



Integrated Sustainment Solutions

NextGen DTADS, IETMX, GE-Connected FMS,
Intelligent Diagnostics

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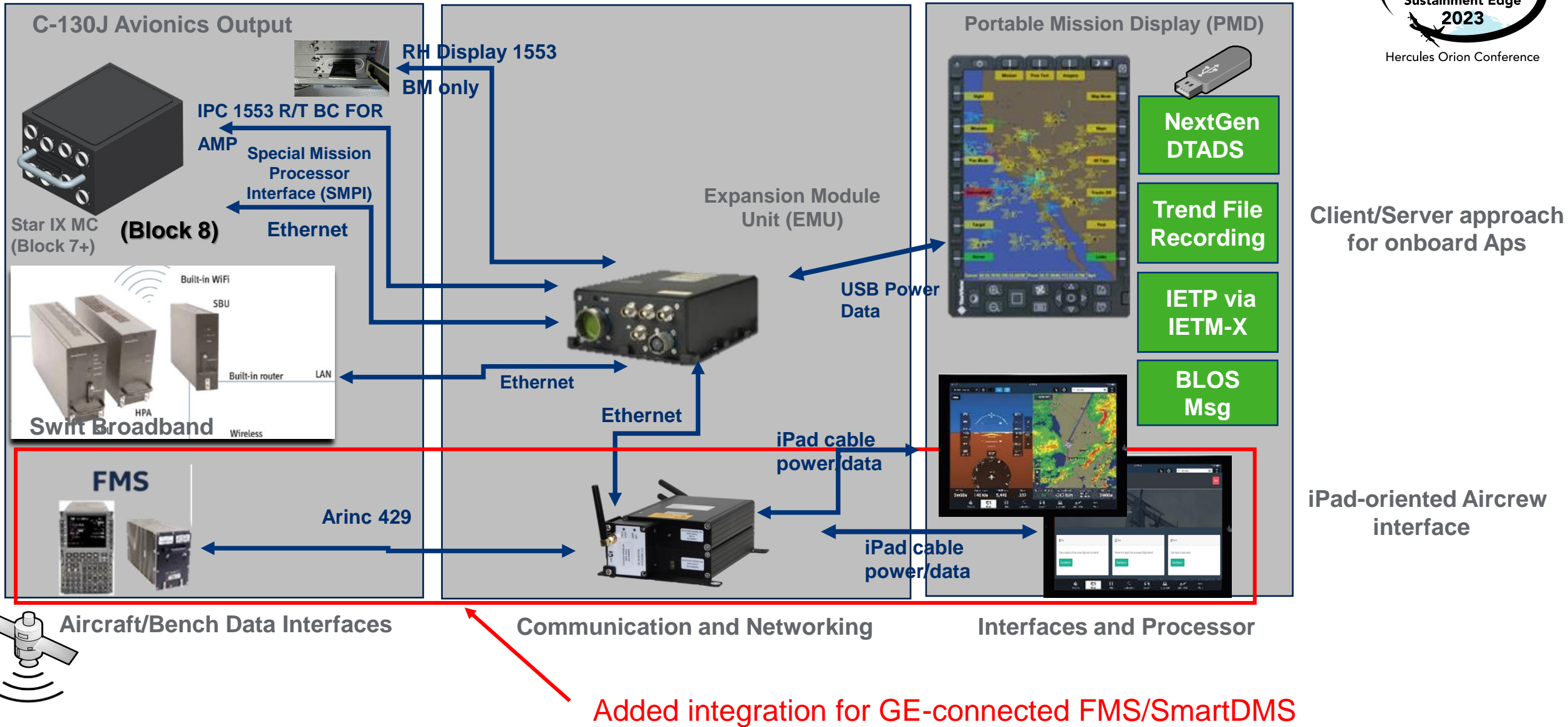
Introduction



- Developmental Solution Integrating the Following New Capabilities
 - NextGen Data Transfer and Diagnostics System (DTADS) onboard the aircraft running in real time
 - Ties in GE-Connected Flight Management System (FMS) capability to Customer Foreflight application
 - Enables iPad/other touch-enabled device to function as User Interface (UI) for NextGen DTADS via web application
 - Brings Intelligent Diagnostics capability fully into Nextgen workflow
 - Provides onboard Interactive Electronic Technical Publications (IETP) Common Source Database (CSDB) and Viewer with Application Programming Interface (API) linkage to NextGen DTADS debrief
 - Wired and wireless iPad connectivity to Connected FMS/NextGen
 - In-flight debrief capability via Satellite Communications (SATCOM) providing Beyond Line of Sight (BLOS) aircraft status updates
- Leverages qualified hardware when able for use on the C-130J as starting position
- Accelerates maintenance through 5th Gen integration

Post-flight to In-flight Material Statusing = Accelerated Maintenance Support

NextGen DTADS (+) for Block 8.1 Implementation



Maintenance Data Transmission and Off-board Processing



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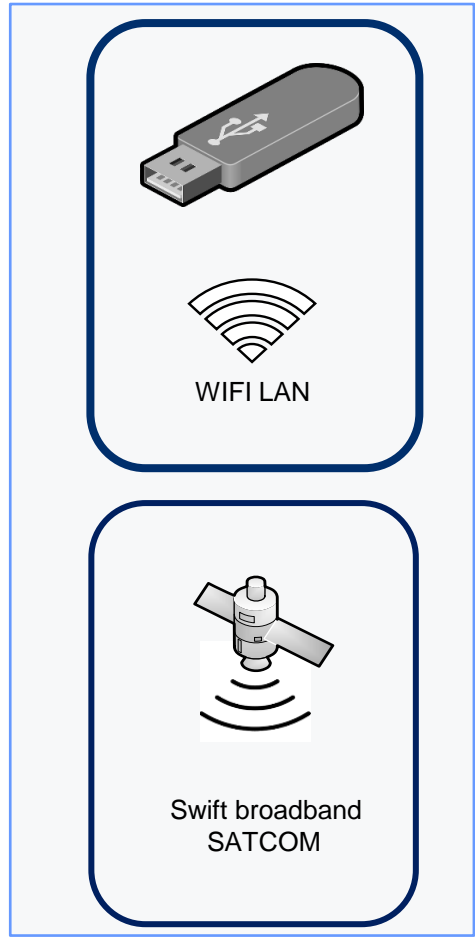
C-130J Installation



Post-Flight

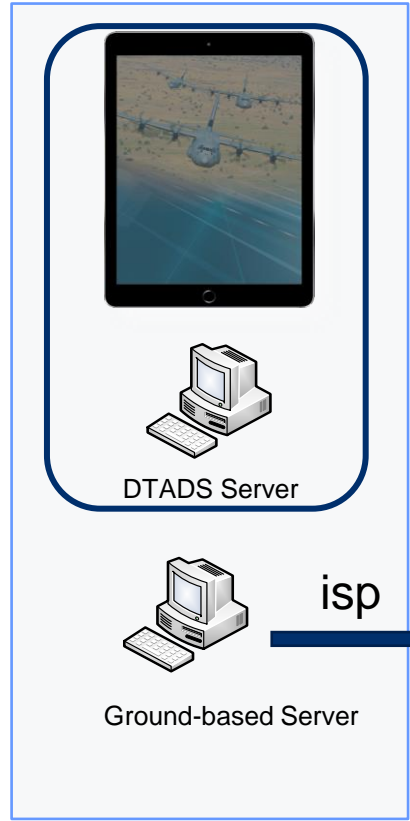


Real-Time, In-Flight Data (read-ahead)



Off-board Comm Links

Routine Post-Flight

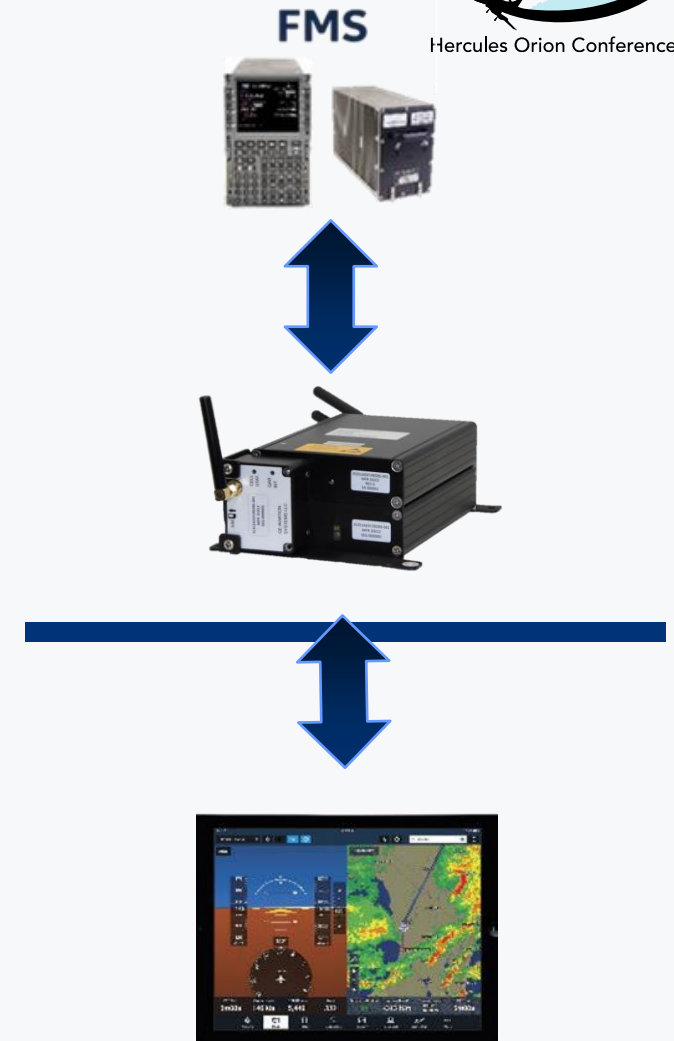


End Recipients

GE-Connected FMS SmartDMS/AID Integration

- Secure wired interface from iPad to Communications, Navigation and Identification-System Processor (CNI-SP) for Block 7 and up with GE-FMS via Aircraft Interface Device (AID)
 - Own position updates to Electronic Flight Bag (EFB) Navigation application
 - Bidirectional synchronization of flight plan data between EFB and FMS
- NextGen DTADS accessible via wired and wireless interfaces
- Multiple applications can run on multiple devices concurrently
- Foreflight Integration in development

Reduced Pilot Workload and Enhanced Safety



In-Flight Debrief



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Debrief Summary Report

SECTION 1: DEBRIEF SUMMARY INFORMATION

Aircraft Serial Number: 5664
 Aircraft Tail Number:
 Download Time: 2016-01-13T13:18:25Z
 MC OFF: 23670112
 DTADS Assembly:

Pilot:

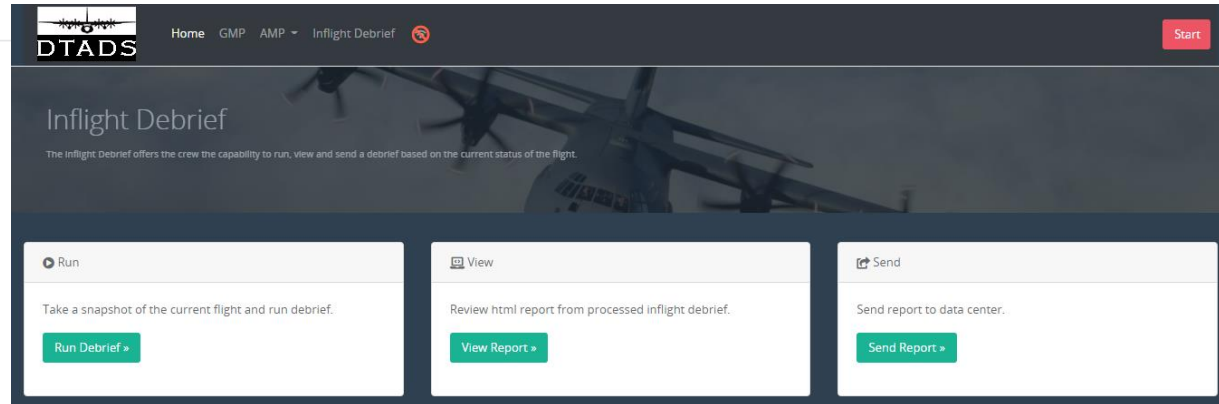
Number of Flights: 4
 Flight Time: 3.273 [hr]
 First Takeoff: 2016-01-13T14:28:10Z
 Final Landing: 2016-01-13T18:40:29Z

Touch and Go Landings: 0
 Full Stop Landings: 7
 Total Landings: 7

Debrief Type: Flight
 SHM Exceedance Detected: Yes
 Ground Power Assurance Check Detected: None Detected.
 Prop Balance Detected: None Detected.

SECTION 2: FLIGHT DATA

Flight	Profile	Event	Date/Time	Runway Type	Max Effort	Gross Weight	Pilot
1	SPC1-DEFAULT	Beginning Flight Event	2016-01-13T14:16:29Z	Standard	No	132075 [lb]	
1	SPC1-DEFAULT	Take Off	2016-01-13T14:28:10Z	Standard	No	133590 [lb]	
1	SPC1-DEFAULT	Full Stop Landing	2016-01-13T18:40:29Z	Standard	No	132870 [lb]	



- Crew initiated
- HTML (text-based) report generated
- Crew releases to ground via Swift Broadband Internet Service Provider (ISP) connectivity
- Recipients can be added/preplanned

Material Condition in Advance Of Landing = Reduced Repair Turnaround Time

New User Interface For Gound Maintenance Program

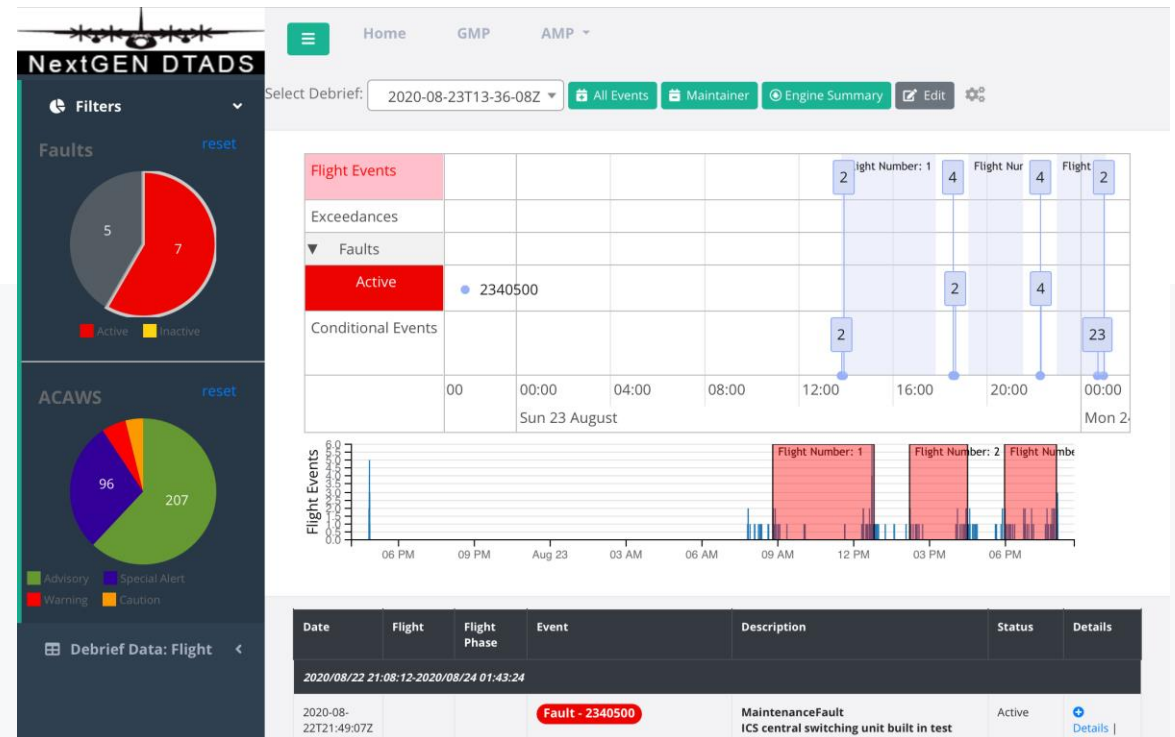


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- Touch-enabled filtering
- Combined flight overview
- Single screen integrated debrief

Status	Flight Id	Actions
Complete	1998-04-23T13-26-03Z	Report Edit Download Html Report Email Reset
Complete	2002-06-19T11-23-25Z	Report Edit Download Html Report Email Reset
Complete	2003-04-09T17-51-38Z	Report Edit Download Html Report Email Reset
Complete	2003-07-15T16-00-00Z	Report Edit Download Html Report Email Reset
Needs Resolution	2004-08-08T14-04-07Z	
Needs Resolution	2016-01-13T13-18-25Z	
Complete	2019-04-30T07-05-17Z	Report Edit Download Html Report Email Reset
Complete	2020-03-28T12-31-11Z	Report Edit Download Html Report Email Reset
Complete	2020-08-21T14-51-40Z	Report Edit Download Html Report Email Reset
Complete	2020-08-23T00-56-56Z	Report Edit Download Html Report Email Reset
Complete	2020-08-23T13-36-08Z	Report Edit Download Html Report Email Reset

- New Debrief Management
- Integrated Intelligent Diagnostics (ID) Processes
- On-aircraft archive for each aircraft

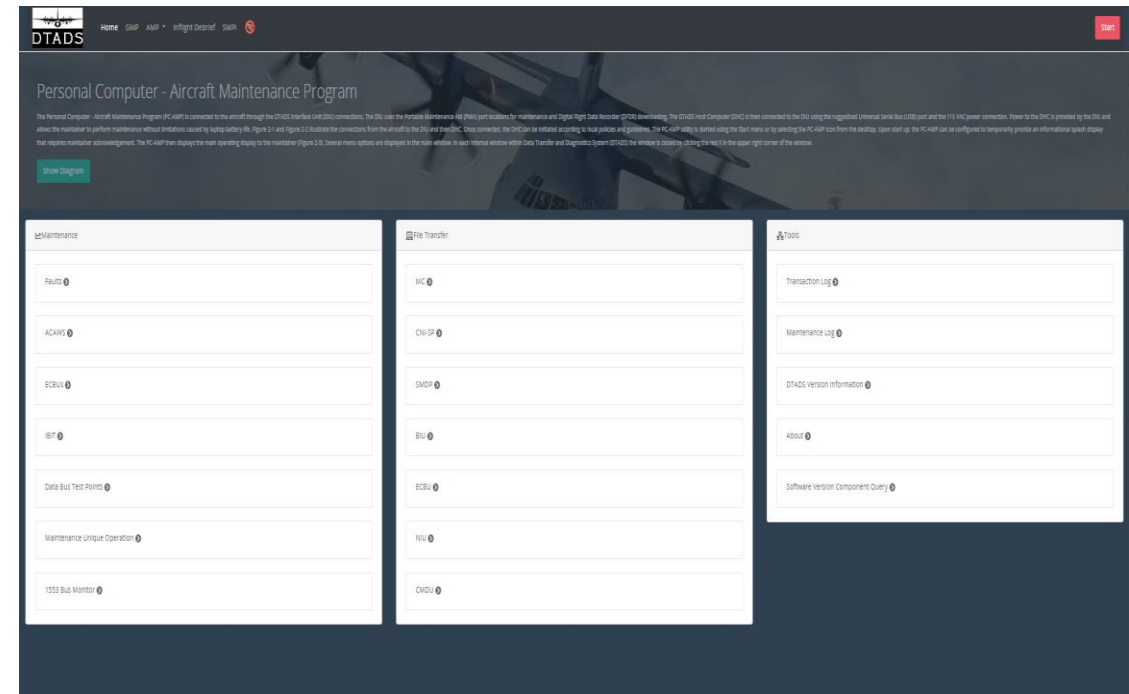
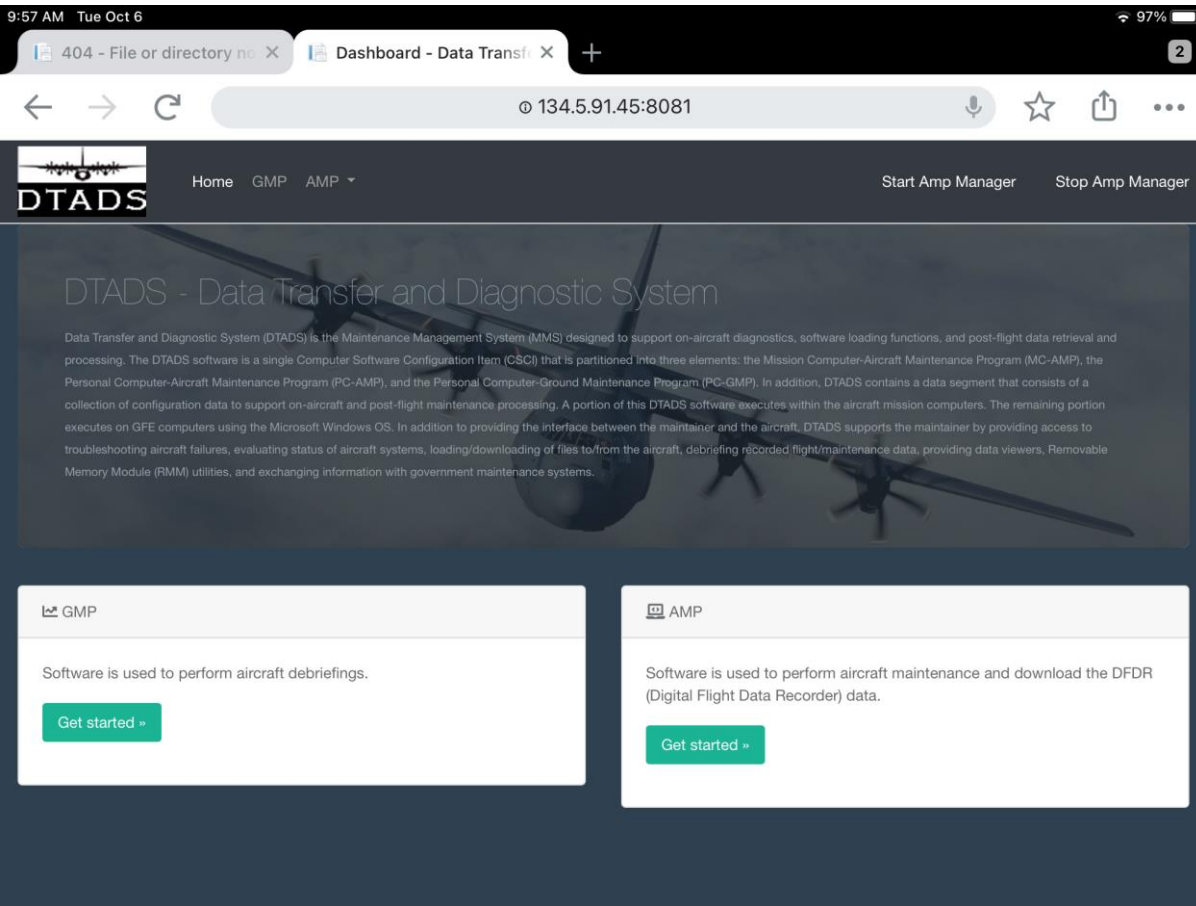


Ground Maintenance Program/Untethered



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- Aircraft Maintenance
 - Built-In Test (BIT) Checks for Integrated Systems
 - Software (SW) Loading for Integrated Systems
 - System Calibrations (i.e., Fuel)
 - System/Component analysis (i.e., test points)

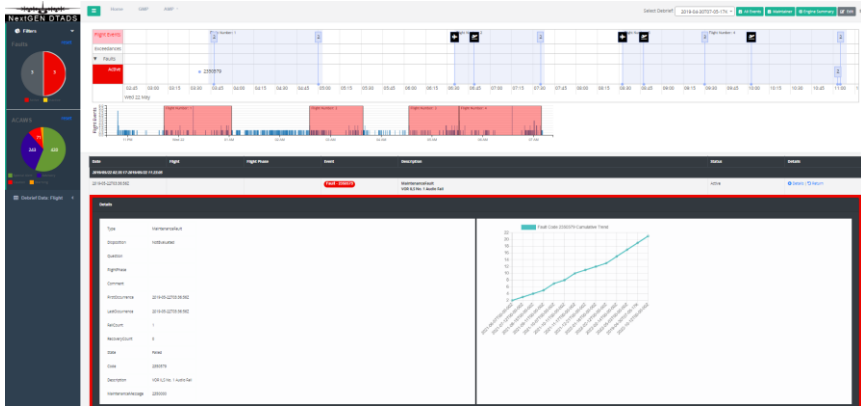


Mobile, Wifi-enabled User Experience Reduces Maintenance Time

Intelligent Diagnostics Integration



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Fully Integrated Intelligent Diagnostics

- Automatic nuisance fault sentencing
- Fault code trending graphics
- Machine Learning-driven recommended actions



Date	Flight	Flight Phase	Event	Description	Status	Details
2019/05/22 02:35:17-2019/05/22 11:23:05						
2019-05-22T03:36:56Z			Fault - 2350579	MaintenanceFault VOR ILS No. 1 Audio Fail	Active	Details Return

Details

Type	MaintenanceFault
Disposition	NotEvaluated
Question	
FlightPhase	
Comment	
FirstOccurrence	2019-05-22T03:36:56Z
LastOccurrence	2019-05-22T03:36:56Z
FailCount	1
RecoveryCount	0
State	Failed
Code	2350579
Description	VOR ILS No. 1 Audio Fail
MaintenanceMessage	2350000

The graph shows a cumulative trend of fault code 2350579 over time. The x-axis represents dates from 2021-06-07 to 2022-10-12, and the y-axis represents the count of faults, ranging from 0 to 22. The trend shows a steady increase, starting at approximately 2 in early 2021 and reaching 22 by late 2022.

Trend data where you need it when you need it

Integrated Post-Flight Debrief with IETP Linking



The screenshot shows the NexiGEN DTADS interface with a flight event timeline and a detailed fault code table. The table below is a reproduction of the data shown in the interface:

Type	MaintenanceFault
Implication	Maintenance
Question	
Comments	
FirstOccurrence	2022-05-05T16:40:00Z
LastOccurrence	2022-05-05T16:40:00Z
Frequency	1
RecoveryCount	0
State	FAULT
Code	2130500
Description	CPC failed BIT. Outflow valve manual motor open coil or limit switch started.
MaintenanceMessage	2130051

Fault Codes are touch-enabled



Environmental control, Pressurization control, 2130500 - General fault isolation procedures

Table 1: References

Date Module/Technical publication	Title
27-31-22-00A-920A-A	Environmental control, Pressurization control, Cabin pressurization outflow valve - Remove and install
27-31-20-00A-920A-A	Environmental control, Pressurization control, Cabin pressure controller - Remove and install

Preliminary Requirements

Required conditions

Table 2: Required Conditions

Action/Condition	Date Module/Technical publication
None	

Applicable to: ALL

DMC-C130-A-21-30-09-00A-420A-A
09/21/22 Page 1

Support Equipment

Table 3: Support Equipment

Name	Identification No	Quantity	Remarks	Applicability
None				

Consumables, Materials and Expendables

Table 4: Consumables, materials and expendables

Name	Identification No	Quantity	Remarks	Applicability
None				

Spares

Table 5: Spares

Name	Identification No	Quantity	Remarks	Applicability
None				

Safety conditions

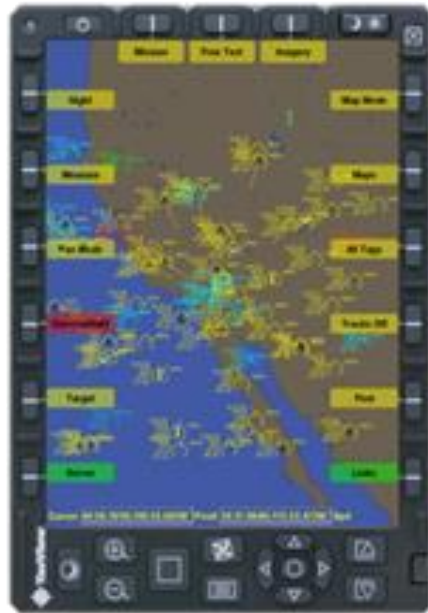
-None-

Procedure

- Disconnect P 1867 (L) from CPC (L).
Is ground present on pin 2, ITP311.
YES: Step 4
NO: Step 2

Active Fault Code Links Launch Directly to Associated Fault Isolation Module

Web-Hosted IETP with IETM-X



- Builds on NextGen IETP functionality
- Supports Server Client Environments
- iOS compatible
- Touch-enabled mobile devices
- Lightweight software implementation
- Enables on-aircraft deployment

IETP/Integrated Electronic Technical Manuals (IETM-X) Onboard Server

Server-Based Execution Onboard the Aircraft

SMPI Data Recording



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- User-friendly data selection table identified data to record

Find:

LRU Name	Description	Rate (Hz)	Req Code	Addl Req Code
CADC_1	Altitude Pressure Value	20	0x5F623	0x5F622
CADC_1	Baroset Corrected Altitude Value	20	0x5F625	0x5F624
CADC_1	True Airspeed Value : True_Airspeed_Value	20	0x5F626	
CADC_1	Mach Number Value : Mach_Number_Value	20	0x5F627	
CADC_1	Calibrated Airspeed Value : Calibrated_Airspeed_Value	20	0x5F628	

Remaining request entries available: 256

Request Rate:

Stopped...

- Capability to record up to 256 data labels
- Data can be used by ID for advanced analytics analysis

Added Control Function



Customer-Tailorable Data Collection Made Easy

Benefits

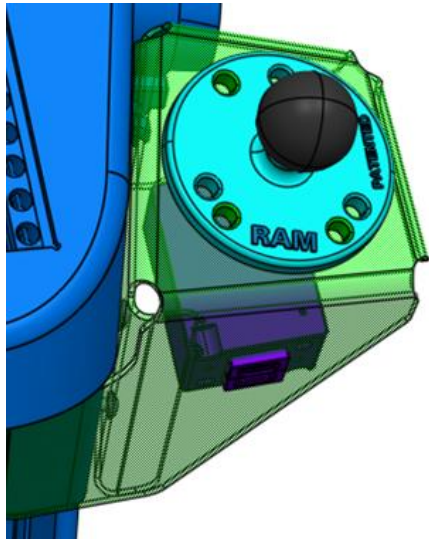


- Reduced crew workload increased safety via GE-Connected Flight Management System (CFMS)
- Read-ahead capability enabling reduced maintenance turn time
- Reduced maintenance time through NextGen-IETP software integration
- Remote capability via SATCOM
- Increased accuracy reduced troubleshooting through enhanced diagnostics
- Data access: Path to Prognostics and Health Management (PHM) and Condition-Based Maintenance (CBM+)

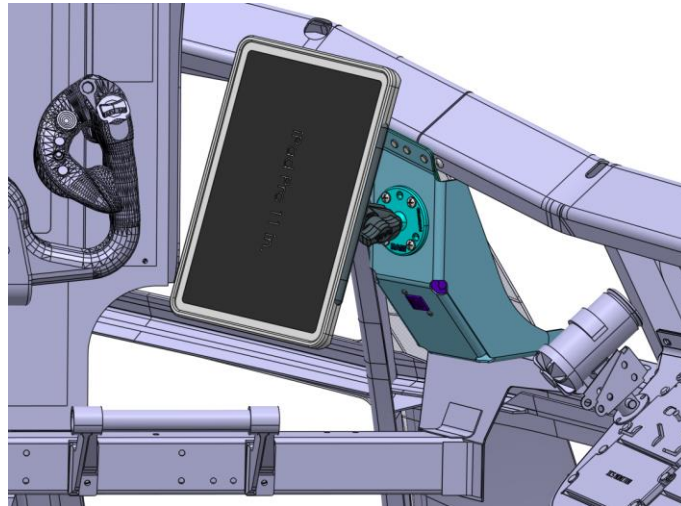
Hardware Demo Available at LM Booth

Hardware Integration

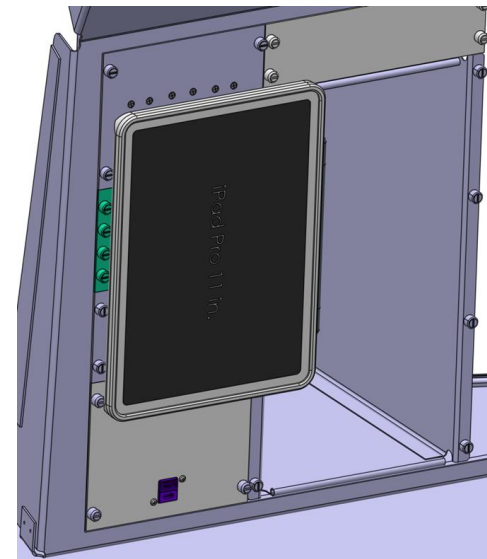
- Electronic Flight Bag (EFB) and Mounting Provisions Kit Supports iPad Interface



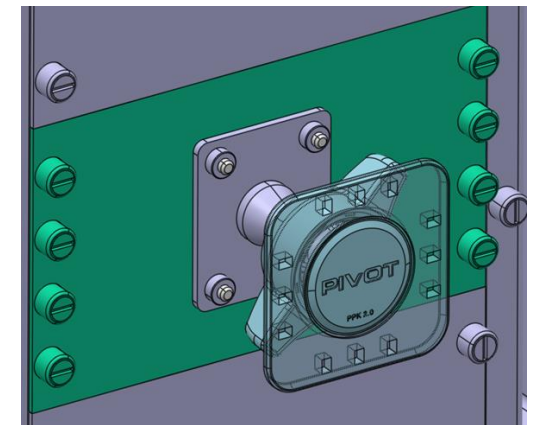
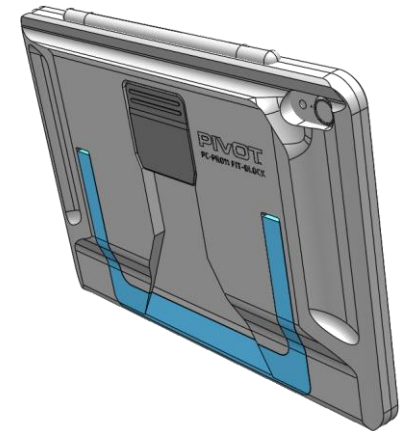
Pilot side



Co-Pilot side



Aug Crew
Station





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Post-Flight Visualization and Anomaly Detection



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Windows Media Player

File View Play Tools Help

Aircraft Escalated Alerts

time	aircraftid	alerttype	Altitude	Flap Position	Indicated Airspeed
2022-09-12 15:30:37	5733	Incorrect Flap Position	2196	100.0	193
2022-09-12 15:30:18	5733	Incorrect Flap Position	2204	100.0	196
2022-09-12 15:29:57	5733	Incorrect Flap Position	2200	50.0	204

Model - SVDD Distance Calculated

Flight Tracker

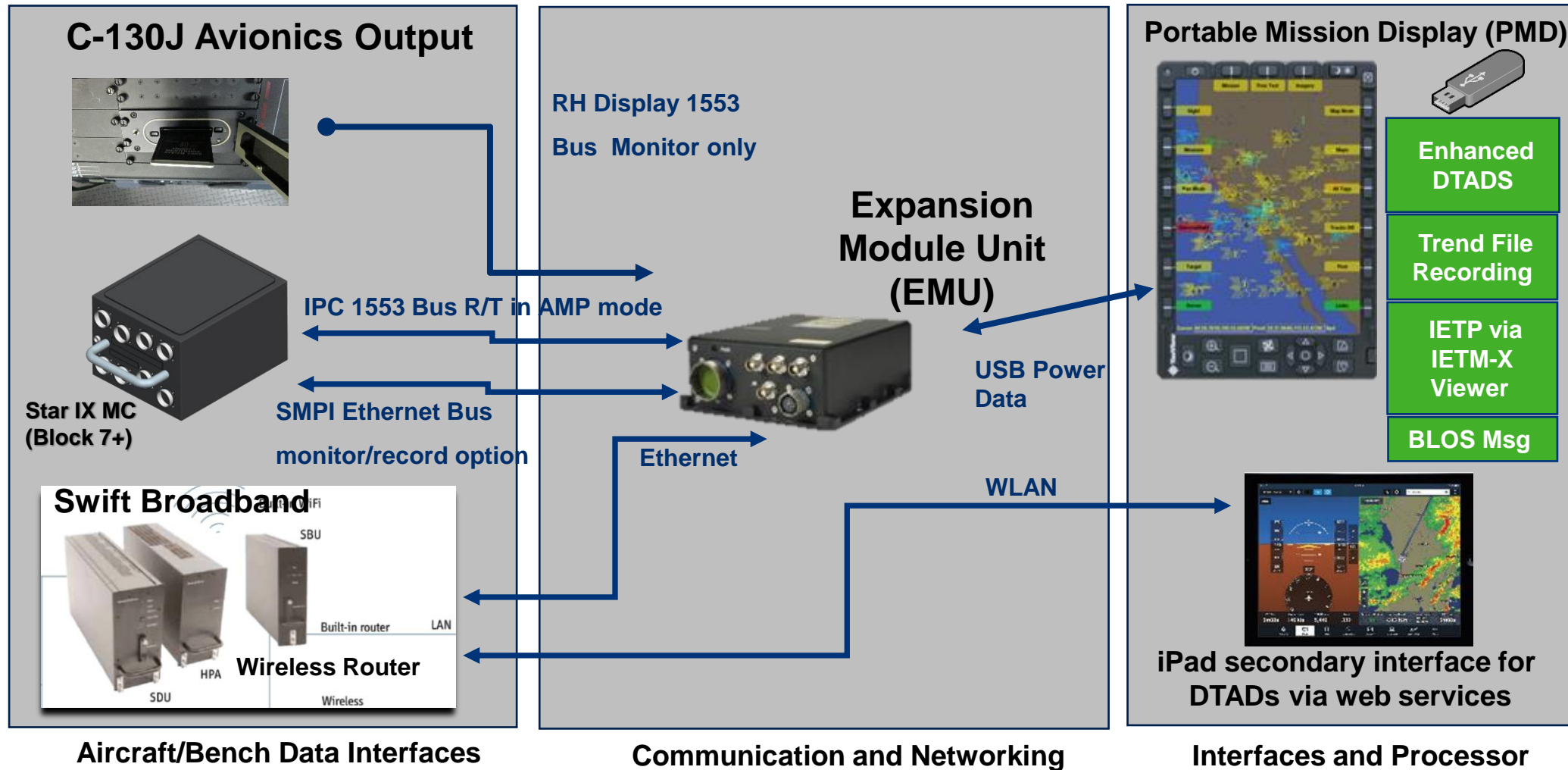
Flap Position

Indicated Airspeed

Type here to search

76°F Mostly sunny 7:33 PM 9/13/2022

NextGen DTADS Hardware Integration



NextGen DTADS Software Integration

- Capability Hosted on Portable Mission Display (PMD)
 - Windows® 10 64 OS with web hosting
 - Web-App interface on iPad or similar device
 - Aircraft Mx and Post-flight capabilities
 - Multiple data exchange methods including wireless
 - Fault assessment using Intelligent Diagnostics (ID)
 - Integrated capability with IETP
- Block 8.1 Enabled Capabilities
 - In-flight debrief
 - Beyond Line of Site (BLOS) read-ahead capability
 - Custom data recording via SMPI
- Advanced Analytics Data visualization tools using ID



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Fault Assessment /SMPI Integration

