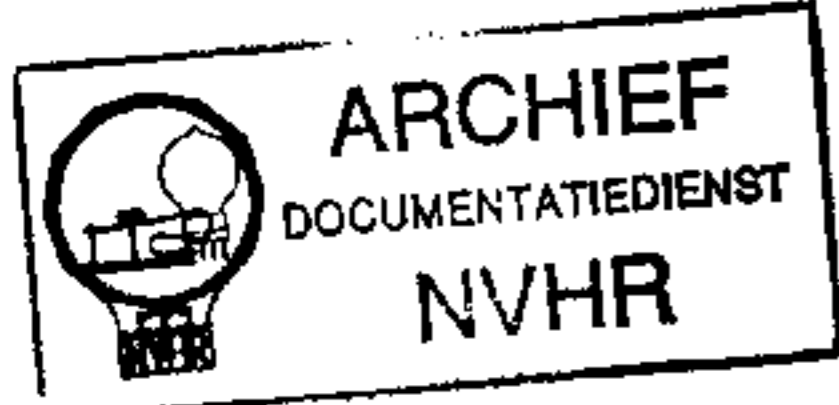
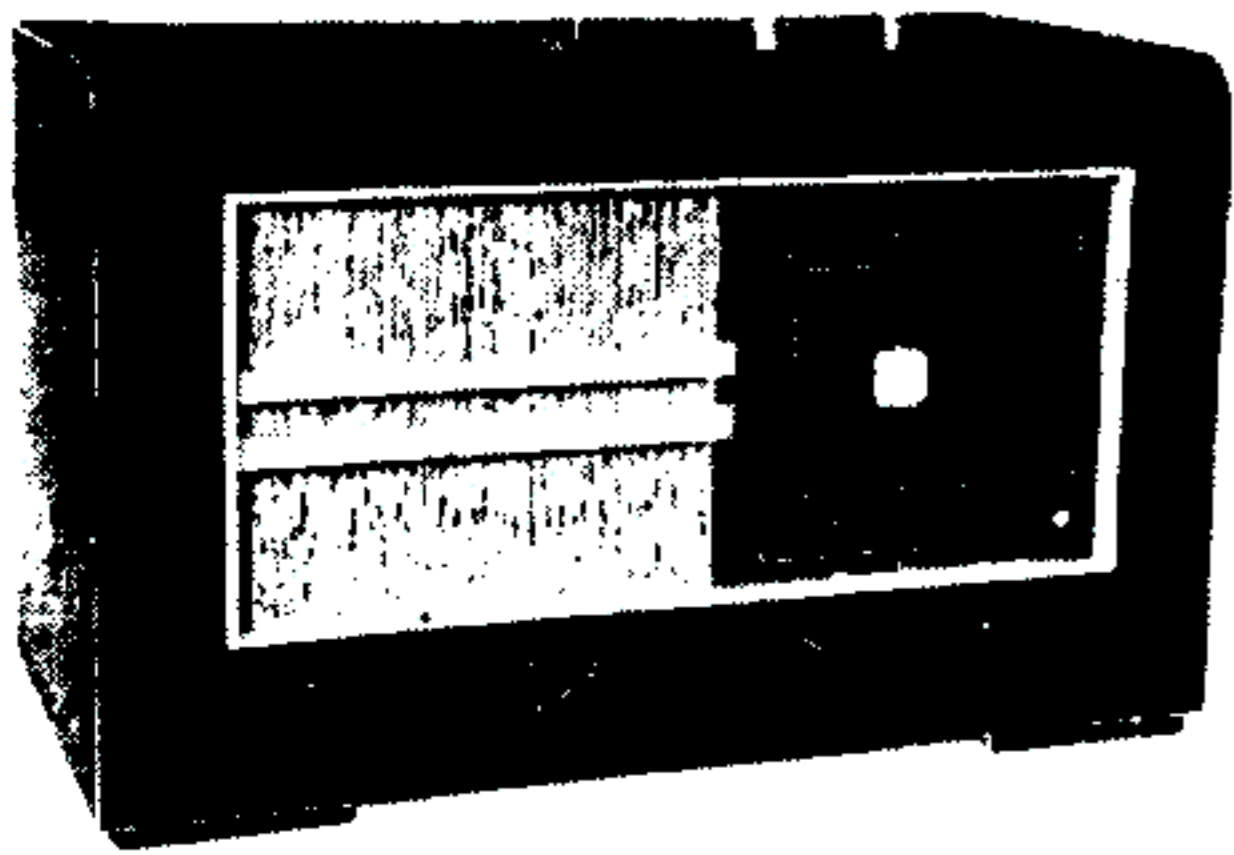


Ned. Ver. v. Historie v/d Radio



ACE U50



quency amplifier with tuned-primary, tuned-secondary transformer couplings C38, L12, L13, C39 and C40, L14, L15, C41.

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve (V3, Tungram 6Q7G). Audio frequency component in rectified output is developed across load resistor R7 and passed via I.F. stopper R8, coupling capacitor C19 and manual volume control R9 to control grid of triode section, which operates as A.F. amplifier. Provision for the connection of a gramophone pick-up across R9.

Second diode of V3, fed from L14 via C18, provides D.C. potentials which are developed across load resistor R14 and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage, together with G.B. for triode section, is obtained from the drop along R10 in V3 cathode circuit.

Resistance-capacitance coupling by R12, C22 and R15, between V3 triode and pentode output

valve (V4, Tungram 14F6G). Fixed tone correction in anode circuit by C24, and variable tone control by C26, R17.

THREE wavebands are provided in the Ace U50, the S.W. range being 16-50 m. The receiver is a four-valve (plus rectifier) superhet designed for A.C. or D.C. mains of 200-250V, 50-100 c/s in the case of A.C.

Release date and original price: November, 1946; £16 16s plus £3 12s 10d purchase tax.

CIRCUIT DESCRIPTION

Aerial input is via isolating capacitor C1 and coupling coils L2 (S.W.), L3 (M.W.) and L4 (L.W.) to single-tuned circuits L5, C33 (S.W.), L6, C33 (M.W.) and L7, C33 (L.W.), which precede triode hexode valve (V1, Tungram 6K8G) operating as frequency changer with electron coupling. I.F. filter L1, C29 shunts the aerial-earth circuit.

Triode oscillator grid coils L8 (S.W.), L9 (M.W.) and L10 (L.W.) are tuned by C34. Parallel trimming by C35 (S.W.), C36 (M.W.) and C7, C37 (L.W.); series tracking by C8 (S.W.), C9 (M.W.) and C10 (L.W.).

Reaction coupling from anode, via C11, is obtained from the common impedance of trackers on all bands, with additional inductive coupling by L11 on S.W.

Second valve (V2, Brimar 6K7G) is a variable-mu R.F. pentode operating as intermediate fre-

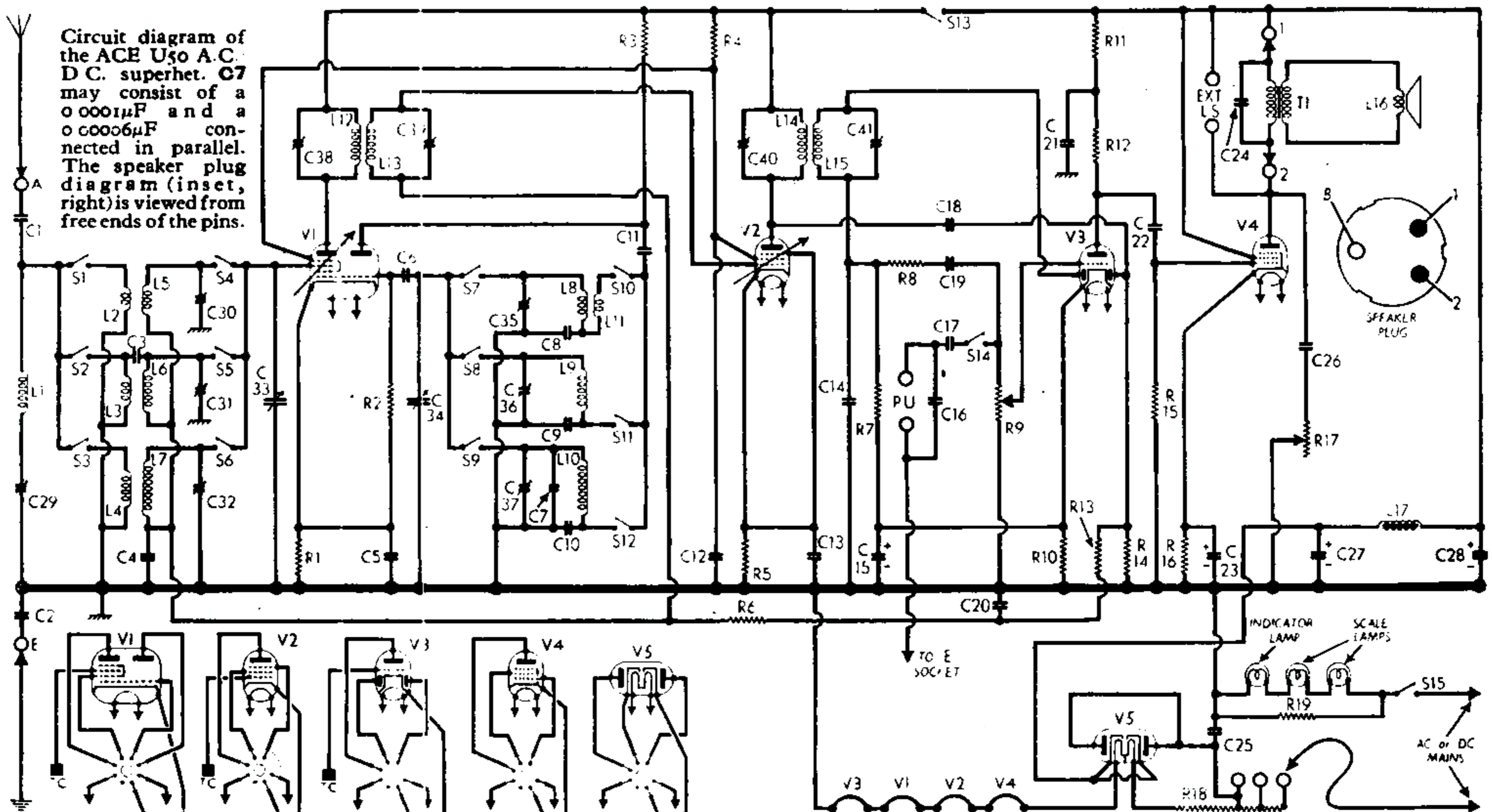
COMPONENTS AND VALUES

RESISTORS	Values (ohms)
R1	V1 fixed G.B. resistor ... 300
R2	V1 osc. C.G. resistor ... 50,000
R3	V1 osc. anode H.T. feed... 50,000
R4	V1, V2 S.G.'s H.T. feed... 50,000
R5	V2 fixed G.B. resistor ... 300
R6	A.V.C. line decoupling ... 300,000
R7	V3 signal diode load ... 820,000
R8	I.F. stopper ... 220,000
R9	Manual volume control ... 500,000
R10	V3 G.B. resistor ... 3,000
R11	V3 triode H.T. decoupling ... 50,000
R12	V3 triode anode load ... 220,000
R13	A.V.C. line decoupling ... 820,000
R14	V3 A.V.C. diode load ... 820,000
R15	V4 C.G. resistor ... 220,000
R16	V4 G.B. resistor ... 330
R17	Variable tone control ... 50,000
R18	Heater ballast resistor ... 530*
R19	Scale lamp shunt... 140

* Tapped at 410Ω : 60Ω + 60Ω from V5 heater.

CAPACITORS	Values (μF)
C1	Aerial isolator ... 0.001
C2	Earth isolator ... 0.1
C3	Aerial M.W. "top" coupling ... Very low
C4	V1 hex. C.G. decoupling... 0.1
C5	V1 cathode by-pass ... 0.1
C6	V1 osc. C.G. capacitor ... 0.0002
C7	Osc. L.W. fixed trimmer... 0.00005
C8	Osc. circ. S.W. tracker ... 0.004
C9	Osc. circ. M.W. tracker ... 0.00045
C10	Osc. circ. L.W. tracker ... 0.000205
C11	V1 osc. anode coupling ... 0.0005
C12	V1, V2 S.G.'s decoupling... 0.1
C13	V2 cathode by-pass ... 0.1
C14	I.F. by-pass ... 0.0001
C15*	V3 cathode by-pass ... 25.0
C16	Pick-up tone corrector ... 0.0001
C17	Pick-up isolator ... 0.05
C18	V3 A.V.C. diode coupling ... 0.0001
C19	A.F. coupling to V3 triode ... 0.01
C20	A.V.C. line decoupling ... 0.1
C21	V3 triode H.T. decoupling ... 0.1
C22	A.F. coupling to V4 ... 0.01
C23*	V4 cathode by-pass ... 25.0
C24	Fixed tone corrector ... 0.005
C25	Mains R.F. by-pass ... 0.025
C26	Part variable tone control ... 0.05
C27*	H.T. smoothing capaci- } 8.0
C28*	tors ... } 16.0
C29†	Aerial I.F. filter tuning ...
C30†	Aerial circ. S.W. trimmer ...
C31†	Aerial circ. M.W. trimmer ...
C32†	Aerial circ. L.W. trimmer ...
C33†	Aerial circuit tuning ...
C34†	Oscillator circuit tuning... ..
C35†	Osc. circ. S.W. trimmer... ..
C36†	Osc. circ. M.W. trimmer... ..
C37†	Osc. circ. L.W. trimmer... ..
C38†	1st I.F. trans. pri. tuning ...
C39†	1st I.F. trans. sec. tuning ...
C40†	2nd I.F. trans. pri. tuning ...
C41†	2nd I.F. trans. sec. tuning ...

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the ACE U50 A.C. D.C. superhet. C7 may consist of a 0.0001μF and a 0.00006μF connected in parallel. The speaker plug diagram (inset, right) is viewed from free ends of the pins.

OTHER COMPONENTS

Approx. Values (ohms)

L1	Aerial I.F. filter coil ...	35.0
L2	Aerial S.W. coupling coil...	1.8
L3	Aerial M.W. coupling coil	10.0
L4	Aerial L.W. coupling coil	35.0
L5	Aerial S.W. tuning coil ...	0.05
L6	Aerial M.W. tuning coil...	3.0
L7	Aerial L.W. tuning coil ...	23.0
L8	Osc. S.W. tuning coil ...	0.05
L9	Osc. M.W. tuning coil ...	3.0
L10	Osc. L.W. tuning coil ...	7.0
L11	Osc. S.W. reaction coil ...	0.3
L12	1st I.F. trans. { Pri. ...	3.5
L13		Sec. ...
L14	2nd I.F. trans. { Pri. ...	5.0
L15		Sec. ...
L16	Speaker speech coil ...	2.4
L17	H.T. smoothing choke ...	100.0
T1	Output trans. { Pri. ...	220.0
	Sec. ...	0.25
S1-S14	Waveband switches ...	—
S15	Mains switch, ganged R17	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver. Voltages were measured on the 400 V scale of a model 7 Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6K8G	195	1.0	50	2.0
	Oscillator			
	60	2.4		
V2 6K7G	195	3.1	50	0.75
V3 6Q7G	50	0.45	—	—
V4 14F6G	188	26.0	195	4.2
V5 25Y5G	*			

* Cathode to chassis, 198V, D.C.

GENERAL NOTES

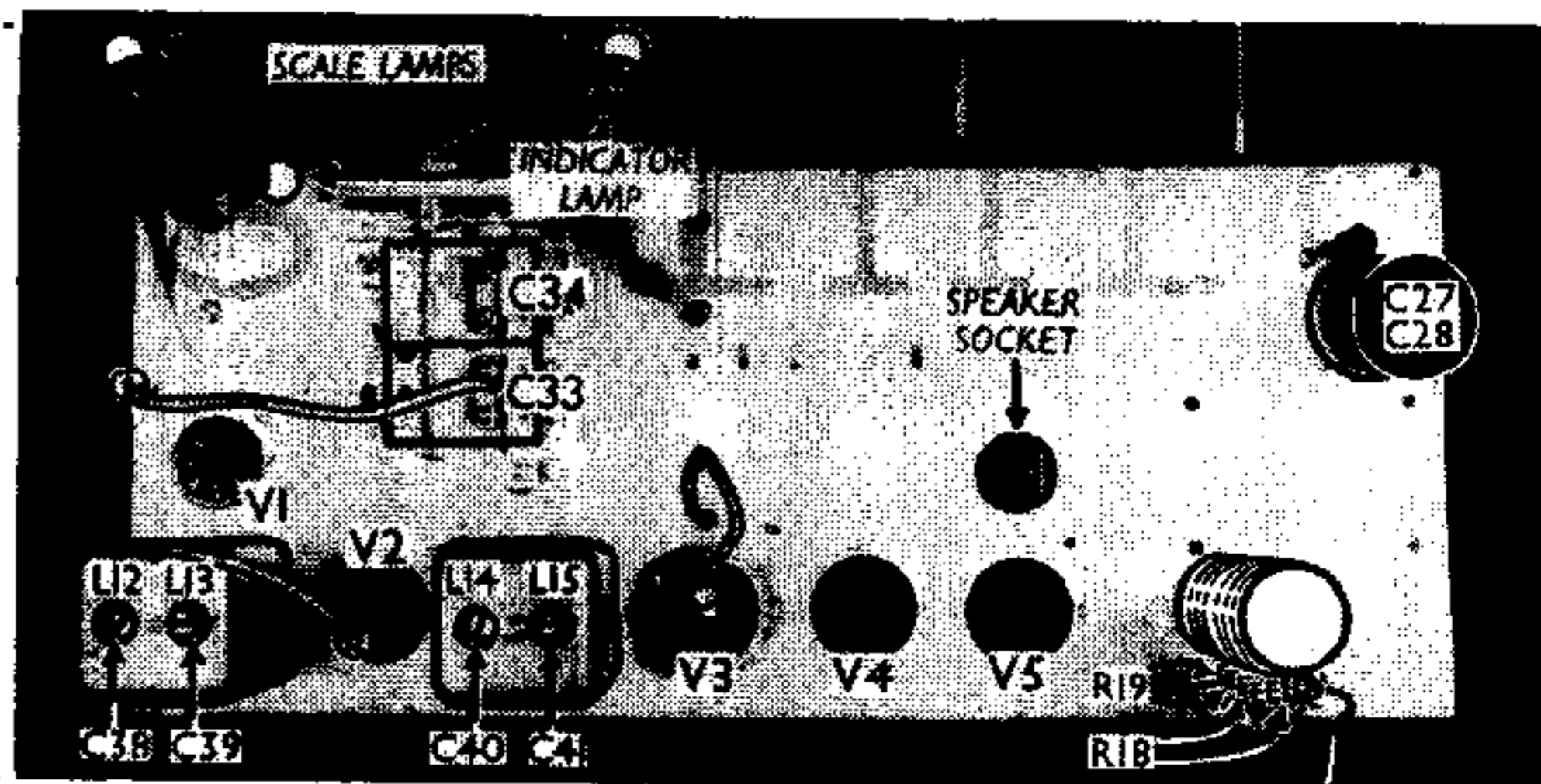
Switches.—S1-S14 are the waveband switches, ganged in a single rotary unit beneath the chassis, in the tuning assembly. The unit is indicated in our under-chassis view, and shown in detail in the diagram in col. 2, where it is drawn as seen from the rear of an inverted chassis.

The table (col. 2) gives the switch positions for the four control settings, starting from the fully anti-clockwise position of the control. A dash indicates open, and C, closed.

Coils.—The R.F. and oscillator coils are in four unscreened tubular units mounted in the tuning assembly beneath the chassis. Instructions for removing and replacing the assembly follow below.

Removing tuning assembly.—Unsolder the eleven leads connecting the assembly to the rest of the chassis;

Plan view of the chassis. The tuning drive is very straightforward, the cord making a 1/2-turn round the drive pulley and 1 1/2 turns round the gang drum.



loosen the grub screw of the waveband indicator drive pulley and lift off the operating cord; slide off the pulley and remove the nut (with large lock washer) securing the tuning assembly to the front chassis member, and then lift out the assembly.

When replacing, connect the leads as follows, numbering the six tags on the strip from left to right when viewed from the rear: 1. to C34; 2. to C33; 3. to pin 6 on V1; 4. to pin 5 on V1; 5. to pin 6 on V2; 6. to right-hand tag on L1; the left-hand earthing tag goes to the earthing lead from the gang; connect C17 to one tag of S14, and the "live" tag of the volume control to the other; connect pin 1 (H.T.+) of the speaker socket to one tag on S13, and the rear right-hand tag on the first I.F. transformer to the other.

Scale and Indicator Lamps.—These are three Osram M.E.S. type lamps, rated at 6.5 V, 0.3 A. They have small clear spherical bulbs.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a high impedance (about 5,000 Ω) external speaker.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to S.W. and turn volume control to maximum. Connect signal generator leads to control grid (top cap) of V2 and chassis, feed in a 465 kc/s (645.16 m) signal, and adjust C40 and C41 for maximum output. Transfer signal generator lead to control grid (top cap) of V1, and adjust C38 and C39 for maximum output. Check settings of C40, C41.

I.F. Filter.—Transfer signal generator leads to A and E sockets, via a suitable dummy aerial, and switch set to M.W. Feed in a 465 kc/s signal, and adjust C29 for maximum output.

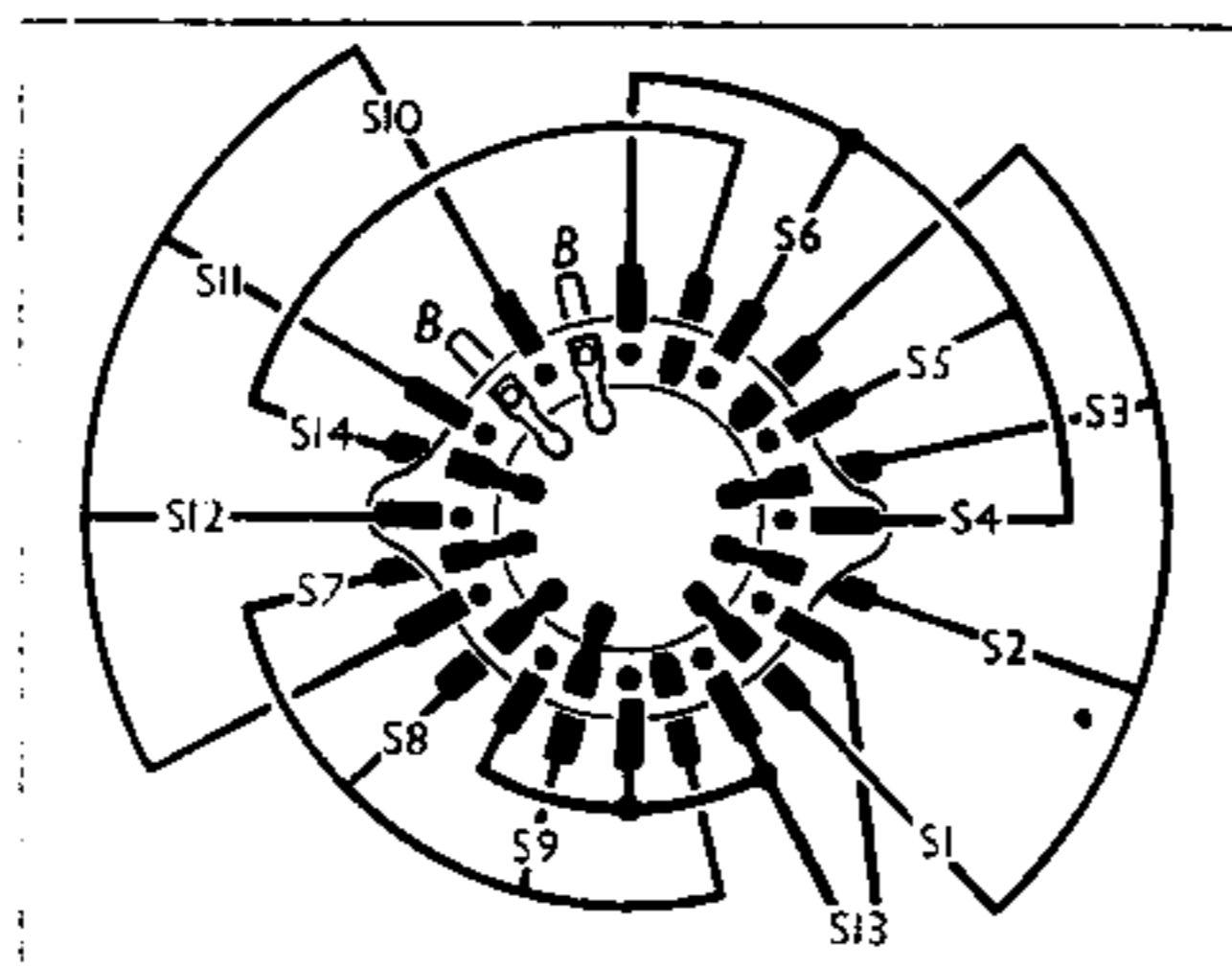
R.F. and Oscillator Stages.—With the gang at maximum capacitance the pointer should be vertical.

S.W.—Switch set to S.W., tune to 17.6 m on scale, feed in a 17.6 m (17 Mc/s) signal, and adjust C35 for maximum output, selecting the peak involving the least trimmer capacitance. Then adjust C30, and check sensitivity and calibration at 50 m (6 Mc/s).

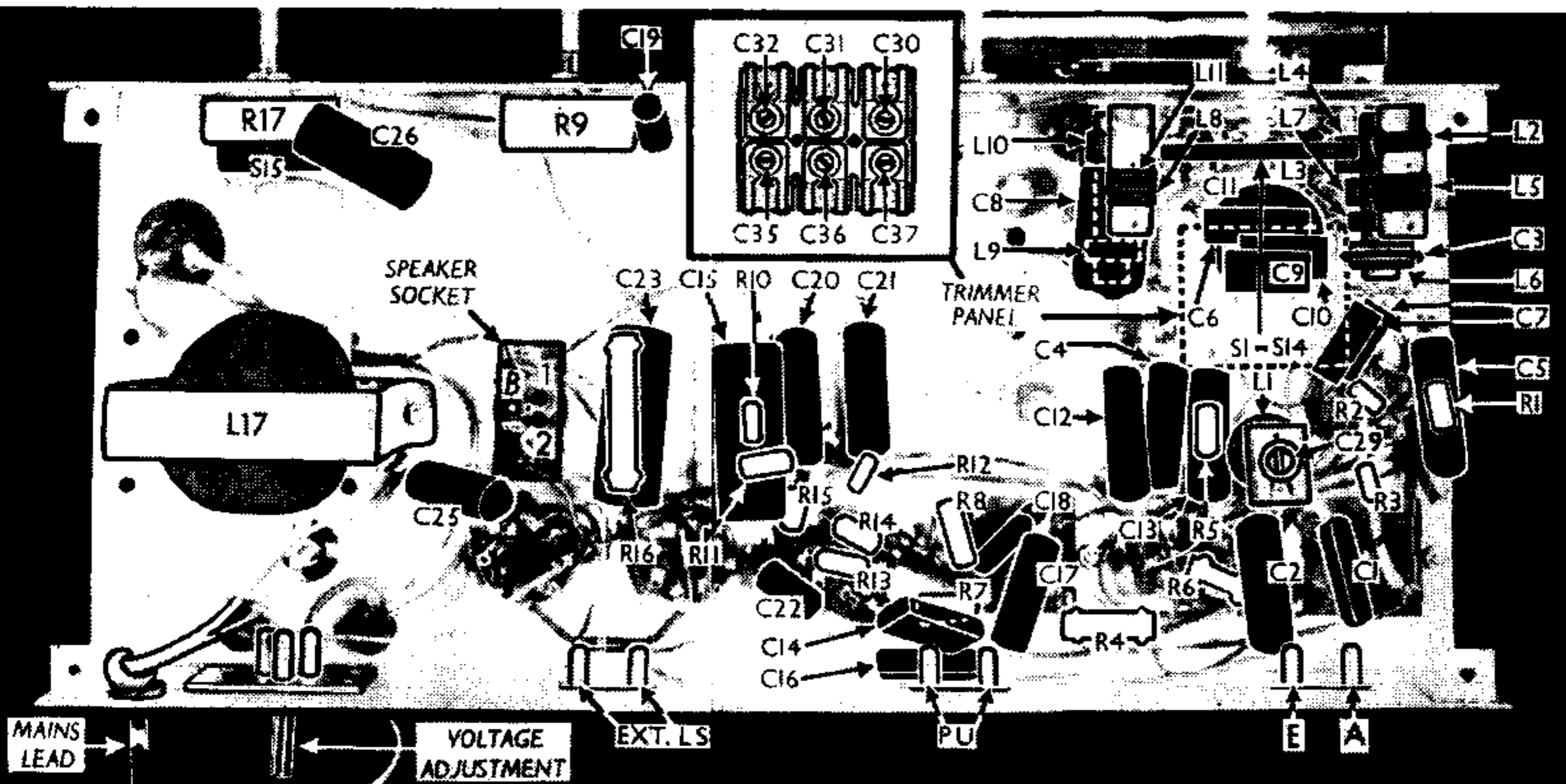
M.W.—Switch set to M.W., tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C36, then C31, for maximum output. Check sensitivity and calibration at 500 m (600 kc/s).

L.W.—Switch set to L.W., tune to 1,200 m on scale, feed in a 1,200 m (250 kc/s) signal, and adjust C37, then C32, for maximum output. Check sensitivity and calibration at 1,800 m (166.6 kc/s).

Switch Diagram and Table



Switch	S.W.	M.W.	L.W.	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	C	C	—
S14	—	—	—	C



Under-chassis view. The tuning assembly is in the top right-hand corner, but the trimmer panel covering it has been removed for clarity and is shown inset to the left of the assembly. A diagram of the waveband switch unit S1-S14 appears above in col. 2.