

**Electro-Voice®**  
a gulton company

## Model PL77AA Cardioid Electret Condenser Microphone

### SPECIFICATIONS

**Generating Element:**

Electret condenser

**Frequency Response (see Figure 3):**

50 - 20,000 Hz

**Polar Pattern (see Figure 4):**

Cardioid

**Impedance:**

150 ohms balanced

**Output Level:**

-50 dB with  
phantom power or 4.5-volt battery  
-54 dB with  
1.5-volt battery  
(0 dB = 1 mW/10 dynes/cm<sup>2</sup>)

**EIA Sensitivity:**

-144 dB with  
phantom power or 4.5-volt battery  
-148 dB with  
1.5-volt battery

**Dynamic Range:**

100 dB with  
phantom power or 4.5-volt battery  
94 dB with  
1.5-volt battery

**Equivalent Noise Level:**

Less than 30 dB  
(0 dB = .0002 dynes/cm<sup>2</sup>)  
A weighted

**Power Supply:**

4.5- or 1.5-volt internal battery  
(not included)  
or 24-to-48-volt phantom supply

**Battery Selection Guide,  
4.5-Volt Battery,**

**Carbon Zinc:**

Eveready No. 333

**Alkaline:**

Mallory PX-21  
Eveready 523  
Burgess AL-523  
Panasonic PX-21

**\*Mercury:**

Mallory TR-133  
Eveready E-133  
Burgess H-133  
Panasonic H3P

**1.5-Volt Battery:**

Any AA size cell

**Current Drain:**

1 mA from 1.5-volt battery  
3-5 mA from 4.5-volt battery or  
phantom power

**Battery Life,**

**4.5-Volt Battery,**

**Carbon Zinc:**  
150 hours

**Alkaline:**  
175 hours

**Mercury:**  
350 hours

**1.5-Volt Battery:**

In excess of 1000 hours for any  
type AA size cell

**Switches, Two:**

Bass contour switch  
Recessed battery on/off switch  
(does not operate in phantom mode)

**Pop Filter:**

Built-in Acoustifoam™ filter

**Cable:**

4.6 m (15 feet),  
two-conductor, shielded, brown,  
rubber-jacketed, with  
Switchcraft A3F connector

**Case Material:**

Diecast zinc & aluminum

**Dimensions:**

191 mm long (7.5")  
25.4 mm (1.0") shank diameter  
50.8 mm (2.0") maximum diameter

**Weight:**

343 grams (12 oz)  
(with battery but not  
including cable)

**Finish:**

Silver tone beige

**Accessories Furnished:**

301B stand adapter  
Zippered vinyl carrying case

**Optional Accessories:**

376 windscreen  
380 attenuator  
AC24M power supply

\*Do not use below 4.5° C (40° F)

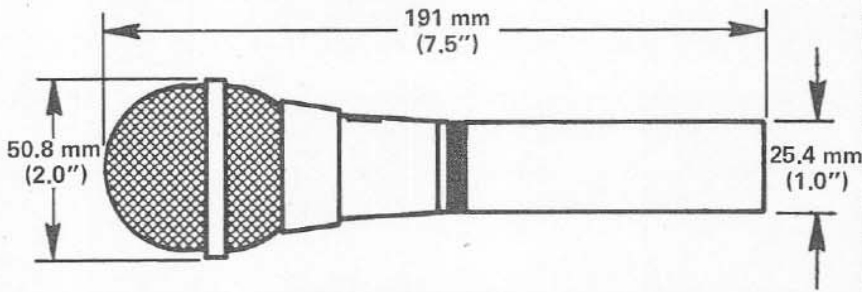


FIGURE 1 - Dimensions

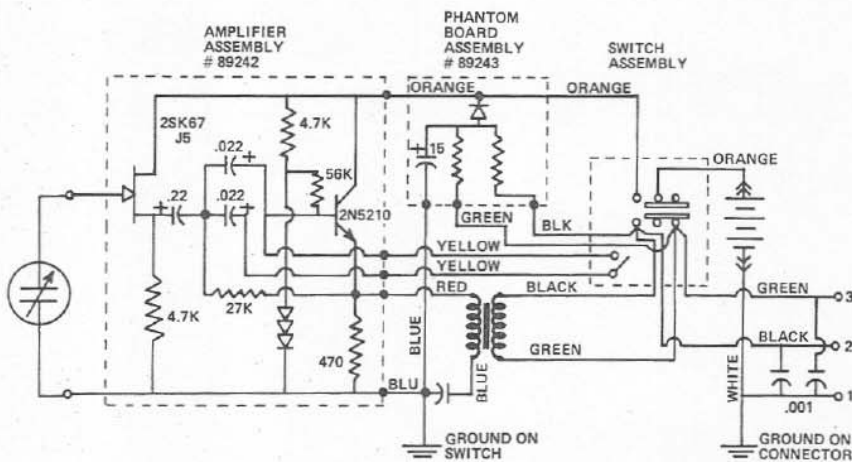


FIGURE 2 - Wiring Diagram

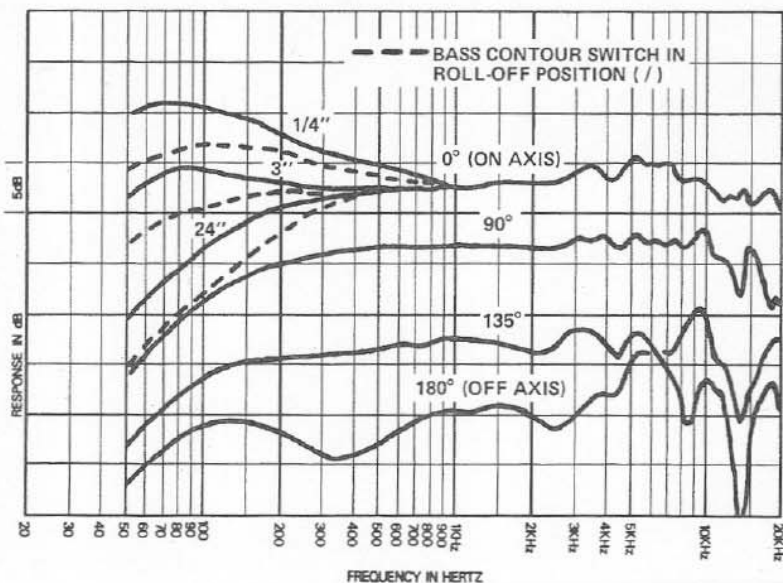


FIGURE 3 - Frequency Response

## DESCRIPTION & APPLICATIONS

The Electro-Voice PL77AA is a Single-D electret condenser cardioid microphone designed for the professional vocalist. The unusually extended, shaped high-frequency response provides a natural, transparent sound quality not available in the usual vocal microphones (see Figure 3). The Single-D design provides the up-close bass boost (proximity effect) preferred by many entertainers. In addition, the PL77AA features a two-position bass response switch which effectively tailors the sound to fit the voice. Unusually uniform directional characteristics over the entire frequency range (see Figures 3 and 4) provide high feedback resistance when working close to sound reinforcement speakers and monitors. A built-in Acoustifoam blast filter enables close talking or singing without worry of "P-popping" or other excessive breath and sibilant noise. The very low mass of the generating element acts as an effective shock mount which keeps handling noise to a minimum. The rugged construction of the PL77AA makes it unique among other condenser microphones. The case is constructed of rugged diecast zinc and the battery compartment sleeve is made of aluminum. The Memraflex grille screen resists deformation. The PL77AA may be phantom or battery powered (see the following section).

## POWERING THE PL77AA

Unlike normal condenser microphones, the electret condenser does not need a polarizing voltage because a permanent charge is captured in the diaphragm material. However, a small voltage with low current drain is necessary to power the FET impedance converter which must be used to lower the extremely high impedance of the electret head.

### Phantom Powering

Powering the PL77AA may be accomplished by use of an external DC phantom power source within the range of 24 to 48 volts. The Electro-Voice AC24M is designed for this purpose. With three AC24S expander modules up to fourteen PL77AA's may be powered.

### Battery Powering

The PL77AA may also be powered by an internal battery. To prolong battery life, the PL77AA's on/off switch should be in the "off" position when the microphone is not in use. Usually, as a battery approaches the end of its service life, a gradual but noticeable reduction in microphone output level

occurs, allowing replacement of the battery without a program interruption.

Access to the battery compartment is gained by unscrewing and pulling away the sleeve shown in Figure 5, exposing the battery clips. A 4.5- or 1.5-volt battery may be inserted, being sure to follow the polarization (plus and minus) label. A 4.5-volt battery should be used for maximum output level and dynamic range. The more easily obtainable 1.5-volt AA-size battery will produce a slightly lower dynamic range and output level (see "Specifications" section). Specific batteries and battery life figures are also shown in the "Specifications" section. In general, alkaline and mercury batteries are recommended because of much greater shelf life and less likelihood of leakage. However, with regular usage, a fresh carbon-zinc battery will give nearly as long a service life due to the low current drain of the PL77AA.

#### Phantom Power Battery Back-Up

The PL77AA with the internal battery supply can be used as a back-up when the microphone is powered by an external power source. When faced with failure of the external supply, the PL77AA will automatically switch over to internal battery power. The switch occurs without interruption of the audio signal.

#### BATTERY ON/OFF SWITCH

When the PL77AA is battery powered but not in use, the recessed battery on/off switch (see Figure 5) should be placed in the "off" position to extend battery life. However, when the PL77AA is phantom powered, the on/off switch has no effect on microphone output. This prevents accidental microphone turn-offs in the typical professional application where both phantom power is used and microphone output must be controlled by technical personnel.

#### BASS CONTOUR SWITCH

The bass contour switch shown in Figure 5 provides a tailoring of sound quality to a specific voice or sonic preference. With the switch in the normal ( - ) position, the up-close bass boost (proximity effect) inherent in the Single-D design provides a much more "robust" sound than the usual dynamic vocal microphone. This sound has proven to be very popular. In the roll-off position ( / ), a less bass-heavy sound results, akin to that found in dynamic Single-D vocal microphones.

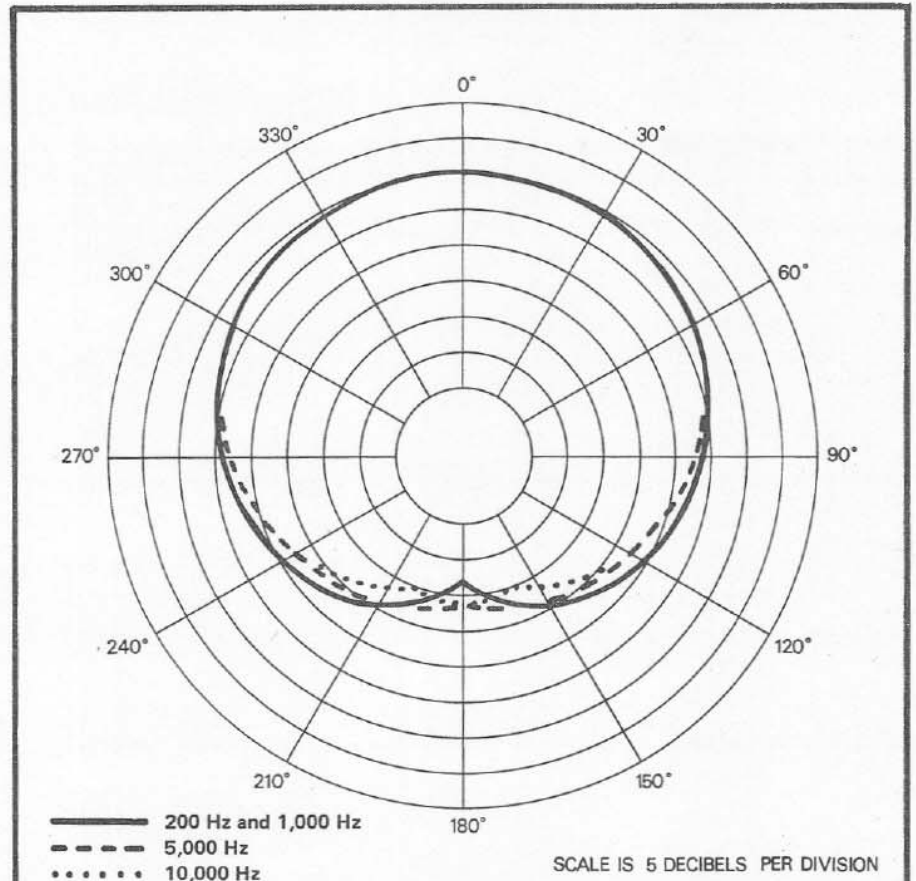


FIGURE 4 – Polar Response

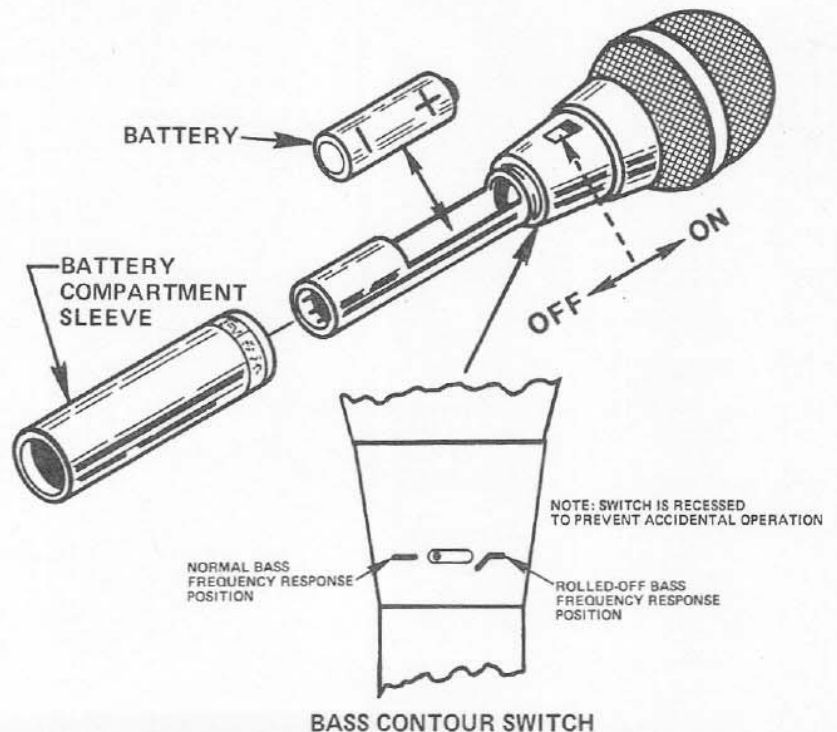


FIGURE 5 – Battery Replacement, Battery On/Off Switch, & Bass Contour Switch



## USING THE VARIABLE LOW-FREQUENCY RESPONSE (PROXIMITY EFFECT)

The PL77AA's low-frequency response varies with the distance from the sound source to the microphone as shown in Figure 3. Maximum bass response is produced in close-up use with the microphone 1/4-inch from the sound source. Minimum bass response is experienced at distances greater than 24 inches. The solid curves in Figure 3 show the response variation with distance with the bass contour switch in the normal ( - ) position. The dashed curves show the variation with the contour switch in the roll-off ( / ) position.

Useful special effects can be created by an imaginative application of the PL77AA's proximity effect:

1. By working closer to the microphone, the human voice will sound more robust, although intelligibility may be adversely affected.
2. Working close to the PL77AA provides a reduced tendency to PA system feedback, over and above that provided by the cardioid directional characteristic alone. When close-talked, the substantial bass boost provides an increase in overall microphone output level. The mixer gain may be proportionately reduced, resulting in a reduction of the system's sensitivity to feedback caused by sound entering the microphone from the distant loudspeakers.
3. For musical instrument pickup, the variable bass response can be utilized to achieve a "clean" bass pickup at a distance of 24 inches or more. By moving the PL77AA to a few inches from the instrument, bass will be increased.

Caution note: with the sound source (lips) closer than 2 inches, bass response is increased dramatically (as shown in Figure 3). If too much signal is generated at the microphone, overloading in the amplifier input circuits may occur, causing severe distortion.

## MAINTENANCE INSTRUCTIONS

You have purchased one of the finest electret condenser microphones available. A little care will allow you continued use of this precision instrument for many years. Your electret condenser microphone should not be left in the open sun or other hot environments where temperatures may approach or exceed 54.4° C (130° F) for any period of time. Following this suggestion will prolong the life of the generating element.

If you feel your unit is malfunctioning, have it examined and repaired only by an Electro-Voice authorized repair service station.

## ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The microphone shall be a Single-D cardioid electret condenser type with frequency response of 50 to 20,000 Hz.

The microphone shall have a 150-ohm balanced output, with an output level of -50 dB with phantom power supply or 4.5-volt battery and -54 dB with a 1.5-volt battery (0 dB = 1 mW/10 dynes/cm<sup>2</sup>). The EIA sensitivity rating shall be -144 dB with phantom powering or 4.5-volt battery and -148 dB with a 1.5-volt battery. Dynamic range shall be 100 dB (phantom power or 4.5-volt battery) or 94 dB (1.5-volt battery), with an equivalent noise level less than 30 dB SPL, A weighted. The microphone shall have an electret condenser generating element whose output shall not be appreciably affected by temperature extremes from -17.8° C (0° F) to 54.4° C (130° F) and/or humidity extremes. Powering is to be by internal 4.5- or 1.5-volt battery or external 24-to-48-volts phantom supply. Recessed battery on/off and bass contour switches shall be provided. A 4.6 m (15 ft), two-conductor shielded, brown, rubber-jacketed cable with Switchcraft A3F connector installed at the microphone end shall be provided.

The case shall be zinc diecast with an aluminum battery compartment sleeve. Grille screen shall be Memraflex. The

finish will be silver tone beige paint. Dimensions shall be 191 mm (7.5 in) long, not including cable connector, with shank diameter of 25.4 mm (1.0 in) and a maximum diameter of 50.8 mm (2.0 in). Net weight (including battery, but less cable) shall be 343 grams (12 oz). The Electro-Voice Model 301B stand adapter shall be furnished.

The Electro-Voice Model PL77AA is specified.

**WARRANTY (Limited) —**  
Electro-Voice Professional Broadcast, Recording and Sound Reinforcement Microphones are guaranteed unconditionally 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 materials. (Any active electronics incorporated in a microphone are guaranteed for three years from date of original purchase 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 cover finish, appearance items, cables, cable connectors, or switches. Defect guarantee does not cover malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

For repair information and service locations, please write: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (Phone 616/695-6831) or 8234 Doe Avenue, Visalia, CA 93277 (209/625-1330, -1).

Electro-Voice also maintains complete facilities for non-warranty service of E-V products.

Specifications subject to change without notice.

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