WIRELESS SET NO. 19, MK. III

FIRST ECHELON WORK

MAINTENANCE

General

1. Regular and careful maintenance is essential for keeping the set in good working order. The maintenance described here should be carried out by an electrician at least once a fortnight, or more often if possible. Whenever he maintains the set he should fill in the maintenance chart, which is kept by the signal officer for each set under his control. A specimen chart is shown in fig. 1.

Lubrication and general cleaning

2. Clean slow-motion drives, rims of dials and flick discs (behind panel), using a rag moistened with petrol and wrapped round a sharpened stick similar to a toothpick. Apply Oildag to all these, or, if none is available, thick oil. Apply thin oil to all moving parts of flick mechanism. Check tightness of screws securing flick arms and stops. If the latter are loose, fix them so that the dial stops definitely engage on them, but without encroaching on the calibrated portions of the dials. Clean interior of set, and inspect for loose or dirty connections; dry out if necessary. Inspect carefully:—aerial plugs, 12-point plugs, lid of "B" set screening box, and lid of "A" sender R.F. box. All oils and greases used must be anti-freeze types.

Controls

3. Check mechanical action of all controls. Work from left to right. The most important points are:—

(*a*) Tuning B—should have no side-play, and should turn stiffly but smoothly. Check tightness of grub screws on hub. Check stops.

(*b*) Quench—should make 12 revolutions, stiff but smooth.

(*c*) Switches—check for clean action.

(*d*) Slow-motion drives—should turn dials smoothly and without slip, especially when turned very slowly. Check fine tuning drive on frequency control for excessive backlash. Check that grooves in slow-motion spindles engage readily on edges of driving discs when flick levers are turned from "flick" to "set"—test this at several positions of dials.

(*e*) Het. tone—should turn through 360°, stiffly but smoothly.

(*f*) Flick controls—check for smooth operation, and that flick arms engage firmly and positively.

(*g*) R.F. gain—check that pointer is over arrowhead in fully clockwise position.

(*h*) All knobs—check that grub screws are tight.

Relays

4. See that contacts and pole-pieces are clean; inspect the latter especially for bits of iron dust. See that the contacts make and break correctly. See that none of the wiring is fouling moving parts of the relays. Check for instant operation by the pressel switch (when the set is connected up and working).

Valves

5. Remove lids of screening cans and see that they make good contact with the cans. Check that screening cans are pushed home on to bases. Check that valves are firmly held in sockets; if loose, lightly squeeze contacts of sockets. Check that clips fit tightly on top caps of valves, and that top caps are secure. Inspect grid leads where they pass through screening cans; if worn, replace if possible, or insulate with tape. Also inspect leads where soldered to clips; if wire is frayed, re-make joint.

Variometer

6. Check that control knob turns easily, but is not so loose as to turn with vibration. Check that aerial lead ferrule is tightly held by grub screw. If internal dampness is suspected, open variometer and dry out. Clean and see that scale is easily readable.

Power supply unit

7. (*a*) Fuses—unscrew and check that fuses are of correct size (250mA.). Clean ends and screw in firmly.

(*b*) Commutators—inspect thoroughly. Wipe with clean soft rag, moistened with petrol if necessary. Replace brushes if too worn or badly bedded. Do *not* oil bearings except in emergency, since special lubricant is needed. When replacing brushes, put the side marked with the maker's name uppermost.

(*c*) Relay—inspect contacts to see that they make properly and are not badly burned or pitted.

(*d*) Variometer fixing screws—where variometer is mounted on supply unit, check tightness of fixing screws.

(*e*) Cleaning—clean inside thoroughly and dry out if necessary. Inspect 6-point and 12-point plugs.

Aerials

8. (*a*) Rods ("A," "B," and spare)—straighten, clean ends and apply a little vaseline to them.

(*b*) "A" base—check and clean spring contact and insulator.

(*c*) "B" base—clean thread. Inspect insulator for dirt and cracks.

(*d*) Pigtails—open "A" and "B" bases and inspect pigtails. Replace if frayed. Check connections. *This must be done very carefully.*

Aerial Feeders

9. (*a*) "A" aerial feeder assembly, between variometer and "A" aerial—check for damage, especially where feeder passes through turret and under cleats. Check connections. Inspect for burning. (*Note.*—In some installations the variometer is mounted immediately below the aerial and there is no feeder assembly.)

(*b*) "A" aerial feeder, between set and variometer—check for damage. Clean plugs and sockets. Check that grub screws in sockets are tight.

(*c*) "B" aerial feeder—check for damage, especially where feeder passes through turret and under cleats. If outer insulation is cut through, exposing screening braid, wrap with tape to prevent rubbing contact between braid and tank. Clean plugs and sockets. Check that grub screws in sockets are tight. This lead must *not* be shortened.

MAINTENANCE LOG—WIRELESS SET No 19 (See Working Instructions—Part II—Chapter II) Vehicle No 745678 Set No 24167

To be completed fortnightly by Son Electrician 3 F rwarded through Son Sig N.C.O. to Regt Sig Offr — 3 Son — 99th RAC Regt — Supply Unit No 24258 — Variometer No 24167.

Date	Mechanical: Aerials (Rods, "A" Base, "B" Base, Pigtails)	Variometer (Friction, Earth, Grubscrew)	Aerial Feeder (Cleaning, Feeder, "A" Set, "B" Set)	Supply Unit (Fuses, Commutators, Vario Screws, Clean'ng)	Sets (Lubrication, Controls, Valves, Cleaning)	Harness (Control Units, Connections, Headsets, Key)	Meter	Test	Operation of Set by Stages: "A" Set Receiving (V1A, V2A, V1B, V1C, V3A)	"A" Set Sending (V2D, V4A, V5A, V4A)	"B" Set Sending (V7A)	"B" Set Receiving (V1D, V1E, V8A, V1F)	"TC" (V8B)
1 Jan 42	✓ ✓ ✓ R	✓ ✓ ✓	✓ ✓ ✓ ✓	✓ R ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓	/ /		450 390 460 52 410 160	410 510 220 6·2 6/ 34 56 48 72	270	400 310 120 300	00
15 Jan 42	R ✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓	R ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓	✓ ✓		440 380 450 52 370 160	400 500 210 6·3 60 33 55 48 71	280	400 300 110 300	100

Date	Alignment: Net "A" Rec'r to 7500 on Wavemeter; Tune Wvmtr. to "A" Sender; Read Wvmtr.	Calibration ("A" Set): Wavemeter Number	Set Wavemeter to Frequency: 2100 2500 3000 3400 4000 5000 6000 >6000 7900 — Net "A" set to Wavemeter & write down reading of "A" frequency Mc/s	Vehicle: Suppression	Vehicle: Charging	Remarks: write here details of all repair work done during maintenance and also any done during the period since the last maintenance	Initials: Electrician Signals	Son Signal N.C.O.	Regt Signal Officer
1 Jan 42	7500 0	90/23	2090 2490 3000 3520 4000 5020 6025 7069 7900	✓	✓	Pigtail frayed, replaced. One HT2 brush worn, replaced.	[illegible]	K.P.	[illegible]
15 Jan 42	7499 5	90/23	2090 2490 3000 3490 3990 4985 5990 7000 7920	✓	✓	Top A rod cracked replaced. HT2 fuse had been replaced by soldered wire	[illegible]	K.P.	[illegible]

Fig. 1. Specimen maintenance chart

Control units and harness

10. (*a*) Control units—check action of switches and buzzer. Clean interior of boxes. Inspect 12-point plugs. Inspect drop cords for fraying and snatch-sockets for cracks.

(*b*) Connectors—examine for kinking and external fraying. Inspect contacts in all connector sockets. Check that heads cannot rotate.

(*c*) Headsets—inspect leads for fraying and snatch-plugs for cracks. Clean out microphone, checking terminals and capsule contacts. Check action of pressel switch, adjusting contacts if necessary. Inspect connections and anchoring of leads to headphones.

(*d*) Key—clean. Check leads for fraying.

Operation

11. (*a*) Meter—switch on supply unit and check freedom of movement of meter on L.T. Switch off and set zero of meter.

(*b*) Set test—carry out tests for daily maintenance (see Working Instructions, Part I), checking operation of each control.

Valve tests

12. By noting at regular intervals the performance of certain valve stages, the electrician can detect when any one of these stages begins to lose efficiency and can thereby keep the general performance of the set at a high level. The value of the test figures depends upon their being taken under the same conditions on each occasion. These conditions are:—

(*a*) "A" set switched to RT.

(*b*) R.F. gain control at normal.

(*c*) 4-ft. rod or dummy aerial on "A" set (the same on each occasion).

(*d*) "A" set tuned to about 3·5 Mc/s, except where otherwise stated. The set must *not* be tuned to an incoming signal.

(*e*) Batteries at least three-quarters charged and battery leads of such a resistance as to give a reading of 11 volts on the set meter. Electricians should use their own batteries, whose state of charge they know, and should have a stock of leads of various resistances.

(*f*) The same voltmeter must be used on every occasion; a Universal Avometer type 7 is preferable. If no high resistance voltmeter is available, the meter in the set may be disconnected and used. A length of wire with a prod on it should be connected to the negative terminal, and two lengths, each with a prod, to the positive. These latter two lengths should have high quality series resistances in them, of 12KΩ and 200KΩ, respectively.

Tables 1–4 show readings which may be expected. Those measured with the set meter are only a very rough indication. Loss of emission is indicated by a fall in the test reading in the case of all valves except V1D and the triode sections of V2A and V2B. Loss of emission in the triode of V2A or V2B is indicated by excessive variation of the drive reading with frequency.

Note.—Great care should be taken not to disturb the relative position of any wiring or components, as this will affect the performance and calibration of the set.

"A" set send-receive alignment

13. Set a wave-meter to 7500 Kc/s and tune the set to it, using the A.V.C. meter. Press the pressel switch and listen

on the wave-meter. If the beat note is more than 1·5 Kc/s, the set needs to be re-aligned and should be handed in to the workshops. Repeat this test, using the netting switch to tune the receiver. In this case the maximum error allowed on send is 0·5 Kc/s.

"A" set calibration

14. Set a wave-meter to 2100 Kc/s and tune the receiver to it. Record the setting of the "A" frequency dial. Repeat this at 2500, 3000, 3500, 4000, 5000, 6000, 7000 and 7900 Kc/s. In the last case, if using a Wave-meter Class C, set it to 3950 Kc/s and tune the set to the 2nd harmonic (i.e. 7900 Kc/s).

Vehicle suppression and screening

15. Finally, operate the set in the vehicle, with the engine running and all electrical gear (e g. fans, power-operated turrets, etc.) switched on. If bad crackling is heard, the suppression and screening system of the engine and charging equipment, etc., are probably faulty.

Maintenance chart

16. A specimen maintenance chart is shown in fig. 1. The electrician, after carrying out each item of his maintenance, puts a tick in the corresponding square on the chart. If he carries out any minor repairs himself, he puts an "R" in the square, and writes the details in the "remarks" column. If he finds that a major repair, which he cannot carry out himself, is needed, he puts an "X" in the square and hands the set in. He also notes in the "remarks" column the details of any work done since the set was last maintained; the chart thus gives a complete history of the set.

Circuit tested	Positive of meter to	Negative of meter to	Voltage	Set meter	
				Series resistance	Reading on 600 scale
V1A	Pin 8	Chassis	3·0	12KΩ	300
V2A (hex.)	Pin 8	Chassis	2·7	12KΩ	270
V2A (triode)	Pin 6	Chassis	90 (400V range)	200KΩ	540
V1B	—	—	—	Normal A.V.C. reading	
V1C	Pin 8	Chassis	3·2	12KΩ	320
V3A	Pin 8	Chassis	30	200KΩ	180

Table 1. Valve test figures with "A" set receiving

Circuit tested	Positive of meter to	Negative of meter to	Voltage	Set meter	
				Series resistance	Reading on 600 scale
V2B (hex.)	Pin 8	Chassis	4·1	12KΩ	410
Drive	Check reading over whole frequency range. If variation is more than 1·5V (3 small divisions), check V2B, V5A, and V2A.				
V2B (triode)	Pin 6	Chassis	50 (400V range)	200KΩ	300
V5A	Pin 6	Chassis	0·7	12KΩ	70
V6A	Record Drive readings at 2·5 and 5 Mc/s.				
V4A	Record AE readings at 2·5, 4, 5 and 7·5 Mc/s.				

Table 2. Valve test figures with "A" set sending

Circuit tested	Positive of meter to	Negative of meter to	Voltage	Set meter	
				Series resistance	Reading on 600 scale
V1D	Pin 3	Chassis	75 (400V range)	200KΩ	450
V1E	Pin 8	Chassis	2·3	12KΩ	230
V8A	Pin 8	Chassis	24	200KΩ	144
With "B" set sending:—					
V7A	HT+	Anode	50	200KΩ	300

Table 3. Valve test figures with "B" set receiving

Circuit tested	Positive of meter to	Negative of meter to	Voltage	Set meter	
				Series resistance	Reading on 600 scale
V1F	Pin 8	Chassis	2·3	12KΩ	230
V8B	Pin 8	Chassis	22	200KΩ	132

Table 4. Valve test figures on "IC" amplifier

MECHANICAL REPLACEMENTS AND ADJUSTMENTS

Het. tone control

17. To remove, first take off the cover plate on the front panel. The connections can then be unsoldered and the control withdrawn. When replacing, make sure that the knob pointer comes over the zero mark on the cover plate when the slider is over the tap in the winding. To do this, set the slider on the centre of the gap between the ends of the winding, twist the complete control so that the flat on the spindle is parallel to the top edge of the cover plate, then tighten the fixing nut.

Removal of on-off switches

18. First remove the cover plate on the front panel. The leads are then accessible for unsoldering from the switch tags.

Removal of meter

19. Disconnect both leads and loosen the clamping screw behind the panel.

Variometer adjustments

20. (*a*) Alteration of the window position—

(i) Choose a position for the window which will allow the scale to be read easily.

(ii) Note the number stamped on the case over the fixing screw nearest to the chosen position.

(iii) Loosen the eight screws F (see fig. 2) and remove the end cover which carries the variometer knob.

(iv) Loosen the four screws C and turn the scale S so that the number on the scale corresponding to the number noted in (ii) above comes opposite to the pointer P.

(v) Tighten the four screws C until a stiff, smooth movement of the knob is obtained.

(vi) Bring the pointer P opposite to the index window.

(vii) Bring the coupling fork Y opposite to the number on the case corresponding to the setting of the pointer P.

(viii) Replace the end cover and tighten the eight screws F.

(*b*) Adjustment of control knob movement—Remove the end cover as described in (*a*) above. Adjust the screws C until a stiff, smooth movement of the control knob is obtained.

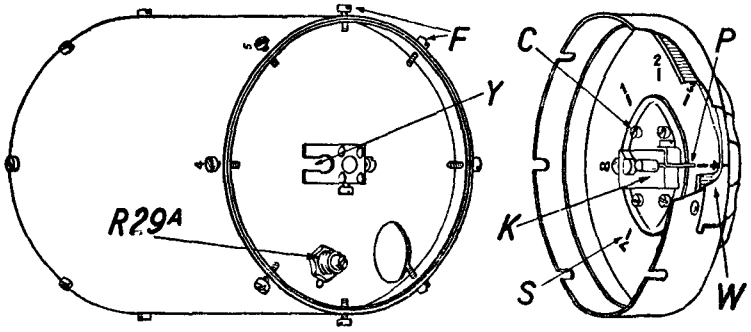


Fig. 2. Details of variometer

(*c*) Adjustment of R29A—this is the calibrating resistance for the metal rectifier used in the meter transformer. It should be adjusted only when the aerial current indicated on the meter is too high, or is too low to allow accurate tuning.

(*d*) Replacing the cork friction plates:—

(i) Note the position of the window.

(ii) Remove the end cover as described in (*a*) above.

(iii) Remove the coupling K (see fig. 2) by loosening the set screw.

(iv) Remove the four screws C and take off the washers.

(v) Smear the new washers with anti-freeze grease and replace them.

(vi) When replacing the end cover, take care that the window is in its correct position.

(*e*) Variometer change-over contacts—by rotating the control knob of the variometer slowly, while listening carefully with headset on and set on receive, check that the operation of the change-over contacts is smooth.

Meter switch

21. By first removing the meter, this switch can quite easily be changed.

Removal of 12-point plugs

22. Undo four screws fixing plug to panel. Pull an inch or two away from panel (the leads are long enough to permit this). Slip back rubber sleeves from tags and unsolder wires. Details of connections are given in table 8.

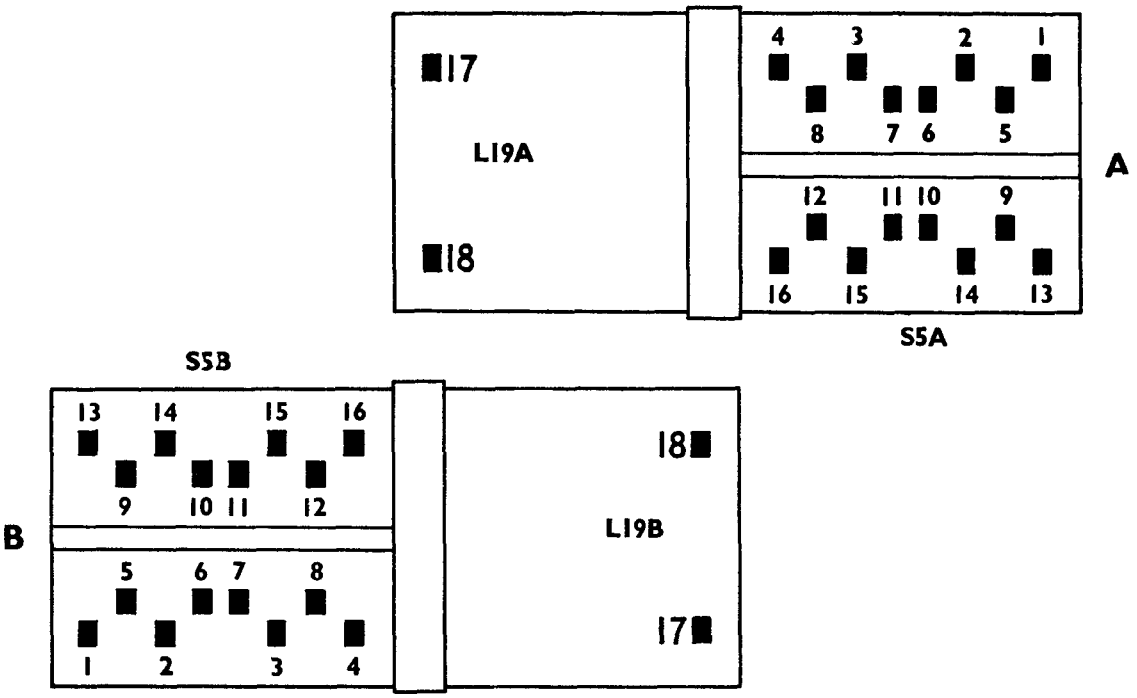


Fig. 3. Connections of relays

"A" set relay

Tag no.	Connections	Circuit ref.
1	Strapped together (H.T.+)	S5A/3C
2	Strapped together (H.T.+)	S5A/2C
3	Red wire to 16-way tag-plate (A9)	S5A/2C
4	Red wire to 16-way tag-plate (A9)	S5A/3C
5	Cable form no. 4, mauve, to S7A (B2)	S5A/3S
6	Cable form no. 4, white, to S7A (C7)	S5A/2S
7	Red wire to V1C pin 6	S5A/2R
8	Red wire to 16-way tag-plate (B7)	S5A/3R
9	Green wire to tag no. 12	S5A/4C
9	Screened lead to V3A grid	S5A/4C
10	Strapped together (Earth)	S5A/1C
11	Black wire to chassis (Earth)	S5A/1C
12	Green wire to tag no. 9	S5A/4C
13	Cable form no. 7, screened, to S7A (A4)	S5A/4S
14	Brown wire to 16-way tag-plate (B10)	S5A/1S
15	Cable form no. 4, orange, to S7A (B8)	S5A/1R
16	Cable form no. 7, screened, to S7A (B12)	S5A/4R
17	Black wire to 16-way tag-plate (B1)	L19A
18	Black wire to V8B pin 6	L19A
18	Black wire to J1A	L19A

"B" set relay

Tag no.	Connections	Circuit ref.
1	Green wire to tag no. 4	S5B
1	Screened lead to V1E grid	S5B
2	Green wire to R32A and R18C	„
3	Blank	
4	Green wire to tag no. 1	„
5	Screened lead to T4A	„
6	Joined to tag no. 9 (Earth)	„
7	R34A. Red wire to V7A pin 6	
8	Screened lead to R35A	„
9	Black wire to chassis (Earth)	„
10	Strapped together	„
11	Yellow wire to L15A	„
12	Red wire to V1E pin 6 (H.T.+)	„
13	Brown wire to V8A pin 6	„
14	Cable form no. 2, mauve, to T5A	„
15	Pink wire to R33A (on L15A)	„
16	Red wire to V7A pin 1	„
17	Cable form no. 1, blue (grey), to PL2A pin 8	L19B
18	Cable form no. 3, black (2 wires), to V1E pin 7 and to S10C	„

Note.—R indicates contacts used on receive. S indicates contacts used on send. C indicates change-over contacts. The wiring colour code should be used as a guide only, as it is not always possible to adhere to it.

Table 5. Connections to relays. (See fig. 3.)

ALL THREE WAFERS ON THIS SWITCH ARE IDENTICAL WITH THE ONE DETAILED

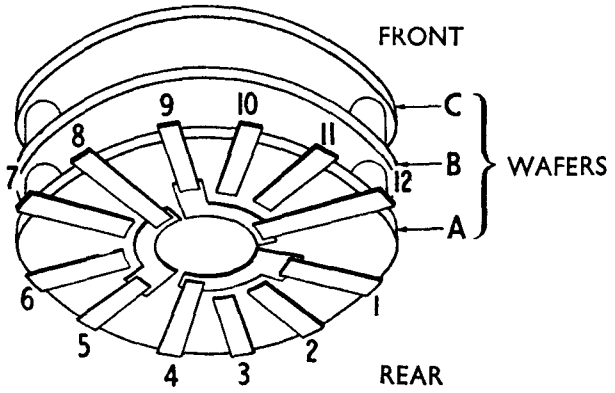


Fig. 4. System switch connections

Contact	Connections	Circuit ref.
A1	Cable form no. 9, screened, to T3A tag-plate	S7A/8 RT
A2	Blank	,, CW
A3	Cable form no. 4, green, to 16-way tag-plate (B9)	,, MCW
A4	Cable form no. 7, screened, to relay (S5A/4S)	,, Common
A5	Brown to A7	S7A/4 RT
A6	Black to A12 (Earth)	,, CW
A7	Brown to A5. Brown to 5-way tag-plate at L9A	,, MCW
A8	Yellow to L8B	,, Common
A9	Cable form no. 8, yellow, to 3-way tag-plate by V1C	S7A/5 RT
A10	Cable form no. 4, brown, to 16-way tag-plate (A6)	,, CW
A11	Pink flex to 16-way tag-plate (A1)	,, MCW
A12	Black flex to 16-way tag-plate (A3). Screens of cable form no. 7. Black to A6 (Earth)	,, Common
B1	Red to C3	S7A/6 RT
B2	Cable form no. 4, mauve, to relay (S5A/3S). Cable form no. 5, mauve, to V2B pin 1	,, CW
B3	Blank	,, MCW
B4	Cable form no. 4, red, to 16-way tag-plate (A9) (H.T.+)	,, Common
B5	Orange to B7. Orange flex to 16-way tag-plate (A7)	S7A/9 RT
B6	Cable form no. 5, orange, to R14A	,, CW
B7	Orange to B5	,, MCW
B8	Cable form no. 4, orange, to relay (S5A/1R)	,, Common
B9	R8C. Screened lead to R13A	S7A/7 RT
B10	Cable form no. 8, screened, to CW A.F. filter	,, CW
B11	Blank	,, MCW
B12	R8C. Cable form no. 7, screened, to relay (S5A/4R)	,, Common
C1	Blank	S7A/2 RT
C2	Red to C6	,, CW
C3	Red to B1. Cable form no. 4, yellow, to 16-way tag-plate (B7)	,, MCW
C4	Cable form no. 6, red, to J1A	,, Common
C5	Red to C7. Cable form no. 6, red, to J1A	S7A/1 RT
C6	Red to C2	,, CW
C7	Red to C5. Cable form no. 4, white, to relay (S5A/2S). Cable form no. 5, white, to V1A pin 6	,, MCW
C8	Cable form no. 5, yellow, to L4. Yellow flex to R20A	,, Common
C9	Blank	S7A/3 RT
C10	Cable form no. 8, orange, to CW A.F. filter	,, CW
C11	Blank	,, MCW
C12	Cable form no. 8, pink, to 3-way tag-plate by V1C	,, Common

Note.—The wiring colour code should be used as a guide only, as it is not always possible to adhere to it.

Table 6. System switch connections. (See fig. 4)

A1	C23A. Pink flex to S7A.	B1	Black flex to S10C. Black wire to L19A. Black wire to meter tag-plate. (L.T.+)
A2	Blank.	B2	Red flex to S10C. Red wire to meter tag-plate (H.T.+)
A3	C15E. Black flex to S7A. (Earth)	B3	—
A4	C34A. R7D. R7G.	B4	C15E. C22B. R7G.
A5	T2A (Blue). C22B. C23A. Cable form no. 9, pink, to V3A pin 3.	B5	Blank.
A6	R7D. R16A. C16C. Cable form no. 4, brown, to S7A (A10). Mauve wire to meter tag-plate.	B6	C22A. T2A (red).
A7	R5G. R11A. Orange flex to S7A (B5).	B7	T2A (white). Red wire to V3A pin 1. Red wire to relay (S5A/3R). Cable form no. 4, yellow, to S7A (C3).
A8	R16A. C4N. C17B. R5G. (Earth.)	B8	—
A9	Cable form no. 4, red, to S7A (B4). Cable form no. 9, red, to S10A. Red wire to 5-way tag-plate at L9A. Red wire to relay (S5A/2C and 3C). (H.T.+)	B9	R6F. C22A. Cable form no. 4, green, to S7A (A3).
A10	R6F. R9E. R11A. C4N. T3A. Cable form no. 8, brown, to CW A.F. filter. Cable form no. 9, brown, to R13A.	B10	Cable form no. 10, green, to S8A. Brown wire to relay (S5A/1S). Brown wire to V4A pin 4. Brown wire to V6A pin 4. Brown wire to V1C pin 1.

Key:—Tags in each row numbered 1–10, starting from end nearest front panel.
A indicates top row, B indicates bottom row (nearest chassis).

Note.—The wiring colour code should be used as a guide only, as it is not always possible to adhere to it.

Table 7. Connections to 16-way tag-plate

Cable form:—

No. 1. Phones and microphones

White (Mauve)	Pl. 2A pin 1	to T3A tag-plate.
Green (Mauve)	,, ,, 4	,, T2A ,,
Blue (Mauve)	,, ,, 7	,, V8B pin 6.
White (Grey)	,, ,, 2	,, T4A tag-plate.
Green (Grey)	,, ,, 5	,, ,, ,,
Blue (Grey)	,, ,, 8	,, L19B.
White (Orange)	,, ,, 3	,, T4B tag-plate.
Green (Orange)	,, ,, 6	,, ,, ,,
Green (Orange)	T6A	,, ,, ,,

No. 2. "B" and "IC" output

Pink	V8B pin 3	to T6A.
Red	,, ,, 4	,, ,,
Orange	V8A ,, 3	,, T5A.
Yellow	,, ,, 4	,, ,,
Mauve	S5B	,, ,,

No. 3. "B" and "IC" L.T. & H.T.

Orange	V1D pin 6	to S10B.
Red	V1F ,, 6	,, S10C.
Black	V1E ,, 7	,, L19B.
Black	L19B	,, S10C.

No. 4. System switch to relay, etc.

Orange	S7A (B8)	to relay (S5A/1R).
White	,, (C7)	,, ,, (S5A/2S).
Mauve	,, (B2)	,, ,, (S5A/3S).
Red	,, (B4)	,, 16-way tag-plate (A9).
Yellow	,, (C3)	,, ,, ,, (B7).
Brown	,, (A10)	,, ,, ,, (A6).
Green	,, (A3)	,, ,, ,, (B9).

No. 5. System switch to R.F.

Yellow	S7A (C8)	to L4.
Orange	,, (B6)	,, R14A.
Mauve	,, (B2)	,, V2B pin 1.
White	,, (C7)	,, V1A ,, 6.

No. 6. System switch to key-jack

Red	S7A (C4)	to J1A.
Red	,, (C5)	,, ,,

No. 7. System switch to relay

Screened lead	S7A (A4)	to relay (S5A/4S).
Screened lead	,, (B12)	,, (S5A/4R).

No. 8. A.F. filter, etc.

Screened lead	CW A.F. filter	to S7A (B10).
Orange	,,	,, ,, (C10).
Brown	,,	,, 16-way tag-plate (A10).
Pink	S7A (C12)	,, 3-way tag-plate by V1C.
Yellow	,, (A9)	,, ,, ,,

No. 9. "A" A.F., etc.

Screened lead	S7A (A1)	,, T3A tag-plate.
Screened lead	R13A	,, 5-way tag-plate by L9A.
Brown	,,	,, 16-way tag-plate (A10).
Red	S10A	,, ,, ,, (A9).
Pink	V3A pin 3	,, ,, ,, (A5).

No. 10. Meter switch, etc.

Yellow	S8A	,, V6A pin 8.
Orange	,,	,, V1A ,, 1.
Green	,,	,, 16-way tag-plate (B10).
Brown	Meter tag-plate	,, V1B pin 8.
Black	V3A pin 2	,, V1A ,, 2.

No. 11. "A" R.F. supplies

Brown	V2B pin 8	,, 4-way tag-plate by V1B.
Orange	V1A ,, 1	,, ,, ,,
Mauve	V1A ,, 4	,, V1B pin 4.
Red	V2A ,, 1	,, V1C ,, 6.

No. 12. "A" I.F. supplies

Red	L8B	,, 5-way tag-plate by L9A.
Brown	L8A	,, ,, ,,
Black	V1B pin 2	,, V1C pin 2.

No. 13. Input plug

Green (Orange)	Pl. 2B pin 2	,, Pl. 2A pin 6.
Green (White)	,, ,, 5	,, ,, ,, 9.
Brown (Brown)	,, ,, 3	,, ,, ,, 10.
Blue (Mauve)	,, ,, 8	,, ,, ,, 7.
Blue (Green)	,, ,, 7	,, Meter tag-plate.
Red (Green)	,, ,, 4	,, ,, ,,
Red (Yellow)	,, ,, 6	,, ,, ,,
Red (Red)	,, ,, 3	,, ,, ,,

Table 8. Connections of cable forms

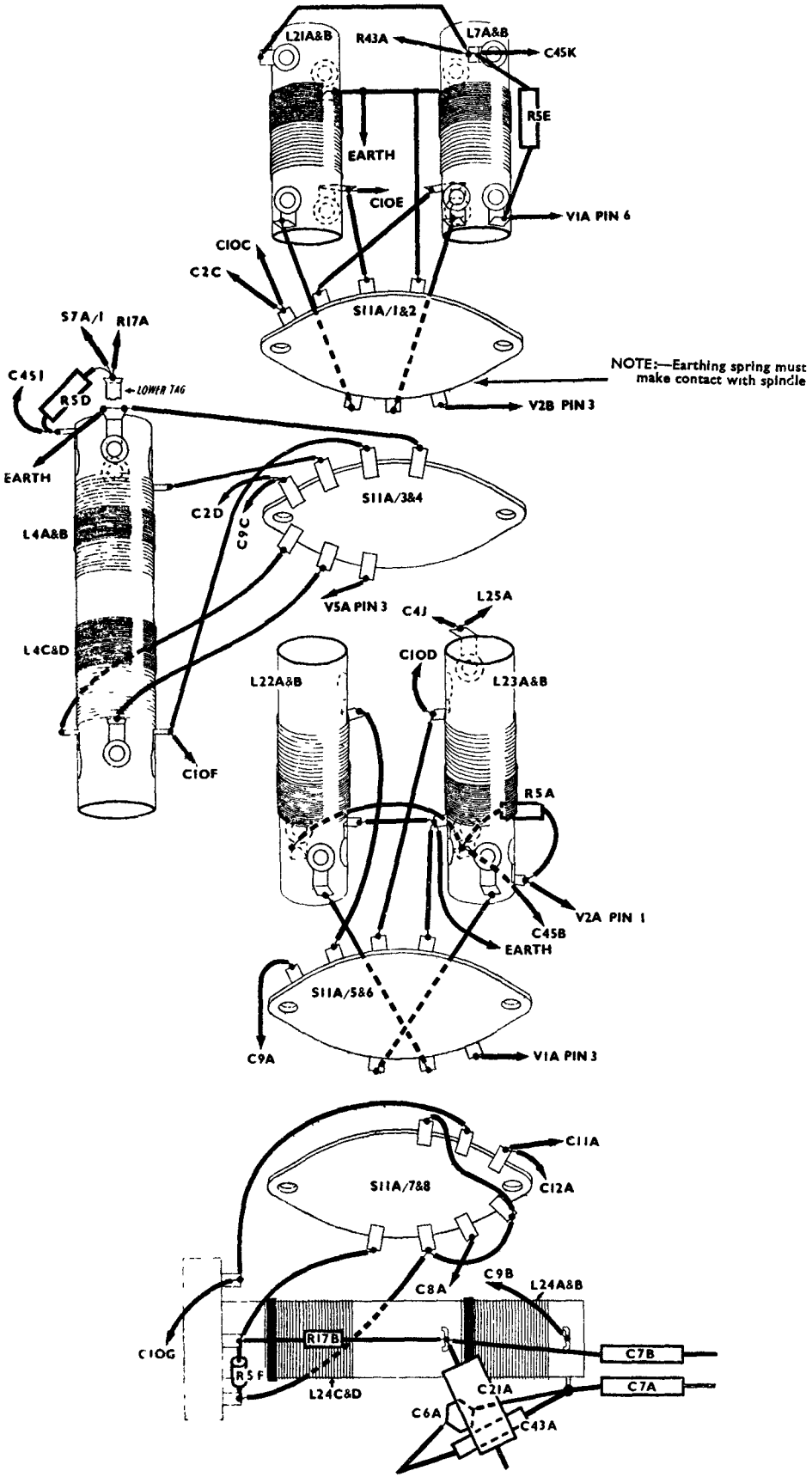


Fig. 5. R.F. coils and switching

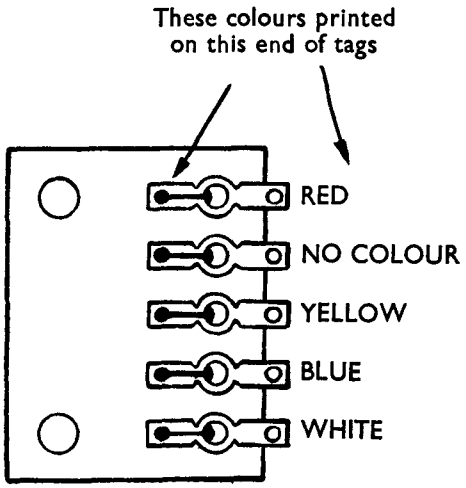


Fig. 6. "A" set output transformer connections

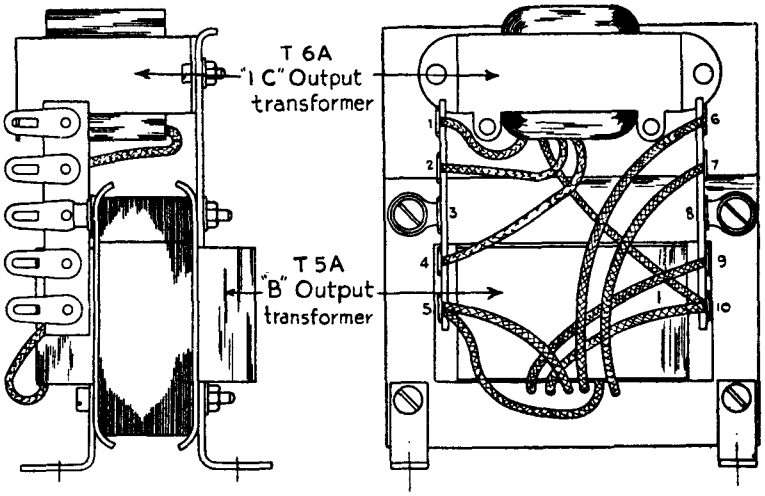


Fig. 7. "B" and "IC" output transformer connections

"A" set output transformer. (See fig. 6)

Lead or tag colour	Internal connections	External connections	Circuit connection
Blue	Primary start	16-way tag-plate. A5.	Anode
White	Primary finish	,, ,, B7	H.T.+
Yellow	Sec. 2 start	3-way ,, centre	Earth
No colour	Junc. sec. 1 & 2	,, ,, right	Phones
Red	Sec. 1 finish	16-way ,, B6	MCW reaction

"B" set and "IC" output transformers. (See fig. 7)

Tag no.	Internal connections	External connections	Circuit
1	T6A sec. finish	R2E, and cable form no. 1, green (orange)	"IC" phone
2	T6A prim. finish	Cable form no. 2, pink	V8B anode
3	—	R2E, and black to chassis	Earth
4	T6A prim. start	Cable form no. 2, red	"IC" H.T.+
5	T5A prim. finish T5A sec. 1 finish	,, ,, yellow	"B" H.T.+
6	T5A sec. 1 start	,, ,, mauve	"B" mod.
7	T5A prim. start	,, ,, orange	V8A anode
8	—	Blank	—
9	T5A sec. 2 finish	R2C, and green to T4A tag-plate	"B" phone
10	T6A sec. start T5A sec. 2 start	R2C, and black to chassis	Earth

Microphone transformers

Lead colour	"A" Set	"B" Set	"IC"
Blue	Earth	Mic.	Earth
Black	Mic.	Earth	Mic.
Yellow	Earth	Earth	Earth
White	Grid	Earth	Earth
Red	Bias	Grid	Grid

Table 9. Connections to A.F. transformers

LOCALISATION OF FAULTS

PRINCIPLES OF FAULT FINDING

General

23. If a fault develops in the installation, the simple tests for operator's daily maintenance, described in Working Instructions, Part I, should be carried out; these will localise most faults. This section describes the action to be taken when the various symptoms are recognised. The instructions printed in ordinary type may be carried out without special apparatus, and could, in an emergency, be done by the operator. Those printed in italics can be carried out only by signals electricians or instrument mechanics equipped with instruments for measuring voltage and resistance, and with a test control box. The latter consists of a spare control unit no. 1, complete with 12-point connector and headset, known to be in good order.

Warning

24. By indiscriminate probing about in the wiring of the set, more faults will be caused than cured. If the relative positions of wires and components are altered, the performance and calibration of the set will be upset. This is especially important in the oscillator sections of the "A" and "B" sets. For this reason, operators must never remove the bottom cover of the set, or the cover of the box containing V7A. Headsets are also liable to damage through unnecessary dismantling.

System

25. Carry out tests methodically and in the correct order. Correct each fault found, and see that the test which led to the discovery of that fault gives satisfactory results before proceeding to the next test. Short cuts do not pay.

External faults

26. Remember that external faults are much more common than internal ones, and, if any test fails, look for faults in the following order:—

(*a*) Faults in setting of switches or knobs; e.g. gain too low.

(*b*) External faults; e.g. aerial, battery or headset connections.

(*c*) Internal faults.

Valve circuit testing

27. The operator can test valves by replacing them with new ones. He must not, however, connect up or switch on the set until he has put it back into its case. A signals electrician or instrument mechanic can test the receiver valve stages very simply by tapping the top cap (i.e. the control grid) of each valve in turn with a wet finger. A loud "plonk" in the headphones when the top cap is tapped means that all the stages between that point and the headphones are working properly; a faint click indicates a fault. He must, therefore, work back through the receiver stages from the headphones to the aerial, thus testing stage by stage. The sequence for the "A" set receiver is: V3A, V1C, V1B, V2A, V1A.

Component faults

28. A fault in a valve stage does not necessarily imply a fault in the valve itself; the fault may be in one of the other components of the stage. The more likely components are mentioned in the tests in the tables, but any component is likely to go wrong. Signals electricians and instrument mechanics should have an ohm-meter or some instrument (home-made or otherwise) for checking components for short circuit or open circuit. Valve voltages should be checked with a high resistance voltmeter; a Universal Avometer type 7 is recommended. A condenser suspected of being open-circuited may be checked by connecting a condenser known to be good in parallel with it.

Sequence of testing

29. The tables which follow show how to localise a fault. The tests should be carried out in the order shown, starting with table 10, test no. 1. The tests are numbered to correspond with those shown in table 2 of Working Instructions, Part I.

FAULT-FINDING TABLES.

Table 10. Tests for localising faults in supply system.

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
Power supply.	1	Switch on "A," "B" and "IC." Switch on supply unit.	Red lamp lights and one machine runs steadily.	(*a*) Machine does not run and lamp does not light, or both are intermittent, with crackles in headphones.	(i) Vehicle master switch off. (ii) Battery flat. (iii) Battery connections faulty.	Switch on. Run engine or replace battery. Test by making temporary connections direct from battery to 5-way block. Check leads from batteries to base junction and from there to 5-way block. Note effect of rotating turret. Clean slip-rings and check brushes in base junction, if necessary.
				(*b*) Machine runs but no light from lamp, or lamp is intermittent with crackles in headphones.	(i) Bulb burnt out. (ii) Heater battery flat (if vehicle has two separate batteries). (iii) Battery connections faulty (if two separate batteries, connections to heater battery faulty). (iv) On-off switch faulty.	Replace bulb. Run engine or replace battery. Check 6-point connector from 5-way block to supply unit (lines 1 and 3). If separate battery for heaters, take action as in (*a*) (iii) above. Inspect heater pole of switch.
				(*c*) Lamp lights but machine does not run, or runs intermittently with crackles in headphones.	(i) Machine battery flat (if vehicle has two separate batteries). (ii) Battery connections faulty; connections to machine battery faulty. (iii) On-off switch faulty. (iv) Machine faulty.	Run engine or replace battery. Check 6-pt. connector from 5-way block to supply unit (lines 4 and 6). If separate battery for machine, take action as in (*a*) (iii) above. Inspect machine pole of switch. Clean L.T. commutator and brushes; if necessary, replace the brushes.
L.T. supply.	2	Set meter switch to L.T.	Meter reads at least normal (11 to 12 V).	Meter reads below 10·5 or 10 V.	(*a*) Battery flat. (*b*) Connections faulty.	Run engine or replace battery. Check 12-pt. connector from supply unit to set (lines 1 and 3).
H.T.1 supply.	3	Set meter switch to H.T.1.	Meter reads about 275 V.	Meter reads zero, or intermittently with crackles in headphones, but machine runs steadily (see test 1 (*b*)).	(*a*) Fuse blown. (*b*) Connections faulty. (*c*) Machine faulty.	Replace fuse. If new fuse blows at once, look for dirt or damp between line 6 and shield of 12-pt. connector from supply unit to set, or of plugs. *Localize by testing, first with connector removed, next with it plugged into supply unit only, then with switch "A" on and connector plugged in both ends, again with switch "B" on, and, finally, with switch "IC" on. If fault is localized to supply unit, C32A may have broken down; the set will work without this condenser but a bad hum will be heard. Otherwise look for a short circuit to earth in the part of set indicated.* If fuse is intact, look for fault in 12-pt. connector (line 6). Clean H.T.1 commutator and brushes; if necessary, replace the brushes.
H.T.2 supply.	4	Set meter switch to H.T.2. Switch "A" set to send RT by pressel switch.	Meter reads about 500 V, and second machine runs steadily.	(*a*) H.T.2 machine runs. Meter reads zero, or intermittently.	(i) Fuse blown. (ii) Connections faulty. (iii) Machine faulty.	Replace fuse. If new fuse blows at once, look for dirt or damp between line 4 and shield of 12-pt. connector from supply unit to set, or of plugs. *Localize as in test 3, but remember fault cannot be in "IC" or "B" set.* If fuse is intact, look for fault in 12-pt. connector (line 4 or 7). Clean H.T.2 commutator and brushes; if necessary, replace the brushes.
				(*b*) H.T.2 machine does not run.	(i) Relay faulty. (ii) Machine faulty.	Inspect. Adjust contacts if necessary. Clean L.T. commutator and brushes; if necessary, replace the brushes.

Table 11. Tests for localising faults in "IC" amplifier.

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"IC" system and headsets.	5	Switch control unit to "IC." Press pressel switch and speak. Test all headsets.	Voice should be heard clearly in all headsets	(*a*) Voice not heard, or heard only weakly.	(i) Microphone faulty.	Try another headset. Change capsule, if necessary. Inspect pressel switch and adjust if necessary. Inspect microphone leads and snatch plugs. Check driver's buzzer; if it does not buzz, check 12V lead to driver's box.
					(ii) Headphones faulty.	Try another headset. Check leads to earpieces. Short circuit each earpiece in turn; if faulty, the other one will work.
					(iii) Speech lead to driver earthing.	*Check that lead does not short circuit to chassis of vehicle or set, between driver's box and set (line 2 in 6-pt. connector).*
					(iv) Control system faulty.	*Try test control box.* Check line 3 (microphone) and line 6 (headphones) in 12-pt. connector.
					(v) Internal fault.	Check "A" set receiver (Table 12). If O.K., check that "IC" switch is on and try replacing valves V8B, V1F, V8A and V1E in turn. *Check V8B with wet finger or inject A.F. signal; if no result, check primary and secondary of T6A for open circuit, check H.T. and L.T. voltages of V8B (remembering that faulty heater in V8A will put V8B out of action); check lead to pin 6 of 12-pt. plug for open circuit or short circuit.* *Check V1F with wet finger or inject A.F. signal; if no result, check H.T. and L.T. voltages (remembering that faulty heater in V1E will put V1F out of action); check coupling condenser C29C for open circuit or short circuit; check primary and secondary of T4B for open circuit or short circuit; check lead to pin 3 of 12-pt. plug for open circuit or short circuit. If result of testing V1F was weak, check V1F voltages; check screen condenser C45 0 for open circuit; check decoupling condenser C31C.*
				(*b*) Voice is heard but reception is very noisy.	Loose connections.	Check battery connections and repeat (i) to (iv) of (*a*) above.
Buzzer.	6	Switch commander's control unit to "A." Press button on driver's junction box.	Buzz should be heard in commander's headphones when button is pressed.	(*a*) No buzz heard, and no sound at junction box.	(i) Buzzer faulty. (ii) 12V supply disconnected. (iii) Connections faulty.	Adjust buzzer. Check 12V supply to box by checking driver's microphone. Check button. *If buzzer is O.K., check signal lead from driver's box to set (line 5 in 6-pt. connector), and on through 12-pt. connector (line 9), for open circuit or short circuit.*
				(*b*) Buzz heard on "IC" but not on "A."	Connections faulty.	*Test driver's signal and speech leads for short circuit or reversal.*
				(*c*) Buzz heard without pressing button.	Button jammed.	Check operation of button.

Table 12. Tests for localising faults in "A" set receiver (RT).

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"A" set receiver.	7	Set switch on control unit to "A." Set system switch to RT. Set meter switch to A.V.C. Turn both gain controls fully clockwise. Tune to any strong RT signal, e.g. civil broadcasting.	Signal heard in headphones in normal manner; meter reads normally.	(*a*) Set dead and meter reads zero. (*b*) Set dead but meter reads normally and dips when tuned.	Internal fault. (i) Headset connections faulty. (ii) Internal fault.	Try replacing V1B and V1C. *Try test control box. Check 12-pt. connectors (line 4) and control units.* Check sender. *If meter reading on AE varies with speech, check coupling condenser C17A for open circuit; check A.F. gain control R13A for open circuit; check connections of signal diode of V3A; check lead to pin 4 of 12-pt. connector for open circuit or short circuit (normal).* If meter reading on AE does not vary, even with loud speech, try replacing V3A. *Check V3A with wet finger or inject A.F. signal; check V3A voltages.*
				(*c*) Set dead but meter reads normally and remains steady even when set is tuned.	Internal fault.	Try replacing V1C, V2A and V4A. *Check hexode portion of V2A with I.F. signal; check hexode portion of V2A voltages, remembering that faulty heater in V4A will put V2A out of action; check I.F. transformers.*
				(*d*) Set sounds alive but no station is heard on either range.	(i) Aerial circuit faulty. (ii) Internal fault.	Tune sender; an unusually low setting of the variometer and high one of "A" PA tuning will probably be necessary. Touch aerial rod and see if AE reading drops. If not, pigtail has probably broken and should be replaced. If there is no reading on AE, fault is probably in variometer lead, which may be shortened slightly, if this is necessary to cure the fault. Try replacing V1A. *Check triode section of V2A. Check C7A and C7B for open circuit or short circuit. Check V1A with wet finger or inject R.F. signal; check V1A voltages; check C2A, C36A, L3A and C1A for open circuit or short circuit, if possible with R.F. signal injected on AE terminal.*
				(*e*) Signals are audible but weak.	Internal fault.	Check as for set dead in (*c*) above if background noise is low, or as for set alive in (*d*) above if background noise is high. *Pay particular attention to high resistance windings or joints in I.F. transformers; open circuit at C4N, C45F, C4H or C4E; open circuit in R.F. anode coils (causes low A.V.C. reading); open circuit or short circuit at C4B, C1A or C2A, open circuit at contacts 5 and 6 of S11A or short-circuited turns on R.F. coils.*
				(*f*) Signals good on one range but not on the other.	Internal fault.	*If 2–4·5 Mc/s is good, check L22A, L22B, and corresponding poles of S11A (contacts 5 and 6). If 4·5–8 Mc/s is good, check L23A, L23B, L24C, L24D and corresponding poles of S11A.*
				(*g*) Set unstable, producing unusual noises or whistles.	Internal fault.	*Check valves as in (a) to (d) above according to symptoms, paying particular attention to short circuit in C16A; open circuit in R7A; open circuit at C38A (causes low A.V.C. reading); open circuit at C45A. Space A.V.C. leads away from anode leads of V2A, V1B and V1C.*
				(*h*) Signals very noisy.	(i) Suppression faulty. (ii) Loose connections. (iii) Internal fault. (iv) Atmospherics.	Stop engine. If this effects a cure, check vehicle suppression system. Check aerial and aerial connections. *If loud hum, check L10A for open circuit. If intermittent noise, look for faulty joint in set.*
Netting whistle.	8	Tune set to an incoming signal (strength 3 if possible) using netting switch.	Whistle heard.	(*a*) No whistle.	Internal fault.	Try replacing V2B and V5A. *Check triode section of V2B, remembering that faulty heater in V5A will put V2B out of action.* Check on CW and, if O.K., check netting switch. *Check L5 and C41A for open circuit and short circuit.*
				(*b*) Weak whistle.	Internal fault.	Proceed as for (*a*). *Check C39A for open circuit.*
				(*c*) Unstable whistle.	Internal fault.	Try replacing V2B and V5A.

Table 13. Tests for localising faults in "A" set sender, and receiver (CW).

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"A" set sender.	9	Set meter switch to AE. Press pressel switch and tune "A" PA tuning and variometer for maximum meter reading.	Meter reads in accordance with maintenance chart (see para. 16).	(*a*) Meter does not read, or reads very low, and no click is heard in set on pressing pressel switch.	(i) Pressel switch circuit faulty. (ii) Control system faulty. (iii) Internal fault.	Change headset and adjust, if necessary. Inspect microphone leads and snatch plugs. *Try test control box.* Check line 7 in 12-pt. connectors. *Check relay connections up to pin 7 on 12-pt. plug.*
				(*b*) Meter does not read, or reads very low, but a click is heard on pressing pressel switch.	(i) Aerial system faulty. (ii) Internal fault.	Check receiver again. *If drive meter reading is normal, check H.T.2 and try replacing variometer and V4A ; check C1A for short circuit ; check S8A for open circuit ; check V4A voltages ; check C36A and C33B for open circuit or short circuit.* *If drive meter reading varies with frequency, try replacing V5A, V2A and V2B in turn. Check V5A voltages.* *If drive meter reads zero, check receiver netting whistle again. Try replacing V5A and V2B. Check V5A voltages. Check R42B, R43A, R1C and R15A for open circuit or short circuit. Check L4, L7 and L21 for open circuit ; check contacts 1 to 4 of S11A. Check hexode section of V2B voltages.*
Modulation circuits.	10	Speak into microphone.	AE reading should kick.	(*a*) Meter reading steady and no side-tone in headphones.	(i) Headset connections faulty. (ii) Internal fault.	Check "IC" and "A" set receiver again. *Try test control box.* Check line 1 in 12-pt. connectors. *Check T3A for open circuit or short circuit. Check microphone connections through S7A to pin 1 of 12-pt. plug.*
				(*b*) Meter reading steady but side-tone O.K.	Internal fault.	Check C22B and R7G for open circuit.
Keying circuits.	11	(*a*) Switch set over to CW. Plug in key and press it.	Meter reads in accordance with maintenance chart (see para. 16), and set stops receiving.	(i) Set continues to receive with plug in socket.	Key socket faulty.	Check operation of jack springs.
				(ii) Set stops receiving but meter reads zero.	Fault in key circuit.	Check key contacts, key lead and plug. Clean key jack, if necessary. *Check key connections inside set.*
		(*b*) Switch over to MCW with key pressed.	Whistle heard in headphones.	No whistle.	Internal fault.	*Check key connections through S7A.*
"A" set receiver on CW.	12	Switch back to CW and withdraw key plug.	Incoming signal should produce a whistle controllable by het. tone control.	No whistle.	Internal fault.	*Check again on RT with netting switch on. Check R14A for open circuit or short circuit ; check connection through S7A.*

Table 14. Tests for localising faults in "B" set receiver.

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"B" set receiver.	13	(*a*) Set control unit switch to "B." Turn up "B" gain.	Loud hiss in headphones.	Set sounds dead.	(i) Headset connections faulty. (ii) Internal fault.	Check line 5 of 12-pt. connectors. Check side-tone on send (see Table 15). If no side-tone is heard, try replacing V8A and V1E. *Check V8A with wet finger; if O.K., proceed to V1E (see below); if not, check T5A for open circuit and check connection from T5A to pin 5 of 12-pt. plug; then check V8A voltages.* *Check V1E with wet finger; if no result, check C45N, C29B and C31B for short circuit and open circuit; then check V1E voltages.* If side-tone is O.K., try replacing V1D. *Check V1D voltages.* *Check L15A and L14A for open circuit or short circuit.* *Check C29A, C45M, C27A and R38A for open circuit.* *Check relay contact.* *Try replacing V7A VERY CAREFULLY.*
		(*b*) Tune "B" set to an incoming signal.	Signal heard clearly.	(i) Set sounds weak.	Internal fault.	*As for* 13 (*a*) *above. Pay particular attention to checking of C16B, R23B and C46A for open circuits.*
				(ii) Set is unstable (i.e. howls).	Internal fault.	*As for* 13 (*a*) *above. Pay particular attention to checking of R6G for open circuit.*
				(iii) Signals are very noisy.	(A) Loose connections. (B) Internal fault.	Check aerial and all aerial connections. Check for faulty joints and microphonic noise, due to mechanical vibration of V1D or V7A.
				(iv) No signal heard but set sounds alive.	Aerial disconnected.	Check "B" pigtail and aerial feeder.

Table 15. Tests for localising faults in "B" set sender.

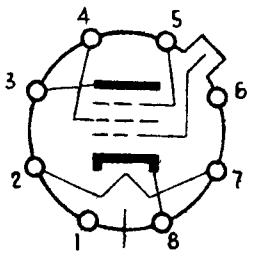
Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"B" set sender.	14	Press pressel switch and speak into microphone.	Hiss is no longer heard in headphones. Side-tone is heard. Signals from set can be heard in another set nearby.	(*a*) Hiss is still heard in phones. No side-tone is heard.	(i) Pressel switch circuit faulty. (ii) Control system faulty. (iii) Internal fault.	Inspect microphone and adjust if necessary. Inspect microphone leads and snatch plugs. If this fails to cure the fault, replace headset. *Try test control box.* Check line 8 in 12-pt. leads. *Check relay connections up to pin 8 of 12-pt. plug.*
				(*b*) Hiss is no longer heard, but no side-tone heard.	(i) Headset connections faulty. (ii) Internal fault.	*Try test control box.* Check line 2 in 12-pt. connectors. *Check T4A for open circuit.* Check lead from pin 2 of 12-pt. plug. *Check relay contacts.*
				(*c*) Side-tone is heard but signals not received by set nearby.	Internal fault.	*Check sender secondary of T5A for open circuit. Check relay contacts.*

Table 16. Tests for localising miscellaneous faults.

Part tested	Test no.	Test	Correct result	Incorrect result	Probable cause	Action to be taken
"A unattended" warning lamp.	15	Switch on all sets. Switch both control units to "B."	Lamp on operator's control box lights.	Lamp does not light.	(*a*) Bulb burnt out. (*b*) Fuse blown. (*c*) Connections faulty.	Replace bulb. Replace fuse in commander's control unit. Check line 10 in 12-pt. connectors.
"A" and "B" sets as background to "IC."	16	Switch on all sets and switch both control units to "IC." Tune "A" and "B" sets to incoming signals and turn up gain controls.	"A" and "B" sets are heard as a background in headphones.	(*a*) "A" set is not heard.	Faulty connections.	Check line 11 of 12-pt. connector between control units. (Not applicable to sets fitted with control units no. 3.)
				(*b*) "B" set is not heard.	Faulty connections.	Check line 12 of 12-pt. connector between control units. (Not applicable to sets fitted with control units no. 3.)
Retransmission (only on sets fitted with Mk. II control units).	17	Switch in turn to "R" and:— (*a*) "A→B." (*b*) "B→A." (*c*) "A and B." (*d*) Press pressel switch.	 "B" set switched to send. "A" set switched to send. Both sets on receive. Both sets on send.	 (*a*) & (*b*) Mush continues in commander's phones when switched to set which should be on send. (*c*) One or both on send. (*d*) As (*a*) and (*b*).	Faulty switches or resistances in control unit.	First check normal operation of sets again. Then check switches and resistances in control unit.

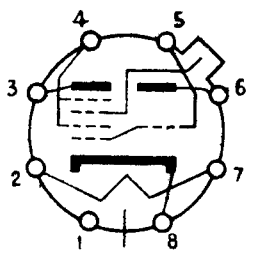
Table 17. Valve connections and point-to-point test voltages, etc.

V.1.A — 6K7G



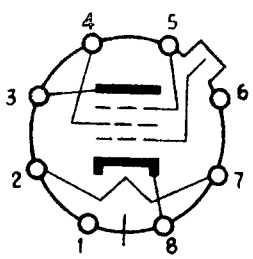
Pin		Volts	mA	Resistance To	Resistance Ohms
1	—	0	—	Ch.	0 Max. RF. GAIN 10,000 Min.
	—	40	—	Ch.	
2	H	6	300	Ch.	1
				L.T.+	1
3	A	268	10	H.T.+	2,200
4	G_s	125	3·5	H.T.+	22,000
				Ch.	36,000
5	Sup.	—	—	Ch.	S.C.
6	—	—	—	Ch.	44,000
7	H	0	300	Ch.	S.C.
8	K	3·0	13·5	Ch.	220
—	—	—	—	—	—
T.C.	G	—	—	A.V.C.	28

V.2.A — 6K8G



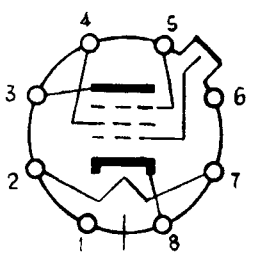
	Volts	mA	Resistance To	Resistance Ohms
—	290	—	H.T.+	S.C.
H	6	300	Ch.	1
			L.T.+	1
A	286	1·8	H.T.+	2,200
G_s	94	4·7	Ch.	18,000
			H.T.+	18,000
G_s	—	—	Ch.	47,000
A_s	120	3·6	H.T.+	47,000
H	0	300	Ch.	S.C.
K	2·7	10·1	Ch.	270
—	—	—	—	—
G	—	—	Ch.	1

V.1.B — 6K7G



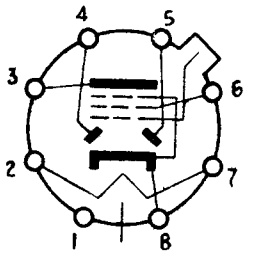
Pin		Volts	mA	Resistance To	Resistance Ohms
1	—	—	—	—	—
2	H	6	300	Ch.	2
				L.T.+	2
3	A	290	5·0	H.T.+	7
4	G_s	125	1·1	H.T.+	22,000
				Ch.	36,000
5	Sup.	—	—	Ch.	S.C.
6	—	—	—	Ch.	100,000
7	H	0	300	Ch.	S.C.
8	K	6·1	6·1	Ch.	1,000
—	—	—	—	—	—
T.C.	G	—	—	A.V.C.	7

V.1.C — 6K7G



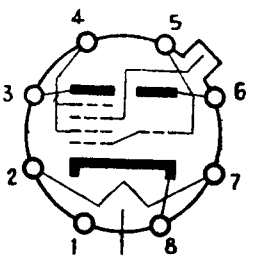
	Volts	mA	Resistance To	Resistance Ohms
—	—	—	Ch.	65,000
H	6	300	Ch.	2
			L.T.+	2
A	268	9·8	H.T.+	2,200
G_s	126	2·0	H.T.+	82,000
Sup.	—	—	Ch.	S.C.
—	290	—	H.T.+	S.C.
H	12	300	Ch.	1
			L.T.+	S.C.
K	3·2	11·8	Ch.	270
—	—	—	—	—
G	—	—	A.V.C.	7

V.3.A — 6B8G



Pin		Volts	mA	Resistance To	Resistance Ohms
1	—	290	—	H.T.+	S.C.
2	H	6	300	Ch.	1
				L.T.+	1
3	A	285	5·1	H.T.+	900
4	D1	—	—	Ch.	570,000
5	D2	—	—	Ch.	1 MΩ
6	G_p	160	1·9	H.T.+	68,000
7	H	0	300	Ch.	S.C.
8	K	30	7·0	Ch.	4,300
T.C.	G	—	—	Ch.	3,300Ω–1 MΩ
—	—	—	—	—	—

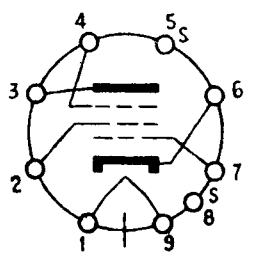
V.2.B — 6K8G



("A" set on send)

	Volts	mA	Resistance To	Resistance Ohms
—	290	—	H.T.+	S.C.
H	6	300	Ch.	2
			L.T.+	2
A	284	2·9	H.T.+	2,200
G_s	100	4·2	Ch.	15,000
			H.T.+	15,000
G_s	—	—	Ch.	6
A_s	70	0·42	H.T.+	517,000
H	0	300	Ch.	S.C.
K	4·1	7·5	Ch.	550
G	—	—	Ch.	100,000
—	—	—	—	—

V.5.A — ARP 35 (EF 50)

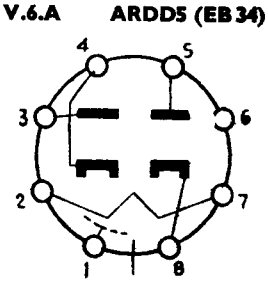


("A" set on send)

Pin		Volts	mA	Resistance To	Resistance Ohms
1	H	12	300	Ch.	1
				L.T.+	S.C.
2	G_s	285*	1·3*	H.T.+	3,900
3	A	277*	5·7*	H.T.+	2,200
4	Sup.	—	—	Ch.	S.C.
5	Scr.	—	—	Ch.	S.C.
6	K	0·7*	7*	Ch.	100
7	G	—	—	Pin 6 V6A	470,000
8	Scr.	—	—	Ch.	S.C.
9	H	6	300	Ch.	2

* Average values: depend on A.V.C. from drive.

V.6.A — ARDD5 (EB 34)

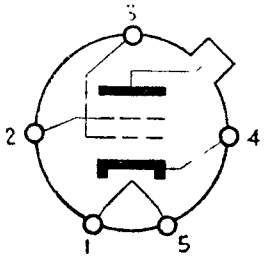


("A" set on receive)

	Volts	mA	Resistance To	Resistance Ohms
M	—	—	Ch.	S.C.
H	12	200	Ch.	1
			L.T.+	S.C.
D1	—	—	Ch.	690,000
K1	67	—	Ch.	65,000
D2	—	—	Ch.	220,000
—	—	—	Ch.	690,000
H	6	200	Ch.	5·5
			L.T.+	4·5
K2	67	—	Ch.	75,000
—	—	—	—	—

Table 17. Valve connections and point-to-point test voltages, etc.- *continued*

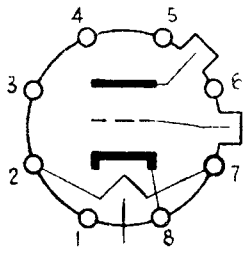
V.4.A — ATS25 (8O7)



("A" set on send)

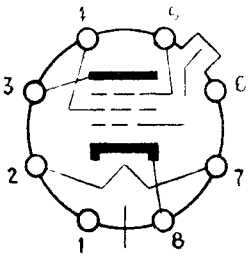
Pin		Volts	mA	Resistance To	Resistance Ohms
1	H	12	900	Ch. L.T.+	1 S.C.
2	G_s	250	1	H.T.+1	100
3	G	—		Ch.	118,000
4	K	0	27	Ch	S.C.
5	H	6	900	Ch. L.T.+	1 1
6	—	—	—	—	—
7	—	—	—	—	—
8	—	—	—	—	—
TC.1	A	300	26	H.T.+2	47
TC.2	—	—	—	—	—

V.7.A — CV 6



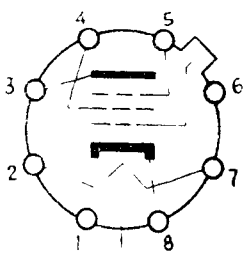
	Volts	mA	Resistance To	Resistance Ohms (Rec.)	Resistance Ohms (Send)
—	R 305	—	H.T.+	S.C.	O.C.
H	6·2	200	Ch L.T.+	3 2	3 2
—	—	—	—	—	—
—	—	—	—	—	—
—	R 105 | S 277	—	Ch H.T.+	65,000 30,000	35,000 35,000
—	R 267 | S —	—	H.T.+	3,300	O.C.
H	O	200	Ch.	S.C.	S.C.
K	—	R 2·0 | S 16·5	Ch.	S.C.	S.C.
G	—	—	Ch.	285,000	15,000
A	R 100 | S 241	R 2·0 | S 16·5	H.T.+	32,500	3,000

V.1.D. — 6K7G



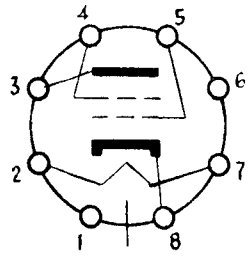
Pin		Volts	mA	Resistance To	Resistance Ohms (Rec.)	Resistance Ohms (Send)
1	—	—	—	Ch.	47 000	47,000
2	H	12	290	Ch. L.T.+	2 S.C.	2 S.C.
3	A	105	4·0	H.T.+	30,000	800
4	G_R	125	3·0	H.T.+	50,000	O.C.
5	Sup.	—	—	Ch.	S.C.	S.C.
6	—	305	—	H.T.+	S.C.	S.C.
7	H	6·2	290	Ch. L.T.+	3 2	3 2
8	K	—	7·0	Ch.	S.C.	S.C.
T.C.	G	—	—	Ch.	47,000	47,000

V.1.E — 6K7G



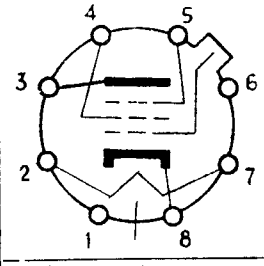
	Volts	mA	Resistance To	Resistance Ohms
—	250	—	H.T.+	22,000
H	6	300	Ch. L.T.+	2 2
A	70	1·8	H.T.+	122,000
G	55	0·5	H.T.+	470,000
Sup.	—	—	Ch.	S.C.
—	305	—	H.T.+	S.C.
H	12	300	Ch. L.T.+	2 S.C.
K	2·3	2·3	Ch.	1,000
G	—	—	Ch.	22,000 –122,000

V.8.A — 6V6G



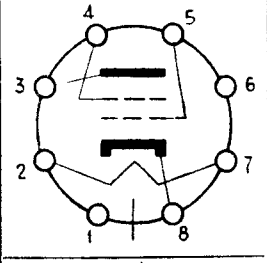
Pin		Volts	mA	Resistance To	Resistance Ohms
1	—	—	—	—	—
2	H	6	450	Ch. L.T.+	1·5 1·5
3	A S	283	39	H.T.+	170
	A R	302	16·6		
4	G_s S	290	2·0	H.T.+	S.C.
	G_s R	305	0·7		
5	G	—	—	Ch.	1MΩ
6	—	R 17·3 S —	—	Ch. R Ch. S	1.000 S.C.
7	H	12	450	Ch. L.T.+	2 S.C
8	K S	16	41	Ch. S	390
	K R	24	17·3	Ch. R	1,390
T.C.	—	—	—	—	—

V.1.F. — 6K7G



	Volts	mA	Resistance To	Resistance Ohms
—	250	—	H.T.+	22,000
H	0	300	Ch.	S.C.
A	70	1·8	H.T.+	122,000
G_R	55	0·5	H.T.+	470,000
Sup.	—	—	Ch.	S.C.
—	305	—	H.T.+	S.C.
H	6	300	Ch. L.T.+	2 2
K	2·3	2·3	Ch.	1,000
G	—	—	Ch.	27,000

V.8.B — 6V6G



	Volts	mA	Resistance To	Resistance Ohms
—	4·2	—	Ch.	550
H	0	450	Ch.	S.C.
A	295	26	H.T.+	360
G_s	305	1	H.T.+	S.C.
G	—	—	Ch.	1MΩ
—	12	—	Ch. L.T.+	100 100
H	6	450	Ch. L.T.+	1·5 1·5
K	22	27	Ch.	820
—	—	—	—	—

NOTES:—

(1) Voltage and current values liable to variation due to batteries, etc.

(2) Current measurements are not to be made as a routine test. Intended as valve data only.

(3) All measurements taken on RT receive, unless otherwise marked.

(4) R.F. gain at maximum (normal), unless otherwise marked.

(5) In each case, the on-off switch for the section of the set on test is on, and the other two are off.

(6) Valve pins are viewed from under chassis.

(7) All voltage figures give the true voltage to chassis, and no allowance has been made for the effect of the meter as this will depend upon its resistance.

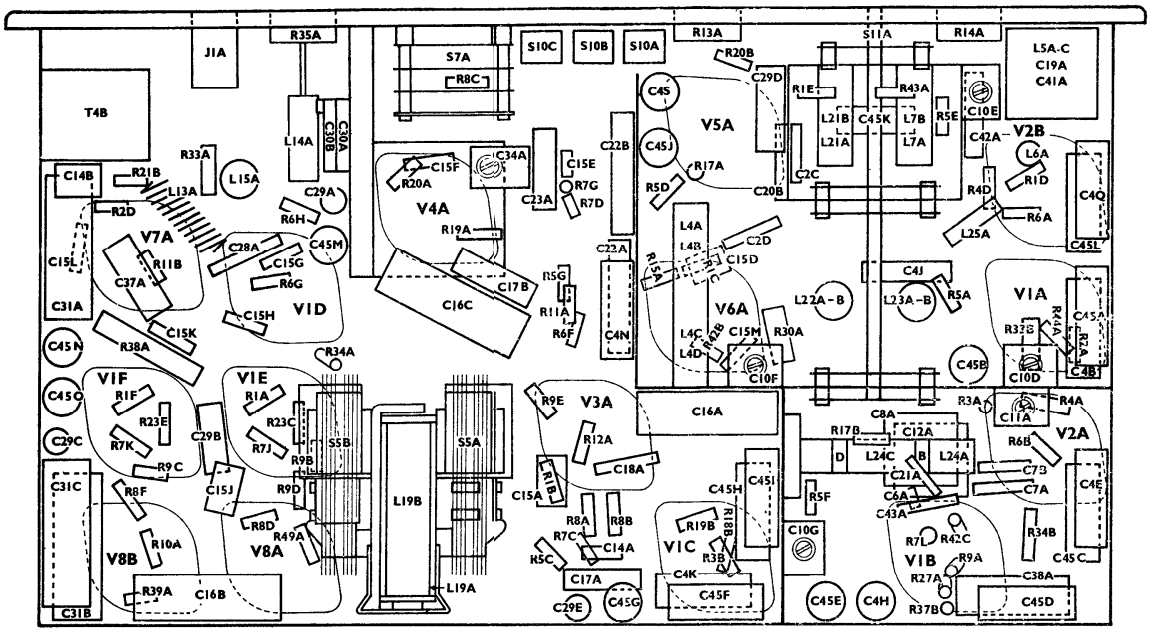


Fig. 1001.
Underneath plan of chassis.

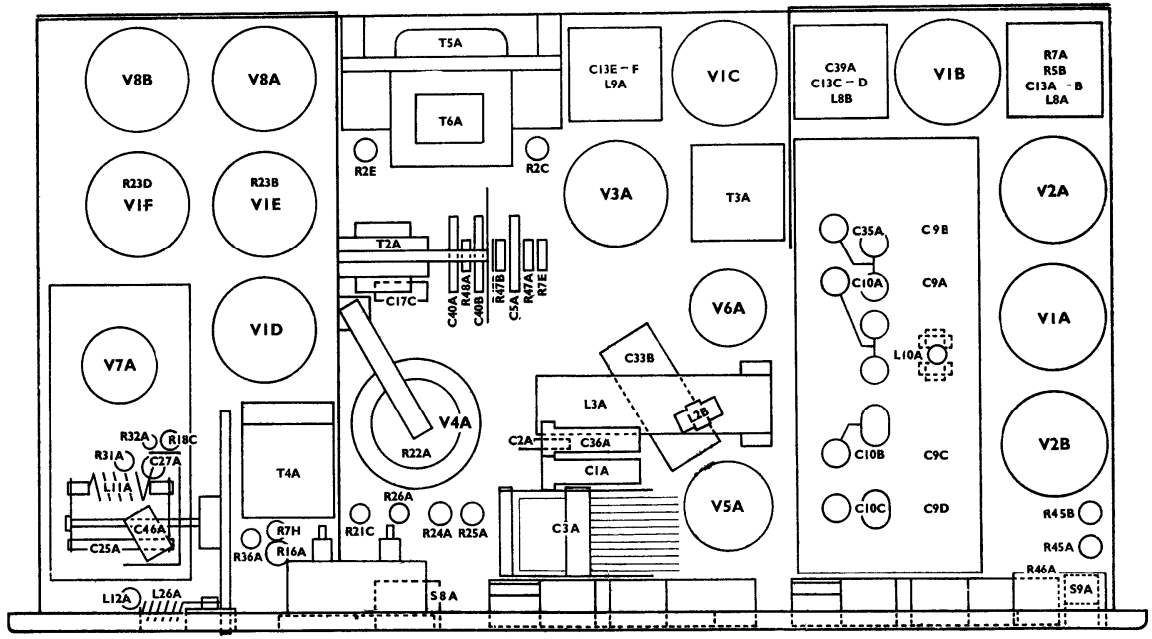


Fig. 1002.
Top plan of chassis.

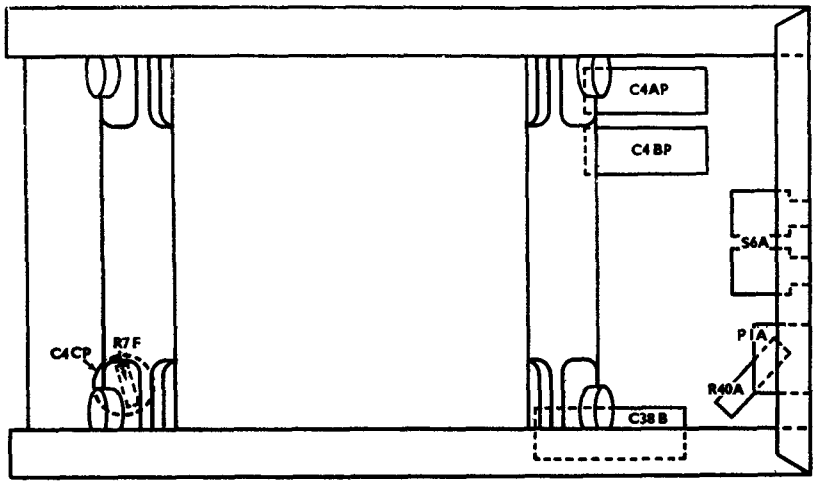


Fig. 1003. Underneath plan of power supply unit.

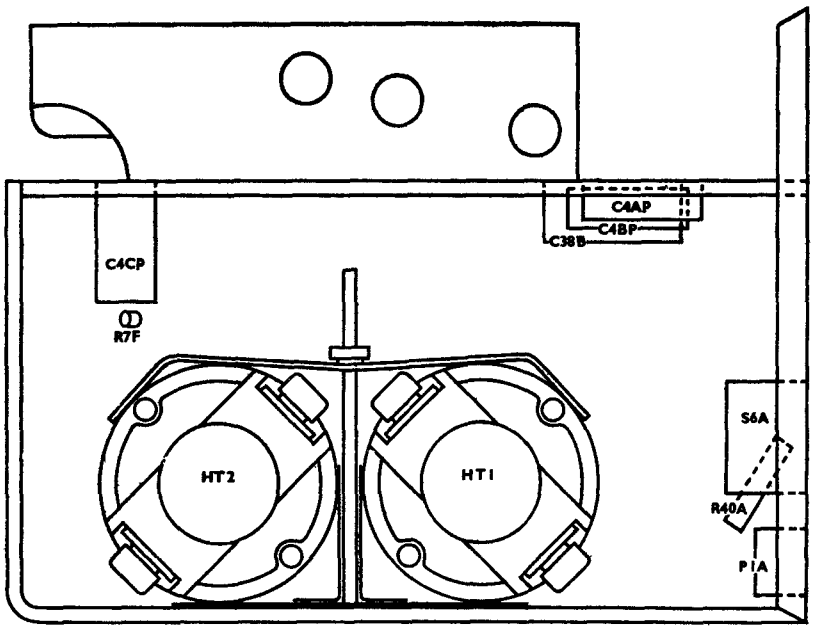


Fig. 1004. Side view of power supply unit.

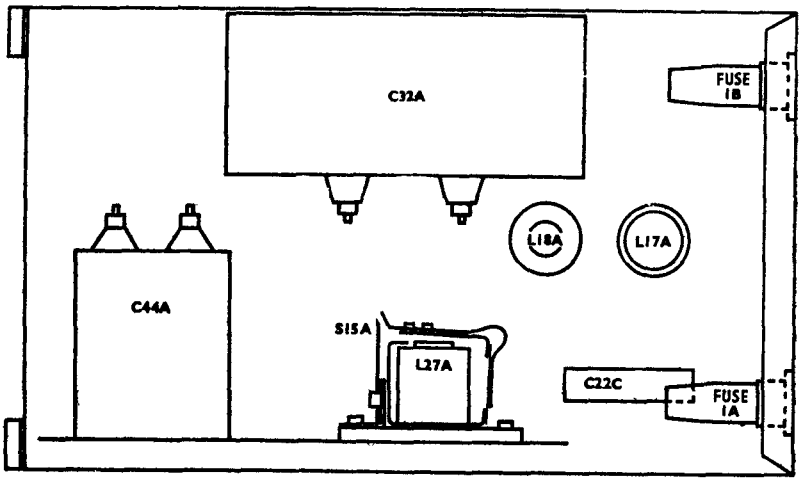


Fig. 1005. Top plan of power supply unit.

END

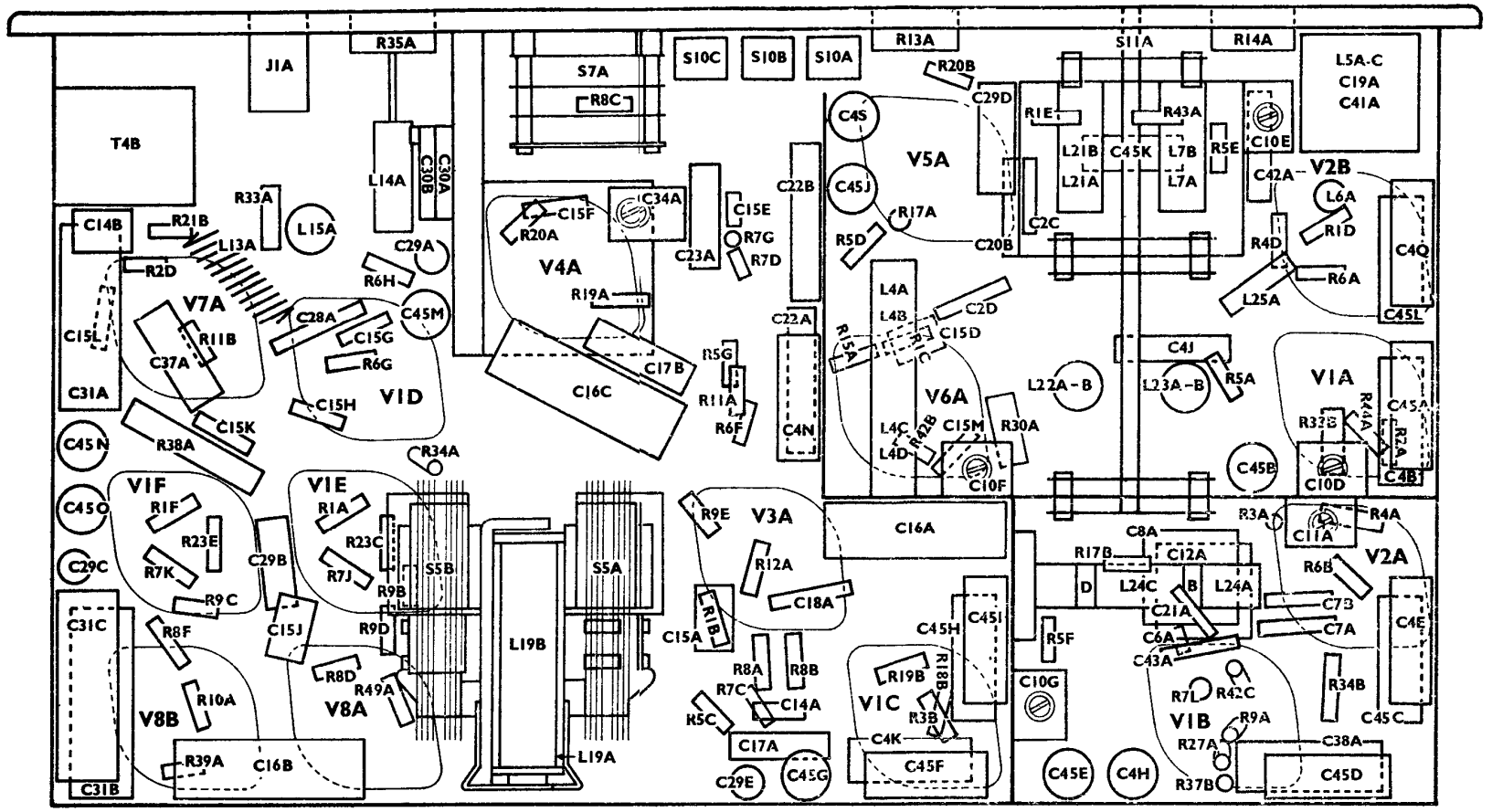


Fig. 1001.
Underneath plan of chassis.

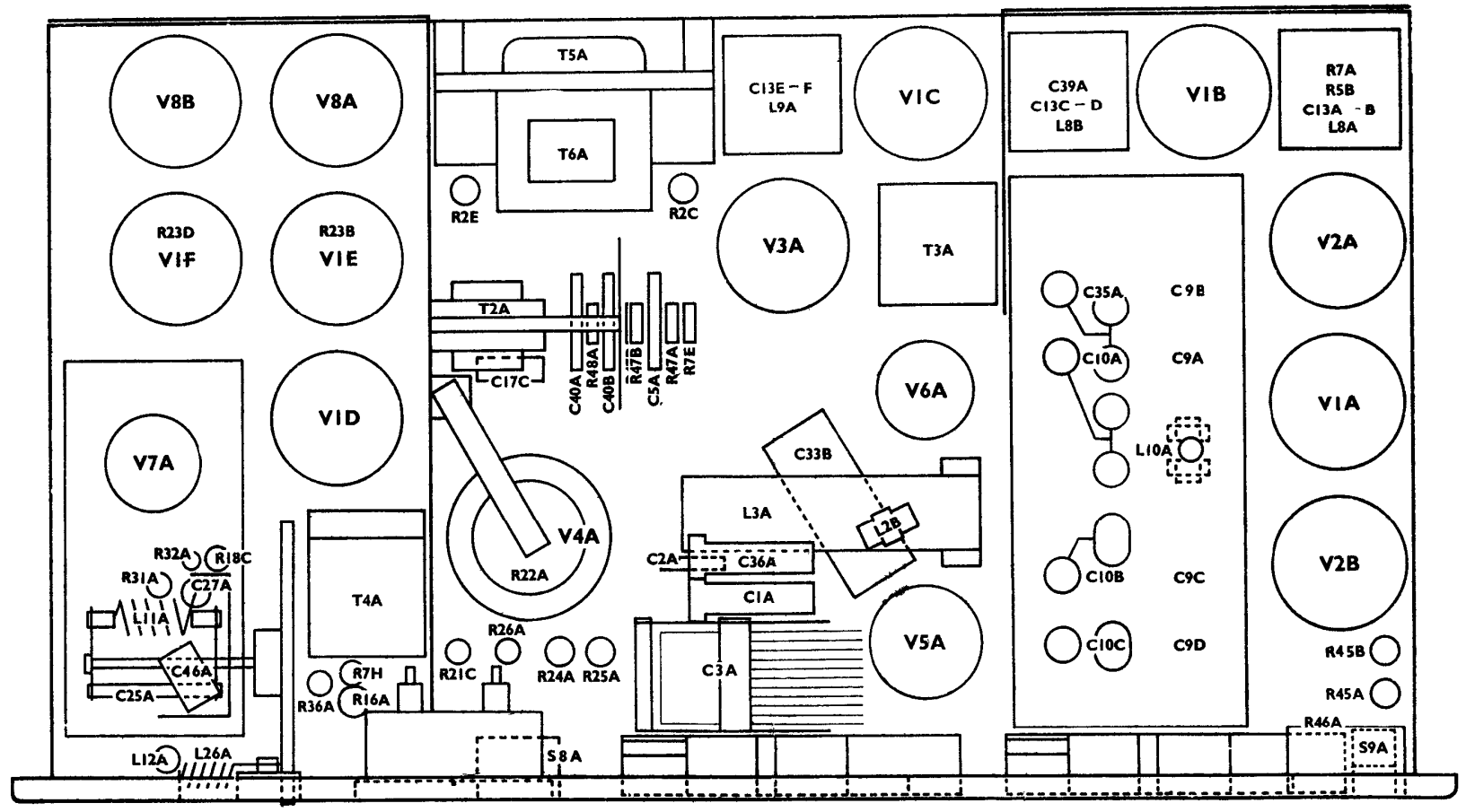


Fig. 1002.
Top plan of chassis.