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ADP010805

TITLE: SO/LIC Symposium Briefing

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This paper is part of the following report:

TITLE: 12th Annual NDIA SO/LIC Symposium &
Exhibition, 12-14 Feb 2001, Arlington VA. NDIA
Event #1880

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ADP010797 thru ADP010815

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USAF Force Protection Battlelab

Innovus Defensor Fortis

SO/LIC SYMPOSIUM BRIEFING

14 February 2001

Lt Col James A. Swaby



U.S. AIR FORCE

Lt Col James Swaby



U.S. AIR FORCE

Overview

- Background Information
- CBAWS Initiative
- DESS Initiative



AFFPB Vision

U.S. AIR FORCE

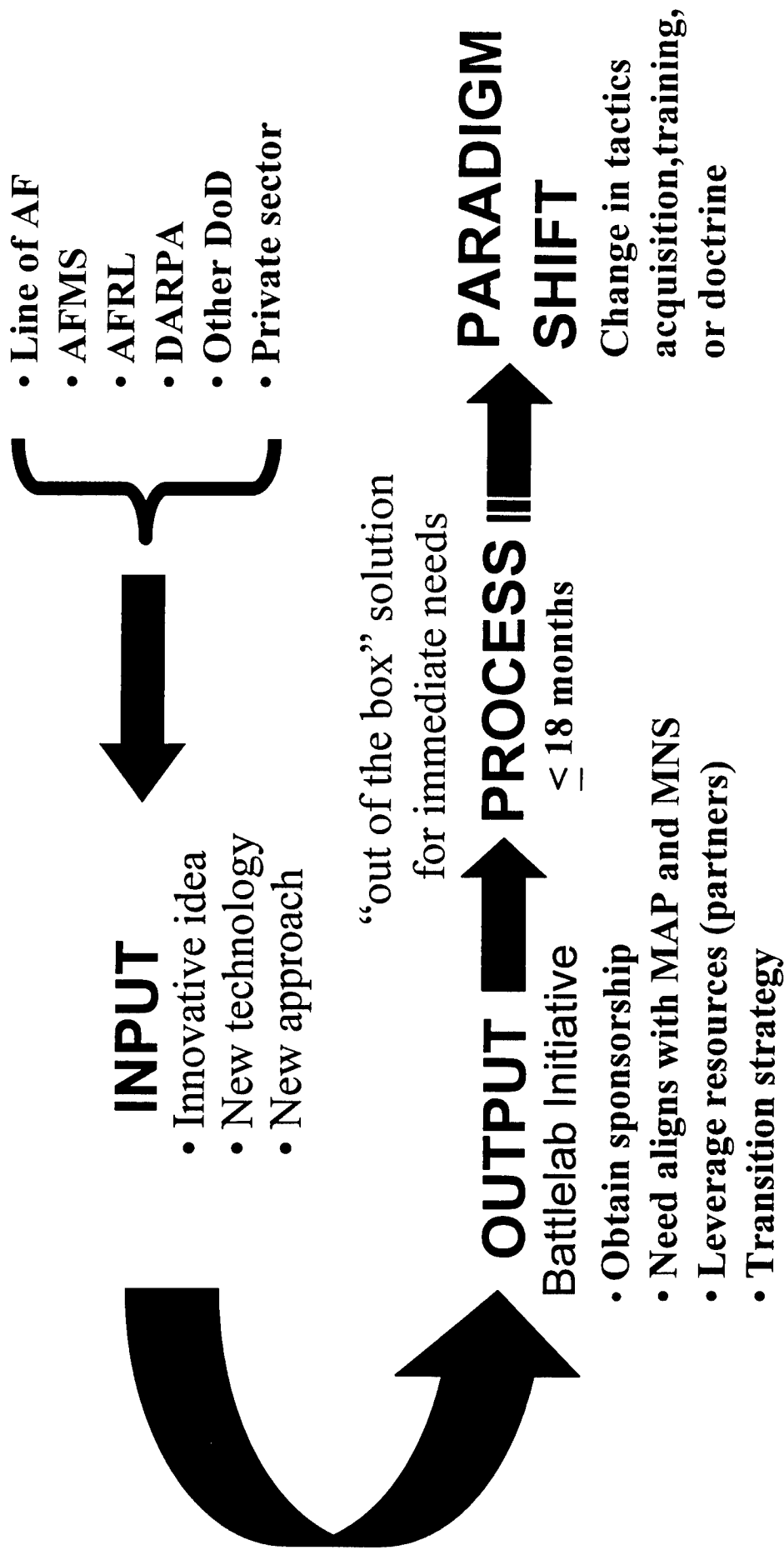
*“Provide an arena to measure the worth
of force protection concepts and ideas; driving
innovations in tactics, organization, and doctrine”*

Innovus Defensor Fortis



U.S. AIR FORCE

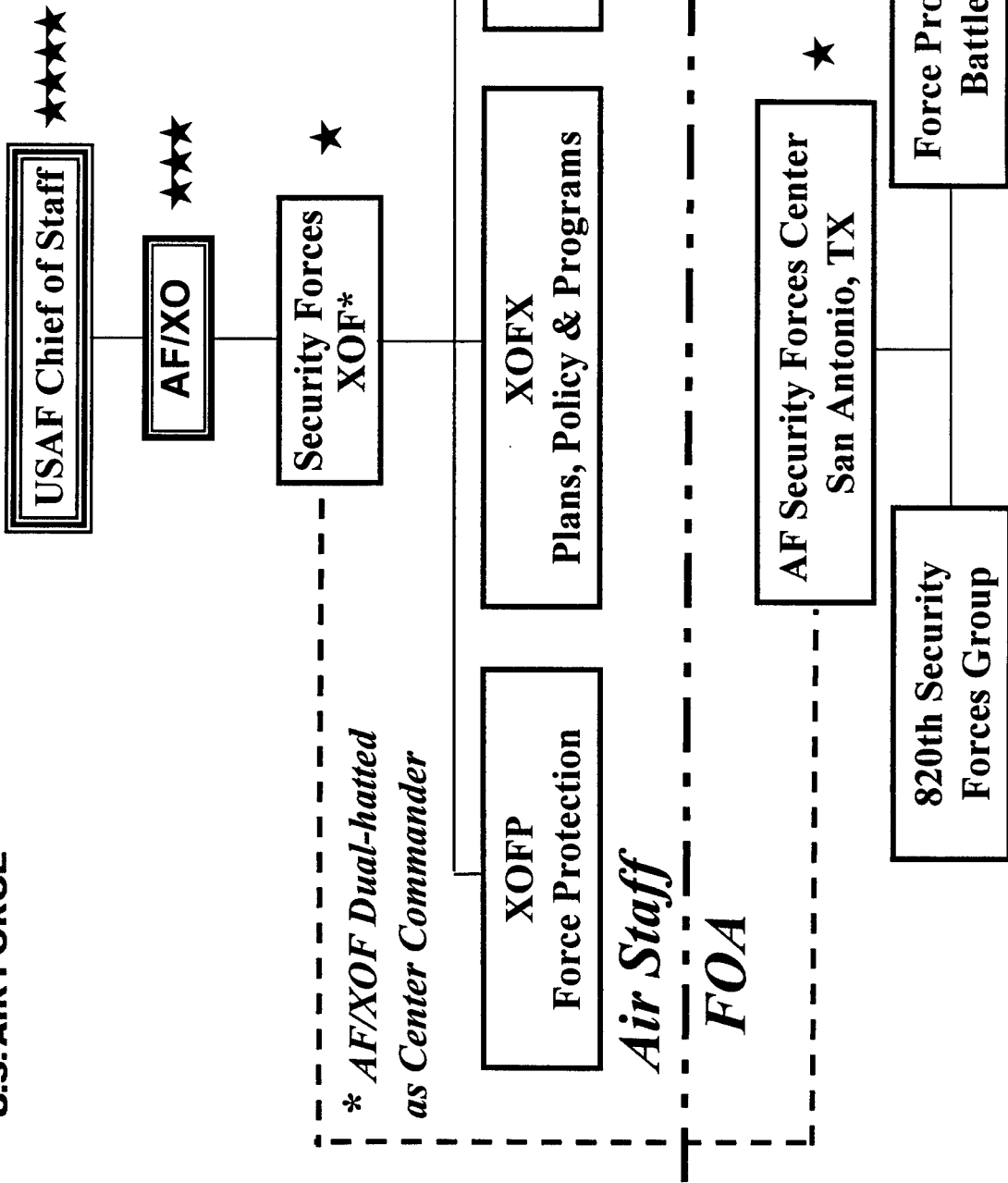
AFFPB Process





U.S. AIR FORCE

Security Forces Organization



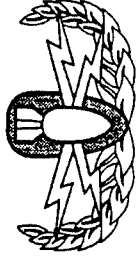


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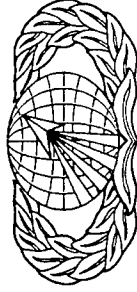
AFFPB Specialists



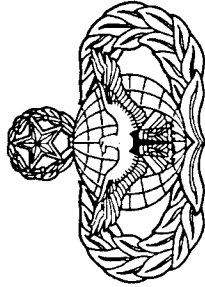
Structural Engineer



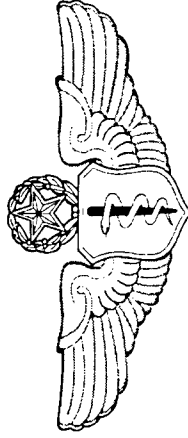
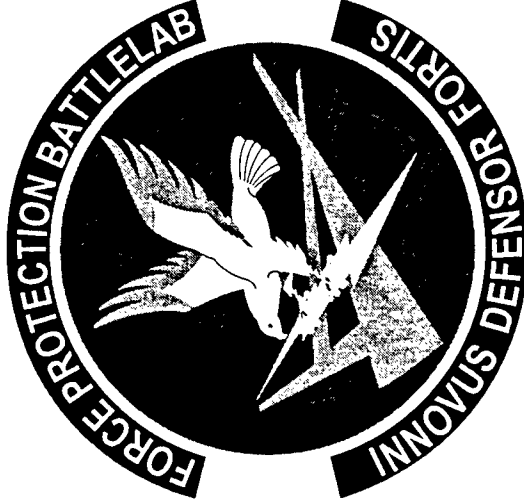
Explosive Ordnance Disposal



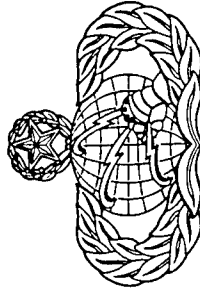
Scientific Analyst



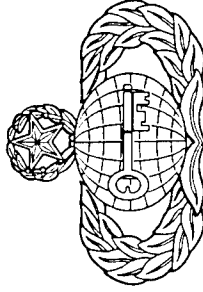
Security Forces



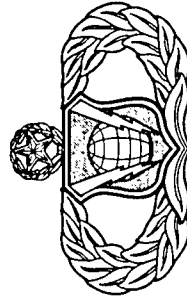
Flight Surgeon



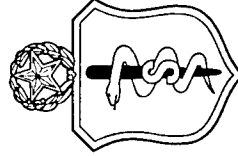
Communications



Intelligence



Command and Control



Entomologist



Readiness Technician

USAF Force Protection Battlelab

Innovus Defensor Fortis

Chemical-Biological Aerosol Warning System



U.S. AIR FORCE

Lt Col James Swaby



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Bottom Line

- A true alert-to-warn and alert-to-treat CBAWS is possible using COTS & GOTS equipment
- First CBAWS kit can be fielded in 6-12 months
- CBAWS is not the ideal, it has limits but it is possible to field a true alert-to-warn system



Initiative Description

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Initiative Name: Chemical-Biological Aerosol Warning System (CBAWS)

Problem: We have no true alert to warn CB sensor system

Innovative Concept: Can we deploy a true alert to warn CB sensor system for the “first-in” rapid deployment forces?

Demonstration Mission Statement: Demonstrate the utility of using a tactical, agile prototype coupled chemical-biological (CB) sensor system for forward-deployed, first-in forces to provide notional early alert & warning capability of an aerosol attack employing chemical or biological agents

Solution set: Use existing technologies COTS & GOTS to devise a CBAWS

Partners: AFIP, MSBL, SBCCOM, 820 SFG, & 786 CRG

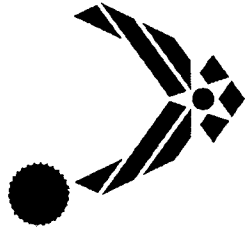
Proposed Sponsorship: HQ ACC/ILE &/or HQ ACC/SG



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Objectives

- **Provide a quickly deployable, small, portable, easy-to-use & maintainable perimeter CB sensor system network for generic “early alert to warn” & specific alert to treat capability**
 - **Contain a personnel alert & warning system (RF/pager link)**
 - **Use wireless COTS & GOTS technology**
 - **Make it one man portable & deployable**
 - **Maintain a small foot print**
- **Enhance force protection situational awareness & rapid decision making.**
 - **Alert to mask in <1 minute from CB detection**
 - **Facilitate phased employment of personal protection equipment**
 - **Reduce time to decision to remove personal protection equipment**



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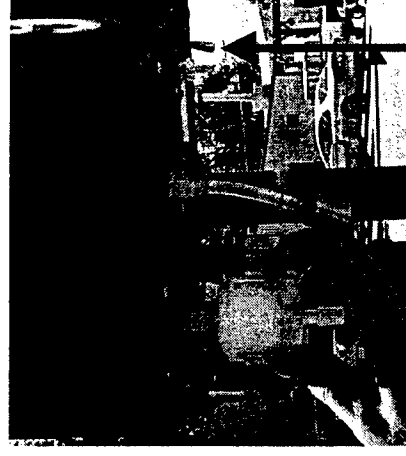
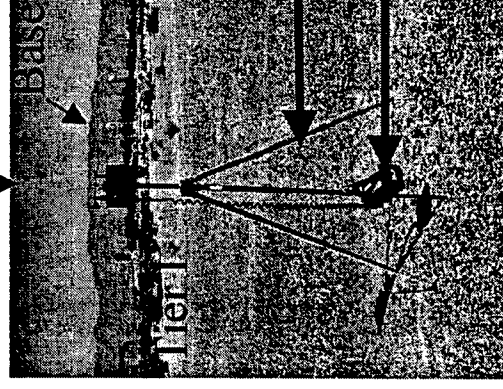
CBAWS Components

— Tier I

- Status: shelved by Army
- Sensor: particle detector
- Advantages:
 - True 13Km alert-to-warn stand-off
 - One-man portable/deployable, simple
 - Battery operated
 - RS 232 connection
 - Capable of collecting a sample



One-man portable
One-man deployable
Simple to operate



Sample filter Switch
Tripod
Battery & cable

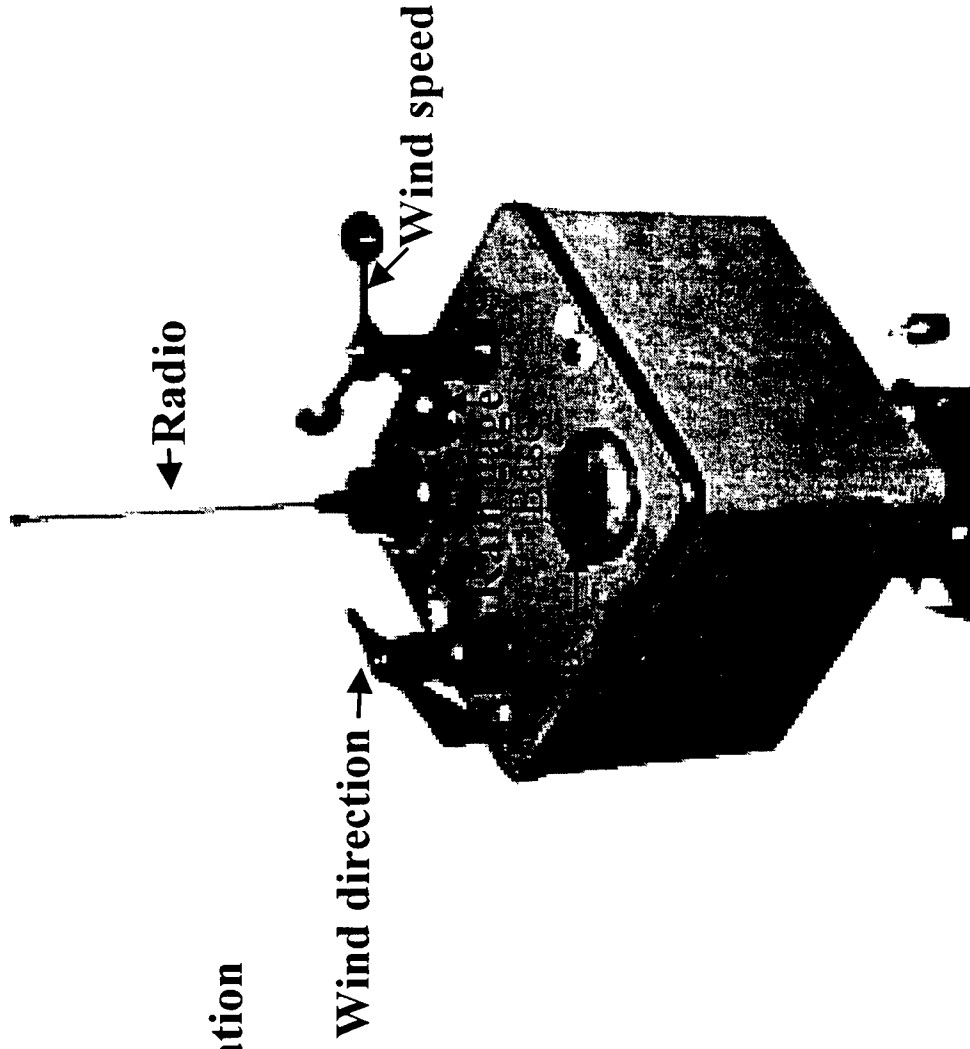


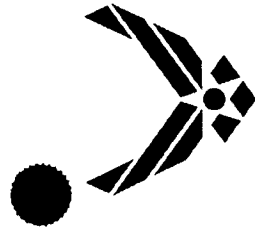
CBAWS Components

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- Tier I (cont.)

- Advantages:
 - GPS
 - Meteorological weather station
- Limitations:
 - False alarm rate
 - Subject to tampering
 - Daily battery maintenance
- Solution:
 - Altered algorithm
 - Connected to TASS



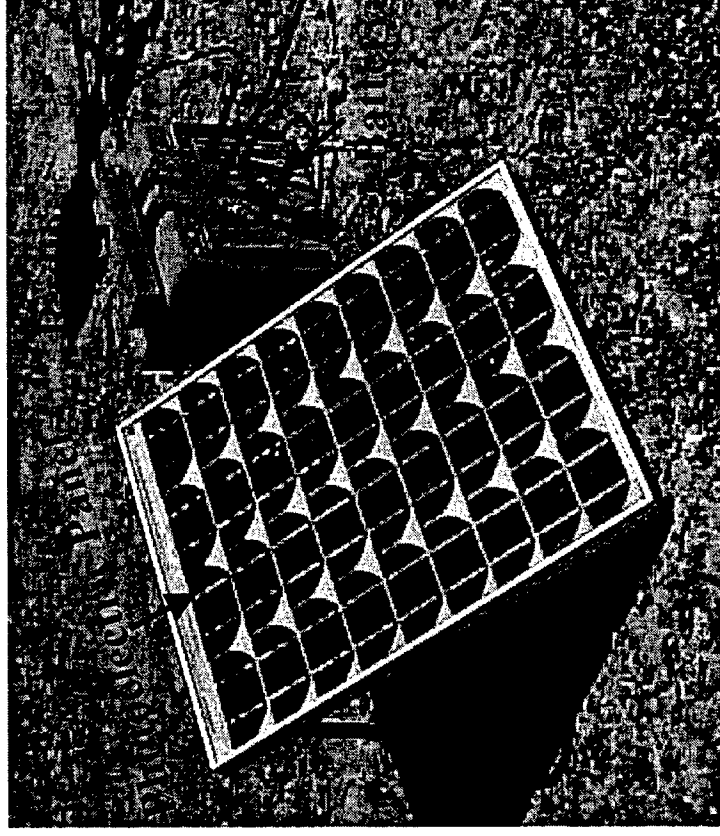


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CBAWS Components

– TASS (Tactical Automated Sensor System)

- Status: Fielded**
- Advantages:**
 - Battery**
 - Photoelectric panel recharger**
 - Radio**
 - Tamper detection**
 - Low battery alert**
 - Simple to operate**
 - One-man portable/deployable**
- Limitations: Needs adapter cables**
- Solution: Built cables**





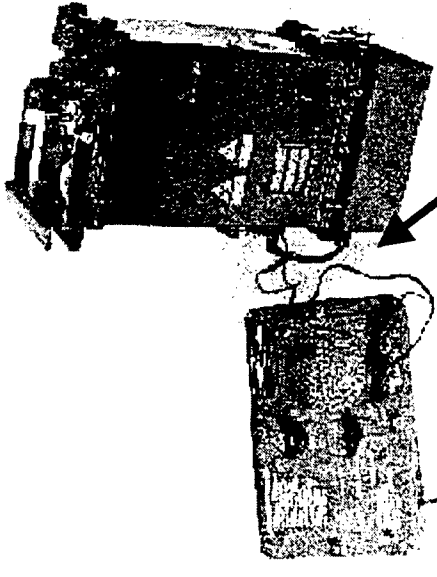
CBAWS Components

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– ACADA

- Status: Being fielded
- Sensor: Ion mobility spectrometry
- Advantages:
 - Gives generic nerve or blister agent ID
 - One-man portable & deployable
 - Battery operated
 - RS 232 connection
 - Simple to operate
- Limitations:
 - Limited by M42's 400M range
 - Alarm difficult to hear in noisy environments
 - Subject to tampering
 - Battery maintenance
- Solution:
 - Connect to Tier I radio
 - Connected to TASS

ACADA



M42 alarm

400M Com. wire



CBAWS Components

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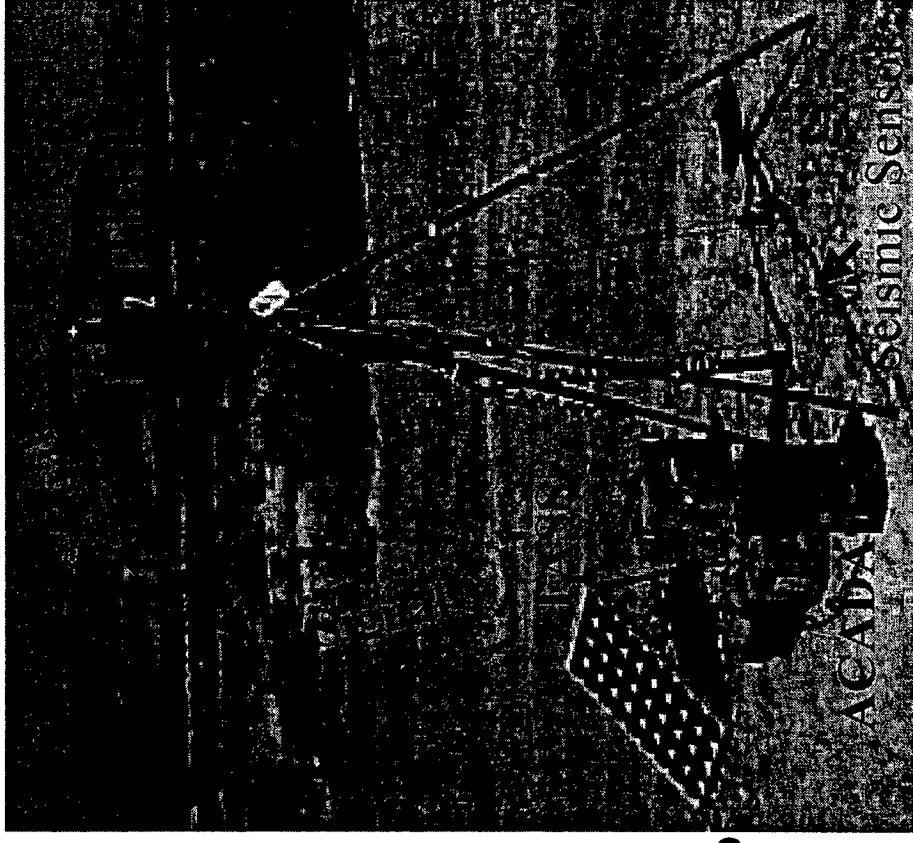
– True alert to warn, stand off CB sensor system

– Combines GOTS:

- Tier I (shelved)
- ACADA (limited range)
- TASS (successfully fielded)

– Advantages:

- 13 Km range
- Wireless (radio)
- Tamper detection
- Low battery alert
- Limited maintenance
- One man portable/deployable
- Bio sample collection
- Simple - 1 hr training, 5 Min setup



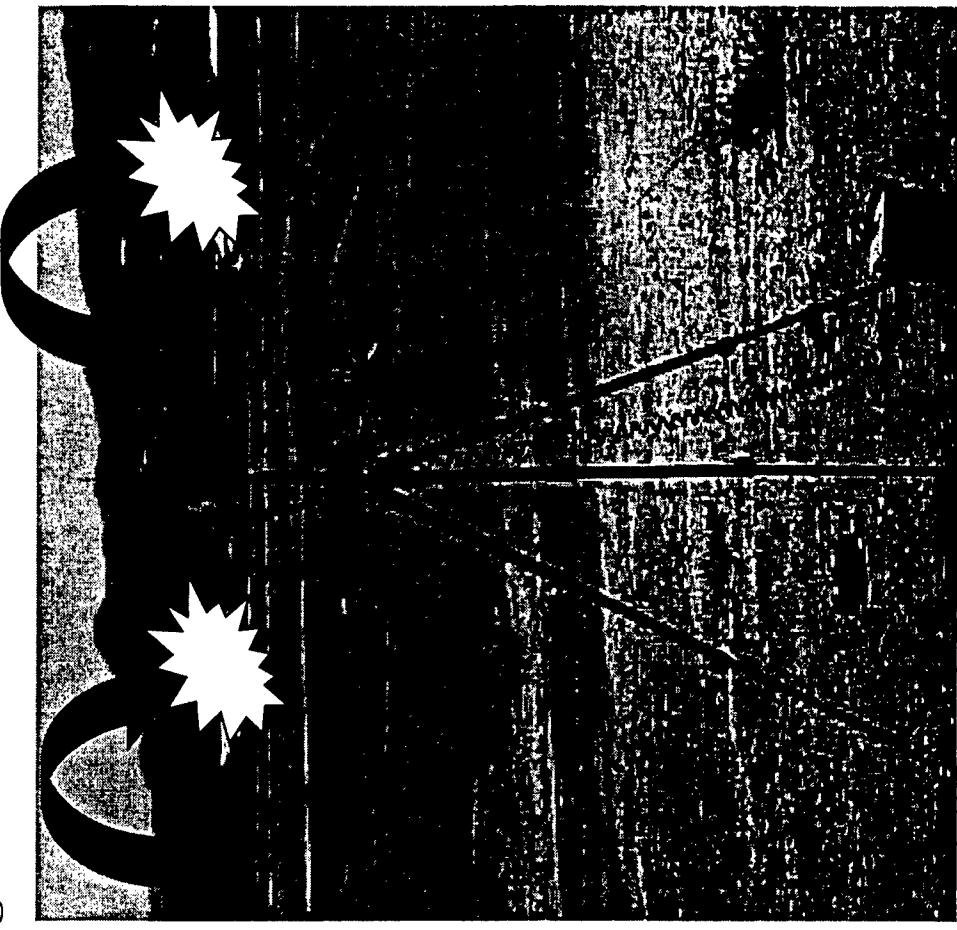


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CBAWS Components

- True alert to warn, stand off CB sensor system (cont.)
 - Limitations:
 - Generic CB identification
 - Possible false alarms
 - Could be circumvented
 - Solution: Algorithm, Tier III, M21, RAPID & M256

Agent delivered over alert-to-warn sensors



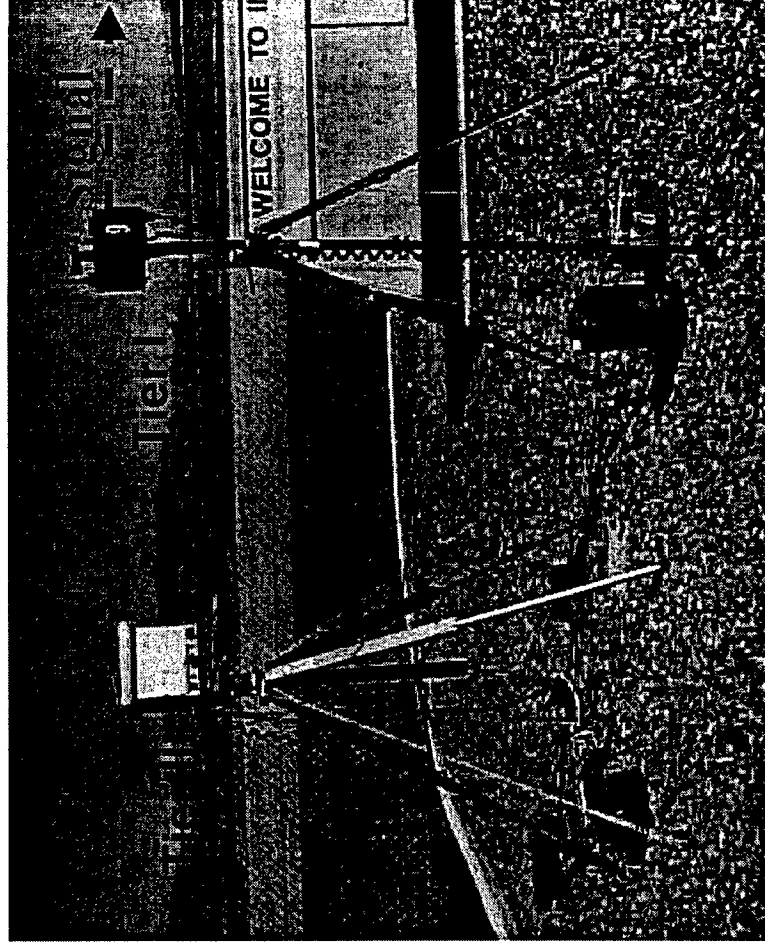


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CBAWS Components

– Tier III

- Status: Early prototype**
- Sensor: Passive UV Laser**
- Advantages:**
 - ID's if particle cloud is biological**
 - One-man portable & deployable**
 - Simple to operate**
- Limitations:**
 - Subject to tampering**
 - Prototype**
- Solution:**
 - Tied to Tier I radio**
 - Used TASS tamper detection**
 - Deployed one per 10 Tier I's**



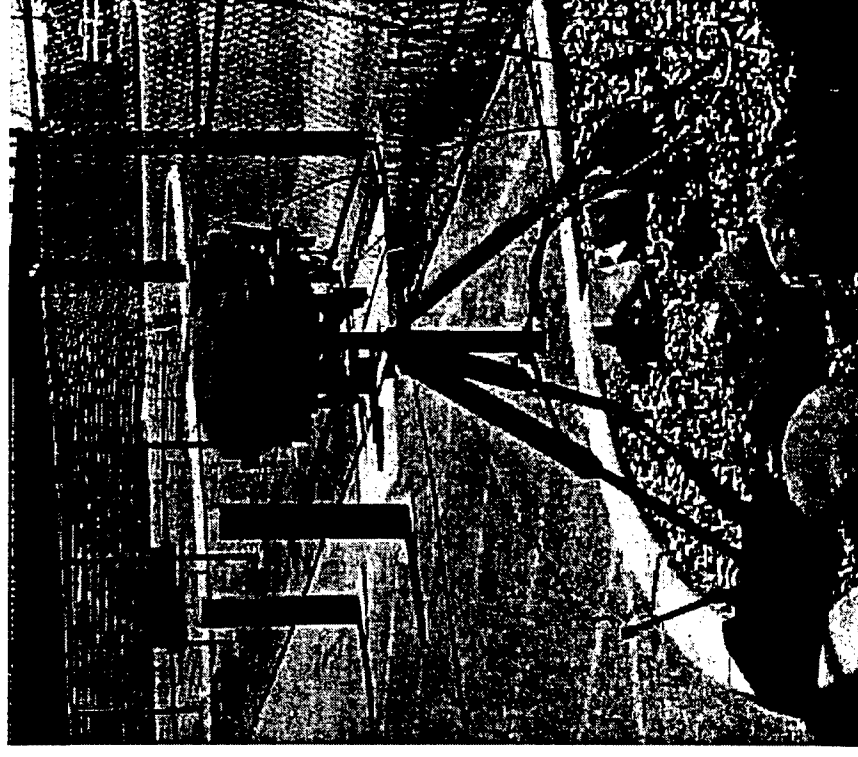


CBAWS Components

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– M21

- Status: Being fielded
- Sensor: Passive infrared detector
- Advantages:
 - Gives generic nerve or blister agent ID
 - One-man portable & deployable
 - 5 mile range
 - Simple to operate
- Limitations:
 - AC power
 - 60° window (need more than one)
 - Direct cable to base station
- Solution: Replace with next generation IR detector





CBAWS Components

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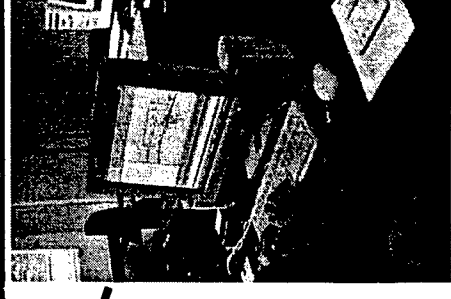
— Base station

— Components:

- PC Analysis Work Station (PAWS)
- Telemetry transceiver (GPS)
- Simulation interface PC
- M42 alarm

—Advantages:

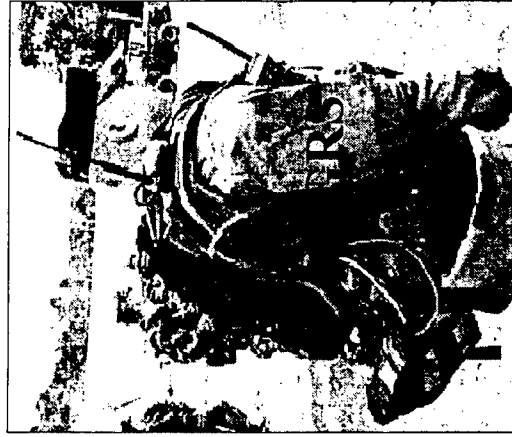
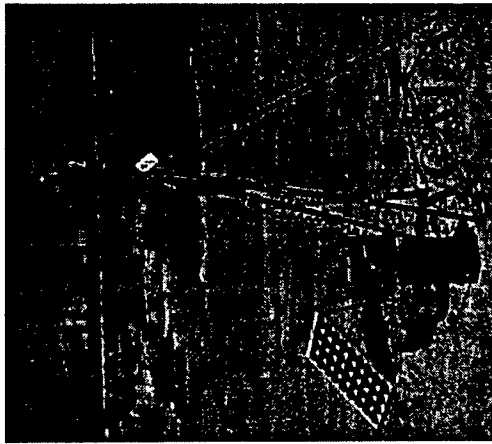
- Adjustable alarm thresholds
- Displays condition yellow then red
- Sounds M42 alarm
- Sends NBC reports
- Can send warning to personnel (beepers)
- Remotely diverts air flow to collect bio sample
- Displays all meteorological data
- One man portable/deployable
- Simple - 3 hr training, 1 Hr setup
- Supports digital rehearsals
- Limitations: Requires AC power



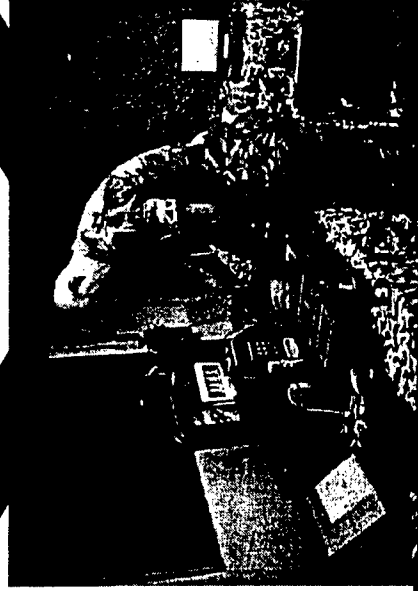


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Generic CB Alert To Warn



< 1 Min.



Real time



CSC2

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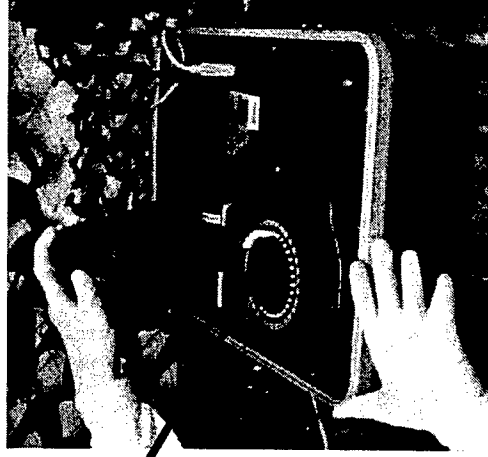


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Specific Alert To Treat

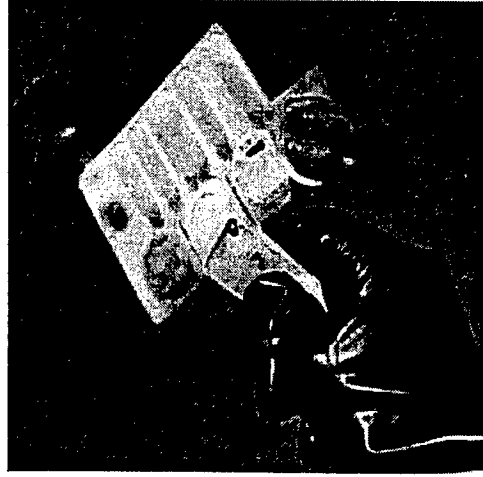


Biological: PCR with the Ruggedized
Advanced
Pathogen
Identification
Device



< 3 hours from first alert

Chemical: M256A1 or
M18A1
kits
in
minutes



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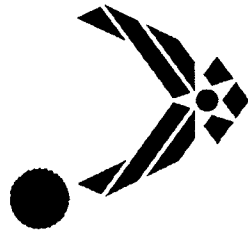
Deployable

Small Footprint



- 20 Tier I sensor-hubs
- 20 Tier I tripods
- 1 Tier III UV sensor
- 1 Tier III tripod
- Batteries
- Cables
- Chargers
- Antenna
- Base station
- RAPID
- PCR expendables

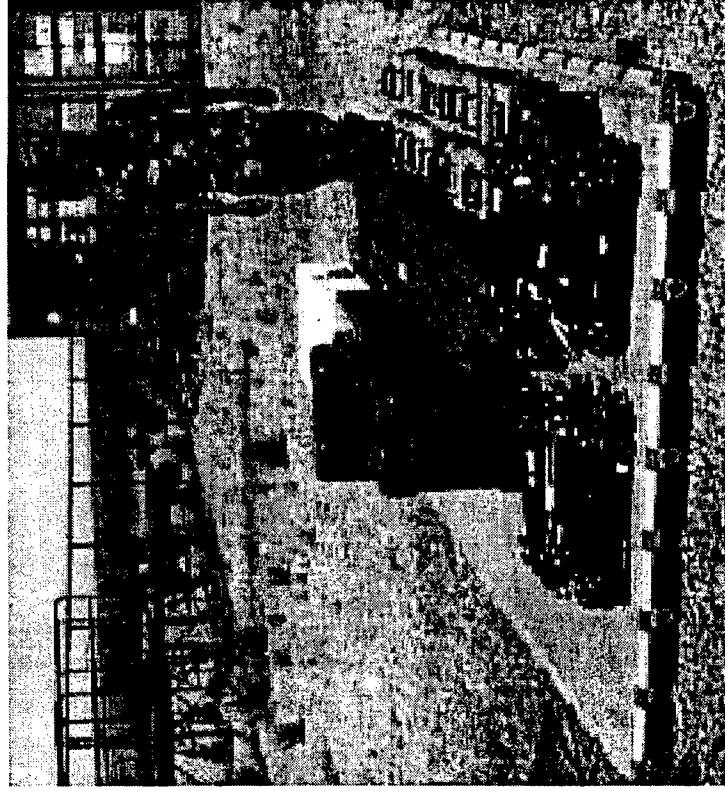
This is a 30 day mission load!



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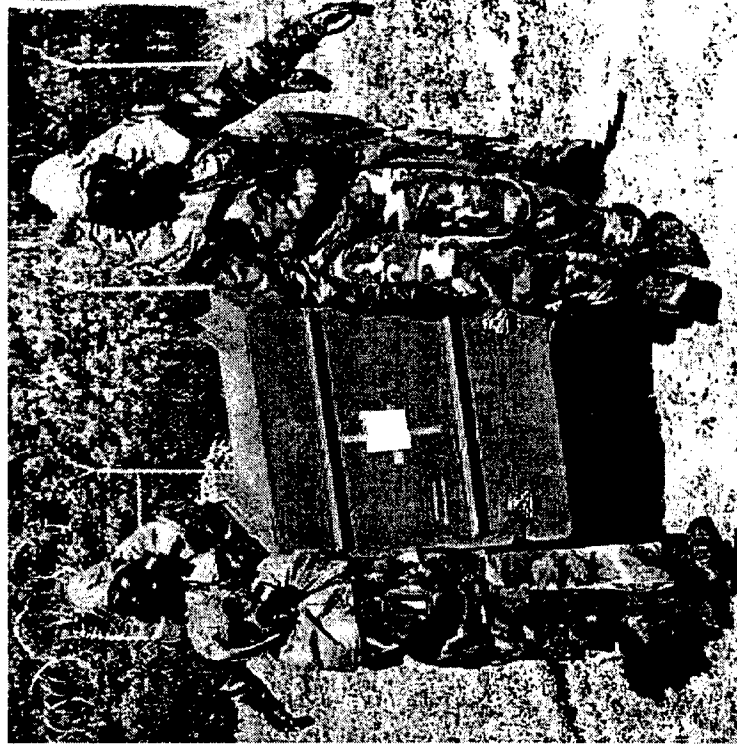
CBAWS vs. JBPDS

CBAWS Total Kit (20 units)



**This is a 30 day mission load!
Small Footprint**

JBPDS (1 unit)



**2 Pieces, 300⁺ lbs. ea.
plus generator**

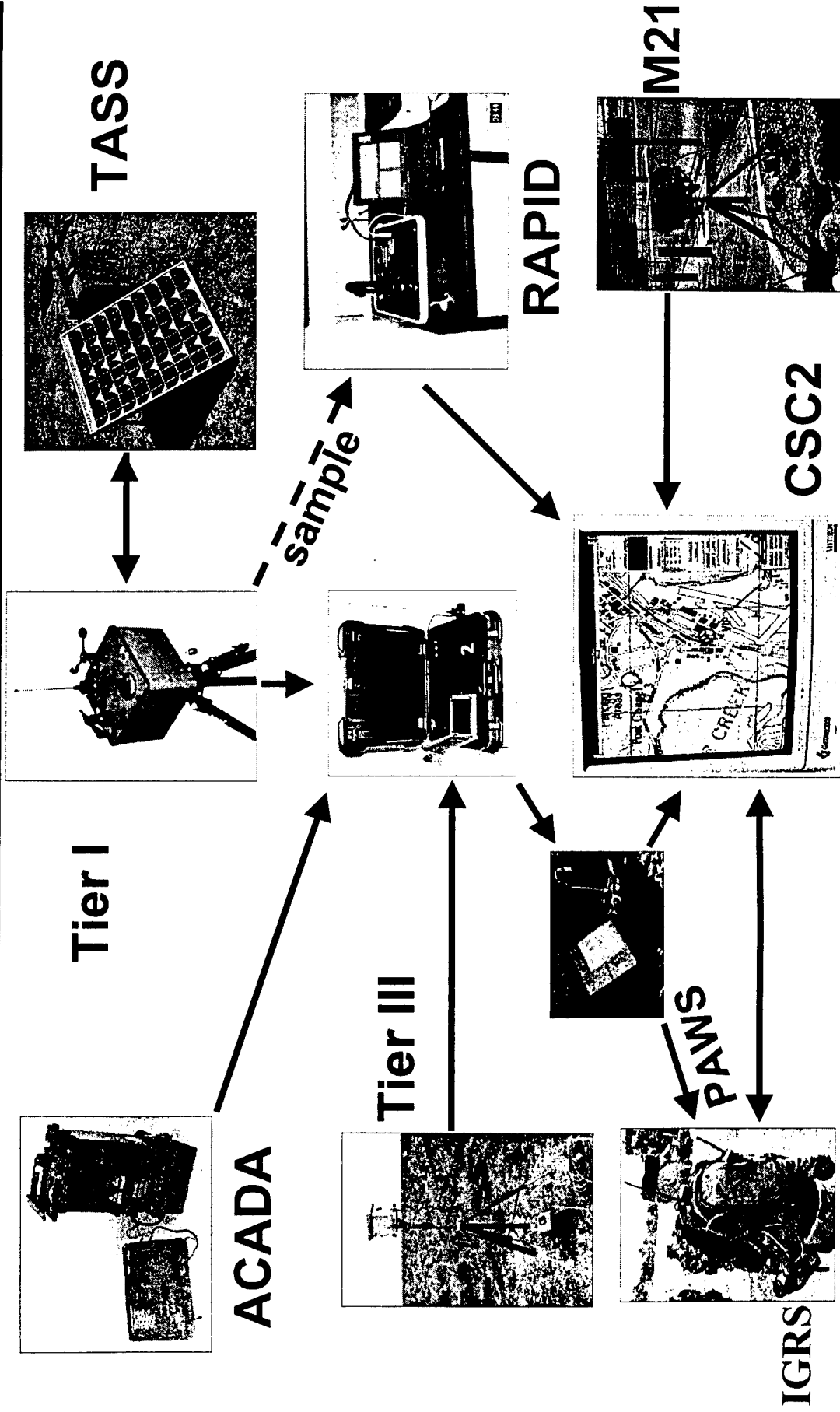
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Chem/Bio Alert and Warning System

(CBAWS)

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Current Status

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- Army field testing completed:
 - 1-25 Jun 99, Dugway Proving Grounds, UT
 - 2-6 Aug 99, Fort Leonard Wood, MS
 - 16-20 Aug 99, ULCI FOCUS LENS 99, Yakima, WA
- Air Force field testing completed:
 - 25 Aug - 3 Sep 99, JEFX 99, Indian Springs, NV
 - 26 Jul - 5 Aug 00, JEFX Spiral 3, Indian Springs, NV
 - 1-16 Sep 00, JEFX 00 Execution, Indian Springs, NV
- Air Force field testing planned:
 - 22-26 Jan 01, 820 SFG, Mountain Home AFB, ID



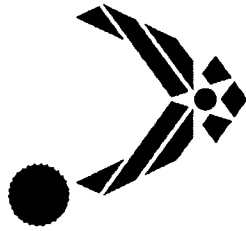
Current Status

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– **Pursuing transition to end-user:**

- Collaborating with ESC/FD and 311th HSW/YA (lead)
- System will be deployed in a two phases:
 - Block 1:
 - Rapid fielding by using COTS/NDI items (3400, O&M funds)
 - Prepare 1 kit (from existing equipment) with 3 options
 - Kit ready within 6 months after receipt of 3400 funds at YA
 - Block 2:
 - Product improvement to block I, effort to include:
 - Incorporate new hardware (JCAD, JSLCAD, and upgrade BAWs)
 - Incorporate latest JWARN software, hardware interface and communications protocols

Streamlined COTS/NDI acquisition approach



Current Status

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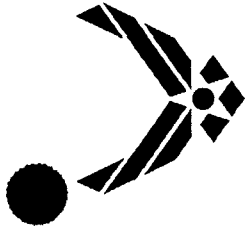
- **Aggressively seeking sponsorship**
 - 12 Oct HQ USAF/SGX briefing
 - 25 Oct TSWIG briefing
 - 7 Nov 00, ACC FP IPT briefing
 - 8 Nov 00, JSIG briefing
 - 9 Nov 00, J-34 briefing
 - 9 Nov 00, RESOPS ACTD briefing
 - 13 Dec 00, Medical Readiness Symposium
 - 14 Dec 00, HQ USAF/SG & GO Council
 - 10 Jan 01, USD/DDR&E & DATSD/CBDP
 - __ CENTAF/CC
 - __ HQ ACC/ILE briefings (working)
 - __ JSMG briefing (planned)
 - __ CENTCOM (planned)
 - __ SOCOM (Planned)
 - __ AFSOC (planned)
 - __ PACAF (planned)
-



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Bottom Line

- A true alert-to-warn CBAWS is possible using COTS & GOTS
 - Includes alert-to-treat chemical identification in minutes
 - Includes alert-to-treat biological agent identification in < 3 hrs
 - One-man portable/deployable & fits on 1/3 of a pallet
- CBAWS has limitations & requires risk management
 - Tactical for first-in, light weight, mobile, 786 CRG, 820 SFG type forces
 - Alert-to-warn CB sensor false alarms minimized but still possible
 - Better in certain environments than others
- There is still work to be done
 - Need CONOPS
 - Need AFOTEC testing
 - Need biological identification probe freeze-drying
 - Need to resolve certain configuration issues



Summary

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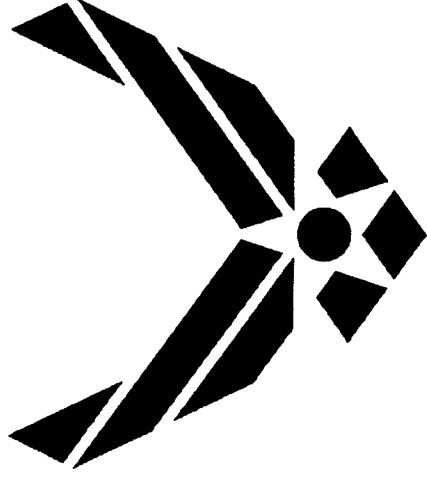
- Users have an immediate need for chem-bio detect to warn capability
- CBAWS has been successfully demonstrated in five test/exercises to meet this need
- AF 311 HSW/YA has draft acquisition plan in coordination
- Seeking consensus
- Firming up sponsorship:
 - Immediate funding for 1st Block 1 basic kit
 - Funding for Block 1 enhancements
 - Launch Block 2

USAF Force Protection Battlelab

Innovus Defensor Fortis

Deployed Environmental Surveillance System

Lt Col James A. Swaby



U.S. AIR FORCE

Lt Col James Swaby



DESS Initiative Description

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Initiative Name: Deployed Environmental Surveillance System (DESS)

Problem: Not fully addressing Public Law 105-85 requirement to monitor individual environmental exposures during contingency operations

Innovative Concept: Can we monitor the environmental exposure of each individual during contingency operations?

Demonstration Mission Statement: Demonstrate the utility of combining use of forward-deployed agile, Chemical, Biological, Radiological, Nuclear (CBRN) detection and identification units with combined environmental hazard databases linked to central consultative services

Solution set: COTS & GOTS, CBRN detection/identification technologies tied to reach-back environmental databases & consultants

Proposed Partners: 786 CRG, 820 SFG, AFIERA, AFIP, AFRL, MSBL, SBCCOM, SWIBR & USDA

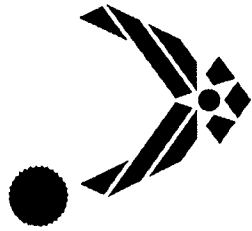
Proposed Sponsorship: HQ ACC/SG



DESS Objectives

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- Capture individual CBRN exposures
 - Use a suite of individually worn sensor technologies
 - Tie to one-man portable/deployable identification technologies
 - Directly/immediately capture/transmit data
- Provide a network solution for distribution & accessing of information
- Create an aggregate CBRN view at the data input level
 - Display dynamic real-time CBRN hazard input, assessment & tracking
 - Link to rear-based CBRN databases & consultants
 - Facilitate immediate, front-line analysis & rapid decision making
- Give tactical & medical commander instantaneous CBRN picture
 - Enhance force protection situational awareness & decision making
 - Provide preliminary CBRN assessment
 - Baseline assessment through real-time database/consultant linkage
- Use one-man deployable COT & GOTS technologies with small footprint

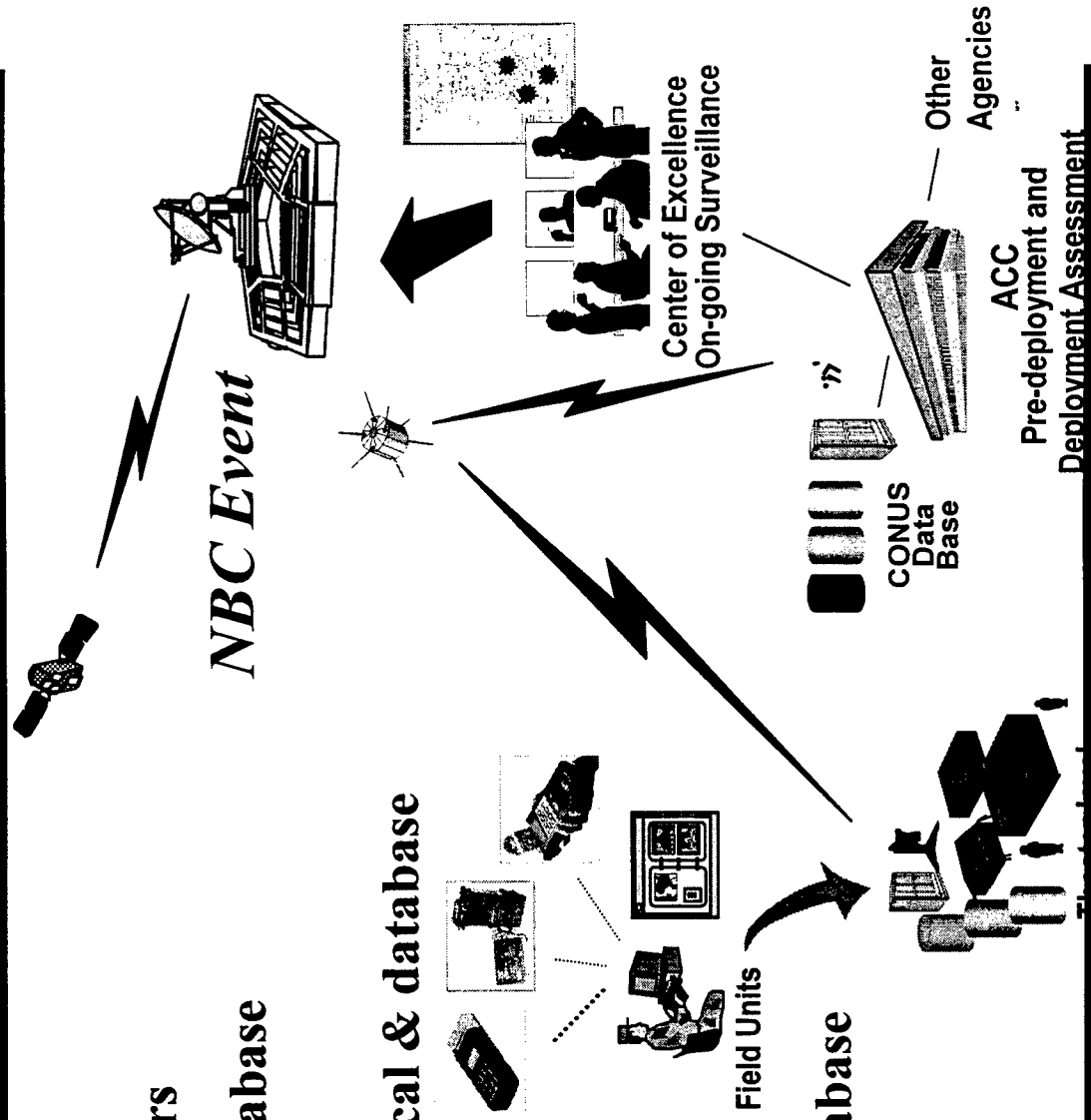


DESS Components

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Components:

- (1) Individual exposure monitors
- (2) 1st echelon analytical & database capabilities
- (3) In theater enhanced analytical & database capabilities.
- (4) Robust, deployable analytical & consultative capabilities
- (5) Reach back, gold standard analytical, consultative, & database capabilities





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DESS Projected Schedule

Aug 00 - Mar 01:	Database & technology market survey (AFIERA & CTC)
Jan - Jun 01:	Initial Biological, Chemical & Radiological technology & procedures assessment
Mar - Jun 01 :	Combined technologies & database integration
Jun - Aug 01:	Initial field testing
Sep - Dec 01:	Demonstration
Jan - Feb 02:	Initiative final report



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DESS Current Status

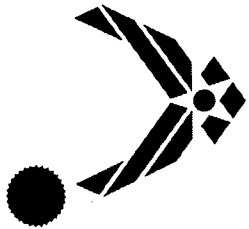
- Doing market survey**
 - Aggressively seeking sponsorship**
 - 12 Oct HQ USAF/SGX briefing**
 - 25 Oct TSWIG briefing**
 - 7 Nov 00, ACC FP IPT briefing**
 - 8 Nov 00, JSIG briefing**
 - 9 Nov 00, J-34 briefing**
 - 9 Nov 00, RESOPS ACTD briefing**
 - 13 Dec 00, Medical Readiness Symposium**
 - 14 Dec 00, HQ USAF/SG & GO Council**
 - __ HQ ACC/SG, & ILE briefings (working)**
 - __ PACAF (planned)**
 - __ AFSOC (planned)**
 - __ JSMG briefing (planned)**
-



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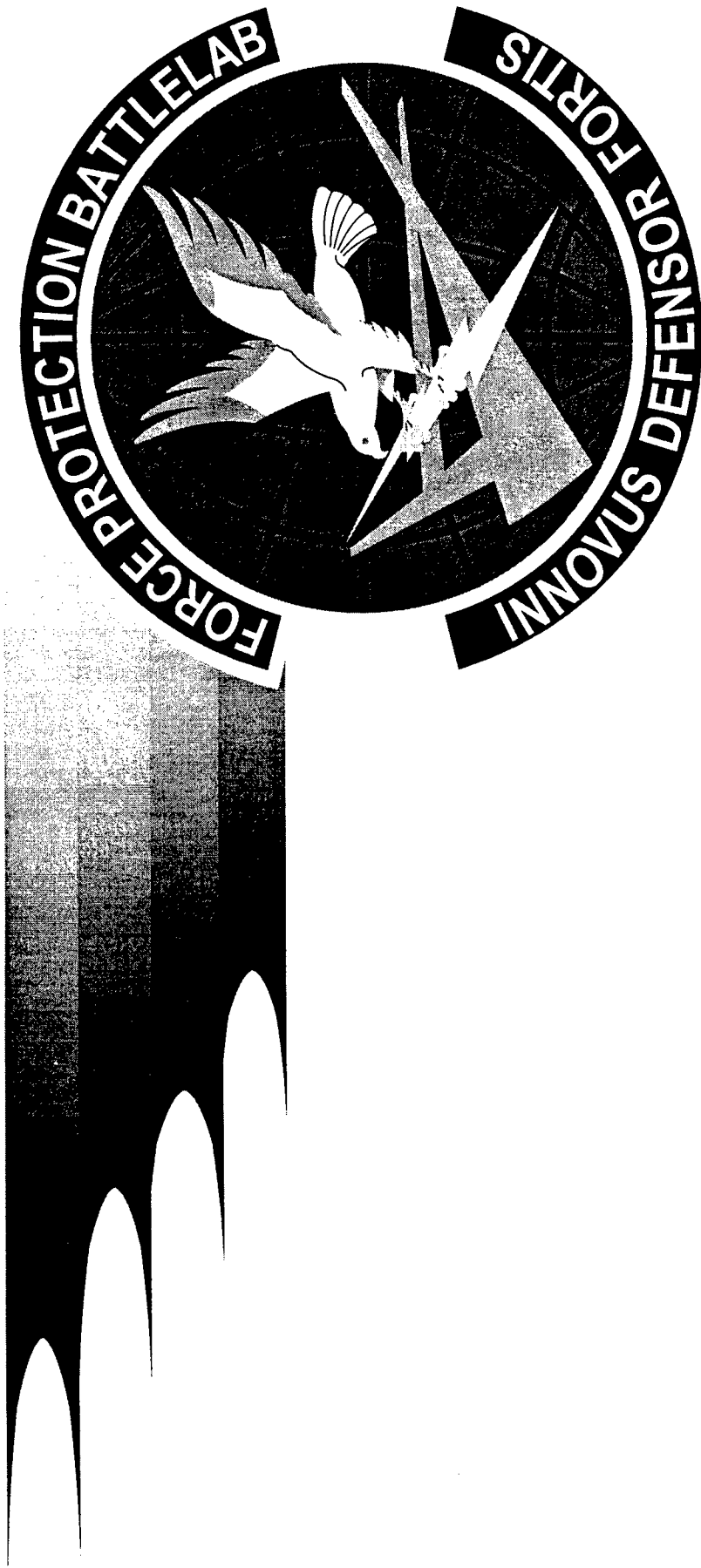
DESS Summary

- Not fully meeting Public Law 105-85
- Only have 18 months to complete initiative
- Concurrently working:
 - Requirements
 - Sponsorship
 - Partnerships
 - Proof of Concept: market survey
 - Transition/acquisition



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Questions?





BATTLE SPACE BATTLE LAB



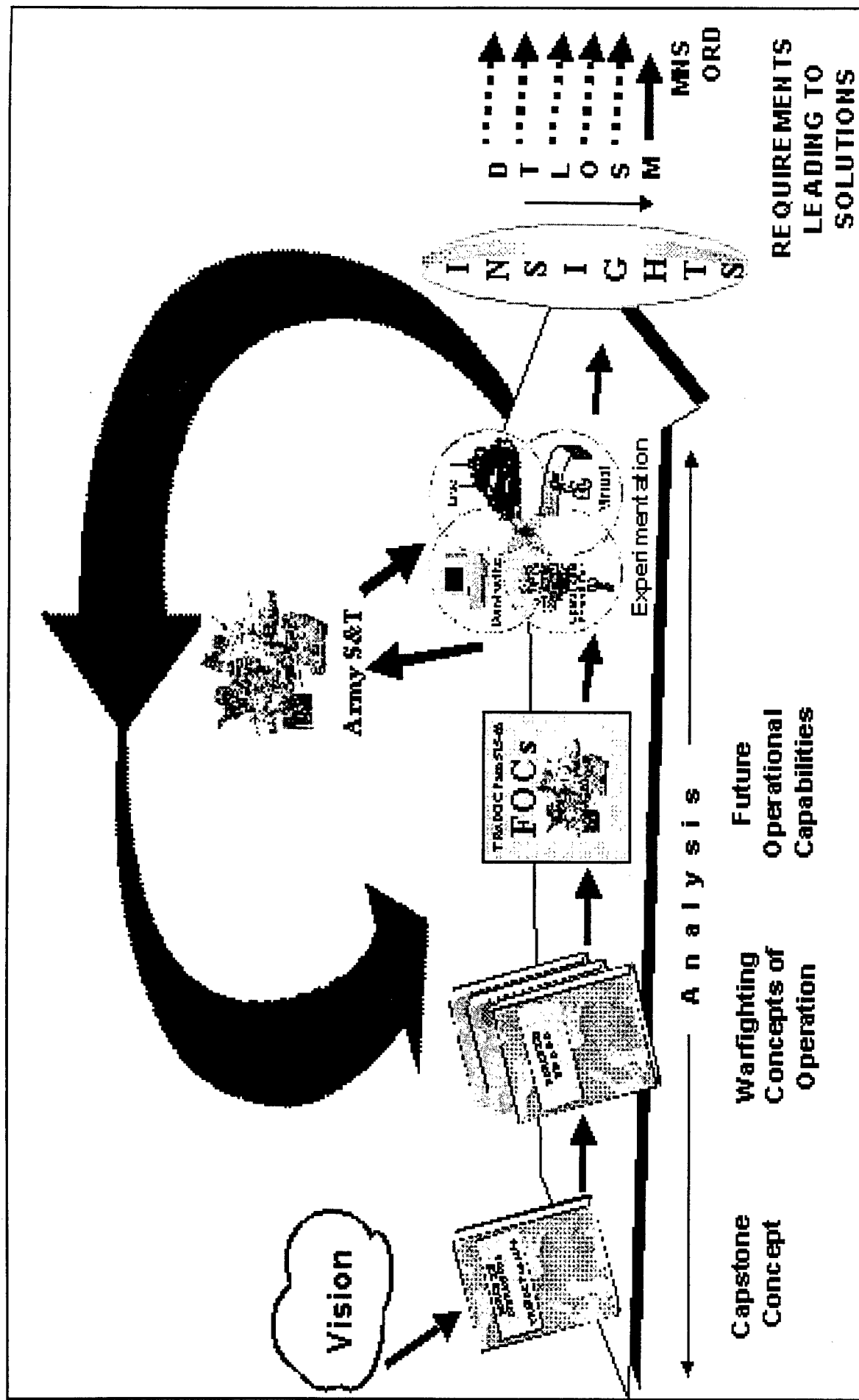


**Special Operations
Low Intensity Conflict
SO/LIC 2001**

Colonel FRANK J. STONE
Director of Combat Developments
United States Army Infantry Center
Fort Benning, Georgia



REQUIREMENTS PROCESS





EXPANDED BATTLE LAB

**BATTLE LAB
DEP DIR/HQ
(COL Poody)**

**LIAISON
OFFICER
SECTION**

Maintains and enhances
close liaison relationship
with the labs and
organizations

AMC

DARPA

**DISMOUNTED
FORCES
DIVISION
(C Kearns)**

Conducts experiments
on Dismounted Soldier
Hardware, TTPs and
Warfighting Concepts

**BATTLE
COMMAND
DIVISION
(W Morimoto)**

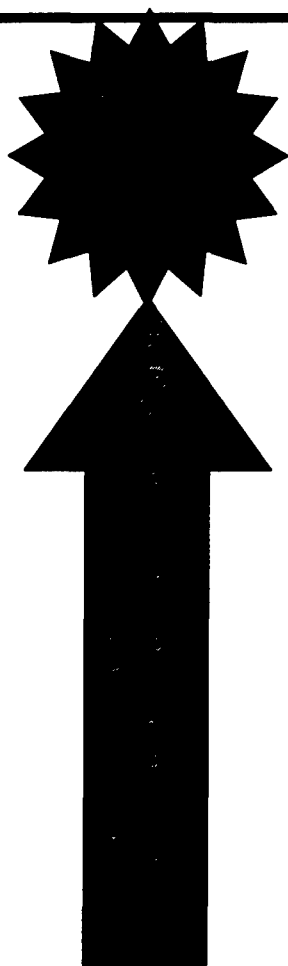
Conducts experiments
on C4I systems

**EXPANDED
BATTLESPLACE
DIVISION
(MAJ Echols)**

Provides user
management and
oversight of the
MOU ACTD

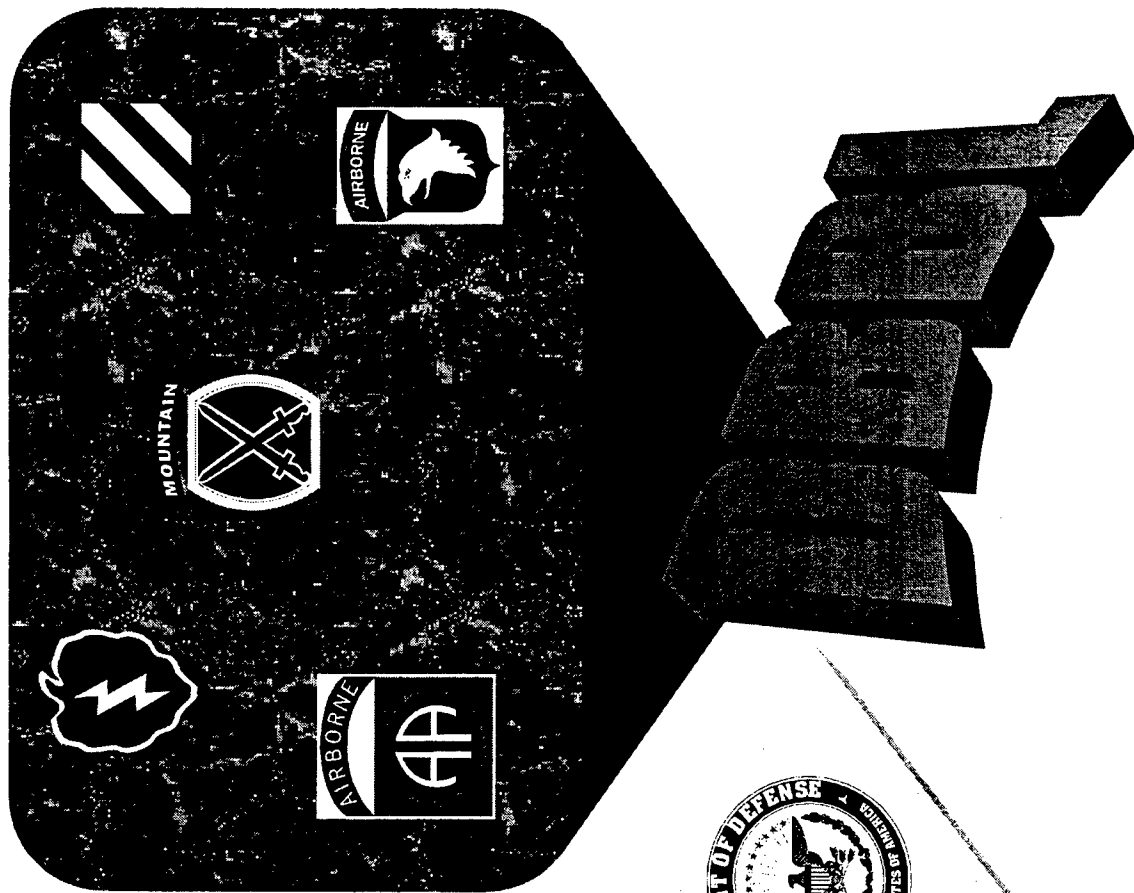
**LAND WARRIOR
SIMULATIONS
DIVISION
(J Chervenak)**

Provides simulation,
constructive and virtual
support to the DBBL and
Infantry School





AFFILIATIONS



Joint Services and Agencies



MEMBERSHIP PROGRAMS

- Dismounted Forces Division Programs
 - OSD Smart Sensor Web(SSW) and Antipersonnel Landmine Alternative (APLA)
 - Countersniper (to include Countersniper ACTD)
 - DARPA Small Unit Operations / Tactical Mobile Robotics / Exoskeleton
 - Combat Identification for the Dismounted Soldier
 - Own the Night
 - Enhanced Night Vision Goggle
 - Fused I2 and Thermal technology
 - LOSAT ACTD
 - Joint Non-Lethal Program
 - Under Barrel Tactical Payload System / Under Barrel Shotgun
 - Unmanned Ground and Aerial Vehicles (UGV / UAV)
 - Canadian/US Test and Evaluation Program - Experiment
- Battle Command Division
 - Light Digital TOC
 - Joint Enroute Mission Planning and Rehearsal System (JEMPRS)
- Expanded Battlespace Division
 - MOUT ACTD
 - Pointer UAV
 - Body Armor
 - Ladders
 - Rifle Launched Entry Munition (RLEM)
- Land Warrior Simulations Division
 - JANUS
 - CCTT
 - Land Warrior Test Bed



• Mckenna Military Operations In Urban Terrain (MOUT) Site

- On-site Lodging (Platoon)
- 3,700 ft Runway and Heliport
- 430 Acre Maneuver Area
- 15 Urban Structures 6 fully instrumented (inside tracking, cameras, audio)
- Tunnel System
- Preplanning and After Action Review Facility
- Day and Night camera coverage outside and inside selected buildings
- Control area for realtime monitoring of activities and data storage for AAR playback
- Observer Controllers
- Robotics Mobility Course under construction

• Griswold Range

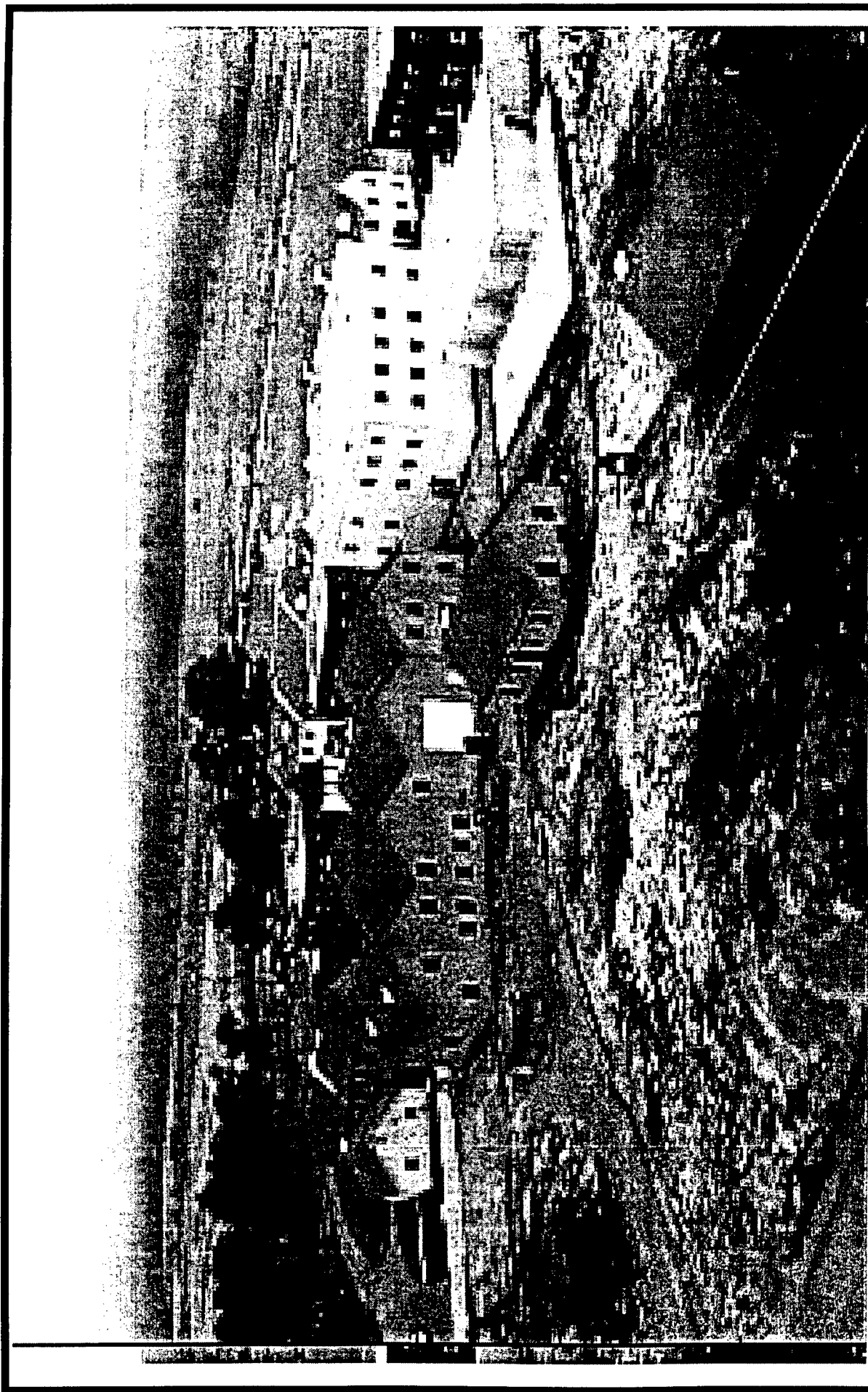
- 800 meter Known Distance firing range (5.56mm – 0.50 Cal)
- Upper firing point that adds 1,000 meters to the range providing 1,800 meter target engagements
- Maneuver area with forested terrain
- Support building for range support

• Kunzig Range

- Instrumented, Hardened Evaluation and Experimentation Tactical Objective
- Fenced in compound
- Two buildings and three out buildings
- Three acre livestock fenced area
- Four camera towers with day and night capability
- Fiber optic export of data to control facility at McKenna MOUT site



DISMOUNTED BATTLE SPACE BATTLE LAB

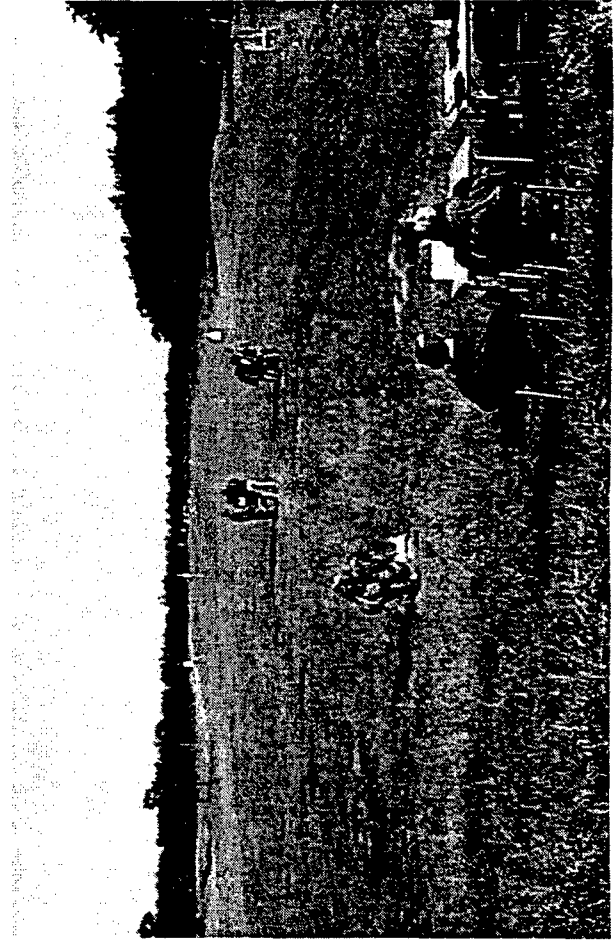
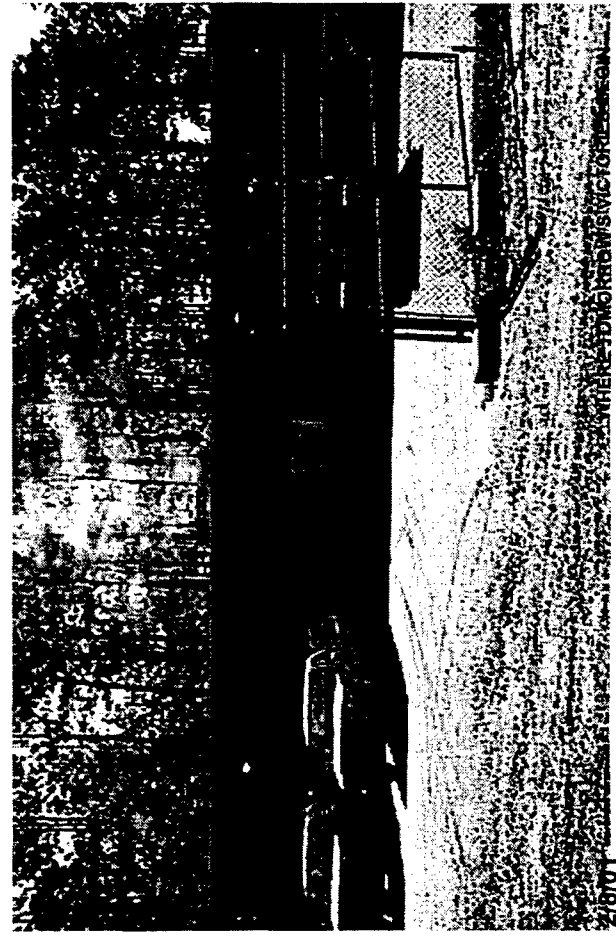


2/8/01

WHERE TOMORROW'S VICTORIES BEGIN



4th Mounted Battle Range



WHERE TO MOUNTAIN VIEW FOR RESERVATION



Change

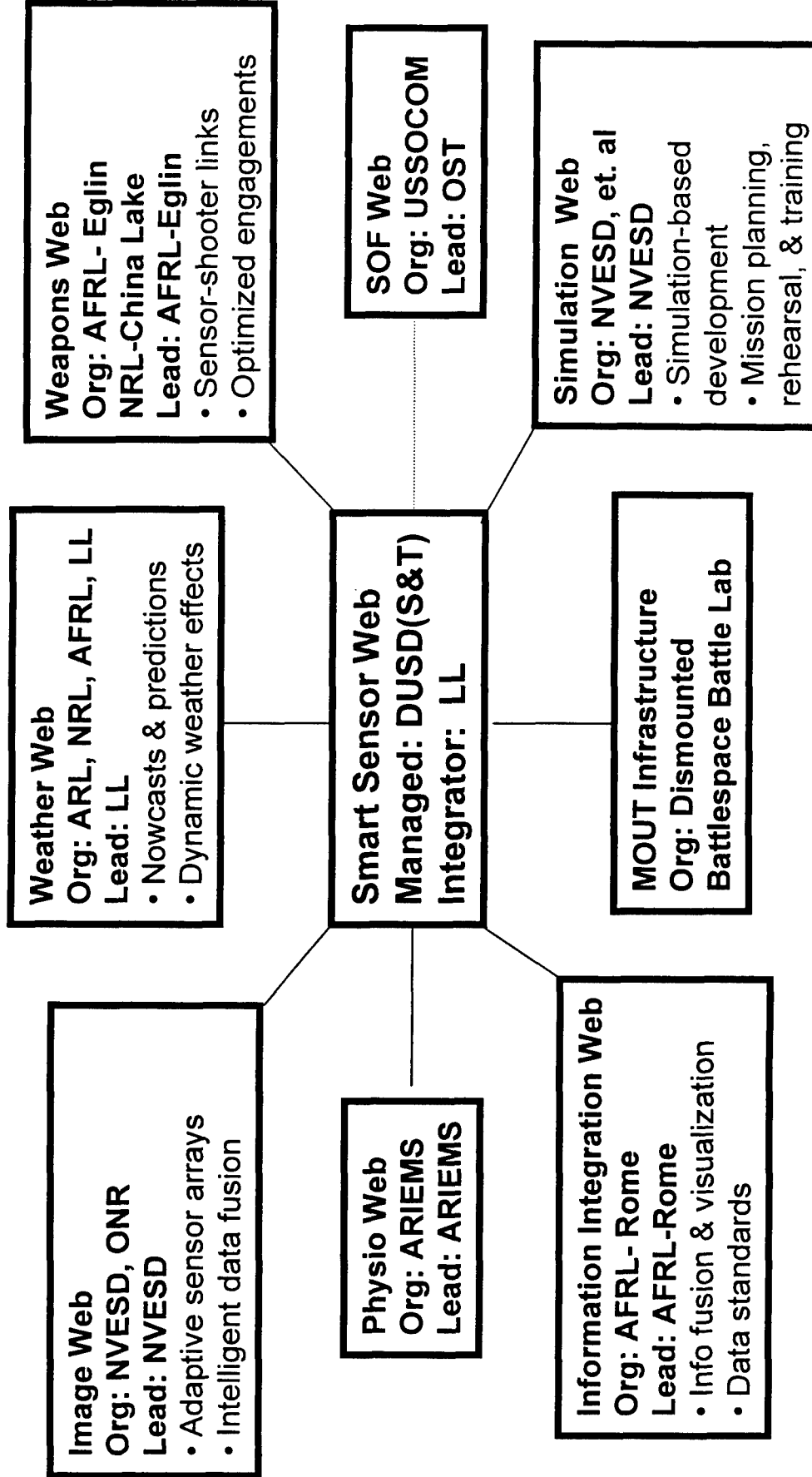




- Own-the-Night experiments
 - Thermal weapon sight evaluation Light, Medium and Heavy
 - Support the Enhanced Night Vision Goggle (ENVG) program
 - Supporting efforts for dismounted I2 and Thermal Fusion
- Combat Identification and training system prototypes
 - Man worn ground to ground
 - AC130H to ground
- Weapon and Weapons Concepts Experimentation
 - Multi-Role Anti-Armor Anti-Personnel Weapons System (MAAWS)
 - Under Barrel Shotgun
 - Future Sniper weapon concept exploration
- Preparation for experimentation of Sympathetic Detonation program
- Field evaluation of new battery technology
- Proponent support to White Feather and Inertial Sight Reticle program
- Hosted SOF WEB experiment for Smart Sensor Web
- Training support to 75th Ranger Regiment, selected ODAs from 5th and 7th SF Group and Navy SEALs



Sensor Web



10-18 July 2000



- Multi-Role Anti-Armor Anti-Personnel Weapons System (MAAWS) Area Deterrent Munitions (ADM)
- Conducted a User evaluation of the MAAWS ADM munition for SOCOM
- Determine the effectiveness and suitability of the ADM
- Support a type-classification standard and materiel release decision.
- Determine probability of hit at 50 and 100 meters during daylight and limited visibility and in Mission Oriented Protective Posture (MOPP) Levels 0 and 4