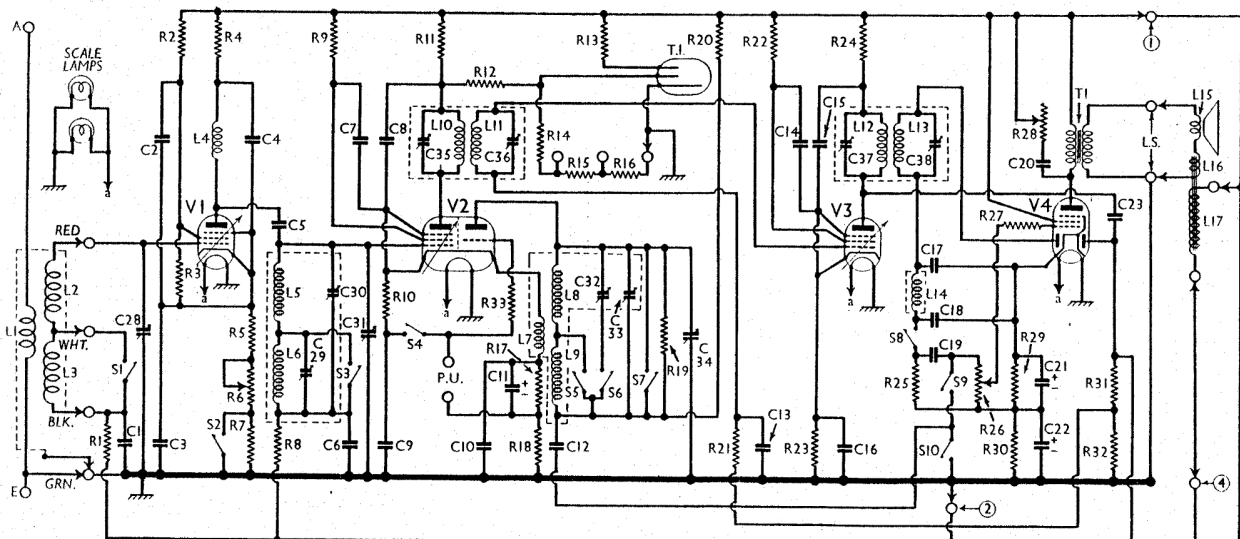


PYE - T 20



Circuit diagram of the Pye T20 portable A.C. superhet. The numbered circles indicate the connections of the power unit plug and socket. An inset diagram is included showing the plug, viewed from the ends of the pins, numbered correspondingly. The colour coding of the frame aerial leads is also indicated.

COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 C.G. decoupling	510,000
R2	V1 S.G. H.T. feed potential divider	15,000
R3	V1 anode decoupling	30,000
R4	V1 fixed G.B. resistance	10,000
R5	Sensitivity control	300
R6	V1 fixed G.B. resistance (L.W.)	2,000
R7	V2 pent. C.G. decoupling	800
R8	V2 S.G. H.T. feed	510,000
R9	V2 osc. C.G. resistance	25,000
R10	V2 pent. anode decoupling	110,000
R11	V2 T.I. anode feed	18,000
R12	T.I. tickler feed	100,000
R13	T.I. adjustment resistances	2,100,000
R14	V2 fixed G.B. resistances	250,000
R15	V2 osc. tuning circuit shunt	150,000
R16	V2 osc. anode decoupling	500,000
R17	V3 C.G. decoupling	250
R18	V3 S.G. H.T. feed	750
R19	V3 fixed G.B. resistance	40,000
R20	V3 anode decoupling	100,000
R21	V3 signal diode load	510,000
R22	Manual volume control	500
R23	V4 pentode C.G. I.F. stopper	260,000
R24	V4 variable tone control	250,000
R25	V4 G.B. and A.V.C. delay voltage resistances	26,000
R26	V4 A.V.C. diode load	140
R27	V2 osc. C.G. circuit stabiliser	750
R28		510,000
R29		260,000
R30		2,100
R31		
R32		
R33		

CONDENSERS		Values (μF)
C1	V1 C.G. decoupling	0.5
C2	V1 S.G. by-pass	0.1
C3	V1 cathode by-pass	0.1
C4	V1 anode decoupling	0.1
C5	V1 to V2 H.F. coupling	0.000025
C6	V2 pent. C.G. decoupling	0.1
C7	V2 pent. S.G. by-pass	0.1
C8	V2 pent. anode decoupling	0.1
C9	V2 osc. C.G. condenser	0.0002
C10	V2 cathode by-pass	0.1
C11	P.U. G.B. circuit by-pass	25.0
C12	V2 osc. anode decoupling	0.1
C13	V3 C.G. decoupling	0.1
C14	V3 S.G. by-pass	0.1
C15	V3 anode decoupling	0.1
C16	V3 cathode by-pass	0.1
C17	V3 cathode by-pass	0.0001
C18	I.F. by-passes	0.0002
C19	L.F. coupling to V4 pent.	0.1
C20	Part of T.C. filter	0.025
C21	V4 cathode by-passes	50.0
C22	V4 A.V.C. diode coupling	20.0
C23	H.T. smoothing	0.0002
C24		8.0
C25		16.0
C26	V5 anode H.F. by-passes	0.001
C27	V5 anode H.F. by-passes	0.001
C28	Frame aerial tuning	—
C29	F.C. C.G. circuit L.W. trimmer	—
C30	F.C. C.G. circuit M.W. trimmer	—
C31	F.C. C.G. circuit tuning	—
C32	Osc. circuit L.W. trimmer	—
C33	Osc. circuit M.W. trimmer	—
C34	Osc. circuit tuning	—
C35	1st I.F. trans. pri. tuning	—
C36	1st I.F. trans. sec. tuning	—
C37	2nd I.F. trans. pri. tuning	—
C38	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS

		Approx. Values (ohms)
L1	External aerial coupling	0.1
L2	Frame aerial windings	1.9
L3	V1 anode H.F. choke	19.8
L4	F.C. C.G. circuit tuning coils	530.0
L5	V1 anode H.F. choke	1.5
L6	V2 pent. C.G. decoupling	4.5
L7	Oscillator reaction coil	0.7
L8	Oscillator tuning coils	1.3
L9	1st I.F. trans. Pri.	4.7
L10	1st I.F. trans. Sec.	42.0
L11	2nd I.F. trans. Pri.	42.0
L12	2nd I.F. trans. Sec.	42.0
L13	I.F. filter choke	700.0
L14	Speaker speech coil	1.5
L15	Hum neutralising coil	0.2
L16	Speaker field coil	1,650.0
L17	Output trans. Pri.	740.0
T1	Output trans. Sec.	0.3
T2	Mains trans. Pri. total	44.0
	Heater sec.	0.1
	Rect. heat. sec.	0.2
	H.T. sec. total	350.0
S1-S3	Waveband switches	—
S4-S9	Radio-gram. changeover switches	—
S10	Radio muting switches (gram.)	—
S7, S8	Mains switch	—
S11	Neon tuning indicator	—
T.I.		—

VALVE ANALYSIS

Valve voltages and currents listed in the table are those obtained from an average receiver operating with a 235 V 50 c.p.s. mains supply (216-235 V mains transformer tap). The red, white and black frame aerial terminals were short-circuited, and the receiver controls were set as follows:—wavechange switch at M.W.; gang condenser at minimum capacity; sensitivity control **R6** at maximum (minimum resistance); volume control **R26** at maximum. All voltages were measured on the 1,200V scale of an Avometer, chassis being negative.

If a valve adaptor is used in making measurements, it may be found necessary to stabilise **V1**, **V2** and **V3** with a 0.1 μF condenser connected between S.G. and cathode, or anode and cathode. The readings given for the triode section of **V2** were taken under oscillating conditions with the valve in its own holder.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 AC/VPt	227	4.0	167	1.2
V2 AC/TP*	177	5.2	233	1.6
V3 AC/VPt	232	7.6	227	1.7
V4 AC/2Pen	—	—	—	—
DD	257	34.0	282	6.8
V5 At1B	350†	—	—	—

* Triode osc. anode 104 V 1.8 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—**S4** is the pick-up jack switch, at the rear of the chassis, which opens when the pick-up plug is pushed fully home. **S1-S3** and **S5-S10**, the wave-change and gramophone switches, are all beneath the chassis, and are in three units, all ganged together by a rod running right across the chassis.

NOTE.—**S5** and **S6** have one common contact, and **S2** is formed of a single fixed contact blade and a metal contact piece which is connected to chassis.

The table (col. 2) gives the switch positions for the various control settings, O indicating open, and C closed.

Switch	M.W.	L.W.	Gram.
S1	C	O	O
S2	C	O	O
S3	C	O	O
S5	C	O	O
S6	O	C	O
S7	O	O	C
S8	O	C	O
S9	O	O	C
S10	C	C	O

S11 is the Q.M.B. mains switch, fitted to the power pack, and operated through a hole in the side of the cabinet.

Coils.—**L1-L3** are the frame aerial and external aerial coupling coils. There is a screen round the outside of the frame, attached to the inside of the cabinet, and consisting of a paper strip carrying a number of parallel wires. The ends of these are joined, and provided with a lead and spade tag connected to chassis by the same screw that attaches the green frame lead.

L4 is an H.F. choke, beneath the chassis, while **L5, L6** and **L7-L9** are in two rectangular brass screening boxes beneath the chassis. The I.F. transformers, **L10, L11** and **L12, L13** are in screened units on the chassis deck. These contain the associated trimmers, and also a number of condensers and resistances which are indicated in our plan chassis view, and may be identified by their values.

L14 is an I.F. choke, beneath the chassis.

Scale Lamps.—These are two Ever-Ready M.E.S. types, rated at 6.2 V, 0.3 A.

PYE T20 CIRCUIT ALIGNMENT

Calibration.—To adjust calibration rotate the tuning knob until pointer is at higher wavelength end of scale. With disc drive against stop, release set screw clamping drive drum to condenser spindle and set rotor vanes fully in mesh with stator, then tighten set screw. Pointer should now be located at end of horizontal scale lines, but if not, the scale end-clasps should be released, and the scale plate moved slightly. If further correction is needed, the three screws at the end of the drive should be released and the indicating pointer and its tracer moved while the gang vanes are kept fully in mesh.

I.F. Transformers.—All adjustments should be made with the volume control at maximum and the frame aerial terminals short-circuited. Remove frequency changer **V2** C.G. connection (top cap) and connect a 0.5 MO resistance between cap and chassis. By-pass triode oscillator anode to chassis with a 0.25 μ F condenser to stop oscillation. Feed in 127 KC/S signal between chassis and **V2** top cap via 0.002 μ F condenser and adjust I.F. trimmer **C38, C37, C36, C35**, in that order, for maximum reading on output meter. A loading resistance of 25,000 Ω must be employed in view of the band-pass characteristics of the transformers. When tuning the primary of either transformer the resistance is connected across the secondary, and when the secondary is tuned, the load is applied to the primary.

Signal Frequency and Oscillator Circuits.—After the I.F. alignment has been carried out, the by-pass condenser in the oscillator circuit should be removed, also the F.C. resistance (replace top cap connection), and the frame aerial terminals shorting wire. All signal frequency and oscillator adjustments are made with the gang condenser vanes fully out of mesh and with the volume control at maximum, the input signal being kept as low as possible to avoid A.V.C. action.

Connect a 0.5 MO resistance across terminals normally holding red and black frame aerial leads, and, with the wavechange switch set to M.W., feed in a 196 m. (1,530 KC/S) signal via a 0.002 μ F condenser to the same two terminals. Adjust M.W. oscillator trimmer **C33** for maximum output, bearing in mind that if more than one peak is obtained, that nearer to *minimum* capacity is correct. Next adjust H.F. M.W. trimmer **C30**. Check calibration at top of scale; if low, it is fairly certain that **C33** is tuned to incorrect peak.

Set wavechange switch to L.W. and feed in 775 m. (387 KC/S) signal (with gang at minimum capacity as before). Adjust L.W. oscillator trimmer **C32**, and then H.F. trimmer **C29**, both for maximum output. Finally, feed in 846 m. (354 KC/S) signal and re-adjust **C32**, observing in this instance that the correct peak is the one nearer to *maximum* capacity. Do not re-adjust **C29**.