

DATE: January 1942

SUBJECT: Models 55A, 55B, 55C
 "Unidyne" Dynamic Microphones

55 Series "Unidyne" Microphones
 (Cardioid Uni-directional Moving-Coil Dynamic)

GENERAL : Models 55A, 55B, and 55C are cardioid type unidirectional moving coil dynamic microphones providing wide-range high quality reproduction of sound. The true unidirectional characteristic of the "Unidyne", obtained by the "uniphase" principle provides highly satisfactory operation under adverse acoustic conditions where a conventional microphone would be practically useless. (See "Acoustic Considerations").

The microphone has a specially designed moving system containing a new type moving-coil element, operating in conjunction with a high flux magnet in the magnetic circuit providing high efficiency and smooth peak free response from 40 to 10,000 cycles. The rear response is down approximately 15 db due to the "uniphase" unidirectional acoustic network.

The case is modern in design with attractive streamlining and grille treatment. The head tilts through an angle of 90° to permit aiming at the source of sound for best pickup. A built-in cable connector is provided and a 25 ft. shielded rubber-jacketed cable with microphone plug attached is included.

APPLICATIONS: Models 55A, 55B, and 55C are suitable for high quality public address, broadcasting, recording and similar applications. The true unidirectional characteristic of the "Unidyne" provides an easy solution to the feedback problem in reverberant locations, facilitates orchestral placement, permits best utilization of space in small broadcast studios, and allows practically complete exclusion of unwanted noises. The swivel allows the head to be tilted through an angle of 90° permitting the microphone to be aimed at the source of sound.

The instrument is unusually rugged and is practically immune to the effects of moisture, temperature and mechanical vibration.

INSTALLATION: All microphones have the standard 5/8"-27 thread and may be mounted on any Shure desk, banquet, or floor stand. Shure floor stands are especially recommended because of the effective isolation against floor vibration which they provide. For overhead suspension, an A35B Suspension Adapter may be used.

CONNECTIONS: Model 55A works directly into a 35-50 ohm line while models 55B and 55C include an internal high quality impregnated transformer with special high-permeability core. The three models their out-put impedances, and cable furnished are listed-below.

| Model | Impedance | Cable Furnished |
|-------|----------------|-------------------------|
| 55A | 35-50 ohms | 25 Ft. two-conductor |
| 55B | 200-250 ohms | 25 ft. two-conductor |
| 55C | high impedance | 25 ft. single conductor |

Low Impedance models 55A and 55B are recommended where long cable lengths are required. The permissible line length is practically unlimited since neither the level nor the frequency response is appreciably affected by reasonable lengths of line. As shown in the table below, the cable loss is very small. When long lines are used, care should be taken that the cable does not parallel A.C. power lines for long distances to avoid A.C. hum induction.

| Cable Length | Loss in Level* | |
|--------------|----------------|-----------|
| | Model 55A | Model 55B |
| 25 ft. | 0 db | 0 db |
| 250 ft. | 0.4 db | 0 db |
| 500 ft. | 0.8 db | 0.2 db |
| 1000 ft. | 1.6 db | 0.4 db |
| 2000 ft. | 2.9 db | 0.7 db |

(*Based on 2-conductor #20 equivalent, twisted and shielded)

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Low impedance models 55A and 55B may be fed into a standard low impedance input amplifier (See Fig. A-3) or into an amplifier with high impedance input (Fig. A-2). In the latter case Shure Model A86A Cable-Type Transformer is available for coupling the low impedance line to the amplifier input. The double-winding primary permits coupling either a 35-50 ohm line or 200-250 ohm line to the high impedance input.

High impedance model 55C may be used with any crystal microphone amplifier or other amplifier with an input impedance of 100,000 ohms or more (see Fig. A-1). For best high frequency response, the total cable length should not exceed 25 feet; longer cable lengths may be used with some loss of high frequency response. The additional loss at 5,000 cycles is of the order of 2.5 db for an additional 25 ft. length of cable (50 ft. total) and 6 db for an additional 50 ft. length (75 ft. total).

OPERATION : The microphone should be placed in its operating position before turning up the volume controls of the amplifier. Jarring or excessive moving of the instrument should be avoided while the system is in operation in order to prevent the spring-suspended microphone unit from touching the inside of the case and producing undesirable noises.

No special precautions beyond ordinary care are necessary in the operation of 55 Series Dynamic microphones. They will operate efficiently and dependably under all ordinary conditions 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.

ACOUSTIC CONSIDERATIONS: The expression "cardioid type" response simply means that the horizontal polar characteristic approximates a cardioid. There is a wide, useful pickup angle at the front of the microphone while the response at the sides is down 6 db from the front response. The rear response in practical cardioid type microphones is

down of the order of 15 db from the front side response. The Unidyne fulfills these requirements over a broad range of frequencies. The true unidirectional characteristic of the "Unidyne" should not be confused with the relatively slight directional effect at high frequencies only which can be produced by baffle effects in the conventional pressure microphone.

The result of this unidirectional characteristic is a complete elimination of acoustic feedback at volume levels which would cause considerable feedback with conventional semidirectional microphones. In practically all cases it is possible to increase loudspeaker levels when a Unidyne 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 objectionable effects if the rear side of the microphone 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

Voltage Sensitivity:

Model 55A 62.8 db below 6 milliwatts for 10 bar signal when loaded with 35-50 ohms.

Model 55B 74 db below 1 volt per bar open circuit, or 63.8 db below 6 milliwatts for 10 bar signal when loaded with 200-250 ohms.

Model 55C 55.5 db below 1 volt per bar when loaded with 100,000 ohms or more. This is equivalent to 1.8 millivolts per bar across 100,000 ohms or more.

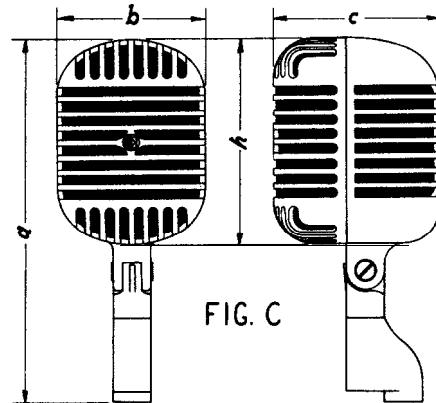
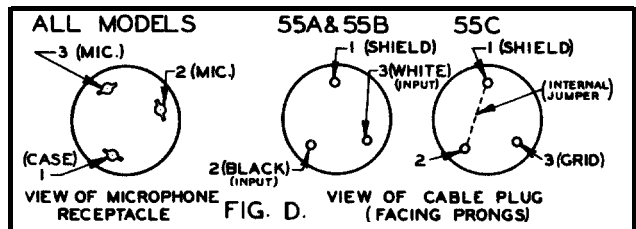
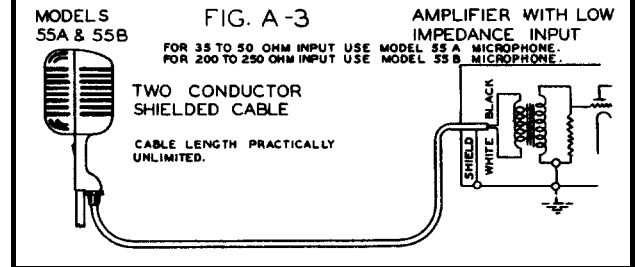
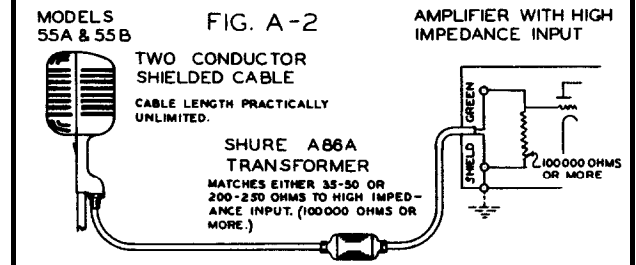
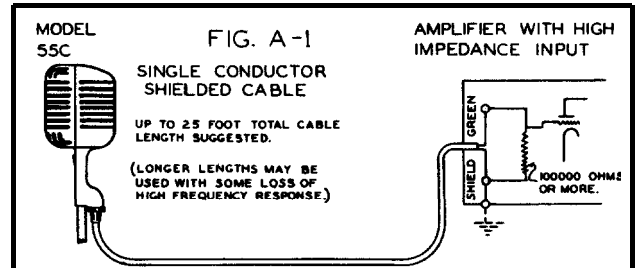
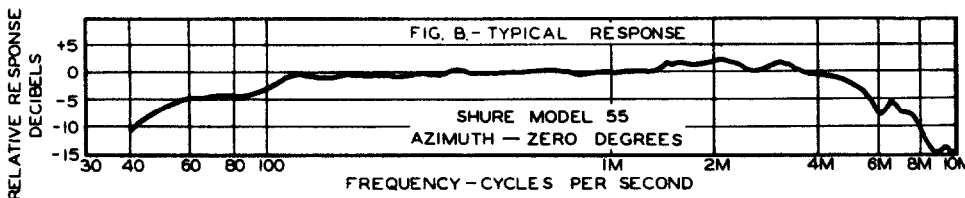
Recommended Load Impedance:

Model 55A 35-50 ohms.
Model 55B 200-250 ohms.
Model 55C 100,000 ohms or more.

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| MODEL | 55A | 55B | 55C |
|----------------------|----------------------|----------------------|-------------------------|
| Code Word | RUDAR | RUDAT | RUDAS |
| Net Wt. Less Cable | 2 3/4 lb. | 2 3/4 lb. | 2 3/4 lb. |
| Shipping Weight | 4 lbs. | 4 lbs. | 3 3/4 lbs. |
| Cable | 25 ft. Two-Conductor | 25 ft. Two-Conductor | 25 ft. Single Conductor |
| Height, Overall (a)* | 7-25/32" | | |
| Height, Case (h)* | 4- 7/16" | | |
| Width (b)* | 3- 3/16" | | |
| Thickness (c)* | 3- 9/16" | | |
| Finish | Satin Chrome | | |

* See Fig. C.



GUARANTEE: Each microphone is guaranteed to be free from electrical and mechanical defects for a period of one year from date of shipment from the 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 case is opened.