RE-150 SERVICE NOTES

First Edition
Second Printing (July 12, 1983 E2)

Input Sensitivity ------- M: 3.16 mv rms (-50 dB)
for Specific Output INSTRUMENT: 17.8 mv rms (-35 dB)
Input Impedance ------- M: 5 k-ohm;
Output Level ------- H: 178 mv rms (-15 dB); M: 56.2 mv rms (-25 dB)
Output Impedance ------- Less than 2 k-ohm
Signal/Noise Ratio ------- Better than 60 dB
Echo Delay Time ------- 60 ms-600 ms
Power Consumption ------- 16 watts
Dimensions ------- 415 (w) x 186 (h) x 310 (d) mm
Weight ------- 8.2 kg

Potentiometers
MIC, INSTRUMENT, ECHO: BVCT3AP15 20 KB (026-478)
REPEAT RATE: BVCT3AP15 1 KB (026-476)
INTENSITY: BVCT3AP15 10 KB (026-477)

Panel no.278 (072-278)
Face screw no.12 (125-012)
Meter EMT-2410 (046-004)
Foot G-9 (111-030)
Cabinet no.134 (081-134)
Jack S2-252 (009-006)

Washer no.18 red (121-018)
LBD SLF-131B (019-013)
Switch SW21-1-1 (001-018)
Washer no.19 grn (121-019)
Jack TJ-253-8 (009-006)

Printed in Japan A3 1
Above OP-141A (149-141A) View from foil side OP-141 (149-141A) Below (pcb 052-487) (pcb 052-487)

OP-141
Q1,2: 28C2240-GR
Q3: 28K117-GR
Q4: 28C7322M-GR or 28CJ.000-GR
Q5,6: 28K530AT-GR
Q7: 28996-90 or 28C1815-GR
or 280336KNP-FP
or 28033818-9
DI-31 1822473 or 181588

Differences between two OP-141's
This change is done for automatic pcb board assembly and has no effects on circuit configuration -- minor parts value and size changes, and pattern shift --- compatible.

OP-141A
R41 470 1/2w 270 + 180 1/2w
R76 3k 1/2w 1.8 k + 1.8 k 1/2w
C44 100/16 v 470/16 v

PS-57
Q10,15,18,19,22,24,25:28D57-L
Q11,12,14: 28C945-P
Q13,16,17,20,21: 28A733-P
D12: 10B2, IM4003 or 18B35
D13: RD5.6S or 02S5.6L
D14-17: 18G473 or 181588

AC CONNECTION
117 V

PS-57A (146-057A) (pcb 052-488A)
<table>
<thead>
<tr>
<th>NO.</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>NO.</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>01</td>
<td>120-036</td>
<td>Face nut no.36</td>
<td>18</td>
<td>070-018</td>
<td>Spring no.18</td>
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<tr>
<td>03</td>
<td>092-006</td>
<td>Top cover (acrylic)</td>
<td>19</td>
<td>...</td>
<td>Collar (plastic) 3 x 6 mm</td>
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<td>04</td>
<td>079-004</td>
<td>Frame no.4</td>
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<td>120-001</td>
<td>Sleeve nut no.1 3 x 10 mm</td>
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<td>07</td>
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<tr>
<td>08</td>
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<td>09</td>
<td>079-015</td>
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<tr>
<td>10</td>
<td>079-016</td>
<td>Frame no.16</td>
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<td>...</td>
<td>Screw 2.6 x 4 mm truss</td>
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<tr>
<td>11</td>
<td>070-033</td>
<td>Leaf spring no.33</td>
<td>28</td>
<td>...</td>
<td>Plain washer 3 x 8 x 0.3 mm</td>
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<tr>
<td>12</td>
<td>101-017</td>
<td>Felt no.17</td>
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<td>...</td>
<td>Spring washer 3 mm dia.</td>
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<tr>
<td>13</td>
<td>061-063A</td>
<td>Tape chassis no.63A</td>
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<td>Nut 3 mm dia.</td>
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<td>14</td>
<td>065-113</td>
<td>Roller cover no.113</td>
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<td>15</td>
<td>113-004</td>
<td>Bearing no.4</td>
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<td>101-026</td>
<td>Felt no.26</td>
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<td>16</td>
<td>063-028</td>
<td>Plate no.28</td>
<td>36</td>
<td>107-003</td>
<td>Cushion no.3</td>
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<tr>
<td>17</td>
<td>070-017</td>
<td>Spring no.17</td>
<td>37</td>
<td>...</td>
<td>Screw 3 x 15 mm blk</td>
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</tbody>
</table>

### AC CONNECTION 220/240 V

**NOTE:**
Primary brown lead can be connected to either 220 v or 240 v.
ADJUSTMENT AND CHECKING

1. MECHANICAL ADJUSTMENT

1-1. Tape Chassis Position (Fig. 1)
   a) Position tape chassis 1 mm off motor shaft.
   b) Secure it by tightening two screws at the rear portion.

1-2. Tape Chassis Height (Fig. 2)
   a) Position chassis 10.5 ±0.5 mm above main chassis.
   b) Check frame no.14 for deformation.

1-3. Leaf Spring Pressure (Fig. 3)
   Position frame no.16 to have spring contact with bearing at 25-30 g.

1-4. Frame 13, 14 and 15 positions
   While pinch roller being kept in contact with motor shaft, position and fix the frames as shown in figure 4.

1-5. Pinch Roller Pressure (Fig. 5)
   With power supplied, position solenoid for 0.7k-1.1 kg pinch roller pressure.

1-6. Heads Alignment (Fig. 6)
   a) Load tape and run it.
   b) Position head gaps perpendicular to the passing tape by adjusting alignment screws.
   c) Also align all heads gaps' height at which the heads are centered on the tape.

2. ELECTRICAL ADJUSTMENT

2-1. Motor Speed
   Connect oscilloscope across TP-1 and terminal no.22 (G) on power supply board F3-57.
   a) Turn REPEAT RATE clockwise.
   b) Check that one cycle of waveform is approx. 20 ms (fig. 1-1).
   c) Back off REPEAT RATE for full counter clockwise.
   d) Adjust VR-11 for 70 ms/cycle on the screen (fig. 1-2).

   Delay Time ------- 600 ms: @ T = 70 ms
   500 ms: @ T = 60 ms

2-2. Bias Oscillator

   (1) Trap Coil
   Connect millivoltmeter across TP-2 and terminal no.22. Shift scope lead to TP-2.
   a) Turn MIC, INSTRUMENT and INTENSITY knobs clockwise.
   b) Adjust trap coil L-2 for minimum reading.
      The reading must be less than 0.7 mv rms(fig.2-1).

   (2) Frequency
   Check that frequency is approximately 60 kHz (16.7 μs). (Fig. 2-2.)
CAUTION: The following adjustments must be done only after completion of Mechanical Adjustment described on page 5.

2-3. Head Alignment

(1) Fine Alignment
Check all heads for misalignment referring to the figures below. Readjust alignment screws at each platform as necessary.

The faces of the head cores must be simultaneously tangent to the same degree with the tape.

(c) AZIMUTH

Width dimension of the head gap is a precise 90-degree angle to the tape edge.

(2) Playback Head
Setup:
Signal: 1 kHz, square wave, -50 dBv into MIC jack (MIC VOLUME: f cw) REPEAT RATE: its midpoint (6th position) INTENSITY: f cw ECHO VOLUME: f cw OUTPUT: -15 dB
10 k ohm resistor: into OUTPUT B jack with its leads connected to scope.

a) With MODE set to corresponding number, adjust playback head for the following:
(1) waveform slope is straightened;
(2) leading edge is as perpendicular to baseline as possible or has shortest rise time.
(Fig. 2-4.)

b) If there is a level difference between playback heads, decrease higher output by slightly moving it up/down to cause the head gaps miss the tracks. Two outputs should be equal in level (Fig. 2-5).
Be careful not to cause losses at high frequency. Keep head movements parallel to the original position.

2-4. Recording Bias
Set audio generator for sine, 1 kHz, -50 dBv.
a) Adjust VR-10 on PS-57 for maximum playback-head output.

2-5. Recording Level
Setup:
Input signal: 1 kHz, sine, -50 dBv (3.2 mV rms) into MIC jack MIC VOLUME: f cw REPEAT RATE: its midpoint (6th point) INTENSITY: f cw OUTPUT switch: -15 dB Millivoltmeter: into ECHO B+ jack ECHO VOLUME: its ninth position (nine points from full counterclockwise)
a) Adjust VR-8 on OP-141 for 178 mV reading.
b) Check that reading becomes -14 dB (200 mV) when ECHO VOLUME is f cw.
2-6. Level Meter

Check that level meter indicates 0 dB in either following A or B setting.

(A) Audio signal: 1 kHz, sine, -50 dBv (3.16 mv rms) into MIC
MIC VOLUME: full clockwise

(B) Audio signal: 1 kHz, sine, -35 dBv (17.8 mv rms) into INSTRUMENT
INSTRUMENT VOLUME: full clockwise

2-7. ECHO INTENSITY

Connect an amplifier and speaker into D+E jack.

a) With no input signal applied, set INTENSITY knob pointer to midway between 8th and 9th points on panel dial (i.e. half past two).
b) Adjust VR-7 on OP-141 to allow echo circuits begin to oscillate.

2-8. ECHO/NORMAL Switching

Connect:
Audio signal: into INSTRUMENT
Amplifier: into D+E
Foot switch: into ECHO/NORMAL

a) Step on the foot switch. Check the following:
   (1) no echoes except for previously recorded;
   (2) level meter reads down scale and rests at -15;
   (3) when another signal is fed through MIC, it will echo.

2-9. ECHO CANCEL Switching

Withdraw foot switch from ECHO/NORMAL and plug it into ECHO CANCEL jack.
a) Step on the foot. Check the following:
   (1) echo ON indicator goes off;
   (2) all echoes are canceled -- unlike in ECHO/NORMAL -- even previously recorded.

PARTS LIST

<table>
<thead>
<tr>
<th>TRANSISTOR</th>
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<tbody>
<tr>
<td>017-139 2SD880-Y</td>
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<tr>
<td>017-104 2SC732TM-GR</td>
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<tr>
<td>017-123 2SC2240-GR</td>
</tr>
<tr>
<td>017-023 2SC945-F</td>
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<tr>
<td>017-072 2SC571-L</td>
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<td>017-024 2A733-P</td>
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<tr>
<td>017-016 2SK30ATM-GR PBT</td>
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<td>017-103 2SK117-GR PBT</td>
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<tr>
<td>018-014 1S2473</td>
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<tr>
<td>018-093 M0C31-14 #1 200 v 3 A</td>
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<tr>
<td>018-082 W2 bridge rectifier</td>
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<tr>
<td>018-101 1SR-35-200</td>
</tr>
<tr>
<td>018-035 RD5.68B or 0555.6L</td>
</tr>
<tr>
<td>019-013 SLP-131B LED red</td>
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<tr>
<td>020-097 µPC4556C</td>
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<table>
<thead>
<tr>
<th>POTENTIOMETER</th>
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<tbody>
<tr>
<td>026-478 EVCT3AF15 20 kΩ</td>
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<tr>
<td>026-477 EVCT3AF15 10 kΩ</td>
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<td>026-476 EVCT3AF15 1 kΩ</td>
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<table>
<thead>
<tr>
<th>OTHERS</th>
</tr>
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<tbody>
<tr>
<td>171-002 Arm unit assy AU-2 including:</td>
</tr>
<tr>
<td>077-027A Arm no.27A</td>
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<tr>
<td>067-071 Guide no.31</td>
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<tr>
<td>005-019 Shaft no.19</td>
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<tr>
<td>065-020 Head cover no.250</td>
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<td>070-005 Spring no.5 head height adj.</td>
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<td>067-025 Tape guide no.5 L</td>
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<td>067-005 Tape guide no.5 post</td>
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<td>063-008A Plate no.6A platforms mount</td>
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<td>070-032A Spring no.32A plunger</td>
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<td>070-007 Spring no.7 plunger</td>
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<td>069-018 Shaft no.18 AU-2 link</td>
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<td>112-001 Pinch roller no.1</td>
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<td>065-250 Cover no.250 in rear of panel</td>
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<td>064-033 Fob fastener LCBS-4N</td>
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For the rest parts of tape drives, see page 4.