THE FISK AWA RADIOLA

14

Models 282, 283, 313 and 314

EIGHT VALVE, FOUR BAND, AUTOMATIC AND MANUAL TUNING A.C. OPERATED SUPERHETERODYNES

Technical Information & Service Data

ELECTRICAL SPECIFICATIONS.

TUNING RANGES

"Standard Medium Wave (a) 1600-550 Kc/s.

"Short Wave" (b) 27-52 M.

"Short Wave" (c) 18-27 M.

"Short Wave" (d) 13.5-18 M.

R.F. ALIGNMENT SETTINGS

"Standard Medium Wave" (a) 600 Kc/s. (Osc.) 1500 Kc/s. (Osc., R.F. and Aer.)

"Short Wave" (b) 28 M. (Osc., R.F. and Aer.)

"Short Wave" (c) 26 M. (Osc., R.F. and Aer.)
18.7 M (Osc., R.F. and Aer.)

"Short Wave" (d) 17.7 M. (Osc., R.F. and Aer.)
14.0 M Osc., R.F. and Aer.)

INTERMEDIATE FREQUENCY ..... 455 Kc/s.

POWER SUPPLY RATING ..... 200-260 V, 40-60 cycles.

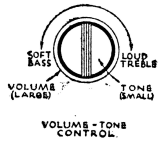
POWER CONSUMPTION (Tuning Motor Inoperative) ..... 95 watts

VALVE COMPLEMENT

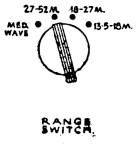
(1) 6U7G—R.F. Amplifier
(2) 6J8G—Frequency Converter
(3) 6U7G—I.F. Amplifier
(4) 6B8G—Detector, A.V.C. & A.F. Amp.
6U5 Visual Tuning Indicator.
(5) 6B8G—Phase Inverter and *Muting
(6) 6V6G—Output
(7) 6V6G—Output
(8) 5V4G—Rectifier

* This function is not performed by valve in Model 282.

CONTROLS



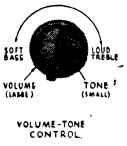
VOLUME-TONE CONTROL.



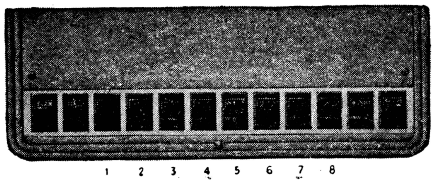
RANGE SWITCH.

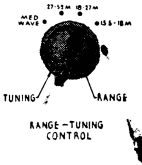

TUNING CONTROL.

Model 282.



VOLUME-TONE CONTROL.





RANGE-TUNING CONTROL

Models 283, 313 and 314.

LOUDSPEAKER

Model 282 ..... 12 inch, Type AS9
Model 283 ..... 12 inch, Type AS11*
Models 313 and 314 ..... 12 inch, Type AS11

* Prior to 31-8-40 a Type AS9 Loudspeaker was employed.

Loudspeaker Transformer TX4
Field Coil Resistance ..... 600 ohms
Voice Coil Impedance ..... 12.5 ohms at 400 cycles

UNDISTORTED POWER OUTPUT ..... 8 Watts

DIAL LAMPS (4) ..... 6.3 volt, .25 amp.

AUTOMATIC TUNING ADJUSTMENT LAMP .. .. 6.3 volt, .25 amp.

These models are of two types, Console (Models 282 and 283) and Radio-Gramophone Combination (Models 313 and 314).

Identical chassis, incorporating automatic tuning, are used in all but the Model 282, which is manually tuned.

The only difference between the two Combination Models is in the Type of gramophone motor used. The motor fitted to the Model 313 is manually operated, and that used in the Model 314 is an Automatic Record Changer Type.

ALIGNMENT PROCEDURE.

Alignment should only be necessary when adjustments have been altered from the factory setting or when repairs have been made to the tuned circuits. Climatic conditions should not seriously affect the Receiver.

It is important to apply a definite procedure, as tabulated, and to use adequate and reliable test equipment. Instruments ideally suited to the requirements are the A.W.A. Junior Signal Generator, Type 2R3911, or the A.W.A. Modulated Oscillator, Type C1070. An output meter is necessary with both these instruments. If the Type C1070 test oscillator is used, see that a 250,000 ohms resistor is connected between the output terminals and, for Short Wave alignment, a 400 ohms non-inductive resistor in series with the active output lead of the instrument.

Connect the ground connection of the instrument to the Receiver chassis.

Perform alignment in the proper order, starting with No. 1 and following all operations across; then No. 2, etc. Adjustment locations are shown in the layout diagrams. Keep the Volume Control set in the maximum clockwise position and regulate the output of the test instrument so that a minimum signal is introduced to the Receiver to give a standard indication on the output meter.

During alignment set the Tone Control in any of the first four positions from left to right, not in the fifth or extreme clockwise position. In the latter position, the I.F. channel is broadened.

R.F. ADJUSTMENTS.

The method of aligning the Medium Wave band is the same as usual; that is, with a core within the oscillator coil for the 600 Kc/s. adjustment and plunger type air-trimmers for the 1500 Kc/s. adjustment.

The 27-52 metre band alignment follows the usual method, adjustments being made at the high frequency end of the band by air-trimmers.

Two frequencies are used in the alignment of the 18-27 and 13.5-18 metre bands, one at the low frequency end and the other at the high frequency end of each band. The low frequency adjustments are series padders (mica trimmers) and the high frequency adjustments shunt padders (air trimmers).

The test instrument used for the Short Wave alignment should have a high degree of accuracy in calibration, as a slight error will produce considerable inaccuracy in the Receiver calibration. The frequency settings of the test oscillator may be checked by one or both of the following methods:

(1) Determine the exact dial settings of the test instrument (for frequencies at or close to the specified alignment frequencies) by zero-beating the test instrument against Short Wave stations of known freqnuency.

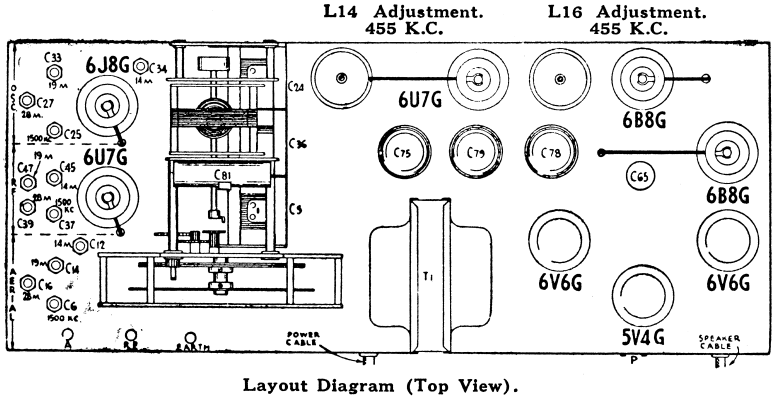
(2) Use harmonics of the standard broadcast range of the test instrument, first checking the frequency settings on this range by zero-beating against standard broadcast stations.

SEALING ADJUSTMENTS.

When the Receiver has been satisfactorily aligned, seal the adjustment screws with a little celluloid cement to prevent them from shifting. Also, if the Receiver requires servicing again in the future, these seals will show whether the adjustments have been moved from the original settings.

ADJUSTING TOOLS.

Two tools, which have been specially designed for aligning Radiolas, may be obtained from the Service Department of the Company. One is for adjusting and locking air-trimmer condensers, and the other is a non-metallic screwdriver for adjusting the magnetite cores and mica trimmers. The part number of the former is No. 5371 and the latter No. 5372.



Layout Diagram (Top View).

NOTE:—Automatic tuning mechanism and condenser C81 are not used in Radiola 282.

SOCKET VOLTAGES.

VALVE.		Control Grid to Chassis Volts.	Cathode to Chassis Volts.	Screen Grid to Chassis Volts.	Plate to Chassis Volts.	Plate Current M.A.	Heater Volts.
6U7G R.F. Amp.	M.W.	-3.0*	0	100	260	8	6.3
	S.W.	-3.0*	0	100	260	8	—
6J8G Converter	M.W.	-3.0*	2.8	100	260	0.5	6.3
	S.W.	0	2.8	100	260	1.0	—
Oscillator	M.W.	—	—	—	130	7	—
	S.W.	—	—	—	130	7	—
6U7G I.F. Amp.	M.W.	-3.0*	3.8	100	260	4	6.3
	S.W.	-3.0*	0	100	260	8	—
6B8G Detector		-3.0*	—	35*	125*	0.5	6.3
6B8G Phase Inverter		-3.0*	0	35*	125*	0.5	6.3
6V6G Output		0	13.5	260	250	38	6.3
6V6G Output		0	13.5	260	250	38	6.3
5V4G Rectifier		650/325 V., 120 M.A. Total Current					5.0

Tuning Motor Voltage (no load), 27 volts A.C.
Tuning Motor Voltage (on load), 24 volts A.C.
Voltage across loudspeaker field — 75 volts

Measured at 240 volts A.C. supply. No signal input. Controls in maximum clockwise position excepting Range Switch, which is set as required.

*Cannot be measured with ordinary voltmeter.

ALIGNMENT TABLE

Alignment Order.	Test Inst. Connection to Receiver.	Test Inst. Setting.	Range Switch Position.	Receiver Dial Setting.	Circuit to Adjust.	Adjustment Symbol.	Obtain Adjust to
1.	*6J8G Grid Cap	455 Kc/s.	M.W.	Past 550 Kc/s.††	2nd I.F. Trans.	L16	Max. (Peak)
2.	*6J8G Grid Cap	455 Kc/s.	M.W.	Past 550 Kc/s.††	2nd I.F. Trans.	L15	Max. (Peak)
3.	*6J8G Grid Cap	455 Kc/s.	M.W.	Past 550 Kc/s.††	1st I.F. Trans.	L14	Max. (Peak)
4.	*6J8G Grid Cap	455 Kc/s.	M.W.	Past 550 Kc/s.††	1st I.F. Trans.	L13	Max. (Peak)
			Repeat the above adjustments before proceeding.				
5.	Aerial Terminal	600 Kc/s.	M.W.	600 Kc/s.†	Oscillator	Core L10	Max. (Peak)
6.	Aerial Terminal	1500 Kc/s.	M.W.	1500 Kc/s.	Oscillator	C25	Max. (Peak)
7.	Aerial Terminal	1500 Kc/s.	M.W.	1500 Kc/s.	R.F.	C37	Max. (Peak)
8.	Aerial Terminal	1500 Kc/s.	M.W.	1500 Kc/s.	Aerial	C6	Max. (Peak)
			Repeat Adjustments 5, 6, 7, & 8.				
9.	Aerial Terminal	28 M.	27-52 M.	28 M.	Oscillator	C27	Max. (Peak)**
10.	Aerial Terminal	28 M.	27-52 M.	28 M.‡	R.F.	C39	Max. (Peak)***
11.	Aerial Terminal	28 M.	27-52 M.	28 M.‡	Aerial	C16	Max. (Peak)***x
			Repeat Adjustments 9, 10, & 11.				
12.	Aerial Terminal	26 M.	18-27 M.	26 M.	Oscillator	C28	Max. (Peak)
13.	Aerial Terminal	26 M.	18-27 M.	26 M.‡	R.F.	C40	Max. (Peak)
14.	Aerial Terminal	26 M.	18-27 M.	26 M.‡	Aerial	C7	Max. (Peak)
15.	Aerial Terminal	19 M.	18-27 M.	19 M.	Oscillator	C33	Max. (Peak)**
16.	Aerial Terminal	19 M.	18-27 M.	19 M.‡	R.F.	C47	Max. (Peak)***
17.	Aerial Terminal	19 M.	18-27 M.	19 M.‡	Aerial	C14	Max. (Peak)***x
			Repeat Adjustments 12-17.				
18.	Aerial Terminal	17.7 M.	13.5-18 M.	17.7 M.	Oscillator	C31	Max. (Peak)
19.	Aerial Terminal	17.7 M.	13.5-18 M.	17.7 M.‡	R.F.	C42	Max. (Peak)
20.	Aerial Terminal	17.7 M.	13.5-18 M.	17.7 M.‡	Aerial	C9	Max. (Peak)
21.	Aerial Terminal	14 M.	13.5-18 M.	14 M.	Oscillator	C34	Max. (Peak)**
22.	Aerial Terminal	14 M.	13.5-18 M.	14 M.‡	R.F.	C45	Max. (Peak)***
23.	Aerial Terminal	14 M.	13.5-18 M.	14 M.‡	Aerial	C12	Max. (Peak)***x
			Repeat Adjustments 18-23.				

* With grid clip connected. A .001 mfd condenser should be connected in series with the active output lead of the test instrument.

† Rock the Tuning Control back and forth through the signal. Reset the dial pointer to 600 Kc/s. if necessary. The pointer is soldered to a link in the control wire and may be moved by applying a hot soldering iron to the connection.

†† With Tuning Condenser plates in full mesh.

‡Rock the Tuning Control back and forth through the signal.

** Use minimum capacity peak if two peaks can be obtained.

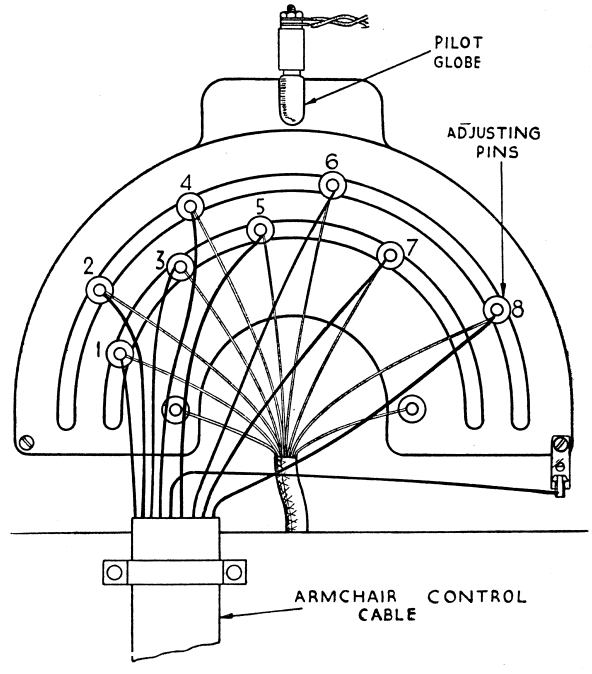
*** Use maximum capacity peak if two peaks can be obtained.

x Check for image signal at 33.25 metres on 27-52 metre band, 20.2 metres on 18-27 metre band, and 14.6 metres on 13.5-18 metre band. It will be necessary to increase the output of the Test Oscillator to receive the signal.

station selector keys on the Receiver's keyboard. That is, after pressing the "Manual" key on the Receiver, eight broadcasting stations may be tuned automatically at any distance up to the length of the connecting cable from the instrument (25 feet).

The unit is supplied fitted with a 9 wire flat cable. Take the centre and solder it to a lug attached to the lower right-hand corner of the selector mechanism frame. The remaining eight wires are then soldered to the eight adjusting pins. The first or right-hand, looking towards the unit, to No. I pin, the second to No. 2 pin, and so on. The call-signs of the eight selected stations, which must correspond with those for which the Receiver is set, should be removed from the sheet, supplied, and fitted beneath the windows of the unit.

Before operating the Receiver from the unit the "Manual" key on the Receiver's keyboard must first be pressed. Then press the first button on the unit for the desired station and hold the button down until the station is tuned. Care must be taken not to hold two push-buttons down at one time, as both windings of the motor may be engaged simultaneously, causing the motor to be inoperative and overheated.



Automatic adjusting pins and Armchair Control connections.

MODEL 313. GRAMOPHONE MOTOR SERVICE.

AUTOMATIC STOP ADJUSTMENT.

The Patent Stop and Switch is fully automatic.

As the needle travels towards the centre of the Record, the Pick-up Arm moves Friction Plate A (see illustration) which, through the friction pad and spring ,carries with it the Main Lever B and Trip Lever C.

This Main Lever moves in towards the Turntable Spindle on which is mounted the Striker, which gently wipes against the rubber bush on end of Trip Lever C at every revolution, thus tapping back the Main Lever B (the friction between Lever A and Lever B allows this).

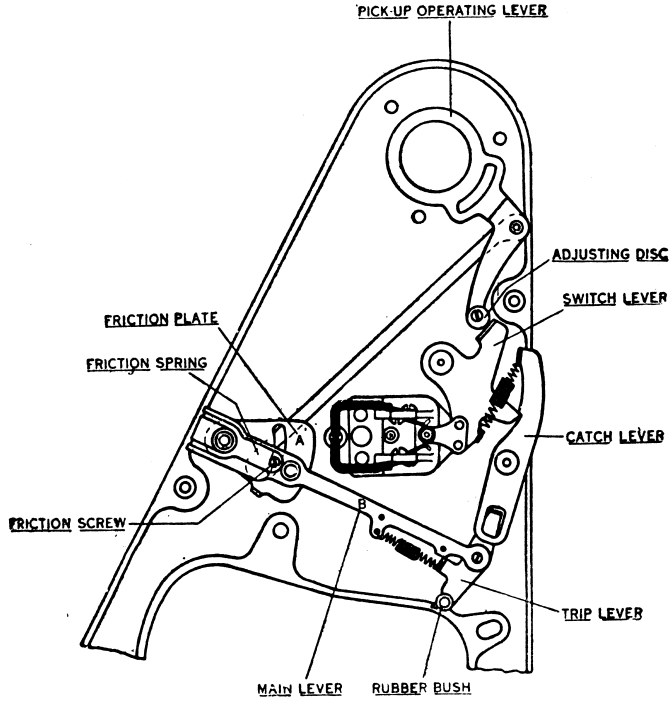
The "tapping back" process continues until the needle reaches the "run-in" groove in the centre of the record. The trip lever is now moved forward into the path of the striker, which strikes the side of the lever and trips the Stop mechanism.

If Stop fails to operate at fiinsh of record, there is probably insufficient friction between Lever A and Lever B. This may be rectified by turning the friction screw in Lever B in a counter-clockwise direction.

When Stop operates early, i.e., before needle reaches the end of the record, the trouble is either due to excessive friction or to the rubber bush on the trip lever being worn. Friction can be reduced by turning the friction screw clockwise.

As this adjustment is very sensitive, the screw should not be turned more than a quarter of a turn at a time. Excessive friction may cause a knocking sound to be heard in the loudspeaker and undue wear on records.

When the rubber bush is worn, this may be turned round on its pin to expose a new face to the striker.



ADJUSTMENTS FOR AUTOMATIC TUNING.

Any eight stations in the Medium Wave band may be selected for Automatic Tuning. The stations are identified by means of the call-sign tabs supplied for inserting in the recesses on the keys located on the cabinet front. A sheet of tabs, on which are printed the call-signs of all Australasian stations, accompanies the Receiver. Call-signs of the eight selected stations should be neatly cut from the sheet.

The stations should be adjusted in order of their frequency in kilocycles. This order is used in the following example:

(1) 2SM—1270 KC.
(2) 2CH—1190 K.C.
(3) 2UW—1110 K.C.
(4) 2KY—1020 K.C.
(5) 2UE—950 KC.
(6) 2GB—870 K.C.
(7) 2BL—740 K.C.
(8) 2FC—610 K.C.

Accompanying the call-sign sheet will be found several celluloid tab covers. Insert a call-sign tab and a celluloid cover in each key. This is easily done by curving the tabs upwards lengthwise and sliding the two ends in the ends of the recesses.

Turn the Receiver ON and allow it to operate for at least five minutes before making adjustments.

Proceed to set up for Automatic Tuning as follows:—

(1) Press the key labelled "Manual" and set the Tone Control in any but the extreme clockwise position.

(2) Manually tune station No. 1. Be sure to tune accurately by watching the Tuning Indicator. Tune till the darkened sector of the Indicator's screen is at the narrowest possible width.

(3) Look in the back of the receiver and two semi-circular slots, in which are eight adjusting pins, will be seen. These correspond with the keys on the keyboard, numbered 1 to 8, from left to right.

(4) Hold the "Manual" key down and press No. 1 on the keyboard. Both keys will stay down. Then move adjusting pin No. 1 along the semi-circular slot, either clockwise, or anti-clockwise, until the pilot globe, situated above the adjusting pins, goes out. It will be noticed that when the adjusting pin is moved to the right past this position, the globe will light brightly and to the left dimly. This is normal, and care should be taken in making this adjustment to see that the globe does go completely out.

(5) Press another key, and key No. 1 and the "Manual" key will then be released.

(6) Press key No. 1 again. The pilot globe will stay out and the station will be heard. If reproduction is not normal repeat the above procedure to ensure that it has been carried out correctly.

Proceed similarly with the other seven keys, and then any one of the eight stations may be obtained by simply pressing the key lettered with the call-sign of the desired station.

To change the station at any time, simply follow the same procedure and remember to replace the call-sign tab in the key.

AUTOMATIC TUNING MECHANISM.

The circuit of the automatic tuning mechanism is shown in the schematic diagram. The action can be understood by following a cycle of operation.

When a station key is pressed, it completes the 24 volt circuit through the corresponding adjusting pin and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energises the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular adjusting pin and the motor circuit is broken. Inertia carries the insulation line past the adjusting pin, which then makes contact with the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction, and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the adjusting pin, when the circuit is broken and the mechanism stops.

MUTING CIRCUIT.

In order that noise be avoided when tuning the Receiver automatically, provision has been made to completely silence the audio end of the Receiver when the automatic tuning motor is running. This is accomplished by connecting one side of the motor to ground and the other, through a condenser (C80) to the diodes of the 6B8G Phase Inverter. When the motor is running, a voltage appears on the diodes and is rectified to appear as a D.C. voltage across R32, R22, and R37. Portion of this voltage appearing across R22 and R37 is used to bias the 6B8G Valves to a point where their plate current is cut off and where, consequently, no signal can be transmitted. This voltage is applied only when the motor is running, and disappears shortly after the motor circuit is broken. The slight delay is due to the time constants of the necessary resistance capacity filter circuits.

ADJUSTMENT OF FLYWHEEL FRICTION.

In normal operation the motor drives the tuning condenser and selector disc until the insulation line just passes the particular adjusting pin. The motor then reverses and moves the disc slowly in the opposite direction until the insulation line is under the pin and the mechanism stops.

In some cases, particularly with high line voltage, the disc may make two or three reversals before stopping.

The flywheel friction spring washer should be set to give the least number of reversals with the chassis in the normal operating position.

ADJUSTMENT OF SELECTOR DISC.

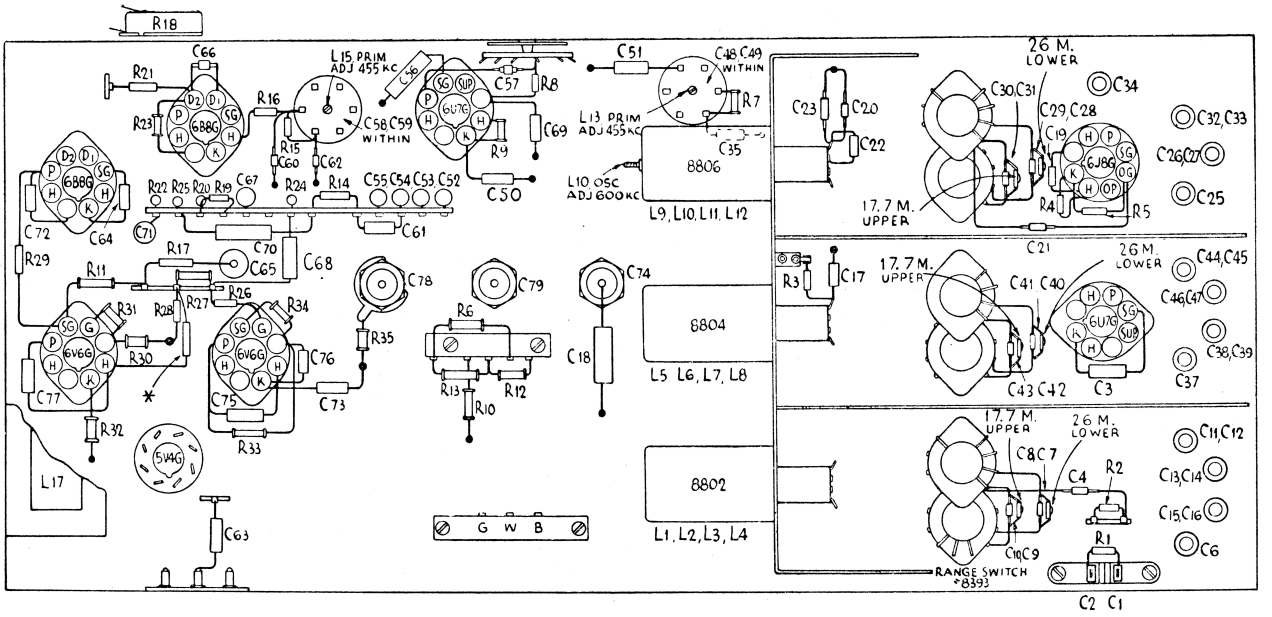
The brass selector disc is fastened to the rear shaft of the Tuning Condenser by means of two set screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal with the operating end at the right (viewed from rear). The operating-end has red insulating material, and the brass is bevelled on either side of the insulation line.

The selector disc should be set so that the contact tips in the adjusting pins project not more than 1/16 inch from the body of the pins.

ARMCHAIR CONTROL UNIT.

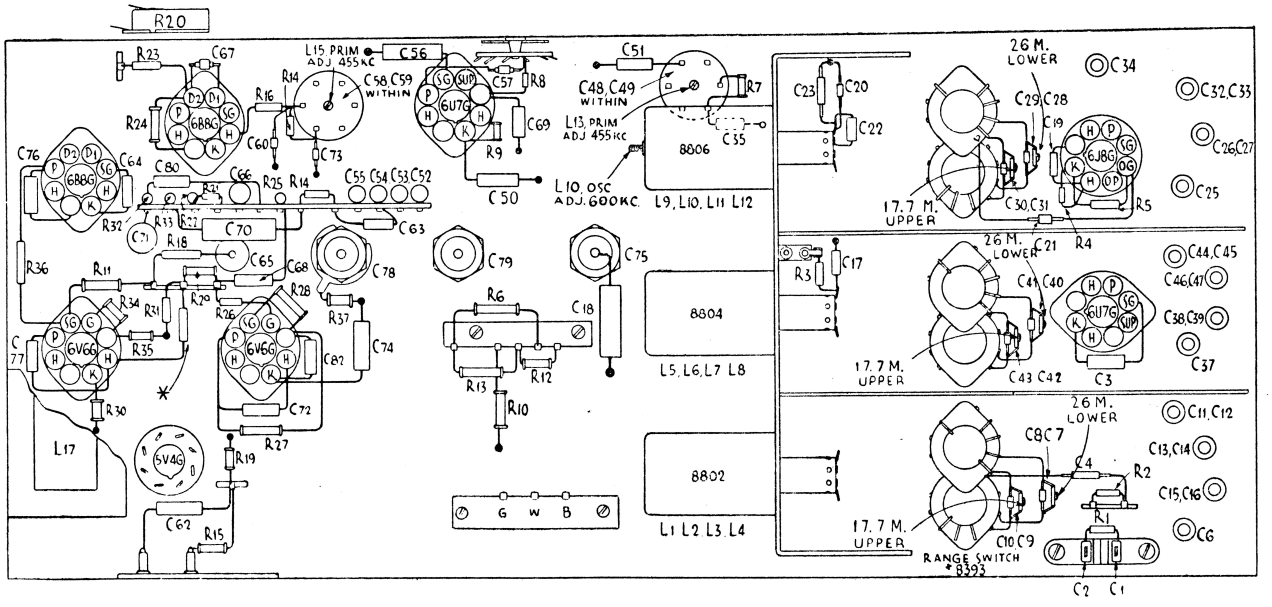
WARNING: Before installing the Armchair Control Unit, be sure that the locking mechanism has been removed from the unit. This can be tested by pressing a push-button. If the button returns to its normal position when pressure is released, the unit is ready for installation. If the button stays down, remove the unit from its case, then remove the locking mechanism by drilling out the four rivets holding it.

When the Armchair Control Unit is connected, as shown in the accompanying diagram, it duplicates the action of the eight



Layout Diagram—Model 282 (Underneath View).

*This resistor is not always used, but, when required, serves to balance the output stage. Resistance value, 30,000-60,000 ohms.



Layout Diagram—Models 283, 313 and 314 (Underneath View).

*This resistor is not always used, but, when required, serves to balance the output stage. Resistance value, 30,000-60,000 ohms.

Condenser C61, which is not shown, connects between volume control R20 and Phono. Switch.

MODEL 314. AUTOMATIC RECORD-CHANGER.

THE AUTOMATIC TRIP. The automatic trip plays an important part in the operation of the record changer, upon the certainty of the automatic trip coming into action depends the whole operation of the record changer.

The auto trip mechanism will operate on all records having a "run off" groove, either eccentric or spiral.

The auto trip will not operate on records without a "run off" groove, and if trouble is experienced with the pick-up remaining at the end of a record and so preventing the changer from operating, it is advisable to see that the record has a "run off" groove before attempting to make any adjustment to the mechanism.

OPERATION OF AUTOMATIC TRIP.

The method of operation is as follows:—The Trip Lever being connected to the Pick-up Arm through a series of levers, is moved forward towards the Main Spindle, a distance proportional to the advance made by the Pick-up. The Striker is fitted upon the main spindle in order to push back the Trip Lever and prevent the Auto Trip from operating whilst the record is being played. When the Pick-up reaches the end of the playing grooves and is moved into the "eccentric" or "run-off" groove, the movement transmitted to the Trip Lever is too much to allow of its being pushed back by the Striker, which strikes the metal Trip Lever itself, and by tripping it, operates the changing mechanism.

STRIKER ADJUSTMENT.

The correct (and silent) functioning of the Trip mechanism depends on the rubber bush on the Trip Lever. When this bush becomes badly worn, a tapping sound will become apparent, and the Trip may operate before the end of the record. This fault may be rectified by turning the rubber bush round, in order to present a new surface to the Striker.

FRICTION ADJUSTMENT.

The Friction Adjusting Screw is readily accessible when the Turntable is removed. This screw is marked "E" on the accompanying diagram.

If the Changer fails to operate at the end of a record, the record spindle should be removed, the Turntable lifted off, and the friction screw adjusted.

Before adjusting this screw, it is advisable to make sure that the operating and trip lever "A" on diagram is clear of the base plate and not setting up additional friction by rubbing the plate.

To adjust the friction, give the friction adjusting screw, "E" on the diagram, a small turn in an anti-clockwise direction to increase the friction.

If the Changer trips before the Pick-up has reached the end of the playing grooves, or if a bumping noise is heard through the amplifier, the Screw should be turned the opposite way, i.e., in a clockwise direction, to decrease the friction. As this adjustment is very sensitive, the screw should be turned not more than a quarter of a turn at a time.

RECORDS.

If an occasional slowing-up is noticed in the reproduction, the trouble is most likely due to the record slipping through being concave or warped. If slip occurs on a new record, examine the centre hole for burrs left in record manufacture. Carefully remove these burrs with a penkniife.

PICK-UP ARM ADJUSTMENT.

The Pick-up Arm has been finely adjusted so that the needle comes on to the 10in. record on 9$\frac{5}{8}$in. diameter circle, and comes on to the 12in. record on 11$\frac{5}{8}$in. diameter circle. These dimensions have been arrived at after checking over a very wide selection of records of various makes.

There may be a few records where the playing groove starts further away from the centre, and in these exceptional cases the needle would come on to the record a few grooves in instead of on the plain part. If the Changer was set for these exceptional records it would mean that the Pick-up would not be lowered on to the edge of records of normal size.

Should the dropping position of the needle require adjustment, the Turntable should first be turned by hand to bring the Pick-up from the loading position to a point where the needle has dropped to within 1/16in. of the record.

A screw, which is accessible through a hole in the unit-plate, should then be turned either to left or right according to requirements—a quarter of a turn in either direction will give the maximum adjustment obtainable.

The adjustment should afterwards be checked by running the Changer and noting the dropping position.

When making any adjustments to the Pick-up Arm, it should on no account be forced into position, and when the turntable is turned by hand it should never be turned backwards.

If required the pick-up height can be adjusted by loosening the grub screw in the pick-up counter balance weight, situated beneath the Pick-up Mount, and turning the weight whilst holding the spindle.

AUTO SWITCH.

The Record Changer automatically stops after the last record has played, and this is achieved by means of the centre spindle.

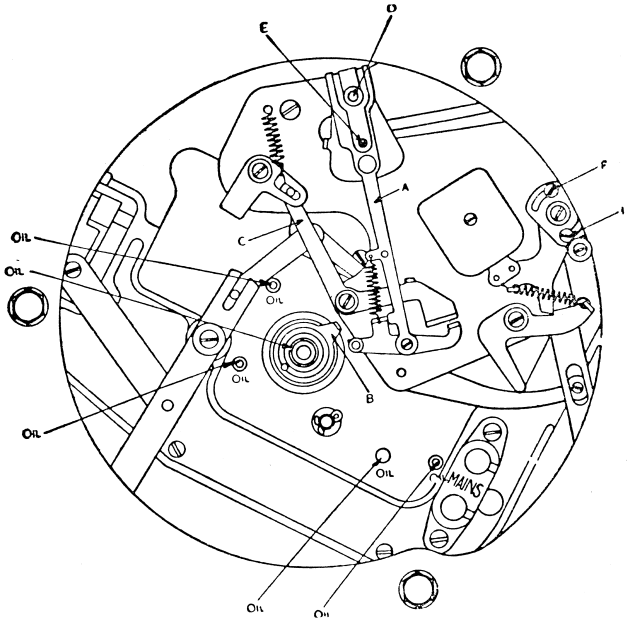
The weight of a record on the centre spindle moves a lever, which interrupts the movement of the Switch Lever from the cam, so preventing the switch from operating.

When the record is removed from the centre spindle, the spindle lifts and allows the lever to move so that it does not interrupt the switch lever, thereby allowing the switch to operate.

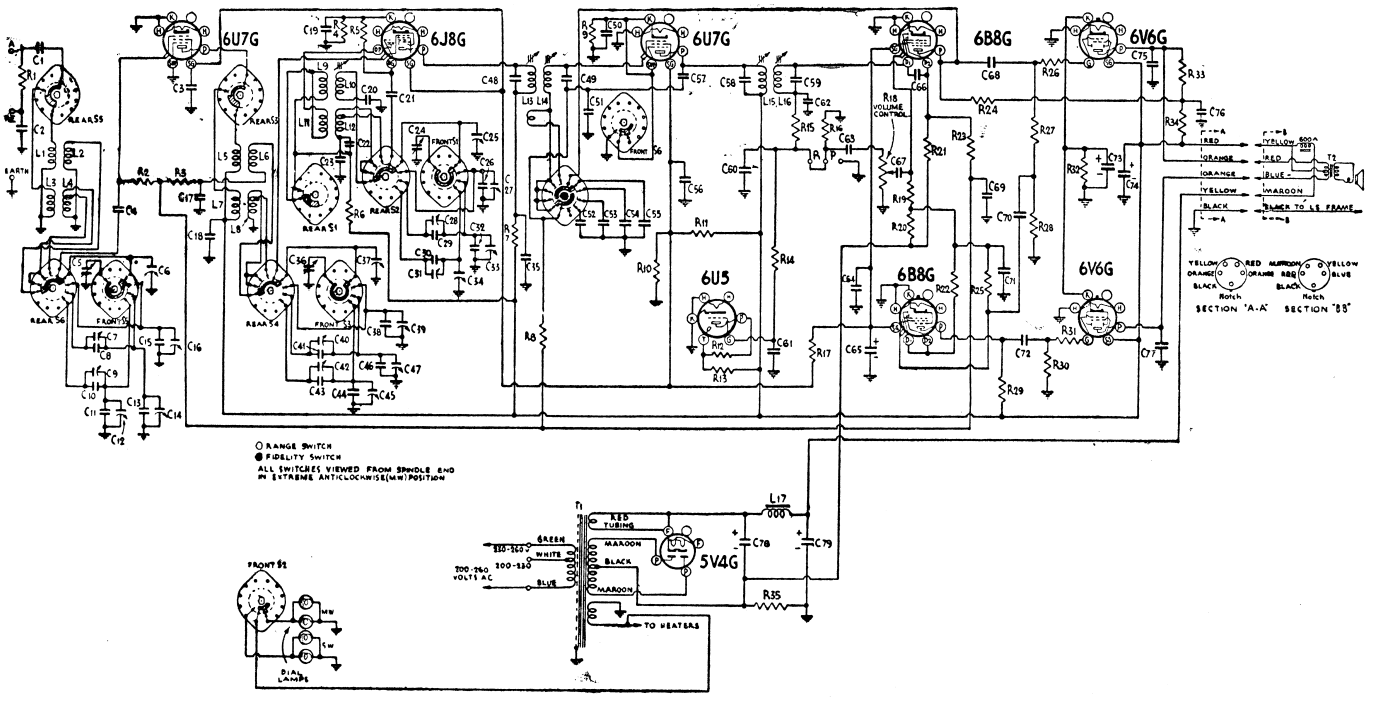
If trouble is experienced with the Auto-Switch not operating at the end of the last record, see that all the levers are free and that all the springs are fixed correctly. Also see that the centre spindle is free in the main spindle—it should move about one-eighth inch when pressed down and should rise the same amount when released. This test should be made when the Changer is in the playing position.

Switch tripping adjustment can be obtained by means of the small quadrant adjustment found on the top of the spindle operated by the switch lever.

If the first record does not drop when the Changer is switched on, this is due to the leather brake pad becoming worn and not braking the turntable sufficiently. To adjust this, loosen the two screws and turn the brake lever slightly to bring the leather pad nearer the turntable rim, then tighten up the screws. After making this adjustment, see that the switch breaks contact before the leather brake pad touches the turntable rim.



CIRCUIT DIAGRAM AND CODE—MODEL 282



COILS.

Code No.	Part No.	
L1, L2	8802	Aerial Coil 1600-550 Kc.
L3, L4	8802	Aerial Coil 13.5-52 M.
L5, L6	8804	R.F. Coil 1600-550 Kc.
L7, L8	8804	R.F. Coil 13.5-52 M.
L9, L10	8806	Osc. Coil 1600-550 Kc.
L11, L12	8806	Osc. Coil 13.5-52 M.
L13, L14	8813	1st I.F. Transformer
L15, L16	8842	2nd I.F. Transformer
L17		5903B Choke

TRANSFORMERS

T1		8811A Power Transformer 40-60C
T2		TX4 Loudspeaker Transformer

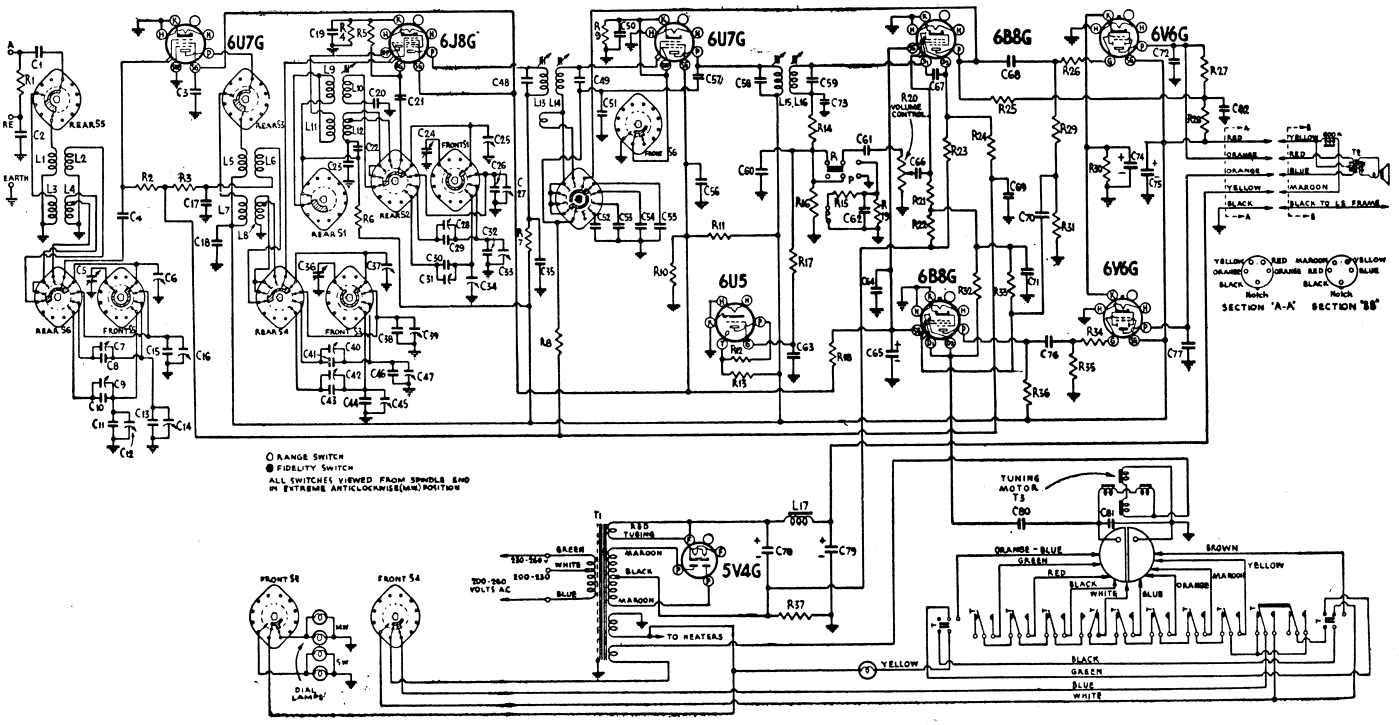
RESISTORS

Code No.	Part No.	
R1		100,000 ohms 1/3 W.
R2		500,000 ohms 1/3 W.
R3		100,000 ohms 1/3 W.
R4		350 ohms 1/3 W.
R5		30,000 ohms 1/3 W.
R6		20,000 ohms 1 W.
R7		300 ohms 1/3 W.
R8		100,000 ohms 1/3 W.
R9		900 ohms 1/3 W.
R10		10,000 ohms 2 W.
R11		11,000 ohms 3 W.
R12		1 megohm 1 W.
R13		20,000 ohms 1 W.
R14		1.75 meg. 1/3 W.
R15		50,000 ohms 1/3 W.
R16		500,000 ohms 1/3 W.
R17		250,000 ohms 1 W.
R18	6370	1 meg. Vol. Control
R19		1.75 megohms 1/3 W.
R20		500,000 ohms 1/3 W.
R21		2.3 megohms 1/3 W.
R22		100,000 ohms 1/3 W.
R23		1.75 megohms 1/3 W.
R24		250,000 ohms 1 W.
R25		1.75 megohms 1/3 W.
R26		50,000 ohms 1/3 W.
R27		390,000 ohms 1/3 W.
R28		7,500 ohms 1 W.
R29		250,000 ohms 1 W.
R30		390,000 ohms 1/3 W.
R31		50,000 ohms 1/3 W.
R32		165 ohms 3 W.
R33		100,000 ohms 1 W.
R34		20,000 ohms 1 W.
R35		26 ohms 3 W.

CONDENSERS.

Code No.	Part No.	
C1		500 mmfd Mica
C2		500 mmfd Mica
C3		.1 mfd Paper
C4		350 mmfd Mica
C5	8933	Tuning Condenser
C6	3658	2-10 mmfd Air Trimmer
C7		3-39 mmfd Mica Trimmer
C8		150 mmfd Mica (O)
C9		3-39 mmfd Mica Trimmer
C10		50 mmfd Mica (D)
C11, C12	5435	4 mmfd Mica; 2-20 mmfd Air Trimmer
C13, C14	6616	30 mmfd Mica (U); 2-20 mmfd Air Trimmer
C15, C16	8913	100 mmfd Mica (T); 2-20 mmfd Air Trimmer
C17		.05 mfd Paper
C18		.5 mfd Paper
C19		.1 mfd Paper
C20		420 mmfd Mica (Pad.) (Temp. Comp.)
C21		70 mmfd Mica (N)
C22		.05 mfd Paper
C23		5100 mmfd Mica (Pad.)
C24	8933	Tuning Condenser
C25	3661	2-20 mmfd Air Trimmer
C26, C27	8807	90 mmfd Mica (Z); 2-20 mmfd Air Trimmer
C28		3-39 mmfd Mica Trimmer
C29		140 mmfd Mica (1A)
C30		50 mmfd Mica (D)
C31		3-39 mmfd Mica Trimmer
C32, C33	3664	20 mmfd Mica (K); 2-20 mmfd Air Trimmer
C34	3658	2-10 mmfd Air Trimmer
C35		.1 mfd Paper
C36	8933	Tuning Condenser
C37	3658	2-10 mmfd Air Trimmer
C38		(90 mmfd Mica (Z)
C39	8807	(2-20 mmfd Air Trimmer
C40		3-39 mmfd Mica Trimmer
C41		150 mmfd Mica (O)
C42		3-39 mmfd Mica Trimmer
C43		50 mmfd Mica (D)
C44		(4 mmfd Mica
C45	5435	(2-20 mmfd Air Trimmer
C46		(30 mmfd Mica (U)
C47	6616	(2-20 mmfd Air Trimmer
C48		70 mmfd Mica (N)
C49		70 mmfd Mica (N)
C50		.1 mfd Paper
C51		.02 mfd Paper
C52		.0025 mfd Paper
C53		.005 mfd Paper
C54		.01 mfd Paper
C55		.02 mfd Paper
C56		.1 mfd Paper
C57		4 mmfd Mica
C58		70 mmfd Mica (N)
C59		70 mmfd Mica (N)
C60		110 mmfd Mica (L)
C61		.05 mfd Paper
C62		110 mmfd Mica (L)
C63		.05 mfd Paper
C64		.1 mfd Paper
C65	EE10774	8 mfd 525 V. Electrolytic
C66		50 mmfd Mica (D)
C67		.05 mfd Paper
C68		.05 mfd Paper
C69		.05 mfd Paper
C70		.5 mfd Paper
C71		.5 mfd Paper
C72		.05 mfd Paper
C73		25 mfd 25 V. Electrolytic
C74		8 mfd 500 V. Electrolytic
C75		.0025 mfd Paper
C76		.0025 mfd Paper
C77		.0025 mfd Paper
C78		16 mfd 500 V. Electrolytic
C79		16 mfd 500 V. Electrolytic

CIRCUIT DIAGRAM AND CODE—MODELS 283, 313 AND 314



Code No.	Part No.	COILS.
L1, L2	8802	Aerial Coil 1600-550 Kc.
L3, L4	8802	Aerial Coil 13.5-52 M.
L5, L6	8804	R.F. Coil 1600-550 Kc.
L7, L8	8804	R.F. Coil 13.5-52 M.
L9, L10	8806	Osc. Coil 1600-550 Kc.
L11, L12	8806	Osc. Coil 13.5-52 M.
L13, L14	8813	1st I.F. Transformer
L15, L16	8842	2nd I.F. Transformer
L17	5903B	Choke

		TRANSFORMERS
T1	8811A	Power Transformer 40-60C
T2	TX4	Loudspeaker Transformer
T3		Tuning Motor

Code No.	Part No.	RESISTORS
R1		100,000 ohms 1/3 W.
R2		500,000 ohms 1/3 W.
R3		100,000 ohms 1/3 W.
R4		350 ohms 1/3 W.
R5		30,000 ohms 1/3 W.
R6		20,000 ohms 1 W.
R7		300 ohms 1/3 W.
R8		100,000 ohms 1/3 W.
R9		900 ohms 1/3 W.
R10		10,000 ohms 2 W.
R11		11,000 ohms 3 W.
R12		1 megohm 1 W.
R13		20,000 ohms 1 W.
R14		50,000 ohms 1/3 W.
R15		20,000 ohms 1/3 W.
R16		500,000 ohms 1/3 W.
R17		1.75 megohms 1/3 W.
R18		250,000 ohms 1 W.
R19		50,000 ohms 1/3 W.
R20	6370	1 megohm Vol. Control
R21		1.75 megohms 1/3 W.
R22		500,000 ohms 1/3 W.
R23		2.3 megohms 1/3 W.
R24		1.75 megohms 1/3 W.
R25		250,000 ohms 1 W.
R26		50,000 ohms 1/3 W.
R27		100,000 ohms 1 W.
R28		20,000 ohms 1 W.
R29		390,000 ohms 1/3 W.
R30		165 ohms 3 W.
R31		7500 ohms 1 W.
R32		100,000 ohms 1/3 W.
R33		1.75 megohms 1/3 W.
R34		50,000 ohms 1/3 W.
R35		390,000 ohms 1/3 W.
R36		250,000 ohms 1 W.
R37		26 ohms 3 W.

Code No.	Part No.	CONDENSERS.
C1		500 mmfd Mica
C2		500 mmfd Mica
C3		.1 mfd Paper
C4		350 mmfd Mica
C5	8849	Tuning Condenser
C6	3658	2-10 mmfd Air Trimmer
C7		3-39 mmfd Mica Trimmer
C8		150 mmfd Mica (O)
C9		3-39 mmfd Mica Trimmer
C10		50 mmfd Mica (D)
C11		(4 mmfd Mica
C12	5435	(2-20 mmfd Air Trimmer
C13		(30 mmfd Mica (U)
C14	6616	(2-20 mmfd Air Trimmer
C15		100 mmfd Mica (T)
C16	8931	2-20 mmfd Air Trimmer
C17		.05 mfd Paper
C18		.5 mfd Paper
C19		.1 mfd Paper
C20		420 mmfd Mica (Pad.) (Temp. Comp.)
C21		70 mmfd Mica (N)
C22		.05 mfd Paper
C23		5100 mmfd Mica (Pad.)
C24	8849	Tuning Condenser
C25	3661	2-20 mmfd Air Trimmer
C26		(90 mmfd Mica
C27	8807	(2-20 mmfd Air Trimmer
C28		3-39 mmfd Mica Trimmer
C29		140 mmfd Mica (A)
C30		50 mmfd Mica (D)
C31		3-39 mmfd Mica Trimmer
C32		20 mmfd Mica (K)
C33	3664	2-20 mmfd Air Trimmer
C34	3658	2-10 mmfd Air Trimmer
C35		.1 mfd Paper
C36	8849	Tuning Condenser
C37	3658	2-10 mmfd Air Trimmer
C38		(90 mmfd Mica (Z)
C39	8807	(2-20 mmfd Air Trimmer
C40		3-39 mmfd Mica Trimmer
C41		150 mmfd Mica
C42		3-39 mmfd Mica Trimmer
C43		50 mmfd Mica (D)
C44		(4 mmfd Mica
C45	5435	(2-20 mmfd Air Trimmer
C46		(30 mmfd Mica (U)
C47	6616	(2-20 mmfd Air Trimmer
C48		70 mmfd Mica (N)
C49		70 mmfd Mica (N)
C50		.1 mfd Paper
C51		.02 mfd Paper
C52		.0025 mfd Paper
C53		.005 mfd Paper
C54		.01 mfd Paper
C55		.02 mfd Paper
C56		.1 mfd Paper
C57		4 mmfd Mica
C58		70 mmfd Mica (N)
C59		70 mmfd Mica (N)
C60		110 mmfd Mica (L)
C61		.05 mfd Paper
C62		.0025 mfd Paper
C63		.05 mfd Paper
C64		.1 mfd Paper
C65	EE10774	8 mfd 525 V. Electrolytic
C66		.05 mfd Paper
C67		50 mmfd Mica (D)
C68		.05 mfd Paper
C69		.05 mfd Paper
C70		.5 mfd Paper
C71		.5 mfd Paper
C72		.0025 mfd Paper
C73		110 mmfd Mica (L)
C74		25 mfd 25 V. Electrolytic
C75		8 mfd 500 V. Electrolytic
C76		.05 mfd Paper
C77		.0025 mfd Paper
C78		16 mfd 500 V. Electrolytic
C79		16 mfd 500 V. Electrolytic
C80		.1 mfd Paper
C81		60 mfd Electrolytic
C82		.005 mfd Paper

MECHANICAL REPLACEMENT PARTS

DESCRIPTION.	PART No.
Pointer (White) and Saddle, with Drive Wire	8046D
Drive Wire Tension Spring	6641
Drive Wire Jockey Pulleys	6646
Pointer Drive Drum	6341
Tuning Control Spindle, with Dual Ratio Mechanism	8745
Dial Scale	8654
Range Switch	8393
Tone Switch	8385
Loudspeaker Cable	8818
Large Knob (Outer)	5625
Small Knob (Inner)	4589

DESCRIPTION.	PART No.
Range Switch Knob	5846
Knob Clips	7929
Range Switch Drive Chain Sprockets	6349
Valve Sockets (7)	4704
Valve Socket (Cushion)	7327
Valve Shields	8147
Valve Clips	7459
Dial Lamp Sockets	4194
Dial Escutcheon	5850
Loudspeaker Cone Assembly	7070-AS9
Loudspeaker Cone Assembly	9332-AS11
Automatic Tuning Unit, including Tuning Condenser	8849
Push Button Switch	6612
Push Button Switch Escutcheon	5851