Aircraft Maintenance Intuitive Troubleshooting (AMIT) Presentation/Briefing

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Logistics Readiness Branch
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November 2005

Interim Report for October 2003 to November 2005
The goal of Aircraft Maintenance Intuitive Troubleshooting (AMIT) is to create job-aiding software, compatible with existing computer systems that will tell maintenance technicians what is really wrong with aircraft faster and more accurately than ever before.
Air Force Research Laboratory
Human Effectiveness Directorate
Program Manager
Christopher Curtis

November 2005
TROUBLESHOOTING (AIMT)
INTUITIVE
AIRCRAFT MAINTENANCE
AMIT Program Description

- Three year Air Force Research Laboratory Proof of Concept Demonstration
- Program Goal: Reduce aircraft downtime by improving human performance in maintenance troubleshooting of complex aircraft system discrepancies

![Diagram](image-url)
AMIT Program Objectives

- Improve expert performance by providing immediate access to task-relevant knowledge
  - Contrasted by currently fragmented processes
  - Historical info, tech orders, logbooks, collaboration

- Improve novice performance by accelerating development of expert mental models and strategies
  - Logical, task-specific knowledge presentation
  - Access to expert sources of knowledge

- Decrease troubleshooting task times, error rates

- Design AMIT proof-of-concept to GCSS-AF and eLog21 objectives/vision
AMIT Vision

**TODAY**
- Technical Data
- Log Books
- History
- Collaboration

**TOMORROW**

**SOLUTION:**
- Complete, timely, and contextual knowledge and information at the point of task
- Capture and reuse expert knowledge and strategies

**Picture photographer and descriptions provided in notes where available.**
Program Approach

Year 1

Expert Knowledge Base

- Logbooks
- Other Maintainers
- TO's
- Procedural Knowledge
- Strategic Knowledge
- Tech Reps
- AFETS
- Training
- Advanced Training
- System Knowledge
- Additional Fault Isolation
- Schematics

Year 2

- Science Exploration
- Technology Demos
- Solution Integration
- Lab Tests
- Field Test Planning
- Obtain R&D Sponsors
- AMUG & CRB Reviews

Year 3

- Field Test to Measure Troubleshooting
- Performance Improvements
- Transition Support
- Final Report

Technology Improvements Serving Maintenance Excellence
Progress to Date
Context Filtering of Knowledge

- Filtered by MX process step
- Filtered by WUC

Procedural Knowledge
**Progress to Date**

**Efficient Information on Demand**

- Search engine in background
- Eliminate multiple manual queries

<table>
<thead>
<tr>
<th>DISCREPANCY</th>
<th>TROUBLESHOOTING</th>
<th>CORRECTIVE ACTION</th>
<th>FOLLOW ON</th>
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<tbody>
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**RADAR CONFIGURATION IN TAIL NO. 0770**

**LRU 74AM0 - RADAR ANTENNA**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Serial Number</th>
<th>History Entries</th>
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<tr>
<td>758R805001</td>
<td>11620</td>
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**11620 History**

- **A/C BASE DATE AT DISC CORR ACT**
  - 9000000720 LUKE 2003233 A FOR 007 CAM ON WITH MASTER CAUTION, FACT DID COME ON AGAIN, ACM DID NOT WORK. RWS SEEMED TO WORK A-G
  - 8900002123 LUKE 2003098 A FOR FAIL MFL 007 AFTER SHUTTING ON AND OFF, FCR WOULD WORK FOR A FEW MINUTES THEN FAIL AGAIN.
  - R2 ELECTRONICS PACKAGE AND RAN END 2 END 2 TIMES AND RATS. THIS LRU WILL BE PROCESSED OUT AS A SERV
  - R2 ELECTRONICS PACKAGE RAN ETE NDN

**System Knowledge**
Knowledge-centric Approach

Progress to Date

Problem Tracking to Resolution Tool

Capture strategic knowledge

Strategic Knowledge
AMIT Benefits

• Maintainer Benefits
  – Reduced preparation time
  – More first-time success repairs
  – Accelerated knowledge & skill progression

• Stakeholder Benefits
  – More productive workforce
  – Reduced parts usage
  – Higher aircraft availability
AMIT Transition Strategy
Joint Capability Technology Demonstration

- Proposed JCTD with ACC and JFCOM in FY07 & 08
- Leverage laboratory investment (end in FY06)
- Prototype development and warfighter assessments
- Allow decision makers to fully understand operational potential before a full up acquisition

Funding
- FY07 – OSD 100%
- FY08 – ACC 70%, OSD 30%

Potential partners
- US Navy (F/A-18)
- Predator
- European Participating Air Force (EPAF) – F-16 (22 countries)
# Sponsorship Summary

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<tr>
<th>Date</th>
<th>Organization</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Nov 04</td>
<td>F16 Management Directorate, OO-ALC (508 FSG)</td>
<td>Tentative sponsorship, pending Air Staff ILI/ILM concurrence</td>
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<tr>
<td>Dec 04</td>
<td>AF/ILMM</td>
<td>Agreed to staff MOU</td>
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<tr>
<td>Dec 04</td>
<td>ACC/DRA</td>
<td>Agreed to sponsor AMIT for ATC</td>
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<td>Dec 04</td>
<td>AETC/DOZ/XPT/XPL, 82nd Trng Wing/CV and Group/CC</td>
<td>Agreed to explore AMIT as an integral part of the Integrated Learning Environment Strategy</td>
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<td>Feb 05</td>
<td>AF/ILMM</td>
<td>Suggested Briefing AMIT at AFM/MAG</td>
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<tr>
<td>Mar 05</td>
<td>ACC/DRA16</td>
<td>Suggested Briefing AMIT at F-16 IPMR</td>
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<td>Mar 05</td>
<td>JFCOM/J8 and CLF/N43</td>
<td>Engaged in preliminary discussions</td>
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<td>Apr 05</td>
<td>F-16 SG, 508 FSG</td>
<td>Briefed AMIT at F-16 IPMR</td>
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<td>Jun 05</td>
<td>AF/ILM</td>
<td>Agreed to include AMIT in MX Portfolio</td>
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<td>Jun 05</td>
<td>SAF/XCIO (AF IPT)</td>
<td>Presented AMIT as ACTD FY07 candidate</td>
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<td>Aug 05</td>
<td>19AF/LG</td>
<td>Support Program and Field Test</td>
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<td>Aug 05</td>
<td>ACC/DRA</td>
<td>Agreed to FY08 POM Requirement</td>
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<td>Sep 05</td>
<td>56MXG</td>
<td>Agreed to host AMIT Field Test at Luke AFB</td>
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<td>Oct 05</td>
<td>JFCOM/J8</td>
<td>AMIT in Top Three JCTD candidates FY07</td>
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Questions?

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