F 722

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

RESTRICTED

TELECOMMUNICATIONS
F ~~662~~

WIRELESS SET NO. 88, TYPE A, A.F.V.

TECHNICAL HANDBOOK - TECHNICAL DESCRIPTION

Erratum

NOTE: This Page 0 will be filed immediately in front of Page 1, Issue 2, dated 6 Feb. 1950.

1. The following amendment will be made to para 1, Page 1, Issue 2, of Tels. F 662

Line 4 - Delete 'It will eventually be replaced by Wireless set C40'

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WIRELESS SET NO. 88, TYPE A, A.F.V.

TECHNICAL HANDBOOK - TECHNICAL DESCRIPTION

Note: This issue, Pages 1 to 5 and 1001 to 1014, supersedes Pages 1 to 3 and 1001 to 1014 of Issue 1, dated 2 May 1949. Fig. 1003 and paras. marked thus * have been amended.

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PURPOSE

1. The Wireless set No. 88, type 'A', A.F.V. is designed to replace the Wireless set No. 38, A.F.V. for installation in tanks and other types of armoured fighting vehicles. It is provided as an interim measure to enable A.F.Vs. to communicate with infantry personnel equipped with Wireless sets No. 88, type 'A'. It will eventually be replaced by Wireless set C40.

2. The vehicle, in which the Wireless set No. 88, A.F.V. is installed, is normally also fitted with a Wireless set No. 19, or a similar type of set. The control harness, with the Control units Nos. 16 and 17, provides the following facilities:-

(a) Operation of Wireless sets Nos. 19A, 19B and 88, and communication between the crew (I.C.).
(b) Rebroadcast facilities

GENERAL FEATURES

3. The installation can be sub-divided into four sections, as follows:-

(a) The wireless set.
(b) The Power supply and L.F. amplifier unit No. 2.
(c) The Control unit No. 16.
(d) The Control unit No. 17.

4. The wireless set is identical with the Wireless set No. 88 (see Tels. F 652) except for two modifications. Firstly, the ON/OFF switching operation is transferred to the Power supply and L.F. amplifier unit No. 2, and secondly, the battery lead and pressel switch are removed and a 6-way lead and socket substituted for them.

5. The Power supply and L.F. amplifier unit No. 2 derives its supply from the same source as the Wireless set No. 19, that is, the 12V battery in the vehicle. There are two A.F. amplifiers in the unit, one of which raises the level of the output of the moving-coil microphone to one suitable for the operation of the Wireless set No. 88, A.F.V., while the other amplifies the audio output of the latter in order to overcome the noisy conditions prevailing in armoured vehicles on the move. There is also a relay in the unit, which performs the send-receive switching, which in the Wireless set No. 88 is actuated by the pressel switch.

6. A metal container, ventilated by louvres, encloses the unit. It is secured by a setscrew, which can easily be removed for maintenance and inspection purposes. The 6-way socket SK3 from the wireless set fits into a 6-way plug, PL2, on the Power supply and L.F. amplifier unit No. 2, thus linking the amplifiers and power supply to the transceiver.

NOTE: In models serial Nos. 1-1000 a 12V bulb serves as the indicator lamp. In models serial Nos. 1001 onwards, a 6.3V bulb in series with R3 is placed across the regulated 7V supply.

CONTROLS

7. On the wireless set:-

S1—the channel selector switch.

8. On the Power supply and L.F. amplifier unit No. 2:-

S1—ON/OFF switch. This performs the following functions:-

(a) It switches the 12V battery supply to the power pack.
(b) When the equipment is switched OFF, S1A connects the operator directly to I.C., instead of through amplifier V3 as is the case when the equipment is ON.

RV3—volume control, adjusting the audio output of the wireless set.

9. The Control units Nos. 16 and 17 provide the following facilities:-

(a) The operator, using Control unit No. 16, can place switch S2 to A, I.C., B, 88 or R. In the last position he controls by switch S3 the retransmission facilities B to A, A and B, A to B, 88 to A, A and 88, and A to 88.
(b) The commander, using Control unit No. 17, can place switch S1 to A, I.C., B or 88.

(c) The gunner is permanently connected to I.C., although under certain conditions he can hear the output of the wireless sets via the feed-through network.

10. A diagram of the installation, excluding the Wireless set No. 19, is shown in Fig. 1001.

TECHNICAL DESCRIPTION

Wireless set (see Fig. 1002)

11. This set is identical to the Wireless set No. 88 (see Tels. F 652) except for a few minor modifications. The relay $\frac{RL}{4}$, situated in the power supply and L.F. amplifier unit, replaces the pressel switch normally attached to the Wireless set No. 88, contacts RL1 and RL2 fulfilling the same purpose as contacts S2A and S2B of the pressel switch, respectively. On send, RL1 short-circuits R29 in the anode circuit of the valve V11. This increases the output of this valve to that necessary for providing the A.F.C. voltage to the reactor valve V4. RL2 disconnects the filaments of V5 and V14 on send, and those of V1, V2, V3 and V4 on receive. Although the ON/OFF switch is still in position, it is not connected electrically and serves no useful function.

12. The relay $\frac{RL}{4}$, is controlled by the pressel switch in either the commander's or the operator's headset, depending on the switch-settings on the control units.

Power supply and L.F. amplifier unit No. 2 (see Fig. 1003)

H.T. supply

13. The supply from the 12V battery is fed to the unit via a plug PL1 on the control panel. A condenser, C1, is permanently connected across the battery and, when the power is switched on, an electrolytic condenser, C2, is connected in parallel with C1. C1 and C2 perform similar functions in smoothing ripples in the 12V D.C. supply. The former also prevents any R.F. derived from the vibrator reaching the battery leads.

14. The indicator lamp on the control panel serves a double purpose:-

(a) It shows whether or not the set is switched on.
(b) It shows supply failure.

Should the vibrator tongue at any time stick on one contact, the fuse F1 prevents damage to transformer T1 and the filtering circuits.

15. The alternating voltage produced by the vibrator is fed to the primary of T1, any R.F. noise occurring being suppressed by the filters L1, C4, C5; L2, C7, C8, R5; L3, C6, C9, R4. The output from the secondary of T1 is rectified by two diodes V1 and V2, and the rectified voltage is smoothed by L4, C12 and C17, C18, and C19. C10 and C11 are buffer condensers, R6 and R7 acting as limiting resistors to reduce surge currents through them.

16. When the wireless set is on receive, R10 is connected in series with the H.T. supply. On send, R10 is short-circuited by relay contact RL3 to keep the H.T. voltage the same on receive as on send, the power pack output voltage rising when the current drain falls.

L.T. supply

17. The L.T. supply is obtained by dropping the 12V input voltage through a parallel arrangement of R1, R2 and the resistive section of X1, to 7V across C3. X1 is a carbon-pile voltage regulator and is an essential part of the circuit in order to maintain a constant filament voltage.

18. The carbon-pile consists of a number of carbon discs housed in a porcelain tube. These discs are spring-loaded at one end. Mounted at the same end is an electromagnet, whose armature is attached to the pressure spring, and whose operating winding is connected in series with a pre-set resistor, RV1, across C3. Thus any fluctuation in the voltage across C3 will have a direct effect on the spring pressure, due to the variation in current through the electromagnet winding, and hence the resistance of the carbon-pile will alter accordingly. The latter is fitted with cooling vanes.

19. RV1 permits the current flowing through the operating coil of R1 to be set up to give an output of 7V with 12V input. This output voltage will then be maintained with varying supply voltages.

20. R8 and R9 drop the 7V regulated L.T. supply to 6.3V for the rectifier valves V1 and V2.

21. As the filament voltage of the Wireless set No. 88, A.F.V. is 1.4V, the pre-set resistor RV2 is used to obtain that value. On receive, R19 is connected in parallel with the filaments, while on send, it is switched out of circuit by relay contact RL2. This is done to compensate for the increased number of filaments to be supplied when the set is on send.

L.F. amplifiers on send

22. The user's moving-coil microphone is connected via the control harness and pins 1 and 6 of PL3 to the primary of transformer T6. The secondary of this transformer is connected to the grid of the amplifier. T5 is the output transformer of V4, and its secondary is connected to the primary of the microphone transformer T3 in the wireless set. The MIC socket of the Wireless set No. 88 is 1.4V above earth potential to energize the carbon microphone used in the manpack station. When connected in the A.F.V. harness, a moving-coil microphone is used, and to prevent D.C. flowing in the secondary of T5, the earthy side of the secondary winding is taken to L.T.+.

23. To provide sidetone when on send, relay contact RL4 connects the anode of V4 via C15 to the grid of V3. The output from V3 is fed to the operator's phone via T4 and the control harness.

L.F. amplifiers on receive

24. Speech received by the unit from the phone and earth socket on the Wireless set No. 88, A.F.V. passes through transformer T2, across the secondary of which is the volume-control RV3. R13 is inserted to improve the frequency response. After being fed through the primary of T3, the signal is fed to the grid of V3, amplified, and from the secondary of T4 goes to pin 2 on the Control unit No. 16. R15 is connected between the negative end of the filament and earth. This gives a negative bias of approximately 4V on the grid. In order that any fluctuations in filament supply should not be amplified by the valve, the extra tag of the filament is connected to the grid of the valve through C14. Thus any fluctuations across R15 will also be fed to the grid and will cancel out.

25. The I.C. signals are fed to the grid of V3 via pin 4 of PL3, S1A and transformer T3. The combined output from the amplifier is taken to pin 2 of PL3 in the Control unit No. 16. Thus, if neither the operator nor commander is connected to 88, but one of them is connected to I.C., then any message from the Wireless set No. 88 net will be picked up by whoever is switched to I.C. If neither the operator nor commander are connected to I.C. or 88, the gunner will receive the message, as he is permanently connected to I.C. Therefore, someone will always receive an incoming message from the Wireless set No. 88 net.

26. The filament voltage of 7V is reduced to 2.8V for V3, and by R18 to 1.4V for V4. The filament current of V3, as in all directly heated valves, is made up of L.T. current at one end and L.T. and H.T. current at the other. The difference, in this case, is compensated by connecting R11 across one half of the filament to absorb the surplus. R20 and C20 prevent any instability due to feedback in the tank harness.

27. The wireless set and the power supply and L.F. amplifier unit No. 2 are issued separately and are interchangeable separately. In exceptional cases two equipments may be found which will not operate together satisfactorily. In these circumstances the pre-set resistor RV2, in the power supply, must be re-adjusted (see para. 21 and E.M.E.R. Tels. F 664).

Control units No. 16 and No. 17 (see Figs. 1004 and 1005)

28. The Control unit No. 16, to which the operator's handset is connected, contains the switching for controlling the retransmission facilities in addition to that associated with the headset. The Control unit No. 17 has two drop-leads, commander's and gunner's, of which only the commander's is switched, and a terminal block for connecting to the driver's headset. Fig. 1006 shows the connections between the Control units Nos, 16 and 17.

29. Table 1001 shows the sets which are heard on the various headsets at differenc settings of S1, S2 and S3 on the control units. The feed-through arrangements are such that any unattended set is heard as follows:-

(a) 88 Set by:-
  (i) Operator if on I.C.; if not, by—
  (ii) Commander if on I.C.; if not, by—
  (iii) Gunner.
(b) A and B sets by anyone on I.C.

Note: The next page is Page 1001.

Switch positions			Headsets			
S1	S2	S3	Commander	Operator	Gunner	Driver
A	A		A	A	I.C., 88, B	I.C., B
I.C.	A		I.C., B, 88	A	I.C., B	I.C., B
B	A		B	A	I.C., 88	I.C.
88	A		88	A	I.C., B	I.C., B
A	I.C.		A	I.C., 88, B	I.C., B	I.C., B
I.C.	I.C.		I.C., A, B	I.C., 88, A, B	I.C., A, B	I.C., A, B
B	I.C.		B	I.C., 88, A	I.C., A	I.C., A
88	I.C.		88	I.C., A, B	I.C., A, B	I.C., A, B
A	B		A	B	I.C., 88	I.C.
I.C.	B		I.C., A, 88	B	I.C., A	I.C., A
B	B		B	B *	I.C., A, 88	I.C., A
88	B		88	B *	I.C., A	I.C., A
A	88		A	88	I.C., B	I.C., B
I.C.	88		I.C., A, B	88	I.C., A, B	I.C., A, B
B	88		B	88 *	I.C., A	I.C., A
88	88		88	88 *	I.C., A, B,	I.C., A, B
A	R	B–A	A(B)	A(B) *	I.C., 88	I.C.
I.C.	R	B–A	I.C., 88	A(B) *	I.C.	I.C.
B	R	B–A	B	A(B) *	I.C., 88	I.C.
88	R	B–A	88	A(B) *	I.C.	I.C.
A	R	A and B	A, B	A, B *	I.C., 88	I.C.
I.C.	R	A and B	I.C., 88	A, B *	I.C.	I.C.
B	R	A and B	A, B	A, B *	I.C., 88	I.C.
88	R	A and B	88	A, B *	I.C.	I.C.
I.C.	R	A–88	I.C., B	88(A)*	I.C., B	I.C., B

Table 1001—S1, S2 and S3 switch positions—reception on various headsets

Notes: 1. * Indicates warning lamp lit.
2. () e.g., (B), indicates set heard on sidetone of preceding set.
3. A represents the Wireless set No. 19A; and B the Wireless set No. 19B.

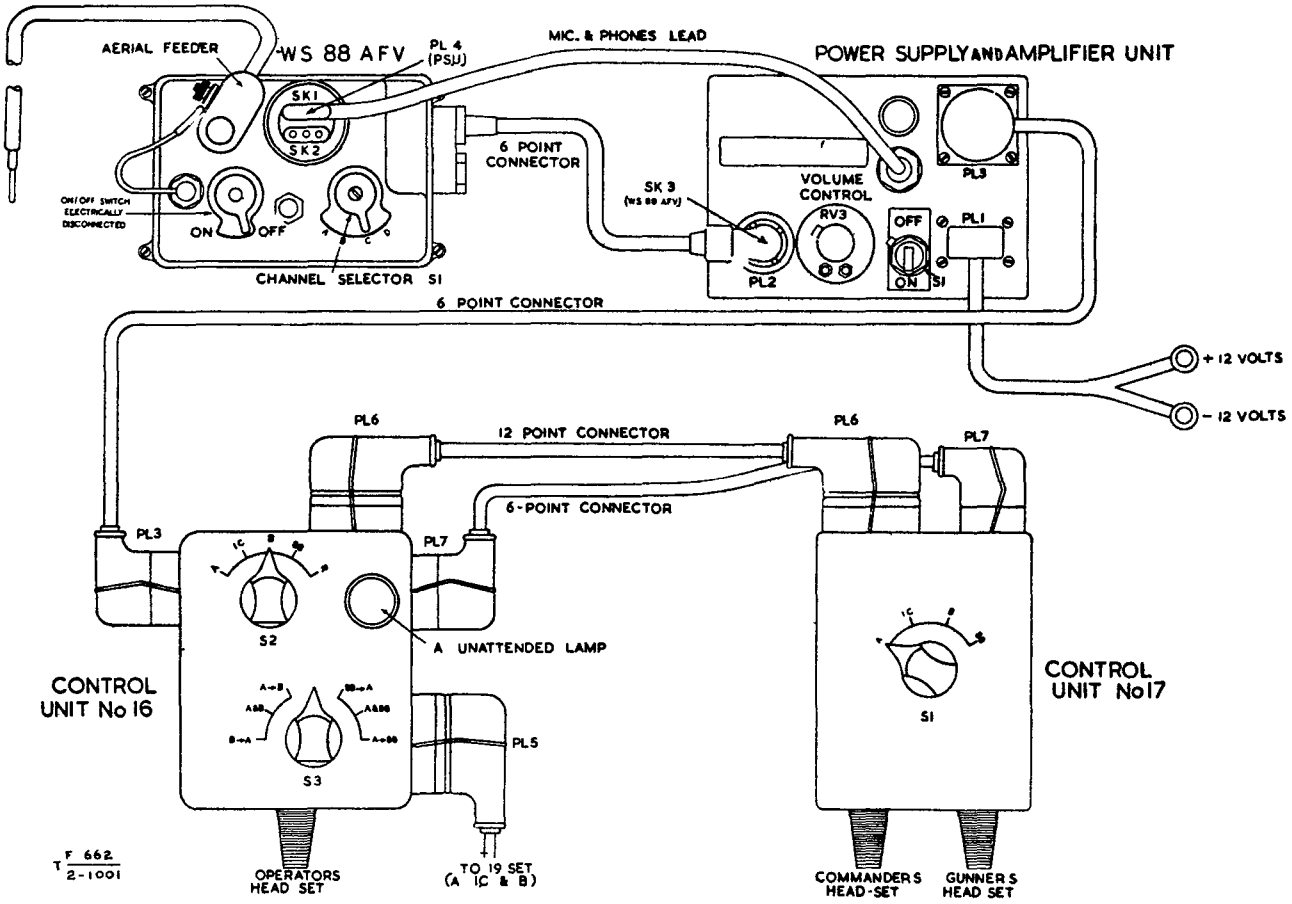


Fig. 1001—Wireless set No. 88, A.F.V. - layout

Table 1002—Wireless set No. 88, A.F.V.—components list (see Fig. 1002)

Circuit ref.	Value	Tolerance	Rating	Type	Location ref. (Fig. 1002)
		RESISTORS			
R1	120kΩ	± 5%	¼W	Tubular, insulated	B4
R2	120kΩ	± 5%	¼W	Tubular, insulated	B5
R3	1.5MΩ	±10%	¼W	Tubular, insulated	B2
R4	1.5MΩ	±10%	½W	Tubular, insulated	C2
R5	560kΩ	± 5%	½W	Tubular, insulated	C4
R7	2.2kΩ	± 5%	½W	Tubular, insulated	C7
R8	68kΩ	± 5%	½W	Tubular, insulated	D5
R9	22kΩ	± 5%	½W	Tubular, insulated	D5
R10	8.2kΩ	± 5%	¼W	Tubular, insulated	D4
R11	220kΩ	±10%	¼W	Tubular, insulated	D2
R12	6.8kΩ	± 5%	¼W	Tubular, insulated	F7
R13	1kΩ	± 5%	¼W	Tubular, insulated	E7
R14	22kΩ	± 5%	¼W	Tubular, insulated	F5
R15	1MΩ	±10%	¼W	Tubular, insulated	F2
R16	2.2kΩ	± 5%	¼W	Tubular, insulated	F5
R17	33kΩ	± 5%	¼W	Tubular, insulated	F4
R19	2.2kΩ	± 5%	¼W	Tubular, insulated	G7
R20	1MΩ	±10%	¼W	Tubular, insulated	F2
R21	33kΩ	± 5%	¼W	Tubular, insulated	G4
R23	120kΩ	± 5%	¼W	Tubular, insulated	G5
R24	1MΩ	±10%	¼W	Tubular, insulated	G2
R25	33kΩ	± 5%	¼W	Tubular, insulated	G4
R26	6.8Ω	± 5%	1W	Tubular	H5
R28	1MΩ	±10%	¼W	Tubular, insulated	H2
R29	82kΩ	± 5%	¼W	Tubular, insulated	H4
R30	12kΩ	± 5%	¼W	Tubular, insulated	H4
R31	47kΩ	± 5%	¼W	Tubular, insulated	H3
R32	680kΩ	± 5%	¼W	Tubular, insulated	J3
R33	680kΩ	± 5%	¼W	Tubular, insulated	J2
R35	120kΩ	± 5%	¼W	Tubular, insulated	K3
R36	680kΩ	± 5%	¼W	Tubular, insulated	K3
R37	220kΩ	±10%	¼W	Tubular, insulated	K2
R38	1.5MΩ	±10%	¼W	Tubular, insulated	K2
R39	12kΩ	± 5%	¼W	Tubular, insulated	L4
R40	2.2kΩ	± 5%	¼W	Tubular, insulated	E6
		CONDENSERS			
C1	0.001μF	±25%	350V D.C.	Moulded, mica	A7
C2	3—30pF	±15% —0% at max.	150V D.C.	Variable	A6
C3	3—30pF	±15% —0% at max.	150V D.C.	Variable	A6
C4	3—30pF	±15% —0% at max.	150V D.C.	Variable	A6
C5	3—30pF	±15% —0% at max.	150V D.C.	Variable	A6
C6	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	B3
C7	0.01μF	±25%	200V D.C.	Paper, insulated, tubular	B2
C8	0.002μF	±20%	350V D.C.	Moulded, mica	B6
C9	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	B5
C10	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	B3
C11	3—30pF	±15% —0% at max.	150V D.C.	Variable	B6
C12	3—30pF	±15% —0% at max.	150V D.C.	Variable	B6
C13	3—30pF	±15% —0% at max.	150V D.C.	Variable	C6

Table 1002—Components, W.S. 88, A.F.V.—(contd.)

Circuit ref.	Value	Tolerance	Rating	Type	Location ref. (Fig. 1002)
		CONDENSERS (contd.)			
C14	3—30pF	±15% —0% at max.	150V D.C.	Variable	C6
C15	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	B2
C16	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	C3
C17	3—30pF	±15% —0% at max.	150V D.C.	Variable	C2
C18	3—30pF	±15% —0% at max.	150V D.C.	Variable	C2
C19	3—30pF	±15% —0% at max.	150V D.C.	Variable	D2
C20	3—30pF	±15% —0% at max.	150V D.C.	Variable	D2
C21	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	D4
C22	0.002μF	±20%	350V D.C.	Moulded, mica	D6
C23	100pF	±10%	500V D.C.	Silvered, ceramic, tubular	D5
C24	3—30pF	±15% —0% at max.	150V D.C.	Variable	D6
C25	2—8pF	±15% —0% at max.	150V D.C.	Variable	D6
C26	2—8pF	±15% —0% at max.	150V D.C.	Variable	E6
C27	2—8pF	±15% —0% at max.	150V D.C.	Variable	E6
C28	0.002μF	±20%	350V D.C.	Moulded, mica	D3
C29	6.8pF	±10%	500V D.C.	Ceramic, non-insulated	D6
C30	0.01μF	±25%	200V D.C.	Paper, insulated, tubular	F5
C31	0.002μF	±20%	350V D.C.	Moulded mica	D6
C32	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	E2
C33	0.002μF	±20%	350V D.C.	Moulded, mica	D6
C34	100pF	±10%	500V D.C.	Silvered, ceramic, tubular	F5
C35	100pF	±10%	500V D.C.	Silvered, ceramic, tubular	F5
C36	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	F1
C37	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	F3
C38	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	F4
C39	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	F2
C40	0.01μF	±25%	200V D.C.	Paper, insulated, tubular	G5
C41	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	G3
C42	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	G3
C43	0.002μF	±25%	200V D.C.	Paper, insulated, tubular	H5
C44	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	C2
C45	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	G3
C46	33pF	±2½%	500V D.C.	Silvered, ceramic, tubular	G3
C47	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	H2
C48	0.01μF	±25%	200V D.C.	Paper, insulated, tubular	H3
C49	25pF	±2½%	500V D.C.	Silvered, ceramic, tubular	H3
C50	47pF	± 2%	500V D.C.	Silvered, ceramic, tubular	J3
C51	47pF	± 2%	500V D.C.	Silvered, ceramic, tubular	J2
C52	200pF	±20%	350V D.C.	Moulded mica foil	J2
C53	0.01μF	±25%	200V V.C.	Paper, insulated, tubular	J3
C54	0.002μF	±25%	200V D.C.	Paper, insulated, tubular	K3
C55	0.001μF	±25%	350V D.C.	Moulded mica	K2
C56	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	K3
C57	300pF	±20%	350V D.C.	Moulded, mica foil	K2
C58	0.001μF	±25%	350V D.C.	Moulded, mica	K3
C59	4.7pF	±0.5pF	500V D.C.	Ceramic, non-insulated	H2
C60	180pF	± 2%	500V D.C.	Silvered, ceramic, tubular	F5
C61	25pF	±2½%	500V D.C.	Silvered, ceramic, tubular	H3
C62	0.1μF	±25%	150V D.C.	Paper, insulated, tubular	G1
C63	4.7pF	±0.5pF	500V D.C.	Ceramic, non-insulated	B6

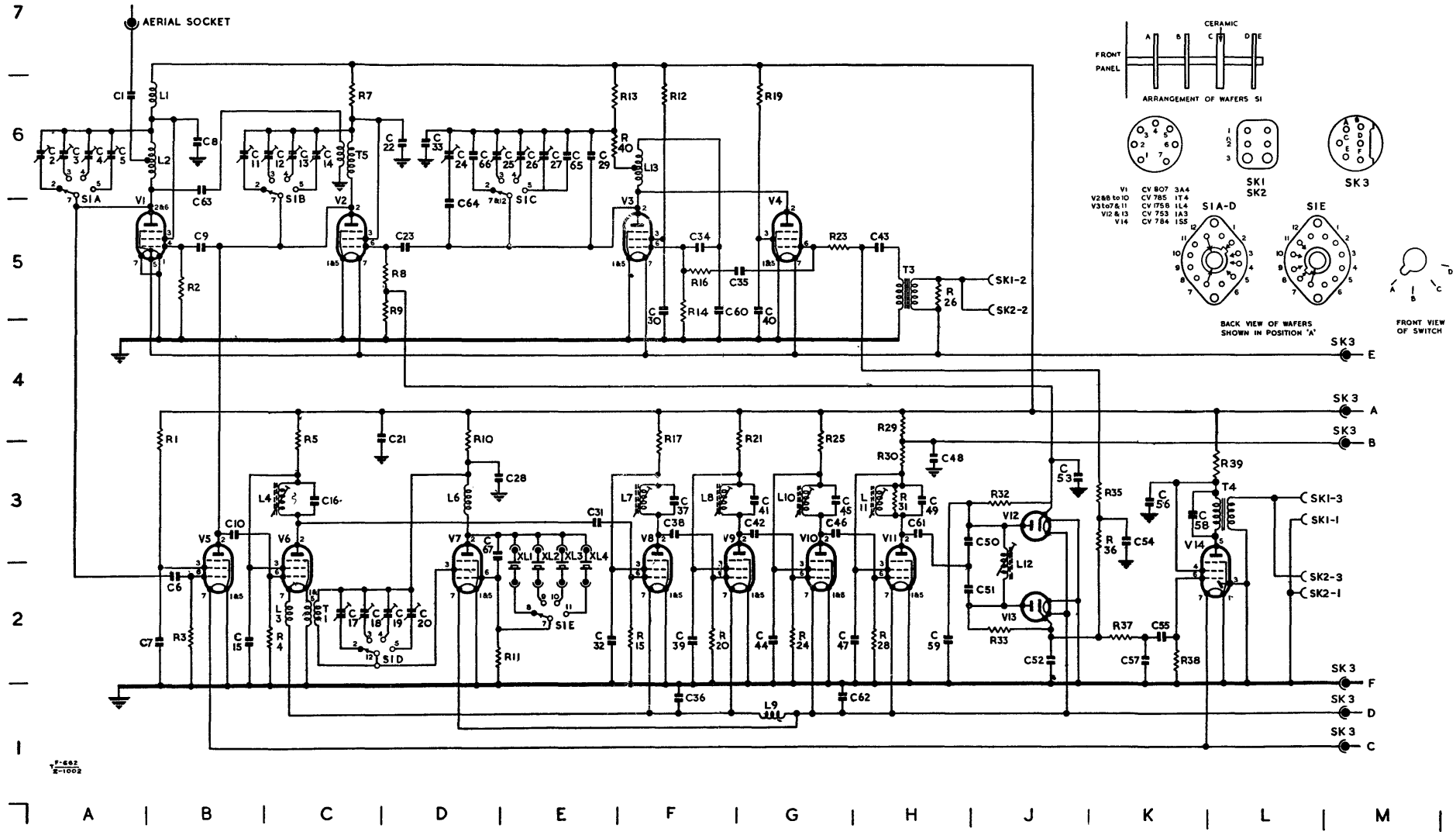
Table 1002—Components, E.S. 88, A.F.V.—(contd.)

Circuit ref.	Value	Tolerance	Rating	Type	Location ref. (Fig. 1002)
			CONDENSERS (contd.)		
C64	56pF	± 5%	500V D.C.	Silvered, ceramic, tubular	D6
C65	1pF	±20%	500V D.C.	Silvered, ceramic bead	E6
C66	1pF	±20%	500V D.C.	Silvered, ceramic bead	D6
* C67	10pF	±0.5%	500V D.C.	Ceramic	D3
* Not in early models					

Circuit ref.	Value or function	Location ref. (Fig. 1002)
	INDUCTORS	
L1	Power amplifier anode choke	B7
L2	Aerial coil assembly	B6
L3	Mixer filament choke	C2
L4	Mixer anode coil	C3
L6	Crystal oscillator anode choke	D3
L7	1st I.F. amplifier anode coil	F3
L8	2nd I.F. amplifier anode choke	F3
L9	Filament circuit choke	G1
L10	3rd I.F. amplifier anode coil	G3
L11	Limiter anode coil	H3
L12	Discriminator coil	J3
L13	Master oscillator coil	F6
	TRANSFORMERS	
T1	Trebler coil transformer	C2
T3	Microphone transformer	H5
T4	Output transformer	L3
T5	Doubler coil transformer	C6
	SWITCHES	
S1A	Part of 5-pole, 4-position, channel selector switch	A6
S1B		B6
S1C		
S1D		C2
S1E		E2

Table 1002—Componenets, W.S. 88, A.F.V.—(contd.)

Circuit ref.	Value or function			Location ref. (Fig. 1002)
	VALVES			
V1	CV 807 (3A4)			A5
V2	CV 785 (1T4)			G5
V3	CV 1758 (1L4)			F5
V4	CV 1758 (1L4)			G5
V5	CV 1758 (1L4)			B3
V6	CV 1758 (1L4)			C3
V7	CV 1758 (1L4)			D3
V8	CV 785 (1T4)			F3
V9	CV 785 (1T4)			F3
V10	CV 785 (1T4)			G3
V11	CV 1758 (1L4)			H3
V12	CV 753 (1A3)			J3
V13	CV 753 (1A3)			J2
V14	CV 784 (1S5)			L3
	CRYSTALS			
		Channel Type A	Crystal frequency Type A	
XL1	Receiver	A	6,525kc/s	E3
XL2	Oscillator (V7)	B	6,400kc/s	E3
XL3	Anode-grid	C	6,317kc/s	E3
XL4		D	6,200kc/s	E3



• Fig. 1002—Wireless set, No. 88, A.F.V.—circuit diagram

0 Table 1003—Power supply and amplifier unit—components list (see Fig. 1003)

Circuit ref.	Value	Tolerance	Rating	Type	Location ref. (Fig. 1003)
				RESISTORS	
R1	12Ω	± 5%	5W	Fixed, wire-wound, vitreous, enamelled	G5
R2	12Ω	± 5%	5W	Fixed, wire-wound, vitreous, enamelled	G5
* R3	33Ω	±10%	½W	Fixed, carbon, Grade II, insulated	G5
R4	15Ω	±20%	½W	Fixed, carbon, Grade II, insulated	E5
R5	15Ω	±20%	½W	Fixed, carbon, Grade II, insulated	E5
R6	1,000Ω	±20%	½W	Fixed, carbon, Grade II, insulated	C5
R7	1,000Ω	±20%	½W	Fixed, carbon, Grade II, insulated	C5
R8	1.5Ω	± 5%	1W	Fixed, wire-wound, vitreous, enamelled, miniature	C5
R9	1.5Ω	± 5%	1W	Fixed, wire-wound, vitreous, enamelled, miniature	C4
R10	820Ω	±10%	¾W	Fixed, carbon, Grade II, insulated	B5
R11	100Ω	±10%	½W	Fixed, carbon, Grade II, insulated	E2
R12	100kΩ	±20%	½W	Fixed, carbon, Grade II, insulated	C2
R13	100Ω	±10%	½W	Fixed, carbon, Grade II, insulated	C2
R14	2.2MΩ	±20%	½W	Fixed, carbon, Grade II, insulated	D2
R15	36Ω	± 2%	½W	Fixed, wire-wound, lacquered	D2
R16	330kΩ	±20%	½W	Fixed, carbon, Grade II, insulated	E3
R17	6.8kΩ	±20%	½W	Fixed, carbon, Grade II, insulated	F3
R18	120Ω	± 2%	½W	Fixed, wire-wound, lacquered	F2
R19	4.7Ω	± 5%	1W	Fixed, wire-wound, vitreous, enamelled miniature	G2
R20	100kΩ	±20%	½W	Fixed, carbon, Grade II, insulated	F2
RV1	10Ω	±10%	20W	Wire-wound, tubular, pre-set	F4
RV2	10Ω	±10%	20W	Wire-wound, tubular, pre-set	F2
RV3	1MΩ	—	¼W	Variable, carbon, miniature	C2
* Not in models serial Nos. 1-1000.					
				CONDENSERS	
C1	0.1μF	±25%	150V	Fixed, metallized, paper, miniature, neoprene, sleeved	H5
C2	250μF	−20% +50%	25V	Fixed, electrolytic, tubular, metal-cased	G5
C3	500μF	−20% +50%	12V	Fixed, electrolytic, tubular, metal-cased	F4
C4	0.1μF	±20%	350V	Fixed, paper, tubular, metal	F5
C5	0.1μF	±20%	350V	Fixed, paper, tubular, metal-cased	F5
C6	0.1μF	±20%	350V	Fixed, paper, tubular, metal-cased	E4
C7	0.1μF	±20%	350V	Fixed, paper, tubular, metal-cased	E5
C8	0.1μF	±20%	350V	Fixed, paper, tubular, metal-cased	D5
C9	0.1μF	±20%	350V	Fixed, paper, tubular, metal-cased	D5
C10	0.1μF	±20%	500V	Fixed, paper, tubular, metal-cased	C5
C11	0.1μF	±20%	500V	Fixed, paper, tubular, metal-cased	C4
C12	8μF	−20% +100%	150V	Fixed, electrolytic, tubular, metal-cased	B4
C14	0.1μF	±25%	150V	Fixed, metallized, paper, miniature neoprene, sleeved	C1
C15	0.001μF	+100% − 0%	350V	Fixed, mica, stacked foil, moulded	E3
C16	0.1μF	±25%	150V	Fixed, metallized, paper, miniature, neoprene, sleeved	E2
C17	8μF	−20% +100%	150V	Fixed, electrolytic, tubular, metal-cased	B4
C18	8μF	−20% +100%	150V	Fixed, electrolytic, tubular, metal cased	A4
C19	8μF	−20% +100%	150V	Fixed, electrolytic, tubular, metal-cased	B4
C20	0.001μF	+100% − 0%	350V	Fixed, mica, stacked foil, moulded	D3

Table 1003—Power supply and amp. unit—components list (contd.)

Circuit ref.	Valve or function	Location ref. (Fig. 1002)
	INDUCTORS	
L1	Choke, R.F. smoothing	F5
L2	Choke, R.F. smoothing	D5
L3	Choke, R.F. smoothing	D4
L4	Choke, H.T. smoothing	B5
	TRANSFORMERS	
T1	Transformer, vibrator	D5
T2	Input transformer to output valve	C2
T3	Intercom. transformer	D2
T4	Output transformer	E3
T5	Microphone, amplifier output transformer	F3
T6	Microphone, amplifier input transformer	F2
	VALVES	
V1	CV 135 (DDR3) Rectifier	C4
V2	CV 135 (DDR3) Rectifier	C5
V3	CV 807 (3A4) Output amplifier	D3
V4	CV 784 (1S5) Microphone amplifier	F3
	SWITCHES	
S1A S1B	2-pole, change-over	E1 G5
	MISCELLANEOUS	
VB1	Vibrator	E5
X1	Carbon-pile voltage regulator	F5
LP1	Indicator lamp	G5
F1	Fuse	F5
RL/4	Send-receive relay	G2
	RELAY CONTACTS	
RL1		F3
RL2		G3
RL3		B5
RL4		D2

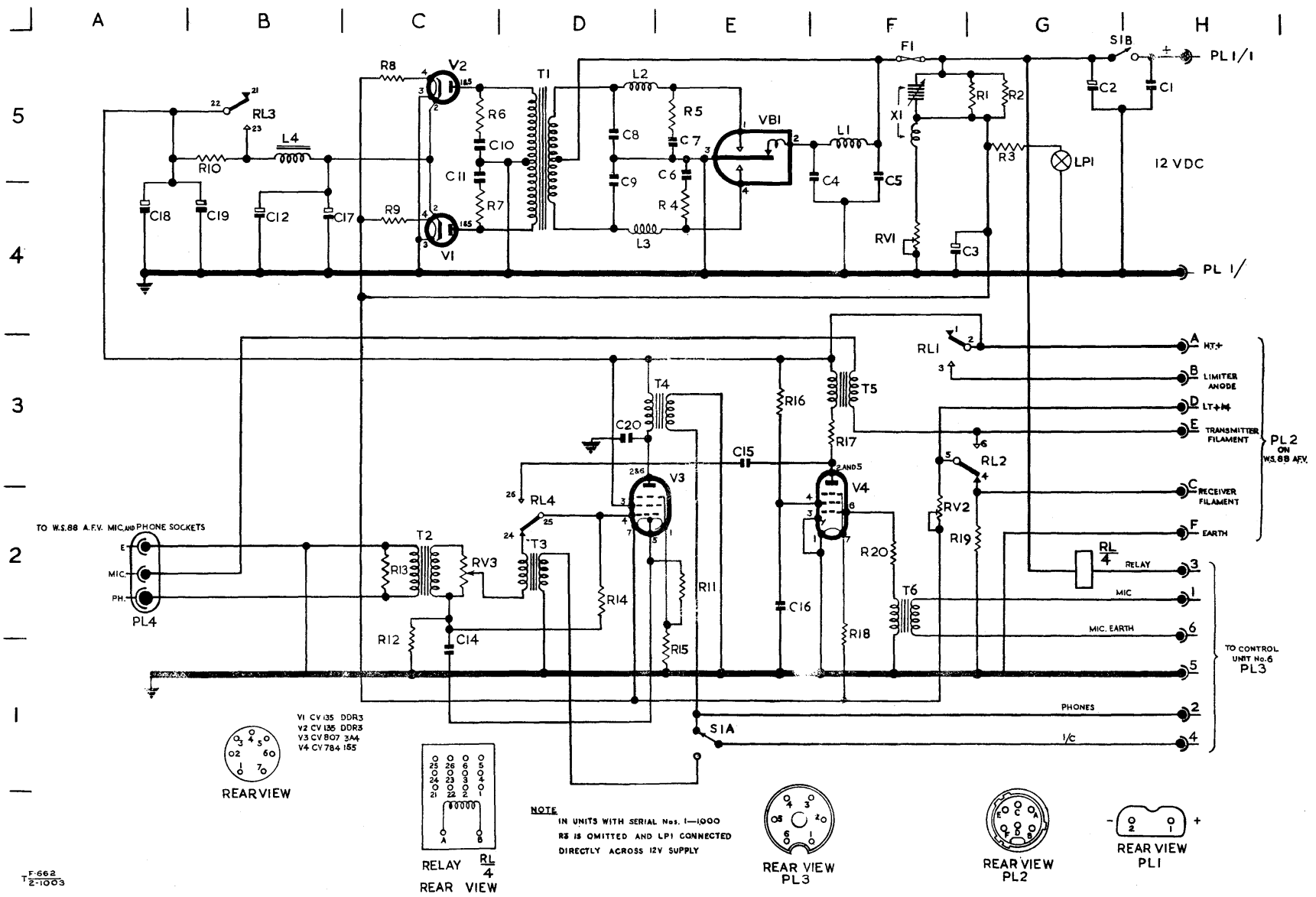


Fig. 1003—Power supply and I.F. amplifier unit No. 2—circuit diagram

Circuit ref.	Value	Tolerance	Rating	Type
		RESISTORS		
R1	22 Ω	±20%	½W	Fixed, carbon
R2	10kΩ	±20%	½W	Fixed, carbon
R3	100 Ω	±20%	½W	Fixed, carbon
R4	100 Ω	±20%	½W	Fixed, carbon
Circuit ref.	**Description**			
		SWITCHES		
S1				
S2				
S3				
		MISCELLANEOUS		
F1	Fuse			
LP1	Indicator lamp			

Table 1004—Control units Nos. 16 and 17—(List of components) (see Figs. 1004 and 1005)

Note: This issue, Page 1012, supersedes Page 1012 of Issue 3, dated 26 Jan. 1951. The figure has been amended.

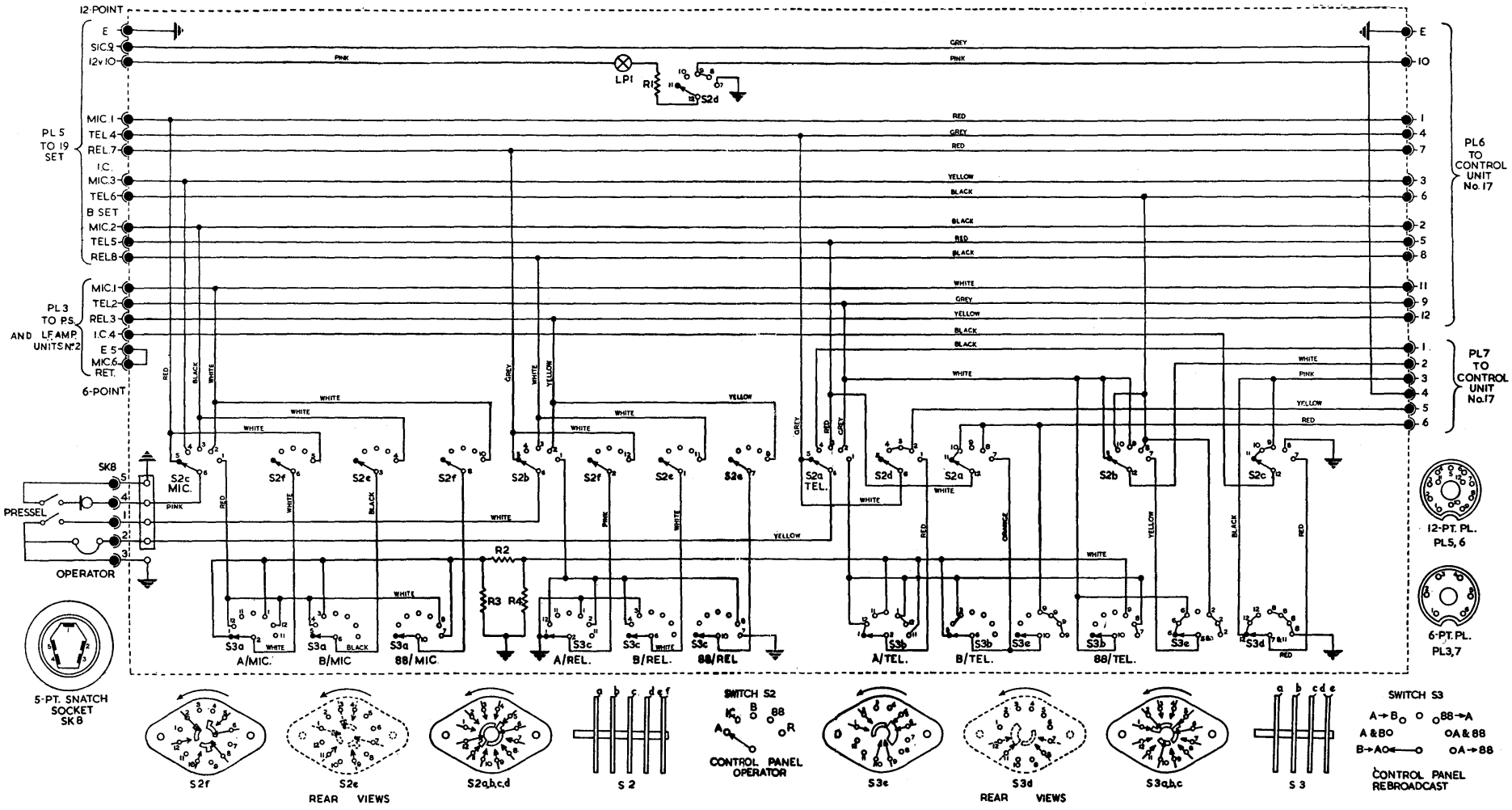


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Fig. 1004 - Control unit No. 16 - circuit diagram

Note: This Issue, Page 1013, supersedes Page 1013 of Issue 2, dated 6 Feb. 1950. The figure has been amended.

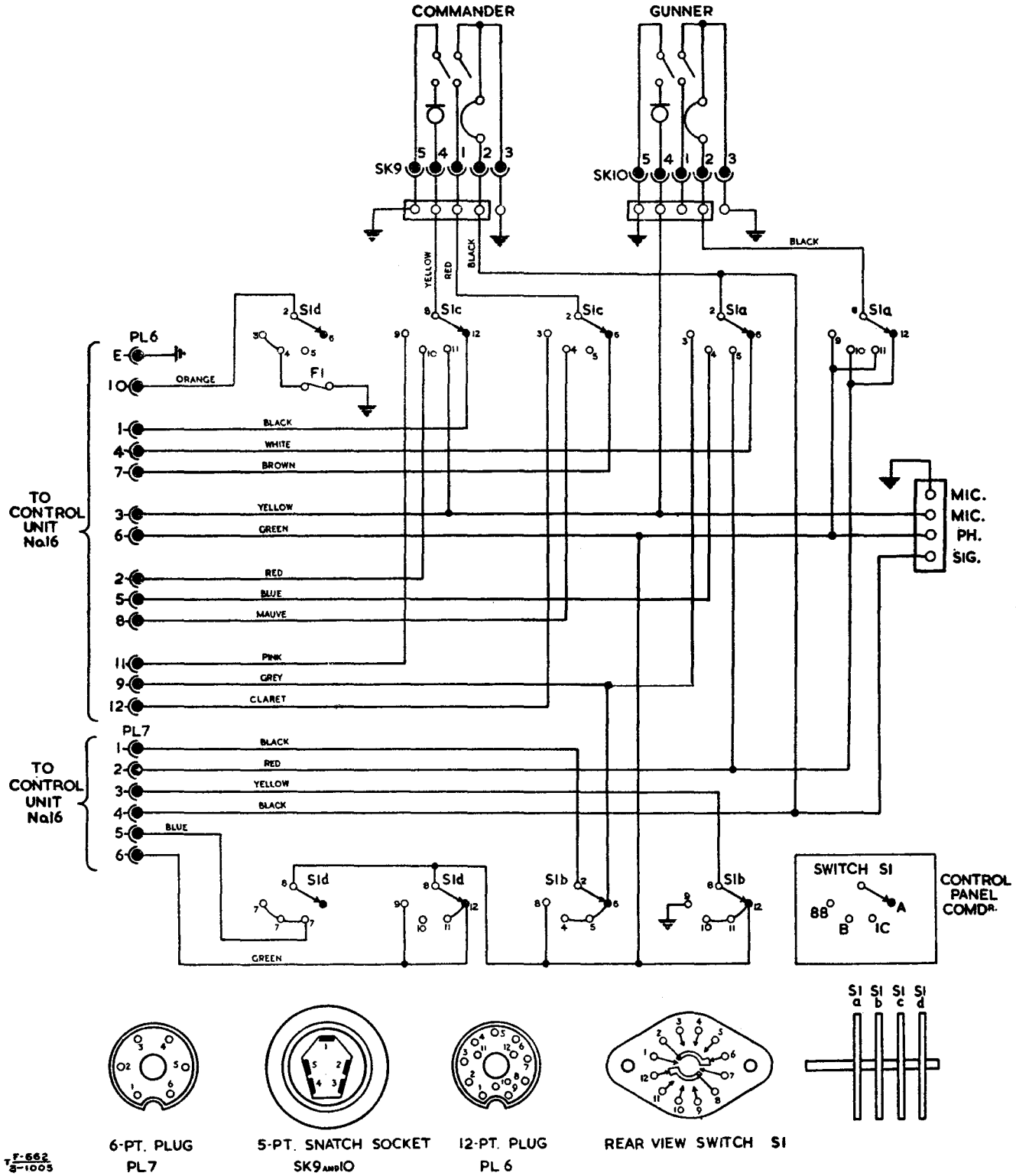

Fig. 1005 - Control unit No. 17 - circuit diagram

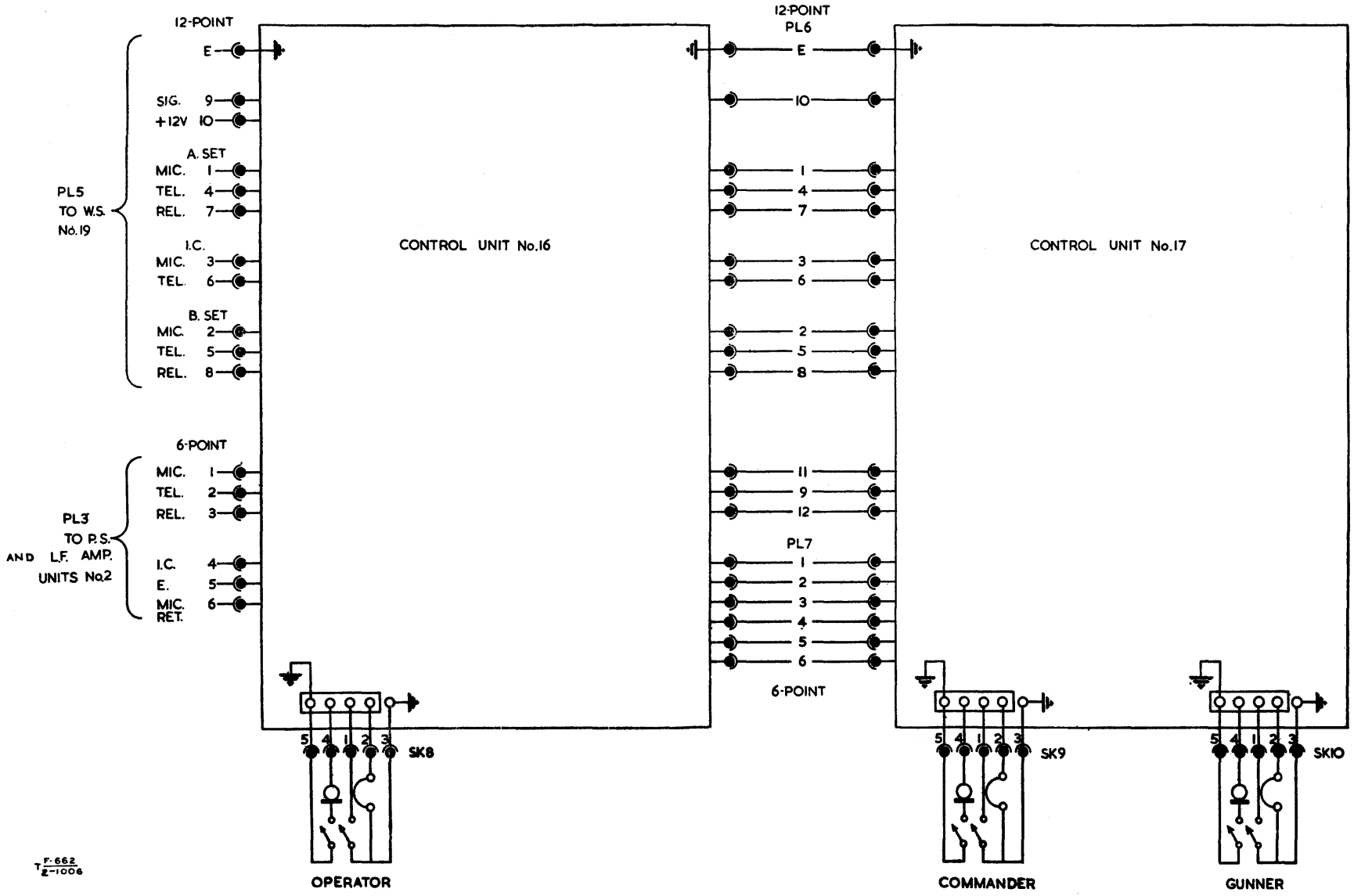

Fig. 1006—Connections between Control units Nos. 16 and 17

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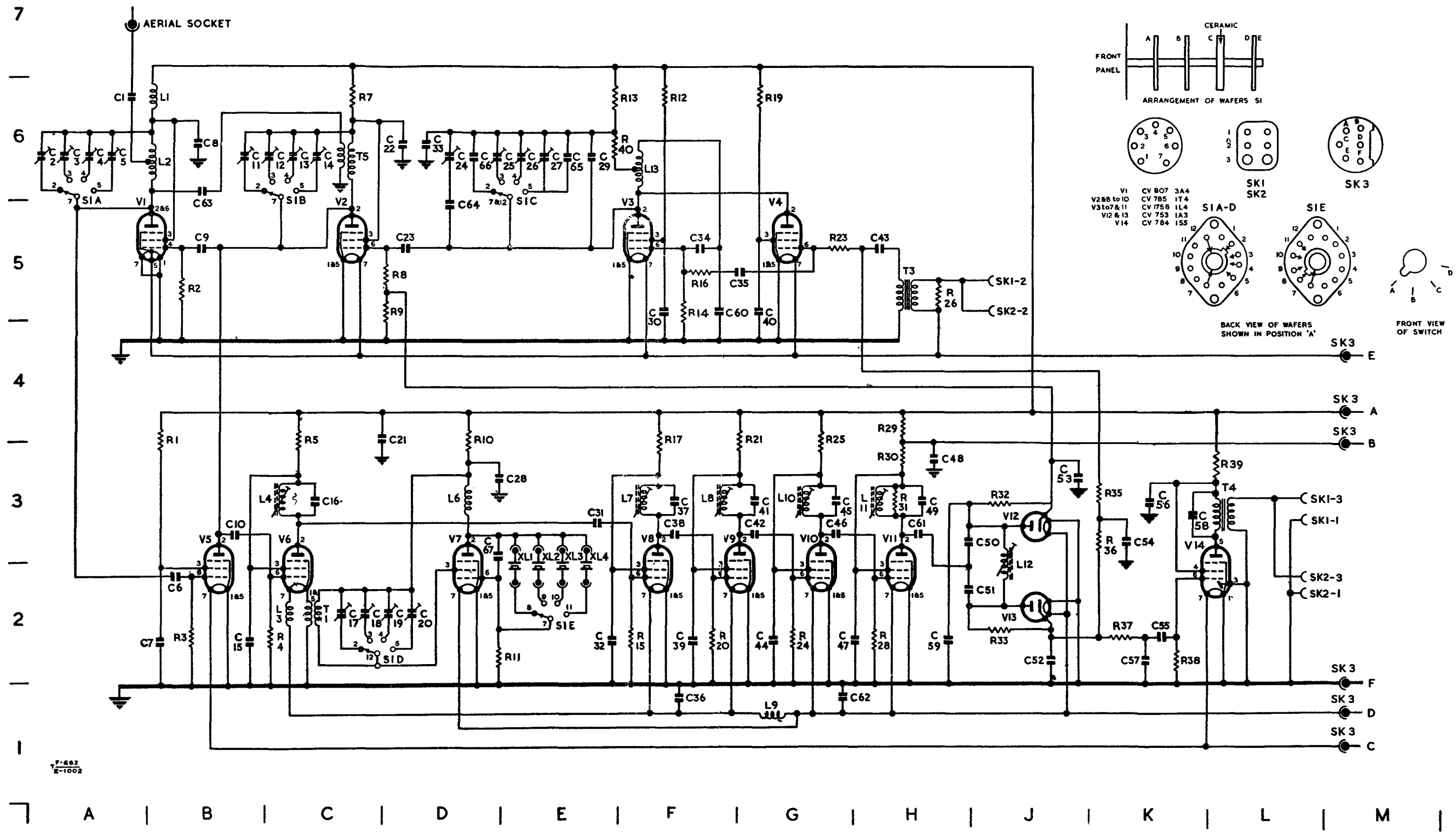

Fig. 1002—Wireless set, No. 88, A.F.V.—circuit diagram

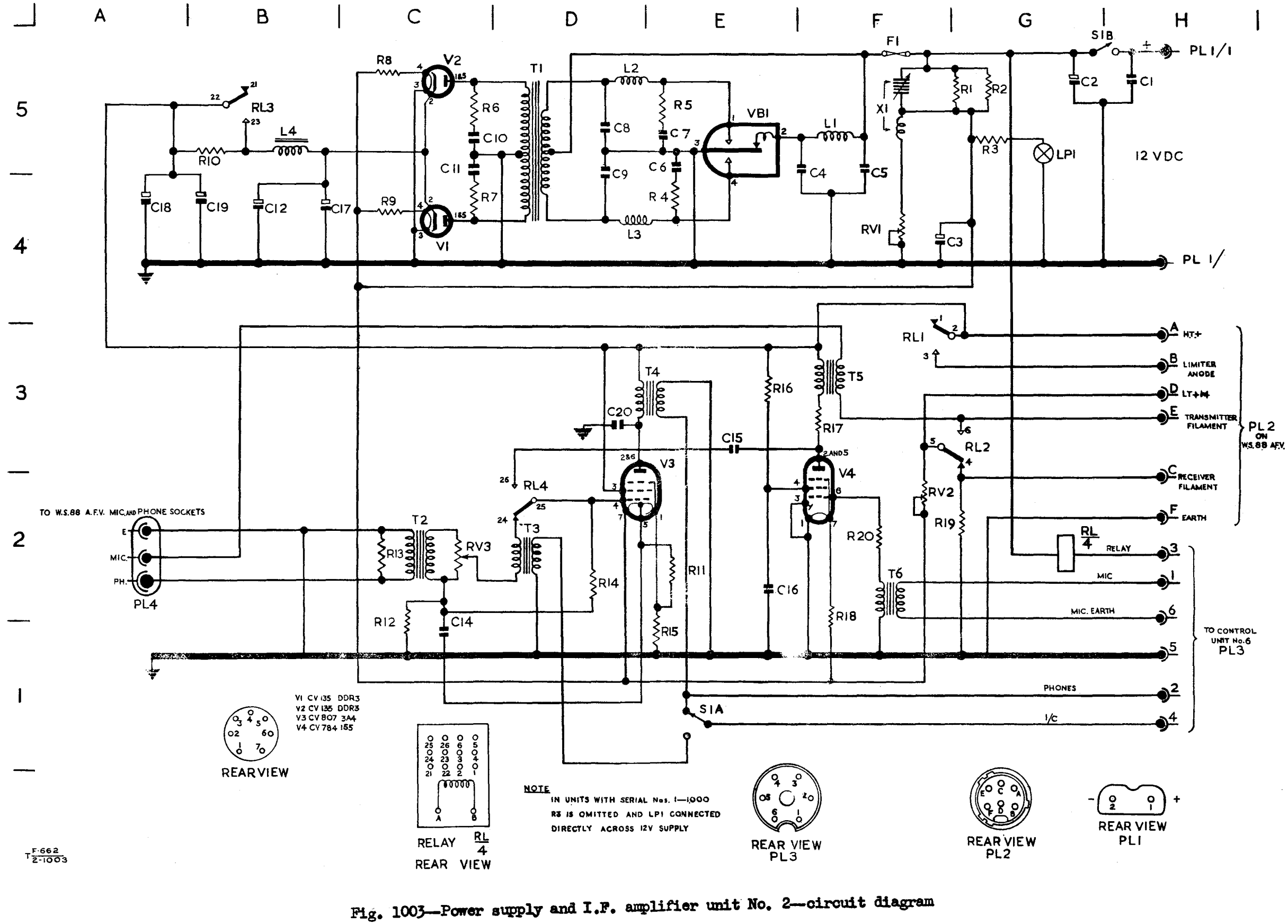

Fig. 1003—Power supply and I.F. amplifier unit No. 2—circuit diagram

Note: This issue, Page 1012, supersedes Page 1012 of Issue 3, dated 26 Jan. 1951. The figure has been amended.

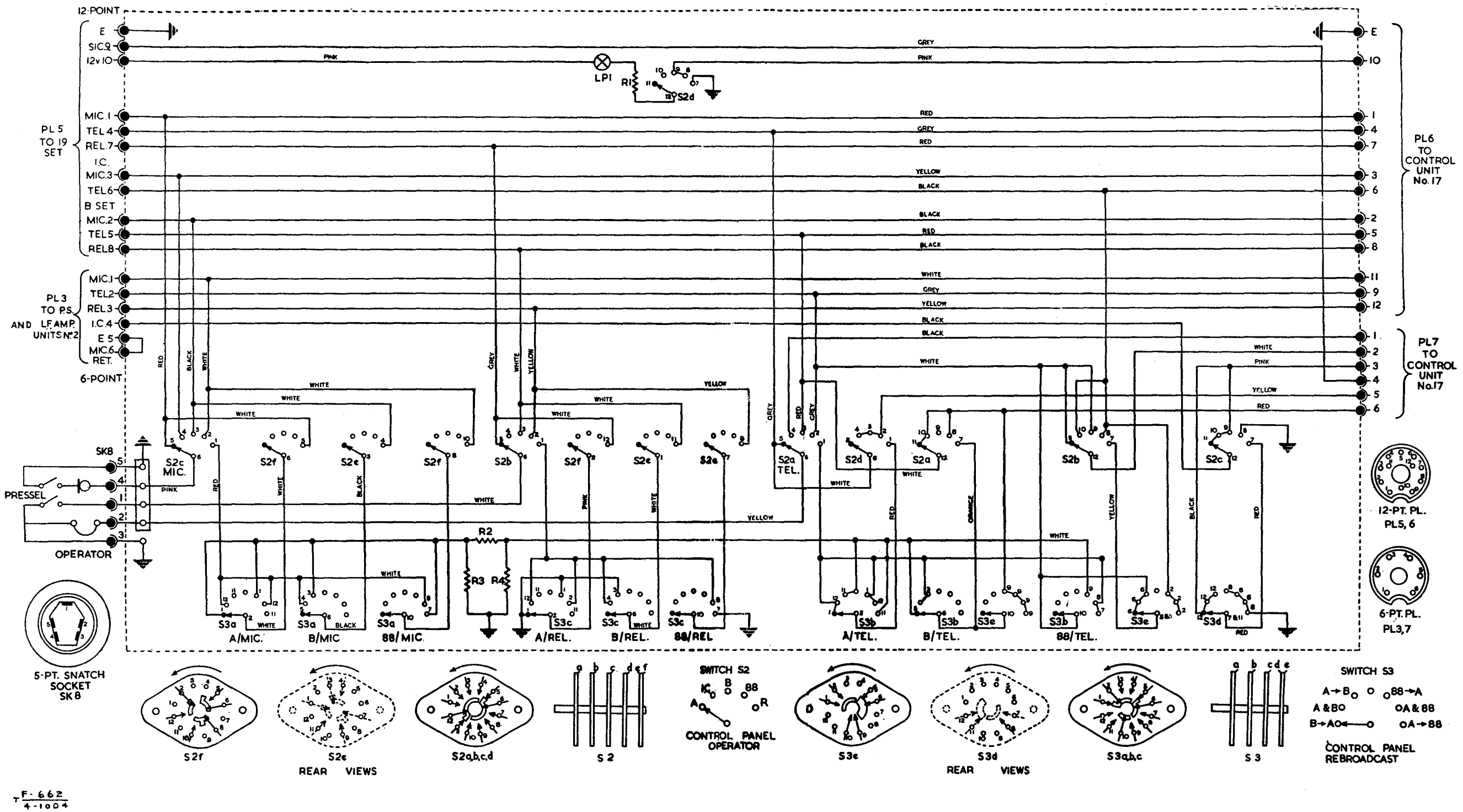

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Fig. 1004 - Control unit No. 16 - circuit diagram

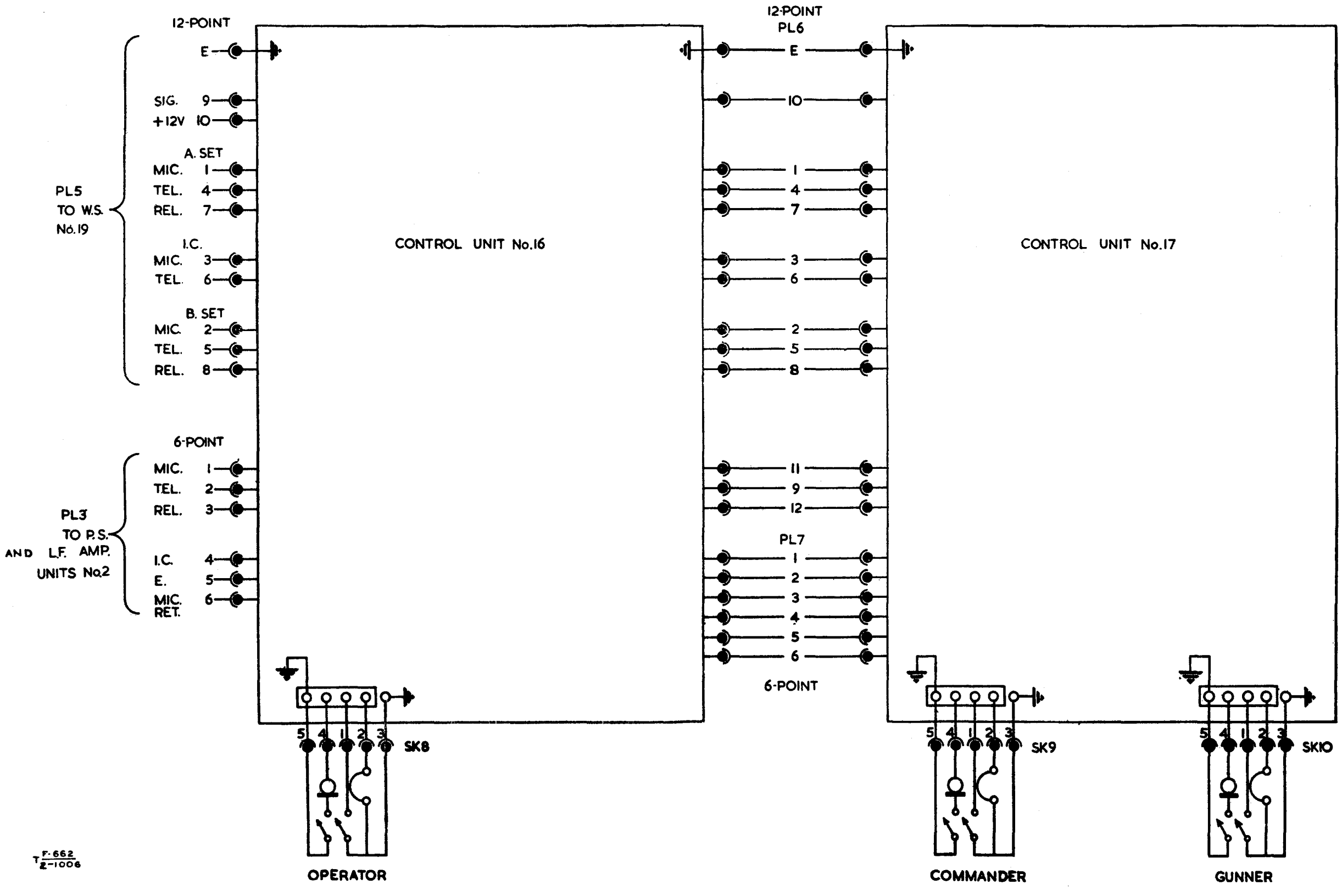

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Fig. 1006—Connections between Control units Nos. 16 and 17

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