Army Vision

- **Future Combat System**
  - Deploy anywhere in the world quickly
    - Self sustainable in 3-7 days
  - Network will gain information superiority in order to engage the enemy before they can engage the manned portion of the FCS
  - Comprehensive Situational Awareness
  - Manned/Unmanned Integration
    - Unmanned Aerial Vehicles
    - Unmanned Ground Vehicles
  - C-130-like Transportable
    - Less armor, rely more on information
  - Reduced Logistics
Program Content

• Research Objectives
  Create technologies with which to design and implement highly mobile ad-hoc wireless tactical and sensor communications networks needed by the Army. Concentrating on the brigade and below communications.

• Scientific Barriers
  • Bits/sec/Hz under power constraints and LPI AJ requirements
  • Platform mobility affecting:
    • Channel
    • Network connectivity
  • No fixed infrastructure:
    • Communications must deploy and move with the unit

Looking for good science that transitions to an Army need
Program Content

• **Mobile Networks**
  • Emphasis on self organizing MANETs
  • Scalability issues with routing
    • Simulation tools for very large MANETs
  • Robustness at the Transport Layer
  • Varied QoS requirements

• **Sensor Networks**
  • Very low energy
    • Receiver energy drain becomes an issue

• **Physical Layer**
  • FHSS for LPI / AJ
  • Physical / MAC Cross Layer
    • Networking with antenna arrays
  • Ultra-wideband communications
    • What are its best applications for the military?
Network Theory MURI

• **Not Business As Usual**
  • Much of the research has been incremental changes to protocols
  • This MURI is to analyze and understand the science of ad hoc networks
  • Results will be better algorithms, better understanding of throughput bounds, and better simulation techniques

• **Reporting**
  • Yearly report every year
  • All papers should be submitted to ARO