

# SONOTONE "8" SERIES

Patented—2,769,867  
2,838,723  
2,717,929  
2,798,120  
2,699,470

## SUPER-FIDELITY STEREOPHONIC CARTRIDGES

**PERFORMANCE STANDARDS:** The Sonotone "8" series stereophonic cartridges have been specifically designed for optimum performance on stereophonic 33 $\frac{1}{3}$ rpm fine groove vinyl records cut according to the RIAA (Record Industry Association of America). Installation of this cartridge according to the following instructions will provide audible proof of the superlative quality of the Sonotone "8" series stereophonic cartridge. The "8" series cartridge will also give equally high quality reproduction of standard monaural 16, 33 $\frac{1}{3}$ , 45, and 78rpm records.

### ELECTRICAL

**Frequency Response (each channel)**—Flat  $\pm 1.5$  db out to 12,000 cycles followed by a smooth rolloff to 20,000 cycles. This is the response to the RIAA characteristic using the optimum loading network described below. No other "equalization" is required.

**Output Voltage (each channel)**—0.3 volt for 45° velocity at standard stereophonic recording level of 3.9 cm/sec.

**Channel Isolation**—20 db at 1000 cycles for full stereophonic effect.

**Impedance (each channel)**—Equivalent to a 615 mmfd capacitance.

**Load Impedance (each channel)**—Optimum loading network as given below.

### MECHANICAL

**Compliance**— $2.4 \times 10^{-6}$  cm/dyne for both lateral and vertical motion. This high flexibility means ex-

### INSTALLATION: Mechanical "8" Series

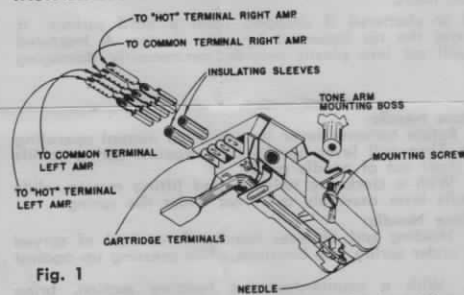


Fig. 1

1. Inspect tone arm for proper stereophonic wiring. Four wires indicate two pairs of independent leads, one pair for each channel (see figure 1). Three wires indicate a common ground connection and one wire for each channel (see figure 2).
2. Solder the terminal clips provided to the tone arm leads. Where only three leads are provided, solder two clips to the common ground lead (see figure 2). **CAUTION: DO NOT SOLDER LEADS TO CARTRIDGE TERMINALS OR TO TERMINAL CLIPS WHILE ATTACHED TO CARTRIDGE.**
3. Slip an insulating sleeve over two of the clips as shown in Fig. 1 for the four terminal connection; or as shown in Fig. 2 for the three terminal connection.
4. Mount cartridge, using hardware provided. Make certain the leads are not shorted to each other or to tone arm.

cellent low frequency tracking ability in both lateral and vertical directions, a factor which lengthens record and stylus life.

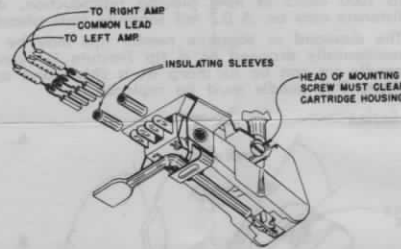
**Stylus Mass**—Less than 11 milligrams. This low value of effective mass (a specific design requirement) means excellent high frequency tracking at low vertical force, a factor which lengthens record and stylus life.

**Vertical Stylus Force**—4 to 6 grams with professional single play equipment; 6 to 8 grams for good quality phonograph changers.

**Rumble Elimination Filter**—A unique feature which eliminates vertical turntable rumble without affecting the quality of the stereophonic program material. This mechanical filter consists of the spring mounting bracket acting in conjunction with the cartridge mass.

**Weight**—7 grams.

**Needle Replacement**—The needle assemblies for all "8" series cartridges are easily replaceable without special tools.

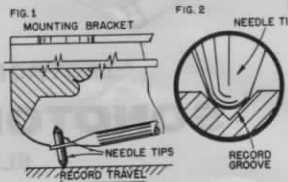


FOR STEREO ARM WITH THREE TERMINALS OR COMMON GROUND, THE TWO COMMON LEADS ARE CONNECTED.

Fig. 2

5. Remove needle guard and adjust the vertical needle force consistent with good performance. This force should be between 4 and 8 grams, depending upon tone arm used, as well as equipment and record condition.
6. Check to see that proper needle tip is in playing position. For stereophonic records as well as 16, 33 $\frac{1}{3}$  and 45rpm lateral records the 0.7 mil tip is required; for 78rpm, the 3 mil. To interchange the tips on the "8T" series, the lever handle should be pressed downward under the tone arm to the opposite side. When "LP" shows, the 0.7 mil tip is in position; when "78" shows, the 3 mil tip is in position.
7. Check electrical connections to be certain that both cartridge outputs are fed to amplifier input impedances consistent with the circuits shown.

**CARTRIDGE PLAYING POSITION**—With the "8T" cartridge properly installed, a side view of the needle on the record should appear as shown in Fig. 1. It might appear at first that the needle tip would tend to dig into and scratch the record. However, the needle-tip, record groove geometry, as shown by the enlarged front view in Fig. 2, is such that this is not true. The tip of every Sonotone needle is precision ground and polished to the proper spherical shape which contacts the "V" shaped record groove at a point on each side of the spherical tip. The angular position of the needle, therefore, has no effect upon the way in which the tip rides in the groove and cannot cause any damage to the record.



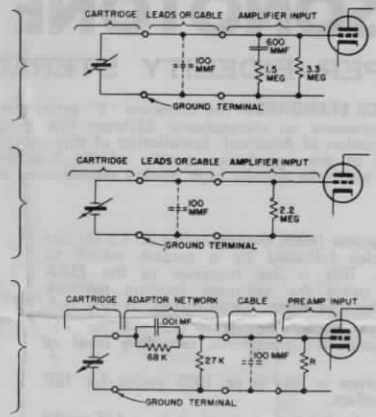
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**INSTALLATION: ELECTRONIC APPLICATIONS DIVISION**  
**OPTIMUM LOADS—FOR EACH CHANNEL**

**Network** — Use of this network at the input of a flat amplifier will result in system performance as previously specified (flat  $\pm 1.5$  db, 0.3 volts at 1000 cycles). For best results, the cable capacity should be 100 mmf (about 2 ft. of average phono cable). The cable capacitance may be increased to as much as 200 mmf (4 ft.) without noticeable change in performance.

**Resistive** — In this case, the proper value of amplifier input resistance will result in response which is flat  $\pm 2.5$  db for frequencies below 1000 cycles. Response above 1000 cycles and voltage output remain the same as for the network load. Again, cable capacitance should be kept low. The value of load resistance may be increased or decreased to similarly affect bass response.

**Magnetic Adaptor** — For direct replacement of magnetic (velocity) cartridges, the adaptor network shown will convert the cartridge response to better than that obtained from most magnetic cartridges, i.e. flat  $\pm 1.5$  db for constant velocity of the stylus. The preamplifier input resistance, R, will determine the 1000-cycle voltage level. For a 10-millivolt level, R = 10K ohms; 20 mv — 33K ohms; 30 mv — 150K ohms. If you desire a complete Sonotone fabricated magnetic adaptor kit, see your Sonotone dealer.



**NEEDLE REPLACEMENT**

**WHEN TO REPLACE NEEDLES:** As it traces along the record grooves, the needle tip rubs against the groove walls. In time, both the needle tip and the record groove surface will become worn. Low vertical needle force and clean dust-free records are factors which minimize wear, but wear occurs as long as the tip slides on the record. A worn needle tip will cause noticeable distortion and a worn record will have noticeable surface noise. The needle should be replaced at the first signs of noticeable distortion. Further, besides being noisy, a worn record accelerates needle wear. A 0.7 mil diamond tip should be good for about 500 to 1000 hours of long playing reproduction, depending upon system quality and upon how critical the listeners may be. A 0.7 mil sapphire lasts about 10 to 50 hours.

The diamond or sapphire needle tips may be chipped or shattered if dropped upon a hard surface. If accidentally dropped or if tip fracture is suspected, have the tip inspected by your dealer. A fractured needle tip can be as sharp as a chisel and as such will cut into plastic records, permanently damaging them. This needle must be replaced.

**"8" Series**

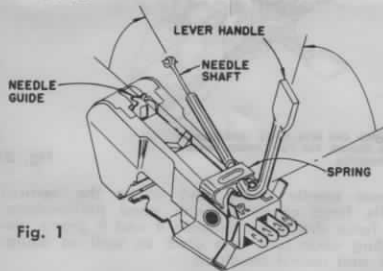


Fig. 1

- A. **To Remove Needle:**  
 Fig. 1. Rotate turnover lever  $\frac{1}{4}$  turn from normal operating position. Then pull lever handle back against spring to lift needle shaft out of needle guide.  
 Fig. 1. With a clockwise twisting and lifting motion, slide the needle lever assembly out from under the spring.

- B. **To Replace Needle:**  
 Fig. 1. Holding end of lever handle, force heel of curved portion under spring into bearings while pressing up against spring.  
 Fig. 1. With a counterclockwise twisting motion, bring needle shaft into line above needle guide. Then lower the needle shaft, making sure it engages in the "V" of the needle guide. If properly installed, the lever should rotate smoothly and snap into either operating position.

- C. **Replacement Needle Part Numbers:**  
 Order Sonotone needles according to the following part numbers:  
 N-8T-SD — 0.7 mil diamond, 3 mil sapphire  
 N-8T-D — 0.7 mil diamond, 3 mil diamond  
 N-8T-S — 0.7 mil sapphire, 3 mil sapphire

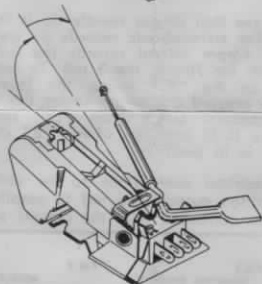


Fig. 2

**MAINTENANCE AND SERVICE:** The "8" series cartridges are precision devices and should receive the same care and attention as a fine watch. "Flicking" the needle with the finger tip to see if system is "on" could cause damage and should be avoided. Play a record to check the system. The needle tip and records should be kept free of dust, which often contains harmful abrasive grit. A soft camel-hair brush will remove dust safely and easily. If your cartridge requires further service or was received defective, return it to the dealer from whom it was purchased.

ELECTRONIC APPLICATIONS DIVISION

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ELMSFORD, NEW YORK

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