

## Chapter 2B FIRESTREAK INSTALLATION

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◀ **General**

1. Technical and operational information relating to the guided weapon installation is given in Sect.5, Chap.7 of this publication which should be read in conjunction with this chapter. The Firestreak weapon pack is interchangeable with the Red Top weapon pack and carries two Firestreak missiles mounted one on each side. The missiles are fitted horizontally on pylons at the aft end, and are provided with electrical supplies through butt type connectors attached to the pylons and launching shoes. The missiles are also provided with a supply of engine air to prevent moving parts icing-up during pre-launch flight. Prior to launch, cooling is required by the missile electronic circuits and the homing head photocells to prevent excessive temperature rises during flight. A 15 minute supply of liquid

ammonia at the rear of each launching shoe, and an air bottle stowed in the pack are used for this purpose.

2. Each missile can be jettisoned in an emergency by the operation of an ejector release unit which secures the launching shoe to the pylon. Details of the guided weapons, the weapon pack, and their components, with instructions for installing, operating and servicing the units are included in the Firestreak publications listed in Chap.2A. The following system operation is written with reference to fig.3 and 3A in Chap. 2A.

**Operation***Safety circuits*

3. With the armament safety break made, supplies are fed to the contacts of the

de-energized safety relay via AE2-AE211 and AA1-AA111, and also to the G.W. jettison microswitch assembly via AJ1-AJ111 and AJ2-AJ211.

4. When the alighting gear is set to UP, the safety relay is energized from fuse 123 via circuit GE1-GE111. Contacts 1-1a complete circuit AE211-AE212 to the weapon pack power unit via pin A of the green pack-break connector, and also supply the coil of the pack master relay (No.21) via pins C and D of the red pack-break connector. Contacts 3-3a provide a positive supply (AA111-AA112) for the pairs/singles switch, the arming switch, the firing triggers, the gun-sight caging push-button, the pupil's camera button, and the amendment master selector switch. Contacts 8-8a open to break the armament indicator test circuit AH1-AH141. ▶

## ◀ Automatic mode

5. With the armament master selector set to G.W., relay I is energized from fuse 101 via AC1-AC112 and a positive supply is passed to the C.R.T./L.F.S. switch (AC111) and the L.F.S. system (Sect.7, Chap.2). This supply ensures that the L.F.S. is not switched off when the C.R.T./L.F.S. switch is set to C.R.T. Contacts 3 of the selector complete circuit AA112-AA116 to energize relay T. The same supply is also fed to the coil of relay G and the missile pack via pin M of the red pack-break connector. In the pack, this supply is fed to the launching sequence unit via contacts of pack relays 21 and 22. Relay 21 is energized via pins C, D of the red pack-break connector from fuse 122-AE2-armament safety break-AE211-relay A contacts-AE212 to ensure that the missile does not disarm when the armament master selector is set to GUNS. Relay 22 is energized when either of the firing triggers is pressed (para.16).

6. With relay I energized, the 'guided weapons selected' signal line (227) is connected to the AI 23C system.

7. With the C.R.T./L.F.S. switch set to C.R.T., the positive supply on AC111 is fed to the A.I. system via switch contacts 5, 4 and 230 ('L.F.S. OFF' signal line). Switch contacts 2, 3 connect a return supply from the AI system to energize relay D via 226-226a.

8. Selection of the arming switch to ARM energizes relay E (via AA118), and relay 24 in the missile pack via pin O

of the red pack-break connector. Relay 24 energizes to connect the positive supply AE1 from fuse 308 to the missile launching sequence unit via pin B of the green pack-break connector and contacts of pack relays 21 and 24. This supply is extended via the missile pack circuits to energize the hydraulic alternator start valve and cold air valve solenoids, and also to the missiles to start the arming sequence.

9. An output from the launching sequence unit is now fed back to energize relay S via pin R of the red pack-break connector and AH112. Relay R is energized in turn from fuse 1 via AH1-relay S contacts - AH114. This supply is extended to the armed time indicator and also, via diode 17 and AH118, to the ARMING caption lamps in the armament indicator.

10. Approximately two minutes after selecting ARM, the missile arming sequence is completed and the feed back from the launching sequence unit switched off. Relay S is now de-energized to complete a circuit to the ARMED caption lamps in the armament indicator from fuse 1 via AH1 relay S contacts, AH119, relay R contacts, AH120, relay U contacts, AH121, rectifier 20 and AH122.

11. With the pairs/singles switch set to PAIRS a positive supply is fed to the launching sequence unit via AA112-AA141 and pin P of the red pack-break connector. This supply is used to modify the launching sequence circuits so that both missiles can be released on acquiring the target. If the switch is set to

SINGLES this supply is disconnected and only the first missile to acquire the target will be released.

12. During the attack sequence the missile slaving unit in the weapon pack is fed with slaving signals and a stabilized reference voltage from the AI 23C system. These signals are passed to the pack via the yellow pack-break connector as follows:-

pin E, core 107 - YAW SLAVING

pin F, core 108 - PITCH/YAW SLAVING  
COMMON

pin G, core 106 - PITCH SLAVING

pin H, core 17 - 40V, 3kHz, phase B

pin J, core 16 - 40V, 3kHz, phase A

13. When the port missile acquires the target a positive supply is fed from the launching sequence unit via pin C of the yellow pack-break connector, core 42a, rectifier 10 and AH123 to the EVENT 1 caption lamps in the armament indicator. This supply is also fed direct to the light fighter sight and, via rectifier 9 and core 42, to the AI 23C indicator, to illuminate the 'acquired' event markers.

14. Similarly, when the starboard missile acquires the target, a positive supply is fed from the launching sequence unit via pin B of the yellow pack-break connector, core 43a, rectifier 4 and AH124 to the EVENT 2 caption lamps in the armament indicator. This supply is also fed direct to the light fighter sight and, via rectifier 6 and core 43, ▶

to the AI 23C indicator, to illuminate the 'acquired' event markers.

15. When the aircraft is within firing range of the target, a signal generated in the AI 23C system is used to illuminate the 'in range' markers on both the AI 23C indicator and the light fighter sight, and also to prepare the launch warning circuits. These circuits supply the armament system via cores 83 and 84, contacts 1F-H and 2F-H of relay D, AA135 and AA126, contacts 1F-H and 2F-H of relay E, AA136 and AA127 to contacts 1F and 2F of relay F. The supply on AA127 is also passed via contacts 3F-H of relay D and AA128, diode 14, AA129 to energize relay V, whose contacts close to operate the G90 camera (*Sect.7, Chap.2*).

16. Operation of either the pupil's or instructor's firing trigger completes circuit AA112-AA121 to energize relay F. Contacts 4F-H close to supply the engine relight circuit (*Chap.7*) via AA123. Contacts 1F-H close to complete the firing line (83) from the A.I. system to the missile pack via relay D contacts 1F-H-AA135-relay E contacts 1F-H-AA136-relay F contacts 1F-H-AA137-relay T contacts 1F-H-AF215-AI 23C system-783-pin E of the red pack-break connector. This supply energizes the pack relay 22, whose contacts close to complete the circuit from pin M of the red pack-break connector (AA116) to the launching sequence unit to initiate the firing sequence. Contacts 6H-F of relay F extend the firing-trigger circuit to relay 47, in the A.C./D.C. fuse and relay box, to illuminate event markers on the AI 23C indicators and recorder visual (*Sect.9, Chap.3*). With 'L.F.S.' selected, the positive supply on AA112 is fed via contacts 3H-F (relay T, G.W. select), AA125, contacts 2B-H (relay D, auto/manual), AA126, contacts 2F-H (relay E, arming), contacts 2F-H (relay F, fire committal), contacts 2F-H (relay T, G.W. select), AA133 and contacts 5H-B (relay D, auto/manual) to relay 46, in the A.C./D.C. fuse and relay box, which energizes to illuminate additional event markers on the AI 23C indicators and recorder visual. ▶

17. Provided that both missiles have been fired, an intermittent positive supply is fed from the launching sequence unit, via pin R of the red pack-break connector and AH112, to the coil of relay S, causing the ARMED caption lamps on the armament indicator panel to flash. The intermittent operation of relay S has no effect on the supply to the armed time indicator as relay R is still held in the energized state by its hold-in circuit (*para.10*).

18. Should either missile fail to fire after having received a firing signal, the appropriate pack safety relay is energized to complete a circuit to its associated misfire indicator, which is extended to indicate that the missile has received the signal.

19. If the weapons have been in the armed condition for a period of 15 min (on the armed time indicator) the ammonia supply in the pack, which is used for cooling the missiles, will be exhausted, and the missiles cannot be fired. To draw attention to this fact, the armed time indicator contacts close, putting a supply from fuse 1 - AH1 - AH131 - to relays AC and U. This circuit, when in operation will cause the ARMED lamp to flash, and remain flashing until the SAFE position is selected. Should both weapons have been fired, or a fault in the pack's hydraulic alternator system develop, the ARMED lamp will commence to flash due to an intermittent supply AH112 from the pack (pin R) being applied to relay S.

#### Manual mode

20. The sequence of operations for a manual attack is identical to that for an automatic attack (*para.5-19*), with the following exceptions:-

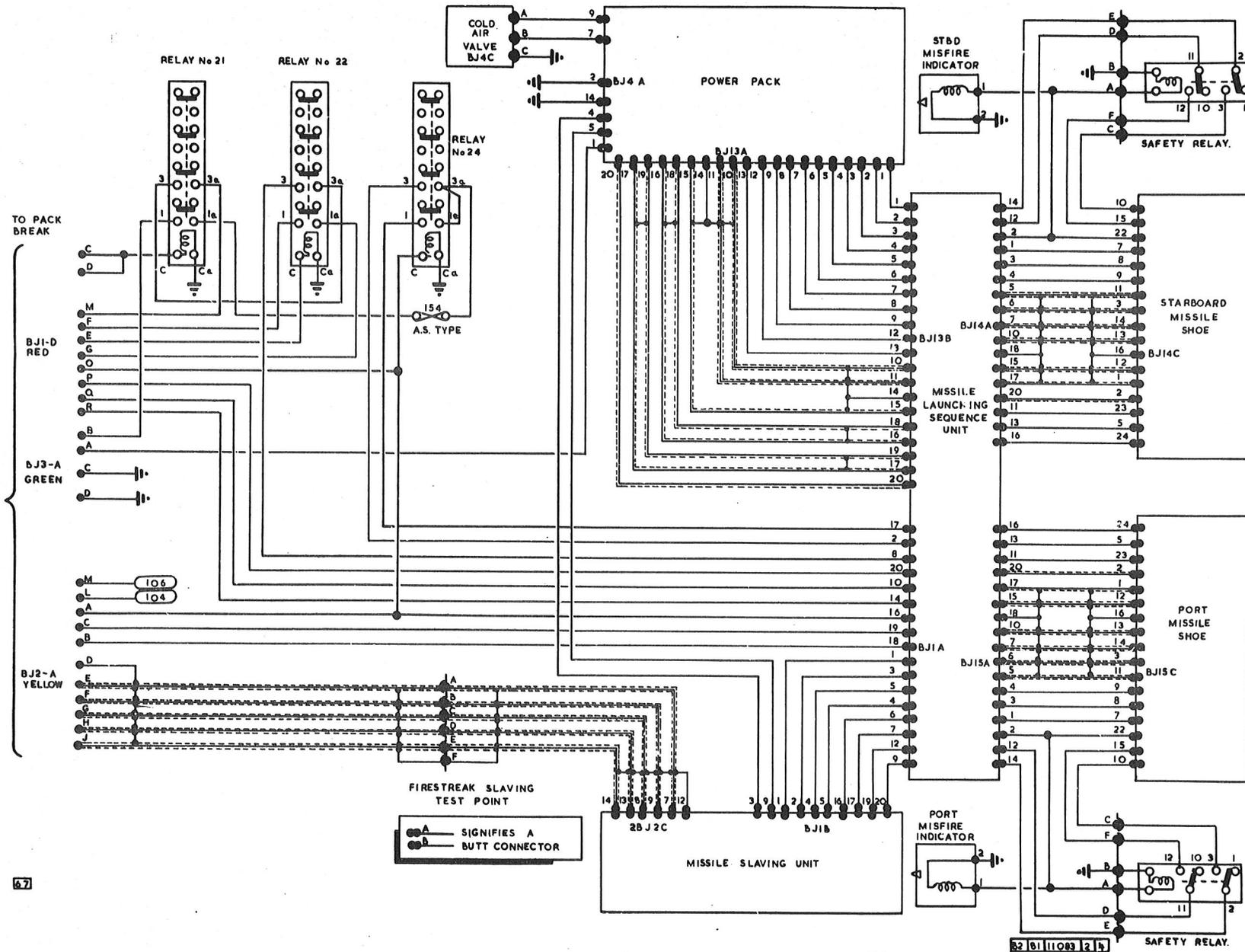
(1) The C.R.T./L.F.S. switch is set to L.F.S., breaking the circuit (226-226a) to relay D, which remains de-energized.

(2) The launch warning supply is now provided from fuse 61 (AH1) via contacts 3H-F of relay T AA125, contacts 2B-H and 1B-H of relay D, AA126 and AA135, contacts 2F-H and 1F-H of relay E, AA127 and AA136, to contacts 2F and 1F of relay F. From contact 1H of relay F, the supply is fed as in the automatic mode (*para.16*) to the missile pack.

(3) The supply to the G90 camera circuit is provided from contacts 3F of relay F, AA122, contacts 3B-H of relay D, AA128, diode 14 and AA129 to relay V operating coil. Also, the 'in-range' signal from the AI 23C via 84 energizes the Telford recorder camera (*Sect.7, Chap.2*). Both cameras are inoperative until the firing trigger is pressed.

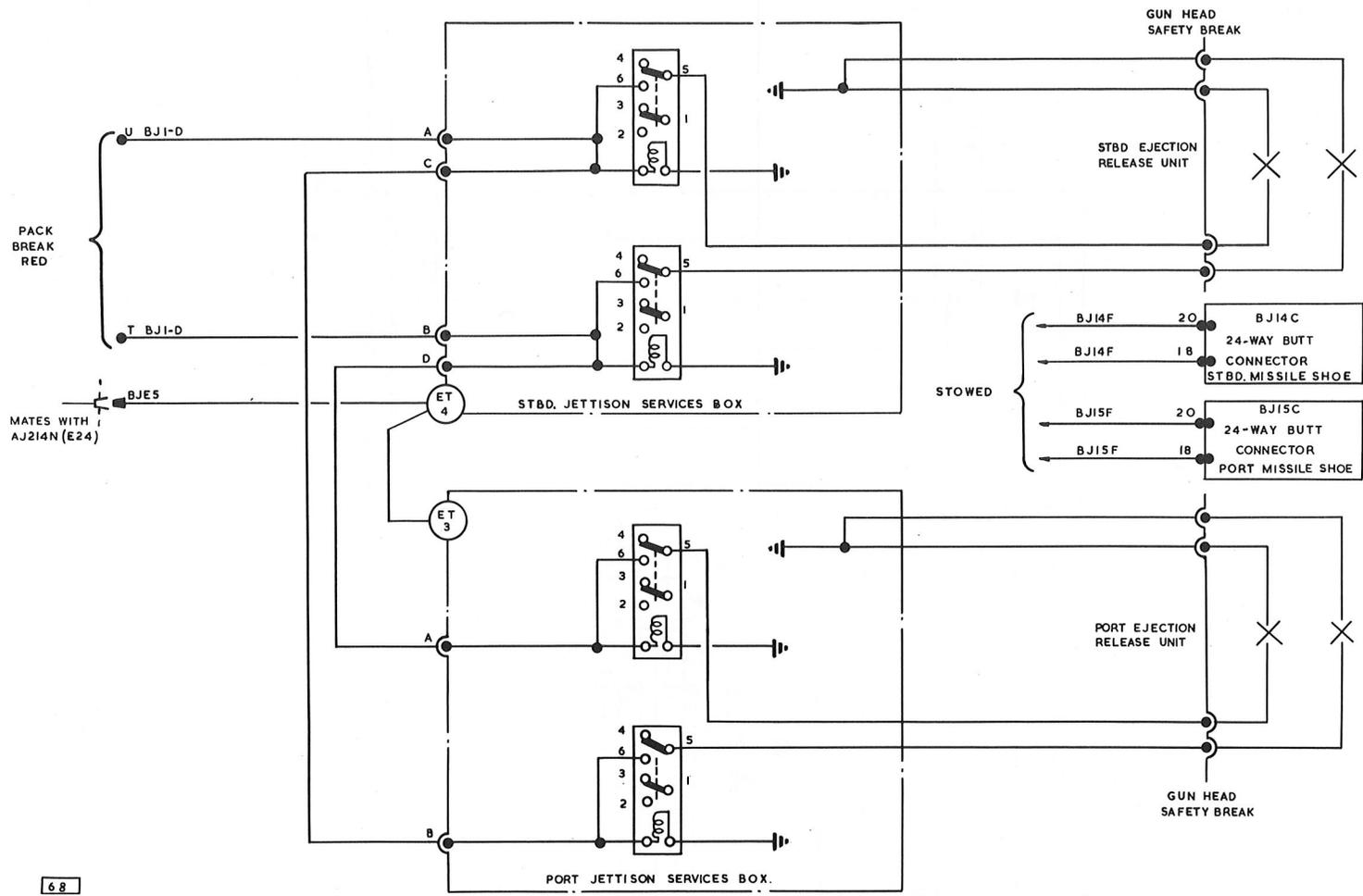
#### G.W. jettison

21. In an emergency, and provided the armament safety break is made, the missiles can be jettisoned by the manual operation of the jettison microswitch assembly which is housed in the ventral tank jettison handle. Operation of the microswitches completes circuits AJ111-AJ113 and AJ211-AJ213, via pins T and U of the red pack-break connector, to energize the four jettison relays in the pack. The relays complete circuits to the port and starboard ejector release units, which fire to release both missiles and launching shoes.



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FIG.1. FIRESTREAK PACK - GENERAL SERVICES



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82 81 11083 4

FIG.2. FIREBREAK PACK - EMERGENCY JETTISON

◀MINOR AMENDMENTS▶

RESTRICTED



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