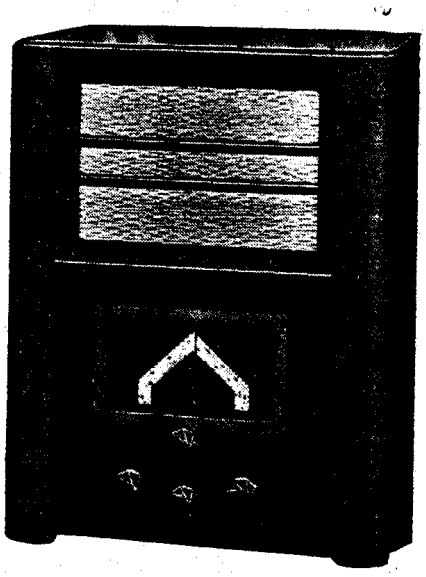
PYE 823 TWO-BAND SUPERHET THREE



A band-pass two-band receiver, the Pye 823 uses three valves, plus rectifier, in a conventional "short" superhet circuit.

CIRCUIT.—A set of medium and long wave band-pass coils, with an aerial coupling condenser C12, form the input circuit to the signal grid of V1, the frequency changer. The screen and oscillator anode electrodes of V1 are fed from a common potentiometer with an associated decoupling condenser C14. A single reaction winding is connected to the oscillator anode.

An I.F. transformer, tuned to 465 kc., effects the coupling between the anode of V1 and the grid of V2, an H.F. pentode operating as the I.F. amplifier. A coupling condenser from the anode of V2 feeds the A.V.C. diode of V3, a double diode output pentode, giving a D.C. potential for A.V.C. to V1 and V2.

The other diode of V3, fed from a further I.F. transformer, provides the rectified impulse which feeds the grid of the pentode section of V3 via an H.F. stopper resistance, a manual volume control—also operating as the demodulating diode load—and an L.F. coupling condenser C22.

A pentode compensator C23, is included and a three-position control switch in combination with a condenser and resistance enables tone to be modified.

Mains equipment consists of a transformer, a full-wave rectifying valve V4, electrolytic smoothing condensers and smoothing choke (the field coil).

Chassis Removal.—The cabinet has a false bottom, removal of which enables the underside of the chassis to be inspected.

Remove the four spring-fixed control knobs. The tuning control shaft may pull off when the control knob is removed, but this is easily replaced.

Remove the four chassis securing bolts and washers from the base and the tag securing the black lead from the electrolytic condenser to the tall coil can. The chassis can then be completely withdrawn.

The speaker and electrolytic condenser block may be removed if desired but this should not be found necessary. If it is desired to operate the chassis outside the cabinet the black lead from the electrolytic condenser should be connected to the speaker frame, otherwise damage may result.

Special Notes.—The electrolytic condenser (smoothing) block, C26 and C27, is secured to the cabinet near the speaker.

A pair of sockets at the rear of the chassis are fitted with plugs to which the internal speaker is connected. Connections from the speech coil of an extension speaker (of 2 to 4 ohms impedance) may be fitted with wander plugs and plugged into the sockets provided on the top of the internal speaker plugs, thus rendering both speakers operative. To cut out the internal speaker connect the external loud-speaker plugs to the sockets at the rear of the chassis.

There are two dial lights mounted in screw-in holders behind the dial, the holders being held in position by knurled-headed nuts. The bulbs have M.E.S. bases and are rated at 6.2 volts .3 amp.

In our particular chassis the valve combination consisted of an FC4, A50P, Pen 4DD and D.W.4/350, but in some models these may be interchanged for corresponding types in the Mullard or Ever Ready ranges, namely, A80A, VP4B, A27D and S11D.

R3, C12 and C13 are inside the band-pass coils can and R9, C19 and C20 inside the oscillator coils can.

The wavechange switch is of simple construction and it is deemed unnecessary to include drawings, especially as the D.C. resistances of coils are measured from other points.

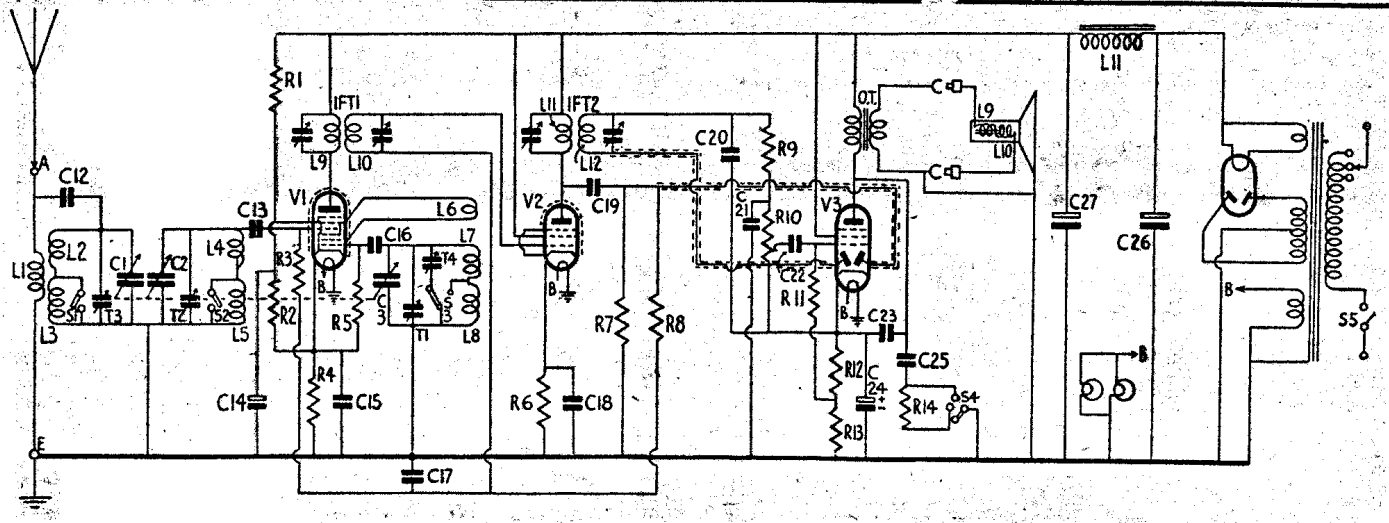
VALVE READINGS

No signal. Volume maximum. M.W. min. cap. 200 volts. A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
	(Mullard)			
1	FC4	Anode ..	230	1
		Screen ..	55	3.6
		Osc.anode	55	2
	(Ever Ready)			
2	A50P	Anode ..	230	7
		Screen ..	230	2.8
3	Pen 4DD ..	Anode ..	210	25
		Screen ..	230	4.9
4	DW4/350 ..	Heater ..	325	—

RESISTANCES

R.	Purpose.	Ohms.
1	V1 screen and osc. anode potr. (part)	25,000
2	V1 screen and osc. anode potr. (part)	40,000
3	V1 A.V.C. feed	510,000
4	V1 cathode bias	150
5	Osc. grid leak	20,000
6	V2 cathode bias	300
7	A.V.C. diode load	1.1 meg.
8	V2 A.V.C. decoupling ..	1.1 meg.
9	H.F. stopper	110,000
10	Volume control and demodulating diode load ..	500,000
11	V3 grid leak	1.1 meg.
12	V3 cathode bias (part) ..	200
13	V3 cathode bias (part) ..	500
14	Tone control	10,000



A perfectly simple and straightforward circuit is employed. A combined double-diode output pentode is used, the A.V.C. diode being energised from the primary of the second I.F. transformer.

Circuit Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer. Switch receiver to M.W. band, turn gang to maximum capacity, volume control to maximum and tone switch to "high."

Connect a service oscillator between the top grid cap of V1 and chassis, shunting the connections with a 500,000 ohms resistance and also with a .25 mfd. condenser if necessary to prevent the valve oscillating.

Tune the service oscillator to 465 kc. and adjust the trimmers of I.F.T.2, then I.F.T.1, for maximum response reducing the input from the oscillator as the circuits come into line to keep the A.V.C. inoperative.

Signal Circuits.—Connect the service oscillator to the aerial and earth sockets *via* a dummy aerial, only feeding sufficient input to obtain reliable peaks in the output meter.

Medium Waves.—Tune set and oscillator to 210 metres (1,425 kc.), and adjust T1, T2 and then T3 for maximum response, simultaneously rocking the gang.

The medium wave padding is fixed, but check calibration at 500 metres (600 kc.), compensating with T1 if very much out.

Long Waves.—Tune set and oscillator to 1,800 metres, and adjust T4 for maximum.

The long wave padding is fixed.

Replacement Condensers

EXACT replacement condensers for the 823 available from A.H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, are: for C14, unit 2964, price 1s. 10d.; C24, 2935, 1s. 9d.; and for the block containing C26 and C27, unit 1979A, 6s. 9d.

CONDENSERS

C.	Purpose.	Mfds.
12	Top aerial coupling	.000005
13	V1 grid isolator	.002
14	V1 screen and osc. anode decoupling	2
15	V1 cathode bias shunt ..	.1
16	Oscillator grid	.0002
17	V2 A.V.C. decoupling ..	.1
18	V2 cathode bias shunt ..	.1
19	A.V.C. diode coupling ..	.0001
20	H.F. by-pass	.0001
21	H.F. by-pass	.0001
22	L.F. coupling	.003
23	Pentode compensator ..	.001
24	V4 cathode bias shunt ..	20
25	Tone control	.025
26	H.T. smoothing	8
27	H.T. smoothing	8

WINDINGS (D.C. Resistances)

Winding.	Ohms.	Range.	Measured between.
L1	10.6	—	Aerial socket and chassis.
L2	2.7	MW	Aerial gang and chassis.
L2+L3 ..	13.5	LW	Aerial gang and chassis.
L4	2.4	MW	Band pass gang and chassis.
L4+L5 ..	13.2	LW	Band pass gang and chassis.
L6	45.7	—	Osc. anode and V1 screen.
L7	1.7	MW	Osc. gang and chassis.
L7 and L8..	5	LW	Osc. gang and chassis.
L9	88.7	—	Anode V1 and screen V2.
L10 ..	88.7	—	Top grid V2 and R8.
L11 ..	90.9	—	Anode and screen V2.
L12 ..	—	—	Inaccessible.
O.T. prim..	700	—	Anode and screen V3.
M.T. prim.	23	—	Black lead and 250 volt tap.
Total HT sec	650	—	V4 anode pins.

Pye 823 on Test

MODEL 823.—Standard model for A.C. mains, 200-250 volts, 40-100 cycles. Price 8 gns.

DESCRIPTION.—Three-valve, plus rectifier, two-band superhet table model.

FEATURES. — Full-vision scale calibrated in metres and station names. Controls for combined volume and master switch, wave-change, three-position tone switch and single ratio tuning. Sockets for extension L.S.

LOADING.—62 watts.

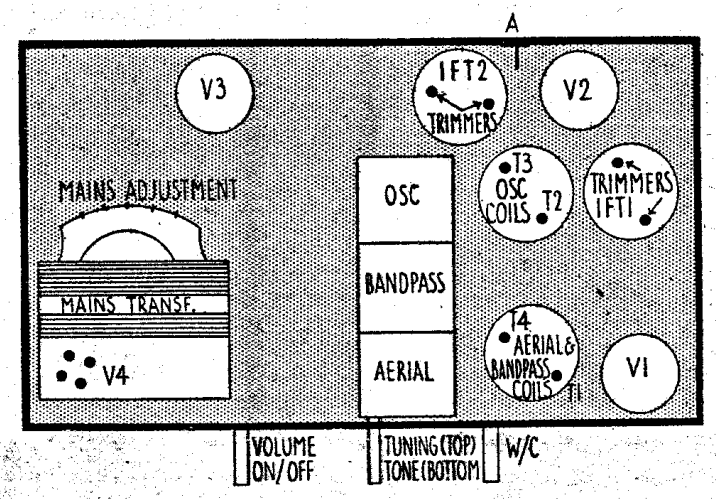
Sensitivity and Selectivity

MEDIUM WAVE (196-558 metres).—Excellent gain and selectivity. Local stations spread on adjacent channels only. Gain very well maintained over band.

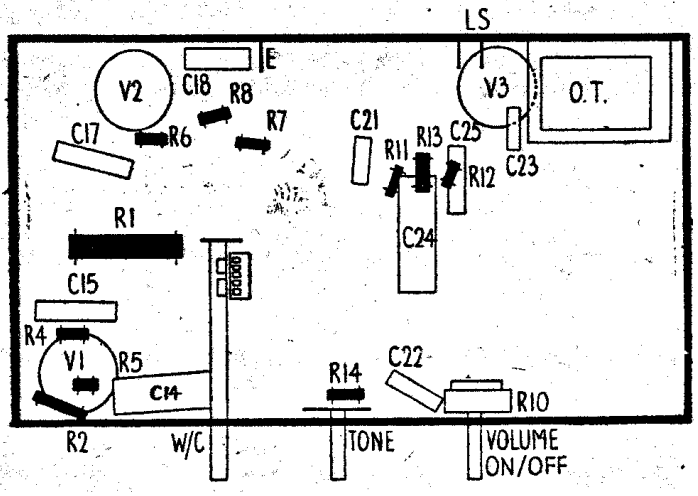
LONG WAVE (900-1,985 metres).—Excellent gain and selectivity. All main stations well received and very little interference on Deutschlandsender.

Acoustic Output

Crisp, clean attack, good balance and appreciable low-note radiation, with very little colouration on speech and a general all-round satisfactory balance.



On the right is the top "deck" layout diagram for the Pye 823. The smoothing condensers, C26 and C27, are not on the chassis but in a block mounted on the cabinet near the speaker.



Left, the diagram identifying the components on the underside of the chassis. Separate switch diagrams are not considered necessary for this receiver (see Special Notes).

Cures for Oscillation

OSCILLATION which occurs only when the volume control is full up or the set is tuned to a powerful local, frequently is due to inadequate decoupling of the screens of frequency-changers or I.F. valves.

In one case of this trouble all the decoupling circuits were very carefully checked.

It was found that the oscillation could only be stopped by connecting an 8 mfd. to the frequency-changer screen in place of the correct .1 mfd. Anything under 8 mfd. was no use.

In another set the trouble proved to be a dry joint between the screen of the I.F. valve and its decoupling condenser.

Sometimes it is advisable to connect decoupling condensers so that the outer foil is the earthed one.—N.C.