



RANGE COMMANDERS COUNCIL FY13 SUMMARY REPORT



Creating Value Through Collaboration

The DoD is now into its fifth strategic drawdown since the end of World War II. The overall RDT&E budget has already fallen by 25% due to a number of major programs that were cancelled while still in development. The impact such reductions will have on test ranges is not difficult to forecast and places renewed importance on the value of interagency collaboration as a force multiplier to maximize the return made on range investments. Since 1951, the Range Commanders Council (RCC) has been extraordinarily effective in fostering inter-range collaboration, shared cost savings, promulgation of best practices, coordination of joint procurements, and range interoperability. The value of having such a dexterous affiliation of ranges (76 member and associate member ranges) is affirmed every year through the cost savings achieved, the test standards developed, and the crises that are averted by our network of technical subject matter experts. With common interests at stake, the RCC uniquely integrates range leaders and senior technical staff with their counterparts from other ranges to develop pragmatic and actionable solutions to technical and operational challenges impacting our collective enterprise. This is a unique collaboration that is enabled by our distinct organizational structure and a collaborative ethos that values adaptability, discretion, and results. A necessary component for maintaining the RCC's effectiveness is to continue to develop the interpersonal collaboration that has evolved continuously since our birth in 1951. Interpersonal collaboration is the enabler that imparts each of our technical groups with a deep level of familiarity of range issues, capabilities, and complexities that extends beyond their home installations. Through interpersonal collaboration, each of our 750 active members is acquainted with his/her counterpart at other member ranges and, along with many other DoD contacts that are often established at RCC functions, enable collective synergy to be applied towards solving range problems.

Priorities for FY 2014

Renewing on-site working group meetings and technical interchanges.

Maintaining the RCC as the principal forum for dispensing technical guidance and best practices.

Preserving the utility and effectiveness of the Instrumentation Radar Support Program (IRSP) as a new contract is being negotiated.

Minimizing the impact wireless broadband spectrum reallocation will impose on DoD and NASA ranges.

Continuing to partner with TRMC on projects that promote the development of common standards at MRTFB installations.

The following pages summarize some of the FY13 contributions made to the range community by the RCC as well as some upcoming efforts.

National Wireless Initiative and the Reallocation of RF Spectrum

The FCC has petitioned the Department of Commerce and the National Telecommunications and Information Administration to initiate the auction of portions of the RF spectrum presently used by DoD. This is part of the National Wireless Initiative intended to double the amount of commercial spectrum available for wireless broadband by the end of the decade. The auction will commence by August 2014 beginning with the 1755-1780 MHz aeronautical telemetry band. The RCC's Frequency Management Group (FMG) has been actively involved in the development of transition plans, data calls, and spectrum reallocation studies associated with the National Wireless Initiative. FMG members have furnished technical expertise and guidance to the Commerce Spectrum Management Advisory Committee, the DoD Chief Information Officer, the Aerospace & Flight Test Radio Coordinating Council, FAA Spectrum Engineering Services, and other agencies, both from within and external to the defense community, to ensure that the frequency reallocation process preserves the DoD mission.

Range Reference Atmosphere

Both the range and space launch communities depend upon accurate meteorological models for their respective missions to succeed. The Range Reference Atmosphere (RRA) is a statistical model of the Earth's atmosphere over a specific geographical location used by both communities for insertion into the Global Reference Atmospheric Model (GRAM). Using RRA inputs, the GRAM may be applied at any MRTFB location throughout the US. The RCC Meteorological Group has partnered with TRMC to conduct upper air atmospheric wind and thermodynamic measurements from rawinsondes launched at various ranges and space launch facilities. Marshall Space Flight Center (MSFC) will be leading this effort which encompasses collecting upper-air data, conducting Monte-Carlo simulations for use in GRAM, and assembling the final data product for general member use. The data can be used in a variety of applications such as predicting upper atmospheric conditions for space launch or landing support, evaluating dispersion models in chemical/biological testing, or preparing models of upper atmospheric microwave propagation.

Radar Roadmap

Since it was first published fourteen years ago, the Radar Roadmap was remarkably prescient in furnishing the technical community a forecast of instrumentation radar needs. Developments in several technical areas, such as digital beam forming, Doppler resolution, multiple-object tracking, and Radar Open Source Architecture (ROSA) suggested a need for an updated document. The Electronics Trajectory Measurements Group (ETMG) authored a new Radar Roadmap to reflect test and training range needs into the mid-21st century. Among the shortfalls of the present radar capability is the

inability of high-resolution radars to accurately measure miss distance and attitude, the capability to measure submunitions or decoys deployed by a tracked object, the availability of inexpensive continuous wave (CW) radars to provide detail from unambiguous Doppler data, and the availability of coherent radars with high-range resolution to observe high-altitude intercepts and low-level dispensing submunitions. GPS does not offer a solution where applications are too small to be augmented for GPS coverage, where the testing occurs in a countermeasured GPS-denied environment, or where objects being tracked are created by the impact of other objects. The updated Radar Roadmap also includes added sections on requirements validation, open-architecture design, spectrum management, stretch processing, range-doppler detection, and remote operations capability. These new sections describe the requirements development process, address requirements for software and hardware extensibility, discuss interoperability considerations, describe desirable signal processing procedures, and outline approaches for integrating radars into a comprehensive system of systems.

TECHNICAL GROUP ACTIVITIES

Data Sciences Group (DSG)

The DSG has recently completed a Live-Virtual-Constructive (LVC) Asset Listing and Data Analysis and Display Capabilities Catalog and are now considering pursuing a consolidation of best practices for Information Assurance (IA) security management, such as tools and processes used to patch, scan, and manage security on relevant Range assets. Issues revolving around Host-Based Security System (HBSS) capabilities on RDT&E systems and the transition from DoD Information Assurance Certification and Accreditation Process (DIACAP) to the Risk Management Framework also have DSG attention.

Electronic Trajectory Measurements Group (ETMG)

The group is promoting the continued sustainment of the Advanced Range Data System (ARDS) to accommodate delays in the full operational capability of the Common Range Integrated Instrumentation System (CRIIS). Developments include small-form-factor internal-mount GPS units that provide the functionality and performance of the newest technology while still being compatible with the legacy Honeywell GNP-10. The ETMG had evaluated a number of interim solutions during FY13 for RADCAL satellite replacement; these will continue to be developed during FY14. Approaches include the University of Hawaii–developed micro-satellite that was successfully launched in November 2013 but with inconclusive operational results. Information Assurance (IA) challenges will be addressed during FY14, particularly those concerning remotely operated test sites and data collection points. The ETMG also continues to support workshop activity with regard to fidelity of TSPI mission data processing across the MRTFB with the end goal of certifying that these diverse functions produce comparable results.

Frequency Management Group (FMG)

The FMG membership, along with spectrum partners, is heavily involved with the 1755-1850 MHz wireless broadband spectrum reallocation and C-Band telemetry implementation efforts. The group has completed a spectrum management metrics standard that defines spectrum utilization along with associated algorithms, metric definitions, cost and scheduling aspects, and other guidance for managing the RF spectrum. The FMG is finishing an aeronautical mobile telemetry receiver site database which will be revalidated and republished annually on behalf of the RF spectrum community.

Meteorology Group (MG)

The MG is coordinating with the FMG on several issues: FCC-mandated changes to radio spectrum use affecting meteorological frequencies, effects of energy farms on radar/profiler signal interference, and assessing the impact of space weather interference on GPS, HF, and radar signals. NAVAIR and Air Force members jointly working on the High-Altitude Lidar for Atmospheric Sensing (HALAS) project and its potential insertion into test ranges. Member ranges are sharing vendor information on helium purchases due to the sharp spike in prices and the reduction of suppliers.

Optical Systems Group (OSG)

Current activities include organizing of a common contract for the purchase of high-speed imagers and accessories; this will require the acceptance of a common file format in time for an FY15 contract. Several ranges have established procedures for timing testing and evaluation that are now being assessed and assembled into a best practices document. The OSG has completed a member range infrared/electro-optical equipment survey and is currently conducting validation testing to establish procedures, equipment set-up, and data reduction algorithms for electro-optical sensor performance characterization. The OSG is also developing a high-speed video standard to capture airborne target separation. The process of sharing software through the DoD Forge.mil website has been initiated for the adoption of Government open-source software (GOSS) applications, libraries, and software source code for 3D visualization, video streaming, video recording, video tracking, and timing certification.

Range Operations Group (ROG)

The ROG will re-examine the targets directory to ensure completeness with possible consideration of incorporating undersea targets in an updated volume. The group is currently focused on unmanned aerial system (UAS) integration procedures at member ranges and the identification of best UAS operations practices and common scheduling solutions.

Range Safety Group (RSG)

Technical details of the Enhanced Flight Termination System, including improvements in immunity to signal interference, multi-path and Doppler affects, wireless configuration, and programmability, and open loop testing, are being incorporated into the updated RCC-319 Flight Termination Systems Commonality Standard. The widely-cited RCC 321, Common Risk Criteria Standards for National Test Ranges, is currently being developed using commercial transport aircraft vulnerability models and FAA penetration equations.

Sustainability and Environmental Group (SEG)

Consisting of elements of the former Range Environmental Group and the RCC Sustainability Group, the SEG is currently conducting a study on the environmental impact from renewable energy projects, including development of a playbook to help guide other ranges through a process for reviewing proposed projects for potential environmental impacts to range missions. An extension to the playbook is being considered to include beyond-installation/range boundary areas such as military training routes and special use airspace. The SEG conducted a review of TRMC's upcoming Test Infrastructure Encroachment Survey which will inform strategic investment decision recommendations from TRMC in support of test ranges.

Telemetry Group (TG)

The RF Systems Committee members of the TG were engaged in multiple OSD spectrum encroachment studies during FY13. The TG is supporting industry proposals for standardization of network meta-data language enhancements. Several Telemetry Attributes Transfer Standard (TMATS) upgrades will be initiated in FY14 including the RCC TMATS Handbook as well as TMATS topics contained in the IRIG 106 Telemetry Standards.

Timing and Telecommunications Group (TTG)

Future direction includes the use of COMSEC with IP Ethernet and serial TDMA transport systems, including NSA Type 1 and Type 2 encryption devices as well as commercial equipment now available that meet government standards. The TTG is engaged in a TRMC-partnered investigation on traffic engineering methodologies for use in range IP networks; their study will define network performance requirements for reducing latency and jitter.

Underwater Systems Group (USG)

Pinger signal code standardization work has been officially completed. The new pinger format was used in an exercise with three submarines and 65 torpedoes with no target code conflict. An RCC task is likely forthcoming on procedure standardization for installation, recovery, and maintenance of mines and mine-like targets. The USG is also sharing lessons learned on defect detection in underwater fiber-optic cables, including the presence of micro-bending, stress, and hydrogen molecule intrusion.

Digest of FY13 RCC Products

Number of Technical Standards Published: 7

- 106-13 Part I: Telemetry Standards
- 121-13 Instrumentation Engineers Handbook
- 124-13 Telemetry Attributes Handbook
- 204-12 Instrumentation Timing Systems
- 260-13 Radar Roadmap
- 556-13 Scheduling Deconfliction Guidelines
- 650-12 Targets Directory

Number of Special Reports Published: 2

- Space Weather Effects on Range Operations
- Standardization of Underwater Pinger Formats

Cost Avoidance/Savings (FY13):	\$ 1,552,611
Cumulative Cost Avoidance/Savings (since 1991):	\$ 548,072,152

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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