'TRADER' SERVICE SHEET 239

BURNDEPT 266 AND VIDOR 275

TWO short-wave ranges of 15-51 metres (referred to below as S.W.1) and 50-180 metres (S.W.2) are covered by the Burndept 266 5-valve 4-band battery superhet. The receiver has separate mixer and oscillator valves, and provision for both a gramophone pick-up and an extension speaker, while a push button on the volume control knob allows the scale to be illuminated when desired.

An identical chassis is fitted in the Vidor 275 receiver.

CIRCUIT DESCRIPTION

Aerial input via coupling coils **L1** (S.W.1), **L3** (S.W.2), **L5** (M.W.), and **L7** (L.W.) to single tuned circuits **L2, C22** (S.W.1), **L4, C22** (S.W.2), **L6, C22** (M.W.) and **L8, C22** (L.W.).

First valve (**V1, Mullard metallised VP2B**) is a variable-mu R.F. hexode operating as frequency changer with suppressor grid injection, in conjunction with separate triode oscillator valve (**V2, Cossor metallised 210 DET**). Oscillator grid coils **L9** (S.W.1), **L11** (S.W.2) **L13** (M.W.) and **L15** (L.W.) are tuned by **C23**; parallel trimming by **C24** (S.W.1), **C25** (S.W.2), **C26** (M.W.) and **C6, C27** (L.W.); series tracking by **C7** (fixed, S.W.1), **C28** (S.W.2), **C29** (M.W.) and **C30** (L.W.).

Anode reaction by coils **L10,** (S.W.1), **L12** (S.W.2), **L14** (M.W.) and **L16** (L.W.).

Third valve (**V3, Mullard metallised VP2B**) is a variable-mu R.F. hexode operating as R.F. pentode intermediate frequency amplifier with tuned-primary tuned-secondary transformers **C31, L17, L18, C32** and **C33, L19, L20, C34.**

Intermediate frequency 473 KC/S.

Diode second detector is part of double diode triode valve (**V4, Mullard metallised TDD2A**). Audio frequency component in rectified output is developed across load resistance **R8** and passed via I.F. stopper **R9,** A.F. coupling condenser **C12** and manual volume control **R10** to C.G. of triode section. Fixed tone correction by condenser **C11.** Provision for connection of gramophone pick-up between **C9** and chassis.

Second diode of **V4,** fed from **V3** anode via **C10,** provides D.C. potentials which are developed across load resistances **R12, R13** and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control.

Resistance-capacity coupling by **R11, C14** and **R14** via I.F. stopper **R15** between **V4** triode and pentode output valve (**V5, Mullard PM22A**). Fixed tone correction in anode circuit by condenser **C15.** Provision for connection of high impedance external speaker across primary of internal speaker input transformer **T1.** H.T. circuit R.F. filtering by **C3, C4** (H.T. + 1) and **C16, C17** (H.T. + 2).

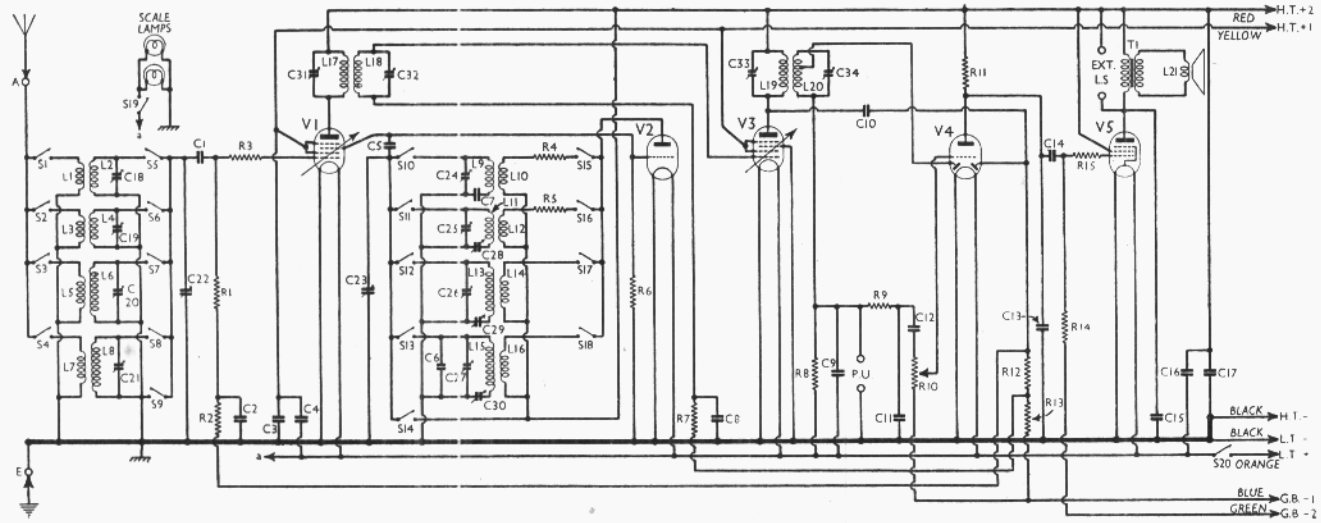
COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 C.G. resistance	500,000
R2	V1 C.G. decoupling resistance	500,000
R3	Aerial circuit stabiliser	50
R4	Osc. anode reaction S.W.1 damping	50
R5	Osc. anode reaction S.W.2 damping	250
R6	V2 C.G. resistance	50,000
R7	V3 C.G. decoupling resistance	500,000
R8	V4 signal diode load	500,000
R9	I.F. stopper	50,000
R10	Manual volume control	500,000
R11	V4 triode anode load	100,000
R12, R13	V4 A.V.C. diode load resistances	1,000,000
R14	V5 C.G. resistance	500,000
R15	V5 C.G. I.F. stopper	1,000,000
		50,000

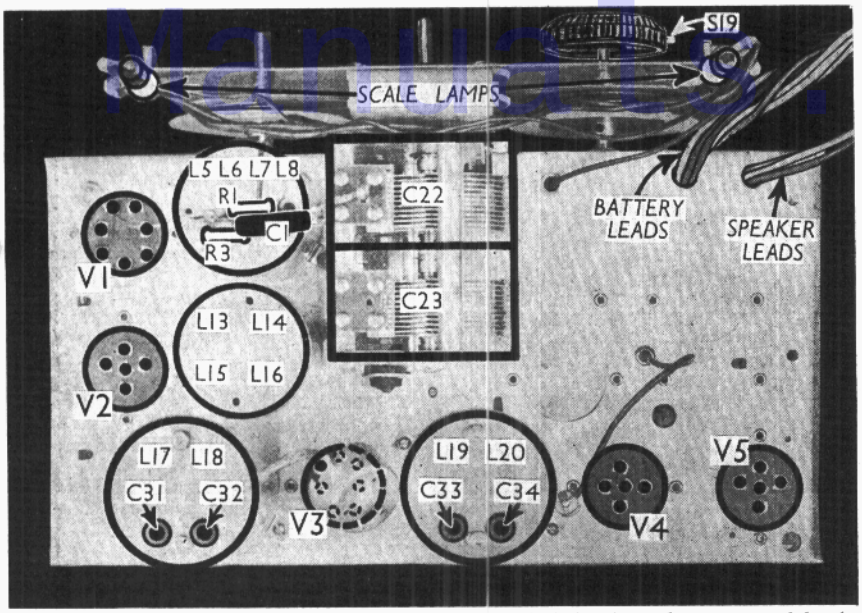
	CONDENSERS	Values (μF)
C1	V1 C.G. condenser	0·0001
C2	V1 C.G. decoupling	0·1
C3, C4	V1, V3 S.G.'s by-pass condensers	0·1
C5	V2 C.G. condenser	0·0001
C6	Osc. circuit L.W. fixed trimmer	0·00004
C7	Osc. circuit S.W.1 tracker	0·005
C8	V3 C.G. decoupling	0·1
C9	I.F. by-pass	0·0001
C10	Coupling to V4 A.V.C. diode	0·0001
C11	Fixed tone corrector	0·001
C12	A.F. coupling to V4 triode	0·05
C13	I.F. by-pass	0·0005
C14	A.F. coupling to V5	0·05
C15	Tone corrector	0·001
C16, C17	H.T. circuit R.F. by-passes	0·1, 0·25
C18‡	Aerial circuit S.W.1 trimmer	—
C19‡	Aerial circuit S.W.2 trimmer	—
C20‡	Aerial circuit M.W. trimmer	—
C21‡	Aerial circuit L.W. trimmer	—
C22†	Aerial circuit tuning	—
C23†	Oscillator circuit tuning	—
C24‡	Osc. circuit S.W.1 trimmer	—
C25‡	Osc. circuit S.W.2 trimmer	—
C26‡	Osc. circuit M.W. trimmer	—
C27†	Osc. circuit L.W. trimmer	—
C28‡	Osc. circuit S.W.2 tracker	—
C29†	Osc. circuit M.W. tracker	—
C30‡	Osc. circuit L.W. tracker	—
C31‡	1st I.F. trans. pri. tuning	—
C32‡	1st I.F. trans. sec. tuning	—
C33‡	2nd I.F. trans. pri. tuning	—
C34‡	2nd I.F. trans. sec. tuning	—

† Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial S.W.1 coupling coil	1·4
L2	Aerial S.W.1 tuning coil	0·05
L3	Aerial S.W.2 coupling coil	0·4
L4	Aerial S.W.2 tuning coil	0·4
L5	Aerial M.W. coupling coil	1·2
L6	Aerial M.W. tuning coil	2·1
L7	Aerial L.W. coupling coil	100·0
L8	Aerial L.W. tuning coil	9·0
L9	Osc. circuit S.W.1 tuning coil	0·05



Circuit diagram of the Burndept 266 and Vidor 275. **V1** and **V3** are both R.F. hexodes.



Plan view of the chassis. **S19** is a push-button switch in the volume control knob.

OTHER COMPONENTS (*Continued*)			Approx. Values (ohms)
L10	Osc. anode S.W.1 reaction		0·4
L11	Osc. circuit S.W.2 tuning coil		0·3
L12	Osc. anode S.W.2 reaction		34·0
L13	Osc. circuit M.W. tuning coil		3·8
L14	Osc. anode M.W. reaction		60·0
L15	Osc. circuit L.W. tuning coil		4·6
L16	Osc. anode L.W. reaction		1·5
L17	1st I.F. trans.	Pri.	5·0
L18	1st I.F. trans.	Sec.	5·0
L19	2nd I.F. trans.	Pri.	5·0
L20	2nd I.F. trans.	Sec., total	5·0
L21	Speaker speech coil		2·5
T1	Speaker input trans.	Pri.	700·0
T1	Speaker input trans.	Sec.	0·4
S1-S18	Waveband switches		—
S19	Scale lamp switch		—
S20	L.T. circuit switch, ganged R10		—

DISMANTLING THE SET

A detachable bottom is fitted to the cabinet and upon removal (four countersunk-head wood screws) gives access to most of the components beneath the chassis.

Removing Chassis.—If it is necessary to remove the chassis from the cabinet, remove the three control knobs (recessed grub screws) and unsolder the lead to the scale lamps from the tag on the switch included in the volume control knob. Now remove the felt from the two feet at the back of the cabinet and remove the four bolts (with washers) holding the chassis to the bottom of the cabinet.

Next free the speaker leads from the cleats on the side of the cabinet and one of the speaker fixing screws, when the chassis can be withdrawn to the extent of these leads, which is sufficient for normal purposes.

When replacing the chassis, do not forget to push the lead for the scale lamp switch through the hole for the volume control spindle before inserting the chassis in the cabinet.

To free the chassis entirely, unsolder the speaker leads and *when replacing*, connect the black leads to the two tags on the transformer terminal strip and the green lead to one of the eyelets holding the strip to the transformer.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, remove the nuts and lock washers from the four screws holding it to the sub-baffle. *When replacing*, see that the transformer is on the left and do not forget to fix the cleat for the speaker leads on the top right-hand screw.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new H.T. battery reading 138 V on the H.T. section, on load. The receiver was tuned to the lowest wavelength on the medium wave band and the volume control was at maximum, but there was no signal input.

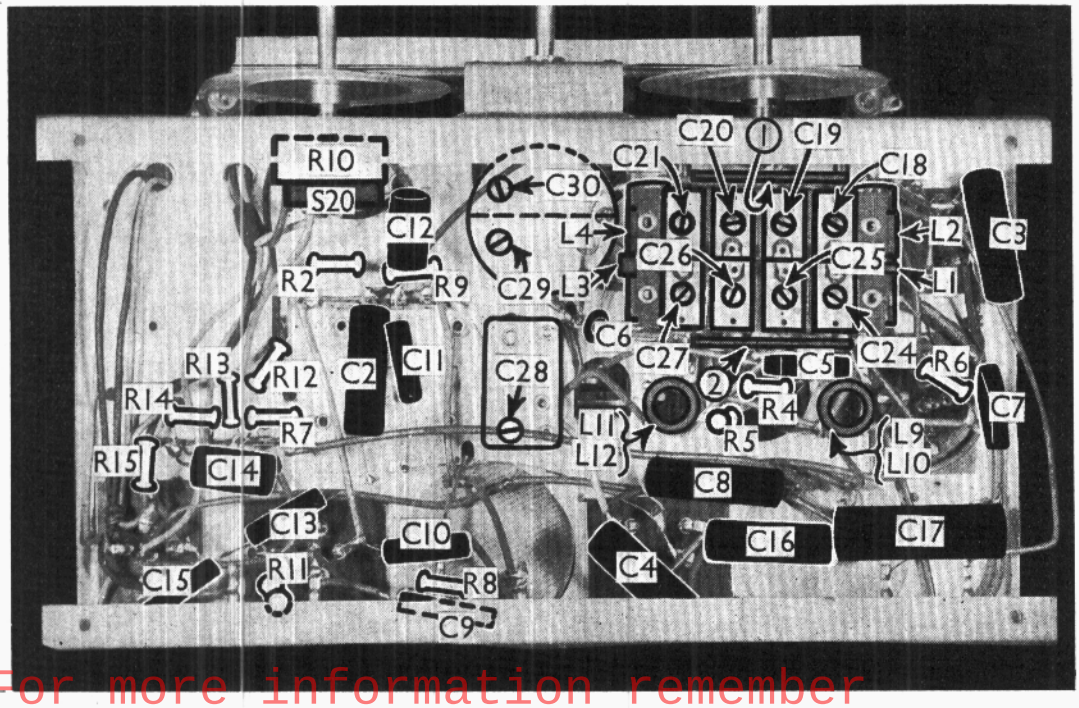
Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VP2B	138	0·7	55	0·9
V2 210DET	138	5·3	—	—
V3 VP2B	138	1·7	55	0·6
V4 TDD2A	78	0·5	—	—
V5 PM22A	133	5·2	138	0·8

GENERAL NOTES

Switches.—The wavechange and gramo-

Continued overleaf



Under - chassis view. Note the bank of trimmers over the wavechange switch units, also the coils **L1, L2** and **L3, L4** at the sides of them.

BURNDEPT 266—*Continued*

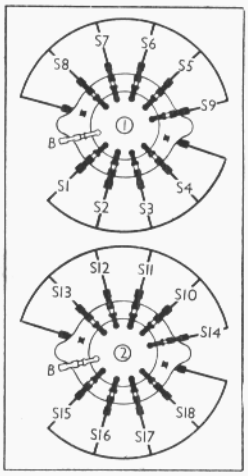
phone switches **S1-S18** are in two ganged rotary units beneath the chassis, indicated in our under-chassis view, and shown in detail in the diagrams on this page. It will be noted on examining the actual units that each has a large plate on the rotor which shorts together all the switches, except the two in use in each unit. On gram. the switches **S9** and **S14** mute the radio circuits.

The makers' diagram shows the two contacts which are marked blank (B) in our diagrams connected to chassis and H.T. line respectively. This modification would add two switches which would provide extra muting on gram.

In our circuit and switch diagrams we have omitted the switches formed by the centre plates for the sake of clarity. If they were included the total number of wavechange and gramophone switches would rise from eighteen to thirty-six.

The table below gives the switch positions for the five control settings, starting from fully anti-clockwise. A dash indicates open, and **C** closed.

Switch	Gram. (G)	S.W.1 (1)	S.W.2 (2)	M.W. (3)	L.W. (4)
S1	—	C	—	—	—
S2	—	—	C	—	—
S3	—	—	—	C	—
S4	—	—	—	—	C
S5	—	C	—	—	—
S6	—	—	C	—	—
S7	—	—	—	C	—
S8	—	—	—	—	C
S9	C	—	—	—	—
S10	—	C	—	—	—
S11	—	—	C	—	—
S12	—	—	—	C	—
S13	—	—	—	—	C
S14	C	—	—	—	—
S15	—	C	—	—	—
S16	—	—	C	—	—
S17	—	—	—	C	—
S18	—	—	—	—	C



Switch diagrams, looking from the rear of the underside of the chassis. These have been simplified as explained above.

S19 is the scale lamp switch, incorporated in the volume control knob. It is normally open, but when the small button is pressed, it closes and switches on the scale lamps.

S20 is the L.T. circuit switch, ganged with the volume control, **R10**.

Coils.—**L1, L2; L3, L4; L9, L10** and **L11, L12** are on four tubular un- screened units beneath the chassis. **L5-L8, L13-L16,** and the I.F. transformers **L17, L18** and **L19, L20** are in four screened units on the chassis deck.

Scale Lamps.—These are two Osram M.E.S. types, rated at 2.5 V, 0.2 A. They are switched in circuit by **S19.**

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance external speaker.

Batteries.—L.T., 2 V cell; H.T. and G.B., Vidor combined H.T. and G.B. battery, 135 V H.T. plus 9 V G.B. (Type L5014/18496).

Battery Leads and Voltages.—Black lead, spade tag, L.T. negative; orange lead, red spade tag, L.T. positive 2 V; black lead and plug, H.T. negative; yellow lead and plug, H.T. positive 1, + 54 V; red lead and plug, H.T. positive 2, + 135 V; blue lead and plug, G.B. negative 1, — 1.5 V; green lead and plug, G.B. negative 2, — 4.5 V.

CIRCUIT ALIGNMENT

For alignment the volume control should be at maximum. With the gang fully meshed the pointer should coincide with the two ends of the scales.

I.F. Stages.—Remove the grid connector from the top of **V1,** and connect signal generator to top cap of the valve and chassis, with a 0.25 MO resistance across these two points. Short **C23.**

Feed in a 473 KC/S (634·2 m.) signal, and adjust **C34, C33, C32** and **C31** in that order for maximum output. Repeat with low signal input, and check by swinging generator from 468 to 478 KC/S, noting that resonance occurs exactly at 473 KC/S.

Remove short from **C23** and replace normal top cap of **V1.**

R.F. and Oscillator Stages.—Connect signal generator to **A** and **E** sockets.

Switch set to L.W., tune to 750 m. on scale, feed in a 750 m. signal, and adjust **C27,** then **C21** for maximum output. Feed in a 2,000 m. signal, tune it in on receiver, and adjust **C30** for maximum output, rocking the gang slightly for optimum results. Re-trim **C27** and **C21** and re-track **C30** until no further improvement results.

On the M.W. (3) band and S.W.2 (2) band a similar procedure is adopted. On M.W., adjust **C26** and **C20** at 200 m. and **C29** at 550 m. On S.W.2, adjust **C25** and **C19** at 50 m., and **C28** at 170 m.

On the S.W.1 (1) band, there is no variable tracker, so **C24** and **C18** are adjusted at 13.5 m. Trimming is very critical on this band, and care must be taken to see that the pressure of the trimming tool is not affecting the process. If a dummy aerial is used with the signal generator, it should be replaced by a 40 $\mu\mu$F fixed condenser on the S.W.1 band.

MAINTENANCE PROBLEMS

Arcing From Output Transformer

AN H.M.V. 438 receiver brought in for service a few weeks ago gave no signals whatsoever, but on rotating the ganged condenser loud sparking sounds were heard at various points.

This looked like being a very tricky fault to locate until I turned out the light and noticed that the sparking was not actually coming from the vanes of the gang but from the speaker. At certain points on the dial, arcing was taking place between the output transformer and the metallic paper which lines the interior of the cabinet.

On examining the speaker I found that the voice coil was open circuited and the resultant surge voltages on a powerful signal were arcing from one of the leads from the transformer primary to the metallic paper. The insulation on this lead had been poor, and had now broken down almost entirely.—A. H. RIGBY, WALLINGTON.

Ekco AD65 Badly Damaged

IT was reported that a flash had been seen in an Ekco AD65 A.C./D.C. receiver, and that it had suddenly ceased working. Taking this as a warning it was decided to make some tests before connecting to the mains.

These tests revealed a dead short on the field coil, a damaged rectifier valve, a wire-wound resistance, feeding the pilot bulb, burnt out, the bulb also burnt out and a 100 O wire-wound resistance in the heater circuit had a burnt appearance on its insulated covering.

The field coil was tackled first, and it was found that the coil itself was not damaged, but the inside lead out had been brought up the side of the coil with no insulating material to protect it. This enamelled wire had chafed on the top edge of the coil, and so caused a dead short. A piece of silk was inserted at this point, and the speaker re-assembled and centred. An independent test proved this to be O.K.

A suitable resistance was not available to replace the bulb feed resistance, which had been wound on the mains resistance former, and it was decided to send for the mains resistance assembly. When received this was found to contain a 100 O resistance in addition, and this was used to replace the burnt heater resistance.

The receiver was then assembled, fitted with a new rectifier and pilot bulb, and ganged, and was found to be normal.—W. G. GOUGH, WORCESTER.

Volume Control Inoperative

RECENTLY I had another interesting case of an Ekco AC86 which, the customer alleged, would suddenly become extremely loud and could not be reduced by the volume control.

This fault would not occur when I tested the receiver and only showed up for a short while when on a soak test. In spite of careful checking of the components in the volume control circuit, nothing could be found wrong, but it was discovered that the symptoms could be produced by disconnecting the condenser at the earth end of the control. We therefore replaced this component and the set has given no further trouble.—J. WALL, YORK.