Western Electric

639A AND 639B
CARDIOID DIRECTIONAL MICROPHONES

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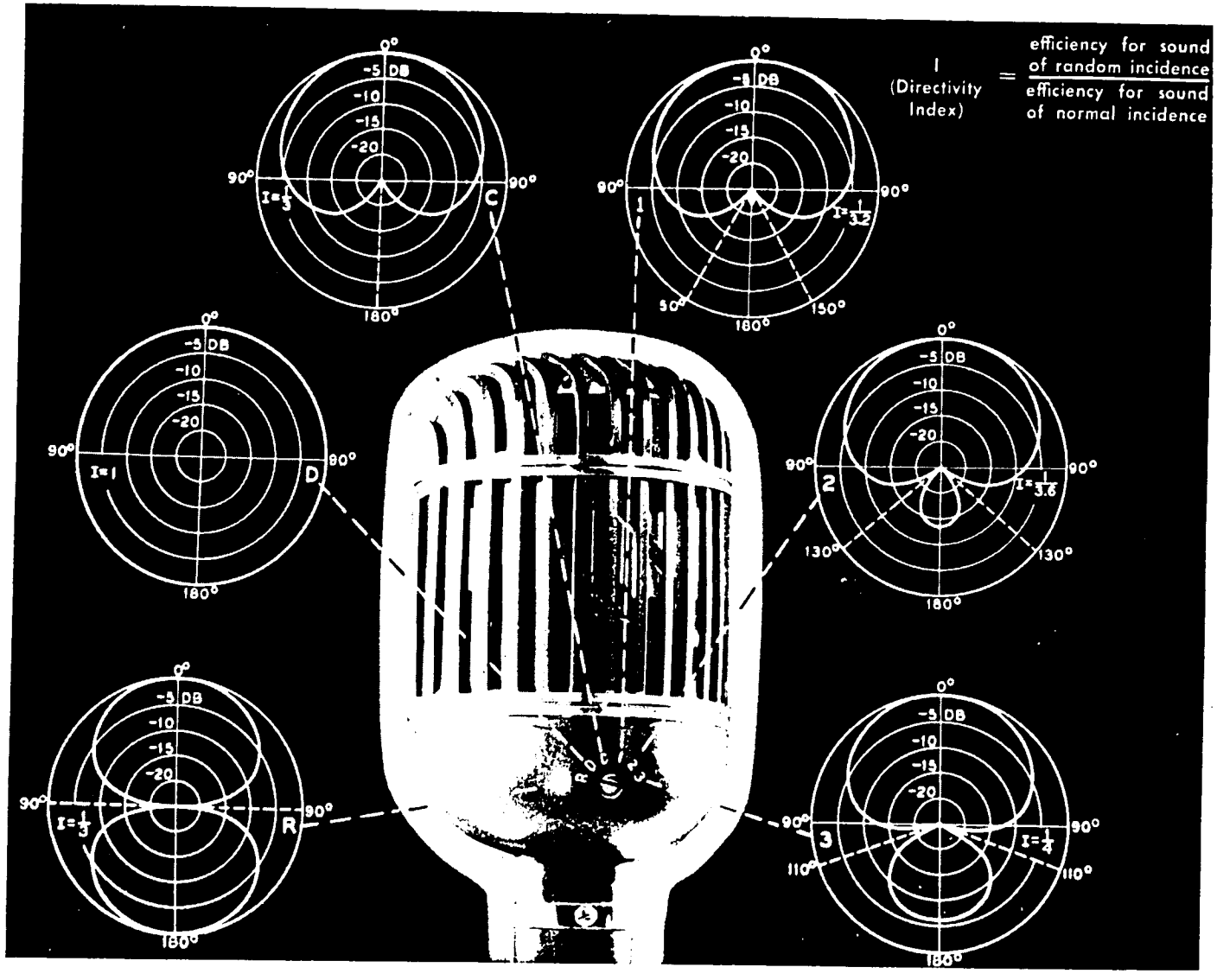

Figure 1—Typical Directional Characteristics

639A AND 639B
CARDIOID DIRECTIONAL MICROPHONES

The 639-type Microphone is a general purpose magnetic microphone with directional characteristics which are selectable by means of a switch. The three basic patterns available are: non-directional, figure 8 and cardioid.

Typical Characteristics

Sensitivity

The open circuit output level is 84 db below 1 volt/dyne/cm^2, 64 db below 1 volt/10 dynes/cm^2.

Power Output Level

—56 dbm for a sound pressure of 10 dynes per square centimeter, or —76 dbm for 1 dyne per square centimeter when the microphone is terminated with a resistance equal to its internal impedance.

Experience indicates that the sound pressure produced at conversational level three feet from a microphone approaches 10 dynes per square centimeter.

Frequency Range

Substantially uniform from 40 to 10,000 cycles per second. See Figure 2.

Signal-to-Noise Ratio

The signal for 10 dynes per square centimeter sound pressure is 78 db above the thermal agitation noise generated within the microphone, and 58 db above for 1 dyne per square centimeter.

Directivity

639A

Three patterns, C, D, and R, selectable through a three position screwdriver operated switch. Refer to Figure 1. At the angle of minimum response the average discrimination with respect to 0° response is 20 db over the range from 40 to 10,000 cycles per second.

639B

Six patterns; R, D, C, 1, 2, and 3, selectable through a six position screwdriver operated switch. Refer to Figure 1. At the angle of minimum response the average discrimination with respect to 0° response is 20 db over the range from 40 to 10,000 cycles per second.

Impedance

Average value is 40 ohms. Intended for use with equipment having a rated source impedance of 25 to 50 ohms.

Dimensions

7-1/2" high, 4-7/16" long, 3-7/16" wide.

Weight

3-1/4 pounds.

Mounting

A list of mounting facilities is given in the section "Accessories."

Description and Operation

The 639-type Microphone combines a dynamic moving coil pressure element and a ribbon velocity actuated element enclosed in a housing which serves as a protective guard and as a wind screen. The outputs of these two elements are used independently, or are combined in various proportions by means of a selector switch attached to the microphone, to yield several directional patterns. The 639A and the 639B are similar with the exception that the former has three selectable directional patterns, and the latter has six selectable directional patterns.

The moving coil pressure element when used alone has non-directional characteristics. The ribbon element when used alone has a figure 8 pattern. The combination of the two elements results in a phasing of the output voltage causing the microphone to have a cardioid directional pattern. The three additional positions on the 639B Microphone are variations of the cardioid pattern, with increasing pickup from the rear as the switch is turned from position 1 to position 3. These patterns are shown in Figure 1.

The 639-type Microphone is an excellent general purpose microphone for studio use in broadcasting and recording, and for remote broadcast pickups where it can be given reasonable care in handling. In addition, the several directional patterns will enhance operation of the microphone where audience or background noise must be controlled, and in public address pickups where acoustical feedback would ordinarily take place before a satisfactory reinforcement level could be reached. (Figure 1 shows the angle, in respect to 0°, of minimum pickup, and is useful for orienting the microphone to discriminate against unwanted acoustical feedback and reverberation.) It is particularly suitable for multi-microphone pickups of a large orchestra group where a sense of realism and an apparent increase of volume level is desired. This is accomplished by utilizing one 639-type Microphone as a non-directional (position D) microphone for general orchestra pickup and several 639-type Microphones (positions R, C, 1, 2 or 3) as accent microphones for soloists and individual groups of the orchestra which the operator may want accentuated.

The general microphone will provide the necessary reverberation which is desirable for realism, and the accent microphones will permit the individual groups to be accented for special musical effects. Skillful operation of the mixing of the various microphones will permit the operator to control, over a considerable range, the liveness of the pickup.

Especially recommended for use with this microphone are the 25-type Speech Input Equipment, the 23-type Speech Input Equipment, the 22-type Portable Speech Input Equipment and the 117A, 120C, 121A, 124D, 124F and H Amplifiers and the 129A Amplifier, all of which are designed to work from 30 ohm input circuits.

Installation

The 639-type Microphone is designed to operate with input equipment having an input impedance of 25 to 50 ohms, either balanced or unbalanced with respect to ground. Use with equipment designed to operate from higher impedances should, for best results, include an input matching transformer such as the Western Electric 172A Repeating Coil, which will match a nominal 30 ohm microphone to a 250 ohm input circuit, with a loss of only 1 db, and will not affect the frequency characteristics of the microphone.

Microphone Connections

Three pins on the microphone accommodate the 442A Jack for external connections. The connections are as follows:

Pins 1 and 3—microphone output
Pin 2 —ground to microphone housing.

When used with 2-conductor cordage, the conductors are connected to pins 1 and 3, and the shield is connected to pin 2. When 3-conductor cordage is used, the third conductor is connected to pin 2 and the shield. Ground connection should not be made to pins 1 or 3 at the microphone, but either conductor may be connected to the shield and ground at the speech input when the input is unbalanced with respect to ground. In any event, the shield should be grounded at the speech input end of the cordage.

Maintenance and Handling Precautions

The microphone should be handled with the care usually accorded similar precision devices. The zipper cover should be left on the microphone at all times when not in use, and when the microphone is being transported it should be carried in a suitable carrying case. It should never be placed on a work bench or other places where there is possibility of iron chips or filings being attracted to the magnets.

Because of the design of the ribbon element, this microphone is much less susceptible to wind noise than usual ribbon microphones and may be used satisfactorily under breezy conditions. However, ribbon microphones should not be subjected to extreme wind conditions, and the 639-type is no exception.

In the event the microphone becomes damaged, or requires repair, it should be returned to the distributor from whom it was purchased.

Accessories

The 639-type Microphone as supplied includes a suede or leatherette protective cover, but does not include any of the accessories listed below. Accessories should be ordered separately if desired.

Cord Assembly

442A Jack

The 442A Jack terminates the microphone cord at the microphone end. A projecting cylindrical plug, which is an integral part of the 639-type Microphone, accommodates the jack.

712A Adapter

This adapter is used in conjunction with the 442A Jack to give greater mounting security. The 712A Adapter is the same as the 708A Adapter (used with the 630A Microphone) except for the addition of a rubber sleeve which increases the mounting stability. Customers who have the 708A Adapter may order the rubber sleeve separately per ES-764300-2.

KS-7133 Cordage

This is 2 or 3 conductor, shielded rubber covered cordage. The 2 conductor cordage is supplied unless otherwise specified. Length as specified.

Mountings

The cord assembly described above is required when the 639-type Microphone is mounted in the 22A or 24A Transmitter Mountings or is suspended by means of the 11A Transmitter Attachment.

713A Adapter

This is a slotted connector which permits the microphone cord to be run outside the stand when the microphone is mounted on the 22A Transmitter Mounting so that it is not necessary to disconnect the cord from the 442A Jack when the cord assembly is removed from the stand.

22A Transmitter Mounting (Floor Stand)

This mounting has a height adjustable from 42-½ to 72 inches. It requires the use of the cord assembly described in the foregoing. The 713A Adapter is required in addition when the cord is to be run outside the stand.

When used with the 639-type Microphone, it is recommended that the weight of the 22A Transmitter Mounting be increased by the use of a six pound pair of iron weights per ES-765305. These weights clamp in the base of the stand and give added stability.

24A Transmitter Mounting

This is a streamlined desk stand and requires the use of the cord assembly described above. The 24A Stand has a cord slot which makes possible the removal of the cord assembly without disconnecting the cord from the 442A Jack.

11A Transmitter Attachment

For suspension mounting. Requires the use of the cord assembly described above.

The 11A Transmitter Attachment may also be used with the 22A and 24A Transmitter Mountings when tilting of the microphone is desired.

172A Repeating Coil

The 172A Repeating Coil is a high quality low level matching transformer with an impedance ratio of 30 to 250 ohms, and is recommended for use between the 639-type Microphone and input circuits which work from a nominal impedance of 250 ohms. It is lightweight and can be attached to the cordage or installed on the associated amplifier.

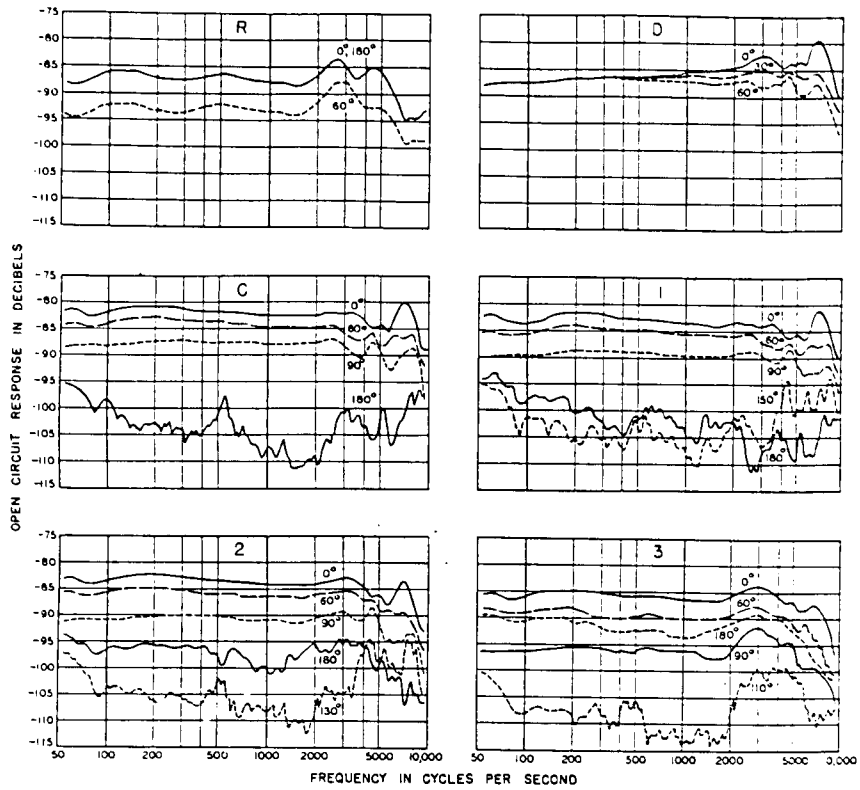

Figure 2—Typical Field Responses

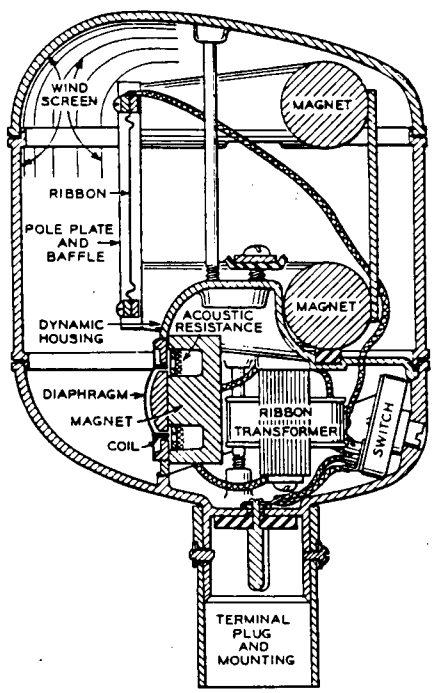

Figure 3—Section View