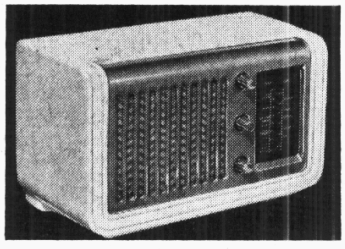
"TRADER" SERVICE SHEET

878

FERRANTI 547



CONSTRUCTED on compact lines, the Ferranti 547 is a table model with frame aerial windings mounted on the back cover. It is a 4-valve (plus rectifier) 2-band superhet designed for A.C. or D.C. mains of 210-250V, 40-100 c/s in the case of A.C. No voltage adjustment is necessary.

Release date and original price: September 1947; £14 14s plus purchase tax.

CIRCUIT DESCRIPTION

Frame aerial input is provided by **L3,** in conjunction with loading coil **L5,** tuned by **C25** (M.W.); and by **L1, L2, L3** in series, in conjunction with loading coil **L4,** tuned by **C25** (L.W.). Provision for the connection of an external aerial, via series capacitor **C1** to the junction of **L1, L2** on L.W., but external aerial coupling on M.W. is provided via the capacitance between windings **L1** and **L2** in the frame aerial assembly only.

First valve **(V1, Ferranti 12K8GT)** is a triode hexode operating as frequency changer with electron coupling. Triode oscillator grid coils **L6** (M.W.) and **L7** (L.W.) are tuned by **C26,** which is shunted by a temperature compensating capacitor **C7** to prevent oscillator frequency drift. Parallel trimming by **C27** (M.W.) and **C8** (L.W.); series tracking by **C10** (M.W.) and **C9, C10** (L.W.). Reaction coupling by anode coils **L8** (M.W.) and **L9** (L.W.).

Second valve **(V2, Ferranti 12K7GT)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C5, L10, L11, C6** and **C11, L12, L13, C12.**

Intermediate frequency 465 kc/s.

Diode second detector is part of double diode triode valve **(V3, Ferranti 12Q7GT).** Audio frequency component in rectified output is developed across manual volume control **R4,** which is the diode load resistor, and passed via I.F. filter network **R5, C14,** A.F. coupling capacitor **C15** and C.G. resistor **R6,** to control grid of triode section, which operates as A.F. amplifier. I.F. filtering by **C13** in diode circuit and **C17** in triode anode circuit.

D.C. potential developed across **R4** is tapped off and fed back through a decoupling circuit **R8, C2** as G.B. to F.C. and I.F. valves, giving A.V.C. The negative D.C. potential developed across **V1** oscillator control grid resistor **R1** is tapped off and applied through **R2** as fixed G.B. to **V1** and **V2** and A.V.C. delay voltage.

Resistance capacitance coupling by **R7, C18, R10,** via grid stopper **R11,** between **V3** triode and beam tetrode output valve **(V4, Ferranti 50L6G or GT).** Fixed tone correction in tetrode anode circuit by **R12, C19.**

When the receiver is operated from A.C. mains, H.T. current is supplied by half-wave rectifying valve **(V5, Ferranti 35Z4GT)** which, with D.C. mains, behaves as a low resistance. Smoothing by speaker field **L16** and electrolytic capacitors **C22, C23.**

COMPONENTS AND VALUES

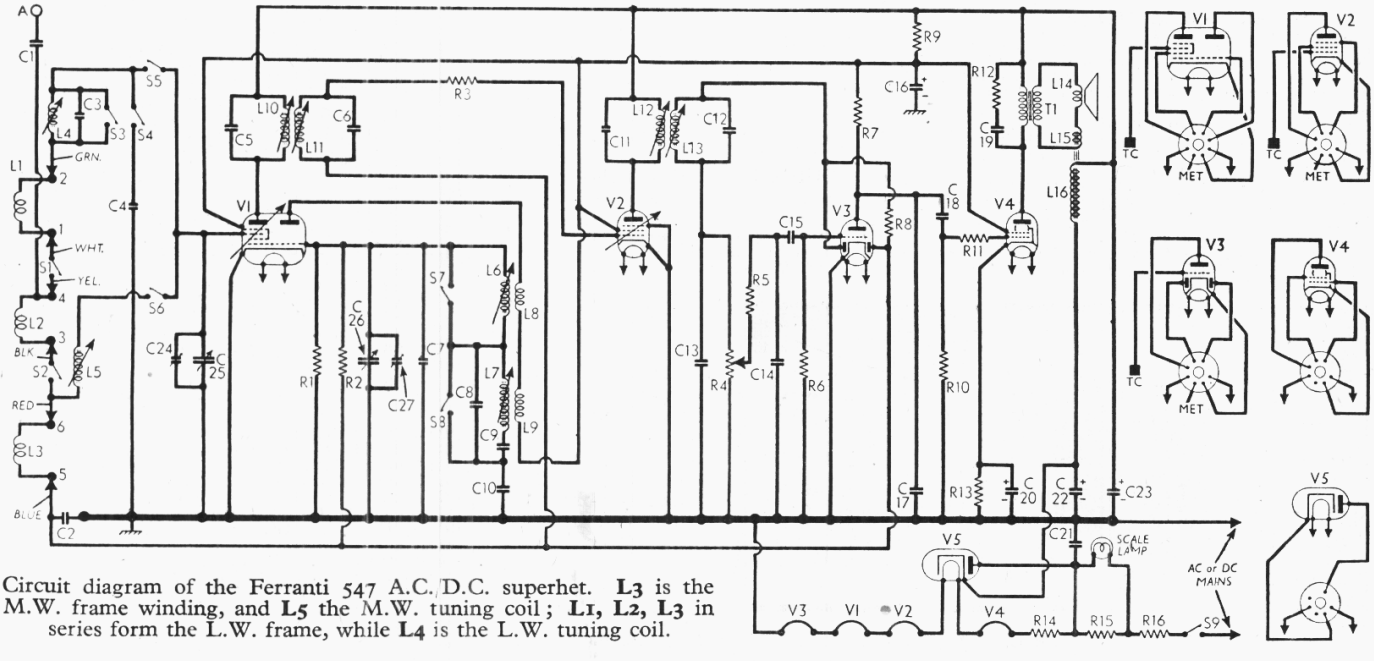
	RESISTORS	Values (ohms)	Locations
R1	V1 osc. C.G. ...	33,000	K8
R2	A.V.C. delay feed	10,000,000	J8
R3	V2 C.G. stopper ...	1,200	A4
R4	Volume control ...	500,000	B1
R5	I.F. stopper ...	100,000	B2
R6	V3 triode C.G. ...	10,000,000	B3
R7	V3 triode load ...	100,000	H7
R8	A.V.C. decoupling	1,000,000	G8
R9	H.T. feed resistor	2,200	G7
R10	V4 C.G. resistor	330,000	F8
R11	V4 C.G. stopper ...	220,000	F8
R12	Part tone corrector	4,700	G8
R13	V4 G.B. resistor	150	E8
R14	Heater ballast and scale lamp shunt resistors	500	A3
R15		100	A3
R16		140	A3

	CAPACITORS	Values (μF)	Locations
C1	Aerial series ...	0·00015	—
C2	A.V.C. decoupling	0·05	J7
C3	Aerial L.W. trimmers	0·00002	J6
C4		0·00006	B3
C5	1st I.F. transformer tuning	0·000105	A4
C6		0·000105	A4
C7	Temperature compensator	0·000018	A2
C8	Osc. L.W. trim. ...	0·000143	B3
C9	Oscillator circuit trackers... ...	0·001	B3
C10		0·0005	A3
C11	2nd I.F. transformer tuning ...	0·00009	B3
C12		0·000105	B3
C13	I.F. by-passes ...	0·00015	B3
C14		0·00015	B2
C15	A.F. coupling ...	0·0047	B3
C16*	H.T. feed decoup.	10·0	G7
C17	I.F. by-pass ...	0·0003	H8
C18	A.F. coupling ...	0·02	G8
C19	Part tone corrector	0·02	G8
C20*	V4 cath. by-pass	25·0	F7
C21	Mains R.F. by-pass	0·05	K6
C22*	H.T. smoothing capacitors ...	16·0	G6
C23*		10·0	G7
C24‡	Aerial M.W. trim.	—	A2
C25†	Aerial tuning ...	—	A2
C26†	Oscillator tuning	—	A2
C27‡	Osc. M.W. trim. ...	—	A2

* Electrolytic ‡ Variable † Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Frame aerial windings	1·6	—
L2		1·6	—
L3		1·3	—
L4	Aerial tuning coils	16·5	J6
L5		3·0	J6
L6	Oscillator tuning coils	3·0	H6
L7		5·0	H6
L8	Oscillator reaction coils	2·0	H6
L9		6·0	H6
L10	1st I.F. trans. Pri.	8·0	A4
L11	1st I.F. trans. Sec.	8·0	A4
L12	2nd I.F. trans. Pri.	8·0	C3
L13	2nd I.F. trans. Sec.	8·0	C3
L14	Speech coil ...	2·5	C2

(Continued overleaf)



Circuit diagram of the Ferranti 547 A.C./D.C. superhet. **L3** is the M.W. frame winding, and **L5** the M.W. tuning coil; **L1, L2, L3** in series form the L.W. frame, while **L4** is the L.W. tuning coil.

OTHER COMPONENTS		Approx. Values (ohms)	Location
L15	Hum neutralizing...	Very low	C2
L16	Field coil	750·0	C2
T1	Speaker trans. { Pri. ...	330·0	C3
	Sec. ...	0·4	C3
S1-S8	W/band switches...	—	B2
S9	Mains sw. g'd R4...	—	B2

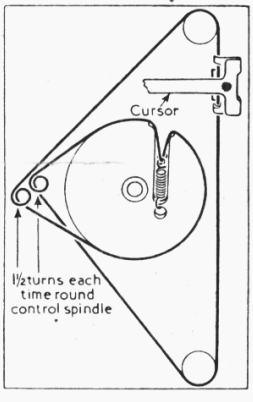
VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from A.C. mains of 223 V. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 400V 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	12K8GT	125	2·5	98	4·0
		Oscillator			
		98	2·9		
V2	12K7GT	125	9·6	98	2·4
V3	12Q7GT	51	0·33	—	—
V4	50L6G	122	39·0	98	3·3
V5	35Z4GT†	—	—	—	—

† Cathode to chassis, 178 V D.C.



The drive cord system, consisting of a single length of cord, as seen from the front with the gang at minimum, after removing the scal assembly.

GENERAL NOTES

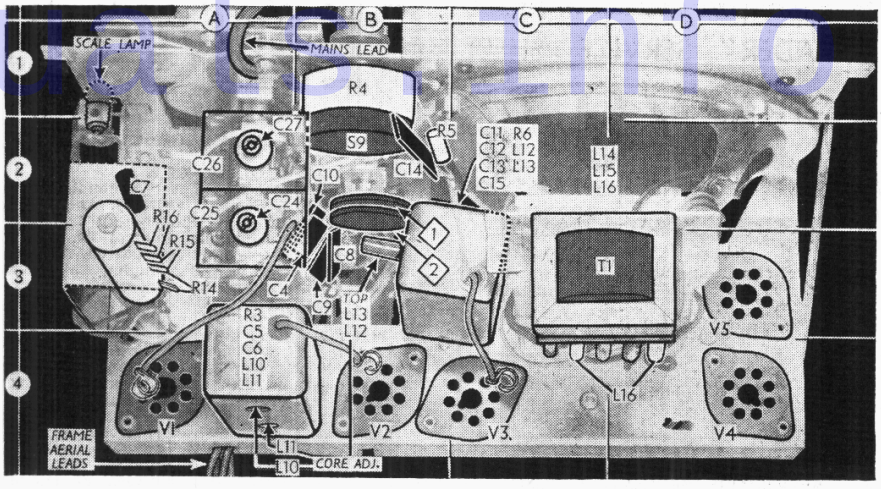
Switches.—S1-S8 are the waveband switches in two rotary units indicated in our plan view of the chassis. These are shown in detail, viewed in the same position, in the diagrams in col. 3. The table, col. 3, gives the switch positions for the two control settings, starting from M.W. (control knob anti-clockwise). **S9** is the Q.M.B. mains switch, ganged with the volume control **R4.**

Scale Lamp.—This is an Osram M.E.S. type, with a small clear spherical bulb, rated at 3.5V, 0.3A. It is shunted by a section **(R15)** of the heater ballast resistor.

Capacitors C1, C7.—C1 will not be found in our chassis illustrations as it is mounted with the frame windings on the back cover. **C7** is a special temperature compensating capacitor, to off-set frequency drift. It is rated at 18pF (0.000018μF) ±10%.

Drive Cord Replacement.—The cord consists of a closed loop of Nylon braided glass, on which the tension spring is threaded. The loop in our sample stretched tightly over two pins stuck in the bench 12½ins. apart.

Remove the scale assembly, then hook the spring to the anchorage provided on the drive drum and run the cord as shown in our sketch (col. 1), taking care that the various runs overlap in the same order as we show them. Otherwise the cord tends to "climb" off the drum. The cursor is slipped on afterwards and can be slid along the cord for correct calibration when the scale is in position.



Plan view of the chassis. **C7** is mounted over the **R14, R15, R16** unit. **V1, V2** and **V3** are provided with close-fitting shields, that for **V1** having an insulating covering.

DISMANTLING THE SET

Removing Chassis.—Remove the four domed-head screws securing the fibreboard back cover and frame aerials to the rear of the cabinet, and lift away the assembly to the extent of its connecting leads;

remove the two cheese-head screws (with metal washers) securing the rear chassis member to the cabinet, and two similar screws securing the top corners of the metal chassis front plate to moulded projections inside the cabinet;

slide out the chassis and speaker as a single unit.

When replacing, if the frame aerial leads have been unsoldered, connect them as follows, numbering the connecting tags from top to bottom: 1, white; 2, green; 3, black; 4, yellow; 5, blue; 6, red.

CIRCUIT ALIGNMENT

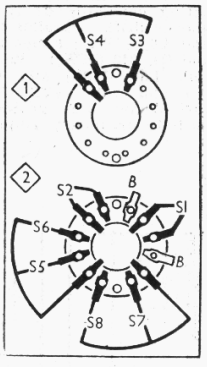
I.F. Stages.—Switch set to L.W. (knob clockwise), turn gang and volume control to maximum, connect signal generator (via an 0.1 μF isolating capacitor in each lead) to control grid (top cap) of **V1** and chassis, and feed in a 465 kc/s (645.16 m) signal. Adjust the cores of **L10, L11, L12** and **L13** (location references A4, B3) for maximum output, and repeat the operation until no improvement results. The core of **L13** is provided with a finger-tip adjustment, which projects from the screening cover, and access may be gained to **L12** core by inserting a long trimming tool beneath the gang.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursor should be horizontal and coincident with the lines at the bottom ends of the two scales. It may be adjusted in position by sliding the cursor carriage along the drive cord. Couple the signal generator output by means of a four-turn loop of wire set up on the bench at a suitable distance from the receiver frame aerial.

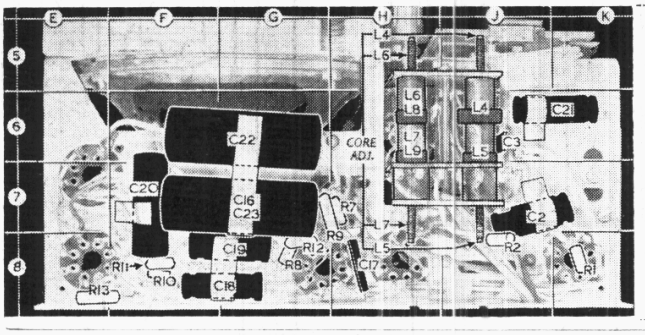
M.W.—Switch set to M.W. (knob anti-clockwise), tune to 500 m on scale, feed in a 500-m (600 kc/s) signal and adjust the cores of **L6** (H5) and **L5** (J7) for maximum output. Tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C27** (A2) for maximum output. Feed in a 228 m (1,316 kc/s) signal, tune it in, and adjust **C24** (A2) for maximum output. Repeat these operations until no improvement results.

L.W.—Switch set to L.W., tune to 1,450 m on scale, feed in a 1,450 m (207 kc/s) signal, and adjust the cores of **L7** (H7) and **L4** (J5) for maximum output.

The waveband switch units, drawn as seen in the direction indicated by the arrows in our plan view above. In the associated table (below), a dash indicates open, and **C**, closed.



Switch	M.W.	L.W.
S1	—	C
S2	—	C
S3	C	—
S4	—	C
S5	—	C
S6	C	—
S7	—	C
S8	C	—



Under-chassis view, showing the R.F. and oscillator coils and their adjustments. **C1** is mounted on the frame assembly, and is not seen in our illustrations.

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