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Rapid Sustainment Office

**Rapid Sustainment Office | 4.25.2023**  
RSO CBM+ Program Office

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**THE MISSION OF THE  
UNITED STATES  
AIR FORCE IS  
TO FLY, FIGHT,  
AND WIN...AIRPOWER  
ANYTIME, ANYWHERE**

**689,000 PERSONNEL  
3 CONTINENTS**



**AIR SUPERIORITY**

**GLOBAL STRIKE**

**RAPID GLOBAL MOBILITY**

**INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE**

**COMMAND AND CONTROL**





# TOTAL AIRCRAFT INVENTORY

5,501 AIRCRAFT

81 VARIANTS

30 YEAR AVERAGE AGE

180,000+ MAINTENANCE TECHS

70% OF A WEAPON SYSTEM'S  
TOTAL OWNERSHIP COST ARE  
SUSTAINMENT COSTS





## Three Levels of Maintenance

Depot – Major airframe, engine, electrical, avionics overhaul, and modification; Refurbishment typically requires near complete disassembly

Intermediate – Moderate inspection requiring removal of maintenance panels and some components to inspect critical aircraft systems

Field – Targeted maintenance that typically includes routine inspection or reactive repair actions required to return the aircraft to service; Unplanned field maintenance operations have immediate mission impact



## WHO WE ARE

Established with a sustainment-centric focus to leverage mature, new, emerging, and disruptive technologies to dramatically improve USAF readiness

Organized with a non-traditional Air Force construct based on agile principles and a short chain of command, we pioneer innovative and cost-effective sustainment technologies and tools for the betterment of the sustainment enterprise

## VISION

Transform the acquisition approach and sustainment enterprise vital to the world's most advanced Air Force

## OBJECTIVE

Through agile acquisition processes, increase mission readiness by identifying, applying and scaling proven solutions at the speed of relevance to advance the operation and sustainment of the United States Air Force





**The RSO increases mission readiness and capabilities by scaling innovative solutions to advance and modernize sustainment operations for the world's most advanced Air Force.**



HEADQUARTERS AIR FORCE



AF MATERIEL COMMAND



AF LIFE CYCLE MANAGEMENT CENTER



# RSO ORGANIZATION & LEADERSHIP



## Board of Directors



LT GEN SHAUN Q. MORRIS  
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LT GEN SHAUN Q. MORRIS  
AFLCMC/CC

## PEO

## PEO Staff



AIMS



Advanced Manufacturing



CONDITION BASED MAINTENANCE **CBM+**

# TECHNOLOGY FOCUS AREAS



## **Artificial Intelligence & Machine Learning**

Employing AI/ML to optimize fleet maintenance and predict / prevent aircraft failure.



## **Advanced Manufacturing**

Utilizing new manufacturing technologies to upgrade fleets, reduce waste, & extend lifespans.



## **Automation & Robotics**

Implementing technology solutions to accelerate maintenance times, mitigate risks, and positively impact costs.



## **Augmented & Virtual Reality**

Deploying augmented reality and virtual reality hardware and software to unify expertise and accelerate the speed of training.



## **Rapid & Austere Maintenance Environments**

Deploying capabilities and providing Airmen with emerging technologies that are rapidly deployable to austere locations.



## **Data & Digital Environments**

Using technology to make data more usable with better quality information and consistency.



# TECHNOLOGY FOCUS AREAS

**Artificial Intelligence & Machine Learning**  
Employing AI/ML to optimize fleet maintenance and predict / prevent aircraft failure



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[Industries](#)

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Announcements

## C3 AI and the Rapid Sustainment Office Achieve Authority to Operate (ATO) from United States Air Force

March 11, 2022



# PREDICTIVE MAINTENANCE & ACE

AOC  
MTO

~~MOB~~  
AEW

FOS

IAMD

PREPOSITIONED

WRM

IAMD

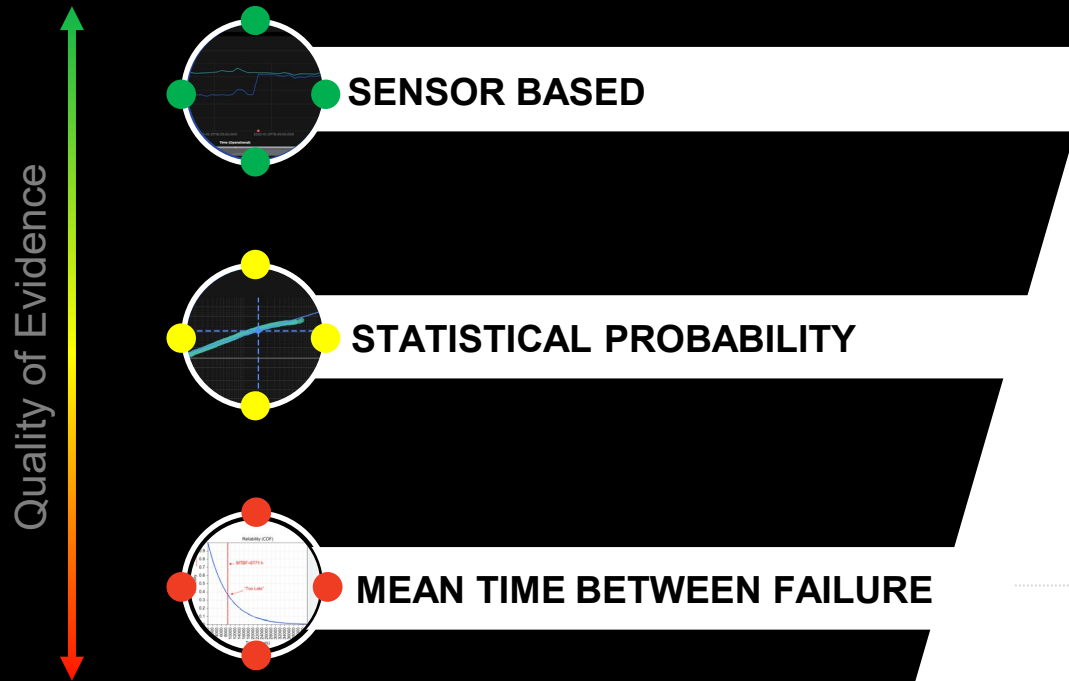
“To generate combat power from a number of locations to create dilemmas for an adversary...I just need a runway, a ramp, a weapons trailer, a fuel bladder, and a pallet of [Meals, Ready-to-Eat]. That’s maybe a little bit bold, but the point is, we’ve got to be light, lean and agile.”

-- General CQ Brown, Jr., Chief of Staff of the Air Force



# PREDICTIVE MAINTENANCE CONCEPT

Measures of Reliability as Evidence of Need



## PREDICTIVE

Advanced analytics and sensing data to accurately predict equipment reliability

## PROACTIVE

Defect elimination to improve performance

## PLANNED

Scheduled maintenance

## REACTIVE

Fly to failure



# WHAT IS PREDICTIVE MAINTENANCE?

A technique to predict the future failure point of a component, so that the component replacement can be planned at an optimal time before it fails

Failure management strategy designed to increase operational reliability of weapon systems assigned to a mission



**WHAT IS FAILURE?**



**HOW ACCURATE CAN WE GET?**



**HOW FAR CAN WE GET?**

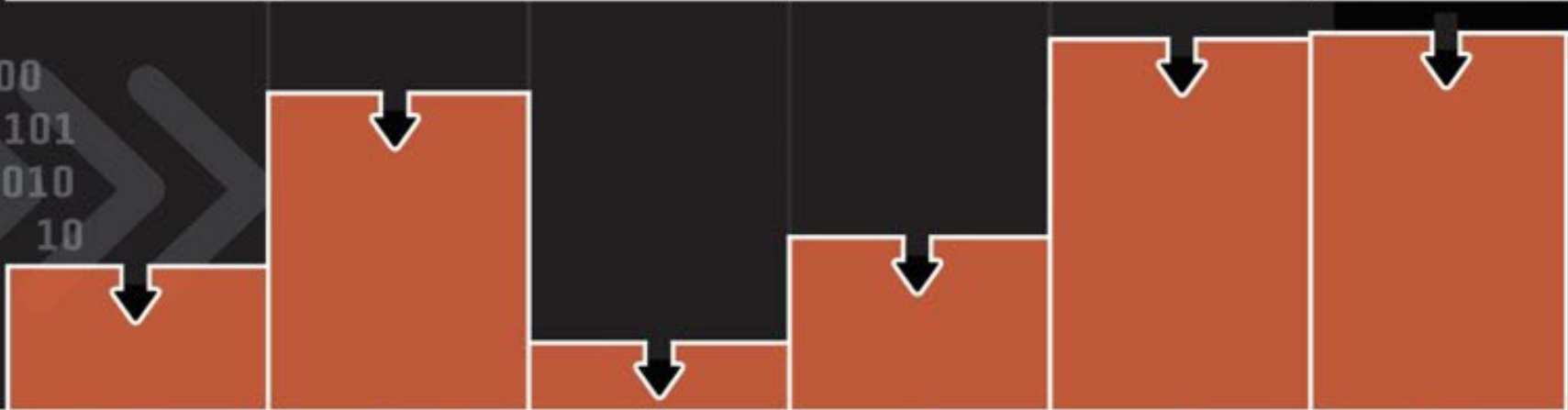
OVERARCHING REQUIREMENTS



CAPTURE TRANSFER STORE ANALYZE IMPLEMENT TRACK

001101  
0000100  
001101 1001101  
001001010  
1001101 10  
01010  
10

**DATA**





# WHAT IS PANDA?

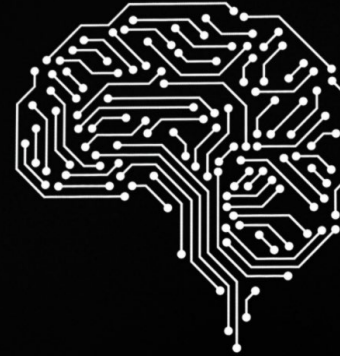
A modern and integrated toolkit for CBM+ enterprise.

## 01 DATA SOURCES



- Maintenance Data
- Supply Data
- Onboard Sensors

## 02 CLOUD ONE



## 03 CBM+ APPLICATIONS

- CBM+ Forecast (eRCM)
- Metrics Dashboard
- Analyzer
- Long Range Supply Forecast (LRSF)
- Supply-Depot Dashboard
- Sensor Based Algorithms (SBA Tracker)

# CONDITION BASED MAINTENANCE

# CBM+

# BY THE NUMBERS



LAST UPDATED 23 MARCH 23

**1**  
USAF  
CBM+ VISION

**43,000**  
SENSOR FEEDS

## SENSOR BASED ALGORITHMS

**75B**  
ROWS OF TELEMETRY  
DATA SPANNING  
FOUR YEARS

**5,000**  
SORTIES ANALYZED

## LEGACY ANALYTIC OUTPUTS

**FIELD**  
**128** ✓

**16**  
FIELD  
PLATFORMS

 **702** ACTIVE  
PANDA USERS

 **3,110**  
AIRCRAFT  
ACTIVELY MONITORED

## WORK UNIT CODE ANALYSIS

**250,889**  
TOTAL WUCs  
IN PRODUCTION

**400,000+**  
HISTORICAL FORECAST  
PREDICTIONS BY  
PRODUCTION MODELS

## eRCM WORK UNIT CODES

**FIELD**  
**116** ✓

**200+**  
MODELS USED TO  
GENERATE A  
WEIBULL ANALYSIS



@airforcerso



@airforcerso



@AFRSO



@AFRSO



@afrso

RAPID  
SUSTAINMENT  
OFFICE **750**

## OPPORTUNITY

In order for the USAF to achieve a fully predictive maintenance posture, a workforce with deep understanding of AI/ML is required across government and industry in:

- Aerospace
- Critical Infrastructure
- Space and Missile
- System Support Equipment and Vehicles



## Fields

- Architecture
- Capture
- Transmit
- Process
- Code/Decode
- Storage
- Analysis
- Reliability Engineering
- Maintenance
- Cleansing





# THANK YOU

