

BOGEN®



MODEL MXM-A

MIXER - PREAMPLIFIER

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 Model MXM-A is a professional broadcast quality, self-powered mixer-preamplifier. It is designed for use in theatres, radio stations, recording studios and public address applications. The output may be used to feed booster amplifiers or a low impedance 500/600 ohm transmission line by means of a 500/600 ohm plug-in transformer.

The preamplifier will accept seven input signals. All inputs may be mixed and faded, and the volume of each, except the bridging input/output, may be controlled individually or simultaneously with the master volume control. All five microphone channels are high impedance but can be converted to low impedance by the use of plug-in transformers. One microphone input converts to an equalized input for a magnetic phono cartridge or tape playback head. Two auxiliary inputs, both high impedance, high level, are connected to a fader control. A bridging input accepts signals from a remote preamplifier or a zero level line. Where additional inputs are required, up to three MXM-A's may be paralleled to accommodate as many as 21 inputs. The master gain control may be used to adjust the output level of the mixed program.

The output level may be monitored visually with a built-in Db meter and aurally from a headset monitor jack. A meter sensitivity control on the front panel provides calibrated meter readings for 500/600 ohm output or full-scale readings on weak signals. Provision is also made for monitoring of the 25 volt or 70 volt outputs of a separate booster amplifier.

Each of the five microphone input channels is equipped with a separate music-speech filter switch, which

may be set to provide a fixed, low-frequency attenuation for the particular input. This selective filtering helps to overcome poor room acoustics and increases speech intelligibility by improving individual microphone response. Included also are separate bass and tone controls to adjust the frequency response of the mixer.

The input channels, except the bridging input and MIC 5, may be provided with remote control and/or microphone precedence control. This is accomplished by using Bogen accessories SR-2, SR-4 and RVC-2 remote volume controls and a LVP-1 plug-in unit plus a customer supplied switch.

Another Bogen accessory, the WMT-1 transformer, enables the pre-amplifier to accept inputs from a balanced 500/600 ohm telephone line, such as a Musak transmission cable. The input, at zero level, is fed into one of the two auxiliary receptacles.

Acoustical problems are relieved and intelligibility is assured through the use of a unique, calibrated low frequency (notch) filter which introduces a sharp notch at the selected frequency without affecting the rest of the audio range. This control effectively eliminates hum, turntable rumble and other undesirable noises without affecting overall amplifier response.

An excellent signal-to-noise ratio, coupled with high microphone sensitivity and DC filament voltages, provide professional quality satisfactory for the most critical applications. Conservatively rated components, thoroughly proven circuit techniques and the use of lifetime silicon rectifiers in the power supply assure highest reliability of performance.

SPECIFICATIONS

POWER OUTPUT: At 20 V into high impedance load at 1% distortion; at 4 V into 600 ohms (with plug-in transformer) at 1% distortion; at 0.1 V into 1 meg ohm from bridging output.

FREQUENCY RESPONSE: 18 to 38,000 cps, ± 1 db.

OUTPUT IMPEDANCE: High impedance less than 3,000 ohm; 500/600 ohm with TL600 (broadcast quality) plug-in transformer.

INPUT SENSITIVITY: High impedance 2 MV; Low impedance 0.1 MV; Mag/Tape 1 MV; Aux 0.1 V; Bridging 0.5 V.

HUM (below rated output): Microphone -60db.

TONE CONTROL ACTION: Treble (10 KC) +12 db to -12 db; Bass (50 cps) +14 db to -8 db.

TUBES: Total of 6; 4 - 12AX7A, 1 - 7247, 1 - 12AU7A, plus 3 silicon rectifiers.

POWER CONSUMPTION: 26 watts at 117 VAC, 50/60 cps.

OVERALL DIMENSIONS: 16½" wide, 12" deep, 4¾" high.

SHIPPING WEIGHT: 23 lbs.

ACCESSORIES

MIC INPUT TRANSFORMERS — Models TM50, TM200 or TM500 transformers constitute a group of plug-in type mic input matching transformers.

These transformers are designed to match the input impedance of the amplifier to the low impedance output of the microphone. The TM50 is designed for 50 ohms; the TM200 for 200 ohms and the TM500 for 500 ohms.

OUTPUT TRANSFORMER—The TL600 plug-in line matching transformer is designed to provide a 500/600 ohm output for matching the MXM-A to a balanced transmission line, or to any 500/600 ohm low impedance input.

MODEL WMT-1 LINE MATCHING TRANSFORMER— Used for distribution of background music directly from leased telephone line, wired music systems, or any 0 level 500/600 ohms balanced line to high impedance input of amplifier (AUX, or BRIDGING INPUT). The transformer is compact and is attached directly to the rear of the amplifier chassis. It has a 3-screw terminal strip for line input connections and a shielded cable terminated in a phono plug for output. No wiring or soldering required to connect it to amplifier. The WMT-1 mounts on the rear of the chassis. Two holes are predrilled for this purpose.

MODEL LVP-1 — A plug-in accessory which permits the user to provide remote volume control or precedence over auxiliary inputs (Input 6) when used in conjunction with the RVC-1 Remote Volume Control.

RVC-2 REMOTE VOLUME CONTROL — This accessory permits remote volume control of the auxiliary inputs (Input 6).

SR-2 AND SR-4 REMOTE VOLUME CONTROLS — The SR-2 permits the user to control the volume as well as mix and fade two mic inputs from a distance of up to 2000 feet without loss of power or signal quality. The model SR-4 will similarly control four mic inputs.

LK-6 CONTROL GUARD LOCKING PLATE — Bogen Model LK-6 Control Guard Locking Plate is designed to prevent unauthorized tampering with controls of amplifier. It comes complete with two sets of keys. Key cannot be removed when lock is in open position.

INSTALLATION

UNPACKING

Inspect shipping container and unit for indications of improper handling. The unit was carefully checked before leaving factory. If unit has been damaged, make an immediate claim to dealer or distributor from whom it was purchased. If unit was shipped to you, notify transportation company without delay and place your claim.

CONNECTIONS BETWEEN COMPONENTS

Use single conductor, low-capacity shielded audio wire for connecting the record player, tape recorder and other components to amplifier. Keep leads under ten feet in length.

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.

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. In areas where the wall-plate screw is not grounded, it will be necessary to connect a grounding wire from the GND terminal on the rear chassis of the amplifier to a water or steam pipe.

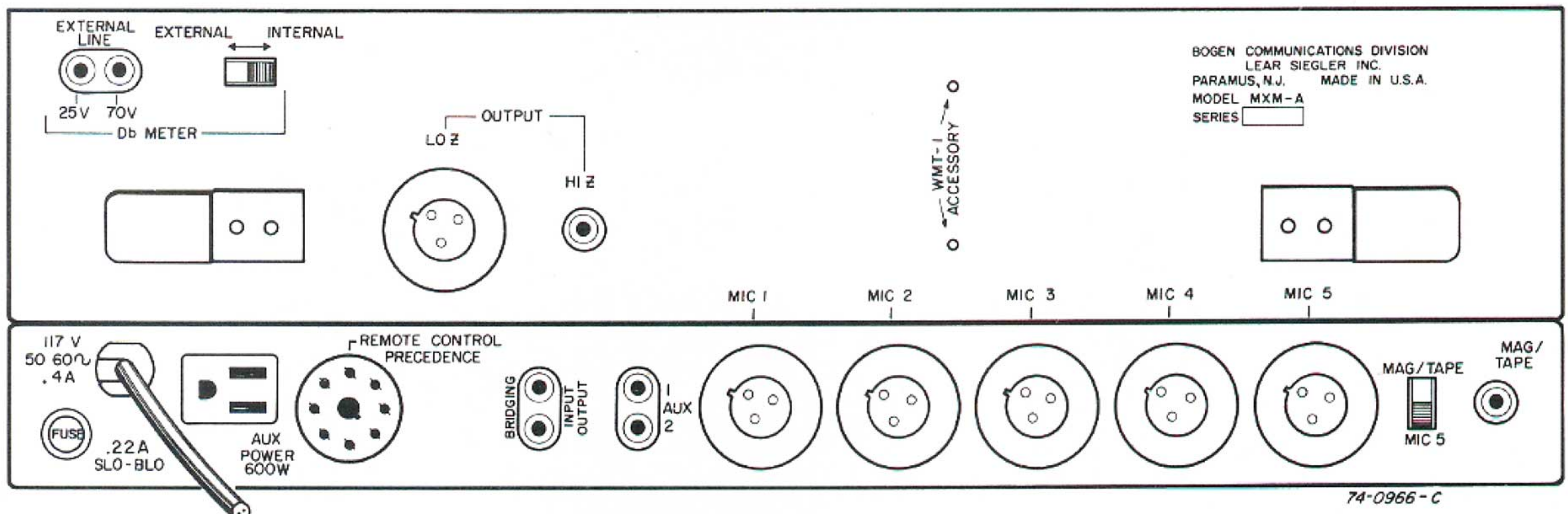


Figure 1 — MXM-A Rear Panel

A three-wire grounded receptacle is located on the rear panel (see figure 1) for the supply of power to another component in the system which does not draw more than 600 watts. Equipment connected to the auxiliary power receptacle will be automatically grounded if the MXM-A power line has been connected as described above.

The auxiliary receptacle is controlled by the power switch on the MXM-A, and any components connected to it will be turned on and off with the power switch. Both the MXM-A power switch and the phono power switch must be used in turning off a record player connected to the MXM-A preamplifier. Flats may develop on the idler wheel of the phonograph if only the pre-amp switch is used to stop the record player.

CONNECTING PROGRAM INPUTS

MICROPHONES: A maximum of 5 high-impedance microphones may be connected simultaneously. The microphone plug should be inserted into the desired microphone receptacle on the rear of the chassis. The microphone inputs are MIC 1, MIC 2, MIC 3, MIC 4, and MIC 5. Microphone inputs 1 through 5 use connector Bogen 85-0124-01 or CON-1, Amphenol 91-854 or Cannon XLR-311C.

Impedance selector switches for MIC 1 through 5 are located on top of the chassis. When using the MIC 1 thru MIC 5 microphone inputs move the respective Impedance Selector switch to either HI Z or LO Z position, depending on microphone impedance. The unit is supplied ready to accept high impedance microphones.

When using low-impedance microphones, insert an input matching transformer into the respective receptacles X1, X2, X3, X4, or X5 on the chassis top (see Figure 4) and place the respective Impedance Selector switch in the LOW Z position. The following plug-in microphone matching transformers are available from Bogen

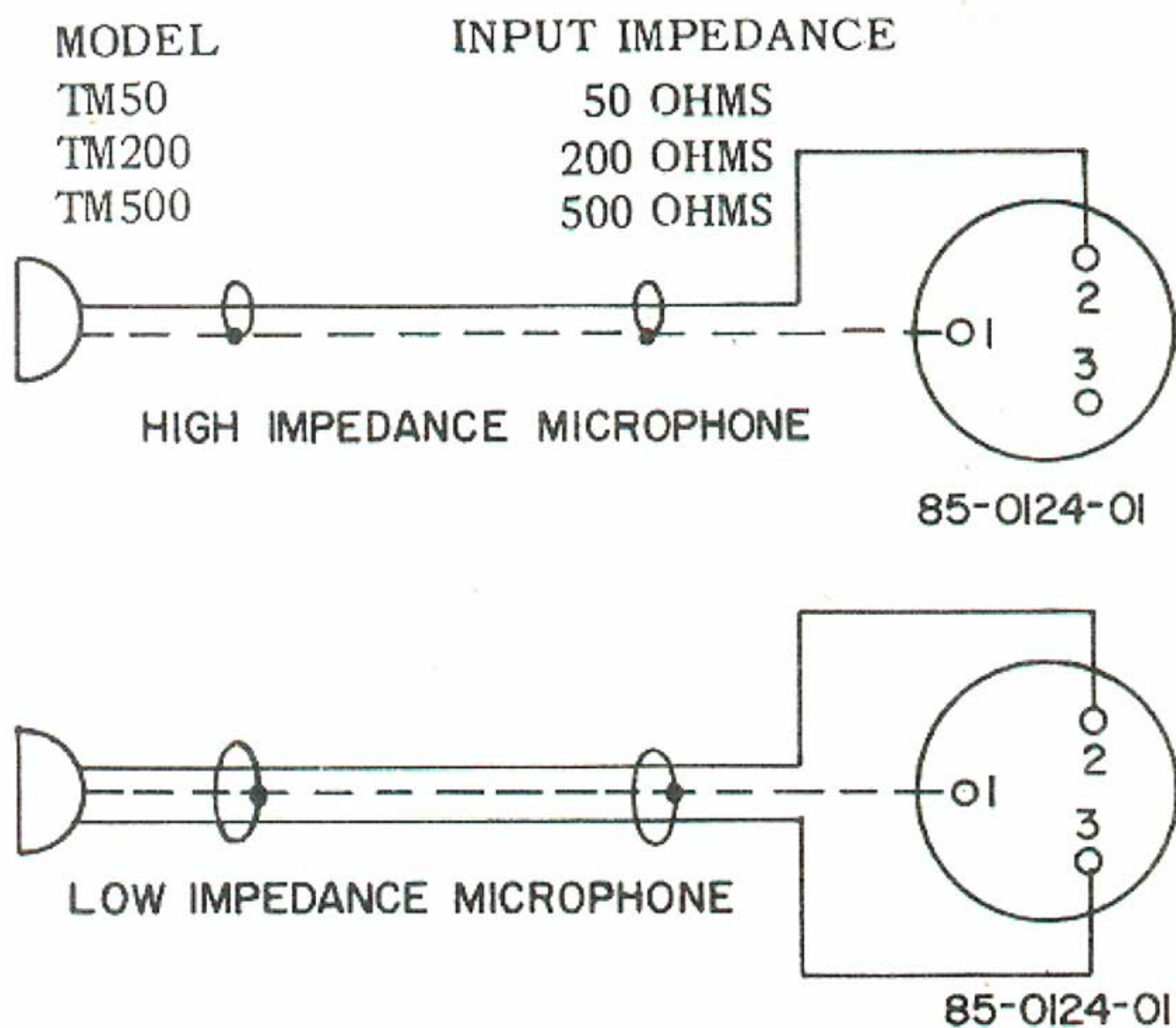
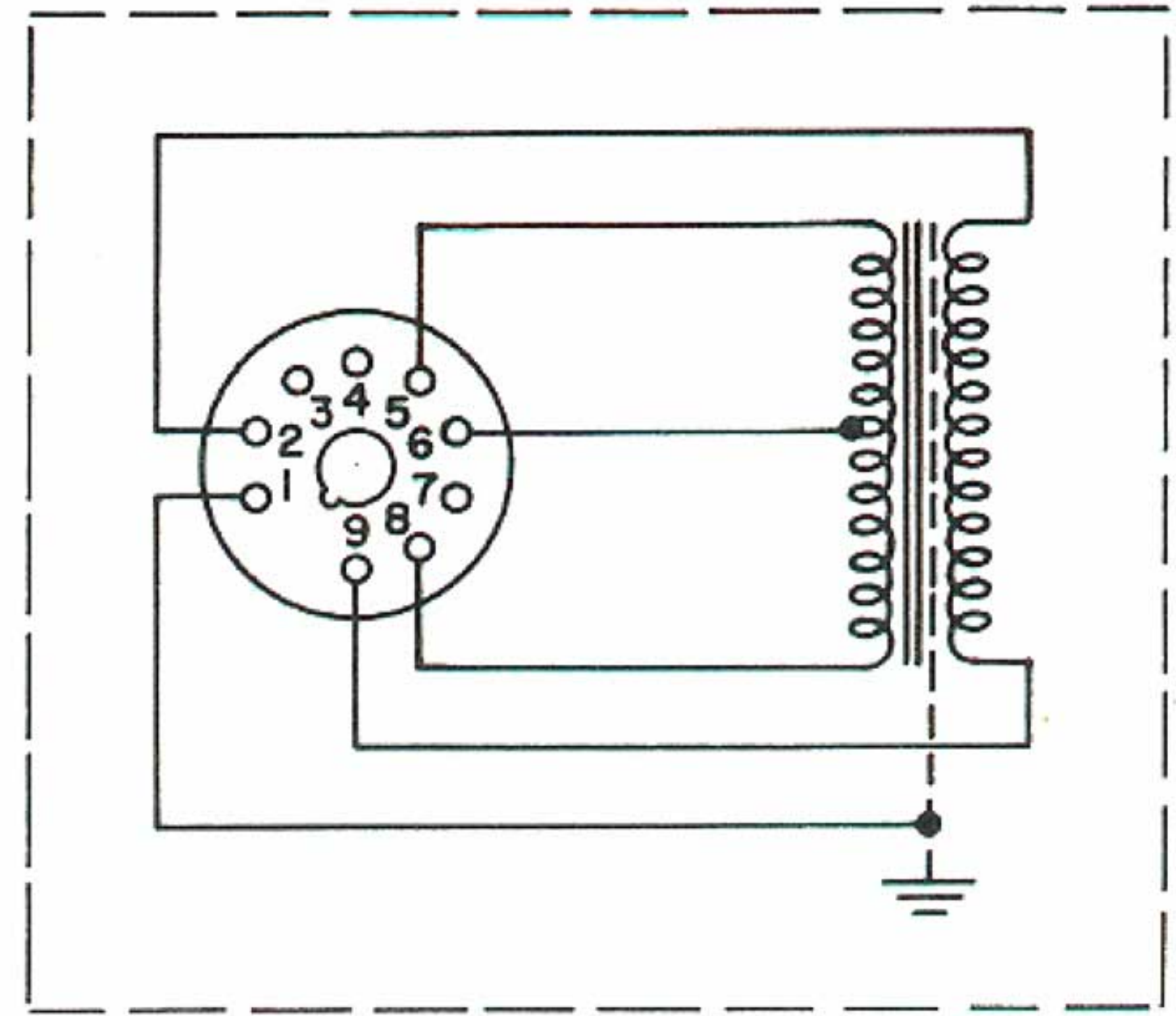


Figure 2
High and Low Impedance Microphone Connections



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Figure 3 – Bogen Plug-in Low Impedance Transformers

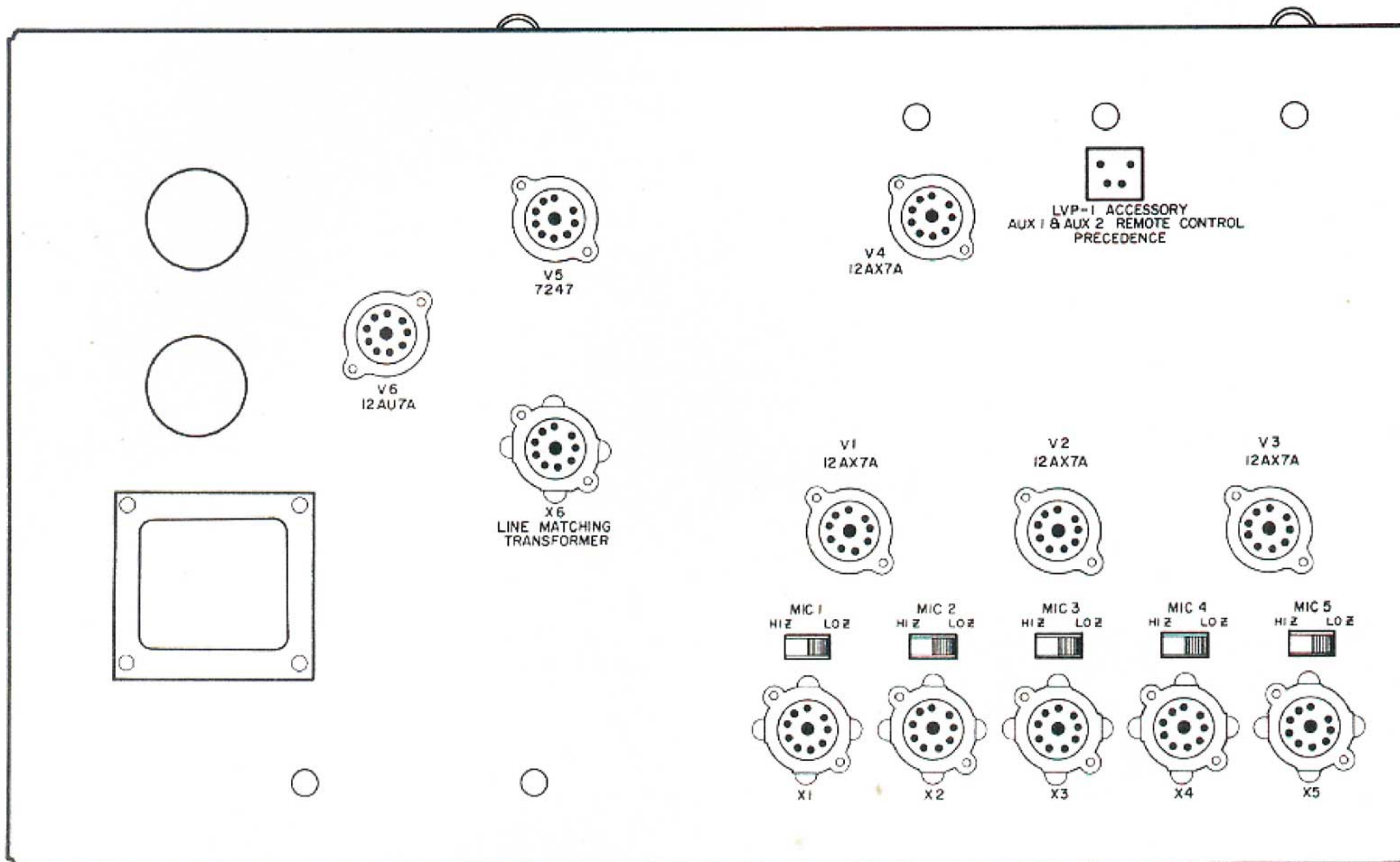
The microphone cables should be shielded cable and the connector wired as shown in Figure 2. High-impedance microphones should use single-conductor shielded cable, under ten feet in length. Low-impedance microphones should utilize two-conductor shielded cable with cable lengths from 50 to 500 feet depending on the microphone. Use three-prong connectors (Bogen 85-0124-01 or CON-1, Amphenol 91-854 or Cannon XLR-311C).

PHONOGRAPH: Phonographs which use either ceramic, crystal, or magnetic cartridges may be connected to the preamplifier. For a magnetic cartridge, connect the input cable to the MAG/TAPE input on the rear of the chassis using a standard single-prong phono plug. Use single-conductor shielded audio cable. The MIC 5 Selector switch on the rear of the chassis should be moved to the MAG/TAPE position.

Phonographs employing a ceramic or crystal type cartridge may be connected to either the AUX 1 or AUX 2 receptacles on the rear of the chassis. Use single-conductor shielded audio cable terminated in a standard single-prong phono plug. It is recommended that a separate ground wire be connected between the phono player base and the preamplifier ground to minimize any possible hum pickup. Use one of the holes provided for WMT-1 mounting (on the rear panel) and secure the wire with a sheet metal screw to assure proper grounding.

TAPE PLAYBACK: The playback signal from a tape recorder or tape deck with built-in preamplifier is connected to the AUX 1 or AUX 2 input of the MXM-A unit. If you are using a tape transport mechanism without a preamplifier, the output of the playback head should be connected to the MAG/TAPE input on the rear panel and the MIC 5 Selector switch set to the MAG/TAPE position.

Use single-conductor shielded audio cable terminated in a phono plug for making connections to tape unit. It is recommended that an extra ground wire be connected between the tape deck and the MXM-A preamplifier. Use one of the WMT-1 ACCESSORY mounting holes on the rear panel, and secure the wire with a sheet metal screw to assure grounding.



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Figure 4 - MXM-A Top of Chassis

AUXILIARY: The AUX inputs (Input 6) may be used for sources other than a phonograph. Any signal source having a high-level high-impedance output may be connected to the inputs. This includes virtually all tuners and tape recorders having preamplifiers. An input signal level of approximately 0.1 volt is required to obtain full output from the preamplifier.

REMOTE CONTROL

Each of the seven input channels except MIC 5 and the BRIDGING INPUT/OUTPUT may be remotely controlled by utilizing Bogen accessories SR-2, SR-4, RVC-2 and the LVP-1 accessory. For remote operation of microphone inputs 1 through 4, connect the SR-2 or SR-4 accessory to the desired terminals and to GND (pin 8) on the REMOTE CONTROL PRECEDENCE socket located on the rear panel (see Figure 1). The SR-2 provides remote volume control for one or two microphones; the SR-4 will handle up to four microphones. See schematic (Figure 5) for specific pins on REMOTE CONTROL PRECEDENCE socket.

Input 5 may also be remotely controlled for MAG phono or TAPE inputs in the same way. However, microphone (MIC 5) input to this channel cannot be remotely controlled.

For remote volume control of auxiliary inputs, the LVP-1 accessory must be plugged into the LVP-1 AUX 1 and AUX 2 Remote Control Precedence socket on the top of the chassis (see Figure 4). Then connect the RVC-2 accessory between the AUX 1/2 (pin 6) and GND (pin 8) on the Remote Control Precedence socket. The RVC-2 may then be operated as a remote volume control.

The recommended distance for remote operation is up to 3000 feet with #22 wire. For longer distances, a proportionately heavier wire must be used.

MICROPHONE PRECEDENCE

Any of the five microphone channels can be set up to provide precedence over any other MIC or auxiliary input except MIC 5. To apply precedence to any particular MIC input, connect a switch (S.P.S.T.) between the specific pin for the microphone to be controlled and GND (pin 8) on the Remote Control Precedence socket. This switch (not supplied by Bogen) when closed disables the input to the controlled channel and permits another MIC input channel to take precedence over it.

Microphone precedence may also be applied to the auxiliary inputs (Input 6). To do so, an LVP-1 accessory is first plugged into the LVP-1 AUX socket on the top of the chassis. Then connect a switch between the AUX 1 and AUX 2 (pin 6) and the GND, pin 8 on the Remote Control Precedence socket. When closed, this switch disables the AUX channel inputs to provide precedence for a microphone input.

PARALLELING AMPLIFIERS

Two or up to three MXM-A preamplifiers may be connected in parallel to increase the number of available inputs. To parallel preamplifiers connect a patch cord (standard audio shielded cable with phono type plugs on each end) from the BRIDGING INPUT/OUTPUT jack on one preamplifier to the BRIDGING INPUT/OUTPUT jack of the next preamplifier. Paralleling may be done with up to three MXM-A units to accommodate as many as twenty-one inputs (including fifteen micro-

phones). The signal taken from a MXM-A Bridging Output is not controlled by the MASTER volume control of that preamplifier. The overall output would then be taken from only one of the three preamplifiers; or the "master" preamplifier. The MASTER volume control of the "master" preamplifier may be used to adjust the output volume level of the mixed program.

OUTPUTS

HI Z: This output may be used to drive any number of booster amplifiers. Use shielded audio cable for connections. The HI Z output may also be connected to the AUX input of any Bogen P.A. amplifier.

LO Z: For low impedance output of 500/600 ohms, a plug-in line matching transformer, Bogen Model TL600, must be inserted into socket X6 on top of the chassis. Use a three-prong connector (Bogen CON-1 or 85-0124-01, Amphenol 91-854 or Cannon XLR-311C).

BRIDGING INPUT/OUTPUT: This can be used as a high impedance output for all mixed input signals to feed a tape recorder or auxiliary amplifier or for paralleling with other MXM-A preamplifiers. This output signal is not affected by the MASTER volume control.

CONTROL FUNCTIONS

POWER: Turn power switch on.

VOLUME AND FILTER

Each one of the 6 input channels has a separate volume control. Microphone inputs 1 through 5 each incorporate a push-pull speech filter switch. When pushed IN the switch provides for wide range (full frequency) response. When the Control Knob is pulled OUT, limited range or speech response is provided. This shapes the audio response to compensate for varying inputs or acoustic conditions. Each switch provides a low frequency cutoff for the input channel it controls, giving the voice a crisp tonal quality so that it can cut through noise and overcome conditions of high reverberation.

MIC 1, MIC 2, MIC 3, MIC 4: Each controls the level of the microphone with which it is associated. Clockwise rotation increases the volume, counterclockwise rotation decreases the volume level. Each of these controls incorporates the filter switch mentioned above.

INPUT 5: This control adjusts the volume level of either the MIC 5 or the MAG/TAPE input, depending on the input selected with the MIC 5-MAG/TAPE Input Selector switch on the rear panel of the chassis. Rotate the control clockwise to increase volume, rotate the control counterclockwise to decrease volume. This control also incorporates the speech filter switch mentioned above.

INPUT 6: This control serves a two-fold purpose. It selects either of the two auxiliary inputs and it controls the volume of the selected auxiliary input. Operate the control as follows: To select the Aux 1 input rotate the control counterclockwise past the center position; rotating the control more counterclockwise increases the Aux 1 volume. To select the Aux 2 input rotate the control clockwise past the center position; rotate the control more clockwise to increase the Aux 2 volume. If the auxiliary input is not to be used, set the control to the mid-position (0).

The control can also be used as a "fader" control when both auxiliary inputs are used. This makes it possible to gradually and smoothly reduce the level of one input and then increase the other when changing inputs. The effect is one of fading from one input to the other.

MASTER: A seventh volume control, marked MASTER controls the level of the mixed program. After first adjusting the MIC 1 through MIC 4, INPUTS 5 and 6 controls to mix the program as desired, use the MASTER control to adjust the overall volume of the output signal.

RESET MARKERS: Each individual volume control has a reset marker on the skirt of the knob. This marker is used to log a particular setting. This is done as follows:

Make a "dry run" or rehearsal to adjust the volume controls to desired levels. Slide the reset markers to coincide with the midpoint mark on the front panel. The individual knob can now be returned to zero or any other point, allowing instant resetting to the predetermined level (indicated settings).

BASS AND TREBLE: These are separate tone controls, operating without interaction. For a flat frequency response, set each control at its mid-position. To boost bass or treble response, rotate the proper control in a clockwise direction; to cut response, rotate in a counterclockwise direction.

LOW FREQUENCY FILTER: This push-pull control, calibrated from 10 to 200 cps, introduces a sharp notch at the selected frequency without affecting the rest of the audio range. When this control is pushed in, there is no filtering action. When low frequency filtering is required, pull the knob out and turn it to the setting which best provides the desired filtering to eliminate hum, turntable rumble or other low-frequency noise.

MIC INPUT SELECTORS: These switches are located on the top of the chassis (see Figure 4). They are used to select either HI Z or LOW Z microphone inputs depending on the type of microphone used; a plug-in transformer is required for low impedance microphones.

METER SENSITIVITY CONTROL AND SWITCH: The Db meter is normally set for a relative full scale calibrated reading with the METER SENSITIVITY control in the extreme counterclockwise position. The meter is calibrated for 500/600 ohm output level using the TL600 plug-in transformer. There are two convenience receptacles on the rear panel for use in monitoring of external booster amplifier outputs of 25 volts or 70 volts. To monitor an external line connect the (25 V or 70 V) external output to the appropriate (use a phono type plug) input jack and move the Metering switch to the EXTERNAL position. The meter is calibrated for the 25 V or 70 V lines to read 0 db at full level with METER SENSITIVITY control in counterclockwise position.

If a meter indication appears too low, for easy reading, the METER SENSITIVITY control can be adjusted by rotating clockwise, so that the maximum desired relative deflection will be achieved. For normal calibrated use, however, the METER SENSITIVITY control should remain in the extreme counterclockwise position.

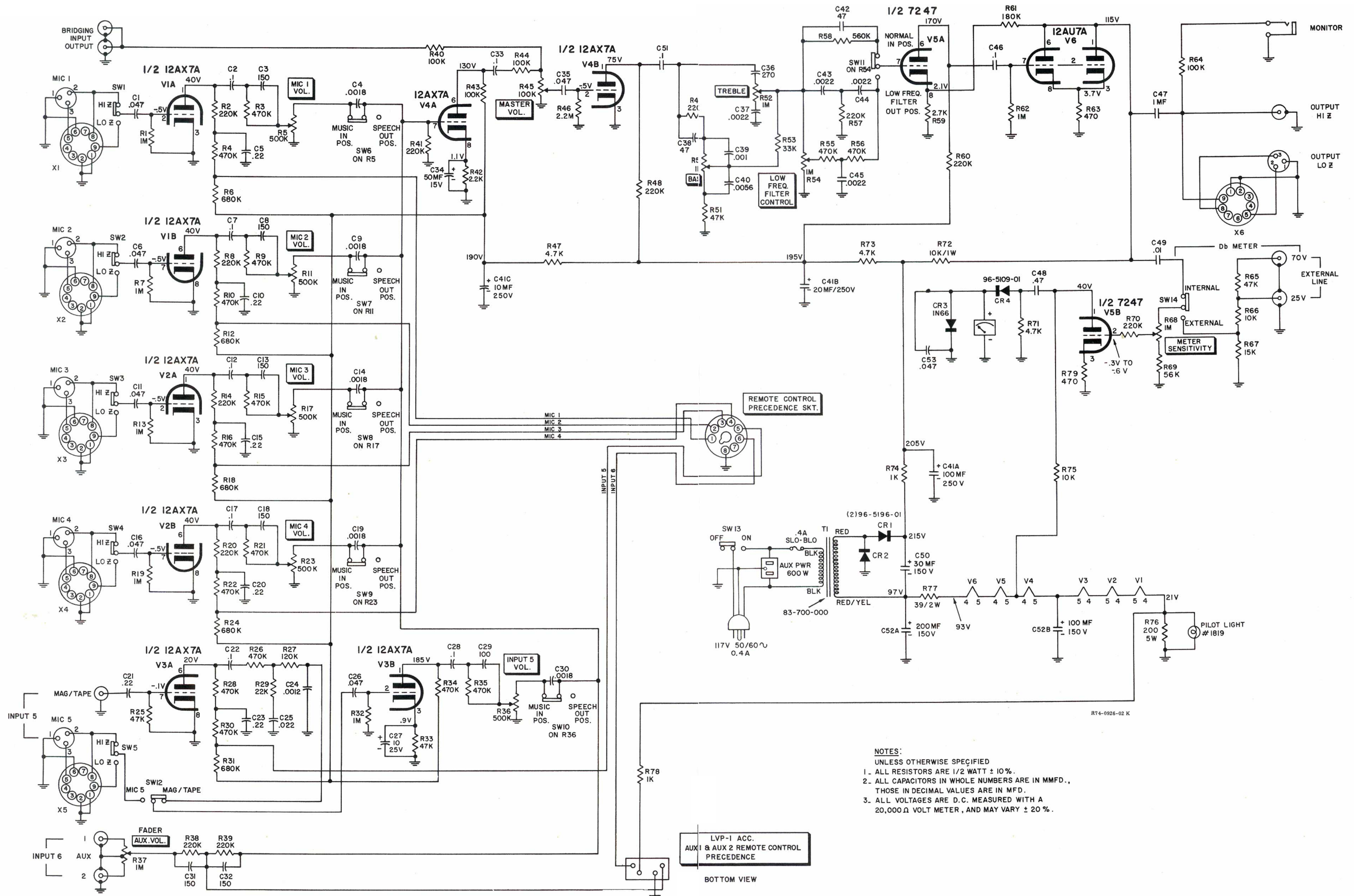


Figure 5 - MXM-A Schematic Diagram

OPERATION

Turn the MXM-A on by moving the POWER switch to the ON position. Rotate the MASTER VOLUME control fully clockwise. Turn up the volume control for each channel used to the maximum desired level. Volume controls not in use should be kept at zero to prevent noise pickup. After volume of each input has been set, overall volume of the mixed input can be adjusted with the MASTER control. Do not try to overcome insufficient output due to turned down MASTER volume control by increasing individual channel controls. This is poor practice and overload will be the result.

If a tuner, tape recorder, or phonograph is used on the INPUT 5 channel, do not forget to set the appropriate input selector switch on the rear of the chassis to the proper position.

CAUTION – READ CAREFULLY

The high output and sensitivity of the model MXM-A preamplifier makes it possible to parallel up to three units with a single Bogen booster amplifier to provide a total of 15 available microphone inputs. It is important, therefore, that the overall system gain be properly adjusted when only one MXM-A preamp is used to drive a single booster 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 a 500/600 ohm input. This is accomplished by turning the booster amplifier Volume control approximately one-quarter turn clockwise from the off position and setting the Master Gain control on the MXM-A to about the "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.

SERVICE

FUSE REPLACEMENT

A 0.4 ampere slow-blow fuse is located on the rear of the chassis. To replace this fuse, press the spring loaded cap slightly inward, rotate counterclockwise slightly and withdraw cap and fuse. Be certain power is disconnected when replacing fuse. Use only a fuse of the same rating for replacement. If replacement fuse blows, do not attempt to further operate equipment. Consult an experienced technician or Bogen representative for inspection of the unit.

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 Division, P. O. Box 500, Paramus, New Jersey 07652.

TUBE REPLACEMENT

Tubes should be tested once every six months to insure optimum high-fidelity performance. To avoid possibility of shock, do not remove bottom plate when replacing tubes. Handle tubes by their bases only when removing or inserting them.

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 component, 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 collect.

REPLACEMENT PARTS

The components used in Bogen equipment, with exception of items listed below, are standard parts available through most parts jobbers. However, several parts should be replaced only with genuine Bogen parts. These parts are listed here and are available through Bogen distributors, service agencies or directly 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.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	94-0213-01	Pilot Light, #1819	R36	77-001-593	Control, Input 5 Volume, includes SW10
	94-1181-01	Meter	R37	77-001-596	Control, Input 6, Fader
	03-0592-01	Knob (0-10)	R45	77-001-573	Control, Master Volume
	03-0593-01	Knob (5-0-5)	R50	77-001-515	Control, Bass
	03-0590-01	Knob	R52	77-001-515	Control, Treble
	02-9029-01	Reset Marker	R54	77-001-594	Control, Low Freq. Filter, includes SW11
C27	79-001-046	Electrolytic, 10 mfd, 25 V	R68	77-001-321	Control, Meter Sensitivity Adj.
C34	79-005-036	Electrolytic, 50 mfd, 15 V	R76	75-642-201	Resistor, Wirewound, 200 ohms, 5 W
C41	79-010-062	Electrolytic, 10-20-100 mfd, 250 V	SW1	81-003-016	Switch, Input Selector
C50	79-001-078	Electrolytic, 30 mfd, 150 V	SW2	81-003-016	Switch, Input Selector
C52	79-001-061	Electrolytic, 200-100 mfd, 150 V	SW3	81-003-016	Switch, Input Selector
CR1, 2	96-5196-01	Diode, 500 P.I.V., 750 ma	SW4	81-003-016	Switch, Input Selector
CR3	96-5059-01	Diode, IN66	SW5	81-003-016	Switch, Input Selector
CR4	96-5109-01	Diode, 150 P.I.V., 100 ma	SW6	See R5	Switch, Speech Filter
R5	77-001-592	Control, Mic 1 Volume, includes SW6	SW7	See R11	Switch, Speech Filter
R11	77-001-592	Control, Mic 2 Volume, includes SW7	SW8	See R17	Switch, Speech Filter
R17	77-001-592	Control, Mic 3 Volume, includes SW8	SW9	See R23	Switch, Speech Filter
R23	77-001-592	Control, Mic 4 Volume, includes SW9	SW10	See R36	Switch, Speech Filter
			SW11	See R54	Switch, Low Freq. Filter
			SW12	81-003-016	Switch, Input 5 Selector
			SW13	81-003-021	Switch, Power
			SW14	81-003-016	Switch, Meter
			T1	83-700-000	Transformer, Power

OWNER'S WARRANTY

Bogen high-fidelity 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.

The above does not apply to phonograph cartridges, which are guaranteed for 90 days, nor to wooden enclosures and bases. The warranty on wooden enclosures and bases is that, if you receive them damaged in any way, you may return them to the factory within one month for replacement or full credit. If we do not receive them within one month of delivery, the warranty is void on wooden enclosures and bases.

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