

• PHONOGRAPH PICKUPS

SHURE

AND

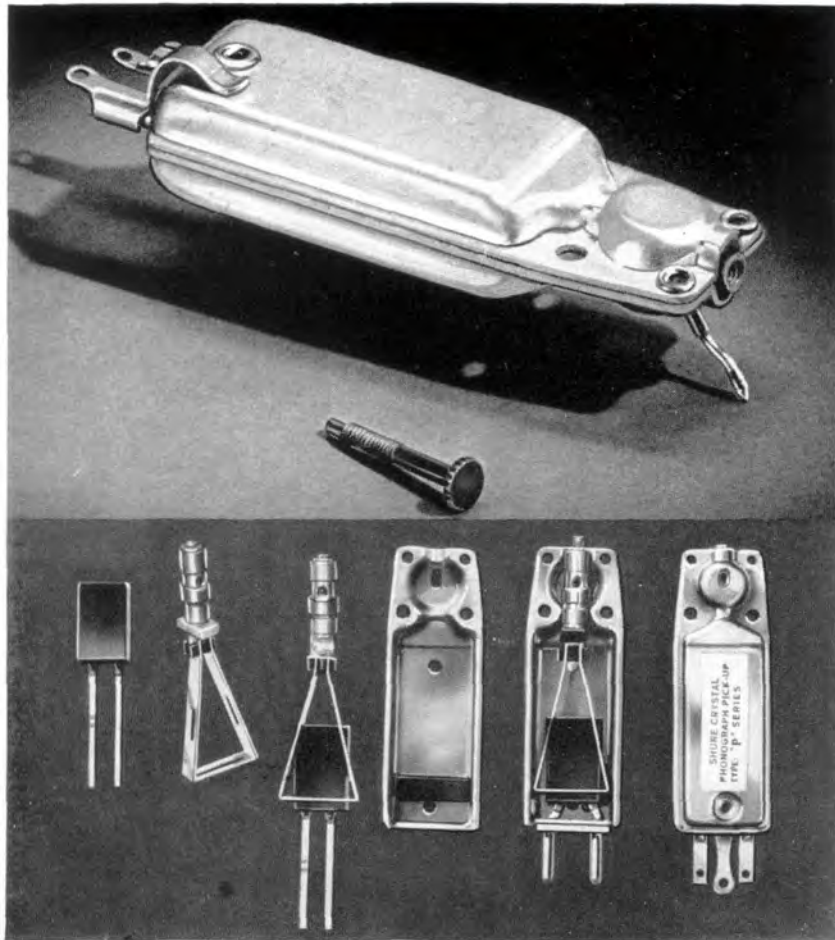
REPLACEMENT CARTRIDGES

CATALOG NO. 156

• FOR INFORMATION ON SHURE MICROPHONES SEE CATALOG NO. 155

SHURE

Lever-Type Cartridges



General Features: The Shure Lever-Type Cartridges listed here are for replacement of crystal cartridges in current use. They are widely used by leading manufacturers of radios and phonographs in original equipment. They offer extremely low needle-point stiffness with high output voltages. They are available in both steel and aluminum cases and are all furnished with quick, easy-to-use pin tips that eliminate the need of soldering.

How the Lever-Type Cartridge is Constructed:

The lever-type cartridge is a patented Shure development. As shown in the illustration, the crystal is mounted in an aluminum

lever. The torque transmitted from the needle chuck to the crystal by means of the lever is built up approximately 5 times. This has permitted decreasing the needle-point stiffness without loss of output voltage. The lever also protects the crystal from sudden shock and strain providing a more rugged cartridge for phonograph use. It produces the highest relative output for given needle-point compliance. This provides a distinct advantage for replacing cartridges of other types.

Basic Considerations For Selecting the Proper Replacement Cartridge:

1. Be certain that the mounting dimensions are the same. Most flat-type cartridges have standard mounting and are interchangeable.
2. Be sure that the output voltage of the replacement cartridge is equal to or slightly greater than the output voltage of the cartridge being replaced.
3. Be sure that the minimum needle force required is the same or lower in the cartridge replacing the original one.

Shure Lever-Type Cartridges will replace most Rochelle Salt standard flat-type cartridges. In addition, they offer the advantages of lower needle-point stiffness and higher output voltage. Where its use is possible, the aluminum case cartridge—W57A—also offers the additional advantage of a reduction in needle force. Its weight is only .43 ounce, making it much lighter than the heavier die-cast cartridges weighing from 1 to 1½ ounces. Installing an aluminum cartridge in a heavy tone arm or record changer arm can reduce the needle force of an existing record changer or phonograph by ½ to 1 ounce. In many cases this converts the heavy-weight pickup into a light-weight pickup and permits the use of permanent-point needles.

When installing aluminum pickup cartridges, be sure that the needle force is not reduced too greatly, as might occur if replacing a heavy cartridge in a counter-balanced arm. If the needle force is reduced to less than one ounce, some record changers might not trip properly. In such cases, the standard steel case—W58A, etc., are recommended.

MODEL	CASE	REPLACES SHURE	OR REPLACES	MIN. NEEDLE FORCE	VOLTAGE	SHPG. WT.	CODE
W57A	Almn.	P87, P93, P87B	Any Standard Flat-Type Cartridge of Equal Output	¾ oz.	1.6	¾ oz.	RUGLA
*W57AN	Almn.	P87, P93, P87B		¾ oz.	1.6	¾ oz.	RUGAN
W58A	Steel	99-182, P90S, P92B, W42A		¾ oz.	1.6	1 oz.	RUGLU
W59A	Steel	99-181, 99-180, W40A, W41A		1 oz.	2.5	1 oz.	RUGAT
W56A	Almn	P89		1½ oz.	4.3	¾ oz.	RUGUS

* With Sapphire Point Needle

SHURE

Glider Pickups



How the "Glider" Are Constructed:

Lever-Type Cartridge. Shure "Glider" use the new lever-type crystal pickup cartridge. The technical story of the lever cartridge is interesting and is given on the opposite page.

The lever cartridge offers high output and also very high needle-point compliance, making possible the use of an aluminum tone arm. The cartridge case is aluminum, helping to further reduce mass in the pickup. The cartridges are supplied with pin tips for easy servicing and quick replacement, eliminating the necessity of soldering.

Low Mass Tone Arm:

The high needle-point compliance and low mass of the lever cartridge makes possible the use of an aluminum tone arm for the first time. No springs or counter-weights are used, and an accurate, uniform needle force of $1\frac{1}{8}$ ounces is maintained. The arm has been scientifically curved to minimize tracking error and produce the best results. The pickup has standard $7\frac{1}{8}$ " mounting centers. A new arm rest is employed which is simple to install and easy to use. The new arm rest grips the pickup at the side, between the cartridge and the tone arm. No fussing around with buttons and locating the arm on the rest. The new design of the arm rest permits it to be mounted closer to the turntable, still permitting the use of 12-inch records. It takes the best advantage of minimum space.

General Features: The Shure "Glider" are light-weight crystal phonograph pickups with a needle force of only $1\frac{1}{8}$ ounces. They have extremely low needle-point stiffness but still have sufficient output to replace old-fashioned, heavy-weight arms. Shure "Glider" save records and needles, have smooth response, reduce surface noise, and reproduce the full tone qualities of the record with natural life-like clarity.

Applications: Due to high output coupled with light weight, Shure "Glider" are especially suitable for the replacement of heavy-weight pickups on older phonographs as well as for installation on new record players. The low needle-point stiffness is a very important advantage for home recording because it brings out the best in home discs without record wear. The low mass tone arm and light weight are excellent for a public address pickup—because they make the "Glider" less susceptible to vibrations, jar and shock.

How to Take Advantage of the New Market Opened by the "Glider":

Shure "Glider" Light-Weight Pickups are being used on many of the leading quality phonographs. Their advantages are many. Less needle and record wear . . . lower surface noise . . . the use of a permanent-point needle . . . better tone quality. You can have these same advantages on old phonographs, for the "Glider" is the first pickup with approximately the same output voltage as the old heavy-weight pickups. Therefore, they can be installed without loss of output. They give better tone quality, the opportunity to use permanent-point needles, and they save records. In addition, they also modernize your set. Whenever a cartridge needs replacement in a manually-operated phonograph, don't bother to change the cartridge—install a new Shure "Glider." It costs so little more . . . and your customer will be so much more satisfied.

MODEL	OUTPUT at 1000 CPS.	NEEDLE FORCE	RESPONSE	NEEDLE SCREW	SHIPPING WEIGHT	CODE
93A	1.6 volts	$1\frac{1}{8}$	60-6000 CPS	SET and THUMB	13 oz.	RUGLI
93AN	Same as 93A but with quiet sapphire point needle. (Replaceable)					RUGLO
96A	4.3 volts	$1\frac{1}{8}$	60-6000 CPS	SET and THUMB	13 oz.	RUGAB

FACTS You Should Know About Pickups

Factors influencing results obtained from crystal phonograph pickups are needle-point compliance, tone arm mass, tracking angle, voltage sensitivity, type of needle, and input characteristics of the amplifier.

Needle-Point Compliance: Needle-point compliance refers to the side-to-side resistance of the motion of the needle. The higher the compliance, the lower the side-to-side resistance. It is the needle-point compliance which determines the needle force required for proper tracking. However, as compliance is increased, voltage is also decreased. Therefore a practical limit is soon reached. The patented Shure lever system permits the highest relative needle compliance to output voltage. It permits greater compliance with higher output voltage than ever before obtained. The needle rides through the record grooves with a minimum of thrust and wear on the side walls, thereby reducing record wear and providing faithful tracking for true reproduction.

Tracking Angle: Fidelity of reproduction is enhanced by a curved tone arm which maintains the axis of the needle closely tangential to the record grooves throughout the playing time of the records.

Tone Arm Mass: Performance of a pickup is greatly influenced by the tone arm. The high needle compliance of the "Glider" makes it possible to use a low mass Tone Arm without undesirable low frequency resonances. The "Glider" uses an aluminum arm that has no springs or counterweights. The low mass makes the pickup less susceptible to floor vibrations and improves the playing of warped records.

Voltage Sensitivity: Shure Lever-Type Phonograph Pickups, depending upon the model, have output voltages of 1.5 to 4.3 volts, for an overall groove amplitude of 0.84 mil at 1000 cycles, and 10 to 30 volt peaks on commercial records. The lower voltage ranges are equal to or greater than those produced by heavy, stiff pickups of older design and are sufficient to produce full output from audio stages of modern radio receivers or moderate gain amplifiers. The higher voltage ranges are more than adequate to drive directly the grid of certain pentode output stages.

Type of Needle Used: "Glider" Pickups will work with any of the conventional needles. The low needle-force makes it feasible to use sapphire or precious metal tipped needles without excessive needle or record wear. The high frequency response of the pickup will depend to some extent on the needle chosen. Typical response characteristics with various needles are shown in Figure A. The Phonograph Pickup used in the response characteristics is the Shure 93A "Glider".

For Shure Pickup and Cartridge Prices See Current Shure Price List

Shure Crystal Pickups Licensed Under Patents of Brush Development Co.

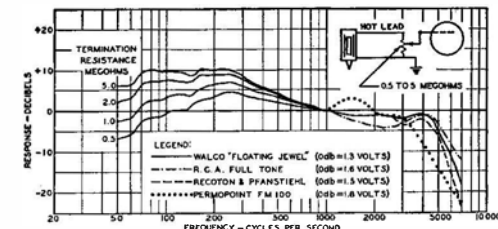


Fig. A. Typical Response Characteristics of the 93A.

Amplifier Input Circuits: In the design of phonograph equipment, quality performance is not automatically assured by choosing better-grade components for the play-back mechanism. The circuit connecting the Pickup to the amplifier plays an important part in the satisfaction which the user obtains from the instrument.

Figure A also shows effect of termination resistance as the response of a Pickup below 500 C.P.S. The user can adjust the low frequency response over wider limits by proper choice of resistance of the input potentiometer or grid resistor. A value of 1.0 megohm will be satisfactory in most cases. The high frequency response is not affected by the value of the terminal resistance.

To reproduce a record in the manner intended by the recording director, the characteristic of the play-back system should match the characteristic of the recording system. For more uniform response at low frequency which conforms to the response of commercial records, the low frequency equalizer circuit of the type shown in Figure B may be employed.

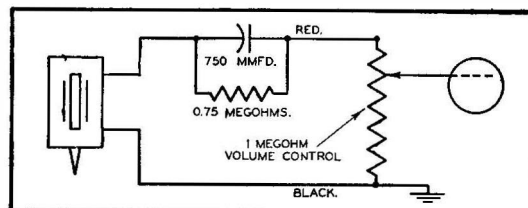


Fig. B. Compensation Circuit.

Surface Noise: Surface noise or "needle scratch" is produced by the passage of the needle over the minute irregularities in the surface of the record grooves. The amount of surface noise noticed will depend upon the overall frequency response of the play-back system and upon the condition of the record. Some needles are designed to decrease record noise by providing attenuation of the high frequency response. Where maximum fidelity is not important it is possible to decrease audible needle-scratch by using the tone control on the amplifier or receiver to attenuate the higher frequencies.

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