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'TRADER' SERVICE SHEET

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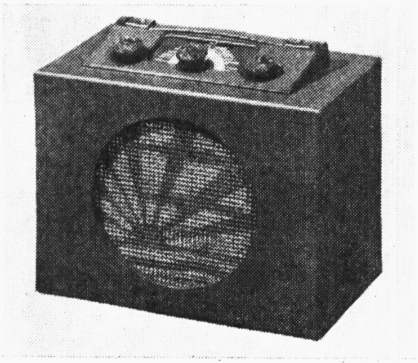
PYE BABY QU

AC/DC PORTABLE



THE Pye Baby QU receiver is a 2-band portable of small size, for use on AC or DC mains. It has a self-contained frame aerial, and there is provision for an external aerial and earth, and for external phones.

It can be used on any mains with voltages between 200 and 250V.

CIRCUIT DESCRIPTION

Tuned frame aerial input **L1, C20** (MW) or **L2, C20** (LW) to variable-mu pentode valve (**V1, Mullard metallised SP13C** or **Ever Ready C50B**) operating as RF amplifier with gain control by variable potentiometer **R9** which forms auto GB resistance in negative HT lead to chassis. Provision for connection of external aerial via **C2**, and earth via isolating condenser **C1.**

Tuned-anode coupling by **L5, L6, C23** between **V1** and pentode detector valve (**V2, Mullard metallised SP13C** or **Ever Ready C50B**) which operates on the grid leak system with **C8, R3.** Reaction is applied from anode by coils **L3, L4** and controlled by variable condenser **C22.**

Resistance-capacity coupling by **R6, C13,** and CG resistances **R10, R11** forming a potential divider across **R9** for GB, via RF filter **C11, R7, C12,** and stopper **R8,** between **V2** and pentode output valve (**V3, Mullard Pen36C** or **Ever Ready C70D**). Fixed tone correction in anode circuit by **C14.** Provision for connection of headphones across secondary of output transformer **T1** by means of plugs and sockets. One plug, when fully inserted, causes **S4** to open muting internal speaker.

When the receiver is used with AC mains, HT current is supplied by half-wave rectifying valve (**V4, Mullard URIC** or **Ever Ready C10B**) which, on DC mains, behaves as a low resistance. Smoothing is effected by speaker field **L9** and dry electrolytic condensers **C15, C16.**

Valve heaters are connected in series, together with ballast resistance **R12,** across mains input, which is provided with double-pole fuses **F1, F2.** Filter circuit comprising chokes **L10, L11,** and **C18, C19** suppresses mains-borne interference.

COMPONENTS AND VALUES

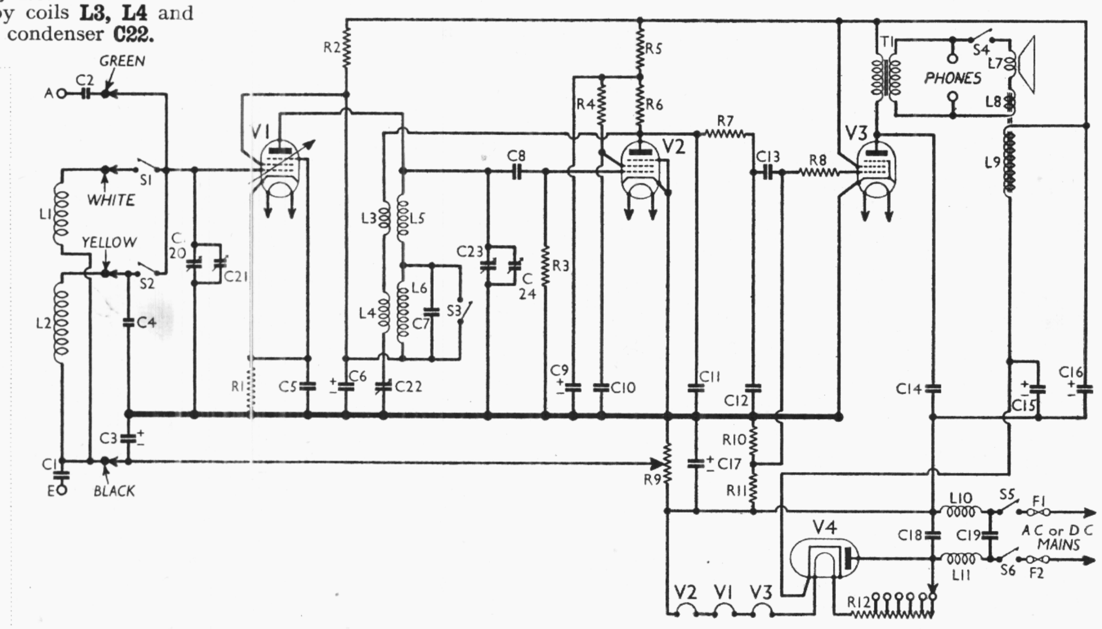
RESISTANCES		Values (ohms)
R1	V1 fixed GB	1,000
R2	V1 anode and SG HT feed ..	5,000
R3	V2 grid leak	510,000
R4	V2 SG HT feed	260,000
R5	V2 anode and SG decoupling	20,000
R6	V2 anode load	110,000
R7	RF stopper	110,000
R8	V3 CG RF stopper	50,000
R9	V1 gain control, ganged C22 ..	250
R10	V3 GB potential divider	1,100,000
R11	and CG resistances ..	1,100,000
R12	Heater ballast resistance ..	840*

* Tapped at 45 O+, 45 O+, 45 O+, 50 O+, 50 O+, 605 O from V4 heater.

CONDENSERS		Values (μF)
C1	Ext. earth isolating	0·05
C2	Ext. aerial isolating	0·000005
C3*	V1 CG decoupling	10·0
C4	Frame aerial LW trimmer ..	0·00002
C5	V1 cathode by-pass	0·1
C6*	V1 anode and SG decoupling ..	2·0
C7	V1 anode circuit LW trimmer	0·00002
C8	V2 CG condenser	0·0001
C9*	V2 anode and SG decoupling ..	2·0
C10	V2 SG RF by-pass	0·1
C11	V2 anode RF by-pass con-	0·0002
C12	densers	0·001
C13	V2 to V3 AF coupling ..	0·01
C14	Fixed tone corrector	0·003
C15*	HT smoothing ..	8·0
C16*		16·0
C17*	Auto GB circuit decoupling ..	10·0
C18	Parts of mains input curcuit	0·1
C19	RF filter	0·1
C20†	Frame aerial tuning	—
C21‡	Frame aerial MW trimmer ..	—
C22†	Reaction control, ganged R9 ..	—
C23†	V1 anode circuit tuning ..	—
C24‡	V1 anode MW trimmer ..	—

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Frame aerial windings	1·72
L2		26·0
L3	Reaction coils	3·5
L4		
L5	V1 anode circuit tuning coils	3·0
L6		12·0
L7	Speaker speech coil	1·6
L8	Hum neutralising coil	0·2
L9	Speaker field coil	1,000·0
L10	Mains RF filter chokes	2·0
L11		2·0
T1	Output trans. Pri.	450·0
	Sec.	0·3
S1-S3	Waveband switches	—
S4	Speaker switch	—
S5, S6	Mains switches	—
F1, F2	Mains circuit fuses	—



Circuit diagram of the Pye Baby QU AC/DC portable receiver. It employs a 3-pentode "straight" circuit. **R9** and **C22** are ganged. Note the grid bias arrangements.

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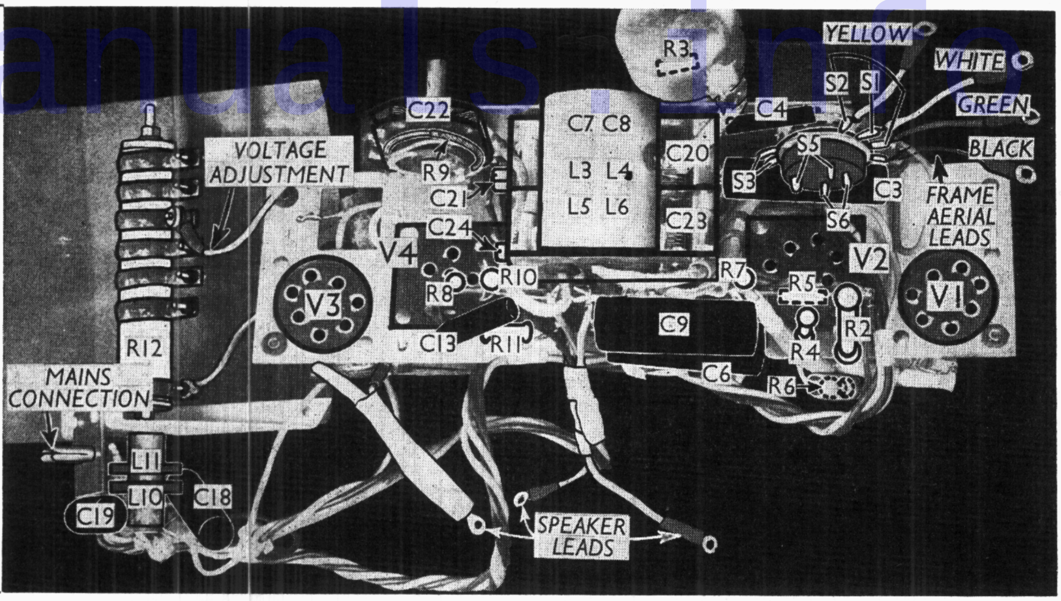
Plan view of the chassis, including the mains input arrangement. All the switches, except that for cutting out the internal speaker, are indicated, and the frame aerial leads are colour-coded.



DISMANTLING THE SET

Removing Chassis.—The mains input unit, with the voltage adjustment resistance, must first be removed. First disconnect the black lead of the electrolytic condenser block on the side of the cabinet from the mains unit bracket (set screw), then remove the two brass nuts (one with spring washer) holding the bracket to the cabinet, when the unit can be removed to the extent of its connecting leads.

Now remove the screen, formed of asbestos and metal, covering the volume control (two round-head wood screws) and *when replacing*, note that three black leads have their solder-tags secured by the right-hand screw, a spring washer going between them and the metal screen, and making contact to it, and a plain washer between them and the screw head.

Next remove the three control knobs (pull-off), the carrying handle (two round-head bolts with nuts) and the two cheese-head screws (with rectangular washers) inside the cabinet holding the moulded escutcheon, when the latter may be removed, and after it the scale pointer from the condenser spindle (pull-off).

Now remove the four frame aerial connections (four screw terminals) from the paxolin strip in the top right-hand corner of the cabinet and *when replacing*, connect them as follows, numbering from left to right: 1, yellow; 2, black; 3, white; 4 (on side of cabinet), green.

Free the leads from the cleat holding them to the right-hand side of the cabinet, remove the four bolts holding the chassis to brackets in the cabinet (four screws with washers) and the two chassis leads from the middle pair of terminals on the output transformer and *when replacing*, connect that in large yellow sleeving to the upper, and the red lead to the lower, of the pair. Remove the yellow chassis lead from the right-hand terminal on the speaker connecting panel, when the chassis can, with some difficulty, be withdrawn by easing the lower projections carefully past the cheek of the speaker field bobbin.

Removing Speaker.—To remove the speaker, remove the five remaining leads from the connecting panel and the three screws (with lock washers) holding it to the sub-baffle. *When replacing*, see that the connecting panel is at the bottom, and connect the leads as follows, numbering from left to right: 1, two red leads, one from the condenser block and from the output transformer; 2, white lead from the output transformer; 3, black lead from the speaker jack on side of cabinet; 4, yellow lead from condenser block (and later, also yellow lead from chassis).

Removing the Output Transformer.—First remove the two fixing bolts (with spring washers) holding the transformer to the sub-baffle, then the leads from the connecting strip. *When replacing*, connect the leads as follows, numbering from top to bottom:—1, black lead from speaker jack; 2, black lead from asbestos and metal screen at top of cabinet; 3, large yellow-sleeved lead from chassis; 4, two red leads, one from chassis and one from speaker; 5, no connection; 6, two white leads, one from speaker jack and one from speaker.

VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 SP13C..	148	1·4	148	0·5
V2 SP13C..	25	0·8	30	0·3
V3 Pen36C	144	37·5	160	6·6
V4 URIC†	—	—	—	—

† Cathode to chassis 290 V DC.

Valve voltages and currents given in the tables above are those measured in our receiver when it was operating on AC mains of 230 V, using the 230 V tapping on the mains resistance. The receiver was tuned to the lowest wavelength on the medium band and volume control was at minimum, but there was no signal input.

Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being negative.

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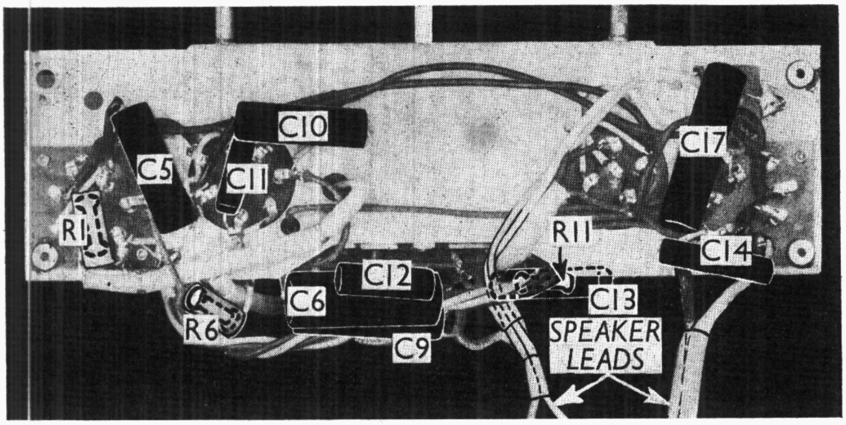

Under-chassis view. **R1** and **R6** are enclosed in insulating sleeving.

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PYE BABY QU—*Continued*

GENERAL NOTES

Switches.—S1-S3 are the waveband switches in a rotary unit, ganged with the mains switches **S5, S6.** In the off position, **S5** and **S6** are open, and in the MW and LW they are closed. In the MW position **S1** and **S3** are closed, and **S2** is open. In the LW position, **S2** is closed and **S1** and **S3** are open. **S4** is the internal speaker jack switch, which opens when external phone plugs are fully inserted into the sockets at the right-hand side of the cabinet. The switch is not shown in our illustrations of the chassis.

Coils.—L1 and **L2** are the frame aerial windings, inside the cabinet. Their connections to the chassis are colour-coded in our circuit diagram. **L3-L6** are in a screened unit attached to the chassis.

External Phones.—These can be plugged into the sockets at the right-hand side of the cabinet, and should be of the low impedance type, having a DC resistance of about 50 O. If an extension speaker is used, it should have a speech coil impedance of 2-4 O.

Condensers C1, C2.—These are associated with the external aerial and earth sockets, and are situated inside the cabinet. They are therefore not included in our chassis illustrations.

Fuses F1, F2.—These are two 1 A ¾ in. glass tubular types, incorporated in the special mains plug. Two spares are fitted in clips inside the base of the cabinet.

Condensers C15, C16.—These are two dry electrolytics in a single carton fitted inside the cabinet, and therefore not shown in our chassis illustrations. They have a common negative (black) lead. The yellow lead is the positive of **C15** (8 μF) and the red the positive of **C16** (16 μF).

Resistance R3.—This is inside the top cap connector of **V2.**

Components C22, R9.—The reaction and gain controls are ganged, in such a way that the gain increases to maximum before reaction is applied, and remains at maximum for the remainder of the travel of the control.

CIRCUIT ALIGNMENT

The chassis should be in the cabinet when aligning. The volume control should be mid-way between minimum and maximum.

Switch set to MW, tune to 210 m on scale, and feed a 210 m (430 KC/S) signal into the external **A** and **E** sockets. Adjust **C21** and **C24** for maximum output. Check calibration at 550, 900 and 1,900 m.

If the pointer has slipped, it can be reset by turning the gang until the rotor vanes are fully in mesh, and adjusting the pointer so that it is located at the mark at the top end of the LW scale.

MAINTENANCE PROBLEMS

Curious Effect in H.M.V. 653

A SERVICE call to an H.M.V. 653 receiver brought to light a very strange effect which I have never previously encountered. The volume was exceedingly low and the volume control had to be fully advanced to hear the programme.

I removed the output valve in order to make a substitution and was greatly surprised to find that the removal of this made no difference whatever to the weak signals issuing from the speaker! Upon testing the valve it was found to have an O/C heater and the fitting of a replacement brought the set back to full strength again.

A study of the circuit diagram of the receiver revealed the cause of the puzzling effect. The triode section of the penultimate valve was found to be resistance coupled to the output stage, with a tone control circuit comprising a variable resistance and condenser in series connected between the anode and grid of the output valve.

This method of connecting the tone control circuit obviously had the effect of feeding the output of the double-diode triode valve straight to the speaker transformer via the coupling condenser and tone control circuit, and as a matter of fact, with the faulty valve in position, the tone control was found to be in effect another volume control!—R.A.C.

Burnt-out Aerial Coil

THE owner of a Mullard MUS4 complained that his set had suddenly gone dead. When tested it was found that signals could be restored by connecting the aerial to the control grid of the frequency changer valve, thus proving that the fault was somewhere in the input circuits.

An ohmmeter test confirmed that one of the aerial coils was O/C which upon being opened up, was found to be burnt-out! After extensive testing one of the mains input pins was found to have continuity to the chassis, which would obviously leave the chassis "live."

Every connection was carefully examined in the mains input circuit, and after much careful elimination it was eventually found that one of the contacts in the special socket which takes the DC vibrator unit plug, had become bent inwards and was touching the chassis, thus shorting one side of the mains to chassis.

Only a few days previously, the owner's house had been "changed over" to AC, and the converter plug, which, of course, was not now required, had been withdrawn. Investigation showed that a sharp projection on the plug had dragged one of the contacts inwards as the plug had been withdrawn, and this was contacting with the chassis.

Strangely enough, one would have thought that with the mains plug inserted so that the chassis was "live," the mains would have been S/C via the receiver earth, blowing the house fuses, without harming the aerial coil in any way.

I can only conclude that in some way or other the earth connection to the set had been either faulty or disconnected, and the AC circuit had been completed via the coil to the aerial, and as the weather was wet when the set went wrong, sufficient AC was able to pass over the wet aerial insulators to earth and burn out the fine windings of the coil.—R. A. COATES, WHITBY.

O/C Decoupling Condenser

A G.E.C. Short-Wave Four came in with the complaint that distant reception had deteriorated until only the very strongest locals could be obtained at strength, and upon testing this was found to be correct.

Replacing all valves made no improvement and so the IF coils were checked for alignment, and it was found that the secondary of the transformer coupling the frequency changer to the first IF valve refused to peak. The coil resistance and grid/earth readings were correct and temporarily changing over the primary and secondary produced the same effect, proving the secondary coil O.K.

The strongest signals were obtained by unscrewing the trimmer right out and it was decided that the grid was being "loaded" in some way. All components connected to grid, cathode and anode circuits were checked without any fault appearing. Then it was noticed that the screening grid was decoupled by an electrolytic and previous experience of these demanded an immediate check for open circuit. Sure enough that was the cause of the trouble and replacement and subsequent realignment brought the set to its original performance.—S. HOWELLS, EBBW VALE.

Faulty Resistor in Philips Sets

SEVERAL Philips receivers which I have recently had to repair have had the same fault; erratic output accompanied by distortion. Pen4DD valves are used in the output stage of the types concerned, and the grid screening cap connected to this valve contains a 1,000 O resistance of the coated variety.

After a time the great heat normally generated by this valve causes the enamel coating on the resistance to crack away from the porcelain base, taking portions of the resistance coating with it. A different type of resistance seems to be needed here.—G.H.W.

NOTE.—Another contributor (R.A.C.) has discovered the same trouble. He suggests the substitution of a small ¼ or ½ W carbon type of resistor, which prevents repetition of the trouble. Incidentally, he remarks that unless the fault is quickly located and cured, it may soon affect the useful life of the pentode.

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