

## PROFESSIONAL ENTERTAINERS UNIDIRECTIONAL DYNAMIC Dual Impedance

**GENERAL:** The Model 545PE "Unidyne III" is a slender moving-coil microphone, built to provide wide-range reproduction of music and voice and featuring an excellent directional pickup pattern. The unidirectional characteristic of the microphone provides highly satisfactory operation under adverse acoustic conditions. It permits placement of the microphone at a 75% greater distance from the performer than is possible with non-directional (omnidirectional) microphones.

The smooth frequency response and attending faithful reproduction are largely due to a specially designed diaphragm attached to a sensitive coil suspended in a magnetic structure. The microphone is ruggedly built to withstand rough usage and is unaffected by temperature and humidity variations.

The case is modern in design with attractive streamlining and grille treatment. The Model 545PE is small in size and is ideal for installations where it is desired to keep the microphone size to a minimum and still retain maximum operating efficiency.

An adjustable swivel adapter is supplied with the microphone and permits the microphone to be tilted through 90° from vertical to horizontal, making it simple to aim the microphone at a source of sound. Another feature of the swivel is that it permits a "quick-disengage." This allows the microphone to be removed from the swivel adapter for use as a hand microphone during audience-participation shows, interviews, etc.

The 15-foot (4.6m) high-quality, shielded three conductor cable is supplied with a microphone plug equivalent to the Amphenol 91-MC4M plug.

The Model 545PE microphone is supplied with two adapters to adapt the microphone for use with an Amphenol type 91-MC3M plug and Cannon types XL-3-11 or XLR-3-11 plugs. In addition a Hubbel type 7567 twist lock plug is provided for attaching to the amplifier end of the microphone cable if this type of amplifier plug is required.

**APPLICATIONS:** The Model 545PE is ideal for high-quality public address, theatre-stage sound systems and recording applications.

The true unidirectional characteristics of the Model 545PE provide an easy solution to the feedback problem in reverberant locations, facilitates orchestral placement, permits best utilization of space in small studios, and provides practically complete exclusion of unwanted noises.

**INSTALLATION:** The Model 545PE, when used with the swivel adapter, has a standard 5/8"-27 thread and may be mounted on any conventional desk, banquet, or floor stand. Adapter Stand Couplers are available at no charge for 1/2" pipe thread or 5/8"-24 thread. (Write Shure Brothers, Inc.). To avoid A.C. hum induction when long lines are used care should be taken that the cable does not parallel A.C. power lines for long distances.

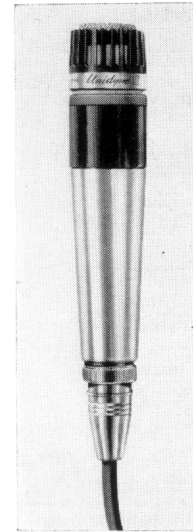
**CONNECTIONS:** The Model 545PE "Unidyne III" Microphone is a dual-impedance microphone. It may be connected directly to a 50-250 ohm line, or high impedance input. Selection of either impedance is accomplished by using the proper connections at the end of the cable. (See Figure A).

The microphone cable plug is equivalent to the Amphenol 91-MC4M plug. The cable shield is connected to the #1 pin and plug shell; the red conductor is connected to the #2 pin; the white conductor is connected to the #3 pin; the black conductor is connected to the #4 pin.

The #1 pin of the microphone receptacle is connected to the ground side of the high impedance winding and, also, is connected to the metal parts of the microphone cartridge. The #2 pin is the "hot" conductor for connection with high impedance amplifiers as shown in Figure A-3. Pins #3 and #4 are the "hot" conductors for balanced line connections to a standard low or medium impedance input amplifier (Figure A-1).

The low impedance connection is recommended where long cable lengths are required or under conditions of severe hum disturbance. The permissible cable length is practically unlimited, since neither response nor level is appreciably affected. For use with high impedance amplifiers, Shure Model A86A Cable-Type Transformer is available for coupling the low impedance line to the amplifier input as shown in Figure A-2. The double winding primary of the Shure Model A86A transformer permits coupling a 50-250 ohm line to the high impedance input.

The high impedance connection in the Model 545PE Microphone may be used with any high gain amplifier with an input impedance of 100,000 ohms or more (See Figure A-3). To connect the amplifier plug to the shielded cable supplied with the microphone, connect the shield lead to the ground terminal of the amplifier plug, and connect the red lead to the "hot" terminal of the amplifier plug.



The maximum recommended length of cable between microphone and amplifier when used in the high impedance position is 25 feet (7.6m). Longer cable may be used with a loss of approximately 2db at 5000 c.p.s. for each additional 25 feet (7.6m) of cable. In using longer cable the 3 conductor shielded cable furnished with the microphone could be replaced with a single conductor shielded cable. When this is done, the shield of the cable must be connected to pin #1 of the microphone plug and the center or "hot" conductor must be connected to pin #2.

The shield, chassis or amplifier ground should be securely connected to a water pipe or similar ground to prevent shock hazard during operation of amplifying system.

When used with amplifiers using the grid leak type of bias at the input tube, it may be desirable to use a .01 mfd. condenser between the microphone and the input grid circuit.

**SPECIAL ADAPTERS:** The adapters supplied with the Model 545PE are wired into the low impedance connection of the microphone. In both the Amphenol 91-MC3M type and the Cannon type adapters, the #1 pin is the shield or ground connection and is connected to the metal parts of the microphone and to the plug shells. Pins #1 and #3 are the "hot" conductors for balanced line connection to a standard low or medium impedance amplifier.

**OPERATION:** No special precaution beyond ordinary care is necessary in the operation of the Model 545PE Microphone. It will operate efficiently and dependably in hot and cold climates. To retain the full strength of the highly efficient permanent magnet and to maintain alignment of the structure, dropping or other severe mechanical shocks should be avoided.

The swivel adapter fits conventional floor stands, desk stands, and the Shure S33 and S33B Desk Stands. The microphone may be easily removed from this adapter for use as a hand microphone.

**ACOUSTIC CONSIDERATIONS:** The front and rear response-frequency characteristic of the Model 545PE is shown in Figure B. The smooth wide-range characteristic is excellent for high-quality reproduction of music and speech.

The polar characteristic resembles a cardioid. But, unlike most directional microphones, this polar characteristic is the same both in the horizontal and vertical planes. There is a wide useful pickup angle at the front of the microphone, while the response at the sides is down 6db from the front response. The rear response is down typically 15db to 20db. The Model 545PE fulfills these requirements over a broad range of frequencies. (See Figure D).

The true unidirectional characteristic of the microphone should not be confused with the relatively slight directional effect at high frequencies which can be produced by baffle effects in the conventional pressure microphone.

The result of this true unidirectional characteristic is elimination of acoustic feedback at volume levels which would cause considerable feedback with conventional semidirectional or omnidirectional microphones. In practically all cases it is possible to increase loudspeaker levels when a Unidyne III is installed. By directing the dead side (rear) of the microphone towards the audience or other source of interfering sound, pickup can be concentrated on the desired source. Reverberation energy pickup is decreased approximately two-thirds. The microphone can be placed close to reflecting surfaces without objectional effects if the rear side of the micro-

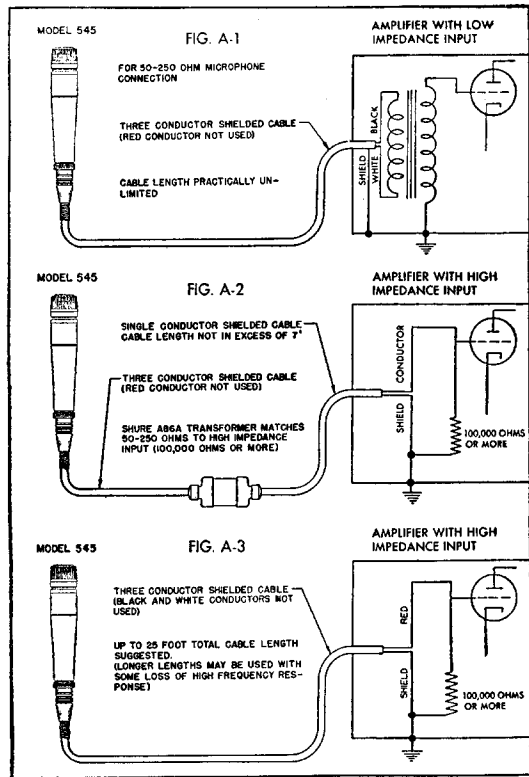


FIGURE A

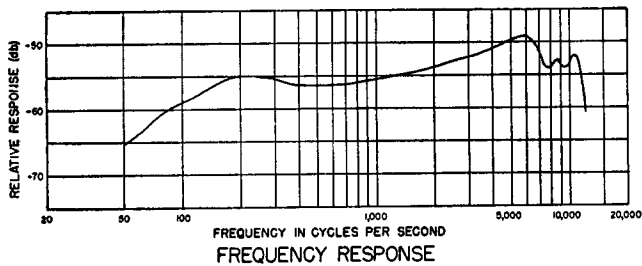


FIGURE B

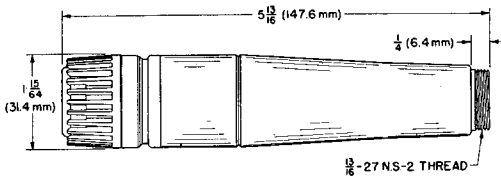


FIGURE C

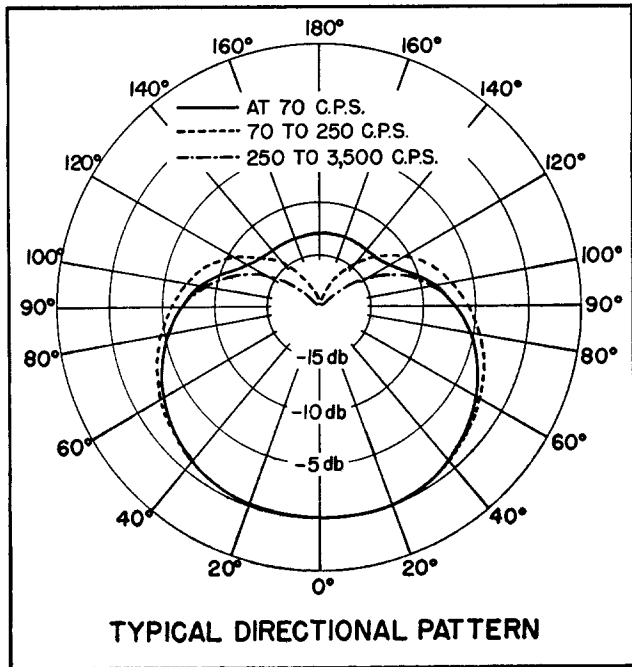


FIGURE D

phone is toward the reflecting surface. This is particularly valuable in small broadcast studios. It is desirable to experiment with microphone placement and orientation in order to secure the greatest benefits from the unidirectional characteristic.

**SPECIFICATIONS**

**1000 c.p.s. Response**

**Model 545PE Low Impedance**

- Open circuit voltage line..... 77db\*
- Loaded with 250 ohm ..... 83db\*
- Power level into 250 ohm..... 57db\*\*
- RETMA Microphone Rating  $G_M$  (Sensitivity)..... 148db\*\*\*

**Model 545PE High Impedance**

- Open circuit voltage level..... 55db\*
- Loaded with 100,000 ohm ..... 58db\*
- RETMA Microphone Rating  $G_M$  (Sensitivity)..... 150db\*\*\*

(\* ) 0db = 1 volt per microbar.  
 (\*\* ) 0db = 1 milliwatt with 10 microbars.  
 (\*\*\*) RETMA Standard SE-105, August 1949.

**Recommended Load Impedance**

- Model 545PE Low Impedance Connection..... 50-250 ohms
- Model 545PE High Impedance Connection... 100,000 ohms or more

MODEL 545PE	
Nt. Wt. Less Cable	0.6 Pound (272.2g)
Cable	15 Foot, (4.6m) 3 Conductor Shielded
Dimensions	See Figure C
Finish	Chrome and Black

**GUARANTEE:** Each microphone is guaranteed to be free from electrical and mechanical defects for a period of one year from date of shipment from factory, provided all instructions are complied with fully. In case of damage, return the microphone to the factory for repairs. Our guarantee is voided if the microphone is subjected to accident or abuse or if the case is opened.

**MODEL 545PE**

**Architect's Specifications**

The microphone shall be a moving coil type microphone with a frequency range of 50 to 12,000 c.p.s. This unit shall have a "cardioid" horizontal polar characteristic. The cancellation at the sides shall be approximately 6db and the cancellation at the rear shall be 15 to 20db. The microphone shall be a dual-impedance microphone having rating impedance of 150 ohms and 40,000 ohms. The microphone rating  $G_M$  (sensitivity) at 1000 c.p.s. shall be within  $\pm 3$ db of the following levels.

- Low impedance ..... 148db
- High impedance ..... 150db

The microphone shall be provided with a swivel adapter adjustable through 90° from vertical to horizontal and a receptacle equivalent to the Amphenol 91-MC4F capable of connecting to a three-conductor shielded cable plug. The microphone swivel adapter will mount on a stand having 3/8"-27 thread. The overall dimension shall be 5 13/16" (147.6mm)  $\pm$  1/64" in length and 1 15/16" (31.4mm)  $\pm$  1/64" in diameter.

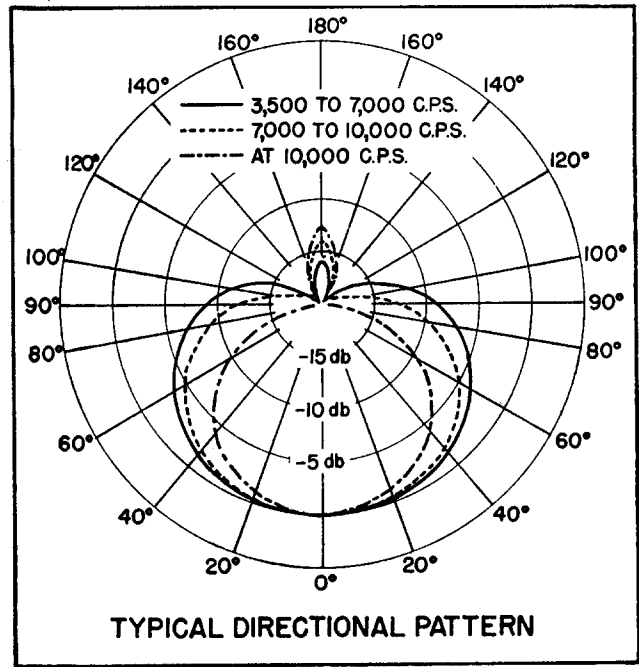


FIGURE D