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Operating Instructions for PRESTO 6N RECORDING TURNTABLE

Bogen

PRESTO RECORDING CORPORATION

~~242 WEST 55th STREET~~ ~~NEW YORK 19, N. Y.~~

P O Box 500

Paramus N. J.

PRICE $1.00

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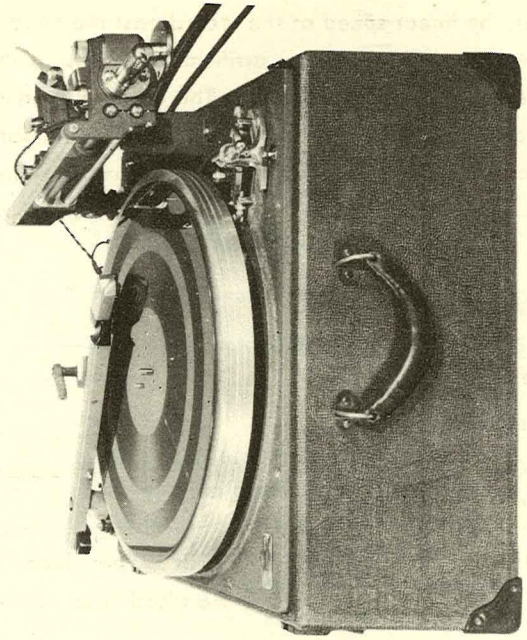
INTRODUCTION

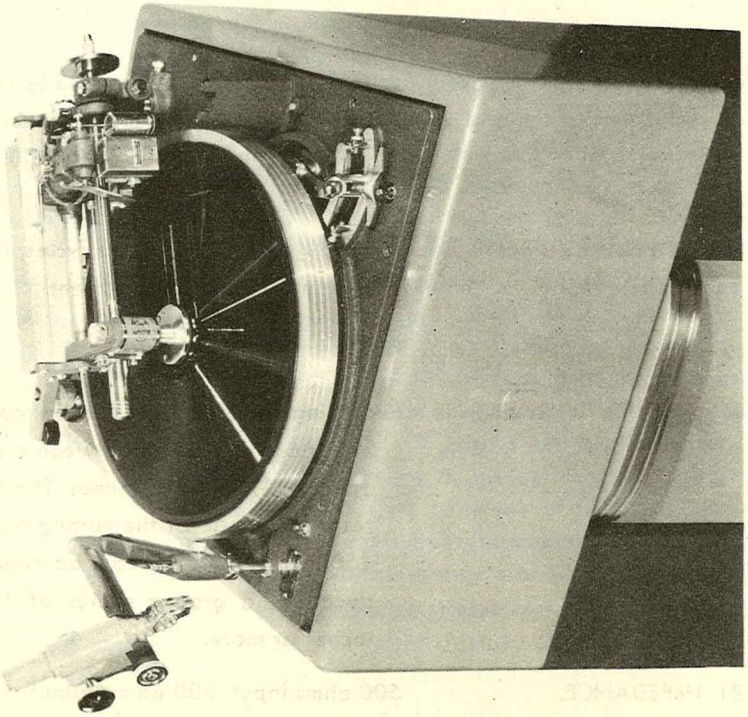
DESCRIPTION OF PRESTO 6N TURNTABLE UNIT

1. GENERAL.

The **Presto 6N Turntable Unit** is a high quality dual-speed recording machine operating at 33⅓ revolutions per minute (rpm) or 78 rpm. It consists of a turntable, motor-drive system, and an overhead cutter-head mechanism mounted on a cast aluminum base. The overhead cutter-head mechanism includes a **Presto 1C** high fidelity cutter head, 112-line-per-inch feed screw, a dashpot and a time scale. The overhead cutting mechanism is designed so that it may be removed as a unit from the turntable and placed into a compartment inside of the carrying case. The turntable-drive system consists of a self-starting synchronous motor which supplies power to the inside rim of the turntable through a steel pulley and two rubber-idler wheels, one for 78 rpm, the other for 33⅓ rpm. The speed-shift handle operates the motor switch and engages the idler wheels. Correct pressure against the idler wheels is obtained by adjustable stops. The overhead cutter mechanism swings from a bushed bearing in the turntable base. A flange which fits over the turntable shaft drives the feed screw through a worm and gear. The entire overhead mechanism (including the automatic equalizer slider unit mounted thereon) swings to a rest at one side of the turntable (when not in use). The spiraling feed screw makes it possible to space grooves up to ½ inch apart at convenient crank speeds. Elapsed recording time at both 78 and 33⅓ rpm may be observed on the time scale. The cutter head is mounted on an apron, hinged for quick adjustment of the cutter angle. The dashpot, for eliminating rumble or flutter due to vertical motion, is mounted beside the cutter carriage. A cam lever is provided for lowering the cutter needle on the disc. The depth of cut is adjusted by a counterbalance spring. A knob on the cutter carriage lowers the feed finger under spring tension on to the feed screw.

The **Presto 160-A Automatic Equalizer** (accessory equipment) consists of two major components: a slider unit and a control box or control panel. It provides a means for keeping the response of 33⅓ rpm recordings uniform throughout. In recording at 33⅓ rpm, a progressive attenuation of the higher frequencies occurs because as the radius of the groove be-





comes smaller, the linear speed of the record past the needle lessens. These losses can be compensated for by artificially increasing the amplitude of the higher frequencies while recording. The automatic equalizer holds the input to the cutter head at a constant level and at the same time, it continuously alters the frequency response of the amplifier to correct for the inner-groove high-frequency attenuations which occur on playback.

2. TECHNICAL CHARACTERISTICS.

a. 6N Turntable.

(1) FREQUENCY RESPONSE.

Cutter head	50 to 8,000 cycles per second (cps).
Pick-up head	70 to 7,500 cps.

(2) CUTTING PITCH — 112 lines per inch, inside-out with standard feed screw.

3. IMPEDANCE.

Cutter head	500, 15 or 8 ohms.
Pick-up head	500 ohms.

(4) SPEED ACCURACY. — Within 0.5 percent at both 33 ⅓ rpm and 78 rpm. Regulation within a single revolution is accurate to 0.25 percent.

(5) POWER REQUIREMENTS. — 60 watts, 115 volts, 50/60 cycles, single-phase alternating current.

b. 160-A Automatic Equalizer.

(1) FREQUENCY RESPONSE. — Recordings at 33 ⅓ rpm can be made uniform to 6,000 cps between a radius of 3 ½ and 4 ½ inches. The full response range of the cutting head (50 to 8,000 cps) can be reproduced at a groove radius of 5 ½ inches or more.

(2) IMPEDANCE. — 500 ohms input, 500 ohms output.

(3) INSERTION LOSS. — 30 decibels (db) at 1,000 cps.

I – INSTALLATION

1. UNPACKING.

a. Portable Carrying Case. The 6N turntable unit in portable carrying case is packed for shipment in two wooden crates. If ordered with an automatic equalizer, the equalizer is packed with the turntable in the same crate. If the equipment is ordered with a microscope, the microscope will be found in the lid of the case. In unpacking the equipment proceed as follows:

(1) Raise lid to a vertical position and push to the right for its removal. (Lid will slip out of hinges.) Clear the cables.

(2) Remove packing from turntable bearing well. Open other crate and remove turntable from carton.

CAUTION: Do not lose ball bearing at bottom of turntable well. Do not allow the weight of the turntable to rest on its shaft.

(3) Remove steel brackets at both sides of motor, see paragraph 2.

(4) Open the small latches of the compartment in one side of the case and remove the protective wadding. Remove packages containing the idler wheels, the pick-up head, the bottle of liquid for use in the dashpot, and the wrench used for tightening the overhead-cutter mechanism.

(5) Install idler wheels, see paragraph 3a.

(6) Loosen the wingnut so that wood block may be moved to a horizontal position (fig. 1). Carefully lift out the overhead-cutter mechanism from compartment.

CAUTION: Overhead mechanism should always be cushioned with wadding when placed on a flat surface.

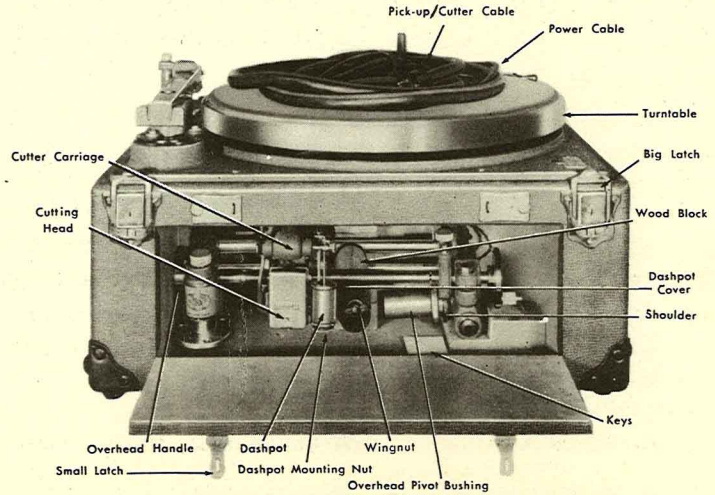


Figure 1. 6N Turntable Unit in portable carrying case.

b. Chassis Model. The 6N turntable unit, chassis model, is packed for shipment in three wooden crates. Miscellaneous accessories are packed in a separate crate. After carefully removing the outside wood containing the chassis and the straps holding the cables securely, proceed as follows:

(1) Remove the eight wood screws from the chassis mounting plate.

(2) Lift chassis out of the wood frame and install in proper location.

CAUTION: Do not allow the weight of the chassis to rest on motor.

(3) Follow steps (2) and (3) of paragraph 1a.

c. Cabinet Model. The 6N turntable unit, cabinet model, packed similarly to the chassis model is shipped in an extra wood crate containing the cabinet itself. Follow the previous instructions for unpacking the equipment.

2. REMOVAL OF STEEL BRACKETS.

During transit (to prevent damage to the motor) two steel brackets are used to hold the motor fast to the bottom of the chassis mounting plate. Proceed as follows:

a. Remove four screws—red painted head.

b. Remove two wingnuts holding brackets against bottom of mounting plate—reached through mounting plate holes.

c. Remove brackets.

d. Check to ascertain that the rubber grommets are properly seated in sockets and motor swings freely.

3. INSTALLATION.

a. Idler Wheels.

(1) Remove spring clips from idler shafts (fig. 7).

(2) Wipe and clean the two shafts. Apply not more than 1 or 2 drops of 3-1 oil to the shafts. Wipe off any oil on rubber of idler wheels.

(3) Replace idler wheels on proper shafts see figures 7 and 9. Replace spring clips.

(4) Replace turntable.

b. Overhead Mechanism. In all 6N turntable units the method of installing the overhead mechanism is as follows:

(1) Turn the overhead pivot bushing (fig. 1) to a vertical position.

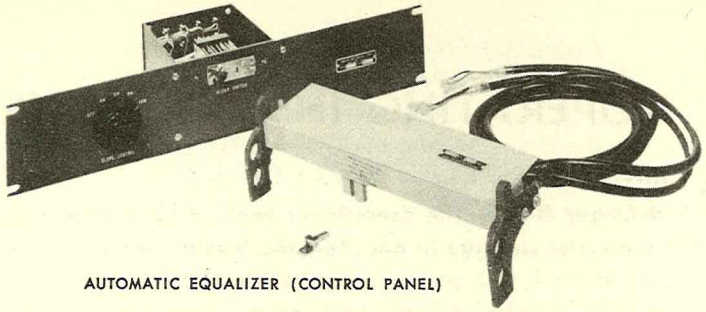
(2) Lower the overhead-cutter mechanism into the hole in the panel casting until the shoulder rests against the top bearing surface of the hole.

(3) Grasp the overhead handle and swing the mechanism to and on top of, the overhead rest (fig. 3).

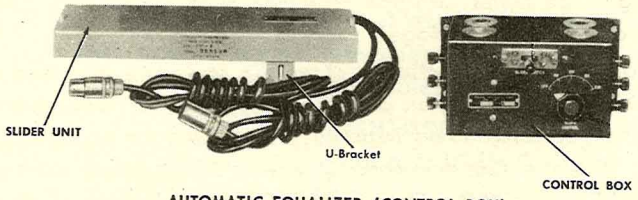
(4) Tighten the overhead-mounting bolt (fig. 8 (32)) with the supplied wrench.

(5) Raise the dashpot cover and fill the dashpot with the supplied liquid (glycerine) to within ¼ inch of the top. Replace dashpot cover.

(6) Push the pick-up head into the pick-up arm spring clips and tighten the screw and nut.



AUTOMATIC EQUALIZER (CONTROL PANEL)



AUTOMATIC EQUALIZER (CONTROL BOX)

Figure 2. 160-A/B Automatic Equalizer.

(7) For chassis or cabinet models it is necessary to install the feed-screw and crank handle. Refer to section II, paragraph 1f.

c. Automatic Equalizer (fig. 2). For installation of the automatic equalizer it is necessary to attach the slider unit to the equalizer-mounting bracket. Proceed as follows:

(1) Loosen the four equalizer mounting screws (two on each end) and push the slider unit between the slots on the equalizer mounting brackets (fig. 3).

(2) For automatic equalization, make sure the tongue at the rear of the overhead mechanism fits into the U-bracket slot (fig. 2) on the slider arm so that the arm will move across the surface of the disc as the

(3) The U-bracket is engaged by pushing the tongue up into the slot. cutter head moves.

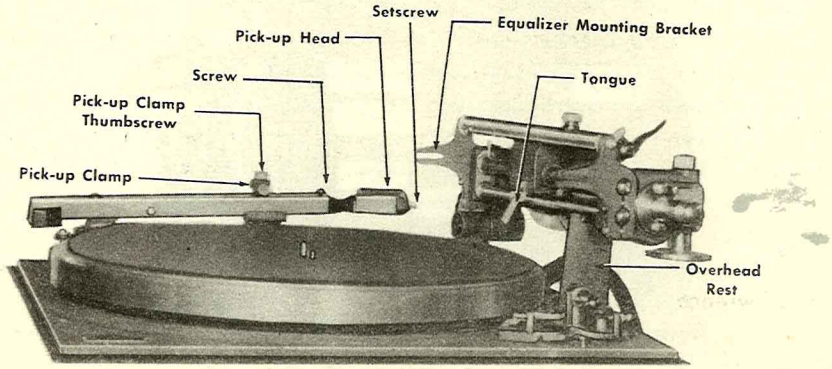


Figure 3. Overhead mechanism mounted on overhead rest.

II – OPERATING INSTRUCTIONS

1. 6N TURNTABLE (fig. 4).

a. Feed-finger Knob. The feed-finger knob is used to engage and disengage the cutter carriage to and from the feed screw. Turned counter-clockwise, as far as it will go, it engages the cutter carriage to the feed screw; turned 180° clockwise from its maximum counterclock-wise position, it disengages the cutter carriage from the feed screw and allows free movement of the cutter carriage.

b. Cutter-head Connections. Three pin jacks are provided for connecting the cutter head to an amplifier. The amplifier output impedance should match the cutter head impedance and have an undistorted output of at least 10 watts. Proper recording level is 20 db which corresponds to .6 watt or 17.3, 3.0, 2.2 volts in 500, 15, 8 ohms, respectively. For 78 rpm recording, the cutter-head leads should be connected to the red and black pin jacks; for 33⅓ rpm recording, the leads should be connected to the white and black pin jacks. In the latter position a filter network is connected in series with one side of the cutter head to provide a steeper attenuation of the low frequencies.

c. Speed-shift Handle. The speed-shift handle is used to start and stop rotation of the turntable. Raised to a vertical position and pushed to

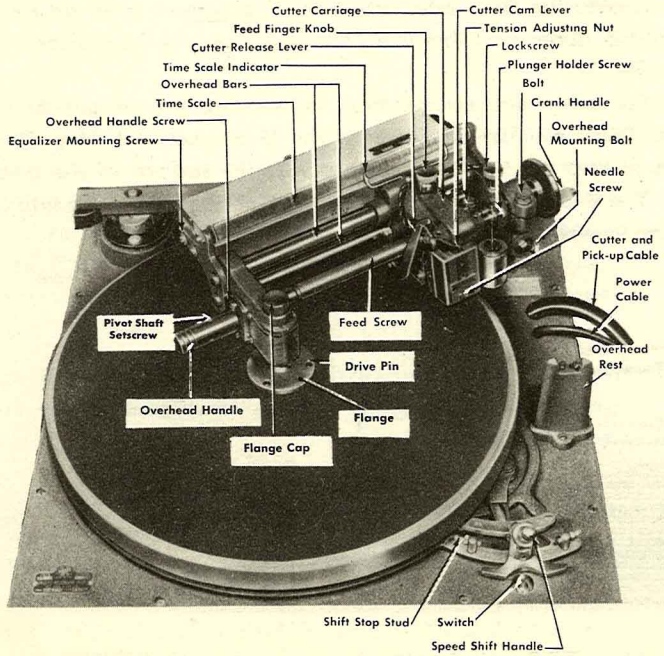


Figure 4. Close-up of the 6N Turntable.

the right, it engages the 78-rpm idler wheel with the motor shaft; pushed to the left, it engages the 33⅓ rpm idler wheel with the motor shaft. After choosing the desired speed, the shift handle should be pressed down and locked firmly in position.

CAUTION: To avoid vibration caused by flats on the idler wheels, keep the speed-shift handle in 0 position when the table is not in use.

d. Cutter-cam Lever. The cutter-cam lever is used to lower or lift the cutter head.

e. Time Scale. The time scale is a convenient attachment which shows the starting point for the cutting needle on each size of disc and the elapsed recording time at both 78 and 33⅓ rpm.

f. Feed Screw. Feed screws are available to cut at 96, 112 or 120 lines per inch inside-out or outside-in. To change the feed screw, move the cutter carriage all the way over to the right (toward the crank handle). Disengage the cutter carriage (par. 1a) and loosen the lockscrew (fig. 4). Hold the feed screw and pull out on the crank, thus disengaging it from the gear mechanism. Slip it out carefully for a replacement.

g. Spiral and Close-out Grooves. Spiral grooves are used to guide the playing needle toward the sound recording at the beginning of a record, and away from the recording at the end. Either inside-out or outside-in spiral grooves may be cut depending upon the type feed screw in use. All that is required is the quick turning of the crank handle before and after the recording is completed. To make a close-out groove without damaging the cutting needle, however, requires considerable practice. It is advisable to put a chalk line on the turntable rim or a thin piece of paper under the rubber pad as a marker for a complete revolution. After spiraling, disengage the cutter carriage from the feed screw by means of the feed-finger knob (sec. II, par. 1a). After one complete revolution (as evidenced by marker) lift cutter head off disc by pushing up on the cutter cam lever.

CAUTION: Damage to the cutting needle will result if the cutter carriage is disengaged from the feed screw for more than two revolutions.

2. 160-A AUTOMATIC EQUALIZER (fig. 2).

a. Slope Control Switch. This switch is used to peak the amplifier response at 4,000, 6,000, 8,000 or 10,000 cps. For a normal recording it is set at 6M. Set the switch in the OFF position for playback or when automatic equalization is not desired.

b. Slider Switch. This switch is used on continuous recording when two turntables are in operation. It is thrown to the No. 1 or No. 2 position, depending upon the table in use.

3. PREPARING EQUIPMENT FOR RECORDING.

For best results level the turntable and ground the equipment. Always make a test cut with no signal being fed to the cutter before recording.

a. Making a Test Cut.

(1) Insert a **Presto** *long shank* cutting needle in the cutter head.

(2) Place a blank disc on the turntable.

(3) Grasp the overhead handle and swing the overhead mechanism to operating position. Rotate the flange cap so that the turntable drive pin lines up with one of the flange holes.

(4) Engage the cutter carriage with the feed screw by turning the feed-finger knob (sec. II, par. 1a). Rotate the crank handle one or two turns to ascertain that the cutter carriage is properly engaged with the feed screw.

(5) Lower the cutter head gently (use the cutter-cam lever) and note the angle of the cutter needle with respect to the disc. The proper angle lies between vertical and 5°. If the angle is incorrect, loosen the bracket securing screw and reposition the cutter head.

(6) Disengage the cutter carriage and move the cutter head toward the center of the disc to about ½ inch outside the record label for a few test grooves.

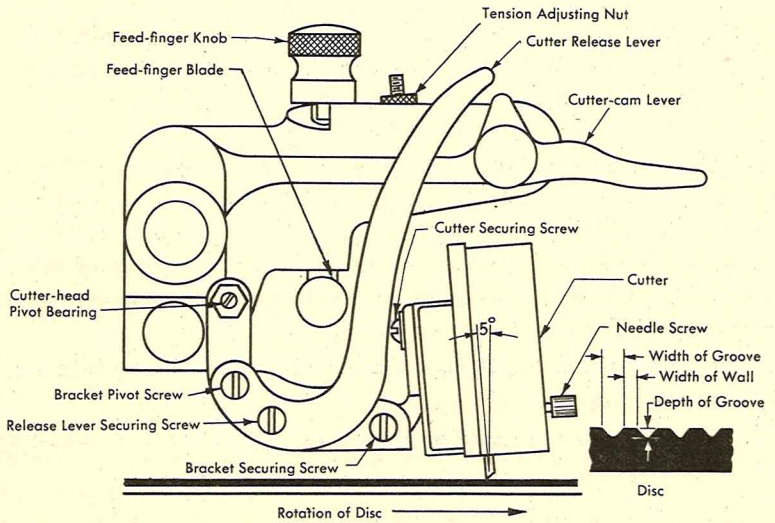


Figure 5. Cutter-head and carriage details.

(a) Start the turntable by moving the speed-shift handle to either 33 or 78 and lock. Engage the cutter carriage.

CAUTION: Damage to the cutting needle will result if the cutter carriage is disengaged from the feed screw for more than two revolutions.

(b) Lower the cutter needle gently onto the disc and cut a few grooves.

(c) Stop the machine by moving the speed-shift handle to the 0 position. Raise the cutter head by means of the cutter-cam lever and swing the overhead mechanism to its rest.

(d) Examine the thread (shavings). The texture of the threads indicates the approximate depth of cut. Thread that is almost straight (slightly curly), shiny, and the thickness of human hair is indicative of the proper depth of groove. If the groove is too shallow, the thread will be very fine and grayish in color; if the groove is too deep the thread will be coarse and kinked. Whenever a microscope is available, check the ratio of groove width to wall width. The accepted correct depth for proper tracking of the pick-up head has been determined as between 0.002 and 0.0025 inches depending upon the feed screw (lines per inch) in use. The former depth when cutting over 120 lines per inch and the latter when cutting below. In other words, the ratio of width of groove to width of wall should be approximately 58/42 at 96 lines per inch and not greater than 65/35 at 136 lines per inch for normal recording level (20 db).

CAUTION: Although discs will not support combustion, the shavings are highly inflammable and should be placed in a metal container.

b. Adjusting for Depth of Groove. If the pressure of a good recording needle upon the disc is correct, cutting will be noiseless (if the cutter angle is also correct). If the angle is incorrect or the needle defective, a faint hiss will be heard upon cutting. Every adjustment of the cutter-needle angle requires a slight readjustment of the tension spring to maintain proper depth of groove.

(1) **Adjustment for Deeper Groove.** Turn the tension-adjusting nut (28) counterclockwise.

(2) **Adjustment for Shallower Groove.** Turn the tension-adjusting nut (28) clockwise.

NOTE: Tightening the tension-adjusting nut increases the tension of the tension spring and decreases the pressure of the recording needle on the disc. Loosening the tension-adjusting nut has the opposite effect.

c. Using the Automatic Equalizer. Equalization is not recommended for 78 rpm recordings. On 33⅓ rpm the higher frequencies are attenuated because of the decrease in linear velocity of the disc under the cutter needle. It is therefore necessary to equalize for the loss. (Playback curves at different frequencies before and after automatic equalization at different record diameters are shown in figure 6.) This is accomplished as follows:

(1) Check the tongue (fig. 3) at the rear of the overhead mechanism to ascertain that it is engaged to the U-bracket of the slider unit.

(2) Set the volume control of the amplifier for proper level with the equalizer slider in the off or extreme outside position. (The cutter carriage at the extreme right.)

(3) The selection of the frequency to be equalized (SLOPE CONTROL setting) will depend upon the type sound to be recorded and upon intelligent judgment of the operator.

NOTE: The added high frequency response of the amplifier at the inner portion of the disc due to the use of the equalizer will cause the pointer on the volume indicator meter to rise past the 20 db level. This should be considered a false reading; do not readjust the volume control.

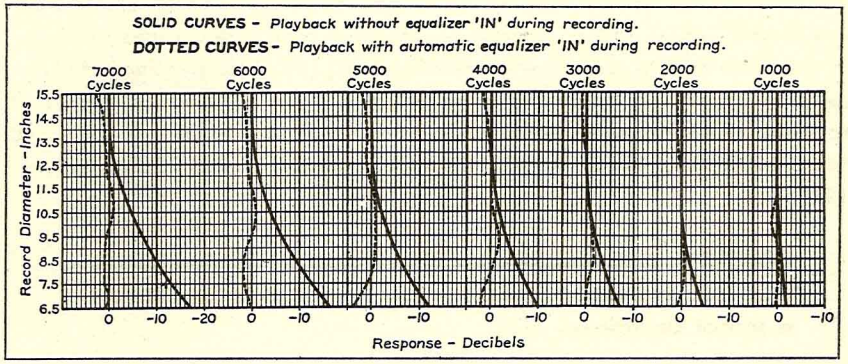


Figure 6. Playback frequency response at different disc diameters.

III – COMMON FAULTS IN OPERATION

1. TROUBLE SHOOTING CHART.

Symptoms	Probable source of trouble	Corrections	Remarks
1. Cutting needle runs in a single groove cutting through the coating of the disc.	The feed-finger blade was not properly engaged with the feed-screw.	A few rapid turns of the crank handle will be sufficient to seat the feed-finger blade (sec. II, par. 1a).	Examine the cutter needle to see that it hasn't been damaged in cutting through the coating of the disc.
2. Pickup repeats a single groove at some point on the record.	Groove was cut too deep. Over-modulation.	Refer to Sec. II, par. 3b for correct depth of cut. Watch meter and adjust volume control for proper recording level.	As the groove becomes deeper, it also becomes wider and the wall between the grooves may become too thin to hold the playing needle in place. Cutting too deeply will wear out the cutting needle quickly and ruin the quality of reproduction.
3. Very little sound on the record, making it necessary to use excess amplification on playback.	Insufficient amplification while recording.	See that the meter needle kicks frequently to the 20 db level. Turn up on the volume control.	When a speaker raises or lowers his voice, or when music becomes louder or softer, the volume control must be adjusted to keep the pointer on the meter kicking to the 20 db level. Avoid making rapid changes in the setting of the volume control. Try, in all cases, to anticipate changes in the sound intensity, shifting the volume control slowly to compensate for them.
4. Reproduction ragged and distorted.	Speaking too close to the microphone or shouting. Pointer on meter kept kicking too high while recording. Improper grounding. Cutting too close to center of record at 33⅓ rpm. Faulty microphone.	Speak into the microphone in a natural tone of voice keeping the microphone between 6 inches and 18 inches away from face. If it is necessary to raise voice, move away from the microphone. Keep pointer on meter kicking up to but not beyond the 20 db level.	In recording a group of singers or musical instruments, care must be taken to place the various members of the group at the proper distance from the microphone, otherwise, certain instruments or voices will predominate. The proper balance is best obtained by listening to the group on a loudspeaker where the direct sound cannot be heard. Make the record only after the proper balance has been obtained.

Symptoms	Probable source of trouble	Corrections	Remarks
5. Playing needle will not stay in groove. Slides across record.	Groove was cut too shallow.	Loosen the tension spring (29) by means of the tension adjusting nut (28), to increase the pressure of the cutting needle on the disc.	Thread from a groove of proper depth should be about the thickness of human hair (sec. II, par. 3a).
6. Cutting needle jumps, chatters or whistles.	Improper angle of the cutting needle.	Refer to figure 5 for proper cutting angle.	If records of varying thickness are used, it is advisable to obtain mats of different thicknesses to compensate for record variations rather than changing the cutter angle frequently. (Mats cut from blotting paper are suitable.)
7. Tone of music wavers or sounds off-key.	Glazed surface on idler wheels. Eccentricity of idler wheels caused by too much oiling thereby swelling them out of round. Improper pressure adjustment of the idler wheels. Improper adjustment of the motor mounting. Improper adjustment of the overhead mechanism.	Clean idler wheels more frequently with carbon tetrachloride. Less oiling of the idler wheels. Refer to sec. VI, par. 2 for idler wheel adjustment. Refer to sec. VI, par. 3 for motor mounting adjustment. Refer to sec. VI, par. 4 for overhead mechanism adjustment.	Occasionally the motor may move out of adjustment due to rough handling in transportation. If the pressure is not sufficient the turntable will slip while recording and run at less than the proper speed. As the drag of the playing needle is not as great as that of the cutting needle, the turntable will return to proper speed when playing the record and the voice or music will sound high pitched. If the pressure is too great, vibration will occur due to the motor being pushed off center.
8. Machine has tendency to howl when records are played loudly.	Defective tube. Placing of extra loudspeaker or amplifier too close to the turntable.	Test tubes for microphonics and replace those at fault.	

IV – MAINTENANCE

1. LUBRICATION (figs. 7 and 8).

To obtain continuous high quality performance from the **Presto 6N Turntable Unit,** it is necessary to properly lubricate all bearing surfaces, gears, idler wheels, etc., periodically, outlined as follows: —

a. Lubrication Every 20 Hours of Service.

(1) Remove the turntable from its bearings, being careful not to lose the ball (bearing) on which the turntable shaft revolves and place *one* drop of 3-1 oil in the center holes of the idler shafts (3). **Do not get oil on the idler wheels.** Always wipe clean (carbon tetrachloride may be used), loose oil will cause loss of friction resulting in improper speed. The idler wheels may be removed by lifting the spring clips (10).

(2) Wipe dry with a soft lint-free cloth the feed screw and overhead bars. Then lubricate well with 3-1 oil.

b. Lubrication Every 60 Hours of Service.

(1) Remove the turntable from its bearing. Wipe the turntable shaft (6) and the bearing well (7) dry with a clean, lint-free cloth; then re-lubricate with a thin film of light grease or high grade vaseline and a few drops of 3-1 oil.

(2) Place four or five drops of 3-1 oil in the motor oil cups.

(3) To lubricate the slider unit of the automatic equalizer, proceed as follows: —

(a) Remove the two nuts at the top of the slider case and lift the dust cover off as shown in figure 8.

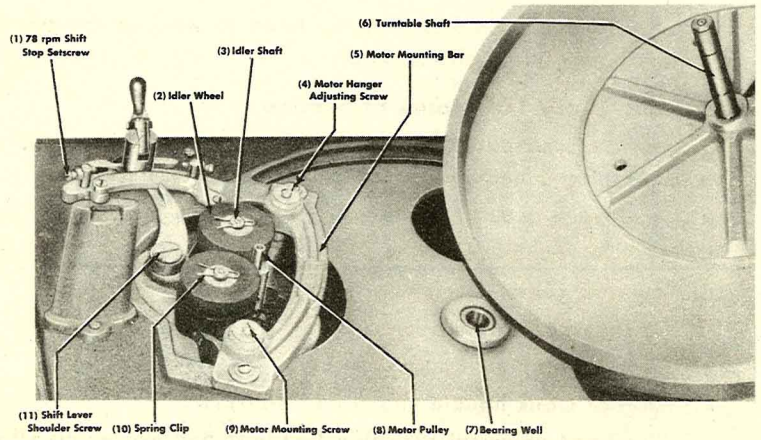


Figure 7. Turntable removed from chassis.

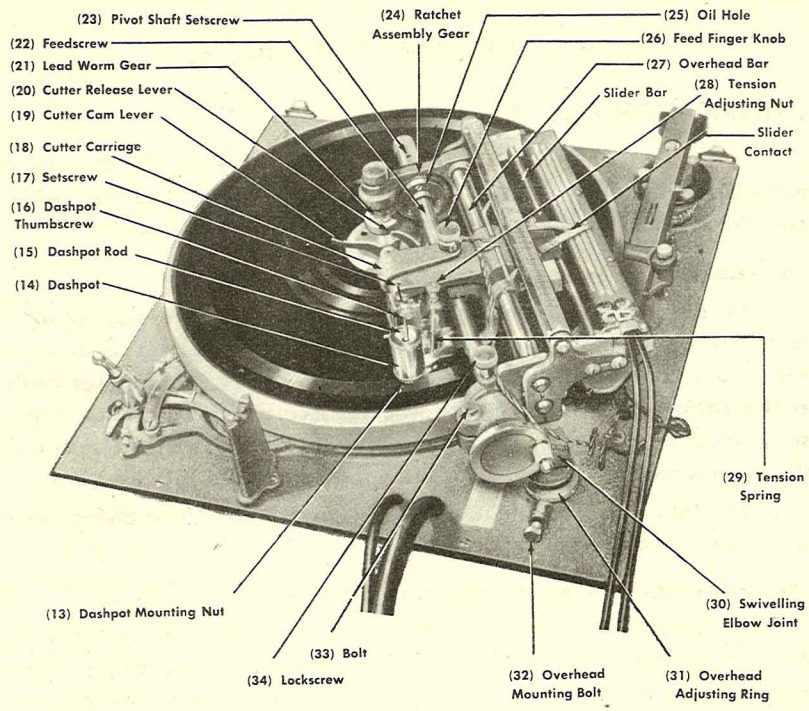


Figure 8. Top view of the 6N Turntable.

(b) Brush out any dirt which may have accumulated on the contacts or contact mounting plate.

(c) Moisten a soft lint-free cloth with Davenoil (supplied with the equipment) and apply a *light* film to the contacts.

(d) Apply a few drops of 3-1 oil on the two slider bars.

(e) Move slider back and forth by hand to work in the oil; the slider must move easily. Wipe off excess oil.

c. Lubrication Every 100 Hours of Service.

(1) Examine all moveable parts of the turntable unit to ascertain if lubrication or cleaning is necessary, especially the parts listed below.

(a) Lead worm gear (21) and ratchet assembly gear (24).

(b) Shift lever shoulder screw (11).

(c) Motor oil cups.

(d) Ratchet assembly oil hole (25).

(e) Cutter head pivot bearing (fig. 5).

(f) Shaft of crank handle (fig. 15 (6N-66)).

(g) Overhead universal assembly bearings and swivelling elbow joint (29). For a clearer description of the bearings see figure 15 part 6N-68.

V – FUNCTIONING OF EQUIPMENT

1. MAIN DRIVE (fig. 9).

The main drive comprises a 115-volt, 50/60-cycle, single-phase self-starting-synchronous motor mounted under the turntable chassis. The motor shaft has a two-diameter pulley at its driving end. This pulley is coupled to the rim of the turntable through one of two idler wheels according to the speed that is preselected. The idler wheels are rubber on molded bronze cores and run freely on vertical steel shafts. The under cut bronze cores contain oil-retarding felt washers to keep the shafts well-lubricated. When the speed-shift handle is in the 78-rpm position, the large diameter section of the motor shaft engages the lower part, b, of the dual idler wheel whereas the upper part, a, engages the inner rim of the turntable. With the speed-shift handle in the 33 ⅓ -rpm position the smaller diameter section of the motor shaft engages the upper part, c, of the 33 ⅓ -rpm idler wheel, which directly transmits the drive to the inside rim of the turntable. With the speed-shift handle in the 0 or center position, the motor is switched off and both idlers are disengaged (this prevents flats from forming on the rims of the idler wheels by being left under pressure between the motor shaft and the rim of the turntable). The speed-shift handle is fitted with a locking-device (handle). When this handle is depressed, the desired idler wheel is locked in position. Figure 10 shows the turntable wiring details.

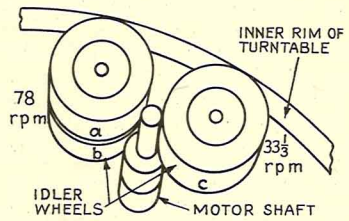


Figure 9. Turntable drive.

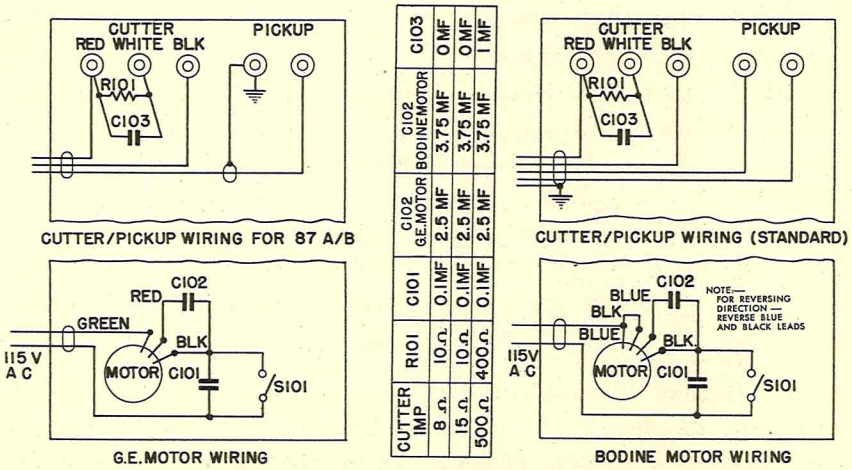


Figure 10. Turntable wiring details.

2. OVERHEAD ASSEMBLY (fig. 8).

The overhead assembly is constructed as a complete unit. One end is mounted on the turntable chassis by means of a swiveling elbow joint (30) which is held fast with the overhead mounting bolt (32). The other end, carrying the driving mechanism, is driven by a flange which fits over the turntable shaft and drive pin. The driving mechanism, which turns the feed screw, consists of a worm gear (21) and ratchet assembly (24). The feed screw can be removed by unscrewing the lockscrew (34) and pulling outward on the crank handle. The cutter carriage (18), which slides laterally on the overhead bars (27), is engaged with the feed screw by the feed-finger knob (26). Turning this knob lowers a metal blade into engagement with the threads of the feed screw. By turning the crank handle the cutter carriage can be moved mechanically in one direction only (inside-out or outside-in) depending upon the type feed screw in use. The crank handle turns in one direction only (clockwise as viewed from the right-hand side of the machine) because of a ratchet device in the ratchet assembly (24). The overhead assembly may be swung clear of the turntable and placed on the rest as shown in figure 3.

3. CUTTER HEAD AND CARRIAGE (figs. 5 and 8).

The cutter head is mounted on a U-shaped bracket and secured by the cutter securing screws; it is pivoted to the overhead carriage by two pivots (cutter head pivot bearing) shown in figure 5. The bracket has a cutter-release lever (20) which engages with the cutter-cam lever (19). A dashpot (14) which serves as a vertical damping device is attached to the cutter-head bracket and secured in place by the dashpot mounting nut (13). The function of the dashpot is to damp out undesirable vertical vibrations of the cutter head. Depth of cut is controlled by the tension spring (29) which suspends the cutter-head bracket. Adjustment of the spring is made by the tension adjusting nut (28). The cutter head employs a resonance-damped moving-iron balanced armature.

4. AUTOMATIC EQUALIZER (fig. 2).

This unit is divided into two sections: a control box or a rack-mount control panel (comprising a parallel-resonant circuit, selector switch, and fixed T pad) and a variable attenuator (slider unit) mounted on the overhead mechanism.

a. Function. The unit is a variable equalizer which progressively increases the high-frequency response as the cutter head travels towards the center of the disc where there is a decrease in linear velocity of the disc under the cutter needle. Some other reasons for a decrease in cutter-head efficiency are as follows:

(1) There is an increasing load opposing the lateral movement of the needle.

(2) The wave lengths at the higher frequencies are so short that they approach the **tip radius** of the pick-up needle; consequently, the needle

point cannot fully explore the modulated groove. A drop in output from the pick-up results.

b. Circuit Description. The schematic diagram of the equalizer with the control box is shown in figure 12. The schematic diagram showing the control panel is illustrated in figure 13. For purposes of explanation refer to the simplified schematic diagram figure 11. The input consists of a variable-ladder pad R_L followed by a fixed T pad R_T. Shunted across the output of the T pad is the parallel resonant circuit Z201 in series with the variable resistor R_S. The pad R_L and the Resistor R_S are part of the slider mechanism whose impedance varies with the position of the cutter head on the disc. Note the operating conditions on the two extremities of the slider unit. With the slider in the outer position (maximum radius on the disc), the attenuation introduced by R_L and R_S is at a maximum. Since the tuned circuit, together with the variable resistor R_S, is shunted across the line, and because its impedance is high as compared with the load, the attenuation introduced by this circuit is negligible at all audio frequencies. Thus the main attenuation at the outer extremity is introduced by the network comprising R_L and R_T. With the slider at the inner extremity (near the center of the disc) where maximum high-frequency equalization is required, R_L and R_S offer minimum attenuation at all frequencies. Since R_S is now at minimum, its effect on the shunt circuit is negligible. Since the impedance of the tuned circuit Z201 is maximum at its resonant frequency, the shunt attenuation at resonance is minimum. The action of the equalizer circuit can be summarized as follows: At the outer extremity of the disc, the equalizer behaves as a pure resistive network offering equal attenuation at all frequencies (as when the equalizer switch is in the OFF position). At the inner extremity, attenuation is minimum in the pure resistive network and maximum for all frequencies in the shunt circuit except the resonant-frequency band covered by the tuned circuit. The resonant frequencies of 4,000 cps, 6,000 cps, 8,000 cps or 10,000 cps are obtained by the setting of the equalizer switch (SLOPE CONTROL) which selects the tappings on the coil L.

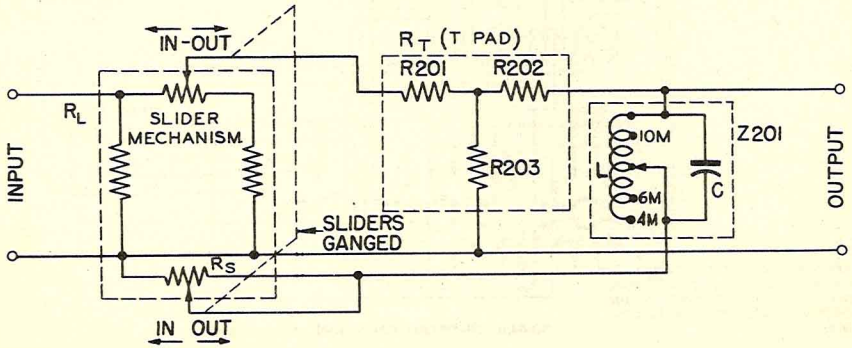


Figure 11. Simplified diagram of the automatic equalizer.

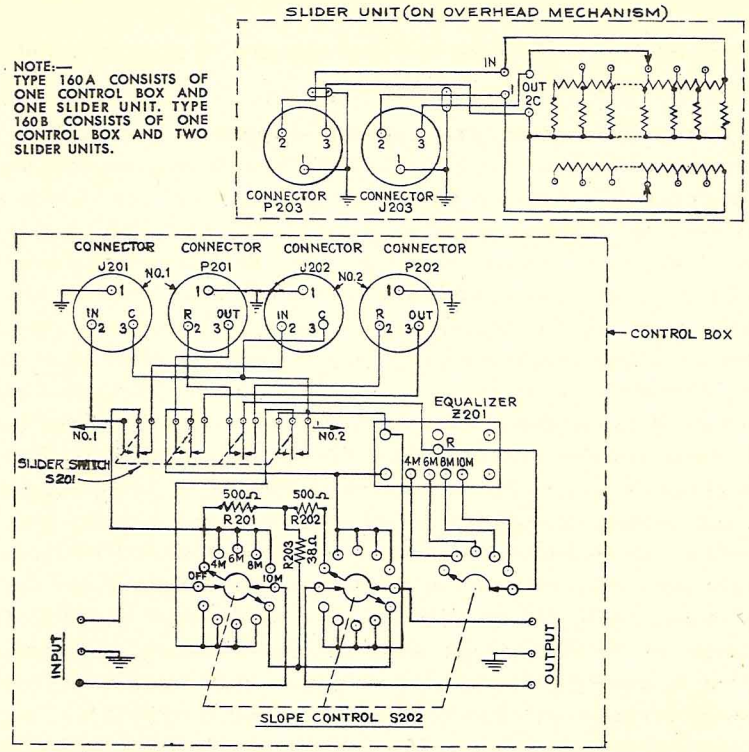


Figure 12. Schematic diagram of 160-A/B equalizer (control box).

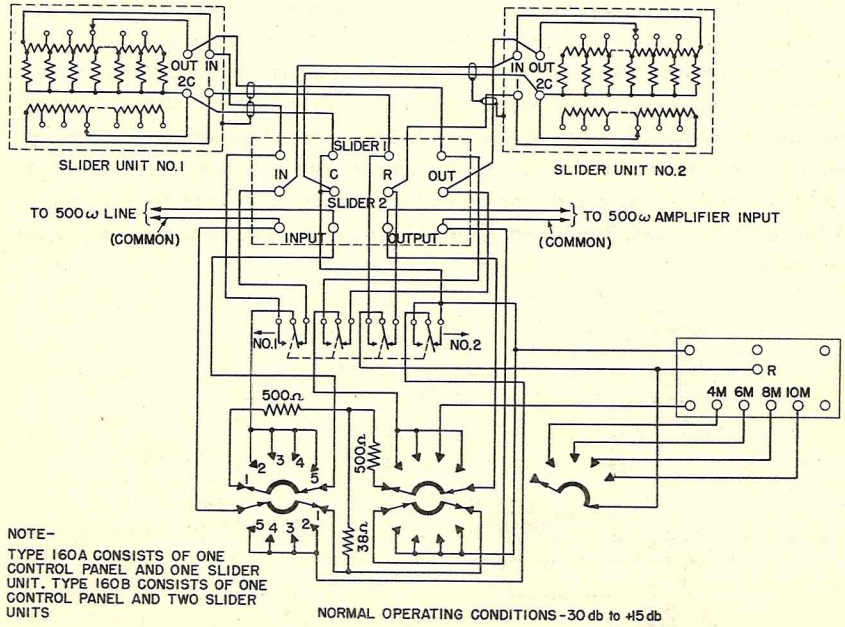


Figure 13. Schematic diagram of 160-A/B equalizer (control panel).

VI – MISCELLANEOUS ADJUSTMENTS AND REPAIRS

1. REPLACEMENT OF PARTS.

All parts of the **Presto 6N Turntable Unit** are readily accessible and may be easily replaced if they are found to be faulty. For a pictorial view of the mechanical parts see figures 14 and 15.

2. IDLER WHEEL ADJUSTMENTS (fig. 7).

a. General. "Wows" are usually due to faulty adjustment of the idler wheels or to faulty idler wheels. Check as follows: lift the turntable from the bearing well (7). Push the speed shift handle to the 78 rpm position. Push the 33⅓ rpm idler wheel counterclockwise so as to engage the 78 rpm idler wheel with the motor pulley (fig. 9). If the drive is out of adjustment it will be noticed that with moderate pressure the 78 rpm idler wheel rises on its spindle until it touches the spring clip (10). If this is so, the idler spindle should be bent slightly *towards* the turntable rim and the motor pulley. The same test should be applied to the 33⅓ rpm idler wheel by engaging the speed shift handle in the 33⅓ rpm position and pushing the 78 rpm idler wheel in a clockwise direction. If the idler wheel rises on its spindle until it touches the spring clip, the idler spindle should be bent slightly *away from* the turntable rim and towards the motor pulley.

NOTE: The above adjustments should only be undertaken by a competent and experienced repairman having shop facilities.

b. For Normal Wear of the Idler Wheels. After three or four months of use it may be necessary to readjust the pressure of the idler wheels against the motor drive pulley and turntable rim. The pressure between the motor, idler wheels and turntable rim should be just sufficient to maintain the speed of the turntable at exact rpm when cutting at a diameter of about 12 inches. Insufficient pressure will allow slippage causing the table to run at improper speed. Too great pressure will cause the motor to labor and shorten the life of the idler wheels. Check and adjust speed as follows:—

(1) Loosen the locknut and back off by several turns the adjustable 78 rpm shift stop stud (1).

(2) Push speed shift handle to 78 rpm position.

(3) Check rpm with stroboscope (furnished with equipment) and handy lamp. When correct speed is obtained push handle down to lock position.

(4) Turn the shift stop stud up to the speed shift handle and lock in this position by tightening the locknut.

(5) Loosen the locknut and back off by several turns the 33⅓ rpm shift stop stud and push speed shift handle to the 33⅓ rpm position.

(6) Follow steps (3) and (4).

3. MOTOR MOUNTING ADJUSTMENTS (fig. 7).

a. General. If the recorder-reproducer has been subjected to abuse during transportation or if parts such as turntable and shift assemblies are replaced, check the rubber grommets to make certain that they are not displaced from their sockets. Check the motor mounting screws (9). They should not be bent.

b. Motor Mounting Bar. Before performing the adjustments, a check should be made to make certain that the motor is suspended absolutely free. A twisted motor wire strap, or wood block (designed to prevent excessive swinging of the motor while equipment is in transit) may be the sole reason for improper suspension of the motor. Check motor pulley (8) and observe whether it is running true. A soft lead pencil held lightly against the pulley while running will show any eccentricity. A few light taps with a piece of wood against the surface should straighten out the pulley. The following procedure is employed to adjust the motor mounting bar (5).

(1) Loosen the motor mounting adjusting screws (4) and move motor mounting bar either towards or away from idler wheels to proper position. This position should be such that there should be sufficient clearance between both idler wheels and the motor pulley when the speed shift handle is in the 0 position.

(2) Tighten the motor mounting adjusting screws (4).

4. OVERHEAD MECHANISM ADJUSTMENTS (fig. 8).

a. Checking Alignment of Flange.

(1) Cut thin strips of tissue paper and attempt to insert between the flange (fig. 4) and disc at several positions (at least 4) diagonally opposite each other. If the tissue paper cannot be inserted, the flange is absolutely flat on the record and the overhead mechanism is properly aligned.

(2) The ability to insert tissue paper under the flange at any point indicates that the flange is raised and adjustment necessary.

(3) If the front or rear edge of the flange is raised the hexagonal bolt (33) should be loosened. Then push the overhead handle (with a forward and backward motion) to straighten the overhead mechanism.

(4) Check again with tissue paper. Tighten bolt.

(5) If tissue paper can be inserted on left or right side of the flange it indicates that the pivot point is out of adjustment.

(6) If tissue paper can be inserted at left side of the flange, the overhead adjusting ring (31) must be lowered, and vice versa. To obtain this adjustment loosen the two Allan head screws on the adjusting ring.

b. Checking Alignment of Feed Screw and Worm Gear.

(1) Hold overhead mechanism up by its handle and revolve the flange slowly.

(2) Sticking or retarding action indicates too close an adjustment of the ratchet assembly gear (24) with the lead worm gear (21).

(3) Loosen the overhead handle screws (fig. 4) and move handle sufficiently to obtain free turning of the flange.

5. CARE OF THE CUTTER HEAD.

The cutter head must be checked occasionally to see that the armature is clean. To inspect, remove the needle screw. Remove the cover screw directly above. Slip off the cover and inspect the armature. Since the gap between the armature and pole pieces of the magnet is only a few thousandths of an inch, this space must be free of dirt so that the radial motion of the armature is unhindered. A blast from an air hose is the simplest means of removing dirt from the armature. If air pressure is not available the dirt can be removed with a thin blade of non magnetic material. Adjustments for centering the armature are sealed and should not be touched. If the armature collapses, (i.e., touches one of the pole pieces) the cutter must be returned to the factory for resetting and re-calibration. When replacing the cover make sure that the rubber dust gasket is in place around the stylus opening in the cover.

6. REPLACEMENT OF FEED-FINGER BLADE.

After considerable use tracking of the feed-finger blade with the feed screw may become erratic and replacement of the blade is necessary. Procedure for its removal follows:

a. Remove cutting needle.

b. Remove feed screw.

c. Remove tension adjusting nut (28).

d. Loosen the cutter-head pivot-bearing locknut and back off the pivot bearing (a few turns counter clock-wise). The lower part of the cutter carriage is then released to enable removal of the feed-finger assembly.

e. Remove feed-finger knob and push feed-finger assembly down and out.

f. Using thin nail, drive drift pin from shaft. Old blade will fall out.

7. SERVICE AND GUARANTEE.

Don't be satisfied with your **Presto 6N Turntable** unless it makes excellent recordings. The Presto Recording Corporation guarantees to repair or replace, without charge, any equipment or part thereof which shows a defect due to workmanship or materials within ninety days after date of sale. To obtain free service or replacements under this guarantee, the equipment or part must be returned, transportation prepaid, either to the Presto factory or to the distributor from whom it was purchased. Before returning instruments to the factory, kindly write to our service department for shipping instructions and return authorization forms. We cannot assume responsibility for any charges incurred in returning equipment without our authorization.

A guarantee card is enclosed with each recorder. This card must be returned to the factory within seven days of the date of purchase to obtain service under the guarantee.

DESCRIPTION OF MECHANICAL PARTS

(Figures 14 and 15)

6N-1—33⅓-rpm-idler wheel
6N-2—78-rpm-idler wheel
6N-3—Retaining clips
6N-4—Motor-support bar
6N-5—Motor-mounting grommets
6N-6—Motor-mounting studs
*6N-7—Motor-mounting ring**
*6N-8—Motor-starting capacitor**
*6N-9—Capacitor-mounting bracket**
*6N-10—Motor pulley **
*6N-11—Motor **
6N-12—Idler-wheel shaft
6N-13—Idler-rocker arm
6N-14—Idler-arm-shoulder screw (⅜")
6N-15—Shift-lever-shoulder screw (½")
6N-16—Speed-shift lever
6N-17—Shift-handle yoke
6N-18—Speed-shift handle
6N-19—Shift-lock pin
6N-20—Shift-stop stud
6N-21—Shift-lock segment
6N-22—Motor switch
6N-23—Switch capacitor
6N-24—Time-scale assembly
6N-25—Time-scale indicator
6N-26—Time-scale pivots
6N-27—Indicator clamp
6N-28—Equalizer mounting brackets
6N-29—Pick-up-mounting grommets
6N-30—Pick-up-arm assembly
6N-31—Pick-up head
6N-32—Pick-up rest
6N-33—Pick-up-clamp thumbscrew
6N-34—Pick-up-clamp grommet
6N-35—Pick-up clamp
6N-36—Overhead bars
6N-37—Overhead handle
6N-38—Ratchet assembly
6N-39—Gear housing
6N-40—Lead worm
6N-41—Flange pad
6N-42—Worm guard
6N-43—Flange assembly
6N-44—Acorn nuts
6N-45—Worm thrust bearing
6N-46—Flange cap
6N-47—Cutter-release lever
6N-48—Cutter-cam lever
6N-49—Cam-lever stud
6N-50—Cutter carriage
6N-51—SAE washers
6N-52—Plunger holder
6N-53—Feed-finger knob
6N-54—Cutter hinge
6N-55—Cutter bracket
6N-56—Feed-finger with removable blade
6N-57—Feed-finger spring
6N-58—Tension spring
6N-59—Tension-adjusting screw
6N-60—Tension-adjusting nut
6N-61—Dashpot rod
6N-62—Dashpot-mounting bracket
6N-63—Dashpot assembly
6N-64—Dashpot-mounting nut
6N-65—Carriage-rest pin
6N-66—Crank handle
6N-67—Feed screw-center lock-screw
6N-68—Overhead-universal assembly
6N-69—Overhead-adjusting ring
6N-70—Overhead-pivot bushing
6N-71—Overhead rest
6N-72—Cutter head
6N-73—Cutter jacks
6N-74—Cutter C-R network
6N-75—Time scale mounting bracket

**When ordering specify motor nameplate data.*

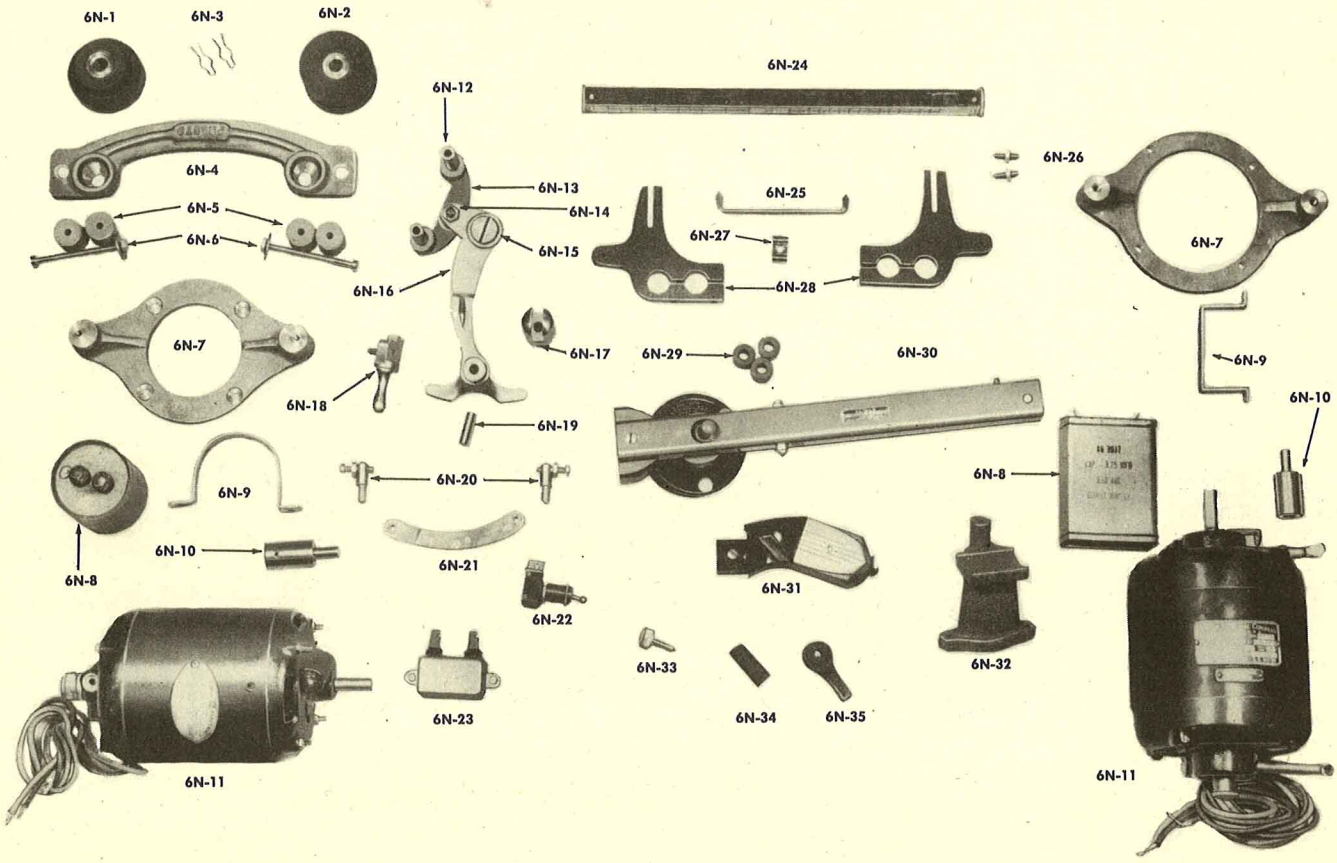


Figure 14. Turntable parts.

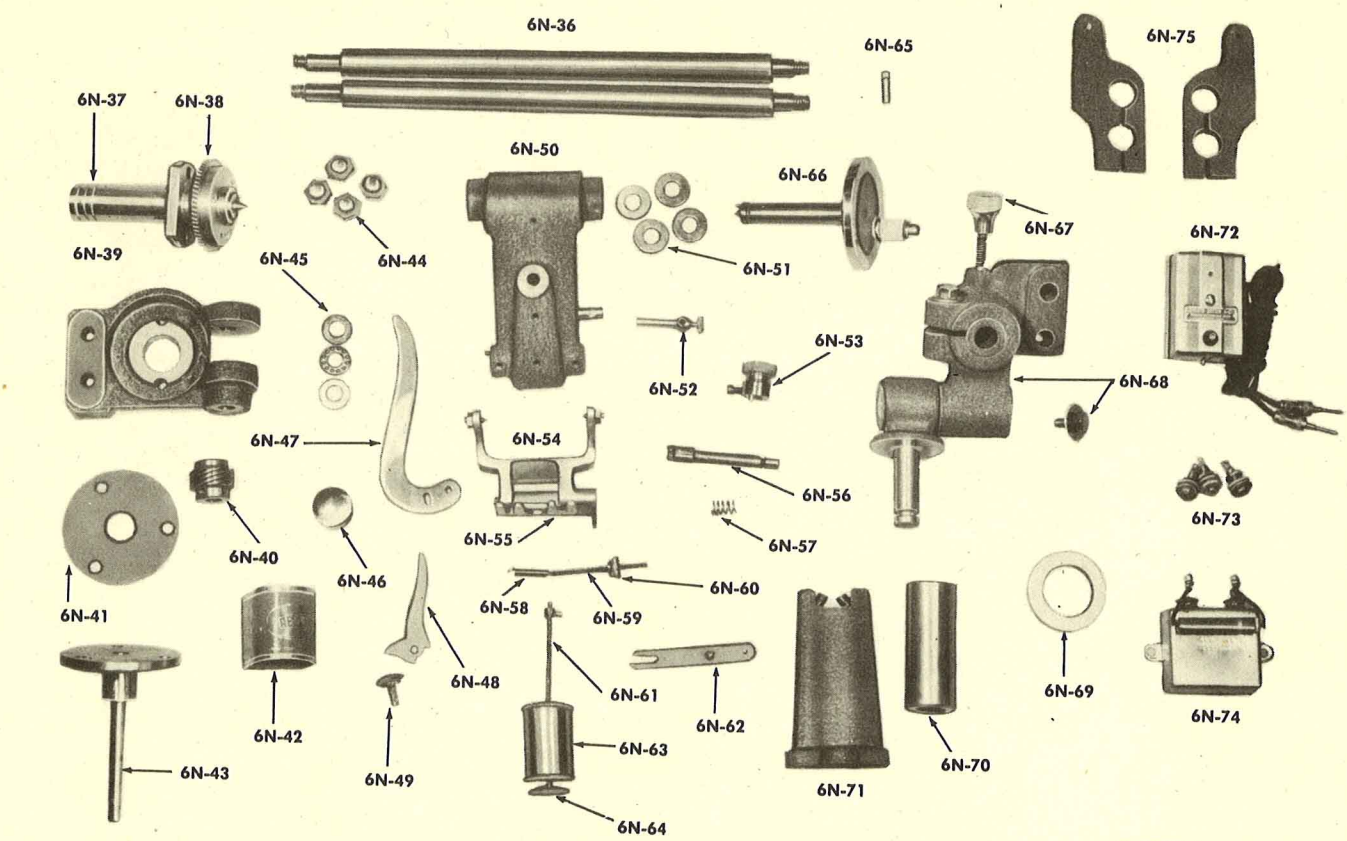


Figure 15. Turntable parts.

TL 90631-S