

GENERAL DYNAMICS

Ordnance and Tactical Systems

2014 NDIA Joint Armaments Conference .338 Medium Machine Gun Suppressor Test Results

Matthew Diehl
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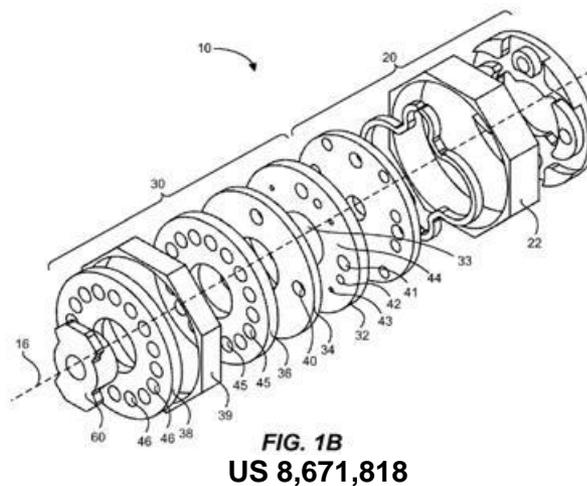
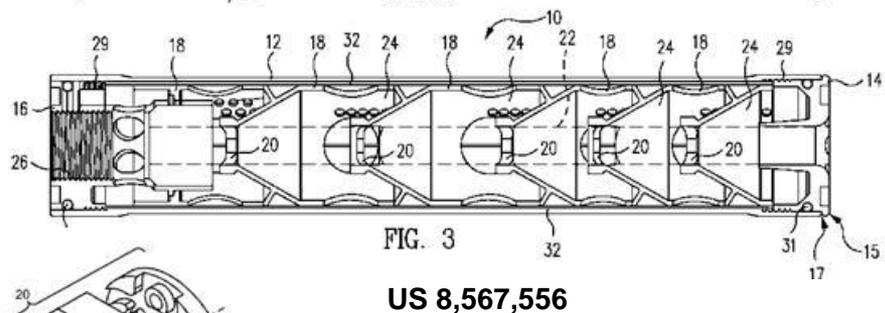
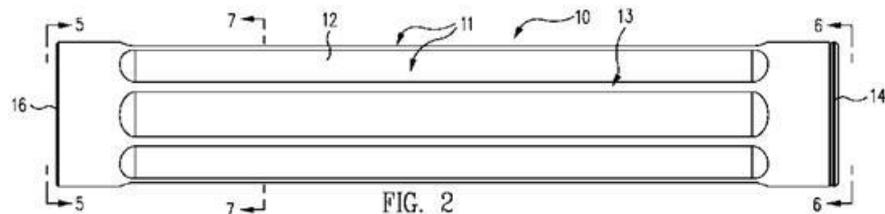
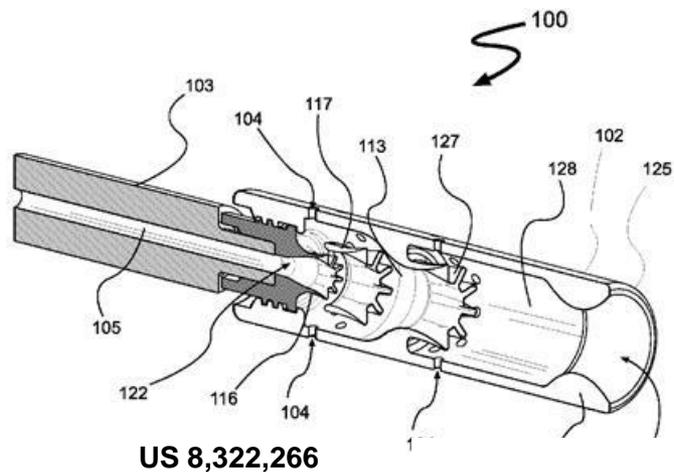
Suppressor History

- Since warfare graduated from archery to firearms signature suppression has been a goal
 - Reduce chance of being located by the enemy
 - Hearing damage to the gunner and others
 - Communication between troops
- Silencers range in size from .22 cal to 155mm
- Amazon.com has 10+ books on how to build your own silencers
- US Patent Office has hundreds of patents

Suppressor Science

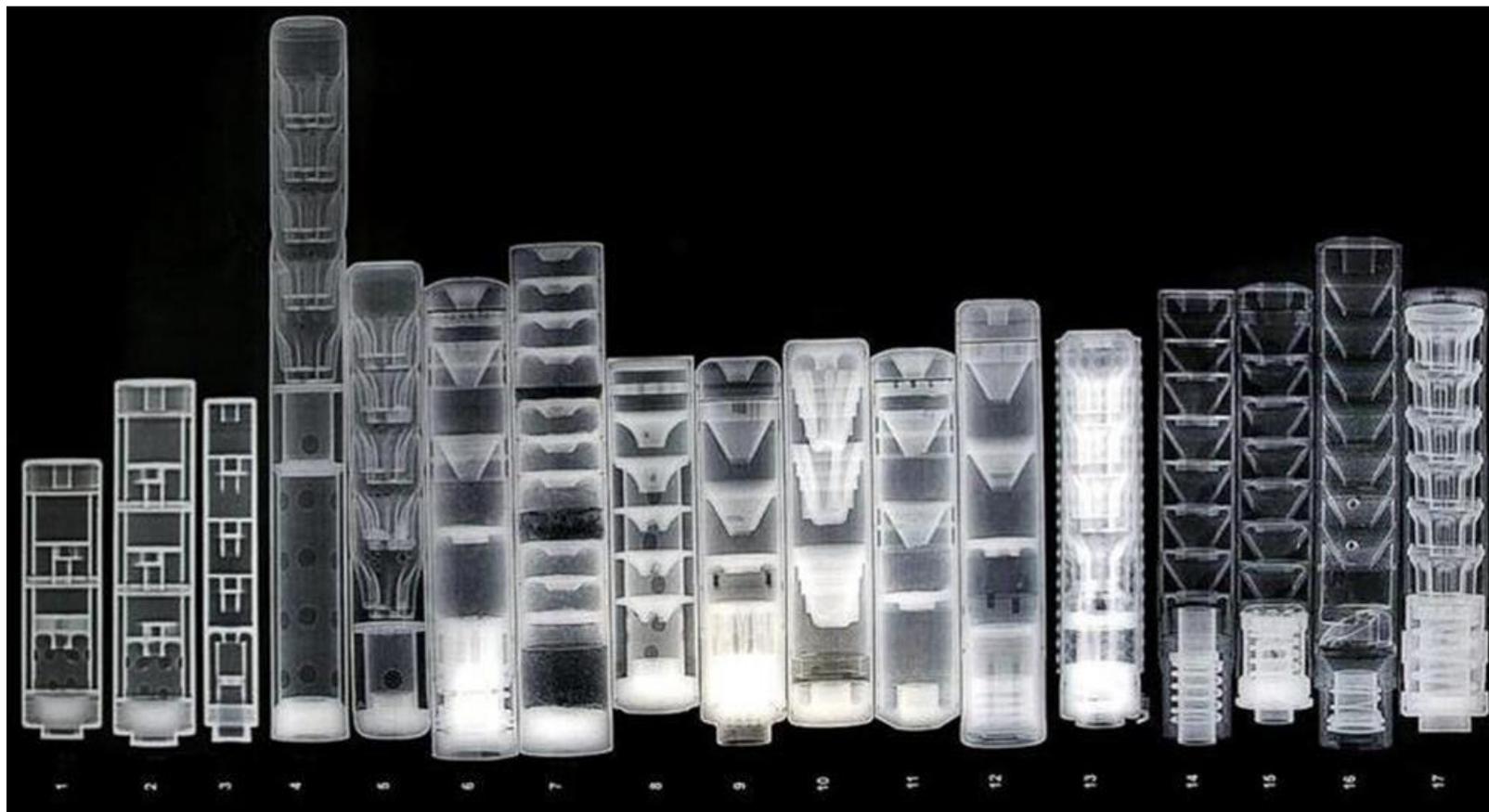
- Suppression = Gas and Energy Management
- Reduce peak energy and increase duration
 - ↗ Controlled expansion into baffles
 - ↗ Release at subsonic velocities
 - ↗ Mixing with cooler ambient air
- Absorb energy
 - ↗ Mechanical work
 - ↗ Heating
 - ↗ Phase change (wet suppressors)

Examples of Suppressor Interiors



Source: www.uspto.gov

Examples of Suppressor Interiors



<http://www.thefirearmsforum.com/showthread.php?t=111003>

Jack404 07-27-2012, 08:36 PM

Medium Machine Gun

- **Lightweight Medium Machine Gun chambered in .338 Norma Magnum that eliminates the capability gap between currently fielded 7.62mm and .50-cal**
- **24 pound system weight similar to M240**
- **Recoil similar to 7.62mm NATO weapons**
- **1900+ meter effective range**
- **5x projectile energy at 1000m (vs. 7.62 NATO)**
- **Rate of Fire: 525 rounds per minute**



MMG Suppressor Design

- Suppression Goals
- Thermal Profile
- Fatigue Cycle
- Cost
- Corrosion
- Length
- Weight
- Manufacturing



2013 IR&D Project

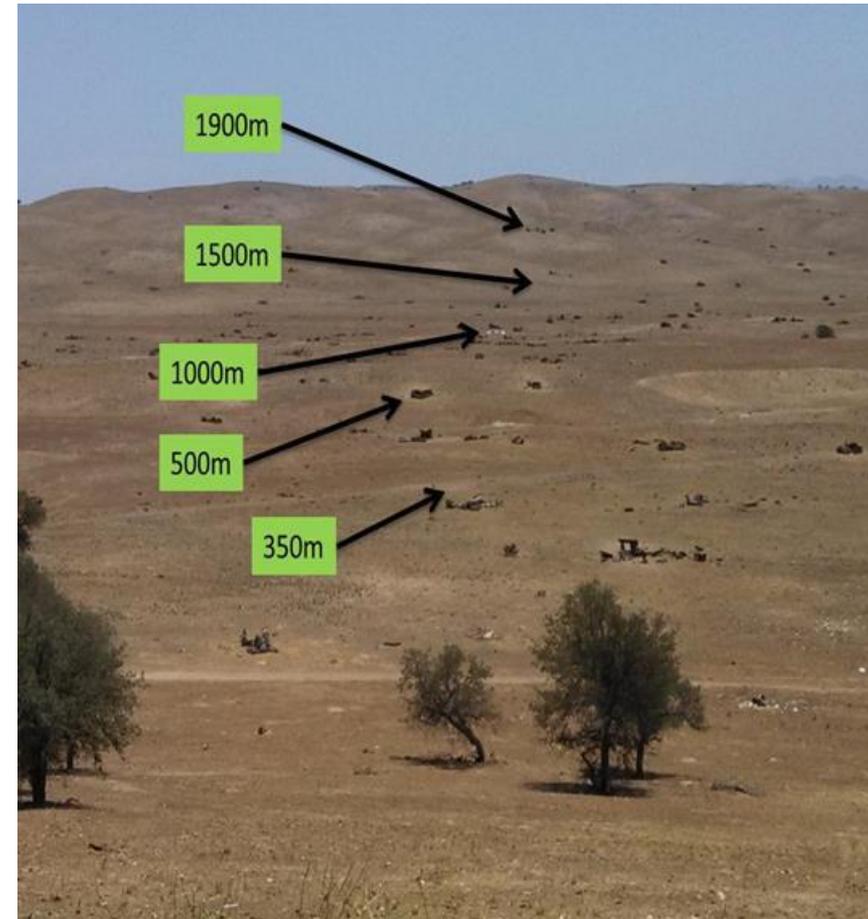
- Step 1: gas volume management analysis
 - Step 2: iterations of baffle shape and placement
 - Step 3: design to cost / manufacturing review
 - Step 4: 500 round fire test
-
- Results: ~10 dB reduction (1/2 peak sound level)
 - Geometry: 12.3" Long
 - Weight: 1.8 Lbs

MMG Suppressor Live Fire Testing

- Three weapons and one suppressor fired 500 rounds during the engineering test

| Weapon | Rds Fired | Rounds Fired Suppressed |
|-----------|-----------|-------------------------|
| Weapon #1 | 300 | 150 |
| Weapon #2 | 170 | 170 |
| Weapon #3 | 180 | 180 |

| Location | MMG Unsuppressed | MMG Suppressed |
|----------|------------------|----------------|
| Left | 123 dB | 113 dB |
| Behind | 120 dB | 110 dB |



Post-test Results

- No thermal damage or distortion to the suppressor
- Minimal erosion to the baffles
- Acceptable amount of fouling
- No detrimental effect on the weapon
- No measurable increase in long range dispersion

- Suppressor reassembled and returned to service

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