

DeHavilland Dash-8 Aircraft Airborne System Testing

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The 84th Test Squadron, a part of the USAF Air Warfare Center in the Air Combat Command, was tasked with assessing the operational effectiveness and suitability of the DeHavilland Dash-8 Aircraft (E-9A) airborne platform/telemetry relay aircraft. The E-9A is an integral part of the Gulf Range instrumentation system at Tyndall AFB and Eglin AFB, Florida. It supports air-to-air (AA) missile firings against aerial drone targets for fighter pilot training and for test and evaluation. The ability to command fighters and targets and to receive telemetry data is currently limited to line of sight (LOS) because of land-based transmitters and receivers. Future operations will be conducted over-the-horizon (OTH), rather than with present LOS systems, because of the increasing number of near-shore pleasure boats and lower altitude missile launches. The E-9A is designed to extend the effective range of existing land-based instrumentation systems. It does this by providing the telemetry, communications, and drone control relay required to support OTH missions in the Gulf of Mexico. It also provides radar surveillance of boats in the Gulf to establish a clear area free of boats for missile launches. This publication covers the qualification operational test and evaluation of the E-9A which was an evaluation of its capability to provide Gulf Range users with radar sea surveillance, telemetry relay, ultrahigh frequency (UHF) radio relay, and Gulf Range drone control relay.

Introduction

TYNDALL and Eglin Air Force Bases, located along the Gulf of Mexico in Florida, possess a Gulf Range instrumentation system which supports Weapons System Evaluation Program (WSEP) missions, and test and evaluation of air-to-air (AA) missile firings against drone targets. Participating fighter aircraft must currently remain within line of sight (LOS) of land-based transmitters and receivers used for command and control. Presently, drone targets and missiles must also remain within LOS of land-based receivers for telemetry data reception from missile launch to impact. Future Gulf Range AA missile firings will involve ranges and altitudes for fighter aircraft, missiles, and drone targets that are not LOS, but are over-the-horizon (OTH).

The E-9A aircraft is part of an overall upgrade to the Gulf Range AA instrumentation to support future OTH missions. The system consists of a modified, instrumented DeHavilland Dash-8 aircraft designated as the E-9A (Fig. 1), a ground support van (GSV), and a high-frequency (hf) ground receiving station. There are only two E-9As in the USAF inventory, and both are stationed at Tyndall AFB.

The E-9A is designed to provide telemetry and communications relay required for land-based transmitters and receivers to support OTH mission participants. Additionally, the E-9A locates an over-water range area clear of boats for missile launches, called a "shoot box," with its sea surveillance radar. The E-9A can also be configured to support OTH Gulf Range drone control.¹

The E-9A has four onboard instrumentation subsystems which are designated as prime mission equipment (PME). These four subsystems (shown in operation in Fig. 2) are the 1) telemetry relay subsystem, 2) ultrahigh frequency (uhf) voice relay subsystem, 3) radar sea surveillance subsystem, and 4) the Gulf Range drone control relay data link subsystem (DLS). This article focuses on operational testing of these

four main subsystems. Qualification operational test and evaluation (QOT&E) of the E-9A was conducted by the 84th Test Squadron (TS), USAF Air Warfare Center (USAFAWC), Air Combat Command, Tyndall AFB, from February 1990 to April 1991. The USAFAWC is presently resolving QOT&E-identified aircraft system deficiencies through further ground and flight testing.

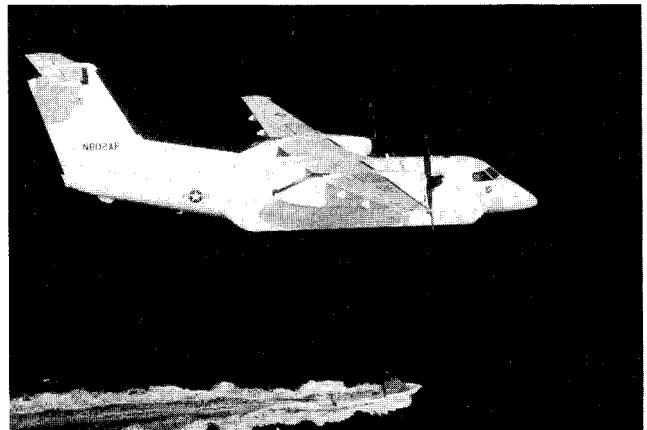


Fig. 1 E-9A aircraft.

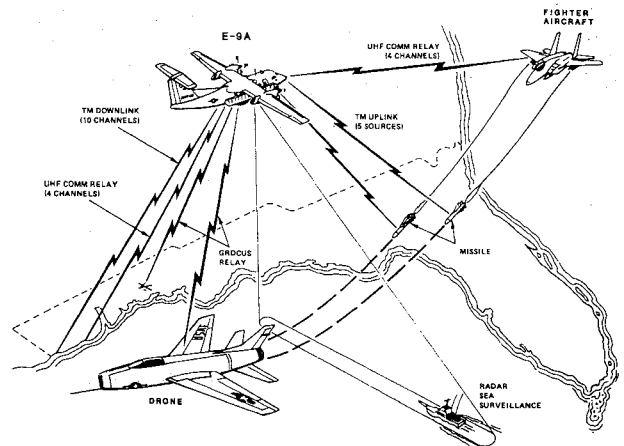


Fig. 2 E-9A during gulf operations.

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