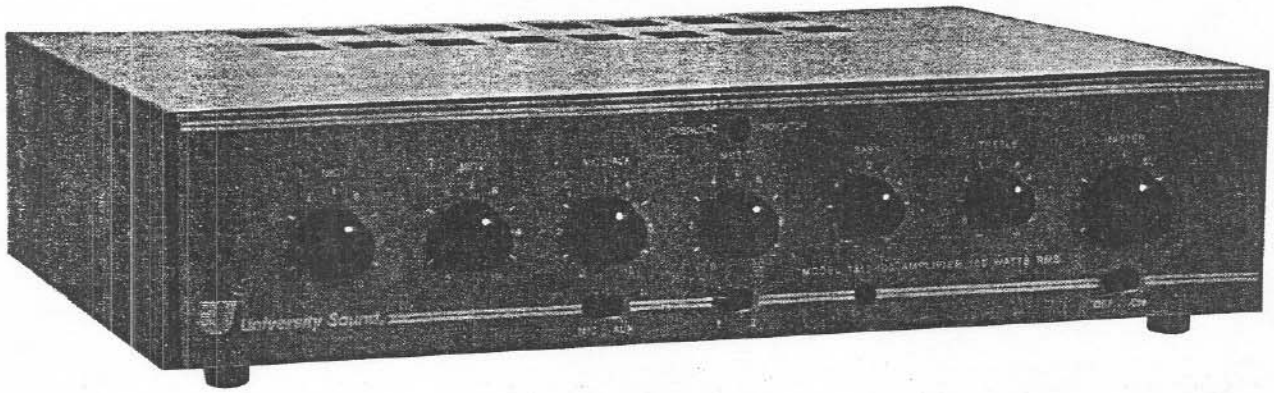
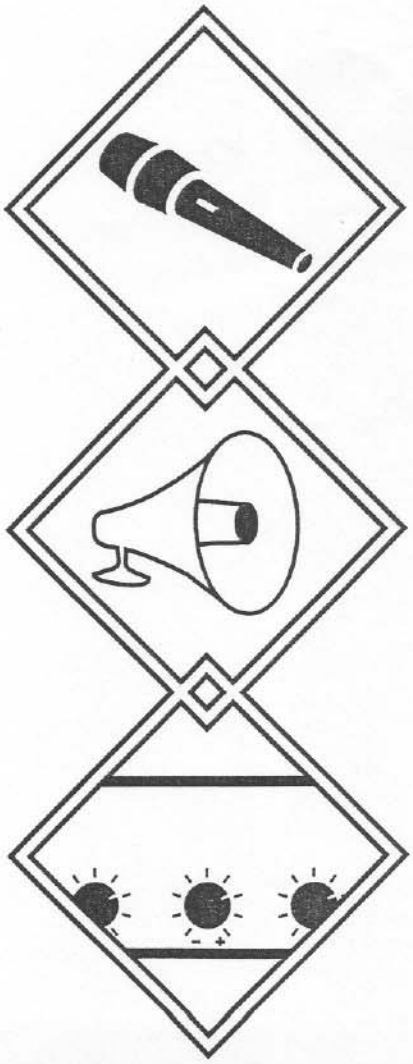


1808-60/1810-100

60/100 Watt Paging Amplifiers

Owner's Manual



University Sound Inc.

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Description

The University Sound Models 1808-60 and 1810-100 are multi-purpose monaural solid state paging amplifiers. They are designed for dependable continuous operation in background music, public address, paging, and sound reinforcement systems. The Model 1808-60 has a power output of 60 Watts RMS while the Model 1810-100 has a power output of 100 Watts RMS. All other characteristics, controls, and functions of the two models are identical.

The amplifiers have a four-input mixer/pre-amp section, consisting of three microphone inputs and a "music input." Each of the three microphone inputs can be used as a low-impedance balanced inputs, or at an alternate level as follows: MIC-1 may be changed to balanced line input by means of a switch on the back panel, MIC-2 and MIC-3 will provide a high impedance unbalanced input by using an alternate input jack, and MIC-3 may also be changed to an AUX input by flipping a switch on the front panel. The Music channel may receive its input from one of two inputs, selected by a slide switch on the front panel. This channel features a Music Mute circuit that can fade the music when a signal is detected on any of the paging (microphone) inputs. The music can also be muted manually by contact closure across a pair of screw terminals on the rear panel. Separate Bass and Treble controls are provided to help compensate for room and speaker characteristics. A master Gain control is provided to permit adjustment of the overall output while preserving the input mix.

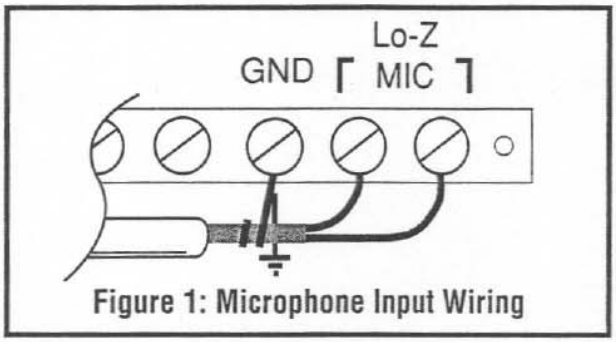


Figure 1: Microphone Input Wiring

A red LED overload indicator on the front panel lights when the amplifier is operating improperly. This may be caused by overdriving the unit, a mismatched load condition, or feedback between the input and output circuits. The Trumpet Protect switch on the rear panel reduces the power delivered to trumpet speakers below their low frequency cutoff point.

The Pre-Amp Output jack on the rear panel provides electrical access to the output of the pre-amp mixer section of the amplifier. An Amplifier Input jack is also provided to input directly to the power amplifier of the unit. These jacks can be used to parallel power amplifiers into a common speaker line to boost power. Power output connections are available for 4 Ohm and 8 Ohm direct speaker coil connections, as well as for 25 Volt and 70.7 Volt constant-voltage speaker distribution lines.

The amplifier is housed in a sturdy steel cabinet that may be rack mounted the Model RPK-5 rack mounting kit. The unit operates from a standard 120 Volt AC 60 Hz power source, and is protected by a push-to-reset circuit breaker.

Unpacking

The unit should be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of damage which might have occurred in shipment, immediately notify your supplier or the transportation company which delivered it. Claims for damage sustained in transit must be made upon the carrier. Save all packing material for the claim agent who will supply you with the proper forms and give you the necessary instructions for filling out a claim.

Installation

Each University Sound amplifier has ample vents for normal cooling through air circulation, and should be installed in a manner that permits free air flow around the unit. **Do not place any object on top of the unit that will block the air flow to these vents. Do not store or operate the unit in areas where the temperature exceeds 140° F.**

Should multiple units be stacked, or heat generating units be installed immediately above or below, then the units should be spaced at least 2" apart vertically to allow for proper ventilation. The unit operates from a standard 120 VAC 60 Hz power source. The AC power cord to the unit has three prongs, and must be connected to a three-prong outlet to insure proper grounding of the unit. A switched AC receptacle is provided on the rear of the unit for powering accessory equipment. The Power on-off switch of the 1808/1810 also switches the power to this receptacle, and thus the accessory equipment is turned on and off with the amplifier.

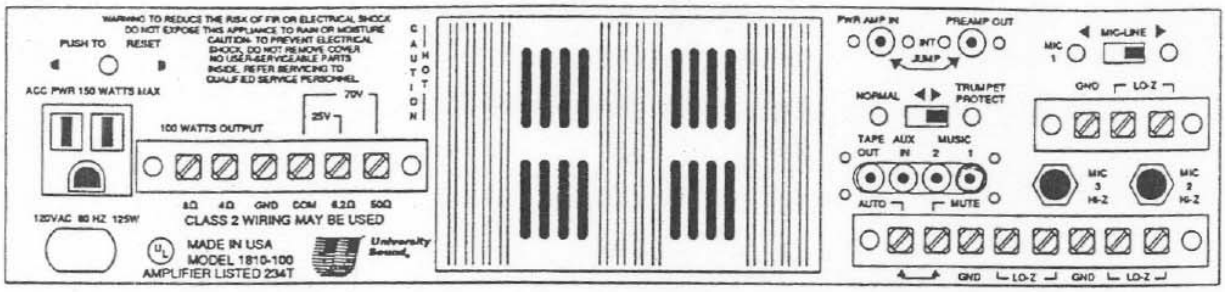
Connections

All connections are made on the rear panel of the unit. All input wiring requires the use of shielded audio cable. Connection to the AUX input, the MUSIC1 or MUSIC2 inputs, the TAPE OUT, and the PREAMP IN/OUT are all made by means of standard RCA phono jacks. These connections should be made with **one**-conductor shielded audio cable to minimize noise pickup. The low impedance microphone connections are made by means of screw terminals. These inputs are balanced and require the use of **two** conductor shielded wire. The high impedance microphone connections are made by means of a 1/4" phone plug, and require the use of **one-** conductor shielded cable.

Mic1 Input

This input is a low impedance balanced circuit that may be used to match either a microphone or line inputs as determined by the switch located directly above the connection terminals. With the switch in the MIC position, this input has a sensitivity of 0.5 mV to match the output of a 150 Ohm to 250 Ohm low impedance microphone. Because of the high gain of this circuit, care must be taken in wiring this input to prevent oscillation caused by capacitive feedback from the output wiring. Microphone wiring requires the use of shielded cable with two center conductors. These two conductors should be connected to the terminals marked Lo-Z and the shield to the terminal marked GND, as shown in Figure 1. No other wiring should be included inside of the shield, and any unused wires in the cable should be grounded to prevent noise pickup.

When the switch is in the LINE position, this input has a sensitivity of 50 mV and an input impedance of 1KΩ. In this position the PAGE input may be used from a phone system as the paging source. The PAGE input may be directly connected to the 600Ω "paging port" output of registered PABX or switchboard equipment. Such equipment contains protective circuitry as required by the FCC. If no paging output is available from the telephone equipment, then either the Model TAP trunk access paging adaptor or the Model TSA telephone station access paging adaptor must be used to properly match this input to the phone system. **Under no circumstances may this input be directly**



Back Panel View of the 1808-60/1810-100

this input to the phone system. **Under no circumstances may this input be directly connected to the national telecommunications network.** Input wiring to the amplifier from the phone circuit may be with unshielded wire. If oscillation, noise, or RFI/EMI interference is noted, however, these wires should be shielded and connected as shown in Figure 1.

Mic2 and Mic3 Input

The low impedance microphone input of these channels is identical to MIC1 and should be wired as described in that section. The high impedance microphone input is unbalanced and has a sensitivity of 5 mV. Input connections to this jack requires the use of a shielded 1/4" phone plug.

AUX Input

The Aux input is used for line level paging sources. This input is selected by flipping the slide switch on the front panel directly below the MIC3/AUX level knob. The AUX input is a high impedance input with a sensitivity of 0.25 Volts. When using more than three microphones in an installation, this input can be connected to the output of a mixer/pre-amp such as the Model 1004 from University Sound.

Music Input

The MUSIC input is a high impedance with a maximum sensitivity of 0.25 Volt to match the output of a tuner, tape player, or other audio equipment with a line level output. Two input jacks are provided to allow different music sources. Selection of the music source is made by means of a slide switch on the front panel located directly below the MUSIC control knob.

Music Mute

Music muting during page can be accomplished manually be contact closure or automatically using the unit's voice-activation circuit. Screw terminals are provided on the rear panel to mute music manually when paging. As delivered from the factory, the AUTO and MUTE screw terminals are jumpered together to allow voice-activated muting. If voice-activation is not desired, this jumper can be removed to allow only manual muting. To trigger a manual mute, a connection (contact closure) is made between the MUTE and GND terminals. For instance, the MUTE and GND terminals could be connected to the leads from a microphone's push-to-talk switch.

Tone Controls

Both Bass and Treble controls are provided to tailor the output of the unit. The Bass control is centered at 50 Hz and the Treble at 15 KHz. Each has a turnover frequency of 1000 Hz and a boost and cut of up to 15 dB. Both controls are located on the front panel. For a "flat" response, place both knobs in a vertical position.

Trumpet Protect

In installations where the amplifier is used to operate trumpet-type speakers, the switch on the rear panel should be in the Trumpet Protect position. This reduces the level of lower frequencies fed to the output of the unit, protecting driver diaphragms from possible damage and avoiding overloading of the amplifier(s). When used with cone-type loudspeakers, the switch should be in the NORMAL position.

Tape Output

The Tape Out signal is taken from the pre-amp portion of the amplifier, prior to the tone and master level controls. This signal can be used to drive the Hi-Z input of a tape recorder, another amplifier, or other audio equipment.

Pre-Amp Output, Amplifier Input

The Amplifier Input jack is directly connected to the input of the power amplifier portion of the unit. The gain from this jack to the 25V line and 70V line output terminals is fixed at the same value for Models 1808-60, 1810-100, and 1811-100. This permits the power amplifier portions of those amplifiers to be operated in parallel to increase the output into a common speaker line.

The Pre-amp Output jack and the Amplifier Input jack are connected together on the inside of the unit by a jumper wire. To use signal processing equipment with the unit, such as a graphic equalizer, it may be desirable to remove the internal jumper so that none of the "dry" pre-amplifier signal appears in the amplifier output. It is necessary to remove the top cover of the unit to access this jumper. **Note: Make certain that the power cord is disconnected before removing the top cover of this unit.**

Overload Conditions

The red LED "Overload" indicator on the front panel monitors the output transistors. When continuously lit, the amplifier is being operated improperly. This condition could be caused by a mis-

operated improperly. This condition could be caused by a mismatch of the output load, incorrect output impedance, a short circuit in the output, or feedback between the input and output circuits. In severe instances, these conditions could cause the circuit breaker to trip. **In the event that the circuit breaker continues to trip, do not attempt to defeat the function of the breaker; have the trouble investigated by a qualified technician.** Occasional flickering of the LED means that the amplifier is being driven to the maximum on peaks of the program material, which is not harmful nor will it in any way damage the amplifier.

Output Connections

Power outputs are provided for 4 Ohm and 8 Ohm speaker lines or for distribution on 25 Volt or 70.7 Volt constant-voltage lines. Output connections are made by means of screw terminals on the back of the unit.

Long speaker lines have an appreciable resistance, resulting in the output power loss. This power loss can be avoided to a large degree by using 25 Volt or 70.7 Volt constant-voltage lines to distribute the output signal (see Figure 5). This line format also allows for the connection of speakers having different wattage ratings, and greatly simplifies the calculation of the total system wattage demand. To avoid inducing hum into the speaker lines do not run speaker cables parallel to power lines. In some areas, 70.7 Volt distribution lines must be run in conduit. Check your local city electrical codes before installing a 70.7 Volt speaker system to determine the requirements. When using either of these outputs, connect one wire of the speaker system to the appropriate 25V/70.7V terminal and the other wire to the "COM" terminal.

The 4Ω and 8Ω outputs are used when connecting directly to speaker voice coils. When using these outputs, connect one speaker wire to the appropriate 4Ω or 8Ω terminal, and the other wire to the terminal marked "GND." Do **not** load both outputs at their rated impedance simultaneously, as this will act a demand for twice the rated output and overload the amplifier. Similarly, do not load both a speaker coil output and a 25/70.7 Volt output at full power demand. A combination of speaker loads is permissible using the various outputs from the amplifier; however, the sum of these demands should not exceed the rated output of the amplifier.

Optimum performance of any amplifier depends upon proper impedance match between the output and the load. Connecting a load of mismatched impedance to an amplifier will deteriorate the overall performance of the system. To accurately measure the impedance of a speaker line, the University Model LWT should be used. This test instrument permits direct reading of the wattage demand or impedance of a speaker line and is a valuable aid in determining opens, shorts, and mismatch conditions.

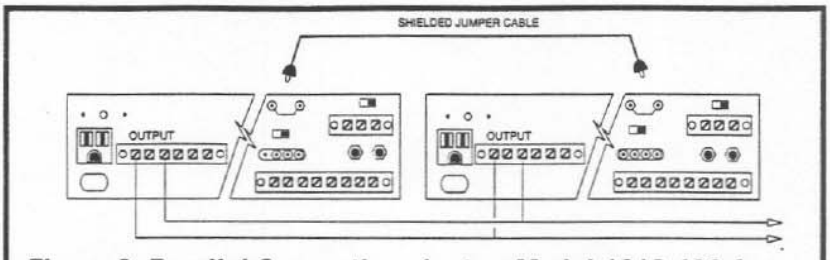


Figure 2: Parallel Connections for two Model 1810-100 Amps

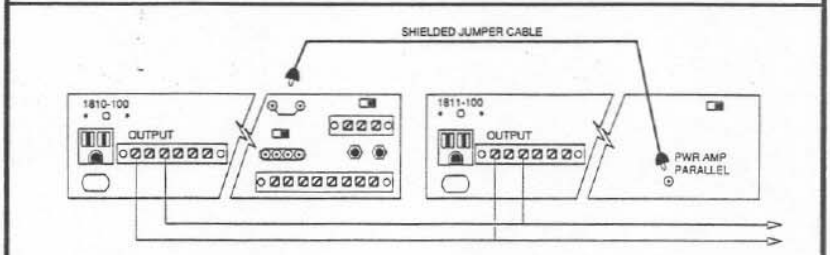


Figure 3: Connections for Models 1810-100 & 1811-100

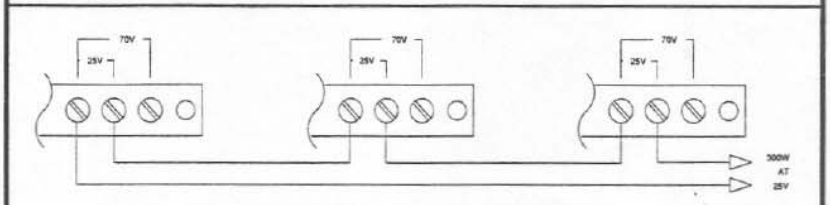
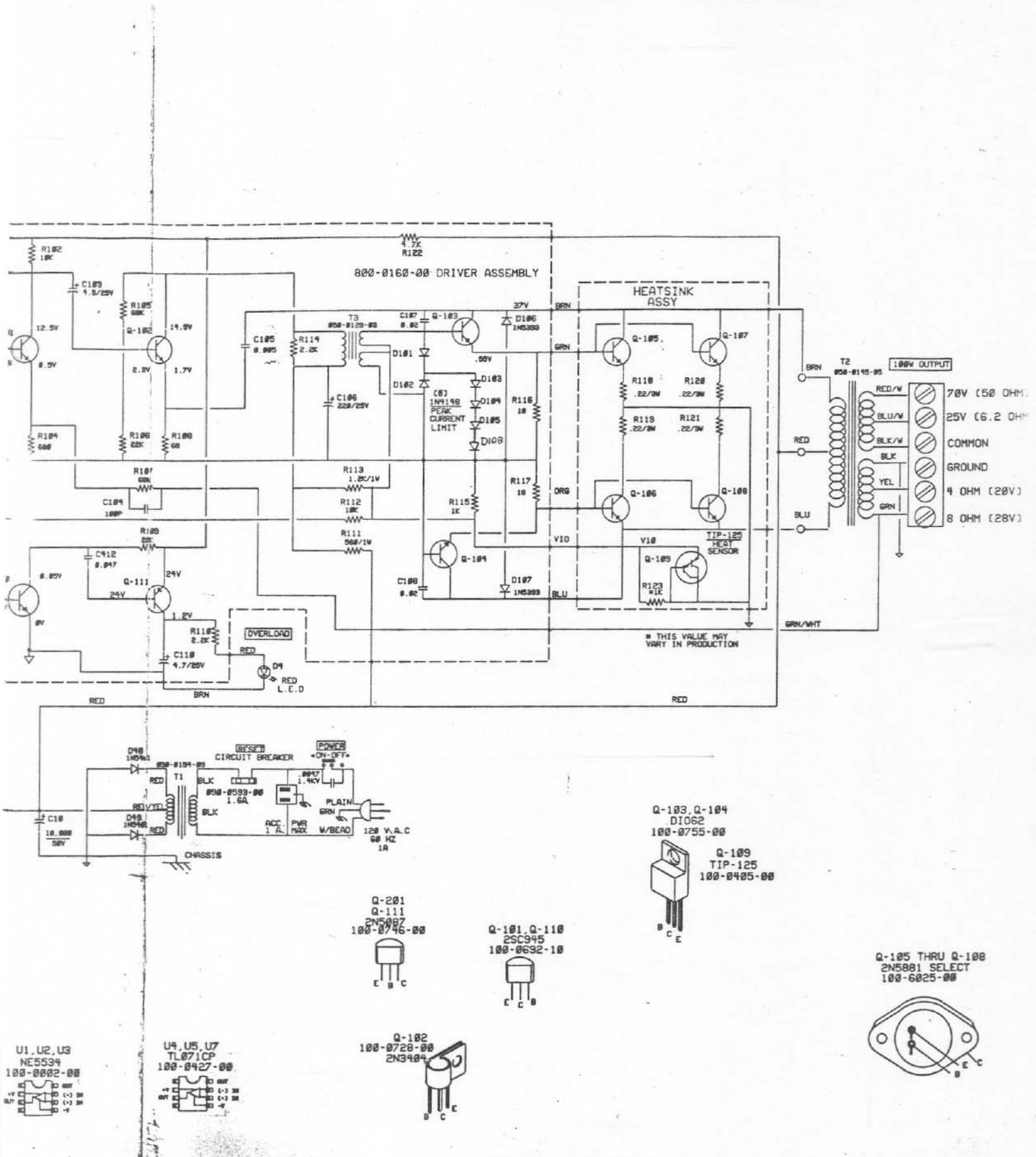


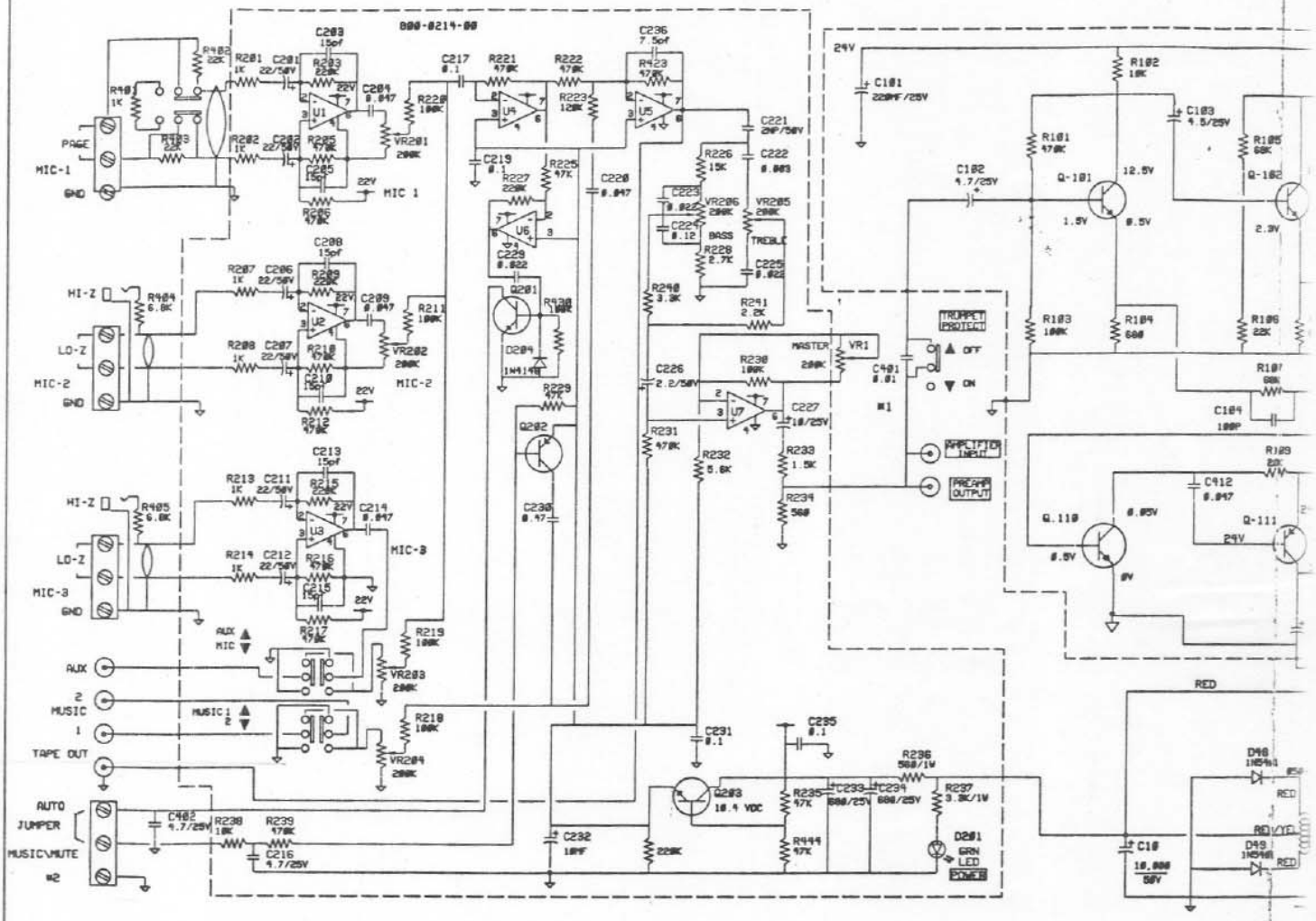
Figure 4: Output Connection when using Three Amplifiers

Load \ Wire	#24	#22	#20	#18	#16	#14	#12	#10	#8
4 Ohms	8	12	19	31	49	78	124	196	312
8 Ohms	15	24	39	61	98	155	247	393	625
70V Volt Line 10 W	119	190	302	480	763	1214	1930	3070	4879
70V Volt Line 20 W	60	95	151	240	382	607	965	1535	2440
70V Volt Line 40 W	30	48	76	120	191	303	483	767	1220
70V Volt Line 60 W	20	32	50	80	127	202	322	512	813
70V Volt Line 100 W	12	19	30	48	76	121	193	307	488
25 Volt Line 10 W	955	1518	2415	3840	6106	9709	15442	24558	39032
25 Volt Line 20 W	478	759	1208	1920	3053	4854	7721	12279	19516
25 Volt Line 40 W	239	379	604	960	1527	2427	3860	6139	9758
25 Volt Line 60 W	159	253	403	640	1018	1618	2574	4093	6506
25 Volt Line 100 W	96	152	242	384	611	971	1544	2456	3903

Maximum Length of Line in Feet for 20% Power Loss
Shaded areas subject to high frequency loss due to wire capacitance



			DATE 2-92	TITLE	UNIVERSITY SOUND INC
			DRAWN RC	1810-100	SIZE C / DRAWING # 600-1010-00 / REV
			CHECK DAY		SHEET 1 OF 1
			APPRVD RR		
REV	ECN #	DATE	TOLERANCE .X ±0.020 .XX ±0.010 .XX ±0.005		

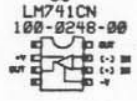


NOTES:

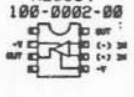
#1 REMOVE INTERNAL JUMPER WHEN ADDING EXTERNAL SIGNAL PROCESSING (IE, EQ, DIGITAL DISPLAY, ETC.)

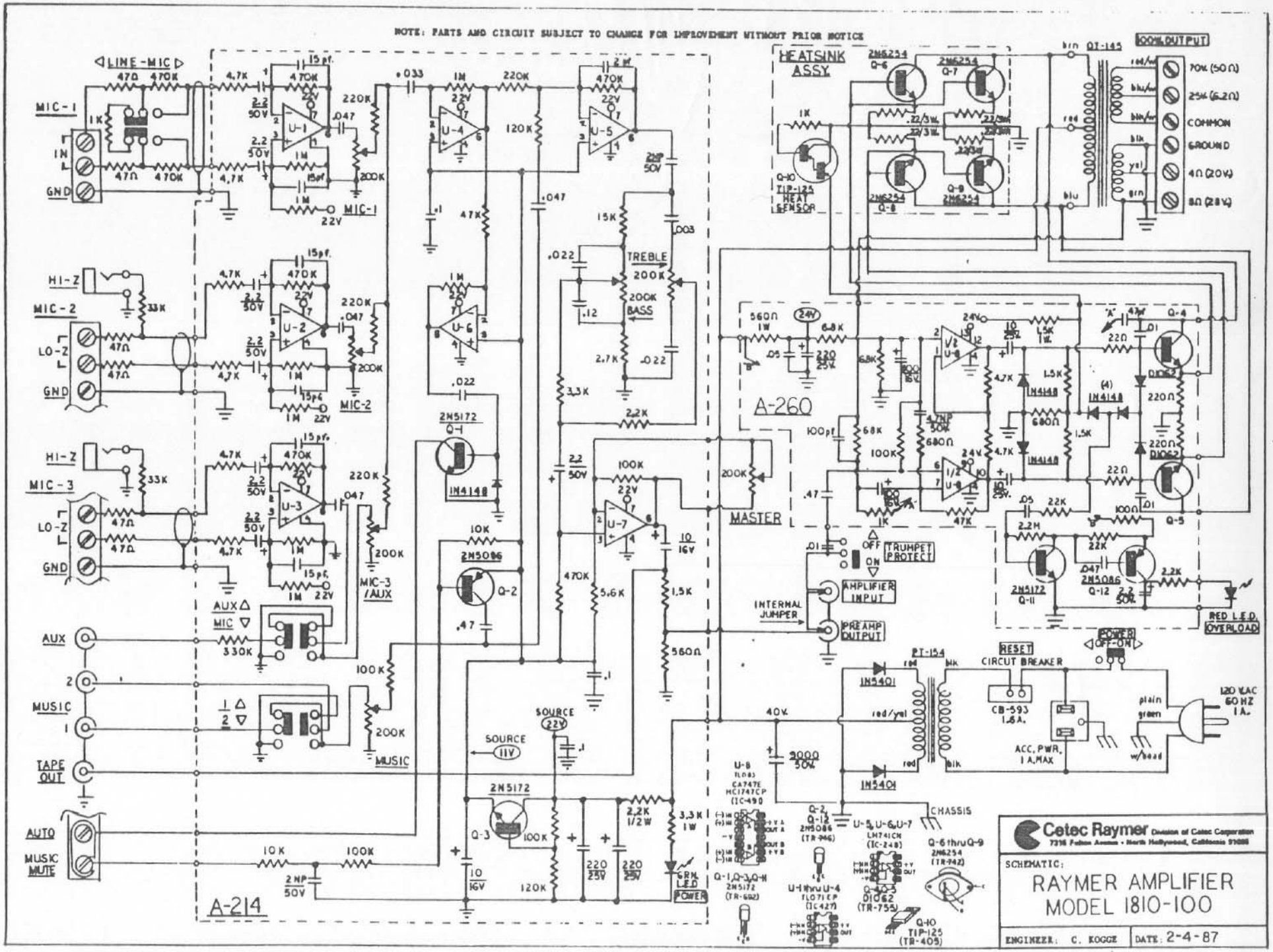
#2 FACTORY JUMPER INSTALLED FOR AUTOMATIC MUTE; FOR MANUAL MUTE, REMOVE JUMPER AND SUPPLY A CONTACT CLOSURE ACROSS THE MUTE AND GROUND TERMINALS TO MUTE MUSIC.

U6
LM741CN
100-0248-00



U1,U2,U3
NE5534
100-0002-00




NOTE: PARTS AND CIRCUIT SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT PRIOR NOTICE
HEATSINK ASSY.
100% OUTPUT
70V (50Ω)
25V (6.2Ω)
COMMON
GROUND
4Ω (20V)
8Ω (28V)
LINE-MIC
MIC-1
MIC-2
MIC-3
HI-Z
LO-Z
GND
A-214
A-260
MASTER
TREBLE
BASS
AUX
MIC
MUSIC
TAPE OUT
AUTO
MUSIC MUTE
SOURCE
INTERNAL JUMPER
AMPLIFIER INPUT
PREAMP OUTPUT
TRUMPET PROTECT
OFF
ON
RESET
CIRCUIT BREAKER
POWER OFF-ON
CB-593 1.6A.
ACC. PWR. 1A.MAX
120 VAC 60 HZ 1A.
RED L.E.D. OVERLOAD
GRN. LED POWER
CHASSIS
Cetec Raymer Division of Cetec Corporation
7216 Fulton Avenue • North Hollywood, California 91605
SCHEMATIC:
RAYMER AMPLIFIER
MODEL 1810-100
ENGINEER: C. KOGGE
DATE: 2-4-87