

**Electronic Warfare (EW)
Center of Excellence
at
NAVAIR Point Mugu, CA**

Briefing to BRAC Commission Staff

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July 2005

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Avionics (WD)**

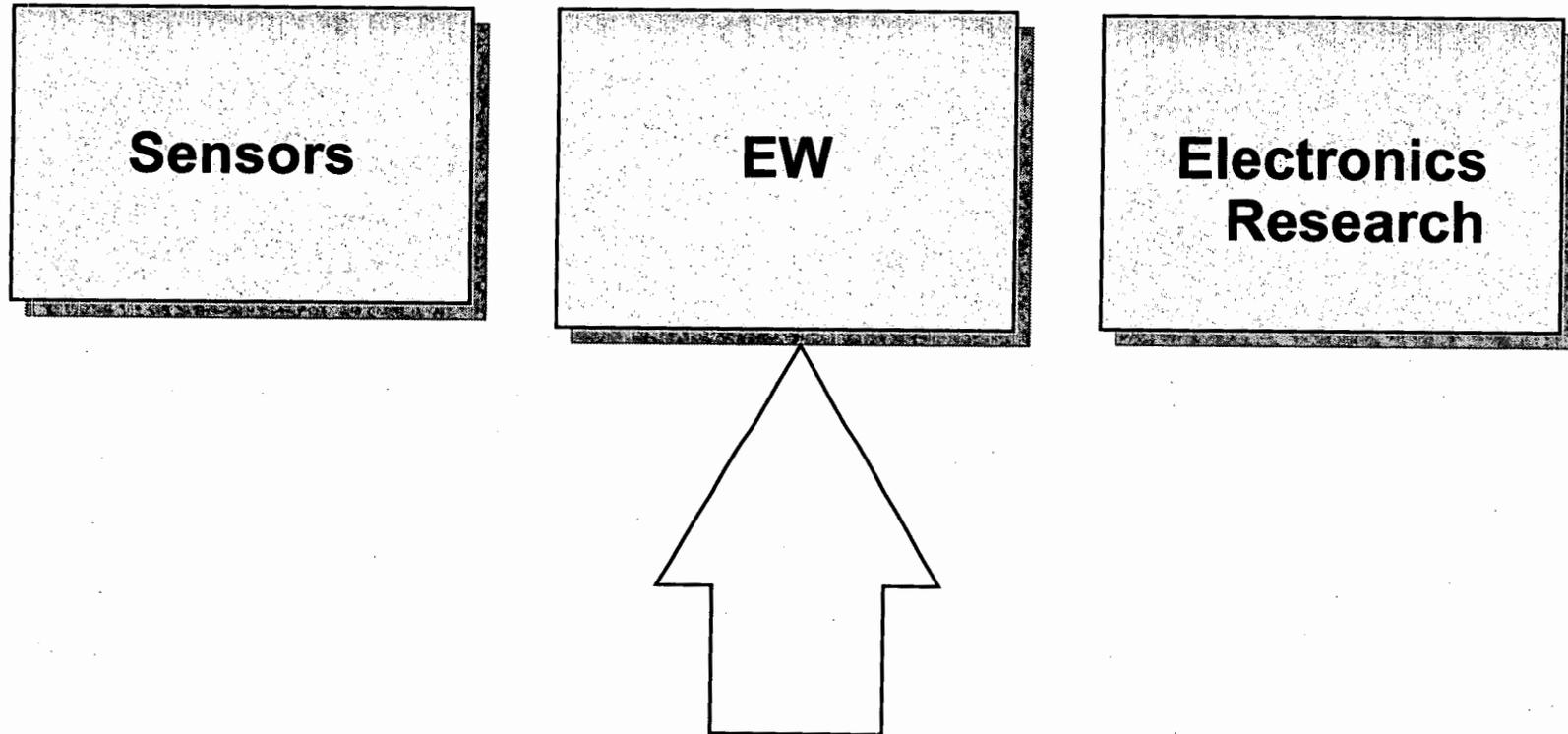
Executive Summary

- **Naval Aviation's Center of Excellence for EW Exists at NAVAIR Point Mugu and is Delivering High Military Value Products & Services Directly Supporting the Warfighter**
- **Our EW Expertise and Products Are Saving Lives Today**
- **Integration of our EW Knowledge Resources at Point Mugu and China Lake Combined with Our Transformational, Linked Laboratory Network Infrastructure, Has Resulted in Increased Synergy and Efficiencies, While Eliminating Un-necessary Duplication**

Outline

- **Discussion Framework and Context**
 - What is EW?
 - Establishment and Growth of Naval Aviation EW at Point Mugu, CA
- **Overview of EW Mission Support at NAVAIR Point Mugu, CA**
 - How We Operate and Support the Warfighter
- **Section 10: Recommendations – Technical Joint Cross Service Group Regarding Realignment of EW**
 - Tech 54 Recommendation
- **Tech 54 Implementation Challenges**
- **Summary**

Framework and Context



Distinct from sensors and electronics research areas, briefing focuses on EW function and mission support capabilities resident at Point Mugu, CA

What is Electronic Warfare (EW)?

- **Military Action Involving: (1) the use of electromagnetic or directed energy to attack an enemy's combat capability, (2) protection of friendly combat capability against undesirable effects of friendly or enemy deployment of electronic warfare, or (3) surveillance of the electromagnetic spectrum for immediate threat recognition in support of electronic warfare operations and other tactical actions such as threat avoidance, targeting, and homing (CJCS MOP 30).**
- **Systems and capabilities that enable our warfighters to execute their missions and return home safely.**

Establishment and Growth of Naval Aviation EW Center of Excellence at Point Mugu, CA

- **1950**

- Testing of missiles for vulnerability to radio frequency interference and countermeasures

- **1951**

- Countermeasures Division formally established at Point Mugu, CA. Responsible for:

- Testing and evaluating missiles under development for countermeasures susceptibility
- Development/utilization of required vulnerability test and measurement facilities and equipment
- Providing technical support to contractors in missile design improvements (i.e., vulnerability performance)

- **1956**

- Critical mass of countermeasures expertise and capabilities accumulated led to expanded mission role of providing Naval Aviation aircraft with EW devices to thwart enemy radars

Establishment and Growth of Naval Aviation EW Center of Excellence at Point Mugu (cont.)

- **1973**

- Establishment of EA-6B System/Software Supt Activity

- **1979**

- Establishment Of TACAIR EW Software Support Activity

- **1985**

- EW Systems Laboratory MILCON Approved

- **1992**

- Consolidation of Pacific Missile Test Center, Point Mugu, CA and Naval Weapons Center, China Lake, CA Commands to Form Naval Air Warfare Center, Weapons Division.
- Mission and Function of EW Center Of Excellence at Point Mugu, CA kept intact in New Command Structure

- **1994**

- NAVAIR Systems Command Reorganization Realigned EW Dev and Mission Support People and Resources at Point Mugu and China Lake under Single Organizational Entity Headquartered at NAVAIR Point Mugu, CA

- **1994 to Present**

- Navy's Center of Excellence for Naval Aviation EW
 - Refinement of new EW Organization to Improve Overall technical Capabilities, Reduce Response Time for Fleet EW Support Requirements, and gain Continuous Improvement of Operating Efficiencies
 - Vulnerability Assessment Expertise and Functions Aligned into Threat/Targets Department Headquartered at NAVAIR Point Mugu, CA

**Overview of EW Mission Support at NAVAIR
Weapons Division, Point Mugu, CA**

EW Mission Support At NAVAIR Weapons Division Organization and Leadership

- **EW Development, In-Service Engineering and Life Cycle Support functions Managed within an Integrated, Functional Department (encompassing people based at Point Mugu and China Lake) and Headquartered at NAVAIR Point Mugu**
 - Under Singular, SES-level Leadership and Direction (Director, EW/Combat Systems/Avionics)
 - EW Workforce Currently Includes ~369 civil service personnel Located at Point Mugu and ~12 at China Lake, CA
- **EW Development and Support Facilities at NAVAIR Weapons Division, Point Mugu, CA and China Lake, CA under Common Management Since 1994**
 - Has precluded unnecessary duplication and investment
- **Naval Aviation Aircraft Development T&E EW Mission Area Assigned to NAVAIR Patuxent River, MD**

How We Operate

- **EW Mission Work Performed Using Our Own Organic Labs, Other Service Specialized EW Lab Facilities, and Navy/Air Force Open Air EW Ranges as Requirements Dictate**
 - **EW Countermeasures Development & OFP/UDF Software Development (Point Mugu)**
 - **F/A-18 Aircraft/Weapons Integration (China Lake)**
 - **Advanced Weapons Laboratory fully integrated with Point Mugu EW Laboratory Complex via Cyberlink to support EA-18G Development**
 - **EA-6B Weapon System Support Activity (Point Mugu)**
 - **Systems Integration Laboratory for 89A, ICAP-II, ICAP-III**
 - **Electronic Combat Range (China Lake)**
 - **Used principally for combined DT/OT support**
 - **UDFs Validated in ECSEL (Point Mugu)**

Flight testing of User Data Files no longer necessary due to validated ECSEL simulation capabilities.

Value to the Warfighting Forces

Types of Assets Our EW COE Mission Support Includes

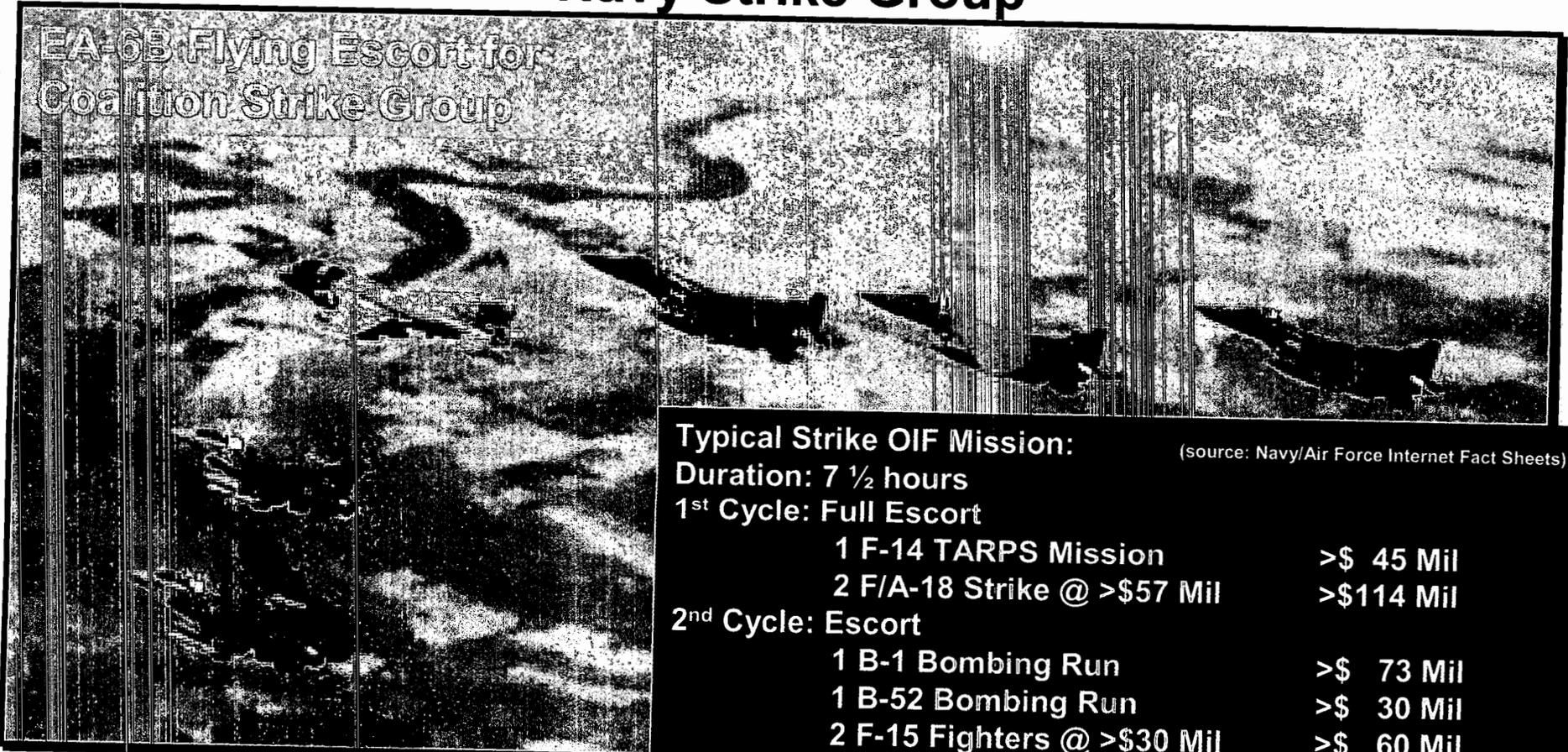
- Self-Protection/SA Capabilities For TACAIR Platforms

- EA-6B/AEA Protection Capabilities For Fleet/Joint Forces Warfighters/Ground Troops

- F/A-18A/B/C/D/E/F
- F-14D
- AV-8B
- E-2C
- MH-60R/HH-60H
- AH-1W/Z
- CH-53E
- MV-22
- KC-130F/R/T

- ALL-NAVY STRIKE GROUPS
- AIR FORCE STRIKE GROUPS
- JOINT FORCES STRIKE GROUPS
- SPECIAL OPS
- PSYCHOLOGICAL OPS

Example: EA-6B EW/AEA Mission Navy Strike Group



Typical Strike OIF Mission:

(source: Navy/Air Force Internet Fact Sheets)

Duration: 7 ½ hours

1st Cycle: Full Escort

1 F-14 TARPS Mission >\$ 45 Mil

2 F/A-18 Strike @ >\$57 Mil >\$114 Mil

2nd Cycle: Escort

1 B-1 Bombing Run >\$ 73 Mil

1 B-52 Bombing Run >\$ 30 Mil

2 F-15 Fighters @ >\$30 Mil >\$ 60 Mil

Total Value Protected for 1 mission = >\$322 Mil

Total Sorties Flown in OIF: 41,404

**Warfighter Protection and Support Role Enabling
"Mission Accomplishment"**

EW Mission Support at NAVAIR Point Mugu, CA

- **Applied Research & Experimentation**

- OSD/HLS support for Counter-MANPADS
- Countermeasure techniques development
- Joint EW signature measurements

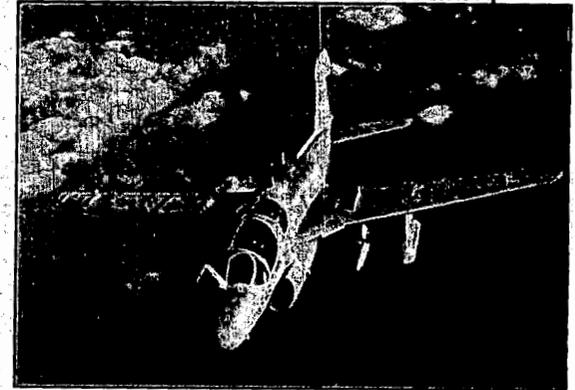
- **Threat Analysis & EW Database Support**

- Electronic Warfare Database Support (EWDS)
- EA-6B Tactical Information Report Management System (ETIRMS)
- USMC Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES)

- **Airborne Electronic Attack**

- EA-6B ICAP II
- EA-6B ICAP III
- EA-18G AEA System
- Jammer Techniques Optimization (JATO)

} EA-6B is sole DOD EW/AEA Mission Asset Supporting Joint Operations Forces



EW Mission Support at NAVAIR Point Mugu, CA

- **EW for Tactical Aircraft (Rotary & Fixed Wing)**

- Radar Warning Receivers
- Missile Warning Systems
- Jammers
- Dispensers/Expendables
- Turn-Key Reprogramming Labs/FMS support

**OFFPs, UDFs,
Fleet &
Joint Service
Support**

- **EW Suite/Systems Integration**

- **EW Mission Planning**

- JMPS (Joint Mission Planning System)
- TEAMS (Tactical EA-6B Mission Planning System)

- **High Fidelity EW Simulation Development & Support**

- Threat Radars

- **EW Support Equipment (SE)**

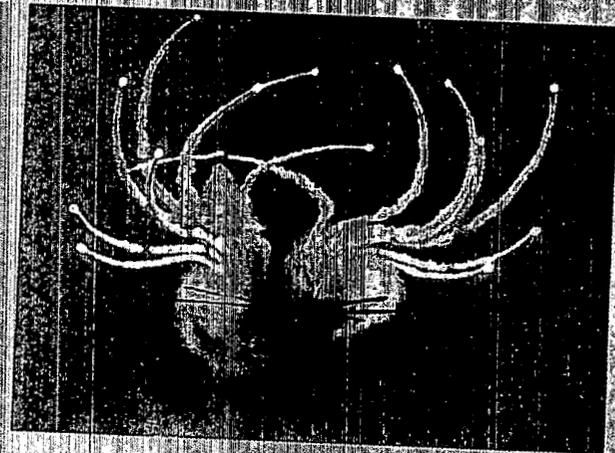
- EW Test Program Set (TPS) Software Development and Fleet Support
- EW SE Development and Fleet Support
- Systems Supportability Analyses Services

NAVAIR POINT MUGU, CA EW Center Of Excellence

WHAT DO WE DO FOR THE FLEET AND JOINT WARFIGHTING FORCES

Provide Reach Back EW Technical Expertise and EW Threat Data Products Required 24/7/365 by the Military Operational Community for:

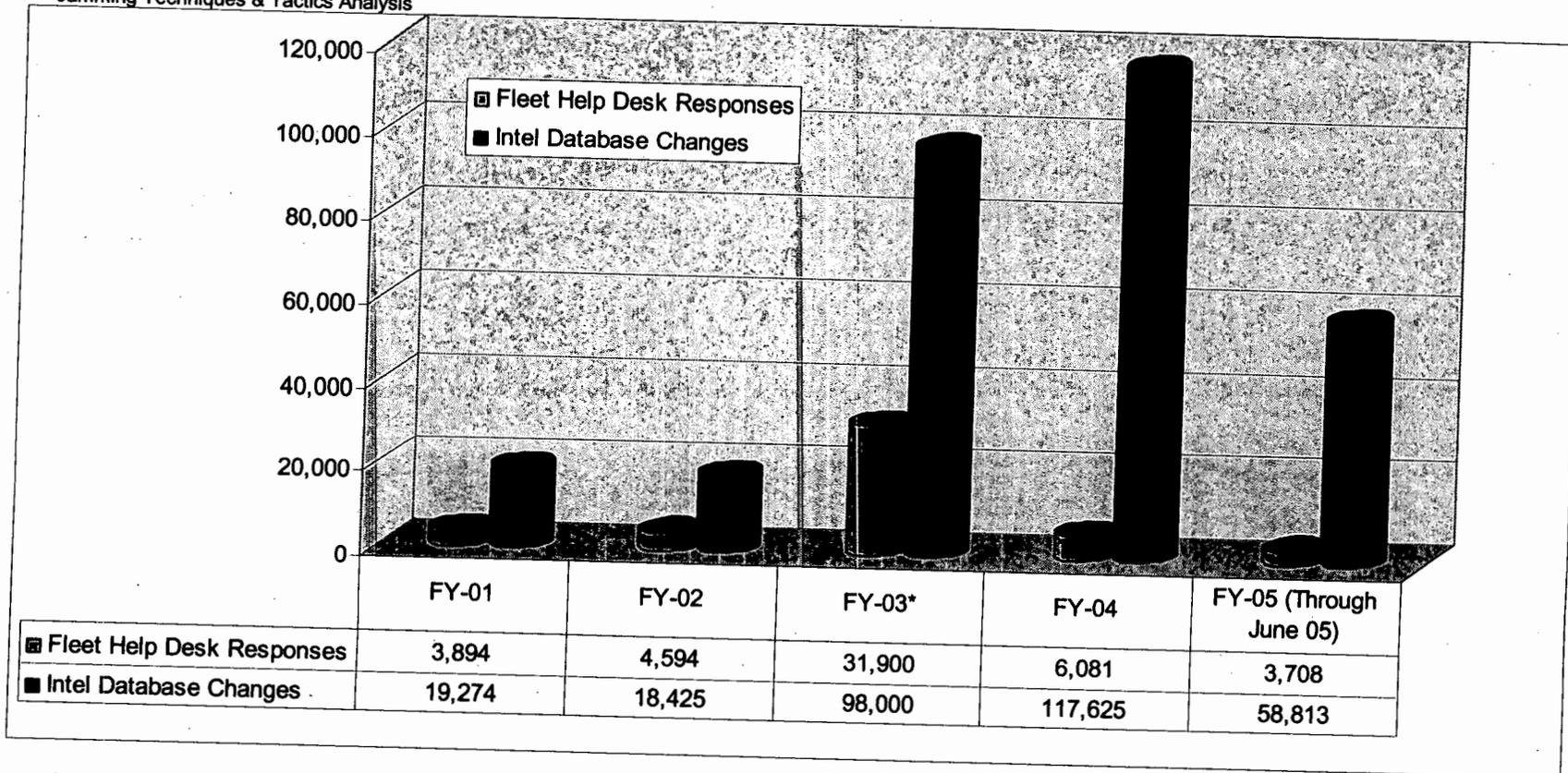
- **Reacting and Adapting to Changing & Dynamic Electromagnetic Environment**
- **Aircrew Situational Awareness**
- **Aircraft Self Protection**
- **AEA Real-Time Mission Support**



Electronic Warfare Database Support: 24/7/365 Fleet Reachback

Fleet Help Desk Responses include:

- SIPRNET E-Mail Responses
- Hotline Phone Support
- Rapid Reaction Files
- Jamming Techniques & Tactics Analysis



* Wartime Preparation

"In the history of the EA-6B, never has our mission been more relevant than today, directly supporting troops on the ground and saving lives everyday."
Captain Chris Field, COMVAQWINGPAC

EXAMPLES OF DIRECT SUPPORT TO FLEET/WARFIGHTING FORCES (FY01 to 05)

EW Suite/System Updates

- **FA-18E/F Second Deployment - ECP-90 (Delivered Dec 02)**
 - ALR-67(V)3 OFP/UDF 3503/3505
 - ALE-47 OFP/MDF 1125/1703
 - ALE-50A OFP/UDF 2.2.4/36
- **EA-6B Operational Flight Program (OFP)**
 - ICAP-2 AEFIS CDNU 09.01.02 Released to the Fleet in Sep 03
 - ICAP-2 SSA-5.4 & 89A-2.1 Released to the Fleet in Jul 04
 - EA-6B HARM Control Panel (HCP) OFP 05.05.03 Released to the Fleet in Jul 04
- **Developed rapid-reaction Mission Planning Support tool (ECAPS) for the USQ-113 Communications Jammer prior to OEF.**
- **EA-6B Block 89A-3.0 (integration of new AEA avionics) delivered early to meet OIF requirements.**

EXAMPLES OF DIRECT SUPPORT TO FLEET/WARFIGHTING FORCES (FY01 to 05)

EW Suite/System Updates

- **Standalone ALQ-126B OFP/UDF (Delivered Feb 03)**
 - Focused UDF technique update for in-theater threat
- **CY2000 Suite Update (Delivered Mar 03)**
- **ALR-67(V)2 UDF for AV-8B (Delivered Mar 03)**
 - UDF built, tested and released within 29 hours
- **CY2002 EW Suite (Delivered Oct 03)**
- **CY2004 EW Suite (Delivered Mar 05)**
- **APR-39A/B(V)2 VCD OFP 213.3 (Dec 03)**
- **APR-39 EIDs 214 (Dec 03), 201 (May 04), and 740 (Nov 04)**
- **ALR-67(V)3 OFP 3505 UDF 3508 (May 04)**
- **ALR-67(V)3 OFP 4604 UDF 4601 (Dec 04)**

EXAMPLES OF DIRECT SUPPORT TO FLEET/WARFIGHTING FORCES (FY01 to 05)

EW Support Equipment Updates/Services

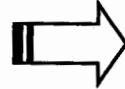
- OIF Rapid Action Solution to F/A-18C/D community for a Configuration change to the RWR. Software issued to the fleet within 2 weeks of problem identification.
- OIF and Afghanistan Ops Rapid Action Solution to the AV-8B community for a configuration change to the RWR. Software issued within 4 weeks.
- Pre-deployment training for the Navy/Marines on the USS Nimitz and the USS Carl Vinson in support of the VFA-41, VFA-14, VFA-115, VFMA-252.

EW Threat Intelligence Support

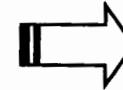
- Operation Enduring Freedom (OEF): On Sept 11th, 2001 we delivered 1 HARM Theater update, 1 RRF, and 2 JTATs by 1500 PST
- Provide Threat Data to all deployed Carrier Air Groups, Intel Agencies, EA-6B, E-2C, MH-60R, HARM, F-117, B-2, USMC USQ-146
- Updated EW Threat Data Files in response to OIF Operational request to handle new threat. From request to reprogramming aircraft in less than 1 hour (May 03)

EW Center of Excellence: Nationally Recognized Unique Capability

INTELLECTUAL CAPITAL



HOW IT'S APPLIED

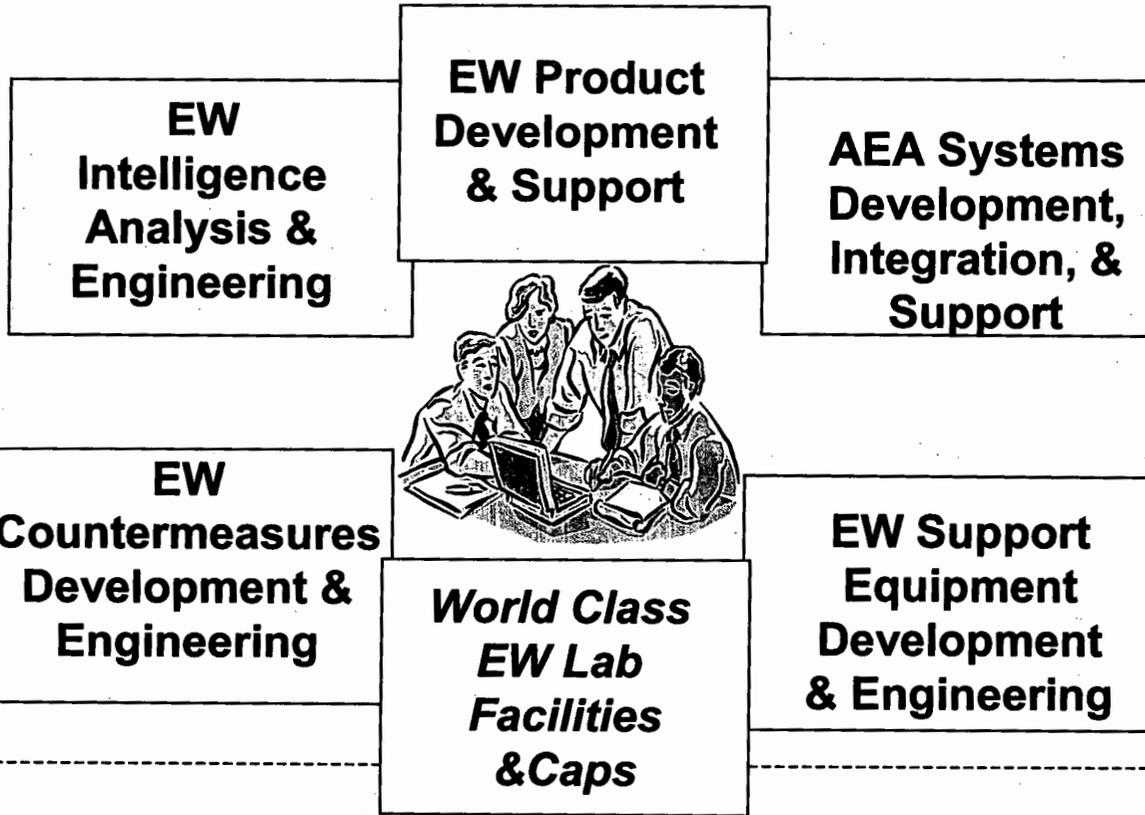


ITS VALUE

• **300+** Civil Service Employees

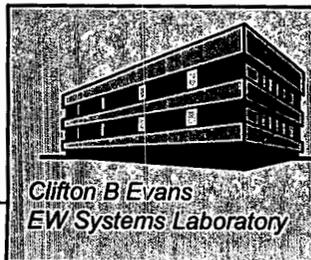
• Avg **20** Yrs of Specialized Exper.

• **SSAs at CMM Level 3+**



Direct Fleet/Joint Coalition Support

- 24/7/365 Fleet Reachback
- EA-6B OFPs
- TACAIR EW OFPs/UDFs
- EWSE TPS's

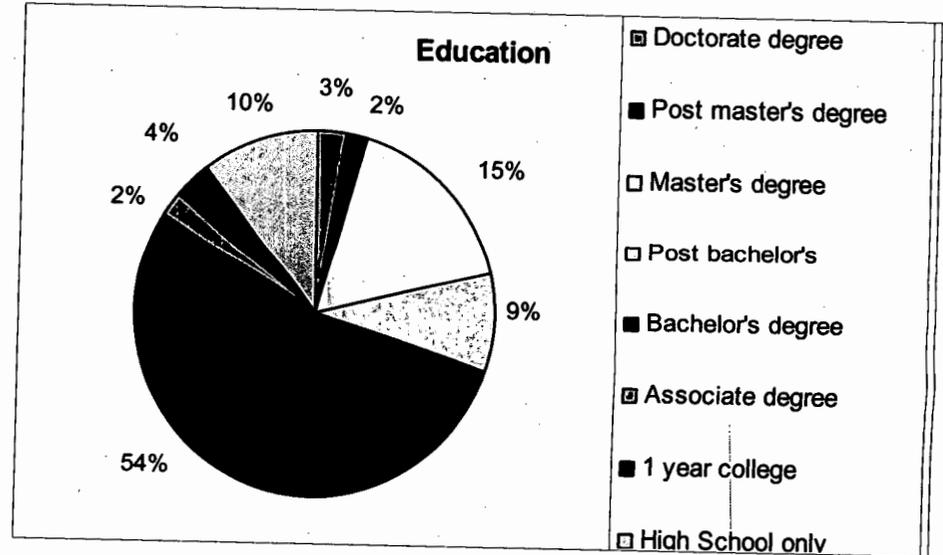
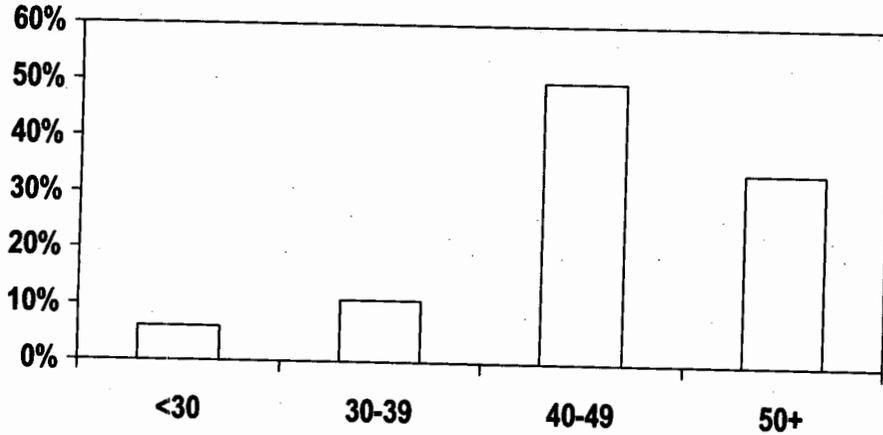


- DoD's Only EA-6B/AEA Development and Support Labs
- Threat Simulator Data Development for DT/OT Ranges
- AEA Portion of EA-18G Distributed Laboratory
- MILCON For Dedicated EW Laboratory Complex Completed 1988

EW COE Workforce Demographics

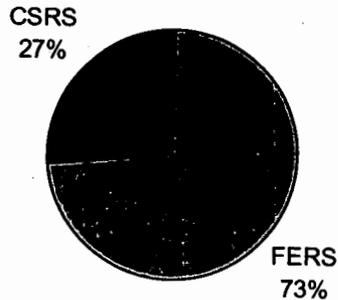
Age, Education, Retirement System

Age Distribution



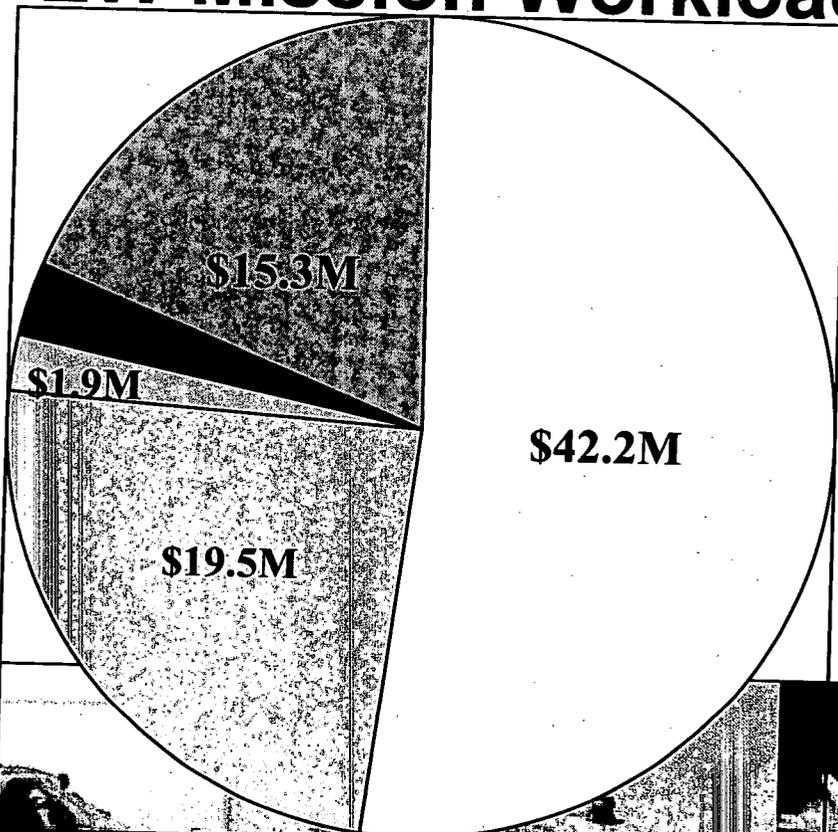
83% Bachelor Degree or higher

Retirement System

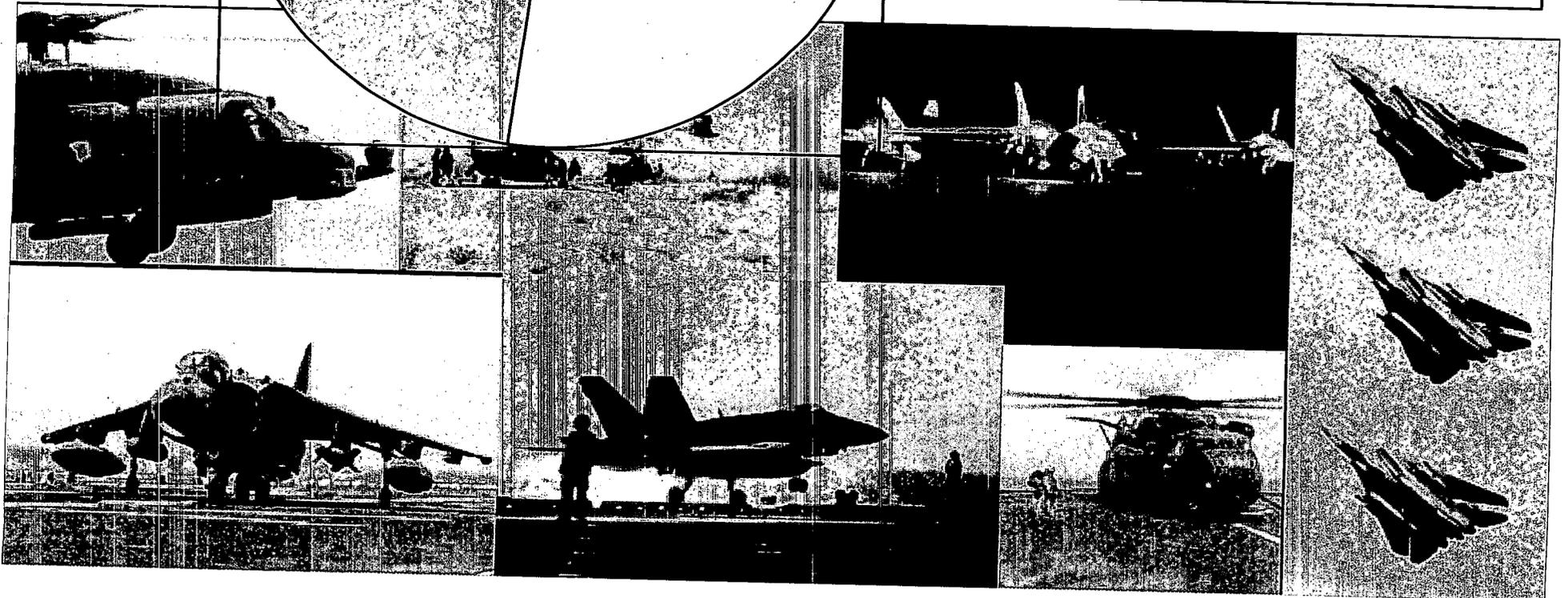


EW Mission Workload/Business Data

\$81.2 Million Business



- EA6B
- TACAIR
- SUPPORT EQUIP
- EWDS
- EW R&D/SPECIAL



**Section 10: Recommendations – Technical Joint
Cross Service Group Regarding Realignment of
EW**

Section 10: Recommendations – Technical Joint Cross Service Group

- **Recommendation (Tech 54) Title:**

- Navy Sensors, Electronic Warfare, & Electronic Research, Development & Acquisition, Test & Evaluation

- **Recommendation:**

- “Realign Naval Air Warfare Center, Weapons Division, Point Mugu, CA. Relocate the sensors, Electronic Warfare (EW), and Electronics Research, Development, Acquisition, Test & Evaluation (RDAT&E) functions to Naval Air Warfare Center, Weapons Division, China Lake, CA.”

- **Justification:**

- “Consolidating the sensors, EW and electronics RDAT&E functions at China Lake will eliminate redundant infrastructure between Point Mugu and China Lake, providing for the more efficient use of the remaining assets including the Electronic Combat Range and other integration laboratories at China Lake.”

Tech 54 Implementation Challenges

- **Relocation and Reconstitution of Existing Dedicated EW Mission Support Capabilities While:**
 - Providing Uninterrupted 24/7/365 EW Reach Back Services and Threat Data Products to Warfighters
 - Ensuring minimal disruption to Naval Aviation Acquisition Programs (e.g., EA-6B, EA-18G, IDECM)
 - Managing Transition of Critical Skills and Experience Required to Perform EW Mission Support Functions

Summary

- **Naval Aviation's Center of Excellence for EW Exists at NAVAIR Point Mugu and is Delivering High Military Value Products & Services Directly Supporting the Warfighter**
- **Our EW Expertise and Products Are Saving Lives Today**
- **Integration of our EW Knowledge Resources at Point Mugu and China Lake Combined with Our Transformational, Linked Laboratory Network Infrastructure, Has Resulted in Increased Synergy and Efficiencies, While Eliminating Un-necessary Duplication**

Point Mugu EW Center Of Excellence

Major Facilities & Tour Plans

Visit/Tour Planned

Clifton B. Evans EW Systems Laboratory Complex

❖ EA-6B-ICAP II	X
❖ EA-6B/AEA ICAP III	X
❖ EA-18G/AEA	X
❖ EWDS/ETIRMS	X
❖ ECSEL	X

Bldg 351

- ❖ EW IRON CROW

Bldg 3015

- ❖ TERPES

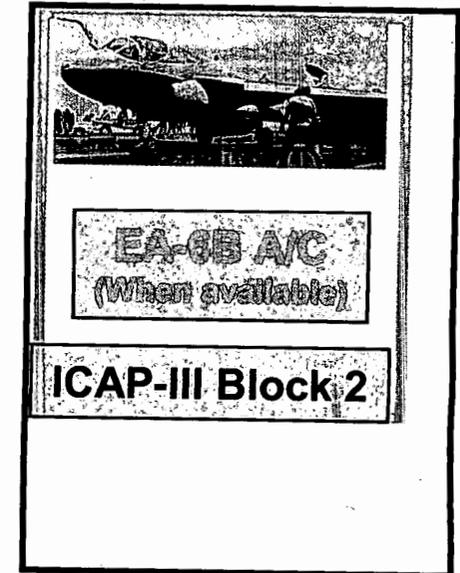
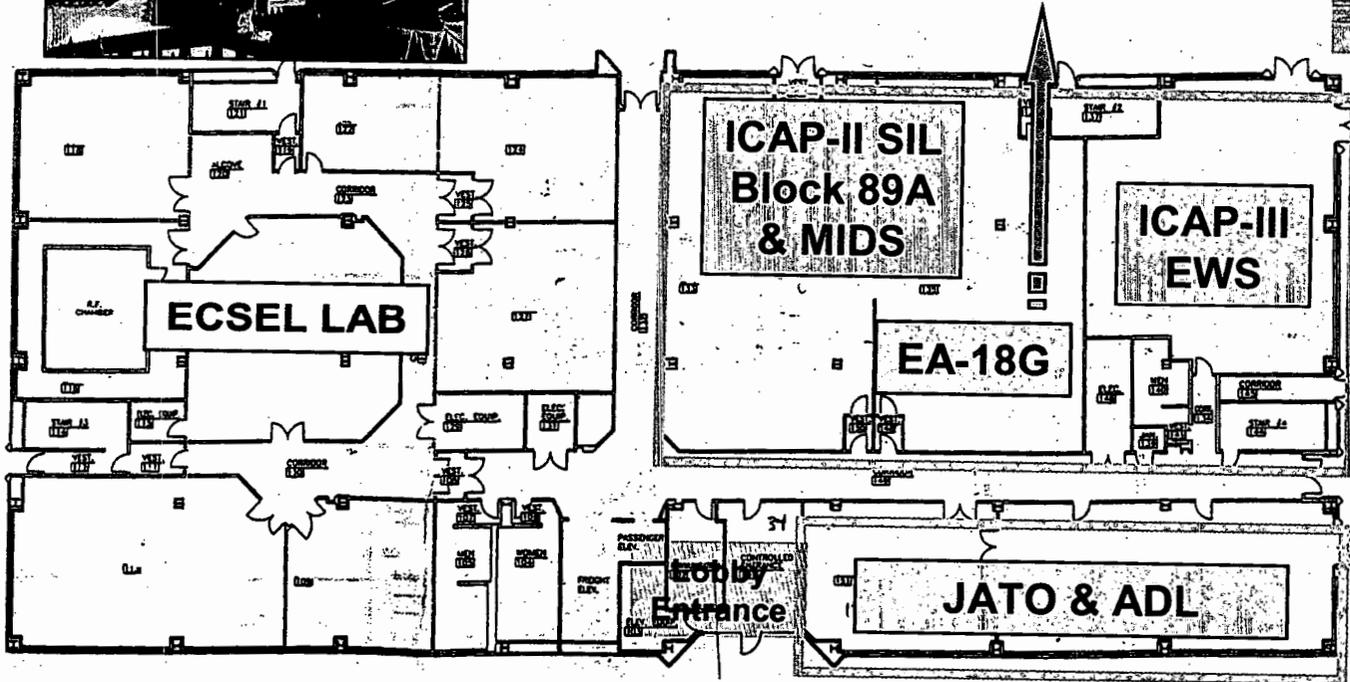
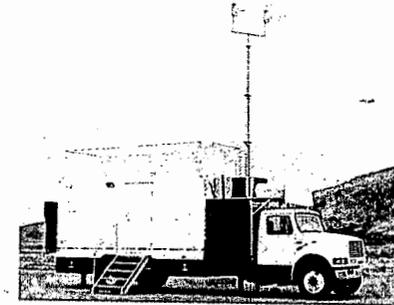
Bldg 36

- ❖ TACAIR EW SW Development Stations
& Personnel

AEA Facilities Building 3008/3009



Cyber link to
F/A-18 AWL
NAVAIR CL



BUILDING 3008 OFFICE AND LABORATORY COMPLEX

**Building 3009
HANGAR**

BACK-UP CHARTS

NAWCWD CORE EW FACILITIES COMPLEMENTARITY

• PT MUGU

- **Electronic Combat Simulation & Evaluation Laboratory (ECSEL): System UDF/OPF Development**
- **Iron Crow: Support Equipment Development & TPS**
- **EA-6B ICAP II BLK 89: Development and Integration**
- **EA-6B ICAP III: Development and Integration**
- **EA-18G AEA: Development and Integration**
- **Tactical Electronic Reconnaissance Evaluation System (TERPES): Mission Planning & Processing**
- **Electronic Warfare Database Support (EWDS): Threat Intelligence Support**
- **Jamming Technique Optimization (JATO): Technique Development**

• CHINA LAKE

- **Electronic Warfare Integration Laboratory (EWIL): Flight Test Support & Data Analysis**
- **Electronic Combat Range (ECR): Open Air Range**

Definition..... “Sensor- (DOD*)”

“A technical means to extend man’s natural senses; an equipment which detects and indicates terrain configuration, the presence of military targets, and other natural and manmade objects and activities by means of energy emitted or reflected by such targets or objects. The energy may be nuclear, electromagnetic, including the visible and invisible portions of the spectrum, chemical, biological, thermal, or mechanical, including sound, blast, and earth vibration.”

*Standardized Definition for Use Within the
Joint Services and Department of Defense

Source: *The Strategy of Electromagnetic Conflict*,
Edited By LT COL Richard E. Fitts

Our Customer's Thoughts...

"The contributions of JATO to the EA-6B community are immeasurable. The professionals at JATO provide continuous support for our front-line combat operations ... This organization is the focal point for all EA issues and provides the Prowler community with timely and accurate information and data support--simply stated, we could not do our mission without them. "

-- LT Kyle Baker / Capt Jeff Long (USAF), VAQ-134

"No one goes into harms way without us...no one."

-- Captain John P. Cryer, COMVAQWINGPAC, 1999

"The Software, Test, Design, and data gathering that Pt. Mugu does is saving lives."

-- Captain Chris Fields, COMVAQWINGPAC, 2005

"Pt Mugu is the reason we have fully functioning EA-6B's and working software. I don't know where to begin in my laudable appreciation of those very talented folks. From developmental testing all the way through operational work continuing on through fleet introduction and beyond. They are always willing to go the extra mile... They have a 24 hour hotline during war and peace time and I've used it during many conflicts including our current det."

-- LCDR Robert "KY" Croxson, VAQ-140



DCN: 8507

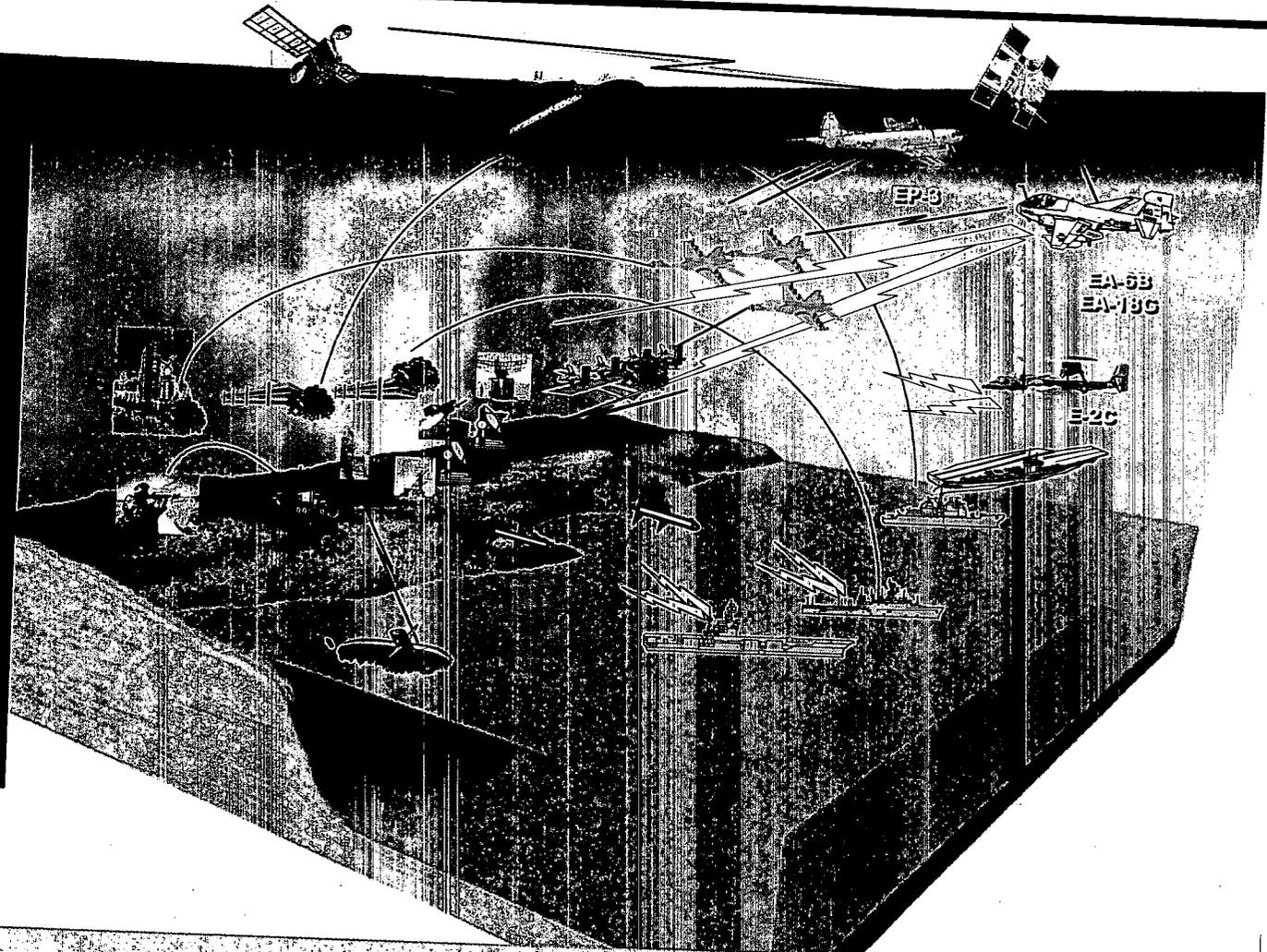
Airborne Electronic Attack



EA6B Music Video Pgm.wmv

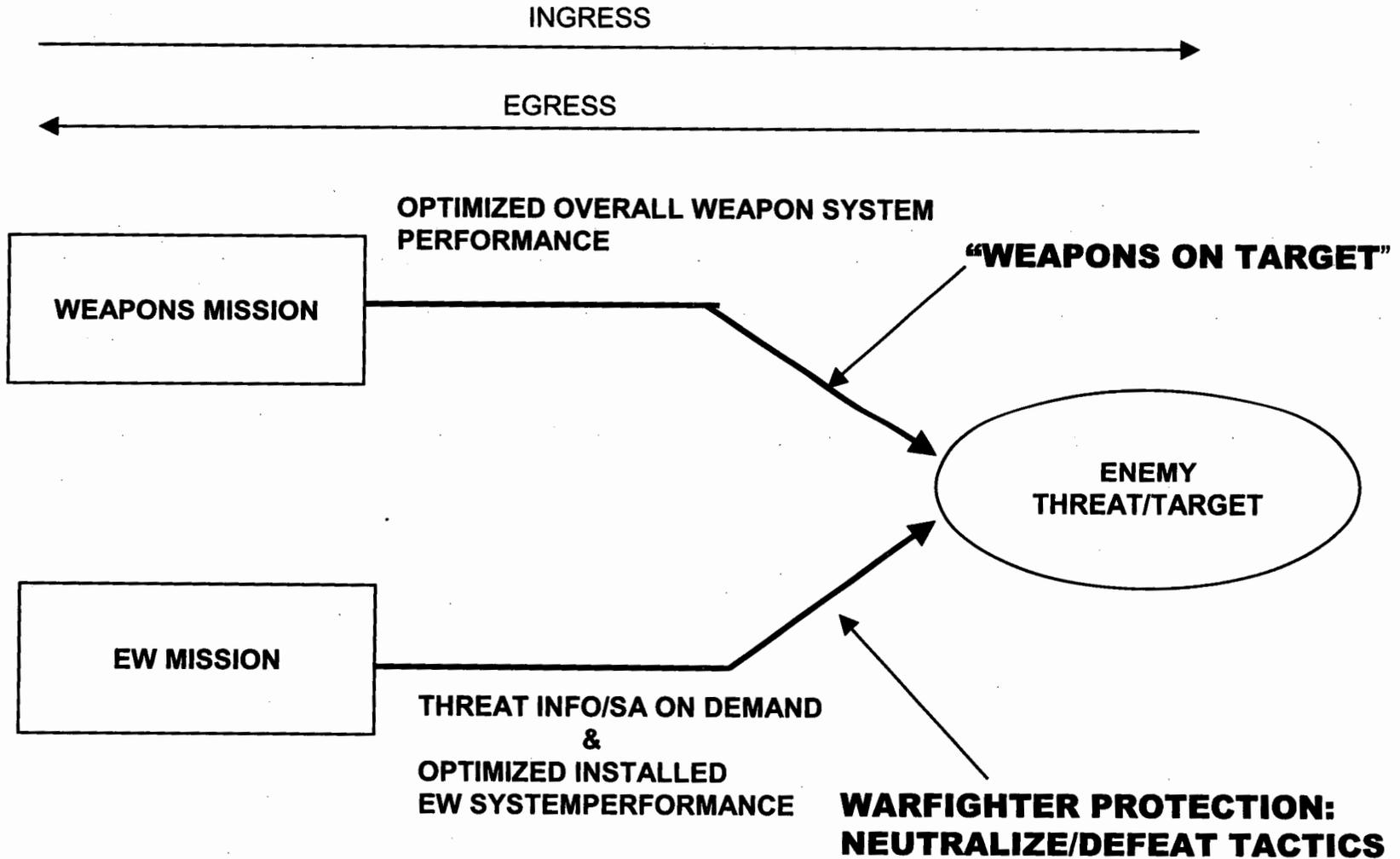
Airborne Electronic Attack (AEA): "Deny, delay, degrade the acquisition of friendly forces by enemy air defenses systems."

- Less exposure time to threat
- Less time for threat to react
- Less shots taken by threat
- Self-protect equip responds to less engagements
- Mission success



*Increases combat survivability of strike force aircraft & weapons.
Communications EA to enhance ground forces.*

DIFFERENT PERSPECTIVES, DIFFERENT APPLICATION OF TALENT/EXPERTISE



EW Intelligence Support Example: EA-6B

