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MICROPHONES AND ELECTRONIC COMPONENTS

AREA CODE 312/328-9000 • CABLE: SHUREMICRO

DATA  
SHEETMODEL M62V  
AUDIO LEVEL CONTROLLER

## MODEL M62V AUDIO LEVEL CONTROLLER

**GENERAL:**

The "Level-Loc" Audio Level Controller is basically a low-noise preamplifier with unity gain from the microphone level input to the microphone level output or 60 dB of voltage gain from the high-impedance microphone level input to the auxiliary level output. The input and microphone level output contain matching transformers so either high- or low-impedance operation may be selected. In addition, a high-impedance auxiliary output is provided capable of driving any high-impedance amplifier, mixer or tape recorder input requiring 1 volt or less. This preamplifier has the additional capability of reducing its gain as the input signal increases, thereby *holding the output signal constant*. After a predetermined input level threshold is reached the output level is "locked", that is, it remains constant even if the input signal increases by as much as 100 times (40 dB). This reduction in gain, which results in a constant output level, is obtained without introducing significant distortion or transients into the program material. The DISTANCE SELECTOR switch determines the input level at which gain reduction (Level-Loc action) begins. An INPUT LEVEL control is also provided that:

1. Can be used as a vernier control to allow fine adjustment of input threshold between the preset threshold levels selected by the DISTANCE SELECTOR switch.
2. Can act as an input attenuator for signals that are higher than normal microphone levels. Such inputs may be: signals from microphones used very close to the mouth, outputs from preamplifiers, line amplifiers, tuners or tape recorders.

**The Audio Level Controller: —**

- Reduces blasting or large volume increases when a speaker or entertainer varies his distance and position from the microphone.
- Upgrades tape-recording systems and the Audio portion of Video Tape Recorders, by controlling the maximum signal level being fed to the recorder. This prevents distortion and overloading of the tape recorder which might be caused by "close talking" the microphone, or by very loud vocal or musical passages.

- Permits any number of microphones to be used in a paging system or conference arrangement, without setting the level for each individual microphone. (For paging systems only low-impedance microphones with normally open switches should be used.) Any number of these microphones may be operated in parallel across the low-impedance input of the M62V, the Audio Level Controller will automatically set a fixed maximum paging level that cannot be exceeded.

**SPECIFICATIONS****Input Impedance** (below threshold):

High Impedance: 50 kilohms

Low Impedance: 300 ohms (for 25 to 600 ohm sources)

**Input Levels:**

High Impedance: Microphone level to 10 volts max. (using INPUT LEVEL control)

Low Impedance: Microphone level to .2 volt max. (using INPUT LEVEL control)

**Output Impedance:**

High Impedance Microphone Level: 3.3 kilohms

Minimum recommended load: 5 kilohms

Low Impedance Microphone Level: Less than 50 ohms

Minimum recommended load: 25 ohms

Aux. Output: 10 kilohms

Minimum recommended load: 10 kilohms

**Gain Characteristics:** [Below threshold, INPUT LEVEL control maximum (10) DISTANCE SELECTOR in "18" or "More" position; measured from input to output]

INPUT	OUTPUT		
	Hi Imp. Mic.	Lo Imp. Mic.	Aux. Output
Hi Imp. Mic.	Unity	-20 dB	+60 dB
Lo Imp. Mic.	+20 dB	Unity	+80 dB

**Frequency Response:**

±2 dB 40 to 20,000 Hz

**Maximum Output Noise (HI IMPEDANCE MIC. OUTPUT, in dB below 1 volt):**

	300-20,000 Hz (Noise)	30-20,000 Hz (Hum and Noise)
Lo Imp. Input		
150 ohm Termination	-103 dB	-95 dB
Hi Imp. Input		
33 kilohm Termination	-104 dB	-95 dB

**Distortion (any level of regulation):**  
3% maximum THD

**Dynamic Characteristics:** Fast attack, moderate recovery, fixed.

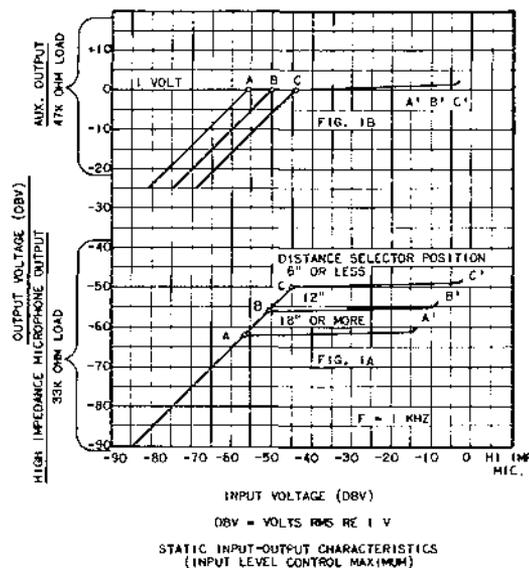
**Attack:** For a 20 dB step increase above threshold, gain is within 2 dB of final value in 500 microseconds.

**Recovery:** For a 20 dB step decrease to threshold, gain is within 2 dB of final value in 700 milliseconds.

**Battery Life:** Approximately 200 hours

**Dimensions:** See Figure 5.

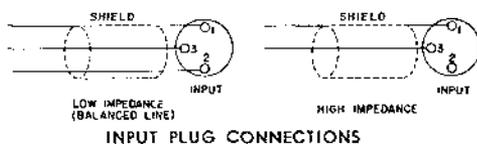
**Net Weight:** 1 kg (2.2 lb)



**FIGURE 1**

**Input Connections:** The receptacle marked MIC. INPUT is designed for either low (25- to 600-ohms) - or high-impedance (50,000-ohms) inputs. The impedance is selected by a slide switch above the input receptacle. The unit is not recommended for use with crystal or ceramic microphones.

The input receptacle is a professional three-pin female audio connector.† See Figure 2A for low- and high-impedance connections to receptacle.

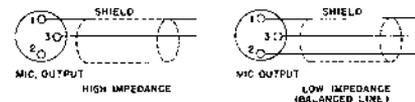


**FIGURE 2A**

**Output Connections:** The receptacle marked MIC. OUTPUT is a dual-impedance output selected by the

† Designed to mate with Cannon XL series, Switchcraft A3 (Q.G.) series or equivalent connector. [Shure part 95A407 (male) or 95A548 (female)].

switch above the receptacle. This output is designed to work into a 25- to 600-ohm microphone line or microphone input, or into a high-impedance amplifier or tape recorder microphone input. The receptacle is a professional three-pin male audio connector.† See Figure 2B for microphone level output receptacle connections.



**FIGURE 2B**

The receptacle marked AUX. OUTPUT is a phono pin jack which accepts a standard phono pin plug. This output is designed to work into a high-impedance (10 kilohms or greater), high-level input of a mixer, preamplifier, amplifier, or tape recorder. This output may be connected to the AUX. INPUT of an M68 Series Mixer, the HIGH-LEVEL INPUT of an M63 Audio Master or the LINE INPUT (bridging) of an M67 Professional Microphone Mixer.

The static characteristics of the high-level AUX. OUTPUT are shown in Figure 1B. This output provides a constant 1volt level (with a 47-kilohm load) whenever the input level is above threshold. Below threshold it provides approximately 60 dB of gain over the HI-IMP MIC. input.

**NOTE:** This output is disabled when the MASTER CONTROL switch is set to "Bypass."

**Battery and Auxiliary Power Connections:**

The battery to power the M62V is shipped with the unit but must be installed. Install as follows:

1. Remove Battery Compartment cover by removing the lower slotted screw holding cover, loosening the upper screw, and sliding the cover down.
2. Snap battery into clips provided.
3. Replace Battery Compartment cover and tighten screws securely.

**Battery Replacement—**Use Eveready type 216 or 222, or equivalent 9V Battery.

**AUX. INPUT POWER:** This jack is used as a power input when using the power supply of a Shure M67 or M68 Series Mixer or M63 Audio Master. In this case, the battery should be disconnected. A special connecting cable is provided to connect the AUX. INPUT POWER jack on the M62V to the ACCESSORY 28 V. D.C. jack on the M68 Mixer or to the POS. (red) 30 V. D.C. jack on the M67 Mixer or M63 Audio Master.

In order to utilize ac current, the use of a 9 volt D.C. Battery Eliminator is suggested. There is a provision in the battery compartment cover that will allow using a 9 Vdc Battery Eliminator to power the M62V. The Battery Eliminator cable is to be slipped into the split rubber grommet on the cover of the battery compartment. To secure cable, rotate grommet 1/2 turn. Connection is to be made using the same battery clips that normally connect to the 9 volt battery.

**(Note: If a Shure M68, M67 or M63, or a Battery Eliminator is to be used, first remove the battery.)**

## CONTROLS AND OPERATION

### MASTER CONTROL:

With the MASTER CONTROL in the "Bypass" position:

1. The battery is disconnected from the "Level-Loc" circuitry and thus the level-controlling action of the M62V is inoperative.
2. The AUX. OUTPUT is disabled.
3. The input to the M62V is switched directly to the MIC. LEVEL OUTPUT so in this "Bypass" condition the unit can serve as a microphone line matching transformer.

With the MASTER CONTROL switch in the "Level-Loc" position, the unit is energized, its level-controlling capability operates, and the AUX. OUTPUT is available.

### DISTANCE SELECTOR:

When the M62V is being fed directly from a microphone source, optimum Level-Loc action is usually obtained when the INPUT LEVEL control is set to maximum (10) and the DISTANCE SELECTOR is set for the actual performer-to-microphone distance. For example: a singer or soloist standing nominally 6 inches from a microphone would require a setting of "6" or Less" on the DISTANCE SELECTOR. A panel discussion where the speaker(s) may be any distance up to 18 inches or more, would require a setting of "18" or More" on the DISTANCE SELECTOR.

For maximum signal-to-noise ratio use the "6" or Less" position of the DISTANCE SELECTOR unless the input signal level is not sufficient to produce the desired Level-Loc action.

When recording in quiet surroundings, the 18" setting of the DISTANCE SELECTOR may be used to obtain maximum control of the recorded level. This is especially advantageous in recording sound sources where the volume is not predictable. If under these conditions, very loud program material or high sensitivity microphones result in distortion, the DISTANCE SELECTOR may be changed from the "18" or More" position to the "12" or "6" or Less" position. (Each position represents a 6 dB change in threshold.) In extreme cases of overload the INPUT LEVEL control can be reduced (see INPUT LEVEL CONTROL).

When using the Audio Level Controller in a public-address system, with the MASTER CONTROL in the "Level-Loc" position, turn up the volume control on the public-address amplifier to that point where the system is just below the threshold of feedback with no one speaking into the microphone. In this manner, the total system gain is reduced as signal above threshold is applied, and the system is more stable during loud parts of the performance. Should accidental feedback occur, the M62V will prevent it from becoming "ear-splitting" or damaging the loudspeakers.

The Level-Loc action may be demonstrated by switching from the "Level-Loc" to the "Bypass" position of the MASTER CONTROL, *provided the MIC. OUTPUT is being used.*

Figure 1 illustrates the static input-output characteristics of the Audio Level Controller, with the INPUT LEVEL control at maximum using the high-impedance input and high-impedance microphone level output.

(Note: there is a 20 dB level difference between the "Hi Imp." and "Lo Imp." setting of the MIC OUTPUT. A high-impedance to low-impedance transformer, as used in the input or output of the M62V, gives a 20 dB reduction of voltage gain.)

As an example, consider the DISTANCE SELECTOR switch set to the "18" or More" position. As the input is increased from a low value say  $-80$  dBV ( $-80$  dBV means 80 dB below 1 volt or .1 millivolt), the output will increase as much as the input until point A, the "threshold," (the input level at which compression takes place), is reached. Above this input level ( $-56$  dBV), the output will remain nearly constant over an input range of 40 dB or more, as represented by curve A-A' (on Figure 1A).

The input threshold voltage, and consequently the regulated output level, may be increased by either 6 or 12 dB by changing the setting of the DISTANCE SELECTOR. In this case, operation above the input threshold is represented by curves B-B' or C-C', according to the setting. These threshold voltages have been chosen to approximate the output of a typical microphone with an average speaker at the distances labeled on the switch. At greater distances or quieter speech, the output will follow the input, but if the person speaking is louder or closer to the microphone, the Audio Level Controller will prevent its output from increasing, thus eliminating "blasting" or overloading of subsequent electronics.

### INPUT LEVEL CONTROL:

The INPUT LEVEL control is employed when a higher-than-normal signal level is fed into the M62V, such as the output of preamplifiers, line amplifiers, tape recorders or tuners. The INPUT LEVEL control may also be used as a vernier control to allow fine adjustments of the input threshold that may occur between the 6 dB steps of the preset "DISTANCE SELECTOR" switch.

High-impedance, unbalanced signals up to 10 volts can be applied to the high-impedance input; low-impedance, balanced signals no greater than 200 millivolts may be connected directly to the low-impedance input. If the low-impedance signal is greater than this (for example, a 600 ohm line at +4 dBm), a line adapter balanced attenuator such as the Shure A15LA may be connected between the line and the input of the M62V. Alternately, if the line can be unbalanced (one side grounded), it may be connected to the high-impedance input with no attenuator.

With such inputs, the DISTANCE SELECTOR should be set to the "6" or Less" position. To adjust the INPUT LEVEL control, monitor the output of the M62V and apply an average level input. Starting at 0, advance the INPUT LEVEL control. The signal will begin to appear at the output and will increase in volume until a point is reached at which no further increase is noted. This is the threshold, and if the control is left at this setting, any inputs less than the test input level will pass through the M62V uncontrolled, while those which are louder will be prevented from rising and overloading succeeding equipment. Operation of the Audio Level Controller above the constant output region is not recommended. The curves shown on Figure 1A and B are valid when the INPUT LEVEL

control is used; however, the appropriate attenuation must be added to the Input Voltage (Horizontal) Scale. For example, if the INPUT LEVEL control is set to "5" approximately 20 dB should be added to the input voltage figures, so the point marked -60 dBV on the input voltage scale (Horizontal) would become -40 dBV. In other words, the entire curve would be shifted 20 dB to the right.

**TO USE WITH SHURE M68 SERIES MICROPHONE MIXERS:**

The two ways of using the M62V with the M68 Series Mixers are:

1. Connect a microphone directly to the microphone input of the M62V. Set INPUT IMPEDANCE switch to appropriate position. Connect the microphone level output of the M62V (Hi or Lo Impedance) to a microphone input on the M68 mixer (either Hi or Lo Impedance, whichever was selected on the M62V). This method gives audio "Level-Loc" control on the one microphone attached to the M62V **ONLY**. All other inputs to the M68 are unaffected.
2. Connect the M62V to control **ALL** inputs of the M68 mixer, by connecting the microphone level output of the M68 to the input of the M62V, (if the low-impedance microphone level output of the M68 is used the M62V input must be set to "Lo Impedance," if the high-impedance microphone level output of the M68 is used, the M62V input must be set to "Hi Impedance") or connect the AUX. HIGH LEVEL OUTPUT of the M68 to the input (set for "Hi Impedance") of the M62V. (The INPUT LEVEL control may be used to control the threshold level as covered under "INPUT LEVEL CONTROL.") The input for the main amplifier or tape recorder is then connected to the M62V microphone level output (Hi or Lo Impedance) or the AUX. OUTPUT. When used in this manner, the MASTER CONTROL of the M68 Mixer should be set to about "5" and the individual controls used to adjust the proper blend between the channels. If more overall volume is required, **the volume control on the main amplifier should be advanced. This precaution will prevent equipment overload.**

**TO USE WITH SHURE M67 MICROPHONE MIXER:**

Follow the instructions above for the M68, but only the low-impedance input or output may be used when connected to the M67. The setting of the M67 controls only need be such that the VU meter indicates properly to avoid overload.

**TO USE WITH SHURE M63 AUDIO MASTER:**

Follow the instructions above but only the AUX. OUTPUT of the M62V may be used to feed the HI LEVEL INPUT of the M63. The setting of the M63 VOLUME control will control the overall system gain after the "Level-Loc".

**OPERATION HINTS:**

Remember that the M62V "Level-Loc" is a device that provides a *constant output level* after a predetermined input level (threshold) is reached, therefore, if more system gain is needed in PA applications or a

higher record level is desired in tape recording applications, **DO NOT INCREASE THE INPUT LEVEL GOING INTO THE "LEVEL-LOC;"** once input threshold has been reached the output level becomes fixed **IT CAN NOT GO ANY HIGHER.** For more system gain, increase the gain control of amplifier, preamplifier or tape recorder that is being fed from the M62V.

**Note:** For best results it is recommended that some time be spent in experimentation with the "Level-Loc" to enable the user to become accustomed to the advantages which this unit presents.

**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.

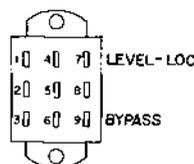
**Shipping Instructions:** Carefully repack the unit and return it prepaid to the factory. If outside the United States, return the unit to your dealer or Authorized Shure Service Center for repair. The unit will be returned to you prepaid.

**M62V Modification for Non-disabling Aux. Output**

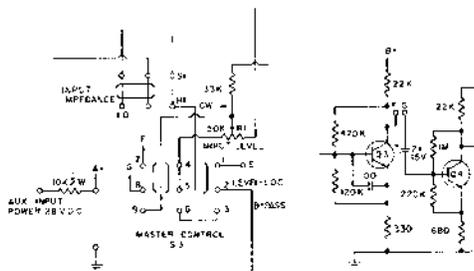
The M62V may be rewired internally so that the AUX. OUTPUT will operate (without "Level-Loc" action) when the MASTER CONTROL is set to "Bypass", rather than being disabled. This option is useful when the M62V AUX. OUTPUT is connected to the auxiliary input of the M63 Audio Master or M68 Series Mixers. Note: With this option, the M62V power cannot be turned off by the MASTER CONTROL switch. Power should be supplied to the M62V from an external source such as the ACCESSORY 28 V. D.C. jack on the M68 Mixer or the POS. (red) 30 V. D.C. jack on the M67 Mixer or M63 Audio Master, and the internal battery must be removed.

To make this modification (see Figures 3 and 4):

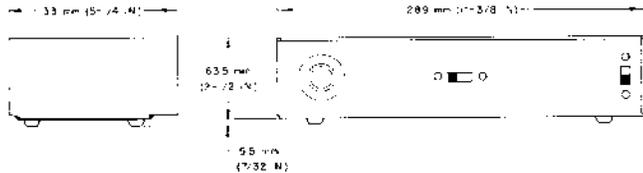
1. Remove battery from unit.
2. Remove cover from unit.
3. Unsolder and remove wire between MASTER CONTROL switch S3, terminal #8, and terminal strip end of 10 kilohm, 1/2 watt resistor.
4. Unsolder wire from S3, terminal #7, and solder it to terminal strip end of 10 kilohm, 1/2 watt resistor.
5. Unsolder positive end of 2 mfd x 15 volt capacitor from collector of Q3.
6. Connect a wire from positive lead of 2 x 15 capacitor to S3, terminal #8.
7. Connect a wire from collector of Q3 to S3, terminal #7.
8. Connect a wire from center terminal of INPUT LEVEL control R1 to S3, terminal #9.
9. Install a jumper wire between terminals #4 and #5 of S3.
10. Replace cover of unit, but do not install battery if the M62V is to be powered from an external source.



MASTER CONTROL SWITCH S3  
TERMINAL DESIGNATIONS  
(REAR VIEW)  
**FIGURE 3**



SCHEMATIC CHANGES FOR MODIFICATION  
**FIGURE 4**



OVERALL DIMENSIONS  
**FIGURE 5**

### OPTIONAL ACCESSORIES

#### A68S Stacking Kit

The A68S Kit enables you to conveniently stack together the M62V with the M63, M67 or M68 Series Mixers. An interconnecting cable is provided for connecting the AUX. OUTPUT of the M62V to the M68 Series Mixers or an M63 Audio Master. Additional units can be stacked with the use of additional A68S Kits. The Stacking Kit includes two brackets and an interconnecting cable.

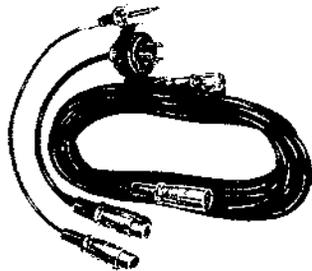
#### A68SC Interconnecting Cable

Cable only, as supplied in the A68S Stacking Kit, for use in connecting the AUX OUTPUT of the M62V to an M68 Series Mixer (AUX INPUT) or M63 Audio Controller. The A68SC is a 305 mm (12 in.) long single conductor shielded cable with a phono plug on each end.

#### A68C OUTPUT CABLE KIT

The A68C Output Cable Kit provides a convenient and flexible method of connecting the microphone level output of the M62V, M63, M67 or M68 Series Mixers to the great variety of amplifier and input receptacle configurations. Enables you to connect to virtually any PA system. Kit includes:

- One 4.6 m (15 ft) two-conductor shielded cable with professional three-pin male and female audio connectors.†
- One 305 mm (12 in.) two-conductor shielded adapter cable with professional three-pin female audio connector on one end and Hubbel twist lock plug on other end.
- One 305 mm (12 in.) single conductor shielded adapter cable with professional three-pin female audio connector on one end and Amphenol type MC1 connector on the other end.
- One Phone Plug adapter for use with MC1 Connector.

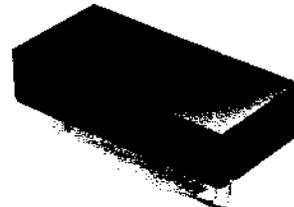


A68C OUTPUT CABLE KIT

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

### A68L LOCKING PANEL

The A68L Panel fastens over the controls of the M62V, M63, M67 or M68 Series Mixers, locks in place with a padlock (supplied), and prevents tampering with controls once they have been set. The A68L Kit contains locking panel, small padlock and two keys.



A68L LOCKING PANEL

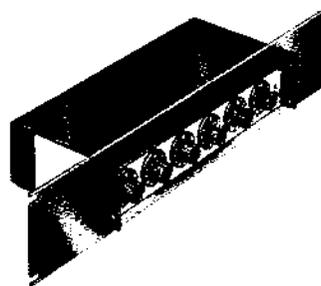
### A68R RACK PANEL KIT

Designed to mount M62V Audio Level Controller in standard 19" rack.

#### Installation and Mounting

1. Assemble brackets to panel using hardware supplied.
2. Remove two cover mounting screws from bottom of M62V.
3. Slide M62V into brackets and re-assemble screws through brackets into bottom of mixer.

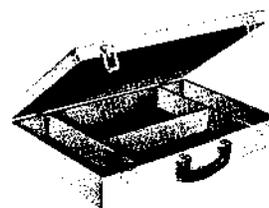
NOTE: The A68L Locking Panel may be used simultaneously with the A68R Rack Panel Kit.



A68R RACK PANEL KIT

### AC60 ATTACHÉ CARRYING CASE

The AC60 is a vinyl-covered attaché type carrying case (compartmentalized and foam lined), with space for any of the M62V, M63, M67 or M68 Series Mixers and as many as four microphones, cables, adapters, and other accessories.



AC60 ATTACHÉ CASE

