Bulletin SE-08

Universal Audio 1108

Solid State Amplifier

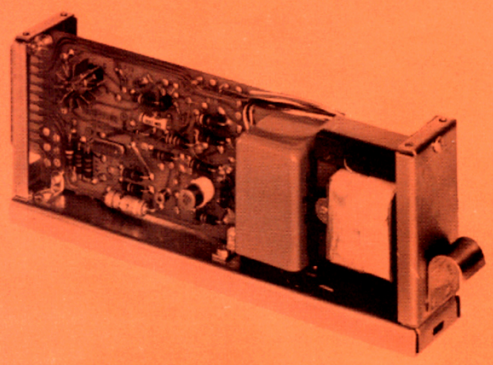
The Universal Audio 1108 amplifier from Studio Electronics Corp. is the first professional audio amplifier to use a field-effect transistor in the first stage to achieve an extremely low noise figure. At the same time, the 1108 preserves the envelopmental-equalization concept pioneered over a decade ago by Universal Audio and can serve as a direct, solid-state replacement for the current 1008 vacuum-tube amplifier.

Designed primarily as a microphone preamplifier, the 1108 can also be used to advantage as a booster or line amplifier. Impedance matching for both the input and the output is accomplished by straps on the mounting-tray connector into which the amplifier is plugged. All the 1108 amplifiers in a system are therefore completely interchangeable, since the fixed trays, not the plug-in amplifiers, carry the particular strapping.

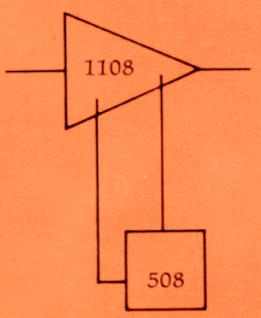
Silicon planar transistors and unique stabilization circuits provide stable operation despite wide variations in inductive and capacitive loads and ambient temperatures. A plug-in accessory (see back page) allows the input level to the first stage to be remotely adjusted to protect against overloads from high-level sources, such as capacitor microphones.

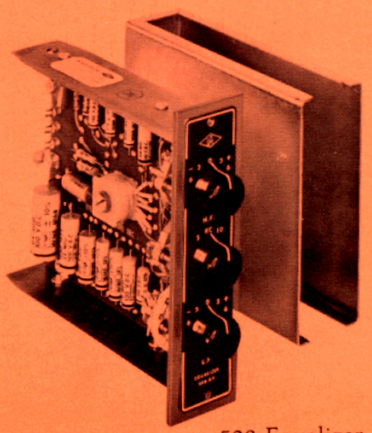
"Envelopmental equalization" is achieved by electronically enclosing an external equalizer within an active feedback loop of the amplifier, as shown in the block diagram below. Used with the Universal Audio 508-A equalizer, the 1108 provides flexible equalization with zero gain loss. High-frequency equalization (switch selectable at 5 or 10 kHz) can be set at 0, plus 3, 6, or 9 db boost, or minus 3 or 6 db rolloff at 10 kHz. Low-frequency equalization can be set at 0, plus 3, 6, or 9 db boost, or minus 3 or 6 db rolloff at 50 Hz. The two units can be separated by as much as 25 feet and interconnected simply by a shielded pair of conductors. The 1108 can also be used without the 508-A equalizer as a flat preamplifier.

The Universal Audio 1108 is $1^1/_2$ inches wide, 3 inches high and $9^1/_4$ inches deep. The amplifier is supplied with a dustcover and is normally mounted in an accessory tray provided with a printed-circuit connector. See back page for complete specifications and accessories.



1108 Amplifier





508 Equalizer

Technical Specifications

Gain	Selectable 40 db or 45 db with input terminated. Selectable 45 db or 50 db with input unloaded.
Power Output	+22 DBM equalized channel power output with less than 0.5% total harmonic distortion from 30 Hz to 15,000 Hz. (Equivalent to an available power output requiring an amplifier to deliver +36 DBM when used with a conventional equalizer of 14 db insertion loss.)
Frequency Response	±0.5 db from 20 Hz to 20,000 Hz.
Source Impedance	50, 150 or 600 ohms.
Input Impedance	Nominally five times rated source impedance. (Secondary of input transformer virtually unloaded.)
Output Impedance	Designed to work into loads of 150 or 600 ohms. Internal output impedance is approximately 10% of rated load impedance.
Noise	Equivalent to an input signal of −124 DBM maximum.
Thermal Stability	No change in operating characteristics to +195 degrees Fahrenheit.
Power Requirement	+24 vdc at 45 milliamperes. (Internal protection against inadvertent polarity reversal optional.)
Mounting	Mates with 1108-TP accessory tray and plug assembly, which does *not* add to the 1 1/2" maximum width of the amplifier chassis.
Size	1 1/2" wide, 3 1/8" high, 9 1/4" deep (including tray).

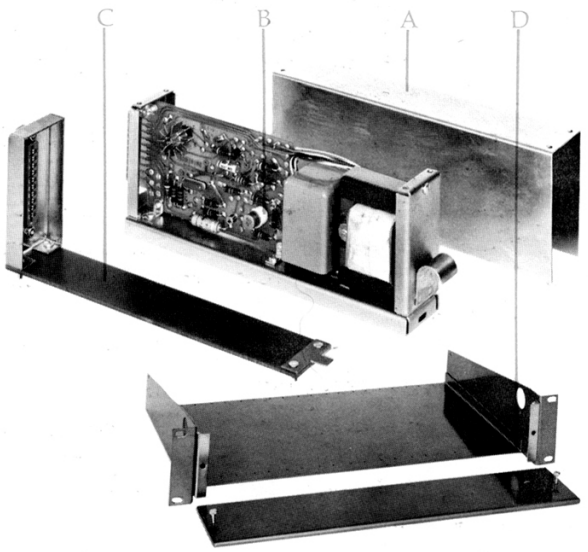
Accessories

A. *1108 Dust Cover* is provided with each amplifier at no extra charge. The dust cover is attached with four screws and serves to enclose and protect all circuitry.

B. *1108 LDR "Inputrim"* is a plug-in accessory, housed in a TO-5 case, that allows gain to be remotely adjusted to accommodate a wide range of input levels.

C. *1108 TP Tray and Plug* is required for installation of 1108 amplifier in audio systems. All impedance strapping is performed at the 10-pin mounting-tray connector.

D. *1608 Rack Mounting Shelf* is designed to hold up to ten 1108 trays and amplifiers. It fits a standard 19-inch rack and is 3 1/2 inches high.



Universal Audio
Division of Studio Electronics Corporation
11922 Valerio Street, North Hollywood, California
phone (213) 764-1500

SE-08-766-5-MP

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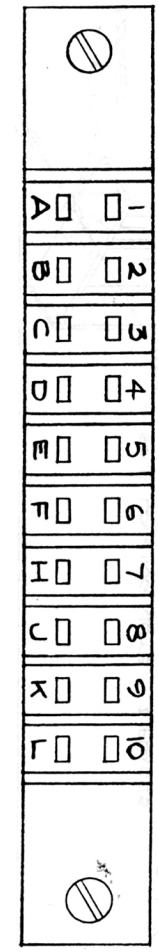


TERMINAL VIEW

INPUT	600 ohms :	Connect to L (+) and 10 (com.) Strap K to 9 (ct)
INPUT	150 ohms :	Connect to K (+) and 9 (com.) Strap K to L; strap 9 to 10
INPUT	37.5 ohms :	Connect to J (+) and 8 (com.) Strap J to K ; strap 8 to 9
OUTPUT	600 ohms :	Connect to A (+) and 1 (com.) Strap 2 to B
OUTPUT	150 ohms :	Connect to A (+) and 1 (com.) Strap A to B; strap 1 to 2
508 EQUALIZER	:	Connect EQ term # 1 to 5 Connect EQ term # 2 to 4 (B-) Connect EQ term # 3 to E
	Note	When 508 Equalizer is not used, connect 8200 ohm resistor between 5 and E
24 vdc. B+	:	Connect to 3 and C
24 vdc. B- (Gnd)	:	Connect to 4 and D
CHASSIS GROUND	:	Connect to 7 and H
INPUTRIM CONTROL	:	Connect control voltage minus to 6. Connect control pot arm to F.
	Note	IF INPUTRIM IS NOT USED, strap both 6 and F to 4 (B-)

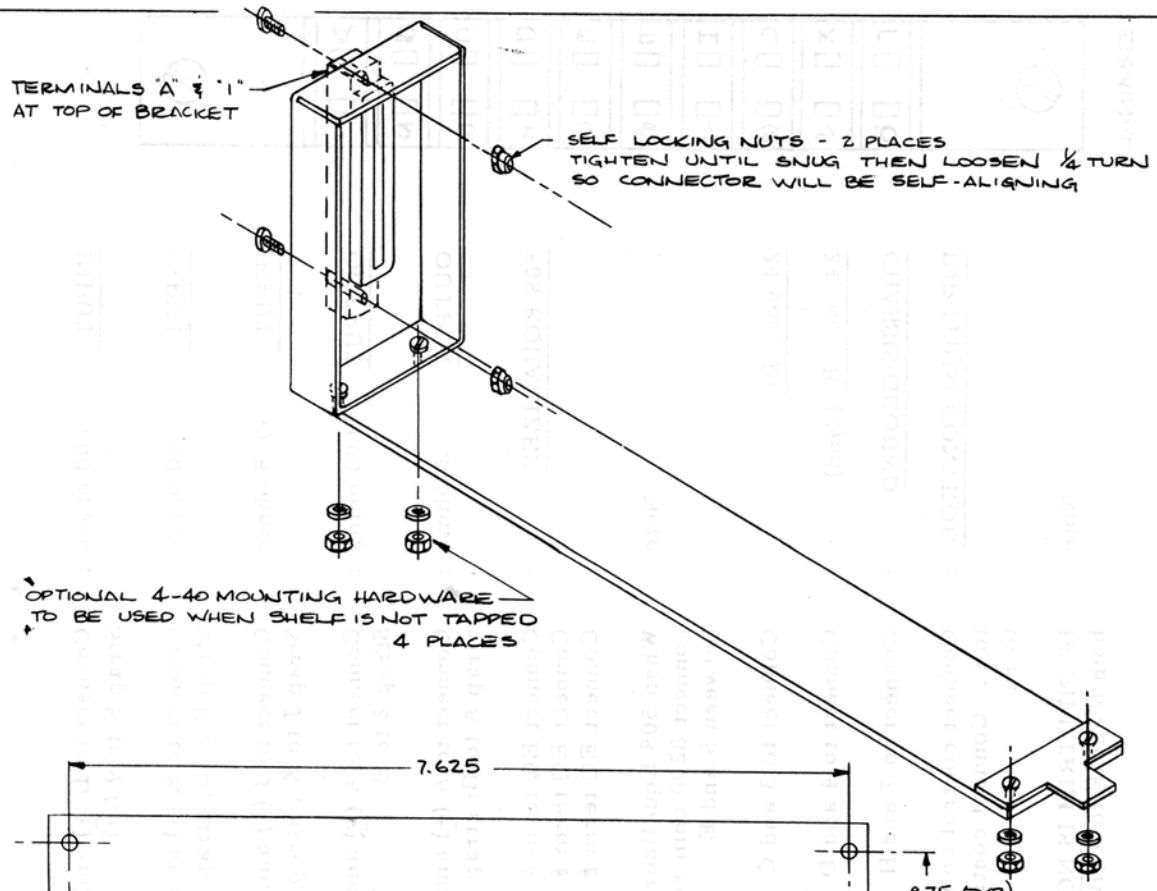
Total current drain per amplifier is 41 ma without INPUTRIM.

UNIVERSAL AUDIO DIV.
STUDIO ELECTRONICS CORP.
11922 VALERIO ST.
NO. HOLLYWOOD, CALIF. 91605

1108 TP TERMINAL CONNECTIONS & STRAPPING

DRAWN	RRA/12-8-66
DESIGN	
APPVD	

A-10735



MOUNTING DIMENSIONS

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1108 TP ASSEMBLY INSTRUCTIONS

DRAWN	GETER 4/6/66	B-10736
DESIGN		
APPVD		

UNIVERSAL AUDIO

MODEL 1108 SOLID-STATE AMPLIFIER

INSTALLATION NOTES and OPERATING SUGGESTIONS

In order to insure the most satisfactory operation of the 1108 amplifier and make maximum use of its unique features and excellent performance, it is important that attention be given to the following details:

1- The amplifier should be powered from a 24 vdc supply with low ripple (one mv. RMS maximum) and no regulator noise. In some instances the low-frequency noise produced by poor power supply regulator circuitry will exceed the residual noise of the amplifier.

2- It is extremely important that good grounding practice be followed in connecting the amplifier in a system, to prevent ground "loops". Separate connections for chassis ground and B- are provided at the receptacle. Note that opposing terminals on the receptacle are provided in each case for B+, B- and ground so that these circuits may be bussed through a bank of amplifier receptacles. It is suggested, however, that flexible wire be used, leaving a small arc between amplifiers to permit some receptacle movement for self-alignment of the amplifier plugs.

3- In cases where the LDR "Inputrim" device is <u>not</u> used, it is imperative that the LDR D. C. control terminals be strapped together and connected to B- (strap F and 6 to D and 4). Leave the jumper wire in the "Inputrim" socket (Pin # 1)

4- In cases where the "Inputrim is used:

A- Remove the jumper wire from " Inputrim" socket (Pin # 1) and insert the accessory "Inputrim" device into the 4-pin socket, aligning the tab with the index dot on the PC board between 1 and 4.

B- Refer to drawing # A-10733 for recommended external d. c. control circuitry for proper operation of the "Inputrim" device. Calibrate the "Inputrim" circuitry as follows:

a- Feed a 1 kHz signal into the amplifier, at a sufficient level to produce some convenient amplifier output reference level (for instance, "O" db on VU meter).

b- Turn the Inputrim control (300 ohm pot) to minimum <u>attenuation</u> position. (This may be clockwise or counter-clockwise, depending on how the control is wired. Some operators may prefer the control to provide full amplifier <u>gain</u> in the maximum clockwise position, and some may prefer maximum gain <u>attenuation</u> in this position).

4- B - Cont'd.

c - Adjust CALIBRATE control (1K pot which may be screwdriver slotted and mounted inconspicuously) to the threshold point at which the slightest amount of signal attenuation is observed on the output VU meter, (fraction of a db).

d - Next rotate the INPUTRIM control (300 ohm pot) to its 12 o'clock (1/2 rotation) position and note amount of attenuation indicated by VU meter. This should be between -7 and -10 db from the reference level.

e - Rotate the INPUTRIM control (300 ohm pot) to its maximum attenuation position (opposite full rotation from (b) above). The output meter should now indicate an attenuation of -18 to -24 db from the reference level.

f - Now rotate the INPUTRIM control fully in the opposite direction. Note that the output level will return slowly to within 0.25 db of the original reference output level.

g - By slightly readjusting the 1 K CALIBRATE pot and checking the 12 o'clock and full attenuation positions of the 300 ohm INPUTRIM controls you will be able to achieve the following "tracking" of the INPUTRIM control:

Minimum attenuation:	0.25 to 0 db
12 o'clock position:	-7 to -10 db
Maximum attenuation:	-18 to -24 db

Since the INPUTRIM device is used to prevent overloading the amplifier from high level microphones (such as capacitor types) it eliminates the need for any external microphone attenuator pads, and further permits convenient fader control settings over a wide range of levels from any microphones in use today.

5- The 1108 amplifier may be used with or without the 508 H or 508 V equalizer, with no change in performance in the "flat" position.

A - When used as a booster, line amplifier or non-equalized preamplifier, an 8200-ohm 1/4 or 1/2 watt 5 % resistor (supplied with the unit) should be connected between terminals 5 and E on the tray receptacle.

B - For use with the 508 Envelopmental Equalizer, a two-conductor foil-shielded pair with drain wire (Belden 8761 or equivalent) should be used to connect the equalizer to the amplifier tray receptacle, and may be up to 25 feet in length.

5- B- Cont'd.

High-capacity miniature audio cable will degrade the performance of the amplifier slightly and should not be used.

a- One wire of the pair connects between terminal E of the amplifier receptacle and terminal 3 of the 508 equalizer.

b- The other wire connects between terminal 5 of the amplifier receptacle and terminal 1 of the equalizer.

c- The drain wire (shield) connects between terminal 4 (B-) of the amplifier and terminal 2 of the equalizer.

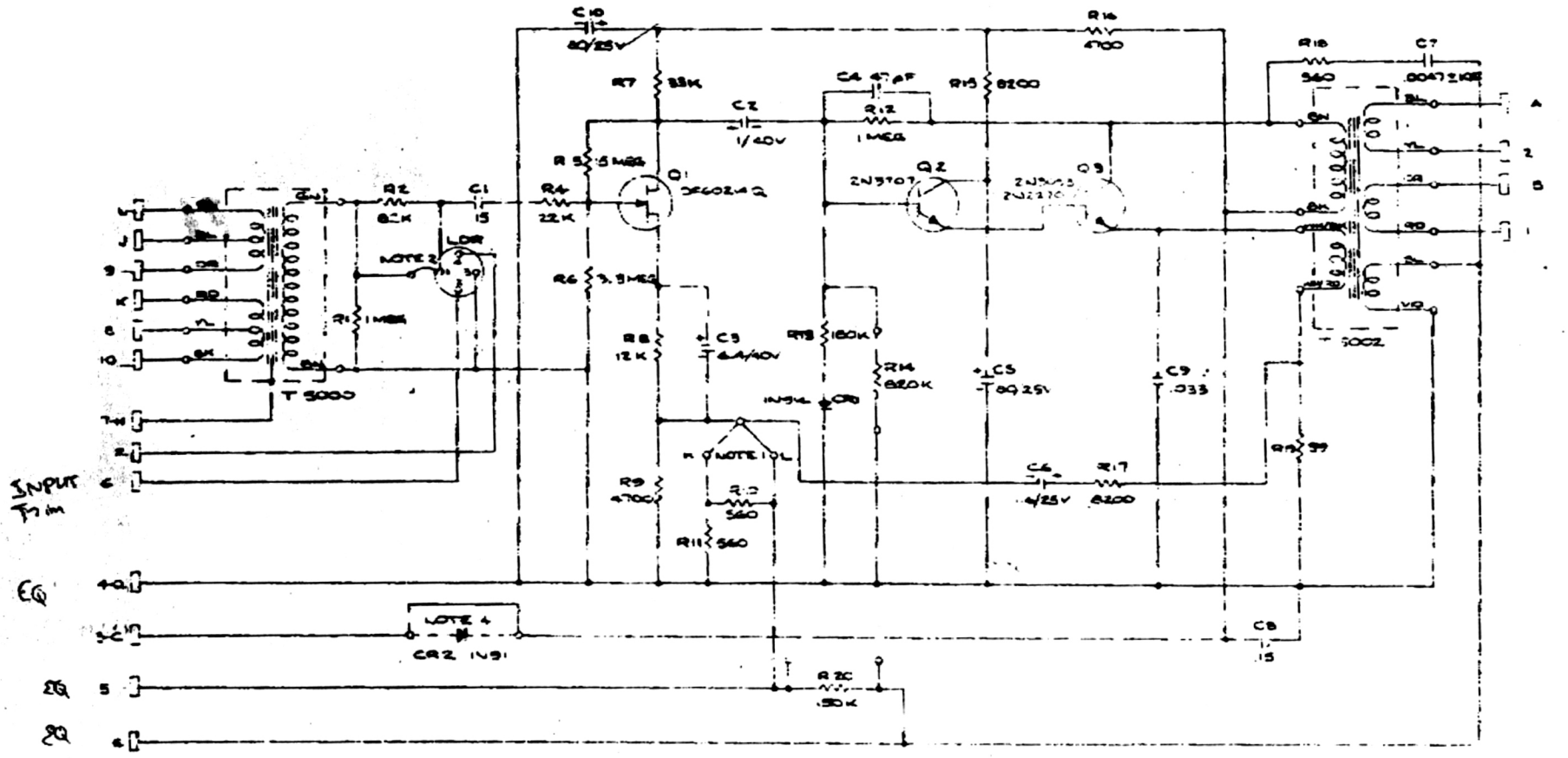
The case of the 508 equalizer should be well grounded (chassis ground), since it is not internally connected to B-. (This prevents a possible ground loop and hum).

6- The gain of the 1108 may be changed from 45 db (unterminated input) to 50 db by removing the internal strap from terminal L and reconnecting it to terminal H. (These terminals are located on the opposite side of the printed circuit board from the transistors, in the lower front corner near the plug end.) The amplifier will function properly with or without the 508 equalizer in either gain configuration. The equivalent input signal noise level remains: -124 dbm or better.

7- As stated in the specifications (Bulletin SE-08) the nominal input impedance of the 1108 is at least five times its source impedance for a given strapping from 30 Hz to 15 kHz. This is a great advantage in microphone preamplifier applications. However, in instances where the 1108 is used as a booster or program/line amplifier, or in cases where the input source fed to the amplifier requires a solid-matching termination (i.e, faders, pads, filters, equalizers, etc.) it is then necessary to externally terminate the source.
Recommended values for input termination resistors are:

From 600 ohm source:	680 ohms	5%
From 150 ohm source:	160 ohms	5%
From 37 1/2 ohm source:	47 ohms	5%

8- The internal output impedance of the 1108 is approximately 10% of the rated load, even to 20 kHz. This has the great advantage of minimizing the loading effect of high capacity audio cable, and makes the 1108 relatively insensitive to reactive loads.

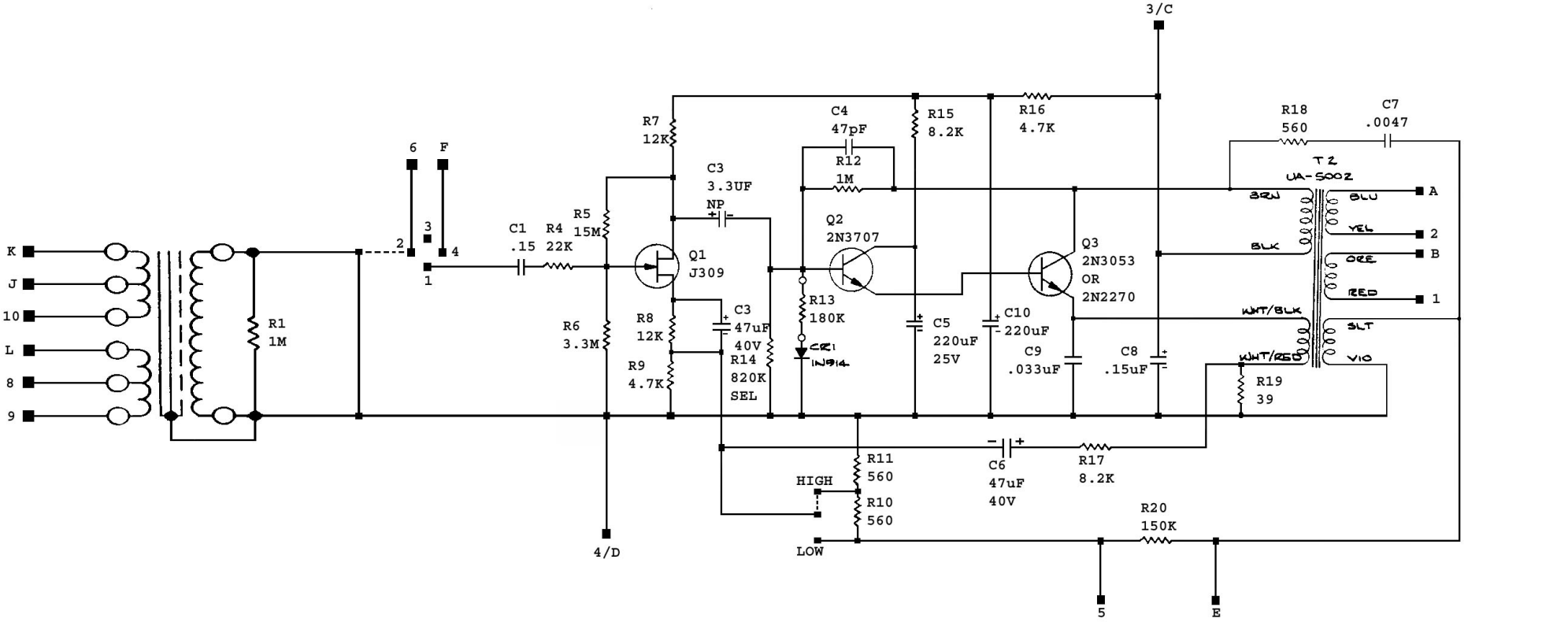


41 MA Current

NOTES:

1. HIGH-LOW GAIN STRAPPING. SEE INSTALLATION NOTES (6)
2. FOR DETAIL ON -10B SEE DWG A-10733
3. ALL RESISTOR VALUES IN OHMS, 1/2 W, 5%
   ALL CAPACITORS IN μF UNLESS OTHERWISE SPECIFIED
4. CR2 NOT FURNISHED, MAY BE ADDED
   FOR POLARITY PROTECTION
5. FOR TERMINAL CONNECTIONS AND STRAPPING
   SEE DWG A-10735

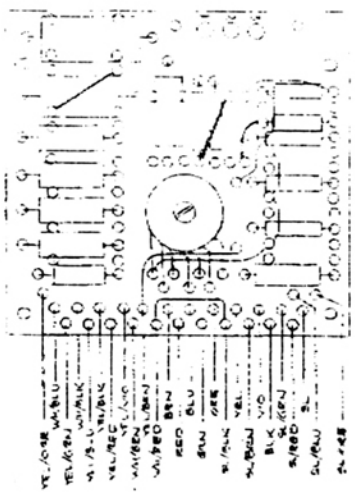
UNIVERSAL AUDIO DIV STUDIO ELECTRONICS CORP 11922 VALERIO ST NO. HOLLYWOOD, CALIF. 91605	MICROPHONE PREAMPLIFIER MODEL - 10B C-10635

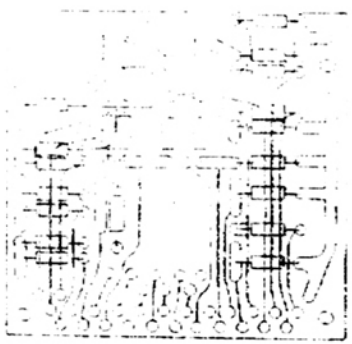


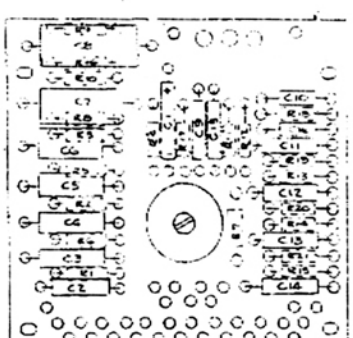
UNITED RECORDING ELECTRONICS INDUSTRIES

SCHEMATIC

1108 Mic Pre







W.

STUDIO ELECTRONICS CORPORATION 11922 VALERIO ST. NO. HOLLYWOOD, CALIF.	COMPONENT BOARD ASSY. EQUALIZER MODEL 506
	DRAWN: Gene Wade
	DESIGNED:
	APPVD: C-10383