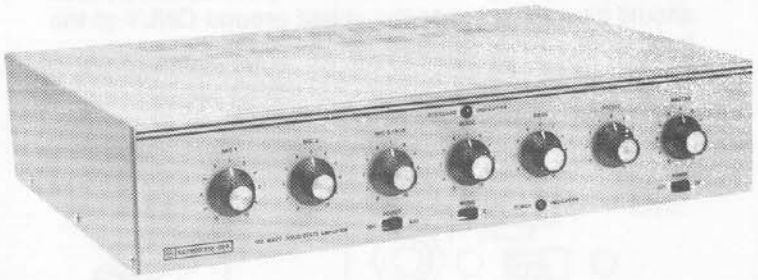
RAYMER

OPERATING INSTRUCTIONS



MODEL 808-60A AMPLIFIER
MODEL 810-100A AMPLIFIER

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

DESCRIPTION

The RAYMER Models 808-60A and 810-100A are multipurpose monaural, all silicon solid state amplifiers. They are designed for dependable continuous operation in background music, public address, paging, and sound reinforcement systems. The Model 808-60A has a power output of 60 watts RMS and the 810-100A has a power output of 100 watts RMS. All other characteristics, controls and functions of these units are identical.

Four input channels are provided. These are identified as three microphone inputs and one music input. All inputs are unbalanced. Mic channel #1, which comes wired for high impedance microphone input, may be converted to low impedance balanced by the use of a Raymer plug-in transformer Model MT-3 or to a 500/600 ohm balanced line input by means of the Raymer plug-in transformer Model TT4-A.

Mic channel #2 may be switched for either high Z or low Z operation by means of a back panel control. Mic channel #3 may also be switched for either high Z or low Z microphone input, or this channel may be used as an Aux input by means of a selector switch on the front panel.

The MUSIC channel has provisions for two different inputs. The input choice is made by means of a selector switch on the front panel. The MUSIC channel also features a MUSIC MUTE (MIC PRECEDENCE) circuit to fade out the music while paging.

Separate BASS and TREBLE controls are provided to compensate for room and speaker characteristics. A master GAIN control is provided to permit adjustment of the overall output without upsetting the balance of the input controls.

A red LED overload indicator on the front panel provides a visual warning when the amplifier is operating improperly. This may be caused by overdriving the unit, a mismatched load condition or oscillation due to coupling 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 cut-off." This protects the speaker diaphragms from damage and reduces the excessive loading caused by trumpet speakers at low frequencies.

The PRE-AMP OUTPUT jack on the rear panel provides electrical access to the output of the pre-amp mixer portion of the amplifier. An AMPLIFIER INPUT jack is also provided to input directly to the power amplifier portion of the amplifier. An internal jumper between these two jacks may be disconnected to permit the inclusion of an equalizer or similar equipment in the circuit. By connecting these jacks together on similar amplifiers, they may be operated in parallel to obtain output to a common speaker line in multiples of the amplifier output wattage.

Output terminals are provided to drive 4 ohm or 8 ohm speaker lines or to drive 25 volt or 70 volt speaker distribution lines. A push-to-reset circuit breaker protects the entire unit from conditions beyond the safe operating limits which might cause component damage.

UNPACKING

The unit is to be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of any 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 inspection by the claim agent who will furnish you with the proper form and will also give you the necessary instructions for filing a claim.

INSTALLATION

Each amplifier has ample vents for normal ventilation; however, it should be placed so as to permit free air flow around the unit. DO NOT PLACE ANY OBJECT ON TOP OF THE COVER OR IN ANY WAY BLOCK THE AIR FLOW OF THE VENTS. DO NOT STORE OR OPERATE THE AMPLIFIER in areas where the ambient temperature exceeds 140°F.

The amplifier may be mountecd in a 3½" vertical panel space in a rack, using a Raymer RPK-5 rack mounting kit. Should multiple units be stacked, or heat generating units be installed immediately above or below the amplifier(s), then at least a 2" spacing must be provided between these units for adequate ventilation.

The amplifier has an AC line cord with a 3 prong plug. The line cord should be plugged into a 3 wire grounded 105 to 120 volt 60Hz AC outlet. This will also ground the amplifier.

The power switch will turn on the amplifier as well as any auxiliary equipment connected to the AC receptacle on the rear panel, and the green LED indicator lamp on the front panel will light.

The AC receptacle on the rear panel is a 3 wire grounded outlet which can supply power to accessory or auxiliary equipment. Any auxiliary equipment connected to this AC receptacle is controlled by the POWER on-off switch so that turning off the power on the unit turns off all equipment.

CONNECTIONS

All input and output connections are made on the rear panel of the unit. MIC 1 input requires a 3 pin audio connector, Switchcraft type A3F or equivalent. MIC 2 & 3 require a standard 1/4 inch phone plug with a metal cover, Switchcraft type 270 or equivalent. MUSIC 1 & 2, AUX IN, PREAMP OUT and AMPLIFIER IN require a standard phono plug.

Connections to the MUSIC MUTE and OUTPUT are made by means of screw terminals and do not require special connectors.

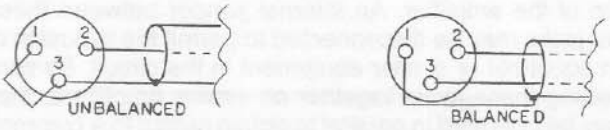


FIGURE 1:WIRING CONNECTIONS FOR MIC.1 INPUT.

MIC 1 input is jumpered at the factory to match a high impedance unbalanced microphone. This input may be converted to a low impedance balanced microphone input by the addition of a RAYMER Model MT-3 plug-in transformer, or it may be converted to a 500 ohm telephone paging access input by the addition of a RAYMER Model TT-4A plug-in transformer.

To install either of these transformers, remove the cover of the unit and locate the octal socket near the back of the chassis by the microhphone jack. Remove the two jumpers on the socket and plug in the transformer.

THE REMOVAL OF THE COVER AND JUMPER WIRES FOR THE INSERTION OF EITHER TRANSFORMER MUST BE DONE BY A QUALIFIED TECHNICIAN. BE SURE THE POWER CORD IS DISCONNECTED BEFORE REMOVING THE COVER.

MIC 2 and MIC 3 inputs are for unbalanced lines only. The input impedance of each input may be selected by a switch located to the left of the input jack. The HI-Z position will match either ceramic or high impedance dynamic microphones; the LO-Z position will match microphones in the 150 to 500 ohm range. High impedance microphone lines should be limited to 100 feet or less to prevent high frequency attenuation caused by cable capacitance. For longer mic cables, low impedance microphones are recommended. For short microphone runs, a cable with one conductor inside of a shield may be used. On long microphone runs, or when using a balanced input, the microphone circuit should be wired with two conductors inside of a shield. When using an unbalanced input, the ground return of this microphone circuit should be connected to the shield ground ONLY at the input plug.

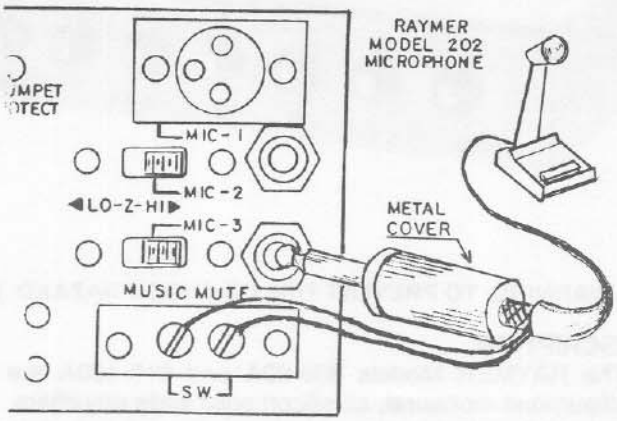


FIGURE 3:INPUT CONNECTIONS TO MIC 2&3 REQUIRE THE USE OF A SHIELDED 1/4 INCH PHONE PLUG.

If the paging source is from the telephone a Voice Connecting Arrangement must be ordered from the telephone company. This arrangement may be identified as "paging access to customer owned equipment." In installations where the music must be muted during the page, a "contact closure" must also be ordered. This arrangement is the same as used to operate dictation equipment and is not available on some computer type PABX systems which offer paging access only. The marketing department of the telephone company should be contacted to determine the availability of paging access arrangements available for the specific PABX system to which the amplifier is to be connected. The technical specification of this voice connecting arrangement is identified as DCK.

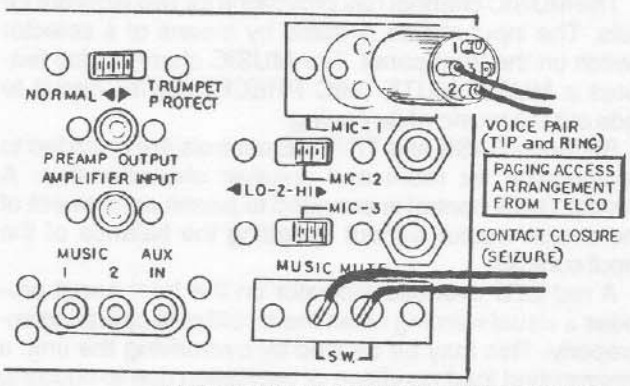


FIGURE 2:PAGING ACCESS FROM THE TELEPHONE REQUIRES THE USE OF THE TT-4A TRANSFORMER.

On long microphone runs which are subject to electrical or radio interference, a balanced input must be used. The RAYMER Model LMT-150 line matching transformer should be used in such cases to match a balanced low impedance microphone line to either MIC 2 or MIC 3 input.

MIC 3 may be used as an auxiliary high impedance input by means of the selector switch directly below the MIC 3 control. If the input to MIC 3 is from a 500 ohm line or telephone paging access, a RAYMER Model TM-2 telephone adaptor should be used between the balanced 500 ohm line and the unbalanced AUX input.

The MUSIC input is high impedance with a maximum sensitivity of 300 millivolts. This input will accommodate the output from a tuner or the output from a preamplifier such as tape, phono, etc. If the source into the music input is from a balanced line, a balanced input transformer must be used. The use of RAYMER Model TM-2 will provide a terminating impedance of 500 ohms to the line or the RAYMER Model MDT will provide a 15K bridging impedance across the line.

The MUSIC channel has two input jacks to allow two different music sources. The selection of the music source is made by means of a selector switch directly below the MUSIC level control.

The MUSIC channel may be muted while paging by means of the MUSIC MUTE circuit. This circuit requires a contact closure during the paging function. To do this, a "dispatcher" type of microphone should be used. The relay control wires from the microphone should be connected to the music mute terminals. If several microphones are used, their control wires may be connected in parallel to these terminals.

The signal at the PREAMP OUTPUT jack is from the preamplifier portion of the amplifier and is controlled by the MASTER level control. This signal may be used to drive the high impedance input of a tape recorder, another amplifier, or other audio equipment.

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 output terminals is fixed at the same value for the Models 808-60A, 810-100A and 811-100. This permits the power amplifier portions of those amplifiers to be operated in parallel to obtain increased wattage output to a common speaker line.

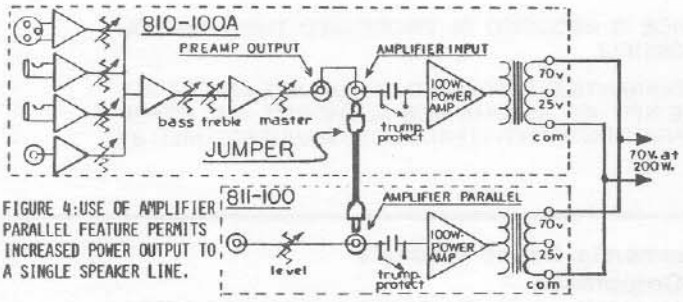


FIGURE 4:USE OF AMPLIFIER PARALLEL FEATURE PERMITS INCREASED POWER OUTPUT TO A SINGLE SPEAKER LINE.

The PREAMP OUTPUT jack and the AMPLIFIER INPUT jack are connected together on the inside of the unit by means of a jumper wire. If it is necessary to add external signal processing equipment, such as an equalizer, this jumper must be cut in order to allow the external equipment to be added between the preamp output and the amplifier input. NOTE: THE REMOVAL OF THE COVER TO ACCESS THIS JUMPER MUST BE DONE BY A QUALIFIED TECHNICIAN. BE SURE POWER CORD IS DISCONNECTED BEFORE REMOVING COVER.

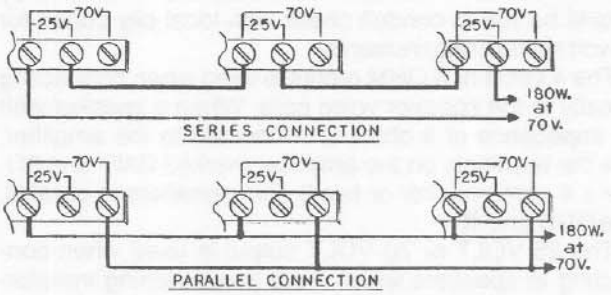


FIGURE 5:THE OUTPUTS OF THREE SIMILAR AMPLIFIERS JUMPERED FOR PARALLEL OPERATION MAY BE CONNECTED IN SERIES OR PARALLEL.

CAUTION: BEFORE OPERATING AMPLIFIERS CONNECTED EITHER IN SERIES OR PARALLEL, MAKE CERTAIN THAT THE TRUMPET PROTECT SWITCHES ARE IN THE SAME POSITION ON ALL AMPLIFIERS. WHEN CONNECTING THE OUTPUTS IN SERIES, MAKE CERTAIN THAT THERE IS NO JUMPER CONNECTION BETWEEN COM AND GND ON THE SCREW TERMINAL BOARD.

The red LED "Overload" indicator on the front panel monitors the output transistors and when it is illuminated continuously it is a warning that the amplifier is being operated improperly. This condition could be caused by mismatch of output load, incorrect output impedance, short circuit in the output, or that the amplifier is oscillating (which could be caused by improper shielding or position of input leads) and may result in the circuit breaker tripping.

To correct and localize the problem, first turn each input control to "0." If the LED is still illuminated, then reduce the Master control to"0." If the LED light goes out, then the trouble is more than likely in the external equipment plugged into the PREAMP OUTPUT/AMPLIFIER INPUT jacks. If the light does not go out, have the amplifier serviced by a qualified service technician or return the unit to the factory.

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 in any way damage the amplifier.

OUTPUT CONNECTIONS

The speaker(s) or line matching transformers are connected to the screw terminal board located on the rear panel. For short distances any ordinary insulated wire, such as parallel lamp cord, may be used.

Long lines have an appreciable resistance with resultant power loss. The use of parallel matching transformers on either 25 volt or 70 volt lines is recommended for long distances. In all cases, it is advisable to run as heavy a wire as possible consistent with the requirements. To avoid inducing hum in the system, do not parallel speaker cables with any AC line power cables.

70 volt distribution systems often require the speaker lines to be run in conduit. To determine whether they should be run in conduit check with local city codes for 70 volt system requirements.

The 4 OHM or 8 OHM output is used when connecting directly to the speaker voice coils. When a speaker with an impedance of 8 ohms is connected to the amplifier, use the terminals on the amplifier marked GND and 8Ω. For a 4 ohm speaker or two 8 ohm speakers in parallel, use GND and 4Ω.

The 25 VOLT or 70 VOLT output is used when connecting to speakers which have line matching transformers. Connecting to the 25 volt or 70 volt tap on the unit permits the use of a number of speakers each with its own corresponding line matching transformer, thereby eliminating the necessity of calculating impedances. The tap on the line matching transformer is selected to give the power desired for each speaker. The total of all the power settings should be no greater than the amplifier output rating. If the speaker uses a 25 or 70 volt line transformer, connect the speaker transformer to the terminals marked COM and 25V (or 70V) according to the line desired.

Optimum performance of any transistor amplifier depends on the proper current delivered at the output terminals. Connecting a total load impedance at any tap less than the impedance indicated on the back panel of the amplifier will cause the transistors to deliver more current than they were designed for and will deteriorate the performance of the unit and cause damage to the transistors. To prevent this from occurring and to protect the components, the unit is equipped with a circuit breaker that will trip if the output impedance is below the specified rated value; for example, if two 8 ohm speakers are connected in parallel (resulting in a 4 ohm impedance), and in turn connected to the 8 ohm output terminal, the circuit breaker will trip as soon as the volume control is turned up to the unit's maximum output.

The circuit breaker located on the rear panel protects the unit from drawing excessive AC line current which could cause damage to the internal components. If the circuit breaker opens, the green LED indicator will go out and the amplifier will have no AC applied to it, but there will continue to be power at the auxiliary power receptacle located on the rear panel. Set the AC power switch to OFF and momentarily depress the red button on the circuit breaker to reset it, and slide the AC power switch to ON. Observe the red "Overload" indicator. If it lights, this indicates that the reason that the circuit breaker is tripping is due to a short circuit, or a mismatch of the output, or an oscillation caused by improper shielding or coupling of the input leads. If the overload light does not come on but the circuit breaker continues to trip, then this indicates a failure of an internal component.

IN THE EVENT THAT THE CIRCUIT BREAKER CONTINUES TO TRIP, DO NOT ATTEMPT TO DEFEAT THE FUNCTION OF THE CIRCUIT BREAKER. HAVE THE TROUBLE INVESTIGATED BY A QUALIFIED SERVICE TECHNICIAN OR RETURN THE UNIT TO THE FACTORY.

WARRANTY

THIS UNIT HAS BEEN VERY CAREFULLY INSPECTED AND IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE FOR A PERIOD OF ONE YEAR FROM DATE OF SALE TO THE ORIGINAL PURCHASER. THIS WARRANTY DOES NOT EXTEND TO ANY UNIT WHICH BEEN SUBJECT TO ABUSE, MISUSE, NEGLECT, ACCIDENT, IMPROPER INSTALLATION, OR ALTERATIONS. THE OBLIGATION OF CETEC RAYMER UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OF ANY DEFECT IN MATERIAL OR WORKMANSHIP AND/OR THE REPLACEMENT OF ANY DEFECTIVE PART, PROVIDED THE UNIT IS RETURNED TO CETEC RAYMER TRANSPORTATION PREPAID.

IT IS RECOMMENDED THAT ANY UNIT ON WHICH SERVICE IS REQUIRED BE PROCESSED THROUGH YOU DISTRIBUTOR OR INSTALLATION COMPANY WHEREVER POSSIBLE.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON OUR PART. WE NEITHER ASSUME NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US ANY OTHER LIABILITY IN CONNECTION WITH THE PRODUCTS MANUFACTURED BY CETEC RAYMER.

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Cetec Raymer

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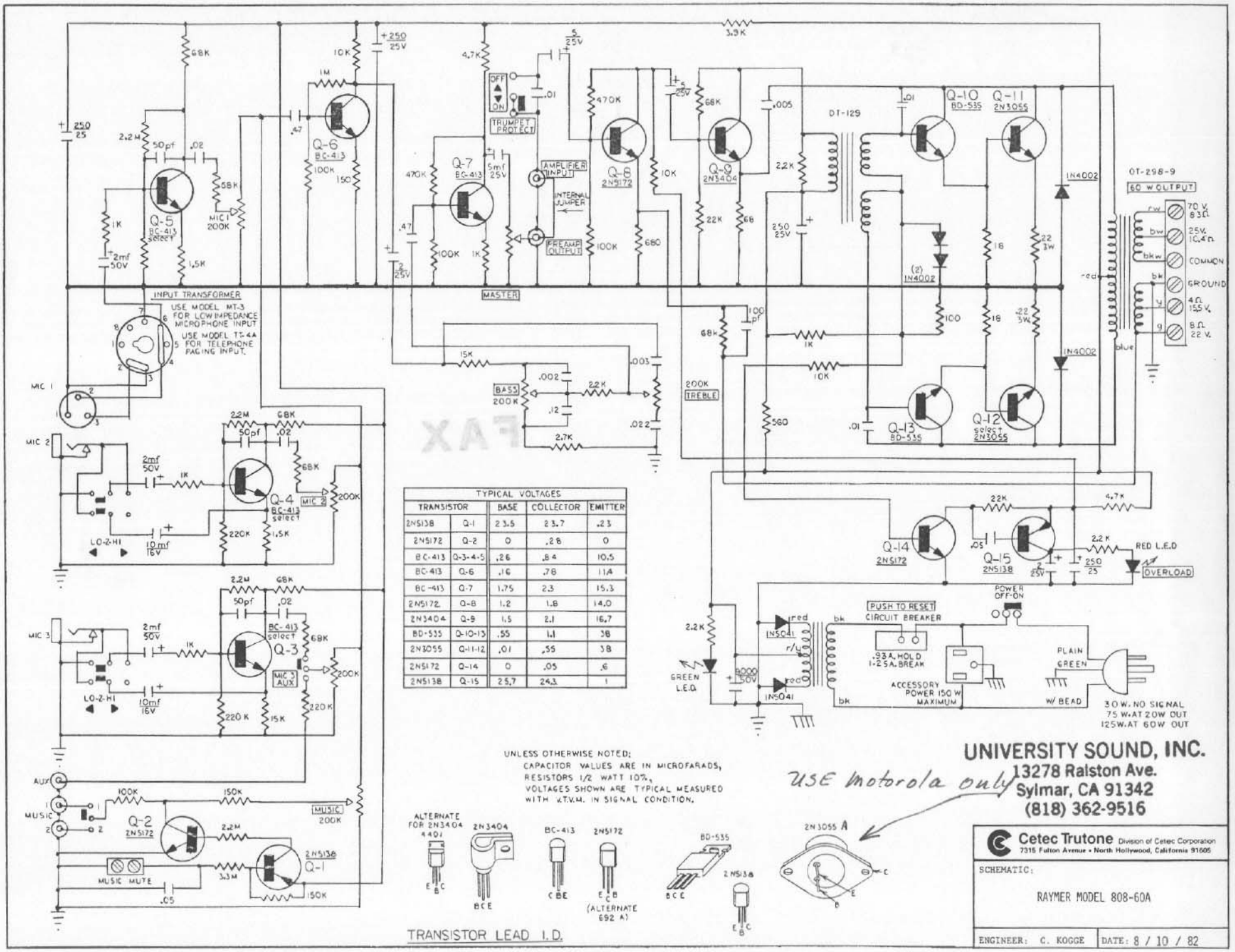

TYPICAL VOLTAGES				
TRANSISTOR		BASE	COLLECTOR	EMITTER
2N5138	Q-1	23.5	23.7	.23
2N5172	Q-2	0	.28	0
BC-413	Q-3-4-5	.26	.84	10.5
BC-413	Q-6	.16	.78	11.4
BC-413	Q-7	1.75	2.3	15.3
2N5172	Q-8	1.2	1.8	14.0
2N3404	Q-9	1.5	2.1	16.7
BD-535	Q-10-13	.55	1.1	38
2N3055	Q-11-12	.01	.55	38
2N5172	Q-14	0	.05	.6
2N5138	Q-15	25.7	24.3	1

UNLESS OTHERWISE NOTED:
CAPACITOR VALUES ARE IN MICROFARADS,
RESISTORS 1/2 WATT 10%,
VOLTAGES SHOWN ARE TYPICAL MEASURED WITH V.T.V.M. IN SIGNAL CONDITION.

TRANSISTOR LEAD I.D.

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SCHEMATIC:

RAYMER MODEL 808-60A

ENGINEER: C. KOGGE | DATE: 8 / 10 / 82