Chapter 1 WIRELESS INSTALLATION

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. This chapter contains a description of the V.H.F. communication and Z.B.X. homing beacon receiver installation and includes notes on servicing the equipment in situ and instructions for the removal of the units. Detailed instructions dealing with the servicing and bench testing of the equipment as well as circuit information and setting up procedures are given in the relevant air publication as follows:—

A.R.I.5489 (T.R.1936) installation — A.P.2538HA, Vol. 1

A.R.I.5307 (Z.B.X.) installation — A.P.2538M, Vol. 1

Figs. 1 and 2 show the location of the equipment in the aircraft and fig. 3 is a wiring diagram showing the interconnection of the units, terminal blocks and switches.

DESCRIPTION

A.R.I.5489 (T.R.1936) installation

2. This equipment provides two-way communication on any one of ten spot frequencies in the 115-145 Mc/s band. It also provides a means of intercommunication between crew members. Selection of the required frequencies is by means of a control unit, Type 382, mounted on the centre instrument panel support structure.

3. The transmitter-receiver, Type T.R. 1936, is mounted in an anti-vibration mounting tray on a shelf attached to bulkhead 1 in the nose compartment. A relay and test panel is located on the forward face of bulkhead 1 starboard side, adjacent to the transmitter-receiver. The test panel contains a V.H.F. test mic.-tel socket and PRESS-TO-TRANSMIT switch, a Z.B.X. test socket, supply and mic.-tel terminal blocks and a relay, Type P.

4. The d.c. supplies to the V.H.F. and Z.B.X. installations are fed from fuses in junction box 1 on the forward face of bulkhead 2, as shown in the wiring diagram, fig. 3 and in Sect. 5, Chap. 1, Group J, fig. 1.

5. The mic.-tel socket for each pilot is located on the left shoulder strap of the ejection seat safety harness. The socket is connected via a further plug and socket at the rear of the seat to the mic.-tel terminal blocks on bulkhead 2.

6. A single muting switch is provided by means of which either pilot can mute the V.H.F. receiver when signals interfere with intercomm. The switch is located on the instrument panel, adjacent to the V.H.F. control unit.

7. A PRESS-TO-TRANSMIT push switch is incorporated in the end of each throttle handle. Operating the switch earths the P-to-T +line from the V.H.F. transmitter-receiver, and in addition energises the relay, Type P, on the relay and test panel in the nose compartment. This relay breaks the Z.B.X. telephone output during transmission, a condition required when transmitting to prevent Z.B.X. signals being transmitted when the switch on junction box, Type 148, is in the MIX position.

8. A whip aerial, Type 226, is mounted on the upper surface of the starboard boom. It is secured to a mounting bracket inside the boom, the whip passing through a rubber

grommet in the boom surface. The co-axial feeder from the aerial to the set is routed into the fuselage just aft of bulkhead 4, a socket adaptor being inserted in the feeder at this point for wing break purposes.

A.R.I.5307 (Z.B.X.) installation

9. The Z.B.X. installation is a navigational aid providing homing information to enable the pilot to ascertain his bearing relative to a ground or carrier-borne beacon. A full description of the function, principles and operation of the system is given in A.P. 2538M, Vol. 1, together with maintenance notes and circuit information.

10. The installation comprises the following main units:—

A receiver, Type R1585, mounted in a rack, Type 64, on the shelf in the nose compartment, adjacent to the V.H.F. transmitter-receiver; a control unit, Type 345, mounted at the lower port corner of the instrument panel; a junction box, Type 148, mounted on the centre instrument panel support structure adjacent to the V.H.F. control unit; and an aerial, Type 221, mounted on the upper surface of the port boom. The co-axial aerial feeder enters the fuselage just aft of bulkhead 4, and a socket adaptor is inserted in the feeder at this point for wing break purposes.

11. The junction box, Type 148, enables the 1st pilot to select the output of the V.H.F. or Z.B.X. receiver, or both. In the MIX position of the selector switch, the Z.B.X. output is connected to the microphone circuit of the V.H.F. set. When the switch is left in the MIX position, it is necessary to interrupt the Z.B.X. output during transmission on V.H.F. or Z.B.X. signals will also be transmitted via the microphone circuit. A relay, Type P, is introduced, the contacts of which open when the relay is energized. The Z.B.X. telephone output is routed via the relay contacts and when the PRESS-TO-TRANSMIT switch is operated the Z.B.X. output is interrupted.

12. A further selector switch, labelled RT/BEAC, is located on the starboard instrument panel and enables the 2nd pilot to select V.H.F. or Z.B.X. reception. It should be noted that with the switch on junction box, Type 148, in the MIX position, the 2nd pilot will also hear both receivers if his selector switch is in the RT position.

13. The selection of the required beacon modulation frequency is by means of a cranked handle on the control unit, Type 345, which drives through a torsional drive cable, a selector switch in the receiver, Type R1585. The channel selected is indicated in a small circular window on the receiver and control unit.

SERVICING

A.R.I.5489 and A.R.I.5307 installation

14. The V.H.F. and Z.B.X. units should be checked for security in their mounting and for their general condition. The anti-vibration shockmounts should be tested for effectiveness, ensuring that sufficient slack is left in the connectors to allow free movement of the sets. The slide fasteners securing the Z.B.X. rack, Type 64, to its mounting should be securely wirelocked in the closed position. All plugs and sockets should be firmly screwed home and free from damage or corrosion. The torsional drive between the Z.B.X. receiver and control unit should be checked for free operation. At the same time a check should be made to ensure that the channel indicated on the set corresponds with that indicated on the control unit. If it does not, disconnect the torsional drive and turn the crank handle on the control unit until the channel indicated on the control unit is the same as that on the receiver. Re-connect the drive.

Bonding and screening

15. To prevent interference with wireless reception, all bonding connections should be kept clean and tight. The resistance between the main earth terminal and any point in the bonding system must not be greater than 0·025 ohm. All metal braided cables and connectors must be securely clipped to the aircraft structure to prevent intermittent contact between the cable screening and airframe. The locking rings on all plug and socket connections should be screwed well home.

Connectors and cables

16. All connectors and cables should be examined regularly for signs of damage or corrosion. The connections at plug pins, sockets and terminal blocks should be clean and secure. An insulation and continuity test should be made periodically of all cables and connector leads. Insulation resistance testing data is given in A.P.1095A, Vol. 1, Sect. 3, Chap. 4. To prevent damage to components in the units, all cables and connectors should be disconnected from the sets before making any insulation tests.

Mic.-tel sockets

17. The mic.-tel sockets and connectors should be examined for signs of corrosion, damage and ingress of moisture. The attachments of the socket and cable to the harness strap should be checked for security, and the connections to the socket examined for fraying or breaks. The plug and socket at the rear of the seat should be firmly mated, with the "click" ring in the plug rim in position. The connections to the terminal blocks on bulkhead 2 should be clean and secure.

Aerials

18. The aerials should be examined at regular intervals for signs of damage or corrosion. The rod should be free from rust and the rubber grommet should be checked for evidence of splitting or perishing. The base block should be examined for cracks or chipping and the connection to the aerial should be clean and tight. The insulation resistance to earth should be checked periodically. When making insulation checks, the matching stub of the aerial, Type 226, should be disconnected, as the end remote from the aerial is earthed to the screening. The earthing tags should be effectively bonded to the aircraft structure.

REMOVAL OF EQUIPMENT

19. Access to the V.H.F. transmitter-receiver and Z.B.X. receiver is gained after raising the hinged nose cap. Disconnect the plugs and sockets on the front face of the unit and release the knurled locknuts on the front of the mounting. The unit can now be withdrawn from its mounting tray. The rack Type 64, can be removed after disconnecting the supply socket and telephone jack from the rear of the rack and releasing the four slide fasteners. Refitting is the reverse of removal. Wirelock the slide fasteners on completion.

20. Before removing the aerials it will be necessary to remove the inspection panels in the side of the boom below the aerials. When this has been done remove the cover from the base of the aerial and disconnect the co-axial feeder. Release the matching stub of the aerial, Type 226, by unscrewing the two 4, B.A. screws in the boom surface aft of the whip. Unscrew the four 2 B.A. csk./hd. bolts in the boom surface at the base of the whip and withdraw the complete aerial assembly, pulling the whip down through the grommet.

KEY TO FIG. 1

1. P.-TO-T. AND P.-TO-M. TERMINAL BLOCK
2. 1st PILOT'S PRESS-TO-TRANSMIT SWITCH
3. Z.B.X. CONTROL UNIT, TYPE 345
4. V.H.F. CONTROL UNIT, TYPE 382
5. MUTING SWITCH
6. MIXER JUNCTION BOX, TYPE 148
7. PRESS TO MUTE SWITCH
8. 2nd PILOT'S PRESS-TO-TRANSMIT SWITCH
9. 2nd PILOT'S PRESS-TO-TRANSMIT TERMINAL BLOCK

DM 57559/2/8785 500 3/60 TXL

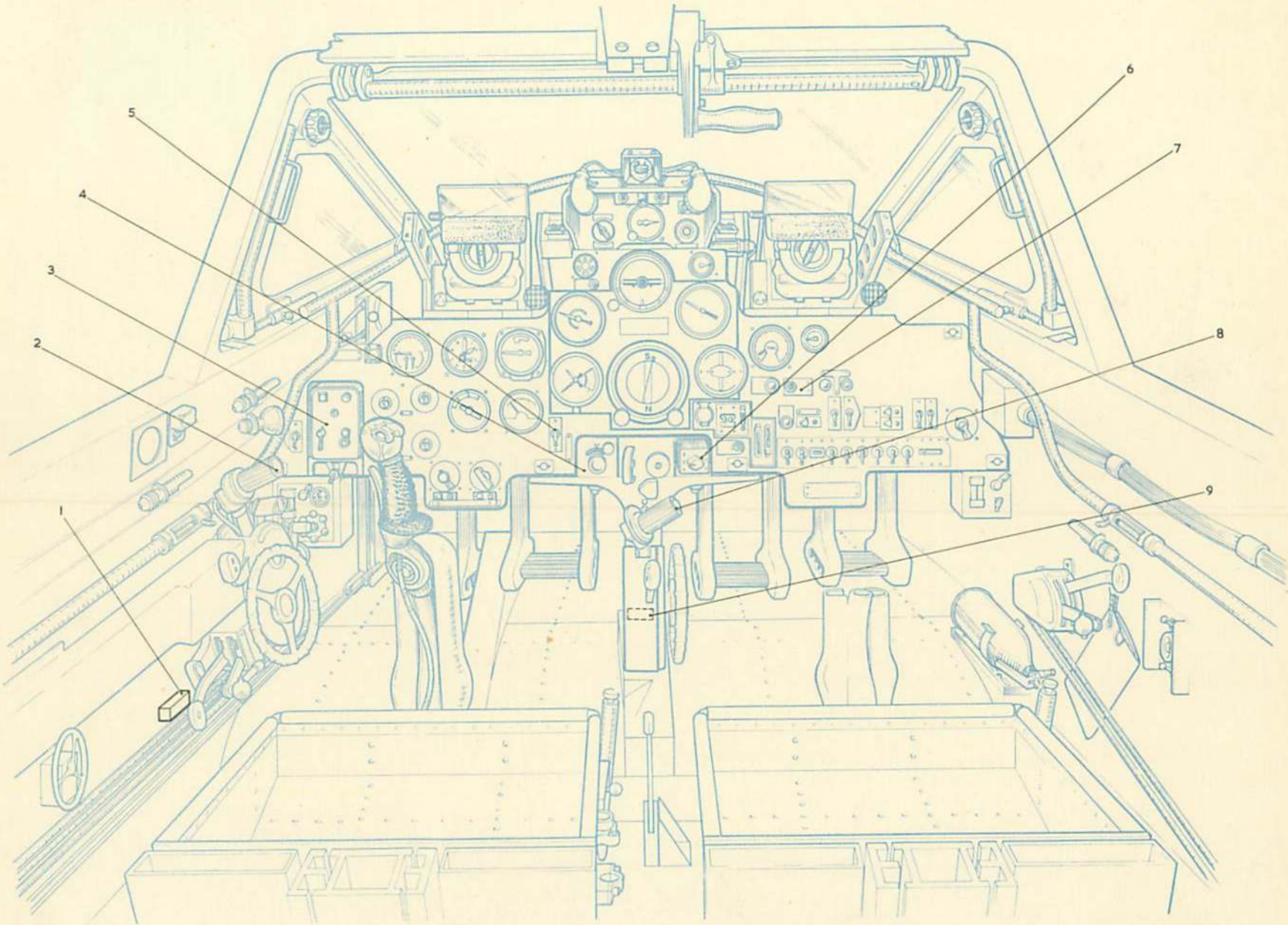

Fig.1 A.R.I.5489(T.R.1936)and A.R.I.5307(Z.B.X.)installation (1)

166910 / 4922 625 1157 BBLtd. Gp. 979

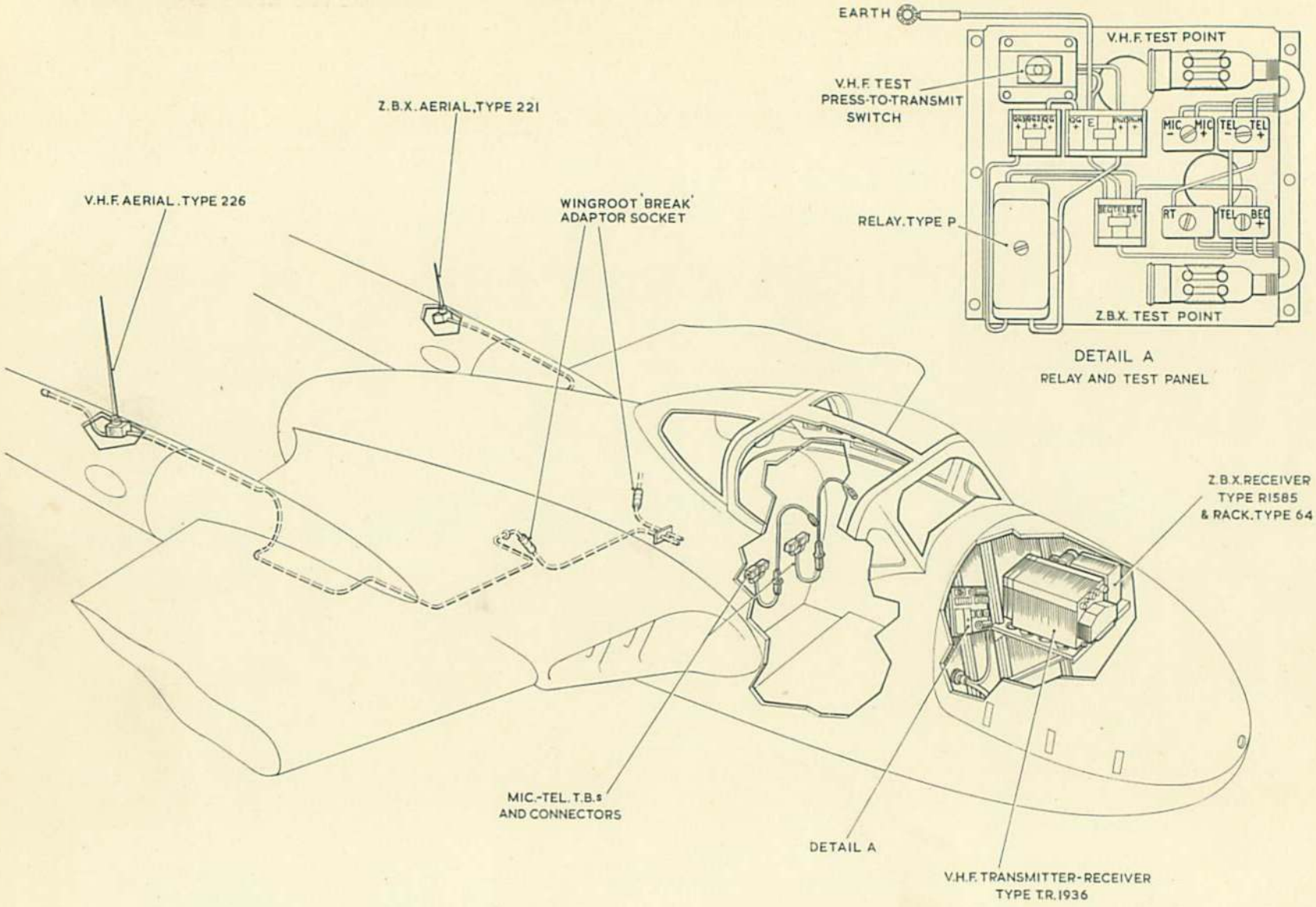

Fig.2 A.R.I.5489 (T.R.1936) and A.R.I.5307 (Z.B.X.) installation (2)

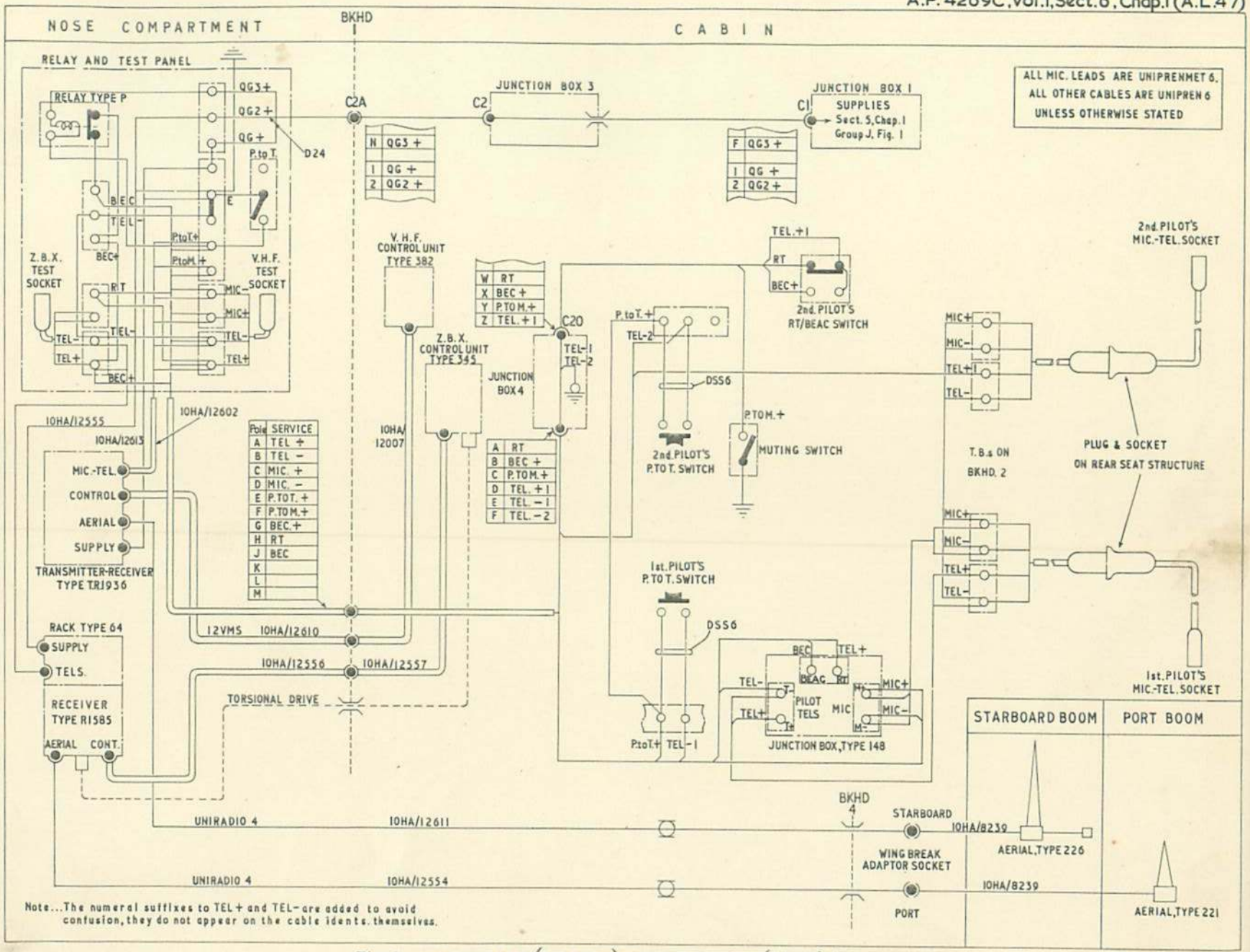

Fig.3 A.R.I.5489 (T.R.1936) and A.R.I.5307 (Z.B.X.) wiring

(A.L.47, DEC.56)

186910 / 4922 625 957 88Ltd Gp. 979