

The Shure Model M64A Stereo Preamplifier provides the proper input and output impedances, voltage gain and equalization necessary to operate magnetic phono cartridges and tape playback heads with audio amplifiers having no equalization. A low-noise and low-distortion device, the M64A permits further signal processing without appreciable degradation in signal-to-noise ratio. In addition, the preamp can be used without equalization for a microphone input or as a buffer amplifier.

Typical Applications

- Permits turntable to be used with PA mixers and amplifiers without phono inputs
- Converting stereo record pickup systems from ceramic to magnetic cartridges
- Microphone preamplifier
- Low-gain buffer amplifier (where long cable lengths are extended to a preamp input)

The M64A has a single three-position slide switch for selecting Phono, Tape or Flat frequency compensation. The Phono position provides the standard RIAA equalization for phonograph records. In this mode, magnetic phono cartridges can operate into auxiliary level inputs, inputs without RIAA equalization, or ceramic phono cartridge inputs. The Tape position provides playback heads on tape recorders with standard 7-1/2 ips NARTB equalization. In the Flat position, the M64A can be used as a flat-response microphone preamplifier, or as a buffer (isolation) amplifier for magnetic phono cartridges when long cable lengths or switching systems are necessary between the turntable and main equalized amplifier (note that the low-level outputs should be used when operating the M64A as a buffer amplifier).

The M64A's inputs and outputs are standard phono pin jacks. Both high- and low-level outputs are provided, so that the M64A can be connected to either high-level auxiliary inputs or low-level microphone inputs (or equalized phono or tape head inputs in buffering applications). A grounding screw is provided for hum pickup reduction.

The M64A as supplied operates on 120 Vac, 50/60 Hz. An internal selector switch (qualified service personnel only) permits operation from 240 Vac, 50/60 Hz sources. The unit can also be modified for balanced line output. The M64A is listed by Underwriters Laboratories, Inc.

SPECIFICATIONS**Gain**

(Measured at 1 kHz; input through 680 ohms; output terminated in 47 kilohms)

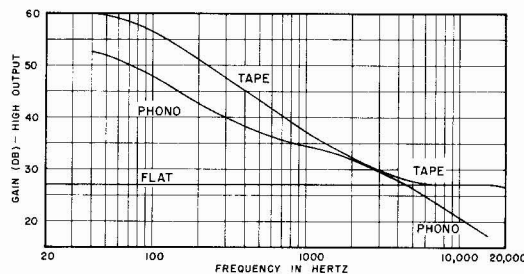
| Switch Position | High-Level Output | Low-Level Output |
|-----------------|-------------------|------------------|
| Phono | +34.5 dB | +11 dB |
| Flat | +27.5 dB | +4 dB |
| Tape | +37 dB | +13.5 dB |

Frequency Response

Phono: ± 2 dB of Standard RIAA curve from 40 Hz to 15 kHz

Flat: 20 Hz to 20 kHz, ± 2 dB

Tape: ± 2 dB of 7-1/2 ips NARTB curve from 50 Hz to 15 kHz



TYPICAL FREQUENCY RESPONSE
FIGURE 1

Total Harmonic Distortion

Less than 1% with 2V output at 1 kHz in all switch positions. Phono position only: less than 1% at 30 Hz with 2V output.

Clipping Level (at 1 kHz)

Phono: 100 mV minimum

Flat: 250 mV minimum

Tape: 80 mV minimum

Channel Separation (at 1 kHz)

50 dB or more

Channel Balance (at 1 kHz)

Within 2 dB

Hum and Noise (20 Hz to 20 kHz)

Phono: Better than 71 dB below 10 mV input

Flat: Better than 64 dB below 10 mV input

Input Impedance (at 1 kHz)

Resistance: 50 kilohms

Capacitance: 160 picofarads

Output Impedance (at 1 kHz)

High Level: Less than 2000 ohms (minimum recommended load is 22,000 ohms)

Low Level: 600 ohms (any load on Low Level output will not affect input clipping level)

Power Consumption

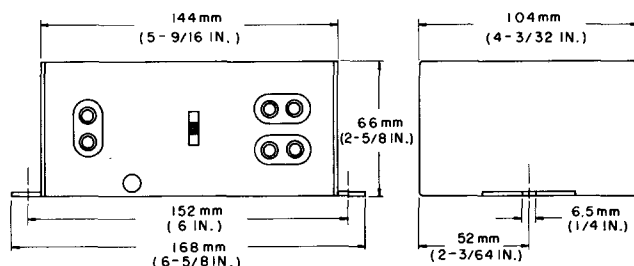
5 watts

Operating Voltage120 or 240 volts ac $\pm 10\%$, 50/60 Hz (internally selectable)**Temperature Range**Operating: -7° to 57° C (20° to 135° F)Storage: -29° to 71° C (-20° to 160° F)**Dimensions**

See Figure 2

Net Weight

986 grams (1 lb 2-1/2 oz)



OVERALL DIMENSIONS
FIGURE 2

INSTALLATION**WARNING**

To reduce the risk of fire or electric shock, do not expose this appliance to rain or extreme moisture.

The M64A can be operated on any flat surface, or (with adequate space) be mounted to an amplifier chassis or cabinet using screws through the M64A's mounting flanges. The unit can be mounted in any position for normal operation, but for best results, it should be located away from motors, lighting dimmers, or other hum-producing power sources and away from intense heat sources.

Should hum be encountered in a sound system or installation, one or more of the equipment power plugs may be reversed to reduce hum. If the turntable has a grounding lead, this wire can be connected to the M64A Ground screw to reduce hum pickup.

OPERATION**WARNING**

Use of the M64A with power amplifiers of the transformerless (ac-dc) type may result in a shock hazard. A suitable power line isolation transformer should be used with such equipment.

1. Set the selector switch to the desired function (Phono, Flat or Tape). This automatically selects the proper equalization (frequency response) for both channels.
2. For the equalized Phono (RIAA) or Tape (NARTB) positions, connect the signal leads from the phono cartridge or tape head to the M64A jacks marked Channel 1 Input and Channel 2 Input. Note that the Flat position can be used for phono cartridge or tape head buffering applications in which the M64A output is connected to an equalized amplifier input.
3. For the Flat position using two high-impedance microphones, connect each microphone cable to one of the M64A Input connectors. If a single high-impedance microphone is used, connect it to either Input connector. NOTE: If low-impedance microphones are to be used, a suitable line matching transformer such as Shure's A95 Series should be used.
4. Refer to the phono cartridge, tape head or microphone data sheet for details on connections, phasing and grounding.
5. Connect the Channel 1 and Channel 2 Output jacks (High or Low Level) to the corresponding input jacks of the power amplifier, preamplifier, tape recorder or mixer. The High Level outputs can be connected to high-level auxiliary inputs, and the Low Level outputs can be connected to low-level microphone inputs (or equalized phono or tape head inputs in buffering applications).
6. If grounding is necessary, the associated equipment ground lead can be attached to the M64A Ground screw.
7. Insert the M64A power line cord into a proper power outlet (120 Vac $\pm 10\%$, 50/60 Hz), preferably one controlled by the power amplifier's on-off switch. Make certain the M64A Power switch is turned on if the unit is to be remotely turned on and off.

SERVICE**WARNING**

Voltages in this equipment are hazardous to life. Refer servicing to qualified service personnel.

Balanced Line Output

For professional low-impedance balanced-line use such as broadcast systems or recording consoles, an external line matching transformer such as Shure's A95 Series can be added to each M64A High Level output. The resultant output level is approximately -32 dBm. If

a higher output is required (-20 dBm), the following modification can be made to increase the output level by approximately 12 dB.

1. Unplug the ac power line cord.
2. Remove the two screws securing the top cover and remove the top cover.
3. Locate the vertically mounted main printed circuit attached to the front panel. Resistors R13 and R14 (1k, 1/4W, 10%) are soldered to the foil side of the board.
4. Carefully wrap and solder the leads of 330-ohm, 1/4W resistors across (in parallel with) the leads of R13 and R14. Use a low-wattage soldering iron and avoid contact with the circuit board or other components.
5. Replace and secure the top cover.

NOTE: The above modification decreases the input clipping level to approximately 25 mV. This means that if high-output cartridges or very highly modulated records are used, the M64A may tend to clip on loud passages. If a gain increase of less than 12 dB is desired, use the following resistor values instead of 330 ohms.

| Gain | Resistor |
|------|----------|
| 3 dB | 2.2k |
| 6 dB | 1k |
| 9 dB | 560 ohms |

240 Vac Operation

The M64A as supplied will operate from a 120 Vac $\pm 10\%$, 50/60 Hz power source. For operation from a 240 Vac $\pm 10\%$, 50/60 Hz power source, perform the following steps.

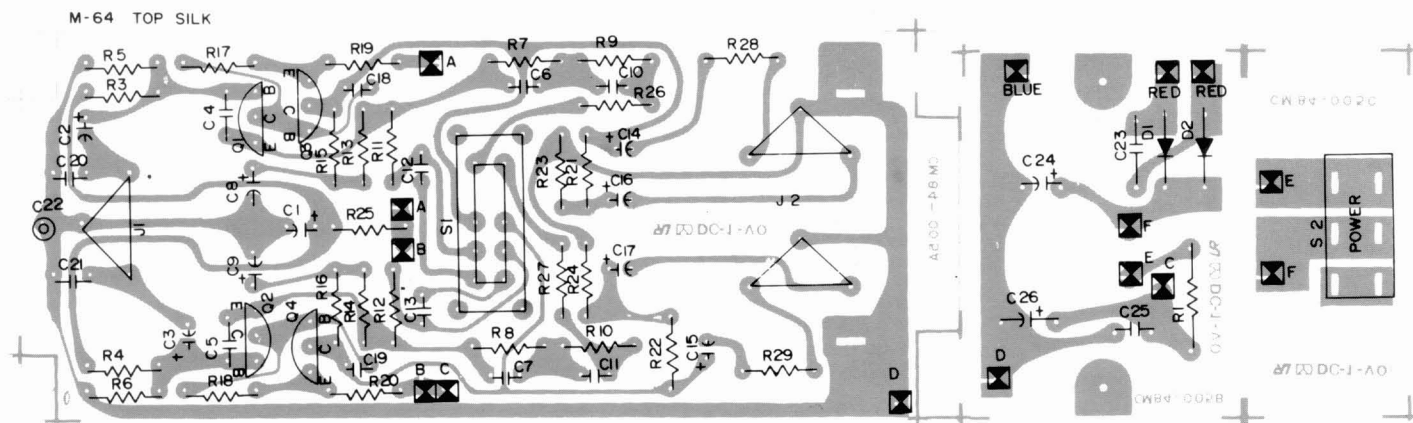
1. Unplug the ac line cord and remove the two black self-tapping screws securing the top cover.
2. Remove the top cover.
3. Locate the voltage selector switch and move it to the 240 position.
4. Replace the ac line cord and plug (if necessary) with one designed for the 240 Vac source. If the M64A is to be used outside the U.S. and Canada, local regulations may require replacing the line cord with one having wire insulation colors as follows:

"Live" or "Hot" **Neutral** **Earth or Ground**

U.S., Canada Black White Green
Europe Brown Blue Green/Yellow

5. Replace the top cover and mark the rear panel to reflect the new operating voltage.

PRINTED CIRCUIT BOARDS COMPONENT SIDE



REPLACEMENT PARTS LIST

| REFERENCE DESCRIPTION | DESCRIPTION | COMMERCIAL ALTERNATE |
|-----------------------|-------------------------------------------|-------------------------------|
| C1 | Capacitor, Electrolytic, 22 μ F, 35V | Sprague 503D226F035MB |
| C2-C3 | Capacitor, Electrolytic, 4.7 μ F, 25V | Nichicon UKB1E4R7KAA |
| C8-C9 | Capacitor, Electrolytic, 100 μ F, 25V | Nichicon UKB1H100KAA |
| C14-C15 | Capacitor, Electrolytic, 4.7 μ F, 35V | Sprague 503D475F035KA |
| C16-C17 | Capacitor, Electrolytic, 47 μ F, 16V | Mallory VTL-47S16 |
| C24 | Capacitor, Electrolytic, 220 μ F, 50V | Mallory VTL-220S50 |
| C26 | Capacitor, Electrolytic, 470 μ F, 50V | Mallory VTL-470S50 |
| D1-D2 | Diode, Silicon Rectifier, 100V, 1/2A | Shure RKC21*, Motorola 1N4002 |
| J1 | Connector Assembly, Input | None |
| J2 | Connector Assembly, Output | None |
| Q1-Q2 | Transistor, Silicon, NPN | None** |
| Q3-Q4 | Transistor, Silicon, PNP | None** |
| R1 | Resistor, Metal Oxide, 1.3k, 1/2W | RCA 830047 |
| R3-R4 | Resistor, Metal Film, 68k, 1/4W, 1% | TRW/IRC TO-60 |
| R5-R6 | Resistor, Metal Film, 180k, 1/4W, 1% | TRW/IRC TO-60 |
| R13-R14 | Resistor, Metal Film, 1k, 1/4W, 1% | TRW/IRC TO-60 |
| S1 | Switch, Slide, DP3T, Equalizer | None |
| S2 | Switch, Slide, DPDT, Power | None |
| S3 | Switch, Slide, DPDT, Voltage Selector | Switchcraft 46206LFR |
| T1 | Transformer, Power | None |
| W1 | Line Cord, Ac, 3-Conductor, 2.1 m (7 ft) | Shure 95A8015 |

Parts listed as "None" should be ordered from Shure Brothers Inc. listing product model number, reference designation, and part description.

*Supplied in multiples of four only.

**When replacing transistors Q1-Q4, pay close attention to lead configurations.

CIRCUIT DIAGRAM

A5011-11-1

