

**CAUTION**—The lateral reproducer has been accurately adjusted and carefully inspected at the factory. Extreme care should be exercised when assembling the reproducer to the arm and when lowering the reproducer onto the record. Failure to observe these instructions may result in a broken diamond point.

IB-24121

MI-4858  
MI-4859  
MI-4860  
IB-24121

## I N S T R U C T I O N S

f o r

### R C A T R A N S C R I P T I O N E Q U I P M E N T

#### T Y P E 7 0 - B T U R N T A B L E S

(MI-4858, MI-4859, MI-4860)

#### P O W E R S U P P L Y

105-125 Volts  
60 Cycles for MI-4858  
50 Cycles for MI-4859  
25 Cycles for MI-4860  
35 Watts

#### M O T O R S P E E D R E G U L A T I O N

0.6 Per Cent at 33-1/3 R.P.M.  
0.4 Per Cent at 78 R.P.M.

#### F R E Q U E N C Y R E S P O N S E

30 to 9,000 Cycles

#### O U T P U T L E V E L

0.0043 Volts across 250 Ohms  
(minus 52 db\*)

#### O U T P U T I M P E D A N C E

To operate into a circuit of  
from 200 to 250 Ohms.

#### T U R N T A B L E D I A M E T E R

16 Inches

#### T U R N T A B L E S P E E D S

33-1/3 and 78 R.P.M.

#### P H Y S I C A L S P E C I F I C A T I O N S

(Approximate)

Width	27	Inches
Depth	22	Inches
Height	34½	Inches
Weight	150	Pounds

## D E S C R I P T I O N

The Type 70-B Transcription Turntable with the new high fidelity lateral pickup has been designed for use with the new high fidelity transcriptions, as well as with other transcriptions. The component units have been designed so that the combination, together with the transcription, produces an excellent frequency characteristic. The new lateral pickup uses a diamond point stylus, thereby eliminating the necessity for changing needles. A selector switch (designated "FILTERS") is conveniently located on the top of the cabinet so that the high frequency response is a maximum, or may be attenuated in three values of cutoff. In order to obtain the desired bass response, a selector switch is provided inside the cabinet. The dial of the bass compensator is marked "1,2,3,4" and the maximum amount of low frequency attenuation is obtained when the switch is at position 1.

(Continued on page 3.)

\*Note: 0 db - 0.0125 Watts

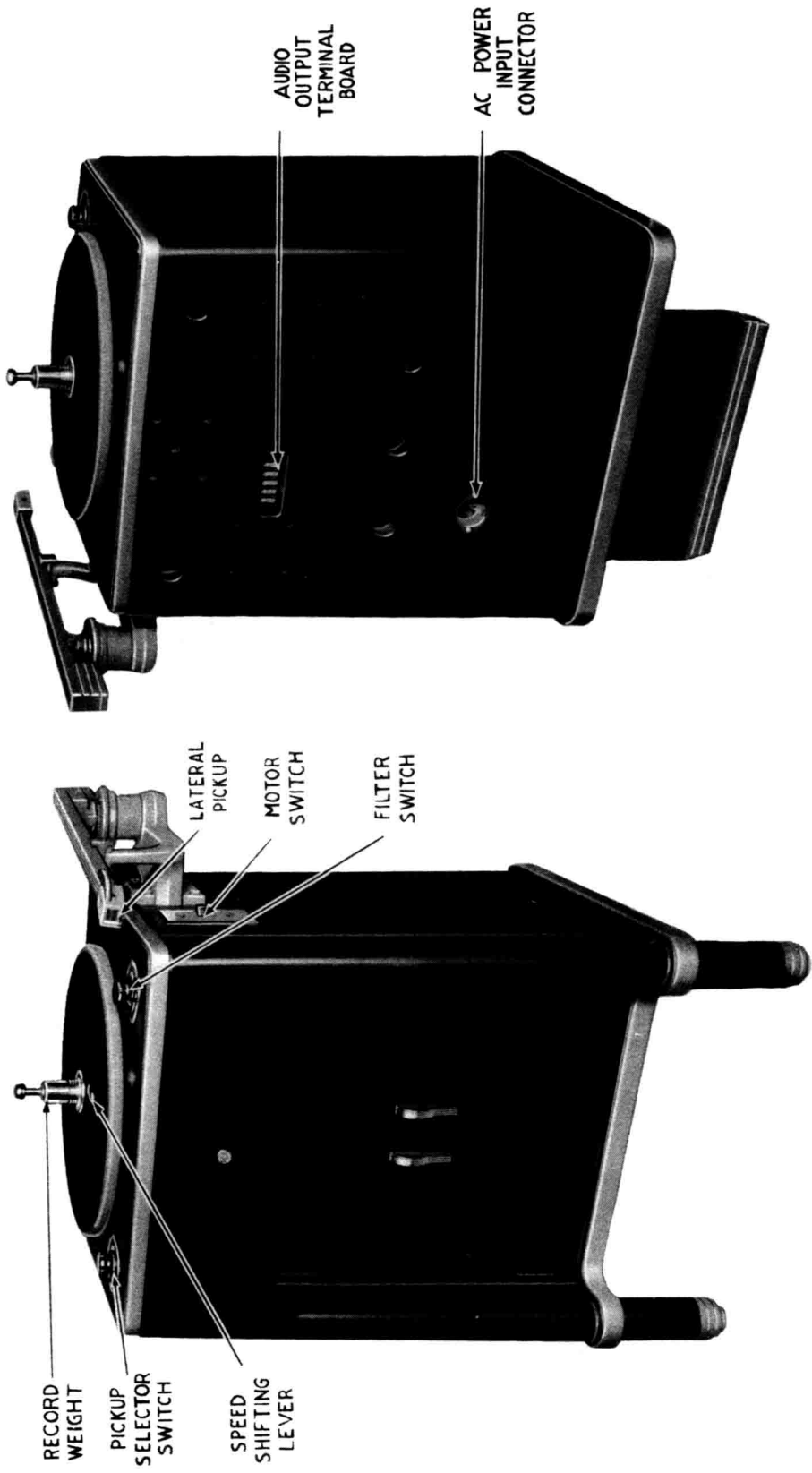


FIGURE 1 - FRONT AND REAR VIEWS OF TYPE 70-B TRANSCRIPTION TURNTABLE (MI-4858)

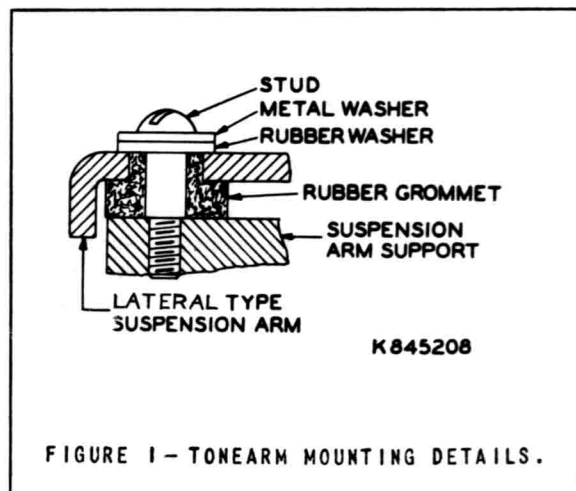
ADDENDA  
to  
I N S T R U C T I O N S  
for  
R C A T R A N S C R I P T I O N E Q U I P M E N T  
T Y P E 7 0 - B T U R N T A B L E  
(MI-4858, MI-4859, MI-4860)

For protection during transportation, the tonearm is shipped un-assembled to the mounting casting. Install the tonearm on the mounting casting, using the studs, grommets, and the washers provided, in accordance with Figure 1, "TONEARM MOUNTING DETAILS"

Also, for protection during transportation, the Turntable Drive Assembly (see Figure 3 on Page 6 of Instruction Book IB-24121) is shipped un-assembled. Read the instruction book carefully before attempting to assemble the drive assembly, and note especially section (b) "ASSEMBLY" under "INSTALLATION AND OPERATION" and Figure 3, "TURNTABLE DRIVE ASSEMBLY"

A bottle of Stock #15914 oil is supplied, the entire contents of which should be poured into the cup-like receptacle of the damper (mechanical filter) mechanism of the turntable drive assembly. The purpose of this oil is to saturate the felt cushions accommodating the two driving vanes of the damper and thus lubricate the assembly. Under normal operating conditions, it should not be necessary to renew this lubricant. If, however, for any reason, it should become necessary to renew this lubricant, use a similar quantity of Vacme "AA" oil or its equivalent (S.A.E. 60). Stock #15914 oil (4 oz. bottle) may be ordered for this purpose.

IMPORTANT: For shipping purposes, the motor and base are fastened to the cabinet floor by means of wooden clamps and carriage bolts on each side of the motor base. These wooden clamps and carriage bolts should be removed and discarded before assembling the turntable drive assembly.



R C A V I C T O R D I V I S I O N

R C A M A N U F A C T U R I N G C O M P A N Y , I N C .

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The Type 71-B Vertical Pickup Kit (MI-4852-A) and its accessory kit (MI-4855) may be ordered for use with the Type 70-B Turntable. The pickup selector switch is located on the top and left of the cabinet, and is marked "VERTICAL-LATERAL".

A high-torque synchronous motor of the capacitor type is mounted horizontally in the bottom of the cabinet. A damper (mechanical filter) mechanism is mounted on the end of the motor gear box vertical shaft and coupled to the turntable drive shaft by means of two semi-flexible couplings between which are interposed a coupling shaft and over-running clutch. The clutch disengages the turntable shaft from the driving shaft whenever the turntable and flywheel are revolving at a greater speed than the motor. This occurs when the motor power supply is turned "off" or when the turntable is advanced by hand. The turntable shaft always revolves at a speed of 78 r.p.m., speed constancy being maintained by means of a heavy flywheel. This shaft, together with its associated flywheel and the turntable (record plate), is entirely supported by means of a cushioned bearing housing mounted in the top of the turntable cabinet. This housing also contains the ball bearing speed reduction mechanism by means of which the turntable speed may be reduced to  $33\frac{1}{3}$  r.p.m. from the constant flywheel-and-shaft speed of 78 r.p.m. The speed shifting lever is located in a slot in the top of the turntable (record plate).

Many of the transcriptions currently used are of a very thin material, with a consequent tendency to warp, and for this reason a record weight is provided to hold them flat. This weight--which has a soft rubber face next to the record--engages the octagonal record spindle and thus assures a positive drive between the turntable and the record.

The lateral pickup tonearm bracket is mounted at the right side of the cabinet. The frequency response characteristic of this unit is sloped to a degree closely complementary to the response characteristics of present day recordings. This compensation results in an overall record reproduction characteristic almost uniform throughout the range.

The vertical pickup tonearm bracket (when used) is mounted at the rear of the cabinet. As in the case of the lateral pickup, the frequency response characteristic is made closely complementary to the response characteristics of present day recordings. The combined characteristic of the vertical pickup and the record is nearly uniform over the frequency range.

The audio and power connections to the turntable unit are made to a terminal board and a recessed male connector, respectively, located on the rear of the cabinet.

The AC power switch is a mercury tube switch of the tumbler type and is located on the right-hand side of the cabinet.

The pickup selector switch is located at the left and on top of the cabinet. When this switch is set in its right-hand position, the lateral pickup is connected to the output terminals of the cabinet; when set in the left-hand position, the vertical pickup is connected to the output terminals; or, when only one pickup is mounted on the cabinet, the switch is so wired that this pickup is connected in both switch positions. The switch is provided with a detent for the assurance of contact and position.

The speed shift control in the turntable (record plate) is plainly marked in two colors as well as with numerals corresponding to the two speeds.

*(Continued on page 5.)*

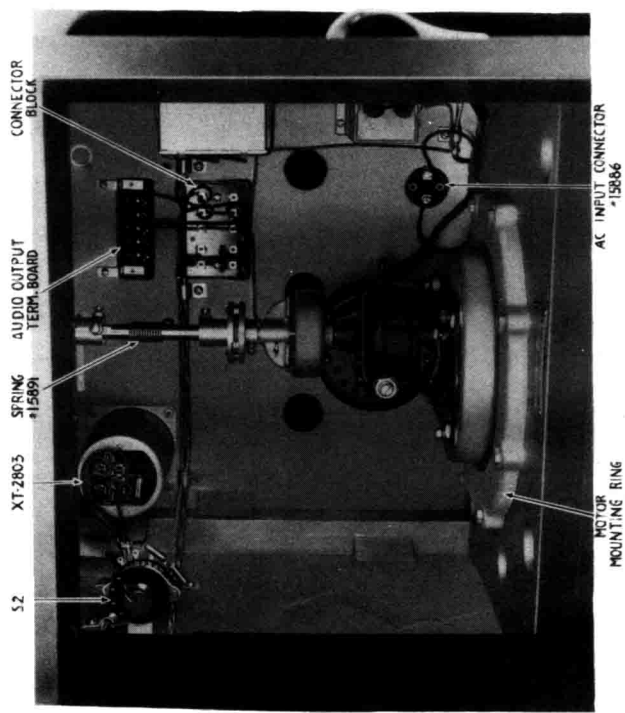
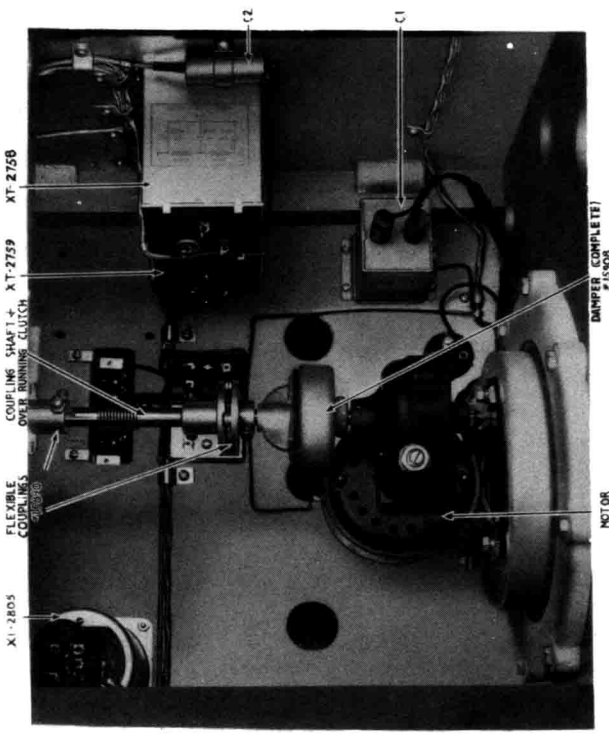
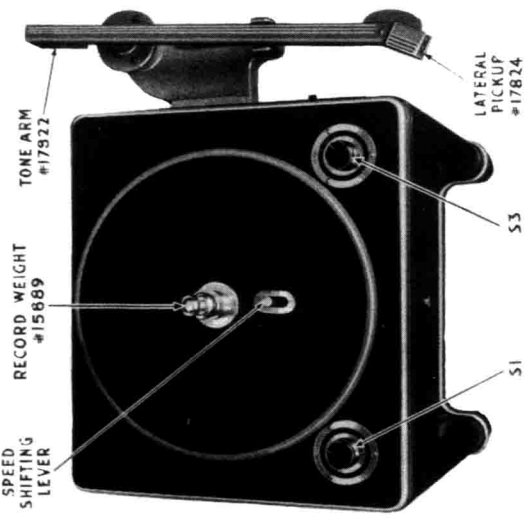
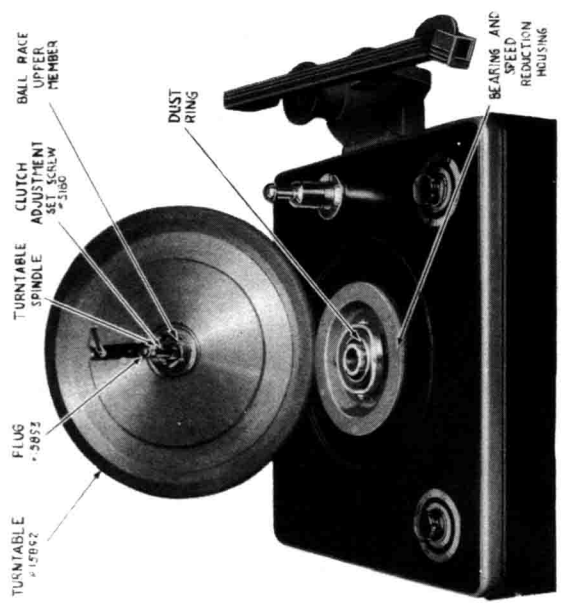


FIGURE 2 - TOP AND INTERIOR VIEWS OF TYPE 70-B TRANSCRIPTION TURNTABLE (MI-4858)

## INSTALLATION AND OPERATION.

### (a) UNPACKING

When unpacking the equipment, extreme care should be exercised in removing the crating which is used to protect the top of the turntable in shipping. The card-board cap that covers the turntable should be lifted off carefully, and in such a manner that the turntable is not raised or disturbed in any way. Remove any shipping wedges that may be under the turntable.

CAUTION: Do not at any time, whether during unpacking, assembly or operation, lift the turntable or remove it from its spindle except as noted in "MAINTENANCE".

All wrappings should be carefully removed from the tonearm.

The flywheel is packed in a cardboard carton beside the cabinet. In this location will also be found, tied in place, a box containing the record weight, and a box containing the pickup. Unpack these very carefully.

When dusting the equipment, subsequent to unpacking, and at all other times, take particular care that dust is not brushed or blown underneath the turntable and thus conveyed to the turntable bearings. The use of an oiled cloth for dusting purposes is recommended.

### (b) ASSEMBLY.

Open the two doors of the cabinet, thus gaining access to the driving mechanism of the turntable; namely, the motor, the mechanical filter (just above the motor gear box), the upper and lower flexible couplings, and the flywheel shaft which extends downward out of the bearing and speed reduction housing, and upon which the flywheel is to be mounted.

Loosen the four set-screws in the upper flexible coupling and the four set-screws in the lower flexible coupling.

Slide the upper flexible coupling down and the lower flexible coupling up on the coupling shaft until the upper collar of the upper flexible coupling clears the bottom of the flywheel shaft and the lower collar of the lower flexible coupling clears the top of the short shaft projecting upward from the mechanical filter and remove the shaft. The couplings, of course, will be, and should remain on the shaft. *Exercise great care when removing the shaft to avoid springing or forcing the couplings in such a way as to cause injury to the bronze spring-washer that forms a part of their assembly.*

CAUTION: The motor and the entire drive shaft assembly are carefully aligned at the factory. Under no circumstances attempt to realign the assembly by loosening the motor mounting bolts or the bolts in the motor mounting ring. The horizontal and the vertical shaft thrust bearing adjustment screws in the motor gear box are likewise carefully adjusted at the factory, and under no circumstances should they be disturbed.

Remove the two hexagon nuts and the shipping bushing from the flywheel shaft.

Place the flywheel, with the recessed side up, on the flywheel shaft and secure it in position by means of the two hexagon nuts removed in the previous operation, and make sure that it is securely clamped. In order to assemble the flywheel on the shaft, it is neces-

(Continued on page 7.)

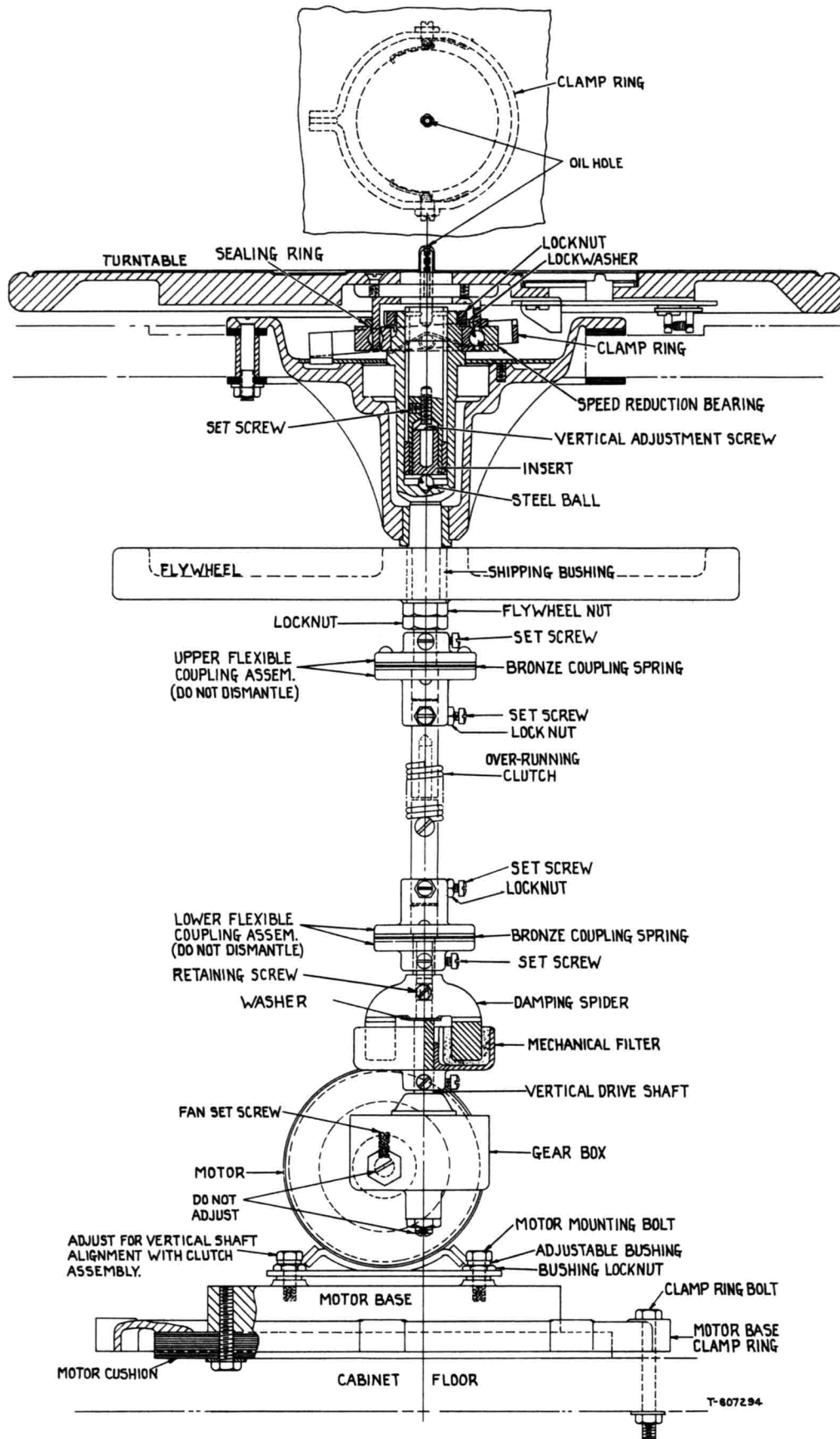


FIGURE 3 - TURNTABLE DRIVE ASSEMBLY

sary to tilt the flywheel above the cross-piece over the cabinet doors, lining up the flywheel hole with the shaft, carefully raising the flywheel into place, then securing as explained above. The flywheel will slip into place on the shaft easily when in position and it must not be forced or damage to the shaft may result.

Replace the coupling shaft and flexible coupling assembly in the position from which it was removed from the drive assembly and tighten the set-screws. Note that the flywheel shaft and the short shaft projecting upward from the mechanical filter are "spotted" for the cone point set-screws and that both ends of the coupling shaft are provided with "flats" for the accommodation of their respective set-screws in the collars of the flexible couplings. Observe also that the coupling shaft consists of two members (male and female), the joint of which is concealed by the spring of the over-running clutch. The shaft should be replaced in such a manner that the retaining screw of this spring is toward the bottom of the shaft. Be sure that the two members of the shaft are completely engaged, one with the other. Do not force the shaft assembly on the flexible couplings when replacing the assembly.

See that all set-screws involved in the foregoing operation are properly seated and tightened.

(c) LUBRICATION.

Two holes are provided, one in each end-bell, for the lubrication of the motor bearings. Use a light, high-grade, non-gumming machine oil (S.A.E. 20), and lubricate at intervals of not more than six months.

An oil hole is provided in the center of the record spindle for the lubrication of the turntable bearings. Use a light, high-grade, non-gumming machine oil (S.A.E. 20) and apply six or seven drops at intervals of one month.

(d) ELECTRICAL CONNECTIONS.

The equipment is now completely set up, lubricated and ready for installation. In order to match the pickup output, the amplifier input impedance should not be less than 200 ohms or more than 250 ohms. Reproducing quality will not, however, be noticeably affected when the output is fed into 500 ohms. Install the equipment as follows:

See that the turntable is level. A three-point method of support is provided to eliminate the possibility of the turntable rocking when the floor is uneven.

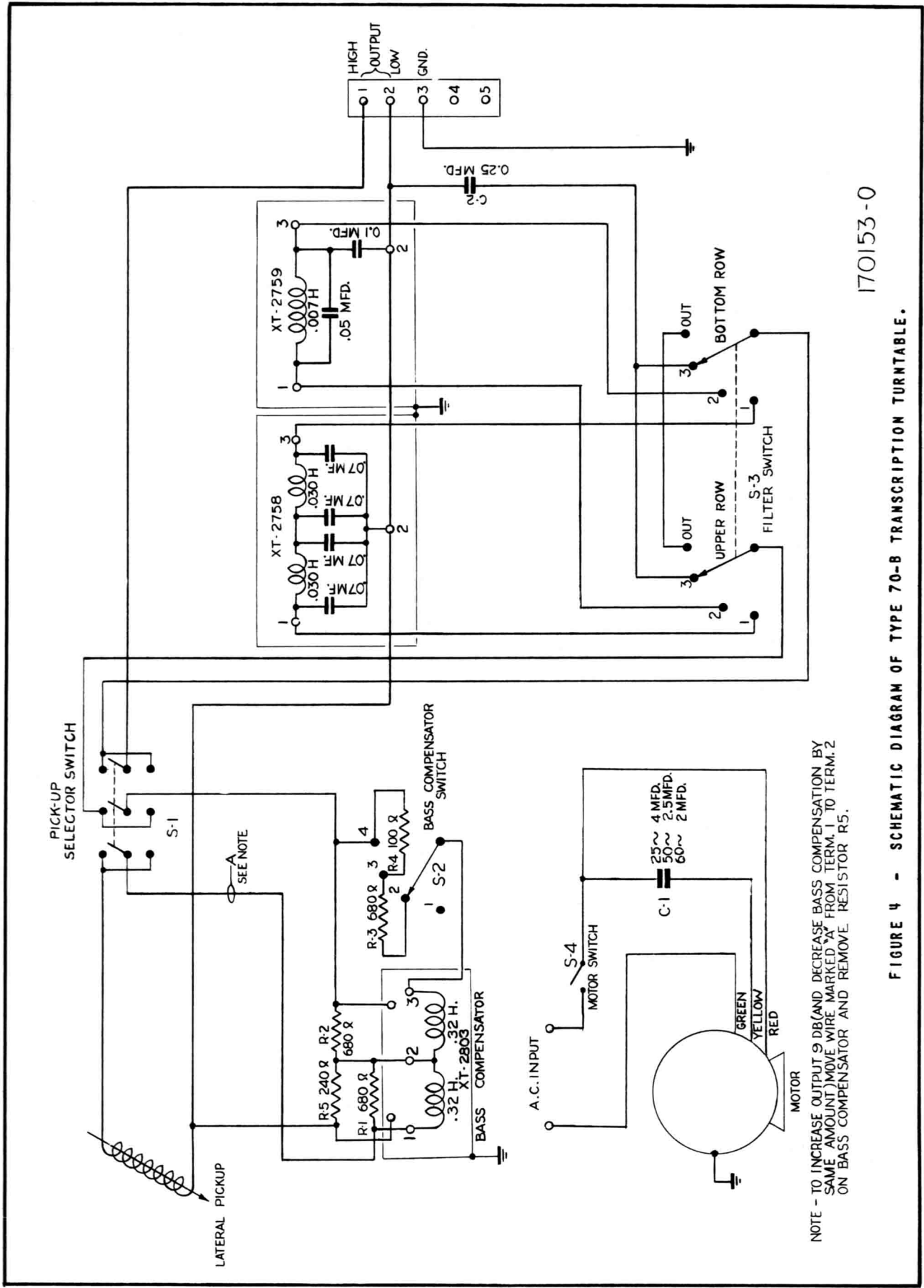
See that the motor starting switch is in the "off" position.

The female cord connector furnished should be fitted with a suitable power cord, as this is not supplied as a part of the equipment. Make the required connections to a 105- to 125-volt, AC power supply of the frequency specified on the name plate. No other type of power supply may be used.

A terminal board, containing the two audio output terminals and the ground terminal, is accessible through an opening in the back of the cabinet. Terminals #1 and #2 are the output terminals; terminal #3 is the ground terminal; terminals #4 and #5 are not used. Make the required connections to the amplifying equipment. It is recommended that a shielded, twisted pair of No. 19 A.W.G. be used for the output connections, and the low side of the audio output (terminal #2) should preferably be grounded at the amplifier to which it is connected. The shield of this audio cable should also be grounded.

((Continued on page 9.)





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FIGURE 4 - SCHEMATIC DIAGRAM OF TYPE 70-B TRANSCRIPTION TURNTABLE.

NOTE - TO INCREASE OUTPUT 9 DB (AND DECREASE BASS COMPENSATION BY SAME AMOUNT) MOVE WIRE MARKED "A" FROM TERM. 1 TO TERM. 2 ON BASS COMPENSATOR AND REMOVE RESISTOR R5.

(e) ROUTINE OPERATION

In order to insure stability of operation, it is recommended that the motor starting switch be turned "on" and the motor allowed to run independently for at least five minutes before playing records. This precaution should be observed especially when the instrument has been idle for an appreciable period, (such as overnight), but is not essential between operations separated by intervals of short duration.

With the external amplifier turned on, the routine operating procedure for the Type 70-B equipment as follows:

1. See that the motor switch is in the "off" position.
2. Set the speed shifting device for the speed of the record to be used (either 33-1/3 r.p.m. or 78 r.p.m.). Engage the speed shifting mechanism by rotating the turntable slowly by hand. The speed change becomes effective in less than one revolution.
3. Place the record on the turntable and place over it the record weight.
4. If necessary, set the pickup head selector switch for the type of pickup to be used. In the case of the Type 70-B equipment which is designed to reproduce lateral cut records only, both positions on this switch are common and no previous setting of the switch is required. In the case of the Type 70-B equipment which is adapted for the use of both the vertical and the lateral cut recordings, clockwise, or right-hand, setting of the selector switch closes the circuit of the lateral pickup head, while the left-hand setting closes the circuit of the vertical pickup head.
5. Start the motor and lower the pickup arm onto the record in accordance with the usual studio practice.
6. When the record has been played, lift the pickup and replace it in the tonearm rest.
7. Move the motor starting switch to the "off" position.

CAUTION: The pickup should never be left resting on the record or the turntable when through playing.

It is recommended that the equipment be covered when not in use.

M A I N T E N A N C E

Lubricate the equipment in accordance with instructions given in "INSTALLATION AND OPERATION". Do not oil the over-running clutch, as lubrication of this device has been properly taken care of at the factory.

Never blow dust from beneath the record plate. Wipe it from this space with a lint-free and slightly oily cotton cloth--WHILE THE RECORD PLATE IS STATIONARY. The speed reduction bearing is protected against the normal accumulation of dust from above, but is liable to contamination if fairly large particles of dust are blown upward from the recess in the turntable cabinet in which the bearing is located.

The lateral pickup arm should ride parallel to the plane of the record. Should this at any time not be the case, adjustment may be made by loosening the set-screw at the back

(Continued on page 10.)

of the tonearm pivot, sliding the tonearm up or down on the pivot until the correct adjustment is obtained, and tightening the set-screw.

As a result of the continued demand for higher and higher quality in the reproduction of broadcast transcriptions, the transcription turntable has been developed, through engineering refinements, into a device in the class with precision instruments and should be treated as such. With reasonable care and proper lubrication, as outlined in this Instruction Book, it should give years of constant service without noticeable increase in speed variation. Therefore, do not tamper with, or alter in any way, any parts of the turntable drive assembly or record plate (except as described in "INSTALLATION AND OPERATION", or change any adjustments of this mechanism, unless it is absolutely necessary because of a known defect.

Should any adjustments or repairs to the drive mechanism become necessary, it is advisable to have the RCA Manufacturing Company's service man make the required adjustment of the device. However, in cases of extreme necessity and with the provision that the work be performed by an experienced machinist, the following repairs and adjustments may be made in the field. Refer to Figure "TURNTABLE DRIVE ASSEMBLY" for part identification.

(a) CLUTCH ADJUSTMENT OF SPEED CHANGING MECHANISM.

Do not remove the turntable unless this adjustment ( or that described in (b) below) is necessary.

The turntable may be removed from its bearing and re-adjustment of the clutch mechanism may be made in the following manner:

1. Grasp the turntable with the hands at diametrically opposite points on its circumference and withdraw it from its bearing by exerting a straight, upward pull. When doing this be sure to hold the turntable in a level position until its spindle is entirely clear of the bearing. Otherwise, damage to the bearing may result.

The steel ball which serves as a thrust bearing under the end of the turntable spindle may adhere to the grease on the spindle and be removed from its seat. Be careful not to lose this ball.

2. Place the turntable, face down, on a clean level surface.
3. Remove the cylindrical plug in the end of the turntable spindle.
4. A vertical bearing adjustment, slotted to accommodate a screw-driver, will be found at the bottom of the hole from which the plug has been removed. A set-screw in the side of the shaft serves to clamp this adjustment.
5. Loosen this set-screw, back out or screw in the adjustment and insert the plug.
6. See that the steel ball thrust bearing is in its seat in the turntable spindle bearing in accordance with instructions given, in (c) below, and test for correct adjustment, the conditions for which are given in sub-paragraph 7, below.
7. The clutch engagement should be accomplished in the first revolution of the turntable, and the equipment must not be operated if the clutch slips.

(Continued on page 11.)

(b) CLEANING THE SPEED REDUCTION BEARING.

If the equipment is not kept clean or is improperly cleaned, dust may become lodged in the speed reduction bearing. If the dust is permitted to remain and accumulate, excessive wear, and possible speed variation, will result. Dust in the speed reduction bearing will be indicated by a faint knocking or grinding noise, heard directly from the mechanism when running at 33-1/3 r.p.m. To remedy this condition, it is necessary to remove the bearing and clean it thoroughly.

Do not raise the turntable or remove the bearing unless it is necessary to perform this work (or that described in (a) above). The procedure is as follows:

1. Remove the turntable as described above.
2. Unlock the bearing nut by bending the lock washer tabs outward and away from the notches in the bearing nut.
3. Remove the bearing nut by means of a spanner wrench.
4. Remove the lock washer and sealing ring.
5. Lift the speed reduction bearing clear of the bearing housing without removing the clamp ring.
6. Clean all parts on the top of the housing of the mechanism and remove all dust from the top of the cabinet.
7. Soak the speed reduction bearing thoroughly in clean kerosene oil, turning the steel balls and ball races to be sure that no dirt or lint remains on the assembly.
8. Wash the bearing in a second rinse of clean kerosene and shake off all kerosene possible. Do not attempt to dry the bearing with a cloth, as this operation may reintroduce lint to the bearing parts and cause a repetition of the trouble.
9. Apply a thin coating of pure, clean, white-vaseline to the ball race. Vaseline sold in a tube-type container is suggested, since there is almost no possibility of its becoming contaminated or dirty.
10. Replace the bearing on the bearing shaft. (See that the notch in the clamp ring is uppermost when the assembly is in position.)
11. Place the lockwasher on the bearing shaft.
12. Place over the lock washer a clean piece of paper, having in its center a round hole the size of the bearing shaft.
13. Screw the nut in place and tighten it with a spanner wrench.
14. Lock the nut by bending a lock washer tab into a notch in the bearing nut.
15. Place the sealing ring in position on top of the speed reduction bearing and center it.
16. Clean the under side of the turntable and replace it on the spindle as described below.

(Continued on page 12.)

(c) REPLACEMENT OF TURNTABLE.

If, for any reason, the turntable has been removed from its bearing in the main drive spindle, replace it in the following manner:

1. Engage the turntable spindle with the female bearing of the drive spindle, align the spindle, and lower the turntable slowly until the upper member of the ball race, which is attached to the turntable, comes into contact with the balls. When performing this operation make certain that the dust ring, which rests on the top of the spindle, is concentric with the bearing.
2. While still holding the turntable, rotate it slowly until the openings in the upper member of the ball race engage the balls, and then lower it slowly and carefully into position.

(d) WOWS.

A variation in the speed of rotation of the turntable, sometimes referred to as "wows", can be caused by a loose flywheel. Be sure that the flywheel nut and its lock nuts are well tightened.

(e) CHANGING THE MOTOR.

To replace the drive motor, disconnect electrically and proceed as follows:

1. Loosen the lock screws on the upper and lower flexible coupling units and on the spider of the mechanical filter.
2. Remove the four motor mounting bolts.
3. Raise the entire spider and coupling assembly to clear the vertical drive shaft and set the upper flexible coupling lock screws and spider lock screws so as to hold the assembly clear of the vertical drive shaft.
4. Carefully lift out the motor.
5. Remove the mechanical filter from the vertical drive shaft and place it in the same position on the vertical drive shaft of the new motor.

NOTE: A washer in the mechanical filter is shown in Figure 3. This washer can be forgotten, or lost, before the reassembly is started. Therefore, be sure to locate this washer and set it safely aside at the time of removing the old motor.

6. Place the new motor carefully on the motor base and lock the mechanical filter to the vertical drive shaft. Flats are provided on the shafts for the lock screws.
7. Align the vertical shaft with the coupling shaft and start, but do not tighten the motor mounting bolts.
8. Loosen the upper flexible coupling and spider lock screws and lower the coupling unit assembly into place so that the spider engages the female section of the mechanical filter.

*(Continued on page 13.)*

9. Lock the lower and upper flexible coupling lock screws to the flats of the shafts to which they fit.
10. Make electrical connections to the new motor. See "INSTALLATION AND OPERATION."
11. Oil the new motor as described previously.
12. Start the motor and observe the bronze coupling spring in the lower flexible coupling unit. The spring will run horizontally between the coupling unit sections and will appear as a plane surface when the motor is properly aligned. If the motor is not correctly in line, the bronze spring will show a definite undulation as it turns.
13. Adjustable motor base bushings with lock nuts are supplied on the motor. These bushings permit the raising or lowering of any corner of the motor and must be adjusted for the alignment of the vertical drive shaft and clutch assembly. The bushings should be locked after they have been set for alignment as described.
14. Tighten the motor mounting bolts while watching the bronze coupling spring with the motor running. Any variation in the bronze coupling spring movement will indicate that further adjusting of the motor base bushings will be necessary.
15. When the adjustable bushings are set so that the tightening of the motor mounting bolts does not throw the vertical drive shaft and clutch assembly shaft out of line, they are correctly set.

NOTE: The over-running clutch must be absolutely free to turn in the clockwise direction and must not bind. It must lock when turned counter-clockwise.

R E P L A C E M E N T   P A R T S   L I S T

The following parts list is included to provide proper identification when ordering replacement parts. When ordering, specify the item by its symbol (wherever possible) as shown in the diagrams, followed by description and catalog number.

Insist on genuine factory-tested parts which are readily identified and may be purchased through Authorized Dealers, or from the Factory.

<u>SYMBOL</u>	<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>
C-2	Capacitor, 0.25 Mfd.	30849
C-1	" For 60 Cycle Motor	12051
C-1	" For 50 Cycle Motor	30398
C-1	" For 25 Cycle Motor	13103
---	Pickup - Lateral Pickup	17824
---	Motor, 60 Cycle (for MI-4858)	16362
---	Motor 50 Cycle (for MI-4859)	16804
---	Motor, 25 Cycle (for MI-4860)	16805
R-1	Resistor, 680 Ohms	31024
R-2	" 680 Ohms	31024
R-3	" 680 Ohms	31024
R-4	" 100 Ohms	30540
R-5	" 240 Ohms	30619
---	Bass Compensator, XT-2803	17653
S-1	Pickup Selector Switch	17670
S-2	Bass Compensator Switch	17672
S-3	Filter Switch (High Frequency)	17671
S-4	Motor Switch	15885
---	Filter Assembly, XT-2758	17651
---	Tone Arm	17822
---	Filter Assembly, XT-2759	17652
---	Knob for S-2	30075
---	Knob for S-3	17268
---	Connector, Cord Connector and Cap.	15886
---	Coupling, drive shaft coupling	15890
---	Damper, (mechanical filter), complete	15908

(Continued on page 15.)

R E P L A C E M E N T P A R T S L I S T ( C o n . )

<u>SYMBOL</u>	<u>DESCRIPTION</u>	<u>CATALOG NUMBER</u>
--- .....	Insert, thrust bearing insert (plug) in bottom of turntable spindle .....	15893
--- .....	Screw, adjustment screw, for adjusting the clutch of the speed reduction mechanism, (located in turntable spindle) .....	5181
--- .....	Screw, set-screw for clamping the clutch adjustment screw .....	5180
--- .....	Spring, coupling shaft, torsional spring .....	15891
--- .....	Turntable, complete with spindle and speed shift lever .....	15892
--- .....	Weight, record weight .....	15889



R C A V I C T O R D I V I S I O N

R C A M A N U F A C T U R I N G C O M P A N Y , I N C .

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