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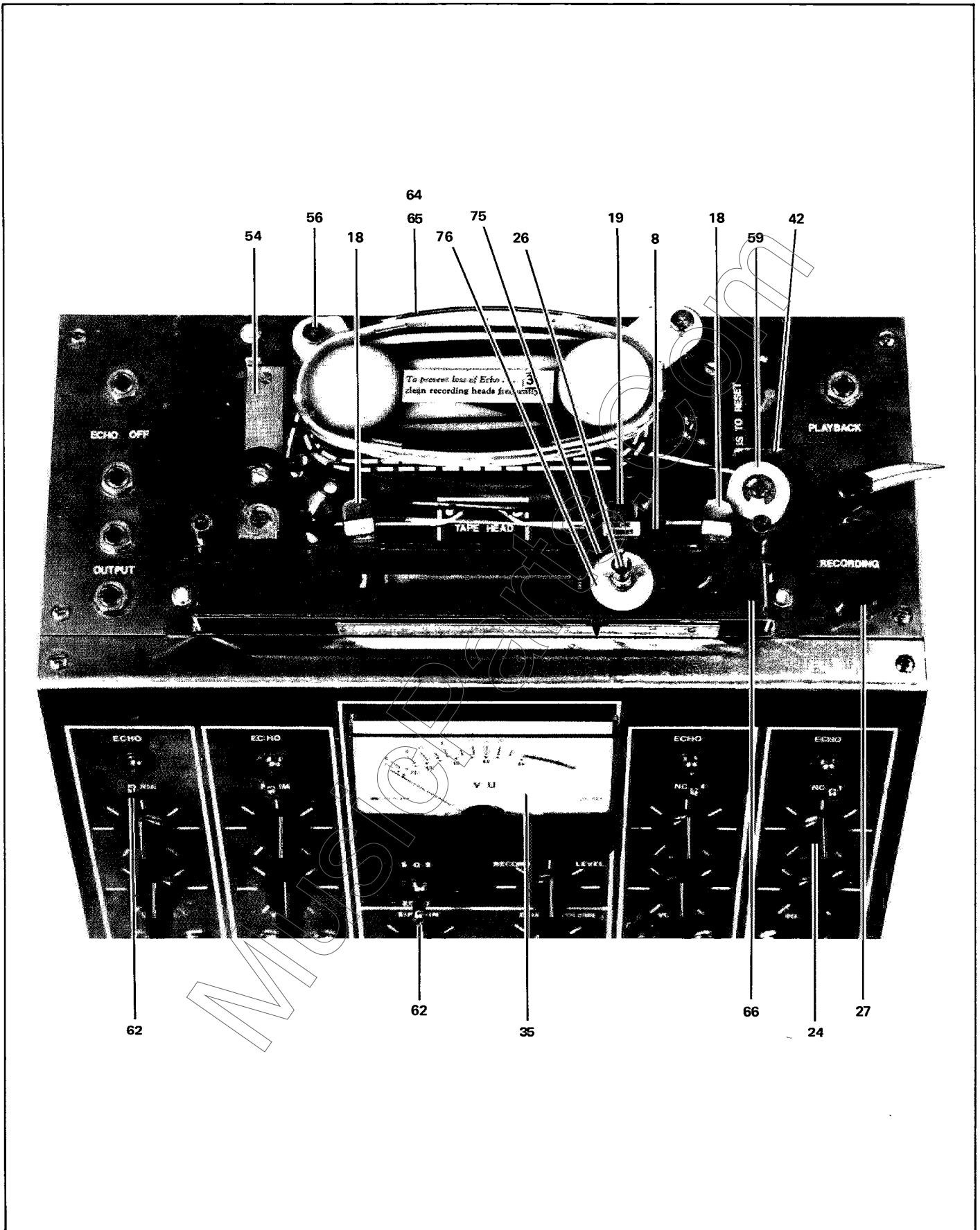
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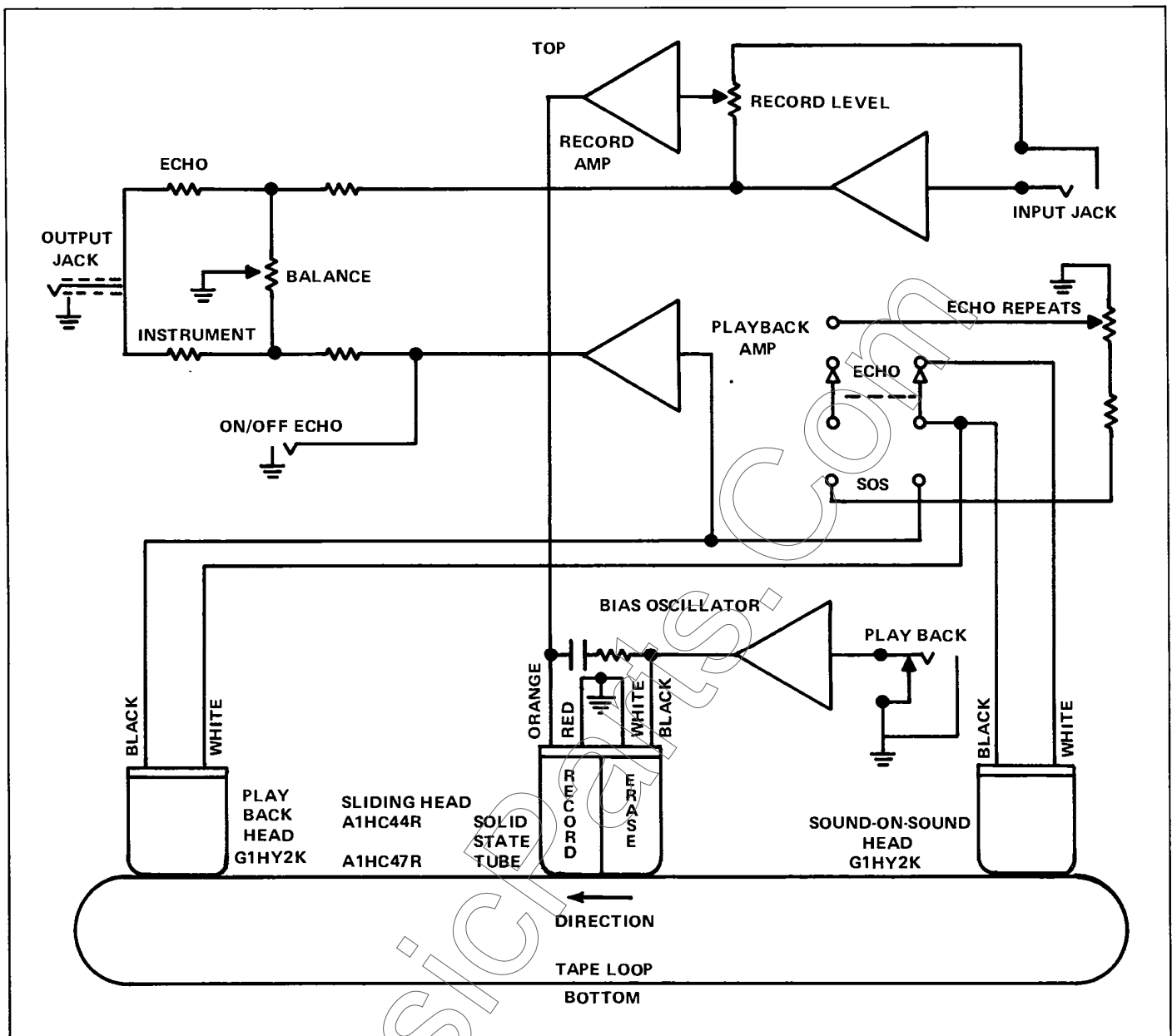
EM-1 Groupmaster



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GROUPMASTER EM-1, FRONT AND TOP VIEW



FUNCTIONAL BLOCK DIAGRAM
OF ECHOPLEX AND GROUPMASTER UNIT

EQUIPMENT REQUIRED

Oscilloscope, Audio Signal Generator and VU Meter or AC Voltmeter.

CONTROL SETTING

Set ECHO VOLUME to MAXIMUM, ECHO SUSTAIN to MINIMUM and ECHO DELAY to MAXIMUM.

BRIDGE ALIGNMENT

Loosen screws holding bridge, and tighten them while spacing bridge approximately 1/8 inch from cover studs located near each end of bridge.

HEAD ALIGNMENT

a) Using your eyesight as your judge, adjust the sliding record/erase head until it is level, and the tape passes the head evenly and smoothly.

b) Make sure tape is flat against the head. Move slider across bridge and observe that tape height on playback head does not change. If tape height does change, place a thin washer under the low side of the bridge to level it.

PLAYBACK HEAD

(Left Head, Looking At Front Of Machine)

a) Set signal generator to 1000Hz sine wave and connect to INPUT jack. Set ECHO DELAY to MAXIMUM.

b) Using needle nose pliers, gently bend playback head mounting bracket up and down until the maximum sine wave is obtained. Use caution not to break metal bracket loose from bridge. Move slider across and observe level change $\pm 3\text{dB}$. If out of specification, repeat step b with ECHO DELAY at MINIMUM.

c) Using trimmer potentiometer adjusting tool, turn trimmer potentiometer on the oscillator board until maximum sine wave is obtained with ECHO DELAY at MAXIMUM.

d) Set signal generator to 6000Hz.

e) Using pliers, turn head horizontally (clockwise or counterclockwise) until maximum wave is obtained.

f) Slide record head along bridge, stopping at each numbered delay position observing oscilloscope that the 6000Hz wave holds maximum heights as much as possible. Make any readjustments needed if wave drops considerably. Slide head next to playback head and check wave. This is necessary for echoing effect.

g) Return signal generator to 100Hz. Turn ECHO SUSTAIN control to position "1". Turn ECHO VOLUME control to position "9". Using small screwdriver, adjust record level by matching sine waves on ECHO VOLUME control in positions "1" and "9".

h) Remove input plug enough to stop incoming signal.

i) Turn ECHO VOLUME to position "6", "7" or "8". Turn ECHO SUSTAIN control to approximately "6" or "7".

j) Quickly push and pull input in far enough to record a signal and pull plug out, and listen or watch for the echoing effect. If unit is set and aligned properly, there should not be any problems. If echo begins, but fades away, turn ECHO SUSTAIN to a higher position, "7" or "8".

k) Slide record head away from present position and test for echo once again.

SOUND ON SOUND HEAD ALIGNMENT

a) Record approximately one minute of 100Hz, no echoing, and approximately one minute of 6000 Hz, no echoing. Connect VU meter to unused connection terminal on record board, next to orange voltage wire. Set VU meter to 100 percent.

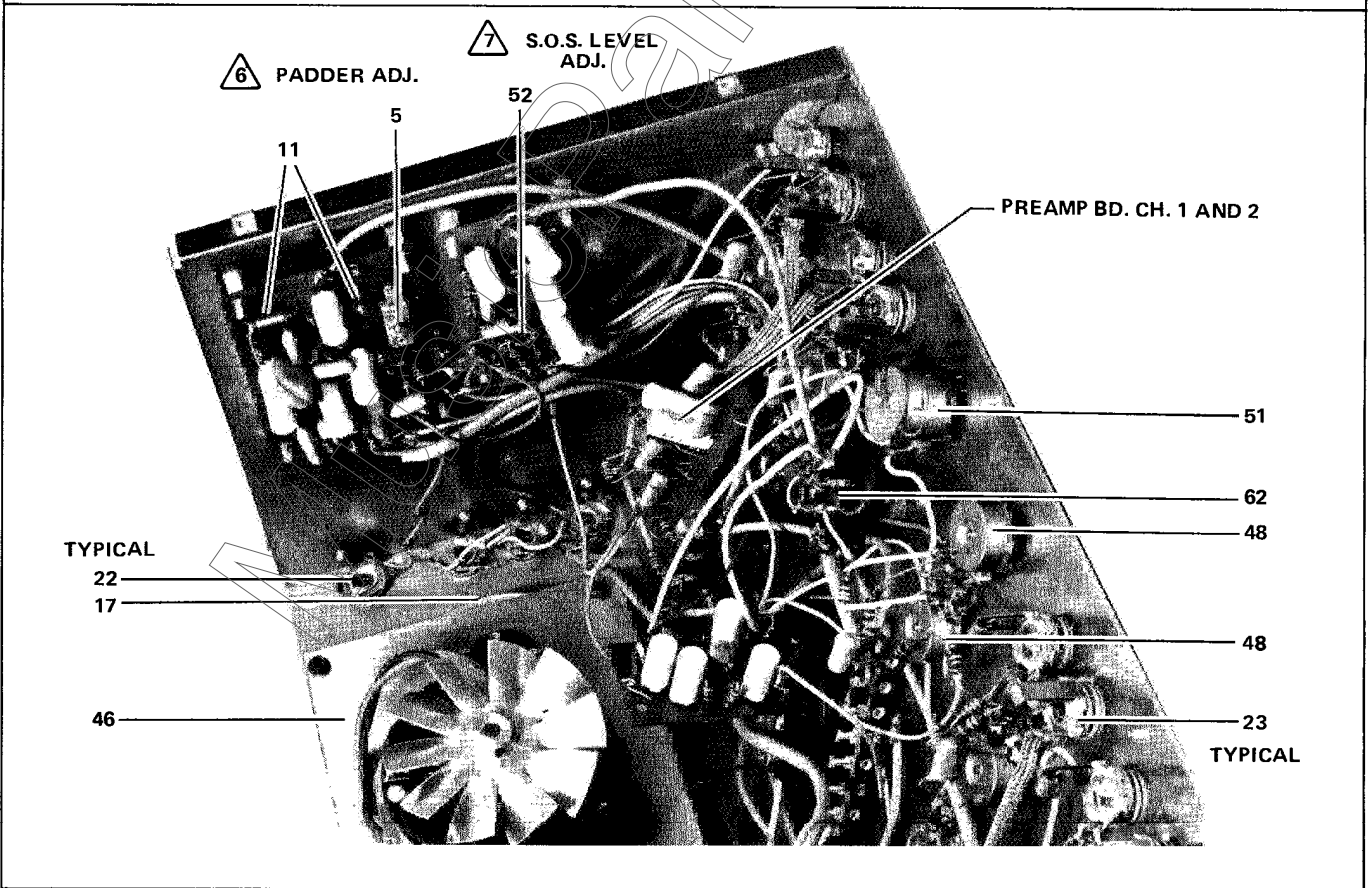
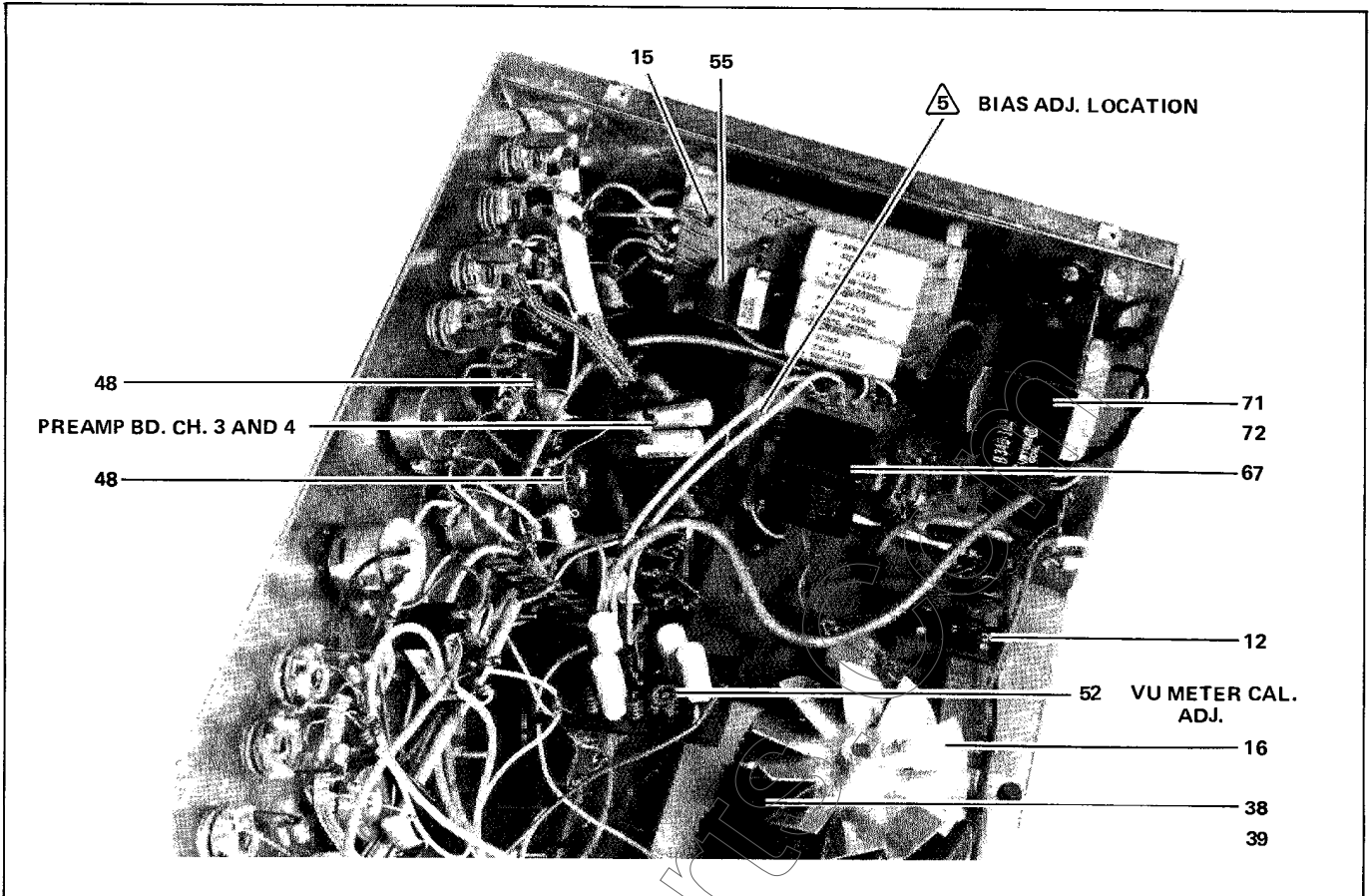
b) Place foot switch in PLAYBACK jack, and shut off when record time is complete.

c) Adjust sound on sound head same as playback, and flip ECHO SOUND ON SOUND switch until both heads produce approximately the same wave amplitude on both frequencies.

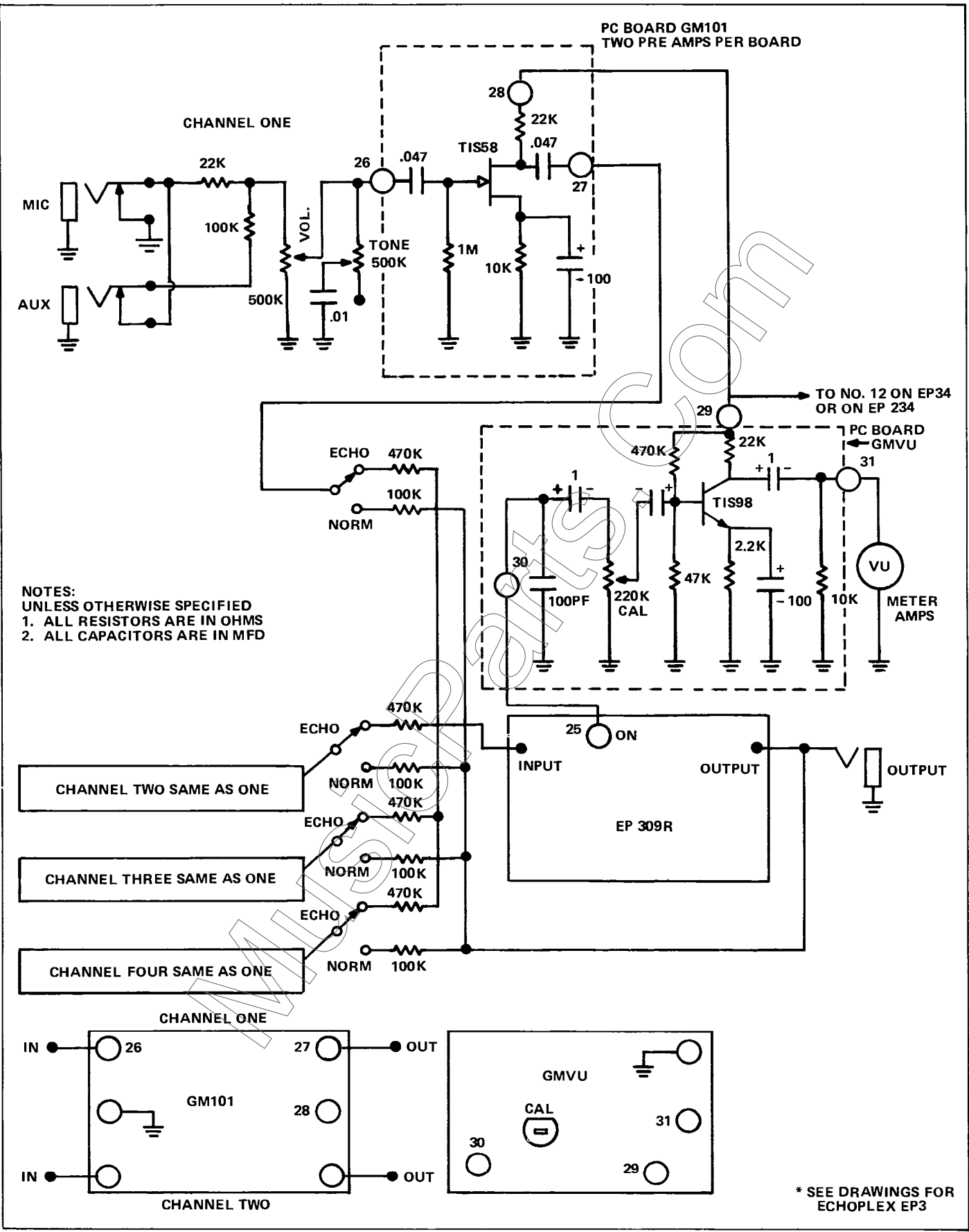
d) Turn foot switch on. During 1000Hz playback, with switch in SOUND ON SOUND position, adjust trimmer potentiometer on playback board until VU meter reads 95 percent.

e) Each time the 1000Hz passes, the VU meter should drop approximately 1dB. If VU meter does not drop 1dB, turn the trimmer potentiometer a little more until the desired results are obtained.

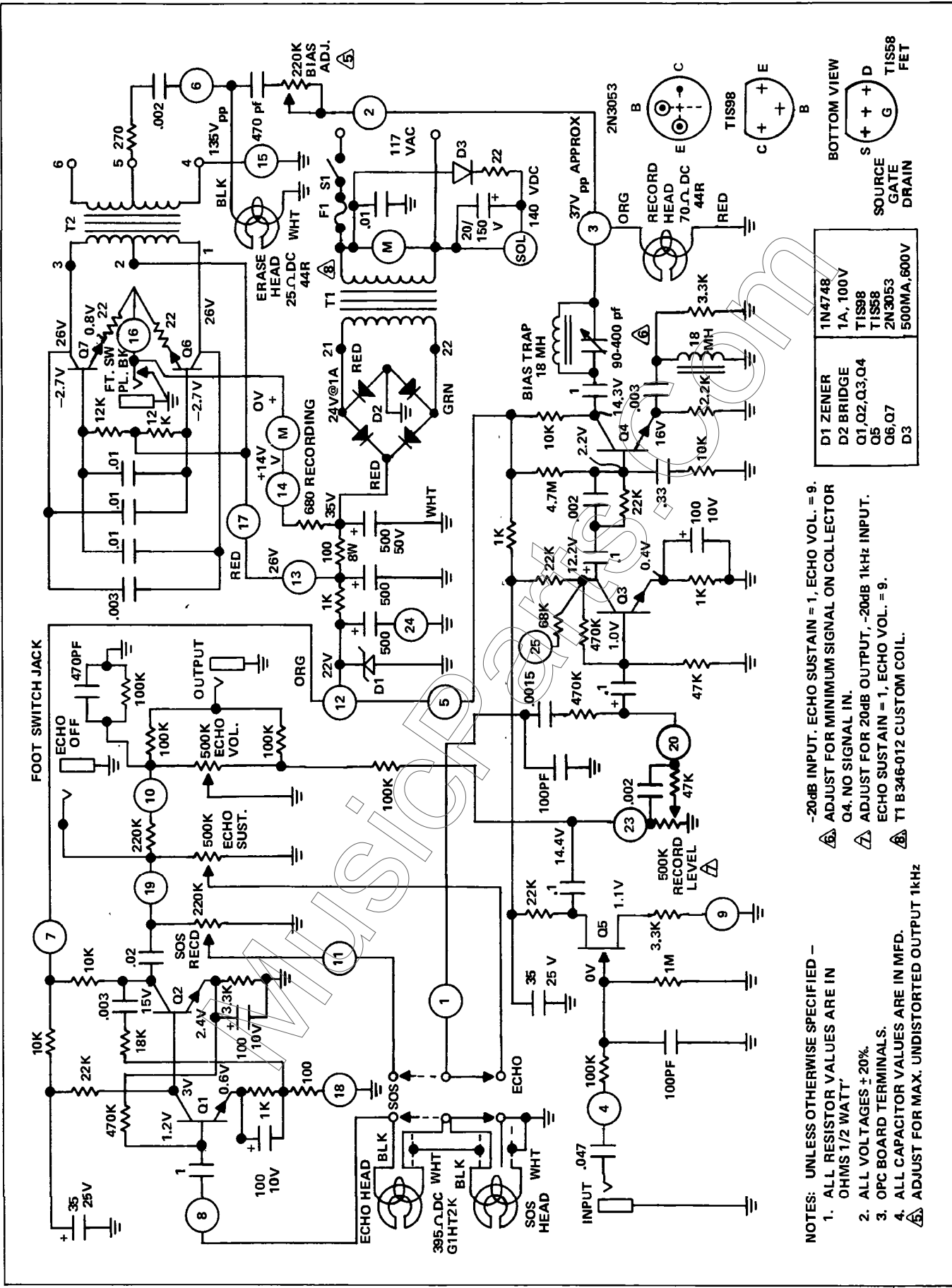
f) Glue heads in this position to maintain setup.



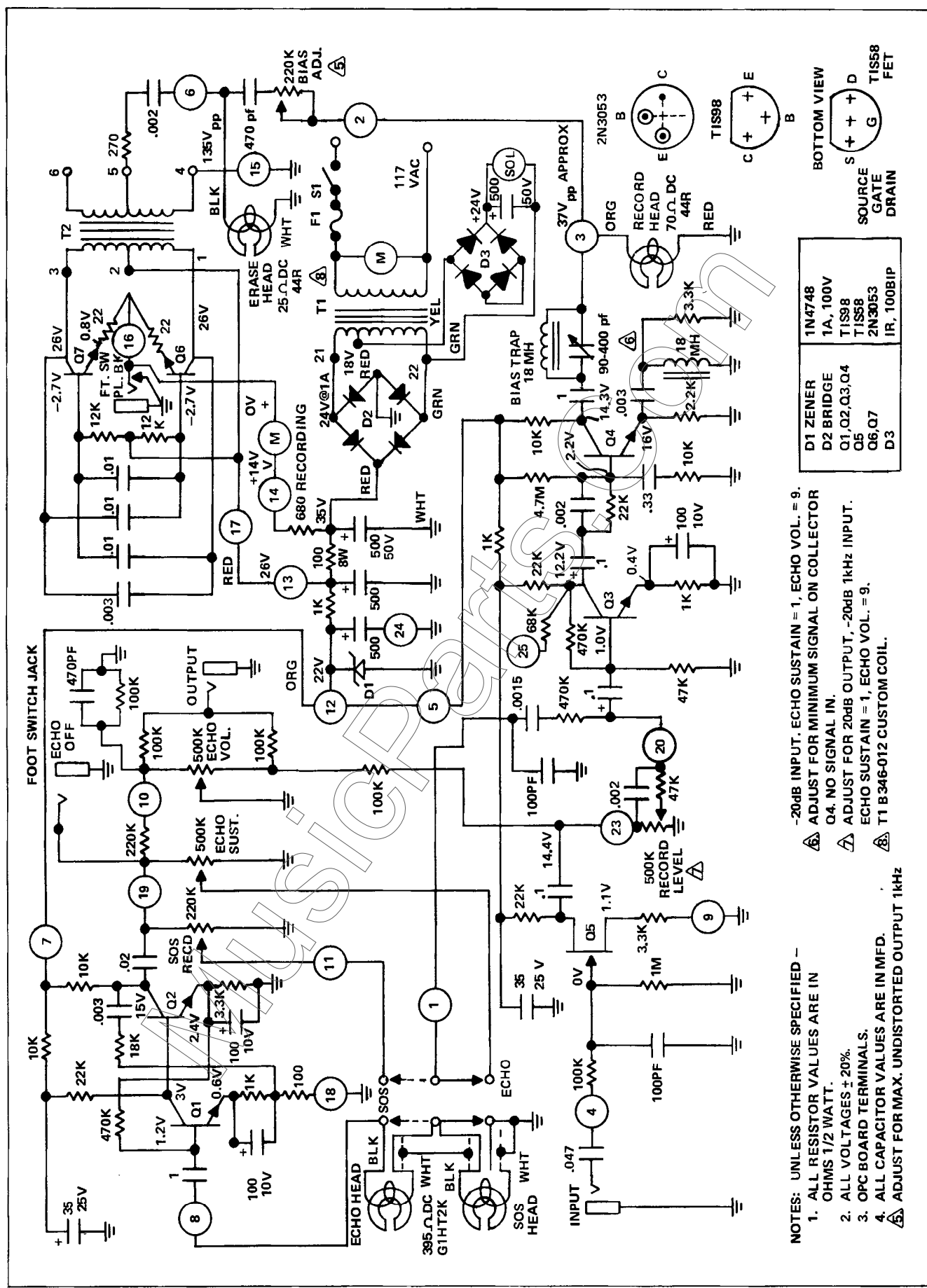
GROUPMASTER EM-1, INSIDE COMPONENT VIEWS



GROUPMASTER EM-1 SCHEMATIC DIAGRAM



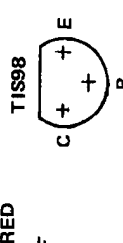
- NOTES: UNLESS OTHERWISE SPECIFIED --
1. ALL RESISTOR VALUES ARE IN OHMS 1/2 WATT
 2. ALL VOLTAGES ± 20%.
 3. OPC BOARD TERMINALS.
 4. ALL CAPACITOR VALUES ARE IN MFD.
- 20dB INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
 ADJUST FOR MINIMUM SIGNAL ON COLLECTOR
 Q4. NO SIGNAL IN.
 ADJUST FOR 20dB OUTPUT, -20dB 1kHz INPUT.
 ECHO SUSTAIN = 1, ECHO VOL. = 9.
 T1 B346-012 CUSTOM COIL.



NOTES: UNLESS OTHERWISE SPECIFIED -

1. ALL RESISTOR VALUES ARE IN OHMS 1/2 WATT.
2. ALL VOLTAGES ± 20%.
3. OPC BOARD TERMINALS.
4. ALL CAPACITOR VALUES ARE IN MFD.
5. ADJUST FOR MAX. UNDISTORTED OUTPUT 1kHz
6. -20dB INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
7. ADJUST FOR MINIMUM SIGNAL ON COLLECTOR
8. NO SIGNAL IN.
9. ADJUST FOR 20dB OUTPUT, -20dB 1kHz INPUT. ECHO SUSTAIN = 1, ECHO VOL. = 9.
10. T1 B346-012 CUSTOM COIL.

D1 ZENER	1N4748
D2 BRIDGE	1A, 100V
Q1, Q2, Q3, Q4	T1S98
Q5	T1S58
Q6, Q7	2N3053
D3	IR, 100BIP



INSTALLING NEW CARTRIDGE ON ECHOPLEX

1. Remove Old Cartridge--

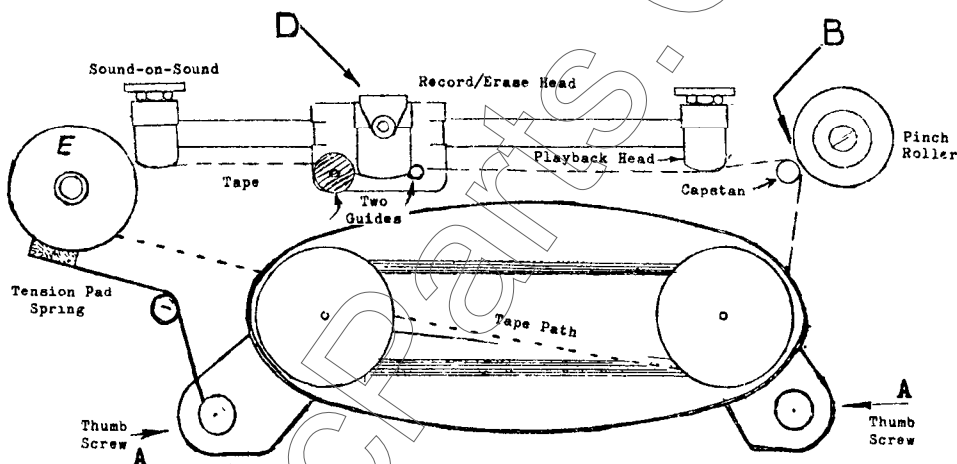
Turn Power off.

Remove 2 thumbscrews and remove the plastic cover over the tape deck.

Observe the present path of the tape and the manner in which tension pad is now installed. Remove tension pad.

Remove the tape from between the capstan "B" and the pinch roller, then remove tape from the sliding head "D" and the plastic roller spool "E".

Remove the 2 thumbscrews "A". This will unfasten old cartridge. Remove old tape cartridge. NOTE--this is a good time to clean heads, rollers and capstan. Use a cotton cue stick dipped in tape head cleaning fluid, alcohol or lighting fluid. Do NOT use any metallic object to scrape heads, as the slightest scratch on the head surface will seriously affect performance and permanently damage the head.



2. Install New Cartridge--

with the two thumbscrews and thread tape between roller "E" and "Sound on Sound" head. Then thread tape between the sliding record head "D" and its two guides. Now thread tape past playback head between capstan "B" and the pinch roller.

Now hold the tape in the plastic roller spool "E" and install the tension pad spring, as shown, with the felt pad against the tape on the spool. Pull excess tape past the capstan. Now momentarily snap the power on, then off and watch tape flow to make sure it runs properly.

If tape runs satisfactorily replace the plastic cover and install the thumbscrews.

On the older tube type Echoplex, should the tape not return smoothly to the cartridge, it is necessary to raise the low end of the tape cartridge. This can be done by placing washers or cardboard of about 1/8" thickness under the cartridge at the thumb screw A2.

MARKET ELECTRONICS

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