

BW-1789 APPLICATION NOTES

The purpose of this bulletin is to discuss some of the critical areas which require special attention when applying the BW-1789 microphone.

The BW-1789 has been designed as a close-talking, noise cancelling microphone for use in such applications as boom-mounted headset microphones and hand-held microphones. By "close-talking" it is meant that the unit is positioned close to the lips of the user. For this reason, it is extremely important that the microphone be protected from foreign material entering its sound ports. Failure to provide proper protection can result in poor performance of the microphone.

The frequency response (shown in Figure 1) is determined by the sound pressure difference between the front and rear ports through which access is provided to both sides of the diaphragm. The cancelling feature is based on the smaller pressure difference between the ports when exposed to sound generated at a much greater distance (far/field) than the gradient resulting from a close-talking sound source (near/field).

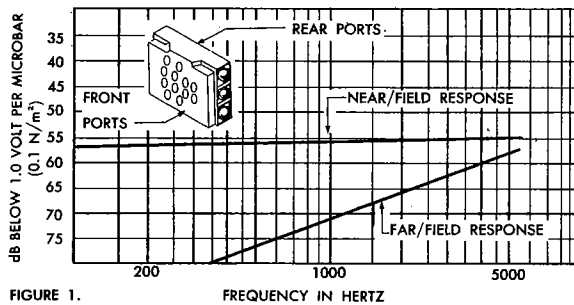


FIGURE 1. FREQUENCY IN HERTZ

One way to measure the near/field response characteristic of this device is to couple the microphone's front port to a high level sound source while allowing the rear port to be opened to the low level ambient field. This condition stimulates the close-talking or near/field situation.

An alternate test method is to couple the rear port to a cavity (.34 cc or greater) and expose the entire microphone to a sound field.

The far/field response characteristic is measured in an anechoic room. Both sound ports are open, and the microphone orientation is adjusted until the maximum response is obtained. This condition simulates a distant noise source pointing in the direction of the microphone's maximum response (the worst case) and generating a noise level at the microphone equal to that of the close-talking sound source.

It is important to note that the above discussion does not concern itself with packaging of the microphone. In any practical application there will be a need to mount the microphone in a housing that provides the necessary protection for the microphone and probably increases the overall size.

As a first estimate of the significance of the housing size to the performance of the BW-1789, two theoretical examples are presented in Figure 2.

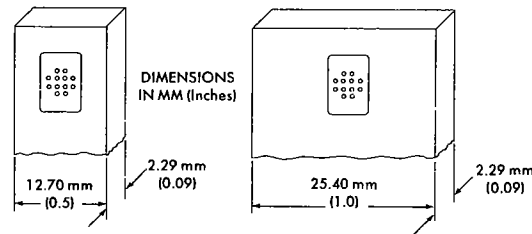


FIGURE 2, EXAMPLE A

FIGURE 2, EXAMPLE B

The near/field response is unchanged by the increase in housing size. Only the far/field response is changed. The primary effect is an increase of sensitivity, thereby decreasing the noise cancelling capability of the microphone/housing system. The calculated typical 1K Hz sensitivity of the BW-1789 in example A is 67 dB re 1 Volt per microbar, and in example B the sensitivity is 62 dB re 1 Volt per microbar.

Other applications exist which do not take full advantage of the BW-1789 characteristics. It is suggested that the factory be consulted for application assistance when required.