



SOUTHWEST RESEARCH INSTITUTE

# **Modeling Equipment Health for Strategic Procurement and Sustainment**

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- **Motivation**
- **Background**
- **Problem Statement**
- **Approach**
- **Discussion**
- **Conclusions**
- **Acknowledgments**
- **References**

- **Aircraft Fleet Age Expected to Increase Before Declining**
- **Support Equipment Age Linked to Fleet Age**
- **Mission Capable Rates Are Dependent on Effective Support Equipment**
- **Fragmented Life Cycle Management of Maintenance Functions**



- **DoDAF Framework**
  - **Relate System and Maintenance Functions**
- **BBP 3.0, Emphasize**
  - **Control LCC**
  - **Productivity**
  - **Innovation**
  - **Competition**

**Avionics**  
AvMxF1  
AvMxF2  
...

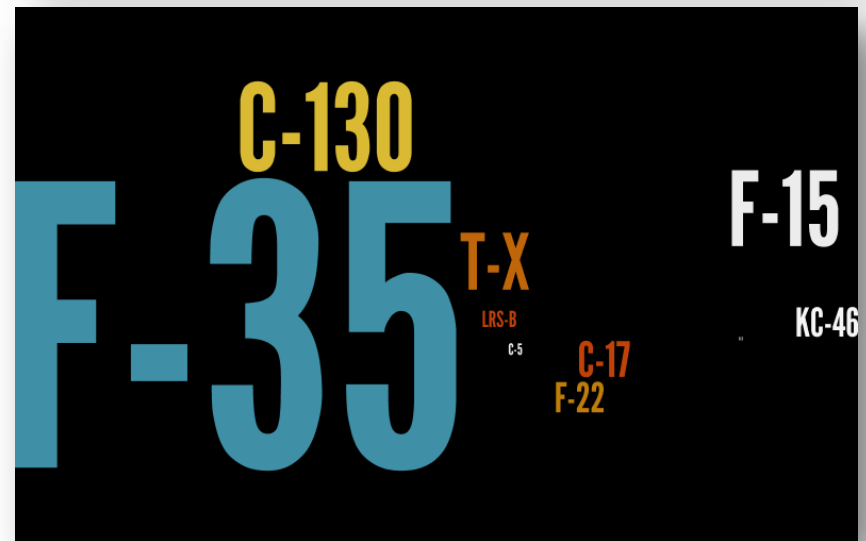
**Fuel System**  
FsMxF1  
FsMxF2  
...

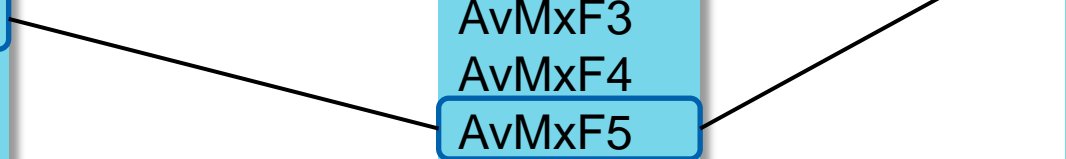
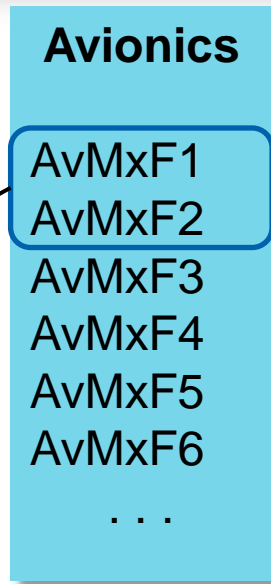
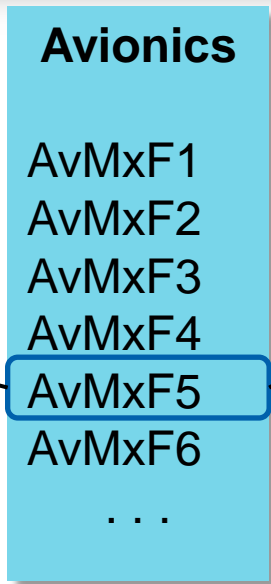
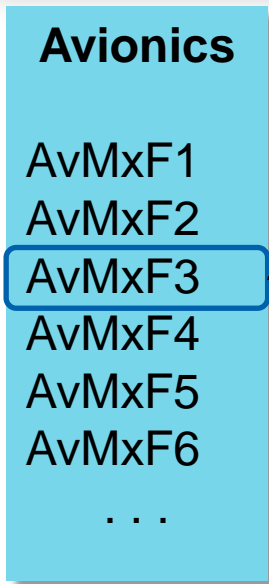


Map Selected Functions to SE

# Problem Statement

- **Strategic Procurement of Support Equipment**
- **Maintenance Functions Across Service**
- **System Health Modeled for Life Cycle Management**





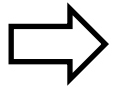
Identify Service-Wide Common Maintenance Functions from System Architecture

**C-130**  
**A-10**  
**B-52**  
**Avionics**

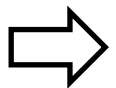
AvMxF1  
AvMxF2  
AvMxF3  
AvMxF4  
AvMxF5  
AvMxF6  
...

**C-130**  
**A-10**  
**B-52**  
**Comms**

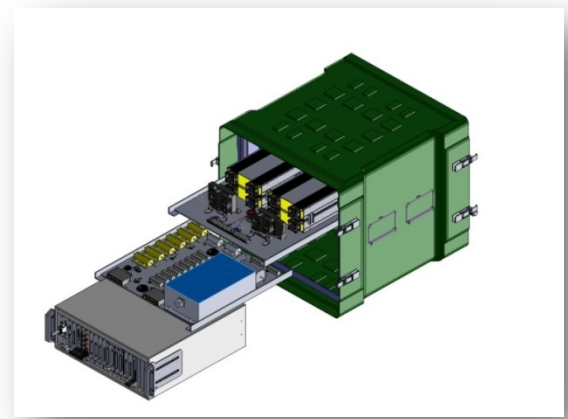
CmMxF1  
CmMxF2  
CmMxF3  
CmMxF4  
CmMxF5  
CmMxF6  
...



Legacy  
Maintenance  
Requirements

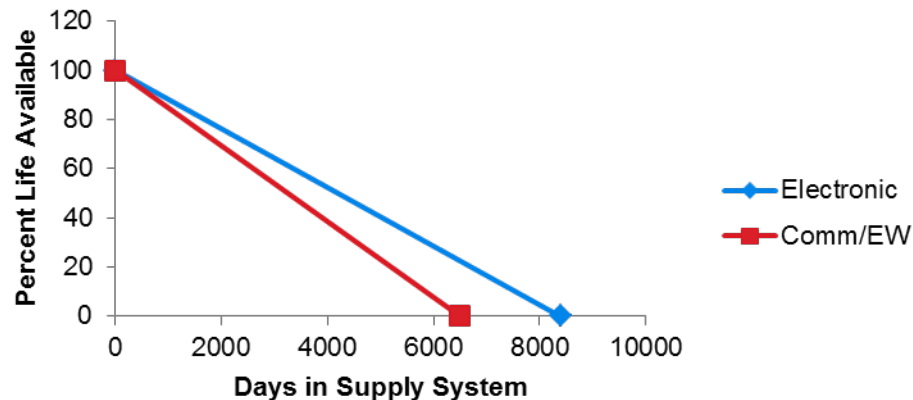


Emerging  
Maintenance  
Requirements



- **Compile Historical Support Equipment Supply System Data**
  - Track for Obsolescence
  - Track for Usage
  - Classify by Dominant Function

**Equipment Class Obsolescence Model**





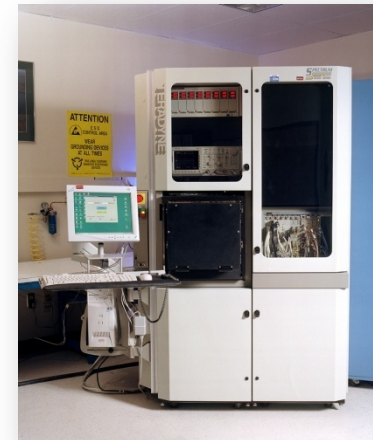
	2017	2018	2019	2020	2021
Legacy SE (Available Life)	78	74	69	65	61
New SE (Available Life)		100	96	92	88
C-130	Legacy	Transition	Transition	Transition	New
A-10*	Legacy	Legacy	Legacy	Legacy	Legacy
F-35		New**	New	New	New

\*Assume draw down in 2020s. High remaining life suggests minimal ROI.

\*\*Assume FRP begins.

Align Legacy Aircraft with Emerging Support Equipment for Maximum Life

- **Modeling Support Equipment Life**
  - Design Life
  - Individual Asset Life
- **Identifying Common Maintenance Functions**
- **Enable Strategic Procurement**
- **Setup for Optimizing Life Cycle Management**



- **Thank you to the Avionics & Support Systems Department of the Defense & Intelligence Solutions Division**

**[1] B. Everstine, “Readiness declines in aging, overworked fleet”, Air Force Times, October 2013.**

**[2] US Dept. of Defense, Defense Acquisition Guidebook, 2004.**

**[3] US Dept. of Defense, DoD Architecture Framework Version 2.02.**

**[4] US Dept. of Defense, Implementation Directive for Better Buying Power 3.0, 2015.**