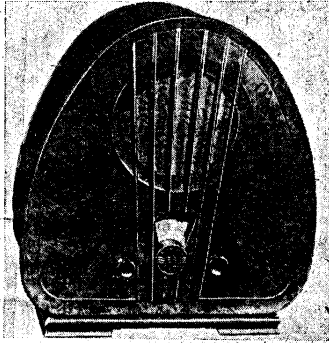


"TRADER" SERVICE SHEET
612

PHILIPS 834A
SUPERINDUCTANCE AC RECEIVER



The Philips 834A receiver.

SUPERINDUCTANCE coils are used in the Philips 834A, a 4-valve (plus rectifier) 2-band TRF receiver designed for use with AC mains of 100-260 V, 40-100 C/S. Provision is made for the connection of a gramophone pick-up (with plug-type switching) and an external speaker.

Release date and original price: 1933; £11.11s.

CIRCUIT DESCRIPTION

Aerial input from socket **A2** is via impedance matching condensers **C1**, **C2** to single tuned circuits **L1** (MW), plus **L2** (LW), and **C18** which precede a variable-mu RF tetode valve (**V1**, Mullard metallised **MM4V**) operating as signal frequency amplifier. An alternative aerial socket **A1**, provided for use with very strong transmissions, is coupled to socket

A2 by the mutual capacity between the two sockets only.

Tuned - secondary, RF transformer coupling by **L3**, **L4** (MW) and **L5** (LW), tuned by **C22**, between **V1** and a second RF tetode valve (**V2**, Mullard metallised **S4VB**) which is also an RF amplifier.

Aperiodic RF transformer coupling by **L6**, **L7** (MW), plus **C7** (LW) between **V2** and anode bend triode detector valve (**V3**, Mullard metallised **994V**). Provision for connection of a gramophone pick-up between **V3** CG and chassis, while a switching device consisting of a pair of split sockets **S4**, **S5** permits the pick-up to be left permanently connected to the chassis. An insulated plug on a springy flexible lead effects the change-over, short-circuiting the two elements of the appropriate socket.

Resistance-capacity coupling by **R9**, **C11**, **R10** between **V3** and directly-heated pentode output valve (**V4**, Mullard **PM24A**). RF filtering by filter circuit **C9**, **R11**, **C13**, **R12**. Fixed tone correction by **C14** in anode circuit. Provision for connection of high impedance external speaker, also in anode circuit.

HT current is supplied by full-wave rectifying valve (**V5**, Philips **1821**). Smoothing by resistance **R13**, in negative HT lead to chassis, and electrolytic condensers **C15**, **C16**. RF filtering in HT positive feed by choke **L9** and **C17**.

DC potential developed across **R13**, which is the gain control potentiometer, is used to provide variable GB for **V1**, the grading being suitably adjusted by shunting part of its element by **R14**. GB for **V4** is obtained from potential divider **R15**, **R16**, across which appears the voltage drop along **R13**.

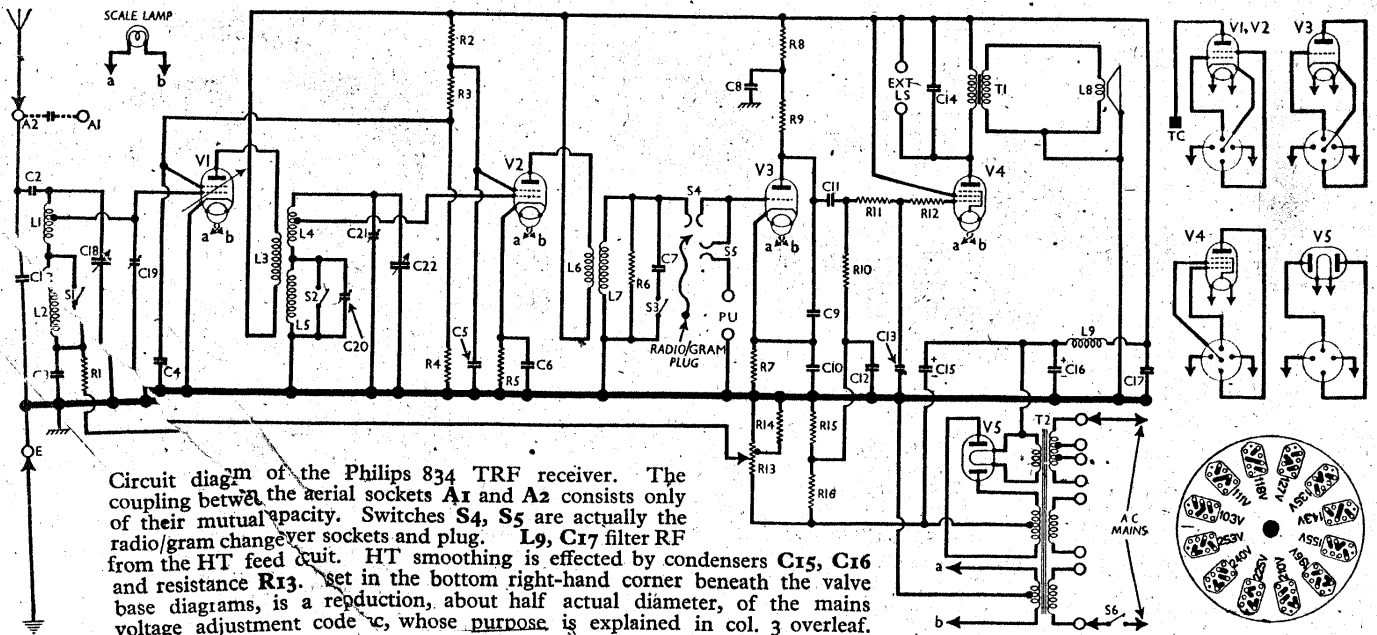
COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 CG decoupling ...	2,000,000
R2	V1, V2 SG's HT feed potential divider ...	40,000
R3		25,000
R4		64,000
R5	V2 GB resistance ...	640
R6	V3 CG damping ...	64,000
R7	V3 GB resistance ...	16,000
R8	V3 anode decoupling ...	100,000
R9	V3 anode load ...	320,000
R10	V4 CG resistance ...	2,000,000
R11	RF filter resistances ...	320,000
R12		640,000
R13		1,000
R14		160
R15	V1 gain control, total*	640,000
R16	V4 GB potential divider ...	400,000

* Tapped at 1260 Ω from HT negative.

CONDENSERS		Values (μF)
C1	Aerial coupling condensers ...	0.0001
C2		0.00002
C3	V1 CG decoupling ...	0.1
C4	V1 SG decoupling ...	0.1
C5	V2 SG decoupling ...	0.25
C6	V2 cathode by-pass ...	0.1
C7	L7-LW shunt ...	0.00064
C8	V3 anode decoupling ...	0.25
C9	RF by-pass ...	0.00025
C10	V3 cathode by-pass ...	0.5
C11	V3 to V4 AF coupling ...	0.002
C12	V4 CG decoupling ...	25
C13	RF by-pass ...	0.00005
C14	Fixed tone corrector ...	0.005
C15*	HT smoothing condensers ...	16.0
C16*		16.0
C17	HT circuit RF filter ...	1.0
C18†	Aerial circuit tuning ...	0.00043
C19	Aerial circ. MW trimmer ...	0.000025
C20†	RF trans. LW trimmer ...	0.000027
C21†	RF trans. MW trimmer ...	0.000027
C22†	RF trans. sec. tuning ...	0.00043

* Electrolytic. † Variable. ‡ Pre-set.



Circuit diagram of the Philips 834 TRF receiver. The coupling between the aerial sockets **A1** and **A2** consists only of their mutual capacity. Switches **S4**, **S5** are actually the radio/gram changeover sockets and plug. **L9**, **C17** filter RF from the HT feed circuit. HT smoothing is effected by condensers **C15**, **C16** and resistance **R13**. Set in the bottom right-hand corner beneath the valve base diagrams, is a reproduction, about half actual diameter, of the mains voltage adjustment code 'c', whose purpose is explained in col. 3 overleaf.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial MW tuning coil ...	3.5
L2	Aerial LW tuning coil ...	27.0
L3	RF trans. primary ...	70.0
L4	RF trans. MW sec. ...	3.5
L5	RF trans. LW sec. ...	27.0
L6	Aperiodic RF transformer {	Pri. ... 17.5
L7		Sec. ... 70.0
L8	Speaker speech coil ...	2.0
L9	HT circuit RF filter ...	140.0
T1	Speaker input transformer {	Pri. ... 750.0
		Sec. ... 0.2
T2	Mains transformer {	Pri., total ... 70.0
		Heater sec. ... Very low
		Rect. heat. sec. ... 0.2
		HT sec., total ... 580.0
S1-S3	Waveband switches ...	—
S4, S5	Radio/gram switches ...	—
S6	Mains switch, ganged R13	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the makers for an average receiver when its voltage adjustment is correctly set for the mains employed, with the volume control advanced, and no signal input.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 MM4V	220	2.5	60	0.5
V2 S4VB	220	2.2	95	1.1
V3 994V	85	0.15	—	—
V4 PM24A	200	18.0	220	5.8
V5 1821	250†	—	—	—

† Each anode, A.C.

DISMANTLING THE SET

Removing Chassis.—Remove the two control knobs (recessed grub screws); from the tag at the base of electrolytic condenser C16 on right of chassis, unsolder the earthing wire going to speaker support strut; remove the four bolts (with metal washers, rubber washers and distance pieces) holding chassis to bottom of cabinet. Chassis may now be withdrawn to the extent of the speaker lead, which is sufficient for normal purposes.

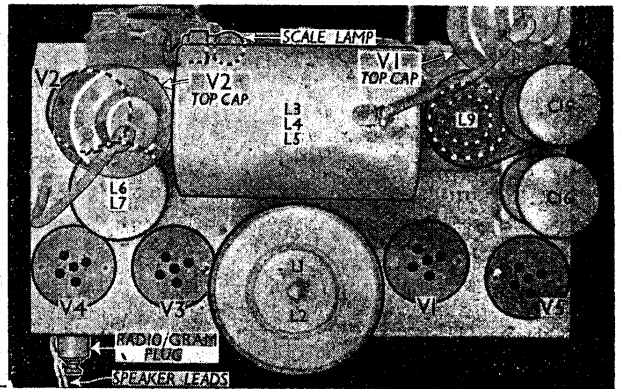
To free chassis entirely, unsolder from the speaker input transformer the two leads connecting it to chassis.

When replacing, one rubber washer should go either side of base of cabinet, with a distance piece between each pair; a small metal strip, to make contact between chassis and the screen on the cabinet base, should be fitted on one of the fixing bolts; connect the speaker leads to the top and middle tags on the left of the transformer.

Removing Speaker.—Remove three nuts holding the speaker struts to the cabinet.

When replacing, the transformer should be at

Plan view of the chassis. The "Superinductance" tuning coils are enclosed in large screening cans. V2 valve holder is obscured by the top cap connector, but its position is indicated by a dotted outline. The radio/gram change-over plug is indicated.



the top, and the earthing tag should be slipped on to the right-hand strut fixing screw. If the leads have been unsoldered, they should be connected as described above.

GENERAL NOTES

Switches.—S1-S3 are the waveband switches, ganged in a lever-operated assembly, indicated in our under-chassis view. The switches are operated by a push-pull movement of the tuning control. On MW (control knob pushed in) S1, S2 are closed, and S3 is open; on LW (knob out) S1, S2 open, and S3 closes.

S4, S5 are the radio/gram change-over switches. They consist of split sockets used in conjunction with an insulated short-circuiting plug. When the plug is inserted in the upper socket, the two split sections are joined by the plug, and S4 is thus closed. When the plug is inserted in the lower socket, S5 is closed for pick-up operation. The pick-up can be permanently connected, but it requires a separate volume control.

S6 is the QMB mains switch, ganged with the gain control R13. It forms part of the R13 assembly and cannot be seen without removing the assembly. Its connecting tags and position are indicated in our under-chassis view.

Scale Lamp.—This is a Philips type 8046 lamp, with a centre contact bayonet cap and clear spherical bulb. It is rated at 6V, 0.5A, 3W. To replace the bulb without removing the chassis, withdraw V2 and V4, then unscrew the single

knurled screw holding the lamp mounting to the front of the chassis deck.

Condenser Block.—C5, C6, C8, C10, C12 and C17 are six paper condensers in a single metal container mounted beneath the chassis. One side of each condenser goes to the case, and the connections to the connecting tags are indicated in our under-chassis view.

Trimmer Condensers.—C19, C20 and C21 are special Philips pre-set trimmer condensers, consisting of brass tubes mounted concentrically on a rod of insulating material. For adjustment purposes, the outer tube should be eased until the sealing paint is broken. After resetting, a daub of paint or shellac should be applied to re-seal them.

External Speaker.—Three sockets are provided at the rear of the chassis for connecting a high impedance (about 10,000 Ω) external speaker. The centre socket is provided only to accept the centre pin on the plug, which is fitted to prevent the plug from being inserted in a mains socket by mistake.

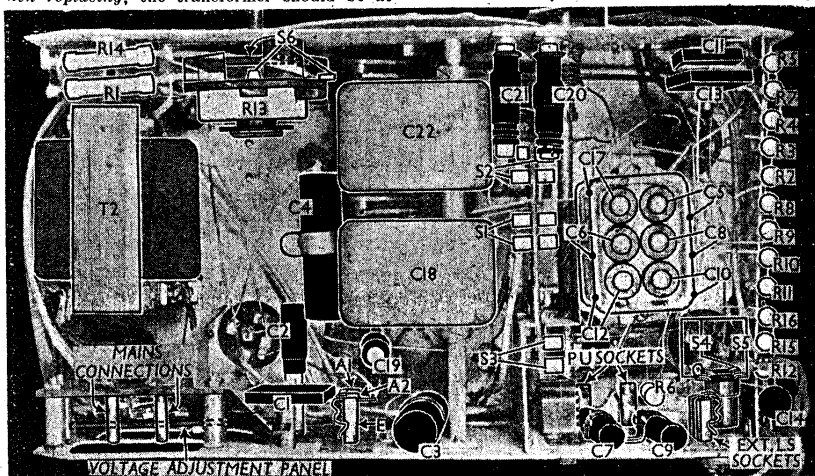
Gramophone Pick-up.—Two sockets and a centre hole are also provided at the rear of the chassis for the connection of a gramophone pick-up. Two further sockets and a plug on a flying lead operate as a radio/gram change-over device, as explained under "Switches," so that the pick-up may be left permanently connected. An external volume control is required for pick-up operation.

Voltage Adjustment.—The mains transformer T2 has a specially wound primary consisting of three sections for universal mains voltage coverage. These are interconnected by four links and eleven tappings to provide a continuous range of adjustments for mains of from 103 V to 253 V. The tappings are contained on a small panel just above the mains connecting pins at the rear of the chassis, and the links are adjusted according to a code diagram on a pink circular disc attached to the back cover of the receiver. On the reverse side of the disc are printed the ranges covered by the twelve settings, that for which the set is adjusted being turned to show through an aperture in the back cover. On the obverse side of the disc are the code diagrams for the positions of the links, with the mean voltage of each range printed beside the appropriate diagram. The obverse side of the disc is reproduced beneath the valve base diagrams, to the right of the circuit diagram overleaf.

CIRCUIT ALIGNMENT

MW.—Switch set to MW (tuning control knob pushed in). Connect signal generator leads to A1 and E sockets, and turn tuning knob to maximum. If the signal cannot be detected, transfer signal generator leads temporarily to A2 socket. Tune to 225 m on scale, feed in a 225 m (1,380 KC/S) signal, and adjust C19 and C21 for maximum output.

LW.—Switch set to LW, leaving everything else as described above. Tune to 900 m on scale, feed in a 900 (333.3 KC/S) signal, and adjust C20 for maximum output. Check calibration on both wavebands.



Under-chassis view. The radio/gram change-over sockets are seen in bottom right corner.