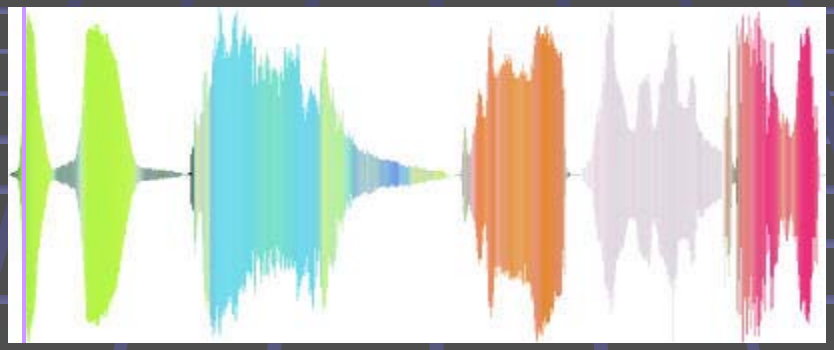
# Supressors, Evolving to an Integrated Unit



## Designing with the Soldier in mind

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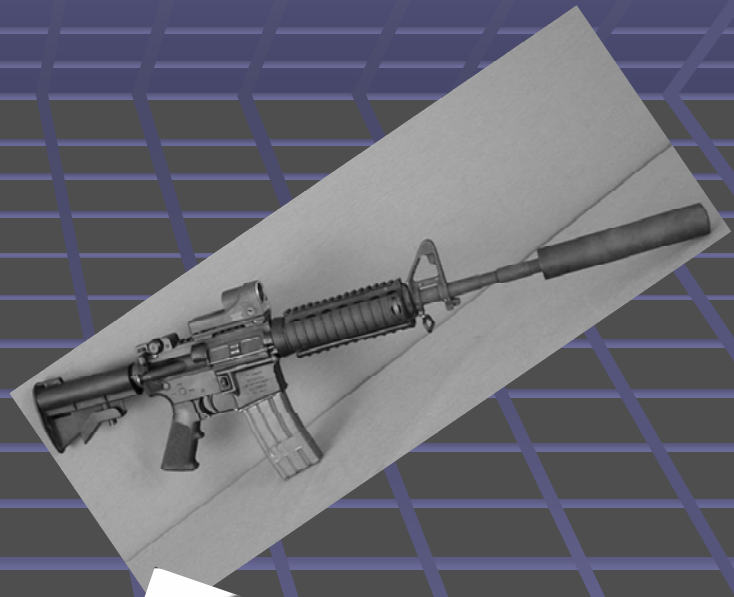
# Briefing Objectives

- Call to Industry for an Integrated Unit
- Update on FoSAS Program Activities and Timeline
- Future Program Expansion



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# CALL for an Integrated Unit

Currently available Designs were adapted to Commercial Market and in some cases to Law Enforcement

Different models & designs, different strengths no Consistency (size, weight, flash, sound, Sights, blowback etc.)

Evaluate currently fielded weapon configurations for Design consideration

Next Generation Suppression system

Two dimensions to Integrating suppression:

1. An Integrated Suppressor Unit that supports the full gamut of features as prescribed in the User requirements

2. An Integrated Weapon system that includes suppression capabilities that meet User requirements but requires no ancillary attachment (good application may be Machine Gun)


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# Design Considerations

**Gap**

- One multi-feature (sound, flash, etc.) Solution for suppressed weapon
- Baseline Data availability (Methodology for acquiring data)
- Performance Standards availability

**Improvement opportunity**

- Blowback Reduction (Gas, Debris, ground disturbance etc.)
- Suppressor Induced Weapons modifications (replacement compensator, barrel etc.)

-Size & weight
-Heat / Cooling
-Sight compatibility
-Method of attachment
-Loosening, Alignment

**Supportability**

Logistic

- Spare Parts management (washers, sights, flash compensator, etc…)
- Suppressor cleaning vs. Weapon cleaning
- Maintenance requirements

-Storage and Handling
-Life expectancy of Suppressor (Life cycle mgt –pats vs. system)


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# Need Statement = User Requirements

| Threshold (t) and Objective (o) | | |
|---|---|---|
| **Attribute** | **Development Threshold** | **Development Objective** |
| Sound Reduction | The suppressor shall lower the average peak sound pressure level 10db when compared with the average unsuppressed weapon, current service pistol; M4 Carbine; M16A2/4 Rifle (T). | The suppressor shall lower the average peak sound pressure level 20 db when compared to an unsuppressed weapon (O). |
| Flash Reduction | The suppressor shall be designed to reduce flash, firing signature visual, and blooming effect of the weapon such that it is less than the existing weapon flash hider. (T) | No flash visible to the naked eye during day and night conditions from a distance of 100 meters.(O) |
| Modification/ Compatibility<br>Blank Firing Adapter<br>MILES<br>M9 bayonet | If mounting the suppressor requires changing the existing weapon flash compensator, the new flash hider/muzzle compensator shall be compatible with the current blank firing adapter, current MILES system and the current M9 bayonet (T) | Suppressor shall attach without modification to the existing flash hider (O) |
| Muzzle Velocity | The suppressor shall not reduce the muzzle velocity of the round more than 2% compared to the baseline system.(T). | The suppressor shall not reduce the muzzle velocity of the round (O). |
| Sight Compatibility | The suppressor must not interfere with the fitting or use of any of the currently issued weapons optical or iron sights, aiming lights or illumination devices (for example: M68, M145, PEQ-2, PAQ-4, PAS13,etc) for M4/M16 and M249 (T). | The suppressor must not interfere with the fitting or use of pistol optical or iron sights, aiming lights or illumination devices (O).<br>There should be no change in zero of optics or sights on any weapon systems when fired suppressed or unsuppressed (O). |
| Ground disturbance | The suppressor shall be designed to reduce visual firing signature such as disturbance of dust, foliage, and debris so that it is less than the base line weapon. | No ground disturbance visible to the naked eye during day and night conditions from a distance of 100 meters.(O) |
| Immersion | The suppressor shall require no more than two second drain time to fire after full submersion in , and removal from, seawater. (T) | Zero second drain time to fire with no special manipulation of weapon is desired other than firing mode selection (O). |
| Blowback | The suppressor when attached shall not create any discernable blowback in the form of carbon, soot, or flash toward the operator (T). | T=O |
| Protective Coating | All suppressors will be corrosion, abrasion, impact and chemical resistant.(T) | T=O |
| Cleaning Kit | The suppressors will be designed in a manner that will permit cleaning utilizing the Warfighter's individual cleaning kit.(T) | T=O |


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# Technical Aims/Design Objective

FoSAS Test subjects :

- M4/M16 (5.56mm) using M855 ball ammunition -
- M9 (9mm) using M882 ball ammunition –

Great Turnout 11-M9 and 11 M4/M16 suppressor models submitted

| Characteristics | Baseline M4-M16/M9 | Desired Performance |
|---|---|---|
| Sound Level | | <=140 db |
| Flash size | | Below baseline |
| Dispersion | | Below baseline |
| Muzzle Velocity | | Below baseline |
| Recoil | | Below baseline |
| Toxic Fumes | | Below baseline |


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# Test Parameters

## Technical Assessment - ATC

**Objective:**

Evaluate Advantages and/or disadvantages of Suppressors in operational exercise

**SAFETY Test**

| Subtest | Rounds Required |
|---|---|
| Inspection | N/A |
| Velocity | 40 |
| Sound Level | 30 |
| Muzzle System Flash | 30 |
| Reliability/Durability | 5,000 |
| Immersion | 45 |
| Mean Point of Impact Shift | 10 |

**Bid Sample Base:**

**11-M9 (77)**

**11-M4/M16 (77)**

**Technical Test:**

| Subtest | Rounds Required |
|---|---|
| Inspection | N/A |
| Toxic Fumes | 30 |
| Low Temperature | 500 |
| High Temperature | 500 |
| Sound Pressure Level | 30 |
| Rough Handling | N/A |
| Muzzle System Flash | 30 |
| Accuracy Dispersion | 30/90 |
| Accessory Compat. | N/A |
| Ammo Compat. | N/A |
| Immersion | 45 |
| Reliability/Durability | 5,000 |



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# Human Factors Engineering

## User Assessment -SBL

1. Determine Test system suitability in the execution of the following tasks
   - **New Equipment Training**
   - **Close Quarters Marksmanship**
   - **Urban Obstacle Course**
   - **Individual Movement Technique Course**
   - **Combat Pistol Qualification Course**
   - **Reflexive Fire**
   - **M4/16 Zero and Qualification Range**

**Bid Sample Base:**

**11-M9 (88)**

**11-M4/M16 (88)**

2. Determine ability of Soldier to engage targets with reduced risk to hearing and without being detected by sound or muzzle flash.

3. Determine ability of Soldier to maintain Command and Control and not be affected by blooming effect, when firing within buildings and especially at night.

4. Determine ability of Soldier to maintain maneuverability and survivability in more open terrain, without compromising location through muzzle blast disruption to vegetation/foliage or signature created by dust, sand and snow disturbance.

5. Determine and compare durability and reliability of suppressed weapon

6. Determine and compare accuracy of soldier/weapon system at know distance ranges (10 rds→100 m, 300m)



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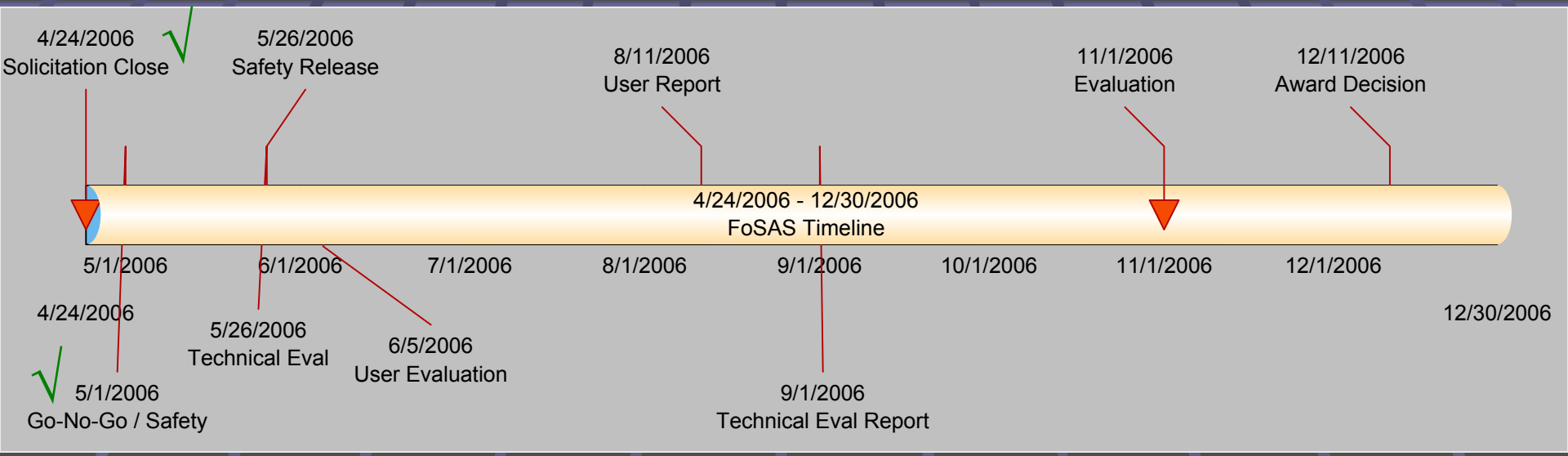
# FoSAS Program Update

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# Program Expansion & Direction

- Expansion of FoSAS to Include M249
- Joint effort with USMC on FoSAS
  - Will be monitoring User Eval
- Rapid fielding effort on the way for M14 and M24
- Survey  for M240 and M2


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