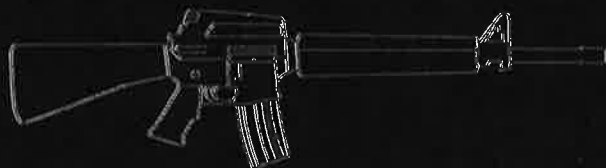


## Exhibit 19

To Defendants' Memorandum in Support of Motion for  
Summary Judgment

*The UDT-SEAL MUSEUM presents*

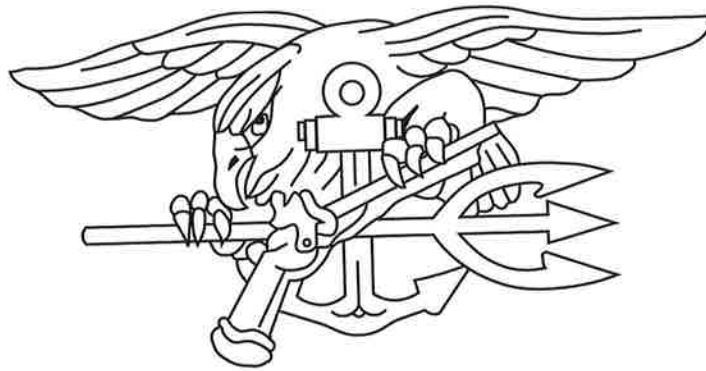
K E V I N   D O C K E R Y



*Special Warfare*  
*Special Weapons*

THE ARMS AND EQUIPMENT OF THE UDT AND SEALS  
*from 1943 to the Present*

T H E   E M P E R O R ' S   P R E S S



# **Special Warfare: Special Weapons**

**The Arms & Equipment of the  
UDT and SEALs from 1943 to the present**

**Produced with the co-operation of the UDT-SEALS Museum**

**By Kevin Dockery**

**EMPEROR'S PRESS  
Chicago, Illinois**



The fortifications put in place on top of a SEAL billet in Vietnam during the Tet Offensive of 1968. At the lower right of the photo can be seen an M1 steel helmet laying on top of an M69 armor vest. Next to the vest is a set of web gear including at least one canteen. On top of the sandbags can be seen the buttplate of a loaded M60 machine gun. Next to the M60, leaning against the crate of ammunition, is a Stoner 63A light machine gun with a 150 round belt drum in place for use. Leaning against the wall just to the left of the sandbags is an M14 rifle with a 20 round magazine locked into place. The bandoleers appear to be additional 7.62mm ammunition in stripper clips for the M14 and additional M14 magazine are laying on top of the wall. Belts of 7.62mm ammunition for the M60 and 5.56mm belts for the Stoner are both draped over the wall. At the base of the M14 are the black fiberboard tubes holding high explosive ammunition for the M29 81mm mortar, the top portion of which can be seen just to the right of the center foreground of the picture.

PHOTO CREDIT: UDT-SEAL MUSEUM

### Special Warfare: Special Weapons

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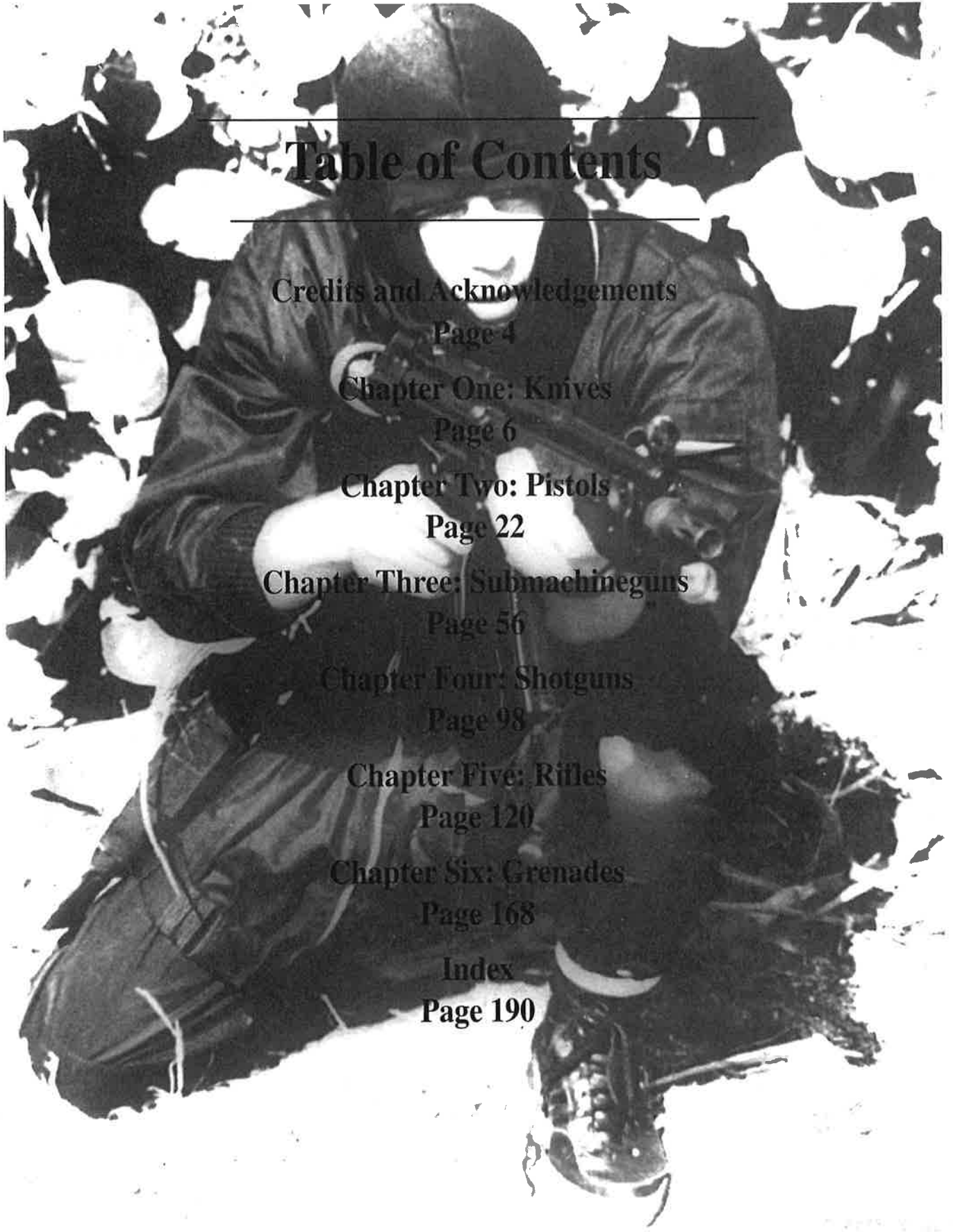
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**This book and others to follow in this field are dedicated to the memory of Dr. Edward C. Ezell, Ph.D. who encouraged me to continue my writing, guided me, and told me I had paid my dues.**

Help from a great many individuals and organizations went into the creation of this book and the items described between these pages. Because of the nature of their work, many of these individuals did not want to see their name in print. For others, the passage of time has rendered them anonymous.

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**And to the men of the Teams,  
past,  
present,  
and future.**



*A member of UDT-21 proudly displays a t-shirt with his unit's emblem after coming ashore in Denmark during NATO exercise Northern Wedding 82. He is armed with a Vietnam era XM177E2 fitted with a China Lake blank adapter. At his left shoulder is a Mark 1 Ka-bar with a cast aluminum pommel dating from World War II. The story of the UDT's came to an end within a year of this pictures being taken. In 1983, all UDT's were decommissioned and became SEAL Teams or SDV Teams.*

*Photo credit: US Navy*

# Rifles

**TECHNICAL DATA—M1 Carbine**

NSN 1005-00-670-7672

—M2 Carbine

NSN 1005-00-575-0057

**CARTRIDGE—**30 Carbine (7.62x33mm)

**OPERATION—**Gas

**TYPE OF FIRE—**Semiautomatic

M2 Selective fire - semiautomatic/full automatic

**RATE OF FIRE—**40 rpm

M2 Practical SS 40 rpm, A 75 rpm, Cyclic 750 to 775 rpm

**MUZZLE VELOCITY—**1970 fps (600 m/s)

**MUZZLE ENERGY—**956 ft/lbs (1296 J)

**SIGHTS—**Open, Ramp-type aperture/blade, Adjustable, graduation marks at 100, 200, 250, and 300 yards

**FEED—**15 or 30 round removable box magazine

**WEIGHTS**

**WEAPON (EMPTY)—**5.31 lbs (2.41 kg)

**WEAPON (LOADED)—**5.92 lbs (2.69 kg) w/15 rd mag

**MAGAZINE (EMPTY)—**15 round 0.19 lb (0.09 kg)

30 round 0.22 lbs (0.10 kg)

**MAGAZINE (LOADED)—**15 round 0.61 lbs (0.28 kg)

30 round 1.06 lbs (0.48 kg)

**SERVICE CARTRIDGE—**M1 Ball 196 gr (12.7 g)

**PROJECTILE—**111 gr (7.2 g)

**LENGTHS**

**WEAPON OVERALL—**35.58 in. (90.4 cm)

**BARREL—**18 in (45.7 cm)

**SIGHT RADIUS—**21.5 in. (54.6 cm) w/rear sight set at 100 yds

*A group of UDT swimmers from Underwater Demolition Team 16 prepare to board their boat prior to going in to an island in the Pacific during World War II. The men are wearing standard jungle fatigues and inflatable canoas/rubber life belts along with M1 steel helmets. The man at the center of the picture has an unloaded M1 carbine slung across his back and is wearing an M1910 pistol belt with one-quart canteen and first aid pouch. In addition he has a pair of binoculars slung at his left side in their leather case. The binoculars indicate that the man is probably an officer and the uniforms and equipment suggest that the UDT men are going in to the island after the actual invasion has taken place. At the bottom left of the photograph can be seen the muzzle and*

PHOTO CREDIT: UDT-SEAL MUSEUM





By the middle of World War II (1943) the average Navy sailor was receiving a limited amount of training in small arms while he attended boot camp as a recruit. Small arms were not a priority in the Navy as the force fought from aboard ship with the U.S. Marines being the primary amphibious ground combat unit. In 1943, when the NCDUs began training at Fort Pierce, Florida, the primary shoulder-fired weapon in the Navy was the bolt-action M1903 Springfield rifle. The semiautomatic M1 Garand was not considered a Navy weapon at that time and all production of the M1 was going to the Army and Marines.

*For the men of the NCDUs and UDTs, it was not considered a mission priority to have the men offensively armed. Little emphasis was given to small arms training in the NCDU curriculum at Fort Pierce. The men who made up the UDT operating platoons were considered to be skilled demolitionists and not people to augment ground troops. Instruction in armed and unarmed combat was given to the UDTs in order that these highly trained men would be able to effectively defend themselves if necessary.*

### M1 (M2) CARBINE

The men who made up the Headquarters Platoon of a UDT were given training in small arms to a much greater extent than the men of the operating platoons. Headquarters personnel were expected to supply boat crews, coxswains, radiomen, and other support to the swimmers who would be doing the actual reconnaissance and demolition swims.

It was towards this end that the men of the Headquarters Platoon received hands-on experience with small arms, primarily the pistol and M1 carbine, as well as gunnery instruction for the .30 and .50 caliber machine guns. If, after the normal eight-week training period, there was a delay in sending the NCDU graduates to Maui for their UDT instruction the men would receive the same classes in small arms as the headquarters personnel.

But for all of their training, the men of the NCDUs and UDTs were still in the military. Common military jobs had to be performed such as guard duty. Because of the highly secret nature of their mission, the men of the NCDUs and UDTs were not able to tell anyone what they did to cause all the explosions heard coming from North Hutchison Island near Fort Pierce. The locals could of

course hear the blasting, but the island was off limits to almost everyone but the NCDU students.

But the ammunition and explosive magazines on North Hutchison Island had to be guarded, and it was the men of the NCDU school who pulled that duty. The same situation was repeated at the UDT training compound on Maui in the Pacific. When necessary, the NCDU and UDT men were normally armed with the M1 Carbine.

The M1 Carbine was designed early in World War II after a directive for its development was put out by the Army Ordnance Board in June 1940. The intent was to develop a shoulder-fired weapon weighing about five pounds and having an effective range of 300 yards. The weapon was intended as a replacement for the service pistol and submachine gun for officers and noncommissioned officers as well as being a supplementary weapon for mortarmen, machine gunners, radiomen, and other similar duty positions.

The US service rifle cartridge (30-06) was far too powerful for as light a weapon as the carbine was supposed to be, and the service pistol cartridge (45 ACP) was unable to reach the range requirement. A special .30



The M2 carbine loaded with a 15 round magazine. The top knob of the small selector lever can be seen at the top of the receiver, above the magazine and just forward of the curved grip of the operating rod.

PHOTO CREDIT: SMITHSONIAN INSTITUTION

**TECHNICAL DATA**—M1918A2 Browning Automatic Rifle

NSN 1005-00-674-1309

**CARTRIDGE**—30-06 (7.62x63mm)

**OPERATION**—Gas

**TYPE OF FIRE**—Full automatic, fast and slow rates

**RATE OF FIRE**—Practical [slow] 40 to 60 rpm, [fast] 120 to 150 rpm, Cyclic [slow] 350 to 450 rpm, [fast] 550 to 650 rpm

**MUZZLE VELOCITY**—2800 fps (853 m/s)

**MUZZLE ENERGY**—2646 ft/lbs (3588 J)

**SIGHTS**—Open, Leaf-type aperture w/round-notch battle sight/blade, Adjustable, battle sight set at 300 yards, leaf graduated 100 to 1500 yards in 100 yard increments,

**FEED**—20 round removable box magazine

**WEIGHTS**

**WEAPON (EMPTY)**—18.96 lbs (8.60 kg) w/bipod

**WEAPON (LOADED)**—20.59 lbs (9.34 kg)w/bipod

Bipod 2.44 lbs (1.11 kg)

**MAGAZINE (EMPTY)**—0.44 lb (0.20 kg)

**MAGAZINE (LOADED)**—1.63 lb (0.74 kg)

**SERVICE CARTRIDGE**—M2 Ball 416 gr (27 g)

**PROJECTILE**—152 gr (9.8 g)

**LENGTHS**

**WEAPON OVERALL**—47.8 in. (121.4 cm)

**BARREL**—24.07 in (61.1 cm)

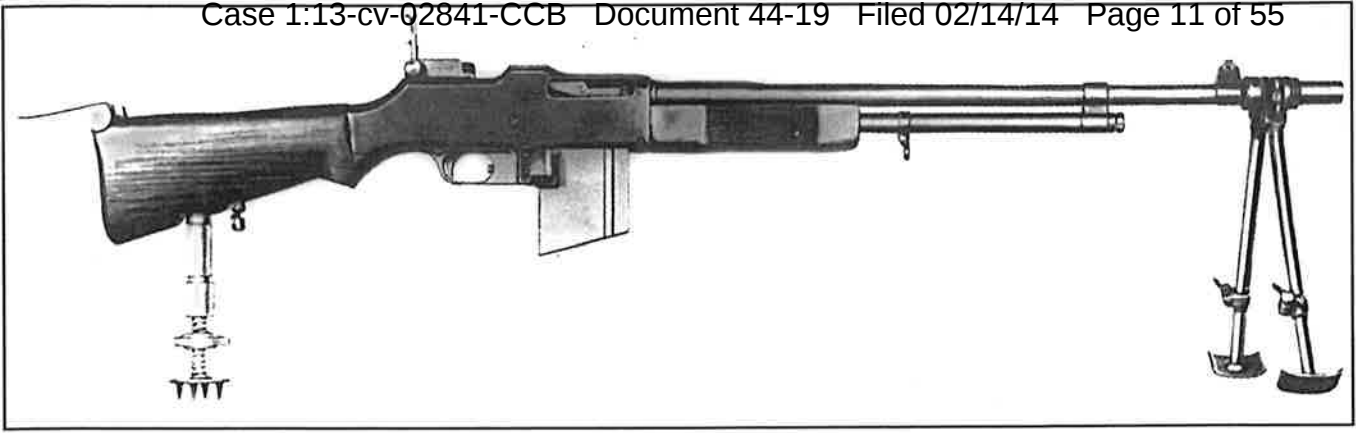
**SIGHT RADIUS**—31.13 in. (79.1 cm)

**“The Browning Automatic Rifle Model 1918A2, or simply BAR, is a very heavy and powerful rifle.”**

*Men on board a Navy ship stand mine watch. The sailor holding the weapon is armed with an M1918A2 Browning Automatic Rifle (BAR) with the bipod removed. The weapon will be used to shoot and detonate mines as they are detected before they can threaten the ship.*

*PHOTO CREDIT: US NAVY*





*A complete M1818A1 Browning Automatic Rifle (BAR). This example is complete with the rear monopod, an item almost always removed by the user in the field.*  
 PHOTO CREDIT: US ARMY

caliber low-powered round was designed specifically for what was then called the "light rifle" trials in 1941. Several arms manufactures submitted prototype weapons chambered for the new round. By the fall of 1941, only sixteen months after the directive had first been issued, a winner of the light rifle trials had been decided on. The Winchester Light Rifle was adopted as the M1 Carbine in October 1941.

As adopted, the M1 Carbine was a small semiautomatic rifle feeding from a fifteen-round magazine. It was this model carbine that was issued to the men of the UDTs as their duties required. Late in 1944, a selective-fire version of the carbine was developed. Issued as the M2 Carbine, the new weapon had a thirty-round magazine available for it that could also be used in the earlier M1 Carbine. As the M2 Carbine became available, it was issued to the UDTs.

**M1918A2 BAR**

The only other shoulder weapon trained with and used in any numbers by the UDTs in World War II was at the opposite end of the small arms scale from the M1 Carbine. The Browning Automatic Rifle Model 1918A2, or simply BAR, is a very heavy and powerful rifle. Normally fired from the prone position with the weapon supported by a bipod, the BAR is capable of good accuracy at a long range. The twenty-round magazine of the BAR limits its capacity for sustained fire somewhat as does its lack of a way to change a hot barrel. But the weapon was a great deal more portable than the contemporary belt-fed automatic weapons of the time.

Instead of being selective-fire, that is firing either semiautomatic or full automatic, the M1918A2 BAR instead had two different rates of fire that could be selected by the operator. The fast rate of fire, around 600 rounds per minute cyclic, could put out a rapid volume of fire in order to engage or suppress an enemy position. The slow rate of fire, about 350 rounds per minute cyclic, allowed for single shots to be easily fired by a trained gunner and has more controllable muzzle climb when fired from the standing position.

In the Navy, the BAR would be used for shore or landing party operations. On board ship, the BAR would

occasionally be found in use to augment a ship's volume of antiaircraft fire. More important to the men of the UDT, the BAR could be used to give a reasonable amount of firepower to small craft such as a rubber boat. The BAR could be fired from such a boat by a single operator while the light machine gun of the time, the Browning M1919A4 would be very clumsy to use and take up a great deal more room.

Used by the UDT in only limited numbers, the BAR saw little if any combat duty with the Teams during



*A technician checks an M1918 Browning Automatic Rifle (BAR) while on board ship in the Pacific during World War II. These early-model BAR's could still be found in Navy arms rooms throughout the war where they were used for ship defense and to arm landing parties. The last weapon on the left is an M1918 BAR with its forearm removed and a pintle adaptor installed. The pintle adaptor would allow the weapon to be placed in any standard machine gun mount on board ship.*  
 PHOTO CREDIT: UDT-SEAL MUSEUM

**TECHNICAL DATA**—AR-15 (Colt Model 601), M-16 (Colt Model 602)  
 NSN 1005-00-983-6877, (M-16) 1005-00-856-6885  
**CARTRIDGE**—.223 Remington (5.56x45mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 950 rpm  
**MUZZLE VELOCITY**—3250 fps (991 m/s)  
**MUZZLE ENERGY**—1313 ft/lbs (1780 J)  
**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters  
**FEED**—20 or 30 round removable box magazines  
**WEIGHTS**  
**WEAPON (EMPTY)**—6.35 lbs (2.88 kg) w/o sling  
**WEAPON (LOADED)**—7.46 lbs (3.38 kg) w/20 rd mag & sling  
 Sling 0.40 lbs (0.18 kg)

**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
 30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)  
 30 round 1.02 lbs (0.46 kg)  
**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)  
**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**  
**WEAPON OVERALL**—38.6 in. (98 cm)  
**BARREL**—20 in (50.8 cm)  
**SIGHT RADIUS**—19.72 in. (50.1 cm)

These weapons are among the first of their kind to be used by the Navy. A noticeable characteristic of the early AR-15/M-16 weapons is the shiny appearance of the chromed bolt carrier, visible through the open ejection port, and the green-colored plastic furniture (stocks). Later versions of the weapon had black plastic furniture and the bolt carrier was parkerized a dull grey.

*A group of SEAL Team Two operators in the early 1960's. They are wearing uniforms that were part of a large open-purchase of commercially-produced equipment that was made to get the newly commissioned SEAL Teams operational as quickly as possible. The groups weapons are early-model Colt AR-15 rifles. The early style, fully chromed bolt carrier is readily visible through the open ejection port of the weapon held by the SEAL at the left of the picture. The smooth right side of the upper receivers show that these weapons do not have the forward bolt assist required by the Army in the later M16A1 rifle. Additionally, these weapons have the first model, stepped-down, double diameter open-prong flash hiders that were part of the early production units in the series. The SEAL at the lower right in the photo is holding the very rare AR-15 carbine with its flash suppressor mounted just ahead of the front sight.*

PHOTO CREDIT: RYAN McCOMBIE COLLECTION



World War II. Photographs of NCDUs at Fort Pierce exist showing at least one man of the six man NCDU armed with a BAR. Training was given on the M1918A2 BAR at Fort Pierce and it is likely that additional training with the weapon was conducted at Maui late in the war. The commander of the UDT school at Maui towards the end of World War II, Commander John T. Koehler, could see the mission of the UDTs expanding inland if the war continued. To account for such a situation, and to expand the capabilities of the UDTs, Commander Koehler added further small arms training and other skills to the UDT training curriculum.

During the Korean War, the land combat application of the UDTs became much more than just a possibility. Guerrilla infiltration and exfiltration, clandestine resupply ops, and behind-the-lines demolition raids all were conducted by the men of the UDT. The M1 and M2 Carbines and BARs again saw duty with the UDTs, only their use was much more serious than simple guard duty. The submachine gun was considered the favorite shoulder weapon, but the carbine, BAR, and even the M1 Garand were seen in UDT hands. Though the UDTs had few small arms of their own, the facilities of a base armory or ship's stores were available to the Teams when necessary.

A watershed event in the weapons of the UDT took place shortly after the commissioning of the SEALs in January 1962. SEAL Team Two on the east coast at Little Creek, Virginia, was faced with the very real possibility of seeing combat operations in Cuba within a short time after its commissioning. Not being satisfied with what was available through Navy supply channels or in the base armory, Lieutenant Roy Boehm, the first officer-in-charge of SEAL Team Two as well as the Team's founder, sought out the best firearms on the market he could then find. Desiring high-firepower, light weight, dependability, and increased lethality over the M1 Carbine, LT. Boehm was highly interested in a very new firearm just available commercially, the AR-15 rifle.

### AR-15 MODEL 601

Early in 1962, LT Boehm and some of his new SEALs traveled to Baltimore, Maryland to visit the Cooper-MacDonald offices. The Cooper-MacDonald firm had been representing the AR-15 rifle to the military for several years. The original manufacturers and developers of the AR-15, the Fairchild Stratos Corporation, had sold the license to produce the ArmaLite AR-15 to the Colt Firearms Corporation in 1959. Though the AR-15 had received praise from many of the people who had fired it, the US Military and especially the Army Ordnance Corps were adamantly not interested.

The Army, then responsible for small arms acquisition for the Air Force and Marines as well, had just adopted the M14 as the new service rifle in May, 1957. Difficulties in production and other delays had kept the M14 from being produced in the quantities needed by the military. It was only in 1961 that productions volume had finally started reaching the numbers needed for full issue. In this atmosphere, the Army Ordnance Corps was very much against any new weapon being even remotely



*On the range at Little Creek in the early 1960's, these SEALs from SEAL Team Two are firing their 01 model AR-15 rifles. The unloaded weapon visible has the first model, stepped-down, double diameter, open-prong flash suppressor. The fairly light color of the handguards of this AR-15 comes from the very early weapons having light green rather than black stocks. The SEAL holding the weapon is wearing faded Marine camouflage fatigues.*

PHOTO CREDIT: RYAN McCOMBIE COLLECTION

considered for adoption. This was particularly true for a weapon that would also add a new caliber of ammunition into the supply system.

The Army had just managed to start coming on line with a new family of weapons, the M14 and the M60 machine gun, that were both chambered for the same 7.62mm NATO round. One of the selling points of the new weapons was that they would eliminate at least one caliber, the .30 Carbine, as well as several weapons, the submachine gun, M1 Carbine, M1 rifle, and BAR. The AR-15 was chambered for the unique .223 Special developed especially for it. In 1959, the new round was renamed the .223 Remington.

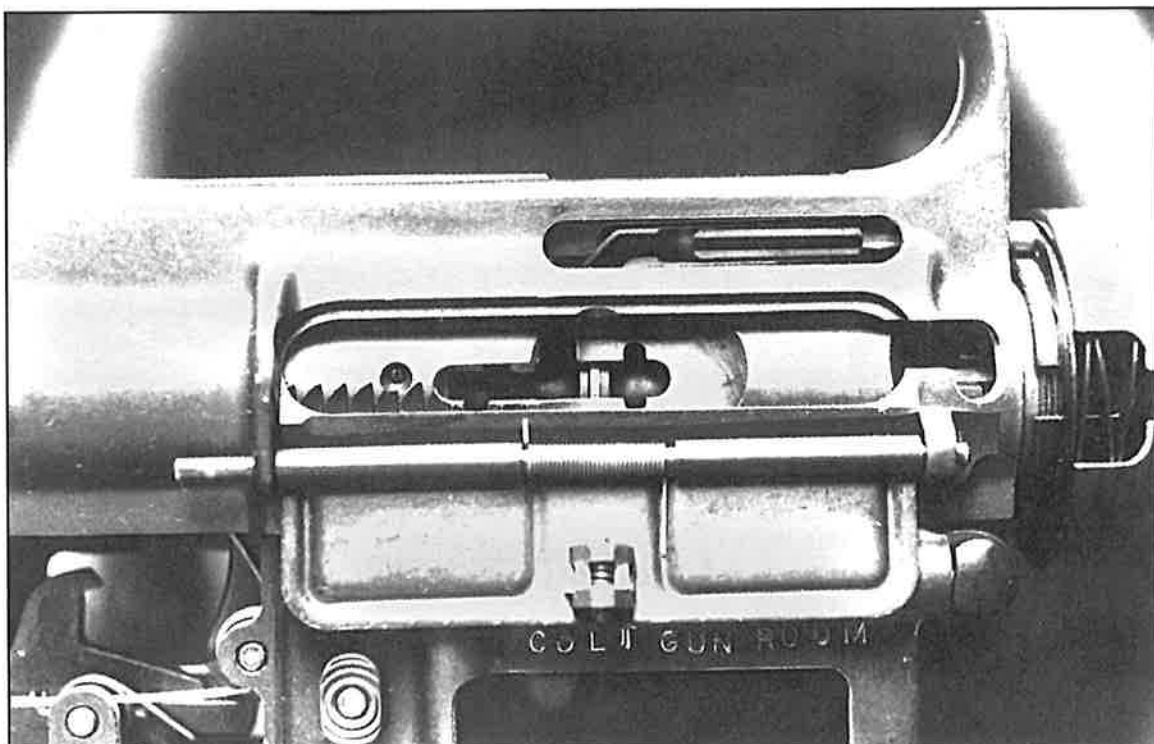
The lightweight .223 bullet did not seem at all a proper projectile for a military weapon according to several prominent people in the Army small arms field. These same people set out to disprove any possible advantages the .223 round might have in the military. The most obvious advantage of the new round was its light weight, at the time two loaded 20- round AR-15 magazines weighed less than a single 20 round- M14 magazine.



*A rare cutaway AR-15 rifle from the Colt Gun Room. This photo shows all of the major internal workings of the AR-15/M16 weapon system. The hammer is forward in the uncocked (fired) position.*  
PHOTO CREDIT: KEVIN DOCKERY/KNIGHT ARMAMENT COMPANY

*A closeup of a cutaway AR-15 rifle from the Colt Gun Room. The gas tube can be seen inside the bolt carrier key in the slot just below the top of the upper receiver. Gasses from the barrel would be guided through the gas tube, down the bolt carrier key, and into the bolt carrier, behind the bolt itself. The pressure of the gases would drive the bolt carrier to the rear with the bolt itself acting as a piston. The cam pin that locks the bolt to the bolt carrier would be guided through a cam track that would force it to rotate and unlock/lock the bolt depending on the direction of travel. Three thin metal discs on the bolt are the bolt rings and they insure a gas-tight seal between the bolt and bolt carrier.*

PHOTO CREDIT: KEVIN DOCKERY/KNIGHT ARMAMENT COMPANY



One problem with the small bore of the AR-15 rifle was strongly pointed out by the Army board examining the weapon. During trials of the AR-15 at the Aberdeen Proving Grounds in 1958, the barrel of one test weapon split while firing during a rain test. Modifications to the barrel were completed by Gene Stoner, the AR-15's designer. But rumors persisted about the danger of the .223 bore retaining water droplets due in part to capillary action.

If the SEALs were to use the new rifle and there was a problem with water retention in the bore, it would be proved useless given the environment of their missions. Not particularly trusting anyone else's tests, Lieutenant Roy Boehm conducted his own examination of the AR-15.

"... Wanting to test the AR-15 himself before making his purchase, Roy took some Team Two men up to Baltimore with him to check out the weapons the dealer had available. Roy and the guys shot the AR and fully tested it. They even tossed the weapon into the surf zone, covering it with sand, silt, and salt water, and it continued operating. With proper care, the AR-15 was able to pass any abuse Roy gave it. Team Two now could issue one of the newest weapons available on the market."

Lt. Boehm found no problem with water retention in the bore of the AR-15. He was in a unique situation where he had to outfit his men and did not have the time to wait for channels. The funds necessary for the equipping of SEAL Team Two were already at Roy Boehm's disposal in the form of open purchases he could make in any market he saw fit. The men of the SEAL Team quickly agreed with "The Boss's" decision.

"The best package of firepower and weight we had were the new AR-15 rifles. This was several years before the Army was to adopt the AR-15 as the M-16, even in limited numbers. But Roy had used his open purchase system and gotten us 66 brand new AR-15's fresh from the Colt factory.

Roy had ordered 136 of the new AR-15 rifles, the selective fire models [Colt Model 601] with green stocks. Half of the weapons were sent to Team One along with instructions, magazines, and spare parts."

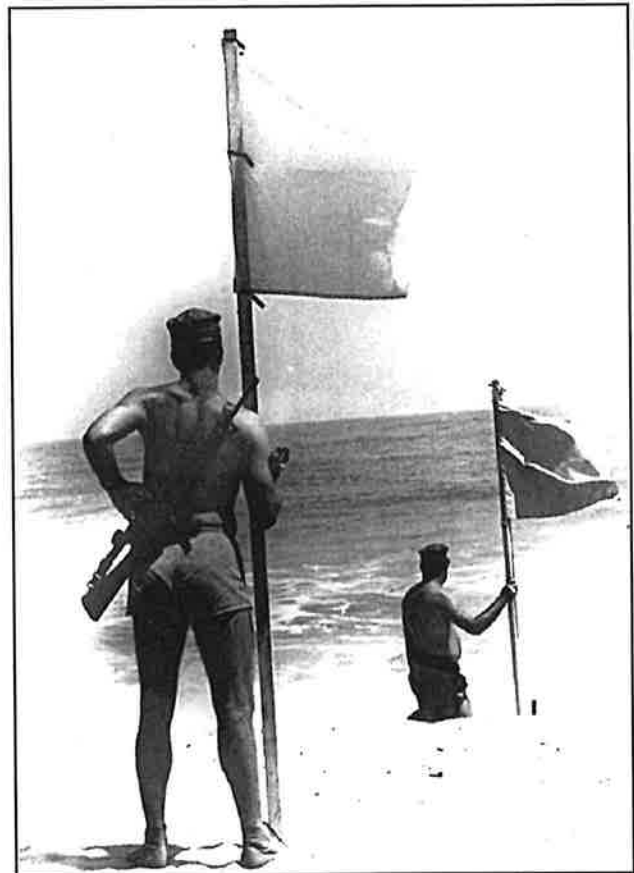
Shortly after the new weapon's arrival, the situation in Cuba began heating up. It looked as if the AR-15 would get combat tested on the beaches of that Caribbean island.

"As the men came in, we issued what we had. Watches, pistols, and other gear was given out. Then when Cuba calmed down, the additional men went back to their parent units, and a lot of our gear went with them. One of the items we had before any one else in the Navy were the AR-15 rifles ... Half of the weapons went to the West coast and SEAL Team ONE with the remainder staying with us. Those were the first rifles of

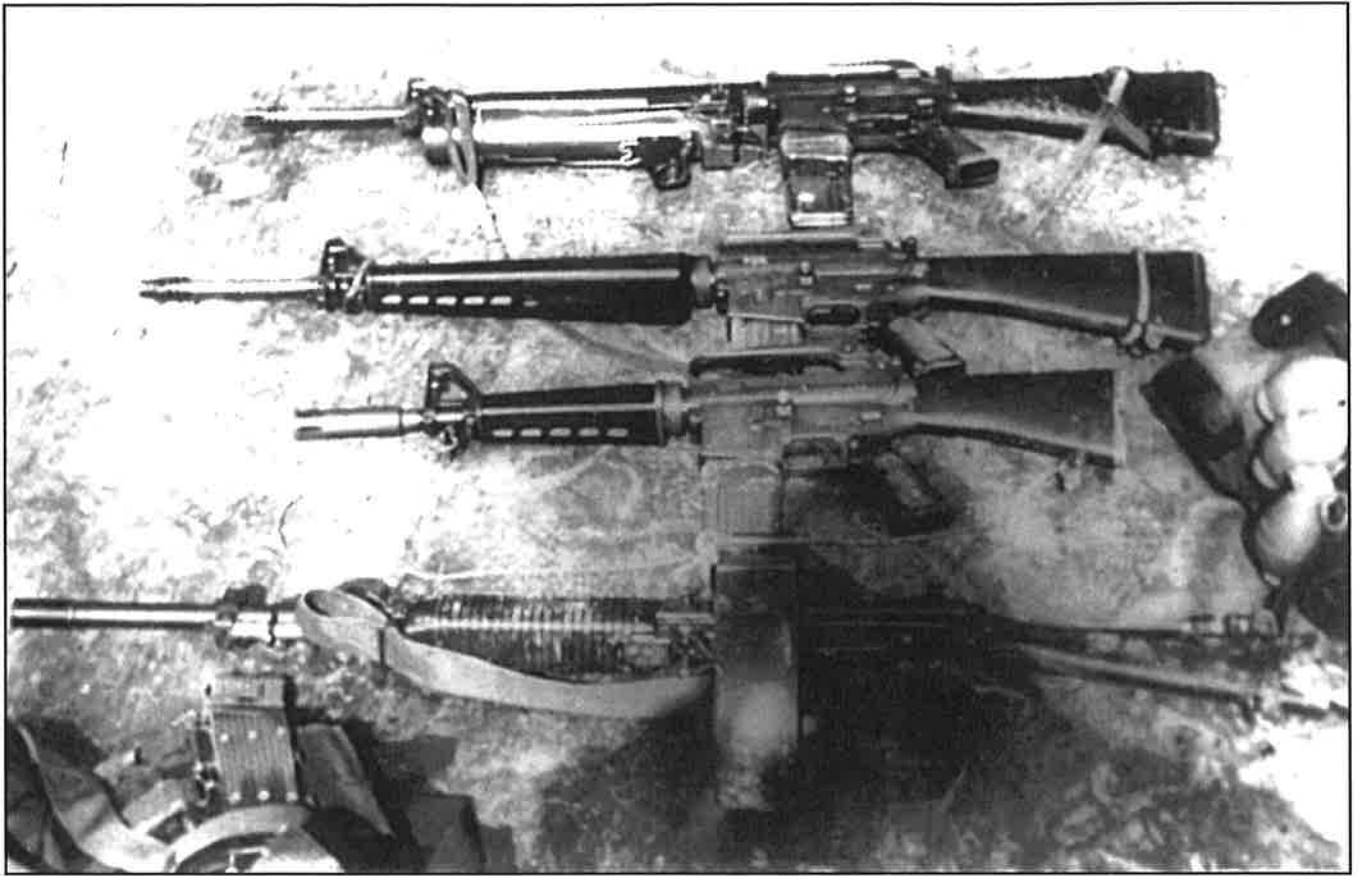
their kind in the Navy and were later adopted by the military as the M-16. We had them first because we needed them."

The new weapons were well and enthusiastically received by the SEALs. For the first time, a light weight, highly-lethal, selective fire weapon was available. Though the M2 Carbine had been both light weight and capable of automatic fire, the round it fired was considered underpowered and had proved itself to have less than ideal stopping power. In defense of the Carbine, it must be remembered that the weapon was designed to be a replacement for the pistol as a secondary arm generally for support troops.

Though the M-14 was the intended standard issue shoulder weapon of the early 1960's, it was considered too large and ungainly for use by the SEALs who might easily have to transport the weapon underwater. Another factor in favor of the AR-15 was its intentional design for controlled automatic fire. The M-14 could have a selector switch easily installed, but the weapon is built along traditional lines. The recoil of automatic fire in the M-14 violently pushes the muzzle up and to the right, especially when fired from the shoulder.



*A pair of UDT operators set up flags to line up swimmers during a beach survey in Vietnam. The UDT man closest to the camera has a Colt Model 01 AR-15 slung diagonally across his back. His partner closer to the water is apparently unarmed except for the Mark 2 Ka-Bar at his right hip.  
PHOTO CREDIT: UDT-SEAL MUSEUM*



A selection of SEAL shoulder weapons in Vietnam circa late 1967-68. The bottom weapon is a Stoner 63A light machine gun fitted with a left-hand feed mechanism and a 150 round aluminum belt drum. Over the muzzle of the Stoner is a black plastic cap developed at China Lake to help keep the barrels of M16 and Stoner weapons clean and clear of mud. The caps can be easily fired through with no damage to the weapon. Second from the bottom is a Colt Model 07 submachine gun loaded with a 20 round magazine and having the sliding buttstock in the forward (collapsed) position. This specimen has been fitted with a 2nd model flash/noise suppressor on its muzzle. Second from the top is a Colt M16-series rifle with a 2nd type open-prong, conical flash suppressor on the muzzle. The weapon at the top is a M16-series weapon also with a 2nd model flash suppressor and a 40mm XM148 grenade launcher mounted underneath the barrel. The curved cocking lever for the XM148 can be seen just ahead of the magazine in the rifle. This rifle is loaded with two butt-taped 20 round magazines. The bottom magazine is loaded with tracer ammunition (not identifiable in this black-and-white illustration). On the right side of the photo is an unusual set of leather and canvas field gear with three M26 fragmentation grenades attached to it.

PHOTO CREDIT: US NAVY



This SEAL is wearing the so-called black pajama tops that were very popular with some members of the Teams in Vietnam. He is armed with an M16A1 rifle loaded with a 20 round magazine. His web gear is mostly M1956 pattern Load Carrying Equipment with several universal small arms ammunition cases on his belt. A number of M26 fragmentation grenades are secured to the mounting straps on the outside of the ammunition cases. At his left shoulder, this SEAL has secured a Mark 2 Ka-Bar with a painted-over Mark 13 day/night flare taped to the scabbard. Slipped through a loop at his right shoulder is an M18 colored smoke grenade.

PHOTO CREDIT: FRANK THORNTON COLLECTION



The AR-15 has the stock in line with the barrel of the weapon. This causes the AR-15 to have less tendency to climb up and right when fired on automatic, though the weapon still takes a good deal of training to properly control. The training is considered very worthwhile as full automatic fire is very much an advantage for sudden close-in fire fights or the overwhelming fire needed for an ambush. The SEALs liked the fact that the AR-15 could be fired on full automatic with just the flip of a selector switch. Sometimes, the SEALs liked full automatic fire a little too much. The first range practice with the new AR-15s for SEAL Team Two took place at a Marine range since they had the proper firing facilities and the fledgling SEAL Teams did not.

“As we were getting down into the firing position the [Marine] Lieutenant sounded off. “There will be no automatic fire on this range,” he said, “Everything will be semiautomatic fire only.” That was a bit of a mistake on his part.

“Lock and load one magazine. Ready on the left? Ready on the right? Ready on the firing line! Shooters, you may commence fire!” We all just raised our heads a little bit and looked up and down at each other. At the command “Commence fire” all of us switched over to automatic and let that magazine rip. The Lieutenant immediately confiscated all of the weapons and threw us off the base.”

One problem that the SEALs did not have was with the lethality of the AR-15. Being the early 601 models, the AR-15s purchased directly by the Teams had barrels rifled with six grooves having a right-hand twist rate of one turn in fourteen inches. This rifling twist rate was the firearms industry standard when Gene Stoner had first designed the AR-15. Since the 55-grain .223 bullet was the same weight as commercial .22 bullets fired in high-velocity center fire rifles, the commercial twist rate was thought to be correct to stabilize the .223 bullet for accuracy.

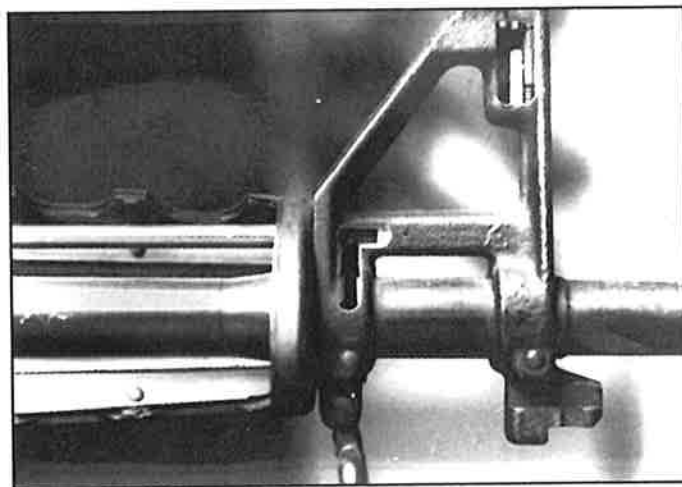
The problem was that the commercial 55-grain bullets then in use were shorter and blunter than the full jacketed projectile designed for the .223 Remington military round. Standard M193 ball ammunition, when fired from the early AR-15, launched a projectile that was just barely stable in flight. When the bullet struck a target, or entered flesh, it began tumbling wildly, expending its energy rapidly. This rapid energy release resulted in the near-explosive wounds coming out of Vietnam in mid-1962.

Almost 1,000 AR-15 rifles, all early model 601s, and over half a million rounds of ammunition had been purchased by the Defense Department in late December 1961. These weapons and ammunition were part of Project AGILE being conducted by the Advanced Research Projects Agency (ARPA). The project intended, in part, to examine new weapons for use by “the small-stature... Vietnamese soldier and to evaluate the weapon under actual combat conditions.”

Project AGILE resulted in the first operational tests of the AR-15 in combat being conducted by selected units of



*These two SEALs crouch down and watch a helicopter come into their area during a training operation. The SEAL to the left is holding an M16A1 rifle with a plastic mud cap over the flash suppressor. The rifle is loaded with a pair of butt-taped 20 round magazines. He is wearing the early model Type 1 Rifleman's buoyant ammunition carrying vest.  
PHOTO CREDIT: UDT-SEAL MUSEUM*



*A cutaway view of the front sight assembly of the M16A1 rifle. The open port that directs the propellant gases from the barrel into the gas tube can be seen just above the sling swivel and in front of the handguard mount. At the upper right portion of the sight assembly can be seen the threaded front sight post and the spring-loaded detent that helps hold it in place. The aluminum reflector that helps keep the handguards cool can be seen riveted to the inside of the left-side handguard.*

*PHOTO CREDIT: KEVIN DOCKERY/KNIGHT ARMAMENT COMPANY*



*The author firing an M16A1 rifle with a Mark 2 Blast Suppressor mounted on the muzzle. The weapon is firing a short burst on full automatic, two ejected cartridge cases visible as the elongated blurs above the firer's left hand and the weapon's front sight. It is interesting to note the lack of muzzle climb on the weapon, even when fired on full automatic. This lack of rise is a by-product of having the extra weight of the suppressor on the muzzle.*  
PHOTO CREDIT: KEVIN DOCKERY

**TECHNICAL DATA**—M16E1 (M16A1) (Colt Model 603)  
NSN 1005-00-939-0584 (M16A1) 1005-00-073-9421  
**CARTRIDGE**—223 Remington (5.56x45mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 800 rpm  
**MUZZLE VELOCITY**—3250 fps (991 m/s)  
**MUZZLE ENERGY**—1313 ft/lbs (1780 J)  
**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters  
**FEED**—20 or 30 round removable box magazines  
**WEIGHTS**  
**WEAPON (EMPTY)**—6.5 lbs (2.95 kg)  
**WEAPON (LOADED)**—7.61 lbs (3.45 kg) w/sling & 20 rd mag  
Sling 0.40 lbs (0.18 kg)  
**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)  
30 round 1.02 lbs (0.46 kg)  
**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)  
**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**

**WEAPON OVERALL**—39 in. (99.1 cm)  
**BARREL**—20 in (50.8 cm) w/o flash suppressor  
21 in (53.3 cm) w/flash suppressor  
**SIGHT RADIUS**—19.75 in. (50.2 cm)  
Modifications from the original AR-15 (M-16 rifle for the A1 version included:  
Chrome plating the chamber and later the entire bore  
Addition of a forward bolt-assist for forcing the bolt closed  
A heavier recoil buffer to slow the cyclic firing rate, this buffer was quickly retrofitted to all M16 rifles  
A buttstock compartment for holding a set of cleaning gear  
A closed "bird-cage" flash suppressor  
A wider charging handle  
Index lines (windage) on the rear sight  
A 30 round magazine was introduced to replace the 20 shot version used in the field. This size magazine had been available since the earliest Colt manufactured weapons but had been available on a very limited basis. Prior to this (about 1968) only the Air Force had been issuing 30 round magazines as a normal item. These larger magazines were a valued "scrounge" item among the SEALs. 20 round magazines remained the norm throughout the Vietnam war.

the South Vietnamese Army supported by American advisors. The tests ran from 1 February to 15 July, 1962. Besides being well-liked by the Vietnamese troops for its size and light recoil, the AR-15 had shown itself to be a very lethal combat weapon. Reports told of almost incredible wounds being caused by single .223 bullets. Amputations of limbs, massive body wounds, and decapitations had all been caused by the very high-velocity AR-15 projectiles.

But there was a drawback that came with the near-instability of the AR-15 bullets being fired in 1-in-14 twist barrels. When the ambient temperature dropped below freezing, the air density changed. In cold air, the AR-15 bullets became unstabilized and accuracy dropped off badly. In independent, unbiased tests run by the National Rifle Association, it was found to be impossible to keep ten rounds on a 3 foot by 4 foot target at 300 meters range with the air temperature below 32 degrees Fahrenheit.

Since SEAL Teams Two did few operations in a cold environment during its first years, the drawback of the AR-15s rifling was not noticed as a problem. By July, 1963, orders had gone out from the Department of Defense that no further AR-15s would be accepted with the old rifling twist rate. The new twist rate, which stabilized bullets in below-freezing temperatures, was 1 turn in 12 inches. All subsequent AR-15s, M-16s, and M16A1s were all made with the 1-in-12 rifling twist rate, including those used by the SEALs.

A SEAL Team Two MTT (Mobile Training Team) 10-62 went to Vietnam to continue training the Beit Hai commandos of the South Vietnamese Navy. The training program had been begun by an MTT primarily from SEAL Team One earlier in the year. Along with "3 to 4 tons" of other equipment, the Team Two MTT took along with them a number of the Team's AR-15s. At the time the AR-15 and its use by the SEAL Teams was still classified. Again, the men of the South Vietnamese military greatly liked the AR-15. In fact the MTT soon ran out of the .223 ammunition they had brought along with them. At the time, the .223 military ball was loaded by Remington Arms and came packaged in a white 20-round cardboard box. As the ammunition was gone, the MTT turned to training the Vietnamese with available weapons including the M1 Garand, M2 Carbine, and BAR. It would be some years later that .223 ammunition would be available in huge numbers in Southeast Asia.

In June, 1963, President John F. Kennedy came to Norfolk and visited SEAL Team Two. While on his tour, President Kennedy saw a number of SEALs who were demonstrating the equipment they used. One man, GMG2 A.D. Clark was holding one of the Team's AR-15 rifles. When President Kennedy approached Clark he asked, "What have you got there, son?"

"This sir," answered Clark, "is the AR-15 rifle, made by ArmaLite."

At that point, one of the officers escorting President Kennedy, an Army Colonel, interrupted, commenting about how the AR-15 was only a limited duty, special-purpose weapon as compared to the issue M-14.

The President cut off the Colonel with a curt, "I am

speaking to this gentleman here," and he resumed his conversation with Clark.

That action probably did as much to endear the President with the men of the SEALs as did his signing their commissioning orders only sixteen months before. But A.D. Clark continued with his praise of the AR-15 stating that it was exactly the weapon the SEALs wanted and no other. In a way it is very proper that A.D. Clark is the SEAL who spoke to the President in regard to the AR-15 rifle. Clark had been one of the SEALs who had accompanied Lt. Roy Boehm the year before when he had gone to Cooper-Macdonald in Baltimore to first test the AR-15.

### M16 MODEL 602

By 1965, even the UDTs had at least some AR-15s in their inventory for issue to operating platoons. By this time, the AR-15 had been purchased in some numbers by



Two SEALs during a training exercise. The front SEAL is carrying an M16A1 rifle loaded with a 30-round magazine and with the flash suppressor replaced with a China Lake blank adaptor. He is wearing a later-model SRU-21/P survival vest over his camouflage fatigues. The rear SEAL is armed with one of the XM177 series weapons also loaded with a 30 round magazine. He is carrying an AN/PRC-77 radio on his back with the coiled feed wire of the handset down over his right shoulder. To minimize his silhouette, the radioman has the short antenna to his radio folded down over his left shoulder and secured to his web gear.

PHOTO CREDIT: US NAVY

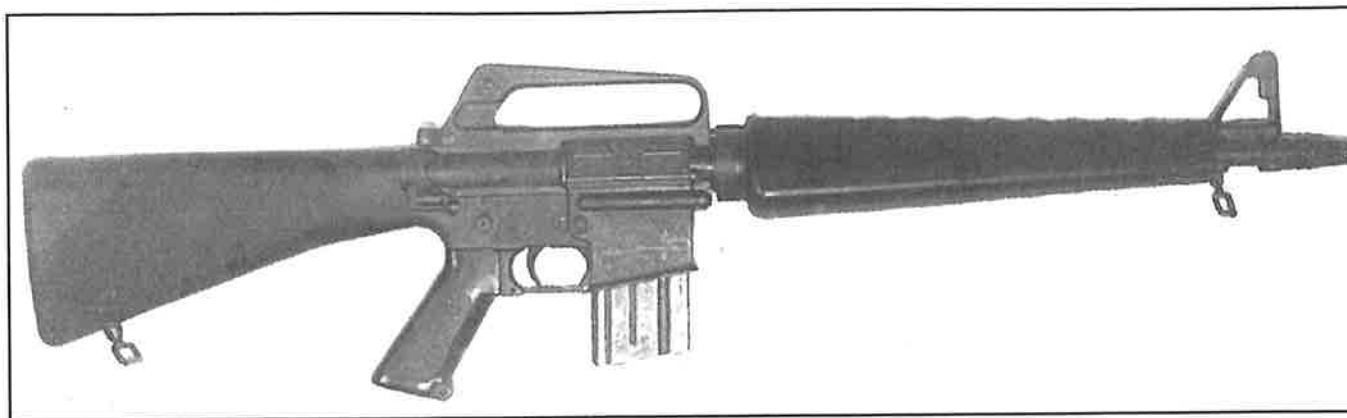
**TECHNICAL DATA**—CAR-15 Carbine (Colt Model 05)  
**CARTRIDGE**—.223 Remington (5.56x45mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 950 rpm  
**MUZZLE VELOCITY**—3050 fps (930 m/s)  
**MUZZLE ENERGY**—1157 ft/lbs (1569 J)  
**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters  
**FEED**—20 or 30 round removable box magazines  
**WEIGHTS**  
**WEAPON (EMPTY)**—6.0 lbs (2.72 kg)  
**WEAPON (LOADED)**—6.71 lbs (3.04 kg) w/20 rd mag w/o sling  
 Sling 0.40 lbs (0.18 kg)  
**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
 30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)  
 30 round 1.02 lbs (0.46 kg)  
**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)  
**PROJECTILE**—56 gr (3.6 g)  
**LENGTHS**  
**WEAPON OVERALL**—33.6 in. (85.3 cm)  
**BARREL**—15 in (38.1 cm)  
**SIGHT RADIUS**—19.72 in. (50.1 cm)

**“The CAR-15, for Colt Automatic Rifle, carbine was the same as the AR-15 rifle except that the barrel had been cut off to just in front of the front sight and the flash suppressor reinstalled.”**



*These SEALs are demonstrating techniques used when landing on a beach with a Combat Rubber Raiding Craft (CRRC). All three of the SEALs are wearing the same type of camouflage uniforms and floppy bush hats. The two visible weapons are M16A1 rifles with the crouching SEAL having loaded his weapon with two butt-taped 30 round magazines. The standing SEAL, with his weapon in his left hand, has his M16A1 loaded with a single 30 round magazine. The bottom of the magazine has been wrapped with tape for additional strength and a small tape tab extends from the bottom of the magazine to assist in drawing it from an ammunition pouch. All of the load bearing gear worn by these SEALs is of the nylon ALICE (All-purpose Lightweight Individual Carrying Equipment) type adopted by the Army in 1974.*

PHOTO CREDIT: UDT-SEAL MUSEUM



*A right-side view of the Colt Model 05 carbine. The weapon is an 01 model AR-15 with its barrel cut back to the front sight assembly. This specimen has the 2nd type conical, open-prong flash suppressor.*  
 PHOTO CREDIT: KEVIN DOCKERY

the Air Force as the M16 rifle. The Navy had purchased an additional 240 M16 rifles, announcing the contract in October, 1964. In the week of 18-22 January 1965, Colt received a priority 04 MIPR from the Navy for an additional 50 M16 rifles. At the time, rifles were shipped with seven 20-round magazines, spare parts and additional materials were shipped separately. The Army was also purchasing thousands of XM16E1s at this time, primarily for use with US Army maneuver battalions in Vietnam.

The AR-15 had been advertised by Colt as an almost self-cleaning weapon needing only "an occasional simple cleaning... [to] keep the weapon functioning indefinitely. Working parts can be cleaned by wiping with a cloth." But in the SEAL Teams and UDTs, maintenance procedures take on an importance close to that of a religion. This attitude stems from the Teams working underwater with Underwater Breathing Apparatus (UBAs). If a diver does not take meticulous care of his UBA, it will fail on him at some point, either killing him outright or causing him to drown. With something like that for a background, it is easy to see how the SEALs and UDTs keep their mania for maintenance.

In the first edition of the UDT Handbook (1965) are listed the cleaning instructions for the AR-15 (M-16) that state; "...all excess carbon [be] simply wiped off the working parts." But with the Team's tradition for complete maintenance, weapons, including the AR-15 were cleaned thoroughly and completely. Because of this situation, the SEALs did not suffer the large numbers of malfunctions experienced by Army personnel when the rifle was fielded in Vietnam.

#### **CAR-15 CARBINE MODEL 605**

Several variations of the AR-15 were also obtained by the SEALs in early 1962 in addition to a number of accessories. Very early in 1962, SEAL Team Two had at least one of the rare AR-15 carbines, the Model 605. The CAR-15, for Colt Automatic Rifle, carbine was the same as the AR-15 rifle except that the barrel had been cut off to just in front of the front sight and the flash suppressor

reinstalled. It is possible that only one of the CAR-15 carbines was ever procured as the weapon was not very successful and very few were manufactured by Colt. The AR-15 carbine was offered by Colt for situations "where stowage is a problem," which would of course hold appeal to the size-conscious SEALs. Though it shows up in a number of photographs of field exercises conducted by Team Two in 1962 and in a 1964 weapons display, the AR-15 carbine was little used and probably never fielded in Vietnam.

Several accessories for the AR-15 were experimented with by the SEALs prior to the Vietnam War. At least one removable telescopic sight was tried out by SEAL Team Two. The telescopic sight was a Delft Optics 3x25 power telescope (weight 0.875 lbs. [0.397 kg]) adapted from the earlier AR-10 rifle. Though it could be easily mounted and dismounted from the carrying handle of the AR-15, the early scope sight simply would not remain zeroed to the weapon. When mounted on the rifle, hand pressure was enough to push the sight out of alignment with the rifle. Other accessories obtained included AR-15 bayonets, clip-on bipods, and a small number of early model 30-round magazines.

#### **XM16E1 (M16A1) MODEL 603**

In 1965, the Army had begun receiving quantities of the XM16E1 rifle and several elite Special Forces and Airborne units were equipped with the new weapon. For Army use a number of modifications had been done to the original Model 601 AR-15. Most of these modifications had also been included in the Air Force issue M16. For the Army XM16E1, the major visible change was the addition of the forward bolt assist, a bolt closure mechanism on the upper receiver of the rifle that allowed the bolt to be pushed forward. To accommodate the new changes, Colt manufactured the M16 and the XM16E1 as their Models 602 and 603 respectively.

In the Spring of 1965, the SEALs were given the opportunity to employ their AR-15s in combat. By April, the rebels in the Dominican Republic had escalated the situation to a crisis point. U.S. Forces were finally called



A group of SEALs establish perimeter security while demonstrating a desert mission. The men are all armed with M14 rifles, preferred for the desert due to their longer effective range than the standard M16 series weapons. The SEAL to the left rear in the photo is removing a Compact Laser Designator (CLD) from the pack of the SEAL kneeling in front of him. The CLD will be used to illuminate or "paint" a target with laser light for an incoming air strike. These men are all wearing the most recent pattern desert camouflage uniforms.  
PHOTO CREDIT: KEVIN DOCKERY



Wearing first-pattern desert camouflage uniforms, these SEALs are patrolling near Kuwait City during Desert Storm. The SEAL in the passenger seat is holding on to his M14 rifle, used in place of the M16 due to its greater range. The action of the M14 has been wrapped in a rag to keep the constant desert dust and sand from the action of the weapon. The large pouch hanging at the SEAL's hip is the M17A1 protective mask carrier with spatters of light paint on the cover in order to help camouflage it.  
PHOTO CREDIT: US NAVY

**TECHNICAL DATA—M14**

NSN 6D1005-00-770-3559

**CARTRIDGE**—7.62mm Nato (7.61x51mm)

**OPERATION**—Gas

**TYPE OF FIRE**—Selective - semiautomatic/full automatic

**RATE OF FIRE**—Practical SS 20 to 40 rpm, A 40 to 60 rpm, Cyclic 700 to 750 rpm

**MUZZLE VELOCITY**—2800 fps (853 m/s)

**MUZZLE ENERGY**—2593 ft/lbs (3516 J)

**SIGHTS**—Open, Aperture/blade,

Adjustable 100 to 1200 meters in 100 meter graduations

**FEED**—20 round removable box magazine

**WEIGHTS**

**WEAPON (EMPTY)**—8.6 lbs (3.90 kg)

**WEAPON (LOADED)**—11.21 lbs (5.08 kg) w/sling, cleaning kit (in buttstock), & 20 rd mag

Sling 0.31 lbs (0.14 kg)

Cleaning kit/combination tool .67 lbs (0.30 kg)

**MAGAZINE (EMPTY)**—0.51 lb (0.23 kg)

**MAGAZINE (LOADED)**—1.63 lb (0.74 kg)

**SERVICE CARTRIDGE**—M80 Ball 393 gr (25.5 g)

**PROJECTILE**—149 gr (9.7 g)

**LENGTHS**

**WEAPON OVERALL**—44.33 in. (112.6 cm)

**BARREL**—22 in (55.9 cm)

**SIGHT RADIUS**—26.69 in. (67.8 cm)

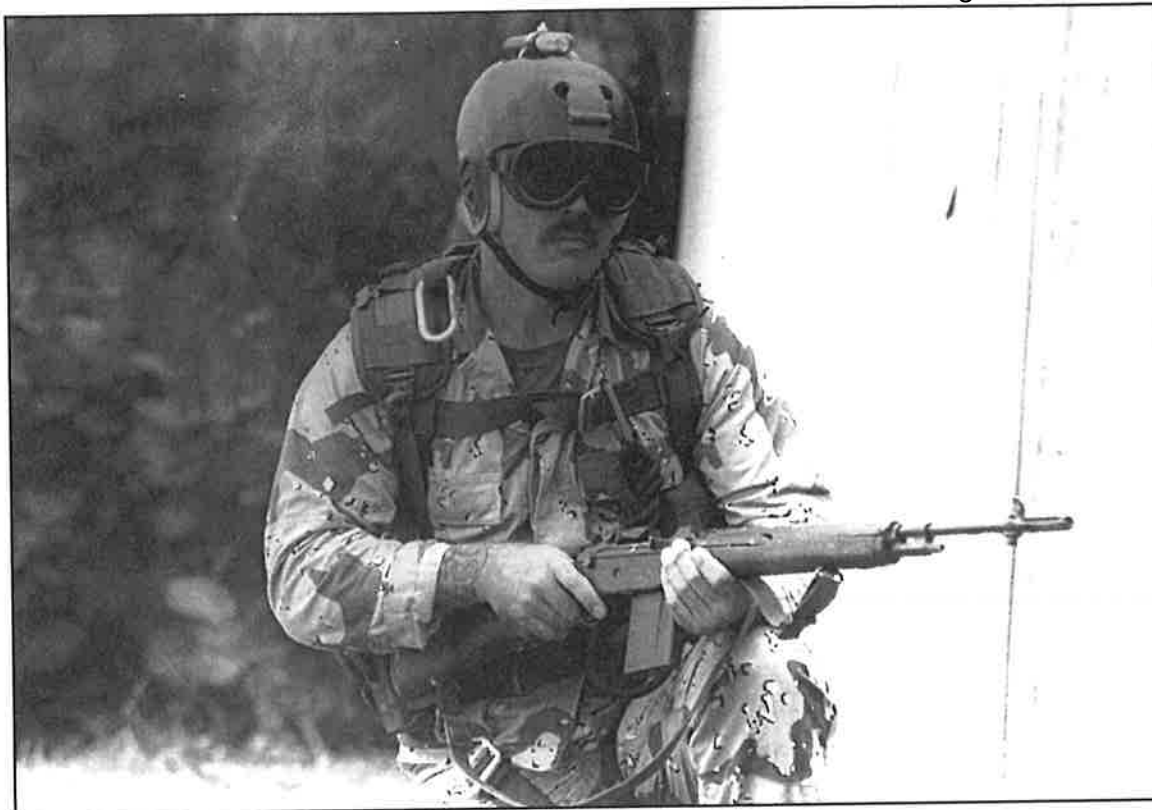
**TECHNICAL DATA—M14 w/folding stock**

**MAGAZINE (EMPTY)**—0.51 lb (0.23 kg)

**MAGAZINE (LOADED)**—1.63 lb (0.74 kg)

**SERVICE CARTRIDGE**—M80 Ball 393 gr (25.5 g)

**PROJECTILE**—149 gr (9.7 g)



*A SEAL equipped for a rescue in a desert environment. He is carrying an M14 rifle, used for its greater effective range in the open spaces of the desert. The dark goggles he is wearing will protect his eyes from the glare of the sun as well as the sudden flash of a flash-bang (stun) grenade. Taped to the top of his PRO-TEC helmet is a strobe light that can be used to identify the wearer to friendly overhead aircraft. For pickup, the modified parachute harness this SEAL is wearing over his desert-camouflage uniform is an integral part of the Special Purpose Insertion and Extraction (SPIE) rig. For a SPIE extraction, a line lowered down from a helicopter would be attached to the carabiner seen just forward of this SEAL's right shoulder. Just above the trigger finger can be seen the cylindrical selector lock that prevents this particular M14 from firing on full automatic.*  
 PHOTO CREDIT: KEVIN DOCKERY

in to protect US interests and help control the fighting in the streets. Two platoons of SEALs from Team Two arrived in the Dominican Republic complete with their equipment, including the AR-15 rifle. At the same time, components of the US Army's 82nd Airborne Division were also conducting operations on the island. The airborne troops were armed with their new XM16E1s.

One drawback of the AR-15 stood out very quickly for the SEALs after their arrival. As the existence of the SEALs was still considered classified at the time and their presence in the Dominican Republic something the military command wanted to keep secret, the SEALs moved about in civilian clothes for at least part of their duties.

But the SEALs were carrying their AR-15 rifles, a very distinctive appearing weapon to say the least. In this instance, the SEAL's penchant for camouflage didn't quite work out.

Combat employment of the AR-15 against the rebels in the Dominican Republic proved out the AR-15 to a number of SEALs' satisfaction. Incidents of combat for the SEALs was limited during the crisis, but few complaints were voiced against the new rifle.

In addition to the AR-15, the SEALs had at least one additional type of rifle with them during their

deployment. Having been issued one of the new AN/PVS-2 starlight scopes for night work, the SEALs mounted the device on an M14 rifle. The power and range of the 7.62mm bullet fired by the M14 proved itself very effective, especially against snipers. Though heavy in comparison to the AR-15, the M14 had a good deal of appeal due to the added range it gave the SEALs. In one instance, the M14 - AN/PVS-2 combination was able to provide security against sniper activity along a beach area at night, something no other weapon system available at the time could have done as well.

### M14

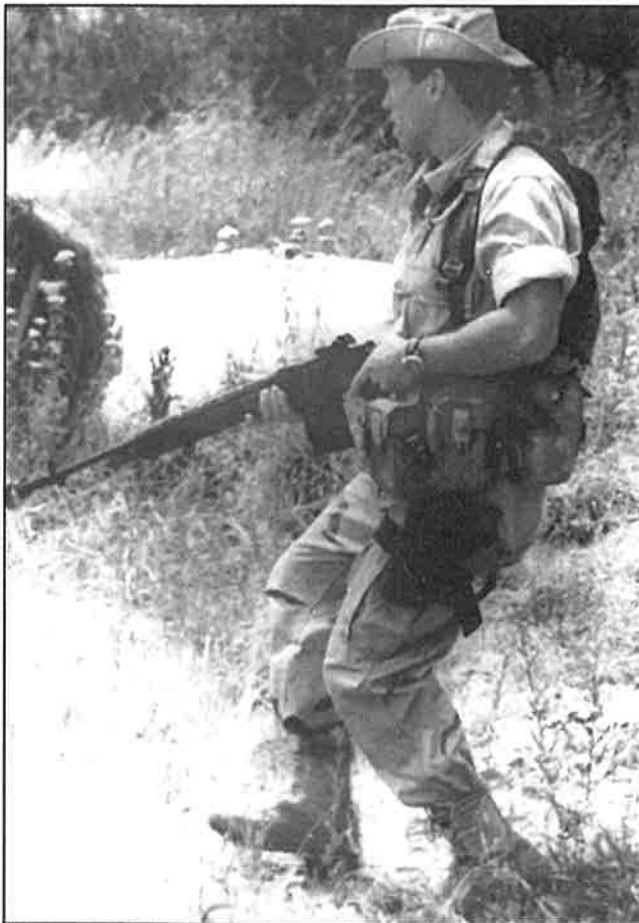
The M14 was the last "full-sized" rifle to reach standard-issue status with the US military. An improved version of the M1 Garand, the M14 is chambered for the 7.62mm NATO round. The 7.62mm NATO ammunition, also identified as the 7.62x51mm or .308 Winchester (civilian), came out of the old school of thought as to what constituted an ideal battle rifle. Old-school opinion held that a military rifle must be effective at what we now consider a very long range. One thousand yards would only be considered a medium long range to earlier military planners, even though a soldier who could effectively use his rifle at that range was very rare.

Modifications to the gas system, a provision for full-



*This SEAL takes a break during a demonstration at the UDT-SEAL Museum in Fort Pierce, Florida. He is wearing the first pattern desert camouflage Battle Dress Uniform (BDUs) as well as a set of nylon web gear (ALICE). He has two LC-2 canteen carriers on his belt on either side of his combat field pack. His weapon is an M14 rifle with the bolt locked in the open position.*

PHOTO CREDIT: KEVIN DOCKERY



*This SEAL operates as part of a patrol during a demonstration. He is wearing the most recent pattern of desert camouflage BDUs. His nylon web gear is the 1974 pattern All Purpose Lightweight Individual Carrying Equipment (ALICE) with several small arms ammunition cases at the side and front of his belt and an LC-2 canteen cover with its 1-quart plastic canteen at the rear of his left hip. The weapon this SEAL is armed with is the standard M14 rifle, preferred for the desert environment due to its greater range over that of the M16 series. The curved attachment on the muzzle of this M14 is a late production M12 blank firing attachment that allows the weapon to operate with blank ammunition. A low-slung holster on his left hip and the way he is carrying his M14 indicate that this SEAL is left-handed.*

PHOTO CREDIT: KEVIN DOCKERY



A group of SEALs awaiting their turn in a demonstration of SEAL abilities. They are all wearing the latest pattern of desert camouflage Battle Dress Uniforms (BDUs) as well as a mix of different types of load bearing equipment. The SEALs at the center and left of the photograph are both armed with M14 rifles fitted with late-pattern M12 blank firing attachments. The SEAL at the left is wearing a set of chest pouches for 20 round M14 magazines in addition to his regular web gear. The SEAL at the far right is armed with an M60E3 light machine gun, a belt of ammunition for which can be seen just above his left forearm.

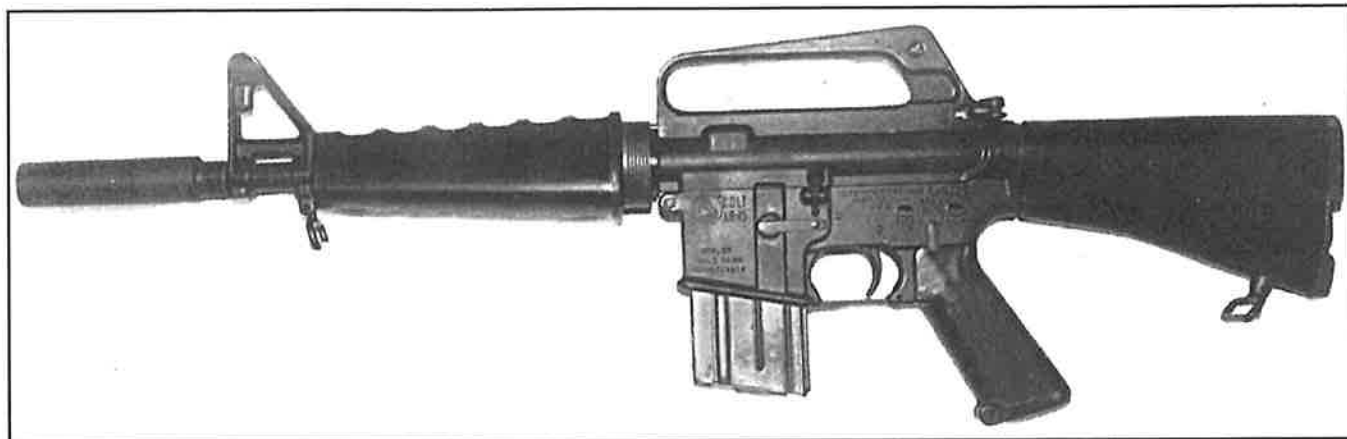
PHOTO CREDIT: KEVIN DOCKERY



At a demonstration of SEAL abilities, this operator is walking across a beach equipped for winter warfare. He is wearing a white camouflage shell over his uniform, complete with hood, gloves, and cover for his pack. Strapped to the sides of his pack are aluminum-framed snowshoes. He is also wearing dark goggles to protect his eyes from the cold and glare off the snow and ice. His weapon is a folding-stock M14A1, unique to the SEALs. The stock on this particular weapon has been partially camouflaged with white tape.

PHOTO CREDIT: KEVIN DOCKERY





A left-side view of the Colt Model 07 CAR-15 submachine gun. The weapon is loaded with a 20 round magazine and the sliding buttstock is in its fully-forward position. The selector lever, directly above the pistol grip, is set to the semiautomatic fire position. This specimen has the longer, second type noise/flash suppressor.

PHOTO CREDIT: KEVIN DOCKERY

**TECHNICAL DATA**—CAR-15 Submachinegun (Colt Model 07)

**CARTRIDGE**— .223 Remington (5.56x45mm)

**OPERATION**—Gas

**TYPE OF FIRE**—Selective - semiautomatic/full automatic

**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 950 rpm

**MUZZLE VELOCITY**—2750 fps (838 m/s)

**MUZZLE ENERGY**—940 ft/lbs (1275 J)

**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters

**FEED**—20 or 30 round removable box magazines

**WEIGHTS**

**WEAPON (EMPTY)**—5.3 lbs (2.40 kg)

**WEAPON (LOADED)**—6.01 lbs (2.73 kg) w/20 rd mag, w/o sling  
Sling 0.40 lbs (0.18 kg)

**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)

30 round aluminium 0.24 lbs (0.11 kg)

**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)

30 round 1.02 lbs (0.46 kg)

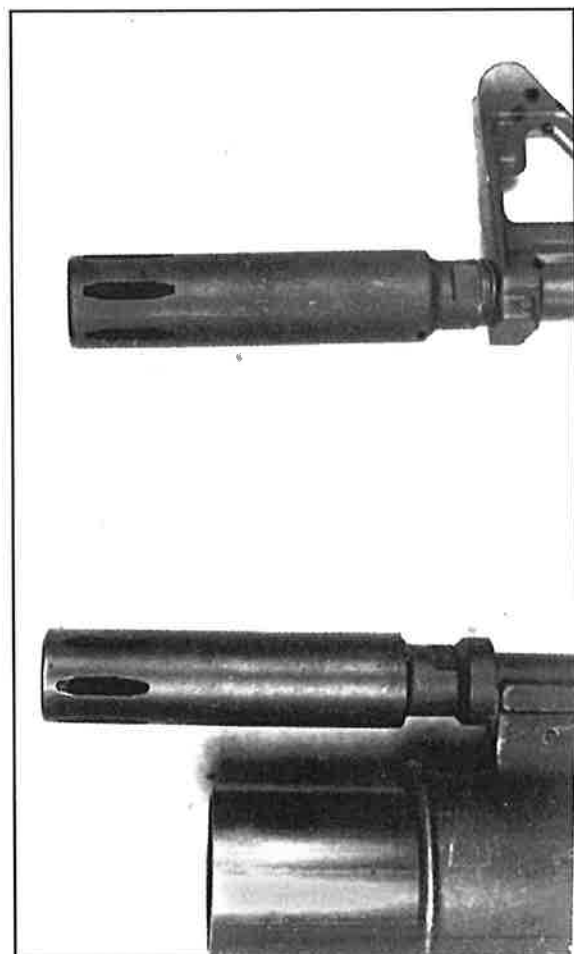
**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)

**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**

**WEAPON OVERALL**—26/28.7 in. (66/72.9 cm)

**BARREL**—10 in (25.4 cm)



Two examples of the second model noise/flash suppressor. The upper specimen is on a Colt Model 07 submachine gun (CAR-15). The longer body of the second model suppressor and the six elongated ports at the muzzle separate the design from the shorter first model suppressor. The lower specimen is mounted on an XM177E2 with an XM148 40mm grenade launcher mounted underneath the barrel. What appears to be a second part of the suppressor, behind the reduced-diameter section, is actually a shaped metal washer. The large washer acted as a gas check and would allow rifle grenades to be launched from the suppressor if desired. Except for slight manufacturing changes that came over time, the two noise/flash suppressors are the same.

PHOTO CREDIT: KEVIN DOCKERY

automatic fire, a 20 round box magazine, and other mechanical improvements made the M14 a better overall battle rifle than the earlier M1 Garand. The long range capability and overall dependability of the M14 kept it held in reserve in the military supply system long after it had been supplanted by the M16A1 as the standard-issue US shoulder arm. Hand fitted and tuned to match specifications, the M14 became a highly accurate base for a later family of sniper rifles for the Teams and the Army.

### CAR 15 MODEL 607

An additional AR-15 based weapon was used by the SEALs prior to their major deployment to Vietnam. The CAR-15 submachine gun was a shortened version of the AR-15, offered by Colt as their Model 607 early in 1965. Originally part of the CAR-15 weapons family, which included the Model 605 Carbine, the CAR-15 submachine gun was a very shortened version of the AR-15 rifle. Since the action of the AR-15 requires that the bolt carrier be able to recoil into the stock when the weapon is fired, a folding stock won't work. For the Model 607, a sliding buttstock of generally standard shape was devised.

The sliding buttstock has a switch on the buttplate to lock or unlock the stock system. Using the switch, the buttstock can be slid in or out and locked firmly into either the extended or collapsed position. With the stock in the collapsed position, the CAR-15 can be easily employed for instinctive shooting while held in the underarm position. Since the weapon was so handy when collapsed, many SEALs never bothered extending the stock.

“... For myself, I preferred the CAR-15, the short submachine gun version of the M16. Using the CAR, I would rarely extend the stock as most of our fighting was done close-in with instinctive firing from the hip being the norm.”

The barrel of the Model 607 was cut down to only ten inches and the standard flash hider installed. The front sight was also moved back and the gas system modified as needed. The handguards of the Model 607 were of the same triangular style as those on the AR-15, only roughly half as long. Well liked by the SEALs for its short size and fast handling characteristics, the Model 607 CAR-15 was available in very limited numbers. Those weapons that were available were used in Vietnam until they were effectively worn out.

To increase the number of possible military sales of the CAR-15 to the military, especially the Army, Colt made a number of changes to the weapon while it still retained the designation CAR-15 submachine gun. The addition of the XM16E1 model forward bolt assist to the CAR-15 added about 0.2 pounds (0.09 kg) to the overall weight of the weapon. Though the forward bolt assist was not particularly desired by the SEALs, the CAR-15 certainly was. This resulted in a number of slightly different CAR-15 submachine guns being used in the Teams through the Vietnam War.

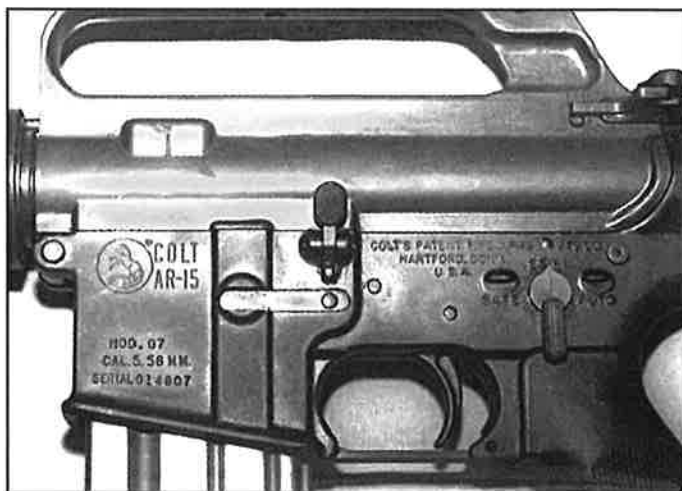
By late 1966, the Army and the Air Force had shown enough interest in the CAR-15 to have ordered several

thousand from Colt. The first weapons examined for the Army were standard model 607s with the forward bolt assist added. During Army testing one serious drawback did stand out immediately when the CAR-15 was fired. The short barrel and standard flash hider gave the weapon a tremendous muzzle blast and loud report accompanied by a large fireball. At night, the muzzle blast from the Model 607 was dazzlingly bright.

To reduce the muzzle blast and report of the CAR-15 submachine gun, Colt developed a combination flash/noise suppressor in September 1966. The first model flash/noise suppressor added only 1.3 inches (3.3 cm) to the overall length of the CAR-15 and about 0.1 pounds (0.045 kg) to its weight. The internal configuration of the combination suppressor eliminated a good deal of the muzzle flash and, when new, reduced the report of firing the CAR-15 to near that of the standard M16 rifle.

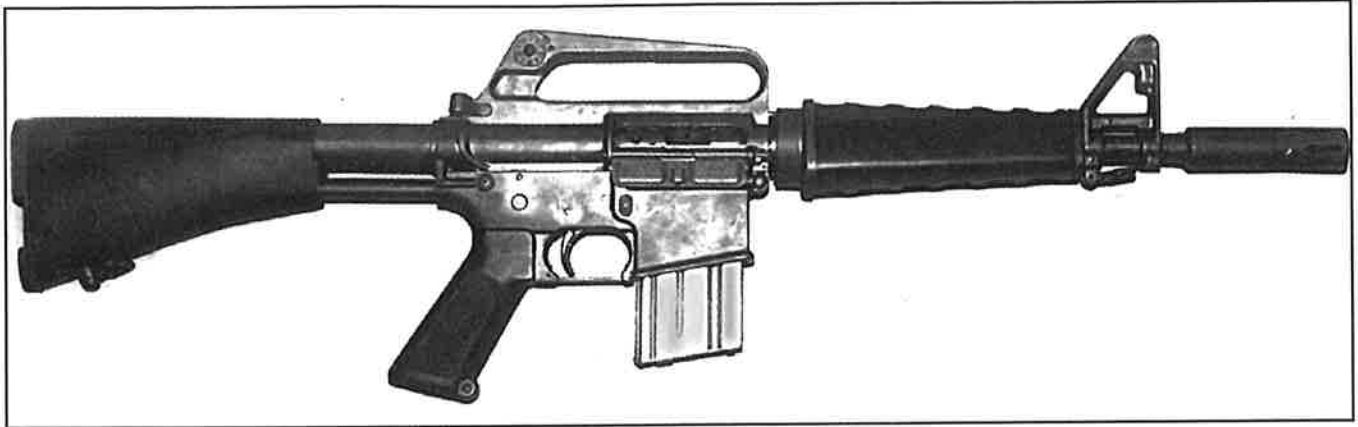
Though a number of the first-model flash/noise suppressors were made in the Fall of 1966, the design was not considered completely satisfactory. In order to cut down on the sound and flash of firing, the first model noise/flash suppressor had a tight muzzle hole, only slightly larger than the .223 projectile. Though the design of the suppressor did reduce the muzzle blast of the CAR-15 it also increased the amount of fouling deposited in the barrel of the weapon. The tight exit hole also caused tracer bullets to yaw badly when fired, destroying their accuracy. To limit the barrel fouling and allow tracer bullets to be accurately fired, a new flash/noise suppressor was developed.

The second model flash/noise suppressor had an overall length of 4.25 inches (10.8 cm) and a weight of



A left-side view of the Colt Model 607 submachine gun (CAR-15). The selector switch can be plainly seen, set at semiautomatic fire, directly above the pistol grip where it can be manipulated by the operator's thumb. The small rectangular part above and in front of the trigger guard is the retaining portion of the magazine catch. Above the rear of the magazine catch is the bolt stop. Pressing in on the serrated portion of the bolt stop releases the bolt allowing it to move forward.

PHOTO CREDIT: KEVIN DOCKERY/KNIGHT ARMAMENT COMPANY



*The Colt Model 07 CAR-15 submachine gun. This specimen has the sliding stock fully extended and locked into place. The additional guide rod needed by this design of sliding stock can be seen as the small tube beneath the action spring guide at the rear of the receiver. The noise/flash suppressor on the muzzle of this weapon is the more common second type. This weapon also has an early-type of upper receiver with no allowance for a forward assist mechanism and a lower receiver with no raised guard ridge around the magazine release. The smooth bolt carrier, with no serrations for the forward bolt assist, is visible through the open ejection port.*

PHOTO CREDIT: KEVIN DOCKERY

*The right side of a Colt Model 07 CAR-15 submachine gun with the spring-operated M3 "clothespin" bipod clamped into place under the front sight. The buttstock is slid back to its open position and the smaller guide rail necessary for this model stock can be seen just below the larger action spring guide. The bolt carrier, visible through the ejection port, is a later model intended for the M16A1 with a bolt closure device. The notches seen on the rear section of the bolt carrier are where the plunger of the closure device would contact the carrier. This specimen has the second-model conical, open-prong flash hider which was mounted on some of the first examples of this model.*

PHOTO CREDIT: KEVIN DOCKERY



**TECHNICAL DATA—XM177E1 (Colt Model 609)**

NSN 1005-00-930-5595

—XM177E2 (Colt Model 629)

NSN 1005-00-021-2429

**CARTRIDGE**— .223 Remington (5.56x45mm)

**OPERATION**—Gas

**TYPE OF FIRE**—Selective - semiautomatic/full automatic

**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm,

Cyclic 700 to 800 rpm

**MUZZLE VELOCITY**—2750 fps (838 m/s)

**MUZZLE ENERGY**—940 ft/lbs (1275 J)

**SIGHTS**—Open, Flip-type aperture/post, Adjustable,

battle aperture 0 to 300 meters,

long range aperture 300 to 500 meters

**FEED**—20 or 30 round removable box magazines

**WEIGHTS**

**WEAPON (EMPTY)**—XM177E1 5.2 lbs (2.36 kg)

XM177E2 5.35 lbs (2.43 kg)

**WEAPON (LOADED)—**

XM177E1 6.62 lbs (3.0 kg) w/sling & 30 rd mag

XM177E2 6.77 lbs (3.07 kg) w/sling & 30 rd mag

Sling 0.40 lbs (0.18 kg)

**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)

30 round aluminium 0.24 lbs (0.11 kg)

**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)

30 round 1.02 lbs (0.46 kg)

**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)

**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**

**WEAPON OVERALL**—XM177E1 28.3/31 in. (71.9/78.7 cm)

XM177E2 29.8/32.5 in (75.7/82.6 cm)

**BARREL**—XM177E1 - 10 in (25.4 cm)

XM177E2 11.5 in (29.2 cm)

The combination flash/noise suppressor adds

about 3.5 inches to the overall barrel length

**SIGHT RADIUS**—14.72 in. (37.4 cm)

0.14 lbs. (0.6 kg). Threading the suppressor onto the 0.635 inch long threaded portion of the barrel muzzle, including a 0.1 inch thick lock washer, increased the overall length of the weapon by 3.72 inches (9.4 cm). The second model flash/noise suppressor was identified by Colt as part #62370. The inside of the second model noise/flash suppressor had a small expansion chamber surrounding a ported barrel extension much the same as the first model device, but the new suppressor had a longer body that incorporated a six-slotted end piece with a large internal diameter, like a standard flash suppressor.

The second model flash/noise suppressor was fitted onto all subsequent models of the CAR-15 and retrofitted onto older weapons as parts became available. Though at least somewhat effective at cutting down the sound and flash of firing the short-barreled AR-15 variations, the suppressor was still easily clogged with fouling and would quickly lose its effectiveness in a combat environment.

**XM177, E1, E2 MODELS 610, 609, 629**

The original sliding buttstock assembly of the Colt model 607 was considered too complex and costly for fielding with the Army. A new type of sliding buttstock was designed and put into production. The new stock was a more skeletal, tubular design while still retaining a full-sized buttplate. To extend or collapse the stock a lever underneath the sliding section was squeezed with the operators fingers, unlocking the rear portion of the assembly. A spring would engage to lock the stock in the extended or collapsed position when the operating lever was released. Lastly, the triangular handguards, which were found to be fragile, were replaced with short, cylindrical handguards with raised reinforcing ribs.

The new weapon, named the "Commando" by Colt, began to be delivered to the military on 7 November 1966 with an initial shipment of 1190 weapons out of a 2815 weapon contract. By January 1967, the Commando had been tentatively type-classified as the XM177 submachine gun (Air Force version) without a forward bolt assist and

*This SEAL is holding an XM177E2 with an XM148 40mm grenade launcher mounted underneath the barrel. The XM177E2 is loaded with an early Colt extended magazine for the M16 weapon series. This magazine is three 20 round magazines welded together to feed straight through. This magazine did not work well in the field and only 35 were reported to have been made at the special request of SEAL Team Two. Hanging from around this man's neck is a hand-held AN/PRT-4 transmitter. The companion AN/PRR-9 receiver can be seen as the box with the spiral part at his left shoulder. The small radios were not well received by the Teams as they soon proved to have a very short range, as little as 40 meters, out in the field.*

PHOTO CREDIT: FRANK MONCRIEF COLLECTION





Two SEALs coming out of the water after a training swim. Both men are armed with XM177E2 submachine guns. The weapon on the left has an early (2nd) model open-prong flash suppressor. The weapon on the right has the standard M16A1 (3rd model) "Birdcage" flash suppressor. Both weapons have their extra-long slings attached to the front sight, allowing them to be carried in a sights-up, muzzle-forward position ready for immediate use. The swimmer on the left has an older pair of UDT "Duck feet" swim fins hanging from his left arm. The swimmer on the right has a newer pair of "rocket" fins developed for the sport-diving industry. Both men are using Mk VI semi-closed circuit breathing rigs.

PHOTO CREDIT: UDT-SEAL MUSEUM



Going out on an operation in Vietnam, this SEAL is armed with an XM177E2. The additional 1.5 inches of barrel on the XM177E2 as compared to the XM177E1 is easily visible in this photo. This weapon has the second model noise/flash suppressor on the muzzle with the additional formed sheet metal washer between the suppressor and the barrel of the weapon. At his left shoulder, this SEAL is carrying a Navy Pilot's Survival knife with the grip covered in tape for additional waterproofing.

PHOTO CREDIT: RYAN McCOMBIE COLLECTION

the XM177E1 (Army version) with a forward bolt assist. The XM177E1 was sent to Vietnam beginning with the first shipments in November 1966 with the Army's distribution of 2800 weapons being completed by March 1967.

SEALs had been using the model 607 CAR-15 submachine gun from the time of their first combat deployments in Vietnam, circa 1966-1967. As the XM177E1 became available, it was picked up for use with the Teams. Development of the XM177 system continued with the Army, the intention being the future replacement of all M3 and M3A1 submachine guns in service as well as the M1911A1 .45 pistol and M16A1 rifle on a selective basis.

After extensive field testing, the XM177E1 was found to not be completely satisfactory. Problems in accuracy were noted and a number of improvements made. In mid-April 1967, the new Colt model 629 Commando was type-classified as the XM177E2. A contract for 510 XM177E2s was signed with Colt with the weapons to go to the Studies and Observation Group, Vietnam (MAC-V SOG). Delivery of the new weapons was to begin in late September, 1967.

Two noticeable aspects of the XM177E2 stand out in photographs of the weapon. The barrel was extended an additional 1.5 inches (3.8 cm) giving the XM177E2 a barrel length of 11.5 inches (29.2 cm). The additional barrel length was found to help cut down on the muzzle blast and increase the stability, and accuracy, of projectiles. Additionally, the longer barrel allows the XM148 40mm grenade launcher to be more easily attached to the XM177E2. Many elite units, including the SEALs, greatly liked the additional firepower of the XM148 launcher, but adding the weapon to the earlier CAR-15 and XM177E1 was difficult and required modifications to both weapons.

In addition to the longer barrel, the XM177E2 appears to have a third model flash and noise suppressor, one with a noticeable raised boss at the barrel end of the device. The boss is actually a stamped metal washer with an elongated cross section. The washer acts as a forward stop for the XM148 40mm grenade launcher and also allowed rifle grenades to be launched from the XM177E2, something that was rarely, if ever, done.

Since the XM177E1/E2 weapons incorporated all of the up-to-the-minute changes and improvements developed for the XM16E1/M16A1, the Commando was noticeably more reliable than many of the M16-type weapons already in Vietnam. By July 1967, thirty XM177E1 barrels with chrome plated chambers arrived in Vietnam. Later production XM177E2s were all produced with chrome plated chambers to help limit corrosion.

Accuracy of fire with the XM177E2 continued to be a problem throughout the life of the weapon, especially when firing tracer ammunition. In November 1968, Colt estimated that a complete ballistic and kinematic study of the XM177E2 would cost \$400,000 and take six months to complete. Recommendations in December 1968 were for the XM177E2 to be reoriented to a \$635,000, 29-month

long R&D program. Due to the winding down of the US forces in Vietnam after 1970, no action was taken on the XM177E2 program and the weapon went out of production in 1970. Though thousands of the XM177E1/E2 weapons had been built, only a few hundred remained in use by the elite forces who strongly desired them. Cannibalization of damaged XM177s to keep the remaining weapons operational became quite common during the 1970's in the SEAL and UDT Teams.

The strong desire to keep the XM-177E1/E2 weapons operational with the SEALs is clearly shown in the mention of the production model weapons first arrival in the Teams. The excerpt is from SEAL Team Two's Command and Control History for 1969, page 14;

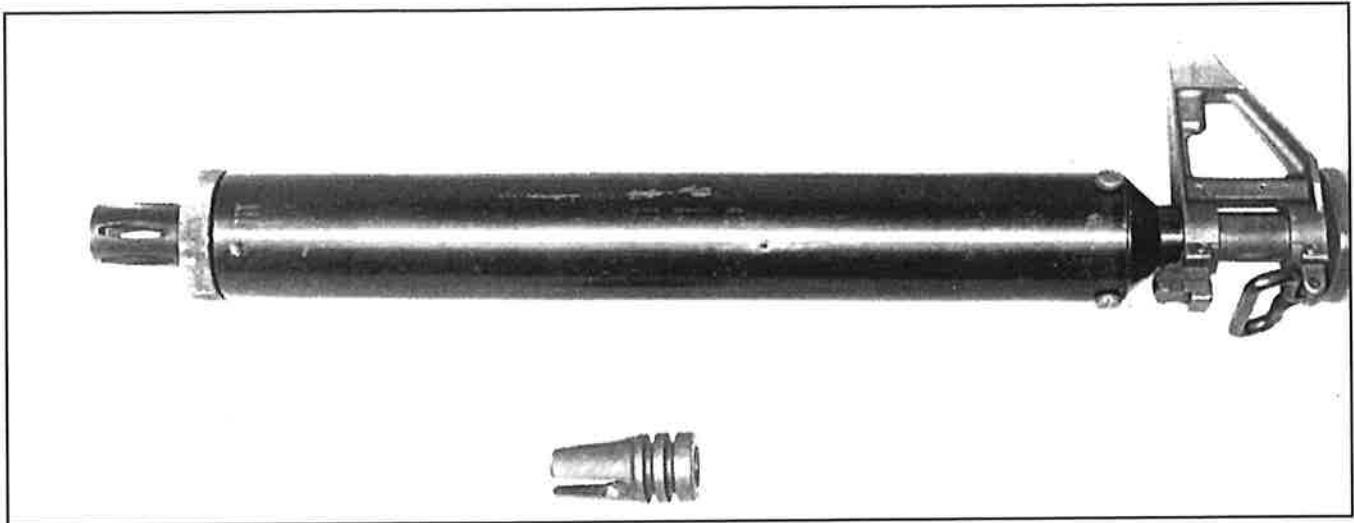
"3. (U) The XM177E1 submachine gun, better known as the CAR 15, appeared at the SEAL Team late in the year [1969]. This weapon is a welcome addition to the Team's family of weapons, because it fills a size gap that had been left open by all our other weapons. Its main characteristic is its relatively short length which makes it perfect for those people in a patrol such as the patrol leader, radio man, and assistant patrol leader, who find the shorter weapon ideal for close-quarter searching and surveillance of prisoners."

On 23 February, 1967 the XM16E1 was adopted by the US Army as the M16A1 rifle. The weapon had received a number of improvements during its testing by the Army, some of which were necessitated by the Army changing the type of powder allowed in loading .223 ammunition. Among other changes the inside of the bolt carrier was chrome plated and the exterior parkerized with a dull finish. The chrome plating minimized corrosion while giving the carrier a non-reflective finish. Earlier bolt carriers had been entirely chromed and could be seen shining through an open ejection port.

A third model flash suppressor was added to the M16A1, this one having a closed muzzle giving it a "bird cage" appearance. The earlier open prong flash suppressors were reported by the Army to hang up on vines, tall grass, and brush, something not noticed by the SEALs. Other changes in the M16A1 included chrome plating the chamber, and later the entire bore, of the weapon. The SEALs simply liked the M16 family completely and used them interchangeably. In a single SEAL platoon in Vietnam could sometimes be seen AR-15s, M16A1s, CAR-15s (model 607s), XM177E1s, and XM177E2s. On the muzzles of the weapons could be found first, second and third model flash hiders, on both long and short barreled weapons, as well as first and second model flash/noise suppressors on the "shorty" weapons.

The SEALs' opinion of the M16E1 shows clearly in the following quote taken from the official Command and Control History for SEAL Team Two, 1967;

"The M16E1 has proven a welcome addition to the SEAL arsenal. The weapon performs very well as long as it is kept reasonably clean.



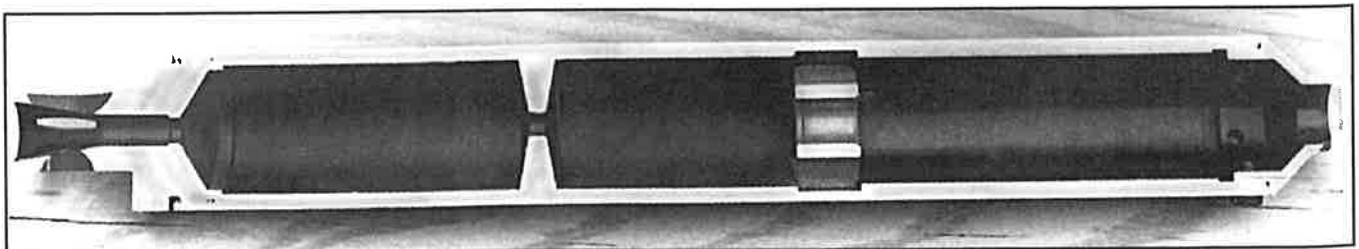
**“The HEL M4 suppressor was mounted as a permanent part of a modified M16A1 and was not intended to be removed.... With the suppressor removed, the modified M16A1 wouldn’t operate except as a manually loaded repeater.”**

*This is the Mark 2 blast suppressor (1st model) mounted on a standard M16A1 rifle. The Mark 2 screws onto the muzzle of the weapon in place of the standard flash suppressor. The conical rear mount of the Mark 2 indexes on the bayonet lug. The suppressor body is turned to line up the screw holes, and the rear mounting screws inserted to lock the device into place. The flash suppressor is the 2nd type, conical, open-prong model. This blast suppressor was based on the earlier design of the Human Engineering Labs (HEL) M4 sound suppressor. Filed for a patent on 12 July, 1968 as a gun blast diffuser, the 1st model Mark 2 did not require the modifications to the weapon that the HEL M4 suppressor did in order to operate. A weapon fitted with the Mark 2 blast suppressor, developed for the Mark 4 rifle, worked equally well with our without the suppressor in place.*

PHOTO CREDIT: KEVIN DOCKERY

*A sectioned view of the 1st model Mark 2 blast suppressor. This very simple design has two expansion chambers and a single baffle. The angular piece to the left of center is the threaded cruciform mounting plate that screws onto the barrel of the using weapon. Though outwardly resembling the HEL M4 suppressor, the Mark 2 blast suppressor is greatly more simplified, having only five major parts as compared to the over 16 parts in the HEL M4. The internal design of the Mark 2 blast suppressor allowed water in the system to easily drain out, something that could not be quickly done with the HEL M4.*

PHOTO CREDIT: KEVIN DOCKERY





The chrome [plated] chambers and barrels should substantially lengthen the life of the barrel. It is believed that the bolt assist should be eliminated from the weapon.”

considered a valuable asset. As noted in the SEAL Team Two Command and Control history for 1968, page 8;

“A silencer has been produced which when used with special ammunition, has an indistinguishable noise level. The SEAL Team now has silencers for pistols and rifles.”

For the SEALs’ operations in Vietnam surprise was as much of a weapon as any ordnance that could be carried. Specialized weapons could sometimes give an additional edge to an operating group of SEALs deep in the bush. Normally, weapon specialization extended into giving the SEALs as much concentrated firepower, in terms of volume of fire, that they could effectively carry. But other types of weapons could increase the “surprise” factor in the SEALs’ favor. And foremost among these weapons are suppressed guns where the sound of firing is eliminated as much as possible.

The weapon was especially valuable on those missions that needed the longer range and accuracy of a suppressed rifle over that of a suppressed pistol or submachine gun. Off-duty SEALs sometimes found additional uses for the suppressed M16A1s they had.

A suppressor, commonly called a silencer, cuts down on the noise of a weapon’s firing, suppressing the sound of the shot. Usually, a suppressor does not effect the velocity of a fired projectile which, if it is moving faster than the speed of sound, causes a sonic “crack” as it passes through the air.

“We shipped out and went on to Song Ong Doc, where we were living on a barge. At night, you’d see groups of rats swimming out from shore in a column maybe twenty feet long, trying to reach the barge and climb up to get into the potatoes that were stacked amidships. When we didn’t have operations, the guys would get M-16s with silencers (suppressors) on them and sit out on deck shooting the rats. As long as they used the silencers (suppressors) the officers didn’t know what they were doing.”

During the first years of the SEALs major deployments to Vietnam, few if any suppressed weapons were available to the Teams. Those that were usually consisted of old World War II weapons that were in very short supply. Back in the States, the US Army’s Human Engineering Laboratory (HEL) at Aberdeen Proving Grounds was one of several places developing suppressors for the military, The HEL M4 suppressor became available to the SEALs in the summer of 1967. The HEL M4 suppressor was mounted as a permanent part of a modified M16A1 and was not intended to be removed. For proper operation with the HEL M4 suppressor attached, the bolt carrier of the designated M16A1 had an extra gas bleed-off hole drilled into it, centered and behind the two holes already in place. The extra hole allowed the weapon to function properly, firing in both semi and full automatic modes, but only with the suppressor attached. With the suppressor removed, the modified M16A1 wouldn’t operate except as a manually loaded repeater.

The SEALs were constantly looking for ways to augment the firepower of their small units. This was one of the reasons that the Teams first looked at the AR-15 weapon. One item that was attractive in the AR-15 was that it came outfitted with a twenty-round magazine. Though a thirty-round magazine had been available from Colt since at least 1964, technical difficulties with the large magazines design kept it from being commonly available.

A gas deflector shield was attached to the charging handle of the modified M16A1 to protect the firer’s face and eyes from any excess propellant gases. The HEL M4 suppressor made the modified M16A1 very difficult to locate by sound when fired. At a distance of 50 meters or so, depending on the surrounding area, the sound of the shot could not be heard.

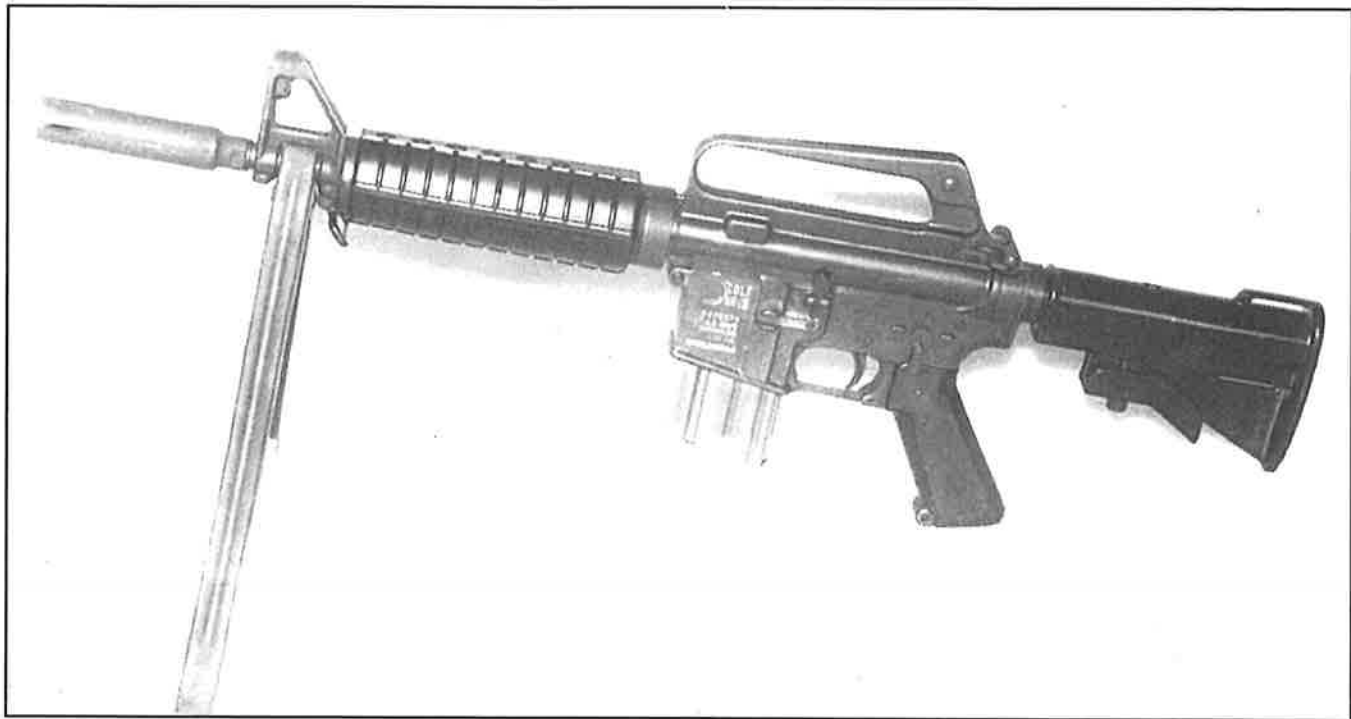
The original Colt thirty-round magazine was a “fully curved” design, that is the magazine had a slight curve, to facilitate feeding rounds, through its entire length. Though the original magazine fed ammunition smoothly, the magazine well of the AR-15 was a straight rectangular hole. Allowances for a curved magazine had not been designed into the weapon. Simply put, not all of the AR-15/M16/XM16E1 weapons made would accept the original thirty-round magazine. If an individual weapon’s tolerances were on the large side, it could accept the curved magazine, if not, it could only feed from the standard twenty-round magazine.

To increase the efficiency of the suppressor, the SEALs obtained a quantity of special downloaded .223 ammunition. The special ammunition would fire a subsonic projectile that did not break the speed of sound, about 1100 feet per second (335 m/s) at sea level, and yet still operate the action of the modified M16A1. Though very quiet and effective, the subsonic ammunition still would not operate the action as dependably as desired. Neither was the terminal effectiveness of the special ammunition as good as the standard round.

The few thirty-round magazines the SEALs had were carefully hoarded and used for combat duty. Though the Teams had at least a small number of the original thirty-round magazines in 1964-65, there were never enough for general issue. The Air Force also had a limited number of the early thirty-round magazines and occasionally individual mags would be “borrowed” by enterprising SEALs.

The suppressor-equipped M16A1 was used by the SEALs throughout their operations in Vietnam and was

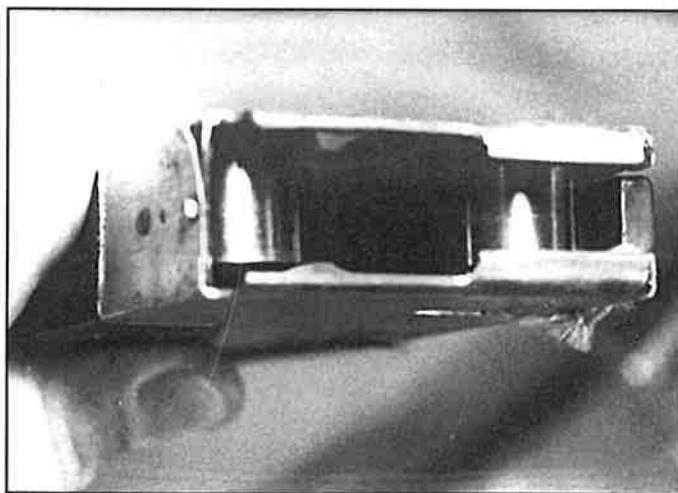
In January 1966, a requirement was put out for a thirty-round magazine to be delivered from Colt for the M16/XM16E1 program. The late 1966 contract for the XM177E1 Commando specified that the weapon come issued with seven thirty-round magazines. But the thirty-round magazine project was overshadowed at Colt by



**“Later production XM177E2s were all produced with chrome plated chambers to help limit corrosion.”**

*A Colt Model 609 XM177E1 “Commando” submachine gun. This specimen has the longer second model noise and flash suppressor mounted on its muzzle. The production model sliding buttstock is in its forward position in this photo. The weapon is loaded with a 20 round magazine and is supported with an M3 bipod clamped in place under the front sight.*

*PHOTO CREDIT: KEVIN DOCKERY*



*A top view of the Mod 3A 50 round M16 magazine. The cartridge follower has been removed in this photo to show the two constant-force extension springs. The constant-force springs resemble a roll of steel tape. The spring steel coils maintain a smooth pressure on the cartridge follower as the rounds are fed into the weapon with the same pressure driving the first cartridge as the last. Most coil spring designs build up pressure as the spring is compressed making the last rounds to be loaded into a long magazine difficult to insert. The constant-force spring design eliminates the spring-loading problem.*

*PHOTO CREDIT: KEVIN DOCKERY*



*Produced by the Naval Weapons Center at China Lake, these are commercially available polypropylene plugs used to block the muzzle of an M16, AR-15, or Stoner. The soft plastic plugs slip tightly into the bore of the flash suppressor where they seal the end of the barrel from mud or rain. The plugs could be simply removed by hand or even shot-off with no danger to the weapon or firer. One drawback of the internal-style rain/mud plug was that it would not work on the noise/flash suppressor found on the CAR-15 and XM177 series weapons.*

*PHOTO CREDIT: US NAVY*

other problems and pushed back in priority. XM177E1s were issued with standard twenty-round magazines.

During the initial field testing of the XM177E1 by the US Army in Vietnam, only four early model thirty-round magazines were sent over for testing. This was along with the 2800 XM177E1s being issued. The four magazines ended up with the 5th Special Forces Group. Though the number of magazines available for testing was laughably small, ninety percent of the people asked in the survey that was part of the XM177E1 testing, stated they preferred the thirty-round magazine if available.

By June 1968, Colt had signed a contract with the Army to supply 1,000 new-model thirty-round magazines with delivery expected in 26 weeks. By 1969, the new model thirty-round magazines started to become available in Vietnam with the SEALs being among the first units to receive them. The new magazine has a straight top and bottom portion connected by a curved section and fit all of the AR-15/M16/16A1 weapons produced at the time of its adoption in 1969. The thirty-round magazine was enthusiastically received by the SEALs who accepted all that they could get their hands on.

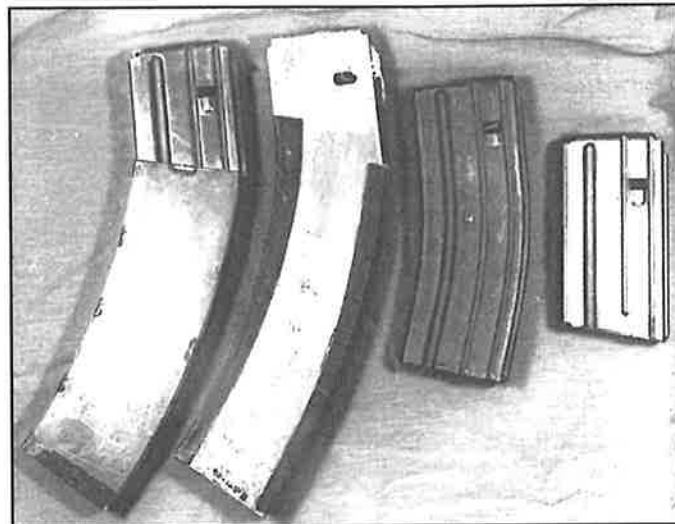
SEAL Team Two Command and Control History, 1969, page 14:

“8. (U) Another favorite piece of operational gear which is now present on the SEAL TWO inventory is the 30-round magazine for the M16 and CAR 15 weapons. This gives an extra 10 rounds per magazine which is a welcome development to a unit such as the SEAL Team which constantly tries to make up for its lack of numbers with superior firepower.”

In 1968, the Naval Research and Development Unit - Vietnam (NRDU/V) sent a representative to Vietnam in order to assess the needs of the Navy units there. During his four-month tour, the NRDU/V representative spent a large portion of his time with the SEALs operating in the Mekong Delta. One of the strong impressions the man came away with was of the SEALs' requirement for sustained firepower with their M16 rifles. This was needed especially to maintain the high volume of fire during the first crucial moments of enemy contact.

There was at least a year's wait before the thirty-round magazine would be available from Colt and the Naval Weapons Laboratory, Dahlgren, decided to address the problem. The first model of a new fifty-round magazine was delivered from Colt in April/May 1969. The Colt magazines were made up from three twenty-round magazines welded together end-to-end. Inside of the magazines were a new follower mechanism designed by the engineers at Dahlgren. Thirty-five of the Colt magazines were made and forwarded to the Navy for testing.

The major engineering problem with such a long magazine is the spring pressure needed to lift the heavy column of cartridges into the rifle. Too heavy a spring and the last rounds loaded will be difficult to insert into the magazine, too light a spring and all of the ammunition will not feed into the weapon. A normal coil spring, such



Four of the magazines used by SEALs in Vietnam in the M16-series of weapons. The magazine to the far right is a standard, aluminum 20 round box magazine used in the M16 from its very early days. An earlier steel 20 round magazine was available for the AR-15 but was dropped in favor of the improved aluminum model. Second in from the right is the production-model aluminum 30 round magazine that started becoming available to the SEALs in some numbers in 1969. The production 30 round magazine has two straight sections connected by a curved portion of the body. An earlier 30 round magazine was available in small numbers but had a fully-curved body that did not fit all M16-series weapons due to tolerance differences between magazine wells. The magazine to the far left is the Childers/Monolo Mod 1 50 round magazine produced by the Naval Weapons Laboratory, Dahlgren in 1969. In the Mod 1 design, a curved extension was attached to a standard 20 round magazine body. In addition, a special constant-force extension spring and Teflon follower were part of the design. The Mod 1 design was not successful and only 10 specimens were produced with several being tested in Vietnam. The center magazine is the Mod 3A design, considered the most successful of the series. Ten of the Mod 3A magazines were made and tested by the SEALs in Vietnam and found a valuable addition to the initial volume of fire that could be put out on contact with the enemy. Though the 50 round magazine project was considered a success, the design was shelved in 1970 and no further work was done.

PHOTO CREDIT: KEVIN DOCKERY

as is used in the twenty-round magazine, “loads up”, that is increases its spring tension as the magazine is filled. For the proposed fifty-round magazines, the pressure needed to load the final rounds against a coil spring would likely need a loading tool for assistance. In addition, the spring pressure could keep the first rounds in a full magazine from being stripped into the barrels by the weapon's bolt.

To answer this problem, the NRDU/V came up with a new method of pushing the rounds through the long magazine. The follower for the fifty-round magazines, the platform that actually pushes the ammunition itself,

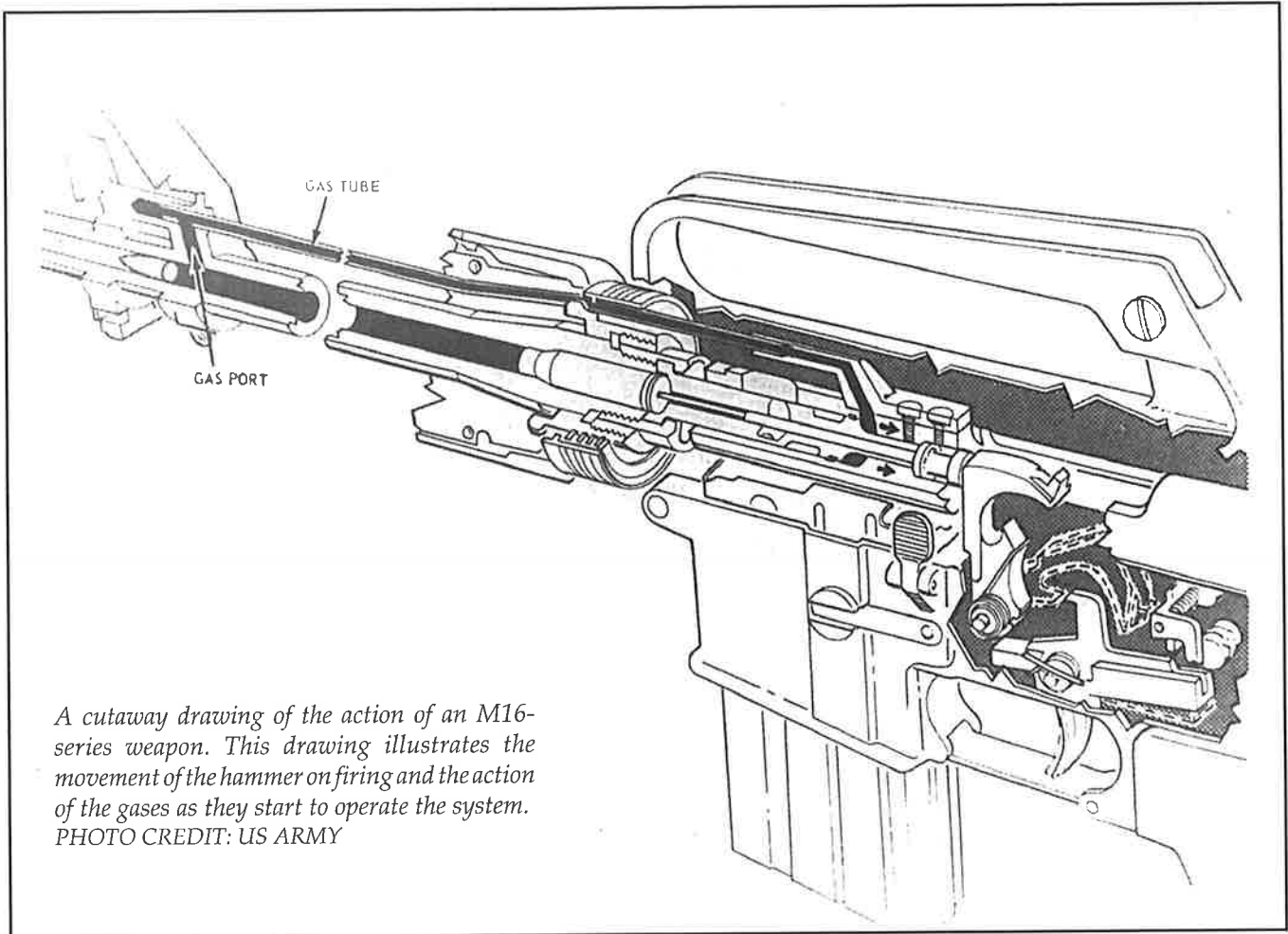


PHOTO CREDIT: US ARMY



The rarely seen patch of the NWC Special Projects Division at China Lake, California. This facility produced many specialized pieces of equipment on a quick-reaction basis for use by the SEALs during the Vietnam War and into the 1970's under the sponsorship of the Vietnam Laboratory Assistance Program (VLAP). The figure wearing the cloak and holding a dagger symbolizes the clandestine nature of much of the SEALs' work. The cactus represent the desert where China Lake is located and the background explosion the end effect of much of the material produced for the SEALs.

PHOTO CREDIT: US NAVY

was made of a low-friction plastic. In the base of the follower were placed two constant-force springs, much like the coiled springs in a clock movement. The ends of the springs were attached to the mouth of the magazine rather than pressing against the magazine's bottom. The constant-force springs would unwind as the magazine was loaded, keeping the same pressure on the last rounds loaded as on the first.

The Colt manufactured (first generation) magazines were made at the special request of SEAL Team Two as an interim measure prior to a magazine becoming available from Dahlgren. Results from using the first generation magazines in the field were poor as the magazines were particularly susceptible to mud and damage from the environment. All the first generation magazines were replaced as new designs became available.

The Naval Weapons Laboratory, Dahlgren (NWL) made a Mod 1 magazine consisting of a twenty-round magazine body attached to a curved magazine extension. The Mod 1 magazine used the constant-force springs and follower and operated much better than the Colt magazine. A further nine Mod 1 magazines were made for testing but remained in the United States.

To eliminate some of the problems noted in testing, a Mod 2 magazine was designed. In the Mod 2 magazine, the follower remained much the same as in the Mod 1 but the body of the magazine was made up of two machined halves rather than an extension being attached to an existing magazine. In the Mod 2 design, the curve of the magazine remained the same but the angle where the curved portion met the straight section was increased. The straight section of the magazine had to be retained for easy insertion into the M16 magazine well.

The Naval Ordnance Station in Forest Park, Illinois fabricated forty-two Mod 2 magazines according to the NWL design. Testing established the viability of the magazine and the unusual follower design. Ten magazines were found to not operate properly and were removed from the test. Five of the Mod 2 fifty-round magazines were sent to other units in Vietnam and the majority of those remaining, twenty-seven units, were distributed to the members of SEAL Team Two operating in the Mekong Delta.

One difficulty with fifty-round box magazines was noted in particular by 8th Platoon in My Tho. The comment made was that the fifty-round magazine was too bulky and too long. When the platoon was operating from a defensive position, the men would have to expose 50% more of their bodies when firing with the fifty-round magazines from the prone position. It was also pointed out that the magazines operated best when only loaded with forty-five rounds rather than fifty.

All told, the fifty-round magazines were considered an effective and valuable piece of equipment by most of its users. A Mod 3 magazine incorporating several improvements over the Mod 2 design was developed. One improvement on the Mod 3 was the addition of a bolt stop to the follower. Now the weapon's bolt would lock open on an empty magazine when the last shot was

fired. Ten of the Mod 2 magazines were made and seven were sent to SEAL Team Two elements in Vietnam.

By February 1971, a final report on the fifty-round magazine project was written as NWL Technical Report TR-2536 by Carroll D. Childers and Joseph C. Monolo. The report listed the recommendation put forward by the SEALs that the fifty-round magazine (Mod 3) be adopted for use and issued one per man as a weapon-ready magazine for deployed platoons. It was suggested that such magazines be serial numbered for positive control and not be considered a consumable item. Cutbacks in the post-Vietnam military kept any funding from being made available for the fifty-round magazine program and the project was shelved.

Other methods were used by the SEALs to extend the firepower of their firearms. The most common technique was to tape together two or more magazine together, upside down to one another. This method allows for a fast reload as the magazine assembly only has to be pulled from the weapon, flipped over, and reinserted. One strong drawback of this technique is that the bottom magazine has its first cartridges exposed to the environment. It is very easy for dirt or mud to enter the exposed magazine and cause a jam when it is used. This problem keeps the technique from being as widely used as it might be.

The problem of dirt and especially mud entering their magazine was one the SEALs discovered very soon after beginning operations in Vietnam. To answer this problem, the Special Operations Branch of the Navy Weapons Center at China Lake, California came up with plastic M16 magazine caps. The caps were simple, black plastic devices, one to fit on the bottom and the other over the top of any size M16 magazine. The caps effectively sealed the magazine against dirt and mud. The top magazine cap had a tab sticking out from one end. The tab could be pulled, with an operator's teeth if necessary, tearing off the cap and clearing the magazine for insertion into a weapon.

In addition to the magazine caps to keep out the mud, China Lake came up with two items to help keep the rain and mud of Vietnam out of the bore of an M16. One device was a simple white plastic plug that could be inserted into the flash suppressor of an M16. The plug was made of a soft plastic and was hollow. The tight fit of the plug into any of the three flash suppressors then in use would effectively seal the bore against rain or mud. But the plugs would not make the weapon waterproof from a full immersion, such as from an underway insertion.

The plugs were just large enough to be pulled from the muzzle with the fingers, or the tip of a knife. The fit was such that the weapon could even be fired with the plug still in place, blowing out the plug with no damage to the weapon.

The other device China Lake found to help keep rain and mud out of the bore of a .223 caliber weapon was a plastic cap. The cap, resembling a plastic film container, could be pressed over any standard-sized flash suppressor on any .223 caliber weapon in the SEALs

**TECHNICAL DATA**—T 223 Rifle (Heckler & Koch HK33)

**CARTRIDGE**—.223 Remington (5.56x45mm)

**OPERATION**—Roller locked delayed blowback

**TYPE OF FIRE**—Selective - semiautomatic/full automatic

**RATE OF FIRE**—Practical SS 40 rpm, A 160 rpm,

Cyclic 650 to 750 rpm

**MUZZLE VELOCITY**—3150 fps (960 m/s)

**MUZZLE ENERGY**—1234 ft/lbs (1673 J)

**SIGHTS**—Open, Drum-type multiple aperture w/V-notch battle sight/blade, Adjustable, Battle sight 100 meters, apertures at 200, 300, and 400 meters

**FEED**—20 or 40 round removable box magazines

**WEIGHTS**

**WEAPON (EMPTY)**—7.65 lbs (3.47 kg)

**MAGAZINE (EMPTY)**—20 round 0.25 lb (0.11 kg)

40 round 0.35 lbs (0.16 kg)

**MAGAZINE (LOADED)**—20 round 0.77 lb (0.35 kg)

40 round 1.39 lbs (0.63 kg)

**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)

**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**

**WEAPON OVERALL**—36.9 in. (93.7 cm)

**BARREL**—15.7 in (39.9 cm)

**SIGHT RADIUS**—18.9 in. (48 cm)



*Transporting a captured VC, the SEAL in the center of this picture is armed with a Harrington & Richardson 5.56mm T223 rifle. This weapon is the US imported version of the Heckler & Koch HK33. This particular weapon is loaded with a 40 round magazine and has a China Lake plastic muzzle plug over the flash hider. Slung muzzle forward under the right arm of the center SEAL is an M72 Light Antitank Weapon (LAW). At the left of the photo is a SEAL carrying a radio and armed with an early model 07 CAR-15, the stock of which can be just seen behind his left hand. The CAR-15 is loaded with a early-style curved 30-round magazine. Underneath the radioman's left arm is a late-model Chicom Type 56 (AKM-47). The Type 56 is probably the weapon taken from the black pajama-clad prisoner who is wearing a three-pocket chest-type magazine carrier.*  
 PHOTO CREDIT: US NAVY

inventory. The cap fit snugly, even on Stoner machine guns and XM177E1/E2s, sealing out mud, dust, and water. Originally, the caps were made of red plastic but this was soon changed to a black material. As with the muzzle plugs, the weapon could be fired with the cap in place with complete safety to the operator and the weapon. The muzzle cap idea worked so well and had such a universal application that they were adopted by the US Army as the Cap, protective, dust and moisture seal: muzzle, still available today as a standard-issue item.

Other materials produced by China Lake for the SEALs and their M16s predated equivalent Army items. By October 1968, a limited number of M16A1s had been modified by China Lake to have a jungle sling and integral cleaning kit. The jungle sling was simply a side mounted sling that allowed the operator to carry his weapon hanging at his side, muzzle forward, ready for use. To accept the sling, the normal rear sling swivel of the M16A1 was moved from the toe of the buttstock to the rear upper left side. The front sling swivel was moved from below the front sight to a sliding position along a one-piece cleaning rod fitted to the upper left side of the weapons' hand guard, from the front sight to the receiver.

In addition to the sling modifications, a complete cleaning kit was made part of the weapon. A lid was added to the bottom of the hollow pistol grip allowing cleaning materials to be securely stored. In addition, a second storage place was made in the buttstock, covered by a trap door in the buttplate of the weapon. Within a few years, a larger buttstock storage area with a latched cover and a redesigned cleaning kit with a sectioned rod was made part of every M16A1 accepted for US service.

Another accessory was made for the Team's M16s weapons family by China Lake. This item was particularly mundane in nature as it was simply a blank firing attachment. Using standard M200 blanks, the China Lake attachment allowed semi and full automatic functioning on the M16 and all of its variants. The unit screwed onto the weapon's barrel in place of the normal flash suppressor. The attachment would work as well on the XM177E1/E2 as it did on the M16A1. Even ball ammunition could be accidentally fired through the China Lake device without any danger to the firer or the weapon, though the attachment would be destroyed.

The China Lake blank firing attachment was much smaller and lighter than the Army's M15E1 blank firing adaptor. In addition, the China Lake device did not catch on brush and was dark in color as compared to the boxy, bright red M15E1 adaptor.

The Teams were sold on the .223 caliber class of weapons very soon after seeing the round's terminal effects in combat. Along with the M16 family of weapons, the SEALs had a commitment in the .223 round as it was used in their Stoner machine guns. But this commitment did not prevent the SEALs from constantly looking for additional weapons to augment their firepower. But one major requirement was that any new weapons use ammunition available in the US inventory.

Other countries in the NATO alliance could see a strong future for the .223 round after its official adoption by the US military. Several small arms companies developed a number of weapons chambered for the high-velocity round, known as the 5.56x45mm round in NATO terminology. Heckler and Koch of West Germany designed a version of their G3 rifle to use the 5.56mm cartridge. The new weapon, known as the HK33, was imported into the United States by Harrington and Richardson of Worcester, Massachusetts.

Marked as the H&R T 223 rifle, the weapon was submitted to the US Army's Small-Arms Weapon Systems (SAWS) study for evaluation. The SAWS study ran from December 1964 to the submission of the final report in December 1966. During the study, a number of weapons were examined including the T 223, M14, M16E1, AK47, and Stoner weapons system.

One result of the SAWS study was a number of weapons being brought to the attention of the SEALs. Even though the empty H&R T 223 was 0.9 pounds (0.41 kg) heavier than an empty M16E1, the weapon had a forty-round magazine available for it and that made it attractive to the SEALs.

"Choice of weapons were left as much as possible up to the tastes of the individual SEAL ... For myself, I had taken a liking to the Harrington and Richardson T223 rifle... One thing that immediately made the T223 appeal to me was the fact that it came with forty-round magazines."

One SEAL from SEAL Team Two carried the H&R T 223 during his first combat tour in Vietnam, April to October 1968:

"My H&R came with four forty-round magazines which I carried in the leg pockets on my cammies for awhile. The magazines tended to rattle around and make too much noise on patrol but were too long to fit in an American ammunition pouch. I solved my problem by getting one of the chicom AK47 chest-type magazine pouches and carrying my ammo in that..."

One interesting point of the H&R T 223 (HK33) is that it very much resembles a slightly smaller, 3.25 inch (8.3 cm) shorter, version of the 7.62mm NATO G3 rifle. In one much published picture of a number of SEALs in Vietnam, one SEAL is holding a T 223 but the weapon can only be seen from its top side. Since the HK33 and G3 are almost identical when viewed from the top, the weapon was identified as a G3 rifle which the SEALs did not use during the Vietnam war. In an earlier-generation copy of the same picture, the long, curved forty-round magazine can be seen sticking out from the bottom of the weapon.

During the SEALs time in Vietnam, a number of different rifles and carbines were used on an intermittent basis. For the most part, the men of the Teams stuck with the M16 family of weapons as their primary weapon. Unlike the other services, an individual SEAL would be



A group of SEALs preparing to go out on an operation in Vietnam. A number of weapons and equipment are visible in this photograph which has long been misidentified as evidence that the SEALs used the German G3 rifle in Vietnam. The SEAL at the top right corner of the photo is armed with an H&R T223 (HK33) rifle. From this top view, it is almost impossible to see the difference between a G3 rifle and this HK33. In an earlier-generation copy of this photograph examined by the author, the 40 round magazine unique to the HK33 can be made out loaded into this weapon. At the top center of this photo can be seen part of the front handguard and barrel of a Colt Model 07 submachine gun (CAR-15). The SEAL at the right-side center is armed with some form of 40mm grenade launcher as he is wearing an early-model nylon mesh grenade carrier vest.

PHOTO CREDIT: US NAVY

**“Even though the empty H&R T 223 was 0.9 pounds (0.41 kg) heavier than an empty M16E1, the weapon had a forty-round magazine available for it and that made it attractive to the SEALs.”**



The unusual rifle with which this SEAL is armed is the Harrington and Richardson (H&R) 5.56mm T223. H&R was the US importer for the German Heckler and Koch HK33 rifle which H&R designated the T223. The specimen held by the SEAL in this photo is loaded with a 40 round magazine. The large capacity magazines that were available for the T223 are what made the weapon of interest to the Teams.

PHOTO CREDIT: US NAVY



**TECHNICAL DATA**—SKS (Chinese Type 56 Carbine)  
**CARTRIDGE**—7.62 Intermediate (7.62x39mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Semiautomatic  
**RATE OF FIRE**—30 to 35 rpm  
**MUZZLE VELOCITY**—2410 fps (735 m/s)  
**MUZZLE ENERGY**—1573 ft/lbs (2133 J)  
**SIGHTS**—Open, Tangent round-notch/post, Adjustable 0 to 800 meters in 100 meter graduations  
**FEED**—10 round integral magazine

**WEIGHTS**  
**WEAPON (EMPTY)**—8.5 lbs (3.86 kg)  
**WEAPON (LOADED)**—8.86 lbs (4.02 kg)  
**MAGAZINE (LOADED)**—10 rds 0.36 lb (0.16 kg)  
 10 rds w/stripper clip 0.39 lbs (0.18 kg)  
**SERVICE CARTRIDGE**—M43 Ball 253 gr (16.4 g)  
**PROJECTILE**—122 gr (7.9 g)  
**LENGTHS**  
**WEAPON OVERALL**—40.2 in. (102.1 cm)  
**BARREL**—20.5 in (52.1 cm)

assigned his weapon while still in the States, carry it with him during his deployment, and return with the same weapon after his tour was over. Other services simply issued a man a weapon when he arrived incountry and he turned it back in for reissue when he left Vietnam. The SEAL system allowed a man to care for his own weapon in such a way as to instill maximum confidence and skill with it. It was when a platoon formed-up for deployment and began pre-deployment training that a man was assigned his weapon and began working with it:

“At [Camp] Pickett the platoon worked on ambushes, popup target courses, weapons familiarization, and zeroing in your own weapon. Each man would take his own M16 and zero the sights on the 1,000 inch range.

Carefully sandbagging his weapon, the firer would adjust his sights until he held a good three-shot group exactly 1 inch below his point of aim at 1,000 inches. For an M16, that would put the bullet’s point of impact on the point of aim at 250 yards. After a man had zeroed his weapon’s sights, that weapon would be assigned to him by serial number for his tour incountry...”

### SKS

There were times when the SEALs carried foreign weapons in order to help confuse any enemy observers. In one instance in 1968, two SEALs on patrol deep in enemy territory were reported as a pair of Russian advisors due in part to the materials they carried. Some SEALs developed a taste for the AK47 and its variants and carried that weapon as a matter of preference. Sometimes, it was the mission parameters that determined the choice of weapons. This proved particularly true during the waning years of the SEALs combat deployments to Vietnam. The following was stated by a SEAL officer who was part of the last SEAL Team Two deployment to Vietnam:

“The kind of operations we went on, it would be rare for someone to detect us, let alone fire directly at us. As rare as it would be for us to be shot at, it would be even more rare for us to return fire. With no support, we just didn’t let ourselves be seen. With the few men we had, we just didn’t have the firepower to take on an enemy unit. This situation greatly affected our choice of weapons. The AK47 and SKS had the same sound signature, muzzle flash and tracer color as the enemy’s own weapons. An M-16, M-60, and especially a Stoner, would stand out to the VC and NVA, telling them where and possibly who we were...”



*A Soviet-bloc produced AKMS-47 rifle with its folding stock extended. The long selector lever, above the trigger, is set to the mid-position for full-automatic fire. This specimen has the standard laminated wood forend and a plastic pistol grip.*  
 PHOTO CREDIT: KEVIN DOCKERY

**TECHNICAL DATA**—AKM-47 (AKMS-47)  
**CARTRIDGE**—7.62 Intermediate (7.62x39mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - Full automatic/semiautomatic  
**RATE OF FIRE**—Practical SS 40 rpm, A 90 to 100 rpm, Cyclic 600 to 800 rpm  
**MUZZLE VELOCITY**—2329 fps (710 m/s)  
**MUZZLE ENERGY**—1469 ft/lbs (1992 J)  
**SIGHTS**—Open, Tangent round-notch/post, Adjustable 0 to 1000 meters in 100 meter graduations  
**FEED**—30 round removable box magazine  
**WEIGHTS**  
**WEAPON (EMPTY)**—AKM-47 6.46 lbs (2.93 kg)  
 AKMS-47 6.90 lbs (3.13 kg)

**WEAPON (LOADED)**—AKM-47 8.27 lbs (3.75 kg) late steel mag  
 AKMS-47 8.71 lbs (3.95 kg) w/late steel mag  
**MAGAZINE (EMPTY)**—Early steel magazine 0.95 lbs (0.43 kg)  
 Late steel magazine 0.73 lbs (0.33 kg)  
 Aluminium magazine 0.37 lbs (0.17 kg)  
**MAGAZINE (LOADED)**—Early steel magazine 2.03 lbs (0.92 kg)  
 Late steel magazine 1.81 lbs (0.82 kg)  
 Aluminium magazine 1.45 lbs (0.66 kg)  
**SERVICE CARTRIDGE**—M43 Ball 253 gr (16.4 g)  
**PROJECTILE**—122 gr (7.9 g)  
**LENGTHS**  
**WEAPON OVERALL**—AKM-47 34.5 in. (87.6 cm)  
 AKMS-47 25.20/35.04 in (64/89 cm)  
**BARREL**—16.3 in (41.4 cm)  
**SIGHT RADIUS**—14.8 in. (37.6 cm)



*A right-side view of a late-model Chinese Type 56 rifle with a folding, spike bayonet. This is the Chicom version of the Soviet AK-47 and was the most common weapon of its type encountered by the SEALs in Vietnam.*

PHOTO CREDIT: KEVIN DOCKERY

**TECHNICAL DATA**—AK-47 (AKS-47)  
**CARTRIDGE**—7.62 Intermediate (7.62x39mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - Full automatic/semiautomatic  
**RATE OF FIRE**—Practical SS 40 rpm, A 90 to 100 rpm, Cyclic 600 to 800 rpm  
**MUZZLE VELOCITY**—2329 fps (710 m/s)  
**MUZZLE ENERGY**—1469 ft/lbs (1992 J)  
**SIGHTS**—Open, Tangent round-notch/post, Adjustable 0 to 800 meters in 100 meter graduations  
**FEED**—30 round removable box magazine  
**WEIGHTS**  
**WEAPON (EMPTY)**—AK-47 8.53 lbs (3.87 kg)  
 AKS-47 7.65 lbs (3.47 kg)

**WEAPON (LOADED)**—AK-47 10.56 lbs (4.79 kg) early steel mag  
 AKS-74 9.68 lbs (4.39 kg) w/early steel mag  
**MAGAZINE (EMPTY)**—Early steel magazine 0.95 lbs (0.43 kg)  
 Late steel magazine 0.73 lbs (0.33 kg)  
 Aluminium magazine 0.37 lbs (0.17 kg)  
**MAGAZINE (LOADED)**—Early steel magazine 2.03 lbs (0.92 kg)  
 Late steel magazine 1.81 lbs (0.82 kg)  
 Aluminium magazine 1.45 lbs (0.66 kg)  
**SERVICE CARTRIDGE**—M43 Ball 253 gr (16.4 g)  
**PROJECTILE**—122 gr (7.9 g)  
**LENGTHS**  
**WEAPON OVERALL**—AK-47 34.25 in. (87 cm)  
 AKS-47 27.52/34.21 in (69.9/86.9 cm)  
**BARREL**—16.30 in (41.4 cm)  
**SIGHT RADIUS**—14.8 in. (37.6 cm)



*A left-side view of a Soviet AKMS-47 with its stock folded. The pattern seen just above the buttplate on the wooden foregrip is distinctive of the laminated wood used in many Soviet Block-produced AK-47 series weapons.*  
PHOTO CREDIT: KEVIN DOCKERY

The AK47 and its variations was the primary shoulder weapon of communist forces throughout the world from 1948 until the 1980's. The SKS which preceded the AK47, is a light semiautomatic carbine that was the first production weapon chambered for the 7.62x39mm round or 7.62mm Intermediate as it was called by Vietnam-era SEALs.

The SKS, for Samozaridnya Karabina Simonova, is a relatively simple carbine with a ten-round internal magazine. The magazine can be filled with loose rounds or quickly loaded from a ten-round stripper clip. The physical characteristics of the SKS made it a very good weapon for the small-stature Asian soldier. Manufactured in several variations in at least five countries, the most common model of the SKS captured in Vietnam was the Peoples Republic of China (PRC) Type 56 Carbine with an integral, folding, spike bayonet.

The 7.62x39mm round was proved out in the SKS carbine and has become arguably the most common military cartridge in the world. When fired in the SKS or AK-47, the 7.62x39mm round has a very unique sound signature, distinctly different from US weapons. In addition, the tracer loading of the 7.62x39mm round emits a green trace when fired as compared to the US, and NATO's, red trace.

#### **AK-47, AKS-47**

By far the most popular weapon chambered for the 7.62x39mm round is the AK47. The original AK47, for Avtomat Kalashnikov, is a very robust, compact, and powerful weapon well suited for the Southeast Asian environment as well as the guerrilla tactics of the Viet Cong. The AK47 will continue to function with little or no maintenance given to it over extended periods. Though not particularly accurate, especially after years in the jungle, the AK47 is capable of putting out a high volume of effective fire when used on full automatic.

#### **AKM-47, AKMS-47**

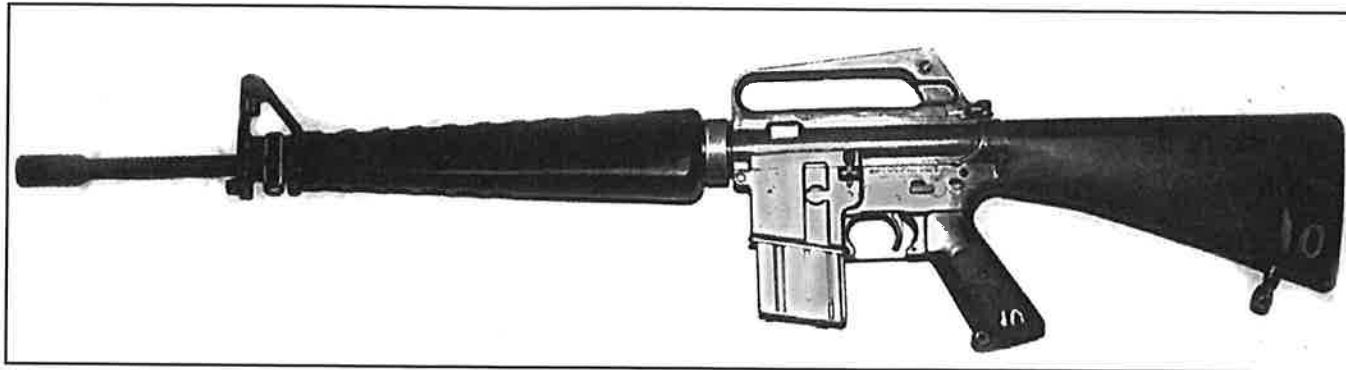
The receiver of the AK47 was manufactured as a complex machining from a solid block of metal. The later, and more common, AKM47 has its receiver made up of sheet metal stampings. Several improvements are incorporated into the AKM47 and it is somewhat lighter, but every bit as rugged, as the original AK47. The AKM47, for Avtomat Kalashnikova Modernizirovanniyi, is also found in a folding-stock version, the AKMS47. The earlier AK47 also had a folding stock version, the AKS47. In both versions, the folding stock swings underneath the weapon and can be locked in the open or closed position. With the stock folded, the AK makes a compact, if heavy, package of firepower.

Literally millions of AK47s have been produced in over ten countries. As found in the SKS, the most common AK47 variant found in Vietnam was the wooden stocked PRC Type 56 assault rifle, found both with and without a folding spike bayonet.

Initially, the AK47 was available in only small numbers to the Viet Cong fighting in South Vietnam. This resulted in the AK47 being something of a prestige weapon among the VC prior to 1968 and the Tet offensive. The SEALs were very quick to notice the importance of finding AK47 armed VC:

“The AK-47 was in very short supply among the VC in 1967. Only the highest ranking VCI [Viet Cong Infrastructure], number one ichi ban, and their number one bodyguards were seen with the weapon...”

Very soon after deployments began in Vietnam, AK47s were kept in stock in the armories of both SEAL Teams. The weapons acted as both training aids and as a possible source of sterile (non-US) weapons if needed. AK47s and SKSs came from captures in Vietnam and elsewhere. Ammunition was also made available from supply caches



**“One of the last specialized weapons received by the UDTs and SEALs while they were still involved in Vietnam was a modified M16A1.”**

*This is the Navy’s Mark 4 version of the M16A1 rifle. The dark appearance of the metal parts is due to the special anticorrosion coating that is part of the Mk 4 conversion. A side-mounting sling swivel can be seen projecting just under the front sight assembly.*

*PHOTO CREDIT: KEVIN DOCKERY*

**TECHNICAL DATA**—Mark 4 Mod 0 w/Mk 2 Mod 0 Blast suppressor

NSN 1005-00-102-8649

**CARTRIDGE**—.223 Remington (5.56x45mm)

**OPERATION**—Gas

**TYPE OF FIRE**—Selective - semiautomatic/full automatic

**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 800 rpm

**MUZZLE VELOCITY**—3250 fps (991 m/s)

**MUZZLE ENERGY**—1313 ft/lbs (1780 J)

**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters

**FEED**—20 or 30 round removable box magazines

**WEIGHTS**

**WEAPON (EMPTY)**—6.37 lbs (2.89 kg) w/o suppressor or flashhider  
8.62 lbs (3.91 kg) w/suppressor

Mk 4 Mod 0 Blast suppressor 2.25 lbs (1.02 kg)

**WEAPON (LOADED)**—7.39 lbs (3.35 kg) w/30 rd mag, w/o suppressor or flashhider

9.64 lbs (4.37 kg) w/suppressor & 30 rd mag

**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)

30 round aluminium 0.24 lbs (0.11 kg)

**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)

30 round 1.02 lbs (0.46 kg)

**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)

**PROJECTILE**—56 gr (3.6 g)

**LENGTHS**

**WEAPON OVERALL**—39 in (99.1 cm) w/o suppressor  
45.38 in (115.3 cm) w/suppressor

**BARREL**—20 in

**SUPPRESSOR LENGTH**—8 in (20.3 cm)

**SUPPRESSOR DIAMETER**—1.75 (4.4 cm)

**SIGHT RADIUS**—19.75 in. (50.2 cm)

Suppressor reduction on the normal sound signature of the weapon, was -32 db. The suppressor is designed to be fully self-draining within eight seconds of removal from immersion.

The Mk 4 Mod 0 rifle is a modified M16A1. The changes are to allow the weapon to be carried at a depth of 200 feet without damage. Provisions are made for the rapid drainage of water from the system and additional protection from the corrosive effects of sea water. Modifications include:

Anticorrosion treatment by applying Kalgard coating to many of the functioning components

Drilling a 1/4 inch hole in the lower receiver extension tube and stock

Installing an O-ring on the end of the buffer assembly

Attachment of the Mk 2 Mod 0 Blast suppressor which is considered an integral part of the Mk 4 rifle.

Basic issue with the weapon includes a sling, complete cleaning kit, and six - 30 round magazines.



*This combat swimmer has just left the water with his Mark 4 variation of the M16A1 rifle. Besides the normal protection from the water that is part of the Mark 4 conversion, this weapon also has a plastic muzzle cap over the flash hider to help keep water out of the barrel. The muzzle cap is plastic and can be easily fired through without any damage to the weapon.*

PHOTO CREDIT: US NAVY

captured in the field by SEALs. As the war progressed, the US military had sterile (unmarked) 7.62x39mm rounds manufactured at US ammunition facilities. Though the cartridges themselves were unmarked, that was not the case with the cardboard boxes the rounds came packaged in. In plain black letters is printed 20 CARTRIDGES - AK 47 RIFLE AMMO - 7.62 X 39 MM - LOT xxx-xxx-xx

But for the Teams, the most common source of supply for 7.62x39mm ammunition was from the original people who made it, captured in Vietnam as shown in the following portion of a BARNDANCE card (Barndance cards were short reports filled out on each SEAL field operation conducted by a SEAL platoon while deployed to Vietnam):

BARNDANCE # 6-19 SEAL TEAM TWO; DET ALPHA; 6 PLT

DATE(S): 10 Jan 68

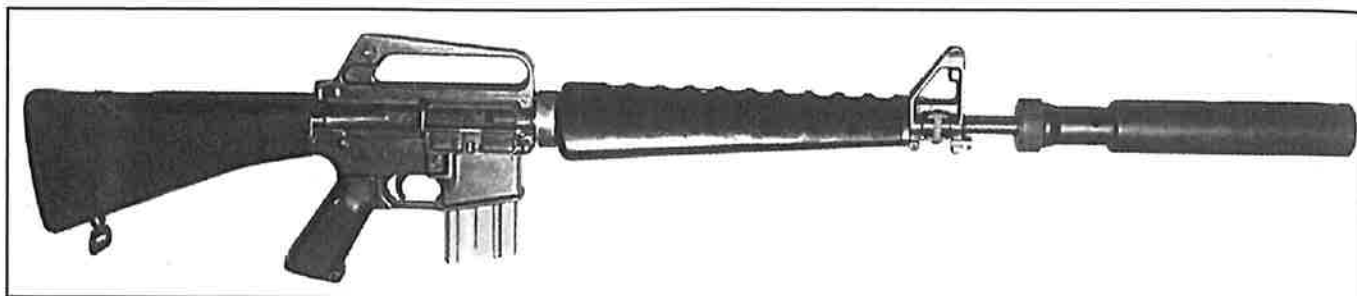
Located four enemy ammunition caches in vicinity of XT 270330. REMARKS (SIGNIFICANT EVENTS, OPEVAL RESULTS, ETC.): Captured the following: 67 - 75mm rockets, 29 - 57mm recoilless rockets, 197 - B40 rockets, 30 - 81mm mortars, 28,120 rounds of AK 47, 24 hand grenades, 1615 1o2 lb blocks of C-3, 6 ponchos, 1 gas mask. All ammunition except 7400

AK47 turned over to Army. 7400 rounds of AK47 retained for SEAL Team 2.

The AK47 and its variations have remained part of the SEALs training. Both the SKS and AK47 were listed as weapons a SEAL should be familiar with in the 1974 edition of the SEAL Training Handbook. It is interesting to note that one of the first weapons the SEALs faced in Vietnam, the AK47, was also one of the last weapons they carried on combat missions in Southeast Asia.

#### **MARK 4 MOD 0 (M16)**

One of the last specialized weapons received by the UDTs and SEALs while they were still involved in Vietnam was a modified M16A1. The modifications done to the M16A1 were to waterproof the weapon and generally make it easier to transport underwater and prepare for immediate use by combat swimmers. Officially identified as the Rifle, 5.56mm Mark 4 Mod 0 at the time of its adoption in April 1970, modifications to the M16A1 included: an anticorrosion treatment consisting of coating many of the working parts of the weapon with Kal Gard gun coating; drilling a 1o2 inch hole in the lower receiver extension tube and stock; installing an O-ring on the end of the buffer assembly; and, attachment of the Mk 2 Mod 0 Blast suppressor



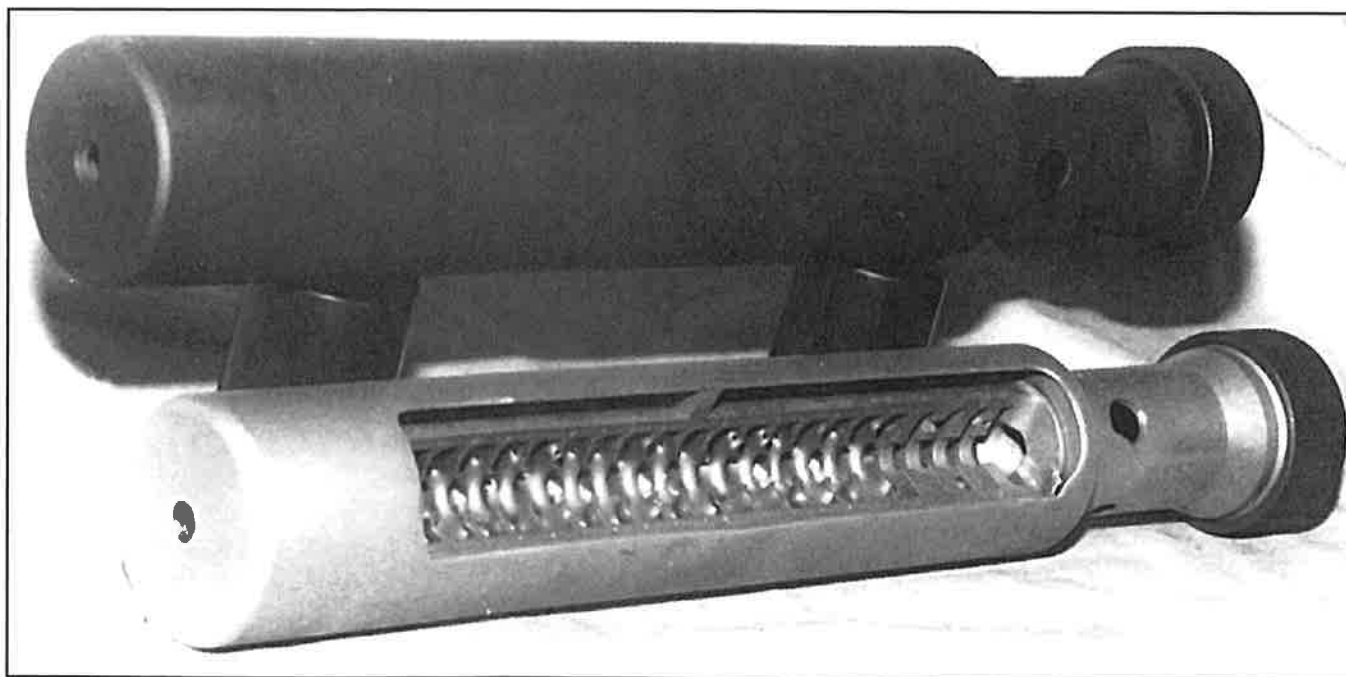
**“The KAC suppressor is a stainless steel, baffle type design with a central perforated baffle tube surrounded by an annular expansion space. The suppressor, now identified as the Mk 2 Blast Suppressor, is able to be fully immersed in water and completely self-draining within 8 seconds.”**

*A right-side view of a complete Navy Mark 4 version of the M16A1 rifle with a Mark 2 blast suppressor in place on the muzzle. The Mark 4 package is issued complete with the Mark 2 blast suppressor and five magazines.*

*PHOTO CREDIT: KEVIN DOCKERY*

*The Knight Armaments-produced Mark 2 blast suppressor. The top specimen is a standard-production model with the stainless steel body covered with a dark anticorrosion coating. The lower cutaway specimen shows the complex baffle arrangement inside the blast suppressor that slows down the escaping gas of a fired round. The multiple large holes in the reduced-diameter section of the Mark 2 allow a fired cartridge casing to be used to hold the Mark 2 while the collet is tightened or loosened. The collet used to secure the Mark 2 to the barrel of an M16 is adjusted by turning the serrated ring at the breech end of the suppressor.*

*PHOTO CREDIT: KEVIN DOCKERY/KNIGHT ARMAMENT COMPANY*





*Two SEALs during a beach insertion demonstration. Both men are holding Colt Model 653 carbines. The weapons are loaded with 30 round magazines and each is fitted with a China Lake blank adaptor on the muzzle. The flat, six-sided cross-section of the blank adaptor can be seen on the weapon at the right. One SEAL is wearing a floppy "boonie" hat while the other is wearing an olive-drab triangular bandage - commonly called a patrol rag - as a bandanna.  
PHOTO CREDIT: UDT-SEAL MUSEUM*

which is considered an integral part of the Mk 4 rifle.  
The changes to the basic M16A1 are to allow the weapon to be carried at a depth of 200 feet without damage. Provisions are made for the rapid drainage of water from the system and additional protection from the corrosive effects of sea water. The basic issue of materials with the weapon includes a sling, complete cleaning kit, and six 30 round magazines.

The original suppressor issued with the Mk 4 was the first model Mk 2 Mod 0 blast suppressor based on the earlier HEL M4. By the late 1970's, the first model blast suppressor was no longer considered adequate for the Mk 4 rifle. Advances in suppressor technology had rendered the earlier design obsolete as a number of new suppressors were on the market with greater sound suppression and durability. After testing a number of available designs, the Navy chose the Knight's Armament Company's (KAC) model

The KAC suppressor is a stainless steel, baffle type design with a central perforated baffle tube surrounded by an annular expansion space. The suppressor, now identified as the Mk 2 Blast Suppressor, is able to be fully immersed in water and completely self-draining within 8 seconds. The advantages of this aspect of the design for the SEALs and UDTs are obvious. The KAC suppressor

*Two combat swimmers come ashore in a more obvious manner than is usually done by the SEALs. The swimmers are both armed with Mark 4 versions of the M16A1 rifle. On their chests are Draeger LAR-V rebreathers and they still hold the breathing tubes in their mouths. The green-painted oxygen cylinder underneath the housing of the Draeger is visible on the front SEAL. PHOTO CREDIT: US NAVY*





*A right-side view of the Colt Model 653 carbine. The buttstock is in the maximum extended position and the weapon is loaded with a production 30 round magazine. The forward bolt assist can be seen on the upper receiver just above the pistol grip. The spring-loaded ejection port is closed in this picture. The weapon is supported by an M3 bipod clamped below the front sight and the muzzle is mounted with the third model "birdcage" flash suppressor.*

*PHOTO CREDIT: KEVIN DOCKERY*

**“Since the carbine did not require the longer flash/sound suppressor but had the shorter standard flash hider, the overall length of the model 653 carbine was only slightly longer than the XM177E2. A favorite weapon of the SEALs is produced when the short, handy carbine is mated with the M203 40mm grenade launcher. The powerful combination of automatic rifle and high explosive grenade launcher became a common sight in SEAL hands.”**

**TECHNICAL DATA**—Colt Model 653 Carbine  
NSN 6D1005-01-029-3866  
**CARTRIDGE**—.223 Remington (5.56x45mm)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 800 rpm  
**MUZZLE VELOCITY**—3020 fps (920 m/s)  
**MUZZLE ENERGY**—1134 ft/lbs (1538 J)  
**SIGHTS**—Open, Flip-type aperture/post, Adjustable, battle aperture 0 to 300 meters, long range aperture 300 to 500 meters  
**FEED**—20 or 30 round removable box magazines  
**WEIGHTS**  
**WEAPON (EMPTY)**—5.6 lbs (2.54 kg)  
**WEAPON (LOADED)**—7.02 lbs (3.18 kg) w/sling & 30 rd mag  
Sling 0.4 lbs (0.18 kg)  
**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.71 lb (0.32 kg)  
30 round 1.02 lbs (0.46 kg)  
**SERVICE CARTRIDGE**—M193 Ball 182 gr (11.8 g)  
**PROJECTILE**—56 gr (3.6 g)  
**LENGTHS**  
**WEAPON OVERALL**—29.8/33 in. (75.7/83.8 cm)  
**BARREL**—14.5 in (36.8 cm)  
**SIGHT RADIUS**—14.72 in. (37.4 cm)





*This SEAL takes aim with his Colt Model 653 Carbine while undergoing desert training. His radio is an AN/PRC-77 with the handpiece pulled under his left arm while he is seated. His loadbearing equipment is the nylon All Purpose Lightweight Individual Carrying Equipment (ALICE) gear adopted by the Army in 1974. He is also wearing 1st pattern desert camouflage BDUs (Battle Dress Uniform) made familiar to the public in the pictures from Desert Storm.*  
 PHOTO CREDIT: SPECIAL OPERATIONS COMMAND PAO

acts as a muzzle blast device and has a very strong barrel attachment system that is still easily removable. In addition to its being made of noncorroding materials and self-draining design, the KAC Mk 4 suppressor is able to withstand full automatic fire from the M16 at the maximum rate possible without being damaged from the heat or blast.

By the end of their involvement in the Vietnam War, the SEALs and UDTs were already experiencing cutbacks in their numbers and financing. New weapons were relatively few in number and parts difficulties were making repair of some of the Vietnam era weapons difficult.

With the ending of the CAR-15 project by Colt in 1970, spare parts unique to the XM177/E1/E2 family were available in very limited numbers. The short barrels that helped make the CAR-15 weapons so popular were particularly rare. Most units, including the Teams, husbanded their remaining CAR-15s carefully and repaired some weapons by cannibalizing other more worn pieces for parts.

The short barrel of the CAR-15 weapons was never noted for its accuracy and when the barrels became worn, accuracy dropped quickly to unacceptable levels.

When finally no more worthwhile 11.5 inch CAR-15 barrels were available, Colt offered their 14.5 inch carbine barrel. The M16A1 carbine was a new weapon from Colt that shared many features with the CAR-15 weapons. Some XM177E1 and E2 receivers were rebarreled for use with the carbine barrel and became hybrid weapons, appearing to be carbines but marked as XM177E1/E2s.

With the declaration by the ATF (Alcohol, Tobacco, and Firearms) department of the Treasury that the CAR-15 flash/sound suppressor qualified as a silencer under the law, and the State Department's outlawing export silencer sales under the Carter administration, Colt changed the design specifications of the CAR-15 to meet market requirements. Since the flash/sound suppressor of the XM177 weapons was a major sticking point, Colt simply extended the barrel of the new carbine weapon to the point where flash and sound could be held to reasonable levels. In addition, the slightly longer barrel of the carbine made it more accurate than the earlier CAR-15 weapons as the bullets had more time to stabilize for flight.

#### **COLT CARBINE MODEL 653**

The Colt Model 653 M16A1 carbine was eventually adopted by the SEALs and UDTs in some small numbers.



At a demonstration, the SEAL in the center is wearing a full set of winter equipment including a white camouflage cover for his uniform and pack as well as aluminum-frame snowshoes. His weapon is a folding-stock M14A1 only found used by the SEALs. The stock on this specimen is folded forward and the magazine removed; that is in the SEAL's left hand. The buttplate of the folding stock is covered by a pad and is still in the extended (vertical) position. The SEAL to the right in this photo is equipped for Close Quarters Battle. A 3-cell pouch for 30 round MP5 magazine can be seen at his waist. Below the magazine pouch is a special 3-cell pouch for holding Flash-Crash (stun) grenades.

PHOTO CREDIT: KEVIN DOCKERY

Members of SEAL Team Two take part in a military biathlon competition while undergoing cold weather training in Norway. The men are target shooting with their folding-stock M14 rifles after having completed a portion of the cross-country skiing part of the competition. Additional weapons have been thrust into the snow butt-first to indicate additional firing positions on the line. Note the folding stocks on the weapons being fired.

PHOTO CREDIT: RYAN McCOMBIE COLLECTION



The model 653 shared the same sliding buttstock and short cylindrical handguards as the XM177E2. The most visible difference between the two weapons is the longer barrel of the carbine protruding well beyond the front sight.

The longer carbine barrel is fitted with the Type 3 flash suppressor as found on the standard M16A1s of the era. Since the carbine did not require the longer flash/sound suppressor but had the shorter standard flash hider, the overall length of the model 653 carbine was only slightly longer than the XM177E2. A favorite weapon of the SEALs is produced when the short, handy carbine is mated with the M203 40mm grenade launcher. The powerful combination of automatic rifle and high explosive grenade launcher became a common sight in SEAL hands.

More compact and powerful weapons have long been a priority with the Teams and especially the SEALs. Room is limited at best on many transports and it is at an absolute premium aboard submarines and Swimmer/SEAL delivery vehicles.

#### **M14 WITH FOLDING STOCK**

Facing much the same problem of space limitations in their armored vehicles, the Army examined fitting the, then standard, M14 rifle with a folding stock during the early 1960's. Four different models of folding stock were developed by the engineers at Springfield Armory. With the winding down of M14 production, the project was abandoned by the Army.

Few of the Army folding M14 stocks were ever made and even fewer still were available for later use by the Teams. A near-duplicate of the M14/M1 Garand was produced by Italy as their BM 59 series of weapons. The Parachutists and Alpine versions of the BM 59 are fitted with folding stocks that proved to be easily adapted to fit the M14 rifle.

The modified M14 stocks with the BM 59 folding buttstock design were obtained by the Teams by the late 1970's. With the stock folded, the M14 is a more compact package, not a great deal larger than an M16A1. The added power and range of the 7.62mm NATO round and the M14 rifle, combined with the compact folding stock gives the Teams the option of fielding the weapon as the tactical situation dictates.

Through the latter half of the 1970's trials were being conducted by the NATO countries to locate a candidate cartridge and possible weapon for NATO standardization. Though the trials did not locate a weapon design that was acceptable to all NATO members, they did focus on a superior cartridge.

What developed out of the NATO trials was not a new cartridge but a better loading for an existing round. The loading chosen was the Belgium SS109 heavy bulletted 5.56mm round. This loading was duplicated in the US counterpart, the XM855 round. The new loading called for a steel-cored, partial armor piercing 61.7 grain (4 g) bullet to be fired from a barrel with a 1 in 7 inch (1 in 30.5 cm) twist. The new projectile held excellent accuracy and terminal effects out to ranges near that of the 7.62mm NATO round.

By late 1979, the US Marine Corps was already discussing the possibility of a new issue rifle. The improved range of the XM855 round caught the Marine's attention as a possible answer to their desire for more of a "rifleman's" weapon to arm the Corps. Requirements later formalized for the Marines desired new weapon, a modified M16A1, were as follows: an adjustable sight good to 800 meters; a projectile with good accuracy to 800 meters and able to penetrate all known helmets and military body armor at that range; stronger plastic and metal parts on the weapon to stand up better to the heavier demands placed on it by Marine training doctrine; and, elimination of the full automatic position and its replacement with a controlled 3-round burst setting.

Additional tests conducted by the Navy added more parameters and suggestions to the physical changes in a possible new Marine rifle. Test weapons were ordered from Colt and examined to see if a modified M16A1 would fit the Marines desires. This led to the development of the third-generation M16, the M16A2.

The Joint Services Small Arms Program (JSSAP) approved a joint-services approach to a new and improved M16A1 by ordering 50 Product Improvement Program (PIP) M16A1s from Colt to be delivered in November 1981. Designated the M16A1E1, the new rifles were extensively tested by the Marines during the last weeks of 1981. The results of the testing gave very favorable reports on the accuracy, range, effectiveness, and handling qualities of the M16A1E1. By September 1982, the M16A1E1 was type-classified as the M16A2.

The Marines ordered 76,000 M16A2's as quickly as they were able. The Army did not have as strong a desire for the new rifle to be immediately available, stocks of M16A1s being considered sufficient to cover several years needs. By 1986, the Army contracted for the purchase of 100,176 M16A2 weapons from Colt.

The M16A2 as issued to the US military is identified by Colt as their model 705. The major differences between the M16A1 and the A2 model include:

- Modification of the flash hider to a fourth type without bottom slots. The lack of bottom slots on the M16A2 flash hider prevents dust and dirt from flying up when the weapon is fired in the prone position. The flash hider also acts as a muzzle compensator, helping to hold the muzzle down when firing bursts.

- A barrel with a heavier contour from the front sight forward. In addition, the new barrel is rifled with a one in 7 inch twist for use with the M855 round.

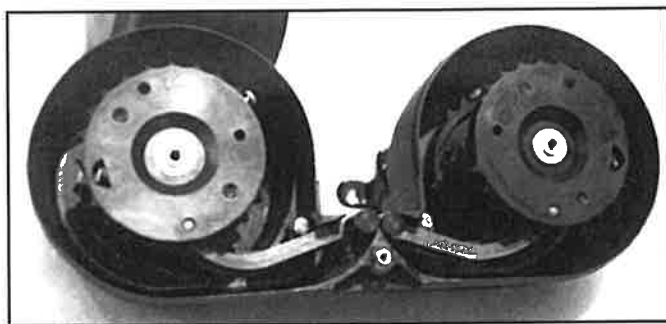
- Different front and rear sights with the rear sight adjustable to 800 meters range with an easily moved elevation drum.

- New cylindrical, ribbed handguards. Stronger and more efficient at cooling than the earlier triangular M16A1 handguards, the new handguards are also ambidextrous. Either one will fit on the right or left side of the barrel. An angled slip ring making it easier to remove the handguards for routine maintenance.

- A strengthening of the upper receiver.

**TECHNICAL DATA**—Colt Model 723  
 NSN OA1005-LL-L99-5287  
**CARTRIDGE**—.223 Remington NATO (5.56x45mm NATO)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm,  
 Cyclic 700 to 950 rpm  
**MUZZLE VELOCITY**—2900 fps (884 m/s)  
**MUZZLE ENERGY**—1158 ft/lbs (1570 J)  
**SIGHTS**—Open, Flip-type aperture/post, Adjustable,  
 battle aperture 0 to 300 meters,  
 long range aperture 300 to 500 meters  
**FEED**—20 or 30 round removable box magazines

**WEIGHTS**  
**WEAPON (EMPTY)**—5.9 lbs (2.68 kg)  
**WEAPON (LOADED)**—7.35 lbs (3.33 kg) w/sling & 30 rd mag  
 Sling 0.4 lbs (0.18 kg)  
**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
 30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.73 lb (0.33 kg)  
 30 round 1.05 lbs (0.48 kg)  
**SERVICE CARTRIDGE**—M855 Ball 190 gr (12.3 g)  
**PROJECTILE**—62 gr (4 g)  
**LENGTHS**  
**WEAPON OVERALL**—29.8/33 in. (75.7/83.8 cm)  
**BARREL**—14.5 in (36.8 cm)  
**SIGHT RADIUS**—14.72 in. (37.4 cm)

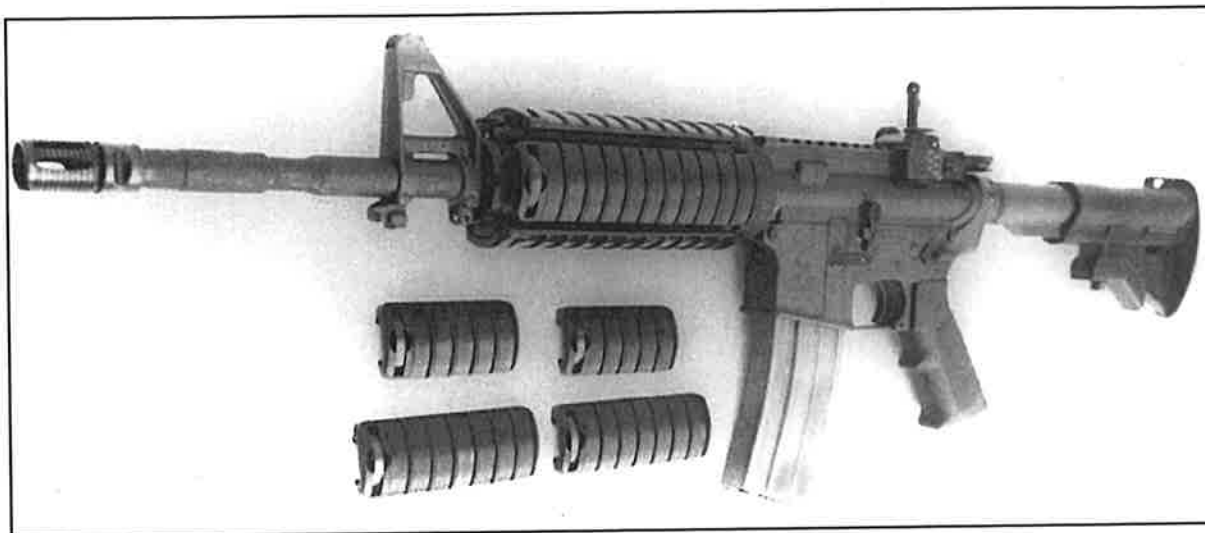


*A rear-view of the Beta Company 100 round C-Mag without the central magazine or rear cover. The two drums hold over forty round of ammunition in a double column around their circumference when fully loaded. The two pusher bars, braced at the center of the magazine for this photograph, drive the ammunition around the edges of the drum and up through the central magazine assisted by the sprockets at the center of each drum. As the magazine is emptied, the drums feed rounds alternately into the central magazine, maintaining a balance in the system.*

PHOTO CREDIT: KEVIN DOCKERY

*A Colt Model 723 Carbine with its sliding stock in the fully-extended position. The weapon is loaded with a C-MAG 100 round double-drum magazine. The C-MAG magazine holds 50 rounds on either side of the magazine well of the weapon and feeds rounds alternately from each drum as the weapon is fired. The low-silhouette of the C-MAG design is illustrated in this photograph. The notch around the barrel of the Model 723 carbine is for the mounting of an M203 40mm grenade launcher without further modification to the carbine or launcher.*  
 PHOTO CREDIT: KEVIN DOCKERY

**“A short carbine version of the M16A2 has been available to the Teams and is much preferred over the M16A2 rifle.”**



*A left-side view of the SOCOM M4A1 carbine with the 800 meter rear sight raised and the forend mounting surfaces covered by grip plates. The different length grip plates below the weapon can be used to cover the forend mounting surfaces when only a portion of the mount is used by a sight or other accessory. On the muzzle of the weapon is the Knight Armament QD muzzle compensator.*

PHOTO CREDIT: KNIGHT ARMAMENT COMPANY

A longer buttstock.

A pistol grip that is slightly larger and has a single finger rest.

All plastic parts are now made of a supertough nylon plastic, ten to 12 times stronger than the original M16A1 parts.

A bulge in the upper receiver acts as a brass deflector allowing easier left-handed firing of the weapon.

Replacement of the full auto position with a controlled 3-round burst.

The replacement of the full automatic fire capability in the M16A2 is one of the most discussed arguments against the new weapon. Though having other good characteristics, the lack of full automatic fire limits the appeal of the M16A2 to the Teams. In addition, flaws were quickly noticed by operators who used the 3-round burst position on the M16A2.

If a 3-round burst is attempted to be fired from the M16A2, and the weapon stops or runs out of ammunition, the mechanism does not reset when the trigger is released. If the weapon runs out of ammunition on the second round of a 3-round burst, when the operator reloads and again pulls the trigger, only a single shot will be fired. If the operator releases the trigger when only a single shot of a 3-round burst has been fired, when he pulls the trigger again, 2 rounds will be fired. This fault is part of the design of the M16A2 controlled burst mechanism and cannot be changed.

### COLT MODEL 723

As the new standard issue shoulder arm in the US military, the M16A2 is issued to the SEALs as well as all the other branches of the service. A short carbine version of the M16A2 has been available to the Teams and is much preferred over the M16A2 rifle. The M16A2 carbine

is identified by Colt as their model 723 weapon. Virtually identical to the earlier model 653 M16A1 carbine, the model 723 weapon has the larger pistol grip of the M16A2, the fourth model flash hider, and the 1 in 7 inch rifling twist. The full automatic capability, sights, and other characteristics of the model 653 carbine, including the thinner contour barrel, remain the same on the new model 723 carbine.

### M4 CARBINE (COLT MODEL 720, MODEL 727)

Another version of the M16A2 system is seeing duty with the SEAL teams and is being much more enthusiastically received than the M16A2 rifle. The M4 carbine is another shortened version of the M16A2 but retains many of the new features found on the full-sized rifle.

The sights on the M4 are the same long range adjustable model as found on the M16A2. The M4 also has the heavier barrel, fourth model flash hider, and brass deflector as on the M16A2. The heavy barrel of the M4 carbine has a slight step in the barrel diameter roughly midway between the muzzle and the front sight. The step is so that the M203 40mm grenade launcher can be mounted on the M4 with no modifications needed on either weapon.

The M4/M203 combination is a very popular one with the Teams. Given the proper circumstances, entire platoons have been armed with the M4/M203 such as during operation JUST CAUSE in Panama. Two different models of the M4 are issued in the military. The Colt model 720 is an M4 carbine with the 3-round controlled burst setting and no other capability for full automatic fire. The Colt model 727 M4 carbine has the capability of full automatic fire and is the preferred model for use by the SEALs.



The complete Knight Armaments Company (KAC) Modular Weapon System recently adopted by the Special Operations Command (SOCOM) for issue to their forces including the Navy SEALs as the M4A1 carbine. The basic weapon is the Colt Model R0927 carbine version of the M16A2 rifle with the KAC Rail Interface System (RIS) in place of the standard front handguard. The RIS has four MIL-STD-1913 mounting rails that will accept a wide range of accessories for both aiming or controlling the weapon. Accessories in this photo include (above the weapon from left to right) the KAC low-profile folding 300 meter rear sight, the ITT "pocketscope" night vision device on a KAC mount, and the Aimpoint 5000 also on a KAC mount. Below the weapon from left to right are; the five different lengths of handguard sections that can fit on the RIS forend different lengths filling in for the space remaining from various devices, the KAC basic vertical foregrip, the KAC monopod vertical foregrip assembly with the monopod extended. Directly below the barrel is the Leupold visible laser aiming device with its companion panel switch module. Below the Leupold assembly is the tactical Streamlight poly flashlight package held to the mounting plate with KAC rings. In addition to these devices, a folding bipod assembly is also available to go on the RIS-equipped M4A1 carbine  
 PHOTO CREDIT: KNIGHT ARMAMENT COMPANY

**TECHNICAL DATA**—M4 Carbine (Colt Model 720)  
**CARTRIDGE**—.223 Remington NATO (5.56x45mm NATO)  
**OPERATION**—Gas  
**TYPE OF FIRE**—Selective - semiautomatic/full automatic  
**RATE OF FIRE**—Practical SS 45 to 65 rpm, A 150 to 200 rpm, Cyclic 700 to 800 rpm  
**MUZZLE VELOCITY**—2900 fps (884 m/s)  
**MUZZLE ENERGY**—1158 ft/lbs (1570 J)  
**SIGHTS**—Open, Flip-type aperture/post. Adjustable, battle aperture 0 to 200 meters, adjustable long range small aperture 300 to 800 meters in 100 meter graduations  
**FEED**—20 or 30 round removable box magazines

**WEIGHTS**  
**WEAPON (EMPTY)**—5.65 lbs (2.56 kg)  
**WEAPON (LOADED)**—7.1 lbs (3.22 kg) w/sling & 30 rd mag  
 Sling 0.4 lbs (0.18 kg)  
**MAGAZINE (EMPTY)**—20 round aluminium 0.19 lb (0.08 kg)  
 30 round aluminium 0.24 lbs (0.11 kg)  
**MAGAZINE (LOADED)**—20 round 0.73 lb (0.33 kg)  
 30 round 1.05 lbs (0.48 kg)  
**SERVICE CARTRIDGE**—M855 Ball 190 gr (12.3 g)  
**PROJECTILE**—62 gr (4 g)  
**LENGTHS**  
**WEAPON OVERALL**—29.8/33 in. (75.7/83.8 cm)  
**BARREL**—14.5 in (36.8 cm)  
**SIGHT RADIUS**—14.72 in. (37.4 cm)



*The M4A1 carbine with the Knight RIS system. Mounted on the top rail of the RIS forend is an infrared aiming light. On either side of the forend are "11 rib" full length handguard sections. On the bottom of the RIS, held in a firing position by the operator, is the KAC "Masterkey" shotgun, a modified 12 gage Remington 870 pump shotgun used primarily for opening doors by blasting off the hinges/lock.*  
PHOTO CREDIT: KNIGHT ARMAMENT COMPANY

As of February, 1994, Special Operations Command (SOCOM) awarded a contract to Colt for production of 5,000 to 6,000 M4A1 carbines. The new M4A1, Colt model 927, is intended specifically for Special Operations forces including the SEALs. Firing settings for the M4A1 will be full and semi automatic, with the sights, barrel, and other aspects retained from the standard M4 carbine. The major change will be in the rear sight system.

The M4A1 will be equipped with the "Picatinny Rail" mounting located under the removable carrying handle. The carrying handle will retain the standard M16A2 rear sight but can be removed to allow different sighting devices to be mounted. Mounting on the Picatinny Rail makes for a much lower weapon outline as well as giving a more solid and accurate mounting interface than the handle of the weapon. Other modifications on some M4A1s will allow a laser sight or 12 gauge shotgun to be mounted underneath the barrel for close-quarters combat. Production of the M4A1 was planned to begin in May 1994.

To increase their available volume of fire, the SEALs and Special Forces have obtained a number of special C-MAG 100 round drum magazine for the M16 family of

weapons. The C-MAG drum is a large capacity, highly dependable feed device that will fit any magazine well that accepts an M16 magazine.

The C-MAG weighs 2.21 pounds (1.00 kg) empty and will accept and feed a full 100 rounds of ammunition. The use of dual drums feeding from either side of the magazine extension allows the C-MAG to have a very low profile when mounted on the M16 weapon. The drums are spring driven and feed their rounds along a spiral track on the outside diameter of the drum. The rounds feed up into the magazine extension alternating one from each drum.

As the ammunition empties onto the magazine extension, flexible feed chains move from the drums up into the magazine extension. The feed chains insure positive tension is kept on the ammunition until the last round is fed into the weapon. When the last round is fired, the C-MAG activates the bolt lock just as a standard magazine would. The design of the C-MAG is such that the weapon actually has a lower profile with the 100 round drum loaded than it does with a standard 30-round box magazine.