

412TW-PA-14175



# Ground-based IFF Interrogator System (GBIIS) at Edwards AFB

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EDWARDS AIR FORCE BASE, CALIFORNIA  
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UNITED STATES AIR FORCE





# 412<sup>th</sup> Test Wing



*War-Winning Capabilities ... On Time, On Cost*

## Ground-based IFF Interrogator System (GBIIS) at Edwards AFB

June 2- 6<sup>th</sup>, 2014



**U.S. AIR FORCE**

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# GBIIS (AN/UPX-44A)



**Ground-based IFF Interrogator System**



# Outline



- Problem/Solution
- GBIS Purpose
- GBIS Features
- Concept of Operations
- Customer Options
- Current Status
- Contact Information
- Q&A



# Problem/Solution



- Problem:
  - Every military platform with IFF transponders needs to upgrade to Mode 5 (IOC 2014 & FOC 2020).
  - No west coast Mode 5 test facility for IFF transponders.
  - UAVs need extra coordination to transport to east coast.
- Solution:
  - Edwards AFB has acquired the Ground-based IFF Interrogator System (GBIIS), a Mode 5 test facility to support IFF transponder test programs.



# GBIIS Purpose



- The purpose of GBIIS is to conduct military IFF transponder flight testing and analysis in accordance with the DOD AIMS 03-1103AB for AIMS certification.
- The GBIIS also supports IFF transponder flight testing for CNS/ATM tailored performance matrices (TPM).



# GBIIS Features



- Telephonics AN/UPX-44A Interrogator
  - Modes 1, 2, 3A, C, 5 L1 and L2, ADS-B OUT
  - Mode S & 4 have been disabled but will use nearby sensors to capture Mode S & 4 data
- KIV-78 Crypto Applique
- Antenna Associates FAI-54M SSR antenna
  - 5 RPM setting (12 second scan rate)
- Toughbook laptop commands the interrogator, displays the returns, and collects data
- 12-channel GPS Network Time Server that time tags the data and provides Time of Day for encryption
- UHF/VHF radios provide communication with the test aircraft



# Concept of Operations



- **Aircraft will need an approved Request for Frequency Authorization (RFA) prior to testing.**
  - GBIS not involved; contact your spectrum management office early!
- **Aircraft will need to be instrumented.**
  - Independent TSPI (position truth source) needed for position, altitude and figure of merit accuracy requirements, or portions of the 03-1103 test cannot be properly verified.
  - MIL-STD-1553/ARINC 429 Bus Instrumentation needed, or certain requirements of the 03-1103 test cannot be properly verified.
  - Contact Edwards AFB early for instrumentation needs!



# Concept of Operations (contd.)



- **Conduct the DoD AIMS 03-1103AB flight test at the GBIS (Edwards AFB) to collect data for AIMS certification of transponder:**
  - Use the AN/UPX-44A SSR to flight test Modes 1, 2, 3A, C, 5 L1/L2, and ADS-B OUT.
  - Use an FAA ATCBI-6 SSR to flight test Mode S ELS/EHS.
  - Coordinate with the Western Air Defense Sector to do an operational checkout of Mode 4.
  - Coordinate with FAA for additional ADS-B In and Out data, per most recent AC 20-165.
  - Send raw data and GBIS analysis to DOD AIMS Office.



# Concept of Operations (contd.)



- **Projected Flight Test Timeline**
  - **2-3 Sorties (3-4 hour sorties)**
  - **Standard profiles approved by AIMS**
- **Projected Ground Test Timeline**
  - **1-2 Days (8 hour days)**



# Customer Options



- GBIS can provide:
  - DoD AIMS 03-1103 and CNS/ATM TPM flight testing using GBIS and FAA radars
  - Raw data (from ground station, bus instrumentation, and TSPI)
  - Data analysis product
  - Installation of Independent TSPI if needed (with coordination from Edwards Range)
  - Installation of MIL-STD-1553/ARINC 429 Bus Instrumentation if needed (with coordination from Edwards Instrumentation)
  - Transponder ground testing if needed (with coordination from Edwards squadron)
- GBIS does not process paperwork for:
  - Request for Frequency Authorization (RFA)
  - DoD AIMS certification or CNS/ATM certification



# Current Status



- In process:
  - Short term frequency assignment (STA) memo to temporarily authorize transmission on 1030MHz frequency
  - AIMS ground and flight test certification. (AIMS 03-1202 & 03-1203)
  - DD 1494 FORM Stage 3 approval



# Contact Info



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# Questions & Answers

