



SHURE BROTHERS INCORPORATED

Microphones and Acoustic Devices
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PHONE DELAWARE 7-4550 :: CABLE: SHUREMICRO

DATA SHEET

DATE: FEBRUARY, 1951

SUBJECT: **Model 55 Multi-Impedance
"Unidyne" Dynamic Microphone.**

55 Multi-Impedance "Unidyne" Microphone (Super-Cardioid Uni-directional Moving-Coil Dynamic)

General: Model 55 is a super cardioid unidirectional moving coil dynamic microphone 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 15,000 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 20 ft. shielded rubber-jacketed cable with microphone plug attached is included.

Applications: Model 55 is 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.

Installations: All microphones have the standard 5/8"-27 thread and may be mounted on any conventional desk, banquet, or floor stand. 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.

Connections: The Model 55 Microphone is of the multi-impedance type. Model 55 may be worked directly into a 30-50 ohm line, a 150-250 ohm line, or a high impedance input. Selection of these impedances is accomplished by changing the position of the switch at the rear of the microphone. The switch positions are marked "L" for low impedance (30-50 ohms), "M" for medium impedance (150-250 ohms), and "H" for high impedance (35,000 ohms).

The low and medium impedance positions of the Model 55 may be fed into a standard low or medium impedance input amplifier (Fig. A-1), 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 of the Shure Model A86A Cable type transformer permits coupling either a 30-50 ohm line or 150-250 ohm line to high impedance input.

The low and medium impedance positions are recommended where long cable lengths are required or under conditions of severe hum disturbances. The permissible

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line length is practically unlimited, since neither response or level is appreciably affected by reasonable lengths of line.

The high impedance position on the Model 55 Microphone may be used with any crystal microphone amplifier or other amplifier with an input impedance of 100,000 ohms or more (See Fig. A-3). For best high frequency response, the total cable lengths should not exceed 25 feet; longer cable lengths may be used with some loss of high frequency response. The additional loss at 5000 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). If the Model 55 Microphone is used in the high impedance position, single conductor shielded cable may be used to provide additional cable lengths; also, the two-conductor cable furnished with the Microphone may be replaced with single conductor shielded cable, if the microphone is intended to operate directly into high impedance (grid) input only. In this instance, the number one pin and the number two pin of the cable plug must be shorted together and connected to the shield of the cable.

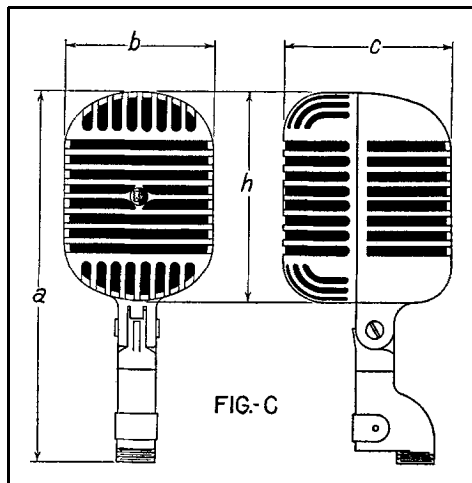
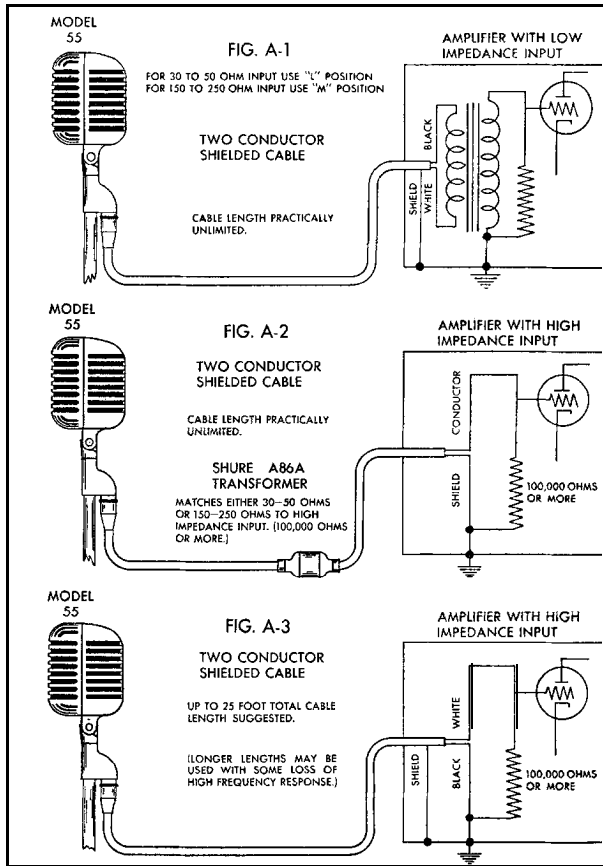
The shield, chassis or amplifier ground should be securely connected to a water pipe or similar ground to prevent shock hazard during operation of amplifying system.

In circuits using the grid leak type of bias on the input tube, it may be desirable to use a .01 mfd. or larger condenser between the microphone and the input grid circuit.

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 the Model 55 Dynamic microphone. It 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 "super cardioid" response simply means that the horizontal polar characteristic approximates a super 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 super cardioid 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.

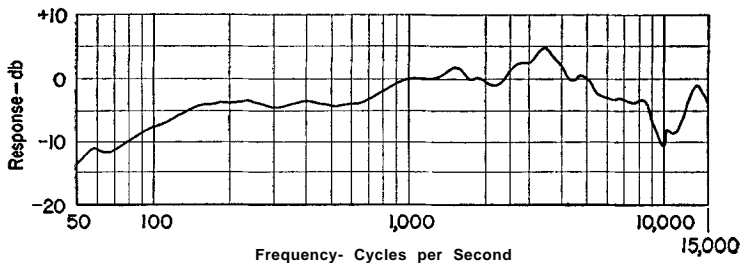


Fig. B. Response-Frequency Characteristic Model "55" Microphone. 27A31. 2-51.

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 objectional 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

1000 C.P.S. Response:

Model 55 "L" Position:	
Open Circuit Voltage Level	-84.1 db. (*)
Loaded With 40 Ohms	-90.1 db. (*)
Power Level Into 40 Ohms	-56.1 db. (**)
RMA Microphone Rating GM (Sensitivity)	-149.8 db. (***)
Model 55 "M" Position:	
Open Circuit Voltage Level	-76.8 db. (*)
Loaded With 250 Ohms	-82.8 db. (*)
Power Level Into 250 Ohms	-56.8 db. (**)
RMA Microphone Rating GM (Sensitivity)	-148.6 db. (***)
Model 55 "H" Position:	
Open Circuit Voltage Level	-57.5 db. (*)
Loaded With 100,000 Ohms	-60.1 db. (*)
RMA Microphone Rating GM (Sensitivity)	-153.7 db. (***)

(*) 0 db. = 1 Volt Per Dyne Per Sq. cm.
 (**) 0 db. = 1 Milliwatt with 10 Dynes Per Sq. cm.
 (***) RMA Standard SE-105 Aug. 1949.

Recommended Load Impedance:

Model 55 "L" Position 30-50 Ohms.
 Model 55 "M" Position 150-250 Ohms.
 Model 55 "H" Position 100,000 Ohms or More.

MODEL 55	
Code Word	RUMUL
Net Wt. Less Cable	2-3/4 lbs.
Shipping Weight	4 lbs.
Cable	20 ft. Two-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 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.

MODEL 55 Architect's Specification

The microphone shall be a dynamic type microphone with a frequency range of 50 to 15,000 c.p.s. This unit shall have a super-cardioid pattern with nulls located at approximately 130° and 230°. The cancellation at the nulls shall be at least 10 db. over the complete range of audio-frequency. The microphone shall be equipped with a three-position impedance change switch for adjusting the microphone rating impedance to 38, 150 or 40,000 ohms. The microphone rating GM (sensitivity) at 1000 c.p.s. shall be within ± 3 db. of the following levels:

- "L" position of switch -149.8 db.
 - "M" position of switch -148.6 db.
 - "H" position of switch -153.7 db.
- RMA Standard SE-105 August 1949.

The microphone shall be provided with a swivel adjustable from 0° to 90° and it shall have a detachable cable connector. The microphone will mount on a stand having a 5/8" -27 thread. The overall dimensions shall be 7-25/32 ± 1/4 inches in height, 3-3/16 ± 1/8 inches in width and 3-9/16 ± 1/8 inches in thickness.