

# Timeline for the Stoner 63 weapon development.

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Much of the included information is from the article "The 5.56 X 45mm Timeline" A Chronology of Development by Daniel E. Watters

**1962**

Gene Stoner joins Cadillac Gage to begin work on the 7.62mm NATO Stoner 62 system.

**1963**

Enticed by Stoner to join him at Cadillac Gage, L. James Sullivan and Robert Fremont scale down the 7.62mm NATO Stoner 62 into the 5.56mm Stoner 63.

**Feb.**

The first firing model of the Stoner 63 is fabricated.

**March**

ARPA orders 25 Stoner 63 in various configurations. The contract will later be modified to add six fixed machine guns for the USAF for use in conducting pod-mounted tests for aircraft armament applications, and five complete systems, of which three go to the US Army and two to the USMC.

Gene Stoner files a patent application for the design used in the Stoner 62 and the Stoner 63.

**April**

Gene Stoner demonstrates the Stoner 63 to BG Lewis W. Walt, Director of the Marine Corps Landing Force Development Center.

**Oct.**

The USAF and Aberdeen each order a pair of Stoner 63 for testing.

**Dec.**

Engineering tests of the Stoner 63 begin at Aberdeen.

**1964**

Marine Corps Landing Force Development Center publishes the report "Stoner 63 Weapons System." A service and troop test was conducted on the Stoner 63 weapons system to determine its suitability for use within the USMC as the basic weapon and/or weapons system. The tests were also to evaluate the operational and organizational concepts, doctrine, tactics, and techniques affected by this weapons system. It is concluded that upon the correction of several deficiencies, the Stoner 63 weapons system will be suitable for use within the USMC as the replacement system for the present M14, M14(M), M60, and M3A1 weapons.

#### **March**

ARPA orders sixty Stoner 63 rifles along with 20 complete systems for USMC testing. USMC Commandant General Wallace M. Greene later becomes a proponent of the system.

Aberdeen's D&PS publishes "Military Potential Test of Stoner 63 Weapons System."

#### **April**

The HEL publishes "Human Factors Evaluation of the Stoner 63 Assault Rifle."

#### **May**

Aberdeen files a report concerning its testing of the Stoner 63.

#### **July**

The Office of the Chief Research and Development files a report concerning Stoner 63 testing.

#### **Aug.**

Army is continuing to examine several small caliber rifles as possible replacements for the current standard M14. These include other Colt CAR-15 developments, the Stoner 63 family, and the AR-18.

The USMC complains directly to General Johnson that their requests for procurement of the Stoner 63 are being ignored. At some point, the opinion is expressed that there is "an effort by some Army individuals to submerge the program."

#### **Sept.**

ACSFOR (Assistant Chief of Staff for Force Development) Lieutenant General Harrell submits a fact sheet to General Johnson with a description of the Stoner 63 weapon system and its current status, noting the limitations of the system cited by WECOM (US Army Weapons Command). These limitations are insufficient barrel life, weak belt pull, stock breakage while launching grenades, insufficient operating energy under adverse conditions, and unreliable tracer functioning in the machine gun.

**Nov.**

USMC briefers tell Deputy Secretary Vance that “the Army has a closed mind on the Stoner system and has been dragging its feet.” The Deputy DDR&E (Director of Defense Research and Engineering) relays to General Johnson that concurrence to this opinion is rapidly growing hold in the DOD (Department of Defense). Following this exchange, General Johnson orders that directives be prepared to the Army Staff, CONARC (US Army Continental Army Command), CDC (US Army Combat Developments Command), and AMC (US Army Material Command) to include the following: 1) tighten the doctrinal bases for the rifle and machine gun; 2) establish the QM, and follow it by the military characteristics needed; and 3) concurrently conduct a thorough test of the Stoner weapons family in order to get the data needed in advance to measure against the military characteristics, which will be determined later.

The AMC requests that TECOM (US Army Test and Evaluation Command) prepare plans for engineering and service tests of the Stoner 63 system. A TECOM directive is issued and planning begins.

The Marine Corps Operations Analysis Group publishes “Analysis of Firing Data of the Marine Rifle Squad Armed with Stoner 63 Weapons.”

**Dec.**

Gene Stoner files a patent application for the design of the Stoner 63’s clamp-on bipod.

**1964**

Nederlandsche Wapen-En Munitiefabriek (NWM) of the Netherlands is granted worldwide manufacturing and sales rights by Cadillac Gage for the Stoner 63 system. Oddly, NWM produces only barrels for the system over its history, and only a handful of weapons are assembled using US-made parts.

**Jan.**

Gene Stoner files a patent application for the design of the Stoner 63’s left-hand belt box and hanger.

**April**

Marine Corps Landing Force Development Center publishes the report “Stoner 63 Weapons Systems.”

The US Army orders 861 Stoner 63 in multiple configurations for the SAWS program. (These are later named the XM22 rifle, the XM23 carbine, and the XM207 LMG.)

The Stoner 63 system ends Arctic testing.

The Marine Corps Landing Force Development Center (MCLFDC) submits "Stoner 63 Weapon System Final Report" to Marine Corps Headquarters. The Stoner 63 system is recommended for further advanced field testing.

## **July**

SAWS testing by the USAIB (US Army Infantry Board) begins at Fort Benning. Test items include the M14, M14E2, M60, XM16E1, CAR-15 SMG, CAR-15 HBAR M1, HK 33, AR-18, and the Stoner 63 rifle, carbine, AR, LMG, and MMG.

The US Army Armor Board receives three Stoner 63 Fixed Machine Guns for testing as coaxial weapons for the M60 tank. Crews are unable to mount the weapons using existing hardware. Given the absence of the Colt CMG-1 Fixed MG, the test parameters are limited to vehicle stowed weapons. Five Stoner 63 Carbines and five Colt CAR-15 SMG are accepted for testing.

## **Aug.**

Gene Stoner receives US Patent #3,198,076 titled "Convertible Gun."

## **Sept.**

The US Army Armor Board begins service testing of the Stoner 63 Carbine and the Colt CAR-15 SMG.

## **Dec.**

The USAIB publishes the report "Small Arms Weapon Systems (SAWS)." Testing indicates that there are no significant differences between the SAWS weapons except for reliability. The current standard 7.62mm weapons (the M14, M14E2, and M60) are found to be significantly more reliable than their 5.56mm counterpart SAWS candidates (the CAR-15 family, Stoner 63 system, HK 33, and AR-18). Testing also indicates that XM16E1 rifles are more likely to foul, exhibit high cyclic rates, and suffer more malfunctions as a result when using cartridges loaded with WC846 versus CR 8136. The USAIB recommends that none of the 5.56mm weapons (including the XM16E1) be adopted until significant improvements over 7.62mm weapons can be made.

The US Army Armor Board publishes "Service Test of Small Arms Weapons Systems." Service tests of the Stoner 63 Carbine and the Colt CAR-15 SMG were conducted to test their suitability as vehicular-stowed weapons on combat vehicles for local security purposes and other dismounted action. The Stoner 63 Carbine and the Colt CAR-15 SMG offered significant advantages over the current standard caliber M3A1 SMG in range, general utility, safety, and handling characteristics for its intended purpose. Except for effective range, the Stoner 63 Carbine and the Colt CAR-15 SMG also offer the same advantages over the M14E1. The Stoner 63 Carbine as tested is suitable for US Army use

as a combat vehicle-stowed individual weapon, and the Colt CAR-15 SMG could be suitable when its deficiency is corrected. Both the Stoner 63 Carbine and Colt CAR-15 SMG are safe for their intended use. It is recommended that, subject to action by Department of the Army to adopt 5.56mm weapons on a scale for general use by ground troops, the Stoner 63 Carbine weapon be adopted for US Army use as a vehicle-stowed individual weapon for combat vehicle crew members.

The USMC orders 1,080 Stoner 63 rifles and accessories for use in additional testing.

## **1966**

### **Feb.**

Gene Stoner receives US Patent #3,235,997 titled "Bipod Gun Mount."

### **March**

Cadillac Gage introduces a series of product improvements to the Stoner 63. The updated weapon is now known as the Stoner 63A.

### **Sept.**

USMC Commandant General Wallace M. Greene reviews results and recommendations of special study group formed to analyze the SAWS study, along with all other references and small arms. General Greene concludes:

1. 5.56mm rifles and automatic rifles are superior to 7.62mm counterparts in firepower and system weight;
2. There is no significant difference between the 5.56mm rifles; and
3. The Stoner 63 MG is not an acceptable substitute for the M60.

General Greene decides that the XM16E1 should be procured for WestPac Marines, and further evaluation is needed for the Stoner 63 concept.

### **Oct.**

The USMC asks Cadillac Gage to upgrade 286 of their early Stoner 63 to the 63A standard.

### **Dec.**

Gene Stoner receives US Patent #3,293,986 titled "Magazine for Belted Ammunition."

## **1967**

### **Jan.**

The US Navy orders eight belt-fed Stoner 63A LMG for field testing by the SEALs in Vietnam.

NWM and its parent company Mauser – Industrie Werke Karlsruhe AG (IWK) of Germany introduce a quartet of 5.56x45mm loads to support the Stoner 63. This includes a 63 grain tungsten core AP load, a 700m-range tracer, and a training blank. Most interesting is the 77 grain FMJ load (2,722 fps), which requires a 1-in-7.8" twist barrel.

#### **Feb.-March**

The Stoner 63A system begins field-testing in South Vietnam with Lima Company, Third Battalion, First Marine Regiment, First Marine Division. Most Marines are issued the rifle, while officers and NCOs are issued the carbine. A couple of the Bren-style LMG are mixed in for squad automatic use, while the Weapons Platoon receive the belt-fed LMG and MMG variants. During the first two weeks of combat, 33 malfunctions are reported, most being failures to feed, fire, eject, and extract. During one night ambush patrol, only one of the four Stoners works reliably. The culprits are determined to be the weapons' tight tolerances combined with the fine sand of the coastal plains in their Area of Operations. In response, Lima Company attempts to break-in their weapons with extended live-fire drills. For the most part, this plan succeeds, in conjunction with the delivery of a different production lot of ammo.

#### **March**

The USMC asks Cadillac Gage to upgrade another eight of their early Stoner 63 to the 63A standard.

#### **April**

Lima Company 3/1 1st MARDIV requests that the test period for their Stoners be extended by an additional month. This request is approved. However, the Bren-style LMG is removed from issue as being redundant.

The USMC places an order with Cadillac Gage for additional spare parts and ammunition linking devices to support the Stoner 63A.

#### **May**

The SEALs order an additional 36 Stoner 63A LMG. In contrast, the remainder of L/3/1 1st MARDIV's Stoners are exchanged for M16A1 at the end of their test schedule.

#### **June**

Springfield Armory also publishes the report "Development of a Stellite-Lined, Chromium-Plated Barrel for 5.56MM Machine Gun." Springfield Armory's procedure for

the design and fabrication of a Stellite-lined, chromium-plated barrel for the Stoner 63 machine gun is described. Results of erosion tests of the Stellite-lined barrels, standard barrels, and two other types of barrels show that the Stellite-lined barrels are superior in erosion resistance. One of the Stellite-lined barrels was fired 43,994 rounds prior to rejection. A maximum of 12,476 rounds was fired from one of the standard barrels prior to rejection. The two other types of barrels – a standard barrel with a nitrided bore and a barrel of two-piece construction – were fired 29,874 and 990 rounds, respectively, before rejection. The two-piece barrel has an 18-inch forward section made from Cr-Mo-V steel and the rear section, including the chamber, is made entirely from Stellite. All barrels were rejected on the basis of the projectile instability criterion – 15 degrees yaw of 20 per cent of the projectiles fired. All barrels were fired at an average rate of 200 shots per minute.

The brief “Six-Day War” leaves Israel troops unimpressed by the reliability of their FN FAL and FALO. Testing for a new rifle begins. After testing the M16A1, Stoner 63, HK 33, and others, it becomes clear that nothing matches the reliability of their Arab enemies’ Kalashnikov rifles. IMI sets about to create an improved clone. With the assistance of Interarms and Valmet of Finland, Israeli Galili and Yaacov Lior combine Valmet M62 receivers, Colt barrel blanks, FAL folding stocks, and a modified Stoner 63 rifle magazine to create the Galil.

## **1968**

The SEALs discover a serious quirk with their Stoners: the “spin-back” jam. When in the belt-fed configuration, the Stoner ejects to the left. However, the 63A also feeds the belt from the left side. Occasionally, an ejected case will hit the drum or belt, and “spin-back” into the ejection port, causing a malfunction. On a positive note, Cadillac Gage introduces several enhancements, the most popular a short LMG barrel. This removes 6.25” in length and drops 1.56 pounds from the standard LMG barrel. Equipped with the new barrel, the LMG becomes known as the “Commando” model.

### **Jan.**

General Johnson writes a letter to the new Marine Corps Commandant, General Leonard F. Chapman, Jr., titled “Stoner Weapon System Evaluation.” The Army agrees to cooperate in a continued evaluation of the Stoner 63A LMG.

## **1969**

Cadillac Gage introduces a right-hand feed mechanism for the Stoner LMG, which replaces the feed cover and feed tray. However, the existing belt boxes are only configured for left-hand feed. Thus, work on an improved belt box begins, resulting in the definitive 100 round box.

### **March**

The SEALs request an official "Mark" number for their Stoner Commando LMG.

**Aug.**

The AMSAA publishes "Effectiveness of the 7.62mm M60 Machine Gun (Firing M80 Ball) and the 5.56mm Stoner Machine Gun (Firing M193 Ball and Several Low-Drag Configuration Bullets)."

**Oct.**

USMC issues a request to the AMC for further tests of the Stoner 63A1 machine gun, rifle, and carbine. The tests are to be conducted in two phases: 1) engineering design tests by WECOM, and 2) engineering tests by Aberdeen. Successful completion of Phase 1 is a prerequisite to Phase 2.

**Dec.**

The Stoner 63 Commando LMG (w/ right-hand feed) is officially type classified by the US Navy under the designation "Gun, Machine, 5.56mm Mark 23 Mod 0." 48 of these are eventually procured.

**1970**

**March**

Because problems have been identified in the design of the weapons during engineering design tests by WECOM, the Stoner 63A1 are returned to Cadillac Gage for evaluation. The evaluation of these weapons leads to a redesign program.

**Oct.**

The British Armament Design Establishment (ADE) at RSAF Enfield creates a 5x44mm cartridge (roughly a .20/223 Remington), and an initial order is placed with Radway Green for test cartridges. Since 1969, the ADE's experiments have centered around the '50s-era prototype EM2 rifle with its 7x43mm cartridge case necked down to 6.25mm. The change is inspired by a West German study indicating that future ideal military calibers will be 5mm or smaller. The final adopted 5mm projectile requires a 1-in-5" twist. Existing AR-15, AR-18, and Stoner 63 rifles are converted to the new cartridge, including the belt fed Stoner 63 variant. Later, bullpup conversions of the AR-18 and Stoner 63 rifles are executed.

**1971**

**Feb.**

Cadillac Gage resubmits the redesigned Stoner 63A1 for renewed Phase 1 testing by WECOM.



**Sept.**

WECOM completes Phase 1 testing of the redesigned Stoner 63A1.

**Dec.**

USMC Commandant General Chapman directs that the contract to Cadillac Gage to design and produce the Stoner 63A1 required for Phase 2 testing at Aberdeen be terminated at no cost to the Government. With this, production of the Stoner 63A1 ends.

**1972**

**March**

The US Army issues a "Materiel Need" document for a "Squad Automatic Weapon, Light Machine Gun." Before the end of FY 1972, development contracts for ten SAW prototypes are let to Maremont (Saco) and Philco-Ford (later, Ford Aerospace). A design team at the Rodman Laboratory ultimately develops their own candidate, the XM235. The goal is to procure a weapon with an effective range of 800-1,100m that weighs 17-21 pounds when loaded with 200rds of ammo. The ball cartridge must be able to defeat a helmet at 800m, and the tracer must remain visible beyond the same range. Gene Stoner has reportedly advised Cadillac Gage not to bother with adapting the Stoner 63 design to the new requirements.

**1974**

**Oct.**

Aberdeen's HEL publishes the report "Determining Human Performance Reliability with Infantry Weapons." This report describes an experiment to measure the extent and consequence of human error in the operation and maintenance of the Stoner 63 rifle and machinegun. Human error rates were related to hardware components, and procedures are explained for modifying otherwise inflated "system reliability" forecasts.

**1983**

The SEALs remove the last of their Stoner LMGs from active duty.

**1986**

ARES introduces the LMG-1 (AKA: the Stoner 86) as a potential sales competitor to the M249 SAW.

**1987**

**Sept.**

Gene Stoner files a patent application for the design of the ARES LMG (AKA: Stoner 86).

**1990**

**July**

Gene Stoner receives US Patent #4,942,802 titled “Convertible, Belt/Clip-Fed Automatic Gun with Positive Shell Casing Ejection.”

**1997**

**April**

Gene Stoner dies.

Draft