

## Group G.1.

ARMAMENT SUPPLIES AND CONTROL  
(All relevant Mods. included up to Mod.1351)  
(CODE GF\*, BS\*, BR, BF, BJ, JG AND RP)

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1223 and 1294	1

# RESTRICTED

## Introduction

1. The information in this Group relates to aircraft using Mod.825 (*interim*) inboard pylons, and also to those using Mod.667 pylons. The interim pylons, which are fitted with electro-magnetic release units (E.M.R.U's) provide for the carriage, either of practice bombs or fuel drop tanks. The later (Mod.667) pylons, which are fitted with ejector release units (E.R.U's.),

provide, in addition, the facility for the carriage of 2 in. air-to-air rocket batteries. On both types of aircraft, E.M.R.U's. are fitted to the outboard pylons for the carriage of fuel drop tanks only. Both types of aircraft have provision for the carriage of 3 in. air-to-ground rocket projectiles on launcher rails when the outboard pylons are not fitted. Neither aircraft has guns, but the gun circuit

wiring is retained, as illustrated in figs.2 and 3. The items of equipment employed in the various circuits are listed in Table 1, together with the Air Publications in which they are fully described, and which contain detailed information on testing and servicing the equipment.

TABLE 1

Equipment type and Air Publication reference

Equipment Type	Air Publication
Control column handgrips, Dunlop Type A.C.63306, A.C.63484 (Mod.1296) or A.C.64616 (Mod.1351) ... ..	A.P.113D-1609-1
Compression and armament safety switches, Dowty Type C.1831Y, Mk.2 ... ..	A.P.4343C, Vol.1, Book 1, Sect.1
Practice bomb release and jettison Bomb/R.P. circuit breaker, Type A.1 ... ..	A.P.4343C, Vol.1, Book 2, Sect.2
Control relays, Type S, No.3 ... ..	A.P.113D-1309-1
Bomb/R.P. switch, Rotax Type D.5501 Pylon stores jettison push-switches, Type B Fuzing selector switch, Single-pole change-over, without centre off No.3 } ... ..	A.P.4343C, Vol.1, Book 1, Sect.1
Practice bomb carriers, 25 lb. ... ..	A.P.1664A, (2nd.Ed.) Book 1, Sect.1
Pylon stores jettison Ejector release units, No.1, Mk.1 ... ..	A.P.1664E, Vol.1, Sect.
Slip release units, No.1, Mk.1 ... ..	A.P.110G-0312-15F
Control relays, Type S.M. 5A-H.19 ... ..	A.P.4343C, Vol.1, Book 2, Sect.3
R.P. firing R.P. selector switch R.P. firing distribution box, Type 2 (Ref.5D/2277) } ... ..	A.P.4343X, Vol.1, Sect.16
Reset indicator, Type A.2 ... ..	A.P.4343E, Vol.1, Book 4, Sect.18
Reset push-switch, Type B ... ..	A.P.4343C, Vol.1, Book 1, Sect.1
Rocket battery launchers, No.3, Mk.1 ... ..	A.P.2802A, Vol.1, Parts 1 & 3, Sect.2

## DESCRIPTION

### General

2. The release of practice bombs and the firing of rocket projectiles is initiated by operating a Bomb/R.P. push-button switch, after the appropriate preliminary selections have been made by means of switches on the armament panel. The Bomb/R.P. push-switches are incorporated in the handgrips on the pupil's and instructor's control columns.

### Power supplies and safeguards

3. The power supplies for the armaments circuits are taken from the supply panel (Group A.1), and are protected by fuses on the panel and a circuit breaker mounted below it. To provide a means of rendering the circuits safe for the purpose of servicing, the supplies are routed to the equipment through a readily accessible safety-plug located in the port stub wing. As a further safeguard, the supply to the Bomb/R.P. firing push-switches is, in addition, routed through compression switches on the port and starboard main oleo legs. This arrangement ensures that bombs cannot be released, or the R.P. equipment fired while the aircraft is

standing on its alighting gear. A key-operated ground test switch (*Butt Test*), is fitted on the cabin starboard shelf. When this switch is put to TEST, it has the effect of short-circuiting the leg compression switches.

#### Armament panel switches

4. Mounted on the armament panel are a Bomb/RP selector switch, a fuzing selector switch, an RP selector switch, and two jettison push-switches. The Bomb/RP selector is a double pole, three-position switch, marked BOMBS, RP, and OFF. One pole of the switch is connected to fuse No.27 on the supply panel, and the other is connected to the Bomb/RP circuit breaker. When the switch is in the BOMBS position, the two supplies are connected to the contacts of a Bomb/RP firing relay, C. With the switch at RP the circuit breaker supply is connected to the RP selector switch, also to a contact on relay C, and to coils of relays in the RP circuit (*para.24*). Relay C is energized by operation of either of the Bomb/RP firing push-button switches.

5. The fuzing selector is a single-pole two-position switch, marked FUZE, and DEFUZE. Its contact arm is connected to supply panel fuse No.27. in the FUZE position, the switch connects the supply via a 2.5 amp fuse and contacts of a jettison relay, B, to the inboard pylons (*Fig.4*). In the DEFUZE position, the switch connects the supply to a contact on the INBOARD STORES JETTISON push-switch (*Fig.6*). The OUTBOARD STORES JETTISON push-switch is supplied from the Bomb/RP circuit

breaker. A flap marked CLEAR AIRCRAFT, mounted above the two push-switches, can be used to depress them together, thereby jettisoning the stores from the inboard and outboard pylons simultaneously. The jettison relay, B, and the firing relay C, together with the 2.5 amp fuse and an RP assessment relay, D (*para.15*) are all located in the centre console, in the cabin.

#### Practice bomb carriers

6. Two practice bombs are installed on each carrier, and when each bomb is fully crutched up to the carrier it depresses a microswitch, thereby connecting its associated release solenoid in circuit with an auto-selector contact. When the carrier is fully crutched up to the pylon, the normal release switch on the pylon is automatically opened, thus isolating the normal release mechanism. The bomb fuzing and bomb release circuits via the carrier butt connector. On the later version (ERU) pylons, the fuzing and release circuits are connected by Type R plugs and sockets.

7. *Fig.4* illustrates the fuzing circuits for the interim and later version pylons, and *Fig.5* illustrates how these are connected to the bomb carrier circuits. The fuzing circuit makes power available at the contact arm of each Q.1 relay; the bomb release circuit operates to energize these relays, whose contacts then pass supplies to the auto-selector circuits. The auto-selector mechanisms, which are operated by electro-magnets, control the bomb dropping sequence by

closing their associated contacts in succession. The contacts are pre-set to release one bomb from each carrier alternately.

#### Pylon stores

8. The interim version inboard pylons are equipped with electro-magnetic release units (EMRUs) in housings which include feed and interlock switches, and manual and electrical jettison mechanisms. *Fig.5* illustrates the circuits for stores release, with the stores loaded and the release units cocked. Also illustrated is the circuit of a cocking test set connected to the cocking test plugs on the pylons, showing how, when the release units are correctly cocked, the circuit of the test lamp is completed via the cocking contact and release unit coil. *Fig.6*, which illustrates the jettison circuits, also illustrates the drop tank jettison circuits used on the outboard pylons.

9. The later version pylons, equipped with ejector release units (ERUs), can carry either fuel drop tanks, practice bomb carriers, or 2 in. air-to-air rocket batteries. The ERUs 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 (*Fig.7*) when the relays are energized by the jettison circuit.

#### ► Note . . .

To prevent inadvertent operation of the ERUs, due to a possible short circuit, the ERU firing circuits in the pylons, post Mod.1079, are isolated from terminal block TB1 and taken through a separate terminal block TB2 (*Fig.12*). ◀

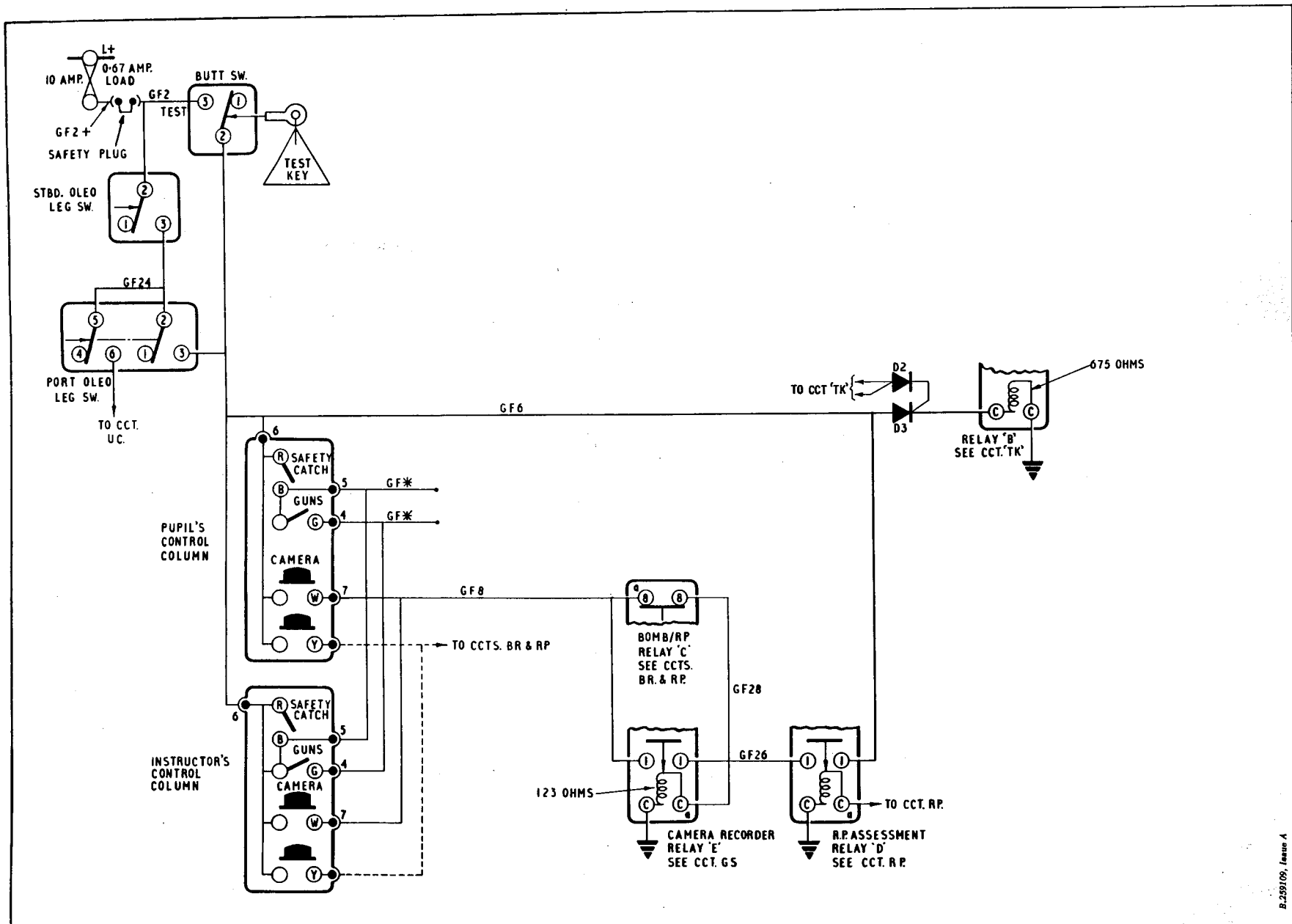


Fig.1 Gun firing (theoretical)

**Operation***Practice bomb release*

10. When the aircraft is airborne, power is available at the Bomb/R.P. firing push-switches, and at the switches on the armament panel (*para.3*). With the Bomb/R.P. selector switch at BOMBS, supplies from the Bombs/R.P. circuit breaker are available at contacts 3 and 5 on the firing relay, C. With the fuzing selector switch at FUZE, supplies from fuse No.27 on the supply panel are available at the contact arms of the bomb carrier Q.1 relays, in readiness to supply the auto-selectors. The circuit from the fuzing selector is via the 2.5 amp fuse, the closed contacts 6a-6 on relay B, and the pylon butt connectors, or (*on ejector unit pylons*) via the Type 'R' plugs and sockets (*fig.5*).

11. When the firing-button is pressed, the firing relay C is energized, and its contacts 3-3a and 5-5a pass supplies to the coils of the Q.1 relays; the relays energize, closing their contacts, thereby passing supplies which energize the auto-selector electro-magnets and, via contact 2 on the port carrier, energize a bomb release solenoid, thereby releasing a bomb. On release of the firing-button, the auto-selector mechanisms operate, each respectively closing its next successive contact. Thus, on the port carrier contact 3 is now closed; on the starboard carrier contact 2 is closed; hence the next operation of the firing-button releases a bomb from this carrier, and also energizes the auto-selector electro-magnets.

12. On release of the firing-button, the mechanisms again operate, closing contact 3, starboard, and contact 4, port; the latter completing the circuit for the remaining port side bomb release. Thus, further operation of the firing button will release this bomb, and release of the button will result in the closure of contact 4, starboard, in readiness to release the remaining bomb when the firing-button is again pressed.

*Pylon stores and drop tank jettison (interim)*

13. To jettison practice bomb carriers or drop tanks from the interim inboard pylons, the fuzing selector must be put to DEFUZE. In this position the selector connects a supply from No.27 fuse to the INBOARD STORES JETTISON push-switch. Operation of this switch causes energization of the jettison relay, B, whose contacts 1a-1 pass supplies from fuse No.26 to the jettison solenoids in the pylons. The jettison solenoids, when energized, operate the manual release plungers of the E.M.R.U's., thus opening the release hooks.

*Pylon stores and drop tank jettison (E.R.U. pylons)*

14. To jettison stores from the ejector unit pylons the procedure is as described in paragraph 13 above, except that operation of the jettison push-switch, in addition to energizing the jettison relay, also supplies the 'D' relays in the pylons, while the supply passed by contacts 1a-1 of the jettison relay feeds the pylon 'C' relays. With the 'C' and 'D' relays ener-

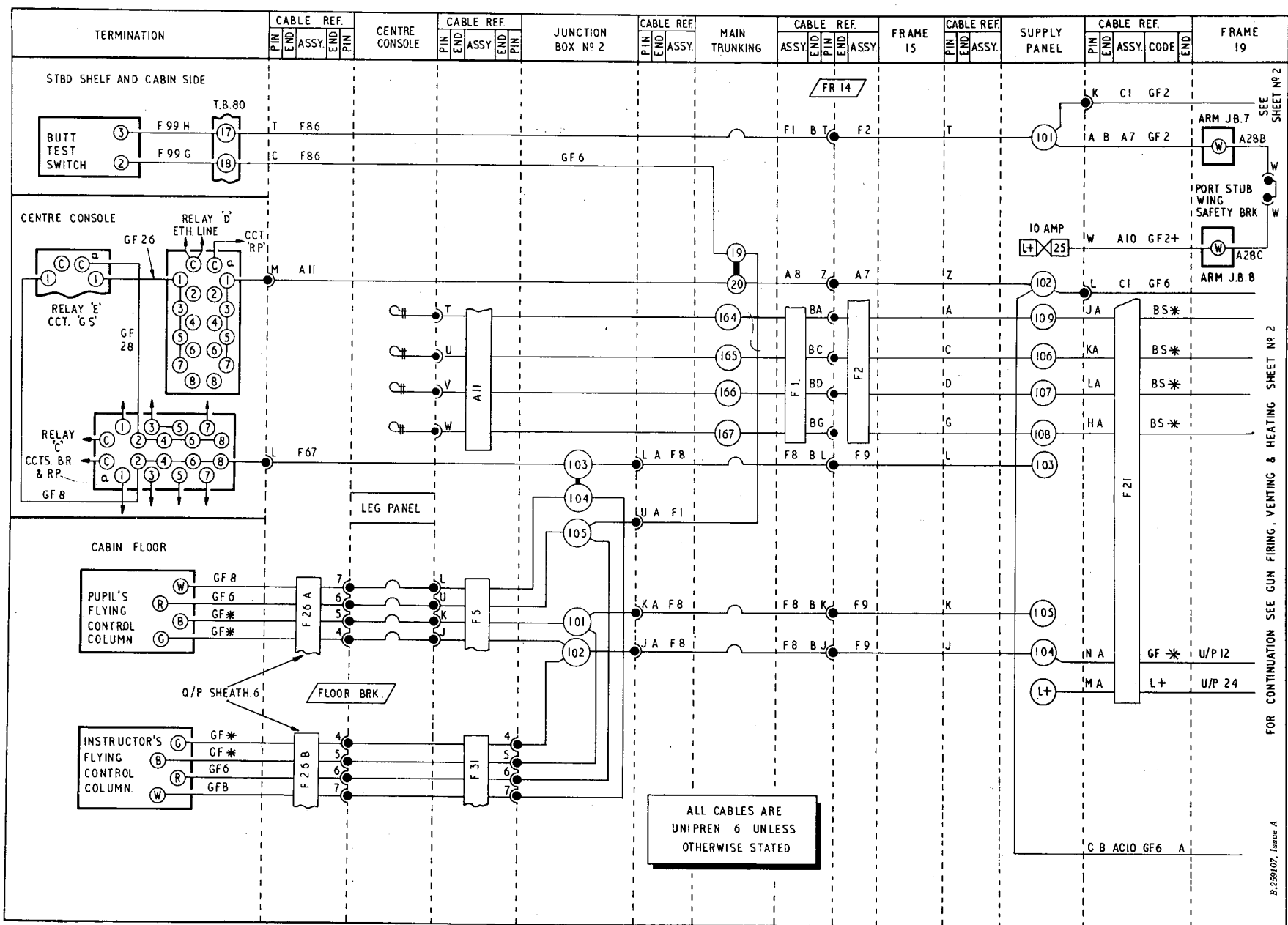
gized, supplies pass via the safety-breaks to fire the initiating caps in each of the E.R.U. cartridges.

**R.P. firing***General*

15. Two methods of R.P. firing are available to those aircraft with Mod.667 pylons: either 2 in. air-to-air rocket projectiles from launchers carried on the E.R.U's. on the inboard pylons, or 3 in. air-to-ground projectiles from launcher rails under the outer wings. Each of these installations is operated by electrical power from the Bomb/R.P. circuit breaker (*para.3*) derived via the Bomb/R.P. selector switch, on the armament panel (*para.4*), and in each installation the firing operation is initiated by use of the Bomb/R.P. firing push-switches on the control columns. In each installation an R.P. assessment relay D (*fig.1*) completes an interconnection with the circuit for the camera recorder (*Chap.2 Group 4A*).

*Air-to-air installation*

16. The 2 in. air-to-air projectiles are fired from No.3, Mk.1 launchers carried by the E.R.U's. on the inboard pylons. The launchers are described in A.P.2802A, (*2nd.Ed.*), Parts 1 and 3. In each launcher a ripple firing unit controls the firing of eight salvoes of three rockets, spaced at a pre-determined time interval. The electrical supply (*para.4 above*) is routed to contact 7 on the firing relay, C, and also energizes the R.P. assessment relay, D. Operation of either firing-button (*fig.7*) energizes the firing relay, whose contacts pass supplies to the launchers.



F.S./4

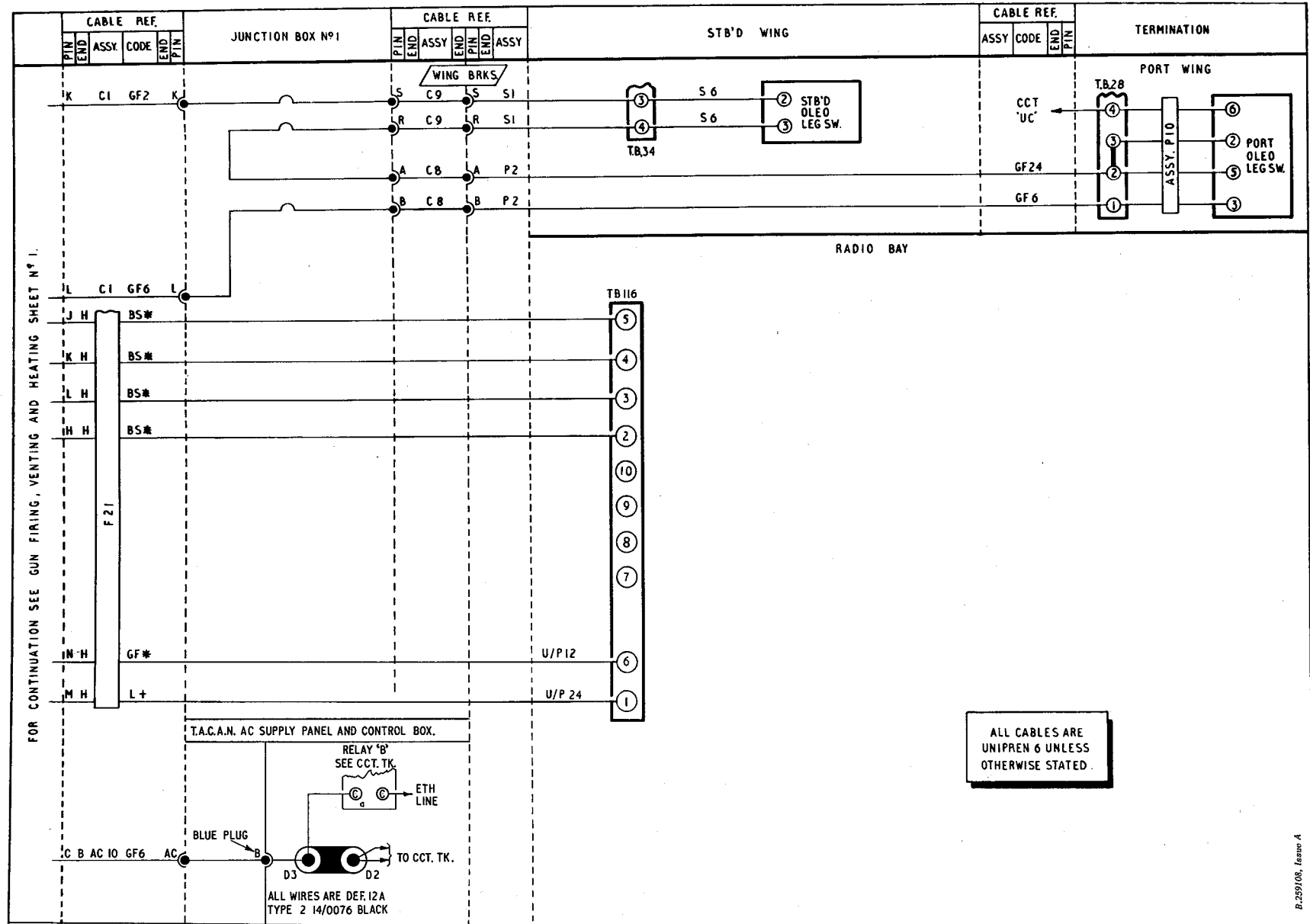
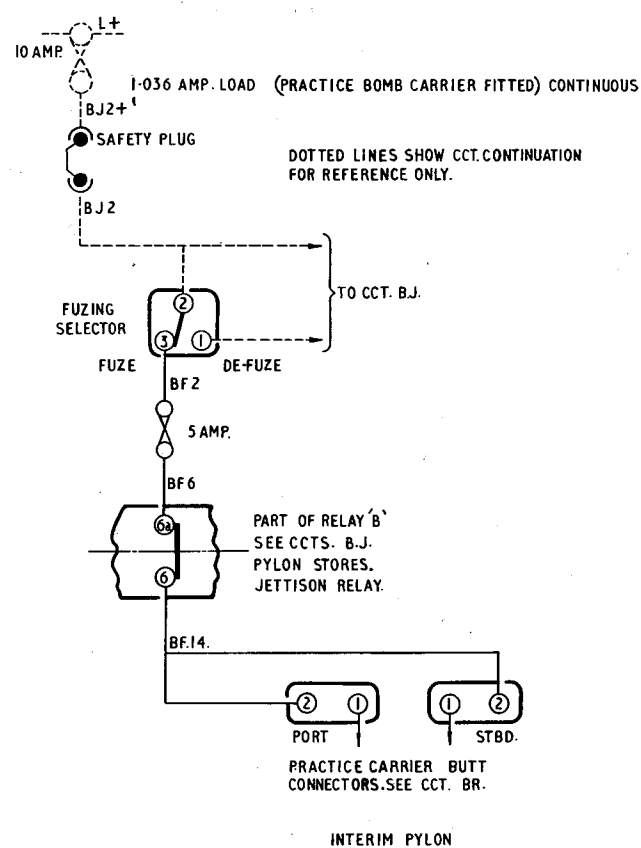
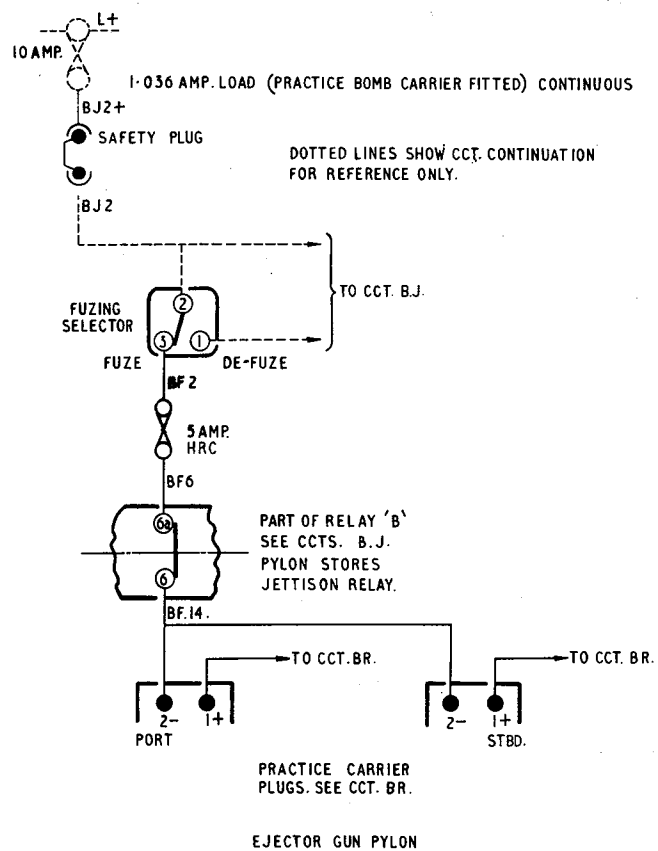


Fig.3 Gun firing spare cables (routeing sheet 2)

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COMPONENT.	LOCATION.	OTHER CCTS. REFERRED TO---
PRACTICE CARRIER BUTT CONNECTORS	E.M.R.U. NO. 1. MK. 2 HOUSING INBOARD PYLONS	B R ... BOMB RELEASE
OR		B J ... BOMB JETTISON
PRACTICE CARRIER PLUGS	EJECTOR GUNS INBOARD PYLONS	

THESE COMPONENTS ARE NOT PART OF THE BASIC AIRCRAFT.

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Fig.4 Bomb fuzing (theoretical)

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*Air-to-ground installation*

17. The air-to-ground rocket projectiles are carried on four sets of Mk.12, Type 3 launchers, and the firing system employed is the Type 2 unselector system, which is designed to fire up to 24 projectiles in salvoes of 2, 4, 6 or 8. The system is described fully in A.P.113G-0304-1. ▶

18. Power is supplied to the installation as described in paragraph 15. When the Bomb/R.P. selector switch is at R.P., (fig.8) in addition to energizing the assessment relay and making the supply available at the firing relay contact 7, the supply is also made available at the R.P. selector switch, and at terminals in the firing distribution box (para.19). The R.P. selector switch, mounted on the armament panel, is a four-position rotary switch, marked 2, 4, 6 and 8.

*R.P. firing distribution box*

19. The R.P. firing distribution box is mounted adjacent to Arm. J.B.1 on the starboard fuel tank access door on frame 19. The control circuit connections to the box are made via a plug 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.

20. Inside the distribution box, supplies are distributed to the firing units by an eight-level, 25-pole unselector distribution switch; only seven of the levels being 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 DS/8, which is supplied via interrupter contacts ds. Four wipers at the distribution levels pass the firing supplies to the R.P. units; the wipers being supplied via resistors R1, R2, R3, and R4, and the change-over contacts A3, A1, A2, and A4 respectively of a relay switch A/4.

21. Contact A3 is supplied from a terminal in the distribution box; contacts A1, A2, and A4 receive supplies via the R.P. selector switch. In the circuit between contact A3 and the relay switch contact B3, a silicon rectifier prevents a passage of firing current occurring during resetting (para.22). 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 resistor R6.

*Resetting*

22. The resetting circuit is used to return the wiper contacts to the first stage of the levels before re-arming. The reset push-switch and a reset indicator are contained

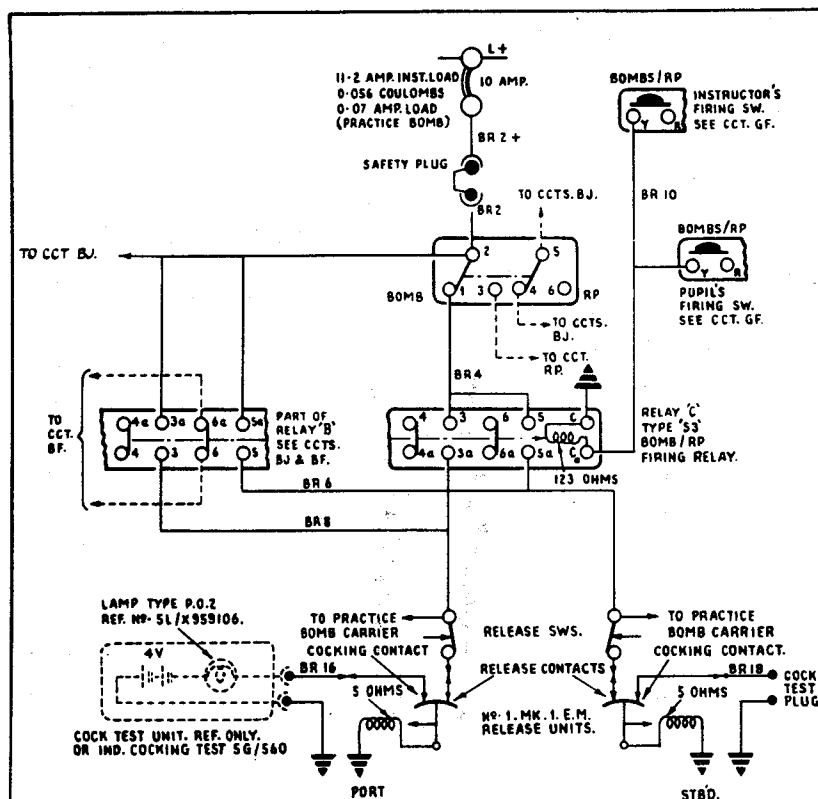
in Arm J.B.1 (Also in Arm J.B.1 is a rippling relay, but this is not used in this aircraft). The reset push-switch is supplied from a fuse on the supply panel, and is wired to wiper 7 at the reset level in the firing distribution box; all the stage terminals at the reset level are connected together, hence, whatever the position of the wiper, the resetting supply will pass to the coil of DS/8 via its interrupter contacts ds. ◀ Mod 1441 renders the reset circuit inoperative. ▶

*Operation**Air-to-air installation*

23. When the aircraft is airborne, the Bomb/R.P. selector switch and the firing push-switches are supplied as described in paragraph 3. When the Bomb/R.P. selector switch is put to R.P., a supply passes to the coil of the R.P. assessment relay, which energizes, making a hold-on supply available to the camera recorder relay (Chap.2, Group 4A). At the same time the Bomb/R.P. selector switch makes a supply available at contact 7 of the firing relay. When a firing-button is pressed, the firing relay energizes, and its contacts 7-7a pass supplies via the pylon pockets to the launchers, which operate, firing salvoes of projectiles until the firing-button is released, or all the rockets are expended.

*Air-to-ground installation*

24. When the aircraft is airborne, the Bomb/R.P. selector switch and the firing push-switches are supplied as described in para.3. When the Bomb/R.P. selector



STORE RELEASE CCT. INTERIM PYLON

COMPONENT.	LOCATION.
RELEASE SWITCHES	E.M.R.U. NO. 1, MK. 2, HOUSING
RELEASE UNITS	INBOARD PYLONS.
COCK TEST PLUGS	INBOARD PYLONS.

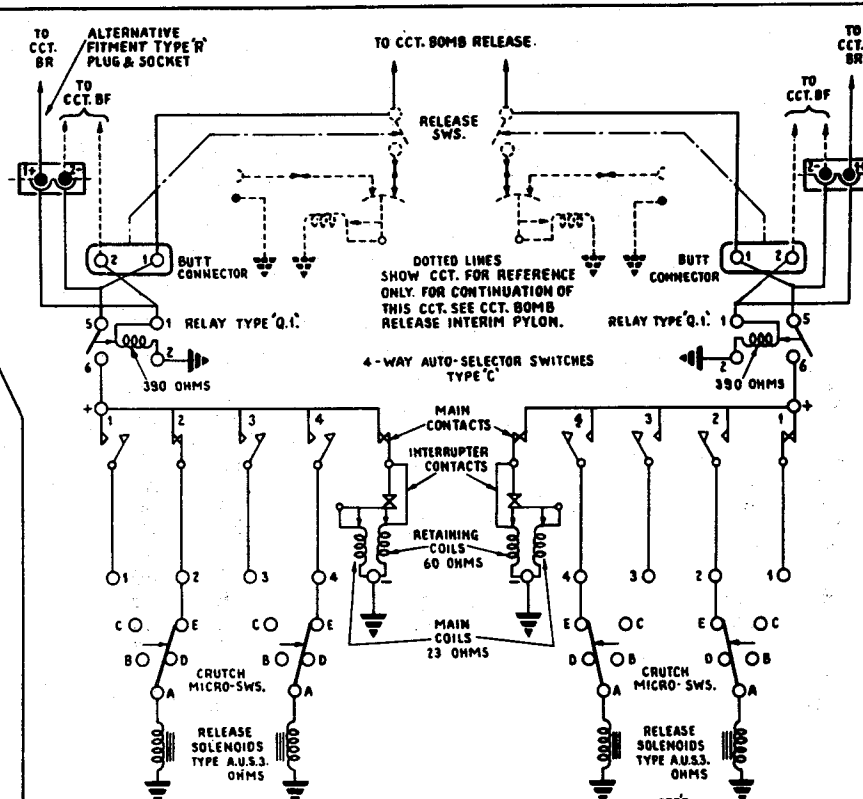
THESE COMPONENTS ARE NOT PART OF THE BASIC AIRCRAFT.

# NOTE...

- ① CCT. SHOWN WITH STORES FITTED I.E. WITH RELEASE UNITS COCKED.
- ② RELEASE AND COCKING CONTACTS OF RELEASE UNITS ARE BROKEN WHEN STORE IS RELEASED.
- ③ FOR ACTION OF RELEASE SWITCHES SEE PRACTICE BOMB RELEASE CCT.
- ④ RELEASE UNITS MUST NOT BE OPERATED ELECTRICALLY UNLESS THEY ARE LOADED WITH A WEIGHT OF AT LEAST 10 LB.

OTHER CCTS. REFERRED TO...  
 BJ... BOMB JETTISON.  
 BF... BOMB FUZING.  
 RP... ROCKET PROJECTILES.  
 GF... GUN FIRING.

THIS DIAGRAM APPLIES TO MOD# 825 ONLY



25 LB. PRACTICE BOMB RELEASE CCT.

COMPONENT.	LOCATION.
BUTT CONNECTOR	E.M.R.U. NO. 1, MK. 2, HOUSING
TYPE 'R' PLUG	INBOARD PYLONS. INTERIM PYLON.
RELAYS TYPE 'Q'	EJECTOR GUNS. INBOARD PYLONS.
4-WAY AUTO-SELECTOR SWS.	25 LB. PRACTICE BOMB CARRIER.
CRUTCH MICRO-SWITCHES	
RELEASE SOLENOIDS	

THESE COMPONENTS ARE NOT PART OF THE BASIC AIRCRAFT.

# NOTE...

- ① CCT. SHOWN WITH STORES FITTED.
- ② RELEASE SWITCHES ARE OPENED, WHEN PRACTICE CARRIER IS FITTED AND CRUTCHED TO PYLON, BY UPWARD MOVEMENT OF BUTT CONNECTOR.
- ③ CRUTCH MICRO-SWITCHES ARE DEPRESSED WHEN PRACTICE BOMB IS CRUTCHED UP TO BOMB CARRIER, THUS COMPLETING THE RELEASE CCT.
- ④ BOMB CARRIERS ARE TO BE ELECTRICALLY HANDLED BY SETTING 4-WAY AUTO-SELECTOR SWITCHES AS FOLLOWS...  
 PORT NO. 2.  
 STBD. NO. 1.

OTHER CCT. REFERRED TO...  
 BF... BOMB FUZING.  
 BJ... BOMB JETTISON.

THIS DIAGRAM APPLIES TO MOD# 825 AND 667

Fig.5. Stores release (theoretical)

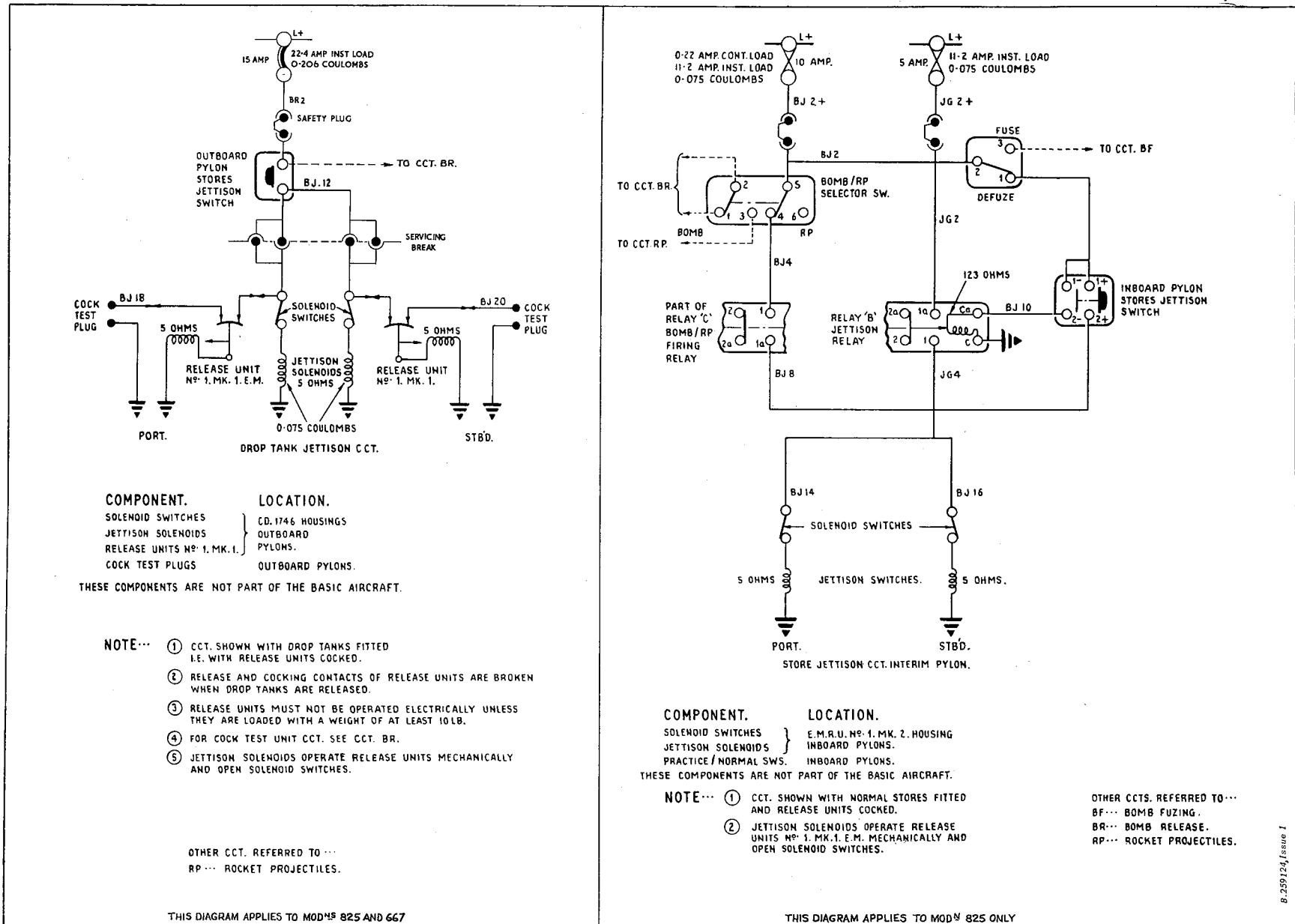


Fig.6 Stores and drop tank jettison (theoretical)

(MOD.1193)

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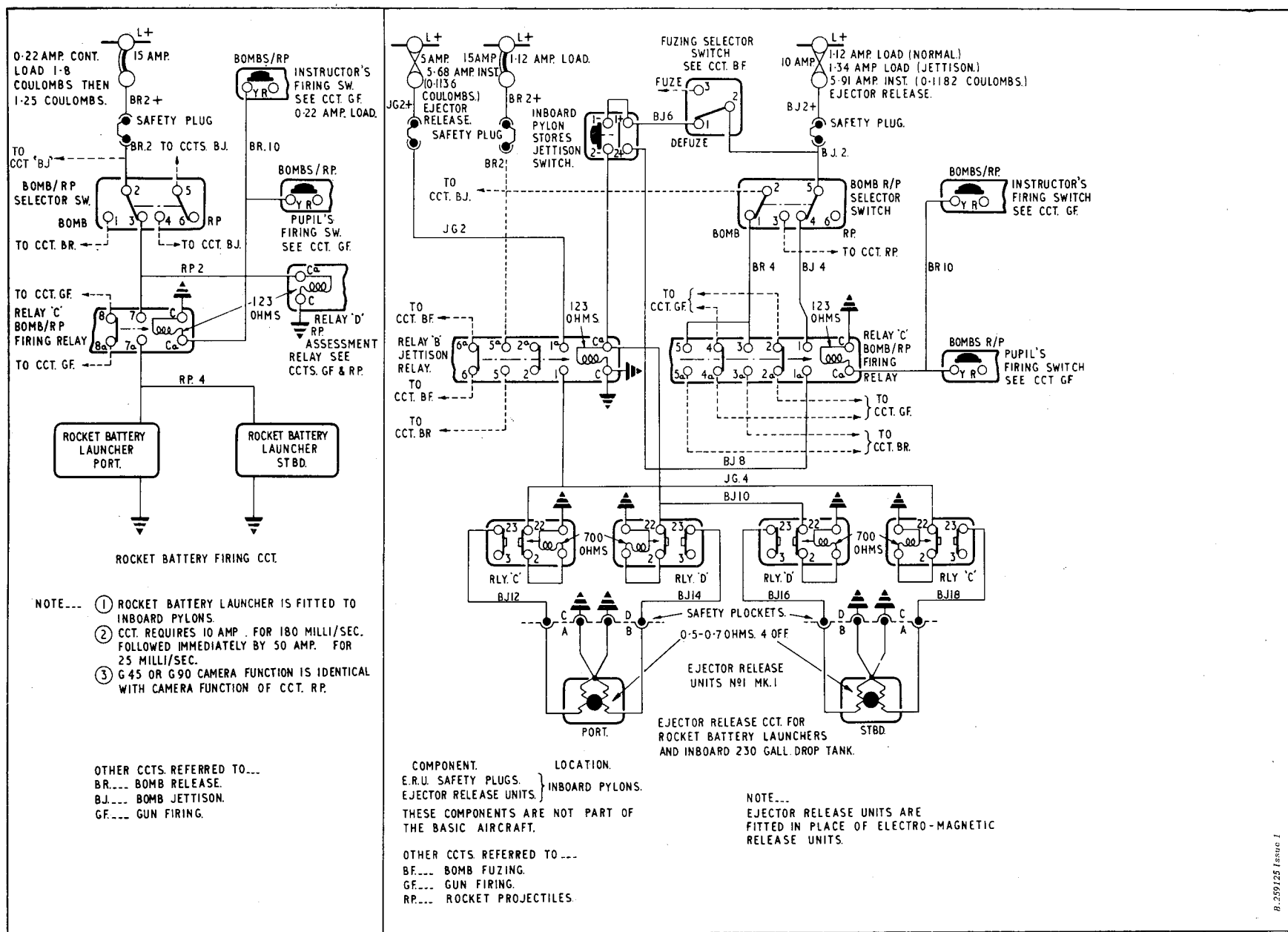


Fig.7 Rocket battery firing and ejector release (theoretical)

(MOD.1193)

RESTRICTED

switch is put to R.P., the assessment relay is energized, and supplies are also made available at contact 7 on the firing relay, at the R.P. selector switch, and at terminals in the firing distribution box. As a result, the distribution box relay B/4, energized by a supply from a terminal via contact A3, opens its contacts.

25. With the R.P. selector at position 2, if the firing-button is now pressed, the firing relay C operates, and its contacts 7-7a pass a supply to the firing distribution box, energizing relay switch A/4. A/4 operates, and its contacts change-over: contact A3 passing a supply from the terminal via resistor R1 to pin A of the firing circuit connector, thereby causing two projectiles to be fired. At the same time, by the change-over of A3, the supply is broken from B/4, which de-energizes, allowing its contacts to close. Contact B3 passes a supply, derived from contact A3 via the rectifier to the coil of the distribution switch, DS/8; while contact B1 conducts a supply to the wiper at the first terminal of level 6, thereby energizing the position marker relay C/4.

26. When the firing-button is released, interrupting the supply to A/4, the slugging action of R7 delays the opening of the relay contacts, ensuring the passage of an adequate firing supply. When the contacts change-over, A3 again passes a supply which energizes B/4, whose contacts open, breaking the supplies from the position marker relay C/4, and the coil of the

distribution switch, DS/8. As the armature of DS/8 opens, the pawl and ratchet mechanism operates, causing the wipers to move to the second terminal stage of the levels; relay C/4 being held on meanwhile by the slug effect of R.6.

27. If the R.P. selector is at position 4, a supply, routed via the selector is made available at the change-over contact A.1. Again starting with the wipers on the first stage terminals of the levels: when the firing-button is pressed, the change-over of contacts A3 and A1 connects supplies to the first stage terminals at No.3 and No.4 levels; thus two firing circuits are completed via R1 and R2. The supplies pass via connector pins A and N, firing four projectiles, one each from rails A and B, port and starboard.

28. The subsequent operations are as described in paragraph 26 until the move forward of the wiper contacts takes place: the second terminal at No.5 level is now supplied from contact A1, via contact C4; relay C/4 being again held by slug R6. DS/8, now supplied via the wiper at No.5 level and the interrupter contacts ds, operates, moving the wipers to the third stage terminals 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 four projectiles, one each from C and D, port and starboard. At the same time, a supply from contact A3, routed via the rectifier and contacts B3 and

B1 to wiper 6, energizes the position marker relay E/4.

29. When the firing-button is released, the wipers are advanced to the fourth stage. On the fourth stage terminal, wiper 5 is supplied 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. It will be seen that on the more forward level, the wipers continue to move forward until a dead terminal is reached; this terminal corresponds with the first unfired terminals of 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 their respective contacts on the move forward level close; thereby supplying a number of terminals to correspond with the setting of the R.P. selector.

#### *Resetting*

30. When the reset switch is operated, supplies derived from the supply panel fuse No. 28, pass to the distribution box. One, passing via wiper 7 at the reset level and so via ds to DS/8, the other energizing relay B/4, whose contacts open, B1 and B2 preventing the position marker relays from being energized. DS/8 operates, causing the wipers to be returned to the first stage of the levels. The indicator will be energized, showing WHITE, when resetting is completed. When the switch-button is released, the indicator will show BLACK.

◀ Mod 1441 renders the reset circuit inoperative. ▶

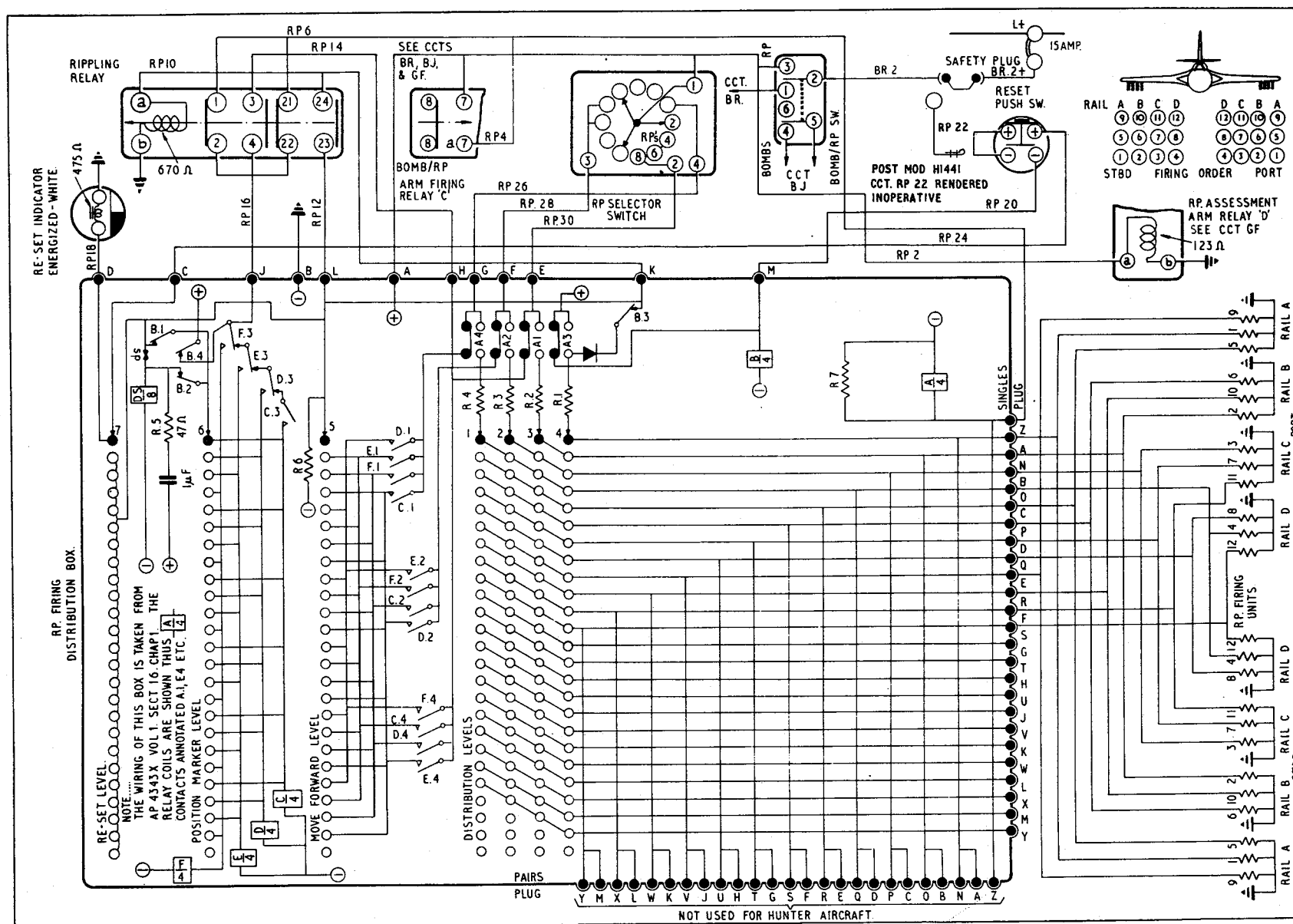


Fig. 8 R.P. firing (theoretical)

◀ (Mod 1441 added) ▶

## SERVICING

## General

31. For general servicing of the electrical system, reference should be made to Group A1. All the components should be kept clean, and should be inspected periodically for signs of damage, and to ensure that they are securely mounted. Except for the standard routine serviceability and bench testing of the equipment as described in the Air Publications listed in Table 1, no other servicing should be necessary.

- ◀ 31A. The Bomb/R.P. push switch, Part No. ACM 22556/6, (*initial fitting to control handle Part No. AC63484*), is subject to failure by jamming. When necessary, switch Part No. 24484/7 (*Mod.1336*) is fitted in lieu.

## Testing and arming ejector release units

32. The procedure for testing and arming the ejector release units fitted to aircraft is given in the following paragraphs:-

## WARNING

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

- (1) **ARMAMENT SAFETY PLUG:-**  
Disconnect the armament safety plug.
- (2) **R.P.:-**  
Disconnect the adaptor plugs (Ref. 11C/3067) on the launcher rails.

## Note . . .

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

33. To test the ejector release unit's electrical circuit in the port and starboard inboard pylons proceed as follows:-

- (1) Ensure that the ejector release unit connectors are disconnected.
- (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 insert the butt test switch key.
- (5) Select the battery master switch to ON.
- (6) Check the voltage at each ejector release unit's connector by operating both Bomb/R.P. push switches and the inner pylon stores jettison switch in sequence. The reading obtained should be the supply voltage.
- (7) Select in the following sequence and operate both Bomb/R.P. push switches for each case; check for no volts at the ejector release unit's connectors:-
  - (a) Remove the butt test switch key

and set the R.P. switch to BOMBS.

- (b) Insert the butt test switch key and set the R.P. switch to OFF.
- (c) With the butt test switch key still in position set the Bomb/R.P. switch to R.P.
- (8) Select the fuzing selector switch to FUSE, and operate the inner stores jettison push switch. Check for no volts at the ejector release unit's connectors.
- (9) Disconnect the armament safety plug and repeat the tests in operations (4), (5) and (6), but in this case check for no volts at the ejector release unit's connectors.
- (10) Remove the butt test key, set the Bomb/R.P. switch to OFF and the fuzing selector switch to DEFUZE.

## Note . . .

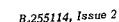
*Do not re-connect the armament safety plug.*

- (11) Re-connect the bombs and R.P. safety circuits.

## 34.

To arm the ejector release units proceed as follows:-

- (1) Disconnect the electrical supply to the aircraft.



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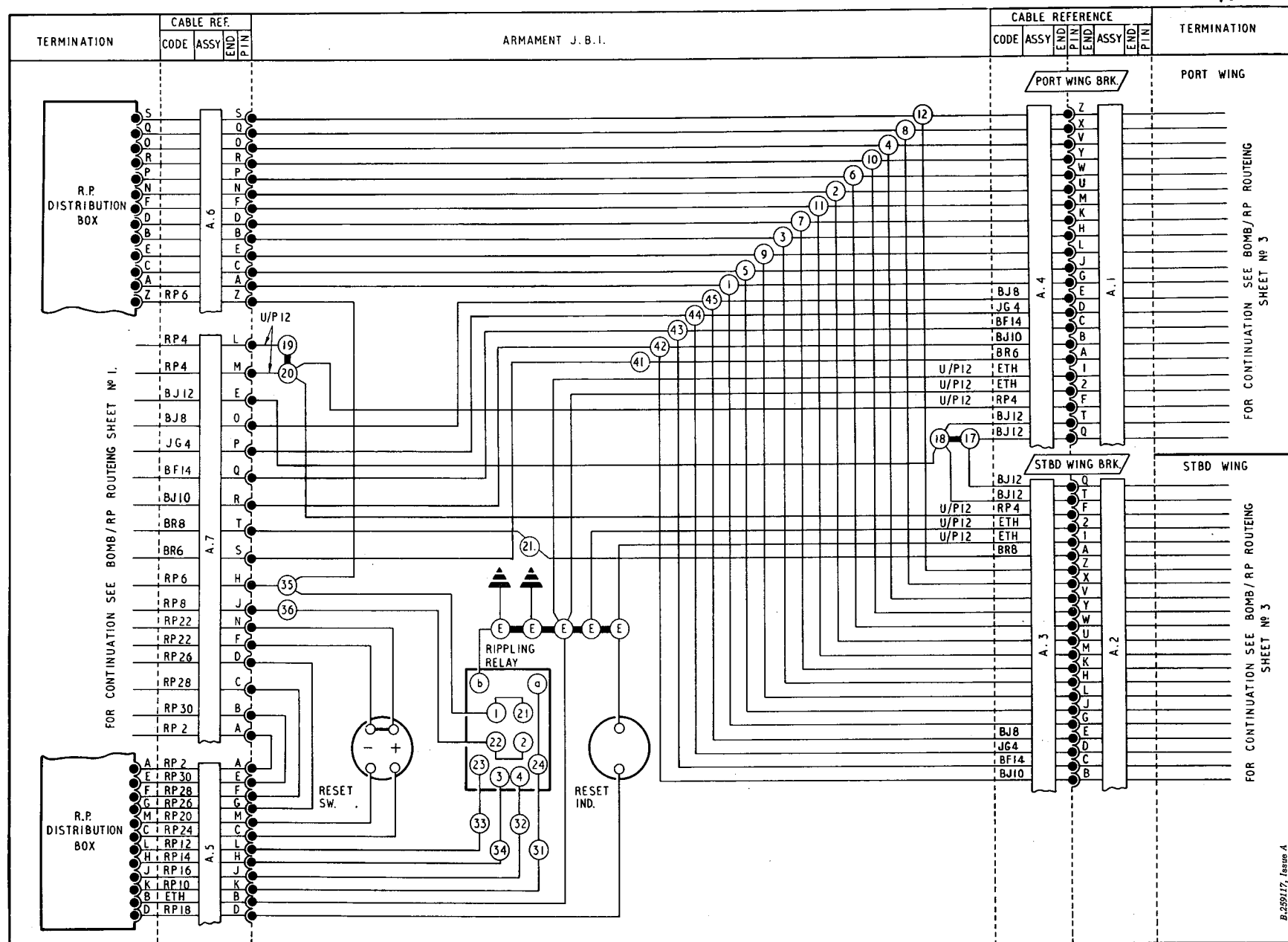


Fig.10 Bomb/R.P.(routeing sheet 2)

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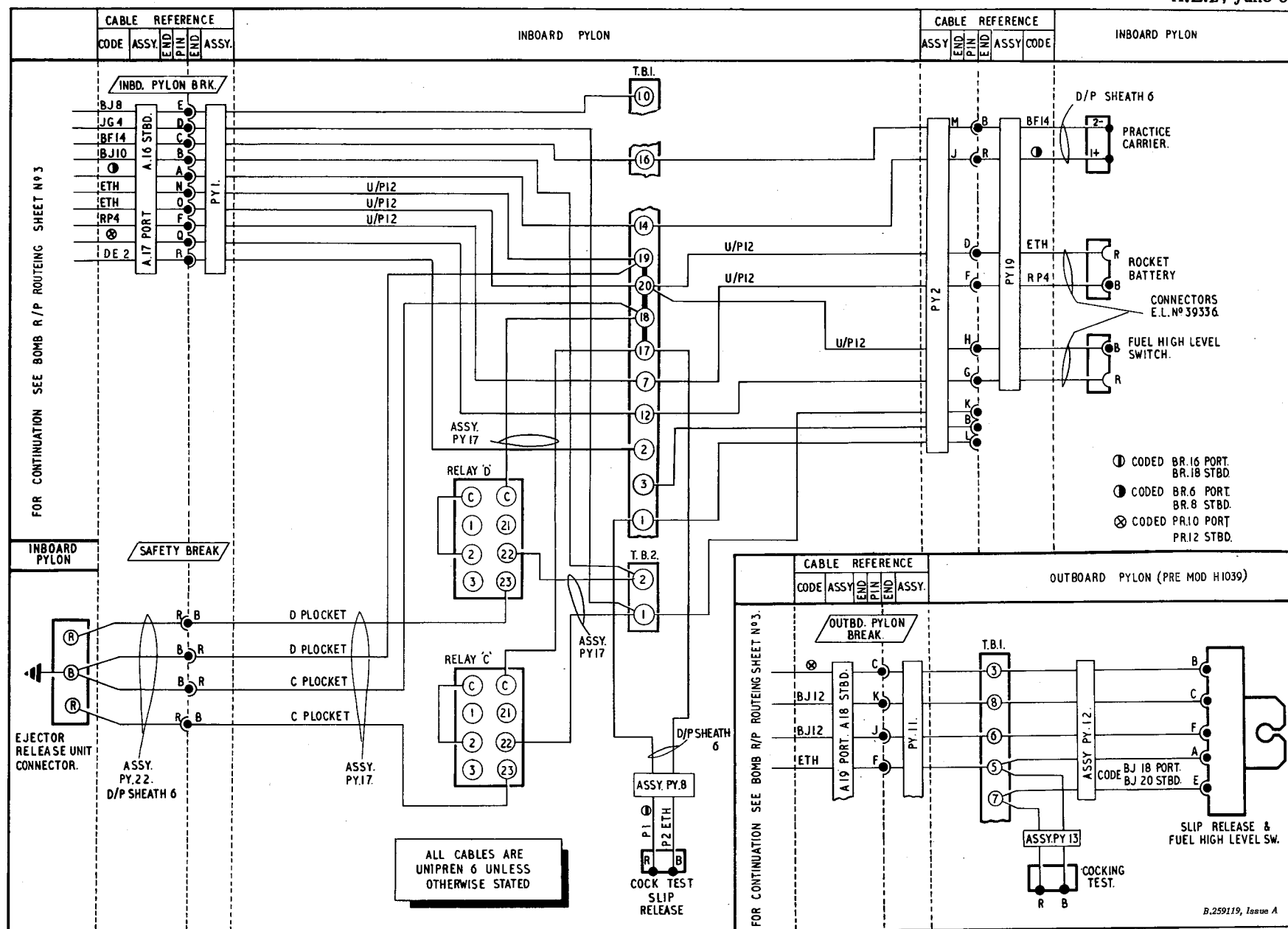


Fig.12 Bomb/R.P.(routeing sheet 4)

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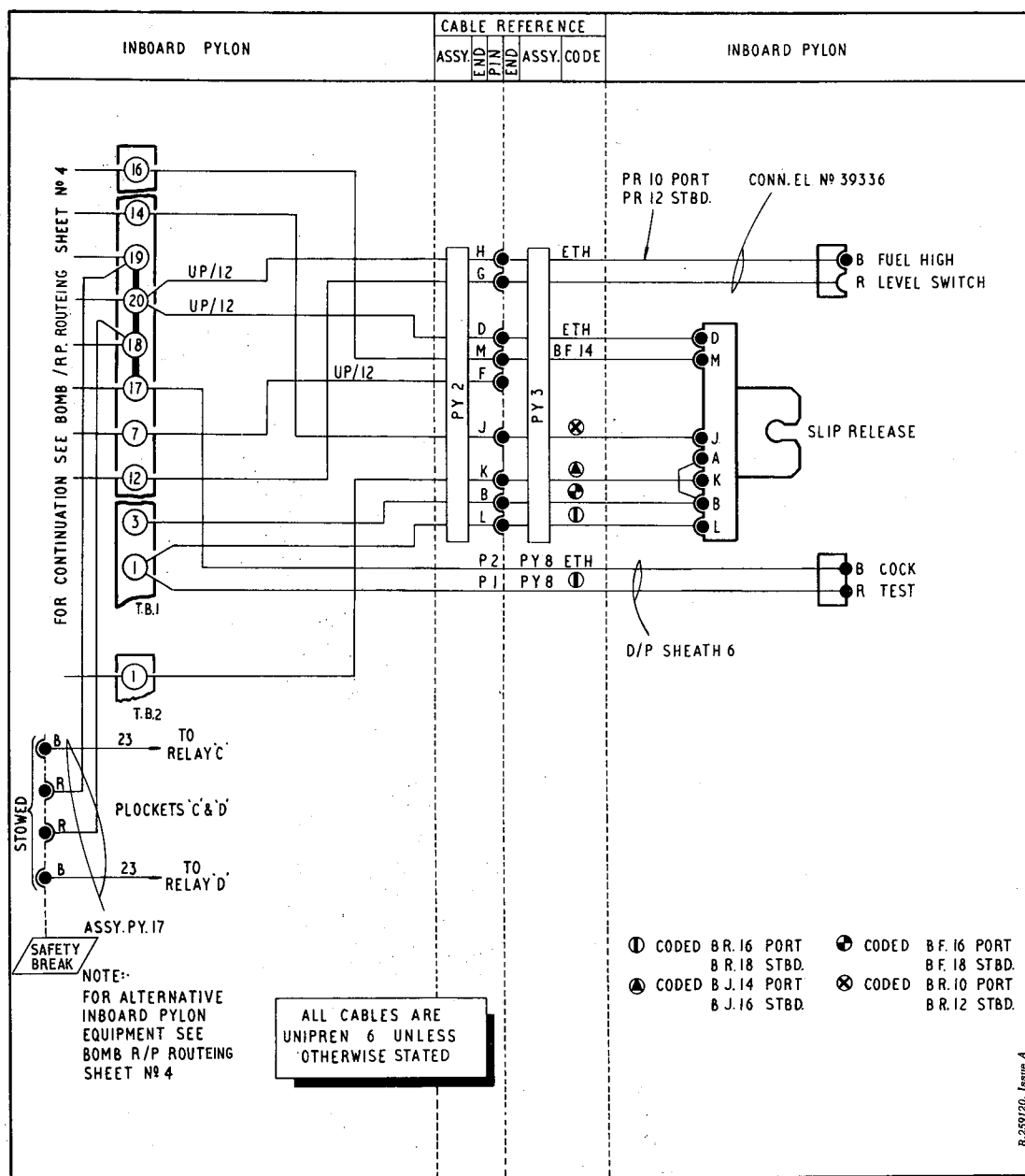
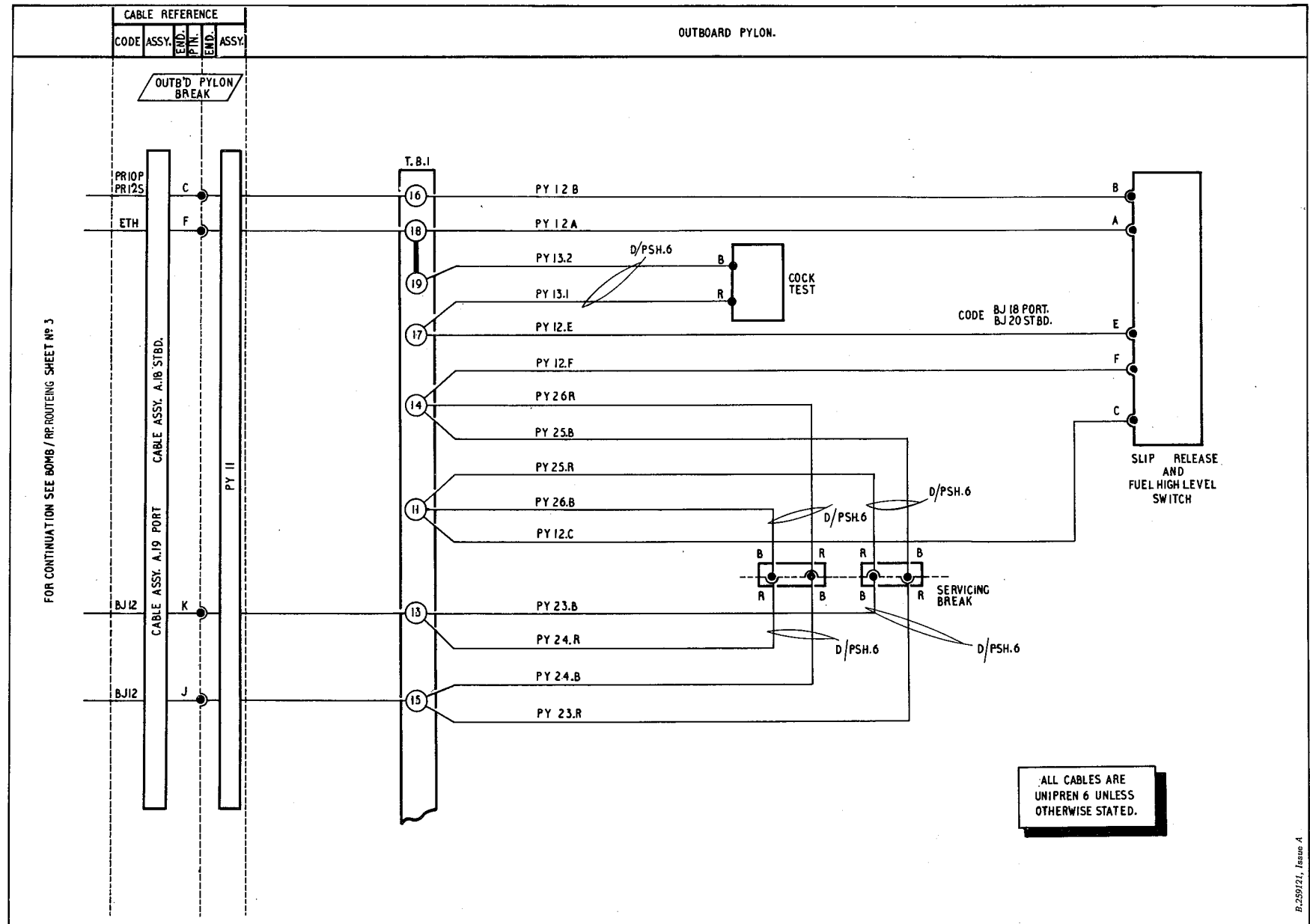


Fig.13 Bomb/R.P. - interim version (routing sheet 5)

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**Fig.14 Bomb/R.P. (routeing sheet 6)**

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- (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 wires on plockets C and D (*free ends*). The readings obtained should be between 20 megohms to infinity.
- (4) Fit a cartridge in each ejector release unit and assemble the connectors.
- (5) Check the resistance of the cartridge

fuzing circuit, by using a suitable Safety Ohmmeter (0-500 ohms) connected between the RED and BLUE wires on plockets C and D (*fixed ends*). The readings obtained should be between 15 to 150 ohms.

- (6) Re-connect plockets C and D in each pylon.

### Note . . .

*All arming of units must be carried out in accordance with local orders. The armament safety plug must only be re-connected just prior to butt test or flight.*

## REMOVAL AND ASSEMBLY

### General

35. Once access has been obtained, the removal and assembly of the armaments services components should present no difficulties. The method of removal of the panels and ARM junction boxes which carry the majority of the components, is described in Group A2. The method of removing the pylons is described in Book 1, Section 3, Chapter 2. The means of access to, and the locations of the armament components are indicated in Group A3.

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## ◀ APPENDIX 1 - MODIFICATIONS 1023, 1220, 1222, 1223 and 1294 ▶

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	Para.		Para.
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<i>Description</i>		<i>General</i> ... ..	8
<i>General</i> ... ..	2	<i>Removal and assembly</i>	
<i>Operation</i> ... ..	4	<i>General</i> ... ..	9

## LIST OF ILLUSTRATIONS

	Fig.		Fig.
<i>Store release (theoretical)</i> ... ..	1	<i>Bomb/R.P. (routeing sheet 3)</i> ... ..	5
<i>Bomb fuzeing (theoretical)</i> ... ..	2	<i>Bomb/R.P. (routeing sheet 4)</i> ... ..	6
<i>Bomb/R.P. (routeing sheet 1)</i> ... ..	3	<i>Bomb/R.P. (routeing sheet 5)</i> ... ..	7
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<i>Bomb/R.P. (routeing sheet 2)</i> ... ..	4	<i>Inboard pylon ejector release (theoretical)</i>	9

## TABLE

## Table

Equipment type and Air Publication

references... .. 1

**Introduction**

1. This appendix contains a description of the revised armament circuitry introduced by Modifications 1220, 1222 and 1223 to provide for the carriage of practice bombs on the outboard pylons and pylon selection facilities. Mod.1294, which introduces a four pole plocket and control relays with improved earthing facilities for the inboard pylon E.R.U.'s, is shown in ◀ Figs. 7 and 9. Fig.6 shows the pressure refuelling circuit routeing with Mod.1023 embodied. ▶

**DESCRIPTION****General**

2. To enable the practice bomb carriers to be used on the E.M. release units of 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 INBOARD and OUTBOARD, is situated on the port top longeron in the region of frame 9. 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

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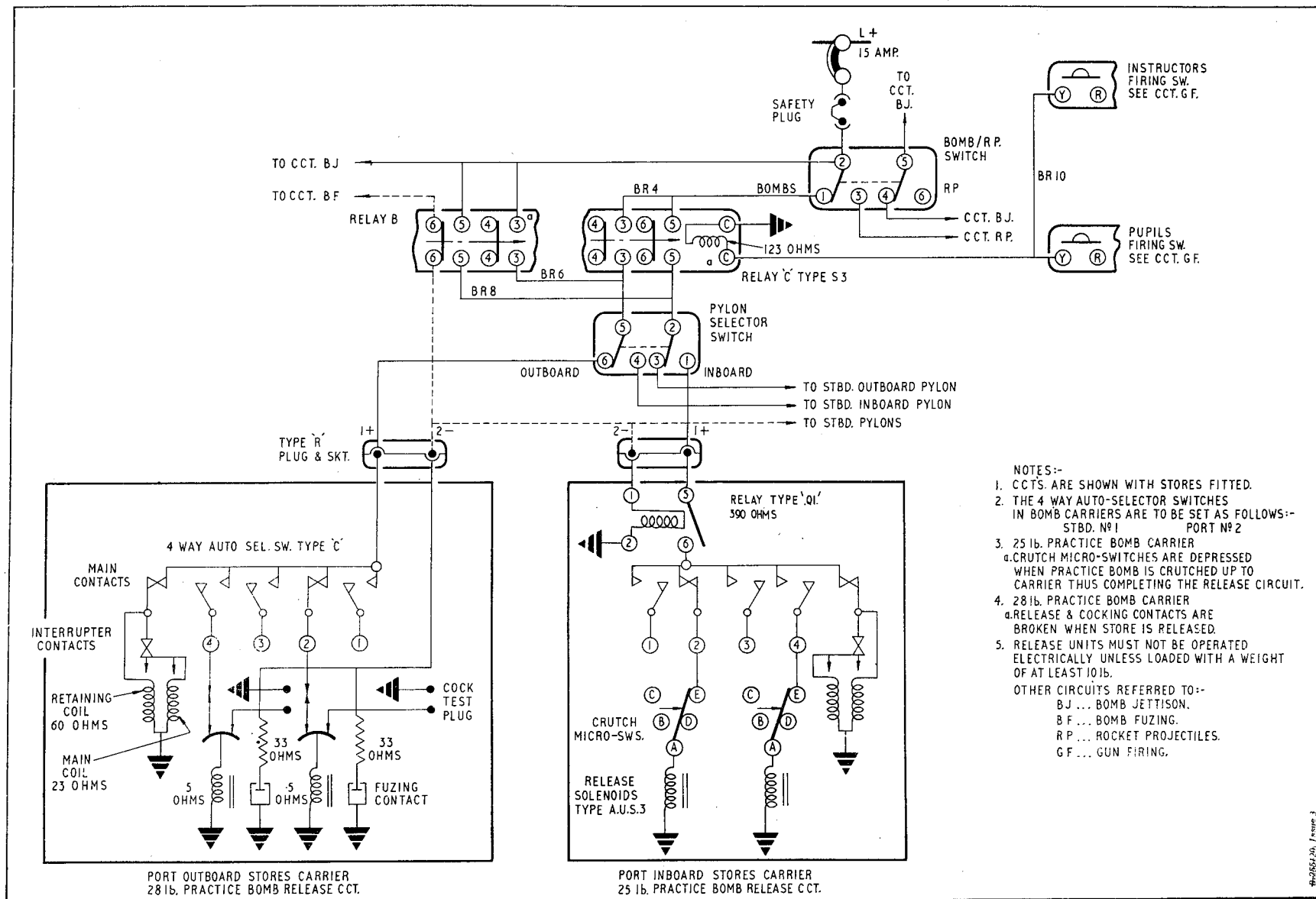


Fig.1 Store release (theoretical)

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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. The outboard pylons are selected for use by placing the pylon selector switch in the OUTBOARD position. With the Bomb/R.P. selector switch at BOMBS and the fuzing selector switch at FUZE a supply is available at contacts 3 and 5 of relay C and, via contacts 6-6a of relay B, to the fuzing contacts of each practice bomb carrier.

5. When either the pupil's or instructor's firing switch is pressed, the firing relay C is energized and its contacts 3-3a and 5-5a pass supplies 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 inches 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 INBOARD position is as described in Group G.1. The inboard pylon jettison circuit also remains as described in para. 14 of 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.

#### 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.

TABLE 1

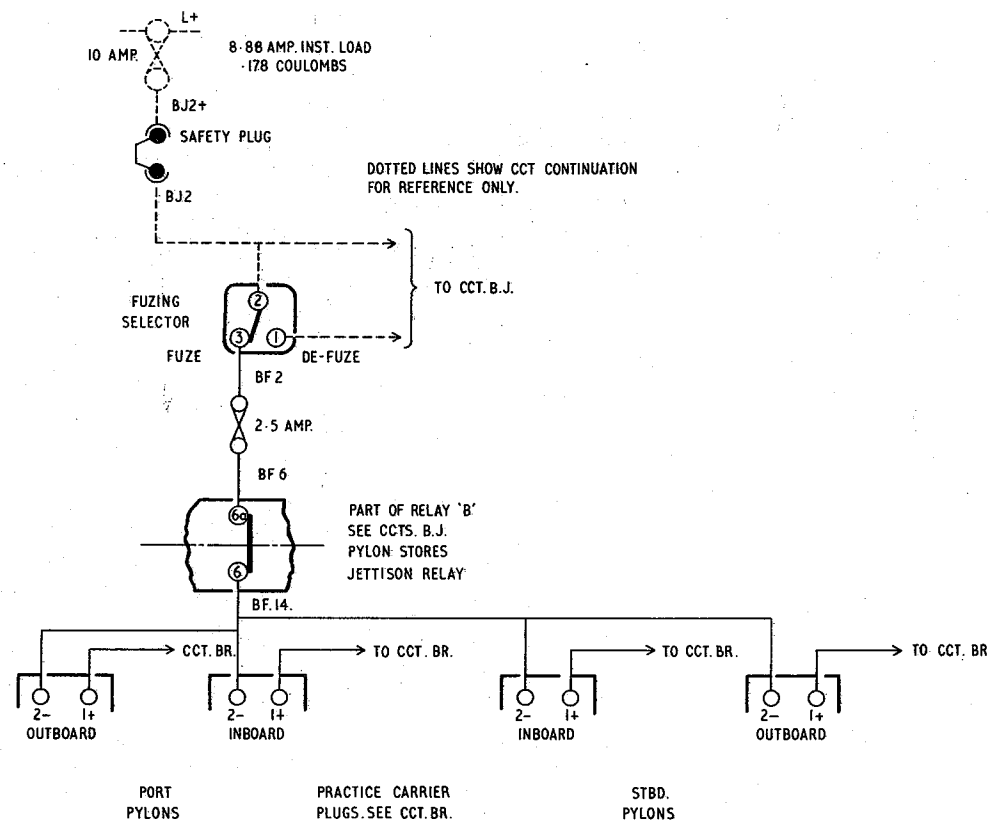
Equipment type and Air Publication reference

Equipment Type	Air Publication
Pylon selector switch, C.W.C. Type XD.789 No.3 ... ..	A.P.4343C, Vol.1, Book 1, Sect.1
Practice bomb carriers, 28 lb. ... ..	A.P.1664A (2nd. Ed.) Book 1, Sect.1
◀ E.R.U. control relays Type SM5A-M4 ... .. ▶	A.P.4343C, Vol.1, Book 2, Sect.3 ▶

#### 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 pylons is described in Book 1, Sect.3, Chap.2.



COMPONENT.	LOCATION.	OTHER CCTS. REFERRED TO...
PRACTICE CARRIER BUTT CONNECTORS	E.M.R.U. NO 1. MK. 2 HOUSING INBOARD PYLONS	B R ... BOMB RELEASE B J ... BOMB JETTISON
OR PRACTICE CARRIER PLUGS		
	OUTBOARD PYLONS	
	INBOARD PYLONS	

THESE COMPONENTS ARE NOT PART OF THE BASIC AIRCRAFT.

Fig.2 Bomb Fuzing (theoretical)

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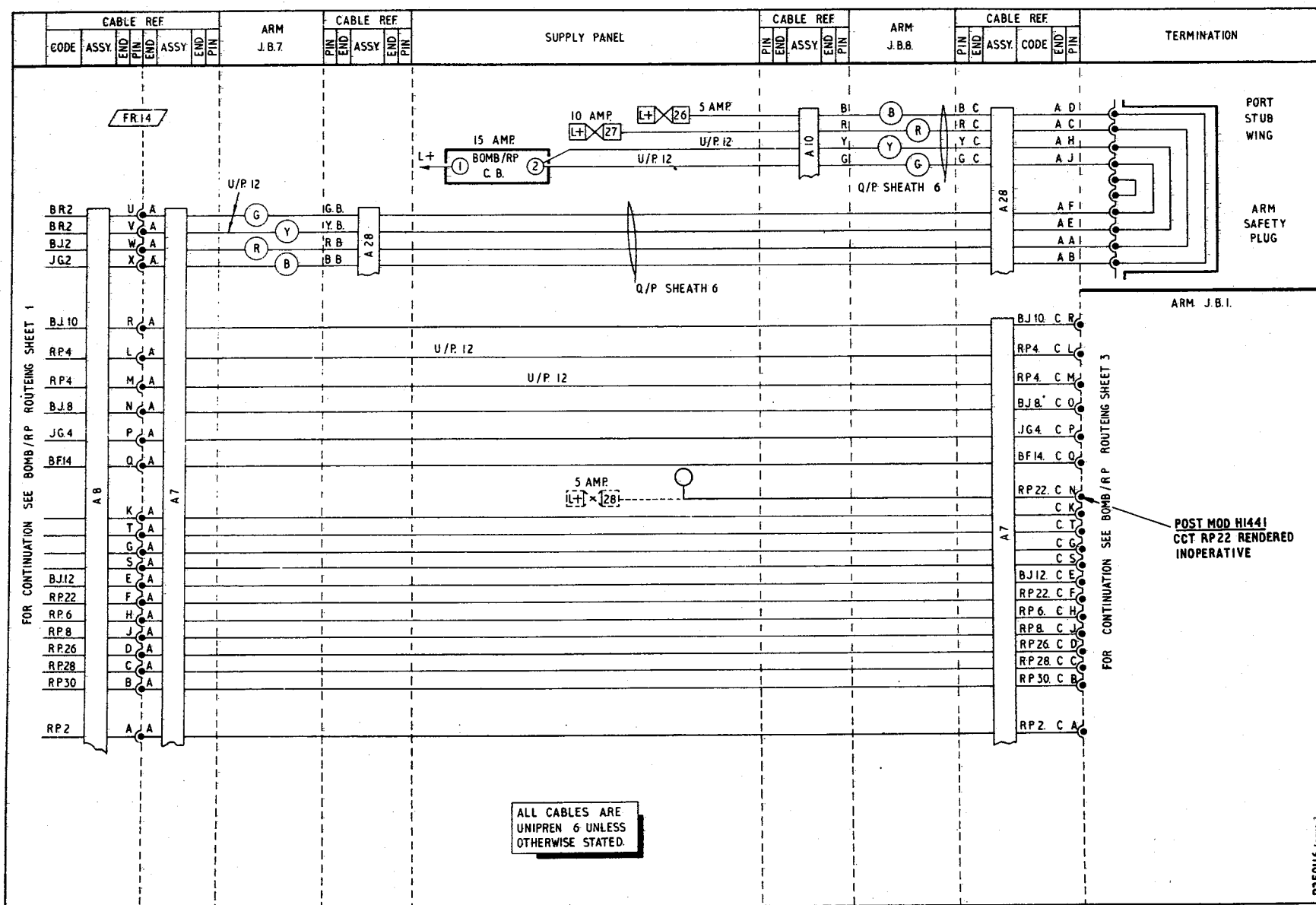


Fig. 4 Bomb/R.P. (routeing sheet 2)  
(Mod 1441 added)

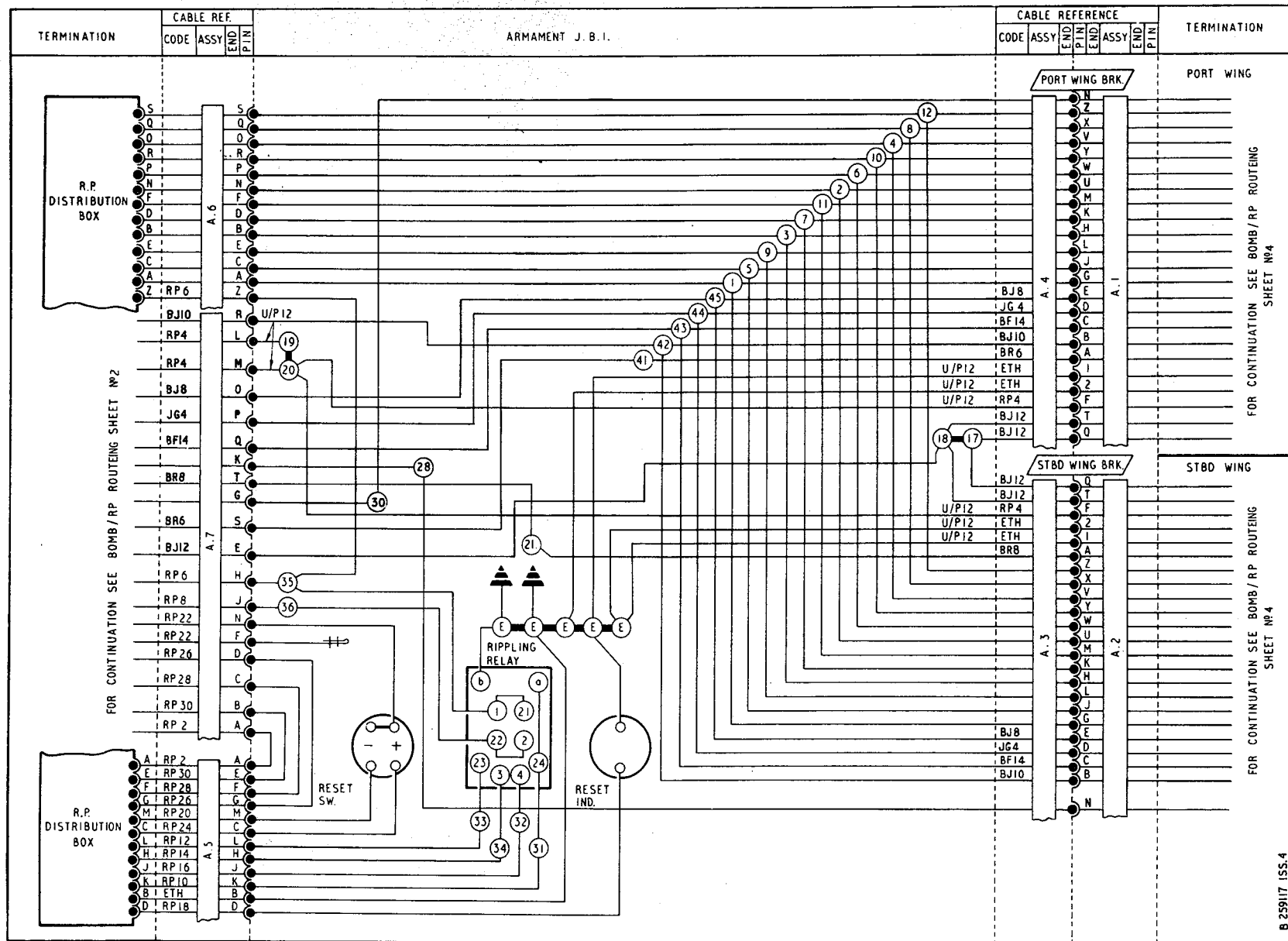


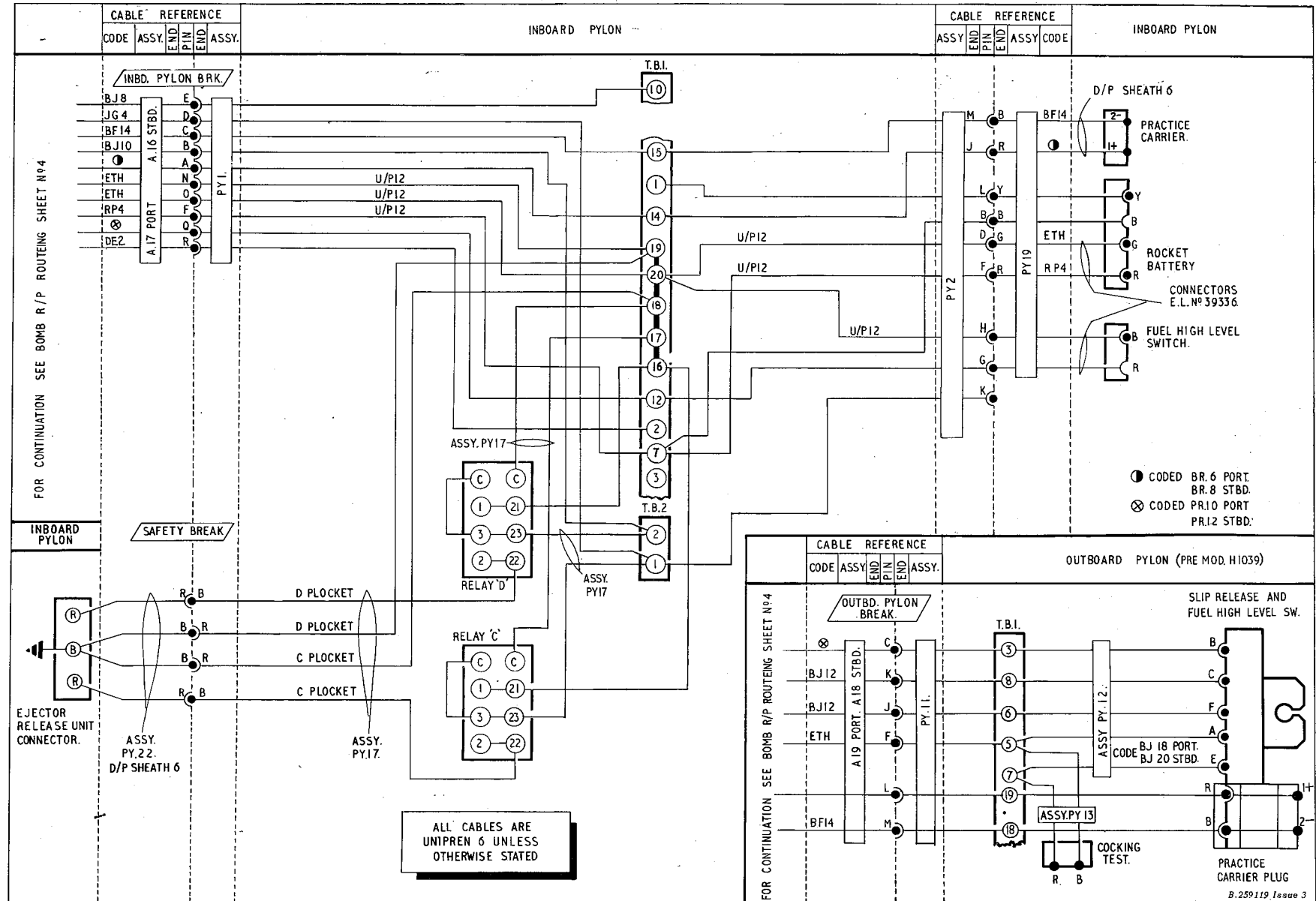
Fig. 5 Bomb/R.P. (routing sheet 3)

◀ (Mod 1441 added) ▶

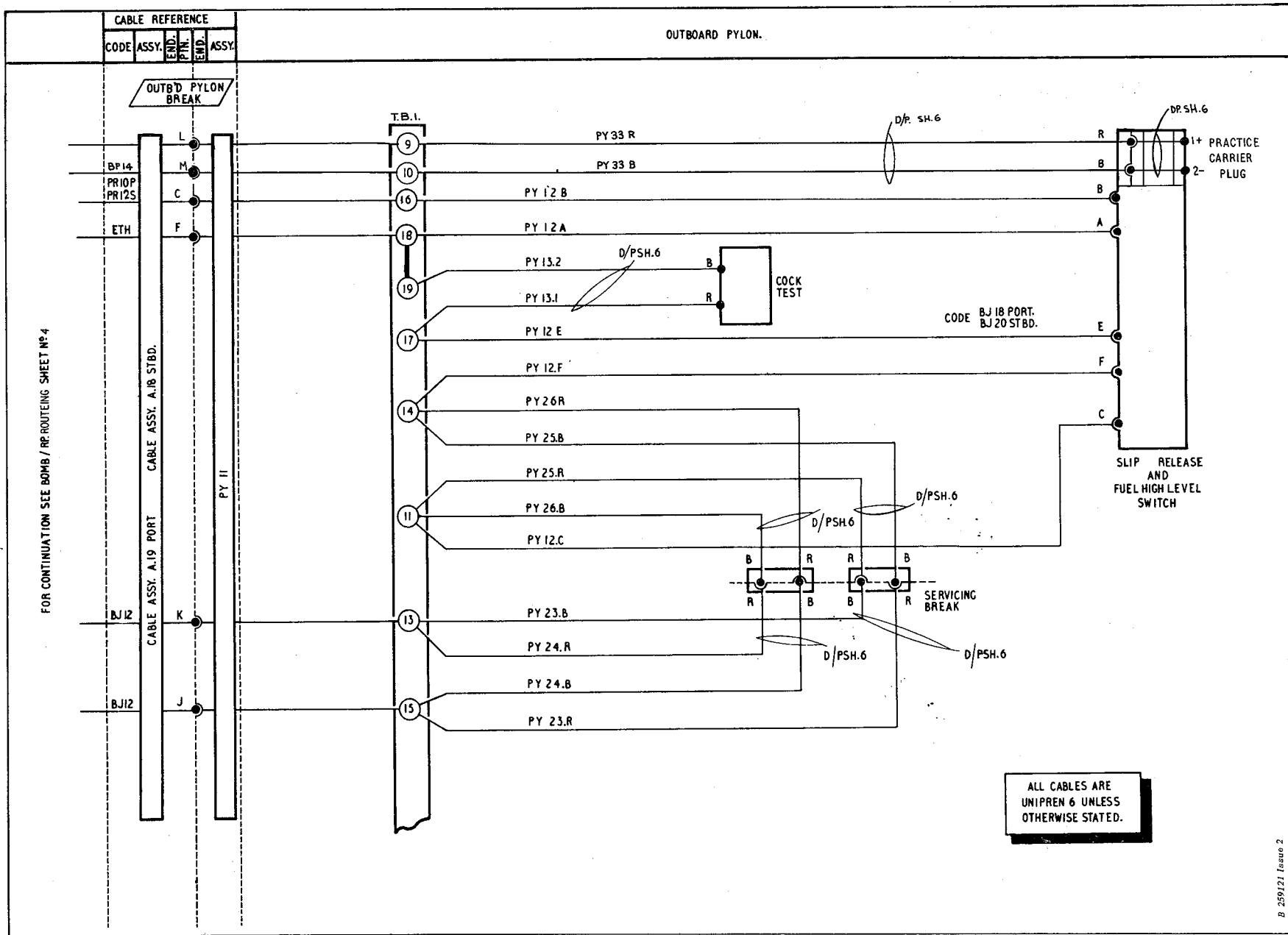


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A.P.101B-1306-1B, Sect. 5, Chap. 1, Group G.1, App. 1  
A.L.41, March 70



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**Fig.8 Bomb/R.P. (routeing sheet 6)**

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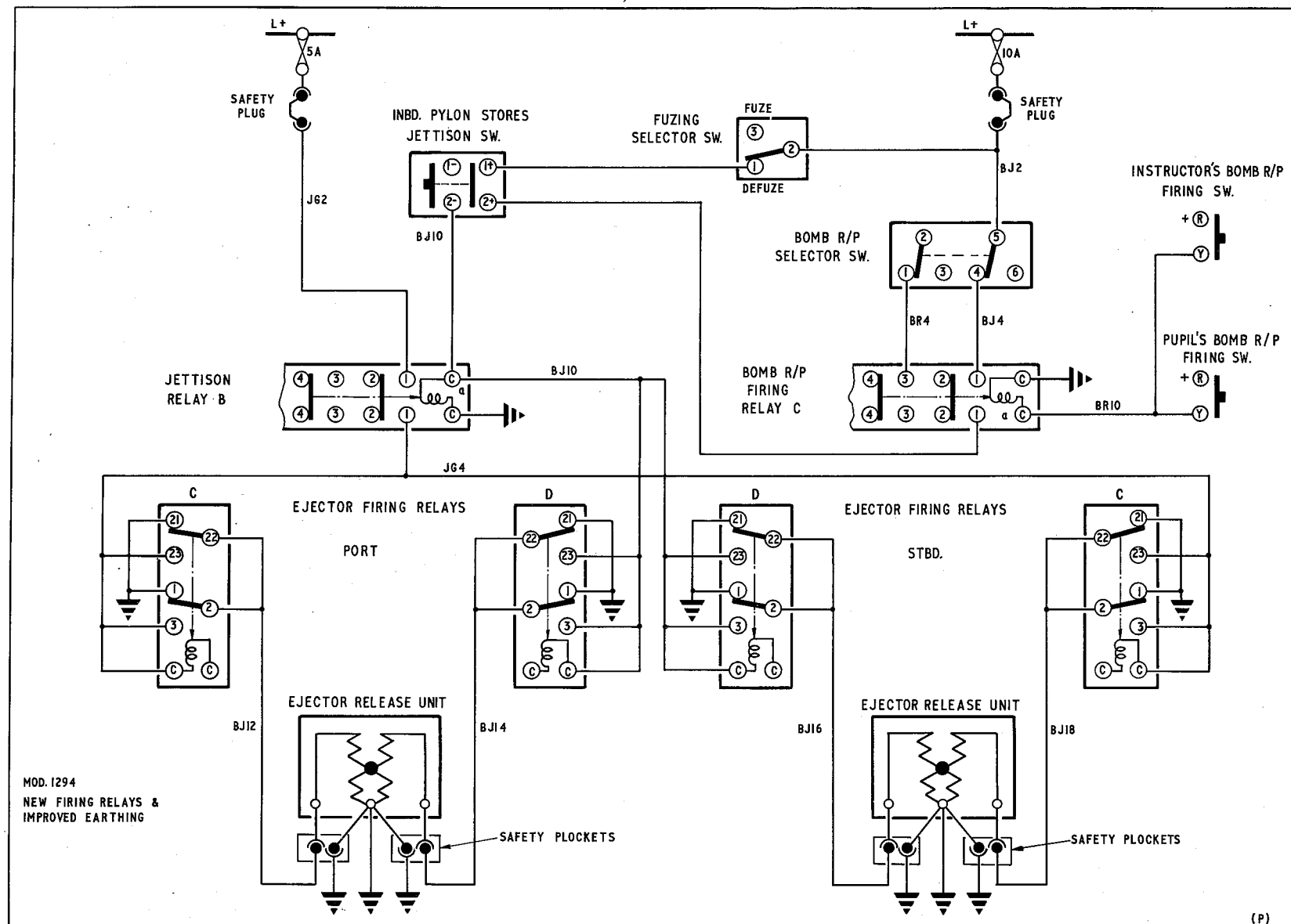


Fig. 9 Inboard pylons ejector release (theoretical)

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