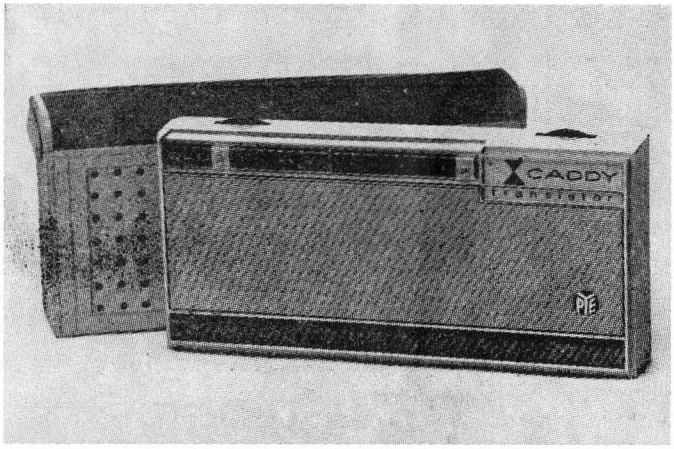
SERVICE DATA SHEET

RADIO

CADDY *TRANSISTOR*

(Model C1)

PORTABLE RECEIVER



C1 SERVICE DATA

The C1 is a portable transistor receiver with a 7.5V battery powered superheterodyne circuit containing five transistors and two diodes.

ELECTRICAL SPECIFICATIONS

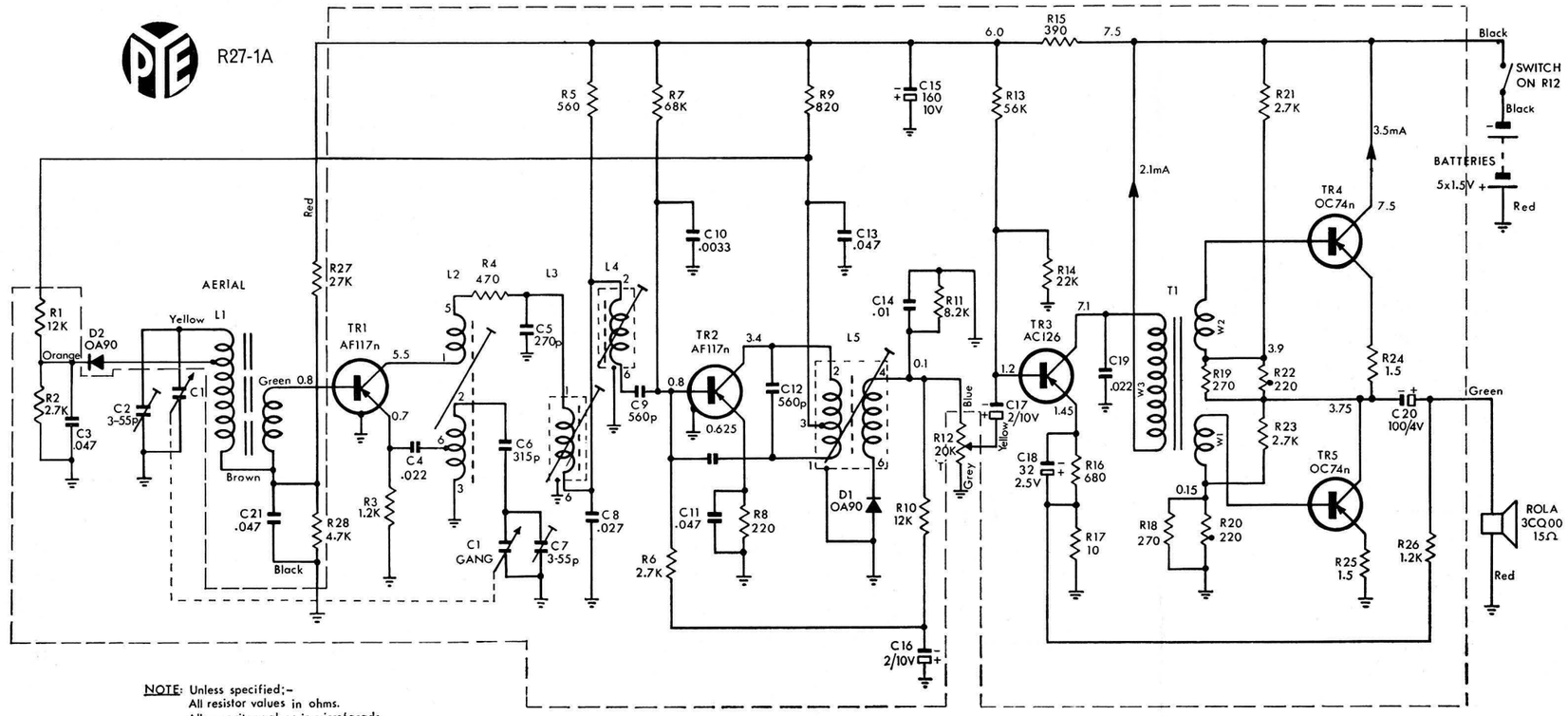
Tuning Range: 525–1640 kC/s
Intermediate Frequency: 455 kC/s
Signal Range: 200 μV/m – 500 mV/metre
Audio Output: 300 mW
Frequency Response: 100 C/s – 6000 C/s
Batteries: Five 1.5V cells, Size C or recommended alternative manganese alkaline long life batteries such as Eveready E93.
Power Consumption: Low levels 10 mA; Normal listening 30 mA.
Battery Life: The receiver will operate satisfactorily down to about 5V, but battery life depends greatly on the way in which the receiver is operated. Standard zinc carbon cells should give more than 250 hours' life with the long life giving up to ten times this.

SUMMARY OF OPERATION

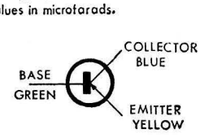
The radio section consists of two stages of amplification incorporating alloy diffused junction transistors for high gain and stability. The loop-stick aerial L1 is matched to the self oscillating mixer TR1 for optimum sensitivity and the IF signal is fed to the IF amplifier by means of the bandpass circuit consisting of L3, L4 and the coupling capacitor C8. This provides high transfer efficiency and prevents the oscillator voltage from appearing at the IF amplifier TR2. TR2 is matched to L4 by the capacitive tap C9, C10 and is neutralised for high gain and stability. The neutralising capacitor is etched into the printed circuit board and is designed so that no adjustment is necessary on changing TR2.

AVC is applied to TR2 in the normal way, and TR2 also acts as a DC amplifier and provides amplified AVC for the damping diode D2. This gives excellent AVC control and enables the audio output to be held constant over widely varying input signal strength.

The audio amplifier consists of a high gain amplifier TR3 driving a Class B output stage using the matched pair TR4, TR5. The output stage is connected in series push-pull, so that the output transformer may be omitted, thus eliminating any power loss and giving greater battery economy, as well as extending the frequency range. Each transistor has an unbypassed emitter resistor to equalise their characteristics and they are thermally compensated by the thermistors R20, R22 and the shunt resistors R18 and R19. This compensation enables the receiver to be run at temperatures as high as 120°F. Overall feedback is applied by means of R26 and R17 to reduce the distortion to a low level and to minimise gain variations.



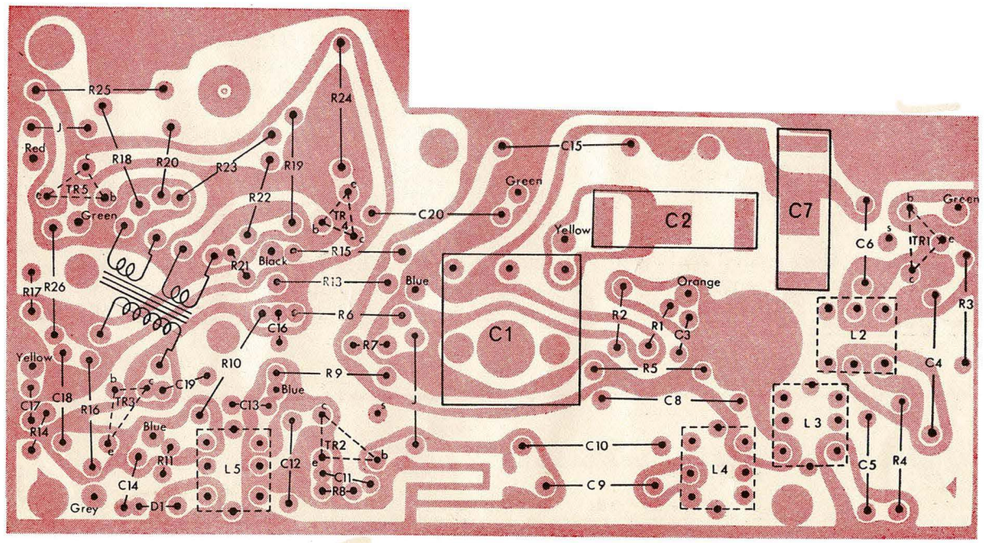
NOTE: Unless specified;–
All resistor values in ohms.
All capacitor values in microfarads.



Base viewed from bottom of coil.

D.C. RESISTANCES IN OHMS.

L2;	1–5	0.29	L5;	1–3	2.2
	2–6	3.6		1–2	3.8
	2–3	3.7		4–6	0.68
L3;	1–6	5.2	T1;	Windings 1 & 2	44
L4;	2–6	3.9		" 3	197



CADDY TRANSISTOR PORTABLE RECEIVER

CIRCUIT CODE NUMBERS

RESISTORS

Code No.	Value in Ohms	± %	Watts	Part No.
R1	12K	10	½	EBJ047
R2	2.7K	5	½	EBJ179
R3	1.2K	10	½	EBJ094
R4	470	10	½	EBJ021
R5	560	10	½	EBJ045
R6	2.7K	10	½	EBJ048
R7	68K	5	½	EBJ209
R8	220	10	½	EBJ033
R9	820	10	½	EBJ188
R10	12K	10	½	EBJ047
R11	8.2K	10	½	EBJ054
R12	20K Linear	20		EBL152
R13	56K	10	½	EBJ083
R14	22K	10	½	EBJ017
R15	390	10	½	EBJ074
R16	680	10	½	EBJ133
R17	10	10	½	EBJ205
R18	270	10	½	EBJ059
R19	270	10	½	EBJ059
R20	220	10 at 25°C	1.25	EBK091
R21	2.7K	5	½	EBJ179
R22	220	10 at 25°C	1.25	EBK091
R23	2.7K	5	½	EBJ179
R24	1.5	10	½	EBK058
R25	1.5	10	½	EBK058
R26	1.2K	10	½	EBJ094
R27	27K	10	½	EBJ113
R28	4.7K	10	½	EBJ106

CAPACITORS

Code No.	Value in μF	± %	DC WV	Part No.
C1	5–269.3p	Gang	2 sect.	EBG415
C2	3–55p	Trimmer		EBG008
C3	.047	+80—20	25	EBE509
C4	.022	10	125	EBA564
C5	270p	10	125	EBA577
C6	330p	—3—7	125	EBA573
C7	3–55p	Trimmer		EBG008
C8	.027	10	125	EBA559
C9	560p	10	125	EBA574
C10	.0033	10	400	EBA546
C11	.047	+80—20	25	EBE509
C12	560p	10	125	EBA574
C13	.047	+80—20	25	EBE509
C14	.01	20	25	EBE515
C15	160	+50—10	10	EBA111
C16	2	+50—10	10	EBA088
C17	2	+50—10	10	EBA088
C18	32	+50—10	2.5	EBA113
C19	.022	20	25	EBE514
C20	100	+50—10	4	EBA089
C21	.047	+80—20	25	EBE509

INDUCTANCES

Code No.	Description	Part No.
L1	Coil aerial assembly	EAC352
L2	Oscillator	EAC348
L3	Bandpass primary	EAC349
L4	Bandpass secondary	EAC350
L5	Detector	EAC351

TRANSISTORS

Code No.	Description		Part No.
TR1	AF117n		ACB178
TR2	AF117n		ACB178
TR3	AC126		ACB179
TR4	OC74n	Matched pairs	ACB180
TR5	OC74n		ACB180

DIODES

D1	Diode OA90	ACC008
D2	Diode OA90	ACC008

TRANSFORMER

T1	Driver	EAB142

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ALIGNMENT PROCEDURE

Alignment should not be necessary unless repairs have been made to a tuned circuit. When alignment is necessary the following procedure should be followed.

Turn the volume control to maximum and connect a 15Ω output meter in place of the speaker or connect an AC voltmeter across the speaker. During alignment the output should be kept below 100 mW (1.2V) to avoid AVC action.

I.F. ALIGNMENT

Connect the signal generator to the base of the converter TR1 via an 0.047 μF capacitor and set the frequency to 455 kC/s. Set the receiver to the extreme low frequency end of the band and tune all IF coils for maximum output.

R.F. ALIGNMENT & SCALE CALIBRATION

If the gang is replaced it may be necessary to realign the dial scale. First fully mesh the gang and adjust the pointer so that it lies over the band limit mark on the right hand side of the scale. This mark and the calibration marks are along the bottom of the dial scale.

When measurements are not necessary a 2 ft length of wire may be used, placed vertically and two feet from the receiver. If sensitivity measurements are to be taken, the following radiator may be used with 1 dB accuracy throughout the band.

Seventeen turns of 22 to 26 B & S wire are wound over an 8″ x ⅜″ dia. loopstick rod and spaced to cover 4″ about the centre of the rod. The generator is fed to one end of the winding via 82Ω and the other end is returned to earth by 100Ω. Both resistors should be carbon types.

In use the radiating loop is placed parallel to the receiver loopstick and 24 inches away from it, keeping the centres of the loops roughly in line. The equivalent field strength at the receiver is then found by dividing the generator reading by 20 i.e., 20 mV on the generator gives a field strength of 1 mV/metre at the receiver.

Connect the signal generator to the radiating aerial and set the frequency to 550 kC/s. Tune the receiver to the first calibration mark (under 2CR) and adjust the oscillator coil and the loopstick aerial coil for maximum output. Set the generator to 1470 kC/s and tune the receiver to the third calibration mark (under 3 MA), and adjust the oscillator and aerial trimmers for maximum output. Repeat these adjustments until no further improvement can be achieved. Set the generator to 980 kC/s and tune the receiver to this signal. Check that the pointer is within 1/16″ of the second calibration mark.

PERFORMANCE FIGURES

1. IF SENSITIVITY
   20 μV ± 3 dB for 50 mW output (0.86V) with the generator connected to the base of TR1 via an 0.047 μF capacitor.
2. RF SENSITIVITY
   300 μV/M ± 3 dB for 50 mW output (0.86V) measured via a radiating loop.
3. AGC CHARACTERISTIC
   300 μV/M — 10 dB (max.)
   1 mV/M 0 dB
   500 mV/M + 10 dB (max.)
4. AUDIO SENSITIVITY
   50 mV rms for 300 mW output.