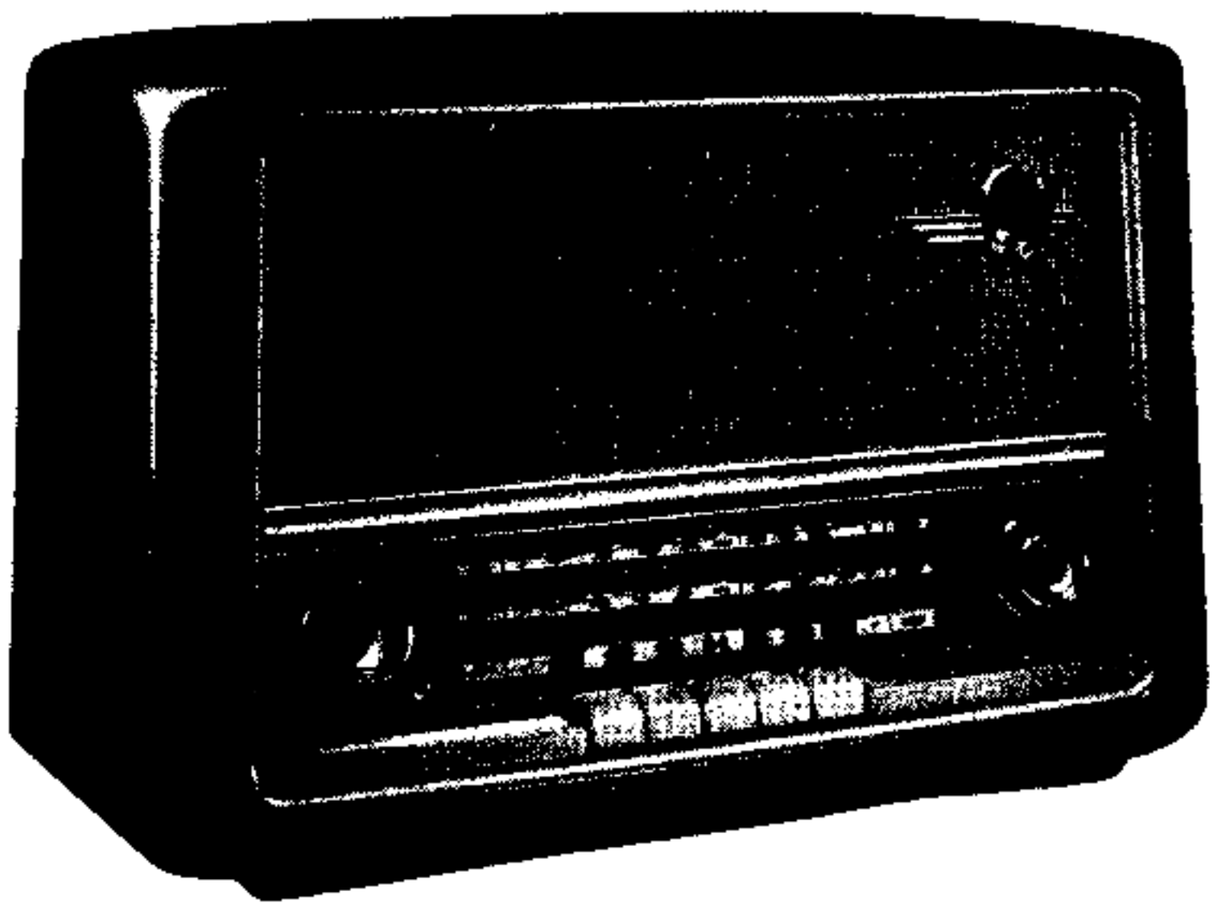
# BUSH RADIO



# Service Instructions



# MODEL VHF.61

## FOR A.C. MAINS

INDEX



## SPECIFICATION

**BASIC DESIGN**

When switched to long or medium waveband the circuit is a conventional 7-valve (including rectifier and tuning indicator) superhet, using Mullard valves in the following sequence :—

Frequency changer ECH 81 (V2), 1st I.F. Amplifier EF 89 (V3), 2nd I.F. Amplifier EF 89 (V4), Detector/AGC Diode and Audio Amplifier EABC 80 (V5), Tuning indicator EM 81 (V6), output EL 84 (V7), Full wave rectifier EZ 80 (V8).

When switched to the V.H.F. band the circuit is modified by the addition of two further stages. The valve sequence is then :—

V.H.F. Amplifier and Mixer ECC 85 (V1), 1st I.F. Amplifier, Heptode section of ECH 81 (V2), 2nd I.F. Amplifier EF 89 (V3), 3rd I.F. Amplifier EF 89 (V4), Ratio Detector and Audio Amplifier, two diodes and triode of EABC 80 (V5), Tuning Indicator EM 81 (V6), output EL 84 (V7), Full-wave rectifier EZ 80 (V8).

V.H.F. Oscillator and R.F. Tuning is by means of iron-dust cores moved by a cord drive system attached to the spindle of the A.M. tuning capacitor. Separate I.F. transformers are used for A.M. (470 kc/s) and F.M. (10·7 mc/s), and the appropriate set of I.F. Transformers is selected by means of slider switches operated by piano key type push buttons.

Negative feedback over the audio stages is taken from the secondary of the output transformer.

**VALVES**

| Mullard Type | Heaters |
|---|---|
| ECC 85 (V1) | 6·3V. 0·435A. |
| ECH 81 (V2) | 6·3V. 0·3A. |
| EF 89 (V3) | 6·3V. 0·2A. |
| EF 89 (V4) | 6·3V. 0·2A. |
| EABC 80 (V5) | 6·3V. 0·45A. |
| EM 81 (V6) | 6·3V. 0·3A. |
| EL 84 (V7) | 6·3V. 0·76A. |
| EZ 80 (V8) | 6·3V. 0·6A. |

**VOLTAGE RANGE**

100/120V. and 200/250V. 40 to 100 c/s.

**MAINS CONSUMPTION**

65 watts approximately.

**SCALE LAMPS**

1 at 6·5V. 0·3A.

**AUDIO OUTPUT**

2·5 watts approximately.

**WAVEBANDS**

| | | |
|---|---|---|
| Long | 280 kc/s—158 kc/s | 1,070—1,900 metres. |
| Medium | 1,604 kc/s—535 kc/s | 187— 560 ,, |
| V.H.F. | 87·5 mc/s—100 mc/s | 3·4— 3 ,, |

**INTERMEDIATE FREQUENCIES**

A.M.—470 kc/s.
V.H.F.—10·7 mc/s.

**CONTROLS** (from left to right)

(*a*) Concentric control, tone outer, volume inner.
(*b*) Piano keys OFF, GRAM, V.H.F., M.W., L.W.
(*c*) Tuning.

**GRAMOPHONE PICK-UP**

The pick-up sockets are situated at the back of the chassis on the left.

**AERIAL CONNECTIONS**

L and M—an internal ferrite rod aerial is fitted, which is permanently connected. Sockets are also provided for an external aerial if desired.

V.H.F.—a loaded dipole is fitted to the cabinet back. This is connected to the receiver by means of an 80Ω line and 2-pin plug. An external aerial may be employed if necessary.

**EXTERNAL SPEAKER**

Use a permanent magnet speaker (approx. 2·5Ω impedance) and connect to the two sockets at the back of the chassis on the right.

**CABINET DIMENSIONS**

Height 11¼ ins. Depth 7¾ ins. Width 16¾ ins.

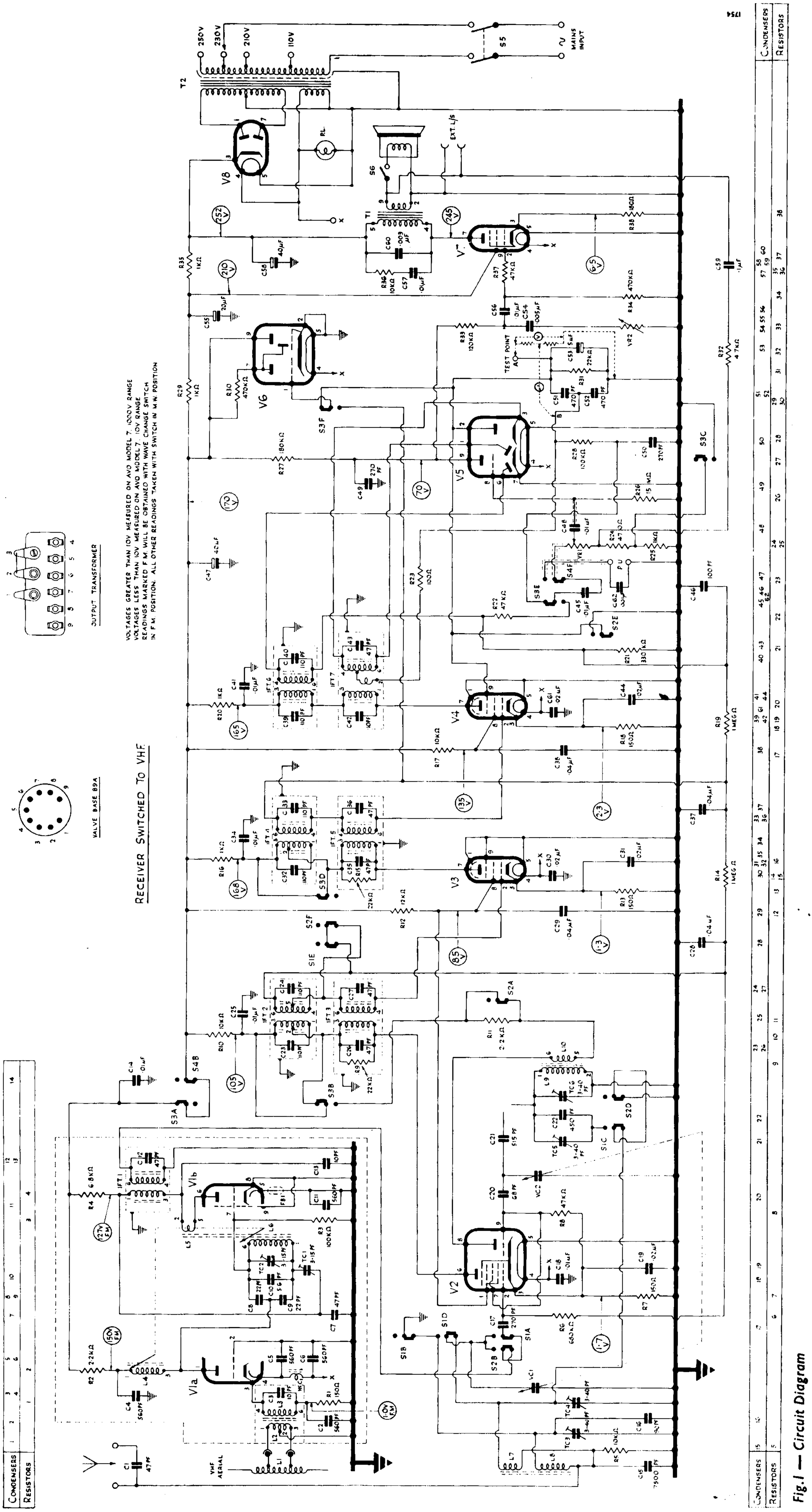



*Fig.1 — Circuit Diagram*

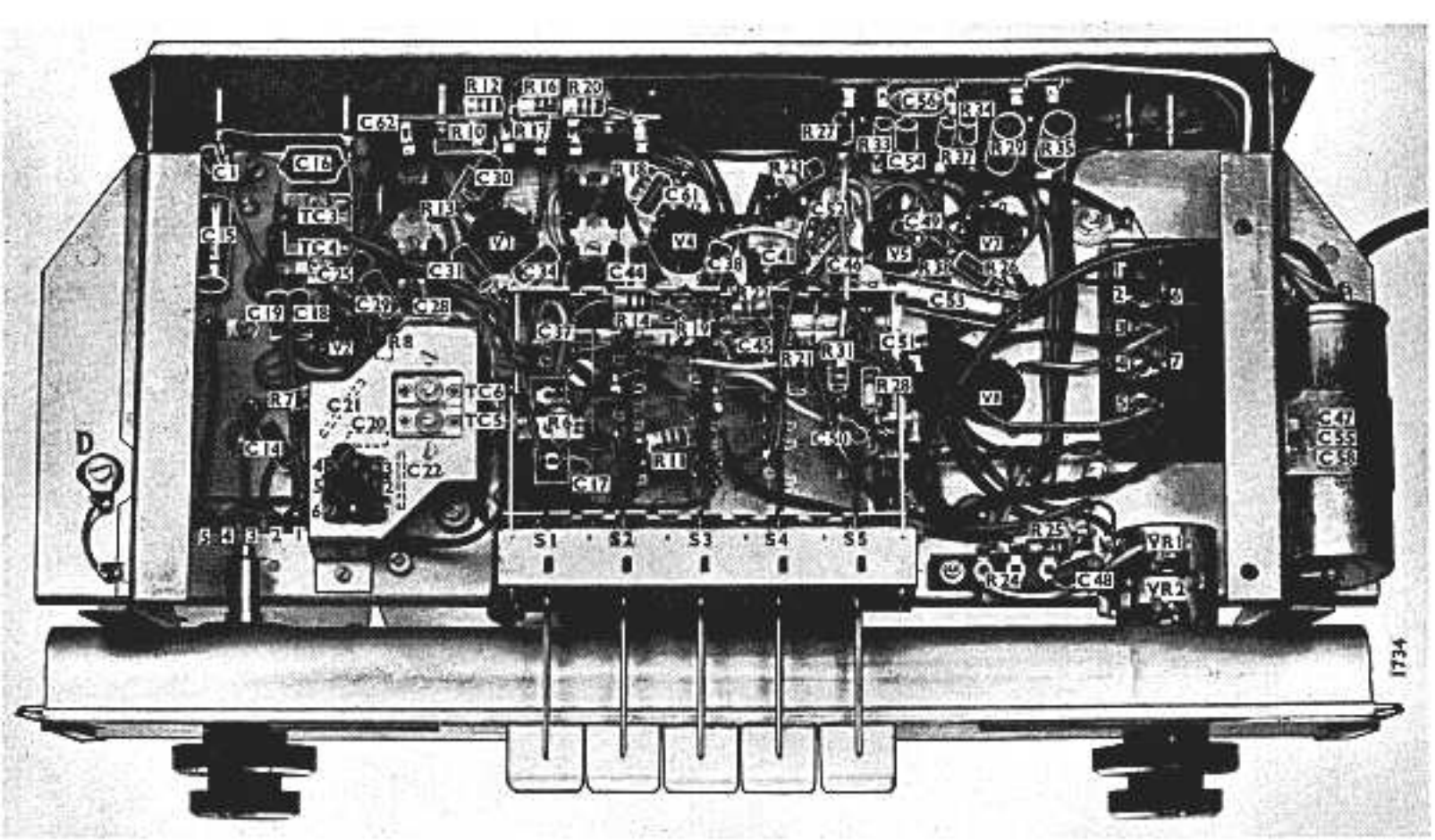



*Fig. 3—Under View of Chassis. See fig. 1 for number references*

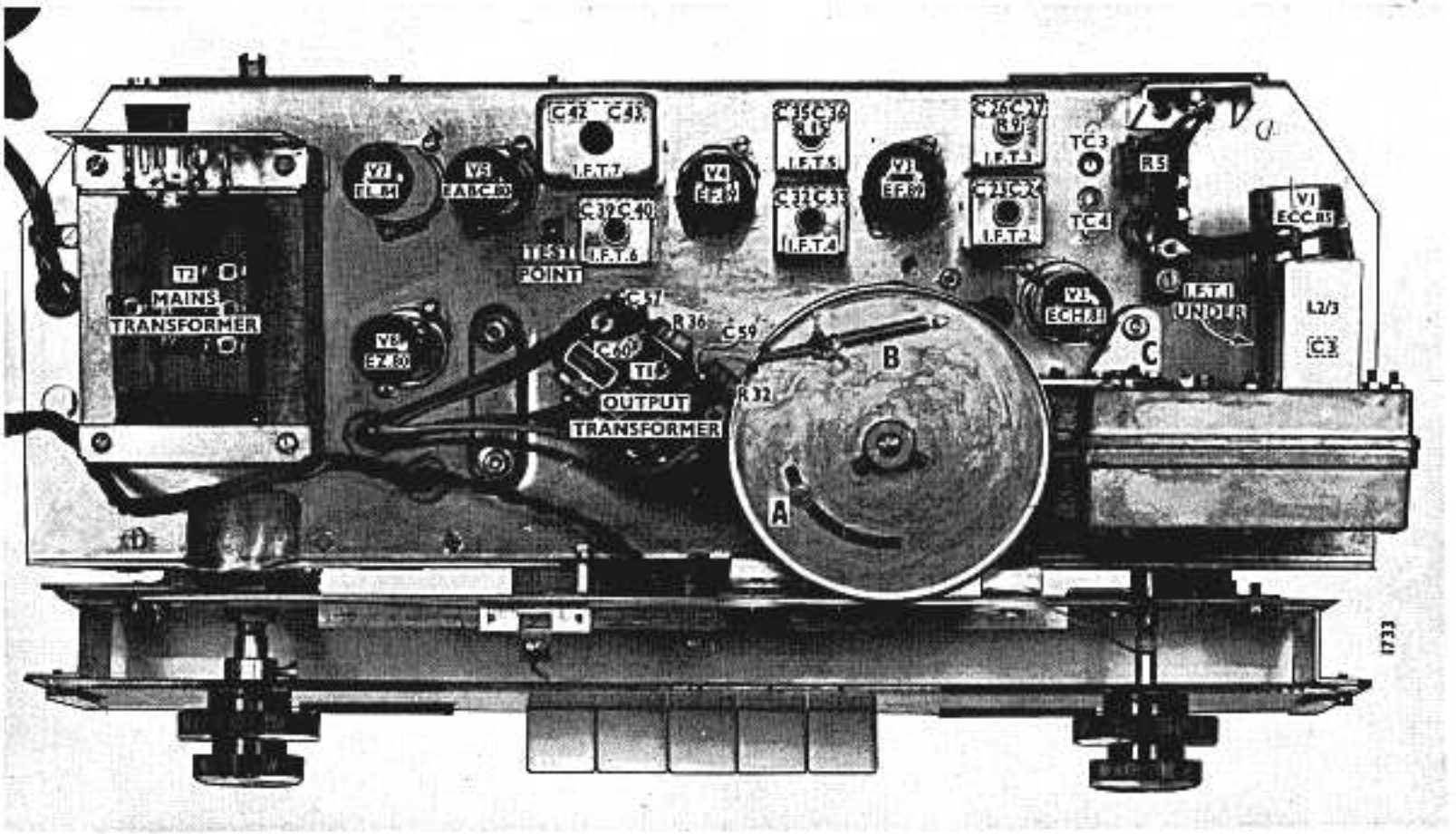



Fig 1—Top View of Chassis

# ALIGNMENT INSTRUCTIONS

*GENERAL*

(*a*) Remove receiver from cabinet.
(*b*) The receiver and signal generator should be switched on 15 minutes before alignment is attempted.
(*c*) Use a non-metallic trimming tool.
(*d*) IFT.7 has the secondary at the bottom of the can. All other IFT's have secondaries at the top.

*A.M.*

**I.F. Alignment (470 kc/s)**

(*a*) Switch the receiver to M.W. and set pointer to approximately 300 metres. Inject 470 kc/s signal 30% modulated at 400 c/s between pin 2, V4 and chassis, and connect the output meter to the secondary of T.I. Disconnect the speech coil.
(*b*) Tune Sec. and Pri. IFT.6 (in that order) for maximum audio output.
(*c*) Transfer generator to pin 2, V3, and tune Sec. and Pri. IFT.4 (in that order) for maximum audio output.
(*d*) Transfer generator to pin 2, V2, and tune Sec. and Pri. IFT.2 (in that order) for maximum audio output.

**R.F. Alignment**

With generator still connected to pin 2, V2, align as follows :—

| Operation | Waveband | Generator (kc/s) | Receiver Calibration | Adjust for Maximum Audio Output |
|---|---|---|---|---|
| 1 | M.W. | 600 | 500 metres | L9 & 10 (Osc.) |
| 2 | M.W. | 1,500 | 200 metres | TC6 (Osc.) |
| 3 | Repeat operations 1 and 2—check calibration | | | |
| 4 | L.W. | 214 | 1,400 metres | TC5 (Osc.) |

For the adjustment of TC4 and TC3 (trimmers on ferrite rod aerial) it is necessary to couple the generator by means of a single turn loop of wire approximately 5″ in diameter, positioned 12″ to 18″ away from the cabinet.

| Operation | Waveband | Generator (kc/s) | Receiver Calibration | Adjust for Maximum Audio Output |
|---|---|---|---|---|
| 5 | M.W. | 1,500 | 200 metres | TC4 (Aerial) |
| 6 | L.W. | 214 | 1,400 metres | TC3 (Aerial) |

*V.H.F.*

Equipment required :—
(1) Signal Generator for 10·7 mc/s (I.F.) and 87·5 to 100 mc/s.
(2) AVOmeter Model 8
or
D.C. Valve-Voltmeter.
(3) Two 47k ¼ watt resistors, matched.
(4) One 1k ¼ watt resistor.

**I.F. Alignment (10.7 mc/s)**

Switch receiver to V.H.F. band. Connect the two 47k resistors in series between test point "A" and chassis. Connect the AVO model 8 (on 10v. D.C. range) or the valve-voltmeter across the two resistors.

*NOTE.*—With the exception of the discriminator (IFT.7) primary, the correct peak associated with all cores is the first one reached :—
(*a*) From the top of the coil former as the core enters the secondary winding ;
(*b*) From the base of the coil former as the core enters the primary winding.

(*a*) Adjust, if necessary, the position of the I.F. cores as follows :—
IFT.3 and IFT.5—primary and secondary cores to be ⅛″ inside coil former.
IFT.7 Primary—core to be ¼″ inside coil former.
IFT.7 Secondary—core to be ⅛″ inside coil former.
(*b*) Inject 10·7 mc/s unmodulated to pin 2, V3, and turn volume control to minimum. Adjust the input level to produce an output of 4v. D.C. across the voltmeter. During alignment the input signal should be maintained at a level just sufficient to produce 4v. D.C. each time a trimming adjustment is made to any core.
(*c*) Adjust Pri. IFT.7 for maximum D.C. output.
(*d*) Connect 1,000Ω damping across Sec. IFT.5 and adjust Pri. for maximum D.C. output. Transfer damping to Pri. and adjust Sec. for maximum D.C. output. Remove damping.
(*e*) Transfer signal to pin 2, V2. Connect damping across Sec. IFT.3 and adjust Pri. for maximum D.C. output. Transfer damping to Pri. and adjust Sec. for maximum D.C. output. Remove damping.
(*f*) Readjust Pri. IFT.7 for maximum D.C. output.
(*g*) Connect the AVO (on 50μA range) or microammeter between the junction of the two 47k resistors and point B (see circuit diagram). Adjust Sec. IFT.7 for zero on the microammeter.
*NOTE.*—Zero response can only occur when the Sec. IFT.7 is in balance. When it is off tune either positive or negative output will be obtained. The AVO Model 8 has a reversing button to allow reading in either direction, but with a microammeter the connections would need reversing.
*NOTE.—It is essential that maximum D.C. output coincides with minimum response on the microammeter.*
(*h*) Transfer signal input to V.H.F. aerial sockets and adjust sec. IFT.1 for maximum D.C. output.

**R.F. Alignment**

(*a*) Set generator and auxiliary pointer to 88 mc/s. Slacken the locking screw on the pivoted adjuster (fig. 3) and rotate arm for maximum D.C. output. This operation adjusts the cores of L4 (R.F.) and L5/L6 (Osc.). Tighten locking screw.
(*b*) Set generator and auxiliary pointer to 94 mc/s and adjust L2/L3 (aerial) for maximum D.C. output.
(*c*) Check calibration.

*NOTE.*—No reference has so far been made to the trimmers TC1 and TC2 (fig. 2).

TC1, the oscillator bridge balancing trimmer, has been adjusted in production for minimum transmission of oscillator voltage to the V.H.F. aerial sockets.

TC2, the oscillator trimmer, has been similarly adjusted for optimum V.H.F. cailbration.

As these trimmers are set up using special alignment gear and subsequent variation is unlikely, no readjustment should be necessary in future.

Replacement of V1 (ECC85) may cause silght changes in oscillator calibration. If so, the pivoted adjuster should be reset as detailed above.

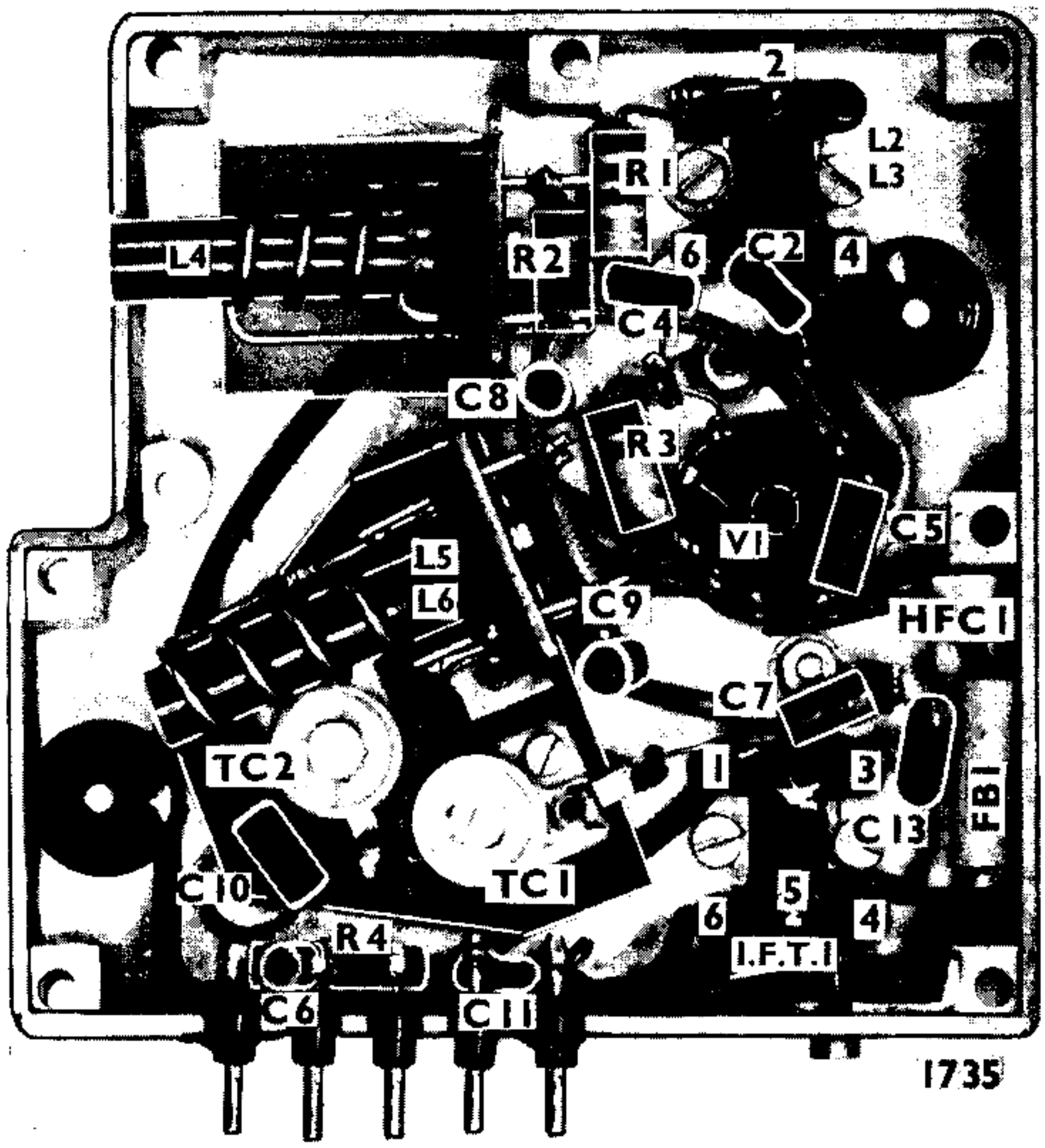



*Fig. 4—VHF Box—Component Layout. See fig. 1 for number references*

## DISMANTLING

### REMOVING V.H.F. BOX FROM CHASSIS

(1) Unsolder the five connections to the box (see below).
(2) Set the tuning capacitor to minimum and unhook the spring (B, fig. 3) from the drive drum.
(3) Remove the cord drive from the drive drum.
(4) Release and remove the screw and washer (A, fig. 3) from the pivoted adjuster.
(5) Unbolt and remove the drive drum.
(6) Remove the cord from around the brass boss.
(7) Remove the three bolts holding the box to the L-shaped bracket (C, fig. 3) and remove the bolt (D, fig. 2) from beneath the chassis.

### CONNECTIONS TO V.H.F. BOX (Fig. 2)

1. S3A.
2. Pin 4V2.
3. Chassis.
4. S2B.
5. Chassis.

### REMOVING OSCILLATOR DECK

1. Remove black lead from S1.C.
2. Remove green lead from stator VC2.
3. Remove green lead from Pin 7, V2.
4. Remove blue lead from Pin 8, V2.
5. Remove pink lead from S2A.
6. Unbolt and remove oscillator deck.

## REMOVING CHASSIS FROM CABINET

1. Remove cabinet back.

2. Remove the four chassis fixing bolts underneath the cabinet and the two bolts holding the chassis fixing brackets to the left and right inside walls of the cabinet.

3. Remove the ferrite rod by gently dislodging the rubber grommets from the metal brackets.

4. Loosen the nut holding the cleat on the top left hand corner of the loudspeaker and slip the tuning indicator leads out from under it. These leads, when freed from the cleat, are long enough to enable the chassis to be removed, but if it is required to separate the chassis entirely from the cabinet, grasp the tuning indicator firmly in the hand and lever its holder clear of the locating notch in the baffle and slide it downwards clear of the spring.

5. Unscrew the spade tags connected to pin 1 and pin 2 of the output transformer (see fig. 3).

## REPLACING VHF TUNING CORD DRIVE

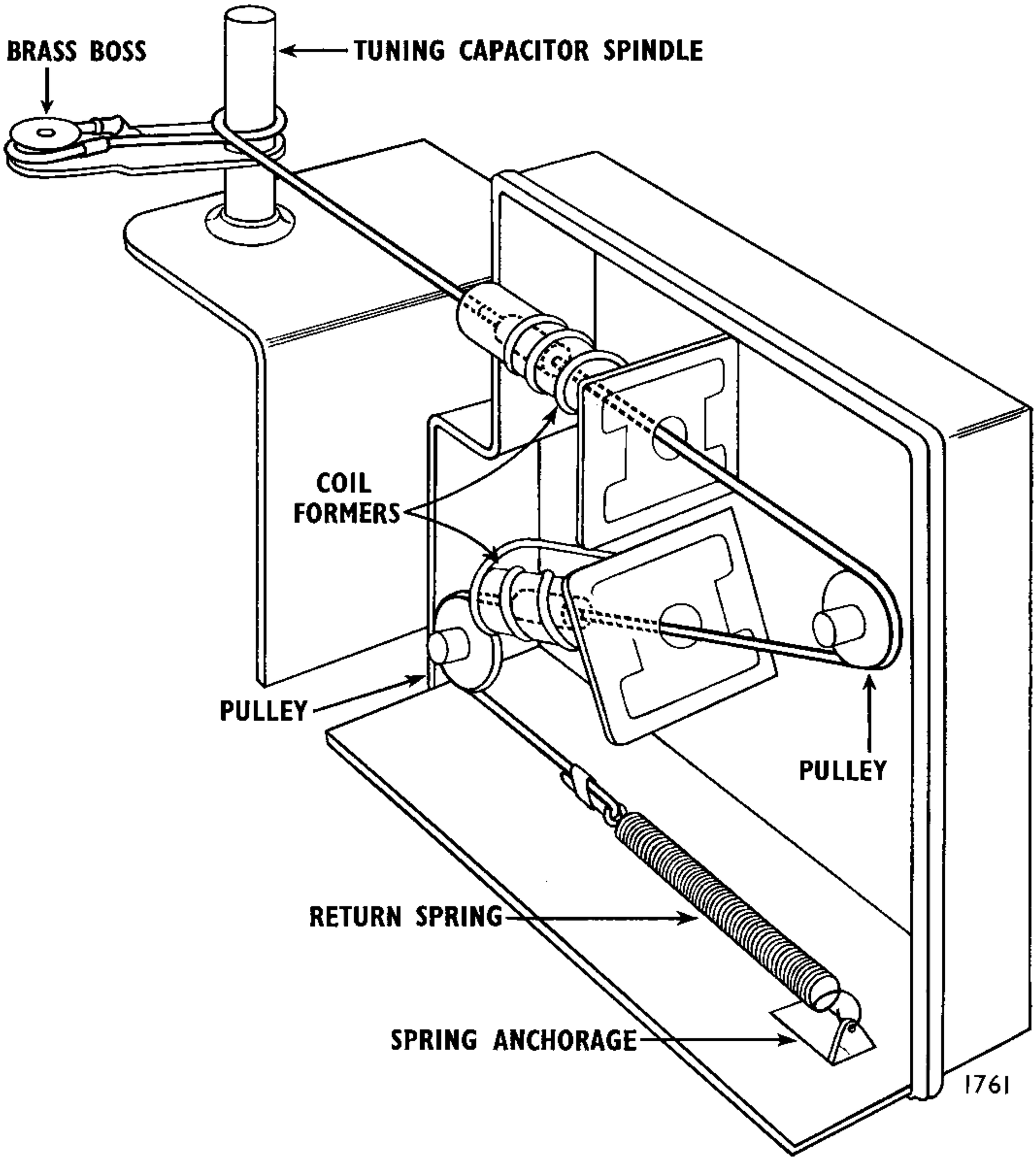



*Fig. 5—VHF Cord Drive*

Should a breakage occur in either cords or cores it is recommended that the complete assembly (AP24888) should be obtained and fitted as follows :—

1. Remove front side of V.H.F. box. To do this it is first necessary to remove the tuning scale (see Instructions for Replacing Tuning Capacitor Cord Drive, page 8), then the screws holding the front side of the box may be removed.
2. Set the tuning capacitor to minimum to ease tension on the return spring in the V.H.F. box.
3. Unhook the spring (B, fig. 3) from the drive drum.
4. Remove the cord drive from the drive drum.
5. Release and remove the screw and washer (A, fig. 3) from the pivoted adjuster.
6. Unbolt and remove the drive drum.
7. Thread assembly of tuning cores (fig. 5) through coil formers and hook the spring to its anchorage.
8. Now take one turn in a clockwise direction around the tuning capacitor spindle and slip the loop in the cord over the brass boss.
9. Re-positioning the drive drum should present no difficulty if it is noted that the gap in the edge of the drive drum (through which the drive cord passes) should be immediately above the visible part of the V.H.F. tuning cord when the ganged capacitor is at maximum capacity. Check that the pointer coincides with the dots at the right hand end of the scale.
10. Re-set pivoted adjuster as laid down in the alignment procedure for V.H.F.

### PART NUMBERS

| | |
|---|---|
| Assembly of Tuning Cores .. .. .. | AP24888 |
| Pulley .. .. .. .. .. .. | AP24684 |
| Spring, cord tension .. .. .. .. | AP24740 |

## REPLACING TUNING CAPACITOR CORD DRIVE

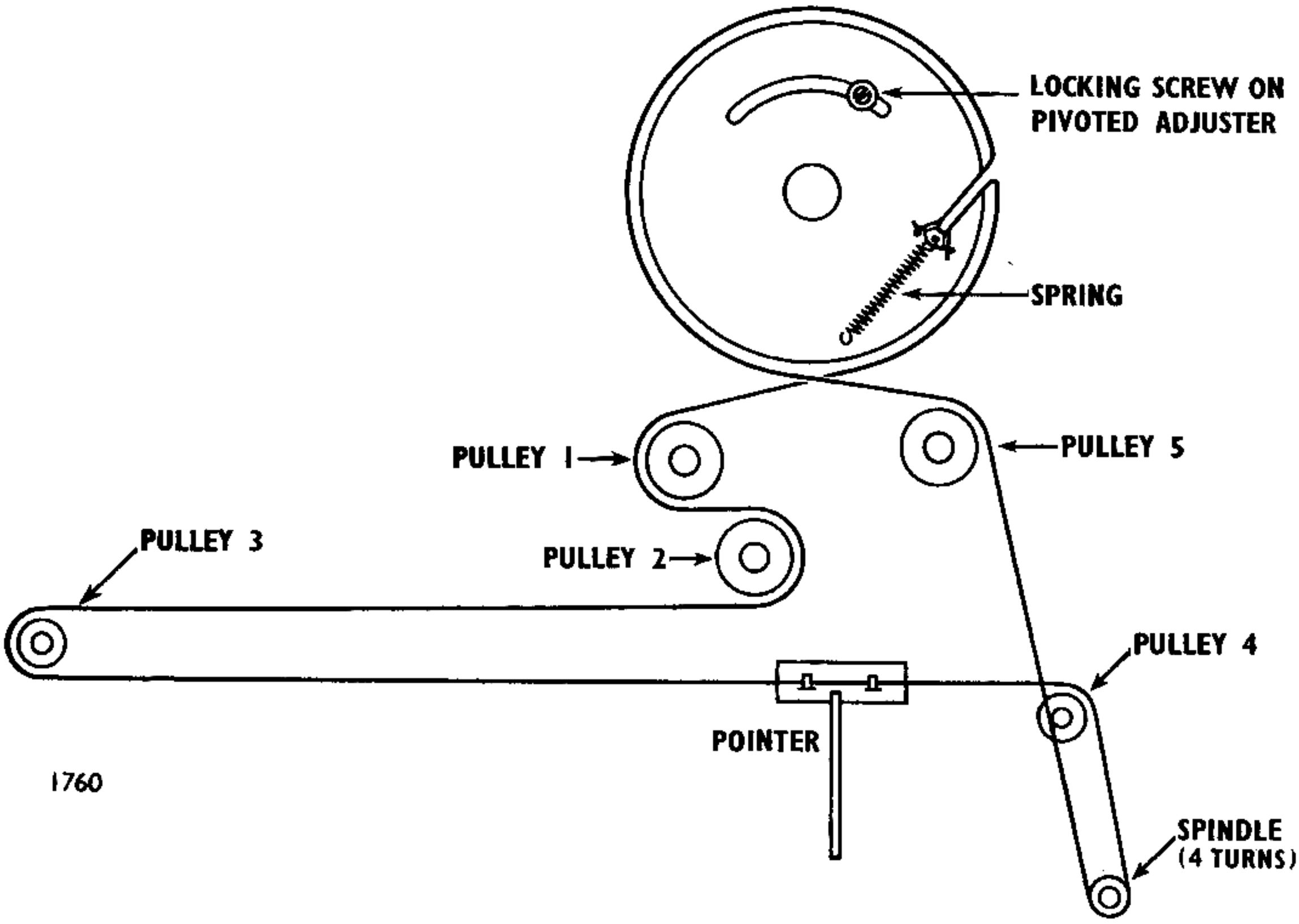



*Fig. 6 — Assembly of Cord Drive*

To replace the cord drive or to remove the front side of the V.H.F. box, the tuning scale must first be removed. This is done as follows : First remove the control knobs by loosening the retaining grubscrews and sliding the knobs off their spindles. Both knobs are in two parts, each fixed to the spindle by a separate grubscrew. Next remove the screws holding the scale-retaining clamps at either end of the scale. Now tilt the scale forward so as to bring it clear of the control spindles and carefully withdraw it, avoiding the piano keys.

The diagram (fig. 6) shows the position of the drive drum with the tuning capacitor at maximum. The length of glass nylon cord required is approximately 48 inches.

Pass the cord around pulley 1 counter-clockwise, then round pulley 2 clockwise, then round pulley 3 counter-clockwise, then round pulley 4 clockwise, then take 4 turns clockwise round the tuning knob spindle, then counter-clockwise round pulley 5, then around the drum clockwise to the opening. Take the other end of the cord from pulley 1 around the drum counter-clockwise and clench both ends in the clip, hook the clip to the spring and attach the other end of the spring to the lug on the drive drum.

Set the pointer to the dots at the right hand end of the scale and clench the two lugs over the drive cord.

| | |
|---|---|
| Carriage .. .. .. .. .. .. | AP24797 |
| Clip, Cord Drive .. .. .. .. | P1940 |
| Cord Drive assembly (including clip, spring and cord) .. .. .. .. .. | AP24899 |
| Drum, drive .. .. .. .. .. | AP24792 |
| Pointer .. .. .. .. .. | AP24798 |
| Pulley (small) .. .. .. .. .. | AP24684 |
| Pulley .. .. .. .. .. .. | AP12416 |
| Spring .. .. .. .. .. .. | P1941 |

## CONNECTIONS TO MAINS TRANSFORMER
**(Part No. AS25716)**

External connections are made to the tags on the base of the transformer (fig. 2) as follows :—

| Tag No. | To |
|---|---|
| 1 | Chassis |
| 2 | Pin 4, V7 |
| 3 | Pin 7, V8 |
| 4 | Pin 5, V8 |
| 5 | Pin 1, V8 |
| 6 | S5 |
| 7 | S5 |

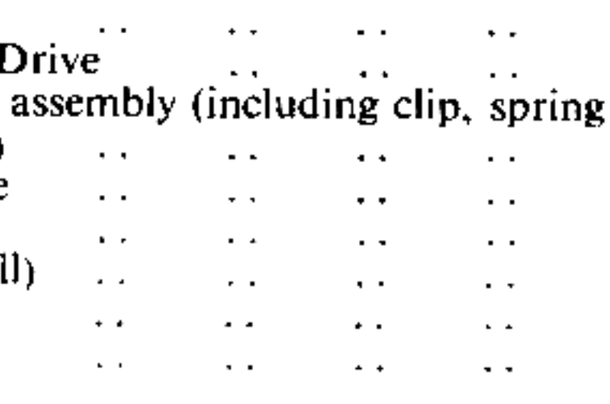



*Fig.7—Key to I.F.T. Bases*
*Under View from rear of chassis*

## COILS, CHOKES AND TRANSFORMERS

| Reference | Resistance (ohms) | Part Number | Description |
|---|---|---|---|
| L1 | Less than 0·5 | AS24894 | V.H.F. Aerial loading coil. |
| L2 | ,, ,, ,, | CS24884 | V.H.F. Aerial coil. |
| L3 | ,, ,, ,, | | |
| L4 | ,, ,, ,, | BS24885 | V.H.F. R.F. Anode coil. |
| L5 | ,, ,, ,, | BS24883 | V.H.F. Oscillator coil. |
| L6 | ,, ,, ,, | | |
| L7 | ,, ,, ,, | DS25698 | M.W. Ferrite aerial coil. |
| L8 | 13 | | L.W. Ferrite aerial coil. |
| L9 | 4 | BS25714 | M.W./L.W. Oscillator coil. |
| L10 | 1 | | |
| HFC1 | Less than 0·5 | AS24886 | Heater choke. |
| IFT.1 | Pri. less than 0·5<br>Sec. less than 0·5 | BS24879 | 1st V.H.F. I.F.T. |
| IFT.2 | Pri. 14<br>Sec. 14 | CS24880 | 1st A.M. I.F.T. |
| IFT.3 | Pri. less than 0·5<br>Sec. less than 0·5 | BS24878 | 2nd V.H.F. I.F.T. |
| IFT.4 | Pri. 14<br>Sec. 14 | CS24881 | 2nd A.M. I.F.T. |
| IFT.5 | Pri. less than 0·5<br>Sec. less than 0·5 | BS24878 | 3rd V.H.F. I.F.T. |
| IFT.6 | Pri. 14<br>Sec. 14 | BS24304 | 3rd A.M. I.F.T. |
| IFT.7 | Pri. less than 0·5<br>Sec. 1 less than 0·5<br>Sec. 2 less than 0·5 | CS24882 | V.H.F. Discriminator Trans. |
| T.1 | Pri. 380<br>Sec. less than 0·5 | AS25716 | Output Transformer. |
| T.2 | Pri. 20<br>Sec. 220 | DS25721 | Mains Transformer. |

## VALVE VOLTAGES AND CURRENTS (see Fig. 1)

| Valve | Anode Volts | Screen Volts | Cathode Volts | Cathode Currents |
|---|---|---|---|---|
| V1A } ECC85 | 150 | — | 1·0 | 6·7 mA. |
| V1B } ECC85 | 127 | — | | 6·3 mA. |
| V2 (ECH81) | Heptode 105 | 85 | 1·7 | 11·3 mA. |
| V3 (EF89) | 168 | 85 | 1·3 | 8·7 mA. |
| V4 (EF89) | 165 | 135 | 2·3 | 15·3 mA. |
| V5 (EABC80) | 70 | — | — | — |
| V6 (EM81) | 170 | — | — | — |
| V7 (EL84) | 245 | 210 | 6·5 | 36 mA. |
| V8 (EZ80) | — | — | 252 | — |

The above-mentioned circuit diagram quotes the conditions under which these readings were taken. Limited variations may occur without impairing the performance of the receiver.

## CONNECTIONS TO PIANO-KEY SWITCH UNIT

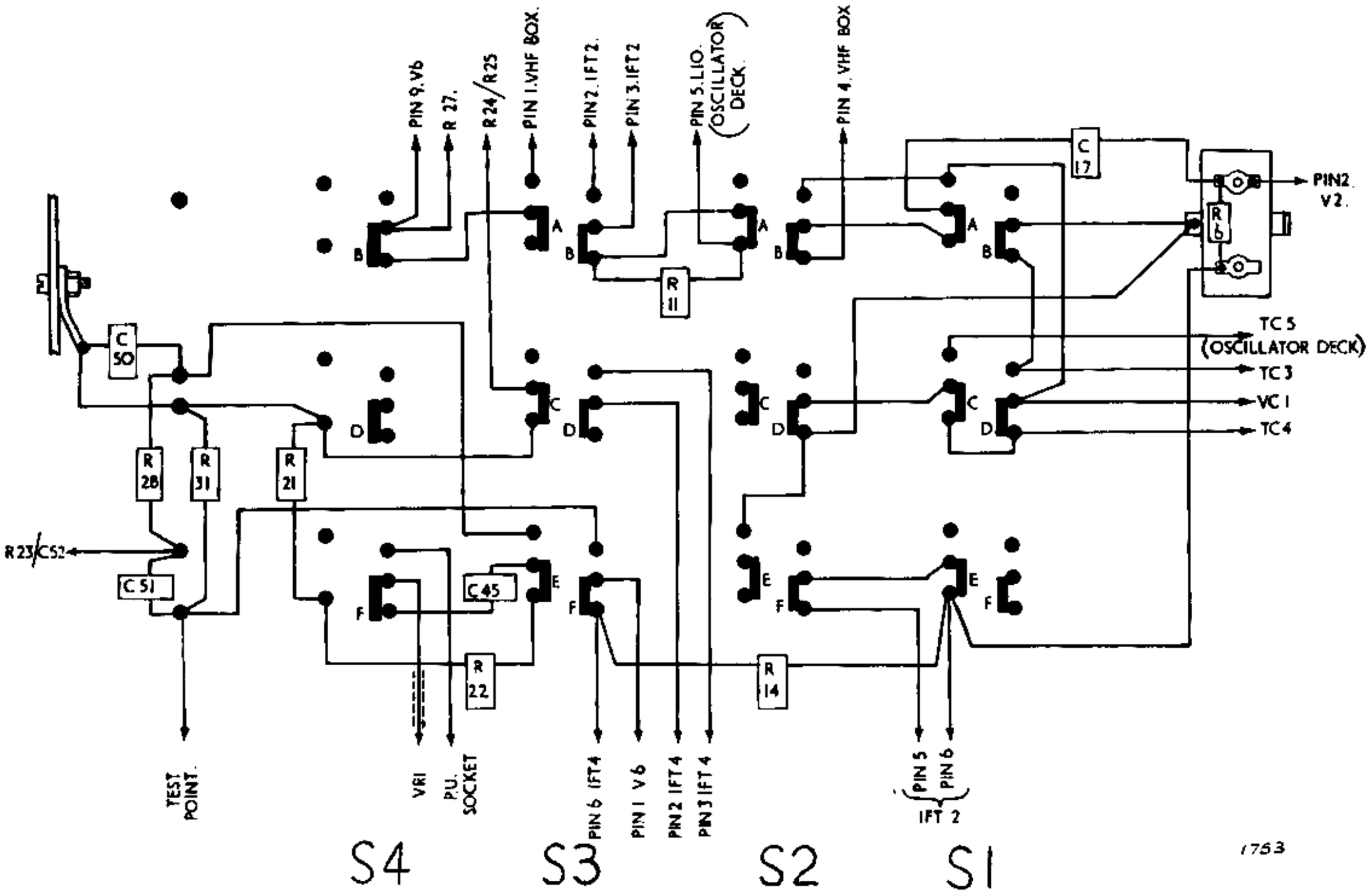



*Fig. 8—Connections and key to switch tags*

## RESISTORS

| Ref. | Value (ohms) | Rating (Watts) | Tolerance ± % | Part No. |
|---|---|---|---|---|
| R1 | 150 | ¼ | 10 | P6155 |
| R2 | 2,200 | ¼ | 10 | P6449 |
| R3 | 100,000 | ¼ | 10 | P6869 |
| R4 | 6,800 | ¼ | 10 | P6574 |
| R5 | 10,000 | ¼ | 20 | P6611 |
| R6 | 680,000 | ¼ | 20 | P7073 |
| R7 | 150 | ¼ | 20 | P6155 |
| R8 | 47,000 | ¼ | 20 | P6779 |
| R9 | 22,000 | ¼ | 10 | P6701 |
| R10 | 10,000 | ½ | 10 | P6616 |
| R11 | 2,200 | ½ | 5 | P6455 |
| R12 | 12,000 | ½ | 10 | P6635 |
| R13 | 150 | ½ | 10 | P6155 |
| R14 | 1 meg. | ½ | 20 | P7115 |
| R15 | 22,000 | ½ | 10 | P6701 |
| R16 | 1,000 | ½ | 20 | P6359 |
| R17 | 10,000 | ½ | 10 | P6617 |
| R18 | 150 | ½ | 10 | P6155 |
| R19 | 1 meg. | ½ | 20 | P7115 |
| R20 | 1,000 | ½ | 20 | P6359 |
| R21 | 330,000 | ½ | 20 | P6989 |
| R22 | 47,000 | ½ | 20 | P6779 |
| R23 | 100 | ½ | 20 | P6107 |
| R24 | 470 | ½ | 10 | P6281 |
| R25 | 1,000 | ½ | 10 | P6365 |
| R26 | 15 meg. | ½ | 33⅓ | P14548 |
| R27 | 180,000 | ½ | 20 | P14227 |
| R28 | 100,000 | ½ | 20 | P6863 |
| R29 | 1,000 | 6 | 5 | AP25615 W.W. |
| R30 | 470,000 | ¼ | 20 | P7031 |
| R31 | 22,000 | ¼ | 10 | P6701 |
| R32 | 4,700 | ½ | 10 | P6533 |
| R33 | 120,000 | ½ | 20 | P14197 |
| R34 | 470,000 | ½ | 20 | P7031 |
| R35 | 1,000 | 6 | 5 | AP25615 W.W. |
| R36 | 10,000 | ¼ | 20 | P6611 |
| R37 | 47,000 | ½ | 20 | P6779 |
| R38 | 180 | ½ | 5 | P6178 |
| VR1 | 1 meg. | — | — | BP24793 |
| VR2 | 1 meg. | | | |

## CAPACITORS

| Ref. | Value | | Type | D.C. Working Voltage | Tolerance ± % | Part No. |
|---|---|---|---|---|---|---|
| | mfd. | pf. | | | | |
| C1 | — | 47 | S.C. | 750 | 20 | AP17338 |
| C2 | — | 560 | S.C. | 350 | 20 | AP23405 |
| C3 | — | 10 | S.M. | 350 | 5 | AP18211 |
| C4 | — | 560 | S.C. | 350 | 20 | AP23405 |
| C5 | — | 560 | S.C. | 350 | 20 | AP23405 |
| C6 | — | 560 | S.C. | 350 | 20 | AP23405 |
| C7 | — | 47 | S.C. (N750) | 750 | 5 | AP24630 |
| C8 | — | 22 | S.C. (P100) | 750 | 2 | AP24626 |
| C9 | — | 22 | S.C. (P100) | 750 | 2 | AP24626 |
| C10 | — | 5·6 | S.C. (N750) | 750 | ± ·5pf. | AP24628 |
| C11 | — | 560 | S.C. | 350 | 20 | AP23405 |
| C12 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C13 | — | 10 | S.C. (N750) | 750 | 5 | AP24629 |
| C14 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C15 | — | 7,500 | P.F.T. | 350 | 5 | AP25617 |
| C16 | — | 90 | S.M. | 350 | 2 | AP15697 |
| C17 | — | 270 | S.C. | 500 | 20 | AP21906 |
| C18 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C19 | ·02 | — | M.P. | 150 | 20 | AP22251 |
| C20 | — | 68 | S.C. | 750 | 20 | AP18161 |
| C21 | — | 515 | S.M. | 350 | 1 | AP17175 |
| C22 | — | 450 | S.M. | 350 | 1 | AP25616 |
| C23 | — | 110 | S.M. | 350 | 2 | AP25808 |
| C24 | — | 110 | S.M. | 350 | 2 | AP25808 |
| C25 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C26 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C27 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C28 | ·04 | — | M.P. | 200 | 20 | AP24028 |
| C29 | ·04 | — | M.P. | 200 | 20 | AP24028 |
| C30 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C31 | ·02 | — | M.P. | 150 | 20 | AP22251 |
| C32 | — | 110 | S.M. | 350 | 20 | AP25808 |
| C33 | — | 110 | S.M. | 350 | 20 | AP25808 |
| C34 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C35 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C36 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C37 | ·04 | — | M.P. | 200 | 20 | AP24028 |
| C38 | ·04 | — | M.P. | 200 | 20 | AP24028 |
| C39 | — | 110 | S.M. | 350 | 2 | AP25808 |
| C40 | — | 110 | S.M. | 350 | 2 | AP25808 |
| C41 | ·01 | — | M.P. | 400 | 20 | AP21909 |
| C42 | — | 10 | S.M. | 350 | 5 | AP24847 |
| C43 | — | 47 | S.M. | 350 | 5 | AP24848 |
| C44 | ·02 | — | M.P. | 150 | 20 | AP22251 |
| C45 | ·01 | — | P.T. | 350 | 20 | AP24117 |
| C46 | — | 100 | S.C. | 750 | 20 | AP17336 |
| C47* | 40 | — | ELEC. | 350 | −20 +50 | AP22257* |
| C48 | ·01 | — | P.T. | 350 | 25 | AP24117 |
| C49 | — | 270 | S.C. | 500 | 20 | AP21906 |
| C50 | — | 270 | S.C. | 500 | 20 | AP21906 |
| C51 | — | 470 | S.C. | 500 | 20 | AP24631 |
| C52 | — | 470 | S.C. | 500 | 20 | AP24631 |
| C53 | 5 | — | ELEC. | 50 | −20 +50 | AP22255 |
| C54 | ·005 | — | P.T. | 500 | 25 | P3767 |
| C55* | 20 | — | ELEC. | 350 | −20 +50 | * |
| C56 | ·01 | — | P.T. | 350 | 20 | AP24117 |
| C57 | ·01 | — | P.T. | 500 | 25 | P3769 |
| C58* | 40 | — | ELEC. | 350 | −20 +50 | * |
| C59 | ·1 | — | M.P. | 150 | 25 | AP21245 |
| C60 | ·003 | — | M.P. | 300 A.C. | 20 | AP23978 |
| C61 | ·02 | — | M.P. | 150 | 20 | AP22251 |
| C62 | ·001 | — | M.P. | 400 | 20 | AP22248 |
| TC1 | — | 3 to 15 | — | — | — | AP24623 |
| TC2 | — | 3 to 15 | — | — | — | AP24623 |
| TC3 | — | 3 to 40 | — | — | — | AP24820 |
| TC4 | — | 3 to 40 | — | — | — | AP24820 |
| TC5 | — | 3 to 40 | — | — | — | AP24820 |
| TC6 | — | 3 to 40 | — | — | — | AP24820 |
| VC1 | — | 528 | Ganged | — | — | BP23657 |
| VC2 | — | 528 | | — | — | |

* In same can.

Elec. = Electrolytic. M.P. = Metalized Paper. P.T. = Paper Tubular. S.C. = Silver Ceramic. S.M. = Silver Mica.

*NOTE.*—It will be noticed that C11 in the V.H.F. box is shorted out. To ensure efficient quantity production it has been found necessary to produce the V.H.F. box as a unit common to this and similar models and to others using a series heater chain. When it is used on an A.C. set like this one it is modified by shorting the filter capacitor as shown.

## MISCELLANEOUS PART NUMBERS

| Description | Part No. |
|---|---|
| Aerial, ferrite | DS25698 |
| Back, Cabinet | DS25700 |
| Carriage | AP24797 |
| Clip, cord | P1940 |
| Cord Drive Assy. | AP24899 |
| Core, ferroxcube (FB1) | AP22966 |
| Knob, Tone (Outer) | AS25771 |
| Knob, Volume (Inner) | AS25741 |
| Knob, Tune | AS25743 |
| Knob (Piano Key) | CP24670 |
| Lamp, pilot, 6·5v. 0·3a. | AP18628 |
| Plug, red | P3733 |
| Plug, black | P3734 |
| Plug, 2-pin | AP20161 |
| Rod, ferrite | DS25698 |
| Scale, tuning | DP24787 |
| Socket | P8231 |
| Speaker, elliptical | BP24776 |
| Switch, piano key | EP24782 |
| Valveholder B9A | AP22419 |
| Valveholder with skirt B9A | AP22843 |
| Valveholder B9A (moulded) | AP25591 |
| Valve Screening Can (with spring) | AP22842 |

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Telephone: PROspect 8271/4

TP 1082

December, 1956

# BUSH RADIO

# Service Instructions

# MODEL VHF. 62

# Radio Receiver

**Supplement to TP1082**

VHF. 62

## GENERAL DESCRIPTION

**CABINET**
Walnut-veneer cabinet with gilt trim.

**DIMENSIONS**

| | | |
|---|---|---|
| Height, | 11⅞ in. | 30·4 cm. |
| Width, | 18¾ in. | 47·7 cm. |
| Depth, | 9 in. | 22·8 cm. |

**WEIGHT**
19¼ lb. 8·83 kg.

## SERVICING

Electrically, the VHF.62 is identical to the VHF.61 and the manual for that receiver (TP1082) should be referred to for all servicing information.

## PART NUMBERS DIFFERING FROM VHF.61

| Description | Part Number |
|---|---|
| Cabinet | FP70106. |
| Cabinet back | EP70111. |

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