GROUP G.1

ARMAMENT SUPPLIES AND CONTROL (Code BR, BF, BJ, JG, RP, CG and GF)

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Note . . .

Incorporation of Modification 1391 (ref. Group F.4) removes the camera Type G45B from G.A. aircraft.

TABLE

LIST OF APPENDICES

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LIST OF ILLUSTRATIONS

TABLE 1
Equipment type and Air Publication reference

Equipment	Air Publication
Bomb/Rocket projectiles	
Control column handgrip, Type A.C. 61044 *(Mod. 948)* A.C. 63304 *(Mod. 1152)* A.C. 63482 *(Mod. 1295)* or A.C. 64614 *(Mod. 1350)*	A.P.113D–1600 Series
Compression microswitches, A.M. Type 4A	A.P.113D–1201–1
Armament ground test switch (Butt Test) Type XD.443 No.1 Bombs/R.P. switch, double-pole change-over Type XD.447 No.1 Ripple/Normal switch, single-pole change-over Type XD.778 No.4 Jettison, Clear aircraft and Reset push-switches, double-pole, Type B R.P. push-button switch Type A.C.M.22556/6, or A.C.M.24484/7 (Mod.1335) Fuzing switch, single pole change-over Type XD.778 No.4	A.P.113D–1100 Series
Rippling relay, Type S.M.5-H12 Relays 'A', 'S', and 'U', Type S, No.3 Relay 'C', Type S, No.1 E.R.U. relays 'C' and 'D', Type S.M.5A-H79	A.P.113D–1300 Series
Ejector release unit No.1, Mk.1 E.M. release unit No.1, Mk.1	A.P.110G–0300 Series
Drop tank float switches, Type F.R.3504100/13	A.P.112G–1109–1
R.P. selector switch	A.P.113D–1100 Series
R.P. firing distribution box, Type 2 5D/2277	A.P.113G–0300 Series
Reset indicator, magnetic, Type A.2	A.P.113F–0615–1
Bomb/R.P. circuit breaker, Type A.3, 15 amp.	A.P.113D–0900 Series
Silicon rectifier, Ferranti	A.P.113D–1900 Series
Camera gun	
Camera gun, Type G45B, Mk.3	A.P.112P–0400 Series
Camera recorder, Mk.3	
Camera master switch, single-pole, ON/OFF Type XD.779, No.3 Sunny/Cloudy switch, single-pole, ON/OFF Type XD.779, No.4	A.P.113D–1100 Series

Introduction

1. This group contains the description, and operation of the armaments supply and control circuits, together with information on the servicing required to maintain the installations in an efficient condition. Routeing and theoretical circuit diagrams are included. The aircraft's electrical system is described in Groups A.1, A.2 and A.3 of this chapter. Additional information on the camera recorder is given in Group 4A, Chapter 2. Detailed information on the standard items of equipment used in the circuits will be found in the Air Publications listed in Table 1.

DESCRIPTION

General

2. Aircraft of pre-mod.228 and 229 standard are equipped to carry inboard pylons only. Post Mod.228 and 229 aircraft may carry both inboard and outboard pylons, or, as an alternative to outboard pylons, they may carry 3 in. air-to-ground R.P. equipment under each outer wing. The inboard pylons for both types of aircraft are identical, and can be used to carry either drop fuel tanks, practice bomb carriers, or 2 in. air-to-air rocket batteries. Both types of aircraft are equipped with G45B and recorder cameras.

Power supplies and safeguards

3. The power supplies for the circuits which control the armament equipment are taken from fuses on the supply panel; while the power by which the equipment is operated is taken from a circuit breaker on the supply panel. Both these supplies are routed via an armament safety-plug located in the port stub wing. The armament safety-plug is readily accessible, and provides a means of rendering the circuits safe during servicing. As a further safeguard, to ensure that pylon stores cannot be released electrically, and that the R.P. equipment and the camera cannot be operated while the aircraft is on the ground, the supply to the Bomb/R.P. firing push-switch and the camera push-switch is routed through compression microswitches in the port and starboard oleo legs of the alighting gear. An armament ground test switch *(Butt Test)* is fitted on the cabin starboard shelf; when this switch is set to TEST, it has the effect of short-circuiting the leg compression switches.

Bombs and pylon stores

General

4. The Bomb/R.P. firing switch, which is incorporated in the flying control column handgrip, is used to initiate practice bombing, or the firing of rocket projectiles, after the appropriate selections have been made. These selections are made via the BOMB/R.P. selector, or the Fuzing selector which are mounted, together with the jettison push-switch, on the Bomb/R.P. control panel, situated above the cabin port shelf.

BOMB/R.P. selector switch

5. The BOMB/R.P. selector is a double-pole, three position, centre OFF type switch. One pole is supplied from the circuit breaker, and the other from a fuse on the supply panel *(para.3)*. With the selector in the BOMB position, supplies are available at contacts 1a and 3a on the Bomb/R.P. firing relay, 'S', *(para.9)*, in readiness to supply the practice bomb carriers on the pylons when the relay is energized by operation of the Bomb/R.P. firing push-switch. With the selector in the R.P. position, the supply energizes R.P. assessment relay, 'C', *(para.9)*, and supplies are also made available to the control circuit of the air-to-ground R.P. equipment *(para.20)* and at contact 7a on the firing relay, 'S'.

Fuzing selector switch

6. The Fuzing selector is a single-pole, two-position switch marked FUZE and DEFUZE; with its contact arm wired to the supply. In the FUZE position, it connects the supply, via a 2.5 amp fuse and a pair of bridged contacts, 4a-4 on the jettison relay, 'A', *(para.9)*, to the practice bomb carriers on the inboard pylons. In the DEFUZE position, the selector connects the supply to the JETTISON switch *(pre-mod.229 aircraft)* or, *(on post-mod.229 aircraft)* the CLEAR AIRCRAFT switch, in readiness to jettison the stores from the pylons.

JETTISON switch (pre-mod.229 aircraft)

7. The JETTISON switch is a double-pole push-switch, wired to the coil of the jettison relay, 'A', and also to one of two isolating relays *(para.12)* in each inboard pylon. The other isolating relays are wired

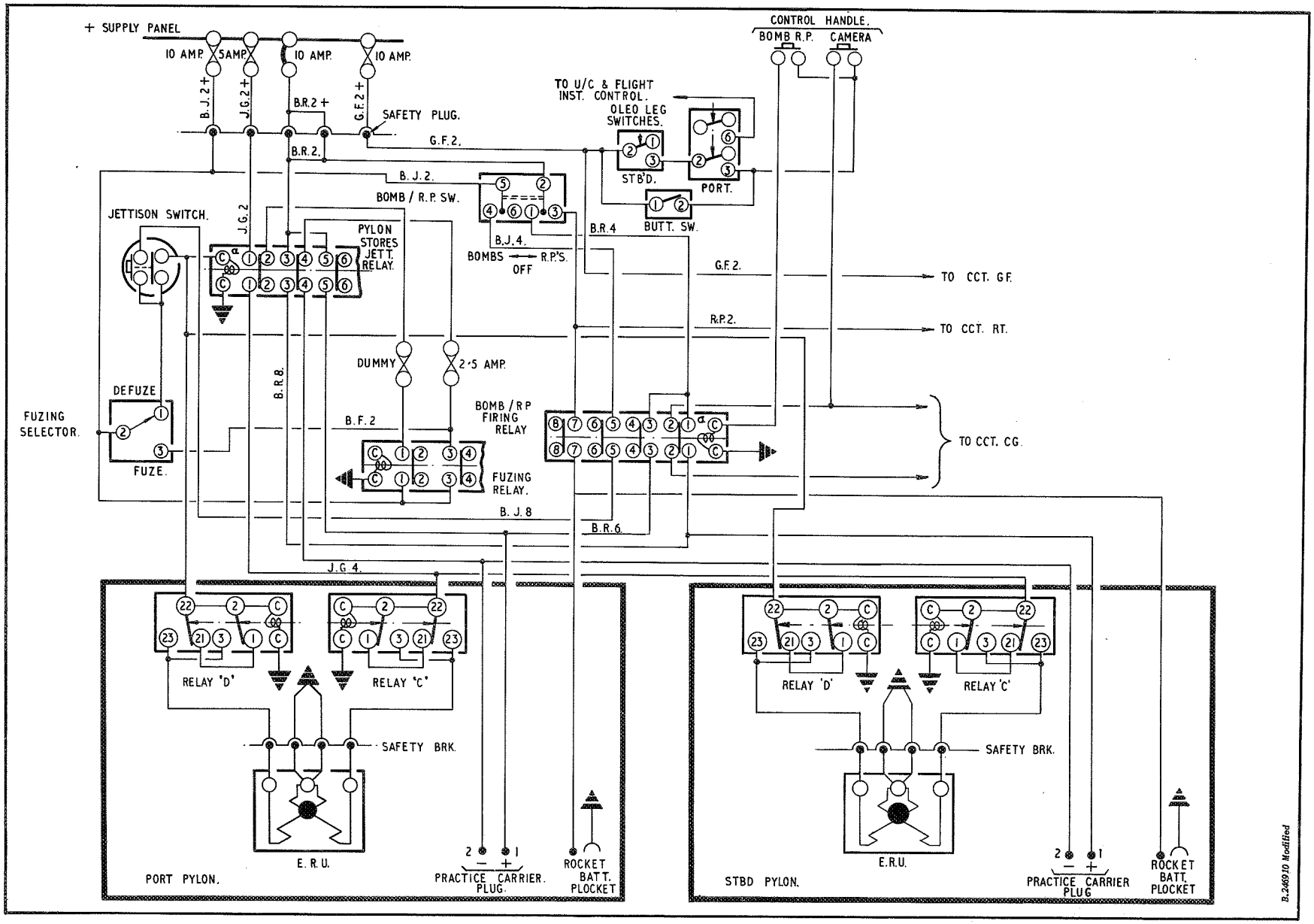

Fig. 1 Bombs and pylon stores (theoretical – Pre Mod. 229)

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to a contact on the jettison relay, so that when, by operation of the JETTISON switch the relay is energized, both isolating relays are supplied, and will operate to jettison the stores *(para.30)*.

Jettison switches (post-mod.229 aircraft)

8. On post-mod.229 aircraft, the jettison switch on the Bomb/R.P. control panel is identical with that described above *(para.7)* except that it is marked CLEAR AIRCRAFT. It is wired as already described, and functions similarly, supplying a relay in each inboard pylon, and also energizing the jettison relay. However, since post-mod.229 aircraft have provision for carrying stores on outboard pylons, the jettison relay is wired accordingly *(para.10)*, and when energized, operates to jettison stores from both inboard and outboard pylons. For independent jettisoning of stores from the outboard pylons, a double-pole push-switch marked OUTER PYLON STORES JETTISON is mounted on the R.P. selector panel situated at the port windscreen arch. The push-switch is supplied direct from the circuit breaker on the supply panel, and is wired to the electro-mechanical release units in the outer pylons *(para.15)*.

Control relays

9. The jettison relay, 'A', fuzing relay, 'B', and the R.P. assessment relay, 'C', are all contained in Arm J.B.2, situated on the port side of the cabin. Relay 'B' is not in use. The Bomb/R.P. firing relay, 'S', and a gyro caging and camera relay, 'U', are mounted on the leg panel.

10. On pre-mod.229 aircraft, relay 'A' is energized by operation of the JETTISON push-switch *(para.7)*. The relay contacts 1a, 3a and 5a, are wired to the supply, and, when the relay is energized, 1a-1, 3a-3 and 5a-5 pass supplies which effect jettisoning of the stores carried on the inboard pylons. On post-mod.229 aircraft, relay 'A' is energized by operation of the CLEAR AIRCRAFT push-switch, and, in addition to the supplies passed by contacts 1a-1, 3a-3 and 5a-5 to the inboard pylons, contacts 7a-7 pass supplies to jettison stores carried on the outboard pylons.

11. The firing relay, 'S', is energized by operation of the firing push-switch, and passes supplies to the bomb, or R.P. equipment, in accordance with the selection made by the BOMB/R.P. selector switch. The R.P. assessment relay, 'C', is energized when the BOMB/R.P. selector is in the R.P. position; the relay passing a hold-on supply to the gyro caging and camera relay, 'U', when this latter has been energized initially by operation of the camera push-button switch *(para.24)*.

Inboard pylons

12. The inboard pylons are fitted with No.1, Mk.1 ejector release units *(E.R.U's)*, by which fuel drop tanks, practice bomb carriers, or 2 in. air-to-air rocket launchers can be carried. The ejector release units are cartridge operated, each cartridge containing two electrically-fired initiating caps. The caps are fired by supplies passed by two isolating relays, 'C' and 'D', in each pylon, when the relays are energized by operation of the jettison circuit *(paras.8 and 10 above)*. In each pylon a safety-break is provided to enable the E.R.U. to be isolated during loading.

13. Each of the inboard pylons is also fitted with a two-pin plug for connecting the circuits of practice bomb carriers, and two plocket connectors for rocket battery launchers and the fuel high lever switches of the drop tanks; these latter are wired to the pressure refuelling circuit *(Group C.3)*. On each of the practice bomb carrier plugs, pin 1 is wired to a contact on the Bomb/R.P. firing relay, and pin 2 to the FUZE contact on the fuzing selector, via the 2.5 amp fuse, and the bridge contacts 4a-4 of the jettison relay. By this means, when the fuzing selector is put to FUZE, power is made available at the contact arm of a relay contained in the practice bomb carrier.

Practice bomb carriers

14. The release solenoids in the practice bomb carriers are energized in sequence by the action of an auto-selector. Power for operating the auto-selector is derived from the FUZE contact of the Fuzing selector switch on the Bomb/R.P. control panel *(para.4)*; the supply being routed via pin 2 of the carrier plug on the pylon to the contact arm of a relay in the carrier. The coil of the relay is wired, via pin 1 of the carrier plug, to a contact on the Bomb/R.P. firing relay, 'S'. Hence, when this relay is energized, the carrier relay will also be energized, and its contact arm

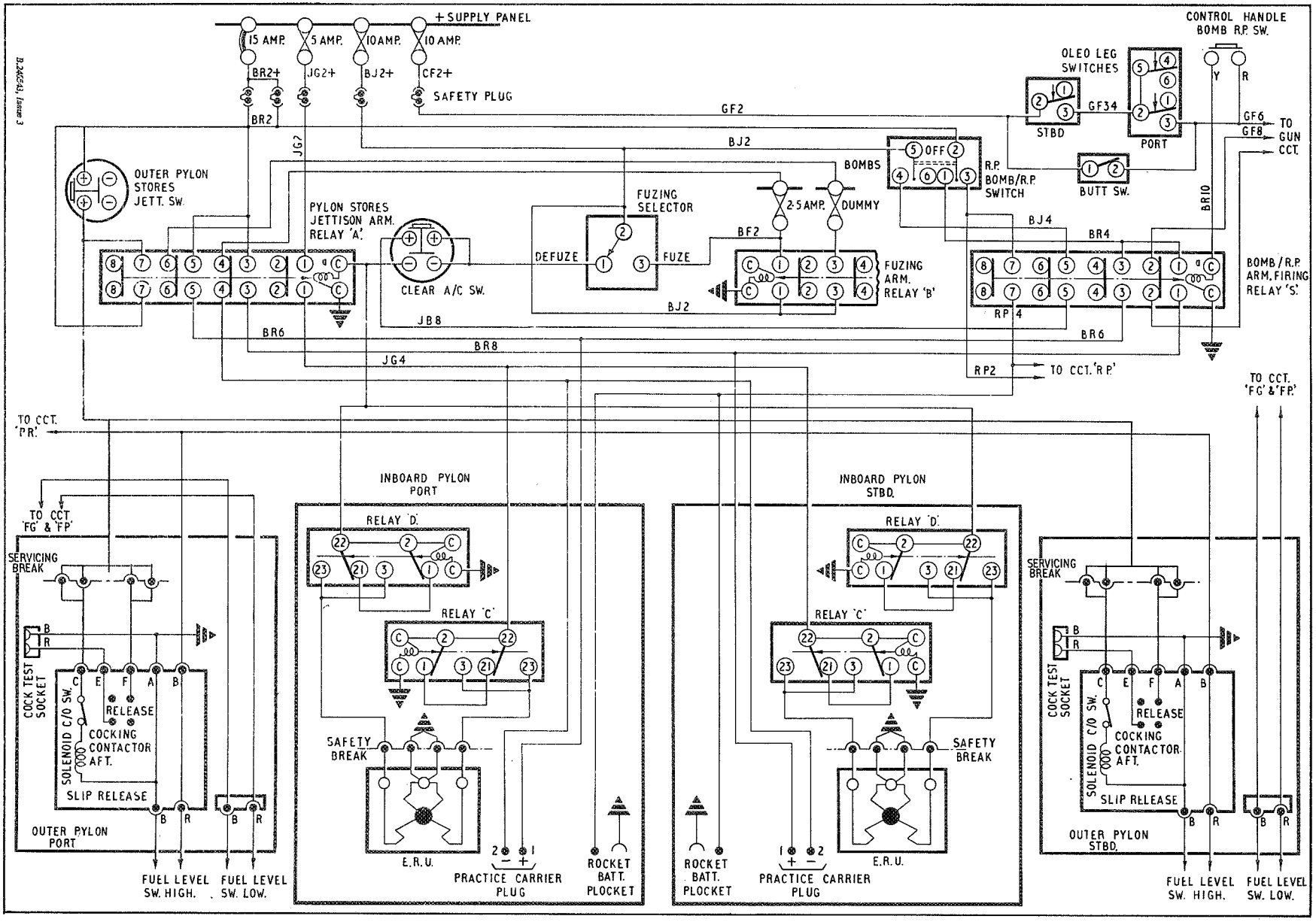

Fig. 2 Bombs and pylon stores (theoretical-Post Mod. 229)

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will pass the supply derived via the Fuzing selector to the carrier auto-selector. Thus, although practice bombs are fuzed before take-off, the normal bombing drill must be carried out before the bombs can be dropped. The earth return for the carrier circuits is completed through the carrier structures and the pylon hooks.

Outboard pylons (post-mod.228 and 229 aircraft).

15. The outboard pylons are fitted with electro-mechanical release units *(E.M.R.U's)* No.1, Mk.1, for the carriage of fuel drop tanks. These may be jettisoned, either independently, by use of the OUTER STORES JETTISON push-switch, or simultaneously with the stores on the inboard pylons, by operating the CLEAR AIRCRAFT push-switch (para.8). On each outboard pylon the equipment comprises a solenoid-operated release slip, a jettison solenoid, a cocking test plug, and two plocket connectors. The plockets enable the circuits of the fuel high level and low level switches in the drop tanks to be connected to the pressure refuelling *(Group C.3)*, and fuel contents *(Chap.2, Group 2A.)* circuits respectively. The jettison solenoids operate to open the release hooks mechanically if they have not already opened by the electrical operation of the release slips. E.M.R.U's. are fully described in A.P.4343X, Vol.1, Section 5.

Cocking test

16. The cocking test plugs on the outboard pylons provide a means of connecting a test set, consisting of a lamp and a low voltage battery, to the release slip circuits. When the release slip is correctly cocked, a circuit will be completed through the release slip feed switches, the solenoid coil, and the test set; thereby lighting the test lamp. This test should always be made after re-arming.

R.P. firing *(post-mod.228 and 229 aircraft)*
General

17. Two methods of R.P. firing can be used on post-mod.228 and 229 aircraft; either 2 in. air-to-air rocket projectiles from launchers on the inboard pylons, or 3 in. air-to-ground projectiles from launchers under the outer wings. Both installations are operated by power derived via the Bomb/R.P. selector switch. When this switch is in the R.P. position, power is available at the R.P. selector on the R.P. control panel at the port windscreen arch, and also at contact 7a on the firing relay, 'S'. When the firing relay is energized by operation of the firing push-switch, the relay contacts 7a-7 pass a supply which initiates the R.P. equipment installed.

Air-to-air installation

18. The 2 in. air-to-air projectiles are fired from No.3, Mk.1 launchers carried on the inboard pylons. The launchers are described in A.P.2802A, *(2nd Ed.)*, Parts 1 and 3, Section 2. In each launcher a ripple firing unit controls the firing of eight salvos of three rockets, spaced at a predetermined time interval. The electrical supply for operating the launchers is routed via the two-pole plockets, on the pylons from contacts on the firing relay 'S', as described in para.17 above.

Air-to-ground rocket installation

19. The air-to-ground projectiles are carried on four sets of Mk.12, Type 3 launchers below each outer wing. The firing circuit is designed to fire up to 24 projectiles in salvos of 2, 4, 6 or 8, as required. The system employed is the Type 2 uniselector system; since this is described fully in A.P.4343X, Vol.1, Section 16, only brief particulars are given in these paragraphs.

20. The projectiles are fired by operating the Bomb/R.P. push-switch, after R.P. has been selected on the BOMB/R.P. selector switch *(para.5)*, and the required R.P. selections have been made. A four-position R.P. selector switch enables the size of the salvos to be selected, and a single-pole change-over switch, marked RIPPLE/NORMAL, determines the method of firing, both these switches are mounted on the R.P. control panel at the port windscreen arch. *(para.17)*.

21. In NORMAL firing, a salvo of the size selected is fired when the firing-

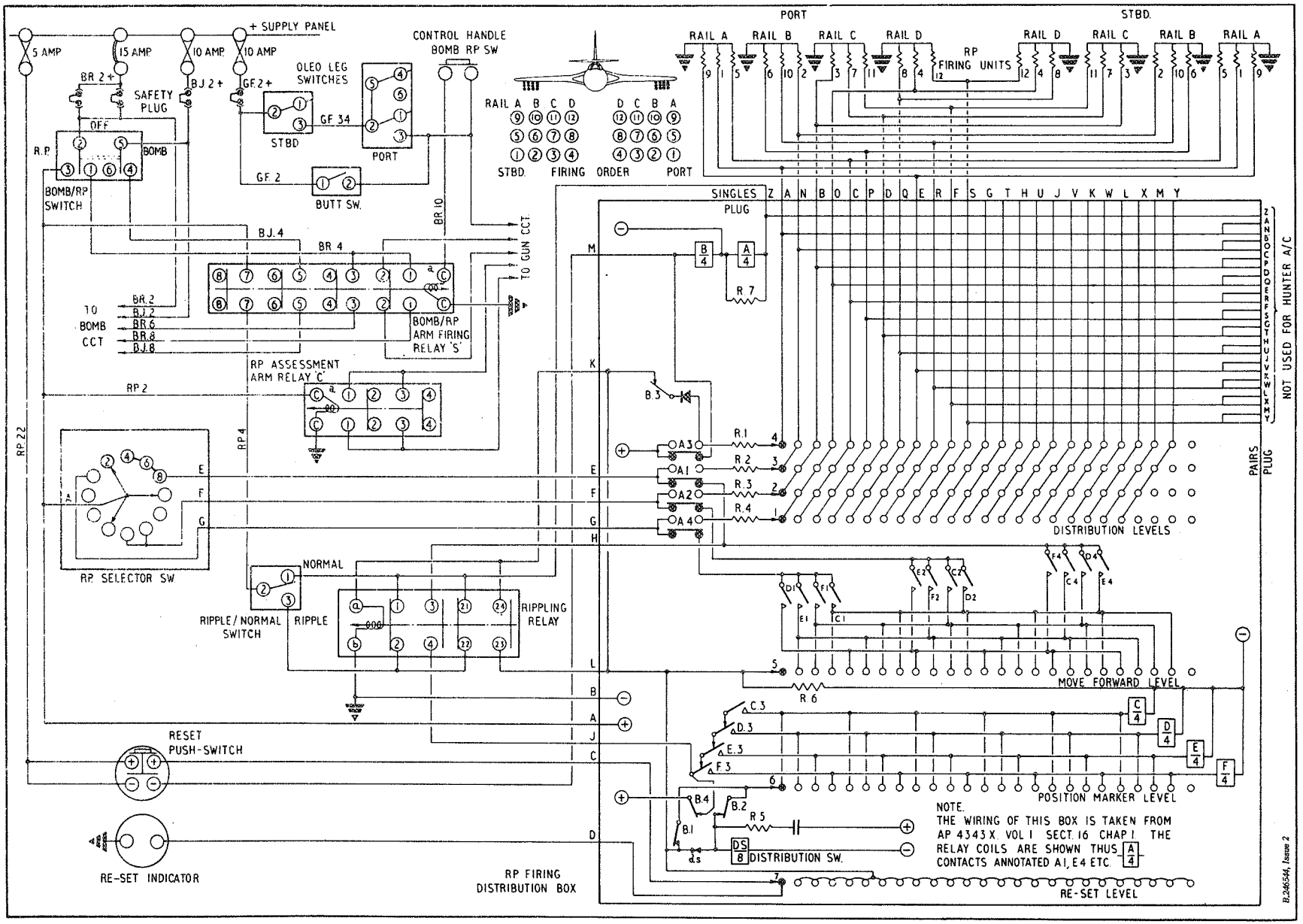

Fig.3 R.P. (theoretical)

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button is pressed. In RIPPLE firing, the salvo selected is fired repeatedly until the firing-button is released, or all the projectiles are expended. The sequence in which the projectiles are fired is controlled by the uniselector and associated equipment in a firing distribution box, operating in conjunction with a rippling relay. The firing distribution box is mounted on frame 19, adjacent to Arm J.B.1. The rippling relay is in Arm J.B.1, which also contains the reset switch, and the reset indicator. The reset switch is used to reset the uniselector prior to re-arming.

22. The control circuit connections to the R.P. firing distribution box are made via a plug on the box that is not marked. Two other plugs on the box, for connecting the firing circuits, are marked PAIRS, and SINGLES. On this aircraft only the plug marked SINGLES is used; the other plug is covered by a protective cap and should not be connected, since in certain conditions its use can result in an incorrect firing sequence, with the possibility of damage to the aircraft.

Firing distribution box

◀ 23. Supplies to the firing units are distributed by an eight-level, 25-pole uniselector distribution switch mounted in the firing distribution box; only seven of the levels are used. On the distribution switch, bridging wipers are caused to move over terminal tags on the levels by the action of a pawl and ratchet wheel mechanism, actuated by a coil which is supplied via interrupter contacts ds *(fig.3)*. The firing supply is passed to the R.P. units by four wipers at the distribution levels; the wipers being supplied via resistors R1, R2, R3, R4 and the normally-open change-over contacts A1, A2, A3 and A4 of relay switch A/4. Contact A3 is supplied from a positive terminal in the distribution box, contacts A1, A2 and A4 receive supplies via the R.P. selector switch. To prevent firing impulses during resetting (para.45) a silicon rectifier is included in the circuit between the firing contact A.3 and the relay switch contact B.3. The relay switch A/4 is slugged by a resistor R7; this ensures that, after operation, the contacts do not open before an adequate firing pulse has passed. The remainder of the relays in the box are miniature types; of these, C/4, D/4, E/4, and F/4 are slugged by a resistor R6. ▶

G.45B camera

24. The G.45B camera gun is mounted on a platform inside the fuselage nose structure, at the top, just forward of frame 3. It is focussed through a vision tube that is riveted round an orifice in the aircraft skin. A push-switch incorporated in the control column handgrip is used to bring the camera into operation. The push-switch is supplied from a fuse on the supply panel, via the safety-plug and leg compression switches, as described in paragraph 3. Power is supplied to the camera from a fuse on the leg panel, in the cabin.

25. A single-pole ON/OFF switch, marked CAMERA MASTER, controls the power supply to the camera, and also controls a supply to a contact on the gyro caging and camera relay, 'U'; when relay 'U' is energized, this latter supply is passed to the camera release solenoid. The master switch and relay 'U' are both mounted on the leg panel. By means of a switch marked SUNNY/CLOUDY, mounted on the starboard flying instrument panel, a choice of two exposure apertures can be made.

26. Connection to the camera is made by a 7-pole plug and socket connector. The supply to the camera motor is completed by a contact which is closed by operation of a release solenoid; this solenoid is wired to contact 3 on the gyro caging and camera relay, 'U'. The speed of the motor is regulated by a governor, and the drive from the motor is transmitted to a film drive claw assembly and the shutter mechanism by means of gears and pinions. Two electrical heaters prevent condensation in the lens and ensure free running of the mechanism at low temperatures; the body heater being controlled by a bi-metal thermostat. A friction plate coupling forms part of the drive, and enables the motor to overrun under its own momentum when the shutter is suddenly stopped.

Operation

Bombs and pylon stores

General

27. When the aircraft is airborne, the Bomb/R.P. push-switch in the control

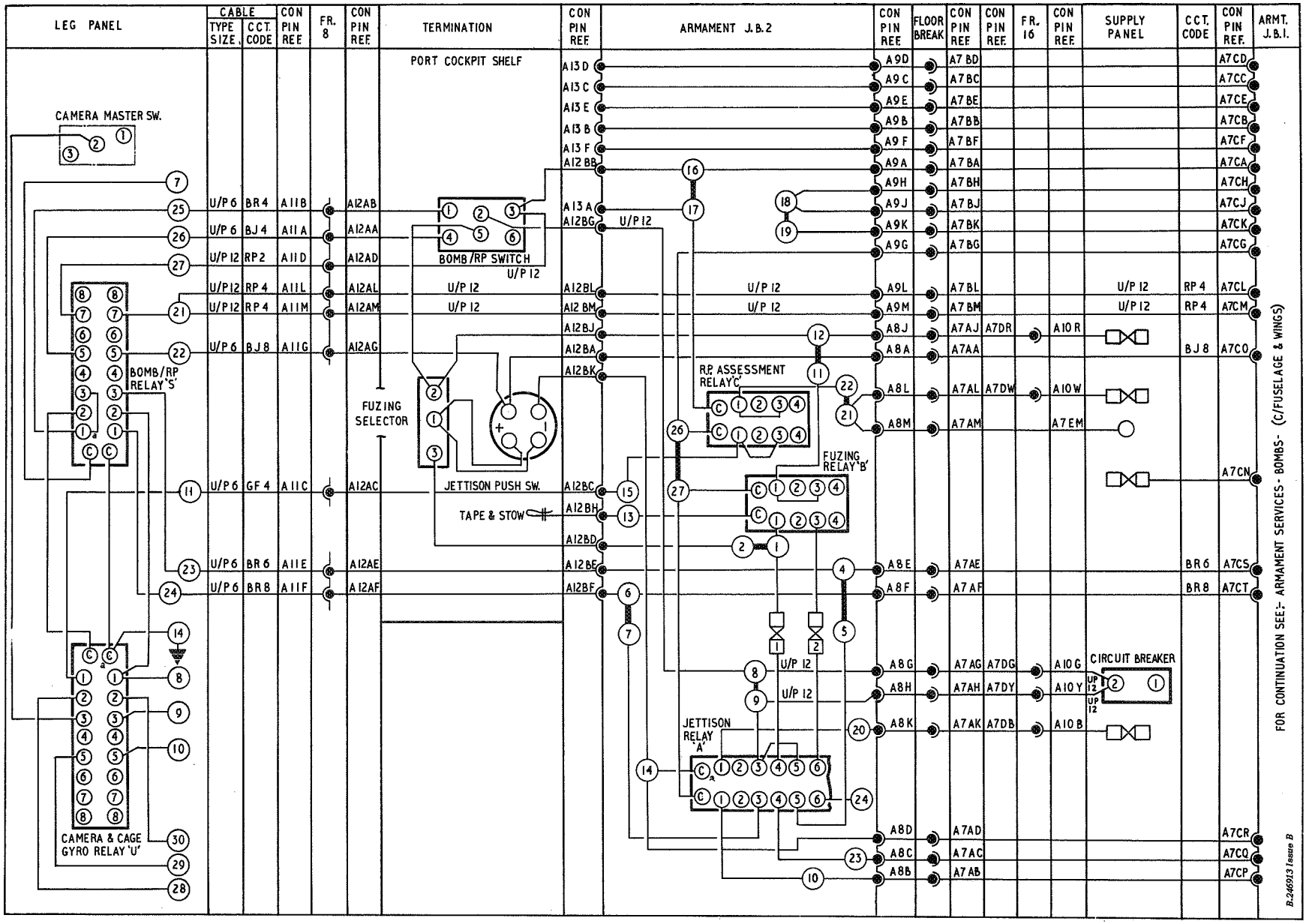

Fig.4 Bomb and R.P. front fuselage (routeing–Pre Mod.229)

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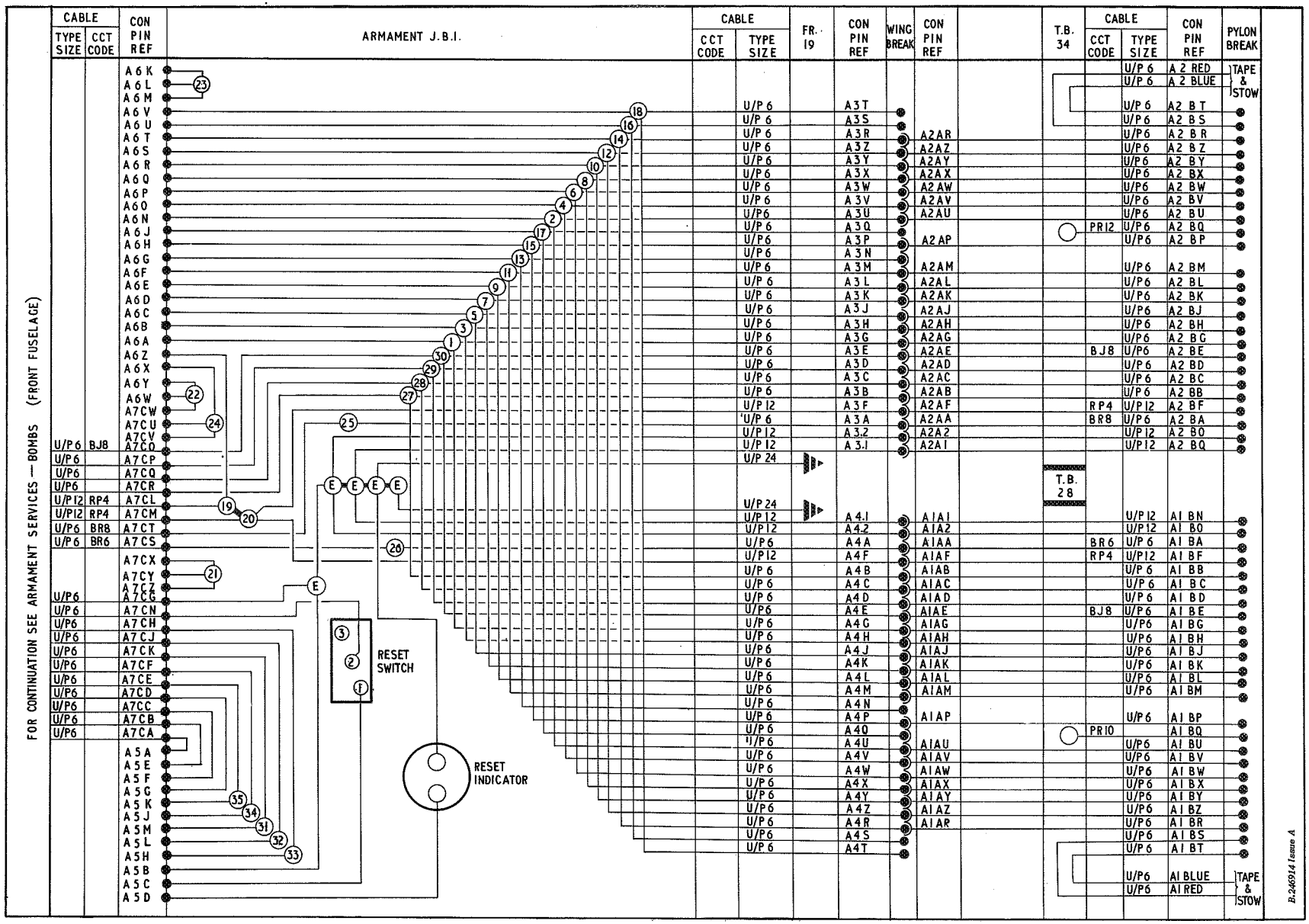

Fig.5 Bombs and R.P. centre fuselage and wings (routeing–Pre Mod.229)

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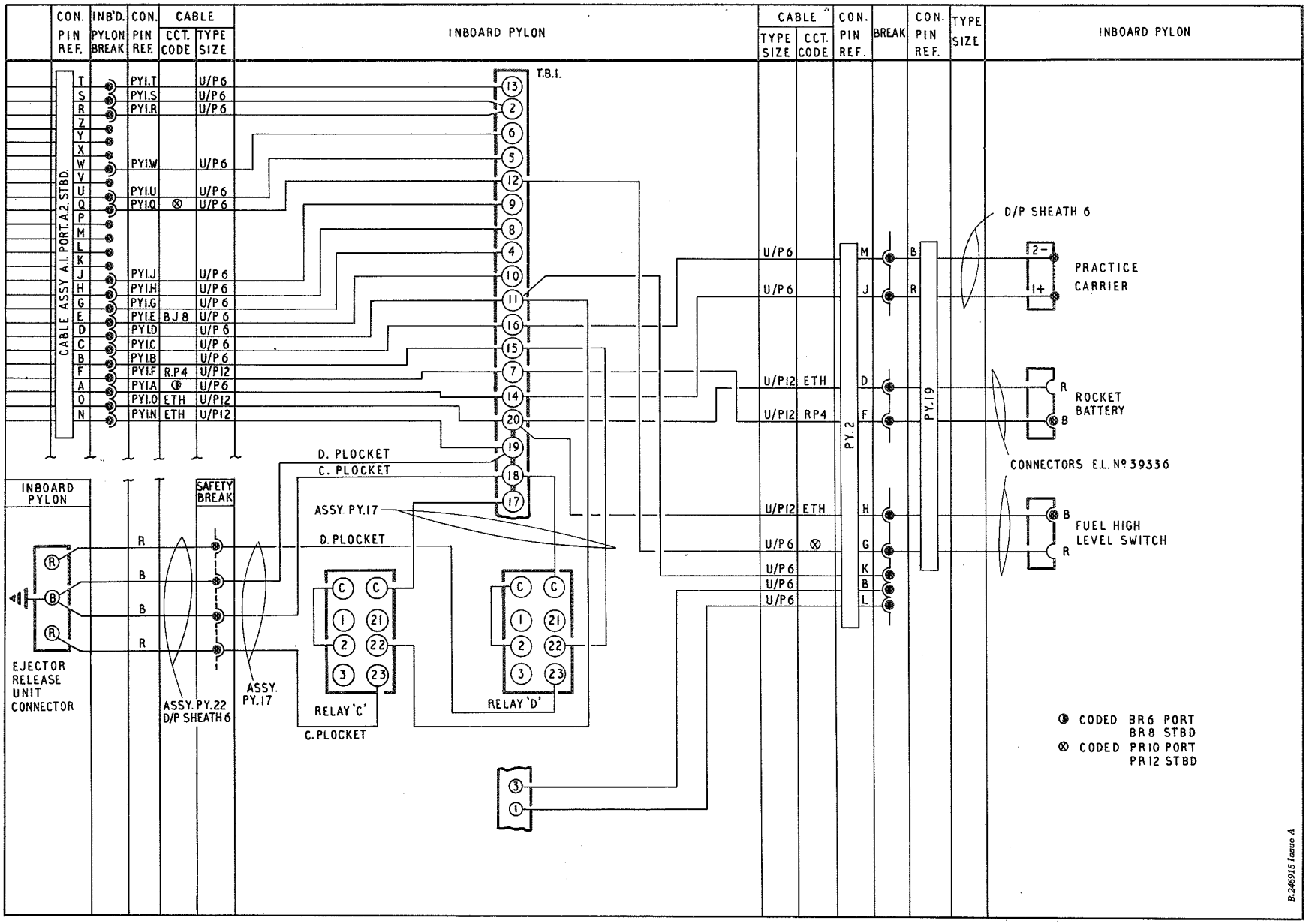

Fig.6 Bombs and R.P. (routeing–Pre Mod.229)

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column handgrip is supplied via the safety-plug and leg compression switches. The BOMB/R.P. selector switch, and the Fuzing selector are also supplied, as described in para.3; the Fuzing selector being in the DEFUZE position, a supply is also available at the contacts of the JETTISON push-switch *(pre-mod.229 aircraft)* or *(on post mod.229 aircraft)*, at the CLEAR AIRCRAFT push-switch.

Fuzing

28. To bring the practice bomb carriers to a state of readiness, the Fuzing selector must be put to the FUZE position. By this means, power supplies are made available at the contact arms of the carrier relays; the supply being routed from the Fuzing selector via the 2.5 amp fuse, the bridged contacts 4a-4 of the unenergized jettison relay 'A', and pin 2 on each of the carrier plugs on the pylons.

Practice bomb release

29. With the BOMB/R.P. selector switch in the BOMB position, the power supply is available at contacts 1a, 3a and 5a on the Bomb/R.P. firing relay 'S'. When the Bomb/R.P. firing-button is pressed, relay 'S' is energized, and its bridged contacts 1a-1 and 3a-3 pass supplies via pin 1 of each of the carrier plugs in the pylons to the coils of the carrier relays. With these relays energized, their contact arms close, passing supplies to the auto-selectors, which then operate to energize the release solenoids in sequence.

Stores jettison (pre-mod.229 aircraft)

30. Jettison of the stores carried on the inboard pylons is effected by first putting the Fuzing selector to DEFUZE. and then pressing the JETTISON push-button. By this means a power supply from the supply panel fuse is passed via the Fuzing selector contact arm to the JETTISON push-switch, whose bridged contacts pass supplies to the 'D' relays in the pylons, and the coil of the jettison relay, which operates; its contacts passing a supply from another fuse to the pylon 'C' relays. With the 'C' and 'D' relays energized, the supplies pass via the safety-breaks to the initiating caps in the E.R.U. cartridges.

Stores jettison (post mod.229 aircraft)

31.

(a) Inboard pylons.
Jettison of the stores carried on the inboard pylons is effected by first putting the Fuzing selector to DEFUZE, and then pressing the CLEAR AIRCRAFT push-button. The ensuing operation of the circuit is as described in para.30.

(b) Inboard and outboard pylons.
When stores are carried on the outboard pylons, these will be jettisoned simultaneously with those on the inboard pylons when the CLEAR AIRCRAFT push-button is pressed. In this instance, however, contacts 7-7a on the jettison relay are used; contact 7 being supplied with power independently. Thus, when the jettison relay is energized, contacts 7-7a pass supplies to the outboard pylons, energizing both the release and jettison solenoids. As a result, the release units operate to open the release slips, and the jettison solenoids operate the plungers which open the hooks mechanically if they have not already opened.

(c) Outboard pylons only.
Stores can be jettisoned from the outboard pylons independently by pressing the OUTER PYLON STORES JETTISON push-button, on the Bomb/R.P. control panel. The stores will be jettisoned as described in (b) above.

R.P. firing

Air-to-air rocket batteries

32. When the aircraft is airborne the control switches are supplied as described in paragraph 3. When the BOMB/R.P. selector is put to the R.P. position, a supply passes to the coil of the R.P. assessment relay, 'C', and to the air-to-ground R.P. control circuit; a supply is also made available at contact 7a on the Bomb/R.P. firing relay, 'S'. The R.P. assessment relay, 'C', is thus energized, and its contacts close, making a hold-on supply available to complete the camera circuit *(para.46)*.

33. When the Bomb/R.P. firing-button is pressed, the firing relay, 'S', is energized, and its contacts 7a-7 pass supplies via the rocket battery plockets in the pylons to the rocket launchers. The launchers then operate, firing salvos of rockets until the firing-button is released, or until all the rockets are expended.

Air-to-ground rocket installation
Normal firing

34. When the aircraft is airborne, supplies are available at the control switches, and when the BOMB/R.P. selector is put to R.P., the assessment relay 'C' energizes, making a hold-on supply available to complete the camera circuit, *(para.46)* Supplies are also available at contact 7a on the firing relay 'S', and the contact arm of the R.P. selector switch on the R.P. selector panel, as well as at the positive supply terminals in the firing distribution box. In this box, relay B/4, supplied via contact A3 operates, and opens its normally-closed contacts B1, B2, B3 and B4. The R.P. selector switch, in position 2, is out of circuit.

35. When the firing-button is pressed, relay 'S' operates, and its contacts 7a-7 pass a supply via the RIPPLE/NORMAL switch to the relay switch, A/4. As a result, A/4 operates and its contacts change over; contact A3 passing a supply from the positive terminal via resistor R1 to pin A of the firing circuit connector, thereby causing a salvo of two projectiles to be fired. At the same time, by the change over of A.3 the supply is broken from B/4, which de-energizes, allowing its contacts to close. Contact B3 passes a supply to the coil of the distribution switch, DS/8, and to the coil of the rippling relay; while B2 conducts a supply to the wiper at the first terminal of level 6, thereby energizing the position marker relay C/4. The rippling relay which is also energized via contact B3, opens its contacts 1-2 and 21-22, and closes contacts 3-4 and 24-23. Contacts 24-23 then complete a connection via pin L with the slug resistor R6. With the RIPPLE/NORMAL switch at NORMAL, however, the rippling relay has no function.

36. When the firing-button is released, relay A/4 de-energizes, but the slug resistor R7 delays its operation sufficiently to ensure the delivery of an adequate firing supply. The relay contacts change over; A3 again supplying B/4, whose contacts open, breaking the supplies from the rippling relay, the position marker relay C/4, and the coil of the distribution switch, DS/8. The armature of DS/8 opens, the pawl and ratchet wheel mechanism operates, causing the wiper contacts to move to the second terminal stage of the levels; relay C/4 being held on meanwhile, by the slug resistor R6.

37. If the R.P. selector is in position 4, a supply from the selector is connected to the change over contact A1. Again starting with the wipers on the first stage terminal of the level; when the firing button is pressed, the change-over of contacts A1 and A3 connects the supply to the first stage terminals of No.3 and No.4 levels. Two firing circuits are thus completed via R1 and R2; the supplies passing via the connector pins A and N, firing four projectiles, one each from rails A and B on both the port and starboard sides. The subsequent operations are as described in paragraph 36 until the move forward of the wiper contacts takes place; the second terminal at level No.5 is now supplied from A1, via contact C4; relay C/4 being again held by the slug resistor R6. The distribution switch, now supplied from the second terminal via the wiper and the interrupter contacts ds, operates, moving the wiper contacts to the third stage terminal of the levels. If the firing-button is again pressed, contacts A1 and A3 will connect firing supplies to pins B and O, thereby firing one projectile each from rails C and D on each side.

38. Relay E/4 is now energized via B1 and wiper 6 of the position marker level. When the firing-button is released, the wipers are moved forward to the fourth stage. On the fourth stage terminal, wiper 5 gets a supply from A1 via E4, and so pulses DS/8 to move the wiper contacts forward to the fifth stage. The fifth terminal is dead, hence no further movement takes place.

39. It will be seen that on the move forward level, the wipers continue to move forward until a dead terminal is reached; this terminal corresponds to the first

unfired terminals on the distribution levels. Depending on the initial position of wiper 5, one of the four position marker relays C/4, D/4, E/4 or F/4 is energized, and its respective contacts on the move forward level are closed; thereby supplying a number of terminals to correspond with the setting of the R.P. selector. The resistor R6 acts as a slug for these relays when they are energized.

Ripple firing

40. With the RIPPLE/NORMAL switch to RIPPLE, and assuming that the R.P. selector is at position 2 and that the distribution switch wiper contacts are on the first terminal stage of the levels when the firing-button is pressed, the firing relay S is energized, and its contacts 7a-7 pass a supply via the RIPPLE/NORMAL switch and the rippling relay contacts 2-1 and 22-21, to the relay switch A/4. A/4 operates and its contacts change-over; contacts A3 passing a supply via R1 to pin A of the firing circuit connector, thereby causing a salvo of two projectiles to be fired. By the change-over of contacts A3, relay B/4 is de-energized, and its contacts close, thereby supplying DS/8, C/4 and the rippling relay. With the rippling relay energized, its contacts 1-2 and 21-22 open, breaking the supply from A/4. A/4 is de-energized, but its drop-off is delayed by the slug action of resistor A7, to ensure that an adequate pulse has been delivered to the firing circuit.

41. As contacts A3 open, the supply to the coil of the rippling relay is broken, but the relay is held on by the slug action of R6 via its contacts 24-23. Also, when A3 changes over, B/4 is energized and its contacts open, de-energizing DS/8, and C/4.

42. When DS/8 drops off, the wipers are moved forward to the second stage; meanwhile, the rippling relay holds on until the movement is completed, then, since the second terminal on the move forward level is dead, it drops off. When this occurs, its contacts 1-2 and 21-22 close, and so re-energize relay A/4, causing a salvo of 2 to be fired. The sequence is then repeated, and will continue to be repeated until the firing-button is released, or the armament expended.

43. With the R.P. selector in position 4, the sequence will be as described in paragraph 40 until the contacts of B/4 open, de-energizing DS/8 and the rippling relay. Since this relay is slugged, its contacts 3-4 remain closed and maintain C/4 energized. The second terminal of the move forward level *(supplied from A1 via C4)* thus remains alive, hence, when the move forward consequent on the dropping off of DS/8 takes place, the rippling relay is re-energized via its contacts 24-23 and wiper 5. The distribution switch DS/8 is also pulsed, and a further move forward is made to the third stage. The third terminal of the move forward level is dead, hence relay C/4 and the rippling relay are de-energized. When this occurs, the rippling relay contacts 1-2 and 21-22 re-close, and so re-energize relay A/4 and repeat the sequence.

44. It will be seen that wiper 6 is on the third terminal of the position marker level when the sequence again commences, and that this time relay E/4 is energized. When the wipers reach the fourth stage, the pulsing supply for the move to the fifth stage will be obtained by wiper 5 from A1 via contact E4. The next repeat will utilise relay C/4 again, and the relays C/4 and E/4 will be used alternately until the end of the run. Other settings of the R.P. selector switch will cause different combinations of the four position marker relays to operate in sequence.

Resetting

45. The resetting circuit operates to return the wiper contacts to the first stage of the levels before re-arming. The reset push-switch is supplied from a fuse on the supply panel. When the switch button is depressed, the supply passes via wiper 7 to the reset level. Here, all the stage terminals are connected together, hence, whatever the position of the wiper, the supply passes to DS/8 via its interrupter ds. A second pair of contacts on the push-switch pass a supply to relay B/4. This relay operates, and, by the opening of contacts B1, and B2, the circuit to wiper 6 is broken. The position marker relays will not therefore be operated by the re-setting supply, but DS/8 will be energized

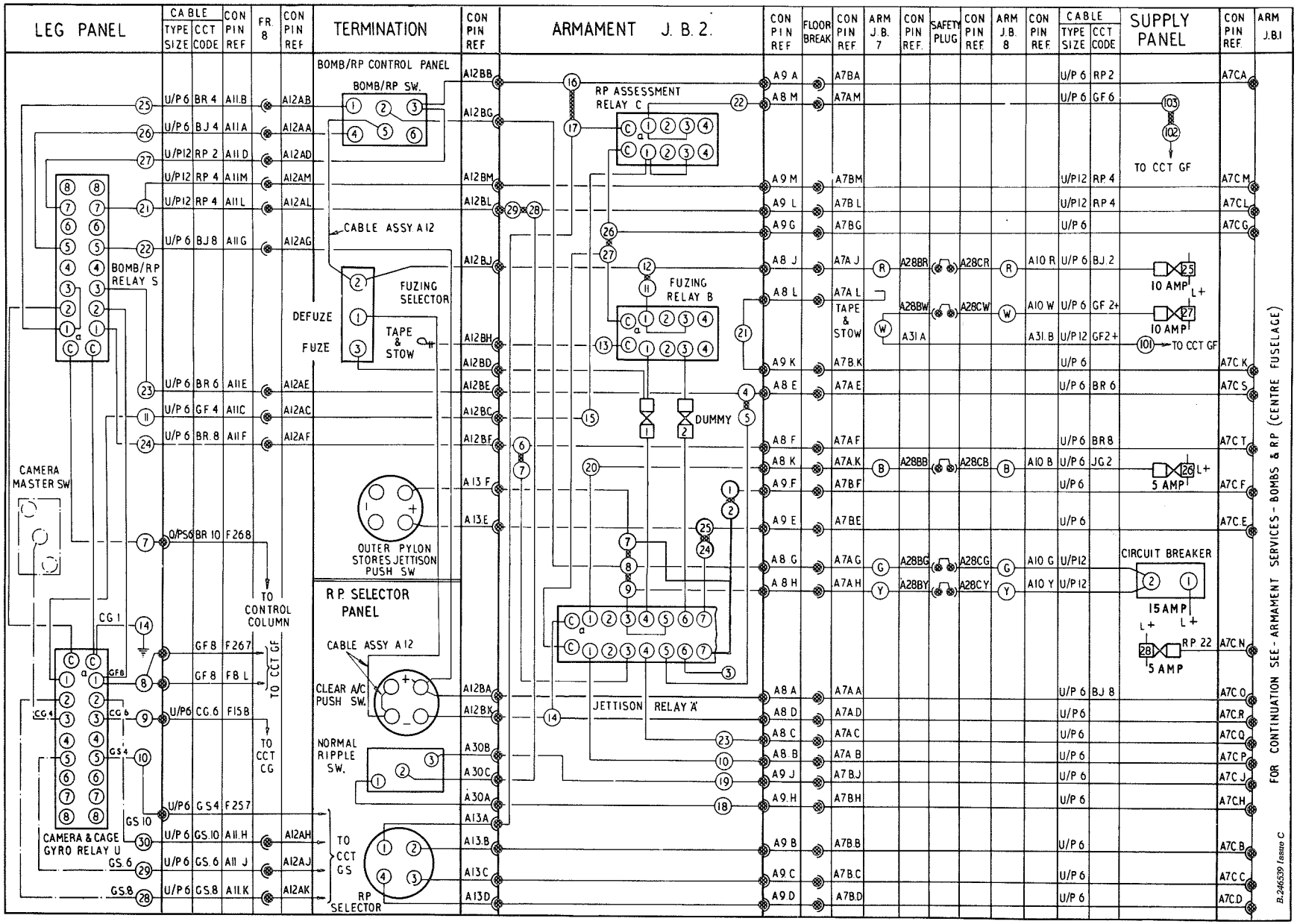

Fig.7 Bombs and R.P. front fuselage (routeing – post Mod.229)
◀ (minor amendment) ▶

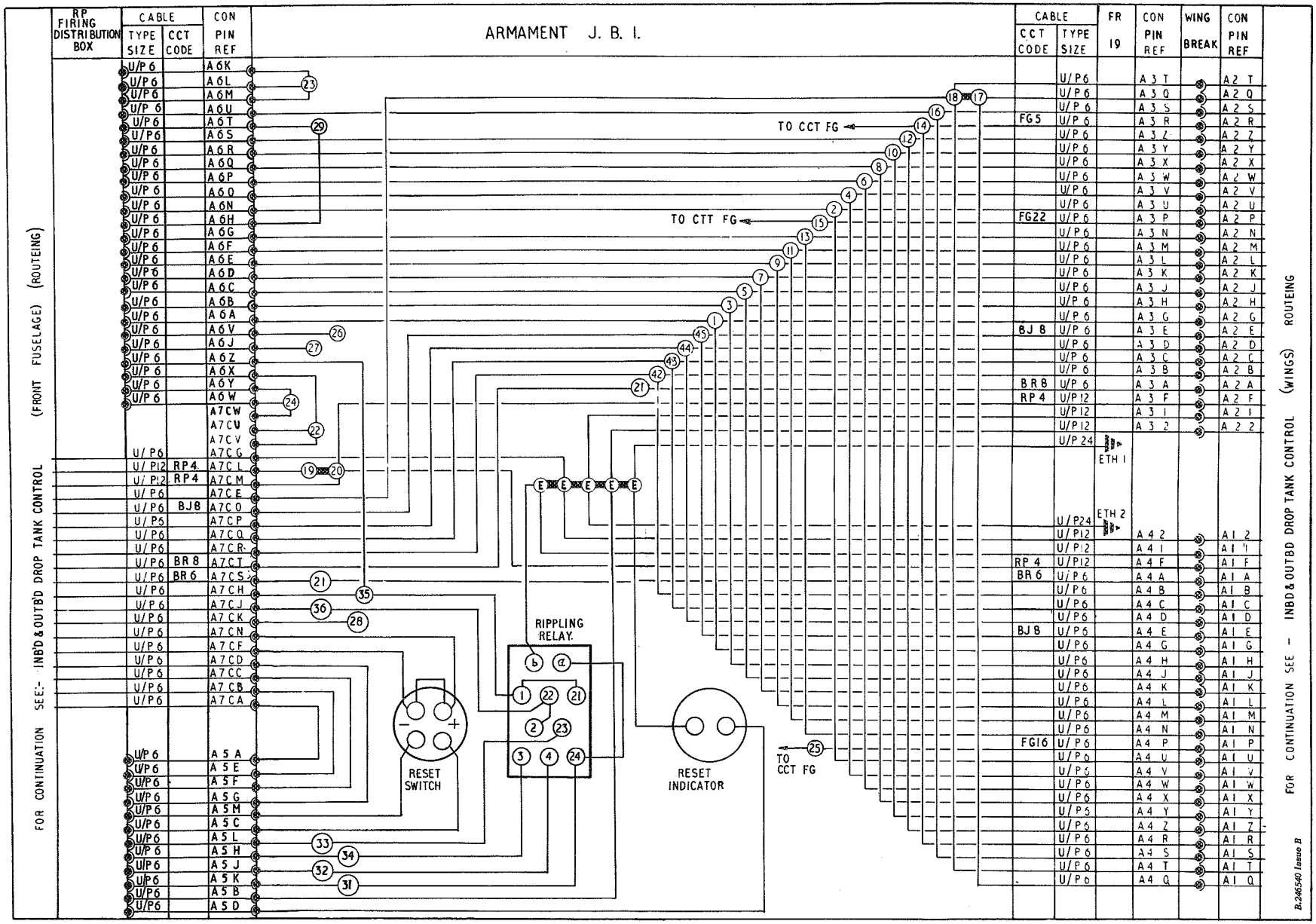

Fig.8 Bombs and R.P. centre fuselage (routeing-Post Mod.229)

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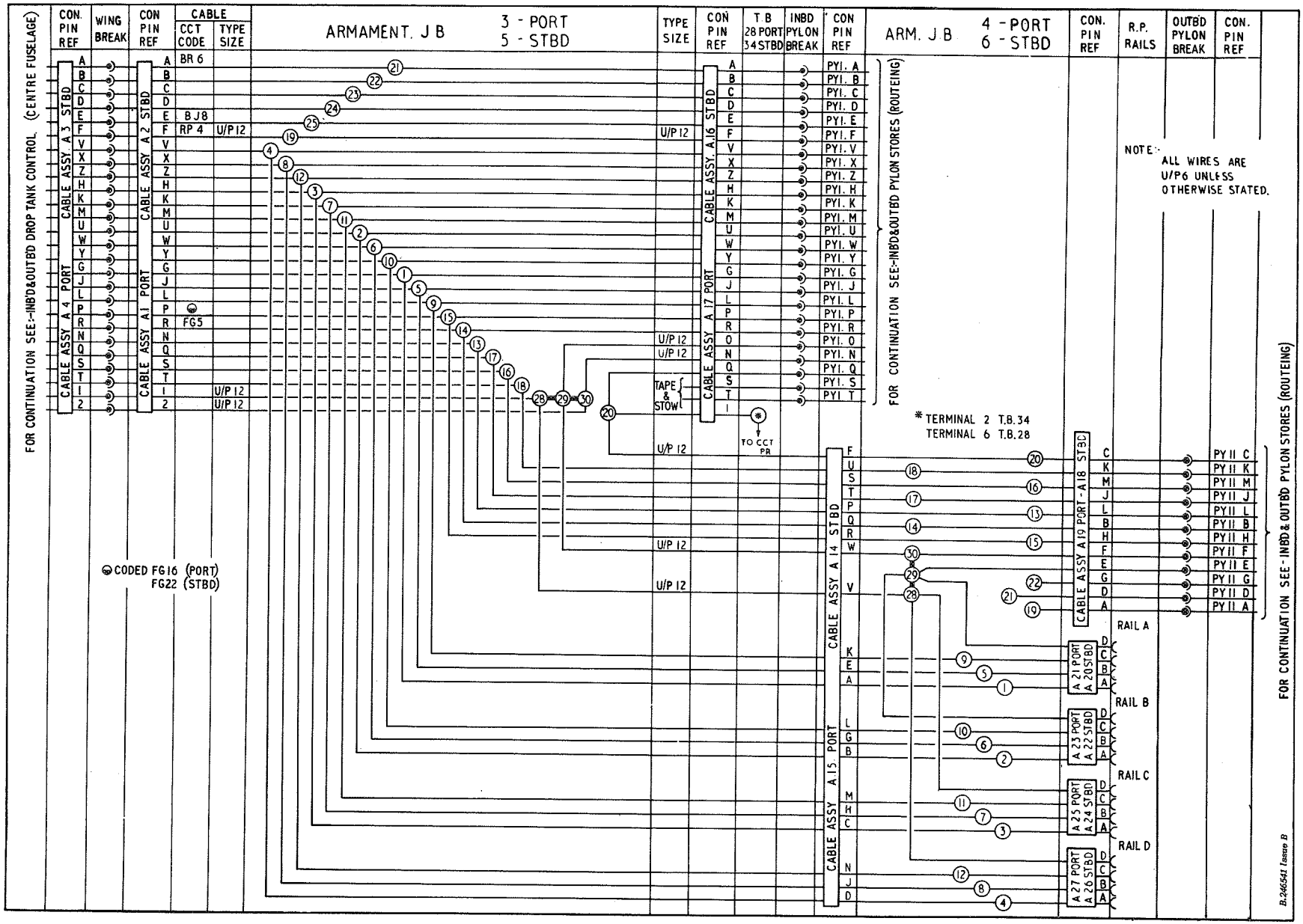

Fig. 9 Bombs and R.P. wings (routeing – Post Mod. 229)

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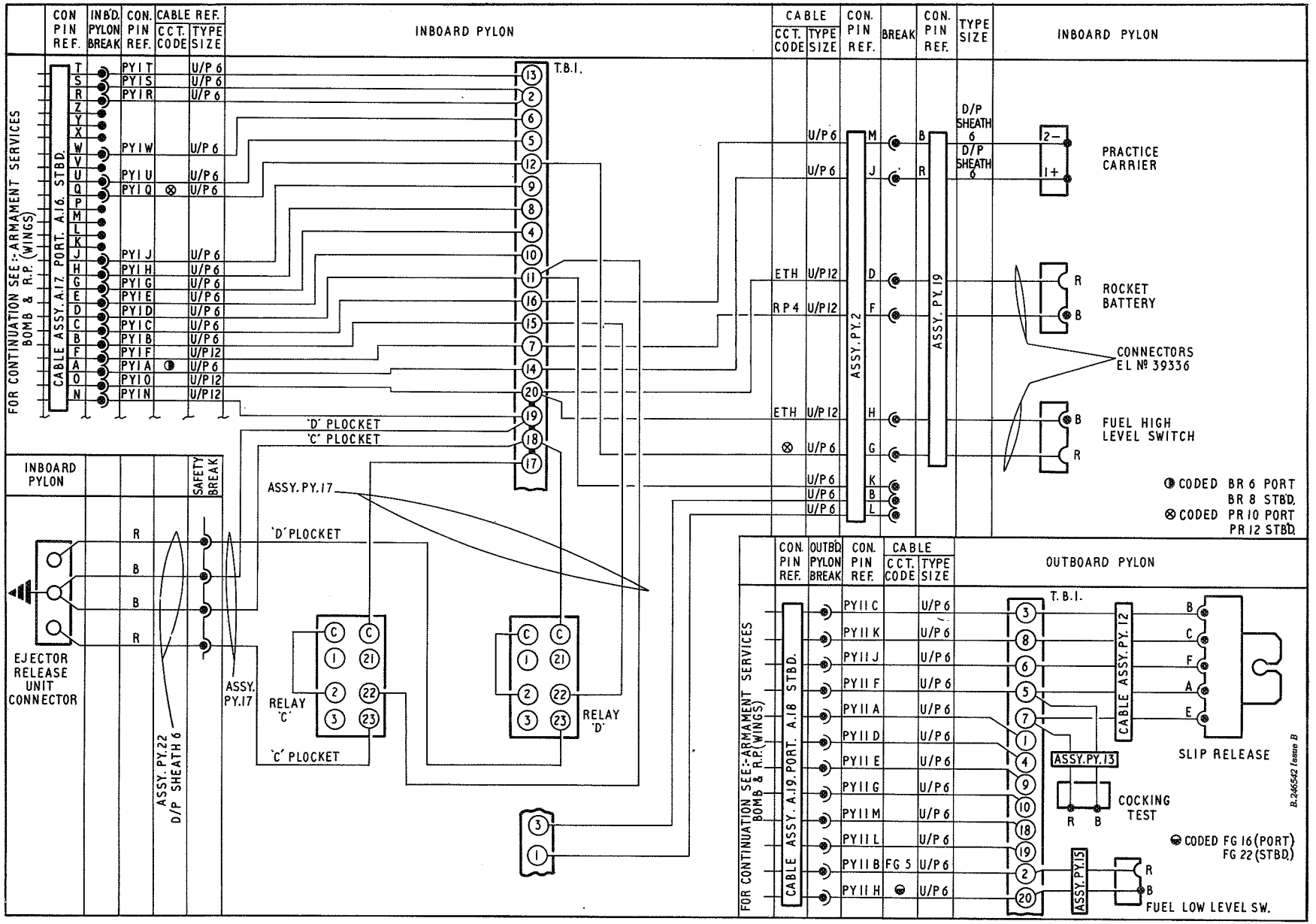

Fig. 10 Inboard and outboard pylon stores (routeing–Post Mod.229)

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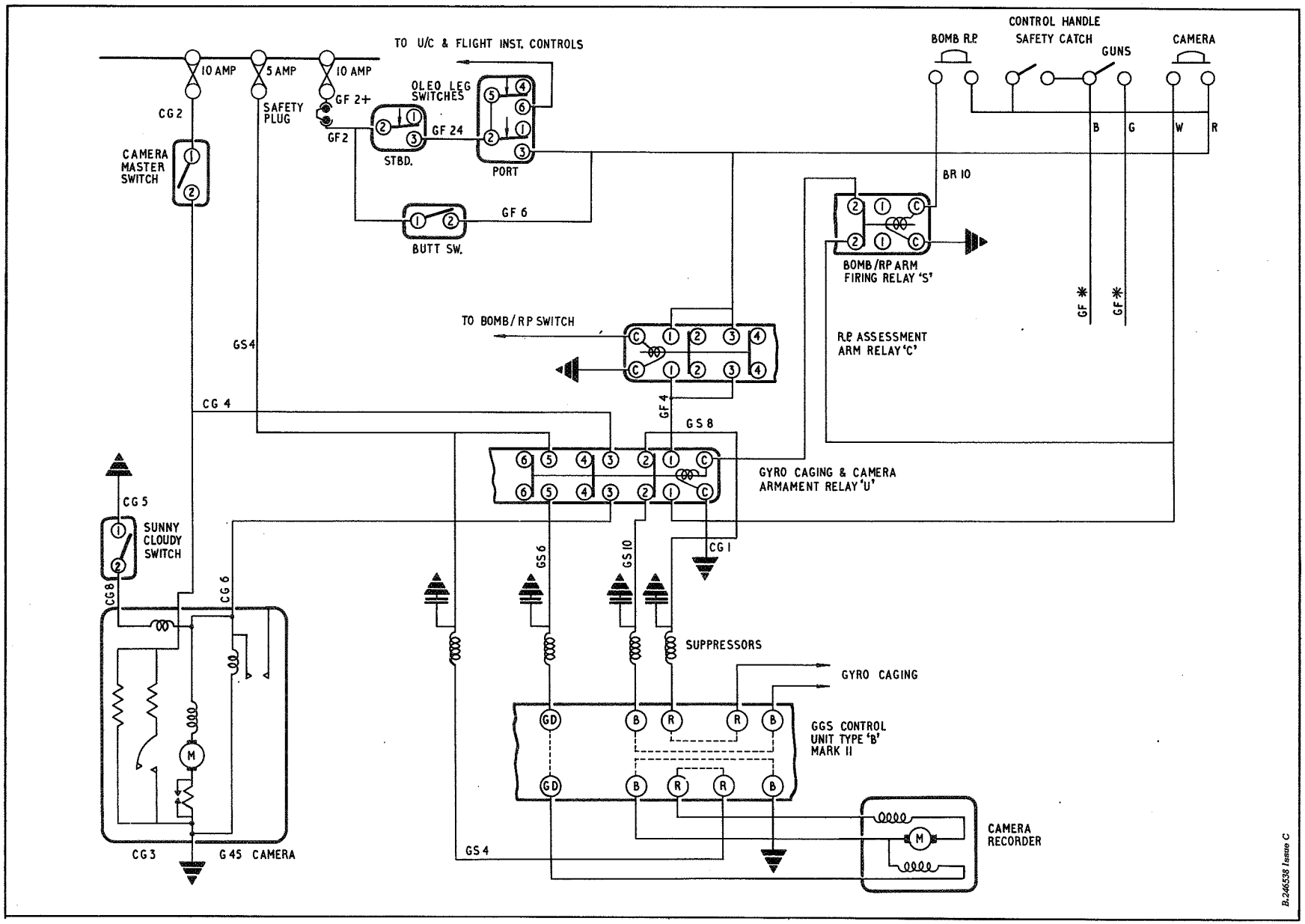

Fig. 11 G.45 camera (theoretical)

RESTRICTED

and will operate, thus returning the wipers to the first stage of the levels. The reset indicator will be energized, and will show WHITE, indicating the resetting is complete; when the reset button is released, the indicator will show BLACK. Mod 1441 renders the reset circuit inoperative.

G.45B camera

Independent operation

46. When the aircraft is airborne, the camera push-switch is supplied, as described in paragraph 3. By putting the CAMERA MASTER switch to ON, the lens and body heaters are supplied, and the supply is also made to contact 3a of the gyro caging and camera relay, 'U'. When the camera push-button is pressed, a supply passes via the bridged contacts 2a-2 of the unenergized firing relay, 'S', through the coil of relay 'U'. With relay 'U' energized, the supply from the master switch passes via the bridged contacts 3a-3 to the release solenoid in the camera. By the operation of the release solenoid, the motor contacts close and start the motor, which in turn operates the film drive and shutter mechanism. When the camera push-button is released, the supply to the camera motor and release solenoid will be broken by the de-energization of relay 'U'.

R.P. photographic tactics

47. When making an R.P. attack the camera is required to photograph the target up to the moment of firing, therefore it is started beforehand and allowed to run until the Bomb/R.P. firing-button is pressed. For this purpose, an interconnection with the R.P. assessment relay, 'C', provides a hold-on circuit for the gyro caging and camera relay 'U', after it has been initially energized by operation of the camera push-button.

48. Thus, when the BOMB/R.P. selector switch is put to R.P. the assessment relay, 'C', is energized *(para 34)* and its contacts 1a-1 pass a supply to contact 1a of the gyro caging and camera relay 'U'. With the CAMERA MASTER switch to ON, the camera heaters will be supplied, as will be contact 3a on relay 'U'. When the camera push-button is pressed, a supply passes via contacts 2-2a of the firing relay 'S', and energizes relay 'U'. The contacts 3a-3 of relay 'U' then pass a supply to the camera release solenoid, while contacts 1a-1 pass a hold-on supply through the relay coil, via the contacts 2-2a of the firing relay 'S'. The camera push-button may now be released, but the camera continues to operate to photograph the target until the Bomb/R.P. firing-button is pressed.

49. When the Bomb/R.P. firing-button is pressed, the firing relay 'S' will be energized, and its contacts 2-2a will open; thereby breaking relay U's hold-on supply. Relay U's contacts will likewise open, thus breaking the supply from the camera release solenoid, with the result that the motor contact will open and the motor will cease to operate.

Camera recorder

50. If the gunsight and camera recorder are in the combat position when the G.45 camera gun is operated, contacts 5a-5 of the gyro caging and camera relay will pass a supply to the camera recorder release solenoid. The camera recorder will then operate, as described in Group 4A, Chap 2.

SERVICING

General

51. For general servicing of the aircraft electrical system, reference should be made to Group A 1 of this chapter. All the components should be kept clean and examined periodically for signs of damage and to ensure that they are securely mounted. Apart from the standard routine serviceability checks and bench testing of the components as described in the Air Publications listed in Table 1, no further servicing should be necessary.

Testing armament circuits

52. The procedures for testing the armament circuits fitted to this aircraft are given in the following paragraphs:-

WARNING

Before proceeding with the following tests, ensure that the battery master switch is in the OFF position and that the rocket projectiles and outboard jettison circuits are rendered electrically safe as follows:-

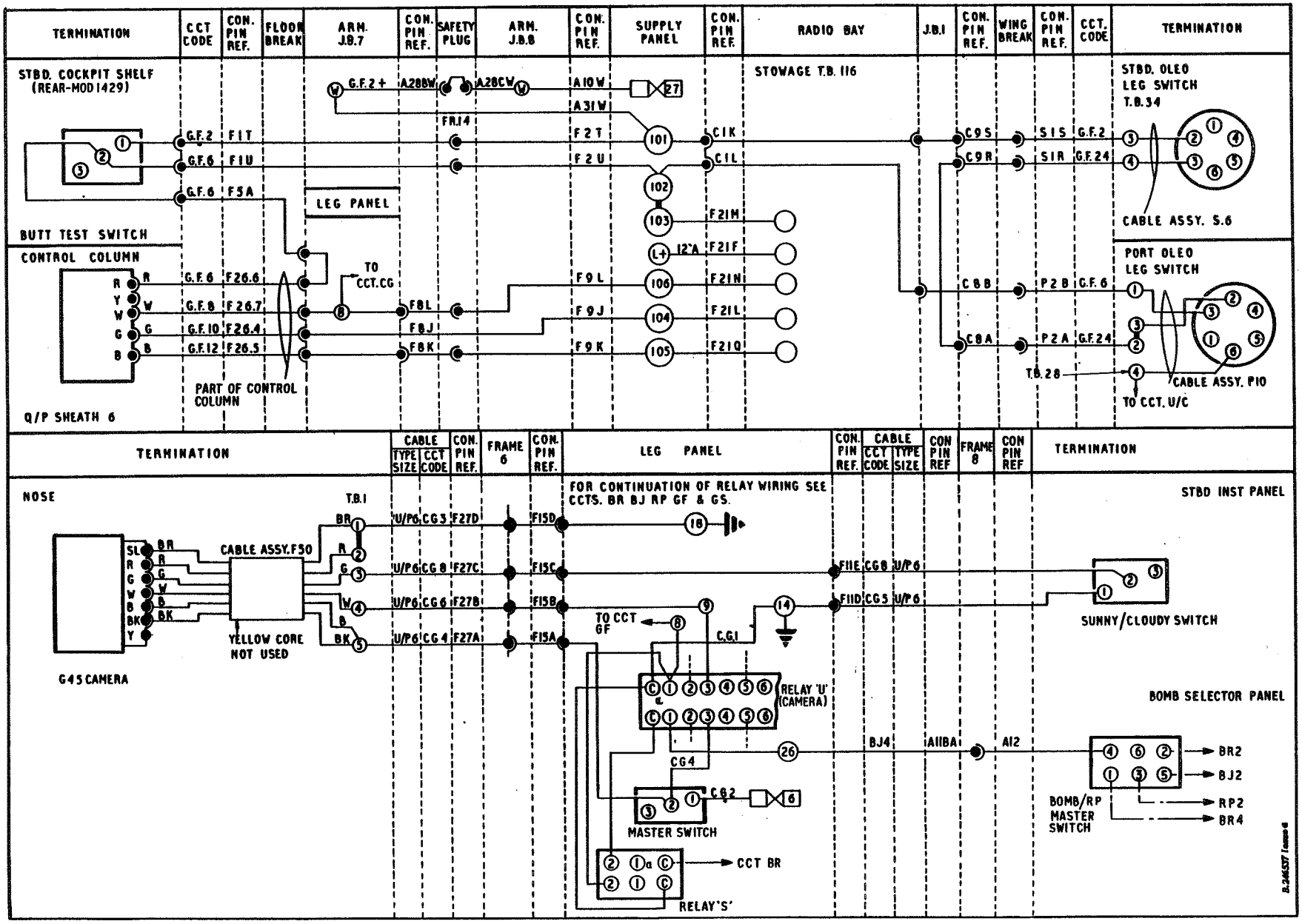

Fig.12 G45 camera (routeing)

▶ (Mod 1429 added) ◀

(1) ARMAMENT SAFETY PLUG
Disconnect the armament safety plugs.

(2) AIRCRAFT POST MOD.228 OUTBOARD PYLONS

(a) If outboard drop tanks are fitted, disconnect cable assembly PY.11 at pylon break and connect test lamps between pins J, K, and common to pin F of wing cables A.18 and A.19. During the test sequence these lamps will be illuminated as stated.

(b) If tanks are not fitted, 10 lb. weights on shackles are to be loaded to the outboard release units these being reloaded and cocking checks carried out whenever they are released during the test sequence. Release will occur instead of test lamp illumination *(Sub-para.(a))*.

(3) R.P.
Disconnect adapter plugs *(Ref.11C/3067)* on the launcher rails.

(4) PRACTICE CARRIER AND ROCKET BATTERY FACILITY
Connect test lamps to practice carrier plug pin 1 or +ve to earth and pin 2 or -ve to earth, and rocket battery plocket. During the test sequence these lamps will be illuminated as stated.

Note . . .

These armament services must not be operated, unless the ejector release unit plockets C and D, in the pylons, are disconnected.

53. To test the ejection release units electrical circuit in the port and starboard inboard pylons proceed as follows:-

(1) Ensure that the ejector release unit connectors are disconnected from the ejector guns.

(2) Connect plockets C and D.

(3) Connect the armament safety plug.

(4) Select the Bomb/R.P. selector switch to 'BOMBS', the fuzing selector switch to 'DEFUZE' and the butt test switch to 'TEST'.

(5) Select battery master switch to 'ON'.

(6) Check the voltage at each ejector release unit connector by operating the Bomb/R.P. push switch. Check for NO VOLTS at ejector release unit connectors. Test lamps at practice carrier plugs pin 1 or +ve should be illuminated.

(7) Post Mod.228 aircraft. Operate clear aircraft switch or Pre-Mod.228 aircraft inner stores jettison switch. The reading obtained should be the supply voltage at the ejector release unit connectors. Test lamps at outboard pylons will be illuminated *(Post Mod. aircraft only)*. Test lamps at practice carrier plugs pins 1 or +ve should be illuminated.

(8) Select butt test switch to OFF, Bomb/R.P. switch to 'OFF', Fuzing selector switch to 'DEFUZE'. Operate clear aircraft switch *(Post Mod. 228 aircraft)* or inboard stores jettison switch *(Pre-Mod.228 aircraft)*.. Reading obtained should be the supply voltage at ejector release unit connectors. The test lamps at the outboard pylon will be illuminated (Post Mod.228 aircraft only).

(9) Select in the following sequence and operate the Bomb/R.P. push switch for each case; check for NO VOLTS at the ejector release unit connectors, practice carrier test lamps should not be illuminated.

(a) Butt test switch to 'OFF', Bomb/R.P. switch to 'BOMBS'.

(b) Butt test switch to 'TEST', Bomb/R.P. switch to 'OFF'.

(c) Butt test switch to 'TEST', Bomb/R.P. switch to R.P.'. Test lamps at rocket battery plockets should be illuminated.

(10) Select the fuzing selector switch to 'FUZE', test lamps at practice carrier plugs pins 2 or –ve should be illuminated.

Operate the inboard stores jettison switch *(Pre-Mod.228 aircraft)* or clear aircraft switch *(Post Mod.228 aircraft)*. Check for NO VOLTS at the ejector release unit connectors, the practice carrier lamps should NOT be extinguished. On aircraft Post Mod.228 the test lamps at the outboard pylon should NOT be illuminated.

(11) Disconnect the armament safety plug and repeat the tests in operations (4), (5), (6) and (7), but in this case check for NO VOLTS at the ejector release unit connectors. The test lamps at the practice carrier plugs should NOT be illuminated.

(12) Select the butt test switch and Bomb/R.P. switch to 'OFF', and the fuzing selector switch to 'DEFUZE'.

(13) Aircraft Post Mod.228 only. Operate the outboard pylon stores jettison switch. The test lamps at the outboard pylon should be illuminated check for NO VOLTS at ejector release unit connectors.

Note . . .

Disconnect the armament safety plug. Do not re-connect plockets C and D in in the inboard pylon.

(14) Re-connect the R.P. adapter plugs to the launcher rails.

(15) If outboard pylons Post Mod.228 aircraft only with drop tanks are fitted, remove the test lamps from A.18 and A.19 cables and re-connect the outboard pylons cable assembly PY.11.

(16) If outboard drop tanks are fitted and are full of fuel, withdraw fuses 13 and 14 from the starboard cockpit shelf, ensure that the drop tank empty indicators show 'WHITE'. Replace the fuses. If the drop tanks are empty, short out terminals 2 and 20 at T.B. in the outboard pylons. The drop tank empty indicators should show 'BLACK'. Check cocking of the outboard pylon release units, using a standard test set.

(17) With a suitable low voltage ohmeter, check between terminals 17 and 18 and earth in ARM J.B.1. A resistance of 1.25 ohms. approx. should be recorded. Any value between 5 and 1.25 ohms, will indicate that the outboard release unit or jettison coils are open circuited *(i.e. plug not properly engaged)*.

54. To arm the ejector release units proceed as follows:-

(1) Disconnect the electrical supply to the aircraft *(Sect.5, Chap.1, Group A.1)*.

(2) Disconnect plockets C and D in each pylon.

(3) Check for open contacts on relays C and D using a 250 volt Megger between the RED and BLUE pins on plockets 'C' and 'D' *(free ends)*. The reading obtained should be between 20 Megohms and infinity.

(4) Fit a cartridge in each ejector release unit and assemble the connectors.

(5) Check the resistance of the cartridge detonator circuit by using a suitable safety ohmeter *(0-500 ohms max. output 5mA at 4V)*, connected between the RED and BLUE pins of plockets C and D *(fixed ends)*. The readings obtained should be between 15 and 150 ohms.

(6) Re-connect plockets C and D in each pylon just prior to flight.

Note . . .

All arming of ejector release units must be carried out in accordance with local orders concerning the safety of aircraft and personnel. The armament safety plug must be re-connected only just prior to flight.

REMOVAL AND ASSEMBLY

General

55. Once access has been obtained, the removal and assembly of the armaments services components should present no difficulties. The removal of the panels and ARM junction boxes, which carry the majority of the components, is fully described in Group A.2 of this chapter. The removal of the pylons is described in Section 3, Chapter 2 of this volume. The means of access to, and the location of the components is indicated in Group A.3 of this chapter.

LIST OF APPENDICES

◀ APPENDIX 1 – MODIFICATIONS 1023, 1221. 1222, 1223 and 1326 ▶

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Introduction

1. This appendix contains a description of the revised armament circuitry introduced by Modifications 1221, 1222 and 1223 to provide for the carriage of practice bombs on the outboard pylons and pylon ◀ selection facilities. Re-routeing of the pressure refuelling wiring introduced by Mod.1023 is shown in Fig.5. ▶

DESCRIPTION

General

2. To enable the practice bomb carriers to be used on the E.M. release units of the outboard pylons, a R-Type plug is added to each pylon release housing to provide a supply connection for the practice carriers. To enable either the inboard or outboard pylons to be selected for use a pylon selector switch is provided in the cabin. This switch, which is marked INB'D and OUTB'D, is situated on the Bomb/R.P. control panel above the cabin port shelf.

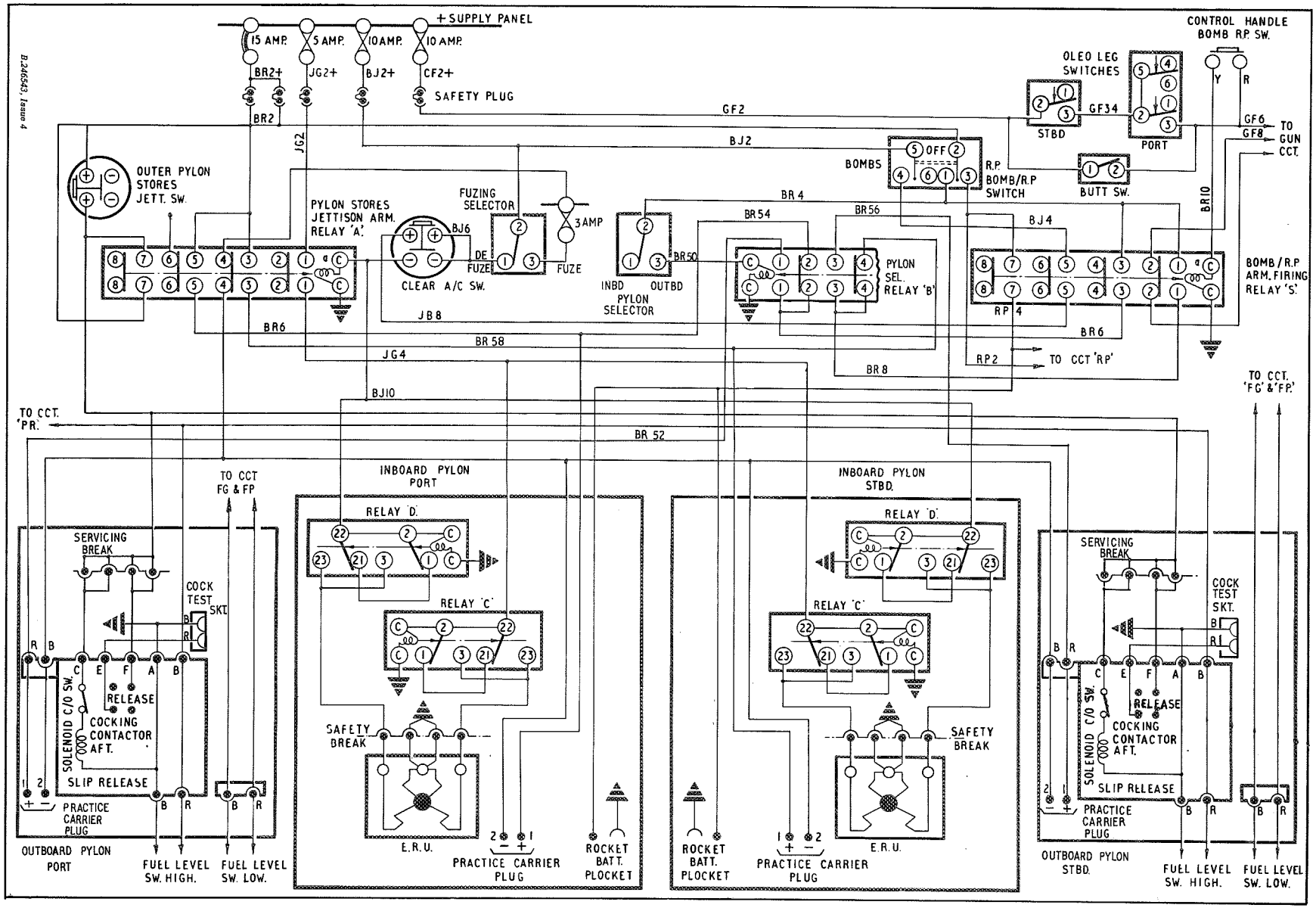

Fig.1 Bombs and pylon stores (theoretical)

T.P.(E) 8191

RESTRICTED

The revised armament circuits are given in the illustrations contained in this appendix and reference should be made to the Air Publications listed in Table 1 for a description of the equipment used.

3. Each outboard practice bomb carrier is provided with three alternative methods of electrical connection with the aircraft's pylon. These consist of two R-Type sockets and a butt connector, on this aircraft one of the R-Type sockets is used. The carriers each contain a four-way auto-selector switch, two solenoid release units, two cock test plugs, a resistance box and two fuzing contacts. For a description of the electrical circuit of the inboard practice bomb carriers, reference should be made to Group G.1.

Operation

4. With the Bomb/R.P. selector switch set to BOMBS and the fuzing selector switch at FUZE, the outboard pylons are selected for use by placing the pylon selector switch in the OUTB'D position, thus energizing the pylon selector relay B. The fuzing selector switch when set to FUZE makes a supply available to the fuzing contacts of each practice carrier and the Bomb/R.P. selector switch makes a supply available to contacts 1a and 3a of the firing relay S.

5. When the Bomb/R.P. firing switch is pressed, the firing relay S is energized and its contacts 1 - 1a and 3 - 3a pass supplies, via the energized pylon selector relay B, to energize the auto-selector electro-magnets and, via contact 2 on the port carrier, energize the release solenoid, thereby releasing one bomb. As the bomb falls away the bomb fusing circuit is completed through a bomb arming cable, which when the bomb has fallen approximately 3 in becomes detached.

6. On release of the firing switch, the auto-selector mechanisms operate, each respectively closing its next successive contact. As contacts 1 and 3 of the auto-selector switch in each carrier are unconnected, this in conjunction with the initial auto-selector switch settings, ensures that successive operation of the firing switch will release one bomb at a time, alternatively from each carrier.

7. The operation of the inboard practice bomb carrier with the pylon selector switch set to the INB'D position is as described in Group G.1.

SERVICING

General

8. For servicing of the armament electrical equipment, reference should be made to Group G.1 and to the Air Publications listed in Table 1. The adaptor cable introduced by Mod.1326 for use when carrying 25/28 lb practice bomb carriers on post Mod.1293 outboard pylons is shown in Fig.8 of this Appendix.

WARNING

When the carriers are loaded, the auto-selector switches must be set as follows:- Port No.2. Starboard No.1. Failure to comply with this warning may result in premature release of the bombs.

REMOVAL AND ASSEMBLY

General

9. The removal and assembly of the practice bomb carriers is described in the Air Publication listed in Table 1. The method of removing the outboard pylon is described in Book 1, Sect.3, Chap.2.

TABLE 1

Equipment type and Air Publication references

Equipment Type	Air Publication
Pylon selector switch, C.W.C.	
Type XD.778 No.4	A.P.4343C, Vol.1, Book 1, Sect.1.
Practice bomb carriers, 28 lb.	A.P.1664A (2nd.Ed.) Book 1,Sect.1.

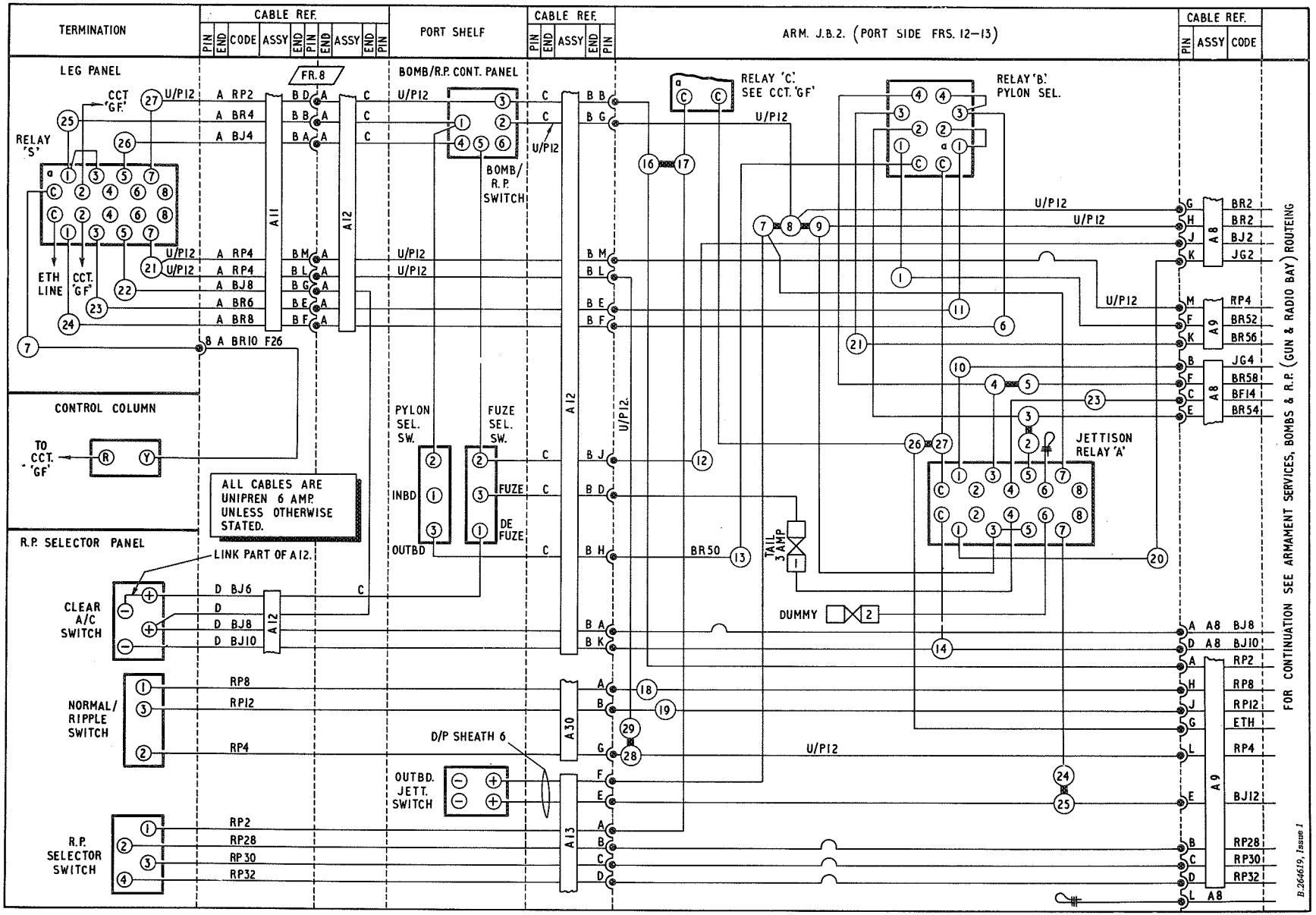

Fig.2 Bomb and R.P. - cabin (routeing)

T.P.(E) 8193

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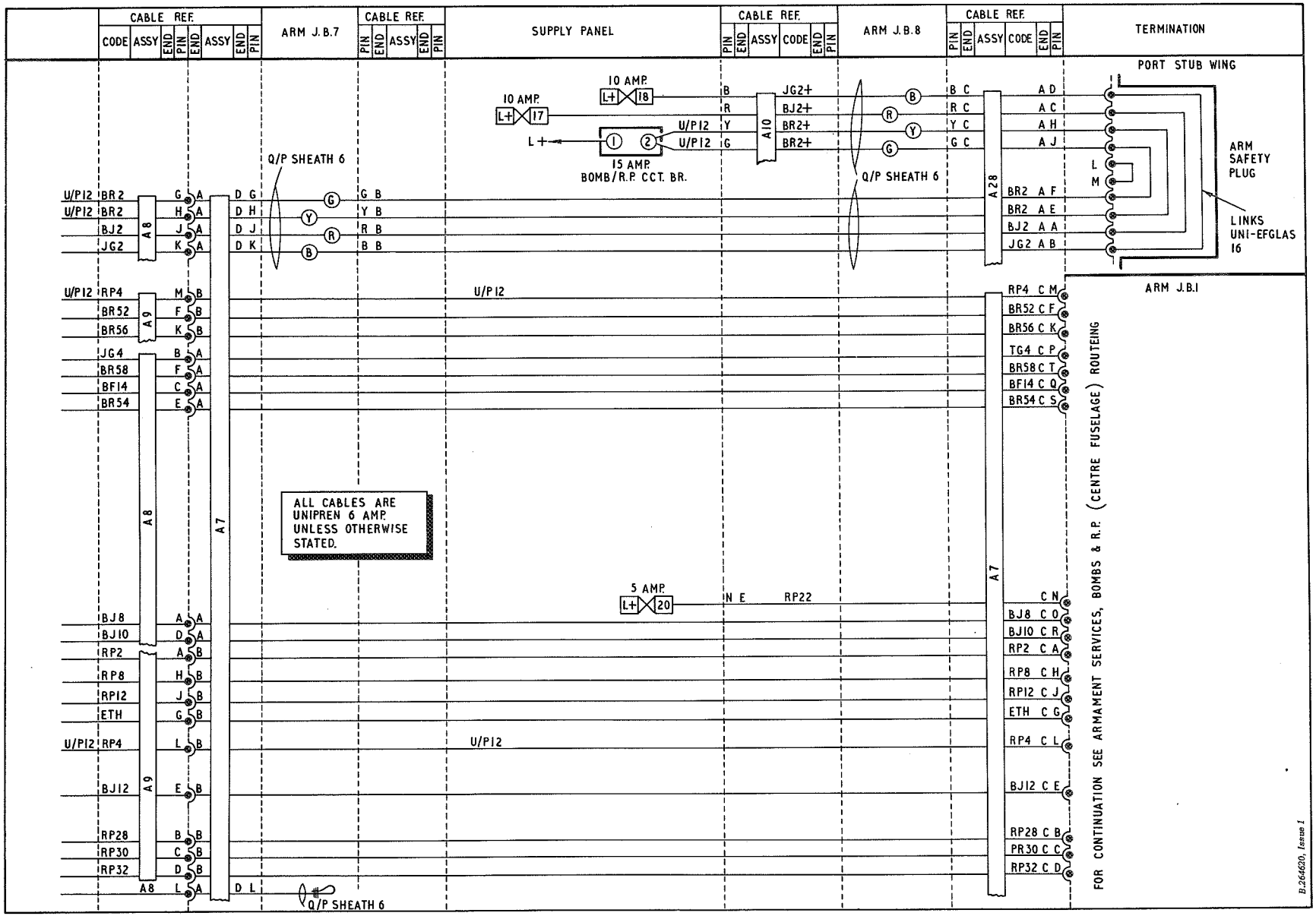

Fig.3 Bomb and R.P. - radio bay (routeing)

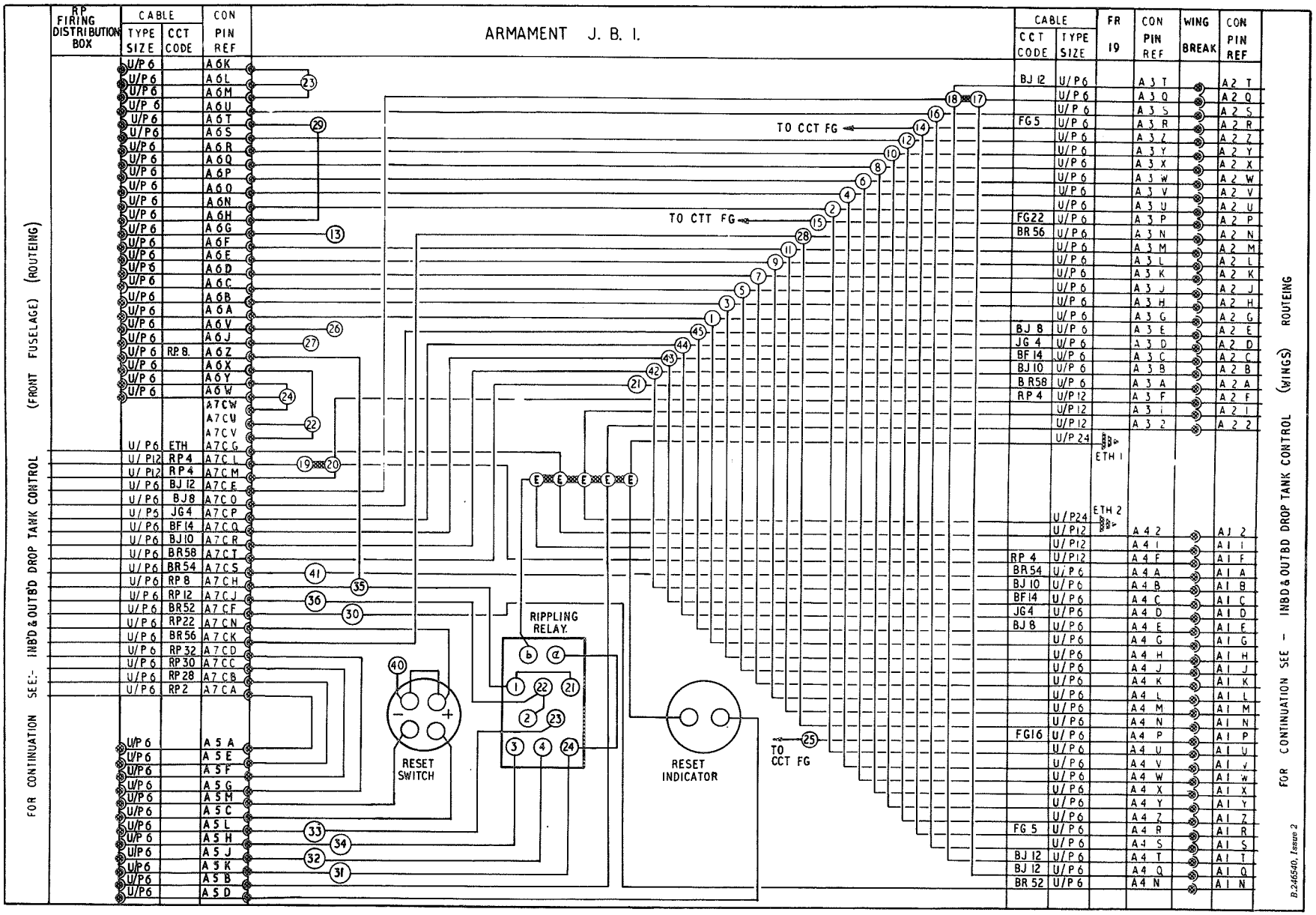

Fig.4 Bomb and R.P. - centre fuselage (routeing)

T.P.(E) 8195

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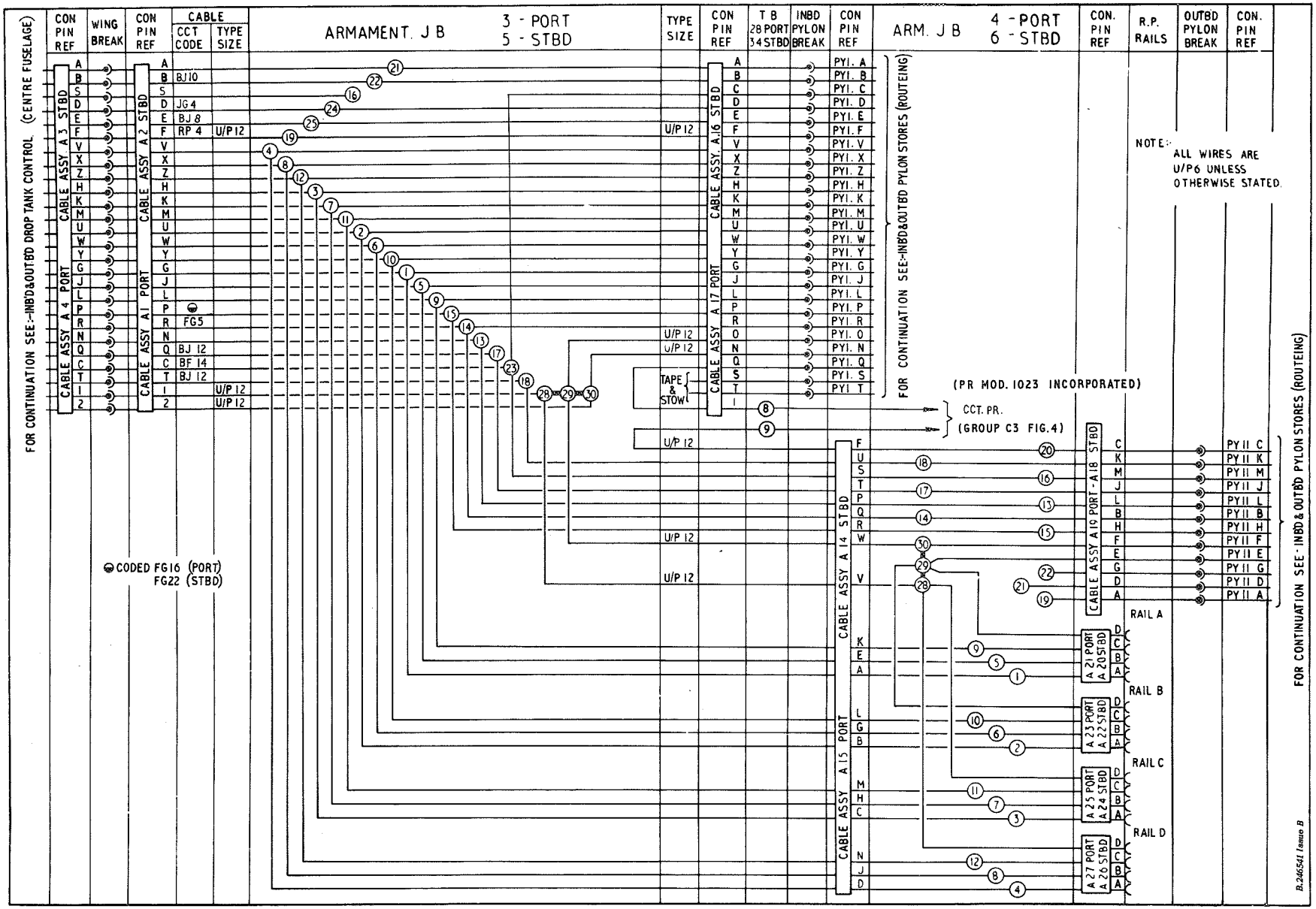

Fig.5 Bomb and R.P. – wings (routeing)

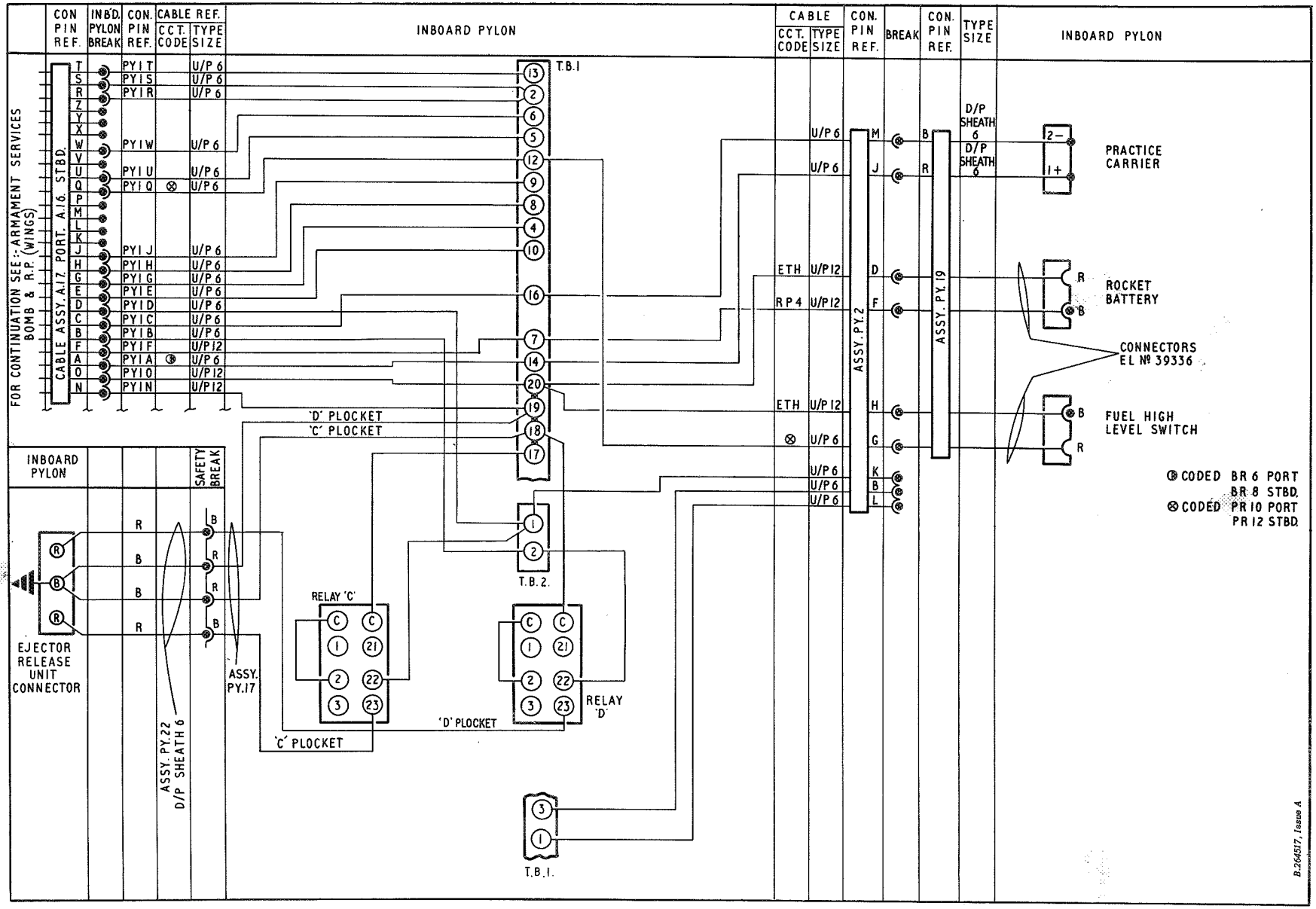

Fig.6 Inboard pylon stores (routeing)

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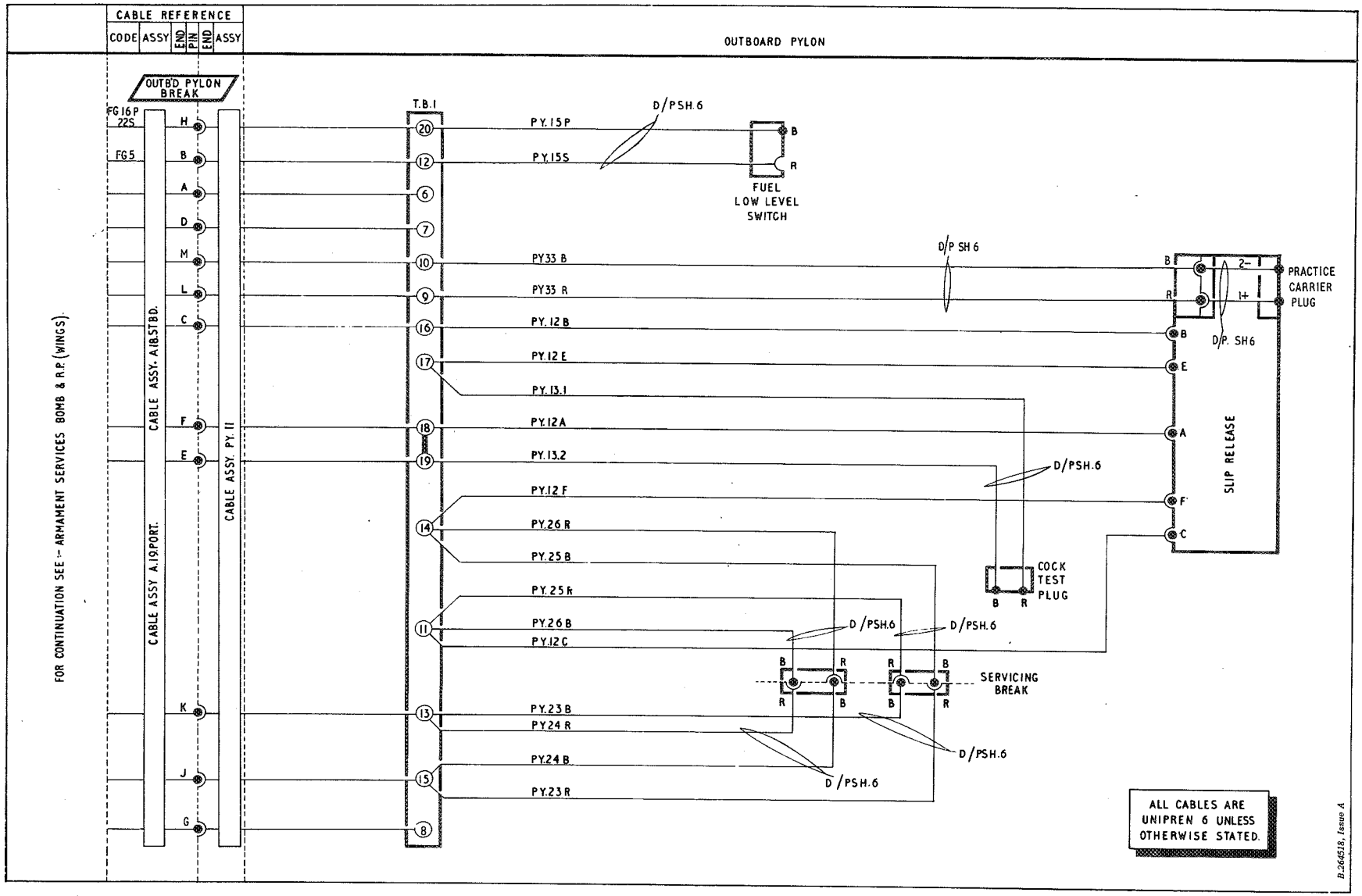

Fig.7 Outboard pylon stores (routeing)

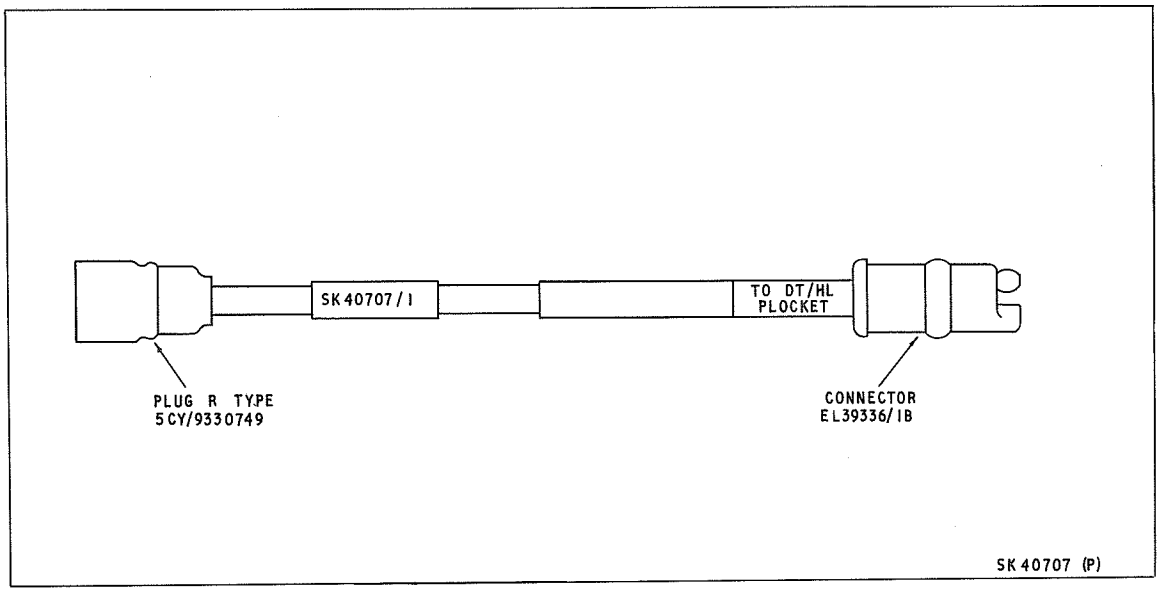

Fig.8 Outboard pylon adaptor cable (Mod.1326)

Appendix 2 - ARMAMENT CIRCUITS MOD. 1211, 1254, 1255, 1256

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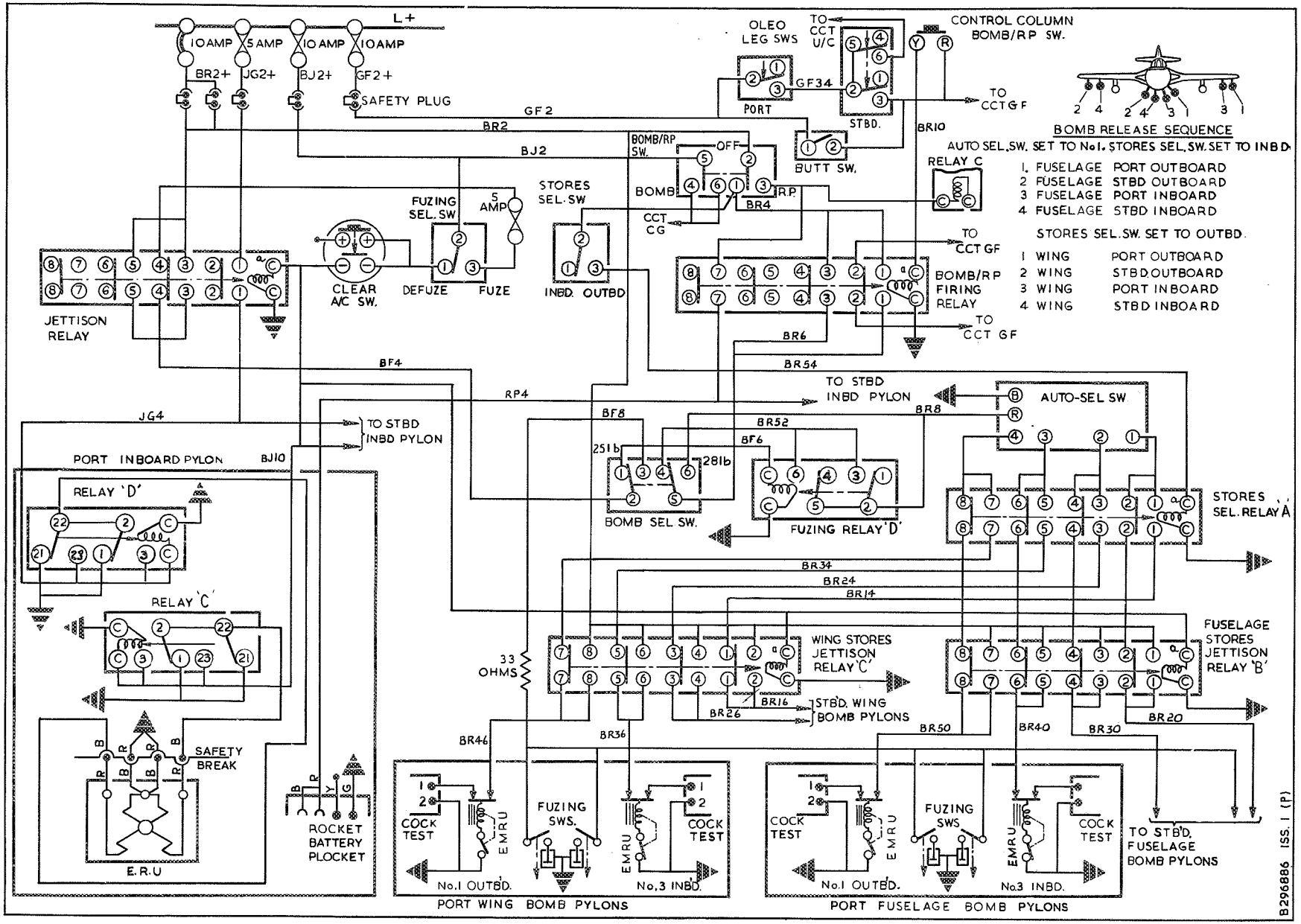


Fig. 1 Practice bombs – Mod.1255 (theoretical)

◀ Amended to include Mod.1345 ▶

TABLE 1

Equipment type and Air Publication reference

Equipment Type	Air Publication
Practice bomb carriers	A.P.(N)1024, Vol. 1, Sect. 2, Chap. 25
Release units, No. 18, Mk. 1	A.P.(N)1024, Vol. 1, Sect. 2, Chap. 21
Auto-selector switch, Type C, No. 2	A.P.4343X, Vol. 1, Sect. 3, Chap. 22, App. 2
Bomb selector—D.P. change-over switch—no centre-off	... A.P.4343C, Vol. 1, Book 1, Sect. 1
◀ Wing Pylon—Inner (Mod.1294) E 251959 (P) and E 251960 (S)	A.P.101B-1309-1A, Sect.3 and 7
Wing Pylon—Outer (pre Mod.1293) D 264628 (P) and D 264629 (S)	A.P.101B-1309-1A, Sect.3 and 7
Wing Pylon—Outer—By Mod.1293 D 273723 (P) and D 273724 (S)	A.P.101B-1309-1A, Sect.3 and 7 ▶

Introduction

◀ 1. This appendix contains a description of the revised circuits for the carriage of eight 25 lb., or 28 lb. practice bombs, together with two 100 gallon, drop tanks. The modifications described are those listed under appendix heading. Other mods. which effect R.P. armament and photographic target assessment are described in appendix 3. ▶

DESCRIPTION

General

2. (*a*) On aircraft Pre Mods. 228 and 229, the installation comprises :—

(i) A bomb pack introduced by Mod. 1211.

(ii) Four bomb pylons, two on each outer mainplane introduced by Mod. 1254.

(iii) Electrical components introduced by Mod. 1255.

(iv) A 100 gallon drop tank on each inboard pylon.

(*b*) On aircraft Post Mods. 228 and 229, the installation comprises :—

(i) A bomb pack introduced by Mod. 1211.

(ii) A practice bomb carrier on each outboard pylon (App. 1).

(iii) Electrical components introduced by Mod. 1256.

(iv) A 100 gallon drop tank on each inboard pylon.

Bomb pack

3. The bomb pack consists of a large panel mounted in the underside of the front fuselage in place of the gun pack. Fitted to the underside of the bomb pack are four bomb pylons. Housed within the bomb pack, at the starboard side, forward, are a 4-way auto-selector and a 25 lb./28 lb. bomb selector switch, to which access is made through a detachable panel immediately forward of the bomb pack. A cable assembly, cleated to the inside of the bomb pack, terminates in two connectors which connect to the aircraft circuits and four connectors, one above each bomb pylon, to which the bomb pylon cables are connected. The bomb pylons are not interchangeable between positions and are supplied as port inner, port outer, starboard inner and starboard outer. The pylons are similar to each other in construction but vary in length and the method of attachment to suit their position on the aircraft. Each bomb pylon is fitted with an E.M.R.U. No. 18 Mk. 1 and is enclosed within an aerofoil section fairing.

Wing bomb pylons

◀ 4. The wing bomb pylons, of similar construction to those on the bomb pack, are fitted with either an E.M.R.U. No.18 Mk.1, or an E.R.U., and other ancillary electrical equipment as specified by the pylon mod. and type of stores carried. Access to the bomb pylon electrical connections is made through a panel in the top surface of the mainplane. Further details concerning the installation are contained in A.P.101B–1309–1A. ▶

◀ Electrical system (fig.1) ▶

(Mods. 1211, 1254 and 1255)

5. The control switches are grouped together as a panel at the port side of the cabin just below the coaming and comprise the following :—

(*a*) Bomb/R.P. selector switch with spring loaded guard.

(*b*) Stores selector switch marked INBD–OUTBD.

(*c*) Fuzing selector switch marked FUZE –DEFUZE.

(*d*) Pylon stores jettison switch marked CLEAR AIRCRAFT.

The butt test switch and the armament safety plug operate in the normal manner and bombs are released by the operation of the

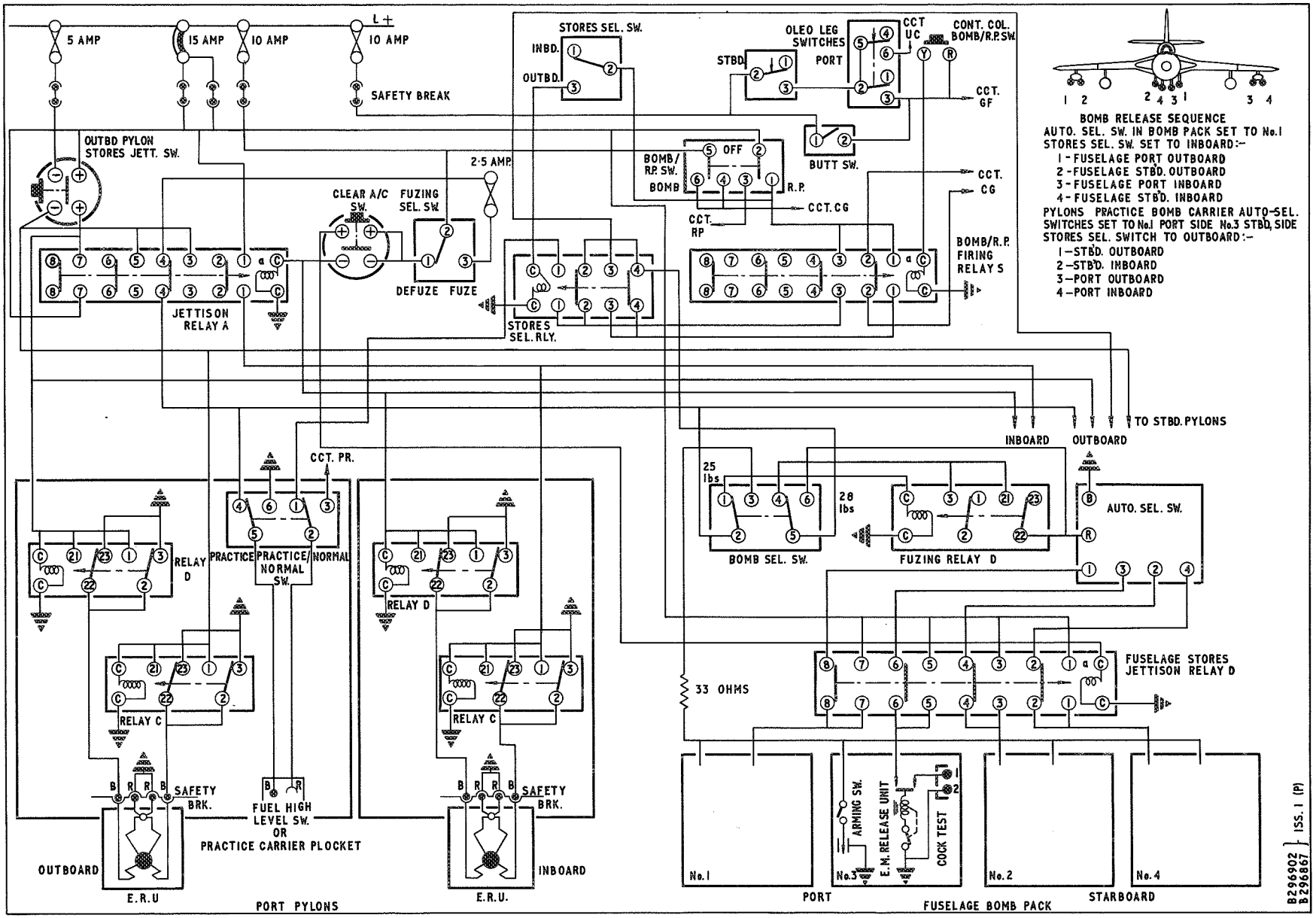


Fig. 2 Practice bombs – Mod.1256 (theoretical)

◀Amended to include Mod.1345▶

release push-switch in the control column handgrip.

6. The fuzing selector, when selected to DEFUZE takes a positive supply to the jettison push-switch and when selected to FUZE, with the bomb pack selector switched to 25 LB., it completes a supply, via contacts 4–4a of the de-energized jettison relay and the bomb pack selector, to energize the fuzing relay. With the bomb pack selector set to 28 lb., a fuzing supply is taken from the fuzing selector via contacts 4–4a of the de-energized jettison relay, the bomb pack selector, a 33 ohm limiting resistance (*in arm. J.B.10*) to the arming separation switch at the rear anti-yaw spigot of each bomb pylon.

7. The bomb/R.P. switch, when selected to BOMB, takes the release positive supply to terminals 1a and 3a of the bomb/R.P. firing relay and to the stores selector switch. This switch, when selected to INBD isolates the supply from the bomb/R.P. switch but when selected to OUTBD, it passes the positive supply to energize the stores selector relay A, whose contacts close to complete a circuit from the output terminals of the auto-selector switch, via contacts on the de-energized wing stores jettison relay, to the E.M.R.U.'s in the wing bomb pylons.

Operation

8. The following switch selections are made for the normal release of 28 lb. practice bombs from the fuselage bomb pack.

(*a*) Bomb/R.P. switch to BOMB.
(*b*) Stores selector to INBD.
(*c*) Fuzing selector to FUZE.
(*d*) Armament safety plug connected.
(*e*) Butt test switch OFF (U/C up and locked).
(*f*) Bomb selector to 28 lb.
(*g*) Auto-selector to No. 1.

9. When the release push-switch on the control column handgrip is pressed, a circuit is made to energize the bomb/R.P. firing relay, contacts 3–3a of which close to pass the release supply from the bomb/R.P. switch to the bomb selector switch. This switch in the 28 LB. position, feeds the release current to the input terminals of the auto-selector switch, across its closed No. 1 contacts, through contacts on the de-energized stores selection and fuselage stores jettison relays to the E.M.R.U. in the port outer fuselage bomb pylon. As the bomb falls away, the arming separation switch in the bomb pylon will close and a fuzing supply (*para. 6*) will be completed into the bomb via the rear anti-yaw spigot and the fuzing snatch lead.

10. When the release push-switch is released, the bomb/R.P. firing relay de-energizes to break the supply to the auto-selector, which rachets to the No. 2 position, closing its No. 2 contacts and opening its No. 1 contacts. Note that the auto-selector in this installation is a Type C No. 2 switch, which has its 'M' contacts short circuited to give continuous operation of the switch. Further operation of the release push-switch will release bombs from the fuselage bomb pack pylons in the following order :—

Starboard outer, port inner and starboard inner.

11. To release bombs from the wing bomb pylons the stores selector is switched to OUTBD. This energizes the stores selector relay, whose contacts change-over to re-route the output release current from the auto-selector to the four wing bomb pylon E.M.R.U.'s, via the de-energized wing stores jettison relay. The circuit operation and sequence of release is then as for fuselage bomb release described in para. 10.

12. Operation of the pylon stores jettison switch (CLEAR AIRCRAFT) releases ALL stores carried, as follows :—

(*a*) Both inboard pylon E.R.U.'s fire and all four fuselage bomb pylon E.M.R.U.'s release.
(*b*) 50–60 milli-seconds later all four wing bomb pylon E.M.R.U.'s operate.

The wing stores jettison relay is slugged to give the 50–60 milli-second delay and must not be energized for longer than 10 seconds. Jettison release occurs regardless of the position of the control switches, except that the fuzing selector must be set to DEFUZE, which ensures that the stores are jettisoned in the safe, unfuzed condition.

13. When operating the installation with 25 lb. practice bombs, the circuit is as in the 28 lb. role, except that the bomb selector, when switched to 25 lb. re-routes the fuzing supply to operate the fuzing relay, whose contacts close to take the release current from the firing relay to the auto-selector. This arrangement ensures that a fuzing selection is made before the 25 lb. bomb can be released

Electrical system (fig. 2)
(Mods. 1211 and 1256)

14. In this installation, besides the fuselage bomb pack, a practice bomb carrier, holding two bombs, is fitted to the E.R.U. of each outboard wing pylon, replacing the four outer wing bomb pylons in the installation described in the paragraphs above. Each carrier has an auto-selector switch wired to operate on positions 3 and 4 only. To obtain the correct release sequence, the port carrier auto-selector is set to No. 1 and the starboard to No. 3. The release sequence is then, starboard outer, starboard inner, port inner and port outer. With the fuzing selector switch set to FUZE and the PRACTICE/

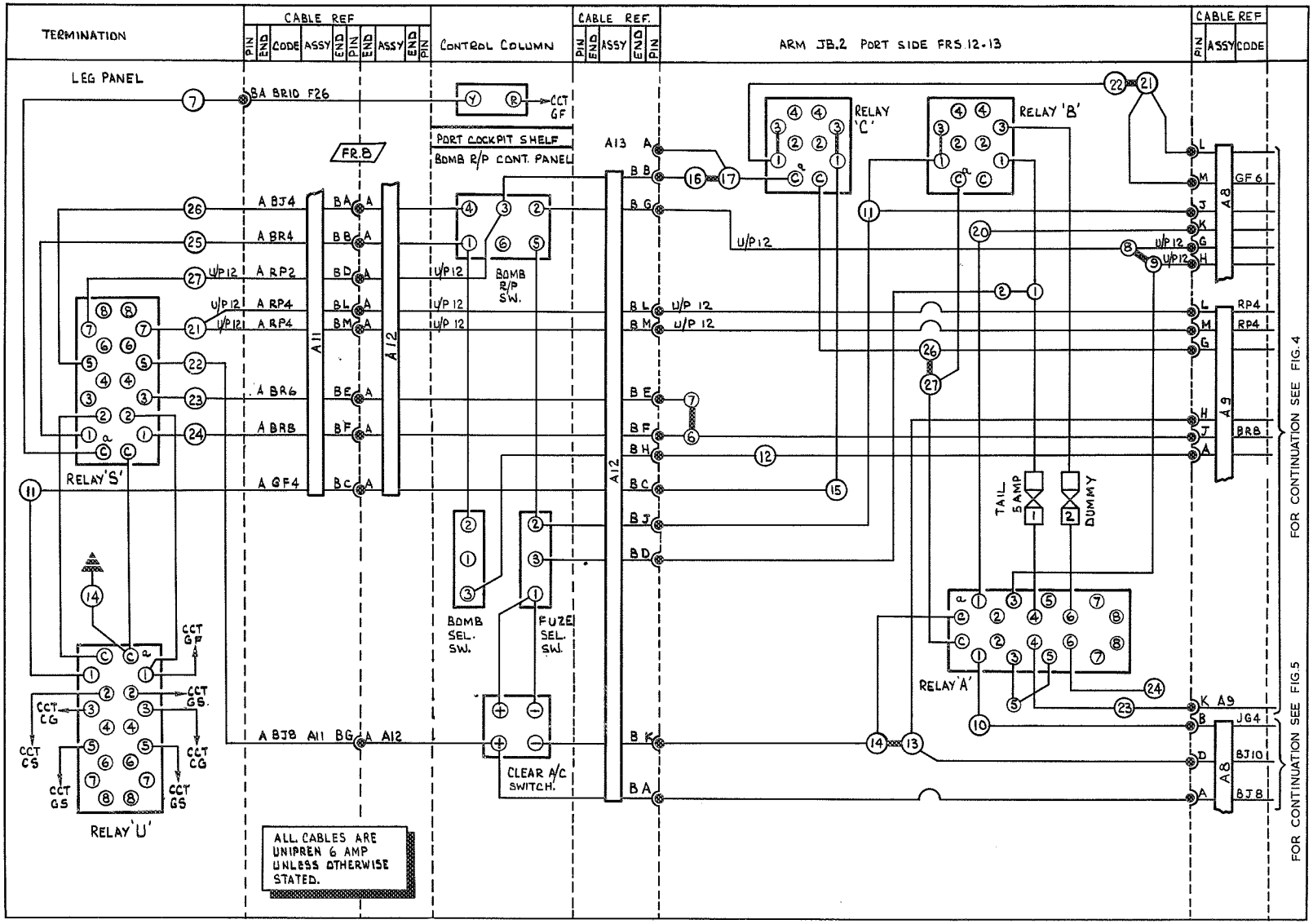
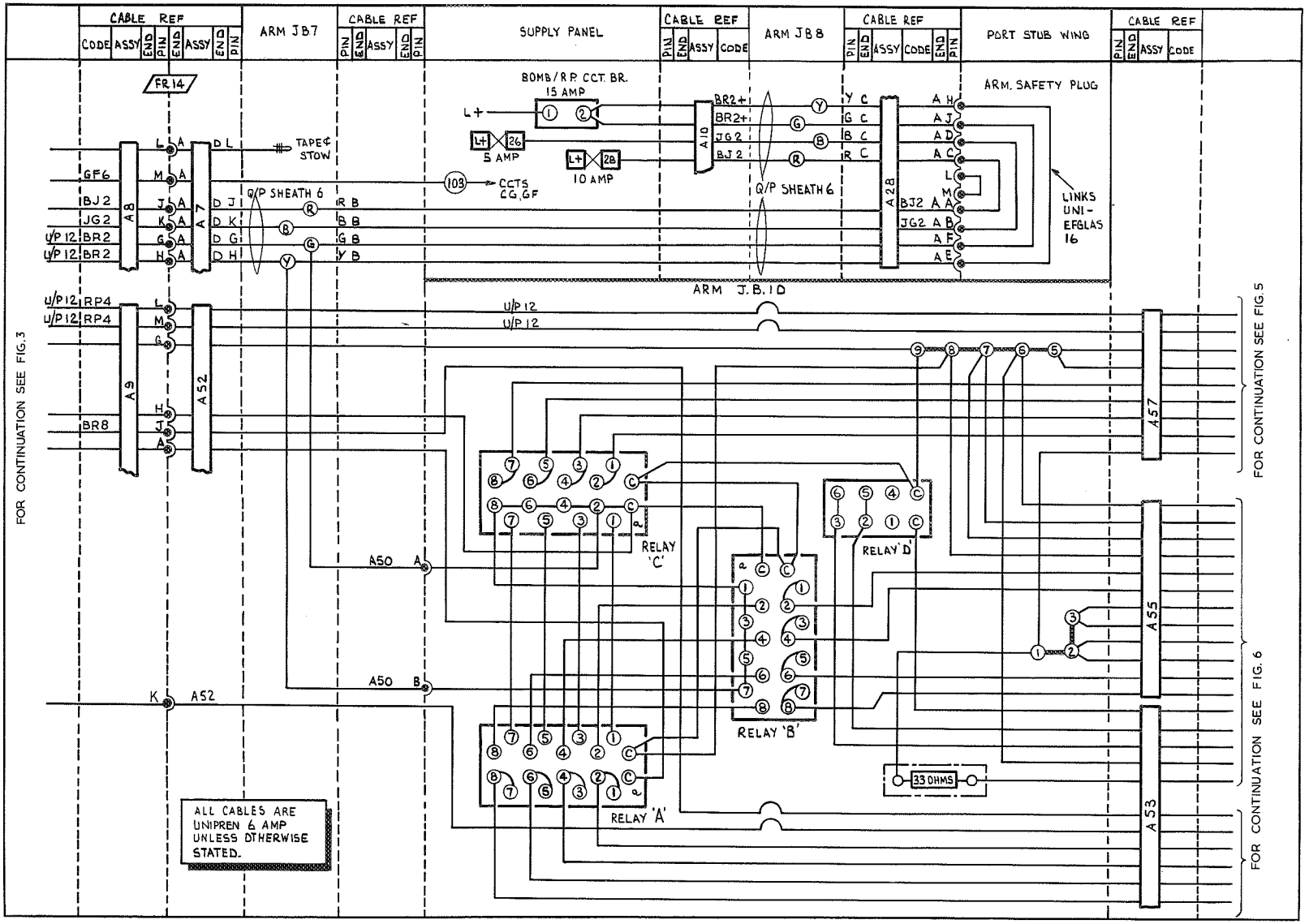


Fig.3 Practice bombs - Mod.1255 cabin (routeing)

T.P. (E) 9361

RESTRICTED



T.P. (E) 9362

Fig.4 Practice bombs - Mod.1255 fuselage - 1 (routeing)

RESTRICTED

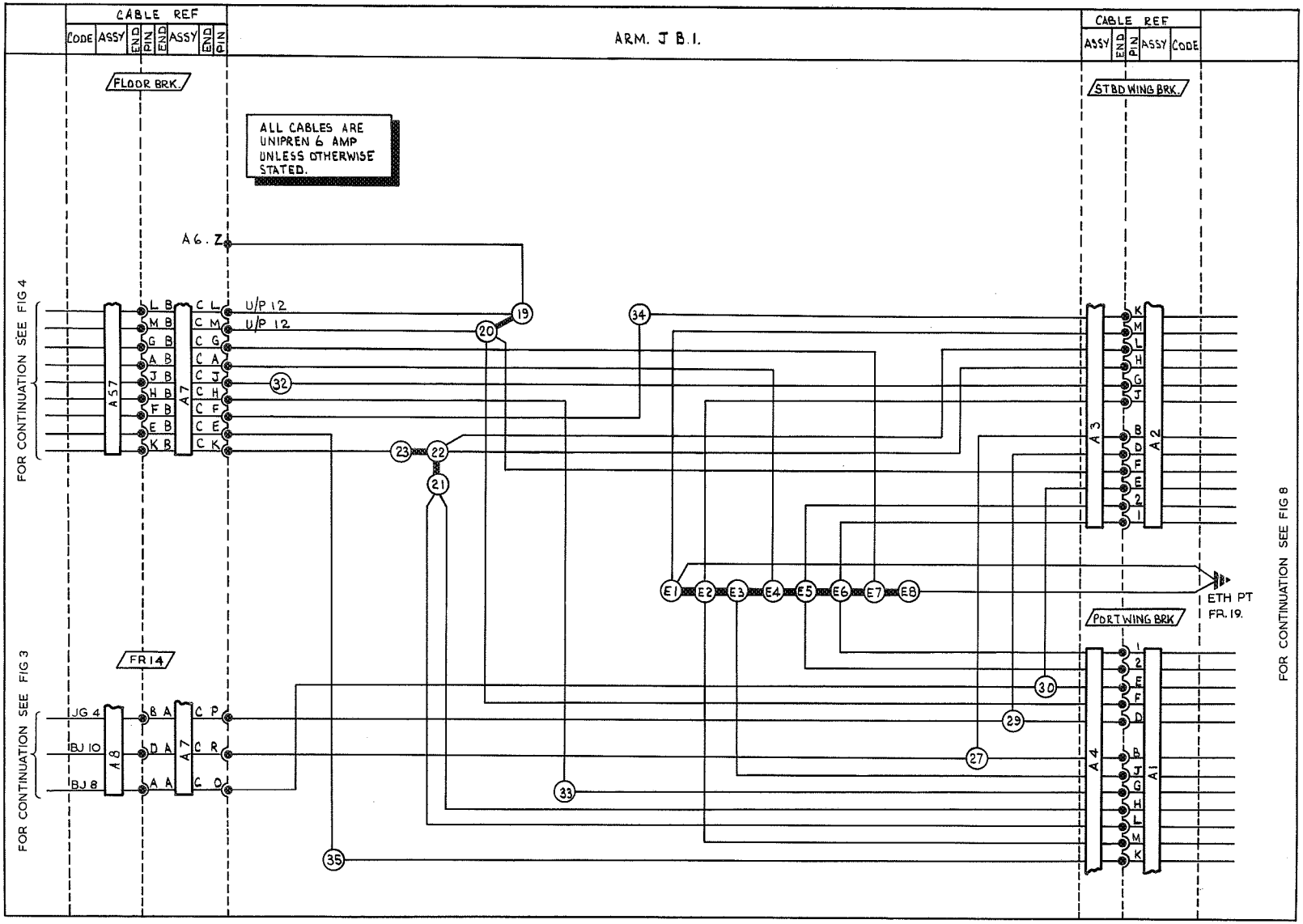
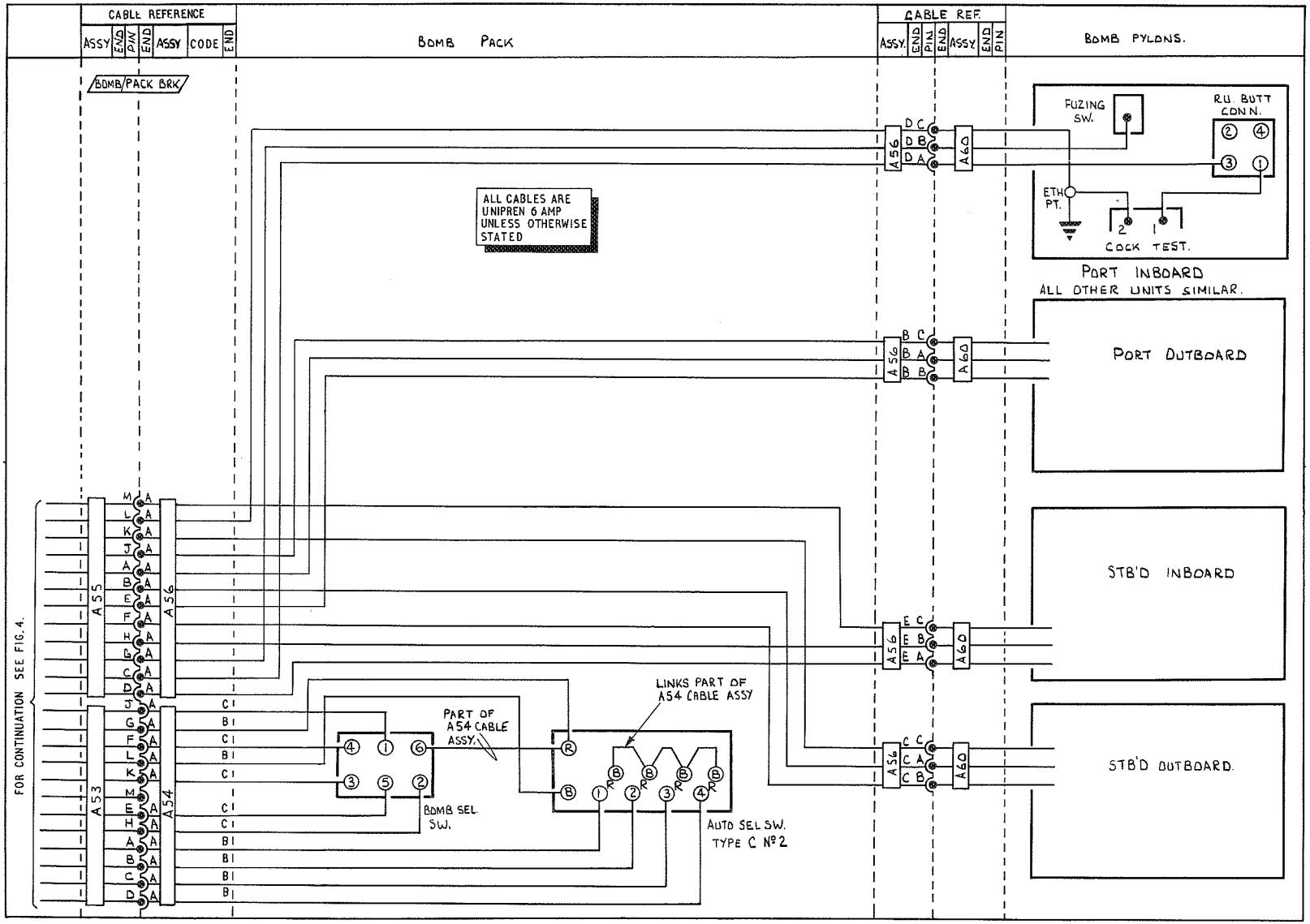


Fig.5 Practice bombs - Mod.1255 fuselage - 2 (routeing)

T.P.(E)9363

RESTRICTED



T.P. (E) 9364

Fig.6 Practice bombs - Mod. 1255 fuselage - bomb pylons (routeing)

RESTRICTED

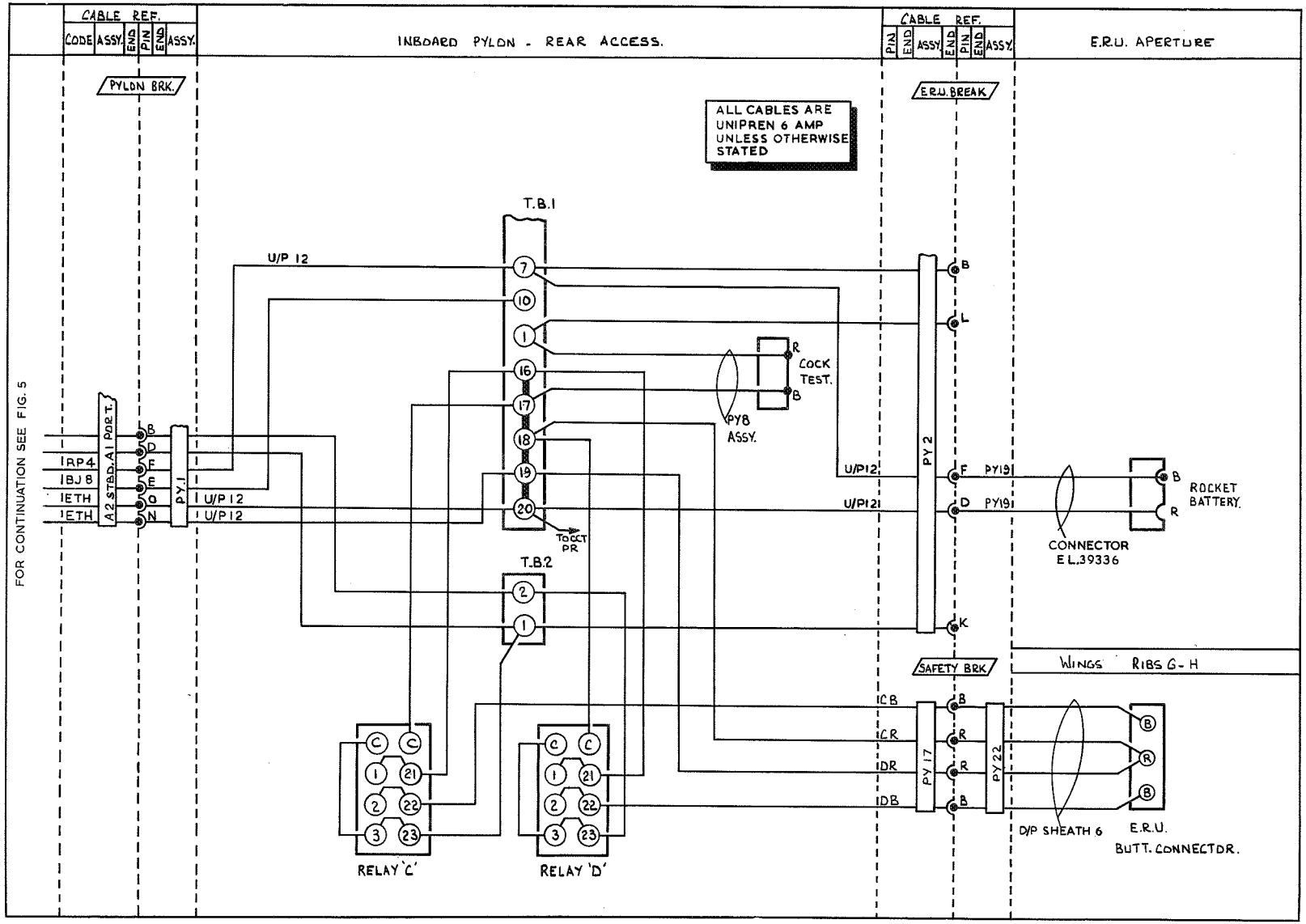
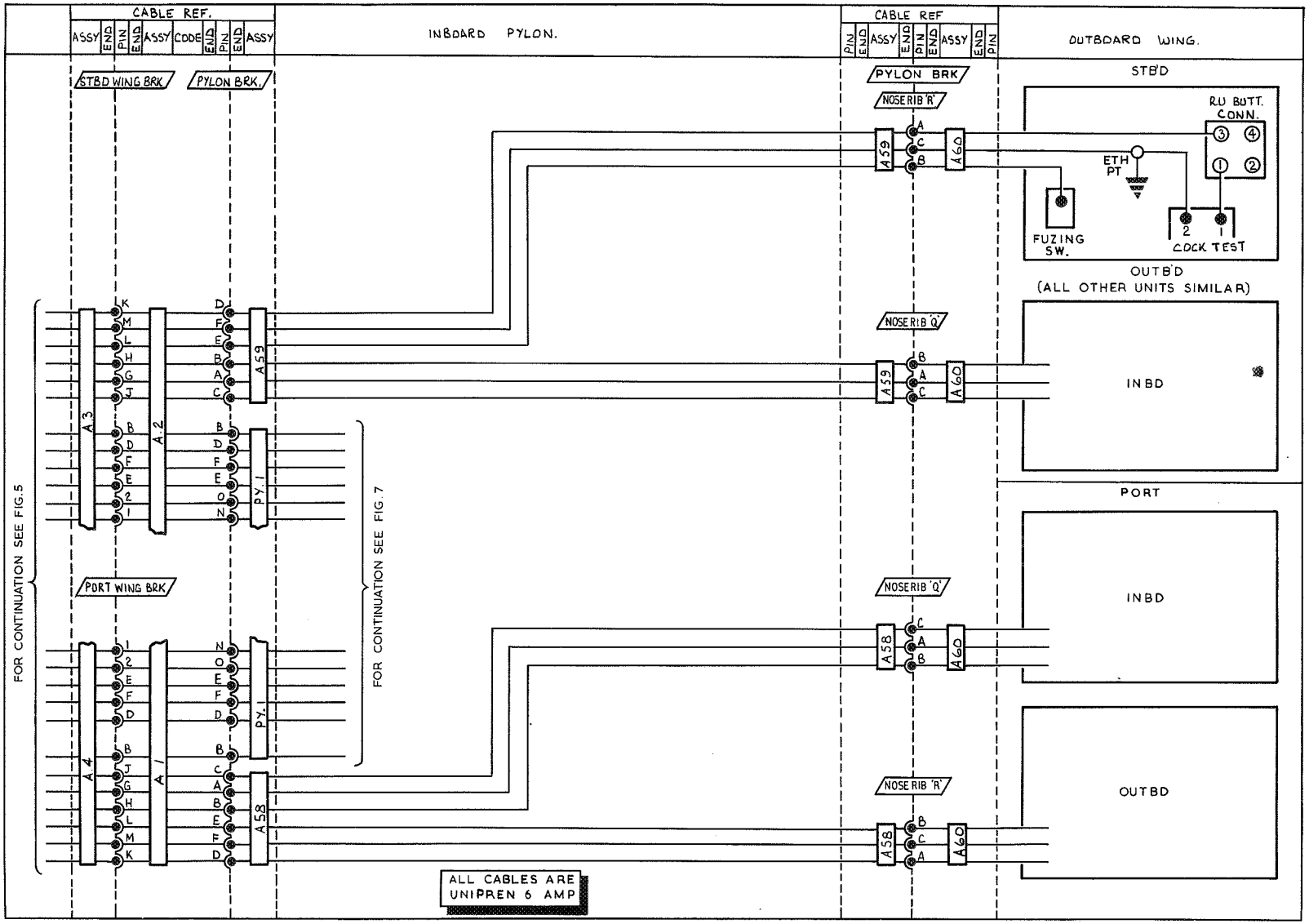


Fig.7 Practice bombs - Mod.1255 Inboard pylons (routeing)

T.P.(E)9365

RESTRICTED



T.P. (E) 9366

Fig.8 Practice bombs - Mod.1255 Wing bomb pylons (routeing)

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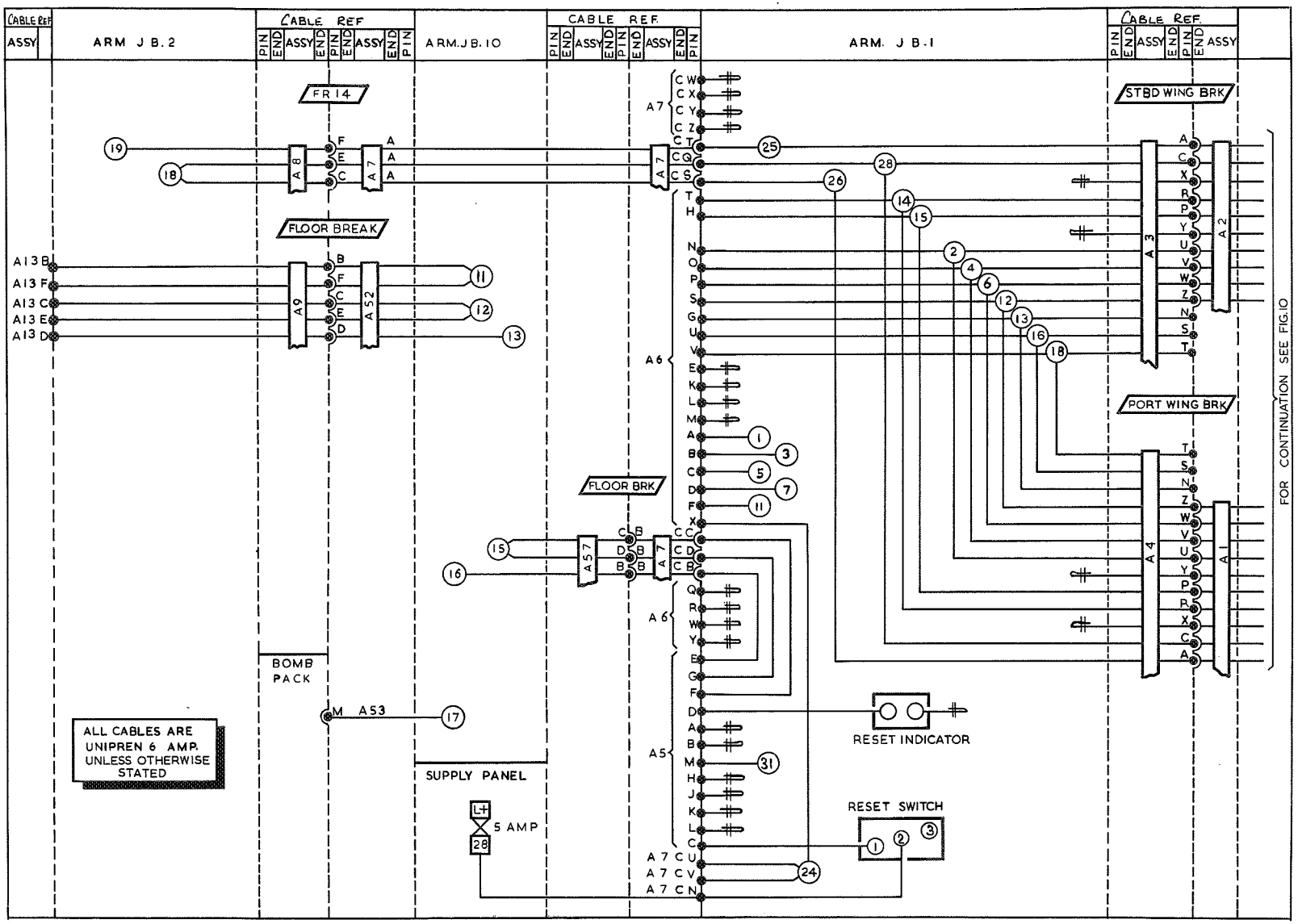

Fig.9 Practice bombs - Mod.1255 Spare wiring fuselage (routeing)

T.P. (E) 9367

RESTRICTED

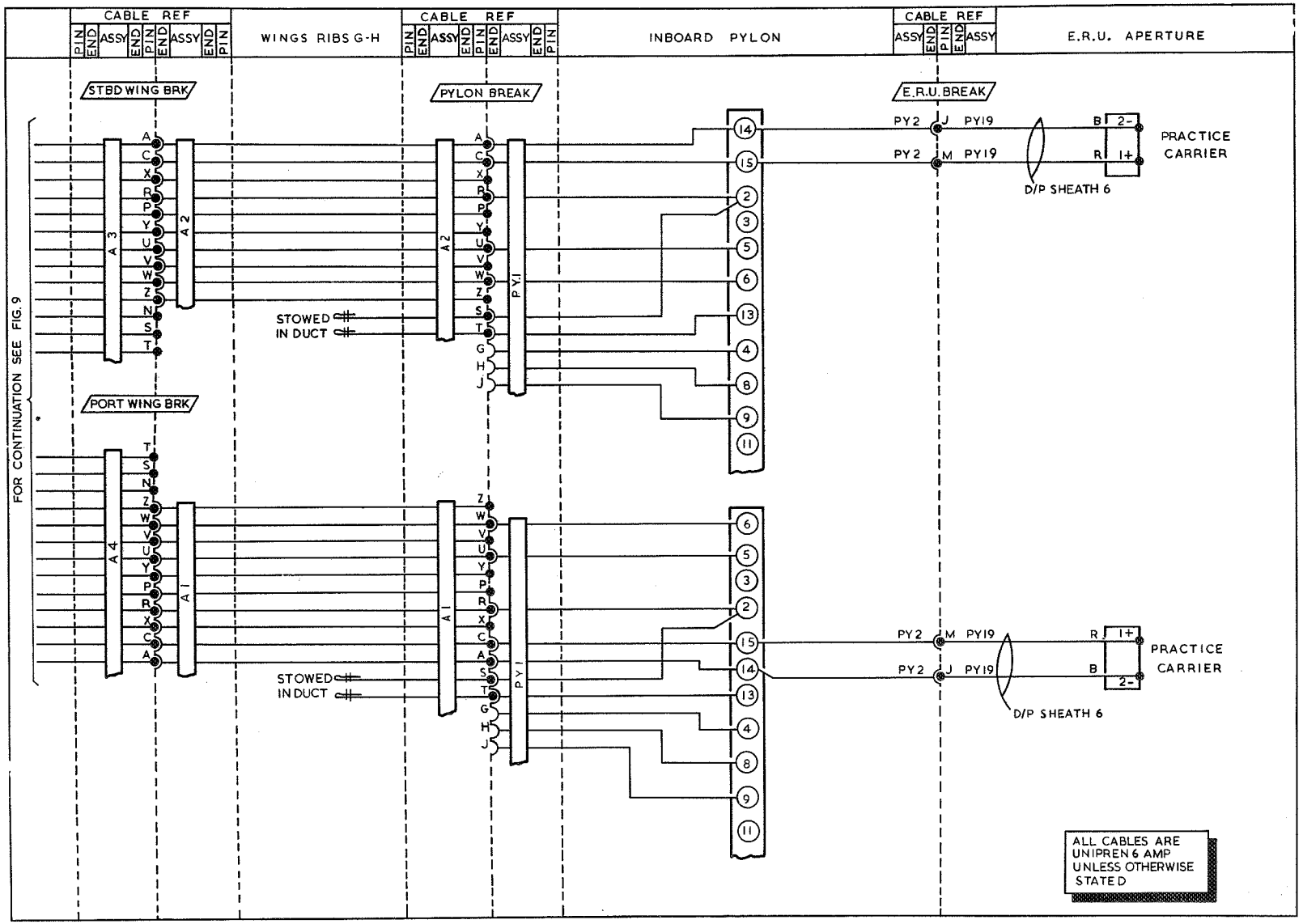

Fig. 10 Practice bombs Mod.1255 spare wiring (routeing)

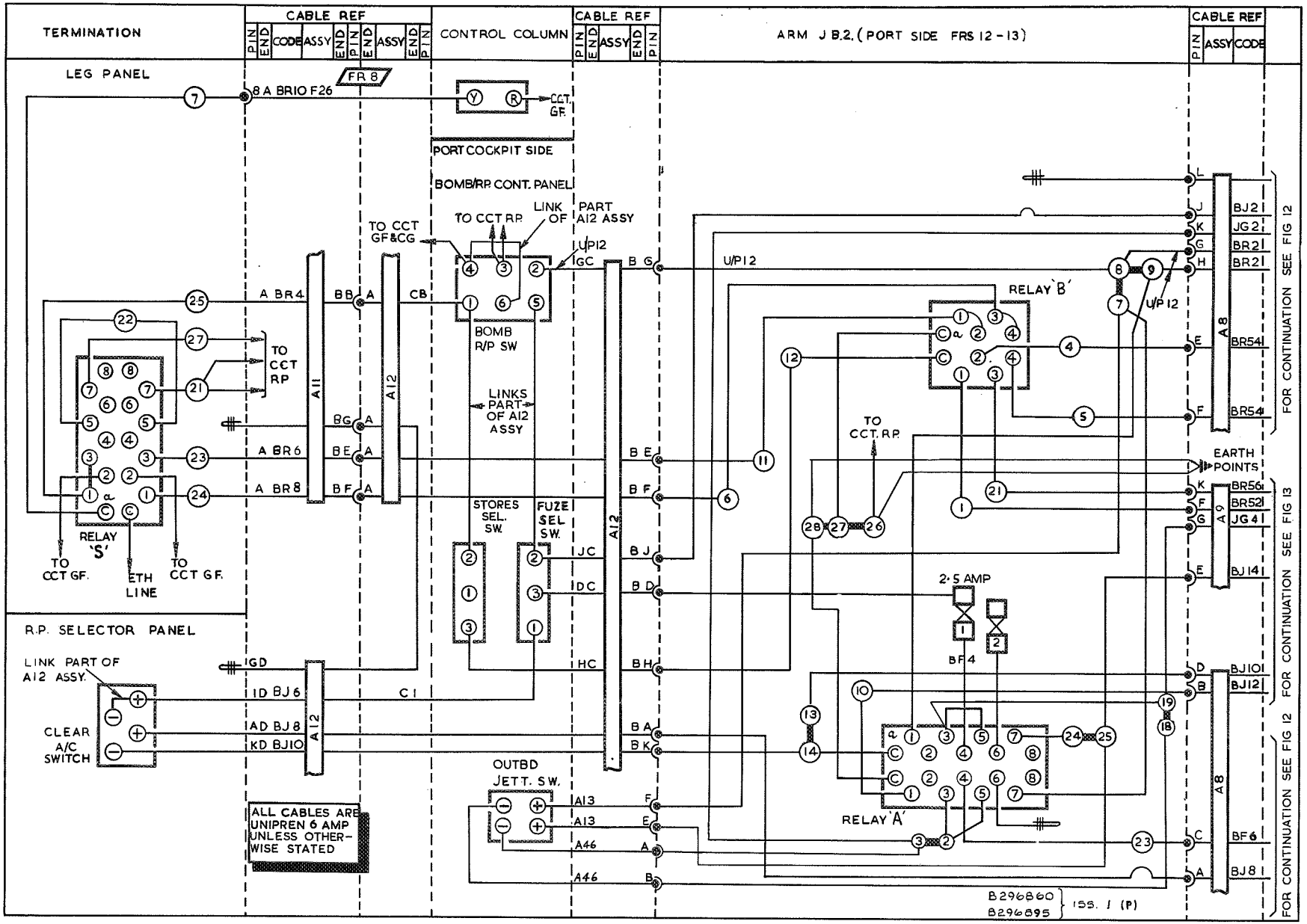

Fig. 11 Practice bombs – Mod. 1256 cabin (routeing)

◀Amended to include Mod. 1345▶

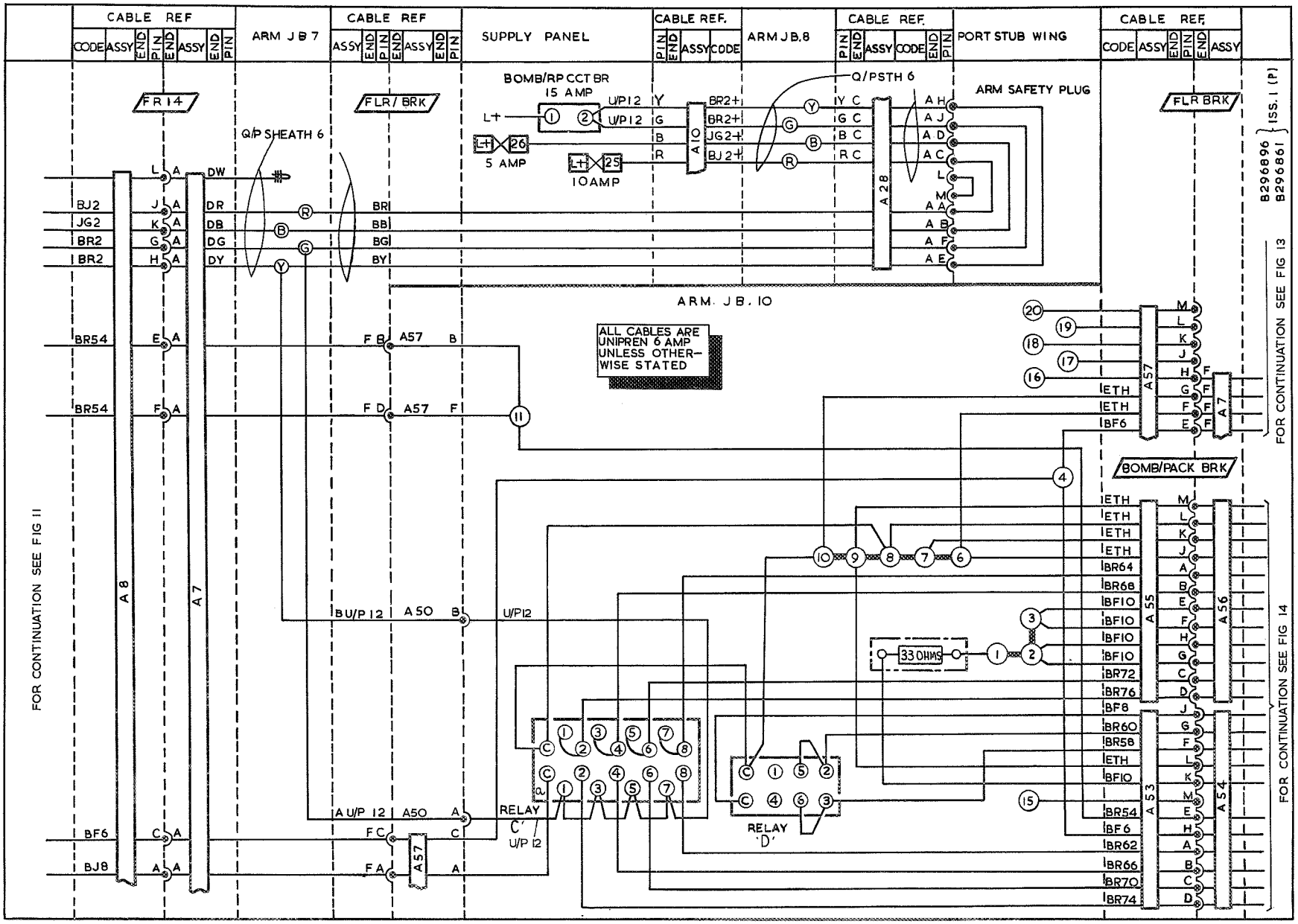

Fig. 12 Practice bombs – Mod.1256 fuselage – 1 (routeing)

◀Amended to include Mod.1345▶

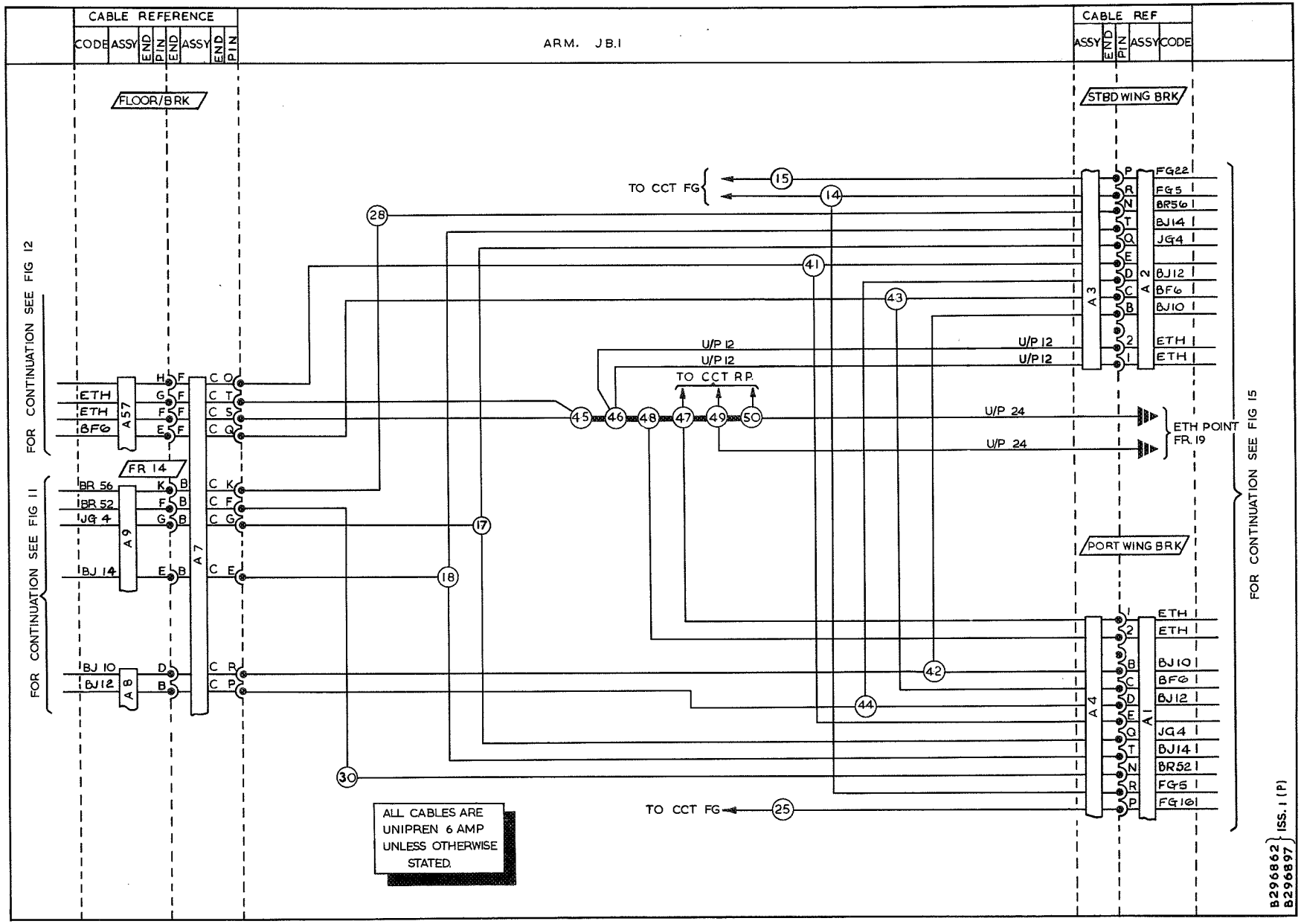

Fig. 13 Practice bombs – Mod.1256 fuselage – 2 (routeing)

◀ Amended to include Mod.1345 ▶

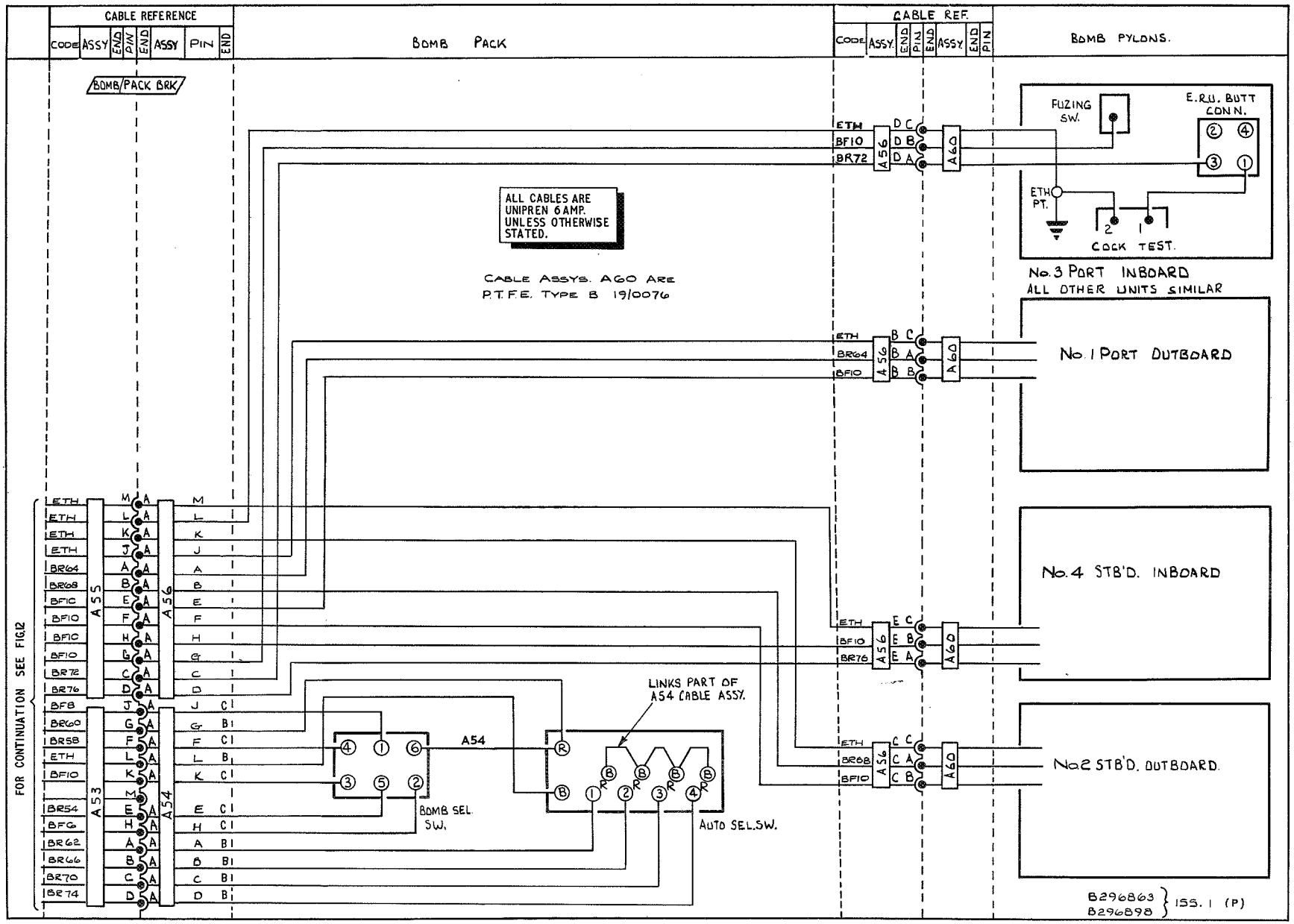

Fig. 14 Practice bombs – Mod.1256 fuselage – bomb pylons (routeing)

◀Amended to include Mod.1345▶

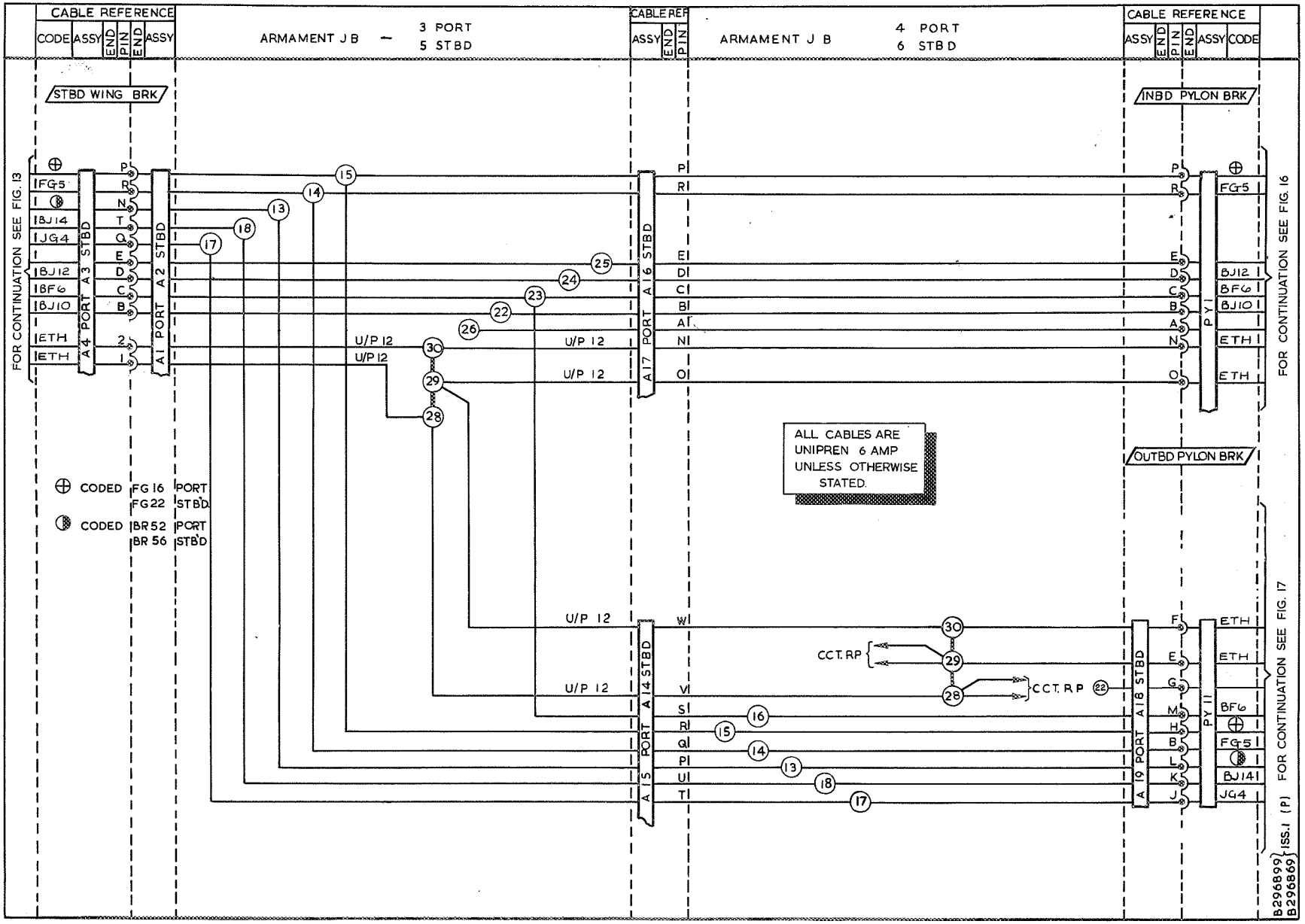

Fig. 15 Practice bombs — Mod. 1256 wings (routeing)

◀ Amended to include Mod. 1345 ▶

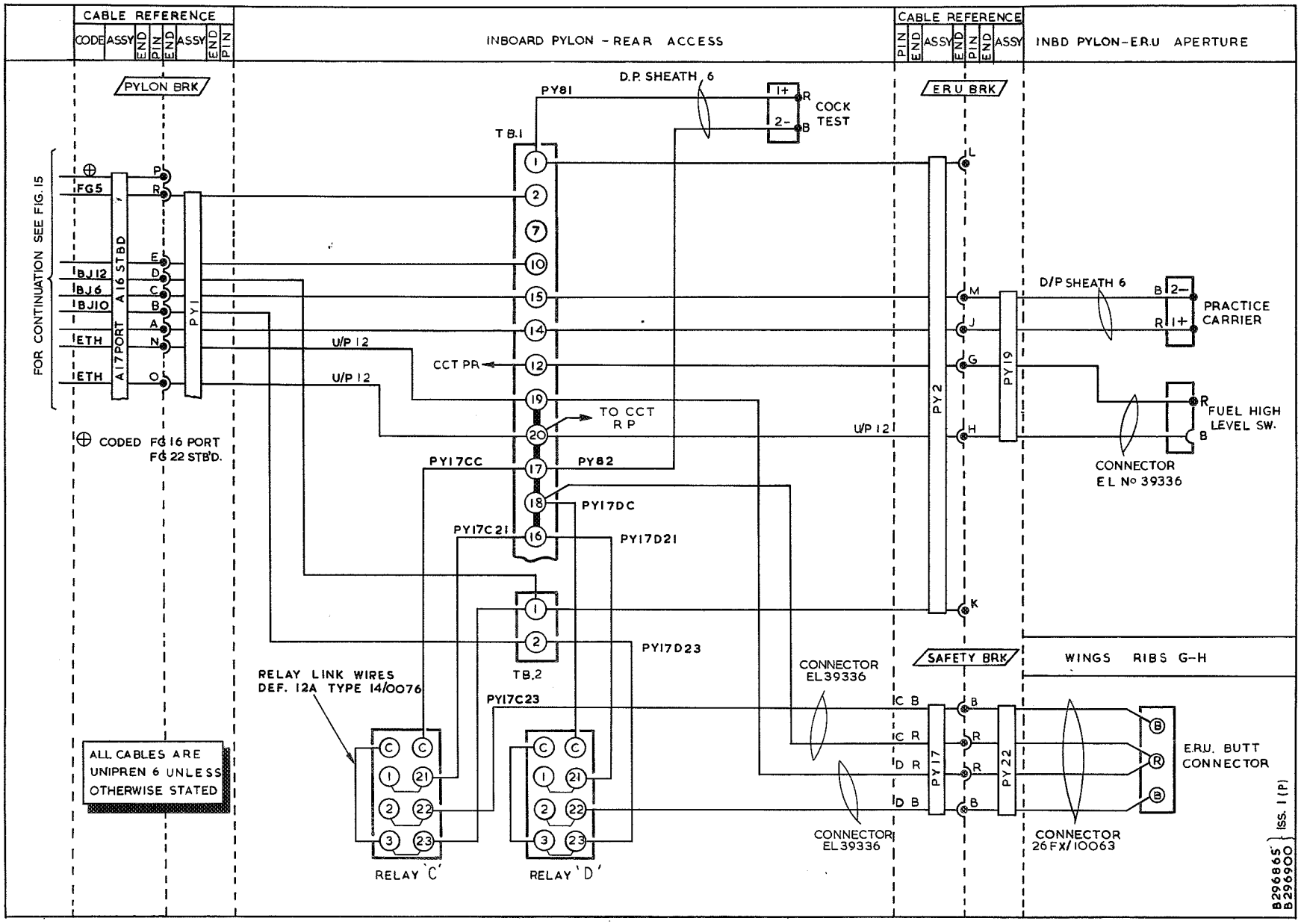

Fig. 16 Practice bombs – Mod.1256 Inboard pylons (routeing)

◀ Amended to include Mod.1345 ▶

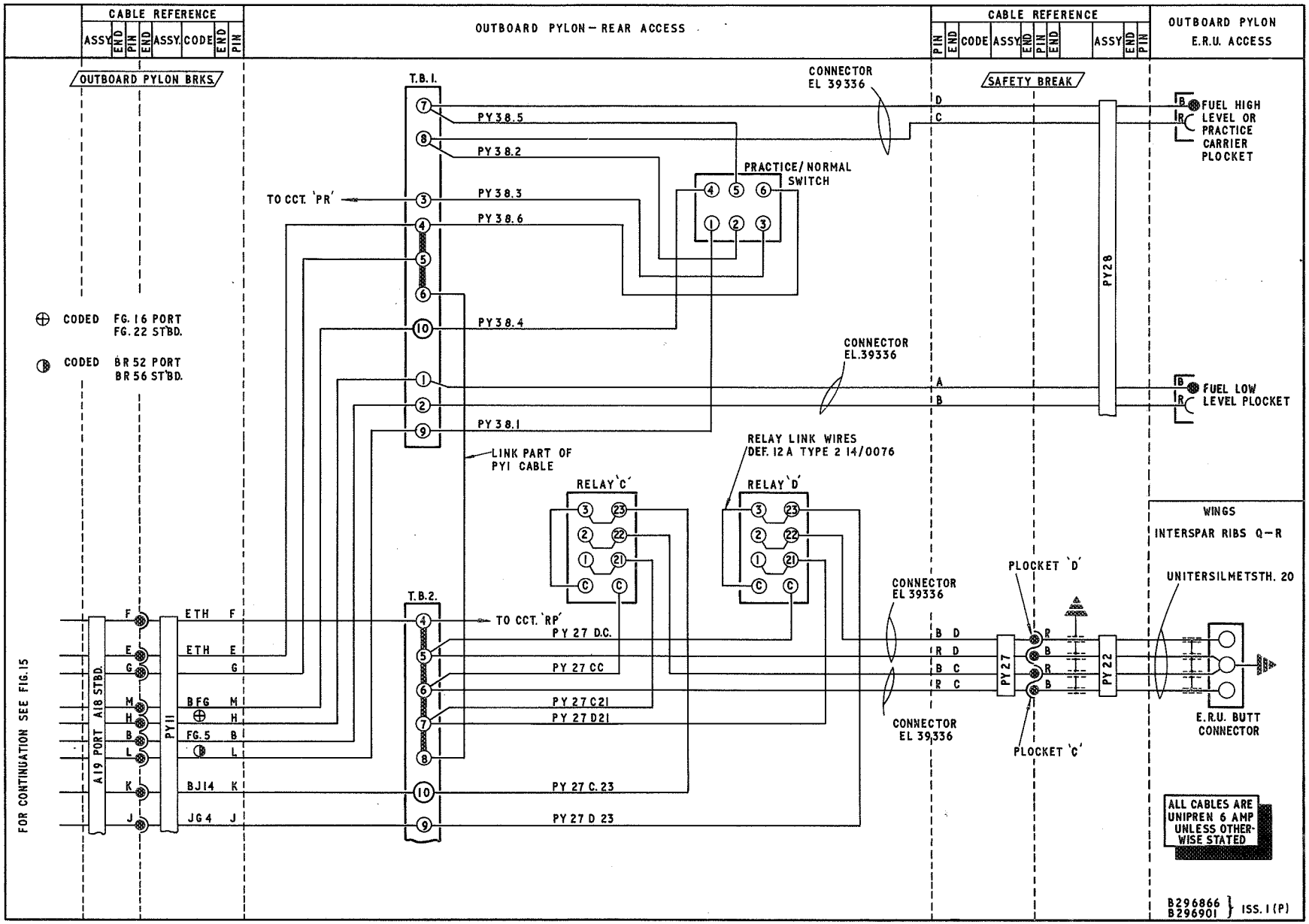

Fig. 17 Practice bombs – Mod.1256 Outboard pylons (routeing)

◀Amended to include Mod.1345▶

◀NORMAL switch to PRACTICE, a standing positive is provided at the fuzing pin of the TYPE R socket on each outer pylon carrier. An outboard stores jettison switch is fitted to provide selective jettison for the outboard pylon stores. ▶

Operation

15. Bombs are released from the fuselage bomb pack by making the switch selections as in para. 8 above. When the release push-switch in the control column handgrip is pressed, a circuit is completed to energize the firing relay, whose contacts 1–1a and 3–3a close to pass the release current through the de-energized stores selection relay to the ◀bomb selection switch. The selector, in▶ the 28 LB. position routes the release supply direct to the auto-selector, and directs the fuzing current from the fuzing selector to the arming switch, via the de-energized jettison relay A and a 33 ohm resistance With the bomb pack selector switched to 25 LB. the fuzing supply is routed to energize the coil of the fuzing relay D, whose contacts close to pass the release supply to the auto-selector, thus ensuring that a fuzing selection is made before the 25 lb. bomb can be released.

16. To release bombs from the practice bomb carriers on the outboard pylons, the stores selector is switched to OUTBD. This ◀energizes the stores selection relay, closing contacts 1–1a and 3–3a, and allowing current to pass from the firing relay to the PRACTICE/NORMAL switch. With this switch set to "PRACTICE", current is passed to the firing pin of the practice carrier plocket. Fuzing current is available at the fuzing pin of this plocket when the fuzing selector is switched to "FUZE". (Para.14). ▶

17. When the CLEAR AIRCRAFT jettison push-switch is operated, with the fuzing selector in the DEFUZE position, circuits are made to jettison :—

(*a*) Drop tanks from the inboard pylon E.R.U.'s.
(*b*) All bombs from the fuselage bomb pack pylons.
(*c*) The practice bomb carriers, complete with stores, from the outboard pylons.

The jettison release supply to the inboard pylons is taken through the clear aircraft push-switch to energize the coil of relay D in the pylon, whose contacts change over to take the current to the butt connector to fire the E.R.U. cartridge. At the same time jettison relay A is energized and its contacts 1–1a route another main supply to energize relay C in the pylon, whose contacts change over to take the duplicate current to the butt connectors to operate the E.R.U.'s. Another circuit from the clear aircraft push-switch energizes the coil of the fuselage stores jettison relay, in arm J.B.10, whose contacts change over to pass current direct from the main supply to operate the E.M.R.U.'s on all the fuselage bomb pack pylons. Also, when the jettison relay A is energized, on pressing the clear aircraft push-switch, its contacts 7–7a close to pass a release current from the main supply, direct to the outboard pylons to operate the ◀E.R.U.'s. ▶

18. Stores, complete with their practice carriers, on the outboard pylons may be jettisoned independently of the other stores by operation of the OUTBOARD PYLON STORES JETTISON switch, which connects the ◀E.R.U.'s directly to the main positive supply. ▶

WARNING

The practice bomb carriers in this installation must have N.A.M.O. General/X 186 embodied, in which the auto-selector is wired to operate only on positions 3 and 4. It is then essential that the auto-selector switches are set Port No. 1 and Starboard No. 3 in order that the correct release sequence is effected. Failure to comply with this warning may result in premature release of bombs.

SERVICING

General

19. For servicing of the armament electrical equipment, reference should be made to Group G.1 and the Air Publications listed in Table 1.

20. Instructions to convert the bomb pylons and practice carriers for the carriage of 25 lb. bombs are contained in A.P.(N)1024, Vol. 1, Sect. 2, Chap. 25, App. 2.

REMOVAL AND ASSEMBLY

General

21. The removal and assembly of the practice bomb carriers is described in the Air Publication listed in Table 1. Removal and assembly of the bomb pack is detailed in Book 1, Sect. 7, Chap. 4, App. 1, of this Air Publication.

Appendix 3 – ARMAMENT CIRCUITS MOD.1291, 1292, 1293, 1294, 1308, 1345

Note . . .

Incorporation of Modification 1391 (ref. Group F.4) removes the camera Type G45B from G.A. aircraft.

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TABLE

LIST OF ILLUSTRATIONS

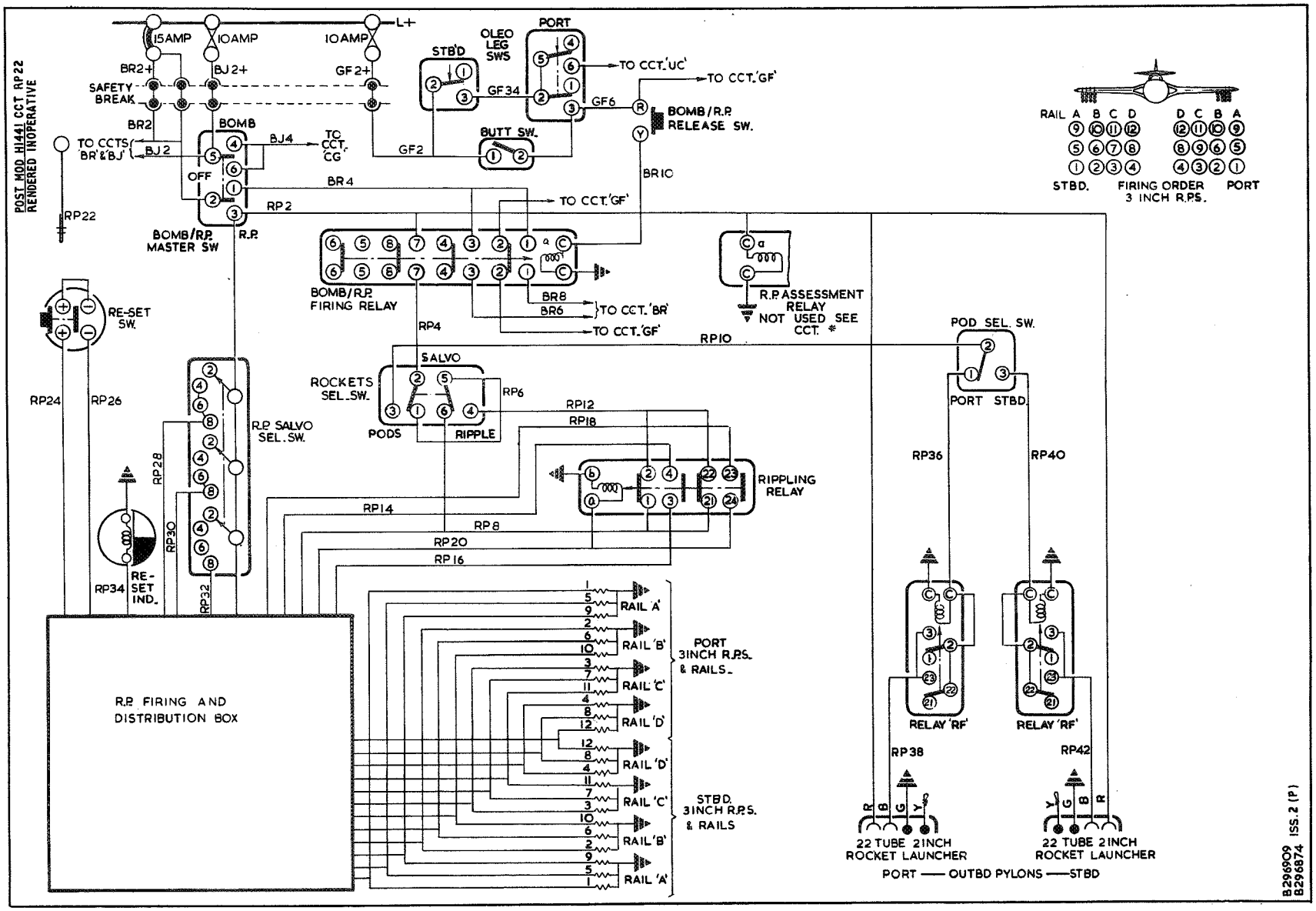

Fig. 1 R.P. (theoretical) — post-Mod 228 and 229

◀ (Mod 1441 added) ▶

Introduction

1. This appendix contains a description of the revised armament circuits introduced by Mods.1291, 1292, and 1293, which provide for the carriage of 22 tube 2 in. rocket launchers from the outboard pylons. Mod.1294, which revises the earthing facilities and introduces a four pole plocket on the inboard pylons, is also described. Mod.1308, which provides for the operation of the G.45B camera when the bombing facility is effected, and Mod.1345 which alters the wiring of the pod selector switch from PORT/ALL, to PORT/STBD.

DESCRIPTION

Power supplies and safeguards

2. The supplies for the circuits which control the armament installations are taken from fuses on the supply panel; while the supply for the operation of the installations is taken from a 15 amp circuit breaker on the supply panel. Both these supplies are routed via an armament safety break located in the port stub wing. The armament safety break is readily accessible and provides a means of rendering the circuits safe during servicing. As a further safeguard, to ensure that pylon stores cannot be released electrically, and that R.P. equipment, bombing facilities and the camera cannot be operated while the aircraft is on the ground, the supply is routed via compression switches in the port and starboard oleo legs of the alighting gear. An armament ground test switch *(Butt Test)* is fitted on the cabin starboard shelf; when this is set to TEST, it has the effect of short circuiting the leg compression switches.

Bomb and R.P. control switches

3. The Bomb/R.P. firing switch, which is incorporated in the flying control column handgrip, is used to initiate either, practice bombing or the firing of rocket projectiles after the appropriate switch selections have been made. If an R.P. facility is required the following switches are made to their respective positions:-

(1) Bomb/R.P. switch
(2) Rocket or Pod selector switch
(3) R.P. salvo selector switch.

Bomb/R.P. selector switch

4. The Bomb/R.P. selector switch, situated on the Bomb/R.P. control panel, is a double pole, three position, centre OFF switch marked BOMB/R.P. One pole is supplied from the circuit breaker and the other from a 10 amp fuse on the supply panel. With the switch selected to BOMB supplies are available at contacts 1a and 3a on the Bomb/R.P. firing relay 'S' in

TABLE 1

Equipment type and Air Publication reference

Equipment Type	Air Publication
Bomb/Rocket projectiles	
Control column handgrip, Type A.C.63482	A.P.4343X, Vol.1, Book 1, Sect.7
Rockets selector switch, double pole change-over, Type 2TLI/10A Pod selector switch, single pole change-over, Type 1TLI/3D	A.P.4343C, Vol.1, Book 1, Sect.1
E.R.U. relays 'C' and 'D', Type S.M.5A-M4 R.P. assessment relay, Type S, No.1 Relay R.F. *(outbd. pylons)* Type SM5A-H79	A.P.4343C, Vol.1, Book 2, Sect.3
E.M. release unit, No.18, Mk.1	A.P.(N)1024, Vol.1, Sect.2, Chap.21
R.P. salvo selector switch, *(Ref.5D 1760)*	A.P.4343X, Vol.1, Book 1, Sect.16
Launcher, No.3 Mk.2	A.P.2802A, 2nd edition, Vol.1, Parts 1 & 3, Sect.2

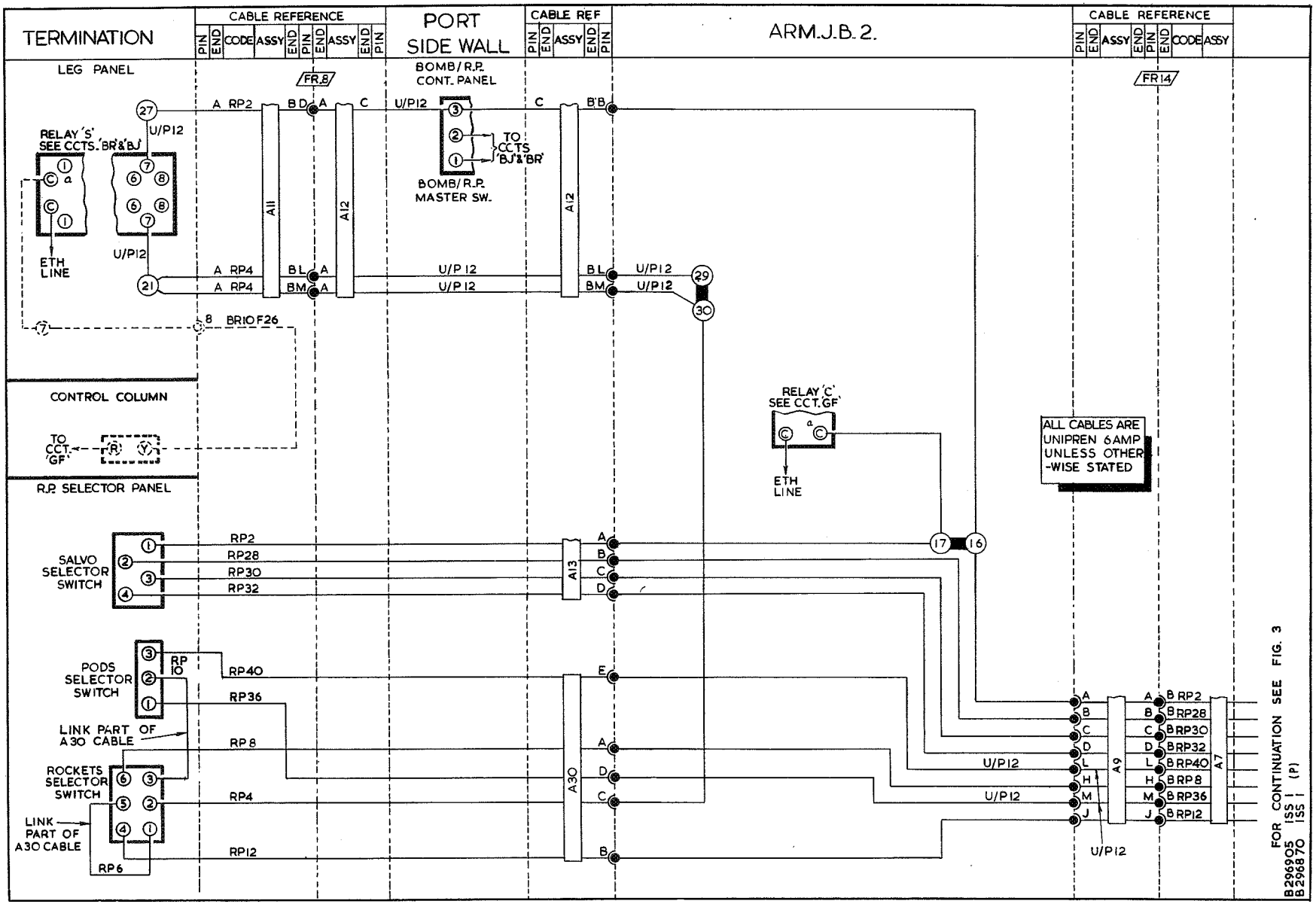

Fig. 2 R.P. (routeing sheet 1) – Post Mod.228 and 229

◀ Amended to include Mod.1345 ▶

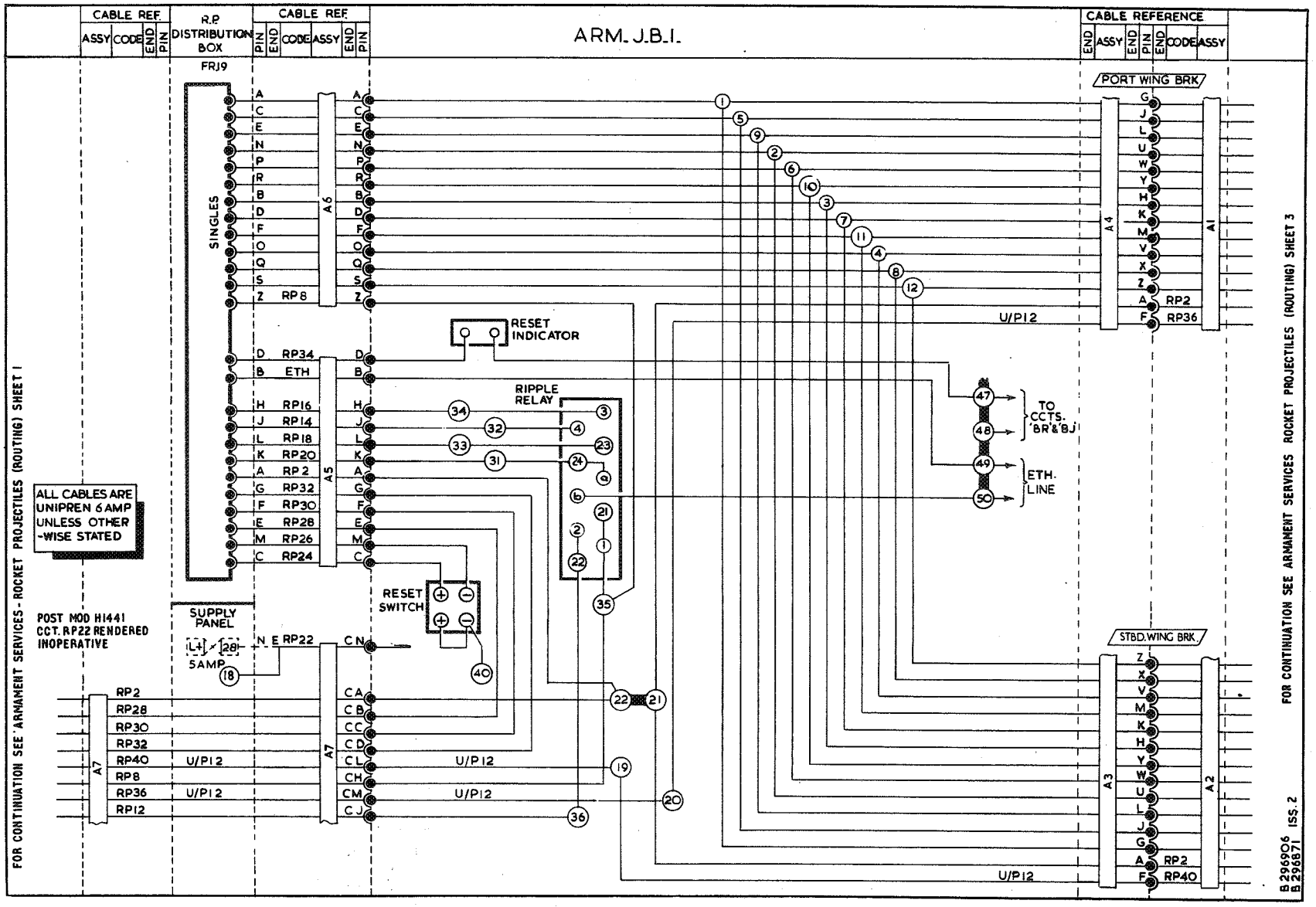

Fig. 3 R.P. (routeing sheet 2) — post-Mod 228 and 229

◀ (Mod 1441 added) ▶

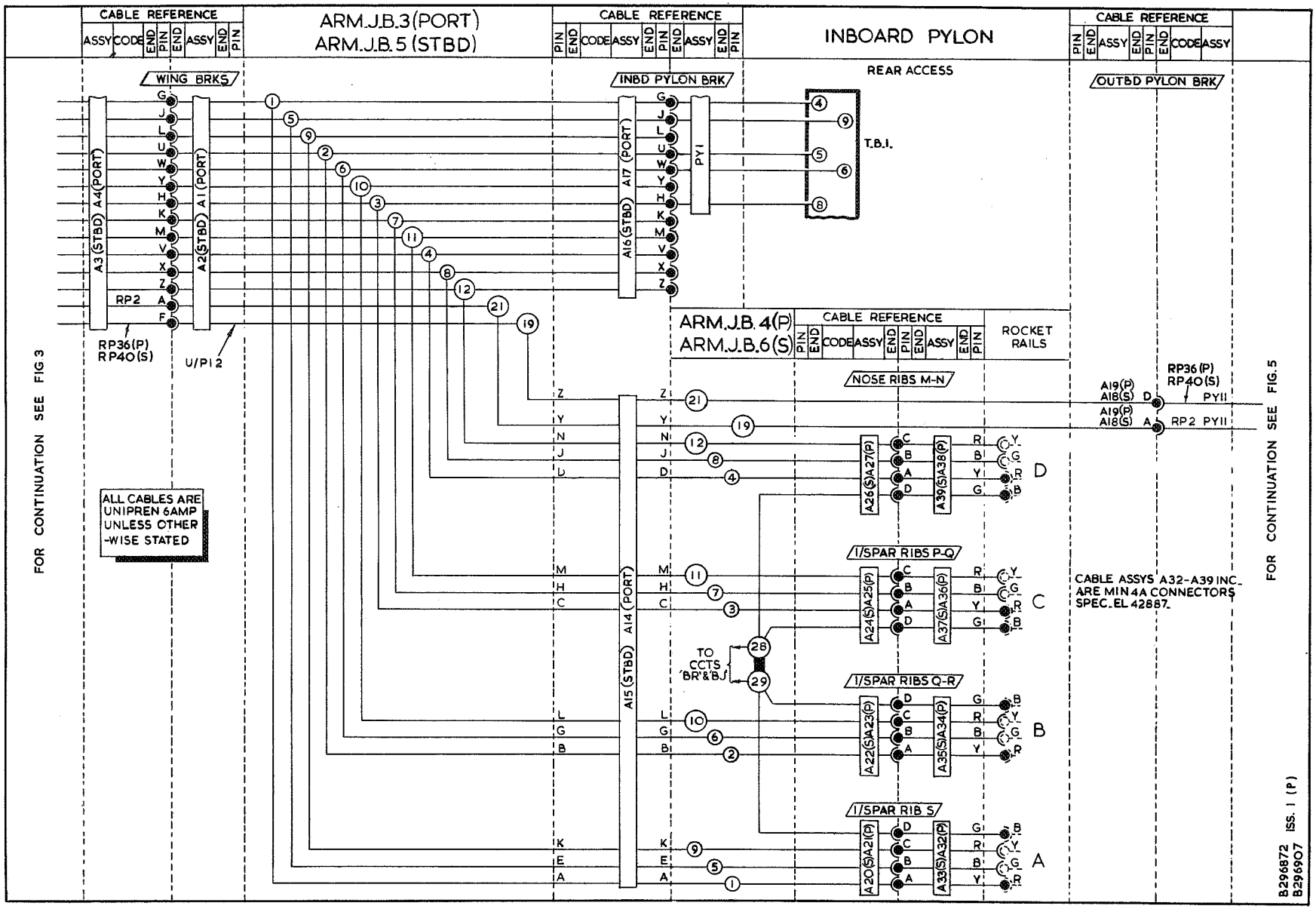

Fig. 4 R.P. (routeing sheet 3) – Post Mod.228 and 229

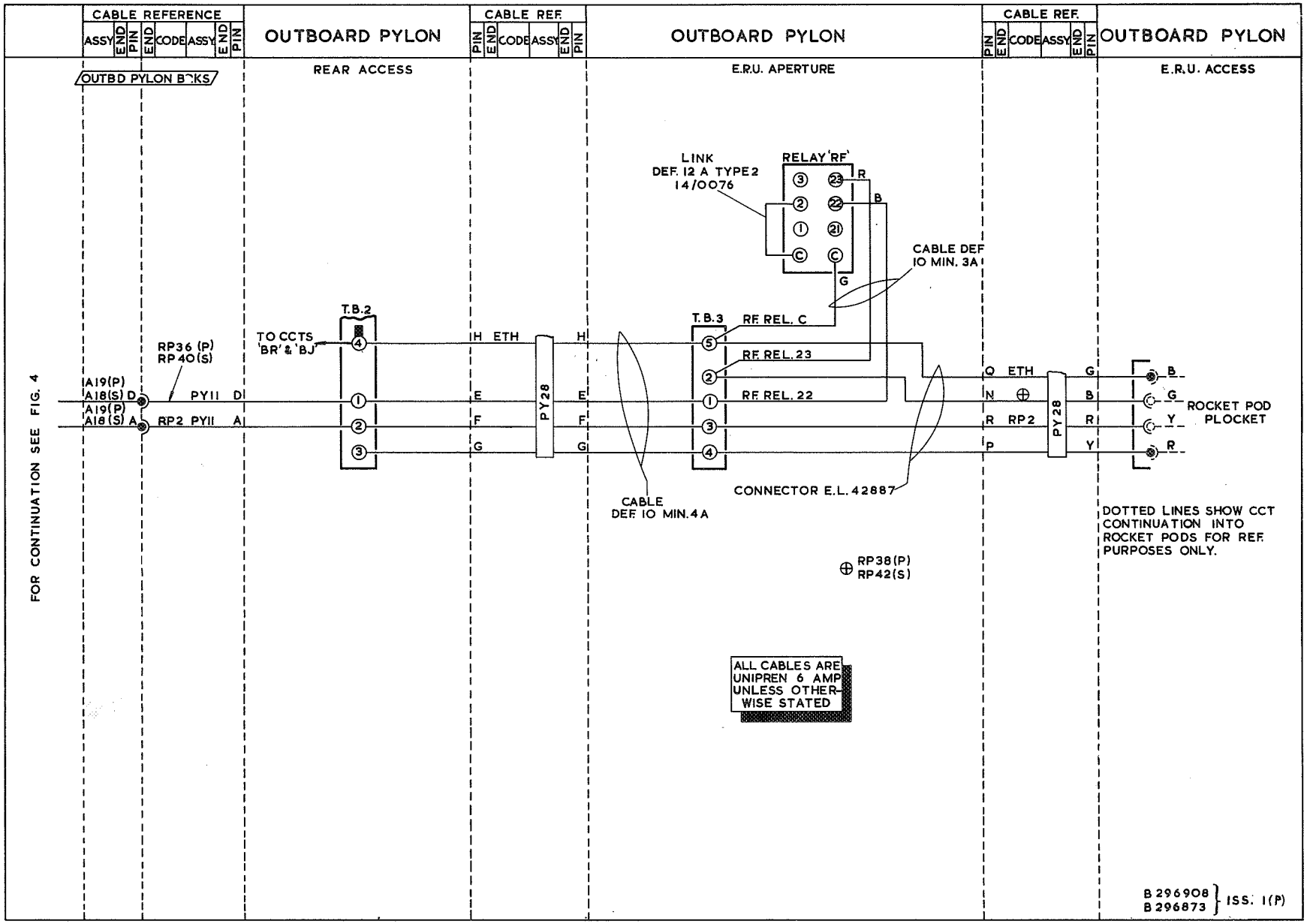

Fig. 5 R.P. (routeing sheet 4) – Post Mod.228 and 229
◀ Amended to include Mod.1345 ▶

readiness to supply the bomb stores, when the relay is energized, by the operation of the Bomb/R.P. firing push switch. With the switch in the R.P. position a supply is passed to energize the R.P. assessment relay "C"; a supply is also passed to contact 7a of the Bomb/R.P. firing relay 'S' and to the control circuits of the R.P. equipment.

Rockets selector switch

5. The rockets selector switch, located on the R.P. selector panel, is a double pole, three position switch marked ROCKETS/RIPPLE, SALVO and PODS. When the switch is selected to RIPPLE, a supply is passed, via the rippling relay and the R.P. firing and distribution box, to the rocket launcher rails *(if fitted)* on the outboard pylons. When selected to SALVO, a supply is passed, via the R.P. firing and distribution box, to the rocket launcher rails *(if fitted)* on the outboard pylons. When the switch is selected to PODS, a supply is passed, via the pod selector switch, to the rocket launcher pods *(if fitted)* on the outboard pylons.

Pod selector switch

6. The pod selector switch, located on the R.P. selector panel is a single pole, two position switch, marked R.P. POD, and having PORT or STBD. selection. With "PORT" selected, a supply is routed via relay R.F. in the port outboard pylon, to the rocket launcher. With STBD. selected, a supply is routed via relay R.F. in the starboard outer pylon, to the rocket launcher.

R.P. salvo selector switch

7. The R.P. salvo selector switch, located on the R.P. selector panel, is a three pole, four position rotary switch marked SELECTOR R.P., 2, 4, 6, 8. The position of this switch determines the number of rockets launched in each salvo. The information being fed via the R.P. firing and distribution box to the port and starboard launcher rails.

Inboard pylons *(pre-mod 228 and 229 aircraft)*

8. The inboard pylons are fitted with No.1, Mk.1 ejector release units *(E.R.U's)* by which fuel drop tanks or 2 in. air-to-air rocket batteries can be carried. The E.R.U.'s are cartridge operated, each cartridge containing two electrically fired initiating caps. The caps are fired by supplies passed by two isolating relays 'C' and 'D', in each pylon, when energized by the operation of the jettison circuit. In each pylon a safety break is provided to enable the E.R.U. to be isolated during loading. Each of the inboard pylons is also fitted with two connectors for rocket battery launchers.

Inboard pylons *(post-mod 228 and 229 aircraft)*

9. The inboard pylons of post-mod 228 and 229 aircraft are identical to those of pre-mod.228 and 229 aircraft. The exception being that the pylons of post-mod aircraft are equipped only for the carriage of drop fuel tanks.

Outboard pylons *(post-mod 228 and 229 aircraft only)*

10. The outboard pylons are fitted with No.1, Mk.1 E.R.U.'s for the carriage of either practice bomb carriers, or 2 in. air-to-air rocket batteries. The stores carried on the outboard pylons may be independently released, by use of the outboard stores jettison switch or simultaneously with the stores on the inboard pylons and fuselage, by operation of the clear aircraft switch.

R.P. equipment *(pre-mod 228 and 229 aircraft)*

11. On pre-mod 228 and 229 aircraft provision has been made for the carriage of 2 in. air-to-air rocket projectiles and the circuit is designed to fire both pods simultaneously. For a further description of the air-to-air installation, reference should be made to the appropriate Air Publication listed in Table 1.

R.P. equipment *(post-mod.228 and 229 aircraft)*

12. On post-mod 228 and 229 aircraft provision has been made for the carriage of either 3 in. air-to-ground rocket projectiles, mounted on launcher rails beneath the outer wings, or 2 in. air-to-air rocket projectiles, contained in pods mounted on the outboard pylons. The 3 in. air-to-ground R.P. circuit is designed to fire up to 24 projectiles in salvo's of 2, 4, 6 or 8 as required, depending upon the selection of the R.P. salvo selector switch.

13. The 2 in. air-to air rocket projectiles are contained in pods, each pod containing 22 rockets; the circuit is designed to fire both pods simultaneously. For a detailed description of the air-to-air installation reference should be made to the appropriate Air Publication listed in Table 1.

G.45B Camera

14. The G.45B camera gun is mounted on a platform inside the fuselage nose structure, at the top, just forward of frame 3. It is focussed through a vision tube, riveted round an orifice in the aircraft skin. A push switch, incorporated in the control column handgrip, is used to bring the camera into operation. The push switch is supplied from a fuse on the supply panel, via the safety plug and leg compression switches, as described in paragraph 2. Power is supplied to the camera from a fuse on the leg panel, in the cabin.

15. A single pole ON/OFF switch, marked CAMERA MASTER, controls the power supply to the camera, and also controls a supply to a contact on the gyro camera and caging relay 'U'; when relay 'U' is energized, this latter supply is passed to the camera release solenoid. The master switch and relay 'U' are both mounted on the leg panel. A choice of two exposure apertures can be made by means of a single pole ON/OFF iris selector switch, which is marked SUNNY/CLOUDY and mounted on the starboard flying instrument panel.

16. Connection to the camera is made by a 7 pole plug and socket connector. The supply to the camera motor is completed by a contact which is closed by operation of a release solenoid; this solenoid is wired to contact 3 on the gyro caging and camera relay 'U'. The speed of the motor is regulated by a governor, and the drive from the motor is transmitted to a film drive claw assembly and the shutter mechanism by means of gears and pinions. Two heaters prevent condensation in the lens and ensure free running of the mechanism at low temperatures; the body heater being controlled by a bi-metal thermostat. A friction plate coupling forms part of the drive, and enables the motor to overrun under its own momentum when the shutter is suddenly stopped.

Operation

R.P. firing *(pre-mod.228 and 229 aircraft)*

17. When the aircraft is airborne the control switches are supplied as described in para.2. When R.P. is selected on the bomb/R.P. selector switch, a supply passes to the coil of the R.P. assessment relay 'C' and contact 7a of the bomb/R.P. firing relay 'S'.

18. When the bomb/R.P. firing push switch is pressed, relay 'S' is energized and its contacts 7-7a pass supplies, via the rocket battery plockets in the pylons, to the rocket launchers. The launchers then operate until the firing push switch is released, or until all rockets are expended.

R.P. firing *(post-mod.228 and 229 aircraft)*

19. *Air-to-air rocket batteries* - When R.P. is selected on the bomb/R.P. selector switch, a supply is passed to contact 7 of the bomb/R.P. firing relay 'S' and to the coil of the assessment relay 'C'.

20. When the bomb/R.P. firing push switch is pressed, relay 'S' is energized and contacts 7-7a pass a supply to the rockets selector switch. With the selector switch in the POD position the supply is passed to the pod selector switch. If PORT is selected on this switch the supply is routed to energize relay R.F. in the port pylon. When relay R.F. is energized the supply passes via a four pole plocket to the rocket launcher. If STBD. is selected, the supply is routed, via relay R.F. and four pole plocket in stbd. pylon, to the starboard rocket launchers.

21. *Air-to-ground rocket installation* - When the bomb/R.P. switch is selected to R.P., a supply is passed via contacts 7-7a of the bomb/R.P. firing relay 'S', when energized, to the rockets selector switch and simultaneously, to the R.P. salvo selector switch. If SALVO is selected on the rockets selector switch, the supply is passed via terminals 2-1 and 5-6 of the switch and the R.P. firing and distribution box to the launcher rails. The rockets may be launched in salvos of 2, 4, 6 or 8 depending upon the selection of the R.P. salvo selector switch.

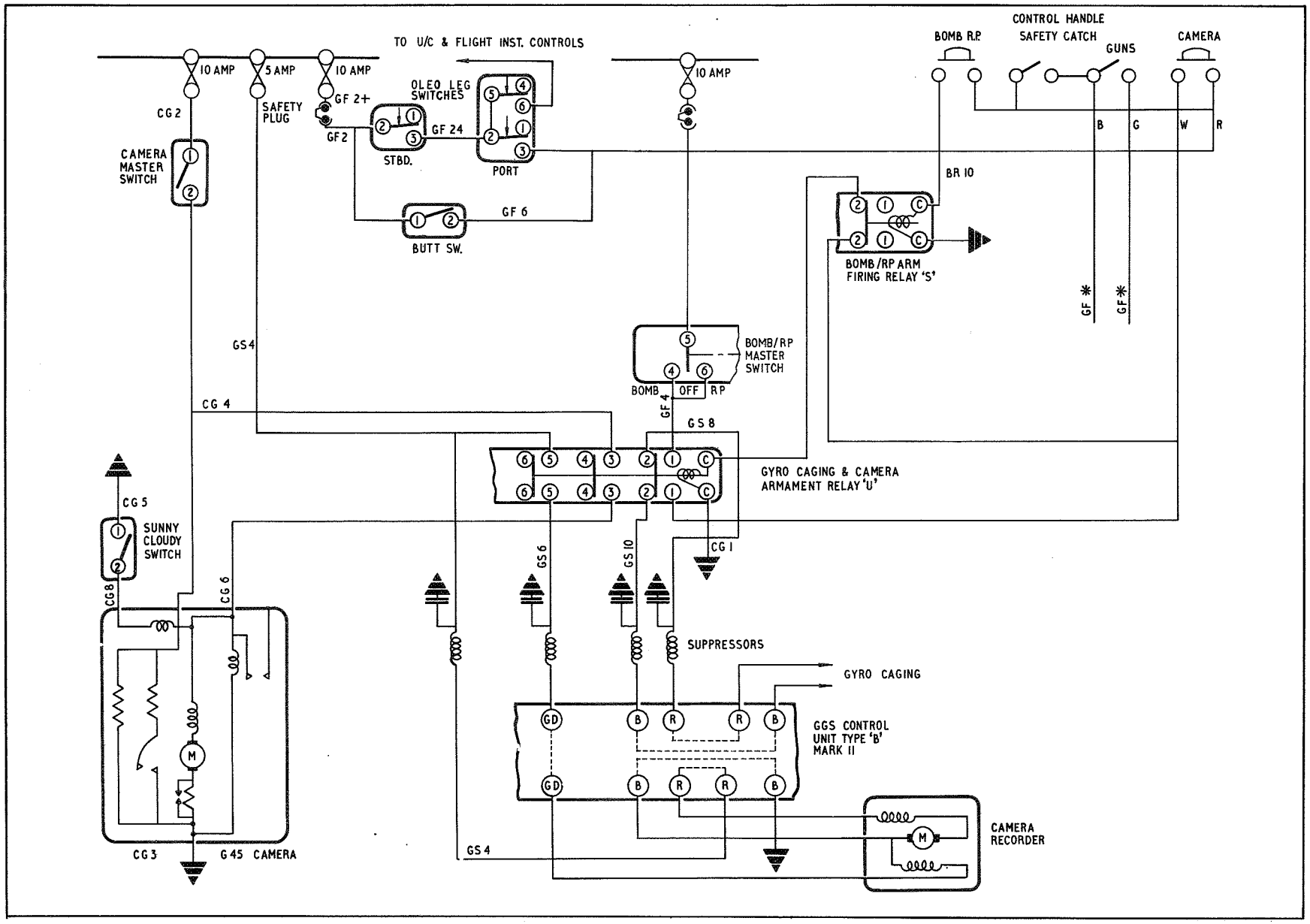

Fig. 6 G.45 camera (theoretical)

22. If RIPPLE is selected on the rockets selector switch, the supply is passed via terminals 2-1 and 5-4 of the switch, to the closed contacts 2-1 and 22-21 of the rippling relay. From the relay the supply is passed via the R.P. firing and distribution box to the launcher rails. The rippling relay is energized by a supply from the bomb/R.P. master switch, via the R.P. salvo selector switch and the R.P. firing and distribution box. Rippling fire is obtained by the rippling relay operating in sequence with the supply from the R.P. firing and distribution box. The number of rockets launched in each ripple depends upon the selection of the R.P. salvo selector switch. For a detailed description of the R.P. firing and distribution box, reference should be made to the appropriate Air Publication listed in Table 1.

G.45B camera

23. When the aircraft is airborne, the camera push switch is supplied as described in paragraph 2. By selecting the camera master switch to ON, the lens and body heaters are supplied, and the supply is also made available at contact 3a of the gyro caging and camera relay 'U'. When the camera push button is pressed, a supply passes via the bridged contacts 3a-3 to the release solenoid in the camera. By operation of the release solenoid the motor contacts close and start the motor, which in turn operates the film drive and shutter mechanism. When the camera push switch is released, the supply to the camera motor and release solenoid will be broken by the de-energization of relay 'U'.

Bomb/R.P. photographic tactics

24. When making a bomb or an R.P. attack the camera is required to photograph the target up to the moment of bomb release or R.P. firing, therefore it is started beforehand and allowed to run until the bomb/R.P. firing push switch is pressed. For this purpose a supply is passed to contact 1a of relay 'U', via either terminal 4 or terminal 6 of the bomb/R.P. master switch. This provides a hold on circuit for relay 'U', after it has been initially energized by operation of the camera push switch.

25. With the camera master switch selected ON, the camera heaters will be supplied as will contact 3a on relay 'U'. When the camera push button is pressed, a supply passes, via contacts 2-2a of the firing relay 'S', and energizes relay 'U'. The supply is then passed, via contacts 3-3a of relay 'U', to the camera release solenoid; simultaneously a hold on supply is passed, via contacts 1a-1 of relay 'U' and 2-2a of relay 'S' to the coil of relay 'U'. The camera push button may now be released, but the camera continues to operate until the bomb/R.P. firing push switch is pressed.

26. When the bomb/R.P. firing push switch is pressed, the firing relay 'S' will be energized and its contacts 2-2a will open, thereby breaking the hold on supply to relay 'U'. The contacts of relay 'U' will also open, thus breaking the supply from the camera release solenoid, with the result that the motor contact will open and the motor will stop.

Camera recorder

27. If the gunsight and camera recorder are in the combat position when the G.45B camera gun is operated, a supply is passed, via contacts 5-5a of the gyro caging and camera relay, to the camera recorder release solenoid. The camera recorder will then operate, as described in Group 4A, Chap.2.

SERVICING

General

28. For general servicing of the aircraft electrical system, reference should be made to Group A.1. All the components should be kept clean and examined periodically for signs of damage and to ensure that they are securely mounted. Apart from the standard routine serviceability checks and bench testing of the components, as described in the Air Publication listed in Table 1, no further servicing should be necessary.

Testing ejector release circuits

29. The procedure for testing the ejector release circuits is given in the following paragraph:-

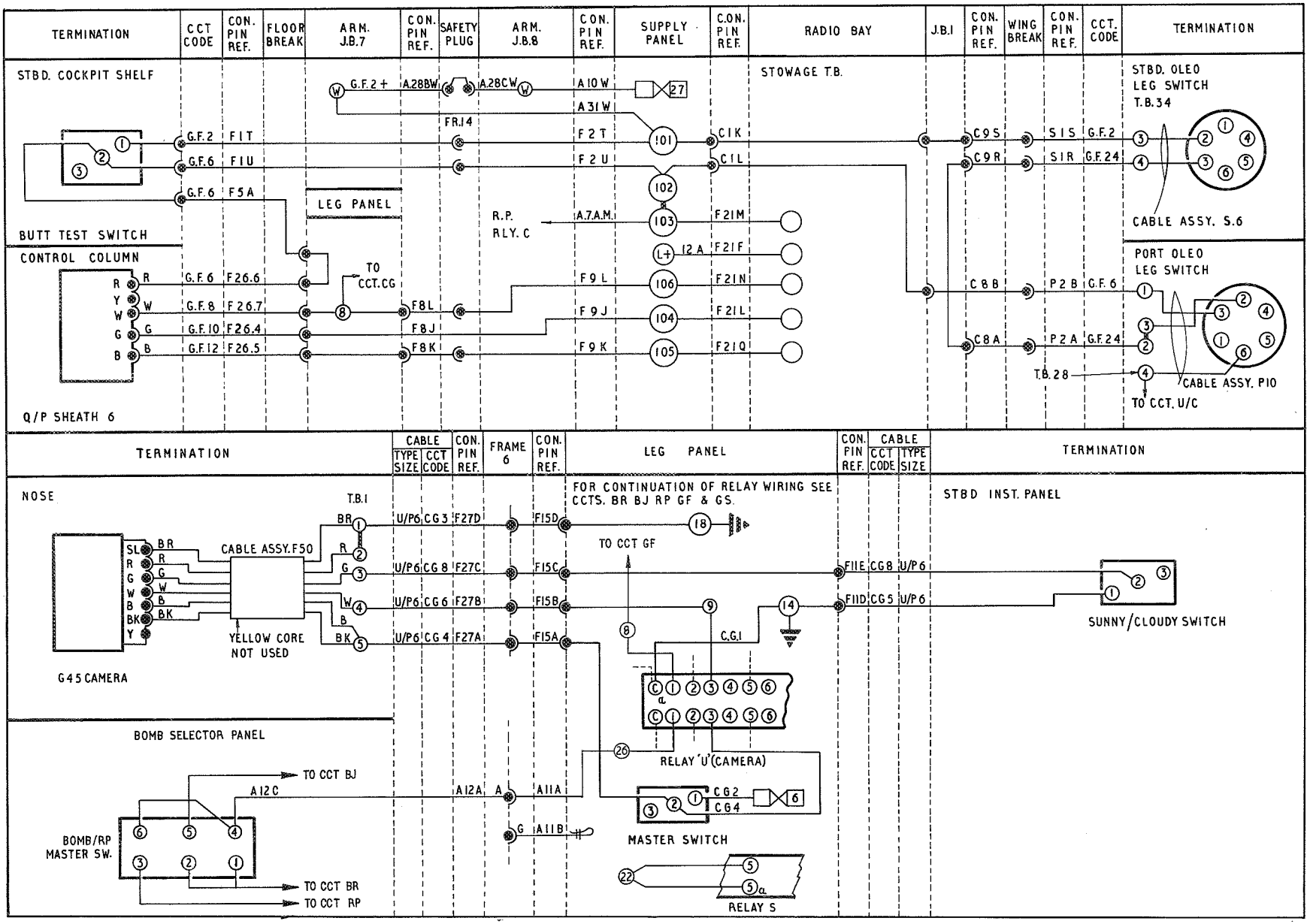

Fig. 7 G.45 camera (routeing)

(1) *Condition*
With the aircraft on the ground and no external stores fitted, check that the following items are *disconnected:*

(a) Armament safety plugs
(b) External supply
(c) Safety plockets in both inboard and outboard pylons
(d) Bomb pack

(2) *Preparation*
(a) In the cockpit select the following switches as shown:-
Battery master to OFF
Fuzing selector to DEFUZE
R.P. salvo selector to 2
Rocket selector to SALVO
Bomb/R.P. master to OFF
Butt test to OFF

(b) Ensure that all armament circuit breakers are 'out'

(c) Ensure that the practice/normal switches in all pylons are set to NORMAL

(d) Connect the pylon safety plockets.

(e) *Pre-arming tests*
Using a suitable Voltage Detector connected at each E.R.U. butt connector, check for no volts or supply volts as follows:-

(a) Connect the armament safety plug and select BOMB on the bomb/R.P. master switch. Connect and switch ON an external supply and check for no volts at the inboard and outboard E.R.U. butt connectors.

(b) Operate the clear aircraft push switch, and check for supply voltage at the inboard and outboard E.R.U. butt connectors.

(c) Operate the outboard pylons stores jettison switch, and check for supply voltage at the outboard and no volts at the inboard E.R.U. butt connectors.

(d) With the switches in the following positions and the bomb/R.P. release switch depressed, check for no volts at the inboard and outboard butt connectors:-

Butt test switch to OFF and bomb/R.P. master switch to BOMB

Butt test switch to TEST, and bomb/R.P. master switch to OFF

Bomb/R.P. Master switch to R.P.

(e) Select the bomb/R.P. master switch to OFF, the butt test switch to TEST, the fuzing selector switch to FUZE and operate the clear aircraft push switch; check for no volts at the inboard and outboard butt connects.

(f) Disconnect the armament safety plug and select BOMB on the bomb/R.P. master switch and TEST on the butt test switch. Check for no volts when the following switches are operated:-

Clear aircraft push switch
Outboard pylon stores jettison switch

(g) On completion, disconnect the following:-

External supply
Safety plockets in the inboard and outboard pylons.

Arming ejector release units

30. To arm the E.R.U.'s proceed as follows:-

(1) Render the aircraft electrically safe *(Sect.5, Chap.1, Group A.1)*

(2) Make the following switch selections:-

Bomb/R.P. master switch to OFF.
Fuzing selector switch to DEFUZE
Butt test switch to OFF.

(3) At the inboard port pylon, using a Bridge Megger in the 'bridge' condition and ensuring that the megger slip speed is maintained, connect the earth terminal to terminal 2 of TB2, and the line terminal to earth. Check that the reading is between 80 and 100 ohms. This checks the correct

positioning of the E.R.U. firing circuit relays 'D'.

(4) To check for correct positioning of the firing circuit relays 'C', connect the earth terminal to terminal 1 of TB2 and the line terminal to earth. The reading obtained should be between 310 and 390 ohms.

(5) To check for correct positioning of the firing circuit relays 'C' in the outboard pylons, using a Bridge Megger, connect the earth terminal to terminal 9 of TB2, and the line terminal to earth. Check that the reading is between 310 and 390 ohms.

(6) To check for correct positioning of relays 'D', connect the earth terminal of the Bridge Megger to terminal 10 of TB2 and the line terminal to earth. Check that the reading is between 310 and 390 ohms.

(7) Fit a cartridge in each E.R.U. and assemble the connectors.

(8) Check the resistance of the cartridge detonator circuit by using a suitable safety ohmeter *(0.500 ohms, max. output 5 mA at 4V)*, connected between the RED and BLUE pins of plockets C and D *(fixed ends)*. The readings obtained should be between 10 and 150 ohms.

(9) Reconnect the plockets in each pylon just prior to flight.

Note . . .

All arming of ejector release units must be carried out in accordance with local orders concerning the safety of aircraft and personnel. The armament safety plug must be reconnected just prior to flight.

REMOVAL AND ASSEMBLY

General

31. Once access has been obtained, the removal and assembly of the armament services components should present no difficulties. The removal of the panels and the ARM junction boxes, which carry the majority of the components, is fully described in Group A.2. The means of access to and the location of the components, is indicated in Group A.3. The removal of the pylons is described in Sect.3, Chap.2