

A high-angle, low-altitude photograph of an F-15 fighter jet in flight, banking to the right. The aircraft is white with dark grey accents on the nose and wings. The background is a bright blue sky filled with white, fluffy clouds. The text is overlaid on the upper portion of the image.

F-15 Service Usage Data Collection Overview and Lessons Learned

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Agenda

(F-15 Usage Data Sources)

- On-board Data Recorder
- Counting Accelerometer (C/A)
- Component Swap
- Component Repair
- Inspection Feedback
- Conclusions/Summary

On-board Data Recorder

- SDR: 1/5 F-15 A/B/C/D

- Installation

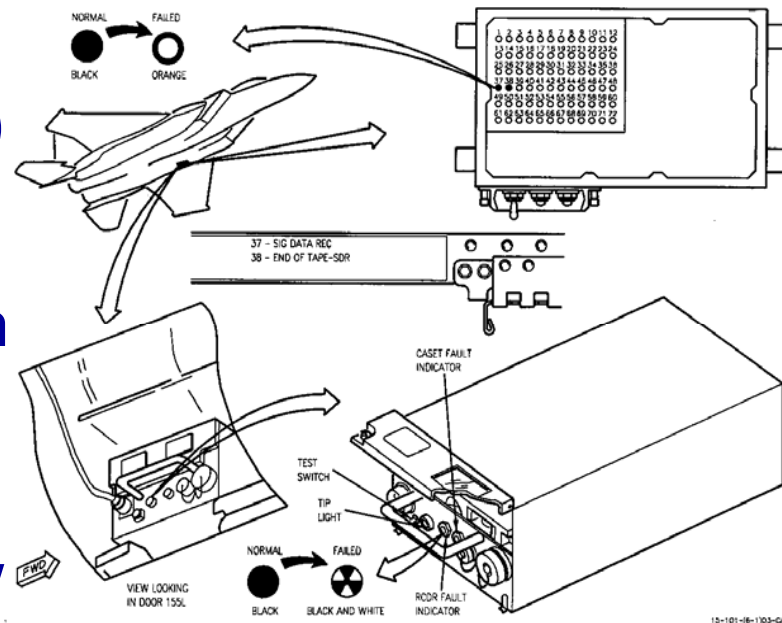
- Otherwise empty bay with structural door

- Recording Criteria

- Rate-based, relatively few parameters

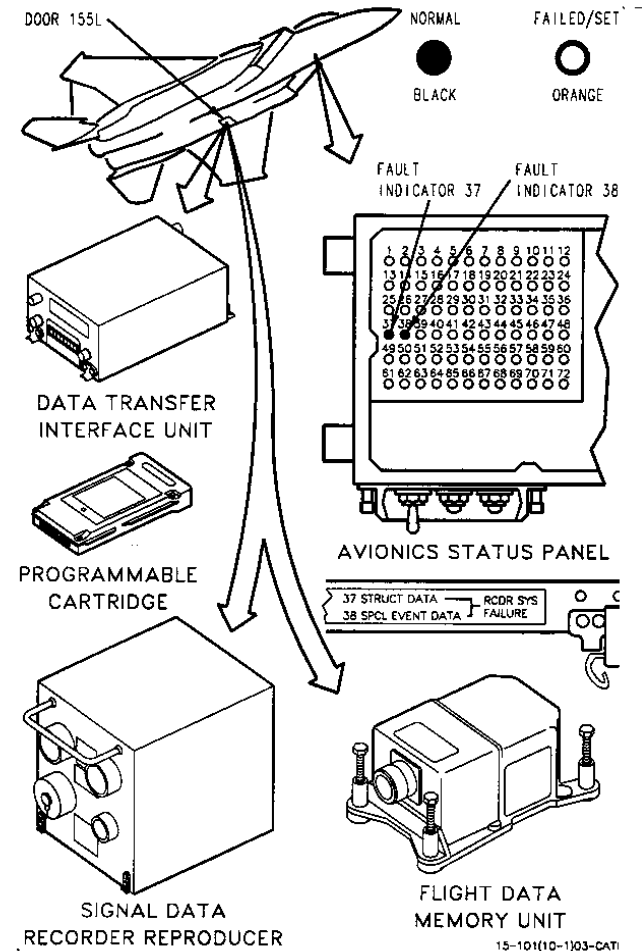
- Data Handling/Transmittal

- Specially designed, Mil-Spec tape cassettes shipped to central facility with special equipment for reading



On-board Data Recorder

- SFDR: 1/5 F-15E
 - Installation
 - Same bay as SDRS
 - Solid state cartridge
 - Includes Crash-survivable memory
 - Recording Criteria
 - Event-based
 - 15 hr download interval
 - Data Handling/Transmittal
 - Transcription performed at O-level, data can be emailed.

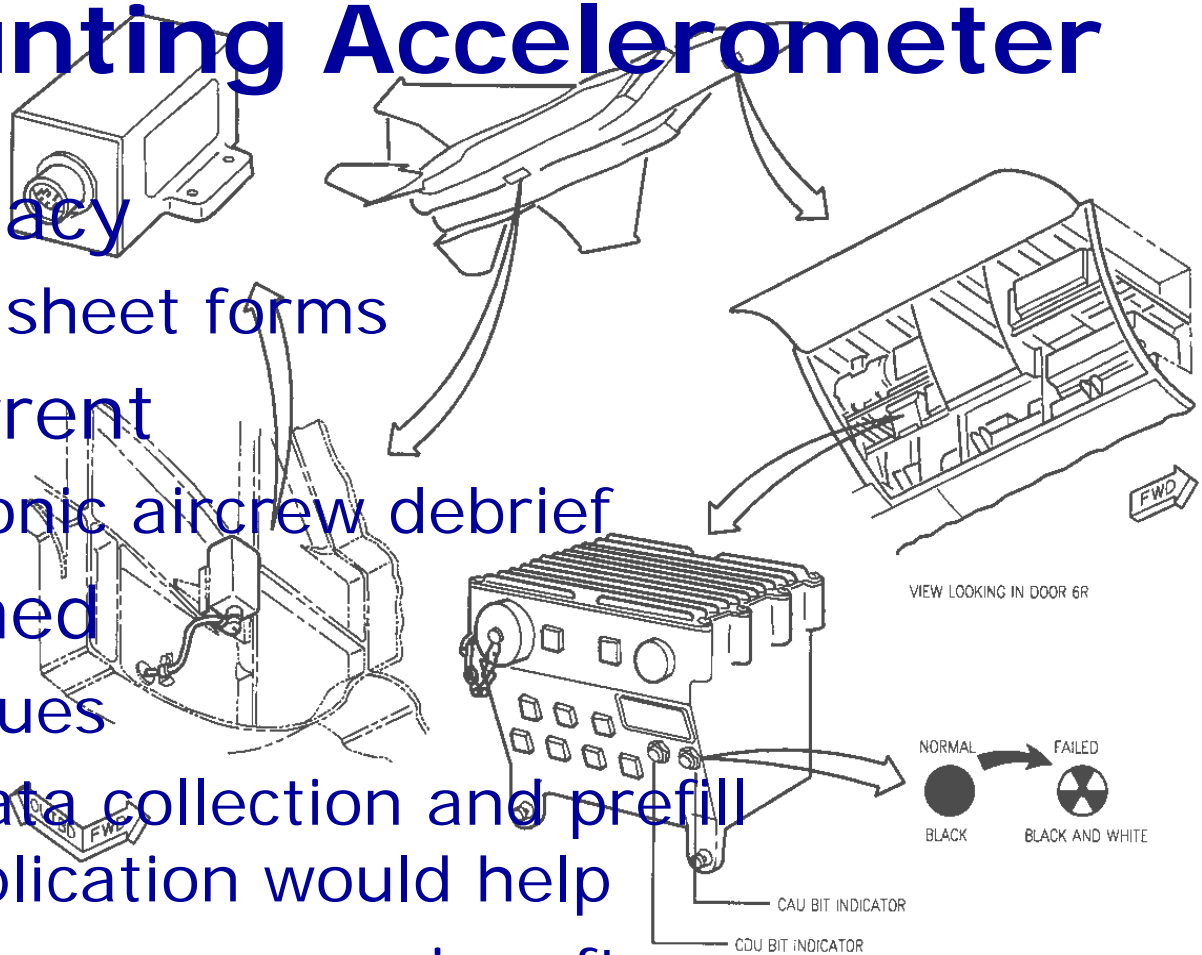


On-board Data Recorder

- Lessons Learned
 - Installation – Drive out complexity and streamline flight line operations. ASIP is the least of your maintainer's worries.
 - Recording Criteria – Keep it simple. Rate-based, generic criteria minimize the chance of having to perform fleet software updates.
 - Data Handling/Transmittal – Again, must streamline this process. Electronic is most efficient but must address bandwidth and security concerns. Hardcopy (cdrom) is not dead. Who needs access?
 - Sustainment – Long-lived systems must be maintained. How many times will computers and software need to be updated/replaced over 30 years? A plan up front will allow for budgeting.

C/A – Counting Accelerometer

- AFTO 239 Legacy
 - Paper bubble sheet forms
- AFTO 239 Current
 - Part of electronic aircrew debrief
- Lessons Learned
 - Both have issues
 - Automated data collection and prefill of debrief application would help
 - A data recorder on every aircraft would eliminate C/A data issues.



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Component Swap

- Legacy (AFTO 238)
 - Paper bubble sheet forms
- Current (Eagle Modification Action Plan-EMAP, AFTO 95)
 - Contractor developed web-application and database
 - Much investigative effort to resolve discrepancies
- Lessons Learned
 - Despite great effort, tracking of field swappable components was abandoned (data quality overwhelmed ability to investigate)
 - Depot is primary source of data
 - EMAP web application has been a good resource

F-15 COMPONENT SERIALIZATION RECORD

AIRCRAFT SERIAL NO	BASE	FLIGHT HR	TOTAL LDO
(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)

COMPONENT CODES

- S - STABILATOR
- M - MAIN LANDING GEAR
- N - NOSE LANDING GEAR
- L - LEFT HAND
- R - RIGHT HAND
- V - VERTICAL

COMPONENT REMOVED	DATE REMOVED			SERIAL NO. OF COMPONENT REMOVED	COMPONENT	DATE REMOVED			SERIAL NO. OF COMPONENT REMOVED
	DAY	MONTH	YR			DAY	MONTH	YR	
(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)

COMPONENT	DATE INSTALLED			SERIAL NO. OF COMPONENT INSTALLED
	DAY	MONTH	YR	
(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)	(Bubble grid)

PREPARED BY: _____ (PLEASE PRINT) DSN _____

INSTRUCTIONS AND BASE CODES ARE ON REVERSE SIDE OF FORM.

REMARKS:

Component Repair

- AFTO 95, AFTO 3
 - Mainly documents depot activity (major structure replacement).
 - Looking for “Zero Damaging Repairs”
- Lessons Learned
 - Find as many related data sources as possible.
 - Not all repairs of interest require engineering disposition.

SIGNIFICANT HISTORICAL DATA			PAGE	OF	PAGES
1. MISSION DESIGN SERIES/TYPE, MODEL AND SERIES		2. MANUFACTURER	3. SERIAL NUMBER		4. ACCEPTANCE DATE
F-15A			75-0047		
DATE	REMARKS			ORGANIZATION	
26 SEP 88	Acft arrived WR-ALC 16/05/8 & placed in work on Project #A-8-5700-WR for Depaint/			WR-ALC	

Inspection Feedback

- AFTO 3 Legacy
 - Paper bubblesheet form
- AFTO 3 Current
 - PC-based software and automated data transmittal
- Lessons Learned
 - Very difficult to implement and maintain no matter what method, but is a central ASIP need. Plan on spending time maintaining feedback.

The image shows a paper bubblesheet form titled 'INSPECTION TRACKING RECORD'. It is divided into several sections:

- Top Section:** Includes fields for 'HORIZONTAL STAR SERIAL NUMBER' and 'WING SERIAL NUMBER'.
- Inspection Grids:** Multiple grids of bubbles for recording inspection results on different parts of the aircraft, categorized by 'LEFT' and 'RIGHT' sides.
- Inspection Method Section:** Contains checkboxes for 'INSPECTOR METHOD' and 'INSPECTION METHOD' (e.g., VISUAL, X-RAY, ULTRASONIC, DYE PENETRANT, SURFACE EDDY CURRENT, BOLT HOLE EDDY CURRENT, OTHER).
- Flaw Size Section:** Includes a 'VIEW LOCUS' diagram and a table for recording 'FLAW SIZE (in)' with columns for 'ZONE', 'REGION', and 'HOLE'.
- Disposition Section:** Contains checkboxes for 'DISPOSITION' (e.g., SURFACE GRIND, REAM HOLE, SOLID WORK HOLE, REPLACE PART, T.O. REPAIR, SPECIAL REPAIR, OTHER).



Conclusions/Summary

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- A detailed cutaway diagram of a modern fighter jet, showing its internal structure, engine, and various systems. The aircraft is shown from a three-quarter perspective, facing right. The cutaway reveals the internal layout of the fuselage, including the cockpit, engine, and various internal components.
- Use existing data reporting or piggyback on existing reports where possible.
 - Optimize access, minimize maintenance time.
 - Automate collection/transmittal/validation – minimize person in the loop
 - Minimize specialized GSE
 - Minimize software tied to specialized hardware
 - Plan for supporting hardware/software for a long time
 - Web-based data collection/transmittal has strong appeal