

# Factory to flight line

Electronic warfare  
end-to-end testing...

**P**assing a system built-in test (BIT) does not ensure a system is fully functional and operationally ready for use. BIT can never achieve a 100% level of fault coverage and there may be elements within a system, such as antennas, that cannot be fully tested by BIT but which are critical to operational effectiveness. The vulnerability inherent in this 'BIT gap' can be much reduced or even eliminated by an external test that applies stimuli to the system and measures its responses.

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The impact on operational effectiveness of BIT gaps in aircraft electronic warfare (EW) systems was examined following the first Gulf War when questions were asked about the functionality of these systems



DRS RF hoods enable accurate characterisation and measurement of EW system performance

and their ability to detect and protect against threats. Following different studies, it was concluded that an external 'end-to-end' test was needed in addition to the BIT to ensure all platforms in a threat environment were adequately protected, so as to discharge the care and responsibility aspects of the authority committing those assets into the threat environment.

Following these studies, DRS Technologies developed and pioneered the use of radio frequency (RF) hoods to measure EW system sensitivity, adjacent quadrant sensitivity and RF jammer power and techniques. The RF hoods are stimulated by bespoke DRS equipment ranging from handheld units to fully ruggedised systems.

Called End-To-End Testing (ETET), the DRS method of testing EW systems using hoods and stimulation equipment has been refined into a tiered concept that incorporates different levels of testing for different user requirements, namely:

- Tier 1: flight line check using a handheld 'free space' stimulator;
- Tier 2: full system test, using a fully ruggedised hangar-based multi-hood, multi-port test system;
- Tier 3: full system test with advanced diagnostics, using a non-ruggedised factory-based multi-hood, multi-port test system.



The ATS-100 Handheld Radar Stimulator provides a rapid confidence check on the flight line before mission embarkation

DRS Technologies has developed stimulation equipment for all three tiers including a handheld unit that offers RF, ultraviolet and infrared test capability. DRS ETET equipment is in use with six different air forces.



Dr Bruce Holley  
DRS Technologies UK Limited  
Tel: +44 (0)1400 283616  
bruce.holley@drsuk.org  
www.drsuk.co.uk