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Model BETA 87A User's Guide

BETA 87A
SUPERCARDIOID CONDENSER MICROPHONE

The Shure Model BETA 87A is a premium quality supercardioid hand-held electret condenser vocal microphone with exceptionally smooth frequency response and high sound pressure level (SPL) capability. Used for professional sound reinforcement, broadcasting, and studio recording applications, the BETA 87A combines superb performance with the ruggedness needed for touring and field production.

The BETA 87A features a controlled low-frequency roll-off that compensates for proximity effect and prevents the "boomy" sound often associated with close pick-up. The characteristic Shure presence rise brightens the upper midrange. The tight supercardioid pattern, with null points at approximately 125°, provides maximum isolation from other vocalists or instruments while offering minimal off-axis coloration. The BETA 87A operates on phantom power.

Features:

- *Smooth frequency response with gradual presence rise*
- *Highly consistent supercardioid polar pattern provides superior gain-before-feedback.*
- *Electronic low-frequency roll-off compensates for proximity effect*
- *Wide dynamic range (117 dB) and low distortion characteristics*
- *Very low susceptibility to RFI and electromagnetic hum*
- *Advanced cartridge shock-mount system absorbs mechanical shocks and reduces handling noise*
- *Built-in pop filter reduces undesirable wind and breath sounds*
- *Reliability for years of trouble-free performance*

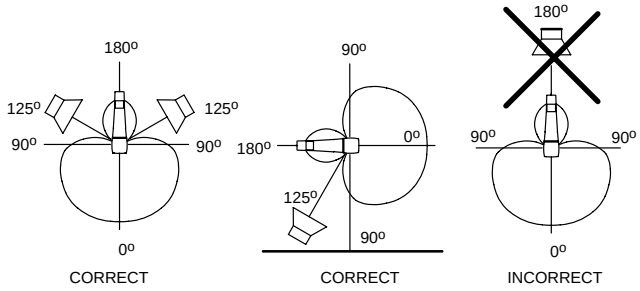
APPLICATION AND PLACEMENT

Some of the most common applications and placement techniques are listed in the following table. Keep in mind that microphone technique is largely a matter of personal taste—there is no one "correct" microphone position.

SUGGESTED MICROPHONE PLACEMENT	TONE QUALITY
Lips less than 6 inches (15 cm) away or touching the windscreen, on axis to microphone.	Robust sound, emphasized bass, maximum isolation from other sources.
6 inches to 2 feet (15 to 60 cm) away from mouth, just above nose height.	Natural sound, reduced bass.
8 inches to 2 feet (20 to 60 cm) away from mouth, slightly off to one side.	Natural sound, reduced bass and minimal "s" sounds.
3 to 6 feet (90 cm to 1.8 m) away.	Thinner, distant sound; noticeable levels of ambient noise.

General Rules for Microphone Use

1. Aim the microphone toward the desired sound source and at a 125° angle away from unwanted sources. Don't place unwanted sound sources directly to the rear of the microphone since supercardioid microphones, such as the BETA 87A, have a narrow pick up range at about 180°. Refer to Figure 1.
2. Place the microphone as close as practical to the desired sound source. Refer to the table above.
3. Use only one microphone for each sound source.
4. Keep the distance between microphones at least three times the distance from each source to its microphone.
5. Place microphones as far as possible from reflective surfaces.
6. Work close to the microphone for extra bass response.
7. Use the fewest number of microphones as is practical.
8. Add a windscreen when using the microphone outdoors.
9. Avoid excessive handling to minimize pick up of mechanical noise and vibration.
10. Do not cover any part of the grille with your hand.



POSITIONING UNWANTED SOUND SOURCES
FIGURE 1

27A2965 (RF)

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OPERATION

Power

The BETA 87A requires phantom power. This may be supplied to the microphone from an external power supply (such as the Shure model PS1A) or directly from preamplifiers, mixers, or consoles with built-in phantom power. Suitable sources should provide 11 to 52 Vdc phantom voltage.

Proximity Effect

Unidirectional microphones such as the BETA 87A progressively boost bass frequencies by 10 to 15 dB at 100 Hz when the microphone is at a distance of about 6 mm (1/4 in.) from the sound source. This phenomenon, known as proximity effect, can be used to create a warmer, more powerful sound. To prevent explosive low frequency sound during close-up use, the BETA 87A bass response gradually rolls off. This provides greater control and helps the user take advantage of proximity effect.

Wind Noise

The BETA 87A has an integral wind and pop filter which provides excellent protection against most wind and breath noise. Under adverse conditions, such as high winds or close proximity to a “problem” vocalist, the optional foam windscreen can be used.

Impedance

A minimum load impedance of 800 ohms should be used for maximum signal handling and minimum distortion. The load may be as low as 150 ohms, but a reduction in output signal strength and output clipping level will result.

SPECIFICATIONS

Cartridge Type
Condenser (electret bias)

Frequency Response
50 to 20,000 Hz (see Figure 2)

Polar Pattern
Supercardioid (see Figure 3)

Output Impedance
Rated at 150 ohms (100 ohms actual ±20%)
Recommended minimum load impedance: 800 ohms

Sensitivity (at 1,000 Hz)
Open Circuit Voltage . . . . . –54 dBV/Pa (2 mV)
(1 Pa = 94 dB SPL)

Clipping Level (at 1,000 Hz)
1000 ohm Load . . . . . –6 dBV (0.5 V)

Maximum SPL (at 1,000 Hz)
142 dB (0.25% THD, 1000 ohm load)

Self-Noise (equivalent sound pressure level; measured with true rms voltmeter)
25 dB typical, A-weighted
27 dB typical, weighted per DIN 45 405

Dynamic Range
117 dB (maximum SPL to A-weighted noise level)

Signal-to-Noise Ratio
69 dB at 94 dB SPL (IEC 651)*

Polarity
Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3

Power
Phantom Supply Requirement . . . . . 11 to 52 Vdc, positive at both pins 2 and 3
Current Drain . . . . . 1.0 to 1.2 mA

Connector
Three–pin (XLR) professional audio

Case
Aluminum construction with blue metallic finish, and hardened steel grille with nickel satin chrome plating

Dimensions
See Figure 4

Net Weight
200 grams (7 oz)

*S/N ratio is difference between 94 dB SPL and equivalent SPL of self–noise A-weighted.

CERTIFICATION

Conforms to European Union directives, eligible to bear CE marking; meets European Union EMC Immunity Requirements (EN 50 082–1, 1992).

FURNISHED ACCESSORIES

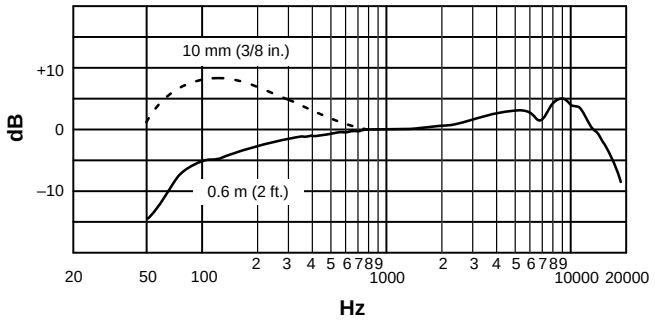
Swivel Adapter A25C
Carrying/Storage Bag 26A13

OPTIONAL ACCESSORIES

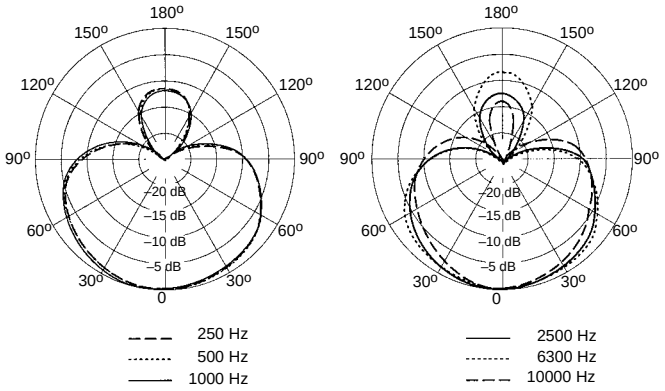
Phantom Power Supply PS1A
Isolation Mount A53M, A53HM
Windscreen A85WS
Cable (7.6 m—25 ft) C25F

REPLACEMENT PARTS

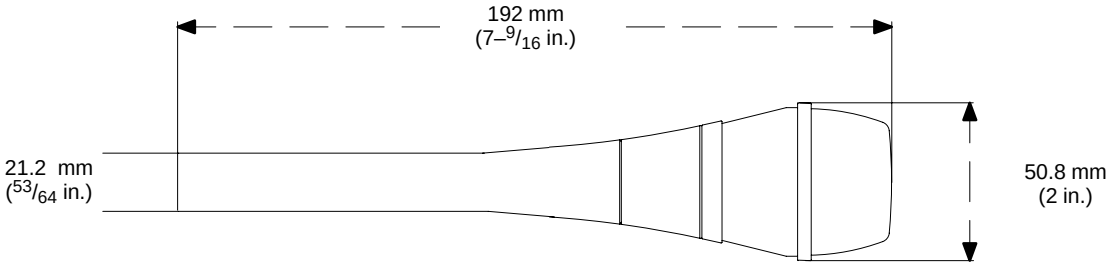
Grille RK312
Cartridge R193
Replacement Amplifier Assembly RK356



TYPICAL FREQUENCY RESPONSE
RÉPONSE EN FRÉQUENCE TYPIQUE
TYPISCHER FREQUENZGANG
RESPUESTA DE FRECUENCIA TIPICA
RISPOSTA IN FREQUENZA TIPICA
FIGURE 2 • ABBILDUNG 2 • FIGURA 2



TYPICAL POLAR PATTERN
COURBE DE DIRECTIVITÉ TYPIQUE
TYPISCHE RICHTCHARAKTERISTIK
PATRON POLAR TIPICO
DIAGRAMMA POLARE TIPICO
FIGURE 3 • ABBILDUNG 3 • FIGURA 3



OVERALL DIMENSIONS
DIMENSIONS HORS TOUT
GESAMTABMESSUNGEN
DIMENSIONES GENERALES
DIMENSIONI COMPLESSIVE
FIGURE 4 • ABBILDUNG 4 • FIGURA 4