CAPT JT Elder, USN
Commanding Officer
NSWC Crane

Ms. Trisha Herndon, SSTM
Acting Technical Director
NSWC Crane

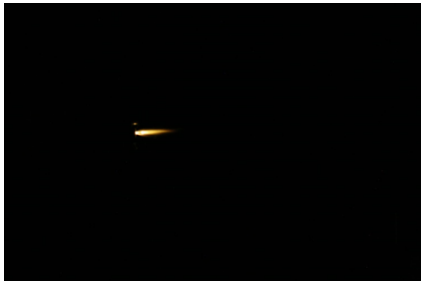
NDIA Armaments Conference

NATO Panel

Presented By: David Long, Small Arms Weapons Division

Date: 27-April-2016

Why Participate in the ToE



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CAPABILITY PRODUCTION DOCUMENT

For

Family of Muzzle Brakes and Suppressors (FMBS)

Increment II, III (III A, III B), IV, and V Version 1.0

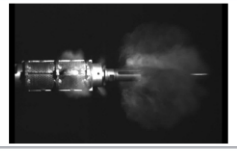
ACAT: 3
Validation Authority: USSOCOM J8

S&T Opportunity
Personal Defense Weapon Upper Receiver Group $XXK

NSWC Crane Division — Internal Rapid Experimentation Funding

FY 2014

Project Description: This concept is to develop an integrally suppressed drop-in, short barreled, between 7 to 8.5 inch, Upper Receiver Group (URG) for the M4A1 Carbine that would use a 30 caliber bullet in a cut-down 5.56 cartridge to improve accuracy and penetration capability at shorter ranges in a more compact system than is currently available to the Warfighter. In addition, the suppressor includes novel material to improve heat transfer and sound dampening. Revolutionary manufacturing methods will also be explored.

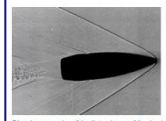


Project Justification: This project needs to be conducted at NSWC Crane based on its Small Arms expertise and established programs of record that would permit easy insertion of the proposed technol
changi

S&T Opportunity
Relevant Weapon Signature Evaluations

$: XXXK
PI: Owen Cramer
NISE Category:
Basic /Applied Research

Project Description:
Developing effective sound and flash suppression for small arms weapons is critical for warfighter survivability. Often, however, visual and acoustic weapon signatures are evaluated subjectively or using potentially irrelevant parameters. Even when quantitative measurements are obtained, well-defined comparison measurements and standardized techniques are lacking. This leads to difficulty in comparing suppression systems. In this project, we'll methodically develop a set of relevant and quantitative parameters and testing procedures to evaluate the efficacy of visual and/or acoustic suppressors in small arms weapons.



Shadowgraph of bullet above Mach 1

A subjective flash measurement technique

= 148.6 dB

What Does NSWC Crane Gain

- Collaboration with doctoral level expertise across NATO


Australia


Canada


Netherlands


Norway

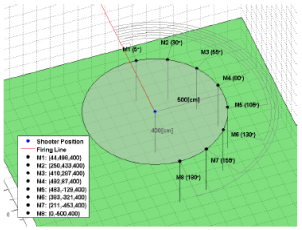

Sweden


United Kingdom


United States (Army, Marine Corps, Navy)

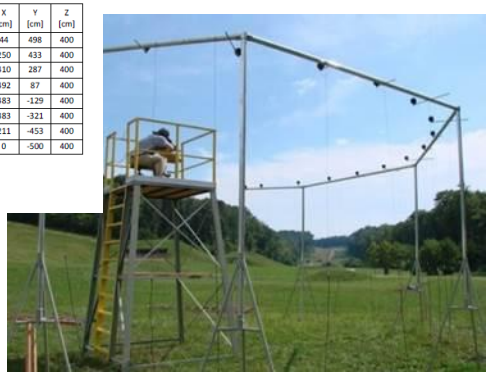
The Result

Repeatable, quantitative methods



Microphone number	Angle [deg]	X [cm]	Y [cm]	Z [cm]
M1	5	44	498	400
M2	30	250	433	400
M3	55	410	287	400
M4	80	492	87	400
M5	105	483	-129	400
M6	130	383	-321	400
M7	155	211	-453	400
M8	180	0	-500	400

Figure 4 Transducer placement specification.



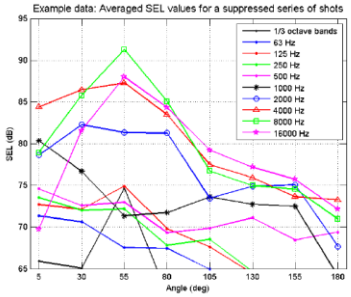


Figure A.2 A selection of averaged 1/3 octave band SEL values for a suppressed series of shots as a function of the angle.

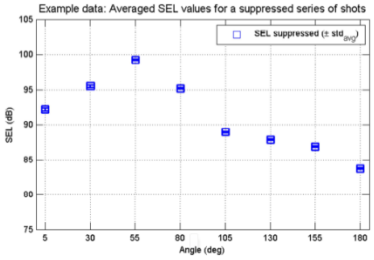
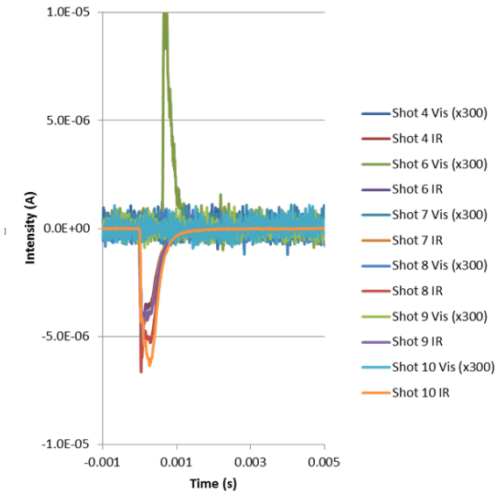


Figure A.1. Averaged SEL values for a suppressed series of shots as a function of the angle (for 8 microphones). Error bars are also given (± the standard deviation of the average based on 20 shots).



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