Group 2

FUZING

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Note . . .

For fuzing circuits on carriers, see Group 1, fig. 5 and 6. For routing charts of bomb fuzing controls on B|PR Mk. 1 and B|K|PR Mk. 1 aircraft refer to Book 3, Sect. 5, Chap. 8, Group 4.

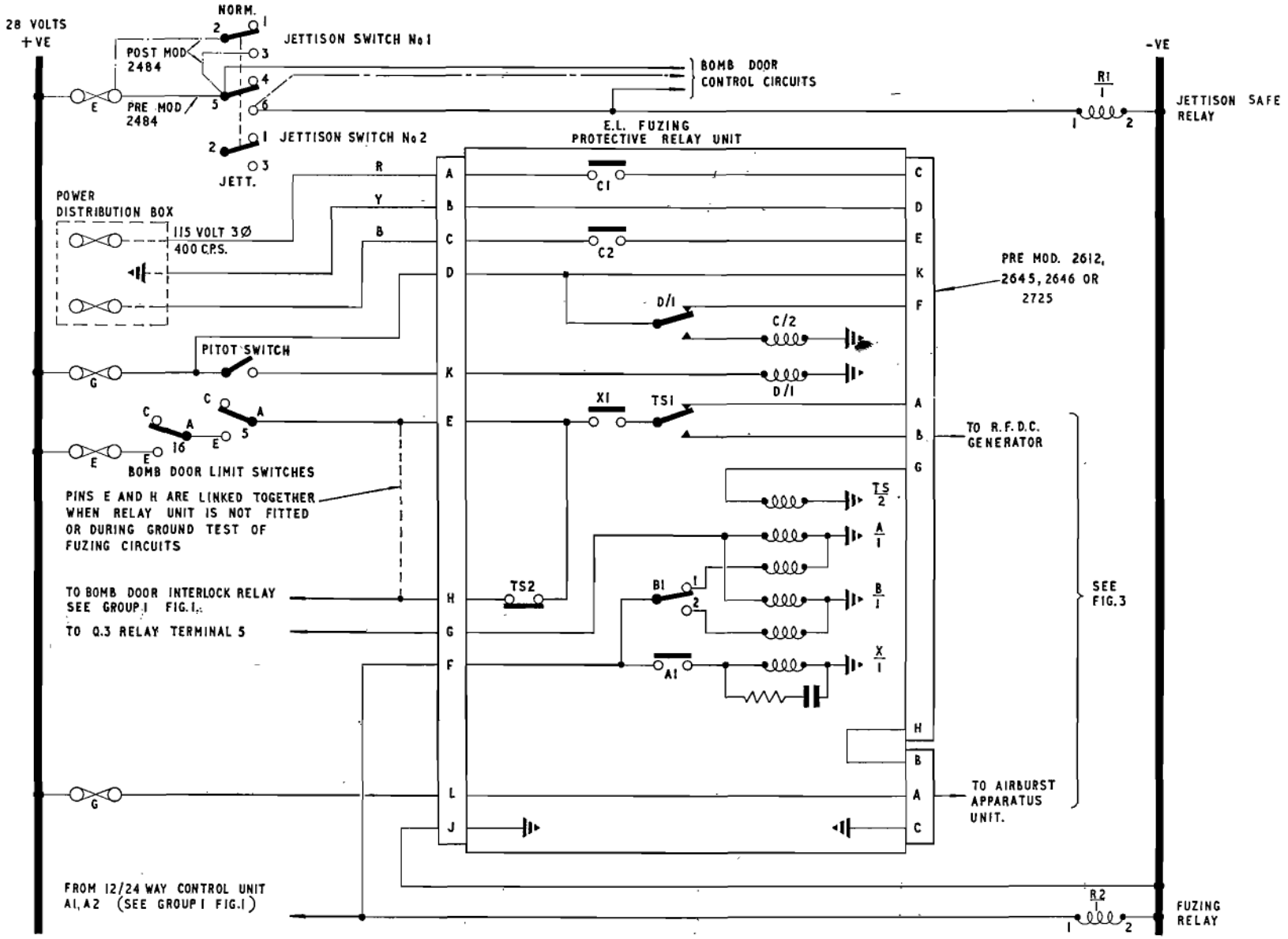


Fig. 1 Fuzing Control

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 be made with the electrical power switched on, the greatest care must be exercised.

Introduction

1. The fuzing systems in the aircraft are for E.M. nose and tail and V.T. fuzing and E.L. fuzing, the latter under the control of the pitot switch operated fuzing protective unit. The aircraft is wired for E.L. fuzing but it is unlikely that the units or the protective relay unit and pitot switch will become available. Until the protective relay unit and pitot switch are available terminals W8 and B8 (B. Mk. 1 and B/K Mk. 1) or BH1 and BG8 (B/PR Mk. 1 and B/K/PR Mk. 1) on panel K must be linked together unless Mod. 1980 is fitted, when the link is connected between pins E and H of the stowage connector provided by this modification for the 12-way socket for the ◀ protective relay unit. A description of the ▶ E.L. fuzing and protective system is given in the text, and circuit diagrams are supplied but these should be treated as reference only.

Post Mod. 2612, 2645, 2646 or 2725 the E.L. fuzing becomes inoperative.

Note . . .

Provision is made by Mod. 2612 (*B/K Mk.* 1), 2645 (*B/PR Mk.* 1) *or* 2646 (*B Mk.* 1) *to carry further alternative stores* (*Group* 3). *This makes the normal bomb controls removable. The bomb aimer's position at the radio crate is modified to take the necessary controls for the various stores, these controls being mounted on separate removable panels. The panel for normal stores is labelled* NO. 3 CONTROL PANEL *and is called for under Mod.* 2611—*The E.M. and V.T. fuzing switches will then be on this panel.*

DESCRIPTION AND OPERATION

Controls

2. The fuzing controls, pre-Mod. 2612, 2645, 2646 or 2725, are at the bomb aimer's position on the radio crate and include an E.M. TAIL/NOSE AND TAIL switch, a V.T. ON/OFF switch, fuze timing selector and airburst control unit. The fuzing controls, post Mod. 2612, 2645, 2646 or 2725 (E.M. TAIL/NOSE AND TAIL switch and the V.T. ON/OFF switch) are mounted on No. 3 ROLE control panel which is provided by Mod. 2611 and is fitted to the radio crate; the fuzing timing selector and airburst control unit will not be fitted. Remote equipment for the E.L. fuzing (pre-Mod. 2612, 2645, 2646 or 2725 only), includes an R.F./D.C. generator, airburst control unit and fuselage amplifier, aft of the rear spar and an amplifier in each wing stalk for the respective wing systems. Protection in the form of a pitot switch and a protective relay unit aft of the rear spar, insures that no E.L. fuzing can be applied until the aircraft attains an airspeed of 110-120 knots.

3. When the jettison switch(es) is (are) operated the jettison safe relay is energized to break the supply to the nose E.M., V.T. and tail fuzing circuits so that all bombs are jettisoned 'safe'. Although the E.L. fuzing lines are apparently not interrupted when the jettison safe relay operates, no E.L. fuzing can be applied since it is necessary to have the tail fuzing supply through to the E.L. connectors to trigger the E.L. fuzing supply.

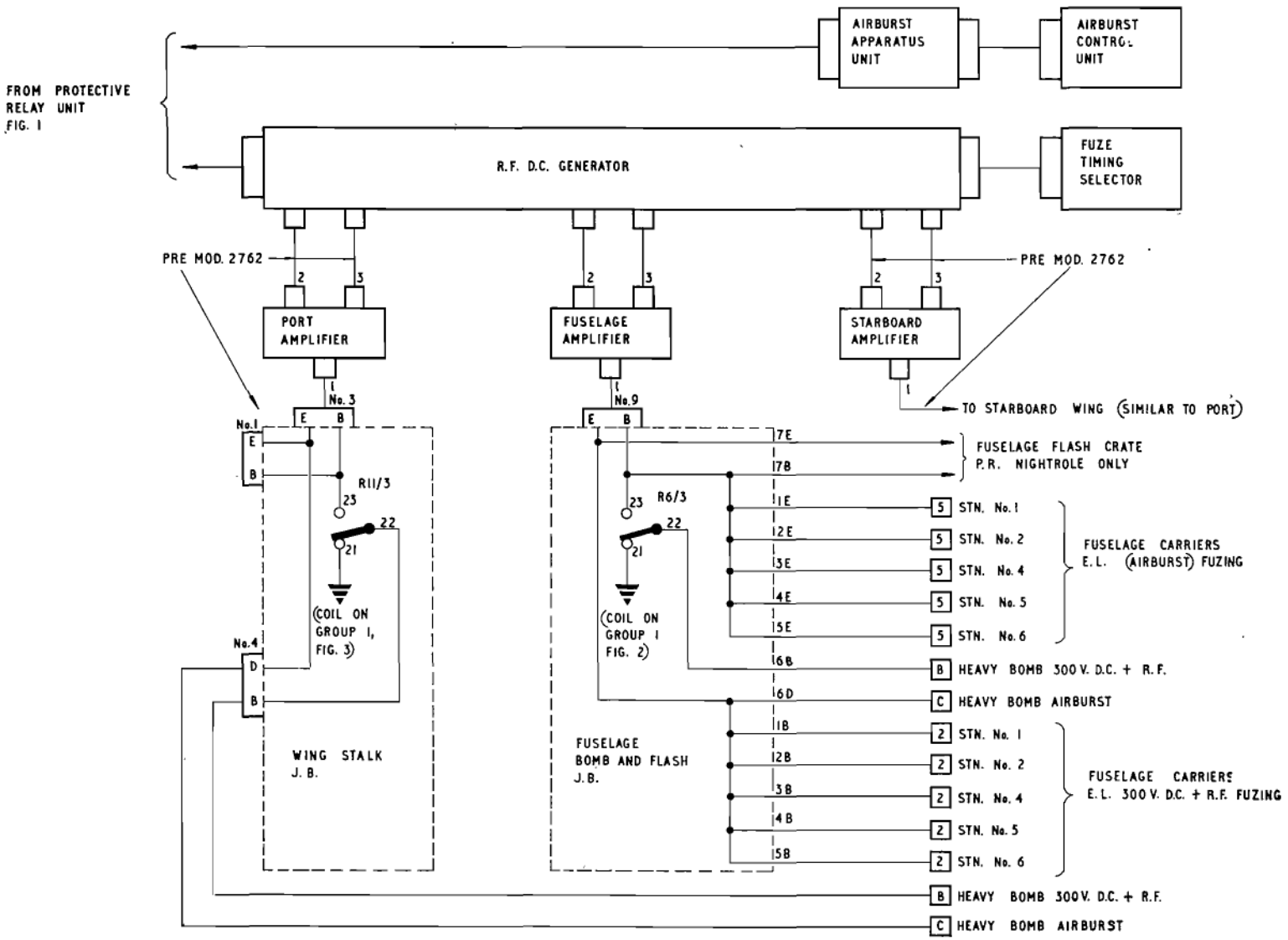


Fig. 3. Fuzing E.L. (pre-Mod. 2612, 2645, 2646 or 2725)

11. The output from the generator is fed to three amplifiers via a relay controlled by the protective relay unit, one for the fuselage and one for each wing store. From the fuselage amplifier the two fuzing supplies (airburst and 300V D.C. + R.F.) are taken to the fuselage bomb junction box and thence to pins 5 (airburst) and 2 of each carrier connector. When the arming relays are energized the 300V D.C. + R.F. fuzing supply is connected to the individual bomb E.L. fuzing connectors; the airburst supply is not controlled by the arming relays but is connected directly to the connectors. The fuselage heavy store arming relay is in the junction box and the two fuzing supplies are taken directly from the junction box to pins C (airburst) and B of the heavy store E.L. fuzing connector.

12. From each wing amplifier the two fuzing supplies (airburst and 300V D.C. + R.F.) are taken to the wing heavy store arming relay in each wing stalk junction box. The two fuzing supplies are taken directly from the junction box to pins C (airburst) and B of the heavy store E.L. fuzing connector and Mod. 1979 introduces polythene bags and stowages for the aircraft cables when the equipment is not fitted.

E.L. fuzing protection (pre-Mod. 2612, 2645, 2646 or 2725 only)

13. The 3-phase supply to the R.F./D.C. generator is controlled by the pitot switch via two relays D and C in the protective relay unit. When the pitot switch is closed, a supply from panel G is connected to the coil of relay D. This closes D/1 to connect the pitot switch supply to the coil of relay C. This closes in turn C/1-2 to close the 3-phase supply red and blue phases (yellow phase earth) to the generator.

14. The R.F. and D.C. output is controlled by relay E in the generator. This relay in turn is controlled by relay X and two high speed relays A and B in the protective ◀ unit operating in sequence; these latter relays have two coils each. When a ▶ bomb selection is made by the START switch on the 12/24 control unit a positive supply is connected from pins A1-2 via pin F of the protective unit and through relay contact B/1 to No. 1 coil of relay A. Relay contact A/1 closes the same supply to the coil of relay X which in turn connects the supply from the bomb door limit switches 16 and 5, via the normally closed test relay contacts TS/1, to energize relay E in the generator to connect the R.F. and D.C. ◀ charging supplies to the normally open contacts of the arming relays on the carriers.

15. When the bomb switch is 'made', a positive supply from the 12/24 control unit via the normally closed contact 3-4 of the Type Q3 relay (Bomb Safe) is connected through pin G of the protective unit to No. 2 coil of relay A and to No. 1 coil of relay B. Relay B connects the supply from the 12/24 way control unit (A1-2) to its No. 2 coil to hold itself in and breaks the supply to No. 1 coil of relay A. Relay A is thus held-in by its No. 2 coil only. When the selected stick of bombs has been released, the supply to the No. 2 coil of relay A will be broken and the relay will drop out to disconnect the supply to relay X. The supply to the No. 1 coil of relay B will be broken, but the relay will remain held-in by its No. 2 coil until the START switch on the 12/24 way control unit is returned to OFF, thereby ensuring that relay A is fully de-energized irrespective of the position of the START switch. When relay A drops out and disconnects the supply to relay X, relay X will not drop out immediately, there being a few milli-seconds delay due to the resistance and capacitance connected across its coil, this allows relay E in the generator to remain closed long enough for the charging supplies to be fed to the last bomb of the stick before it is clear of the carrier. Relay B will only be de-energized when the START switch is selected to STOP; it is therefore necessary to select STOP before setting up the START and STOP switches for a second stick of bombs if E.L. fuzing is to be applied.

16. When the JETTISON LIVE switch is operated for jettisoning all bombs 'live', the supply to relay A coil No. 1 and relay B coil No. 2 is connected from the 12/24 way control unit (F-5) via the normally open contact 5-6 of the type Q3 relay (Bomb Safe). This relay is energized when by the same supply LIVE JETTISON is selected and closes the contact 5-6; contact 3-4 is opened to prevent a feed-back into the normal release circuits in the 12/24 way control unit (F-6). ▶

21. The control unit must be ON for these tests.

(1) For tail E.M. fuzing, set E.M. switch to TAIL and V.T. switch to OFF. Check with test lamp on pin C on socket No. 5 of the port wing/stalk junction box. The lamp should light continuously.

(2) To test the nose E.M. fuzing, place the E.M. switch to NOSE AND TAIL and V.T. switch to OFF. Check that the test lamp glows continuously from pin D on socket No. 5 of the port wing/stalk junction box.

(3) To test the V.T. fuzing, place the E.M. switch to NOSE AND TAIL and the V.T. switch to ON. Check that the test lamp lights continuously from pin A on socket No. 5 of the port wing/stalk junction box.

(4) Repeat items 1-3 for the starboard wing.

(5) Check that the fuzing supplies are NOT live when the door jettison control switch is at JETTISON, the E.M. switch at NOSE AND TAIL and the V.T. switch at OFF.

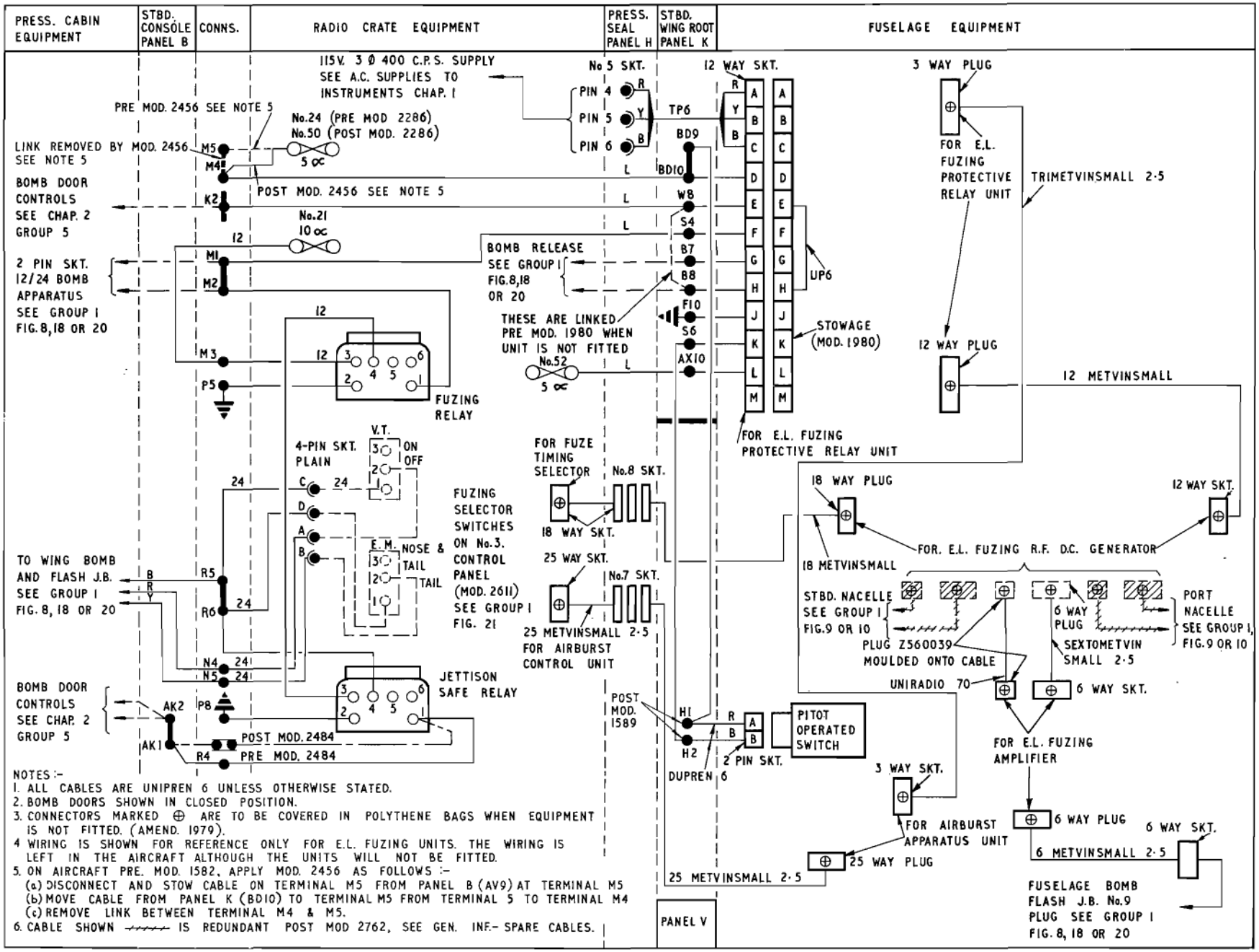
Wing E.L. fuzing (*pre-Mod.* 2612, 2645, 2646 *or* 2725 only)

22. This cannot be tested without the wing stalk being attached, other than a pin to pin continuity check.

Final Check

23. When all tests have been completed, ensure that all switches are in the NORMAL position and remove the external ground supply.

24. ▶◀



NOTES :-
1. ALL CABLES ARE UNIPREN 6 UNLESS OTHERWISE STATED.
2. BOMB DOORS SHOWN IN CLOSED POSITION.
3. CONNECTORS MARKED ⊕ ARE TO BE COVERED IN POLYTHENE BAGS WHEN EQUIPMENT IS NOT FITTED. (AMEND. 1979).
4. WIRING IS SHOWN FOR REFERENCE ONLY FOR E.L. FUZING UNITS. THE WIRING IS LEFT IN THE AIRCRAFT ALTHOUGH THE UNITS WILL NOT BE FITTED.
5. ON AIRCRAFT PRE. MOD. 1582, APPLY MOD. 2456 AS FOLLOWS :-
   (a) DISCONNECT AND STOW CABLE ON TERMINAL M5 FROM PANEL B (AV9) AT TERMINAL M5
   (b) MOVE CABLE FROM PANEL K (BD10) TO TERMINAL M5 FROM TERMINAL 5 TO TERMINAL M4
   (c) REMOVE LINK BETWEEN TERMINAL M4 & M5.
6. CABLE SHOWN ------ IS REDUNDANT POST MOD 2762, SEE GEN. INF.- SPARE CABLES.

Fig. 5 Bomb fuzing (post Mod. 2612 or 2646) - B. Mk.1 and B/K Mk.1

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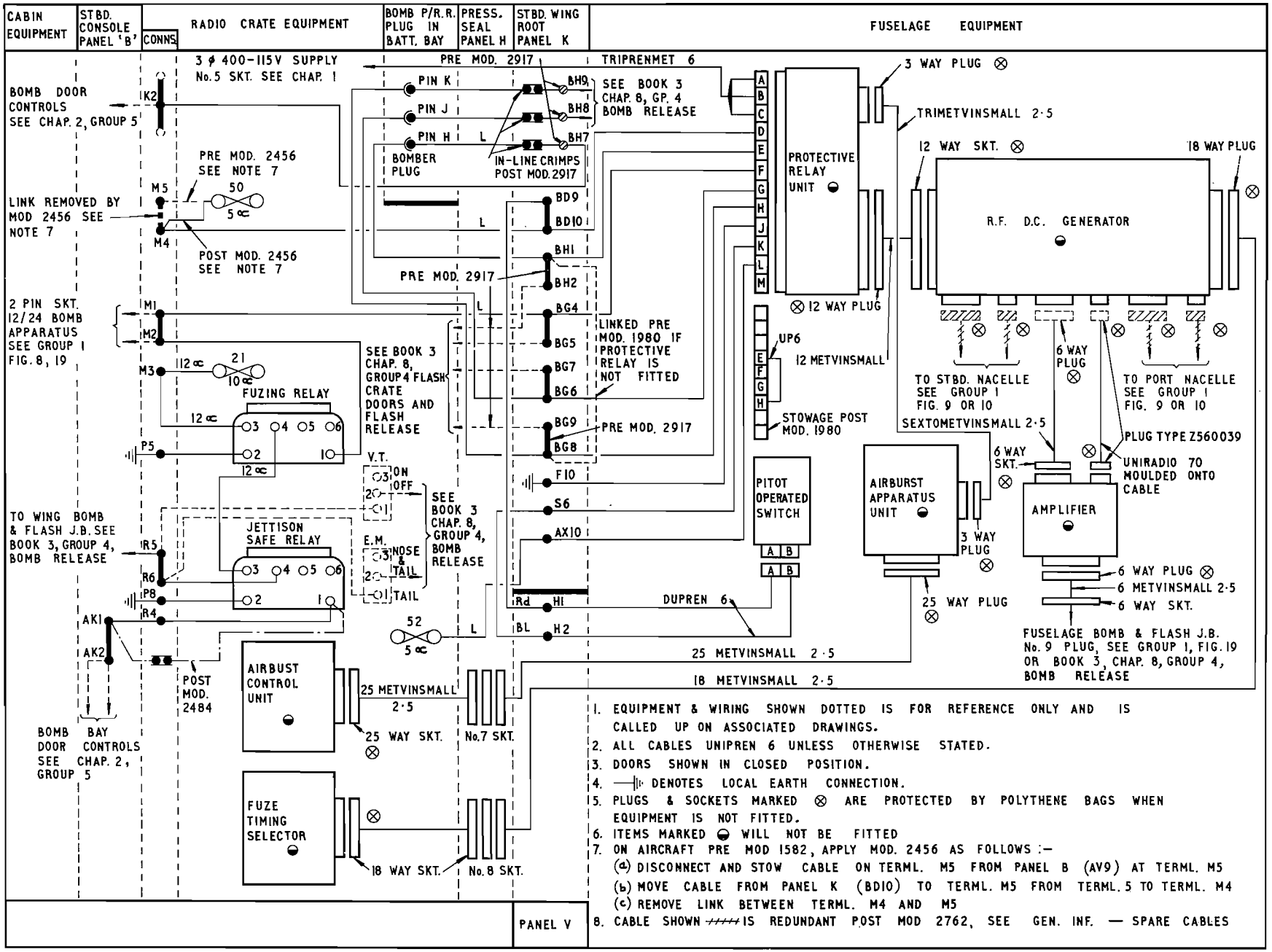

Fig. 6 Bomb fuzing (pre Mod. 2645 or 2725) B/P.R. Mk. I. and B/K/P.R. Mk. I

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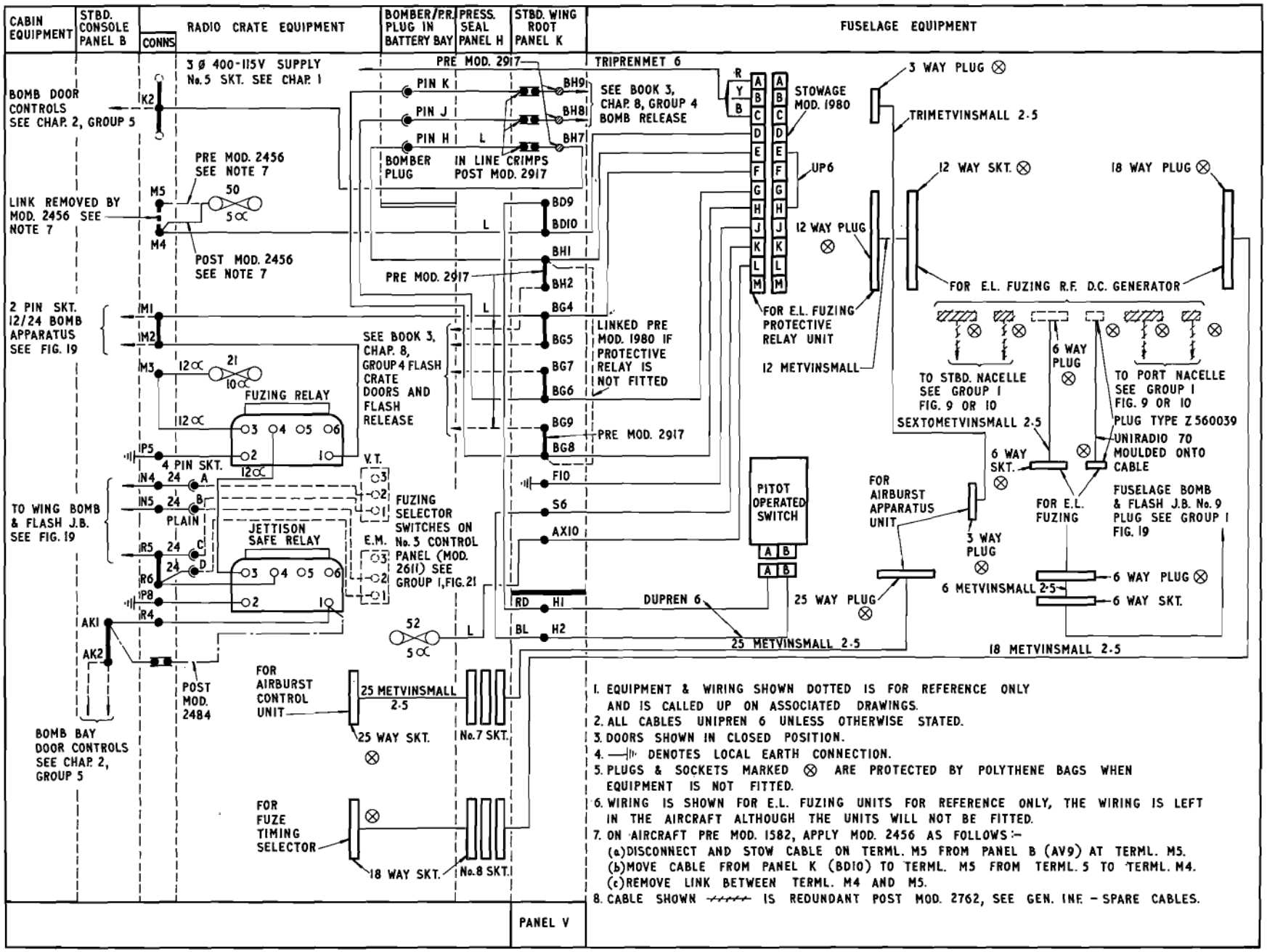

Fig. 7. Bomb fuzing (post Mod. 2645 or 2725) B/P.R. Mk. I. and B/K/P.R. Mk. I

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