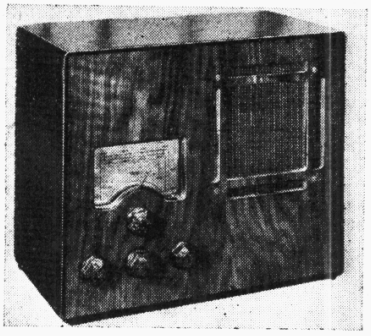
Supplement to The Wireless & Electrical Trader, June 2, 1945

"TRADER" SERVICE SHEET 725

VIDOR CN213

AC/DC TRF RECEIVER



The appearance of the Vidor CN213, AC/DC TRF receiver.

THREE pentodes and a rectifier form the valve complement in the Vidor CN213, a 2-band TRF receiver designed to operate from AC or DC mains of 200-250 V, 50-100 c/s in the case of AC mains.

Heater current is controlled by a current regulating barretter, so that mains voltage adjustments are not required. In some models the speaker field is shunted across the HT circuit, but in others it is used as an HT smoothing choke.

Our sample was of an early type, but the differences in the later version are described under "Chassis Divergencies" overleaf.

Release date and original price: 1934; £8 8s.

CIRCUIT DESCRIPTION

Aerial input via variable series capacitor **C15** and coupling coils **L1, L2** to single-tuned circuit **L3** (MW), plus **L4** (LW), and **C16,** which precedes variable-mu RF pentode valve **(V1, Mullard metallised VP13A),** a signal frequency amplifier.

The earth socket is isolated from the mains by **C1,** and the aerial socket by **C15.** A potential divider **R1, R2, R3, R4** across the HT circuit provides screen and cathode potentials for **V1,** whose gain is varied by adjusting **R4. R3** limits the minimum GB excursion by preventing the cathode from reaching chassis potential. **C15,** which is controlled by the user, permits a certain degree of aerial matching.

Tuned-anode coupling by **L6, L7** and **C19** between **V1** and RF pentode detector valve **(V2, Mullard metallised SP13),** which operates on the grid leak system with **C5** and **R6.** Reaction coupling from anode is applied via **L5,** and controlled by **C18.** RF filtering by **C7** and **R9.**

Resistance-capacitance coupling by **R8, C8** and **R10,** via grid stopper **R11,** between **V2** and pentode output valve **(V3, Mullard Pen 26).** Fixed tone correction by **C11** in anode circuit.

When the receiver is operating from AC mains, HT current is supplied by half-wave rectifying valve **(V4, Mullard UR1** or **CY1;** or **UR2** or **CY2** with the two halves in parallel) which, with DC mains, behaves as a low resistance. Smoothing by iron-cored choke **L11** and electrolytic capacitors **C12, C13.** The surge limiter **R14** and fuse lamp **F1** protect the valve from overload.

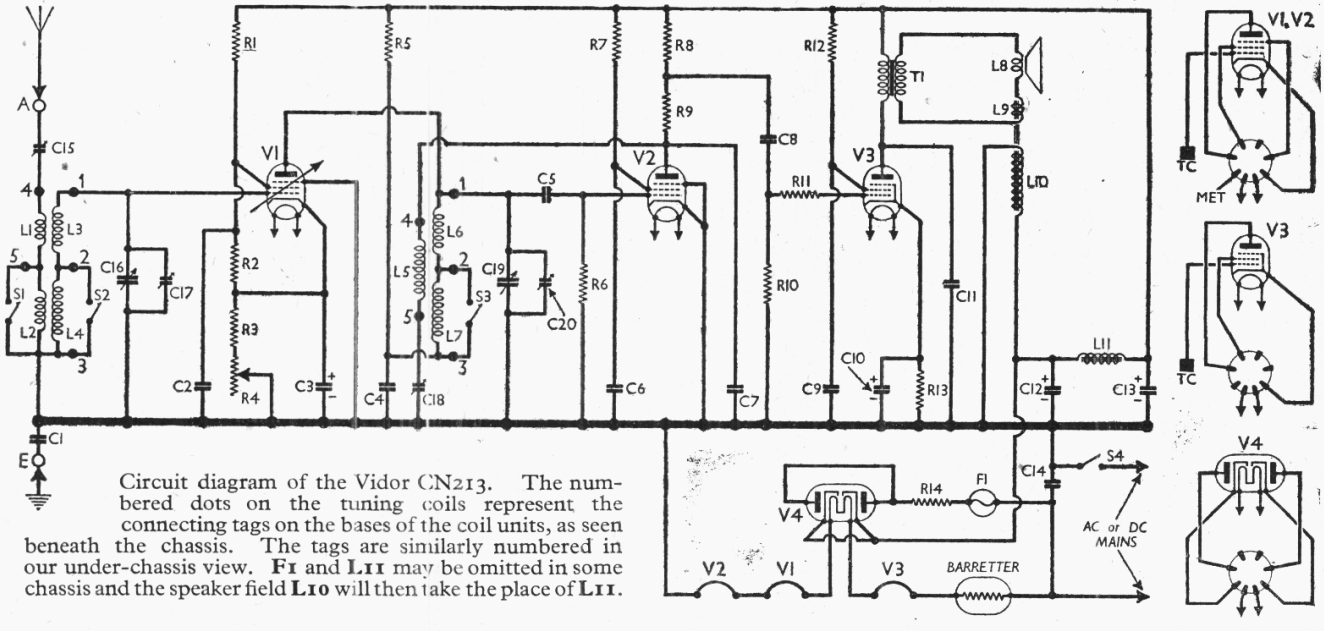
Valve heaters, together with current regulating barretter **(Philips C1)** are connected in series across mains input circuit. Mains RF filtering by **C14.**

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)
R1	V1 SG potential divider	15,000
R2	V1 SG potential divider	15,000
R3	V1 fixed GB resistor	300
R4	V1 gain control	10,000
R5	V1 anode HT feed	20,000
R6	V2 grid leak	1,000,000
R7	V2 SG HT feed	1,000,000
R8	V2 anode load	250,000
R9	RF stopper	50,000
R10	V3 CG resistor	500,000
R11	V3 grid stopper	250,000
R12	V3 SG HT feed	20,000
R13	V3 GB resistor	400

	CAPACITORS	Values (μF)
C1	Earth isolator	0·02
C2	V1 SG decoupling	0·05
C3*	V1 cathode by-pass	25·0
C4	V1 anode decoupling	0·25
C5	V2 CG capacitor	0·0001
C6	V2 SG decoupling	0·05
C7	RF by-pass	0.0002
C8	V2 to V3 AF coupling	0·01
C9	V3 SG decoupling	1·0
C10*	V3 cathode by-pass	25·0
C11	Fixed tone corrector	0·01
C12*	HT smoothing capacitors	8·0
C13*	HT smoothing capacitors	16·0
C14	Mains RF by-pass	0·05
C15†	Aerial series capacitor	0·000175
C16†	Aerial circuit tuning	—
C17‡	Aerial MW trimmer	—
C18†	Reaction control	—
C19†	V1 anode tuning	—
C20‡	V1 anode MW trimmer	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Vidor CN213. The numbered dots on the tuning coils represent the connecting tags on the bases of the coil units, as seen beneath the chassis. The tags are similarly numbered in our under-chassis view. **F1** and **L11** may be omitted in some chassis and the speaker field **L10** will then take the place of **L11.**

	OTH	ENTS	Approx. Values (ohms)
L1	} Aerial coupling coils	... {	1.25
L2			3·0
L3	} Aerial tuning coils...	... {	4·25
L4			15·0
L5	Reaction coil ...	...	2·5
L6	} V1 anode tuning coils	... {	4·25
L7			14·5
L8	Speaker speech coil	...	2·0
L9	Hum neutralising coil	...	0·2
L10	Speaker field coil ...	...	7,500·0
L11	HT smoothing choke	...	400·0
T1	Speaker input trans. { Pri.		600·0
	Sec.		0·2
S1-S3	Waveband switches	...	—
S4	Mains switch, ganged R4...		—
F1	HT fuse (0·5A lamp)	...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the makers. Voltages were measured with a Universal Avometer. They refer in particular to the later model, with the series-connected speaker field, but values will still be approximately correct for either model.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP13A	128	4·25	80	0·4
V2 SP13	40	0·5	25	0·15
V3 Pen 26	190	38·0	105	5·5
V4 UR1	—	58·0†	—	—

†At 220V. input.

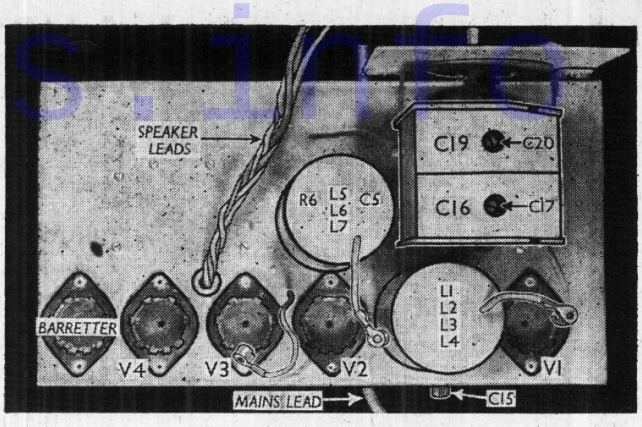
DISMANTLING THE SET

Removing Chassis.—Remove the four control knobs (recessed grub screws); remove the four screws (with washers) holding the chassis to the bottom of the cabinet, when the chassis may be withdrawn to the extent of the speaker and fuse leads (if a fuse is fitted).

To free chassis entirely, free the fuse lamp bracket from the side of the cabinet (wood screw) and unsolder from the speaker transformer the leads connecting it to chassis.

When replacing, connect the speaker field leads to the two outer tags on the transformer, and the two leads from **V3** anode and HT + to the two inner tags. In chassis where the speaker field is used as a smoothing choke, only three leads will be necessary, and the two tags connected to HT + will be joined together.

Plan view of the chassis. The connecting tags of the coil units **L1–L4** and **L5–L7** are indicated in the under-chassis view below. **C17** and **C20**, on the gang assembly, are the only pre-set adjustments.



Removing Speaker.—Remove the nuts and washers from the four ornamental-headed screws holding the speaker to the front of the cabinet.

When replacing, the transformer should point to the top right-hand corner of the cabinet. The leads should be connected as previously described.

GENERAL NOTES

Switches.—The waveband switches **S1-S3** are ganged in an assembly mounted on the front chassis member. They all close in the MW position (control knob anti-clockwise) and open in the LW position. **S4** is the QMB mains switch, ganged with the gain control **R4.**

Coils.—The aerial coils **L1-L4** and the RF and reaction coils **L5-L7** are in two screened units on the chassis deck, the second unit also containing **C5** and **R6.** The connections to these units are brought out to tags on their bases, beneath the chassis, and the tags are identified in our under-chassis view by numbers in circles (1 to 5 in each unit) to agree with similar numbers in the circuit diagram, where the tags are indicated by large black dots. A sixth tag on the **L5-L7** takes one end of **R6** to chassis. **L11** is the HT smoothing choke, beneath the chassis deck.

External Speaker.—No provision is made for this, but one of low impedance (about 2.5 Ω) could be connected to the secondary tags of **T1,** suitable precautions being taken to avoid the possible risk of shock to the user if **T1** insulation should go down.

Capacitors C3, C10.—These were separate 25 μF, 25 V DC working electrolytics in our chassis, but the makers' instructions suggest that in some cases the two might be contained in a single unit.

Capacitors C12, C13.—These are two dry electrolytics in a single container beneath the chassis deck. Both sections are rated at 500 V peak. The red lead is the positive of **C13** (16 μF) and the yellow lead that of **C12** (8 μF). The black lead is the common negative connection.

Fuse F1.—This consists of a lamp rated at 0.5 A with an MES base. It is fitted to the side of the cabinet and connected by flexible leads to the chassis.

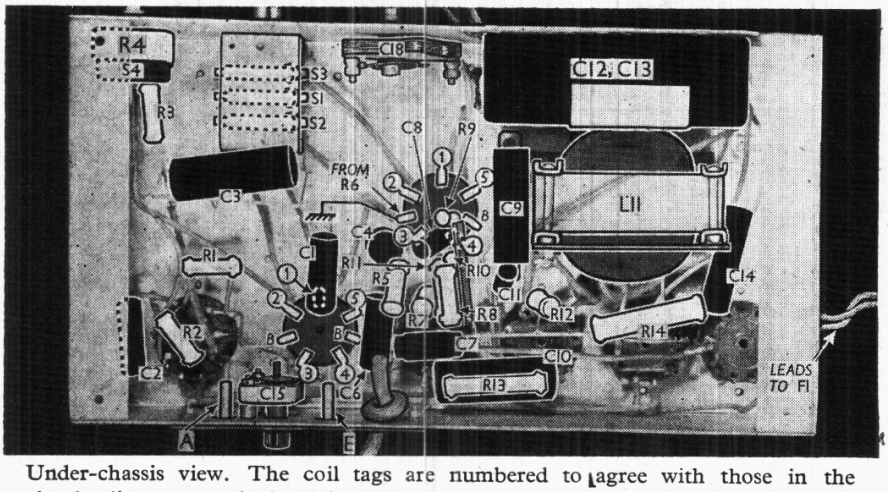
Chassis Divergencies. — Our sample chassis was of a fairly early type, and later several modifications were made during production. The speaker field **L10,** which was shunt-fed, was connected in series with the HT supply and used as a smoothing choke to replace **L11,** which was discarded. The DC resistance of **L10** was then reduced from 7,500 Ω to 820 Ω.

The fuse lamp **F1** was also discarded, and the surge limiter **R14** may in some cases consist of two 200 Ω resistors in parallel. **V4** was changed from **UR2** to **UR1,** although where a chassis is wired for **UR2,** either type can be used, because pins 1 and 4 (cathodes) are joined together, as are also pins 5 and 8 (anodes), on the holder. **CY1** and **CY2** can also be used as direct replacements, and so can **UR3C** if the valve holder is changed to seven-pin.

CIRCUIT ALIGNMENT

This consists simply of adjusting **C17** and **C20** for maximum output at 200 m, which the pointer should indicate when the gang is at minimum, feeding in a 200 m (1,500 kc/s) signal to **A** and **E** sockets, with **C15** set a little short of maximum, and the gain control at maximum.

C20 and **C18** (reaction control) should then be adjusted in turn for optimum results. Finally, the calibration should be checked at several positions on both wavebands.



Under-chassis view. The coil tags are numbered to agree with those in the circuit diagram overleaf. The HT smoothing choke **L11** may be omitted in some chassis. The fuse lamp **F1** is mounted on the cabinet.

Printed in Great Britain by The Cornwall Press Ltd., Paris Garden, London, S.E.1