

SPARTAN

Terrain Referenced Navigation/Terrain Following System



SPARTAN TRN/TF



Tornado



AFTI/F16

SPARTAN is an accurate flight proven automatic terrain referenced navigation (TRN) and terrain following (TF) system, developed by GEC Avionics. Combining navigation and flight control expertise SPARTAN provides a fully integrated system which allows low level covert operation, by day or night in all weather conditions.

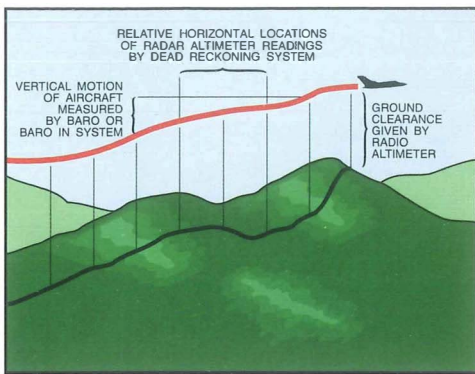
SPARTAN is highly resistant to Electronic Counter Measures (ECM), and requires no forward emissions thus minimising the approach warning available to ground and air defences. The system operates automatically, reducing cockpit workload and freeing crews to concentrate on overall mission objectives.

The TRN function of SPARTAN is a method of accurate position fixing by using conventional navigational equipment inputs and then matching the profile of the overflown terrain, established with a digital terrain elevation database of the operational area.

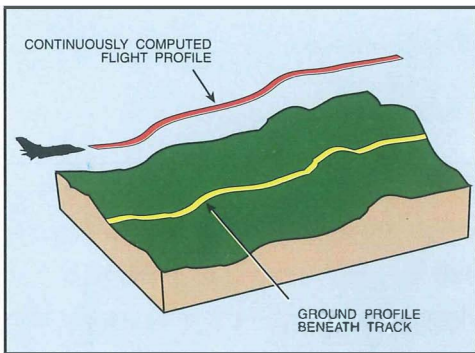
The navigation correlation algorithm is robust requiring no position priming and having a high tolerance to any database errors. This navigation accuracy ensures precise waypoint steering and fixpoint cueing to aid en-route mission monitoring.

Using the accurate navigational information, SPARTAN looks ahead in the terrain database in wings level or turning flight to calculate the vertical flight path necessary to maintain the required clearance height over the ground and obstacles at the selected manoeuvre limits of the aircraft. This path can be followed either manually, using the flight director, or automatically, via the aircraft autopilot.

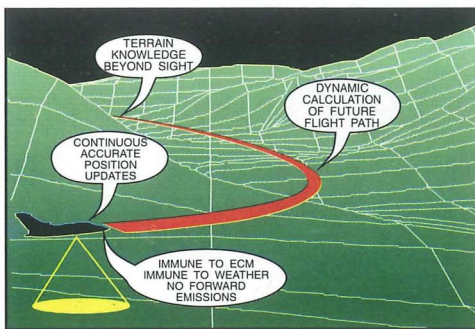
Comprehensive internal monitoring is carried out to ensure that a high level of integrity is maintained at all times. This includes a number of TF system monitors that provide effective and automatic ground proximity warning and avoidance.



Principles of terrain referenced navigation



Calculation of the terrain following flight profile



SPARTAN features



GEC AVIONICS
Combat Aircraft Controls Division

Maturity of Design

SPARTAN has been extensively flight demonstrated on a variety of low level attack aircraft including Tornado, A6-E Intruder and AFTI/F-16, and has been selected by the UK Ministry of Defence for the Royal Air Force Tornado upgrade programme.

SPARTAN offers:

- ☐ **Rapid, accurate navigational fixing.**
- ☐ **Covert, passive terrain following.**
- ☐ **High tolerance to database errors.**
- ☐ **High resistance to ECM.**
- ☐ **24 hour all weather capability.**
- ☐ **Ability to "see" around curved tracks and through hills.**
- ☐ **Obstruction cueing to displays.**
- ☐ **Precise target height and terrain slope information for target ranging and weapon aiming.**
- ☐ **Rugged solid state digital terrain database store.**

Operational characteristics:

Size: 3/4 ATR short LRU
 Weight: 15 Kg
 Interface: Mil-Std-1553B
 MTBF: 3000 hours
 Environmental: Mil-Std-461/462 Mil-Std-810
 Power: 200 W
 Coverage: 600,000 sq km
 Rapid database reprogramming: within aircraft turn round time

This brochure is intended only to give a general impression of the products and services which are available and none of the descriptions contained herein shall form part of any contract.

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