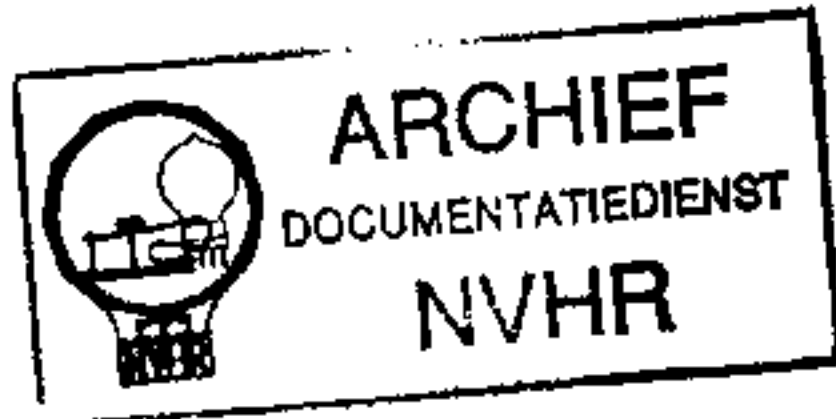
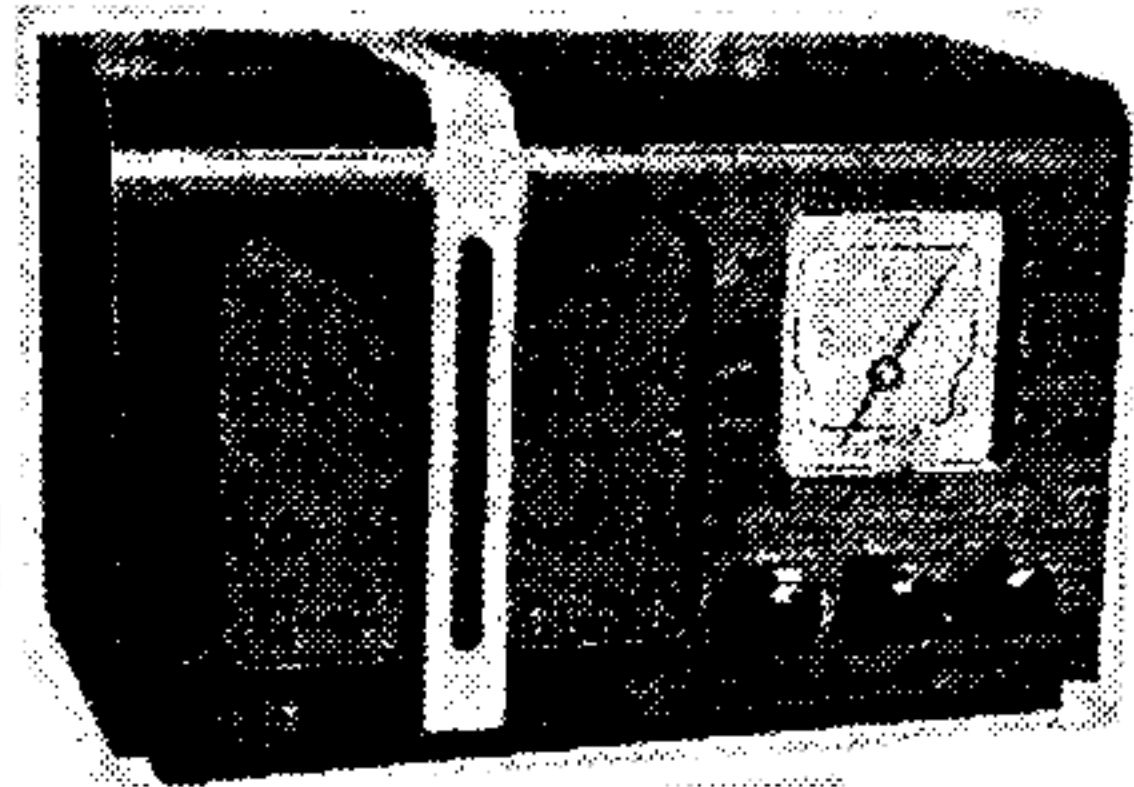


Ned. Ver. v. Historie v/d Radio



FERGUSONIC 908

MAINS MINOR (AC/DC)



THE Fergusonic Mains Minor receiver, model 908, is a 2-band AC/DC superhet for mains of 200-240V. It employs four valves, plus a valve rectifier, and is for use with an external aerial, but no earth must be connected.

Release date: February, 1940.

CIRCUIT DESCRIPTION

Aerial input on LW is via isolating condenser C1, aerial choke L1 (which operates as coupling transformer primary), secondary coupling circuit L2, C3 and switch S2 to single tuned circuit L3, L4, C22.

On MW, input is via C1, C2 and L4 (which becomes diagrammatically inverted and operates as MW coupling coil) to L3, C22.

First valve (V1, Mullard ECH3) is a triode heptode operating as frequency changer. Triode oscillator grid coils L5 (MW), plus L6 (LW), are tuned by C24; parallel trimming by C25 (MW) and C26 (LW); series tracking by C27 (MW) and C28 (LW). Reaction by coil L7.

Second valve (V2, Mullard EF9) operates as IF amplifier with tuned-primary, tuned secondary transformer couplings.

Intermediate frequency 470KC/S.

Diode second detector is part of double diode triode valve (V3, Mullard EBC3). Audio frequency component in rectified output is developed across load resistance R7 and passed via C13 and manual volume control R8 to CG of triode section. IF filtering by C11, R6, C12 and C15.

Second diode of V3, fed from V2 anode via C10, provides DC potential, which is developed across load resistances R11, R12, and fed back through decoupling circuits as GB to FC and IF valves, giving AVC.

Resistance-capacity coupling by R10, C16 and R13 between V3 triode and pentode output valve (V4, Brimar 7D6). Fixed tone correction by C17.

On AC mains, HT current is supplied by IHC rectifying valve (V5, Brimar 1D5), which on DC mains behaves as a low resistance. Smoothing by speaker field L14 and electrolytic condensers C18, C19. Valve heaters, together with scale lamp and ballast resistance R17, are connected in series across mains input.

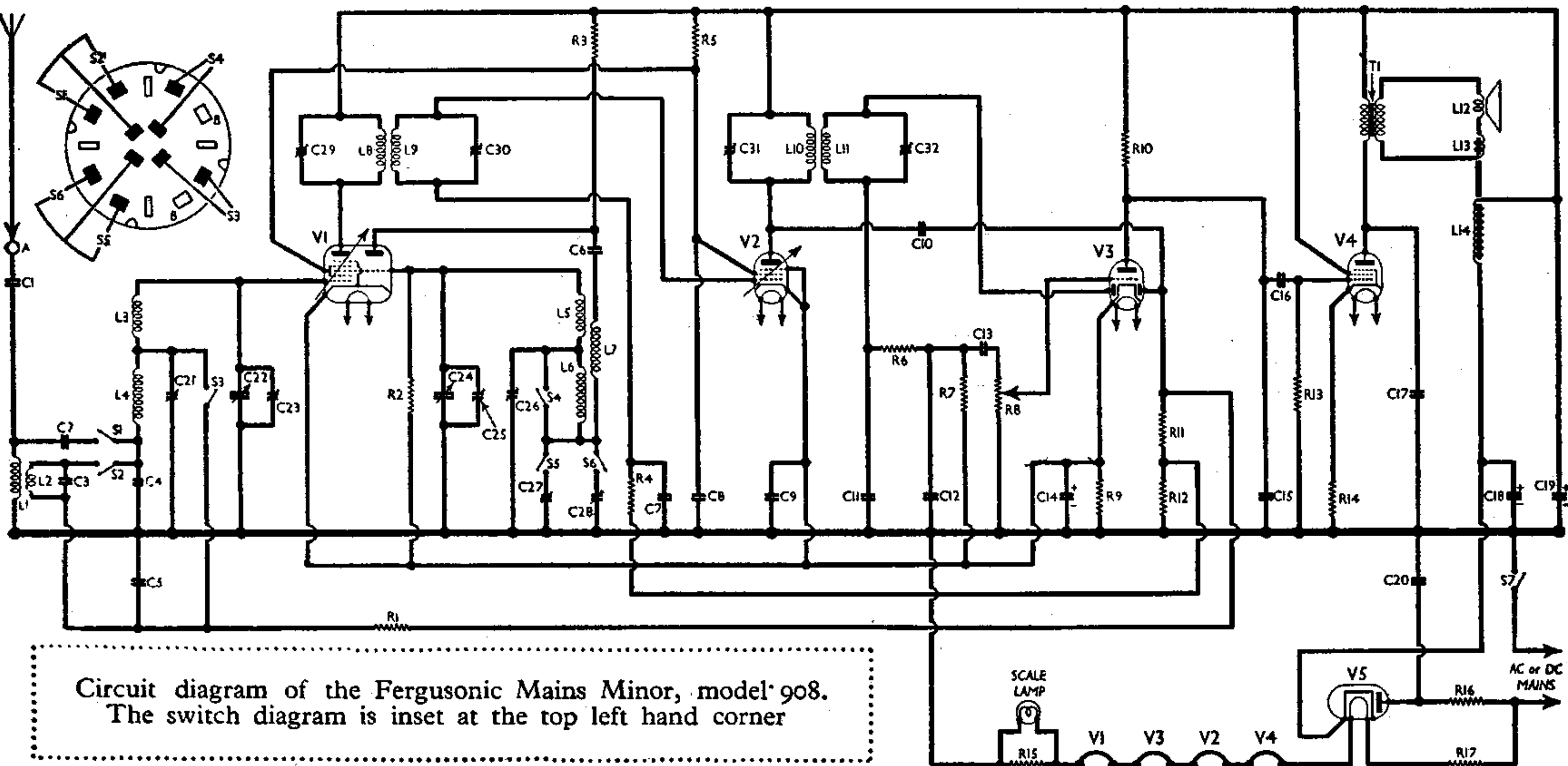
DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull-off) and the two screws (with washers and lock-washers) holding the chassis to the bottom of the cabinet.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 heptode CG decoupling ...	500,000
R2	V1 osc. CG resistance ...	50,000
R3	V1 osc. anode HT feed ...	25,000
R4	V2 CG decoupling ...	500,000
R5	V1, V2 SG's HT feed... ..	25,000
R6	IF stopper	100,000
R7	V3 signal diode load	500,000
R8	Manual volume control	2,000,000
R9	V1, V2 fixed GB; V3 triode GB; AVC delay	150
R10	V3 triode anode load	50,000
R11	V3 AVC diode load resistances {	500,000
R12		500,000
R13		1,000,000
R14	V4 CG resistance	100
R15	V4 GB resistance	100
R16	Scale lamp shunt	50
R17	V5 anode surge limiter	100
	Heater circuit ballast	855

CONDENSERS		Values (μF)
C1	Aerial isolating condenser...	0.002
C2	Part aerial MW coupling ...	0.0005
C3	Part aerial LW coupling ...	0.002
C4	Part aerial MW coupling ...	0.000075
C5	V1 heptode CG decoupling ...	0.1
C6	V1 osc. anode coupling	0.00025
C7	V2 CG decoupling	0.1
C8	V1, V2 SG's decoupling	0.1
C9	V1, V2, V3 cathodes RF by-pass	0.1
C10	Coupling to V3 AVC diode...	0.0001
C11	IF by-pass condensers ... {	0.00025
C12		0.00025
C13		0.02
C14*	AF coupling to V3 triode ...	25.0
C15	V1, V2, V3 cathode by-pass	0.00025
C16	IF by-pass	0.00025
	V3 triode to V4 AF coupling	0.02



Circuit diagram of the Fergusonic Mains Minor, model 908. The switch diagram is inset at the top left hand corner

FERGUSONIC 908—continued.

CONDENSERS (continued)		Values (μ F)
C17	Fixed tone corrector ...	0.005
C18*	HT smoothing condensers	16.0
C19*		16.0
C20	Mains R.F. by-pass ...	0.02
C21†	Aerial circuit LW trimmer	0.0092
C22†	Aerial circuit tuning	—
C23†	Aerial circuit MW trimmer	—
C24†	Oscillator circuit tuning ...	—
C25†	Osc. circuit MW trimmer ...	—
C26†	Osc. circuit LW trimmer ...	0.00011
C27†	Osc. circuit MW tracker ...	0.00045
C28†	Osc. circuit LW tracker ...	0.00018
C29†	1st IF trans. pri. tuning ...	—
C30†	1st IF trans. sec. tuning ...	—
C31†	2nd IF trans. pri. tuning ...	—
C32†	2nd IF trans. sec. tuning ...	—

*Electrolytic. †Variable. ‡Pre-set.

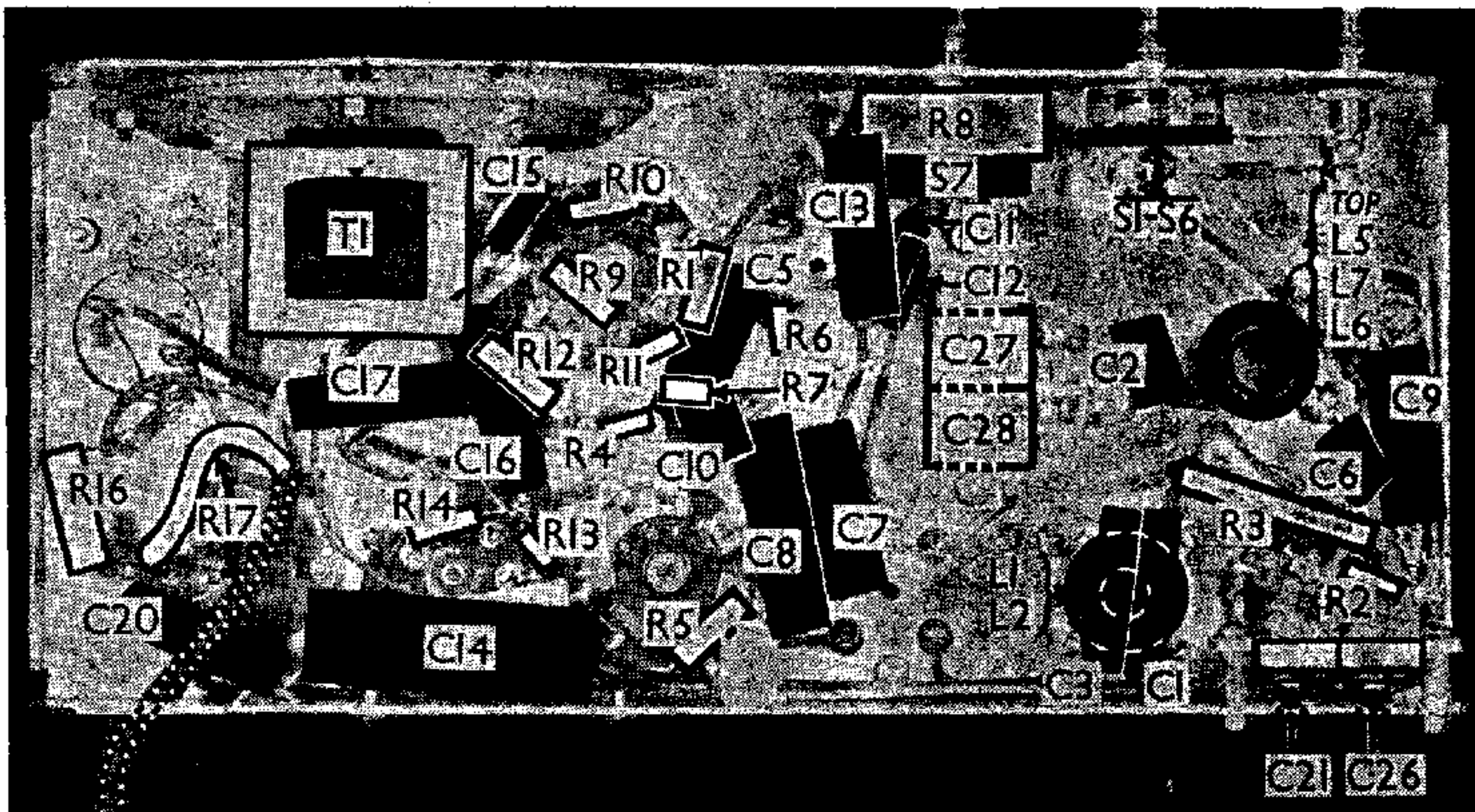
OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial circuit choke...	450.0
L2	Aerial LW coupling coil ...	12.5
L3	Aerial MW tuning coil ...	3.5
L4	Aerial LW tuning coil ...	18.5
L5	Osc. circuit MW tuning coil	2.6
L6	Osc. circuit LW tuning coil	6.1
L7	Oscillator reaction coil ...	1.25
L8	1st IF trans. { Pri. ...	7.5
L9		{ Sec. ...
L10	2nd IF trans. { Pri. ...	17.0
L11		{ Sec. ...
L12	Speaker speech coil ...	3.0
L13	Hum neutralising coil ...	0.1
L14	Speaker field coil ...	1,200.0
T1	Speaker input trans. { Pri. ...	650.0
	{ Sec. ...	0.3
S1-S6	Waveband switches...	—
S7	Mains switch, ganged R8 ...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 ECH3	175	1.5	88	2.2
	Oscillator	75		
V2 EF9	175	5.0	88	1.5
V3 EBC3	90	—	—	—
V4 7D6	150	29.0	175	5.4
V5 1D5	255†	—	—	—

† Cathode to chassis, DC.



Underneath view of the Fergusonic Mains Minor chassis. A diagram of the switch unit is inset at the top left hand corner of the circuit overleaf

AC mains of 238V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400V scale of a model 7 Universal Avometer, chassis being negative.

GENERAL NOTES

Switches.—S1-S6 are the waveband switches, in a single rotary unit beneath the chassis. This is indicated in our under-chassis view, and shown in detail in the diagram inset at the top left hand of the circuit, where it is drawn as seen looking from the rear of the underside of the chassis. On LW (knob anti-clockwise), S2 and S6 are closed, and the other switches are open; on MW (knob clockwise), S1, S3, S4 and S5 are closed, and the other switches are open.

S7 is the QMB mains switch, ganged with the volume control R8.

Coils.—L1, L2 and L5-L7 are in two unscreened units beneath the chassis. L3, L4 are in an unscreened unit on the chassis deck, while the IF transformers L8, L9 and L10, L11 are in two screened units on the chassis deck, together with their associated trimmers.

Scale Lamp.—This is a National Union type N51, having a miniature bayonet

cap base. It has a rating of 6-8V, 0.2A.

Condensers C18, C19.—These are two 16 μ F dry electrolytics in a single metal-cased tubular unit on the chassis deck, the can being the common negative connection. The red spotted tag is the positive of C18, and the plain tag the positive of C19.

Resistance R17.—This is the wire-wound asbestos covered line cord resistance, incorporated in the mains lead.

Chassis Divergencies.—C11 is returned to cathode of V3 in the makers' diagram, but to chassis in our model. C15 is given as 0.0005 μ F by the makers, but is 0.00025 μ F in our chassis.

Pre-Set Condensers.—Apart from the IF trimmers in their respective cans, there are two trimmers on the gang condensers, two trimmers reached through holes in the rear member of the chassis, and two trackers reached through holes in the chassis deck.

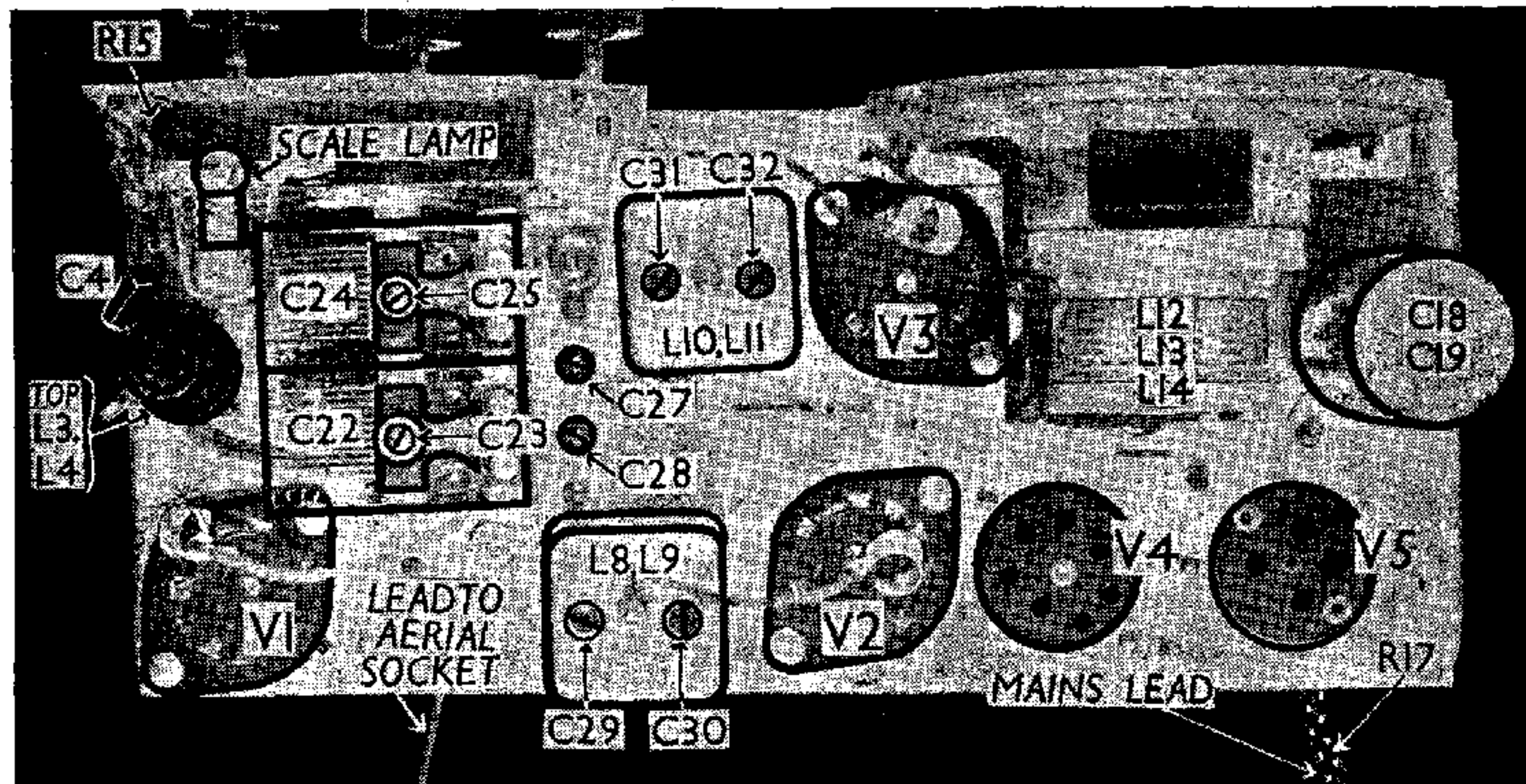
CIRCUIT ALIGNMENT

IF Stages.—Remove top cap connector of V1, and connect a 0.5MO resistance in series between connector and the top cap of the valve. Connect signal generator from top cap of valve to chassis, via isolating condensers of about 0.1 μ F. Switch set to MW, turn gang to maximum, and feed in a 470 KC/S signal. Adjust C32, C31, C30 and C29 in turn for maximum output.

RF and Oscillator Stages.—With gang at maximum, pointer should be horizontal. Connect signal generator via a suitable dummy aerial to aerial lead of set, and via a 0.1 μ F condenser to chassis.

MW.—Switch set to MW, tune to 214m on scale, feed in a 214m (1,400 KC/S) signal, and adjust C25, then C23, for maximum output. Feed in a 500m (600 KC/S) signal, tune it in, and adjust C27 for maximum output, while rocking the gang for optimum results.

LW.—Switch set to LW, tune to 1,250m on scale, feed in a 1,250m (240 KC/S) signal, and adjust C26, then C21, for maximum output. Feed in a 2,000m (150 KC/S) signal, tune it in, and adjust C28 for maximum output, while rocking the gang for optimum results.



Plan view of the chassis. Note the two trackers reached through holes in the chassis deck. R17 is incorporated in the mains lead