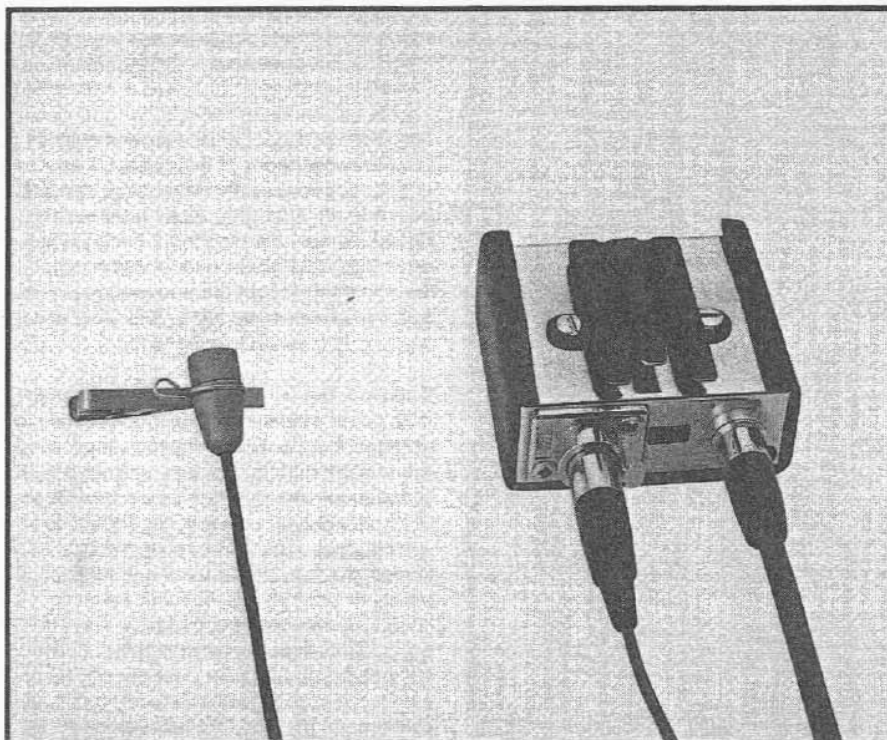




Electro-Voice®

a MARK IV company

Model CO94 Miniature Electret Condenser Omnidirectional Microphone

SPECIFICATIONS

Element:

Electret condenser

Frequency Response:

80 to 15,000 Hz

(see Figure 2)

Impedance:

150 ohms nominal (balanced)

Polar Pattern:

Omnidirectional

Output Level:

-45 dB ref

(0 dB = 1 mW/10 dynes/cm²)

EIA Sensitivity Rating:

-136 dB

Self Noise:

2 uV A weighted

S/N Ratio:

72 dB A weighted

Dynamic Range:

117 dB

(141 dB input-open circuit)

Equivalent Noise Level:

Less than 24 dB re

.0002 dyne/cm²

Maximum SPL at 1% THD:

141 dB (SPL) at 1 kHz

Operating Voltage:

9 V dc internal "transistor radio" battery
(not supplied. See Replacement Guide.)

8 to 50 V dc external via battery
termination

8 to 50 V dc phantom power

Current Required:

3.9 mA maximum

Output Cable:

4.6 m (15 feet), two-conductor, shielded,
brown, rubber-jacked, with TA3F and A3M
connectors

Case Material,

Mic Capsule:

Brass

Electronic Housing:

Aluminum

Power-Supply/Buffer:

Steel with plastic cover

Connections:

See Figure 3

Dimensions:

See Figure 1

Finish,

Mic Capsule/Electronic Housing

Assembly:

Fawn beige micomatte

Power-Supply/Buffer Assembly:

Nickle plated with black plastic cover

Weight,

Mic Capsule/Electronic Housing

Assembly:

19 grams (including tie clasp)

Power-Supply/Buffer Assembly:

120 grams (less battery)

Furnished Accessories:

385 windscreen

Belt clip

Storage pouch

Tie clasp (EV No. 70316)

Optional Accessories:

522 extension miniature interconnect
cable, 10 ft long

390 dual tie clasp

AC24M power supply

CO9R*

*The CO9R is a field replacement for the
microphone capsule electronics and cable.

DESCRIPTION AND APPLICATIONS

The CO94 is a miniature lavalier electret microphone designed to attach to the user's clothing with a tie clasp. The CO94 consists of two separate assemblies: the microphone element and the power-supply/buffer module. The microphone element and power-supply/buffer module are connected by a 1.83 meter (6 ft) length of durable miniature cable. This cable is connected to the power-supply/buffer module with a miniature connector, permitting the use of cable extensions. In normal operation, the microphone element is attached to the user with the supplied tie clasp or the optional 390 dual tie clasp. The power-supply/buffer module is normally clipped to the user's belt using the supplied clip. The small physical size of the microphone element portion of the CO94 is ideal for on-camera use.

The CO94 can be powered in several ways, depending on the application. The CO94 can operate from a 9-volt battery located in

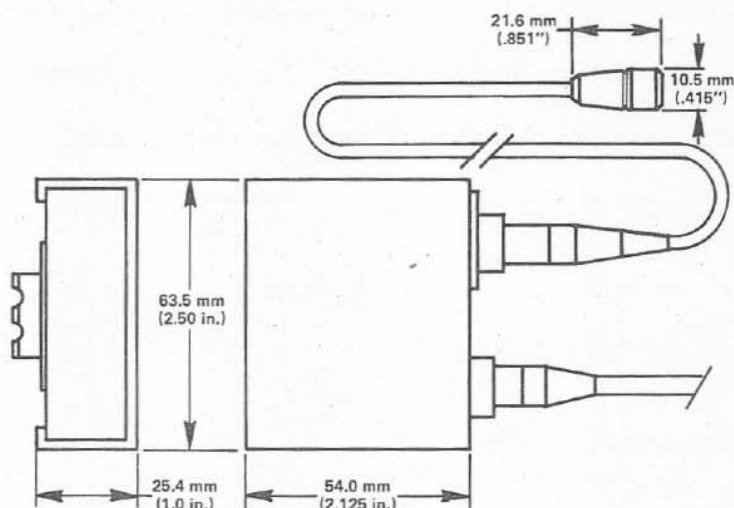


FIGURE 1 — Dimensions

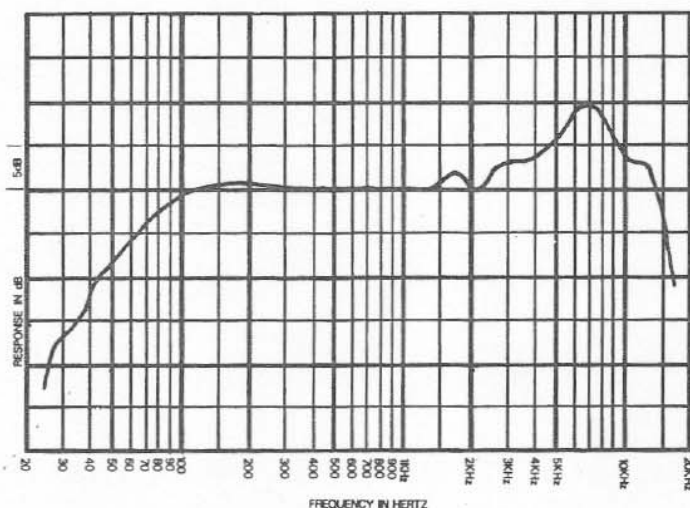


FIGURE 2 — Frequency Response

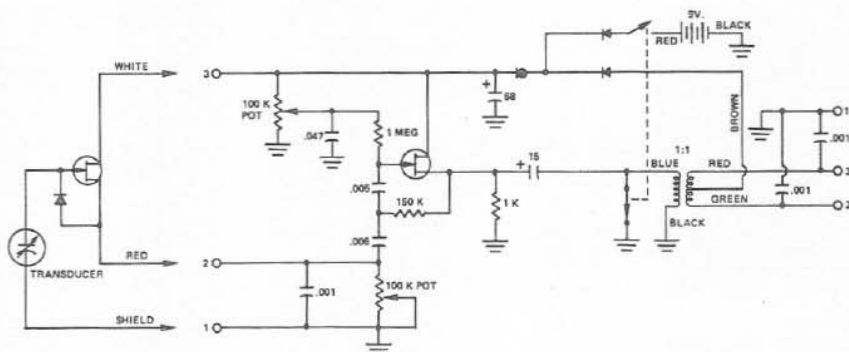


FIGURE 3 — Wiring Diagram

the supply/buffer module. In this mode, the switch located on the power-supply/buffer module's front surface functions as an "on-off" switch.

The CO94 can also operate as a phantom powered unit on any of the currently used phantom power systems employing voltages from 8 to 50 V dc. (The series resistance should maintain the required 3.9 mA.) When operating in the phantom powered mode, the switch located on the power-supply/buffer module's front surface functions as a silent muting switch (see Figure 3).

If desired, the CO94 can be operated in a dual power mode employing both battery and phantom powering. The advantage of this configuration is insurance against loss of signal should the phantom power fail. When phantom voltage is present, the battery is automatically switched from the circuit. Should phantom power fail, the phantom supply is automatically removed from the circuit and the battery activated. A shorted battery or a shorted phantom power supply (assuming the short is to ground and not across the output leads) will not affect the operation of the CO94 on the remaining power source.

In applications using a large number of CO94 microphones such as in board room installations, the CO94 can be powered by a positive (with respect to ground) dc voltage of 8 to 50 volts connected to the battery leads. The CO94 employs a series regulating device that automatically adjusts the current flow from any power supply to the required 3.9 mA. Refer to Figure 4 for power supply circuit diagrams.

The CO94 does not have the limited dynamic range typical of electret lavaliers powered by low voltage batteries. A CO94 is typically 10 dB greater in sensitivity than conventional electret lavaliers and will accept 20 dB greater SPL before overload. Due to its superior signal-to-noise ratio and headroom, the CO94 can be used in recording and sound reinforcement applications where other miniature tie-clasp electrets would fail. These would include, for example, stereo spaced omni recording, binaural recording, and close miking of instruments. The CO94 may also be employed in wall or floor-mounted recording, where it receives the advantages resulting from barrier reinforcement.

The CO94 is an excellent microphone for barrier recording.¹ A fundamental requirement for a microphone, if it is to be used for barrier recording, is small size with respect to the wavelength of the highest frequency of

¹ Barrier recording refers to the technique of mounting a microphone close to a large barrier such as the floor, wall or ceiling so that the direct sound is reinforced by an in-phase reflected sound from the barrier.

interest. Another critical factor is sensitivity. In typical barrier recording situations the source-to-microphone distance is much greater than is typical of more conventional microphone techniques. The CO94, by virtue of its extremely high sensitivity, small size and uniform response, is ideally suited for use in barrier recording situations. See Figure 5.

An important feature of the CO94 is a buffered second-order bass cut-off filter. This filter cuts off energy below 80 Hz such as machinery rumble, wind noise, etc.

OPERATING INSTRUCTIONS

To prepare the CO94 for operation in the battery mode, slide the black cover forward and install a 9-volt battery in the exposed compartment. Slide the cover rearward until a slight click is felt. Plug the microphone element assembly into the power-supply/buffer assembly.

(An extension cable up to 25 feet long can be used, if desired.) Plug the output cable into the connector on the power-supply/buffer front panel. Slide the switch to the "ON" position. The unit should now operate properly. If the unit should fail to operate, check the battery voltage and verify the seating of the connectors.

Phantom Powered Operation

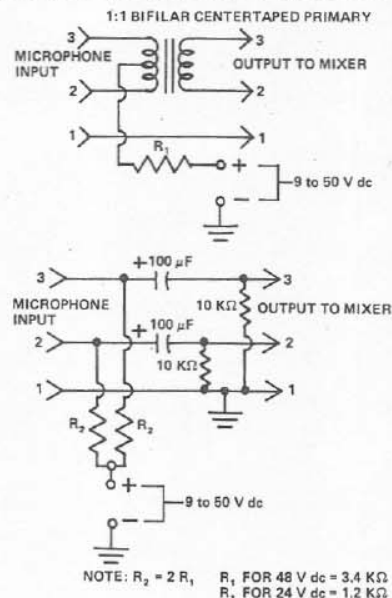
To prepare the CO94 for phantom powered operation, plug the microphone element and output cables into the power-supply/buffer assembly. Slide the front panel switch of the power-supply/buffer assembly to the "ON" position. If the output cable is connected to equipment providing phantom power, the unit should operate properly. If proper operation does not occur, check the phantom power supply back to its source. Refer to Figure 4 for power supply circuit diagrams.

TECHNICAL INFORMATION

The CO94 can be separated into two major assemblies: the microphone element assembly and the power-supply/buffer assembly. In a similar fashion the microphone element assembly can be divided into two subassemblies: the microphone capsule subassembly and the electronics and cable subassembly. The microphone capsule houses the omnidirectional electret condenser element. The capacitance of this element changes in response to sound pressure variations occurring at the diaphragm. These changes in capacitance are converted to a usable output voltage by the electronics subassembly. Electrical connection to the electronics subassembly is accomplished through a probe which extends from the electronics assembly into a recess in the back of the microphone capsule.

The microphone/electronics assembly is connected to the power-supply/buffer assembly via a TA-3M connector. As its

PHANTOM POWERING CIRCUITS



BUSS POWERING VIA BATTERY LEADS

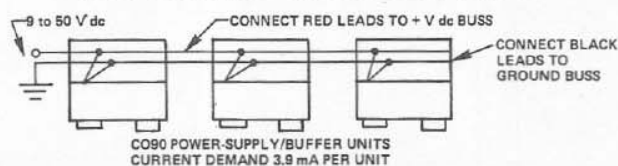
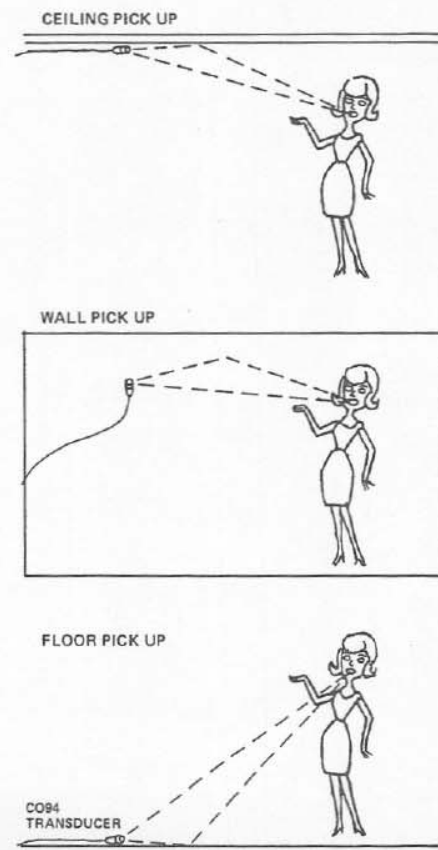


FIGURE 4 — Phantom and Bus Power Supply Circuits

FIGURE 5
 Barrier Recording Pictorial



name implies, the power-supply/buffer provides the electronics in the microphone unit with power and buffers the approximately 7,000-ohm microphone signal down to the 150-ohm impedance typical of a high-quality low-impedance microphone. There is a 12-dB-per-octave active filter in the buffer that provides a bass roll-off starting at 80 Hz. The CO94 can be powered from virtually any source ranging from 8 V dc to 50 V dc through the use of a constant-current regulator that is part of the power supply circuitry (see Figure 3).

BATTERY REPLACEMENT GUIDE

	Alkaline	Mercury	Carbon-Zinc
Mallory	MN1604	TR146X	M1604
Eveready	522	E146X	215
Burgess	2NG	H146X	2U6
NEDA	1604A	1604M	1604

WARRANTY (Limited)

Electro-Voice Professional, PL & BK Series Microphones are guaranteed against malfunction from any cause for a period of two years from date of original purchase. Also, these microphones are guaranteed without time limit against malfunction in the acoustic system due to defects in workmanship and material. Any active electronics incorporated in the microphone are guaranteed for three years from date of original purchase for parts and labor against such malfunction. If such malfunction occurs, microphone will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, cables, cable connectors, switches, or malfunction due to abuse or operation under other than specified conditions, nor does it extend to incidental or consequential damages. Some

states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized warranty service agencies will void this guarantee. A list of authorized warranty service centers is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107.

Specifications subject to change without notice.



ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107

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Part Number 530154-145