



AVMI

Additive Manufacturing Capabilities



24 July 2014

Presented to:

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Presented by:

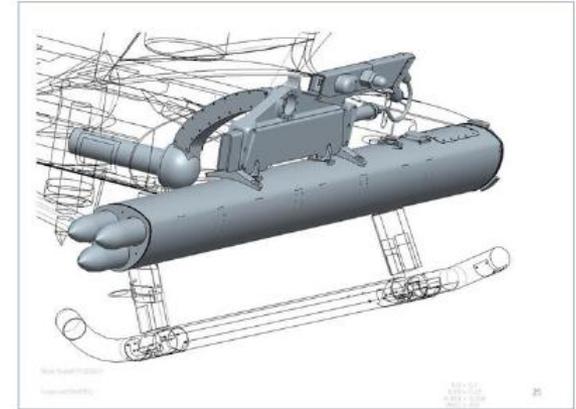
Jack Pratt, Chief Engineer, AVMI



AVMI – Background

Aircraft Prototyping Systems Division* (APSD) – 5.2.8 (Pax River)

- Aircraft/weapons systems modifications
- Flight Test Instrumentation support
- Rapid Engineering/Prototyping
- Fleet Sustainment
- Obsolescence Provisioning



Airborne Instrumentation Division (AID) – 5.2.9 (Pax River)

- Aircraft/weapons systems instrumentation
- Flight Test support

Airborne Instrumentation Systems Division (AISD)– 5.2.10 (China Lake)

- Weapons systems instrumentation
- Flight Test support

****Focus of brief***



APSD Organization

APSD 52800MA



**52810MA
Aircraft
Structural
Modification
Branch**

**52830MA
Planning
and
Quality
Assurance
Branch**

**528500A
Aircraft
Modification
Design
Branch**

**528700A
Prototype
Engineering
Branch**

**528200A
Engineering
Technical
Support
Branch**

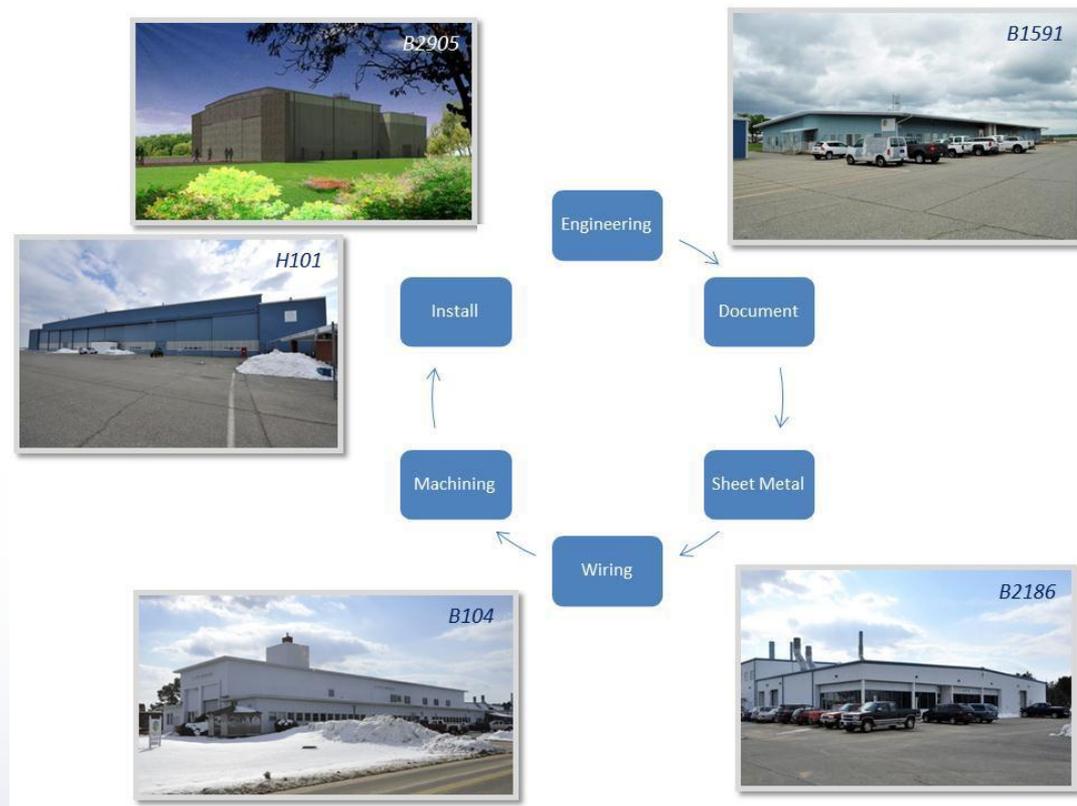
**52840MA
Mechanical
Design
Branch**

**52860MA
Prototyping
Facility
Support
Branch**



APSD Organic Capabilities

As of 5 March 2014, APSD employed 104 civil service employees and 59 contractor support personnel. The primary workforce includes engineers, draftsmen, planning and system management specialists, artisans and technicians. APSD is comprised of the following buildings, work areas, and capabilities:





APSD AM Capabilities

AM and Reverse Engineering (AMRE) Laboratory

1. AM and RE systems **co-located** with engineers and designers
Design and usage paradigm
2. Control usage of AM systems to ensure **R&D rigor**
Control technology creep
3. Assign personnel to focus on **technology development**
Partner with AIR 4.3, Joint Services, industry, academia
Avoid duplication, rabbit holes
4. **Alignment** with NAVAIR AM IPT Roadmap
Fill gaps, buttress database



APSD AM & RE Capabilities cont'd

Existing

Stratasys **Fortus eT**

Upgraded – 2014

Fit/concept support

Non SOF critical parts

Makerbot **Replicator**

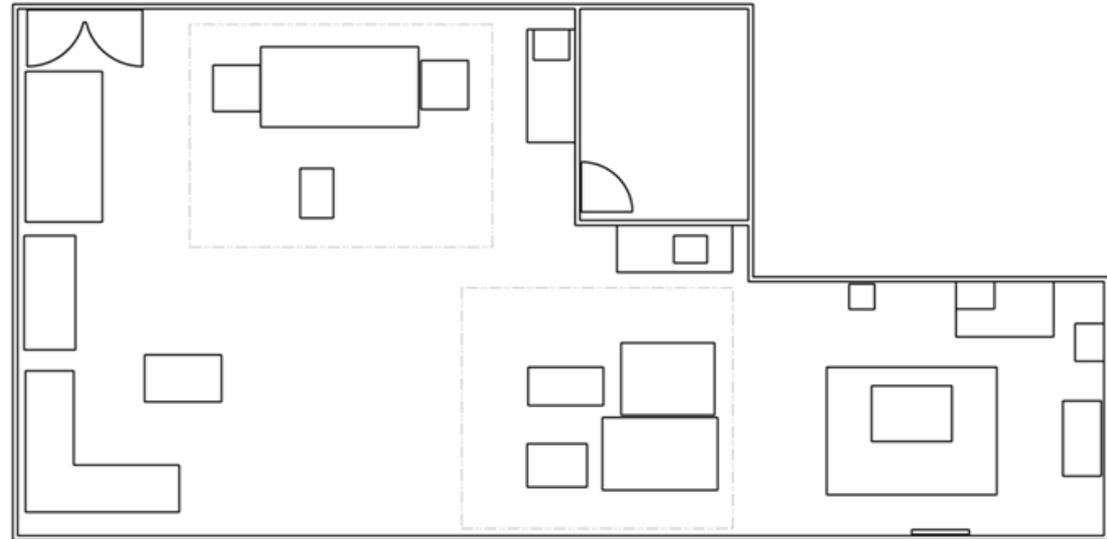
Training / Paradigm shift

Fit/concept support

Materials development

FARO **Titanium** Arm

Touch probe



Growth

EOS **DMLS** (FY15?)

Industry/academia R&D already underway

Align with NAVAIR AM IPT Roadmap

Materials development

Makerbot **Replicator Z**

Training

Fit/concept support

FARO **Edge**

Laserline probe



APSD AM History

Stratasys **Fortus eT**

Over 10+ years of use

Currently located at APSD's primary Metal Shop Facility

Planning to move to AMRE Lab

Makerbot **Replicator** – June 2014

AMRE Lab

Controlled implementation plan in development

Naval Innovative Science and Engineering (**NISE**) Project (FY10-FY14)

- F/A-18 MLG door half hinge replacement

 ARCAM Electron Beam Melting (EBM) powder bed

 NCState University

- E-6 MLG Trunnion Bracket

 Sciaky Wire-Fed Electron Beam System

- AIR 4.3.4 Material Properties Testing

 Covers Titanium and 4340 steel

 Reports issued to 5.0T, 4.0T

- ASTM Participation