

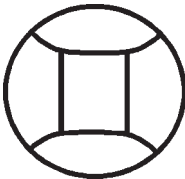
TM-HALO

OPERATION AND MAINTENANCE OF SOUND SUPPRESSOR MODEL HALO

INCLUDING ILLUSTRATED PARTS
AND SPECIAL TOOLS LIST

**Before using this suppressor,
be certain you have read and
understand this manual.**

Manufactured by



GEMTECH
Div. of Gemini Technologies, Inc.
P.O. Box 140618
Boise, Idaho 83714

ISSUED: February 23, 2004

★ ★ ★ ★ ★ **WARNING** ★ ★ ★ ★ ★

☞ **Because sound suppressed weapons make less noise than non-suppressed weapons, it is easy to forget that they are still firearms. It is of vital importance to remember that a sound suppressed firearm is just as dangerous as a non-suppressed one, and the same safe handling requirements apply.**

TM-HALO

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OPERATIONAL MANUAL FOR
SOUND SUPPRESSOR MODEL
HALO™ (5.56mm)

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☆☆☆☆☆ **WARNING** ☆☆☆☆☆

☞ **Failure to follow installation and maintenance instructions detailed in this manual can result in potential for serious injury to the user and damage to the weapon.** Firearm sound suppressors are user attached firearm muzzle devices, and as such are subject to improper attachment unless the proper procedures outlined in this manual are followed.

MANUFACTURER'S DISCLAIMER

The manufacturer is not responsible for improper usage of this product. This product is potentially dangerous, and as such it is the user's responsibility to understand and implement its proper use. If you do not understand the instructions in this manual, please contact the manufacturer for further clarification.

SAFETY NOTES

Always handle weapons in a safe manner and assume they are loaded until they have been cleared.

User installation or removal of the sound suppressor must be accomplished in accordance with the instructions contained in this book.

Any replacement or re-installation of the standard flash compensator must be accomplished by a qualified armorer in accordance with the instructions contained in this book.

Serious injury to the user may result from an improperly installed flash compensator and/or suppressor.

☆☆☆☆☆ **DANGER** ☆☆☆☆☆

☞ **Before performing any maintenance operation, always remove the magazine from the firearm, open the action, and visually ascertain that the chamber is empty and the weapon unloaded. Failure to do so can result in potential for serious injury to the user and others in the vicinity.**

CHAPTER 1: INTRODUCTION

I GENERAL

- 1.1 Scope. This manual describes the operation, installation and maintenance of the Gemtech HALO Sound Suppressor by the operator and qualified armorer personnel.

II DESCRIPTION AND DATA

- 1.2 Equipment Description: The HALO sound suppressor is a precision fire-arms sound suppressor designed to mount without tools on a standard NATO specification flash hider for weapons chambered for the 5.56x45mm NATO cartridge. The sound suppressor will reduce sound and flash signatures as well as recoil. Featuring a patented tool-free mounting system, the suppressor can be installed or removed in less than 30 seconds. Because of standard flash hider mounting, the suppressor can be interchanged between a variety of weapons chambered for the 5.56x45mm cartridge.
- 1.3 Compatibility with existing accessories: Because the suppressor mounts on the standard NATO specification (22 mm diameter) flash hider, there are no incompatibilities with other standard accessories as may occur with a proprietary flash compensator/mount. It is compatible with the KAC SOCOM suppressor mount.

1.4 PHYSICAL SPECIFICATIONS

Length	7.77 (max) in.
Diameter	1.5 in
Weight	24.8 oz
Sound Reduction	32 dB
Operating Temperature Range	-10/+170° F
Finish	Black Oxide Coating
Material	Series 300/400 Stainless steel

1.5 Items Comprising a System (See also Annex)

1.5.1 Standard Equipment

Quan.	Description
-------	-------------

1	Sound Suppressor, HALO
1	Compensating Spacer, Peel washer
1	Operation Manual TM-HALO

1.7 Location and Description of Components

1.7.1 Compensating Spacer: The M4-W1 peel washer is located on the threaded barrel in place of a lockwasher or crush washer. It is to function as a compression washer and to provide a means of orienting the flash compensator properly. It is used only for re-mounting of the factory flash compensator if the original installation utilizes a crush washer or lockwasher.

1.7.2 Sound Suppressor: This is a device for significantly lowering the sound and flash signatures of any 5.56x45 mm firearm. Capable of handling fully automatic fire, it is specifically designed for use with the M4A1 Carbine but can be mounted on any rifle utilizing a NATO specification (22 mm) flash hider.

CHAPTER 2: INSTALLATION

SECTION I: GENERAL

2-1 Unpacking the Suppressor. Upon receiving the suppressor kit, inventory the contents of the kit in accordance with the packing list enclosed. The packing list should supersede this manual because of the possibility of special configurations ordered by the user.

2.2 Tools required for installation. (See also Annex C)

1. Wrench, combination, NSN 4933-00-070-9152
2. Wrench, torque limiting, 0-120 ft/lbs, 1/2 in drive.

2.3 Torque Values: Compensator 35-45 ft/lbs

SECTION II: WEAPONS INSTALLATION INSTRUCTIONS

- 2.4 These instructions apply to the M4 carbine and other weapons in the M16 family. The compensator (flash hider) is used as a mount for the suppressor. In order to maintain proper suppressor alignment with the bore, it is absolutely essential that the flash hider be concentric with the bore. If it is not, alignment will be impossible. Baffle strikes from misalignment are the responsibility of the user and do not reflect a defect in the suppressor.
- 2.5 For there to be proper alignment, it is essential that the compensator backs against a surface that is 90° to the bore axis. Any washer that does not have perfectly parallel sides will tilt the compensator. Lock washers and the newer crush washers cannot provide parallel sides and will always result in misalignment. For this reason, a standard peel washer is included with the suppressor. If the compensator is already mounted with a peel washer, skip to Section 3 (next page).

CAUTION

UNLOAD AND CLEAR ALL WEAPONS BEFORE BEGINNING THIS PROCEDURE! SECURE WEAPON IN A HOLDING FIXTURE. DO NOT DAMAGE THE STOCK.

- 2.6 Removal of existing Compensator. Remove existing Compensator (flash hider) from the muzzle of the weapon using the Combination Wrench (NSN 4933-00-070-9152). Remove and discard the existing crush or lock washer.
- 2.7 Preparation of the barrel. The barrel must be cleaned of all dirt, grease, rust and other foreign matter using an approved solvent such as MEK (methyl ethyl ketone). Rust, if any, must be removed with a wire brush or steel wool. Do not let any solvents contact the stock or leak between the stock and the action.
- 2.8 Re-installation of the compensator. The desired orientation is with the non-slotted portion of the compensator down. Installation is to be performed in the following steps:
- 2.8.1 Heat the M4-W1 compensating spacer in a propane torch to delaminate the sections. Place the thickest portion of the M4-W1 compensating spacer on the barrel.
- 2.8.2 The compensator is screwed hand tight onto the muzzle threads and lightly snugged with the Combination Wrench. Note the relative position of the blank section of the bird cage.

- 2.8.3 Thin flakes of the M4-W1 compensating spacer are added as needed to obtain the correct thickness. The thick flake is the rearward most part.
- 2.8.4 The M4-W1 compensating spacer is replaced on the barrel and the compensator is reinstalled as described in paragraph 2.7.2 above.
- 2.8.5 This procedure in paragraphs 2.8.2 through 2.8.4 is repeated until the compensator can be torqued to the correct location.
- 2.8.6 The compensator is then removed, thoroughly degreased with MEK, and 2-3 drops of Flexbar Rocksett™ ceramic thread adhesive is placed on the treads. The compensator is then torqued into its final orientation utilizing a torque wrench and the Combination Wrench (NSN: 4933-00-070-9152). The final torque must not be less than 35 ft/lbs nor more than 45 ft/lbs.
- 2.8.7 Alignment is checked utilizing a mounted HALO suppressor and an alignment gauge. (See Annex A)
- 2.9 OTHER WEAPONS: Similar procedures may be necessary with other weapons.
- 2.9.1 Special versions of the HALO suppressor are available for use with the USA version of the Sigarms model 551 (which uses a 21.5 mm integral flash hider) or the Robinson Armament M96 rifle.
- 2.9.2 The HK weapons may require some resourcefulness in re-mounting the flash compensator if it is not concentric with the bore axis. It is essential to check alignment before using the suppressor.

SECTION III: MOUNTING and DISMOUNTING THE HALO SOUND SUPPRESSOR

2.10 SAFETY WARNING:

CAUTION

Before initiating Mount/Dismount Procedures, be absolutely certain that the weapon is unloaded, the magazine removed, and the bolt locked in the rear position.

- 2.10.1 Mounting: To mount and dismount the HALO sound suppressor on the compensator, follow the following steps, detailed in the Fig. 2.1 through 2-4, P. 11 and 12. :

2.10.1.1 Remove the retaining collar from the mount.

2.10.1.2 Slide the retaining collar over the flash hider as shown in Fig. 2.1.

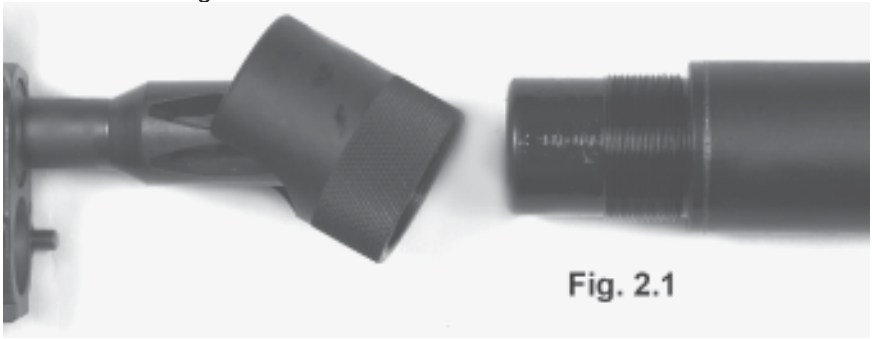


Fig. 2.1

2.10.1.3 Align the retaining collar with the flash compensator as shown in Fig. 2.2. Align suppressor with flash compensator.

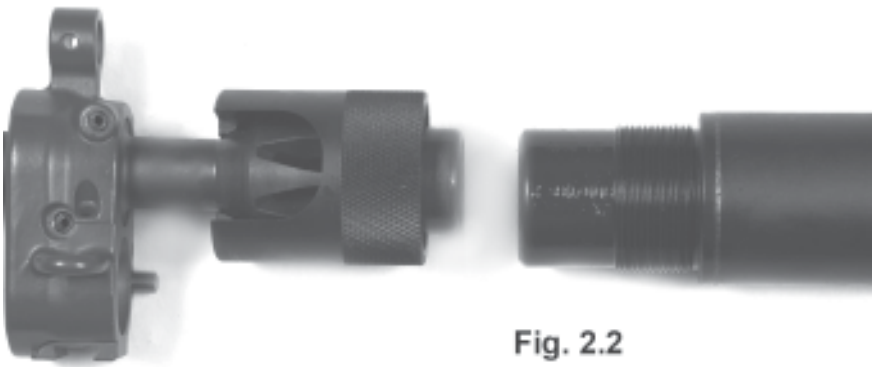


Fig. 2.2

2.10.1.4 Slide suppressor on flash compensator (Fig. 2.3).

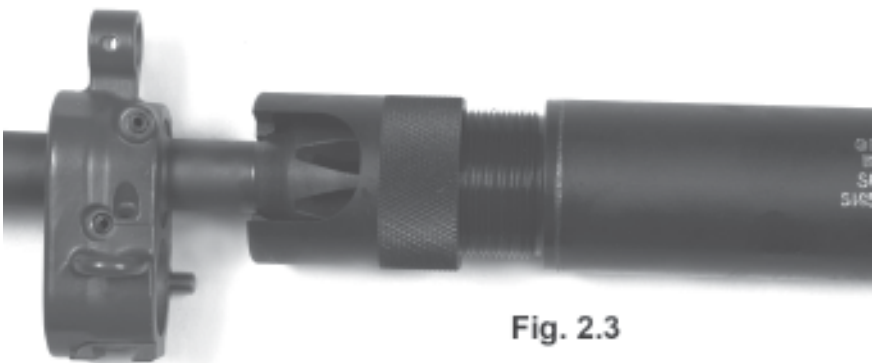
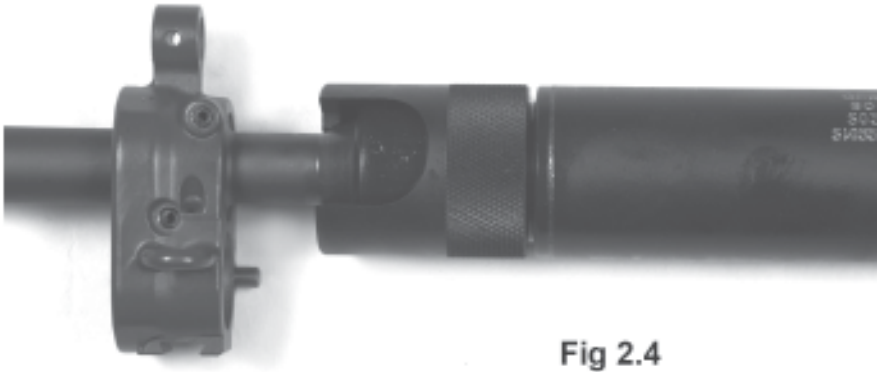


Fig. 2.3

2.10.1.4 Screw retaining collar onto mount until secure (Fig. 2.4)



2.10.2 Dismounting: Dismounting is the reverse of mounting.

2.10.2.1 The suppressor will become dangerously hot with usage. If the suppressor must be dismounted when hot, a protective glove, such as Nomex, must be worn.

2.8.2.2 Carbon buildup through the flash compensator slots may make unscrewing difficult. A rubber grip enhancer or a non-marring strap wrench may be used.

SECTION IV: SUPPRESSOR OPERATION

2.11 Operating Temperatures. During use, the HALO suppressor absorbs large quantities of heat from the burning propellant gases. This heat is dissipated by radiation, convection, and conduction. The heat buildup is particularly noticeable during fully automatic fire, where the temperature of the suppressor can easily exceed 900°F in a short period of time. The rate of heat build-up approximates 7.5°F per round at an average rate of 2 rds/sec. The rate of cooling in the atmosphere increases slightly as the temperature differential between the suppressor and the ambient air increases. The elevated temperatures can pose a hazard to personnel and materials that may contact the suppressor when hot. Although **not** recommended, the suppressor can be cooled rapidly by immersion in a nonflammable liquid, such as water.

2.10 Operation under unusual conditions. The only modification to operation of the suppressor shall be to wipe mud, sand and dust off the mating

parts of the retaining collar and suppressor mount before mounting during extreme conditions.

CHAPTER 3: MAINTENANCE INSTRUCTIONS

I PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

- 3.1 Purpose of PMCS: PMCS is performed daily while the suppressor is in use. The procedures are a systematic inspection of the system that will enable you to spot defects that might cause it to fail during a mission.
- 3.2 Frequency of performing PMCS: The frequency of performing PMCS is as follows:
 - A) Daily in use
 - B) Weekly in standby condition
 - C) Immediately after any severe shock to the weapon action.
 - D) After any maintenance to the weapon or suppressor.
- 3.3 Performance of PMCS: PMCS shall be performed in the following sequence:
 - 3.3.1 Weapon Flash Compensator: Check for cleanliness, including carbon build-up. Clean and lubricate with MILITEC-1 Metal Conditioner as necessary. See ANNEX B.
 - 3.3.2 Suppressor:
 - 3.3.2.1 Visually inspect the suppressor bore for foreign objects, including sand and mud. Rinse sand or mud out with water, draining to the rear. **Do not use soaps.** Follow any water immersion by immersion in Diesel fuel, WD-40, Automatic Transmission Fluid, or other water absorbing organic solvent followed by draining. Lightly finger coat the interior of the suppressor mount with a light grease, CLP, or MILITEC-1 Metal Conditioner. Carbon buildup in the mount may be scraped with a scraper and polished with red Scotchbrite.
 - 3.3.2.2 No other cleaning of the suppressor is necessary or desirable. If solvent immersion is required, only CLP Solvent, WD-40, Diesel fuel, or a mixture of 3:1 mineral spirits and Automatic Transmission Fluid are authorized. **Do not use water based solvents**

- 3.3.2.3 Inspect the exterior for dents and other evidence of external damage. Replace suppressor if damaged.
- 3.3.2.4 Inspect the front end cap. If there is evidence of damage from bullet impact or copper streaking, this is an indication of misalignment requiring re-mounting of the flash compensator.

II TROUBLESHOOTING

3.4 General troubleshooting information

- 3.4.1 This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the suppressor. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections that will help to determine probable causes and corrective action to take. Perform the tests/inspections and corrective actions in the order listed.
- 3.4.2 This manual cannot list all possible malfunctions that may occur, or all possible tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, the suppressor should be serviced at the DEPOT level.

3.5 TROUBLESHOOTING PROCEDURES

3.5.1 Flash Compensator loose or mis-aligned

Re-install with new compensating spacer M4-W1. Gauge alignment with alignment rod or laser gauge while suppressor is mounted. (ARMORER)

3.5.2 Flash Compensator damaged due to external abuse.

Replace Flash Compensator (ARMORER)

3.5.3 Suppressor will not fit on Flash Compensator

Clean Flash Compensator and mating surface inside suppressor mount, lubricate with CLP or MILITEC-1. Light oil or motor oil can be used as a field expediant. (USER)

3.5.4 Retaining collar will not screw suppressor tightly on flash compensator.

Clean threads with solvent and lubricate. Be certain retaining collar encloses entire flash compensator and is not engaged in the blank firing attachment groove. (USER)

3.5.5 Suppressor housing dented or damaged

Replace suppressor

III MAINTENANCE PROCEDURES

- 3.6 Scope of operator maintenance. Operator maintenance consists of external inspection of components of the suppressor for serviceability and cleaning. Maintenance instructions covered elsewhere in this manual (e.g., PMCS, troubleshooting) are not repeated in this section. Specifically refer to paragraph 3.3.2 and its subparagraphs.
- 3.7 Scope of Armorer's Maintenance: Armorer's maintenance shall consist of the installation, adjusting, gauging and replacement of the flash compensator.
- 3.8 Scope of Depot Maintenance: Depot maintenance shall include disassembly of the suppressor for replacement of damaged internal parts. This is best done by the manufacturer.
- 3.9 Cleaning and lubrication. The operator is responsible for keeping the suppressor and flash compensator clean and serviceable. Consumable cleaning and lubricating items are listed in ANNEX B. Cleaning and lubrication procedures are outlined earlier in this chapter (PCMS and Troubleshooting) and will not be repeated.
- 3.10 Inspection. Inspection procedures are considered a part of preventive maintenance (PCMS) and trouble-shooting.
- 3.11 **Destruction and disposal:** Destruction of the HALO suppressor may be necessary to prevent its capture, utilization, or examination by hostile personnel. Techniques of disposal and destruction vary with circumstances, time available, and resources. Total destruction is preferable, as it prevents disclosure of the technology to the enemy.
- 3.11.1 Disposal at sea. The suppressor will rapidly sink to the depths of the sea, making recovery impractical.
- 3.11.2 Total destruction on land. This can be accomplished through the use of thermite grenades or high explosives. If time permits, the suppressor can be sawed into several pieces and the pieces scattered and/or buried over a wide area.
- 3.11.3 Partial destruction on land. The suppressor can be made unusable by means of small arms fire.

CHAPTER 4: AMMUNITION and DUTY CYCLE

I Ammunition

- 4.1 This suppressor was specifically designed for use with M855 ball ammunition. NATO SS-109 ammunition is also suitable. Most commercial 5.56mm ammunition will function properly in this suppressor.
- 4.2 Ammunition loaded with highly frangible projectiles is not recommended nor is damage from this ammunition covered under warranty. If necessary it may be used only in barrels having a twist rate of 1:12 or slower.
- 4.3 Subsonic ammunition is not recommended for use with this suppressor. With rare exceptions, subsonic ammunition does not stabilize properly, resulting in excessive yaw and potential baffle contact. With loose military chambers, there may not be enough pressure to properly obturate the neck, resulting in projectiles stuck in the barrel.

II Duty Cycle/Fully Automatic Fire

- 4.4 In the case of suppressors designed for .223 (5.56mm), there are some limitations in the duration of fully automatic fire due to shortcomings in the ammunition, not the suppressor.
- 4.5 5.56mm is a unique cartridge. The projectile is physically small and lightweight. The relatively high muzzle velocity causes excessive barrel heating from friction, with outside barrel temperatures exceeding 600° F in a 100 round burst. Bore temperature is considerably higher. The projectile contains a small quantity of lead, which after a 100 round burst softens and/or melts. The softening of the lead core results in geometric instability of the projectile, causing excessive yawing, tumbling, and suppressor baffle contact. These effects are not normally seen anywhere near this early in larger caliber projectiles, such as 7.62 NATO.
- 4.6 Although the suppressor is capable of withstanding long bursts using ammunition not containing any lead, any lead containing 5.56mm ammunition will damage the suppressor. Because of the deleterious heating effect, most weapon manufacturers place serious limitations on sustained fully automatic fire and state that the barrel is ruined after a 200 round burst.

Limitations are ammunition limitations, and damage that results from host weapon abusive firing will not be covered under warranty.

ANNEX A: WARRANTY**WARRANTY STATEMENT**

The Magnuson-Moss Act (Public Law 93-637) does not require any seller or manufacturer of a consumer product to give a written warranty. It does provide that if a written warranty is given, it must be designated as "full" or as "limited" and sets minimum standards for a "full" warranty.

GEMTECH has elected not to provide any written warranty, either "limited" or "full," rather than to attempt to comply with the provisions of the Magnuson-Moss Act and the regulations issued thereunder.

There are certain implied warranties under state law with respect to sales of consumer goods. As the extent and interpretation of these implied warranties varies from state to state, you should refer to your state statutes.

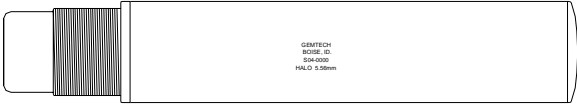
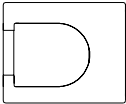

GEMTECH certifies that all sound suppressors manufactured by them are free of defects in materials or workmanship, and that they meet manufacturing specifications at the time of manufacture. Gemtech disavows responsibility for damages resulting from neglect, abuse, misuse, or acts of war.

GEMTECH denies any liability resulting from the use, abuse, or criminal misuse of this product.

ANNEX B: SPECIAL TOOLS AND SUPPLIES LIST

QUAN.	PART No. and/or DESCRIPTION
1	NSN: 4933-00-070-9152, Wrench, Combination (for remounting flash compensator).
1	Torque wrench, 1/2 inch drive, 0-100 ft-lbs (for remounting flash compensator)
1	Flexbar ROCKSETT™ ceramic thread locking adhesive, 2-3 drops (for remounting flash compensator)
1	Dispenser, MILITEC-1 metal conditioner
1	Alignment gauge, consisting of either A. Team Alpec Laser bore gauge with muzzle collimator, or B. 28 inch length of straight drill rod, 7/32 inch diameter

ANNEX C:

COMPONENTS OF A SYSTEM and ILLUSTRATED PARTS LIST	
QUAN.	PART No. and DESCRIPTION
1	 <p style="text-align: center;">HALO: Sound Suppressor Body</p>
1	 <p style="text-align: center;">HALO: Retaining Collar</p>
1	 <p style="text-align: center;">M4-W1: Compensating Spacer (Used with M4/M16 Compensators only)</p>

All Gemtech products are
100% manufactured in the
United States of America.

