

Chapter 1 TACAN

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DESCRIPTION

General

1. The Tacan navigational system (A.R.I.18107) provides continuous meter readings showing the bearing and distance position of the aircraft with respect to a beacon to which the Tacan equipment is tuned. It also provides aural indication to the pilot and a flag alarm signal should the correct distance signals fail.

2. In addition to the normal air-to-ground operation of Tacan, an air-to-air facility is available when Mod.2334 is fully incorporated. In this mode, range indication only between two aircraft is shown on the display unit, such as during flight refuelling when it is required to know the range of the tanker aircraft.

3. The Tacan system can be selected to operate in any one of 126 crystal-controlled channels in a 962-1214 Mc/s band. Each channel covers two frequencies, one for air-to-ground interrogation and the other for ground-to-air responses. Each beacon radiates a recurring morse signal which can be heard in the pilot's headset, enabling him to identify the beacon.

4. Both bearing and range information is shown by the navigation display unit of the flight instrument system. The installation includes an offset computer which can be set to modify the direct Tacan signals so that the display unit presents both range and bearing of an off-set homing point other than the Tacan beacon.

The main components of the Tacan system are:-

- Transmitter/receiver
- Mounting tray for the above
- Coupler/indicator unit
- Control unit
- Aerial
- Off-set computer

A full description of the Tacan system, its equipment and function, will be found in A.P.2534N, Vol.1.

Transmitter/receiver

5. The aircraft may be fitted with either a Type RT.220C-ARN-21C transmitter/receiver or a Type RT.636-ARN-72, the former caters for normal air-to-ground Tacan, the latter covers air-to-

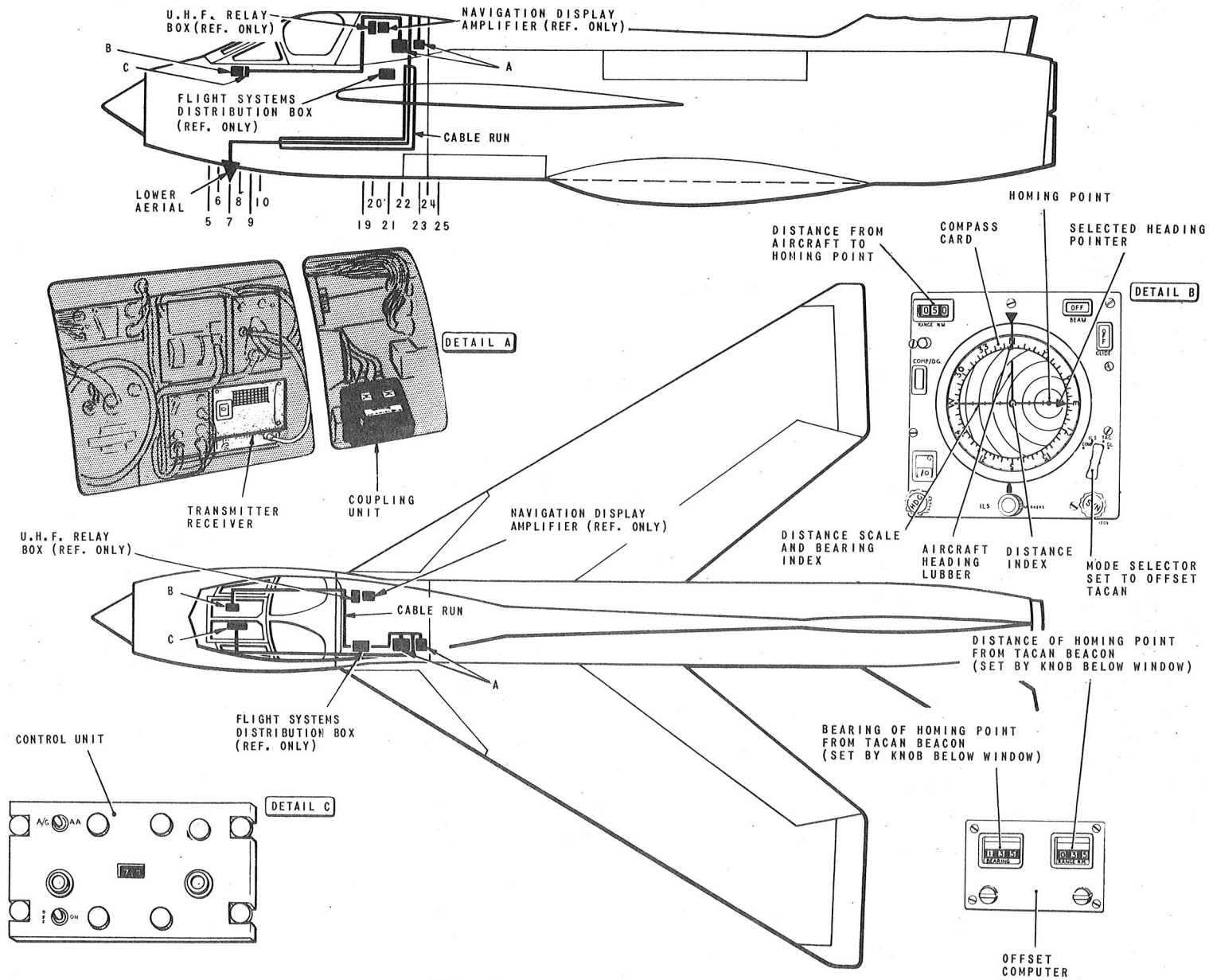


FIG.1. TACAN SYSTEM DETAILS

RESTRICTED

ground working and also provides an air-to-air facility. In either case, the transmitter/receiver is fitted to a mounting tray and located in the front spine compartment. The tray is secured to the aircraft and holds the transmitter/receiver by two spring-loaded locating spigots at the rear, and at the front by dual purpose securing screws which engage in fittings on the set. When these latter screws are undone, a split skirt on the screw collar engages under a claw on the front of the set, which is gently withdrawn from the mounting.

6. With the exception of the aerial socket on the front panel, all connec-

tions to the unit are at the rear through a 45-way socket which mates with a plug on the mounting tray when the transmitter/receiver is secured in position. An integral blower motor cools the unit by circulating cold air fed from the equipment cooling system.

Mounting tray

7. The transmitter/receiver's spring-loaded mounting tray incorporates a polythene cloth air filter fitted in the base of the tray. This filter protects the internal equipment of the set from dust. Cold air is fed from the equipment cooling system via ducting, to a point below the tray. The air is then drawn through the filter and the

unit, to be expelled through louvres into the transmitter/receiver cover.

Coupling/indicator unit

8. The coupling/indicator unit located in the spine compartment, receives output signals from the transmitter/receiver and transcribes them into bearing and distance components before passing them on to the integrated flight instrument system. The dial readings of the unit coincide with the bearing of the Tacan beacon from the aircraft and are used for checking and adjusting the equipment.

Control unit

9. The Tacan control unit located on

TABLE 1
Equipment details

| Equipment | Location | Access | Air Publication |
|---|---|-------------|-----------------|
| Transmitter/receiver unit, Type RT. 220C-ARN-21C Ref. No. 10D/22927 or Type RT. 636-ARN-72 Ref. No. 10D/26801 | Front spine compartment, port side As above | 16P | 2534N, Part 2 |
| Control unit, Type 9273 Ref. No. 10L/16324 or Type 9273/A | In cockpit on the extension panel | Via cockpit | 2534N, Part 2 |
| Coupler/indicator unit, Type 13555, Ref. No. 10D/23349 | Front spine compartment, port side | 16P | 2534N, Part 2 |
| Aerial, Type 4169, Ref. No. 10B/19435 | Protruding from lower fuselage skin, nose wheel bay | | 2534N, Part 2 |

panel A1, may be one of two types, according to the transmitter/receiver in use. The Type 9273 control caters for normal air to ground mode in conjunction with a Type RT.220C-ARN-21C transmitter/receiver. If using a Type RT.636-ARN-72 set with the air-to-air facility, then the control unit must be a Type 9273A. The difference between the control units is that the BRG/DIST.BRG switch on the Type 9273 is altered to an AG/AA switch on the Type 9273A. ►

10. The control unit provides switching facilities for the power supplies to the equipment, selecting the appropriate channels for use, receiving bearing and distance information, and adjusting the volume of the beacon's identity tone in the pilot's headset.

11. The channel indicator numbers and faceplate lettering are lit by two miniature lamps incorporated in the unit. These lamps are controlled by the light-

TABLE 2
Fuses, circuits and location

| Fuse No. | Rating | Code | Circuit | Location |
|----------|--------|------|---------------------------|----------------------------|
| 33 | 7.5A | RH2 | D.C. supply to Tacan unit | A.C./D.C. fuse & relay box |
| 232 | 7.5A | XA7 | Tacan transformer input | A.C./D.C. fuse & relay box |
| 236 | 7.5A | XB7 | Tacan transformer input | A.C./D.C. fuse & relay box |
| 252 | 5A | XD2 | A.C. supply to Tacan unit | A.C./D.C. fuse & relay box |

ing system dimmers (*Sect.6, Chap.8*).

Aerial

12. The Tacan system uses a Type 4196 aerial in the shape of a shark's fin. This blade is about 3 in. high and protrudes through the underside skin of the aircraft in the nose wheel bay. It is connected to the transmitter/receiver by co-axial cable.

Power supplies

13. Power supplies of 28-volt d.c. and 115-volt, single-phase a.c. are required for the Tacan system. These are taken from the normal aircraft electrical systems, their routing being shown on fig.2. The offset computer receives its supplies from the navigation amplifier of the integrated flight system (*Sect.7, Chap.3*).

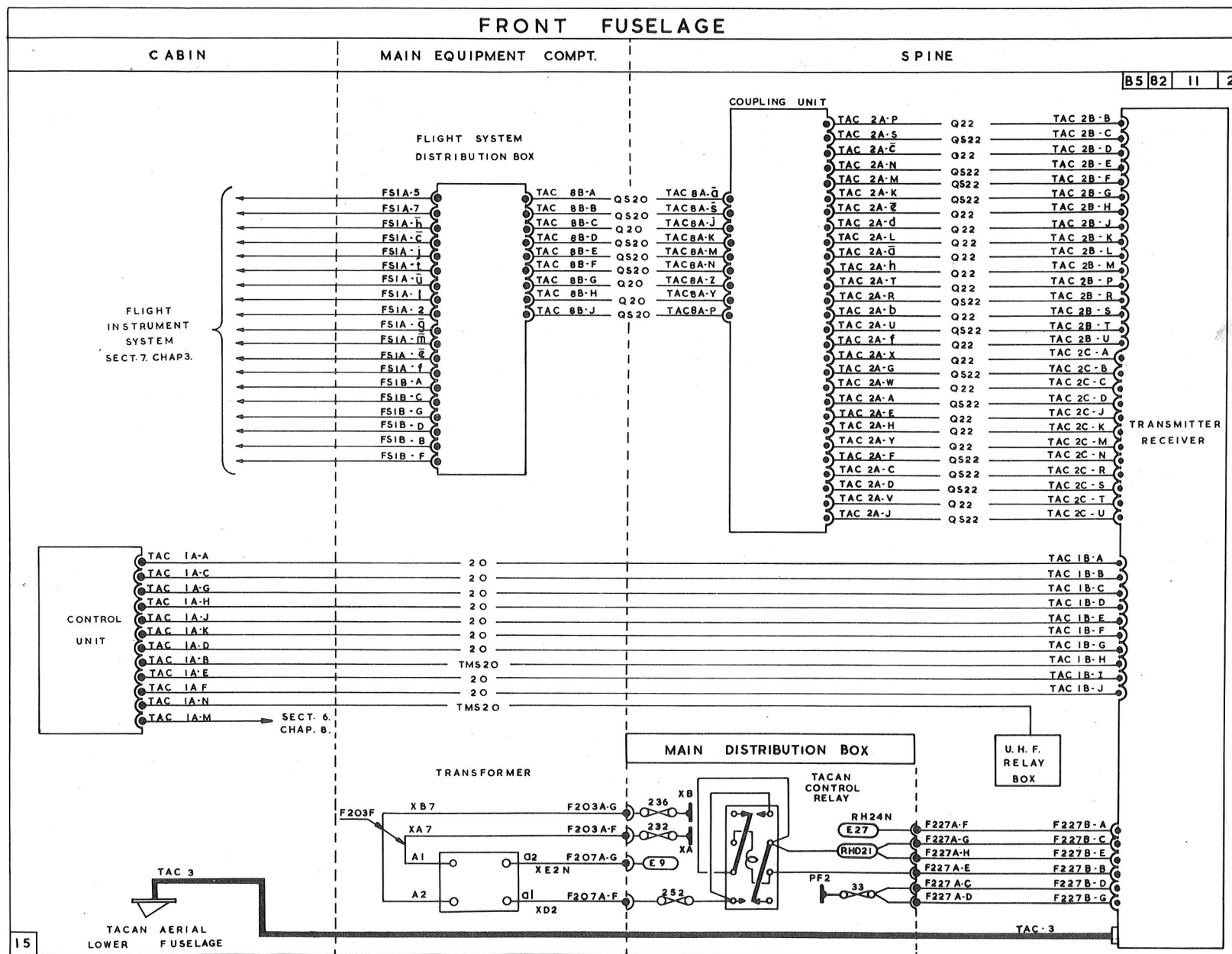


FIG. 2. TACAN INSTALLATION