

DATE: May 1941

Models 700D, 701D, and 702D,
 SUBJECT: "ULTRA" Wide-Range Crystal
 Microphones

MODELS 700D, 701D AND 702D "ULTRA" WIDE-RANGE CRYSTAL MICROPHONES

GENERAL: Models 700D, 701D and 702D Crystal Microphones are "ULTRA" Wide-Range response instruments for high quality reproduction of sound. All three models are pressure-actuated diaphragm-type microphones. The crystals used are grafoil (high capacity) bimorph units, triple moisture-sealed to withstand adverse climatic conditions.

Each model is provided with a built-in receptacle and 25-foot single conductor shielded rubber-jacketed cable with plug attached. Microphone, receptacle, and plug are completely shielded.

APPLICATIONS: Shure Ultra series microphones are suitable for high quality Public Address, Broadcasting, Recording and industrial applications. All models have unusually good frequency response characteristics and will provide sound reproduction of exceptional quality. Model 700D is of the conventional semi-directional type and is provided with a swivel which permits pointing the microphone toward the source of sound. A removable directional baffle (A90A) is available for the 700D, which considerably increases discrimination against high-frequency sounds coming from the sides and rear. Model 701D embodies highly distinctive modern "skyscraper" appearance. Model 702D is of the spherical type and is semi-nondirectional (non-directional in horizontal plane). Artists may be placed around the microphone without frequency discrimination.

INSTALLATION: All three models are equipped with the standard 5/8"-27 thread and may be mounted on any Shure desk, banquet, or floor stand. For overhead suspension, an A35B Suspension Adapter may be used. Convenient cable changing is possible with the built-in receptacle. A 25-foot single-conductor shielded rubber-jacketed cable is furnished with plug attached. (See catalog for bulk length and special cables with plug attached.) External flexible couplings are unnecessary since the internal elements of the microphone are substantially isolated from the outer case.

CONNECTIONS: The inner conductor or "green" lead should be connected to the grid of the first tube in the amplifier across a load resistance of 5 megohms. Input resistances as low as 1 megohm may be used if necessary but higher values are recommended because of the better low-frequency response obtained. The black lead or ground should be connected to the chassis. See Fig. A.

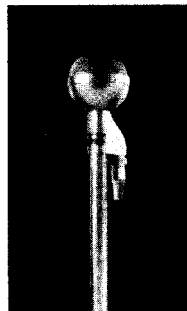
Added lengths of connecting cable will be accompanied by a decrease in output level as given in the table below. There is no frequency discrimination introduced by the cable, regardless of length.

Total Cable Length	Output Level* at Cable Terminals
7 Ft.	- 56.0 db
25 Ft. (Standard)	- 59.0 db
50 Ft.	- 61.5 db
75 Ft.	- 63.0 db
100 Ft.	- 65.0 db
150 Ft.	- 68.0 db
200 Ft.	- 70.0 db

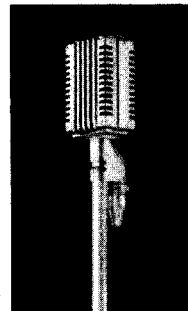
* (Expressed in db below 1 volt per bar.)

Most modern high-gain amplifiers have a sufficient margin of gain to make up for the decrease in output levels shown in the table. If the amplifier does not have the necessary gain a preamplifier at the microphone or near the main amplifier, is suggested. Preamplifiers with low impedance output are recommended if the main amplifier system has low impedance transformer or mixed input.

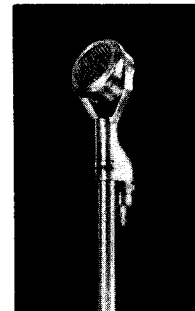
Cable should be of high quality and low capacity. The inner leads should be soldered and insulated with a good grade of rubber tape. Metal braid sleeve or a serve of fine wire should be soldered between the shields of the cable to complete the shielding. Longer lengths of cables with standard plug attached may be purchased at small cost, and may be used interchangeably



702D



701D

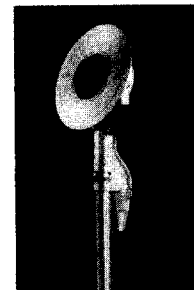


700D

with shorter cables. For unusually long cable lengths or for applications where the hum conditions are bad, Shure Type C30A Super-Shielded cable is recommended. (See Catalog).

OPERATION: No polarizing voltage is required for crystal microphones.

Crystal microphones may be seriously damaged if accidentally connected to loud speaker or power supply outlets carrying high voltage. Check your connections carefully.



700D With A90A Baffle

Crystal microphones should not be used or kept in places where the temperature exceeds 125°F. They should not be exposed to the rays of the sun in very hot weather for any considerable length of time - or left in closed automobiles parked in the sun during hot weather, as the temperature inside the automobile may easily build up to over 125°F. and permanently damage the crystal.

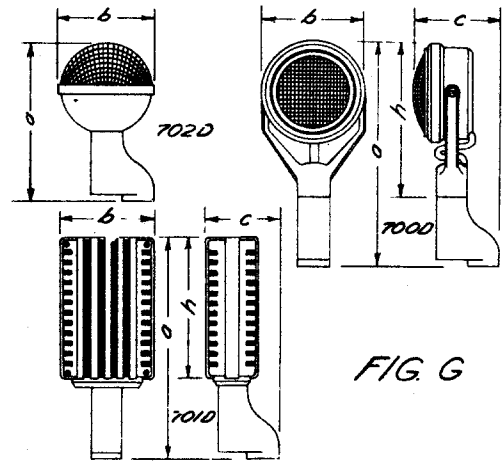
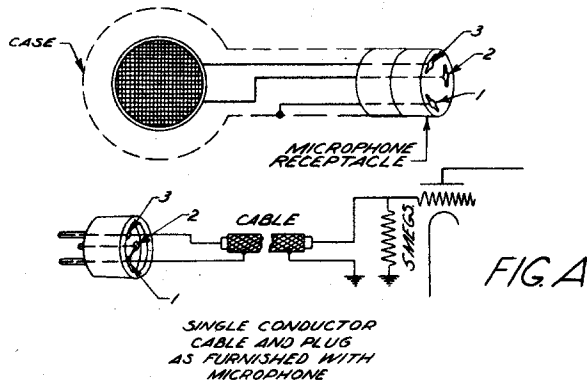
When used near a radio transmitter, use the minimum length of cable consistent with placement requirements. Careful grounding of the cable shield is advisable.

ACOUSTIC CONSIDERATIONS: Model 700D is semi-directional with a polar characteristic as shown in Fig. D. Note that for best reproduction the source of sound should be included within a total angle of approximately 90 degrees at the front of the microphone.

The addition of the A90A Directional Baffle to Model 700D increases discrimination against high frequency sounds coming from the side and rear of the microphone, thus decreasing feed-back tendency and cutting down room-noise pickup. (See Fig. E. Note that these are not response curves. They show the attenuation of sounds approaching from the side and rear, with and without baffle. See Fig. C for response curve.) In cases where this type of directional discrimination is not sufficient, a true unidirectional microphone is recommended, providing directional discrimination over a wide frequency range, such as Shure Model 730A "UNI-PLEX" or Model 720B "TRI-POLAR".

Model 701D is also semi-directional as indicated in Fig. E. Performers should be included within a total angle of 90 degrees at the front of the microphone for best reproduction.

Model 702D is of the semi-nondirectional type. The vertical plane directivity is shown in Fig. F. The microphone is perfectly nondirectional in the horizontal plane, and is ideal for the grouping of artists around it without frequency discrimination. It is also well suited for "large-group" pickup of orchestras, etc. The 702D may be used for pickup of soloists and for practically all purposes for which conventional semi-directional microphones are used.



SPECIFICATIONS

Voltage Sensitivity: 1.1 millivolts r.m.s. per bar at the end of a 25-foot cable across 1 to 5 megohms at 400 cycles. This is equivalent to 55 db below 1 volt per bar open circuit, or 59 db below 1 volt per bar at the terminals of the 25-foot cable.

Internal Output Impedance: Equivalent to a 1,500 micro-microfarad condenser.

Recommended Load Impedance: 1 to 5 megohms.

	MODEL 700D	MODEL 701D	MODEL 702D
Height, Overall (a)*	5-3/8"	5-9/16"	4"
Height, Case (h)*	3-1/2"	3-1/2"	
Width (b)*	2-1/2"	2-1/4"	2-1/4"
Thickness (c)*	2-1/8"	1-11/16"	
Finish	Satin Chrome Plated		
Net Weight	7/8 lb.	1-3/16 lb.	3/4 lb.
Shipping Weight	1-3/4 lb.	2 lb.	1-1/2 lb.
Code Word	RUPAJ	RUPAP	RUPAV

* See Fig. G.

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.

License Notice: Shure patents pending. Licensed under patents of the Brush Development Company.

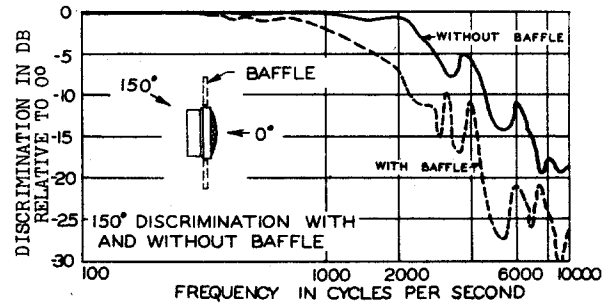
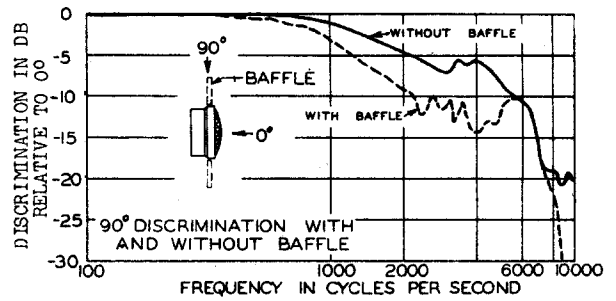
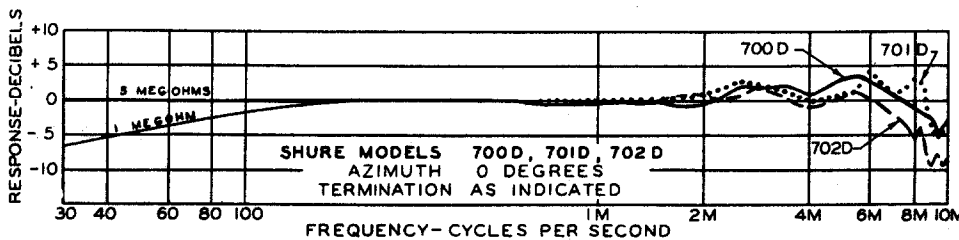
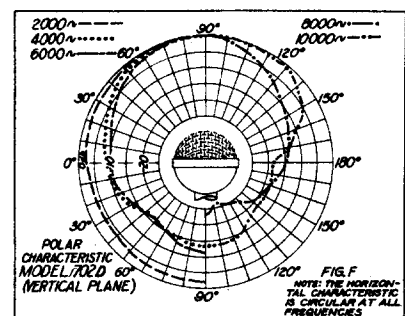
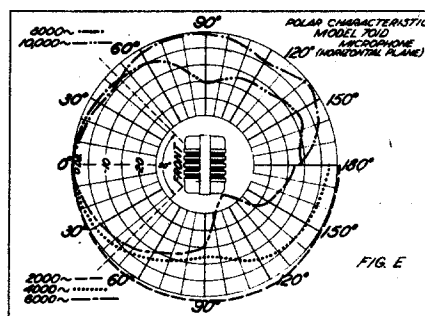
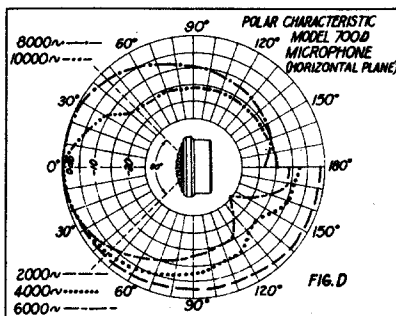


Fig. B. Directional Discrimination of 700A With and Without Baffle



FREQUENCY CHARACTERISTIC OF MODELS 700D, 701D, 702D