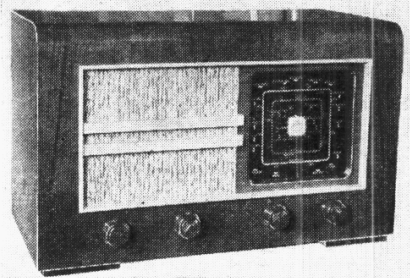


"TRADER" SERVICE SHEET
824

ACE U50



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-mou R.F. pentode operating as intermediate fre-

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.

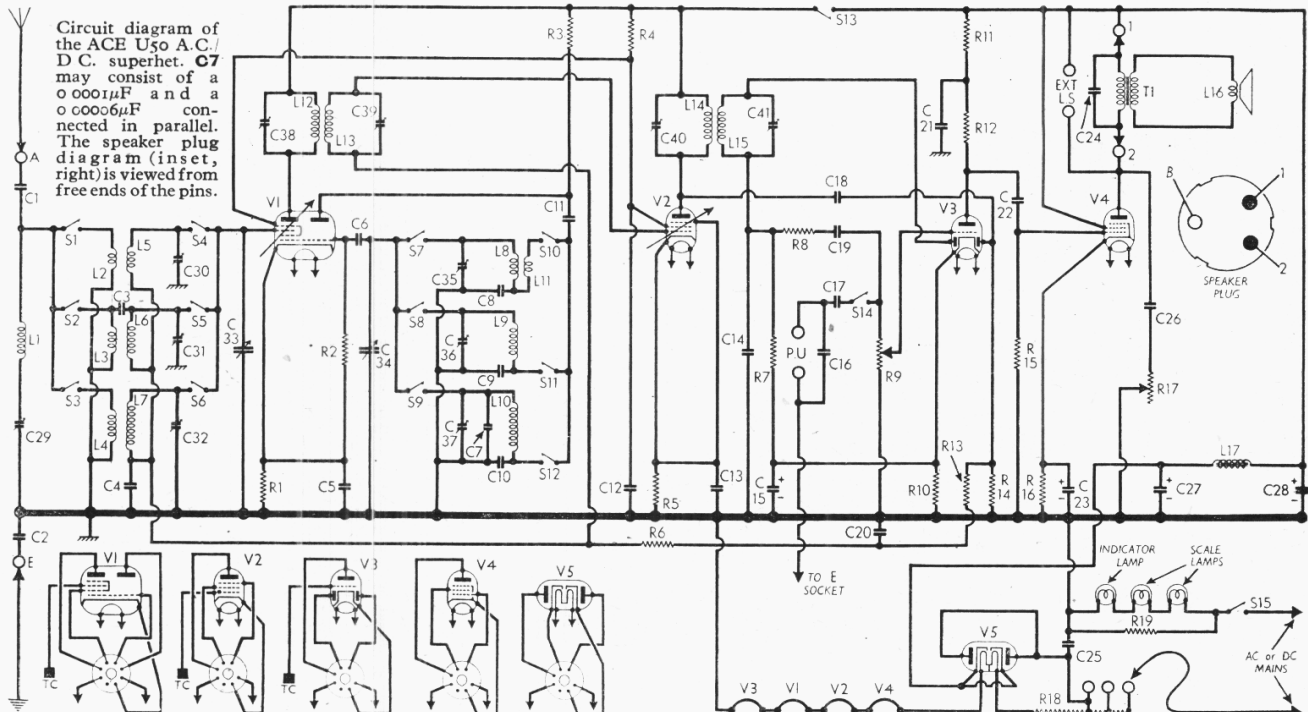
COMPONENTS AND VALUES

| 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 capacitor ... | 8-0 |
| C28* | †ors ... | 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.



| 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 Oscillator 60 | { 1-0 2-4 | 50 | 2-0 |
| 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

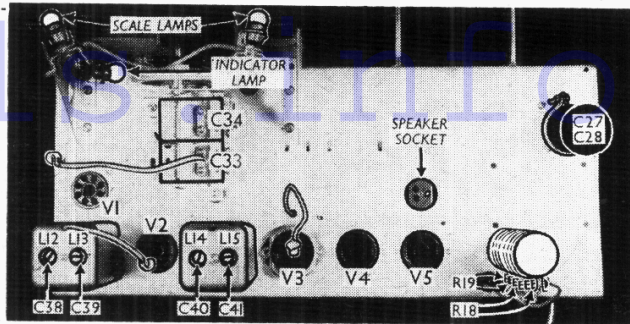
Switches.—S1-S14 are the waveband switches, ganged in a single rotary unit beneath the chassis, in the tuning assembly. The unit is indicated in our under-chassis view, and shown in detail in the diagram in col. 2, where it is drawn as seen from the rear of an inverted chassis.

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 ½-turn round the drive pulley and 1½ 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 the 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.

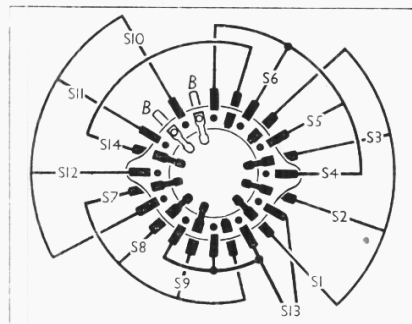
R.F. and Oscillator Stages.—With the gang at maximum capacitance the pointer should be vertical.

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).

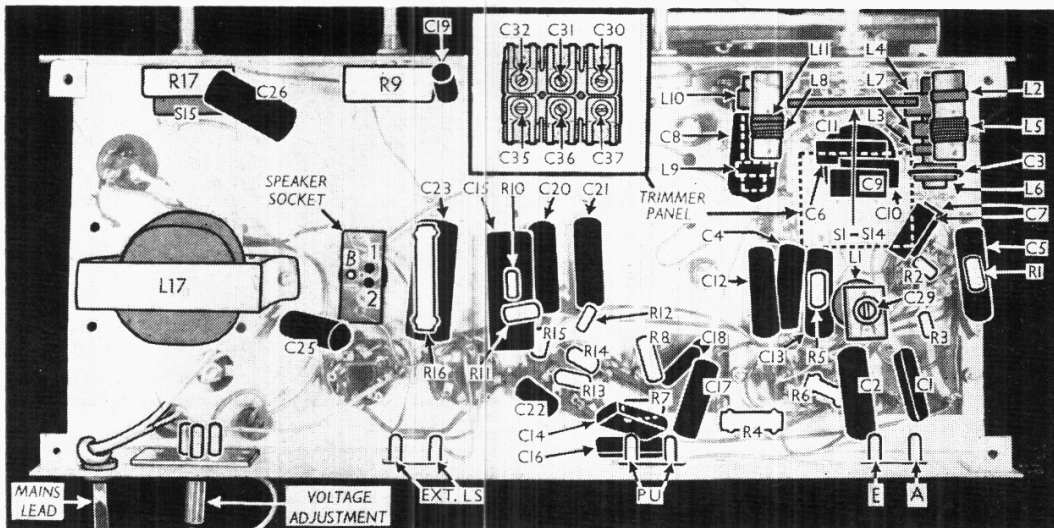
M.W.—Switch set to M.W., tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C36, then C31, for maximum output. Check sensitivity and calibration at 500 m (600 kc/s).

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.