VIDOR RADIO ATTACHE
Models CN.381A, CN.381B

General Description : Four-valve, two-waveband " attaché-case " all-dry battery superheterodyne receiver. Released 1949.

Power Supplies : Vidor battery, type L5512 (90 volts); Vidor battery, type L5040 (1·5 volts).

Wavebands : M.W. 200–550 m.; L.W. 1000–2000 m.

Intermediate Frequency : 456 kc/s. 475 kc/s. on later models.

Valves : (V1) DK91 (1R5); (V2) DF91 (1T4); (V3) DAF91 (1S5); (V4) DL94 (3V4).

Circuit Variations : In Model CN381B, the medium wave aerial trimmer (C3) is omitted.

Alignment Procedure : The I.F. transformer cores are sealed during manufacture, and normally need no further adjustment. However, if necessary, the cores may be released by melting the wax.

Connect signal generator to grid (pin 6) of V1 via 100-pF. capacitor. Short-circuit front (osc.) section of gang capacitor. Adjust cores of I.F. transformers for maximum output at 456 kc/s., reducing signal as sensitivity increases. Seal cores with soft wax.

R.F. : Check that with gang fully meshed, the left-hand edge of the pointer (not pointer itself) is directly under, and in line with, the left-hand edge of the 550-m. block on the scale.

M.W. : Loosely couple signal generator to receiver. Set pointer to 200 m., inject 1500-kc/s. signal and adjust C8 and C3 for maximum output. Set pointer to 550 m., inject 545·5-kc/s. signal and adjust core L3 for maximum output, rocking gang slightly after each adjustment. Repeat at 200 m. and 550 m. With model CN381B, C3 is omitted, and alignment should be carried out at 190 m. (1579 kc/s.) and 550 m. (545·5 kc/s.).

L.W. : Set pointer to 1200 m., inject 250/kc/s. signal, and adjust C1 for maximum output. No L.W. oscillator trimmer is provided, and if L.W. calibration is incorrect, C10 should be checked. This capacitor must be 533 pF. (½ per cent) for CN381A, and 540 pF. (½ per cent) for CN381B.

Voltage Check Points : Measurements taken on Avo Model 7 (1000-volt range). Total H.T. consumption 8·75 mA.

V1	Anode (pin 2)	85 v.	Osc. anode (pin 3)	45 v.	—
V2	Anode (pin 2)	85 v.	Screen (pin 3)	35 v.	—
V3	Anode (pin 2)	6 v.	Screen (pin 4)	5 v.	—
V4	Anode (pin 2)	80 v.	Screen (pin 3)	82 v.	Bias 7·25 v.

"TRADER" SERVICE SHEET

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VIDOR 381

Miniature All-Dry Portable

MINIATURE valves and components are employed in the Vidor 381, an all-dry portable superhet designed very much on the lines of a "Personal" receiver. The wavebands are M.W. and L.W.

Release date and original price: November, 1948, £9 17s 6d, including batteries, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L2, C23,** on L.W., to a heptode valve **(V1, Mullard DK91)** which operates as frequency changer with electron coupling. For M.W. operation, **L2** is shunted by the M.W. winding **L1.**

Oscillator grid coil **L3** is tuned by **C24,** with parallel trimming by **C25** (M.W.) and series tracking by **C6** on both bands. For L.W. operation, a fixed trimmer **C7** is shunted across **L3** by **S3.** Reaction coupling from anode by **L4.**

Second valve **(V2, Mullard DF91)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C3, L5. L6, C4** and **C11, L7, L8, C12.**

Intermediate frequency 456 kc/s.

Diode second detector is part of a single diode pentode valve **(V3, Mullard DAF91)** Audio frequency component in rectified output is developed across the manual volume control **R7,** which is also the diode load resistor, and passed, via A.F. coupling capacitor **C15** and C.G. resistor **R8,** to control grid of pentode section, which operates as A.F. amplifier. I.F. filtering by **C13, R6, C14** in diode circuit.

The D.C. potential developed across **R6, R7** in series is tapped off and fed back, through a decoupling circuit **R5, C9,** as G.B. to F.C. and I.F. valves. giving automatic gain control.

Resistance-capacitance coupling by **R10, C17, R11** between **V3** pentode and pentode output valve **(V4, Mullard DL92),** the dual filament sections of which are wired in parallel.

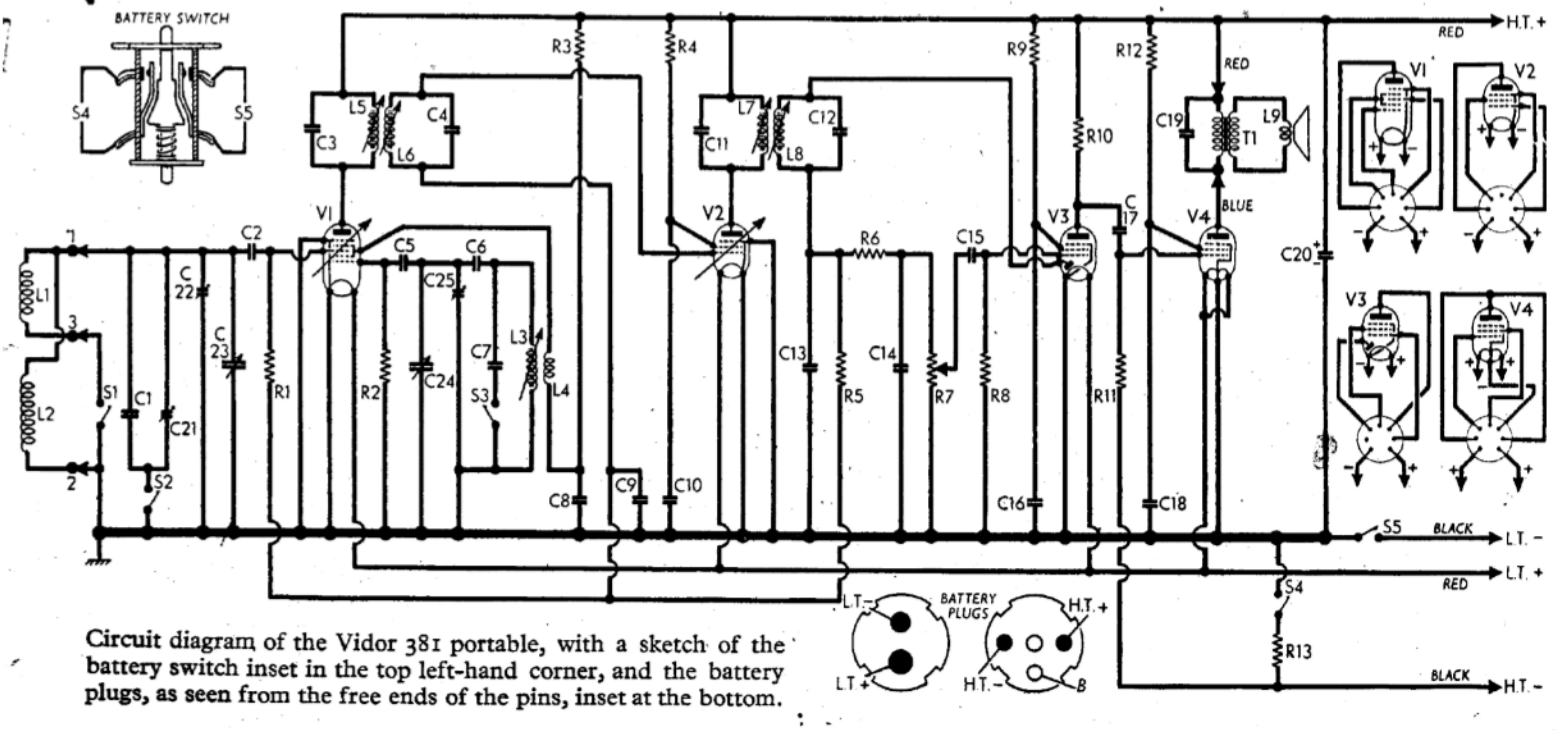
COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Locations
R1	V1 pent. C.G. ...	470,000	G5
R2	V1 osc. C.G. ...	100,000	H5
R3	Osc. H.T. feed ...	22,000	F3
R4	V2 S.G. feed ...	100,000	E4
R5	A.G.C. decoup. ...	2,200,000	F5
R6	I.F. stopper ...	47,000	E5
R7	Volume control ...	1,000,000	H3
R8	V3 pent. C.G. ...	4,700,000	E4
R9	V3 S.G. feed ...	4,700,000	E4
R10	V3 pent. load ...	1,000,000	E4
R11	V4 C.G. resistor ...	2,200,000	E5
R12	V4 S.G. feed ...	15,000	E5
R13	V4 G.B. resistor ...	1,000	F5

	CAPACITORS	Values (μF)	Locations
C1	Aerial L.W. trimmer	0·00015	H4
C2	V1 pent. C.G. ...	0·0001	H5
C3	1st I.F. transformer tuning	0·0001	C2
C4		0·0001	C2
C5	V1 osc. C.G. ...	0·0001	H4
C6	Oscillator tracker ...	0·000635	H4
C7	Osc. L.W. trimmer	0·000533	G4
C8	Osc. H.T. decoup. ...	0·1	C1
C9	A.G.C. decoupling	0·05	G5
C10	V2 S.G. decoupling	0·1	C1
C11	2nd I.F. trans-former tuning ...	0·0001	D2
C12		0·0001	D2
C13	I.F. by-passes ...	0·0001	F5
C14		0·0001	H4
C15	A.F. coupling ...	0·001	E4
C16	V3 S.G. decoupling	0·05	E5
C17	A.F. coupling ...	0·01	E5
C18	V4 S.G. decoupling	0·1	D2
C19	Tone corrector ...	0·005	—
C20*	H.T. reservoir ...	2·0	B2
C21‡	Aerial L.W. trim...	0·00005	D1
C22‡	Aerial M.W. trim...	0·000015	D1
C23†	Aerial tuning ...	0·000523§	A2
C24†	Oscillator tuning ...	0·000523§	A1
C25‡	Osc. M.W. trim ...	0·00005	D1

* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, minimum to maximum.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Frame aerial windings	1·5	—
L2		13·0	—
L3	Osc. tuning coil ...	1·2	G4
L4	Osc. reaction coil ...	0·6	G4
L5	1st I.F. Pri. ...	11·0	C2
L6	trans. Sec. ...	11·0	C2
L7	2nd I.F. Pri. ...	11·0	D2
L8	trans. Sec. ...	11·0	D2
L9	Speech coil ...	2·4	—
T1	Speaker Pri. ...	500·0	—
	trans. Sec. ...	0·4	—
S1–S3	W/band switches ...	—	G3
S4, S5	Battery switches ...	—	—



Circuit diagram of the Vidor 381 portable, with a sketch of the battery switch inset in the top left-hand corner, and the battery plugs, as seen from the free ends of the pins, inset at the bottom.

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Supplement to The Wireless & Electrical Trader, February 19, 1949

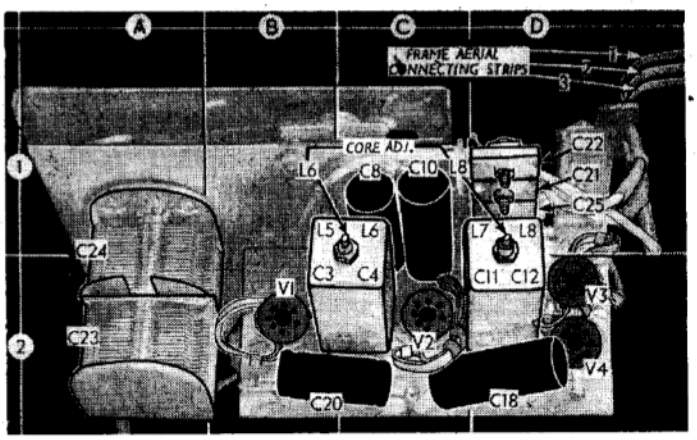
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a set of new batteries.

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 DK91	84	0·3	43	1·6
V2 DF91	84	0·95	37	0·4
V3 DAF91	7	0·05	3	0·006
V4 DL92	82	4·5	63	1·0

The vertical chassis deck, viewed from the valve side. The frame aerial connections are numbered to correspond with the circuit diagram overleaf. C19 is not seen in the chassis illustrations.



DISMANTLING THE SET

Partial access may be gained to the chassis, for valve replacement and circuit alignment purposes, by carrying out the first and fourth groups of operations described below and sliding the chassis assembly up the frame aerial connecting strips while tilting it towards the lid.

Removing Chassis Assembly.—Lift out the battery compartment cover, remove and unplug the batteries, and withdraw the fibreboard cover over the trimmers and frame aerial connecting strips;

remove the short wood screw and metal plate on the bottom edge of the carrying case lid, and ease out the frame aerial cover, which is a spring fit inside the lid;

unsolder the three frame aerial connecting strips at tags in the lid;

withdraw the three long wood screws securing the front panel to the carrying case;

lift out the chassis and speaker as a single unit.

When replacing, the L.T. battery should be fitted in the rear left-hand corner of the case, with its connector facing the speaker, and the H.T. battery connector should face the fibreboard trimmer cover.

Removing Front Panel.—Remove chassis as previously described, and then remove the two control knobs (recessed grub screws), and the three nuts (two 4 BA and one 6 BA, with washers)

GENERAL NOTES

S1-S3 are the waveband switches, in a simple unit with four contacts and a sliding plate. The unit is indicated in our illustration of the underside of the chassis deck. In the L.W. position (control knob slid to left) **S2** and **S3** close; in the M.W. position, **S1** only closes.

S4, S5 are the battery circuit switches, in a spring-loaded unit mounted at the far end of the control panel, beyond the speaker louvres. Its plunger is operated by a projection on the inner edge of the lid of the carrying case. This unit is not seen in our illustrations.

Close Tolerance Capacitors.—For correct alignment tracking, the values of **C1, C6** and **C7** are fairly critical. **C1** and **C6** are rated at ± 2% and **C7** is rated at ½% (0.5%).

Batteries.—The L.T. unit is a Vidor type L5040, rated at 1.5 V, made specially for this receiver. It contains two dry cells and has a non-reversible 2-pin outlet socket. The H.T. unit is a Vidor type L5512, rated at 90 V. This is a layer-built battery with a three-pin outlet socket. Diagrams of the two sockets, drawn as seen from the free ends of the pins, are inset in the circuit diagram overleaf.

Drive Cord Replacement.—The cursor drive cord is quite straightforward, and a sketch is unnecessary. A piece of cord about two feet long is tied into a loop measuring 11 inches overall when stretched between two pins driven into the bench, and the tension spring is tied in when making the knot. Before the knot is tied, the cursor must be threaded on to the cord.

CIRCUIT ALIGNMENT

I.F. Stages.—It is necessary to remove the chassis assembly from the carrying case for these operations, but this is quite easily accomplished by following the instructions referred to in the first paragraph of "Dismantling the Set."

Switch set to L.W., tune to 2,000 m on scale and turn volume control to maximum, short-circuit **C24** (location reference A1) and connect signal generator, via an 0.0001 μF capacitor in the "live" lead, to control grid (pin 6) of **V1** and chassis.

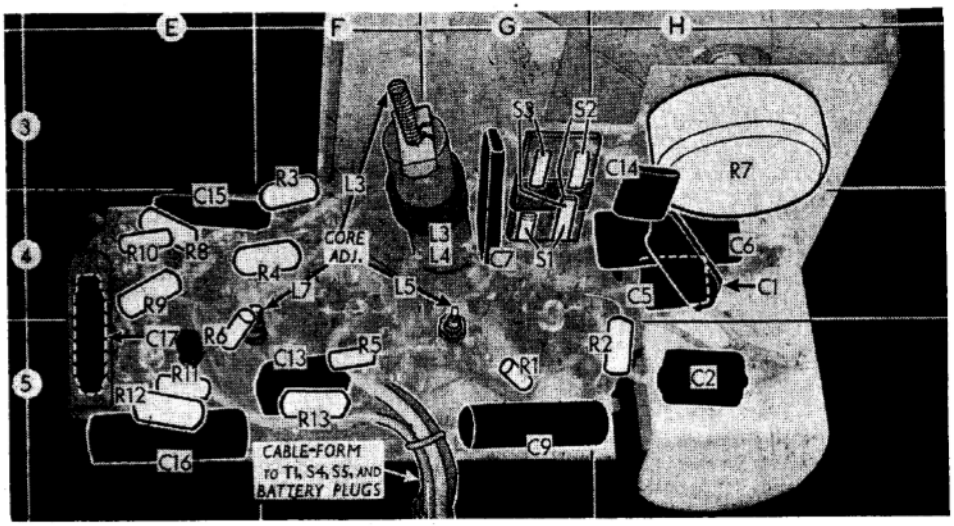
Feed in a 456 kc/s (657.8 m) signal, and adjust the cores of **L8, L7, L6, L5** (D1, E4, C1, G5) for maximum output. Repeat these operations until no improvement results, and finally, remove the short-circuit from **C24** and replace the chassis assembly in the carrying case.

R.F. and Oscillator Stages.—With the gang at maximum capacitance, the left-hand end of the cursor carriage should be coincident with the left-hand edge of the 550 m calibration mark. It may be adjusted in position by rotating the drive drum on its spindle, after slackening the two grub screws, but before this can be done the chassis must be removed from the front panel in accordance with the instructions under "Dismantling the Set."

Replace chassis in carrying case, connect batteries, and lay the signal generator leads close to the frame aerial.

M.W.—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C25** (D1) and **C22** (D1) for maximum output. Tune to 550 m on scale, feed in a 550 m (545.4 kc/s) signal, and adjust the core of **L3** (F3) while rocking the gang, for maximum output. Access may be gained to **L3** core via the battery compartment. Repeat.

L.W.—Switch set to L.W., tune to 1,200 m on scale, feed in a 1,200 m (250 kc/s) signal, and adjust **C21** (D1) for maximum output. If any calibration error exists it will be due, in all probability, to incorrect M.W. alignment or a change in the capacitance of the L.W. loading trimmer **C7** (tolerance ± ½%).



Underside view of the deck. **L3** core can be reached from the battery compartment.

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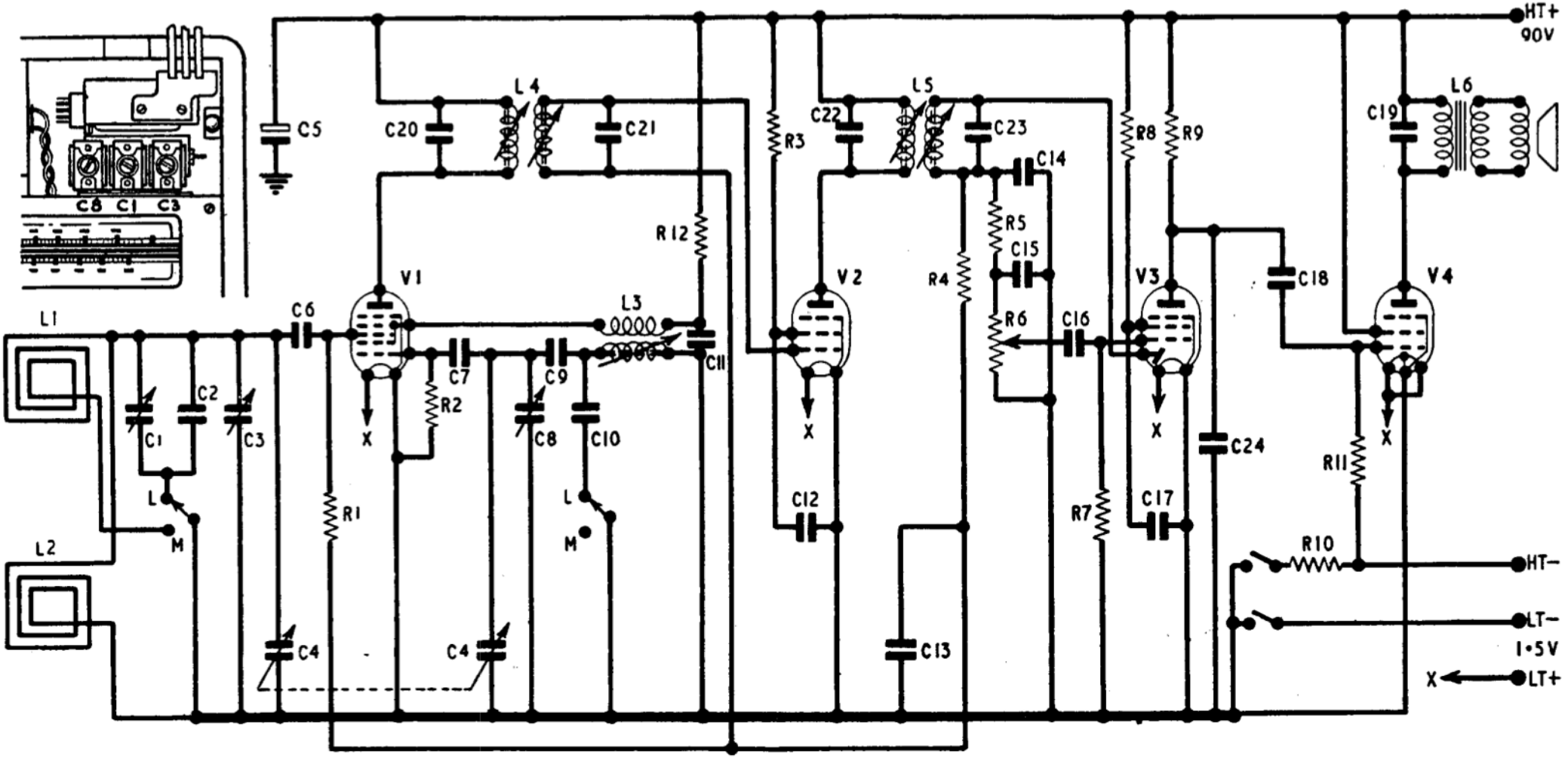

CIRCUIT DIAGRAM AND TRIMMER LAY-OUT—VIDOR MODEL CN.381A

Capacitors.

C1	3·5–50 pF
C2	150 pF.
C3	1·5–15 pF.
C4	523 pF. Swing
C5	2 (200 v.)
C6	100 pF.
C7	100 pF.
C8	3·5–50 pF.
C9	635 pF.
C10	533 pF. (CN381B. 540 pF.)
C11	0·1
C12	0·1
C13	0·05
C14	100 pF
C15	100 pF.
C16	0·001
C17	0·05
C18	0·01
C19	0·005
C20	65 pF.
C21	65 pF.
C22	65 pF.
C23	65 pF.
C24	65 pF.

Resistors.

R1	470k 20%
R2	100k 20%
R3	100k 20%
R4	2·2M 20%
R5	100k 20%
R6	1M Pot.
R7	4·7M 20%
R8	1M 20%
R9	270k 20%
R10	820 10%
R11	2·2M 20%
R12	22k 20%

All ½ W.