

# *Electro-Voice*®

## ELECTRONICS SERVICE MANUAL



MODEL E-V 1244X

**EV STEREO-4™**  
compatible four channel

# INTRODUCTION

This service manual was designed with the experienced technician in mind. It has been kept brief without over-simplification. All procedures are presented in a clear step-by-step manner. Although we have tried to anticipate all of your problems and questions, in special instances you may need additional guidance. Address any such inquiries to our Technical Service Department.

## DESCRIPTION

The E-V 1244X is designed primarily to add two back channels to an existing stereo system to provide easy expansion into 4-channel operation. In addition to two complete amplifier channels with full controls, the E-V 1244X includes the Electro-Voice STEREO-4 integrated circuit decoder. By decoding records and FM stereo broadcasts which have been previously encoded with 4-channel material, four distinct sources of sound can be recreated in the home using conventional stereo phono cartridges and standard FM stereo tuners.

In addition to the recovering of four channels from a STEREO-4 encoded program, the E-V 1244X decoder creates a remarkable enhancement of conventional two-channel program material. While this enhancement is not "real" four-channel, the effect ranges from pleasing to astounding, depending upon the information contained in the stereo signal. If four-channel playback or enhancement is not desired, the decoder is easily bypassed for conventional system operation.

Because the E-V 1244X has full switching and control facilities, it may be used with an existing stereo system for 4-channel tape playback. Either open reel or cartridge machines may be used. The E-V 1244X may also be used independently as the heart of a fine 2-channel stereo system.

## SPECIFICATIONS

|                       |   |
|-----------------------|---|
| <b>Power Output,</b>  |   |
| IHF Music Power:      | 65 watts into 4 ohms,<br>50 watts into 8 ohms |
| Continuous Sine Wave: | 18 watts per channel<br>into 8 ohms           |

The pages of this manual are punched to fit a three-ring binder so that any production changes and additional service tips can be easily added. This will keep your Electro-Voice Service Data as up to date as possible.

An Owner's Manual (E-V Part No. 535340) is shipped with each system. That manual contains instructions for installing and operating the system as well as minor maintenance procedures.

|                               |  |
|-------------------------------|--|
| <b>Frequency Response:</b>    | ±1.5 dB,<br>20–20,000 Hz at rated output<br>±1.5 dB,<br>20–30,000 Hz at 1 watt |
| <b>Harmonic Distortion:</b>   | Less than 1.0%<br>at rated output  |
| <b>Hum and Noise,</b>         |  |
| High Level Inputs:            | Better than 70 dB<br>below rated output  |
| Magnetic Phono Input:         | Better than 60 dB<br>below rated output  |
| <b>Channel Separation:</b>    | 40 dB minimum at 1,000 Hz  |
| <b>Inputs:</b>                | Mag. Phono, Tuner, Aux, Tape (high level)                                      |
| <b>Input Sensitivity,</b>     |  |
| Phono:                        | 3 mv   |
| Tuner, Aux, Tape:             | 150 mv   |
| <b>Controls (Rotary),</b>     |  |
| Volume:                       | with on/off switch   |
| Balance:                      | with Pull/Mono switch  |
| Selector:                     | Phono–Tuner–Aux  |
| Bass:                         | +10 dB, –12 dB at 50 Hz  |
| Treble:                       | +10 dB, –12 dB at 10 kHz   |
| <b>Controls (Switches),</b>   |  |
| Decode                        | On/Off   |
| Source/Tape                   |  |
| Speaker                       | On/Mute  |
| Loudness                      | On/Off   |
| Amp. Selector                 | Front/Back   |
| Tape Monitor                  | Tape Mon 2/Normal  |
| <b>Outputs,</b>               |  |
| Speakers:                     | 4–16 ohms per channel  |
| Line Outputs:                 | to other amplifiers  |
| Stereo Tape Recorder          |  |
| Stereo Headphones:            | on front panel   |
| <b>Output Damping Factor:</b> | 35 at 8 ohms   |
| <b>Auxiliary AC Outlet:</b>   | one switched   |
| <b>Power Requirements:</b>    | 110–120 volts,<br>50–60 Hz AC  |
| <b>Dimensions:</b>            | 3-3/8" h., 8-3/8" w., 10 1/4" d.   |



# DISASSEMBLY INSTRUCTIONS

## REMOVING TOP COVER

1. Remove the four Phillips Screws securing top cover from rear of unit.
2. Slide Top Cover to rear and remove.

## REMOVING WALNUT END PANELS

3. Remove the two Phillips Screws securing end panels on bottom rear of unit.
4. Remove brass Grounding Strap.
5. Pull back firmly on end panel to disengage metal clip.

## REMOVING FRONT PANEL

6. Remove Control Knobs by pulling forward.
7. Remove felt washers behind knobs.
8. Remove the two Palnuts from the threaded studs on front panel.
9. Remove Front Panel.

### NOTE:

The following removal procedure on printed circuit board assemblies is only intended to be a partial removal of the assembly to a point where it is accessible. Complete removal necessitates unsoldering the remaining connecting wire leads. When replacing pcb assemblies in mounted position, properly dress all wire leads to avoid possible pinching.

## REMOVING PREAMP ASSEMBLY

1. Perform Steps 1 through 9 above removing Top Cover, End Panels and Front Panel.
2. Remove Control Nuts and Control Lockwashers from control shafts.
3. Work as much slack as possible into all wire leads connecting to preamp pcb. Unsolder wire leads from foil side of preamp pcb which are excessively tight; Points L, M, N, P, S, T, W, etc. A preamp pcb foil pattern is provided at the back of this manual.

# SERVICING PROCEDURE

## POWER OUTPUT AND HARMONIC DISTORTION MEASUREMENTS

With the Decode Switch "OFF," Tape/Source switch in "SOURCE" position and Tape MON 2/NORMAL switch in "NORMAL" position, the E-V 1244X may be checked as a conventional stereo amplifier. STANDARD TEST CONDITIONS:

TONE CONTROLS ..... FLAT  
 BALANCE ..... CENTERED  
 TAPE MON 2/NORMAL ..... NORMAL  
 INPUT SELECTOR ..... AUX  
 TAPE SOURCE ..... SOURCE  
 SPEAKERS ..... ON  
 LOUDNESS ..... OFF  
 DECODE ..... OFF  
 FRONT/BACK ..... FRONT  
 OUT-TO-OTHER AMP ..... OPEN CIRCUIT  
 SPEAKER LOAD ..... 8 OHMS

1. Terminate both amplifier output channels into 8-ohm non-inductive load resistors, 20 watts minimum rating.
2. Simultaneously perform the following for both channels. In parallel with each load resistor, connect the input leads of an accurately calibrated audio VTVM and an H.D. analyzer.
3. Connect a low-distortion audio generator to the "AUX" input jacks. Set generator output level to 150 mV $\pm$ 1 dB @ 1000 Hz.
4. Apply AC power to the receiver and carefully advance VOLUME control clockwise for full output - 12 volts (18 watts).
5. TOTAL HARMONIC DISTORTION should measure 1.0% or less.

4. Slightly raise rear of tone pcb and carefully work up out of mounted position. Do not put excessive strain on any wire lead.

## REMOVING DECODER PCB ASSEMBLY

1. Perform above steps removing Top Cover, End Panels, Front Panel and Preamp pcb.
2. Remove the Decoder pcb from its mounted position. If the pcb is secured by plastic fasteners, use a pair of long nose pliers and squeeze fasteners together while prying pcb assembly up.

## REPLACING OUTPUT TRANSISTORS

The output transistors may be replaced by removing the hardware securing the pcb assembly and wire leads which bind against the assembly.

## REPLACING INDICATOR LAMPS

1. Remove Top Cover, End Panels and Front Panel.
2. Remove Tape holding fishpaper shield in place.
3. Replace defective lamp(s) and reverse steps above. It may be necessary to replace tape.

The E-V 1244X may be checked to the additional specifications given at the front of this manual.

Due to the confidential E-V proprietary process, information regarding integrated circuit U1 is not supplied in this service manual. DC voltages for U1 are supplied along with proper output RMS signal relations. Use standard integrated circuit servicing precautions including a heat sink when soldering leads.

## DECODE FUNCTION CHECK OUT

Use the standard test conditions listed above. Place the Decode switch in the "Decode" position. Connect an audio-generator to the Left or Right AUX input jacks. Adjust audio-generator for a 1 kHz 0.1V (100 mV) RMS out level. Connect an audio VTVM to the "Out-To-Other-Amp" jacks on the rear of unit and across the speaker output terminals. Advance the volume control to maximum.

With the input specified, output voltages shall be as follows: tolerance on voltages at speaker output is  $\pm$  2 dB. Tolerance at "Out-To-Other-Amp" Jacks is  $\pm$  1 dB. Place the Front/Back Switch in position indicated.

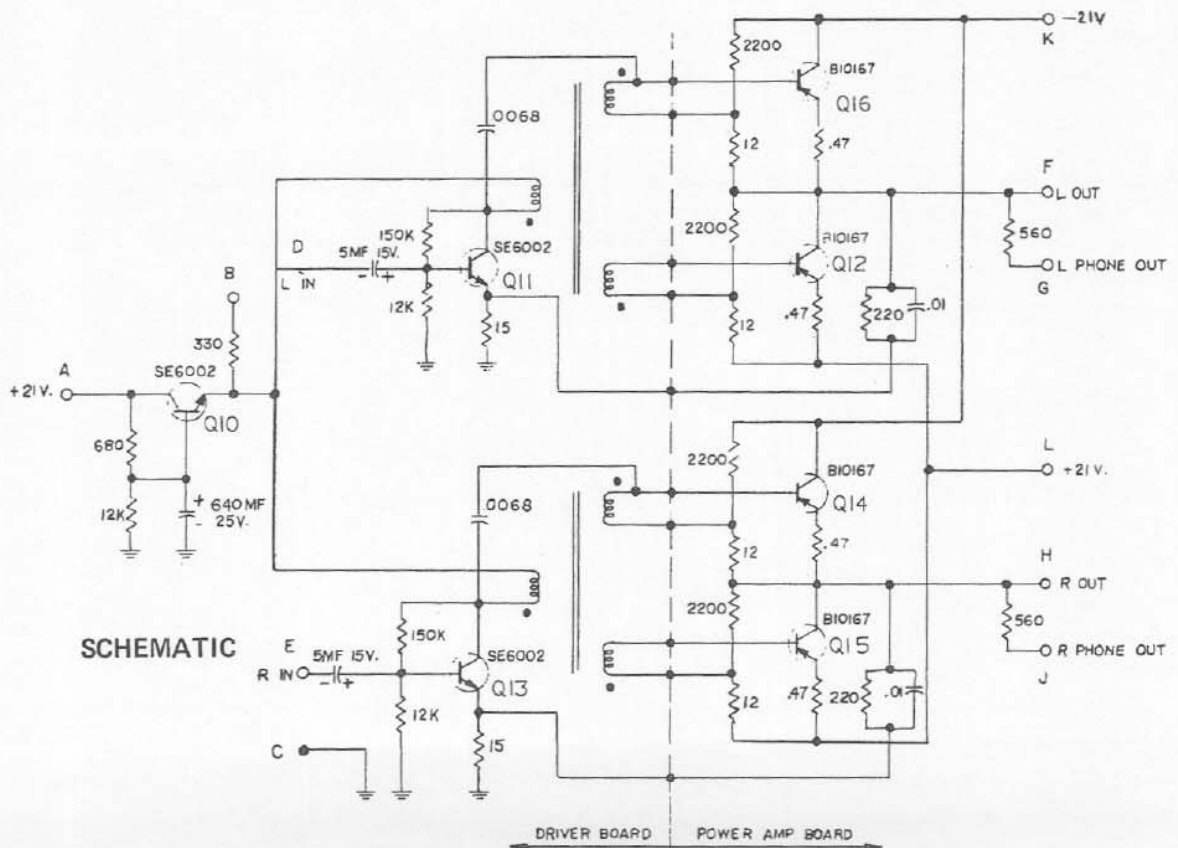
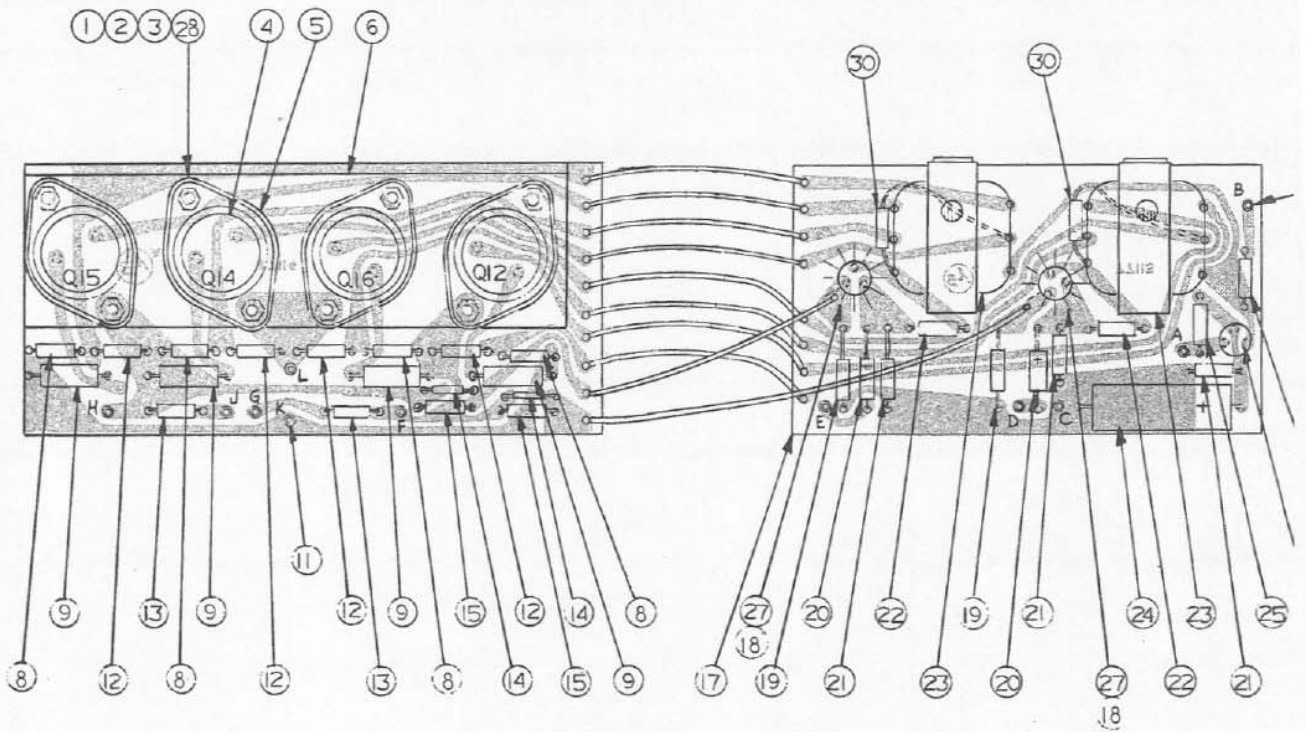
| INPUT<br>mV @ 1 kHz |       | F/B SWITCH<br>POSITION | SPEAKER OUTPUT<br>V <sub>rms</sub> $\pm$ 2 dB |       | REAR OUTPUT<br>mV <sub>rms</sub> $\pm$ 1 dB |       |
|---------------------|-------|------------------------|---|-------|---|-------|
| LEFT                | RIGHT |                        | LEFT  | RIGHT | LEFT  | RIGHT |
| 100                 | 0     | FRONT                  | 6.0   | 1.2   | 370   | 300   |
| 0                   | 100   | FRONT                  | 1.2   | 6.0   | 300   | 370   |
| 100                 | 0     | BACK                   | 4.4   | 3.6   | 500   | 100   |
| 0                   | 100   | BACK                   | 3.6   | 4.4   | 100   | 500   |

Place the Decode switch in the "OFF" position. There should be no output from the out-to-other-amp jacks.

# CHASSIS PARTS

| REF NO.                        | PART NO.  | DESCRIPTION                              |
|--------------------------------|-----------|--|
|                                | 15174     | Transformer – Power                      |
|                                | 20171     | Fuse – 1½ Amp Slo-Blo (Output)           |
|                                | 20676     | Fuse – 1 Amp Slo-Blo (Pigtail)           |
|                                | 20911     | Fuseholder – Output                      |
|                                | 17139     | Phone Jack                               |
|                                | 17137     | Phono Jack – Dual                        |
|                                | 17138     | Insulator – Dual Phono Jack              |
|                                | 17054     | Phono Jack – Single                      |
|                                | 84952     | Pilot Light Assembly                     |
|                                | 43055     | Bulb – Pilot                             |
|                                | 76501-PK  | Lens – Phono (Red)                       |
|                                | 76502-PJ  | Lens – Aux (Amber)                       |
|                                | 76503-PH  | Lens – Tuner (Green)                     |
|                                | 16511     | AC Line Cord                             |
|                                | 20109     | Strain Relief (Heyco)                    |
|                                | 27050     | Terminal Strip (3T)                      |
|                                | 27258     | Terminal Strip – Speaker                 |
|                                | 4487      | Receptacle – AC                          |
|                                | 28179     | Foot – Rubber                            |
|                                | 46289     | Resistor – 5.6 $\Omega$ 2W (10%)         |
|                                | 4652      | Resistor – 56 k $\Omega$ ½W (10%)        |
|                                | 77111     | Fiber Shield – Fuses                     |
|                                | 77610     | Fiber Shield – Power Supply              |
|                                | 20135     | Fastener – Decoder PCB (Plastic)         |
| <b>SWITCHES &amp; CONTROLS</b> |           |  |
|                                | 46411     | Control – Balance w/swt (25 k $\Omega$ ) |
|                                | 56075     | Switch – Rocker                          |
|                                | 56138     | Switch – Front/Back                      |
|                                | 56139     | Switch – Tape Mon 2/Normal               |
| <b>CABINET PARTS</b>           |           |  |
|                                | 85597     | End Panel Assembly                       |
|                                | A77643-JD | Cover – Metal Screen                     |
|                                | 20954     | Fastener (Tinnerman)                     |
|                                | 76660-BX  | Clip – Panel Retainer                    |
|                                | 62440-BX  | Screw – Clip (6 x 3/8)                   |
|                                | 62484-BX  | Screw – Covers (6 x 5/8)                 |
|                                | C85081-ED | Front Panel Assembly                     |
|                                | A76499-RA | Lens – Front Panel                       |
|                                | 20907     | Palnut – Front Panel                     |
|                                | 76668     | Ground Strap                             |
|                                | 38294     | Washer – Felt                            |
|                                | 38288     | Washer – Steel (1 inch)                  |
| <b>KNOBS</b>                   |           |  |
|                                | 76557-CX  | Knob – Tone                              |
|                                | 76558-CX  | Knob – Volume                            |
|                                | 76717-CX  | Knob – Selector                          |
| <b>PACKING PARTS</b>           |           |  |
|                                | 96001     | Carton & Fillers                         |
|                                | 535340    | Instruction Sheet                        |
|                                | 535255    | Warranty Card                            |
|                                | 534419    | Caution Label                            |
|                                | 534707    | Label – Power Output                     |

# AMPLIFIER PC BOARD ASSEMBLY





**DRIVER & POWER AMPLIFIER PCB ASSEMBLY  
(E-V 87636)  
PARTS LIST**

| REF NO. | PART NO.  | DESCRIPTION                        |
|---------|-----------|------------------------------------|
| 1       | 20261-AD  | Nut—Hex (4-40)                     |
| 2       | 3843-AD   | Washer—Int. Lock (No. 4)           |
| 3       | 38415     | Washer—Fiber                       |
| 4       | 43046     | Transistor—Output (B10167)         |
| 5       | 20747     | Insulator—Mica                     |
| 8       | 46328     | Resistor—12 $\Omega$ 1/2W (10%)    |
| 9       | 46428     | Resistor—0.47 $\Omega$ 2W (10%)    |
| 10      | 85432-XXA | Power Amplifier Assembly           |
| 11      | 27259     | Terminal—Malco                     |
| 12      | 4676      | Resistor—2.2 k $\Omega$ 1/2W (10%) |
| 13      | 46119     | Resistor—560 $\Omega$ 1/2W (10%)   |
| 14      | 42367     | Capacitor—Ceramic .01 $\mu$ F/125V |
| 15      | 4664      | Resistor—220 $\Omega$ 1/2W (10%)   |
| 17      | 85431-XXA | Driver Assembly                    |
| 18      | 43044     | Transistor—Driver (SE6002)         |
| 19      | 46069     | Resistor—15 $\Omega$ 1/2W (10%)    |
| 20      | 42365     | Capacitor—Elect. 5 $\mu$ F/15V     |
| 21      | 4649      | Resistor—12 k $\Omega$ 1/2W (10%)  |
| 22      | 4603      | Resistor—150 k $\Omega$ 1/2W (10%) |
| 23      | 15200     | Transformer—Driver                 |
| 24      | 42391     | Capacitor—Elect. 640 $\mu$ F/25V   |
| 25      | 46045     | Resistor—680 $\Omega$ 1/2W (10%)   |
| 26      | 4623      | Resistor—330 $\Omega$ 1/2W (10%)   |
| 27      | 20893     | Heat Sink                          |
| 28      | L60328-BP | Screw—Transistor (4-40 x 1/2 Pan)  |
| 30      | 42534     | Capacitor—Ceramic .0068 $\mu$ F    |

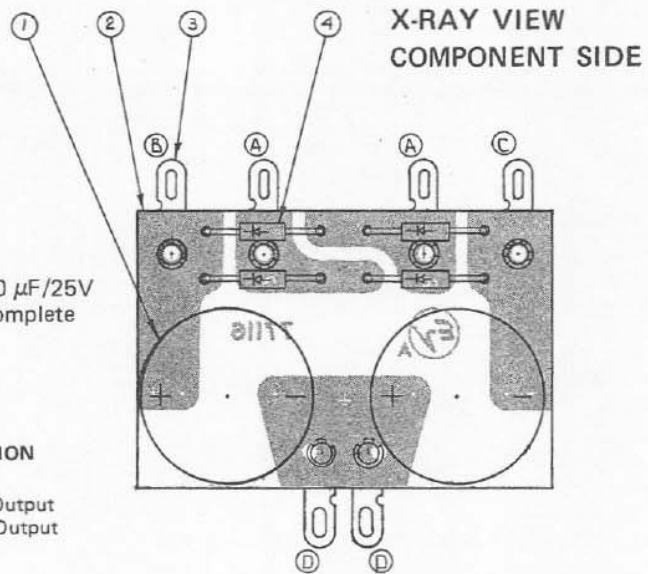
X-RAY VIEW —  
COMPONENT SIDE

Power transistors in the same channel must be from identical beta groups as coded on the transistor case. (Yellow, Green, or Blue.)

**POWER SUPPLY ASSEMBLY  
PARTS LIST**

| REF NO. | PART NO. | DESCRIPTION                             |
|---------|----------|---|
| 1       | 42407    | Capacitor—Electrolytic 2500 $\mu$ F/25V |
| 2       | 84951    | Power Supply Assembly—Complete          |
| 3       | 27139-AD | Terminal                                |
| 4       | 43067    | Diode—Power                             |
|         | 77116    | PC Board (Only)                         |

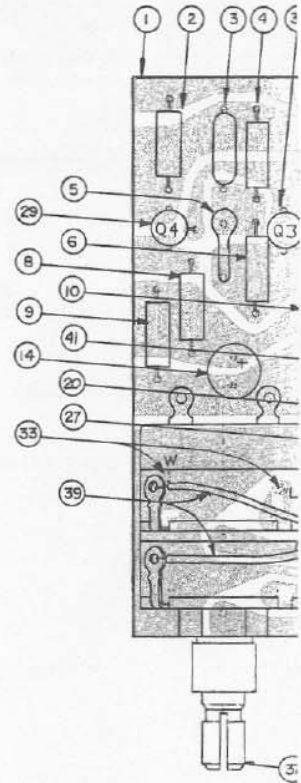
| PIN | IDENTIFICATION      |
|-----|---------------------|
| A   | AC Input            |
| B   | +21 Volts DC Output |
| C   | -21 Volts DC Output |
| D   | Common              |



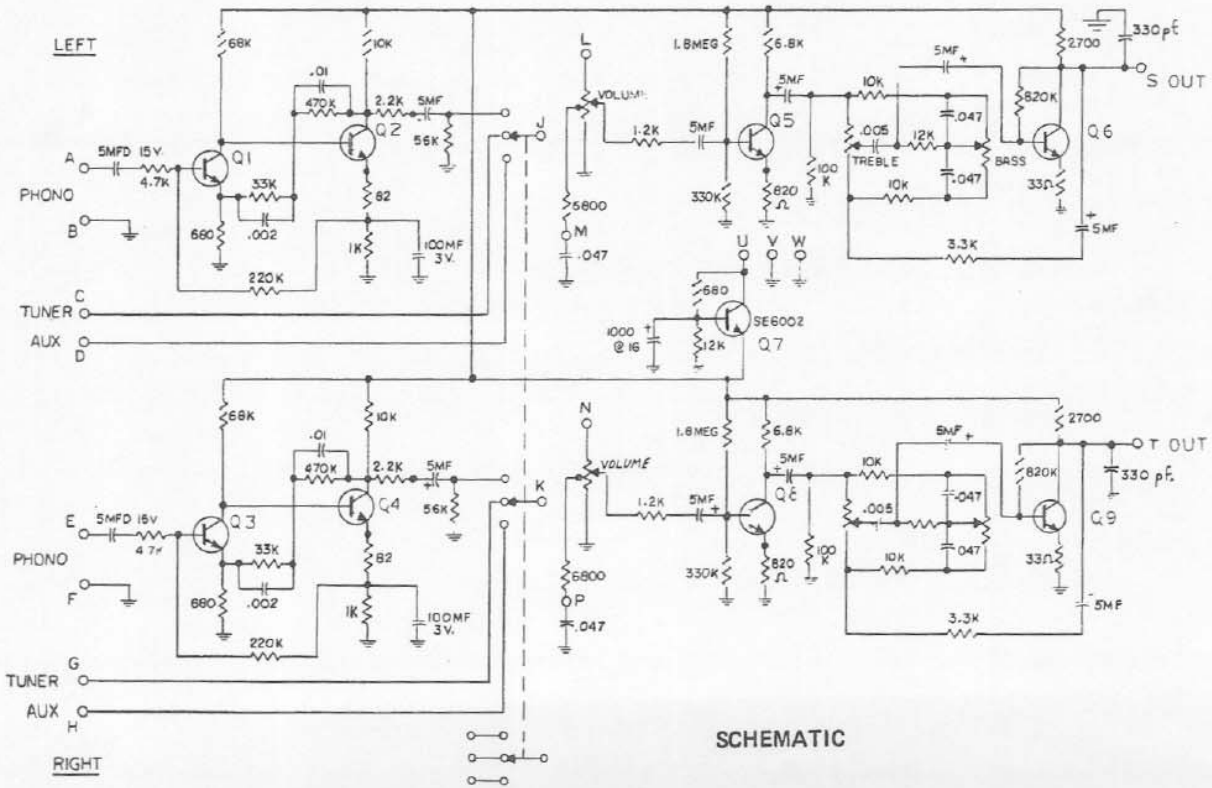
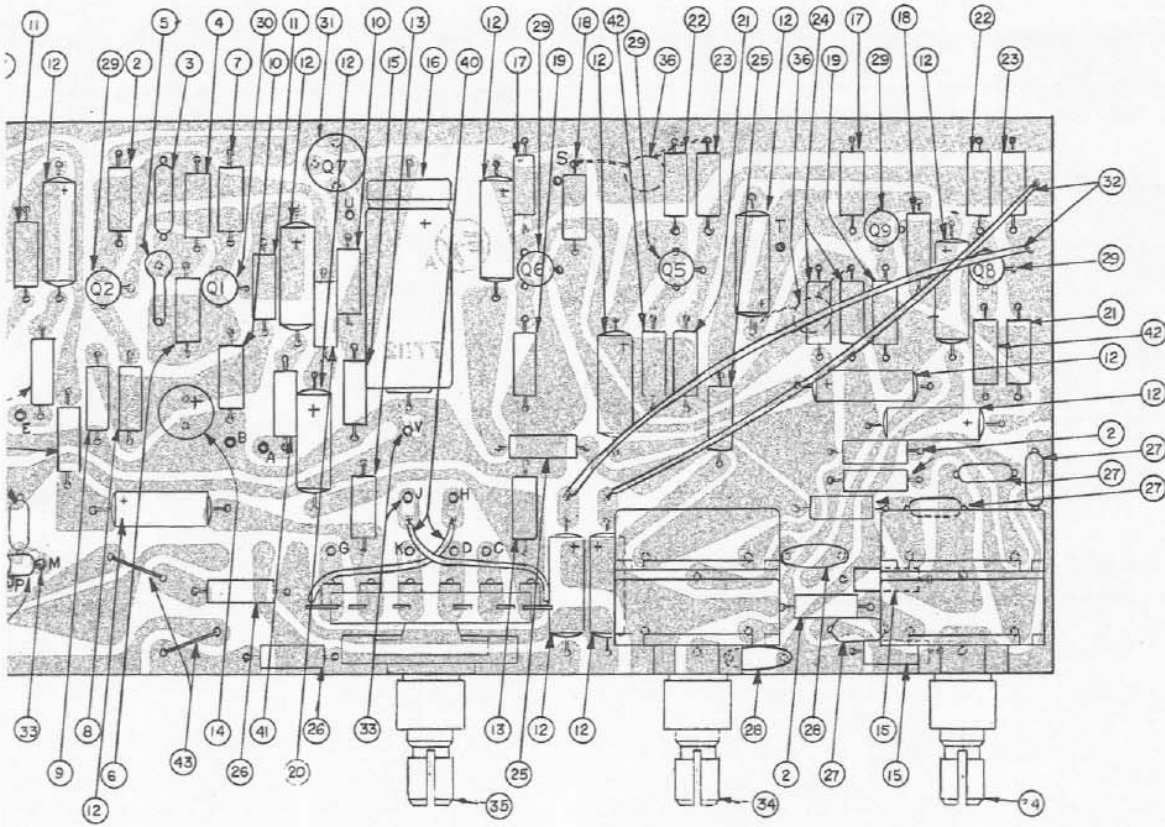
# PREAMPLIFIER PC BOARD ASSEMBLY

## PREAMPLIFIER ASSEMBLY PARTS LIST

| REF NO. | PART NO. | DESCRIPTION                          |
|---------|----------|--------------------------------------|
| 1       | 87635    | Preamp Assembly - Complete           |
| 2       | 4691     | Resistor 10 k $\Omega$ 1/2W (10%)    |
| 3       | 42367    | Capacitor - .01 $\mu$ F              |
| 4       | 4650     | Resistor - 470 k $\Omega$ 1/2W (10%) |
| 5       | 42368    | Capacitor - .0022 $\mu$ F            |
| 6       | 4665     | Resistor - 33 k $\Omega$ 1/2W (10%)  |
| 7       | 46019    | Resistor - 68 k $\Omega$ 1/2W (10%)  |
| 8       | 46410    | Resistor - 82 $\Omega$ 1/2W (10%)    |
| 9       | 4693     | Resistor - 1 k $\Omega$ 1/2W (10%)   |
| 10      | 46045    | Resistor - 680 $\Omega$ 1/2W (10%)   |
| 11      | 46024    | Resistor - 220 k $\Omega$ 1/2W (10%) |
| 12      | 42365    | Capacitor - Elect. 5 $\mu$ F/15V     |
| 13      | 4652     | Resistor - 56 k $\Omega$ 1/2W (10%)  |
| 14      | 42439    | Capacitor - Elect. 100 $\mu$ F/3V    |
| 15      | 4649     | Resistor - 12 k $\Omega$ 1/2W (10%)  |
| 16      | 42393    | Capacitor - Elect. 1000 $\mu$ F/16V  |
| 17      | 46036    | Resistor - 2.7 k $\Omega$ 1/2W (10%) |
| 18      | 46027    | Resistor - 820 k $\Omega$ 1/2W (10%) |
| 19      | 4634     | Resistor - 33 $\Omega$ 1/2W (10%)    |
| 20      | 4676     | Resistor - 2.2 k $\Omega$ 1/2W (10%) |
| 21      | 4685     | Resistor - 330 k $\Omega$ 1/2W (10%) |
| 22      | 46050    | Resistor - 6.8 k $\Omega$ 1/2W (10%) |
| 23      | 4673     | Resistor - 1.8 M $\Omega$ 1/2W (10%) |
| 24      | 4695     | Resistor - 100 k $\Omega$ 1/2W (10%) |
| 25      | 46017    | Resistor - 3.3 k $\Omega$ 1/2W (10%) |
| 26      | 4658     | Resistor - 1.2 k $\Omega$ 1/2W (10%) |
| 27      | 42371    | Capacitor - .047 $\mu$ F             |
| 28      | 42437    | Capacitor - Ceramic .0047 $\mu$ F    |
| 29      | 43045    | Transistor (SE4002)                  |
| 30      | 43054    | Transistor - Lo Noise                |
| 31      | 43044    | Transistor (SE6002)                  |
| 33      | 27259    | Terminal - Malco                     |
| 34      | 46413    | Control - Tone (100 k $\Omega$ )     |
| 35      | 56084    | Switch - Selector                    |
| 36      | 42396    | Capacitor - Ceramic 330 pF           |
| 37      | 46412    | Control - Volume (25 k $\Omega$ )    |
| 38      | 46050    | Resistor - 6.8 k $\Omega$ 1/2W (10%) |
| 41      | 4675     | Resistor - 4.7 k $\Omega$ 1/2W (10%) |
| 42      | 4694     | Resistor - 820 $\Omega$ 1/2W (10%)   |



# X-RAY VIEW — COMPONENT SIDE



DE



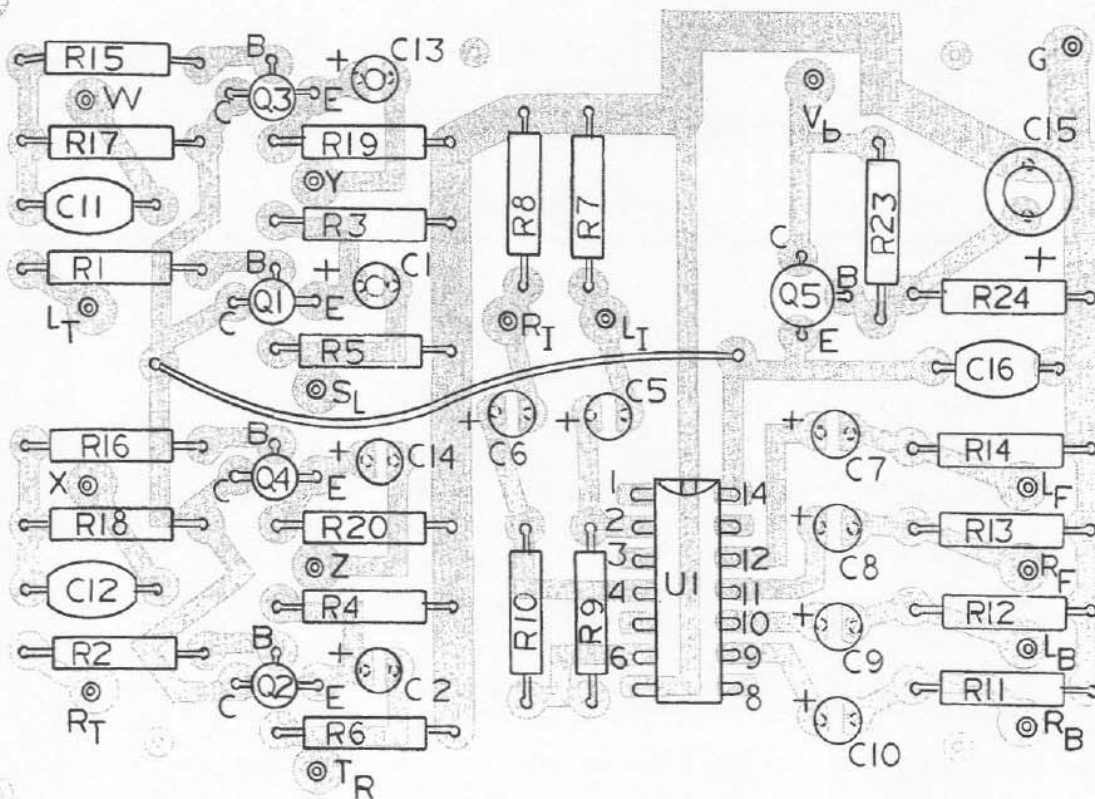
# DECODER PC BOARD ASSEMBLY

## DECODER PCB ASSEMBLY (87637) PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION                        | REF NO. | PART NO. | DESCRIPTION                         |
|----------|----------|------------------------------------|---------|----------|-------------------------------------|
| Q1-Q4    | 43045    | Transistor                         | R18     | 46025    | Resistor-2.2 M $\Omega$ 1/2W (10%)  |
| Q5       | 43092    | Transistor-Regulator (2N3566)      | R19     | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%)  |
| U1       | 87403    | Integrated Circuit-Decoder         | R20     | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%)  |
| R1       | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | R23     | 4646     | Resistor-12 k $\Omega$ 1/2W (10%)   |
| R2       | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | R24     | 4670     | Resistor-120 k $\Omega$ 1/2W (10%)  |
| R3       | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | C1      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R4       | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | C2      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R5       | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C5      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R6       | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C6      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R7       | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C7      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R8       | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C8      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R9       | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C9      | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R10      | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C10     | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R12      | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C11     | 42371    | Capacitor-Mylar .047 $\mu$ F        |
| R13      | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C12     | 42371    | Capacitor-Mylar .047 $\mu$ F        |
| R14      | 4670     | Resistor-120 k $\Omega$ 1/2W (10%) | C13     | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R15      | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | C14     | 42608    | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R16      | 46017    | Resistor-3.3 k $\Omega$ 1/2W (10%) | C15     | 42609    | Capacitor-Minilytic 100 $\mu$ F/25V |
| R17      | 46025    | Resistor-2.2 M $\Omega$ 1/2W (10%) | C16     | 42371    | Capacitor-Mylar .047 $\mu$ F        |

### PARTS NOT REFERENCED

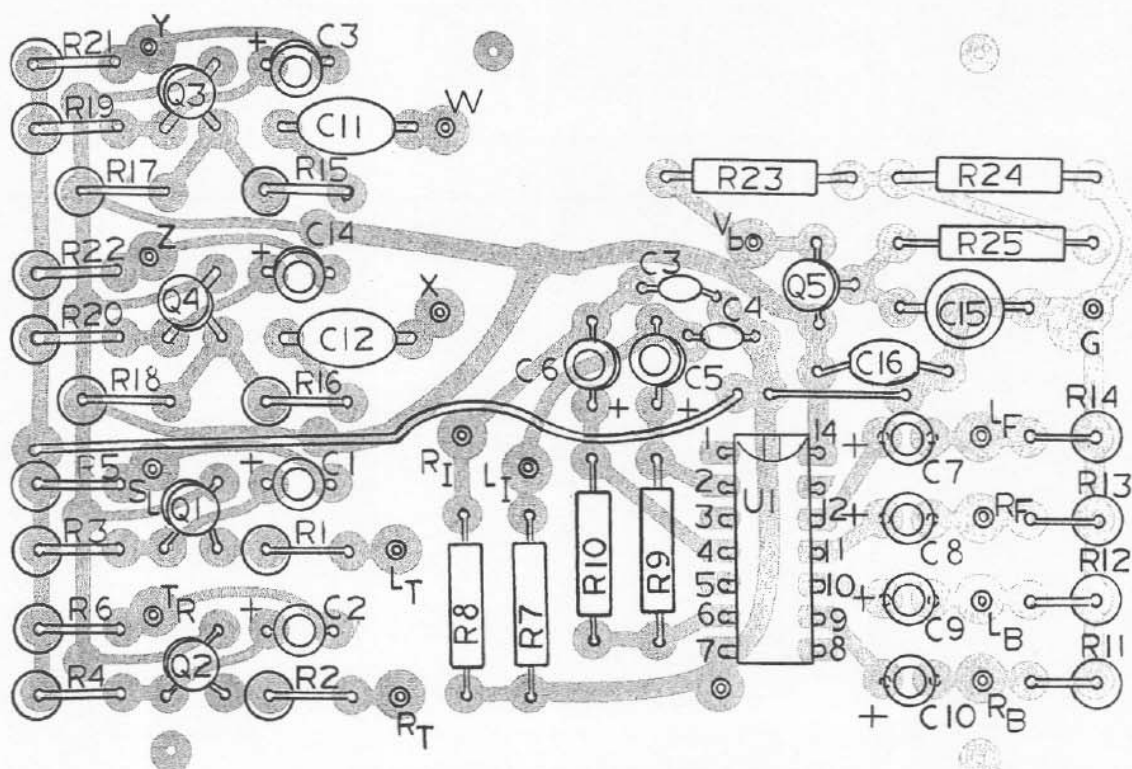
27259 Terminal (Malco)

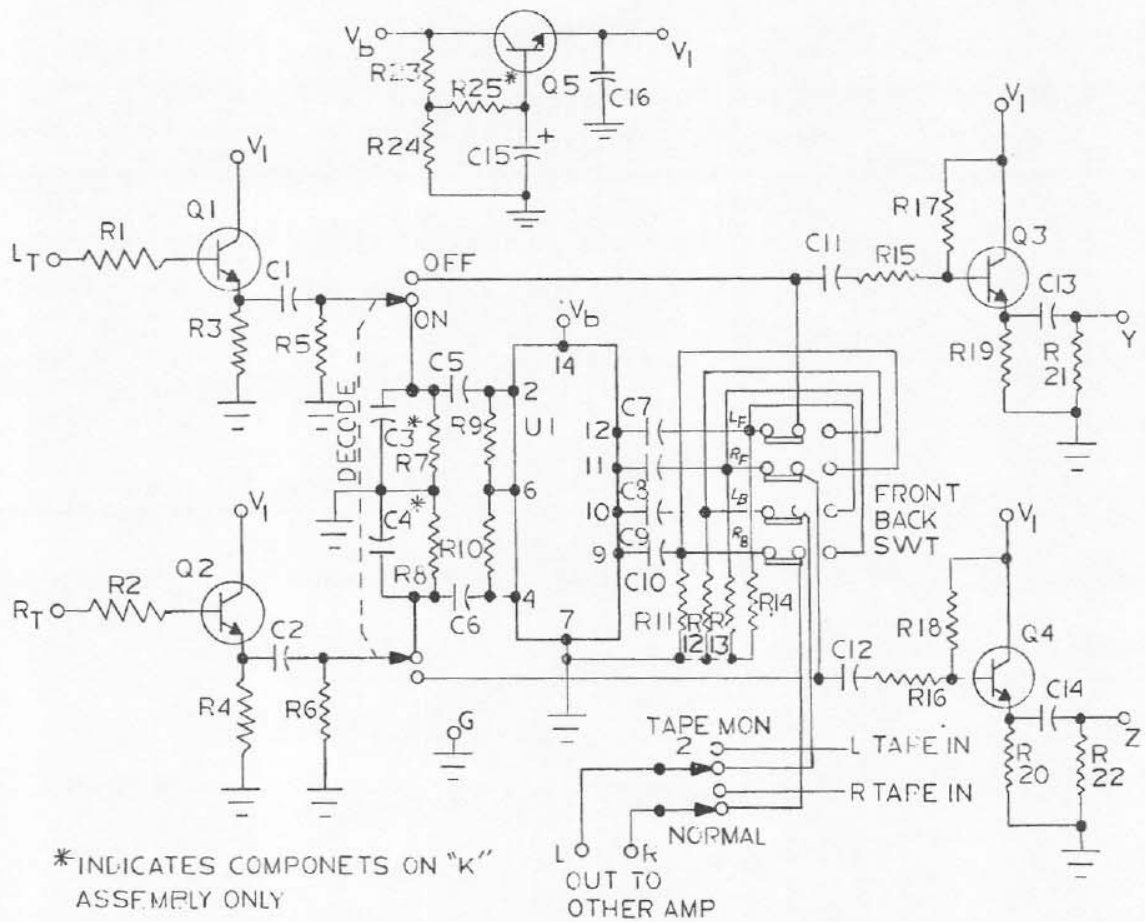


# DECODER PC BOARD ASSEMBLY

## DECODER PCB ASSEMBLY (K87637)

| REF NO. | PART NO. | DESCRIPTION                       | REF NO.                     | PART NO.         | DESCRIPTION                         |
|---------|----------|-----------------------------------|-----------------------------|------------------|-------------------------------------|
| Q1-Q4   | 43045    | Transistor                        | R21                         | 4695             | Resistor-100 k $\Omega$ 1/2W (5%)   |
| Q5      | 43044    | Transistor-Regulator              | R22                         | 4695             | Resistor-100 k $\Omega$ 1/2W (5%)   |
| U1      | 87403    | Integrated Circuit-Decoder        | R23                         | 4677             | Resistor-1.8 k $\Omega$ 1/2W (5%)   |
| R1      | 4693     | Resistor-1 k $\Omega$ 1/2W (5%)   | R24                         | 46029            | Resistor-18 k $\Omega$ 1/2W (5%)    |
| R2      | 4693     | Resistor-1 k $\Omega$ 1/2W (5%)   | R25                         | 4691             | Resistor-10 k $\Omega$ 1/2W (5%)    |
| R3      | 46017    | Resistor-3.3 k $\Omega$ 1/2W (5%) | C1                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R4      | 46017    | Resistor-3.3 k $\Omega$ 1/2W (5%) | C2                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R5      | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C3                          | 42497            | Capacitor-Ceramic 100 pF            |
| R6      | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C4                          | 42497            | Capacitor-Ceramic 100 pF            |
| R7      | 4651     | Resistor-27 k $\Omega$ 1/2W (5%)  | C5                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R8      | 4651     | Resistor-27 k $\Omega$ 1/2W (5%)  | C6                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R9      | 46024    | Resistor-220 k $\Omega$ 1/2W (5%) | C7                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R10     | 46024    | Resistor-220 k $\Omega$ 1/2W (5%) | C8                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R11     | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C9                          | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R12     | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C10                         | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R13     | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C11                         | 42371            | Capacitor-Mylar .047 $\mu$ F        |
| R14     | 4695     | Resistor-100 k $\Omega$ 1/2W (5%) | C12                         | 42371            | Capacitor-Mylar .047 $\mu$ F        |
| R15     | 4693     | Resistor-1 k $\Omega$ 1/2W (5%)   | C13                         | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R16     | 4693     | Resistor-1 k $\Omega$ 1/2W (5%)   | C14                         | 42608            | Capacitor-Minilytic 5 $\mu$ F/25V   |
| R17     | 46048    | Resistor-1 M $\Omega$ 1/2W (5%)   | C15                         | 42609            | Capacitor-Minilytic 100 $\mu$ F/25V |
| R18     | 46048    | Resistor-1 M $\Omega$ 1/2W (5%)   | C16                         | 42363            | Capacitor-Mylar .1 $\mu$ F          |
| R19     | 46017    | Resistor-3.3 k $\Omega$ 1/2W (5%) | <b>PARTS NOT REFERENCED</b> |                  |                                     |
| R20     | 46017    | Resistor-3.3 k $\Omega$ 1/2W (5%) | 27259                       | Terminal (Malco) |                                     |

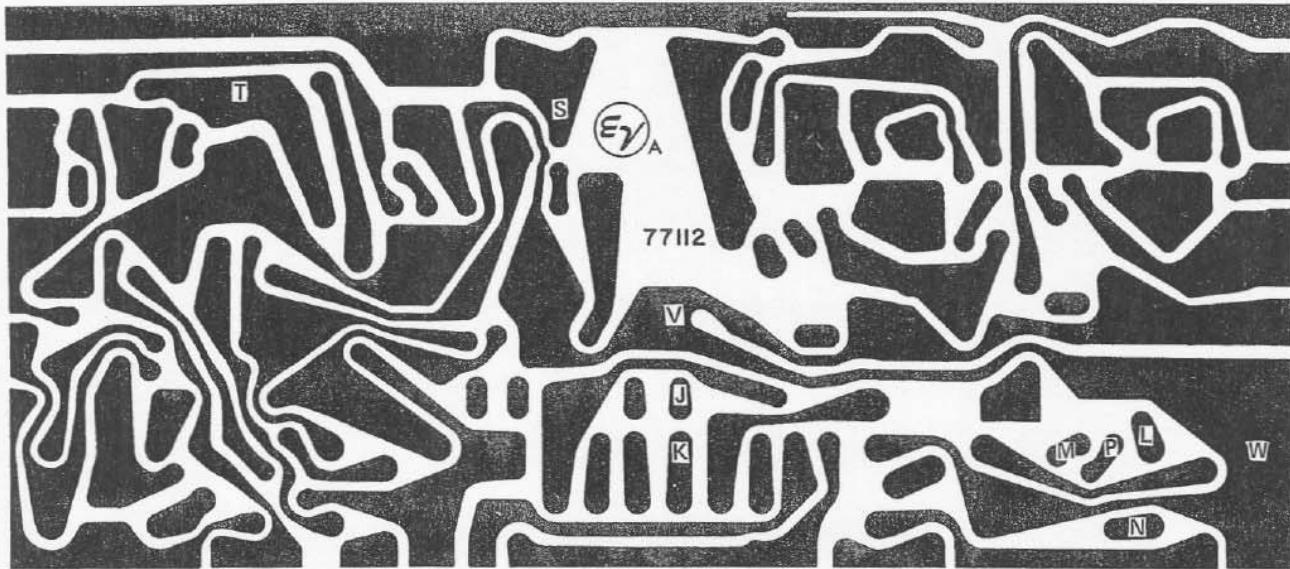




DECODER SCHEMATIC

INTEGRATED CIRCUIT U1 (87403)  
DC VOLTAGE VALUES (NO INPUT)

| PIN | VOLTS | PIN | VOLTS |
|-----|-------|-----|-------|
| 1   | 0     | 8   | 0     |
| 2   | 5.8   | 9   | 9.2   |
| 3   | 0     | 10  | 9.6   |
| 4   | 5.8   | 11  | 10.6  |
| 5   | 0     | 12  | 10.6  |
| 6   | 6.8   | 13  | 0     |
| 7   | 0     | 14  | 16    |



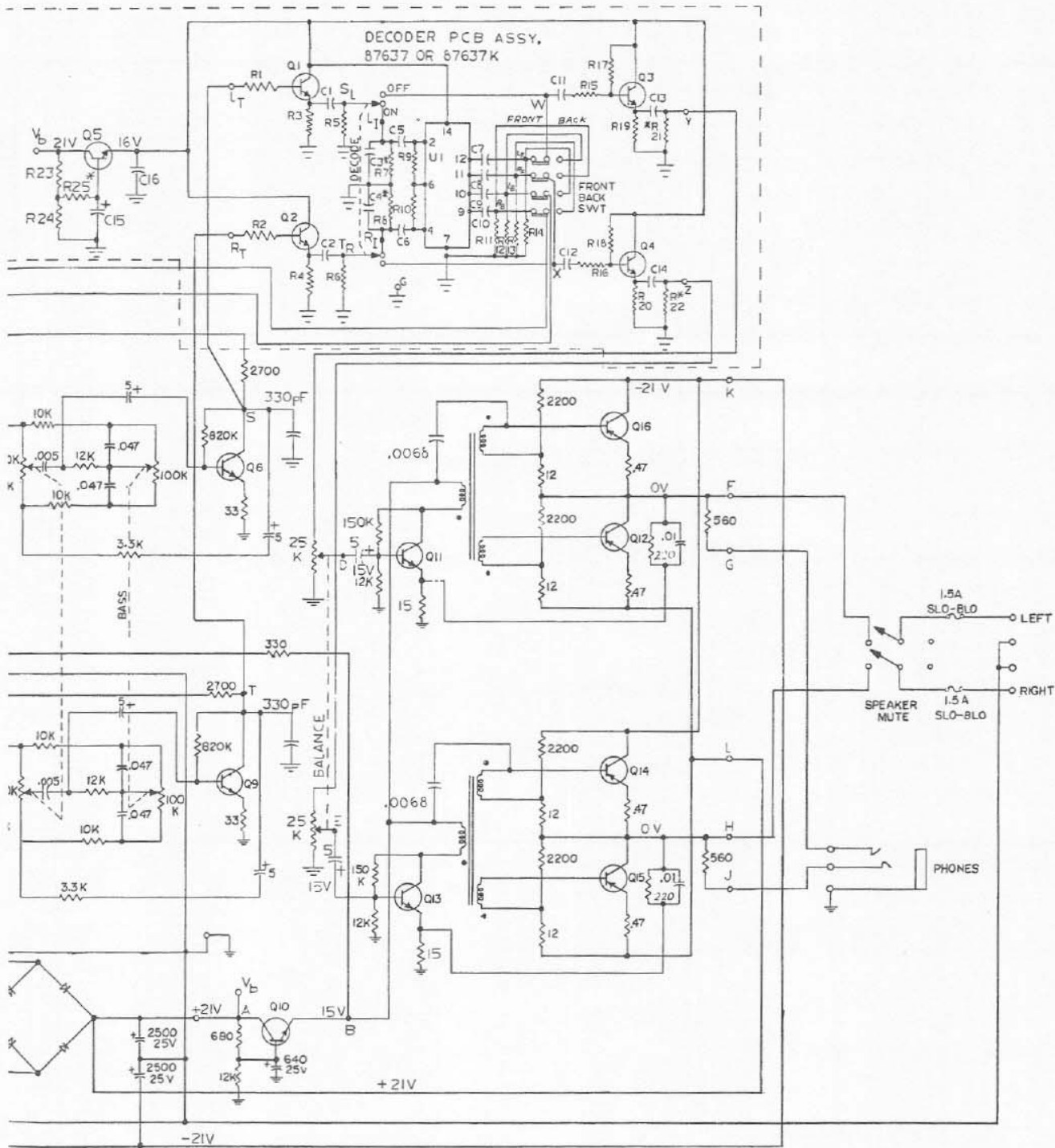
PREAMP PCB FOIL PATTERN



**ELECTRO-VOICE, INC. / Buchanan, Michigan 49107**  
*A Subsidiary of Gulton Industries, Inc.*







**NOTES:**

1. All resistor values are in ohms at 1/4 watt unless otherwise specified.
2. All capacitor values in  $\mu\text{F}$  unless otherwise specified.
3. Junction points refer to terminal pins on individual PCB assemblies.