Capabilities of U.S. Army 21st Century Control Systems

47th Annual Targets, UAVs and Range Operations Symposium

Barry Hatchett
(256) 842-6797
TMO Lead Project Director
Barry.Hatchett@us.army.mil

22 October 2009
Outline

• Need
• History
• Description and Highlights
  • Aerial
  • Ground
• Summary and Path Forward
• Questions/Comments
Need

- WSMR requires a remote control system for testing with both aerial and ground targets
- The existing control system, Drone Formation Control System (DFCS) developed in the early 70’s using 70’s technology
- Existing WSMR legacy remote ground control system is obsolete
- Upgrade to modular control system utilizing state-of-the-art technology
**History**

- **'03** Tri-Service MSTCS
- **'04** C-band & L-band
- **'05** New 915MHz & UHF data link
- **'06** WSMR WSTCS
- **'07** MQM-107 D&E models certified
- **'08** WSMR 21C TCS
- **'09** Ground Missions Supported
- **'10** MQM-107 IAP Certified
- **'10** WSMR 21C TCS Ground Certified
- **'10** QF-4 Certified
- **'10** TMO Management
Description

Control Processor / DataLink (Network Manager) (CP/DL(NM))

Range Interface Controller

Consoles

Datalink 1
TDMA
L-Band

Datalink 2
TDMA
C-Band

Datalink 3
915 MHz

Datalink 4
UHF

Datalink 5
TDMA
Freewave
L-Band
Description: *Consoles*

Heads Down Display Console
Description: Datalink

21st Century White Sands Target Control System

Dual Xeon Blade Computer & Legacy IBM RS/6000

100BT Ethernet Network Switch

Legacy Data Link Replacement Herley 915 MHz units QF4’s MQM-107

Army TMO UHF Data Link Micro Systems Inc (MSI) 380 – 400 MHz MQM-107

MSTCS L-Band Data Link 1350 – 1450 MHz

MSTCS Navy ESDLT C-Band Data Link MSI 4.4 – 4.8 GHz

Transponder Ground Interface Unit (GIU)
Description: Aerial Target Control

Targets to be certified for flight:

MQM-107
- Models: D*, E*, IAP
- Datalink: UHF

QF-4
- Datalink: 915MHz

* MQM-107 D and MQM-107 E have been certified
Highlights: Aerial Target Control

• Certified UHF MQM-107 D & E Fall of ‘08*
  – Dual Formation
• Scheduled UHF MQM-107 Integrated Avionics Package (IAP) flights within next 6 months
• QF-4 testing FY10
Description: *Ground Target Control*

**CP** | **DLNM**
---|---
**RISC 6000**

**Ground Station Network L Band**

**TCS**

- **GPS/IMU** used for TSPI Solution and L-Band DL

**Integrated Vehicle Interface Unit (VIU)**

**Actuator Controller (p-box)**

**Actuator**

**Vehicle Kit**

**Equipment on board Target**

- **GPS/IMU** based instead of legacy multi-lateration
- **Radio Agnostic** (L-band instead of 915 Mhz) based Solution

*(From legacy VBS to state-of-the-art VIU)*
Description: *Ground Target Control*

- **Compact Design**
- **New Control System Architecture**
- **Vehicle Telemetry Information Display**
Description: *Ground Target Control*

Vehicles Currently Configured

- T-72
- 5-ton Truck
- Light Truck
- BMP
- 2S3
- Sedan
• Demonstrated in Dec 2007 control of actuators for truck using older Vehicle Control Module (VCM) and 915MHz Vehicle Bourne Subsystem (VBS) on an M-60 tank.

• Demonstrated remote control of BMP and T-72 using updated Vehicle Remote Control (VRC) with 915MHz radio local/manual Line Of Sight (LOS) control with mobile van.

• Supported and continue to support testing missions:
  – Single target, dual target, formation control
  – 3-vehicle convoys – BMP and T-72
Summary

- Multiple datalinks supported
- Both ground and aerial control
- Currently supporting ground missions
- MQM-107 D & E models flight certified
Path Forward

- Complete Console Integration
- MQM-107 IAP Certification Flights
- Ground Target Certification
  - T-72, BMP, 2S3, 5 Ton, Pickup
- QF-4 Certification Flights
Questions/Comments

Questions???
Backup Charts
History

PM-ITTS

Targets Management Office

History

‘98 ‘99 ‘00 ‘01 ‘02 ‘03 ‘04 ‘05 ‘06 ‘07 ‘08 ‘09 ‘10

Tri-Service NGTCS

Tri-Service MSTCS

WSMR WSTCS

WSMR 21C TCS

C-band

L-band

C-band

L-band

915 MHz

UHF

New 915MHz & UHF data link

MQM-107 D&E model certified

Ground Missions Supported

TMO Management

New 915MHz & UHF data link

MQM-107 D&E model certified

Ground Missions Supported