Group 1 COMMUNICATIONS

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WARNING . . .

Voltages in excess of 100 volts a.c. or d.c. can be dangerous under certain circumstances Personnel should therefore ensure that the electrical system is electrically safe before any servicing is attempted. Where it is essential that tests or adjustments are to be carried out with the electrical power switched on the greatest care must be exercised.

DESCRIPTION AND OPERATION

Introduction

1. This group contains brief descriptive notes on the operation and functioning of equipment used in the communications installation. The servicing instructions consist only of checking the power supplies to the installation as all necessary information on the testing and servicing of equipment, together with detailed descriptions of operation, is given in the relevant Air Publication for each system referred to in the appropriate paragraphs.

INTERCOMMUNICATION
(post Mod. 2874)

Introduction

2. The system provides normal mic./tel facilities at each crew station and at the sextant position. For servicing purposes mic./tel. sockets are provided in the nose radome (behind the access panel), and on the port side of panel J. A mic./tel. socket for ground external communication is located at the external electrical service panel. Conference facilities are provided for, between the 1st and 2nd navigator. A list of the components which make up the system is contained in Table 1.

3. Facilities are provided for H.F., V.H.F. and U.H.F., (Mod. 2437) communication by connecting these three systems into the normal I/C system. The A.R.I.5800 (tail warning), A.R.I.23023 (Radio Compass) and A.R.I.18011 (I.L.S.) systems are also fed into the normal I/C system.

Amplifiers, Type A.1961

4. Two amplifiers are mounted in the radio crate to provide power for the normal I/C and conference I/C systems. Rotary transformers contained in the units provide the H.T. for the valves, whilst voltage regulators also contained in the units provide the 19 volts for the valve heaters. 28 volts d.c. is supplied to the normal I/C amplifier either from a fuse at panel G or from a fuse at the essential services bus-bar. The conference amplifier is supplied from a fuse at panel G via the conference amplifier ON/OFF switch, at the 2nd navigator's station, on the radio crate. For detailed information on the operation and description of the amplifier reference may be made to A.P.2876E, Vol. 1.

Junction box, Type 154

5. The junction box, mounted in the radio crate, connects the output of the normal I/C amplifier to the mic./tel. sockets and associated circuits. Two relays are mounted on the junction box beneath a small screening cover. The normal/emergency relay allows the system to function in either condition upon selection at the control unit, whilst the transmitting relay operates when the press-to-transmit switch is selected. For detailed information on the operation and description of the junction box reference should be made to A.P.2876E, Vol. 1.

Control unit, Type 702

6. The unit, mounted in the radio crate, incorporates ON/OFF and NORM./EMY. switches. With the ON/OFF switch selected to ON and the NORM./EMY. switch selected to NORM. all the microphone services are connected to the amplifier. If the pilot's press-to-transmit switch is operated, while the system is operating normally, the pilot's microphone is connected to the V.H.F.

transmitter receiver and isolated from the I/C system, but all telephones will remain connected to the I/C system.

7. When the NORM./EMY. switch is selected to EMY. with the ON/OFF switch in either position, all the microphones are connected to the microphone lines of the V.H.F. or U.H.F. (Mod. 2437) transmitter-receivers as required, and the telephones to the A.F. amplifiers to provide emergency communication.

Relay box

8. The I/C relay box, mounted in the radio crate, contains five relays numbered 1 to 5 which operate as follows:—

9. When the 1st pilot's I.C./H.F. switch, mounted on the port coaming panel, is selected to H.F., relay No. 1 is energized and operates to disconnect the 1st Pilot's mic./tel. circuit from the I/C system and connect it to the H.F. system (A.R.I.5874). With the 1st pilot's switch in the H.F. position the press-to-transmit circuit is inoperative but V.H.F. or U.H.F. (Mod. 2437) facilities remain available to the 2nd pilot.

10. When the 2nd pilot's I.C./H.F. switch, mounted on the starboard coaming panel, is selected to H.F., relay No. 2 is energized and operates to disconnect the 2nd pilot's mic./tel. circuit from the I/C system and connect it to the H.F. system (A.R.I.5874). With the 2nd pilot's switch in the H.F. position the press-to-transmit circuit is inoperative but V.H.F. or U.H.F. (Mod. 2437) facilities remain available to the 1st pilot.

11. When the Air Electronics Officer's I.C./H.F. switch is selected to H.F., relay No. 3 is energized and operates to disconnect the A.E.O.'s mic./tel. circuit from the I/C system and connect it to the H.F. system (A.R.I.5874). The morse key may be used when the switch is selected to H.F.

12. Operation of either the 1st or 2nd pilot's press-to-transmit switches energizes relay No. 4, which operates to complete the negative lines of the V.H.F. or U.H.F. (Mod. 2437) transmitter microphones. It should be noted that the operation of only one press-to-transmit switch brings both pilot's microphones into circuit when both the pilot's I.C./H.F. switches are selected to I.C., and that each press-to-transmit switch is operative only when the I.C./H.F. switch for the same pilot's position is selected to I.C.

13. Relay No. 5 is energized, when the I.L.S. power supply is switched on, to connect the I.L.S. installation to the I/C system via the I/C junction box, Type 154.

14. Mod. 2746 provides an additional terminal block (No. 9) to cater for V.H.F. simulated bombing release tone (*para.* 60).

Radio compass/intercommunication switches

15. RC/IC switches are provided for the 1st and 2nd pilots, and for the 1st navigator. Selection to RC isolates the respective telephone circuit from the I/C system and connects it to the radio compass installation. Selection to OVERRIDE of the pilot's NORMAL/OVERRIDE switch, mounted on the port coaming panel, energizes a type 102A relay, located in the radio crate, to override the navigator's RC/IC switch. The A.E.O.'s CALL PILOT switch, when selected ON, completes an alternative telephone circuit to the pilot's mic/tel. socket.

V.H.F. isolation switches

16. The A.E.O.'s V.H.F. IN ISOLATION switch, when selected ON, completes a circuit from the relay box to the operating coils of the two Type 102A relays, mounted in the radio crate. Operation of the relays isolates the A.E.O.'s mic./tel. socket from the normal I/C system and completes it to the V.H.F. installation. Communication between the 1st pilot and the A.E.O., when in isolation, is facilitated by the CREW CALL switch, mounted on the port coaming panel. Selection of the switch to CREW CALL, connects a 28 volts d.c. supply from the relay box to a call lamp at the A.E.O.'s station.

Conference/normal I/C change-over

17. With the 1st navigator's CONFERENCE/NORMAL switch selected to CONFERENCE, a circuit is completed from the relay box via the pilot's NORMAL/OVERRIDE switch to the operating coil of a type 102A relay, mounted in the radio crate. Operation of the relay isolates the normal I/C system from the 1st navigator's and 2nd navigator's mic./tel. sockets, and completes the conference I/C system. Communication between the two navigators when in conference, and the 1st pilot is facilitated by a call lamp at the 1st navigator's station, wired in parallel with the A.E.O.'s call lamp (*para.* 16).

18. Post Mod. 2894 combined oxygen and I/C leads are fitted at each crew station on the radio crate.

INTERCOMMUNICATION (pre. Mod. 2874)

Introduction

19. The system provides normal mic./tel. facilities at each crew station. In addition mic./tel. sockets are provided at the sextant station and, for servicing purposes, in the radome behind the access panel in the upper part and on the port side of panel J. A mic./tel. socket for ground external communication is located at the external electrical services panel. A list of the components which make up the system is contained in Table 2.

20. Facilities are provided for H.F., V.H.F. and U.H.F. (Mod. 2437) communication by connecting these three systems into the I/C system. The A.R.I. 5800 (Tail warning), A.R.I.23023 (Radio compass), and A.R.I. 18011 (I.L.S.) systems are also connected to enable their output signals to be fed into the I/C system.

Amplifier, Type A.1961

21. The amplifier, mounted in the radio crate, provides the power for the system. A rotary transformer contained in the unit provides the H.T. for the valves, whilst a voltage regulator, also contained in the unit, provides the 19 volts for the valve heaters.

22. For detailed information on the operation and description of the amplifier reference should be made to A.P.2876E, Vol. 1.

Junction box, Type 154

23. The junction box, mounted in the radio crate, connects the output of the amplifier to the mic./tel. sockets and associated circuits. Two relays are mounted on the junction box beneath a small screening cover. One relay, known as the normal/emergency relay, allows the system to function in either condition, on selection at the control unit. The other relay is known as the transmitting relay and operates when the press-to-transmit switch is depressed.

24. For detailed information on the operation and description of the junction box reference should be made to A.P.2876E, Vol. 1.

Control unit, Type 702

25. The unit, mounted in the radio crate, incorporates ON/OFF and NORM./EMY. switches. With the ON/OFF switch selected to ON and the NORM./EMY. switch to NORM., all the microphone services are connected to the amplifier. If the pilot's press-to-transmit switch is depressed, whilst the system is operating normally, the pilot's microphone is connected to the V.H.F. or U.H.F. (Mod. 2437) transmitter receiver and isolated from the I/C system, but all telephones will remain connected to the I/C system.

26. When the NORM./EMY. switch is selected to EMY. with the ON/OFF switch in either position, all the microphones are connected to the microphone lines of the V.H.F. or U.H.F. (Mod. 2437) transmitter receivers as required, and the telephones to the A.F. amplifiers to provide emergency communication.

Relay box

27. The I/C relay box, mounted in the radio crate, contains five relays numbered 1 to 5 which operate as follows.

28. When the 1st pilot's I.C./H.F. switch, mounted on the port coaming panel, is selected to H.F., relay No. 1 is energized and operates to disconnect the 1st pilot's mic./tel. circuit from the I/C system and connect it to the H.F. system (A.R.I.5874). With the 1st pilot's switch in the H.F. position the press-to-transmit circuit is inoperative, but V.H.F. or U.H.F. (Mod. 2437) facilities remain available to the 2nd pilot.

29. When the 2nd pilot's I.C./H.F. switch, mounted on the starboard coaming panel, is selected to H.F., relay No. 2 is energized and operates to disconnect the 2nd pilot's mic./tel. circuit from the I/C system and connect it to the H.F. system (A.R.I.5874). With the 2nd pilot's switch in the H.F. position the press-to-transmit circuit is inoperative, but V.H.F. or U.H.F. (Mod. 2437) facilities remain available to the 1st pilot.

30. When the A.E.O.'s I.C./H.F. switch is selected to H.F., relay No. 3 is energized and operates to disconnect the A.E.O.'s mic./tel. circuit from the I/C system and to connect it to the H.F. system (A.R.I.5874). There is no press-to-transmit circuit for the A.E.O., but the morse key may be used when the switch is selected to H.F.

31. Operation of either the 1st or 2nd pilot's press-to-transmit switches energizes relay No. 4, which operates to complete the negative lines of the V.H.F. or U.H.F. (Mod. 2437) transmitter microphones. It should be noted that the operation of only one press-to-transmit switch brings both pilots microphones into circuit when both the pilots I.C./H.F. switches are selected to I.C., and that each press-to-transmit switch is operative only when the I.C./H.F. switch for the same pilot's position is selected to I.C.

32. Relay No. 5 is energized with the I.L.S. power supply switched on, when the I.L.S. receiver system will be connected to the I/C system, via the I/C junction box Type 154. Mod. 2746 provides an additional terminal block, No. 9, to cater for V.H.F. simulated bombing release tone (*para.* 60).

A.R.I.5874 H.F. COMMUNICATIONS

Introduction

33. The high frequency communications system is a general purpose medium power installation, with 24 pre-set crystal controlled channels giving a frequency coverage of between 2·8 and 18·1 Mc/s that may be switched in any order. Table 3 contains a list of the components which constitute A.R.I.5874.

34. It operates in bands Nos. 1, 2 and 3 over a range beyond and supplementing that of the V.H.F. and U.H.F. (Mod. 2437) systems, and provides for C.W., M.C.W. and R/T operation with a transmitter carrier output of approximately 100 watts.

35. The transmitter and receiver may be operated on dissimilar frequencies, or together on the same frequency. The system can be switched to I/C., and then linked through the power and radio unit Type 4192.

36. For detailed information on the description and operation of the items of equipment reference should be made to A.P.2535E, Vol. 1.

Receiver, Type 4187

37. The receiver, mounted in the radio crate, contains a power unit Type 4231 operated by a 28-volt d.c. supply and located behind the louvres of the receiver front panel. Also contained inside the receiver are the crystal oven Type 12, amplifier units, Type 4208 (I.F.) and Type 4207 (R.F.).

Band selection

38. The receiver range is divided into three frequency bands with the following coverage:—

Band 1 2·8—5·2 Mc/s
Band 2 5·2—9·7 Mc/s
Band 3 9·7—18·1 Mc/s

The operative frequency is selected by 'Band' relays in the R.F. amplifier, the selected inductors being tuned by a motor driven ganged capacitor.

Transmitter, Type T4188

39. The input from the crystal-controlled oscillator in the control and drive unit, Type 4190, is applied to an input amplifier in the transmitter, thence to a driver stage and finally to a power amplifier stage. The R.F. output from the final stage is applied to an aerial change-over relay in the control unit, Type 4190.

Auto/Manual operation

40. The change over from automatic to manual control is possible by using the AUTO/MAN. switch. In the manual conditon the transmitter coils can be rotated by means of the TRANS/TUNE knob to enable a mechanical check to be made during inspection of the equipment. The transmitter H.T. is not available in this condition.

Control unit, Type 4190

41. All control circuits necessary to operate the transmitter, together with the pre-set potentiometers for setting up the channels, are contained in this unit.

42. The control unit, mounted in the radio crate, is fitted with 24 crystals and an aperiodic crystal oscillator which determines the transmitter frequency and gives a nominal 2 volts at the signal frequency into a 70 ohms cable feeding the transmitter. The crystals are heated in an enclosed thermostatically controlled container, the thermostat controlling the temperature at above 10°C.

Control unit, Type 4189

43. All the controls for the operation and setting up are located at the remote control unit, Type 4189, mounted in the radio crate.

Channel letter (selection) switch

44. When the channel has been selected, the switch open-circuits the selector motor relay.

Channel number switch

45. This switch enables either of the two channel groups, 1A to 1M and 2A to 2M, to be selected.

Power switch

46. With the power switch in the S/BY position the receiver is switched on, but the transmitter H.T. is off and only the heater circuit is on. With the power switch selected to TX both the receiver and transmitter are on.

Service switch

47. The service required is selected with the switch in one of the following positions:—

RT —to permit operation of the press-to-transmit key.

MCW—transmitter to MCW.

CW.1—transmitter to CW. The CW oscillator at the receiver is switched on and the audio output is reduced.

CW.2—as for CW.1 but higher selectivity is provided in the IF amplifier.

INT. —this position gives an intertube facility by keying the transmitter oscillator only. The receiver mute line is broken to permit signal reception.

Fine tuning control

48. The frequency of the receiver 2nd oscillator can be varied by the fine tuning control which may be also used as a beat note control.

1/8 Power switch

49. The 1/8 power switch, mounted in the radio crate, enables the output from the transmitter to be reduced when the system is being tuned or when the full output of the transmitter is not required.

Control unit, Type 7216

50. The control unit, mounted in the radio crate, contains the necessary controls for frequency range selection and tuning of the aerial system. In addition the control unit is used for setting up the aerial system on pre-set frequencies and for manual fine tuning after the system has been automatically set up to a frequency channel. Located on the front panel of the unit is a SAFE indicator lamp, controlled by a pressure switch in the aerial tuning unit, Type 7016. Pressure in the aerial tuning unit is normally maintained at about 20 lb. per square inch absolute, when the SAFE indicator will be illuminated. Should the pressure fall below 16 lbs. per square inch absolute, operation of the pressure switch will extinguish the SAFE lamp.

Aerial system

51. Pre. Mod. 2690, the aerial probe and the matching strips are located in the port wing root, the impedance matching unit and the pressurized aerial tuning unit being mounted in the radar crate. Post Mod. 2690, the units and the probe and matching strips are located in the dorsal fin as shown in Group 4, figs. 1 and 8.

Power supplies

52. The 28-volts d.c. supply for the system is fed from the H.R.C. fuse W/T No. 2 on panel Z, via a 45 amp. circuit breaker, mounted on Panel G (pre. Mods. 2362 or 2446) or the port radio crate (post Mod. 2362 or 2446). The supply from the circuit breaker divides, one supply feeding the power and radio unit, Type 4192, and receiver, Type 4187, and another supply feeding the voltage regulator, via a fuse on panel G. The 19-volts d.c. for the valve

heaters is supplied from the voltage regulator, via a fuse on panel G.

A.R.I.18064 V.H.F. COMMUNICATIONS

Introduction

53. The V.H.F. system is a twin transmitter/receiver installation using one aerial located on the cabin hood fairing (pre. Mod. 2750 tail fin tip) and switched through a relay, Type 125, as required. Table 5 lists the components which comprise A.R.I. 18064. The two V.H.F. sets, No. 1 and No. 2, are 10-channel transmitter/receivers and are mounted with the change-over relay Type 102A, the aerial change-over relay Type 125 and the two voltage regulators Type 60 on a tray below the cabin floor. Pre.Mod.2750 the two sets are mounted, together with change-over relays Type 102 and S.2 and the aerial change-over relay Type 125, in the rear fuselage port side, forward of the rear access hatch. Located adjacent to the Type 102A (pre. Mod. 2750, Type 102) relay are two mic./tel. sockets, one for each V.H.F. set, for use when testing the respective set.

54. Pre. Mod. 1382 the aerial, besides being connected to the V.H.F. system, is also connected into the radio compass installation. Connection of the V.H.F. system to the normal I/C installation is via the junction box Type 154. Post Mod. 2437 a V.H.F./U.H.F. change-over switch, mounted on a panel at the rear of the control pedestal, connects either system to junction box Type 154 as required.

Control units, Type 382

55. Two control units, No. 1 mounted on the control pedestal, and No. 2 on the radio operator's table, provide remote control for their respective V.H.F. sets. Pre. Mod. 2437 both control units are mounted on the control pedestal. The control unit incorporates a rotary switch having an OFF position and providing 10 channel selections. A lamp mounted on the unit, and controlled by a dimmer switch, illuminates the channel lettering whenever a channel is selected.

Change-over of V.H.F. sets

56. When the system is operating normally only one V.H.F. set is working. To enable the other set to be brought into operation a change over system is incorporated.

57. Should No. 1 V.H.F. set be operating and it is necessary to bring into operation No. 2 V.H.F. set, the change over switch on the control pedestal must be selected NO. 2. When the change over switch is selected to NO. 2, a 28 volts d.c. supply from a fuse in panel G is connected to the operating coils of the change over relays, Type 102A and 125 (Pre. Mod. 2750, Types 102, S2 and 125).

58. Operation of the aerial change over relay, Type 125, disconnects No. 1 V.H.F. set from the aerial and connects No. 2. No. 1 V.H.F. set is isolated from the I/C system, and No. 2 V.H.F. set connected, by the operation of the change over relay Type 102A. (Pre. Mod. 2750, Type 102). Pre. Mod. 2750, operation of the change over relay, Type S2, disconnects the 28 volts d.c. supply, from a fuse at panel G, from No. 1 V.H.F. set and at the same time connects another 28 volts d.c. supply, from a fuse at panel G, to No. 2 V.H.F. set. Additionally, operation of the S2 relay disconnects the supply for the press-to-transmit circuit from No. 1 V.H.F. set and reconnects a supply from No. 2 V.H.F. set.

Power supplies

59. Both the No. 1 and No. 2 V.H.F. sets are supplied with 28 volts d.c., from their respective fuses in panel G, via type 60 voltage regulators. A three ohm variable resistor is mounted adjacent to the voltage regulator to provide for adjustments in supply voltage. Pre. Mod. 2750 both the No. 1 and No. 2 V.H.F. sets are supplied with 28 volts d.c., from their respective fuses in panel G, via contacts '4-4a' and '3-3a' respectively of the change-over relay, Type S2.

Simulated bombing V.H.F. release tone (Mod. 2746)

60. During practice bombing, a bomb release signal from the N.B.C. system is used to control a V.H.F. monitored single note tone.

61. Two relays, 'X' and 'Y', are contained in the No. 1 relay box mounted at the rear of the radio crate, starboard side. Relay Y is controlled by a SIM. BOMB ON/OFF switch and a SIM. BOMB TONE push switch, mounted together with an indicator lamp on the radio crate, at the 2nd Navigator's station. The relay box wiring is so arranged that operation of relay X, by a N.B.C. signal, isolates the operating coil of relay Y.

62. A release tone oscillator and controlling relay 'A' comprise the relay box No. 2, which is mounted adjacent to the I/C relay box on the radio crate, at the A.E.O.'s station.

63. At the commencement of a bombing run the SIM, BOMB ON/OFF switch is selected ON to complete a hold-in circuit for the operating coil of relay 'Y', from a fuse at panel G. With the V.H.F./U.H.F. change-over switch set to V.H.F., the SIM. BOMB TONE switch is depressed to energise the relay and supply the indicator lamp. The operating coil circuit of relay 'A' is completed, via contacts 5 and 6 of relay 'Y', whilst contacts 3 and 4 complete the V.H.F. press-to-transmit circuit. Operation of relay 'A' isolates the normal V.H.F. transmitter microphone circuit and completes the release tone oscillator circuit.

64. At the moment of release a signal from the N.B.C. calculator Type 3 (*see Sect.* 5, *Chap.* 3 *and* 7) operates relay 'X' to de-energise relays 'Y' and 'A' and cut off the tone.

65. A tone override switch is fitted to the radio crate switch panel which may be selected to EMERGENCY (override) or NORMAL as required .

A.R.I.18124 U.H.F. COMMUNICATIONS (Mod. 2437)

Introduction

66. The ultra high frequency communica-

tion system incorporates a pressurised multi-channel transmitter/receiver operating over the frequency range of 225·0 Mc/s to 399·9 Mc/s, and two aerials (upper and lower) switched through a magnetic relay as required. Table 6 lists the components which constitute A.R.I.18124 and detailed information on the system together with servicing instructions, is contained in A.P. 2531J.

Transmitter-receiver—TR5/ARC52

67. The transmitter-receiver, which is crystal controlled, has sufficient crystals incorporated to provide 1,750 frequency channels spaced 100 Kc/s apart. Facilities are provided to enable 18 of these channels to be pre-set to the prescribed frequencies. The required channel can be selected by an automatic frequency selector mechanism operated by a single rotary switch. Alternatively four manually operated controls permit the transmitter-receiver to be set to any one of the 1,750 channels as required.

68. The transmitter-receiver is mounted, together with a system interconnecting junction box, on the radar crate in the compartment above the nose wheel bay. A filter unit is also fitted at the radar crate on aircraft embodying Mod. 2796 (Eureka-Rebecca power supplies).

Auxiliary audio output (A.D.F.)

69. The transmitter-receiver provides auxiliary audio output for automatic direction finding purposes, controlled in addition to the control unit, Type C1607, by a U.H.F. TONE switch located on the control pedestal. Post Mod. 2746, auxiliary audio output is also used for simulated bomb release (*para.* 73).

Aerials, Type 12535

70. Both aerials used in the installation are of the broad band type, having a characteristic impedance of 50 ohms. A magnetic relay, Type 1741, controlled by a two position change-over switch, is provided to select upper or lower aerial as required. The upper aerial is mounted on the top surface of the pilot's canopy, port side, whilst the lower aerial is mounted to protrude through the fuselage skin at the rear of the bomb aimer's prone position, The magnetic relay is fitted adjacent to the transmitter-receiver on the radar crate, and its control switch on the control pedestal.

Control unit, Type C1607

71. The control unit, mounted on the control pedestal, provides remote control for the transmitter-receiver. The unit incorporates the following controls.

(1) Function switch.
(2) Channel selector (CHAN.)
(3) Manual control.
(4) Volume control (VOL.)

Two panel lamps are mounted in the unit and controlled by the THROTTLE lights dimmer switch on the starboard fuel panel bracket. Detailed information on the control unit, together with servicing instructions, may be found in A.P.2531J.

U.H.F./V.H.F. change-over

72. A change over system is incorporated to connect either the U.H.F. or V.H.F. installation into the I/C system via the I/C junction box Type 154. When the double-pole change-over switch, on the control pedestal, is selected to U.H.F. a 28 volts d.c. supply, from a fuse in panel G, is connected to the operating coils of the Type 102A relays mounted behind the window control units on the radio crate. Both relays operate simultaneously, connecting the U.H.F. system to junction box, Type 154, and isolating V.H.F. With the change-over switch selected to V.H.F. the type 102A relays are de-energized to connect V.H.F. into the I/C system and to disconnect U.H.F.

Simulated bombing U.H.F. release tone

73. Post Mod. 2746, the transmitter-receiver auxiliary audio output (*para.* 69) is used on a U.H.F. release tone, controlled in the same manner as the V.H.F. simulated bombing release tone described in para. 60.

74. With the control unit, Type C1607, FUNCTION SWITCH set to ADF and the U.H.F./V.H.F. change-over switch to U.H.F. the release tone circuit is completed via contacts 9 and 10 of relay " Y ". At the moment of bomb release, contacts 9 and 10 open to cut off the release tone.

75. A U.H.F. TONE OVERRIDE switch, located on the radio crate, may be selected NORMAL for release tone or EMERGENCY to cut off the tone irrespective of relay position.

Note . . .

Operation of the U.H.F. TONE *switch* (*para.* 69) *will render the* U.H.F. *simulated bombing release tone circuit in-operative.*

Power supplies

76. The transmitter-receiver is supplied with 28 volts d.c., from a fuse in panel G via the inter-connecting junction box.

Table 1

Intercommunication and associated equipment (post Mod. 2874)

Item	Type or Ref. No.	No. off	Location
Amplifier	10U/16596	2	Radio crate
Mounting	10AJ/121	2	Radio crate
Junction box	10D/17805	1	Radio crate
Control unit	10L/260	1	Radio crate
Switch	5CW/5056	1	Radio crate
Switch	Z510554	2	Radio crate
Switch	LHE/A.1	2	Port and starboard hand wheel
Switch	10F/10338	5	Port and starboard coaming panels and radio crate
Switch	Z510304	1	Port coaming panel
Switch	Z510503	2	Port coaming panel and radio crate
Switch	Z510551	3	Port and starboard coaming panels and radio crate
Relay	5CW/3942	1	Radio crate
Relay	10F/17287	4	Radio crate
Socket	10H/2206	9	Crew stations
Socket	10HA/9326	1	External supply panel
Volume control	10L/240	3	Control pedestal, radio crate and port coaming panel
Relay box	—	1	Radio crate

TABLE 2

Intercommunication and associated equipment (pre-Mod. 2874)

Item	Type or Ref. No.	No. off	Location
Amplifier	A1961	1	Radio crate
Mounting	936	1	Radio crate
Junction box	154	1	Radio crate
Control unit	702	1	Radio crate
Switch	Z.510554	1	Radio crate
Relay	S2	1	Radio crate
Socket	359	9	Crew positions, radome and panel J
Socket	3570	1	Battery bay
Volume control	11	2	Control pedestal and port coaming panel
Switch	Z.510551	3	Port and starboard coaming panels and radio crate
Relay box		1	Radio crate

TABLE 3

A.R.I.5874—H.F. Communications equipment

Item	Type or Ref. No.	No. off	Location
Power and radio unit	4192	1	Under radio crate table
Back plate	10AR/438	1	Under radio crate table
Transmitter	T4188	1	Under radio crate table
Back plate	10AR/440	1	Under radio crate table
Receiver	R4187	1	Under radio crate table
Back plate	10AR/442	1	Under radio crate table
Junction box	4191	1	Under radio crate table
Voltage regulator	5UC/6010	1	Under radio crate table
Back plate	5UC/6011	1	Under radio crate table
Control and drive unit	4190	1	Radio crate
Back plate	10AR/441	1	Radio crate
Aerial control unit	7216	1	Radio crate
Aerial selector unit	7003	1	Radio crate
Back plate	10AR/474	1	Radio crate
1/8 power switch		1	Radio crate
◄ Morse key, Type F	10A/7741 (pre Mod. 2992)	1	Radio crate table
Morse key, Type 51	10F/20366 (post Mod. 2992)		Radio crate ►
Tuning unit (Aerial)	7015 (pre-Mod. 1530)	1	Dorsal fin (pre-Mod. 2690 Radar crate)
	7016 (post Mod. 1530)	1	Dorsal fin (pre-Mod. 2690 Radar crate)
Mounting	10AJ/233	1	Dorsal fin (pre-Mod. 2690 Radar crate)
Impedance matching unit	7217 (pre-Mod. 1530)	1	Dorsal fin (pre-Mod. 2690 Radar crate)
	7949 (post Mod. 2280)	1	Dorsal fin (pre-Mod. 2690 Radar crate)
Inductor (pre-Mod. 1530)	X7006	1	Dorsal fin (pre-Mod. 2690 Wing root)
Tag board (post Mod. 2630)	121	2	Dorsal fin (pre-Mod. 2690 Wing root)
Resistor (150-2) (post Mod. 2630)		1	Dorsal fin (pre-Mod. 2690 Wing root)
Circuit breaker	5C/2564	1	Panel G (pre-Mod. 2362 or 2446) Radio crate (post Mod. 2362 or 2446)

Table 4

A.R.I.18064—V.H.F. communications equipment (post Mod. 2750)

Item	Type or Ref. No.	No. off	Location
Transmitter-receiver (T.R.1985)	10D/17937	1	Cabin, under floor
Transmitter-receiver (T.R.1986)	10D/17938	1	Cabin, under floor
Mounting	10AJ/82	2	Cabin, under floor
Voltage regulator	5UC/5418	2	Cabin, under floor
Relay	10F/17287	1	Cabin, under floor
Relay	10F/16827	1	Cabin, under floor
Socket	10H/2206	2	Cabin, under floor
Aerial	10B/19122	1	Hood fairing
Control Unit No. 1	10L/246	1	Control pedestal
Control Unit No. 2	10L/246	1	Radio crate
Switch	10F/11714	1	Control pedestal

Table 5

A.R.I.18064—V.H.F. communications equipment (pre. Mod. 2750)

Item	Type or Ref. No.	No. off	Location
Transmitter-receiver	TR.1985	1	Rear fuselage
Transmitter-receiver	TR.1986	1	Rear fuselage
Mounting	873-2	2	Rear fuselage
Relay	S2	1	Rear fuselage
Relay	102A	1	Rear fuselage
Relay	125	1	Rear fuselage
Socket	359	2	Rear fuselage
Aerial	7121	1	Fin
Control unit	382	2	Control pedestal
Switch	170	1	Control pedestal

Table 6

Simulated bombing V.H.F. release tone equipment (Mod. 2746)

Item	Type or Ref. No.	No. off	Location
Capacitor 0·1mF	Z 115560	1	Radio crate
Resistor 4·7K	Z 222086	1	Radio crate
Relay	10FB1443	1	Radio crate
Relay	10FB/623	1	Radio crate
Relay	5945-99-053-0453	1	Radio crate
Switch	Z 510555	1	Radio crate
Switch	10F/10338	1	Radio crate
Switch		1	Radio crate
Lamp	5CX/1553	1	Radio crate
Resistor 22K ohms	Z 222170	1	Radio crate

Table 7

A.R.I.18124—U.H.F. communications equipment

Item	Type or Ref. No.	No. off	Location
Transmitter-Receiver	TR5/ARC 52	1	Forward servicing bay
Mounting	MT 1477/ARC 52	1	Forward servicing bay
Filter unit	10P/16255	1	Forward servicing bay
Relay	10F/18374	1	Forward servicing bay
Interconnecting box	ARC/52	1	Forward servicing bay
Control unit	C1607/ARC 52	1	Control pedestal
Switch	Z 510578	1	Control pedestal
Switch	Z 510553	1	Control pedestal
Switch	Z 510551	2	Control pedestal and radio crate
Switch	Z 510554	1	Control pedestal
Relay	10F/17287	2	Radio crate
Socket	10H/20734	1	Rear pressure bulkhead
Socket	10H/2206	1	Rear pressure bulkhead
Plug	10H/19452	1	Rear pressure bulkhead
Aerial	12535	1	Front fuselage skin

SERVICING

WARNING . . .

Voltages in excess of 100 volts either a.c. or d.c. can be dangerous under certain circumstances. Personnel should therefore ensure that the electrical system is electrically safe before any servicing is attempted. Where it is essential that tests or adjustments are to be carried out with the electrical power switched on, the greatest care must be exercised.

Introduction

77. For detailed information on the servicing of the items of equipment, used in the various installations, reference should be made to the relevant Air Publications.

78. Detailed descriptions of all the general tests to be applied to all aircraft electrical circuits, and of the press-to-transmit switches on the pilot's handwheels, can be found in the General Information group contained in Book 2 immediately after Section 5 marker card.

Intercommunications

79. For detailed information on the servicing of the items of equipment used in the installation, reference should be made to A.P.2876E, Vol. 1.

80. To check the functioning of the system it is necessary to employ two men.

(1) Check the circuit fuses and connect a 28-volt d.c. supply to the appropriate aircraft external supply plug.

(2) Select the 24-VOLT BATTERY switch to ON.

(3) Select all the IC/HF switches to IC.

(4) Select the switches on the control unit, Type 702, to ON and NORMAL

(5) One man should connect his headset into any socket while the other man connects his headset to all the remaining mic./tel. sockets in turn, and communicates to the first man from each crew position.

(6) Select the switches on the control unit, Type 702, to OFF and EMY.

(7) Switch on the V.H.F. and U.H.F. (Mod. 2437) in turn, and check that communication is possible between the two men.

(8) Switch off the V.H.F. and U.H.F. (Mod. 2437) systems.

(9) Select the conference I/C switch (post Mod. 2874) to CONFERENCE and the conference amplifier switch to ON.

(10) Check that communication is possible between the 1st navigator and 2nd navigator.

(11) Switch off the conference I/C system and remove the two headsets from the sockets.

A.R.I.5874 H.F. Communication

81. For detailed information on the servicing of items of equipment, setting up of the system and aerial tuning unit pressurization, reference should be made to A.P.2535E, Vol. 1.

82. To check the power supplies proceed as follows:—

(1) Check the circuit fuses and connect a 28-volt d.c. supply to the appropriate aircraft external supply plug.

(2) Select the 24-VOLT BATTERY switch to ON.

(3) Connect a voltmeter to fuse No. 35 on panel G and earth. Check that the voltmeter reads zero.

(4) Reset the circuit breaker (mounted on panel G pre. Mod. 2362 or 2446) mounted on the port side of the radio crate and check that the voltmeter reading is 24 volts approximate.

(5) Disconnect the voltmeter and connect it to fuse No. 36 on panel G and earth. Check that the voltmeter reading is 19 volts.

(6) Disconnect the voltmeter and trip the circuit breaker.

A.R.I.18064 V.H.F. Communications

83. For detailed information on the servicing of items of equipment used in the installation, reference should be made to A.P.2538HA, Vol. 1.

84. To check the operation of the system proceed as follows:—

(1) Check the circuit fuses and connect a 28-volt d.c. supply to the appropriate aircraft external supply plug.

(2) Select the 24-VOLT BATTERY switch to ON.

(3) Connect a head set to either of the pilot's mic./tel. sockets.

(4) Select the V.H.F./U.H.F. change-over switch to V.H.F.

(5) With the change-over switch at NO. 1, select No. 1 control unit to channel A and allow the transmitter receiver to warm up. When the set has warmed up, select each channel in turn and check that each channel can be heard to come in. After all the channels have been selected, return the control unit to OFF.

(6) Select No. 2 control unit to the first channel. The transmitter receiver should not operate.

(7) Select the CHANGE-OVER switch to NO. 2 and check that the set operates. Allow the set to warm up and then select each channel in turn. Check that each channel can be heard to come in. After each channel has been selected return the control unit to OFF.

(8) Select the frequency for the control tower and with the CHANGE-OVER switch in the appropriate position operate the respective pilots press-to-transmit switch and keep depressed whilst checking transmission with the control tower.

(9) Select the SIM. BOMB ON/OFF switch to ON, depress the SIM. BOMB TONE switch and check that the release tone can be heard on any one headset.

(10) Select the SIM. BOMB EMERGENCY/NORMAL switch to EMERGENCY and check that the release tone cuts off. Select the switch to NORMAL.

(11) Disconnect plug No. 12 at the N.B.C. junction box, Type 343, and connect a 28-volts d.c. supply to pin A of the free socket. Check that with the supply connected the release tone cuts off.

(12) Select the SIM. BOMB ON/OFF switch and the V.H.F. control unit to OFF. Disconnect the headset from the socket.

A.R.I.18124 U.H.F. communications

85. For detailed information on the servicing of the items of equipment used in the installation, reference should be made to A.P.2531J, Vol. 1.

86. To check the operation of the system proceed as follows:—

(1) Check the circuit fuses and connect a 28 volts d.c. supply to the appropriate aircraft external supply plug.

(2) Select the 24-VOLT BATTERY switch to ON.

(3) Connect a headset to either of the pilots mic./tel. sockets.

(4) With the change-over switch set to U.H.F., select the control unit to channel A and allow the transmitter-receiver to warm up.

(5) With the function switch set to each of its three operating positions in turn, check that each channel can be heard to come in when selected.

(6) With the aerial change-over switch set to UPPER, select the frequency for the control tower. Select the function switch to each of its three operating positions in turn and operate the respective pilots press-to-transmit switch. With the switch held depressed check transmission with the control tower. Check for correct operation of the volume control.

(7) Set the aerial change-over switch to LOWER and repeat the procedure detailed in sub-para. (6).

(8) Select the SIM. BOMB ON/OFF switch to ON, and the control unit FUNCTION SWITCH to A.D.F. Depress the SIM. BOMB TONE switch and check that the release tone can be heard on the headset.

(9) Select the U.H.F. TONE OVERRIDE switch to EMERGENCY and check that the release tone cuts off. Select the switch to NORMAL.

(10) Disconnect the plug No. 12 at the N.B.C. junction box, Type 343, and connect a 28-volts d.c. supply to pin A of the free socket. Check that with the supply connected the release tone cuts off.

(11) Select all controls to OFF and disconnect the headset from the socket.

(12) Check for correct operation of the control unit panel lighting.

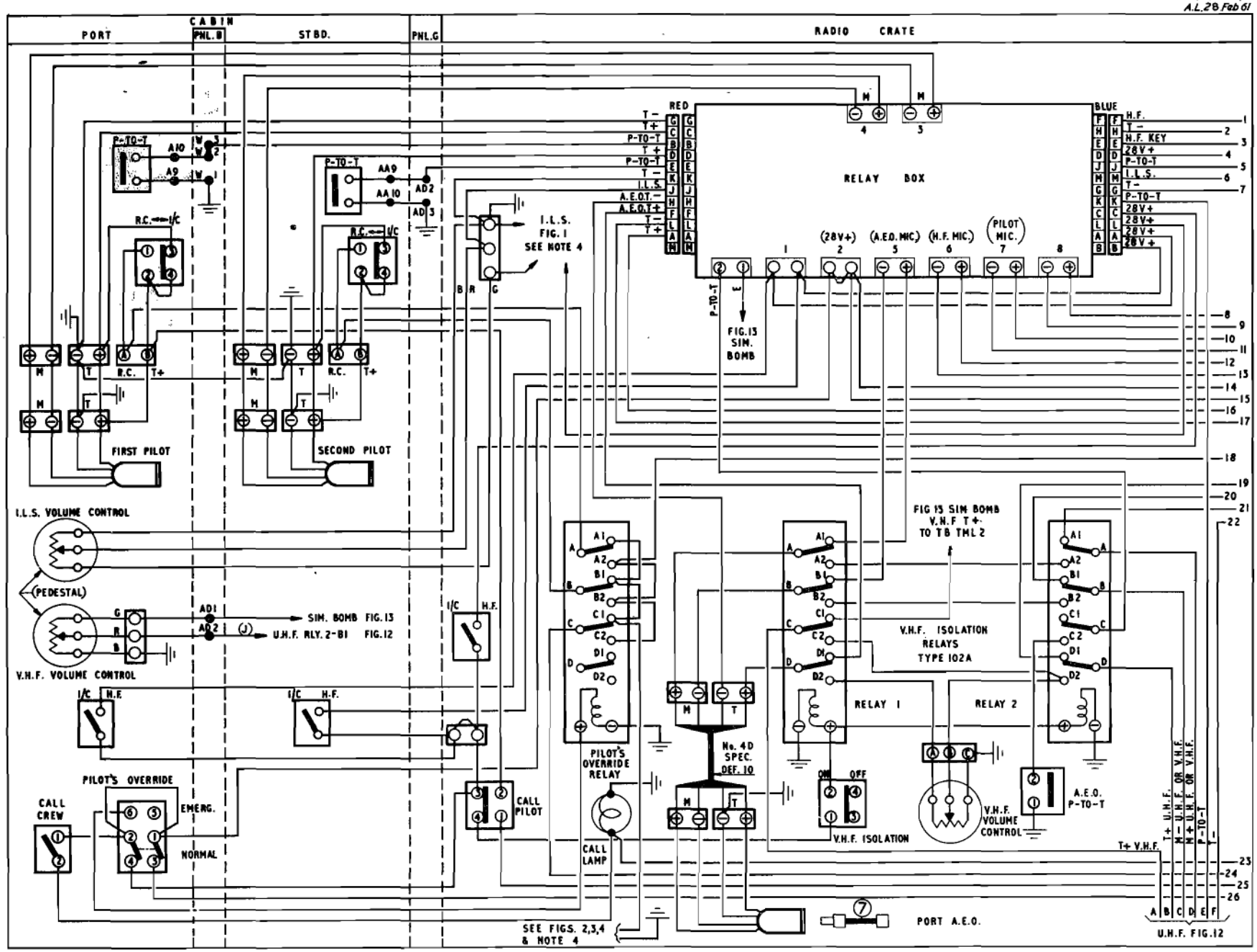

Fig.1 (1). Intercommunications system (post Mod. 2874)

70653 SHT. 139 ISS.F.

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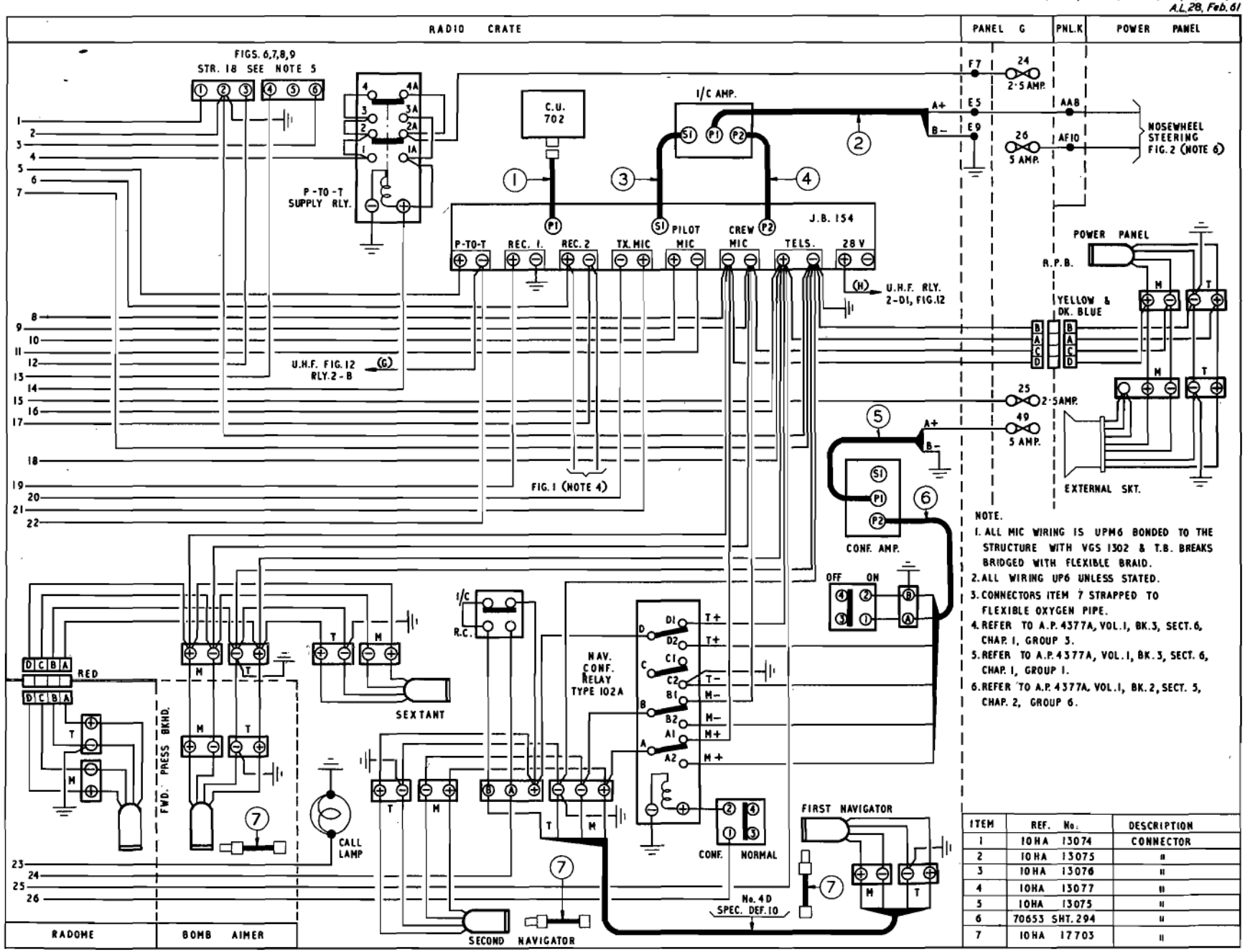

ITEM	REF. No.	DESCRIPTION
1	10HA 13074	CONNECTOR
2	10HA 13075	"
3	10HA 13076	"
4	10HA 13077	"
5	10HA 13075	"
6	70653 SHT. 294	"
7	10HA 17703	"

Fig. 1 (2) Intercommunications system (post Mod. 2874)

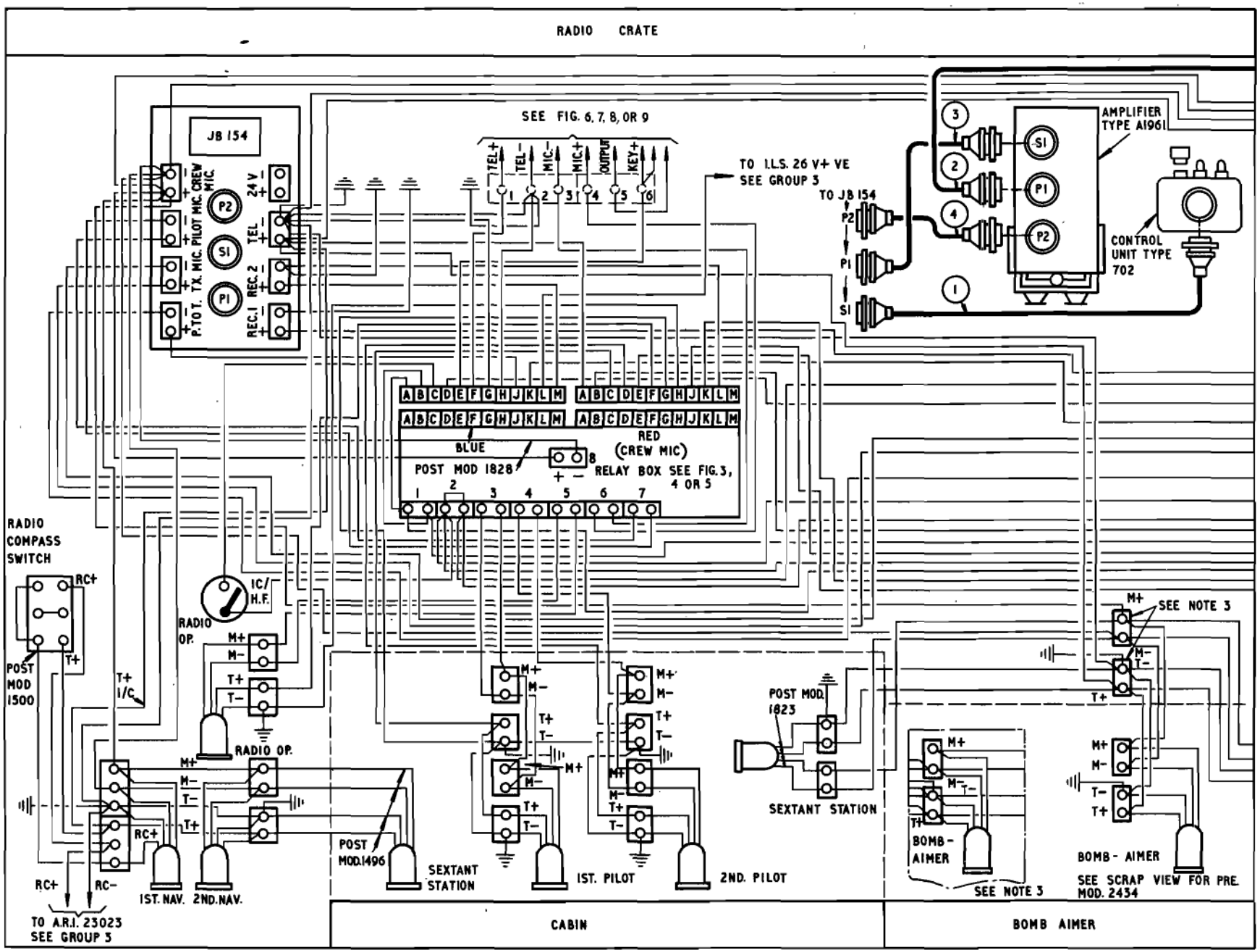

Fig. 2 (1) Intercommunication and associated circuitry (pre Mod 2874)

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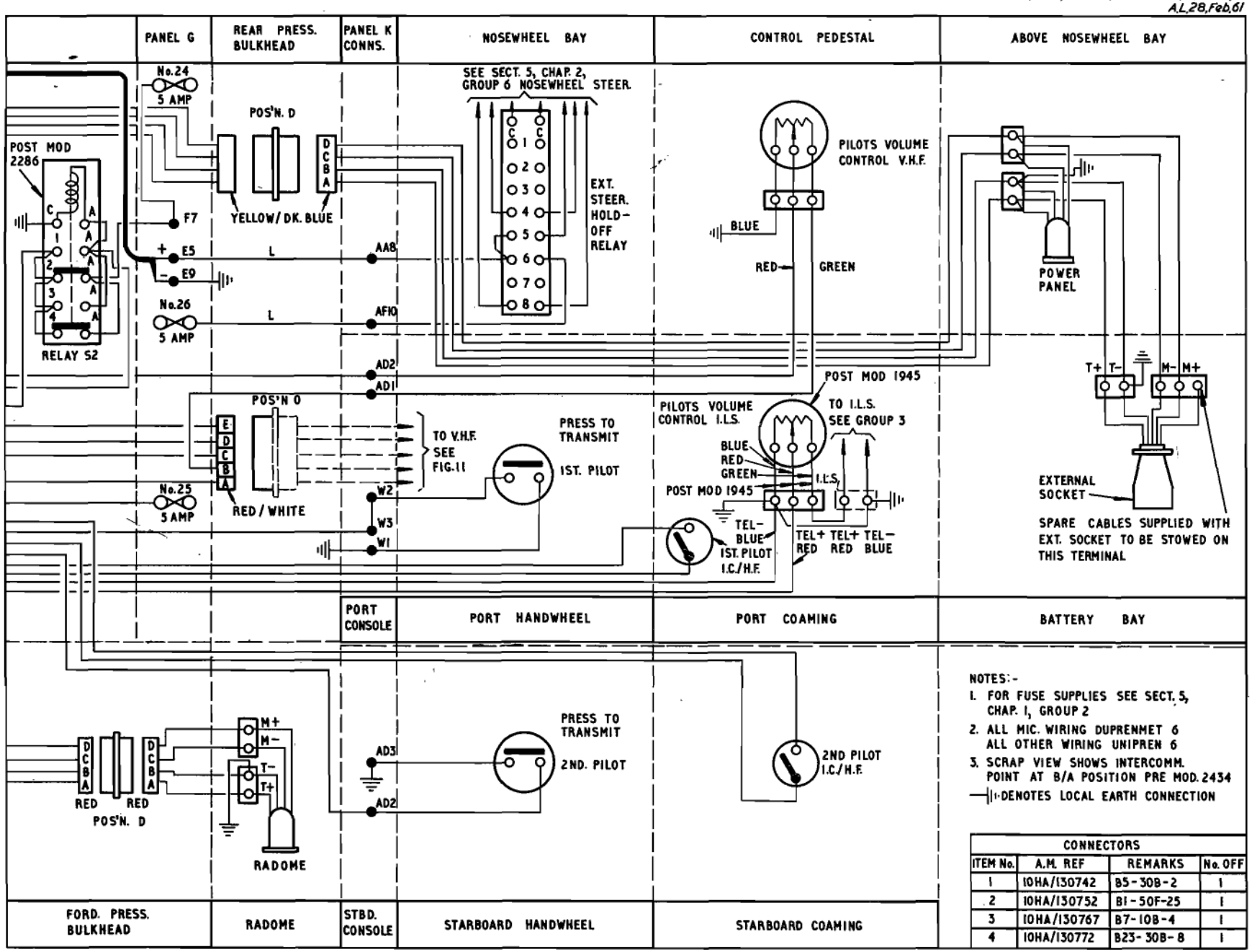
67453 SHT.97-Y



NOTES:-

1. FOR FUSE SUPPLIES SEE SECT. 5, CHAP. 1, GROUP 2
2. ALL MIC. WIRING DUPRENMET 6 ALL OTHER WIRING UNIPREN 6
3. SCRAP VIEW SHOWS INTERCOMM. POINT AT B/A POSITION PRE MOD. 2434

—||— DENOTES LOCAL EARTH CONNECTION

CONNECTORS			
ITEM No.	A.M. REF	REMARKS	No. OFF
1	10HA/130742	B5-30B-2	1
2	10HA/130752	B1-50F-25	1
3	10HA/130767	B7-10B-4	1
4	10HA/130772	B23-30B-8	1

Fig. 2 (2) Intercommunication and associated circuitry (pre Mod 2874)

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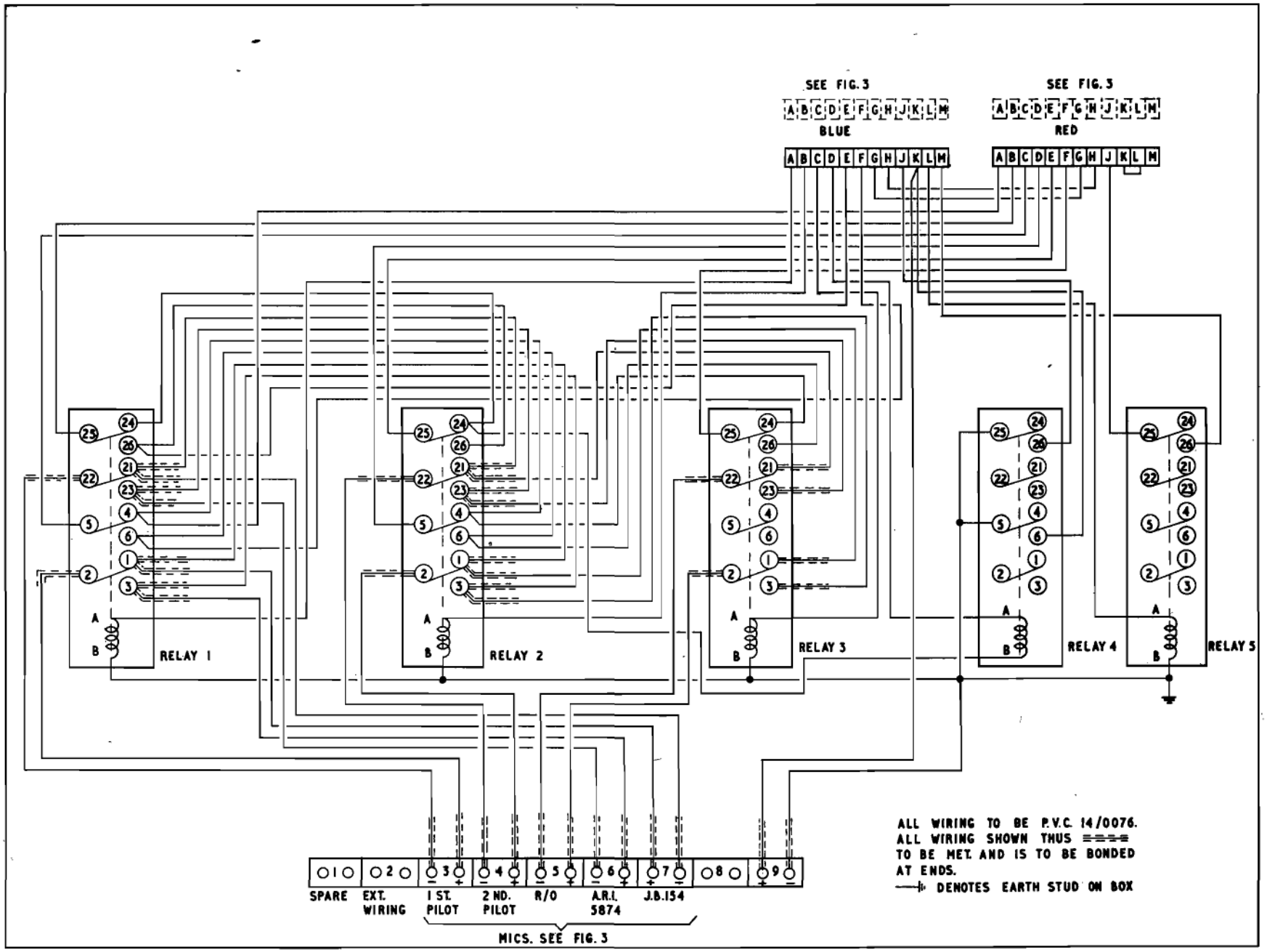

Fig. 3 Intercommunication relay box. (Mod.22 & 2746)

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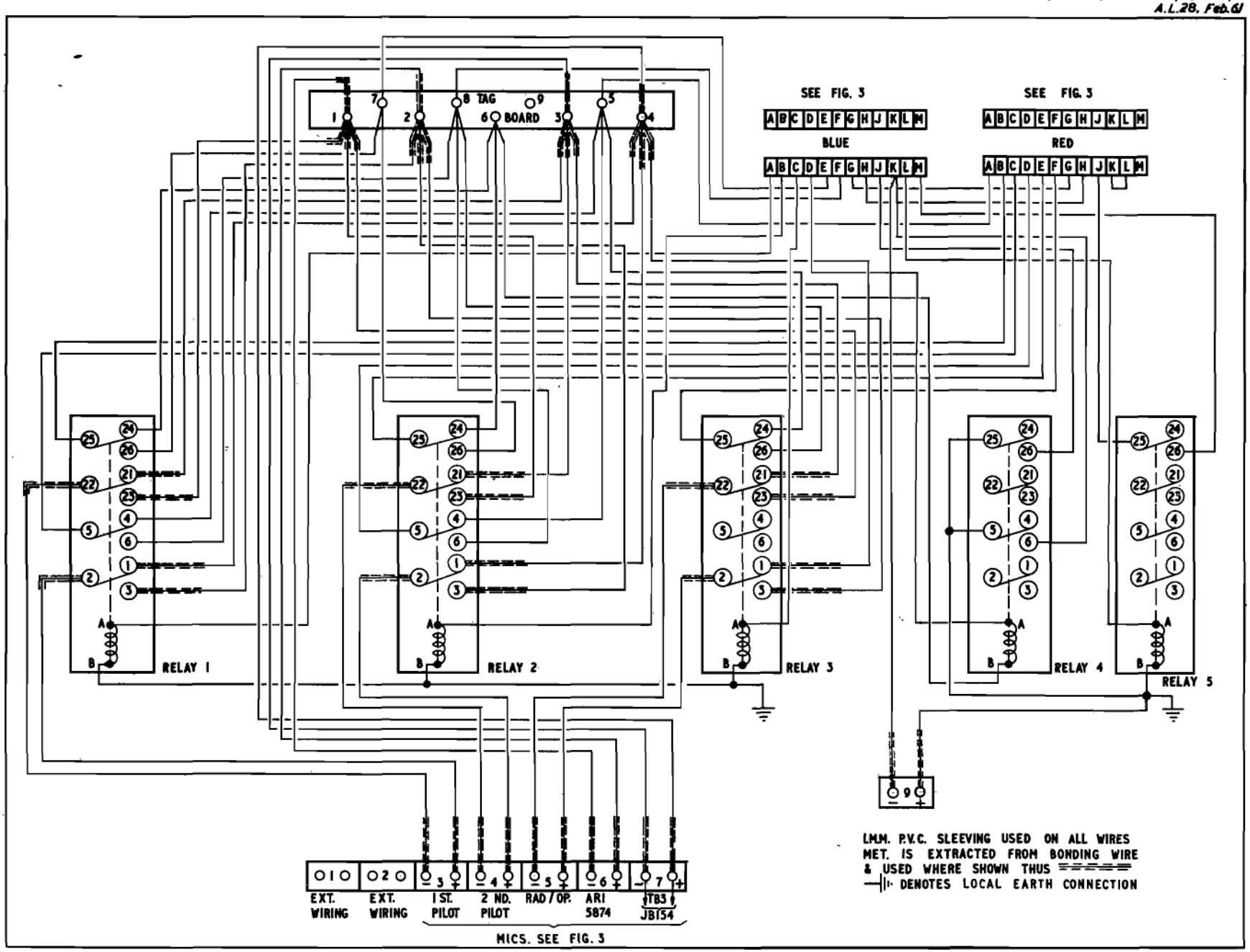

Fig. 4. Intercommunication relay box (pre Mod. 1826, post Mod 2746)

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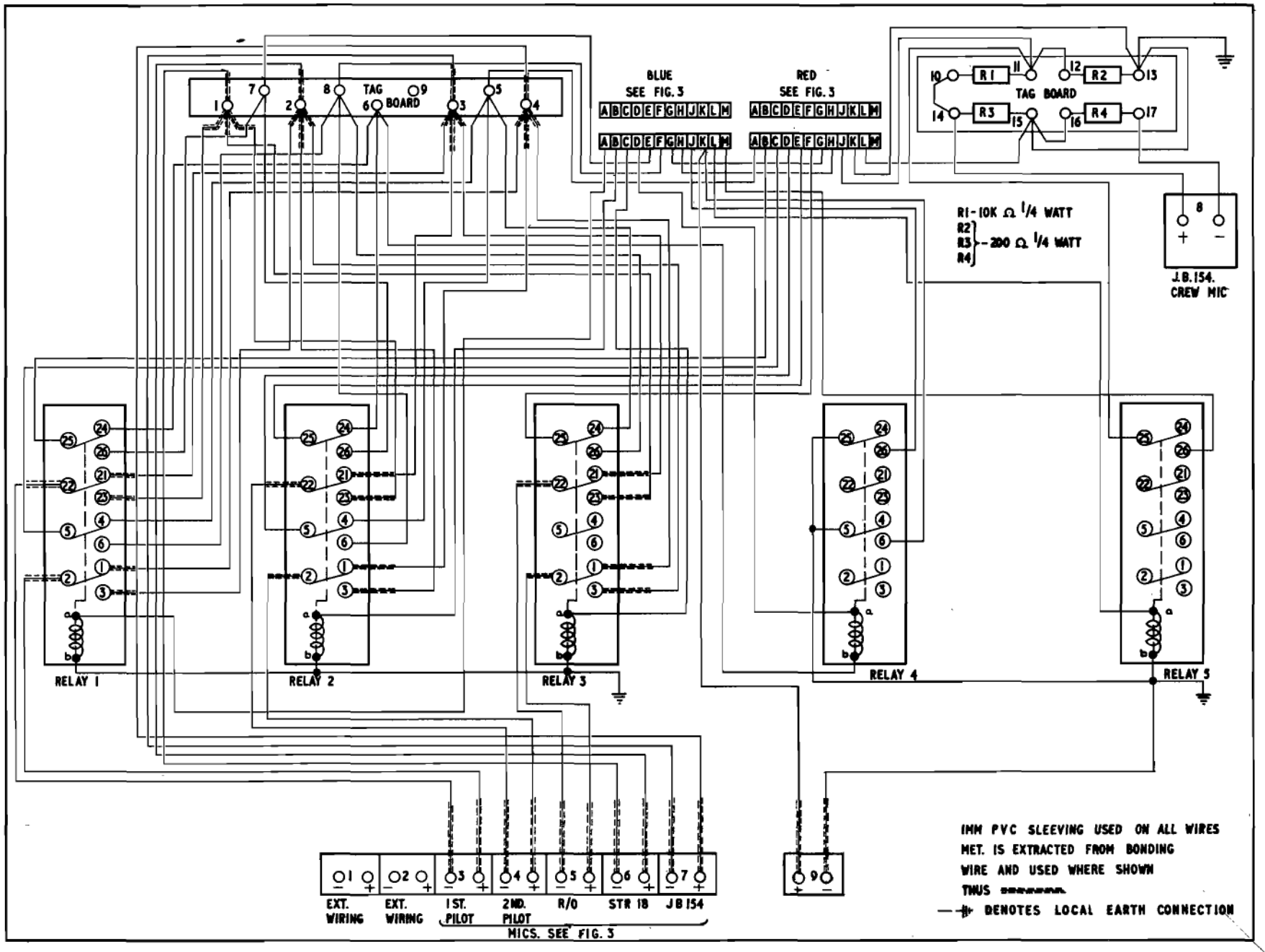

Fig. 5 Intercommunication relay box (post Mod. 1826. & 2746)

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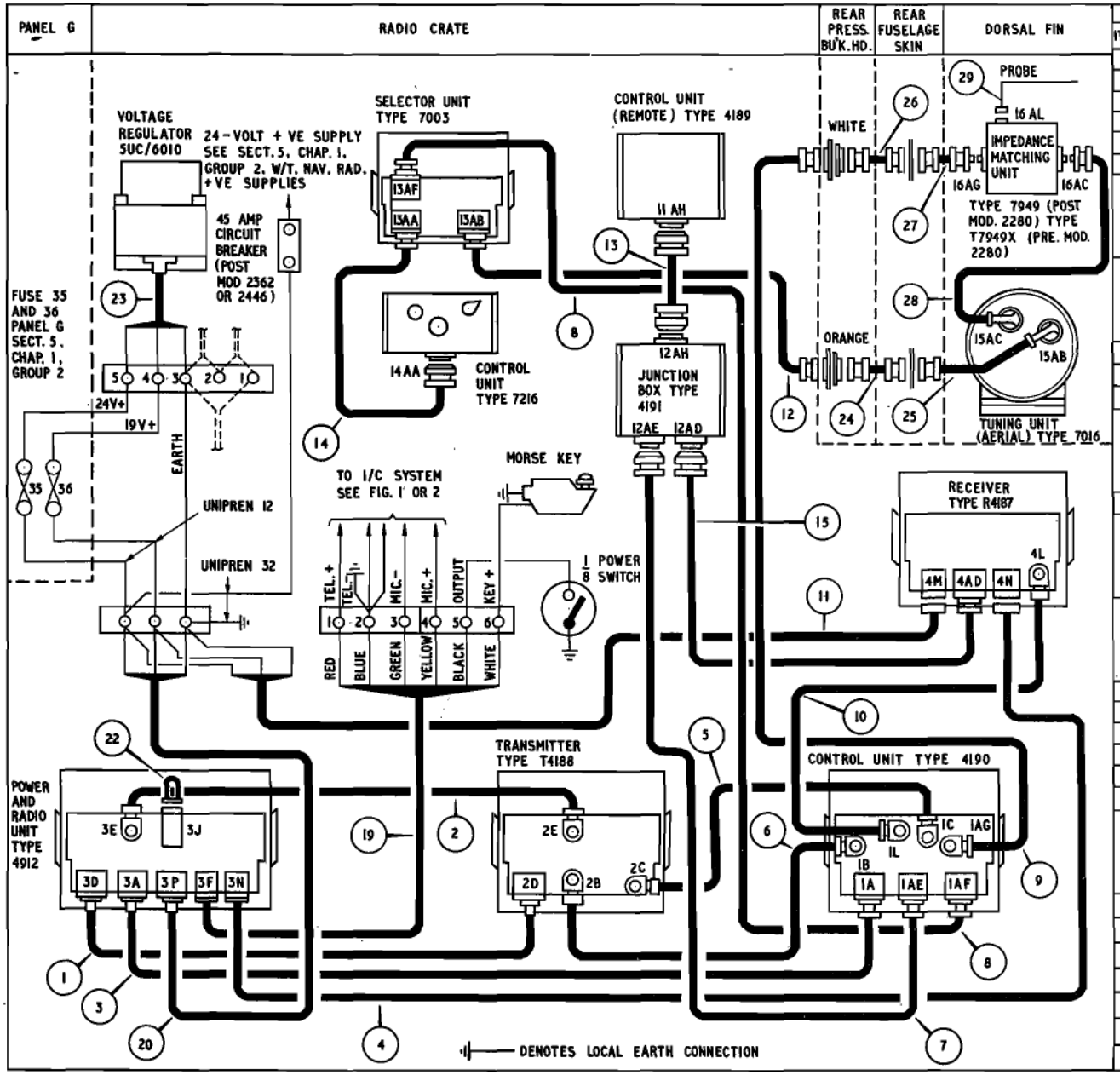
67453 SHT. 195-F



CONNECTORS			
ITEM No.	A.M. REF.	REMARKS	No. OFF
1	10HA/14146	TYPE EX/20C/7	1
2	10HA/14159	TYPE D221/32C/4	1
3	10HA/14145	TYPE EX/20C/6	1
4	10HA/14150	TYPE EX/20C/8	1
5	10HA/14158	TYPE D221/32C/3	1
6	10HA/14157	TYPE D270/31C/1	1
7	10HA/17073 (POST MOD 2119) 10HA/14153 (PRE MOD. 2119)	TYPE EB14/30C/R2	1
8	10HA/17074 (POST MOD 2119) 10HA/14154 (PRE MOD. 2119)	TYPE E14/20C/R1	1
9	10HA/14161	TYPE D221/31C/3	1
10	10HA/14160	TYPE D270/31C/2	1
11	10HA/14149	TYPE EX/50F/6	1
12	10HA/17076 (POST MOD 2119) 10HA/14156 (PRE MOD. 2119)	TYPE EB14/30C/R3	1
13	10HA/14162	TYPE B14/20C/13	1
14	10HA/17075 (POST AMD 2149) 10HA/14155 (PRE AMD. 2149)	TYPE EB31/30B/R2	1
15	10HA/17072 (POST MOD 2119) 10HA/14152 (PRE MOD. 2119)	TYPE EB14/30C/R1	1
16	DELETED BY	MOD. 2690	
17	DELETED BY	MOD. 2690	
18	DELETED BY	MOD. 2690	
19	10HA/14147	TYPE E23/40F/2	1
20	10HA/14151	TYPE EX/50F/7	1
21	10HA/14171	TYPE D243/50E/2	1
22	10HA/15652 (POST AMD 2149) 10HA/14148 (PRE AMD. 2149)	TYPE EX/40F/1	1
23	10HA/14163	TYPE EX/50F/8	1
24	DRG. 70653	SHT. 253	1
25	DRG. 70653	SHT. 254	1
26	DRG. 70653	SHT. 255	1
27	DRG. 70653	SHT. 256	1
28	DRG. 70653	SHT. 257	1
29	DRG. 70653	SHT. 258	1

Fig. 6. A.R.I. 5874 H.F. Communications system (post Mod. 2690)

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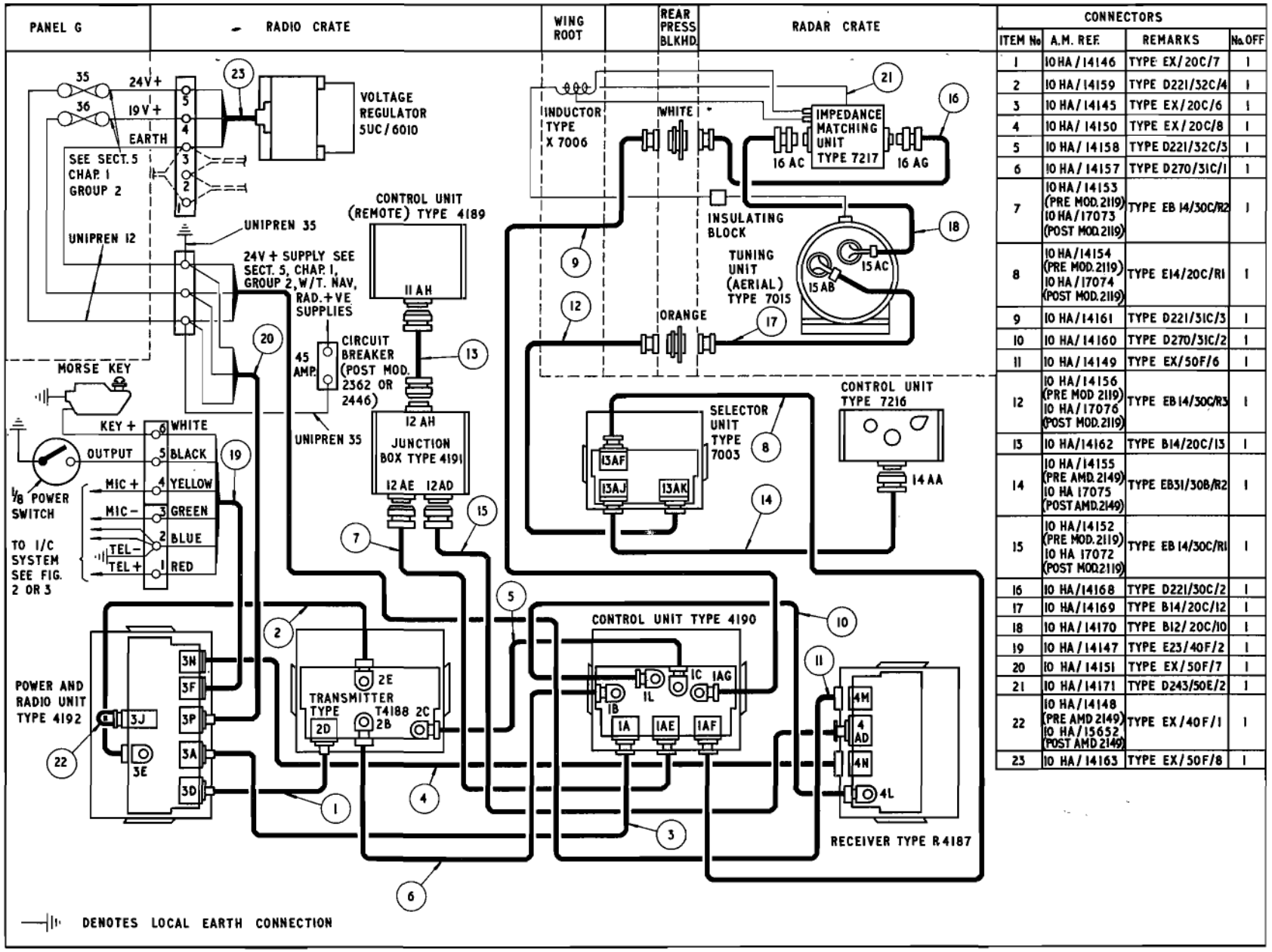

CONNECTORS			
ITEM No	A.M. REF.	REMARKS	No. OFF
1	10 HA/14146	TYPE EX/20C/7	1
2	10 HA/14159	TYPE D221/32C/4	1
3	10 HA/14145	TYPE EX/20C/6	1
4	10 HA/14150	TYPE EX/20C/8	1
5	10 HA/14158	TYPE D221/32C/3	1
6	10 HA/14157	TYPE D270/31C/1	1
7	10 HA/14153 (PRE MOD. 2119) 10 HA/17073 (POST MOD. 2119)	TYPE EB 14/30C/R2	1
8	10 HA/14154 (PRE MOD. 2119) 10 HA/17074 (POST MOD. 2119)	TYPE E14/20C/R1	1
9	10 HA/14161	TYPE D221/31C/3	1
10	10 HA/14160	TYPE D270/31C/2	1
11	10 HA/14149	TYPE EX/50F/6	1
12	10 HA/14156 (PRE MOD 2119) 10 HA/17076 (POST MOD. 2119)	TYPE EB14/30C/R3	1
13	10 HA/14162	TYPE B14/20C/13	1
14	10 HA/14155 (PRE AMD. 2149) 10 HA 17075 (POST AMD. 2149)	TYPE EB31/30B/R2	1
15	10 HA/14152 (PRE MOD. 2119) 10 HA 17072 (POST MOD. 2119)	TYPE EB 14/30C/R1	1
16	10 HA/14168	TYPE D221/30C/2	1
17	10 HA/14169	TYPE B14/20C/12	1
18	10 HA/14170	TYPE B12/20C/10	1
19	10 HA/14147	TYPE E23/40F/2	1
20	10 HA/14151	TYPE EX/50F/7	1
21	10 HA/14171	TYPE D243/50E/2	1
22	10 HA/14148 (PRE AMD 2149) 10 HA/15652 (POST AMD 2149)	TYPE EX/40F/1	1
23	10 HA/14163	TYPE EX/50F/8	1

Fig. 7. A.R.I. 5874 H.F. Communications system (pre Mod. 1530)

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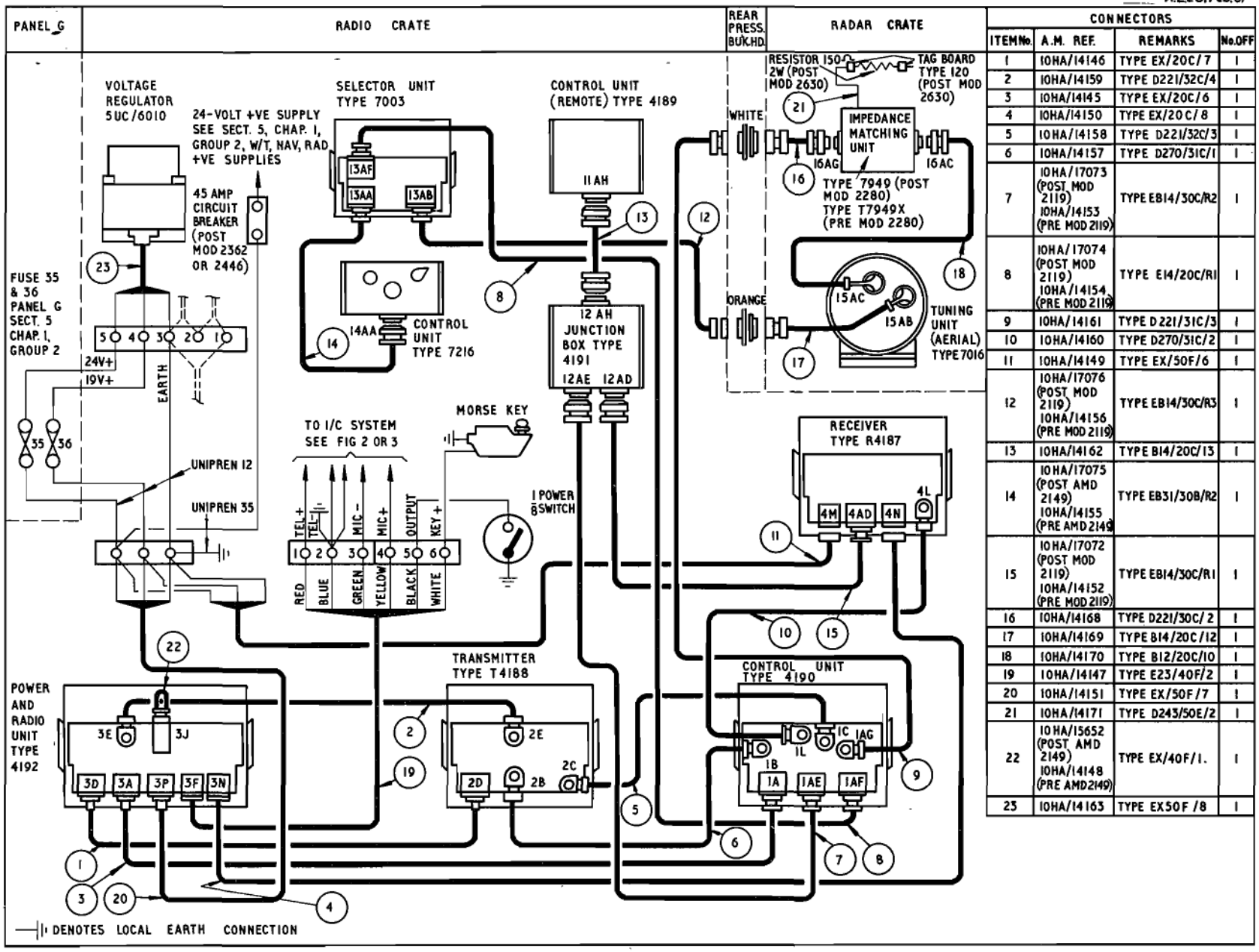

CONNECTORS			
ITEM No.	A.M. REF.	REMARKS	No. OFF
1	10HA/14146	TYPE EX/20C/7	1
2	10HA/14159	TYPE D221/32C/4	1
3	10HA/14145	TYPE EX/20C/6	1
4	10HA/14150	TYPE EX/20C/8	1
5	10HA/14158	TYPE D221/32C/3	1
6	10HA/14157	TYPE D270/31C/1	1
7	10HA/17073 (POST MOD 2119) 10HA/14153 (PRE MOD 2119)	TYPE EB14/30C/R2	1
8	10HA/17074 (POST MOD 2119) 10HA/14154 (PRE MOD 2119)	TYPE E14/20C/R1	1
9	10HA/14161	TYPE D221/31C/3	1
10	10HA/14160	TYPE D270/31C/2	1
11	10HA/14149	TYPE EX/50F/6	1
12	10HA/17076 (POST MOD 2119) 10HA/14156 (PRE MOD 2119)	TYPE EB14/30C/R3	1
13	10HA/14162	TYPE B14/20C/13	1
14	10HA/17075 (POST AMD 2149) 10HA/14155 (PRE AMD 2149)	TYPE EB31/30B/R2	1
15	10HA/17072 (POST MOD 2119) 10HA/14152 (PRE MOD 2119)	TYPE EB14/30C/R1	1
16	10HA/14168	TYPE D221/30C/2	1
17	10HA/14169	TYPE B14/20C/12	1
18	10HA/14170	TYPE B12/20C/10	1
19	10HA/14147	TYPE E23/40F/2	1
20	10HA/14151	TYPE EX/50F/7	1
21	10HA/14171	TYPE D243/50E/2	1
22	10HA/15652 (POST AMD 2149) 10HA/14148 (PRE AMD 2149)	TYPE EX/40F/1.	1
23	10HA/14163	TYPE EX50F/8	1

Fig. 8 A.R.I. 5874 H.F. Communications system (post Mod. 1530 pre Mod. 2690)

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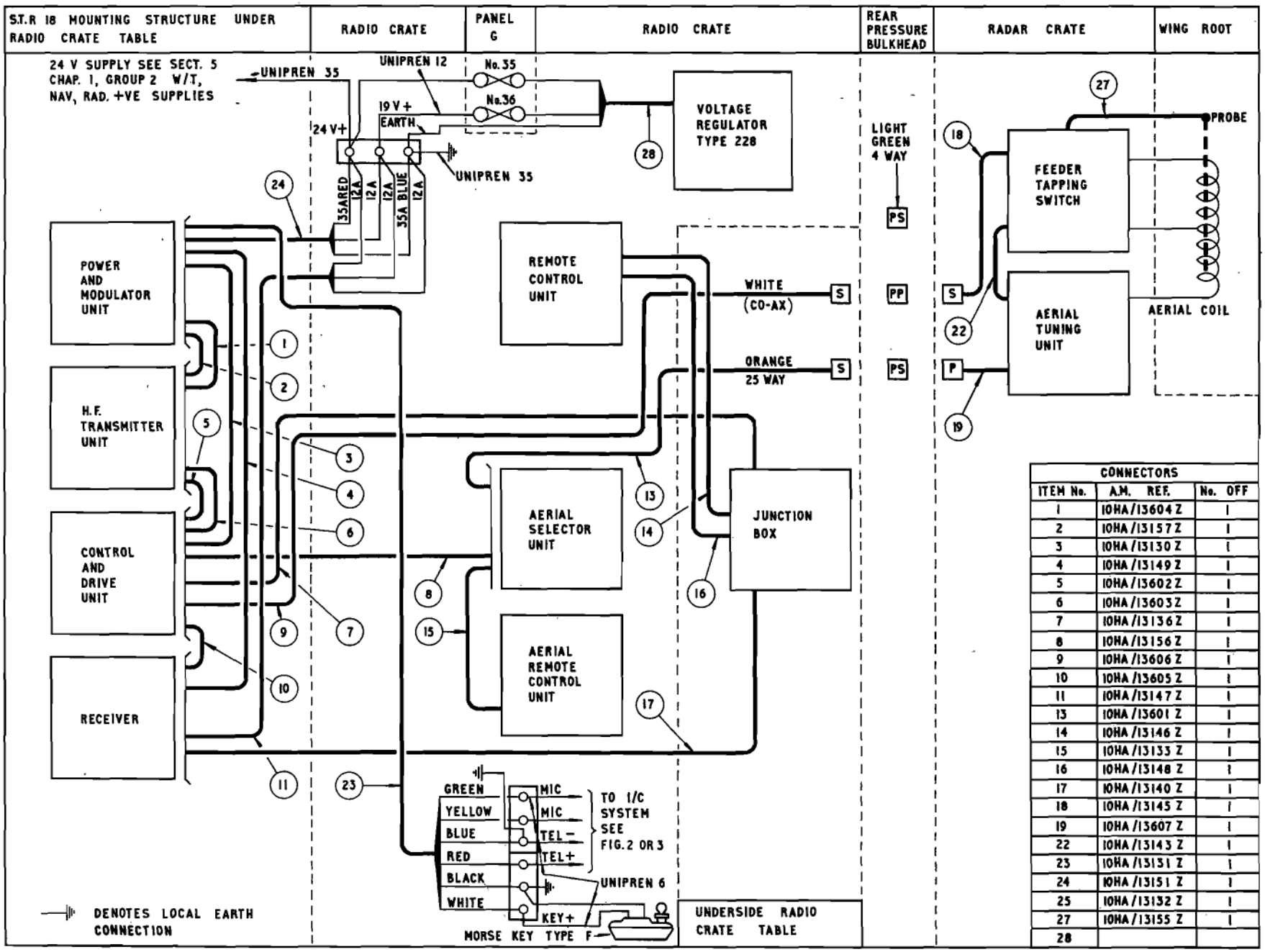

CONNECTORS		
ITEM No.	A.M. REF.	No. OFF
1	10HA/13604Z	1
2	10HA/13157Z	1
3	10HA/13130Z	1
4	10HA/13149Z	1
5	10HA/13602Z	1
6	10HA/13603Z	1
7	10HA/13136Z	1
8	10HA/13156Z	1
9	10HA/13606Z	1
10	10HA/13605Z	1
11	10HA/13147Z	1
13	10HA/13601Z	1
14	10HA/13146Z	1
15	10HA/13133Z	1
16	10HA/13148Z	1
17	10HA/13140Z	1
18	10HA/13145Z	1
19	10HA/13607Z	1
22	10HA/13143Z	1
23	10HA/13131Z	1
24	10HA/13151Z	1
25	10HA/13132Z	1
27	10HA/13155Z	1
28		

Fig. 9. A.R.I. 5873 H.F. Communications system

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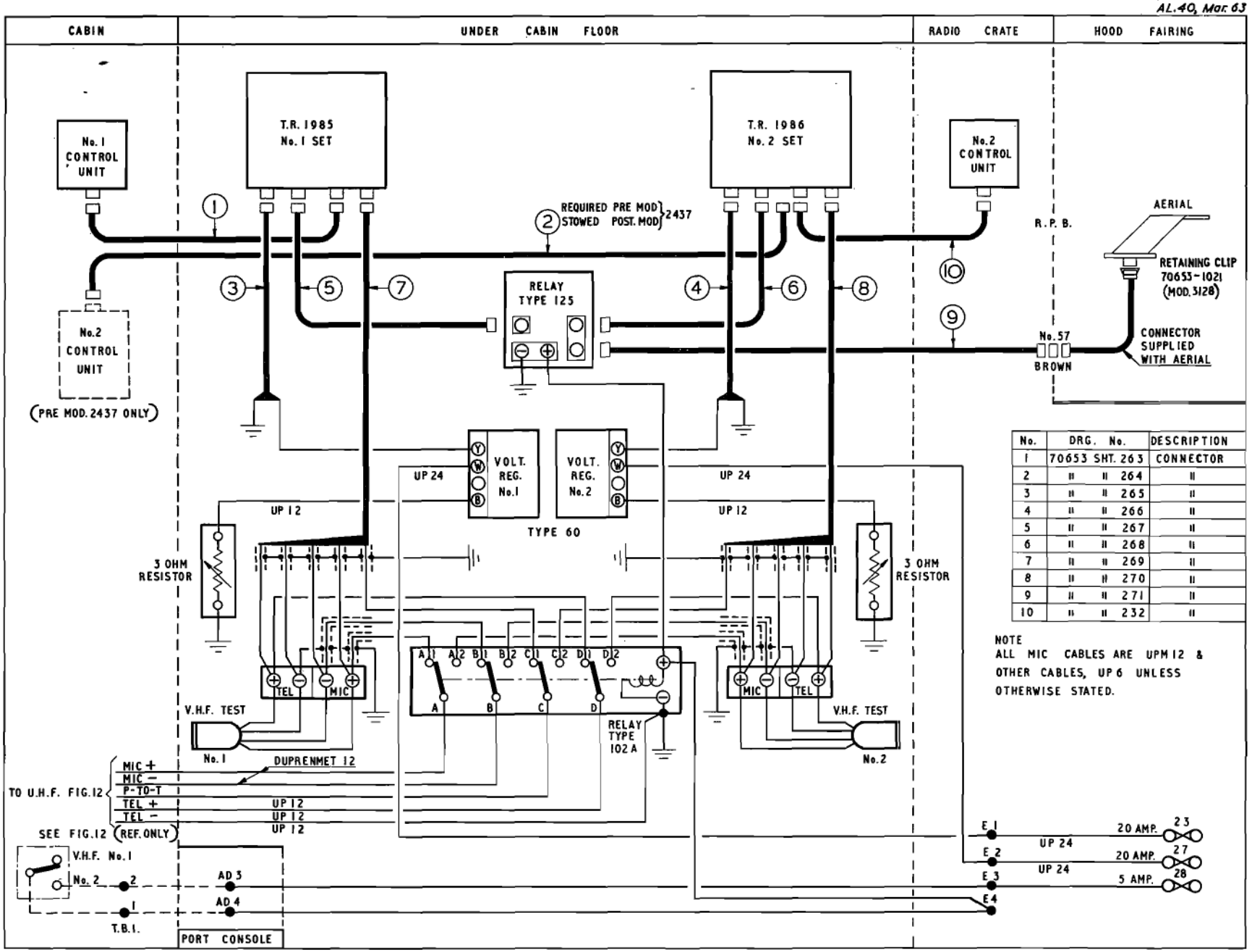
67453 SHT. 89 - L

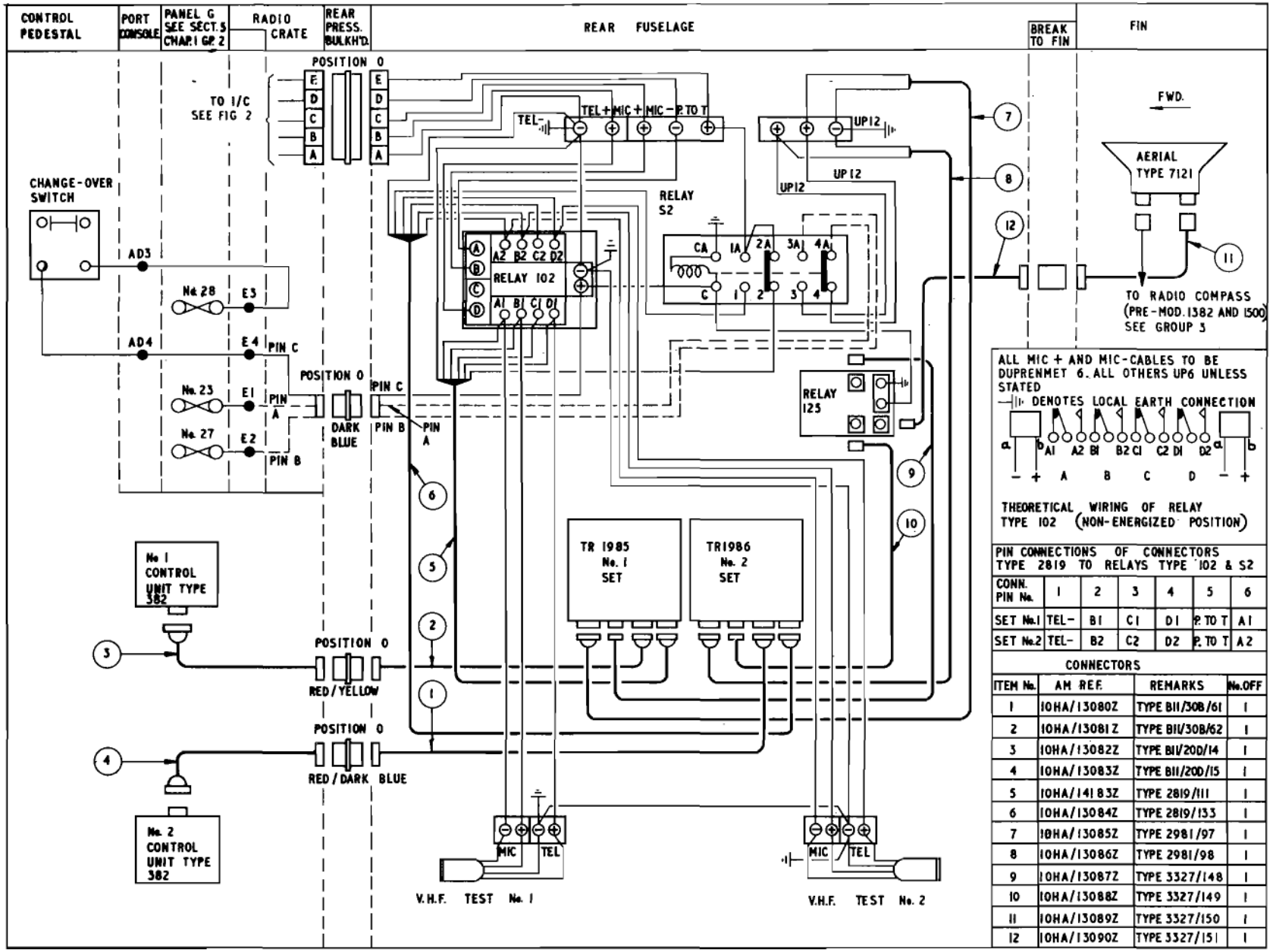


No.	DRG. No.	DESCRIPTION
1	70653 SHT. 263	CONNECTOR
2	" " 264	"
3	" " 265	"
4	" " 266	"
5	" " 267	"
6	" " 268	"
7	" " 269	"
8	" " 270	"
9	" " 271	"
10	" " 232	"

NOTE
ALL MIC CABLES ARE UPM 12 & OTHER CABLES, UP 6 UNLESS OTHERWISE STATED.

Fig. 10 A.R.I. 18064 V.H.F. communications system (post Mod. 2750. 2437 & 3128)

70653 SHT. 121-D



PIN CONNECTIONS OF CONNECTORS TYPE 2819 TO RELAYS TYPE 102 & S2

CONN. PIN No.	1	2	3	4	5	6
SET No.1	TEL-	B1	C1	D1	P. TO T	A1
SET No.2	TEL-	B2	C2	D2	P. TO T	A2

CONNECTORS

ITEM No.	AM REF.	REMARKS	No. OFF
1	10HA/13080Z	TYPE BII/308/61	1
2	10HA/13081Z	TYPE BII/308/62	1
3	10HA/13082Z	TYPE BII/200/14	1
4	10HA/13083Z	TYPE BII/200/15	1
5	10HA/14183Z	TYPE 2819/111	1
6	10HA/13084Z	TYPE 2819/133	1
7	10HA/13085Z	TYPE 2981/97	1
8	10HA/13086Z	TYPE 2981/98	1
9	10HA/13087Z	TYPE 3327/148	1
10	10HA/13088Z	TYPE 3327/149	1
11	10HA/13089Z	TYPE 3327/150	1
12	10HA/13090Z	TYPE 3327/151	1

Fig. 11 A.R.I. 18064 V.H.F. Communications system (pre Mod 2437 & 2750)

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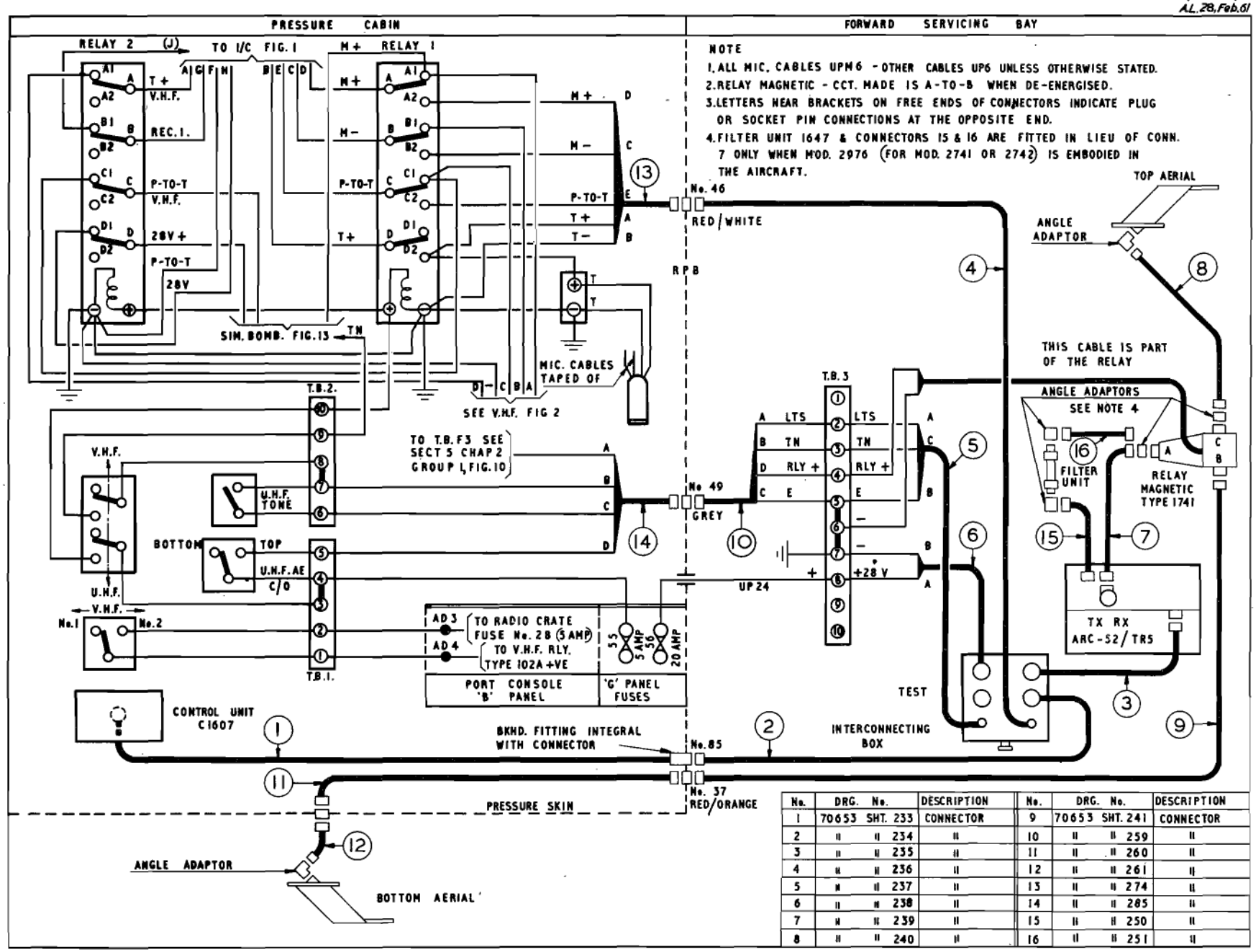

No.	DRG. No.	DESCRIPTION	No.	DRG. No.	DESCRIPTION
1	70653 SHT. 233	CONNECTOR	9	70653 SHT. 241	CONNECTOR
2	" " 234	"	10	" " 259	"
3	" " 235	"	11	" " 260	"
4	" " 236	"	12	" " 261	"
5	" " 237	"	13	" " 274	"
6	" " 238	"	14	" " 285	"
7	" " 239	"	15	" " 250	"
8	" " 240	"	16	" " 251	"

Fig. 12 A.R.I. 18124/1 U.H.F. communication system (mod 2437)

70653 SHT. 116-L

RESTRICTED

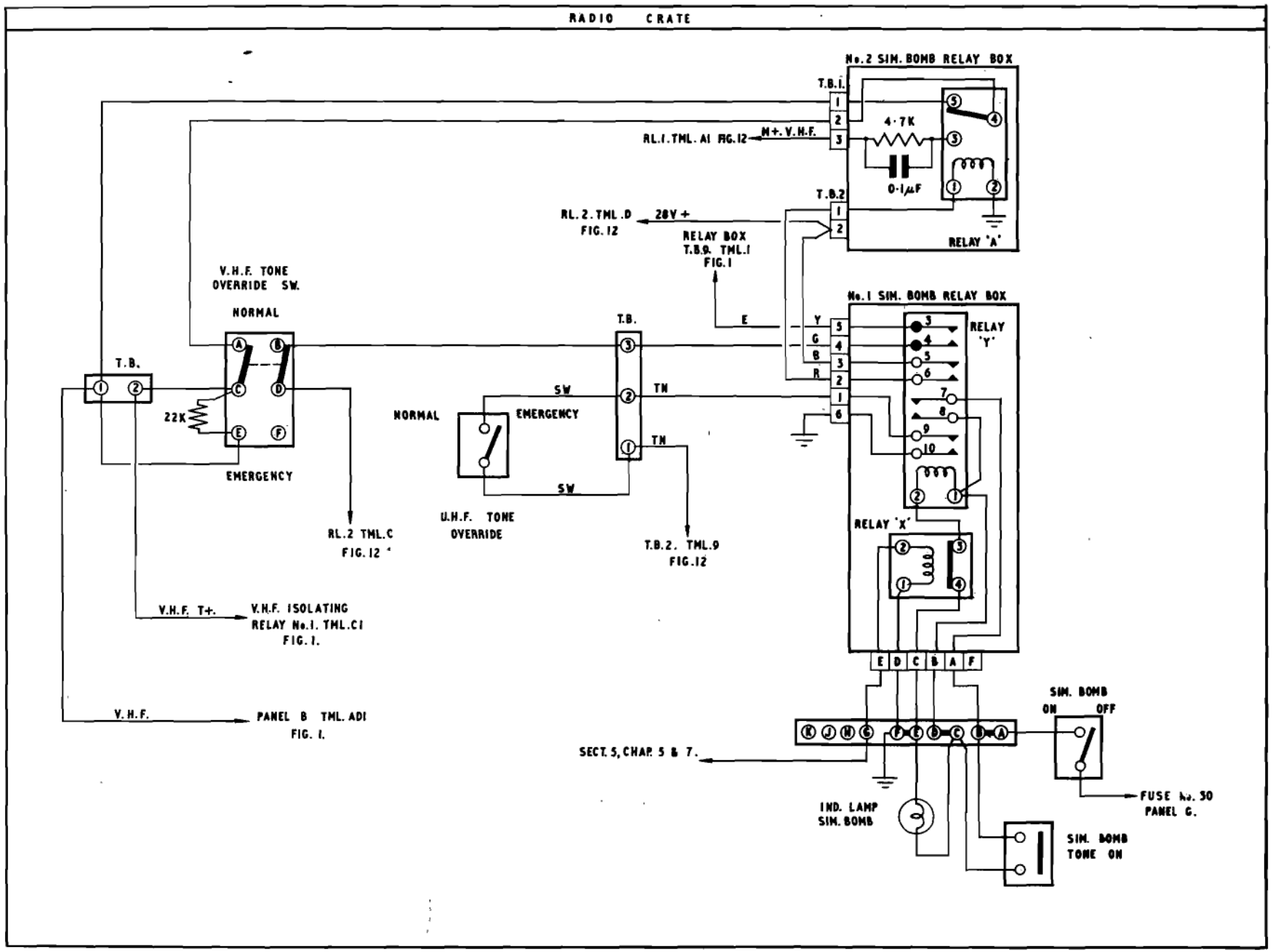

Fig. 13. Sim. Bombing V.H.F. and U.H.F. release tones (Mod. 2746)

RESTRICTED

LIST OF APPENDICES

APPENDIX 1

A.R.I. 18124—U.H.F. COMMUNICATIONS (post Mod. 3114)

1. Post Mod. 3114, connector No. 16 shown on Fig. 12 in Group 1 becomes 70636—Sht. 258

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Appendix 2

INTERCOMMUNICATIONS (Post Mod. 3109)

1. Post Mod. 3109, the I/C system is used to provide the A.E.O. with audio output reception from the Eureka Mk. 10 installation (*Chap.* 2, *Group* 1, *App.* 1). A routing chart included in this Appendix (*fig.* 1) shows alterations to I/C wiring and the disposition of new components is given in the Group 4 location diagrams.

2. An I/C-EUREKA switch on the radio crate facilitates selection of Eureka signals and isolates the A.E.O.'s Telephone from normal communication services. To afford the 1st pilot control in an emergency, the switch is connected to the Eureka control unit via the pilot's override relay.

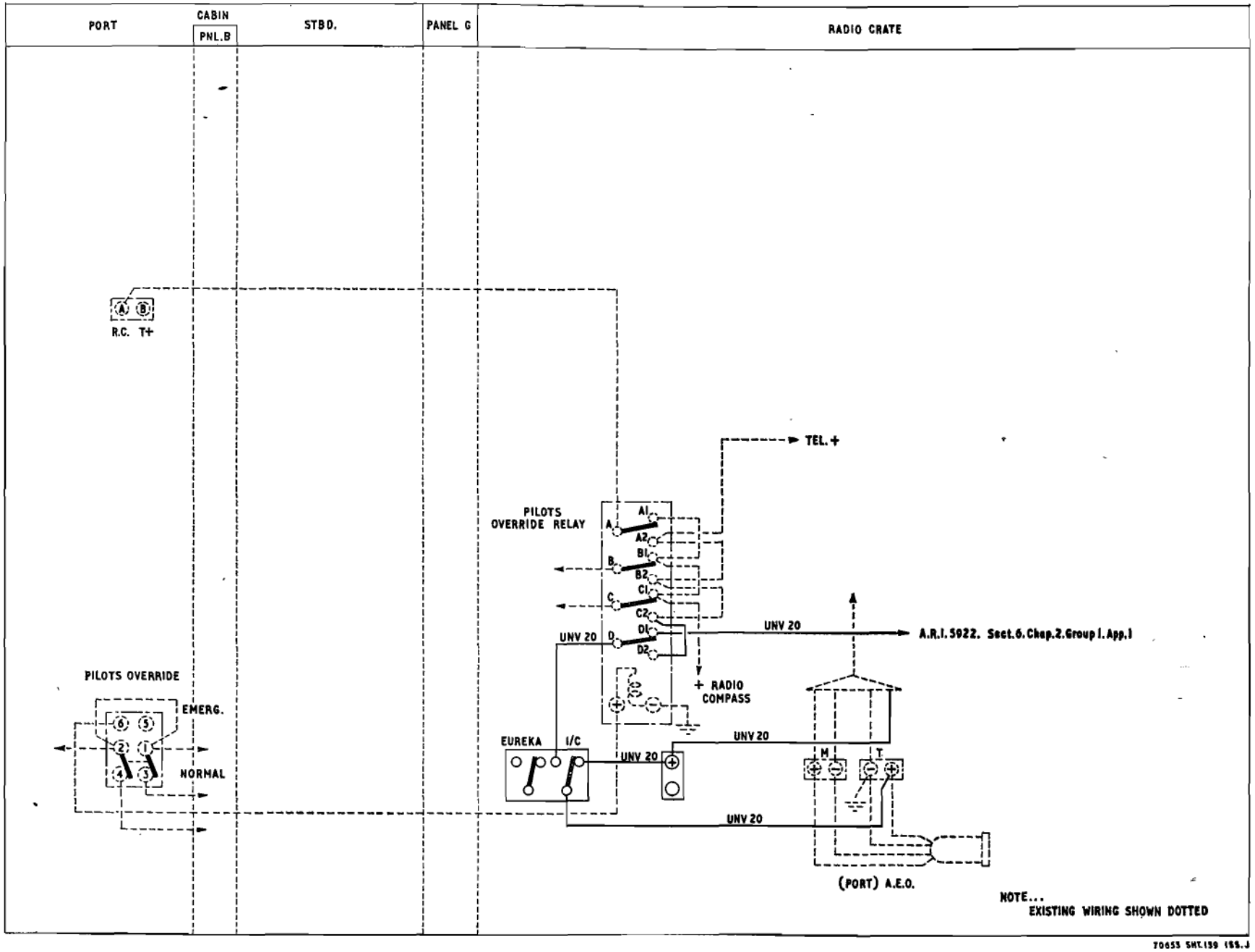

Fig. 1. Alterations to Fig. 1 in Group 1

Appendix 3
TELEBRIEFING (Mod. 3089)

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. This appendix describes the telebriefing services introduced by Mod. 3089. The modification introduces a seven-pin plug, Type 3750, located in the nosewheel bay port side, a pilot and co-pilot change-over switch, a press-to-test warning lamp and six relays. A routeing diagram is included in this appendix, and the location of equipment is shown in Group 4 location diagrams.

DESCRIPTION AND OPERATION

General

2. The telebriefing system provides communication between the air crew and ground control for rapid take-off, in conjunction with Mod. 3087—Engine starting (Sect. 5, Chap. 4), Mod. 3088–28–volt Standby services (Sect. 5, Chap. 1), and Mod. 3090—True earth (Sect. 5, General Information).

3. The seven-pin plug is mounted in a box and connected via a pressure bulkhead fitting to the relays. The relays are mounted on the radio crate and obtain their power, together with the warning lamp, from fuse No. 63 on panel G.

4. The warning lamp is mounted on a panel which also accommodates the pilot and co-pilot change-over switch; the panel is secured on the left-hand side of the coaming panel. The warning lamp gives an indication that the telebriefing socket is properly connected.

5. The telebriefing plug is contained within a metal box in which the true earth plug is also situated. The box is inclined at an angle to facilitate automatic disconnection of the socket upon take-off and is fitted with a spring-loaded hinged lid for protection of the plug.

Operation

6. With the telebriefing socket connected to ground control, the warning lamp will be illuminated, thus indicating to the crew that the intercommunicating system is operative; at the same time relay No. 1 is energized, disconnecting the I.L.S. receiver output from the intercommunication system, and connecting telebriefing and crew circuits, via relay No. 2 and the Type 154 J.B. This allows crew members to receive incoming signals from the telebriefing system, at the same time normal intercommunication facilities are still available.

7. With the change-over switch in the 1st pilot's position, relays No. 2, 3 and 4 are energized which in turn accomplish the following functions simultaneously:—

(1) Relay No. 2 disconnects crew telephones from the briefing system, and completes a circuit to provide the necessary 'call' indication for the operations controller.

(2) Relays No. 3 and 4 connect the 1st pilot's microphone and telephone to telebriefing, and isolate these circuits from the airborne intercommunication system.

8. With the change-over switch in the 2nd pilot's position, relays No. 2, 5 and 6 are energized. Relay No. 2 functions as described in para. 7 (1), relays No. 5 and No. 6 operate in a similar manner to No. 3 and No. 4 (para. 7 (2)), except that the 2nd pilot's microphone and telephone circuits are connected to telebriefing.

9. Operation of the change-over switch enables the selected pilot to converse with the operations controller, without affecting other crew members intercommunication facilities. When the switch is released, services are restored as described in para. 6.

10. When the telebriefing connector is removed from the aircraft plug, the indicator lamp is extinguished and relay No. 1 returns to its de-energized position, so reconnecting I.L.S. output to the intercommunication telephone system.

SERVICING

General

11. After every Simstart ensure that no damage is sustained by the Type 3570 plug.

12. The general tests to be applied are contained in the General Information group contained immediately after Section 5 marker page.

13. Details of the components in the telebriefing system are contained in A.P.2876G, Vol. 1.

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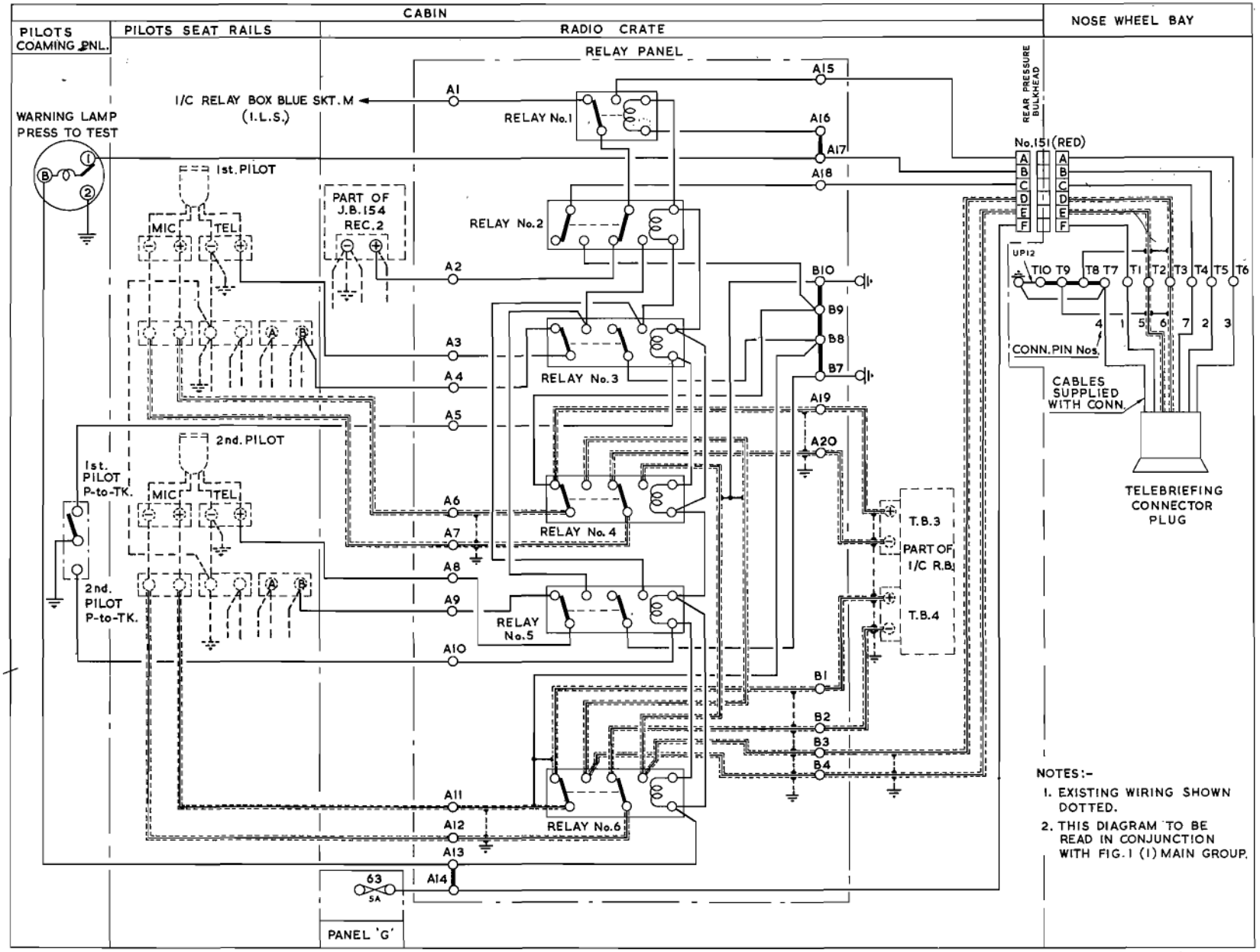

Fig.1 Telebriefing (Mod. 3089)

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Appendix 4

A.R.I.18124—U.H.F. COMMUNICATIONS (Post Mod. 3166)

LIST OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

Introduction

1. This appendix describes the alterations to the U.H.F. system when Mod. 3166 (T.A.C.A.N. and Collins D.F. system, Chap. 2, Group 1, App. 3) is embodied.

DESCRIPTION AND OPERATION

General

2. The modification includes three relays, idented DF RELAY NO. 1, DF RELAY NO. 2; and DF RELAY NO. 3, fitted on the rear of the radio crate at the 1st Navigator's position. Two switches, one idented NAV P-TO-T DF ONLY and the other U.H.F. SELECT DF-COMM are mounted on the T.A.C.A.N. control and indicator panel at the 1st Navigator position. Extra terminal blocks, and a junction box idented U.H.F./D.F. mounted on the radar crate are also included. The filter unit Type 16437 (introduced by Mod. 2742) is deleted. Fig. 1 of this appendix shows the modification, and the components introduced are illustrated in Group 3.

3. The operation of the switches and relays are as follows:—

(1) With the DF-COM switch in the COMM position, relay 1 is de-energised and the line from pin E of socket 6, T.A.C.A.N. junction box (Chap. 2, Group 1, App. 3) is connected to the line from pin F at terminal B2 of relay 1, through terminals C and C1 of relay 2, and D and D1 of relay 3. The 1st Navigator's microphone lines to I/C are completed through terminals A and A1, and B and B1 of relay 3. The A.E.O./Pilot P-to-T line is completed through terminals D and D1 of relay 1.

(2) When the DF-COMM switch is placed in the DF position, relay 1 is energised and changes over its contacts with the following effects:—

(*a*) The lines from pins E and F socket 6 of the T.A.C.A.N. junction box are earthed via terminals B and B2. This causes the output line of the Collins D.F. loop aerial to be switched to the U.H.F. receiver through a coaxial switch in the Collins D.F. System. The output from the receiver is fed back to the Collins control amplifier through the U.H.F./D.F. junction box.

(*b*) The A.E.O./pilot P-to-T line is changed over from D and D1 to D and D2.

(*c*) The 1st Navigator P-to-T line is switched from C and C1 to C and C2.

(*d*) The P-to-T line at terminal C of relay 3 is connected to earth through terminals A and A2.

(3) When the NAV P-TO-T DF ONLY switch is operated, relay 3 is energised through contacts C and C2 of relay 1 and D and D1 of relay 2, the relay changes over its contacts, with the following effects:—

(*a*) The 1st navigator microphone lines are switched from I/C to U.H.F. through contacts A and A2 and B and B2.

(*b*) The P-to-T line is completed through terminals C and C2, and the already closed contacts A and A2 of relay 1.

(*c*) The Collins D.F. co-axial switch line is broken by contacts D and D1 opening, and the connection between the Collins D.F. loop aerial and the U.H.F. receiver is interrupted.

(4) Relay No. 2 is fitted in the circuit to allow the pilot or A.E.O. to override the 1st Navigator P-to-T facility. When either the pilot or A.E.O. P-TO-T switch is operated (with the V.H.F./U.H.F. selector switch in the U.H.F. position) relay 2 is energised through contacts D and D2 of relay 1 and contacts C and C2 of the U.H.F. relay No. 1, the relay changes over its contacts with the following effects:—

(*a*) Relay No. 3 is de-energised through contacts D and D1 opening.

(*b*) The Collins coaxial switch line remains interrupted by contacts C and C1 opening.

(*c*) The P-TO-T line is maintained to earth through contacts B and B2.

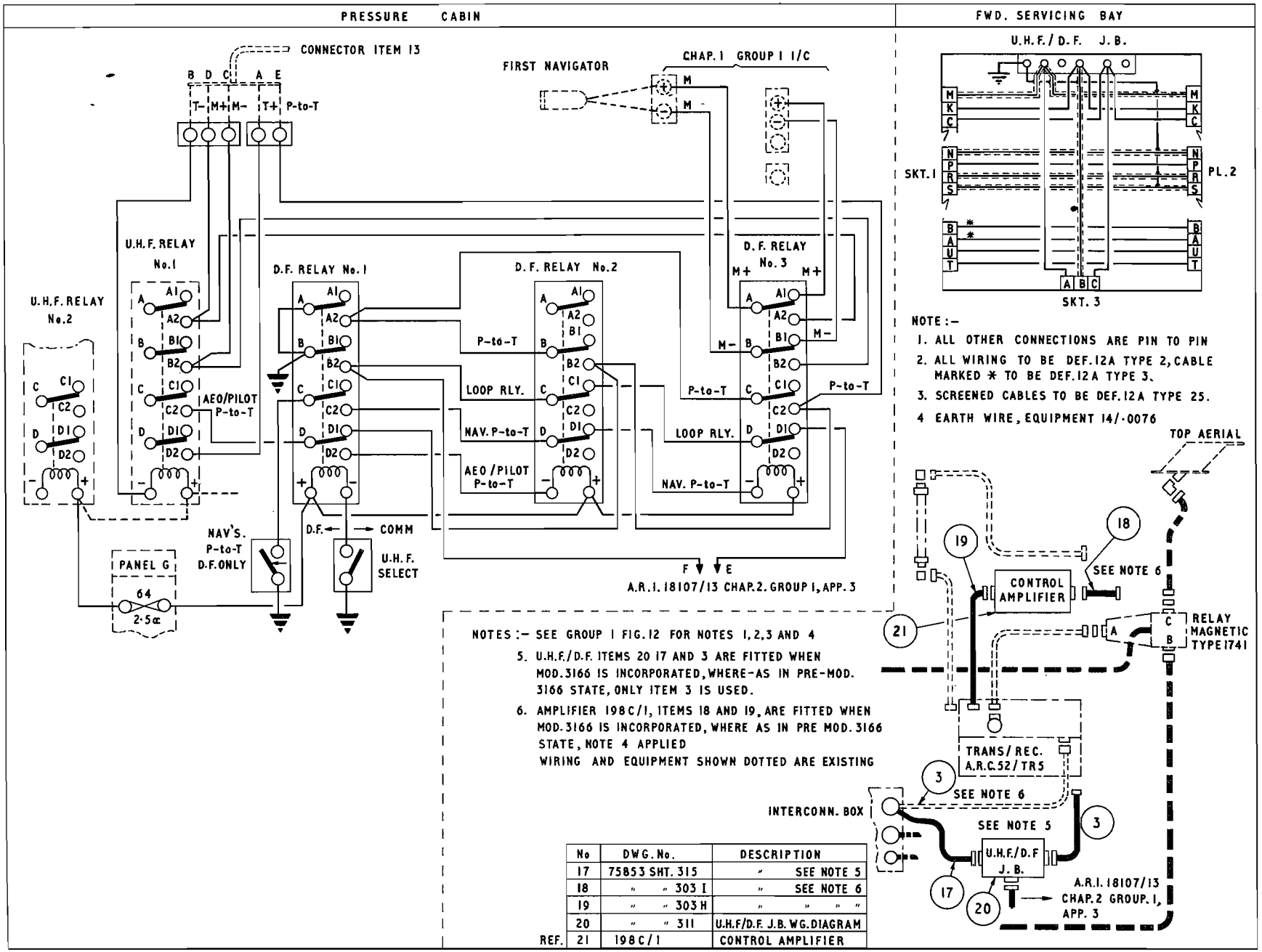
(*d*) When relay 3 is de-energised, the 1st Navigator's microphone lines are switched from U.H.F. back to I/C.

4. Table 1 lists the equipment introduced by Mod. 3166.

TABLE 1

A.R.I.18124 U.H.F. Communications Equipment (Post Mod. 3166)

Item	Type or Ref. No.	No. off	Location
Relay	102A	3	Radio crate
Switch	Z510578	1	T.A.C.A.N. control panel
Switch	Z510579	1	T.A.C.A.N. control panel
Junction box	75853 Sht.311	1	Radar crate
Terminal block	5CZ/430	1	Radio crate
Terminal block	5CZ/432	1	Radio crate



	No	DWG. No.	DESCRIPTION
	17	75853 SHT. 315	" SEE NOTE 5
	18	" " 303 I	" SEE NOTE 6
	19	" " 303 H	" " " "
	20	" " 311	U.H.F/D.F. J.B. WG. DIAGRAM
REF.	21	198C/1	CONTROL AMPLIFIER

75853 SHT. 309 ISSUE A
70653 SHT. 116 ISSUE Q
75853 SHT. 311 ISSUE A

Fig. 1 Alterations to Fig. 12 (Mod. 3166)

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Appendix 5

INTERCOMMUNICATIONS (Post-Mod. 3165 or 3166)

Introduction

1. This appendix described the alterations to the intercommunications system when Mod. 3165 (T.A.C.A.N.) or Mod. 3166 (T.A.C.A.N. and Collins D.F. system) Chap. 2, Group 1, App. 3 is embodied.

Description and operation

2. T.A.C.A.N. beacon identification signals are fed into the I/C JB Type 154 from the T.A.C.A.N. receiver, through a tone level switch in the T.A.C.A.N. control unit, and an AUDIO ON/OFF switch on the T.A.C.A.N. control panel.

3. On Mod. 3166 aircraft only, in addition to the details given in para. 2, the 1st navigator's microphone lines are altered by routeing them through the contacts of the No. 3 D.F. relay (Group 2, App. 4).

4. Fig. 1 to this appendix shows the alterations described in paras. 2 and 3.

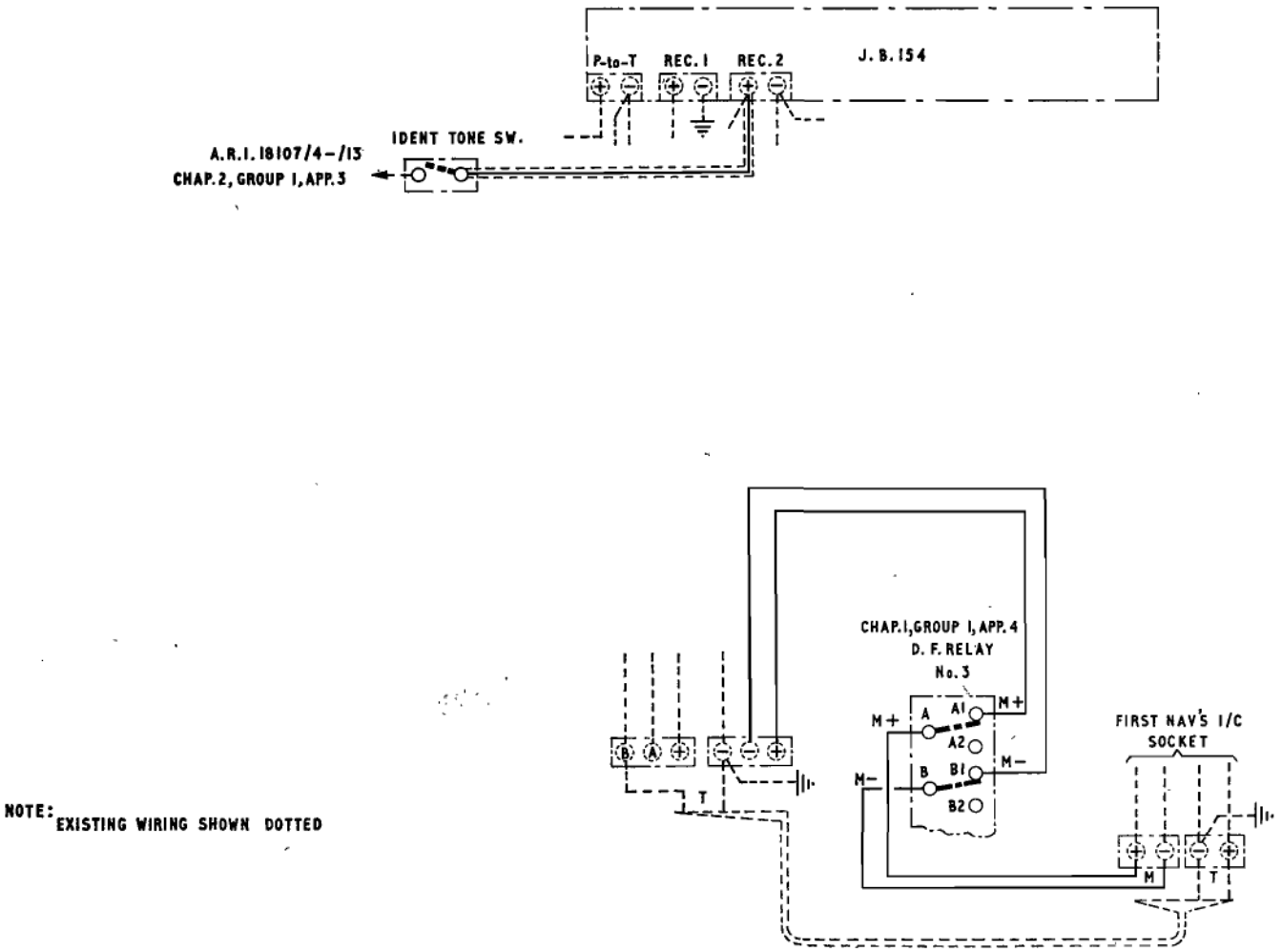

Fig. 1. Alterations to Fig. 1(2) intercomm. system (Post Mod. 2874) Post Mod. 3165 and 3166