

SERVICE MANUAL

PERSONAL PORTABLE
MODEL **UP 11**

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"CADET"

COMBINED RADIO AND TELEVISION SERVICE LTD

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Service Data

for

MODEL UP II (CADET)

GENERAL DESCRIPTION

A personal portable receiver mounted in a simulated leather case incorporating eight transistors giving complete coverage on long and medium wave bands.

Tuning is by means of a dial on the front of the case and the volume control, on/off switch is of the rim edge type located on the left side.

Fitted to the rear of the case are two sockets which provide for the connection of a car aerial and output for an earpiece or Tape recorder.

The earpiece is an optional extra.

DIMENSIONS

Width	Height	Depth
5 $\frac{7}{8}$ "	3 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "

WEIGHT (including Battery) . . 1 lb.

LOUDSPEAKER 3" diameter.

BATTERY

Single 9 volt	Ever Ready	PP4
	Drydex	DT4
	Vidor	VT4

TRANSISTOR COMPLEMENT

	Function	TEXAS	G.E.C.	S.T.C.	MULLARD
TX1	Oscillator Mixer	2G344A	GET874	TK1000C	OC44
TX2	1st I.F.	2G345A	GET873	TK1000C	OC45
TX3	2nd I.F.	2G345B	GET873	TK1000C	OC45
TX4	Detector Diode	Y25		TK5025	
TX5	1st Audio Amp.	2G371B			OC75
TX6	Driver	2G371B			OC81D
TX7 } TX8 }	Matched Pair	2G381A(PNP)			OC81(PNP)
	Push-Pull Output	2G339A(NPN)			AC127(NPN)

IMPORTANT NOTE

Should I.F. Transistors be replaced in the course of service by one of the alternative types, it may be necessary to change the neutralising condensers. See Chart on circuit sheet.

Should TX5 be replaced by an alternative type, two resistors must also be changed. See chart on circuit sheet.

POWER OUTPUT

150 mW for 10% distortion.

POWER CONSUMPTION

On Loudspeaker	Quiescent	9 mA
	50 mW Output	24 mA
	150 mW Output	36 mA
	Average Listening Level	20 mA
On Earpiece		9 mA

REMOVAL OF CHASSIS

To remove chassis from case, first detach tuning knob which is a push on fit, remove two 6BA chassis fixing nuts (for location see printed circuit drawing). Prise open sides of case and withdraw chassis. **Note** Speaker is mounted in case and after partial removal of chassis, the speaker leads must be unsoldered.

CIRCUIT DESCRIPTION

The UPI1 is an eight transistor super-het receiver. Medium and Long wave aerial coils are mounted on a Ferroxcube rod and coupled to the base of the mixer transistor TX1.

Two stages of I.F. amplification are employed, TX2 and TX3 and to maintain stability, neutralizing is applied via capacitors wired between the secondary of the I.F. transformers and the base of the preceding transistors.

The value of these capacitors (C8 and C12) is critical and varies according to the make of transistor used (see chart on circuit diagram).

Detection is achieved by using a transistor (TX4) wired as a diode. Positive A.G.C. voltage is developed across the diode load resistor and applied to the base of the first I.F. transistor (TX2).

AUDIO STAGES

TX5 is the first audio amplifier followed by the driver stage TX6.

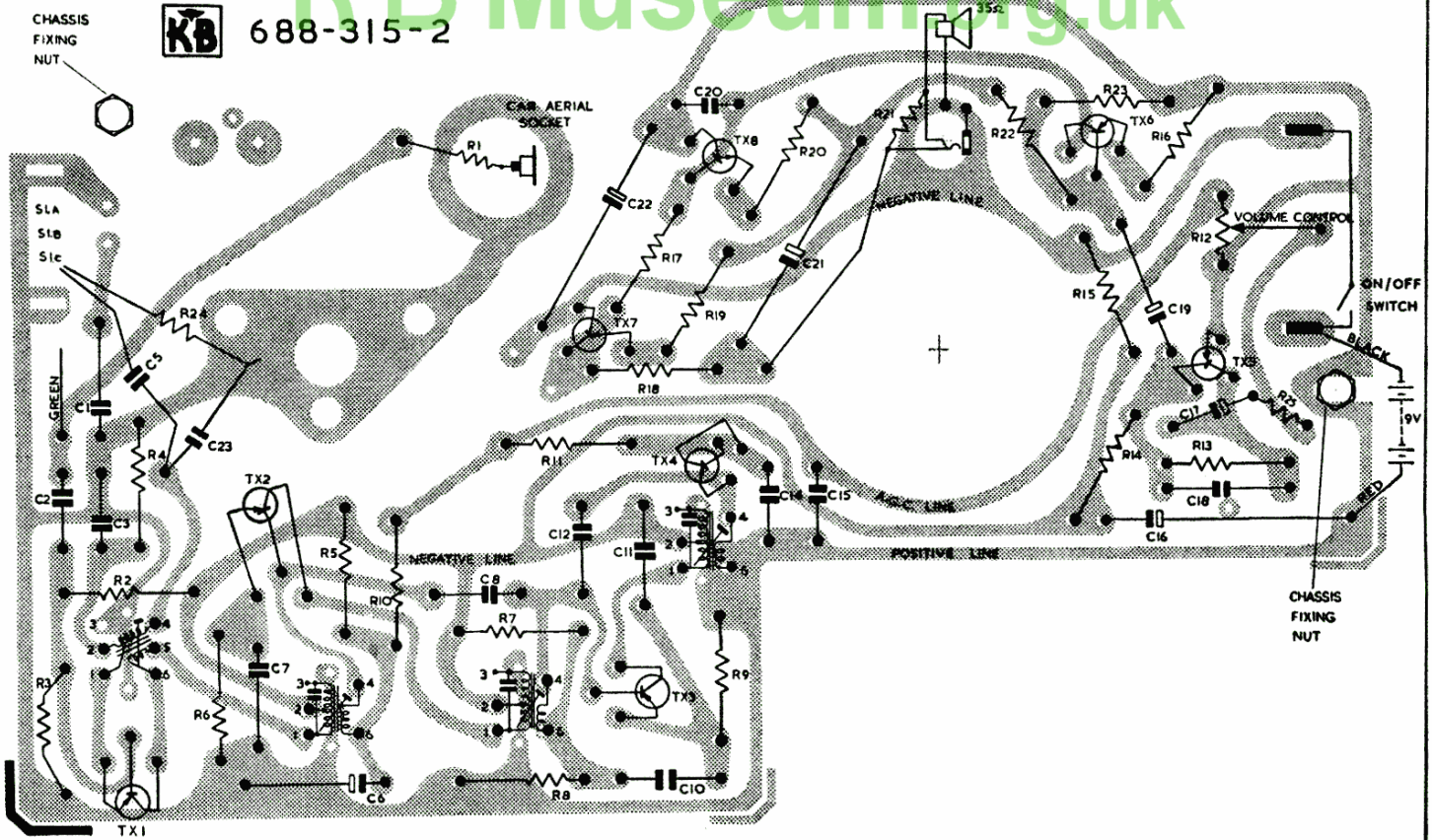
The output stage is class B push pull and as complementary transistors are employed, i.e. one PNP and one NPN, a phase splitter circuit is unnecessary. TX7 operating on the negative half cycle and TX8 on the positive half cycle of the signal.

The A.C. output load is represented by the loudspeaker which is of 35 ohm impedance, the audio signal being fed to the speaker via C21 80 μ F capacitor.

When the earpiece socket is used for the purpose of recording on tape, R21 comes into circuit to maintain a reasonable load to the output stage and to allow sufficient signal to reach the loudspeaker for monitoring purposes.



688-315-2



The following equipment will be required:—

1. A.M. signal generator covering the range 140–1700 Kc/s.
2. Output power meter.
3. Shielded test coil (85 turns of enamel covered wire on 2" diameter former).

Procedure

1. All measurements made with signal modulated 30% at 400 c.p.s.
2. Progressively reduce signal input as the sensitivity increases with alignment maintaining approximately 50 mW output.

I.F. Alignment

1. Set generator to 470 Kc/s and connect via a 0.1 μ F condenser to base of mixer transistor.
2. Set gang to minimum capacity on M.W.
3. Trim for maximum gain by adjusting cores in the following order: 3rd, 2nd, 1st, and then readjust if required.

R.F. Alignment

1. Connect signal generator to test coil.
2. The following operations should be carried out in the order indicated, being repeated as necessary until scale accuracy, with maximum sensitivity, is attained.

Operation	Input Frequency	Waveband	Gang Position	Adjustments
1	540 Kc/s	M.W.	180° (max. C)	Osc. core L3.
2	1610 Kc/s	M.W.	0° (min. C)	Osc. trimmer.
3	Check operation 1.			
4	600 Kc/s	M.W.	—	Move MW aerial coil for maximum gain.
5	1450 Kc/s	M.W.	—	Adjust aerial trimmer for maximum gain.
6	225 Kc/s	L.W.	—	Adjust LW aerial coil for maximum gain.

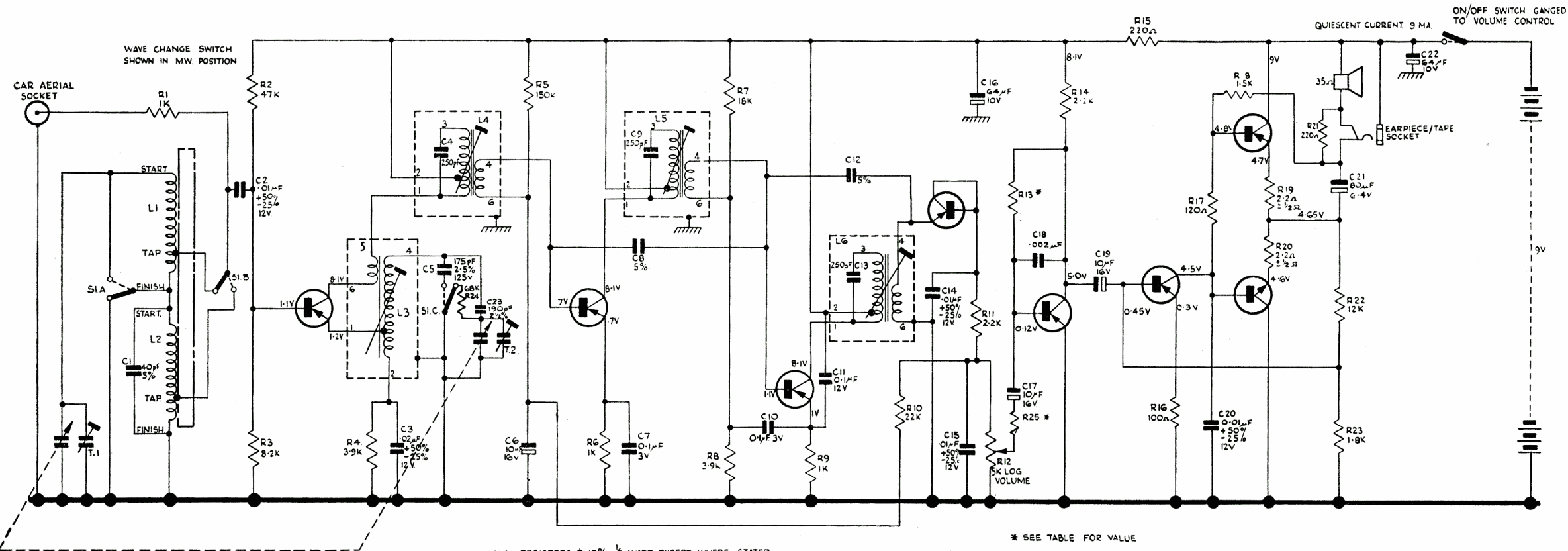


SPARE PARTS LIST UP.11
 Prices are subject to alteration without notice.

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COMPONENT	CIRCUIT REF.	PART NO.	PRICE
			£ s. d.
BATTERY LEAD ASSY.			
Stud		13/89	9
Socket		13/90	9
CASE (TAN)		688/4	3 7 6
COILS			
Rod Aerial Assy.	L1, L2	688/30	9 0
Ferrite Rod		433/199/6	1 6
LW Winding	L2	688/24	2 9
MW Winding	L1	688/21	1 11
Oscillator Coil	L3	688/27	6 9
1st and 2nd I.F. Coils	L4, L5	688/50	7 9
3rd I.F. Coil	L6	688/52	7 9
CONDENSERS			
Tuning Condenser		38/3	18 0
80µF 6.4v.	C21	KEM188/S	2 6
64µF 10v.	C16, C22	KEM181/S	1 9
10µF 16v.	C6, C17	KEM164/S	2 0
.1µF 12v.	C11	KC194	1 3
.1µF 3v.	C7, C10	KC183	1 3
.02 12v.	C3	KC218	1 3
.01µF 12v.	C2, C14, C15	KC215	1 3
175pf ± 2½%	C5	KST286	1 0
190pf ± 2½%	C23	KST350	1 0
40pf ± 5%	C1	KC188	1 0
NEUTRALISING CONDENSERS			
19pf ± 5%	C12	KC224	1 0
69pf ± 5%	C8	KC225	1 0
22pf ± 5%	C12	KC131	1 0
84pf ± 5%	C8	KST348	1 0
15pf ± 5%	C12	KC90	1 0
56pf ± 5%	C8	KC214	1 0
RESISTORS			
2.2Ω ± ½Ω		RZD2KED	1 0
SPEAKER			
35Ω		688/250	1 4 6
			Plus 4 1 P/Tax
SLIDE SWITCH			
WAVE CHANGE		13/86	4 3
TUNING DIAL ASSY.		688/260	6 9
VOLUME CONTROL & ON/OFF SWITCH		9/76	7 3

MIXER TX1



ALL RESISTORS $\pm 10\%$ 1/2 WATT EXCEPT WHERE STATED.
CAPACITORS NEED NOT EXCEED 9V WORKING

I.F. 470 Kc/s

* SEE TABLE FOR VALUE

TYPE	TX	FUNCTION	GEC		T.I		S.T.C		MULLARD		
			TRANSISTOR	C8 C12	TRANSISTOR	C8 C12	TRANSISTOR	C8 C12	TRANSISTOR	C8 C12	
PNP	1	MIXER	GET 874		2G 34+A		T.K. 1000C		OC44 (YELLOW)		YFG3
PNP	2	1ST I.F.	GET 873	56pF	2G 34.5 A	56pF	T.K. 1000C	84pF	OC45 (ORANGE)	69pF	
PNP	3	2ND I.F.	GET 873	15pF	2G 34.5 B	15pF	T.K. 1000C	22pF	OC45 (BLUE)	19pF	
PNP	4	DIODE			Y25	RED		T.K. 5024			LFK3
PNP	5	PRE-DRIVER			2G 371B	PURPLE			OC75		
PNP	6	DRIVER			2G 371B	GREEN			OC81D		
PNP	7	MATCHED			2G 381A	BLACK			OC81		
NPN	8	OUTPUT PAIR			2G 339A	BLACK			AC127		
					R13 1.2M & R25 4.7K				R13 820K & R25 2.2K		