

NUMBER FORTY-ONE  
(VOLUME TWO)

# 'TRADER' SERVICE SHEETS

## LOTUS MODEL 66

UNIVERSAL (A.C./D.C.) RECEIVER

Condensers (cont.)		Values (μF)
C16	Mains by-pass	0.1
C17	Aerial circuit tuning	0.0005
C18	Aerial circuit trimmer	—
C19	H.F. circuit tuning	0.0005
C20	H.F. circuit trimmer	—
C21	Reaction condenser	0.0003
C22*	Across speaker field winding	4.0

\* Not in our chassis.

THE Lotus Model 66 Universal receiver has a "straight-three" circuit, employing three pentode valves, two of the H.F. type in the H.F. and detector stages, and one output type. In addition there is, of course, a rectifier which operates when the set is used on A.C., and a barretter lamp for breaking down the mains voltage (150-250 A.C. or D.C.), and keeping the heater voltages substantially constant.

### CIRCUIT DESCRIPTION

Aerial input by way of alternative fixed series condensers **C1**, **C2**, and coupling coils **L1**, **L2**, to single tuned circuit **L3**, **L4**, **C17**.

First valve (**V1**, **Triotron metalised S2034N**) is a variable-mu pentode operating as H.F. amplifier with gain control by variable cathode resistance **R4**.

Tuned-secondary transformer coupling to H.F. pentode detector (**V2**, **Triotron metalised S2035N**) working on grid leak system with **C6** and **R6**. Primary **L5**, **L6**; secondary **L7**, **L8** tuned by **C19**. Reaction applied from anode of detector by coils **L9**, **L10**, and controlled by variable condenser **C21**. Provision for connection of gramophone pick-up in grid circuit, with switching by **S4**.

Resistance-capacity coupling to high-efficiency output pentode (**V3**, **Triotron P2460**). Fixed tone compensation in anode circuit by condenser **C12**.

When the receiver is used with A.C. mains, H.T. current is supplied by a half-wave rectifier which takes the form of a special full-wave valve (**V4**, **Triotron G3412**) with its anodes and cathodes strapped. With a D.C. supply in use the

valve behaves as an ordinary resistance of low value.

Smoothing is effected by a choke **L14** and electrolytic condensers **C14**, **C15**, and the speaker field is connected across the main H.T. supply.

The valve heaters are connected in series together with two scale lamps and an automatic voltage regulating barretter (**Philips 1928**).

### COMPONENTS AND VALUES

Resistances		Values (ohms)
R1	V1 S.G. pot. divider	50,000
R2		50,000
R3	V1 fixed G.B. resistance	400
R4	V1 gain control	10,000
R5	V2 S.G. H.T. feed	250,000
R6	V2 grid leak	250,000
R7	V2 anode decoupling	20,000
R8	V2 anode resistance	50,000
R9	V3 aux. grid H.T. feed	20,000
R10	V3 grid H.F. stopper	50,000
R11	V3 grid resistance	500,000
R12	V3 G.B. resistance	400
R13*	V4 anodes resistances	50
R14*		50

\* Not in our chassis.

Condensers		Values (μF.)
C1	Aerial series condensers	0.001
C2		0.0001
C3	Earth blocking condenser	0.01
C4	V1 S.G. by-pass	0.1
C5	V1 cathode by-pass	0.1
C6	V2 grid condenser	0.0001
C7	V2 S.G. by-pass	0.1
C8	V2 anode decoupling	0.1
C9	V2 anode H.F. by-pass	0.0003
C10	L.F. coupling to V3	0.01
C11	V3 aux. grid by-pass	0.1
C12	V3 anode tone compensator	0.02
C13	V3 cathode by-pass, electrolytic	25.0
C14	H.T. smoothing, electrolytics	25.0
C15		8.0

Other Components		Values (ohms)
L1	Aerial coupling coils	10.0
L2		100.0
L3		3.5
L4	Aerial tuning coils	12.0
L5		1.4
L6	M.W. H.F. coupling coil	Very Low
L7	L.W. H.F. coupling coil	230.0
L8		3.5
L9	H.F. circuit tuning coils	12.0
L10		8.0
L11	Speaker speech coil	2.2
L12	Hum neutralising coil	0.1
L13	Speaker field winding	10,000
L14	H.T. smoothing choke	430
T1	Speaker input trans.	{ Pri... 450 Sec... 0.3
S1-S3	Wave-band switches, ganged	—
S4	Radio-gramophone switch	—
S5	Mains switch, ganged R4	—
F1*	500 mA fuse	—

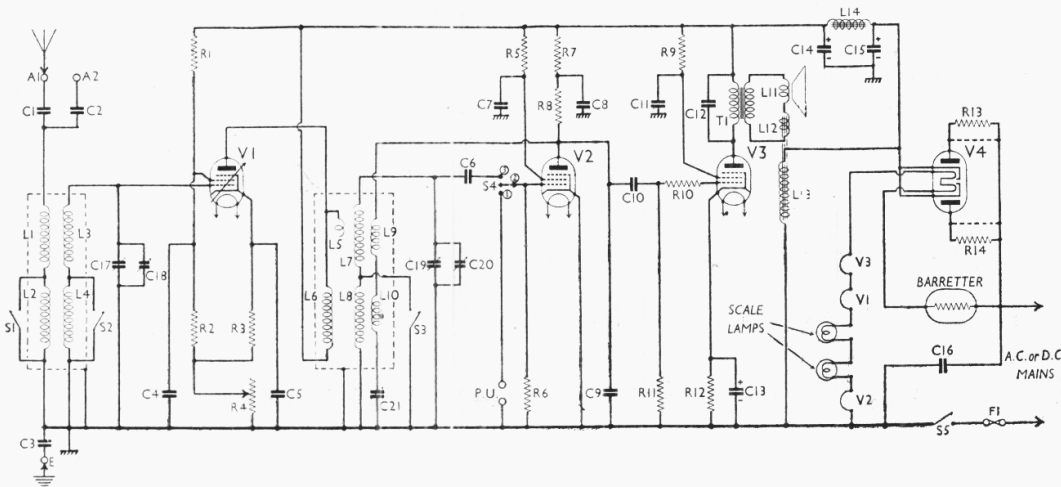
\* May be 800 mA.

### DISMANTLING THE SET

**Removing Chassis.**—Remove the knobs (grub screws), and unscrew the four screws, with washers, holding chassis to base of cabinet. Chassis may now be withdrawn to extent of speaker cable. To remove it entirely, unsolder the speaker leads from the tags on speaker transformer. When replacing, the colour coding, from left to right, is yellow, blue, blue, red.

After the chassis has been replaced, it is advisable to insulate the chassis fixing screws by means of enamel or wax to prevent accidental contact with them, while it is a good plan to insert wax into the grub screw holes in the control knobs. Do not forget the felt washers behind the knobs.

**Removing Speaker.**—This should be



The circuit diagram of the Lotus Model 66 Universal receiver. Note that the coupling coil **L5** has only one end connected. The switch **S4** has its contacts numbered as in our under-chassis view. In our chassis **R13** and **R14** are omitted, and dotted lines indicate the connections to the anodes of **V4**. An alternative rectifier circuit is shown on the opposite page.

removed, where necessary, complete on its baffle. The baffle is held in place by two wood screws at the bottom, and a grooved wooden fillet at the top.

### VALVE ANALYSIS

The voltage and current readings listed in the table are those obtained from an average chassis working with a 230 V 50 c.p.s. A.C. mains supply. No aerial or earth connections were made, and the gain control was set at maximum and the reaction control at minimum.

All voltages were measured on the 1,200 V scale of an Avometer.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 S2034N	240	3.5	85	1.4
V2 S2035N	85	2.0	40	0.85
V3 P2460	220	40.0	120	6.0
V4 G3412*	—	—	—	—

\* Cathodes to chassis 270 V D.C.

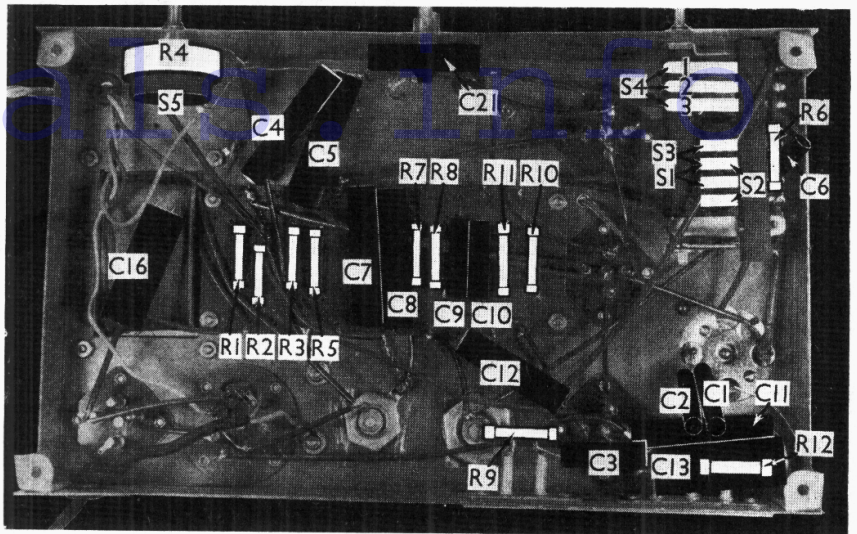
### GENERAL NOTES

**Switches.**—S1-S3 are the wave-change switches, S4 is the single-pole change-over radio-gram switch, and S5 is the Q.M.B. mains switch ganged with R4.

S1-S4 are in a single assembly shown in our under-chassis view. The three fixed contacts at the top and above the moving spindle are those of S4, and are numbered. On "gramophone," contacts 1 and 2 are closed, while on M.W. or L.W., contacts 2 and 3 are closed.

The remaining four contacts, beneath the operating spindle, form switches S1-S3, one contact, the second from the top of the lower group, being common. The three switches are indicated by arrows. All three are closed on M.W. and open on L.W. and Gram.

**Coils.**—These are in two units mounted on top of the chassis and seen in our

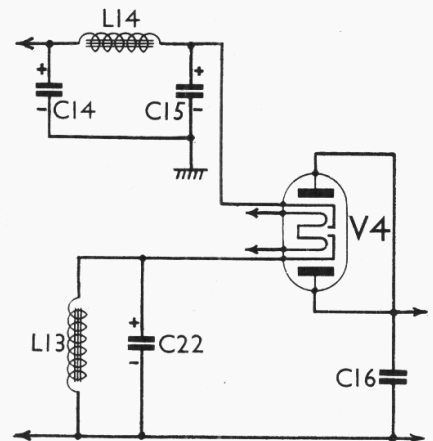


Under-chassis view. The contacts of the switch unit S1-S4 are clearly indicated. Note that S1, S2 and S3 each have one contact common. The S4 contacts are numbered as in the circuit diagram.

plan chassis view. The screening covers have been removed in our illustration. The aerial unit comprises L1-L4 and the H.F. unit, L5 to L10. L1 is actually mounted inside the tubular former, near the base, and is indicated by a dotted arrow. L5 consists of two turns only, wound over L7. L9 is also wound over L7, but there is a thick band of insulating material between. L8 and L10 are separate, but are wound in one unit.

**Alternative Rectifier Circuit.**—The rectifier circuit may be as shown in our main circuit diagram, or as in the separate small diagram on this page. In the first case the two cathodes are

connected together, while in the second they are separate. In this case one-half of the valve supplies H.T. for the set (when used on A.C.), and the other supplies the speaker field energising current. Note that R13 and R14 are omitted, and C22 (electrolytic) is added in the second case.



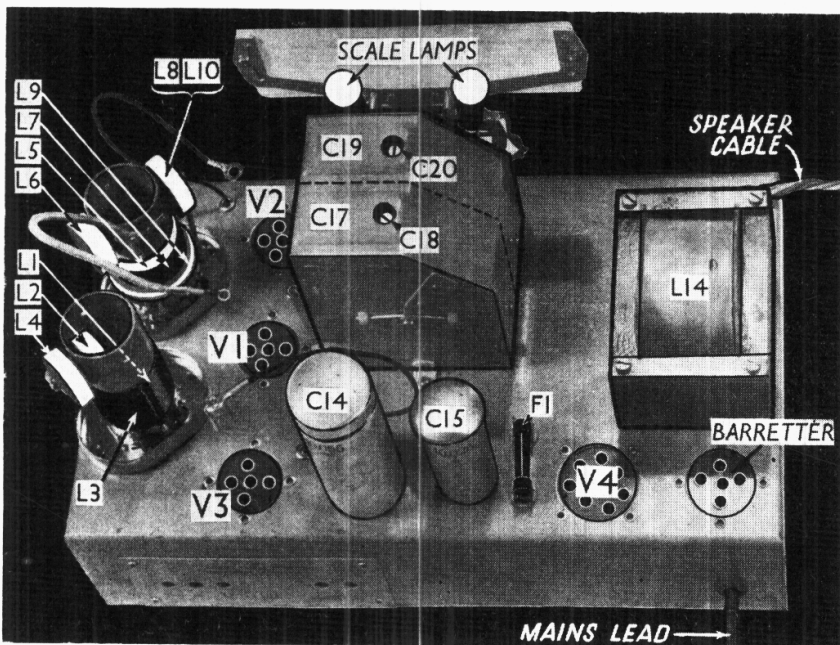
Alternative output circuit, in which the extra condenser C22 is introduced, but R13 and R14 are omitted. Note that the cathodes of V4 are separated.

**Fuse F1.**—This is a standard 1 1/4 in. glass type, rated at 800 mA, but that in our chassis was marked 0.5 A.

**Scale Lamps.**—These are two Ever Ready M.E.S. types, rated at 6.2 V, 0.3 A.

**Connections of R3.**—The circuit diagram shows the connections as in our chassis, but these may be slightly different in others.

**Valve V3.**—This is an indirectly-heated output pentode with a 5-pin base, instead of the more usual 7-pin. The top cap is the control grid and the "grid" pin is the auxiliary grid, the other pins being connected normally.



Plan view of the chassis. The coil screens have been removed, and all the individual coils are indicated by arrows. L1 is out of sight inside the cylindrical former, and close to the chassis.