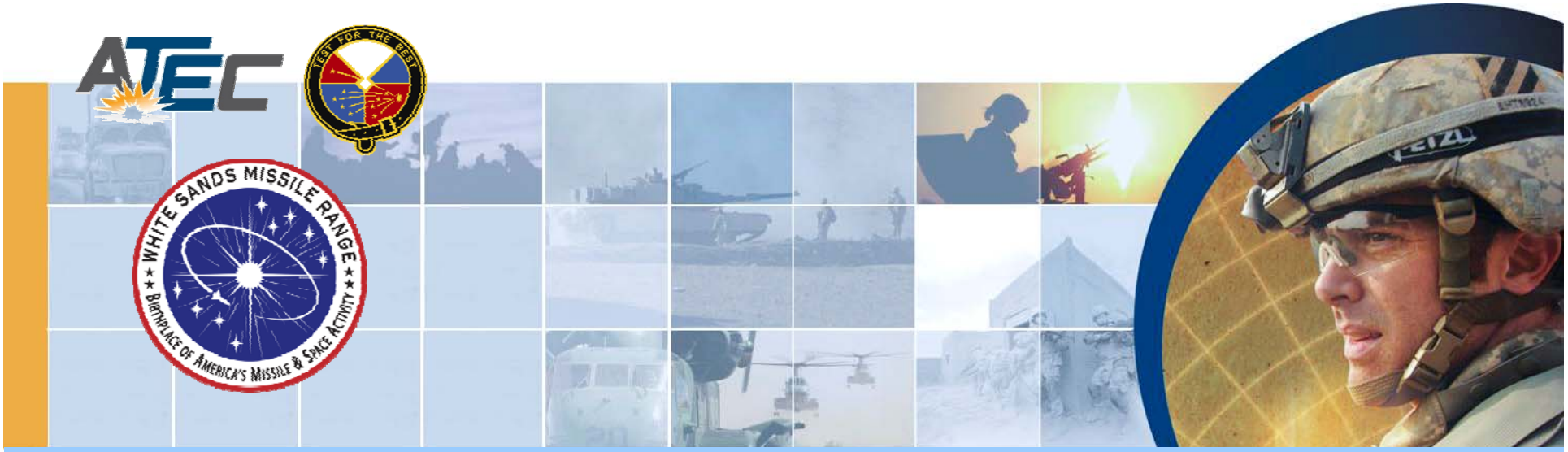

21st Century Target Control System (21st Century TCS)

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20 Oct 2010

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Battle Ready

Outline

- Requirement
- History
- Description and Highlights
  - Overview
  - Ground
  - Aerial
- Future Enhancements
- Questions

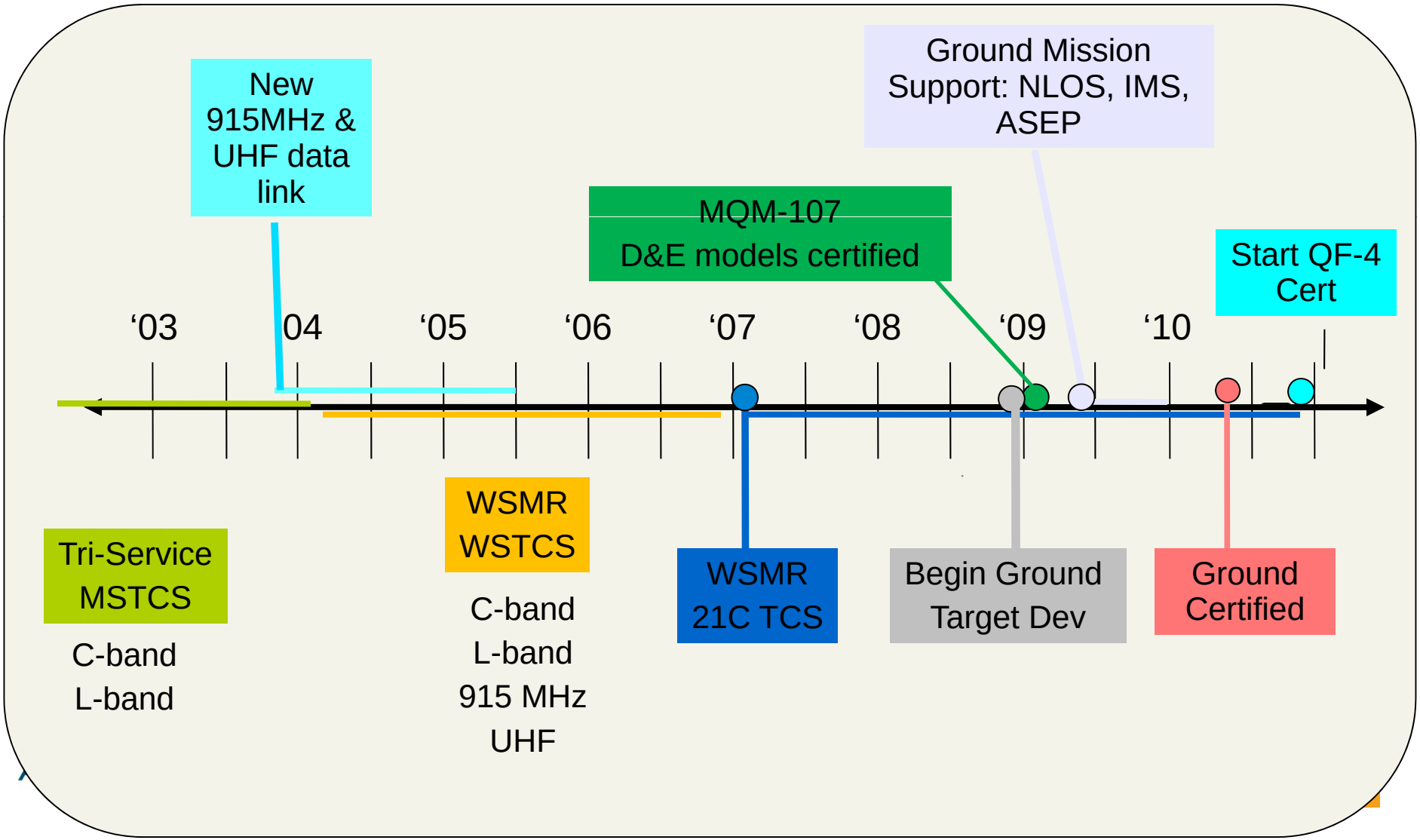
Requirement

- WSMR requires a remote control system for controlling 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 was obsolete
- Upgrade to modular control system utilizing state-of-the-art technology

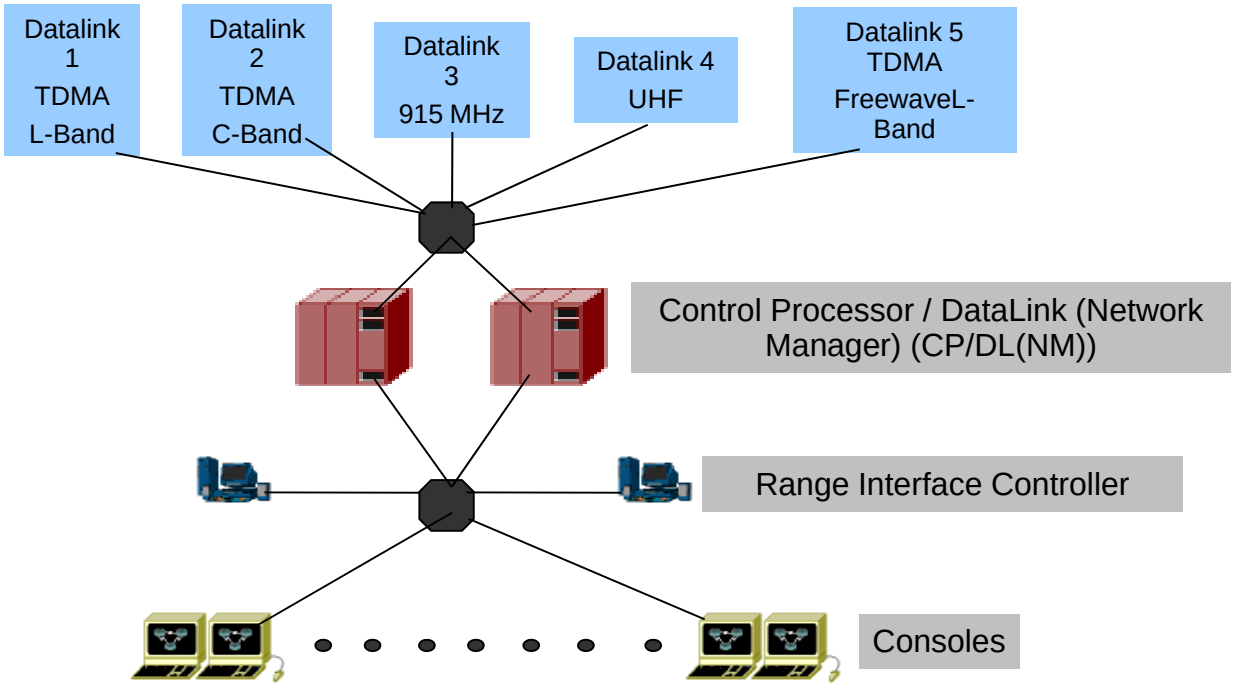
HISTORY

- MSTCS restructure Jan, 2002 led the Army to develop new TCS as replacement for aging DFCS.
- IBM to adopt LINUX as OS of choice starting in 2004
- Future support of AIX by IBM not predictable
- Initial 21st Century TCS tied to legacy AIX in DFCS
- Port of datalink network function to TCS
- Need to eliminate multiple computers and port system into a single multiprocessor computer

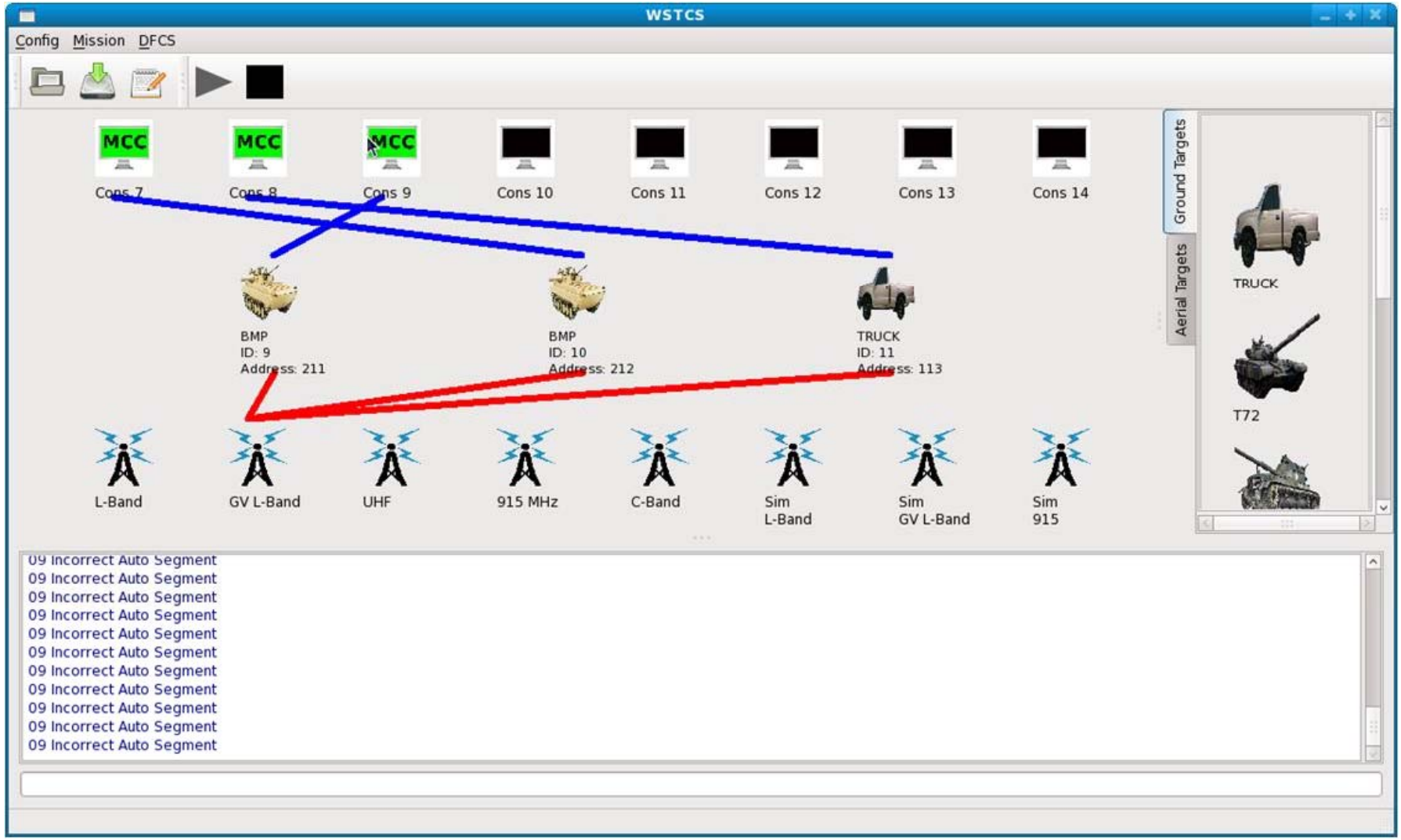
HISTORY


New 915MHz & UHF data link
Ground Mission Support: NLOS, IMS, ASEP
MQM-107 D&E models certified
Start QF-4 Cert
'03
04
'05
'06
'07
'08
'09
'10
Tri-Service MSTCS
C-band
L-band
WSMR WSTCS
C-band
L-band
915 MHz
UHF
WSMR 21C TCS
Begin Ground Target Dev
Ground Certified

Description



Qt Based GUI


WSTCS
Config Mission DFCS
MCC
Cons 7
Cons 8
Cons 9
Cons 10
Cons 11
Cons 12
Cons 13
Cons 14
BMP
ID: 9
Address: 211
BMP
ID: 10
Address: 212
TRUCK
ID: 11
Address: 113
L-Band
GV L-Band
UHF
915 MHz
C-Band
Sim
L-Band
Sim
GV L-Band
Sim
915
Ground Targets
Aerial Targets
TRUCK
T72
09 Incorrect Auto Segment
09 Incorrect Auto Segment
09 Incorrect Auto Segment
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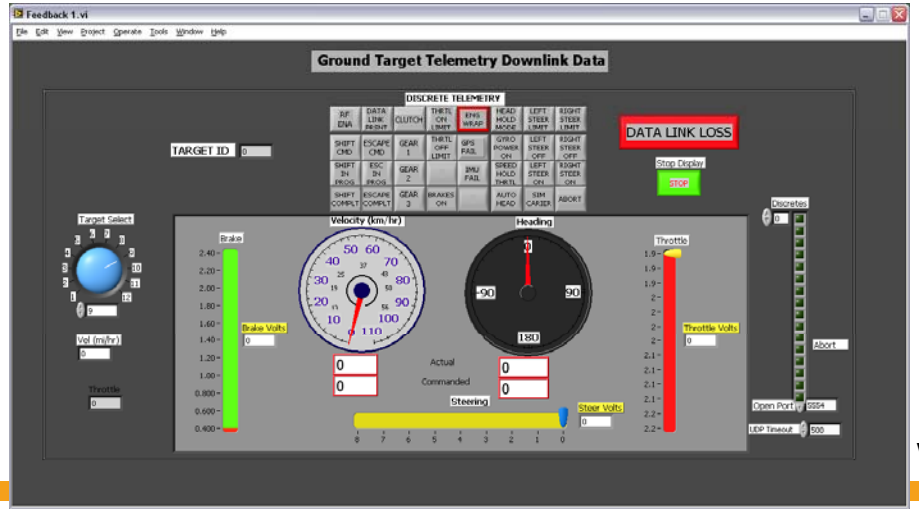
TCS HDD Console

Description: *Ground Target Control*

Compact Design

New Control System Architecture

Vehicle Telemetry Information Display



Description: *Ground Target Control*

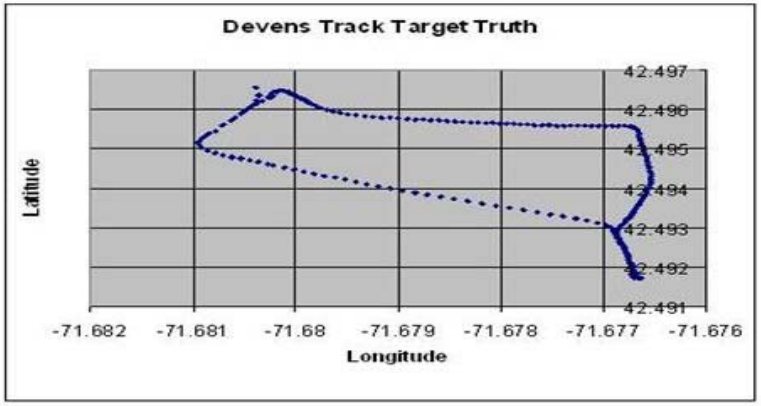
Vehicles Currently Configured

21st Century TCS Mobile Van

Highlights: *Ground Target Control*

Intelligent Munitions System (IMS)-Support Fort Devens, MA, Feb 2009.

- Team support at Fort Devens, MA 17 -27 Feb 2009. Conditions of track Sat 7 Feb 2009.

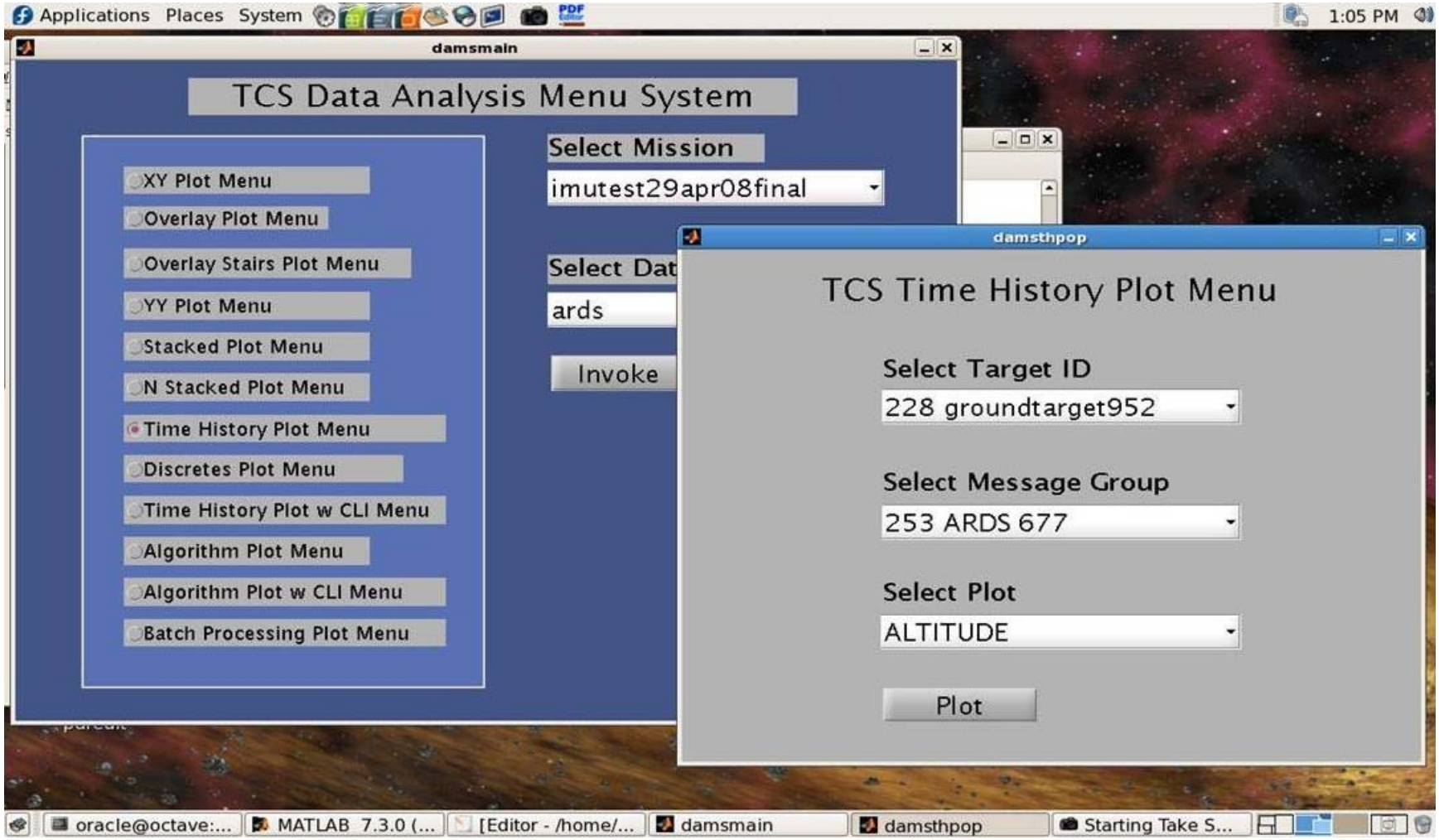


- Track was approximately 626 meter long and 10 feet wide.
- Ice and Snow made for poor traction of two 1997 black Nissan trucks

Two vehicle convoy mission @ Zumwalt Track 7 July 2009 using 21st Century TCS from B312 (95 mi. from test site)

US Army White Sands Missile Range

Automated Analysis Environment



Innovations and Milestones

- Dynamic Speed Control (5 – 65 mph)
- Auto vehicle spacing (30 – 100 m)
- Formation control of different vehicle permutations
- Multiple formation support
- Auto launch of formation
- Multiple Safety Options
  - Collision Avoidance
  - Remote Abort
  - Master Stop (Mission Pause)
  - Automatic slot allocation

Innovations and Milestones

- Sub-meter (60 cm) GPS accuracy
- Automatic generation of ground path based on GPS data
- Over-the-air modifications of vehicle configurations
- Health of systems display capability
- Logging and state of the art analysis capability
- Ability to change segment velocities in real time
- Mobile systems capability

Description: *Aerial Target Control*

Targets to be certified for control

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*
- Scheduled UHF MQM-107 Integrated Avionics Package (IAP) flights within next 6 months
- QF-4 testing FY11

Future Enhancements

- Touchscreen (Haptic feedback) user interface
- New actuator control
- Integration of surrogate targets
- UAV integration
- Threat management system capability
- New kill switches
- More efficient vehicle instrumentation

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US Army White Sands Missile Range

Questions??