



BIOLOGICAL DEFENSE

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Advanced Planning Briefing to Industry

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JPM Biological Defense

Biological Detection System Family



Portal Shield



Dry Filter Unit (DFU)

DFU 1000



DFU 2000



Biological Integrated Detection System (BIDS)



Joint Biological Standoff Detection System (JBSDS)



Joint Biological Point Detection System (JBPDS)



Shipboard





Overarching Goals



- **Improve current capabilities:**
 - **Effectiveness**
 - Increase capability for traditional & non-traditional threat agents
 - Increase selectivity and reduce interference
 - **Supportability**
 - Reduce logistics foot print
 - Reduce operations and support costs
 - **Science**
 - Threat agent science and dissemination
 - Sensor performance and capability
- **Products of Interest:**
 - JBTDS
 - JBSDS



Outline



- **Overview**
- **S&T and Warfighter Needs**
- **Technical Challenges**
- **Acquisition Strategy/ Funding/ Schedule**
- **Upcoming Business Opportunities**
- **Contacts**



S&T Overview



Joint Biological Tactical Detection Systems (JBTDs)

- **Overall Objective - Develop science and technology to detect, identify, quantify, map, and track the presence of chemical and biological warfare agents**
 - Fundamental development of signatures
 - Understand the interactions of the signatures with the environment
 - Develop physics based models enhanced with system engineering principles to provide a virtual system
 - War-gaming to develop optimal system capabilities, needs, and requirements
 - Virtual proving ground to optimize T&E requirements



S&T Overview



Joint Biological Standoff Detection System (JBSDS)

- **Demonstrate mature technology concepts for augmenting or replacing the current technology being pursued under Increment I of the JBSDS program**
- **Assess the merit of selectively integrating some of these technologies into a hybrid system that meets a broader subset of the Increment II specifications.**
- **Potential Resources Include Existing and Future:**
 - **Laser Induced Fluorescence**
 - **Elastic Scatter Depolarization**
 - **Differential Elastic Scattering**
 - **Passive IR Spectroscopy**
 - **Hyperspectral Imaging**
 - **Algorithm Development**
 - **Technology Modeling**



Program Overview



Joint Biological Tactical Detection Systems (JBTDS)

- **Program seeks to provide a light weight, low cost biological aerosol detection and sampling capability to the Joint Force.**
 - **FY07 New Start**
 - **Technology Readiness Evaluation (TRE) Planned 3rd-4th Qtr FY08**
 - **May adopt a Family of Systems approach**
- **Proposed Expeditionary Biological Detection (EBD) Advanced Technology Demonstration (ATD) supports JBTDS by:**
 - **Developing Concepts of Operations for tactical biological detectors**
 - **Clarifying requirements and systems engineering tradeoffs**
 - **Conducting Military Utility Assessment (MUA) of emerging technologies**



Program Overview



Joint Biological Standoff Detection System (JBSDS)

- **JBSDS Increment 2 will be employed to provide mobile on the move detection of biological hazards employed by various means and will provide early warning via the Joint Warning and Reporting Network (JWARN).**
- **Essential Resources Include Existing and Future:**
 - **Mobile Detectors (Vehicles, Ships, Unmanned Platforms)**
 - **Fixed Site/Static Detectors (Buildings, Vehicles)**



S&T Needs



Joint Biological Tactical Detection Systems (JBTDs)

- **Development of new sources and detectors**
 - Optimal performance at room temperature
 - Low cost, solid state
- **Development of physics based models enhanced with system engineering principles to provide a virtual system**



S&T Needs



Joint Biological Standoff Detection System (JBSDS)

- **Algorithm development**
 - Improvement of detection and discrimination algorithms
- **Spectral vs. narrow band fluorescence data**
- **Eye safe energies to increase system use in different environments**
- **Biological signature data collection and background data collection**
- **Prototype/test bed development**



Warfighter Needs



Joint Biological Tactical Detection Systems (JBTDS)

- **Rapid, automated detection of biological events**
- **Organically deployable, employable, and supportable**
 - **Reduce size and weight of systems/components**
 - **Reduce logistical footprint**
 - **Modular components for flexible integration**
 - **Simplified operation for unrestricted Military Occupational Specialties (MOS)**
- **JBTDS MS A will be based on the CBRN Sensors for Unmanned Applications ICD signed February 23, 2006**



Warfighter Needs



Joint Biological Standoff Detection System (JBSDS)

- **Ability to safely operate, survive and sustain operations in a biological agent threat area**
- **Defense from worldwide proliferation of biological warfare capabilities**
- **Detection of biological threat agents to provide early warning capabilities at mobile and fixed operating locations, mobile dismounted forces, naval and air platforms, during both day and night operations**



S&T Technical Challenges



Joint Biological Tactical Detection Systems (JBTDS)

- **Low cost, solid state replacement for photomultiplier tubes**
- **Enhance component life on excitation sources**
- **Direct electron pumped excitations sources (below 300nm)**



S&T Technical Challenges



Joint Biological Standoff Detection System (JBSDS)

- **Decreasing system size and weight while increasing detection and discrimination sensitivities**
- **Algorithm development**
 - Decreasing false alarm rates
 - Robustness to handle I-2 requirements and future capabilities
- **Modeling promising and future technologies**



Program Technical Challenges



Joint Biological Tactical Detection Systems (JBTDS)

- **Operationally significant capability within tactical constraints**
 - Sensitivity and False Alarm Rates
 - Size/Weight/Power tradeoffs
 - Rugged design for full range of environments and operational temperature range
 - Life cycle cost
 - Next-generation battery technology to extend mission life
 - Built in Test / Confidence checkers to increase availability



Program Technical Challenges



Joint Biological Standoff Detection System (JBSDS)

- **Suitable detection and discrimination sensitivities and ranges based on validated threat assessment**
- **Low false alarm rate**
- **Day/night capability**
- **System robustness to handle future biological threats**
- **Integration into future platform and systems - Modular Design**
- **CONOPS for future biological standoff**
- **Comprehensive testing of future systems**



S&T Capability Strategy



- **JBTDS**

- **Solid state components for excitation sources and detector elements**
 - **LEDS below 300nm**
 - **Direct electron pumped sources below 300nm**
- **Molded plastic optics**
- **Virtual models based on first principles linked with system engineering concepts**

- **JBSDS**

- **Development of signatures for exploitation**
- **Algorithms to take advantage of signatures**
- **Imaging technology**
- **Virtual models based on first principles linked with system engineering concepts**



Program Acquisition Strategy



Joint Biological Tactical Detection Systems (JBTDs)

- **System of Systems / Family of Systems approach:**
 - Multiple detection and sampling systems optimized for cost, weight, and power
 - Range of capability across the family:
 - Speed: Time to detect 1 min – 30 min
 - Information: Bio/non-bio, class-based ID, presumptive ID
 - Sensitivity
 - Confidence
 - Breadth of threat detected: 1 agent – many traditional and non-traditional agents
- **Spiral Development and Acquisition**
 - Field increments of capability for each family member as technology matures
- **Based on Marine Corps requirement for a man-portable modular system**
- **Conduct ATD FY06-08 to evaluate available technology**
- **In parallel with ATD develop CDD and prepare for Milestone B**
- **Select technology for JBTDs based on ATD results**



Program Acquisition Strategy



Joint Biological Standoff Detection System (JBSDS)

- **Joint Service Acquisition with 4 Service interest**
 - Smaller, more sensitive version of JBSDS Increment 1 with a lower false alarm rate that operates on the move and during the day & night
- **Assess multiple technologies to determine the synergy with Increment 1 technology**
- **Develop concepts to address Future Combat System and UAV platforms that integrate other battlefield/CB sensor data**
- **Perform requirements assessment and trade off analysis in conjunction with JRO/Combat Developers**
 - To validate CDD requirements
 - To develop CONOPS and employment architecture
- **Award competitive SDD contract to integrate improvements/other technologies with LRIP and production options**



S&T Funding



(\$M)	FY06	FY07	FY08	FY09	FY10	FY11	TOTALS
6.2	4.7	4.0	5.0	5.0			18.7
6.3	12.0	12.0	8.0				32.0
TOTAL	16.7	16.0	13.0	5.0			50.7

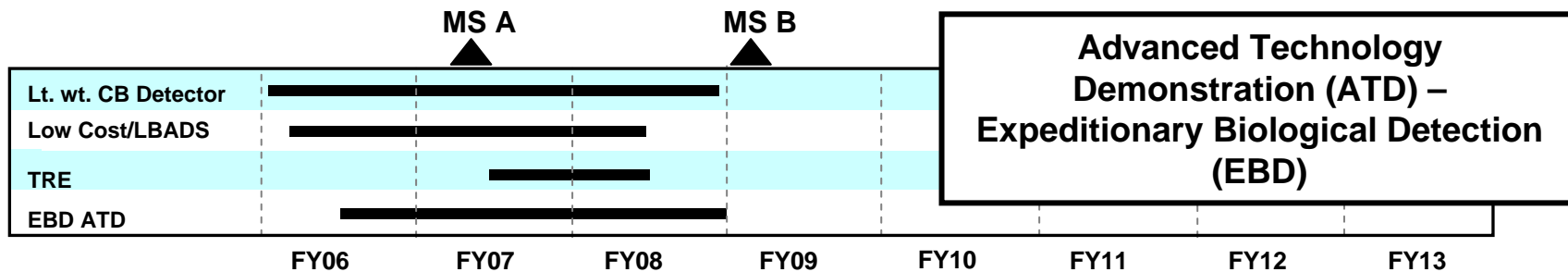


Program Funding

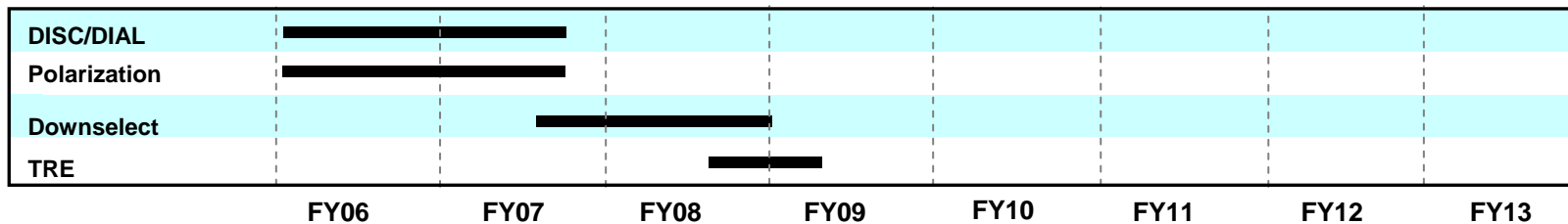


(\$M)	FY06	FY07	FY08	FY09	FY10	FY11	TOTALS
6.4			1.0	6.0	7.2		14.2
6.5		9.9	13.0	18.1	16.6	5.0	62.6
Proc						10.2	10.2
TOTAL		9.9	14.0	24.1	23.8	15.2	87.0

Joint Biological Tactical Detection Systems (JBTDS)



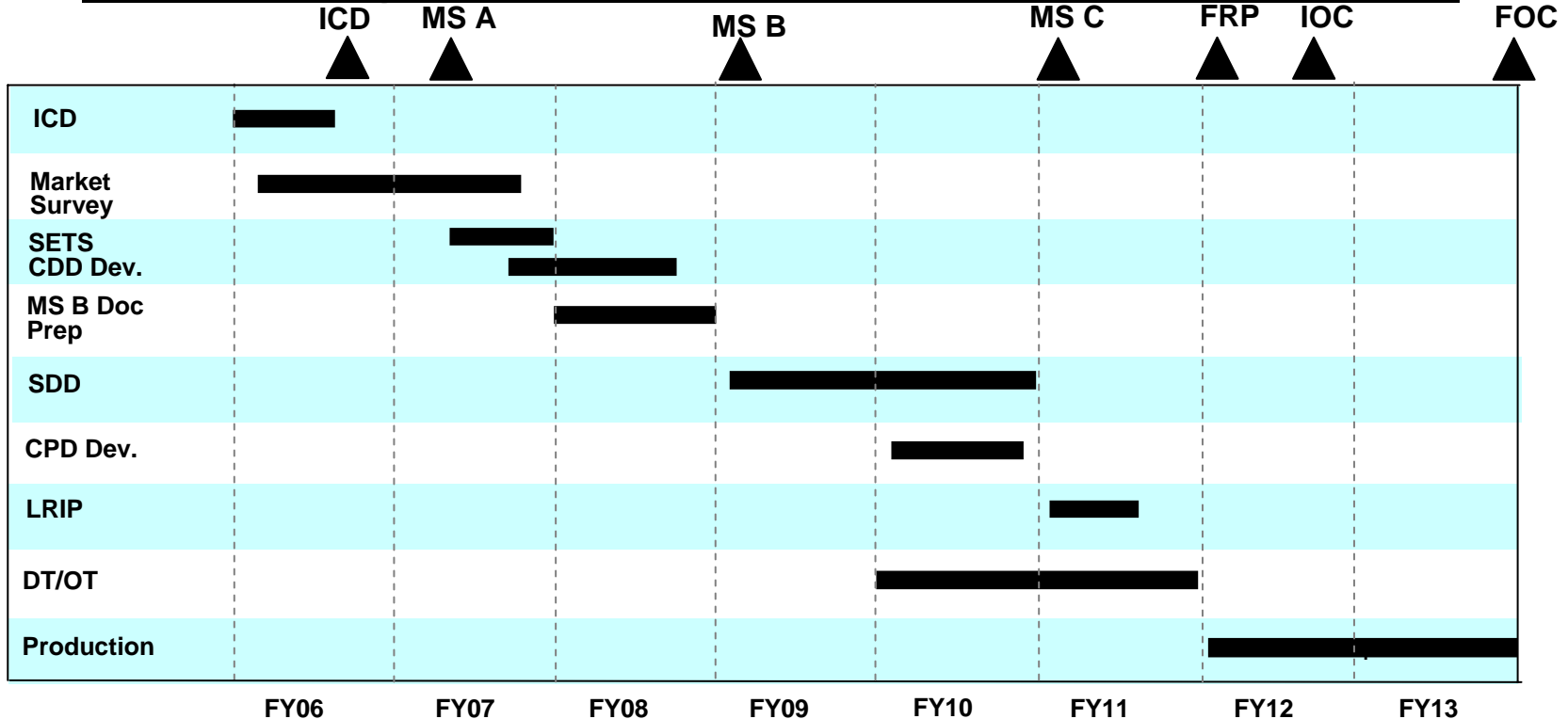
Joint Biological Standoff Detection Systems (JBSDS) Incr 2



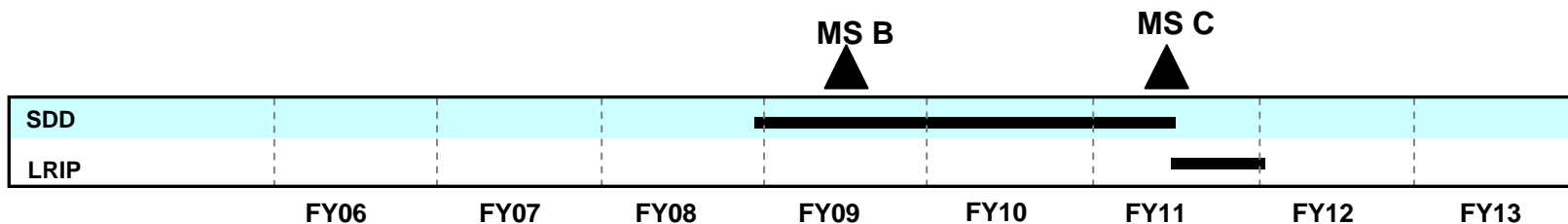


Program Schedule

Joint Biological Tactical Detection Systems (JBTDSD)



Joint Biological Standoff Detection Systems (JBSDS) Incr 2





Upcoming Business Opportunities



Joint Biological Tactical Detection Systems (JBTDS)

- Expeditionary Biological Detection (EBD) ATD
 - RFP 4th Qtr FY06
- Joint Biological Tactical Detection System (JBTDS)
 - Technology Readiness Evaluation RFP 2nd Qtr FY08

Joint Biological Standoff Detection System (JBSDS)

- Technology Readiness Assessment FY08
- RFP For System Development and Demo FY09

S&T Opportunities

- Techbase – SBIR FY07 – 09
- Techbase – CBDIF FY06 – 09
- Techbase – S&T BAA FY08 – 10



S&T Points of Contact



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Program Points of Contact



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