

SHURE



SHURE BROTHERS INC.

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Microphones ~ Electronic Components

DATA SHEET

315 GRADIENT¹ MICROPHONE

BI-DIRECTIONAL RIBBON ELEMENT Multi-Impedance

General: The Model 315 is a miniature 1st order gradient microphone, which combines the best features of conventional velocity microphones with an advanced acoustical design. Model 315 has a high-fidelity response and a bi-directional "figure-8" polar pattern. The bi-directional pattern, effective over a wide frequency range, allows wide-angle sound pickup at the front and rear of the microphone, but greatly reduces pickup at the sides. Model 315 reduces reverberation and undesired random sounds by 66% and permits the sound systems to operate at a level nearly 6 db higher than is possible with omni-directional microphones.

The Model 315 is the result of modern research and it constitutes such an important advance over conventional velocity microphones as to almost place it in an entirely new class. The sound is received by the acoustically streamlined external grilles through thousands of tiny apertures which attenuates blast and breath noises.

The extended smooth frequency response and the attending faithful reproduction is largely due to a sensitive metallic ribbon carefully suspended between the poles of the magnetic structure. The use of high efficiency magnetic materials and especially designed magnetic circuits has permitted a small microphone while retaining maximum operating efficiency. The microphone is ruggedly built to withstand hard usage and is unaffected by temperature and humidity variations.

The case is modern in design with attractive streamlining and grille treatment. Model 315 is ideal for installations where it is desired to keep the microphone size to a minimum and still retain maximum performance. A new self-adjusting swivel permits tilting of the head through 90° so that the microphone can be aimed at the source of sound. A built in cable connector is provided; and a twenty foot, high quality, two conductor, shielded cable with plug attached is included.

Applications: Model 315 is ideal for high quality public address, theater stage sound systems, and all recording applications. For studio broadcasting, T.V. use, and similar applications where utmost in quality is desired, Model 300 Broadcast Gradient¹ Microphone is recommended.

Due to the bi-directional polar pattern of the Model 315, it may be used for either single performer, a dialogue, or group; solo or orchestra; and other individual or chorus applications. This type of polar pickup characteristic provides highly satisfactory operation under many adverse acoustical conditions.

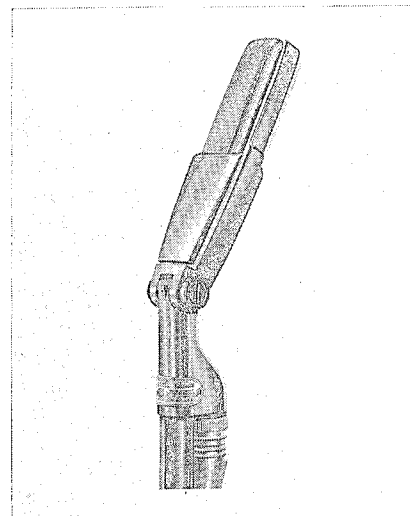
Installation: All microphones have the standard 5/8"-27 thread and may be mounted on any conventional desk, banquet, or floor stand. Physical dimensions are shown in Fig. C. When long lines are used, care should be taken that the cable does not parallel A.C. power lines for long distances to avoid A.C. hum induction.

Connections: The Model 315 Microphone is of the multi-impedance type. Model 315 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 removing plate at the rear of the microphone and changing the position of the switch. 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 microphone plug is equivalent to the Amphenol 91-MC3M plug. Number 1 pin is connected to the microphone case and to the cable shield. Pins No. 2 and 3 are connected to the internal elements, and the microphone may be used with a balanced line. Pin No. 2 should be grounded if it is desired to use the microphone into a single ended input.

In the low and medium impedance positions, Model 315 may be connected directly to a standard low or medium impedance input amplifier (Fig. A-1). For use with high impedance amplifiers connect as shown in Fig. A-3.

The low and medium impedance positions are recommended where long cable lengths are required or under conditions of severe hum disturbances. A two conductor shielded cable, such as supplied with the microphone must be used. 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 Fig. A-2. 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 the high impedance input.

The high impedance position in Model 315 microphone may be used with any high gain amplifier with an input impedance of 100,000 ohms or more (See Fig. A-3). To connect the amplifier plug to the two conductor shielded cable supplied with the microphone, connect the black lead and the shield lead together to the ground terminal of the amplifier plug, and connect the white lead to the "hot" terminal of the amplifier plug.

The maximum recommended length of cable between the microphone and the amplifier when used in the high impedance position should be 25 feet. Longer cable may be used with a loss of approximately 3 db at 5000 cps for each additional 25 feet of cable. In using longer cable, the two conductor shielded cable furnished with the microphone should be replaced with a single conductor shielded cable; when this is done, the shield of the cable must be connected to Pins 1 and 2 of the microphone plug and the center or "hot" conductor must be connected to Pin No. 3.

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.

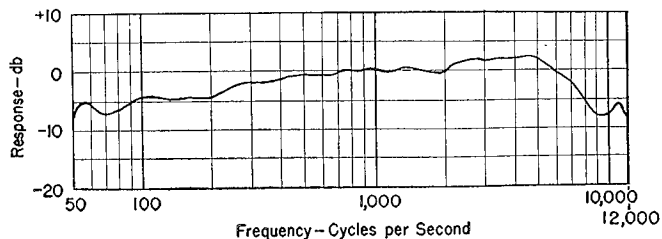
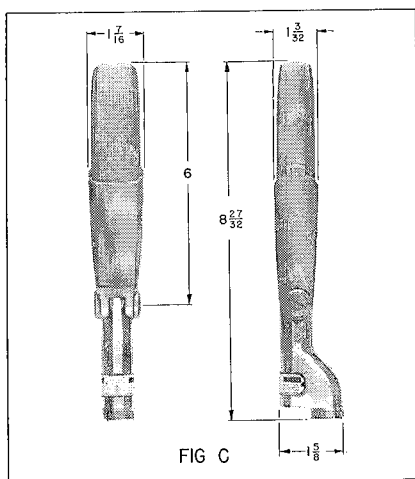
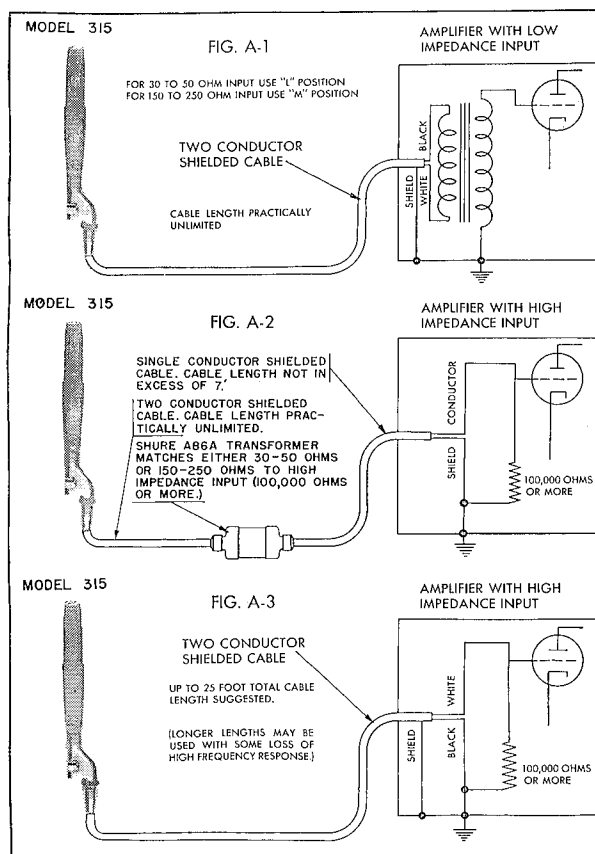
When used with amplifiers using the grid leak type of bias at the input tube, it may be desirable to use .01 mfd. condenser between the microphone and the input grid circuit.

Operation: No special precautions beyond ordinary care are necessary in the operation of the Model 315 Gradient¹ 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.

CAUTION: To prevent serious or permanent damage to the ribbon element, do not check the continuity of the microphone with a circuit tester or an ohmmeter.

To adjust swivel tightness, if necessary, loosen hex nut and adjust slotted screw. Lock swivel screw in place by securely re-tightening hex nut.

Acoustic Considerations: The front response frequency characteristic of the Model 315, is shown in Figure B. The rear response-frequency characteristic is almost identical to the front



Response-Frequency Characteristic Model 315 Microphone.

response-frequency characteristic, and therefore, the microphone can be used equally well from the front and the rear. The smooth wide-range characteristic is ideal for high-quality reproduction of music and speech. The horizontal polar characteristic has a bi-directional or a "figure-8" pattern, which provides wide angle pickup at the front and rear of the microphone. At the same time, the response at the sides is down 15-20 db from the front and rear response; the Model 315 fulfills these requirements over a broad range of frequencies. The result of this bi-directional characteristic is reduction of acoustic feedback at volume levels which would cause considerable feedback with conventional, semi-directional or omni-directional microphones.

Model 315 microphone is especially suitable for use with P.A. and theater installations where loudspeakers are located at either side of the microphone, thus taking the best advantage of the "figure-8" pattern. By directing the "dead" sides of the microphone toward the audience or other interfering sound, pickup can be concentrated on the desired source. It is desirable to experiment with microphone placement and orientation in order to secure the greatest benefits from the bi-directional characteristics.

Specifications

1000 C.P.S. Response:

Model 315 "L" Position

Open Circuit Voltage Level.....	— 89 db*
Loaded with 50 ohms.....	— 94 db*
Power Level into 50 ohms.....	— 62 db**
RTMA Microphone Rating G_M (Sensitivity)....	—155 db***

Model 315 "M" Position

Open Circuit Voltage Level.....	— 82 db*
Loaded with 250 ohms.....	— 87 db*
Power Level into 250 ohms.....	— 62 db**
RTMA Microphone Rating G_M (Sensitivity)....	—153 db***

Model 315 "H" Position

Open Circuit Voltage Level.....	— 59 db*
Loaded with 100,000 ohms.....	— 61 db*
RTMA Microphone Rating G_M (Sensitivity)....	—155 db***

(*) 0 db = 1 Volt Per Microbar
(**) 0 db = 1 Milliwatt with 10 Microbars
(***) RTMA Standard SE-105, August 1949.

Recommended Load Impedance:

Model 315 "L" Position 30-50 ohms.
Model 315 "M" Position 150-250 ohms.
Model 315 "H" Position 100,000 ohms or more.

MODEL 315	
Code Word	RUDOX
Net Wt.	1 lb.
Packaged Weight	3 1/4 lbs.
Cable	20 ft. Two-Conductor
Height, Overall *	8 3/8"
Height, Case *	6"
Width *	1 7/16"
Depth *	1 3/8"
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 315

Architect's Specification

The microphone shall be a Gradient type microphone with a frequency range of 50 to 12,000 c.p.s. This unit shall have a bi-directional horizontal polar characteristic. The cancellation at the sides shall be 15 to 20 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 G_M (sensitivity) at 1000 c.p.s. shall be within ± 3 db of the following levels.

"L" Position of switch—155 db
"M" Position of switch—153 db
"H" Position of switch—155 db

RTMA 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 capable of connection to a two conductor shielded cable. The microphone will mount on a stand having 5/8"-27 thread. The overall dimensions shall be 8 3/8" \pm 1/4 inches in height, 1 7/16" \pm 1/8 inches in width, and 1 3/8 inches in depth.