

GENERAL

The Shure M675 Broadcast Production Master is designed for use in conjunction with a Shure M67 or M67-2E Professional Microphone Mixer, M63 Audio Master, or SE30 Gated Compressor/Mixer. The combination of the two units provides a complete, compact console permitting mixing of a number of microphones, high level sources (such as tape or tape cartridge or cassette machines) and turntables. By making an internal jumper change, the two phono inputs may be used for tape head or high impedance microphone inputs.

The M675 is *not* a complete mixer in itself. It may be thought of as two separate sections: a four-input mixer, and a monitor amplifier and speaker. The mixer section adds four more inputs to the M67, M63 or SE30. Two inputs are line level (switchable to "Bridge" or "Terminate"), and the other two are switchable between "Phono" (RIAA equalized preamplifier) and "Bridging" line level.

The primary purpose of the monitor amplifier and speaker section of the M675 is to allow the operator to audibly monitor the output of the M67, M63 or SE30. Note that the output of the associated mixer consists of its own signals plus those from the M675 inputs. The M675 speaker reproduces the M67, M63 or SE30 output signal, and the M675 "Monitor" control adjusts the speaker volume. A second function of the M675 monitor amplifier and speaker is to "cue" or preview the signals entering the M675 mixer section without having these signals appear at the M67, M63 or SE30 output. This is accomplished using the "Cue" position of the appropriate M675 "Input" control knob.

NOTE: Except as noted, references to M67 refer also to operation with M63 or SE30.

Features

- Provides a complete compact portable production console when used with M67 or other Shure Microphone Mixers.
- Adds four channels with cue provision, when used with the M67.
- Powered by either internal batteries (popular 9V type) or by M67. Can also provide battery voltage for powering M67.
- Operator can hear program material at a reduced level during cuing.
- Wide flat frequency response and low distortion.
- Extremely low noise and RF susceptibility.
- Four balanced line inputs with individual gain controls.
- Two line inputs switchable to magnetic phono inputs (RIAA equalization).

- Convertible line inputs are switchable at front panel.
- Two line inputs are switchable between high impedance, bridging, or 600-ohm terminating.
- Front-panel 600-ohm headphone output jack for program monitor and cue. Rear panel headphone output jack for program monitor.
- External 8-ohm speaker output jack for monitoring program and cue, with provision for external muting.
- Internal monitor speaker for program and cue.
- All connections are phase-matched to M67.
- Compact, lightweight.
- Stacking hardware included for mounting M675 to M67.

SPECIFICATIONS

Frequency Response:

Program Channel (measured at M67 output):

phono: ± 2 dB of standard RIAA
line: ± 2 dB, 30–20 kHz

Monitor Channel: response tailored to -5 dB @ 40 Hz, -3 dB @ 15 kHz.

Gain at 1 kHz:

A. Program Channel:

Input	Mix Bus Output (with 3.5k load)	M67 Output
Phono	+13.5 ± 2 dB	+83.5 ± 2 dB
Line 1, 2	-29 ± 2 dB	+41 ± 2 dB
Line 3, 4 bridge	-29 ± 2 dB	+41 ± 2 dB
Line 3, 4 terminate	-35 ± 2 dB	+35 ± 2 dB

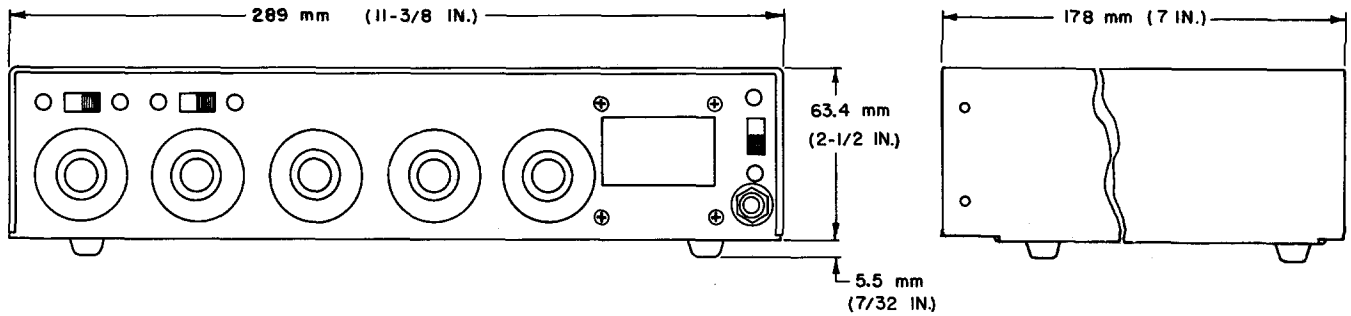
NOTE: Gain to Mix Bus output will be approximately 13 dB higher than shown above if loaded with high impedance (50k).

B. Monitor Channel (to 8-ohm speaker output loaded with 8 ohms):

Input	Condition	Gain
Headphone cable (from M67)	No pots in cue	+13 ± 2 dB
Phono	This input only in "cue"	+49 ± 2 dB
Line 1 or 2	"	+7.5 ± 2 dB
Line 3 or 4, bridge	"	+7.5 ± 2 dB
Line 3 or 4, terminate	"	+1.5 ± 2 dB

NOTE: Monitor channel gain to 600-ohm output loaded by 600 ohms is 19 dB higher than gain shown in above table.

NOTE: Connections of M675 to M67 will reduce gain on M67 inputs by 3 dB.



Noise:

Phono: measured at Mix bus output, at least 71 dB below 10 mV input, 20–20 kHz. Measured at M67 output, noise depends upon M67 master gain control. With M67 master gain at "5½" (–20 dB) noise output of M67 will be –50 dBV maximum.

Line: will not add to noise of M67.

Distortion:

Program Channel: (measured at Mix Bus output)

Phono: Less than 1% THD with input level of 35 mV, 30 Hz–20 kHz.

Line: Less than 1% THD with input level of +18 dBm, 30 Hz–20 kHz.

Monitor Channel: measured at 8-ohm speaker output with 8-ohm load. Less than 1.0% THD with output level of .56 volts to 8 ohms (40 mW) 100 Hz–15 kHz. Less than 2% THD with level of .31 volts at 40 Hz.

Control Interaction:

Under 1½ dB with any control combination.

Inputs:

Input	Impedance		Input Clipping
	Designed For Use With	Actual (Internal)	
Phono	Magnetic phono cartridges	25 kilohms* + 350 pF	90 mV
Line Bridging	Less than 10 kilohms	75 kilohms ± 10%	Over +16 dBV (6.3 VRMS)
Line Terminated	600 ohms	600 ohms ± 10%	Over +18 dBm (6.3 VRMS)
Monitor Input (via headphone plug)	M67 headphone jack	1000 ohms ± 20%	Over +8 dBV (2.5 VRMS) Corresponds to +18 dBm output from M67

*NOTE: The input impedance is set for 25k which is the correct load for a stereo cartridge operating with the L & R channels parallel (monophonic mode). If an input impedance of 47k is desired, the 47k resistors (R226, R227) across the phono input jacks may be removed.

Minimum Common Mode Rejection:

80 dB with line input of 10 volts at 100 Hz.

Outputs:

Output	Impedance		Output Clipping Level
	Designed For Use With	Actual (Internal)	
Mix Bus	M67 Mix Bus (3.5k load) or higher	13 kilohms ± 20%	—
Front-Panel Headphone Jack	600 ohms or greater	70 ohms ± 10%	+17 dBV (7 VRMS)
Rear-Panel Headphone Jack	Low High (See "Headphone" section)	5 kilohms ± 20% 1.1 kilohms ± 20%	Same as M67
8-ohm Speaker Output	8 ohms or greater	4 ohms max.	–2dBV (0.8 V; 80 mW)

Overload and Shorting Protection:

Shorting the outputs will produce no damage. Overload of phono inputs up to 3 volts will produce no damage.

Operating Voltage:

27 Vdc nominal supply from either internal supply comprised of six 9V type 216 batteries or from the associated M67 or M63 Audio Master. Minimum supply is 21.5 Vdc; maximum is 35.0 Vdc.

Weight:

Without batteries: 2.38 kg (5 lb, 4 oz)
With batteries: 2.61 kg (5 lb, 12 oz)

CONTROLS, CONNECTIONS AND OPERATION

CONNECTIONS (TO M67, M63 OR SE30)

Stacking hardware is included for mounting the M67 or M63 on top of the M675. See installation instructions for the A68S Stacking Kit provided in the data sheet covering mixer and circuitry accessories. The stacking kit is not used with the SE30. The plug on the "Headphones" output cable at the rear of the M675 is inserted fully into the M67, M63 or SE30 Headphones jack. The phono-type plug on the "Mix Bus" cable at the rear of the M675 is inserted into the Mix Bus jack on the M67 or SE30, or High Level Input of the M63. The red and black "30 VDC" wires at the rear of the M675 should be connected to the 30 Vdc connectors on the M67, M63 or SE30. If rack mounting is desired, the M67 and M675 can each be mounted in A68R rack mount accessories. The connecting cables on the M675 are of sufficient length to reach the M67 in this case.

INPUTS

Line:

The four line inputs (professional three-pin female audio connector†) are located on the rear panel and designated "Line 1" through "Line 4." Inputs are balanced (internal transformer, mumetal shielded) and connections are Pins 2 and 3 "hot," Pin 1 "ground."

Line 3 and Line 4 may be either 600 ohm line termination or bridging, the choice being made by the appropriate position of the "Bridge-Terminate" switches above the Line 3 and Line 4 input connectors. To obtain "Line" operation for the Line 1 and Line 2 inputs, the corresponding "Line-Phono" switch above the Input 1 and Input 2 controls on the front panel must be in the "Line" position.

Impedances and operating signal levels are shown in the "Input Specifications" Section.

Phono:

The two phono inputs (RCA type phono jack) are located on the rear panel and designated "Phono 1" and "Phono 2." To obtain "Phono" operation for the Phono 1 and Phono 2 inputs, the corresponding "Line-Phono" switch above the Input 1 and Input 2 controls on the front panel, must be in the "Phono" position.

The nominal "Phono" input impedance is 25 kilohms resistive, 330 pF capacitive. In order to change the resistive input to 47 kilohms, remove the 47-kilohm resistors at "Phono" input terminals (R226, R227).

When phono inputs are not being used, both "Line-Phono" switches should be left in "Line" to conserve battery life.

CONTROLS

Individual Input Gain Controls:

Front panel controls designated "Input 1" through "Input 4" are the individual gain controls for correspondingly numbered inputs. Note that the input connectors are located on the rear panel directly behind their corresponding control.

The Input 1 and Input 2 controls may be used to control either "Line 1-Phono 1" or "Line 2-Phono 2" inputs, respectively, depending upon the position of the "Line-Phono" switch located immediately above the Input 1 and Input 2 controls.

NOTE: The Line-Phono switches above Controls 1 and 2 are intended as SET-UP CONTROLS, not operating controls. To conserve battery life, these switches also control supply voltage to the phono preamplifiers. Hence, the Line-Phono switches should not be thrown while "on the air" unless the input controls are both fully CCW ("0") to avoid introducing switching noise in the program material. If phono inputs are not being used, both of these switches should be switched to "Line" to conserve battery life.

Monitor Gain Control:

This control is used to adjust the level of the front panel monitor speaker, the front panel Headphone jack, and the rear panel speaker jack. (See Cue Operation below.)

†Designed to mate with Cannon XL series, Switchcraft A3 (Q.G.) series or equivalent connector.

OUTPUTS

Mix Bus:

The Mix Bus output is a shielded cable extending from the rear of the M675 cabinet and terminated with a phono plug. This cable should be connected to the "Mix Bus" jack on the back of the M67 or SE30 (use the "Aux Level Input" on the M63). Once this connection is made, the four M675 input signals will be added and mixed with the M67, M63 or SE30 input signals.

Front Panel Headphone Jack:

This jack provides both program and cue material to 600-ohm headphones. The "Monitor" control on the front panel is used to adjust this headphone level. The internal (or external) 8-ohm speaker is muted when a plug is inserted into this jack.

Rear Panel 600 Ohm Headphone Jack:

This is a two-position jack for monitoring the output of the M67, when the "Headphone" cable at rear of M675 chassis is connected to the M67 "Headphone" jack. The two-position phone jack is used to provide a choice of level. Normally, a single circuit plug should be used. If inserted only partially to the first detent, the output level will be less than when pushed fully in. If stereo phones are used, the two-position plug may be inserted fully and the output will appear in both phones.

This jack is an extension of the two-level headphone jack of the M67, and hence, it carries program material only and its level is not controlled by the monitor level control on the front panel.

While intended primarily for 600-ohm to 2-kilohm headphones, this jack may be used with 8-ohm to 50-kilohm headphones, with resultant variation in level. Crystal phones may also be used.

The "Tip" connections of the headphone plugs and the two phono inputs are in phase with Pin 3 of all input connectors on both the M675 and M67, and with the tip of the Mix Bus connector.

Rear Panel 8-Ohm Output Speaker Jack:

This jack is for an 8-ohm high efficiency speaker or for 8-ohm high quality headphones and provides both program and cue material. The internal speaker on the front panel is muted when the phone plug is inserted into this jack. Use of the front panel headphone jack, in turn, will mute the internal (or external) speaker. A mono (2 circuit) plug should normally be used. If a stereo (3 circuit) plug is used, external muting of the internal speaker is possible. See schematic.

Monitor Speaker:

The internal speaker is activated unless either the external 8-ohm Output Jack or the front-panel 600-ohm Headphone Jack is used. It monitors both program and cue material.

OPERATION

Cue Operation:

The M675 "Input" controls are in the Cue position when rotated fully counter-clockwise and past the detent.

With no M675 Input Controls in the "Cue" position, the monitor amplifier receives a program feed via the connection to the M67 headphone output. The

"Monitor" gain control can then be used to adjust the level of this signal which appears across the front panel monitor speaker, the front panel Head-phone jack, and the rear panel speaker jack.

When one or more M675 Input controls are turned to "Cue" (fully counter-clockwise), the program feed to the monitor amplifier is attenuated by 19 to 31 dB. The Cue material is then routed to the monitor amplifier, overriding the program material. When all Input controls are returned to normal (not in cue), program feed is again applied at normal level to the monitor amplifier. This provision allows monitoring of program material at a low level while simultaneously cuing.

Talkback Operation:

To hear talkback material originating at the opposite end of a two-way line connected to the M67 line output, turn all input pots on the M675 out of cue and turn up the monitor amp volume control. The M67 master volume control may be turned down if necessary.

DC Power

The M675 can be powered in two ways: by an external source or by internal batteries. When 30 Vdc is applied to the "30 VDC" connectors of the M675, the M675 will be turned on. The power "On-Off" switch on the front panel controls only its own internal battery supply. Thus, if the M675 is to be powered by an external source such as an M67, M63 or SE30, the power switch on the M675 need not be on. Note that if the M675 internal battery supply is used to power an accessory such as the A68M Microphone Preamplifier, the power switch will control power to the accessory.

The M675 internal battery supply can be used to provide automatic switchover to battery operation when used with the M67. When the M675 batteries are installed and the M675 is connected to an ac-operated M67, automatic power switchover will take place if the ac line voltage fails, as long as the M675 power switch is in the "On" position. The M675 batteries will then power both the M675 and the M67. Note that automatic power switchover is not advisable with the M63, because some battery drain will occur even when the M63 is operating on

an acceptable ac line voltage, due to the characteristics of the M63 power supply. Automatic power switchover is possible with the SE30, although the SE30 has its own built-in battery supply for this purpose.

Battery Replacement:

The M675 contains a battery supply consisting of six 9V transistor radio batteries (Burgess 2U6, Eveready #216 or equivalent are recommended). Access to the steel, leak-resistant battery compartment is on the bottom panel of the M675. To remove the battery compartment, each of the two locking screws should be given a 1/4 turn CCW. The battery assembly may then be removed. The six 9V batteries are snapped into position on the printed circuit board contained in the compartment cover. The entire compartment is removable from the M675 by disconnecting the snap connector (attached to the leads leaving the cover) from the M675 receptacle. When the M675 is stacked with an M67 Mixer, the M675 should be below the M67 to retain access to this compartment.

Battery Check:

The nominal voltage available from the complement of six 9V batteries is 27.0 volts. Initially, new batteries may provide a supply voltage of up to 30.5 volts. Minimum acceptable battery voltage is considered to be 21.5 volts.

The battery-check function of the M67 may be used to indicate battery condition when the M67 and M675 are used together. "0" on the M67 VU meter indicates a marginal battery condition.

For best performance on battery operation at temperatures below 40°F, change batteries when the Battery Check meter reading is +1.0 VU or lower. This is due to the operating characteristics of carbon zinc batteries at low temperatures.

NOTE: For improved performance and longer operation at low temperatures (0°C - 32°F - or lower), use manganese-alkaline batteries (Mallory MN-1604 or equivalent).

RF Susceptibility:

When using M675-M67 combination in a high RF location, RF pickup may occur due to the grounding system of the Mix Bus on early M67s. If this difficulty should occur, it may be easily remedied by

Current Drain and Battery Life:

Condition	Approximate Current Drain	Approximate Battery Life
M675 only, "Phono-Line" in "Line," monitor level down	1 mA	over 300 hrs
M675 only, "Phono-Line" in "Phono," monitor level down	4 mA	170 hrs
M675 + M67, "Phono-Line" in "Line," M67 @ +4 dBM	5 mA	140 hrs
M675 + M67, "Phono-Line" in "Phono," M67 @ +4 dBM	8 mA	85 hrs
M675 + M67, "Phono-Line" in "Line," M67 @ +4 dBM, M675 monitor speaker at 10 mW	7 mA	100 hrs
M675 + M67, "Phono-Line" in "Phono," M67 @ +4 dBM, M675 monitor speaker at 10 mW	10 mA	65 hrs

NOTE: Due to operating characteristics of carbon-zinc batteries at low temperatures, the useful operating life will be noticeably shorter at lower than normal room temperatures. See Battery Check Instructions.

shorting the ground connection of the M67 Mix Bus input jack to chassis. To make this modification, which should be performed by qualified service personnel only, disconnect ac power from the M67 and remove M67 cover. Connect a short wire from the ground lug of the Mix Bus jack to the nearest chassis point. The ground lug of mic. input connector #2 or #3 may be used. The ground lug is the large lug closest to the cover. This wire should be as short as possible.

Conversion of Phono Inputs to Tape (NAB) or Flat:

Inputs 1 and 2 may be converted from RIAA equalization to tape (7½ i.p.s. NAB) or flat. The modification should be performed by qualified service personnel only.

1. Disconnect M675 from M67.
2. Remove four Phillips Head Screws retaining cover—one on front, one on back, two on bottom.
3. Remove cover.
4. Refer to Figure of Printed Circuit Assembly B1. Note the jumpers on the printed circuit assembly.
5. Remove jumpers from Pin C to Pin E (Channel 1) and Pin S to Pin V (Channel 2).
6. Replace jumpers to achieve desired equalization. For Channel 1, jumper C to D for "flat," or B to D for "tape." For Channel 2, jumper S to T for "flat" or R to T for "tape."
7. DO NOT remove any jumpers inserted through the actual printed circuit board. Only change jumpers between pins mentioned above.
8. Replace cover.

Specifications for Tape and Flat Equalization:

Gain in flat = 6.5 dB to Mix Bus output, Gain in Tape (7½ i.p.s.) = 16.0 dB to Mix Bus output.

Response in flat is ± 2 dB, 30–20 kHz.

Response in tape is ± 2 dB of the 7½ i.p.s. NAB curve from 50 Hz to 15 kHz.

Distortion: under 1.0% with tape input of 26 mV or flat input of 78 mV.

Input Clipping Level: Tape: 80 mV; Flat: 225 mV.

Conversion of Cue Circuitry:

If it is desired that the cuing action (reduction of program level during cuing) be more pronounced than the 19 dB-31 dB obtained in a standard M675, the following modification may be performed by qualified service personnel only: Remove R115 (470k) and change R112 (330k) to 2.2 megohms. Program level reduction during cuing will now be 37 to 49 dB.

Adding Microphone Inputs:

The M675 line inputs may be adapted for use with microphone inputs by the addition of one or two Shure A68M Microphone Preamplifiers. Remove the phono pin output connector on the A68M and attach a professional three-pin male audio connector† in its place ("hot" lead to pin 3; shield to pins 1 and 2). Connect the A68M to Line Input 3 or 4 of the M675. Place the corresponding Bridge/Terminate switch in the Bridge position. Connect the (+) and (–) power cables of the A68M to the M675. Note that the M675 power switch must be turned off to conserve batteries when the A68M is not in use.

†Designed to mate with Cannon XL series, Switchcraft A3 (Q.G.) series or equivalent connector.

DESCRIPTION OF CIRCUITRY (Refer to Schematic)

Input Circuitry:

Line inputs 1 and 2 are transformer coupled to Line/Phono switches 1 and 2. Phono inputs are amplified by the two phono preamplifiers consisting of Q1 and Q3 for channel 1 and Q2 and Q4 for channel 2. In the phono preamps, equalization is provided in the feedback path from the collector of Q3 (Q4) to the emitter of Q1 (Q2). For channel 1 phono equalization, gain is determined by the ratio of the R7-C6, R9-C10 combination versus R13. The outputs of the phono preamps also drive the Line/Phono switches. Setting a Line/Phono switch to Phono will, in addition to transferring the associated input volume control, apply dc voltage to the pre-amplifier power supply terminal. Either switch will apply power to both phono preamplifiers.

Line inputs 3 and 4 are directly transformer coupled to input volume controls 3 and 4. Bridge/Terminate switches on these two inputs switch a 600-ohm terminating resistor off or onto the input of the transformer.

The outputs of the four input pots are summed via 33k build-out resistors and carried via shielded cable to the Mix Bus input of the associated M67.

Monitor-Cue Circuitry:

The phone plug and cable at rear of the M675 are plugged into the associated M67 headphone output. Program material appearing at the M67 output is brought via this cable to the M675 where it is transformer coupled into emitter-follower Q106. The output of the follower is applied to FET Q105, which serves only as a variable attenuator. With no input pots in cue, the FET is "on" and presents a low impedance in parallel with R115 (470k). The output of the FET (Drain) drives the monitor volume control. When any pots are in cue, their associated 330k resistor (R218-221) is switched to the cue bus which, thru R112 (330k) turns the FET off. Hence, the resistance of the FET in shunt with R115 is now very high, and the program material fed to the monitor volume pot is reduced in level by 19 to 31 dB. At the same time, the cue material for the channel in cue is fed to the cue bus and hence to the top of the monitor volume control (for channel 1 the path is R210, C204, C106).

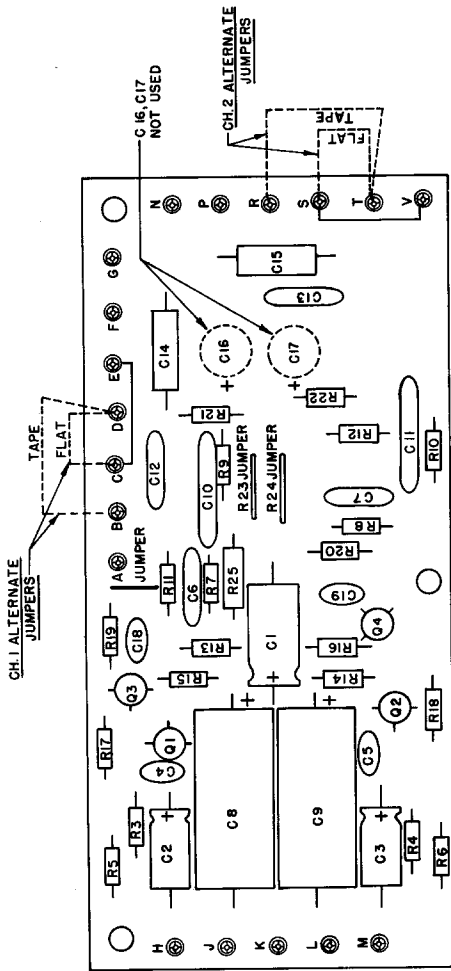
The monitor amplifier is a complementary symmetry amplifier similar to many hi-fi power amplifiers. The gain of the stage is 40 dB, determined by the ratio of R105 to R106. The idle current of the stage is approximately 1 mA. The output of the monitor amp drives J7 directly. J7 is transformer coupled to J8 and the internal 2" speaker.

GUARANTEE

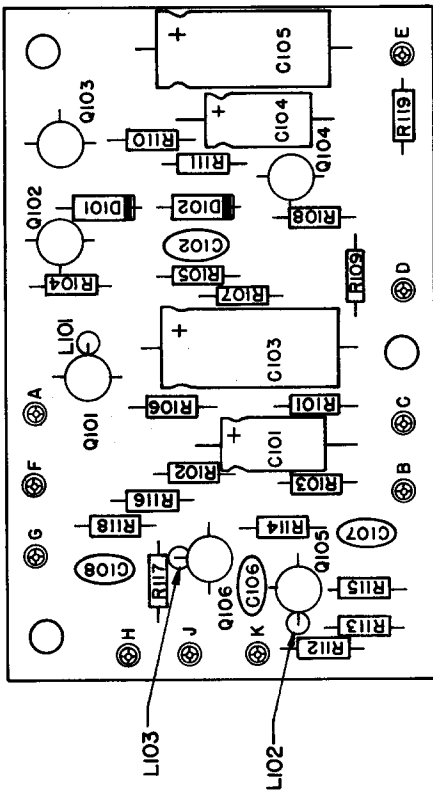
This Shure product is guaranteed in normal use to be free from electrical and mechanical defects for a period of one year from the date of purchase. Please retain proof of purchase date. This guarantee includes all parts and labor.

SHIPPING INSTRUCTIONS

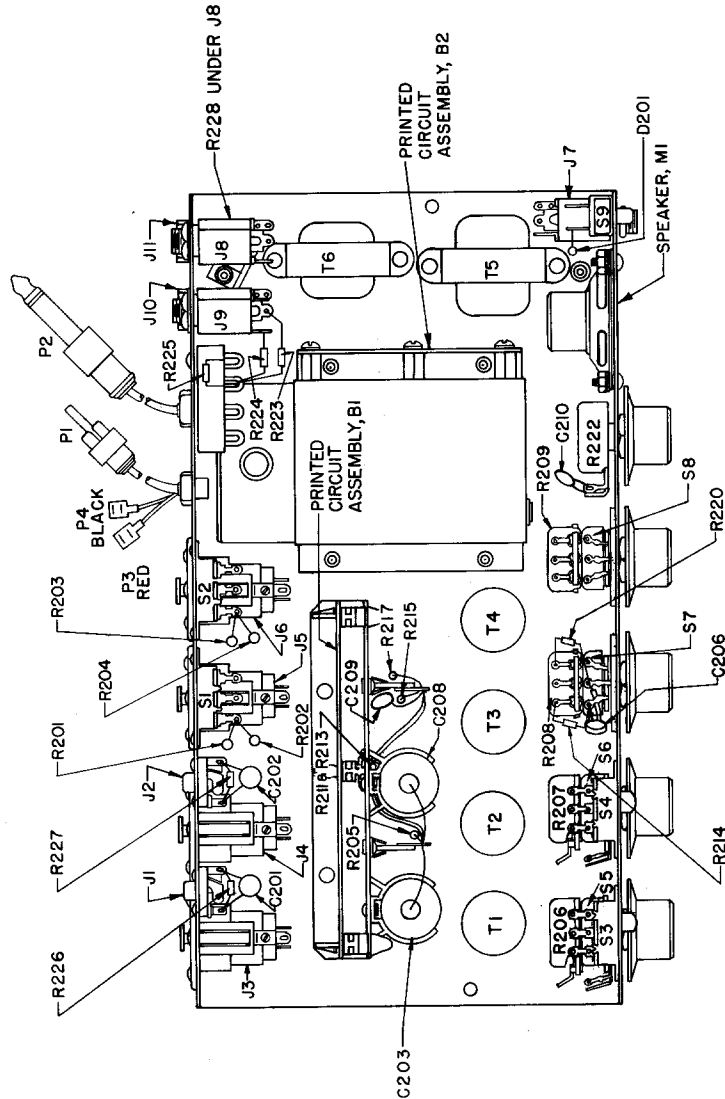
Carefully repack the unit and return it prepaid to the factory. If outside the United States, return the unit to your dealer or Authorized Shure Service Center for repair. The unit will be returned to you prepaid.



PRINTED CIRCUIT BOARD ASSEMBLY B-1



PRINTED CIRCUIT BOARD ASSEMBLY B-2



NOTE: PARTS PLACEMENT ON R206-S7 IS TYPICAL FOR R206-S5, R207-S6, AND R209-S8. REFER TO SCHEMATIC FOR IDENTIFICATION.

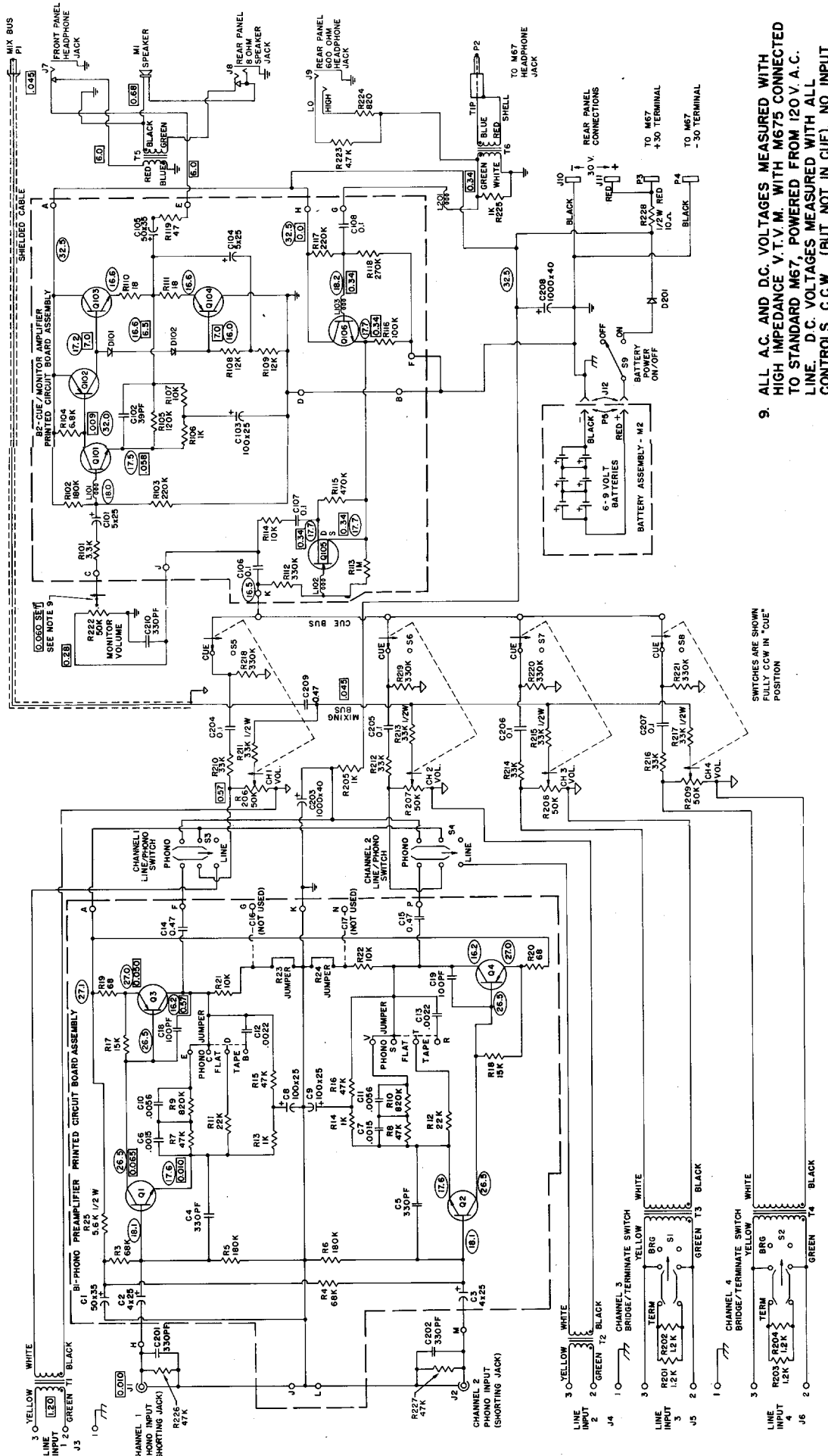
NOTE: FRONT SECTIONS OF R206-R209 ARE ACTUALLY SWITCHES S5-S8.

PARTS PLACEMENT

ITEM	SHURE KIT NO.	SHURE PART NO.	DESCRIPTION
B1	---	301006	PRINTED CIRCUIT ASSEMBLY MONO PREAMPLIFIER
B2	---	301004	PRINTED CIRCUIT ASSEMBLY MONO AMP & GUE CIRCUIT
D10, D102, D201	RK621	86A404	DIODE SILICON, IN4002 OR EQUIVALENT
M1	---	80A242	SPEAKER, 2 INCH, 8 OHM
M2	---	90A1657	BATTERY ASSEMBLY (WITH PRINTED CIRCUIT BOARD)
Q102, Q101, Q106	RK62	86A336	PNP TRANSISTOR, SILICON, T.I. T1S97
Q103, Q104	RK66	86A348	PNP TRANSISTOR, SILICON, T.I. T1S93
Q102, Q104 **	RK66	86A335	PNP TRANSISTOR, SILICON, T.I. T1S93
Q103 **	RK65	86A334	PNP TRANSISTOR, SILICON, T.I. T1S92
Q105	---	86A329	FIELD EFFECT TRANSISTOR, N CHANNEL JUNCTION, MOTOROLA, 2N545B
R206 THRU R209	---	46A046	POTENTIOMETER, 50K AUDIO TAPER, WITH SWITCH
R222	---	46A028	POTENTIOMETER, 50K AUDIO TAPER
S5, S6, S7, S8	---	55C019	INCLUDED ONLY WITH R206, R207, R208, R209
S1, S2	---	55C019	SLIDE SWITCH, D.P.D.T.
S3, S4	---	55A119	SLIDE SWITCH, D.P.D.T.
S9	---	55983	SLIDE SWITCH, D.P.D.T.
T1, T2, T3, T4	---	30C260	TRANSFORMER AND SHIELD ASSEMBLY
T5	---	51A224	TRANSFORMER, OUTPUT
T6	---	51A229	TRANSFORMER, INPUT

** FOR REPLACEMENT, PURCHASE Q103 AND Q104 AS MATCHED PAIR TEXAS INSTRUMENTS T1S92M-T1S93M OR PURCHASE FROM SHURE BROTHERS AS ONE RK66 AND ONE RK65.

* ORDER REPLACEMENT PARTS UNDER THIS NUMBER WHEN APPLICABLE. WHEN NO NUMBER IS SHOWN IN THIS COLUMN, ORDER UNDER SHURE PART NUMBER.



- NOTES:**
- ARROWS ON POTS INDICATE C.W. ROTATION.
 - ARROWS ON SWITCHES INDICATE TO LEFT.
 - ALL FIXED RESISTORS IN OHMS, 1/4 WATT COMPOSITION TYPE, $\pm 10\%$, UNLESS OTHERWISE SPECIFIED. K=1000, M=1,000,000.
 - ALL CAPACITORS IN MFD, 50 VOLT OR GREATER, UNLESS OTHERWISE SPECIFIED.
 - ALL LEAD PAIRS TO INPUT TRANSFORMERS T1 - T4 ARE TWISTED; YELLOW WITH GREEN AND BLACK WITH WHITE.
 - GROUNDS:
 - \uparrow CHASSIS
 - \uparrow MIX BUS
 - \uparrow CIRCUIT GROUND
 - PARTS INSIDE DOTTED LINES ARE ON PRINTED CIRCUIT BOARD ASSEMBLIES.
 - \square DENOTES A.C. MEASUREMENTS.
 - \square DENOTES D.C. MEASUREMENTS.
 - ALL A.C. AND D.C. VOLTAGES MEASURED WITH HIGH IMPEDANCE V.T.V.M. WITH M675 CONNECTED TO STANDARD M67, POWERED FROM 120 V. A.C. LINE. D.C. VOLTAGES MEASURED WITH ALL CONTROLS C.C.W. (BUT NOT IN CUE), NO INPUT SIGNAL. A.C. VOLTAGES MEASURED WITH 0.010 V (10 MV) 1KHZ AT PHONO INPUT (OR 1.2 V A.C. AT BRIDGING LINE INPUT), ONE INPUT CHANNEL FULLY C.W., OTHER INPUTS FULLY C.C.W. BUT NOT IN CUE. M67 MASTER ADJUSTED TO GIVE "0 VU" ON +4 DBM SCALE, M67 LINE OUT TERMINATED IN 600 OHMS. MONITOR VOLUME ON M675 SET TO PRODUCE 0.060 V A.C. AT ITS ROTOR (APPROX. "7" ON SCALE). TO CHECK CUE CIRCUIT OPERATION, MEASURE SIGNAL AT PIN "E" OF CUE/MONITOR BOARD. SIGNAL = 6 VOLTS. IF ONE INPUT CONTROL IS SWITCHED TO CUE (NOT INPUT BEING DRIVEN), LEVEL AT PIN "E" SHOULD DROP TO 0.54 V A.C.
 - VOLTAGES SHOWN ARE TYPICAL AND MAY VARY $\pm 20\%$.