

RE-150 SERVICE NOTES

First Edition

Second Printing (July 12, 1983 E2)

Input Sensitivity ----- MIC: 3.16 mv rms (-50 dB)
 for Specific Output INSTRUMENT: 17.8 mv rms (-35 dB)
 Input Impedance ----- MIC: 5 k-ohm; INSTRUMENT: 470 k-ohm
 Output Level ----- H: 178 mv rms (-15 dB); M: 56.2 mv rms (-25 dB)
 L: 17.8 mv rms (-35 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: EVCT3AP15 20 kB (026-478)
 REPEAT RATE: EVCT3AP15 1 kB (026-476)
 INTENSITY: EVCT3AP15 10 kB (026-477)

Face screw no.12
(123-012)

Panel no.278
(072-278)

Switch
SRN2046SK15 (001-281)
Knob no.58 (016-058)

Switch SDG5P-001 (001-156)
Button no.9 blk (016-009)

Meter EMT-2410
(046-004)

Top panel no.18
(086-018)

Knob no.57
(016-057)

Handle H-15
(108-004)

Foot G-9
(111-030)

Cabinet
no.134
(081-134)

Jack
TJ-252
(009-006)

Foot G-5
(111-021)

Washer no.18
red (121-018)

LED SLP-131B
(019-013)

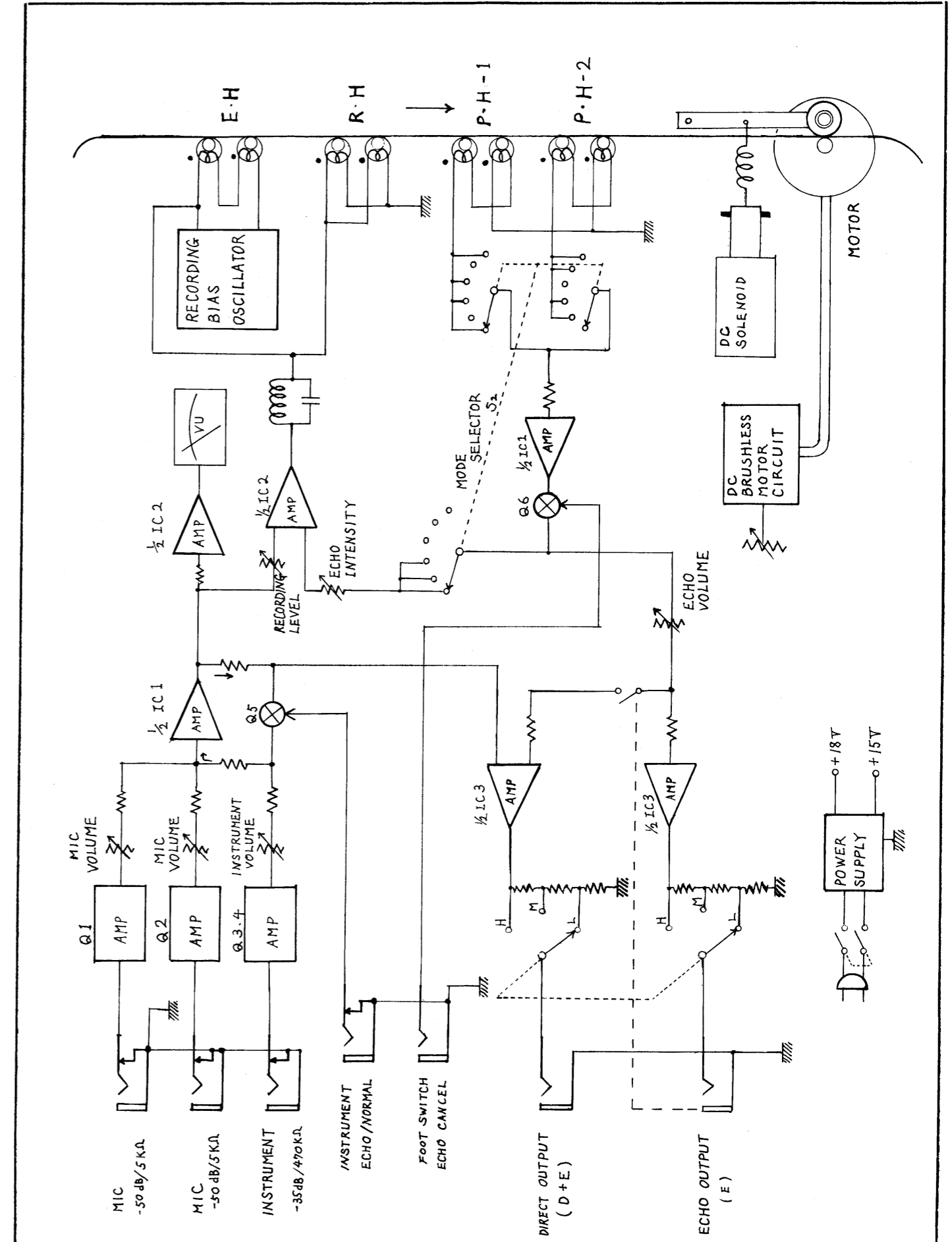
Switch
SW321-1-1
(001-018)

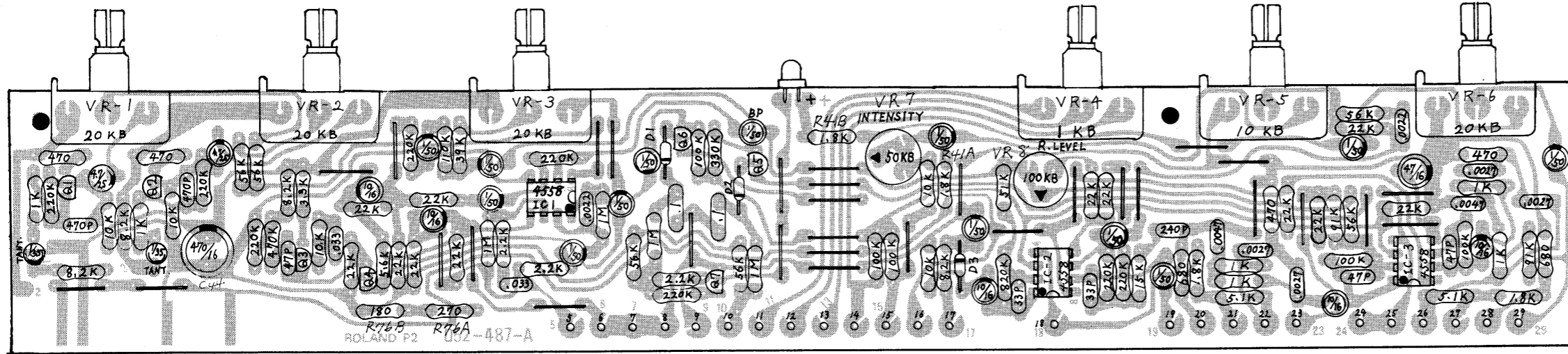
Washer no.19
grn (121-019)

Jack
TJ-253-8
(009-008)



RE-150 BLOCK DIAGRAM





Above **OP-141A (149-141A)**
(pcb 052-487A)

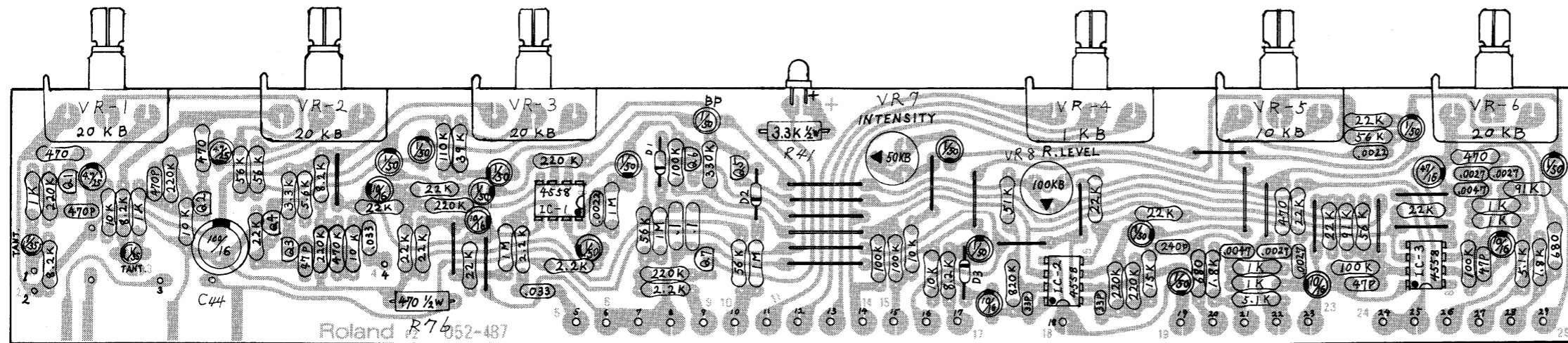
View from foil side

OP-141 (149-141)
(pcb 052-487)

- OP-141
- Q1,2: 2SC2240-GR
- Q3 : 2SK117-GR
- Q4 : 2SC732TM-GR or 2SC1000-GR
- Q5,6: 2SK30ATM-GR
- Q7 : 2SC945-P or 2SC1815-GR
or 2SC536KNP-F
or 2SC828-R
- D1-3: 1S2473 or 1S1588

Differences between two OP-141's

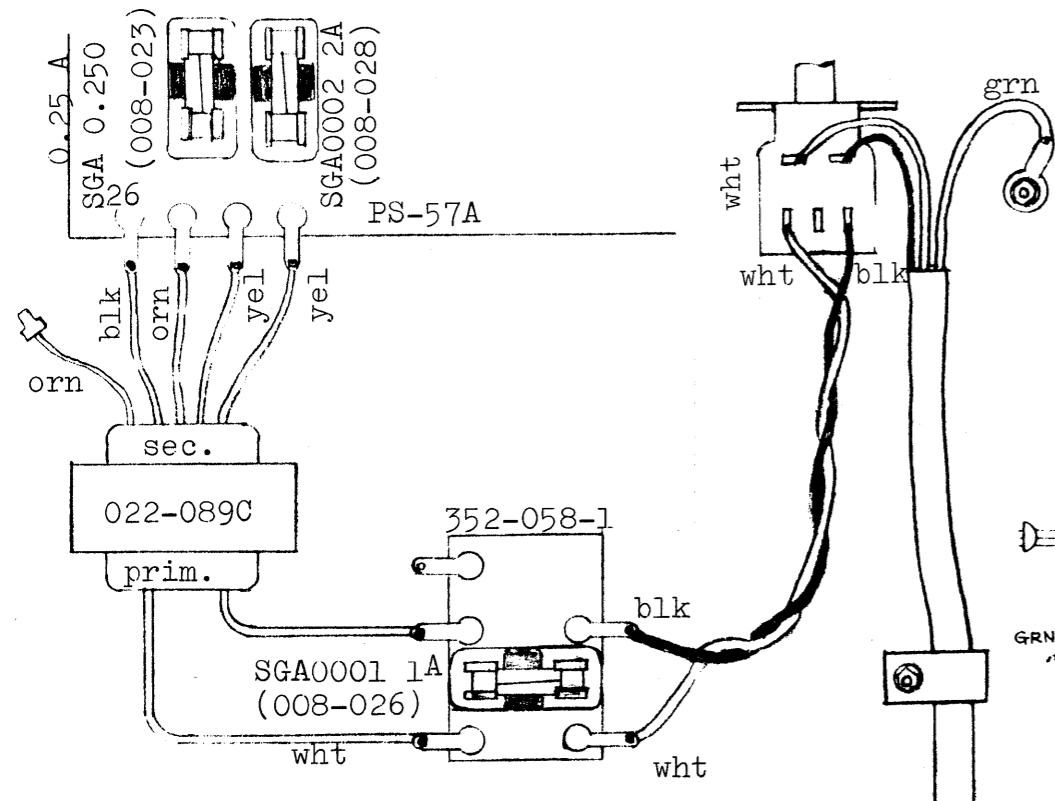
This change is done for automatic pc board assembly and has no effects on circuit configuration -- minor parts value and size changes, and pattern shift --- compatible.



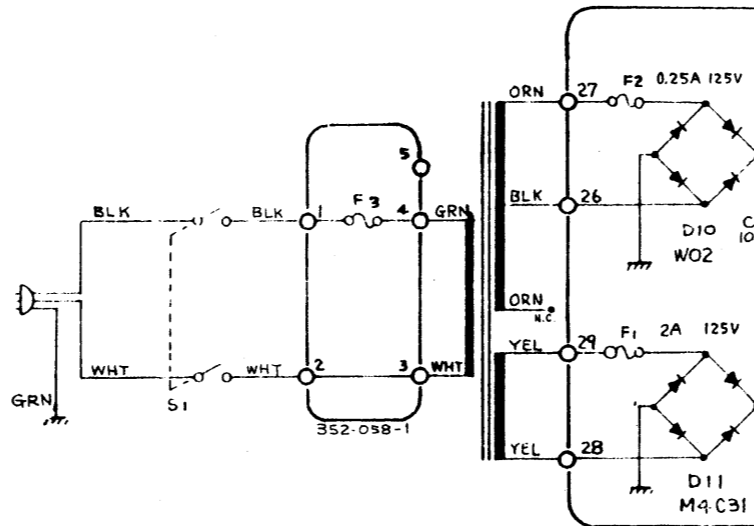
- | | | |
|-----|------------|--------------------|
| | OP-141 | OP-141A |
| R41 | 470 1/2w | 270 + 180 1/4w |
| R76 | 3.3 k 1/2w | 1.8 k + 1.8 k 1/4w |
| C44 | 100/16 v | 470/16 v |

PS-57

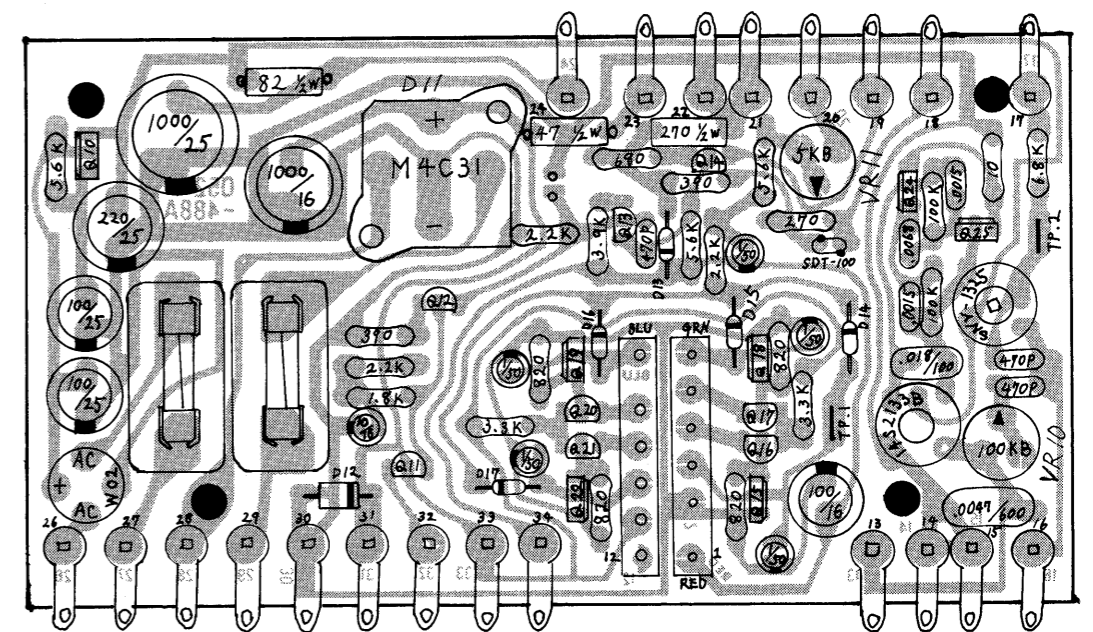
- Q10,15,18,19,22,24,25: 2SD571-L
- Q11, 12, 14 : 2SC945-P
- Q13, 16, 17, 20, 21: 2SA733-P
- D12 : 10E2, 1N4003 or 1SR35
- D13 : RD5.6EB or 05Z5.6L
- D14-17: 1S2473 or 1S1588

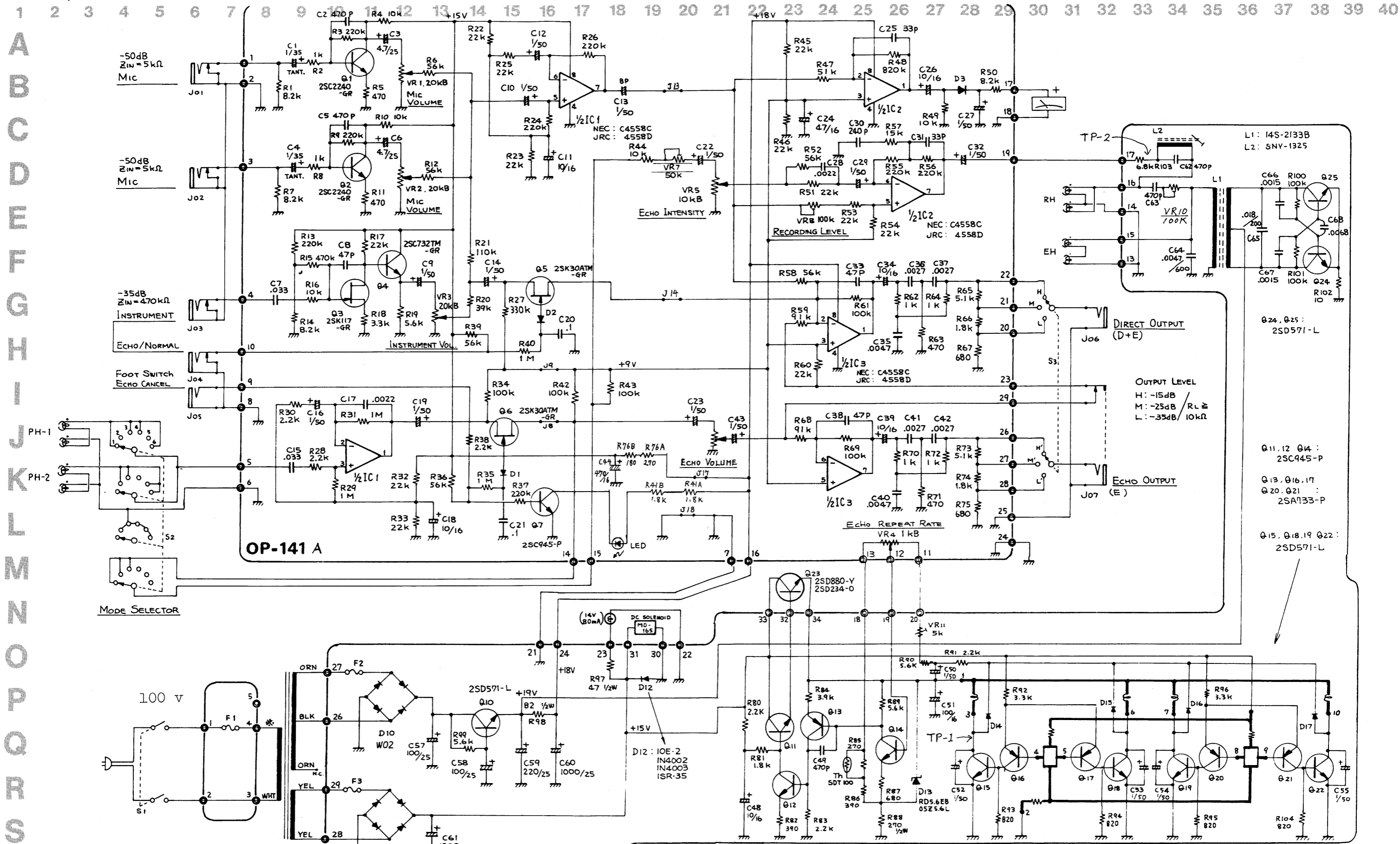


AC CONNECTION
117 V



PS-57A (146-057A) (pcb 052-488A)





For 220/240 v see page 4.

LINE VOLTAGE	POWER TRANSFORMER		FUSE		
	*		F1	F2	F3
100	022-089N	blue	1 A	250 mA	2 A
117	022-089C	green	1 A	250 mA	2 A
220/240	022-089D	brown	T1 A	T250 mA	T1.6 A

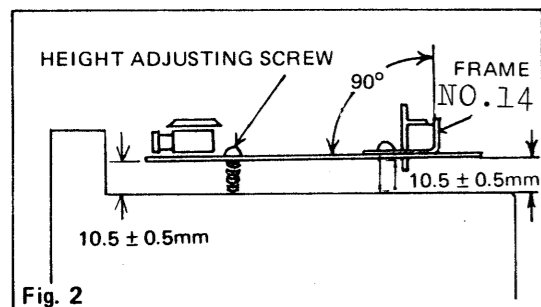
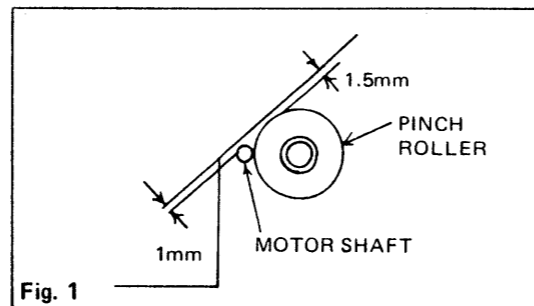
A
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V

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.

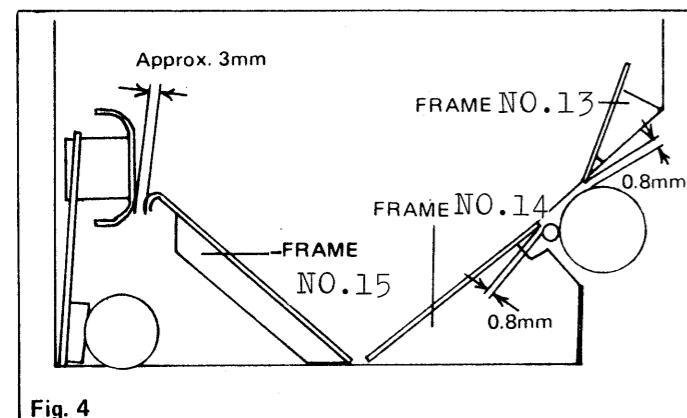
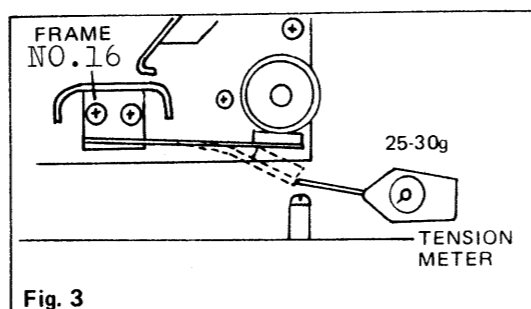


1-2. Tape Chassis Height (Fig. 2)

- 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.

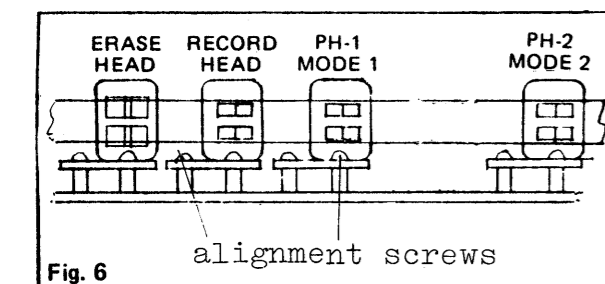
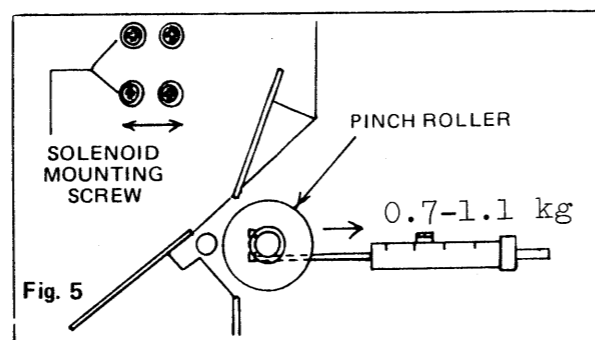


1-4. Frame 13, 14 and 15 positions

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)

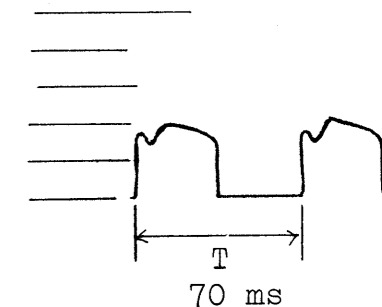
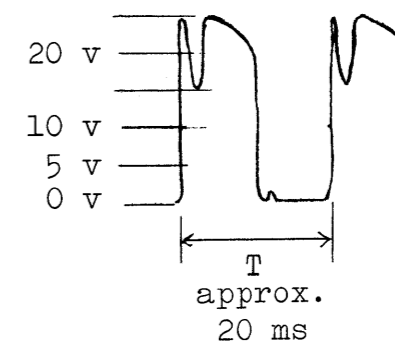
- a) Load tape and run it.
- b) Position head gaps perpendicular to the passing tape by adjusting alignment screws.
- c) Also align all heads gaps' height at which the heads are centered on the tape.

2. ELECTRICAL ADJUSTMENT

2-1. Motor Speed

Connect oscilloscope across TP-1 and terminal no.22 (G) on power supply board PS-57.

- a) Turn REPEAT RATE fcw (full clockwise).
- b) Check that one cycle of waveform is approx. 20 ms (fig. 1-1).
- c) Back off REPEAT RATE fccw (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

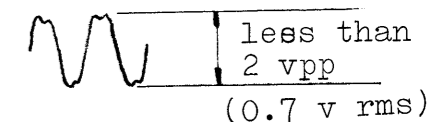
2-2. Bias Oscillator

(1) Trap Coil

Connect millivoltmeter across TP-2 and terminal no.22. Shift scope lead to TP-2.

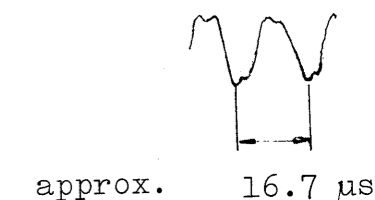
- a) Turn MIC, INSTRUMENT and INTENSITY knobs fccw.
- b) Adjust trap coil L-2 for minimum reading.

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.)



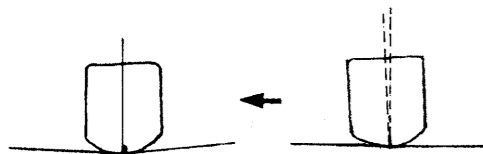
CAUTION: The following adjustments must be done only after completion of Mechanical Adjustment described on page 5.

2-3. Head Alignment

(1) Fine Alignment

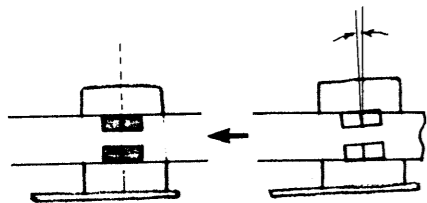
Check all heads for misalignment referring to the figures below. Readjust alignment screws at each platform as necessary.

(a) TANGENCY



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

(c) AZIMUTH



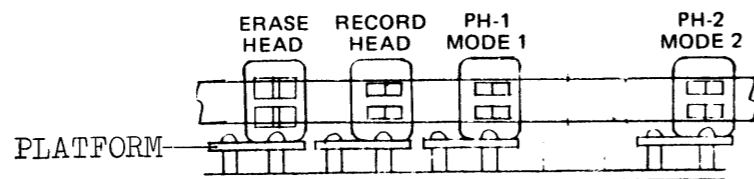
Width dimension of the head gap is a precise 90-degree angle to the tape edge.

(2) Playback Head

Setup:

Signal: 1 kHz, square wave, -50 dBv into MIC jack (MIC VOLUME: fcw)
 REPEAT RATE: its midpoint (6th position) INTENSITY: fccw
 ECHO VOLUME: fcw OUTPUT: -15 dB
 10 k ohm resistor: into OUTPUT E jack with its leads connected to scope.

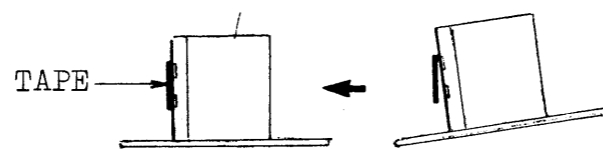
(b) HEIGHT



Every gap-width dimension is centered on the same track location.

Fig. 2-3

(d) TILT



Tape head must be simultaneously tangent to the same degree with both edges of the tape.

a) With MODE set to corresponding number, adjust playback head for the following:

- (1) waveform slop is straightened;
- (2) leading edge is as perpendicular to base line as possible or has shortest rise time. (Fig. 2-4.)

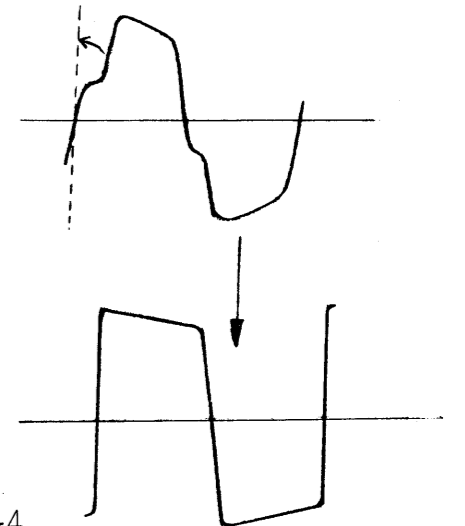


Fig. 2-4

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 movement parallel to the original position.

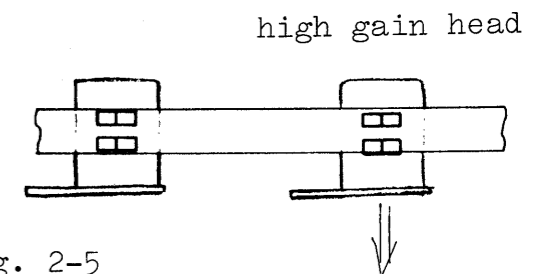


Fig. 2-5

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 VOLUM : fcw REPEAT RATE : its midpoint (6th point)
 INTENSITY : fccw OUTPUT switch : -15 dB
 Millivoltmeter : into ECHO D+E 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 fcw.

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

CABINET

081-134 Cabinet no.134 lower
086-018 Top panel no.18
108-004 Handle H-15
111-021 Rubber foot G-5 large
111-030 Rubber foot G-9 small
115-002 Hinge no.2
123-012 Face screw no.12
073-036 Spacer no.36, scrw no.12 mount
(panel no.18-chassis no.250)
061-250 Chassis no.250
072-278 Panel no.278
016-057 Knob no.57 26 mm dia.
016-058 Knob no.58 32 mm dia.
016-009 Button no.9 power switch
009-006 Jack TJ-252
009-008 Jack TJ-253-8 w/switch
121-019 Washer no.19 green
121-018 Washer no.18 red

SWITCH

001-156 SDG5P-001 power
001-281 SRN2046S K15 rotary
001-018 SW-321-1-1 slide

TRANSFORMER. COIL. HEAD

022-089N P.T. no.89N 100 v
022-089C P.T. no.89C 117 v
022-089D P.T. no.89D 220/240 v
022-094 Osc coil 14S-2133B
022-045 Trap coil SNY-1325
050-011 Solenoid MD-165
050-010 Motor PHM-503E-M01
049-001 Erase head AE-28
049-003 Record head R-280-MR
049-004 Playback head R-280-MP
can be replaced by 280-MR

PCB ASSY

149-141A OP-141A (pcb 052-487A)
146-057A PS-57A (pcb 052-488A)
Fuse mount (pcb 052-500)
352-058-01 117 v
352-058-02 220/240 v

FUSE. FUSEHOLDER

008-023 SGA 0.250 250 mA 100/117 v
008-026 SGA 0001 1 A prim.100/117 v
008-060 CEE T250 mA 220/240 v
008-066 CEE T1 A prim. 220/240 v
008-069 CEE T1.6 A 220/240 v
012-003 TF-758 clip

TRANSISTOR

017-139 2SD880-Y
017-104 2SC732TM-GR
017-123 2SC2240-GR
017-023 2SC945-P
017-072 2SD571-L
017-024 2SA733-P
017-016 2SK30ATM-GR FET
017-103 2SK117-GR FET

DIODE

018-014 1S2473
018-093 M4C31-14 #1 200 v 3 A
018-082 W02 bridge rectifier
018-101 1SR-35-200
018-035 RD5.6EB or 05Z5.6L
019-013 SLP-131B LED red

IC

020-097 μ PC4558C

POTENTIOMETER

026-478 EVCT3AP15 20 kB
026-477 EVCT3AP15 10 kB
026-476 EVCT3AP15 1 kB

OTHERS

171-002 Arm unit assy AU-2
including:
077-027A Arm no.27A
067-031 Guide no.31
069-019 Shaft no.19
065-020 Head cover no.250
064-012 Platform no.12
070-005 Spring no.5
head height adj.
067-025 Tape guide no.25 L
067-005 Tape guide no.5 post
063-008A Plate no.8A
platforms mount
070-032A Spring no.32A plunger
070-007 Spring no.7 plunger
069-018 Shaft no.18 AU-2 link
112-001 Pinch roller no.1
065-250 Cover no.250 in rear of
panel
064-033 Pcb fastener LCBS-4N

For the rest parts of tape
drives, see page 4.