

NUMBER SIXTY-FIVE

'TRADER' SERVICE SHEETS

BURGOYNE 'FURY STAR'

3-VALVE (PLUS RECTIFIER) A.C./D.C. RECEIVER

A THREE-VALVE (plus rectifier) A.C./D.C. circuit is employed in the Burgoyne "Fury Star" table model receiver, the chassis being suitable for operation on A.C. mains of 25-100 cycles, 200-250 V, or D.C. supplies of 200-250 V.

The same chassis is fitted in a table radio-gramophone and also a pedestal radio-gramophone. Under the same name "Fury Star" there is also a pedestal radio-gramophone designed for A.C. mains only.

CIRCUIT DESCRIPTION

Two alternative aerial input connections via choke coil **L2** and fixed condenser **C1** to coupling coil **L3**. **A2** is for normal use, while **A1**, with wavetrap **L1**, **C18**, is for use when interference from Droitwich is experienced.

Single-tuned circuit **L4**, **L5**, **C19** precedes variable- μ pentode H.F. amplifier (**V1**, Mullard metallised **VP13A**). Gain control by variable resistance **R4**, which varies G.B. applied.

Tuned-secondary transformer coupling by **L6**, **L7**, **L9**, **L10** and **C22** to H.F. pentode detector (**V2**, Mullard metallised **SP13**) which operates on grid-leak system with **C6** and **R5**. Reaction is applied from anode by coil **L8** and controlled by variable condenser **C21**. Provision for connection of gramophone pick-up in grid circuit; **S6** connects pick-up, and **S2** short-circuits aerial coupling coil and thus prevents radio break-through.

H.F. filtering in **V2** anode circuit by choke **L11** and condenser **C10**.

Resistance-capacity coupling by **R8**, **C11** and **R10** to pentode output valve (**V3**, Mullard **Pen36C**). **R9** is an H.F. stopper and **C12** an H.F. by-pass. Tone compensation in anode circuit by fixed condenser **C14**.

When the receiver is used with A.C. mains, H.T. current is supplied by a special half-wave rectifying valve (**V4**, **Brimar 1D5**), which operates as a low resistance with D.C. supplies. Smoothing by speaker field winding **L14** and the two dry electrolytic condensers **C15**, **C16**.

Heaters of all valves are connected in series together with voltage regulating barretter lamp (**Philips C1**) across mains supply.

COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 S.G. potential divider	10,000
R2		30,000
R3	V1 fixed G.B. resistance	400
R4	V1 gain control	5,000
R5	V2 grid leak	500,000
R6	V2 S.G. H.T. feed	1,000,000
R7	V2 anode decoupling	10,000
R8	V2 anode load	100,000
R9	V3 grid H.F. stopper	50,000
R10	V3 grid resistance	250,000
R11	V3 auto. G.B. resistance	160

Condensers		Values (μ F)
C1	Aerial series condenser	0.0001
C2	Aerial circuit L.W. trimmer	Very low
C3	Earth blocking condenser	0.1
C4	V1 cathode by-pass	0.1
C5	V1 S.G. by-pass	0.1
C6	V2 grid condenser	0.0001
C7	Pick-up isolating condenser	0.1
C8	V2 anode decoupling	0.1
C9	V2 S.G. by-pass	0.1
C10	V2 anode H.F. by-pass	0.0005†
C11	L.F. coupling to V3	0.01
C12	V3 grid H.F. by-pass	0.001
C13*	V3 cathode by-pass	50.0
C14	Tone compensator	0.005
C15*	H.T. smoothing	8.0
C16*		12.0
C17	V4 anode-cathode by-pass	0.15
C18	Droitwich wavetrap tuning	0.0002
C19	Aerial circuit tuning	0.0005
C20†	Aerial circuit trimmer	—
C21	Reaction condenser	0.0005
C22	H.F. transformer tuning	0.0005
C23†	H.F. transformer trimmer	—

*Electrolytic. †Pre-set. ‡May be 0.0003 μ F. §May be 0.01 μ F.

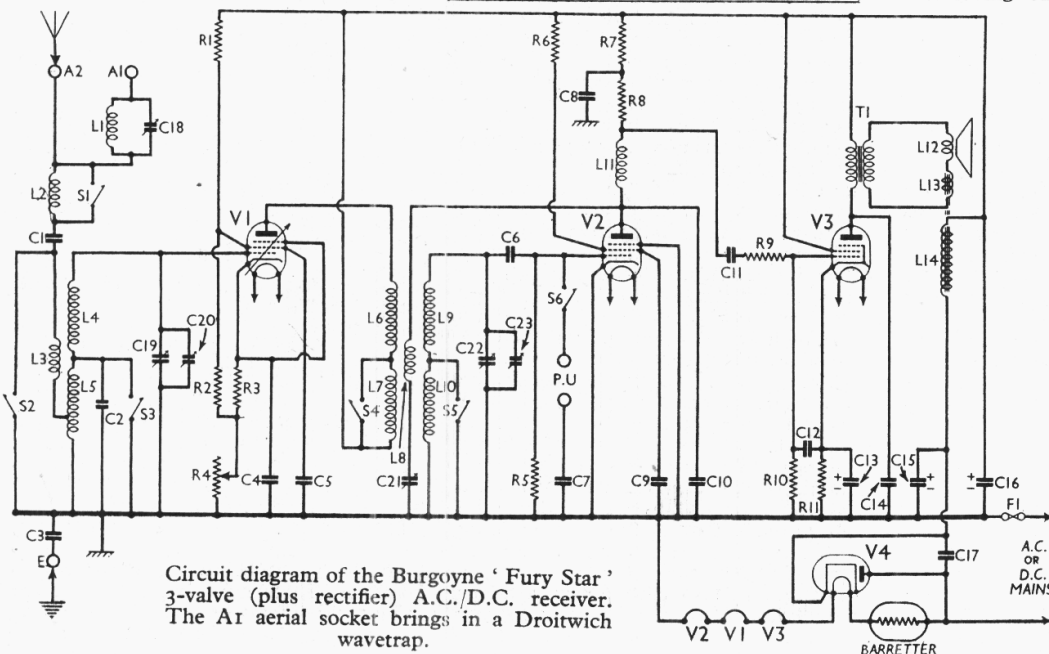
Other Components		Values (ohms)
L1	Droitwich wavetrap coil	31.0
L2	Aerial choke coil	20.0
L3	Aerial coupling coil	2.5
L4	Aerial tuning coils	4.6
L5		20.0
L6	H.F. transformer primary	2.9
L7		8.6
L8	Reaction coil	1.6
L9	H.F. transformer secondary	4.6
L10		20.0
L11	V2 anode H.F. choke	290.0
L12	Speaker speech coil	2.5
L13	Hum neutralising coil	0.1
L14	Speaker field winding	2000.0
T1	Speaker input trans. { Pri... Sec... }	500.0 0.4
S1	Waveband switches	—
S2-S5		—
S6		Radio muting switch (gram.)
S7	Gram-pick-up switch	—
F1	Mains circuit fuse	—

DISMANTLING THE SET

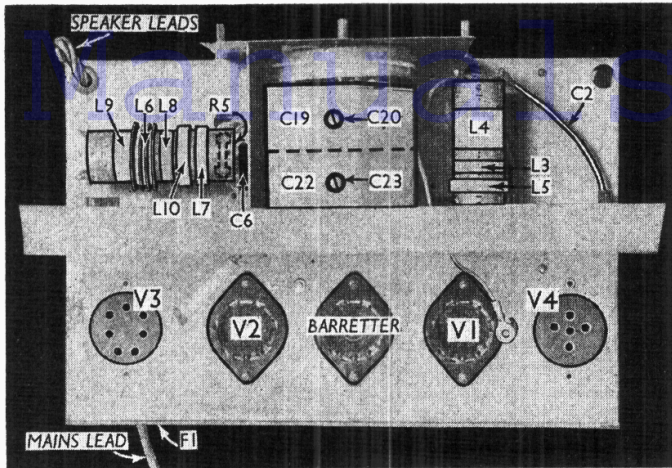
Removing Chassis.—Remove the back (eight wood screws and washers), the three control knobs (recessed grub screws) and the threaded bush from the switch. Remove the three round-head wood screws passing through the flange at the back of the chassis into the cabinet bottom.

It is now possible to withdraw the chassis to the extent of the speaker leads, which is enough to allow normal repairs to be carried out.

If it is necessary to remove the chassis entirely, free the speaker leads from the cleat holding them to the top of the cabinet, and unsolder them from the terminal panel. The tags on the panel are numbered and the code (reading



Circuit diagram of the Burgoyne 'Fury Star' 3-valve (plus rectifier) A.C./D.C. receiver. The A1 aerial socket brings in a Droitwich wavetrap.



Plan view of chassis. All the coils are indicated. Note that R5 is inside the H.F. transformer, with C6 at its side. C2 is a very small fixed condenser.

external speaker, and it would not be wise to connect one across the primary of the internal speaker transformer. If one is fitted at all, it must be across the secondary of the internal speaker transformer, and should therefore be of the low resistance type.

Valve Connections.—Two of the valves and the barretter have bases of the Mullard side contact type. The contacts are numbered on the moulding beneath the holders, and a separate diagram is also given on this page. The connections are as follow: **V1** and **V2**.—1, Metallising; 2, Heater; 3, Heater; 4, Cathode; 5, Supp. grid; 6, Blank; 7, Scr. grid; 8, Anode; Top Cap, cont. grid. **NOTE.**—In the case of **V1** the tag of contact 6 is used as a bearer. **Barretter.**—Pins 5 and 8 only are used.

V3 and **V4** have standard 7 and 5 pin bases respectively.

Condensers C10, C14.—These are 0.0003 μ F and 0.1 μ F types in our chassis,

from left to right, with the transformer at the top) is:—F and 3 joined together, blue-white; 1, grey; 2, blank; F, green-white. The green lead goes to the speaker chassis.

When replacing control knobs, take care that the switch knob is replaced correctly, since the spindle is not slotted.

Removing Speaker.—Four bolts hold the speaker to the sub-baffle, and by taking the nuts off these, the speaker can be removed.

VALVE ANALYSIS

Valve voltages and currents given in the table below were measured with the receiver operating on 225 V A.C. mains, with no signal input, and the volume control turned up to such a point that the plates of the reaction condenser were just out of mesh. Voltages were measured on the 1,200 V scale of an Avometer, with chassis as negative.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 VP13A	160	4.2	115	0.8
V2 SP13	75	0.5	20	0.1
V3 Pen36C	140	34.5	160	7.4
V4 1D5*	—	—	—	—

*Cathode to chassis 265 V D.C.

GENERAL NOTES

Switches.—The wavechange and radiogram switches, S1-S6, are in a single unit, and are indicated in the under-chassis view. Note that S1, S3, S4 and S5 are in the lower bank, looking from beneath the chassis, while there are two switches between S2 and S3 in the upper bank which are blank. The following table gives the switch positions for the various settings of the knob, O indicating open and C closed.

Position	S1	S2	S3	S4	S5	S6
M.W.	C	O	C	C	C	O
L.W.	O	O	O	O	O	O
Gram.	O	C	O	O	O	C

No mains switch is fitted in this receiver. **Coils.**—The two coils L1 and L2, and the choke L11 are beneath the chassis, the remainder of the coils being in two unscreened units on the chassis deck. The individual coils are plainly indicated

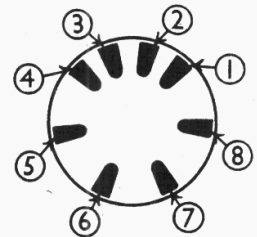
in our plan chassis view. Note that the resistance R5 is within the H.F. transformer unit.

Fuse.—This is reached by taking off a paxolin cover plate at the rear of the chassis (2 screws). The fuse itself is a length of 1 A fuse wire gripped under two screws.

Condensers C13, C15, C16.—These are three dry electrolytics in one unit. They have a common negative (black) lead. The green lead is the positive of C13 (50 μ F), the yellow the positive of C15 (8 μ F) and the red the positive of C16 (12 μ F).

Condenser C2.—This is a very small fixed condenser, formed by the capacity between the wire in a short length of rubber-covered flex and its metallic braiding. It is indicated in the plan chassis view. The braiding is taken to chassis, and the wire in the rubber covered lead to one of the coil tags.

External Speaker.—Since this is an A.C./D.C. set, there is no provision for

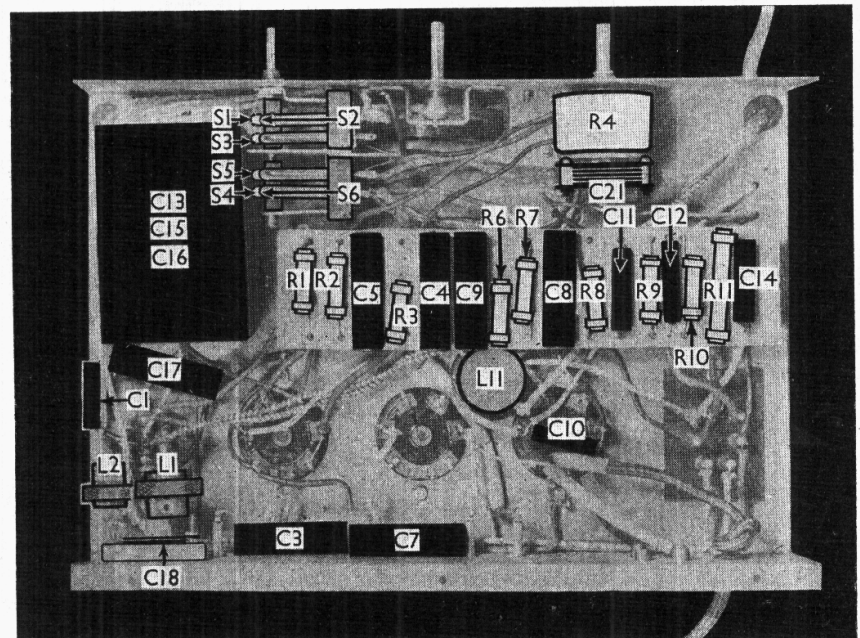


Under-side view of a side-contact valve base.

but in earlier models they may be .0005 μ F and 0.01 μ F respectively.

Valve V3.—This is a Mullard Pen 36C in our chassis, but may be a Mazda Pen 3520 in early models.

Coil L1.—This may be centre-tapped in later chassis.



Under-chassis view. S1, S3, S4 and S5 are at the lower side of the switch unit, with S2 and S6 above, having two blank contacts between them.