



# Time for a Change

## US “Incremental” Small Arms Fielding – Failures and Solutions

Part I - Small Arms  
by Jim Schatz

052108



# Introduction



- **2-part Presentation – Q&A’s after Part II**
  - Part I – Small Arms – Jim Schatz
  - Part II – Ammunition – Dr. Gary Roberts
- **All parts “stand-alone” – author prepared**
- **Historic “Snap Shot” look at complex issues. Insufficient time available for a detailed look.**  
**Full briefing available on request.**
- **Part I – Excess Data for future reference**



# Purpose



- To create a national awareness and dialogue on serious small arms issues for US war fighters
  - Not to cast blame
  - To breach the deeply ingrained “institutional resistance” to “incremental” change
  - To affect positive, permanent change now
    - Current small arms and ammunition
    - In P&P to prevent repeated failures
  - To persuade “the system” to test incrementally superior COTS small arms systems today!
- Pertains to more than just the one weapon type!*



# Goal



***To find, test and field  
the best small arms  
and ammunition available  
to the American war fighter  
today and always!***



# Qualifications – Jim Schatz



- **User: 11B – 82<sup>nd</sup> Airborne Division**
- **Trainer: US Army Marksmanship Unit**
- **Provider: 22+ years to the US Government, war fighter**
  - **Logistical Support**
  - **Contracts**
  - **Fielding**
- **Developer: HK416, M1014, USP, MP5/10, others**
- **Student: Of small arms since age ten**
- **Supporter: Of the end user**

**No direct affiliation with firearms or ammo makers.**

**Not the “lone voice” on this issue! One of many.**



# Caveats



- Not all services, organizations are the same
- The larger the organization, **the less they support the true needs of the end user**
- There are well intentioned people trying to do the right thing for the war fighter **but are often smothered by entrenched bureaucracy**
- Specific weapons, names, organizations omitted
- All data and claims supported by reference materials, public domain info and/or first hand knowledge



# Definitions – Part I



- **“War Fighters” “End Users”** – current US ground combatants who engage the enemy with small arms
- **“Select US Units”** – Public domain. See **“Army Times”**
- The **“System”** – DoD organizations tasked weapons acquisition, testing, fielding and logistical support of US DoD small arms and ammunition. **Contacted by author for comment. Included herein where possible.**
- **“US Standard”** – current issue



# Definitions – Part I



- **“Incremental”** Improvements
  - The “90% solution”
  - Available as COTS/NDI, modified COTS
  - **Significant advantages for the end user!**
    - > **Reliability:** 7X that of US standard
    - > **Service Life:** 3 – 4X that of US standard
    - > **Improved Accuracy:** 30-50% increase
    - > **Safety:** OTB (2 vs. 6 sec. drain time), Increased (60%+) Cook Off (210-240 vs. 120-150 rounds), SBFA (catch live projectiles during blank firing)
    - > **Weight Reduction**





# Definitions – Part I



- **“Incremental” Improvements (cont.)**
  - **Significant advantages for the end user**
    - > **Modularity, User Configurable, Controls: (SCAR, XM8, USP)**
    - > **Parts Commonality: 82% between 5.56mm, 6.8mm and 7.62mm (SCAR)**
    - > **Reduced Maintenance (user, maintainer): 72% less cleaning time (any Op Rod system)**
    - > **Reduced Procurement Costs: (complete weapons, barrels, piece parts)**
    - > **Reduced Life Cycle Costs: 45-75%**



# Prime Example: Op Rod “No Brainer”



- **Operating Rod Gas Systems deemed superior**
  - **Fielded with Select US Units and soon(?) USSOCOM**
  - **Fielded with OGA’s and Foreign Friendly nations**
  - **NLT 17 manufacturers offer op rod AR’s since 2004**
  - **NLT 2 available from current carbine producer**
  - **Superior performance in SCAR L, XM8, HK416 and ATEC Extreme Dust test (4 and 7X better)**
  - **Deemed superior by SME’s, experts, AR-15 designer**

***Yet the system still plans to release the current direct gas system carbine TDP for recompetete in June 2009!***



## Prime Example: Op Rod “No Brainer” (cont.)

- **The system presently has no mechanism or policy that automatically and regularly evaluates, in a detailed fashion and against current legacy weapons, available and emerging superior COTS, OGA, threat and foreign friendly incremental small arms innovations.**

***Requirements are being written and lucrative multi-year procurements are being made without considering/including state-of-the-art and available incremental improvements!***



# Incremental vs. “Leap Ahead”



- **Ground combatants still kill the enemy with KE mechanisms (bullets, fragments) that must be:**
  - Accurately aimed and delivered to the target by skilled operators (**even AB munitions and LRF's**)
  - From belt buckle distance to MER
  - **Same for all – Conventional, SOF, enemy**
- **The last “leap ahead” advancement in small arms – 14 century “Hand Cannon” (first KE firearm)**
- **The last substantial US “**incremental**” advancement in small arms was America’s first Assault Rifle the AR-15/M16 more than four decades ago!**



# “Leap Ahead”



## “Leap Ahead” =

- Looking past available incremental advantages for the war fighter
  - Incremental weapons stagnation
  - Increased risk to the end user
  - Decay in US small arms ingenuity
  - Increased cost to tax payers
  - Increased threat capabilities
  - Irreversible damage to the American small arms industry
  - Loss of respect for the US small arms system
- NLT \$430M spent since 1980 alone!**



# At Stake



***”Most of the boots on the ground in OEF/OIF will be the first to tell you that the enemy has no respect for our war fighters in a head-to-head confrontation while maneuvering with his individual weapon.***

***An enemy who does not respect a Soldier’s ability to deliver pain or death will always bring the fight directly to the Soldier, at belt buckle distance.”***

**MSG Steve Holland – 5<sup>th</sup> Special Forces Group (ABN)**

**30 year Army veteran, NDIA Hathcock Award Recipient**



# At Stake



- **SGT Peralas – B Co. 2/504 PIR 82<sup>nd</sup> Abn Div**  
**Afghanistan April 2005 – March 2006 <sup>(1)</sup>**

***“I saw first hand what happens when your weapon jams up because of harsh environments we have to call home here.***

***An 18B weapons sergeant was shot in the face due directly to his weapon jamming. I just cant believe that after things like this happen, the Army is still buying more (weapons).”***

- **507<sup>th</sup> Maintenance Company (PFC Jessica Lynch)**  
**An Nasiriyah, Iraq – 23 March, 2003 <sup>(2)</sup>**

**- 33 soldiers ambushed by Iraqi troops**

**- 11 KIA, 2 WIA, 6 POW's**

**PFC Patrick Miller – Silver Star recipient.**

**Repeated rifle failures drove him to surrender.**

**Most weapons failed.**





# At Stake (cont.)



- SSG Jason Fetty – US Army Reserve – **Silver Star recipient**  
Khost, Afghanistan – February 2007 <sup>(3)</sup>

*“Staff Sgt. Fetty **fired into his (suicide bomber) lower legs, then his kneecaps.** He stood back up, even though I gave him a crippling wound”. “He got back up and tried to come at me again”. “**He shot again at the man’s stomach**”. “**I abandoned all hopes of killing the guy before he would explode**”. “The blast came as he hit the ground, peppering him with shrapnel in the face, leg and ankle.”*

- MSG Anthony Pryor – 5<sup>th</sup> SFG (ABN) – **Silver Star recipient**  
Afghanistan mountains – 23 January 2002 <sup>(4)</sup>

*“...Pryor snapped his gun around and **shot the terrorist at point blank range with two rounds of 5.56.** The man crumpled.” “**So I went left to right, indexed down and shot those (two more) guys**”. “What he thought were their corpses sagged lifelessly to the floor”. “I realized that I was halfway through my magazine, so I started to change magazines. Then I felt something behind me, and thought it was one of my teammates...”. “The blow came suddenly. With stunning power.” “**He heard a noise, looked over and saw the ghostly apparition of the two men he had shot clamber back to their feet, fumbling for their weapons**”. <sup>17</sup>*



# At Stake (cont.)



- CPT Nate Self  
Ranger Regiment –  
**Silver Star recipient**  
Shah-I-Kot Mountains,  
Afghanistan  
4 March, 2002 <sup>(5)</sup>

*“Once behind cover, Self tried to fire again, but his weapon jammed.” “I pulled my charging handle back, and there was a round stuck in the chamber.” **Like the rest***

***of his men, Self always carried a cleaning rod zip tied to the side of his weapon in case it failed to extract a round from the Chamber.** “I started to knock the round out by pushing the rod down the barrel, and it broke off. There was nothing I could with it after that.”*



Cleaning  
Rod taped  
to an M16  
Rifle

Vietnam 1966



# The Hidden Truth



# The “Smoking Gun” – CNAC Survey

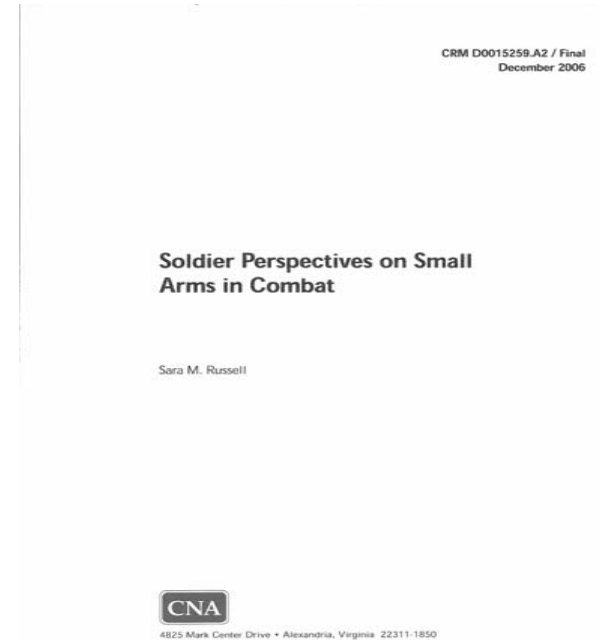


- CNA “**Soldier Perspectives on Small Arms in Combat**” Study - December 2006 <sup>(6)</sup>

CRM D0015259.A2/Final - Sara M. Russell  
Center for Naval Analysis Corporation  
4825 Mark Center Drive  
Alexandria, VA 22311-1850

Found at:

[http://www.defenseindustrydaily.com/  
the-usas-m4-carbine-controversy-03289/](http://www.defenseindustrydaily.com/the-usas-m4-carbine-controversy-03289/)



- **Army Sponsored – Never published. Survey author told not to release information.**
- **2,607 surveys taken from OIF/OEF veterans within 12 months of their return from theater.**

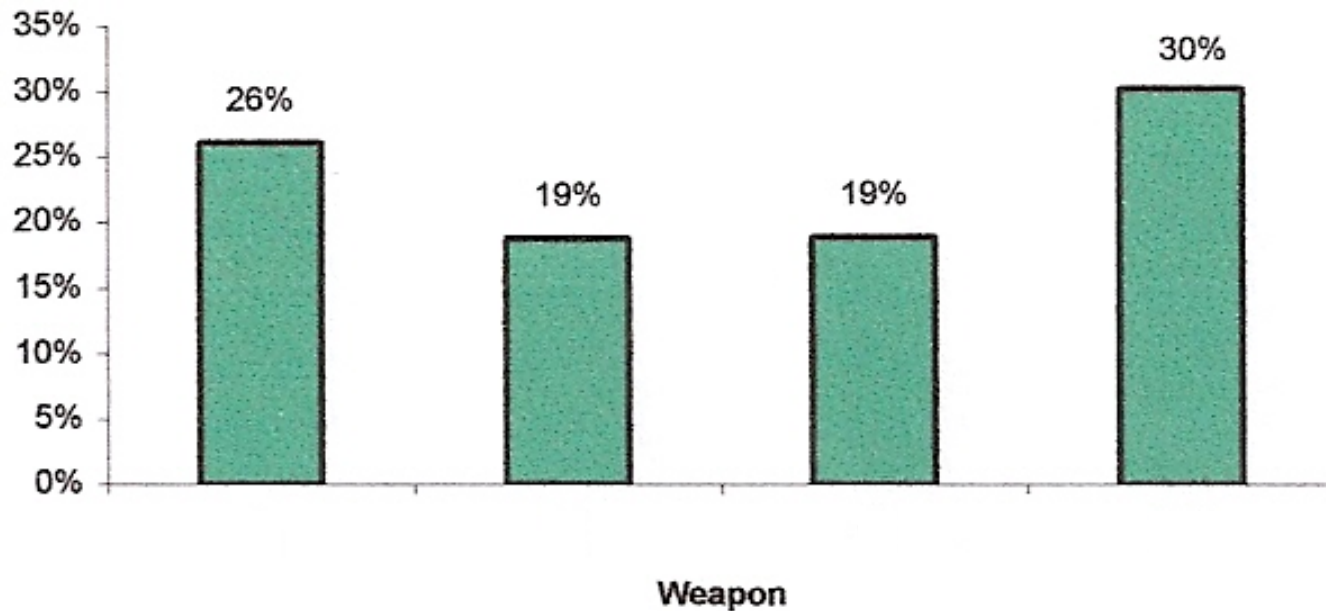


# CNAC Survey (cont.)



## Page 17 – % of Weapon Stoppages

Figure 4. Percentage of soldiers who report experiencing a stoppage while engaging the enemy





# CNAC Survey (cont.)



## Page 17 – % of Weapon Stoppages (cont.)

a. These numbers reflect the response from the 541 (21 percent) of soldiers who experienced a weapon stoppage while engaging the enemy in theater.

**Small Impact – Ability to engage target with weapon after performing immediate or remedial action to clear the stoppage.**



**Handgun – 62%**

**Carbine – 82%**

**Rifle – 80%**

**SAW – 59%**

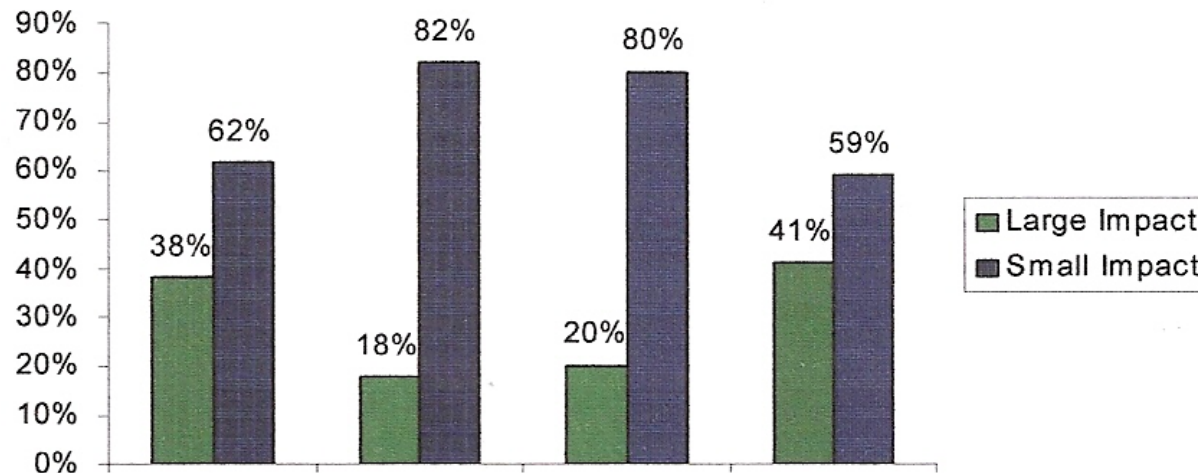


# CNAC Survey (cont.)



## Page 18 – Impact of Weapon Stoppages

Figure 5. Impact of stoppages during enemy engagement<sup>a</sup>



a. These numbers reflect the responses from the 541 (21 percent) of soldiers who experienced a weapon stoppage while engaging the enemy in theater.

Small impact – Ability to engage target with weapon after performing immediate or remedial action to clear the stoppage.

Large impact – Inability to engage target with weapon during a significant portion or entire firefight after performing immediate or remedial action to clear the stoppage.



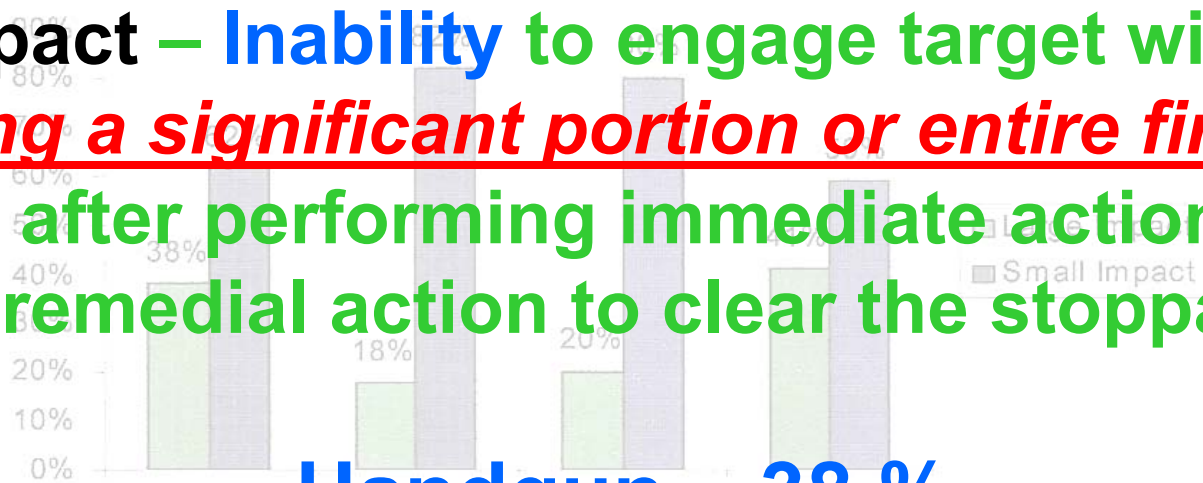
# CNAC Survey (cont.)



## Page 18 – Impact of Weapon Stoppages (cont.)

Figure 5. Impact of stoppages during enemy engagement<sup>a</sup>

**Large Impact – Inability to engage target with weapon during a significant portion or entire firefight after performing immediate action or remedial action to clear the stoppage.**



**Handgun – 38 %**

**Carbine – 18%**

**Rifle – 20%**

**SAW – 41%**

**29.25% Average!**

- a. These numbers reflect the impact of stoppages on the 541 (100 percent) of soldiers who experienced a weapon stoppage while engaging the enemy in theater.
- Small impact – Ability to engage target with weapon after performing immediate or remedial action to clear the stoppage.
- Large impact – Inability to engage target with weapon during a significant portion or entire firefight after performing immediate or remedial action to clear the stoppage.





# CNAC Survey (cont.)



- While quick to ask the soldiers if they were “satisfied with their weapons” (78% positive, but with a limited soldier point of reference), **the survey never asked those who reported stoppages in firefights:**
  - Did injuries or deaths result?
  - Was the mission compromised as a result?
  - Did the enemy escape or threaten friendly forces as a result?

*Any formal process for the end user to report weapon failures is unknown to the end users!*



# CNAC Survey (cont.)



- 544 weapon stoppages reported out of the 2607 surveys collected – **a 21% average failure rate**
- A full one-fifth of soldiers placed at risk due to weapon failures while engaging the enemy! **How many fatalities resulted?**
- Official Army News Release 29 May, 2007: ***“Soldiers reported overwhelming satisfaction with their (weapon)!”*** (7)

***System leadership terms soldier reports “emperical”***  
***How many soldiers today are carrying weapons that will fail when called upon to perform? 21%?***



***“This has been a sore point for me for some time. Soldier's have no clue what else is out there. I can tell you first hand from looking around where I work everyday, those with (rifles) are the wretched refuse - the non-"in" crowd. Those with (carbines) are the cool troops.***

***Quite simply the (carbine) is so popular and desired among the troops because it is so much handier to carry around.***

***99% of the weapon time over here is lugging it from place to place 24/7.***

***Make no mistake ease of carry is the reason most Soldier's love their (carbines).”***



# Our Aged Fleet



***“The United States military is in bad shape because they’ve let these small arms deteriorate to a point now where the US is a superpower only when it fights in a naval or an air battle.***

***It’s not a superpower when it fights a rifle battle.”***

**Mr. James Sullivan**

**2001 NDIA Chinn Award Recipient**

**Designer: AR-15/M16, Stoner 63, Ultimax 100,**

**Mini 14, Beta Magazine**



# The Cause – Our Aged Fleet



The “Big 8” – Primary US Military Small Arms						
Weapon	Year First Fielded <sup>(1)</sup>	Age (Years)	Manufacturer	Modern Design Available	Replaced by OFW candidate	Comments
M9 Pistol 9x19mm	1985 (Army)	23	Beretta USA	Beretta Brigadier, PX4, others	No	Numerous modern alternatives abound, to include PDW calibers
M4 Carbine 5.56x45mm	1994 (Army adoption)	14	Colt Defense	Colt M5, XM8, HK416, SCAR L, others	No	Modern Op Rod designs
M16A1 Rifle 5.56x45mm	1967 (Type classified by Army)	41 <sup>(2)</sup>	FNMI, Colt Defense	FN SCAR, F2000 Colt M5, HK416, XM8	No	Modern Op Rod and/or bull pup designs
M203 Grenade Launcher 40x46mm	1969	39	Various	US XM320	No	3+ years since COTS contract award
M249 Squad Automatic Weapon 5.56x45mm	1982	26	FNMI	FN MK46	No	MK46 fielded with USSOCOM
M240B Medium Machine Gun 7.62x51mm	1976 (Army)	32	FNMI	FN MK48, Vector SS77, US Ord. M60E4, Barrett LW240, HK121	No	MK48 fielded with USSOCOM
MK19 MOD 3 Automatic Grenade Launcher 40x53mm	1988 (Army)	20	GD	GD MK47, HK GMG	No	MK47 and GMG fielded with USSOCOM, OGA's
M2HB Heavy Machine Gun .50 BMG	1923	85	GD	GD M2E2, GD XM312	No	
	<b>Average:</b>	<b>35</b>	<b>All eight weapons above</b>			
	<b>Average:</b>	<b>28</b>	<b>Without M2HB</b>			
	<b>Average:</b>	<b>26</b>	<b>Without M2HB and M203</b>			
	<b>Average:</b>	<b>23</b>	<b>Without M2HB, M203, M16</b>			

“OFW” - Objective Family of Weapons from “Small Arms Master Plan” (SAMP) first briefed in 1984 by the USAIC.

<sup>(1)</sup> All initial fielding dates taken from “Jane’s Infantry Weapons, 2007/2008 edition. <sup>(2)</sup> America’s longest serving service rifle.



# The “Big 8” – Showing their Age



Average: **35** All eight weapons

Average: **28** Without M2HB

Average: **26** Without M2HB and M203

Average: **23** Without M2HB, M203, M16

- **Trickle Down” effect. What the system buys often ends up in:**
  - All branches of our military
  - US State Department/Embassy security
  - OGA’s (federal law enforcement, DOE, NRC, FBP, other)
  - State and Local law enforcement
  - Foreign Military Sales (FMS)



# Small Arms “Disconnect”



- While US small arms remain fundamentally unchanged in regards to performance, **the same does not apply to other and often more costly (3-8 X) equipment items.**
- Behind water and rations, small arms rank third as the most important piece of individual equipment to the war fighter. Yet we fight today with on average Vietnam-age small arms and ammunition. **Do we have the best available? Is there better out there? How will we know if we don't look? Others have.**





# Small Arms “Disconnect” (cont.)



- Night Fighting Equipment
- Helmets and suspension
- Load bearing equipment
- Uniforms, boots, gloves
- Body Armor
- Eye, Ear Protection
- Rations, water carriers
- Communications gear
- Cold/wet weather gear
- First Aid pack, gas masks
- Anti-tank weapons

20 years Ago



2008



**Weapons designed in the 1960's, or earlier!**



***“We buy new laptop computers every few years across the gamut, so couldn’t we do the same for our single most important piece of equipment? Are the lives of those in our most elite units of any more value than the lives of those individuals who drive trucks on the battlefield, who purify water, who cook our grits?”***

**Major Chaz W. Bowser  
Former Weapons/SCAR Combat Developer  
US Army Special Operations Command**



# System “Fast Track” Fielding



<u>Item</u>	<u>Years in Pipeline</u>	<u>Status</u>
● COTS XM26 MASS	> 10	FUE FY09 <sup>(14)</sup>
● COTS XM320 GLM	> 4*	FUE 2QFY09 <sup>(15)</sup>
● COTS XM110 SASS	> 2**	FUE CY08
● M240E6	> 11	FUE 3QFY10
● OICW/XM25	> 17	Pending
● OCSW/XM307/312	> 13	Pending

\* Since contract award (05/05)                      \*\* Since RFP release (03/06)



# Success Stories



# The German Success Story



German Military Small Arms Fielded..... *all since 1994*

#	Weapon	Year First Fielded	Age (Years)	New Weapon	New Capability	Unique Capability	New Caliber	Comments
1	P8 Pistol – 9mm	1994	14	Yes	No	No	No	*First general military issue PDW caliber pistol – planned fielding after 2009.
2	P12 Pistol - .45 ACP	1998	10	Yes	Yes	No	Yes	
3	P46 – 4.6mm	*Pending		*Pending	Yes	Yes	Yes	
4	MP 7 PDW <sup>(1)</sup> 4.6mm	2002	6	Yes	Yes	Yes	“ “	<sup>(1)</sup> First general military issue PDW in NATO.
5	G36 Carbine 5.56mm	1998	10	Yes	Yes	No	Yes	Modern Op Rod design
6	G36 Rifle 5.56mm	1997	11	Yes	Yes	No	“ “	Modern Op Rod design
7	G22 Sniper Rifle .300 Win Mag	1998/99	10	Yes	Yes	No	Yes	
8	G82 Sniper Rifle 50 BMG	2005	3	Yes	Yes	No	No	Modified Barrett M82A1
9	AG36 Grenade Launcher 40x46mm	2001	7	Yes	Yes	No	No	COTS variant of US XM320. Fielded in USSOCOM, OGA's, UK, Spain, Norway, etc.
10	MG4 LMG 5.56mm	2005	3	Yes	Yes	No	Yes	Demonstrated 100K round weapon, barrel service life.
11	Grenade Machine Gun - 40x53mm	2002	6	Yes	Yes	No	Yes	Also fielded with USSOCOM, OGA's, UK, Norway, etc.
			<b>8</b>	<b>10</b>	<b>10</b>	<b>2</b>	<b>6</b>	



# The Answer – Incremental Fielding



## German small arms successes *all since 1994*

- 10 new (of 13) small arms fielded
- 10 new weapon capabilities fielded
- 2 unique capabilities (1<sup>st</sup> general issue PDW)
- 6 new calibers fielded
- Worlds most reliable op rod carbine fielded
- Family of rifles/carbines/LSW fielded
- Lower per capita defense budget than the US and most of Europe
- Similar incremental success in UK, Spain, Norway, Canada, Mexico, Turkey, China, Russia, elsewhere.<sup>38</sup>



# US SOF Success Story



## SOF WEAPONS



EX16 MOD 0 (SCAR-L)  
SOF Combat Assault Rifle (Light)



EX17 MOD 0 (SCAR-H)  
SOF Combat Assault Rifle (Heavy)



EX 13 MOD 0  
Enhanced Grenade Launcher Module  
EGLM



MK12 MOD 1  
Rifle, Special Purpose, 5.56mm  
1005-01-504-3276



MK18 MOD 0  
Close Quarters Combat Carbine CQBR  
1005-01-527-2288



MK11 MOD 0  
Rifle, Sniper 7.62mm  
1005-01-475-7980



MK23 MOD 0  
Pistol, .45 Cal  
1005-01-426-8951



MK46 MOD 1  
Machine Gun, Lightweight, 5.56mm  
1005-01-534-3682



MK48 MOD 1  
Machine Gun, Lightweight, 7.62mm  
1005-01-539-4164



MK47 MOD 0  
Advanced Lightweight  
Grenade Launcher, 40mm  
1010-01-522-3257



MK13 Rifle, .300 WINMAG  
MOD 0: 1005-LL-L99-5364  
MOD 1: 1005-LL-L99-5477  
MOD 2: 1005-01-523-4611



MK15 MOD 0  
Rifle, Special Application Sniper .50 Cal  
1005-01-525-7716



M3 Carl Gustaf  
Multi-role Antiamour Antipersonnel  
Weapon System MAAWS  
1015-01-314-1770



NSWC Crane Division  
Point Of Contact  
sofsustainment@navy.mil



- User driven, user tested, user selected
- **Even faster fielding model in Select US Units**



# Select US Unit Success



- Have replaced 7/8 US standard weapons with incrementally superior COTS weapons – 90% solution
  - In near term (< 2 years)
  - Few if any R&D dollars spent – low risk to vendors
  - Advanced and unique capabilities fielded – **ALL COTS!**
    - > FN Minimi before M249
    - > MAG58 before M240
    - > MK19 in Navy Spec War in 1960's
    - > .50 caliber Sniper Weapons before M107
    - > SR-25 before M110
    - > AG416 before XM320
    - > .40 S&W caliber handguns years before JCP/CP/MHS
    - > PDW caliber weapons and ammo
    - > HK416/417, GMG, SCAR/EGLM, others

Most fielded  
with limited  
US Govt R&D  
spending, if  
any!





# Select US Unit Success (cont.)



- Also uniforms, visual augmentation, protective gear, etc.
- Model small arms acquisition that ***can and should be replicated for all US military war fighters ASAP!***
  - User driven, tested, selected
  - Realistic requirements!
  - Pushing the envelope of COTS
  - Less cost to the tax payer
  - Enhanced war fighter confidence, safety, survivability



# Threat Successes



## Russian AN-94 “Shifted Pulse” Assault Rifle

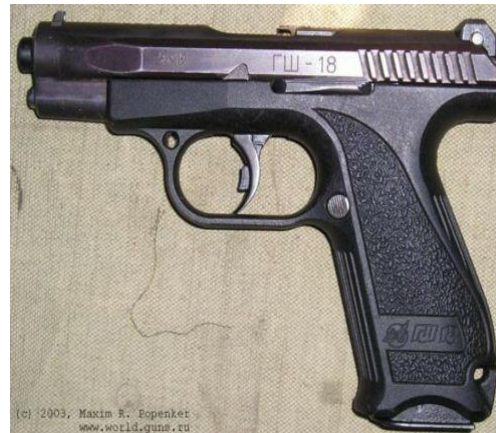
5.45x39mm

pH doubled @ 1800 rpm ROF  
In limited production and  
**fielding since 2001.** Being  
developed in 7.62x39mm.

*The System has nothing  
that competes with these  
weapon capabilities!*

Chinese QBZ-95 Family of Weapons  
5.8x42mm Superior cartridge/bull pup  
ammunition performance.

**First fielded in 1998.**



Russian GSh-18 Armor  
Piercing Semi-  
automatic Pistol.

9x19mm PBP.

**First fielded in 2000.**

Penetrates 8mm mild  
steel or Class III body  
armor at 20 meters.



# Threat Successes (cont.)



Iranian KH2002 Bull pup Assault Rifle  
5.56x45mm **First fielded in 2004.**  
Increased terminal effects due to  
bull pup MV increase.

Russian SR-1 Gyurza Armor  
Piercing Semi-automatic Pistol  
9x21mm SP-10, SP11, SP-12 **Adopted  
in 2003.** Penetrates 2.8mm Titanium  
and 30 layers Kevlar at 100 meters.



(c) 2003, Maxim R. Popov  
www.world-guns.ru



Russian "VSSK" Silenced Sniper Rifle  
12.7mm Special Subsonic  
**First fielded in 2002.**  
Defeats 16mm steel plate at 200 meters.  
US NIJ Class III at 100 meters.

*The System has nothing that competes  
with these weapon capabilities!*



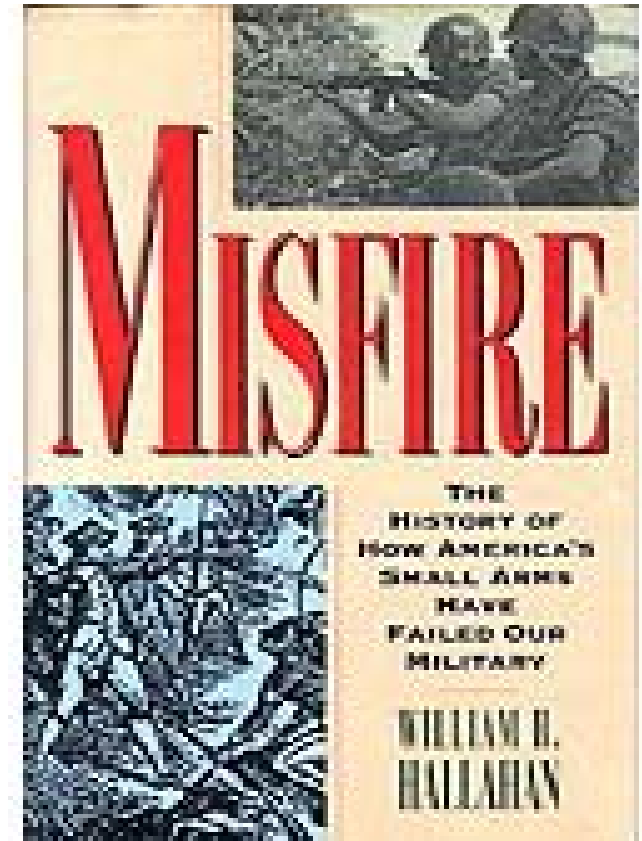
# **A Long, Sad History of Ignoring the War Fighter**



# More of the Same Shame



- Current “dysfunction” reoccurs @ every 30-50 years
- Top Driven, enabled
- War fighter ignored
- Incremental advancements ignored
- Required reading: “*Misfire*”



*The history of how American small arms have failed our military”* By William H. Hallahan. Available from [amazon.com](https://www.amazon.com)

**Summary available. Send email to presenter.**



# More of the same (cont.)



- ***Always results from a system/individuals unwillingness to address the specific requests of the war fighter!***
- **Requires direct media, SECWAR/DEF, Congressional, POUS intervention to remedy.**
  - **1777 – “US Ordnance Corps” founded at Springfield, MA**
  - **1854 - Franklin Pierce – restored civilian control of armories.**
  - **Abraham Lincoln twice (1861 – Sent for Union arms from Europe, 1863 – pushed for Spencer carbines)**
  - **1901 – Teddy Roosevelt – forced leadership change at Springfield Armory**
  - **1914 – SECWAR Baker orders complete overhaul of “Ordnance Bureau”**
  - **1916 – Woodrow Wilson Presidential campaign (Lewis Gun controversy)**
  - **1962 - John F. Kennedy – direct involvement in AR-15 fielding**
  - **1967 - US “Ordnance Department” disbanded/ restructured by SECDEF McNamara after stalling on AR-15 production**



# More of the same – **TODAY!**



- **We are at that time in history again!**
  - Our small arms are aged and no longer state-of-the-art.
  - Troops and Commanders are not getting what they are asking for.
  - Decisions on small arms are happening far from the front lines.
  - Superior weapons are being taken from troops by those unqualified to do so (AWG).
  - Limited funds are being squandered on useless small arms “ventures.”
  - The system irrationally and irresponsibly hides facts and then fights any and all changes.
  - With few exceptions the best new small arms are coming from foreign sources.
  - ***Weapons are failing in combat and lives have been placed at jeopardy as a result!***



# American Revolutionary War (1775 – 1783)



- American forces armed with muzzle loading British “Brown Bess” and “Charleville model 1763 Muskets” (2 shots per minute, unrifled bore)
- Breech-loading “Ferguson Rifle” demonstrated 4-6 shots per minute during 27 April, 1776 demo in England. 200 man British unit formed and excelled against a much larger force at the Battle of Brandywine, Sept. 1777.

***Lesson forgotten by the US Ordnance Corps after the war's end!***





# War of 1812 (1812 to 1814/15)



- **1811 – John Hall invents breech-loading “rifle” with:**
  - Rifled bore for increased (2-3 times) range and accuracy over muskets
  - Interchangeable parts (versus hand fitted which was the norm)
  - Was deemed “superior by every other kind of small arm” by US Army Rifle Test Board.
- **America enters another war with the Charleville model 1763 Muskets (2 shots per minute, unrifled bore) 36 years after the British had proven the breech-loading Ferguson Rifle superior in battle!**



# Missed opportunities



- **1816 – All-weather percussion cap invented and first used in Europe. *First field in the US 26 years later in 1842!***
- **1827 – Congress directs SECWAR to investigate the failure of the US Ordnance Corps to manufacture and field a breech-loading rifle *16 years after the Hall Rifle was offered and 50 years after the Ferguson first killed Americans in 1777!***
- **1836 – Repeating rifles from Hall tested again, along with samples from Cochran, Colt and Hackett. Hall rifle judged best. US Ordnance Corps opined *“the complex mechanism of breech-loading weapons deranges and perplexes the soldier.”***
- **1840 – First bolt-action “Dreyse Needle Gun” repeating rifle designed and fielded in Germany.**



# More Missed Opportunities



- 1841 – Muzzle-loading US Charleville musket *turns 80, still in US Army service!*
- 1845 – US Army goes to war against Mexico, mostly armed with muzzle-loading US percussion cap (not all-weather cap) *rifles 29 years after Europe first used all-weather percussion caps!*



# American Civil War (1861 – 1865)



- **Confederate Calvary used mostly Hall model 1843 breech-loading rifles. Union forces fought with mostly Springfield model 1855 muzzle-loaders.**
- **Henry, Marsh and Sharps rifles mostly ignored by the US Ordnance Corps. Experts believe they could have shortened the war by giving the Union troops superior firepower.**
  - **Henry – Tube-fed, lever-action repeater firing copper-cased cartridges (>15 rpm).**
  - **Marsh – Converted Springfield model 1855 with trap-door (6-8 rpm).**
  - **Spencer model 1860 – 7-shot, tube-fed, lever-action, metallic cartridges (21 rpm)**
  - **Sharps – Single-shot, breech-loader, paper/linen cartridges (8-10 rpm). Personally tested by President Lincoln himself – summer 1861. *Chief of Ordnance General Ripley repeatedly and for years defied the President's direction to test and field a repeating rifle!***



# More of the same



- 1863 (24 June) - Commanding Officer Wilder's "Lightning Brigade", Union Infantry, at Union Gap battle, **armed with Spencer repeaters**. Out numbered 4/1 by Bushrod Johnson's confederate unit. Four confederate attacks, all repelled by the Spencers. Wilder lost 51, Johnson 156.  
**US Ordnance Corps refused to provide the requested Spencers. Wilder got promissory notes for \$35 from each of his men, borrowed the money from a bank and purchased the Spencers direct from the factory in Boston.**  
After the battle the War Department reimbursed the troops for their Spencers!
- 1865 – Springfield Armory Rifle Board Field Trails – 108 rifle models submitted, **including 10 repeaters and 10 bolt actions**. **The board "selected" the single-shot Springfield model 1873 trap-door rifle!**



# 1866 - Indian Uprisings Begin



- 1871 – German Mauser Company develops model 71 bolt-action repeating rifle, later redesigned with a clip-chargeable internal magazine.
- 1875 – Last of the repeating rifles pulled from service by the US Ordnance Corps.
- 15 June, 1876 – General George Armstrong Custer and 650 Calvary armed with single-shot Springfield model 1873 trap-door rifles (Custer left behind 2 Gatling guns) ride up the Rosebud river to the mouth of the Little Big Horn valley to 1,500 Sioux waiting with Henry, Spencers and Winchester repeaters. All 650 soldiers died!



# More Missed Opportunities



- 1887 – First Maxim Machine Guns (“Devils Paintbrush”) appear and are quickly adopted by the British, Russians, Turkey, many others. Used with devastating effect by the Germans against the British in 1899 during the Boer War and during the Russo-Jap War in 1904-05, **27 years before World War I began.**
- 1888 – US Ordnance Corps *tests and rejects the Maxim Machine Gun!*
- 1890 – 1st model Springfield Trap-door single-shot rifle, second longest serving US service rifle (**besides the AR-15/M16/M4 @ 43 years**) retired from service after 25 years:
  - *50 years after the first bolt-action repeater was fielded in Germany!*
  - *47 years after the first Hall repeater was designed!*



# More Missed Opportunities



- 1891 – US Army Ordnance Corps Rifle Board solicits industry for new rifles for trails. ***Not one US design submitted!***
- 1892 – US adopts Danish Krag-Jorgensen with single-load chamber for the .30-40 Krag with round nose projectile, ***after 5 reworks!*** ***Most every European country turned it down due to its weak design and magazine type!***
- 1898 (1 July) – Battle of San Juan Hill, Cuba  
5,000 Americans armed with Krag's engage 700 Spaniards armed with 7mm Mauser bolt-actions firing smokeless-powder "spitzer" bullets.  
***1,300 Americans died!***





# ***First World War (1914-1918)***



- **1901 – Browning Machine Guns and the BAR offered to US Ordnance Chief General Crozier. Not used until 1918, 17 years later and months before the wars end!**
- **Regardless of the brilliance of US-born small arms designers (Browning, Lewis, Maxim, etc.)**  
**the US entered WWI with:**
  - **Unreliable French Benet-Mercie M1909 and Chauchat (“Show-Shaw”) machine guns**
  - **British P14/17 rifles**
- **1916 – The US had still not formally selected a machine gun; 29 years after the first Maxims were already killing masses on battlefields all over the world!**



# Missed “Medium Caliber “Opportunity – Top Driven Mistakes



- 1918 – 1st model John Cantius Garand semi-auto rifle developed.
- 1918 – J. D. Petersen develops .276 Pedersen cartridge and automatic rifle – 42% less recoil than .30 caliber rifle/cartridge.
- 1928 – Infantry Board (30 April) and “Semi-auto Rifle Board” (July) recommends replacing .30 caliber M1903 bolt-action with .276 caliber, 125 grain bullet firing auto-rifle.
- 21 Feb. 1929 - The .276 cartridge is approved for issue.
- 1932 – Semi-auto Rifle Boards 3rd test – **the .276 caliber semi-auto Garand T3E2 rifle is selected!**
- 1932 - Army COS Douglas McArthur ***reverses decision on T3E2 fielding after 13 years of testing!***
- Nov. 1935 – 9.5 pound .30 caliber M1 Garand adopted  
***32 years after the 1903 bolt-action rifle was adopted!***



# Second World War (1939-1945)



- 1 Sept. 1939 – Germany invades Poland – US is producing 100 M1 Garands per day. **The first time in history where the US Army has the lead with a service rifle going into a war.**  
**ALL because of John Garand's tireless efforts and genius!**
- Congress repays John Garand by dropping him from the Armory payroll **(a whopping \$3600 a year savings to Uncle Sam!)**
- 1942 – Germany develops the first assault rifle; MKb42. Fires a new 7.92x33mm Kurz Patrone “intermediate” cartridge at 400 rounds/minute. Lighter, cheaper and easier to make, less recoil, 2-3X combat load, detachable 30-rd magazine, select fire, straight line stock design.
  - **7 years before the first AK-47 is fielded!**
  - **15 years before the US M14 is fielded!**
  - **20 years before the first AR-15's were issued in Vietnam!**



# German Successes Ignored



- Nov. 1992 – German “Kampfgruppe Scherer” surrounded by Russian forces on the Russian front. German Luftwaffe drops MKb42’s to the vastly outnumbered unit. German unit breaks out to fight another day. **Credit given to the use of the MKb42 in its first appearance on the battlefield.**
- 1943-1944 – By this time Germany was producing 400K MP44 Assault Rifles per year. **Given one more year the entire German military could have been armed with MP44’s.**
- 1945 – American Ordnance experts at Mauser plant – collect drawings and samples of MP44, Gerot 03 and 06 rifles.



# Hard Lessons Learned – Anyone Listening?



- 1947 – WWII study by General S.L.A. Marshall “Men against Fire” released. Gen. Marshall writes “**most officers had little or no knowledge of how their men fought individually that when interviewed knew that as few as 15/100 were doing all the fighting**”. **“The least knowledgeable would be the highest ranking men in the Army and in the place most distant from the battlefield: the Pentagon.”**
- 1947 – British “Beeching” report is published. **Maximum effective rifle cartridge range in combat is 600 yards. .28 caliber deemed ideal (recoil, lethality, weight). 18 years after the US develops, approves and then mothballs the .276 Pederson cartridge and rifle!**



# The Russians were Listening



- **1947 – Mikhail Timofeyevich Kalashnikov designs the first “Avtomat Kalashnikov” which was to become the AK-47; the most commonly encountered assault rifle on the planet. Estimates are that more than 9M AK’s have been produced.**
- **1949 – AK-47’s first fielded with Russian troops  
13 years before the US issues its true first assault rifle (the AR-15) to the USAF and 18 years before the AR-15/M16 is adopted by the US Army!**



# Korean Conflict (1950-1953)



- ***Beeching, Hall, Hitchman reports all agree on the maximum effective range of small arms in combat is NGT 300 meters (average 120 meters). Mirrors wartime findings of Germans and Russians that lead to the development and successful fielding of the MP44 and AK-47.***
- ***Yet in 1960 America fields the non-select fire M14 rifle that fires a full-power .30 caliber cartridge with excessive range and recoil and is uncontrollable on full auto fire!***
  - ***18 years after the MKb42 was fielded!***
  - ***11 years after the AK-47 was fielded!***



# Korean Conflict (cont.)



- 1953 – US forces 7.62x51mm cartridge on NATO.
- 19 Sept. 1958 – Infantry Board “CONARC” report finds “AR-15 more reliable (compared to the M14) under simulated combat conditions – which is a rifles most essential attribute”. ***Second such official finding.***
  - **COTS AR-15. Developed in 9 months.**  
Combat load 650 rounds. Weight 6.35 lbs. Select-fire.
  - **US Ordnance System M14. Developed in 12+ years.**  
Combat load 220 rounds. Weight 9.32 lbs.  
Semi-automatic only (90% issued without full auto selector switch).





# Vietnam Conflict



- 1958 - .258 caliber (between .22 and .30 caliber) AR-15 proposed by US Army. Eugene Stoner to design it. ***Cartridge never completed by US Ordnance Department.*** Effort dropped.
- Nov. 1958 – Feb. 1959 – Full comparative tests of AR-15 and M14. ***AR-15 far “out distances the M14 in overall combat potential”.*** CDEC personnel recommend early retirement of the M14. ***Third such official finding.***



# Vietnam Conflict (cont.)



- Feb. 1959 – **General Taylor orders no additional AR-15 purchases and full-scale M14 production.** 1st commercial contract for M14's is issued to Winchester.
- 1960 – First M14's produced **3 years after adoption!**
- June 1960 – US Ordnance Dept. refuses to retest AR-15 due to **“the lack of any military requirement for such an arm.”**



# Vietnam Conflict (cont.)



- 27 Sept. 1962 – Charles Hitch (DOD Comptroller) releases “Hitch Report”. **AR-15 outclassed M14 in all areas.** Production cost/ease, performance, basic combat load. **M14 found inferior to M1 Garand and AK-47.** **AR-15 firepower found advantageous for US troops over AK-47.**
- 15 May 1963 – Springfield Armory changes rifling twist from 1/14” to 1/12” to increase helmet penetration but which reduces also lethality by 40%, *just in time for Vietnam!*



# Vietnam Conflict (cont.)



- **March 1964 – USAF receives first “M16’s”.**  
**May 26, 1964 – US Army receives first “M16E1’s”.**  
***NO CLEANING KITS ISSUED! (And would not be in quantity for almost 2 years!)***
- **5TH WARNING (of 6) – Winter 1965/66 - Fort Ord tests of M16, AK-47 and M14. Report states:**  
**“3 years of development (by the Ordnance Dept. of the M16) has done more harm than good.”**



# Vietnam Conflict (cont.)



- **Oct. 1966 – Reports of M16 failures in battle – *troops dying!***
- ***2 years have passed since problems were identified* and cleaning kits recommended!**
- **1966 - American troops order “Dri-Slide” lubricant from family and friends in the US. *Reports of 70% failures to extract in M16’s found with dead US GI’s!***
- **32 of 80 USMC rifles failed in combat.**



# Vietnam Conflict (cont.)



- **Fall 1969 – US Army formally adopts M16A1 and 5.56x45mm cartridge, and for use in Europe.**
  - ***27 years after the German MKb42 was first fielded!***
  - ***20 years after the first AK-47 was fielded!***
  - ***15 years after the AR-15 was first developed by Armalite!***
  - ***11 years after the first successful US Army tests of the AR-15!***
  - ***8 years after the first USAF and CDTTC requests for AR-15's!***
  - ***6 years after official M16 production begins!***
  - ***5 years after the first M16's and M16E1's were fielded in Vietnam!***



# Vietnam Conflict *and Today*



- 7 May – 10 Oct. 1967 - Ichord Congressional Subcommittee formed to investigate M16 issues/combat failures (*Mirrors Congressional involvement today!*)
  - Chief of Ordnance COL Yount blames problems on troop maintenance. (*Like Today! 507<sup>th</sup> BN*)
  - Troops were told to “tape a cleaning rod to the rifle and never leave a cartridge in the chamber overnight!” (*Like CPT Nate Self in 2002!*)
  - 89M rounds of ball powder were fired before the Army acknowledged it was the primary cause of stoppages in the M16. (*Still used today!*)
  - *Ichord Committee blames problems on the Ordnance Department, specifically due to their failed AR-15 “conversion” to the M16.*



# Post Vietnam



- **1982 - America adopts the worlds only national service rifle without a fully automatic mode of fire (M16A2 w/ 3rb only)**
- **1985 – US adopts 9mm M9 Pistol to replace combat - proven .45 ACP M1911A1 Pistol.**  
**38% stoppages reported in combat** (2006 CNAC Survey) <sup>(6)</sup>
- **1994/95 – US adopts the M240G/B to replace the M60.**  
**6.2 pounds (24%) heavier. No other weapons tested.**  
**The only weapons considered were those already in the inventory!**





# Post Vietnam (cont.)



- **1984 – “XM-4” Carbine Program initiated by the US Army.**
- **1986 – Army withdraws funding – USMC picks up project.**
- **1987 – USMC M4 Fielding Decision made**
- **1989 – Army interest in M4 is renewed**
- **1994 – 1<sup>st</sup> M4’s fielded in the US Army *after 10 years!***



# Post Vietnam (cont.)



- **Today** - US Service Rifle “dumbed down” to short-barrel carbine length performance compromise by carbine “pure fleeting”
  - Reliability (2002 USMC test) <sup>(19)</sup>
  - Max. Eff. Range (500 vs. 600 meters – point targets) <sup>(18)</sup>
  - Muzzle Velocity (3050 vs. 2750 fps)
  - Muzzle Energy (1765 vs. 1645 j)
  - Accuracy
  - Penetration
  - Terminal Effects (150 m. max. with M855) <sup>(17)</sup>

***Never before in US history has the rifle been fully replaced with a carbine with front line combat units!***



For those who say this problem is “old news”



- Returning OIF Soldier Testimonials from 2008
- Easy to obtain, if you ask. **The Army has no process to collect shooting failure data!**
- 7 failure accounts while in combat collected from 21 soldiers polled (33% - on par with CNAC survey), all seasoned combat veterans, most with multiple tours in OIF/OEF.
- Notice these are the enlisted men doing the fighting and reporting the problems – **those furthest from the small arms decision making process!**



## For those who say this problem is “old news” (cont.)



- Returning OIF Soldier Testimonials from 2008

*“During my deployment from Jan 07’ to March 08’ I had numerous failures to extract with my XXX. One such incident was during an engagement where we took sniper fire. My extractor was only a few months old but wouldn’t extract after about 20 rounds. **I took remedial action taking me out of the fight for about 3 minutes.** Another time I tried to fire a controlled pair for a warning shot **and it did not extract the round causing vehicles to get close to our formations”***

**SPC. B**



## For those who say this problem is “old news” (cont.)



- Returning OIF Soldier Testimonials from 2008

***“In summertime, 2006, my XXX failed to extract/eject in a firefight with the Taliban. The weapon had just been through a thorough cleaning that morning. I performed immediate action, cleared and reloaded, the weapon fired one round and again, failed to extract/eject. I repeated the process with the same results during the duration of the firefight.”***

**CPL B.**



# For those who say this problem is “old news” (cont.)



- Returning OIF Soldier Testimonials from 2008

*“While serving in Iraq on a Provincial Reconstruction team security mission in and around the city of Tikrit my team was perimeter security on the actual building itself. My team and I moved to a guard tower outside the building to pull security. While pulling security I noticed a man peeking around a corner and looking in my general location. He did this once or twice and on the third time I had already placed my weapon from safe to semi and aimed my XXX at the corner. **When he came around holding his AK-47 we fired at each other simultaneously. I tried to pull a controlled pair but the round from the first shot did not extract. After performing SPORTS on my weapon the target was gone.**”*

**SGT V.**



# Politics over Lives



***“The 110th Congress doesn’t even care. They don’t care that the (weapon) has got exactly the same problems that this thing had in ’67. Back then people raised all kinds of hell over it. The 110<sup>th</sup> Congress doesn’t do a damn thing, and those soldiers over there in Iraq right now have exactly the same problems with their (weapons) in spite of the improved buffer.”***

**Mr. James Sullivan  
2001 NDIA Chinn Award Recipient  
Designer: AR-15/M16, Stoner 63,  
Ultimax 100, Mini 14, Beta Magazine**





# User requests ignored



- **March 2004 - 3<sup>rd</sup> ID ONS for Integrated Modular Assault Weapon System” – *died with XM8!***
- **2005 and 2006 – 10<sup>th</sup> SFG (A) CMNS for 10” Op Rod Uppers – 2 requests - *never acted upon!***
- **March 2007 - 1<sup>st</sup> SFG (A) Procurement for 84 10” Op Rod Uppers – *cancelled by higher headquarters due to “program conflict!”***



# User requests ignored (cont.)



- **2006-Present - Urgent CMNS from 5<sup>th</sup> SFG for 6.8mm SPC caliber CQBR PMOD *not acted on by higher headquarter's!***
- **2005-Present - XXX DIV request for DM rifles. *No action to date!***
- **2006-Present – Modular Handgun System Program – *held up by “system dysfunction” for years!***



# User requests ignored, *and worse!*



*And Worse* - December 2007

Army leadership directs that superior HK416 carbines, in use with zero issues/breakages since August 2005 (and Glock pistols) be removed from the Asymmetric Warfare Group

*Real Reason: Other units asking for similar advanced capabilities!*

**ASYMMETRIC WARFARE GROUP**

The AWG is looking for officers and NCOs for its field teams and staff that are seasoned warfighters and functional experts.

Mission: Provide operational advisory assistance to Army and Joint Force Commanders to enhance the combat effectiveness of the operating force and enable the defeat of asymmetric threats.

(301) 833-5366 | [www.awg.army.mil](http://www.awg.army.mil)

Mission: Provide operational advisory assistance to Army and Joint Force Commander to enhance the combat effectiveness of the operating forces and enable the defeat of asymmetric threats

*EXCEPT FOT SMALL ARMS!*



# User Request Process.

## Death by a thousand cuts!

- The End User/War Fighter requirement must navigate an endless and often insurmountable maze of bureaucracy to successfully realize an Urgent Mission Need Statement.
  - Unit
  - BCT
  - Division
  - Corps
  - Command
  - Proponent
  - DA
  - Joint Services

And back again. *Few survive!*



# **System R&D**

# **“Dysfunction”**



***“The fact of the matter is that technology changes every 10 or 15 years and we should be changing with it. And that has not been our case. We have been sitting on this thing for far too long.”***

***“Our bureaucracy failed our troops.”***

***“Holding a competition is the only way for the Army to make sure soldiers still have the best weapons available!”***

**GEN. Jack Keane – Former US Army VCOS**



# System R&D Dysfunction



- **Constant Shift in Direction**

- **Multiple/Micro Bullets, Flechettes - 1960's, 1970's  
(Projects SALVO, SPIW)**

***Millions spent – nothing fielded!***

- **Flechettes, Caseless Ammunition – 1980's  
(Advanced Combat Rifle)**

**Started as caseless ammo experiment. Redirected  
by CG change to 100% increase in pH over M16A2.  
Forced Mutation. DOA!**

***\$54M+ spent – nothing fielded!***

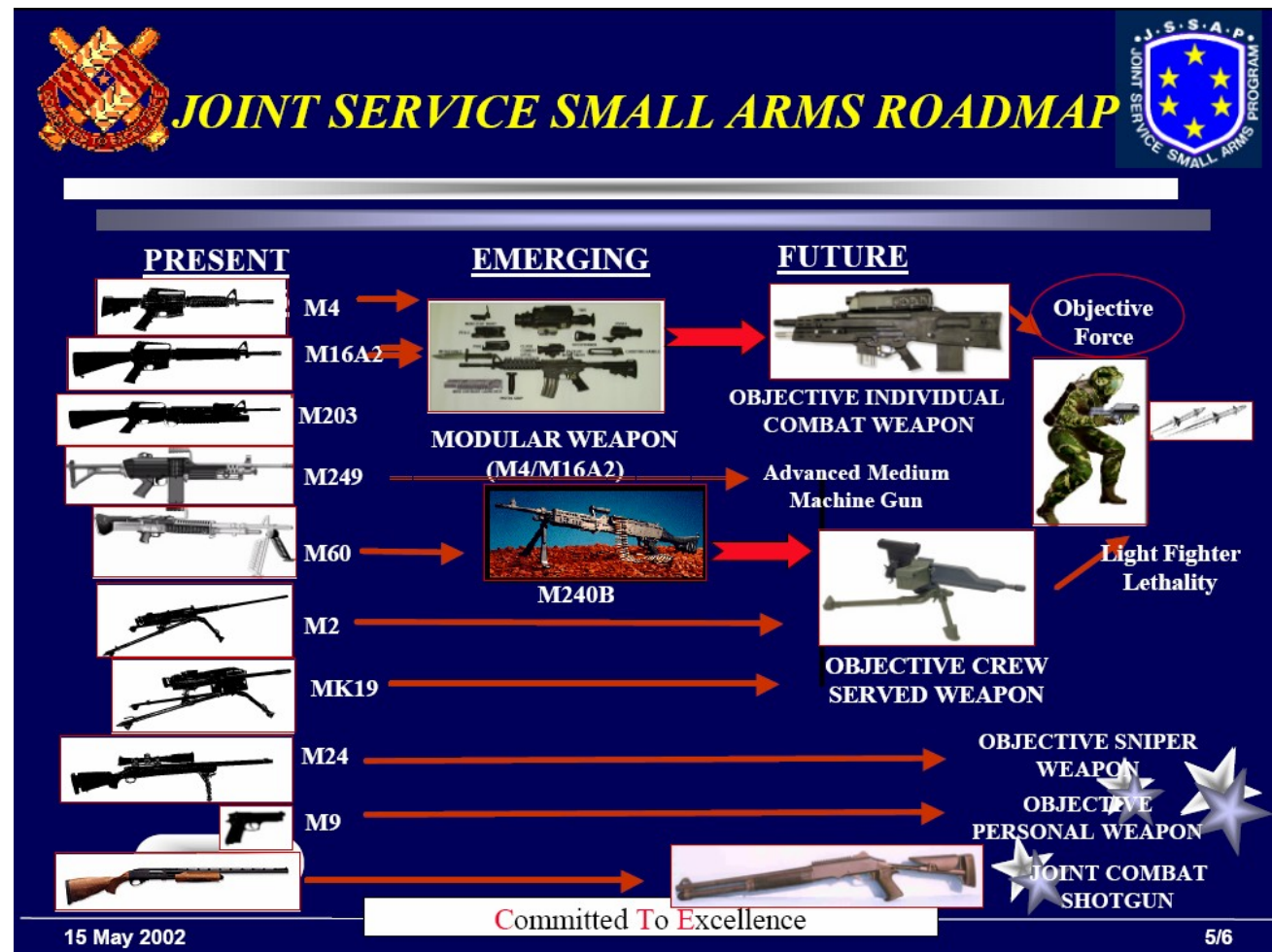


# System R&D Dysfunction (cont.)



## 1984 - USAIC first briefs "Small Arms Master Plan"

10 legacy weapons to be replaced by 3 "Objective" Weapons (OICW, OCSW, OPDW) (8)



**24 years later.**  
**Millions spent.**  
**Nothing fielded!**  
**Talk of next gen!**





# System R&D Dysfunction (cont.)



- Shift to “Air Bursting/Counter Defilade” technology  
OICW Program – Unrealistic requirements and expectations (Semi-auto AB 20mm GL, FS/FCS, detachable 5.56mm KE module @ 14 pds!  
Not supported by end user, SOF, industry  
*\$207M spent over 17+ years (1991-2008).*  
*Nothing fielded!*
- OCSW Program – Failed attempt to field AB 25mm crew-served weapon. Program “saves” through FCS and Light weight .50 caliber Machine Gun initiatives.  
*\$170M+ spent over 13+ years (1994-2007).*  
*Nothing fielded!*



# System R&D Dysfunction (cont.)



**12 June, 1987**

**Twentieth Century  
Fox Film Corporation  
releases “*Predator*”  
with wrist-mounted KE  
system and shoulder-  
mounted “plasma caster”**

***\$18M spent!***

***31M rentals fielded!***





# System R&D Dysfunction 2000-2001



## JSSAP “Autonomous Seeker Projectile” (9)

**ARD-04, Light Fighter Lethality After Next**

Provide the individual AAN warfighter with an ultra-light/versatile lethality system that yields: dramatically reduced system weight; overwhelming lethality; and maximum operational utility and survivability.

- Dual munition pod system weighing less than 10 lbs (T), 5 lbs. (G)
- Course correcting, seeker projectiles to 1,000M w/ unprecedented lethality
- “Metal Storm” Type KE pod tube for close quarter engagements
- Forearm or pistol grip mounted
- Design architecture permits use for other weapon platforms
- Hands-Free operation & ergonomics
- Exceed 75% Probability of Incapacitation
- Lethality component of NRDEC Light Weight Warrior initiative

OPM: DARPA, Oak Ridge Nat. Lab.

**Dramatically Reduced Warfighter Weight Plus Near 100% Lethality for AAN**

### PROGRAM SCHEDULE & FUNDING:

Systems Analysis	██████████			
* Feasibility, Error Budget & Lethality	██████████			
Constructive Simulation	██████████			
Prototype (Mock-Up) Delivery		▲		▲
Critical Sub-System Design/Demo	██████████			
System Integration Plan				▲
Funding (\$K)				
PE62623A/AH21	881	1,000	3,328	3,340
DARPA	480	510		

Feb99

- **Unrealistic unobtainable science fiction based requirements.**
- **\$8.6M actually planned for FY00-03 spending!**



# System R&D Dysfunction 2002-2004



## - XM8 Effort – 2002-2005 *Good attempt at change!*

- > Sole-source manipulation of OICW contract.
- > Project forced on the user proponent.
- > Weapon highly favored by the war fighters.
- > Abandoned due to political pressure.

**\$50M spent. Nothing fielded!**

## - Multiple Parallel US DoD Efforts since 2003

- > ECR, PMOD, FCR, SCAR, XM8, CSC (HK416)
- > 95% compatible requirements
- > No joint cooperation

**\$M's spent. Only HK416 fielded! (no USG R&D \$ spent)**



# System Dysfunction 2005-Present



- **JSSAP LSAT Program**

- **Plastic cased ammunition and links. *Doable if durable!***
- **Caseless Ammunition – same ammunition and chamber sealing challenges/barriers as encountered during 20+ year G11 and ACR Programs. *High risk! Little payoff possible over plastic cased weight savings!***

**Transition to PM-SW @ 2012**

**FUE @ 2019**

**Can our troops afford to “hope” for an unlikely technological breakthrough? (again!)**



# System Dysfunction *Today!*



- In 2008 a representative from the advance technology directorate of a major US military service at a public event was quoted as having said:

*“XXX is looking for “tunable weapons,” which can adjust from nonlethal to something more powerful. Like the Star Wars phasers of science fiction, such a weapon could presumably go from “Stun” to “Kill.” (16)*

**A statement like this is simply detachment from reality!**



# “Gun Shy” Industry



***“We have a broken process.  
When you don’t have a requirement  
and acquisition process with  
a shared vision,  
you are not going to get anything,  
and you are going to waste a lot of money”***

**COL Robert Carpenter  
Former Crew-Served Weapons PM  
PM-Soldier Weapons**





# False Start 1



- **March 2005** – “**OICW Increment I Family of Weapons**” solicitation released to industry.
  - Closing date is November 2005
  - Intended to replace M4, M16, M249 and select M9’s
  - Full Rate Production Options of 134,500 weapons
  - Family of Weapons “commonality” Concept flawed – “games” LMG requirement at the cost of performance
  - 8 vendors respond they can meet/exceed specs**
- **October 2005** - DoD IG suspends OICW Increment I RFP due to lack of required program documentation and appropriate ACAT (Acquisition Category), weak OICW ORD. <sup>(10)</sup> **ARDEC cancels RFP!**



# False Start 2 - *4 months later!*



- Feb. 2006 – “Non-developmental Carbine” solicitation W52H09-06-R-0195 released to industry
  - 193,400 carbines worth approximately \$295M
  - *Done to force down rising cost of US standard!*
- 27 April, 2006 – *RFP Cancelled by ASA(ALT)!*
- Nov. 2006 – IG investigation - “Prematurely released”, “bad business practice”, “wasted procurement resources”, “engages industry for response to a solicitation then cancels the competition”, “**second carbine solicitation that the Army cancelled within one year**”. *Industry is understandably gun shy!*



# **Army's own data supports end user claims**



**“Everyone  
in the  
Army has  
high  
confidence  
in this  
weapon”**



**BG Mark Brown – PEO Soldier  
after 4th place weapon finish  
in Extreme Dust Test III**



# Proven Last – APG Dust Tests



- **3 “Extreme Dust Tests” conducted by ATEC/APG.**
  - **Test 1 – January 2007**  
**“Baseline Reliability and Dust Assessment”**  
- 9,836 stoppages in 60,000 rounds. (page 3-16)  
**1 stoppage every 6.1 rounds.**
  - **Test 2 – June 2007 –**  
**“Extreme Dust Test II” - Changes in Lubrication (increased)**  
678 stoppages in 60,000 rounds  
**1 stoppage every 89\* rounds.** <sup>(23)</sup> (\*89 rd figure in contention)
  - **Test 3 – November 2007 – “Extreme Dust Test”** <sup>(11)</sup> <sup>(12)</sup>  
Included 3 modern op rod carbines as per Congress  
XM8 – 1 stoppage every 472 rounds.  
SCAR L – 1 stoppage every 266 rounds.  
HK416 – 1 stoppage every 258 rounds.  
**1 stoppage every 68 rounds.\*\***  
**3 test average less than two full magazines (54.4 rounds)!**



# Proven Last – APG Dust Tests (cont.)



**\*\*The US Standard had 296 more Class I and II stoppages than all 3 op rod guns combined.**

**Army's response: "These tests were conducted in extreme conditions that did not address reliability in typical operational conditions." (13)**

***Ask those soldiers in the Army-sponsored CNAC Soldier survey who had stoppages in a firefight if they agree!***

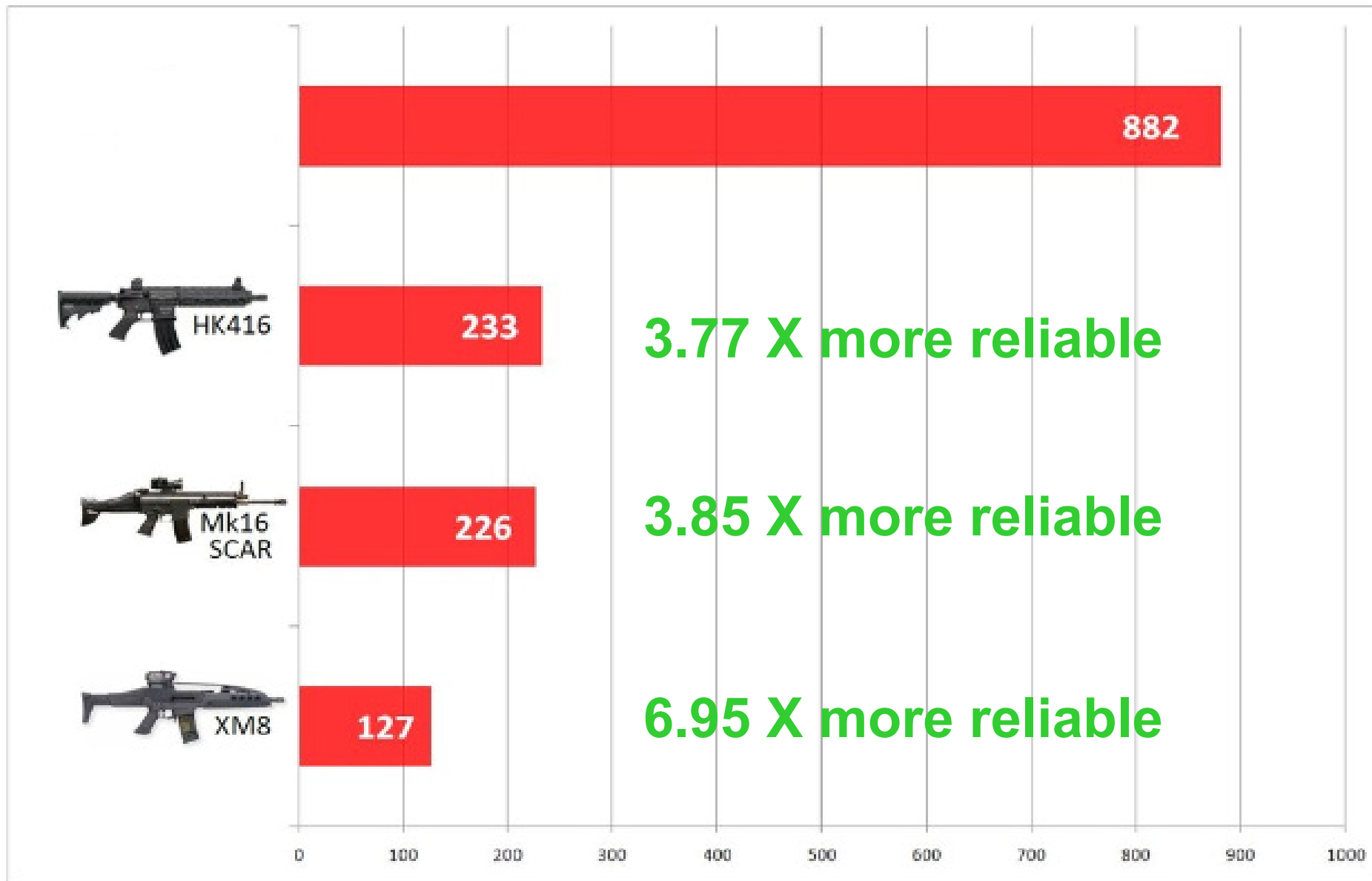




# STOPPAGES IN 60,000 ROUNDS FIRED PER SYSTEM



## ATEC EXTREME DUST TEST III - 2007





# System Answer



- **System Offers to look into:**
  - **Hammer Forged Barrels**
    - > **Already used in 3 op rod guns tested!**
  - **Improved Magazines**
    - > **Already used in 3 op rod guns tested!**
    - > **NSN 1005-01-520-5992 in the system since 2004!**
- ***But we already knew this in 1990!***
  - **USAMC “Independent Assessment of the 5.56mm XXX” – June 1990**
    - > **Barrels last < 10K rd. service life (7K)**
    - > **298 of 538 failure to feed stoppages caused by the magazine.**





# System Dysfunction - Current



- **After:**

- Troubling 2006 CNAC Soldier Survey
- 3 Unsuccessful ATEC/APG Dust Tests  
(mirrors that from CNAC Soldier survey reports)
- NLT \$430M spent on so-called “Leap Ahead” programs with nothing fielded
- Congressional involvement and media exposure
- Limited plans for superior replacements to the “Big 8”

- **The Army:**

- “Pure fleets” the US Standard (< range, accuracy, E, pH)
- Issues multiple, million dollar delivery orders for more carbines (up to \$525M), rifles, SAW’s, pistols, AGL’s, M203 grenade launchers without conducting comparative tests!

- **And states: “We are in a strategic pause.”**




# Continues New Purchases



- 6 April, 2007 – M4 Carbines - \$50.8M  
up to \$375M planned + \$150M for mods

WEAPONS AND TRACKED VEHICLES	Army Times 2/19/07
1,037 M1 Abrams tank engines	\$185.9 million
69,678 M4 carbines	\$97.6 million
Nine M1A2 SEP tanks	\$52.9 million
8,382 M249 squad automatic weapons	\$35 million
2,308 M240 machine guns	\$37 million
970 MK19 automatic grenade launchers	\$21 million
694 XM110 semi-automatic sniper rifles	\$10 million
5,328 modular shotgun systems	\$7 million



69,678  
M4 carbines

- 3 August, 2007 – M249 SAW's – up to 40,065 weapons
- 26 December, 2007 – M16A3/A4 Rifles - \$49.6M (between two vendors) 3<sup>rd</sup> vendor bid \$117 less per rifle (\$20M over life of contract) – NO DEAL! You never made an M16A4!
- Additional MK19's and M2HB's ordered in 2007  
Production maxed out!
- 2008 contract award for 25,403 M9 pistols



# **The Cost Argument (Tail wagging the Dog!)**



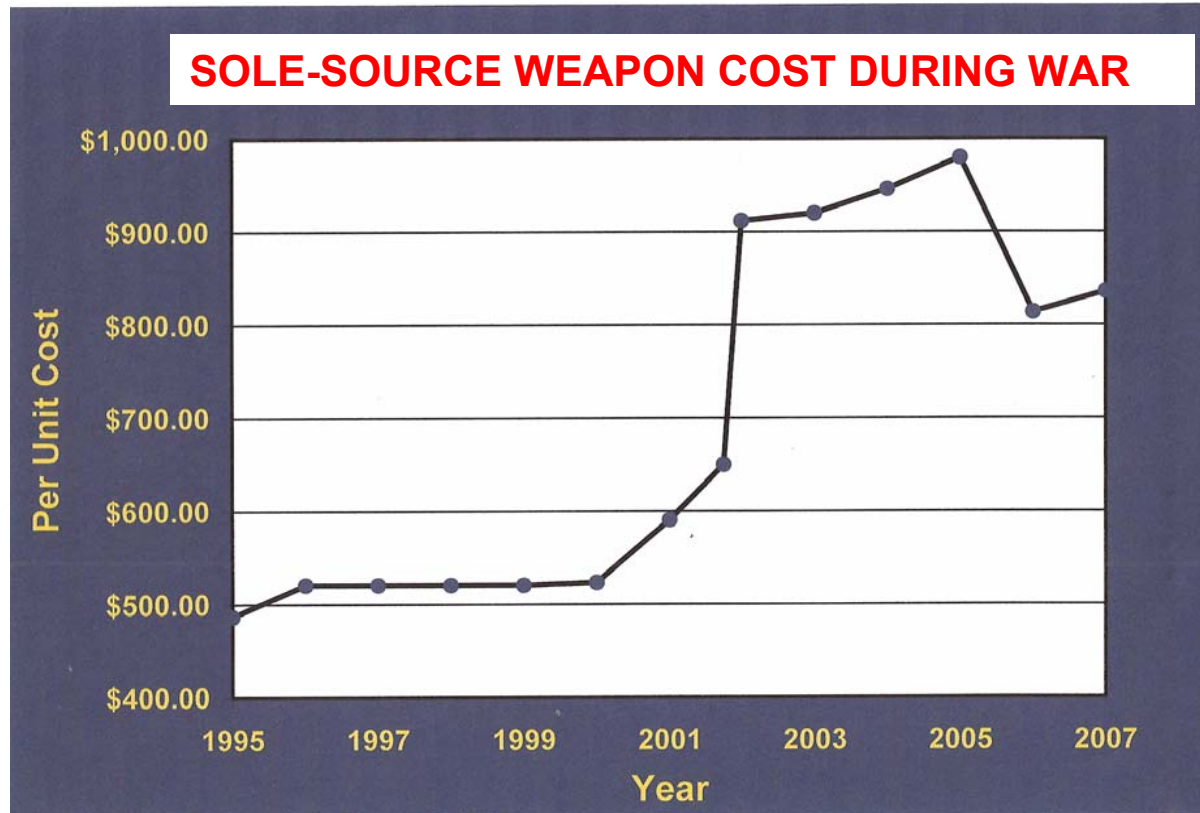
# System Dysfunction 2007



- **GAO Report – 2007**
  - **72 DoD weapon programs \$295B over budget and 21 months on average behind schedule. (20)**
  - **R&D costs are 40% over budget**
  - **\$355B is planned for new weapon systems**
- **For the \$430M spent on “Leap Ahead” Small Arms efforts since 1980 we could have purchased:**
  - **238,908 SCAR-L’s @ \$1800 each**
  - **330,756 new op rod rifles @ \$1300 each**
  - **430,000 new op rod Upper Receivers @ \$1000 each**



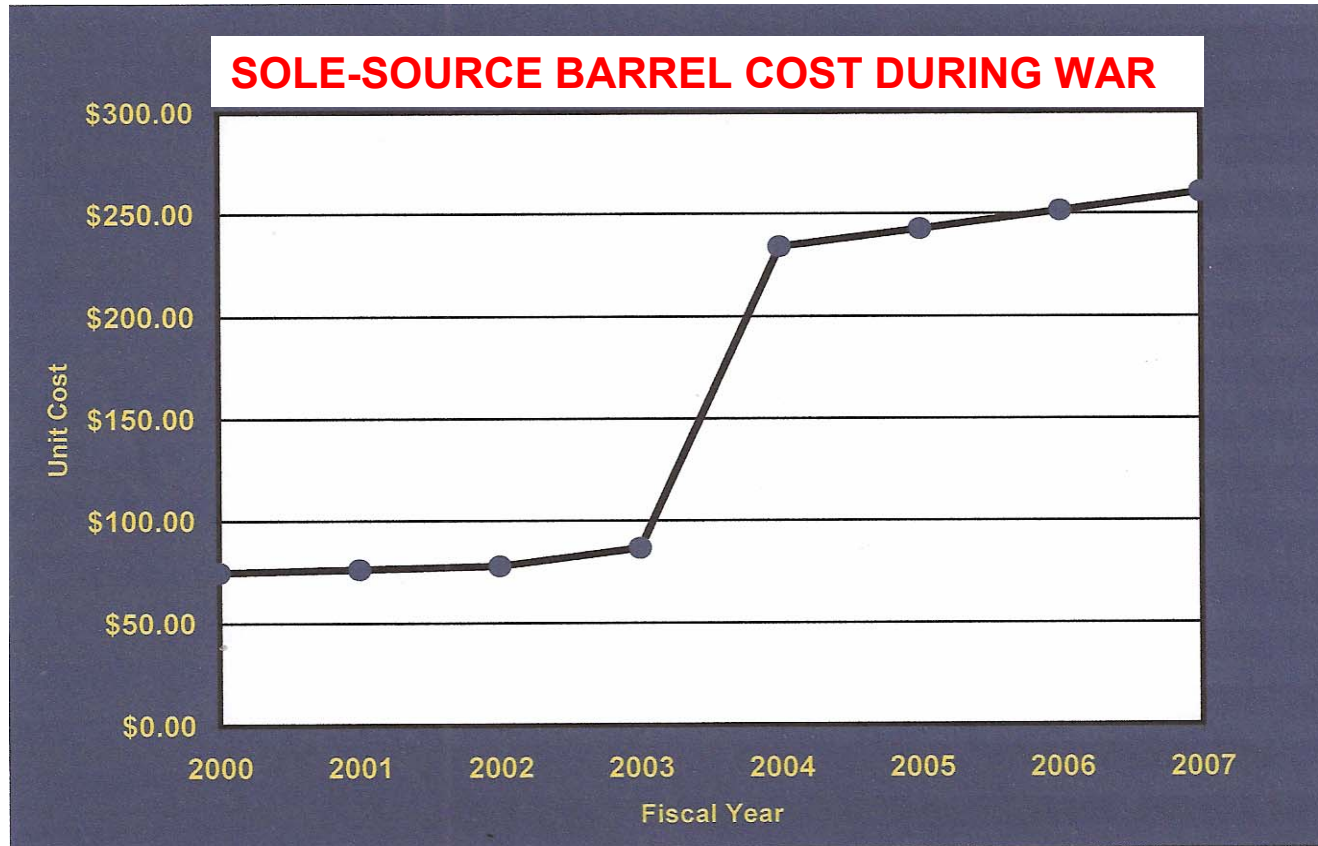
# Sole Source Cost to the Tax Payer



- **40%** increase in purchase price (\$523.84 in 2001, \$980.00 in 2005, \$1169.48 in 2007)  
(15) (22)
  - During war time
  - At increased order quantities (economies of scale?)
- **2.5 X** the purchase price of the longer US Standard



# Sole Source Cost to the Tax Payer (cont.)



- **248%** increase in purchase price (\$74.91 in 2000 - \$260.57 in 2007) <sup>(15)</sup>
  - At increased order quantities (economies of scale?)
  - During war time
- **140%** higher purchase price compared to that of longer US Standard (\$240 vs. \$100)
- **Proven superior COTS alternatives (3-4X service life) available for =/< purchase price**



# Purchase Cost vs. Life Cycle Cost - **Weapon**



Item	Unit Cost (\$)	÷ Service Life <sup>(1)</sup> (# rounds) =	Cost (cents) per rd. fired	X 20,000 rd. Life Cycle Cost =	X Division Cost (18K) =
US Standard Weapon	\$1,000 (Qty K's)	6,000 <sup>(2)</sup>	17	3,400	\$61,200,000
Superior COTS Weapon	\$1,425 (Q 1)	24,000 <sup>(3)</sup>	.06	1,200	\$21,600,000
Superior USG Weapon	\$1,800 (Qty K's)	35,000 <sup>(3)</sup>	.05	1,000	\$18,000,000

- Superior Weapons **3.4X less costly to maintain** over projected 20K round service life.
- Superior weapons offer **67% lower life cycle costs.**
- Costs do not include: **Armorers repair time/cost/training, piece parts, replacement effort for user, logistical burden, serial number accountability, operator safety, confidence, survivability.**

(1) # rounds that can be fired before parts replacement. (2) US MIL SPEC (3) USG test data

Q = Quantity K = Thousands 1 = one



# Purchase Cost vs. Life Cycle Cost - Barrels



Item	Unit Cost (\$)	÷ Service Life <sup>(1)</sup> (# rounds) =	Cost (cents) per rd. fired	X 20,000 rd. Life Cycle Cost =	X Division Cost (18K) =
US Standard Weapon	\$243 (Qty K's)	6,000 <sup>(2)</sup>	.04	800	\$14,400,000
Superior COTS Weapon	\$475 (Q 1)	24,000 <sup>(3)</sup>	.02	400	\$8,000,000
Superior US Weapon	\$300 (Qty K's)	35,000 <sup>(3)</sup>	.009	180	\$3,600,000

- Weapons using superior barrels are **1.8 - 4X less costly to maintain** over 20K rounds.
- Superior Barrels offer 4 - 5.8X increased service life and **45 - 75% lower life cycle costs**.
- Costs do not include: Armorers exchange time/cost/training, piece parts, test fire, replacement effort for user, logistical burden, serial number accountability, operator safety (OTB), confidence, survivability.

(1) # rounds that can be fired before replacement. (2) US MIL SPEC (3) USG test data

Q = Quantity    K = Thousands    1 = one





# Business Case Analysis



- 2 August, 2005 an Army (PM-SW) Business Case Analysis determined that **the US could save \$1.2B over the life of the system** by replacing the legacy carbine, rifle, **SAW (# 1 urgent USAIC replacement priority at that time)** and select handguns with a “modular family of weapons.”
- The Army projected \$12M (2% of the cost of procurement) would be spent to conduct the competition.

***No further action has been taken to date!***



# Better Available Off-the-Shelf



At least one manufacturer has stated publicly they would offer their **superior combat proven COTS op rod weapon far exceeding the MIL SPEC's of the current US issue weapon at prices matching the US current contract price** and can begin producing and delivering no less than 4,000 weapons per month immediately after receipt of order.....  
***And the US is not interested?!?!***



**Every Problem  
has a Solution**



# # 1 – End User Absence



**Small Arms Decisions are being made “too far from the field” and end user by:**

- **GO's, PEO's, PM's, Proponents, Retirees**  
***that are not fighting with small arms!***
- **The system MUST support the specific needs of the end user, ***NOT vice versa!*****
- **The current Executive Agent for Small Arms repeatedly fails or is too slow to react.**

***ANSWER: Adopt Select US Unit SOP!***





## # 2 – Unrealistic Requirements



### Stop chasing “Star Wars” (SAMP, OFW)

- What does US select/SOF purchase, field? **Combine efforts.**
- Efforts must focus on **obtainable** goals.
- “Leap ahead” efforts divert focus and funds from end user requirements.

**ANSWER: Look to the future  
but buy what works, and now.**



# # 3 – Changes in Direction



## Too many Changes, False Starts, Revisions

- "User Small Arms Advisory Panel" (USAAP)
- Directs system on:
  - > Incremental Fielding Focus (1-3 years)
  - > Future Programs (3-5 years)
  - > R&D (5-10 years)

**Answer: Form the USAAP now!**

**Answerable to Congress and SECDEF only!**



# USAAP

(User Small Arms Advisory Panel)



- **User, US select unit Representation.**
- **Proven incremental fielding representation.**
- **Self-vetting. No PM's, PEO's, AO's, other.**
- **Answerable only to Congress, SECDEF**
- **Directs, approves actions of system on:**
  - **Current product performance**
  - **New item testing**
  - **Contract awards and extensions**
  - **R&D program funding (current and new)**

***The system truly working for the end user!***<sup>120</sup>





# # 4 – Outdated MIL SPECS



**US Small Arms Performance Specs (PS's)  
are outdated and force sole-source  
procurement of outdated materials**

- **Must be revised every 3 years and for each new contract** based upon current state-of-the-art performance
- **New “best of breed” must be found and evaluated regularly**
- **New PS's must be written/approved by USAAP *before* recompetes!**

**ANSWER: Update PS's often**



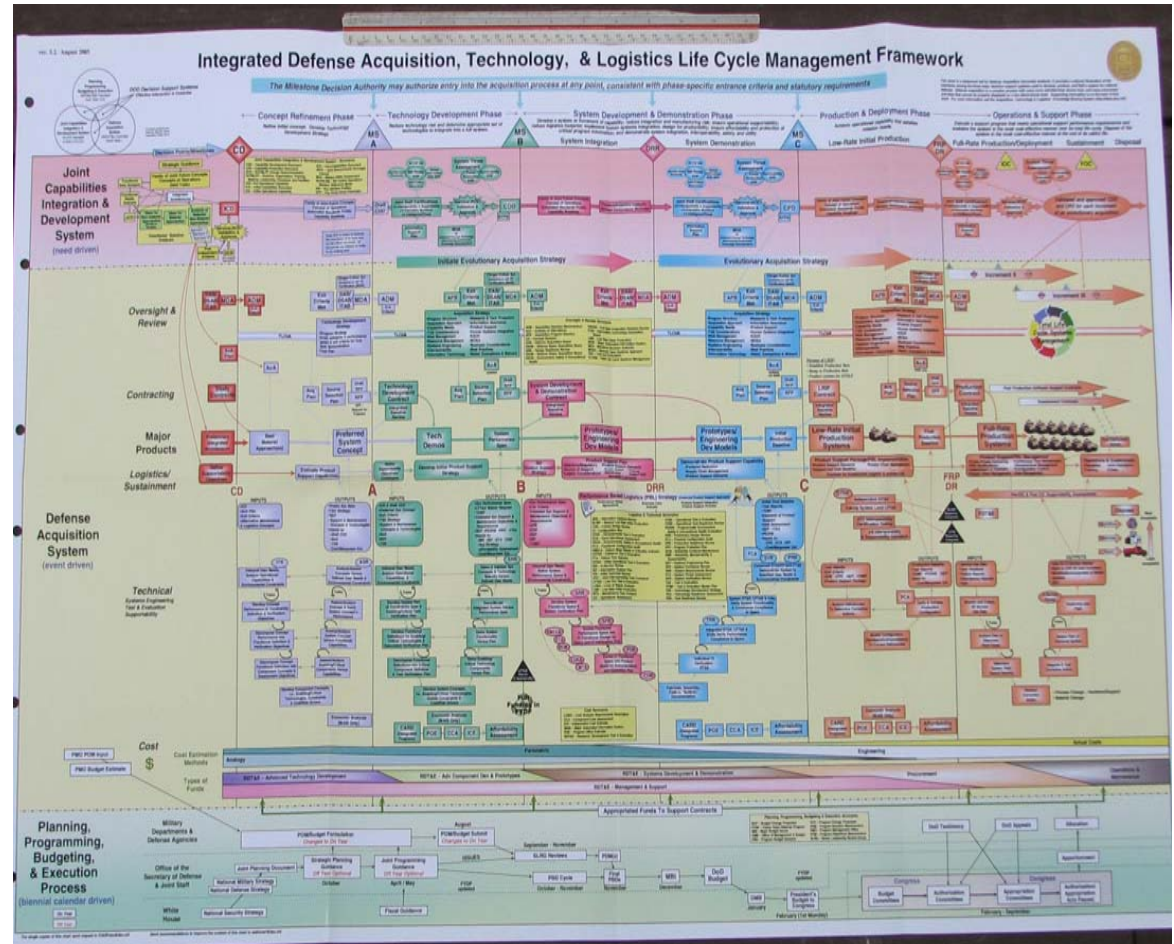
# # 5 – Remove JCID's for Small Arms



The JCID's process is simply unworkable for incremental and timely small arms fielding

- Delays fielding
- Hampers urgent responses
- Drives up costs
- Creates programs versus solutions!

**ANSWER: Dump JCID's for Small Arms**





# # 6 – System Support



**The Small Arms Support System (Development, Acquisition, Contracts, Logistics) must support the direction/decisions of the end user through the USAAP.**

- **Utilize the talents, facilities already in the system**
- **Stop chasing the Logistical Tail!**
- **The system works for the end user.**
- **More security for all by greater turnover of new systems and system success**

**ANSWER: User/USAAP directs Support System**



# # 7 – R&D Black Hole



**Studies, Simulation and Modeling should not replace regular incremental fielding**

- Find and field the “90% solution”, and regularly
- Incremental fielding provides the greatest return on investment
- Endless Multi-year Programs do not kill bad guys! Nor do they protect the friendlies!

**ANSWER: User/USAAP approves all new small arms R&D programs**



# # 8 – Promotion Suicide



**Remove the “Yes Man” promotion rule  
from small arms efforts**

- **Few AO’s, PM’s have small arms experience let alone expertise**
- **Act on user/USAAP direction, not that of superiors inexperienced with small arms who control a subordinates future and push bad small arms decisions**

**Then PM’s will become true “Action Officers”**

**ANSWER: Make the system answerable  
to the User/USAAP**



# # 9 – Joint Efforts



**Very few combined efforts today in US Small Arms development yet the basic use of small arms is the same**

- **Combine Requirements, Interagency Participation and Support**
- **Generate Realistic User/USAAP Based Requirements for Near Term Fielding**
- **User/USAAP Selection *a must!***

**ANSWER: Joint efforts will bring success if User requirements are supported by the system**



# # 10 – Contract Limits



**No Small Arms Contract should exceed 6 years**

**Regular contract awards will:**

- **Generate more competition, innovation, willingness to participate by non-traditional vendors**
- **Keep unit prices low and quality high**
- **Will leverage emerging technology more often**
- **Will respond to ever changing warfare**

**ANSWER: Restrict contracts to maximum of 6 years for same item from same vendor**



# # 11 – Don't Buy TDP's



**Most small arms production TDP's are usually outdated before contract end and often even before they are received**

- Especially in a “stimulated” small arms competitive environment as described above**

**ANSWER: Look for new superior products, not yesterdays product drawings**





# # 12 – Avoid Distractions



**System developed alternatives (NSAC/NSATC) seldom bring value to the war fighter**

- **Costly duplication of effort. A distraction.**
- **Must “pay to play” (\$1000 + 10%)**
- **Would Messrs. Hall, Maxim, Browning, Lewis, Thompson, Garand, Stoner, etc. have paid to participate?**

**ANSWER: Focus the existing support system on rapidly answering the needs of the End User**



# # 13 – Limited Combat Evals



**Use Limited Combat Evaluations by actual end users to assess the effectiveness of proven systems and capabilities**

- **Apply Select US Unit SOP**
- **Field at Company or BN level**
- **After mandatory safety testing**
- **After pre-deployment, New Equipment Training by SME's (SOF, contractor, etc.)**

**ANSWER: Let the Users and their Commanders decide what works best on the battlefield and against the enemy**



# # 14 – “Up gun” Calibers



## **Reevaluate US self-imposed voluntary restrictions on Ammunition and Projectile limitations for Conventional US Forces**

- **Consider medium caliber for America’s rifle/carbine and LMG**
- **Look at non-NATO calibers**
- **Look at Non-compliant “Land of Warfare” approved projectiles (BTB, JSP, HP, etc.)**
- **Follow Select US Unit SOP, successes**
- **Develop an optimum weapon/ammo “system”**

**ANSWER: Adopt the very best in ammunition and projectile technology**



# 15 # - Small Arms Funding



**With greater success in small arms fielding for the war fighter the system will:**

- Be rewarded with additional funding for future procurements and small arms efforts
- Stop being maligned and criticized
- Attract the best and brightest
- Better guarantee job and facility security
- Experience unparalleled support from Industry, Congress and the American people

**ANSWER: Field it and they will come.**



# 3-year Incremental Fielding Cycle



## On a three-year cycle USAAP:

- **Reviews (every 3rd year)**
  - **USG and COTS System Performance and Specifications, PIP's, Threats, etc.**
  - **R&D Programs (current, new)**
- **Tests (every 4<sup>th</sup> year)**
  - **Solicits Industry for and tests incrementally superior systems**
- **Contract Award (every 5<sup>th</sup> year) NTE 6 years**



## **3-year Incremental Fielding Cycle (cont.)**



- **Limited Combat Evaluations to prove out system capabilities**
- **First fielding to high-use, front line units**
- **Keeps opponents guessing on US small arms capabilities set while leveraging newly emerging COTS capabilities**
- **Contractor-provided Logistical Support should be leveraged as in the UK and Germany**



# You may be part of the problem



- **If you use words and phrases like:**
  - **”Backwards Compatibility”**
  - **”Too expensive to change”**
  - **”Meets Specs”**
  - **”Is good enough”**
  - **”Tactical Patience” - excuse for more of the same**



# You may be part of the problem (cont.)



- **If you:**

- **Cherish words like “Logistical Tail”, “Revolutionary” and “Leap Ahead”**
- **Respond to urgent user requirements by looking at a calendar (PM) and not your watch (End User)**
- **State conventional and SOF small arms performance needs are not the same**





# You may be part of the problem (cont.)



- **If you:**
  - **State that those who question the poor performance of current equipment undermine the confidence of the war fighter**
  - **Do not embrace and seek out regular and direct end user involvement in ordnance selection**
  - **Have not read the book “Misfire” and “The Black Rifle”**



***“The Soldier in the field is our number one priority”***

**Secretary of the Army Pete Geren  
From US Army News Release dated 17 December, 2007  
after forth place finish of US Standard  
in APG Extreme Dust Test III**



# References



- (1) Excerpts – “Dangerous Weapons Jams” – Army Times – 26 March, 2007**
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- (3) Excerpts – “Eye to eye with a suicide bomber” - SOF Magazine – February 2008**
- (4) Excerpts - “Real world experience” – Combat Tactics Magazine - 2005**
- (5) Excerpts – “Why you won’t get your hands on the Army’s best carbine” – Army Times – 26 February, 2007**
- (6) Study, “Soldier Perspectives on Small Arms in Combat “ CNA Corp. - December 2006 <sup>(6)</sup>**
- (7) US Army News Release – “Army position: M4 Carbine is Soldiers battlefield weapon of choice” – 29 May, 2007**
- (8) Slide – JSSAP briefing to NDIA SA - “Joint Service Small Arms Roadmap” - 15 May, 2002**
- (9) Slide – JSSAP ARD-04, Light Fighter Lethality After Next” - 2002**
- (10) Report – DoD IG “Program Management of the Objective Individual Combat Weapon Increment I” – Report No. D-2006-123(PDF) – 29 September, 2006**
- (11) Report – ATEC “Carbine Extreme Dust Test” – 17 December, 2007**
- (12) Article – “Dead last” – Army Times – 24 December, 2007**
- (13) US Army News Release – “Army tests carbines for the third time in extreme dust” – 17 December, 2007.**
- (14) Article – “The XM26 Modular Accessory Shotgun System” – Small Arms Review – November , 2007**
- (15) Spreadsheet – “M4 History” – US Army source - November, 2007**
- (16) Article – “Special Ops Technologists Have Unique Wish List” – National Defense magazine, April 2008**



# References (cont.)



- (17) **White Paper – “Enhancement of Current Carbine & Rifle Capability using 6.8x43mm Rem. SPC” – LCDR Gary K. Roberts, USNR – 1 Jan. 2007**
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- (19) **Article – “The USA’s M4 Carbine Controversy” (2002 USMC Tests of M4 and M16A4) – Defense Industry Daily – 30 July 2007**
- (20) **Article – “US Weapons Budget under fire for overspending” – Defense News – 1 April 2008**
- (21) **Report – “Technical Evaluation Report for the Heckler & Koch (HK) 416 5.56mm Carbine and M4A1 5.56mm Carbine – NSWC Crane – March 2006.**
- (22) **Report – “Competition of the 5.56-Millimeter Carbine” – DODIG – 26 Sept. 2006**
- (23) **Article – “Giving M4 failures ‘an alibi’?” – Army Times – 29 Dec. 2007**



# Time for a Change

## US “Incremental” Small Arms Fielding – Failures and Solutions

Part I - Small Arms  
by Jim Schatz

052008



# Incremental Excellence

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

By Jim Schatz

# Introduction

- Follow-on to the 2008 NDIA Paper  
“Incremental Small Arms Fielding – Failures and Solutions”  
May 2008 - Dallas, TX
- Explore the “What If” Possibilities for the War Fighter of:
  - Considering and cataloging superior incremental performance & features scattered throughout the world’s leading assault rifles
  - Exploiting the 10 most important proven incremental enhancements available in today’s modern assault rifles
  - Conventional vs. Bullpup configuration
  - Quantifying “Package Performance” of the ultimate incrementally superior assault rifle/carbine, or family of weapons, for near term fielding (< 3 years)
  - Primary aspects covered – others (ruggedness, safety, environmental extremes) “a given”

\* *All data, claims supported by reference materials*

# Qualifications – Jim Schatz

- **User: 11B – 82<sup>nd</sup> Airborne Division**
- **Trainer: US Army Marksmanship Unit**
- **Provider: 22+ years to the US Government, war fighter**
  - *Logistical Support*
  - *Contracts*
  - *Fielding*
- ***Involved as US Contractor Developer: HK416/417, M1014, USP/JCP, MP5/10, MSG90, ACR/G11, others***
- **Student: Of small arms since age ten**
- **Supporter: Of the end user**

**NO direct affiliation with firearms or ammo makers.**  
**NOT the “lone voice” on this issue! One of many.**





# Goal



***To find, test and field  
the best small arms  
and ammunition available  
to the American war fighter  
today and always!***



# Small Arms “Disconnect”

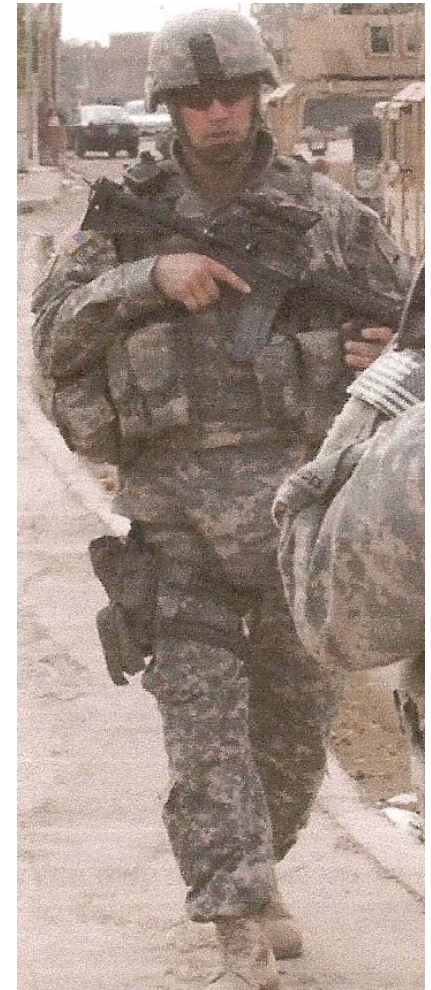


- Night Fighting Equipment
- Helmets and suspension
- Load bearing equipment
- Uniforms, boots, gloves
- Body Armor
- Eye, Ear Protection
- Rations, water carriers
- Communications gear
- Cold/wet weather gear
- First Aid pack, gas masks
- Anti-tank weapons

20 years Ago



2008



Weapons designed in the 1960's, or earlier!



# The Cause – Our Aged Fleet



The “Big 8” – Primary US Military Small Arms						
Weapon	Year First Fielded <sup>(1)</sup>	Age (Years)	Manufacturer	Modern Design Available	Replaced by OFW candidate	Comments
M9 Pistol 9x19mm	1985 (Army)	23	Beretta USA	Beretta Brigadier, PX4, others	No	Numerous modern alternatives abound, to include PDW calibers
M4 Carbine 5.56x45mm	1994 (Army adoption)	14	Colt Defense	Colt M5, XM8, HK416, SCAR L, others	No	Modern Op Rod designs
M16A1 Rifle 5.56x45mm	1967 (Type classified by Army)	41 <sup>(2)</sup>	FNMI, Colt Defense	FN SCAR, F2000 Colt M5, HK416, XM8	No	Modern Op Rod and/or bull pup designs
M203 Grenade Launcher 40x46mm	1969	39	Various	US XM320	No	3+ years since COTS contract award
M249 Squad Automatic Weapon 5.56x45mm	1982	26	FNMI	FN MK46	No	MK46 fielded with USSOCOM
M240B Medium Machine Gun 7.62x51mm	1976 (Army)	32	FNMI	FN MK48, Vector SS77, US Ord. M60E4, Barrett LW240, HK121	No	MK48 fielded with USSOCOM
MK19 MOD 3 Automatic Grenade Launcher 40x53mm	1988 (Army)	20	GD	GD MK47, HK GMG	No	MK47 and GMG fielded with USSOCOM, OGA's
M2HB Heavy Machine Gun .50 BMG	1923	85	GD	GD M2E2, GD XM312	No	
	<b>Average:</b>	<b>35</b>	<b>All eight weapons above</b>			
	<b>Average:</b>	<b>28</b>	<b>Without M2HB</b>			
	<b>Average:</b>	<b>26</b>	<b>Without M2HB and M203</b>			
	<b>Average:</b>	<b>23</b>	<b>Without M2HB, M203, M16</b>			

“OFW” - Objective Family of Weapons from “Small Arms Master Plan” (SAMP) first briefed in 1984 by the USAIC.

<sup>(1)</sup> All initial fielding dates taken from “Jane’s Infantry Weapons, 2007/2008 edition. <sup>(2)</sup> America’s longest serving service rifle.



# The “Big 8” – Showing their Age



Average: **35** All eight weapons

Average: **28** Without M2HB

Average: **26** Without M2HB and M203

Average: **23** Without M2HB, M203, M16

- **Trickle Down” effect. What the system buys often ends up in:**
  - All branches of our military
  - US State Department/Embassy security
  - OGA’s (federal law enforcement, DOE, NRC, FBP, other)
  - State and Local law enforcement
  - Foreign Military Sales (FMS)



# Definitions – Part I



- **“Incremental”** Improvements
  - The “90% solution”
  - Available as COTS/NDI, modified COTS
  - **Significant advantages for the end user!**
    - > **Reliability**: 7X that of US standard
    - > **Service Life**: 3 – 4X that of US standard
    - > **Improved Accuracy**: 30-50% increase
    - > **Safety**: OTB (0 vs. 6 sec. drain time), Increased (60%+) Cook Off (210-240 vs. 120-150 rounds), SBFA (catch live projectiles during blank firing)
    - > **Weight Reduction**: up to 20% (system)



# Definitions – Part I



- **“Incremental” Improvements (cont.)**
  - **Significant advantages for the end user**
    - > **Modularity, User Configurable, Controls:** (SCAR, XM8, ACR/Masada)
    - > **Parts Commonality:** 82% between 5.56mm, 6.8mm and 7.62mm (SCAR)
    - > **Reduced Maintenance (user, maintainer):** 72% less cleaning time (any Op Rod system)
    - > **Reduced Procurement Costs:** (complete weapons, barrels, piece parts)
    - > **Reduced Life Cycle Costs:** 45-75%



# Incremental vs. “Leap Ahead”

- Ground combatants still kill the enemy with KE mechanisms (bullets, fragments) that must be:
  - Accurately aimed and delivered to the target by skilled operators (even AB munitions and LRF's)
  - From belt buckle distance to MER
  - Same for all – Conventional, SOF, enemy
- The last “leap ahead” advancement in small arms – 14 century “Hand Cannon” (first KE firearm)
- The last substantial “**incremental**” advancement in US-issue rifles/carbines was America’s first Assault Rifle the AR-15/M16 more than four decades ago!
- The US “Big 8” small arms are 35 years old on average. 23 years without the oldest 3. In comparison, Germany has replaced 9 of 10 small arms since 1994 with incrementally<sup>51</sup> superior small arms now available as COTS items.



# Threat Successes



**Russian AN-94  
“Shifted Pulse”**

**Assault Rifle**

**5.45x39mm**

**pH doubled @ 1800 rpm ROF**

**In limited production and  
fielding since 2001. Being  
developed in 7.62x39mm.**

*The US has nothing that  
competes with these  
weapon capabilities!*



**Chinese QBZ-95/97 Family of Weapons**

**- 5.8x42mm Superior cartridge/bull pup  
ammunition performance. Heavy  
penetrator (lead penetrator “pusher”)  
coming. First fielded in 1998.**



**Russian SR-1 Gyrza  
Armor Piercing Semi-  
automatic Pistol  
9x21mm SP-10, SP11,  
SP-12 Adopted in 2003.  
Penetrates 2.8mm  
Titanium and 30 layers  
Kevlar at 100 meters.**

(c) 2003, Maxim R. Popenker  
www.world.guns.ru



# Quad Chart Explanation

## Performance Category

**Description of  
Performance Category**

**Example:  
Legacy System  
Performance**

**Example:  
Incrementally superior  
COTS/NDI System  
Performance**

**The Value to the  
War Fighter**

# Conventional Configuration

**Comparison Table**  
**10 current/modern Conventional-configuration Carbine-length Assault Rifles**

Weapon	HK33K	Beretta ARX 160	G36K	Daewoo K1A	SIG 551	AK102	XM8 BC	M4	HK416	SCAR L	Averages
Overall Length <sup>(1)</sup> mm/(in.)	865 (34.1)	900 (35.4)	860 (33.9)	838 (33.0)	833 (32.8)	824 (32.4)	838 (33.0)	838 (33.0)	900 (35.4)	889 (35.0)	859 (33.8)
Barrel Length mm/(in.)	322 (12.7)	305 (12.0)	320 (12.6)	263 (10.4)	363 (14.3)	314 (12.4)	318 (12.5)	368 (14.5)	368 (14.5)	355 (14.0)	330 (13.0)
Muzzle Velocity mps/fps	840 (2756)	838 (2750)	N/A	820 (2690)	N/A	850 (2789)	N/A	838 (2750)	N/A	826 (2710)	835 (2740)
Key Features	BB	OR ACH QCB ECH AE CC	OR, ACH, AFA	OR – <u>K2 Carbine only</u>	OR	OR	OR, ACH, AFA, ISM	ACH	OR, ACH, QCB option	OR, ECH	OR – 7-8/10

<sup>(1)</sup> Length provided is weapon in “fighting” configuration (buttstock fully extended, if applicable).

**Note:** Threat Standard (7.62x39 mm AKM) – OL = 870/690 mm (34.3/27.2 in.) Bbl Length = 415 mm (16.34 in.) MV = 710 mps (2330 fps)

**Note:** OL on average is 529 mm (20.1 in.) longer than barrel length.

**Key:** ACH – Ambidextrous Charging Handle AE – Adjustable Ejection AFA – Ambidextrous Forward Assist BB - Blowback  
 CC - Caliber Conversion (by user) ECH – Exchangeable Charging Handle FE – Forward Ejection  
 ISM – Integrated Sight Module (reflex sight/lasers) LAM – Laser Aiming Module OR - Op Rod Gas System  
 QCB – Quick-change Barrel (w/o tools) SM – Sight Mount permanent to barrel

# Bullpup Configuration

Comparison Table											
10 current/modern <b>Bullpup</b> -configuration Carbine-length Assault Rifles											
Weapon	FAMAS	AUG	F2000	QBZ-97	TAR-21	SAR-21	Vector CR-21	L85A2	A-91	Valmet M82	Averages
Overall Length mm/(in.)	757 (29.8)	805 (31.7)	694 (27.3)	760 (29.9)	720 (28.4)	805 (31.7)	760 (29.9)	780 (30.7)	660 (26.0)	710 (28.0)	745 (29.3)
Barrel Length mm/(in.)	488 (19.2)	508 (20.0)	400 (15.8)	520 (20.5)	460 (18.1)	508 (20.0)	460 (18.1)	518 (20.4)	400 (15.8)	420 (16.5)	468 (18.4)
Muzzle Velocity mps/fps	960 (3156)	940 (3084)	920 (3019)	930 (3051)	910 (2986)	N/A	980 (3215)	940 (3084)	N/A	N/A	940 (3084)
Key Features	BB	OR, QCB	OR, FE	OR, ACH	OR, AE, ECH, LAM SM	OR, ACH, LAM	OR	OR	OR, FE, ACH	OR	OR - 9/10 FE - 2/10

**Note:** Threat Standard (7.62x39 mm AKM) - OL = 870/690 mm (34.3/27.2 in.) Bbl Length = 415 mm (16.34 in.) MV = 710 mps (2330 fps)

**Note:** Bullpup average OL is 125 mm (4.92 in.) shorter than the AKM (stock extended) and provides @ 230 mps (755 fps) > MV from a 52.3 mm ( 2.06 in.) longer barrel.

**Note:** OL on average is only 277(10.9) longer than barrel length.

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# #1 – Reliability

**Most important aspect of all combat equipment – all other aspects are reliant upon proper operation when needed.**

## Legacy System

- MRBS
  - 1,130 rds (0106DT)
  - 667 rds (US MIL SPEC)
- MRBF
  - 3,000 rds (US MIL SPEC)

- XM8 = 18,000 MRBS/F  
= 7X more reliable in 2007  
Extreme Dust Tests
- SCAR L = 3.9X more reliable in 2007  
Extreme Dust Tests
- HK416 = 3.8X more reliable in 2007  
Extreme Dust Tests
- L85A2 = 25,200 MRBF

\* All with Operating Rod Gas Systems

- Increased end user survival
- Increased confidence
- Enhanced unit performance and mission success

# #2 – Safety

**End user must be protected from catastrophic equipment failure under all conditions.**

1. Cook off @ 180 rds.
2. Barrel failure @ 540 rds.
3. Blank firing safety  
– Tragic French Military shooting, June 2008
4. OTB – 6+ seconds

1. 180-210 rds. (SCAR L),  
> 240-270 rds. (HK416, XM8, G36)
2. > 900 rds. – (G36)
3. Safety Blank Firing Adapter catches 3+ live rounds
4. OTB capable (0-2 sec SCAR L, 0 sec HK416)



**Enhanced user & bystander safety –  
+30% (cook off)  
+40% (barrel failure)  
6X faster OTB**

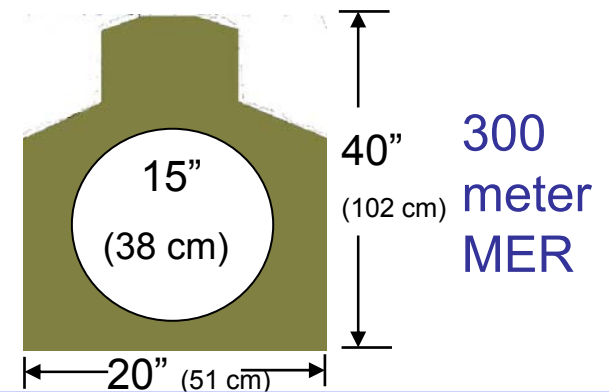
# #3 – Probability of Hit

## A – System Accuracy

**A reliable, safe operating weapon must facilitate hit probability through inherent system accuracy (weapon, ammo, sight).**

**NTE 5" (127 mm) 10-shot group @ 100 y (91.4 m) with M855 (SS109) ammo**

**No room for system variation, shooter error, environmental influences**



**Confined spaces use = short weapon & barrel length**

- 10 shot 13" (330 mm) 300 y
- 5 shot @ 1" (28 mm) 100 m 55 gr. match ammo (after 12K rds)
- 10 shot @ 3.5" (89 mm) 100 m groups M855 ammo, 1.9" (48mm) after 15K rds
- Ammo + .7 MOA after 17K

(LWRC 8" [203 mm] bbl M6A2 PSD 6.8x43mm)

(HK416 10.5" [254 mm] bbl 5.56x45mm)



(SCAR L)

**Improved system accuracy increases hit probability under normal and worse case scenarios:**

- Extended ranges
- Shooter error
- Stress
- Equipment variables
- Environmental influences

# #3 – Probability of Hit (pH)

## B – Targeting

**Optical/laser sighting/targeting systems enhance & increase pH under most operational conditions.**

**Multiple, time-consuming and often complex mounting and zeroing procedures required for 3 or more separate devices**

- BUIS
- Laser pointer
- Reflex sight
- Other (Thermal, Magnified Optics)

- Integrated Reflex Sight & Laser Pointer – XM8 ISM, AMO

- Single zeroing procedure
- Single power source
- Single mount – reduced footprint, lighter
- Single pressure switch – wireless



- PCAP's Mounting Interface

- “Negative” accessory mounting footprint
- > 1 lb. (.45 kg) weight reduction – no front end weight penalty
- Improved zero retention over P rail
- Reduced cost (@ \$300 USD)



**Integrated mounting points and/or aiming devices reduce system weight and improve weapon handling aspects and pH.**

# #4 – Ease of Use

## A – General

**Soldier survivability is enhanced when small arms are easy to use, simple to maintain and instinctual in their application under stress.**

- Similarity to “Legacy” weapons is desirable for current troops, but may force system compromise for optimum performance
- Smart “Clean Sheet” approach yields advantages for new troops and their organizations.
- Instinctual controls improve response time on target, under stress, in CQB.
- Simplified and/or minimized system upkeep insures reliable function.

- Similarity of controls (SCAR, HK416) with advanced functional characteristics
- Op Rod Gas Systems\* insure:
  - Improved function & safety
  - Reduced maintenance interval (up to 15K rounds) and duration of operator cleaning (3 vs. 15+ mins.)
- (\* 15 of 20 sample weapons use Op Rod Gas Systems)
- Fully ambidextrous controls improve response time of operators (XM8)

**In armed encounters:**

- Reliable function
- Speed of engagement
- Precision

**Equals user survivability**



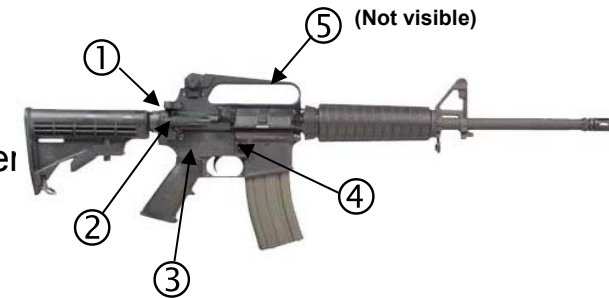
# #4 – Ease of Use

## B – Ambidextrous & “Centralized” Controls

“Fighter Joystick” strong hand controls offer speed of response, reducing multiple unnecessary and time consuming hand movements, improved muscle memory, and passive control status, and free the weak hand to support/aim the weapon, change magazines, operate the charging handle and perform other non-weapon tasks.

Legacy weapons have distributed controls positioned at multiple and often hard to find/reach locations and seldom are fully ambidextrous.

1. Charging handle
2. Forward assist
3. Safety/selector lever
4. Magazine release
5. Bolt catch/release



**Five separate controls/control locations**

### State-of-the Art Systems

Concentrate like-controls @ the trigger:

First location:

1. Magazine catch/release
2. Bolt catch/release
3. S/S lever

Second location:

4. Charging handle
5. Forward assist



XM8

**Strong hand activation of multiple controls speeds response time while allowing the weapon to remain in a ready firing position at all times.**

# #4 – Ease of Use

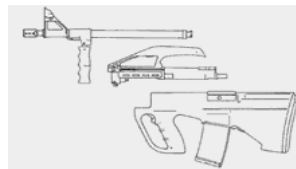
## C – Modularity

**The ability of the operator to reconfigure the assigned weapon in the field without special tools to adapt to ever-changing mission and operational environments and threats.**

**Legacy modularity is most often limited to the exchange of complete upper receivers (where applicable) with few offering buttstock or barrel modularity or caliber conversion.**



Modular user-replaceable sub-assemblies offer a wide range of weapon flexibility available on user demand:



- Barrel lengths (AUG, Masada. SCAR 4-6 mins)
- Buttstock modules (XM8, HK33K)
- Trigger groups (G36, XM8, HK33K)
- Caliber conversion (ACR/MASADA, AUG, ARX 160. AR-style systems – upper receiver replacement)

• \$1.2B USD projected savings over life-of-system by fielding a family of modular weapons, \$12M USD to conduct the competition.

For use in current fluid operational environments a modular reconfigurable family of weapons would offer:

- CQB to DM/AR flexibility from a single platform (bbl, sights, stocks, trigger group)
- Adaptable ammunition performance (pistol caliber to 5.56x45mm NATO to medium caliber [6.5mm, 6.8mm])
- Enhanced terminal ballistics from short-barreled platforms for confined spaces use

# #5 - Lethality

**5.56x45mm NATO M855 ammunition provides diminishing terminal effects < 2,500 fps (762 mps) striking velocity due to reduced fragmentation and/or yaw.**

**\*L85A2 has a 20.4" (518mm) barrel!**

- 150 m from 14.5" (368 mm) barrel
- 0 m from a 10.4" (264 mm) barrel



Compliance with Hague Convention limitations restrict the use of superior LE-style "deforming" projectiles that improve terminal performance at < 2,500 fps (762 mps), especially through intermediate barriers (clothes, magazines, car panels, wind shields).

- "Medium caliber" (6.8x43mm Rem. SPC, 6.5mm Grendel, 7.62x39mm) user installable conversion kits (upper receivers, barrels, bolts/magazine) provide enhanced (up to 55%) terminal performance at the lower striking velocities often obtained from short-barreled carbines desired for confined spaces use.
- **8" (203 mm) bbl LWRC 6.8x43mm PSD 115 gr. OTM @ 300m.**
  - 318 mm (12.53") 10-shot group (3 group average)
  - 450 mps (1475 fps)
  - 949 j (700 ft. lbs) ME remaining
- **14.5" (368 mm) bbl 5.56x45mm Carbine 62 gr. M855 @ 300 m.**
  - 650 mps (2,133 fps)
  - 834 j (615 ft. lbs.)
- Newly emerging "BTB" ammunition – equal performance through intermediate barriers and unprotected targets.



**Improved terminal performance on protected targets with medium caliber conversion kit while retaining NATO standard ammo compatibility as required for training, interoperability<sup>63</sup>**

# #6 – System Weight

The elusive and highly desirable attribute all soldiers want (yet seldom acquire).

Second in importance to reliability and performance

(à la US M240B 28 lbs, US M60 21 lbs.)



70 kg (155 lbs!)

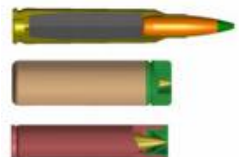
Even with the liberal use of lightweight materials such as aluminum and polymer since the 1960's the infantryman's combat load continues to increase as new capabilities such as MRS and optical aiming devices are added with no change in ammunition or magazine weight (poly mags same as aluminum) .

- Limited possibilities to reduce rifle weights while retaining desired features and performance
- Accessory mounting and combined function – @ 20% weight reduction (XM8)
- Increased accuracy and terminal performance can increase kills/rounds fired
- Lightweight sights/sight mounting, ammunition technology offers the greatest weight savings:
  - Polymer Case (US LSAT Prog.) > 40%
  - LW Stainless Steel Case - @ 20%
  - **Caseless – too problematic for field use**

Leverage emerging lightweight case material, ISM's, PCAP's and BTB projectile technology to reduce system weight while increasing terminal performance

= more kills/pound

= more kills/round



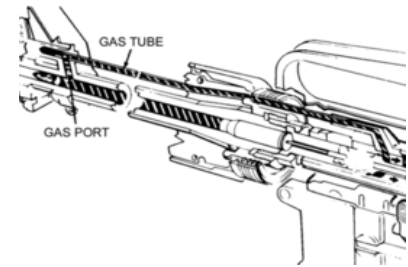
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(20% of 70 kg = 56 kg (124 lbs!))

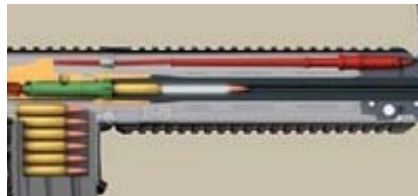
# #7 – Maintenance

**Reducing the frequency and duration/difficulty of mandatory operator maintenance can insure user compliance and thus system readiness when called upon.**

Direct “impingement”-style gas systems common in Stoner AR-15/M16-style platforms contaminate key working parts, burn-off lubrication, create hard baked-on carbon fouling that reduces proper function and requires extensive (unnecessary) cleaning (@ 1,000-5,000 rounds).



- Op Rod Gas Operated weapons (HK416, G36, SCAR, **etc., etc., etc.**)
  - Reduce cleaning time by > 72% (3 vs. 15+ minutes)
  - Reduce the interval of cleaning (> 15K rounds: HK416) and lubrication
  - Can operate w/ minimal lube in dusty environments (and reapplication at > 5K rds) and correspondingly increase reliability and weapon readiness



- **System reliability is the most important aspect of a combat weapon for soldier survival**
- More than 17 new Op Rod designs since 2004 in the US alone
- **Good news is most AR's (15 out of 20) and new designs are using Op Rod Gas Systems. AR15/M16 and clones are prime holdouts of the direct gas system.**

# #8 – Service Life

**Improved (modern) performance specs can result in increased piece part and system service life, resulting in substantially reduced life-cycle costs and improved system performance.**

- Bolt = 6-10K rounds
- Barrel = 3-6K rounds
- Magazine = < 12,000 rounds
- Receiver = @ 50,000 rounds

- Bolt = 15,000 – 24,000 rds.  
(HK416, SCAR L, XM8)
- Barrel = 24,000 – 35,000 rds.  
(HK416, SCAR L, XM8)
- Magazine = 17,000 rds.  
(XM8, G36)
- Receiver = 100,000 rds.  
(SCAR, G36)



**Modern System Cost  
(Purchase vs. Life-cycle)  
Legacy vs. Superior COTS  
(SCAR L, HK416)**

**SEE NEXT SLIDE**

**\* EQUAL PURCHASE COST!**



# Purchase Cost vs. Life Cycle Cost - **Weapon**



Item	Unit Cost (\$)	÷ Service Life <sup>(1)</sup> (# rounds) =	Cost (cents) per rd. fired	X 20,000 rd. Life Cycle Cost =	X Division Cost (18K) =
US Standard Weapon	\$1,000 (Qty K's)	6,000 <sup>(2)</sup>	17	3,400	\$61,200,000
Superior COTS Weapon	\$1,425 (Q 1)	24,000 <sup>(3)</sup>	.06	1,200	\$21,600,000
Superior USG Weapon	\$1,800 (Qty K's)	35,000 <sup>(3)</sup>	.05	1,000	\$18,000,000

- Superior Weapons **3.4X less costly to maintain** over projected 20K round service life.
- Superior weapons offer **67% lower life cycle costs.**
- Costs do not include: **Armorers repair time/cost/training, piece parts, replacement effort for user, logistical burden, serial number accountability, operator safety, confidence, survivability.**

<sup>(1)</sup> # rounds that can be fired before parts replacement. <sup>(2)</sup> US MIL SPEC <sup>(3)</sup> USG test data Q = Quantity K = Thousands 1 = one

# #9 – Performance

## “Conventional” vs. “Bullpup” Configuration

Rifle/carbine layout is mostly driven by user specifications written by legacy users (“old timers”) without equal consideration of overall system performance in the hands of all users.

Two strong trends in recent years:

- Product improvements in conventional legacy systems (HK416, Stgw. 90, L85A2)
- Trend towards bullpup configuration (F2000, QBZ-97, TAR-21, A-91, SAR-21)
  - Improved terminal ballistics
  - Shorter system length – improved handling

5.56mm Bullpup vs. Conventional (Carbine length) Size vs. Terminal Performance



classic design - Ak74



bullpup design - Steyr AUG

	Conventional	Bullpup	Bullpup Difference	%
• <b>OL mm (in.)</b>	854 (33.6)	754 (2.93)	-112 (4.3)	-12
• <b>Barrel Length mm (in.)</b>	332 (13.1)	468 (18.4)	+136 (5.3)	+29
• <b>MV mps (fps)</b>	835 (2740)	940 (3084)	+105 (344)	+11

- **Clear advantage in handling, terminal effects, portability and confined spaces use with bullpup configuration.**

- Only arguable disadvantages are “manual of arms” and prone magazine changes.

- **How about a medium-caliber Bullpup with 18” bbl in 6.8x43mm @ 3,196 fps (974 mps) w/ BTB ammo?**





# Bullpup Configuration

Comparison Table											
10 current/modern <b>Bullpup</b> -configuration Carbine-length Assault Rifles											
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Overall Length mm/(in.)	757 (29.8)	805 (31.7)	694 (27.3)	760 (29.9)	720 (28.4)	805 (31.7)	760 (29.9)	780 (30.7)	660 (26.0)	710 (28.0)	<b>745</b> <b>(29.3)</b>
Barrel Length mm/(in.)	488 (19.2)	508 (20.0)	400 (15.8)	520 (20.5)	460 (18.1)	508 (20.0)	460 (18.1)	518 (20.4)	400 (15.8)	420 (16.5)	<b>468</b> <b>(18.4)</b>
Muzzle Velocity mps/fps	960 (3156)	940 (3084)	920 (3019)	930 (3051)	910 (2986)	N/A	980 (3215)	940 (3084)	N/A	N/A	<b>940</b> <b>(3084)</b>
Key Features	BB	OR, QCB	OR, FE	OR, ACH	OR, AE, ECH, LAM SM	OR, ACH, LAM	OR	OR	OR, FE, ACH	OR	OR - 9/10 FE - 2/10

**Note:** Threat Standard (7.62x39 mm AKM) - OL = 870/690 mm (34.3/27.2 in.) Bbl Length = 415 mm (16.34 in.) MV = 710 mps (2330 fps)

**Note:** Bullpup average OL is 125 mm (4.92 in.) shorter than the AKM (stock extended) and provides @ 230 mps (755 fps) > MV from a 52.3 mm ( 2.06 in.) longer barrel.

**Note:** OL on average is only 277(10.9) longer than barrel length.

**Key:** ACH – Ambidextrous Charging Handle AE – Adjustable Ejection BB - Blowback ECH – Exchangeable Charging Handle  
FE – Forward Ejection ISM – Integrated Sight Module (reflex sight/lasers) LAM – Laser Aiming Module OR - Op Rod Gas System QCB – Quick-change Barrel (w/o tools) SM – Sight Mount permanent to barrel

# #10 – Accessories

## Enhanced Features

**COTS enhancements exist as accessories and/or weapon system technologies to improve system performance.**

- Op Rod Gas Systems
- ISM and/or integral LAM vs. multiple targeting devices (2-3)
- PCAP's (XM8) or hard points (SCAR) vs. dedicated MRS (MRS adds 1 lb. [.45 kg] and costs @ \$300 USD)
- “Nested” High Reliability magazines (>18K rd. life)
- Cold hammer forged barrel
- SBFA
- Medium caliber conversion option

- Russian GP30 40mm add-on grenade launcher
- “Shifted pulse” or “Balanced action” operating systems (AN-94, AEK-971)
- ST Kinetics PPAB 40x46mm LV System – **All COTS or near COTS**



**Available COTS enhancements available today to enhance legacy performance, or to be considered in new systems.**

# The "Ultimate" Incrementally Superior Conventional Assault Rifle

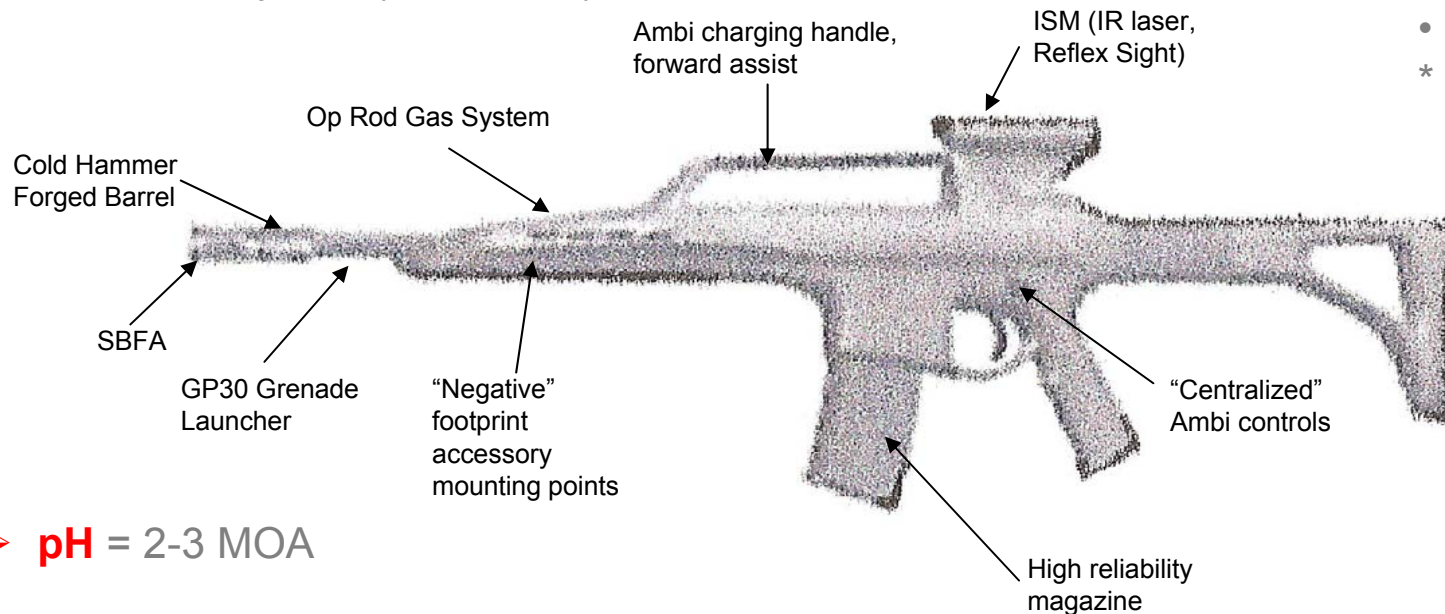
## ➤ Safety

- 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

- =< 2.8 kg (6.1 lbs.) (XM8 BC)
- LW ammunition

## ➤ pH = 2-3 MOA

## ➤ Lethality

- BTB projectiles
- Medium caliber option
- Increased Terminal Effectiveness against unprotected and protected targets

## ➤ Maintenance

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

# The "Ultimate" Incrementally Superior Bullpup Assault Rifle

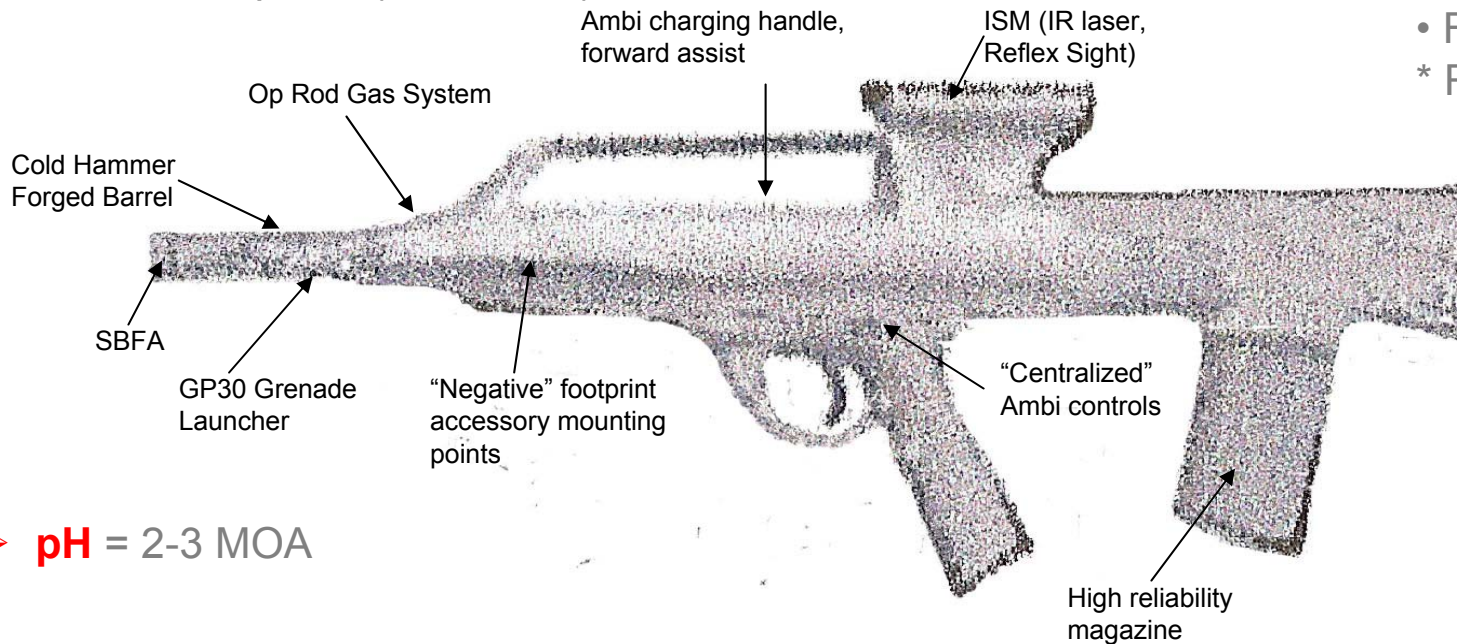
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## ➤ Family of Modular Weapons

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



## ➤ System Weight

- =< 3.27 kg (7.2 lbs.) (TAR-21)
- LW ammunition

## ➤ pH = 2-3 MOA

## ➤ Lethality

- BTB 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

# SUMMARY

- The last 10 years have produced substantial incremental enhancements in small arms and ammo technology (most notably in potential threat weaponry).
- With few but partial exceptions these incremental enhancements have not been combined into a single system.
- Too many new developments/procurements are being made using outdated performance specifications and/or legacy user input only.
- The “Ultimate” incrementally superior system could be available in 18-24 months if all inclusive performance specs would be released to industry in a “responsive” program.
- Incrementally superior COTS weapons fielded today will always outperform promised and “unfielded” so-called “Leap Ahead” technologies, and at comparably modest developmental costs!  
(\$430M USD spent in past 20 yrs on “Leap-ahead” programs vs. 0 dollars spent on HK416).
- **America is not matching threat weapon/ammunition capabilities and is quickly falling behind in its small arms superiority!**



# A parting thought...



***”Most of the boots on the ground in OEF/OIF will be the first to tell you that the enemy has no respect for our war fighters in a head-to-head confrontation while maneuvering with his individual weapon.***

***An enemy who does not respect a Soldier’s ability to deliver pain or death will always bring the fight directly to the Soldier, at belt buckle distance.”***

**MSG Steve Holland – 5<sup>th</sup> Special Forces Group (ABN)**

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**30 year Army veteran, NDIA Hathcock Award Recipient**

# Contact Information

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