SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

RADIO CASSETTE TAPE RECORDER

March 1983

TOKAI WORKS
SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi’s replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes. Critical parts are marked with △ in the schematic diagram and circuit board diagram.

2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

3. Before returning a repaired unit to the customer, the service technician must measure the leakage-current or resistance to determine that the exposed parts are acceptably insulated from the power circuit.

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## CP-90S/CP-900S SYSTEM COMPONENTS

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<thead>
<tr>
<th>Components</th>
<th>CP-90S</th>
<th>CP-900S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>HC</td>
</tr>
<tr>
<td>Stereo Amplifier</td>
<td>CP-90S</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>CP-900S</td>
<td>○</td>
</tr>
<tr>
<td>Tuner</td>
<td>CP-90TH</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>CP-90TE</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>CP-90TW</td>
<td>○</td>
</tr>
<tr>
<td>Cassette Recorder</td>
<td>CP-90DEX</td>
<td>○</td>
</tr>
<tr>
<td>Dolby/Graphic Equalizer</td>
<td>CP-91EQ</td>
<td>○</td>
</tr>
<tr>
<td>System Rack</td>
<td>CP-90REX</td>
<td>○</td>
</tr>
<tr>
<td>Speaker</td>
<td>CP-90SP</td>
<td>○</td>
</tr>
<tr>
<td>Cassette Player</td>
<td>CP-91DEX</td>
<td>○</td>
</tr>
</tbody>
</table>

### DIFFERENCES BETWEEN CP-90S AND CP-900S

- The cassette player (CP-91DEX) is not provided in the CP-90S.
- The position where the tuner is assembled in the rack is different.
- The function select buttons to be pressed are different as shown below.

### Details of operation

<table>
<thead>
<tr>
<th>Function select button to be pressed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When listening to radio or when recording while listening to radio</strong></td>
</tr>
<tr>
<td><strong>When recording from the wireless microphone</strong></td>
</tr>
<tr>
<td><strong>When mixing playback or mixing recording of radio and wire microphone</strong></td>
</tr>
<tr>
<td><strong>When recording from the wire microphone</strong></td>
</tr>
<tr>
<td><strong>When playing the tape or when mixing playback of the tape and wire microphone</strong></td>
</tr>
<tr>
<td><strong>When recording while mixing tape and wire microphone</strong></td>
</tr>
</tbody>
</table>

![Diagram showing function select buttons for CP-90S and CP-900S](image)

- shows the button to be pressed.
1. CP-90S

(1) When the Tuner (CP-90T) is operating

The TUNER switch (S403) is set to ON, so the +3V power is derived from JK403 pin 8 of CP-90S and input to 8P pin connector pin 4 of CP-90T via CP-90REX. The radio signal is derived from 8P pin connector pin 1 (right) and pin 2 (left) and input to JK403 pin 4 (left) and pin 5 (right) of CP-90S via CP-90REX. The LINE IN/PHONO switch (S404) and the TAPE switch (S402) have been switched over to OFF, so the radio signal is amplified by Q401 and IC402, derived from JK404 pin 2 (right) and pin 5 (left) and sent to the Dolby/Graphic Equalizer (CP-91EQ). The radio signal with its tone controlled by the graphic equalizer amplifier (IC803) is sent to CP-90S from DIN802 pin 1 (right) and pin 3 (left) and is derived via the volume control/amplifier circuits.

(2) When the Stereo Cassette Recorder (CP-90DEX) is operating

1) During play

The TAPE switch (S402) is set to ON, so the TUNER switch (S403) and the LINE IN/PHONO switch (S404) are switched over to OFF. The +3V power is supplied to 8P pin connector pin 4 from JK403 pin 2 via CP-90REX.

The play signal is amplified by the preamplifier (IC401), output from 8P pin connector pin 1 (right) and pin 2 (left) and sent to CP-90REX. The DIN switch (S951) has been switched over to ON, so the play signal is sent to DIN 801 of CP-91EQ from JK951 pin 3 (right) and pin 5 (left) and decoded via the play Dolby NR circuit, then it is sent to JK951 of CP-90REX from DIN801 pin 1 (left) and pin 4 (right). This play signal is applied to CP-90S from JK952 pin 1 (right) and pin 3 (left), and is output via the graphic equalizer circuit the same as during CP-90T operation.

2) During recording

The TUNER switch (S403) is set to ON during recording of the tuner signal and the LINE IN/PHONO switch (S404) is set to ON during recording of line input (or phono input) signal, so the TAPE switch (S402) is changed over to OFF.

The record signal is amplified by Q401 and IC402, and derived from JK403 pin 1 (right) and pin 3 (left) via Q402 and S402, then it is sent to CP-90REX. This record signal is applied to DIN801 of CP-91EQ from JK951 pin 1 (left) and pin 4 (right), and encoded via the record Dolby NR circuit, then it is derived from DIN801 pin 3 (right) and pin 5 (left). This output is sent to 8P pin connector pin 1 (right) and pin 2 (left) of CP-90DEX via CP-90REX and recorded via the record amplifier (IC401).
(1) When the Tuner (CP-90T) is operating

The +3V power is input to the DC IN 3V jack (JK503) from JK403 pin ① of CP-900S/CP-90S via the DC OUT 3V jack (JK953) of CP-90REX. The relay cord plug is inserted into the headphone jack (JK501), so this +3V power input is supplied to the circuit via JK501.

The radio signal is output from JK501 and sent to the PHONON/LINE IN jack (JK401). The LINE IN PHONON select switch (S401) is switched to LINE IN and the TUNER/LINE IN PHONON switch (S404) to ON, so the signal is fed to the amplifier circuit via S401 and S404. S407 is a DIN switch with OPTION jack (JK404) built-in and switched over to ON when the 6P DIN cord is connected to JK404, so the signal amplified via the line amplifier (IC402) is sent to the Dolby NR/Graphic Equalizer circuit (CP-91EQ) from JK404 pin ⑥ (left) and pin ⑤ (right) without passing through the tone control circuit, then it is input to JK404 pin ③ (left) and pin ① (right) again after adjusting its tone via the graphic equalizer amplifier (IC803), and is output via the volume control circuit and amplifier circuit.

The tuner output is changed according to the volume, so fix the volume to "6".

(2) When the stereo cassette player (CP-91DEX) is operating

When the TAPE switch (S403) is switched over to ON, the +3V power is supplied to 8P pin connector pin ④ from CP-900S/CP-90S via CP-90REX and the stereo cassette player is operated when the power switch (S602) is set to ON by button operation.

The play signal is amplified by the preamplifier (IC401) and derived from 8P pin connector pin ① (right) and pin ② (left), then sent to CP-900S/CP-90S via CP-90REX. This signal is output via the graphic equalizer as in operation of the CP-90T.

(3) When the stereo cassette recorder (CP-90DEX) is operating

The +3V power is supplied to 8P pin connector pin ④ from JK403 pin ① of CP-900S/CP-90S via CP-90REX and the stereo cassette recorder is operated when the power switch (S602) is set to ON by button operation.

1) During play

The play signal is amplified by the preamplifier (IC401) and derived from 8P pin connector pin ① (right) and pin ② (left), then sent to CP-90REX.

The DIN switch (S951) has been switched over to ON, so the play signal is sent to DIN801 of the Dolby NR/Graphic Equalizer (CP-91EQ) from JK951 pin ③ (right) and pin ⑤ (left) without passing through the switch, decoded by the play Dolby NR circuit, derived from DIN801 pin ① (left) and pin ④ (right) again and sent to JK951 of CP-90REX.

This play signal is further sent to CP-900S/CP-90S from JK952 pin ① (right) and pin ③ (left).

2) During recording

The TUNER/LINE IN PHONON switch (S404) is set to ON during recording of the tuner signal and the TAPE switch (S403) is set to ON during recording (dubbing) of the signal from the stereo cassette player, so the TAPE switch (S402) is switched to OFF. The record signal is amplified by Q401 and IC402, and derived from JK403 pin ① (right) and pin ② (left) via Q402 and S402, then it is sent to CP-90REX. This record signal is
supplied to DIN801 of CP-91EQ from JK951 pin 1 (left) and pin 4 (right), and encoded via the record Deby NR circuit, then it is output from DIN801 pin 3 (right) and pin 5 (left). This output is sent to BP pin connector pin 1 (right) and pin 2 (left) of CP-90DEX via CP-90REX and recorded via the record amplifier (IC401).

DESCRIPTION OF NEW CIRCUIT

1. SBBS (Super Bass Boost System) Circuit (CP-90S/CP-900S)

This circuit combines a BTL amplifier and low-pass filter, boosts the super bass frequency band at the minimum resonance frequency $f_0$ (approx. 140 Hz) or less of the mini-speaker (caliber: 9 cm) and compensates for lack of low frequencies. When the SBBS switch (S406) is set to OFF, the SBBS signal (inversion signal) is applied to GND via Q501L by the activation of the switching transistor (Q501L), so the inversion signal circuit of IC501L (BTL amp) amplifies and outputs the inverted input signal resulting from the feedback resistor (R503L).

When S406 is set to ON, the SBBS indicator (LED401) is lit and at the same time Q501L is set to OFF, so the SBBS signal is fed to the inversion signal circuit of IC501L via C501L. The active low-pass filter composed of R512L, R513L, C514L, C515L and IC502 (1/2) passes frequencies less than the minimum resonance frequency ($f_0$) of the mini-speaker.

The free-edge speaker with the edge made from special rubber is used to improve the effect further and the speaker box which uses a high density compound resin combined with a special inorganic filler to enhance its acoustic characteristics.
2. AC-DC combination erase head (CP-90DEX)

A higher erase ratio is required to record and playback sound with less noise and distortion, so AC erasing with high erase ratio is ideal, but it requires large power, so the DC erase (magnetic erase) is used for the mini-tape recorder. The AC-DC combination erase head used in CP-90DEX is an erase head with combined AC erase and DC erase (magnetic erase); DC erase is applied by the magnet first and then AC erase is applied. Power is reduced by approx. 60% compared with an AC erase head and at the same time, the erase ratio equivalent to that using an AC erase head can be obtained.

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**CAUTIONS ON REPAIRING PRINTED RESISTOR**

1. Cautions during soldering

Do not heat the resistor and conductor directly. The resistor and conductor may be broken by heat or the resistance may be changed when the resistor or conductor is heated directly by a soldering iron or when the heat from the soldering iron is conducted via the parts lead.

- Do not apply the soldering iron directly to the printed resistor.
- The printed resistor is directly heated via the parts lead.

2. Cautions on checking

Be careful not to scratch the printed resistor and printed pattern using tweezers, tester lead or screw-driver, etc. with a sharp edge during checking.

When the resistor is scratched, it can cause trouble such as resistance change, disconnections, etc. It is recommended to bend up the tip of the tweezers, etc. as shown in the diagram or use tweezers made of bamboo or plastic.

![The radius of curvature of the tip of the tweezers should be 1 mm or more so that the printed resistor is not scratched.]

3. Checking printed resistor

**Tester check**

Cut the copper pattern to check the capacitance of the printed resistor.
Solder the cut section of the copper pattern to connect it after checking.
4. How to repair

(1) Printed resistor

Check printed resistors and perform the following when they are faulty.

① Cut the resistor completely as shown in the diagram. When it is not cut completely, it causes unstable operation or trouble.

② Solder a resistor with a resistance equal to that of the printed resistor to the copper pattern to which the printed resistor has been connected as shown in the diagram.

(2) Printed pattern

Check the pattern in the same way as the printed resistor. When the printed pattern is disconnected, solder 0.65 φ plated wire or 7/0.2 solder-plated UL wire to the copper pattern connected to the printed pattern.

When this printed resistor is faulty (dotted line shows the copper pattern on the back)

(Power capacitance of resistor: 1/8W)
TUNER  CP-90TH/CP-90TE/CP-90TW

KEY TO ILLUSTRATIONS
1. FM STEREO INDICATOR
2. BAND SELECTOR
3. BAND SELECTOR (CP-90TE, CP-90TW ONLY)
4. MODE SWITCH
5. TUNING CONTROL
6. VOLUME CONTROL

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>CP-90TH</th>
<th>CP-90TE</th>
<th>CP-90TW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuning Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td>88 to 108 MHz</td>
<td>87.5 to 108 MHz</td>
<td>88 to 108 MHz</td>
</tr>
<tr>
<td>SW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM(MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td>0 dB (Max.), 8 dB (Pra.)</td>
<td>42 dB (Max.), 52 dB (Pra.)</td>
<td></td>
</tr>
<tr>
<td>SW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AM(MW)</td>
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<td>LW</td>
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<tr>
<td>Antennas</td>
<td></td>
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<tr>
<td>FM</td>
<td>Ferrite antenna</td>
<td>Telescopic antenna (Rack part)</td>
<td></td>
</tr>
<tr>
<td>AM</td>
<td></td>
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<tr>
<td>SW/MW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW/LW</td>
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<td></td>
<td></td>
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<tr>
<td>Semiconductors</td>
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</tr>
<tr>
<td>ICs</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Transistors</td>
<td>3</td>
<td>2</td>
<td>2</td>
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<tr>
<td>FET</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diodes</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Output</td>
<td>30 mW + 30 mW (T.H.D. 10%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Impedance</td>
<td>Headphone: 8 ~ 300 Ω</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>DC: 3V (“AA” cell or IEC R6 x 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>30 mA (with no signal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>120(W) x 33.5(H) x 80(D) mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>160 g (with batteries)</td>
<td></td>
<td></td>
</tr>
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</table>
### CONNECTORS

![Diagram of Connectors]

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<thead>
<tr>
<th>Connector</th>
<th>Terminal</th>
<th>Input/Output</th>
<th>System CP-90S</th>
<th>System CP-900S</th>
</tr>
</thead>
<tbody>
<tr>
<td>8P pin connector</td>
<td>1</td>
<td>R signal output</td>
<td></td>
<td>R signal output</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>L signal output</td>
<td></td>
<td>L signal output</td>
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<tr>
<td></td>
<td>3</td>
<td>GND</td>
<td></td>
<td>FM ANT. input</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>+3V power input</td>
<td></td>
<td>+3V power input</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td>Individually</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>FM EXT. ANT. input</td>
<td></td>
<td>R signal output</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td>L signal output</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td></td>
<td></td>
<td>FM ANT. input</td>
</tr>
</tbody>
</table>

**DISASSEMBLY**

1. **Escutcheon and Upper Case**
   1) Remove two* knobs (Band, Stereo/Mono).
   * three knobs for CP-90TE/TW.
   2) Remove A (three) screws.

2. **Main PC Board**
   Remove B (two) screws.

3. **Connector PC Board**
   Remove C (two) screws and unsolder the soldering part.

![Disassembly Diagram]
## ADJUSTMENT

### 1. CP-90TH

<table>
<thead>
<tr>
<th>Step</th>
<th>Adjustment Item</th>
<th>Measuring Instrument and Connection</th>
<th>Genescope or Signal Generator Frequency</th>
<th>Dial Pointer Position</th>
<th>Adjust</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Measuring Instrument</td>
<td>Input Terminal</td>
<td>Output Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>FM IF</td>
<td>• Genescope (10.7 MHz)</td>
<td>TP3</td>
<td>TP4</td>
<td>10.7 MHz</td>
<td>Highest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turn T203 fully counterclockwise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>S-Curve</td>
<td>• FM OSC. (Covering)</td>
<td>TP1, 2</td>
<td>Headphone socket (8 Ω load)</td>
<td>109 MHz</td>
<td>Highest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• FM signal generator (400Hz 30% mod.)</td>
<td></td>
<td></td>
<td>87 MHz</td>
<td>Lowest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Oscilloscope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VTVM</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>FM ANT. (Tracking)</td>
<td>Connect a 10μF 25V electrolytic capacitor between the No.1 pin of IC301 and ground.</td>
<td></td>
<td>TP5</td>
<td></td>
<td>RT301</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ferrite-core antenna (Note 5)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>FM MPX (Multiplex)</td>
<td>• Frequency counter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>AM IF</td>
<td>• Genescope (455 kHz)</td>
<td>Ferrite-core antenna (Note 5)</td>
<td>TP4</td>
<td>455 kHz</td>
<td>Highest</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>AM OSC. (Covering)</td>
<td>• AM signal generator (400Hz, 30% mod.)</td>
<td>Ferrite-core antenna (Note 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Headphone socket (8 Ω load)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>AM ANT. (Tracking)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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**Note 1**: [Additional notes or references if applicable]
<table>
<thead>
<tr>
<th>Step</th>
<th>Adjustment Item</th>
<th>Measuring Instrument and Connection</th>
<th>Genoscope or Signal Generator Frequency</th>
<th>Dial Pointer Position</th>
<th>Adjust</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Measuring Instrument</td>
<td>Input Terminal</td>
<td>Output Terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (1)</td>
<td>FM IF</td>
<td>Turn T203 fully counterclockwise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Genoscope (10.7 MHz)</td>
<td>TP3</td>
<td>TP4</td>
<td>10.7 MHz</td>
<td>Highest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (1)</td>
<td>FM OSC. (Covering)</td>
<td>FM signal generator (400Hz 30% mod.)</td>
<td>TP1, 2 (thru FM dummy antenna) (Note 3)</td>
<td>Headphone socket (8 Ω load)</td>
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Note:

1. **Feed in a weak signal to TP3 from the genescope, Adjust T201 for maximum gain and the waveform shown in Figure 1. If the center of the waveform cannot be lined up on the marker, adjust the right/left balance.**

2. **Use the T203 core to form the S-curve shown in Figure 2. Adjust the symmetry of A and B about point C for linearity.**

3. **FM dummy antenna shows Figure 3.**

4. **Connect the frequency counter to TP5, via a resistor of 220 kΩ.**

5. **Connect AM signal generator to loop antenna, bring near to ferrite antenna.**

6. **Feed in a weak signal from the genescope. Adjust T202 and T204 for maximum gain and the waveform of Figure 4.**

**Fig. 1**

**Fig. 2**

**Fig. 3**

**Fig. 4**

---

**ADJUSTMENT PARTS LOCATION**

1. **CP-90TH**

- TP1
- TP2
- L151
- AM ANT
- AM OSC
- CT152
- CT151
- CT101
- CT102
- L152
- FM ANT
- IC 101
- T201
- T202
- T203
- T204
- FM IF
- AM IF
- IC 301
- TP4
- TP5
- RT 301
- FM MPX
DIAL CORD STRINGING

Stringing Method
1. Turn the pulley fully clockwise.
2. Swing the dial cord in the direction of the arrow (Nos. 4 and 6) 3
3. Set the pointer to the setting position.

REPLACEMENT PARTS LIST

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## REPLACEMENT PARTS LIST

### CAPACITORS FOR CP-90T

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<td>CERAMIC FILTER 45MH</td>
</tr>
<tr>
<td>JK01</td>
<td>5736425</td>
<td>JC JACK-5,6LND</td>
</tr>
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</table>
STEREO AMPLIFIER CP-90S/CP-900S
SYSTEM RACK CP-90REX
SPEAKER CP-90SP

KEY TO ILLUSTRATIONS
1. TELESCOPIC ANTENNA
2. RELEASE BUTTONS
3. FUNCTION SELECTORS
4. OPERATION INDICATOR [FOR H, HC, AU, W, EW]
5. AC POWER INDICATOR [FOR E, EZ, E(BS)]
6. POWER SWITCH [FOR H, HC, AU, W, EW]
7. OPERATE SWITCH [FOR E, EZ, E(BS)]
8. MIC MIXING VOLUME CONTROL
9. LED LEVEL INDICATORS
10. BASS CONTROL
11. TREBLE CONTROL
12. BALANCE CONTROL
13. HEADPHONE SOCKET
14. SPEAKER SWITCH
15. VOLUME CONTROL
16. SBBS SWITCH

SPECIFICATIONS

Semiconductors: ICs: 8
Transistors: 10
Diodes: 7
LEDs: 2

Input Sensitivity and Impedance:
- Mix. Mic.: 0.3 mV, 3.3K ohms
- Line in: 450 mV, 50K ohms
- Phono in: 6 mV, 50K ohms

Output Level and Load Impedance:
- Line out: 775 mV, 1K ohms
- Headphone: 8 to 300 ohms
- Ext. Speaker: 6 to 8 ohms

Power Output:
- 12W/CH (T.H.D. 10%)

Speakers:
- 9 cm, 6 ohms x 2
- 2 cm ceramic tweeter x 2

Power Supply:
- [For H, HC, W, EW]

Power Consumption:

Dimensions:
- Amplifier: 276(W) x 83(H) x 201(D) mm
- System Rack: 276(W) x 88(H) x 168(D) mm
- Speaker: 112(W) x 163(H) x 164(D) mm

Weight:
- Amplifier: 2.8 kg
- System Rack: 1.2 kg
- Speaker: 1.5 kg x 2
### CONNECTORS

#### 1. Stereo Amplifier (CP-90S/CP-900S)

![Amplifier Diagram]

<table>
<thead>
<tr>
<th>Connector</th>
<th>Terminal</th>
<th>Input/Output</th>
<th>Connector</th>
<th>Terminal</th>
<th>Input/Output</th>
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<tr>
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<td>Phono or Line input (L, R)</td>
<td>PHONO/LINE IN</td>
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<td>CP-90T signal input (L, R)</td>
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<tr>
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<td>(JK401)</td>
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<td>LINE OUT</td>
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<td>Line output (L, R)</td>
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<td>(JK402)</td>
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<td>(JK402)</td>
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<td>GND</td>
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<td>RACK (JK403)</td>
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<td>GND</td>
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<td>R encoder input/encoder output</td>
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<td>R decoder input/encoder output</td>
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<td>L encoder input/decoder output</td>
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<td>CP-90DEX L signal input/output</td>
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<tr>
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<td>CP-90T +3V power input</td>
</tr>
</tbody>
</table>

### Diagram

- **GND**: Antenna GND
- **FM EXT ANT**: FM external antenna input
- **DC OUT 3V (JK953)**: CP-90T +3V power input
1. Stereo Amplifier (CP-90S/CP-900S)

1. Back cover
   After removing the A (eight) joint holder fixing screws, remove the B (six) screws.

2. Front panel
   1) Remove the five knobs (Mic mixing, Bass, Treble, Balance, Volume).
   2) Remove the C (two) screws.

3. Switch/Jack PC board
   After removing the D (five) screws, remove the E (two) connectors.

4. Power PC board
   1) Remove the F (two) power PC board bracket fixing screws.
   2) Lift up the power PC board bracket and remove the G (two) connectors.
   3) Remove the H (two) screws.
5. Indicator PC board
   Remove the (two) tabs and lift up the PC board.

6. Audio PC board
   Remove the (three) screws.

2. System Rack (CP-90REX)
   1. Bottom cover
      Remove the (seven) screws.

2. Rack PC board
   1) Remove the (six) PC board cover fixing screws.
   2) Push the 8P connectors in the direction of the arrow and remove the PC board.

3. Release button
   Remove the (two) screws.
### REPLACEMENT PARTS LIST

#### CAPACITORS

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<th>VALUE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>C615L6</td>
<td>0208135</td>
<td>CERAMIC DISC (RESISTOR SHAPE) 33pF (10%)</td>
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<tr>
<td>C620L6</td>
<td>0209010</td>
<td>CERAMIC DISC (RESISTOR SHAPE) 100pF (±15%)</td>
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<tr>
<td>C621L6</td>
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<td>CERAMIC DISC (RESISTOR SHAPE) 0.1uF (±30%)</td>
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<tr>
<td>C641L6</td>
<td>0209010</td>
<td>CERAMIC DISC (RESISTOR SHAPE) 10nF (±15%)</td>
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<tr>
<td>C642L6</td>
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<td>CERAMIC DISC (RESISTOR SHAPE) 0.1uF (±30%)</td>
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<tr>
<td>C647L6</td>
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<td>ELECTROLYTIC 220uF 8V</td>
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<td>C751</td>
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<td>ELECTROLYTIC 100uF 6V</td>
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#### RESISTORS

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<td>R402</td>
<td>5K30716</td>
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<td>R402L6</td>
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#### TRANSFORMERS

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<td>TRANSFORMER 120V/240V A/C</td>
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#### FUSIBLES

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<td>F27</td>
<td>5740173</td>
<td>150mA 5V (CP-090S/090EX)</td>
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<td>F28</td>
<td>5740173</td>
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#### CONNECTORS

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<td>FUSE 8A (CP-090S/090EX)</td>
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#### VOLTAGE SELECTOR SW (CP-090S/090EX)

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# Replacement Parts List

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<th>Description</th>
<th>Symbol-No.</th>
<th>P.No.</th>
<th>Description</th>
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<td>KNOB (MIC VOLTE, TREBLE, BALANCE)</td>
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<td>35</td>
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<td>ROD ANTENNA</td>
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For accessories:

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<th>Description</th>
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<tr>
<td>36</td>
<td>5650212</td>
<td>SIEMENS PLUG (CP-905H/HC/EW, CP-905SW)</td>
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<tr>
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<td>5746062</td>
<td>BD PIN CORO (CP-905H/HC)</td>
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<td>BD PIN CORO (CP-905E/EZ/EIBS/EW, CP-905E/AU)</td>
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<td>JOINT HOLDER</td>
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<td>DT FLAT SCREW 3MM x 8MM</td>
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<td>DC CORO (CP-905E/AW)</td>
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<td>'RELAY CORO (CP-905E/AU)</td>
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<td>MOULD LEG</td>
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KEY TO ILLUSTRATIONS

1. OPERATION BUTTONS
2. TAPE COUNTER
3. TONE SWITCH
4. VOLUME CONTROL
5. HEADPHONE SOCKETS
6. MICROPHONE SOCKET
7. RIF SWITCH
8. PAUSE SWITCH
9. TAPE SELECT SWITCH
10. OPERATION/BATTERY INDICATOR
11. RECORD BUTTON

SPECIFICATIONS

Tape: Cassette tape (C-30, 60, 90)
Track System: 4 track 2 channel
Tape Speed: 4.75 cm/s
Recording System: AC Bias, 57 kHz
Erasing System: AC erase
Frequency Response: Metal: 50 to 14,000 Hz
Normal: 50 to 12,000 Hz
S/N (Signal to Noise Ratio): 50 dB
Distortion: 2%
Motor: DC micromotor
Cross Talk: 50 dB (Between tracks)
30 dB (Between channels)
Erase Ratio: 50 dB

Input Sensitivity and Impedance:
Microphone: 0.3 mV, 3.3k ohms
Output Impedance:
Headphone: 8 ohms to 300 ohms

Wow and Flutter: 0.2% (WRMS)
Fast Forward or Rewinding Time: 120 sec. (Using C-60)
Semiconductors:
ICs: 4
Transistors: 9
Diode: 2
LED: 1

Power Output: 30 mW + 30 mW (T.H.D. 10%)
Power Supply: DC 3V (“AA” cell x 2 or IEC R6 x 2)
Power Consumption: 160 mA (with no signal)
Dimensions: 120(W) x 33.5(H) x 80(D) mm
Weight: 320 g (with batteries)

CONNECTORS

System CP-90S/CP-900S

<table>
<thead>
<tr>
<th>Connector</th>
<th>Terminal</th>
<th>Input/Output</th>
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<tr>
<td>1</td>
<td>R signal input/output</td>
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<tr>
<td>2</td>
<td>L signal input/output</td>
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<tr>
<td>3</td>
<td>GND</td>
<td></td>
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<tr>
<td>4</td>
<td>+3V power input</td>
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<tr>
<td>5</td>
<td>REC +B</td>
<td></td>
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<td>7</td>
<td>Motor GND</td>
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<td>8</td>
<td>Motor +B</td>
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Independently

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<th>Input/Output</th>
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<td>MIC</td>
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<tr>
<td>PHONES A</td>
<td>Headphone output</td>
</tr>
<tr>
<td>PHONES B</td>
<td>Headphone output</td>
</tr>
<tr>
<td>DC IN 3V</td>
<td>+3V power input</td>
</tr>
</tbody>
</table>
DISASSEMBLY

1. Cassette lid
   Remove A (three) screws.

2. Esutcheon
   Remove B (five) screws.

3. Rear case
   1) Remove C (four) screws.
   2) Lift the record button side of the chassis a little and take out the chassis carefully.

4. Main PC board
   Remove D (three) screws.

5. Decoration metal
   Remove E (two) screws.

6. Eject/counter holder
   Remove F (two) screws.

ADJUSTMENT

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

<table>
<thead>
<tr>
<th>Step</th>
<th>Adjustment Item</th>
<th>Measuring Instrument and connection</th>
<th>Check Tape</th>
<th>Mode</th>
<th>Adjusted Position</th>
<th>Adjusted Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tape speed</td>
<td>· Frequency counter - Headphone socket</td>
<td>Tape speed adjustment tape (3,000 Hz)</td>
<td>· Playback</td>
<td>Semivariable resistor in the motor PC board</td>
<td>3.005Hz ±0.0 Hz</td>
<td>Note 1</td>
</tr>
<tr>
<td>2</td>
<td>Head azimuth</td>
<td>· VTVM - Headphone socket</td>
<td>Head azimuth adjustment tape (10 kHz)</td>
<td>· Playback</td>
<td>Azimuth adjusting screw</td>
<td>Output Max.</td>
<td>Note 2</td>
</tr>
<tr>
<td>3</td>
<td>Record bias</td>
<td>· VTVM - Both ends of R430R (10 kΩ)</td>
<td>· Record</td>
<td>RT401</td>
<td>3.7 mV</td>
<td>Note 3</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. Adjust within 30 sec. after heat running for more than 20 minutes.
2. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.
3. 1) Set the RIF switch to the "H" position in the recording mode.
   2) Connect the VTVM to both ends of R430R (10 kΩ) and adjust RT401 so that the bias current is 3.7 mV.

INSPECTION OF MECHANISM

<table>
<thead>
<tr>
<th>Item</th>
<th>Checking item</th>
<th>Reference value</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Pressure of pressure roller</td>
<td>200 g ± 40 g</td>
<td>Note 1</td>
</tr>
<tr>
<td>2</td>
<td>Take-up torque</td>
<td>30 ~ 65 cm</td>
<td>Measure in cassette torque meter</td>
</tr>
<tr>
<td>3</td>
<td>Fast forward torque</td>
<td>55 g, cm or more</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Rewind torque</td>
<td>55 g, cm or more</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Back tension torque</td>
<td>Take-up 2.0 g, cm or less</td>
<td>Measure without tape counter</td>
</tr>
<tr>
<td>6</td>
<td>Button operation force</td>
<td>Fast forward button 0.8 kg or less</td>
<td>Measure without leaf switches (REC, Power)</td>
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<tr>
<td>7</td>
<td>Flywheel thrust gap</td>
<td>0.1 ~ 0.2 mm</td>
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</table>

Note:
1. Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan,
LUBRICATION

Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point. Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use. Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

<table>
<thead>
<tr>
<th>Lubrication point</th>
<th>Oil or Grease</th>
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<tbody>
<tr>
<td>Rotary section</td>
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<tr>
<td>Metal and metal</td>
<td>Pan motor oil (10W-40)</td>
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<tr>
<td>Mold and metal</td>
<td>Semic slider oil (e-1600)</td>
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<tr>
<td>Sliding section</td>
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<tr>
<td>Metal and metal</td>
<td>Hitanol (MG-13B)</td>
</tr>
<tr>
<td>Mold and mold</td>
<td>Floil (GB-TS-1)</td>
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<tr>
<td>Mold and metal</td>
<td>Floil (GB-TS-1)</td>
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<tr>
<td>Spring resonance prevention</td>
<td>Floil (GB-TS-1)</td>
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Note: Components marked without numbers in this drawing are not specified as replacement parts.
<table>
<thead>
<tr>
<th>SYMBOL-NO</th>
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<th>DESCRIPTION</th>
<th>SYMBOL-NO</th>
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<td>SPRING</td>
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<td>PRESSURE ROLLER ARM ASSEMBLY</td>
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<td>SCREW FOR MOTOR MOUNTING</td>
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<td>C501</td>
<td>0256155</td>
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</tr>
<tr>
<td>C502LR</td>
<td>0256166</td>
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<tr>
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</tr>
<tr>
<td>C504LR</td>
<td>0247007</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>C505LR</td>
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<td>ELECTROLYTIC 220MF 4V</td>
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<td></td>
</tr>
<tr>
<td>C506</td>
<td>0256162</td>
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</tr>
<tr>
<td>C601</td>
<td>0256366</td>
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<tr>
<td>C602</td>
<td>0247066</td>
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<tr>
<td>C603</td>
<td>0256595</td>
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<tr>
<td>C604</td>
<td>0256591</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>C605</td>
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<td>ELECTROLYTIC 220MF 4V</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C606</td>
<td>0247003</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>C607</td>
<td>0256591</td>
<td>TANTALUM ELECTROLYTIC 22MF 3.15V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R01</td>
<td>5307441</td>
<td>SPRING VARIABLE 100 OHM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R02</td>
<td>5008621</td>
<td>VARIABLE RESISTOR 10KOHM(A)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>R03</td>
<td>1027972</td>
<td>CHIP JUMPER RESISTOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R04</td>
<td>1027933</td>
<td>CHIP RESISTOR 680 OHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R05</td>
<td>1027951</td>
<td>CHIP RESISTOR 22KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R06</td>
<td>1027936</td>
<td>CHIP RESISTOR 1.2KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R07</td>
<td>1027943</td>
<td>CHIP RESISTOR 4.7KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R08</td>
<td>1027946</td>
<td>CHIP RESISTOR 4.2KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R09</td>
<td>1027950</td>
<td>CHIP RESISTOR 18KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R10</td>
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<td>CHIP RESISTOR 10KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R11</td>
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<td></td>
<td></td>
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<tr>
<td>R12</td>
<td>1027943</td>
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<td></td>
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<td>R13</td>
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<td>R14</td>
<td>1027937</td>
<td>CHIP RESISTOR 1.5KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R15</td>
<td>1027911</td>
<td>CHIP RESISTOR 10 OHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R16</td>
<td>1027944</td>
<td>CHIP RESISTOR 5.6KOHM±5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R17</td>
<td>1027944</td>
<td>CHIP RESISTOR 5.6KOHM±5%</td>
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**Semi- conductors**

<table>
<thead>
<tr>
<th>SYMBOL-NO</th>
<th>P-NO</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>D02</td>
<td>5331591</td>
<td>DIODE 16V33WV</td>
</tr>
<tr>
<td>IC01</td>
<td>5355701</td>
<td>IC PC12176</td>
</tr>
<tr>
<td>IC02</td>
<td>5355691</td>
<td>IC BA504</td>
</tr>
<tr>
<td>IC01</td>
<td>5355872</td>
<td>IC P5T517</td>
</tr>
<tr>
<td>LED1</td>
<td>5380621</td>
<td>LED SLC-22UR</td>
</tr>
<tr>
<td>SYMBOL-NO</td>
<td>P-NO</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Q401</td>
<td>5329043</td>
<td>MICRO PACKAGE TRANSISTOR 2SC1623(L5-6)</td>
</tr>
<tr>
<td>Q402LR</td>
<td>5329192</td>
<td>MICRO PACKAGE TRANSISTOR 2SC2462D</td>
</tr>
<tr>
<td>Q403LR</td>
<td>5329143</td>
<td>MICRO PACKAGE TRANSISTOR 2SC1623(L5-6)</td>
</tr>
<tr>
<td>Q404</td>
<td>5329043</td>
<td>MICRO PACKAGE TRANSISTOR 2SC1623(L5-6)</td>
</tr>
<tr>
<td>Q405</td>
<td>5323011</td>
<td>TRANSISTOR 2SC2603B</td>
</tr>
<tr>
<td>Q601</td>
<td>5329681</td>
<td>MICRO PACKAGE TRANSISTOR 2SB1031</td>
</tr>
<tr>
<td>Q602</td>
<td>5329043</td>
<td>MICRO PACKAGE TRANSISTOR 2SC1623(L5-6)</td>
</tr>
<tr>
<td>L401LR</td>
<td>5152652</td>
<td>CHOKE COIL</td>
</tr>
<tr>
<td>L402</td>
<td>5261232</td>
<td>DIAB OSCILLATOR COIL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ERASE HEAD REPLACEMENT

Replace the erase head according to the procedure shown below.

1. Replace the erase head with the new one specified as replacement parts.
   
   Erase heads in mass production products: Red, Blue or Black marking
   Erase heads as replacement parts: No marking

2. Unsolder sections A, B, C and D shown below.

3. Solder section E shown below.

4. Re-adjust the record bias current according to Step 3 in page 58 "ADJUSTMENT".
**DOLBY/GRAPHIC EQUALIZER CP-91EQ**

**SPECIFICATIONS**
- Equalizer Frequencies: 60 Hz, 250 Hz, 1 kHz, 3.5 kHz, 10 kHz
- Adjustment Range: ±10 dB
- Gain: 0 dB
- Signal to Noise Ratio: 80 dB
- Distortion: 1 kHz, 0.5%
- Current Consumption: 45 mA (with no signal)
- Semiconductors: 3 ICs, 4 transistors, 3 diodes, 2 LEDs
- Dimensions: 120(W) x 33.5(H) x 80(D) mm
- Weight: 200 g

**CONNECTORS**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Terminal</th>
<th>Input/Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>5P DIN socket</td>
<td>1</td>
<td>L Decoder output/Encoder input</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>R Decoder input/Encoder output</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>R Decoder output/Encoder input</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>L Decoder input/Encoder output</td>
</tr>
<tr>
<td>6P DIN socket</td>
<td>1</td>
<td>R Equalizer output</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>R Equalizer input</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>L Equalizer output</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>+12V Power supply</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>L Equalizer input</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>GND</td>
</tr>
</tbody>
</table>
1. Case
Remove A (five) screws and pull the chassis in the direction of the arrow.

2. Main PC board
Remove B (two) screws.

3. Volume PC board
Release locking the tab C and unsolder the part D.

4. Indicator PC board
Remove E (two) screws.

---

**REPLACEMENT PARTS LIST**

<table>
<thead>
<tr>
<th>SYMBOL-NO</th>
<th>P-NO</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESISTORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8RO1LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
<tr>
<td>8RO2LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
<tr>
<td>8RO3LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
<tr>
<td>8RO4LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
<tr>
<td>8RO5LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
<tr>
<td>8RO6LR</td>
<td>5027113</td>
<td>VARIABLE RESISTOR Z02K10K(3)</td>
</tr>
</tbody>
</table>

**SEMICONDUCTORS**

<table>
<thead>
<tr>
<th>Symbol-No</th>
<th>P-No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8RO1-L030</td>
<td>5334404</td>
<td>IC 74123BT</td>
</tr>
<tr>
<td>8RO2-L030</td>
<td>5334404</td>
<td>IC 74148BT</td>
</tr>
<tr>
<td>8RO3-L030</td>
<td>5334404</td>
<td>IC 4069BT</td>
</tr>
<tr>
<td>8RO4-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
<tr>
<td>8RO5-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
<tr>
<td>8RO6-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
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</table>

**MISCELLANEOUS**

<table>
<thead>
<tr>
<th>Symbol-No</th>
<th>P-No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8RO1-L030</td>
<td>5334404</td>
<td>IC 74123BT</td>
</tr>
<tr>
<td>8RO2-L030</td>
<td>5334404</td>
<td>IC 74148BT</td>
</tr>
<tr>
<td>8RO3-L030</td>
<td>5334404</td>
<td>IC 4069BT</td>
</tr>
<tr>
<td>8RO4-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
<tr>
<td>8RO5-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
<tr>
<td>8RO6-L030</td>
<td>5334404</td>
<td>IC 4017BT</td>
</tr>
</tbody>
</table>

Note: Components marked without numbers in this drawing are not specified as replacement parts.
STEREO CASSETTE PLAYER CP-91DEX

KEY TO ILLUSTRATIONS
1. OPERATION BUTTONS
2. TAPE COUNTER
3. TONE SWITCH
4. VOLUME CONTROL
5. HEADPHONE SOCKETS
6. MODE SWITCH
7. PAUSE SWITCH
8. TAPE SELECT SWITCH
9. OPERATION/BATTERY INDICATOR

SPECIFICATIONS

- **Tape:** Cassette tape (C-30, 60, 90)
- **Track System:** 4 track 2 channel stereo
- **Tape Speed:** 4.75 cm/s
- **Frequency Response:**
  - Normal: 50 to 12,000 Hz
  - Metal: 50 to 14,000 Hz
- **S/N (Signal to Noise Ratio):** 50 dB
- **Cross Talk:** 50 dB (Between tracks)
- **Distortion:** 2%
- **Wow and Flutter:** 0.2% (WRMS)
- **Output Impedance:**
- **Power Output:** 30 mW + 30 mW (T.H.D. 10%)
- **Power Supply:** DC 3V ("AA" cell or IEC R6x2)
- **Current Consumption:** 160 mA (with no signal)
- **Semiconductors:** 4 ICs, 2 transistors, 2 diode, 1 LED
- **Motor:** DC micromotor
- **Dimensions:** 120(W) x 33.5(H) x 80(D) mm
- **Weight:** 320 g (with batteries)

CONNECTORS

<table>
<thead>
<tr>
<th>System CP-900S</th>
<th>8P Pin Connector</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connector</strong></td>
<td><strong>Terminal</strong></td>
<td><strong>Input/Output</strong></td>
</tr>
<tr>
<td>1</td>
<td>R Signal output</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>L Signal output</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>+3V power input</td>
<td></td>
</tr>
<tr>
<td>5, 6</td>
<td>Blank</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Motor GND</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Motor +B</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independently</th>
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</thead>
<tbody>
<tr>
<td><strong>Connector</strong></td>
</tr>
<tr>
<td>PHONES</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>DC IN 3V</td>
</tr>
</tbody>
</table>
**DISASSEMBLY**

1. Cassette lid
   Remove A (three) screws.

2. Navigation
   Remove B (five) screws.

3. Rear case:
   Open the battery lid and remove C (four) screws.
   Then take out the chassis from the rear case by carefully lifting the tape selector side of the chassis.

4. Main PC board
   Remove D (three) screws.

5. Decoration metal
   Remove E (two) screws.

6. Eject/counter holder
   Remove F (two) screws.

**ADJUSTMENT**

Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

<table>
<thead>
<tr>
<th>Step</th>
<th>Item</th>
<th>Measuring Instrument and Connection</th>
<th>Check Tape</th>
<th>Mode</th>
<th>Adjusted Position</th>
<th>Adjusted Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tape speed</td>
<td>Frequency counter</td>
<td>---</td>
<td>Head phone socket</td>
<td>Tape speed test tape (10 kHz)</td>
<td>Playback</td>
<td>Semiautomatic</td>
</tr>
<tr>
<td>2</td>
<td>Head azimuth</td>
<td>VTVM</td>
<td>---</td>
<td>Head phone socket</td>
<td>Head azimuth test tape (10 kHz)</td>
<td>Playback</td>
<td>Azimuth adjusting screw</td>
</tr>
</tbody>
</table>

**Note:**
1. Adjust within 30 sec. after heat running for more than 20 minutes.
2. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.

**INSPECTION OF MECHANISM**

<table>
<thead>
<tr>
<th>Item</th>
<th>Checking item</th>
<th>Reference value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pressure of pressure roller</td>
<td>200 g ± 40 g</td>
<td>Note 1</td>
</tr>
<tr>
<td>2</td>
<td>Take-up torque</td>
<td>30 ~ 65 g cm</td>
<td>Measure in cassette torque meter</td>
</tr>
<tr>
<td>3</td>
<td>Fast forward torque</td>
<td>55 g cm or more</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Rewind torque</td>
<td>55 g cm or more</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Back tension torque</td>
<td>Take-up</td>
<td>Measure without tape counter</td>
</tr>
<tr>
<td></td>
<td>Supply</td>
<td>4.5 g cm or less</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Button operation force</td>
<td>Play button</td>
<td>0.3 kg or less</td>
</tr>
<tr>
<td></td>
<td>Fast forward button</td>
<td>0.8 kg or less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rewind button</td>
<td>0.5 kg or less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stop button</td>
<td>0.5 kg or less</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Flywheel thrust gap</td>
<td>0.1 ~ 0.2 mm</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan.

**LUBRICATION:** Refer to CP-90DEX

[Diagram of tape speed adjustment hole and other assembly details]
Note: Components marked without numbers in this drawing are not specified as replacement parts.
<table>
<thead>
<tr>
<th>SYMBOL-NO</th>
<th>P-NO</th>
<th>DESCRIPTION</th>
<th>SYMBOL-NO</th>
<th>P-NO</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>7044232</td>
<td>SUR CHASSIS ASSEMBLY</td>
<td>46</td>
<td>6548516</td>
<td>HEAD PLATE SPRING</td>
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<tr>
<td>2</td>
<td>6543124</td>
<td>SPRING</td>
<td>47</td>
<td>7782822</td>
<td>SPECIAL SCREW</td>
</tr>
<tr>
<td>3</td>
<td>6548487</td>
<td>SPRING</td>
<td>48</td>
<td>6774491</td>
<td>PRESSURE ROLLER ARM ASSEMBLY</td>
</tr>
<tr>
<td>4</td>
<td>6543072</td>
<td>SPRING</td>
<td>49</td>
<td>6548533</td>
<td>SPRING</td>
</tr>
<tr>
<td>5</td>
<td>7350761</td>
<td>F,F ARM ASSEMBLY</td>
<td>50</td>
<td>7787563</td>
<td>POLY SLIDER WASHER</td>
</tr>
<tr>
<td>6</td>
<td>6548521</td>
<td>SPRING</td>
<td>51</td>
<td>6774281</td>
<td>REVIEW/CUE ARM</td>
</tr>
<tr>
<td>7</td>
<td>7350781</td>
<td>REWIND ARM ASSEMBLY</td>
<td>52</td>
<td>7787563</td>
<td>POLY SLIDER WASHER</td>
</tr>
<tr>
<td>8</td>
<td>6543091</td>
<td>SPRING</td>
<td>53</td>
<td>6548605</td>
<td>SPRING</td>
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</table>

<table>
<thead>
<tr>
<th>MISCELLANEOUS</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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</tr>
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| C502R     | 0256166 | ELECTROLYTIC 47MF 4V             | M602      | 5329443 | MICRO PACKAGE TRANSISTOR 2SC1623(LS-3)
| C503R     | 0256166 | ELECTROLYTIC 47MF 4V             | L501      | 5152472 | CHOKE COIL 100 MICRO H            |
| C504R     | 0247007 | CERAMIC CHIP 0,01UF+-20%         | L602      | 5152561 | CHOKE COIL 88 MICRO H            |
| C505R     | 0256152 | ELECTROLYTIC 220NF 4V            |            |        |                                  |
| C506R     | 0256162 | ELECTROLYTIC 220NF 4V            |            |        |                                  |
| C601      | 0256366 | TANTALUM 1,0UF 35V               |            |        |                                  |
| C602      | 0247006 | CERAMIC CHIP 0,033MF+-10%        |            |        |                                  |
| C603      | 0256395 | TANTALUM ELECTROLYTIC 47MF 3V    |            |        |                                  |
| C604      | 0256391 | TANTALUM ELECTROLYTIC 22MF 3,15V|            |        |                                  |
| C605      | 0256162 | ELECTROLYTIC 220MF 4V            |            |        |                                  |
| C606      | 0247003 | CERAMIC CHIP 1000PF+-20%         |            |        |                                  |
| C607      | 0256391 | TANTALUM ELECTROLYTIC 22MF 3,15V|            |        |                                  |
| RV401     | 500%+21 | VARIABLE RESISTOR 10KOHM(A)      |            |        |                                  |
| R001-013  | 0127972 | CHIP JUMPER RESISTOR             |            |        |                                  |

**Type of head**

- **P**: Pan head screw
- **F**: Flat countersunk head screw
- **B**: Binding head screw
- **T**: Round head tapping screw

- **BT**: Binding head tapping screw
- **BL**: Bolt
- **W**: Washer
- **E**: "E" ring

**Dimensions**

- **Length (L mm):**
- **Diameter (D mm):**

When ordering hardware excluding stated on these lists, be sure to make your orders with type and size.