



## **Airborne Communications Node (ACN)**

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# Airborne Communications Node (ACN) Concept

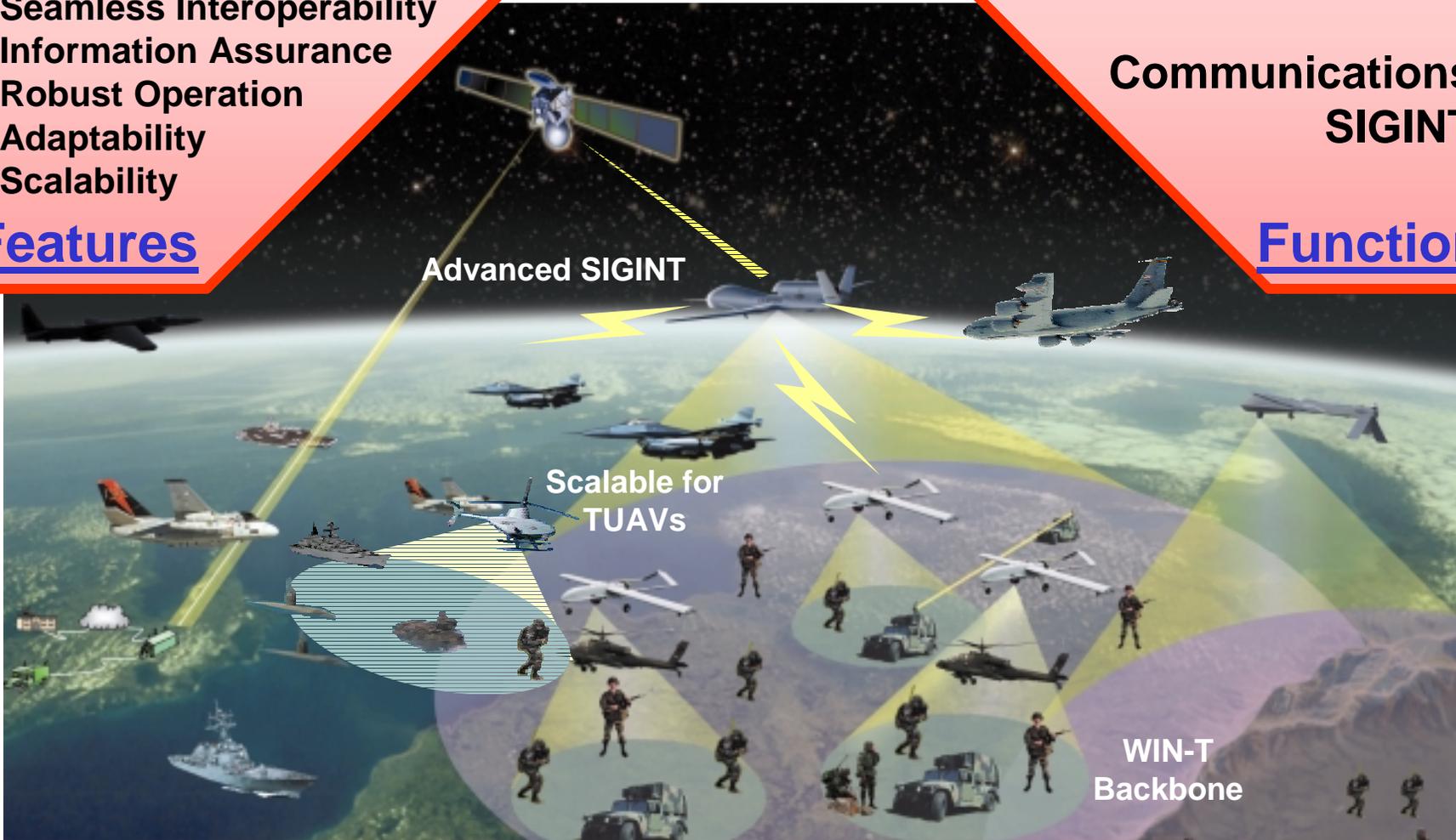


Seamless Interoperability  
 Information Assurance  
 Robust Operation  
 Adaptability  
 Scalability

Features

Communications  
 SIGINT

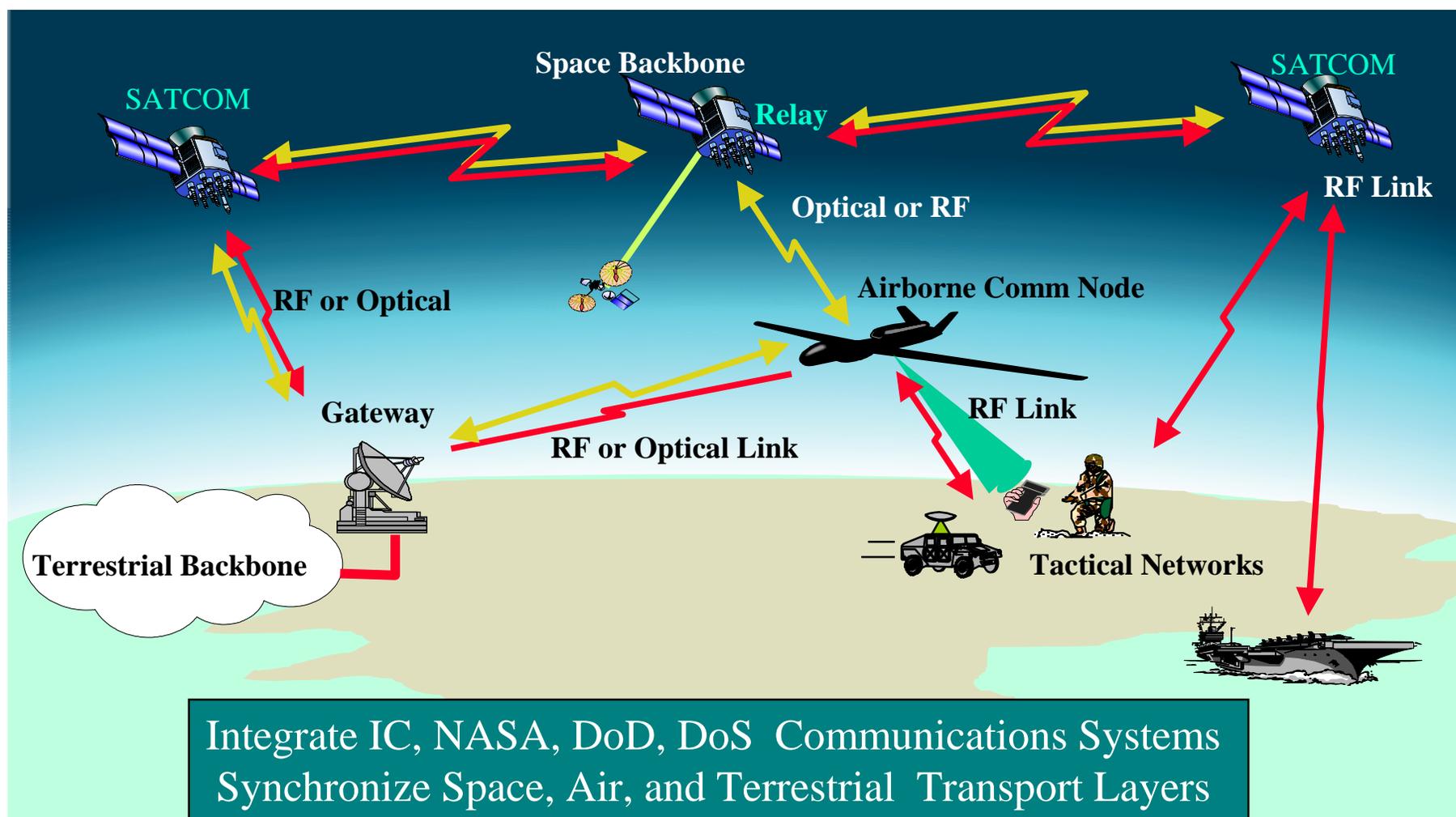
Functions



- Utility
- BLOS & Any-to-Any Connectivity
  - Relief of SATCOM Oversubscription
  - Early Entry / Rapid Insertion
  - Warfighter Mobility
  - SIGINT / Communications Synergy
  - Tactical SIGINT



# High-Level Communications Architecture Concept



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# Platform Agnostic Architecture



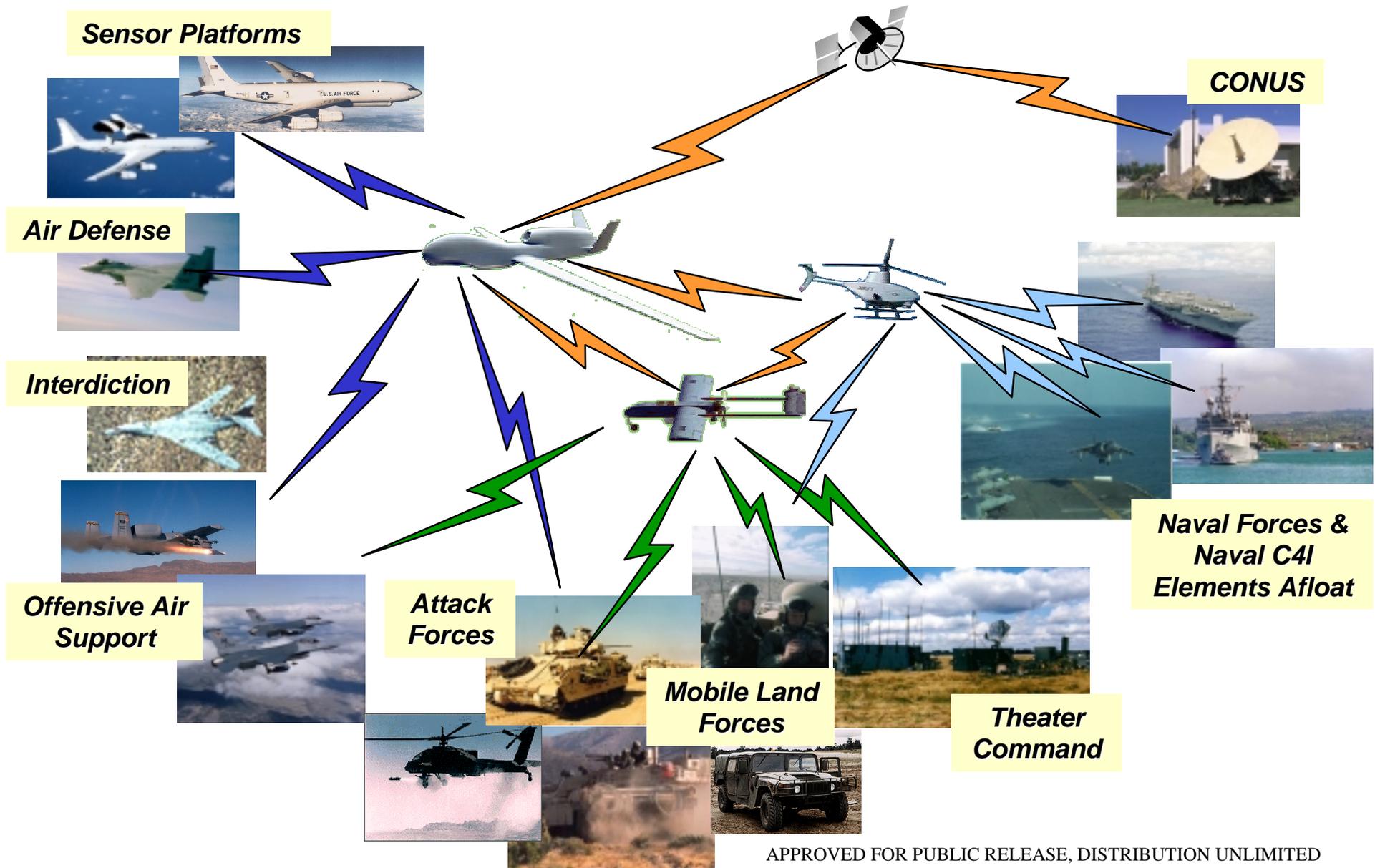
**Scaleable and Modular Architecture**

		
<b>25 lbs</b> <b>4 Channels</b>	<b>100 lbs</b> <b>12 Channels</b>	<b>900 lbs</b> <b>100 Channels</b>





# ACN Utility: BLOS Any-to-Any Connectivity





# ACN Utility: Relieve SATCOM Oversubscription



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## Within the Battlespace:

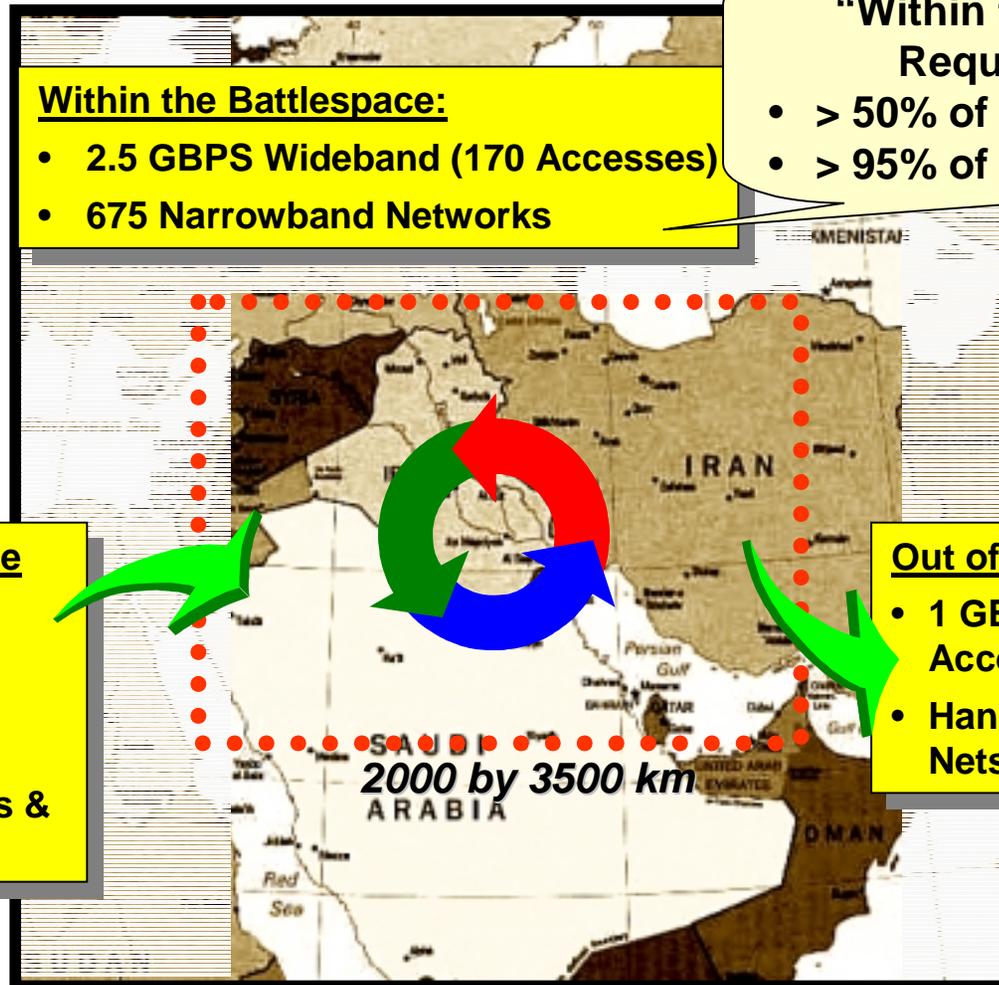
- 2.5 GBPS Wideband (170 Accesses)
- 675 Narrowband Networks

## **“Within the Battlespace” Requirements are:**

- > 50% of Wideband Total
- > 95% of Narrowband Total

## Into the Battlespace

- 1.15 GBPS Wideband (360 Accesses)
- Hand-full of Narrowband Nets & P-Ps



## Out of the Battlespace:

- 1 GBPS Wideband (310 Accesses)
- Handful of Narrowband Nets & P-Ps

**ACN Can Offload “Within the Battlespace” Accesses and Provide BLOS Connectivity to Fiber Nodes for “Outside the Battlespace” Accesses**

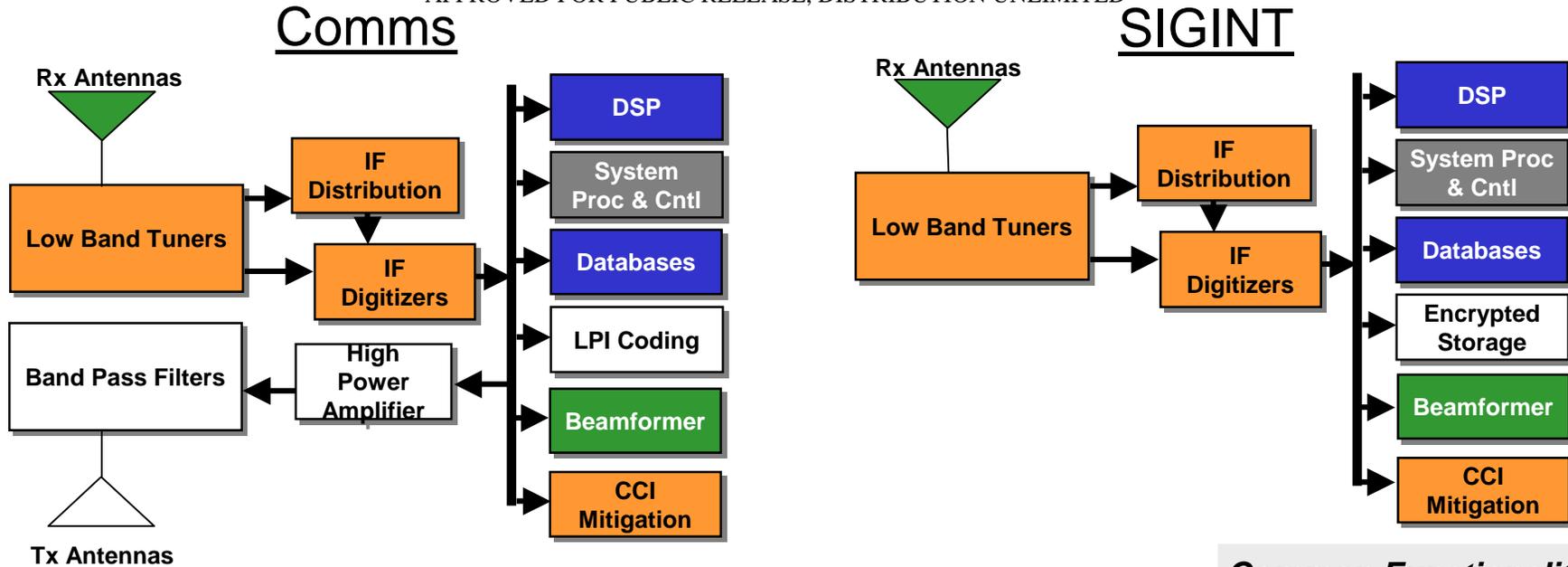
Source: “The Demand for SATCOM Today and in the Future,” J6, Nov. 1997



# Comms, SIGINT, and EW Convergence



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LPD Techniques, Commercial Systems, Bands of Interest



Vulnerabilities, CCI Techniques, Spectrum Utilization

## Synergistic Capabilities

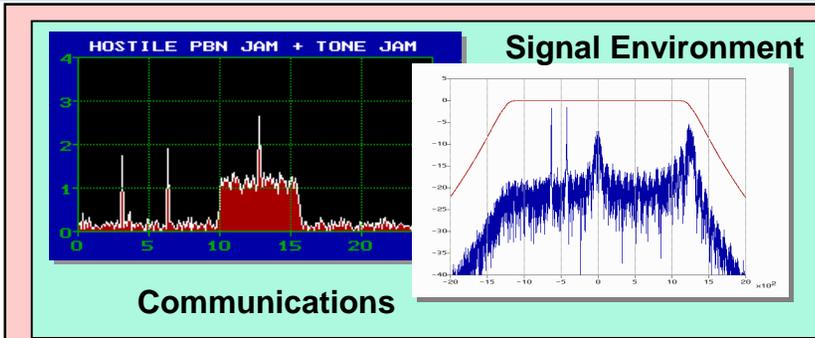
- Opportunity for multi-mission platforms
- SIGINT can find “holes” in spectrum for transmission
- Platforms can work together for “direction finding”, conduct IW, ...

## Common Functionality

- **Antenna Beamsteering**
- **Wideband RF Frontend**
  - 20 MHz - > 18 GHz
  - 90 dB Dynamic Range
  - 50 - 100 MHz BW
- **High Speed MODEM**
  - 3 - 10 GFLOP
  - AM, FM, QAM, QPSK

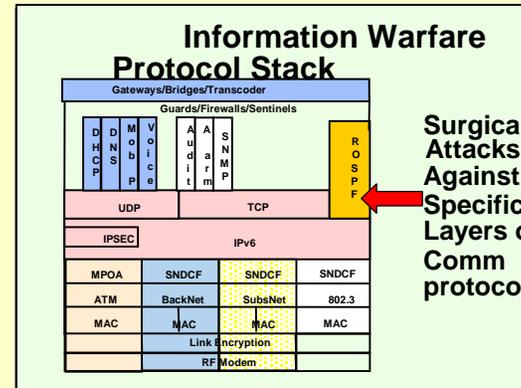


# Communications / SIGINT Synergy

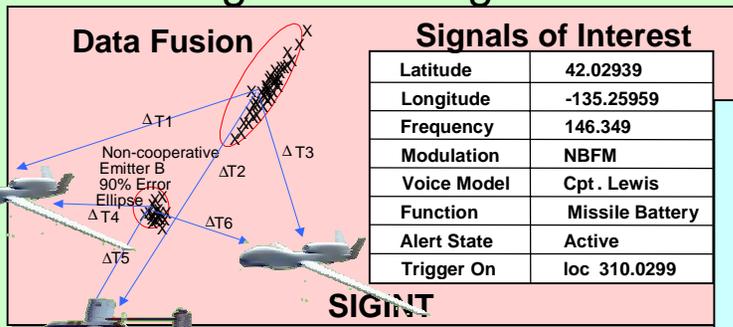


- Wideband Receiver Can Support:
  - + Dynamic Spectrum Allocation -- Transmit in the Spectrum "Holes"
  - + Signals-of-Interest (SOI) Detection

- Onboard Assets Can Track SOI
  - + Crosslinks Allow Cooperative Tracking and Precise Geolocation
  - + Advanced Antenna Design and Signal Processing Supports Tracking with a Single Platform



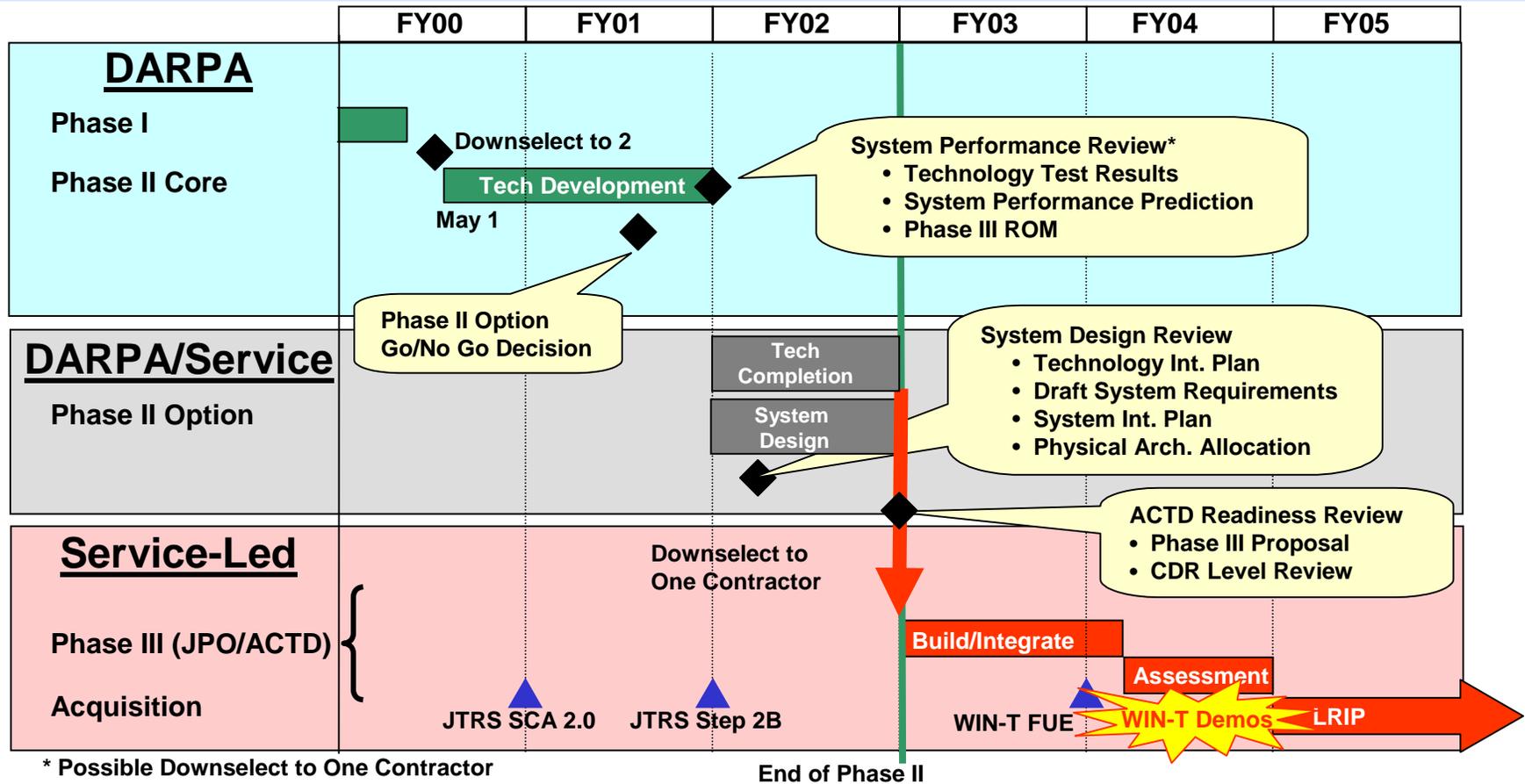
- Modify the SOI and Retransmit the Signal for Information Warfare



- Common Hardware & Software Reduces:
  - Size, Weight, and Power
  - Life Cycle Cost
  - Training
  - Logistics



# Current Program



- DARPA Concentrates on Revolutionary Technology
- Phase II Technology Products are Applicable Outside ACN (e.g. JTRS, SIGINT)
- Technology Development Consistent with JTRS and WIN-T Demos



# *ACN Phase II Teams*



## Major Program Events

<b>Phase II Program Kickoff</b>	<b>May 2000</b>
<b>Architecture Review</b>	<b>Sep 2000</b>
<b>System Performance Review</b>	<b>Sep 2001</b>
<b>System Design Review (“PDR”)</b>	<b>Jan 2002</b>
<b>Phase III Readiness Review (“CDR”)</b>	<b>Aug 2002</b>