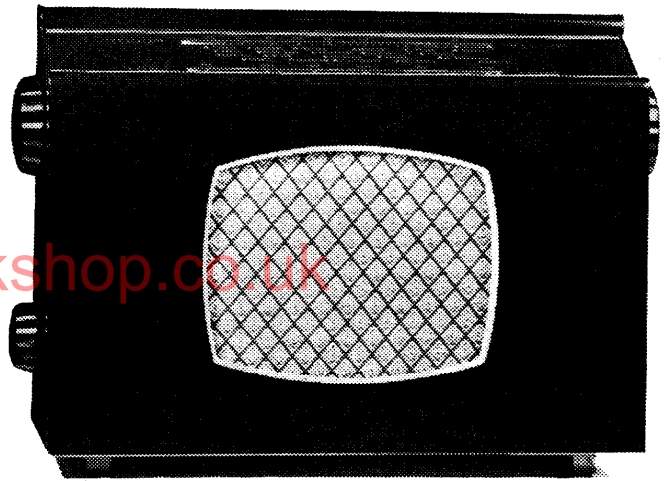


FERRANTI

A.C./D.C. Transportable

MODEL 545



Service Instructions

GENERAL DESCRIPTION	Universal mains, 4 valves plus rectifier, medium and long waveband superheterodyne receiver with built-in frame aerials and external aerial and earth sockets ; housed in a walnut cabinet.
WAVE-RANGES	M.W. 190-570 Metres. L.W. 1000-2000 Metres.
INTERMEDIATE FREQUENCY	470 Kc/s.
VALVES	Triode-Hexode Frequency Changer UCH42 ; Pentode I.F. Amplifier UF41 ; Double Diode Triode Demodulator, A.V.C. and L.F. Amplifier UBC41 ; Pentode Power Amplifier UL41 ; Half-wave Rectifier UY41. (Valves are B8A based.)
DIAL LAMP	6.3 volts, 0.115 amp. M.E.S.
CONTROLS	Volume/On-Off Switch ; Tuning ; Wave-range.
LOUDSPEAKER	6½ inches diameter P.M. moving coil.
POWER OUTPUT	3 watts.
POWER SUPPLY	A.C. 200/250v., 40/100 c.p.s. D.C. 200/250v.
POWER CONSUMPTION	50 watts at 230v. A.C. 40 watts at 220v. D.C.
DIMENSIONS (Overall)	Height 10¾ inches ; Depth 5⅝ inches ; Length 14¼ inches.

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VOLTAGE AND CURRENT MEASUREMENTS

The voltage (measured to chassis) and current readings given below are averaged and were measured under no signal conditions with the receivers tuned to 550M, using a Model 7 Avometer.

Unsmoothed H.T. at V5 cathode	200 volts.
Part smoothed H.T. at low end of R12	165 volts.
Smoothed H.T. at low end of R15	130 volts.
Smoothed H.T. at low end of R19	90 volts.
Total H.T. current at V5 cathode	65 milliamps.
Bias across R14	-2.1 volts.

To check that the oscillator is functioning earth VI oscillator grid (pin 4) and note that oscillator anode current increases from approx. 4 mAs. to approx. 8 mAs.

Ref.	Valve	Anode Volts	Anode Current mAs.	Screen Volts	Screen Current mAs.	Osc. Anode Volts	Cathode Volts
V1	UCH42	165	4	90	2.5	90	—
V2	UF41	165	5	90	1.7	—	—
V3	UBC41	67	0.45	—	—	—	—
V4	UL41	190	40	130	6.5	—	6.8
V5	UY41	—	—	—	—	—	200

Ref.	Capacitance	Tol. ±%	Wkg. Volts	Part No.	Function	Ref.	Ohms	Tol. ±%	Watts	Part No.	Function		
C1	2.5-40 pF			07/17703	L.W. aerial trimmer, variable	R3	1K	20	½	07/98387	V2 grid stopper		
C2	2.5-40 pF			07/17703	M.W. aerial trimmer	R4	100K	20	½	07/98411	I.F. filter		
C3	100 pF	5	350	07/99028	L.W. aerial trimmer, fixed.	R5	10M	20	½	07/98370	V3 grid leak		
C4	15-535 pF			07/17701	Aerial tuner (ganged capacitor)	R6	100K	20	½	07/98411	V3 anode load		
C5	200 pF	20		07/99191	A.V.C. decoupler	R7	2.2M	20	½	07/98419	A.V.C. decoupler		
C6	100 pF	5	350	07/99200	IFT-1 primary tuner	R8	2.2M	20	½	07/98419	A.V.C. diode load		
C7	100 pF	5	350	07/99200	IFT-1 secondary tuner	R9	4.7K	20	½	07/98395	Tone corrector		
C8	50 pF	20		07/99276	VI oscillator grid capacitor	R11	330K	20	½	07/98414	V4 grid leak		
C9	15-535 pF			07/17701	Oscillator tuner (ganged capacitor)	R12	1.5K	10	W.W.	07/98644	H.T. smoother		
C10	2.5-40 pF			07/17703	L.W. oscillator trimmer, variable	R13	150	10	½	07/98451	V4 cathode bias		
C11	2.5-40 pF			07/17703	M.W. oscillator trimmer, variable	R14	33	20	½	07/98374	Auto bias		
C12	190 pF	1		07/99144	L.W. oscillator trimmer, fixed	R15	2.2K	20	½	07/98338	H.T. smoother		
C13	540 pF	1	350	07/99046	M.W. oscillator padder	R16	270	10	W.W.	07/18831	Mains voltage dropper		
C14	250 pF	2	350	07/99297	L.W. oscillator padder	R17	250	15	W.W.				
C15	0.05 µF		350	07/99277	VI-V2 screen and VI oscillator anode decoupler	R18	746	5	W.W.				
C16	100 pF	5	350	07/99200	IFT-2 primary tuner	R19	4.7K	20	½	07/98342	VI-V2 screen and VI oscillator anode H.T. dropper		
C17	300 pF	5		07/99201	IFT-2 secondary tuner	R20	Varite			07/98788	Mains voltage dropper		
C18	100 pF	25		07/99300	I.F. filter	R25	Varite		Pot'r	07/98788	Dial lamp protection		
C19	100 pF	25		07/99300	Demodulator diode reservoir	VR1	0.5M			07/18838	Volume control and demodulator load		
C20	50 pF	20		07/99276	A.V.C. coupler	D.C. Resistance in Ohms							
C21	5000 pF		500	07/99193	Audio coupler to V3 grid								
C22	400 pF	20		07/99279	Tone corrector	L1	15			07/17738	L.W. frame aerial		
C23	0.02 µF		350	07/99167	Audio coupler to V4 grid	L2	1			07/17158	M.W. frame aerial		
C24	0.01 µF	20	500	07/99298	Tone control	L3	1.25			07/17740	M.W. aerial trimmer		
C26	16 µF		350	07/99280	H.T. smoother	L4	7			07/17508	IFT-1 primary		
C27	32 µF		350	07/99174	H.T. smoother	L5	7			07/17508	IFT-1 secondary		
C28	32 µF		350		H.T. reservoir	L6	11			07/17545	L.W. oscillator grid coil		
C29	0.01 µF	25	300A.C.	07/99316	R.F. bypass	L7	1.5			07/17545	L.W. oscillator reaction coil		
C30	0.05 µF		350	07/99277	A.V.C. decoupler	L8	4			07/17543	M.W. oscillator grid coil		
C31	0.05 µF		350	07/99277	R.F. bypass	L9	0.5			07/17543	M.W. oscillator reaction coil		
C32	15 pF	10	350	07/99164	M.W. oscillator trimmer, fixed	L10	7			07/17509	IFT-2 primary		
C33	100 pF	15	750	07/99149	Aerial isolating capacitor	L11	3.5			07/17509	IFT-2 secondary		
C34	0.02 µF	20	300	07/99203	Chassis isolating capacitor	L12	250(Pri.) (Sec.)	}		07/18844	Output transformer		
R1	1M	20	½	07/98417	VI grid resistor	L13						07/18844	Output transformer.
R2	47K	20	½	07/98407	VI oscillator grid leak	LS						07/18606	Loudspeaker.

Note—To prevent shock or damage to equipment connect the receiver to the mains so that the chassis is neutral. Check this with a lamp or voltmeter.

Connect a high resistance output meter (100v. A.C.) via a 0.1 μ F series capacitor across T1 primary. During alignment maintain the input signal at a level which produces a meter reading of 10-20 volts. To prevent damage to iron dust cores use a non-metallic screwdriver which exactly fits the slots in the cores.

I.F. Alignment 470 Kc/s

1. Set the wave-range switch to L.W. (clockwise); set the tuning gang to maximum (vanes fully meshed); set the volume control to maximum (fully clockwise).
2. Inject 470 Kc/s via a 0.1 μ F capacitor into V1 signal grid (pin 6), i.e., front section of tuning gang.
3. De-tune L11 until the core is fully unscrewed then adjust L5, L4, L10 and L11 in that order, for maximum gain.

Note—Do not repeat the adjustments without first de-tuning L11.

R.F. Alignment

To be carried out with the frame aerials correctly mounted in the slot on the baseboard and secured by the extension bolts to the chassis.

Note—Handle the frame aerial with care, otherwise there is likelihood of open circuiting the connections to the M.W. trimming coil L3 resulting in low gain on M.W.

Alignment signals may be coupled to the receiver by means of a three turn, approximately ten inches diameter loop of stout gauge enamelled copper wire placed in front of and parallel to the receiver frame aerial at a distance of approximately two feet. The signal generator to be connected to the loop via a non-inductive resistor approximately equal to the terminating impedance of the signal generator. **Note**—Alignment should **not** be carried out by injecting the R.F. signals into the aerial input socket.

If any of the following alignment frequencies are unusable because of heterodyning by broadcasting stations, select a frequency a few Kc/s away from the interfering station but as close as possible to the stated frequency.

Prior to alignment set the tuning gang to maximum (vanes fully meshed), and check that the pointer coincides with the end of the calibrated scale. The pointer can be adjusted by sliding it along the drive cord.

Medium Waves 190–570 Metres

1. Set the wave-range switch to M.W. (anti-clockwise) and check that the volume control is at maximum.
2. Set the signal generator to 500M (600 Kc/s) and set the pointer to 500M. Adjust the M.W. oscillator core L8 and then the M.W. aerial core L3 for maximum gain.
3. Set the signal generator to 200M (1500 Kc/s) and set the pointer to 200 M. Adjust the M.W. oscillator trimmer C11 and then the M.W. aerial trimmer C2 for maximum gain.
4. Repeat 2 and 3 until no further increase in gain can be obtained.

Long Waves 1,000–2,000 Metres

1. Set the wave-range switch to L.W. (clockwise) and check that the volume control is at maximum.
2. Set the signal generator to 1800M (166.6 Kc/s) and set the pointer to 1800M. Adjust the L.W. oscillator core L6 for maximum gain.
3. Set the signal generator to 1128M (266 Kc/s) and set the pointer to 1128M. Adjust the L.W. oscillator trimmer C10 and then the L.W. aerial trimmer C1 for maximum gain.
4. Repeat 2 and 3 until no further increase in gain can be obtained.
5. Set the pointer to 1500M and if necessary slightly readjust the L.W. oscillator core L6 to receive the Light Programme or a 1500M (200 Kc/s) signal from the generator.

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