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# Small Arms Signature: FY2024

*Presented by: Dr. Les Flemming & Mr. Jonathan VanBuskirk*



*CAPT Rex Boonyobhas, USN  
Commanding Officer*



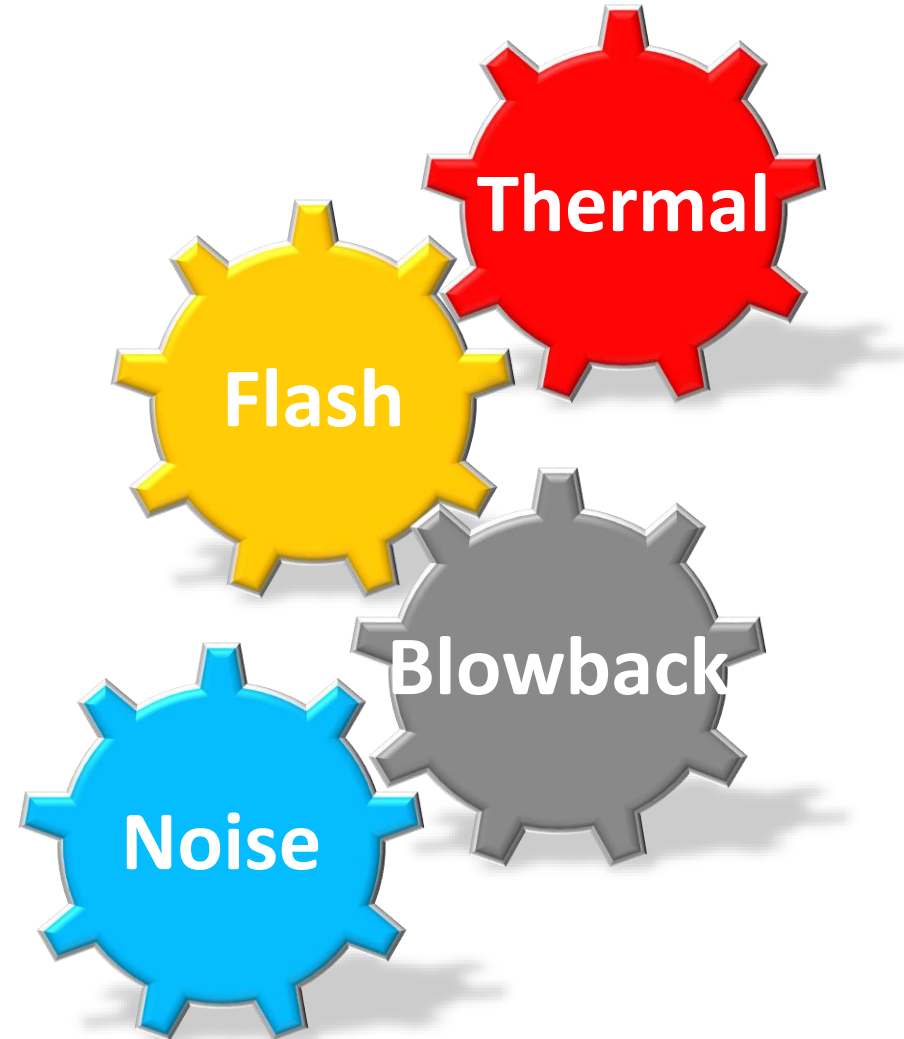
*Dr. Angela Lewis, SES  
Technical Director*

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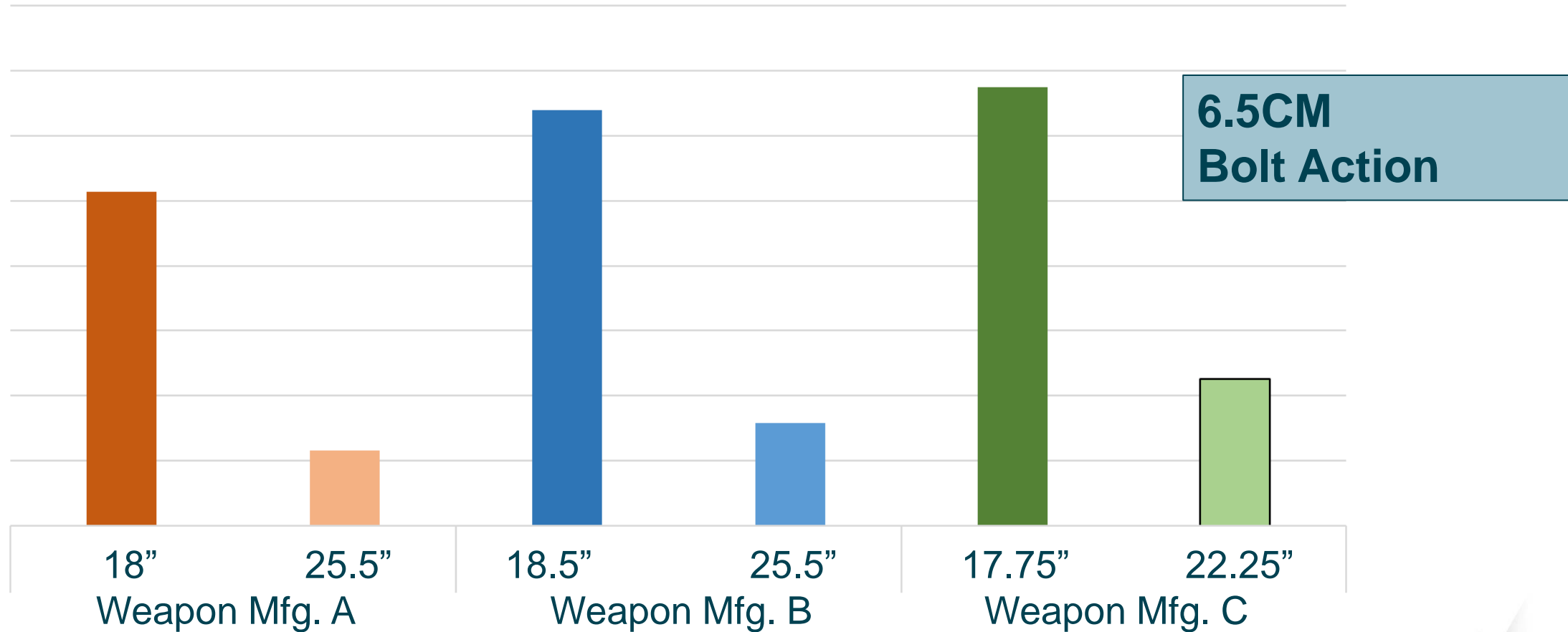
- **Suppressor Metrics**
- **Test result**
  - Barrel length
  - Suppressor size
  - Ammunition
- **Novel Suppressor Development**
- **State of the Industry Testing**
  - FY24
  - FY25

**Impulse Noise**  
**Flash**  
**Blowback**  
**Thermal**  
**Cyclic Rate increase**  
**Weight**  
**Length**  
**Condemnation & Sustainment**  
**Cost**



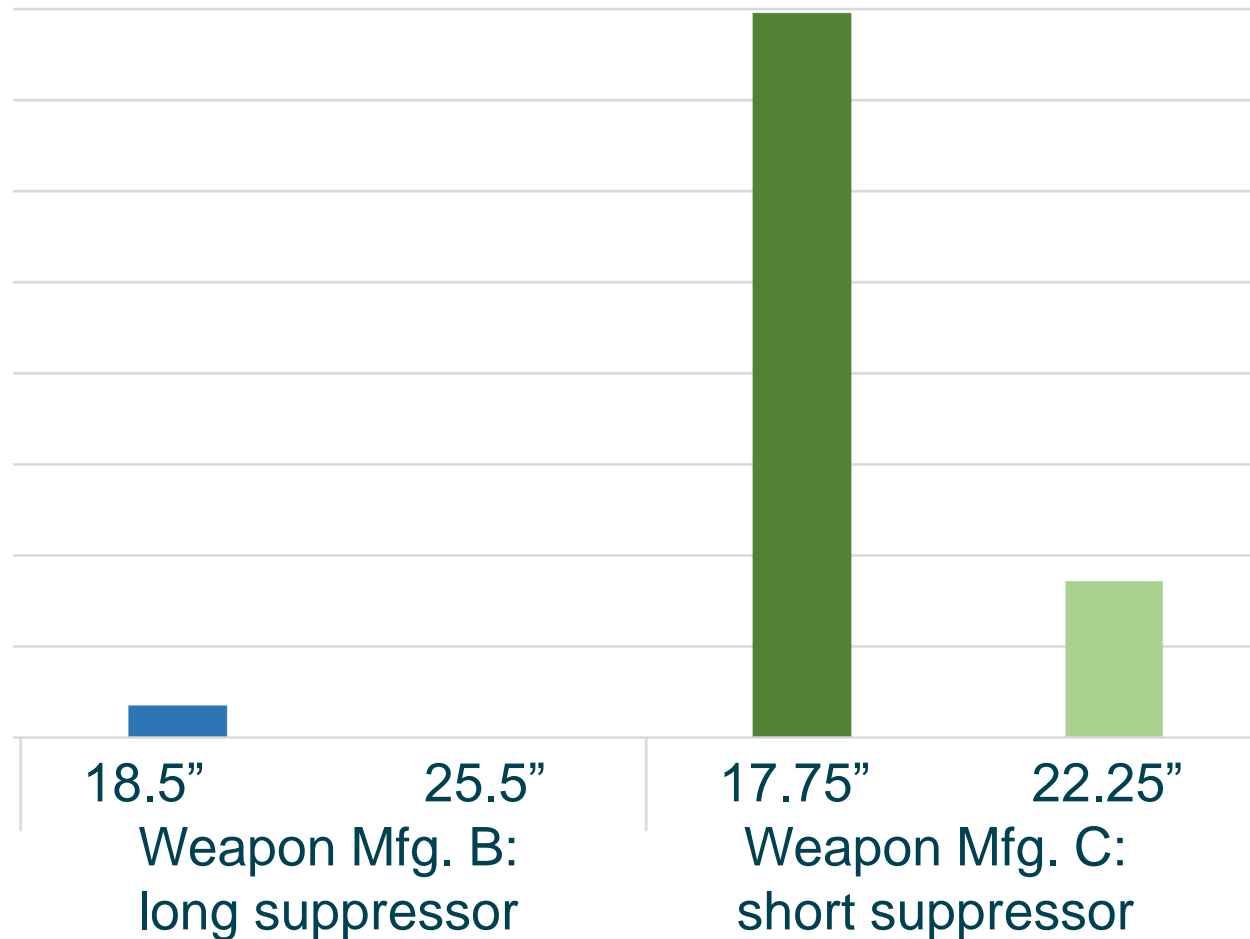
# Visible Flash Factors: Barrel Length

Visible Flash Energy (mcd x s) - Unsuppressed



# Visible Flash Factors: Suppressor Size

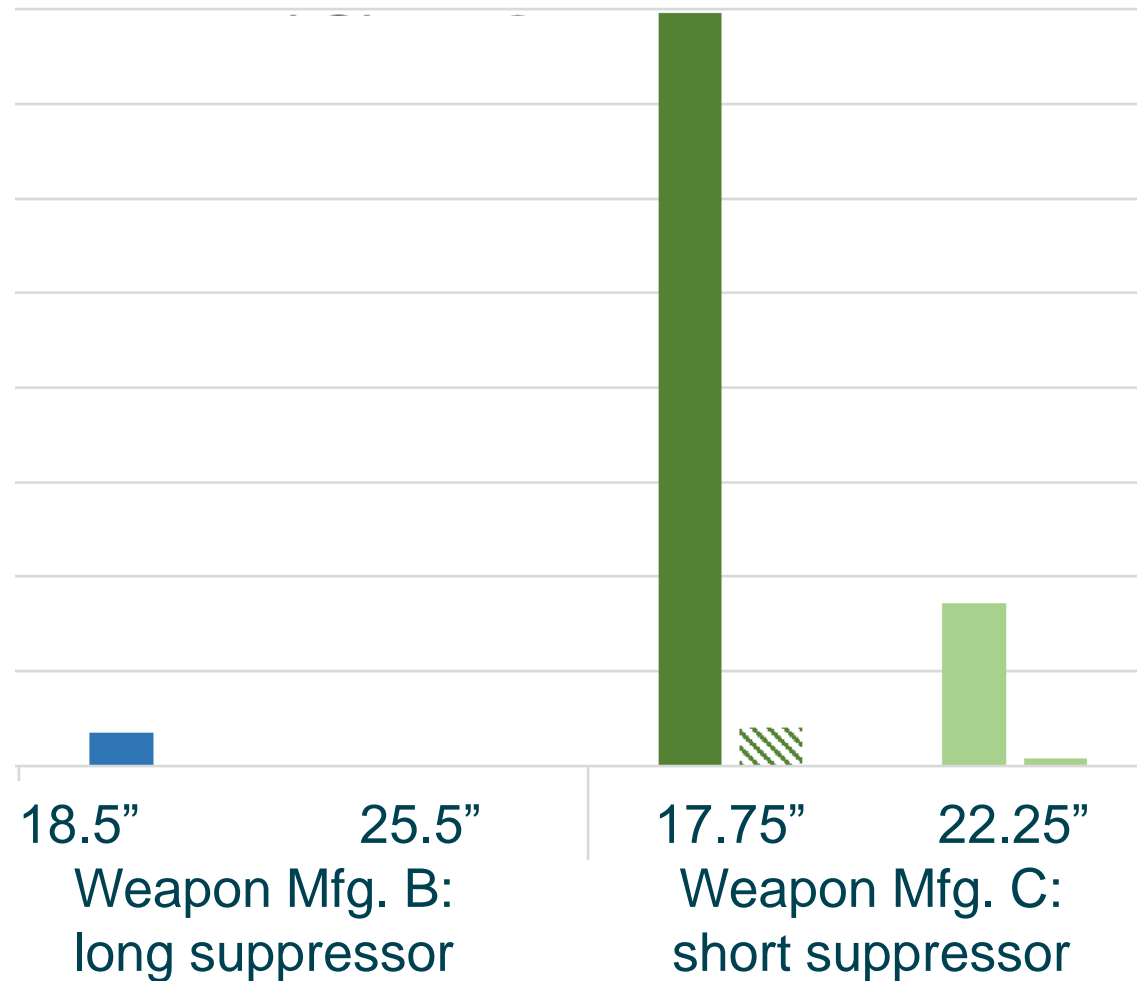
Visible Flash Energy (mcd x s) – Suppressed Shot 1



**6.5CM  
Bolt Action**

# Visible Flash Factors: Shot

Visible Flash Energy (mcd x s) - Suppressed Shot 1 and Shots 2+



**6.5CM  
Bolt Action**

# Peak Sound Pressure Levels – Lpk: Barrel Length

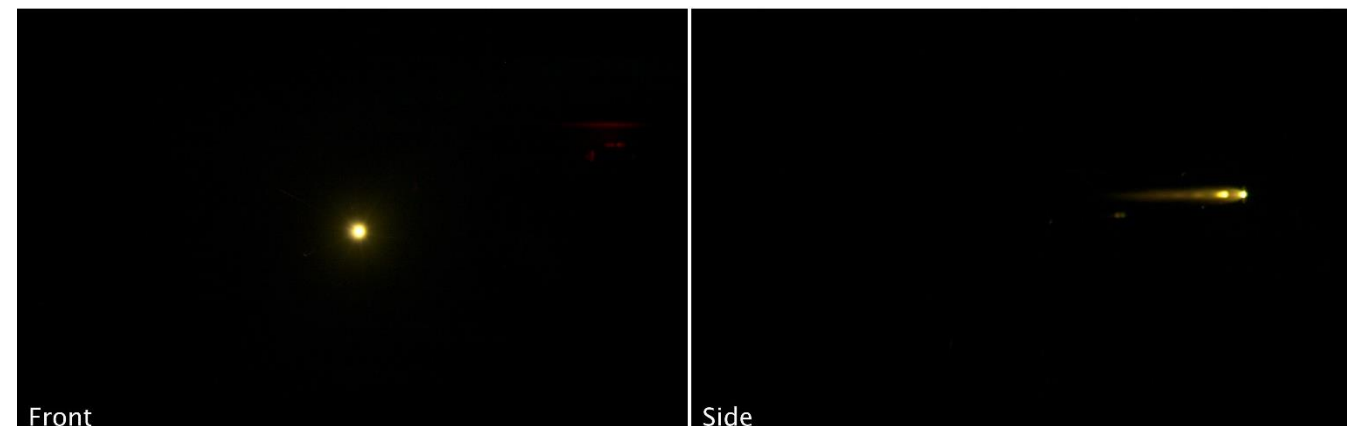
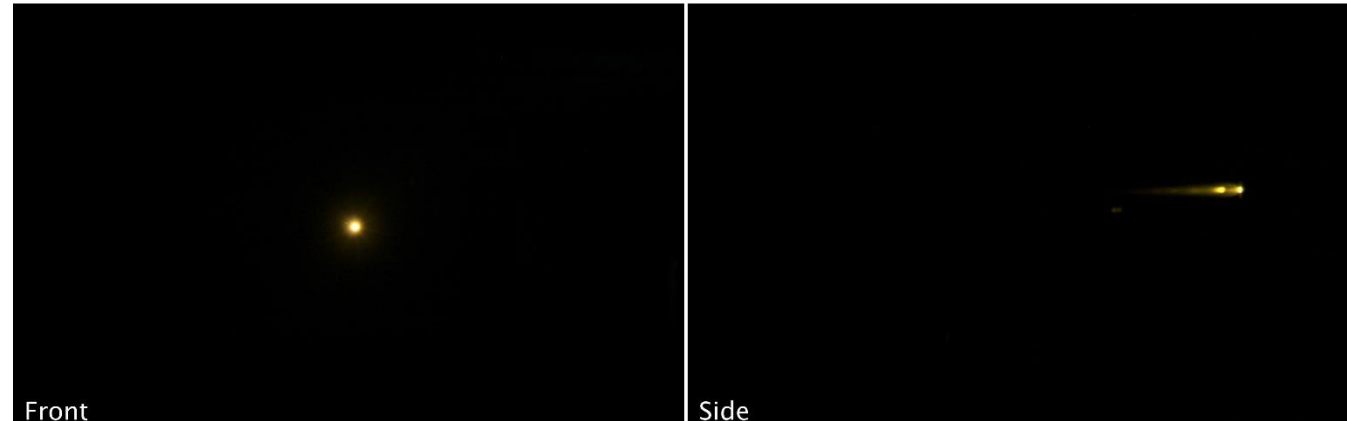
- **Shooter’s Head Location:**
  - 11” rear of trigger and 3” left of bore

**6.5CM  
Bolt Action**

	Barrel Length	Difference in Barrel Length	Difference in Lpk (dB)
Suppressor Vendor A	18.0"	7.5	-5.36
	25.5"		
Suppressor Vendor B	18.5"	7.5	-4.89
	26.0"		
Suppressor Vendor C	17.75"	4.5	-3.40
	22.25"		

## Visible Flash Factors: M855 vs M855A1

- 5.56x45, 11.5", Gas Gun
- M855
- M855A1
  - 20% higher pressures
  - 21% higher visible flash energy





# Novel Suppressor Development

- **Blast overpressure**
  - Operators
  - Sensors
- **50 Cal MG**
- **Mini Gun**
- **30mm**



Radical Defense – 30mm



Thunder Beast – 50Cal BMG

- **Thunder Beast Arms Corp. Silencer Summit (August 2024)**
  - Test as many silencers as possible in one place at one time with the exact same setup.
  - Share sound-testing best practices and train additional people on the PULSE.
- **JSSAP collaborated to collect flash signature using mobile blackout shooting bay.**



<https://thunderbeastarms.com/sound/summit2024/>



Shooting bay with weapon mount & data collection.

NSWC Crane Mobile Black-out Shooting Bay for Flash Testing

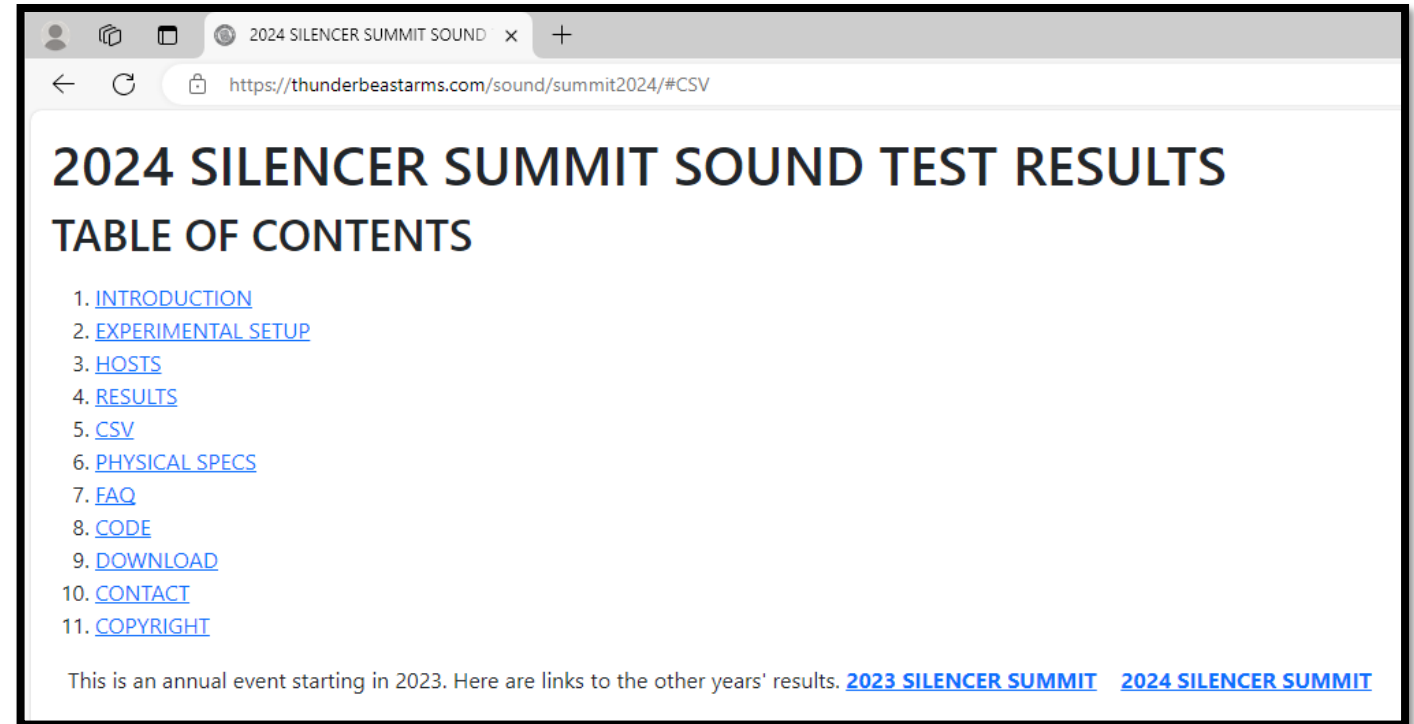
- **Thunder Beast Arms Corp. Silencer Summit**

- **Sound testing**

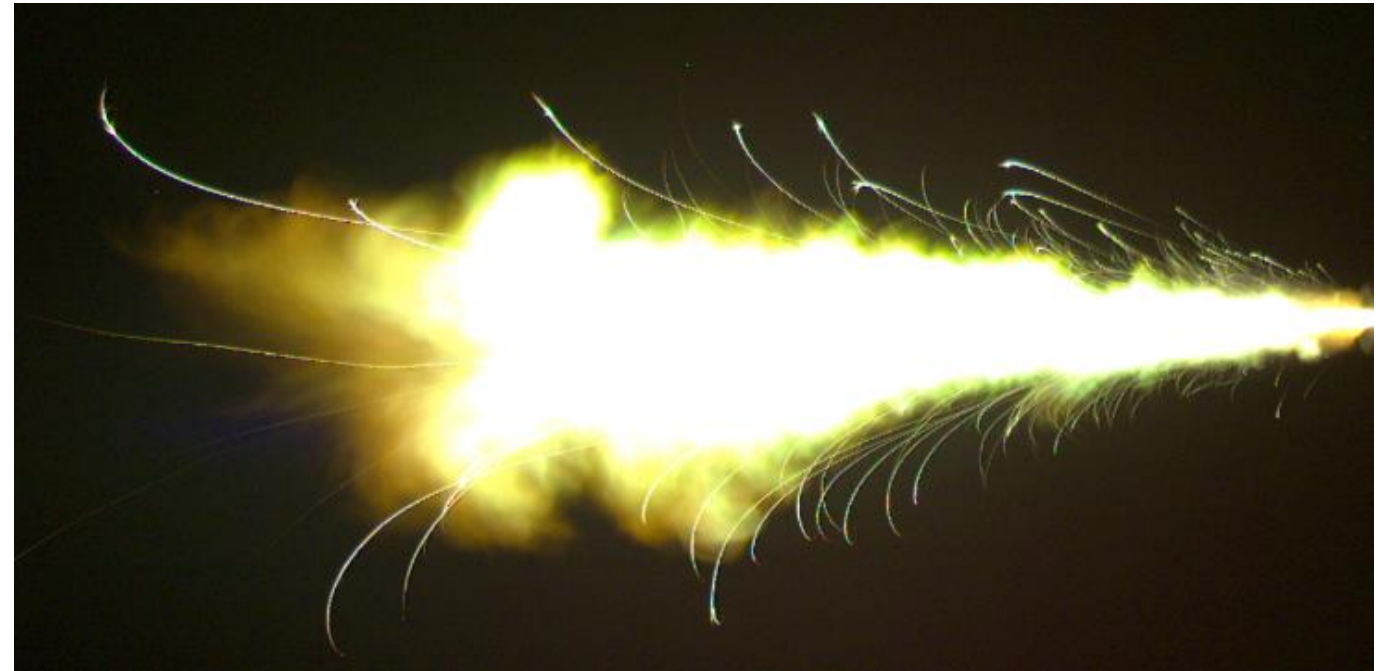
- 23 Vendors
- 365 Configurations
- Bolt-action .308
  - M118LR
- Daniel Defense 16" AR-15
  - M193 ammo

- Results available at

- **<https://thunderbeastarms.com/sound/summit2024/#CSV>**



- **Thunder Beast Arms Corp. Silencer Summit**
  - **Flash Testing conducted by NSWC-Crane according to NATO AEP 4785**
    - 17 vendors
    - 98 Configurations
    - 18" .308 AR-10
      - M118LR
    - 10.5" AR-15
      - M193 ammo
  - **Still processing data**
  - **Access to military weapons & ammo continues to be an issue.**



- **2024 USMC Suppressor Rodeo (September 2024)**
  - Use the current state of industry to establish requirement
  - Inform vendors of suppressor testing methodologies
    - Flash, Impulse Noise, Blowback, Back Pressure, Dispersion
  - 12 Vendors
  - 36 Configurations (suppressed, unsuppressed)
  - 20” 5.56x45mm Mann accuracy barrel
  - M855A1 ammo



Mann accuracy barrel



NSWC Crane outdoor range for sound





- **USMC Suppressor Rodeo key takeaways**
  - Muzzle device – some NOT flash hidiers
  - Thermal signature – rate of heating / cooling
  - Blowback
  - Size & weight
  - More to come.



- **2025 Joint Service Signature Suppression (JS3) Test Event**
  - Held in conjunction with ISOF Range 2025
  - Use the state of industry to establish requirement
  - Inform vendors of suppressor testing methodologies
    - Flash, Impulse Noise, Blowback, Back Pressure, Dispersion
  - M4 - 5.56x45mm – 16” barrel
  - M855A1 ammo
  - Participation will be conducted via SAM.GOV

**March 2024**



- **Joint Service Small Arms Program (JSSAP)**
  - Joint Services Small Arms Metrics & Evaluation (JSSAME) Group
  - Joint Service Signature Suppression (JS3)
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