

SPECIFICATIONS

**Sensitivity:** Output at 1000 cycles — 4.5 millivolts ± 2db per channel on WS-1A Test Record (5 centimeters per second).

**Response Frequency Characteristic:** From 20 to 20,000 c.p.s. ± 2.5db (See Fig. C). There is considerable response down to 10 cycles and up to 30,000 cycles per second.

**Channel Separation:** More than 20db at 1000 cycles per second.

STYLUS M21 CARTRIDGE

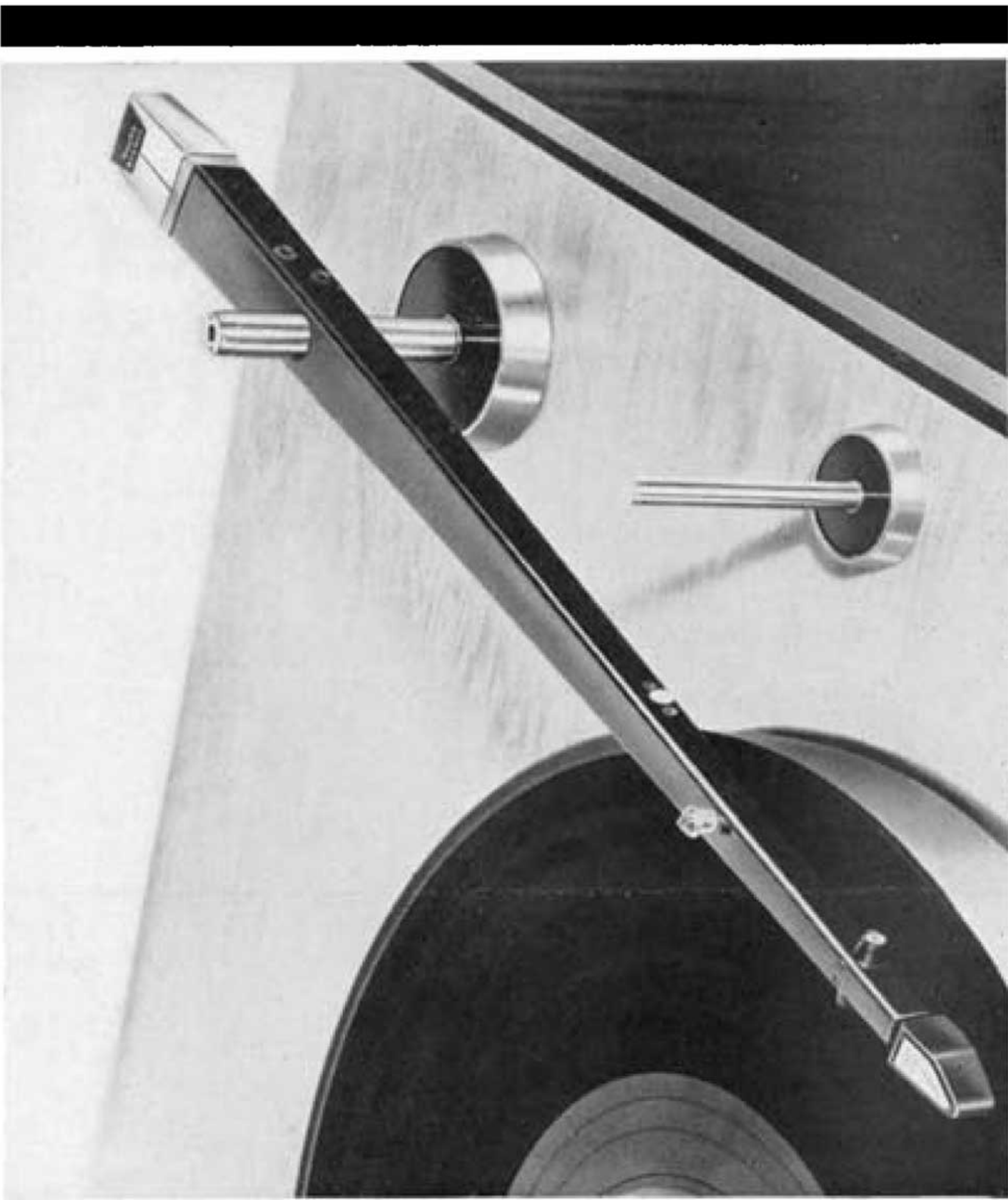
- Needle tip material .....Diamond
- Needle tip radius .....0.7 mil (0.018 mm.) ± 0.1 mil
- Lateral and vertical needle tip compliance .....9.0 x 10<sup>-6</sup> centimeters per dyne
- Needle tip mass .....1.3 milligram
- Tracking force .....1.5 to 2.5 grams — adjustable

**Recommended Load Impedance:** 47,000 ohms. Higher values of load impedance will produce a slight increase in high frequency response.

- Inductance .....400 millihenries per channel
- D. C. Resistance .....600 ohms per channel

Dimensions	Model M216		Model M212	
	in.	mm.	in.	mm.
Overall length .....	14¾	374	11⅝	287
Stylus to center of base ..	11	279	8½	216
Base diameter .....	2	50.8	2	50.8
Range of height of adjustment .....	1⅝	41.3	1⅝	41.3
Arm pivot to turntable center .....	10⅞	269	8¾	210

- Weight M216 .....11.1 ounces (315 g.)
- Weight M212 .....10.6 ounces (300 g.)
- Replacement Styli:
  - M21 Cartridge —
  - Shure N21D Stylus .7 mil radius (0.018 mm.)



SHURE STUDIO

Stereo Dynamic

PHONO REPRODUCER

M 2 1 6 / M 2 1 2 / M 2 1 / N 2 1 D

222 HARTREY AVE • EVANSTON, ILL • CABLE SHUREMICRO

SHURE

MICROPHONES AND ELECTRONIC COMPONENTS

EVANSTON PHONE DA-8-9000 • CHICAGO PHONE SH 3-1600



## General:

Model M216 Studio Stereo Dynetic reproducer is of the highest quality, employing a new electromagnetic transducer for playing monophonic and stereophonic phonograph records. It is intended to reproduce recordings with needle forces of 1.5 to 2.5 grams practically eliminating record and needle wear. The Model M216 Studio Dynetic is intended for studio and professional use and is capable of reproducing records up to 16" (40 cm.) in diameter. The M212 Studio Dynetic is similar to Model 216, but is intended for use with equipment where space is limited. It is designed to reproduce records up to 12" (30 cm.) in diameter.

The cartridges in the Studio Stereo Dynetic reproducers are of the plug-in type and can be readily removed and replaced. Both models M216 and M212 play stereo discs stereophonically, monophonic discs monophonically and stereo discs monophonically. For perfectionists who demand the ultimate in monophonic reproduction, the Shure Studio Dynetic Monophonic Cartridge (Model M1) can be used in place of the Stereophonic Cartridge (Model M21). The Model M21 Stereophonic Cartridge has a replaceable 0.7 mil (0.018 mm.) radius stylus bearing the Model Number N21D.

The needle load in the Studio Stereo Dynetic reproducers is readily adjustable by turning a counter-balance (See Fig. A) visible from underneath the arm. With a high grade turntable and motorboard free of vibrations, the counter-balance may be adjusted as far from cartridge as possible resulting in a 1.5 gram needle load. Under unsatisfactory conditions of motorboard vibration or when playing records with extremely high modulation, the counter-balance may be set all the way towards the cartridge, resulting in a 2.5 gram needle load. The Studio Stereo Dynetic reproducer is available with diamond styli only. To prevent damage, the diamond stylus is packaged in a separate plastic container and should only be installed after mounting the arm.

A magnetic type arm rest designed to harmonize with the appearance of the Studio Stereo Dynetic reproducer, is furnished in the package.

## Features:

The Studio Stereo Dynetic reproducers embody exclusive improvements which represent a break-through in the art of phonograph reproduction.

1. *The Dynetic Principle employs a moving magnet transducer which provides extreme linearity and freedom from distortion. The stylus assembly is readily removable and can be replaced by the user.*

2. *Since the magnet has its mass concentrated at the pivot point, it is possible to place the diamond tip at the end of a light beam providing a needle tip mass of 1.3 milligrams. The stylus assembly is held in a durable elastomer composition which provides a lateral and vertical needle compliance of  $9 \times 10^{-6}$  cm. per dyne. Because of these factors, needle talk is practically nonexistent.*

3. *The tone arm is made of light high-strength aluminum in the form of a column tapering toward the front and reinforced at midpoint for greater strength. Because of this construction, the arm is devoid of resonance. A new groove-oriented stylus assembly provides the correct offset angle for proper tracking.*

4. *All of the load bearing pivots are jewelled. The cartridge is mounted on a balance beam which has a cross shaft pivoting in a sleeve-and-cap ruby bearing at either end. The main arm bearing is a convex ruby thrust bearing. These bearings are extremely sturdy, durable, and provide an almost frictionless pivot designed to provide a lifetime of trouble-free service.*

5. *The arm is brought into position to play a record by means of a stylus control button (See Fig. A). The cartridge is lifted by pressing the control button. With the finger pressed down on the button, the arm may be brought into any desired position on the record. When the button is released, the stylus contacts the grooves gently with a force of 1.5 to 2.5 grams (depending on counter-balance adjust-*

*ment). In the normal operation of the arm, the cartridge never needs to be touched. By using the control button, it is next to impossible to damage the record or the needle.*

6. *The Studio Stereo Dynetic reproducer is fully balanced around the vertical axis and this provides maximum stability to the reproducer. The need for leveling of the motorboard is entirely eliminated.*

7. *A newly developed dynamic damping system is employed in the Studio Stereo Dynetic reproducer. The counter-balance is floated on a suspension bar imbedded in special elastomer damping material (See Fig. A). Any tendency of the arm to resonate is damped by this member, helping to keep rumble and "boom" to a minimum.*

The Models M212 and M216 reproducers are recommended for the highest quality applications where a stereophonic reproducer is required, such as playing back master records, broadcasting, highest fidelity home systems, etc.

The M212 and M216 reproducers have adequate output to operate all modern preamplifiers. The characteristics of the cartridge permits the use of up to 15 feet (4.6 m.) of recommended cable between the pickup and the preamplifier with no loss of high end response (see connections).

The M212 or M216 reproducer may be mounted on any convenient place on the motorboard. For optimum tracking angle reduction, the M216 reproducer is mounted with the needle tip passing  $\frac{7}{16}$ " (11.1 mm.) beyond the center pin of the turntable. The M212 reproducer is mounted with the needle top passing  $\frac{1}{4}$ " (6.4 mm.) beyond the center of the turntable.

A template is included with the reproducer to facilitate correct installation of the reproducer and the arm rest with respect to the turntable.

When properly mounted the Studio Stereo Dynetic reproducers are less subject to the effects of floor vibration than conventional high-fidelity pickups and they will not be unduly affected by walking, dancing, etc. in the vicinity of the reproducer. To achieve this type of performance, both the reproducer and the turntable should be rigidly attached to the motorboard. In this manner any vibration reaching the motorboard will act equally upon the turntable and the reproducer, thus cancelling the effect of vibration. It is recommended that the motorboard itself be at least  $\frac{3}{4}$ " (19.1 mm.) thick and be mounted on a sponge rubber strip to minimize the possibility of being set into motion by vibrations.

The following steps are recommended in installing the Studio Stereo Dynetic reproducer (See Fig. A):

1. *Remove the cartridge by gently pulling it lengthwise away from the arm. This is to avoid the possibility of damage during installation.*

2. *Using the template, drill three starting holes for the mounting crews which fasten the base against the motorboard (if the motorboard is made of metal, drill three through holes of suitable size).*

3. *Drill through hole for the leads, as indicated on the template.*

4. *Fasten stand-off terminal strip at any convenient place underneath the motorboard, near the location of the arm base.*

5. *Fasten the base in place securely using the three larger wood screws furnished. (For mounting to metal turntable base, use the three larger machine screws furnished.) Slip over the arm pivot post the black ornamental disc so that it is seated in the larger recess at the top of the base, with the slot aligned with lead hole in the base.*

6. *Slip the template on the base and pivot it to any convenient place on the motorboard. Locate and drill the holes for the arm rest and fasten arm rest in place with the three small wood screws furnished. (For mounting to metal turntable base, use the three smaller machine screws furnished.) Slip the black ornamental disc on the arm rest.*



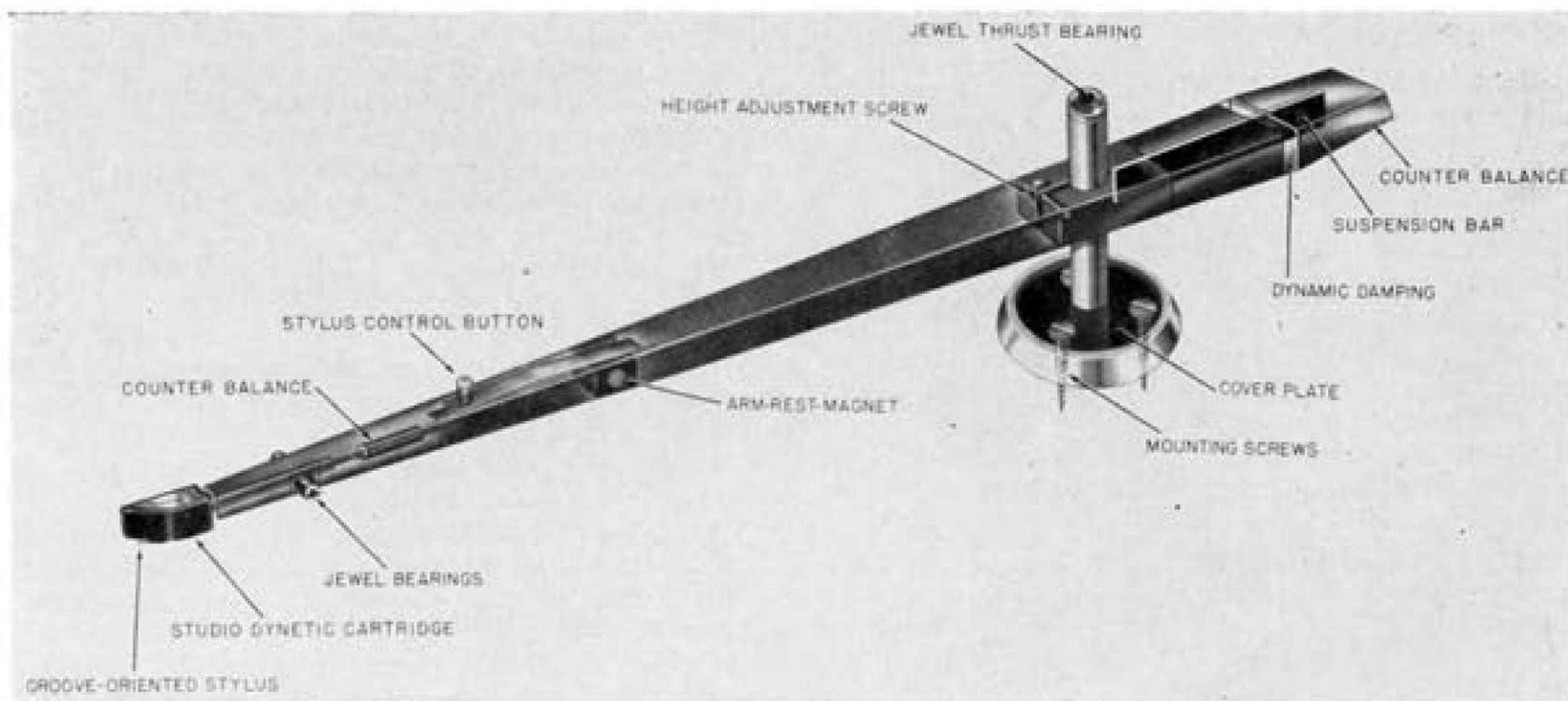
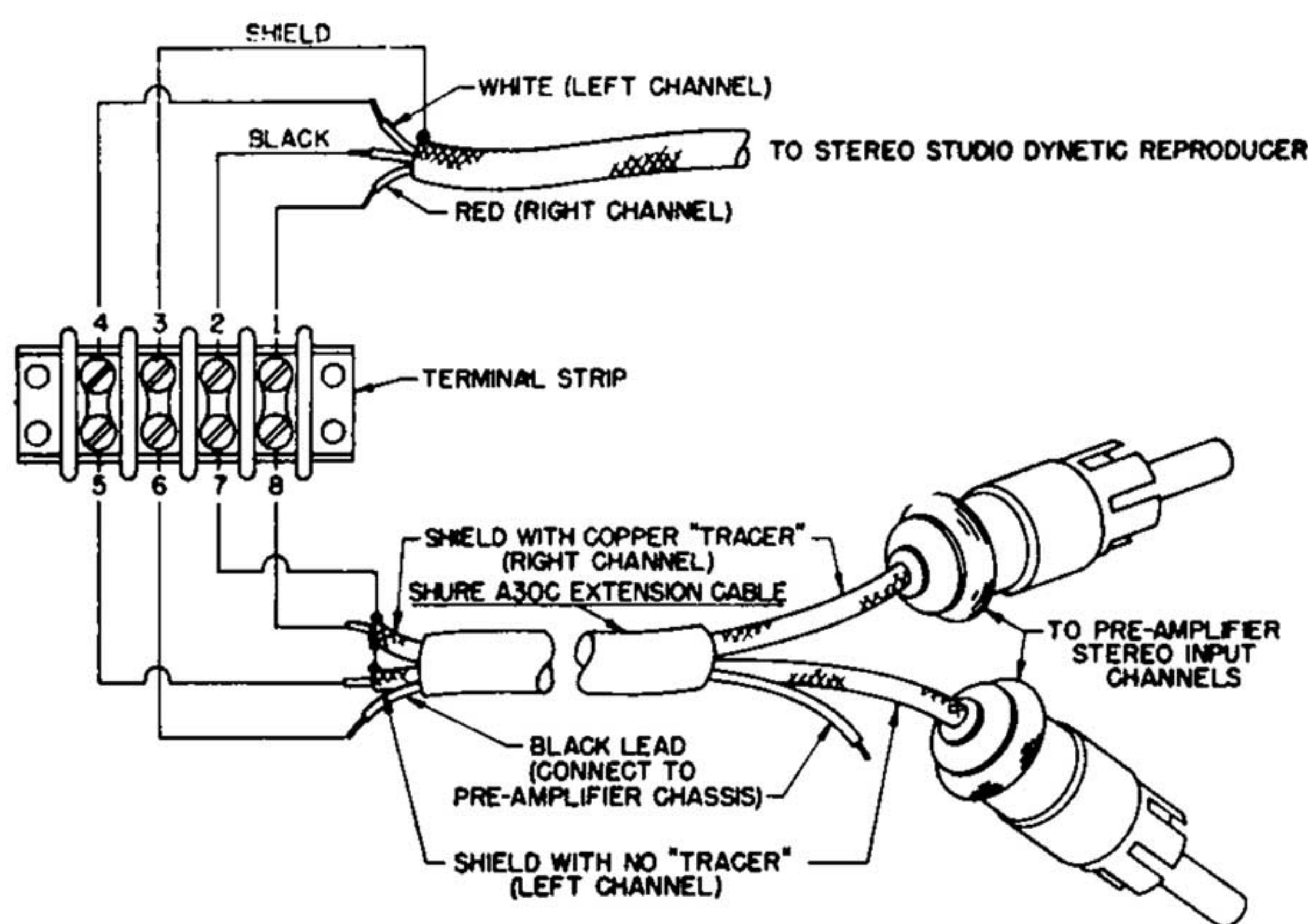


FIGURE A

7. Slide the arm on the post and tighten height adjustment screw gently so that the bottom edge of the front of the arm is approximately 5/16" (7.9 mm) from the surface upon which record rests. (Caution: The cartridge should be removed from the arm during this adjustment) The height adjustment screw should be tightened only sufficiently to hold the arm firmly in place. Excessive tightening will deform the vertical bearing and prevent free motion of the arm.

The circuit diagram of recommended connections for Stereo is shown in Fig. B.

8. Thread the pickup lead through slot in the black disc and through the hole in the base, and connect to the terminal strip. Make sure the leads are sufficiently slack to permit the arm to move freely. The red lead represents



NOTE: CONNECT ADDITIONAL LEAD FROM TERMINAL 3 (OR 6) TO MOTOR AND/OR TURNTABLE GROUND

FIGURE B

the right channel and should be connected to terminal 1 on the terminal strip; the white lead represents the left channel and should be connected to terminal 4; the black lead is the common "ground" and should be connected to terminal 2; the shield of the cable should be connected to terminal 3.

The Shure A30C Extension Cable is an available accessory especially designed to connect the Stereo Studio Dynetic as shown in Figure B. The A30C is a six foot (1.8 m.) low capacity, two conductor shielded cable with a third unshielded lead beneath the jacket. A copper "tracer" is used in the shield of one of the shielded conductors for identification when connecting the cable to the pickup and amplifier.

If the A30C Extension Cable is not available at your dealer, it may be obtained for \$1.95 postpaid by sending

a check or money order to Shure Brothers, Inc.

The shielded conductor with the copper tracer shield should be connected to terminal 8 (right channel) of the terminal strip; the shielded conductor with NO tracer should be connected to terminal 5 (left channel); both shields of the A30C cable should be connected to terminal 7 (common ground); the unshielded black lead of the A30C cable should be connected to terminal 6 and to the pre-amplifier chassis. A separate wire should, also, be connected from terminal 6 to the motor and turntable ground.

As a substitute for the A30C Extension Cable, two single conductor shielded cables and a separate unshielded lead may be used and connected as in Figure B.

9. Install the needle in the cartridge in accordance with instructions (see "stylus installation and replacement"). Handle the needle with care, but be sure that needle is firmly seated in socket. Use gentle and sufficient pressure to accomplish this. A poorly set needle will affect tracking and cause distortion.

10. Replace the cartridge in the arm socket. Check height of arm by gently and carefully swinging the arm over the turntable pad. In some installations, it may be desirable to raise or lower the arm to insure proper record contact or turntable clearance. The tip of the stylus must clear the pad to prevent damage to the stylus.

When mounting the M212 Studio Dynetic Reproducer on the Rondine Rek-O-Kut B12 Series turntables, the Shure A29R Adapter Plate is an available accessory, designed to mount on the turntable chassis, using the pre-drilled and tapped holes in the upper right hand corner of the chassis. (See information provided with the turntable.) The adapter mounts with three 8-32 screws.

The M212 reproducer can now be installed on the adapter plate using the 8-32 screws provided with the A29R Adapter. (See instructions for mounting reproducer under "Installation.")

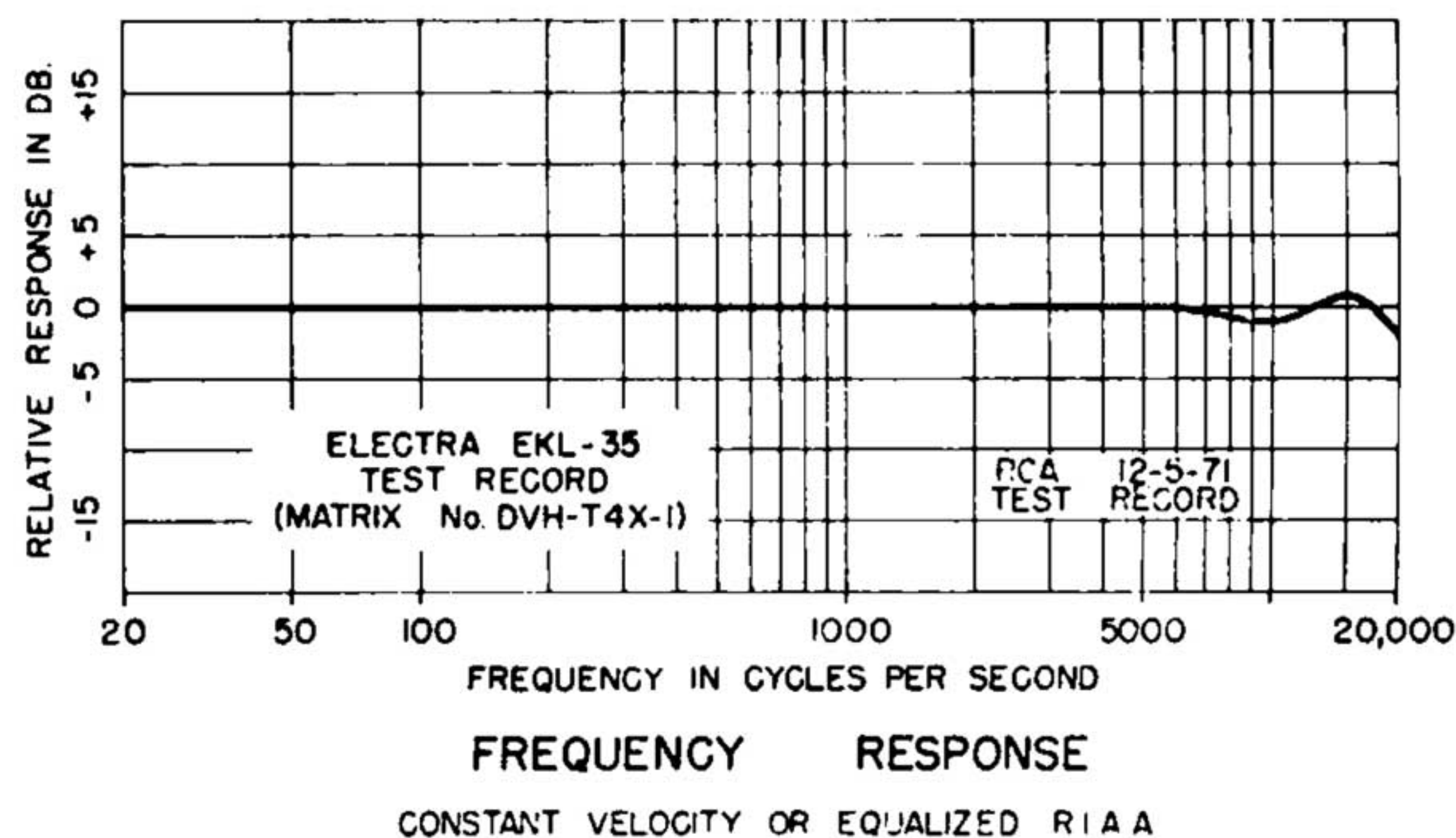


FIGURE C



## Operation:

Place a record on the turntable, press the stylus control button, and move the arm so that the stylus tip is over the desired place on the record. Release the control button and the tip will fall gently into the groove. The ornamental name plate at the top of the cartridge has a line which indicates the location of the stylus. In this manner, it is very simple to find any desired selection on a record.

The records should be kept clean and free from dust and scratches. In playing dusty records, it will be found that dust accumulates on the tip of the stylus. This can seriously affect tracking of any high fidelity reproducer. The stylus tip should be cleaned periodically with a soft camel's hair brush. This can be done without removing the needle or cartridge from its socket. Brush along axis of needle to remove dust.

No special precautions are necessary beyond ordinary care. The reproducer will operate dependably in hot or cold climates.

## Phasing:

It is important to maintain correct phasing of both loudspeakers. Although the phasing of the Models 216 and 212 are carefully controlled, there are many possibilities where a particular High Fidelity system can cause opposite phasing of the sound from the speakers. The phasing can be easily checked by a listening test. Play a monaural record using the Studio Stereo Reproducer. Reverse the connections of the wires to one speaker. This can be done at the amplifier or the speaker, whichever is more convenient. When the sound appears to come from a point halfway between the speakers, they are in phase. Also, bass reproduction will be much fuller when speakers are correctly phased.

## Associated Equipment:

For reproducing stereo records you require the same basic equipment that you need for playing monaural records. However, you will need two amplifiers, two preamplifiers and two speakers. If you already have a monaural system then you need to add the extra preamplifier, amplifier and speaker. Figure D shows typical stereo systems.

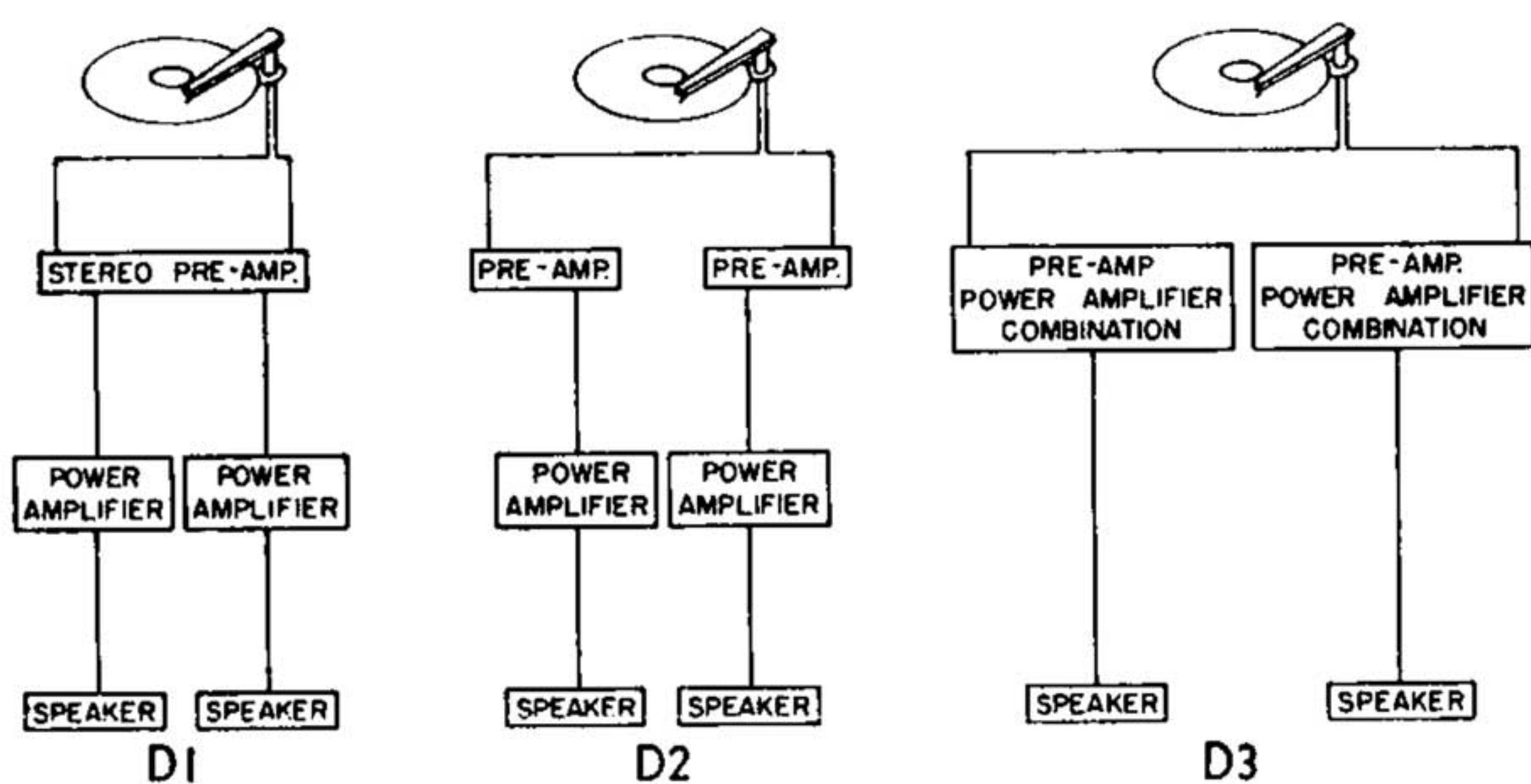


FIGURE D  
TYPICAL STEREO SYSTEMS

If your system is represented by Figure D1, merely follow the connection instructions that accompanied your stereo preamplifiers.

If your system is represented by Figure D2 or D3, consider your stereo dynetic as two separate arms and connect one set of leads (see connection) to each pre-amplifier. In general, these leads should be connected to the "low level" phono input. Again, the instructions that come with each of your preamplifiers will be your best guide in making these connections.

After making the arm connections, it is necessary to balance the system by adjusting the volume from each channel until they are equal. To do this, play a monaural record. Adjust the volume control on one preamplifier until you have the sound as loud as you want it. Then, adjust the volume on the second preamplifier to match the first.

It will become apparent to you when performing the operation that you will have to adjust the balance between the channels every time you wish to raise or lower the volume. There are several relatively inexpensive devices available that provide a solution to this problem by means of a master volume control that controls the sound level from both channels with a single control. The dealer from whom you purchased your stereo dynetic will be able to give you information on a device of this type.

## Speaker Placement:

Because acoustic factors vary so greatly from room to room, it is impossible to establish a definite rule of speaker location for optimum results. In general, the speakers should be placed along the wall of the room opposite the most comfortable listening area. The speakers should be separated by a distance equal to  $\frac{1}{2}$  to  $\frac{3}{4}$  of the width of the wall against which they are placed. It is well to keep in mind the fact that the farther apart the speakers are the farther away you will be able to sit and still achieve good results. Also, the closer together the speakers are, the closer you will have to sit and the fewer the number of people that will be able to listen at one time. By experimenting with the placement of the speakers, you can determine the location that will give the best results in your particular room.

## STYLUS REPLACEMENT

**Special Note:** The "Dynetic" Stylus assembly used in this cartridge is its most critical component. To maintain the original performance standards of your cartridge be certain that any replacement stylus you buy bears the following certification on the package:

"This 'Dynetic' Stylus is precision manufactured by Shure Brothers, Inc."

Avoid inferior imitations. They will seriously degrade the performance of your cartridge.

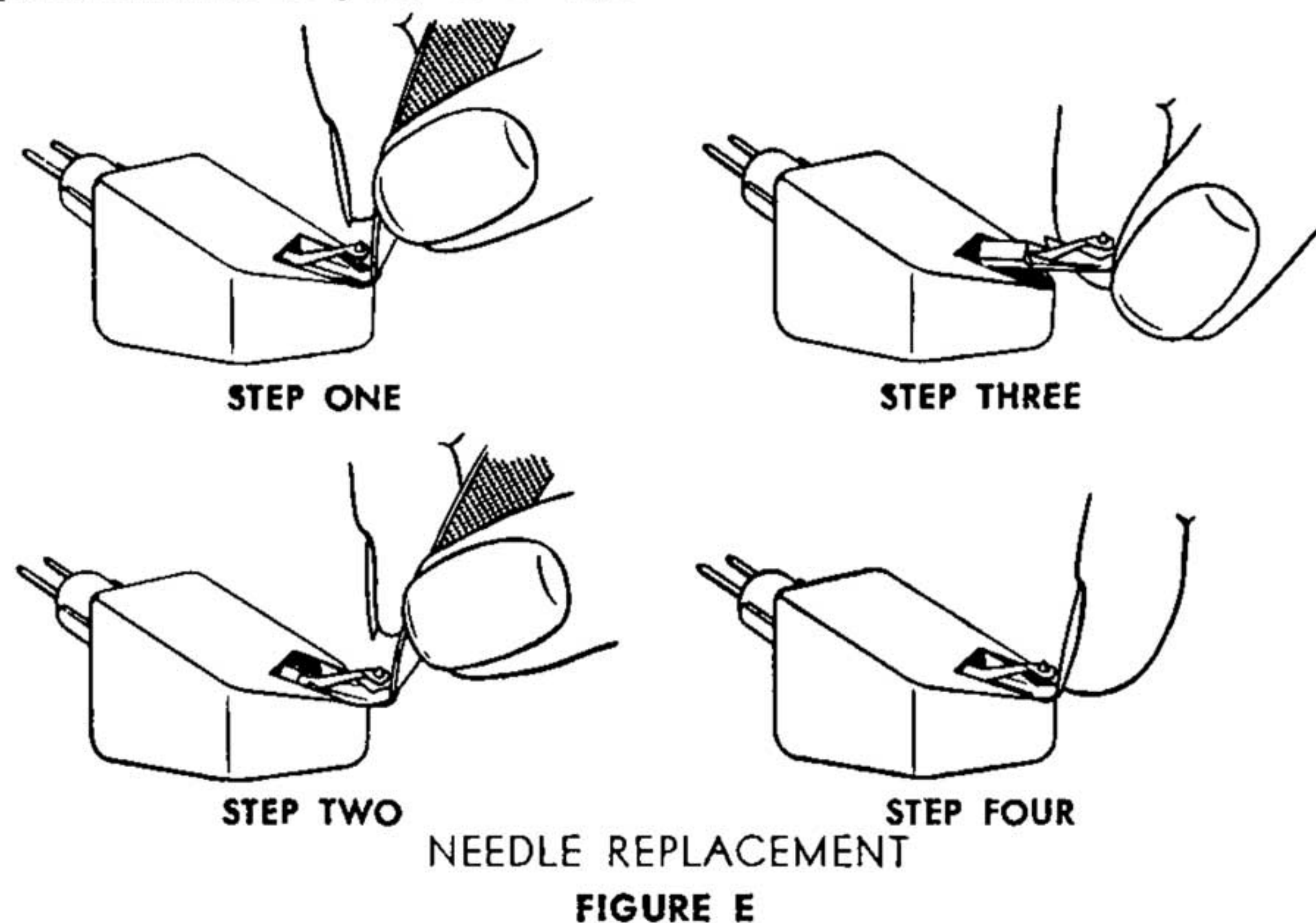


FIGURE E

Stylus replacement is simple and fast (See Figure E). To replace (Step 1) — Insert fingernail file (or a similarly pointed tool) behind the lip at the front of the stylus spade. Care must be taken not to deform needle shank (portion holding needle tip) or spring wire in the stylus assembly. (Step 2) — Withdraw stylus by pulling forward out of cartridge — lift completely out with thumb and forefinger. (Step 3) — Grasp new stylus between thumb and forefinger and insert into stylus socket cartridge. (Step 4) — Press stylus into socket until it is firmly seated. Apply pressure at the front portion of the spade. Care must be taken not to allow the finger to slip off the front of the stylus spade, resulting in damage to the stylus tip.

## Guarantee:

Each Studio Stereo Dynetic Reproducer is guaranteed to be free from electrical and mechanical defects for one year from the date of shipment from the factory, provided all instructions are complied with fully. The guarantee does not cover needle wear nor does it cover damage to the needle from abuse of mishandling.