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2. Select the correct printer if necessary.
3. Select the pages you want to print – even if you want to print all of the document, you will probably not want to print this notice and help page, so start the printing at page 3.
4. In the "Page Handling" area, next to "Page Scaling", select "Fit to paper". The press "OK"

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Please get in touch with me at archivist@vmarsmanuals.co.uk.

Richard Hankins, VMARS Archivist, Summer 2004

RECEPTION SETS R106, MKS 1 AND 2

TECHNICAL HANDBOOK - UNIT REPAIRS

GENERAL

1. No adjustments, except those detailed in this Regulation, will be made to the receiver by unit repair sections since the accuracy and sensitivity of the set depend on very accurate alignment and adjustment carried out in Base workshops.

2. For technical description, circuit diagrams and component tables, refer to Tels E 162.

SETTING-UP INSTRUCTIONS

3. The receiver is set up for normal operation as follows:-

(a) Ensure that the appropriate power supply unit is connected to the set, but it is at this stage switched OFF. For operation from 100-250V A.C. mains use the Supply unit, rectifier, No. 5, and for 6V D.C. battery operation use the Supply unit, vibratory, No. 2.

(b) Select the appropriate plug-in coil unit and insert it in position in the receiver (see para 3, Tels E 162).

(c) Connect the loudspeaker, if required, to the terminals at the rear of the set. If a loudspeaker is not used, these terminals must be short-circuited. Do not stand the loudspeaker on the receiver cabinet.

(d) The aerial terminals are located on the left-hand side of the receiver. If a single wire aerial or unbalanced feeder line is to be used, connect the aerial or feeder lead to the terminal nearest the front panel and connect the flexible earth lead to the other terminal. If a balanced transmission line is used, connect it to both terminals and in this case, the flexible earth lead is not used.

(e) Switch on the P.S.U. and switch on the H.T. to the receiver at SW5; (terminals BSW at the back must be short-circuited if the receiver is not to be used on a relay system).

(f) Tune the receiver by setting the dial to the scale reading given by the calibration chart on the coil unit for the frequency desired.

(g) Set the R.F. GAIN, RV1 and AUDIO GAIN, RV33 to give the required output level.

(h) The selectivity control, C46, when used with the crystal filter in circuit gives minimum selectivity in the vertical position. Selectivity is increased by rotating the knob either way. When the crystal filter is not in use, this control acts as an I.F. trimmer, and should be set to give maximum volume.

(j) The PHASING control and crystal filter switch is used when receiving C.W. or M.C.W. In position 0 the crystal is short-circuited; in any other position the PHASING control may be used to eliminate any one interfering station more than 300c/s away from the required station.

(k) The C.W. OSC. switch and control is used on C.W. to give an audible note, or on M.C.W. to assist in the location of a weak station. Rotating the control varies the pitch of the beat note.

(l) The A.V.C. switch, SW2, may be used as required on R.T. or M.C.W. A.V.C. should not be used when the C.W. oscillator is in operation.

4. If it is desired to change the coil unit while the set is in operation, the H.T. must first be switched OFF at switch SW5.

ROUTINE TECHNICAL MAINTENANCE

Receiver

5. Daily:-

(a) Check all controls for smoothness of action and freedom from backlash, especially the main tuning control. If the tuning control is defective, report immediately. Do not remove the wormwheel casing.

(b) Clean the outside of the case. Examine external cables and plugs ensuring that these are in good condition and that all connections are tight.

6. Monthly:-

(a) Remove the receiver from its case and remove the baseplate. Brush out all dust, being careful not to disturb any R.F. wiring or damage the vanes of the tuning capacitor. Remove the coil unit and clean out the coil compartment. If a portable air blower is available, use this in preference to a brush for cleaning the equipment.

(b) Check all valves for loose top caps and bases, replacing any that are defective. Ensure that all valve pins make good contact with their sockets. Test all valves.

(c) Examine all soldered joints, repairing any that are loose or broken. Check that all components are firmly mounted and that no fixing nuts or screws are loose.

(d) Ensure that the contacts on all coil units and in the coil compartment are clean and make good contact with each coil unit in position in turn. Clean the sliding earth contacts on each gang of the tuning capacitor and lubricate with a trace of grease PX 7.

(e) Check the calibration of the receiver on all bands, using either the Wavemeter, class D, or the Frequency meter, SCR 211. If re-calibration or re-alignment is necessary, the set must be returned to Base workshops.

Power supply unit

7. Monthly:-

Remove the P.S.U. from its case and clean it thoroughly. Check all connecting wires and soldered joints and check the continuity of all choke and transformer windings. Check the external cable to mains or battery. Check all input and output voltages on load. If both types of P.S.U. are held, both units should be checked.

Unit maintenance record

8. On completion of maintenance the appropriate entry will be made on AF B2661 (see Table 1003).

FAULT FINDING

9. In the event of a fault occurring on the receiver, it may be localised:-

(a) by observing the action of the controls

(b) by making the voltage and resistance checks detailed in Table 1001

(c) by detailed testing of components.

10. Table 1001 has been drawn up for a Mk 1 receiver. The corresponding values for the Mk 2 receiver should generally be similar. Where the values differ widely, both are noted. The readings were taken under the following conditions, using Instrument testing, AVO, universal, 46 range, Mk I or 50 range.

(a) S-meter switch OFF

(b) AUDIO GAIN at 10

(c) A.V.C. OFF

(d) C.W. oscillator OFF

(e) Selectivity set vertical

(f) PHASING at 5

(g) R.F. GAIN at 10

(h) H.T. ON

(j) No phones in use and loudspeaker terminals linked

(k) Coil unit for 50-100kc/s range.

11. Table 1002 gives a number of possible faults and the action required.

Note: The next page is Page 1001.

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Table 1001 - Voltage and resistance test figures

Valve	Electrode	Valve base pin No.		D.C. voltage to chassis		Resistance to chassis		Remarks
		Mk 1	Mk 2	Mk 1	Mk 2	Mk 1	Mk 2	
V1	Anode	2	3	250	220	30kΩ	40kΩ	
	Screen	3	4	100	85	24kΩ		
	Cathode	5	8	3.0		300Ω		
	Grid	T/C	T/C	-		750kΩ		1.5MΩ with A.V.C. ON
V2	Anode	2	3	250	220	30kΩ	40kΩ	
	Screen	3	4	100	85	24kΩ		
	Cathode	5	8	1.5		300Ω - 10kΩ		Maximum with minimum R.F. gain
	Grid	T/C		-		750kΩ		
V3	Anode	2	3	250	220	30kΩ	40kΩ	
	Screen	3	4	65	85	200kΩ		
	Cathode	5	8	3.0		5kΩ		
	Grid	T/C	T/C	-		80Ω		
V4	Anode	2	3	250	220	30kΩ	40kΩ	
	Screen	3	4	100	85	50kΩ		
	Cathode	5	8	-		-		
	Grid	T/C	T/C	-2.4		20kΩ		
V5	Anode	2	3	220	200	30kΩ	40kΩ	
	Screen	3	4	100	85	24kΩ		
	Cathode	5	8	2.6-33		300Ω - 10kΩ		Maximum with minimum R.F. gain
	Grid	T/C	T/C	-		750kΩ		1.5MΩ with A.V.C. ON
V6	Anode	2	3	220	200	30kΩ	40kΩ	
	Screen	3	4	100	85	24kΩ		
	Cathode	5	8	12-40		2.6Ω - 12kΩ		Maximum with minimum R.F. gain
	Grid	T/C	T/C	-		750kΩ		1.5MΩ with A.V.C. ON
V7	Anode	2	6	75	150	220kΩ	100kΩ	
	Screen	3	-	35		20kΩ		Mk 1 only
	Cathode	6	3	1.2		800Ω		
	Grid	T/C	2	-		500kΩ		With maximum A.F. gain
V8	Anode	2	3	25		150kΩ		With C.W. oscillator switched on
	Screen	3	4	12		85kΩ		
	Cathode	5	8	-		-		
	Grid	T/C	T/C	-		50kΩ		
V9	Anode	2	3	250	220	30kΩ	40kΩ	
	Screen	3	4	250	220	30kΩ	40kΩ	
	Cathode	5	8	15	12	500Ω	300Ω	
	Grid	4	5	-		500kΩ		

Table 1002 - Fault location

Sympton	Possible fault	Action
1. Set dead	(a) Fault in power supply unit or leads	1. Examine all power leads and plugs 2. (a) Test power unit fuses and indicator lamp. Check rectifier valve. Test SW1, C1, C2 and power transformer. (b) On D.C. working check battery volts. Recharge if necessary. Check fuse and test switch
2. Set dead, but pilot lamp lights up	(a) No H.T. on receiver	1. Test switch on receiver and examine external connecting leads from P.S.U. 2. Test P.S.U. as follows:- (a) A.C. working: test fuse F1, V1 (CV1863), C3, C4A, C4B, L1, L2 and L3. Test secondary windings of transformer (b) D.C. working: if vibrator not functioning replace with known good one. Test V1A. (CV692) by replacement with known good one. Test all associated smoothing components.
3. Set dead but H.T. and L.T. present	(a) Faults in A.F. stages (b) Faulty phones or loudspeaker	1. Check voltage on pins of V7 and V9 (see Table 1001) Test valves by replacing them with known good ones 2. Test loudspeaker and output transformer or phones. Examine jack JK1 for good contact

Table 1002 - (contd)

Sympton	Possible fault	Action
4. No signals but noise present	(a) Fault in local oscillator	1. Measure voltage at pins of V4 (see Table 1) Test V4 by replacement with known good one. If coil unit is suspected change frequency band and report as necessary.
	(b) Fault in R.F. stages	2. Measure voltages on pins of V1, V2 and V3 (see Table 1) replace valves with known good ones. Test receiver on another frequency band
	(c) Fault in I.F. or detector stages	3. Measure volts at pins of V5, V6 and V7. Test valves by replacement with known good ones
5. Low sensitivity	(a) Low H.T. volts	Check supply voltage. Test P.S.U. and replace any faulty components
	(b) Valve faults	Replace all valves one at a time. Always replace the old valve if sensitivity does not improve
	(c) Fault in R.F. or I.F. stages	Take action as detailed in 4 above
	(d) Faulty aerial system	Inspect and repair aerial system

TYPE OF EQUIPMENT ..... R106 Mk I ..... Army Form B2661
SERIAL No. OF EQUIPMENT ..... AP 656 .....
Note - Unit tasks are detailed in Working Instructions

DATE (week ending)	UNIT MAINTENANCE LOG 1 DAY	2 DAY	3 DAY	4 DAY	5 DAY	6 DAY	7 DAY	UNIT MAINTENANCE LOG
								INITIAL DATE
								NOTE: UNIT TASKS ARE DETAILED IN RELEVANT EMER
To be completed by user								
								INITIAL DATE
								INITIAL DATE
								INITIAL DATE
								INITIAL DATE
								INITIAL DATE
								INITIAL DATE
								INITIAL DATE

REPAIR RECORD
(eg VALVE REPLACEMENTS, MAJOR REPAIRS, REME INSPECTIONS etc)

DATE	REMARKS
28.10.52	V9 replaced, screen to grid short circuit
29.10.52	V5 replaced, broken grid cap
29.10.52	Loudspeaker output terminal parted from mounting

Note:- The space indicated by heavy black lines under days 3 and 7 are to be initialled on completion of unit weekly and monthly tasks respectively.

Table 1003 - Specimen AF B2661

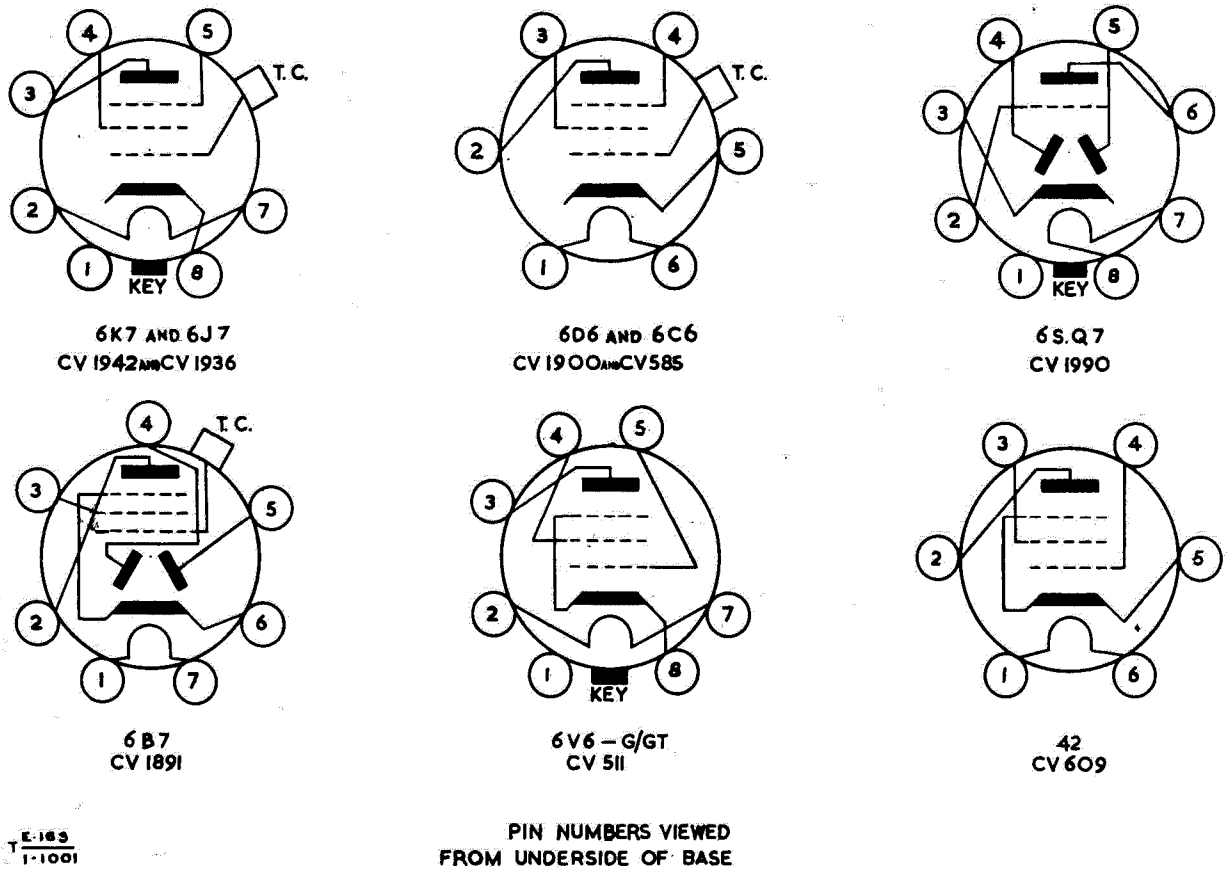

Fig 1001 - Valve bases

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END

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