



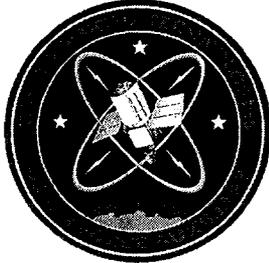
Civil Air Patrol
 United States Air Force Auxiliary
...performing Missions for America

ARCHER
 AIRBORNE RECONNAISSANCE
 & TARGETING SYSTEM

Roll Out
March 2, 2005



Presented by



Col Drew Alexa, CAP
Director
Advanced Technologies
&
ARCHER Program
Manager



ARCHER Overview

- ◆ ARCHER Concept & Capabilities
- ◆ ARCHER System Components
- ◆ ARCHER Target Detection and Data
- ◆ ARCHER Deployment
- ◆ ARCHER Contractors
- ◆ Multi-Organizational Support
- ◆ A Cause for Celebration




ARCHER Concept & Capabilities

What is ARCHER?

- Airborne**
- Real-Time**
- Cueing**
- Hyperspectral**
- Enhanced**
- Recon**



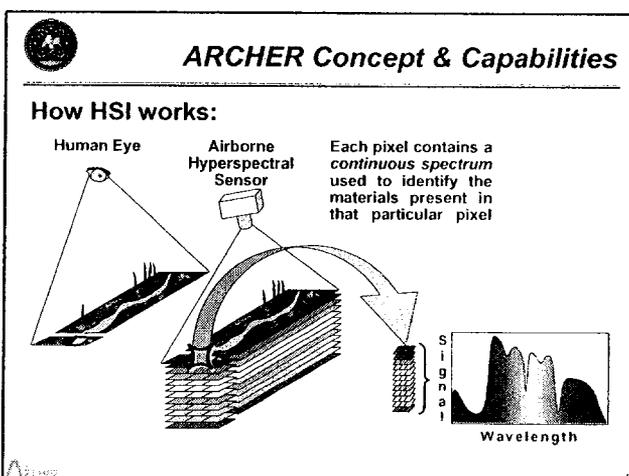
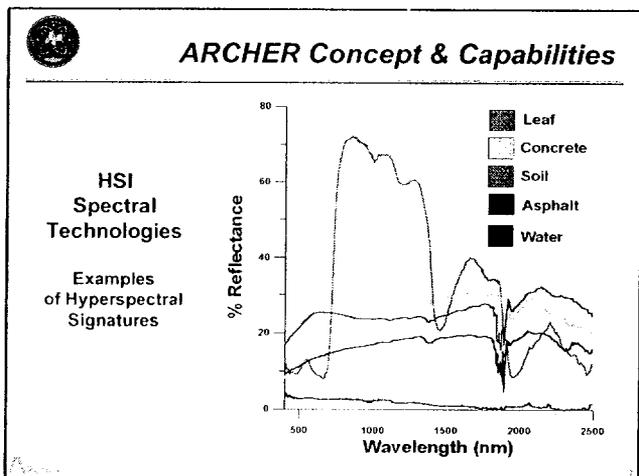
ARCHER Concept & Capabilities

- ◆ ARCHER is a custom-designed system of hyperspectral imaging hardware and software (HSI).
- ◆ HSI is a technology that allows a sensor on a moving platform to detect and/or gather reflected radiation (light) from man-made or natural objects on the ground.
- ◆ Hyperspectral Imaging will support current and future CAP missions
 - ◆ Search and Rescue (SAR)
 - ◆ Counter Drug (CD)
 - ◆ Disaster Relief (DR)
 - ◆ Homeland Security (HLS)

ARCHER Concept & Capabilities

ARCHER executes three separate algorithms for target acquisition and identification:

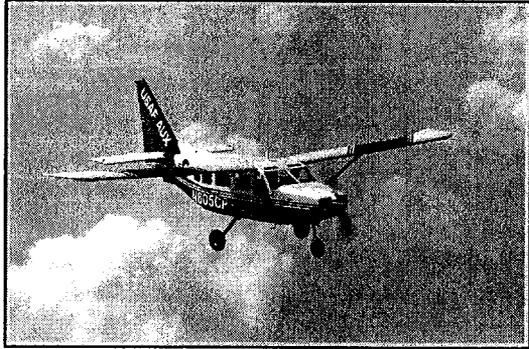
- ◆ Spectral signature matching: detects specific spectral signatures using matched filters (find things with known spectral properties)
 - ◆ Potential Missions: Counter Drug, HLS
- ◆ Anomaly detection: detects spectral anomalies (things that do not "belong")
 - ◆ Potential Missions: Search and Rescue, Disaster Relief
- ◆ Change detection: detects changes over time through a pixel-by-pixel comparison.
 - ◆ Potential Missions: HLS, Disaster Relief



ARCHER Concept & Capabilities

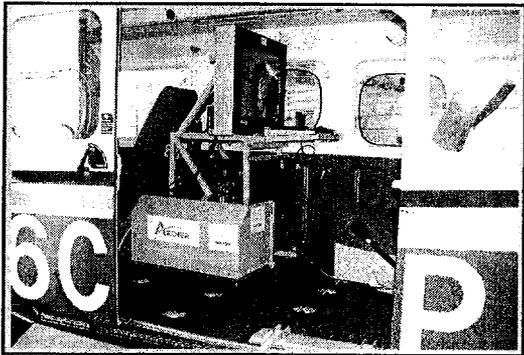
- ◆ ARCHER is a non-invasive reflective light technology.
- ◆ ARCHER will NOT make detections:
 - ◆ Through solid materials (e.g., roofs, buildings, walls, floors, etc.)
 - ◆ Underground
 - ◆ Under snow
 - ◆ Under water
 - ◆ At night

ARCHER System Components



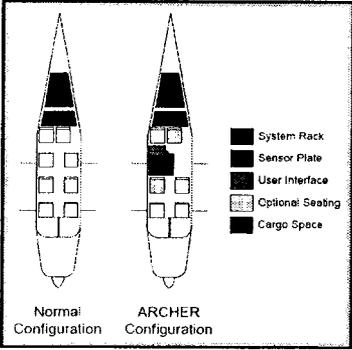
HSI Aircraft: GA-8 Airvan

ARCHER System Components



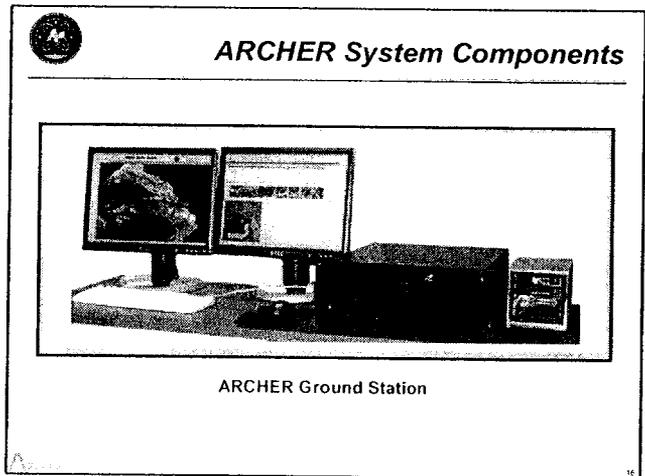
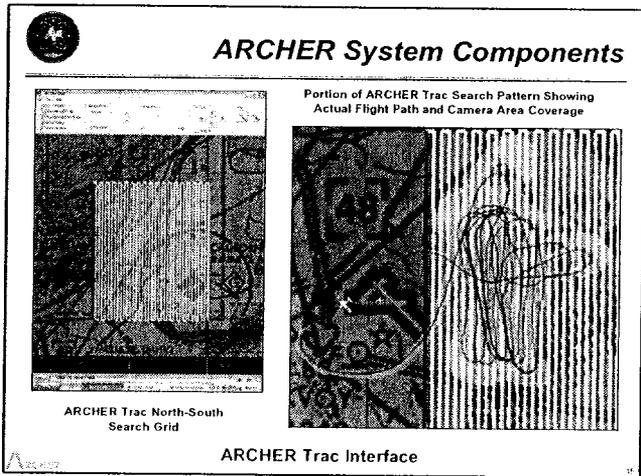
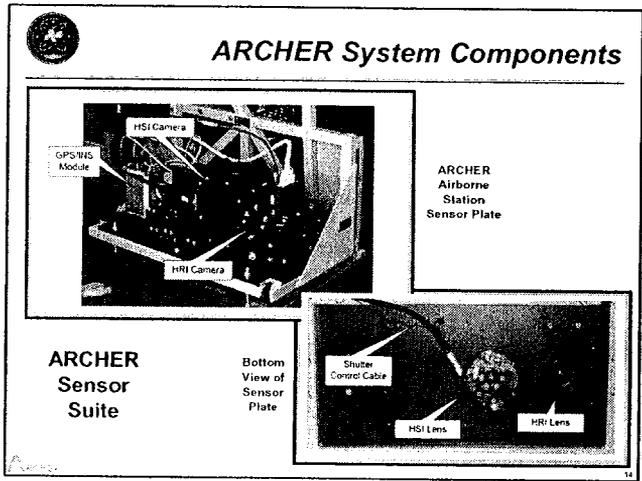
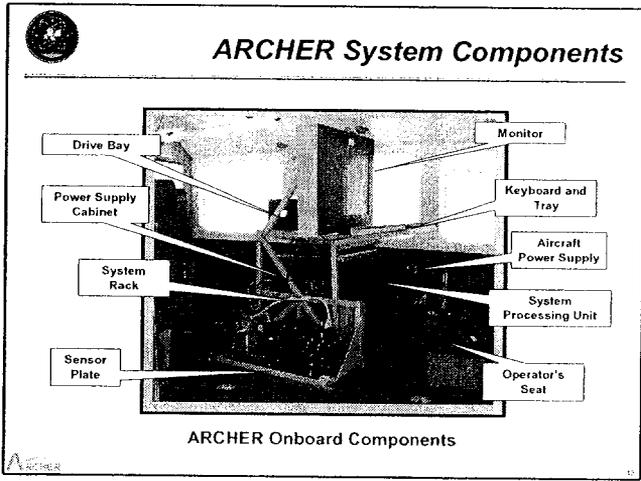
ARCHER Onboard

ARCHER System Components

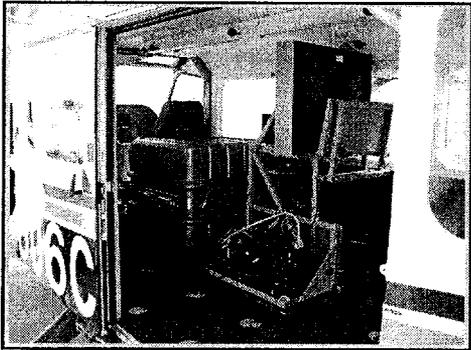


Normal Configuration ARCHER Configuration

ARCHER Install Configuration



ARCHER System Components



ARCHER with Ground Station (Packed)

ARCHER System Components



ARCHER Packed for Transport

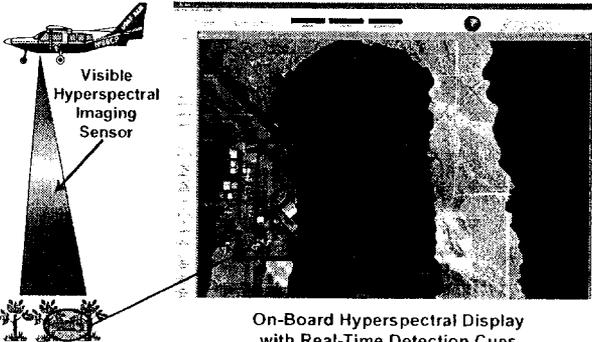
ARCHER System Components



Maxwell AFB Test

Hand held spectrometer allows for the collection of HSI signatures to be imported into the airborne ARCHER system for match filter detections.

ARCHER Target Detection & Data



Visible Hyperspectral Imaging Sensor

On-Board Hyperspectral Display with Real-Time Detection Cues

ARCHER Target Detection & Data

ARCHER
Real-Time
Onboard
Data
Georectification

Rectified Image Unrectified Image

21

ARCHER Target Detection & Data

Red box – match filter detection Yellow box - anomaly detection

Multiple Cue Detections:
Algorithms are applied in real-time, and require little user input.

22

ARCHER Target Detection & Data

ARCHER Geo-Paint™ Window

23

ARCHER Target Detection & Data

Sortable Chip List Chip Viewer Command Buttons

Scrolling Chips Target Spectra

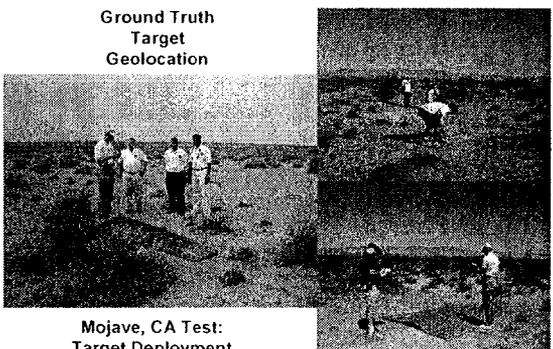
High-Resolution Image of Selected Chip Chip Comments

ARCHER Chip Viewer Window

24

ARCHER Target Detection & Data

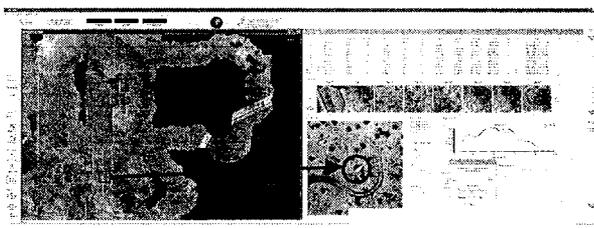
Ground Truth
Target
Geolocation



Mojave, CA Test:
Target Deployment

25

ARCHER Target Detection & Data



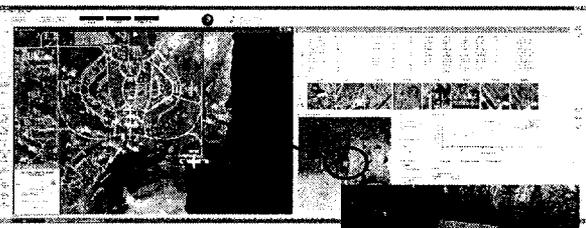
Mojave, CA Test:
Anomaly Detection



Ground Truth Image of
Target

26

ARCHER Target Detection & Data



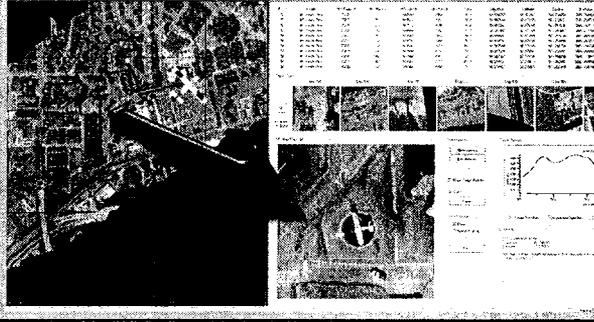
Seymour, IN Test:
Match Filter Detection



Ground Truth Image of
Target

27

ARCHER Target Detection & Data



Maxwell AFB Test: Match filter detection of
display aircraft in front of CAP Headquarters using spectral signature
collected by the hand held spectrometer.

28

ARCHER Target Detection & Data

CA Coast Testing:
Coastal over water detection

ARCHER Deployment

HSI Airborne Asset Distribution

1. NORTHEAST REGION 5. NORTH CENTRAL REGION
2. MIDDLE EAST REGION 6. SOUTHWEST REGION
3. GREAT LAKES REGION 7. ROCKY MOUNTAIN REGION
4. SOUTHEAST REGION 8. PACIFIC REGION

CAP is organized into eight geographic regions.
Each state within a region represents 1 wing.
● National Headquarters Civil Air Patrol

HSI Asset

ARCHER Contractors

- ◆ Gippsland Aero – Traralgon, Victoria, Australia
 - ◆ GA-8 Aircraft, Rack System & Camera Port
- ◆ NovaSol – Honolulu, HI
 - ◆ ARCHER Hardware (Airborne & Ground)
- ◆ Space Computer Corp. – Los Angeles, CA
 - ◆ ARCHER Operating System & Software

Multi-Organizational Support

Air Force Research Lab (AFRL)

With special thanks to:

*Col Robert Gaudette, USAF
Lt Col Robert Mack, USAF
Mr. Barry Karch
Dr. Michael Eismann
Maj Patrick Kee, USAF
Capt David Jones, USAF
Lt Steven Harris, USAF*

Multi-Organizational Support



**Naval Research Lab
(NRL)**

With special thanks to:

**Dr. Thomas G. Giallorenzi
Dr. John Kershenstein
Dr. Richard Priest**

Multi-Organizational Support



**USCG Research &
Development Center**

With special thanks to:

**CAPT Francis (Fritz) Dutch, USCG
LT Brian Khey, USCG**

Multi-Organizational Support



**United States
Coast Guard
Headquarters**

With special thanks to:

**LCDR William Makell, Jr., USCG
CWO Tracy Nixon, USCG**

A Cause for Celebration

CAP History in the Making...

- ◆ Funding for ARCHER was provided in 2002 by Congress under the 2002 Defense Appropriations Act.
- ◆ ARCHER is a strategic, cooperative, multi-organizational project CAP has undertaken in its 63-year history.
- ◆ ARCHER will be the nation's first fully deployed hyperspectral imaging system.
 - ◆ Deploying 42 complete systems nationwide
 - ◆ Supporting a wealth of real-world applications
 - ◆ Enhancing CAP's core mission capabilities
 - ◆ Establishing CAP as a force multiplier



Just the beginning...

*Civil Air Patrol ...performing missions for
America through advanced technology*



Thank You

*Col Drew Alexa, CAP
Director, Advanced Technologies
&
ARCHER Program Manager*

CADET PROGRAMS SUB-COMMITTEE



**National Board – 05 Mar 05
Washington, D.C.**

**U. S. AIR FORCE
AUXILIARY**

**Col Rex Glasgow, CAP
NCR/CC**



Members

Chairman: Col Rex Glasgow
Vice Chair: Col Virginia Keller
Members: Col Matt Sharkey
Col Merle Starr
Col Bryn Cooper
Lt Col Curtis Boehmer
Lt Col Phyllis Griffin
Capt Janeen Chazell
Ex Officio: NCAC Chairperson
Spatz Association Representative
Advisor: Mr Rob Smith, Nat'l HQ
Recorder: Mr Curt LaFond, Nat'l HQ

The Eyes of the Home Skies



Success

**Unique committee with representation from
across the field –**

- ◆ HQ Cadet Programs Staff
- ◆ Representatives from each Region
- ◆ NCAC
- ◆ Spatz Assoc

The Eyes of the Home Skies



NCAC

Introduction of NCAC

The Eyes of the Home Skies



CPFT Changes

- ◆ In your packet you will find a recent change to the Cadet Physical Fitness Program
- ◆ Signed by the National Commander, MG Dwight Wheless
- ◆ Effective 18 Feb 05
- ◆ "2 out of 3 rule"

The Eyes of the Home Skies



CPFT Changes

- ◆ Cadet must pass mile run or shuttle run

AND

- ◆ Two of the other three events,
Sit Ups
Push Ups
Sit and Reach

The Eyes of the Home Skies



CPFT Changes

- ◆ Cadet does not have to identify which events they intend to pass
- ◆ Cadet should be encouraged to participate in all events
- ◆ CPFT test marked "pass" on event waived

The Eyes of the Home Skies



CPFT Changes

- ◆ Good through Summer National Boards (20 Aug 05) when you will be presented with additional changes to CAPR52-16 and CAP52-18.

The Eyes of the Home Skies



Other Changes

Additional changes being discussed:

- ◆ Eliminating CPFT for Phase I, Curry level
- ◆ Offering free uniform after completion of Phase I, Curry level
- ◆ "Train the Trainer" Cadet Programs Senior Members with distance learning options

The Eyes of the Home Skies



NCAC Ideas

CAC has brought items for discussion,

- ◆ Including an age requirement for milestones
- ◆ COS credit for AFIADL (ECI 13) course

Some insensitive ideas to allow easy transition from cadet to senior member,

- ◆ New membership for occasionally active college students
- ◆ Paying "renewal" dues rather than "new" member dues

The Eyes of the Home Skies



NCAC Ideas

- ◆ Adding a "Radio Controlled" airplane program
- ◆ Ideas for new National Cadet Special Activities
- ◆ Some of these concepts will need to be addressed or shared with Professional Development and Recruiting Retention committees
- ◆ Pleased to have additional input and creative ideas from the cadets

The Eyes of the Home Skies



New

- ◆ Excited to announce three new NCSA activities for this year . . .
- ◆ Aircraft Manufacturing and Maintenance Academy (AMMA)
 - ◆ Cessna Plant in Independence, KS
- ◆ Wright State Engineering Technology Academy
- ◆ 3rd Space Command Academy at Vandenberg AFB in CA

The Eyes of the Home Skies



COF

- ◆ Last year the Cadet Orientation Reimbursement Program was released
- ◆ Program has preformed well this past year and expedited reimbursements to the Wings
- ◆ During your initial briefing last year, I inadvertently forgof to mention two members of the committee,
 - ◆ Col Austyn Granville
 - ◆ Lt Col Warren Vest

The Eyes of the Home Skies



Gliders

- ◆ At the finance committee meeting last Thursday funds were identified for the Cadet Glider Program
- ◆ Due primarily to the contribution by Intergraph
- ◆ \$45,000 will be divided between the Regions

The Eyes of the Home Skies



Gliders

- ◆ Process like COF,
 - ◆ Funding to RG CC by formula
 - ◆ Divided by RG CC
 - ◆ Loaded into reimbursement program
- ◆ This funding is in addition to the initial \$17,000 allocated in FY05 corporate budget
- ◆ Warmer season coming, fly, Fly, FLY

The Eyes of the Home Skies

CADET PROGRAMS SUB-COMMITTEE



**U.S. AIR FORCE
AUXILIARY**

Thank you . . .



CIVIL AIR PATROL
United States Air Force Auxiliary
Office of the National Commander
105 S Hansell St., Maxwell AFB AL 36112-6332

18 February 2005

MEMORANDUM FOR ALL UNIT COMMANDERS

SUBJECT: Policy Letter – Revision to the Cadet Physical Fitness Test Standards

1. Effective immediately, the National Commander, exercising the authority of imposing emergency regulations and policies, amends the Cadet Physical Fitness Test (CPFT) requirements prescribed in CAPR 52-16, *Cadet Program Management* (paragraph 1-3B), and the related pamphlet, CAPP 52-18, *Cadet Physical Fitness Program* (chapter 5), as follows:

2. **Revised Test Standards – Category I Cadets.** Most cadets are assigned to Physical Fitness Category I, and for them the simple rule is “*Run plus 2 out of 3.*” Category I cadets must meet the performance standards listed in CAPP 52-18 for the mile run or shuttle run, plus two of the three other CPFT events (curl-ups, push-ups, and the sit-and-reach) to pass the CPFT. Cadets need not declare in advance which two events they will attempt, and should be encouraged to attempt all test events if logistically feasible.

Example: If a cadet passes the shuttle run, push-ups, and sit-and-reach, but fails the curl-ups and the mile run, the cadet earns an overall passing grade for the CPFT.

3. **Revised Test Standards – Category II, III, and IV Cadets.** Cadets assigned to Physical Fitness Categories II, III, or IV are waived from one or more CPFT events due to a medical condition. Testing officers score each waived event as a “pass.” Cadets need not declare in advance which two events they will attempt, and should be encouraged to attempt all test events if logistically feasible.

Example: Suppose a cadet broke his or her arm, is temporarily assigned to Category II, and is waived from the push-up, yet remains able to perform all other events. To earn an overall passing grade for the CPFT, this cadet would need to pass the mile or shuttle run, and either the curl-up or sit-and-reach (the push-up is scored as a “pass”).

4. **Individual Differences.** Some cadets who are relatively fit may nevertheless struggle with a particular event. The “run plus 2 out of 3” rule recognizes that reality and makes an accommodation for individual differences. The National Cadet Program Committee and the National Cadet Advisory Council studied this issue together and support this policy change.

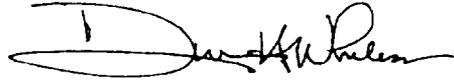
5. **Award Programs.** The “run plus 2 out of 3” rule affects some award programs as well.

A. **President’s Challenge:** Cadets remain eligible to earn President’s Challenge Awards (see CAPP 52-18, chapter 4). However, cadets must pass all CPFT events (the “run plus 2 out of 3” rule described above does not apply) to qualify for these awards. Nevertheless, commanders should encourage their cadets to strive to meet the President’s Challenge.

Attachment 10-1

B. CAP Squadron Physical Fitness Awards: When a unit attempts to earn a Squadron Physical Fitness Award, the "run plus 2 out of 3" rule applies. If 70% of a squadron's cadets meet or surpass the bronze, silver or gold standards described in CAPP 52-18, using the "run plus 2 out of 3" rule, then the unit qualifies for the award.

6. **Effective Dates.** This policy letter takes effect immediately. It does not allow for any "grandfather" provisions. The policy will remain in effect through the 2005 National Board Meeting (20 August 2005).



Major General, CAP
National Commander

AGENDA ITEM: 8 - NEW BUSINESS

SUBJECT: Operations vs. MIMS Business Rules
TXWG/CC – Col Eldridge

INFORMATION BACKGROUND:

Currently CAPR 60-1 outlines the responsibility for the wing commander or their designee to designate in writing the check pilots, mission check pilots, cadet orientation pilots and ROTC pilots. However, MIMS does not allow for the wing commander or a designee to approve the above flight qualifications. Whereby this has caused approximately 30 hours of work by our volunteers each month to produce a valid pilot qualification listing. It's our understanding with the direction of the Operations Committee the MIMS business rules can be updated with minimum effort by the National Headquarters staff. Specifically, allowing each wing commander or designee approve each pilot as they become qualified within one of the above pilot qualifications in MIMS. With the appropriate approval level within MIMS, this would save a tremendous amount of work by our volunteers each month. In addition, wings with a group echelon may have their business rules within MIMS to include this approval level without impacting the wings without groups. After the business is implemented, MIMS will have the capability to generate a qualifications listing.

In addition, with the new requirements for ROTC pilot qualifications, a separate designation needs to be created for ROTC pilots.

PROPOSED NATIONAL BOARD ACTION:

The National Board vote to give direction for the National Headquarters staff to have the appropriate business rules be implemented within MIMS as indicated above by 1 April 2005.

ESTIMATED FUNDING IMPACT:

None

CAP NATIONAL HEADQUARTERS' COMMENTS:

CAP-USAF HEADQUARTERS' COMMENTS:

COMMITTEE RECOMMENDATION:

REGULATIONS AND FORMS AFFECTED:

None

NATIONAL BOARD ACTION:

International Air Cadet Exchange



2005



Responsibilities



- Participating CAP Cadets
 - ◆ Represent the United States and Civil Air Patrol as an Ambassadors of Goodwill
 - ◆ Need to Know and understand
 - The programs and background of Civil Air Patrol
 - Their state heritage (nickname, flower, bird, etc)
 - State and federal government operations
 - ◆ Provide report to Wing Commander
 - ◆ And most importantly:

 - ◆ Enjoy the experience and have a great time



IACE Background



- Promote international understanding, goodwill, and fellowship
- U.S. participation has spanned a period of over 50 years
- Financing IACE is the mutual responsibility of the participating nations' air forces and the various cadet organizations in each country
- All but personal expenses, while in the host country (approximately two weeks) are borne by that country's cadet organization and/or Air Force.
- IACE cadets are selected for participation on the basis of demonstrated leadership ability, character, and good citizenship.



Responsibilities



- Participating Seniors – Escort - responsibilities and obligations.
 - ◆ Health, safety and well-being of cadets.
 - ◆ Represent the United States and Civil Air Patrol as an Ambassadors of Goodwill
 - ◆ Provide report to IACE Staff, NHQ, & Wing Commander
 - ◆ And most importantly:

 - ◆ Enjoy the experience and have a great time



IACE Activities - US



- Washington - Phase I - travel to Washington D.C
- Lodging and meals in Arlington, VA hotel
- 2 days civic education in National Capital.
- Prep participants in customs and courtesies of host countries



Host Wings



- Have responsibility to provide food, housing, and recreation **at no cost** to visiting participants.
 - CAP provides host wings a daily subsidy for cadets and escorts.
 - State Directors can help with billeting and meals.
 - Utilize host families.
 - Seek outside funding sources (IACE Alumni, local AFA, Civic Org, etc.)
- Should use team approach in planning activities.
 - National hosting guide available
 - Include the State Director.
- Plan a balance of free time, local culture, sight seeing, and aviation activities.



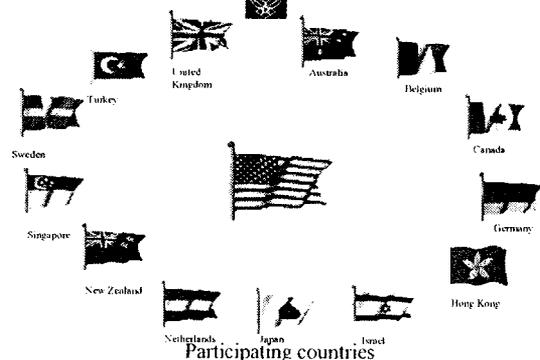
IACE Activities Visiting Participants



- Washington Phase I - Arrive Washington D.C from home country
- Lodging and meals in Arlington, VA hotel
- 2 days education on US government, history and area visitation prior to departure to host wings



IACE 2005



Civil Air Patrol
Performing Missions For America



**U.S. AIR FORCE
AUXILIARY**

04 Chaplain Service Report

Chaplain (Col) Charles Sharp
Chief, CAP Chaplain Service



**U.S. AIR FORCE
AUXILIARY**

Chaplain Service Report

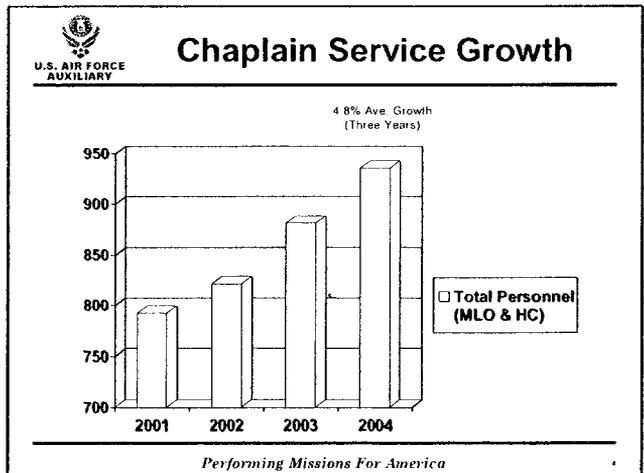
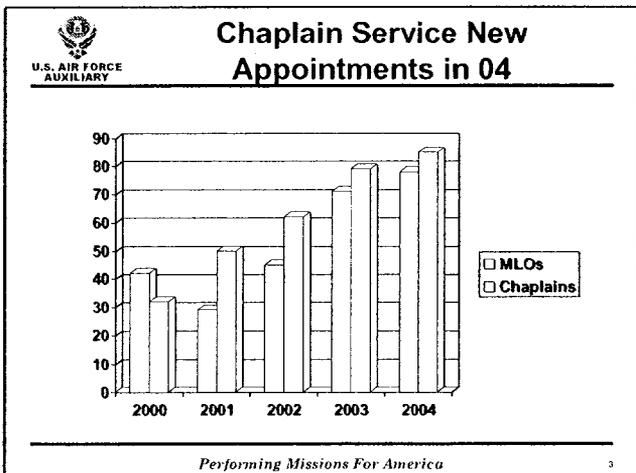
- ◆ 935 Chaplain Service Personnel*
 - 675 Chaplains
 - 260 Moral Leadership Officers
- ◆ Representation
 - 18% Catholic priests
 - 12% Female
 - 3% 29 Latter Day Saints
 - 1% Christian Orthodox
 - 1% Jewish Rabbis
 - All others- Christian Protestant

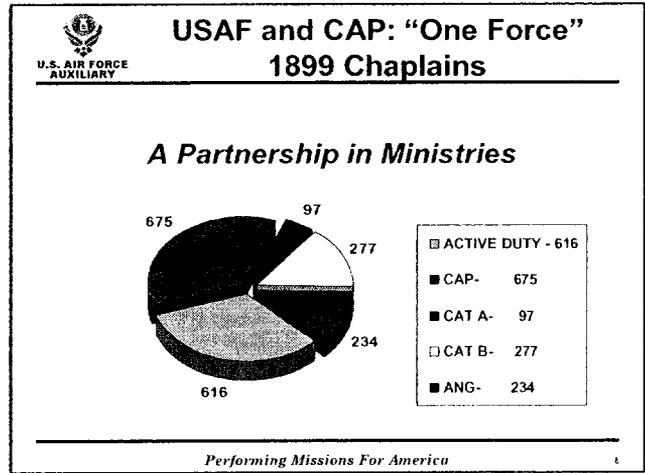
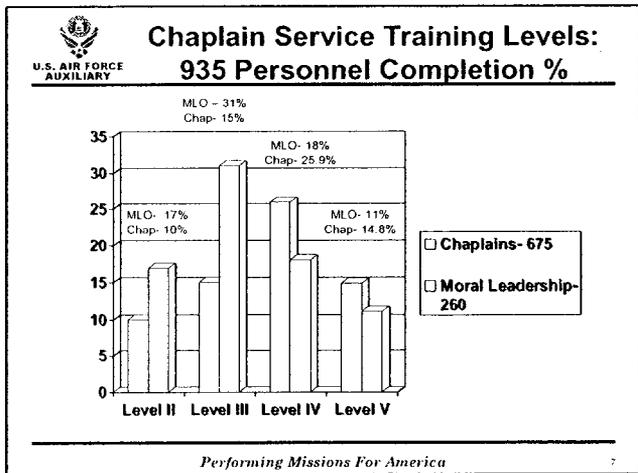
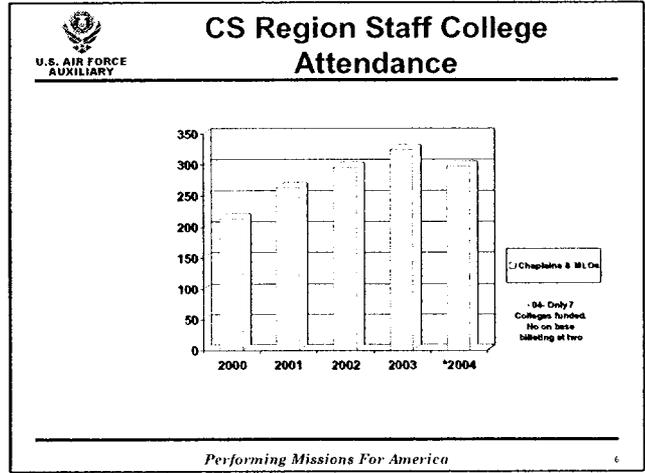
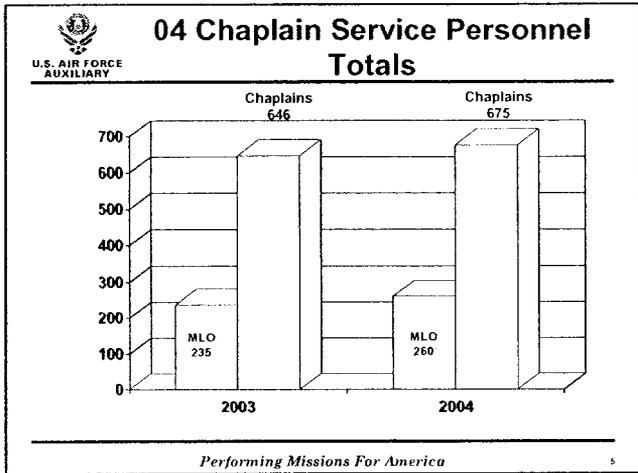
*44% hold aviation ratings- (pilot, observer, scanner)



Chaplain Nancy Smalley, TX Wing Chaplain, preparing to go with a ground team after Columbia break up

Performing Missions For America 2







U.S. AIR FORCE
AUXILIARY

Support to the Military

- Over 40 units served
- Including:
 - MacDill AFB
 - Luke AFB
 - Hill AFB
 - Little Rock AFB
 - Wright-Patt AFB
 - Travis AFB
 - Kirkland AFB
 - Hanscom AFB
 - Maxwell AFB
 - McGuire AFB
 - Ramstein AFB
 - Homestead ARB
 - MO ANG- 139 AW
 - Carswell JRB
 - Buckley ANGB
 - MA ARNG
 - FL ANG -125 FW
 - Selridge ANGB
 - FL Coast Guard Station



Chaplain Whit Woodard, Pacific Region Chaplain, performing a worship service for an Army Reserve unit in California



Ramsden Sq Cadet offers clothes to recovering soldier at Landsuhl hospital

Performing Missions For America

9



U.S. AIR FORCE
AUXILIARY

Questions?



Performing Missions For America

10