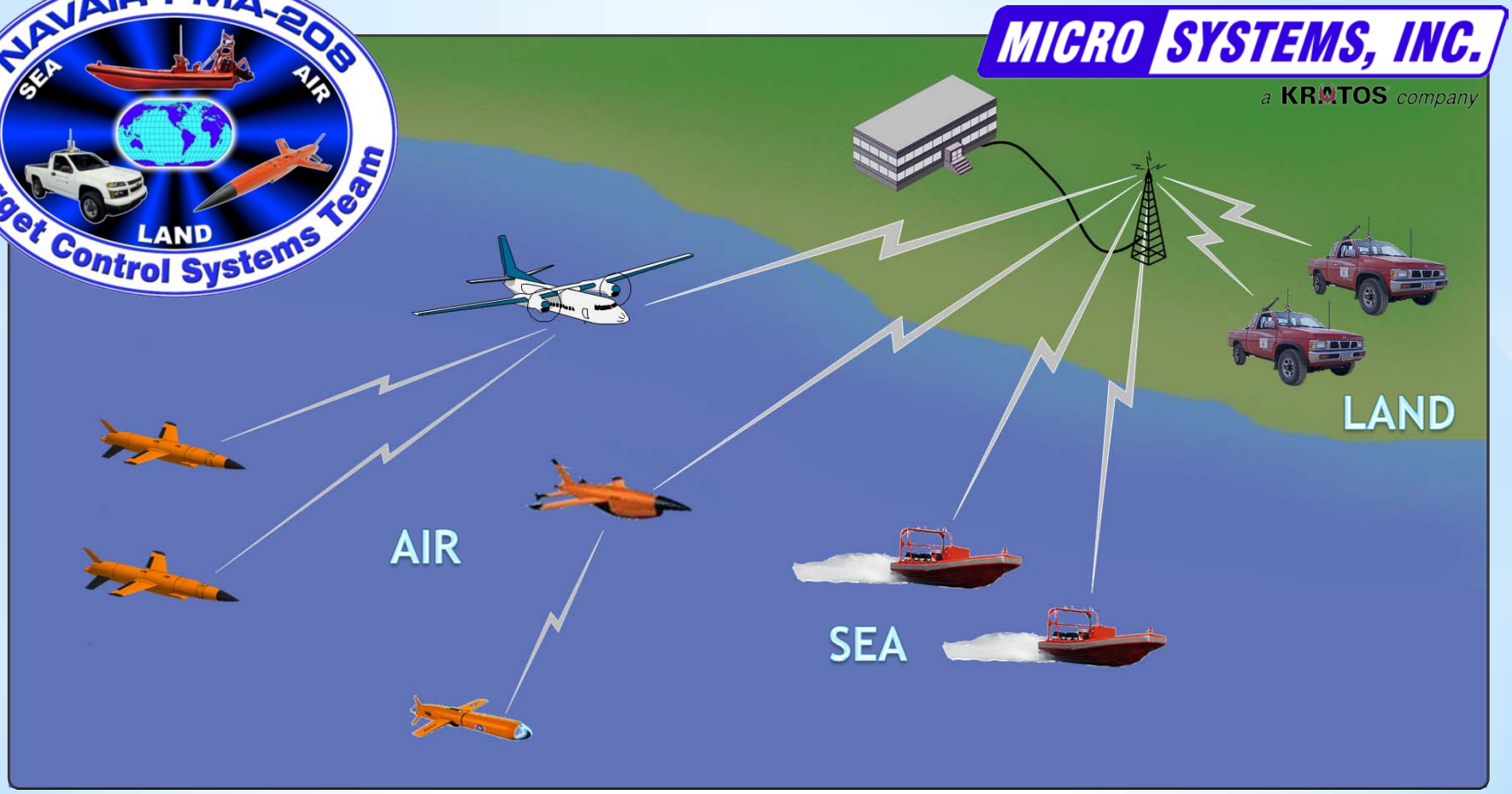
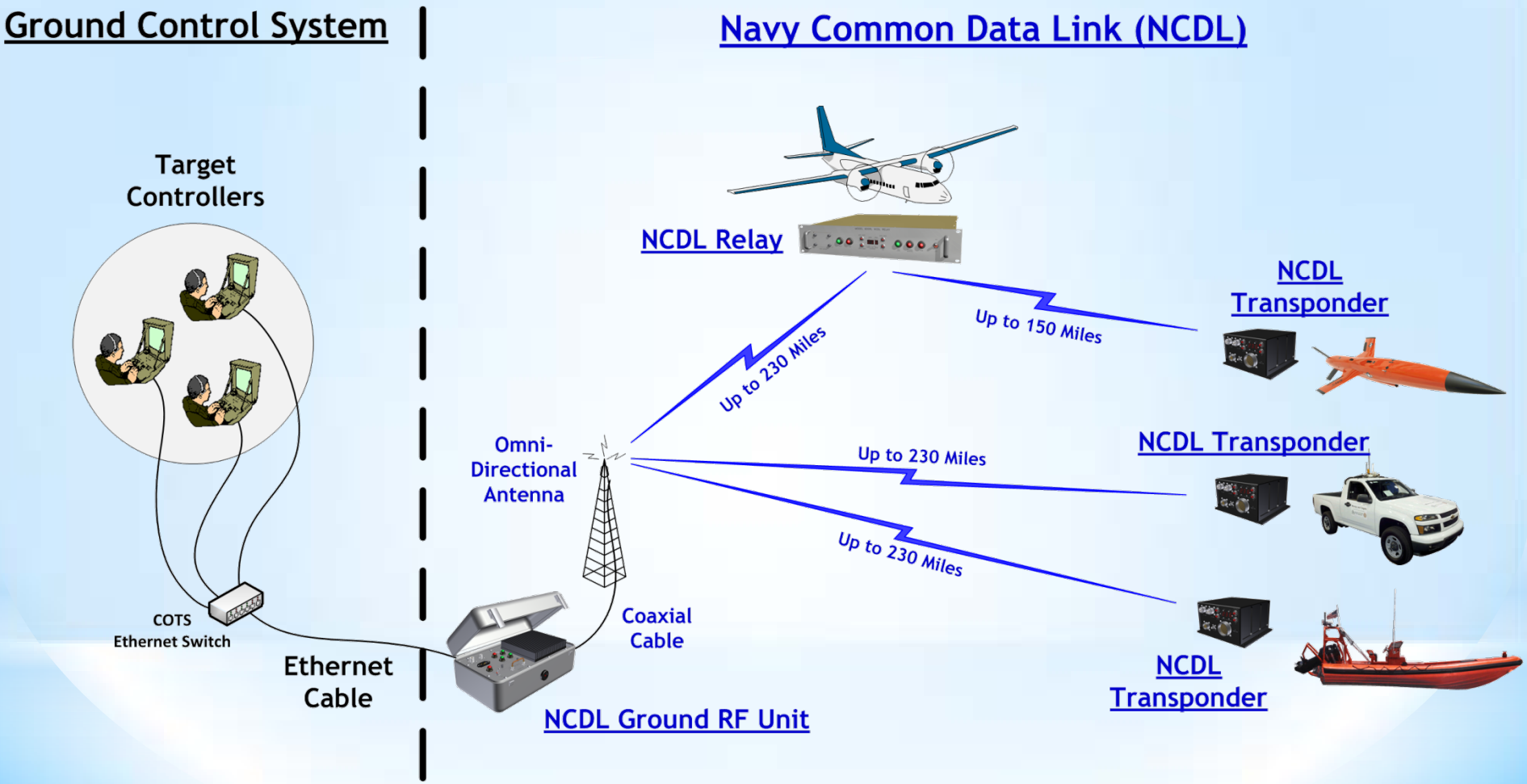
THE NAVY COMMON DATA LINK



50th Annual NDIA Targets Symposium
October 3rd, 2012

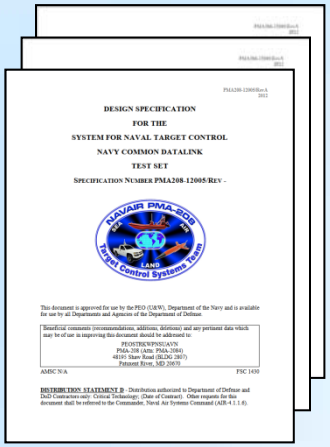
Mick Owens
Micro Systems, Inc.

The NCDL In Operation …

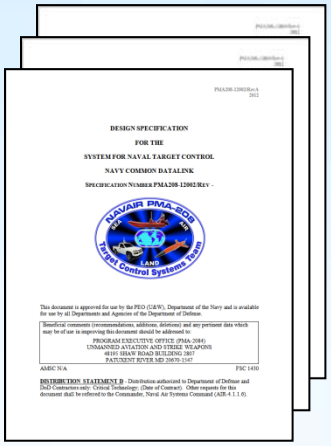


Program Summary

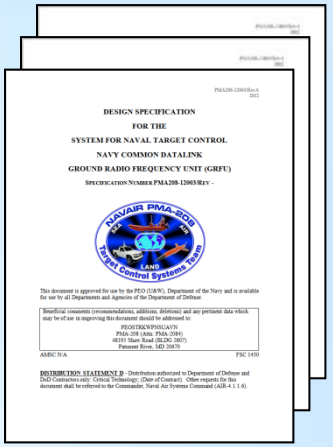
- The NCDL is an upgrade to a previously fielded design for the System for Naval Control (SNTC)
  - The NCDL is at Technology Readiness Level 6
- Equipment qualification tests will begin in October 2013
  - Environmental Tests per MIL-STD-810F (temp, altitude, etc.)
  - EMI Tests per MIL-STD-461G
- All NCDL engineering drawings and manufacturing data are controlled by the Navy



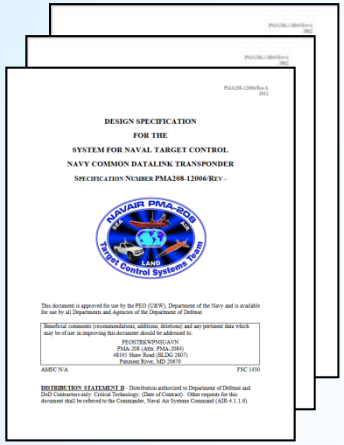
Data Link



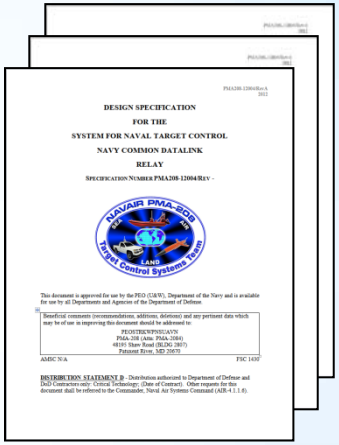
Transponder



Ground RF Unit



Relay



Test Set

- These 5 Design Specifications define the NCDL
- Over 200 pages of detailed performance requirements

NCDL Transponder

- 25 watts of transmit power, -96 dBm receive sensitivity
- 28 VDC or 12 VDC operation (MIL-STD-704F)
- Frequency, Address, and LOC Timeout set by users

NCDL Ground RF Unit

- 25 watts of transmit power, -96 dBm receive sensitivity
- Internal GPS provides precision datalink timing
- Power: 100 - 240 VAC, 50/60 Hz

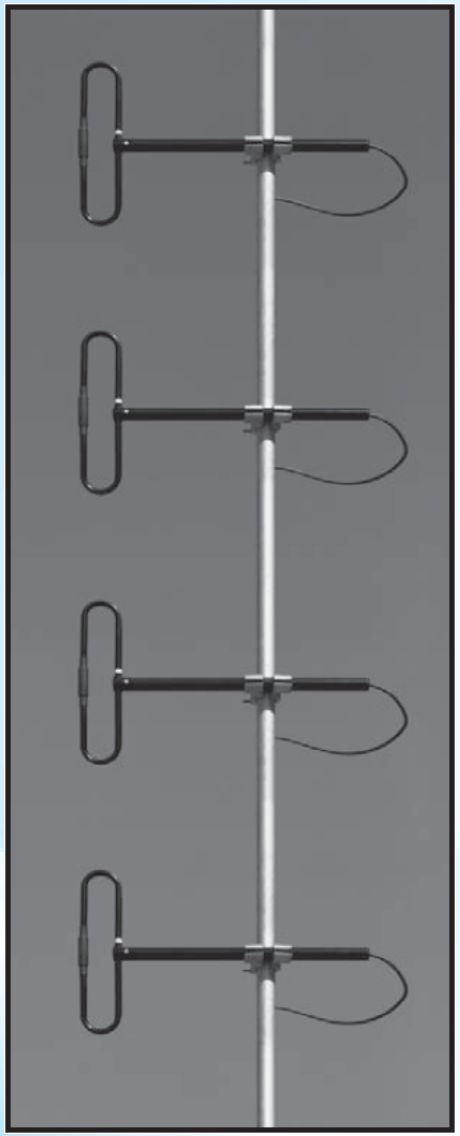
NCDL Relay

- 50 watts of transmit power, -99 dBm receive sensitivity
- Uses 28 VDC MIL-STD-704F aircraft power
- Frequency & Address set by users prior to mission
- Internal GPS provides Relay position to Ground Control System

NCDL Test Set

- Tests NCDL Relays and Transponders
- Supports factory level ATP testing and Go/No Go testing
- Laptop software runs on Windows 7® operating system
- Complies with Navy's Information Assurance (IA) requirements

Low Cost Omnidirectional Antennas



Tower Mounted GRFU Antenna

Target Antenna

Relay Antenna

Features & Benefits …

- Enhanced system performance
  - Transfers 16 times more data than the legacy SNTC datalink
- Fewer equipment requirements
  - Controls up to 8 aerial targets per GRFU or Relay
  - Cuts equipment requirements by a factor of 4
- Primary User Status in UHF Band
  - Users of this band are military only
  - Simplifies frequency coordination at each test range
  - DD Form 1494 Stage 1 approved by NTIA
- Transponders can operate with or without GPS
  - TSPI provided by MEMS INS on Navy's new SSAT target
  - Other targets fitted with low cost OEM GPS receivers

Features & Benefits …

- Eight frequency channels are available
  - Support for very complex mission profiles
  - Example: 4 GRFUs can control up to 32 aerial targets or up to 64 land targets *simultaneously*
  - Separate operations can be performed in the same local area
- Extensive Recording Capabilities
  - Removable SD cards
  - Transponders, GRFUs, and Relays record every RF message that is transmitted or received
  - Transponders record all Serial Bus messages that are transmitted or received from the target autopilot
  - All recorded messages are time stamped with 1 millisecond accuracy

Features & Benefits …

- Reduced susceptibility to interference and multipathing
  - Operating frequencies can be changed ***during a mission*** to counteract the effects of interference and multipathing
- Improved datalink reliability
  - Forward Error Correction (FEC) detects data errors and corrects them in real time
  - 24-Bit Cyclic Redundancy Check (CRC) ensures no remaining data errors will get to the target
- Increased Flexibility
  - Uplink and downlink message content is defined by the target requirements, not the datalink (i.e., open architecture)
  - User-defined message data and user-defined message lengths
    - Uplink and downlink messages can be up to 255 bytes long

Features & Benefits …

- Transponders provide multiple serial buses to interface with current and future targets
  - CAN, RS-232, RS-485 and ITCS
- Transponders have built-in capability to operate in dual-transponder systems
  - “CTS Enable” signal input provided
- Transponders can become Relays at any time during a mission (Target Relay Mode)
- Transponders, Relays and GRFUs all report the RF Signal Strength of each message they receive

The Navy Common Data Link

"Any Target, Anywhere"

MICRO SYSTEMS, INC.
a KRATOS company