C^{4}I for the Warrior

HIGHLY MOBILE NETWORKING IN THE AF

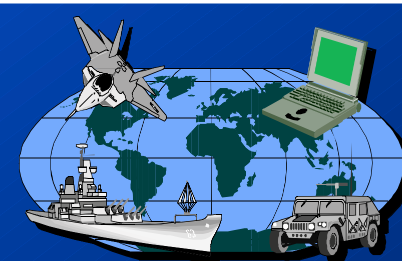
Larry Messina
AFC4A/TNBC
3 Dec 95

Outline

C^4I for the Warrior

- Highly Mobile Networking in the AF
  - Tactical Messaging
    - Close Air Support (CAS)
    - Combat Control
  - Aeronautical Telecommunication Network (ATN)
  - Airborne Comm Initiative
- Requirements and benefits of a Highly Mobile IP Routing Protocol

Tactical Messaging (CAS)



C4I for the Warrior

- Description
  - Target Identified
  - CAS Request Initiated
  - Resources assigned by ASOC or by TACP deployed with the Army
  - Aircraft handed over TACP/FAC
  - Mission results passed up

Tactical Messaging (CAS)

C^4I for the Warrior

- **Data Communication Characteristics**
  - Exchange formatted/freetext messages
  - Reduce time on air to prevent identification
  - AF unique protocol migrate to joint MIL-STD-188-220 protocol
  - Operation over UHF, VHF, HF radios
  - Fixed Frequency, Frequency Hopping
  - Air/Air, Air/Ground, Ground/Ground
  - Multiaddressing
  - Limited bandwidth (data rates upto 16 Kbps)

Tactical Messaging (CAS)

C4I for the Warrior

- Data Communication Characteristics Cont.
  - Automatic Relay
  - Potential for noise or voice interruption
  - Secure/non-secure communications

Tactical Messaging (Combat Control)

C^4I for the Warrior

- **Description**
  - **Establish communications in a forward area to support C2, e.g. setup ATC and comm, place Navaids**
  - **Provide situation reports, intelligence, weather information to rear echelons**
- **Data Communication Characteristics**
  - **Similar to CAS**

ATN

C⁴I for the Warrior

- Description
  - ATN is a newly endorsed ICAO navigational system for ATC providing digital communications, navigation, and surveillance
  - Developed in response to congestion of airspace
  - Reduce pilot and controller workload
  - Reduce communication errors and delays
  - Exchange more detailed information

ATN

C^4I for the Warrior

- Data Communication Characteristics
  - Support the automated exchange of information between aircraft and ground stations
  - Based on OSI networking protocols
  - Supporting UHF, VHF, HF, and satellite communications
  - ATN routers inteconnect various subnetworks
  - Dynamically adapt to aircraft movement

ATN

C^{4}I for the Warrior

- **Data Communication Characteristics Cont.**
  - **Route to mobile users via “well-known, home” domain**
  - **Route based on policy, priority and quality of service**
  - **Limited bandwidth**

Airborne Comm Initiative

C⁴I for the Warrior

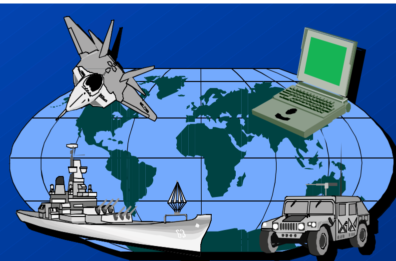
- Description
  - Provide secure/unsecure voice, video and data services on special mission aircraft.
  - Provide airborne office environment
  - Prototype on the Speckled Trout

Airborne Comm Initiative

C^4I for the Warrior

- Data Communication Characteristics
  - Scalable ATM/fiber optic backbone
  - COTS
  - Secure/unsecure communications
  - Provide ethernet connectivity across ATM backbone
  - Initial focus within aircraft services

Highly Mobile IP Routing Protocol



C⁴I for the Warrior

- Requirements
  - Dynamic, near real-time routing versus static or dynamic, non real-time
  - Efficient use of limited bandwidth
  - Route on QoS, priority, security

Highly Mobile IP Routing Protocol

C4I for the Warrior

- Benefits
  - COTS
  - Current fixed infrastructure is IP based
  - Simplify subnetwork technologies