RADIO CORPORATION PTY. LTD.
DIVISION OF ELECTRONIC INDUSTRIES LTD.
126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

MODEL "ML" MICROGRAM

A. 5-Valve Superheterodyne Broadcast Receiver
and
A. 3-speed ($33\frac{1}{3}$, 45 and 78 R.P.M.) Single Record Player

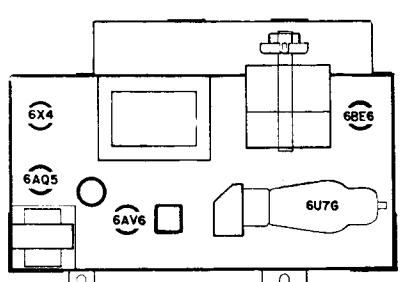
For operation from:-
200-250 Volts 50 Cycle AC Supply Mains.
Power Trans. Primary Mains Taps: 200-220V. and 221-250V.

Power Consumption:-
Radio Operation:- 40 Watts.-approx.
Gramo Operation:- 60 Watts.-approx.

Tuning Range:-
535-1610 Kc/s.: 560.7 - 186.3 Metres.

This Bulletin contains:-

1. Alignment Procedure
2. Circuit Diagram
3. Component Parts List
4. Connections for I.F. and R.F. Transformers
5. Dial Drive Cording Diagram
6. Valve Placement Diagram
7. Service Adjustments for Record Player
8. Record Player Needle Replacement



892/279
VALVE PLACEMENT DIAGRAM

ALIGNMENT PROCEDURE

EQUIPMENT

Signal Generator:

Output Meter:

Mica Capacitor : 0.01MF (for I.F. trans. alignment)

Dummy Antenna : 200MMF. Mica Capacitor

Alignment Tools : Type M195 and PM581.

ALIGNMENT CONDITIONS

Load Impedance : 5,500 Ohms when output meter is connected across speaker transformer primary.

Load Impedance : 4 Ohms when output meter is connected across speaker transformer secondary.

Output Level : 50 Milliwatts
Vol. Control : Max. Vol. fully clockwise
Intermed. Freq. : 455 Kc/s.
Input Voltage : 230 Volts 50 Cycle AC. input to trans. 221-250 volt pri. tap.

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	To align the I.F. transformers – Close the cabinet lid, then lay the cabinet down on the lid. Remove the cabinet base board and then the three control knobs by pulling the knobs straight off their spindles. Remove the nuts and washers on each screw protruding through the two brackets on the rear of the chassis, and the nut and washer on each screw protruding through the two slotted brackets on the front of the chassis.			
2.	Leave all connecting wires attached to the chassis and tilt the chassis so that the control spindles are pointed upward.			
3.	To control grid of 6U7G valve	455 Kc/s.	0.01MF. Mica capacitor in series with generator	Leave grid cap on valve. Peak 2nd I.F. trans. pri. and sec. for max. output.
4.	To control grid of 6BE6 valve (pin No. 7)	455 Kc/s.	0.01MF. Mica capacitor in series with generator	Turn cond. gang plates fully out of mesh. Leave grid wire attached to valve socket. Peak 1st I.F. trans. pri. and sec. for max. output.
5.				Repeat operations No. 3 and 4.
6.	Refit chassis to cabinet and make sure the nuts on the mount screws are tightened securely.			
7.	Refit control knobs to control spindles.			
8.	Fully mesh the cond. gang plates. Set the centre of the dial pointer to align with the centre of the end of travel mark on the dial reading near 540 Kc/s.			
9.	To AVC end of loop aerial (outside turn of sec.)	600 Kc/s.	200 MMF Mica capacitor in series with generator	Turn cond. gang and dial pointer to 600 Kc/s. and peak the oscl. coil ind. trim (iron core) for max. output. Rock the gang to and fro through the signal while adjusting.
10.	To AVC end of loop aerial (outside turn of sec.)	1400 Kc/s.	200 MMF Mica capacitor in series with generator	Turn cond. gang and dial pointer to 1400 Kc/s. Adjust oscl. coil trim. condenser for logging and peak loop aerial trim. cond. for max. output. The loop aerial must be in its mounted position when the loop trimmer is being peaked.
11.	Repeat operations No. 9 and 10.			

SPEED CHANGE:

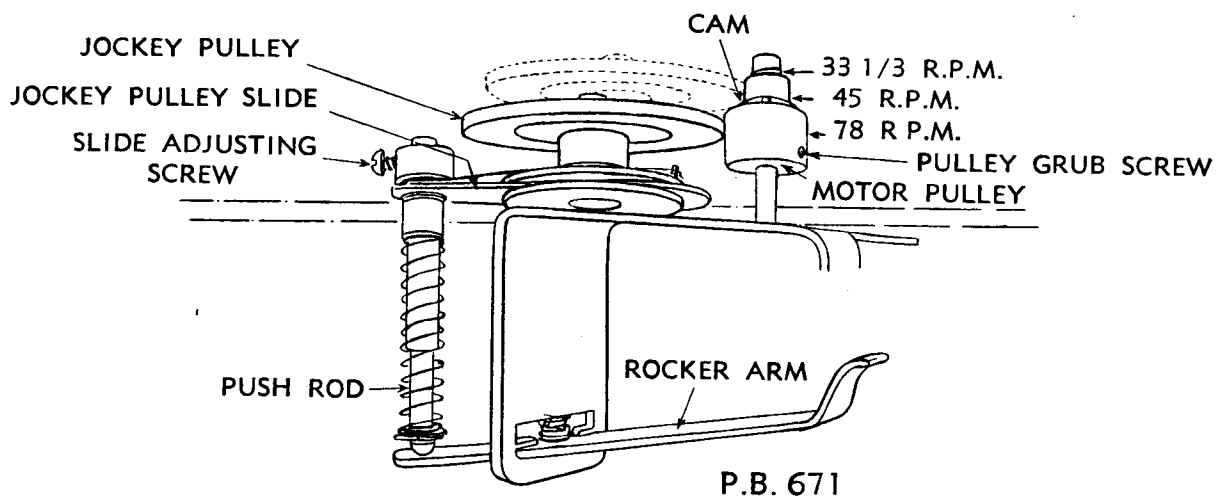
If the speed change mechanism is not operating correctly or severe vibration occurs on selected speeds, an adjustment is necessary:

Severe vibration is caused when the jockey pulley tyre runs permanently on the small cam on the motor pulley. This fault can be corrected as described below. The purpose of the cam is to throw the jockey pulley outwards DURING the speed change. Thereafter the jockey pulley tyre runs on the smooth surface of the motor pulley. Once correctly adjusted no further trouble should be experienced, and the speed change will be rapid and smooth. The slide faces of the jockey pulley slide (refer diagram) should be oiled only with thin oil. If they are allowed to get dry, no damage will result, but there is a risk of slight rattle developing during operation.

ADJUSTMENT OF SPEED CHANGE:

Do not allow oil to get on the jockey pulley tyre - Oil attacks rubber.

1. Set speed change knob at 78 R.P.M. position.
2. With the push rod resting on the rocker arm, slacken the jockey pulley slide fixing screw, and adjust the jockey pulley slide to the fully down position. Tighten the fixing screw.
3. Set the speed change knob to 45 R.P.M. and adjust the motor pulley (after slackening the grub screw) until the jockey pulley tyre is midway on the 45 R.P.M. step of the motor pulley. The tyre must be clear of the cam on motor pulley as shown by the dotted line in the diagram.
4. Check that the jockey pulley spring is coupled to the pulley slide plate, and that the pulley assembly slides freely. The spring should push the pulley to the extreme end of the slide.
5. Check that the push rod is free to move up and down.



Circuit No.	Description	Tol. ±	Rating	Part No.
1.	.1 MF Paper condenser	20%	400V DCW	PC103
2.	.1 MF " "	20%	400V DCW	PC103
3.	.05 MF " "	20%	200V DCW	PC102
4.	.03 MF " "	20%	200V DCW	PC303
5.	.02 MF " "	20%	400V DCW	PC111
6.	.002 MF " "	20%	600V DCW	PC112
7.	.00045 MF Mica condenser	2½%	1000VT.	PC727
8.	.0002 MF " "	10%	1000VT.	PC124
9.	16 MF Electrolytic condenser	20%	350 PV	PC283
10.	24 MF " "	20%	350 PV	PC276
11.	1.5-18 MMF Trimmer cond. (Part of loop aerial assy. circuit No. 31)			PC250
12.	3-50 MMF Trimmer cond.			PC843
13.	2 gang varb. condenser (includes drive assy.)			PC880
14.				
15.	3 megohm carbon resistor	10%	½ Watt	PR282
16.	1.75 megohm carbon resistor	10%	½ Watt	PR248
17.	.5 megohm " "	10%	½ Watt	PR245
18.	.25 megohm " "	10%	1 Watt	PR496
19.	50,000 ohm " "	10%	½ Watt	PR160
20.	40,000 ohm " "	10%	1 Watt	PR198
21.	20,000 ohm " "	10%	½ Watt	PR166
22.	15,000 ohm " "	10%	1 Watt	PR225
23.	3,000 ohm " "	10%	1 Watt	PR295
24.	3,000 ohm " "	10%	½ Watt	PR185
25.	2,000 ohm " "	10%	½ Watt	PR253
26.	250 ohm Wire wound resistor	10%	½ Watt	PR259
27.	50 ohm " " "	10%	½ Watt	PR280
28.	25 ohm " " "	10%	½ Watt	PR281
29.	25 ohm " " "	10%	½ Watt	PR281
30.	.5 megohm carbon potentiometer tapped at 40K.ohms DP.ST. switch attached to rear of housing			PR662
31.	Loop antenna			PT910
32.	I.F. Transformer 455 Kc/s.			PT869
33.	I.F. Transformer 455 Kc/s.			PT869
34.	Oscillator coil			PT859
35.	Speaker input trans. 5,500 - 3.7 ohms imped. code No. EDB64			PT930
36.	Power transformer 200-250 volt 50 cycle mains			PT962
37.	5" permag. speaker type 5F with type F91 cone			K181
38.	Gramo-radio change-over switch			S176
39.	B.S.R. type GU4/C. Single Record Player 200-250V. 50 cycle AC. operation. Dual turn over type crystal cartridge head			M288
	Motor, B.S.R. type 1A			220/524
	Motor Pulley, 50 cycle, B.S.R. type 4A			221/524
	Jockey Pulley, B.S.R. type 1B.			222/524
	Speed Change Knob, B.S.R. type 1C.			223/524
	Pick-up Arm for Turn Over Crystal, B.S.R. type 3D.			224/524
40.	Crystal Cartridge, B.S.R. type 2E, for turn over type pick-up, needles not included			225/524
	Long Playing Needle, B.S.R. type 4E (red spot), for turn over pick-up			226/524
	Standard 78 R.P.M. Needle, B.S.R. type 5E (green spot), for turn over pick-up			227/524
41.	Receiver ON/OFF switch (Part of volume control circuit No. 30)			—
42.	Record player ON/OFF switch SP. ST.			S160
43.				
44.	Antenna loading coil (Part of loop antenna circuit No. 31)			PT942
45.	.5 megohm carbon resistor	10%	½ Watt	PR245
46.	.1 MF Paper condenser	20%	200V. DCW	PC218
47.	15,000 ohm carbon resistor	10%	½ Watt	PR500
48.				
49.	.0001 MF Mica condenser	10%	1000VT.	PC571

LOOP AERIAL

Primary (3 turns)

Outside turn - AERIAL LOADING COIL

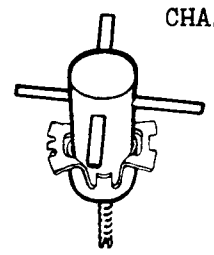
Inside turn - EARTH SOCKET AND CHASSIS

Secondary

Outside turn - AVC.

Inside turn - GRID.

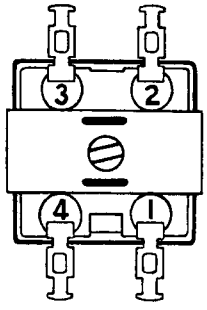
OSCL. COIL



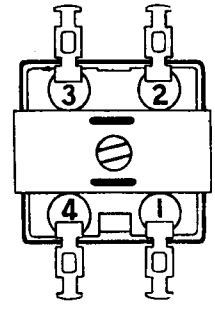
GRID - Series Pad (Red spot under lug)

CATHODE

No. 1 I.F. TRANS.



No. 2 I.F. TRANS.



B.S.R. TYPE GU4/C SINGLE RECORD PLAYER ADJUSTMENTS

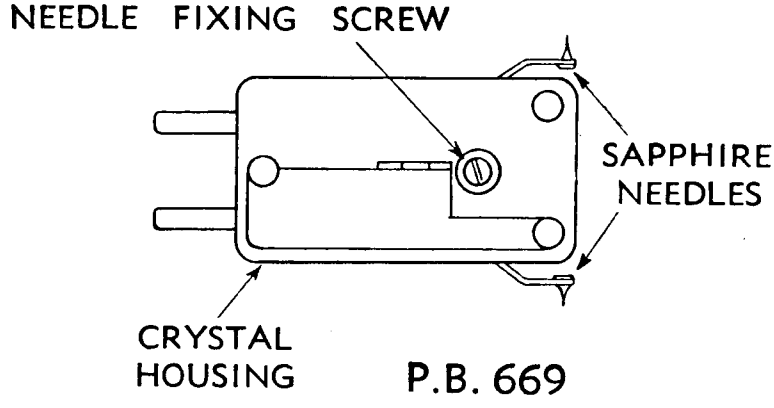
NEEDLE REPLACEMENT

To change a sapphire point needle in the change-over head the screw situated in the side of the crystal housing should be loosened. The needles can then be removed with a pair of tweezers. Re-tighten the fixing screw after replacing the needle. The needles are marked with colours to correspond to the crystal cartridge in the pick-up head:-

Red, for long playing microgroove 33⅓ and 45 R.P.M.
Green, for standard 78 R.P.M.

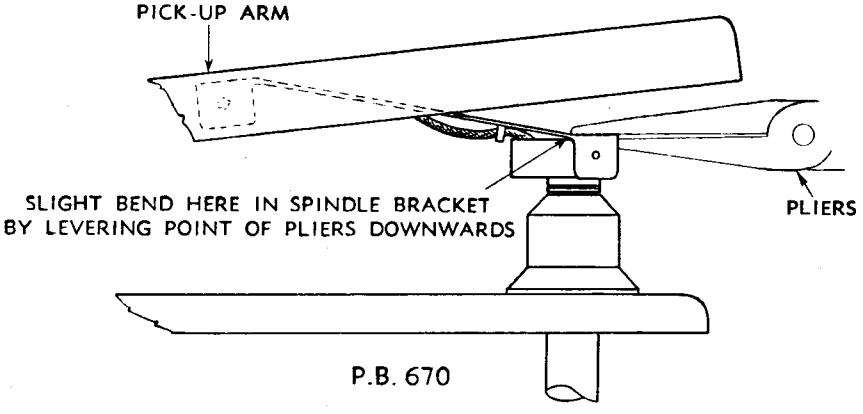
The crystal cartridge may be removed from the pick-up by unscrewing the screw in the shank of the turn-over knob, then pull the knob forward. Spring contacts to which the leads are attached may be prised off the rear lugs of the cartridge.

Part Numbers of the replacement needles are detailed in the parts list.



PICK-UP ARM CATCHING ON EDGE OF 12 in. RECORD

Due to rough handling, it is possible that the rear end of the pick-up arm may tend to catch on the edge of a 12 in. record when playing. If this occurs, a simple adjustment is necessary. Using a pair of long nose pliers, bend the pick-up spindle bracket slightly as shown by the diagram below. This bend should be sufficient to enable the rear of the pick-up arm to clear a 12 in. record by approximately 3/16 in.



LUBRICATION:

NO OIL OR GREASE MUST BE ALLOWED TO GET ON THE RUBBER-TYRE ON THE RUBBER-TYRED JOCKEY WHEEL.

1. As the motor bearings are of the oil-retaining type, lubrication should only be necessary about every 1,000 hours of running. To lubricate, put a drop of fine machine oil in the bushes at each end of the motor.
2. The jockey pulley bearing should be oiled in a similar manner.
3. The turntable spindle should be removed, lightly smeared with grease, and replaced in its bearing housing. To remove the spindle, remove the screw in the bearing housing and lift out.
4. Only non-vegetable oil and grease must be used.

"WOW" OR SLOW RUNNING TURNTABLE:

If "WOW" is experienced or the turntable runs slow, the following action should be taken.

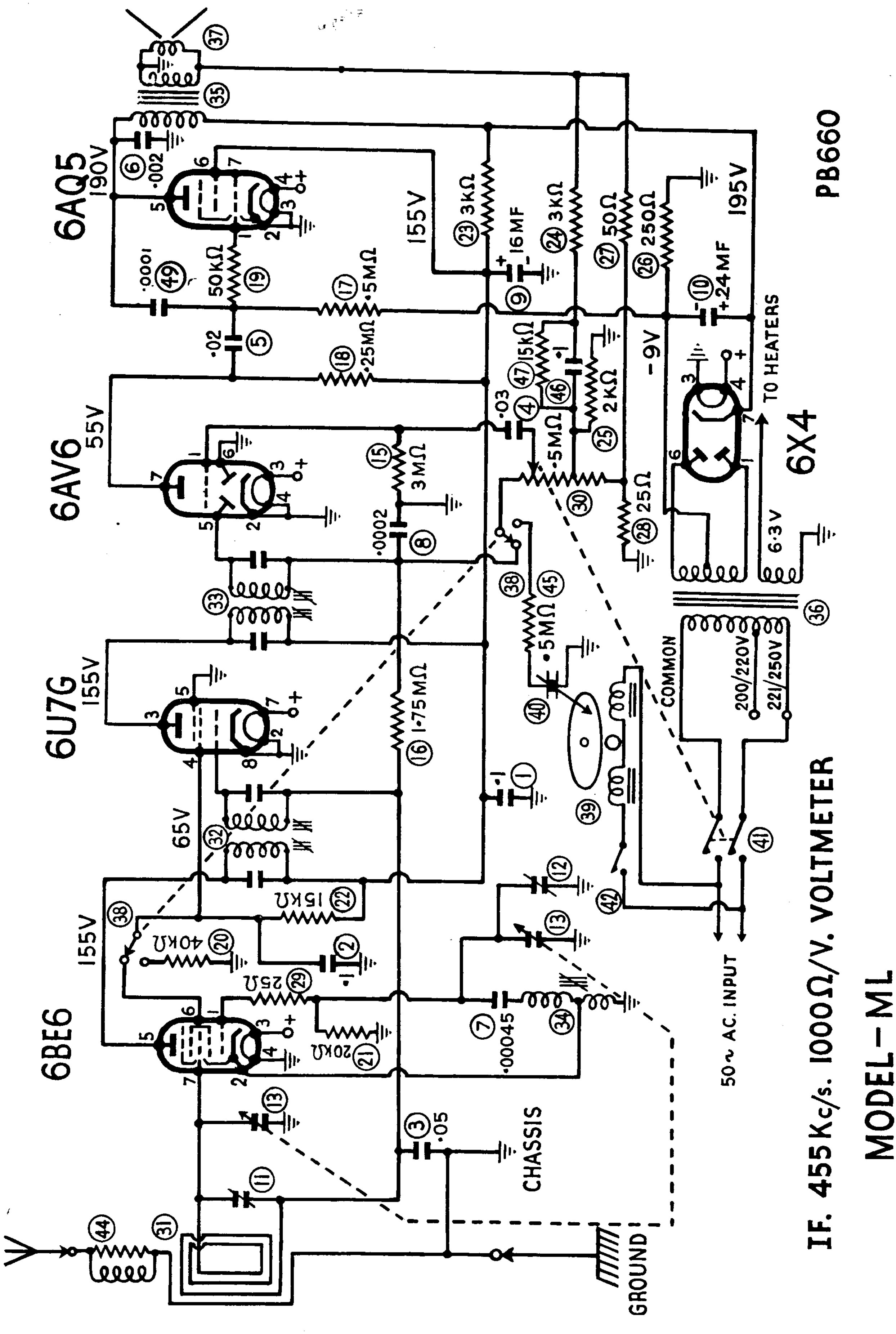
Remove the turntable and check that the turntable spindle revolves freely in its housing. Also check spindle to ensure that a vertical movement of at least 1/16" is possible. If not, remove the spindle, clean thoroughly and grease as instructed under the heading of 'Lubrication'. Check that the jockey pulley revolves freely in its bearing and that it is perfectly free in its slide.

PICK-UP TRACKING:

If the pick-up jumps a groove consistently -

(a) Oil the pick-up spindle with light machine oil.

(b) Check that the 1/64" longitudinal play in the pick-up spindle is maintained.


6AQ5
6AV6
6U7G
6BE6
6X4
PB660
190V
155V
55V
65V
195V
-9V
TO HEATERS
6·3V
200/220V
221/250V
COMMON
50~ AC. INPUT
CHASSIS
GROUND
IF. 455Kc/s. 1000Ω/V. VOLTMETER
MODEL—ML

Blue Cabinet Assy.	A105/775-3
Metal Cover Strip - on motor board, over top of speaker	A103/775-7
Cover Strip - on motor board, over top of loop	A107/775-7
Cabinet Base	32/775-4
Tan Cabinet Assy.	A105/775-2
Metal Cover Strip - on motor board, over top of speaker	A103/775-6
Cover Strip - on motor boadr, over top of loop	A107/775-6
Cabinet Base	32/775-3
Fawn Cabinet Assy.	A105/775-1
Metal Cover Strip - on motor board, over top of speaker	A103/775-5
Cover Strip - on motor board, over top of loop	A107/775-6
Cabinet Base	32/775-2
Light Bronze Cabinet Assy.	A105/775
Metal Cover Strip - on motor board, over top of speaker	A103/775-4
Cover Strip - on motor board, over top of loop	A107/775-4
Cabinet Base	32/775

DIAL DRIVE CORDING

Length of cord required is 2 ft. which includes about 8" to spare for tying to tension spring.

Cord Part No. 7/282.

Tension Spring Part No. 3/753.