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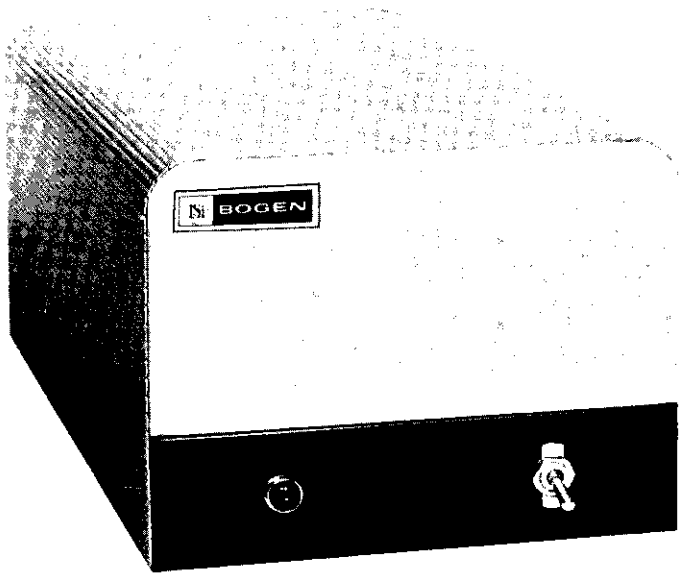
BOGEN®



MODEL MO100A

100 WATT
PUBLIC ADDRESS
BOOSTER AMPLIFIER

LEAR SIEGLER, INC.
BOGEN DIVISION
P.O. BOX 500
PARAMUS, N. J. 07652

INSTALLATION AND OPERATING MANUAL

READ THOROUGHLY BEFORE OPERATING EQUIPMENT

DESCRIPTION

The Bogen MO100A is an excellent booster amplifier capable of delivering 100 watts of audio power. It is ideal for installation with sound systems in industrial plants, stadiums, theaters, and auditoriums. This high quality amplifier has exceptional power handling ability over the entire range of audio frequencies.

The MO100A has provisions for high and low impedance inputs. Balanced-isolated speaker output impedance of 16 ohms is provided as well as 25 volt (6Ω) C.T. balanced, 70 volt (49Ω) C.T. and 115 volt constant voltage sources, to eliminate difficulties encountered in speaker matching when unequal amounts of power are required for different speakers of a distribution system. Sockets are provided on the chassis for power to an external preamplifier and for connection of a model KR6 remote standby power control unit.

Two or more MO100A booster amplifiers may be connected in parallel for installations requiring more than 100 watts of power. This is made possible by interconnecting the "C.P." jacks of the units and paralleling the inputs and outputs of the units. The "C.P." connections tie the feedback components of the amplifier together, thereby balancing their characteristics.

SPECIFICATIONS

POWER OUTPUT: 100 Watts

HARMONIC DISTORTION: Less than 2% at 100 watts output.

FREQUENCY RESPONSE: ± 2 db, 8 to 50,000 cps.

HUM: 80 db below rated output.

SENSITIVITY (for rated output): ***High impedance input:*** better than 2 volts; ***Low impedance*** (using TL600 transformer): better than 0.5 volt.

INPUTS: ***High impedance:*** 0.5 megohms; ***Low impedance:*** 500/600 ohms (balanced) using TL600 transformer; ***bridging:*** 10,000 ohms using TL10K transformer.

OUTPUTS: 16 ohms balanced, 25 volt C.T. balanced (6.25Ω), 70 volt C.T. balanced (49Ω) and 115 volt output (for industrial applications.)

POWER REQUIREMENTS: 250 Watts (2.5 amps at 117 volts) 50-60 cycles AC (for P.A. applications).

TUBES: 7247, 8417 (4), 3 silicon rectifiers.

DIMENSIONS: 8" wide, 13" deep, 6¾" high.

WEIGHT: 33 lbs.

INSTALLATION

INPUT CONNECTIONS

High impedance: The amplifier can be driven to full output, using the high impedance input, from any preamplifier capable of developing 2.0 volts across a 500,000 ohm load. Connect the preamplifier output to the HI Z phono type receptacle on the rear of the amplifier.

Low impedance: The amplifier can be driven to full output, using the low impedance input (model TL600 input transformer), from any preamplifier capable of developing 0.5 volts across a 500 ohm load.

Plug the Bogen TL600 transformer into the X1 socket on top of the MO100A chassis. Connect the 500/600 ohm input to the LO Z terminals on the rear of the amplifier.

Bridging Input: The amplifier will accept a bridging input at 10,000 ohms by utilizing the Bogen TL10K is plugged into the X1 socket, and the bridging input is connected to the LO Z terminals on the rear of the amplifier.

Obtaining signal from output of other power amplifier: For amplifiers with a 70 volt output tap, the following circuit is recommended to deliver the signal required to drive the HI Z input receptacle of the MO100A.

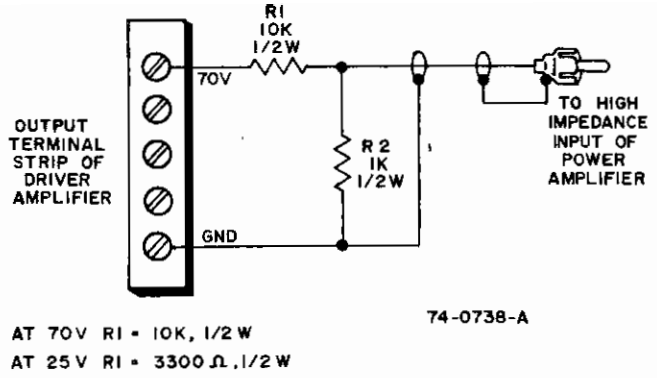


Figure 1 – Input Circuit

NOTE: *The network above is in addition to the normal load (loudspeakers, etc.) on the output of the driver amplifier.*

OUTPUT

An output impedance of 16 ohms as well as constant voltage lines of 115, 70 and 25 volts have been provided to meet speaker and distribution line matching. For 16 ohms connect leads to 16 ohm terminal and COM 1. For 70-volt operation connect leads to 70V (49Ω) terminal and COM 2 terminal and connect shorting wire from COM 2 terminal to GND if grounding is desired. For 70-volt balanced operation remove shorting wire between COM 2 terminal and GND and connect leads from 70V (49Ω) to COM 2. For 25 volt operation connect leads between 25V (6Ω) terminal and COM 1; for balanced 25 volt operation remove shorting link between COM 1 and GND. For 115 volt operation use Jones plug # P-302-CCT and class 1 wiring.

CONNECTIONS BETWEEN COMPONENTS

Use single-conductor, low capacity shielded wire for connecting preamplifier to amplifier. Keep leads under ten feet in length (unless cathode follower output is employed).

Speakers may be connected with standard flexible line cord ("zip-cord") and up to 100 feet of cable may be used without appreciable loss.

Make certain that all audio cables are kept away from speaker cables, power cables, and power transformers, and that speaker cables are kept away from power cables.

POWER AND GROUNDING

The amplifier is furnished with an AC line cord terminated in a three-prong plug. Plug the line cord into a three-wire grounded outlet providing a nominal 120-volt, 50-60 cycle power source. This will ground the amplifier as well as supply power to it.

It is advisable to ground the amplifier. Therefore, if a three-wire outlet is not available, an adapter such as Leviton No. 5017 should be used to convert a standard two-wire outlet for use with three-wire plugs. The adapter is provided with a grounding pigtail which should be connected to the screw holding the wall plate to the receptacle.

NOTE

In some areas, the wall plate screw is not grounded. In this case it will be necessary to connect a grounding wire between the GND terminal on the rear chassis of the amplifier and a water or steam pipe.

AUXILIARY POWER

The auxiliary power receptacle located on the top chassis is a three-wire grounded outlet. Hence, any associated equipment connected to it with a three-prong line cord will be grounded, providing the amplifier or preamp power switch and the phono on-off switch must be used in turning off a record player connected to the auxiliary receptacle. Flats may develop on the idler wheel of the phonograph if only the amplifier power switch is used to stop the record player.

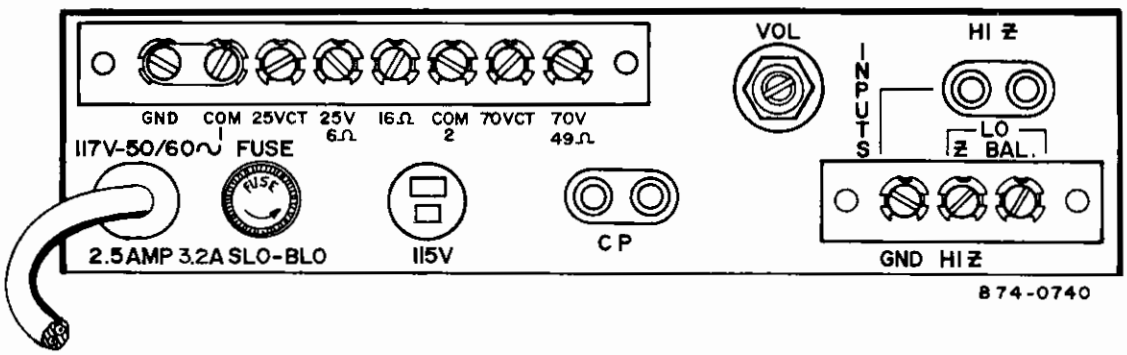


Figure 2 – MO100A Rear Panel

PARALLELING AMPLIFIERS

Dual High Impedance Input and C.P. (cathode paralleling) receptacles are provided to facilitate paralleling of amplifiers without wiring. When paralleling amplifiers interconnect the units as shown in figure 4. Any number of units may be paralleled to provide the desired output power. The interconnecting cable for the "High Z" and "C.P." receptacles should be standard audio shielded cable with phono type plugs at both ends.

NOTE: *Only transformer taps of the same output impedance should be paralleled. It must be borne in mind that paralleling outputs reduces the output impedance.*

Be certain that each SPEECH-MUSIC switch is in the same position on all amplifiers. Rotate all VOLUME controls to maximum gain position. When it is desired to reduce the volume, each amplifier's VOLUME control should be set to achieve exactly equal gain for all amplifiers. Preferably, a common resistance loss circuit should be installed.

The 70 volt outputs of two or more MO100A units may be connected in series to provide a 140 volt output for two amplifiers or 210 volts for three units. To install a series hookup connect the 70 volt outputs as shown in figure 3. The HI Z and C.P. outputs are paralleled as described above and as shown in figure 4.

CAUTION – READ CAREFULLY

The high output and sensitivity of the model MXM-A preamplifier makes it possible to parallel up to three units with the MO100A booster, to provide a total of 15 available microphone inputs. However, the overall system gain should be adjusted when only one MXM-A preamp is used to drive the MO100A amplifier. Adjust the Volume control on the booster amplifier to provide a high-impedance booster sensitivity of 20 volts for full output or a sensitivity of about 4 volts for 500/600 ohm input. This is accomplished by turning the Volume control approximately one-quarter turn clockwise from the off position and setting the Master Gain control on the MXM-A to about "6" position. When the amplifier and preamp level controls have been adjusted as described above, all input channels will have more than sufficient sensitivity. In addition, these settings will eliminate unnecessary and excessive system gain, hum, noise and possible oscillation.

STANDBY CONTROL UNIT

Model KR-6 standby control unit, which permits control of the amplifier from a remote location, is available as an accessory unit. The KR-6 cable can be plugged in on top of the chassis of the MO100A unit (a separate instruction sheet is furnished with the unit).

Control leads from this relay can be run to any desired point. By means of a control switch these leads can be shorted, placing the amplifier in a ready-to-operate condition. When the switch is open, the amplifier is placed in a standby condition. In standby, the filaments of the amplifier tubes are heated, but screen voltage and plate current is removed, reducing power consumption and extending the lite of the tubes.

An 8-prong shorting plug, inserted into the STANDBY CONTROLLER SOCKET, is furnished with the MO100A. When the relay is installed, this plug should be removed and the 8-prong plug furnished with the relay inserted into the socket.

The length of control cable which can be used between the remote switch and the KR-6 unit is limited only by the DC resistance of the control leads. The total length of control cable used, therefore, should not exceed the following:

#22 AWG wire – 45 feet
#18 AWG wire – 120 feet
#14 AWG wire – 300 feet
#12 AWG wire – 450 feet.

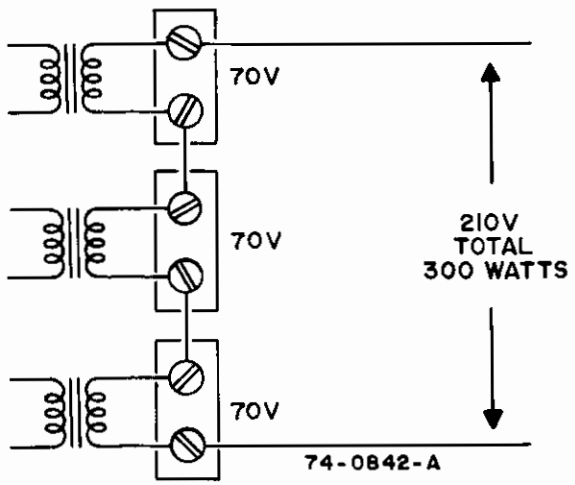


Figure 3 – Series Hookup of 70-Volt Outputs

OPERATION

Although the MO100A incorporates an ON-OFF switch, it is advantageous to control the unit from the preamplifier. In this way the MO100A will be switched on and off together with the preamplifier, thereby simplifying operation. The power cord of the MO100A should therefore be inserted into the controlled Auxil-

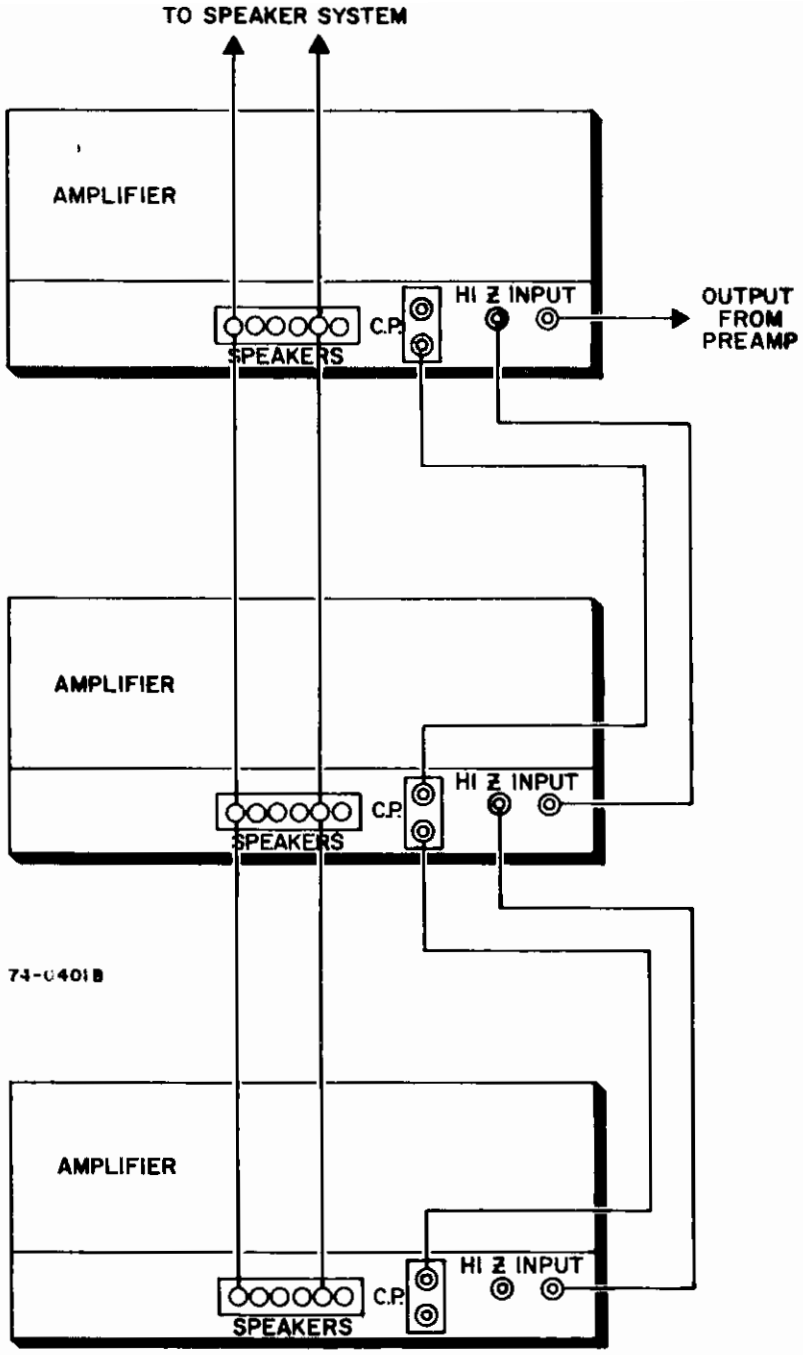


Figure 4 – Paralleling Amplifiers

iary Power receptacle of the preamplifier, which is controlled by the unit's ON-OFF switch.

If the MO100A cannot be controlled from the preamplifier unit then the ON-OFF switch on the MO100A should be used to turn it ON and OFF.

The volume control on the MO100A is used to compensate for a great variation in preamplifier output levels. Thus, if the preamplifier output is very high, the user will find that it is necessary to operate the preamplifier's volume control near minimum to prevent "blasting" volume output from the speaker system. Conversely, if the preamplifier output is low, the preamplifier's volume control may have to be operated near maximum to achieve sufficient volume. The volume control on the MO100A thus permits the user to adjust the gain of the MO100A so that the preamplifier's volume control is operated in its mid-range to achieve the desired volume level range. This control need be set only once, on installation (therefore it is a screwdriver adjustment).

The SPEECH-MUSIC switch, located on top of the chassis, is used to provide optimum response for speech when placed in speech position.

The Input Terminal switch located on top of the chassis, is used for switching between high impedance and low impedance inputs on the input terminals. When low impedance input is desired the proper impedance matching transformers (TL600 or TL10K) should be plugged into socket X1 and the switch placed in LO Z position.

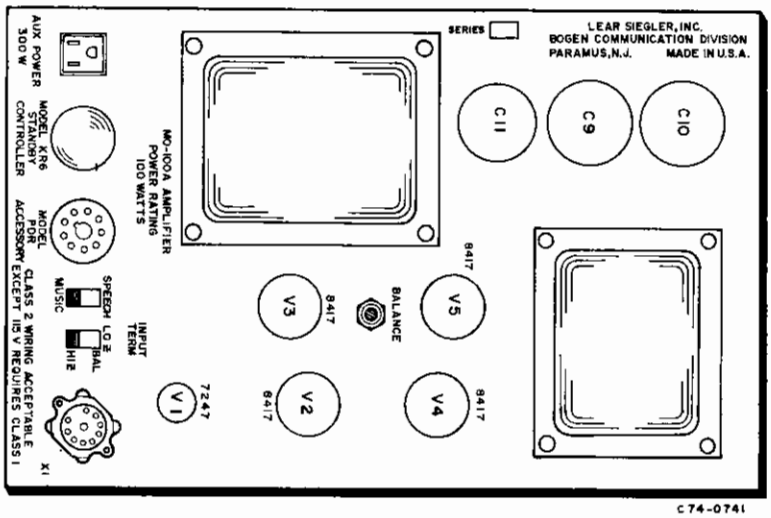


Figure 5 – Top View of Chassis

MAINTENANCE

PILOT LIGHT REPLACEMENT

The pilot light is located in a holder behind a jewel on the front panel. To replace bulb, first remove eight self tapping screws holding chassis bottom plate. Press bulb in and rotate counterclockwise slightly. The bulb will then spring free. Use only a #47 bulb for replacement.

FUSE REPLACEMENT

A 3.2 ampere slow-blow fuse is located on the rear of the chassis. To replace fuse press the spring-loaded cap slightly inward and withdraw cap and fuse. Use only a fuse of the same rating for replacement. If a second fuse blows, do not attempt to further operate the equipment. Consult an experienced technician or Bogen representative for inspection of the unit.

BALANCING OUTPUT TUBES

If any of the four output tubes are replaced, balance tubes as follows:

1. Connect a dummy load across amplifier output, which is capable of handling full rated power output. In addition connect an AC VTVM and an oscilloscope across dummy load.

2. Feed a 1,000 cycle signal into the HI Z input and adjust signal level (to point where clipping occurs) to provide slightly over full rated output of amplifier as measured with AC VTVM.

3. BALANCE ADJUSTMENT is located on top of chassis adjacent to output tubes. This control is a screwdriver adjustment. Rotate control to position which provides equal clipping on oscilloscope. **NOTE:** *If a distortion analyzer is available, this should be used in preference to oscilloscope. In this case, a distortion reading of approximately 1 percent should be measured at full output provided everything else in amplifier is operating properly.*

For field service, where test equipment is not available, set balance control to approximately center position.

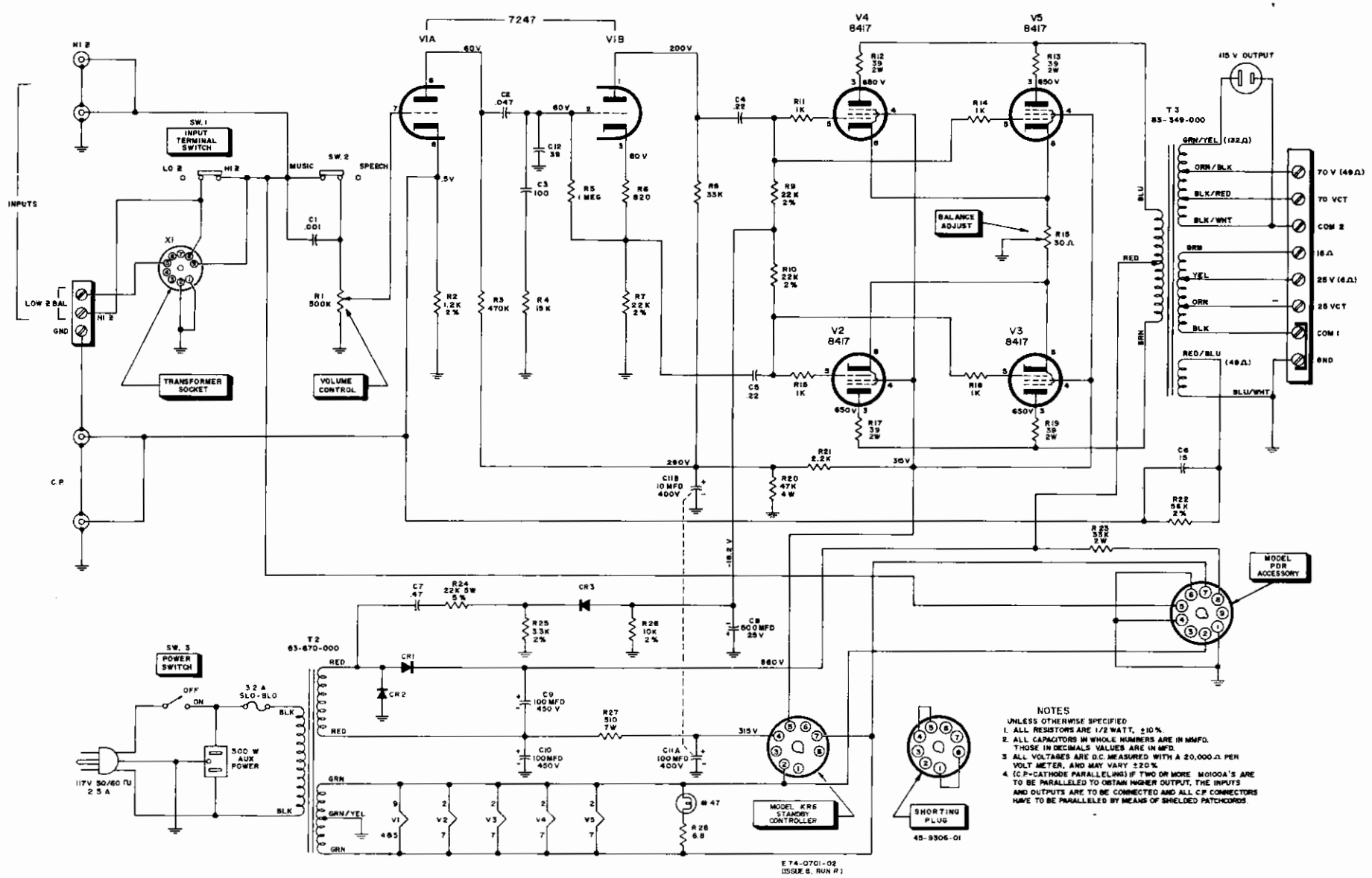
BOGEN SERVICE

We are interested in your Bogen unit for as long as you have it. If trouble ever develops with your unit, please do not hesitate to ask our advice or assistance. Information can be obtained by writing to: Service Department, Bogen, P. O. Box 500, Paramus, New Jersey.

When communicating with us give the model number and serial number of your unit. Completely describe the difficulty encountered. Describe the effects each operating control has upon the symptoms of trouble. Include details on electrical connections to associated equipment and list such equipment.

When we receive this information we will send you service information if the trouble appears to be simple (e.g. bad vacuum tube, incorrect connections). If trouble requires servicing, we shall send you the name and address of the nearest Bogen authorized service agency to which you can send your unit for repair.

When shipping your unit, pack instrument well using the equivalent of the original shipping carton and filler material to prevent damage in transit. Send unit, fully insured and prepaid, via railway express. Do not ship via parcel post unless so instructed. The unit will be promptly repaired and returned to you via express prepaid.



NOTES
UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE 1/2 WATT, ±10%.
2. ALL CAPACITORS IN WHOLE NUMBERS ARE IN MMFD. THOSE IN DECIMALS VALUES ARE IN MFD.
3. ALL VOLTAGES ARE D.C. MEASURED WITH A 20,000Ω PER VOLT METER, AND MAY VARY ±20%.
4. (C.P.=CATHODE PARALLELING) IF TWO OR MORE MO100A'S ARE TO BE PARALLELED TO OBTAIN HIGHER OUTPUT, THE INPUTS AND OUTPUTS ARE TO BE CONNECTED AND ALL C.P. CONNECTORS HAVE TO BE PARALLELED BY MEANS OF SHIELDED PATCHCORDS.

Figure 6 – Model MO100A Schematic Diagram

REPLACEMENT PARTS

The components used in Bogen equipment, with exception of items listed below, are standard parts through all reputable parts jobbers. However, several parts are custom-made to strict Bogen specifications and should be replaced only with genuine Bogen parts. These custom-made parts are listed here and are available through Bogen distributors, service agencies or direct from the factory.

When ordering a part, specify part number and description of the part as listed below. Specify the model and give the series designation, which is a run letter followed by numbers, stamped or screened on the rear of the chassis. Also, give the component board assembly number (45–) for all parts mounted on PC boards.

Ref. No.	Part No.	Description
C8	79-005-052	Capacitor, Electrolytic, 500Mfd, 25V
C9	79-010-046	Capacitor, Electrolytic, 100Mfd, 450V
C10	79-010-046	Capacitor, Electrolytic, 100Mfd, 450V
C11	79-010-047	Capacitor, Electrolytic, 10-100Mfd, 400V
CR1, 2	96-5195-01	Diode, Rectifier
CR3	96-5109-01	Diode, Silicon, 150 P.I.V.
R1	77-001-275	Control, Volume, Screw Driver Adjust
R2	75-235-122	Resistor, 1.2K, ½W, 2%
R7	75-235-223	Resistor, 22K, ½W, 2%
R9	75-235-223	Resistor, 22K, ½W, 2%
R10	75-235-223	Resistor, 22K, ½W, 2%
R15	77-001-563	Control, Balance, Screw Driver Adjust
R22	75-235-563	Resistor, 56K, ½W, 2%
R24	75-653-223	Resistor, 22K, 5W, 5%
R25	75-235-332	Resistor, 3.3K, ½W, 2%
R26	75-235-103	Resistor, 10K, ½W, 2%
R27	75-742-511	Resistor, 510 ohms, 7W, W.W.
R28	76-101-114	Resistor, 6.8 ohms, ½W, W.W.
T2	83-670-000	Transformer, Power
T3	83-349-000	Transformer, Output
	45-9306-01	Plug, Shorting

OWNER'S WARRANTY

Bogen solid state sound equipment is guaranteed against defects in material and workmanship for one year from the date of sale to the original purchaser, provided that the equipment has not been subjected to abuse or accident or altered in any way. Any part of the equipment covered by this warranty which, with normal installation and use, becomes defective will be repaired or replaced by Bogen, provided the equipment is delivered or shipped prepaid and insured to our authorized service station or to the Bogen Factory Service Department, Route 4 and Forest Avenue, Paramus, New Jersey 07652. The equipment may be picked up by you personally or will be returned to you freight prepaid.

Models containing vacuum tubes carry the same warranty as above, except that it does not apply to the vacuum tubes, which are guaranteed for 90 days.

The registration card enclosed with the equipment must be completed and mailed within five days of purchase to place the warranty in effect.

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54-5253-05

ADDENDUM TO MO100A MANUAL (54-5253-) FOR 240 VOLT OPERATION

Bogen Model MO100A public address amplifier with 240 V. kit is an export version of the standard MO100A that will operate from a 240 V. or 120 V. 50/60 Hz power source. It is provided with a power transformer having two series-connected primary windings and a line fuse suitable for operating from a 240 VAC 50/60 Hz power outlet. See below for 120 V operation.

Except for statements regarding the power source and fuse rating, all information in the Bogen Instruction Manual 54-5253- is applicable to the MO100A 240 V. unit. Figure 1 in this addendum is an insert for the schematic diagram (Figure 6) in the basic manual.

In the Parts List on page 8 of the manual, change the listing for the transformer as follows:

T3	83-670-240	Power Transformer

The MO100A 240 V. amplifier can easily be converted to operate from a 120 VAC 50/60 Hz power line by making a simple wiring change and by installing a different fuse. In this use, the two primary windings of the transformer must be connected in parallel, taking precautions to obtain proper phasing of the windings. See Figure 2.

1. Remove the plastic wire nut that connects the black/green and black/yellow wires.
2. Solder the black/yellow wire to black/red lead that is connected to a tie strip.
3. Solder the black/green wire to the black lead that is connected to a tie strip.
4. Install a 3.2 Amp. slo-blo fuse in the fuseholder.

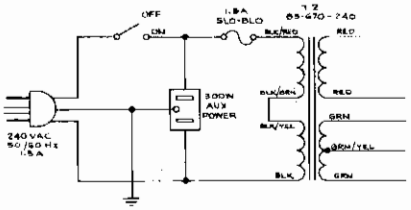

Figure 1 - 240 V. Line Wiring.

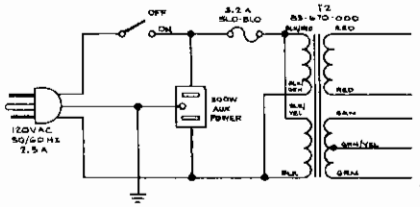

Figure 2 - 120 V. Line Wiring.

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MODEL MO100A

ADDENDUM to MANUAL

BOOSTER AMPLIFIER

ADDENDUM TO MANUAL NO. 54-5253-05

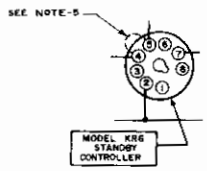
The MO100A Installation & Operating Manual includes a shorting plug which is not a part of your unit. The following changes should be made to your copy of the manual.

On Page 4, the third paragraph under "STANDBY CONTROL UNIT" should be replaced with the following:

> NOTE: Remove jumper between pins 4 and 5 of KR-6 standby socket on rear panel of amplifier. To accomplish this, remove bottom plate.

At the bottom of Page 6, the last word "prepaid" should read "collect."

On Page 7, at the bottom of the schematic diagram, delete the shorting plug shown. To the left of that, the KR-6 standby socket should appear this way:



and the following should be added to the "NOTES."

5. Disconnect jumper when using KR-6 standby controller.

R20 should be 47KΩ, 5W.

On Page 8, R24 75-653-223 should be 75-643-223. Also, delete last line of the Replacement Parts List which is "45-9306-01 Plug, Shorting."

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54-6590-01