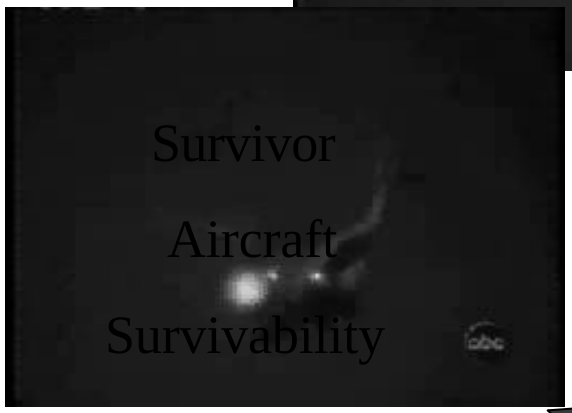
Personnel Recovery Extraction Survivability aided by Smart-Sensors (PRESS)

Purpose
(What is the Problem?)

Correct Personnel Recovery Deficiencies:

- **Survivor Location / ID / SA**
  - Passive Detection / Location
  - Covert Signaling / Communication
- **Aircraft / Survivor Survivability**
  - Situational Awareness
  - Threat Avoidance
  - Passive / Active Countermeasures



Identified and Revalidated by:

- Capt O'Grady, Bosnia
- Vega 31, Hammer 34, Kosovo
- WO Durant, US Army POWs, Macedonia
- JCSAR Joint Test & Evaluation study over 3 years

MNS Supported
PACOM CAF

PRESS ACTD Corrects Deficiencies Thru
2 Phased, 2 Pronged Approach and Leveraged Capabilities

WARFIGHTER NEEDS

(per JPRA Commander, Apr 00)

- ✓ **Evader location #1 recovery problem**
  - **Tagging, Tracking, and Locating**
- ✓ **Inexpensive, simple and unique personnel ID beacon**
- ✓ **Counter-counter CSAR survivability**
- **Reliable over-the-horizon real time data or voice**
- **Secure communications**
- **Command and control (PRCC and ABCCC) tasks saturated**
- ✓ **Reliable ground-to-air signals (GTAS)**
- **End-to-end PR mission rehearsal via Joint Exercises**
  - **Permits OT&E of technology**

✓ **ACTD Addresses Most *Pressing* Warfighter Needs thru Focused Evader and Aircraft Survivability Technologies**

PRESS Concept

- **Real time, automated, precision <u>Survivor Location, Tracking and Re-Supply</u> (Phase I / II)**
- **Highly survivable <u>Extraction Aircraft</u> (Phase II)**
- **Integrated, semi-automated, real time <u>Situational Awareness and Mission Management</u> capabilities (Phase I / II)**

<u>OUTCOME</u>: Provides SARTF with Improved Survivor Loc / ID / SA and Aircraft Survivability and Reduced Mission Timelines

Why ACTD Now?

- **Military Utility Assessment needed on integration of advanced technologies for Personnel Recovery (PR)**
  - Evader TTL + Aircraft Survivability
  - Leverage ongoing mission software ACTD and CSEL efforts

- **Higher Priority / Visibility**
  - Personnel Recovery Advisory Group (PRAG) est. FY99
  - Personnel Recovery Technology Working Group (PRTWG) est. FY99

- **Technology now more mature, risk lower**

  (e.g. Infrared Countermeasures, RF Tags, Decision Aides, Dazzler)

Captured U.S. Personnel = Political Victory for Enemy

Projected Operational Capabilities

Capabilities	Courses of Action	
ACTD Phase I/II — Survivor ID/Location; Situational Awareness	Plan	Search, ID, Track survivor. ID Threat; prep the battlespace.
	Avoid	Friendly forces maneuver to avoid hazarding survivor.
	Safeguard	Friendly forces restrict their fire and/or direct survivor to move to safer area.
		Direct survivor to safer area for impending extraction
	Extract	Extraction in all environments
ACTD Phase II — A/C Survivability	Extract	Friendly forces extract /retrieve survivor in non-permissible environment

<u>Overarching Critical Operational Issues</u>

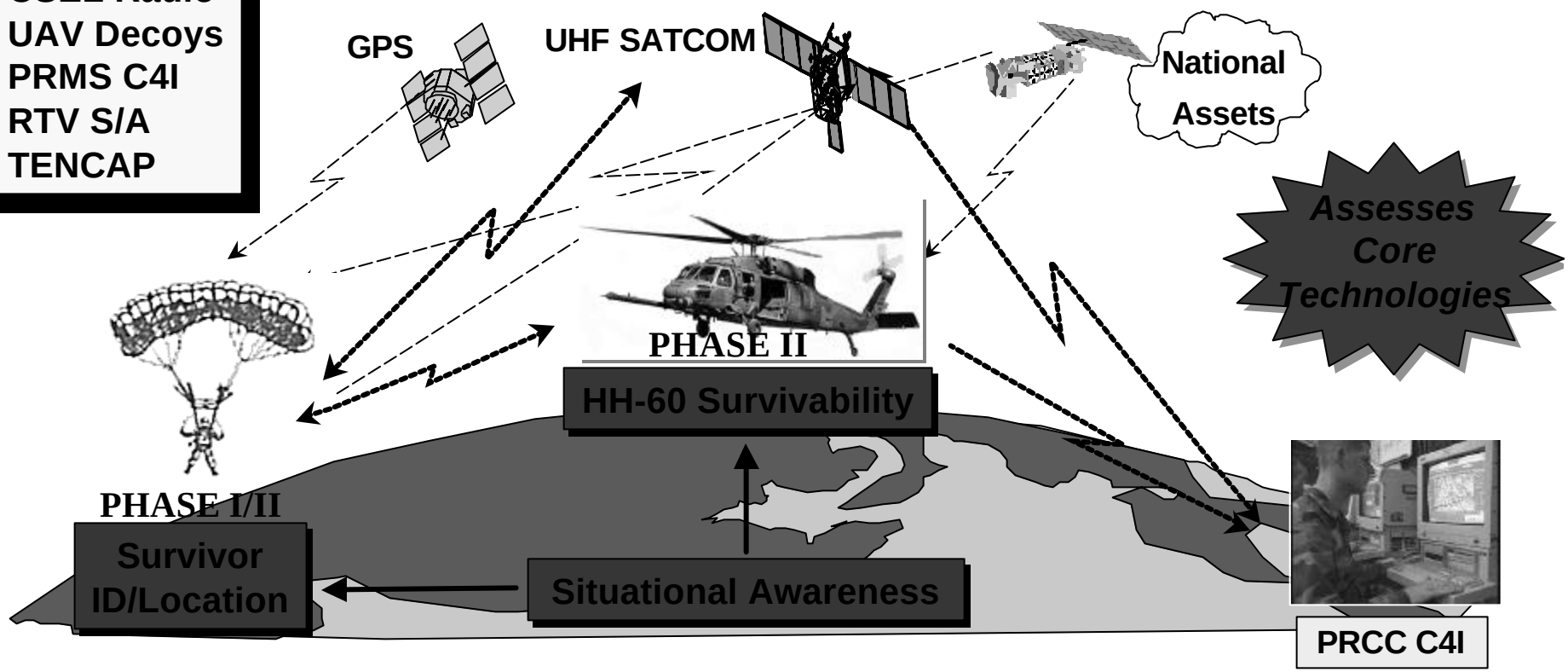
COI 1: Does the system work; provide necessary capabilities/functionality?

COI 2: Does the system enhance the warfighter's CSAR/PR mission?

COI 3: Can the system be integrated within the existing C4I architecture/infrastructure?

Personnel Recovery Extraction Survivability aided by Smart-Sensors (PRESS)

Leverages:
- CSEL Radio
- UAV Decoys
- PRMS C4I
- RTV S/A
- TENCAP



SURVIVOR

[Military Capabilities: Location / ID / SA]

PHASE I, FY 01-02

Core Technologies

- **Tagging / Tracking / Locating (e.g. GPRS)**
- **Situational Awareness (e.g. CDA's)**

PHASE II, FY 02-04

Core Technologies

- **Tagging / Tracking / Locating**
- **Situational Awareness (e.g SSW / CDA's)**
- **Covert Signaling**

Leverages:

CSEL Radio / PRMS C4I / TENCAP

Extraction Platform

[Military Capabilities: A/C Survivability]

PHASE II, FY 02-04

Integrated
With Smart Sensor Web

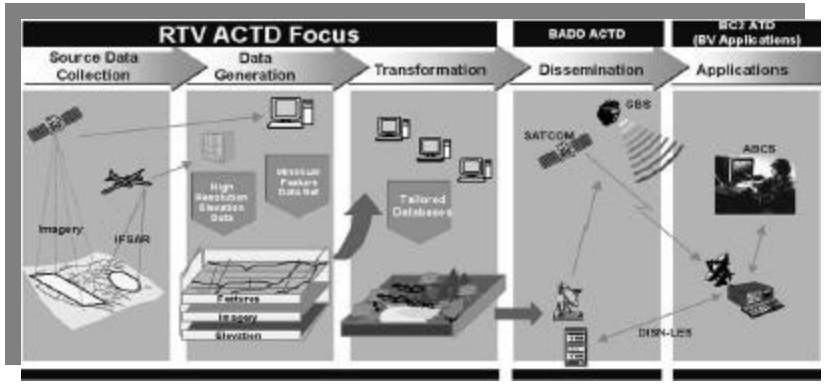
Core Technologies

- **Situational Awareness**
  (e.g. CDA / MMW Imaging)
- **Survivability**
  (e.g. CDA / Dazzler/ LIDAR/ DIRCM / ATIRCM / MMW Imaging)

Leverages:

CSEL Radio / PRMS C4I / TENCAP/ UAV Decoy / RTV

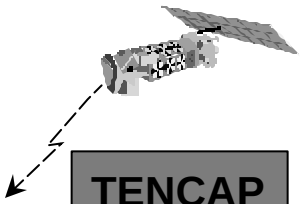
Leveraged Technologies



Rapid Terrain Visualization

CSEL Radio

UAV Decoy



TENCAP

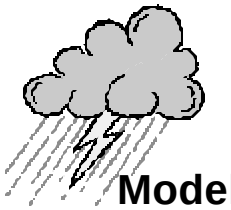
PR Mission Software

Value-Added Capabilities

- Situational Awareness
- Deception
- Communication Relay
- Mission Management
- C4I
- Data Collection
- Evader Location / ID
- Secure Comms

Smart-Sensor Web Testbed

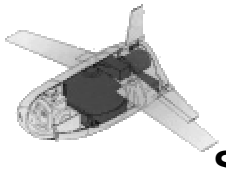
Supporting Virtual Simulations



Weather Models/Simulations

Information Integration

Cueing and Image Sensors (live & simulated)



Weapons Simulation

Demos Aug 00 & Jan 01

DREN

C4I Gateway

Personnel Recovery NEO scenario in McKenna MOUT site, and/or pilot in surrounding wood line

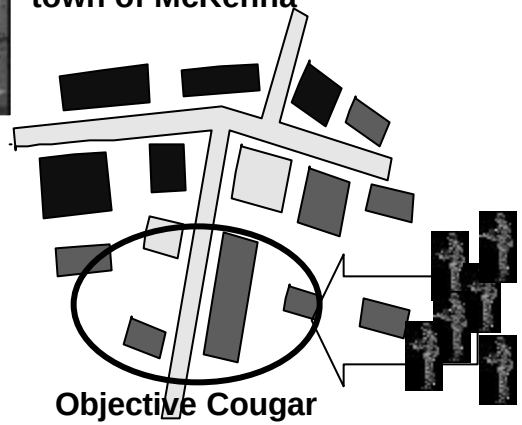
Army Squad and/or SOCOM Unit

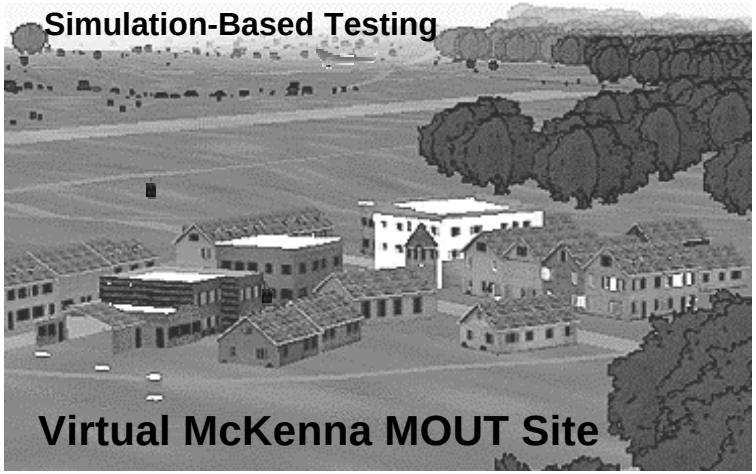
Simulated Forces

Live McKenna Exercise

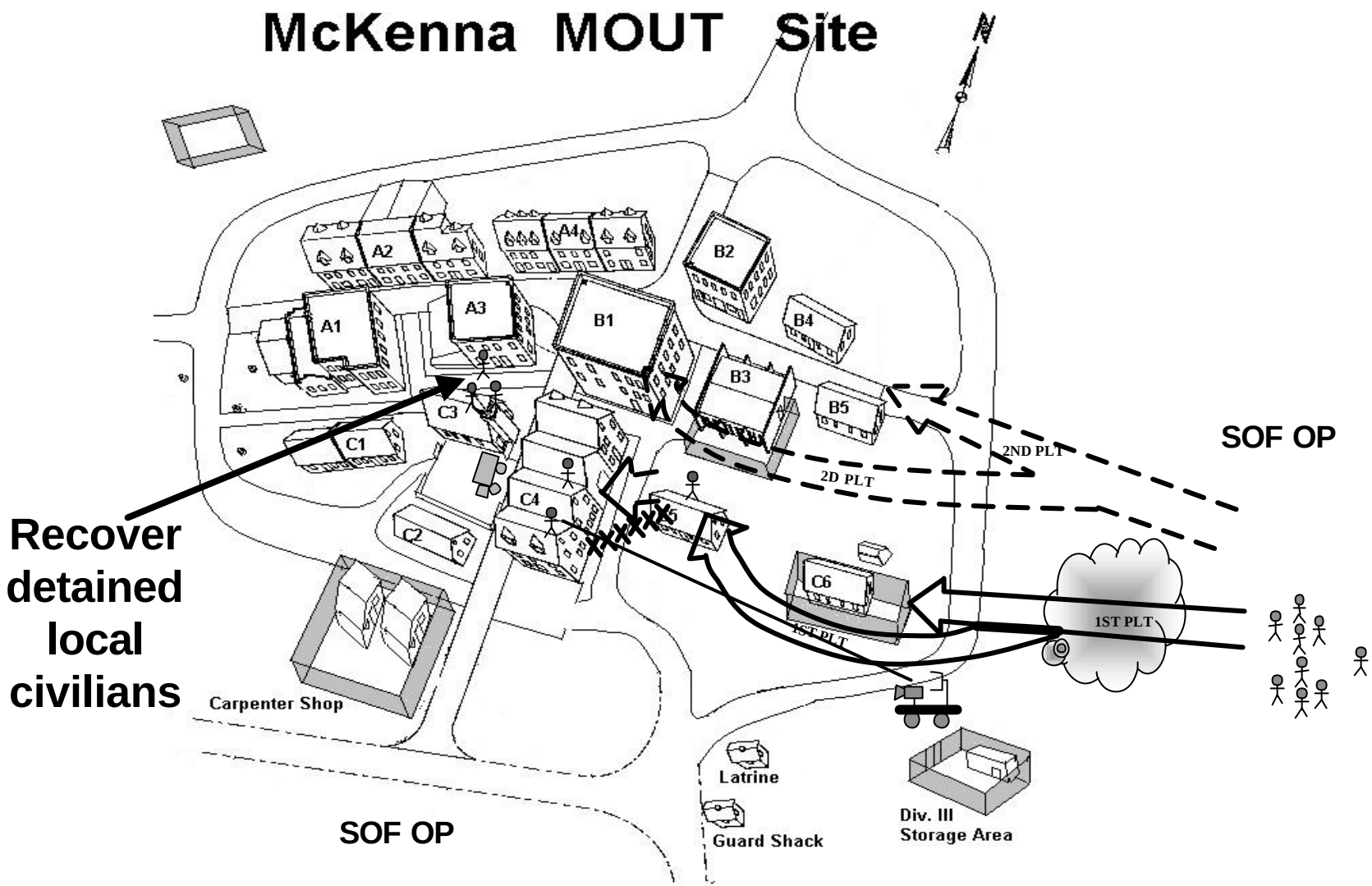
Co TOC

Emplace numerous live visual, IR, acoustic, laser beam, etc. sensors in the town of McKenna



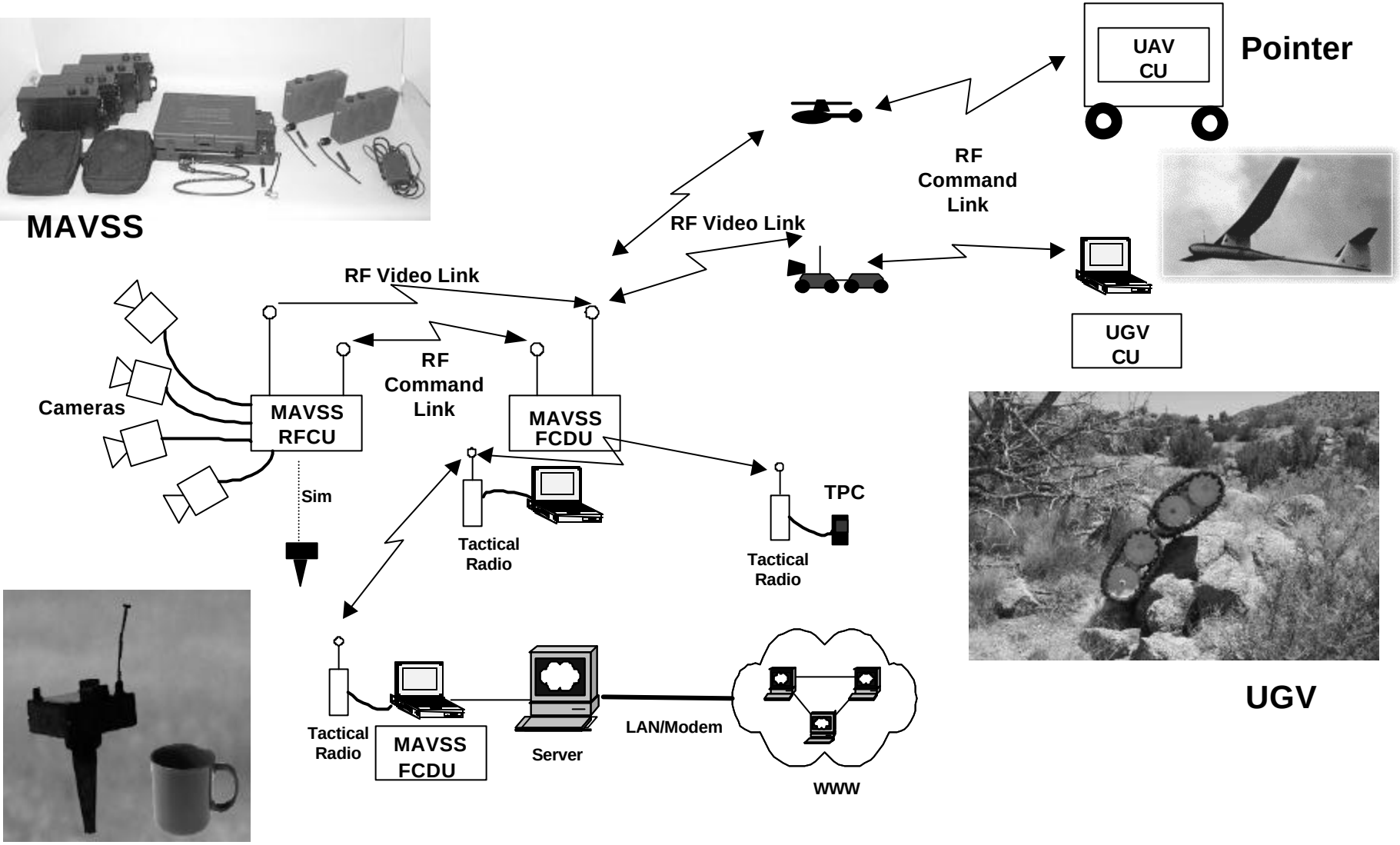


Smart-Sensor Web
August Demonstration



SOF Web

MAVSS



UGV

SSW Preliminary Results

- SSW concept has value in supporting/providing:
  - Location, Identification, & enhanced Survivability
  - Recovery within MOUT site
  - Isolated pilot local SA
  - Indirect protection if linked to remote/autonomous weapons
  - Pilot recovery team SA (needs to be evaluated in forest)
- Consider as candidate technologies for PRESS ACTD
  - SOF system
  - SSW concept and technologies
  - Commercial systems using PDAs
- Consider unmanned recovery
  - With/without UGV assist
  - Ready for demo in ACTD

SCHEDULE

TASK	FY 01				FY 02				FY 03				FY 04				FY 05	FY 06
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
PR ACTD Approved	◇																	
PHASE I	PHASE I																	
ANALYSIS	• Tagging Tracking, Location (e.g., GPRS)																	
DESIGN																		
FAB/TEST	• Situational Awareness (e.g., CDA)																	
IINTERIM MUA								◇										
PHASE II							PHASE II											
ANALYSIS							• Tagging Tracking, Location (e.g., GPRS)											
DESIGN																		
FAB/TEST							• Situational Awareness (CDA / MMW Imaging)											
FLT TEST																		
DEMO / MUA							• Survivability (CDA / Dazzler / LIDAR / DIRCM / ATIRCM / MMW Imaging / SSW / Covert Signaling									◇		
END ACTD RESIDUAL																		◇

ACTD MANAGEMENT

Stakeholders

- Lead Service: Air Force
- User Sponsor: JFCOM
- Supporting CINC: SOCOM

Program Execution

- Tech Mgr: JPRA
- Ops Mgr: JFCOM
- Transition Mgr: Air Force

Validation

- JWFC / JTASC / JE / Red Team
- ACC Analysis of Alternatives
- John Hopkins Applied Physics Lab
- Warfighters / Technical Experts

RESIDUALS

- **SURVIVOR LOCATION / ID / SA PACKAGE**
  - TAGGING / TRACKING / LOCATING
    - GPRS
  - SITUATIONAL AWARENESS
    - SSW SURVIVOR KITS
    - COGNITIVE DECISION AIDES
  - COVERT SIGNALING

PHASE I/II

- **HH-60G SURVIVABILITY PACKAGE**
  - SITUATIONAL AWARENESS
    - COGNITIVE DECISION AIDES
  - SURVIVABILITY SUITE
    - MMW IMAGING
    - ATIRCM / DIRCM
    - DAZZLER
    - LIDAR
    - COGNITIVE DECISION AIDES

PHASE II

- **CONOPS**
  - TRAINING / ADL MODULES
  - MISSION TTPs

SUMMARY

- **Two Phased Program:**
  - **Phase I, FY 01-02, Survivor (Location / ID / SA)**
  - **Phase II, FY 02-04 A/C Survivability**
- **Two Pronged Approach Focused on**
  - **Survivor Location / ID / SA**
  - **A/C Survivability**
- **Integrates High Impact, Leveraged Capabilities**
- **Exploits Smart Sensor Web**
- **Multi-Service technology investment and return**
- **Joint and Special Ops CINC Users**
- **Potential for investment / participation by U.K.**

Solves Warfighter's Most Pressing PR Deficiencies

- Provides UNPRECEDENTED Operational Capabilities -