

Chapter 3 DOPPLER NAVIGATION SYSTEM

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Introduction

1. The Doppler navigation system installed in pre-Mod 1800 aircraft is similar to that described in AP 101B-1202-1B, Cover 2, Sect 9, Chap 3 except for the differences described herein. With the introduction of Mod 1800 the system is removed from Mk.2B aircraft and replaced with an inertial navigation system described in Section 17, Chapter 11

2. On Mk. 2B aircraft with Mod 1629 embodied, provision is made for installation of a ground position indicator corrector unit (GPIC), Part No. D.3995-24062, introduced by Mod 1661, in the Doppler navigation system. The unit is interfaced with the search and fire control radar (*Chap. 4, this Section*). A different ground position indicator (GPI), Ref. No. 5840-99-649-1661, introduced by Mod 1670 is fitted for compatibility with the corrector unit. Mod 1630 provides a shorting plug which can be fitted to allow the Doppler navigation system to function when the corrector unit is not installed.

2A. On aircraft with Mod 1724 embodied a modified navigation computer introduced by

Mod 1759 provides additional outputs of wind speed and wind direction for use with the Sea Eagle missile system. Changes to the aircraft wiring to accommodate these additional signals are included in the wiring diagrams in Sections 19 and 20 of the SDM (AP 101B-1202-10B2).

Note ...

A pre-Mod 1759 navigation computer is not suitable for use on a post-Mod 1724 aircraft operating in the Sea Eagle role.

General

3. The GPIC is used in the navigation/attack system to provide accurate and instantaneous range and steering information to identification points, turning points, and targets. The coordinates of any radar response can also be accurately determined and a facility is provided in the unit enabling the GPI to be automatically updated from radar or visual overfly fix points.

Ground position indicator corrector unit

4. The GPIC, identified C-LA, is at the forward starboard side of the rear cockpit fitted

immediately below the GPI. The unit incorporates indications and controls with associated functions as follows:-

- Windows in the upper section of the unit reveal a digital display indicating the selected latitude/longitude or grid coordinates.
- A rotary thumb-wheel switch marked PROG and associated 10-position indicator marked numerically 0 to 9, selected by the navigator for the appropriate programme.
- Three, square-faced push-switches marked respectively FAST F, MED M and SLOW S for controlling the framing rate of the digital display.
- Two, two-way selector switches marked N-S and W-E for selecting, respectively, the latitude and longitude of the desired fix point. The switches are used in conjunction with the programme selector and framing rate switches (*sub-para (b) and (c), this para*).

- (e) A square-faced push switch marked OVERFLY. With the display selected to the known fix-point, the switch is pressed at the instant of overfly and the ground position indicator is updated automatically.
- (f) A square-faced push-switch marked IN-OUT. With the search and fire control radar transmitting and the push-switch selected IN, the range and bearing marker on the azimuth range indicator can be positioned and the planned radar fix-point identified. Using the radar set control, the range and bearing markers are positioned over the planned fix-point response. This applies the necessary adjustments to the northings and eastings offsets and automatically updates the GPI counters; the radar may now be switched off and the corrector unit selected OUT.
- (g) Two-way selector switch marked DE-SELECT. Normally set to the down position in flight. If the GPIC becomes unserviceable, setting the switch to the up position disconnects the unit from the

navigation/attack system; it will be necessary to perform a normal GPI overfly update using the STORE facility to ensure reliability from the GPI indications.

- (h) A rotary DIM control, turned clockwise increases the brilliance of the digital display and the push-switches in sub-para (c) and (f) of this para.

Built-in-test

5. To perform the built-in-test, select 0 on the programme selector switch (para 4 (b)), and IN on the IN-OUT push-switch (para 4 (f)). All elements of the digital display should now be illuminated. Press the OVERFLY push-switch (para 4 (e)) and a programmed self-test routine is initiated.

Note...

- (1) *The self-test routine can be stopped at any instant by pressing the OVERFLY switch; the unit is then restored to the digital display illumination phase.*

- (2) *Depression of the OVERFLY push-switch, with the programme selector switch at any selection other than 0, will result in an overfly update mode (para 4 (e) refers).*

Lighting

6. The digital display illumination is controlled as described in para 4 (h) while the controls on the front face of the unit are illuminated by integral lamps, their supply being controlled by the observer's instrument lighting circuit (Sect. 16, Chap. 9B).

Power supplies

7. 200-V, 3-phase, 400-Hz a.c. supplies are fed from fuses 2A12, 2B12 and 2C12 in distribution box R-A directly to pins T, U and V respectively of the 19-pole connector A, at the corrector unit. A 28V d.c. supply is fed from fuse F2 on panel C-Q, to pin T of the 26-pole connector B, at the unit.