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CHAPTER 5

GUIDED WEAPONS INSTALLATION

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Introduction

1. This Chapter describes the electrical circuitry used in the launching of Sidewinder guided missiles. The servicing diagrams associated with this Chapter and information regarding location of components complete with a list of associated Air Publications is contained in the relevant chapter of A.P.101B-1202-10B.

2. For details of the basic armament controls, reference should be made to Chap. 2 of this Section. For details of the jettison circuits, reference should be made to Chap. 8.

Modification standard

3. This Chapter includes Mod 751, 951, 1033, 1105, 1157A, 1168A, 1190A, 1430, 1577, 1589, 5030, 5031, 5082, 5106, 5141, 5153, 5196 and 5197.

Missile pylon

5. Each missile pylon can be adapted to carry a Sidewinder missile. Electrical connection with the aircraft is via a 54-pole plug fitted on a junction box at the front end of the pylon, the junction box contains a relay and a time delay unit used in the missile jettison circuit (*Chap. 8, this Section*).

GENERAL DESCRIPTION

4. The guided weapons installation provides for the launching of a Sidewinder air-to-air missile from a pylon at either outboard wing station 3 or 4.

6. For the carriage of a Sidewinder missile, a launcher adapter (*para 14*) is fitted to the pylon. A cable from the pylon junction box connects to a receptacle on top of the Sidewinder launcher adapter.

SIDEWINDER

General

7. Provision is made on the aircraft for the carriage and launching of one Sidewinder air-to-air guided missile. The missile is carried on an Aero 3B launcher bolted to an adapter which is attached to a missile pylon at either the port or starboard outer wing station.

8. The SOO equipment required for the carriage of Sidewinder missiles includes:-

A Sidewinder launcher adapter (Mod 5153)

A missile pylon (Mod 5196)

9. The Sidewinder guided missile employs passive infra-red target detection and since it homes on to infra-red energy radiated by hot parts of the target, it requires no auxiliary equipment for guidance.

10. While a missile is on the aircraft launcher, standby electrical power is provided from the aircraft supply to the launcher and thence via an umbilical connector to the missile. The control and guidance unit within the missile receives, from the target area, signals which govern the strength of an audio signal tone received in the pilot's headset. This tone assures the pilot that the missile tracking system is working, and that the missile is on target. The intensity of the tone varies with the strength of the target signals.

11. After the missile is launched from the aircraft, the control and guidance unit independently homes the missile to the target by continuously converting target signals into missile-control and constant-bearing signals. Consequently, action by the pilot is confined to aiming and then

firing the missile in the target area; all corrections necessary to hit the target are originated in the control and guidance unit in the missile.

DESCRIPTION

Aero 3B launcher

12. The Aero 3B guided missile launcher consists essentially of a rail assembly to which is attached a power supply unit and a detent and snubber assembly, the whole being enclosed by nose and centre covers and an aft fairing.

13. The power supply unit is self contained and is fed with d.c. and a.c. supplies from the aircraft. It contains an audio amplifier for

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amplification of the missile signal, and four relays which control the power supply to the missile and the firing of the rocket motor. Further details of the Aero 3B missile launcher are in A.P.118M-0503-1.

Sidewinder launcher adapter

14. The Sidewinder launcher adapter enables the Aero 3B missile launcher to be fitted to the missile pylon (para 5). The adapter contains a power interlock relay which controls the d.c. and a.c. power supplies to the launcher.

Selector control panel

15. The selector control panel C-GR on the port side of the observer's cockpit carries two double-pole switches, one marked STN 3-STN 4 and the other marked UNARMED-OFF-ARMED, to facilitate the selection of the missile and type of launch to be made.

Audio control unit

16. The audio control unit, U, mounted on panel C-G/2 on the pilot's port console, provides control over the audio signal tone from the missile fed via the CASS to the pilot's headset (Cover 2, Sect. 8, Chap. 2). Mounted on the unit are a single-pole changeover switch, B, marked SIDEWINDER ON-OFF, and a potentiometer, C, marked VOLUME. The switch controls the transmission of the signal tone to the pilot's headset, and the potentiometer enables the noise level in the headset to be adjusted as required.

OPERATION (fig 1, 2 and 3)

Note...

In the following sequence of operations it is assumed that a Sidewinder missile is attached to station 3 (port outer wing station).

Preparation

17. With power available at the aircraft d.c. and a.c. busbars and a Sidewinder missile attached to the launcher, a 28-V d.c. supply from fuse C4 is fed to energize power interlock relay B in the Sidewinder launcher adapter, the earth return circuit for the relay being completed via the launcher and missile.

18. Contacts 3-2 of relay B connect the a.c. supply from fuse 1B3 to pin J on the Sidewinder launcher, and contacts 23-22 connect the d.c. supply from fuse C4 to pin B.

19. When the aircraft becomes airborne, circuit protection relay C is energized and contacts C6-5 and C9-10 close to prepare the circuits to secondary firing relays B and A respectively.

Launching - missile armed

20. With the attack selector set to MANUAL RR or MANUAL DSL, and the weapon selector switch set to SIDEWINDER, a d.c. supply from fuse N6 is fed to energize relay Ba, contacts 9-10 of which close to connect the 28-V d.c. supply from fuse B12 to pin C on the Sidewinder launcher. A time

delay unit in the engine auto-relight circuit (Cover 1, Sect. 6, Chap. 4) also receives a supply from fuse N6; the delay unit is energized on operation of firing relay A when the weapons release trigger switch is depressed (para 23). Further d.c. supplies, from fuses C5 and N2, are fed to the attack system control and release computer (Cover 2, Sect. 9, Chap. 4), resulting in the computer release circuits being inhibited. The supply from fuse C5 is also fed to the open contacts of the weapons release trigger switch.

21. On the approach to the target, the accept switch is operated. This connects the 28-V d.c. supplies from fuses M3 and N2 to the control and release computer, resulting in the start of radar ranging and the modification of the display on the pilot's display unit. The arming switch is selected to ARMED, the station selector switch to STN 3, and the audio control switch to ON, with the associated volume control adjusted for maximum volume.

22. When the missile 'sees' the target, an audio signal tone is generated in the missile guidance electronics and is transmitted via pin M of the Sidewinder adapter and the audio control unit to the pilot's headset.

23. Launching of the missile is effected by pressing the weapons release trigger switch on the control column. This results in the d.c. supply from fuse C5 energizing secondary firing relays A and B.

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24. The closing of contacts 5-6 of relay A connects a d.c. supply from fuse N6 to the arming switch. With ARMED selected, the supply is fed via the station selector switch to pin A on the Sidewinder launcher, resulting in the missile being launched. The supply from fuse N6 is also fed to energize the time delay unit in the engine auto-relight circuit via contacts A12-13.

25. Contacts A2-3 and B2-3 of the firing relays connect d.c. signals via resistors R2 and R3 in the SCR module, to the gate electrode of SCR VT1. This causes VT1 to be triggered into conduction and complete the earth return circuit for the stores release indicator lamp, which is then illuminated. Contacts A2-3 also route a d.c. signal via resistor R1 in the SCR module, to the weapons system performance recording

system.

Launching — missile unarmed

26. Using the normal jettison facility (*Chap.8, this Section*) results in the unarmed launch of the missile. Although the aircraft Sidewinder installation includes a missile arming switch to provide for an unarmed launch using the pilot's trigger switch, there is no wiring for this circuit in the missile pylon.

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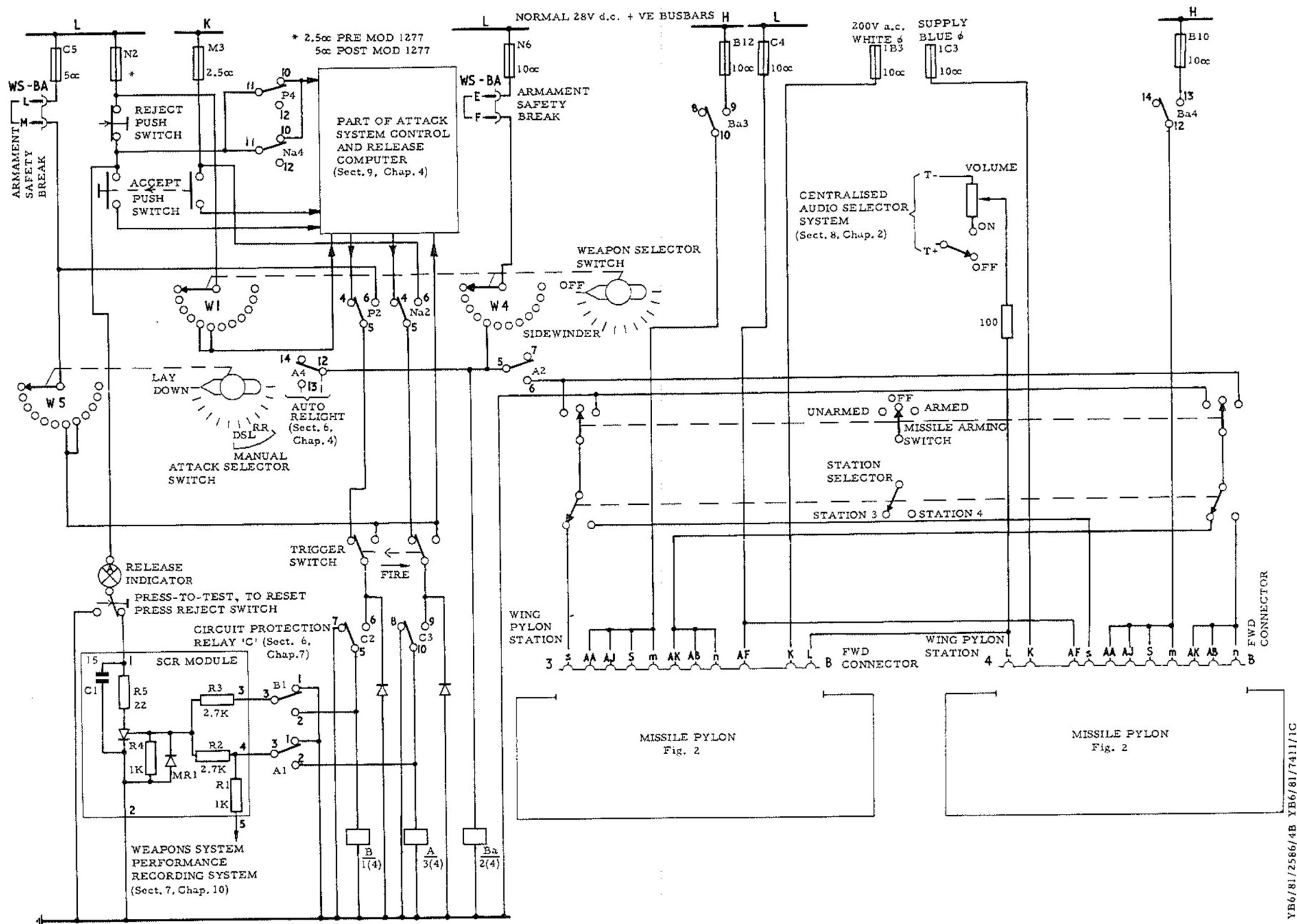


Fig.1. Sidewinder release - theoretical

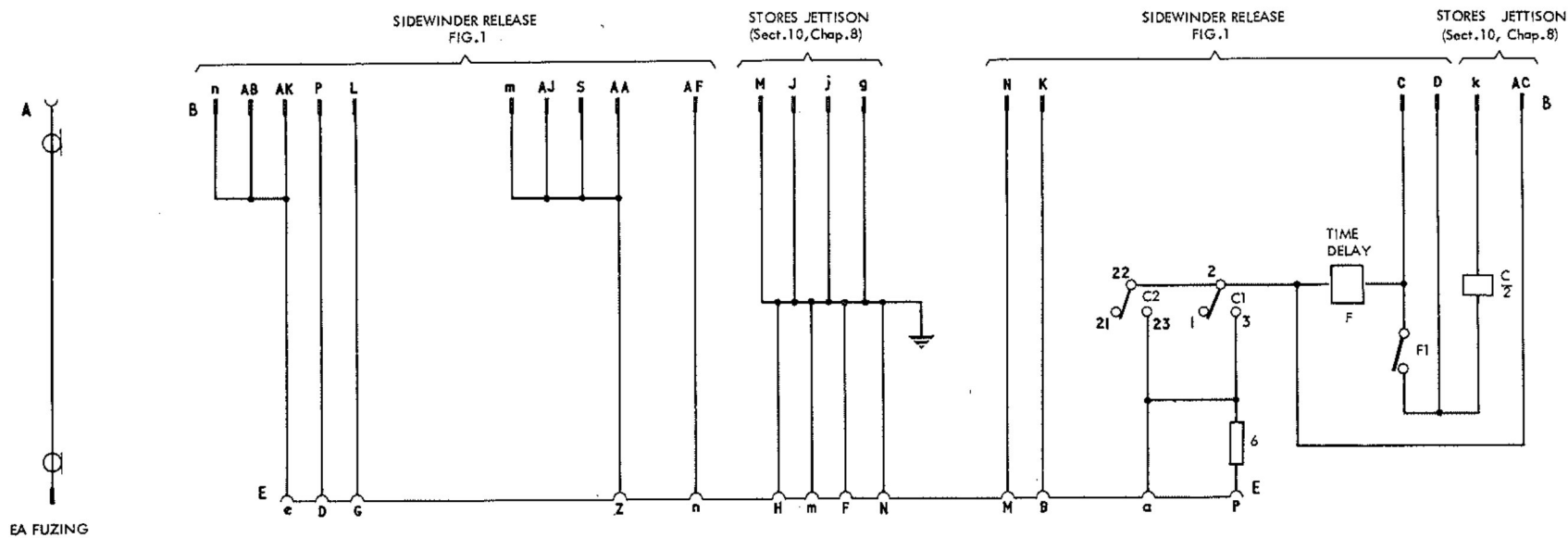


Fig.2. Missile pylon - theoretical

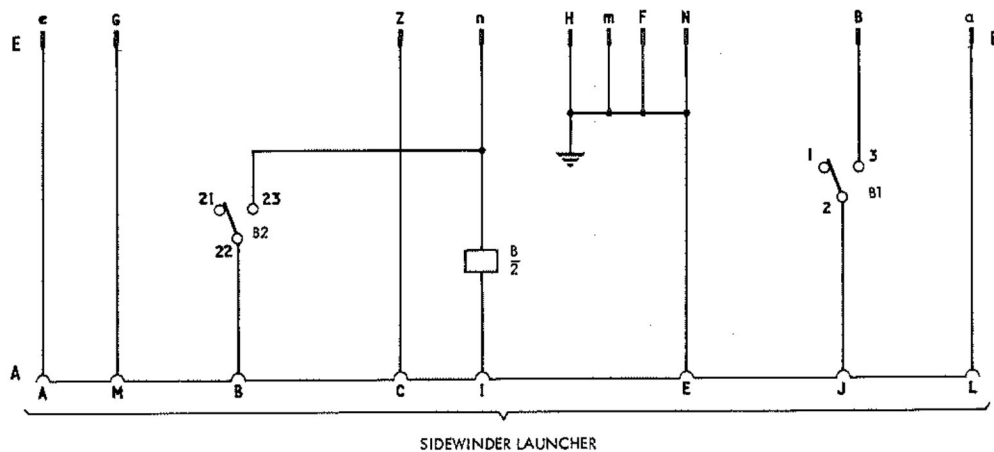


Fig.3. Sidewinder launcher adapter - theoretical