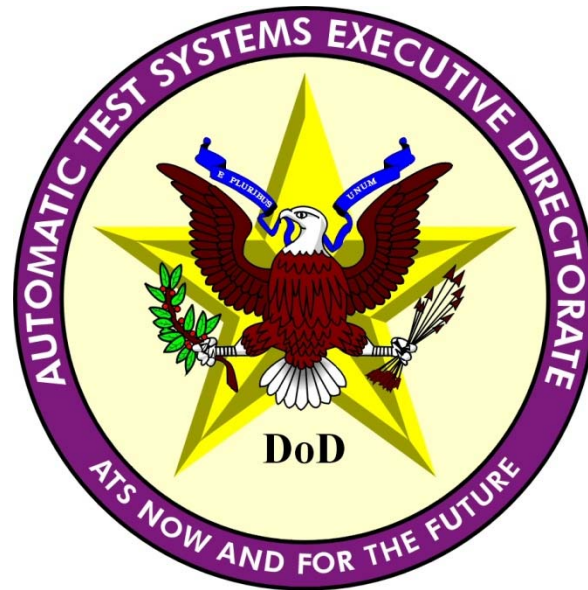


# DoD Automatic Test Systems Strategies and Technologies



## JTEG Forum on ATE/ATS

28 October 2014

# Service ATS Participants

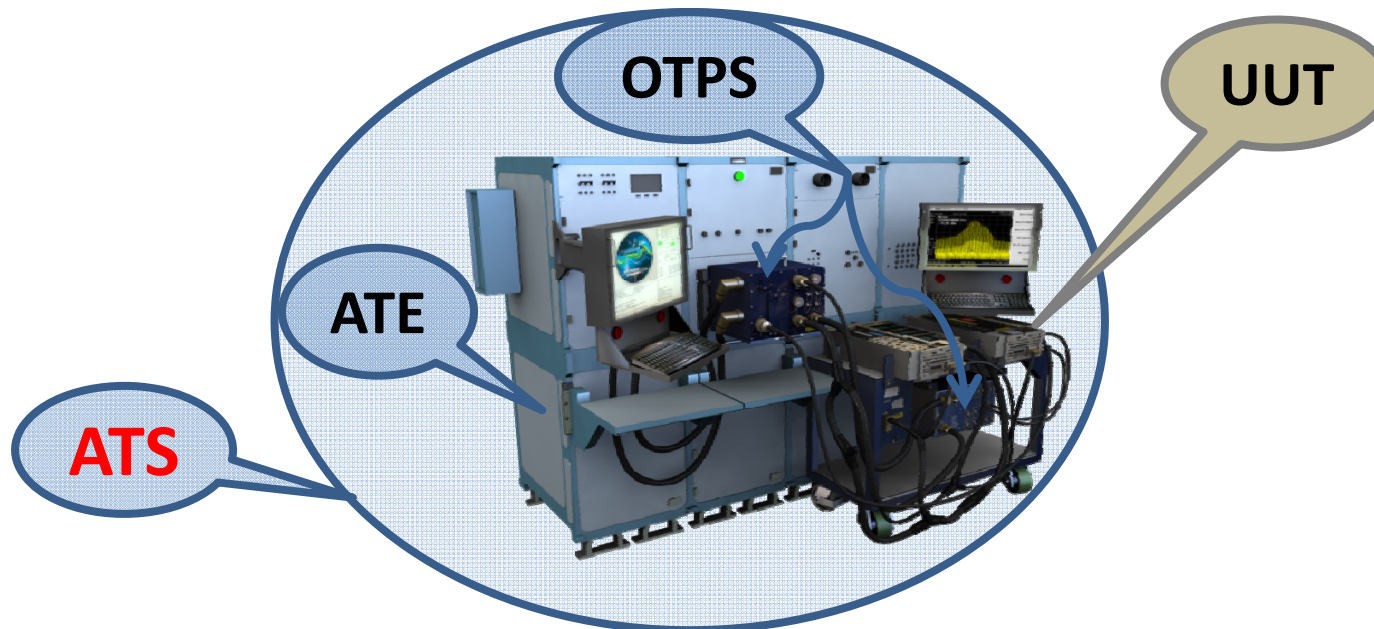
## ATS

- **Bill Ross** (Eagle Systems, NAVAIR and DoD ATS Support)
  - Introduction and Background
- **George Mitchel** (Army, Product Director TMDE)
  - US Army ATS Roadmap
- **Chris Giggey** (Navy, Dept. PM for ATS)
  - Naval Aviation ATS Roadmap
- **Mike Heilman** (Marine Corps, ATS Team Lead)
  - Ground Marine Corps ATS Roadmap
- **Lt Col Sean Rivera** (Air Force, Chief ATS Division)
  - Air Force ATS Roadmap
- **Jay Romania** (Army, Competency Manager, ATS Division)
  - Dod ATS NxTest IPT Chair – Joint Test Technologies
- **Mike Malesich** (Navy, Automatic Test Software Branch Head)
  - DoD ATS Framework IPT Chair – ATS Standards

# “Automatic Test Systems” Terminology

ATS

- **ATE or Automatic Test Equipment** = Integrated set of test and measurement instruments able to do weapon system test and diagnostics
- **OTPS or Operational Test Program Set** = A set of hardware to physically interface a group of weapon system Unit(s) Under Test (UUTs) to the ATE and the UUTs test program software
- **ATS or Automatic Test System = ATE + its OTPSs**



# Automatic Test Systems

ATS



- Complex electronic test and diagnostics equipment
- Used at all levels of maintenance from factory to field
- Hundreds of different types in DoD inventory and tens of thousands of application test programs in use
- \$51B spent on automatic test systems from 1980 – 1992



# The DoD ATE Problem

--- Over 400 different ATE ---



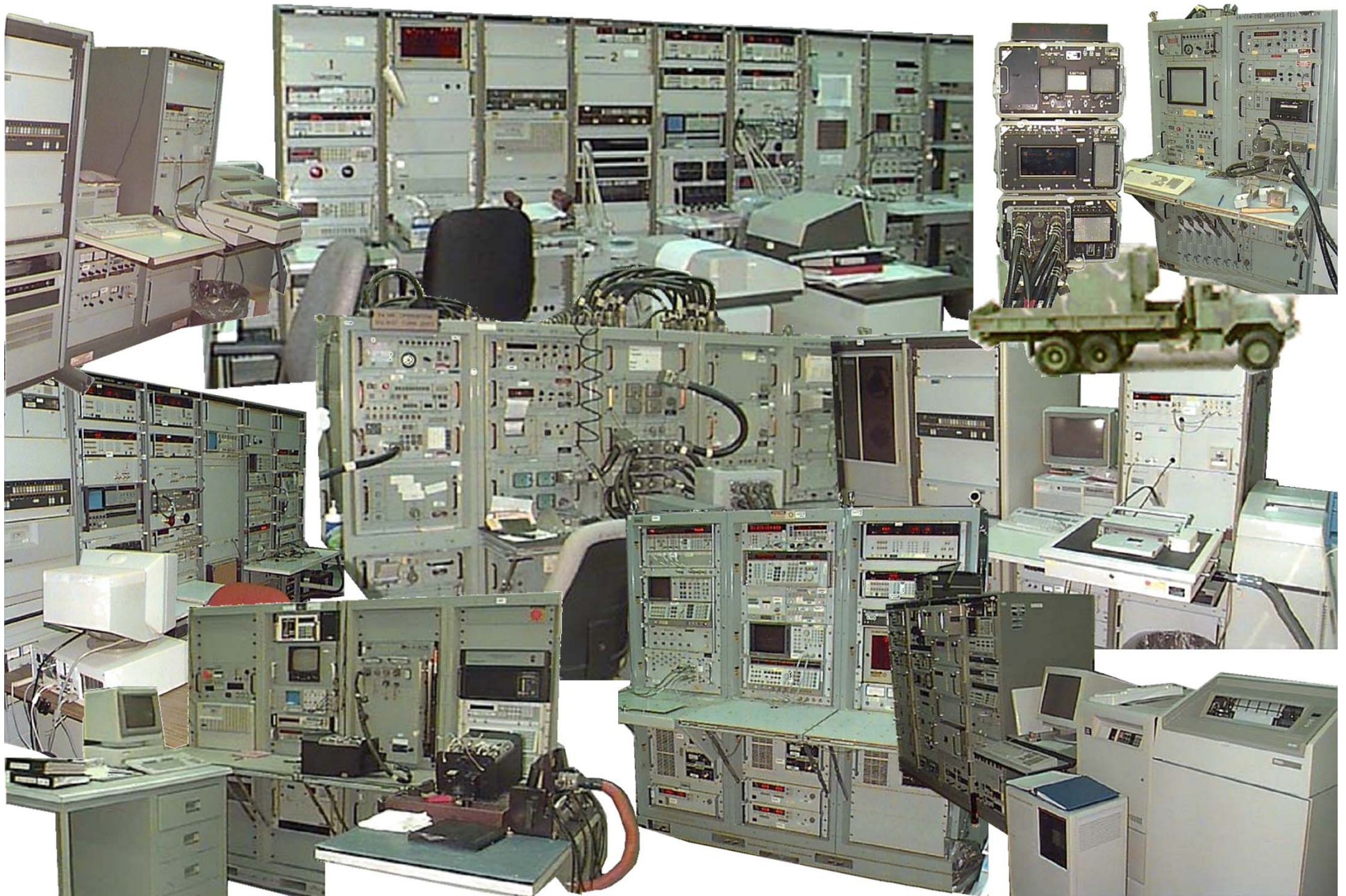


more problems.....





...and there's even more



# The Major Issues Facing DoD - Late '90s

ATS

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1. 85-95% common test capability among the different DoD ATE
2. Most ATE are or are becoming obsolete
3. We pay for similar redesigns multiple times
4. We have NO interoperability among our different ATE types
5. Our ATS does NOT leverage available valuable diagnostic data
6. Combat technologies are being fielded faster than the required support equipment
7. Support costs are rising significantly as DoD combat support systems age
8. Old technology drives huge logistic footprints (volume)
9. Existing ATE does NOT allow for easy and cost effective technology insertion
10. Unique labor skills are required to operate, maintain and support each ATE



# DoD ATS Executive Directorate (ED)

ATS

- OSD established the DoD ATS ED Office to better coordinate ATS across the DoD
  - DoD IG, Congress, and GAO “Tried to Help”
- Goals of the DoD ATS ED:
  - “Reduce the total cost of ownership of DoD ATS”
  - “Provide greater flexibility to the warfighter through Joint Services interoperable ATS”
  - “Reduce logistics footprint”
  - “Improve quality of test”



# DoD ATS Executive Directorate

ATS

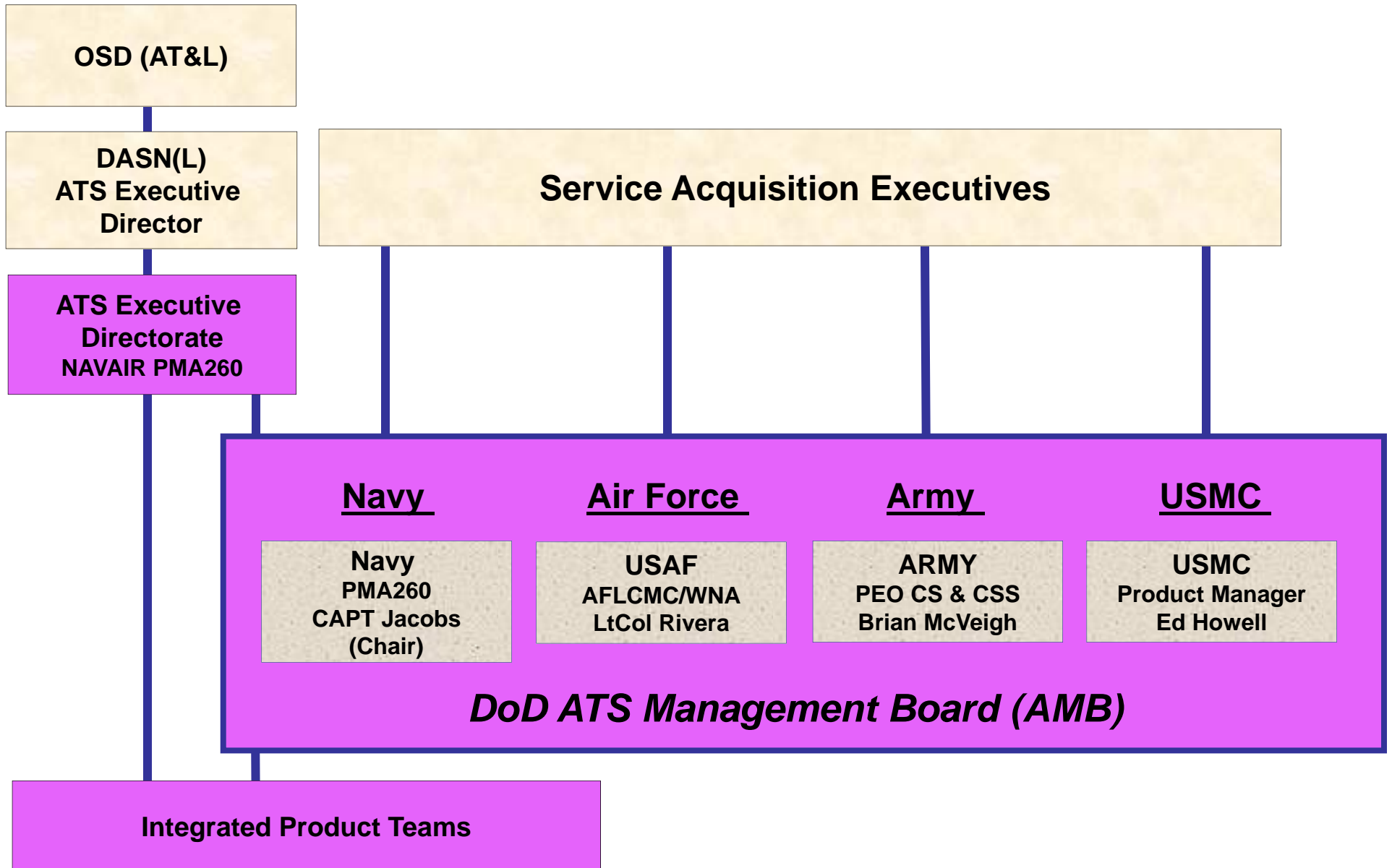


## Two Primary Organizational Elements

- **DoD ATS Management Board or AMB**
  - Senior ATS leader from each Service
- **Joint Services Integrated Product Teams or IPTs**
  - Service members interested in the IPT topic



# DoD ATS Management Board



# Joint Services Integrated Product Teams

**TPS  
Standardization**

**Procedures for standardizing the Test Program Set acquisition process**

**ATS  
Processes**

**DoD ATS Master Plan; Processes and tools for analyzing ATE selections**

**ATS Framework**

**Defines/selects the elements or standards desired in DoD ATS**

**NxTest**

**Assessing and demonstrating emerging test technologies  
Defining and managing the DoD ATS Framework (architecture)**

**IT**

**Developing an Information Assurance Framework for ATE**



# DoD ATS Executive Directorate

ATS



- Originally focused on putting internal Service and cross Services ATS Policies and Processes in place
- Now, more focused on sharing test technologies and leverage ATS investments among the Services

# DoD ATS ED General Strategy

ATS

- 1. Designate DoD Standard ATS Families**
- 2. Define a Technical Open System Framework for ATS designs**
- 3. Share test technology development and insertion**
- 4. Each Service modernize own Standard ATS Family**



# DoD ATS Technology Demonstration

ATS

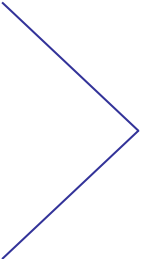
## Agile Rapid Global Combat Support (ARGCS)

- 2004 – 2008 OSD Advance Concept Technology Demonstration project
  - Competitively awarded to Northrop Grumman
- Investments by OSD, Army, Navy, Marine Corps, and Air Force
  - Funding, technical support and material
  - Information exchange with UK MOD

# Share Investment in Next Generation ATS Demonstrations

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## ARGCS Key Features & Metrics

- ATS interoperability among weapon systems, Services, and other countries
  - Scalable to need and performance enhancements
  - Smaller footprint, reduced logistics burden
  - Better use of weapon system diagnostics data and historical maintenance data
    - ATE Net-Centric functions
  - Key technologies demonstrated:
    - Common Tester Interface (CTI)
    - Synthetic Instruments – stimulus and measurement
    - ATML – net-centric diagnostics functions
- 
- Validation of emerging ATS Technical Framework standards

# Share Investment in Next Generation ATS Demonstrations

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- Services jointly supported the Agile Rapid Global Combat Support (ARGCS) ACTD system-level demonstration
- Successfully demonstrated a number of test technologies:
  - ARGCS Architecture
  - ATML Standards
  - ATML (first implementation)
  - Common Tester Interface
  - Net-Centric Diagnostics
  - Synthetic Instrumentation (SI)
  - SI Component Interface Standards
  - LXI standards
  - Multiple Run-time Environments
  - Commercial Instrument Maturity
    - Bus Test Emulation Instrument
    - High Density Digital Instrument
    - High Density Analog Instrument
    - Advanced Power Supplies





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    - High Density Analog Instrument
    - Advanced Power Supplies



**These technologies are being incorporated into the current generation of DoD ATS Families**