Time for a Change

US "Incremental" Small Arms Fielding

- Status Report 2009 -

by Jim Schatz

052109

Part I
Introduction

Observations

Oh what a difference a year can make! Turning a corner.

- New Opportunities. Making progress.
- New industry confidence in the process
- Is visible in attendance and industry response, developments

New Leadership at PEO-S, PM-SW, USAIC Small Arms Division

- User Focused. Openness. Engaged. Less Arrogance.
- Incremental fielding successes (MK48, M24 PIP, NC, M2 QCB)
- Participation Here – online at the firepower demo!

User Proponent Excellence

- LTC Henthorn's "SWEAT" concept and briefing
- New Requirements Documents seeing the light of day

Still takes too long and is too difficult to rapidly field what is needed.

SAAS – Got it! Right on! But training cannot make up for hardware failures.

Briefing Take-Aways

1. **Author not employed in any way by any small arms/ammo maker since May 2006.**

2 Concern is for the front line small arms end user

3 Is not, never was about just one weapon

4 Current legacy producers are producing quality weapons that meet *current* Performance Specs

5 Current Performance Specs are aged and not current with the available state-of-the science for small arms and ammunition

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Briefing Take-Aways

6. How do we know we have the very best if we do not assess available new offerings, technology?

7 We have assessed and selected through F&O competition only 1 of 8 legacy weapons for replacement (M203) since 1985 (XM9)

8 Only asking that we assess and field "incrementally superior" small arms and ammunition through regular full and open competition

9 Empower the front line small arms end user through policy change and the formation of the USAAAP

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6. How do we know we have the very best if we do not assess available new offerings, technology?

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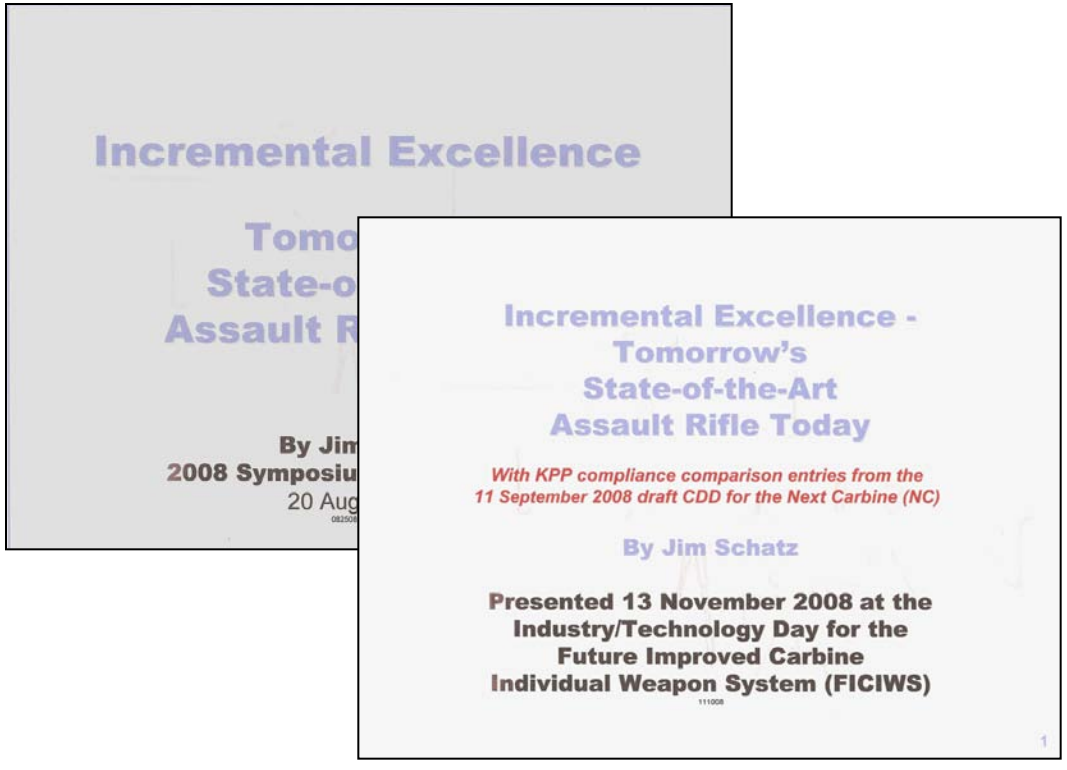
10. The enemy of progress is bureaucracy – <u>it must be breached!</u>

Past Public Presentations

Both available at www.dtic.mil/ndia/2008Intl/Schatz.pdf



May 2008
NDIA Small Arms Conference
Dallas, Texas USA

Aug. 2008 – European Small Arms Symposium
Shrivenham, England
Nov. 2008 – US Army Next Carbine Industry Day
Arlington, Virginia USA

Purpose

- **To create a national awareness and dialogue on serious small arms issues for *"the real"* (front line, close combat) small arms end user**
- **Not to cast blame. No one entity responsible!**
- **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 continued/future stagnation**
- **To persuade "the system" to test incrementally superior ammunition and COTS small arms systems *today!***

Caveats

- **Not all services, organizations are the same**
- **The larger the organization, the less they tend to support the true needs of the real 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

- "War Fighters" "Real Small Arms End Users" – current US ground combatants who engage the enemy with small arms in close combat

- "Select US Units" – Public domain. See "Army Times"

- The "System" – DoD organizations tasked with weapons acquisition, testing, fielding and logistical support of US DoD small arms and ammunition. *Contacted by author for comment. Included herein when received.*

- "US Standard" – current issue

"Incremental" Improvements

- The "90% solution"
- Available as COTS/NDI, modified COTS
- Fielded elsewhere and available *NOW*
- Some ***in threat use***
- Significant advantages for ***the real end user!***
  - > **Reliability**: 4-7X 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**: 25-40%
  - > **Unique Capabilities**: Advanced penetrator technologies, "caseless" cartridges (40mm), mechanically increased pH, LV 40mm ABMS, advanced threat body armor

Part II
The state of the science

"The Big 8" – Showing their Age

Average:	**34**	**All eight weapons**
Average:	**27**	**Without M2HB**
Average:	**25**	**Without M2HB and M203**
Average:	**24**	**Without M2HB, M203, M16A2** (3)
Average:	**27.5**	**Without M203 & M4 - replaced by current programs**

(1) All initial fielding dates extracted from "Jane's Infantry Weapons" (2007/2008 edition).
(2) "OFW" - Objective Family of Weapons from "Small Arms Master Plan" (SAMP) first briefed in 1984 by the USAIC.
(3) America's longest serving service rifle in models AR-15, M16, M16A1, M16A2, M16A3/M16A4 (> 42 years).

- **Trickle Down" effect. What the US Army 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)**

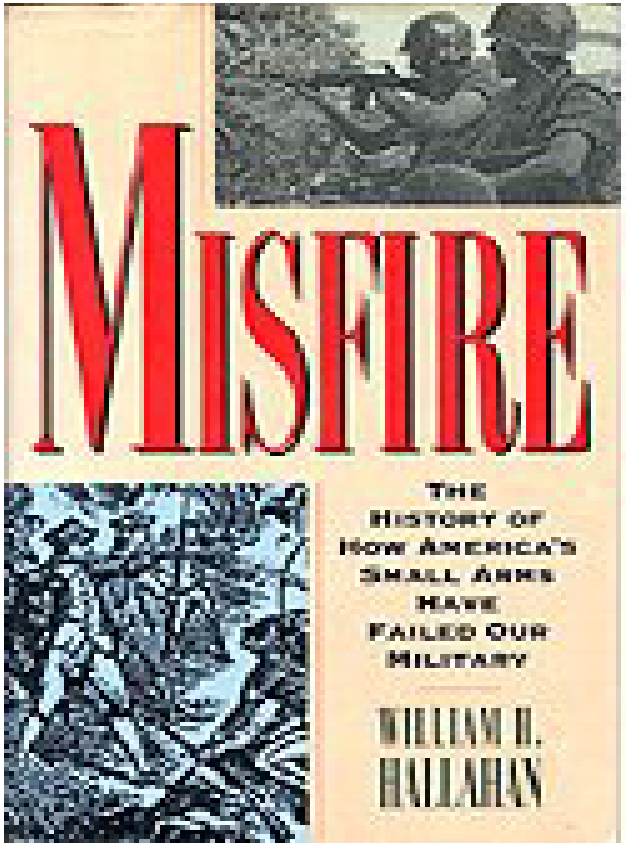
Our Aged Fleet – "The Big 8"

8 Primary US DoD Small Arms

Weapon	Year First Fielded [1]	Age (Years)	Manufacturer	Modern Design Available	Replaced by OFW Candidate[2]	Comments
M9 Pistol 9x19mm	1985 (Army)	24	Beretta USA	Beretta Brigadier, PX4, others	No	Numerous modern alternatives abound, to include PDW calibers.
M4 Carbine 5.56x45mm	1994 (Army)	15	Colt Defense	Colt M5/APC/AHC, HK XM8, HK416, SCAR L, others	No	Modern Op Rod designs abound, fielded in select US units. Army "Next Carbine" effort underway CY09 – FUE not before 2012 (18 years after M4).
M16A2 [3] **Rifle 5.56x45mm**	1982 [4] (Army)	27	FNMI, Colt Defense	FN SCAR, F2000 Colt M5, HK XM8, HK416	No	[4] M16A1 type-classified by Army in 1967 – 42 years ago. Modern Op Rod and/or bull pup designs abound, fielded.
M203 Grenade Launcher 40x46mm	1969 [5]	40	Various	US XM320, FN Mk13 Mod O (SCAR EGLM)	No	[5] M203 replacement w/ M320 begins in CY09 - 4+ years since COTS contract award.
M249 Squad Automatic Weapon 5.56x45mm	1982	27	FNMI	FN MK46	No	MK46 fielded within USSOCOM since 2000.
M240B Medium Machine Gun 7.62x51mm	1976 (Army)	33	FNMI	FN MK48, Vector SS77, US Ord. M60E4, Barrett LW240, HK121	No	MK48 fielded within USSOCOM since 2002. First "forced" Army fielding in 2008 to 101st.
M2HB Heavy Machine Gun .50 BMG	1923	86	GD	GD M2E2, GD XM312	No	
MK19 MOD 3 Automatic Grenade Launcher 40x53mm	1988 (Army)	21	GD	GD MK47, HK GMG, Russian 40mm 6G27 "Balkan"	No	MK47 and GMG fielded with USSOCOM, OGA's, numerous foreign friendly countries.

Required Reading

- **Current "dysfunction" reoccurs @ every 30-50 years**
- **Bureaucracy enabled**
- **War fighter input "lost" in the red tape**
- **Incremental advancements mostly ignored**



- **Required reading: *"Misfire"***

***The history of how American small arms have failed our military"* By William H. Hallahan. Available from amazon.com**

Summary available. Send email to presenter.

Threat Successes - Weapons

Russian AN-94 "Blow Back Shifted Pulse" Assault Rifle caliber 5.45x39mm w/ 40mm GP-34 grenade launcher. pH doubled w/ 1800 rpm ROF. In limited production and fielding since 2001. Used/ found outside Russia. Being developed in 7.62x39mm.

The System has nothing that competes with these weapon capabilities!

Chinese QBZ-95 Family of Weapons Caliber 5.8x42mm rifle, carbine, LMG, GPMG, sniper rifle, and 5.8x21mm PDW. Superior cartridge/bull pup ammunition performance. First fielded in 1998. Now fully fielded in the PLA (2.25-3M). Exported.

Russian GSh-18 Armor Piercing Semi-automatic Pistol. Fires 9x19mm PBP AP ammo. Penetrates 8mm mild steel or Class IIIA body armor at 20 meters. First fielded in 2000.

Threat Successes - Ammo

Russian "family" of compact and in some cases "subsonic" exposed-penetrator core AP rounds. L-R: 9x18mm AP, 9x38mm SP-6 subsonic, 9x21mm SP-10 for Gyurza pistol and Veresk submachine gun. Found often outside Russia. Defeats level IIIA body armor @ 20+ m.

The System has nothing that competes with these weapon capabilities!

Russian 7P39 40mm HV Caseless Grenade for Russian "Balkan" 6G27 AGL. MER 2,500 meters. 2X increased HE-Frag effectiveness. 71 lb. AGL system weight is 40% < US standard w/ LW tripod (98 lbs.). Ready for fielding in 2009.

Left to right 5.56x45mm, 5.45x 39mm, 5.8x42mm

Chinese 5.8x42mm DBP-95 round (with enhanced penetrator defeats 10+ mm steel at 310 m.) - outperforms both 5.45x39 mm AP and 5.56x45mm SS109/M855 "penetrator" rounds while retaining more energy for soft tissue destruction behind armor. A PDW in 5.8x21mm is now also available. In service since 1998. Fully fielded with Chinese forces.

Export Threats - Weapons

K11 Combination Air-bursting Weapon

- 5.56x45mm select-fire rifle
- 20mm bolt-action grenade launcher
- MER 460-500 meters
- Weight: 13.5 lbs empty
- 6-round 20mm box magazine
- Developed 2000-2009
- http://www.youtube.com/watch?v=j_MdhG6bxao
- http://www.youtube.com/watch?v=XNr8bWqrP5s&feature=related

Nov. 14 2008 Press Release: "Im chung-bin, the chief of staff of the ROK Army examines the new South Korean double-barreled rifle K-11 at the ground weapon conference on 11 Nov. 2008 in Daejeun South Korea. This rifle uses 20mm airburst ammunition and 5.56mm NATO ammunition. The 20mm launcher operates as bolt-action and uses a 5 round mag. This weapon will be fielded next year"(2009)

- **April 23 2009 Press Release** "South Korea has become the first nation in the world to operate a battle rifle using precision-guided high-explosive airbursting projectiles," said the press release. "The K11 is expected to be a key defense export item, as well as help boost the South Korean military's operational capability to an extent."

Small Arms “Disconnect”

- **While various US small arms, ammunition types 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 (34 years) 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.**

We must!

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

21 years Ago

2009

…but many positive developments have occurred since May 2008

It simply takes too long!

Item	Years in Pipeline	Status
COTS XM26 MASS	> 11	FUE FY10
COTS XM320 GLM	> 4*	FUE 2QFY09
COTS XM110 SASS	> 2**	FUE CY08
M240L	> 11	FUE 3QFY10
OICW/XM25	> 17	Pending as XM25
OCSW/XM307/312/806	> 13	Pending as XM806

* Since contract award (05/05)

** Since RFP release (03/06)

Select US Unit Success

- **Have replaced 7/8 US standard weapons with incrementally superior COTS weapons – *the 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 SASS**
    - **> AG416 before XM320**
    - **> .40 S&W caliber handguns years before JCP/CP/MHS**
    - **> PDW caliber weapons and ammo**
    - **> HK416/417, MK46/48, GMG, SCAR/EGLM, others**
    - **>.300 WINMAG sniper rifles before M24 PIP**

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

The US DoD should embrace and adopt the winning ways of these Select US units to prevent US small arms stagnation.

Much Good News

Incremental Fielding Successes since May 2008

- **USSOCOM fields LRIP SCAR/EGLM's (and soon SOST)**
- **Army announces "Next Carbine" effort**
  - **RFP expected out summer 2009. Caliber still "open".**
- **Army fields MK48's, MK46's in OEF. More to come.**
- **Army SEC Geren requests JAT/DST of the "Big 8".**
- **Army w/ help from industry - Congress funds M24 .300 WINMAG PIP**
- **Army fields first M320's to replace 1960's era M203**
- **Army plans release of new JCIDS-approved handgun CDD/RFP**
- **M2E2/QCB kits and M240L – soon ready**
- **USMC IAR effort enters down-select phase**

Well Done!

The “7 Talons”

What is takes to breach the bureaucracy

Catalyst	1960’s	2006-2009
1 Legacy System Stagnation	M14 fielded – after 13 years. (19 after MP44, 11 after AK47)	Average age of the US “Big 8” is 34 years - 24 years w/o the oldest 3
2 Field Reports	May, Sept, Nov 1958 – Inf Board, CONARC, CDEC reports - AR-15 vs. M14 - 1962 DoD “Hitch” report	2006 CNAC Survey – - 18% average failures - M855 failures Extreme dust test x 3
3 Media	July 1969 – Newspapers report on SECDEF attack of M14 in Congress	Army Times, AP, Defense News, CNN, This Wk in Def News, etc.
4 Congress	- Def. App. Comm - 1961 - 1967 Ichord comm. after 6 reports of M16 combat failures.	Congressmen Coburn, Webb, Salazar, Tancredo, others (5/15/09 ltr to Army COS x 10 Senators)

The "7 Talons" (cont.)

What is takes to move the mountain

Catalyst	1960's	2006-2009
5 VIP Involvement	Pres. Kennedy, SECDEF McNamara – Ord. Corps becomes AMC.	SECDEF Gates, USD AT&L Young, SEC Army Geren - JAT/DST
6 Users	Vietnam troops writing home	User "Advisors" to Army SEC Geren, Army VCOS
7 New Requirements Documents	AR-15/M16/M16A1	- Next Carbine CDD - Sub Compact CDD? - SAA JAT/DST - LW LMG's to OEF - New Pistol CDD - USAAAP?

A culmination of historic events, an "aligning of the stars", that has not occurred in @ 4 decades. Events that are making a real difference in the weapons and ammunition carried by the end users of today and tomorrow *if the trend continues*.

Still more Work to Do

Incremental Fielding "Challenges" since May 2008

- **Legacy purchases continue using *old performance specs***
  w/o looking first at superior, proven, fielded COTS alternatives
  - **1000's/$10M's of Pistols and SAW's –**
    26% and 30% stoppages in 2006 CNAC survey
  - **1000's/$10M's 7.62mm MMG's and 40mm *AGL's***
    their performance eclipsed by lighter, more modern COTS systems fielded in Select US SOF units
- **AWG has 9mm Glock pistols stripped from operators**
  like COTS HK416 Carbines in 2007
- **Follow-on to M855 round not yet ready for fielding *after @ 15 years***
  superior COTS "BTB" rounds already fielded in US SOF
- **XM25 funding continues after 17+ years, $207M – *(S.K K11 ready!)***
  Summer 2009 user assessment to determine fate. SOGOTP!
- **LSAT Caseless Ammunition funding continues**
  High risk with serious, well known technical obstacles (ACR)

Part III

Modern Incrementally/ Evolutionary Superior COTS Alternatives

(already fielded and available today for US Army comparative testing)

Quad Chart Explanation

Each quad represents one proven, fielded COTS system in use by select US units or foreign organizations

- Each quad provides a photo and Key Superior Performance Capabilities over the comparable US DoD legacy system

- All items are available NOW for US Army evaluation and are already on US Govt contract where noted or in threat use

- System Cost and Delivery Schedules are comparable to US legacy systems when ordered in volume

Intermediate/"Medium Caliber" Rounds

The effectiveness of any small arms system is only as good as the projectile it launches.

- Current US handgun and rifle cartridges/ projectiles have not changed since the 1980's when they were first adopted.
- Incrementally superior intermediate or "medium" caliber cartridges are available.

- Proven by various US military, SOF, and law enforcement organizations, the two medium caliber COTS rounds described below offer NLT 33% increased terminal performance and maximum effective range from small arms platforms comparable in size, capacity, cost, reliability, accuracy, felt recoil, ease of use and weight to current legacy systems & with superior ergonomics.

Medium caliber 6.8x43mm round flanked by 5.56x45mm (left) and 7.62x51mm (right) rounds

- **The 6.8x43mm cartridge can be fired from the M4 or M16 by exchanging barrel, bolt and magazine only.**
- **The cartridge is available commercially in all bullet styles to include Hague-compliant FMJ, as well as AP rounds.**
- **The 115 gr. 6.8 projectile has 2X the projectile mass compared to the 62 gr. 5.56mm M855 projectile.**
- **The 6.8 projectile has 24% greater frontal surface area than the 5.56mm projectile to better destroy tissue in FMJ loadings, especially when fired from short-barreled carbines in common use today.**

- **The COTS .40 S&W round is in the US DoD supply system (US Coast Guard) in various loads to include a Hague-compliant FMJ and is the most popular pistol cartridge in US law enforcement to include the DHS, TSA, FBI, DEA, etc.**
- **The .40 S&W round/pistol is in use and has been proven in combat by select US SOF units wherein it replaced both 9x19mm *and .45 ACP pistols*.**

Medium caliber .40 S&W round flanked by 9x19mm (left) and .45 ACP (right) rounds.

- **The 155-180 gr. .40 S&W projectile is 35-56% greater in weight than that of the 115 gr. 9mm projectile and has 34% greater frontal surface area to destroy tissue in Hague-compliant FMJ loadings.**
- **COTS .40 S&W pistols, that are smaller in size than the 9mm US M9 pistol but with =/> magazine capacities, are available on US Govt contract.**

Blind to Barrier Ammo

- **"Blind to Barrier" (BTB) Ammunition** ***User must ask for it!***
  - **New development within last 5 years**
  - **Offers a balanced combination of penetration through armor, windshields, heavy clothing and personal equipment and soft tissue destruction beyond the intermediate barrier**

- **Is not reliant upon muzzle velocity, fragmentation or bullet yaw to destroy tissue (like M855)**

- **Proven. Already fielded in Select US Units, US Federal Law Enforcement**

- **COTS – Available Now AND Hague-compliant, DoD General Counsel "friendly"!!!**

Barnes TSX – Solid Copper Projectile

(available in four 5.56mm bullet weights and many calibers – Lead Free)

- Two of many -

Remington CLUB (Core-Lokt Ultra Bonded)

(fully encapsulated lead core with bonded copper jacket – Lead Free)

Alternative COTS Handguns

Glock 22
Glock 23

Fielded with US LE and DoD units

- Most popular modern free-world pistol fielded worldwide
- Magazine Capacity in excess of US M9 (19 versus 15 rounds)
- Various sizes, models, calibers available
- Comparable in cost to 9mm M9

HK P2000

@ 60,000 fielded with US DHS (USBP, ICE, etc.)

- Minimum 20,000 round service life – all parts
- Ambidextrous slide and magazine releases
- Various sizes, models, calibers available
- One-piece steel slide
- Convertible fire controls and operating modes (SA, DA, DAO)

SIG P229

Fielded with US DHS (USBP, ICE, etc.) & US Coast Guard

- One-piece steel slide and integral accessory rail
- DAK trigger system requires no external safety or decocker
- Various sizes, models, calibers available
- One-piece steel slide and integral Picatinny accessory rail
- Convertible fire controls and operating modes (SA/DA, DAO)

Russian “Gyurza”

SR-2 Veresk
Submachine gun

Fielded with Russian GRU, police, special forces

- Fires 103 gr. 9x21mm armor piercing SP-10 ammo at 1378 fps
- Defeats NATO CRISAT target (2 x 1.4mm Ti plates, 30 layers Kevlar) @ 100 m! Maximum effective range of 200 m.
- 18 round magazine
- Part of family “complex” with Russian SR-2 Veresk sub gun

Alternative COTS/Near COTS Carbines

FN MK16 MOD 0 - SCAR Light
(Op Rod Gas System)

Fielded with USSOCOM units (LRIPs)
- Ambidextrous operating controls, user barrel replacement
- Barrel, parts service life in excess of 30,000 rounds
- Various sizes, models, calibers available
- Comparable in cost to US legacy weapons (in volume)
- Over-the-Beach capable

HK HK416
(Op Rod Gas System)

Fielded with Select US SOF units
- Available as a complete weapon or M4/M16 upper receiver kit
- Barrel, parts service life in excess of 24,000 rounds
- Various sizes, models, calibers available
- Comparable in cost to US legacy weapons (in volume)
- Over-the-Beach capable

HK XM8 Baseline Carbine
(Op Rod Gas System)

Modular "Family of Weapons" (5) - developed for the US Army
- Fully ambidextrous operating controls
- Barrel, parts service life in excess of 30,000 rounds
- High reliability polymer magazine and hammer forged barrel
- Comparable in cost to US legacy weapons (in volume)
- Modular stock, Dual Function sight, PCAP accessory mounts

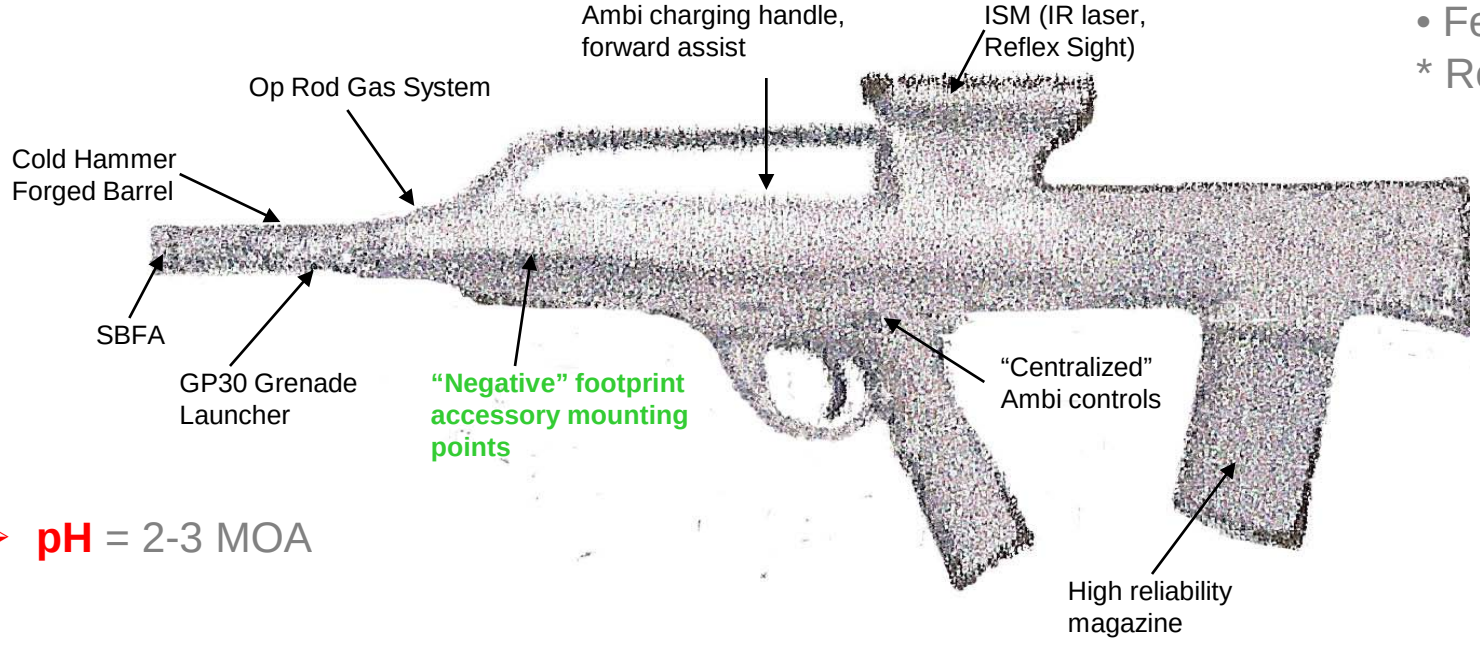
Chinese Type 95 (aka QBZ-95)
(Op Rod Gas System)

Fielded w/ Chinese PLA and police since 1998. Fully fielded.
- "Bullpup" configuration – only 29" long with 19" barrel delivering 3051 fps MV/1330 ft. lbs. ME (US standard carbine is 33"long (stock open) with 14.5" barrel and delivers 2750 fps MV/1222 ft. lbs. ME)
- @12% increase in MV over US standard (longer barrel)
- @9% increase in ME (64 gr. bullet) vs. US M855 (62 gr. bullet)
- "Family" includes PDW, rifle, carbine, sniper rifle, LMG, GPMG

The "Ultimate" Incrementally Superior Bullpup Assault Rifle

If the US Army asks for it, Industry can (has provided it) already

- **Safety**
  - **Cook-off =/> 270 rds.**
  - Barrel failure =/> 900 rds.
  - OTB Capable (0 seconds)
- **Reliability** =/> **18,000 MRBF/S**
- **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

Alternative COTS/Near COTS Rifles

HK HK416
(Op Rod Gas System)

- Fielded with Select US SOF units
- Available as a complete weapon or M4/M16 upper receiver kit
- Barrel, parts service life in excess of 24,000 rounds
- Various sizes, models, calibers available
- Comparable in cost to US legacy weapons (in volume)
- Over-the-Beach capable

FN MK16 MOD 0 - SCAR Light
(Op Rod Gas System)

- Fielded with USSOCOM units (LRIP's)
- Ambidextrous operating controls, user barrel replacement
- Barrel, parts service life in excess of 30,000 rounds
- Various sizes, models, calibers available
- Comparable in cost to US legacy weapons (in volume)
- Over-the-Beach capable

Colt M5/APC/ AHC Carbine
(Op Rod Gas System)

- Follow-on development to excellent SCAR candidate
- Available as a complete weapon or M4/M16 upper receiver kit
- Increased barrel, parts service life
- Various sizes, models available
- Comparable in cost to US legacy weapons (in volume)
- Monolithic rail system, folding PDW-style buttstock option

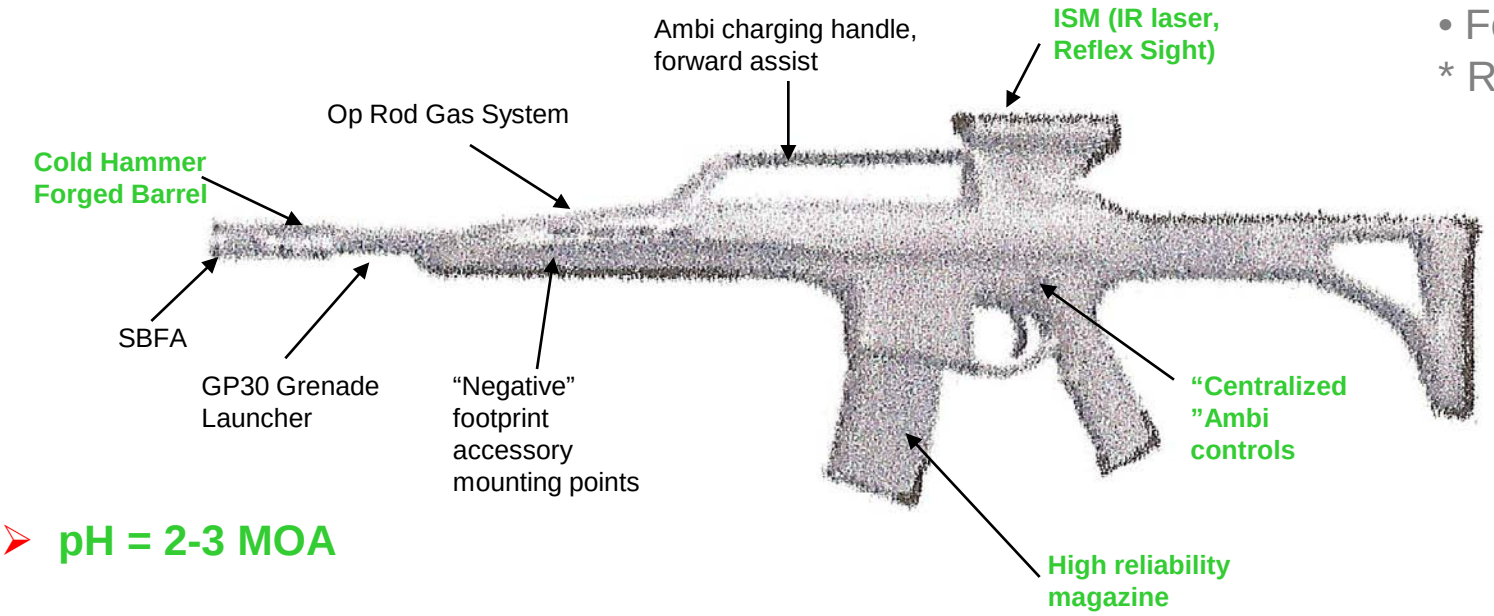
Russian AN-94 "Nikinov"
(Blow Back Shifted Pulse)

- Limited fielding since 2001. Offered for export. Seen abroad.
- "Shifted Pulse" operating system delivers 2 rounds at 1800 rpm
- Reduced felt recoil, advanced muzzle break reduces dispersion
- 1.5X increase in pH due to controlled 2 round dispersion
- Available in 5.45x39mm. Development underway in 7.62x39mm
- Body Armor defeat capability due to successive strikes @ POA

The "Ultimate" Incrementally Superior Conventional Assault Rifle

If the US Army asks for it, Industry can (has provided it) already

- **Safety**
  - Cook-off =/> 270 rds.
  - **Barrel failure =/> 900 rds.**
  - OTB Capable (0 seconds)
- **Reliability** =/> 18,000 MRBF/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

Alternative COTS/Near COTS 40mm LV Grenade Launchers

US Army (HK) M320/320A1 GLM

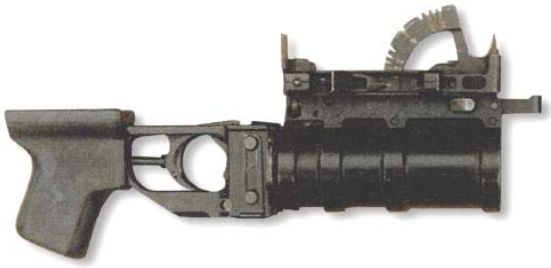
- First fielded by US Army in 2009. Contract awarded in 2005.
- Fielded with Select US SOF units, foreign armies since 2000
- Can be used on any rifle or in stand-alone mode
- Barrel, parts service life in excess of 10,000 rounds
- Day/Night sighting system available as an option
- Improved reliability over M203

FN MK13 MOD 0 (SCAR EGLM)

- Fielded with USSOCOM units in 2009 (LRIP's) with SCAR rifles
- Can be used on MK16 and MK17 rifles or in stand-alone mode
- Rotating barrel can be loaded from left or right side
- Day/Night sighting system available as an option
- Medium velocity (to 800 meters) ammunition in development

ST Kinetics 40mm LV ABMS

- First shown publicly in 2008 at the Eurosatory expo
- Fires pre-programmed, RF set, air-bursting 40x46mm rounds
- Can be attached to most host weapons with adapters
- Full solution fire control "reflex" sight with laser range finder
- Fires all 40x46mm grenades
- Time based air-bursting rounds include self-destruct feature



Russian GP34 (40mm)

- First fielded by Russian forces in 1989 (in 30mm).
- Fires "caseless" 40mm rounds. No breach to open/close.
- Is only 11" long (M203 is 15 inches long)
- Weighs only 2.8 lbs. (M203 weighs 3.1 lbs)
- Double action only trigger system
- Silenced version available (30mm BS-1)

Alternative COTS Light Machine Guns

FN MK46 MOD 0
(5.56x45mm NATO)

- Fielded with USSOCOM and other units since 2000
- Light weight – only 12.6 pounds (US M249 weighs 16.5 lbs.)
- Barrel, parts service life in excess of 50,000 rounds
- 7.62x51mm "family" variant (MK48) available
- Comparable in cost to US legacy weapons (in volume)

HK MG4E
(5.56x45mm NATO)

- Fielded with German Army (in 2006) and Spanish Army
- Short overall length – 29.5" with short barrel and stock folded
- Barrel, parts service life in excess of 50,000 rounds
- Safe loading features include locking cocking handle, belt position indicator and case deflector
- Comparable in cost to US legacy weapons (in volume)

Israeli (IWI) Negev
(5.56x45mm NATO)

- Fielded with Israeli IDF units since 1998
- Light weight – only 15.3 pounds (US M249 weighs 16.5 lbs.)
- Folding buttstock for compact carry, use from confined spaces
- Semi-automatic fire option for "probing" fire
- Excellent performance in dusty, desert-type environments

Russian PKP "Pecheneg"
(7.62x54mm Rimmed)

- Fielded with Russian Spetsnaz and other units
- Developed as LMG based on Chechnya experience with PKM
- Light weight – 19.2 lbs. (US M240E6 weighs 23.5 lbs.)
- Special heavy profile barrel with active cooling fins/jacket
- 600 round sustained fire capability
- Maker claims 2.5X increase in accuracy out to 1500 meters over competing designs

Alternative COTS/Near COTS Medium Machine Guns

FN MK48 MOD 0

- Fielded with USSOCOM and other units since 2002
- Light weight – only 18.6 lbs (17% lighter than US M240B)
- Barrel, parts service life in excess of 50,000 rounds
- 5.56x45mm "family" variant (MK46) available
- Comparable in cost to US legacy weapons (in volume)

FN M240L

- Under contract through US Army PM-SW
- Light weight – > 3.5 pounds lighter than US M240B
- Durability and reliability equal to US M240B
- Titanium receiver block, light weight barrel
- Improved charging handle, bipod, gas regulator, front sight, buttstock and trigger group

US Ordnance M60E4/MK43 MOD 0

- Fielded with USSOCOM and other units since the 1990's
- Light weight – 22.5 lbs with short barrel
- Eliminates all previous/past M60 technical issues
- Produced and assembled in the United States
- Comparable in cost to US legacy weapons (in volume)

Russian PKM (7.62x54mm Rimmed)

- In service in more than 100 countries
- Light weight – 19.8 lbs. (US M240B weighs 27 lbs.)
- Extremely reliable and durable in hostile conditions
- Easily maintained by the untrained
- Removable barrel, right side feed (ease of carry)

Alternative COTS Automatic Grenade Launchers

GD-ATP STRIKER40 (MK47 MOD 0)

- Fielded with USSOCOM and other units since 2004
- Light weight – only 39.6 lbs. (US MK19 MOD 3 weighs 77 lbs.)
- % of Recoiling Mass – 55% (22% for US MK19 MOD 3)
- Full Solution FCS w/ Preprogrammed Air-Bursting ammunition
- QC Barrel and lightweight tripod with non-conventional T&E mechanism

HK GMG

- Fielded with select USSOCOM units and 15+ other countries
- Light weight – only 64 lbs. (US MK19 MOD 3 weighs 77 lbs.)
- Unpowered Day/Night reflex sight, buffered mount and QC barrel
- Enhanced user safety w/ NLT 6 internal safeties
- LMG-type loading and unloading improves operator safety
- Comparable in cost to US legacy weapons (in volume)

ST Kinetics 40LWAGL ABMS

- Manufactured for Indonesian armed forces. Samples exported.
- Light weight – only 31 lbs. (US MK19 MOD 3 weighs 77 lbs.)
- Soft-mount cradle and non-conventional "lock-fire" T&E mech.
- Full Solution FCS with Preprogrammed Air-Bursting ammunition
- Man portable (3 man crew)

Russian 6G27 "Balkan"

- Undergoing official Russian Army trials in 2008
- Light weight – only 71 lbs. (weapon *with tripod & sights*)
- Fires 40mm extended range "caseless" ammunition
- MER of 2,500 meters w/ 2X effectiveness of earlier HE rd
- Equipped with optical and back-up iron sights

Alternative COTS/Near COTS .50 BMG Heavy Machine Guns

GD-ATP M2E2

- Adopted b y US Army as "M2E1" in 2009
- Increases user safety and reduces operator pre-firing effort
- QCB "kit" can be retrofitted to existing M2HB's
- Kit includes fixed headspace components (barrel, barrel ext.)
- Under US Army testing for procurement as of 2008/2009

NOTE: Similar kits available from other vendors

FN M2 HB QCB

- In production and in foreign service since 1978
- Increases user safety and reduces operator pre-firing effort
- QCB "kit" can be retrofitted to existing M2HB's
- Kit includes fixed headspace components (barrel, barrel extension) as well as optional flash hider

NOTE: Similar kits available from other vendors

GD-ATP XM806 (LW50MG)

- Light weight – only 30 lbs. (US M2HB weighs 84 lbs.)
- Reduced recoil similar to 7.62x51mm M240 MMG
- Light weight tripod – man-portable system
- QC barrel and fixed headspace
- Under US Army testing for procurement and FUE in FY12
- Byproduct of OCSW/XM307/312 effort started @ 13 years ago

ST Kinetics CIS 50MG

- Light weight – only 66 lbs. (US M2HB weighs 84 lbs.)
- Left or right hand feed option
- Open-bolt operation to reduce cook-offs
- QC barrel and fixed headspace
- Reflex and night vision sights available

Part IV

Policy & Procedure Changes Required

(to address and prevent continued US DoD small arms and ammunition stagnation)

1 – End User Absence

Small Arms Decisions are being made "too far from the field" and not by <u>the real</u> small arms end user but by:

- **GO's, PEO's, PM's, Proponents, Retirees *that are not fighting with small arms!***
- **The system MUST support the specific needs <u>of the real end user</u>, *NOT vice versa!***
- **Current system bureaucracy repeatedly fails or is too slow to react.**

ANSWER: *Adopt Select US Unit SOP!*

2 – Unrealistic Requirements

Stop chasing after "Star Wars"
(SAMP, OFW, Caseless Ammo, XM25?)

- **What do US select units/SOF purchase, field?**
  Combine efforts!
- **Efforts must focus on obtainable goals.**
- **"Leap ahead" efforts divert focus and funds from real end user *combat needs*.**

ANSWER: Look to the future
but buy what works, and buy it now!

3 – Changes in Direction

Too many Changes, False Starts, Revisions

- Form the ”User Small Arms and Ammunition Advisory Panel” (USAAAP)

- Directs DoD Small arms “system” on:
  - > Incremental Fielding Focus (1-3 years)
  - > Future Programs (3-5 years)
  - > R&D (5-10 years)

Answer: Form the USAAAP now!

Answerable to Congress and SECDEF only!

USAAAP

(User Small Arms and Ammunition Advisory Panel)

- **Real Users, Select US 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 assessment, testing**
  - **Contract awards and extensions**
  - **R&D program funding (current and new)**

The system truly working for the real end user!

3-year Incremental Fielding Cycle

On a three-year cycle the USAAAP:

- Reviews (every 3rd year)
  - USG and COTS System Performance and Specifications, PIP's, Threats, etc.
  - R&D Programs (current, new)
- Tests (every 4th year)
  - Solicits Industry for and tests incrementally superior systems
- Contract Award (every 5th 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 the US small arms capabilities set while leveraging newly emerging COTS capabilities**
- **Contractor-provided Logistical Support should be leveraged as in the UK and Germany**

4 – Outdated SPECS

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

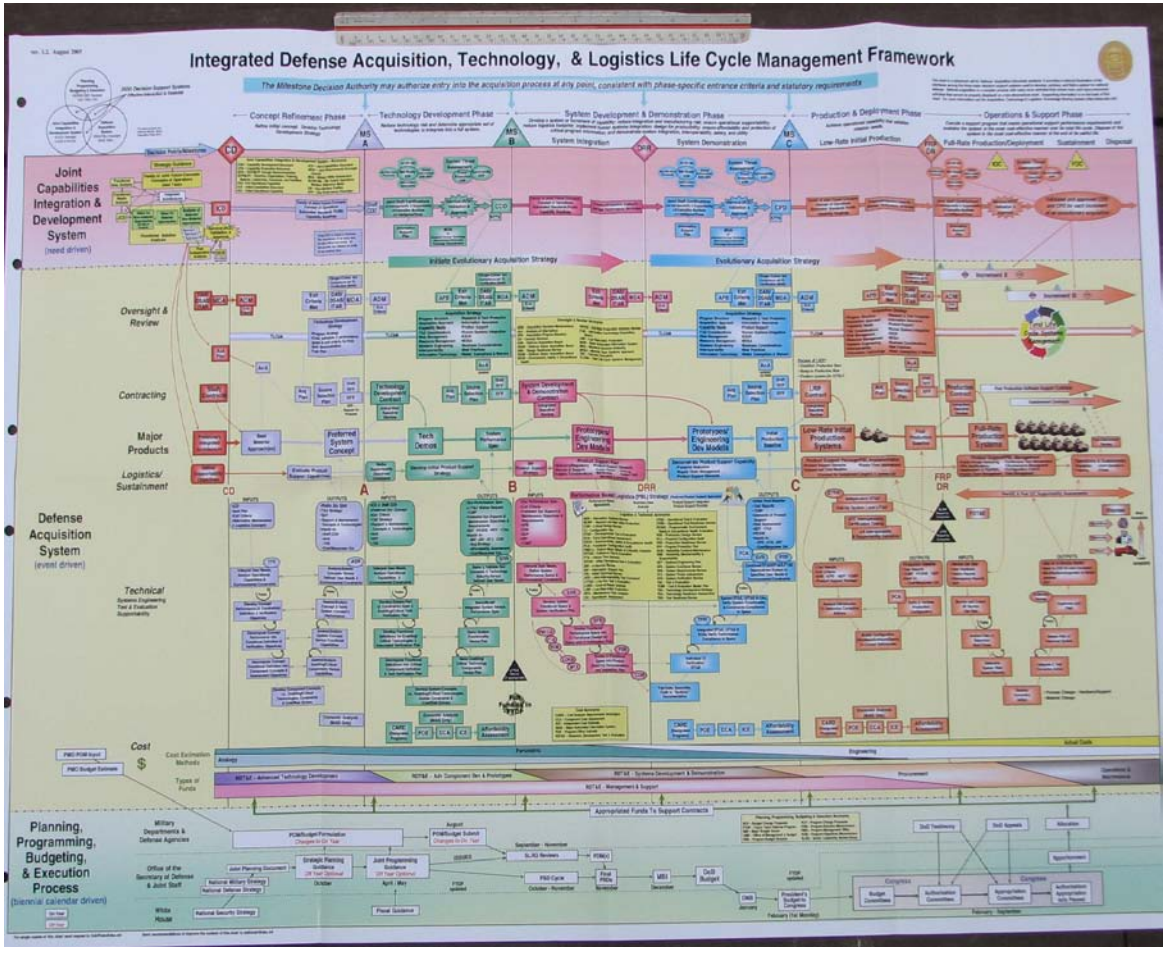
- **Must be revised every 3 years and for each new contract based upon comparative testing of available and emerging state-of-the-art COTS/NDI systems**
- **New "best of breed" must be found, evaluated and exploited regularly for the benefit of the real end user**
- **New PS's must be written/approved by USAAAP *before contract recompetes!***

ANSWER: Update PS's often

5 – Amend JCID's for Small Arms

The JCID's process is simply unworkable <u>for incremental and timely small arms fielding</u>

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



ANSWER: Amend JCID's for Small Arms

6 – System Support

The Small Arms Support System (Development, Acquisition, Contracts, Logistics) must support the direction/decisions of the real small arms end user through the USAAAP.

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

ANSWER: User/USAAAP 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***
- **Reoccurring Competition and Incremental Fielding provides the greatest return on investment and innovation**
- ***Endless Multi-year Programs do not kill bad guys! Nor do they protect the friendlies!***

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

8 – "Career Suicide"

Remove the "Yes Man" promotion rule from small arms efforts/programs

- **Few AO's, PM's have extensive small arms experience let alone hands-on small arms expertise**

- **Act on real user/USAAAP 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 real end User/USAAAP

9 – Joint Efforts

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

- **Combine Requirements, Interagency Participation and Support**
- **Generate realistic real user/USAAAP-based requirements for Near Term Fielding**
- **Real User/USAAAP Selection *a must!***

ANSWER: Joint efforts will bring success if real 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 talented non-traditional vendors (e.g. Daewoo K11 success)**
- **Keep unit prices low and quality high**
- **Will leverage emerging technologies more often**
- **Will respond to ever-changing warfare trends**

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 real value to the real small arms end user

- **Costly duplication of effort. A distraction at best.**
- **Must "pay to play" ($1000 + 10% on award)**
- **Would Messrs. Hall, Maxim, Browning, Lewis, Thompson, Garand, Stoner, Sullivan, etc. have paid to participate?**

(or would they have taken their designs elsewhere to more "welcoming arms" overseas as was the case with many superior weapon designs from US inventors?)

ANSWER: Focus the existing support system on rapidly answering the needs of the real end user

13 – Limited Combat Evals

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

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

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

14 – “Up gun” Calibers

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

- **Consider a medium-caliber for America’s rifle/carbine and LMG**
- **Consider non-NATO “medium” calibers (.40 S&W, 6.5/6.8mm, .300 WINMAG/.338)**
- **Consider proven COTS US “Land of Warfare” approved “Blind to Barrier” (BTB) projectile technology (TSX, CLUB, SOST, etc.) already successfully employed**
- **Follow Select US Unit SOP, successes**
- **Field a PDW (handgun) round that can defeat threat body armor)**
- **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 AND INDUSTRY 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
- Better insure the safe return of American troops from close combat

ANSWER: Solicit for it and they will come!

SUMMARY

- **The last 10 years have produced substantial incremental enhancements in small arms and ammo performance (*most notably in potential threat weaponry, ammunition and AP projectile technology).***
- **With few but partial exceptions these incremental enhancements have not been combined into single systems or evaluated by the US Army for potential use.**
- **Too many new developments/procurements are being made using outdated performance specifications and/or without "real" user input/direction.**
- **The "Ultimate" incrementally superior "Big 8" systems could be available in 18-24 months if all-inclusive performance specs would be released to industry in "responsive" programs (Example: current "Next Carbine" effort).**
- **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 years on "Leap-ahead" programs vs. low $ Select US Unit successes).**

America has not been matching threat weapon/ammunition capabilities and has fallen behind in its conventional small arms superiority!

Thank you for your time and attention!

Contact Information

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www.dtic.mil/ndia/2008Intl/Schatz.pdf