

R E S T R I C T E D

ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS
(By Command of the Army Council)

TELECOMMUNICATIONS
F 643

TRANSMITTER-RECEIVER, RADIO, NO 62

TECHNICAL HANDBOOK - UNIT REPAIRS

Erratum

Note: This Page 0, Issue 1, will be filed immediately in front of Page 1, Issue 2, dated 27 Feb 47.

1. The following amendment will be made to the regulation.

2. Page 11, Table 1, Test No 7, column 3 (Test),

Delete: detail

Insert: 'Switch to ALL ON and NET and tune set for zero beat

T/61199/MAG

Issue 1, 31 Oct 63

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Page 0

WIRELESS SET NO.62

FIRST ECHELON WORK

Note: This issue supersedes Issue 1, which has been amended throughout.

MAINTENANCE

GENERAL

1. Regular and careful maintenance is essential to keep the set in good working order. The maintenance detailed here should be carried out by a radio mechanic at least once a month, and more often if possible. Whenever maintenance is carried out the radio mechanic (Signals) should fill in the maintenance chart which is kept by the Signals officer for each set under his control.

AERIALS

2. (a) Rods. See that the rods are straight and are clean at the ends and greased with a little Vaseline to ensure good contact. Inspect for corrosion and, if found, clean and repaint.
- (b) Bases. Clean and check the spring contact and insulator.
- (c) Pigtails. If the set is part of a vehicle installation, remove the aerial base and inspect the pigtail and connection to the aerial.
- (d) Guy ropes and pegs. Repair or replace as necessary.
- (e) Wire aerial. Examine and remove kinks.

WIRELESS SET NO.62

Controls

3. Check the mechanical action of all controls, working from left to right. The most important are:-

- (a) AERIAL TUNING. Check for correct action, i.e., that the clutch slips at the end of travel and that the counter operates correctly.
- (b) Slow-motion drive. This should turn the dial smoothly and without slip; if not, return to workshops for repair. See that the slow-motion drive releases on FLICK and takes up on TUNE and SET.
- (c) Switches. Check all switches for positive action.
- (d) HET TONE. Should turn stiffly and smoothly through 360°.
- (e) Flick control. See that it operates correctly.
- (f) Ensure that all grubscrews are tight.

All controls are sealed with Neoprene washers and care should be taken when removing knobs not to impair the waterproofing. Examine all controls to see that the sealing is intact. To remove a knob, remove the centre screw and loosen the grubscrew. Take off the knob thus exposing the metal cap covering the sealing; the metal cap and the sealing can be prised off and the component reached. When replacing the cap, refill if necessary with Grease, Kingsnorth, 1026.

Valves

4. See that the valves are firmly held in their sockets and that the top-cap clips are tight. Where the valves are fitted with retaining clamps see that they are held firmly. See that the screening cans are in position and that the lids fit securely. If grid leads are worn, repair or replace.

Lubrication

5. Clean the slow-motion drive, rim of dial and flick discs with a soft cloth. Apply Oildag (Grease, special, H.P.M., HA6302) to the slow-motion drive, rim of dial and discs. Apply thin oil to all moving parts of the flick mechanism. All lubricants must be of a high-temperature type.

Cleaning

6. (a) Clean the interior of the set and inspect for loose or dirty connections. When cleaning the set, care must be taken not to disturb unduly the position of wires as this might affect calibration. If the set is damp, dry out. Inspect carefully:-
- (i) Aerial terminal and insulator
 - (ii) 3-point and 2-point plugs
- (b) Carefully clean the aerial tuning inductor with a dry, soft cloth. See that the cloth is free from grit before use. Carefully clean the rod, wheel, and wire so that a good electrical contact is made. See that when the indicator reads 0-0-0, one wheel is $\frac{1}{2}$ -1 turn from the back end of the inductor.
- (c) Remove the rotary transformer as detailed in para.15 and examine for:-
- (i) Dirty contacts
 - (ii) Worn brushes
- After 500 hours running the bearings should be greased.

Relay

7. See that the contacts and pole-piece are clean. Inspect the latter to see that it has no iron dust on it. See that contacts make and break correctly and do not foul the cam. Check that the relay operates instantaneously on closing or opening the pressel switch.

8. The relay can be removed by unsoldering the connections and removing the two screws holding the relay to the chassis.

Relay adjustments

9. The relay is of the K600 type, but is non-standard in certain details. Method of adjustment is given in Tels. A 424/5; the following information is also required:-

Contacts: Special low-capacity, high-voltage type, platinum, with 14 mil springs.

Spring	1 and 5, 21 and 23	:	16-20 grams
tensions:	2 and 22	:	8-12 grams

Armature travel: 31 mils.

Note: These Pages 3 and 4, Issue 3, supersede Pages 3 and 4, Issue 2, dated 27 Feb 47. Para 16 to 18 contain new information.

Armature residual stud: 12 mils.
Currents: Saturate: 100 mA
Operature: 70 mA
Coil: 100Ω, high voltage. 4,500 turns

Headgear, case and webbing harness

10. Examine the headgear for wear or fraying of the cord, and the snatch plugs and sockets for wear. Examine the case and associated webbing for wear or damage. See that the case has no holes in it and that the neoprene round the lip is intact.

Send-receive alignment

11. Set a wavemeter to 4Mc/s and tune the receiver on the higher range, switching to NET and tuning for zero beat. Press the pressel switch and set a wavemeter to the frequency at which the set is sending. If it differs from 4Mc/s by more than 1.5kc/s, the set should be returned to workshops for realignment. Similarly check at 4Mc/s on the lower range.

Calibration

12. Set the crystal calibrator to 2.1Mc/s and tune the receiver to it, using the A.V.C. meter. Record the setting of the frequency dial. Repeat this at 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0 and 9.9Mc/s. If the error is greater than 1% return to workshops for realignment.

Vehicle suppression and screening

13. If the set is used in a vehicle station, switch on the set and then run the engine and switch on all the electrical equipment. If the receiver noise increases, the suppression and screening system of the engine and electrical equipment are probably faulty. Listen for noise from the receiver with the vehicle free-wheeling and the engine switched off (or with the vehicle being rocked on its suspension).

MECHANICAL REPLACEMENTS AND ADJUSTMENTS

14. Note that when components are replaced in this set, the replacements must be of tropical pattern and in accordance with the identification list. If the case is removed for any purpose, the fixing screws must be resealed, after replacing, with either shellac or bakelite varnish.

Rotary transformer

15. To reach the rotary transformer for changing brushes, etc, remove the baseplate and disconnect the wires connecting the transformer to the set at the terminal blocks fitted in the side of the chassis (Fig 1). Place the set right way up on a bench and remove the two rubber-mounted screws at the rear of the chassis at the back of the a.t.i. The rotary transformer and associated smoothing components can now be removed as one unit. The transformer is mounted on the bottom half of the case when it is placed right way up (as in the set). The remainder of the case can be removed by

undoing the screws around the edge. Check that the rubber grommets used for suspension have not perished. The l.t. brushes will be found to wear more rapidly than the h.t. ones. When these require replacing, it is also likely that the commutator will require skimming. The armature bearings should at the same time be examined for wear, and if any side-play is present, they should be renewed.

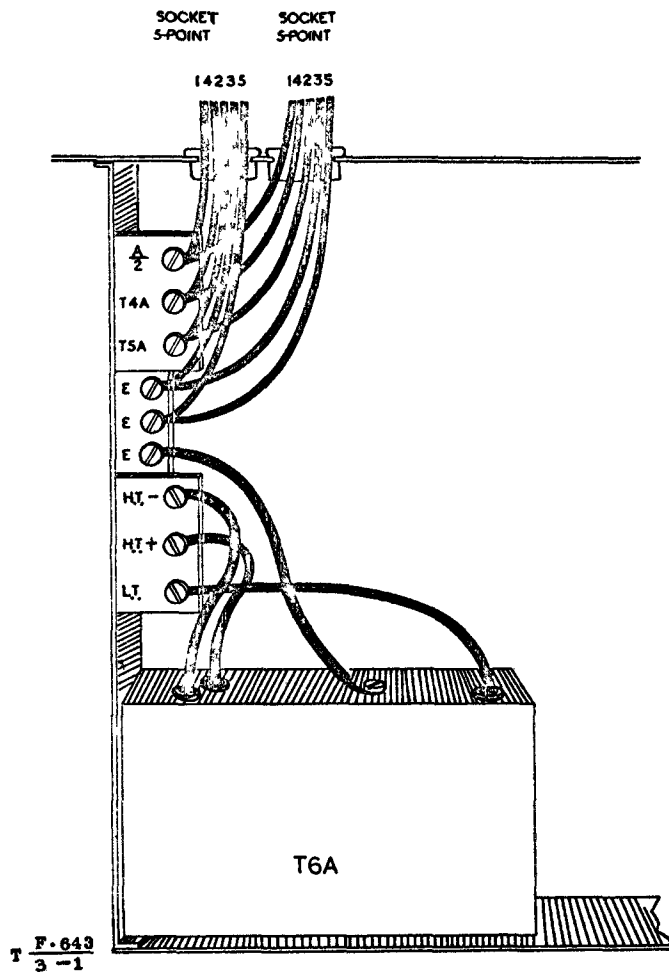


Fig 1 - Connections to the rotary transformer or P.S.T. No 36

TRANSISTOR POWER SUPPLY UNIT

Fitting instructions

16. To replace the rotary transformer supply unit with the transistorized version, first remove the rotary unit as laid down in para 15.
17. Remove the rubber shock absorbing pads and also the rubber grommets upon which the power unit was mounted. Ensure that when the transistor unit is fitted the whole of its upper side is in contact with the chassis.
18. Remove the two mounting bolts and adaptor washers from the transistor power unit and place the unit on the TR No 62 chassis so that the four lead out wires are nearest to the h.t. and l.t. terminal board.

Note: These Pages 5 and 6, Issue 3, supersede Pages 5 and 6, Issue 2, dated 27 Feb 47. Para 19 to 26 contain new information, Fig 1A is a new figure.

19. Place the adaptor washers in the mounting holes on the upperside of the TR No 62 chassis and using the two No 2 BA bolts supplied, bolt down the power unit. Seal the washers and bolt heads with suitable locking varnish or shellac.

20. Connect the lead out wires to appropriate terminals on the terminal board. The connections use the same colour coding as for the rotary unit, ie

Red lead to H.T.+
Brown lead to H.T.-
White lead to L.T.
Black lead to E

21. Removal of the unit for servicing should be carried out in the reverse order to that given in para 16 to 20.

Maintenance

22. No mechanical maintenance is required.

23. If transistors or diodes are suspected of being faulty care must be taken not to apply the soldering iron too long to their connections when removing or re-fitting them. A heat shunt must be used on the leads between the transistor and joint to be soldered.

24. Transistors should be tested using the transistor test set CT446. If this is not available the emergency tests shown in Fig 1A will determine if a transistor or rectifier diode is faulty and requires replacement.

25. The metal cases of the power transistors are at collector potential and are insulated from the chassis by insulating washers and mica washers coated with a silicon compound to give efficient thermal contact. When replacing transistors ensure that these are re-fitted. The diode rectifiers fitted only with insulated washers must be treated similarly.

26. Do not remove or replace components or valves with the power on. Surges may occur which could result in excessive voltage being applied to valves and transistors with consequent damage to both.

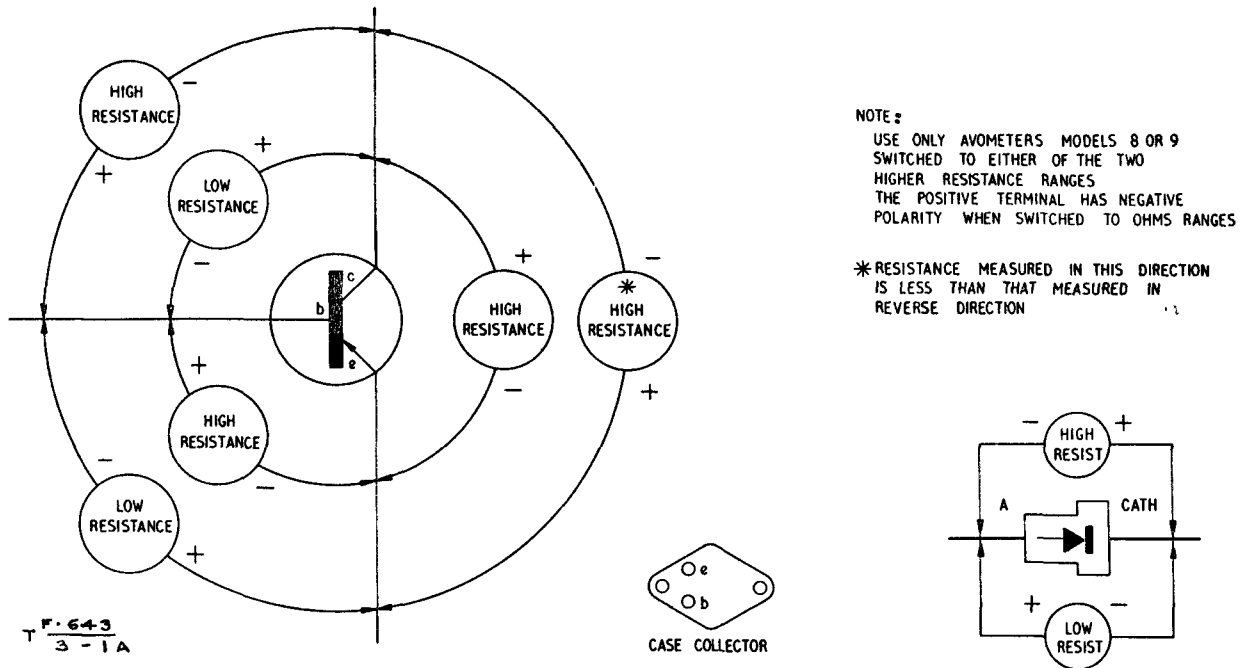


Fig 1A - Transistors - emergency tests

AERIAL TUNING inductance L13A

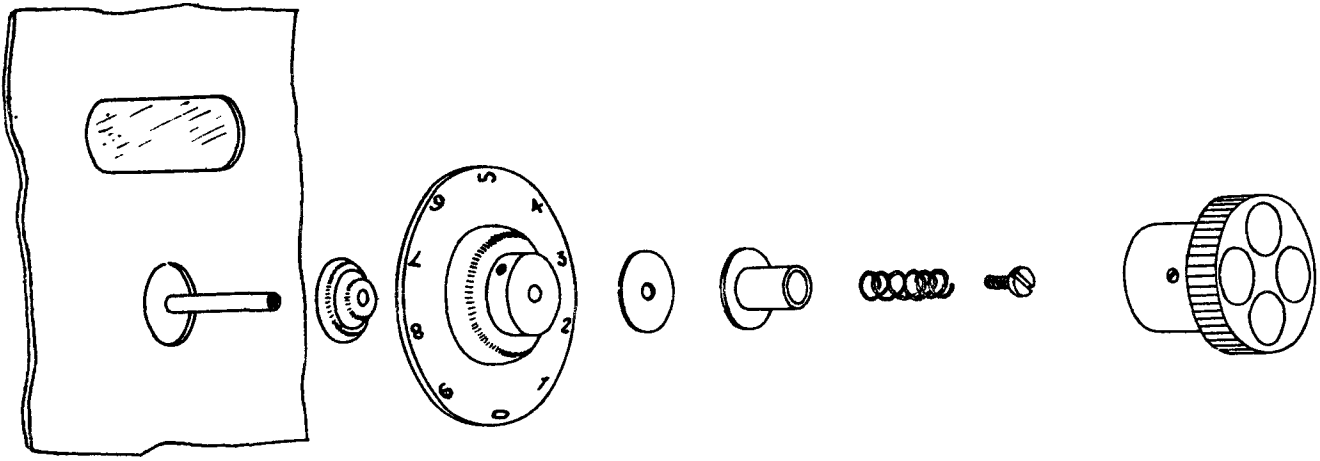
27. Remove the AERIAL TUNING knob and drive by removing the knob and unscrewing the clutch screw, taking care not to lose the clutch spring. Remove the dial by unscrewing the two grub screws. Unsolder the connections to the a.t.i. and the fuse panel, and remove the tape holding the antenna lead to the frame. Remove the three screws holding the a.t.i. frame to the chassis and lift out the a.t.i. To do this it will be necessary to move the fuse panel.

28. The a.t.i. should be replaced in the reverse order. When reassembling the drive, reference should be made to Fig 2. Adjust the clutch screw so that the drive operates correctly but slips at the ends of the coil.

OFF/REC ON/ALL ON switch S3A (Fig 3)

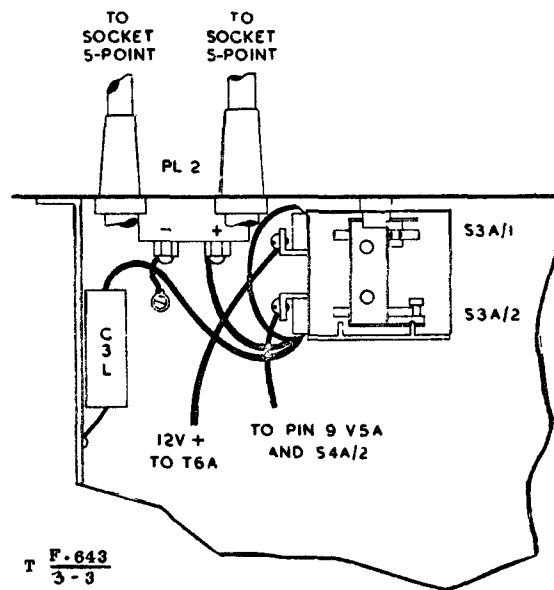
29. Remove the knob and remove the nut holding the gland to the panel. Remove the nut holding the switch mounting to chassis, disconnect the switch and remove. To do this it may first be necessary to remove C3W. The separate switches can then be removed by undoing the fixing screws.

Note: These Pages 6A and 6B, Issue 3, are to be filed immediately after Page 6, Issue 3, dated 15 Dec 65. They contain information previously on Pages 5 and 6, Issue 2, dated 27 Feb 47.



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Fig 2 - Exploded view of the a.t.i. drive



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Fig 3 - S3A connections

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ELECTRICAL AND MECHANICAL
ENGINEERING REGULATIONS

Flick mechanism

30. If the flick mechanism requires attention, the set should be returned to workshops, since recalibration will be needed.

FAULT-FINDING

31. The principles of fault-finding are too well known to need explanation here. To assist in locating a fault, Table 1 gives a sequence of fault-finding. All the tests are made on the complete set and must be supplemented by the usual circuit checks to isolate the faulty component. Table 2 lists resistance and voltage checks.

32. The sequence of the tests should be observed as in later tests it is assumed that all previous tests have been completed satisfactorily.
IMPORTANT. When changing valves, switch off first. If the filament of one valve is open-circuit, the other valves may also be damaged. If one valve is replaced because of an open-circuit filament, check the filament of all remaining valves before switching on.

JEEP INSTALLATION

Fitting antenna bases and brackets

33. Detailed installation instructions are given in the following pamphlet:-

ZA 27865 Station, radio, No 62
in Cars, 5 cwt, 4 x 4 and
animal pack/man-pack, fitting
and loading instructions

EME8c/2795

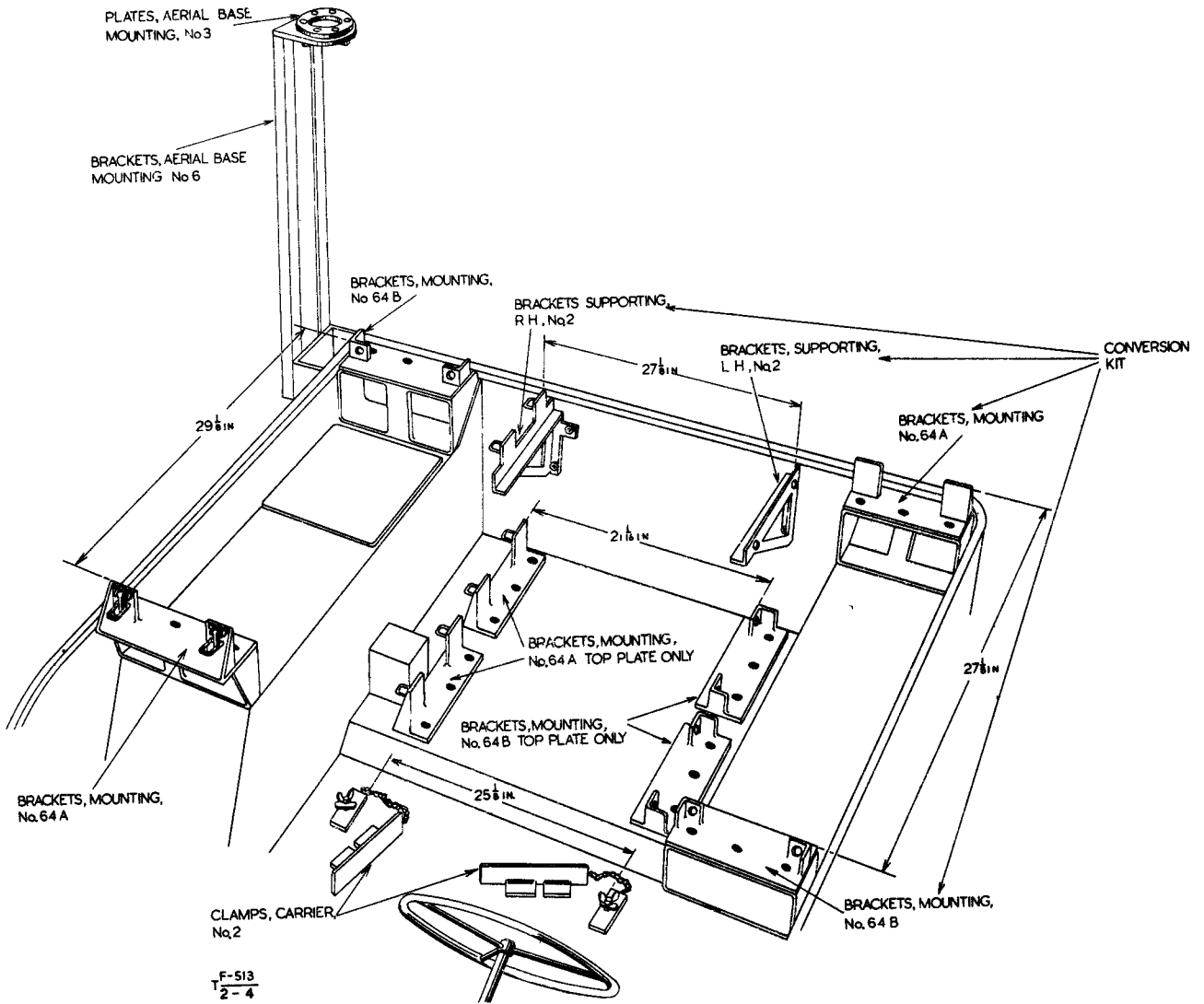


Fig.4 - Layout of Jeep station, brackets

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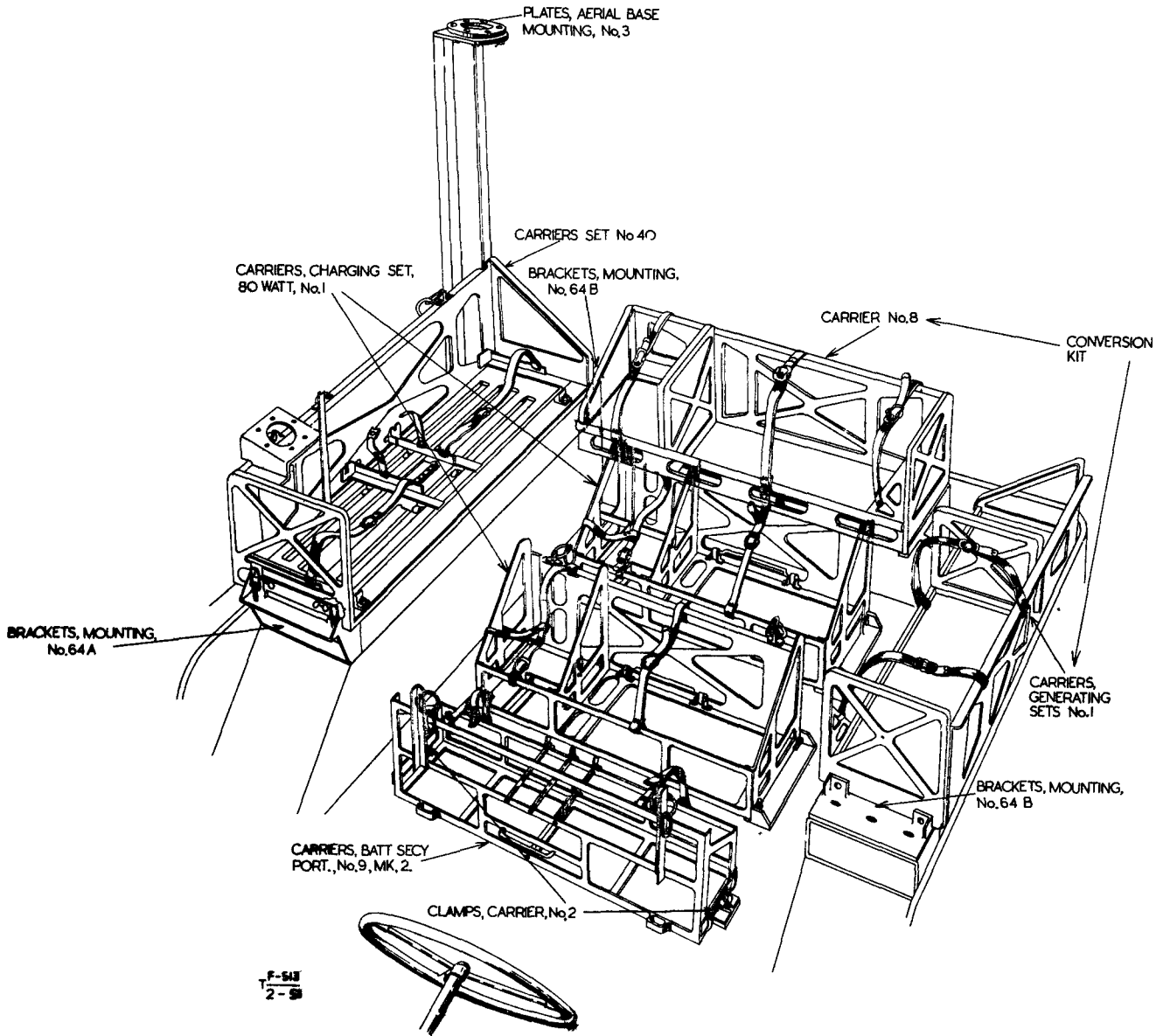


Fig.5 - Layout of Jeep station, carriers in position

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Table 1 - Fault-finding

Part tested	Test No.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
L.T. supply	1	Plug in operator's lamp into R.C. unit socket	Lamp lights	Lamp does not light	(1) Lamp faulty (11) No 12V supply	Change bulb, check lamp Check 12V supply connections
	2	Switch OFF/REC ON/ALL ON to REC ON Meter switch to L.T.	Rotary transformer starts. Meter reads 12V	(a) Rotary transformer does not start. Meter does not read (b) Rotary starts Meter does not read (c) Rotary does not start. Meter reads (d) Meter reads low (10V)	(1) S3A/1 faulty (11) Both meter and rotary faulty (1) S5A faulty (11) R27A O.C. (1) Brushes faulty (11) L8A O.C. Batteries flat	Check S3A/1 for continuity Check Check continuity Examine brushes Check connections, etc. Change battery
H.T. receive	3	Set meter switch to H.T.R.	Meter reads	Meter reads zero, or incorrectly	(1) Fuse blown (11) Brush trouble (111) L1B or L1C O.C. (1v) R15A, R28A or R11A O.C. (v) A/2 contacts faulty	Replace fuse. If it blows, carry out test 4 Examine brushes Check continuity Check continuity Check A/2 for continuity
(Omit if test 3 satisfactory)	4	Test continuity from test side of F1A to earth (F1A removed)	Resistance of 67kΩ	Short-circuit or low resistance	(1) C23A S.C. (11) Short-circuit on H.T. line	Unsolder and check C23A Check relay and H.T. line for short-circuit
H.T. send	5	Switch meter switch to H.T. send OFF/REC ON/ALL ON to ALL ON CW./NET/R/T switch to R/T and press pressel switch	Meter reads	Meter does not read	(1) Pressel switch faulty (11) A/2 relay coil or contacts faulty (111) R29A faulty	Change handset for tested one Check by applying 12V across relay coil. Examine contacts Check

Table 1 - Fault-finding - contd.

Part tested	Test No.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
Receiver	6	Switch OFF/REC ON/ALL ON to REC ON C.W. - NET R/T switch to R/T METER Switch to A.V.C. Tune to strong R/T signal	Signal heard in 'phones. Meter reads normally	(a) Set dead and meter reading zero (b) Set dead but meter reads normally and rises when tuned (c) Set dead but meter reads steadily; does not rise on tune (d) Set sounds alive but no station is heard on either range (e) Signals audible but weak (f) Signals audible but weak on one range only	Internal fault (1) Headset faulty (11) Internal fault Internal fault (1) Aerial circuit faulty (11) Internal fault Internal fault Internal fault	Check C3A, R7C, R6B, R11A and C3G Change for tested headset Check at grid of V3A with A.F. signal. Check at detector diode of V2A with I.F. signal Change V1B, V1D, V1E and V2A. If no improvement, check anode and screen voltage; if satisfactory, return to workshops Disconnect aerial, tap aerial terminal; if noise in 'phones, check aerial and lead for continuity or earth Try replacing V1A, V1B, V1C. If no result, return for repair Try changing V1A-E, V3A Return for repair

Table 1 - Fault-finding - contd.

Part tested	Test No.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
				(g) Set very noisy	(i) Dirty commutator or worn brushes (ii) Vehicle suppression faulty (iii) Loose connectors (iv) Internal fault	Check, and clean, or replace Stop engine; if noise stops, check vehicle suppression Check aerial and connector Check set for loose wires
	7	Switch to NET and tune set for zero beat SWITCH TO ALL ON AND NET AND TUNE SET FOR ZERO BEAT	Beat note	No beat note	No H.T. on beat oscillator	Check H.T. on V4A triode section and R30A/S4A. Return set for repair
	8	Switch to C.W.	Beat note variable by HET TONE	(a) No beat note (b) Net variable	S4A faulty (i) R22A open-circuit (ii) S4A or A1 faulty	Check S4A Check R22A, C25A and L9A Check
Sender	9	Switch to R/T and ALL ON. Press pressel switch. Switch to AE and tune aerial	Meter reads normal reading	No reading or low reading	(i) Aerial system faulty (ii) Internal fault	Check by receiver performance If drive reading normal, try changing V6A If drive low, change V5A, V4A If no result, check anode and screen voltage on these valves. Return for repair
Modulation	10	Speak into microphone	Meter reading should fluctuate	Meter reading steady no sidetone	(i) Handset faulty (ii) Internal fault	Change handset Try changing V2A, V3B, Check V2A, V3B anode and screen circuits. Return for repair

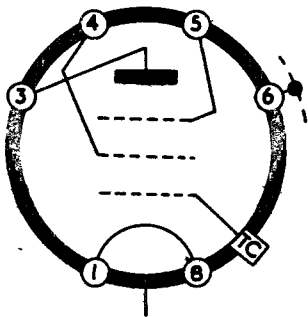
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Table 1 - Fault-finding - contd.

Part tested	Test No.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
Keying circuit	11	Switch to C.W. Plug in key and press it	AE meter reads normal aerial current	No reading	Key faulty	Change key

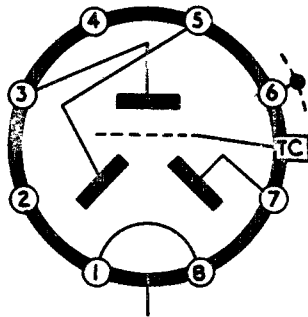
V1

CV1331



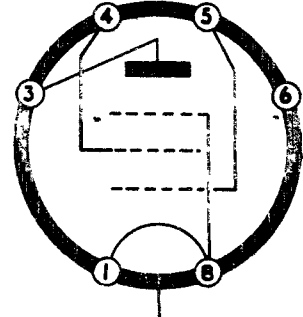
V2

CV1306



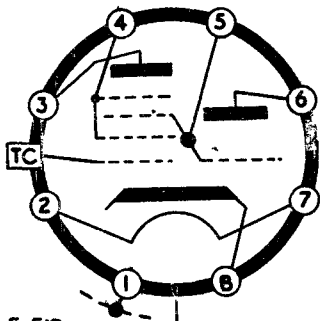
V3

CV65



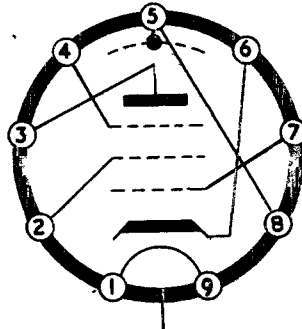
V4

CV1347



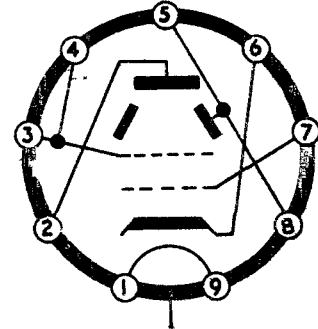
V5

CV1091



V6

CV1510



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Fig.6 - Valve bases (see Table 2)

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Table 2 - Voltage, current and resistance checks (see Fig. 6)

CONDITIONS OF MEASUREMENT

For all measurements use Avometer, model 7

H.F. band 6 Mc/s.

Voltages above 50V: 400V range
between 10 and 50V: 100V range

ON/OFF switch at ALL ON.

Gain control at maximum.

Meter switch at DRIVE.

X'TAL/MO switch at MO.

12V input at plug.

Pin	Voltage	Current (mA)					Resistance (Ω)								
		Receive		Send		To	Receive		Send						
		R/T	NET C.W.	R/T	C.W.		R/T	NET C.W.	R/T	C.W.					
connections V1A (CV 1331)															
1 Fil. +	2 2 2 2 2	50	50	50	50	50	Chassis	1.9	1.9	1.9	1.9	1.9			
2 -	315 320 320	-	-	-	-	-	H.T.	S.C.	S.C.	S.C.	S.C.	1.2k	1.2k		
3 Anode	100 112 112	1.5	1.4	1.4	-	-	H.T.	100k	100k	100k	100k	100k	100k		
4 Screen	60 75 75	0.6	0.5	0.5	-	-	H.T.	220k	220k	220k	220k	220k	220k		
5 Sup.	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
6 Met.	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
7 -	2 2 2 2 2	-	-	-	-	-	Chassis	2.9	2.9	2.9	2.9	2.9			
8 Fil. -	-	50	50	50	50	50	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
T.C. Grid	-	-	-	-	-	-	Chassis	700k	105k	105k	700k	105k			

Pin	Voltage	Current (mA)					Resistance (Ω)								
		Receive		Send		To	Receive		Send						
		R/T	NET C.W.	R/T	C.W.		R/T	NET C.W.	R/T	C.W.					
connections V1B (CV 1331)															
1 Fil. +	4 4 4 4 4	50	50	50	50	50	Chassis	7.7	7.7	7.7	7.7	7.7			
2 -	115 135 135	-	-	-	-	-	H.T.	33k	33k	33k	33k	33k	33k		
3 Anode	80 80 80 85 85	2	2	2	2	2	H.T.	40k	40k	40k	42k	42k			
4 Screen	80 80 80 85 85	0.85	0.85	0.85	0.85	0.85	H.T.	63k	63k	63k	67k	67k			
5 Sup.	-	-	-	-	-	-	Chassis	0.05	0.05	0.05	0.05	0.05			
6 Met.	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
7 -	-	-	-	-	-	-	-	-	-	-	-	-			
8 Fil. -	2 2 2 2 2	50	50	50	50	50	Chassis	5	5	5	5	5			
T.C. Grid	-	-	-	-	-	-	Chassis	470k	470k	470k	470k	470k			

Pin	Voltage	Current (mA)					Resistance (Ω)								
		Receive		Send		To	Receive		Send						
		R/T	NET C.W.	R/T	C.W.		R/T	NET C.W.	R/T	C.W.					
connections V1C (CV 1331)															
1 Fil. +	2 2 2 2 2	50	50	50	50	50	Chassis	2.9	2.9	2.9	2.9	2.9			
2 -	2 2 2 2 2	-	-	-	-	-	Chassis	5.1	5.1	5.1	5.1	5.1			
3 Anode	95 95 95 100 100	4	4	4	4	4	H.T.	28k	28k	28k	30k	30k			
4 Screen	95 95 95 100 100	-	-	-	-	-	H.T.	28k	28k	28k	30k	30k			
5 Sup.	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
6 Met.	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.			
7 -	132 132 132 142 136	-	-	-	-	-	H.T.	18k	18k	18k	18k	18k			
8 Fil. -	-	50	50	50	50	50	Chassis	0.05	0.05	0.05	0.05	0.05			
T.C. Grid	-	-	-	-	-	-	Chassis	47k	47k	47k	47k	47k			

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Table 2 - Voltage, current and resistance checks (see Fig.6) - contd.

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive			Send		Receive			Send			Receive			Send	
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Fil. +	2	2	2	2	2	50	50	50	50	50	Chassis	1.9	1.9	1.9	1.9	1.9
2	-	4	4	4	4	4	-	-	-	-	-	Chassis	7.8	7.8	7.8	7.8	7.8
3	Anode	115	115	135	-	-	1.7	1.6	1.6	-	-	H.T.	33k	33k	33k	33k	33k
4	Screen	60	75	75	-	-	0.6	0.5	0.5	-	-	H.T.	220k	220k	220k	220k	220k
5	Sup.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
6	Met.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
7	-	4	4	4	4	4	-	-	-	-	-	Chassis	7.9	7.9	7.9	7.9	7.9
8	Fil.	-	-	-	-	-	50	50	50	50	50	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
T.C.	Grid	-	-	-	-	-	-	-	-	-	-	Chassis	600k	100	100	600k	100

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive			Send		Receive			Send			Receive			Send	
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Fil. +	2	2	2	2	2	50	50	50	50	50	Chassis	1.9	1.9	1.9	1.9	1.9
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Anode	115	135	135	-	-	1.7	1.6	1.6	-	-	H.T.	33k	33k	33k	33k	33k
4	Screen	62	85	85	-	-	0.9	0.8	0.8	-	-	H.T.	80k	80k	80k	80k	80k
5	Sup.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
6	Met.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
7	-	0.3	0.4	0.4	-	-	-	-	-	-	-	Chassis	*3.3k	*3.3k	*3.3k	*3.3k	*3.3k
8	Fil. -	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
T.C.	Grid	-	-	-	-	-	-	-	-	-	-	Chassis	600k	100	100	600k	100

* NOTE. Meter in all positions except A.V.C. When in A.V.C., resistance 480Ω.

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive			Send		Receive			Send			Receive			Send	
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Fil. +	4	4	4	4	4	50	50	50	50	50	Chassis	7.9	7.9	7.9	7.9	7.9
2	-	-3	-3	-3	-5.5	-6.3	-	-	-	-	-	Chassis	100	100	100	100	100
3	Anode	-	-	-	97	95	-	-	-	0.35	0.35	H.T.	290k	290k	290k	280k	280k
4	-	-	-	-	-3	0	-	-	-	-	-	Chassis	600k	1M	1M	600k	1M
5	Sig. Diode	-	-	-	-	-	-	-	-	-	-	Chassis	570k	570k	570k	570k	570k
6	Met.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
7	A.V.C. Diode	-	-	-	-	-	-	-	-	-	-	Chassis	600k	1M	1M	600k	1M
8	Fil. -	6	6	6	6	6	50	50	50	50	50	Chassis	4.8	4.8	4.8	4.8	4.8
T.C.	Grid	-	-	-	-	-	-	-	-	-	-	Chassis	28k	28k	28k	28k	28k

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive			Send		Receive			Send			Receive			Send	
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Fil. +	4	4	4	4	4	150	150	150	150	150	Chassis	3.9	3.9	3.9	3.9	3.9
2	-	6	6	6	6	6	-	-	-	-	-	Chassis	5.2	5.2	5.2	5.2	5.2
3	Anode	108	108	108	98	98	7.5	7.5	7.5	7	7	H.T.	20.5k	20.5k	20.5k	20.5k	20.5k
4	Screen	112	112	112	103	103	2.5	2.5	2.5	2.3	2.3	H.T.	20k	20k	20k	20k	20k
5	Grid	-	-	-	-	-	-	-	-	-	-	Chassis	1M	1M	1M	1M	1M
6	-	-	-	-	-	-	-	-	-	-	-	Chassis	2M	2M	2M	2M	2M
7	-	12	12	12	12	12	-	-	-	-	-	Chassis	0.5	0.5	0.5	0.5	0.5
8	Fil. -	2	2	2	2	2	150	150	150	150	150	Chassis	1.8	1.8	1.8	1.8	1.8

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Table 2 - Voltage, current and resistance checks (see Fig.6) - contd.

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive		Send			Receive		Send				Receive		Send		
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Fil. +	6	6	6	6	6	150	150	150	150	150	Chassis	5	5	5	5	5
2	-	-	-	-	-	-	-	-	-	-	Chassis	470k	470k	470k	470k	470k	
3	Anode	-	-	-	80	80	-	-	-	2.8	2.8	H.T.	75k	75k	75k	68k	68k
4	Screen	-	-	-	95	95	-	-	-	0.3	0.3	H.T.	270k	270k	270k	270k	270k
5	Grid	-	-	-	-	-	-	-	-	-	Chassis	220k	220k	220k	220k	220k	
6	-	-	-	-	265	250	-	-	-	-	H.T.	5k	5k	5k	S.C.	S.C.	
7	-	-	315	315	270	250	-	-	-	-	H.T.	5k	S.C.	S.C.	S.C.	S.C.	
8	Fil. -	4	4	4	4	4	150	150	150	150	150	Chassis	3.9	3.9	3.9	3.9	3.9

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive		Send			Receive		Send				Receive		Send		
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Met.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
2	Heater	12	12	12	12	12	300	300	300	300	300	Chassis	0.5	0.5	0.5	0.5	0.5
3	Hex Anode	-	-	-	270	250	-	-	-	2.8	2.6	H.T.	10k	10k	10k	4.7k	4.7k
4	Hex. Screen	-	-	-	50	50	-	-	-	1	1	H.T.	105k	105k	105k	100k	100k
5	Osc. Grid	-	-	-	-	-	-	-	-	-	Chassis	3	3	3	3	3	
6	Osc. Anode	-	90	90	90	90	-	1.5	1.5	1.5	1.5	H.T.	155k	150k	150k	150k	150k
7	Heater	6	6	6	6	6	300	300	300	300	300	Chassis	2	2	2	2	2
8	Cath.	4	4	4	4	4	-	1.5	1.5	5.3	5.1	Chassis	3.9	3.9	3.9	3.9	3.9
T.C.	Hex. Grid	-	-	-	-	-	-	-	-	-	-	Chassis	3.3k	3.3k	3.3k	3.3k	3.3k

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive		Send			Receive		Send				Receive		Send		
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Heater	6	6	6	6	6	300	300	300	300	300	Chassis	2	2	2	2	2
2	Screen	-	-	-	150	135	-	-	-	0.65	0.63	H.T.	105k	105k	105k	100k	100k
3	Anode	-	-	-	280	265	-	-	-	5	5	H.T.	5k	5k	5k	S.C.	S.C.
4	Sup	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
5	-	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
6	Cath.	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
7	Grid	-	-	-	-	-	-	-	-	-	-	Chassis	470k	470k	470k	470k	470k
8	-	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
9	Heater	12	12	12	12	12	300	300	300	300	300	Chassis	0.5	0.5	0.5	0.5	0.5

Pin	connections	Voltage					Current (mA)					To	Resistance (Ω)				
		Receive		Send			Receive		Send				Receive		Send		
		R/T	NET	C.W.	R/T	C.W.	R/T	NET	C.W.	R/T	C.W.		R/T	NET	C.W.	R/T	C.W.
1	Heater	6	6	6	6	6	600	600	600	600	600	Chassis	2	2	2	2	2
2	Anode	-	-	-	265	250	-	-	-	24	40	H.T.	5k	5k	5k	1.5k	1.5k
3	Screen	-	-	-	265	250	-	-	-	-	-	H.T.	5k	5k	5k	S.C.	S.C.
4	Screen	-	-	-	265	250	-	-	-	3.5	5	H.T.	5k	5k	5k	S.C.	S.C.
5	Earth Screen	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
6	Cathode	-	-	-	0.2	0.25	-	-	-	27.5	45	Chassis	4.2	4.2	4.2	4.2	4.2
7	Grid	-	-	-	38	31	-	-	-	-	-	Chassis	2.3k	2k	2k	2.3k	2k
8	Earth Screen	-	-	-	-	-	-	-	-	-	-	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.
9	Heater	-	-	-	-	-	600	600	600	600	600	Chassis	S.C.	S.C.	S.C.	S.C.	S.C.

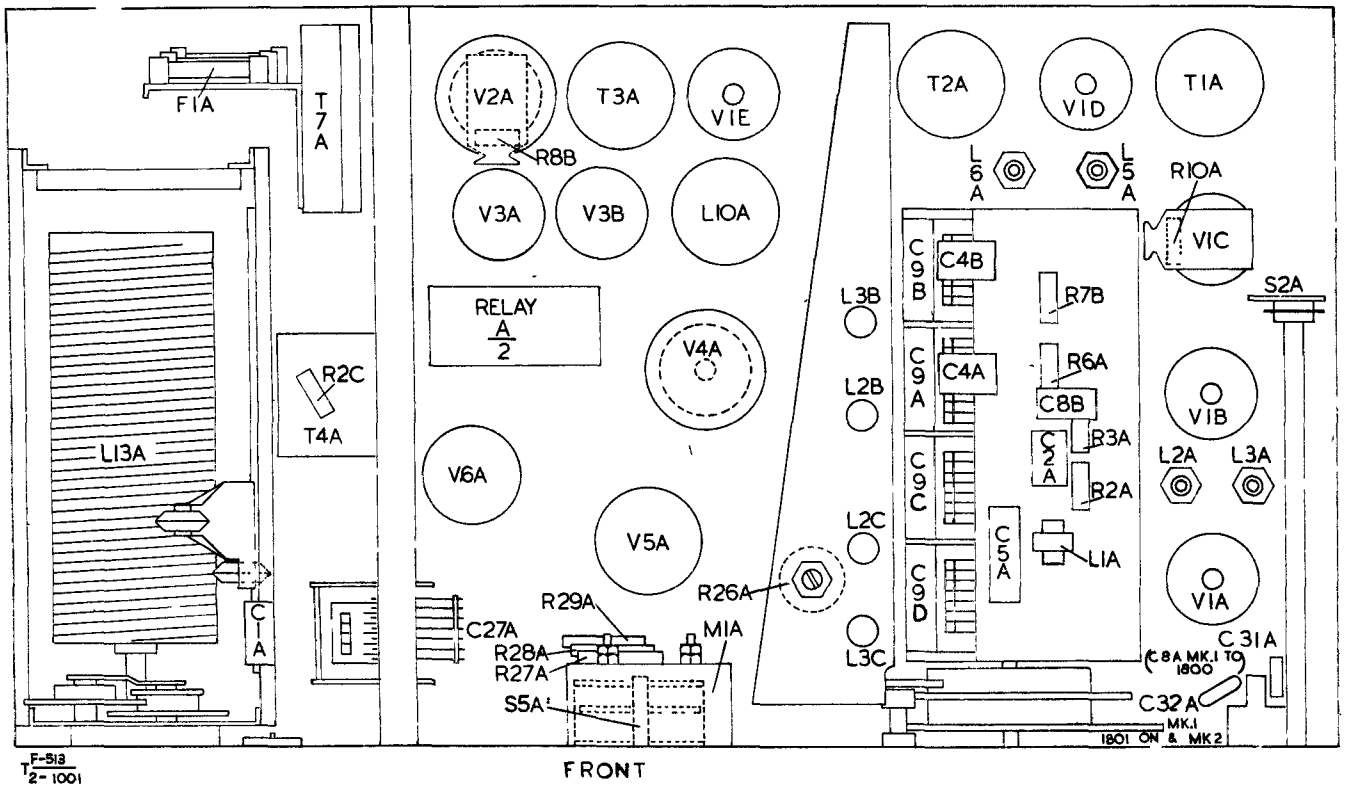


Fig.1001 - Chassis layout, top

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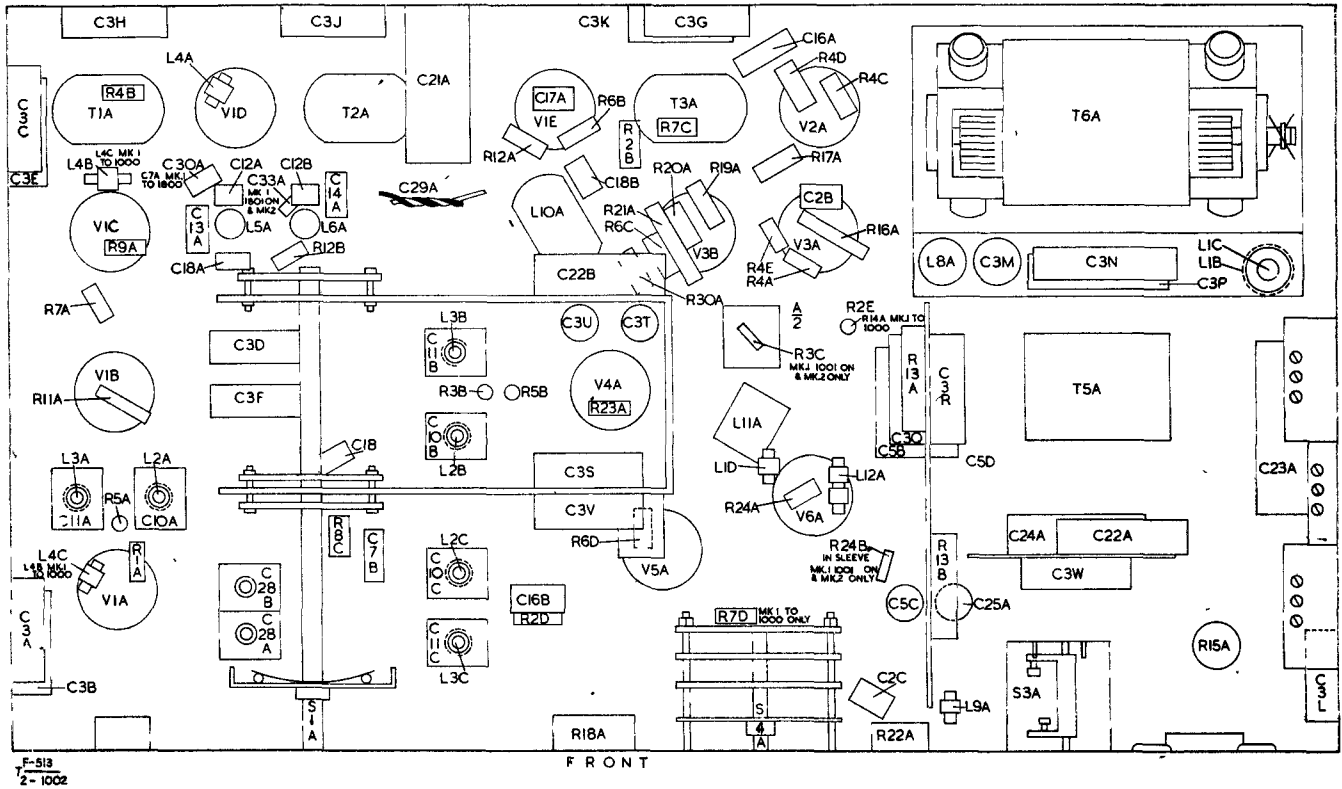


Fig.1002 - Chassis layout, bottom

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