



**SHURE BROTHERS**  
INCORPORATED

Microphones and Acoustic Devices  
225 WEST HURON STREET :: CHICAGO 10, ILLINOIS  
PHONE Delaware 7-4550 :: CABLE: SHUREMICRO

# DATA SHEET

**DATE:** MAY, 1951

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

## 55s Multi-Impedance "Small Unidyne" Microphone (Ultra-Cardioid, Unidirectional, Moving-Coil Dynamic)

**General:** The Model 55s is a small, compact Microphone in which high-fidelity response and excellent directional pattern are achieved. The Ultra-Cardioid unidirectional characteristic of the microphone (obtained by the "Uniphase" principle\*) provides highly satisfactory operation under adverse acoustic conditions. It permits placement of the microphone at a distance from the performer 75% greater than is possible with non-directional (omni-directional) microphones.

The new "Small Unidyne," Model 55s, embodies all of the advantages found in the world-famous Shure Model 55 Unidyne. Its improvements are notable. The Shure-patented acoustic phase-shift network has been redesigned: the moving-coil system has been revised for high efficiency and extended, smooth, frequency response. Large air-gap clearances, together with a rugged coil construction, provide immunity of the moving system to abnormal atmospheric conditions and severe mechanical shock.

The care is modern in design, with attractive streamlining and grille treatment. Model 55s is smaller than the Model 55, and is therefore ideal for installations where it is desired to keep the microphone size to a minimum and still retain maximum operating efficiency.

A new self-adjusting swivel permits tilting of the head through 80° so that the microphone can be aimed at the source of sound. A built-in cable connector is provided; and a 20 foot, high-quality, two-conductor shielded cable with microphone plug attached is included.

**Applications:** Model 55s is ideal for high-quality public address, theatre-stage sound systems, and recording applications. Because of its unusual ruggedness and reliability, Model 55s microphone is, also, recommended for fixed station use in the Police, Fire, and Transportation services. For studio broadcasting and T.V. use, and similar applications where the utmost in quality is desired, Model 556s Broadcast Unidyne is recommended.

The true unidirectional characteristics of the Model 55s provides an easy solution to the feedback problem in reverberant locations, facilitates orchestral placement, permits best utilization of space in small broadcast studios, and provides practically complete exclusion of unwanted noises.

**Installation:** All microphones have the standard 5/8"-27 thread and may be mounted on any conventional desk, banquet, or floor stand. Physical dimensions are shown in Fig. C. 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 55s Microphone is of the multi-impedance type. Model 55s may be connected directly to a 30-50 ohm line, a 150-250 ohm line, or 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).

In the low and medium impedance positions, Model 55s may be connected directly to 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 line length is practically unlimited, since neither response nor level is appreciably affected by reasonable lengths of line.

The high impedance position on the Model 55s Microphone may be used with any high gain microphone amplifier or other amplifier with an input impedance of 100,000 ohms or more (See Fig. A-3). For best high frequency response in high impedance 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 55s 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.

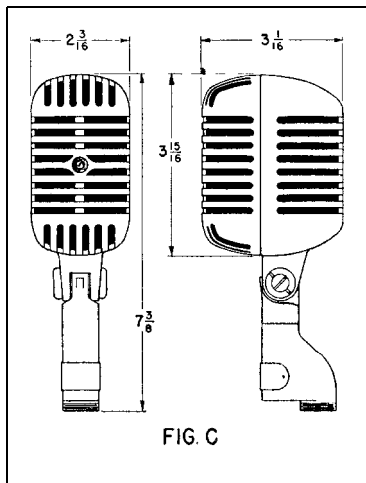
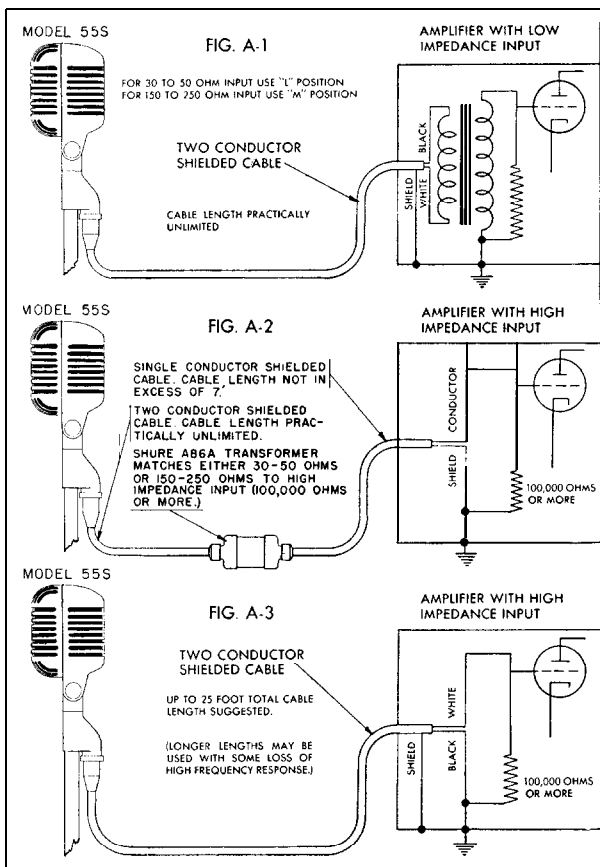
The shield, chassis or amplifier ground should be securely connected to a water pipe or similar ground to prevent shock hazard during operation of amplifying system.

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.

**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.

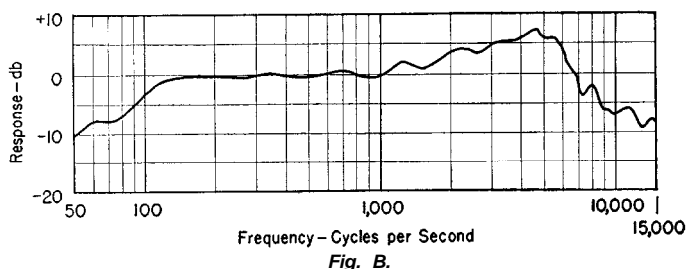
No special precautions beyond ordinary care are necessary in the operation of the Model 55s Dynamic microphone. It will operate efficiently and dependably under all ordinary conditions in hot and cold climates. To retain the full strength of the highly efficient permanent magnet and to maintain alignment of the structure, dropping or other severe mechanical shocks should be avoided.

\*Patented by Shure Brothers Inc.  
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**Acoustic Considerations:** The front response-frequency characteristic of the Model 55s is shown in Figure B. The smooth, wide-range characteristic is excellent for high-quality reproduction of music and speech.

"Ultra-Cardioid" describes the horizontal polar characteristic of the Model 55s. This polar characteristic resembles a cardioid but is slightly more directional. 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 is down approximately 15 db. The Model 55s fulfills these requirements over a broad range of frequencies. 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 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 loud-speaker 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 55s "L" Position

Open Circuit Voltage Level.....	— 87.9 db*
Loaded with 50 ohms .....	— 92.4 db*
Power Level into 50 ohms.....	— 59.4 db**
RTMA Microphone Rating GM (Sensitivity) ...	— 153.6 db***

Model 55s "M" Position

Open Circuit Voltage Level .....	— 81.0 db*
Loaded with 250 ohms.....	— 86.1 db*
Power Level into 250 ohms.....	— 60.1 db**
RTMA Microphone Rating GM (Sensitivity) ...	— 152.8 db***

Model 55s "H" Position

Open Circuit Voltage Level.....	— 60.5 db*
Loaded with 100,000 ohms.....	— 62.3 db*
RTMA Microphone Rating GM (Sensitivity) ...	— 157.0 db***

(\*) 0 db = 1 Volt Per Microbar

(\*\*) 0 db = 1 Milliwatt with 10 Microbars

(\*\*\*) RTMA Standard SE-105, August 1949.

### Recommended Load Impedance:

Model 55s "L" Position 30-50 ohms.

Model 55s "M" Position 150-250 ohms.

Model 55s "H" Position 100,000 ohms or more.

MODEL 55s	
Code Word	RUDOT
Net Wt.	3 1/8 lb.
Shipping Weight	4 1/4 lb.
Cable	20 ft. Two-Conductor
Height, Overall *	7 3/8"
Height, Case *	3 15/16"
Width *	2 3/16"
Depth	3 1/16"
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 is subjected to accident or abuse or if the case is opened.

### MODEL 55s Architect's Specification

The microphone shall be a moving coil type microphone with a frequency range of 50 to 15,000 c.p.s. This unit shall have an "Ultra-Cardioid" horizontal polar characteristic. The cancellation at the sides shall be approximately 6 db and the cancellation at the rear shall be in the order of 15 db. The microphone shall be equipped with a three-position impedance change switch for adjusting the microphone rating impedance to 38 ohms, 150 ohms or 40,000 ohms. The microphone rating GM (sensitivity) at 1000 c.p.s. shall be within  $\pm 3$  db of the following levels:

"L" Position of switch	153.6 db
"M" Position of switch	152.8 db
"H" Position of switch	— 157.0 db
RTMA Standard SE-105 August 1949	

The microphone shall be provided with a swivel adjustable from 0° to 80° and it shall have a detachable cable connector capable of connection to a two-conductor shielded cable. The microphone will mount on stand having 5/8"-27 thread. The overall dimensions shall be 7-3/8  $\pm$  1/4 inches in height, 2-3/16  $\pm$  1/8 inches in width, and 3-1/16  $\pm$  1/8 inches in depth.