SHURE
Crystal MICROPHONES

...with the Exclusive Cantilever Principle

Shure Crystal Microphones are the result of exhaustive engineering development by the technical staff of "Microphone Headquarters," working in cooperation with scientists of The Brush Development Company, the inventors of the "Bimorph" piezo-electric (crystal) unit.

These microphones are of the diaphragm-actuated type. Vibrations of the diaphragm produced by sound waves are transmitted to the crystal element through a new "matched-impedance" mechanical coupling system devised by Shure engineers. This system employs the advanced Shure "cantilever" principle, thus providing efficient transfer of energy from sound wave to crystal element.

The output level is above that of the average crystal microphone, requiring only one additional low-gain stage of amplification to give the equivalent output of a two-button microphone (—30 db). Many amplifiers have sufficient gain to operate directly from these Shure Crystal Microphones without auxiliary preamplifiers.

No polarizing voltage or exciting-current batteries or power supplies are required for any of the Shure Types "70" and "71" Crystal Microphone Heads. The microphone may be connected through the shielded, single-conductor cable directly to the grid circuit of the first tube across a resistance of 1 to 5 megohms. The shielded connecting cable may be lengthened somewhat if necessary, reducing the output level with increase in length of cable without in any way impairing the frequency characteristic.

Shure Crystal Microphones are rugged and durable. Extreme conditions of heat, cold, and humidity do not impair their operation. Only moderate care in handling is necessary.

Shure Crystal Microphones are quiet. No background noise or "hiss" is produced by the crystal itself, thus permitting operation down to the noise level of the amplifier where necessary. Shure Crystal Microphones are also remarkably free from mechanical vibration pickup.

The frequency characteristic is excellent over the entire audio frequency range — accomplished through the use of a specially-shaped Dural diaphragm and new advanced design of the mechanical system. Pleasingly, "full" low frequencies with brilliant "highs," are reproduced through average high quality amplifier and loud-speaker equipment.

Crystal MICROPHONE HEADS
(Diaphragm-Type)

These SHURE Crystal Microphone Heads are general purpose instruments, designed for direct mounting on microphone stands and do not require suspension ring or springs. The fittings supplied with the microphone will mount directly on any SHURE Microphone Stands except the 42A, which requires an adapter (See page 2). However, the Model 70H Microphone may be installed in regular carbon microphone rings of any manufacture by inserting four Shure "Quickway" Hooks which are supplied with each unit, and mounting with suspension springs in the usual manner.

The crystal and associated mechanical system are mounted in a heavy cast metal case of distinctively modern bevel-edged design, finished in gleaming chromium plate overall. The diaphragm is protected by a heavy chromium-plated screen. The instrument is small in size and hence does not obstruct the view of audience or artist.

MODEL 70H Crystal MICROPHONE
Specifications: Overall diameter of case, 3 inches (7.62 cm.). Thickness: 1/2 inches (1.97 cm.). Overall Length: 9 inches (22.86 cm.). Net Weight, including cable and EF ring: 11/4 lbs. (5.67 kg.). Shipping Weight: 21/2 lbs. (1.02 kg.).


$2250

DEMOUNTABLE MODEL 70H-79A
The Shure Model 70H-79A Demountable Crystal Microphone has been designed for convenience and security. Insert the plug...push...click...and it is instantly installed on its stand. And it's only a matter of a second to remove it for safekeeping or use elsewhere, without the use of tools or attention to the cable.

Model 70H-79A. Demountable Crystal Microphone. Including Plug, wired into Microphone, and Receptacle. Code: Rureb. List Price...

$2750

SHURE MODEL 70A
CRYSTAL MICROPHONE PREAMPLIFIER

A two-stage preamplifier with a frequency characteristic flat within 2 db from 40 to 10,000 cycles. Approximate gain: 55 db. Has both 200-ohm and "high impedance" output. Furnished with wood screws for mounting, two type 76 tubes, but without power supply or battery power cable. Attractive black japonized steel case. Length: 8" (20.3 cm.). Width: 3" (7.62 cm.). Height: 4 1/2" (11.43 cm.).

Model 70A. Crystal Microphone Preamplifier. Code: Ruraf. List Price...

$2750

MICROPHONE HEADQUARTERS
PREAMPLIFIER MODELS

Now "Microphone Headquarters" brings you these new and important contributions to the science of sound reproduction. In introducing the several new models of the "70" Series shown below, all the advantages of the Model 70H Crystal Microphone Head (shown on Page 1) have been retained, while many features hitherto unavailable have been added—in new and useful designs. The output is brought out at a standard low impedance (200 ohms), making it possible to run long lines to the main amplifier and to work into existing 200-ohm mics to low-gain amplifiers without making any circuit changes whatsoever.

In each of the models listed below the frequency response is uniform within 6 to 8 db from 30 to 10,000 cycles. Average output level—9 db, unless otherwise specified (zero level 3.18% of full scale). Sound pressure 10 bars. Current requirements supplied by SHURE Model 41H Power Supply or by 6-volt storage "A" battery and 110 to 200 volts "B" supply.

SHURE MODEL 70C

Studio-Type

The Model 70C is a modernistic design of the popular "camera" type case. The beauty of its finish makes it a fitting addition to any studio, and the features of its construction make it convenient and ruggedly durable.

Specifications: Head polished chromium plated. Cast aluminum case, finished in double-baked satin nickel. Overall diameter: 11/16" (1.75 cm.). Combined overall length when connected: 31/2" (8.89 cm.). Fitted with outside diameter of approximately 1/2" (1.27 cm.) rubber-jacketed cable. Fits cables outside diameter of approximately 1/2" (1.27 cm.).

Dimensions: Case diameter, 3/4" (9.5 cm.). Height overall: 11/16" (30.2 cm.). Shipping weight, 6 lbs. (3.06 kg.).

Model 70C, Crystal Microphone, Studio-Type, complete with tubes, 12 ft. of 83-l cable, suspension adaptor, and instructions. Code: Rurac. List Price: $70

Model 70HC, Head only with flange mounting. Code: Rurlt. List Price: $2450

SHURE MODEL 70D

Bullet-Type

The Model 70D brings you the utility of "bullet" construction with the advantages of the Crystal Microphone. The head can be aimed directly at the source of sound for best pickup. Invaluable for overhead use.

Specifications: The head is polished chromium plated. Case is aluminum, finished in double-baked satin rubber-black japanned. Mounts on standard SHURE stands.

Dimensions: Case diameter, 3/4" (9.5 cm.). Height overall: 11/16" (30.2 cm.). Shipping weight, 6 lbs. (3.06 kg.).

Model 70D, Crystal Microphone, Bullet-Type, complete with tubes, 12 ft. of 83-l cable, suspension adaptor, and instructions. Code: Rurad. List Price: $65

SHURE MODEL 70E

Desk-Type with Remote Preamplifier

The Model 70E presents the Crystal Microphone in an entirely new form. With the head mounted on a standard Shure desk stand and the remote preamplifier located "off the desk," many pickup problems are conveniently and efficiently solved.

Specifications: An assembly of three standard SHURE units; the 70H with its "close-fitting" ring on a 5IC adjustable desk stand, and the standard Model 70A preamplifier described on the other side.

Dimensions: Height, adjustable from 9" to 14" (22.86 to 35.56 cm.). Shipping weight, 9 lbs. (4.08 kg.).

Model 70E, Crystal Microphone, Desk Type, with Remote Preamplifier, complete with tubes and instructions, but LESS power cable. Code: Rures. List Price: $5650

(Shielded Power Cable, 83-l, listed in next column)
High-Fidelity
A REALITY with the NEW SHURE
Wave-Equalized
CONDENSER MICROPHONE

"High Fidelity" is definitely a requirement of modern high quality broadcast and sound transmission systems. Wide frequency range with uniform reproduction is an essential characteristic of all equipment in the "High Fidelity" installation.

The new Shure "Wave-Equalized" Condenser Microphones are the first condenser microphones which attain true "High-Fidelity" performance...a frequency characteristic uniform within a total range of only 4 db from 40 to 10,000 cycles. But in addition to this remarkable performance, all the well known advantages of the condenser microphone have been retained...simple, familiar pickup technique...high output level, standard low-impedance output...direct connection to existing microphone input channels without auxiliary preamplifiers.

The following pages give complete data on Shure "Wave-Equalized" Condenser Microphones...instruments which bring you true "High-Fidelity" performance economically, conveniently...dependably.

COMPARATIVE "UNIFORM TONE RANGES"

The above chart graphically shows the remarkable "High-Fidelity" reproduction achieved in the new Shure 43 Series "Wave-Equalized" Condenser Microphones as compared with the performance of the best "standard" condenser microphones previously available for broadcast service.

The measure of microphone fidelity chosen in a definite, numerical figure, expressed in per cent, and termed the "Uniform Tone Range". A rating of 100% means that the microphone reproduces the entire range of frequencies contained in a particular type of sound with a total variation of 5 db or less. A total variation of 5 db is well within the definition of "High-Fidelity" reproduction, and is difficult to distinguish from perfectly uniform reproduction in listening tests. Values of the "Uniform Tone Range" of the microphones are indicated by the "thermometers" directly above the sketches representing the musical instruments, voices or sound. Black "thermometers" represent the performance of Shure 43 Series "Wave-Equalized" Condenser Microphones, while the shaded "thermometers" are for the "standard" condenser microphone.

The following page gives complete data on Shure Condenser Microphones...instruments which bring you true "High-Fidelity" performance economically, conveniently...dependably.

SHURE BROTHERS COMPANY
Manufacturers Microphone Headquarters
425 West Huron St. Chicago, Illinois
Any conventional condenser microphone has a wave ("field") response curve which is characterized by a marked rise in the vicinity of 3,000 cycles followed by more or less rapid "cut-off" in the high frequency range. This is due to the "obstacle" effect of the microphone and its housing and acoustic resonance in the cavity in front of the diaphragm. "Obstacle" effect cannot be eliminated without reducing the dimensions of the microphone to impracticably small values of the order of ½ inch. It is thus impossible for any conventional condenser microphone to approach a "flat" response characteristically.

The "Wave-Equalized" Principle overcomes these deficiencies and makes possible the achievement of "High-Fidelity" response while retaining the time-proved advantages of the condenser microphone. A special precision condenser head has been designed for minimum cavity effect and the widest possible frequency range. The wave response of the head only is shown by the dashed line in the above illustration. The electrical output of the head is delivered to a high-gain two-stage preamplifier containing a selective two-section equalizer. This equalizer has the effect of reducing the gain as the head response rises and increasing the gain at the high frequencies where the head response is falling. Through proper design, the gain-frequency characteristic of amplifier and equalizer (shown dotted above) is almost exactly the inverse of the head characteristic and the combined performance of head, amplifier and equalizer thus closely approaches the ideal of flat response over the audio frequency range. The overall response shows a total variation of only 4 decibels between 40 and 10,000 cycles per second as indicated by the solid line above. Reliable published data shows a total variation of 10 decibels in wave response for the best condenser microphones used to this time on broadcast network programs.

**GENERAL SPECIFICATIONS**

**OUTPUT LEVEL:** Minus 32 to minus 38 decibels, depending on the model. (Zero level 6 milliwatts. Sound pressure 10 bars.)

**OUTPUT IMPEDANCE:** 200 ohms.

**OPERATING PRINCIPLE:** Pressure actuated condenser head. Pickup technique is the same as for conventional condenser microphones.

**DIRECTIVITY:** Front pickup practically non-directional.

**FREQUENCY CHARACTERISTICS:** Total wave response variation only 4 db between 40 and 10,000 cycles. Pressure principle insures uniform low-frequency response regardless of distance to source.

**"Obstacle" effect, cavity resonance, and high-frequency loss are corrected by built-in "Wave-Equalizer".**

**HEAD:** Precision, lathe-turned condenser head. Shallow cavity.

**Equalized damping provided with special back plate design. Carefully stretched and aged Dural diaphragm. Leakage-proof India Mica insulation.**

**AMPLIFIER:** High-gain two-stage unit with 8C5 and '76 tubes. Completely shielded, "sectionalized" construction throughout. Special, individually "noise" tested, S. S. White coupling and isolation resistors, guaranteed to have less noise than that corresponding to a change in resistance of 1 part in 10,000,000. Low-leakage bakelite-encased mica coupling condensers. Moulded bakelite tube sockets. Built-in "Wave-Equalizer".

**AMPLIFIER POWER REQUIREMENTS:** Designed for A.C. or storage battery heater supply. Requires 6 volts A.C. or D.C., and 180 to 200 volts D.C. at 5 M.A. Power requirements may be obtained from batteries, Shure 41H Power Supply unit or 41H-538C Combination Floor Stand and Power Supply.

**NEW USEFUL MOUNTINGS:** Shure 43 Series "Wave-Equalized" Condenser Microphones are available in a wide variety of new, useful mountings for studio, stage and announcing purposes. "Bullet" Type, Desk Type with Remote Preamplifier, and Floor Stand Types with Preamplifier in base are described here. A floor stand with power supply in base is also available.

**SHURE MODEL 43E**

"Wave-Equalized"* CONDENSER MICROPHONE

The Model 43E "Wave-Equalized" Condenser Microphone presents the condenser transmitter in an entirely new form . . . a desk-stead mounted head with separate remote preamplifier unit . . . the solution to many pickup problems requiring a "High-Fidelity" microphone of small dimensions. The microphone has many evident applications for "announce" purposes, news broadcasts, sound effects and dramatic radio presentations, sound recording, high-quality public-address and radiotelephone communications.

The 43 Condenser Head is mounted on a Shure Model 51C Desk Stand. A special low-capacity shielded rubber-jacketed cable six feet long, terminating in a reaction rubber shielded plug, connects the head output to the high-gain two-stage preamplifier. The shielded conductor introduces no frequency discrimination and has very low attenuation. The condenser head is an accurately machined, precision instrument designed for maximum stability under a wide range of operating conditions. Dimensions have been chosen for minimum phase-shift with angular incidence and a small cavity. The residual response rise and slight high-frequency loss are almost perfectly compensated by the "Wave-Equalizer" in the preamplifier, with a resulting overall wave-response which is flat within a total range of only 4 db from 40 to 10,000 cycles.

Head insulation is leakage-proof selected India Mica.
**High-Fidelity**

**DENSER MICROPHONES**

**SHURE MODEL 43D**

"Wave-Equalized"

**CONDENSER MICROPHONE**

The Model 43D "Wave-Equalized" Condenser Microphone has the conventional "bullet" type case and is an instrument of wide utility for all "high-fidelity" microphone applications. Since it has high output level and standard 200-ohm output impedance it may directly replace existing condenser and carbon microphones without change in the speech input system. Power requirements are readily obtained from battery facilities or from the Shure Model 41H Power Supply. A floor stand with power supply in base (see Model 41G-38C, page 4) is also available. The 43D may be suspended overhead or mounted on a suitable stand as illustrated at the right. The head swivels to allow the diaphragm to be faced directly toward the source of sound.

The highest quality components are used throughout and every part is rigidly tested and inspected before it is built into the microphone. The precision condenser head has a very shallow cavity and low phase-shift distortion for angular incidence. Every part is accurately machined to extremely close tolerances to insure absolute uniformity. The head design has been worked out for maximum stability under a wide range of temperatures. Insulation is selected India Mica which is noted for its negligible hygroscopic properties. Many unusual features in the amplifier design contribute to the performance and dependability of the unit. "Sectional" construction is employed in which the head coupling elements are housed in an individual, fully shielded compartment at the top of the unit. At the bottom of the unit is a similar compartment containing the "Wave-Equalizer". Since a 6C6 tube is used in the first stage, the control-grid lead is extremely short and widely separated from power leads. This makes it possible to use A.C. heater supply without appreciable hum.

A.C. or D.C. for noise. The first stage employs a type 6B6 tube with a '76 in the second stage. Power requirements are 6 volts A.C. or D.C. for heater circuits and 180-200 volts D.C. from Shure Model 41H Power Supply or batteries. The frequency characteristic is typical of all Shure "Wave-Equalized" Condenser Microphones—uniform within a total of only 4 db from 40 to 10,000 cycles. Output level is minus 32 db, based on a zero level of 6 milliwatts with a sound pressure of 10 bars.

The microphone head is chromium plated and polished overall, including protective screen, presenting a pleasing contrast to the rubber-black japanned finish of the case. Furnished with 25 feet of shielded, rubber-jacketed, multiple-conductor power cable, special chromium plated suspension adapter, one each type 6C6 and '76 tubes, and complete instructions. Dimensions: Case diameter, overall, 4" (10.16 cm). Overall height, 15" (38.1 cm.). Shipping weight, 10 1/2 lbs. (4.77 kg.).

**Accessories**


**STANDS and ACCESSORIES for "Wave-Equalized" CONDENSER MICROPHONES**

Microphone stands and accessories are described in a catalogue sheet devoted to this subject, which will be sent on request. Several popular "Automatic Friction Lock" Floor Stands and extra cable are listed below for convenience.


**DESK TYPE WITH REMOTE AMPLIFIER**

The amplifier is unobtrusive in appearance, resembling a standard telephone ringer box. The front cover is hinged and may be easily removed. A shielded coupling unit containing head coupling resistors and condensers is built around the input receptacle, thus eliminating induction noise. The first stage employs a 6C6 tube with a '76 in the second stage, making it possible to operate the heaters from A.C. or 6-volt storage battery. The circuit design and shielding have been worked out to permit the use of pure A.C. on the heater circuits with negligible resulting hum, even when the microphone output is followed by high-gain line amplifiers. (The Shure Model 41H Power Supply, described on page 4, operates from the AC line and furnishes all power requirements.)

Every amplifier component has been selected for the highest possible quality to insure the utmost in performance and reliability. Individually noise-tested high resistance units, low-loss mica coupling condensers, moulded bakelite tube sockets... these are but a few of the many points which have received careful engineering scrutiny. Individual parts and the complete unit are carefully inspected and tested for performance. The amplifier case is finished in rich rubber black matching the desk stand. The head is chromium plated and polished.

The output level is minus 38 db, based on a zero level of 6 milliwatts with a sound pressure of 10 bars. Output impedance, 200 ohms. Power requirements may be obtained from the Shure Model 41H Power Supply or from a 6-volt storage battery and 180 to 200 volt D.C. station high-voltage supply or "B" batteries. Dimensions: Height adjustable from 9" to 14" (22.86 to 35.56 cm). Amplifier case 10" High (25.4 cm). 7 1/2" wide (18.42 cm). 4 1/2" deep (11.4 cm). Shipping weight, 17 1/2 pounds (7.95 kg.). Furnished with one each type 6C6 and '76 tubes, twenty-five feet of multiple-conductor, shielded, rubber-jacketed power cable and complete instructions.

The Model 43F "Wave-Equalized" Condenser Microphone has been designed for stage and studio work where it is often desirable to have a microphone of small size which will not obstruct the view of audience or artist. This is accomplished by mounting the microphone head directly on a new Shure "Automatic Friction-Lock" Floor Stand which contains a high-gain two-stage preamplifier within the base. The head is connected to the preamplifier by means of a shielded, low-capacity, rubber-jacketed conductor which passes inside the upright tubing of the stand. The height of the microphone is adjustable with the silent, smooth, self-locking adjustment which has made Shure "Automatic Friction-Lock" Floor Stands famous the world over. The base of the stand is styled in the modern manner with beveled panel design and finished in baked rubber-black japen. The microphone head and stand fittings are chromium plated and polished.

The frequency characteristic is typical of all Shure "Wave-Equalized" Condenser Microphones—a total variation of only 4 db from 40 to 10,000 cycles. Output impedance is 200 ohms. The output level is minus 38 db, based on a zero level of 6 milliwatts with a sound pressure of 10 bars. The amplifier employs one type 6C6 and one '76 tube and is constructed of the finest quality components. Power requirements may be obtained from the Shure Model 41H Power Supply or from a 6-volt storage battery and 180 to 200 volt D.C. station high-voltage supply or "B" batteries. Furnished with twenty-five feet of multiple-conductor shielded, rubber-jacketed power cable and complete instructions.

Shipping weight 45 lbs. (20.43 kg.). Base diameter 15 in. (38.1 cm.). Height adjustable from 47" to 72" (119.4 to 182.9 cm.).

Model 43F, "Wave-Equalized" Condenser Microphone (Floor Stand Type with Preamplifier in Base). Complete with tubes and cable. Code: RUJEM. List Price........................................................................................................$190

SHURE MODEL 41H-53BC FLOOR STAND with POWER SUPPLY IN BASE

This new combination Floor Stand and Power Supply is intended for use with the Model 43D "Wave-Equalized" Condenser Microphone. When used in this manner, a completely AC-operated "High-Fidelity" microphone unit, which is highly convenient for remote and studio broadcasts and high-quality public-address work, is the result.

The stand is of the "Automatic Friction-Lock" type with a newly designed base, artistically proportioned in modern, paneled design. Finish is baked rubber-black japon with polished chromium-plated fittings. The "Automatic Friction-Lock" feature makes possible silent, smooth, self-locking adjustment of microphone height without set-screws or wing-nuts, a refinement affording the ultimate in convenience with perfect safety even in the hands of careless performers.

The power supply is completely shielded and protected in the cast-iron base. Stray hum is negligible and "ripple" is so low as to be inaudible even when the microphone is followed by very high gain amplifiers. The unit operates from 105-125 volt, 60-cycle A.C. lines and furnishes 6 volts A.C. at 6.8 amp., for heaters and 200 volts D.C. for tube plates and head polarization. A flush receptacle is provided inside the base for A.C. line connections. The microphone plugs into a receptacle on the side of the base. The stand is furnished complete with power supply mounted, one tested Type '80 rectifier tube, one plug each for microphone and A.C. connections, and complete instructions. Base diameter, 15" (38.1 cm.). Height adjustable from 44" to 69" (111.8 to 175.3 cm.). Shipping weight, 48 lbs. (21.8 kg.).

Model 41H-53BC, Combination Floor Stand and Power Supply, Complete as described above. Code: RUPOM. List Price..............................$79

SHURE MODEL 41H POWER SUPPLY

Operates from 105-125 volt 60-cycle A.C. lines and furnishes all voltage requirements for Shure Model's 43D, 43E and 43F "Wave-Equalized" Condenser Microphones. "Ripple" is reduced to negligible proportions by means of a multiple section filter. The unit delivers 6 volts A.C. for heaters and 200 volts D.C. for tube plates and head polarization. Equipped with six-foot A.C. cord and plug, primary On-Off switch, and plug for attachment to microphone cable. Binding posts for ground and speech-transport connections are provided. All parts are enclosed within a perforated chromium-plated case. Base finished in rubber-black japon. Dimensions: 6½" (16.42 cm.) wide, 7½" (18.42 cm.) high, 10" (25.4 cm.) long overall. Shipping weight, 12½ lbs. (5.67 kg.).

Model 41H, Power Supply. Complete with plug for microphone cable, A.C. cord and plug and one tested Type '80 rectifier tube. Code: RUHAB. List Price..............................................$40

GUARANTEE

Each instrument is guaranteed to be free from mechanical and electrical defects for a period of one year from date of shipment from factory; provided all instructions are compiled fully.

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SHURE BROTHERS COMPANY

Microphone Headquarters

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