PYE 806 PUSH-BUTTON THREE-BAND FIVE

Permeability automatic tuning is a feature of the Pye 806 A.C. three-band receiver, which retails at 16½ gns.

CIRCUIT.—Aerial input to the signal grid of V1, a triode hexode frequency changer, is by single tuned circuits on the medium and long bands. A 465-kc. I.F. filter, L1 and C57, and a second channel filter coil, L8, are included.

On the short waves an additional input circuit for a dipole feeder is included. In the oscillator section single coils are used on medium and long bands.

A variable selectivity I.F. transformer couples V1 to the I.F. amplifying valve V2, an H.F. pentode operating on a frequency of 465 kc.

An iron-cored I.F. transformer effects the coupling between the I.F. amplifier and the demodulating diode of V3, a double diode triode, and to the demodulating diode load *via* an H.F. filter. It will be seen that the manual volume control R19 operates by varying the input to the triode grid, and is tone compensated by C39 and R20.

The coupling arrangements to the volume control include an optional bass limiting tone condenser C38. The demodulated potentials also feed the Mullard TV4A visual tuning indicator.

The other diode of V3 provides a D.C. potential utilised to energise the A.V.C. network controlling V1 and V2.

V3 is resistance-capacity coupled to V4, an output pentode, and an optional treble limiting condenser C44 is included. Negative feed-back potentials are fed to the cathode of V3, giving different tone modifications. A tone circuit, R27 and C45, and a 9-kc. filter, L25 and C46, are connected across the primary of the speaker transformer.

Mains equipment consists of a mains transformer, a full-wave rectifying valve V5, electrolytic smoothing condensers and two smoothing chokes (one of which is the speaker field coil).

Chassis Removal.—The cabinet has a false bottom secured by wood screws. Removal of this gives access to the underside of the chassis and enables components to be replaced.

Detach the back of cabinet (secured by screws) and two spring-fixed control knobs. Remove the four chassis securing bolts from the base, and the two wood screws securing the wavelength dial assembly and the two screws securing the bracket (fixed to the front of the chassis) to the wood block on the front of the cabinet.

Uncleat the leads from the speaker baffle board, remove the rectifying valve from its socket and the four wood screws securing the two lower metal brackets that are threaded to receive two of the screws securing the back of the cabinet.

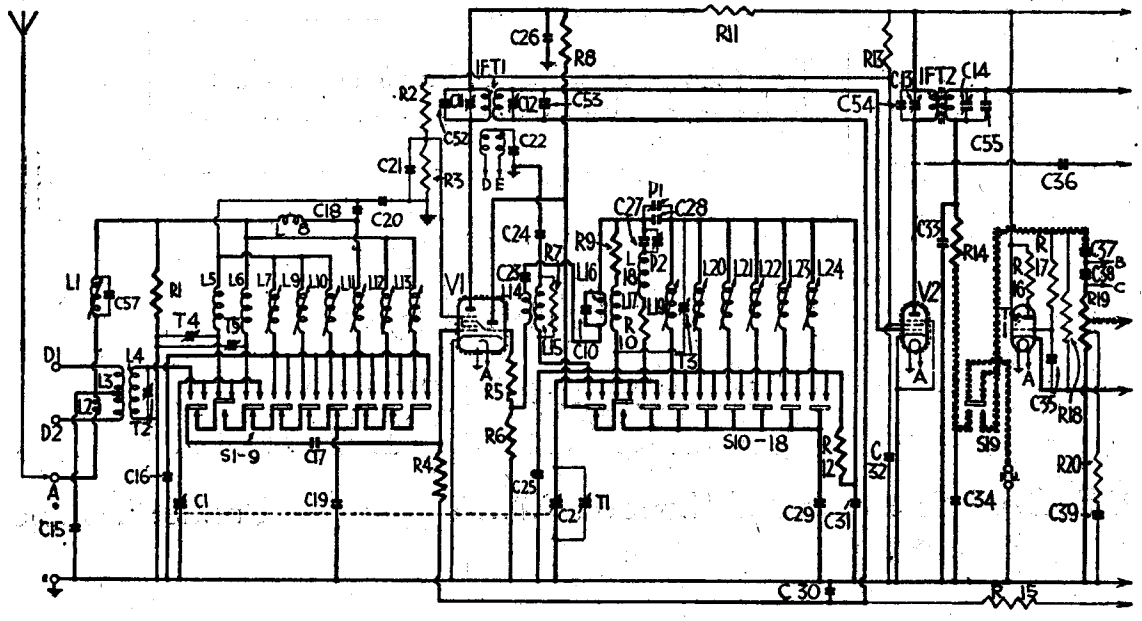
The chassis may then be removed from the cabinet to the extent of sundry leads, and is fully accessible for service.

Special Notes.—Socketed plugs at the rear of the chassis enable an extension speaker of some 2 to 4 ohms impedance to be used in conjunction with or separately from the internal speaker.

The visual tuning indicator is a Mullard TV4A, and the anode feed resistance R16

CONDENSERS

C.	Purpose.	Mfds.	C.	Purpose.	Mfds.
10	M.W. osc. fixed trimmer ..	.0005	36	A.V.C. diode coupling ..	.00002
15	Dipole centre-point earth ..	.0002	37	L.F. coupling	.01
16	Aerial tune	.00044	38	Tone modifier	.001
17	V1 grid isolating	.0001	39	Tone modifier	.01
18	Shunt with coils	.005	40	V3 anode decoupling ..	2
19	Additional pre-set capacity	.00003	41	V3 cathode bias shunt ..	20
20	Shunt with coils	.005	42	V3 anode shunt	.003
21	V1 screen decoupling ..	.1	43	L.F. coupling	.01
22	Variable selectivity	.0005	44	Feed back condenser ..	.01
23	Osc. grid.	.0001	45	Tone modifier	.01
24	S.W. osc. fixed padder ..	.005	46	Tone modifier	.005
25	Osc. fixed padder	.00041	47	V4 cathode bias shunt ..	50
26	V1 anode decoupling ..	.1	48	H.T. smoothing	8
27	L.W. osc. fixed padder ..	.00022	49	H.T. smoothing	8
28	M.W. osc. fixed padder ..	.00055	50	H.T. smoothing	8
29	Osc. L.W. fixed trimmer ..	.00009	51	A.V.C. delay resistance shunt	50
30	A.V.C. decoupling	.05	52	I.F.T.1 prim. fixed trimmer. .	.00009
31	Osc. coupling.	.002	53	I.F.T.1 sec. fixed trimmer ..	.00009
32	V2 screen decoupling ..	.1	54	I.F.T.2 prim. fixed trimmer. .	.00009
33	H.F. by-pass	.00005	55	I.F.T.2 sec. fixed trimmer ..	.00009
34	H.F. by-pass	.00005	56	Feed back potr. shunt ..	.25
35	T.I. grid decoupling. . ..	.1	57	I.F. filter tuning	.002



Four valves, a rectifier and a cathode ray tuning indicator are incorporated in the circuit of the Pye 806. For short waves there is a special dipole feeder input.

and decoupling condenser C35 are mounted across the valveholder.

Sockets at the rear of the chassis deck are for connecting a dipole aerial for short-wave work.

The electrolytic condenser pack containing C48, C49 and C50 is mounted on the speaker baffle board. R14 and C33 are inside IFT2, and C22 in IFT1. The fixed trimming condensers are inside the respective transformers.

The trimming condenser T3 has a further trimming condenser in parallel, as indicated on the push-button panel drawing.

In some models the valves may be Ever Ready make with similar characteristics.

L29, the first smoothing choke, is mounted on the speaker baffle board.

Another pair of sockets at the rear of the chassis enable a high output pick-up to be connected.

RESISTANCES

R.	Purpose.	Ohms.
1	Aerial shunt	10,000
2	V1 screen potr. (part) ..	30,000
3	V1 screen potr. (part) ..	80,000
4	V1 A.V.C. feed	1.1 meg.
5	Regeneration modifier ..	100
6	Osc. grid leak	50,000
7	Regeneration modifier ..	10,000
8	Osc. anode feed	10,000
9	Regeneration modifier ..	25
10	Regeneration modifier ..	100
11	V1 anodes decoupling ..	1,000
12	Osc. pre-set coils shunt ..	40,000
13	V2 screen decoupling ..	10,000
14	H.F. stopper	110,000
15	A.V.C. decoupling	1.1 meg.
16	T.I. anode feed	2.1 meg.
17	T.I. anode feed	2.1 meg.
18	Demodulating diode load ..	510,000
19	Volume control	1 meg.
20	Tone modifier	80,000
21	V3 cathode bias	1,500
22	Feed back potr. (part) ..	5
23	V3 anode decoupling ..	80,000
24	V3 anode load	110,000
25	V4 grid leak	510,000
26	V4 grid stopper	25,000
27	Tone modifier	5,000
28	V4 cathode bias	150
29	A.V.C. diode load	1.1 meg.
30	Feed back	20
31	A.V.C. delay volts	15
32	Feed back potr. (part) ..	150

The pilot lights illuminating the push-button panel and the wavelength scale are rated at 6 volts .5 amp., and have M.E.S. bases.

The expander indicator light is fitted inside a rubber mounting that is removed by unscrewing a knurled knut. The bulb has an M.E.S. base and is rated at 4 volts .06 amp.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the speaker transformer. Press the fidelity tone button. Prevent operation of the oscillator section of V1 by shorting the oscillator section of the gang. Set volume control to maximum.

Connect a service oscillator between the top grid cap of V1 (*via* a .002-mfd. condenser) and chassis. Remove the normal grid connection and connect a 500,000-ohms resistance between the grid of the valve and chassis.

Tune the service oscillator to 465 kc. (645 metres) and adjust the trimmers of IFT2 and then IFT1 for maximum response, reducing the input from the service oscillator as the circuits come into line, so as to keep the A.V.C. inoperative.

Remove short from osc. section of gang.

Signal Circuits.—Connect the service oscillator to the A. and E. sockets *via* a dummy aerial, replace normal grid connection to V1 and remove the 500,000-ohms resistance.

Only feed sufficient input from the service oscillator to obtain reliable peaks in the output meter, and reduce the input as the circuits come into line, so as to keep below the A.V.C. point.

Short Waves.—Tune set and oscillator to 15 metres (20 mc.) and adjust T1 and then T2 for maximum.

The short-wave padding is fixed, but check at 50 metres (6 mc.).

Medium Waves.—Tune set and oscillator to 210 metres (1,425 kc.) and adjust T3 and then T4 for maximum.

Tune set and oscillator to 500 metres (600 kc.) and adjust P1 for maximum, simultaneously rocking the gang.

(*Continued on page* 11.)

Pye 806 on Test

MODEL 806.—A.C. mains operation, 200-250 volts, 40-100 cycles. Price 16½ gns.

DESCRIPTION. — Four-valve, plus rectifier, three-band receiver with permeability push-button tuning.

FEATURES. — Three full-vision scales traversed by three vertical pointers. Each scale calibrated in metres and station names. Visual tuning indicator and expander indicator. Press-button panel with buttons for six stations, four tone positions, gramophone, wave selection and master switch. Other controls for flywheel manual tuning and volume. Sockets for dipole short-wave aerial, pick-up and extension speaker.

LOADING.—96 watts.

Sensitivity and Selectivity

SHORT WAVES (13.5-51.3 metres), —Excellent gain and selectivity well maintained over the whole band with clean background and easy handling.

MEDIUM WAVES (196-565 metres). —Very good gain and selectivity with local stations spreading on adjacent channels only. Well-maintained sensitivity.

LONG WAVES (900-1,985 metres).—Similar performance to medium waves with very slight interference on Deutschlandsender.

Push-button Operation

The push-button settings were accurate and did not change during our entire test of the receiver.

Acoustic Output

Very well-balanced tone with well-designed control positions for frequency modifications. Speech is clean and general reproduction crisp with good low-note radiation. The expansion control works satisfactorily and its action is definitely noticeable. The volume is ample for a large room.

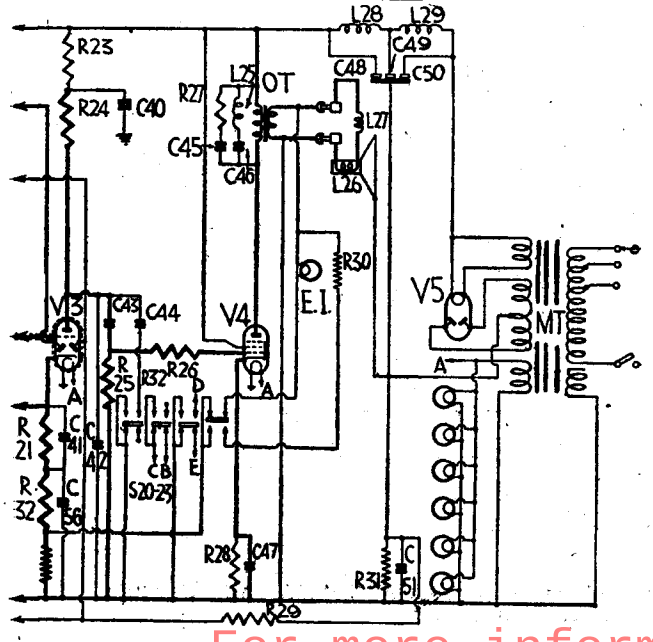
VALVE READINGS

No signal. Volume maximum. M.W. minimum capacity.

V.	Type.	Electrode.	Volts.	Ma.
1	(All Mullard) TH4A	Anode ..	240	.9
		Screen ..	50	2.9
		Osc.anode	155	7.5
2	VP4B	Anode ..	253	9.4
		Screen ..	165	3.4
3	TDD4	Anode ..	70	1.2
4	PenB4 ..	Anode ..	230	69
		Screen ..	253	10
5	DW4/350 ..	Heater	370	—

WINDINGS (D.C. Resistances)

L.	Ohms.	L.	Ohms.
2	1.35	18	4.5
5	2.1	K	1.5
6	12	E	3
B	1.15	Field	800
C	1.4	Choke	270
D	1.9	I.F.T.s	5
E	3	O.T. prim. ..	290
F	23.5	M.T. prim. ..	15
G	28	M.T. sec. ..	330
14	9		
17	2.25		



Details of the automatic tuning feature of this receiver are given on page 11, together with diagrams of the push-button and trimmer arrangement and the chassis layouts.

PYE 806 PUSH-BUTTON FIVE

(*Continued from page* 3.)

Repeat both operations until no further improvement results.

Long Waves.—Tune set and oscillator to 1,800 metres (166 kc.) and adjust P1 for maximum, simultaneously rocking the gang, and then line up T5 for maximum on a 1,000-metres (300 kc.) signal.

I.F. Wavetrap.—With gang at maximum and receiver switched to M.W. band, inject a strong 465-kc. signal and adjust the core of L1 (the brass stem underneath chassis) for maximum response.

Push-button Realignment

TO realign the push-buttons all that is necessary is to connect an aerial and earth system to the receiver and press each button in turn and adjust first the lower (oscillator) trimmer to bring in the station spot on, and then the upper (aerial) trimmer to bring in the station at full strength.

The visual tuning indicator will show the correct tuning position and the maximum response. The coils corresponding to the various press-buttons are linked to the buttons by black lines on the button plate and are inscribed A (aerial) and O (oscillator).

Before realigning the buttons, it is necessary to allow the valves to heat up thoroughly to obviate drift on heating.

The appended tables indicate the correct combination of aerial and oscillator coils.

If the station on the push-button is not required then the new station may be tuned in as in push-button realignment and the new station name fitted.

If it is desired to retain the station, then a push-button belonging to a station that is not particularly required must be brought into service, the coils corresponding to the button being removed and a new coil combination fitted.

A Pye calibrated coil adjuster, obtainable from the makers price 1s., is required for the subsequent operation.

After the set has warmed up, press the button in question and remove the push-button escutcheon plate. Insert the stem of the adjuster into the calibrated sleeve and push the latter on to the brass collar of the aerial coil concerned. Adjust the aerial coil to approximately the correct setting for the required station (see table). The position on the line engraved on the adjuster is read from the calibration on the sleeve.

Then adjust the corresponding oscillator coil to approximate setting (see table) and then finally tune to actual resonance by reference to the tuning indicator.

Repeat the aerial coil adjustment, this time obtaining resonance by reference to the tuning indicator, change the name-plate behind the escutcheon window, and finally replace the escutcheon.

Replacement Condensers.

EXACT replacement condensers are available from A. H. Hunt, Ltd. These are: For C51, Type 2915, 1s. 9d.; for C41, Type 4015, 1s. 6d.; for C40, Type 2964, 1s. 10d.; and for C48, C49 and C50, Type 4200, 9s. 3d.

WAVELENGTHS & COILS

Button.	Aerial coil.	Oscillator coil.	Wavelengths covered.
1	G	E	1420—1935
2	F	E	1245—1680
3	E	M	400— 555
4	D	K	334— 464
5	C	J	253— 352
6	B	H	195— 275

COIL ADJUSTER SETTINGS

Station.	Wavelength.	Combination number.	Reading. Aerial coil.	Reading. Oscillator coil.
Hilversum 1 ..	1,875	1	7½	5
Radio Paris ..	1,648	1	4½	4½
		2	7½	4½
Droitwich ..	1,500	1	2½	4
		2	5½	4½
Luxembourg ..	1,293	2	2½	3½
Radio Eireann ..	531	3	7½	6
Stuttgart	522.6	3	6½	5½
Brussels 1.. ..	483.9	3	5½	5
		3	4	4½
North Regional ..	449.1	4	7½	6½
Paris (P.T.T.) ..	431.7	3	3½	4
		4	6½	6½
Rome 1	420.8	3	2½	3½
		4	6½	6
Scottish Regional	391.1	4	5	5½
Welsh Regional ..	373.1	4	4½	4½
London Regional..	342.1	4	2½	4
		5	7½	7
Hamburg	331.9	4	1	3½
		5	7	6½
Poste Parisien ..	312.8	5	6	6
N.Ireland Regional	307.1	5	5½	5½
Midland Regional	296.2	5	5	5½
Konigsberg ..	291	5	4½	5
West Regional ..	285.7	5	4½	5
Stagshaw	267.4	5	3	4½
		6	7½	6½
Nationals	261.1	6	7	6½
Cork	242.9	6	5½	5½
Aberdeen	233.5	6	5	5
Dublin	222.6	6	4½	4½
Radio Lyons ..	215.4	6	3½	3½
Radio Normandy..	212.6	6	3½	3½
Bournemouth ..	203.5	6	2½	3
Plymouth	203.5	6	2½	3

Right is the arrangement of push-buttons and trimmers in the Pye 806 automatic tuning receiver. Below are the diagrams showing the chassis layout.