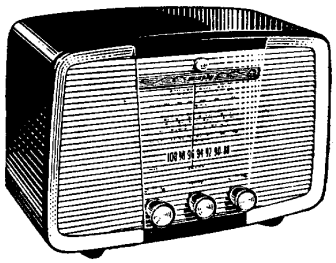
MURPHY SERVICE MANUAL



SPECIFICATION

MAINS SUPPLY:		200–250V a.c., 50–100 c/s
CONSUMPTION:		42 watts, approximately
WAVE BANDS:	L:	1,000–2,000 metres (300–150 Kc/s)
	M:	187–568 metres (1,605–528 Kc/s)
	Band II:	100–87·5 Mc/s (3·0–3·43 metres)
INTERMEDIATE FREQUENCIES:	L & M:	470 Kc/s
	Band II:	10·7 Mc/s
VALVES:		UCC85, 10C1, 10F9, EABC80, 10P14, U404
SCALE LAMPS:		Two 6·5V, 0·3 amp., m.e.s.
LOUDSPEAKER:	Type:	5 in. dia., permanent magnet
	Impedance:	3 Ω
OVERALL DIMENSIONS:	10¼ in. high, 14¾ in. wide, 8⅛ in. deep	
WEIGHT:		12½ lb.
RELEASED:		June, 1955
PRICE:		£16 8s. 7d. plus P.T.

Issued by

MURPHY RADIO LTD

WELWYN GARDEN CITY · HERTS

Telephone: WELWYN GARDEN 3434

35611

ELECTRICAL NOTES

Introduction. The A362 is a superheterodyne receiver designed for the reception of a.m. transmissions in the Long and Medium wave-bands, and f.m. transmissions in the v.h.f. Band II. For the Long and Medium wave-bands, the circuits follow normal practice and the intermediate frequency is 470 Kc/s. For the v.h.f. wave-band, extra valves are brought into use, and the intermediate frequency is 10·7 Mc/s; the more important features of the v.h.f. circuits are described in some detail in the following notes.

The v.h.f. circuits. The receiver is designed for use with a dipole aerial which must be connected to the aerial coupling coil by a balanced feeder having a characteristic impedance of seventy to eighty ohms. Where an external aerial is used, and the level of local interference is high, screened balanced feeder will generally give a worthwhile reduction in the noise introduced into the receiver, as compared with unscreened feeder. It is inadvisable to use coaxial cable.

The internal dipole aerial will give good reception over a major portion of the service area of a v.h.f. transmitter and, because the centre tap of the aerial coupling coil (L1) is permanently connected internally to the L and M aerial socket, it can also be used for local station reception in the L and M bands.

The r.f. amplifier and frequency changer are the two halves of a double triode valve. The r.f. section operates as a grounded grid amplifier and a tuned anode circuit is used to couple it to the frequency changer section, which operates as a self-oscillating additive mixer. To minimize radiation of the local oscillator frequency, the amount of oscillator current that flows in the aerial circuit has been reduced to a minimum by arranging the r.f. anode circuit in the form of a bridge with the anode coil L3 connected across the null points. This is illustrated in Fig. 1, which shows the essential components rearranged in the shape of the conventional bridge diagram; C21 is adjusted to balance the bridge (see "Circuit Alignment" on page 4).

The inter-electrode capacitances of the frequency changer also present a problem. The circuit of a valve amplifier can be arranged so that there is no feedback between the anode and the grid. Alternatively, positive or negative feedback may take place according to the magnitude and nature of the impedances involved in the two circuits. In this case, with an anode circuit tuned to the i.f. and a grid circuit that is capacitive at the i.f., the feedback would be negative, resulting in excessive damping on the primary winding of the first i.f. transformer. To overcome this, however, the circuit and component values have been arranged in such a way as to introduce a controlled amount of positive feedback, thus removing the damping and increasing the stage gain. For this reason, the value of C13 is critical and it must not be increased or decreased; in the event of a failure, the replacement must be an exact equivalent, because too high a value will result in loss of gain and too low a value may cause self-oscillation.

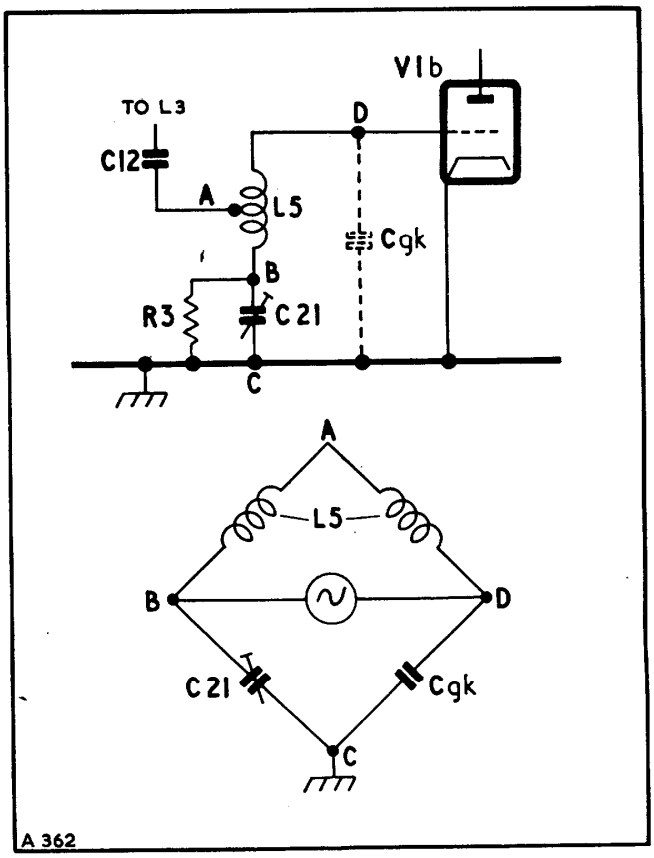


Fig. 1

The i.f. amplifier employs two valves—V3 and the heptode portion of the Medium and Long wave frequency changer (V2). The response curves of the three i.f. transformers have been adjusted to provide an overall response suitable for the B.B.C. f.m. transmissions having a maximum deviation of ±75 Kc/s.

An Unbalanced Ratio Detector is used in the discriminator circuit. It differs from the conventional unbalanced circuit in that the tertiary winding is connected to a capacitive centre tap instead of an inductive centre tap in the secondary circuit. This method of

connection overcomes the difficulty of providing an exact electrical centre on the secondary coil. The circuit functions basically in the same manner as the conventional unbalanced circuit shown in Fig. 2, where the audio output is developed across an i.f. by-pass capacitor connected in series with the tertiary winding; the currents from each diode circulate in opposite directions through the tertiary winding and the capacitor, and the a.f. output is proportional to the resultant of these two

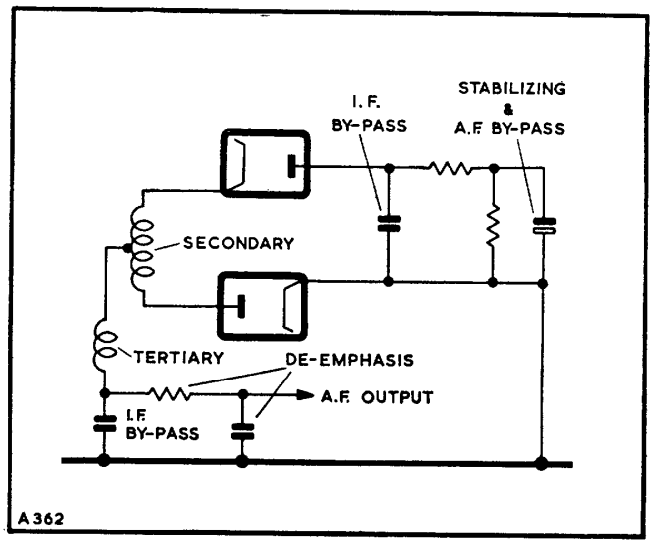


Fig. 2

currents. In the A362, as the tertiary winding is connected to a capacitive tapping, it is not possible to take off the a.f. output in the same manner as before. It is, instead, taken from one side of the secondary winding via a high-value resistor (R18) which serves the dual purpose of acting as a choke to i.f. currents and forming a de-emphasis circuit with C68. As all points along the secondary winding (L22) have the same a.f. potential it is not necessary to connect R18 to a centre tapping. When aligning the third i.f. transformer secondary winding, it is necessary to provide an artificial centre tap in the load circuit by connecting two closely matched 100 KΩ resistors in series across the stabilizing capacitor (C67); the secondary is then adjusted for zero voltage between this tapping point and the junction of R18 and C68.

The a.f. amplifier. The a.f. amplifier and output stage follow normal practice. In one position of the Tone switch, negative feedback is introduced at the middle and upper frequencies via C83, R39, and R38, which has the overall effect of emphasizing the bass frequencies while maintaining a level middle and upper frequency response. In the other position of the switch, the negative feedback is removed and a capacitor (C74) is connected between V4d anode and chassis to attenuate the upper frequencies, producing a change from "wide band" to "narrow band" response.

The power supplies. Two fuses are incorporated, a heat fuse in the mains transformer and a cartridge fuse in series with the h.t. rectifier. V4 heater is supplied from a separate winding on the mains transformer in order to minimize mains hum. The filter circuit L28, C81, C79, in the main heater chain serves to prevent radiation from the v.h.f. unit along the heater supply leads and to keep harmonics generated by the discriminator circuit out of the v.h.f. unit. To prevent certain ill effects which can take place within a valve when the heater is energized and the anodes are open circuited, a 470 KΩ resistor (R9) is connected across the switch (S2c) in the h.t. line to V1a and V1b.

V.H.F. UNIT COVER

It is most important that the cover of the v.h.f. unit is firmly and cleanly soldered to the front and rear locating lugs. Failure to ensure good electrical contact may result in instability. To facilitate the removal of the cover for servicing the unit, the middle lug is not soldered. A shakeproof washer must be fitted immediately under the head of the cover fastening screw beside the ganged capacitor.

MODIFICATIONS

(*Also see page* 16)

Receiver oscillator frequency. In early sets, the receiver oscillator frequency in Band II was above the signal frequency. It was changed to be below the signal frequency to prevent the possibility of its second harmonic causing interference with Band III television reception.

In these early sets, C19 was connected to the high potential end of L4, a 47 pF capacitor (C16, 1%, p.s.m., 350V d.c., Part No. 28264) was connected in series with the high potential side of C17, the value of C18 was 12 pF (10%, cer., 750V d.c., Part No. 67114), and L4/L5 was Part No. 68196 (see Fig. 3).

All those sets which have the low oscillator frequency are identified by a BLUE paint spot on the rear of the v.h.f. r.f. unit. This change need not be made unless it is established that a particular set is creating interference in Band III.

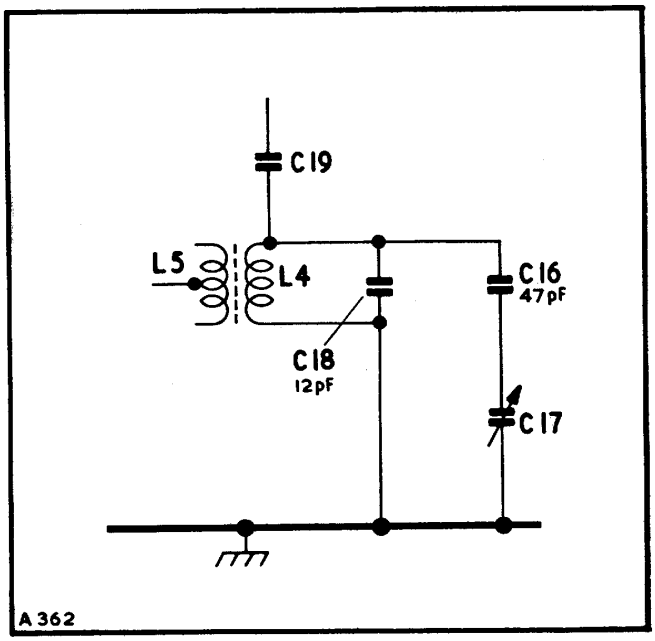


Fig. 3

Capacitor (C13). In early sets the value of this capacitor was 620 pF, 5%, p.f. tub., 350V d.c., Part No. 66303. The change was made to overcome component supply difficulties and need not be introduced by dealers.

CIRCUIT ALIGNMENT

General note. Do not attempt re-alignment of the v.h.f. circuits if the appropriate apparatus is not available. Good amplitude-modulated signal generators, which cover from 150 Kc/s to 30 Mc/s and 85 Mc/s to 100 Mc/s, and suitable output meters are required (see the following notes under the heading "Output meters"). A frequency-modulated signal generator is not necessary.

If V1, V2, V3, or V4, or any other v.h.f. circuit components are changed, the associated v.h.f. circuits must be re-aligned.

When aligning the v.h.f. i.f. circuits, make sure that no external signals are being picked up at the same time; slightly alter the setting of the ganged capacitor if necessary.

Output meters. The following items are essential if satisfactory results are to be obtained:

L and M circuits. Any good a.f. output meter or an a.c. voltmeter with a full scale deflection of about 1·5 volts.

V.H.F. circuits. A high-resistance d.c. voltmeter (20 KΩ/V or better) with ranges of approximately 10 volts f.s.d. and 2 volts f.s.d. or a d.c. valve-voltmeter with similar ranges and a **stable zero adjustment.** A pair of closely matched resistors of approximately 100 KΩ in value are also required.

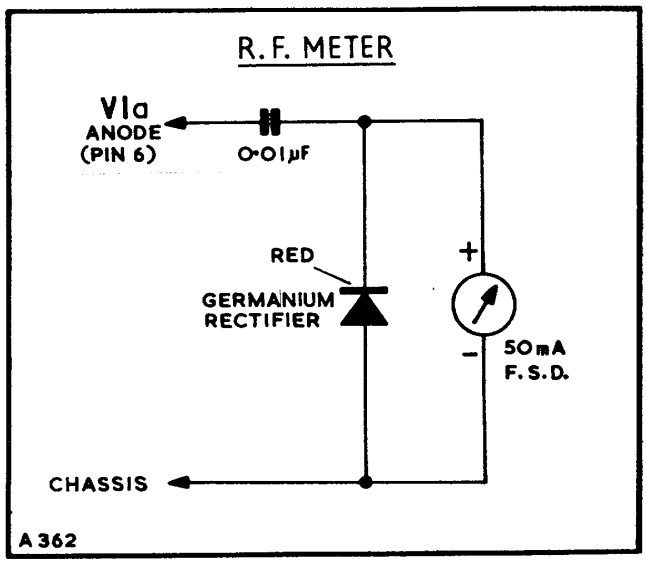


Fig. 4

In addition, a simple r.f. meter, as shown in Fig. 4, is required for observing the oscillator voltage present at the anode of V1a while adjusting the Balancing Capacitor (C21). A germanium rectifier such as the G.E.C. type GEX34 (Part No. 63218) would be suitable, together with a meter such as the Avo model 8, Taylor models 88A or 77A, or Weston model E772 (type 5), switched to the 50μA range. Alternatively, a good r.f. valve-voltmeter with a full-scale deflection of about 1 volt could be used.

Receiver output. Excepting where otherwise stated, make all adjustments for maximum voltmeter or output meter reading.

L and M circuits. Set the volume control at maximum and adjust the signal generator attenuator so that the a.f. output does not exceed 180 mW (or 0·7V a.c. across the loudspeaker speech coil).

V.H.F. circuits. Turn the volume control to minimum if the loudspeaker or output meter is not connected. Check that the zero adjustment of the d.c. meter is correct. Connect the two 100 KΩ resistors as shown in Fig. 5. Connect the d.c. meter, switched to the 10V range, in position **X** (Fig. 5) when adjusting the v.h.f. i.f. and r.f. transformers, including L21. Connect the d.c. meter in position **Y** (Fig. 5), using the 100 KΩ resistors mentioned above, when adjusting the discriminator transformer (last v.h.f. i.f.t.) secondary winding (L22). Adjust the signal generator attenuator so that during alignment, the d.c. voltage across C67 (meter position **X**) is maintained as near as possible to 8 volts without the damping unit in circuit, and 4 volts with the damping unit in circuit. If necessary, roughly align all the v.h.f. i.f. trimmers so that the appropriate output can be obtained. The third v.h.f. i.f. transformer secondary winding (L22) must be adjusted for exactly zero d.c. volts with the d.c. output meter connected in position **Y**.

Trimming tool. A non-metallic tool must be used for adjusting the coil cores.

Damping unit. When aligning the 1st and 2nd v.h.f. i.f. transformers, it is necessary to connect a damping unit across the primary circuit while adjusting the secondary circuit and vice versa. The unit consists of a 2·2 KΩ resistor connected in series with a 0·01μF capacitor; use miniature components and connect the capacitor to chassis.

Coil cores. These must be adjusted to lie between the middle of the winding and the open end of the coil former in all cases, with the exception of L10 (L ae.) core, which must lie between the tuned and coupling windings (second peak from the end of the coil former).

3rd V.H.F. i.f. transformer. When adjusting the secondary core for zero reading on the d.c. voltmeter, it will be observed that the meter reading changes sharply from negative to positive, or vice versa, on either side of the correct alignment point. For this reason, it is essential that the output meter zero adjuster is accurately set.

1st V.H.F. i.f. transformer. To avoid distorting the response characteristic of this transformer due to the presence of the signal generator in the grid/anode feedback circuit of V1b, the signal generator must not be connected to V1b grid circuit when aligning the v.h.f. circuits. The signal generator must instead be connected to V1a cathode (pin 8).

Receiver oscillator frequency. This is above the signal frequency on the L and M bands, but below the signal frequency on the v.h.f. band. In early sets it was above the signal frequency on the v.h.f. band (see Modifications on page 4).

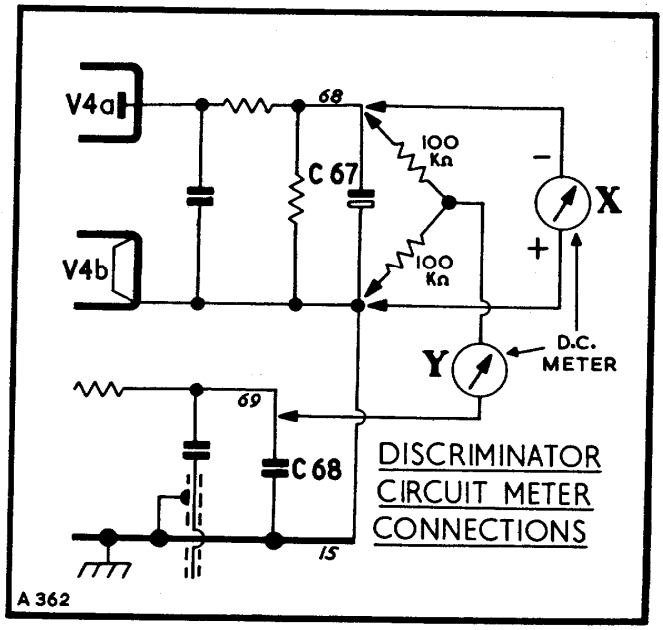


Fig. 5

Tuning pointers. When the chassis is outside the cabinet, the degree scale on the circumference of the tuning drum is used for calibration; 0° must register with the notch on the indicator (opposite the bottom of the drum) when the ganged capacitor is at maximum capacitance. When the chassis is inside the cabinet and with the ganged capacitor at maximum capacitance, the middle of the pointer must register with the right-hand edges of the tuning scale "apertures".

Balancing capacitor (C21). The setting of this trimmer is normally very stable and it need not be checked if only slight trimming adjustments are being made to the v.h.f. circuits. It must be checked, however, if there is reason to suspect that its setting may have been interfered with, or if V1, the oscillator coil (L4/L5), or any associated components, have been replaced.

Connection to V1 pins. The signal generator and r.f. meter must be connected to the pins of V1 via a very short insulated wire. Bare both ends of the wire, loop one end round the valve pin, and connect the signal generator or r.f. meter to the other end.

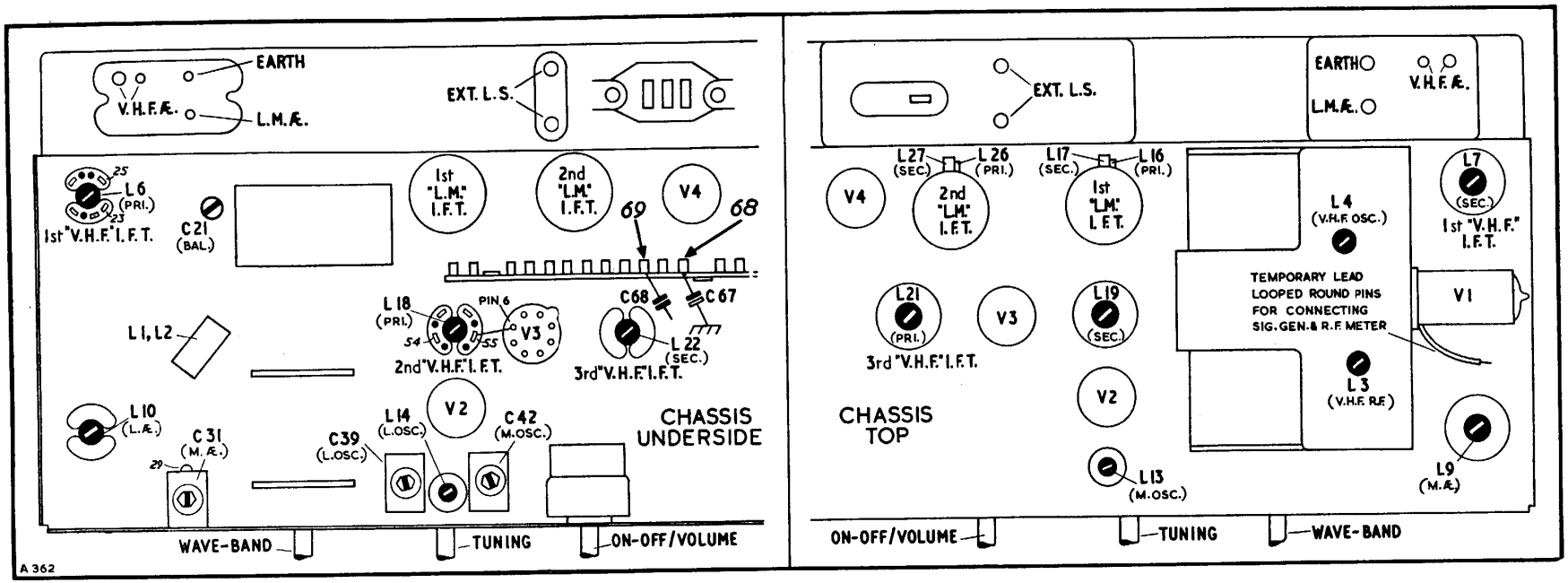


Fig. 6. Trimmer positions and connecting points.

CIRCUIT ALIGNMENT TABLE

CIRCUIT	NOTES	SIG. GEN. SETTING	SIG. GEN. CONNECTIONS	OUTPUT METER CONNECTIONS	RECEIVER SETTING	ADJUSTMENTS
2nd L&M i.f.t.	Switch to M band. Unscrew pri. core (bottom of can) and both 1st L&M i.f.t. cores before starting adjustments.	470 Kc/s Mod. on	Via 0·01 μF to V3 pin 6 (grid 1)	A.F. meter to ext. l.s. sockets	Ganged capacitor at maximum	L27 (sec.) top of can L26 (pri.) bottom of can DO NOT READJUST SEC. CORE
1st L&M i.f.t.		470 Kc/s Mod. on	Via 0·01 μF to C31 (under chassis)	As above	As above	L17 (sec.) top of can L16 (pri.) bottom of can DO NOT READJUST SEC. CORE
M	Repeat these adjustments until there is no further improvement.	600 Kc/s Mod. on	Via dummy aerial to L.M. ae. socket	As above	32° (500 m.)	L13 (osc.) chassis top L9 (ae.) chassis top
		1,364 Kc/s Mod. on	As above	As above	143° (220 m.)	C42 (osc.) chassis underside C31 (ae.) chassis underside

L	As above. Also, adjust L10 (ae.) core to the second peak from the end of the former.	176·5 Kc/s Mod. on	As above	As above	48° (1,700 m.)	L14 (osc.) chassis underside L10 (ae.) chassis underside
		300 Kc/s Mod. on	As above	As above	158·5° (1,000 m.)	C39 (osc.) chassis underside
3rd V.H.F. i.f.t.	Switch to v.h.f. band and maintain 8V d.c. output (see "Receiver Output" notes).	10·7 Mc/s Mod. off	Via 0·01 μF to V1 pin 8 (cath. a)	D.C. meter across C67 (chassis +ve.)	Ganged capacitor at maximum	L21 (pri.) chassis top
	Connect 100 KΩ + 100 KΩ from C67 to chassis; remove it after adjusting L22. Adjust core for **zero** deflection on D.C. meter, without altering sig. gen. attenuator.	10·7 Mc/s Mod. off	As above	D.C. meter between C68 and 100 KΩ tap.	As above	L22 (sec.) chassis underside
2nd V.H.F. i.f.t.	Connect damping unit to pri. (tag 2, t.p. 54). Maintain **4V** d.c. output.	10·7 Mc/s Mod. off	As above	D.C. meter across C67 (chassis +ve.)	As above	L19 (sec.) chassis top
	Connect damping unit to sec. (tag 7, t.p. 55). Maintain **4V** d.c. output.	10·7 Mc/s Mod. off	As above	As above	As above	L18 (pri.) chassis underside
3rd V.H.F. i.f.t.	Remove damping unit and check earlier adjustment of L21. Maintain **8V** d.c. output.	10·7 Mc/s Mod. off	As above	As above	As above	L21 (pri.) chassis top
1st V.H.F. i.f.t.	Connect damping unit to pri. (tag 1, t.p. 23). Maintain **4V** d.c. output.	10·7 Mc/s Mod. off	As above	As above	As above	L7 (sec.) chassis top
	Connect damping unit to sec. (tag 8, t.p. 25). Maintain **4V** d.c. output.	10·7 Mc/s Mod. off	As above	As above	As above	L6 (pri.) chassis underside
Band II		91 Mc/s Mod. off	Via 80 Ω termination to v.h.f. ae. sockets	As above	56° (91 Mc/s)	L4 (osc.) chassis top
	Disconnect sig. gen. and adjust C21 for minimum reading (dip between major peaks) on r.f. meter. Also see "Balancing Capacitor" notes.	—	—	R.F. meter to V1 pin 6 (anode a)	90°	C21 (bal.) chassis underside
	Before adjusting L4 and L3, remove external lead from V1.	91 Mc/s Mod. off	Via 80 Ω termination to v.h.f. ae. sockets	D.C.meter across C67 (chassis +ve.)	56° (91 Mc/s)	L4 (osc.) chassis top L3 (r.f.) chassis top

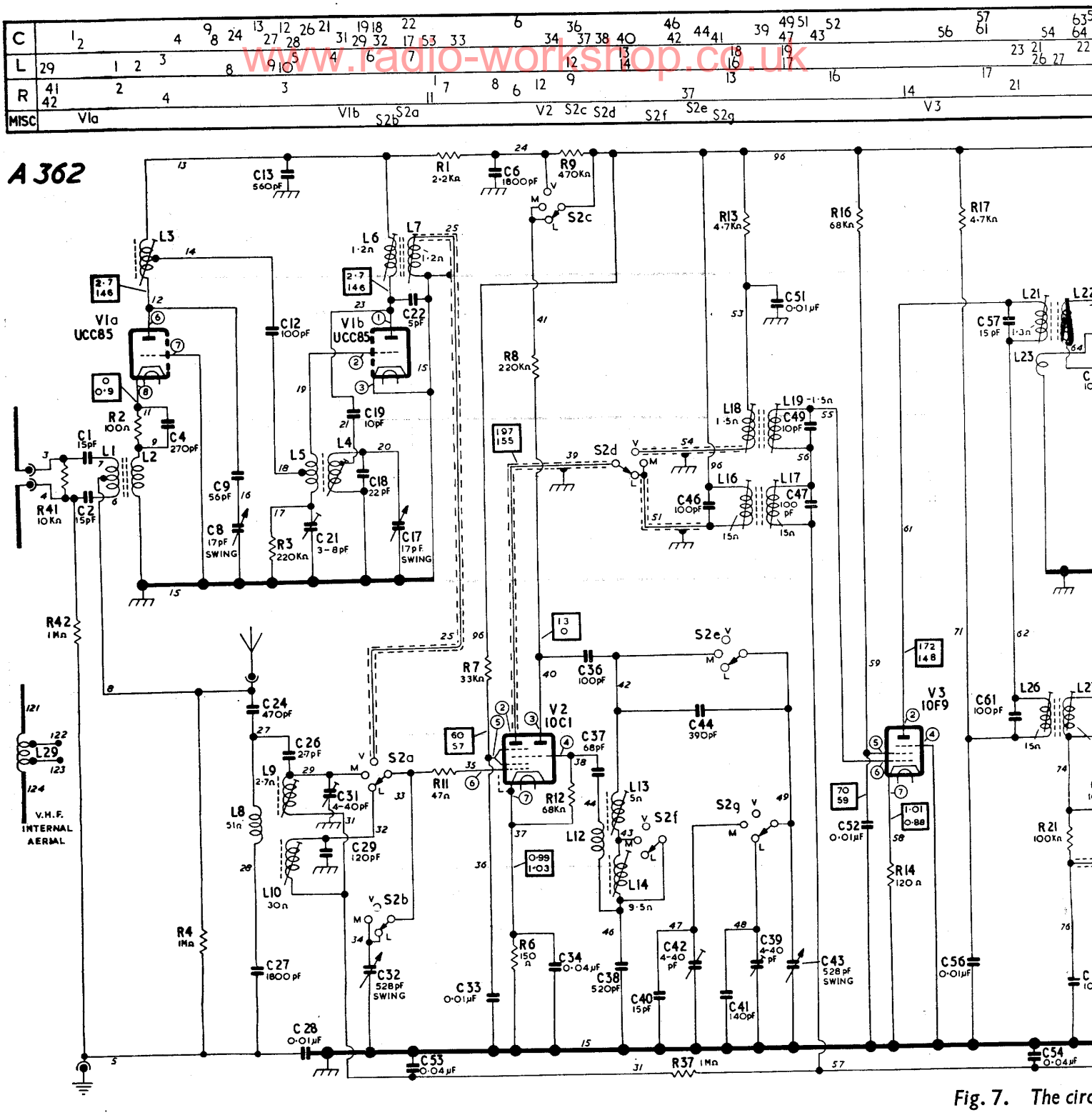
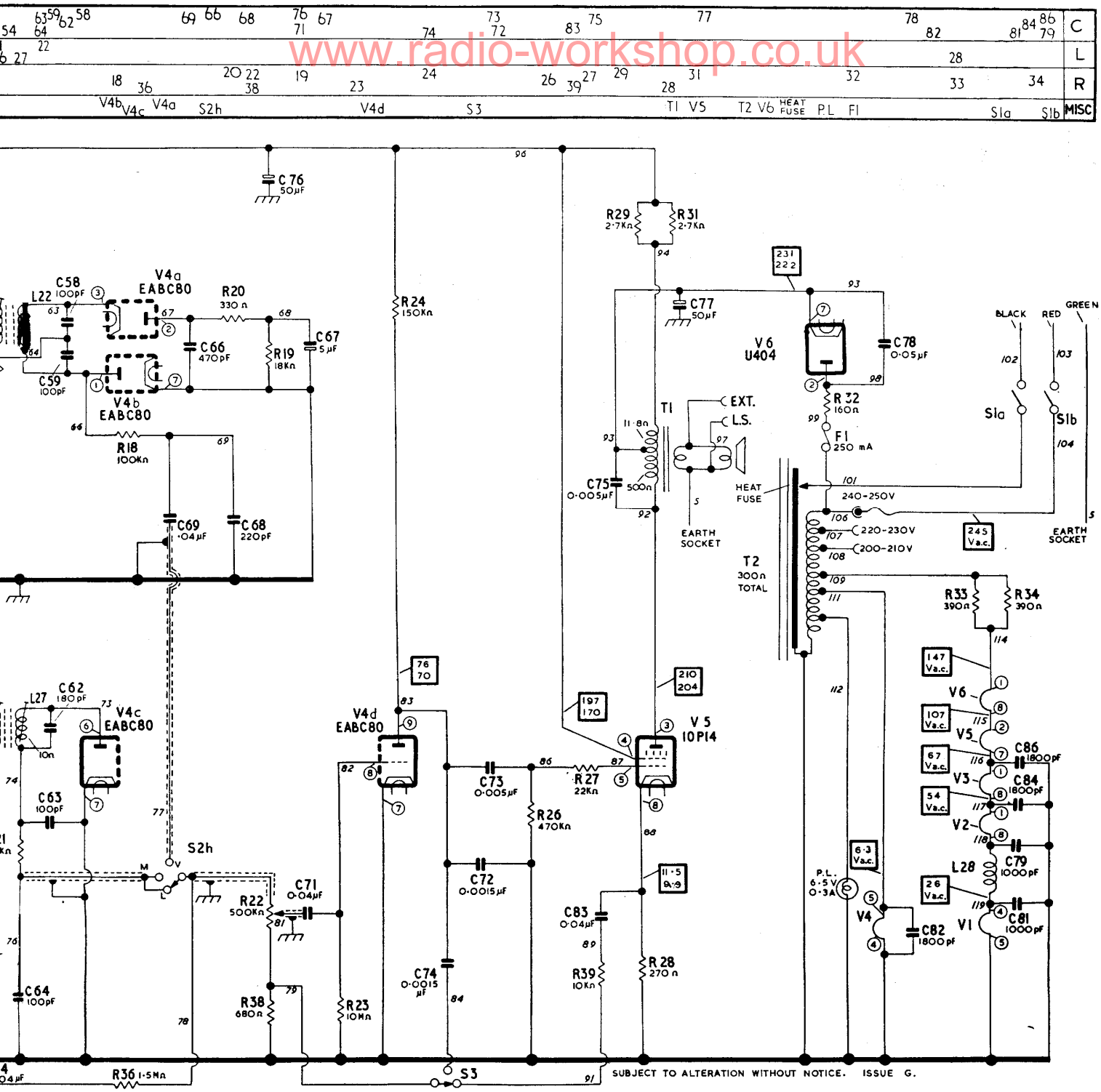


Fig. 7. The circ

The wave-band switch (S2a–S2h) is shown in the L position and the Tone switch (S3) in the maximum top response position.

Circuit voltages are shown within rectangles and were measured under no-signal conditions using a 20 KΩ/V meter, with the receiver switched first to the M band and then to Band II. Where readings differ appreciably, both are quoted with the M band reading at the top.



e circuit diagram.

Where the resistance of a coil is less than one ohm, the value is omitted.

Component terminals and connecting leads are identified by test point (t.p.) numbers which correspond with those appearing on the chassis diagrams. The valve pin numbers are shown in small circles.

NOTE. In later sets, C62 is fitted inside the i.f.t. can.

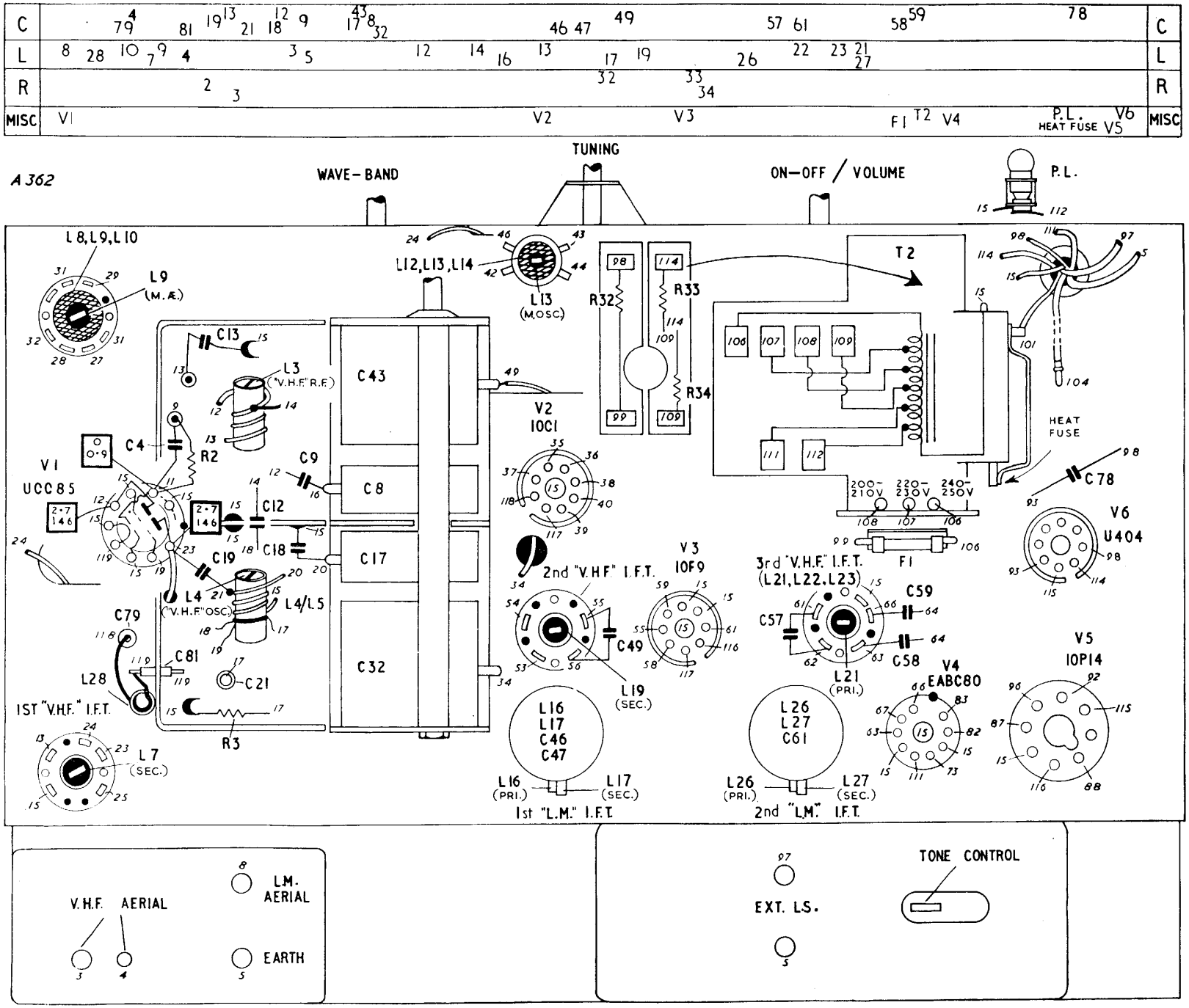


Fig. 8. The layout of the top of the receiver chassis.

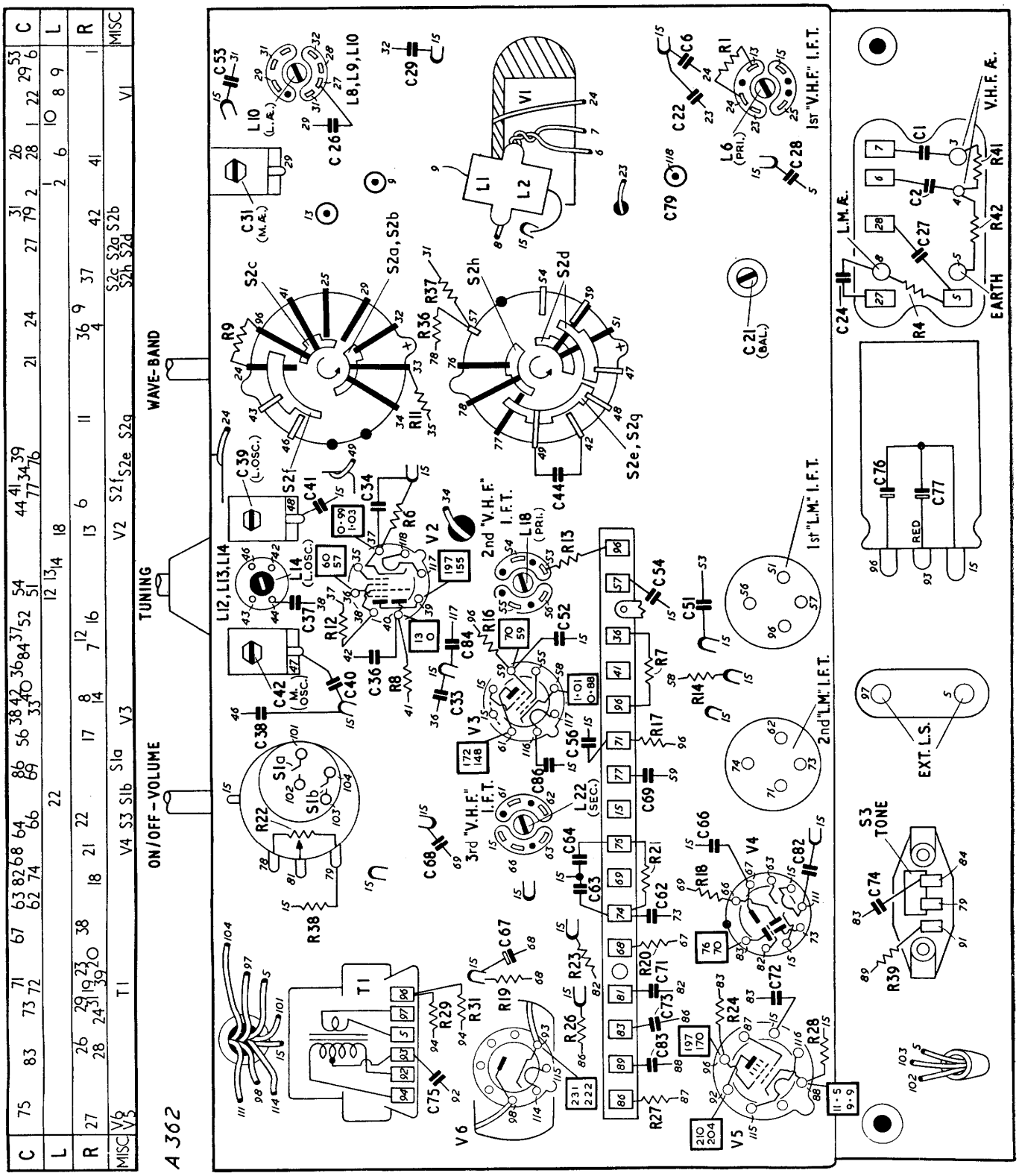


Fig. 9. The layout of the underside of the receiver chassis.

The wave-band switch wafers are viewed from the rear of the chassis and are shown in the L position; the black contacts and inner rotors are on the hidden sides of the wafers. The lugs marked with a cross are the nearer to the chassis.

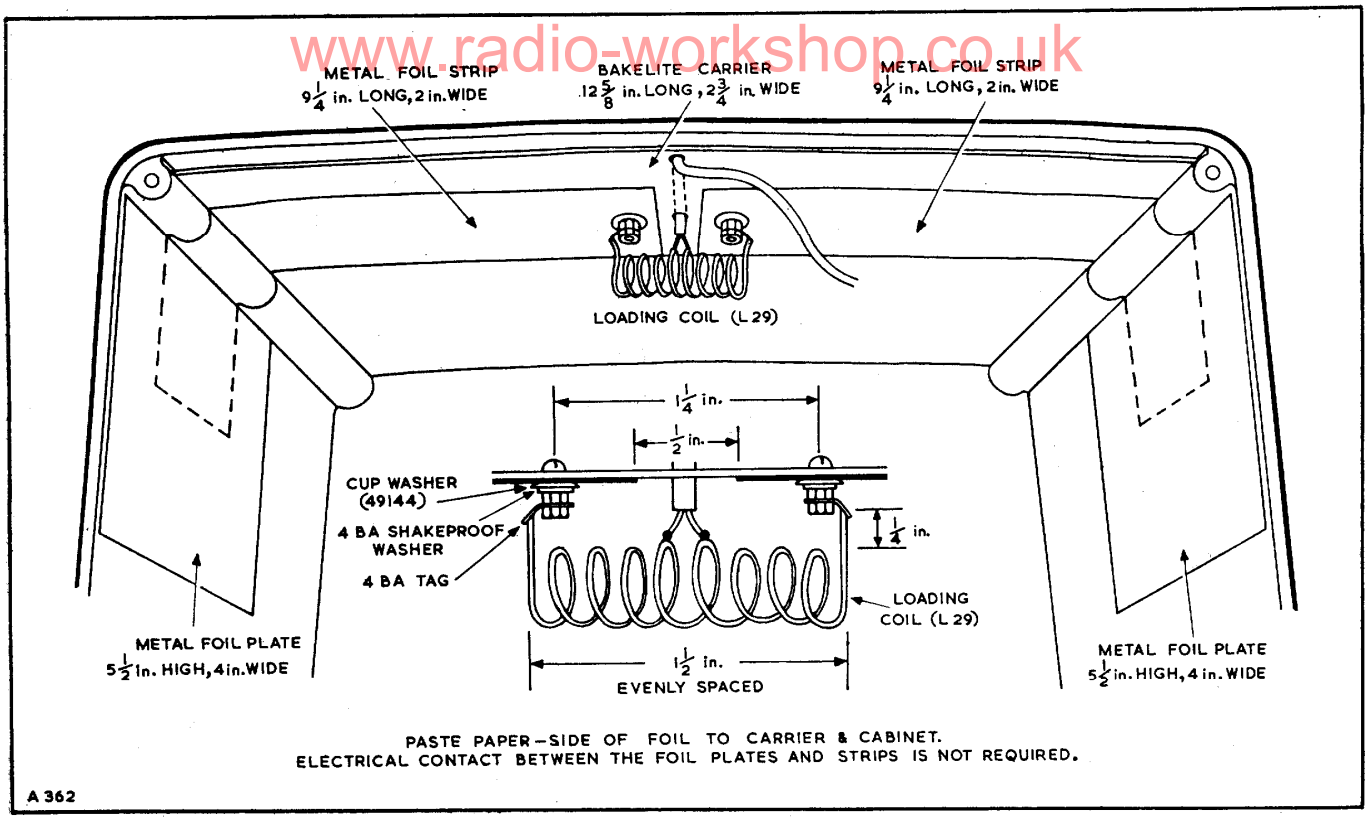


Fig. 10. The internal aerial.

BINDING CASES

A binder, to hold this and fourteen other Service Manuals in book form, is available from Murphy Radio Ltd, Service Department.

The cost, at the date of publication of this manual, is 8s. 3d. net.

PARTS LIST (Electrical Components)

Replacement capacitors must have a negative temperature coefficient where this is specifically indicated The d.c. resistance quoted for the coil and transformer windings is an average figure and should be used as a general guide only; it is omitted where the value is less than one ohm.

cer. — ceramic
p.s.m. — protected silvered mica
tub. — paper tubular
m.tub. — metallized paper tubular
i.s.tub. — insulated sealed paper tubular (metal case)
p.f.tub. — plastic film tubular
elec. — electrolytic
i.elec. — insulated electrolytic
-ve. — negative temperature coefficient
V a.c. — a.c. voltage rating
V d.c. — d.c. voltage rating
W — wattage rating
w.w. — wire wound
lin. — linear law

PART NO.	CIRCUIT NO.	VALUE	TOLERANCE AND REMARKS
66159	C1	15 pF	20%, cer., 500V d.c.
66159	C2	15 pF	20%, cer., 500V d.c.
54080	C4	270 pF	20%, cer., 500V d.c.
68466	C6	1,800 pF	+50%−25%, cer., 500V d.c.
67965	C8	17 pF swing	Ganged capacitor, v.h.f. r.f. section (with C17, C32, and C43)
28268	C9	56 pF	1%, p.s.m., 350V d.c.
40722	C12	100 pF	5%, cer., 500V d.c.
66237	C13	560 pF	10%, p.f.tub., 350V d.c.
67965	C17	17 pF swing	Ganged capacitor, v.h.f. osc. section (with C8, C32, and C43)
67152	C18	22 pF	5%, cer., −ve., 750V d.c.
28272	C19	10 pF	5%, p.s.m., 350V d.c.
63319	C21	3–9 pF	Trimmer, v.h.f. balancing
28295	C22	5 pF	±0·5 pF, p.s.m., 350V d.c.
60824	C24	470 pF	20%, cer., 1,750V d.c. isolator type
52142	C26	2·7 pF	20%, cer., −ve., 500V d.c.
60822	C27	1,800 pF	+80%−20%, cer., 1,250V d.c. (isolator)
51766	C28	0·01 μF	20%, i.s.tub., 275V a.c.
28276	C29	120 pF	5%, p.s.m., 350V d.c.
56323	C31	4–40 pF	Trimmer, M ae.
67965	C32	528 pF swing	Ganged capacitor, L and M ae. section (with C8, C17, and C43)
49453	C33	0·01 μF	25%, m.tub., 350V d.c.
49454	C34	0·04 μF	25%, m.tub., 150V d.c.
28156	C36	100 pF	5%, p.s.m., 350V d.c.
28172	C37	68 pF	5%, p.s.m., 350V d.c.
28288	C38	520 pF	1%, p.s.m., 350V d.c.
56322	C39	4–40 pF	Trimmer, L osc.
52160	C40	15 pF	20%, cer., −ve., 500V d.c.
28376	C41	140 pF	2%, p.s.m., 350V d.c.
56322	C42	4–40 pF	Trimmer, M osc.
67965	C43	528 pF swing	Ganged capacitor, L and M osc. section (with C8, C17, and C32)
28311	C44	390 pF	1%, p.s.m., 350V d.c.
52630	C46	100 pF	5%, p.s.m., 350V d.c.
52630	C47	100 pF	5%, p.s.m., 350V d.c.
52638	C49	10 pF	10%, p.s.m., 350V d.c.
49453	C51	0·01 μF	25%, m.tub., 350V d.c.
49453	C52	0·01 μF	25%, m.tub., 350V d.c.
49454	C53	0·04 μF	25%, m.tub., 150V d.c.
49454	C54	0·04 μF	25%, m.tub., 150V d.c.
49453	C56	0·01 μF	25%, m.tub., 350V d.c.
52636	C57	15 pF	10%, p.s.m., 350V d.c.
28346	C58	100 pF	1%, p.s.m., 350V d.c.
28346	C59	100 pF	1%, p.s.m., 350V d.c.
52630	C61	100 pF	5%, p.s.m., 350V d.c.
52639	C62	180 pF	5%, p.s.m., 350V d.c.
52952	C63	100 pF	20%, p.s.m. 350V d.c.
	C64	100 pF	
54083	C66	470 pF	20%, cer., 500V d.c.
31380	C67	5 μF	+50%−20%, i.elec., 50V d.c.
54100	C68	220 pF	20%, cer., 500V d.c.
49454	C69	0·04 μF	25%, m.tub., 150V d.c.
49454	C71	0·04 μF	25%, m.tub., 150V d.c.
57780	C72	0·0015 μF	25%, m.tub., 350V d.c.
51551	C73	0·005 μF	25%, tub., 500V d.c.

PART NO.	CIRCUIT NO.	VALUE	TOLERANCE AND REMARKS
57780	C74	0·0015 μF	25%, m.tub., 350V d.c.
51560	C75	0·005 μF	25%, tub., 750V d.c.
56157	C76	50 μF	+50%−20%, elec., 350V d.c.
	C77	50 μF	
51559	C78	0·05 μF	20%, tub., 1,000V d.c.
63294	C79	1,000 pF	+80%−20%, cer., 500V d.c., lead through type
63294	C81	1,000 pF	+80%−20%, cer., 500V d.c., lead through type
68466	C82	1,800 pF	+50%−25%, cer., 500V d.c.
49454	C83	0·04 μF	25%, m.tub., 150V d.c.
68466	C84	1,800 pF	+50%−25%, cer., 500V d.c.
68466	C86	1,800 pF	+50%−25%, cer., 500V d.c.
26949	R1	2·2 KΩ	20%, 0·6W
26693	R2	100 Ω	20%, 0·6W
27333	R3	220 KΩ	20%, 0·6W
27461	R4	1 MΩ	20%, 0·6W
26725	R6	150 Ω	20%, 0·6W
25509	R7	33 KΩ	10%, 0·6W
25829	R8	220 KΩ	10%, 0·6W
27397	R9	470 KΩ	20%, 0·6W
26629	R11	47 Ω	20%, 0·6W
25637	R12	68 KΩ	10%, 0·6W
27013	R13	4·7 KΩ	20%, 0·6W
24581	R14	120 Ω	10%, 0·6W
25637	R16	68 KΩ	10%, 0·6W
27013	R17	4·7 KΩ	20%, 0·6W
27269	R18	100 KΩ	20%, 0·6W
25413	R19	18 KΩ	10%, 0·6W
24741	R20	330 Ω	10%, 0·6W
27269	R21	100 KΩ	20%, 0·6W
68519	R22	0·5 MΩ	Volume control, lin. (with S1)
27653	R23	10 MΩ	20%, 0·6W
27301	R24	150 KΩ	20%, 0·6W
27397	R26	470 KΩ	20%, 0·6W
27141	R27	22 KΩ	20%, 0·6W
24709	R28	270 Ω	10%, 0·6W
25119	R29	2·7 KΩ	10%, 1·5W
25119	R31	2·7 KΩ	10%, 1·5W

PART NO.	CIRCUIT NO.	VALUE	TOLERANCE AND REMARKS
51090	R32	160 Ω	5%, 5W, w.w.
24799	R33	390 Ω	10%, 1·5W
24799	R34	390 Ω	10%, 1·5W
27493	R36	1·5 MΩ	20%, 0·6W
27461	R37	1 MΩ	20%, 0·6W
26853	R38	680 Ω	20%, 0·6W
27077	R39	10 KΩ	20%, 0·6W
27077	R41	10 KΩ	20%, 0·6W
27461	R42	1 MΩ	20%, 0·6W

PART NO.	CIRCUIT NO.	RESISTANCE (D.C.)	REMARKS
68335	L1	—	Pri.
	L2	—	Sec. — V.H.F. ae.
68195	L3	—	V.H.F. r.f.
69993	L4	—	Tuned
	L5	—	Coupling — V.H.F. osc.
68193	L6	1·2 Ω	Pri.
	L7	1·2 Ω	Sec. — 1st V.H.F. i.f.t.
62585	L8	51 Ω	Coupling, L and M ae.
	L9	2·7 Ω	Tuned, M ae.
	L10	30 Ω	Tuned, L ae.
68197	L12	—	Coupling, L and M osc.
	L13	5 Ω	Tuned, M osc.
	L14	9·5 Ω	Tuned, L osc.
63936	L16	15 Ω	Pri.
	L17	15 Ω	Sec. — 1st L and M i.f.t.
68200	L18	1·5 Ω	Pri.
	L19	1·5 Ω	Sec. — 2nd V.H.F. i.f.t.
68334	L21	1·3 Ω	Pri.
	L22	—	Sec.
	L23	—	Tertiary — 3rd V.H.F. i.f.t.
63937	L26	15 Ω	Pri.
	L27	10 Ω	Sec. — 2nd L and M i.f.t.
68194	L28	—	Heater choke
67962	L29	—	Int. aerial loading coil
68203	T1	500+11·8Ω	Pri.
		—	Sec. — o.t.
68201	T2	300 Ω total	M.t.

PARTS LIST (Mechanical Components)

This list contains only those parts which are not included in the Electrical Parts List; items such as self-tapping screws, bolts and nuts, etc., may be obtained from Murphy Radio Ltd, Service Department. When more than one item is used per receiver, the quantity is given in brackets after the description.

PART NO.	DESCRIPTION	REMARKS
65074	Anchor, plastic	for mains lead
68905	Back	for cabinet, complete
62556	Bezel, ornamental	for top of tuning scale
63406	Boss, transparent	for mounting tuning scale and bezel

PART NO.	DESCRIPTION	REMARKS
52591	Bracket, mounting	for chassis rear, near ext. l.s. panel
52592	Bracket, mounting	for chassis rear, near aerial and earth panel
61421	Bracket, mounting	for lampholder
68748	Bracket and pulley, short	for cord drive
68749	Bracket and pulley, long	for cord drive
68329	Bracket	bearing for tuning spindle
67980	Bracket, mounting (2)	for Tone control switch
64447	Bung, sealing (4)	plugs for L and M i.f.ts.
62639	Cabinet	less internal aerial and all fittings
59906	Can (3)	for v.h.f. i.f.ts.
67959	Carrier, Bakelite	for internal aerial
34181	Clamp	for C76/C77
48658	Clamp (2)	for fuse
14347	Clamp	for mains lead
52292	Clip, retaining	for L12/L13/L14
37385	Clip	for lamp leads
68199	Clip, retaining (2)	for L and M i.f.ts.
1871/2	Compound	for coil cores
2033/5	Cord, nylon, 38 in.	for cord drive
46910	Core, iron dust (4)	for L16, L17, L26, L27
46921	Core, iron dust (6)	for L6, L7, L18, L19, L21, L22
46925	Core, iron dust (2)	for L3, L4
46913	Core, iron dust (2)	for L13, L14
46916	Core, iron dust (2)	for L9, L10
67969	Cover, screening	for v.h.f. r.f. unit
57421	Dowell (2)	for mounting front of chassis
53774	Drum, tuning	for cord drive
68723	Foil, aluminium plate (2)	for internal aerial
67960	Foil, aluminium strip (2)	for internal aerial
33204	Fuse	250mA plain cartridge
48701	Fuseholder	with panel
0075/1	Fusible alloy	for heat fuse
49883	Grommet (4)	for chassis mounting
57422	Guide rail	for pointer
68208	Indicator, calibration	
68829	Insulator (3)	sleeve for control knob spindles
65059	Insulator (2)	for furnishing nail
67977	Insulator, Presspahn	for aerial and earth panel
68340	Insulator, Presspahn	for ext. l.s. panel
57009	Insulator (3)	inside v.h.f. i.f. cans
71568	Knob (2)	for On-Off/Volume and Tuning controls
71567	Knob	for Wave-Band Switch
64392	Label, warning (2)	for L and M i.f.ts.
59397	Label, warning	heat fuse
16882	Lamp	6·5V, 0·3 amp., m.e.s.
61416	Lampholder	
65409	Loudspeaker	5 in. dia. permanent magnet
71753	Lug (3)	sockets for mains voltage adjustment panel
62909	Nail, furnishing (2)	for lead through terminal
68991	Panel and sockets	for mains adjustment
71572	Panel, sockets, and tags	for aerial and earth
71571	Panel and sockets	for ext. l.s.
71569	Panel and tags	for mounting R32, R33, and R34
55695	Pin (2)	rivet for **pulley** (58850)
65162	Pin, contact	plug for mains adjustment
65101	Plug, 2 pin, polarized	for internal aerial lead
51314	Plug, black	for earth
51313	Plug, red	for aerial
61438	Pointer	with carrier
58850	Pulley, metal (2)	for cord drive
63407	Reflector	for **boss** (63406)
68198	Scale	tuning
67970	Screen	for V1
103842	Screw, fluted self-tapping 10Y × 1 in., countersunk (4)	for fastening chassis rear mounting brackets
62598	Screw, 6BA × $\frac{3}{8}$ in., brass instrument head	for fastening **bezel** (62556)
103267	Screw, OBA × $\frac{1}{2}$ in., countersunk (2)	for fastening chassis rear in cabinet
103903	Screw, fluted self-tapping, 6Y × $\frac{3}{8}$ in., round head (3)	for fastening pointer guide rail and lamp bracket
103877	Screw, fluted self-tapping, 8Y × $\frac{1}{2}$ in. round head (8)	for fastening loudspeaker and cabinet back
19642	Screw, grub, 2 BA × $\frac{5}{16}$ in.	for tuning drum
68209	Spindle, tuning	
68828	Spring, retaining (3)	for control knobs
51171	Spring, retaining	for tuning spindle
19460	Spring, tension	for cord drive
72121	Spring, earthing (2)	for V1 screen
68204	Switch	Wave-Band
71566	Switch, tone	complete with brackets
65180	Trimmer, body	for C21
59142	Valveholder, noval (2)	for V1 and V4
51451	Valveholder, B8A (3)	for V2, V3, and V6
5687	Valveholder I.O.	for V5
49910	Washer, cup (2)	for chassis fixing screws
34588	Washer, felt (3)	for control knobs
60820	Washer, insulating (2)	for Tone control **mounting brackets** (67980)
49144	Washer, cup (2)	for internal aerial
16649	Washer, shakeproof, $\frac{3}{8}$ in. (2)	for Wave-Band switch and Volume control

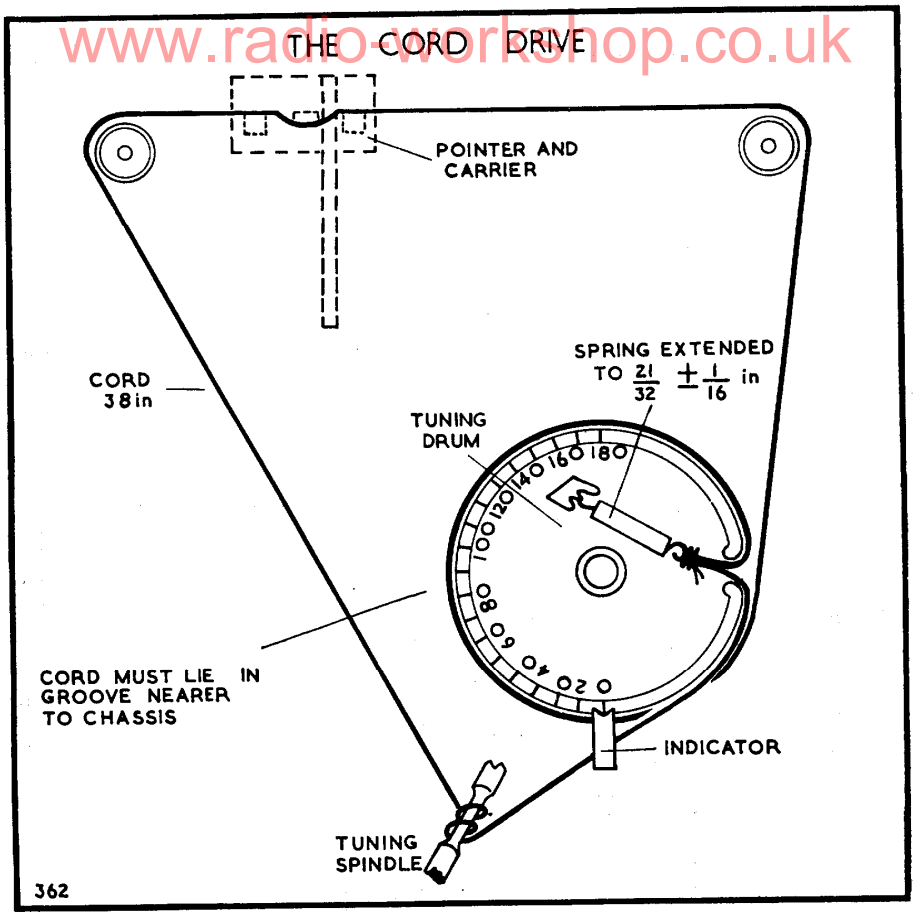


Fig. 11. The cord drive.

With the ganged capacitor at maximum capacitance, the centre of the pointer must register with the right-hand edges of the tuning scale apertures.

MODIFICATIONS (cont.), also see page 4.

C62 and 2nd LM i.f. transformer. Later transformers will have the secondary tuning capacitor (C62) included within the can; C62 was previously connected underneath the chassis, as shown in the diagram on page 11. The bases of the transformers are identified by paint spots, Red/Brown for early types and Red/Brown/Orange for later types. If a later type transformer is fitted as a replacement to an early receiver, the original capacitor (C62) must be removed from underneath the chassis.

Improved top response (a.m.). In the latest sets, C68 is 470pF, Part No. 28385; C70, 0·1μF, Part No. 41404 is added between chassis and the junction R22, R38, S3.

Tone correction. In the latest sets, C74 is 0·005μF, Part No. 41409.

PLEASE QUOTE THE PART NUMBER WHEN ORDERING COMPONENTS

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LOUDSPEAKER POSITION

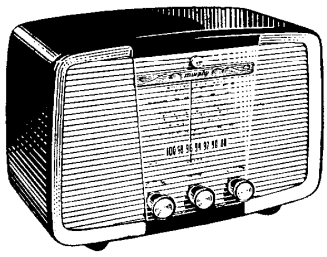
IN its original position the frame of the loudspeaker on the A362 is in close proximity to one of the tuning drive supports. If these two parts should touch, when there is an earth wire connected to the receiver, it is possible that the loudspeaker may be damaged, since the speech coil will be at earth potential and the speaker frame at chassis potential which may be "live".

To avoid this possibility the loudspeaker has now been turned so that its terminals are parallel to the receiver chassis and there is now a gap in the speaker frame adjacent to the tuning drive support.

As a precautionary measure, it is recommended that the position of the loudspeaker should be checked when A362's are returned for service and, if necessary, the mounting should be altered by rotating the speaker through the required 30 degrees.

MURPHY SERVICE MANUAL SUPPLEMENT

FOR USE WITH THE A362 SERVICE MANUAL



INTRODUCTION

This supplement gives the differences between the A362T and the A362.

The A362T covers three wave-bands, Medium, Trawler, and V.H.F. Band II. The Trawler wave-band includes the frequencies used for the trawler radio-telephone transmissions; the full coverage of the band is from 66·7 metres to 187·5 metres (4·5 Mc/s to 1·6 Mc/s).

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NOTES

The differences between the two models lie in the aerial and oscillator coils, the wave-band switch, and some of the associated components, together with some other components mentioned in the parts lists. To prevent i.f. break-through on the Trawler wave-band, an i.f. rejector (L20, C25) has been added in the aerial circuit.

The modifications detailed on pages 4 and 16 of the A362 manual are all incorporated in the A362T.

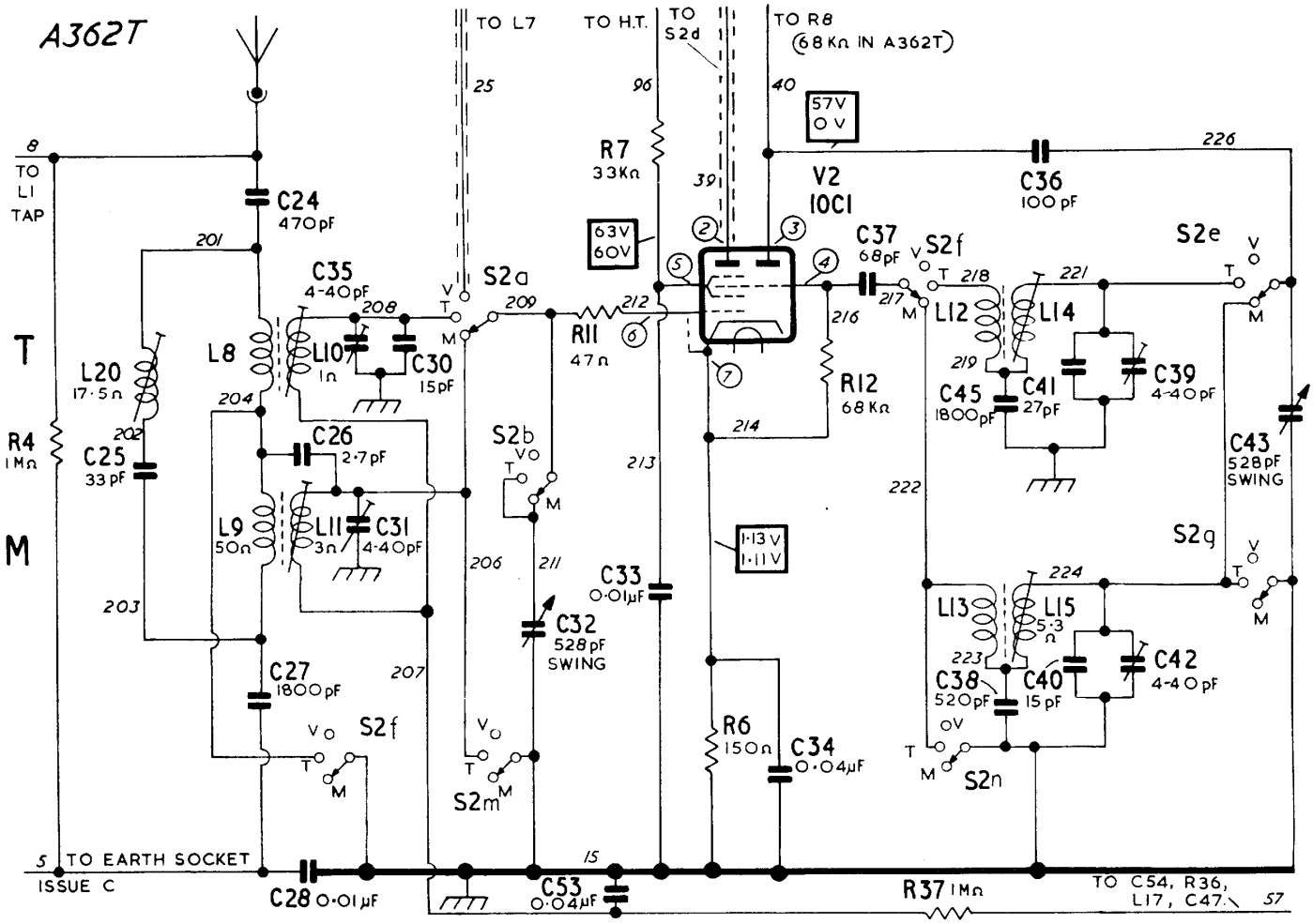

Fig. 1. The M and T band aerial and oscillator circuit.
The wave-band switch (S2) is shown in the M position. Circuit voltages are shown within rectangles and were measured under no-signal conditions using a 20 KΩ/V meter, with the receiver switched first to the M band (upper reading) and then to Band II (lower reading).

CIRCUIT ALIGNMENT

The following notes cover the alignment of the Trawler band r.f. and oscillator circuits, and the i.f. rejector; the i.f., Medium wave, and Band II circuits are aligned as for the A362. The i.f. rejector and Trawler band adjustments must be made before the Medium wave-band adjustments. In normal circumstances, it is unlikely that the i.f. rejector will need readjustment.

Since the A362 manual was published, the v.h.f. balancing capacitor (C21) has been changed to a fixed capacitor (5·6 pF, ±0·5 pF, cer., 750V d.c., Part No. 66799). The references to the balancing capacitor adjustments on pages 2, 5, and 7 should therefore be disregarded.

PROCEDURE

I.f. rejector. Connect the signal generator to the T and M aerial and earth sockets via a dummy aerial and tune it to 470 Kc/s, with the modulation "on". Switch the receiver to the M band and tune it to the highest wavelength. Adjust L20 core for minimum a.f. output.

Trawler band. Connect the signal generator as above and tune it and the receiver to 2·5 Mc/s (120 m., or 79° on the receiver calibration scale); adjust L14 and L10 (chassis top) for maximum output. Tune the signal generator and the receiver to 3·7 Mc/s (80 m., or 134° on the receiver calibration scale); adjust C39 and C35 (chassis underside) for maximum output. Repeat the adjustments until there is no further improvement.

Note. The receiver oscillator frequency is above the signal frequency.

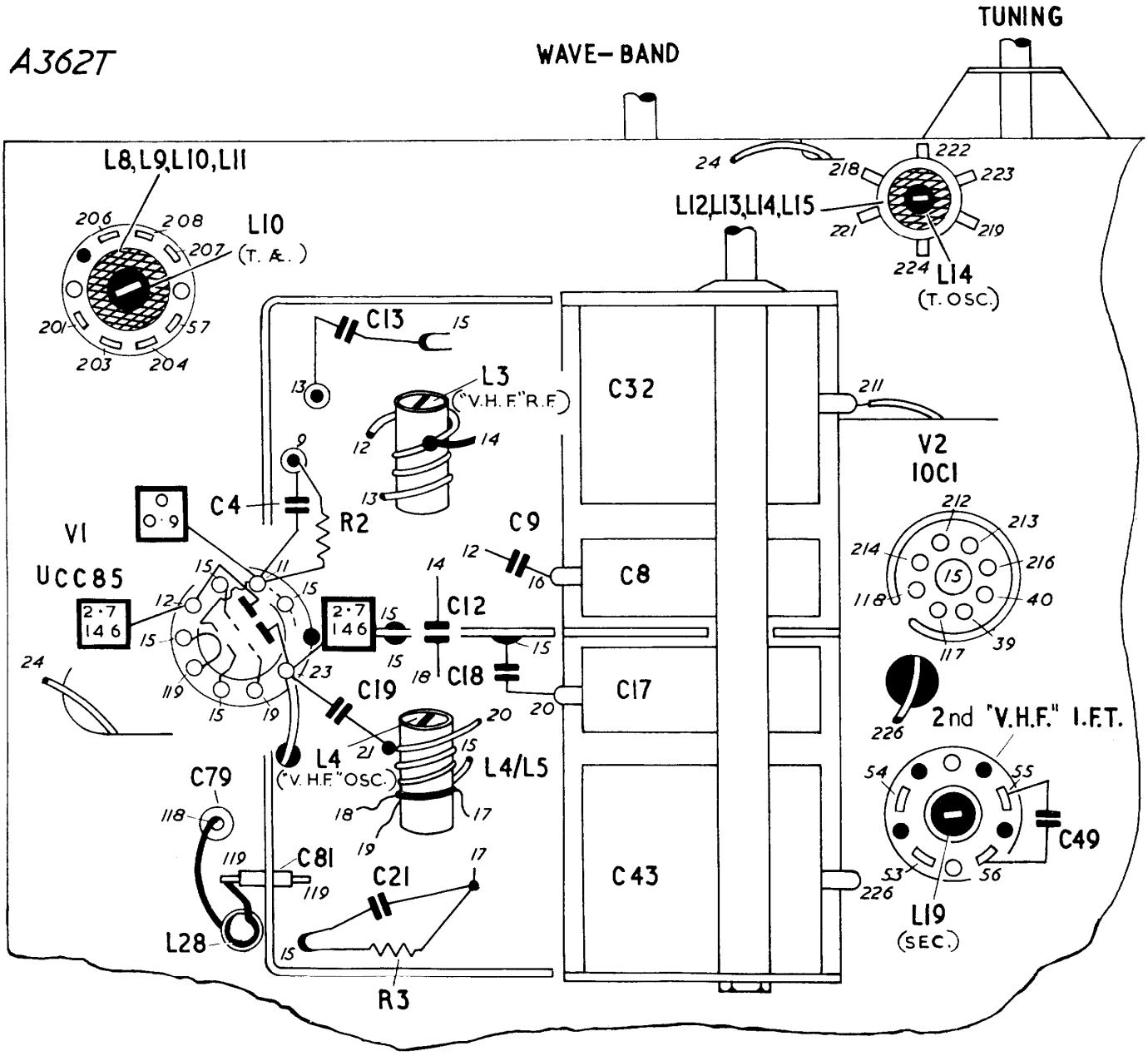

Fig. 2. The r.f. end of the chassis top showing the M and T band aerial and oscillator circuit connections.

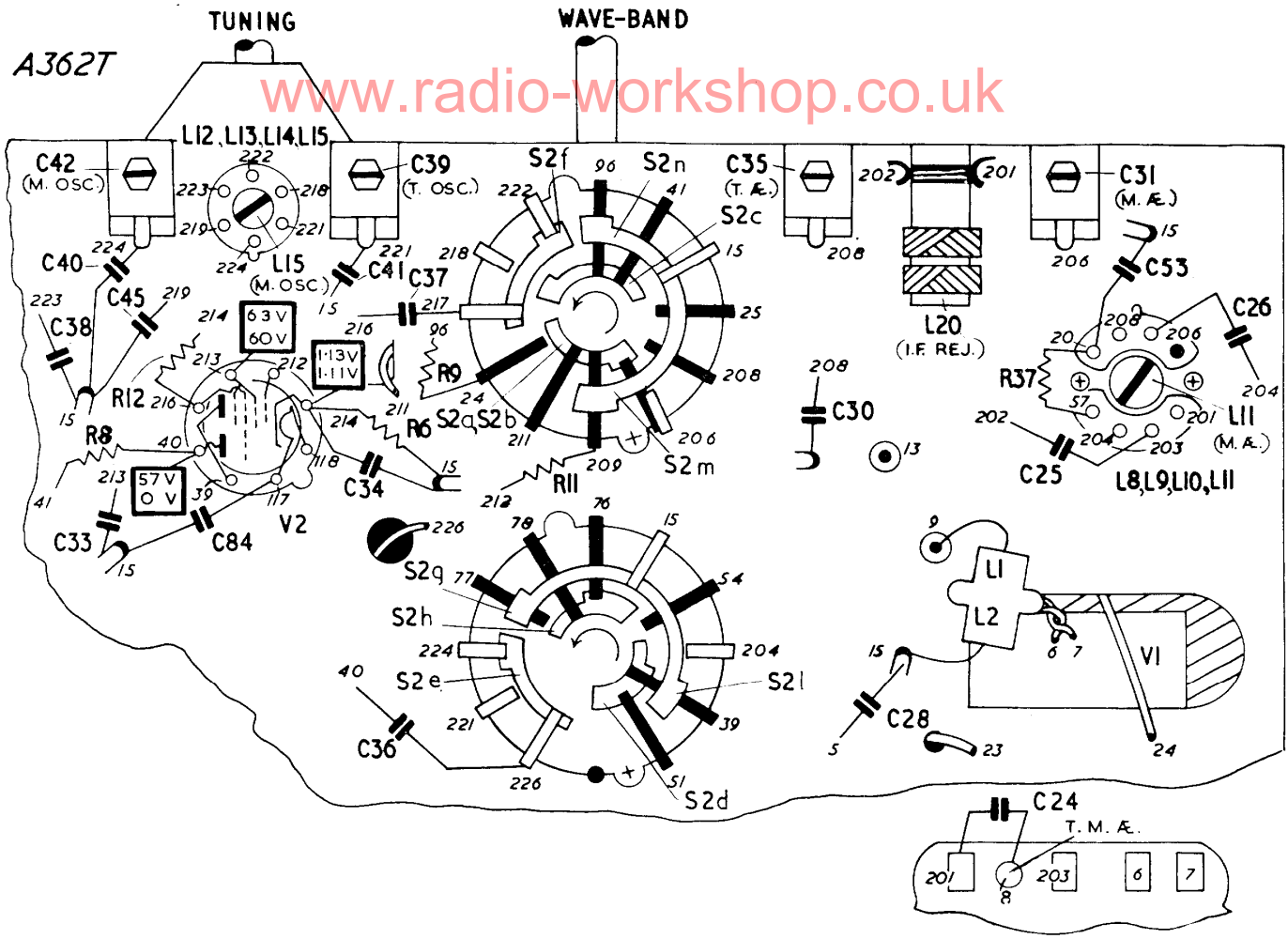

Fig. 3. The r.f. end of the chassis underside showing the M and T band aerial and oscillator circuit connections.

The wave-band switch wafers are viewed from the rear of the chassis and are shown in the M position; the black contacts and inner rotors are on the hidden sides of the wafers. The lugs marked with a cross are the nearer to the chassis.

PARTS LIST

PART NO.	CIRCUIT NO.	VALUE	TOLERANCE AND REMARKS
66799	C21	5·6 pF	±0·5 pF, cer., 750V d.c.
28299	C25	33 pF	2%, p.s.m., 350V d.c.
—	C29	—	Not used in A362T
23602	C30	15 pF	10%, p.s.m., 350V d.c.
67965	C32	528 pF (swing)	Ganged capacitor, T and M ae. section (with C8, C17, C43)
56323	C35	4–40 pF	Trimmer, T ae.
56322	C39	4–40 pF	Trimmer, T osc.
67498	C41	27 pF	10%, cer., −ve., 750V d.c.
67965	C43	528 pF (swing)	Ganged capacitor, T and M osc. section (with C8, C17, C32)
—	C44	—	Not used in A362T
28291	C45	1,800 pF	2%, p.s.m., 350V d.c.
28385	C68	470 pF	20%, p.s.m., 350V d.c.
41404	C70	0·1 μF	20%, tub., 350V d.c.
41409	C74	0·005 μF	25%, tub., 500V d.c.
56152	C76, C77	50 μF, 50 μF	+50% −20%, elec., 275V d.c.
25637	R8	68 KΩ	10%, 0·6W
72151	L8	—	Coupling, T ae.
	L9	50 Ω	Coupling, M ae.
	L10	1 Ω	Tuned, T ae.
	L11	3 Ω	Tuned, M ae.
72152	L12	—	Coupling, T osc.
	L13	—	Coupling, M osc.
	L14	—	Tuned, T osc.
	L15	5·3 Ω	Tuned, M osc.
55856	L20	17·5 Ω	470 Kc/s i.f. rejector
73460	Back		for cabinet
72156	Scale, tuning		
72153	Switch		Wave-band

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