Augmented Reality MAINTENANCE AID

ARMA

AVATAR
PARTNERS

Simplifying Complex Systems™

About Avatar Partners / Avatar Reality

- **Our Mission**
  - *Avatar Partners develops innovative solutions that Simplify Complex Systems™ to increase the efficiency, safety and effectiveness of equipment, systems, and processes for the Warfighter*

- **Develop Advanced Training Systems and Job Performance Aids**
  - Portable Interactive Electronic Publications
  - Interactive Multimedia Instruction
  - Augmented Reality Maintenance & Decision Aids
  - Additive Manufacturing & 3D Scanning
  - Virtual Reality
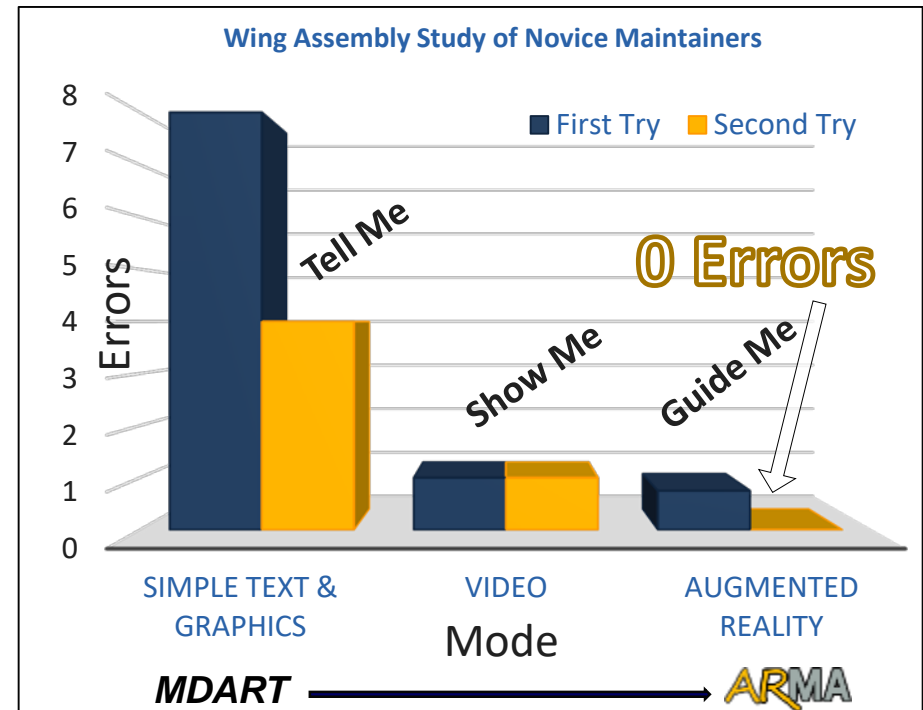 - Holographic Reality

AR Aligns With How Users Learn

*Early responses indicate ARMA prototype of Aircraft Electrical System troubleshooting task Reduces Time to Troubleshoot from **4 hours to 30 minutes**.*

- Hands-Free Training Tool and Field Performance Aid using Augmented Reality

Benefits

- Improves Unit Readiness
- Increases Warfighter Safety
- Reduces Total Ownership Cost
  - Reduces Time to Complete Task up to 90%
  - Reduces Errors to Zero
  - Reduces Time to Train*
- Improves Quality

Boeing / IOWA State Study

Wing Assembly Study of Novice Maintainers

Errors (y-axis: 0–8)

First Try / Second Try

Tell Me — Show Me — Guide Me

0 Errors

SIMPLE TEXT & GRAPHICS — VIDEO — AUGMENTED REALITY

Mode

MDART ⟶ ARMA

ARMA is used by operators and maintainers to access and interact with aircraft / ship / vehicle specific information including:

- Maintenance Actions
- Troubleshooting
- Part Information
- Controls and Indicators
- Theory of Operation
- Illustrated Parts Breakdown
- Wiring
- Remote Assistance

ARMA overlays on the actual system or on a scaled down training model through the user's viewing device

ARMA Use Case

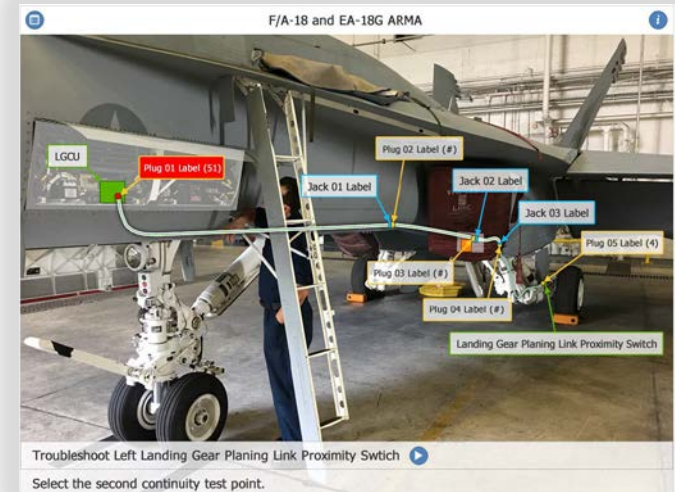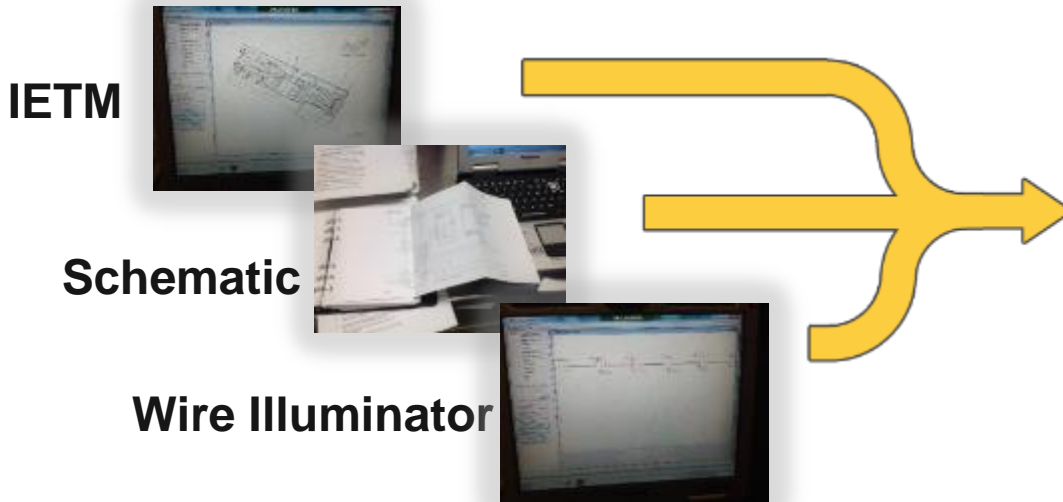## *Electrical System Troubleshooting & Repair*

Current Pain Points:

- Task requires 3 non-integrated sources - IETM, Wire Illuminator, Schematic
- Tasks to gain access to test points not identified
- Wire Illuminator visuals cause confusion in wiring orientation
- Lack of visuals showing necessary views of connection points
- Time intensive testing
- Strict time constraints!
- Error prone due to misinterpretation of instructions and 2D illustrations

ARMA Features

- One Stop Shop for all troubleshooting and repair
- Hands-Free Field Performance Aid and Training Tool in One
- Component and wiring visuals displayed as 3D overlays on the aircraft
- Color coded and filterable
- Reference additional required maintenance tasks
- Architected to integrate to Procurement
- Provides Maintenance Task Validation
- Supervisor Viewing in Real-Time

IETM

Schematic

Wire Illuminator

F/A-18 and EA-18G ARMA

LGCU
Plug 01 Label (51)
Plug 02 Label (#)
Jack 01 Label
Jack 02 Label
Jack 03 Label
Plug 05 Label (4)
Plug 03 Label (#)
Plug 04 Label (#)
Landing Gear Planing Link Proximity Switch

Troubleshoot Left Landing Gear Planing Link Proximity Swtich
Select the second continuity test point.

ARMA

ARMA *by:* AVATAR PARTNERS

NDIA

ARMA Technology Summary

- **High Fidelity & Precision**
  - Object Tracking - No Marker Required
  - Solution for AR Jitter
- **Open Source / Rapid Updates**
  - S1000D Common Source Database Architecture
  - Modular / Agile Design
- **Disruptive Technology**
  - Driving Commercial Industry to Provide Warfighting Solutions
    - PTC / Vuforia
    - Microsoft