Chapter II WIRELESS AND RADAR POWER SUPPLIES

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WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cockpit or performing any operations upon the aircraft.

DESCRIPTION

General

◀ **1.** This chapter has been revised to incorporate the effect of the following modification:-

Mod.4499 To introduce I.F.F./S.S.R. in lieu of I.F.F. in accordance with S.R.I.M. 3399. ▶

2. Power supplies of 28-volt d.c., 200-volt, three-phase a.c., and 115-volt, single-phase a.c. are required to operate the wireless and radar systems. The 200-volt a.c. supply is taken direct from the a.c. generator busbars, whilst the 115-volt supplies are provided by single-phase transformers coupled to the busbars. A full description of the a.c. power supplies, complete with circuit and routeing diagrams, will be found in Chap.13.

U.H.F. and telebriefing

3. The 28-volt d.c. supplies required for the U.H.F. and telebriefing systems are provided via fuses from the d.c. feeder fuse panel. Circuits RP3 (fuse 116) and RP4 (fuse 113) are fed direct to the U.H.F. relay box located between frames 20 and 20A in the spine. The telebriefing circuit to the PRESS-TO-TRANSMIT push-buttons (RP2-RP22-RP25) is taken from fuse 115 via a 0.68-ohm

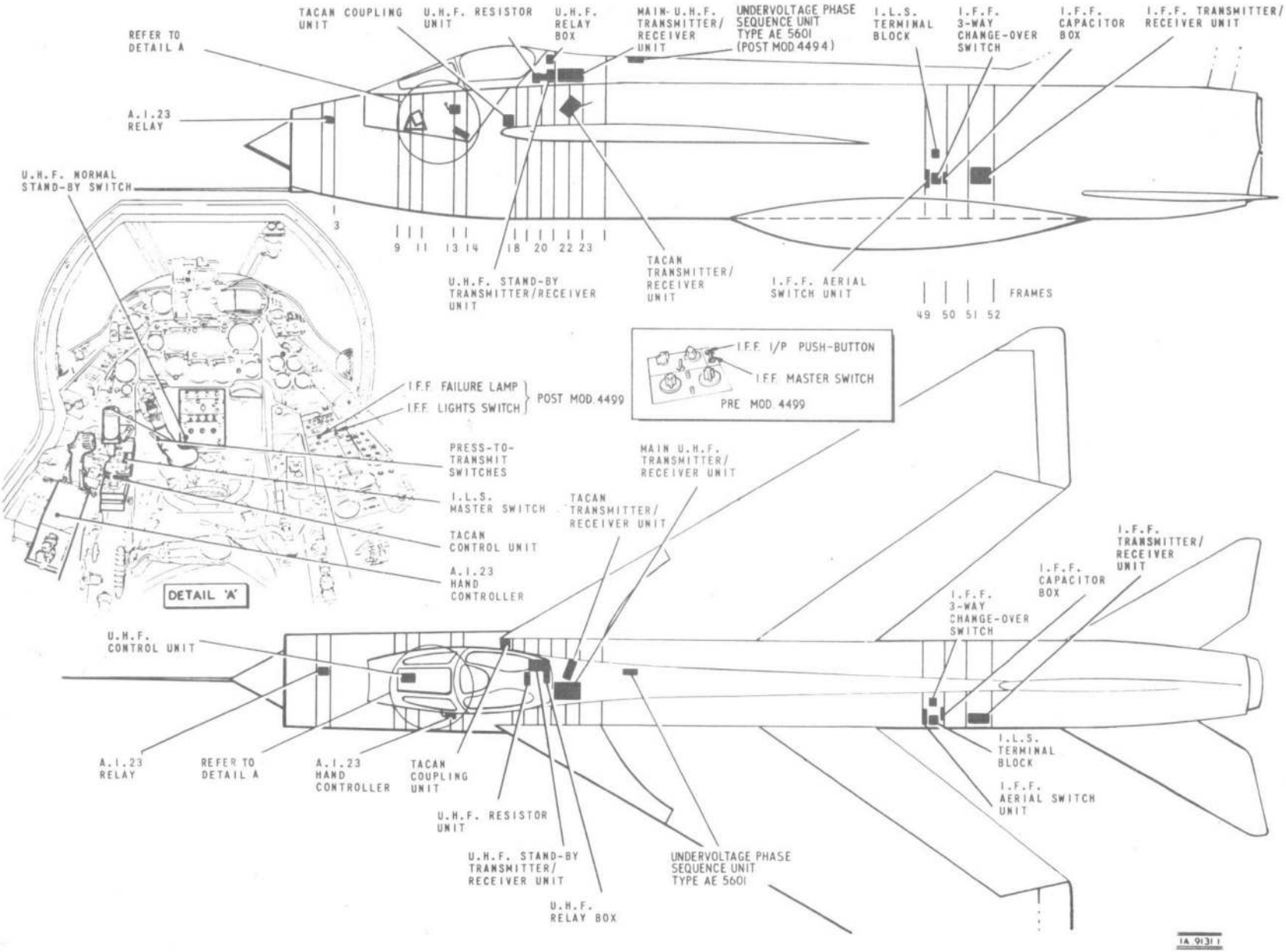

FIG.1. WIRELESS AND RADAR SUPPLY EQUIPMENT.

◀ MOD.4499 EMBODIED ▶

a.c. and d.c. supplies for its operation. The 200-volt, 3-phase a.c. supply is fed via busbars XA, XB and XC, which are normally controlled by the a.c. supply main contactor *(Chap.13)*. The a.c. supply is then routed through the contacts of a Type 10B relay in the forward equipment compartment to the radar head in the nose. This relay is controlled through the radar head strut wiring, by the main switch on the A.I. hand controller on the port console. The d.c. supplies of 28 volts, VA1 and SS1 respectively are derived from the aircraft d.c. system via fuses 99 and 117 in the d.c. feeder fusebox. The ground test switch on the A.I. hand controller, when set to the outboard position, breaks circuit VA17 and the radar head is caged while operational checks are made on the installation.

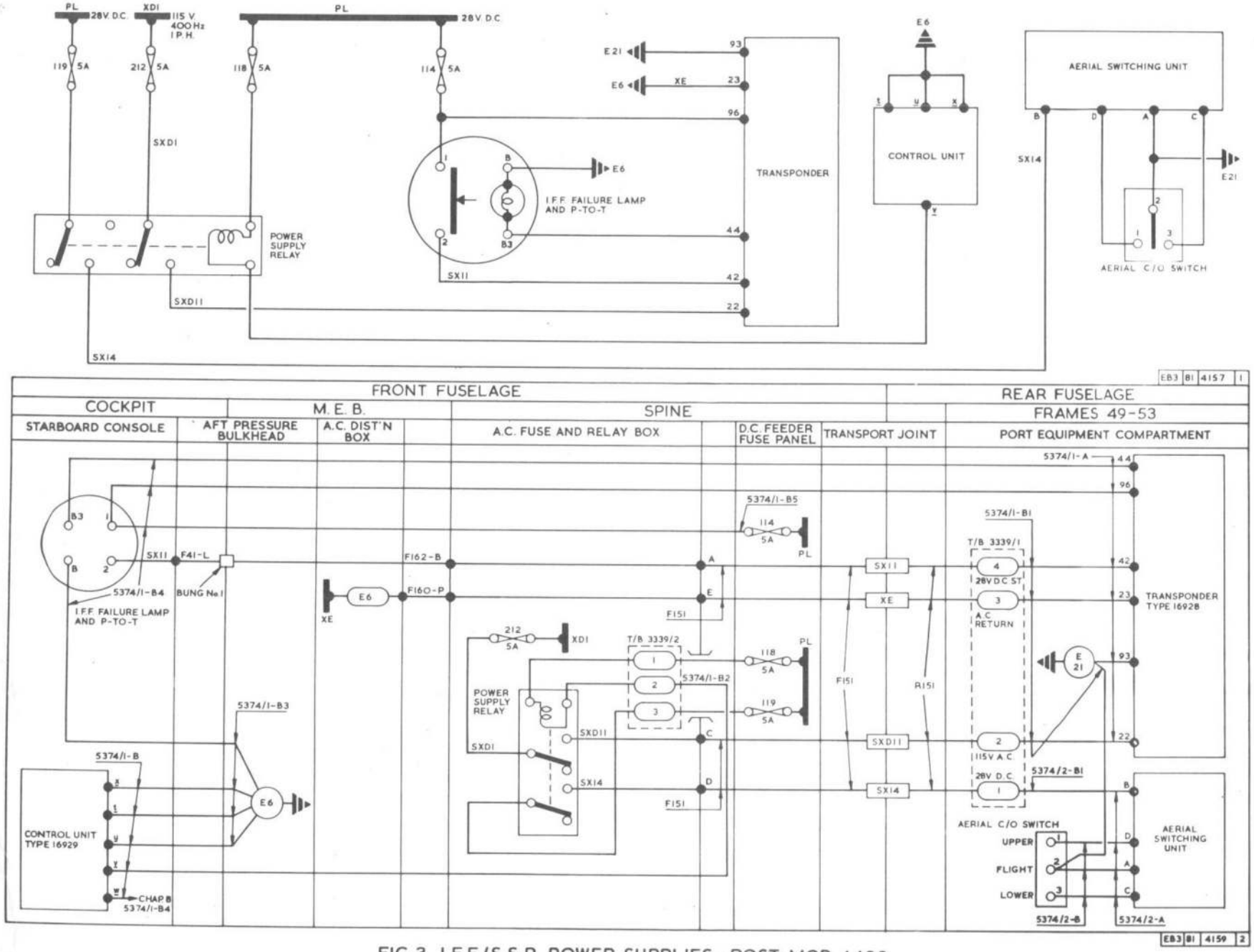

FIG. 3. I.F.F./S.S.R. POWER SUPPLIES – POST MOD. 4499

FIG.4. WIRELESS AND RADAR POWER SUPPLIES

(illustration overleaf)

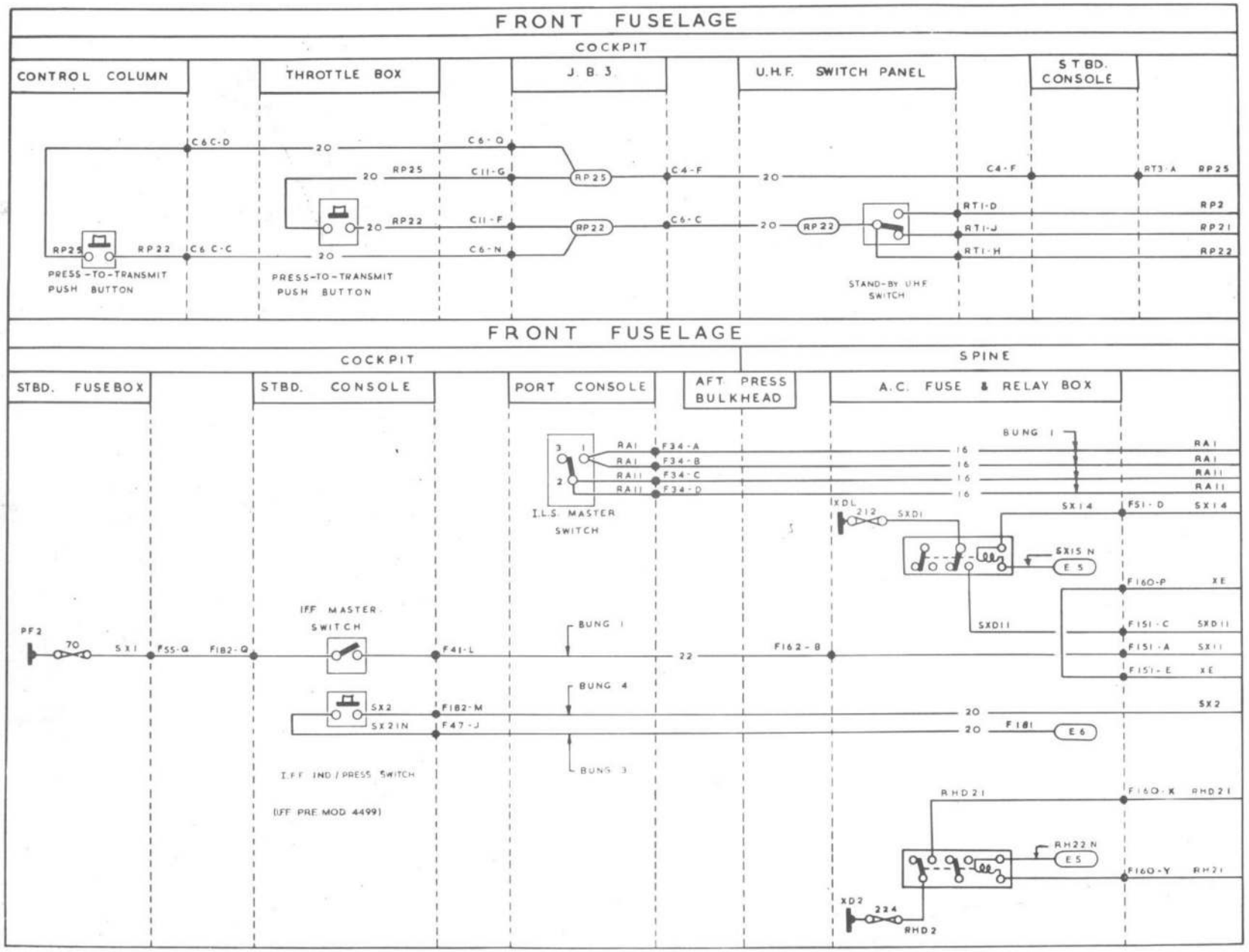

FIG.4 WIRELESS AND RADAR POWER SUPPLIES

◀ MINOR AMENDMENTS ▶

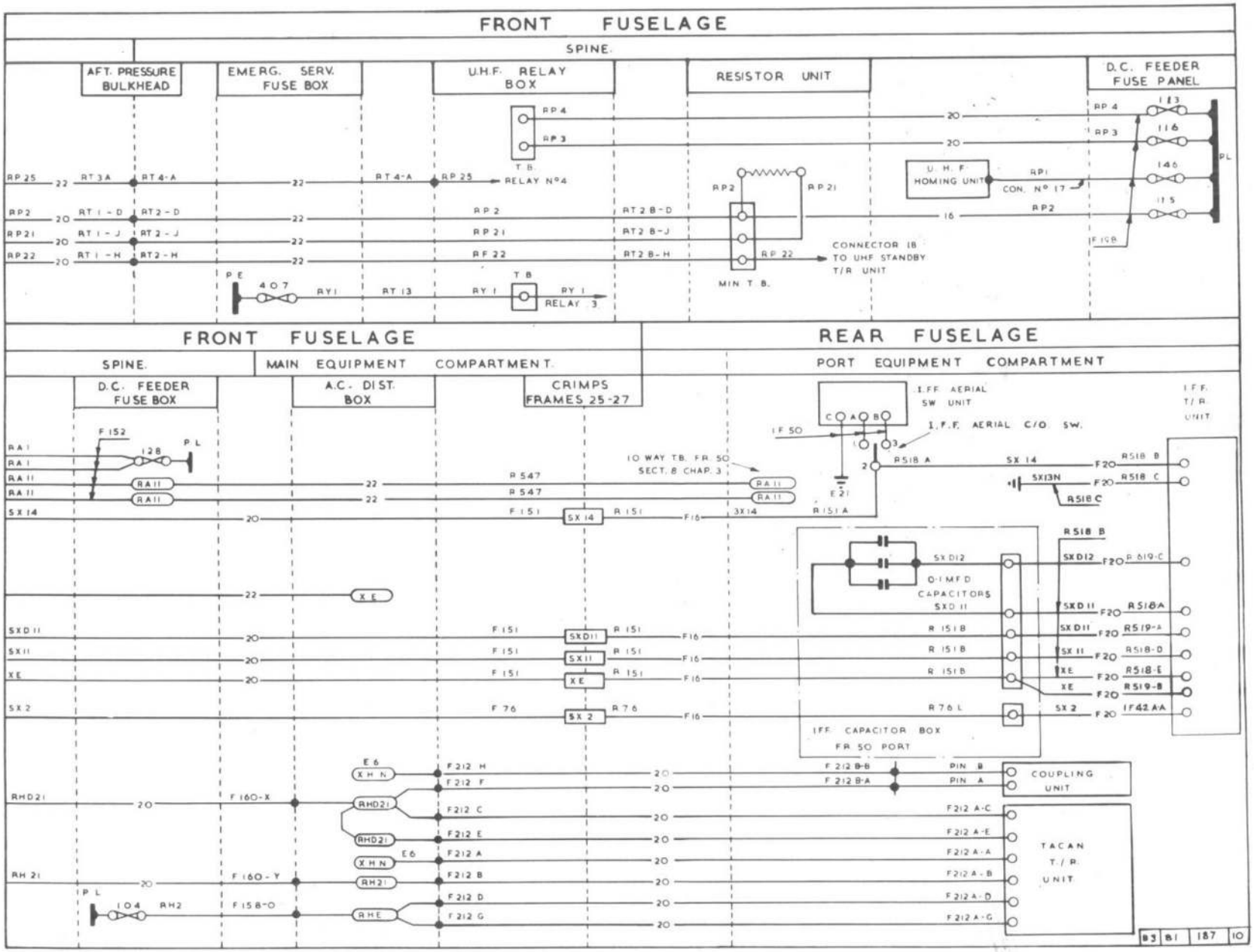

FIG. 4A. WIRELESS AND RADAR POWER SUPPLIES

◄ MINOR AMENDMENTS ►

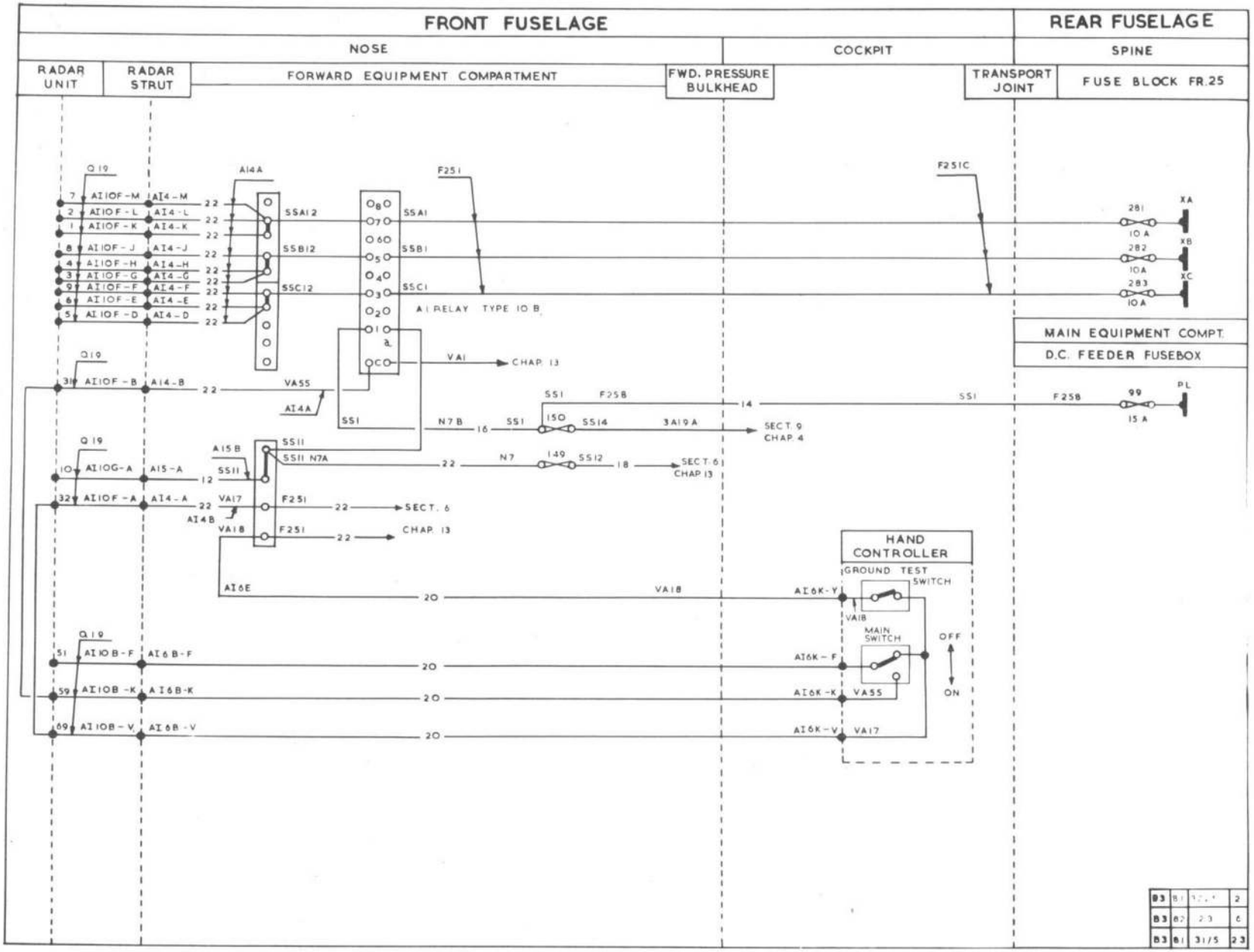

FIG. 5. A.I. 23 POWER SUPPLIES.

◄ MINOR AMENDMENTS ►

voltage-dropping resistor and the stand-by U.H.F. switch. Should the aircraft d.c. generator supply fail, operation of the switch to the STANDBY position shorts out the resistor and feeds the circuit direct from fuse 115 to the U.H.F. stand-by T/R unit. The telebriefing circuit is also arranged so that it can be operated when the battery master switch is off, a supply (fuse 407-RY1) from busbar PE in the emergency services fusebox provides a circuit to relay No.3 in the U.H.F. relay box. Fuse 146 (circuit RP1) supplies the U.H.F. homing unit.

I.L.S. (A.R.I.18011)

4. This system operates from the 28-volt d.c. supply via fuse No.128 in the d.c. feeder fusebox. The supply is controlled by the I.L.S. master switch located on the Tacan/I.L.S. control box on the port console, and is routed to a terminal block on frame 50 (port) adjacent to the localizer/marker receiver.

◀ **I.F.F. (A.R.I.5848) (pre Mod.4499)**

5. Both the 28-volt d.c. and the 115-volt, single-phase a.c. power supplies required for the I.F.F. system are taken from the normal aircraft sources. The supplies are controlled by the I.F.F. MASTER switch on the starboard console in conjunction with a Type A24NR/1 (post Mod.4049), Type STC 4190HD or A24NR (pre Mod.4049) relay in the a.c. fuse-and-relay box. Closing of the master switch completes a supply (SX11) to the transmitter/receiver via the I.F.F. capacitor box. From the transmitter/receiver the supply (SX14) is extended to the coil of the relay, which when energized, completes the a.c. circuit (fuse 212-SXD11) to the transmitter/receiver, via the capacitor box. The control circuit ensures that in the event of a d.c. failure, the relay will open and cut off the a.c. supply automatically. Circuit SX14 also provides a d.c. supply to the aerial change-over switch.

6. Incorporated in the transmitter/receiver is a cooling blower driven by a three-phase motor. To enable the motor to operate from the single-phase supply, one of its windings is connected to one line of the supply through a network of three parallel-connected 0.1 mF capacitors, the other two windings being connected normally i.e. one to each line of the supply.

I.F.F./S.S.R. (post Mod.4499)

7. The I.F.F./S.S.R. operates from 28-volt d.c. and 115-volt, single-phase a.c. power supplies. The d.c. supply is drawn from fuse 118 to the coil of the power supply relay, and fuse 119 to one set of contacts of the power supply relay, in the a.c. fuse-and-relay box, whilst the a.c. supply is drawn from fuse 212 and is connected to the remaining contacts of the relay. Energization of the relay coil is controlled by the function switch on the I.F.F./S.S.R. control unit located on the starboard console. When the switch is selected to SBY the earth circuit to the relay coil is completed and the relay contacts change-over completing the d.c. and a.c. supplies to the transmitter/receiver. This control circuit therefore ensures that in the event of a d.c. supply failure the supply relay becomes de-energized and interrupts the supplies to the transmitter/receiver.

8. A further 28-volt d.c. supply, drawn from fuse 114, is connected to the self test (TEST) and system failure warning circuits in the transmitter/receiver unit, simultaneously this supply is connected to a press-to-test switch labelled I.F.F. FAILURE, located adjacent to the control unit. This switch provides a confidence check facility for the filaments of the I.F.F. FAILURE and TEST warning lamps by completing a circuit to the lamp filaments which by-passes the failure and self test circuits in the transmitter/receiver.

Tacan (A.R.I.18107)

9. The Tacan equipment operates from power supplies of 28-volt d.c. and 115-volt, single-phase, a.c. The d.c. supply is taken from fuse 104 in the d.c. feeder fusebox and fed direct to the transmitter/receiver, and is then routed to a switch on the Tacan control unit, port console. Selecting the switch to ON completes the d.c. supply from the transmitter/receiver to the solenoid of a Type A24NR/1 (post Mod.4049), Type STC 4190HD or A24NR (pre Mod.4049) relay in the a.c. fuse-and-relay box. Closing of the relay completes the a.c. circuit (fuse 224-RHD2) to the transmitter/receiver. In the event of failure of the d.c. supply, the a.c. circuit will be automatically disconnected. ▶

A.I.23

10. The A.I.23 system requires both

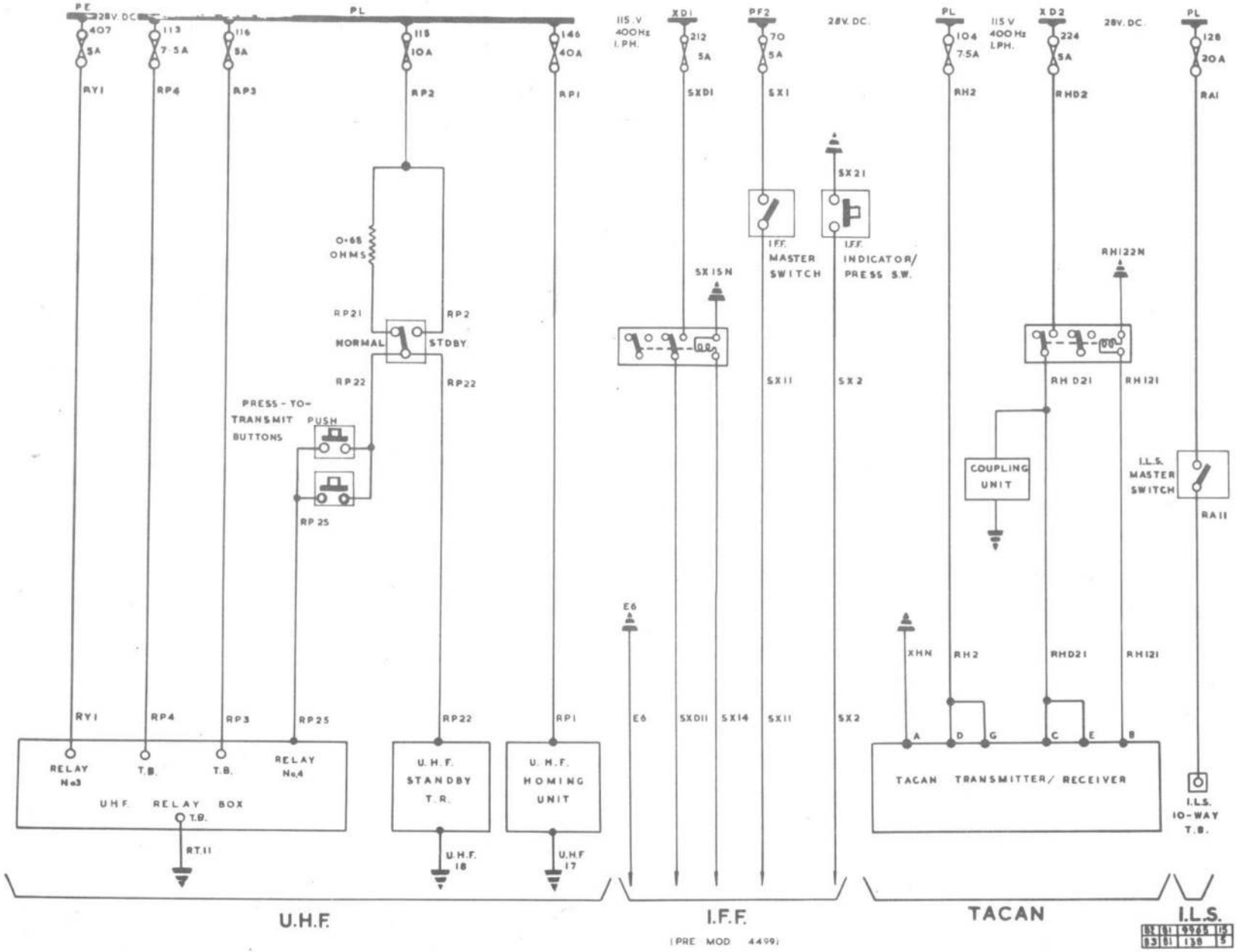

FIG.2. WIRELESS AND RADAR POWER SUPPLIES

◀ MINOR AMENDMENTS ▶

Appendix I MODIFICATION 4494

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LIST OF ILLUSTRATIONS

General

1. On the embodiment of Mod.4494 a Type AE 5601 undervoltage phase sequence unit is connected between the A.I.23 system 3-phase supply fuses and the A.I. relay Type 10B. The unit is mounted on the hinged cover above the a.c. control equipment in the rear fuselage spine, and ensures that the a.c. supplies to the A.I.23 cannot be switched ON unless the phasing and voltage of the supplies are correct. The unit comprises an assembly of transistors, resistors, capacitors, a transformer and a relay. The phasing and voltage of the a.c. supplies, which are connected via pins A, B and C, are sensed by the transformer; the resultant signal is then amplified and, if correct, energizes the relay coil. Operation of the relay contacts then completes the circuit between pins 1 and 2. The unit relay contacts are connected in the supply to the coil of the A.I. relay, the energization of which is controlled by the ON-OFF switch on the hand controller.

Operation

2. With the hand controller switch set to ON, and the a.c. supplies at the correct phasing and voltage, the A.I. relay coil is energized and the contacts of the relay complete the supplies to the A.I.23 system. Should the a.c. supplies fail the undervoltage phase sequence unit relay becomes de-energized interrupting the supply to the coil of the A.I. relay which, in turn, disconnects the a.c. supplies to the A.I. 23 system. The supply to the A.I. relay coil will be interrupted irrespective of the position of the hand controller switch.

3. The location of the unit is shown in fig.1 of the main chapter whilst the alteration to fig.5, A.I.23 power supplies, is shown in fig.1 of this appendix.

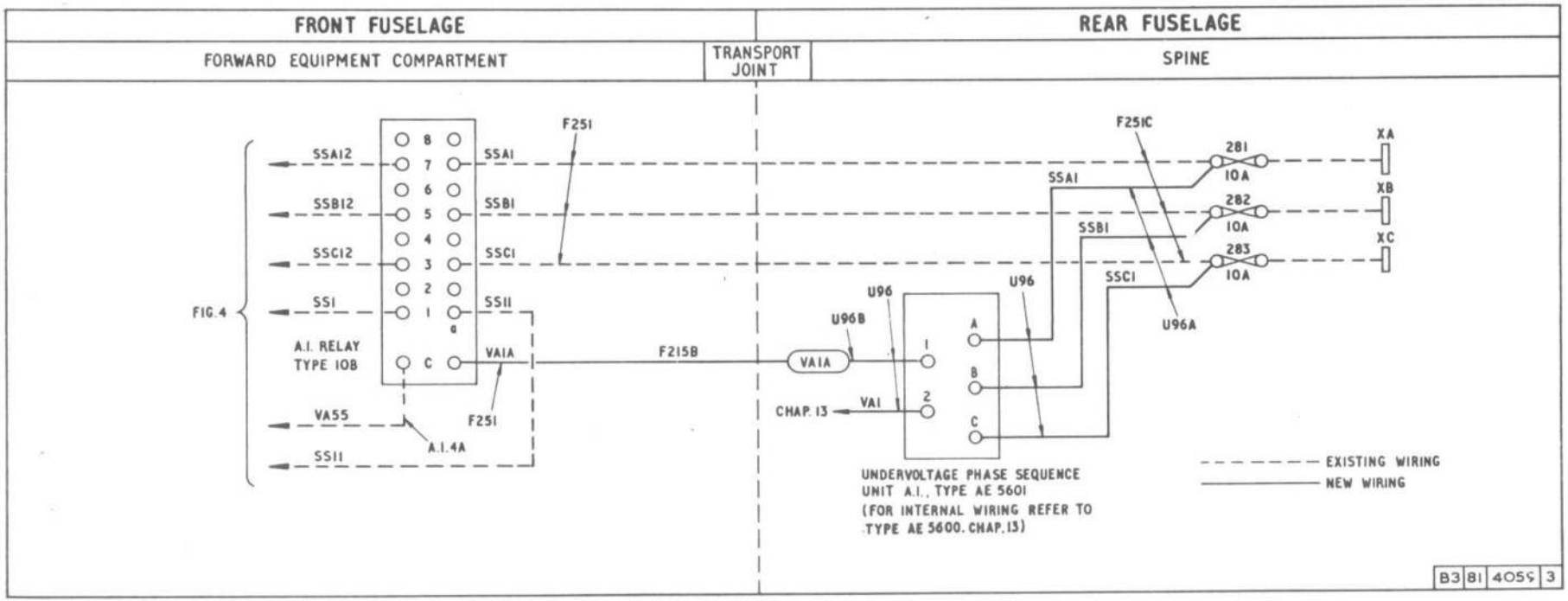

Fig.1. Alterations to fig.5 for Mod.4494