

"TRADER" SERVICE SHEET
738

LISSEN 8216

AND EVER READY 5016

REVISED ISSUE OF
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The Lissen 8216.

THE Lissen 8216 is a 3-valve (plus rectifier) AC 3-band receiver, with a short wave range of 18.5-52 metres, designed to operate from AC mains of 200-250 V. A similar chassis is employed in the Ever Ready 5016.

Release date, both models, 1936.
Original prices: 8216, £9 9s.; 5016, £9 19s. 6d.

CIRCUIT DESCRIPTION

Two alternative aerial input sockets, **A1** via series capacitor **C1** and **A2** via Droitchich retractor circuit **C2**, **L1**, to coupling coils **L2** (SW) and **L3** (MW and LW). Single tuned circuit **L4**, **C20** (SW), **L5**, **C20** (MW) and **L6**, **C20** (LW), precede variable-mu pentode RF amplifier (**V1**, Ever Ready metallised A50P). Gain control by variable cathode resistor **R4**, which varies GB applied and progressively shunts the aerial circuit on MW and LW as GB is increased.

Tuned anode coupling by **L7** (SW), **L8** (MW) and **L9** (LW) tuned by **C21**, between **V1** and an RF pentode detector valve (**V2**, Ever Ready Metallised A50B) which operates on the grid leak system with **C6** and **R6**. Reaction is applied from

anode by coils **L10** (SW) and **L11** (MW and LW) and controlled by variable capacitor **C23**. RF filtering in anode circuit by **C9**, **R11** and **C10**. Provision for connection of gramophone pick-up in control grid circuit of **V2**.

Resistance-capacitance coupling by **R10**, **C11** and **R12**, via RF stopper **R13**, between **V2** and pentode output valve (**V3**, Ever Ready A70D). Fixed tone correction by **C12**, and two-position tone control by **C15**, **S8**, in anode circuit. Provision for connection of low impedance external speaker across **T1** secondary.

HT current is supplied by an IHC full-wave rectifying valve (**V4**, Ever Ready A11D). Smoothing is effected by speaker field **L14** and dry electrolytic capacitors **C16** and **C17**.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 216-235 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but the reaction control was at minimum. There was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 A50P	200	9.1	195	3.7
V2 A50B	165	1.6	80	0.6
V3 A70D	225	31.0	250	5.1
V4 A11D	370†	—	—	—

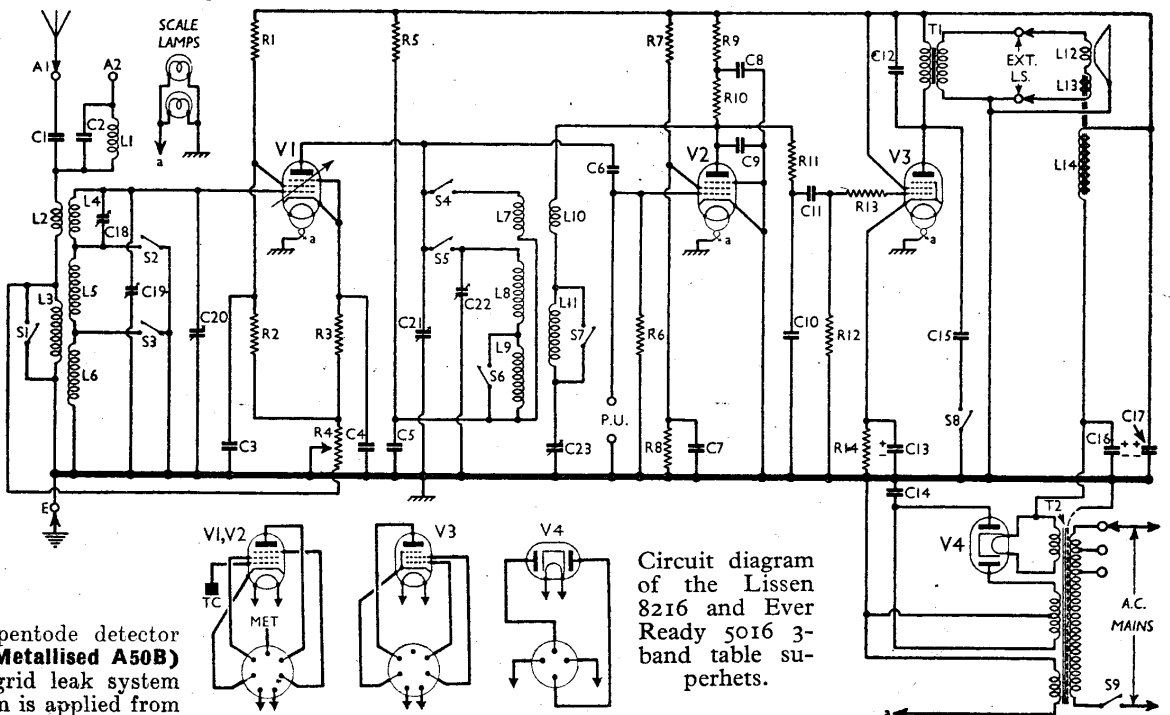
† Each anode, AC.

COMPONENTS AND VALUES

RESISTORS		Values (ohms)
R1	V1 SG HT potential divider	10,000
R2		110,000
R3		200
R4	V1 gain control	21,000
R5	V1 anode HT feed	5,000
R6	V2 grid leak	510,000
R7	V2 SG HT potential divider	50,000
R8		30,000
R9	V2 anode decoupling	20,000
R10	V2 anode load	40,000
R11	V2 anode RF stopper	21,000
R12	V3 CG resistor	260,000
R13	V3 CG RF stopper	26,000
R14	V3 GB resistor	200

CAPACITORS		Values (µF)
C1	Aerial series capacitor	0.0002
C2	Droitwich retractor tuning	0.0003
C3	V1 SG decoupling	0.1
C4	V1 cathode by-pass	0.1
C5	V1 anode decoupling	0.1
C6	V2 CG capacitor	0.00005
C7	V2 SG decoupling	0.1
C8	V2 anode decoupling	0.5
C9	RF by-pass capacitors	0.0002
C10		0.0005
C11	V2 to V3 AF coupling	0.1
C12	Fixed tone corrector	0.0025
C13*	V3 cathode by-pass	50.0
C14	V4 anode RF by-pass	0.01
C15	Tone control capacitor	0.01
C16*	HT smoothing capacitors	8.0
C17*		16.0
C18†	Aerial SW trimmer	—
C19†	Aerial MW trimmer	—
C20†	Aerial circuit tuning	—
C21†	Anode circuit tuning	—
C22†	Anode circ. MW trimmer	—
C23†	Reaction control	—

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Lissen 8216 and Ever Ready 5016 3-band table superhets.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Droitwich rejector coil ...	21.0
L2	Aerial SW coupling coil ...	0.8
L3	Aerial MW and LW coupling coil ...	39.2
L4	Aerial SW tuning coil ...	0.05
L5	Aerial MW tuning coil ...	2.15
L6	Aerial LW tuning coil ...	10.35
L7	Anode SW tuning coil ...	Very low
L8	Anode MW tuning coil ...	2.6
L9	Anode LW tuning coil ...	12.5
L10	SW reaction coil ...	0.3
L11	MW and LW reaction ...	4.7
L12	Speaker speech coil ...	1.85
L13	Hum neutralising coil ...	0.25
L14	Speaker field coil ...	3,000.0
T1	Output trans. { Pri. ...	780.0
	{ Sec. ...	0.5
	{ Pri. total ...	48.0
T2	Mains trans. { Heater sec. ...	0.12
	{ Rect. heat. sec. ...	0.3
	{ HT sec. total ...	365.0
S1-S7	Waveband switches ...	—
S8	Tone control switch ...	—
S9	Mains switch ...	—

DISMANTLING THE SET

A detachable bottom giving access to the underside of the chassis is held by four wood screws.

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

If the mains switch is freed (two round-head wood screws) from side of cabinet, and the speaker field leads are freed from the strip across back of cabinet, the chassis may be withdrawn; or, if the speech coil plugs are withdrawn from their sockets and the field coil leads are removed from their terminals, the chassis may be freed entirely.

When replacing, the field coil leads go to the two left-hand terminals, and the cardboard covers must be replaced over the heads of the chassis bolts.

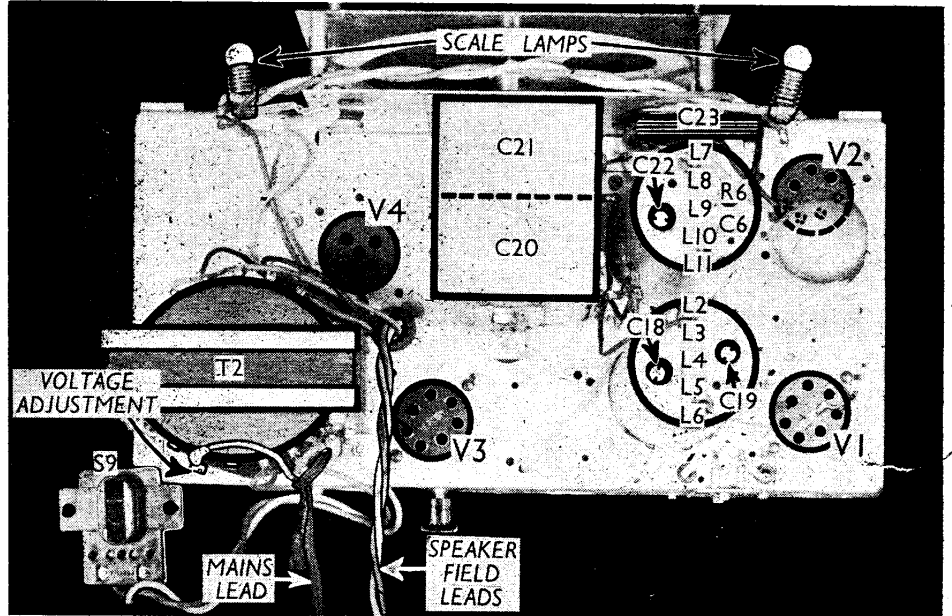
Removing Speaker.—Remove the four cheese-head screws (with washers and lock-washers) holding speaker to sub-baffle.

When replacing, the terminal panel should be at the bottom.

If the speech coil leads have been disconnected, the black lead goes to the third terminal from the left, and the red one to the cleat holding the leads to the speaker frame.

GENERAL NOTES

Switches.—S1-S7 are the wavechange switches, ganged in a single unit beneath the chassis. All the switches are clearly



Plan view of the chassis. The mains switch unit S9 is seen here, but in use it is fitted on the side of the cabinet. The three pre-set trimmer adjustments are seen at the tops of the coil units.

marked in our under-chassis view. Note that one set of contacts (between S1 and S4) is not used.

All switches except S5 close on SW (control fully anti-clockwise); S3, S5, S6 close on MW; and S5 closes on LW; otherwise they are open.

S8 is a 2-position switch at the rear of the chassis for tone control. In the anti-clockwise position it is closed, and brings C15 into circuit.

S9 is the QMB mains switch, in a moulded unit fitted to the side of the cabinet.

Coils.—L1 is in two sections on a tubular former beneath the chassis. L2-L6 and L7-L11 are in two screened units on the chassis-deck. The first of these contains the trimmers C18, C19, while the second contains, besides the trimmer C22, the components C6 and R6.

Scale Lamps.—These are two Ever Ready MES types rated at 6.2 V, 0.3 A.

External Speaker.—Provision is made at the rear of the chassis for a low impedance (2.4 Ω) external speaker. For use with the internal speaker, it should be plugged into the socketed plugs of the latter; for use alone, the internal speaker plugs should be removed, and those of the external speaker substituted.

Capacitors C16, C17.—These are two dry electrolytics in a single carton beneath the chassis, with a common negative (black) lead. The yellow lead is the positive of C16 (8 μF) and the red the positive of C17 (16 μF).

Aerial Connections.—There are two aerial sockets, and the use of A2 brings into action the fixed-tuned Droitwich rejector, L1, C2.

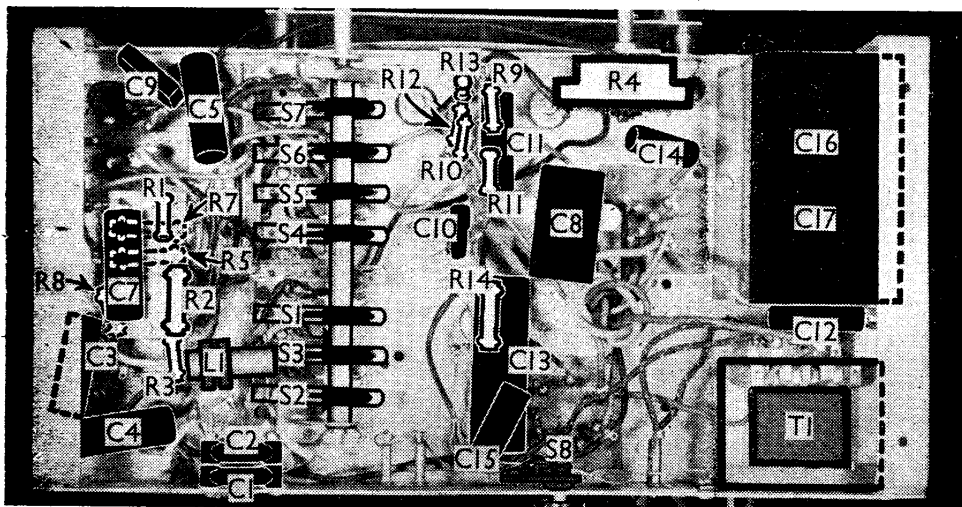
Mains Transformer T2.—This has an extra winding which is not used in this set. The two tags belonging to it (next to those of the heater winding) are blank.

CIRCUIT ALIGNMENT

Rotate the gang until the pointers are at the higher wavelength ends of the scales. Push a flat-ended rod against the vanes, which are accessible from the open side of the gang, at the same time rocking the vanes of the rotor until it can be felt that they are fully in mesh. If the pointers do not coincide with the horizontal line dividing the scale, release the centre fixing screw, and adjust them to this position.

MW.—Rotate the gang until the pointers are at the lower wavelength ends of the scales, and switch the set to MW. Turn the volume control to maximum, and reaction to minimum. Set the pointer to minimum wavelength. Connect signal generator to A1 and E sockets, feed in a 202 m (1,484 kc/s) signal and adjust C19 and C22 in turn for maximum output.

S.W.—Switch the receiver to S.W., set pointer to 16 MC/S on the scale, feed in a 16 MC/S signal, and adjust reaction until the receiver is just short of oscillation, with the volume control at maximum. Now adjust C18 for maximum output, rocking the gang slightly for optimum results, and if necessary re-adjusting reaction to keep the receiver just short of oscillation.



Under-chassis view. The waveband switch unit S1-S7 is seen at left centre, the individual switches being identified. An eighth switch on the unit, between S1 and S4, is unused. S8 is the tone control switch.