

M6169 STEREO TRANSISTOR

EQUALIZED T.T. PREAMPLIFIER

# INSTRUCTION BOOK



**GATES**

**GATES RADIO COMPANY**

*A Subsidiary of Harris-Intertype Corporation*

**QUINCY, ILLINOIS**

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INSTRUCTION BOOK  
FOR  
M-6169 STEREO TRANSISTOR  
EQUALIZED TURNTABLE PREAMPLIFIER

I.B. 888 0706 001

GATES RADIO COMPANY  
QUINCY, ILLINOIS

TECHNICAL DATA

GAIN: 45 DB,  $\pm 1$  DB @ 1KC, adjustable with Gain Control.

RESPONSE: To follow RIAA Curve  $\pm$  DB or better

DISTORTION: 0.5% or lower, 30 to 15,000 CPS at 0 DBM out.

NOISE: 60 DB or lower from -63 DBM input at 30 cycles (-123 DBM equivalent input noise). Capable 70 down (30 CPS used because it is maximum gain frequency of amplifier).

CROSSTALK: Below noise level at all frequencies

INPUT IMPEDANCE: 47K ohms,  $\pm 5\%$  unbalanced. Allows a wide range of cartridge selection.

OUTPUT IMPEDANCE: 600 ohms or 150 ohms balanced.

MAXIMUM OUTPUT LEVEL: 0 DBM.

MAXIMUM OPERATING AMBIENT TEMPERATURE: 55°C (131°F).

MAXIMUM STORAGE AMBIENT TEMPERATURE: 85°C (185°F)

POWER: 110/117/125 volts, 60 CPS @ 1 watt.

TRANSISTORS: 4-2N1414, 4-2N422.

RECTIFIERS: 2-1N2069 (Silicon).

FINISH: Natural, corrosion-protected aluminum.

MOUNTING: Four holes for mounting to Gates Turntables or to ~~the~~ inside of cabinet. Can be mounted in any position.

SIZE: 9½" x 5 1/8" x 3½".

WEIGHT: 3¼ lbs.

CUBAGE: Domestic Packed- 1 cu. ft.

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M6169

Transistorized  
Preamplifier

## DESCRIPTION

The Gates M6169 Transistor Equalized Turntable Preamplifier is a two channel stereo preamplifier. The amplifier is designed for use in broadcasting, recording and general sound requirements where low distortion and exacting frequency response characteristics are demanded. Special techniques have been employed to obtain reliability, low distortion and excellent temperature stability.

The amplifier can be mounted in any position and does not require ventilation as long as the inside ambient temperature does not exceed 55°C (131°F). All necessary connections can be made to the amplifier without removing shields or making solder connections.

## INSTALLATION

### Mounting

The amplifier has been provided with four mounting holes in the flange for mounting in any position.

1. All new Gates Turntables have been provided with the necessary holes to mount the amplifier.
2. Older Turntables will have to be drilled as shown in figure 1.

### Input Connections

The amplifier has been designed to present a 47K ohm input impedance, which will properly terminate all popular stereo pickups. The amplifier is completely equalized to the RIAA Curve.

To connect the cartridge observe Fig. 2. Keep all leads as short as possible to maintain low cable capacity and reduce the possibility of excessive hum pickup.

Ground the Turntable proper to external (Terminal 1 TB-2 or TB-3) and in turn ground this point to the station ground. In extreme cases it will be necessary to ground the motor plate and terminal 1 separately.

### IMPORTANT NOTICE

Since the amplifier is unbalanced the ground side of the pick-up should be returned, as shown in Fig. 2, to terminal 2.

### Output Connections

The output load impedance required for the amplifier is 600 ohms. However, the output transformer may be connected for either 600 ohm or 150 ohm balanced. Observe Fig. 3 for output connections, and strapping information.

The output leads should be routed away from the input leads to prevent possible oscillation.

### Power Connection

The amplifier is designed to operate from 117V.a.c., 60 cps power and is wired this way at the factory. However, transformer taps have been provided for 110V and 125V. lines. To connect for 110V. remove grey wire of T1 from TB1 and replace with the brown lead of T1.

To connect for 125V. remove grey wire from TB1 and replace with blue wire from T1. All unused leads should be taped to prevent possible shorting.

### Program Level Adjustment

It will be necessary to adjust the output level of the amplifier after installation due to the variation in levels obtained from different make cartridges and also to suit the input facilities of the Console.

### To Adjust

Play back a standard monophonic record recorded at 7 cm/sec, and with the attenuators on the Console set at their normal position adjust the level out of the preamps for the correct reading and balance on the Console VU meters. This procedure is recommended for stereo, since the program material on both channels will be the same; however, keep in mind that a stereo recording will be about 3 db lower in level.

### THEORY OF OPERATION

The amplifier theory can be best explained in two parts: First, the preamp section and second, the power supply section.

#### Preamplifier

The preamplifier is a four stage transistor circuit utilizing an emitter follower input stage, (Q1). This was chosen because it provides the 47,000 ohm input impedance required to properly load stereo cartridges.

The second and third stages (Q2 & Q3) are connected in the common emitter configuration for maximum gain and utilize selective feedback to produce the RIAA Curve. The feedback network consists of R11, C6, and C7. Temperature stability for Q1 is provided by base bleeder resistors, R1 and R2 together with emitter resistor R3, R5, R6, R9 and R13 provide temperature stability for Q2 and Q3.

Q4 is an emitter follower shunt feeding the output transformer (T2) and is virtually distortionless. Temperature stability is provided by R16, R17 and R18. The level control is located between Q3 and Q4 and is connected in the conventional manner.

### Power Supply

The power supply is designed to provide low ripple DC voltage necessary to operate the high gain, low noise transistors. The power transformer, T1, is a special low flux density transformer designed to prevent hum fields in the amplifier. The power supply connection is a conventional full wave ground return type. It should be noted, however, that the DC for each amplifier channel is supplied from a different output capacitor. This provides the necessary isolation that prevents cross-talk.

### MAINTENANCE

Transistor circuits allow this unit to be operated without the need for a heavy schedule of routine maintenance. The amplifier should, however, be kept free of dust and dirt.

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Transistorized  
M6169 Preanplifier

PARTS LIST

<u>Symbol No.</u>	<u>Gates Part No.</u>	<u>Description</u>
C1,C2,C4, C8,C10,C11	522 0242 000	Cap., 25 uf., 25 V DC
C3	522 0257 000	Cap., 35 uf., 50 V DC
C5	522 0166 000	Cap., 400 uf., 3 V DC
C6	508 0210 000	Cap., .015 uf., 100 V., 10%
C7	508 0253 000	Cap., .04 uf., 100 V., 10%
C9	522 0185 000	Cap., 100 uf., 6 V DC
C12,C13,C14	522 0297 000	Cap., 250 uf., 50 V DC
CR1,CR2	384 0018 000	Diode, 1N2069
F1	398 0017 000	Fuse, 1 amp., 250 V.
R1	540 0103 000	Res., 180K ohm, 1/2 W., 5%
R2	540 0101 000	Res., 150K ohm, 1/2 W., 5%
R3	540 0062 000	Res., 3.6K ohm, 1/2 W., 5%
R4	540 0066 000	Res., 5.1K ohm, 1/2 W., 5%
R5,R7,R16,R17	540 0078 000	Res., 16K ohm, 1/2 W., 5%
R6,R10	540 0055 000	Res., 1.8K ohm ohm, 1/2 W., 5%
R8	540 0075 000	Res., 12K ohm, 1/2 W., 5%
R9	540 0018 000	Res., 51 ohm, 1/2 W., 5%
R11	540 0064 000	Res., 4.3K ohm, 1/2 W., 5%
R12	540 0073 000	Res., 10K ohm, 1/2 W., 5%
R13	540 0002 000	Res., 11 ohm, 1/2 W., 5%
R14	540 0057 000	Res., 2.2K ohm, 1/2 W., 5%
R15	552 0215 000	Control, 10K ohm
R18	540 0058 000	Res., 2.4K ohm, 1/2 W., 5%
Q1	380 0004 000	Transistor, 2N422
Q2,Q3,Q4	380 0014 000	Transistor, 2N1414
T1	472 0423 000	Transformer, Power
T2	478 0227 000	Transformer, Output
XQ1,XQ2, XQ3,XQ4	404 0066 000	Socket

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M6169 Transistorized  
Preamplifier



# Warranty

This equipment is warranted under the liberal Gates Radio Company warranty, terms and conditions of which are fully set forth on the reverse page.

GATES RADIO COMPANY



PRESIDENT

# WARRANTY

This equipment is warranted by Gates Radio Company of Quincy, Illinois to be free from defects in workmanship and material and will be repaired or replaced in accordance with the terms and conditions set forth below:

1. Gates Radio Company believes that the purchaser has every right to expect first-class quality, materials and workmanship and has created rigid inspection and test procedures to that end, and excellent packing methods to assure arrival of equipment in good condition at destination.
2. Gates Radio Company will endeavor to make emergency shipments at the earliest possible time giving consideration to all conditions.
3. Gates Radio Company warrants new equipment of its manufacture for one (1) year (six (6) months on moving parts), against breakage or failure of parts due to imperfection of workmanship or material, its obligation being limited to repair or replacement of defective parts upon return thereof f.o.b. Gates Radio Company's factory, within the applicable period of time stated. Electron tubes shall bear only the warranty of the manufacturer thereof in effect at the time of the shipment to the purchaser. Other manufacturers' equipment covered by a purchaser's order will carry only such manufacturers' standard warranty. These warranty periods commence from the date of invoice and continue in effect as to all notices, alleging a defect covered by this warranty, received by Gates Radio Company prior to the expiration of the applicable warranty period.  
The following will illustrate features of the Gates Radio Company warranty:

**Transmitter Parts:** The main power or plate transformer, modulation transformer, modulation reactor, main tank variable condensers all bear the one (1) year warranty mentioned above.

**Moving Parts:** As stated above, these are warranted for a period of six (6) months.

**Electron Tubes:** As stated, Electron tubes will bear such warranty, if any, as provided by the manufacturer at the time of their shipment. Gates Radio Company will make such adjustments with purchasers as given to Gates Radio Company by the tube manufacturer.

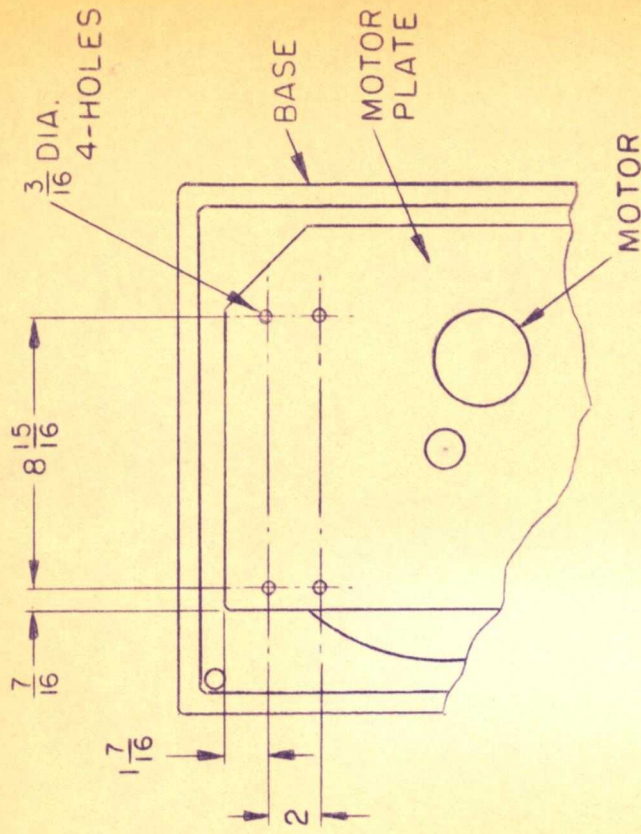
**All other component parts (except as otherwise stated):** Warranted for one (1) year.

**Abuse:** Damage resulting from abuse, an Act of God, or by fire, wind, rain, hail, in transportation, or by reason of any other cause or condition, except normal usage, is not covered by this warranty.

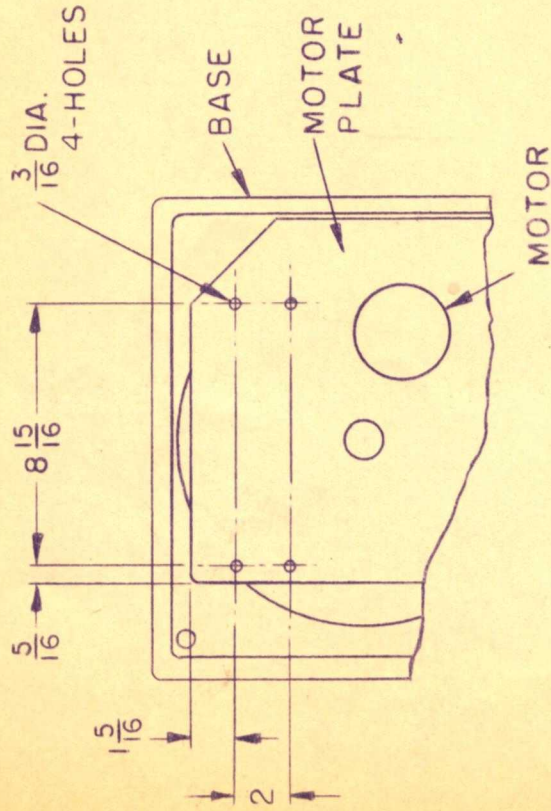
4. Operational Warranty — Gates Radio Company warrants that any new transmitter of its manufacture, when properly installed by purchaser and connected with a suitable electrical load, will deliver the specified radio frequency power output at the output terminal(s) of the transmitter, but Gates Radio Company makes no warranty or representation as to the coverage or range of such apparatus. If a transmitter does not so perform, or in the event that any equipment sold by Gates Radio Company does not conform to any written statement in a contract of sale relative to its operating characteristics or capabilities, the sole liability of Gates Radio Company shall be, at the

option of Gates Radio Company, either to demonstrate the operation of the equipment in conformance with its warranty, or to replace it with equipment conforming to its warranty, or to accept its return, f.o.b. purchaser's point of installation and refund to purchaser all payments made on the equipment, without interest. Gates Radio Company shall have no responsibility to the purchaser under a warranty with respect to operation of equipment unless purchaser shall give Gates Radio Company a written notice, within one (1) month after arrival of equipment at purchaser's shipping point, that the equipment does not conform to such warranty.

5. Any item alleged by a purchaser to be defective, and not in conformance with a warranty of Gates Radio Company shall not be returned to Gates Radio Company until after written permission has been first obtained from the Gates Radio Company home office for such return. Where a replacement part must be supplied under a warranty before the defective part can be returned for inspection, as might be required to determine the cause of a defect, purchaser will be invoiced in full for such part, and if it is determined that an adjustment in favor of the purchaser is required, a credit for an adjustment will be given by Gates Radio Company upon its receipt and inspection of a part so returned.
6. All shipments by Gates Radio Company under a warranty will be f.o.b. Quincy, Illinois or f.o.b. the applicable Gates Radio Company shipping point.
7. Gates Radio Company is not responsible for the loss of, or damage to, equipment during transportation or for injuries to persons or damage to property arising out of the use or operation of Gates equipment. If damage or loss during transportation occurs, or if the equipment supplied by Gates Radio Company is otherwise damaged, Gates will endeavor to make shipment of replacement parts at the earliest possible time giving consideration to all conditions. It is the responsibility of a purchaser to file any claim for loss or damage in transit with the transportation company and Gates will cooperate in the preparation of such claims to the extent feasible when so requested.
8. Gates Radio Company, in fulfilling its obligations under its warranties, shall not be responsible for delays in deliveries due to depleted stock, floods, wars, strikes, power failures, transportation delays, or failure of suppliers to deliver, acts of God, or for any condition beyond the control of Gates that may cause a delayed delivery.
9. This warranty may not be transferred by the original purchaser and no party, except the original purchaser, whether by operation of law or otherwise, shall have or acquire any rights against Gates Radio Company by virtue of this warranty.
10. Gates Radio Company reserves the right to modify or rescind, without notice, any warranty herein except that such modification or rescission shall not affect a warranty in effect on equipment at the time of its shipment. In the event of a conflict between a warranty in a proposal and acceptance and a warranty herein, the warranty in the proposal and acceptance shall prevail.
11. This warranty shall be applicable to all standard Gates catalog items sold on or after March 1, 1960.



INSTALLATION INSTRUCTIONS  
FOR MOUNTING PREAMPLIFIER TO  
16" TURNTABLE



INSTALLATION INSTRUCTIONS  
FOR MOUNTING PREAMPLIFIER TO  
12" TURNTABLE

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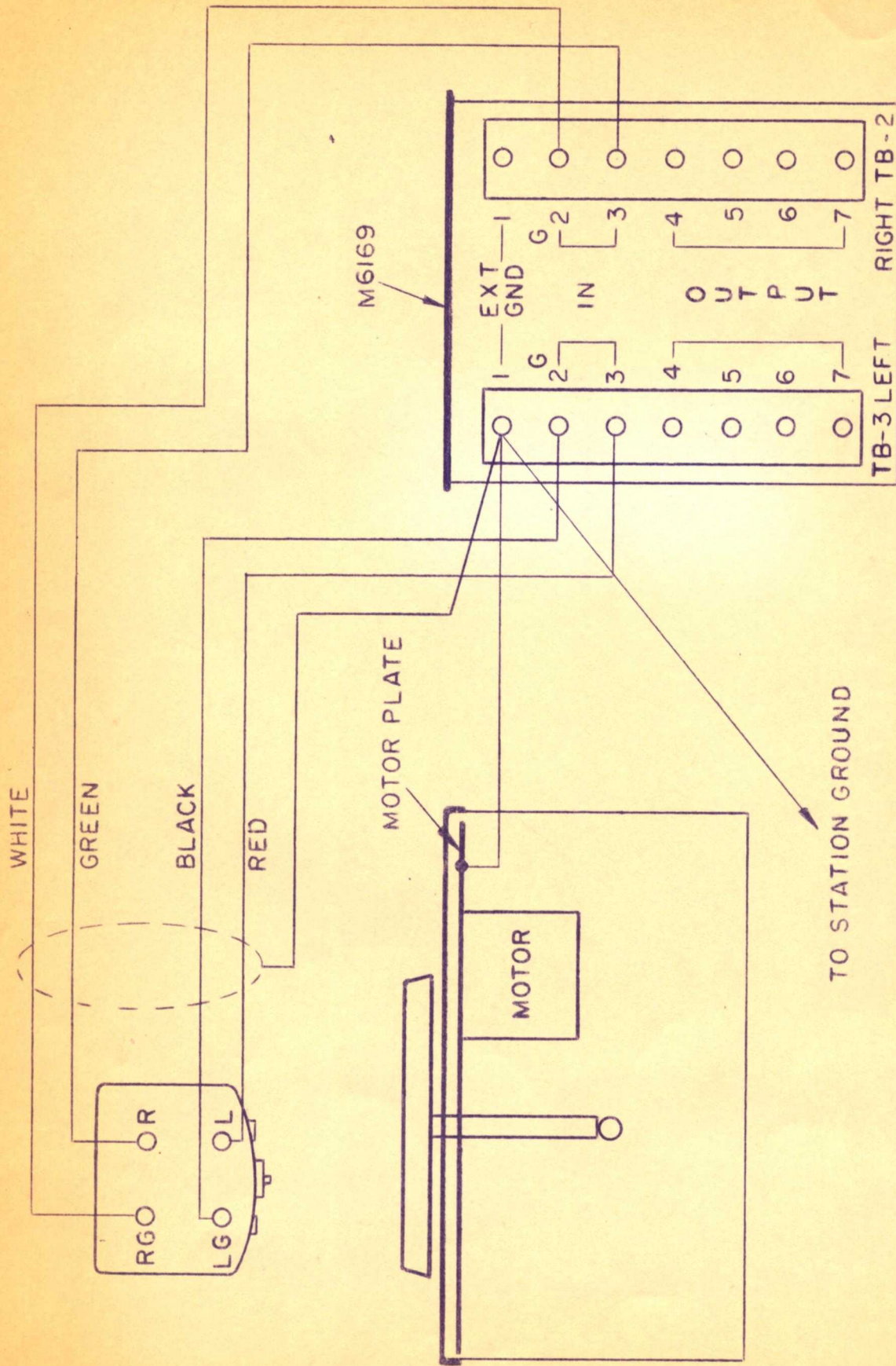


FIG 2

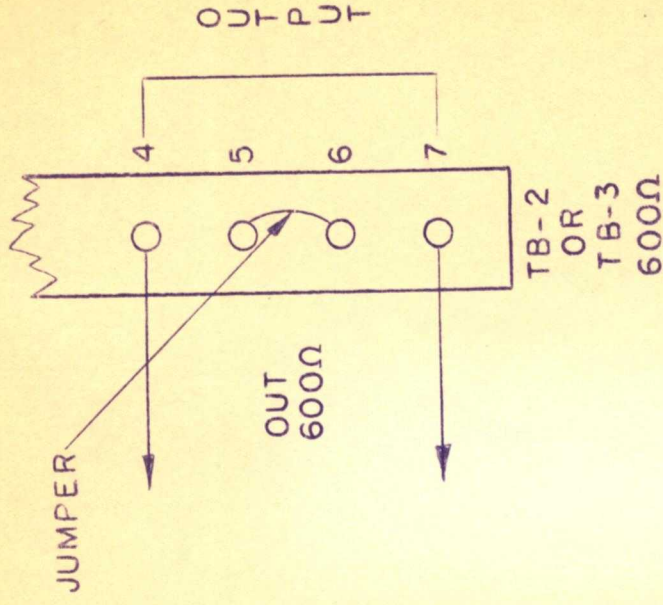


FIG 3B

LOAD IMPEDANCE  
STRAPPING INSTRUCTIONS

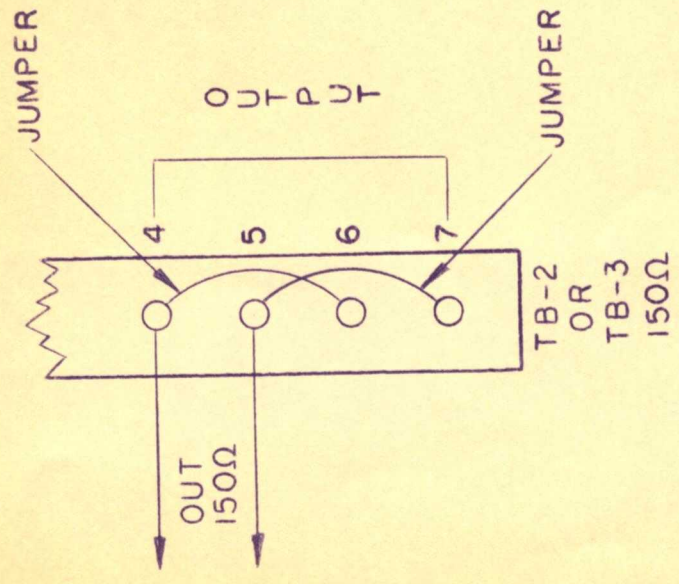
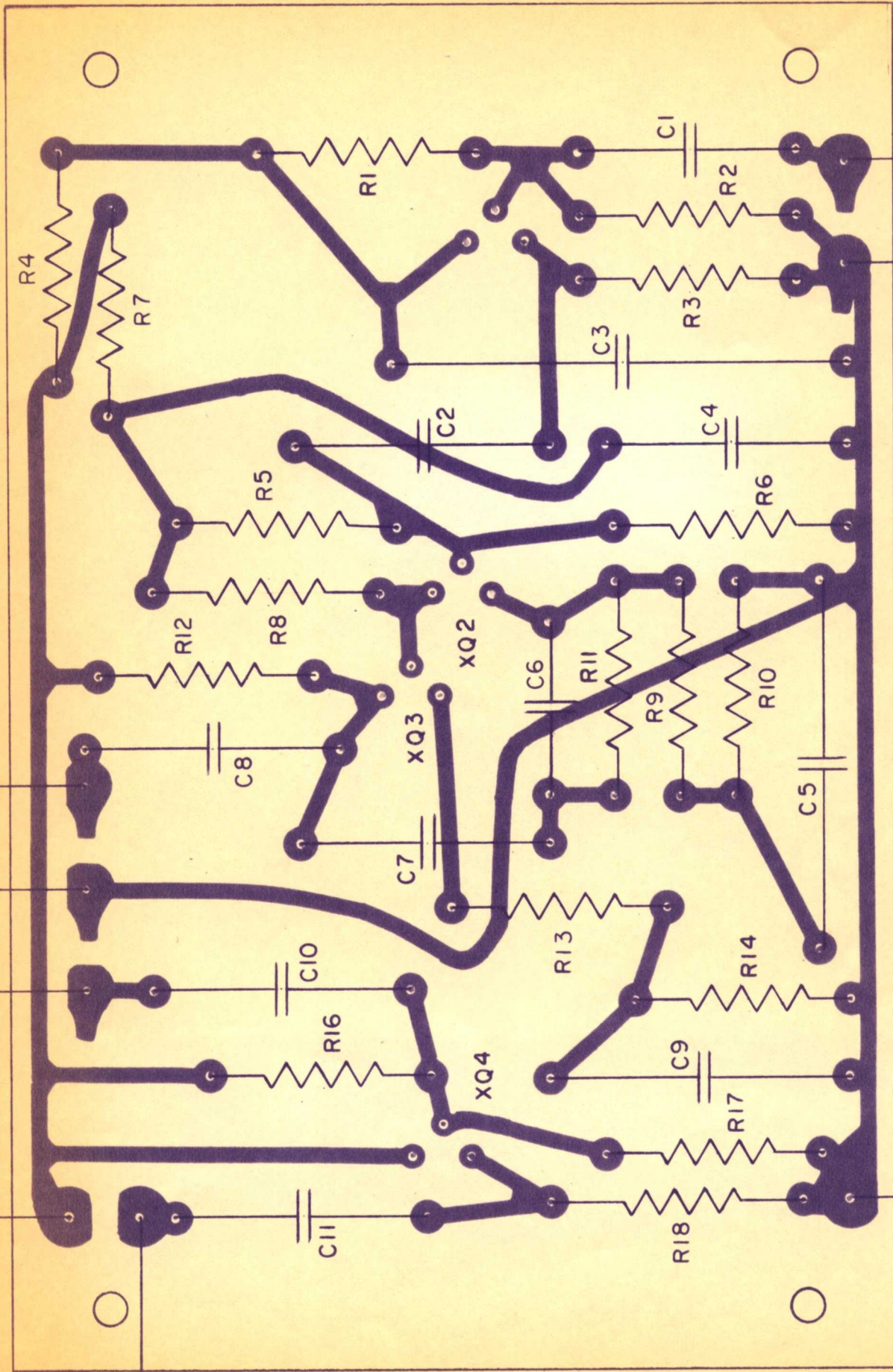
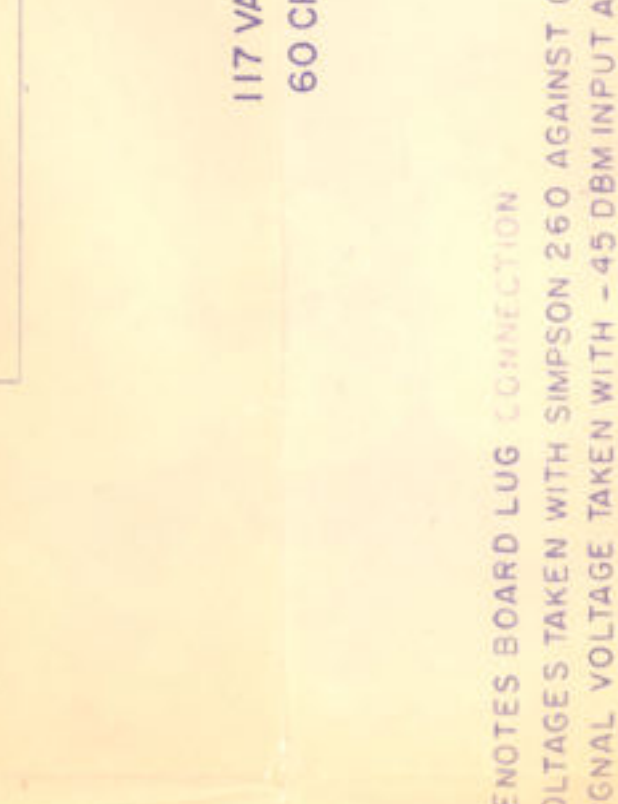
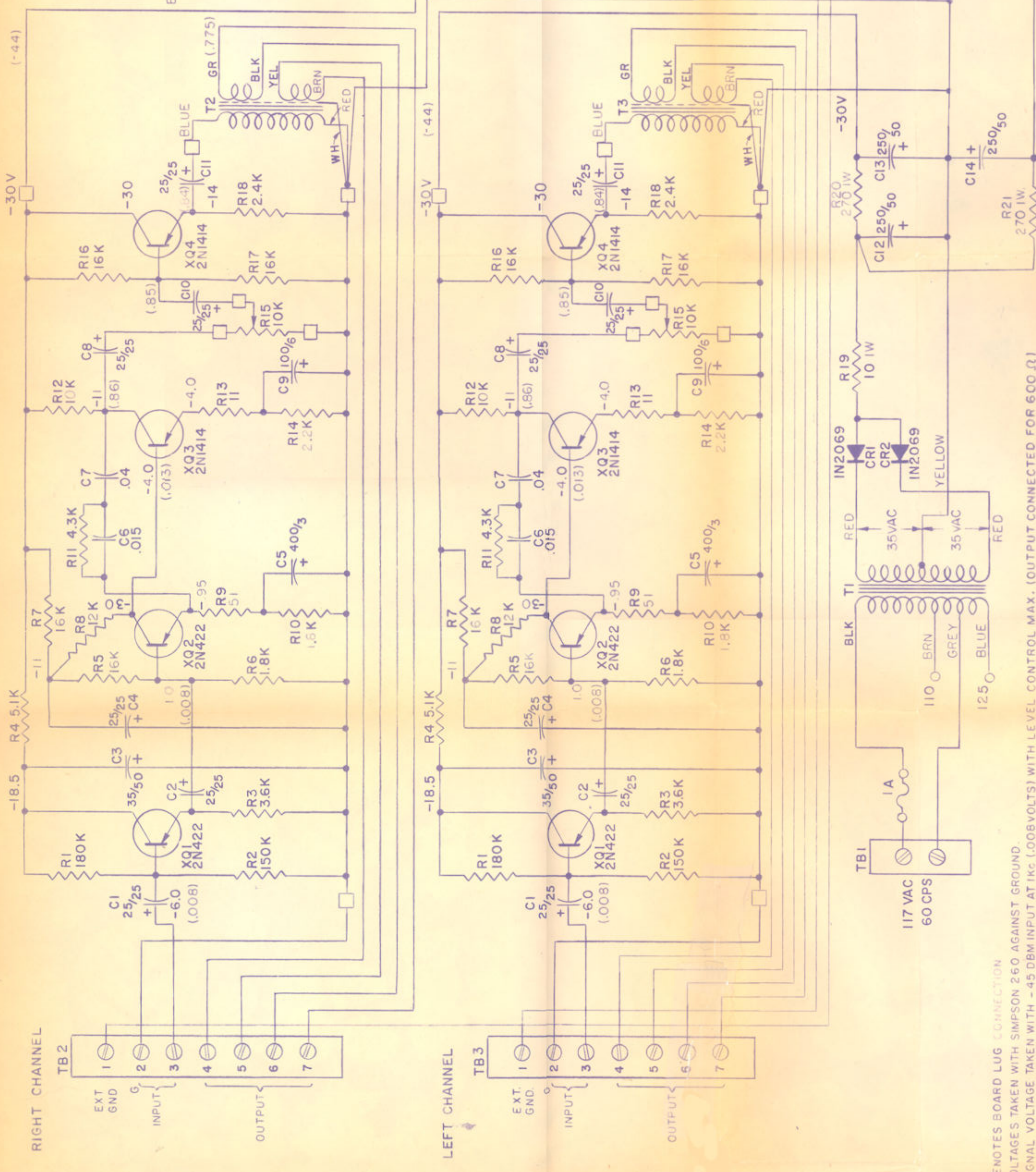
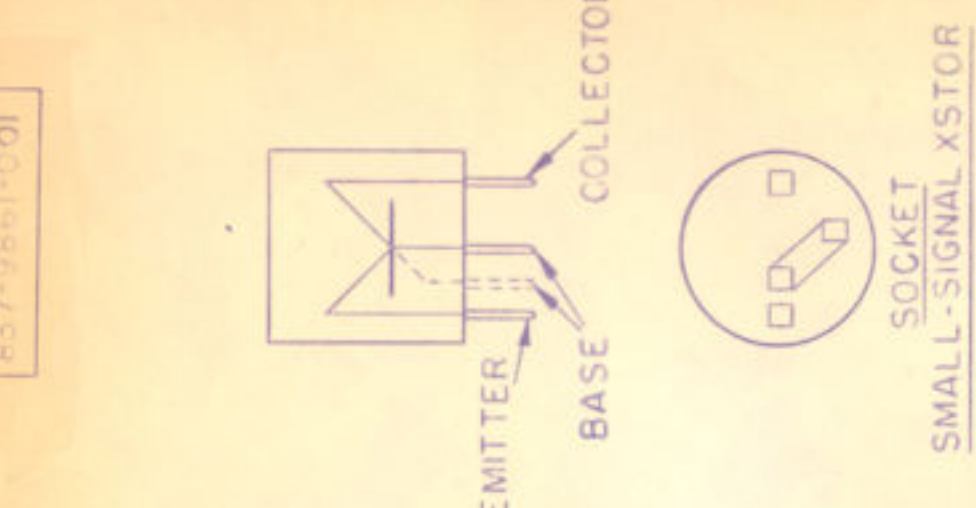


FIG 3A

VOLUME CONTROL  
ARM  
BOTTOM  
TOP



PRINTED CHASSIS SHOWING (OVERLAY)  
COMPONENTS AND WIRING  
TRANSISTOR PREAMPLIFIER M6169



- NOTES
- 1) □ DENOTES BOARD LUG CONNECTION
  - 2) DC VOLTAGES TAKEN WITH SIMPSON 260 AGAINST GROUND.
  - 3) AC SIGNAL VOLTAGE TAKEN WITH -45 DBM INPUT AT 1Kc (.008VOLTS) WITH LEVEL CONTROL MAX.

FIG. 4

Speed R.P.M.	Cue Allowance Maximum	Rumble
33-1/3	1/6 turn	- 40db
45	1/4 turn	- 38db
78	1 turn	- 33db

Wow: .15% Max.

Flutter: .07% Max.

Power Requirements: 105-125 V., 35 W.

Motor: Hysteresis synchronous, single phase, 600 R.P.M. with 2.0 mfd. running capacitor and 40° temperature rise.

Chassis Size: 16 X 16 X 1-5/16"

Motor Hang Below Bottom of Chassis: 5-3/4"

Platter Size: 13-3/8"

Weights: 30 lb. Net  
40 lb. Shipping

#### INTRODUCTION

The Gates CB-77 transcription turntable is surprisingly simple in operation, yet over-simplification has been avoided in the interest of quality, standards of performance, and low mechanical noise. Certain features that have proven themselves over the years have been retained, such as the shear type idler wheel, oilite bearings, heavy cast aluminum platter and chassis, "Monoball" self-aligning bearings, self-centering idler wheel (that insures exact tension at all times) and the direct speed shift mechanism.

New features are the hub drive, the improved motor mounting (to insure low noise rumble free operation) and the rocker type mercury OFF-ON switch.

The result is a transcription turntable built for low noise: long rugged service; and positive in operation with reduced maintenance.

#### INSTALLATION

The turntable is packed in a shipping carton with a piece of heavy corrugated board to separate the platter from the rest of the assembly. Lift the platter out of the assembly and remove the separator. Then remove the rest of the assembly from the shipping carton.

Before installing remove the metal bar that locks the control mechanism in the neutral position.

Add about a tablespoon of oil supplied with each unit to the center bearing housing, before the platter is set in place.

The turntable should be installed with clearances as indicated on drawing A-33146. When installed, the rubber stripping around the edge is the only part of the turntable that comes in contact with the cabinet. The turntable platter and arm should be carefully leveled when placed in operation. This is very important if pickups with very low tracking force are used.

#### OPERATION

This turntable is specifically designed for three speed operation; 78, 45 and 33-1/3 RPM. The speed is selected by moving the control lever to the desired index. This lever engages and disengages the neoprene idler from the three step motor pulley. The floating action of the idler assembly, transfers the optimum torque from the motor pulley to the platter, at all speeds.

The motor is energized with the rocker type switch on the control plate. The "ON" position is indicated when the translucent lever is illuminated. This is a mercury switch so its operation is silent. It is located close to the turntable platter so it can be actuated while holding a record.

#### MAINTENANCE

Under normal use the CB-77 turntable should be cleaned and oiled once every month. Place a drop of oil at each point indicated by an "O" in figures 1 and 5. Care should be taken to keep oil off the surfaces of the motor pulley, the idler wheel and the drive surface of the platter. It is a good plan to clean the driving surfaces with lighter fluid, or a similar solvent on a lint free cloth as part of the monthly maintenance program. This should be done when the platter is removed for servicing. Oil the idler wheel bearing by putting a drop of oil in the gap of the idler wheel retaining ring. About a tablespoon of oil should be placed in the center bearing housing when the unit is first placed in service.

When the turntable is not in use the control lever should be in the neutral position. (See Fig. 2). This disengages the idler wheel from the motor drive pulley. If the idler wheel is left resting against the motor pulley for a length of time a flat spot will develop on the driving face of the idler. This flat spot will usually smooth out after a period of running the turntable. Some undesirable thumping will occur until it regains the original shape. It is suggested that a spare idler wheel be kept on hand.

**CAUTION:** Under no circumstances should the motor pulley be removed from the motor shaft. The motor shaft and pulley constitute a very close and precise fit. After the motor and pulley are assembled at the factory, a finish cut is taken on the pulley to assure perfect concentricity and the proper diameter for very accurate speed. Any attempt to remove the pulley from the motor will result in damage to the motor shaft and also to the pulley itself. Any adjustments to the motor and pulley assembly should be handled at the factory.

When oiling the various points mentioned, including the motor, use only "Gulfoil Electric Motor Oil". Oils with a paraffin base will gum up in use, so they should not be used.

#### TROUBLE SHOOTING

##### 1. Idler Wheel Hangs Up On Motor Pulley

The idler wheel is adjusted at the factory to have approximately 1/64" clearance between each step on the motor pulley and the bottom of the drive surface of the wheel when in the 33-1/3 and 45 RPM positions. (See Fig. 3). There should also be 1/64" clearance between the driving surfaces of the idler wheel and the motor pulley (See Fig. 3). When the control lever is in the neutral position (Fig. 2). This clearance can be checked as follows; remove the platter, place the control lever in neutral, and slide the idler wheel all the way back on the idler arm. (See Fig. 5). If there is not enough clearance at these two points, the idler will hang up on the motor pulley.



To adjust this clearance, lengthen or shorten the rod which disengages and engages the idler (Fig. 1). This can be done by backing off the locknut on the ball joint, and removing the fillister head screw at the bottom of the idler assembly. (Fig. 5). Turn the ball joint in or out a half turn at a time until the proper clearance is obtained. Too much clearance will not allow the idler to seek the proper location when "floating" from one speed change to another. Be sure to replace the lock washer and tighten the lock nut, as shown in Fig. 5.

The idler will also hang up on the motor pulley steps if the control lever is not adjusted properly in relation to the three slots of the index plate.

To check this, remove the platter and place the idler arm in the 45 RPM position. You can feel the idler arm fall into the ball detent on the idler arm shaft. (Fig. 1). The control lever should be perfectly centered in the 45 RPM index slot. If the lever is not centered, this can be remedied by removing one of the screws on the ball joint transfer mechanism (Fig. 1) just below the control lever, and turning the ball joint in, or out a half turn at a time until the lever is centered in the index slot.

When the control lever is not centered correctly in the three index slots it will not allow sufficient travel when changing from one speed position to another. The control lever should never touch the sides of the index slots when in the engaged position.

## 2. Idler Wheel Will not Float Properly.

The CB-77 is equipped with a floating idler wheel which allows the idler to seek the proper relation or position between the motor pulley and the drive surface of the platter (Fig. 5). If the two shafts (on which the idler floats) should become dirty or gummed up, the idler will not move back and forth when changing from one speed to another. This will result in the loss of speed and torque, or possibly the platter may start with a jerk.

To correct this condition, slip the idler from the two shafts and wipe the shafts with a clean cloth. Place a drop of oil on each shaft and replace the idler. Move the idler back and forth by hand until it slides freely. Repeat the operation, if necessary, to clean the holes in the block.

The idler will not float if the clearance between the idler and pulley is not correct. See instruction #1 in this section for treatment of this condition.

## 3. Control Lever Shifts Hard; Too Much Play.

Keep all the moving joints and pivot points clean and well oiled. This will help to keep the control lever moving freely.

If the control lever has considerable play and does not move easily it is possible that some of the hardware has become loose. There may be too much clearance between the pivot blocks or some of the pivot pins are loose. (See Fig. 4). Loosen the screws that mount the pivot blocks to the motor plate. Also loosen the set screws which hold the pivot shafts in place. Squeeze the pivot blocks together and tighten the mounting screws and set screws. Move the parts back and forth while tightening the screws so they will not bind.

## 4. Torque

Torque is affected greatly by the idler hanging up or not floating properly. These two problems can be corrected by following instruction #1. The set screws, located in front of the index plate are not torque adjustments. They are for the purpose of preventing the idler wheel from pulling in too far when the platter is being accelerated.

They are properly adjusted when there is about 1/64" gap between the shift lever arm and the rubber tip on the set screw, observed while the turntable is running and engaged in one of the three speeds. Check each of the three speeds to see if the set screws are in the proper position. If the arm is allowed to ride on the rubber tips during operation, the rumble level will be increased. Turning the set screws in too far will result in loss of torque.

Torque is also affected by dirt or oil on the idler wheel, motor pulley or platter. Oil on the driving surfaces will cause the platter to slip. Clean these surfaces as indicated in the MAINTENANCE section.

## 5. Turntable Will Not Start Smoothly.

If the idler wheel hangs up on the motor pulley, the platter will start with a sudden jerk. This is also caused by failure of the idler to float freely as you change from one speed position to another. Correct these faults as outlined in instruction #1.

## 6. Platter Wobble

The CB-77 is equipped with a hardened, ground center spindle and runs in a porous type bronze bearing which retains the oil for a long period of time.

If the oil supply in the center bearing housing should get low, and the platter seems to wobble slightly when you press on the outer rim, simply replenish the oil and the wobble will disappear.

Very little wear will occur on the center spindle or bearing even after long periods of operation.

## 7. Wow.

This could be caused by low torque, idler wheel hang up or failure of idler to float properly. The adjustments are covered under instructions #1, #2 and #4.

## 8. Transcription Arm Does Not Track Properly.

Tracking trouble usually indicates that the arm or turntable is not level. Check the turntable with a spirit level. Refer to the instructions supplied with the transcription arm for correct adjusting procedures and stylus pressure.

## 9. Tighten All Hardware Securely.

It is a good practice to check all of the mounting screws, etc., as part of the routine maintenance procedure.

Be sure to tighten all screws, etc., after making any adjustment.

Gates Radio Company  
Quincy, Illinois

NOTE: Refer to drawing for part location. (813 6346 001)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
2	842 2591 002	Turntable Base
3	913 1605 003	Turntable Platter Assembly
4	837 8456 002	Motor Plate
5	926 7605 001	Motor Plate & Shockmount Assembly
6	910 2400 002	Center Bearing Housing Assembly
7	911 0857 001	Idler Wheel Assembly
8	913 1606 002	Speed Change Arm Assembly
9	646 0449 000	Control Plate
10	911 0869 001	Idler Arm Assembly
11	811 0837 001	Change Arm Support
12	811 0836 001	Speed Change Shaft
13	811 0845 001	Speed Change Stud
14	811 0829 002	Stop Collar
15	811 0831 002	Spring for Ball Detent
16	811 0863 001	Idler Arm Shaft
18	811 0833 001	Spacer for Ball Joints
19	813 2284 001	Idler Control Rod
20	813 2573 001	Idler Tension Spring
22	811 0843 001	Control Arm Pivot Block
23	811 0841 001	Control Arm Bearing
24	811 0842 002	Speed Control Link
25	813 1591 001	Speed Change Lever Pivot Pin
26	911 0868 002	Speed Control Link Assembly
27	813 2282 001	Control Lever
28	811 0839 001	Speed Change Arm Bearings
29	450 0003 000	Ball Joint (Female)
31	813 1592 001	Idler Spring Stud
32	826 6926 001	Topping Felt
33	(913 5785 001)	Motor Assembly (60 cycles)
	(913 5785 002)	Motor Assembly (50 cycles)
34	250 0026 000	A.C. Line Cord
36	406 0009 000	Socket
37	396 0018 000	Lamp, Double Contact Bay. 130V. 6W.
38	650 0053 000	Knob, 1" dia.
39	344 0008 000	#8-32 x 1-1/4" Allen Head Cup Point Set Screw
40	604 0135 000	Mercury Switch
42	926 5797 001	Switch Assembly
43	813 1595 001	Switch Stop
44	813 1611 001	Switch Shaft Support
47	424 0067 000	#12-9425 Sponge Rubber Stripping, 1/2 x 9/16 x 85" lg.
49	450 0007 000	1/2" dia. Ball Bearing, Steel
57	(646 0478 000)	60 cycle Stroboscope
	(646 0477 000)	50 cycle Stroboscope
61	358 0409 000	#8-32 x 7/16" Spade Bolt (1-5/32" lg.)
65	450 0006 000	5/32" dia. Ball Bearing, Steel
68	358 0413 000	Retaining Ring, 7/16"
69	357 0004 000	W27 Nylon Washer, 1/32" thick
70	913 1648 001	Filter Assembly
72	358 0411 000	Retaining Ring, 1/4"
76	450 0004 000	Ball Joint (Male)
77	(510 0366 000)	Motor Capacitor, 2.0 uf (60 cycle)
	(510 0369 000)	Motor Capacitor, 3.75 uf (50 cycle)
86	424 0062 000	Handle Stop

## WARRANTY

This equipment is warranted by Gates Radio Company of Quincy, Illinois to be free from defects in workmanship and material and will be repaired or replaced in accordance with the terms and conditions set forth below:

1. Gates Radio Company believes that the purchaser has every right to expect first-class quality, materials and workmanship and has created rigid inspection and test procedures to that end, and excellent packing methods to assure arrival of equipment in good condition at destination.
2. Gates Radio Company will endeavor to make emergency shipments at the earliest possible time giving consideration to all conditions.
3. Gates Radio Company warrants new equipment of its manufacture for one (1) year and (six (6) months on moving parts), against breakage or failure of parts due to imperfection of workmanship or material, its obligation being limited to repair or replacement of defective parts upon return thereof f.o.b. Gates Radio Company's factory, within the applicable period of time stated. Electron tubes shall bear only the warranty of the manufacturer thereof in effect at the time of the shipment to the purchaser. Other manufacturers' equipment covered by a purchaser's order will carry only such manufacturers' standard warranty. These warranty periods commence from the date of invoice and continue in effect as to all notices, alleging a defect covered by this warranty, received by Gates Radio Company prior to the expiration of the applicable warranty period.

The following will illustrate features of the Gates Radio Company warranty:

Transmitter Parts: The main power or plate transformer, modulation transformer, modulation reactor, main tank variable condensers all bear the one (1) year warranty mentioned above.

Moving Parts: As stated above, these are warranted for a period of six (6) months.

Electron Tubes: As stated, electron tubes will bear such warranty, if any, as provided by the manufacturer at the time of their shipment. Gates Radio Company will make such adjustments with purchasers as given to Gates Radio Company by the tube manufacturer.

All other component parts (except as otherwise stated): Warranted for one (1) year.

Abuse: Damage resulting from abuse, an Act of God, or by fire, wind, rain, hail, in transportation, or by reason of any other cause or condition, except normal usage, is not covered by this warranty.

4. Operational warranty - Gates Radio Company warrants that any new transmitter of its manufacture, when properly installed by purchaser and connected with a suitable electrical load, will deliver the specified radio frequency power output at the output terminal(s) of the transmitter, but Gates Radio Company makes no warranty or representation as to the

coverage or range of such apparatus. If a transmitter does not so perform, or in the event that any equipment sold by Gates Radio Company does not conform to any written statement in a contract of sale relative to its operating characteristics or capabilities, the sale liability of Gates Radio Company shall be, at the option of Gates Radio Company, either to demonstrate the operation of the equipment in conformance with its warranty, or to replace it with equipment conforming to its warranty, or to accept its return, f.o.b. purchaser's point of installation and refund to purchaser all payments made on the equipment, without interest. Gates Radio Company shall have no responsibility to the purchaser under a warranty with respect to operation of equipment unless purchaser shall give Gates Radio Company a written notice, within one (1) month after arrival of equipment at purchaser's shipping point, that the equipment does not conform to such warranty.

5. Any item alleged by a purchaser to be defective, and not in conformance with a warranty of Gates Radio Company shall not be returned to Gates Radio Company until after written permission has been first obtained from the Gates Radio Company home office for such return. Where a replacement part must be supplied under a warranty before the defective part can be returned for inspection, as might be required to determine the cause of a defect, purchaser will be invoiced in full for such part, and if it is determined that an adjustment in favor of the purchaser is required, a credit for an adjustment will be given by Gates Radio Company upon its receipt and inspection of a part so returned.

6. All shipments by Gates Radio Company under a warranty will be f.o.b. Quincy, Illinois or f.o.b. the applicable Gates Radio Company shipping point.

7. Gates Radio Company is not responsible for the loss of, or damage to, equipment during transportation or for injuries to persons or damage to property arising out of the use or operation of Gates equipment. If damage or loss during transportation occurs, or if the equipment supplied by Gates Radio Company is otherwise damaged, Gates will endeavor to make shipment of replacement parts at the earliest possible time giving consideration to all conditions. It is the responsibility of a purchaser to file any claim for loss or damage in transit with the transportation company and Gates will cooperate in the preparation of such claims to the extent feasible when so requested.

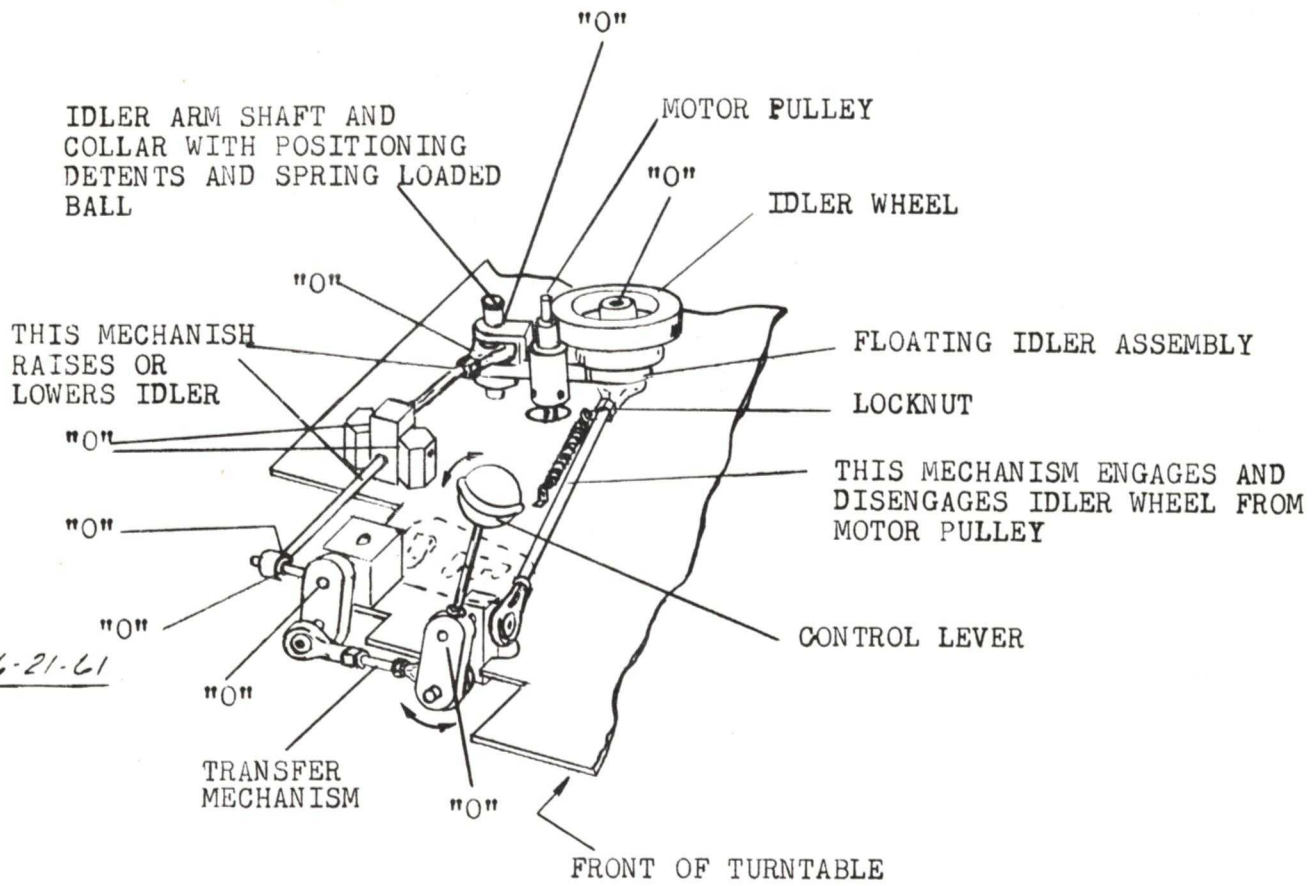
8. Gates Radio Company, in fulfilling its obligations under its warranties, shall not be responsible for delays in deliveries due to depleted stock, floods, wars, strikes, power failures, transportation delays, or failure of suppliers to deliver, acts of God, or for any condition beyond the control of Gates that may cause a delayed delivery.

9. This warranty may not be transferred by the original purchaser and no party, except the original purchaser, whether by operation of law or otherwise, shall have or acquire any rights against Gates Radio Company by virtue of this warranty.

10. Gates Radio Company reserves the right to modify or rescind, without notice, any warranty herein except that such modification or rescission shall not affect a warranty in effect on equipment at the time of its shipment. In the event of a conflict between a warranty in a proposal and acceptance and a warranty herein, the warranty in the proposal and acceptance shall prevail.

11. This warranty shall be applicable to all standard Gates catalog items sold on or after March 1, 1960.

Gates Radio Company  
Quincy, Illinois



REVISED 6-21-61

Fig. 1

A-32042

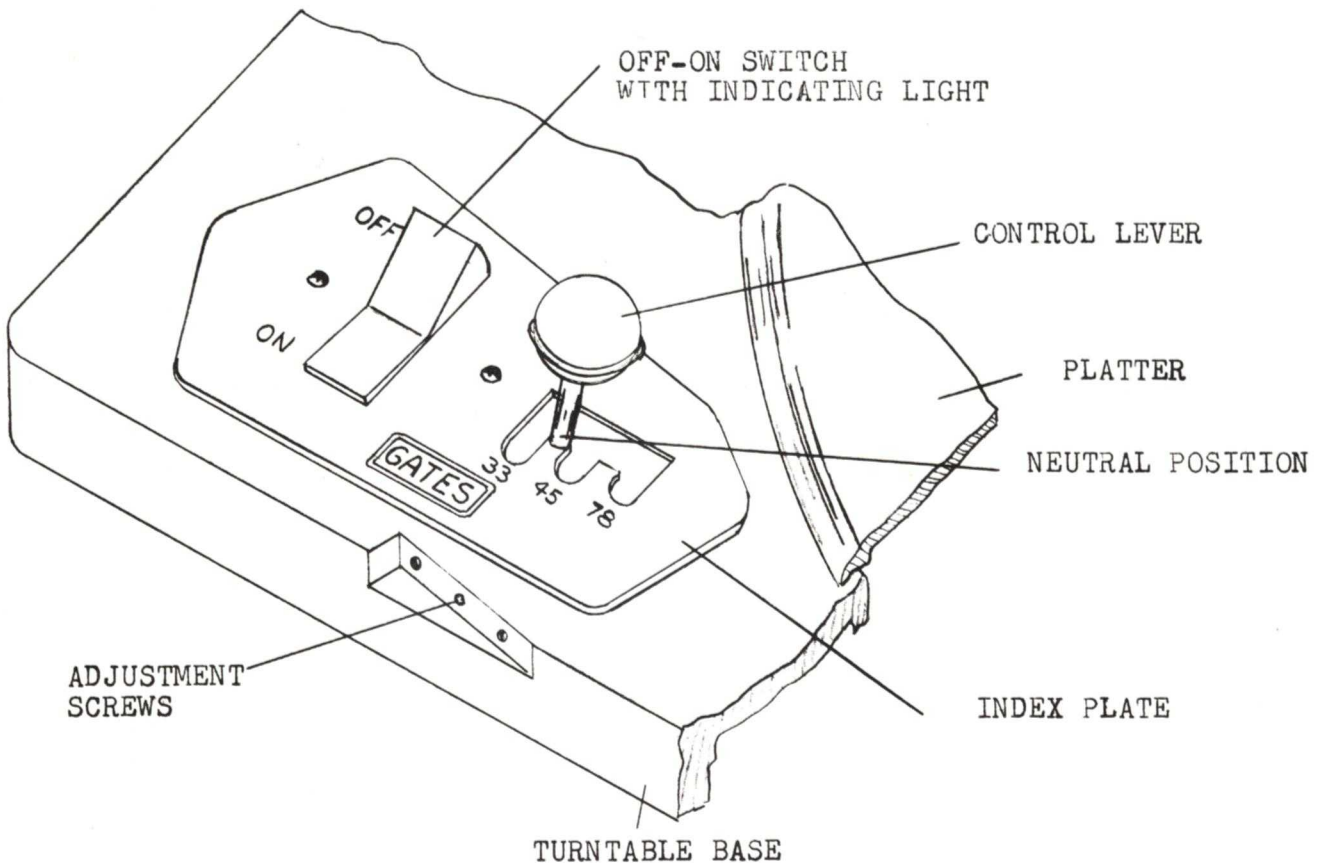


Fig. 2

A-32043

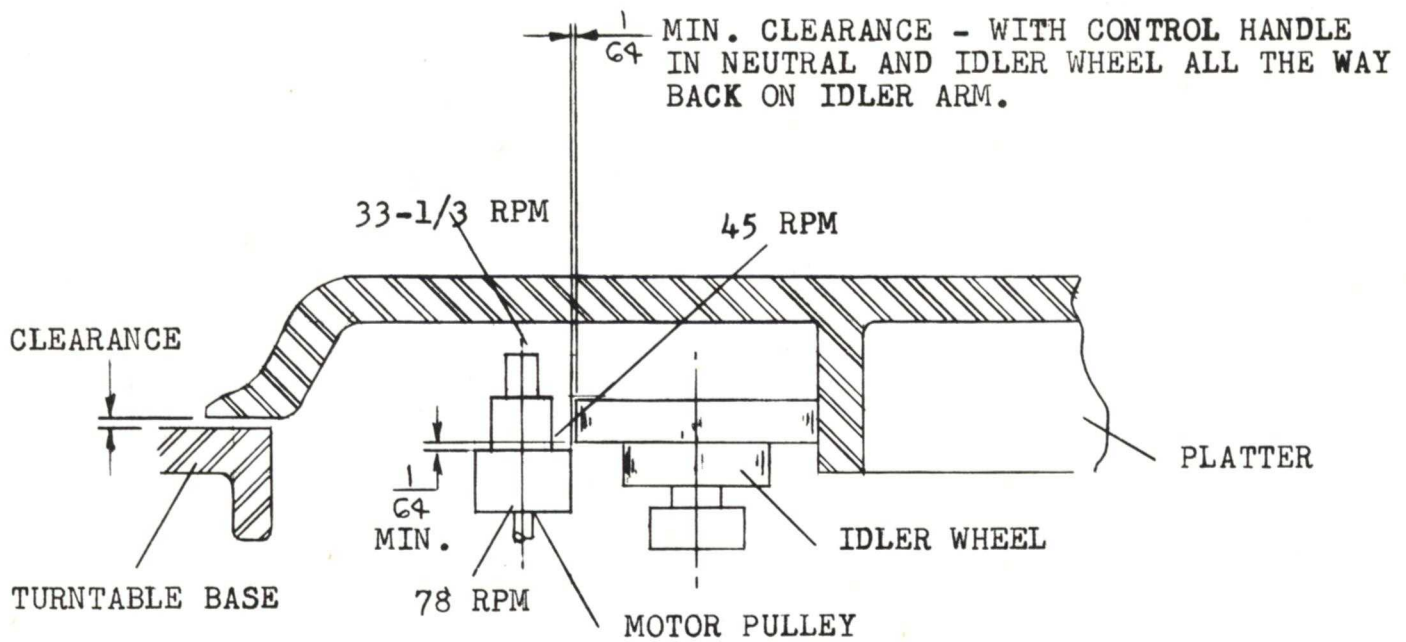
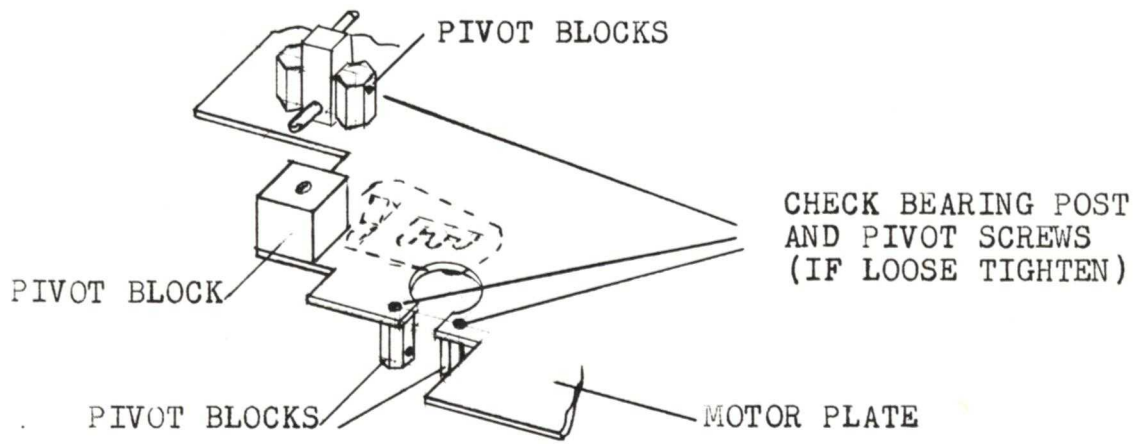


Fig. 3

A-32044



REVISED 6-21-61

Fig. 4

A-32045

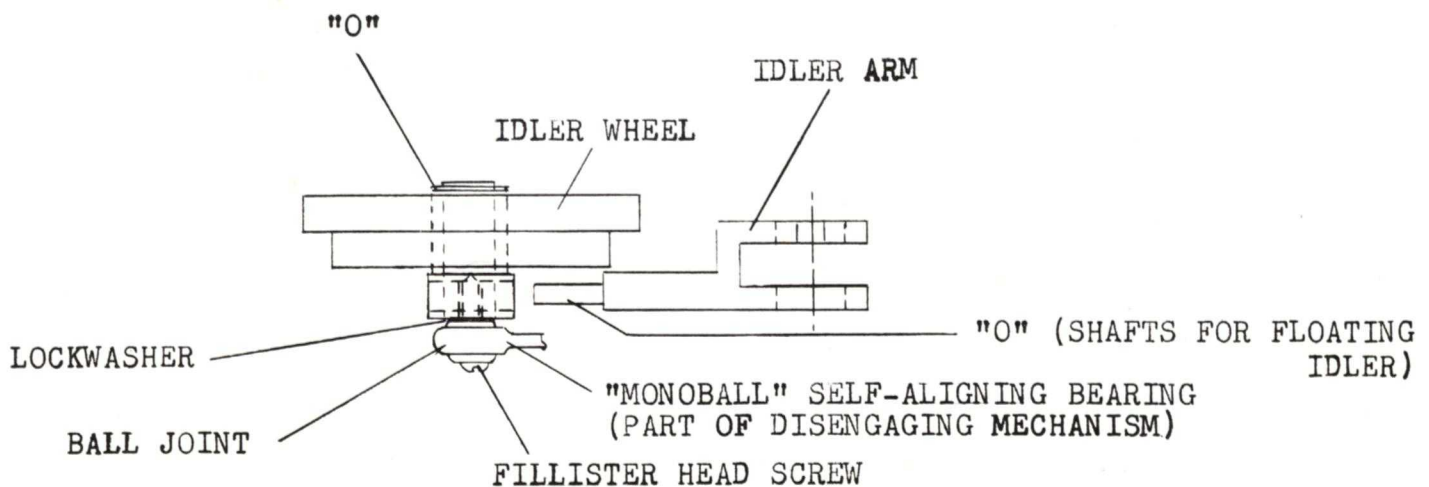


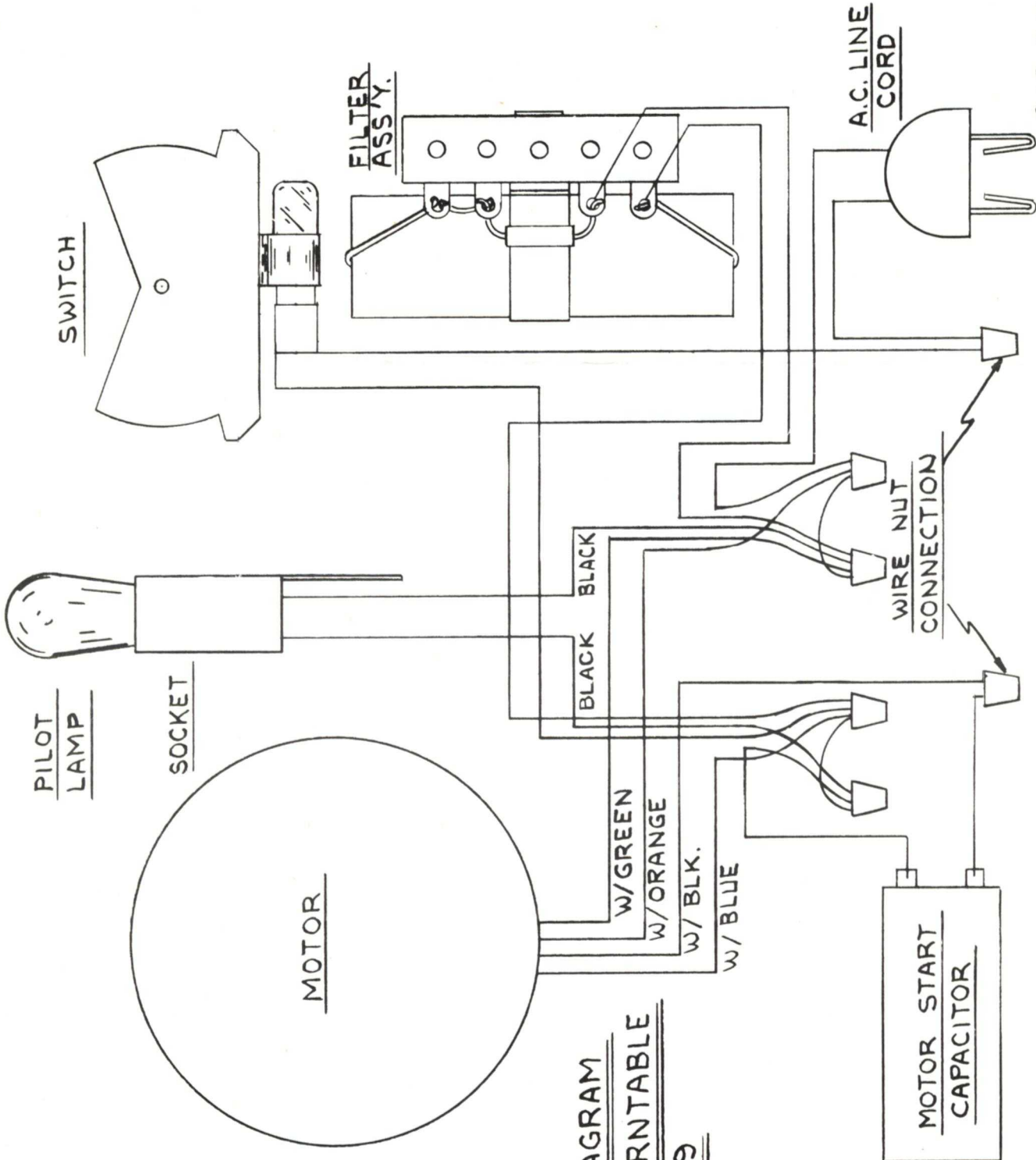
Fig. 5

A-32046

A-32028  
8/13 2028 001

ECN 8153  
3-8-59 P.L. 1

8/13 2028 001  
A-32028



WIRING DIAGRAM  
CB 500 TURNTABLE  
M 5739



813 6346 001