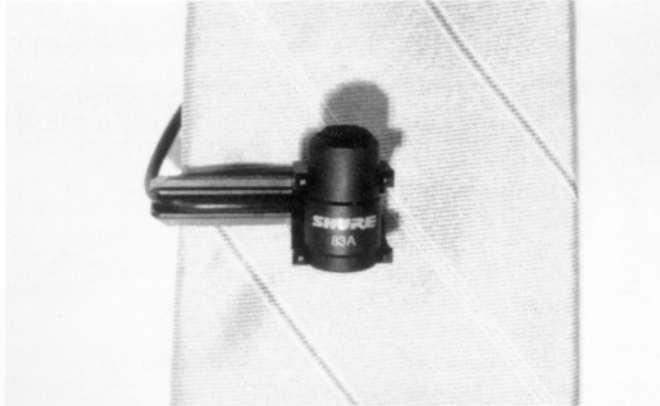


SHURE®

MODEL WL83A AND SM83A OMNIDIRECTIONAL CONDENSER LAVALIER MICROPHONES



GENERAL

The Shure Model WL83A and SM83A Microphones are professional quality, omnidirectional miniature, lavalier electret condenser microphones designed to meet the most demanding requirements in broadcasting or sound reinforcement applications. The Model WL83A is for wireless use; the SM83A for wired applications. Both models feature the 83A microphone element.

The 83A microphone element features a specially tailored frequency response designed to provide a natural "stand mike" sound when the microphone is chest-worn. This response is achieved by an acoustically controlled high-frequency boost for a flatter response in the lavalier-worn position.

The 83A, in wired or wireless configurations, is also suited for pickup of acoustic instruments such as guitar, woodwinds, and strings.

To enhance the microphone's small size, the 83A cable emerges from the side, rather than the bottom of the microphone housing. This arrangement makes the strong, small-diameter microphone cable even more unobtrusive by eliminating the distracting cable loop visible below most lavalier microphones.

Both models are supplied with two mounting blocks for hook-and-loop (VELCRO) or sewn mounting, a mounting block with attached tie bar, and an acoustic windscreen to minimize wind noise in outdoor applications. In addition, the SM83A features a double-mic tie bar.

The 1.2-meter (4 ft) microphone cable is terminated with a miniature 4-pin connector (Switchcraft TA4F type) that connects directly either to a Shure wireless body-pack transmitter or to the amplifier assembly supplied with the SM83A.

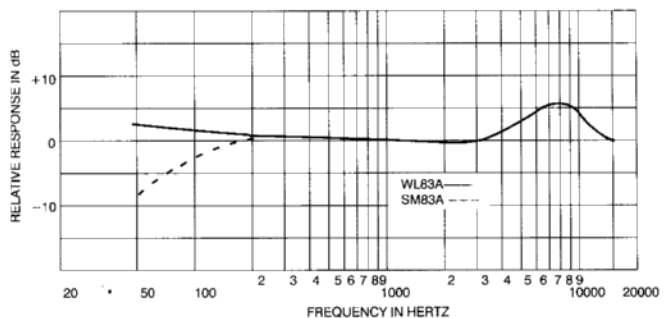
The WL83A Wireless Lavalier Microphone, when used with a Shure Wireless Body-Pack Transmitter, features a wide frequency response, low distortion, and reliable operation at temperature and humidity extremes that suit it well for virtually any application where an entertainer or speaker needs optimum sound pickup without the distraction of conventional microphone cables or stands.

The SM83A Wired Lavalier Microphone with a supplied amplifier assembly, features a 12 dB/octave rolloff below 100 Hz to help reduce room noise and other undesirable low-frequency signals. The SM83A consists of the 83A microphone element and an amplifier assembly with an attached 3 m (10 ft) output cable terminated by a three-pin professional (XLR-type) audio connector.

The SM83A is powered either internally by a readily available 9-volt battery (not supplied) or externally by phantom power supplied by broadcast, sound reinforcement or recording equipment, or an external phantom supply. An automatic power switchover feature provides automatic switching from battery to phantom power. The SM83A operates over an extremely wide voltage range of 11 to 52 Vdc, covering both DIN and IEC phantom power standards. A dual-channel power supply (Shure Model PS1A) is available for providing phantom power to the SM83A.

Features

- Wide-range frequency response specially tailored for chest-worn microphone operation
- Very low susceptibility to RFI and electrostatic and magnetic hum
- Low distortion and wide dynamic range
- Tiny size, light weight and non-reflective finish for inconspicuous use
- Usable over wide range of temperature and humidity conditions
- Side-exit cable for sleeker appearance, lower cable noise transmission
- Rugged construction for outstanding reliability
- Versatile mounting accessories permit fast and simple user installation
- SM83A amplifier assembly or Shure wireless body-pack transmitter can be pocketed, strapped to the body, or clipped to belt or waistband
- Controlled low-frequency rolloff (SM83A) reduces low-frequency room noise
- Wide-range phantom powering (SM83A) accepts all commonly used voltages

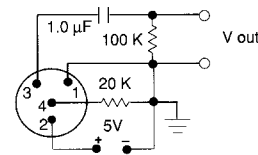
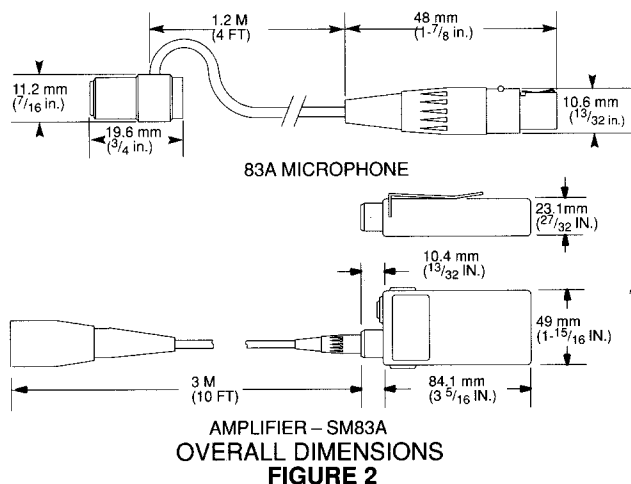


FREQUENCY RESPONSE
FIGURE 1

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SPECIFICATIONS	WL83A MICROPHONE (with standard test circuit—Figure 3)	SM83A MICROPHONE
Type	Condenser (electret bias)	
Frequency Response (Figure 1)	50 to 20,000 Hz	80 to 20,000 Hz, 12 dB/octave rolloff below 100 Hz
Polar Pattern	Omnidirectional	
Output Impedance	1200 Ω	Rated at 150 Ω (90 Ω actual) Recommended minimum load impedance: 800 Ω (May be used with loads as low as 150 Ω with reduced clipping level)
Output Level (0 dB = 1 volt per μ bar)	Open Circuit Voltage -63 dB (0.70 mV)	Open Circuit Voltage -70.5 dB (0.30 mV)
Output Clipping Level (at 1,000 Hz)	-3 dBV (0.70 V)	800 Ω Load -13 dBV (0.22 V) 150 Ω Load -27 dBV (0.045 V)
Total Harmonic Distortion	Less than 1% (134 dB SPL at 1,000 Hz)	Less than 1% (132 dB SPL at 1,000 Hz)
Maximum SPL	134 dB	132 dB with 800 Ω Load 121 dB with 150 Ω Load
Dynamic Range (maximum SPL to A-weighted noise level)	110 dB	108 dB
Output Noise (equivalent SPL)	24 dB typical, A-weighted	24 dB typical, A-weighted 28 dB, weighted per DIN 45 405
Hum Pickup (electromagnetic)	N/A	-10 dB equivalent SPL in a 1 mOe field (60 Hz)
Signal-to-Noise Ratio	70 dB at 94 dB SPL (IEC 651)	70 dB at 94 dB SPL (IEC 651)
Phasing	Positive pressure on microphone diaphragm produces positive voltage on pins 3 and 4 with respect to pin 1 (ground)	Positive pressure on microphone diaphragm produces positive voltage on pin 2 relative to pin 3 of amplifier output cable connector
Recommended Operating Voltage	1.5 to 6 V (pin 2 to pins 3 and 4)	11 to 52 Vdc Phantom, or 9 Vdc alkaline battery (Duracell MN1604 or equivalent) Protected against reverse voltage application
Current Drain	60 to 180 μ A	0.33 mA, approximately 1600 hours continuous use with fresh alkaline battery
Environmental Conditions	Operating Temperatures: -18 $^{\circ}$ to 60 $^{\circ}$ C (0 $^{\circ}$ to 140 $^{\circ}$ F) Storage Temperatures: -29 $^{\circ}$ to 66 $^{\circ}$ C (-20 $^{\circ}$ to 150 $^{\circ}$ F)	
Cable	Microphone: 1.2 m (4 ft), attached, two-conductor, shielded terminated by Switchcraft TA4F type connector	Microphone: 1.2 m (4 ft), attached, two-conductor, shielded terminated by Switchcraft TA4F type connector Amplifier: 3 m (10 ft) attached, two-conductor, shielded, TRIPLE-FLEX [®] with 3-pin (male) XLR-type professional audio connector
Case	Microphone: Brass construction with black finish and stainless-steel-mesh grille	Microphone: Brass construction with black finish and stainless-steel-mesh grille Amplifier: Black molded high-impact plastic with detachable belt clip
Net Weight	Microphone: 45 g (1.6 oz)	Microphone: 45 g (1.6 oz) Amplifier: 270 g (9.45 oz) including battery

Dimensions (See Figure 2)



WL83A STANDARD TEST CIRCUIT
FIGURE 3

WIND NOISE

Lavalier microphones generally need no windscreen for proper operation. However, when used outdoors, an acoustic foam windscreen (supplied, Shure Model RK242WS) helps eliminate any unpleasant “rushing” noise.

MOUNTING THE MICROPHONE

The tie bar mount attaches to a blouse, shirt, coat or tie using the spring-loaded tie clasp. Snap the microphone into the mounting block and tuck the cable into the channel behind the microphone (Figure 4A). The mounting block permits the microphone to be mounted in four positions. The mounting

blocks provided can be used in the following mounting methods:

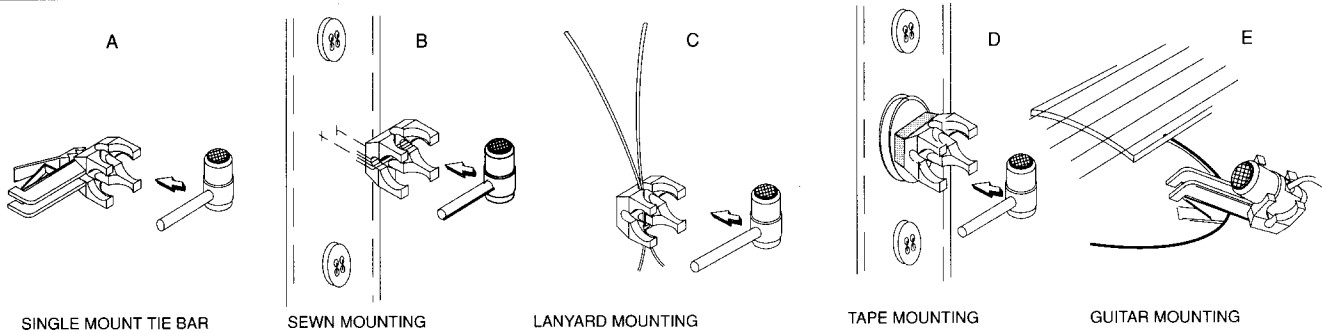
1. **Sewing.** The mounting block can be sewn like a button using the narrow channels in the block as guides for the thread (Figure 4B). Dark thread is recommended.
2. **Lanyard.** The narrow channels of the mounting block will accept a lavalier-type lanyard for mounting in the conventional lavalier manner (Figure 4C).
3. **Tape.** The mounting block can be fastened to almost any non-porous, flat surface with heavy-duty, double-stick

foam mounting tape (Figure 4D).

4. **Acoustic Instruments.** The tie bar can secure the microphone to an acoustic guitar, a horn bell or other instrument (Figure 4E).

Caution: The tie bar teeth can mar wood or metal. Protective material should be placed over the teeth in these applications.

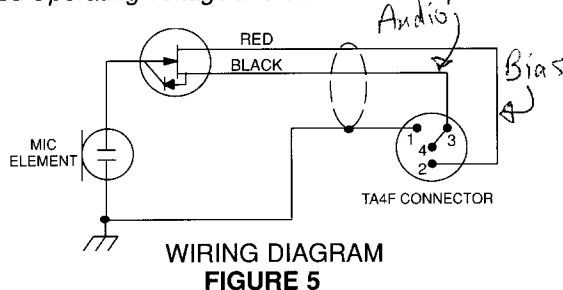
The 83A can also be mounted with hook-and-loop (i.e., VELCRO) fasteners, safety pins, or other items available in hardware and fabric stores.



MOUNTING THE 83A MICROPHONE
FIGURE 4

POWERING THE 83A MICROPHONE

The 83A impedance conversion circuitry is designed to be powered, as shown in Figure 5, from a regulated +5 Vdc source provided at microphone connector pin 2 from a Shure wireless body-pack microphone transmitter or from the amplifier supplied with the SM83A. If the 83A is to be used with any other wireless transmitter, either the microphone cable or the transmitter input may have to be rewired for proper operation and powering within the constraints of the *Recommended Operating Voltage and Current Drain* specifications.



NOTE: The 83A Microphone alone is not designed to be operated directly into the input of a mixer.

POWERING THE SM83A AMPLIFIER

Phantom Powering

The SM83A with supplied amplifier can be powered by virtually any microphone phantom supply providing 11 to 52 Vdc phantom voltage. The Shure Model PS1A Power Supply provides power to one or two SM83A microphones. Phantom powering uses the balanced audio cable pair to carry the supply current to the microphone; the cable shield is the ground return.

Use only high-quality cables. Intermittent shorts between broken shield wires and balanced conductors will cause objectionable noise transients in the system. A reliable ground path is essential for the same reason.

Battery Powering

The SM83A can also be powered by an internal 9-volt alkaline battery (Duracell MN1604 battery recommended). Under normal operating conditions, a fresh alkaline battery should provide approximately 1600 hours of operation. The SM83A is designed without an on-off switch. The amplifier is on whenever a "good" battery is installed, or phantom power is applied. The highly efficient circuit can operate for up to two months continuously with a fresh alkaline battery.

No current is drawn from the battery when a phantom voltage higher than the battery voltage is applied. Phantom power can be used whether or not a battery is in place.

Microphone Amplifier Loading

A load impedance of 800 Ω or greater should be used for maximum signal handling and minimum distortion. The load can be as low as 150 Ω , but a reduction in output clipping level will result. It should be noted that the power supply itself may add loading (3300 Ω in the Shure PS1A) to the microphone.

INSTALLING THE BATTERY (SM83A)

To install the battery, depress the ridged area of the case and swing the hinged door open. Insert the battery in the compartment, battery terminals toward the hinge with the positive terminal inward (the negative contact is marked inside the compartment). Depress the battery slightly and hook it under the "ledge" in the compartment. Close and lock the battery compartment door. (The door will not lock if the battery is inserted incorrectly.)

To prevent battery drain when the unit is not in use, remove the battery and store in the battery compartment upside-down (contacts upward) with the positive contact inward. If the unit is not used for longer periods, remove the battery to prevent damage from possible leakage.

MOUNTING THE AMPLIFIER

Most SM83A applications require that the amplifier be worn on the body. The spring-loaded belt clip will hold the amplifier to a belt, skirt or trouser waistband, or inside pocket.

The belt clip can be removed from the case and the amplifier placed on a nearby surface or worn in an inside pocket. To remove the clip, disassemble the case by removing two Phillips screws in the case and two slotted screws in the connector collar.

NOTE: The "W"-shaped belt clip permits the power supply to be worn with the cable end either upward or downward, depending on the speaker's comfort and the particular application.

REPLACEMENT PARTS

Amplifier Assembly	90B3789
Amplifier Cable	C106
Battery Compartment Door	65A1536
Belt Clip	44A279

TROUBLESHOOTING

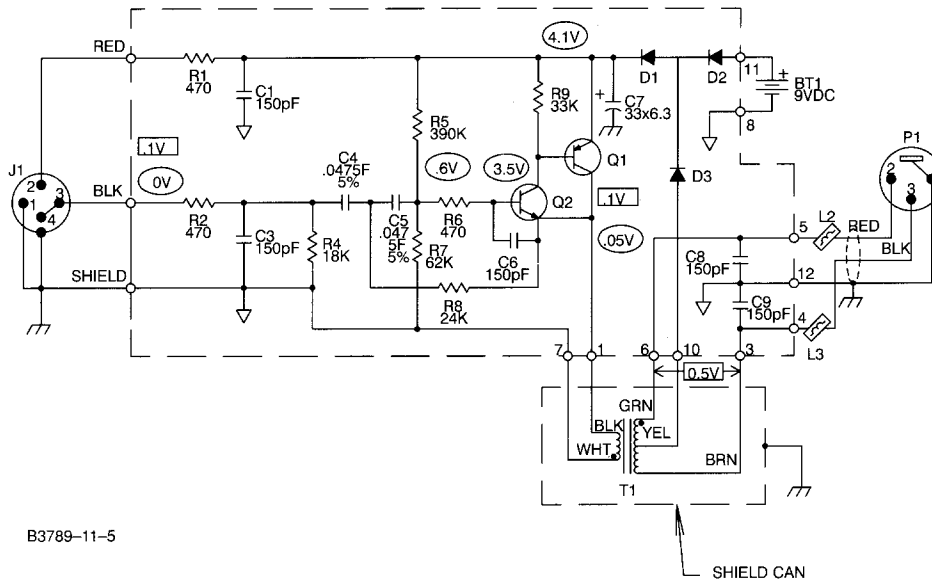
If problems arise with the SM83A microphone, take the following steps:

1. Check that battery voltage (or external voltage on pins 2 and 3 of amplifier cable output connector) is adequate.
2. If another SM83A is available, interchange microphones and amplifiers to attempt to localize the problem.
3. Check the microphone and amplifier cables for continuity.

FURNISHED ACCESSORIES*

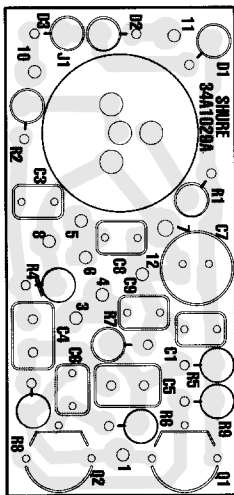
Mounting Block	RK239MB
Dual-Mount Tie Bar (SM83A Only)	RK241DB
Windscreen	RK242WB
Single-Mount Tie Bar	RK240SB

*Replacements furnished in multiples of 4



B3789-11-5

SM83A AMPLIFIER CIRCUIT DIAGRAM



AMPLIFIER PRINTED CIRCUIT BOARD

Reference Designation	Shure Part No.	Description	Commercial Alternate
A1	90A3837A	Printed Circuit Board Assy	None
C7	86B651	Capacitor, Tantalum, 33 μ F, 6.3 W	Sprague 196D336X9010KA1
D1	86B429	Diode, Current Regulator, 100 V, 0.33 mA	Motorola 1N4148
D2, D3	86A415	Diode, Computer, 75 V, 0.4 A	TI/GE 1N4148
J1	95A8188	Connector, Receptacle Miniature 4-pin	Switchcraft TB4M
L1	95A976	Inductor, 1 H	None
L2, L3	80A253	Ferrite Bead Ring	Stackpole 57-0180
P1	90BT2600	Connector, Receptacle, 3-pin	None
Q1	86A348	Transistor, PNP	Motorola 2N5087
Q2	86A350	Transistor, NPN	Motorola 2N5210
T1	51B286	Transformer, Audio	None
W1	90A3792	Cable and Connector Assy (Inc. P1)	None

AMPLIFIER REPLACEMENT PARTS LIST