

A Path to Overmatch Next Generation Individual Weapon System

by

Jim Schatz

Presented at the
2016 NDIA Armament Systems Forum
Fredericksburg, VA
27 April 2016



A Quick Review



Review (2008 – 2015)

2008
Capability Stagnation through Acquisition Dysfunction

Time for a Change
US "Incremental" Small Arms Fielding Failures and Solutions
Part I - Small Arms
by Jim Schatz

Incremental Excellence

Tomorrow's State-of-the-Art Assault Rifle Today

By Jim Schatz
Symposium 2009

Incremental Excellence
Tomorrow's State-of-the-Art Assault Rifle Today

By Jim Schatz
13 November 2009
Technology Day for Improved Carbine Weapon System (F)

Incremental Excellence

Tomorrow's State-of-the-Art Assault Rifle Today

By Jim Schatz
20 August 2008 Symposium

2009
New & Emerging Material Opportunities

Time for a Change
US Small Arms & Ammunition Fielding Status Report – August 2009
Presented by Jim Schatz
at the
23rd Annual European Small Arms Symposium
Shrivenham, UK

2014
A Strategic Opportunity?

Where To Now?
by
Jim Schatz
Presented at the
2015 NDIA Armaments Small Arms Forum
Whippany, NJ

2015
How to Counter the Threat

2010
Allied Agreement

Historic Opportunities for US and NATO Ground Combatants

by Jim Schatz
Int Armaments Conference
19 May 2010
Dallas, Texas USA

2013
Falling Behind The Threat

Seize the Moment – An Optimized Caliber and the IC Competition

Presented by
Jim Schatz
25 May 2011
Indianapolis, Indiana

2011
IC - A Missed Opportunity



RUS Crimea/ISIS Hybrid (2015-Present)



	100	200	300	400	500	600	700	800	900	900	800	700	600	500	400	300	200	100	
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M4 5.56x45					500									500					AKM/AK74
M249 5.56x45								800											
									1000										SVDS 7.62R
M249 5.56x45								800											
				1500															PKP 7.62R
M14EBR 7.62								800											
									1000										SVDS 7.62R
M240 7.62													1100						
				1500															PKP 7.62R

Threat +4

2 additional 7.62R's added



RUS/Chechen SF w/ 26 lb.* 7.62x54mmR PKM's



From their Intl Trng Cntr for Special Forces Facebook page – Mar. 2016





SO what have we learned since 2008?



- The threat (RUS, ISIS, al-Qaeda, others) continues to exploit the stand-off advantages (800+ meters) of 7.62x54mmR weapons (PKs/SVDs) beyond 5.56mm NATO effective range (500 meters).
- The US & NATO acknowledge this capability gap. Response is:
 - 16+ caliber studies since 2005 (CAN, FR, GBR, GER, USA – **RUS?**)
 - 2014 US Army Small Arms Strategy spawned SAAC Study
- Key Enablers are available, being fielded/implemented **NOW**
 - Carbine **Training** to 600 meters (US Army Small Arms MMTc)
 - Disturbed Reticle Carbine Sight** (Steiner ICS - Italian Army - 2016)
 - Lightweight Ammo** for Legacy Weapons (MAC .50 BMG in SOF)
 - Industry/Govt **LICC's** (.260 Rem., LSAT 6.5mm CTA, .264/.277 USA)
 - **@ 6 lb. Host Platforms** (in 7.62mm) for LICC, LSAT 6.5mm Carbine
- **SO IW Overmatch Art-of-the-Possible is “fieldable” in 1-3 years.**



NO what have we learned?



**Exploiting Available
Next Generation Technology
& Training**

**Can/Will Bring Overmatch
to the War Fighter
in Short Order**

BUT WE MUST ACT NOW!



Exploiting Available Technology = Overmatch

The Medium vs Heavy Machine Gun Example



- TRL7+ Maturity, IR&D Funded by GD-OTS, available now!
- 23 lb. weapon (versus 28 lbs. M240B, 84 lbs. M2HB)
- 1900 meter MER (= .50 caliber M2HB, Threat DShK HMG's)
- 2X MER and 5X ME (at 1000M) of 7.62x51mm NATO
- .338NM Ammo Weight 1/3 that of .50BMG (+19% in polymer)
- Can replace both MMG (dismounted) and HMG (mounted) using exiting US tripods & mounts

System weight comparison for 10 minutes of sustained fire

		
Min Combat System M240	Min Combat System MMG	Min Combat System M2HB
M240 28 lbs	MMG .338 Variant 23 lbs	M2HB 84 lbs
ACOG Sight 2.5 lbs	ACOG Sight 2.5 lbs	ACOG Sight 2.5 lbs
M192 Tripod 11 lbs	M192 Tripod 11 lbs	M3 Tripod 44 lbs
Spare Barrel 6.6 lbs	Spare Barrel 6.2 lbs	Spare Barrel 25 lbs
800 Linked Rds 53 lbs	500 Linked Rds 60 lbs	400 Linked Rds 132 lbs
Total 101 lbs	Total 102.7 lbs	Total 287.5 lbs
Load Break Down (3 person team)	Load Break Down (3 person team)	Load Break Down (9 personnel)
Gunner (wpn, sight 100 rd) 37 lbs	Gunner (wpn, sight 100 rds) 37.5 lbs	3 personnel (Weapon) 84 lbs
A. Gunner (Trpd, S.Brl 300 rd) 37 lbs	A. Gunner (Trpd, Sp Brl, 100 rds) 29.2 lbs	1 person (Tripod) 44 lbs
Ammo Bearer (400 rds) 27 lbs	Ammo Bearer (300 rds) 36 lbs	1 person: (sp barrel and ACOG) 27.5 lbs
		4 personnel (100 rounds each) 132 lbs



.50BMG .338NM 7.62 5.56



**So let's do this
for the rifleman
(70-80% of our small unit,
rifle squad, SOF team
members)**



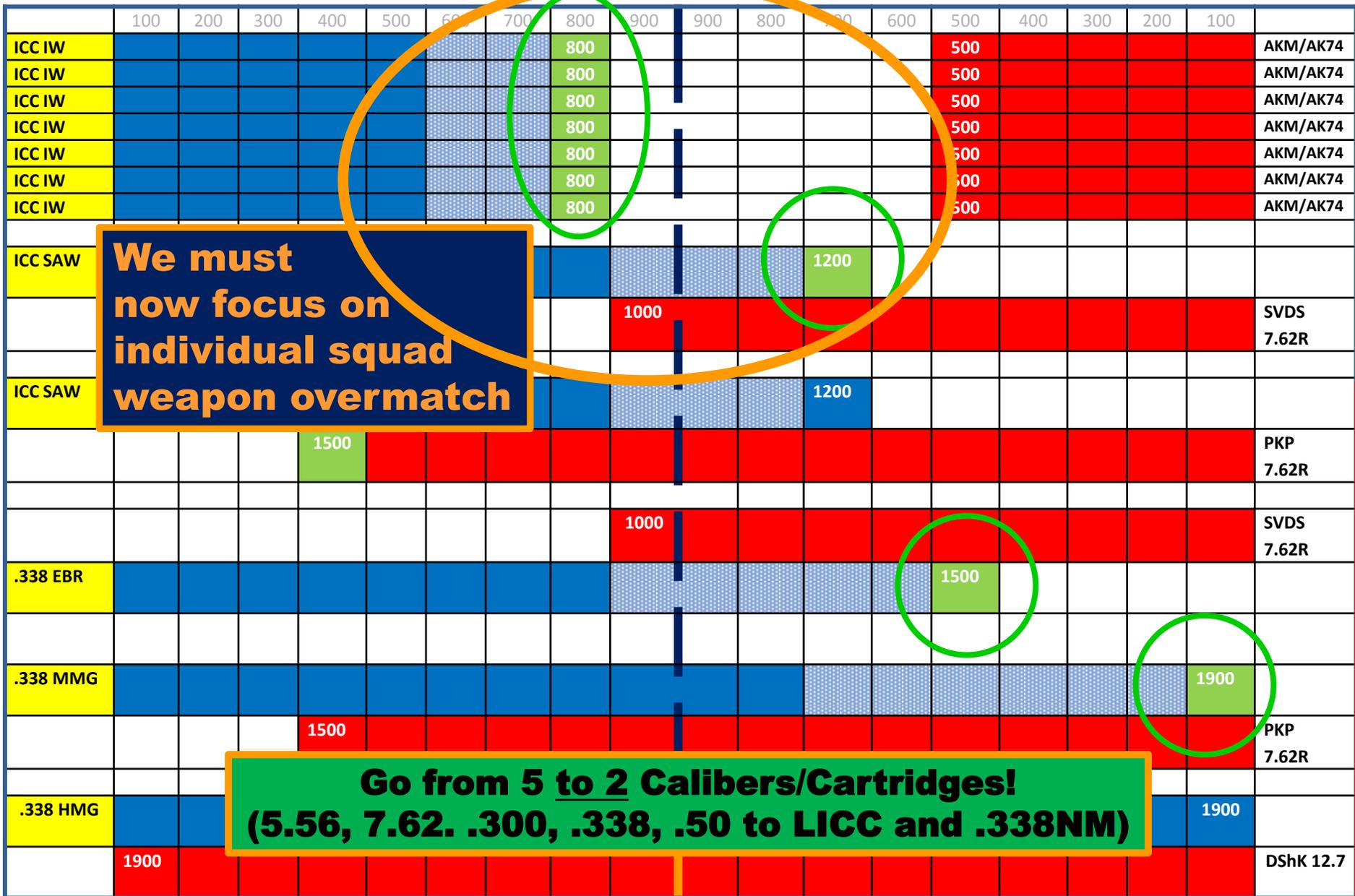
Next Gen Individual Weapon Overmatch

How do we get there?



**T
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1**

**U
S
A
+
1
0**



We must now focus on individual squad weapon overmatch

Go from 5 to 2 Calibers/Cartridges! (5.56, 7.62, .300, .338, .50 to LICC and .338NM)



Next Gen IW Capabilities List



- **Extended Stand-off Range** (=/> existing, emerging threats)
- **Improved PID, pH (point target), pS (suppression)**
- **Improved Speed of Target Engagement**
- **Improved Terminal Effects/pl** (all ranges)
- **Reduced Load** (Ammo, Weapon, Soldier Combat Load, Transport)
- **Family of Weapons** (Mission-Tailorable SCW through SDMR/IAR)
- **Open Architecture** (for varying missions/AO's, UMNS response time)
- **24/7 Signature Reduction** (Flash, Sound, Blast, Location)
- **Reduced Cost Burdens & Response Times**
(Development, Procurement, Life-Cycle Sustainment)
- **Commonality** (training, parts, operation, enablers)
- **Superior Function** (Safety, Performance, Reduced Maintenance)

**ALL
POSSIBLE
TODAY WITH
A LICC IW!**





Incremental Advantages Waiting to be Exploited

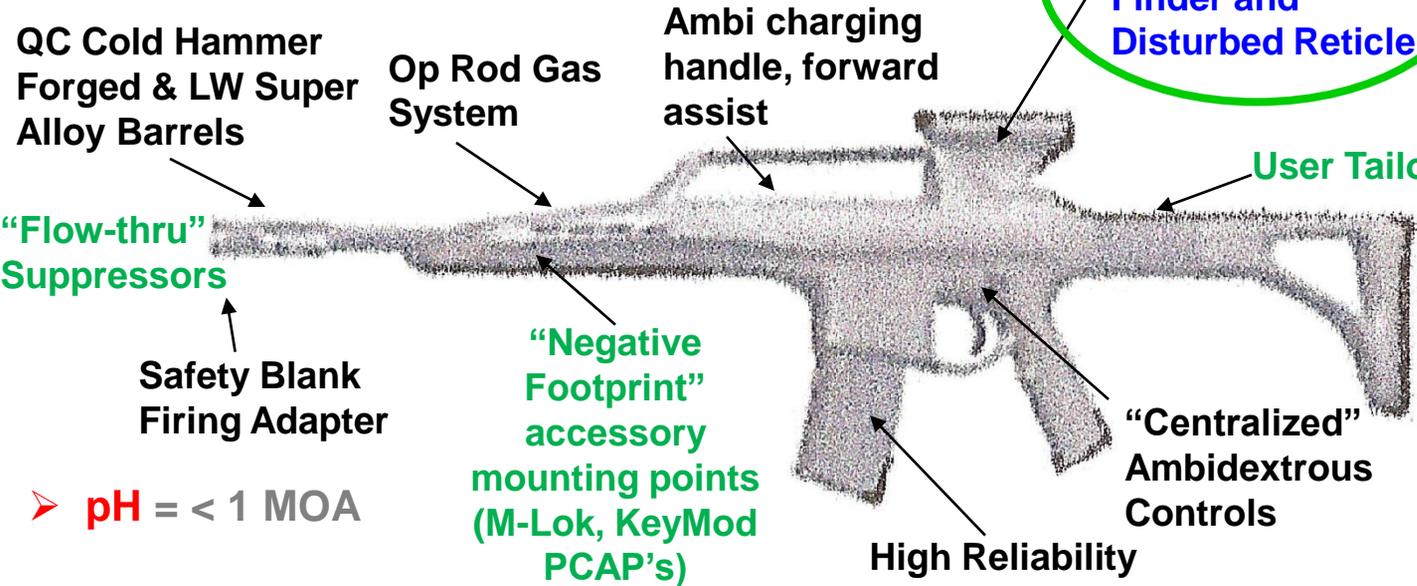
➤ Safety

- Cook-off => 270 rds.
- Barrel failure => 900 rds.
- OTB Capable (0 second drain time)
- Sustained Fire Rate > 300 RPM

➤ Reliability => 18,000 MRPF/S

➤ Mission/AO Tailorable

- Quick-Change barrels, stocks, trigger groups
- Caliber Convertible
- Convertible Feed System
- Reduced life-cycle costs



➤ pH = < 1 MOA

➤ Terminal Effects ("Lethality")

- "Blind to Barrier" projectiles
- "Intermediate Caliber" options
- Increased Terminal Effectiveness => 7.62mm NATO against unprotected and protected point targets out to 800 meters w/ 1/3 < recoil

➤ Maintenance

- 72% < operator cleaning
- > 3X bolt service life
- > 3X barrel service life
- 2X receiver service life

➤ System weight

- =< 2.8 kg (6.1 lbs.) w/ an 800m MER
- LW ammo (27-36%)

Same Advantages for a Bullpup Configuration

Safety

- Cook-off => 270 rds.
- Barrel failure => 900 rds.
- OTB Capable (0 seconds)

Reliability => 18,000 MRPF/S

Family of Modular Weapons

- Barrels
- Stocks, trigger groups
- Calibers
- Feed systems
- Reduced life cycle costs

System Weight

- =< 3.27 kg (7.2 lbs.) (TAR21)
- LW ammunition

pH = 2-3 MOA

Lethality

- STB projectiles
- Medium caliber option
- Increased MV (NLT 11%)
- Increased ME

Maintenance

- 72% less operator cleaning
- > 2X bolt service life
- > 3X barrel service life
- 2X receiver service life



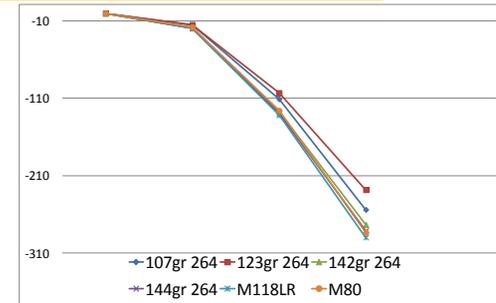
For the 140K “Front Liners”



800 m.
Disturbed
Reticle Sight



LICC IW (.264 USA)
(w/o 24/7 Suppression)
10.7 pounds
CURRENT (March 2016)



LICC Cartridge +
“Blind to Barrier”
Projectile = Overmatch

800 m. Disturbed Reticle Sight



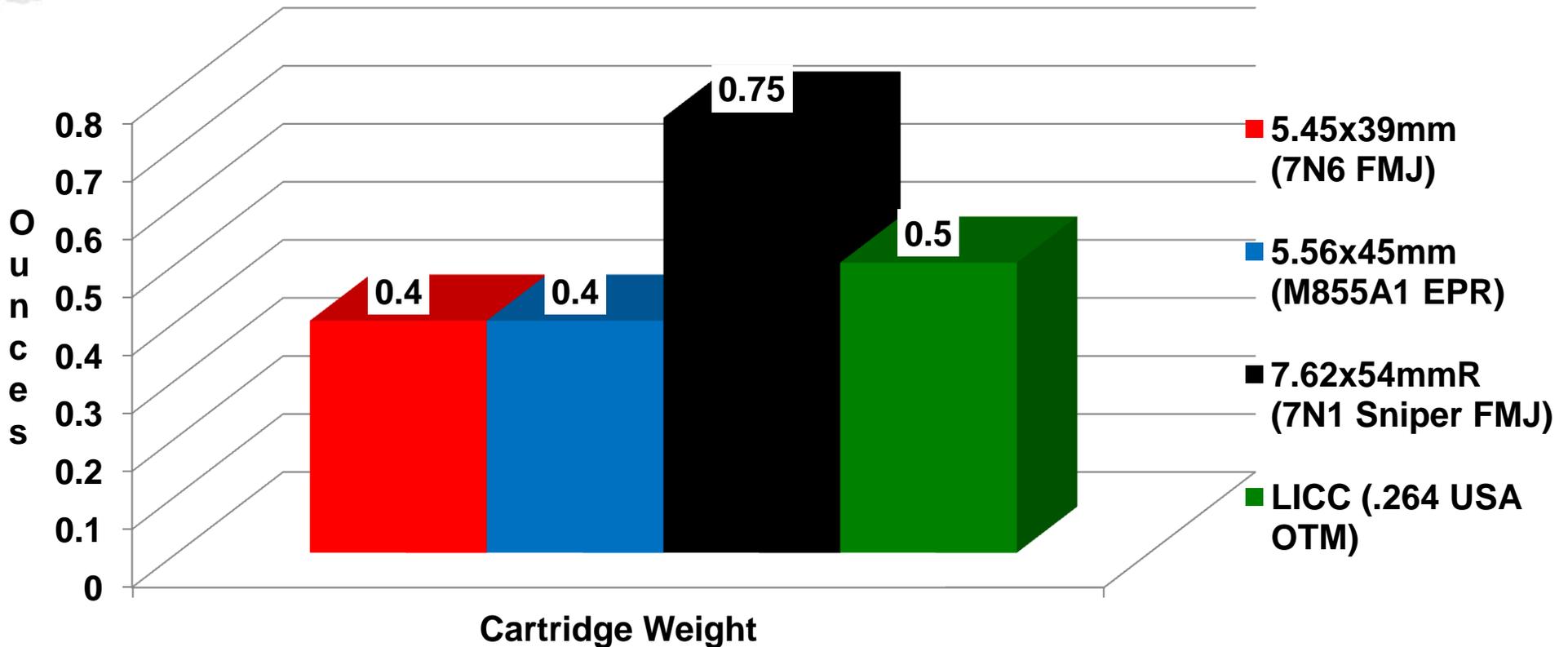
- +300m MER v. M4
- > pH to 800m
- Improved p/K
- Reduced Signature 24/7
- Mission Tailorable (modular)

ALL NEXT GEN CAPABILITIES (Slide 11)

Next Gen LICC IW
(with 24/7 Suppression)
9.98 pounds
Ready 1-3 Years



Cartridge Comparison



Left to Right

-5.45x39mm 7N6 FMJ

-5.56x45mm M855A1 EPR

-7.62x54mmR 7N1 Sniper FMJ

-LICC (.264 USA) Polymer 108 gr. OTM



Comparison of Cartridges USA vs. Threat vs. LICC



Left to Right

- 5.45x39mm 7N6 FMJ
- 5.56x45mm M855A1 EPR
- 7.62x54mmR 7N1 Sniper FMJ
- 7.62x51mm US M80 Ball
- LICC (.264 USA) Polymer 108 gr. OTM
- LICC (.264 USA) Brass 108 gr. OTM

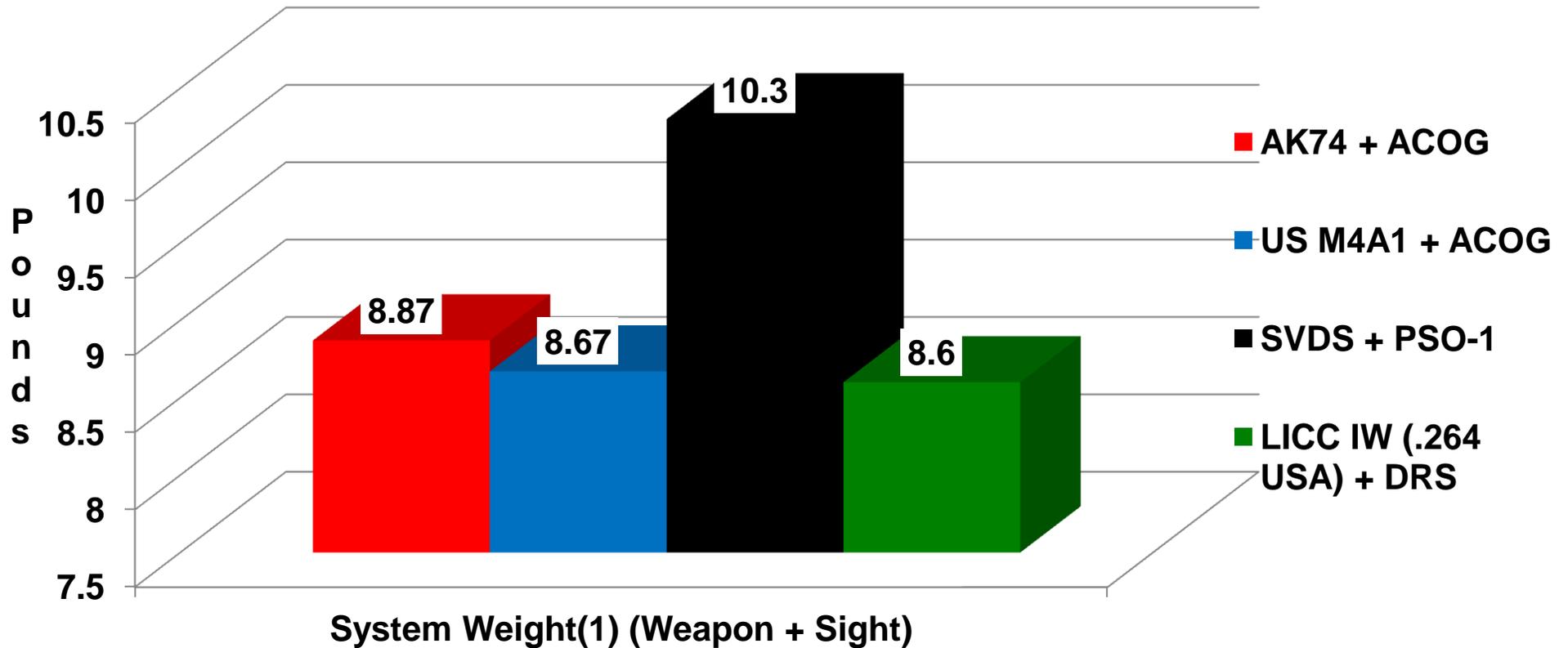
Combat Load Comparison

(Qty of Rounds at 5.25 lbs. Weight. US M4A1 Basic Load = 210 rounds)

Caliber/ Cartridge	5.45x39mm (53 gr. 7N6 FMJ)	5.56x45mm (62 gr. M855A1 EPR)	7.62x54mmR (151 gr. 7N1 Sniper FMJ)	.264 USA Poly (6.5x48mm) (108 gr. OTM)
# of Rounds	210	210	112	168
# of Rounds			98 (147 grain 7.62x51mm US M80 Ball)	120 (108 gr. Brass Case)



System Weight (Weapon + Sight)



(1) Systems as defined on Slide 15



Comparison of Systems

USA vs. Threat vs. LICC IW



AK74M w/ ACOG⁽¹⁾⁽²⁾ 5.45x39mm
8.87 pounds. 16.3" bbl. 30-rd mag.
(14.1 pounds with 210 rounds)⁽⁴⁾



SDVS w/ PSO-1⁽²⁾ 7.62x54mmR
10.3 pounds. 22.2" bbl. 10-rd mag.
(20.8 pounds with 210 rounds)⁽⁴⁾



US M4A1 w/ ACOG⁽²⁾ 5.56x45mm
8.67 pounds. 14.5" bbl. 30-rd mag.
(13.9 pounds with 210 rounds)⁽⁴⁾

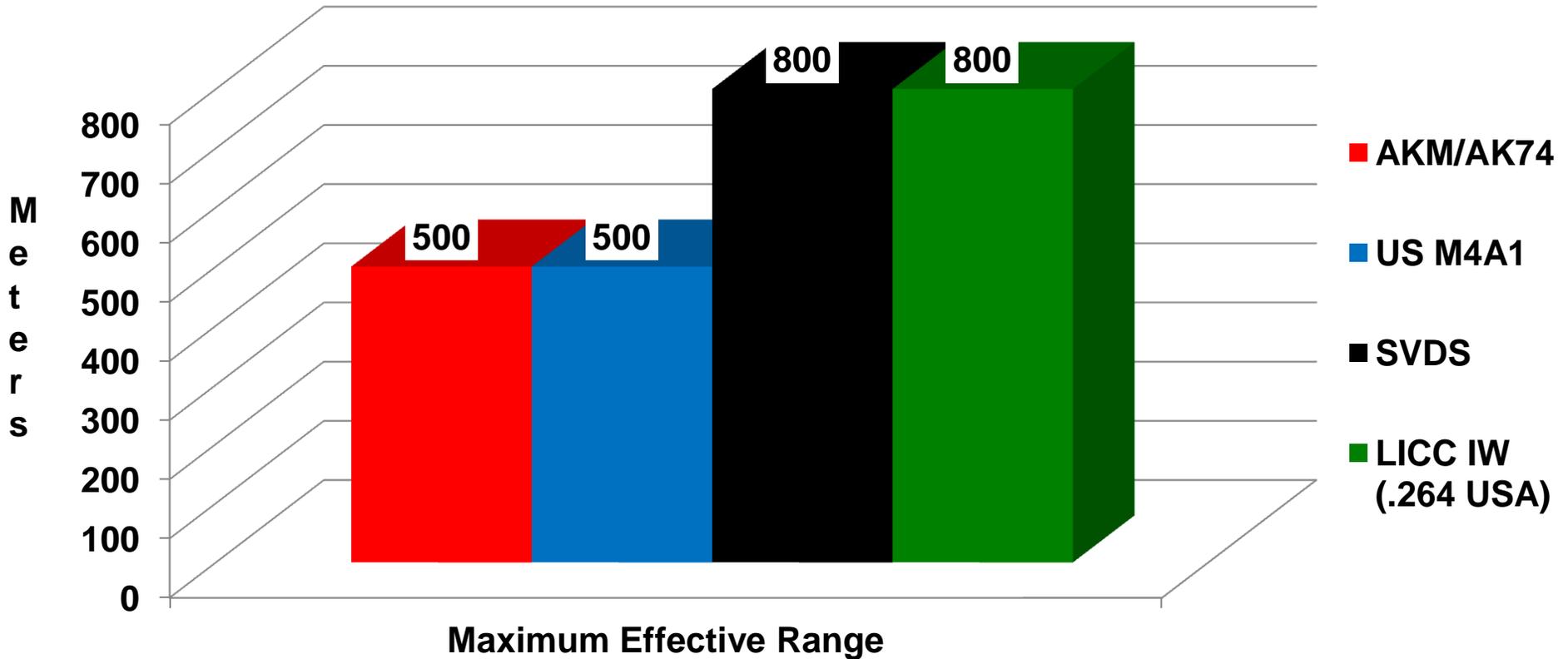


LICC IW w/ DRS⁽³⁾ 6.5x48mm LICC
8.60 pounds. 16.5" bbl.⁽⁵⁾ 25-rd mag.
(15.2 pounds with 210 rounds)⁽⁴⁾

(1) AK74 pictured (2) Graduated Reticle Sight (3) Disturbed Reticle Sight (DRS) (4) Comparable Combat Load to US M4 + 210 rds. (5) Fluted Barrel



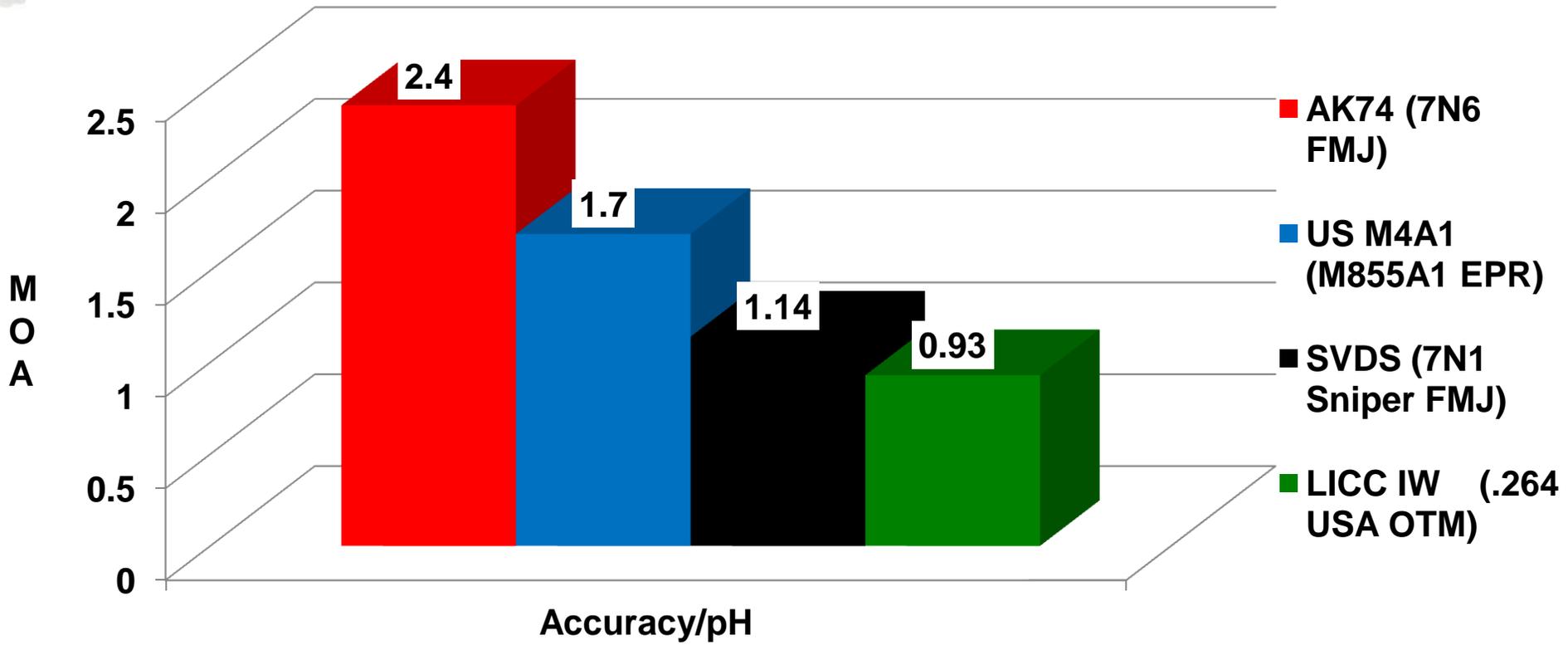
Maximum Effective Range



Maximum Effective Range – This is the maximum range at which an average shooter can hit a human-sized target (US E-type Silhouette [20”Wx40”H]) 50% of the time.



Accuracy/pH



By exploiting superior cartridge accuracy on both long-range and smaller partially obscured targets, superior external cartridge ballistics, a full-solution disturbed reticle aiming point and magnified optics, pH is increased through simplified ranging/aiming/target BDA & rapid adjusted follow-up engagements.

This is the best path to achievable IW overmatch.



Briefing Take-Away's

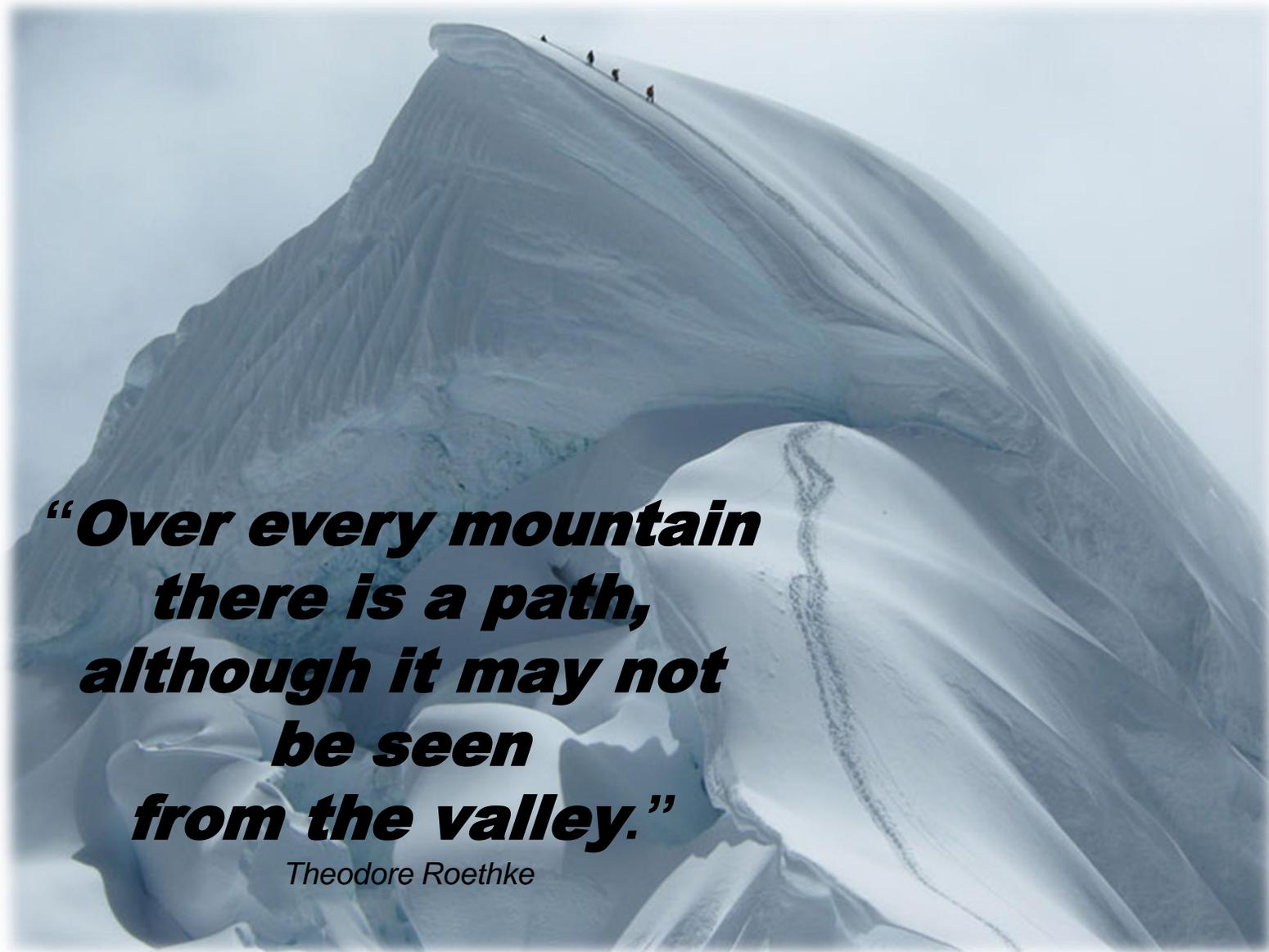


- **A Capability Gap exists for 80% of US and NATO riflemen who are armed w/ 5.56mm weapons. The threat engages friendly forces with 7.62mmR weapons 300+ meters beyond the effective range of 5.56mm NATO ammo. These 5.56mm riflemen have no effective means to engage the enemy.**
- **7.62mm NATO weapons and ammo provide a counter to this threat overmatch but add unwanted weight, cost and recoil to the warfighter.**
- **Paradigm-changing key materials (LICC Ammo, Disturbed Reticle Carbine Sights, Blind-to-Barrier Bullets, LW Modular Weapons & Advanced Training) ARE AVAILABLE TODAY to counter this current threat & emerging threats.**
- **The 140K US “Frontliners” need this capability *NOW*. It could be transitioned to the support ranks as funding and availability allows.**
- **The DoD or ACOS GEN. Milley/US Army or US Marine Corps or USSOCOM should brief Congress (SEN’s McCain, Ernst, Cotton, the SASC, the HASC) ask for \$100M to develop and field the next gen IW and LICC cartridge for our most deployed/at risk weapon system; our “Frontliners”.**

Overmatch IW Capabilities can be ours but we must ask for it!



Thank you for your attention!



***“Over every mountain
there is a path,
although it may not
be seen
from the valley.”***

Theodore Roethke

Jim Schatz schtred@aol.com



Back-up Slides



Polymer Case Enabler



- **Game-changer!**

- Greater Effect and MER with Less Weight & Volume
- Enables Paradigm Shift in Weapon Design, Employment
- Increased Stowed Rounds
- Increased Sustained Rate of Fire
- Improved Safety, Reduced Cook-off
- Improved Accuracy

- **Weight Reduction**

@ 28-40% over brass (caliber dependent)

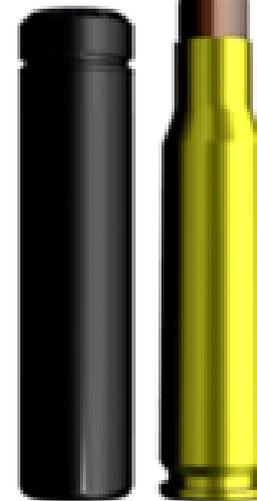
- **Volume Reduction (CTA)**

@ 12 to 24% (caliber dependent)

- **Production, Transport Costs (ROM)**

@ 10-20% lower after initial tooling costs

- **First Fielding in 2015 in caliber .50 BMG**



Telescoped Configuration
(US Army LSAT/
TEXTRON
7.62mm)



Conventional Configuration
(US/PCP
.260 Rem Round)



Conventional Configuration
(USMC/MAC
MK323 MOD 0
.50cal Round)



Art of the Possible – *Now/Emerging* *Time to Challenge the Industry!*



**Polymer Case
Weight Savings
(20-40%)**



**Advanced
Marksmanship
Training**

**Lightweight
Barrels**



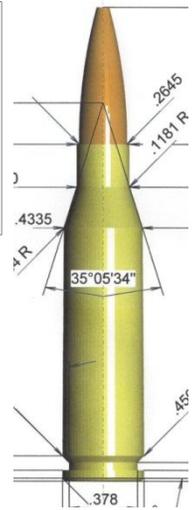
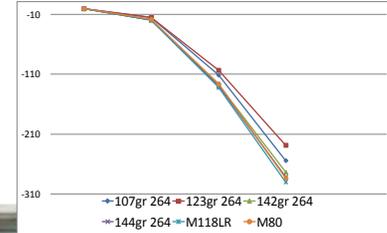
**Novel
Projectile
Designs**



**Affordable
Individual
Weapon
FS/FCS**



**Intermediate Caliber
Cartridge Overmatch**



**Advanced Integrated
Signature Suppression**

**Modular/Tailorable
Caliber-Convertible
Weapon Systems
(SCW – LMG)**



**One-Way
Luminescent
24/7 Tracers**

**Novel Recoil
Reduction
Technology**



“Tailorable” Modular Weapon System

On-the-Fly “Changing with the Times”



CLIN/Item Description	Caliber	Barrel (OL/Type)	Comments
1. Subcompact Weapon, cpl.	ICC	8.5"/Standard	One Common Receiver
2. Carbine, cpl.	ICC	12.5"/Standard	
3. Rifle/IAR, cpl.	ICC	16.0"/Standard	
4. SDMR, cpl.	ICC	18.5"/Standard	
5. LMG, cpl.	ICC	18.5"/Standard	LMG Receiver
1.A.- 5.A. Barrel Assemblies , cpl.	All	SCW, Carbine, Rifle/IAR, SDMR, LMG	Operator install- able w/o tools/ special tools
1.B.- 5.B Magazines , cpl.	All	10, 20/30, Hi Capacity Magazine	
1.C.- 5.C. Accessories	All	Grenade Launcher, Sign. Suppres- sor, Bayonet, Sights, Slings, etc.	
1.D- 5.D Kits, Caliber Conversion	5.56mm, 7.62mm	Includes bolt, barrel, magazine. For support troops, trng, reverse comp.	
1.E.- 5.E Spare Parts	All		
1.F.- 5.F Tools, Gauges	All	To include Manuals	

ICC - (Intermediate Caliber Cartridge) OL - Overall Length (in.) Cpl. - Complete



O-T-S Lightweight ICC IW (Polymer CTA)



Intermediate Caliber Cased Telescoped (CT) Weapon System



- .264 (6.5mm) Polymer CTA Intermediate Cal.
- 800/1200 meter MER (33% > 5.56mm)
- < Drift, Drop, > Retained Energy, Penetr.
- ME > 7.62mm M80 Ball at 600 m. & 800 m.
- Shorter than an M4 Carbine w/ stock closed

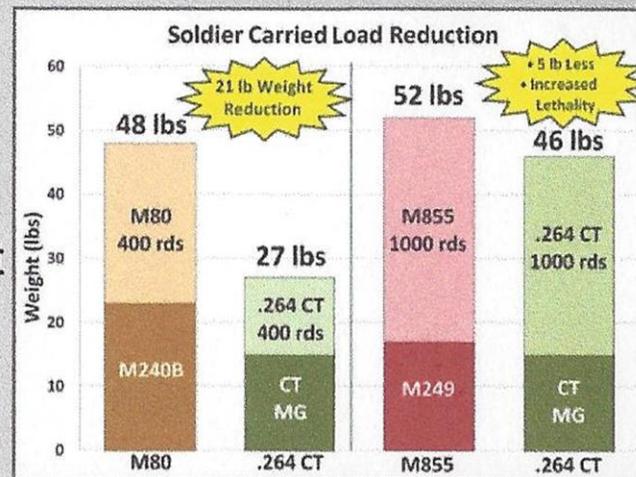
Operational and Performance Capability

- **Reduced Soldier Load** – An optimized intermediate caliber CT system will provide lethality equivalent to 7.62mm with significant weight reduction.

Example-

- 0.264" caliber CT system lethality equals 7.62mm at 1,200m
- Provides 21 lb (43%) weight reduction vs. 7.62mm M240B/M80, same lethality
- Is 5 lb lighter (10%) than 5.56mm M249/M855, provides significant increase in lethality

- **Improved Controllability** – long stroke, soft recoil, semi/full-auto firing modes
- **Compact Size** – 27" (folded, short barrel)
 - Reference- M4: 29.75" (collapsed)



• 43% system weight reduction over 7.62mm NATO M80/M240B MMG

Why not a 11 pound 100-round belt-fed ICC Individual Weapon?



O-T-S Lightweight ICC IW (Conventional Polymer)



Small Case Option: .450" Base, 2.60" OAL, 40gr. Case Capacity



AR-10 7.62x51mm - 9.64 lbs



AR-12 264 USA - 7.23 lbs (16" bbl)



M4 5.56x45mm - 6.24 lbs



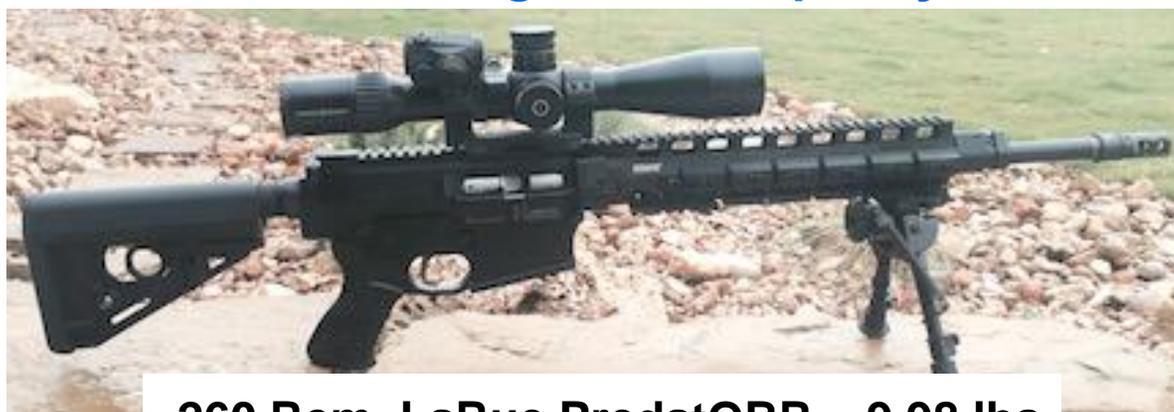
L: 264 USA
(Brass case)

R: 264 USA
(Polymer case -
28-31% lighter)

Large Case Option: .471" Base, 2.80" OAL, 53.5gr. Case Capacity



Brass - **24% weight savings** - Polymer



.260 Rem. LaRue PredatOBR – 9.98 lbs
(18" heavy bbl, no optics or bipod)



9 Known Truths



General Thoughts on Modern Warfare and Small Arms Technology

- 1 The asymmetric threat, unencumbered by “western” doctrine and politics, exploits our capability gaps faster than we can react within our cumbersome infrastructure.**
- 2 Kinetic Energy (KE) kill mechanisms (launched bullets, fragments) have been and remain state-of-the-art weapons technology since the 15th century. That will not change anytime soon so we should embrace and improve on it.**
- 3 Man-portable “directed energy” technology is decades away. One cannot “schedule a break through”, regardless of what the sci fi writers and S&T community developers espouse.**
- 4 For the ground combatant, pH and pl/K has not been markedly improved by so-called “Leap Ahead” or “Revolutionary” technology and “Star Wars” S&T projects, yet \$B’s have been spent on unrealistic and undelivered promises.**



9 Known Truths (cont.)



General Thoughts on Modern Warfare and Small Arms Technology

5 Desired Target Effects (direct hits or effective target suppression) depends on aiming and launch “hold proficiency” (marksmanship) be it used for semi, burst or full auto KE fire, air-bursting engagements via accurate lasing, XM25 or “TrackingPoint”-style FS/FCS, or even directed energy “pulses” .

6 Repeatable First Shot hits/kills will never be readily accomplished due to the many “hold” and error factors beyond the control of the operator. Immediate through-optic BDA and rapid adjusted follow-on shots offer the greatest chance of improved target effects, BUT the equipment must provide that core capability to the trained operator.



9 Known Truths (cont.)



General Thoughts on Modern Warfare and Small Arms Technology

- 7 Snipers as “force multipliers” exploit magnified optics, superior weapons, sights and ammunition to increase pH & PI/K at all ranges, especially those beyond assault rifle range. Rifleman can/should leverage that capability by employing affordable “paradigm shifting” precision enablers.**
- 8 Training is paramount to effectiveness BUT advanced hardware enables advanced training and employment.**
- 9 Incremental, available and emerging (and affordable) advancements in small arms, sighting and ammunition technologies offer the greatest return on investment and are waiting to be exploited.**



Misses Count – UK “Suppression Study”



- **“*Infantry Direct Fire Suppression*”** – Cranfield University
Published 31 August 2009 – Author MAJ M Baker - RIFLES
- Looked at past suppression data, studies. Interviewed UK OIF/OEF Combat Infantry Veterans.
- Determined the Chief Factors of Small Arms Suppression are:
 - Accuracy (proximity of the rounds to the target)
 - Kinetic Energy (mass, velocity) of the Projectile
 - Volume of Fire (number of rounds passing the target)
- The larger and faster the projectile the greater suppressive effect it has when passing the target at a given distance
- UK Operational Feedback: **“*5.56mm Taliban ignore, 7.62mm worries them, 0.5 scare them*”**
- **Path Forward?** Intermediate Caliber Cartridge, Precision Weapons, Magnified Optics, True Rifleman Training = > Suppression, pH, pI/K



Emerging Polymer Case Payoff in Weight Savings



Near equal weights (# rounds per caliber/cartridge type)

Metallic Cases

Polymer Cases

STD COMBAT LOAD	210 rds 62gr M855 =	5.58 LBS	Approx polymer wghts	
EQUAL WGT to 5.56 load	133 rds 108gr 264 USA =	5.55 LBS	174 rds 108gr 264 USA =	5.56 LBS
EQUAL WGT to 5.56 load	127 rds 123gr 264 USA =	5.55 LBS	163 rds 123gr 264 USA =	5.56 LBS
EQUAL WGT to 5.56 load	123 rds 135gr 277 USA =	5.55 LBS	155 rds 135gr 277 USA =	5.55 LBS
EQUAL WGT to 5.56 load	97 rds 175gr M118LR =	5.55 LBS		
EQUAL WGT to 5.56 load	104 rds 147gr M80 =	5.54 LBS		
EQUAL WGT to 5.56 load	108 rds 135gr M80A1 =	5.51 LBS		

Basic Combat Load

- 62 grain 5.56mm M855 (**brass case**) = 210 rds
- 108 grain 264 USA (**polymer case**) = 174 rds (-36, 17%)
- 123 grain 264 USA (**polymer case**) = 163 rds (-47, 22%)
- 135 grain 277 USA (**polymer case**) = 155 rds (-55, 26%)
- 147 grain 7.62mm M80 (**brass case**) = 104 rds (-106, 50%)

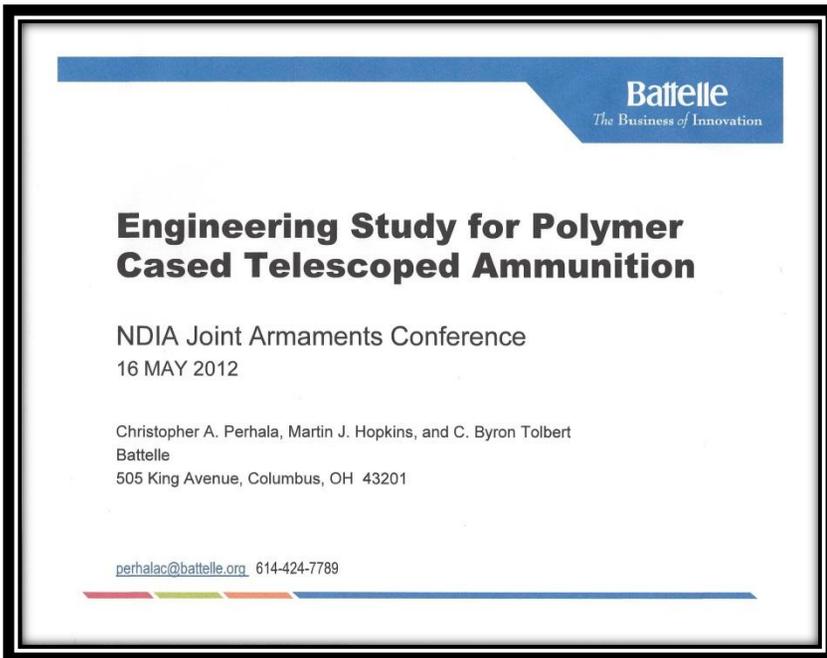


The Cost to Change Calibers



- 2012 Battelle study conducted for JSSAP on the ROM cost to convert production at Lake City Army Ammunition Plant (LCAAP) from brass to polymer-cased telescoped 5.56mm M855 and M856 Tracer ammunition.
- One-time LCAAP Retooling Costs were estimated to be:
 - @ \$98M for up to 200M rounds per year
 - @ \$160M for up to 400M rounds per year
 - @ \$400M for up to 1B rounds per year

- The study's author was asked what the cost difference would be if tooling was purchased for an intermediate caliber cartridge was produced instead of 5.56mm. His response was "**same cost**". **So for the same cost the US could not only reduce the load on the war fighter by 20 - 40% using polymer-cased ammunition but could also vastly improve the pH, pl, and pS of the entire small unit by switching to a squad-common ICC.**





ROM Cost to Change from 5.56mm & 7.62mm to a Squad-Common Lightweight Intermediate Caliber Cartridge (SCLICC) for Front Line Troops

One Time Costs Estimate: \$230 MIL

\$883M

- SAAC Study = \$10M (Department of the Army G-8 estimate)
- New Polymer Ammunition Production Machinery (LCAAP) = \$160M (2012 Battelle study)
- Competition/Contract Award – Intermediate Caliber Rifle (ICR) & LMG = \$30M
- Logistical Materials – ICR & LMG (gauges, rifle racks, mag pouches, etc.) = \$30M

Initial Operational Capability (IOC) Estimate: \$653 MIL⁽¹⁾

-- {140K Front Line Ground Combatants}⁽²⁾

- Intermediate Caliber Rifles (w/ BILI) @ \$1400 each x 140,000 = \$196M⁽³⁾
- Intermediate Caliber LMG's (w/ BILI) @ \$4500 each x 14,000 = \$63M⁽³⁾
- Intermediate Caliber Optical Sights @ \$1000 each x 154,000 = \$154M⁽³⁾
- Rounds, LICC @ .60 each x 400M (1 year usage) = \$240M
- Miscellaneous Ancillary Equipment (LICC unique spare parts, accessories)⁽³⁾

Logistical Support⁽³⁾ (dollars already being spent on 5.56mm & 7.62mm systems)

-Manuals, Training, POI's, TTP's

-Spare Parts

-Ranges (LICC SRTA [ballistic match] to use current training ranges)

⁽¹⁾ Total Cost includes One-time Costs.

⁽²⁾ 140K – Estimated number of current front line combatants (Infantry, Marines, Special Operations Forces)

⁽³⁾ This funding is already being spent on 5.56mm M4A1 Carbines and M249 SAW's/M240L's and ancillary equipment
It could be preprogrammed to the new caliber with little to no increase in overall cost