ER-7C
SERIES B
CLINICAL PROBE
MICROPHONE SYSTEM

ETYMOTIC RESEARCH INC.

ER-7C Series B Microphone System

- Probe microphone for real ear measurement
- Equalized flat frequency response to 10 kHz
- Electrostatic-discharge protection
- Accurate measurements in all ear canals
- Touch-proof connectors
- Radio-frequency interference (RFI) rejection
- Battery operation prevents ground loop problems
- Convenient built-in 1 kHz calibrator:
  94 dB SPL = 94 dB uV RMS

SYSTEM INCLUDES

- Microphone and cable assembly
- Preamplifier
- 20 probe tubes
- Velcro headband
- Earhook
- Shirt clip
- Carrying case

SPECIFICATIONS

The ER-7C Series B probe microphone has an equalized flat frequency response from a small-diameter .95 mm O.D. probe tube. The equalization network is contained in an accompanying preamplifier and is individually adjusted for each microphone. A built-in acoustic calibrator provides a tone of 94 dB SPL at 1 kHz. The preamplifier is battery operated (9-volt alkaline battery) which prevents ground loop problems when the probe system is connected to other equipment. When the green test indicator does not illuminate during calibration operation, replace the battery.

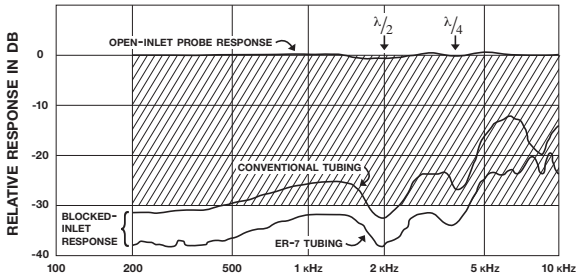
Calibrator built into preamplifier: 94 dB SPL@ 1 kHz
Probe Tube: .95 mm OD x .58 mm ID x 76 mm long (approx. 3.0") medical grade silicone rubber
Sensitivity: 50 mV/Pascal (-46 dB re 1 V/u Bar): 0 dB SPL = 0 dB uV
Limits: ± 1 dB at 1 kHz; ± 2 dB between 250 and 10 kHz
Output Impedance: 235 Ohms, typical
Undistorted Output: 126 dB SPL (2 Volts) min., 5 mA min. in "0 dB" position
(140 dB SPL min. in "-20 dB" position)
Noise Level: 55 dB SPL equivalent 20 Hz to 20 kHz bandwidth, typical
45 dB SPL equivalent 20 Hz to 5 kHz bandwidth, typical
Acoustic Polarity: Positive acoustic pressure gives positive voltage
Temperature: 0-50˚ C
Humidity: 0-95% relative humidity, non-condensing
Microphone Cable: Replaceable, 2 m (78") two-conductor miniature, with shield
Battery Life: Approx. 200 hours

REPLACEMENT PARTS

ER7-14C
probe tubes 20/pkg

ER7-01
2 m cable assembly

High Attenuation Probe Tubing



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INSTRUCTIONS FOR USE

1. Microphone calibration

To check microphone calibration, insert the end of the probe tube 10-20 mm into the calibration source outlet in the top right corner of the front panel on the preamplifier box. A 94-dB SPL tone at 1 kHz will be generated when the "ON-OFF" switch is placed in the "BAT TEST & CAL TONE" position. This output may be used as a level calibration on accompanying test equipment or, with an AC voltmeter connected, as a check on the probe microphone itself. The preamplifier output in the "0 dB" switch position should be 50 mV RMS nominal. A voltage between 40 and 63 mV RMS would be acceptable given the $\pm$ 1 dB tolerance on the probe microphone calibration and the $\pm$ 1 dB tolerance on the calibration tone SPL. A change of one or two mV from a fresh battery to an old battery is normal.

- The calibration may also be checked using a sound level calibrator and appropriate adapter (if needed).
- Etymotic recommends annual factory calibration of the built-in calibrator, or after the system has been subject to shock or is suspected to have been damaged.

Fig.1a Probe placement in ear with headband (option 1)

Fig.1b Probe placement in ear with headband (option 2)

2. Probe placement suggestions

There are two methods of attaching the probe. 1) Place the headband around the head and attach the microphone via Velcro (see Fig.1a & b). 2) Place the hook over the ear and attach the microphone via Velcro (see Fig. 2). The location of the probe tube in the ear canal can affect the measurement. If the ear canal is open, the probe tube should be at least 15 mm but not over 20 mm from the entrance of the canal to avoid causing discomfort. A slight tickling sensation is normal when the tube is placed deep in the ear canal.

For closed-canal measurements (i.e., with an earmold in place) be sure the open end of the probe tube is greater than 4 mm past the opening of the earmold tubing (toward the eardrum). This avoids false readings due to proximity effects. The most accurate way to make measurements with a probe tube in an earmold is to drill an extra vent hole (1 mm dia.) that can be plugged after the response is measured. Inserting the probe tube between the canal wall and earmold runs the risk of breaking the earmold seal (slit leak) which will affect measurements below 1kHz. The primary vent hole may be used as the entry point for the probe tube, but the resulting partial or total occlusion will change the vent response below 1 kHz.

- Probe tubes are single-use only.

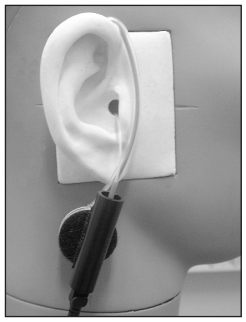

Fig.2 Probe placement in ear with earhook.

3. Replacing probe tubes

Replacement tubes may be purchased from Etymotic Research. The total length of the silicone rubber probe tube is 76 mm (3"). If the length and/or diameter are changed, the microphone response will be altered. New probe tubes must be seated fully on the microphone. To avoid risk to the eardrum, and to ensure that operating specifications are met, use only the soft silicone rubber probe tips supplied by Etymotic Research.

CAUTION: Do not use stiff tubing for a probe tube when using in real ears.

WARRANTY

Etymotic Research Inc. warrants each clinical probe microphone system it manufactures to be free from defects in material and workmanship for a period of one year from the date of sale to the original purchaser. Etymotic Research's obligation under this warranty is limited, at its option, to replace the product without charge to the original purchaser, repair the part, or to credit the original purchaser with the purchase price of the returned defective part. For a part to be covered by the warranty it must be returned to Etymotic Research, postage prepaid, within the warranty period. The part must not show evidence of misuse, neglect, incorrect wiring by others, or improper installation.

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