

"TRADER" SERVICE SHEET

879

PYE PERSONAL

M78F MINIATURE PORTABLE

MINIATURE components are employed in the Pye "Personal" model M78F, a 2-band 4-valve all-dry battery superhet. The chassis is divided into two separate units, mounted on the frame of a 5-inch speaker.

Release date and original price: June 1948; £12 12s including batteries, plus purchase tax.

CIRCUIT DESCRIPTION

Tuned frame aerial input by L1, C20 (M.W.) and L1, L2, C20 (L.W.) to heptode valve (V1, Mullard DK91) operating as frequency changer with electron coupling.

Triode oscillator grid coils L3 (M.W.) and L3, L4 (L.W.) are tuned by C21, with parallel trimming by C22 (M.W.) and C6 (L.W.), and series tracking by C5 on both bands. Reaction coupling from anode by coils L5 (M.W.) and L6 (L.W.).

Second valve (V2, Mullard DF91) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings C2, L7, L8, C3 and C9, L9, L10, C10.

Intermediate frequency 465 kc/s.

Diode second detector is part of single diode pentode valve (V3, Mullard DAF91). Audio frequency component in rectified output is developed across manual volume control R5 and passed, via A.F. coupling capacitor C13 and C.G. resistor R7, to control grid of pentode section, which operates as A.F. amplifier. I.F. filtering by C11 in diode circuit and C15 in pentode anode circuit.

The D.C. potential developed across R5

is tapped off and fed back through a decoupling circuit as G.B. to I.F. valve, giving A.V.C.

Resistance-capacitance coupling by R9, C16, R11 between V3 pentode and pentode output valve (V4, Mullard DL92), the filament sections of which are wired in parallel. Fixed tone correction by C18 in V4 anode circuit.

Audio frequency voltages developed across T1 secondary winding are applied, via a correcting network R6, C12, to V3 C.G. circuit for feed-back purposes.

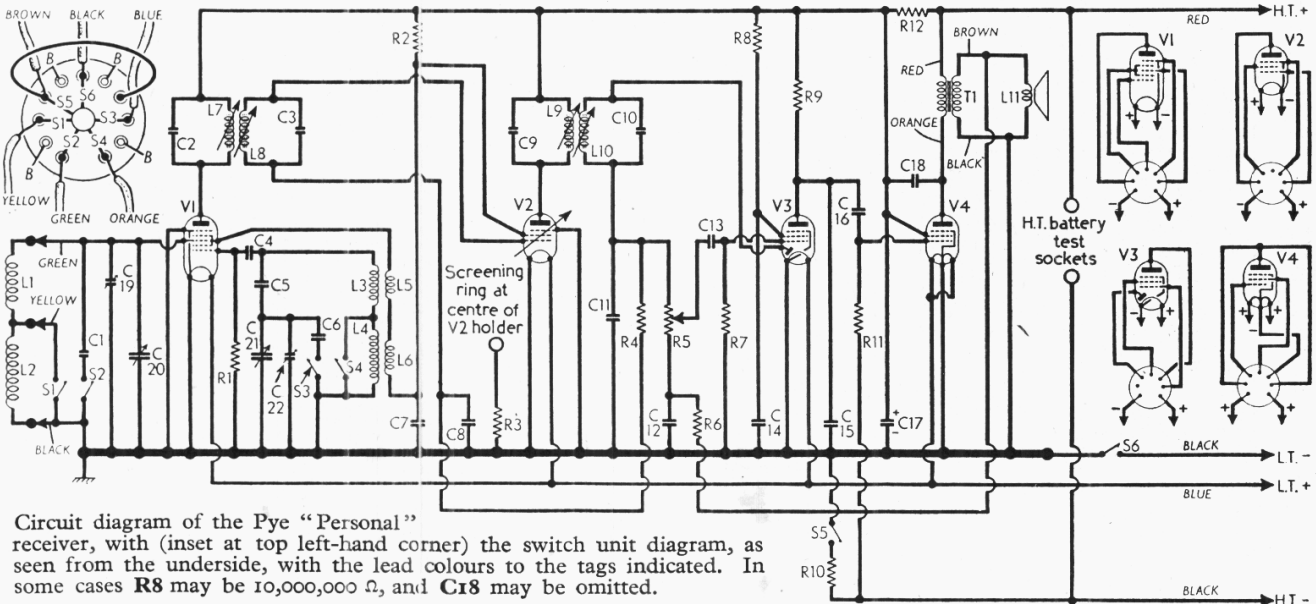
G.B. potential for V4 is obtained from the drop across R10 in the H.T. negative lead to chassis.

COMPONENTS AND VALUES

RESISTORS		Values (ohms)	Locations
R1	V1 osc. C.G. ...	47,000	E2
R2	H.T. feed resistor...	10,000	C2
R3	Isolating resistor ...	10,000	F3
R4	A.V.C. decoupling	3,300,000	F3
R5	Volume control ...	2,000,000	F1
R6	F.-B. series ...	100,000	D4
R7	V3 pent. C.G. ...	22,000,000	H5
R8	V3 S.G. feed ...	4,700,000	G6
R9	V3 pent. load ...	1,000,000	G6
R10	V4 G.B. resistor ...	820	B3
R11	V4 C.G. resistor ...	1,000,000	G6
R12	H.T. decoupling ...	680	K5

CAPACITORS		Values (µF)	Locations
C1	Aerial L.W. trim....	0-00005	D3
C2	} 1st I.F. transformer {	0-00006	E4
C3		} tuning ...	0-00006
C4	V1 osc. C.G. ...	0-0001	D2
C5	Oscillator tracker...	0-0005	D2
C6	Osc. L.W. trim....	0-0002	C2
C7	H.T. feed decoupl...	0-01	C2
C8	A.V.C. decoupling	0-01	E3
C9	} 2nd I.F. transformer {	0-00006	F4
C10		} tuning ...	0-00006
C11	I.F. by-pass ...	0-0001	E2
C12	F.-B. by-pass ...	0-01	D4
C13	A.F. coupling ...	0-01	H5
C14	V3 S.G. decoupl. ...	0-01	G5
C15	I.F. by-pass ...	0-0001	G5
C16	A.F. coupling ...	0-001	G6
C17*	H.T. decoupling ...	8-0	K5
C18	Tone corrector ...	0-001	G6
C19†	Aerial M.W. trim....	0-00005	C4
C20†	Aerial tuning ...	0-000363§	B4
C21†	Oscillator tuning ...	0-000363§	B4
C22†	Osc. M.W. trim. ...	0-00005	D4

* Electrolytic. † Variable. ‡ Pre-set. § "Swing" value, min. to max.



Circuit diagram of the Pye "Personal" receiver, with (inset at top left-hand corner) the switch unit diagram, as seen from the underside, with the lead colours to the tags indicated. In some cases R8 may be 10,000,000 Ω, and C18 may be omitted.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	Frame aerial windings	2-2	—
L2		65-0	—
L3	Oscillator tuning coils	10-0	D2
L4		10-0	D2
L5	Oscillator reaction coils, total	—	D2
L6		10-0	D2
L7	1st I.F. trans.	Pri. 25-0	E4
L8		Sec. 25-0	E4
L9	2nd I.F. trans.	Pri. 25-0	F4
L10		Sec. 25-0	F4
L11	Speech coil	2-2	—
T1	Output trans.	Pri. 800-0	K6
		Sec. 0-2	K6
S1-S4	W/band switches	—	A2
S5	H.T. circuit switch	—	A2
S6	L.T. circuit switch	—	A2

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from new H.T. and L.T. batteries. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

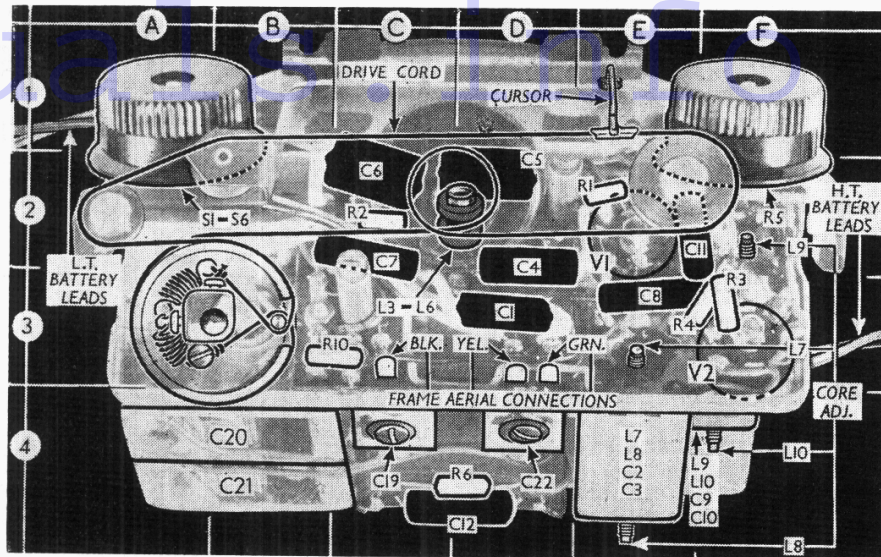
Voltages were measured on the 400 V scale of a model 7 Avometer, chassis being the negative connection. Owing to the compactness of the receiver and the size of the components, unnecessary soldering for the insertion of a current meter is inadvisable, so we quote in the third column the total current, measured in the H.T. negative lead, when the valve against which it is quoted is withdrawn. The total current with all valves in was 7.45 mA.

Valve	Anode Voltage (V)	Screen Voltage (V)	Current Totals† (mA)
V1 DK91	56	33	7.18
V2 DF91	56	33	7.2
V3 DAF91	5	2	7.53
V4 DL92	56	56	3.6

† Current totals with associated valve removed.

DISMANTLING THE SET

Removing Chassis Assembly.—Lift one end of bottom cover and slide it out of the case; remove batteries and press the metal tongue just beneath the receiver identity label towards battery compartment to free chassis edge from beneath the moulded lip inside the carrying case; release bottom edge of frame aerial from beneath opposite lip inside cabinet; press gently on control knobs and slide assembly from case. When replacing, the L.T. battery holder should be placed in line with the gang capacitor end-plate, with its spiral spring adjacent to



Three-quarter plan view of the upper chassis, with the metal control panel raised. The switch unit and volume control are housed inside their respective control knobs. The complete drive cord system has been sketched in, the drum having been slipped out of its slot.

the end-plate, and the H.T. battery should occupy the remaining space with its connector pointing toward the side of the carrying case. The bottom cover should be fitted so that the two small holes coincide with the H.T. battery test sockets on the chassis.

Removing Control Panel Assembly.—Before commencing this operation, mark in pencil on the backing plate the position taken up by the cursor when the gang is at minimum and maximum.

Unclip the frame aerial (two press studs); turn gang to maximum and slacken the two machine screws securing the drive wheel to its spindle;

remove two cheese-head screws located at opposite corners of the scale backing plate, and unclip the assembly, bending it back on its connecting leads.

It must be noted that the metal-work of the panel has to be joined to the main chassis by a short piece of wire if it is desired to operate the receiver in this condition.

When replacing, turn gang to maximum and set cursor to coincide with pencil mark on scale backing plate adjacent to volume control knob before tightening drive drum fixing screws.

GENERAL NOTES

Switches.—The switch unit S1-S6 is a special miniature component, totally enclosed in its control knob. The knob can be removed if its "hairpin" retaining spring (with washer) is hooked out with a pin.

Inside is a circle of eleven contact studs, a space for the twelfth being blank. A 5-pronged "spider" connects selected contacts to the central pivot, which is the chassis connection. On M.W. (knob anti-clockwise), S1, S4, S5, S6 close; on L.W., S2, S3, S5, S6 close. In between, all are open.

Our diagram of the unit (overleaf), viewed from the underside, shows the connecting tags and the colours of the leads going to them. It can be freed if its fixing screw is removed, when it hangs on its leads. Access to the screw is obtained by slipping the gang drive drum from its keyhole slot (see "Drive Cord Replacement").

Volume Control R5.—Like the switch unit, this is a special component totally enclosed by its knob, which can be removed in the same way as the switch knob.

Batteries.—L.T., 1.5 V dry cell; H.T., 67.5 V layer type. The makers quote Alpha A12, Vidor V0007 and G.E.C. BB397 for L.T., and G.E.C. BB501, Ever Ready B101 and Drydex 501 for the H.T. They say a standard U2 cell may be used for L.T., but it requires packing and has a shorter life than the recommended types.

Valve Screening.—V1 is fitted with a metal sleeve connected to chassis by a flexible lead. The metal collar on the base of V2 influences the gain of the receiver, and is stabilised by a 10,000 Ω resistor R3 which returns it to chassis.

Drive Cord Replacement.—The gang drive is mounted entirely on the metal panel at the top of the chassis. To obtain access to the drum, raise the metal panel as explained under "Dismantling the Set," when the new cord can be fitted. The course it takes is shown in our upper-chassis illustration, where the gang is at maximum. If it is desired to free the drive drum, it may be slipped out of its keyhole slot, when it will hang in the position shown in our photograph.

The actual length of the cord is 16³/₁₆ in overall, measured between the inner extremities of the two end loops, and should consist of Nylon braided glass yarn. The knots should be treated with an acetate adhesive after tying.

CIRCUIT ALIGNMENT

Remove control panel assembly, and join the metal-work of the panel to the receiver chassis by means of a short length of wire, before commencing the following operations.

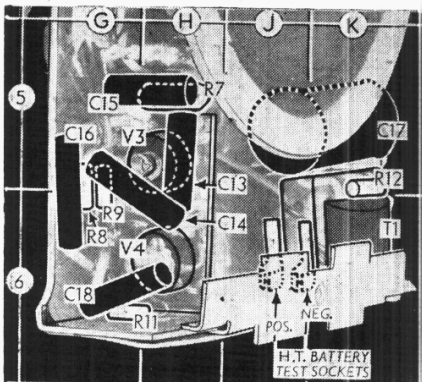
I.F. Stages.—Switch set to M.W. (knob anti-clockwise), turn gang and volume control to maximum, connect signal generator to control grid (pin 6) of V1 and chassis, feed in a 465 kc/s (645.16 m) signal, and adjust the cores of L7, L8, L9 and L10 (location references E3, E4, F2, F4) for maximum output. Finally, disconnect signal generator leads and replace control panel assembly.

R.F. and Oscillator Stages.—Since the calibrated scale is fixed to the carrying case, an alternative system of calibration must be adopted for alignment purposes. A simple method is to make measurements on the scale backing plate, with respect to the pencil line (adjacent to the volume control) already marked on the plate, and these measurements are referred to in the following instructions.

Check that the cursor coincides with the appropriate pencil marks on the backing plate. It may be adjusted by rotating the drive-drum on its spindle after slackening the set screws. Lay the signal generator leads on the bench, close to the frame aerial.

M.W.—With set switched to M.W. tune to 1¹/₂ in on scale, feed in a 210 m (1,425 kc/s) signal, and adjust C22 (D4) and C19 (C4) for maximum output. Tune to 1 in on scale, feed in a 500 m (600 kc/s) signal and check calibration.

L.W.—Switch set to L.W. (knob fully clockwise) tune to 1¹/₂ in on scale, feed in a 1,200 m (250 kc/s) signal, and check calibration. Tune to 1 in on scale, feed in an 1,800 m (167 kc/s) signal, and check calibration.



Three-quarter end view of the lower chassis, showing the components grouped round the undersides of V3, V4 holders. The lower edge of the speaker is seen at top right.