

DATE: December, 1940

SUBJECT: Model 730A "Uniplex"
 Crystal Microphone

MODEL 730A "UNIPLEX" CRYSTAL MICROPHONE

GENERAL: Model 730A is a uni-directional wide-range diaphragm-type crystal microphone. 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 of 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. 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 a detachable three-way plug and a 25-foot single conductor "Super-Shielded" cable which practically eliminates the possibility of electrostatic or electromagnetic hum pickup.

APPLICATIONS: Model 730A is suitable for high-quality public address, broadcasting, recording and similar applications. The true wide-range uni-directional characteristic of the "Uniplex" creates an easy solution to the feedback problem in reverberant locations, facilitates orchestral placement, permits best utilization of space in small broadcasting studios, and allows a practically complete exclusion of 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 730A 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 25-foot single-conductor "Super-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 "hot" 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 shield or ground should be connected to the chassis. See Fig. A.

The microphone is supplied with a 25-foot length of C14A "Super-Shielded" cable. Longer cable lengths provided with microphone plugs are available. If the "Uniplex" is to be used with considerably less than 25-feet of cable, a shunt condenser having 30 mmf capacity for each foot of cable removed should be connected across the terminals at the amplifier, otherwise an increase in high frequency response will result.

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
25 Ft. (Standard)	-63.0 db
50 Ft.	-67.5 db
75 Ft.	-70.5 db
100 Ft.	-72.5 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. 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. 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.

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, use the minimum length of cable consistent with placement requirements. 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 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 from the front response. The rear response in practical cardioid type microphones is down of the order of 15 db from the front side response. The Uniplex fulfills these requirements 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 semidirectional microphones. In practically all cases it is possible to increase loud-speaker levels when a Uniplex 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 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:** 0.7 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 63 db below 1 volt per bar.
- Internal Output Impedance:** Approximately 1 megohm.
- Recommended Load Impedance:** 1 to 5 megohms.

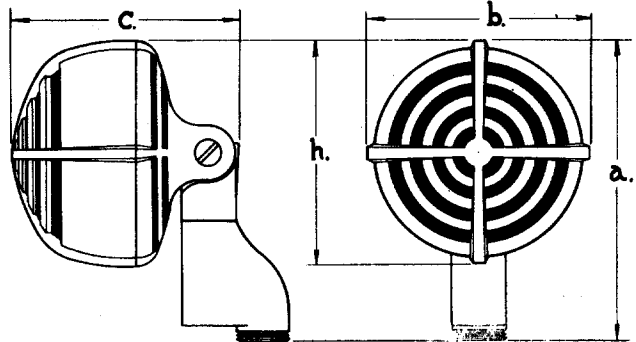
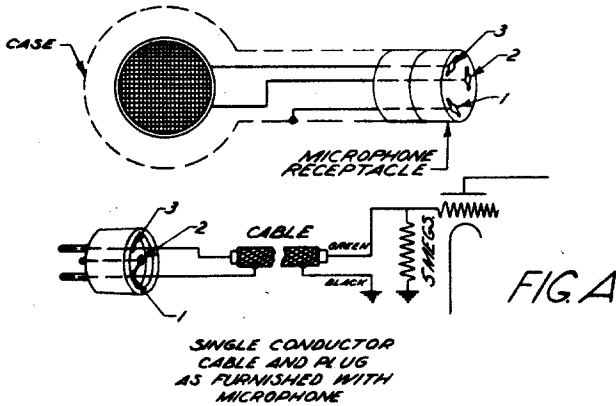


FIG. B.

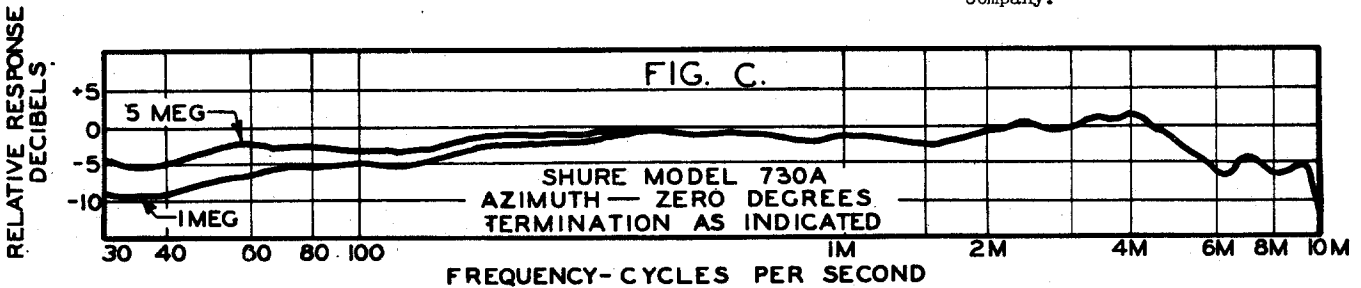
Height, Overall (a)*	4-3/8
Height, Case (h)*	3-1/8
Width (b)*	3-1/8
Thickness (c)*	3-3/8
Finish	Satin Chrome
Net Weight	2-1/4 lbs.
Shipping Weight	2-1/2 lbs.
Code Word	RUPEL

* See Fig. B



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.



TYPICAL FREQUENCY RESPONSE. SHURE MODEL 730A "UNIPLEX" MICROPHONE.