



## 1592A MIXER/AMPLIFIER

### OPERATING INSTRUCTIONS



Figure 1. 1592A Mixer/Amplifier

#### SPECIFICATIONS

Type: Mixer-Amplifier

Gain: 87 dB with 1578A or 1588A Plug-In Microphone Preamp. 40 dB with 15095 Plug-In Transformer, bridging 600 ohm line.

Frequency Response:  $\pm 1$  dB, 20-20,000 Hz.

Power Output: +21 dBm at less than 1% THD  
+18 dBm at less than 0.5% THD, 30-20,000 Hz.

Monitor Output: 6 dB below amplifier output, into 600 ohm load with Monitor-Control full on.

Source Impedance: 150/250 ohm nominal with 1588A Pre-amplifier (balanced input).  
150 to 20,000 ohm with 1578A Pre-amplifier (unbalanced input).  
Up to 50,000 ohm with 1579A equalized (phono) amplifier.  
600 to 15,000 ohm with 15095 Transformer (balanced).

Load Impedance: 150 and 600 ohm (transformer isolated output).

Noise Level: -120 dBm equiv. input noise: Output noise with master gain-control closed: 80 dB below full output.

Controls: 5 Mixer, 1 Master, 1 Bass, 1 Treble, 1 Monitor-Volume; Dialog equalizer switch for each input (-6 dB at 100 Hz); Articulation equalizer switch for output (+3 dB at 5 KHz); VU Meter Range Switch; Test-Tone off-on switch; Tone-Control in-out switch; Power switch controlling ac or dc power source.

Input Connectors: 5 Cannon XLR 3-13 Receptacles.

Power Supply: 120/240V ac 50/60 Hz 10W; or 12V dc @ 0.16A or 24V dc @ 0.17A (Battery (-) is ground).

Dimensions: 5-1/4" H x 19" W x 5-1/4" D


Color: Dark Green

Weight: 12 lbs.

Accessories: 1588A Plug-In Transformer Isolated Input Pre-amplifier (Microphone).  
1578A Plug-In Pre-amplifier (Microphone).  
1579A Plug-In Equalized Amplifier for magnetic phono pickup.  
15095 Plug-In Transformer (high-level balanced line bridging input).  
15356 Plug-In Transformer, matched input.  
41222 VU Meter.  
12866 Portable Carry-Case.

*Specifications and components subject to change without notice. Overall performance will be maintained or improved.*



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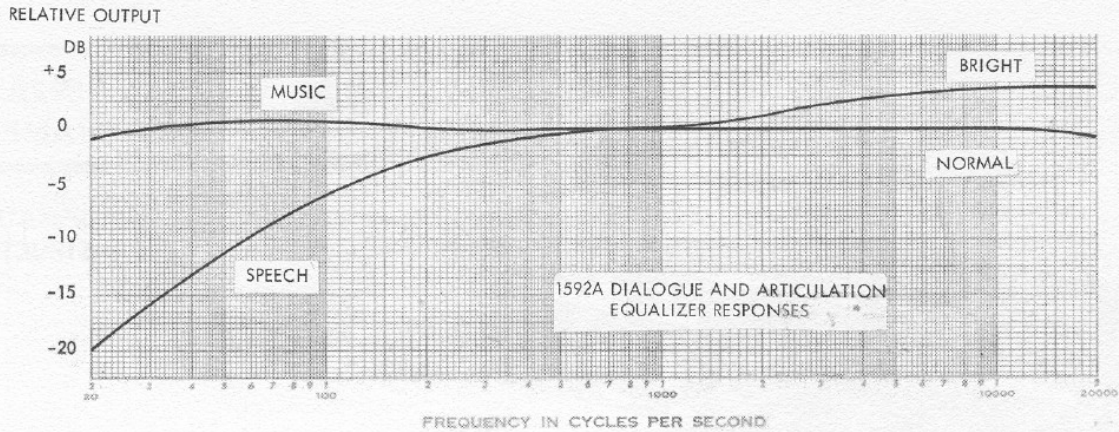


Figure 2

DESCRIPTION

The ALTEC 1592A is an all Solid-State Mixer Amplifier having FIVE INDEPENDENT INPUTS, any of which may be used for low or high impedance microphones, magnetic phonograph pickups or high-level sources. Plug-in accessories available provide for impedance matching, preamplification, or equalization. Each input is equipped with a Speech/Music switch, in conjunction with its Mixer Control, to allow dialog equalization. A Normal/Bright switch, associated with the Master Gain Control, gives a rise in response in the 3 to 5 KHz region, for articulation enhancement. Response curves illustrating the performance of the 1592A when using these controls is shown in Figure 2. The 1592A provides a smooth frequency response at less than 1% total harmonic distortion, 20 to 20,000 Hz, less than 0.5% THD, 30 to 20,000 Hz. (See Figure 3). Power outputs are +21 dBm (at less than 1% THD) and +18 dBm (at

less than 0.5% THD). Gain is 87 dB with the 1588A plug-in microphone preamplifier; 44 dB with a 15095 plug-in transformer bridging a 600 Ω line (see Input Connection descriptions). Bass and treble tone controls are provided with their functions illustrated in Figure 4.

Power for the 1592A can be derived from 120V or 240V 50/60 Hz ac lines, or from 12/14V or 24/28V dc sources. The change of battery source voltage i.e., 12/14 to 24/28V is accomplished with a rear-panel slide-switch, equipped with a locking plate (Figure 5). When ac and battery power are both connected, the amplifier operates from the ac source and automatic transfer to battery power is achieved if the ac source fails.

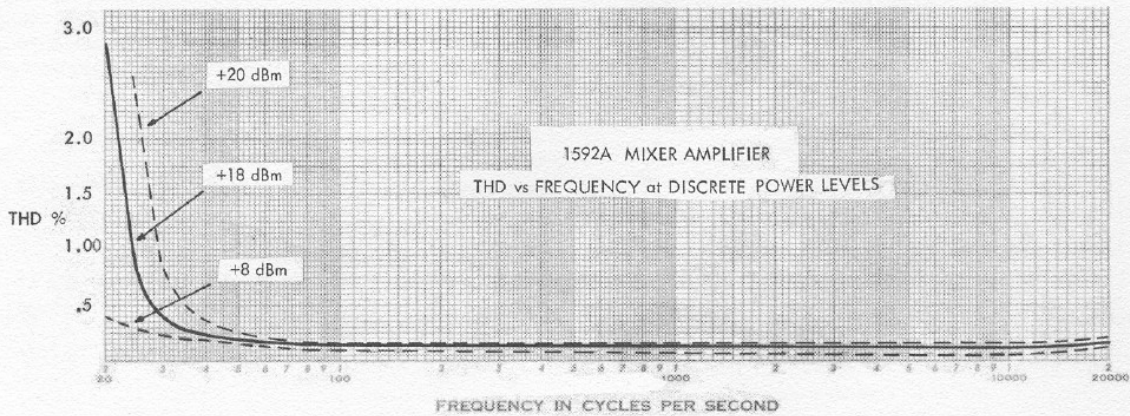


Figure 3

ADDITIONAL ALTEC FEATURES

1. BUILT-IN TEST TONE (nominally 1000 Hz) to aid in setting system levels, adjusting compressor thresholds, and checking multiple-speaker arrangements. The Test Tone is switch-activated on the equipment front-panel, and its level is adjusted by the Mixer-1 Control.

2. MONITOR PHONE JACK AND VOLUME CONTROL.

An independent monitor winding is contained in the output transformer. The monitor output terminates in a standard headphone jack on the front-panel, with its own volume level control.

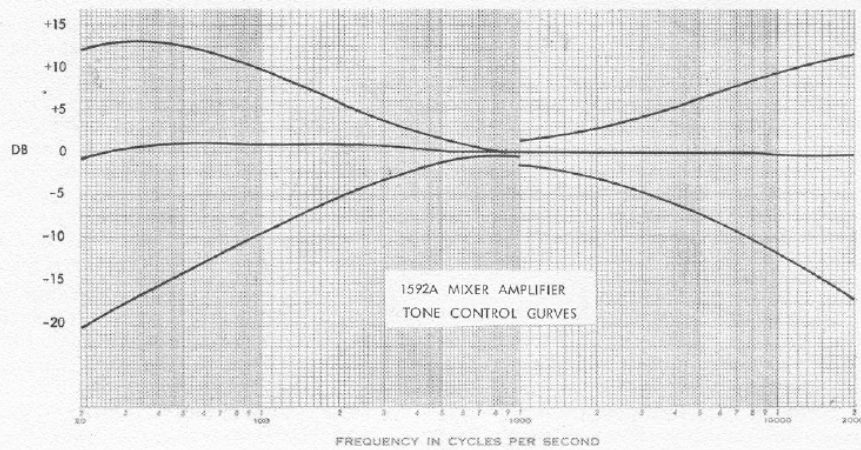


Figure 4

3. MEANS FOR PARALLELING a pair of 1592A Mixer Amplifiers -- is accomplished at a midpoint in their circuitry. Externally, the amplifiers are connected by a single coax patch-cord between the "Multiple Master Jacks" on their rear panels (Figures 5 and 6). There are two multiple master jacks on the rear panel of each amplifier, so that up to 4 amplifiers may be paralleled in a single system.

Note: When more than two 1592A Amplifiers are paralleled in a single system, make certain that the signal-to-noise ratio meets the optimum sound standards.

When two 1592A's are paralleled, the Master Control

of each amplifier can be used to control its 5 inputs and 1 output, or the Master Control of either amplifier may be used to control all 10 inputs to their respective outputs. Such an arrangement proves indispensable, for example, at a large gathering where radio/TV and public-address (sound reinforcement) requirements originate from one group of microphones. One output line, with its own Master Control and VU Meter (see accessories) would feed the house reinforcement system; the other master control setting the level for the network line (Figure 6).

The tone control on each amplifier will control only the 5 inputs being fed to that amplifier.

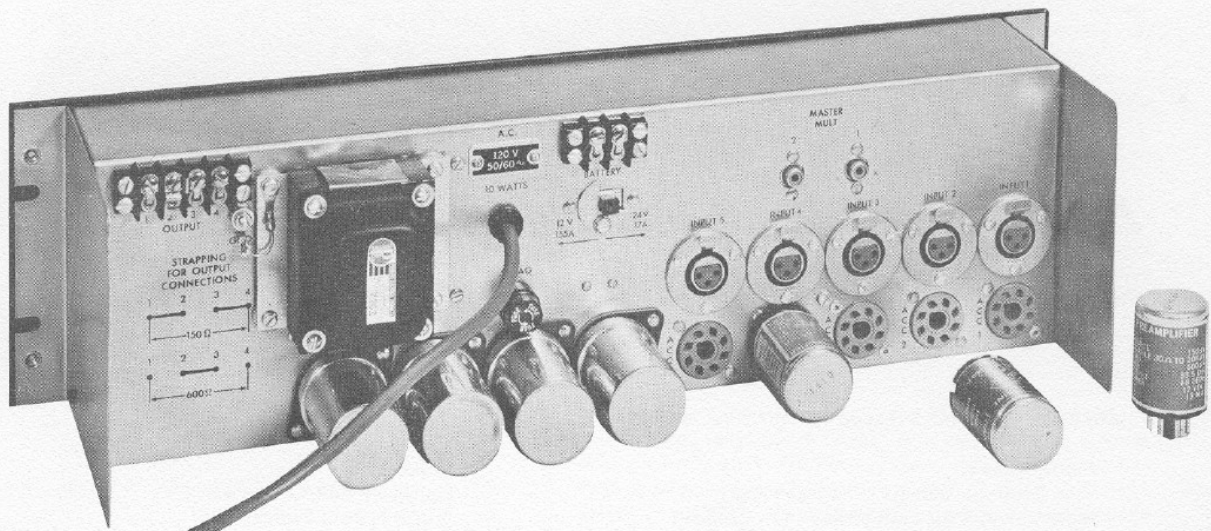


Figure 5. Rear View of 1592A

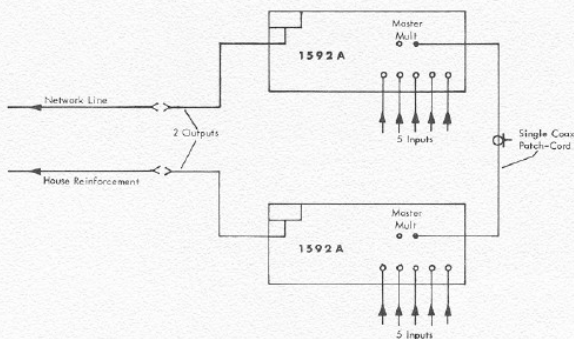


Figure 6. Paralleling two 1592A Mixer-Amplifiers

4. DEFEAT OF TONE CONTROLS (variable low and high frequency tone controls with front-panel controls) is incorporated in the event fixed equalization is utilized at some other point in the system. This is accomplished by turning Tone Controls "OFF" at labeled switch, available only from inside chassis (Figure 7).
5. A FOUR-INCH METER, MODEL 41222, is available

as an accessory. All circuitry for the meter, including front-panel range switch, are standard, pre-wired parts of the amplifier, and provisions are made for meter mounting and illumination. The VU Meter can be installed in minutes, without soldering. (Figure 13).

6. ALTEC HINGE-MECHANISM, on which the front-panel is mounted, allows the panel to be opened while the unit is in operation, without interrupting program material or requiring removal of the amplifier from its rack. (Figure 7).
7. PORTABILITY of the 1592A is enhanced by its weight of only 12 pounds, and an optional, accessory carry-case, Model 12866, fitted and leather-bound, with luggage-type grip. The lid of the carry-case is compartmentalized for cable and microphone storage.
8. ABRASION-RESISTANT LETTERING is featured on the 1592A front-panel, which also has bleached "write-in" blocks for channel identification. Background areas of the panel are etched and colored in non-glare green.
9. The 1592A Mixer Amplifier is constructed on a standard 19" rack chassis, occupying but 5 1/4" of mounting space.

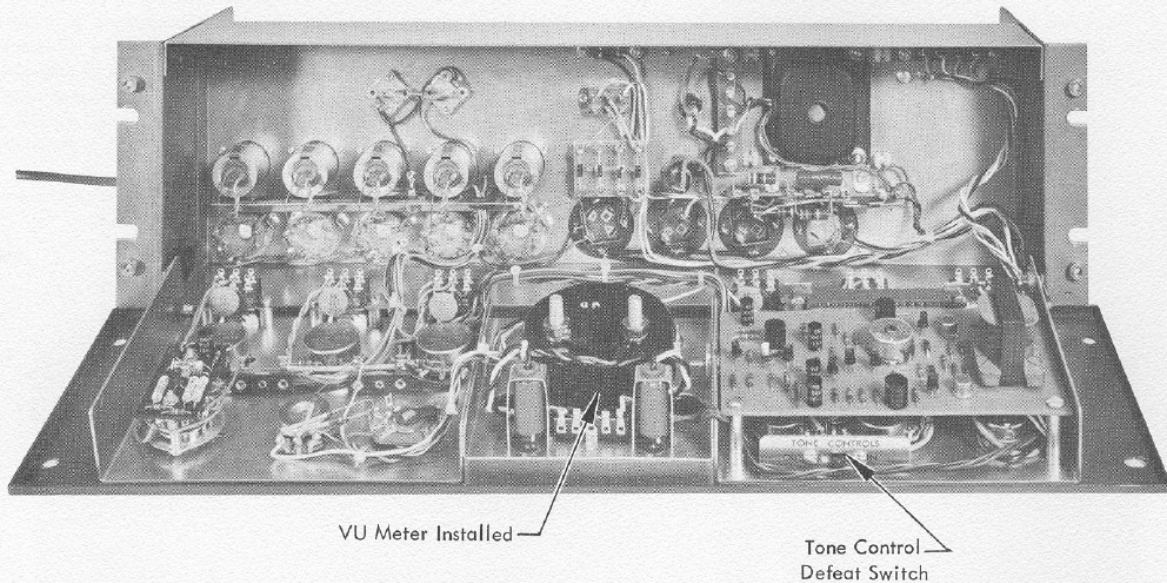


Figure 7. 1592A Mixer-Amplifier with Front Panel Open

FRONT PANEL CONTROLS (Figure 1).

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Master Control</li> <li>2. Tone Controls: Bass (LF) and Treble (HF)</li> <li>3. Mixer Controls for each of five input channels</li> <li>4. VU Meter Range adjustment (if VU used)</li> <li>5. Monitor volume control and output jack</li> <li>6. Test Tone ON/OFF switch (Tone level adjusted at</li> </ol> | <ol style="list-style-type: none"> <li>Mixer-1)</li> <li>7. Equipment ON/OFF switch</li> <li>8. Bright/Normal Switch</li> <li>9. Speech/Music Switch</li> </ol> |
|---|---|

## REAR PANEL CONTROLS (Figure 5)

1. Battery voltage selector (12/14V or 24/28V dc) slide-switch with locking plate.
2. Output Strapping Connections (Figures 5 and 12).
3. Multiple Master Jacks (Figures 5 and 6).
4. Individual channel plug-in accessory sockets (Figure 5).

## INPUT CONNECTIONS

Five input signals may be connected to the amplifier with standard, three-pin XL connectors, and may be used in any combination of microphone, magnetic phono, or high-level line by using the appropriate plug-in accessory in the socket beneath the input female plug. Four types of plug-in accessories are available for the input circuits. Following are descriptions of the plug-in accessories, with curves and graphs to aid use and installation.

Figure 11 illustrates the proper connections required for the individual plug-in accessories.

### 1578A TRANSISTOR PREAMPLIFIER

The 1578A Transistor Preamplifier is designed as a microphone preamplifier with a gain of 33.5 dB. Sensitivity is 43 millivolts rms for an output of +8 dBm. Frequency response is  $\pm 1.5$  dB, 20-20,000 Hz, or  $\pm 1.5$  dB, 15-50,000 Hz. Source impedance is 150  $\Omega$  nominal, usable 30 to 20,000  $\Omega$ . Equivalent input noise is -122 dBm. The 1578A requires 12V dc at 13 mA. Input connections are shown in Figure 11. The curve in Figure 8 illustrates the performance of the 1578A.

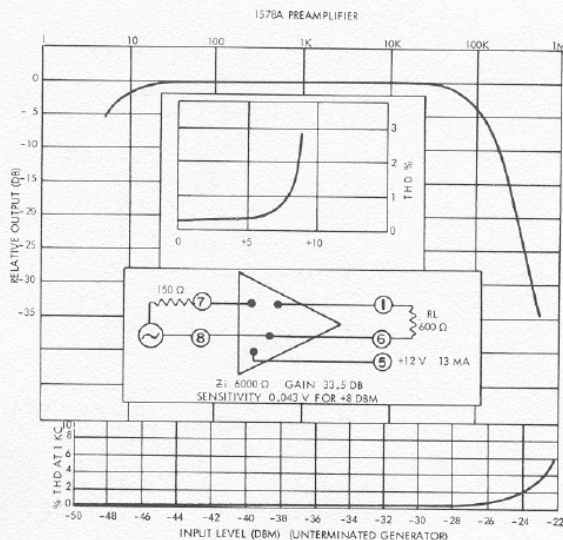


Figure 8

### 1588A MICROPHONE PREAMPLIFIER

The 1588A Transistor Preamplifier has a transformer-isolated input and is designed for use with microphones. The 1588A has a gain of 33.5 dB and a frequency response of  $\pm 1$  dB from 30

to 30,000 Hz. Source impedance is 150/250  $\Omega$  and the load impedance is 600  $\Omega$ . The 1588A is encased in mu-metal providing effective magnetic shielding for the input transformer of 90 dB. The equivalent input noise level is -122 dBm. Physically and electrically the 1588A is interchangeable with the 1578A Preamplifier. Input connections are the same as those shown for the 1578A in Figure 11. The curve in Figure 9 illustrates the performance of the 1588A.

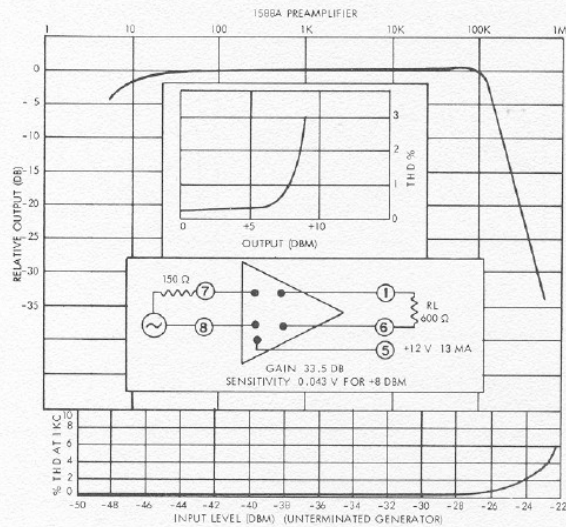


Figure 9

### 1579A PHONO EQUALIZED PREAMPLIFIER

The 1579A Phono Equalized Preamplifier is specially designed for magnetic phono pick-ups to meet the RIAA standard. Sensitivity is 5 millivolts for 70 millivolt output at 1 KHz. Output is +9 dBm at less than .5% THD (total harmonic distortion). Input impedance is 47,000  $\Omega$  and power required is 12V dc at 11 mA. Input connections are shown in Figure 11. Figure 10 illustrates the performance of the 1579A as referenced to the RIAA standard.

### 15095 LINE TRANSFORMER

The 15095 Line Transformer may be used as a bridging transformer in the input of the 1592A mixer/amplifier for bridging a balanced 600  $\Omega$  line. When a terminating function rather than a bridging function is required a 680  $\Omega$  resistor is added between pins 2 and 3 of the XL connectors.

### OPERATION (Normal Settings)

For average input signals, Mixer and Master Gain controls should be set for a loss of 14 dB. With these settings, average microphone levels will produce Zero VU line levels. When high-gain power amplifiers, such as ALTEC 1568A and 1569A follow the 1592A, the gain control on the power amplifier must be set for sufficient attenuation to prevent overdriving the loudspeakers. It is important that the loss be taken in the power amplifier, rather than in the Master Control of the 1592A,

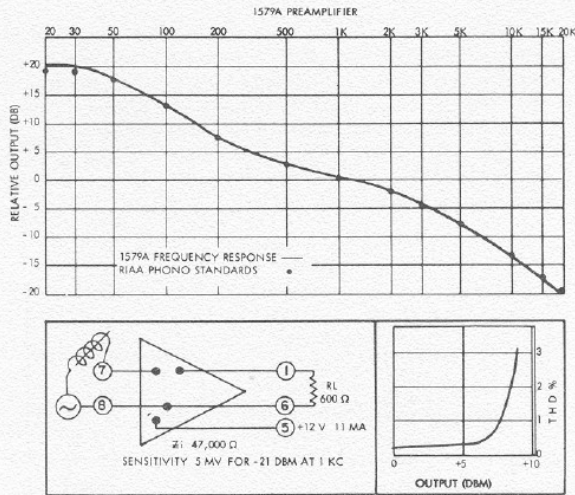


Figure 10

in order to preserve optimum signal-to-noise ratio.

Compressor Amplifiers connected between the 1592A and following amplifiers may provide excessive gain, which must be attenuated. The following adjustment procedure is suggested:

1. Set the 1592A operating controls at "normal" settings.
2. With a typical signal feeding the 1592A, adjust attenuation at the input of the compressor amplifier to provide the desired amount of compression. If a control is not provided on the compressor equipment, an attenuator or fixed pad must be added.
3. Adjust power amplifier gain control for desired loudspeaker level.

IT IS IMPERATIVE THAT EXCESSIVE GAIN IS ATTENUATED AT THE POINTS INDICATED ABOVE, RATHER THAN BY GREATER LOSS SETTINGS OF THE MIXER AND MASTER GAIN CONTROLS. NOISE ASSOCIATED WITH THE 1592A WILL BE CAUSED IN MOST EVERY INSTANCE BY FAILURE TO FOLLOW THE ABOVE PROCEDURES.

VU METER ACCESSORY INSTALLATION (See Figure 13).

To install the 41222 VU meter, open the 1592A frontpanel. Remove the light shield located on the front of the panel by removing two screws, two nuts, two washers and two spacers. Discard the light shield and the hardware. Unclip the pilot lamp holders and remove the two screws which hold the meter mounting bracket in place. Mount the VU meter in the bracket with the bracket flanges facing toward the front of the meter. Return the mounting bracket to its original position and secure with the two screws. Clip the pilot lamp holders into the upper set of bracket cut-outs. Attach the prepared leads to the VU meter terminals, observing polarity.

CARRYING CASE ASSEMBLY

The 12866 Assembly consists of a fitted case having two covers, two brackets and eight screws, furnished as loose parts. The 1592A mounts on the brackets when they are attached to the

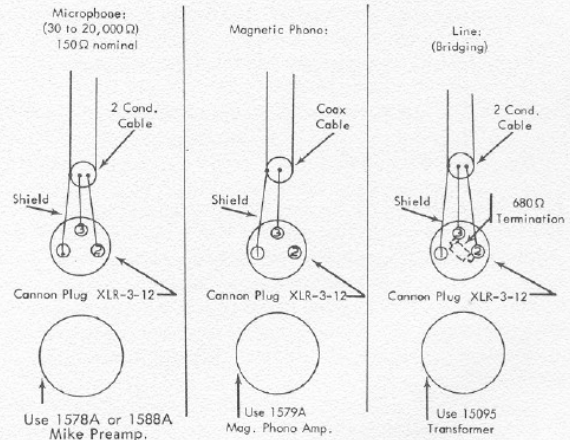


Figure 11

ends of the cabinet. The brackets are fastened to the cabinet, using four of the screws furnished. The other four screws are used to fasten the amplifier chassis to the brackets. NOTE: Do not mix the four panel screws furnished as part of the 1592A with the case mounting screws. Both are of the same type, but of different lengths. The panel screws must not be greater than 1/4" in length, whereas the case screws are 3/8" in length.

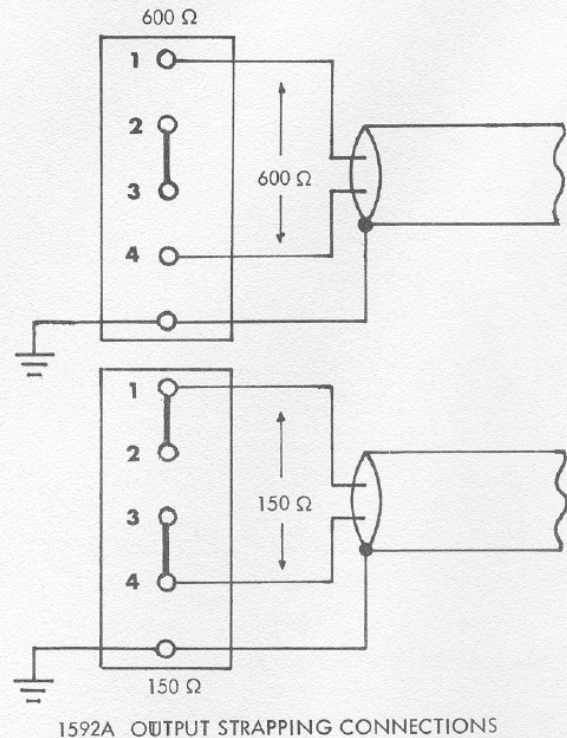
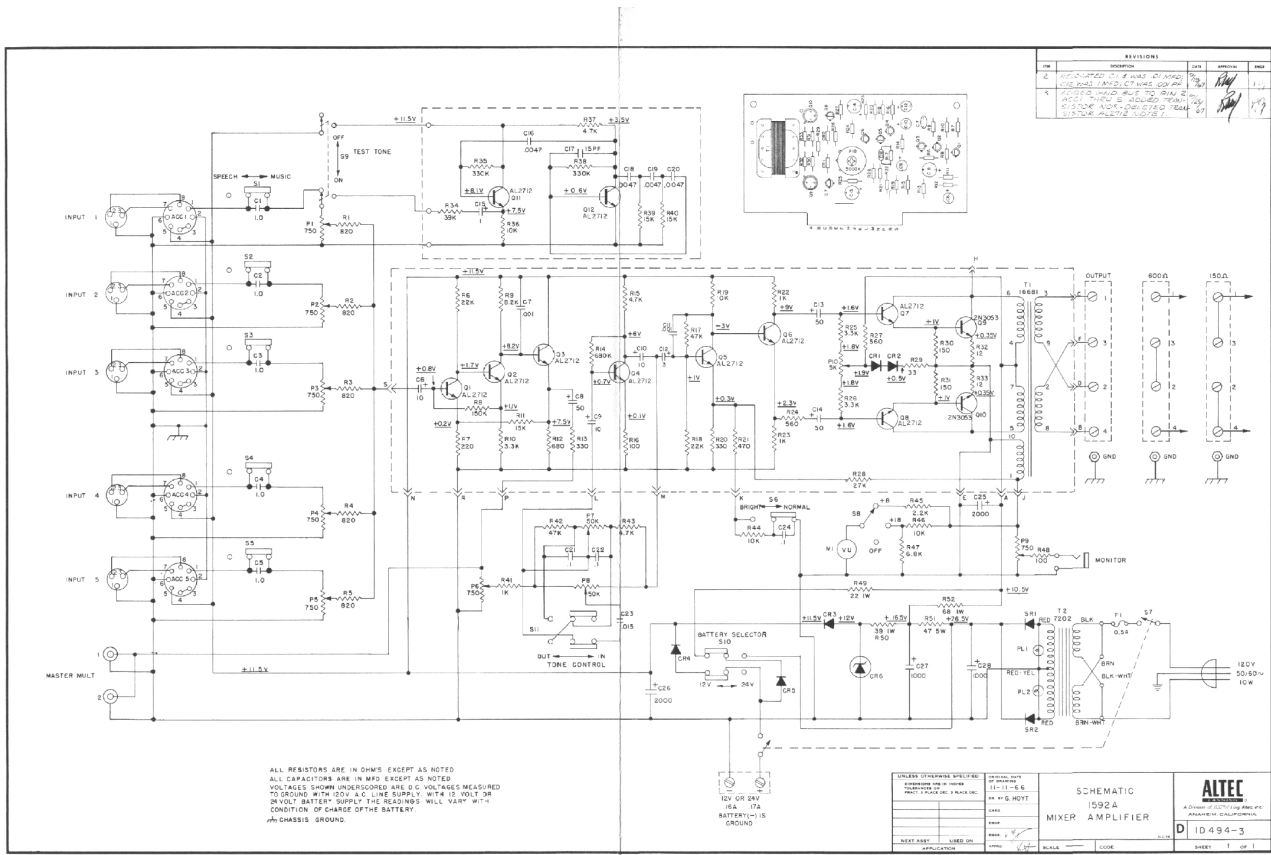


Figure 12

## PARTS LIST

Reference Designator	Name and Description	Reference Designator	Name and Description
C1,2,3,4,5	Capacitor, 1.0 $\mu$ F, 3V (Centralab UK105)	R14	Resistor, 680K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C6,9,10	Capacitor, 10 $\mu$ F, 15V (Callins 2-55UPSS10-15)	R15,37,42,43	Resistor, 4.7K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C7,11	Capacitor, .001 $\pm$ 10%, Ceramic Disc, 1/4" lead spacing	R16,48	Resistor, 100 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C8,13,14	Capacitor, 50 $\mu$ F, 15V (Callins 4-55UPSS50-15)	R17	Resistor, 4.7K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C12	Capacitor, 3 $\mu$ F, 15V (Callins 2-55UPSS3-15)	R19,36,44,46	Resistor, 10K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C15	Capacitor, 1.0 $\mu$ F, 15V (Callins 2-55UPSS1-15)	R21	Resistor, 470 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C16,18,19,20	Capacitor, .0047 $\pm$ 10%, 100V (C.D. #WMF1D47)	R22,23,41	Resistor, 1K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C17	Capacitor, 15 $\mu$ F $\pm$ 10%, Ceramic Disc, 1/4" lead spacing	R24,27	Resistor, 560 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C21,22,24	Capacitor, 0.1 $\mu$ F, $\pm$ 10%, 100V (C.D. #WMF1P1)	R28	Resistor, 27K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C23	Capacitor, .015 $\mu$ F, $\pm$ 10%, 100V (C.D. #WMF1S15)	R29	Resistor, 33 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C25,26	Capacitor, 2000 $\mu$ F, 15V, 1-3/8 x 2" (Sprague TVL1168 or Mallory WP041A)	R30,31	Resistor, 150 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
C27,28	Capacitor, 1000 $\mu$ F, 35V, 1-3/8 x 2" twist-lock type (Sprague or Mallory or C.D.)	R32,33	Resistor, 12 $\Omega$ $\pm$ 10%, 1/4W (A.B.)
CR1,2,3,4,5	Diode, Rectifier (Diodes Inc. #TS-1)	R34	Resistor, 39K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
SR1,2	Diode, Rectifier (Diodes Inc. #TS-1)	R35,38	Resistor, 330K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
CR6	Diode, Zener, 12V $\pm$ 5%, 2W (Semcor #LMZX 12A)	R45	Resistor, 2.2K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
F1	Fuse, 0.5A 3AG type	R47	Resistor, 6.8K $\Omega$ $\pm$ 10%, 1/4W (A.B.)
P1,2,3,4,5,6	Potentiometer, 750 $\Omega$ (ALTEC 13600-2)	R49	Resistor, 22 $\Omega$ $\pm$ 10%, 1W (A.B.)
P7,8	Potentiometer, 50K linear (ALTEC 14573-1)	R50	Resistor, 39 $\Omega$ $\pm$ 10%, 1W (A.B.)
P9	Potentiometer, 750 $\Omega$ (ALTEC 14574-5)	R51	Resistor, 47 $\Omega$ $\pm$ 10%, 5W W.W. Axial leads
P10	Potentiometer, (ALTEC 14698-1)	R52	Resistor, 68 $\Omega$ $\pm$ 10%, 1W (A.B.)
PL1,2	Pilot Lamp, 28V 40 MA, (GE #1819)	S1,2,3,4,5,6	Switch, Rocker DPDT, Stackpole RS50 with flat bracket and Style C white knob
Q1,2,3,4,5,6,7,8,11,12	Transistor, (ALTEC 2712)	S7	Switch, Power CTS type SWF 125V 3A, 20V 5A 3/8" lg bushing-shaft length 11/16" fms.
Q9,10	Transistor, 2N3053	S8	Switch, Rotary (Centralab type PA215) (1 pole 3 pos.) with locating lug, 3/8" lg bushing, shaft length 3/4" fms.
R1,2,3,4,5	Resistor, 820 $\Omega$ $\pm$ 10%, 1/4W (A.B.)	S9	Switch, Rotary (ALTEC 41238-1)
R6,18	Resistor, 22K $\Omega$ $\pm$ 10%, 1/4W (A.B.)	S10	Switch, Slide DPDT, (Stackpole SS-50) blk trigger
R7	Resistor, 220 $\Omega$ $\pm$ 10%, 1/4W (A.B.)	S11	Switch, Slide miniature, DPDT (Continental Wirt G126ETMH4-40)
R8	Resistor, 150K $\Omega$ $\pm$ 10%, 1/4W (A.B.)	T1	Transformer - Output (ALTEC 16681)
R9	Resistor, 8.2K $\Omega$ $\pm$ 10%, 1/4W (A.B.)	T2	Transformer - Power (ALTEC 7202)
R10,25,26	Resistor, 3.3K $\Omega$ $\pm$ 10%, 1/4W (A.B.)		Phone Jack, single circuit, nylon (Switchcraft N-111)
R11,39,40	Resistor, 15K $\Omega$ $\pm$ 10%, 1/4W (A.B.)		Knob, 1-1/2", (Kurz-Kasch S-1653-3L)
R12	Resistor, 680 $\Omega$ $\pm$ 10%, 1/4W (A.B.)		Knob, 1", (Kurz-Kasch S-1647-3L)
R13,20	Resistor, 330 $\Omega$ $\pm$ 10%, 1/4W (A.B.)		Knob, 3/4", (Kurz-Kasch S-1645-3L)
			Phono Jack, insulated, (Switchcraft #3511 or Carter K21)
			Fuseholder, Bus (HKP)
			AC Cord Set (Belden #17237)
			Condenser Wafer (Mallory BP6)

REV	DESCRIPTION	DATE	BY	CHKD
1	REVISED TO # 1000 OF DRAWING	11-1-58		
2	REVISED TO # 1000 OF DRAWING	11-1-58		
3	REVISED TO # 1000 OF DRAWING	11-1-58		
4	REVISED TO # 1000 OF DRAWING	11-1-58		
5	REVISED TO # 1000 OF DRAWING	11-1-58		
6	REVISED TO # 1000 OF DRAWING	11-1-58		
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8	REVISED TO # 1000 OF DRAWING	11-1-58		
9	REVISED TO # 1000 OF DRAWING	11-1-58		
10	REVISED TO # 1000 OF DRAWING	11-1-58		



ALL RESISTORS ARE IN OHMS EXCEPT AS NOTED  
 ALL CAPACITORS ARE IN MFD EXCEPT AS NOTED  
 VOLTAGES SHOWN UNDERSCORED ARE D.C. VOLTS MEASURED  
 TO GROUND WITH 20V A.C. LINE SUPPLY WITH 13 VOLT OR  
 28 VOLT BATTERY SUPPLY THE READINGS WILL VARY WITH  
 CONDITION OF CHARGE OF THE BATTERY  
 IN-CIRCUIT GROUND

UNLESS OTHERWISE SPECIFIED USE: STANDARD RESISTOR AND CAPACITOR TOLERANCE: 5% RESISTOR, 10% CAPACITOR PARTS LISTED IN DRAWING	27 5000 11-1-58 BY H. G. HOYT CHECKED DRAWN PARTS LISTED IN DRAWING SCALE 1:1000 SHEET 1 OF 1	<b>SCHEMATIC</b> <b>192A</b> <b>MIXER AMPLIFIER</b> <b>ALTEC</b> 4000 ELECTRONIC BLDG. ANAHEIM, CALIFORNIA <b>D 10494-3</b>
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Figure 14