



RANGE COMMANDERS COUNCIL FY12 SUMMARY REPORT



The Range Commanders Council and the Declining Test Range Budget Cycle

In the late 1940's the development of test range infrastructure was a low priority for the Armed Services. Range engineers were forced to depend upon surplus WWII equipment, such as tracking optics confiscated from Peenemunde and leftover surveillance radars, for the testing of new missile systems. This was the gestation period for what was to become the Range Commanders Council (RCC). The RCC was born out of the need to maximize the range community's collective strategic, materiel, and intellectual capital at a time of accelerated weapons development that, paradoxically, was not accompanied by concomitant upgrades to range infrastructure. This experience was to be repeated in drawdowns following the Korean, Vietnam, and Cold Wars and is not unlike the period we are experiencing now. In each case the value of having a dexterous affiliation of ranges like the RCC was reaffirmed through the cost savings/avoidances that were achieved, the test standards that were developed, and a host of other technical achievements. The RCC stressed range interoperability before interoperability became a buzzword. The value of the RCC is amplified by the breadth and depth of its membership expertise, which is now comprised of over 750 members representing 76 member and associate member installations. Technical standards developed by the RCC continue to be adopted as industry best practices. Our role in sustaining the range community will be even more vital as the budget cycle enters another phase of declining resources.

The following pages summarize some of the contributions made to the range community by the RCC during FY12.

Digest of FY12 RCC Products

Number of Technical Standards Published: 6

- 118-11 Test Methods for Telemetry Systems and Subsystems, Volume V: Test Method for Digital Recorder/Reproducer Systems and Recorder Memory Modules**
- 118-12 Test Methods for Telemetry Systems and Subsystems, Volume II: Test Methods for Telemetry RF Subsystems**
- 215-12 Asynchronous ASCII Event Count Status Codes**
- 325-11 Test Standards for Enhanced Flight Termination Receivers**
- 354-11 Range Atmospheric and Oceanic Environmental Support Capabilities**
- 501-12 Universal Documentation System**

Number of Special Reports Published: 6

- Development of Electro-Optical Standard Processes for Application**
- Digital Imagery Compression Best Practices Guide**
- Laser Rangefinder Integration**
- Link Encryptor Synchronization**
- Sanitization of IRIG 106 Chapter 10 Storage Media**
- Specification for High Speed Digital Video Camera**

Cost Avoidance/Savings (FY12):	\$ 31,633,500
Cost Avoidance/Savings (since 1991)	\$ 544,568,636

TRMC/RCC Collaborative Range Capability Developments

The TRMC has a long history of contributing to the advancement of range instrumentation through such activities as CTEIP, the T&E/S&T Investment Program, and the JMETC Program. The TRMC has also helped advance a number of RCC initiatives, such as validation of the GPS Technology Investment Plan, impact assessments of DoD Information Assurance Processes on range data, and other similar efforts. For FY13, TRMC has selected six important RCC projects for funding and further development: an assessment of debris models using radar data, a FAA beacon study for space vehicles, an update on risk criteria standards in maritime environments, and the development of IRIG/RCC guides for telemetry networks, telemetry metadata standards, and IP traffic engineering. The principal criterion for project selection was their contribution towards the development of common standards that benefit the conduct of T&E at Major Range and Test Facility Base (MRTFB) installations. For this year, half of the funded projects revolve around safety in test arenas of emerging importance.

Multiple Object Tracking Radar

Vandenberg AFB had decommissioned its AN/MPS-39 Multiple Object Tracking Radar (MOTR) in October 2008 after 17 years of operation. Capable of simultaneously tracking up to 40 objects, this advanced radar was one of only 5 MPS-39s ever built, each at a cost of over \$25M. Deactivating this radar enabled operating costs to be re-directed towards other critical priorities. White Sands Missile Range (WSMR) maintained two MPS-39s and originally had a requirement to operate three (the third radar was diverted to Cape Canaveral following the Challenger accident). Both Vandenberg AFB, through its 30th Space Wing, and WSMR are active members of the Electronics Trajectory Measurement Group (ETMG), the only forum in the range radar community where operational challenges are openly discussed and collaborative Service-wide solutions are developed. Through the ETMG, an arrangement was made to transfer the radar along with spare parts to WSMR. Because the Vandenberg radar was configured for a permanent mount, the transfer entailed identification and utilization of experts capable of disassembly, transport, and reassembly of a complex radar system to full capability.

Information Assurance Reciprocity

The RCC's Data Science Group's Data Protection Committee recognized the need for ranges to adopt common Information Assurance (IA) criteria to establish reciprocity when connecting accredited test assets to range networks and other equipment. Reciprocity of IA implies the acceptance of security evaluations between different approval authorities, such as when obtaining IA approval to use an Air Force range radar system on a Navy range. Among the obstacles to reciprocity implementation are the use of non-standardized vulnerability assessment tools, variable requirements definitions, and the asymmetry of data environments (e.g. system under test vs. range systems). The DSG's goal is to ultimately develop templates and strategies to overcome these obstacles in a manner that is also in compliance with existing recognized policies. Two approaches are being considered. The first is to develop a decision flowchart defining full documentation sets for various scenarios. The second is to define a minimum documentation set required to establish reciprocity. Regardless of approach IA reciprocity will be an ongoing task as the threat environment continues to shift and IA continues to evolve. The initial effort at developing an IA reciprocity strategy is expected to be complete in early 2014.

TECHNICAL GROUP ACTIVITIES

Data Sciences Group (DSG)

New tasking to catalog Live-Virtual-Constructive (LVC) assets across the range community and to survey lessons learned from current knowledge management efforts by member ranges. Establishing an Information Assurance (IA) reciprocity standard and developing templates for demonstrating adherence to a minimum set of IA requirements that would permit interchange of data between ranges having met uniformly accepted IA standards. Surveying MRTFB data display and analysis capabilities.

Electronic Trajectory Measurements Group (ETMG)

Completed transfer of MOTR radar from Vandenberg AFB to WSMR. Completed independently derived best estimates of trajectory from three different test ranges for the same Minuteman III mission flown from Vandenberg AFB to Kwajalein Atoll (the 30th Space Wing provided evaluation of the independent track files with very favorable results). Developing a new methodology for radar performance monitoring using the DMSP and RADCAL satellites for tracking. Provided an update to the 1998 Radar Roadmap that will incorporate needs derived from the Range Radar Replacement Program as well as from Test and Evaluation Master Plans for upcoming test programs. Examining the viability and sustainment of the Advanced Range Data System Service Life Extension Program. Worked closely with TRMC on Time-Space-Position Information investments to insure maximum MRTFB utility.

Frequency Management Group (FMG)

The FMG is assessing the problem of DD Form 1494 applications that are approved without taking into account the spectrum noise that will be imposed onto the transmitted signal. Training ranges are now using the FMG-developed Integrated Frequency Deconfliction System to schedule transmitter use for Remotely Piloted Vehicles (RPVs). Continuing to furnish spectrum use data to a variety of forums engaged in preserving aeronautical telemetry bands including to the Spectrum Stewardship Senior Steering Group (S4G), C-Band Implementation Workgroup, Defense Spectrum Organization, Joint Spectrum Center, and the Electronic Attack Working Group. The FMG is investigating the emerging problem of RPVs that were successfully operated in theater but unsupportable stateside due to spectrum conflicts.

Meteorology Group (MG)

Activities include attempting to resolve differences in Range Reference Atmosphere data and assessing the systems impact of space weather during the current maximum in the 11-year solar activity cycle; solar flare-induced GPS receiver altitude errors in excess of range safety limits have already been identified. The MG is compiling lessons learned from new dual polarization radars and is examining quality control and integration of Doppler Radar Wind Profiler data.

Optical Systems Group (OSG)

Current activities include drafting a sensor testing best practices document as well as attempting to standardize on a common video file format (the latter effort is complex due the high bit depth of many video formats). Evaluating protocols for common control as well as for improvements in timing offered by IEEE 1588 over IRIG standards and GPS-based timing methodologies. A survey of video capture software tools is pending and will focus on uncompressed video and associated metadata. Members of the OSG participated in the Cast Glance aircraft test for imager timing evaluations and discovered several significant latencies in sensor data.

Range Environmental Group (REG)

The REG has partnered with the Strategic Environmental Research and Development Program and the Environmental Security Technology Certification Program on review of proposals, statements of need, and data sharing. Data was furnished to TRMC to assist in their 2012 TRMC Encroachment Survey to help identify encroachment issues impacting MRTFBs. The RCC will continue environmental-related initiatives under the newly formed Sustainability and Environmental Group which combines initiatives of both the REG and the RCC Sustainability Group under one umbrella.

Range Operations Group (ROG)

The ROG is currently updating the Range Scheduling Guidelines document and has completed work on a generic targets directory as well as a new version of the Universal Documentation System Guide. Current focus on unmanned aerial system (UAS) integration procedures at each range and the identification of best UAS operations practices and common scheduling solutions.

Range Safety Group (RSG)

The RSG is investigating the impact of commercial space launches on mission planning; the historically high levels of conservatism on space launch risk assessments are no longer acceptable for mission planning associated with commercial launches. Related issues include the use of NextGen technologies for operational airspace management (to minimize impacts to commercial aviation of large airspace closures) and legal issues associated with the usage of space launch infrastructure funded by private investment. The RSG is mapping failure states and key design requirements for autonomous flight safety systems and safety requirements for target aircraft overflights of public highways. The RSG's Risk Committee has developed and distributed a probability of failure database for community-wide use. Range Safety Criteria for Directed Energy Weapons Systems is currently under development.

Sustainability Group (SG)

The SG continues monitoring energy related issues, specifically Section 358 of NDAA, OSD Energy Siting Clearinghouse activities, DoD green energy initiatives, and lessons learned from member range MOUs with the BLM. Several SG members are now on the Western Regional Partnership leadership team. Efforts to further develop GIS tools and nationwide data for encroachment mitigation continue. The SG has merged with the REG forming the RCC's new Sustainability and Environmental Group.

Signature Measurements Standards Group (SMSG)

This group was formally disbanded. The OSG will undertake former SMSG initiatives related to electro-optical measurements and radiometry.

Telemetry Group (TG)

Group activity includes iNET metadata language studies, updates to the instrumentation engineer's handbook, and standardization of instrumentation hardware descriptions. Telemetry Attributes Transfer Standard-related activities include updates to the XML schema and compliance with updates to the forthcoming IRIG 106-13. The IRIG-106 update will include a Chapter 10 (Digital On-Board Recorder) revision, a new Appendix on Transmitter Control Commands and serial control interfaces, and bandwidth definition updates (the National Telecommunications and Information Administration's Redbook will also be updated with the new bandwidth definitions). The entire B-52 fleet will soon be updated with the RCC's IRIG-106 Chapter 10 standardized recorders (the F-16 program already uses Chapter 10 recorders as the mission recorder).

Timing and Telecommunications Group (TTG)

Investigating encryption methodologies for Flight Termination Systems, timing solutions for GPS-denied environments, and development of a Precision Time Protocol Profile specifically customized for range usage. The TTG has completed a study on Asynchronous ASCII event count status codes and is currently investigating interface requirements for cryptological equipment, including developing a set of recommendations for sync refresh circuitry and assessing the lack of discrete re-sync interface in modernized link encryptors. The TTG is also updating the range instrumentation timing compendium (last updated in 1996) including requirements for remote rekey.

Underwater Systems Group (USG)

Researching moving towards a longer set of agreed pinger codes (79 bit vs. 19 bit) for targets, submarines, and torpedoes. Developing a compendium on all legacy cable systems in use at Navy range facilities, sources for their replacement, and technical specifications for procurement. Member ranges providing lessons learned on such issues as surface ship-radiated noise measurements, in-water tracking accuracy excursions in the Z-axis, and undersea warfare training developments. Continuing work on transponder tracking systems for fleet training and Global Cable Projects.

Priorities for FY 2013

Protecting the DoD frequency spectrum from potential sale to commercial interests.

Enabling Information Assurance protocols across multiple platforms.

Partnering with the Test Resources Management Center (TRMC) on extending range capabilities.

Posturing the range community for anticipated FY13 budgetary and workforce challenges.

Sustaining the ability to conduct the RCC mission at member ranges while adhering to new travel restrictions.

RCC Member Ranges

Army

Aberdeen Test Center
Dugway Proving Ground
Reagan Test Site
White Sands Missile Range
Yuma Proving Ground

Navy

NAVAIR Atlantic Ranges (Patuxent River)
NAVAIR Pacific Ranges (Point Mugu/China Lake)
Naval Undersea Warfare Center Division, Keyport
Naval Undersea Warfare Center Division, Newport
Pacific Missile Range Facility

Air Force

30th Space Wing (Vandenberg, AFB, CA)
45th Space Wing (Patrick AFB, FL)
96th Test Wing, (Eglin AFB, FL)
412th Test Wing (Edwards AFB, CA)
Arnold Engineering Development Complex

Non-DoD

National Aeronautics and Space Administration



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