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*Office of the Director, Defense
Research & Engineering*

The Joint Capability
Technology Demonstration
(JCTD) Program

8th Annual NDIA Science and
Engineering Technology Conference/
DOD Tech Expo



Mr. John J. Kubricky

DUSD(AS&C)

17 April 2007

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DDR&E/AS&C Mission

OSD/Advanced Systems & Concepts



- Find, demonstrate and transition the operational concepts and technologies that meet **Joint and Coalition Warfare Needs**
- Leverage RDT&E Defense-wide resources through partnerships with Services and Agencies to meet the **Most Critical** needs of the joint warfighter as defined by **Combatant Commanders (COCOMs)**
- **Induct Innovative Technologies** inside the traditional Planning, Programming, Budgeting, and Execution (PPBE) process that result in an enduring **Capabilities-based Portfolio** to defeat asymmetric threats

Thrusts: Agile, Adaptive, Affordable, Relevant, Urgent, Enduring, Transition



AS&C: Inside Statutory Budget Process

OSD/Advanced Systems & Concepts

Needs Process

1. Develop & specify needs
2. Review budget-based programming and acquisition solutions
3. Allocate resources to commanders

Needs Roles

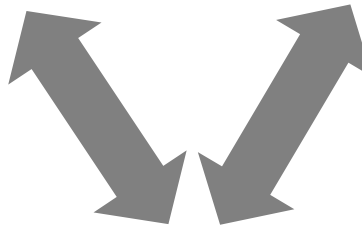
CJCS/JCS
COCOMs
Joint Staff
Military Staffs
COCOM/Component Cdr Staffs

Acquisition Solutions Process

1. Consult with needs authorities in solution development
2. Acquire material solutions
3. Deliver resources for allocation to joint/combatant commanders

Solution Roles

USD (AT&L)/DAE
Service Secretaries/SAEs
OSD (AT&L) Staff
Service Secretariat Staffs
Systems/Materiel Commands
Military Agencies



PPBE: Program – Budget Process

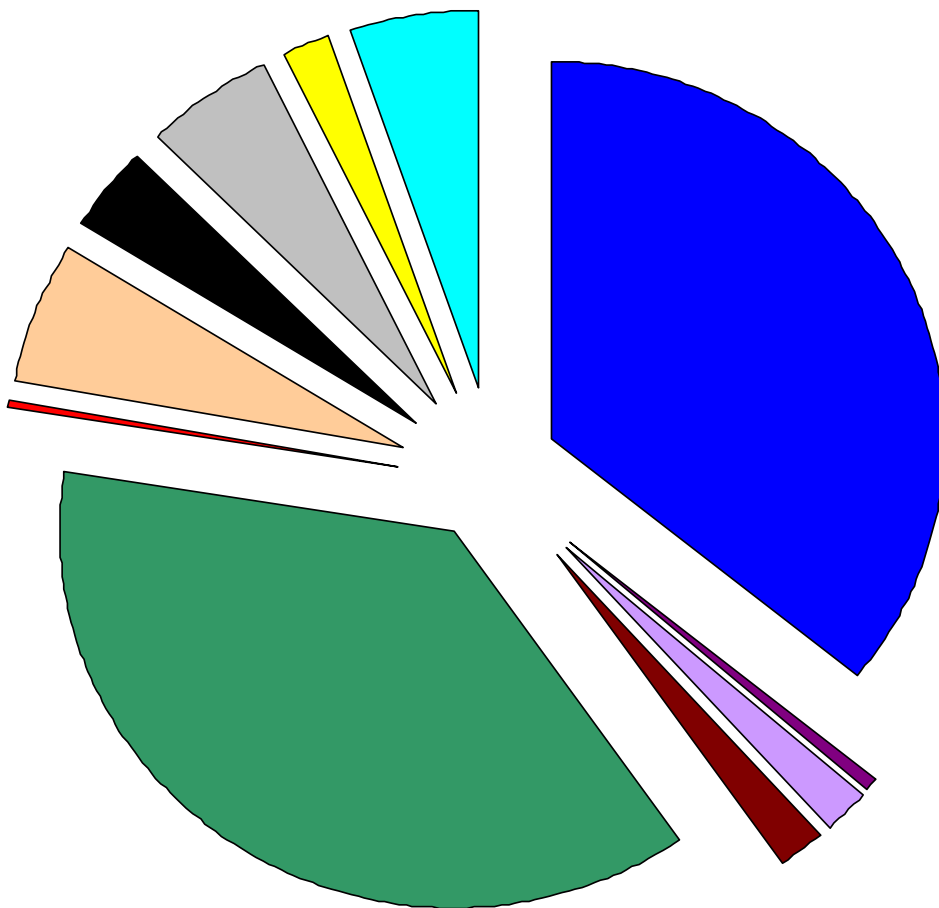
FY 2008 DDR&E/AS&C Oversight

FY 2008 PRESBUD (Feb 2007)

OSD/Advanced Systems & Concepts



Total Current Estimate: \$540.018M



- JCTD (BA-3)
- JCTD Trans (BA-4)
- DAE Pilot (BA-5/P/O&M)
- JWP (BA-3)
- JFCOM (BA-3/4/7)
- Tech Transfer (BA-3)
- FCT (BA-6)
- DPA Title III (P)
- DACP (BA-5)
- Manufacturing Tech
- TTI (BA-3)

FY 2008 RDT&E President's Budget Request



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DDR&E/AS&C Transition Programs are Highly Leveraged across Service & Agency Budgets, but are less than 1% of DoD RDT&E each year

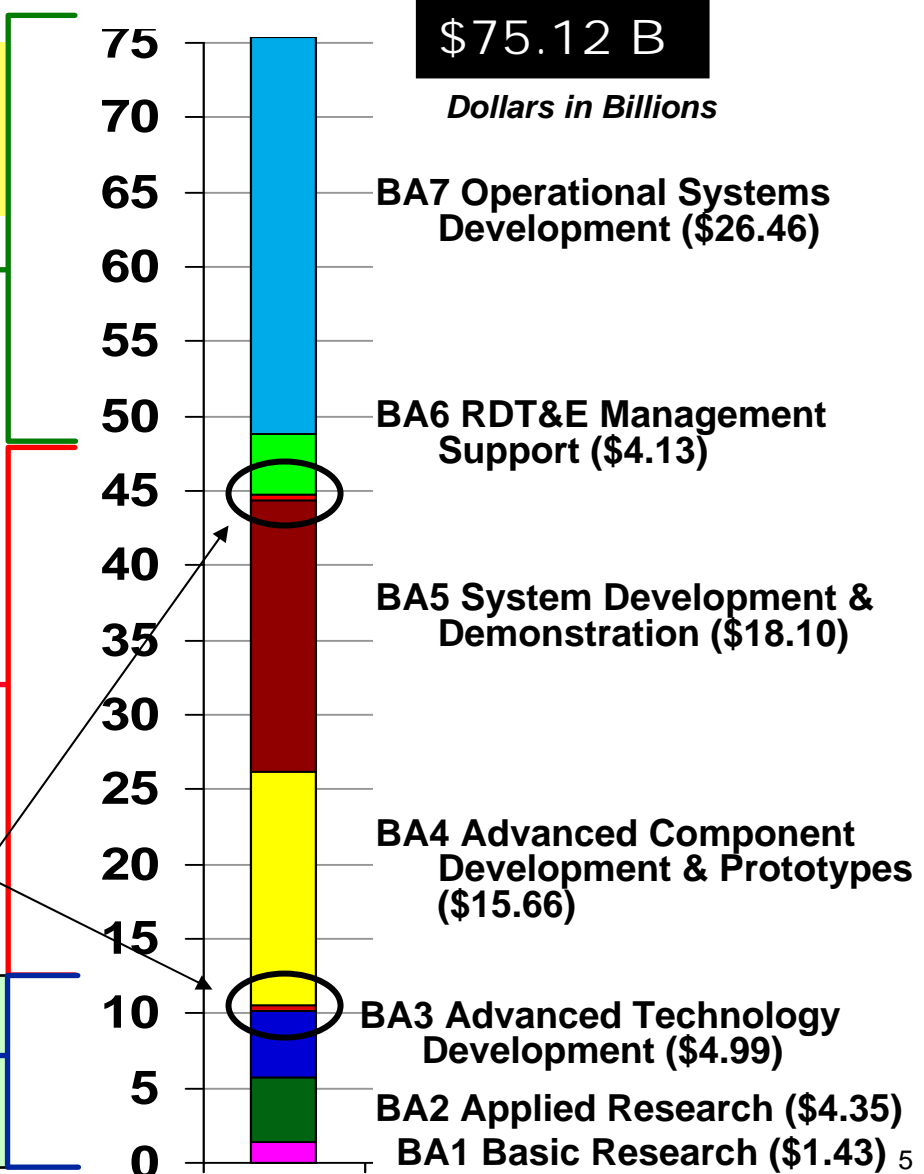
Components (All RDT&E)	\$B
USA	10.59
USAF	26.71
USN/USMC	17.08
Def Agency & SOCOM	20.74

(BA6 + BA7 = \$30.59B)

Development (BA4 + BA5 = \$33.76B)

DDR&E/AS&C Total = \$0.540 B
 (BA3/4 \$0.398; BA4/5/6 - \$0.122)
 (Includes USJFCOM \$0.202B)

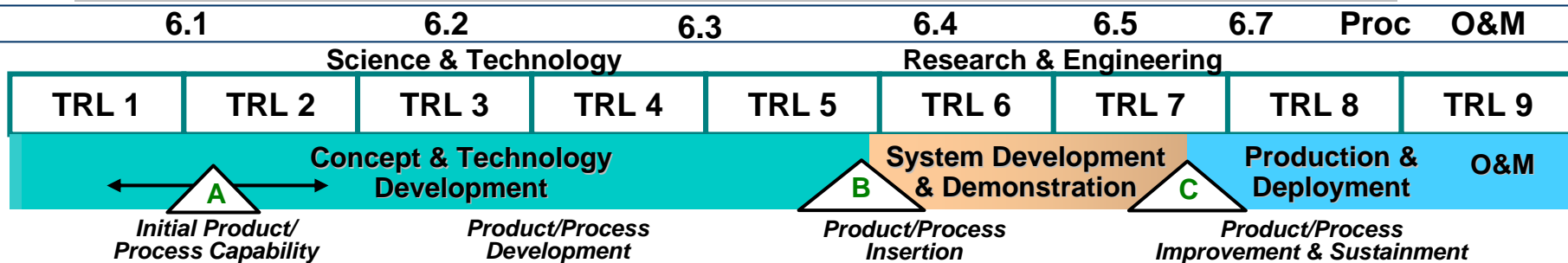
Technology Base (BA1 + 2 = \$5.78B) - Science and Technology (BA1 + BA2 + BA3 = \$10.77B) **14% of RDT&E**



The AS&C Portfolio



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COCOM /Joint/Coalition focused ACTD/JCTDs **Demo 1-4 yrs**

AC/JCTDs Transition Enabler – “joint peculiar” capabilities JCTD Transition & DAE Pilot Program

Industry “On” Ramp – Test to Procure Tech Refresh Defense Acquisition Challenge

Service, SOCOM Nominated - Test to Procure Foreign Comparative Testing

Congressionally Directed Tech Transition Initiative **DOD Lab Tech Push**

DoD Technology Transfer TechLink **to Private Sector**

JFCOM as Joint Force Integrator Joint Warfighting, Experimentation, & Integration

Domestic Technologies Critical to National Security Defense Production Act (Title III)

ManTech Joint Investments Manufacturing Technology (Service and OSD funded)

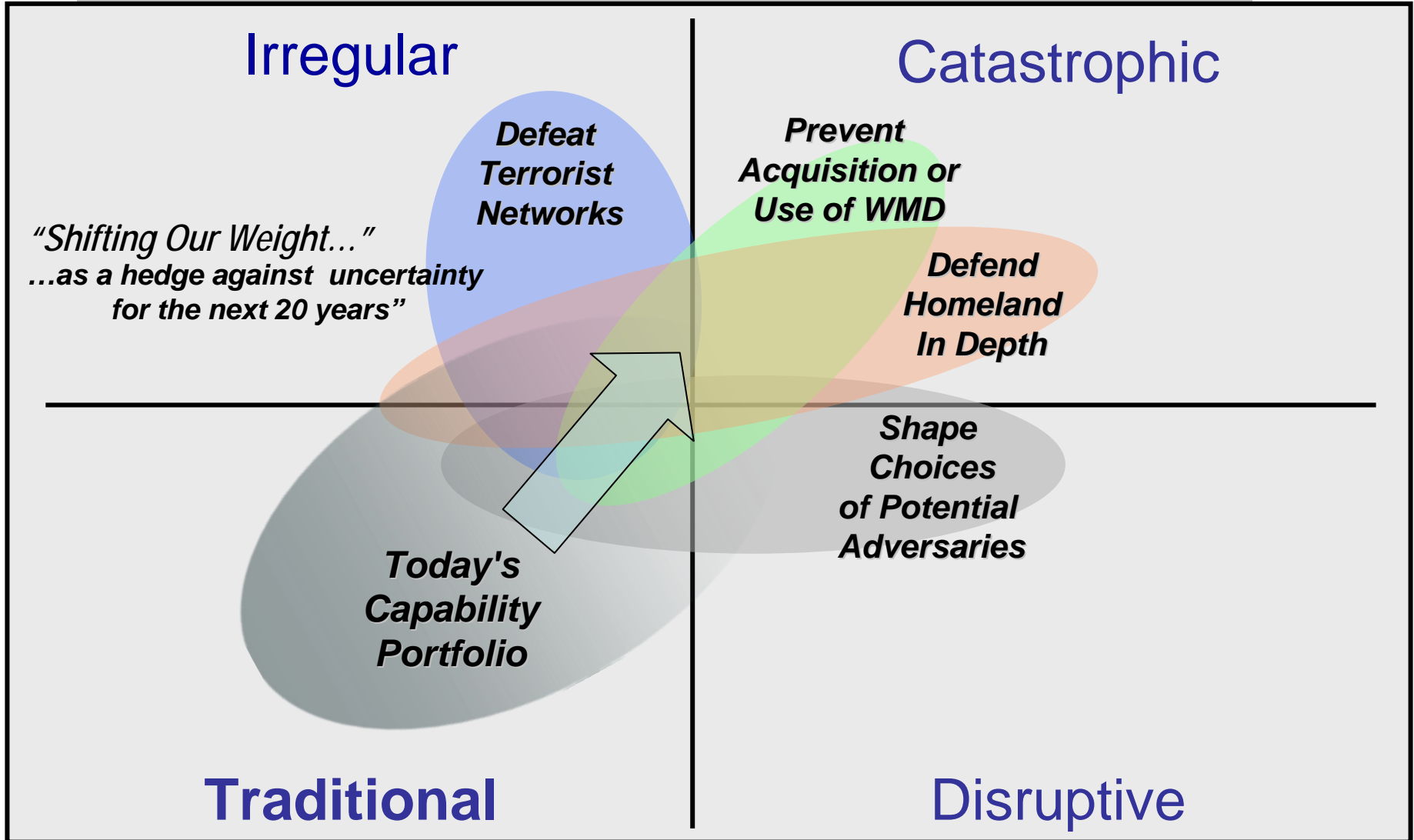
Industry’s Edge Independent Research & Development (Contractor Reimbursable Funding)

Note: Grey indicates industry funding; OSD oversight

21st Century Paradigm for COCOMs



OSD/Advanced Systems & Concepts





Characteristics of JCTDs

OSD/Advanced Systems & Concepts

- Address CoCom needs with *Mature Technology and/or an Innovative Concept*
- Provide technical solution with *Operational Concepts and TTPs*
- Evaluate solutions in warfighter *Operational Demonstrations*
- Usually *Joint*, often *Combined/Coalition/Interagency*
- *Rapid Results: 1 to 3 Years or less to Final Demonstration and a Prototype “Leave-Behind”*
- *Multiple Funding* sources with a *Transition Agreement*

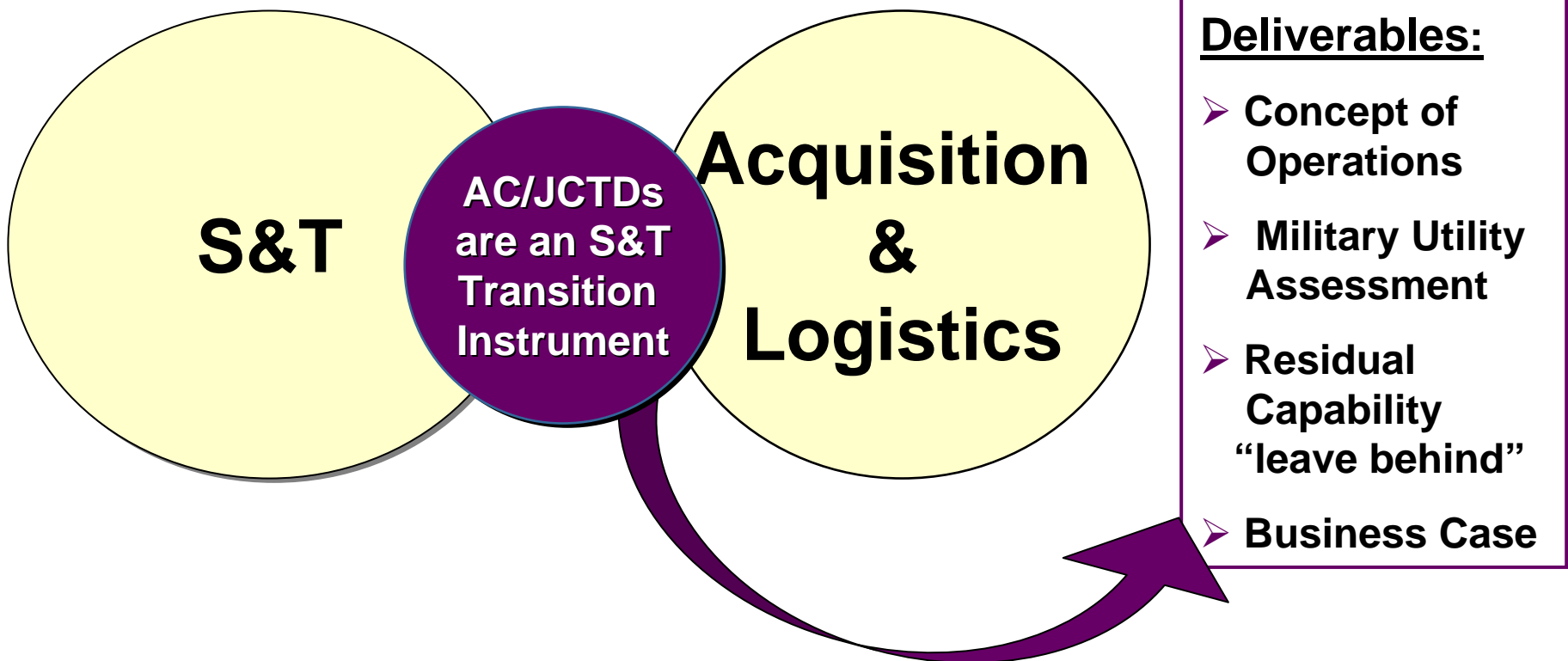
Emphasis on demonstration and transition...try with intent to buy



AC/JCTDs Bridge S&T and Acquisition

OSD/Advanced Systems & Concepts

Filling the Gap between S&T and Acquisition for COCOM Customers -
Providing Relevant/Urgent Tools to Joint and Coalition Warfighters



AC/JCTDs are not acquisition programs; they demonstrate new capabilities

Completed ACTDs Deployed in Recent Conflicts*



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Adaptive Course of Action	Integrated Collection Management
Advanced Joint Planning	Joint Biological Remote Early Warning
Airbase/Port Biological Detection	Joint Combat Identification
Area Cruise Missile Defense	Joint Logistics
Battlefield Awareness & Data Dissemination	Joint Medical Operations/Telemedicine
Chemical Add-On to Biological Detection	Link-16
Coastal Area Protection	Medium Altitude Endurance UAV – Predator
Coherent Analytical Computing Environment	Military Ops in Urban Terrain
Common Spectral MASINT Exploitation	Navigation Warfare
Consequence Management	Precision/Rapid Counter-MRL
Counterproliferation I	Personnel Recovery Mission Software
Counterproliferation II	Precision SIGINT Targeting
Counter Sniper	Precision Targeting Identification
C41 for Coalition Warfare	Rapid Force Protection Initiative
Extending Littoral Battlespace/JTF WARNET	Small Unit Logistics
Global Monitoring of Space ISR Systems	Space Based Space Surveillance Operations
High Altitude Endurance UAV – Global Hawk	Theater Air & Missile Defense Interoperability
Human Intel & Counterintelligence Tool	Theater Precision Strike Operations
Info Assurance: Auto Intrusion Det Envir	Unattended Ground Sensors

**Recent conflicts include: Operation Allied Force (Kosovo), Operation Enduring Freedom (Afghanistan), Operation Iraqi Freedom (Iraq), Noble Eagle (US Air Space), and Other (support to USFK, Space Shuttle Columbia recovery operation, and US Olympics)*

Active ACTDs Deployed in Recent Conflicts*



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Active Network Intrusion Defense	Overwatch
Adaptive Battlespace Awareness	Pathfinder
Boundary Step	Personnel Recovery Extraction
Coalition Theater Logistics	Survivability
Comm/Navigation Outage Forecast System	Restoration of Operations
Computerized Operational MASINT Weather	Spartan C2 Module & CONOPS
Contamination Avoid at Seaports of Debarkation	SIGINT Processing
Expendable Unmanned Aerial Vehicle	Theater Support Vessel
Ground-to-Air Passive Surveillance	Thermobarics
Homeland Security Command & Control	
Joint Adv Health & Usage Monitoring System	
Joint Area Clearance	
Joint Distance Support & Response	
Joint Explosive Ordnance Disposal	
Joint Intelligence, Surveillance, and Reconnaissance	
Language & Speech Exploitation Resources	

JPADS

**Recent conflicts include: Operation Allied Force (Kosovo), Operation Enduring Freedom (Afghanistan), Operation Iraqi Freedom (Iraq), Noble Eagle (US Air Space), and Other (support to USFK, Space Shuttle Columbia recovery operation, and US Olympics)*



AC/JCTD Performance Statistics

OSD/Advanced Systems & Concepts

- Total ACTDs and JCTDs Initiated 162
- Total ACTDs On Hold 3
- Total Active ACTDs/JCTDs 61
- Total ACTDs Terminated/Return to Tech Base 21
- Completed ACTDs (Demo Complete + Tech Base) 99

- Completed ACTDs that have/are Transitioning Products (Program of Record or Residual Sustainment):
 - ACTD Products Transitioned to Program of Record 38%
 - ACTDs where Residuals Products are Meeting Needs 42%
 - ACTDs Returned to Technology Base 20%

80% of completed ACTDs have transitioned products into new or existing PORs or as residual products to meet warfighter needs.



USPACOM/AS&C AC/JCTD Partnership

OSD/Advanced Systems & Concepts

- 14 new PACOM sponsored A/JCTDs since 2004 (27% of total)
- Started 11 of 12 A/JCTD proposals ranked by PACOM #1, 2, and 3 since 2004*
- Significant direct support to PACOM J85 and J006 for JE and A/JCTD roles
- Strong focus on USPACOM priorities, as shown below

USPACOM Focus Areas	Active USPACOM Sponsored AC/JCTDs														
	COSMOS	CMS	JMMES	CMA	JETA-SPOD	ASAP	CUGR	MSAT	ARGCS	FTTS	TEBO	Overwatch	MAV	JSuW*	AWSS*
Prosecute and Win the War on Terror	█		█	█		█	█	█				█	█	█	█
Advance Regional Security Cooperation and Engagement	█	█	█	█							█				█
Mature Joint and Combined Capabilities and Readiness	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Posture Forces for Agile and Responsive Employment		█			█			█	█	█					
Ensure Operational Plans Are Credible		█			█						█			█	█

* Assumes successful start of planned FY07 rolling starts

Joint Capability Technology Demonstrations

- 2007 JCTD New & Potential Rolling Starts -



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- **Coalition Mobility System (CMS)**
 - *Integrates data from US systems with data from coalition partners for coalition decisions.*
- **IP Routing in Space (IRIS)**
 - *Provides routing and dynamic bandwidth resource allocation from a commercial geo-sat.*
- **Joint Multi-Mission Electro-Optic System (JMMES)**
 - *Automated image processing and targeting for wide-area surveillance in a common turret.*
- **Mapping the Human Terrain (MAP-HT)**
 - *Data collection and visualization toolkit to support Brigade Combat Teams.*
- **Maritime Domain Awareness (MASTER)**
 - *Automatically generates and maintains vessel tracks by fusing all available data.*
- **Smart Threads Integrated Radiological Sensors (STIRS)**
 - *Detects and identifies radiological and nuclear materials using next-gen neutron detector.*
- **Tactical Service Provider (TSP)**
 - *Provides wideband, high-bandwidth services for tactical users using a hybrid of emerging, standards-based SATCOM and wireless technologies in a mobile tactical environment.*
- **Airborne Weapons Surveillance System (AWSS)**
 - *Line-of-sight detection, identification and location hostile ground fire for counter fire.*
- **Global Observer (GO)**
 - *Liquid hydrogen-powered UAV with affordable persistence and low footprint*
- **Joint Surface Warfare (JSUW)**
 - *Uses maturing weapon data link network technologies to integrate multiple ISR & launch platforms with existing stand-off weapons to provide targeting data for multiple weapons.*

Increasing Your Support to COCOMs



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AS&C Program

Actions and Outcomes

**Joint Capability
Technology
Demonstrations**

- Needs Specified
- Lead Proposal Development
- Operational Management
- Solutions Assessed

**Foreign
Comparative
Test**

- Projects Supporting Theater Security Cooperation Strategy are Advocated

**Technology
Transition
Initiative**

- Projects Addressing Capability Gaps
- Coordinate with Components



Considering Warfighter R&D Investments...

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...questions should be answered affirmatively:

1. Does the action address the COCOM's needs*?
2. Is a significant Joint capability or military advantage gained?
3. Do we have a clearly stated and attainable goal/outcome?
4. Have risks and costs been fully and frankly analyzed?
5. Have all other DOTMLPF** means been fully explored?
6. Is there an exit strategy to avoid endless development?
7. Have consequences of inaction been fully considered?
8. Can support be garnered from the Services and Congress?
9. Are experienced people available to execute the effort?
10. Can results be demonstrated to project champions (<PCS)?

* Integrated Priority Lists and Most Pressing Military Issues – as validated by JCS J8

** DOTMLPF: Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities

Criteria proposed by John Kubricky for selecting project candidates to support CoCom needs.



Joint Staff - Most Pressing Military Issues



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- **Collect and fuse multi-source sensor data increasing situational understanding**
- **Provide persistent surveillance in ungoverned/denied areas**
- **Using Department/Interagency capabilities, develop shaping strategies to assist nations at strategic crossroads**
- **Improve information sharing to support operational forces and mission partners by providing adequate bandwidth and information sharing tools, as well as appropriate information sharing policies.**
- **Improve joint force management; joint force projection and joint force sustainment**
- **Establish capability to locate, tag, and track individuals and loose WMD (securing and rendering safe)**
- **Integrate defenses for cruise and ballistic missiles**
- **Improve skills and capacity to detect and prevent state and non-state actors from acquiring and using WMD**
- **Define and develop strategic communications concepts**
- **Increase and improve irregular warfare capacity in conventional forces (language, cultural, behavioral, HUMINT) and ability to model irregular challenges**
- **Improve C2 for joint ops in distributed environment that facilitates joint interdependence**
- **Insert Spec Ops into denied areas**
- **Improve capacity to protect critical infrastructure**



Reducing Risks after Capability Demonstration

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Manufacturing Readiness Levels

5000	Pre-Concept	Concept Refinement	Technology Development			System Development and Demonstration	Production and Deployment	Ops & Support		
		Concept Decision	Component	System		Design Readiness Review	FRP Decision Review			
TRL	Technology Readiness Levels									
			TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9		
MRL	Manufacturing Readiness Levels									
	1	2	3	MRL 4 Lab or Modeling Environment	MRL 5 Prototypical Environment	MRL 6 Pre-production Representative Environment	MRL 7 Transition into LRIP	MRL 8 Low Rate Initial Production	MRL 9 Full Rate Production	MRL 10 Lean Production
Considerations	Manufacturing Concepts Identified			Mfg. Processes Identified Key Processes Identified Producibility Assessments Initiated	Mfg. Processes Developed Producibility Assessments On-going Mfg. Cost Drivers Identified	Critical Processes Demonstrated Cost Drivers Analyzed Long Lead Items Identified Equipment in a Relevant Environ	Mfg. Processes in Validation Producibility Improvement Underway Trade Studies Applied Supply Chain Validated	Process Maturity Demonstrated All Materials Ready for LRIP Mfg. Processes Proven Supply Chain Established	Mfg. Processes Operating at Target Quality, Cost and Performance Supply Chain Stabilized to Meet Production Lead Time Requirements	Lean/Six Sigma Production in Place Meeting or Exceeding Cost, Schedule and Performance Goals
	Exit Criteria		<ul style="list-style-type: none"> Meeting TRL 1 – 3 Identify Industrial Base (IB) Sources Characterize Basic Materials for Mfg. Identify Material Concerns Identify Funding Identify Advanced ManTech Initiatives Coordinate with Technology Plan 	<ul style="list-style-type: none"> Meeting TRL 4 Identify IB Gaps Assess Design for X Baseline Materials and Issues Funding/Budgeting for Trade Studies Identify ManTech or Other Initiatives Quality Strategy Mfg. Strategy Material and Tooling Planning 	<ul style="list-style-type: none"> Meeting TRL 5 IB Analysis Finished KPPs Allocated Material Development Begun Funding to Meet Next Level ManTech Initiatives Initiated Key Characteristics Identified Make/Buy Evaluations Begun 	<ul style="list-style-type: none"> Meeting TRL 6 IB Capability Est. Initial Trade Studies Materials Matured on Similar Lines Funding to Meet Next Level ManTech Solutions Developed Quality Thresholds Established Make/Buy Evaluations Done 	<ul style="list-style-type: none"> Meeting TRL 7 IB Monitored PEP Completed Materials Being Proven Funding to Meet Next Level ManTech Solutions Demonstrated Collecting Quality Data BOM Suppliers Identified 	<ul style="list-style-type: none"> Meeting TRL 8 Multiple Sources Established Pilot Line Builds Validated Materials Proven Funding to Meet Next Level ManTech Solutions Applied/Validated Validated Quality Characteristics BOM Supports LRIP 	<ul style="list-style-type: none"> Meeting TRL 9 IB Supports Sched Continuous Process Improvement is Ongoing Materials in Control Funding to Meet Next Level Quality Validated with LRIP Articles Make/Buy Supports FRP 	<ul style="list-style-type: none"> Meeting TRL 9 Monitor and Manage Key Characteristics at Six Sigma Level Funding Meets Six Sigma Goals No Changes to Make/Buy Decision All Key Suppliers Meet Six Sigma Goals



Discussion

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AS&C	www.acq.osd.mil/asc	703-695-5036
AC/JCTD	www.acq.osd.mil/actd	703-697-5558
Comparative Test Office (FCTs)	www.acq.osd.mil/cto	703-602-3740
Office of Technology Transition	www.acq.osd.mil/ott/tti	703-607-5316
Joint & Coalition Operations Support	(under construction)	703-693-0462