| 118 | | 1223-00207018 | SOFT SHEET, LID |
| 119 | | 1241-R0160601 | POLYETHY BAG, SET |
| 120 | | 1241-R0123351 | POLYETHY BAG, IB |
| 834 | | 4161-04601102 | CORD W/PLUG (RCA TYPE) |
| 880 | | 4191-0355 | BATTERY, DRY |
| 881 | | 6142-07404 | CONT BLOCK |

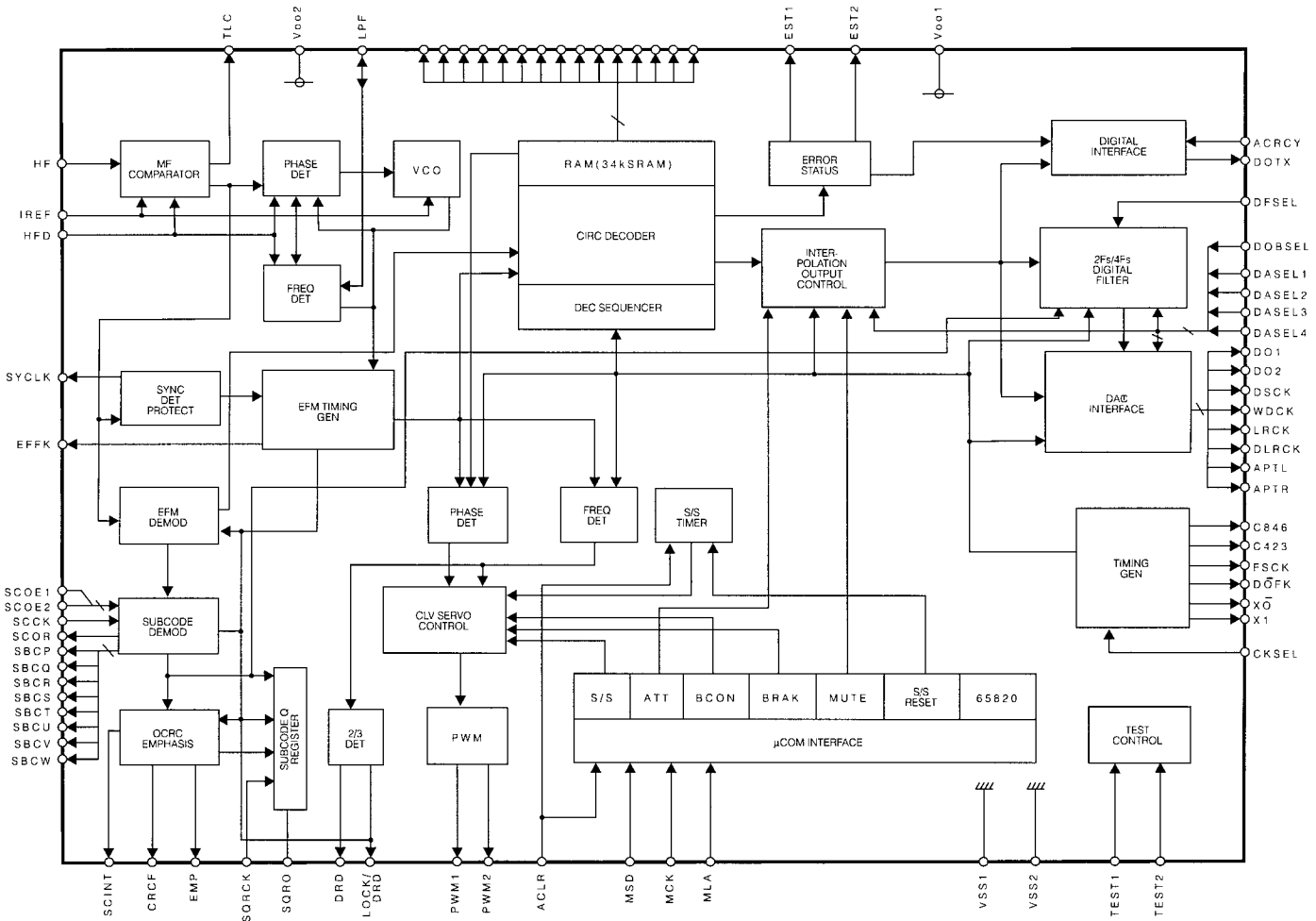
IC101 : CXA1081S
RF Amp.



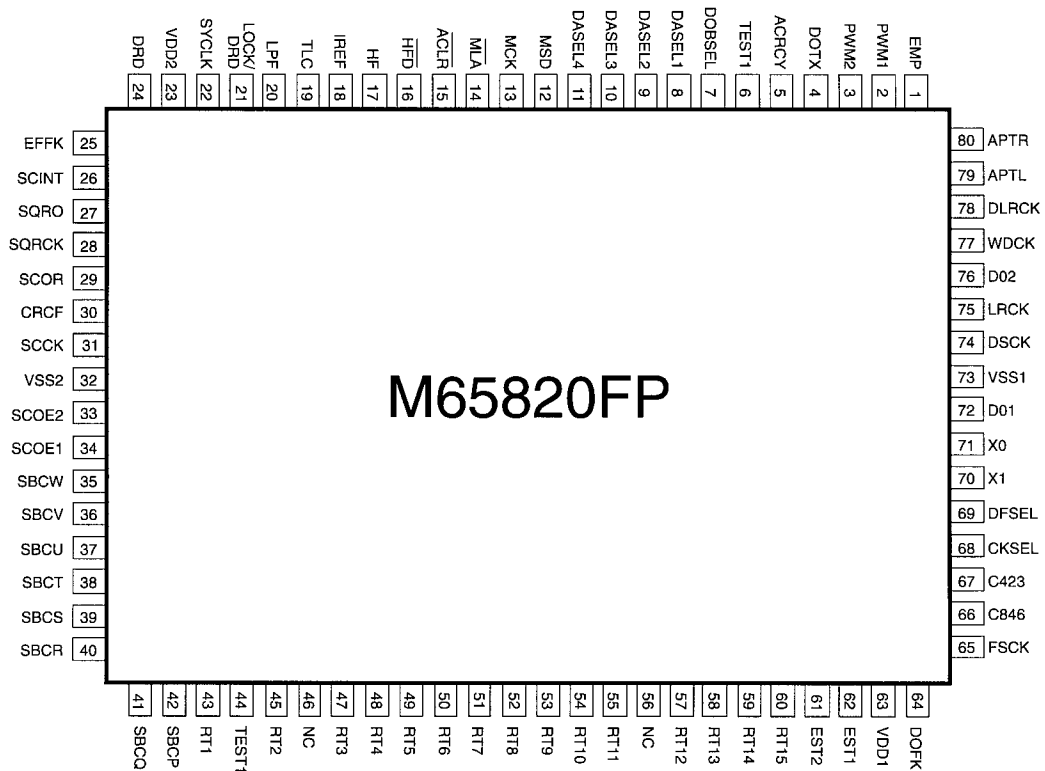
IC102 : M51594FP
Optical Pick-up Servo Control



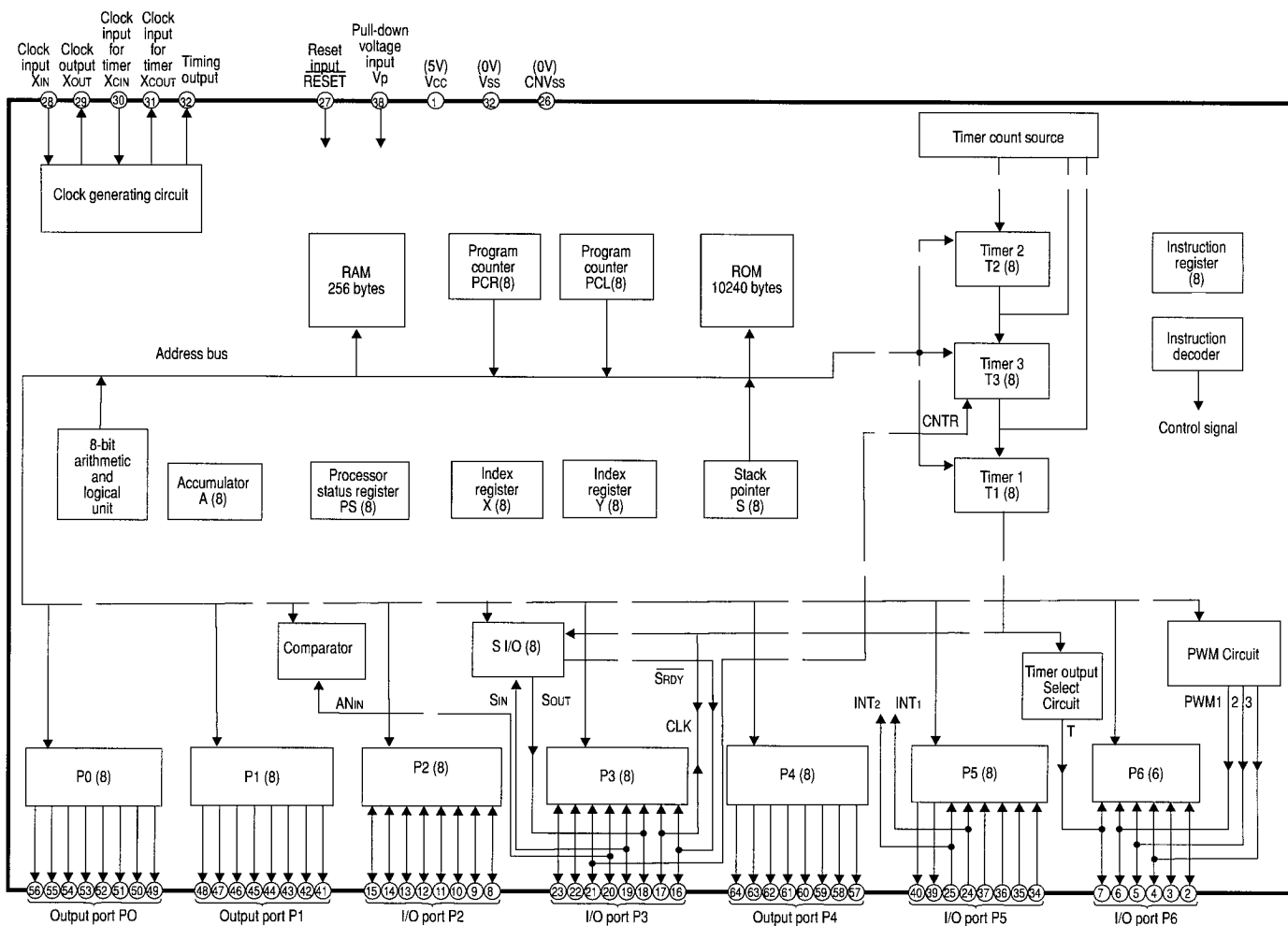
IC201 : M65820FP
Digital Signal Processor



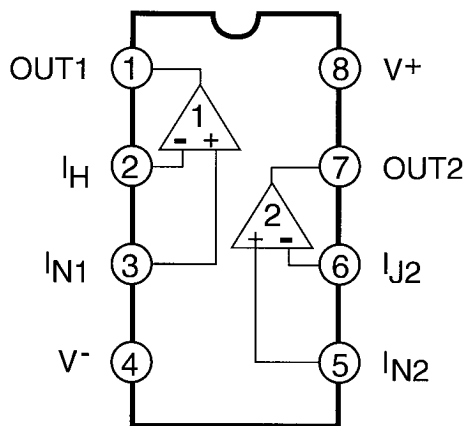
IC201



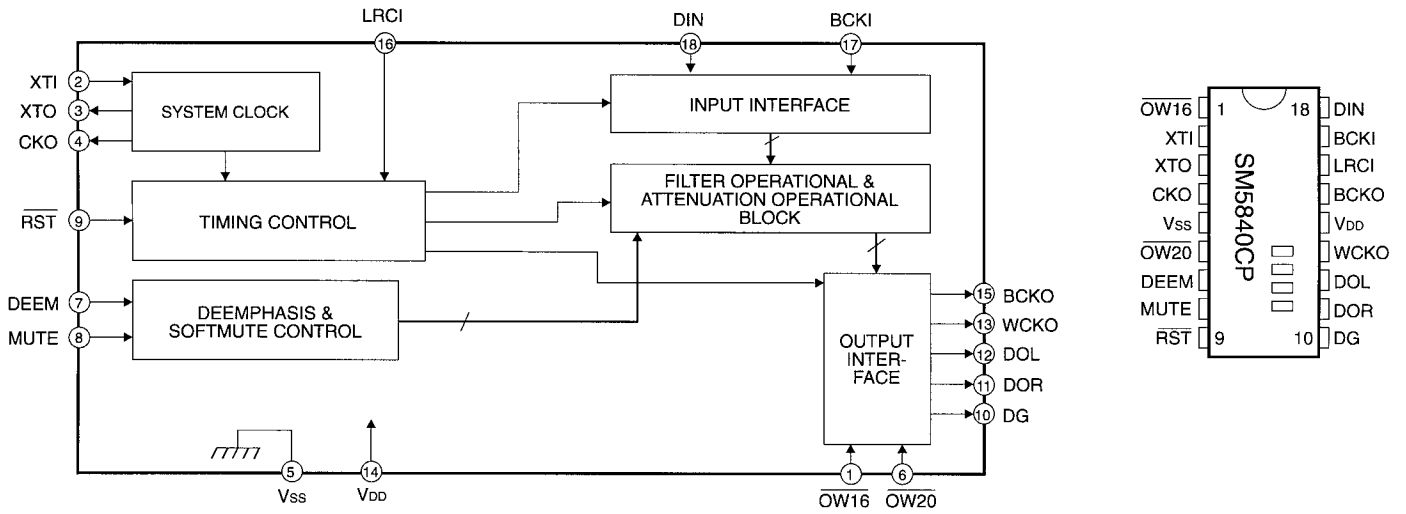
IC401 : M957-243 Microcomputer



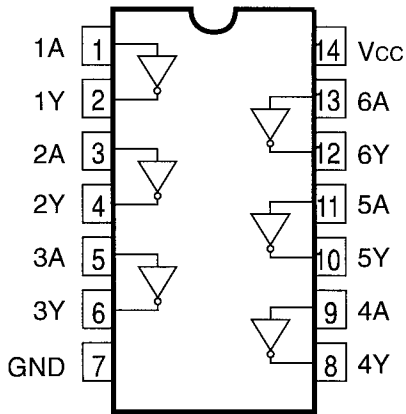
IC501 : NJM4565D Headphone Amp.



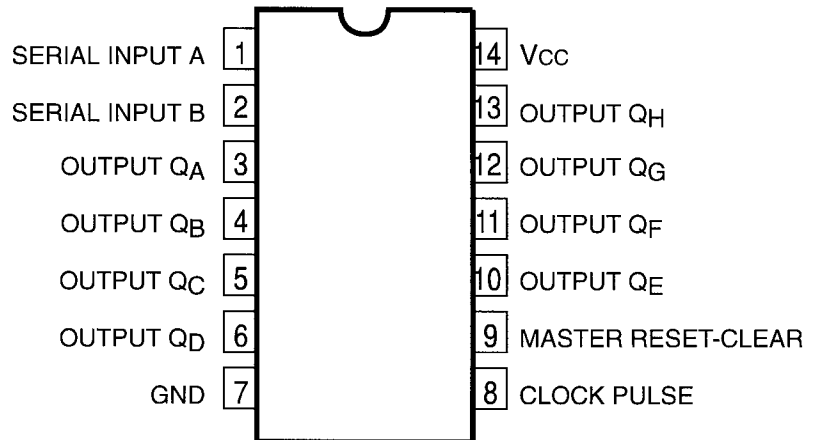
IC601 : SM5840CP
8 fs Digital Filter



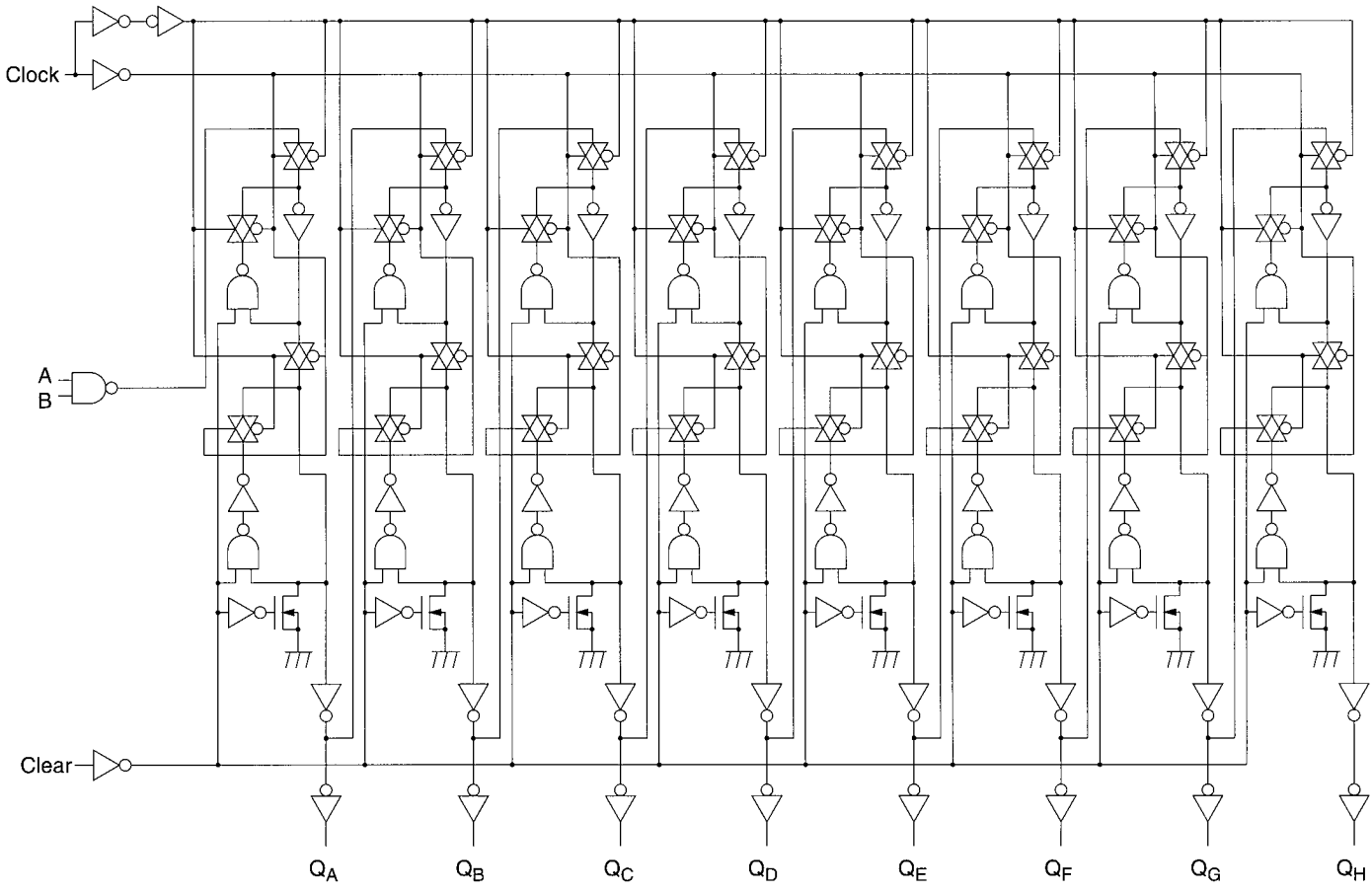
IC602 : H74H04P
Hex Inverter



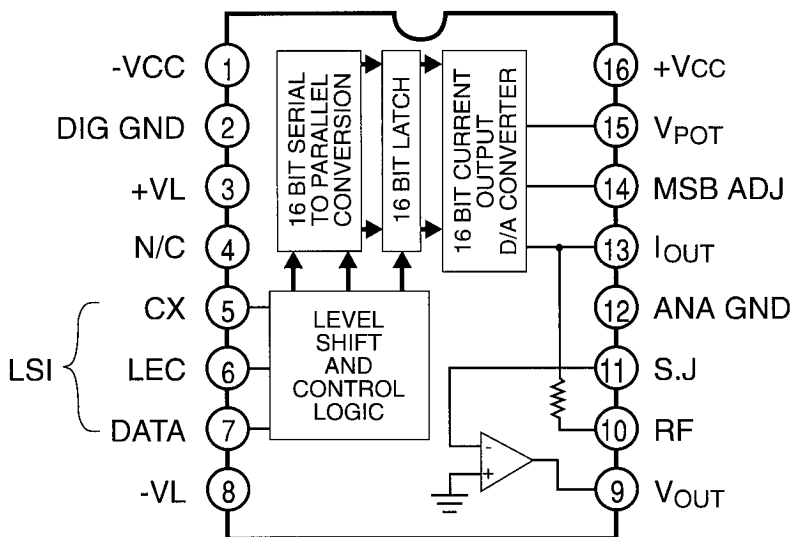
IC603 : H74H164P
8-bit Shift Register



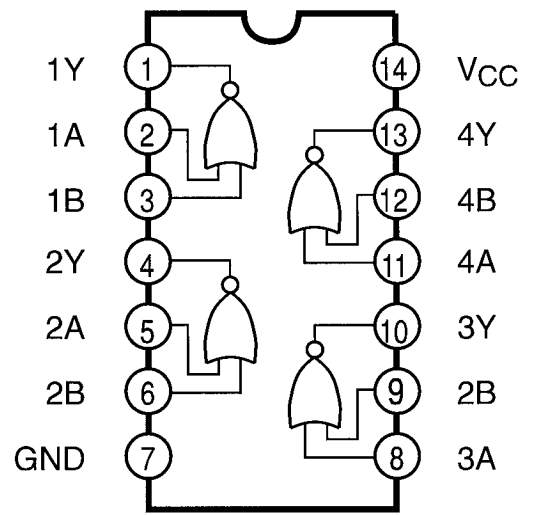
IC603



**IC611 - 614 : PCM61P
D/A Converter**

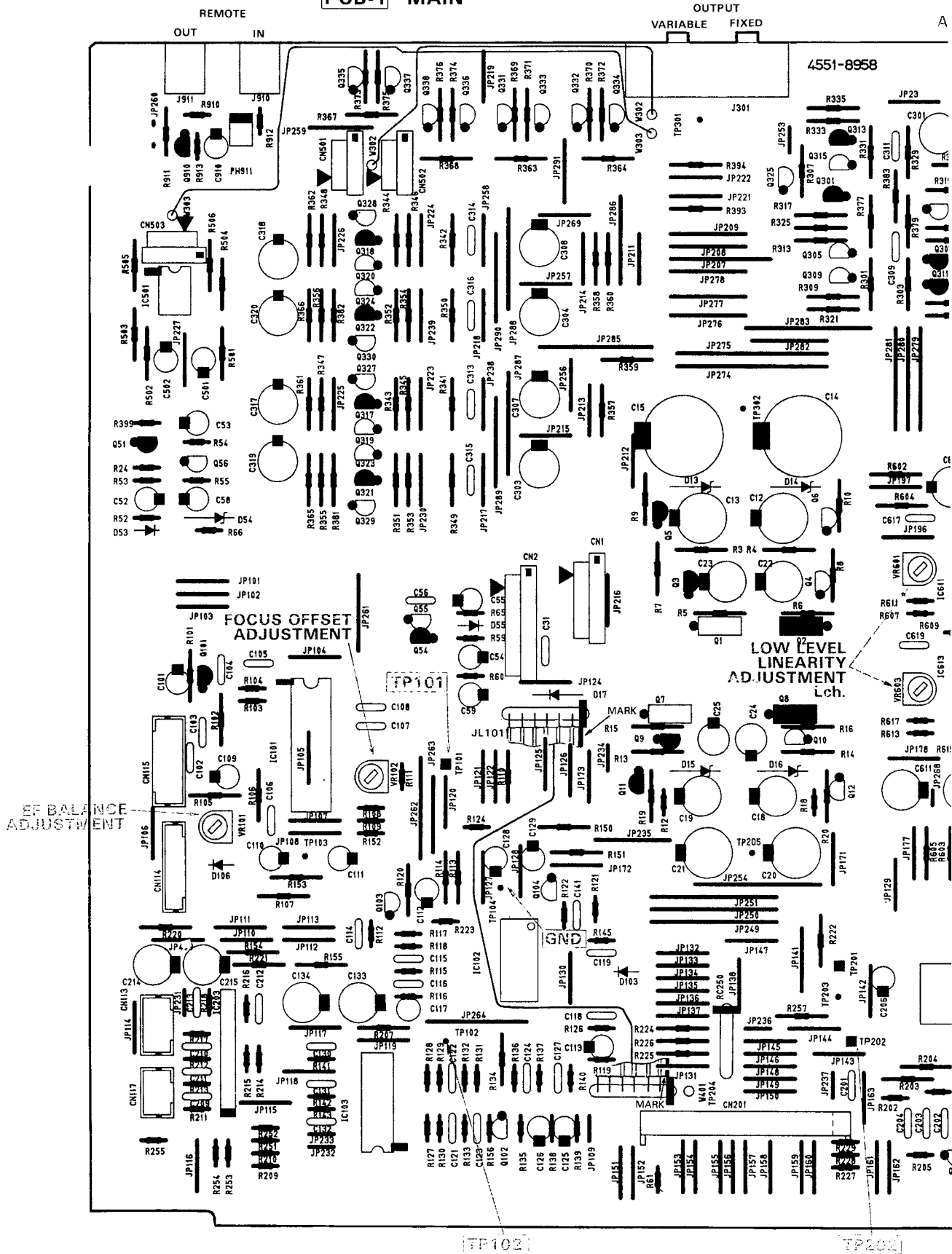


**IC801 : T74HC02P
Buffer Amp.**



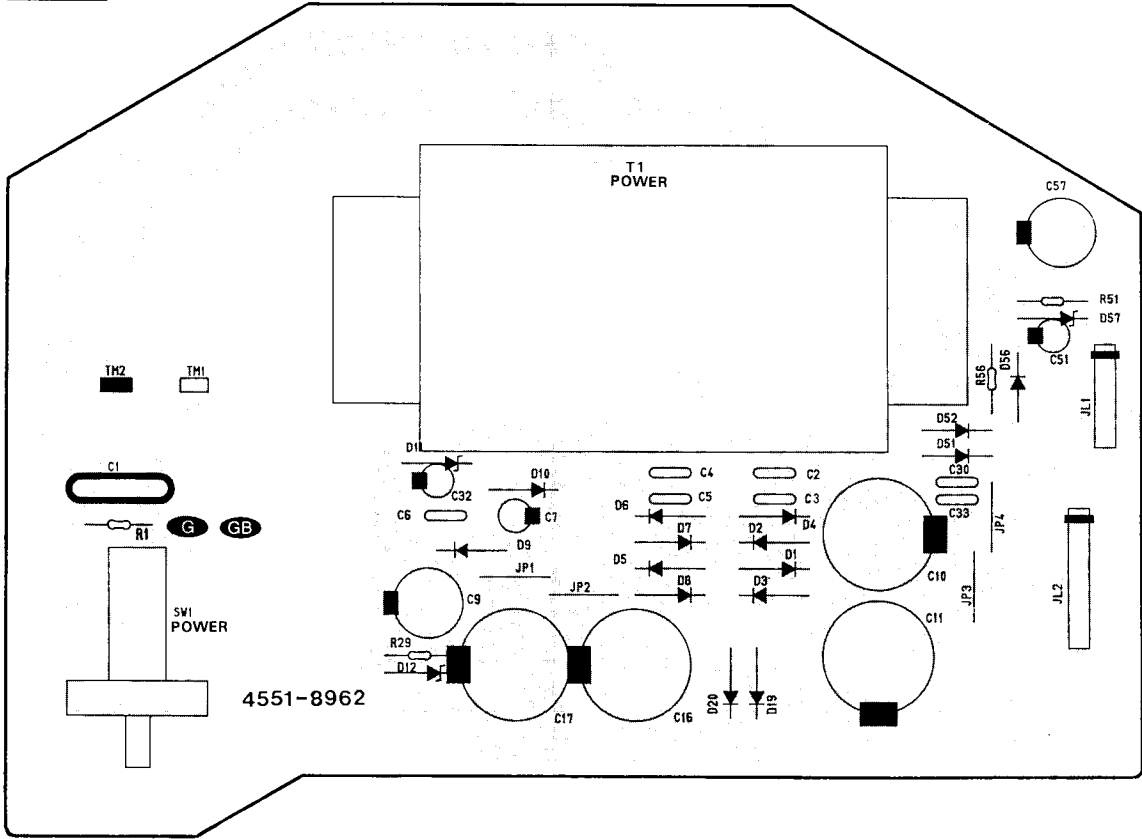
P. C. BOARDS (1)

PCB-1 MAIN

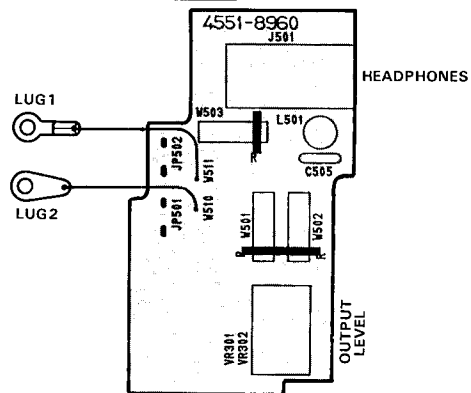


P. C. BOARDS (2)

PCB-4 POWER SUPPLY



PCB-3 VOLUME

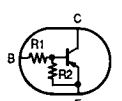
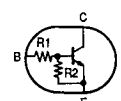
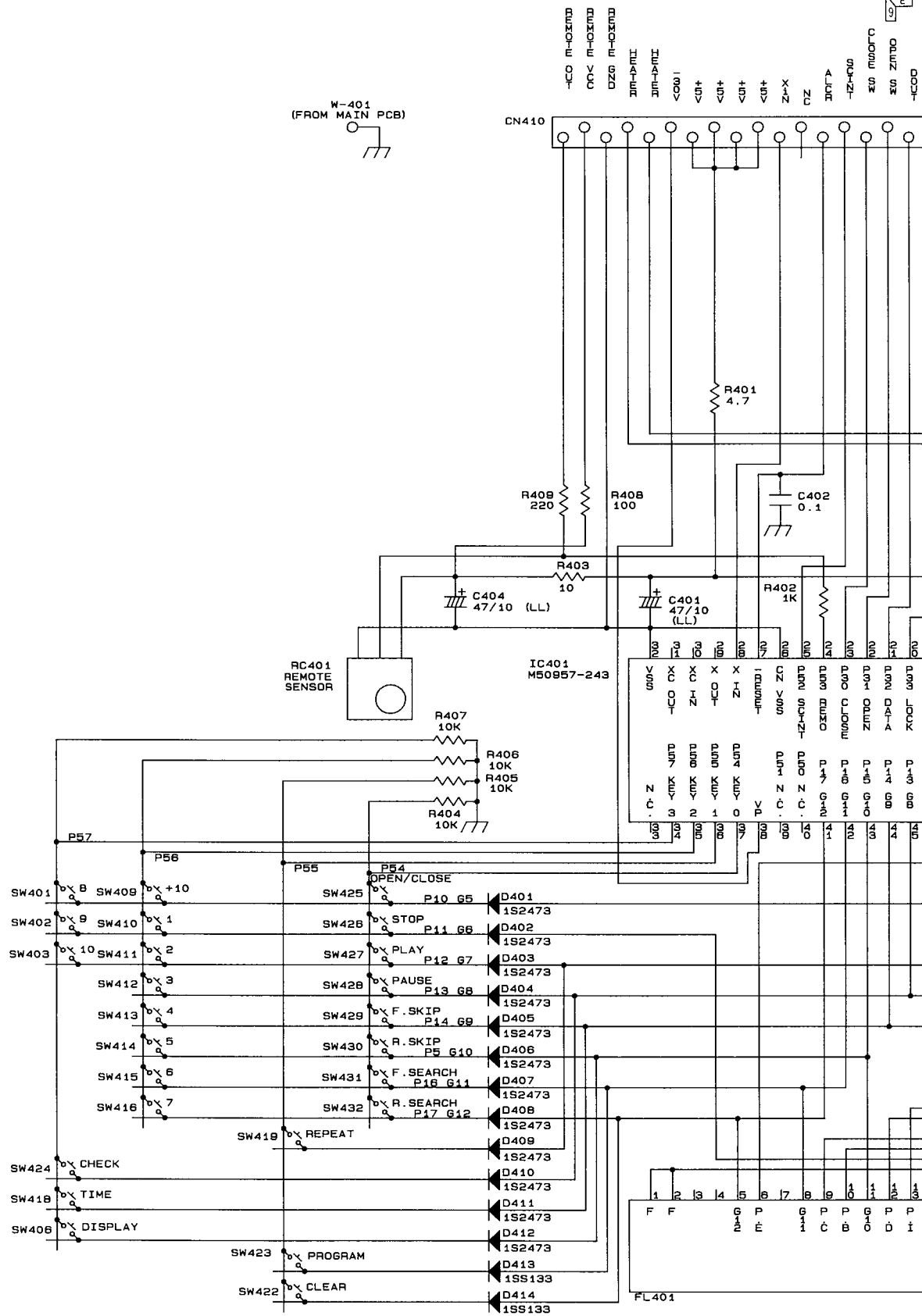


A B C D E

SCHEMATIC DIAGRAM (1)

SCHEMATIC DIAGRAM (1)

1
2
3
4
5
6
7

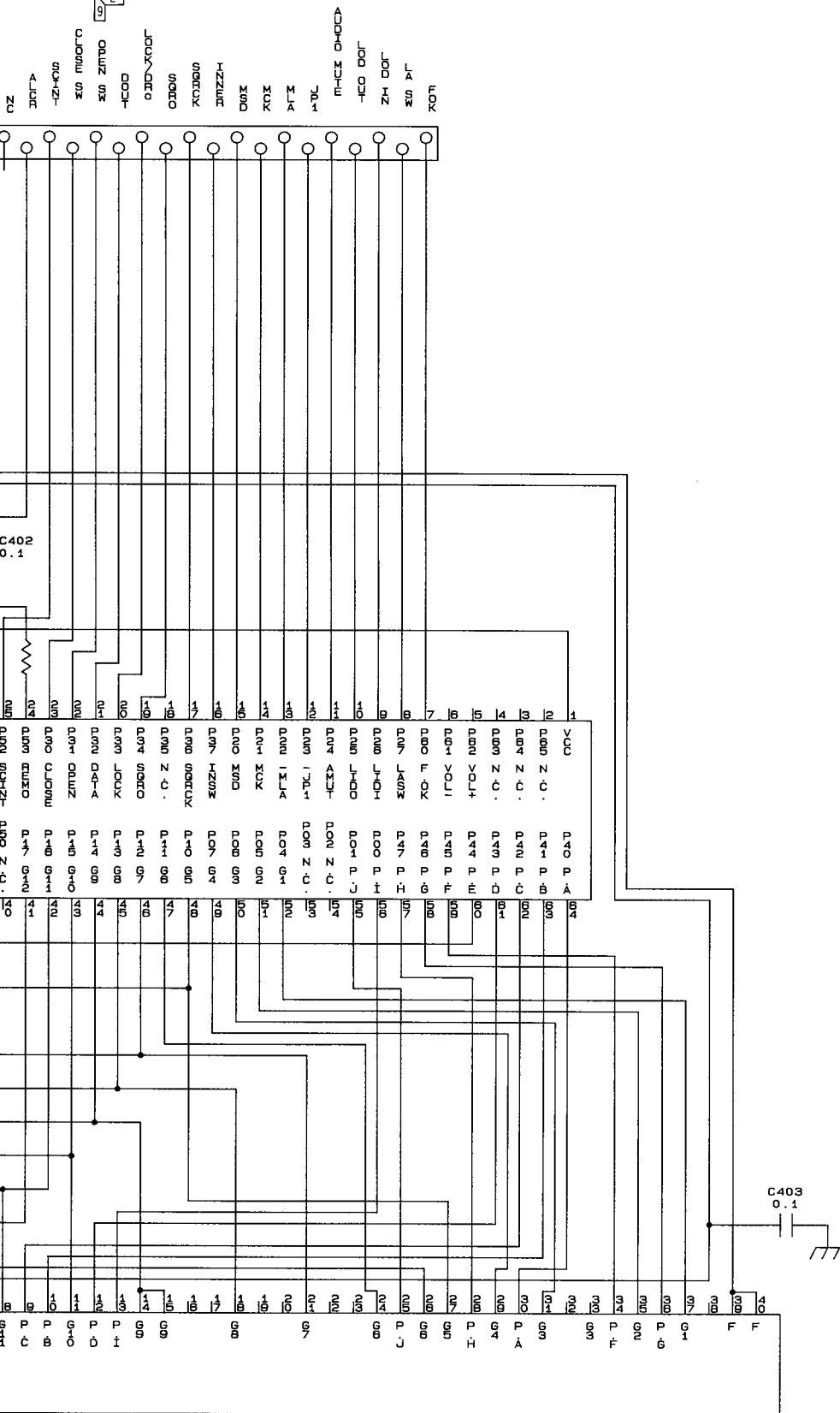


NOTE :
 1. A
 2. T
 3. A
 4. S
 5. T

| Type | R1(kΩ) | R2(kΩ) |
|--------|--------|--------|
| RN1202 | 10 | 10 |

| Type | R1(kΩ) | R2(kΩ) |
|--------|--------|--------|
| RN2201 | 10 | 10 |

SCHEMATIC
DIAGRAM (3)

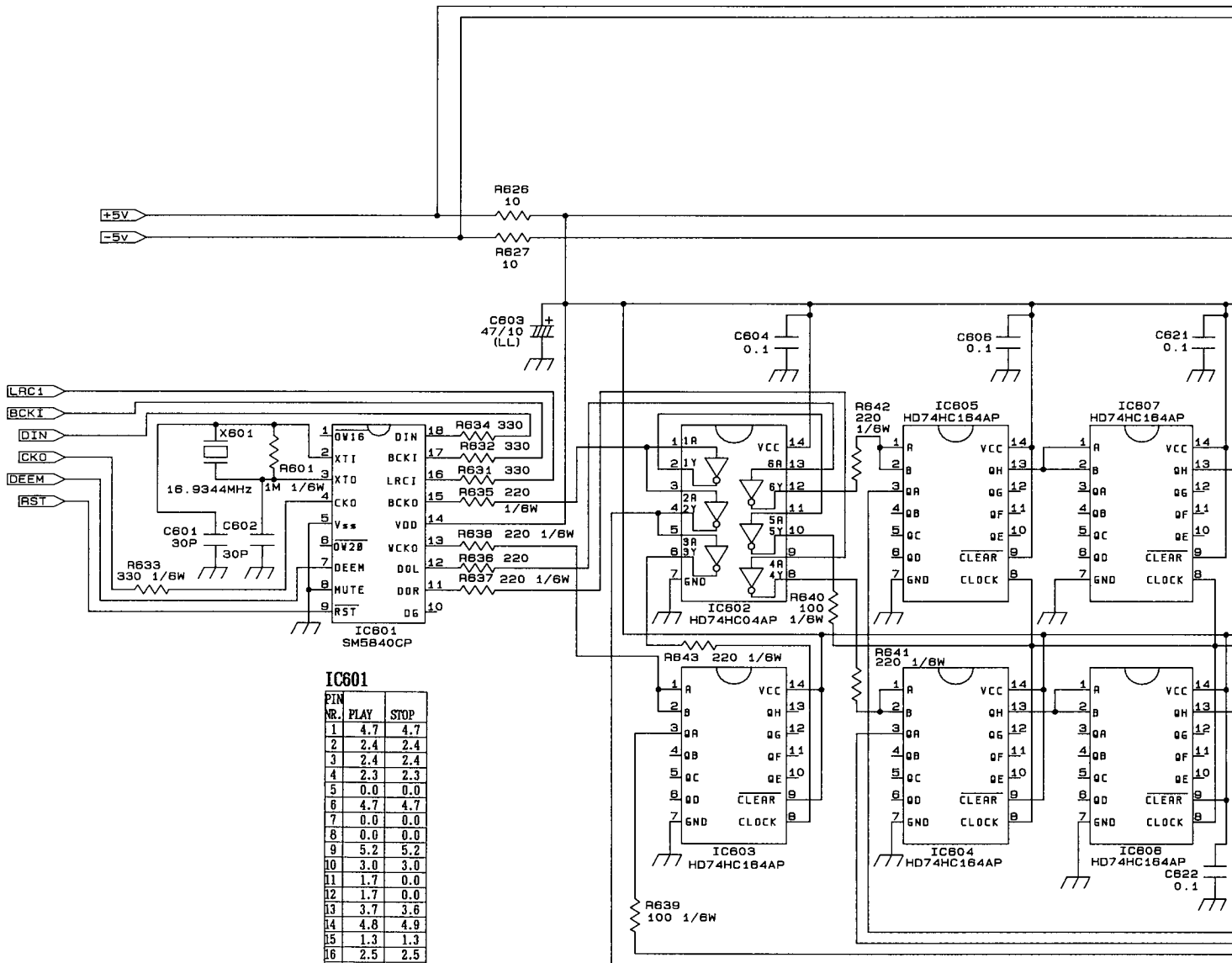


IC401

| PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP |
|---------|------|------|---------|-------|-------|
| 1 | 5.2 | 5.2 | 33 | | |
| 2 | 0.0 | 0.0 | 34 | | |
| 3 | 0.0 | 0.0 | 35 | | |
| 4 | 0.0 | 0.0 | 36 | | |
| 5 | 0.0 | 0.0 | 37 | | |
| 6 | 0.0 | 0.0 | 38 | -27.6 | -27.3 |
| 7 | 3.7 | 0.1 | 39 | | |
| 8 | 0.0 | 5.1 | 40 | | |
| 9 | 0.0 | 0.0 | 41 | | |
| 10 | 0.0 | 0.0 | 42 | | |
| 11 | 8.5 | 0.0 | 43 | | |
| 12 | 5.2 | 5.2 | 44 | | |
| 13 | 5.2 | 5.2 | 45 | | |
| 14 | 5.2 | 5.2 | 46 | | |
| 15 | 5.2 | 5.2 | 47 | | |
| 16 | 5.2 | 5.3 | 48 | | |
| 17 | 5.3 | 5.2 | 49 | | |
| 18 | 0.0 | 0.0 | 50 | | |
| 19 | 0.0 | 5.0 | 51 | | |
| 20 | 5.1 | 0.0 | 52 | | |
| 21 | 5.2 | 0.0 | 53 | | |
| 22 | 0.0 | 0.0 | 54 | | |
| 23 | 5.2 | 5.2 | 55 | | |
| 24 | 5.2 | 5.1 | 56 | | |
| 25 | 5.0 | 5.1 | 57 | | |
| 26 | 0.0 | 0.0 | 58 | | |
| 27 | 5.2 | 5.2 | 59 | | |
| 28 | 2.5 | 2.5 | 60 | | |
| 29 | 2.3 | 2.2 | 61 | | |
| 30 | 0.0 | 0.0 | 62 | | |
| 31 | 5.1 | 5.1 | 63 | | |
| 32 | 0.0 | 0.0 | 64 | | |

- NOTE :
1. ALL RESISTANCE VALUES ARE IN (ohm).
K=1000 (ohm) M=1000K (ohm)
 2. THE WATTAGE OF RESISTANCES IS 1/4W UNLESS OTHERWISE NOTED.
 3. ALL CAPACITANCES VALUES ARE IN uF UNLESS OTHERWISE NOTED.
P=uuF
 4. SAFETY REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS.
 5. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM (2)



IC601

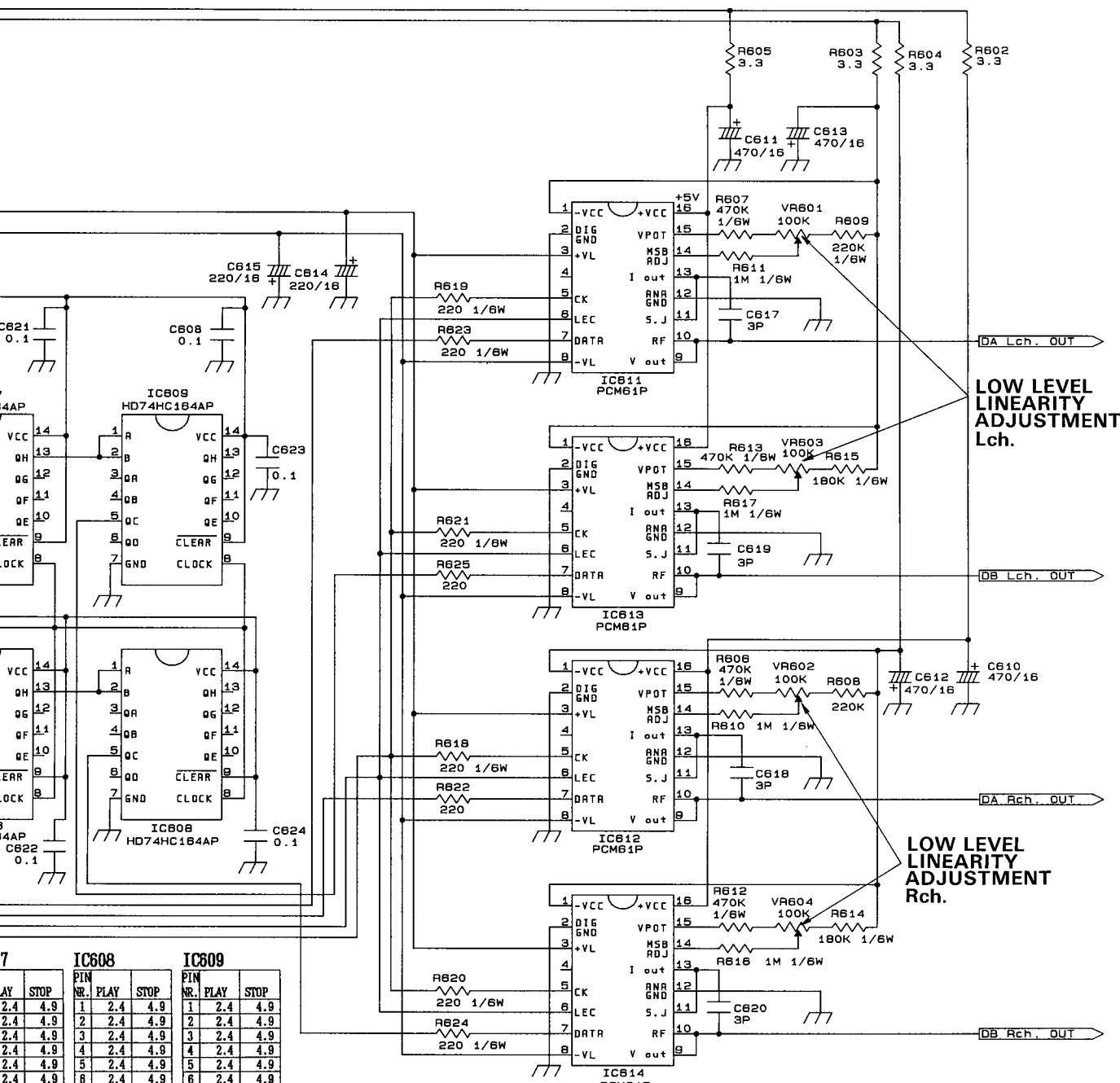
| PIN NR. | PLAY | STOP |
|---------|------|------|
| 1 | 4.7 | 4.7 |
| 2 | 2.4 | 2.4 |
| 3 | 2.4 | 2.4 |
| 4 | 2.3 | 2.3 |
| 5 | 0.0 | 0.0 |
| 6 | 4.7 | 4.7 |
| 7 | 0.0 | 0.0 |
| 8 | 0.0 | 0.0 |
| 9 | 5.2 | 5.2 |
| 10 | 3.0 | 3.0 |
| 11 | 1.7 | 0.0 |
| 12 | 1.7 | 0.0 |
| 13 | 3.7 | 3.6 |
| 14 | 4.8 | 4.9 |
| 15 | 1.3 | 1.3 |
| 16 | 2.5 | 2.5 |
| 17 | 2.5 | 2.5 |
| 18 | 2.5 | 0.0 |

| IC602 | | | IC603 | | | IC604 | | | IC605 | | | IC606 | | | IC607 | | |
|---------|------|------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|
| PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP | PIN NR. | PLAY | STOP |
| 1 | 1.4 | 1.4 | 1 | 3.6 | 3.6 | 1 | 3.0 | 4.9 | 1 | 3.0 | 4.9 | 1 | 2.4 | 4.9 | 1 | 2.4 | 4.9 |
| 2 | 3.1 | 3.2 | 2 | 3.6 | 3.6 | 2 | 3.0 | 4.9 | 2 | 3.0 | 4.9 | 2 | 2.4 | 4.9 | 2 | 2.4 | 4.9 |
| 3 | 1.4 | 1.4 | 3 | 3.8 | 3.8 | 3 | 2.4 | 4.9 | 3 | 2.4 | 4.9 | 3 | 2.4 | 4.9 | 3 | 2.4 | 4.9 |
| 4 | 3.1 | 3.2 | 4 | 3.8 | 3.8 | 4 | 2.4 | 4.9 | 4 | 2.4 | 4.9 | 4 | 2.4 | 4.9 | 4 | 2.4 | 4.9 |
| 5 | 3.1 | 3.2 | 5 | 3.8 | 3.8 | 5 | 2.4 | 4.9 | 5 | 2.4 | 4.9 | 5 | 2.4 | 4.9 | 5 | 2.4 | 4.9 |
| 6 | 1.6 | 1.6 | 6 | 3.8 | 3.8 | 6 | 2.4 | 4.9 | 6 | 2.4 | 4.9 | 6 | 2.4 | 4.9 | 6 | 2.4 | 4.9 |
| 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 |
| 8 | 3.0 | 4.9 | 8 | 1.6 | 1.6 | 8 | 1.6 | 1.6 | 8 | 1.6 | 1.6 | 8 | 1.6 | 1.6 | 8 | 1.6 | 1.6 |
| 9 | 1.7 | 0.0 | 9 | 4.8 | 4.9 | 9 | 4.8 | 4.9 | 9 | 4.8 | 4.9 | 9 | 4.8 | 4.9 | 9 | 4.8 | 4.9 |
| 10 | 1.6 | 1.6 | 10 | 3.8 | 3.8 | 10 | 2.4 | 4.9 | 10 | 2.4 | 4.9 | 10 | 2.4 | 4.9 | 10 | 2.4 | 4.9 |
| 11 | 3.1 | 3.2 | 11 | 3.8 | 3.8 | 11 | 2.4 | 4.9 | 11 | 2.4 | 4.9 | 11 | 2.4 | 4.9 | 11 | 2.4 | 4.9 |
| 12 | 3.0 | 4.9 | 12 | 3.6 | 3.6 | 12 | 2.4 | 4.9 | 12 | 2.4 | 4.9 | 12 | 2.4 | 4.9 | 12 | 2.4 | 4.9 |
| 13 | 1.7 | 0.0 | 13 | 3.8 | 3.8 | 13 | 2.4 | 4.9 | 13 | 2.4 | 4.9 | 13 | 2.4 | 4.9 | 13 | 2.4 | 4.9 |
| 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 |

NOTE :

1. ALL RESISTANCES VALUES K=1000 [ohm], M=1000K
2. THE WATTAGE OF RESISTANT
3. ALL CAPACITANCES VALUES P=UF
4. SAFETY REQUIREMENTS COM
5. THESE COMPONENTS MUST C





| 7 | | IC608 | | | IC609 | | |
|-----|------|-------|------|------|-------|------|------|
| AY | STOP | NR. | PLAY | STOP | NR. | PLAY | STOP |
| 2.4 | 4.9 | 1 | 2.4 | 4.9 | 1 | 2.4 | 4.9 |
| 2.4 | 4.9 | 2 | 2.4 | 4.9 | 2 | 2.4 | 4.9 |
| 2.4 | 4.9 | 3 | 2.4 | 4.9 | 3 | 2.4 | 4.9 |
| 2.4 | 4.9 | 4 | 2.4 | 4.9 | 4 | 2.4 | 4.9 |
| 2.4 | 4.9 | 5 | 2.4 | 4.9 | 5 | 2.4 | 4.9 |
| 2.4 | 4.9 | 6 | 2.4 | 4.9 | 6 | 2.4 | 4.9 |
| 0.0 | 0.0 | 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 |
| 1.6 | 1.6 | 8 | 1.6 | 1.6 | 8 | 1.6 | 1.6 |
| 4.8 | 4.9 | 9 | 4.8 | 4.9 | 9 | 4.8 | 4.9 |
| 2.4 | 4.9 | 10 | 2.4 | 4.9 | 10 | 2.4 | 4.9 |
| 2.4 | 4.9 | 11 | 2.4 | 4.9 | 11 | 2.4 | 4.9 |
| 2.4 | 4.9 | 12 | 2.4 | 4.9 | 12 | 2.4 | 4.9 |
| 2.4 | 4.9 | 13 | 2.4 | 4.9 | 13 | 2.4 | 4.9 |
| 4.8 | 4.9 | 14 | 4.8 | 4.9 | 14 | 4.8 | 4.9 |

| IC611 | | | IC612 | | | IC613 | | | IC614 | | | | | | |
|-------|------|------|-------|-----|------|-------|------|-----|-------|------|------|-----|------|------|------|
| PIN | NR. | PLAY | STOP | PIN | NR. | PLAY | STOP | PIN | NR. | PLAY | STOP | PIN | NR. | PLAY | STOP |
| 1 | -5.1 | -5.1 | | 1 | -5.1 | -5.1 | | 1 | -5.1 | -5.1 | | 1 | -5.1 | -5.1 | |
| 2 | 0.0 | 0.0 | | 2 | 0.0 | 0.0 | | 2 | 0.0 | 0.0 | | 2 | 0.0 | 0.0 | |
| 3 | 4.8 | 4.9 | | 3 | 4.9 | 5.0 | | 3 | 4.8 | 5.0 | | 3 | 4.8 | 5.0 | |
| 4 | 0.0 | 0.0 | | 4 | 0.0 | 0.0 | | 4 | 0.0 | 0.0 | | 4 | 0.0 | 0.0 | |
| 5 | 3.1 | 3.2 | | 5 | 3.2 | 3.2 | | 5 | 3.1 | 3.2 | | 5 | 3.1 | 3.2 | |
| 6 | 3.8 | 3.9 | | 6 | 3.8 | 3.9 | | 6 | 3.8 | 3.9 | | 6 | 3.8 | 3.9 | |
| 7 | 2.4 | 5.0 | | 7 | 2.4 | 5.0 | | 7 | 2.4 | 5.0 | | 7 | 2.4 | 4.9 | |
| 8 | -4.7 | -4.7 | | 8 | -4.8 | -4.7 | | 8 | -4.7 | -4.7 | | 8 | -4.7 | -4.7 | |
| 9 | 0.0 | 0.0 | | 9 | 0.0 | 0.0 | | 9 | 0.0 | 0.0 | | 9 | 0.0 | 0.0 | |
| 10 | 0.0 | 0.0 | | 10 | 0.0 | 0.0 | | 10 | 0.0 | 0.0 | | 10 | 0.0 | 0.0 | |
| 11 | 0.0 | 0.0 | | 11 | 0.0 | 0.0 | | 11 | 0.0 | 0.0 | | 11 | 0.0 | 0.0 | |
| 12 | 0.0 | 0.0 | | 12 | 0.0 | 0.0 | | 12 | 0.0 | 0.0 | | 12 | 0.0 | 0.0 | |
| 13 | 0.0 | 0.0 | | 13 | 0.0 | 0.0 | | 13 | 0.0 | 0.0 | | 13 | 0.0 | 0.0 | |
| 14 | -2.6 | -2.6 | | 14 | -2.5 | -2.5 | | 14 | -2.6 | -2.6 | | 14 | -2.6 | -2.6 | |
| 15 | 2.3 | 2.3 | | 15 | 2.3 | 2.3 | | 15 | 2.3 | 2.3 | | 15 | 2.3 | 2.3 | |
| 16 | 5.2 | 5.2 | | 16 | 5.2 | 5.2 | | 16 | 5.2 | 5.2 | | 16 | 5.2 | 5.2 | |

RESISTANCE VALUES ARE IN (ohm).
 M=1000K (ohm)
 RESISTANCES IS 1/4W UNLESS OTHERWISE NOTED.
 CAPACITANCE VALUES ARE IN uF UNLESS OTHERWISE NOTED.
 COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS.
 PARTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM (3)

A

B

C

D

E

F

G

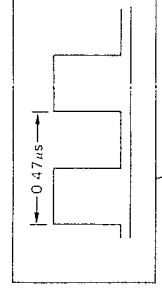
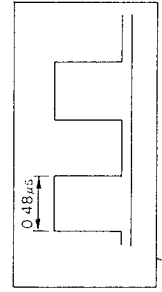
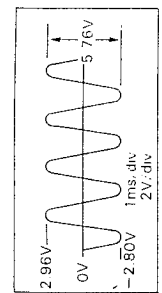
1

2

3

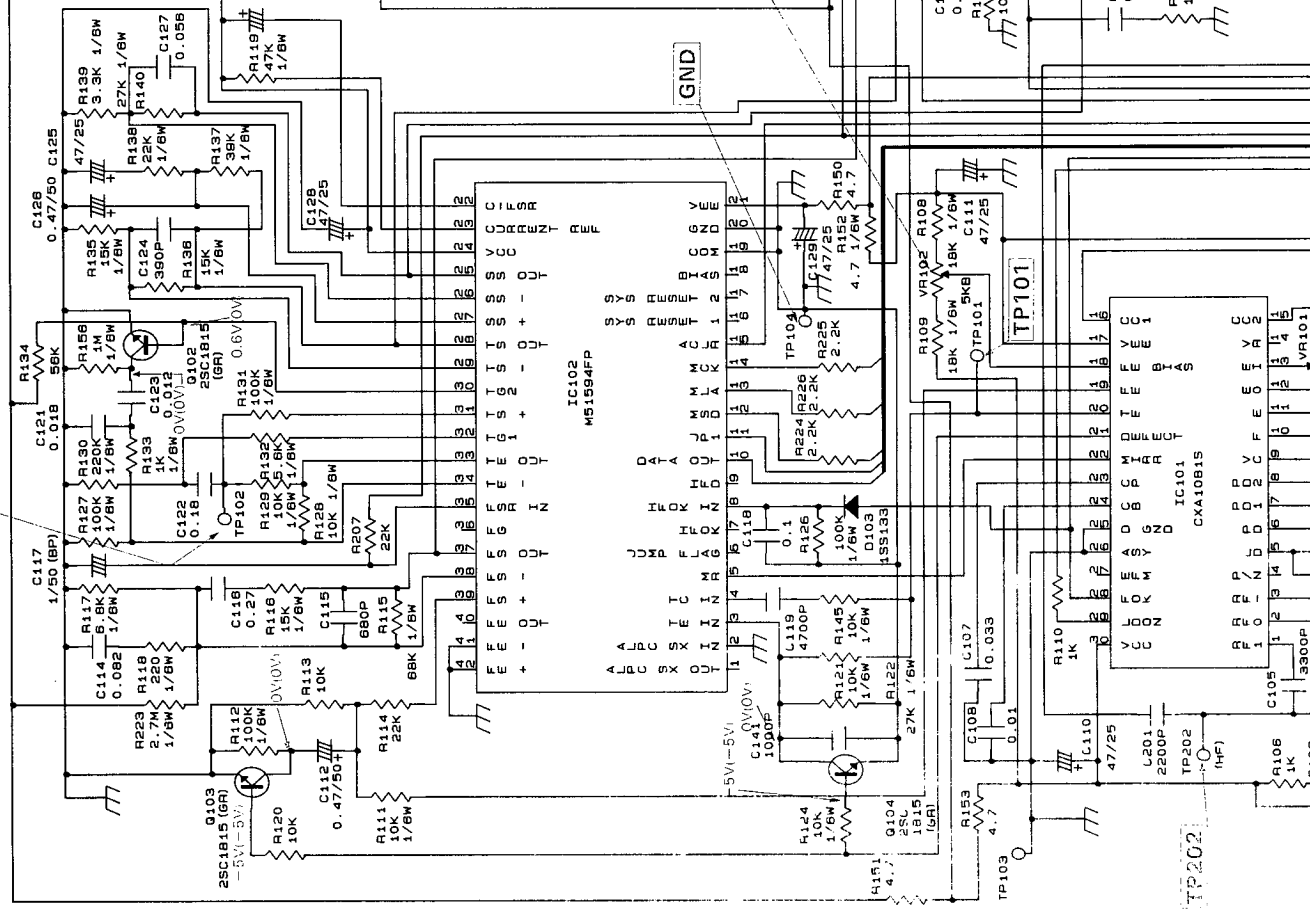
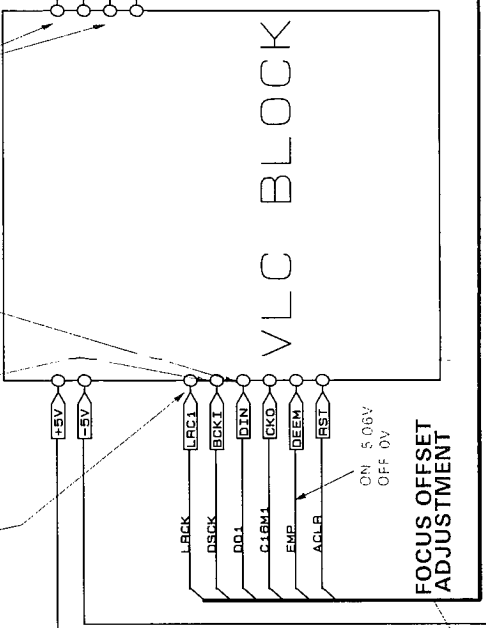
4

5



PCB-1 MAIN

Q301, Q302, Q307, Q308, Q311, Q312, ... 25A1015L (GR)
Q313, Q314, Q316, Q317, Q318, Q319, Q320, Q321, Q322, Q323, Q324, ... 25C1815L (GR)
Q303-Q306, Q309, Q310, Q315, Q316, Q319, Q320, Q323, Q324, ... 25C1815L (GR)



IC102

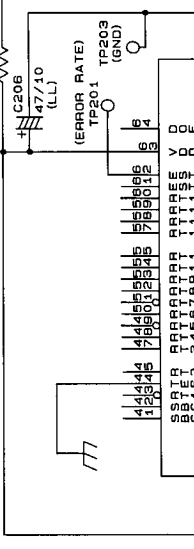
| Pin | Symbol | Value |
|-----|-----------------|-------|
| 1 | V _{CC} | 5V |
| 2 | V _{EE} | 0V |
| 3 | V _{EE} | 0V |
| 4 | V _{EE} | 0V |
| 5 | V _{EE} | 0V |
| 6 | V _{EE} | 0V |
| 7 | V _{EE} | 0V |
| 8 | V _{EE} | 0V |
| 9 | V _{EE} | 0V |
| 10 | V _{EE} | 0V |
| 11 | V _{EE} | 0V |
| 12 | V _{EE} | 0V |
| 13 | V _{EE} | 0V |
| 14 | V _{EE} | 0V |
| 15 | V _{EE} | 0V |
| 16 | V _{EE} | 0V |
| 17 | V _{EE} | 0V |
| 18 | V _{EE} | 0V |
| 19 | V _{EE} | 0V |
| 20 | V _{EE} | 0V |
| 21 | V _{EE} | 0V |
| 22 | V _{EE} | 0V |
| 23 | V _{EE} | 0V |
| 24 | V _{EE} | 0V |
| 25 | V _{EE} | 0V |
| 26 | V _{EE} | 0V |
| 27 | V _{EE} | 0V |
| 28 | V _{EE} | 0V |
| 29 | V _{EE} | 0V |
| 30 | V _{EE} | 0V |
| 31 | V _{EE} | 0V |
| 32 | V _{EE} | 0V |
| 33 | V _{EE} | 0V |
| 34 | V _{EE} | 0V |
| 35 | V _{EE} | 0V |
| 36 | V _{EE} | 0V |
| 37 | V _{EE} | 0V |
| 38 | V _{EE} | 0V |
| 39 | V _{EE} | 0V |
| 40 | V _{EE} | 0V |
| 41 | V _{EE} | 0V |
| 42 | V _{EE} | 0V |
| 43 | V _{EE} | 0V |
| 44 | V _{EE} | 0V |
| 45 | V _{EE} | 0V |
| 46 | V _{EE} | 0V |
| 47 | V _{EE} | 0V |
| 48 | V _{EE} | 0V |
| 49 | V _{EE} | 0V |
| 50 | V _{EE} | 0V |

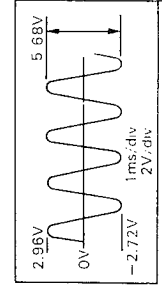
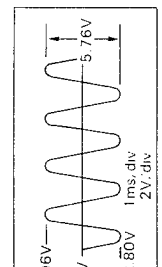
IC103

| Pin | Symbol | Value |
|-----|-----------------|-------|
| 1 | V _{CC} | 5V |
| 2 | V _{EE} | 0V |
| 3 | V _{EE} | 0V |
| 4 | V _{EE} | 0V |
| 5 | V _{EE} | 0V |
| 6 | V _{EE} | 0V |
| 7 | V _{EE} | 0V |
| 8 | V _{EE} | 0V |
| 9 | V _{EE} | 0V |
| 10 | V _{EE} | 0V |
| 11 | V _{EE} | 0V |
| 12 | V _{EE} | 0V |
| 13 | V _{EE} | 0V |
| 14 | V _{EE} | 0V |
| 15 | V _{EE} | 0V |
| 16 | V _{EE} | 0V |
| 17 | V _{EE} | 0V |
| 18 | V _{EE} | 0V |
| 19 | V _{EE} | 0V |
| 20 | V _{EE} | 0V |
| 21 | V _{EE} | 0V |
| 22 | V _{EE} | 0V |
| 23 | V _{EE} | 0V |
| 24 | V _{EE} | 0V |
| 25 | V _{EE} | 0V |
| 26 | V _{EE} | 0V |
| 27 | V _{EE} | 0V |
| 28 | V _{EE} | 0V |
| 29 | V _{EE} | 0V |
| 30 | V _{EE} | 0V |

IC101

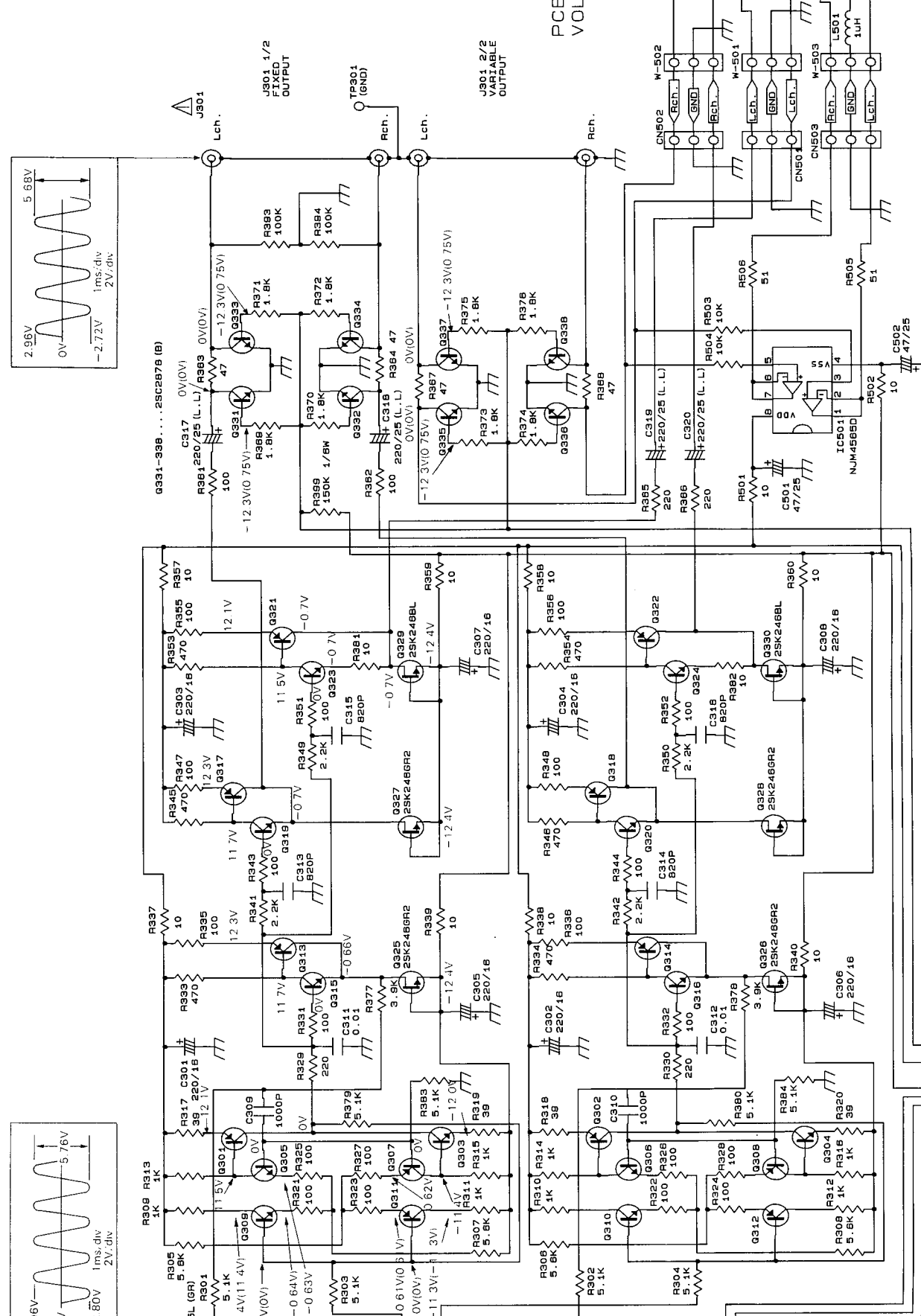
| Pin | Symbol | Value |
|-----|-----------------|-------|
| 1 | V _{CC} | 5V |
| 2 | V _{EE} | 0V |
| 3 | V _{EE} | 0V |
| 4 | V _{EE} | 0V |
| 5 | V _{EE} | 0V |
| 6 | V _{EE} | 0V |
| 7 | V _{EE} | 0V |
| 8 | V _{EE} | 0V |
| 9 | V _{EE} | 0V |
| 10 | V _{EE} | 0V |
| 11 | V _{EE} | 0V |
| 12 | V _{EE} | 0V |
| 13 | V _{EE} | 0V |
| 14 | V _{EE} | 0V |
| 15 | V _{EE} | 0V |
| 16 | V _{EE} | 0V |
| 17 | V _{EE} | 0V |
| 18 | V _{EE} | 0V |
| 19 | V _{EE} | 0V |
| 20 | V _{EE} | 0V |
| 21 | V _{EE} | 0V |
| 22 | V _{EE} | 0V |
| 23 | V _{EE} | 0V |
| 24 | V _{EE} | 0V |
| 25 | V _{EE} | 0V |
| 26 | V _{EE} | 0V |
| 27 | V _{EE} | 0V |
| 28 | V _{EE} | 0V |
| 29 | V _{EE} | 0V |
| 30 | V _{EE} | 0V |





IC201

| NR. | PLAY | STOP | NR. | PLAY | STOP |
|-----|------|------|-----|------|------|
| 1 | 0.0 | 0.0 | 1 | 0.0 | 0.0 |
| 2 | 2.0 | 0.0 | 2 | 0.0 | 0.0 |
| 3 | 2.0 | 0.0 | 3 | 0.0 | 0.0 |
| 4 | 2.1 | 2.9 | 4 | 0.0 | 0.0 |
| 5 | 0.0 | 0.0 | 5 | 0.0 | 0.0 |
| 6 | 0.0 | 0.0 | 6 | 0.0 | 0.0 |
| 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 |
| 8 | 0.0 | 0.0 | 8 | 0.0 | 0.0 |
| 9 | 0.0 | 0.0 | 9 | 0.0 | 0.0 |
| 10 | 0.0 | 0.0 | 10 | 0.0 | 0.0 |
| 11 | 5.1 | 5.1 | 11 | 5.1 | 5.1 |
| 12 | 5.2 | 5.2 | 12 | 5.1 | 5.1 |
| 13 | 5.1 | 5.2 | 13 | 5.1 | 5.1 |
| 14 | 5.2 | 5.2 | 14 | 5.1 | 5.1 |
| 15 | 5.2 | 5.2 | 15 | 5.1 | 5.1 |
| 16 | 0.0 | 0.0 | 16 | 0.0 | 0.0 |
| 17 | 2.6 | 0.0 | 17 | 2.6 | 0.0 |
| 18 | 1.6 | 1.6 | 18 | 1.6 | 1.6 |
| 19 | 2.6 | 0.0 | 19 | 2.6 | 0.0 |
| 20 | 2.6 | 5.0 | 20 | 5.1 | 5.1 |
| 21 | 5.1 | 0.0 | 21 | 5.1 | 0.0 |
| 22 | 5.1 | 0.0 | 22 | 5.1 | 0.0 |
| 23 | 5.1 | 5.1 | 23 | 5.1 | 5.1 |
| 24 | 0.0 | 0.0 | 24 | 0.0 | 0.0 |
| 25 | 2.5 | 2.5 | 25 | 2.5 | 2.5 |
| 26 | 2.5 | 2.5 | 26 | 2.5 | 2.5 |
| 27 | 0.1 | 5.1 | 27 | 0.1 | 5.1 |
| 28 | 0.1 | 5.1 | 28 | 0.1 | 5.1 |
| 29 | 0.0 | 0.0 | 29 | 0.0 | 0.0 |
| 30 | 0.0 | 0.0 | 30 | 0.0 | 0.0 |
| 31 | 0.0 | 0.0 | 31 | 0.0 | 0.0 |
| 32 | 0.0 | 0.0 | 32 | 0.0 | 0.0 |
| 33 | 0.0 | 0.0 | 33 | 0.0 | 0.0 |
| 34 | 0.0 | 0.0 | 34 | 0.0 | 0.0 |
| 35 | 0.0 | 0.0 | 35 | 0.0 | 0.0 |
| 36 | 0.0 | 0.0 | 36 | 0.0 | 0.0 |
| 37 | 0.0 | 0.0 | 37 | 0.0 | 0.0 |
| 38 | 0.0 | 0.0 | 38 | 0.0 | 0.0 |
| 39 | 0.0 | 0.0 | 39 | 0.0 | 0.0 |
| 40 | 0.0 | 0.0 | 40 | 0.0 | 0.0 |



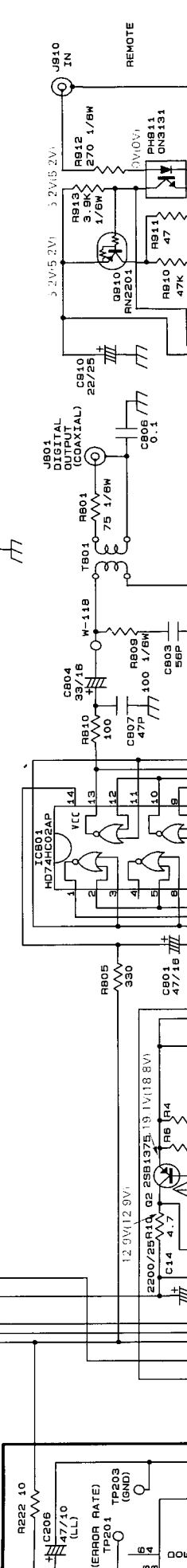
PCB-3
VOLUME

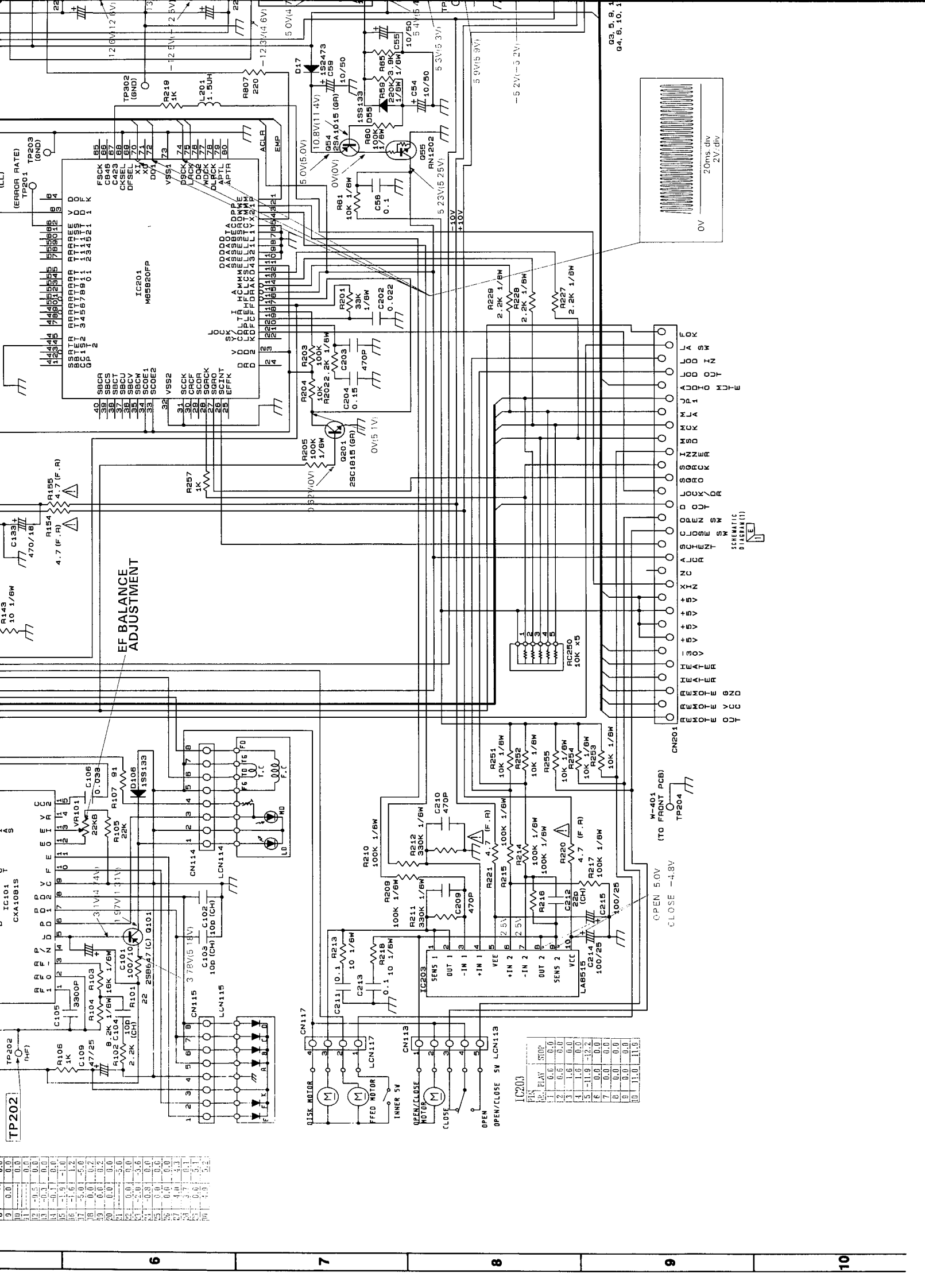
IC501

| NR. | PLAY | STOP | NR. | PLAY | STOP |
|-----|-------|-------|-----|-------|-------|
| 1 | 0.0 | 0.0 | 1 | 0.0 | 0.0 |
| 2 | 0.0 | 0.0 | 2 | 0.0 | 0.0 |
| 3 | 0.0 | 0.0 | 3 | 0.0 | 0.0 |
| 4 | -12.4 | -12.4 | 4 | -12.4 | -12.4 |
| 5 | 0.0 | 0.0 | 5 | 0.0 | 0.0 |
| 6 | 0.0 | 0.0 | 6 | 0.0 | 0.0 |
| 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 |
| 8 | 12.5 | 12.5 | 8 | 12.5 | 12.5 |

IC801

| NR. | PLAY | STOP | NR. | PLAY | STOP |
|-----|------|------|-----|------|------|
| 1 | 2.2 | 2.2 | 1 | 2.2 | 2.2 |
| 2 | 2.2 | 2.2 | 2 | 2.2 | 2.2 |
| 3 | 0.0 | 0.0 | 3 | 0.0 | 0.0 |
| 4 | 2.2 | 2.2 | 4 | 2.2 | 2.2 |
| 5 | 2.2 | 2.2 | 5 | 2.2 | 2.2 |
| 6 | 0.0 | 0.0 | 6 | 0.0 | 0.0 |
| 7 | 0.0 | 0.0 | 7 | 0.0 | 0.0 |
| 8 | 0.0 | 0.0 | 8 | 0.0 | 0.0 |





EF BALANCE ADJUSTMENT

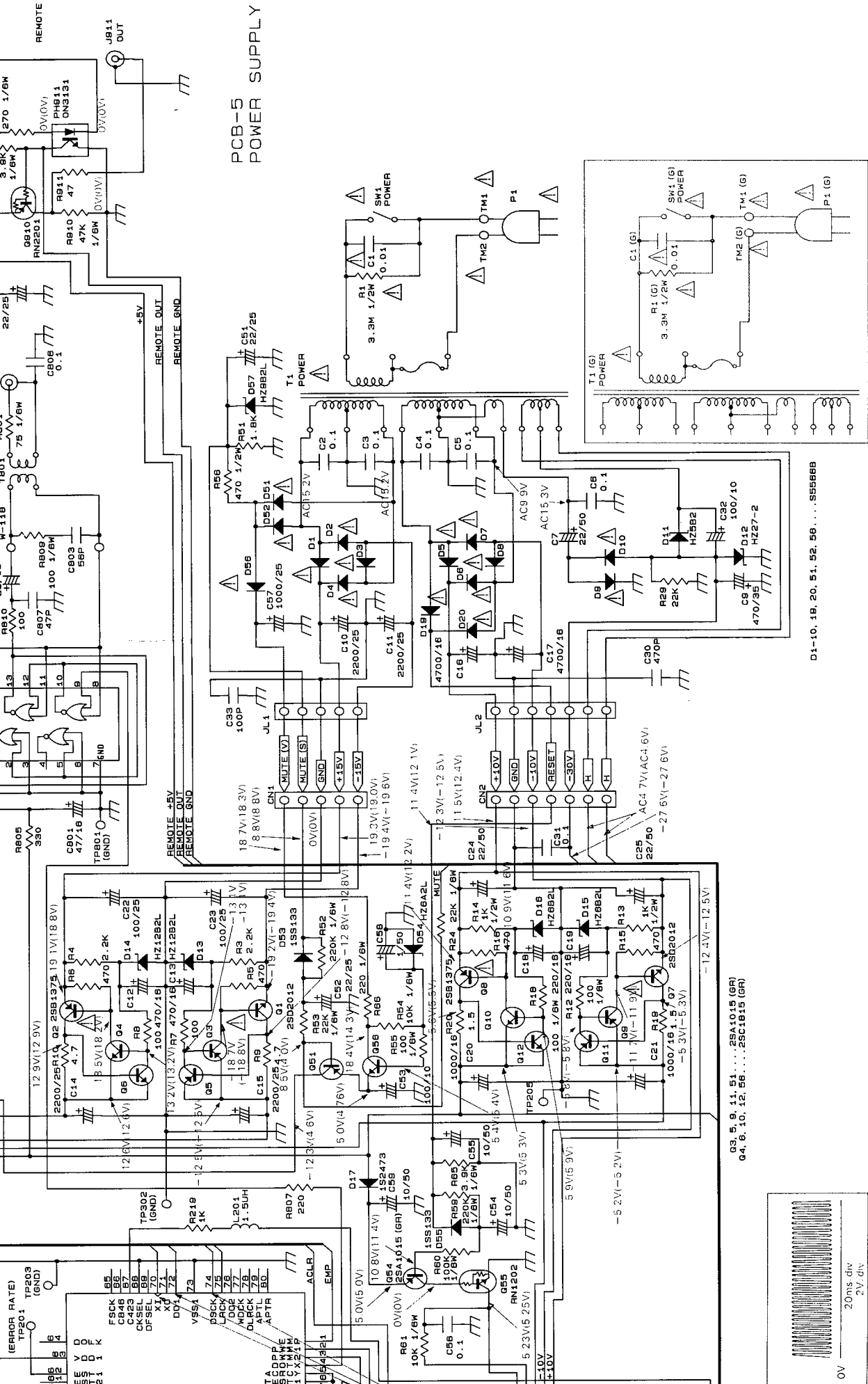


| Pin | Signal | Level |
|-----|--------|-------|
| 1 | STOP | 0.0 |
| 2 | STOP | 0.0 |
| 3 | STOP | 0.0 |
| 4 | STOP | 0.0 |
| 5 | STOP | 0.0 |
| 6 | STOP | 0.0 |
| 7 | STOP | 0.0 |
| 8 | STOP | 0.0 |
| 9 | STOP | 0.0 |
| 10 | STOP | 0.0 |
| 11 | STOP | 0.0 |
| 12 | STOP | 0.0 |
| 13 | STOP | 0.0 |
| 14 | STOP | 0.0 |
| 15 | STOP | 0.0 |
| 16 | STOP | 0.0 |
| 17 | STOP | 0.0 |
| 18 | STOP | 0.0 |
| 19 | STOP | 0.0 |
| 20 | STOP | 0.0 |

| | |
|----|-----|
| 1 | 0.0 |
| 2 | 0.0 |
| 3 | 0.0 |
| 4 | 0.0 |
| 5 | 0.0 |
| 6 | 0.0 |
| 7 | 0.0 |
| 8 | 0.0 |
| 9 | 0.0 |
| 10 | 0.0 |
| 11 | 0.0 |
| 12 | 0.0 |
| 13 | 0.0 |
| 14 | 0.0 |
| 15 | 0.0 |
| 16 | 0.0 |
| 17 | 0.0 |
| 18 | 0.0 |
| 19 | 0.0 |
| 20 | 0.0 |
| 21 | 0.0 |
| 22 | 0.0 |
| 23 | 0.0 |
| 24 | 0.0 |
| 25 | 0.0 |
| 26 | 0.0 |
| 27 | 0.0 |
| 28 | 0.0 |
| 29 | 0.0 |
| 30 | 0.0 |
| 31 | 0.0 |
| 32 | 0.0 |
| 33 | 0.0 |
| 34 | 0.0 |
| 35 | 0.0 |
| 36 | 0.0 |
| 37 | 0.0 |
| 38 | 0.0 |
| 39 | 0.0 |
| 40 | 0.0 |

| NO. | PLAT. | SUP. |
|-----|-------|------|
| 1 | 2.2 | 2.2 |
| 2 | 2.2 | 2.2 |
| 3 | 0.0 | 0.0 |
| 4 | 2.2 | 2.2 |
| 5 | 2.2 | 2.2 |
| 6 | 0.0 | 0.0 |
| 7 | 0.0 | 0.0 |
| 8 | 0.0 | 0.0 |
| 9 | 2.4 | 2.4 |
| 10 | 2.2 | 2.2 |
| 11 | 0.0 | 0.0 |
| 12 | 2.2 | 2.2 |
| 13 | 2.2 | 2.2 |
| 14 | 4.6 | 4.6 |

PCB-5
POWER SUPPLY



- NOTE :
1. ALL RESISTANCE VALUES ARE IN (ohm) .
K=1000 (ohm) . M=10000 (ohm) .
 2. THE MATTAGE OF RESISTANCES IS 1/4W UNLESS OTHERWISE NOTED .
 3. ALL CAPACITANCES VALUES ARE IN UF UNLESS OTHERWISE NOTED .
 4. SAFETY REGULATIONS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS .
 5. THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS .

D1-10, 18, 20, 54, 52, 50 5B5566B

G3, 5, 9, 11, 51 25A1015 (GR)
G4, 6, 10, 12, 56 25C1815 (GR)

OV
20ms div
2V/div

WIRING DIAGRAM

