

The home of the turntable

THE VINYL **ENGINE**®

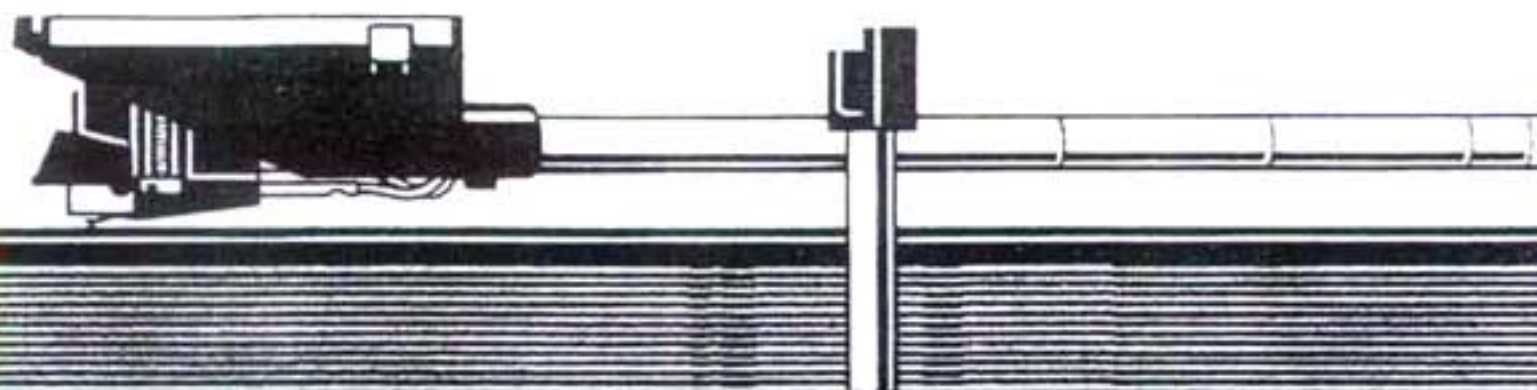
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OWNER'S MANUAL

GA 312/212 ELECTRONIC

PHILIPS HIGH FIDELITY LABORATORIES, LTD.



PHILIPS

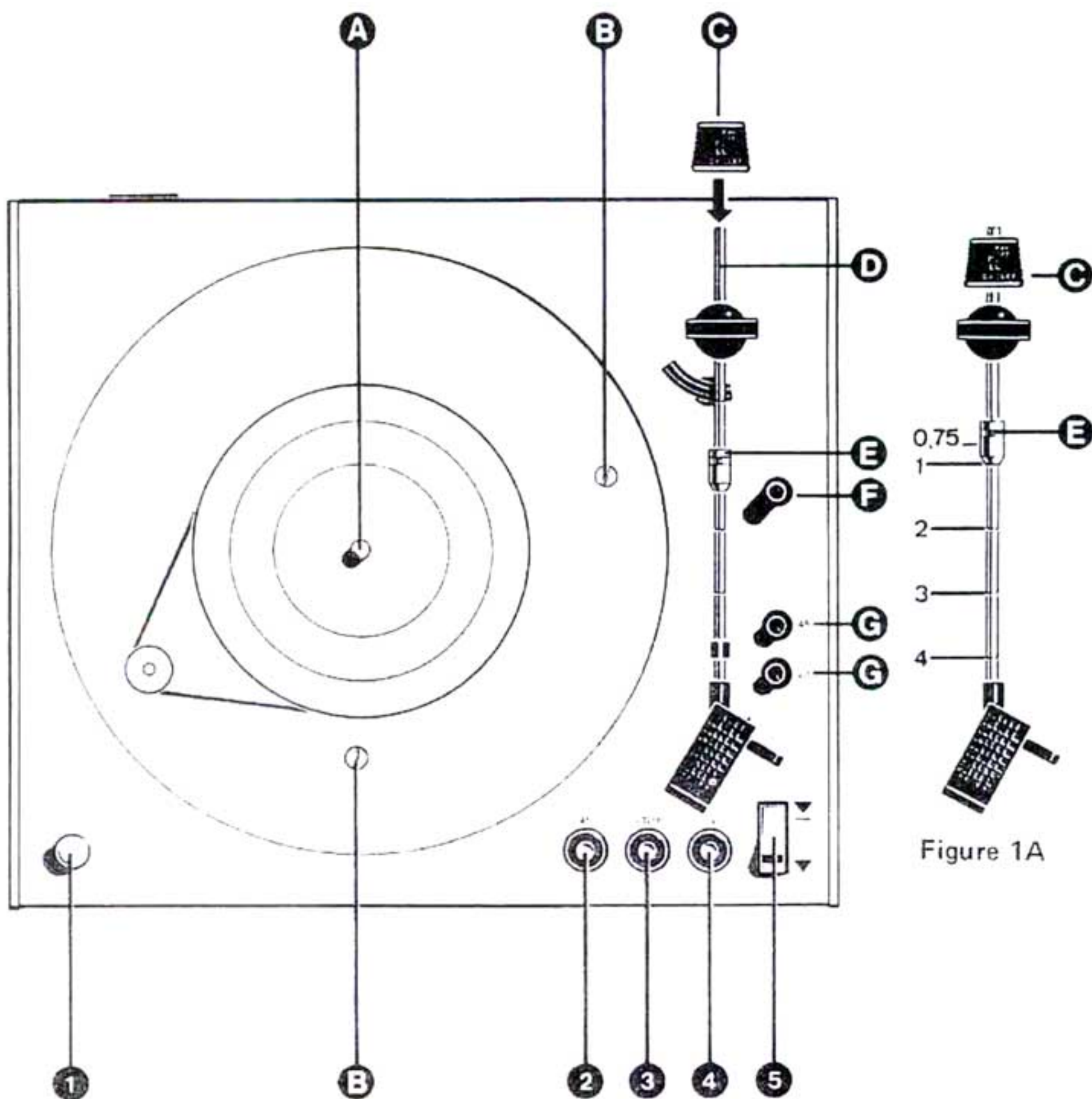


Figure 1

WARNING – TO PREVENT DAMAGE WHICH MAY RESULT IN FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR EXCESSIVE MOISTURE.

Introduction

This Hi Fi record player features electronic speed control employing a tachogenerator, photo-electronic off switch, floating suspension of turntable and pickup arm and electronic touch controls for start, speed selection and stop.

The important advantages which result from the electronic speed control are high stability of turntable speed, negligible wow and flutter and accurate individual speed adjustment.

The slow running high-torque motor, the high quality turntable bearing and the precision drive belt ensure exceptionally low rumble transmission.

The photo-electronic off-switch works without any forces acting upon the virtually frictionless and fully resonance damped pickup arm. By means of the electronic touch controls operation is possible without exerting any mechanical force on the mechanism, thus avoiding unwanted vibration during operation and moreover acting absolutely silent.

The pickup lift with a new damping mechanism is a valuable control as it helps to prevent records being damaged; it permits immediate interruption of the music and accurate cueing and automatically lifts the pickup arm at the end of the record or when the Stop control is touched.

The floating suspension of the pickup arm and the turntable isolate these against mechanical shocks and vibrations.

The stylus force is very low, the tracking error negligible over the entire recorded area, and the side thrust compensation equally effective for all positions of the pickup arm.

The head shell is of the universal type and is designed to carry all types of cartridges with standard $\frac{1}{2}$ inch mounting centers.

The high mechanical quality of this precision instrument will ensure that the excellent performance is maintained over a very long period.

Installation

UNPACKING

The various parts of the record player are packed separately to prevent them from damage during transit. Remove all parts from the packing, these are: dust cover; turntable; record player on base; counterweight; 45 r.p.m. adaptor and an alignment jig with hardware and plastic carrier for mounting your cartridge.

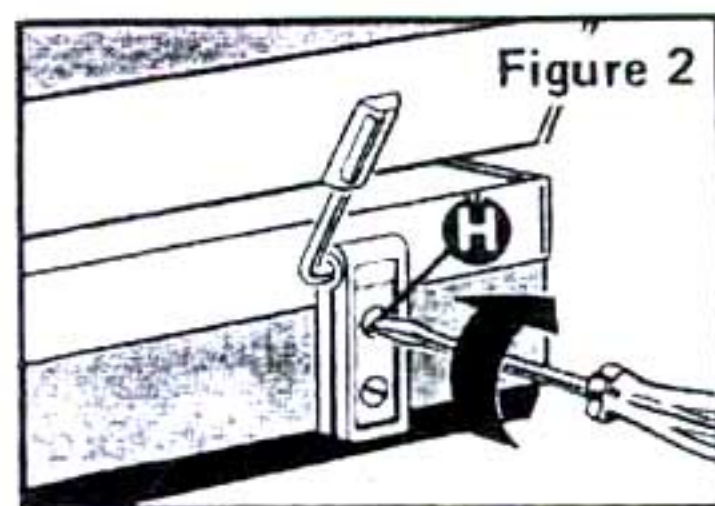
Remove plastic bag from the head shell and the string securing the pickup arm.

TRANSPORT LOCKING

This apparatus incorporates "transit" securing of the sub-chassis. This must be removed before the record player is used, and be replaced before transporting it. Remove the two screws and washers (B); the sub-chassis will then be freely suspended.

ASSEMBLY

- Place the turntable on turntable spindle (A) and screw counterweight (C) on end (D) of the pickup arm.
- Place the dust cover on the hinges. These are friction hinges designed to support the opened cover in practically any position. If the cover does not stay in the required position or does not close squarely re-adjust hinge screws (H) (see Figure 2).
NOTE: Do not oil the hinges.



- All cartridges with standard mounting distances ($\frac{1}{2}$ ") can be mounted on the sliding carrier. A mounting kit is supplied with the record player. This kit consists of mounting material and a jig; the function of the jig is to determine the position of the cartridge on the carrier accurately.

Mount the cartridge (see Figure 3) with screws and nuts on the smooth side of the carrier, but do not tighten the screws completely. the length of the screws should be chosen so that they do not project above the edge of the carrier when they are tightened. If necessary, use cylindrical spacers around the screws.

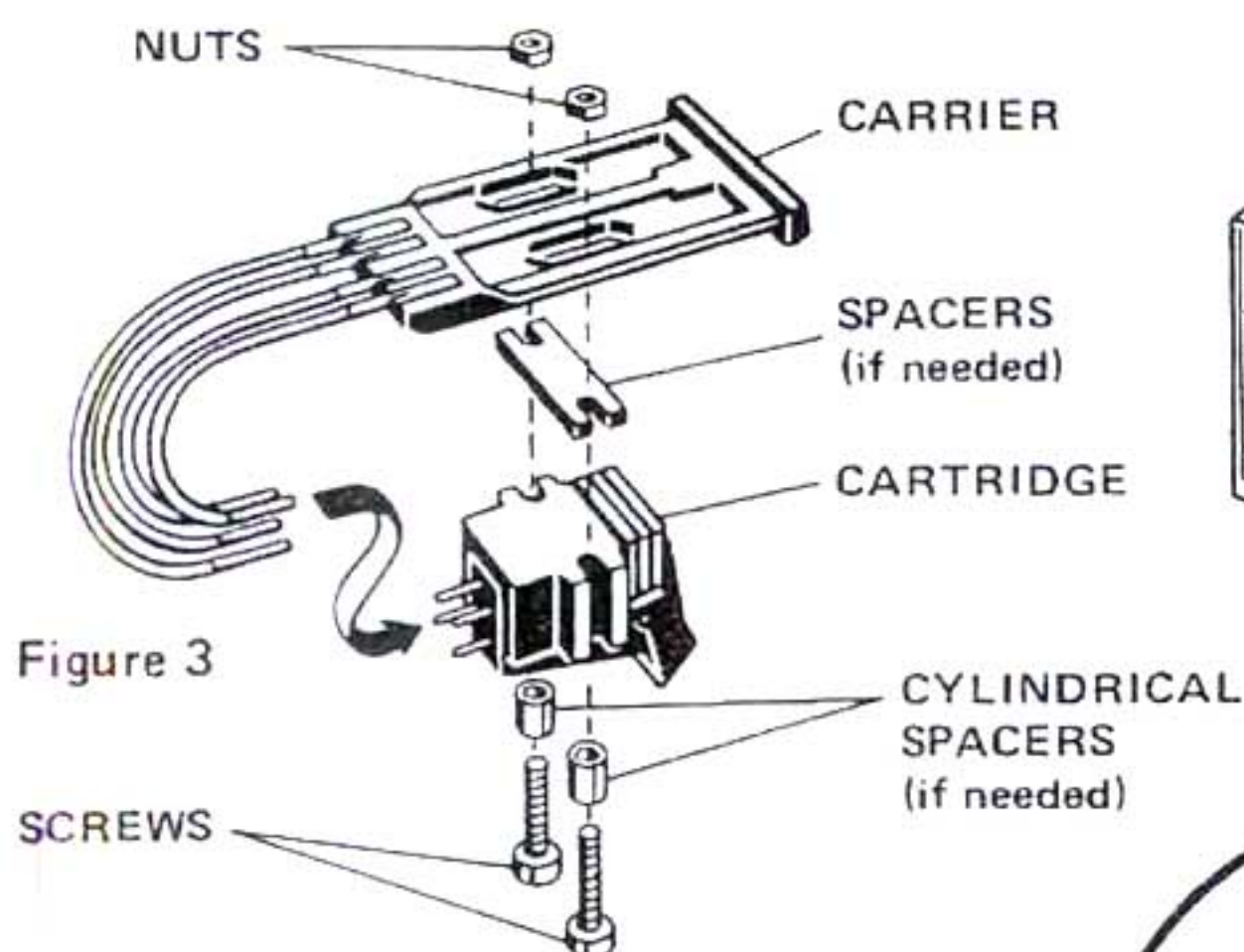


Figure 3



Figure 4

Slide the carrier with the cartridge into the grooves in the jig (see Figure 4). First of all, check whether the stylus is about $\frac{1}{16}$ " below the top plate of the jig. If the clearance is greater than this place one or more spacers under the cartridge. Now adjust the cartridge carefully until:

- the stylus is exactly in the middle of the notch in the jig;
- the main axis and the long sides of the cartridge are parallel with the lines on top of the jig (see Figure 5).

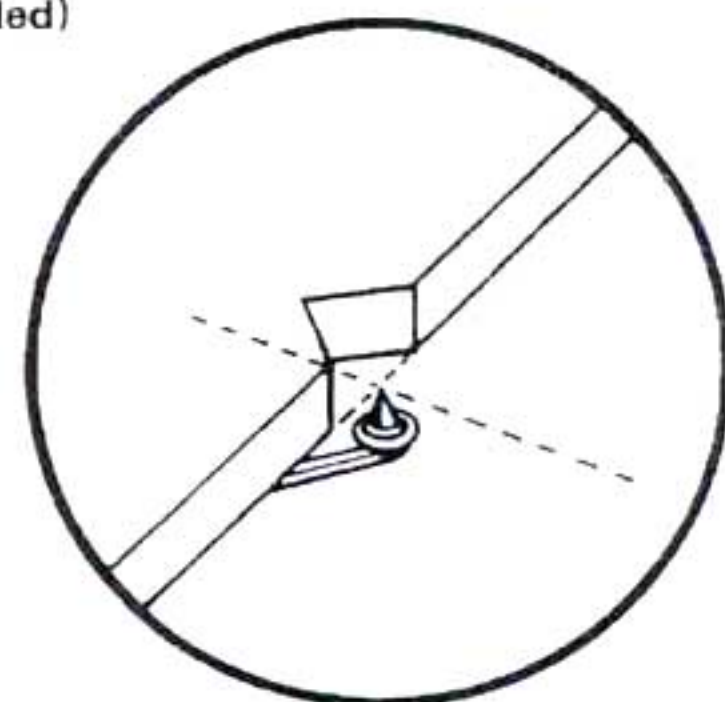


Figure 5

Now fix the cartridge firmly in place by tightening the screws uniformly.

Connect the wires on the carrier to the pins on the cartridge as follows:

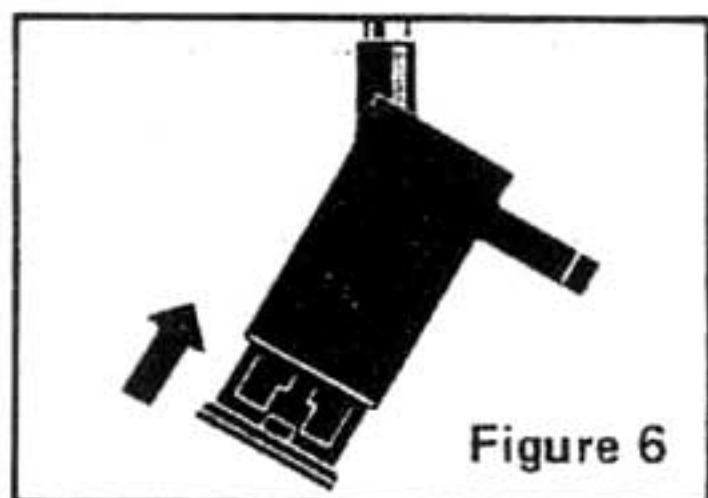
White to L (left channel)

Red to R (right channel)

Blue to LG (left channel ground)

Green to RG (right channel ground)

Finally; slide the carrier with the cartridge into the head shell (see Figure 6).




CONNECTION TO AC AND AMPLIFIER

Insert the plug from the AC line cord into a standard AC receptacle supplying 110/120 volts, 60 hertz power.

Connect the pickup leads to the input sockets of your amplifier or tuner/amplifier—lead marked "L" to the left channel input and the lead marked "R" to the right channel input.

Connect the ground lead from the record player to the ground terminal on the amplifier or tuner/amplifier.

STYLUS FORCE ADJUSTMENT

Depress rocker key (5) at the end marked  and set the anti-skate knob (F) to position "O". Place slide weight (E) in position "O" against the pickup arm bearing. Turn counterweight (C) until the pickup arm remains in balance when lifted free from its support and the pickup arm lift. This means that the pickup arm floats freely and does not move upwards or downwards. Now push slide weight (E) forwards until its chamfered side is against the first, second, third, fourth or fifth ring on the pickup arm, for 0.75: 1: 2: 3: 4 grams respectively. (Figure 1A shows an example of a stylus force of 1 gram).

For the required stylus force of your cartridge consult its technical data.

ANTI-SKATE

Turn knob (F) in a position corresponding to that of slide weight (E). For example when the chamfered side is halfway between the 3rd and 4th ring (2.5 grams), set knob (F) to a position halfway between 2 and 3.

The calibration with indication "O" is for the cartridges with a spherical (conical) stylus tip and the calibration with the indication "O" is for cartridges with an elliptical (bi-radial) stylus tip.

Operation

- Press down the power switch (1). The lamp in touch control (3) lights up.
- Place a record on the turntable; for 45 r.p.m. records with a large center hole, install the adapter.
- Start the turntable by touching the 33 control (4) for 33 1/3 rpm records or the 45 control (2) for 45 rpm records. The control that is touched will light

up. **NOTE:** When it is desired to change speed while the turntable is revolving, it is necessary to touch the stop control (3) first.

- Lift the pickup from its support and position it above the beginning of the part of the record you wish to play.
- Depress key (5) at the end marked "Σ". The built-in damping mechanism then smoothly lowers the pickup arm onto the record.
- Playing can be interrupted at any time by depressing key (5) at the end marked "Σ". The motor can be stopped by touching the stop control (3).
- After the record has finished playing, the photo-electronic switch shuts off the motor; a fact which is indicated by the illumination of the stop control (3). When the motor shuts off, the pickup arm is automatically lifted from the record.
- Return the pickup arm to its support and depress power switch (1) to switch off the turntable completely.

FINE SPEED ADJUSTMENT

Press down power switch (1). Touch control (2) or (4) for the desired speed. The appropriate figure on the stroboscopic ring should appear stationary when viewed under a lamp operating from 60 Hz power. The inner stroboscopic ring is for 33 r.p.m. and the outer one for 45 r.p.m. If it appears to move turn knob (G), corresponding to the required speed, anti-clockwise if the figure appears to turn clockwise, and vice-versa.

When a musical instrument is played along with the record player it is possible that the pitch of the record needs to be adjusted to that of the instrument. The pitch of the record can be varied by varying the turntable speed. This is achieved by turning knob (G) corresponding to the turntable speed.

Maintenance

In order to replace the cartridge, the sliding carrier with the cartridge can be pulled out of the head shell by its raised edge (see Figure 7).

A diamond stylus is subject to very little wear, but it is recommended to have it checked regularly (e.g. once a year) by your dealer. Stylus cleaning is best achieved with a small soft haired brush.

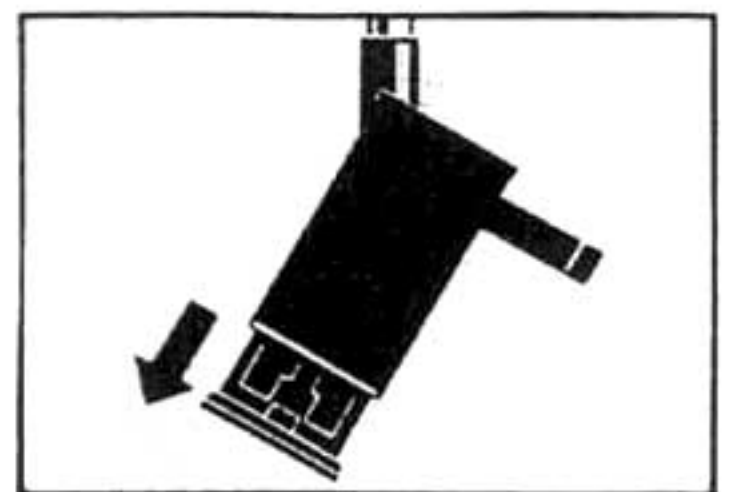


Figure 7

Putting on or taking off a record should only be done while the turntable is at rest.

The mechanism of this record player does not require any maintenance since its bearings are self-lubricating.

General

STYLUS FORCE

Stylus force is the vertically directed downward force with which the stylus rests in the record groove. It is essential that the stylus force recommended by the manufacturer is applied. Forces higher as well as forces lower than indicated by the manufacturer will lead to inferior reproduction and even groove deformation. Stylus force is set by means of the slide weight on the pickup arm after this is balanced with the counterweight.

ANTI-SKATE

Anti-Skate is the force that causes the pickup arm to move to the center of the record. As a consequence of this the stylus tip is pressed against the inner side of the groove which results in inferior tracking of the outer groove wall. This results in more distortion.

To prevent this distortion the player is equipped with an adjustable anti-skate which applies a preset force to the arm counteracting this phenomenon.

Anti-skate is proportional to the stylus force and dependent on the type of the stylus used (spherical or elliptical).

PHOTO-ELECTRONIC AUTO-STOP

The photo-electronic auto-stop is actuated by the rate of interception of a light-beam striking a photo-sensitive cadmium sulphide cell. When this rate exceeds a certain value, a bi-stable multivibrator is triggered which cuts off the motor supply voltage. Thus switch-off is performed without any mechanical force, hence "thumping" and other undesired effects cannot occur.

ELECTRONIC SPEED CONTROL

The motor speed of this record player is continuously controlled and kept constant by solid state circuits in combination with a tacho generator which is directly coupled to the motor shaft. In this way a high grade of precision and great reliability is achieved. The fully stabilized circuits are not influenced by fluctuations of the line voltage or frequency.

FLOATING SUSPENSION

The turntable and the pickup arm are mounted on a sub-chassis, which is damped, spring suspended from the rigidly mounted main chassis. This construction absorbs mechanical shocks and external vibrations. It also allows more accurate cueing as the movements of the arm-lift lever do not cause any displacement of the sub-chassis.

CABLE CAPACITANCE

The total capacitance of the audio cable (including tone arm wiring harness) is 100 pf per channel.

Technical Data

Turntable speeds	33 1/3 and 45 r.p.m.
Speed adjustment range	$\pm 3\%$
Wow/flutter (DIN)	0.1%
Rumble (DIN B)	62db
Tracking error	$0^{\circ} 9'/\text{cm}$
Arm friction lat./vert.	15 mgf
Stylus force	0.75 - 4 grams
line voltage	120V
line frequency	60 Hz
Power consumption	5W