“A Day In The Life…”

C-130J Maintenance Management System / Logistics Support System

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C-130J Maintenance Management System

C-130J Data Transfer And Diagnostic System (DTADS)

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• Total 289 C130Js in service for 11 countries
  – Over 1 million total flight hours
• C-130J Integrated Health Management equals efficient diagnostics and repair across various configurations and operating environments
  – Improve Aircraft Availability
    • Minimize Aircraft Downtime
  – Reduce Operating Costs
    • Minimize No Fault Found rate
C-130J Maintenance Operations

Abbreviations
DFDR – Digital Flight Data Recorder
MC-AMP – Mission Computer – Aircraft Maintenance Program
RMM – Removable Memory Module
OFP – Operational Flight Program
GFE – Government Furnished Equipment

DTADS Provides new tools to maintainers
In-Flight Processing
Post-Flight Processing
Interactive Ground Maintenance
Structural Health Monitoring
Engine Health Monitoring
Data Viewing
Data Management

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C-130J In-Flight Processing

• During operation aircraft avionics system provides dynamic reporting to Flight Crew and Maintenance to:
  – Self-diagnose system malfunctions
    • Extensive Built-In-Test
  – Determine system status
    • ACAWS (Situational Awareness for Aircrew)
    • Fault Detection (Diagnostics for Maintenance)
  – Record data for post flight analysis
DTADS Post Flight Processing

- Maintainers perform debrief processing to:
  - Increase fault resolution accuracy
    - More specific fault isolation strategy
  - Improve Aircraft Availability
    - Minimize troubleshooting time, return aircraft to service quicker
  - Reduce NFF/CND Rates
Maintainers use DTADS to perform onboard interactive maintenance:

- Real Time Diagnostics
  - Initiated Bit-In-Test/DBTP/Bus Check
- Interactive Maintenance Operations
  - System calibrations/WOW/Defensive Systems
  - ECBU control/DFDR Download
- Software Loading

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DTADS Engine and Structural Health Monitoring

• Production Analysts utilize post debrief processed data to:
  – Monitors individual engine/structural components to support long term aircraft management
    • Accurate/consistent operating hour reporting
    • Tracking of all identified life limited components
    • Automatic generation of inspections/life limits
    • Adjust structural inspection intervals based on usage/severity

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• Maintainers examine recorded aircraft data to:
  – Perform trend data analysis to support logistics/training decisions
    • 1553/Engine
    • Identify and correct negative trends
  – Validate data integrity of aircraft sensors through local analysis of DFDR data
DTADS Data Management

- Data Management organizations utilize automatic centralized data storage to support Fleet Health reporting/monitoring
- DTADS data format facilitates delivery to designated Maintenance Data Collection and Logistics Management Systems
C-130J DTADS to LSS Integration

Data Collected from A/C Sensors

C-130J

Data Transfer and Diagnostics System (DTADS)

Fault Codes & Usage Data

Defined ICD Data Access Point (DAP)

Maintenance Debrief

Logistics Support System

- Auto Generation of Work Orders for Approval & Assignment
- A/C State of Health Data Captured
- Supports Fleet Wide Asset Management, Decision Support, PHM, etc.

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C-130J Maintenance Management System

Logistics Support System

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• What is meant by Fleet Management?
  – The management of an operator's aircraft fleet (and other assets used to operate the fleet, e.g. SE)
  – Fleet management can include related functions such as activity based costing, regulatory and engineering compliance, configuration management, supply management, maintenance management and diagnostics and reporting
  – Fleet Management is a function which allows the operator to remove / minimize risks associated with investment, capability, efficiency and/or costs.
The Status Quo

• Many operators are managing their aircraft fleet with some combination of the following.
  – White boards and grease pencils
  – Spreadsheets and stand alone databases
  – Bespoke systems that are becoming outdated and hard to maintain
  – Non integrated, stove pipe systems
  – Newly implemented ERP systems (e.g. SAP) that are too difficult to use
What’s the Risk?

• Poor fleet management can result in;
  – Excess inventory – ‘shadow’ storage locations, lack of trust in the supply chain
  – Misuse of resources - manpower, SE, special tools
  – Time delays and loss of data – use of expeditors, phone calls, no single source of ‘truth’
  – Missed maintenance, improper maintenance, engineering or compliance failures
  – Low asset operational availability (Ao)
  – And, in the worst case - Mission Failure

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Fleet Mgmt Needs

- **What is Needed??**
  - Tools that are **simpler to use** and maintain
  - Less stuff, w/ smaller Footprint
  - Fully integrated and consistent across platforms and organizations
  - Affordable !!
Realizing the Vision

- Adopting an automated Fleet Management Solution – *a good first step*
  - One that is focused on the military operator
  - Look for something that scales to match your Fleet
- Look for one that can fully address your needs
  - Asset Management, Personnel Management, ‘On Condition’ and Preventive Maintenance, Supply, Operational Planning, DTADS Integration
- *LM’s Logistics Support System (LSS)*
Value Proposition vs. Availability

C-130J + RMM Card
Data Transfer and Diagnostics System (DTADS)

Defined ICD
Data Access Point (DAP)

Logistics Support System
- Auto Generation of Work Orders for Approval & Assignment
- A/C State of Health Data Captured
- Supports Fleet Wide Asset Management, Decision Support, PHM, etc.

Legacy C130 B - H

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Fleet Management

Asset Status

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LSS Provides Total Asset Management

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Updated Asset Status

LSS Automates the Debrief Process

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LSS Provides DTADS Integration

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DTAD’s Import Generates Corresponding Operational Info in LSS

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LSS DTADS Debrief

Individual Asset’s Debrief Viewable in LSS
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LSS Parses Debrief

LSS Delivers DTADS “General” Debrief Data into Fault Specific Information

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LSS Gets Data From DTADS Download

LSS Works with Detailed Usage Data From Debrief

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LSS Identifies Active Faults

LSS Generates Appropriate Faults Automatically

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LSS Auto-Generates Problem Reports

Problem Reports are Generated in LSS Against Asset

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LSS Auto-Generates Work Orders

Work Orders are Generated in LSS Against Asset
Logistics Support System (LSS)

- **Personnel Management**
  - Creation / modification of personnel resources
  - Link to external identity management services
  - Define skills / certifications
  - Associate with organizational elements
  - Includes personnel location / identification
  - Personnel information and personnel search

- **Operational Planning**
  - Creation, modification & use of operational plans (e.g. activities, sorties, missions, etc.)
  - Includes assignment of resources to a plan

- **Problem Reporting**
  - Creation, modification & use of problem reports per asset
  - Batch operations (e.g. Inspection TCTOs)
  - Modifications (e.g. TCTOs that revise P/N)
  - Manage faults by type or serial range

- **Work Order Planning / Management**
  - Creating, planning & searching work orders
  - Assignment of resources & material
  - Linked to Problem Report or PM
  - Dependencies - Hierarchical work orders
  - Update & Sign-off completion
  - Display of work order status & history

- **Preventive Maintenance**
  - Define Preventive Maintenance (PM) regimes
  - Events can be calendar-based or usage-based (e.g. Conditioned Based Maintenance)
  - Batch rescheduling of PM events
  - On-demand rescheduling
  - Reflect PM schedules in availability / status
  - Reflect PM schedules in operational plans

- **Base Level Supply**
  - Create / update inventory part types - location, min/max stockage levels, repairable / consumable, expiration date, warranty, HAZMAT, manufacturer and supplier, etc.
  - Manage kits as inventory parts
  - Trigger and track material request upon breach of minimum inventory level
  - Perform inventory audit, record discrepancies, generate / view parts counting reports
  - Generate / view inventory turnover rates
  - Create / view warehouse facility with locations
  - Decrement inventory levels on parts issuance
  - Transfer Request for assets across organizational sites
  - Record issue of assets to work orders

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Want to Learn More?

- DTADS-to-LSS Interface Demonstrations Are Available in the Exhibitor Booth 20-21
- DTADS Side Session available upon request
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