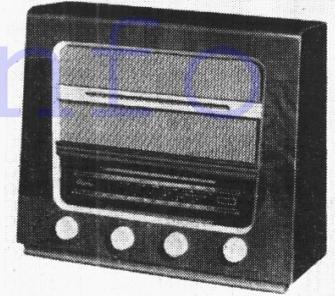


"TRADER" SERVICE SHEET

991

ETRONIC
ETA5316



COMPONENTS AND VALUES

CAPACITORS		Values	Locations
C1	Aerial series	0.002 μ F	G4
C2	Aerial coupling	0.0032 μ F	G4
C3	1st I.F. trans. tuning ...	120pF	A2
C4		120pF	A2
C5	V1 cath. by-pass	0.1 μ F	G4
C6	A.G.C. decoupling	0.05 μ F	F4
C7	S.W. tracker	0.0025 μ F	G4
C8	M.W. tracker	410pF	G3
C9	L.W. tracker	150pF	G4
C10	L.W. trimmer	150pF	G3
C11	Osc. anode coup.	50pF	G4
C12	H.T. decoupling	0.1 μ F	F4
C13	2nd I.F. trans. tuning ...	120pF	B2
C14		120pF	B2
C15	V2 cath. by-pass	0.1 μ F	F4
C16	I.F. by-pass	100pF	F3
C17	A.F. coupling	0.005 μ F	E3
C18	I.F. by-passes	100pF	E3
C19		400pF	E4
C20	Part tone control	0.01 μ F	E4
C21	A.F. coupling	0.01 μ F	E4
C22	Tone correction	0.01 μ F	E3
C23*	H.T. smoothing	16 μ F	B1
C24*		16 μ F	B1
C25*		16 μ F	B1
C26†	S.W. aerial trim.	—	G3
C27†	M.W. aerial trim.	—	G3
C28†	L.W. aerial trim.	—	G4
C29†	Aerial tuning	—	A1
C30†	S.W. osc. trimming	—	G3
C31†	M.W. osc. trimming	—	G3
C32†	L.W. osc. trimming	—	G4
C33†	Oscillator tuning	—	A2

DESIGNED to operate from A.C. mains only of 200-250V, 50 c/s, the Etronic ETA5316 is a 4-valve (plus rectifier) 3-band superhet. The waveband ranges are 15-51 m, 190-550m and 1,000-2,000m. Provision is made for the connection of a gramophone pick-up, which may be left connected permanently, and an external speaker.

There is an A.C./D.C. version of this receiver, called the ETU5316, and this is covered separately in Service Sheet 992.

Release date and original price: October, 1950; £15 11s 5d. Purchase tax extra.

CIRCUIT DESCRIPTION

Aerial input via coupling coil L1 (S.W.) and "bottom" capacitance coupling C2 (M.W. and L.W.) to single tuned circuits L2, C29 (S.W.), L3, C29 (M.W.) and L4, C29 (L.W.). Modulation hum is bypassed by R1.

First valve (V1, Brimar 7S7) is a triode-hexode operating as frequency changer with internal coupling. Oscillator anode coils L7 (S.W.), L8 (M.W.) and L9 (L.W.) are tuned by C33. Parallel trimming by C30 (S.W.), C31 (M.W.) and C10, C32 (L.W.); series tracking by C7 (S.W.), C8 (M.W.) and C9 (L.W.). Reaction coupling from grid across the common impedance of the trackers, with the addition of inductive coupling by L5 (S.W.) and L6 (M.W.). Stabilization by R6.

Second valve (V2, Brimar 7B7) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C3, L10, L11, C4 and C13, L12, L13, C14.

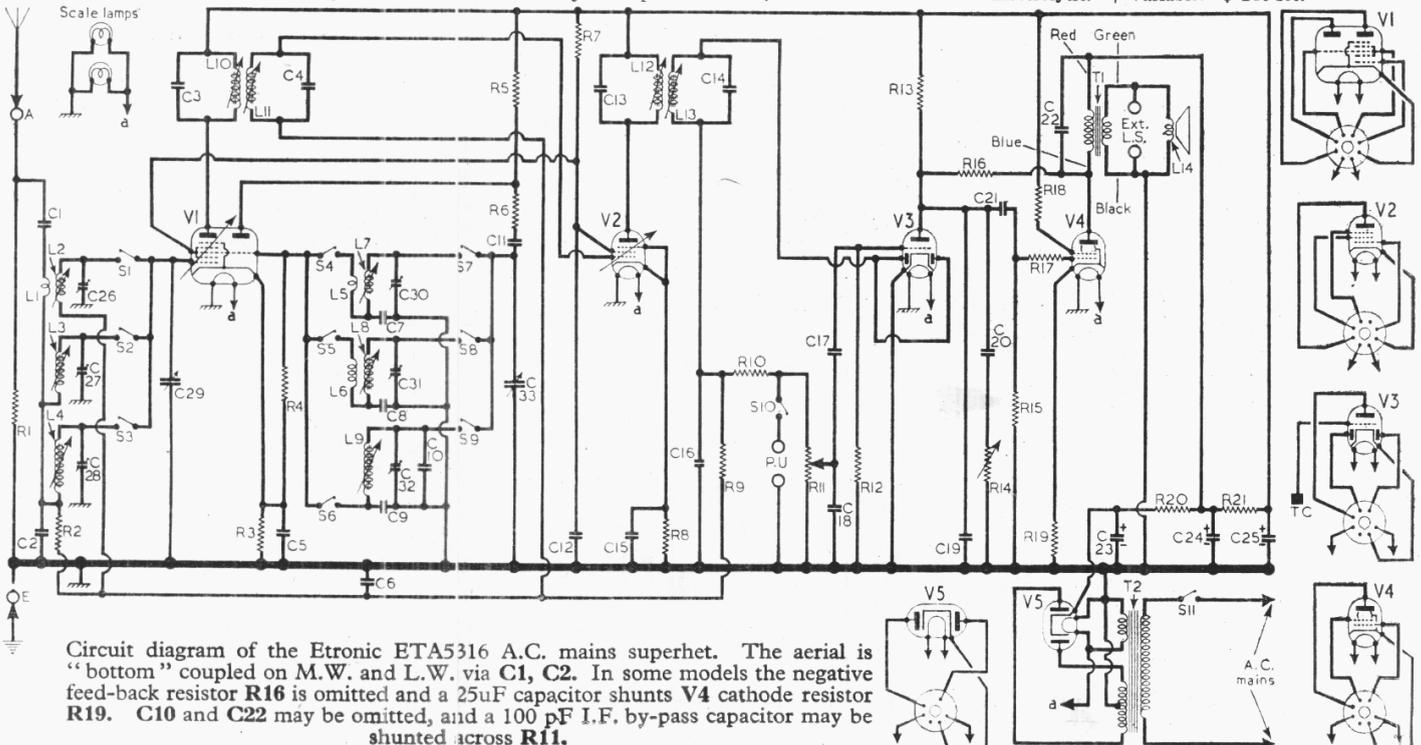
Intermediate frequency 470 kc/s.

Diode signal detector is part of double-diode triode valve (V3, Brimar 6Q7GT). A.F. component in rectified output is developed across volume control R11, which acts as the diode load, and is passed via C17 to the grid of the triode section. I.F. filtering by C16, R10, C18 and C19. Provision is made for the connection of a gramophone pick-up across R11 via S10, which closes in the "Gram." position of the waveband switch. D.C. potential developed across R10, R11 is fed back as bias to F.C. and I.F. valves, giving automatic gain control.

Resistance-capacitance coupling by R13, C21 and R15 between V3 triode and beam tetrode output valve (V4, Brimar 6V6GT). Variable tone control by C20 and R14. Tone correction by C22 and by negative feed-back between V3 and V4 anodes via R16. Grid and screen-grid stoppers R17, R18 suppress parasitic oscillation developing in V4.

H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Brimar 6X5GT) whose heater is fed from the same winding on T2 as the other valves. Smoothing by resistors R20, R21 and electrolytic capacitors C23, C24 and C25.

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Etronic ETA5316 A.C. mains superhet. The aerial is "bottom" coupled on M.W. and L.W. via C1, C2. In some models the negative feed-back resistor R16 is omitted and a 25 μ F capacitor shunts V4 cathode resistor R19. C10 and C22 may be omitted, and a 100 pF I.F. by-pass capacitor may be shunted across R11.

RESISTORS		Values	Locations
R1	Aerial shunt ...	4.7kΩ	G4
R2	A.G.C. decoup. ...	10kΩ	G4
R3	V1 G.B. ...	220kΩ	G4
R4	V1 osc. C.G. ...	47kΩ	G4
R5	Osc. anode feed ...	38kΩ	G4
R6	Stabilizer ...	47kΩ	G4
R7	H.T. feed ...	33kΩ	F4
R8	V2 G.B. ...	330kΩ	F4
R9	A.G.C. decoup. ...	2.2MΩ	F4
R10	I.F. stopper ...	56kΩ	F3
R11	Volume control ...	500kΩ	E3
R12	V3 C.G. ...	10MΩ	E4
R13	V3 anode load ...	220kΩ	E4
R14	Tone control ...	270kΩ	D3
R15	V4 C.G. ...	470kΩ	E4
R16	Neg. feed-back ...	470kΩ	E4
R17	V4 stoppers ...	47kΩ	E4
R18	V4 G.B. ...	100kΩ	E4
R19	V4 G.B. ...	250kΩ	D4
R20	H.T. smoothing ...	1kΩ	E3
R21	H.T. smoothing ...	3.3kΩ	F3

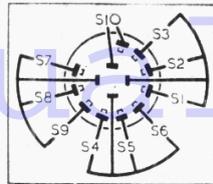
OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	S.W. coupling coil ...	Very low	G3
L2	Aerial tuning coils	Very low	G3
L3	Aerial tuning coils	4.4	G3
L4	Aerial tuning coils	34.0	G4
L5	S.W. reaction coil	Very low	G3
L6	M.W. reaction coil	1.0	G3
L7	Oscillator tuning coils	Very low	G3
L8	Oscillator tuning coils	5.0	G3
L9	Oscillator tuning coils	12.0	G4
L10	1st I.F. trans	10.0	A2
L11	1st I.F. trans	10.0	A2
L12	2nd I.F. trans	10.0	B2
L13	2nd I.F. trans	10.0	B2
L14	Speech coil	2.5	—
T1	Primary	240.0	—
T1	Secondary	0.5	—
T1	Primary	60.0	—
T2	H.T. sec., total	500.0	C2
T2	Htr. secondary	0.1	—
S1-S10	Waveband switches	—	G3
S11	Mains sw., g'd R14	—	D3

VALVE ANALYSIS

Valve voltages and currents given in the table below are those derived from the manufacturer's information. Readings were taken with the receiver tuned to the highest wavelength end of M.W. and the volume control at maximum.

Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 7S7 ...	175 Oscillator	1.9 1.0	70	2.2	1.5
V2 7B7 ...	175	4.0	70	2.0	2.0
V3 6Q7GT ...	70	0.35	—	—	—
V4 6V6GT ...	225	43.0	180	3.0	9.0
V5 6X5GT ...	250†	—	—	—	28.0

† A.C., each anode.

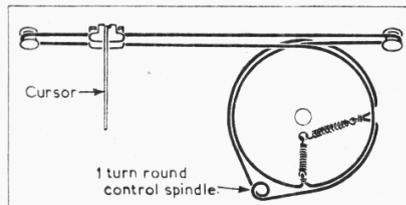


Above. Diagram of the waveband switch unit, with the associated table below.

Switch	S.W.	M.W.	L.W.	Gram.
S1	C	—	—	C
S2	—	C	—	—
S3	—	—	C	—
S4	C	—	—	C
S5	—	C	—	—
S6	—	—	C	—
S7	C	—	—	—
S8	—	C	—	—
S9	—	—	C	—
S10	—	—	—	C

GENERAL NOTES

Switches—S1-S9 are the waveband switches, and S10 is the gram pick-up switch, ganged in a single 4-position rotary unit beneath the chassis. This is indicated in our underside drawing.



Sketch of the tuning drive system, as seen from front, showing both cords.

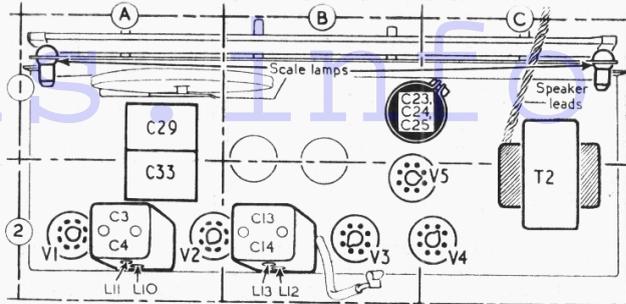
ing of the chassis, and shown in detail in the diagram inset beside the plan drawing, where it is drawn as seen from the rear of an inverted chassis.

The table below it gives switch positions for the four control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C, closed.

S11 is the Q.M.B. mains switch, ganged with the tone control R14.

Scale Lamps.—These are two Osram M.E.S. type lamps, with small clear spherical bulbs, rated at 6.5 V, 0.3 A.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 3.4 Ω) external speaker.



Plan view of the chassis. No voltage adjustment tappings are provided on the mains transformer T2.

Drive Cord Replacement.—Two cords of different material are used in this receiver: the drum drive, which requires about 18 inches of fine gauge nylon braided glass yarn; and the cursor drive, which requires about 42 inches of fine gauge plaited flax fishing line.

The course taken by the two cords is clearly indicated in the sketch in col. 2, where the tuning drive system is drawn as seen from the front, but in order to gain access to the gang drum it is necessary to remove the metal plate forming the front member of the chassis structure.

To do this, remove the glass scale panel (spring clips at corners), remove the fixing nuts and lock washers from the tone control and volume control spindle bushes, and remove the four self-tapping screws holding the metal front plate to the rest of the chassis. The drive system is then exposed as shown in our sketch.

DISMANTLING THE SET

Removing Chassis.—Remove four control knobs (pull-off) with felt washers; unsolder two leads from the speaker speech coil tags, and two leads from the tag strip on the right of the output transformer; remove three hexagonal head, self-tapping chassis bolts (with washers) and withdraw chassis.

When replacing, the black and green speaker leads should go to the speech coil tags on the left and the red and blue leads to the tags on the right of the output transformer.

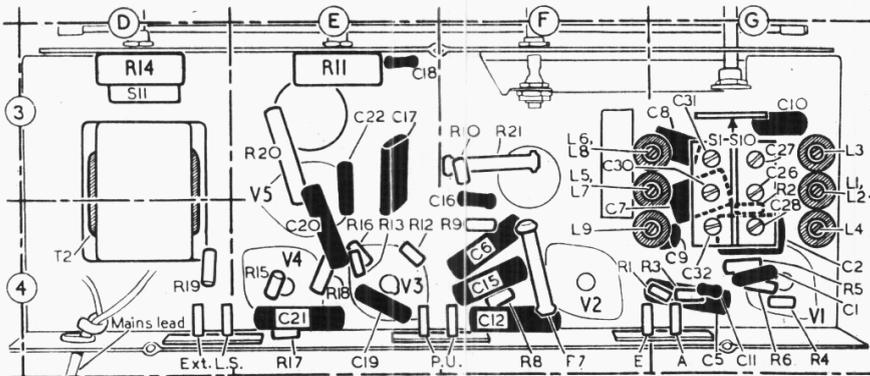
CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang to maximum and set tone and volume controls fully clockwise. Connect the output from the signal generator, via a 0.1 μF capacitor in the "live" lead, to control grid (pin 6) of V2 and chassis. Feed in a 470 kc/s (888.3 m) signal and adjust the cores of L13, L12 (location reference B2) for maximum output. Transfer "live" signal generator lead to control grid (pin 6) of V1, and adjust the cores of L11, L10 (A2) for maximum output. Repeat these adjustments.

R.F. and Oscillator Stages.—Remove chassis from cabinet and check that with the gang at maximum capacitance, the cursor coincides with the highest wavelength ends of the tuning scales. Transfer the signal generator leads, via a suitable dummy aerial, to A and E sockets. L.W.—Switch set to L.W., tune to 2,000 m, feed in a 2,000 m (150 kc/s) signal and adjust the cores of L9 (G4) and L4 (G4) for maximum output. Tune to 1,000 m, feed in a 1,000 m (300 kc/s) signal and adjust C32 (G4) and C28 (G4) for maximum output. Repeat these adjustments.

M.W.—Switch set to M.W., tune to 500 m, feed in a 500 m (600 kc/s) signal and adjust the cores of L8 (G3) and L3 (G3) for maximum output. Tune to 200 m, feed in a 200 m (1,500 kc/s) signal and adjust C31 (G3) and C27 (G3) for maximum output. Repeat these adjustments.

S.W.—A dummy aerial consisting of a non-inductive 400 Ω resistor should be connected in series with the "live" signal generator lead. Switch set to S.W., tune to 50 m, feed in a 50 m (6 Mc/s) signal, and adjust the cores of L7 (G3) and L2 (G3) for maximum output. Tune to 20 m, feed in a 20 m (15 Mc/s) signal and adjust C30 (G4) and C26 (G4) for maximum output, "rocking" the gang slightly while adjusting C26 to obtain optimum results. Repeat these adjustments.



Underside drawing of the chassis. A diagram of the S1-S10 unit is inset above.