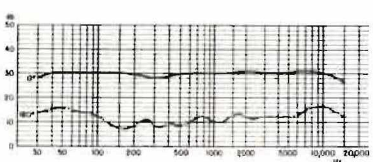
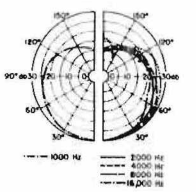
professional two-way cardioid dynamic microphones

D-202E





DESCRIPTION

The D-202E is the original cardioid dynamic microphone based on the two-way concept, described on the opposite page. Its frequency response is virtually flat and the 90° off-axis response approximately 4-6 dB lower in output, is parallel to the on-axis response, resulting in superb linear acceptance. The front-to-back discrimination is 20 dB over the entire range and offers maximum feedback cancellation. The unit is provided with two-step low frequency attenuation (—7 & —20 dB at 50 Hz). The D-202E is equipped with AKG's unique sintered bronze cap which functions as a windscreen and pop filter, is waterproof and protects the microphone system from iron particles and dust.

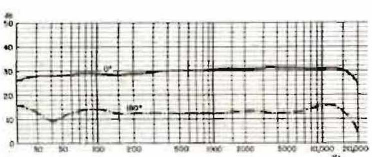
SPECIFICATIONS

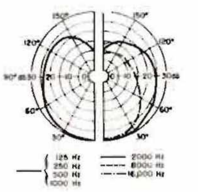
Sensitivity: —53 dB (re 1 mw/10 dynes/cm^2)
Impedance: 200 ohms
Max. Sound Pressure level: 0.5% = 124 dB SPL (300 μbar)
Dimension: $8^{1}/_{2}$" long, $2^{1}/_{2}$" dia. at largest point
Weight: 10 oz.

ACCESSORIES

SA-16/1 Stand adapter
W-7 Windscreen
W-9A Windscreen, rear
H-70/SA-70/9 Suspension
MSH-58 Flexible shaft
AKG Stands

D-224E





DESCRIPTION

The D-224E is the studio version of the two-way cardioid dynamic microphones. In addition to all the features inherent in the two-way technique, the D-224E's noteworthy characteristic is its exceptionally wide and smooth frequency response, normally expected only from condenser microphones. Its linear acceptance, up to 90° off-axis, is of particular importance in recording applications since signals reaching the microphone off-axis will not be discriminated against. The low frequency response may be attenuated by an electrical, two position (—7 and —12 dB at 50 Hz) bass roll-off switch.

SPECIFICATIONS

Sensitivity: —55 dB (re 1 mw/10 dynes/cm^2)
Impedance: 200 ohms
Max. Sound Pressure level: 0.5% = 124 dB SPL (300 μbar)
Dimension: $7^{3}/_{4}$" lg, 15/16" dia.
Weight: $9^{1}/_{2}$ oz.

ACCESSORIES

SA-18/3 Stand adapter
W-2 Windscreen
H-70/SA-70/3 Suspension
MSH-58E Flexible Shaft
AKG Stands

two-way concept

This AKG series of cardioid dynamic microphones is based on a new revolutionary concept — the two-way microphone system*, representing the most significant advancement in microphone development and audio engineering.

The communication field is growing at a rapid pace. Primarily the electro-acoustical engineer is concerned with transmitting a message, in our case a sound event, without deterioration and as faithfully as possible, including all its tangible and irrational components.

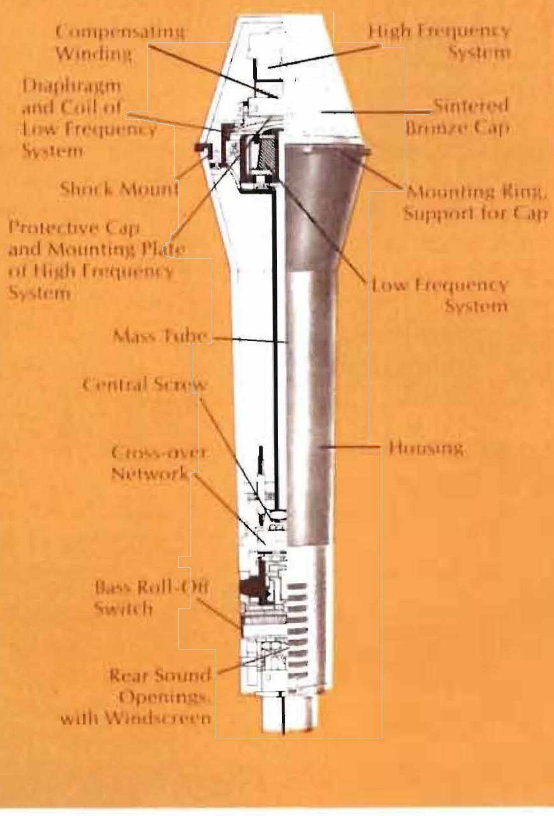
Usually acoustic message transmission begins with a microphone and ends with a loudspeaker. It is interesting to note that development engineers in the U.S. have concentrated primarily on loudspeaker improvement, whereas the microphone received greater attention in Europe. However, the first basic work on dynamic directional microphones was conducted in the U.S. and reported in 1933.

Because of its convenient and reliable operating characteristics, the dynamic microphone has found widespread applications in studio use – particularly in field work and public address installations. Compared to the condenser microphone its disadvantages have until now been considered to include its narrower frequency range, some irregularity in frequency response, lower sensitivity, susceptibility to magnetic stray fields and – especially in the case of directional microphones – directional characteristics that were not completely satisfactory and rather frequency-dependent.

Assisted by computer research findings it was found that it is not possible, even with complex acoustic networks, to significantly and concurrently increase frequency range, frequency response and uniform front-to-back discrimination of a cardioid dynamic microphone.

To aid in this research project, AKG's Research and Engineering Department developed an Analog-Computor (Simulator), unique in this field. The Simulator is capable of electronically imitating all acoustical-physical relations of electro-acoustical transducers.

A two-way cardioid dynamic microphone system evolved from this research. In a two-way microphone system, the total response range has been subdivided between a high frequency and a low frequency transducer, each of which is optimally adjusted to its specific range (similar to a two-way speaker system). The two systems are connected by means of a cross-over network with the cross-over frequency at 500 Hz.



This arrangement is depicted in the cross-section drawing shown at bottom of left column. The high frequency system is mounted on the protective cap of the low frequency system. The low frequency system is connected to a mass tube with apertures at the rear of the microphone. For maximum reduction of wind sensitivity at the rear sound openings, the aperture of the mass tube does not connect directly with the open air but instead leads to a chamber which communicates with the sound field via slotted openings covered with damping material.

The high frequency system is shock-mounted to reduce handling sensitivity and is provided with a compensating winding to eliminate the effects of magnetic stray fields.

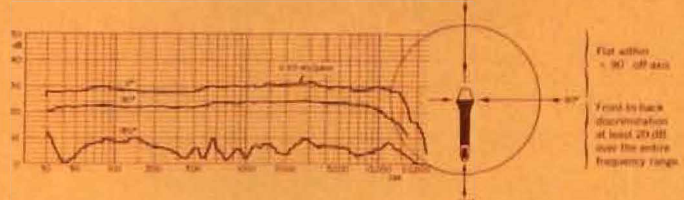
The cross-over network is housed in the lower portion of the microphone. In the case of the D-202E and D-224, the output circuit of the microphone contains an electrical bass attenuator to permit a reduction in low frequencies.

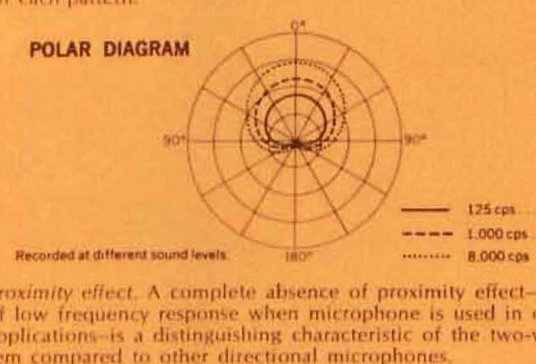
This unique arrangement achieves a number of previously unobtainable performance characteristics for cardioid dynamic microphones:

Flat frequency response over the entire audible range. The low as well as the high frequency system is optimally adjusted to its specific frequency range and the cross-over point, at 500 Hz, is unnoticeable.

Linear off-axis response. Sound reaching the microphone 90° off-axis is reproduced naturally. No frequency discriminating characteristics, which commonly arise from dynamic microphones, are audible.

Uniform front-to-back discrimination. The two-way system maintains a front-to-back discrimination of at least 20 dB over its entire range, even in the critical low frequency and upper mid-range area. The polar pattern shows the directional characteristics of the microphone at 125 Hz, 1,000 Hz and 8,000 Hz as recorded with a polaroscope. For better graphic clarity, a different sound level was used for each pattern.





Proximity effect. A complete absence of proximity effect–the rise of low frequency response when microphone is used in close-up applications–is a distinguishing characteristic of the two-way system compared to other directional microphones.

These features offer several advantages in practical applications: The flat frequency response allows the most natural and faithful pick-up of the sound event for transmission during a recording application. In public address installations it permits control of feedback at any frequency.

The linear 90° off-axis response is of particular importance in recording applications whenever a number of microphones are used, since frequencies reaching the microphone ±90° off-axis (leakage from left or right of microphone, other instruments, etc.) are reproduced faithfully without discriminating characteristics. The same also applies to public address installations where a speaker may move to the left or right (off-axis) of the microphone.

Uniform front-to-back discrimination is of prime importance in public address installations since it virtually eliminates feedback and offers almost complete freedom in microphone and speaker placement. For instance, it was found that a gain of approximately 6 db could be achieved in a majority of sound systems. The exceptional front-to-back discrimination of this exclusive design offers better than average separation in recording applications.

*U.S. Patent #3,204,031