Rapid Reaction Technology Office (RRTO)

Overview

Defense Strategy

Secretary of Defense detailed three lines of effort for the Department:

- **Restore military readiness as we build a more lethal force**
- **Strengthen alliances and attract new partners**
- **Bring business reforms to the Department of Defense**

The United States depends on science, technology and innovative engineering to not only protect the American people but to advance our national interests and to prepare us to meet the challenges of an uncertain future.

– ASD(R&E) Mission

Mitigate current and anticipated threat capabilities.

Affordably enable new capabilities in existing military systems.

Create technology surprise through science and engineering.

Investing in science and technology to support the Warfighter.

Rapid Reaction Technology Office

"Some of the challenges we have today are not challenges we have foreseen and so we need to adapt, but also we need to be focused on how we innovate, to make sure that tomorrow's force, perhaps doing things in a fundamentally different way, is prepared for the challenges of 2020 and beyond. And that's actually our focus."

General Joseph Dunford, Chairman of the Joint Chiefs of Staff, 29 March 2016

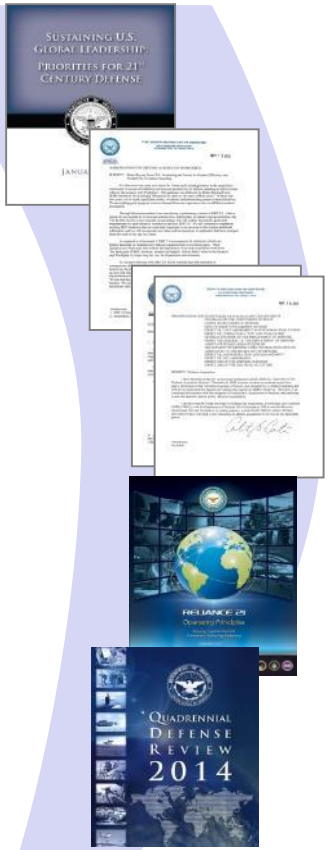
- **RRTO Mission**
  - RRTO develops prototypes and hosts technology demonstrations to counter emerging and anticipated threats in order to accelerate the delivery of resilient solutions leading to affordable Warfighter capabilities.

- **RRTO Vision**
  - RRTO is the model for developing and demonstrating less mature, high-reward technologies that produce game-changing capabilities by leveraging non-traditional sources of innovation, interagency partnerships, and rapid prototyping.

RRTO develops prototypes to create a hedge against technical uncertainty, emerging capabilities, and unanticipated threats

RRTO Project Selection

- **Filtered through the lens of DoD's strategic priorities**
- **Accept proposals on a rolling basis**
- **Seek proposals from small businesses; traditional and non-traditional performers; academia; CCMDs and Services; FFRDCs & UARCs**
- **Streamlined process for funding consideration**
  - **Small Group Review of technical and operational subject matter experts deconflict and provide recommendations**
- **Awards made during the year of execution**



Guiding principles

1. Invest where others do not (seams, cracks, & fissures)
2. Co-funding from other stakeholders
3. Clear transfer/transition path
4. High risk, high payoff acceptable
5. Advance emerging technology development for the joint Warfighter
6. Mitigate risk towards future S&T development
7. Inform future acquisition decisions

RRTO Portfolios

- **Emerging Capabilities Technology Development (ECTD):** Proof-of-Principle and fieldable prototypes; < 36 months, < $6M
  - **Multi-domain, Autonomous Systems**
  - **Counter-Weapons of Mass Destruction**
  - **Dismounted Soldier Systems**
  - **Energy Efficient Systems**

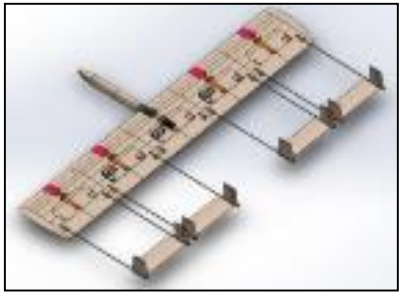
- **Quick Reaction Special Projects (QRSP):** Time-sensitive operational needs
  - QRF: Conventional warfare, <12 months, < $3M
  - RRF: Irregular warfare, <18 months, < $1M
  - **Counter Anti-Access / Area Denial**
  - **Persistent ISR**
  - **Low-cost Precision Engagement**
  - **Open Source Data Exploitation**
  - **Biometrics & Forensics**

Characteristics of RRTO Projects

- Address Joint / Interagency needs
- Provide timely response to user needs
- Innovative, leap ahead capabilities rather than incremental improvements
- Most have co-sponsors
- Most provide residual capabilities
- Partnerships are critical to success

RRTO Example Prototypes

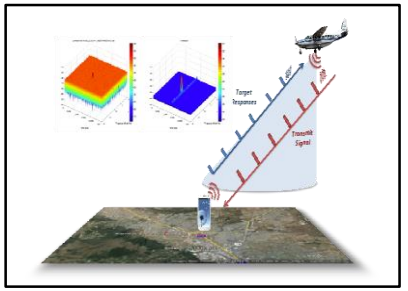
- **Operational Responsiveness (OR-1)**
  - Couples product architecture, design tools, and manufacturing to provide extremely short development cycles
  - Demo case: Mission tailored, modular, 3D printed unmanned aerial vehicle
  - Extensible to other prototyping efforts
  - Transitioned to Navy, USMC, UK Ministry of Defense



- **Persistent Aerial Recon. & Communications (PARC)**
  - 24/7 ISR via ultra-lightweight low-tension power/data wire
  - Autonomous launch, flight, and recovery
  - Transitioned to SOCOM, Army Rapid Equipping Force

- **Accelerated Nuclear DNA Equipment (ANDE)**
  - Processes DNA samples and matches to terrorist database
  - Replaces expeditionary lab with a fieldable laser printer size device
  - Transitioned to SOCOM, DHS, DoJ

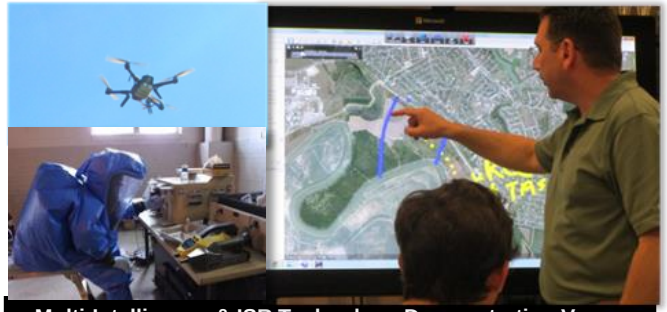
- **XONE**
  - Standoff airborne system to detect, identify, and geolocate WIFI devices of interest within meters
  - Enables ability to correlate signals intelligence (SIGINT) with human intelligence (HUMINT)
  - Transitioned to SOCOM



RRTO Demonstration Venues

High Speed, Electronic Keel Marine Testbed

Stiletto is a maritime technology demonstration platform with an "electronic keel" that enables rapid integration of new technology. The 88-foot experimental boat supports the rapid acquisition, integration, and demonstration of new capabilities, to explore their military utility for special and expeditionary forces. Stiletto conducts coordinated exercises and technology assessments, and partners include small business, military, and interagency participants. In FY 2016, Stiletto demonstrated 68 technologies, including systems from 20 small businesses, and achieved a cost avoidance to the DoD of $4M.



Multi-Intelligence & ISR Technology Demonstration Venue

Thunderstorm is an enduring technology demonstration venue open to a wide range of participants, including small businesses, military, and interagency representatives. New and existing technologies from focus areas such as Intelligence, Surveillance, and Reconnaissance (ISR), can be integrated, evaluated, and assessed under real world conditions with scripted and unscripted scenarios. Thunderstorm spirals are conducted three times a year. In FY 2016, Thunderstorm demonstrated 65 technologies, including systems from 32 small businesses, and achieved a cost avoidance to the DoD of $2M.

RRTO Innovation Outreach

- **Innovation Outreach connects DoD end-users with non-traditional solution providers**

Develop Needs	Identify Companies	Present Solutions	Technology Solutions
Identify Sponsor & publish needs as special notice on FedBizOpps	Interested companies submit tech overview via FedBizOpps	Companies with most promising solutions brief potential users	Experimentation / demonstration with follow-on acquisition

- **FireEye threat detection and protection against advanced cyber threats**
  - **Licensed by Air Force and Army**

- **MotionDSP software-only solution for automatic FMV enhancement**
  - **Fielded by DIA, NGA, and Air Force**