Science and Technology Development

From the Combatant Command Perspective
Where we fit in with the rest of the COCOMs
Central Region
Crossroads of Three Continents
Strategic Interests & Mission

- Security of the U.S. citizens & the U.S. Homeland
- Regional stability
- International access to strategic resources, critical infrastructure, & global markets
- Promotion of human rights, rule of law, responsible & effective governance, & broad-based economic growth & opportunity

With our national & international partners CENTCOM will:
- Promote security & cooperation among nations
- Respond to crisis
- Deter & defeat state and non-state aggression
- Support development & reconstruction to establish conditions for regional security, stability, & prosperity
Complex
- 20 Countries, 4.5 million square miles
- 1.1 Million square miles of ocean
- 531 Million people, 16 major ethnic groups
- 7 Major languages, hundreds of dialects
- 4 Major religions

Global Economic Impact
- Arabian Gulf produces ~ 31% of world crude oil
- Region exports ~ 26% of global LNG supply
- 3 x Strategic Choke Points
  - Appx 40% internationally traded oil transits SoH
  - 21% of LNG goes through Strait of Hormuz
Vision – We seek a region:

• At peace with itself & its neighbors
• Focused on common security & cooperation
• With stable governments responsive to the needs of the people
• With economic development that advances the population’s well being
• Free of nuclear weapons & where nuclear energy use is verifiable & for peaceful purposes
• With unhindered international access to strategic resources, critical infrastructure, & global markets
• Which does not allow the safe haven of extremists which threaten Americans or our friends & allies
Challenges

• Lack of progress in the Middle East Peace Process
• Extremist ideological movements & militant groups
• Proliferation of WMD
• Ungoverned, poorly governed, & alternatively governed spaces
• Terrorist & insurgent financing & facilitation
• Piracy
• Ethnic, tribal, & sectarian rivalries
• Disputed territories & access to vital resources
• Criminal activities: weapons smuggling, narcotics, human trafficking
• Uneven economic & employment opportunities
• Lack of regional & global economic integration
Priority Tasks for CENTCOM

• Reversing the momentum of the insurgency in Afghanistan
  • Regain the initiative
  • Restore public confidence in the GoA
• Maintain kinetic / non-kinetic pressure against threats to National security and our Allies
• Expand our partnership with Pakistan
  • Support their operations against militants
  • Assist in developing their counterinsurgency capability
• Counter malign Iranian activities & policies
• Counter proliferation of WMD & build partner capacity to prevent and/or respond to WMD events
• Bolster military & security capability of our regional partners
• With our partners counter piracy, illegal narcotics, & arms smuggling
• Ensure responsible expenditure of funds
• Reduce strain on the force & the cost of our operations
Major Activities

• Defeat al-Qaeda & associated movements
• Deny sanctuary & support for violent extremist groups
• Counter proliferation of WMD & associated technologies
• Deter & counter state-based aggression & proxy activities
• Support peaceful resolution to long-standing conflicts
• Build bi-/multi-lateral partnerships
• Develop partner nation capacity
• Assist nations in their ability to protect their critical infrastructure & support robust infrastructure development
• Bolster at-risk states
• Respond to humanitarian crisis
• Counter arms smuggling
• Protect freedom of navigation
The Nature of the Enemy

- A network guided by ideology
- Amorphous worldwide network which operates as a web of cells
- Fueled by militant Islamic zeal
- Anti-Zionist
- No state boundaries
- Powerful virtual element
- “Virtual Caliphate” - All directed toward the eventual establishment of a pan-Islamic state - the “Physical Caliphate”
- Seek safe-havens, physical footholds for recruitment, training, financing, and propaganda initiatives which complement its virtual element
- Well financed and has a simplified acquisition/training/fielding strategy
Al Qa’ida and Associated Movements (AQAM)
AQAM: A Threat in All Realms

- Recruitment and Education
- Internet and Proselytizing
- Media and Propaganda
- Front Companies
- Safe Havens
- Training Camps
- Ideologically Sympathetic NGO’s
- Financiers
- Facilitators, Smugglers
- Technical Expertise, Weapons Suppliers
- Human Capital, Fighters and Leaders
- Sympathetic Members of Legitimate Govt’s
It Takes a Network ... To Defeat a Network
The Role of Science & Technology
Charter

Conduct *discovery, research, analysis*, and *sponsor development* of new and emerging technologies which have the *potential to provide material solutions* to Headquarters and Component validated Joint needs.

*Review* USCENTCOM and Component *plans, operations*, programs, policies and activities for areas where technology will improve efficiency and effectiveness.

*Integrate* across USCENTCOM headquarters and Component staffs for transformational, integrating, and experimentation activities.
What we do

• Technology discovery, research & analysis, and inform the staff & OSD on promising initiatives
  • Attend technology symposiums / reviews
    – Service Labs, DARPA, FFRDCs
    – Private industry & Academia
  • Conduct global market research
  • Provide initial feasibility / technical merit on proposals

• Needs pull
  • Conduct HQ USCENTCOM Leadership, Directorate, & Component outreach
  • Participate in planning, operations, & exercises
  • Review submissions from the requirements generation processes for technology needs to support the Warfighter

• Operationally Manage technologies we sponsor
• Participate in limited objective experiments
Director
Resources and Analysis

Analysis and Requirements

Integrated Priority List (IPL), JQRR, Warfighting Challenges (WFCs), etc.

Joint Capability Integration & Development Sys (JCIDS) Process

Quick Reaction Branch

Science and Technology

Financial Management

Science & Advanced Concepts

Joint Urgent Operational Need (JUON)

Transformation & Integration

Needs

Solution

Tech Search
How we connect
We focus on the JOINT solution that has the potential to satisfy a JOINT validated need.

Separate from the many technology needs of our customer(s) those technology challenges which:

- Do not have a readily available solution
- For high-impact needs there is insufficient activity pursuing a solution

Seek out game-changing technologies which our customer(s) don’t know they need.
Some technology areas we “pursue”:

- Detection of CBRNE at tactically significant distances; with emphasis on the “E”
- Pre-shot counter-sniper, counter-mortar, counter-RPG technologies; with emphasis on automated systems

Technologies which enable the transfer of information more securely, more quickly, to a wider set of users, to include the warfighter when it makes sense, with less bandwidth and dedicated support resources, e.g.:

  - Multi-level Security over single architectures
  - Bandwidth compression / reduction techniques
  - Data reduction [data=>info=>knowledge=>understanding=>wisdom]

Through automation, remote action, new and novel techniques, technologies which reduce risk and / or stress on the force and / or improve the efficiency and effectiveness of our action(s)

Technologies which allow for greater persistence over the battlespace with fewer platforms; employing improved sensor technology providing greater fidelity of information
Common thematic areas of concern
(not in priority order)

- Detect / Defeat:
  - IED initiators / initiator systems
  - Buried / concealed IEDs
  - Production and assembly of IEDs
- HME production standoff detection
- Culvert access denial / alerting
- Persistence in surveillance
- Biometrics
  - Identity dominance
  - Force protection / access
- Non-lethal vehicle / vessel stop
- Reduce stress on the force:
  - Force Protection requirements
  - Increased automation
- Anti-swarm lethal / non-lethal
- More efficient / effective / timely trng
- Predictive analysis techniques
- Voice to text technologies
- C4ISR systems:
  - Info sharing between system
  - Multi-level security
  - Cross domain solutions
  - Faster ... Better sorting / retrieval
  - On the move w/ GIG access to tactical edge
    - SATCOM, WiFi, WiMax, etc.
- Tagging, Tracking, and Locating (TTL)
- Lightweight “x” with greater “y”
- More power per unit of weight
- Scalable effects – non-lethal to lethal
  - Directed Energy
  - Kinetics
- True SA for Blue ... Fused Red
- Sustaining the force – reduced size, weight, amount, and retrograde
- Holding all targets at risk
- Any sensor ... any shooter; the Soldier as a sensor; any adversary ... any battlespace ... anytime
What would the battlespace be like if …

• Bandwidth could be made irrelevant
• Concealed / buried explosive material could be detected at significant distances
• Tagants in dual-use items used to make homemade explosives when combined cause the mixture to inert
• Intent could be pre-determined
• A two-way certified cross-domain exchange was available
• Warfighter equipment drew its power from the environment (day or night); making power storage devices optional
• Aural simultaneous two-way translation into any language was available in a miniature form-factor

…
Technology Review Process
When proposing a solution ...
The Heilmeier Questions … adapted

• What are you trying to do?
  • Articulate your objectives using absolutely no jargon
• Who should care?
• How is it accomplished today?
• What are the limits of the current practice?
• What is new in your approach?
• Why do you think you will be successful?
  • How do you define / measure success?
  • What is your strategy to get there?
• How long will it take and at what cost?
• What are the risks?
• What is your risk reduction / mitigation strategy?
• What are the payoffs / return on investment?
For Technology Developers Some
Points to Consider

• Seek to understand how your solution fits in the overall DoD system of systems
  – Integrate with legacy systems vice replace them
  – Open architectures receive higher interest / support

• Consider partnering with others to bring a ‘greater’ solution to the table - system best-of-breed vice at the component level

• Determine your relative impact to a program of record
  – Training
  – Initial fielding
  – Sustainment

• Substantiate your position with data
  – Testing
  – Cost-benefit analysis
We are Venture Capitalists without any Capital. When a promising technology is discovered, we:

• Seek OSD / Joint Staff / Service support for funding *
  • Service programs of record (PORs)
  • Joint Rapid Acquisition Cell (JRAC)
  • Joint IED Defeat Organization (JIEDDO)
  • Quick Reaction Funds (QRF)
  • Rapid Reaction / New Solutions (RR/NS)
  • Force Transformation / Operational Experimentation (FT/OE)
  • Operational Test and Evaluation (Joint Tests & Quick Reaction Tests)
  • JFCOM Limited Acquisition Authority (LAA)
  • Defense Acquisition Challenge (DAC)
  • Technology Transition Initiative (TTI)
  • Foreign Comparative Testing (FCT)
  • Combatant Commander Initiatives Fund (CCIF)
  • Defense Venture Catalyst Initiative (DeVenCI)

• For those technologies we desire to “sponsor”
  • Assist the Headquarters and Components in the development of technical proposals to satisfied identified needs
  • Provide oversight management to get the technology into the hands of the Warfighter

* Not an all-inclusive list
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Raise your Hand