*Issued with British Radio and Television, September,* 1955

# *Test Report*

# VIDOR model CN421

## portable radio receiver

**R79** **VIDOR CN421**

THIS is a four-valve superheterodyne receiver for use on a.c. or d.c. mains or from self-contained dry batteries. It covers medium waves (187–571 metres) and long waves (1,052–2,000 metres) and incorporates internal frame aerials, negative feedback and a 5in. p.m. speaker.

### CIRCUIT DETAILS

The input circuit incorporates two high impedance frame aerials. The long wave frame (L2) is situated on a card retained in position against the front of the cabinet by the loudspeaker and output transformer fixing screws and the medium wave frame (L1) is cleated to the four corners of the cabinet. Each frame has an iron cored coil in series (L4 and L3) to facilitate inductance adjustment. The long wave circuit has the loading coil L4 in the earthy end and the medium wave circuit has the frame aerial at the earthy end. When the wavechange switch is set to the medium wave position, the long wave circuit L2/L4/C1/TC1 is shorted out to chassis.

The signal is fed to grid 3 of V1, the heptode frequency changer, via C2 and the r.f. choke L13. A.g.c. is shunt fed to this stage via R1. The local oscillatory voltage, produced by L5/L6 on medium wave or L7/L8 on long wave, is fed into grid 1 via the coupling capacitor C3. All oscillator coils are iron dust cored for inductance adjustment, the padding capacitors being C6 (m.w.) and C8 (l.w.).

The i.f. signal is coupled to the i.f. amplifier V2 via the iron dust cored transformer L9/L10, tuned to 475 kc/s, and the amplified signal is then fed to V3 in a similar manner, to the signal diode, for demodulation. The load resistor is variable and acts as the manual volume control (VR1) and R6/C14/C15 form the usual filter. The voltage developed across the load is applied through the decoupling filter R5/C11 to the grids of the i.f. amplifier and mixer as a.g.c. The bias for the pentode section of V3, which functions as an a.f. amplifier, is obtained from R7, the signal being coupled to the grid via C16.

The audio signal is r.c. coupled to the output valve V4, with fixed tone compensation provided by C18 and C25. A degree of negative feedback is provided by the output/input path through R10. To economise in h.t. battery consumption, extra negative bias is applied to grid 1 of V4 when the receiver is used on batteries only; the bias is developed across part of the grid return resistance (R12) and is fed to the grid via R11.

The power selector switch S3, which is used to select battery or mains operation, is manually operated from inside the cabinet at the rear. In the battery position it connects the 7.5 volt battery to the series-connected filaments and also connects the 90 volt h.t. battery to the receiver. For mains operation the switch disconnects the batteries and supplies the receiver with h.t. voltage from the main supply which has passed through the metal rectifier MR1 and smoothed by R13D, C20 and C22.

The filament supply is obtained from the ballast resistor R13E, with additional smoothing provided by C23. Mains voltage adjustment is by a selector panel which provides a shorting link for use with resistors R13B, R13C and R13D. The taps provided are for 200–210, 220–230 and 240-250 volts. When the back of the receiver is opened, the mains connecting link is broken and the chassis is completely isolated from the mains.

### ALIGNMENT PROCEDURE

If the i.f. circuits have been disturbed, complete i.f. and r.f. alignment must follow. For i.f. alignment the chassis must be withdrawn from the chassis. On mains operation, the chassis and loudspeaker speech coil are "live" and care should be taken when using an output meter connected to the speech coil. During alignment, input signal should be progressively reduced so that the output does not exceed 50 mW.

During r.f. alignment, the receiver must be complete with batteries in their correct positions. To facilitate alignment, the right hand ventilation grille on back of cabinet may be easily removed to afford access to the coils and trimmers. Sufficient signal can be obtained by laying the signal generator output leads close to the receiver.

**I.F. Alignment**

With receiver switched to m.w., volume control to maximum and gang capacitor to minimum capacitance, inject modulated signal of 475 kc/s into rear section of gang capacitor and chassis. Adjust L12, L11, L10 and L9 for maximum output and repeat for optimum results.

**Pointer Alignment**

With chassis assembled into cabinet, rotate gang capacitor to maximum position and move pointer carriage along drive cord to align to calibration point on scale at extreme right hand edge.

**R.F. Alignment**

*Medium Wave*: Inject signal of 600 kc/s, tune receiver to 500 metres and adjust L5 and then L3 for maximum output. Inject signal of 1,500 kc/s, tune receiver to 200 metres, and adjust TC4 and then TC2 for maximum output. Repeat above operations for maximum output.

*Long Wave*: Inject signal of 158 kc/s, tune receiver to 1,900 metres, and adjust L7 and then L4 for maximum output. Inject signal of 273 kc/s, tune receiver to 1,100 metres, and adjust TC3 and then TC1 for maximum. Repeat above operations for optimum results.

**VALVE VOLTAGE DATA**

| Valve | | Mains Volts | Mains mA | Battery Volts | Battery mA |
|---|---|---|---|---|---|
| V1 | Anode | 90 | 0.6 | 87 | 0.8 |
| | Grid 2 | 30 | 1.6 | 29 | 1.6 |
| | Grid 4 | 48 | 0.15 | 45 | 0.15 |
| V2 | Anode | 90 | 1.2 | 87 | 1.6 |
| | Grid 2 | 48 | 0.5 | 45 | 0.6 |
| V3 | Anode | — | 0.035 | — | 0.035 |
| | Grid 2 | — | 0.015 | — | 0.015 |
| V4 | Anode | 86 | 7.7 | 84 | 4.3 |
| | Grid 1 | — | — | —2 | — |
| | Grid 2 | 90 | 1.7 | 87 | 0.9 |
| Total nominal h.t. current | | | 13.5mA | | 10mA |
| Total nominal l.t. current | | | 46.28mA | | 55.2mA |
| Reservoir voltage | | | 218 | | — |

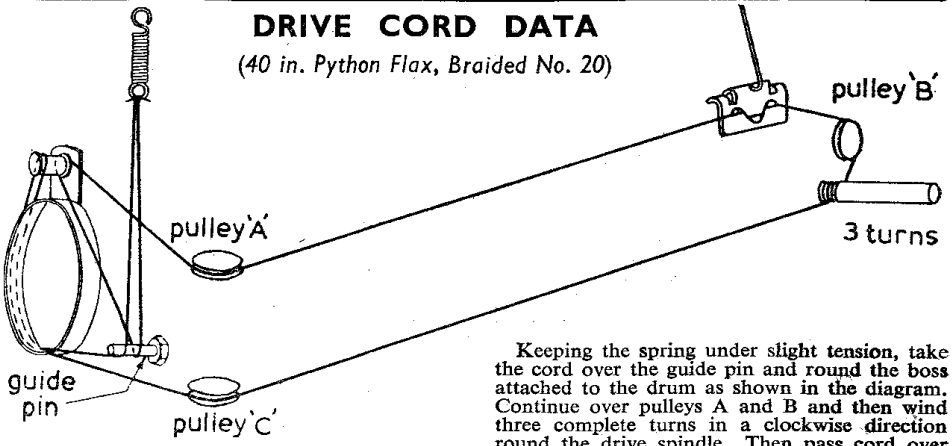
Above figures taken using 500 o.p.v. metre, wavechange switched to m.w. and under no-signals conditions. Variations of ±15% may be anticipated between models and with higher or lower mains voltages. The figures above were made with input voltage of 245 volts a.c. into 240–250V tap. Batteries were 90 and 7.5 volts.

**SERVICE SNAPS FOR THE VIDOR MODEL CN421**

**Valves:** DK92 (f.c.), DF91 (i.f.), DAF91 (det., a.g.c., a.f.), DL94 (output).
**Intermediate Frequency:** 475 kc/s.
**Volume Control:** 1MΩ, log law, with d.p. switch.
**Electrolytics:** 32+32μF, 275V; 100μF, 25V.
**Voltage Range:** Mains—200–250 volts a.c. or d.c., *live chassis.* Batteries—90V h.t., 7.5V l.t.

**DRIVE CORD DATA**

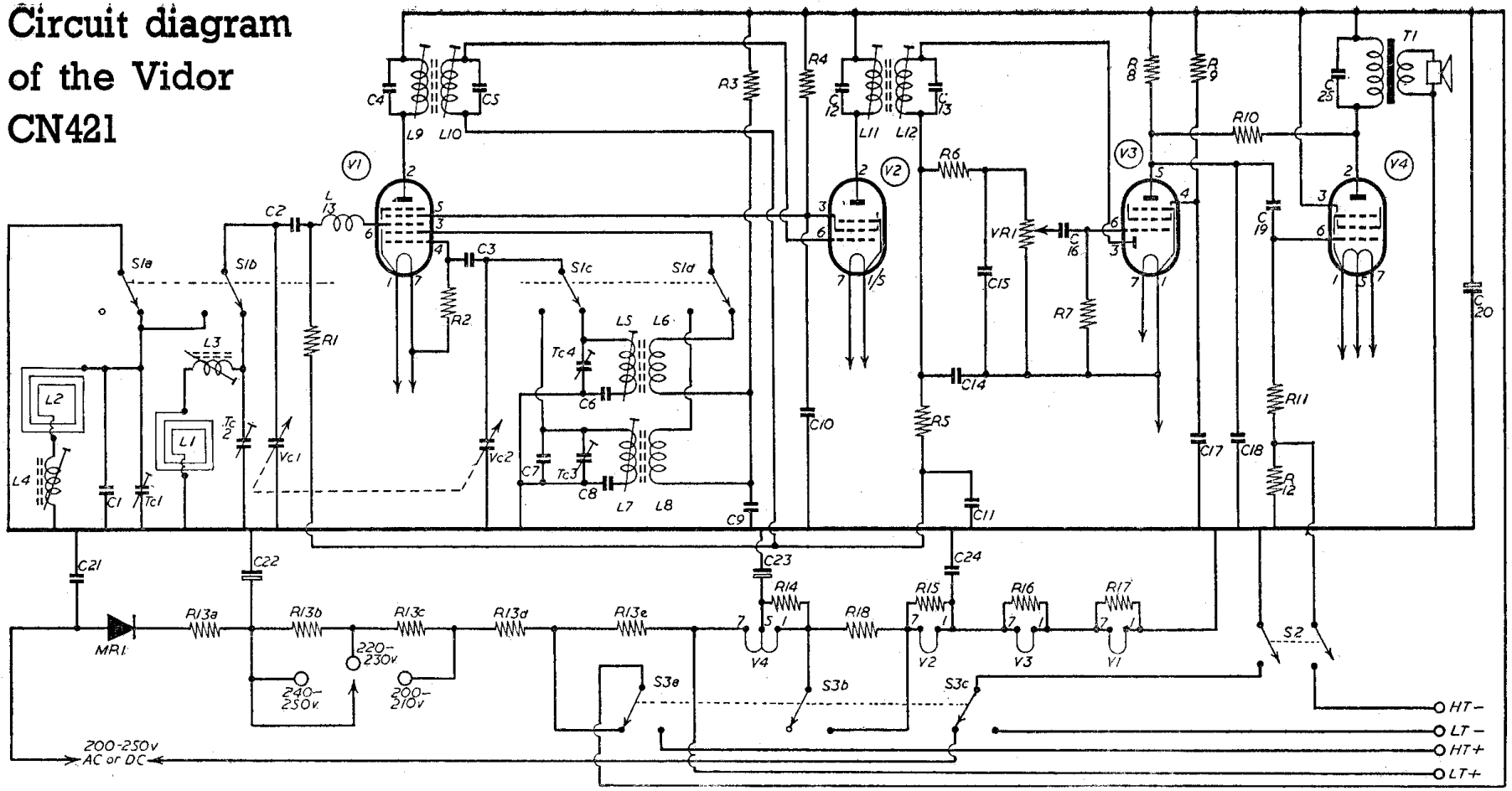
*(40 in. Python Flax, Braided No. 20)*




To fit new cord, first rotate gang capacitor to maximum (vanes fully meshed). Then tie one end of drive cord securely to spring and anchor other end of spring to the lug projecting from the chassis adjacent to the long wave oscillator coil.

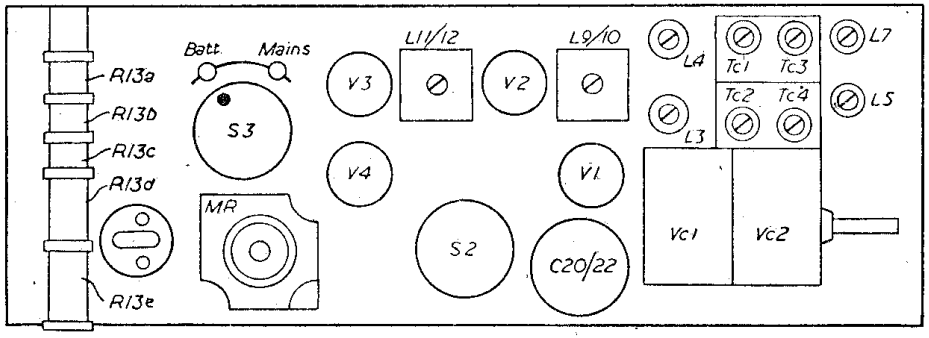
Keeping the spring under slight tension, take the cord over the guide pin and round the boss attached to the drum as shown in the diagram. Continue over pulleys A and B and then wind three complete turns in a clockwise direction round the drive spindle. Then pass cord over pulley C and round drum in clockwise direction for approximately half turn, round boss and back round drum in reverse direction. Continue over guide pin, pass end of cord through spring and knot under tension. Attach pointer carriage to cord as shown.

# Circuit diagram of the Vidor CN421




## COMPONENT LIST

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Resistors** | | R14 | 330Ω | C13 | 65pF | L3 | 4.4Ω |
| R1 | 4.7MΩ | R15 | 150Ω | C14 | 100pF | L4 | 6.6Ω |
| R2 | 27kΩ | R16 | 120Ω | C15 | 100pF | L5 | 3.2Ω |
| R3 | 33kΩ | R17 | 120Ω | C16 | 0.001μF | L6 | 1.3Ω |
| R4 | 39kΩ | R18 | 10Ω | C17 | 0.05μF | L7 | 6.6Ω |
| R5 | 2.2MΩ | VR1 | 1MΩ | C18 | 220pF | L8 | 2.25Ω |
| R6 | 47kΩ | **Capacitors** | | C19 | 0.01μF | L9 | 20.5Ω |
| R7 | 4.7MΩ | C1 | 100pF | C20 | 32μF,275V | L10 | 20.5Ω |
| R8 | 1MΩ | C2 | 100pF | C210.01μF,600Va.c. | | L11 | 20.5Ω |
| R9 | 4.7MΩ | C3 | 100pF | C22 | 32μF, 275V | L12 | 20.5Ω |
| R10 | 8.2MΩ | C4 | 65pF | C23 | 100μF, 25V | L13 | 6.4Ω |
| R11 | 2.2MΩ | C5 | 65pF | C24 | 0.05μF | T1 | 760Ω (pri.) |
| R12 | 220Ω | C6 | 532pF | C25 | 220pF | | |
| R13 | 4,255Ω, 18¾W | C7 | 200pF | Tc1-Tc4 | 4-70pF | **Valves** | |
| R13a | 315Ω, 5¼W | C8 | 280pF | Vc1/Vc2 | 528pF swing | V1 | DK92 |
| R13b | 365Ω, 1¼W | C9 | 0.1μF | **Coils** | | V2 | DF91, W17, 1T4 |
| R13c | 365Ω, 1¼W | C10 | 0.1μF | L1 | 1.8Ω | V3 | DAF91, ZD17, 1S5 |
| R13d | 1,410Ω, 6W | C11 | 0.05μF | L2 | 16.4Ω | V4 | DL94, N19, 3V4 |
| R13e | 1,800Ω, 4½W | C12 | 65pF | | | | |




**Above chassis view showing location of valves, trimmers and i.f.t's.**

### DISMANTLING

To remove the chassis from the cabinet, pull off the knobs from the three front controls and open back of cabinet. Then unsolder the four leads from the frame aerial and unscrew two nuts at each end of the chassis. Raise carrying handle and remove chassis by drawing it to the rear.

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