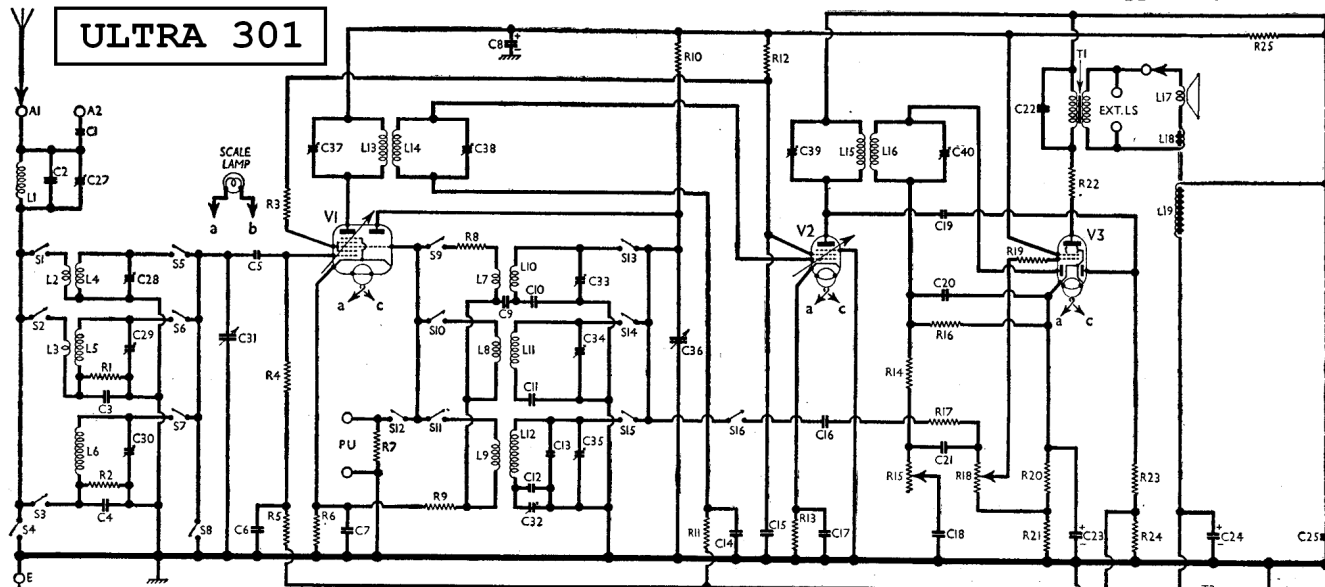


ULTRA 301



CONDENSERS

		Values (μ F)
C1	A2 series condenser...	0-00005
C2	Aerial IF rejector fixed trimmer	0-002
C3	Aerial MW coupling condenser	0-004
C4	Aerial LW coupling condenser	0-002
C5	V1 heptode CG condenser...	0-00005
C6	V1 heptode CG decoupling	0-05
C7	V1 cathode by-pass...	0-1
C8*	V1; and V2, V3 SG's decoupling	4-0
C9	Part osc. SW reaction coupling	0-0002
C10	Osc. circuit SW tracker	0-004
C11	Osc. circuit MW tracker	0-000318
C12	Osc. circ. LW fixed tracker	0-00006
C13	Osc. circ. LW fixed trimmer	0-00001
C14	V2 CG decoupling	0-05
C15	V1; V2 SG's RF by-pass	0-1
C16	V1 triode to V3 AF coupling	0-004
C17	V2 cathode by-pass...	0-1
C18	Part of variable tone control	0-002
C19	Coupling to V3 AVC diode	0-00001
C20	IF by-pass	0-0002
C21	AF coupling to V3 tetrode	0-01
C22	Fixed tone corrector	0-004
C23*	V3 cathode by-pass...	50-0
C24*	HT smoothing condensers	8-0
C25*	HT smoothing condensers	16-0
C26	Mains RF by-pass	0-004
C27†	Aerial IF rejector tuning	—
C28†	Aerial circuit SW trimmer	—
C29†	Aerial circuit MW trimmer	—
C30†	Aerial circuit LW trimmer	—
C31†	Aerial circuit tuning	—
C32†	Osc. circuit LW tracker	—
C33†	Osc. circuit SW trimmer	—
C34†	Osc. circuit MW trimmer	—
C35†	Osc. circuit LW trimmer	—
C36†	Oscillator circuit tuning	—
C37†	1st IF trans. pri. tuning	—
C38†	1st IF trans. sec. tuning	—
C39†	2nd IF trans. pri. tuning	—
C40†	2nd IF trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS

		Approx. Values (ohms)
L1	Aerial IF rejector coil	4-0
L2	Aerial SW coupling coil	0-15
L3	Aerial MW coupling coil	0-3
L4	Aerial SW tuning coil	Very low
L5	Aerial MW tuning coil	3-0
L6	Aerial LW tuning coil	20-0
L7	Oscillator SW reaction	8-5
L8	Oscillator MW reaction	1-0
L9	Oscillator LW reaction	1-25
L10	Osc. circuit SW tuning coil	Very low
L11	Osc. circuit MW tuning coil	6-5
L12	Osc. circuit LW tuning coil	18-0
L13	1st IF trans. Pri.	13-0
L14	1st IF trans. Sec.	13-0
L15	2nd IF trans. Pri.	13-0
L16	2nd IF trans. Sec.	13-0
L17	Speaker speech coil...	2-0
L18	Hum neutralising coil	0-2
L19	Speaker field coil	1,000-0
T1	Speaker input trans. Pri.	420-0
	Speaker input trans. Sec.	0-6
T2	Mains Heater sec., total	40-0
	Rect. heat. sec.	0-1
	HT sec., total	450-0
S1-S11	Waveband switches	—
S12-S16	Radio/gram change switches	—
S17	Mains switch, ganged R18...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 236 V, using the 220-240 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH41	225	3-8	116	8-7
V2 VP41	76	2-7	116	5-3
V3 Pen45DD	270	6-3	225	6-8
V4 UC6	318†	—	—	—

† Each anode, AC.

SWITCH TABLE

Switch	SW	MW	LW	Gram.
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

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator via a 0.1 μ F condenser to control grid (top cap) of V1 and chassis. Turn gang to maximum, press MW button, and feed in a 470 KC/S signal. Adjust C40, C39, C38 and C37 in turn for maximum output. Repeat these adjustments.

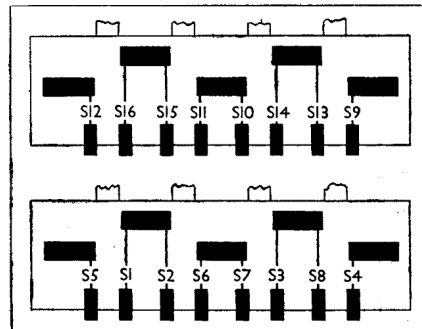
IF Rejector.—Connect signal generator to A1 and E sockets, feed in a strong 470 KC/S signal, and adjust C27 for minimum output.

RF and Oscillator Stages.—Connect signal generator to A1 and E sockets, via a suitable dummy aerial. With gang at maximum, pointer should be horizontal.

MW.—Press MW button, tune to 200m on scale, feed in a 200m (1,500 KC/S) signal, and adjust C34 for maximum output. Feed in a 250m (1,200 KC/S) signal, tune it in, and adjust C29 for maximum output, rocking the gang slightly if necessary.

LW.—Press LW button, tune to 1,000m on scale, feed in a 1,000m (300 KC/S) signal, and adjust C35 for maximum output. Feed in a 1,300m (230 KC/S) signal, tune it in, and adjust C30 for maximum output, rocking the gang slightly if necessary. Feed in a 1,700m (176.5 KC/S) signal, tune it in, and adjust C32 for maximum output, while rocking the gang for optimum results.

SW.—Press SW button, tune to 19m on scale, feed in a 19m (15.8 MC/S) signal, and adjust C33, then C28, for maximum output. Check at 30m and 50m.



Two views of the press-button switch unit. Above, the side seen looking at the underside of the chassis; below, the side facing the chassis deck