



M27

FROM BAR TO IAR:

HOW THE MARINES FINALLY GOT

THEIR INFANTRY AUTOMATIC RIFLE

by ROBERT BRUCE

THE U.S. MARINE CORPS' M27: PART 2

As threat forces match the firepower of the current rifle squad, the Marine Corps must maintain the innovative edge for which it is famous. While experimentation is still required, the evaluations undertaken by Second Battalion, Seventh Marines, definitively indicate that the Marine Corps should place the M249 into a light machine gun role and add a true automatic rifle to the squad's inventory. (Conclusion to AUTOMATIC RIFLE CONCEPT, an unsigned monograph circa 2001, circulated in the USMC Infantry community)

Friends and foes of the M249 Squad Automatic Weapon in the U.S. Marine Corps' infantry fire teams have been engaged in often fierce verbal firefights dating back years before this innovative light machine gun entered Leatherneck service; soon after the Army adopted FN's MINI-MI in 1984. While the reasons for this are many and varied, astute observers often cite two main points of contention:

- Advocates of belt fed weapons like the M249 admire their relative portability and high volume of fire at critical times in offensive and defensive actions.
- Critics say the 5.56mm SAW's hefty 20+ pound combat weight slows movement and reliability issues too often degrade the gun's claimed firepower advantage.

This second group has argued long and strenuously for an "Infantry Automatic Rifle" that's both lighter and simpler than the SAW, with similar combat effectiveness from better accuracy and realistic capability in full auto and sustained fire.

Now, more than a quarter century



after the Belgian belt-fed joined the Marines, and a decade after the infantry automatic rifle tests by 2nd Battalion 7th Marine Regiment, the IAR camp has

won the argument.

"After a rigorous testing process, both in garrison and deployed environments, and in-depth consultation with weapons experts through the Corps, the Commandant approved the fielding of the M27 Infantry Automatic Rifle. Fielding of the IAR will significantly enhance the ability of infantrymen to gain and maintain fire superiority, reduce the fighting load and provide them with a more ergonomic and accurate weapons system that can keep up during the assault." (USMC press statement, June 2011)

The winning IAR is a lightly modified HK416, beating out dozens of rivals along the way to earn Heckler & Koch an initial contract for as much as \$23.6 million to supply up to 6,500 M27s.

More than 400 of these are already



PREVIOUS PAGE: September 2011, Camp Leatherneck, Helmand Province, Afghanistan. A Marine with 1st Battalion, 25th Marine Regiment adjusts the SU-258/PVQ SDO (Trijicon Model TA11SDO-CP) day scope for battle sight zero on his M27 Infantry Automatic Rifle in live fire exercises upon arrival in country. This MOS 0311 Squad Automatic Rifleman is likely to agree with many others who are more than happy to make the switch from the heavier, and often troublesome M249. (U.S. Navy photo by Petty Officer 2nd Class Jonathan Chandler) **TOP:** January 2005, Camp Habbaniyah, Iraq. Iraqi soldiers aim in their magazine-fed 7.62x39mm RPK light machine guns during the Iraqi Small Arms Weapons Instructor Course taught by the Marines of the 2nd Marine Division Training Center here. Admiration of the combat efficiency of the Soviet-designed RPK was a factor in persistent and growing requests from rank-and-file Marines for a true automatic rifle. (USMC) **ABOVE:** August 2005, MCB Quantico, Virginia. Marine Corps Major Mike Manning, Individual Weapons Team Leader for MARCOR-SYSCOM, introduces the experimental XM8 weapon system, developed for the U.S. Army by Heckler & Koch, to attendees at the USMC's 2005 symposium for Infantry Operations Chiefs. The XM8's short-stroke gas piston operation and other essential elements now found in HK's M27 Infantry Automatic Rifle directly evolved from that firm's G36 rifle. Intended as a replacement for trouble-prone M16s and M4s, the story of the murder by bureaucrats and politicians of the versatile and reliable XM8 family of weapons on the eve of adoption by the Army is a little-known travesty. (USMC photo by Corporal Justin Lago) **OPPOSITE:** Okinawa, 1945. A Marine of the 1st Marine Division draws a bead on a Japanese sniper with his .45 caliber Thompson submachine gun while his companion, armed with a .30-06 caliber Browning Automatic Rifle, ducks for cover. Although heavy and having only a 20 round magazine, the accurate, hard hitting and long-reaching BAR is held in highest regard by many veterans of WWII and Korea. The Corps' subsequent tries at its replacement started with a bipod-equipped M14. When this proved unsatisfactory and "Fourteens" were replaced during the Vietnam War with M16s, certain riflemen in each fire team were designated as "automatic riflemen." That didn't work very well either so the Corps fielded the M249 in 1985. (US Marine Corps photo/National Archives)



in the fight in Afghanistan and full fielding to all of the Corps' Infantry Battalions and Light Armored Recon units should be complete in 2013.

BACK STORY

What follows here contains only brief note of the tactical pros and cons of SAW vs. IAR because these have long been and are likely to remain an ongoing debate. This is, we believe, best left to the Corps' combat-hardened professionals who have a 'Devil Dog,' so to speak, in the fight.

Instead, it is intended to be a close look at how the Marine Corps went about the process of fielding what is hoped will

be a worthy successor to the iconic "B.A.R." – John Moses Browning's Automatic Rifle.

In addition to official program documentation, our primary sources of information for this feature include three career Marines, each with detailed knowledge and relevant perspectives. They are CWO5 (Ret) Jeffrey Eby, recently Senior Gunner for the Corps, Major (Ret) Charles Clark III, USMC Infantry Weapons Capabilities Integration Officer at Marine Corps Headquarters, and Gunnery Sergeant (Ret) Robert Reidsma, HK's M27 IAR Project Manager. Reidsma's interview served well as the backbone for the first installment of this two-part series.

Additional input has come from other knowledgeable individuals who, not surprisingly, have asked not to be identified due to sensitivities both professional and personal.

Gunner Eby, now Advanced Technology Programs Manager for the cutting-edge weapon sighting systems innovator Trijicon, moved up steadily in rank and responsibilities from CWO2 with 2nd Battalion, 7th Marine Regiment, 1st Marine Division, to the pinnacle of this career field in the USMC.

An outspoken, principled and tireless advocate of the IAR from the time he was involved in the first real IAR trials around

2001 and continuing through the M27's adoption, Eby offers us his detailed perspective on the Corps' recent decision:

"The primary focus of replacing the M249 with a true automatic rifle stemmed from the understanding that the M249 is a Light Machine Gun that was adopted by the USMC because the Army had a contract method that we could use. The goal of the effort that led to the M27 stemmed from a desire to reduce system weight from 26.5 lbs to 10.5 lbs, increase lethality by increasing the hit ratio of all shots fired and increase the portability of a system in the hands of an offensive force that is trying to "close with the enemy" as opposed to attempting to use a weapon such as the M249, better designed for defensive engagements.

"The Commandant of the Marine Corps, along with many other Marines, was concerned about the loss in pure volume of fire when moving from a belt fed weapon to a magazine fed weapon. Experiments by Marine Corps Operational Test and Evaluation Activity (MCOTEA) proved that the M27 significantly outperformed the M249 in suppression, used significantly less ammunition and had less downtime during reloads when total down time was

measured through a full combat load of ammunition. This was especially true at night due to the complexity of the M249 function/operation creating a greater frequency of stoppages and malfunctions.

"The Marine Corps believes, as do I, that the M27 will prove to be a key component to:

- Level the movement, portability and maneuverability across all personnel,
- Reduce the visible indication of the location of automatic weapons to the enemy,
- Utilize a common ammunition source,
- Streamline all training tasks,
- Enhance the automatic rifleman's direct fire contribution in Counter Insurgency environments when the volume of fire is not necessarily desirable (collateral damage),
- Allow the squad to maintain the ability to provide a high-volume of fire when required.

"The squad will be more lethal from accurate fires. The squad will be more mobile from significant weight reduction of both weapon and total ammunition requirements. The tempo of the rifle squad

can now be set by the squad leader instead of the slow moving light machine gun.

"The loss of the psychological effect of a high volume of inaccurate fire provided by the M249 will NOT be an issue, as any combat veteran who has heard gunfire can attest to, as after the first "dive to cover" occasion has been conducted, the sound of inaccurate fire passing somewhere nearby no longer impresses the veteran to the point of taking cover.

"I do not believe there are any negatives to the M27 replacing the M249 from any aspect that has been considered."

SOME OF THE M27'S MAIN MARINES

Success of the IAR initiative in the form of the M27 is the result of a team effort with many players in addition to Eby, Clark and his immediate predecessor, Patrick Cantwell. These men and others, notably Major (now Lieutenant Colonel) John "Ethan" Smith, IAW Project Officer, labored long and hard in the honored tradition of quiet and selfless service to the Corps.

While the scope of this report doesn't permit identifying all of them, some of the key personnel brought to our attention are Lieutenant Colonel Mark Brinkman, MAR-

ABOVE: 29 March 2010, Djibouti, Africa. Lance Cpl. Tim Eastep, with 1st platoon, Alpha Company, Battalion Landing Team 1st Battalion, 9th Marine Regiment, 24th Marine Expeditionary Unit, provides suppression fire using his M249 squad automatic weapon, allowing his team to advance forward, during a mechanized assault as part of a live fire range exercise. The 5.56mm belt-fed M249 Squad Automatic Weapon, adopted by the Marine Corps in 1985, is seen here in its latest "Para" configuration. This evolved from an effort initiated in Marine Force Recon to make it lighter and more maneuverable, but now falling short of the new M27 Infantry Automatic Rifle. Combat weight of this light machine gun with 200 rounds loaded plus the USMC version ACOG, laser aiming module and bipod, is about twice that of a comparably equipped M27 and seven loaded mags. (USMC photo by Gunnery Sgt. Chad R. Kiehl) **OPPOSITE TOP:** 21 November 2011, The Crucible training center, Stafford County, Virginia. The final version of HK's M27 Infantry Automatic Rifle as officially adopted for use throughout the Marine Corps. This is one of the Corps' hard worked test and evaluation rifles, lacking only the "M27" receiver marking that will replace "HK 416 D" on the magazine well. It's topped with a 3.5 power SU-258/PVQ SDO (Trijicon Model TA11SDO-CP) day scope with distinctive "piggyback" RMR (Ruggedized Miniature Reflex) close combat sight. Note the folded down BUIS (back up iron sight) and Manta's black colored soft polymer rail and broomstick covers that will be standard in USMC service. The M27's ambidextrous selector features HK's intuitive "pictographic" markings for SAFE in white, SEMI and FULL AUTO in red. To reinforce previous training these positions (and the charging handle, forward assist and magazine release) are the same as on M16 series rifles. The trigger guard swings down to allow shooting with heavy gloves or mitts. (Robert Bruce)

of those capabilities, but also for all the Marine Corps doctrine relating to those weapons systems.

This seasoned Marine brings impressive credentials to the job, having held every billet in infantry battalions from Platoon Commander through Battalion Operations Officer. His combat experience spans 2005 through 08, including rifle company commander in the Al Anbar Province in Iraq, and as a combat advisor with the Afghan Commando Kandak (battalion), primarily in Kunar Province, Afghanistan.

We asked Clark when and why Marines in the field began asking for an alternative to the M249 that the Corps fielded beginning in 1985 and he suggested we talk with Gunner Eby, describing him as both a fellow Marine and personal friend. As seen earlier in this feature, we certainly did and it proved highly instructive.

"Historically, the Marine Corps kind of understood the shortcomings of the SAW but it was a service level decision to adopt it," Clark said, "a Marine Corps requirement that was initially developed by the Army."

Dissatisfaction soon arose and grew in the dozen or so years that followed, leading to the often-cited initial IAR trials conducted by the 1st Marine Division's 2nd Battalion, 7th Marine Regiment circa 2000.

"Until you operate with a weapon system for some period of time, you haven't identified all the considerations for employment," Clark explained. "2-7 was not the only battalion that had this epiphany. It was a growing thought process in the Marine Corps."

2-7 did a limited IAR experiment and then provided their findings up through the Gunner community; the highly respected duty experts on weapons employment whose opinions carry considerable weight in the Marine Corps. Their endorsement of the Infantry Automatic Rifle, echoed in formal recommendations, continued year after year as Marine infantrymen fought the Global War on Terror in Afghanistan, Iraq and other hot spots.

Clark cited a list of complaints from the field including SAW gunners lagging behind, particularly in the attack. He called the M249 an effective but cumbersome light machine gun, not best suited for the Corps' tactical doctrine for rifle

squads in urban combat.

"When you go into a MOUT (Military Operations on Urban Terrain) environment you've got to strip the SAW gunner out of the 'stack' (of Marines entering and clearing buildings)," he said. "And so now you've effectively taken what was your automatic rifle out of the attack in a MOUT environment where it's really about maintaining momentum and tempo."

This and other gripes fueled the escalation from an evolving "Universal Need Statement" initiated back in 1999, to official program status six years later, the bureaucratic birthday of a laborious and strictly defined procurement process. In early 2005, Clark and others under the Deputy Commandant for Combat Development and Integration wrote up a set of capabilities desired for a theoretical Infantry Automatic Rifle, sending the specifications over to Marine Corps Systems Command.

On 14 July 2005, MARCORSSYSCOM kick-started the process by issuing its Request for Information to the defense industry, listing both threshold (minimum) and objective (desirable) IAR characteristics they might be able to meet with an existing weapon. With this, the IAR machine started picking up speed.

While the initial solicitation's 100 round minimum magazine capacity was soon dropped in favor of standard GI 30-rounders for reasons detailed later in the feature, the specified caliber begged for discussion. Since performance shortcomings in the U.S. military's standard issue M855 5.56x45mm cartridges have been well documented, we asked Clark if alternatives like 6.8mm had been considered.

"We did not," he said, but quickly added, "We're considering alternate calibers in the future."

Clark emphasized that one of the driving factors for the desired IAR was commonality among the weapons in the Marine rifle squad. "We have an M27 with common ammunition - (5.56mm) ball, not linked - and a common ammunition source with the approved service rifle magazine," he said. "Now we can switch back and forth. It's much easier, and having been a company commander, I think that offers a lot of capability to trade magazines back and forth on reaching the objective."

It was Clark's job to take up the cause

CORSYSCOM's Product Group 13 Program Manager for Infantry Weapons, along with Captain Edward Leon, succeeding Smith as IAR/M27 Project Officer. Also, working patiently and steadily behind the scenes was PMIW Engineering Team Leader Salvatore Fanelli, well known and respected for decades of important work in the world of military small arms.

Our initial requests through USMC public affairs channels to interview any of these men proved unsuccessful until persistent efforts eventually paid off with permission to conduct only one - a telephonic interview with Clark, speaking from his office at MCB Quantico, Virginia. This retired Marine Major is the Infantry Weapons Capabilities Integration Officer for the Deputy Commandant for Combat Development and Integration, a three star command at Headquarters, Marine Corps.

Identifying himself as the "user representative" inside the acquisition process, Clark was well positioned in the latter stages of moving the IAR requirement through the bureaucratic maze. The IWCIIO and his five person team cover all infantry weapons, individual and crew served weapons, optics, sniper capabilities, and remote weapons stations. They're not only responsible for the requirements for each

3 June 2011, Marine Corps Base 29 Palms, California. A Marine with 2nd platoon, Company B, 1st Battalion, 6th Marine Regiment, 2nd Marine Division, provides cover fire while an M249 squad automatic weapon gunner and another fire team member work to clear the belt fed weapon's malfunction during a platoon attack course, part of the Enhanced Mojave Viper training evolution. This is particularly difficult and time consuming at night. (USMC photo by Corporal James W. Clark)

from his predecessors and steer the IAR past the metaphorical mudholes, mines and ruts that are noted in what follows here. Analysis of responses to the RFI and further input from the Gunner community and other elements of the Corps resulted in a modified set of IAR specifications rolled up in a Capabilities Development Document. The CDD was signed in June 2007, marking what's called a Milestone B in 'acquisition-speak,' the jargon used in government procurement circles.

More industry responses followed – samples and related support provided at no cost to the government but considerable cost to the hopefuls – used in several rounds of tests that eventually narrowed the field to four candidate weapons. Then, intensive verification testing was done on this quartet; two from Colt and one each from FN and HK.

On 19 December 2008, four "IDIQ" (indefinite delivery, indefinite quantity) contracts were formally announced, one for each of the finalist IARs, identically worded except for the company name and price. The purpose for these multiple awards was two-fold; first to have a contract structure in place to support purchase of test samples, spares and services. Then, when the winning rifle among the four contenders was finalized, to expedite full rate production, getting IARs into the hands of Marines as fast as the hidebound system would allow.

Heckler and Koch Defense, Inc., Ashburn, Va., is being awarded a five year indefinite delivery, indefinite quantity contract with possible delivery orders up to \$23,600,000 for the production, delivery, and associated support of the Marine Corps' Infantry Automatic Rifle (IAR). The IAR will be a light weight, magazine fed, 5.56mm weapon which will enhance the automatic rifleman's maneuverability and displacement speed while providing the ability to suppress or destroy not only area targets, but point targets as well. The IAR is planned to replace the M249 Squad Automatic Weapons (SAW) currently employed by automatic riflemen within Infantry and Light Armored Reconnaissance (LAR) Battalions. Although four contracts will be made initially, delivery orders will be awarded for samples. First Article, spare/repair parts, and various support services; and, eventually one of the four contractors may be awarded delivery orders for up to 6,500 IARs. Work will be performed in Ober-

EXCERPT FROM "AUTOMATIC RIFLE CONCEPT"

(an unsigned monograph circa 2001, circulated in the USMC Infantry community)

In May 2001, the First Marine Division commissioned a study tasking Second Battalion, Seventh Marines to execute a quantitative and qualitative assessment of several automatic rifle candidates alongside the M249 SAW.

Based on the generally held weapons definitions adopted, three automatic rifles were acquired off-the-shelf to participate in the assessment with the M249 SAW. These three weapons were the Colt Automatic Rifle, the Ultimax 100 (manufactured by Singapore Arms), and the Heckler & Koch G36.

THE WEAPONS

The Colt is a variant of the current M16A2 with the exact same sights and commonality of parts. The Colt AR weighs fifteen pounds, eight more pounds than the M16A2. The additional weight is due primarily to a heavy barrel intended to retard heat build up. Other alterations include a pistol grip attached to the forend, a hydraulic buffer to retard recoil and rise, and a design change enabling the automatic variant to fire from the open bolt, reducing the possibility of cook offs from excessive heat build up. The Colt has a rate of fire of 650 rounds per minute.

The Ultimax 100, made by Singapore Arms, is similar in look to the M249 SAW. Like the SAW, it fires from the open bolt, But the MKII does not possess a spare barrel and is fed by magazine only. Because it weighs only nine pounds, shooters can easily employ the Ultimax in a variety of methods. An adjustable gas regulator with three settings allows for a rate of fire varying from 450 to 600 rounds per minute.

The Heckler & Koch G36 is a lightweight battle rifle, capable of being fired in a fully automatic role from the closed bolt. The version tested had optical sights with an over/under system. The lower sight system has a 3.5 magnified scope with multiple crosshairs. The upper system was an aim point dot variation for limited visibility shooting. Total weight of the weapon system tested was seven pounds. The rate of fire is 650 rounds per minute.

Unfortunately, the competitors tested during Phase I of the automatic rifle assessment do not appear to offer what the Marine Corps needs.

As stated previously, the HK failed to stay on target in burst fire while the Ultimax sight system did not present to the eye at all. The commonality of the Colt AR with the M16A2 appeared to be advantageous. Yet, the Colt proved to be the only weapon that experienced negligent discharges during the firing of 120,000 rounds. This fault resulted, in part, from young Marines failing to understand the open bolt system, but also in part from weapon design.

Open bolts are inherently dangerous. Traditionally we fear to carry an open bolt weapon in the condition one mode of ready to fire. The primary shooter can be trained to be safe with the weapon, but primary shooter casualties will soon place the weapon in an untrained hand, quickly leading to friendly fire hazards.

Using the assessment as a "jumping off" point, at the conclusion of Phase I of the Automatic Rifle Test, a Universal Need Statement was drafted and submitted through First Marine Division. The statement requested that the M249 be replaced with a "true" automatic rifle. The weapon envisioned would fire 5.56mm ball ammo, be capable of receiving the M16A2's 30-round magazine, would possess a selector lever that went from safe to auto to semi-auto (in that order), would weigh less than 12 pounds loaded, employ sights equal to the M16A2, use clip-on bipods, and have a 450-600 rounds per minute (cyclic?) rate of fire.

dorf, Germany. Delivery of contract line items will be as stated on applicable delivery orders. Contract funds will be obligated in multiple delivery orders. This contract was competitively procured. The Marine Corps Systems Command, Quantico, Va., is the contracting activity (M67854-09-D-1038).

Some insight into the eventual outcome may be had by comparing the total

cost bid by each for the theoretical purchase of 6,500 IARs. Both Colt rifles were the least expensive at \$14 million, HK was in the middle at \$23.6 million, and FN wanted \$27.9 for theirs.

Left behind were rifles from LWRC and Knight's, as well as the Ultimax light machine gun, offered under special arrangement with Singapore-based ST Kinetics and the United States defense



23 April 2012, MCB Camp Hansen, Okinawa, Japan. Lance Cpl. Zachary A. Whitman of III Marine Expeditionary Force, familiarizes himself with the M27 Infantry Automatic Rifle in preparation for the Australian Army Skill at Arms Meeting 2012. AASAM is a multilateral, multinational event allowing Marines to exchange skills tactics, techniques and procedures with members of the Australian Army, as well as other international militaries in friendly competition. SADJ was told that the Aussie's – armed with the M249 – disallowed the M27 in some events. Sounds like quite a compliment to the HK's accuracy and reliability.... (USMC photo by Sergeant Brandon Saunders)

requirements document was "agnostic to operating system." "We didn't go into this saying 'Hey, we want a closed bolt, piston driven gun.' We considered gas impingement, gas piston, we considered operating rod." Clark explained. "We didn't go in with preconceived notions. I wouldn't characterize it as tradeoffs. We had the performance specifications and we just simply took the gun that best met our performance specifications."

Lessons learned along the way (Clark says there wasn't much change from the CDD) were codified in a Capability Production Document, signed in November 2009. The CPD enabled Milestone C decisions that resulted in "down-select" of a single weapon system, announced a month later. The Corps' source selection panel named HK's candidate best in meeting the requirements.

giant General Dynamics.

Not surprisingly, contending firms with weapons that were passed over weren't happy. We, of course, asked why they didn't make the cut.

Clark, tightly constrained by all manner of legal restrictions arising from the military's too-often bitter experience with countless contract protests, lawsuits and even political interference, gave the ex-

pected answer. "That's where we get into 'source selection sensitive' information," he stated. "I can't release what the deliberations were."

We kept fishing, asking him to comment on any significant tradeoffs necessary to meet IAR's specifications. Things like piston vs. gas, open bolt vs. closed, cookoff, barrel swap, etc. Carefully choosing his words, Clark emphasized that the



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gun and I've got an automatic rifle, I'm going to be hard pressed to get fire superiority over him; you know, to keep his head down instead of him keeping mine down, because that 200-round magazine just keeps on giving.

"Let's talk about what it does to squad tactics and see how the troops feel about this thing, because you're not only changing the kit, you're changing the way, potentially, that we fight. And with this new automatic rifle, every 30 rounds, you got to change magazines. Well, you're probably not going to do that, you know, in an exposed position. You're going to have to drop down, change that magazine and come back up again. You know, fire superiority is fleeting. And so I'm concerned about the sustained effects of all of that."

"I'm concerned that moving at night, that the other squad members carrying those additional magazines for that automatic rifleman might, in a spread formation, be hard pressed to get him what he needs in a timely fashion. I mean, how

are they going to do that? Are they going to throw them over to where they think he is? They're going to be a little bit occupied themselves, I suspect, in a firefight.

"So there's just some – and I don't want to get so far down in the weeds that, you know, I'm doing lance corporal work here. But it's a big deal when you start changing how a Marine infantry squad fights. And we're going to treat it as a big deal. And I'm going to have to be convinced that we're making the right move before we start to purchase another system and change that whole dynamic.

"By the way, we also have to be able to justify to the Congress, and to you folks, arguably, that we're moving away from a tried and true weapon system that the Army's going to continue with, and yet we're going to go another way. And there's another additional burden of proof here, I think, that has to be met simply because of the expense to the taxpayer. So there's a number of things out there that we've got to accomplish."

It was our duty to again ask the logical question: What performance and other factors led to the decision to adopt HK's modified 416 rifle as the USMC's Infantry Automatic Rifle?

Clark's answer was patient, cautious and brief. "Across the board, it best met our requirements. When we hold a source selection... we consider cost, schedule, performance and past performance." Then, after a moment of reflection, he added with emphasis, "As the user representative, performance is always the most important aspect to me."

THE COMMANDANT GOES PUBLIC

HK's IAR candidate had won the battle but not yet the war. The SAW vs. IAR debate hadn't gone away and not only were there were skeptics in the ranks but General James Conway, the soon-to-retire Commandant of the Marine Corps, had been cautiously weighing pros and cons for quite some time.

In his response to a reporter's question at a 15 December '09 news briefing at the Pentagon, the top Marine referenced previously revealed criticism of the relative inaccuracy of the SAW in burst fire along with concern about losing that belt-fed light machine gun's high volume of fire. It was clear that this former muddy boots infantry officer was carefully considering implications of its replacement by an IAR:

"I got it that a SAW [Squad Assault Weapon] with a 200-round magazine is not perhaps terribly accurate shot to shot, but it's a light machine gun. Let's step away from accuracy for a moment and talk about suppression. And the psychology of a small-unit fight, that says that the other guy's got a light machine

3 April 2009, Hawthorne Army Depot, Nevada. One of four finalists – two from Colt and one from FN – in the IAR competition, an HK candidate seen here gets a live fire workout from a Marine during what is termed a Limited User Evaluation. The LUE is designed to provide infantrymen some hands-on experience followed by the opportunity for direct input on likes and dislikes. Note the stubby GripPod mounted just forward of the magazine. While handy and useful on rifles and carbines, it didn't make the cut for medium and long range accuracy in prone shooting. Beginning in 2008, Marine Corps Systems Command's conducted verification testing on the four finalist IARs including reliability, rate of fire, environmental chambers, and user assessments. Environmental and drop tests were done at the Army's Aberdeen Test Center. 20,000 round durability and reliability testing as well as sustained rate of fire testing at MCB Quantico. (MARCORSYSCOM)

THE FIRST FORMAL IAR SOLICITATION

Classification Code 10--Non-Developmental, 5.56mm, Infantry Automatic Rifle (IAR)
Solicitation Number: ARRFI Notice Type: Sources Sought
Agency: Department of the Navy
Office: United States Marine Corps
Location: Marine Corps Systems Command
Posted Date: July 14, 2005. Response Date: August 8, 2005

The United States Marine Corps is currently seeking information for a non-developmental, 5.56mm, Infantry Automatic Rifle (IAR). CAPABILITY DISCUSSION. The IAR will enable the fire team to rapidly suppress point and area targets of immediate concern. The IAR will replace the infantry's M249 Squad Automatic Weapons (SAWs) with an automatic rifle easily operable by a single infantry Marine that emphasizes lightweight and portability in order to maximize dismounted maneuverability. SYSTEM ATTRIBUTES. The attributes that follow describe some of the specific characteristics that are required to provide the desired capability. Some attributes include threshold and objective criteria. A threshold criterion is defined as a mandatory requirement and an objective criterion is defined as a desirable (but not mandatory) requirement. System Portability. The IAR (excluding the magazine and accessories) shall weigh less than 12.5 pounds empty (Threshold), 10.5 pounds (Objective). Ammunition Commonality. The IAR shall fire 5.56mm ammunition. Interoperability. The IAR shall possess a military standard 1913 rail interface. Sustained Rate of Fire. The IAR shall be capable of a sustained rate of fire of 36 rounds per minute (Threshold), 75 rounds per minute (Objective). (Sustained rate is defined as the rate at which a weapon can fire indefinitely without experiencing a major malfunction such as [but not limited to] a cook-off or a significant degradation in accuracy.) Magazine. The IAR shall utilize a magazine with a capacity of 100 rounds (Threshold). The magazine shall permit rapid visual determination of the number of rounds remaining (Objective). Magazine Compatibility. The IAR shall accept and function with the current Marine Corps service rifle (the M16A4) 30-round magazines. Firing modes. The IAR shall be capable of both semiautomatic and full automatic firing. Collapsible/Adjustable Bipod. The IAR shall possess a robust, detachable, collapsible, and adjustable bipod.

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'MCOTEA'

In view of concerns up the leadership chain from Corporals to the Commandant, Clark explained that, beginning in December 2009, extensive operational testing of the HK IAR was carried out by a unique element of the Corps, specifically structured to yield objective data.

"That's done by an independent," Clark said, "Marine Corps Operational Test and Evaluation Activity – referred to as 'MCOTEA.' They don't report to our 'three star' (Lieutenant General) and they don't report to the 'one star' (Brigadier General) at Systems Command, they're a separate entity that reports up to the Assistant Commandant."

"They're a really good backstop for the Marine Corps," he added, "to make sure that, while a system may technically meet the requirements, it also has to be operationally effective and operationally suitable in the hands of the Marines from the operating forces who are going to be employing this weapon system in combat."

What the Commandant said at the December news briefing had apparently been said at staff level at least a couple of months earlier. The March 2011 issue of *Marine Corps Operational Test and Evaluation Activity's MCOTEA Journal*, proudly noted their quick response in supporting IAR testing:

"...in October 2009 MCOTEA received an urgent request, coordinated through Deputy Commandant, Combat Development & Integration, to compare the performance of Marine rifle squads equipped with combinations of the infantry automatic rifle, the squad automatic weapon (SAW), and the para-SAW. On December 22, 2009, MCOTEA delivered its assessment report of squad performance to the Assistant Commandant of the Marine Corps. In the intervening 85 days, MCOTEA put together a test team, prepared a test plan, gathered required resources, traveled to Twentynine Palms, executed the test in both day and night operations, and returned to Quantico...."

A dozen HK IARs went through the 'MCOTEA' wringer in the hands of infantry Marines running standard tactical scenarios at three separate locations with environmental conditions from cold to hot. At the first of these, in the windblown sand and dust of the Mojave Desert at Twentynine Palms, California, squads equipped

with SAWs were compared to others with IARs in realistic combat scenarios.

Cold weather operational reliability determinations were made in February 2010 in the snow at Ft. McCoy, Wisconsin, followed in June by hot/humid testing at the notoriously swampy Camp Shelby, Mississippi.

ENGINEERING TWEAK

We had heard that there may have been an engineering change arising from some of the trials. Clark confirmed this as something that was observed in the variety of firing tests done from cold to hot temperatures.

"The cyclic rate in extreme heat was a little bit faster than we desired," he said, citing concerns for reliability/durability over the long haul from stress on the gun's moving parts. This was easily fixed with the minor engineering change of a small enlargement in the vent on the gas block, optimizing the cyclic rate across all operating environments. It's said that the M27 now tops out at about 900 rpm in the hot environment.

LIMITED USER EVALUATION

Clark walked us through the process that eventually resulted in a go-ahead decision for full rate production. With the Milestone C decision previously in hand and very positive operational test results, he said, the Commandant authorized a Limited User Evaluation (LUE).

458 "low rate production" guns were ordered under the existing IDIQ contract. The first group of these was ceremoniously delivered by HK – not coincidentally – on the Marine Corps' 235th Birthday, 10 November 2010.

As HK began to deliver batches of rifles, four infantry battalions and one light armored recon battalion, all prepping for deployment to Afghanistan, each received in turn a full issue of IARs. 1st Battalion, 3rd Marine Regiment, Kaneohe Bay, Hawaii, was first to get a visit from Systems Command's NETT – New Equipment Training Team – delivering 84 of the M27 rifles in December 2010 for a comprehensive, week-long program. Classroom instruction was given to both armorers and operators; then the shooters would go out to the range for known-distance and combat marksmanship. Both transitioning SAW gunners and new Automatic Riflemen got plenty of live fire with the new M27, building skills in full auto takedowns at close targets and



21 November 2011, The Crucible training center, Stafford County, Virginia. In Reidsma's hands, the M27's approx. 12 rounds per second full auto cyclic rate is no impediment to effective target engagement from prone to standing. In addition to a favorable ratio of 12.7 lb. weight vs. the relatively light recoil of its 5.56mm ammunition, the rifle's in-line stock, broomstick grip, quick adjusting sling, and forward-mounted bipod combine with the inherent accuracy of the weapon's 16.5 inch cold hammer forged barrel for remarkable long range performance. (Robert Bruce)

long range accuracy in semi-auto. Leaders got their own block of instruction on tactical employment considerations as well as the opportunity for live fire.

The decision was made to officially designate the new IAR the M27, honoring the 1st Marine Division's 2nd Battalion, 7th Marine Regiment where then-CWO2 Eby was for the original IAR testing way back in 2001.

THE NEW COMMANDANT

General James F. Amos, who took over from Conway on 22 October 2010 as 35th Commandant of the Marine Corps,

ter by adding, "And that was from some old broken-down fighter pilot... even I could do it."

While the formal decision to begin full rate M27 production was still several months away, Amos went on to say, "We are fielding that now on a test basis in Afghanistan with five battalions. My sense is this weapon could take the place of our squad automatic weapon." He then tossed out a tantalizing tidbit; "And it could also take the place, possibly, of our service weapon: So yet to be seen."

Reports from 1/3 and other user units, as well as the Corps' highly influen-

Clark said, there was "overwhelming support for full fielding."

On 15 September 2011, HK announced to the world that the tentative \$23.6 million IDIQ contract it had gotten back in December 2008 was finally going to be exercised for full rate "production, delivery and associated support of the Marine Corps' Infantry Automatic Rifle (IAR)."

While the Corps' internal decision to go ahead with full rate production had been publicly announced three months earlier, it apparently took that long to get all the procurement legalities in order.

"Then we go through some acquisi-

uations got to keep their IARs and the rest of the Corps started getting theirs in January 2012. "Initially to our schoolhouses," Clark said, "the Infantry Officers Course, School of Infantry East and West, and Maintainers Course. Then we start pushing them out to all the other battalions. It's about an eighteen month process to get all the guns fielded."

GRUNTS GET THEIR SAY

We asked what 'lessons learned' had come out of the formal tests, field evaluations and combat experience. Clark noted that the Grip Pod (a vertical handgrip with

with everything but ammo. The package includes an operator's manual, cleaning kit, SDO, backup iron sights, soft rail covers, bipod, two-point sling, and twenty two 30-round service rifle magazines (basic load of 660 rounds per IAR).

This last component comes because feeding the beast was another thing that changed along the way. The original RFI had an objective of a hundred round magazine. But, Clark said, at the time testing began the available hundred round magazines weren't sufficiently reliable.

"I think that potentially we could go to higher capacity magazines than we

the M27. Clark explained how this came about. "We only tested optics within our inventory... because we wanted commonality, an optic that the Marines were familiar with," he said. "We tested the RCO (Rifle Combat Optic), a 4 power day optic that we field on the M16A4 and the M4. We tested that and the SDO. The SDO was just a little more durable in automatic fire. We've also fielded backup iron sights; not just on the M27, but also on the M16A4 and the M4."

Clark also pointed out advantages to the SDO's piggyback reflex sight. "That gives you more flexibility in a closer operating environment where you're doing CQB or you've got popup targets close to you. One thing we've really seen is that the automatic rifleman brings a lot to the fight. And now, because he's got a more portable, more compact weapon, he's able to remain in the rifle squad, in the 'stack' in a MOUT environment. So giving him that reflex sight is a lot of capability too."

IN WITH THE NEW

It makes sense that similarities between current M16A4 rifles and the M27 have made it relatively easy to integrate as far as logistical support and training of operators and armorers. As is customary in the Corps, Systems Command sends out NETTs (New Equipment Training Teams) with the IARs. These include both active duty and contract personnel, many of whom are former Marines, all dedicated to ensuring seamless transition from old to new.

But changes in tactical doctrine are quite a different matter. We offered the long held belief that belt fed machine guns delivering a 'wall of lead' with supersonic ballistic cracks and uncomfortably close impacts of incoming rounds, are essential to suppression of the enemy. This, it is said, is a big part of where fire superiority comes from; allowing attacking infantry to advance or outnumbered defenders to prevail.

The response we got from this battle-hardened infantry leader was strongly stated. "I totally disagree," Clark said. "Fire superiority is based on both accuracy and volume of fire. The greater your accuracy the less volume of fire you need." Current doctrine, he added, is based on the belief that there's no effective 'acoustic suppression' below the sound of a 'fifty cal.' With the M27 we're increasing the accuracy and because of that we can reduce the volume and maintain the same or better effects."

He also pointed out tangible ad-



had apparently become a strong supporter of the new IAR. In the Q&A following a presentation on 8 February, 2011, Amos spoke enthusiastically about his personal experience in firing the M27:

"We went out and fired it before Christmas and it is absolutely dead on: 500 meters – and a bullet out 500 meters is a long ways," Amos said, drawing laugh-

tial Infantry Operational Advisory Group, were apparently positive enough to spur a decision on 23 May 2011, authorizing Full Fielding. Commandant Amos' decision, Clark said, was reached after collecting positive feedback from grunts. Each of the five battalions in the Limited Fielding did an assessment of the M27 at the end of their pre-deployment training and,

tion hoops to put guns on contract, obligate money and things like that," Clark said. "We had money programmed, waiting to execute based on completion of our testing and then the Limited User Evaluation. The money was there and so authorization from senior leadership to proceed with full fielding enabled us to obligate those funds."

The first five battalions from the eval-

small bipod inside) had been replaced by a simple 'broomstick' type grip, along with a real bipod like those found on the Corps' M40 series sniper rifles.

Also, he said, "We've got a new two-point sling ... that's also probably going to be a common sling across the Marine Corps." This, we learned, is Blue Force Gear's Vickers Combat Applications Sling and rail sling mount.

Soft and flexible Manta rail covers are another user recommendation that found official favor. "Not only does the Manta rail cover give you a good heat shield, but you can also integrate things like touch pads," Clark said.

IARs sent to battalions for issue come

have but there's not a strong demand signal from the operating forces to do that. We've had very positive feedback with the thirty-round magazines both during pre-deployment training and through the current limited fielding."

Reliability of standard GI issue aluminum wall mags has improved considerably, Clark noted, since a joint services development of a new follower that is characterized by its tan color.

SQUAD DAY OPTIC

It was the Marine Corps' decision to put Trijicon's tough and versatile TA11S-DO-CP, already serving on the M249 as the SU-258/PVQ Squad Day Optic, on

ABOVE: 3 December 2010, MCB Hawaii. Under direction of a member of the MARCORSYSCOM's M27 NETT (New Equipment Training Team), 1st Battalion, 3rd Marine Regiment armorers perform a function check on the brand new Infantry Automatic Rifles just delivered. This battalion's Marines have the distinction of being the first of five to conduct the M27 limited fielding evaluation in pre-deployment training. Each of the three fire teams in the squad will carry one IAR on operations when they deploy in a few weeks to Afghanistan. (*Department of Defense*) **OPPOSITE:** 3 December 2010, MCB Hawaii. One of 84 brand new M27 IARs, packed with its regulation set of accessories, as delivered by MARCORSYSCOM's NETT (New Equipment Training Team) to 1st Battalion, 3rd Marine Regiment prior to scheduled deployment to Afghanistan. Each Infantry Company gets 28 IAR's, one for each fire team and one in reserve. Six M249s will remain in the company for use as the tactical situation requires. Light Armored Recon Companies get 14 IARs. (*Department of Defense*)

THE U.S. MARINE CORPS' M27: PART 2

vantages of aimed fire from IARs in COIN (Counter-Insurgency) environment where every single projectile going downrange has potentially a strategic effect. In major combat operations volume of fire in putting out a wall of lead can be a good thing, he said, but in a COIN environment it's important to avoid non-combatant casualties.

Then, with ease arising, no doubt, from more than a bit of repetition in a variety of settings, Clark summarized the M27 IAR's practical and tactical virtues. "By being far more accurate and more portable we are achieving better effects and having to expend fewer rounds. Particularly in the defense, we use about half the ammunition with an M27 equipped squad to achieve the same effects on target," he noted. "In the offense, in a squad attack in a MOUT environment, you're keeping your automatic rifleman in the fight longer. His immediate and remedial action is faster, his time to reload is faster, he's got a more portable and more accurate weapon system. The impacts are pretty significant in the attack and in defense in our testing as well as combat 'lessons learned' have demonstrated that."

FIREPOWER FLEXIBILITY

We repeated something we'd heard along the way in support of the M27 concept; other weapons in the Marine infantry company – M240 and M249 in particular – provide the belt-fed, sustained and suppressive fire effect that some might find desirable. They all work together. When the Marine rifle company is in the attack or in the defense there are six M249s and other weapons that are in the game.

Clark agreed, adding, "So that company commander does his mission analysis based on the task that he's assigned by his higher. He has the flexibility to keep a light machine gun in his plan. Weapons platoon is still going to have M240s and you've got weapons company that the battalion commander can task organize to provide additional machine guns down to the company level and below."

BAR VS. IAR

There was an 'optional question' in what we had sent in advance of the interview and it seemed like this was the time to bring it up: What do you want to tell those proud old warriors from WWII, Korea, and maybe a few right up to Vietnam who were humpin' the big BARs?

To many of them, their way of thinking is you've got to have .30-06 caliber BAR to have a real Infantry Automatic Rifle. And now their beloved Marine Corps has gone to that pipsqueak 5.56 and the world is goin' to hell.

Clark's polite response was a well measured combination of appreciation and official findings. "We'll always respect the Marines who have gone before us so I would not tell them their opinions are wrong. They've earned the right to have those opinions...." He patiently repeated the essential points; that it has been shown through testing, evaluation and combat experience with the M27 that accuracy and shot placement are more important to target incapacitation than caliber. "If you're engaging a target and you're hitting where you're aiming, you're more likely to incapacitate the target."



We gave it another try, quoting part of a conversation with a salty old Marine combat vet who had told us, "When I was layin' on my belly in the mud in Korea, I could hit a ChiCom at 500-600 yards with my BAR, single-shot." Would you tell him he was carrying something too heavy, too long, too cumbersome? And if he wasn't laying on his belly and had to pick it up and run with it would he rather be running with an M27 or a BAR? Clark's answer was befitting of an officer and a gentleman. "I would say to our Marine brothers who carried the BAR; if they had an opportunity to carry the M27, I think a lot of them would take that opportunity to carry it in combat."

NEARLY A DECADE

Our last question – likely the most controversial – was only implied among those on the list we had sent. But Clark

was clearly well prepared to answer. Quoting more than one source familiar with the process, we asked, "Why the hell did it take the Corps ten years to buy an off-the-shelf rifle?"

"I would argue that it didn't take ten years," he firmly stated, "It took three. Because we had an approved Milestone B in 2007 and we fielded guns in 2010. There was a lot of experimentation that went into refining the Infantry Automatic Rifle concept. But from the time we initiated a program to fielding took three years."

Again echoing credible observers, we cited the Universal Need Statement from back in 1999-2001. Clark acknowledged that the call for an infantry automatic rifle was more than a decade old, but noted that the Corps is constantly doing experimentation in small arms and every other aspect of its capabilities. "Not every concept is fielded," he said, "we have to go through a deliberate process to assess new concepts. (With) these types of developmental efforts, it's not uncommon for them to take ten years. I would argue that the M27 took three years."

CRADLE TO GRAVE

That was then and this is now. Having successfully shepherded the IAR through the last critical stages leading to fielding, Clark's Infantry Weapons Capabilities Integration team is responsible for "life cycle management" of the M27 and most every other weapon in the Devil Dogs' arsenal. "I'm responsible for where every gun – everything that shoots something – is located in the Marine Corps. We have tracking systems to do that," he said. "If units are having 'wash-outs' – in the last ten years we've had combat replacements, combat washouts, combat losses – I have to know where those are to program funding to replace those. We never really lose visibility of weapons throughout the life cycle." And, we asked, what about the M27? "Maybe a twenty year life cycle, maybe more," Clark speculated.

Unless, we speculate in turn, something 'new and improved' comes along in the meantime. Like the increasingly promising developments in JSSAP's Lightweight Small Arms Technologies Program. And don't forget that tantalizing tidbit from General Amos, today's Commandant: "...it [IAR] could also take the place, possibly, of our service weapon. So yet to be seen."

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