



MOBILE P.A. AMPLIFIER

MODEL MA-40



The Bogen Model MA-40 is a rugged, compact, weather-resistant DC-operated amplifier intended for use in mobile and portable public address work. It may be powered from any 12-16 VDC source with negative ground, and provides one mic input and one aux input.

The MA-40 supplies a full 40 watts output at less than 5% distortion, with a frequency response of 200 Hz to 12 kHz \pm 2 dB, for maximum intelligibility. Separate front-panel inputs and individual gain controls are provided for a low-impedance (50-600 ohm) microphone and a high-level auxiliary unit, such as a tuner or cassette player. An MC1-M connector for the mic input and an RCA phono jack for the aux input are also provided.

The unit will operate from any motor vehicle battery with a negative ground that supplies a minimum of 12 VDC. Max-

imum power supply current drain is 6A; quiescent drain is 500 mA. Rear panel terminal strips provide 8 and 16 ohm (25V) output impedance connections to speaker systems. A fuse and self-reset thermal breaker offer protection from output shorting and thermal overload. A diode in the positive lead wire protects the unit against reversed polarity of battery connections. The MA-40 mobile amplifier will operate within a wide range of temperatures—from -22 to +149 degrees Fahrenheit. Compact, lightweight and rugged in construction, it is also splashproof.

The MA-40 is designed for quick and flexible installation in mobile and portable uses. The U-type adjustable bracket and thumbscrews supplied permit mounting on any convenient surface and easy removal or repositioning. Four rubber feet are also supplied for tabletop use.

TECHNICAL SPECIFICATIONS

| | |
|-----------------------------------|--|
| FREQUENCY RESPONSE | 200 Hz to 12 kHz, ± 2 dB |
| DISTORTION AT FULL POWER | Less than 5% |
| RATED OUTPUT (RMS) @ 1 kHz | 40 watts |
| MIC SENSITIVITY | 1 mV |
| AUX SENSITIVITY | 250 mV |
| AUX INPUT IMPEDANCE | 47k ohms |
| MICROPHONE TYPE | 50 to 600 ohms nominal |
| MIC SIGNAL TO NOISE RATIO | -54 dB |
| AUX SIGNAL TO NOISE RATIO | -70 dB |
| MIC DYNAMIC RANGE | 30 dB |
| OUTPUT IMPEDANCE | 8 ohms and 16 ohms (25V) |
| POWER REQUIREMENTS | |
| <i>No Signal</i> | 500 mA |
| <i>Full Power</i> | 6A |
| CONTROLS | Power On/ Off switch, Mic volume, Aux volume |
| CIRCUIT PROTECTION | Fuse and self-reset thermal cut-out |
| MOUNTING | Easy-to-install with U-type adjustable bracket; Rubber feet for table-top use |
| DC POLARITY | Negative ground operation with protection from reversed polarity |
| TEMPERATURE RANGE | -22° to +149° F (-30° to +66° C) |
| INPUT CONNECTIONS | Front-panel MC1-M for MIC; RCA phono for AUX |
| DIMENSIONS | 9 $\frac{1}{8}$ " W x 8 $\frac{1}{8}$ " D x 2-11/16" H (23.18 x 20.64 x 6.83 cm) |
| SHIPPING WEIGHT | 7 lbs. (3.2 kg) |
| ACCESSORY | Bogen MDP-520 Microphone |

INSTALLATION

MOUNTING

The MA-40 may be mounted in any position and on practically any hard surface. A typical installation on the underside of a vehicle dashboard is illustrated in figure 1. The unit may also be mounted on the frame of the vehicle and at any convenient angle.

POWER

Two leads (black and red) consisting of four feet each of No. 14 AWG wire are provided with the amplifier for making power connections at the rear-panel terminal strip marked 12-16V. Connect the black lead between the negative (-) side of the DC source and the unit's negative terminal; connect the red lead to the positive (+) side. The front-panel power switch turns the unit on and off; when lighted, the red LED above the switch indicates that power is on.

MICROPHONE

Any low impedance microphone—50 to 600 ohms—may be used. Connection should be made with shielded audio cable terminated in a Bogen Model MC1F (or equivalent) connector. A plastic-cased accessory microphone, Bogen Model MDP-520, or equivalent, is recommended for use with the MA-40. The front-panel MIC control adjusts microphone volume.

Caution

For best results use a microphone with a case at floating potential (both center and outside leads insulated from the case). With other microphone types, do not short the shield or case of the microphone to ground (or vehicle frame).

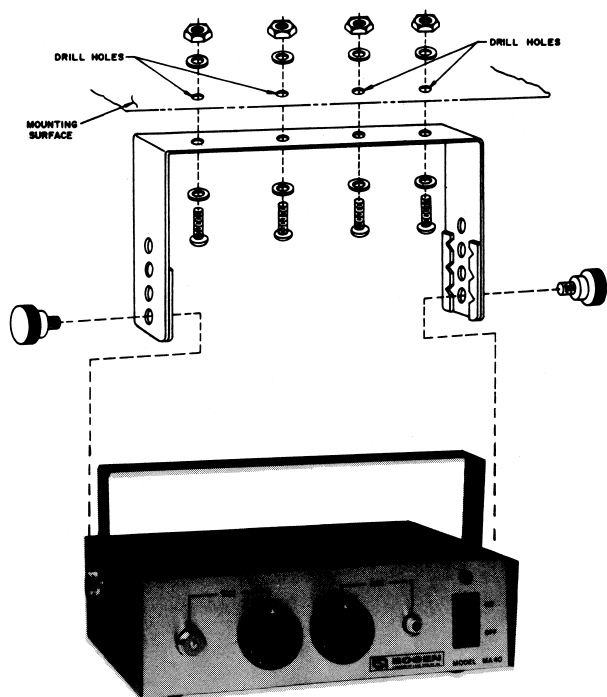


Figure 1 — Typical installation

OPERATION

After the amplifier is mounted and the connections made according to the instructions given in **INSTALLATION**, set the power switch to the "on" position and adjust controls as follows.

MIC

With the MIC level control rotated fully counterclockwise, make a speech test using the microphone while slowly rotating the MIC control clockwise until the desired output volume is reached. If acoustic feedback (squealing or ringing) occurs, either increase the distance between microphone and speakers or reduce the setting of the MIC level control.

AUX

Rotate the AUX level control to obtain the desired level from the tuner/tape accessory. Clockwise rotation (to the higher numbers) increases the volume. If the accessory unit has an output level control, be certain the control is not set too low.

Note

Because of the low quiescent current drain of the MA-40, the unit may be left on for extended periods of no signal input without excessive drain on the power source.

AUXILIARY

The front-panel AUX receptacle accommodates a high impedance input from a tuner or tape player with a minimum level of .25V. Use shielded audio cable terminated in an RCA phono plug. Output level is adjusted by the AUX control on the front panel.

SPEAKERS

A terminal strip on the rear panel provides output connections to speakers rated at 8 or 16 ohms. Correct matching between amplifier output and speaker systems used is essential to obtain rated power. Connect the speaker leads between COM and the appropriate output terminal. The 16-ohm terminal is also at 25V potential and may feed a 25V distribution system.

MAINTENANCE

Note

There are no user-replaceable parts within the unit. All internal servicing must be performed by qualified service personnel.

CIRCUIT PROTECTION

The amplifier has a self-resetting thermal circuit breaker that protects against overheating. If the breaker trips, there will be no output. The breaker will automatically reset after a safe operating temperature is reached (normally within 2 minutes). If it resets and then re-opens, investigate the cause of the temperature overload: typically, improper connections at the output terminals or excessive environmental heat with inadequate ventilation.

The fuse, rated at 10A, is located in a holder on the rear of the chassis. To replace it, press the fuse holder cap in and turn it counterclockwise. Remove both cap and fuse. Insert another fuse of the same rating and replace the cap; do not replace a fuse with one of higher current rating. If a second fuse blows, do not attempt to operate the amplifier further. Consult a qualified service technician or contact your Bogen service agency.

The amplifier requires a minimum of 12VDC to maintain operating efficiency. If power supplied to the unit falls below the minimum, degradation in performance will occur. Check the 12-volt supply and interconnections regularly.

If there is system failure, check speakers and microphone by substitution, or by connecting them to an amplifier which is known to be in proper operating condition. If it has been determined that the amplifier is defective, standard troubleshooting procedures should be used.

A thorough check of the complete system at regular intervals greatly reduces the possibility of failure when the system is in use. The output of the amplifier should be routinely checked when the microphone and auxiliary inputs are used. Tests should be performed under operating conditions. Transistors should not be removed for checking unless they are suspected of being defective.

REPLACING OUTPUT TRANSISTORS

Clean all foreign matter from the heat sink insulator and transistor. Brush on a light coating of silicon compound to completely cover both surfaces of the insulator (part no. 16-9278-01). Place the insulator between the heat sink and the replacement transistor. Use the original transistor mounting hardware to mount the replacement.

REPLACEMENT PARTS

Most components used in the unit are standard parts available through reputable parts jobbers. The parts listed here may be obtained from Bogen distributors, service agencies, or directly from the factory. When ordering a part, specify the part number and the model of the unit. Also, give the SERIES designation, which is a letter followed by numbers, usually stamped on the chassis directly under the model designation. For parts on printed circuit boards, include the PC board assembly number, which begins with "45".

| Schematic Reference | Part No. | Description |
|---------------------------|------------|--|
| — | 45-7118-05 | P.C. board assembly |
| C3,6 | 79-008-054 | Electrolytic, 10mF, 50V |
| C4, 18, 19 | 79-008-046 | Electrolytic, 22mF, 35V |
| C7, 20 | 79-008-049 | Electrolytic, 470mF, 35V |
| C14, 15 | 79-005-042 | Electrolytic, 10mF, 16V |
| CR1 | 96-5344-01 | Diode, zener, 2W, 10V |
| IC 1, 2 | 96-5387-01 | IC, LM386N-3 |
| Q1 | 96-5213-01 | Transistor, 2N5089 |
| Q2 | 96-5176-01 | Transistor, MPS6518 |
| Q3, 4 | 96-5357-01 | Transistor, 2SD389P/2SD313D/ TIP31A |
| R11, 12 | 77-001-803 | Control, 10K ohms |
| R14, 23 | 77-007-005 | Trimpot, 2200 ohms |
| R17 | 75-442-470 | Resistor, 47 ohms, 2W, w/w |
| R27, 28 | 76-121-006 | Resistor, .1 ohm, 10W |
| <i>Chassis Components</i> | | |
| CB101 | 94-0014-07 | Thermal breaker |
| CR101 | 96-5452-01 | LED |
| CR102 | 96-5451-01 | Diode, 1N1199A |
| F101 | 94-0003-07 | Fuse, 10A |
| Q101, 103 | 96-5454-01 | Transistor |
| Q102 | 96-5290-01 | Transistor, MPSA05 |
| SW101 | 81-009-033 | Switch, 10A |
| T101 | 83-466-000 | Transformer, output |
| — | 14-9002-02 | Foot, rubber |
| — | 03-0651-01 | Knob, 0-10 |
| — | 70-8131-01 | Thumbscrew |

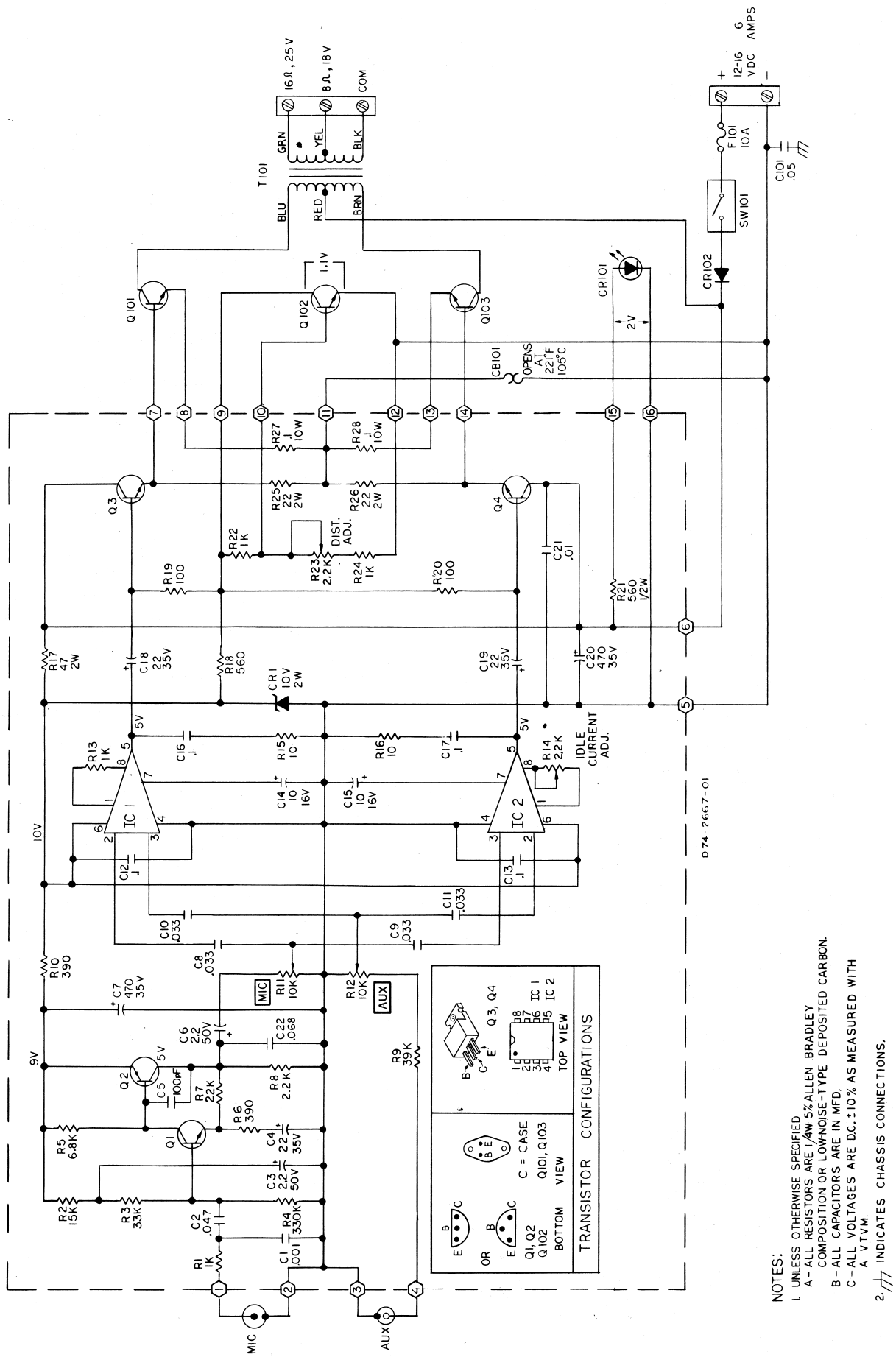


Figure 2 - Model MA-40, schematic diagram