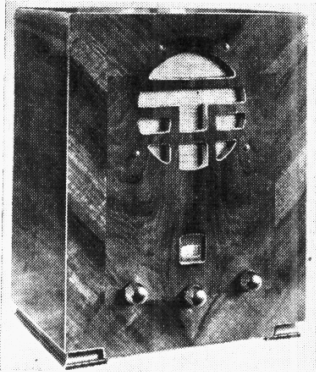


"TRADER" SERVICE SHEET

711

FERRANTI LANCASTRIA 1933/4

LANCASTRIA PARVA & LANCASTRIA MAGNA



The Lancastria Magna.

FIRST of the Lancastria series, the 1933/4 version is a 4-valve (plus rectifier), 2-band superhet, designed to operate from AC mains of 200-260 V, 40-100 c/s. The Lancastria Parva is similar in every respect, but it was released at a lower price. The Lancastria Magna, on which this Service Sheet was prepared, employs an identical chassis, but it is housed in a different cabinet. Release date, all models, 1933. Original prices: Lancastria, £15 15s.; Lancastria Parva, £14 3s. 6d.; Lancastria Magna, £15 15s.

CIRCUIT DESCRIPTION

Aerial input via coupling coils L1, L2 to mixed coupled band-pass filter. Primary coils L3, L4 are tuned by C26; secondaries L8, L9 by C28. Coupling by L6, L7 and C2. First valve (V1, Ferranti VHT4) is a heptode operating as frequency changer with electron coupling. Oscillator grid coils L10 (MW) and L11 (LW) are tuned by C30. Parallel trimming by C31 (MW); series tracking by C9, C32 (MW) and C10, C33 (LW). Reaction coupling by L12, L13 and C11. Image suppression by L5 in V1 cathode lead to chassis.

Second valve (V2, Ferranti VPT4) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings C34, C5, L14, L15, C6, C35 and C36, C15, L16, L17, C16, C37. Intermediate frequency 125 kc/s.

Diode second detector is part of double diode triode valve (V3, Ferranti H4D), the two diodes being strapped. Audio-frequency component in rectified output is developed across load resistor R11 and passed via C19 and tag X to the pick-up terminal which is connected to CG of triode section. For pick-up operation, tag X is disconnected, muting radio. IF filtering by C17, R10, C18 and L18, C21.

Resistance-capacitance coupling by R14, C22 and R16 between V3 triode and triode output valve (V4, Osram PX4 or Ferranti LP4). Provision for connection of low-impedance external speaker across secondary of internal speaker input transformer T1.

HT current is supplied by full-wave rectifying valve (V5, Ferranti R4). Smoothing by speaker field L21, in negative HT lead to chassis, and electrolytic capacitors C24, C25. DC potential along L21 is divided by R19, R20, that across R19 being further divided by R17, R18; GB for V4 is obtained from the drop along R17, which is a potentiometer acting as gain control for V1 and V2, its slider being returned via decoupling circuits to V1, V2 control grids.

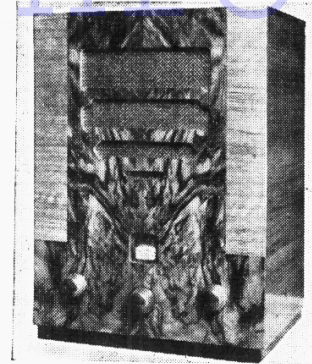
DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (pull-off); remove four bolts (with washers) holding chassis to bottom of cabinet.

Chassis may now be withdrawn to the extent of the speaker leads, or freed entirely if these are unsoldered from the tags on the speaker transformer, beneath the fibre cover held over them by a set screw (with washer) in the speaker magnet pot. This operation is simplified if the speaker is removed first.

When replacing, connect the speaker leads as follows, numbering the tags from left to right: 1, red (with speaker earthing lead and one black lead from electrolytic block); 2, blue (with the other black lead from electrolytic block); 3, black; and 4, green (with red lead from electrolytic block).

Do not omit to replace the fibre cover.



The 1933/4 Lancastria.

Removing Speaker.—Remove the four nuts and washers from the fixing bolts on front of cabinet.

When replacing, the transformer goes at the top. The leads should be connected as described previously.

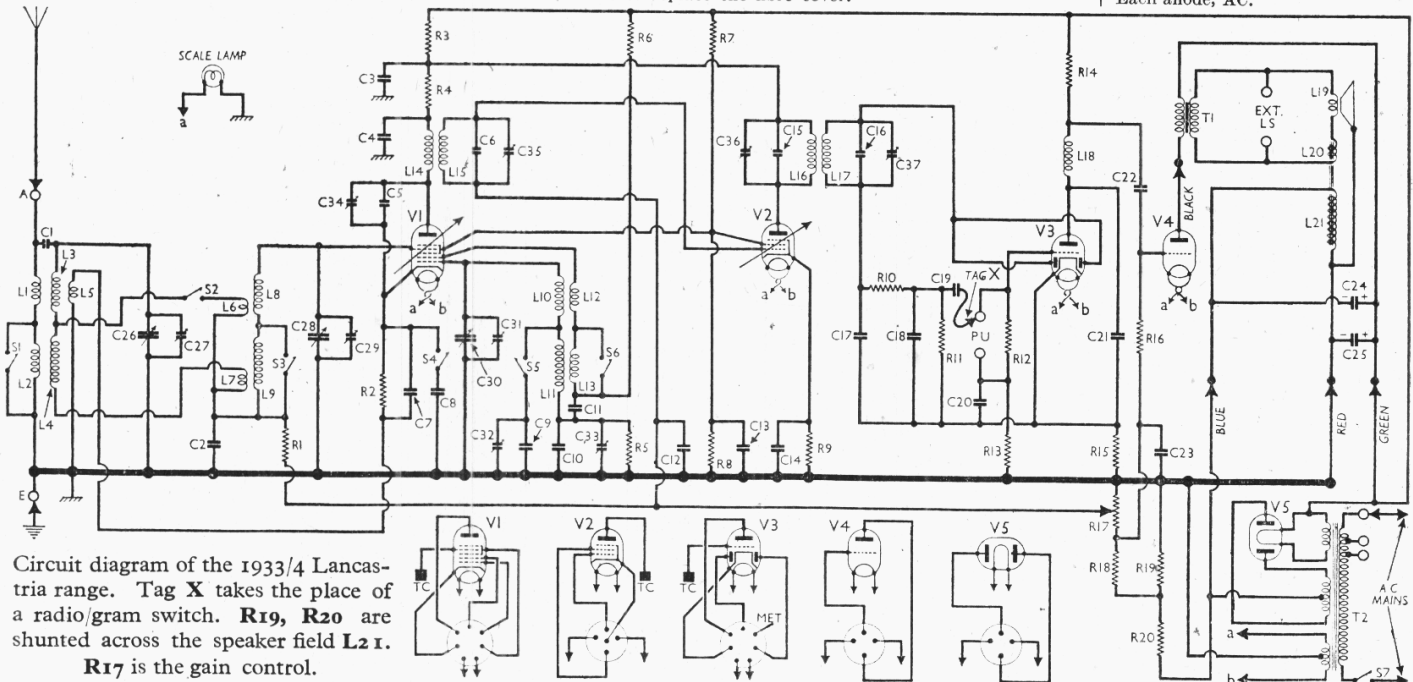
VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the makers. They represent average conditions when the receiver is tuned to 200 m, the volume control is at maximum, and there is no signal input.

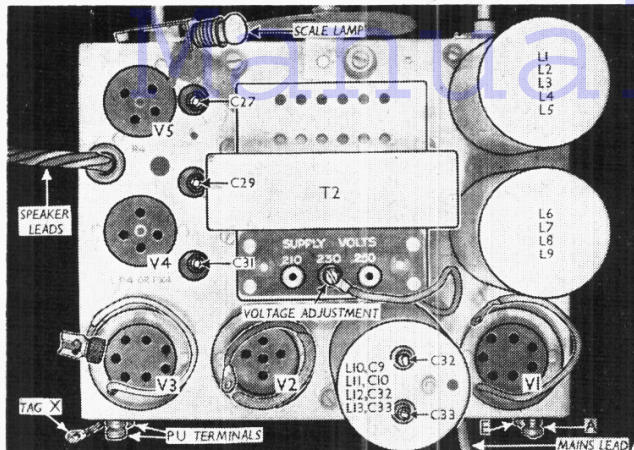
Voltages were measured on the 300 V scale of a Ferranti AC/DC circuit tester. For V1-V3, the cathode was the negative connection; for V4, V5, the negative lead went to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 VHT4	168 Oscillator 62	1.7 1.4	82	4.0
V2 VPT4	165	3.3	82	3.0
V3 H4D	145	1.7	—	—
V4 PX4	230	46.0	—	—
V5 R4	350†	—	—	—

† Each anode, AC.



Circuit diagram of the 1933/4 Lancastria range. Tag X takes the place of a radio/gram switch. R19, R20 are shunted across the speaker field L21. R17 is the gain control.



Plan view of the chassis. Tag X goes to the upper pick-up terminal for radio reception. C27, C29, C31 can be adjusted from above or below the chassis, but the makers recommend adjusting them from above.

GENERAL NOTES

Switches.—S1-S6 are the waveband switches, ganged in a barrel-operated assembly indicated in our under-chassis view, where the switches are identified. S1, S2, S3, S5 and S6 all close on MW and open on LW; S4 opens on MW and closes on LW.

S7 is the QMB mains switch, operated by a lever on the waveband control.

Scale Lamp.—This is an Osram MES type, rated at 3.5 V, 0.3 A, connected across one half of the heater winding. Its holder is specially designed to facilitate replacement.

Gramophone Pick-up.—For pick-up operation, tag X should be removed from the upper pick-up terminal, to mute radio. A 50,000 Ω external volume control will be required, and if output is insufficient, a Ferranti AF8 input transformer is recommended.

External Speaker.—Two terminals are provided on the internal speaker assembly for a low impedance (4-6 Ω) external speaker.

Capacitor Blocks.—There are two metal-cased capacitor blocks beneath the chassis, with flexible outlet leads. The three leads from one side of C4, C13 and C14 (all 0.1 μF) are indicated in our under chassis view; the case forms the common negative connection.

In the C3 (0.1 μF), C20, C23 (both 0.25 μF) unit, the colour coding of the leads is indicated, C3 and C23 each have one side returned to the case, but C20 is isolated from it.

Capacitors C24, C25.—These are two 8 μF electrolytics in a rectangular carton mounted in a metal bracket attached to the speaker assembly. The unit has a common positive (red) lead, and two negative (black) leads, and these are connected to the transformer, T1.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator leads to control grid (top cap) of V1 and chassis, and turn volume control to maximum. Feed in a 125 kc/s (2,400 m) signal and adjust C37, C36, C35 and C34 for maximum output.

RF and Oscillator Stages.—With the gang at minimum, the scale should indicate 200 m.

MW.—With signal generator leads connected as for IF stages, and the set switched to MW, tune to 228 m on scale, feed in a 228 m (1,315 kc/s) signal, screw up C31 to maximum, then adjust it for maximum output on the second peak reached as it is unscrewed.

Transfer signal generator leads to A and E terminals, via a dummy aerial, feed in a 228 m signal, and adjust C27 and C29 for maximum output. Feed in a 500 m (600 kc/s) signal; tune it in, and adjust C32 for maximum output while rocking the gang for optimum results.

LW.—Switch set to LW, feed in a 1,807 m (166 kc/s) signal, and adjust C33 for maximum output while rocking the gang for optimum results. Check calibration at 1,128 m (266 kc/s).

COMPONENTS AND VALUES

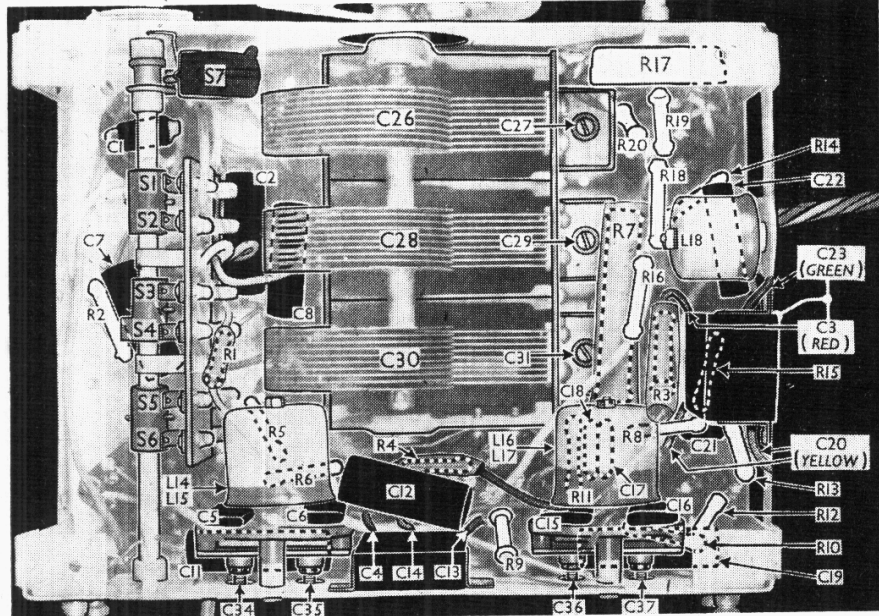
RESISTORS		Values (ohms)
R1	V1 pent. CG decoupling	500,000
R2	V1 fixed GB resistor	300
R3	V1, V2 anode HT feed resistors	10,000
R4	V1 osc. CG resistor	1,000
R5	V1 osc. anode HT feed	50,000
R6	V1, V2 SG's HT feed	100,000
R7	V1, V2 SG's HT feed potential divider	20,000
R8	V2 fixed GB resistor	30,000
R9	V2 fixed GB resistor	450
R10	IF stopper	100,000
R11	V3 diode load	500,000
R12	V3 CG resistor	1,000,000
R13	V3 CG decoupling	100,000
R14	V3 triode anode load	120,000
R15	V3 triode GB resistor	3,500
R16	V4 CG resistor	250,000
R17	V1, V2 gain control	1,000,000
R18	V4 GB pot. divider	200,000
R19	Speaker field potential divider	200,000
R20	Speaker field potential divider	250,000

OTHER COMPONENTS

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial coupling coils	17.5
L2		68.0
L3		5.0
L4		41.0
L5		1.7
L6	Band-pass primary coils	0.5
L7		2.0
L8	Image rejector coil	5.0
L9		40.0
L10	Osc. circ. MW tuning coil	4.0
L11	Osc. circ. LW tuning coil	23.0
L12	Oscillator reaction coils	6.5
L13		3.2
L14	1st IF trans. {Pri. ...	110.0
L15		{Sec. ...
L16	2nd IF trans. {Pri. ...	110.0
L17		{Sec. ...
L18	IF filter choke	200.0
L19	Speaker speech coil	3.5
L20	Hum neutralising coil	0.5
L21	Speaker field coil	1,500.0
T1	Speaker input {Pri. ...	220.0
	{Sec. ...	0.3
	{Pri., total	38.0
T2	Mains {Heater sec. ...	0.1
	{Rect. heat. sec. ...	0.1
	{HT sec., total ...	450.0
S1-S6	Waveband switches	—
S7	Mains switch	—

CAPACITORS

CAPACITORS		Values (μF)
C1	Aerial "top" coupling	0.00018
C2	Band-pass coupling	0.05
C3	V2 anode decoupling	0.1
C4	V1 pent. anode decoupling	0.1
C5	1st IF transformer fixed trimmers	0.00005
C6		0.00005
C7	V1 cathode by-pass capacitors	0.02
C8	V1 cathode by-pass capacitors	0.02
C9	Osc. MW fixed tracker	0.00172
C10	Osc. LW fixed tracker	0.0006
C11	Reaction coupling	0.01
C12	V2 CG decoupling	0.05
C13	V1, V2 SG's decoupling	0.1
C14	V2 cathode by-pass	0.1
C15	2nd IF transformer fixed trimmers	0.00005
C16		0.00005
C17	IF by-pass capacitors	0.00015
C18	IF by-pass capacitors	0.00015
C19	AF coupling to V3 triode	0.01
C20	V3 triode CG decoupling	0.25
C21	IF by-pass	0.0003
C22	AF coupling to V4	0.02
C23	V4 CG decoupling	0.25
C24*	HT smoothing capacitors	8.0
C25*		8.0
C26†	Band-pass pri. tuning	—
C27†	B-P pri. MW trimmer	—
C28†	Band-pass sec. tuning	—
C29†	B-P sec. MW trimmer	—
C30†	Oscillator circuit tuning	—
C31†	Osc. circ. MW trimmer	—
C32†	Osc. circ. MW tracker	0.0002
C33†	Osc. circ. LW tracker	0.0002
C34†	1st IF trans. pri. tuning	—
C35†	1st IF trans. sec. tuning	—
C36†	2nd IF trans. pri. tuning	—
C37†	2nd IF trans. sec. tuning	—



Under-chassis view. Components hidden by others, or by sleeving, are shown dotted.

* Electrolytic. † Variable. ‡ Pre-set.