

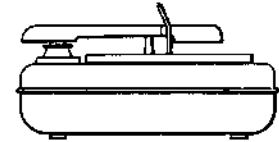
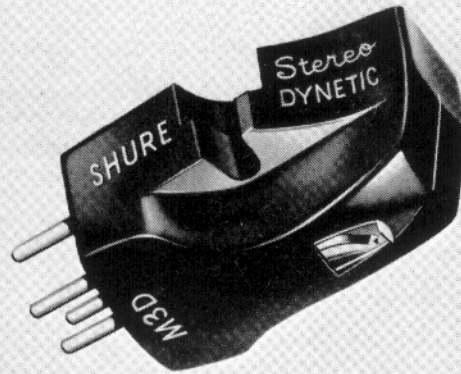
SHURE

MICROPHONES AND ELECTRONIC COMPONENTS

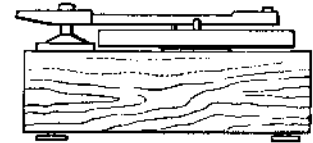
EVANSTON PHONE DA-8-9000 • CHICAGO PHONE SH 3-1600

DATA SHEET**MODEL N21D TUBULAR
STYLUS MOUNTED IN
M3D CARTRIDGE
(Model M3-N21D)**

Stereo
**PROFESSIONAL
DYNETIC
PHONO
CARTRIDGE**



For use in Record Changers
Tracking at 2½ Grams Maximum



For use in Transcription Tone Arms
Tracking at 2½ Grams Maximum

SPECIFICATIONS

Response Frequency Characteristics: From 20 to 20,000 c.p.s. ($\pm 2\frac{1}{2}$ db). There is considerable response down to 10 cycles and up to 30,000 cycles per second.

Output Voltage: 4 millivolts per channel at 1000 c.p.s.

Channel Separation: More than 20 db at 1000 c.p.s.

Recommended Load Impedance: 47,000 ohms (per channel) for Stereo. 22,000 ohms for Monaural (see connections). Higher values will produce a slight increase in high frequency response.

Stylus: Number N21D.
Radius .0007" (0.018mm) Diamond.

Compliance: VERTICAL $\left\{ \begin{array}{l} 9.0 \times 10^{-6} \text{ centimeters} \\ \text{HORIZONTAL} \left\{ \begin{array}{l} \text{per dyne} \end{array} \right. \end{array} \right.$

Tracking Force: 2 grams optimum.

Inductance: 420 millihenries.

D. C. Resistance: 280 ohms.

Terminals: 4 terminals. An independent ground terminal for each channel. (See Fig. 2).

Mounting: Standard $\frac{1}{2}$ " (12.7mm) mounting centers. (See Fig. 1).

Weight: .30 ounces (8.5 grams).

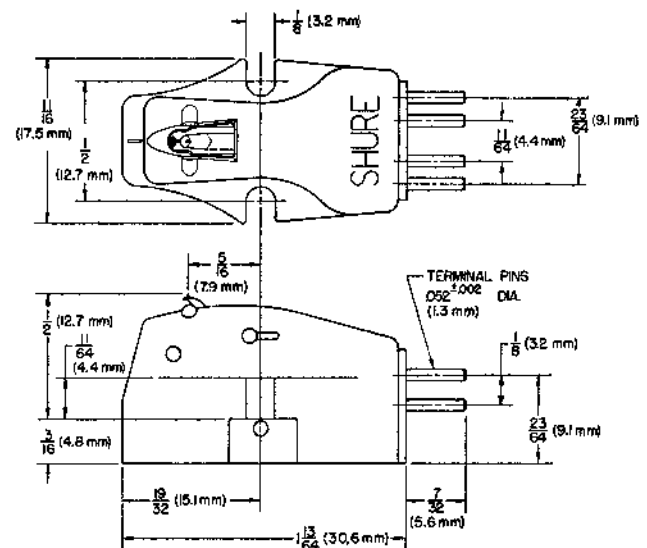
General: The Model M3-N21D Stereo Professional Dynetic Phono Cartridge has been developed for use in all high fidelity applications. It has been designed to connect into magnetic and constant velocity inputs.

The Model M3-N21D is completely compatible. In other words, the Model M3-N21D will play Stereo Discs Stereophonically, Monaural Discs Monaurally, and Stereo Discs Monaurally without excessive wear and without distortion.

The Model M3-N21D utilizes the same Moving Magnet principle employed in both the Studio and Professional Dynetics and offers the same important features, such as:

- High needle compliance.
- Low needle talk.
- Low tracking forces.
- Wide range frequency response.
- Magnetic induction from external fields is reduced to a minimum.
- No magnetic attraction to steel turntables.

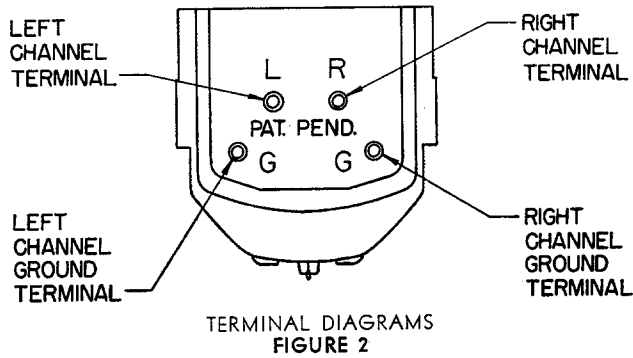
Mounting: The M3-N21D Cartridge has standard $\frac{1}{2}$ " (12.7mm) mounting centers. (See Figure 1). Two #3-48 \times $\frac{1}{4}$ " long machine screws are supplied with each cartridge for mounting purposes. It is important, during installation, that the white line on the front of the cartridge be perpendicular to the turntable or record surface. If no adjustment is available to do this, a paper or metal shim can be used on one mounting post to adjust angle of cartridge.



DIMENSIONAL DRAWING
FIGURE 1

Operation: The recommended needle point force for optimum results is 2.0 grams. Forces greater than 2½ grams should not be used. The M3-N21D should be installed in an arm especially designed for low tracking forces and having very low friction at all bearing surfaces. The Shure M232 and M236 Professional Tone Arms are recommended. For applications requiring higher needle point force, such as for changer applications, the Shure models M3D Stereo "Professional" Dynetic Phonograph Cartridges is recommended.

Connections: The M3-N21D cartridge utilizes a 4 terminal arrangement for connections having a separate ground terminal for each channel. (See Figure 2).



For Stereo reproduction terminal R and its ground terminal represent the right channel (outside groove wall). Terminal L and its ground terminal represents the left channel (inside groove wall).

To use a 4-lead arrangement connect each section of the cartridge to separate amplifiers. To prevent "ground loops" and hum, no common connection should exist between the two amplifier systems.

When used with a 3-lead arrangement, the shield lead should be connected to both of the ground terminals at the cartridge. No other common ground connection should exist.

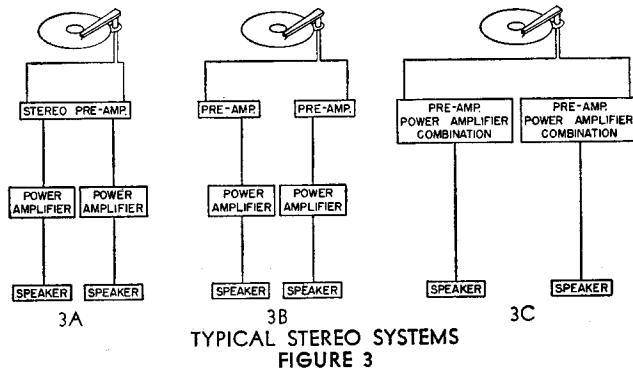
For single channel reproduction of Monaural or Stereo recordings, connect the "hot" lead to both R and L terminals and connect the ground or shield lead to both of the ground terminals marked G.

For 3-lead arrangements and for single channel reproduction, a "double loop" pin jack is provided to make a convenient connection between the two ground terminals—simply slide the loop ends onto the ground terminals. This connection should be made before connecting the regular terminal jacks to the cartridge. Connect ground pin jack to either ground terminal.

Caution: Do not make solder connections to cartridge terminals. Make all solder connections to terminals jacks provided.

Phasing: It is important to maintain correct phasing of both loudspeakers. Although the phasing of the M3-N21D cartridge is 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 M3-N21D. 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 pre-amplifiers and two speakers. If you already have a monaural system then you merely need to add the extra preamplifier, amplifier and speaker. You will also have to add another set of leads to your tone arm for the second channel. Figure 3 shows typical stereo systems.



If your system is represented by Figure 3A, merely follow the connection instructions that accompanied your stereo preamplifiers.

If your system is represented by Figure 3B or 3C, consider your stereo dynetic as two separate cartridges and connect one set of leads (see connection) to each preamplifier. 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 cartridge 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 with the stereo cartridge. 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.

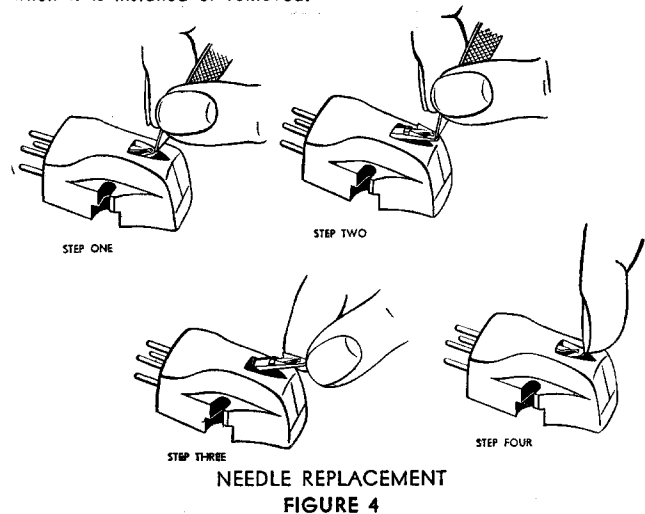
It will become apparent to you when performing the operation that you will have to adjust the balance between the channels every time you wish to raise or lower the volume. There are several relatively inexpensive devices available that provide a solution to this problem by means of a master volume control 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: Because the stylus-magnet assembly plays such an extremely important part in the overall performance of the Stereo Professional Dynetic Phono Reproducer, be certain that any replacement stylus is a genuine Shure "Stereo Professional Dynetic" stylus.

The stylus assembly, when installed in the cartridge is practically immune to damage during normal usage. However, care should be taken to avoid bending or distorting the stylus assembly when it is installed or removed.



Stylus replacement is simple and fast. (See Figure 4). 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 of the front of the stylus spade resulting in damage to the stylus tip.

Guarantee: The M3-N21D Stereo Professional Dynetic Cartridges are 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 assembly from abuse or mishandling.