Session: 20148

JSSAP Science and Technology Advisory Council

2018 ARMAMENT SYSTEMS FORUM

May 9th, 2018

Marc Ritt

Joint Service Small Arms Program (JSSAP)

Today's Agenda

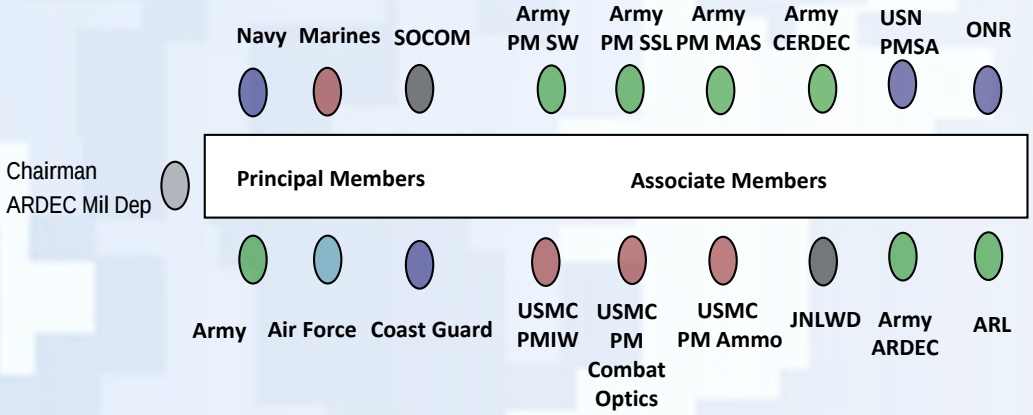
- **Purpose**
- **Mission of the JSSAP Organization – JSTAC Intersection**
- **JSSAP Science and Technology Advisory Council**
- **The Joint Small Arms Technology Development Strategy (JSATDS)**
  - **Technical Challenges**
  - **The Strategy**
- **Key Takeaways**

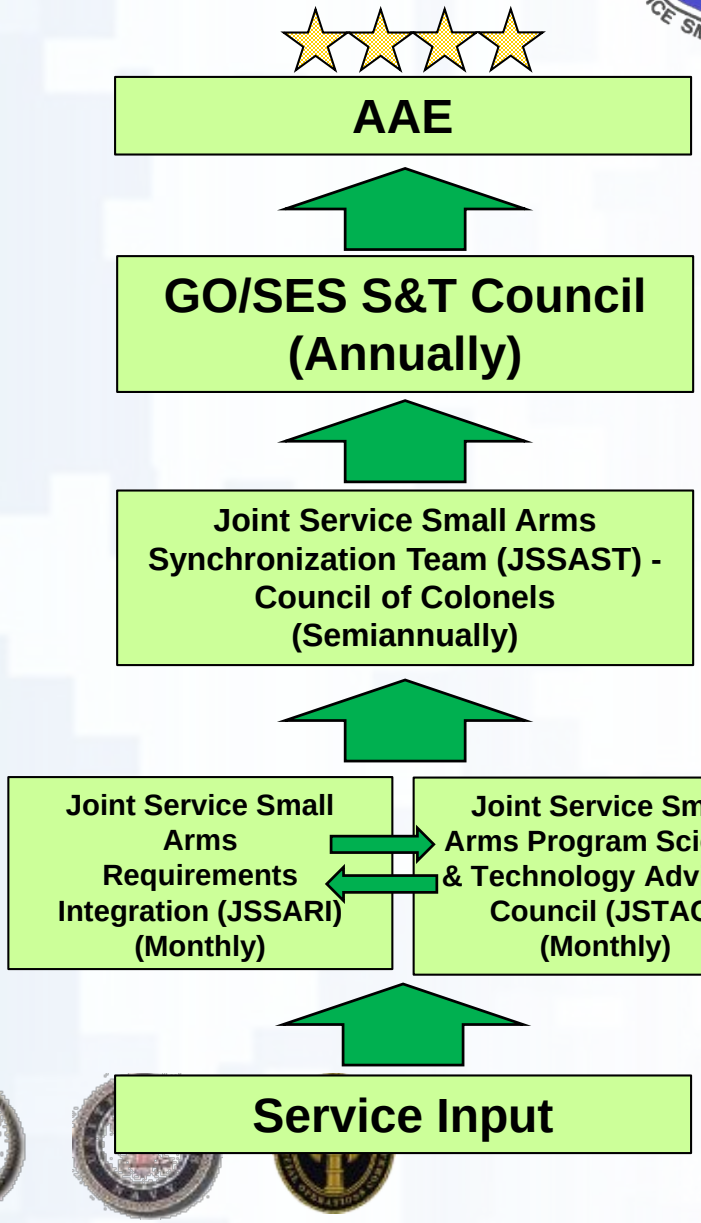
Joint Small Arms Synchronization Team Framework

Mission

The JSSAST Charter identifies 5 principal areas of responsibility:

1. **Intensive Management of the DoD Small Arms Tech Base**
2. **Harmonization of Requirements**
3. **Transition to Project Managers for Engineering and Manufacturing Development**
4. **Long Range Plans and Strategies**
5. **Influence of International Small Arms Activities**





Joint Service Small Arms Program Science and Technology Advisory Council (JSTAC) Update

JSTAC Approved for Execution on June 11, 2014 by the JSSAST

JSTAC Charter Mission Essential Tasks

1. **Establish a process for the timely exchange of Science & Technology information**
2. **Develop and maintain a Joint Service Small Arms Technology Development Strategy (JSATDS)**
3. **Maintain an awareness of the small arms Science & Technology portfolio**
4. **Maintain an awareness of both domestic and foreign technology and identify areas of possible exploitation**
5. **Recommend to the JSSAST prioritized plans, programs and strategies semi annually**

JSTAC Participants

1. **Army (ARCIC, ARDEC, ARL, ASA ALT, CERDEC, MCoE, PM MAS, PM SSL, PM SW, PEO Soldier, PEO Ammunition, RDECOM RFEC)**
2. **Navy (ONR, Navy Small Arms Programs, Naval Surface Warfare Center Crane)**
3. **Air Force (USAF HQ Security Forces Center)**
4. **Marines (PM MERS, PM IWS, S &T lead MARCORSYSCOM, USMC Capabilities Development Directorate)**
5. **Coast Guard (Specialized Capabilities CG-721)**
6. **SOCOM (SORDAC S&T, SOF AT&L, PEO-SW)**
7. **Other Agencies: JNLWD, CTTSO**

JSSAP Small Arms Systems R&D Strategy

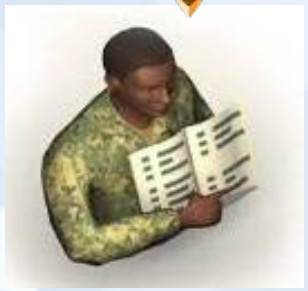
Futures Conferences

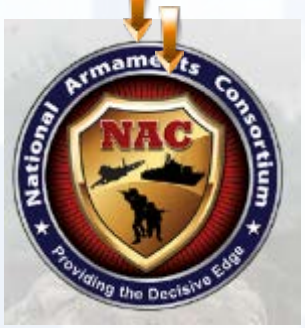
Small Arms Capability Based Assessments

Documented Requirements

Soldier Lethality Cross Functional Team

TRADOC Gaps Warfighte Outcomes





Technology Information Exchanges

International Small Arms Activities

JSSAST Priorities

The National Armaments Consortium

Joint Small Arms Technology Development Strategy

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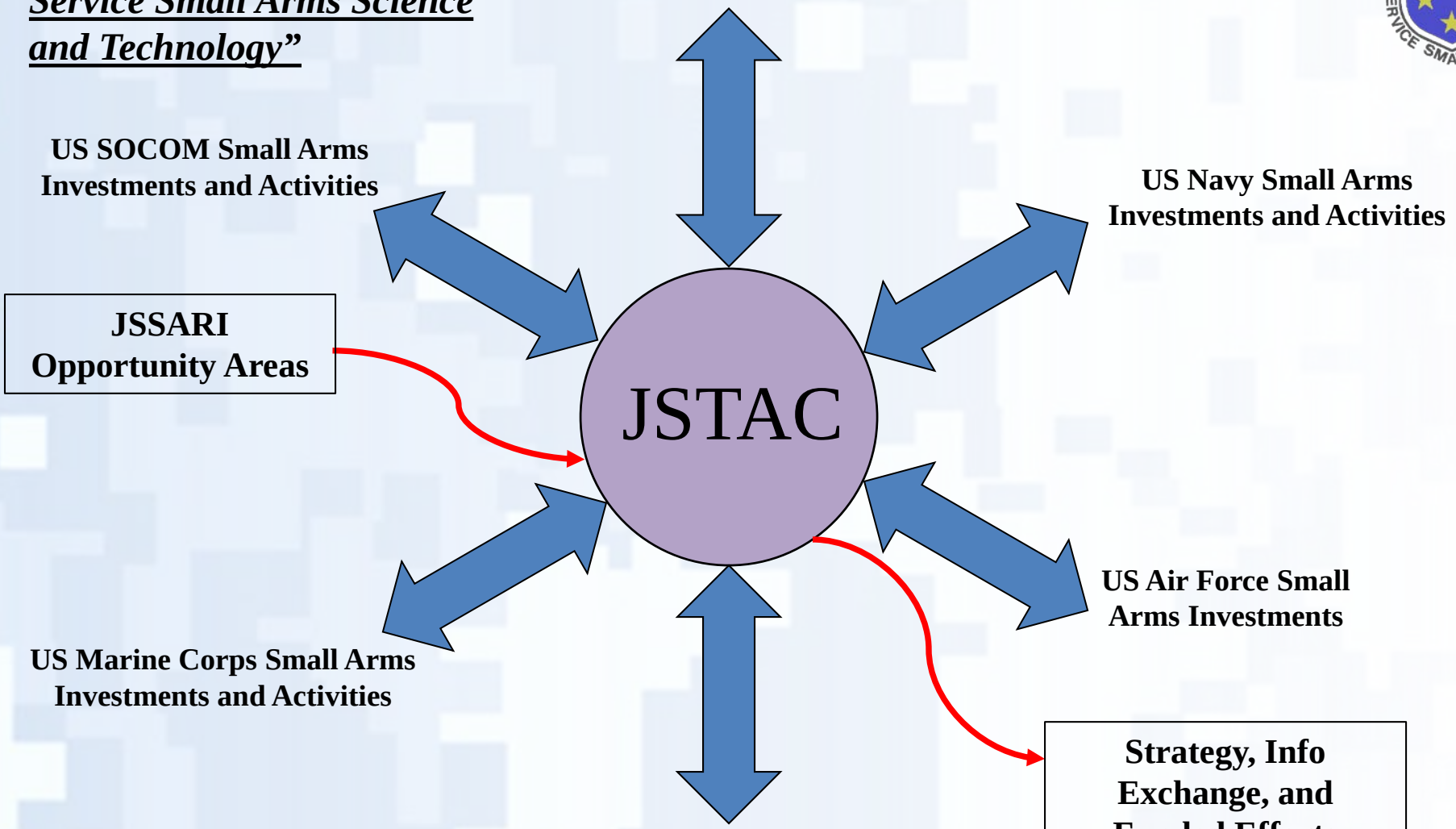
"The Crossroads of Joint Service Small Arms Science and Technology"



JSTAC Battle Rhythm (2018)

January – Post POM Submission Review

February – Soldier Lethality CFT Updates

March – Canada Program Agreement Meeting Prep

April – Prep for Spring JSSAST

May – NGIC Threat Briefing

June – Opportunity Area Analysis and Decomposition

July – Roadmapping, House of Quality for FY19 Project Selection, FY 21-25 POM Formulation

August – Tech Development Strategy Review and Update

September – Project Selection Voting Session

October – NATO Meeting Update

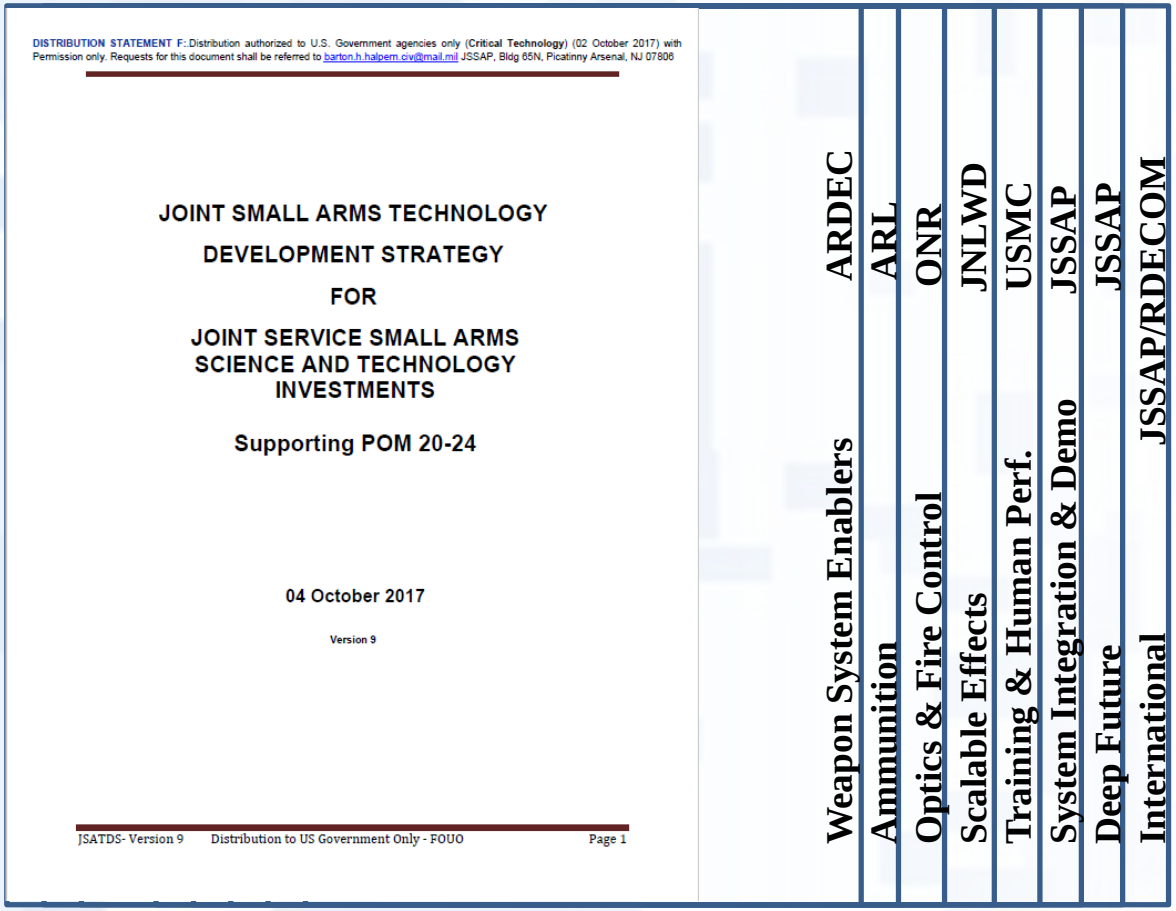
November – Prep for Fall JSSAST

December – Prepare Annual DOTC Input

*** In addition to other technical happenings within the joint small arms community

Joint Small Arms Technology Development Strategy (JSATDS) - Synergistic S&T Investments - Small Arm Weapon Systems

- **V6 (DIST F) Briefed to JSSAST June 2015**
- **V6 Used as the basis of POM 18-22 submission August 2015**
- **V7 (DIST F) created with Lead/Shape/Watch justifications to support POM 18-22**
- **Distribution A v1 version created Jan 2016**
- **V8 (DIST F) created to support POM 19-23 June 2016**
- **V9 (DIST F) created to support POM 20-24 October 2017**



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JOINT SMALL ARMS TECHNOLOGY
DEVELOPMENT STRATEGY
FOR
JOINT SERVICE SMALL ARMS
SCIENCE AND TECHNOLOGY
INVESTMENTS

Supporting POM 20-24

04 October 2017

Version 9

JSATDS- Version 9 Distribution to US Government Only - FOUO Page 1

Weapon System Enablers ARDEC
Ammunition ARL
Optics & Fire Control ONR
Scalable Effects JNLWD
Training & Human Perf. USMC
System Integration & Demo JSSAP
Deep Future JSSAP
International JSSAP/RDECOM

Foundational Strategies in BA 6.2 and 6.3 That Will Lead To Dominant Future Capabilities

Joint Small Arms Technology Technical Challenges

BA 6.2: Weapon Systems and Enablers	• Weapon systems, as a whole, must be designed as a system • Most significant contributor to the weapon error budget is operator induced aim error • Higher recoil energies • Higher operating pressures and more muzzle energy often come with increased weapon signature and weight
BA 6.2 Ammunition	• Higher muzzle velocities and muzzle energies are needed for improvement in accuracy, range, and lethality • Lack of knowledge regarding levels of noise, flash, IR signatures, and what levels these signatures result in detections • Seeker navigation that allows the munition to adjust while in flight
BA 6.2 Optics & Fire Control	• Positive threat Identification at Range night/day • Low SWaP-C sensors integrated across all of or parts of the visual, near-short-mid-long wavelength infrared (Vis-NIR-SWIR-MWIR-LWIR) range of frequencies • Biometric sensors for Human Tagging, Marking, and Tracking
BA 6.2 Scalable Effects	• Desired operational impact with increased range – multi mission/ multi effects • Miniaturization of Directed Energy Technologies for Small Arms • Sensors and non-lethal weapons
BA 6.2 Training & Human Performance	• Cognitive Burden of S&T investments on the Soldier as a System • Objective system to measure and analyze the performance of the soldier together with his/her weapon, equipment, ammunition, and training
BA 6.3 System Integration and Demonstration	• Integration of 6.2 key enablers onto applicable platforms, and demonstrate them in relevant environments as in integrated system
BA 6.2 Deep Future Plans	• Advanced Propulsion • Electromagnetic Launch • Battery Tech – High Density. Lightweight, Fast Charging
International Strategy	• Avoiding Technological Surprise

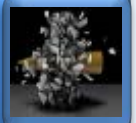
Joint Small Arms Technology Development Strategy (JSATDS) - Synergistic S&T Investments - Small Arm Weapon Systems

BA 6.2 S&T Investment Areas (Ranked 1-N)

Weapon System/ Enablers

1. Accuracy / Controllability
2. Advanced Weapon Operation
3. Signature Reduction
4. Maintenance and Reliability
5. Enabling Weapon Technology Areas
6. Remote Weapon Technologies
7. Deep Futures

Ammunition



1. Advanced Weapon Operation
2. Signature Reduction
3. Propulsion
4. GNC for defilade kill
5. Improved Projectiles
6. Reduced Range Training Ammo
7. Deep Futures

Optics & Fire Control

1. Optics Sensors, Imagers, & Displays
2. Deformable Visible Optics
3. Enhanced Ballistic Computer
4. Active Barrel Stabilization
5. Human Tagging, Marking, and Tracking
6. Wind and Environmental Sensing
7. Steerable Range Finding
8. Ballistic Trajectory Shaping and Off-path Lethality
9. Deep Futures

Scalable Effects

1. Multi mission/ Multi effects
2. Adjustable range and velocity
3. Directed Energy Miniaturization
4. Embedded Sensors
5. Deep Futures

Training & Human Performance

1. Adapt LEAP - A to characterize task/ condition/ standards parametric data for small arm Soldier in the Loop Performance
2. Human Factor Studies - reduction of training for operations, reduction in cognitive burden

Deep Future Plans

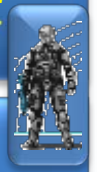
1. Advanced Propulsion
2. Electromagnetic Launch
3. Advanced Fire Control System
4. Future Studies
5. Increased S&T Exchanges w/ Research Labs , DARPA & Depart of Energy Labs
6. Dedicated 10% of 6.2 Investments

International Strategy

1. Create additional agreements with NATO Allies and Partners for Peace
2. NATO Leadership
3. Leverage RDECOM RFEC

NATO OTAN

BA 6.3 S&T Investment Areas



SI&D

1. Integrated Fire Control
2. Weapons & Ammo for NGSWT
3. Ammunition
4. Smart Munitions
5. Scalable Effects

Foundational Strategies in BA 6.2 and 6.3 That Will Lead To Dominant Future Capabilities

Final Thoughts

The JSATDS provides a great example of the Success of the JSSAP Organization and Stakeholders.

Key Takeaways:

1. **JSSAP continues to fulfill its mission through a series of strategic engagements (JSSAST, JSSARI and JSTAC) with key stakeholders at multiple echelons at the service component level.**
2. **JSATDS section leads were provided from ARDEC, ARL, USMC, JSSAP, JNLWD, and ONR creating a Joint document from inception. This document serves as a partnership with shared accountability (creation and financial), with joint engagement, joint learning and decision making. The JSATDS supports the tenets of the chartered mission of the Joint Service Small Arms Program (JSSAP) office.**
3. **JSATDS summarizes by investment taxonomy and Army Budget Activity dollars, associated investments necessary to mitigate the JSSAST Top 50 Opportunity Areas, Supports Program Objective Memorandum FY20-24 submission to support the Dismounted Warfighter, portrayed through the lens of the Soldier Modernization Deep Dive.**
4. **The resultant POM 20-24 Strategy requires a significant increase in budget activity funds 6.2 & 6.3 to support near term product improvements as directed by the Soldier Lethality Cross Functional Team and far term revolutionary investments in order to Maintain and Achieve Joint Warfighter Overmatch.**