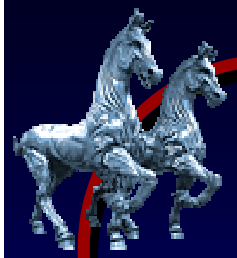
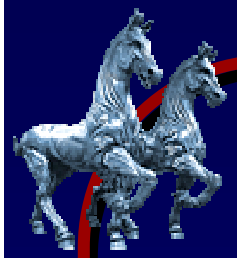


ATO

Airborne Communications Node (ACN)

Ms. Gladys Reichlen

DARPA



ACN Goals

ATO

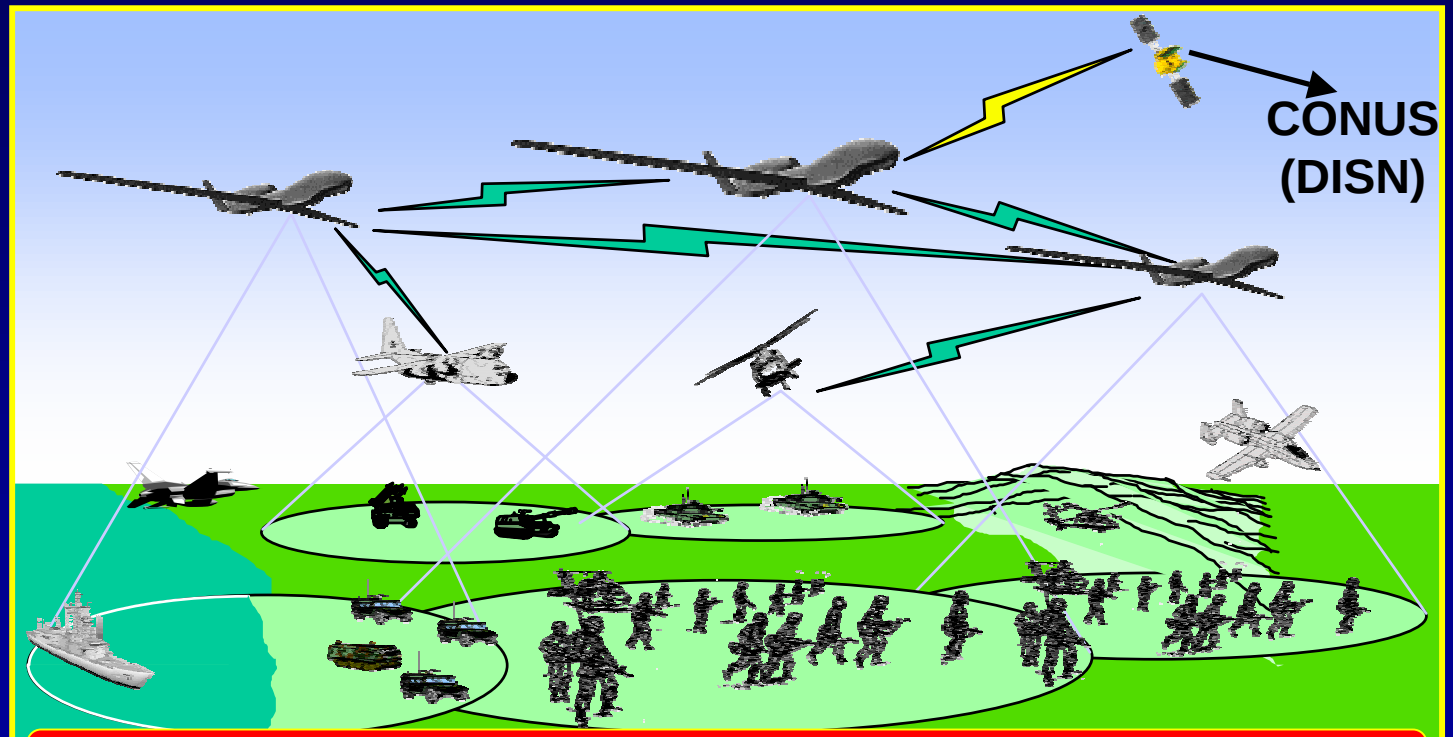
Multi-Function Comm Node Supporting On-the-Move Forces with Enhanced:

- **Connectivity**
- **Coverage**
- **Throughput**
- **Interoperability**

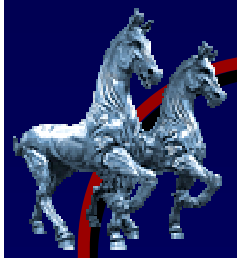
ACN061v001

ACN Connectivity

ATO



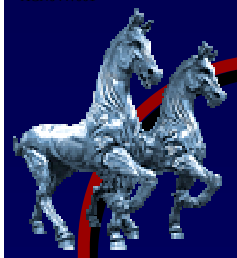
Augments/Enhances Existing Infrastructure



ACN Features

ATO

- **Autonomous Wireless Infrastructure**
- **Dynamic Payload Control and Configuration**
- **Adaptable to Any Mission**



ACN Payload

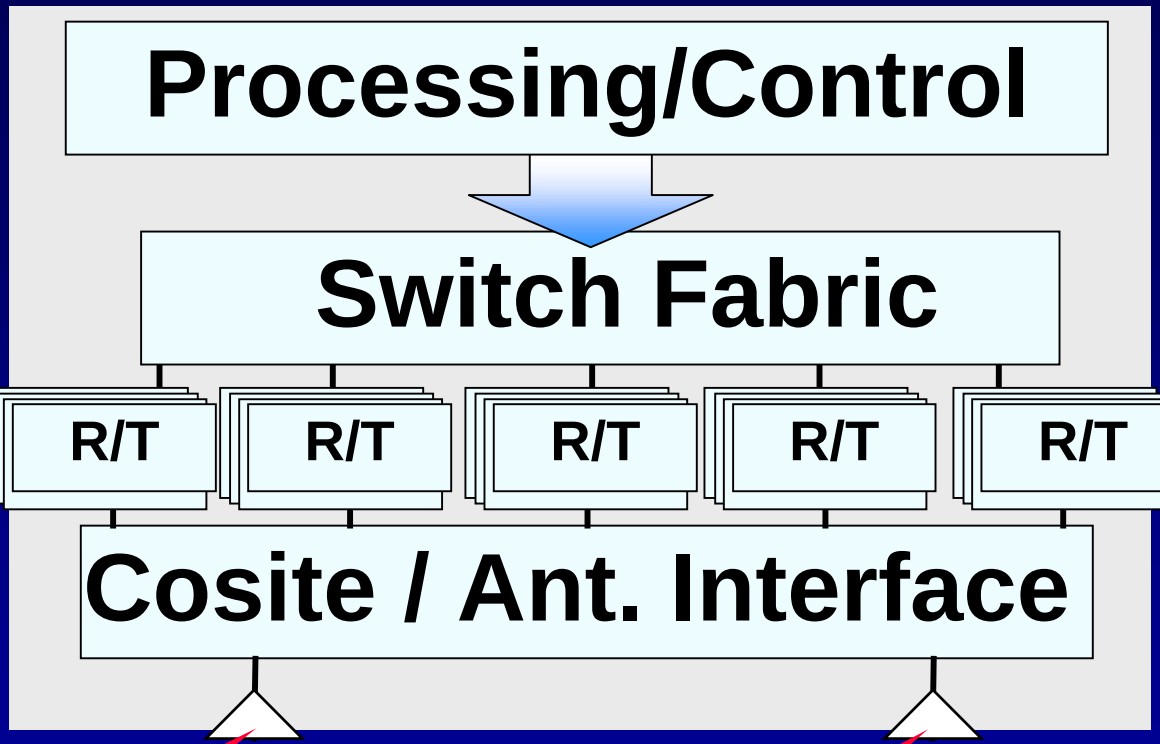
ATO

A Highly Flexible, Generic Communications System that's:

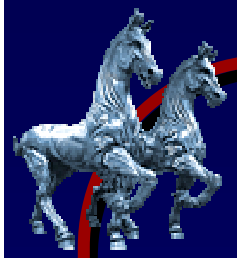
- **Reprogrammable at the Waveform Level**
- **Reconfigurable at the Channel Level**
- **Modularly Constructed**
- **Scaleable to Any Platform**

ACN Design

ATO



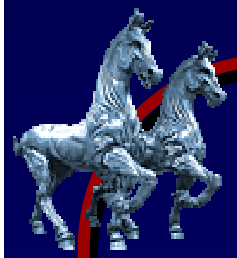
Any - to - Any Communications



ACN Services

ATO

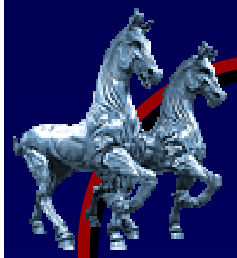
Functionality	Level
Range Extension	
• SINGARS	10 - 20 User Pairs
• UHF LOS/Have Quick	10 - 20 User Pairs
• EPLRS	1 - 3 Channels
• Link 16	1 Channel
• TWR (MSE)	2 - 4 Channels



ACN Services

ATO

Functionality	Level
• Dissimilar Radio Interoperability	Any to Any
• UHF Surrogate Satellite	10 - 20 User Pairs
• High Speed Infrastructure Access	10 - 45 Mbps
• Tactical Battlefield Multicast	64 - 1,544 Kbps
• Internet-like Data Networking	400 - 600 Users
• Alpha-Numeric Paging	500K Addresses
• Cellular / PCS-Like Voice / Data	50 - 200 Calls



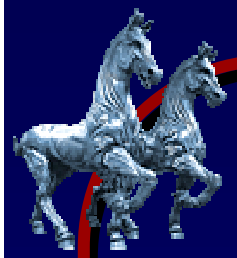
Performance Objectives

ATO

SWAP

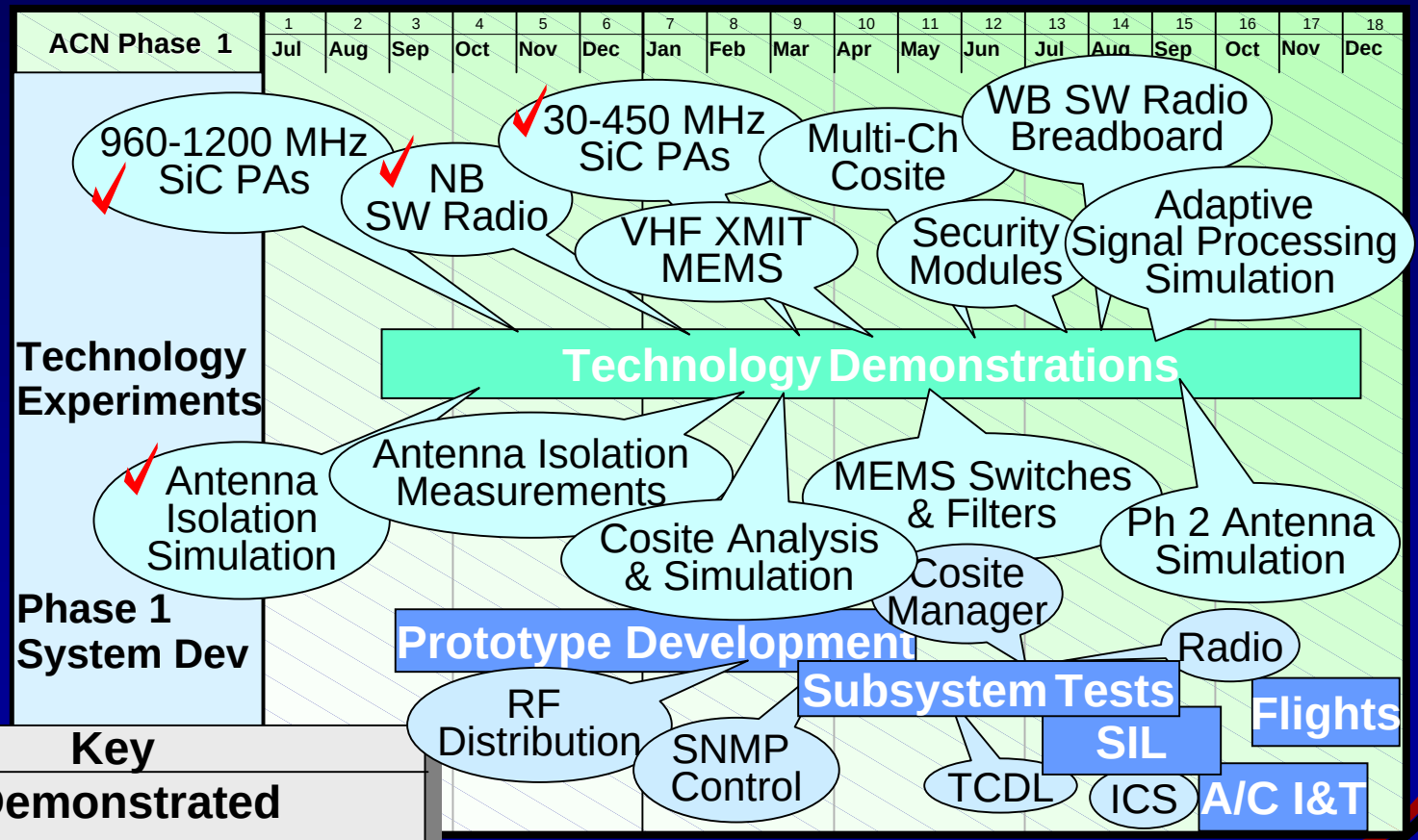
- **Volume 100 - 130 cu ft**
- **Weight 450 - 900 lbs**
- **Power 5 - 9.7 kW**

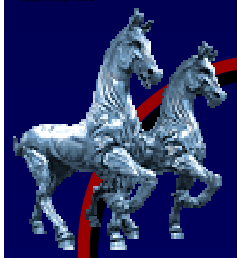
Range 100 - 150 mi



Phase 1 Experiments

ATO

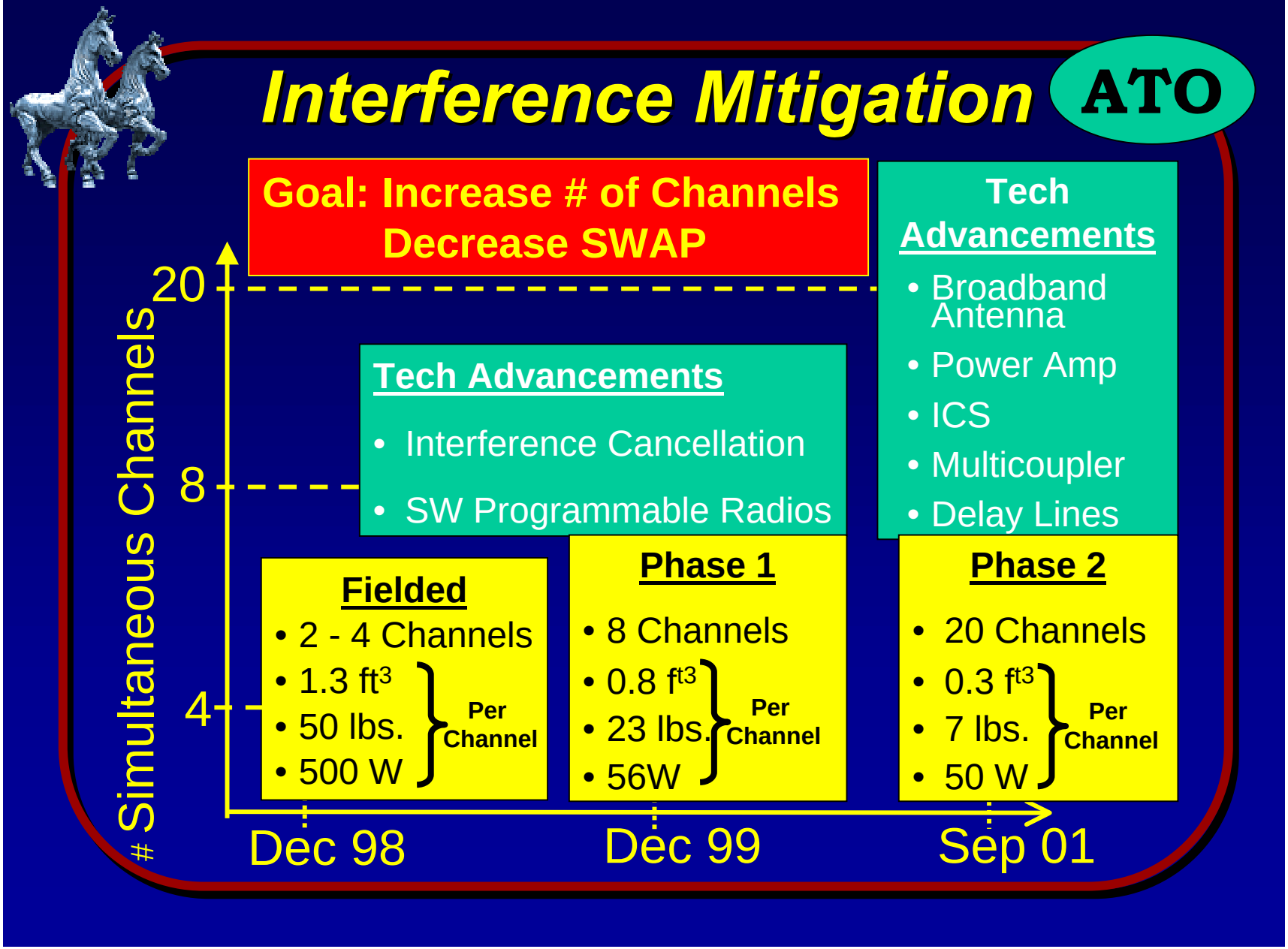


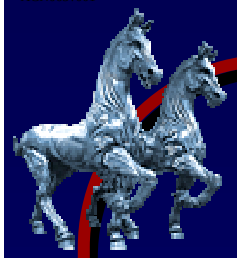


ACN Key Challenges

ATO

- Complex Interference Environment
  - Cosite Interference
  - Electromagnetic Compatibility
  - Intentional / Unintentional Jamming
- Size, Weight, & Power (SWAP)


Interference Mitigation
ATO
Goal: Increase # of Channels
Decrease SWAP
Tech Advancements
• Broadband Antenna
• Power Amp
• ICS
• Multicoupler
• Delay Lines
Tech Advancements
• Interference Cancellation
• SW Programmable Radios
20
8
4
Simultaneous Channels
Fielded
• 2 - 4 Channels
• 1.3 ft3
• 50 lbs.
• 500 W
Per Channel
Phase 1
• 8 Channels
• 0.8 ft3
• 23 lbs.
• 56W
Per Channel
Phase 2
• 20 Channels
• 0.3 ft3
• 7 lbs.
• 50 W
Per Channel
Dec 98
Dec 99
Sep 01



Other ACN Challenges

ATO

- **Adaptive Mobile Communications**
- **Waveform Supportability**
- **Scalability and Modularity**
- **Security**
- **Commercial Services**

Phase 1 Teams

ATO

SANDERS
A Lockheed Martin Company

Bellcore

LOCKHEED MARTIN
Tactical Defense Systems, Eagan, MN

L3 communications

MOTOROLA

SAIC

SRC Scientific Research Corporation

ViaSat

XETRON

Raytheon

GEC-Marconi Hazeltine

GTE

HARRIS COMMUNICATIONS

Houston

HRL LABORATORIES

QUALCOMM

TRW

BOEING

GDE Systems Inc

GTE INTERNETWORKING

L3 communications

Rockwell Collins

UCSD