NDIA 2007 World Wide Personnel Recovery Conference
Integration of Emerging Civilian SAR Technologies
into DoD Personnel Recovery Systems
Presented by Mr. Kenneth H Brockel
Senior Program Coordinator ACI

- **Reduced Total Operating Cost**
  - 3:1 reduction in Initial System Cost
  - Reduced Maintenance Costs

- **Enhanced Features**
  - Software Defined Radio
  - BIT
  - CSEL
  - Standard Interfaces and Specifications

- **Improved Availability**
  - Any Number of Suppliers can Build System
  - Multiple Suppliers for Subsystems
  - Open Architecture for Future Upgrades
  - Depot Repairable
  - System Commonality

- Open Architecture software defined structure facilitates improved performance
- Open Architecture software defined structure facilitates improved performance
  - Hook Tag Operations
  - Protected 406 MHZ PLB
  - PING/GPS Location for all DME
  Radios (Mitigates Ground GPS Fragility)
  - Digital Protected COMS
  - SATCOM Network Centric Links
- These Options added via software/field upgrades are less costly
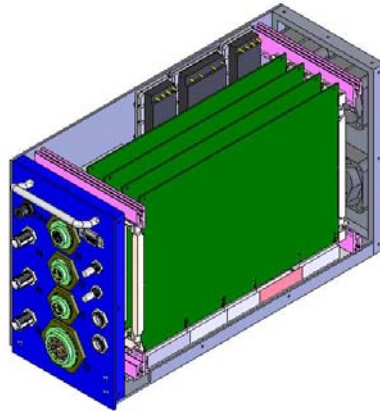- Allows user hand held products to be very simple without sacrificing precision

ARS-6A (V) Program

- Quad Chart

OBJECTIVE

- Form/Fit Replacement for Current AN/ARS-6
- Improved affordability
- Integrate Standardized Modules & COTS Technology
- Allow for multiple source arrangement at LRU level
- Develop open architecture system for future upgrades
- Reverse engineer DME waveform and generate a specification.

APPROACH

- Standardizing RF and digital Modules
- Integration of Software Defined Radio technology
- Developing software-centric design
- Utilize LabView in reverse engineering the DME waveform

BUSINESS STRATEGY

- US Army Funded – potential benefits for all current DoD AN/ARS-6 (V) Integration Platforms

- Primary Organizations:
  - CECOM LRC
  - Tobyhanna Army Depot
  - PM – Utility Helicopters
  - Boeing

- Funding: US Army

LEVERAGED EFFORTS

- Utilizing lessons learned during the execution of C6533A CSC Intercom upgrade Program
- Separate effort to re-engineer PRC-112 Radio Case and Rechargeable Battery
- Collaborate with university partners
- Coordinate Testing with Blackhawk 'M' Program Office

BENEFITS

- Reduce total ownership cost of the ARS-6 Upgrade by 67%
- Enhanced Features (CSEL, Freq Range, BIT)

IMPLEMENTATION

- UH-60L, UH-60M (FY06)
- UAVs and other platforms (FY08)
- Air National Guard
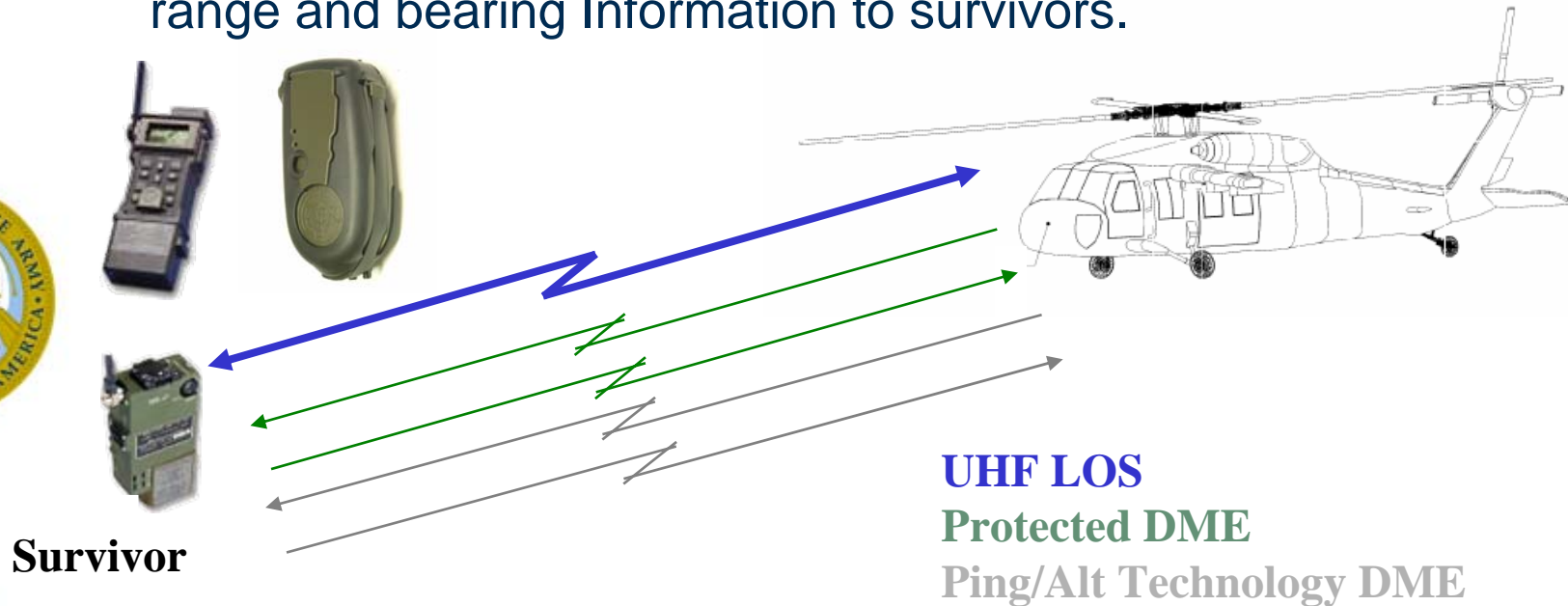
AN/ARS-6A (V)

- ARS-6A (V)

The ARS-6A will work in conjunction with the PRC-112 series,CSEL and other radios, such as Hook, to provide range and bearing Information to survivors.

Survivor

UHF LOS
Protected DME
Ping/Alt Technology DME

- From a higher level view, this is a system that takes input, transforms it as it moves across different subsystems, and provides an output to the user.
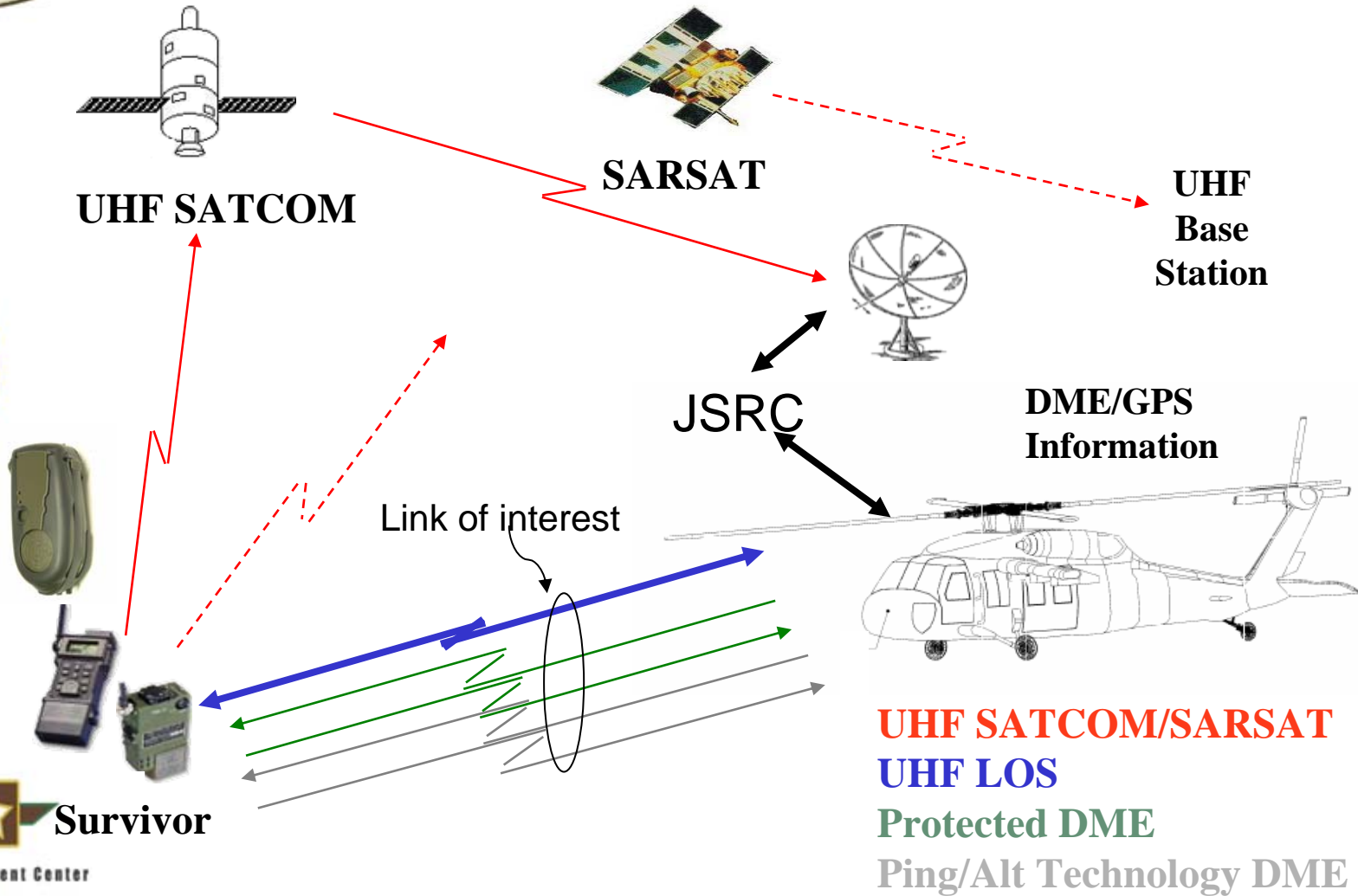
aci

DEPARTMENT OF THE ARMY UNITED STATES OF AMERICA 1775

AESC U.S.Army Electronics Sustainment Center

AN/ARS-6A (V)

UHF SATCOM

SARSAT

UHF Base Station

JSRC

DME/GPS Information

Link of interest

Survivor

UHF SATCOM/SARSAT
UHF LOS
Protected DME
Ping/Alt Technology DME

- Standard ½ ATR Short Case

- Standard 4 slot 6U cPCI Backplane connectors & I/O
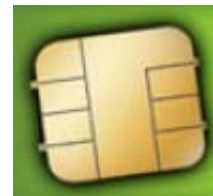
- Standard 6U cPCI Cards & Standard PMC Daughtercards

AN/ARS-6A with Protected PLB

- PLB Design Features

- **Frequency Coverage**
  - Existing: 406.xxxMHz
  - Proposed Military option: 395-400 MHZ
  - Impact to Design: CDU Mode
    Select CIV/MIL BCN

- **Programming Methods**
  - Location: OEM, Depot, Field
  - Allows switch (PLB side) from CIV to MIL mode

- **Encryption**
  - 3 DES (effective storage length 128 bit)

Aircraft Platform GPS Aided Ping (APGAP)

- Provides protected precision location without need to transport sensitive location data from survival radio (SR) and beacons to rescue platform/network entry points
  - Acts as redundant position location tool when CSEL GPS waveform lost
  - Works with all DME/transponder capable SRs
  - Removes the need for multiple antenna on aircraft
  - Could be used with other network radios on MEDEVAC platform
  - All new aviation platforms with SDR or network centric radios could be PLS capable

Aircraft Platform GPS Aided Ping (APGAP)

DISTANCE   73,884 FT
LAT   35°06'226"
LONG   176°27'595"

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Barstow

Aircraft Platform GPS Aided Ping (APGAP)

DISTANCE   45,064 FT
LAT   35°06'457"
LONG   116°43'717"

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- Questions