

DATE: January, 1942

SUBJECT: Model 730S "Uniplex" Cardioid Crystal Microphone

MODEL 730S "UNIPLEX" CARDIOID CRYSTAL MICROPHONE

GENERAL : Model 730S is a uni-directional diaphragm-type crystal microphone designed especially for high quality reproduction or speech. The true uni-directional "cardioid" characteristic of the "Uniplex" allows highly satisfactory operation under adverse conditions of background noise and reverberation where a conventional microphone would be practically useless. (See "Acoustic Considerations" for a discussion of directional characteristics).

The "Uniplex" contains a diaphragm-type element combined with acoustical networks which cause cancellation or sound pressures for sounds incident from the rear. The crystal is a Grafoil (high capacity) bimorph unit, triple moisture-sealed to withstand adverse climatic conditions. The microphone has a built-in filter circuit for protection against R.F. burnouts. Case is pivoted at the rear and may be conveniently pointed in the direction of the desired sound, or pointed upwards for non-directional horizontal plane pickup.

The microphone is provided with an S36A Desk Stand detachable three-way plug and 7-foot single conductor cable. The same Microphone without a stand is available under the Model No. 730SH.

APPLICATIONS: Model 730S is designed especially for voice transmission and is suitable for public address, amateur broadcasting, and other applications where clear, intelligible reproduction or speech is of prime importance. The Microphone has a high output permitting its use with moderate gain amplifiers. The wide-range unidirectional characteristic of the "Uniplex" provides an easy solution to the feedback problem in reverberant locations, permits best utilization of space in small rooms, and allows a practically complete exclusion or unwanted noises.

By pivoting the microphone upwards a 360° non-directional horizontal plane characteristic is obtained which is useful for group or round-table pickup. (See "Acoustic Considerations" for information on non-directional placement).

INSTALLATION: Model 730S is 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 due to the built-in receptacle. A 7-foot single-conductor cable is furnished with plug attached. (See catalog for bulk length and special cables with plug attached).

CONNECTIONS: The inner conductor or "hot" lead of the cable should be connected to the grid of the first tube in the amplifier across a load resistance of ½ to 5 megohms. Although an input resistance of approximately ½ megohm should be used to decrease the low frequency response of the Microphone for improvement in speech transmission efficiency, higher values are recommended if good low frequency response is desired. The shield or ground should be connected to the chassis. See Fig. A.

The microphone is supplied with a 7-foot length or C10C cable. Longer cable lengths provided with microphone plugs are available. 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. (Standard)	53.0 db
25 Ft.	55.5 db
50 Ft.	58.0 db
75 Ft.	60.0 db
100 Ft.	60.5 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 mixer input.

Cable should be of high quality and low capacity. If cables are to be joined, 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 with shorter cables. (See Catalog 3)

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.

The microphone case should not be opened. Our guarantee is voided by tampering with the mechanism.

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° and permanently damage the crystal.

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

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

ACOUSTIC CONSIDERATIONS: The high-frequency response of the 730S is accentuated and the low frequencies are attenuated to give a smoothly rising response characteristic. (See Fig. C). The result of this is a microphone in which a high degree of speech intelligibility is achieved without undue loss of quality. The expression "cardioid type" response simply means that the horizontal polar characteristic approximates a cardioid of revolution. There is a wide, useful pickup angle at the front of the microphone while the response at the sides is down 6 db and the rear response is down of the order of 15 db from the front side response over a broad range of frequencies. The true unidirectional characteristic of the "Uniplex" 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 semi-directional microphones. In practically all cases it is possible to increase loud-speaker levels when a Uniplex is installed. By direct-

ing 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 halls.

It is desirable to experiment with microphone placement and orientation in order to secure the greatest benefits from the unidirectional characteristic.

SPECIFICATIONS

- Voltage Sensitivity: 2.25 millivolts r.m.s. per bar at the end of a 7-foot cable across 1 to 5 megohms at 400 cycles.
- This is equivalent to 53 db below 1 volt per bar.
- Internal Output Impedance : Equivalent to a 1500 micro-micro-fared condenser.
- Recommended Load Impedance: 1 to 5 megohms.

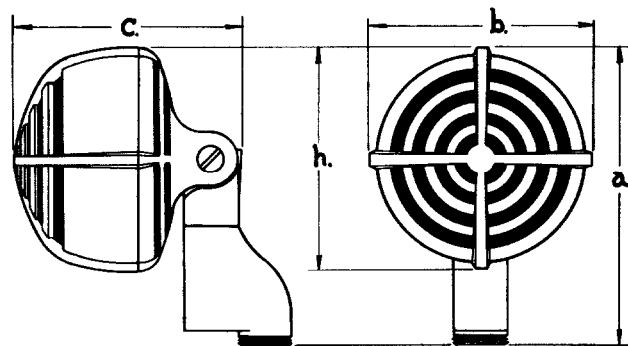
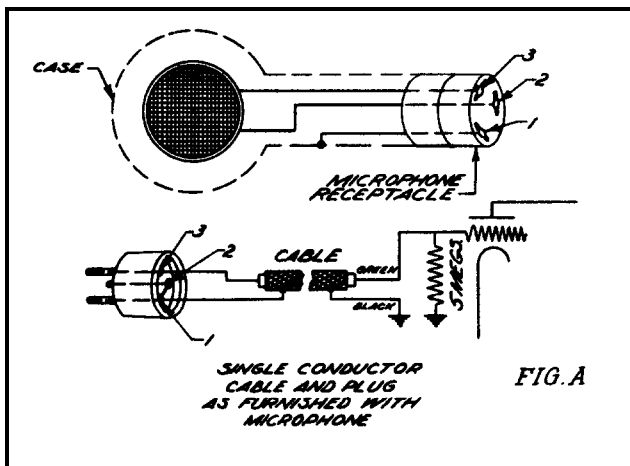


FIG. B

Height, Overall (a)*	4-3/8
Height, Case (h)*	3-1/8
Width (b)*	3-1/8
Thickness (c)*	3-3/8
Finish	Satin Chrome
Net Weight	2-1/4 lbs.
Shipping Weight	2-1/2 lbs.
Code Word	RUPOD

* See Fig. B.

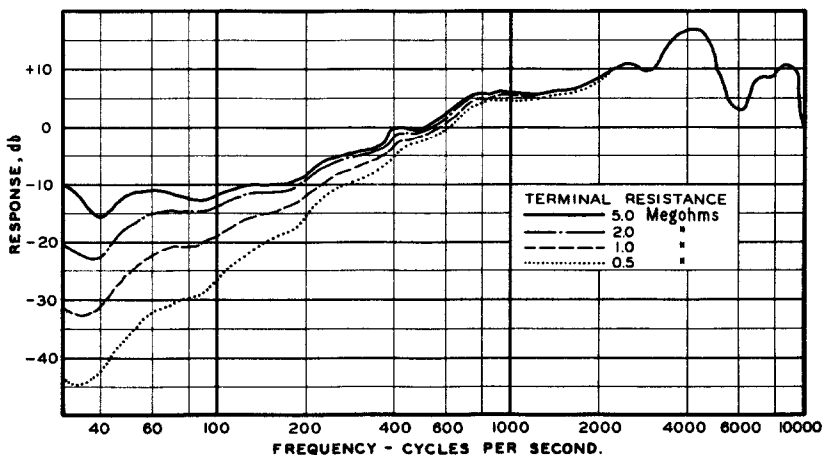


FIG. C TYPICAL FREQUENCY RESPONSE. SHURE MODEL 730S "UNIPLEX" MICROPHONE

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 patent 2,198,424. Other patents allowed. Licensed under patents of the Brush Development Company.