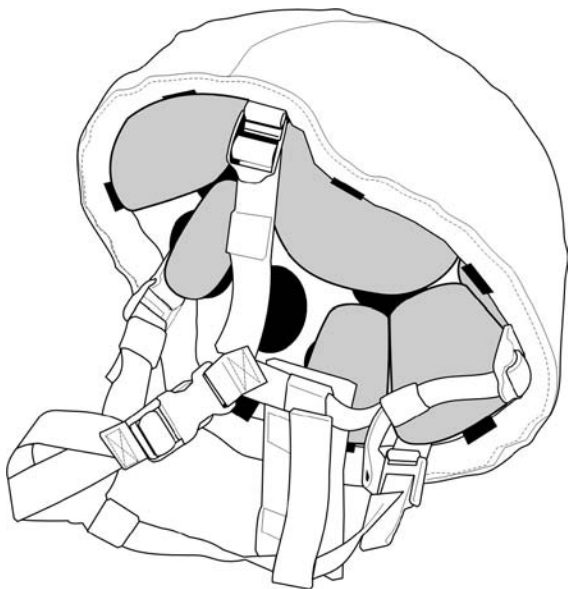


**TECHNICAL MANUAL**

**OPERATOR'S MANUAL FOR**

**ADVANCED COMBAT HELMET (ACH)**



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---

## WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel.

### **DANGER**

This helmet provides **LIMITED** protection to the head, it will not protect the wearer against all possible hazards. Some conditions can exceed the helmet's capacity to provide protection and result in serious head, brain, spinal, or other injury including paralysis or death.

### **WARNING**

- All seven (7) helmet pads must be worn during airborne operations and other high-risk operations such as air assault and rappelling/ mountaineering.
- The hardware (p-clamp, ladder lock, screw, and nut) inside the helmet--where the chinstrap retention system webbing attaches to the helmet shell--must be covered by padding during airborne and other high risk operations such as air assault and rappelling/ mountaineering. The oblong/oval pad must be placed flush with the rim (edge) of the helmet and completely cover the hardware-- See illustration Pad Placement over Hardware (Front) and Pad Placement over Hardware (Rear).
- In order to maximize ventilation, reduction of **NO MORE THAN 2** pads is authorized in non-risk situations.
- If you experience fit problems, tightness/looseness, or helmet profile is too high or too low refer to Sizing and Fitting Troubleshooting guidelines.

- When donning the helmet for the first time in a cold environment, it may be necessary to wear the helmet for a few minutes or otherwise to warm the pads, such as by placing in pockets, so that the pads will conform to the shape of your head. As the pads warm up and conform to the shape of your head, it may be necessary to retighten the chinstrap retention system.
- If you pull too tightly on any strap during steps 3 and 4 (See Chapter 2 Operator Instructions Donning and Removing)—or if you don't position helmet on head and hold in place with one hand on top of helmet for initial adjustment as instructed in Step 2-- the helmet may become uncomfortable and tilted on your head and chin cup may become un-centered.
- For first aid treatments, refer to FM 21-11.

### **WARNING**

- This helmet is **NOT** designed to provide protection from objects that contact the helmet surface within one inch of the edge of the helmet shell.
- This is not a DOT Fed Motor Vehicle Std. 218 approved helmet. Do not use for protection in or on a motorcycle.
- Inspect the helmet before and after **EACH** use (as defined in Chapter 3) following the inspection instructions. Do not alter the helmet or attach any item not defined in this manual.
- If no NVG front bracket is used - and the helmet has a hole for the front bracket - plug hole with 8-32 x 3/8 long screw and post.

Failure to follow these warnings can result in serious personal injury or death.

Follow all warnings and instructions provided with this helmet. For replacement instructions, contact MSA.

---

**TECHNICAL MANUAL**  
**OPERATOR'S MANUAL FOR**  
**ADVANCED COMBAT HELMET (ACH)**

**REPORTING ERRORS AND RECOMMENDING  
IMPROVEMENTS**

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, MSA Corporate Headquarters, P.O. Box 426, Pittsburgh, PA 15230 USA or call MSA Customer Service at 1-866-672-1001 or email: [military.cs@msanet.com](mailto:military.cs@msanet.com)

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**TABLE OF CONTENTS**

	<u>Page no.</u>
WARNING SUMMARY.....	3
HOW TO USE THIS MANUAL .....	7
GENERAL INFORMATION .....	9

---

## TABLE OF CONTENTS (Cont)

### CHAPTER 1 - DESCRIPTION AND THEORY OF OPERATION

Equipment Description and Data.....	11
Theory of Operation .....	19

### CHAPTER 2 - OPERATOR INSTRUCTIONS

Sizing and Fitting Instructions .....	21
Pad Configurations.....	25
Pad Suspension Adjustment .....	27
Sizing and Fitting Troubleshooting .....	30
Donning and Doffing.....	36
Removing and Replacing the Chinstrap Retention System .....	40
Attaching Helmet Cover .....	42
Front Bracket Assembly Kit Installation.....	44
Eyewear Retention Strap Installation .....	47
Configuration for Airborne Operations .....	50

### CHAPTER 3 - MAINTENANCE PROCEDURES

Replacing the Hardware .....	53
Replacing the Pad Suspension .....	55
Cleaning Instructions.....	56
Preventive Maintenance Checks and Services.....	57

### CHAPTER 4 - SUPPORTING INFORMATION

References .....	62
ACH Helmet Parts List .....	63
Expendable and Durable Items List .....	69
Record of Hit .....	70

---

## HOW TO USE THIS MANUAL

### OVERVIEW

This manual contains operating instructions and maintenance procedures for the Advanced Combat Helmet (ACH).

This manual is divided into the following major sections:

**Front Cover.** Provides information about the equipment covered by the TM.

**Warning Summary.** Provides a summary of all warnings that apply throughout the manual.

**Table of Contents.** Lists chapters and work packages in order of appearance.

**Chapter 1, Description and Theory of Operation.** Provides descriptions, equipment data, and theory of operation information.

**Chapter 2, Operator Instructions.** Provides sizing information, donning information, and operating instructions in both usual and unusual conditions.

**Chapter 3, Maintenance Procedures.** Provides cleaning and repair instructions and maintenance procedures.

**Chapter 4, Supporting Information.** Provides reference information, P/N, NSN & descriptions.

---

## **NAVIGATION**

This TM is broken down by chapters. All of the chapters contained within the TM are listed in the table of contents in the order they appear by chapters. The chapter name is listed in the table of contents. The page numbers appear at the bottom of each page.

## **OPERATION AND MAINTENANCE**

Before you use the Operator's Manual for Advanced Combat Helmet (ACH), familiarize yourself with the assembly and fitting instructions and the operating instructions (Chapter 2). Perform maintenance procedures (Chapter 3) on a regular basis. Always follow the WARNINGS and CAUTIONS.

---

## **ADVANCED COMBAT HELMET GENERAL INFORMATION**

---

### **SCOPE**

This manual covers the basic fitting, & care use instructions for the Advanced Combat Helmet (ACH), hereafter referred to as the ACH or the helmet.

### **MOST CURRENT VERSION OF THIS MANUAL**

The most current version of this manual may be found at  
<http://www.MSAnet.com>

### **LIST OF ABBREVIATIONS/ACRONYMS**

Advanced Combat Helmet (ACH)

Manual Revision (rev)

Night Vision Goggles (NVG)

Preventive Maintenance Checks and Service (PMCS)

**CHAPTER 1**  
**DESCRIPTION AND THEORY OF OPERATION**  
**FOR**  
**ADVANCED COMBAT HELMET (ACH)**

---

## **ADVANCED COMBAT HELMET EQUIPMENT DESCRIPTION AND DATA**

---

### **EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

The ACH is a helmet system that provides ballistic and impact protection. This system is compatible with the current night vision devices (NVG's), communications packages, and nuclear, biological, and chemical (NBC) defense equipment and body armor.

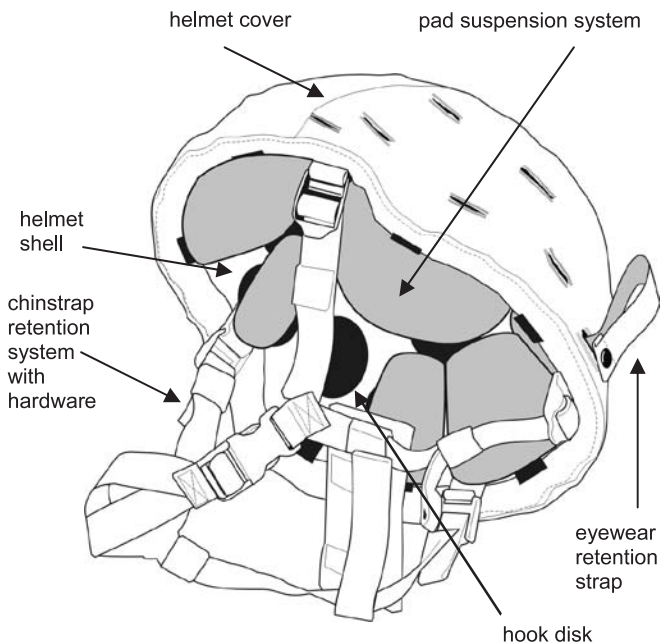
- The ACH provides ballistic protection within the full spectrum of operational environments.
- The ACH allows maximum sensory and situational awareness for the operator. This includes an unobstructed field of view and increased ambient hearing capabilities.
- The ACH's chinstrap retention system and pad suspension system provides unsurpassed balance, stability, and comfort. This system provides for proper size, fit, and ventilation.
- The ACH's pad suspension system provides impact protection throughout all operational scenarios, including static-line airborne operations.

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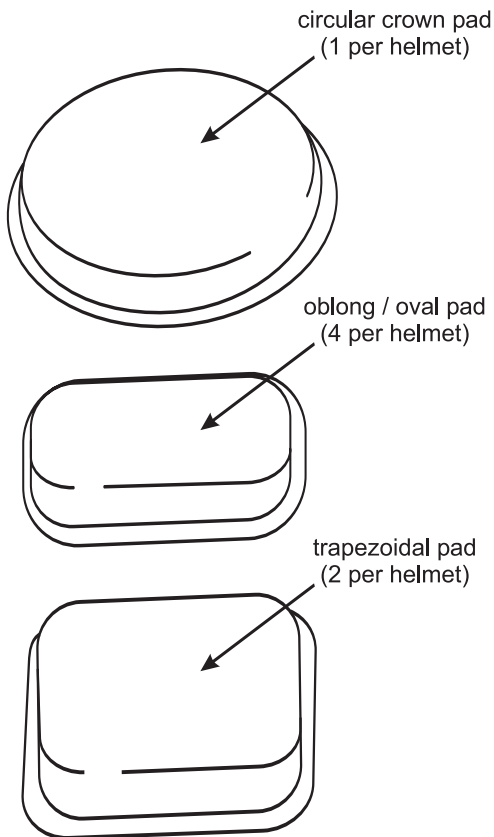
## DESCRIPTION OF MAJOR COMPONENTS

The Advanced Combat Helmet is made up of the following major components, which are illustrated below:

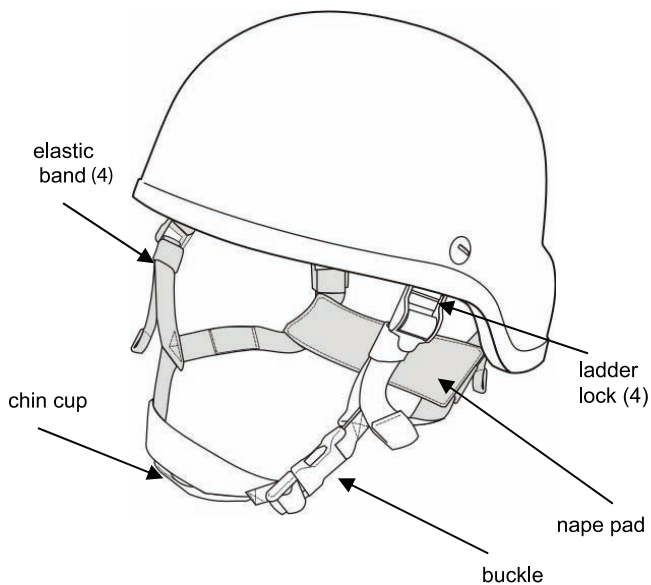
helmet shell  
pad suspension system  
chinstrap retention system with hardware  
helmet cover  
eyewear retention strap



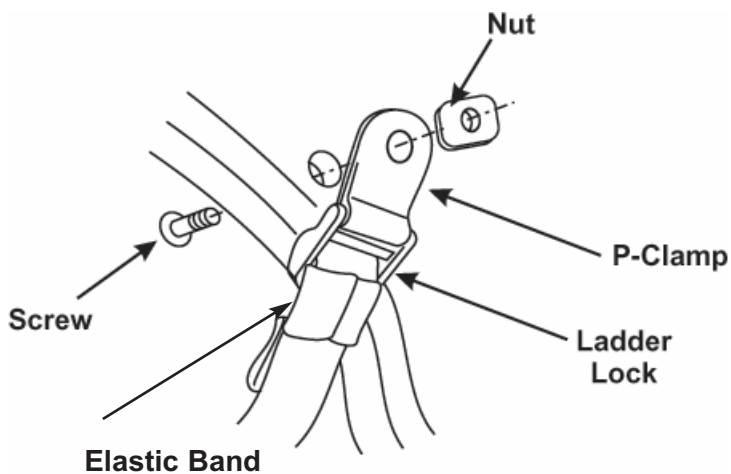
**Major Components**



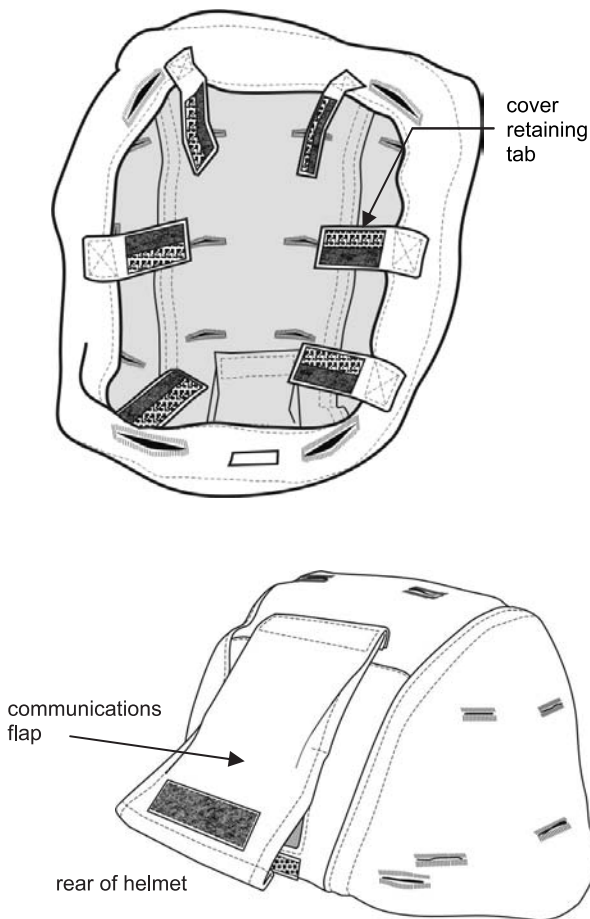
**Pad Suspension System**  
**Pad Set (7 pads)**



### **Chin Strap Retention System with Hardware**

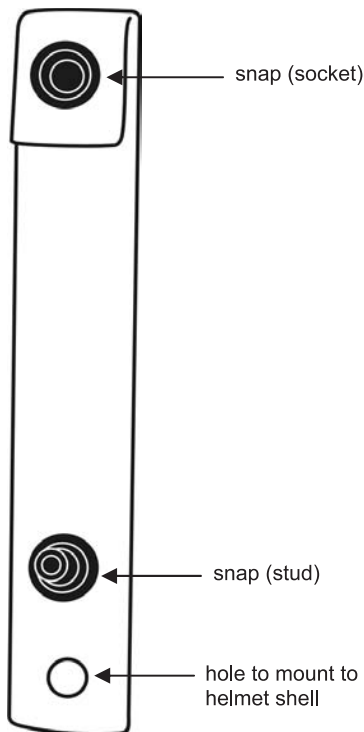


**Hardware**



### Helmet Cover

The communications flap is used to store cables from the headset that is sometimes used with the helmet.



### **Eyewear Retention Strap**

---

The following are used in certain operations:

chemical protective cover  
helmet band

---

## **ADVANCED COMBAT HELMET THEORY OF OPERATION**

---

This work package discusses theory of operation and protective qualities of the ACH.

This ACH is designed to provide the Soldier with ballistic and impact protection. It is compatible with night vision, communications, and Nuclear Biological and Chemical (NBC) equipment. The ACH weighs approximately slightly less than 3 lbs for the size small, 3 lbs for the size medium, 3.25 lbs for the size large, and slightly more than 3.6 lbs for the extra large.

The edge cut of the shell has been reduced when compared to the Helmet, Ground Troops and Parachutists. This enables better situational awareness through improved field of vision and hearing.

The shell provides ballistic protection. The pads act as a suspension system providing sizing and fitting. In conjunction with the shell, the pad suspension system provides impact protection. In conjunction with the chinstrap retention system, the pad suspension system provides stability.

The chinstrap retention system is a four-point design, attaching to the shell at four locations. In conjunction with the pad suspension system, it provides improved stability.

**CHAPTER 2**  
**OPERATOR INSTRUCTIONS**  
**FOR**  
**ADVANCED COMBAT HELMET (ACH)**

---

## SIZING AND FITTING INSTRUCTIONS

---

This work package provides instructions for choosing the proper size ACH.

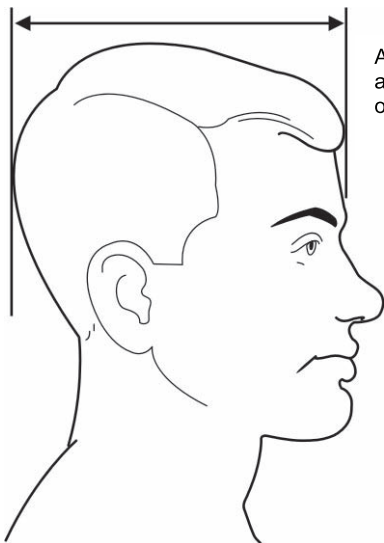
### ACH Shell Sizing

#### Head Measuring Procedure

Use tape measure and caliper to make the following measurements. See Expendable and Durable Items List in the back of this manual, for appropriate NSNs.

Step 1. Subject must be seated in upright position.

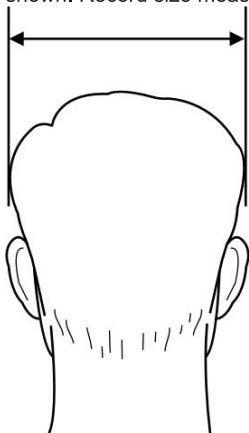
Step 2. Measure head length. Measurement is best made with a caliper. If caliper is not available, an approximate measurement can be made using a tape measure aligned with the front and back of head as shown. Record size measured.



Arrows denote the proper alignment of the caliper or tape measure.

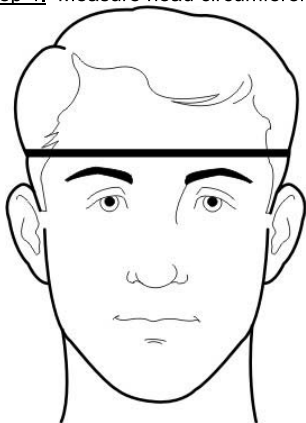
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Step 3. Measure head width. Measurement is best made with a caliper. If no caliper is available, an approximate measurement can be made using a tape measure aligned with each side of head as shown. Record size measured.



Arrows denote the proper alignment of the caliper or tape measure.

Step 4. Measure head circumference. Record size measured.



Subject sits erect with head level. Measure circumference by passing tape measure just above the bony eyebrow ridges of the forehead and above both ears. The tape measure must be pulled tight.

Step 5. Using the chart below, select the helmet size based on the largest of the 3 measurements. This is the proper shell size for the soldier measured.

**NOTE**

If any measurement falls on the dividing line between sizes, select the larger size.

**Head/Shell Sizing Chart**

<b>Helmet Shell</b>	<b>Head Length</b>	<b>Head Breadth (Width)</b>	<b>Head Circumference</b>
Small Helmet Shell	Up to 7-1/4 inches (184mm)	Up to 6-1/2 inches (162mm)	Up to 21-1/4 inches (538mm)
Medium Helmet Shell	From 7-1/4 inches (184mm) up to 7-3/4 inches (198mm)	Up to 6-1/2 inches (162mm)	From 21-1/4 inches (538mm) up to 22-1/2 inches (573mm)
Large Helmet Shell	From 7-3/4 inches (198mm) up to 8-1/4 inches (210mm)	Up to 6-1/2 inches (162mm)	From 22-1/2 inches (573mm) up to 23-1/2 inches (597mm)
Extra-Large Helmet Shell	8-1/4 inches (210 mm) and over	6-1/2 inches (162 mm) and over	23-1/2 inches (597mm) and over

---

## ACH Pad Sizing

Two size pads are available—size 6 (3/4 inch thick) and size 8 (1 inch thick).

To select pad size:

1. Assemble helmet in standard pad configuration (see Pad Configuration section). If other equipment is to be used with the helmet, such as headset/microphone, evaluate size with that equipment (if possible).
2. Try on helmet and evaluate fit. Proper fit is achieved when the helmet does not sit too high (crown pad does not contact head or too much of the forehead is exposed) or too low (too low on brow or not compatible with eyewear, etc.) and is not too tight or too loose (see Sizing and Fitting troubleshooting section). Shake head rapidly from side to side to check for stability. Helmet should not rotate from side to side when head is shaken. While evaluating fit, be sure to have the chinstrap retention system cinched down.
3. The ACH should fit so that the front rim is not more than 1/2" above the eyebrows. A properly sized and fitted ACH will sit level on the Soldier's head (side to side), with the lower edge of the front rim being level to the ground or slightly inclined with respect to the ground. While looking upward by moving only the eyes, the Soldier can test for proper fit by observing that the edge of the rim is just in view. All ACH's should be fitted with the thinner size 6 crown pad (3/4" thick) in the top of the helmet. The Soldier should feel the crown pad touch the top of his head. Fit can be adjusted by adjusting the pad positions inside the helmet, tightening the retentions straps, or exchanging the helmet shell for a larger size. A quick evaluation of the height of the ACH can be made by looking at the height of the ACH relative to the ear canal openings. The bottom of the ACH should come to the top of the Soldier's ear canal opening.

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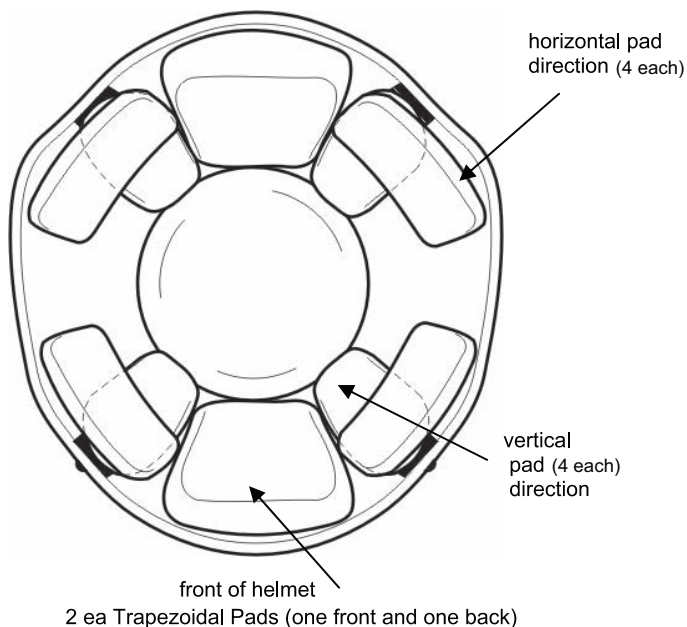
## PAD CONFIGURATIONS

---

This work package provides instructions for different pad configurations.

### Standard Pad Configuration

- All seven (7) pads are worn when first trying on the helmet for sizing and fitting and for airborne and other high-risk operations (see configuration for airborne operations in for additional information).



### Standard Pad Configuration

---

## Alternate Pad Configurations

Alternate pad configurations are allowed to obtain a better fit or more comfort.

- Pads can be placed in vertical or horizontal directions (as shown in illustrations) or a combination or at an angle between horizontal and vertical (diagonal).
- Pads should be placed around the inside of the helmet to provide optimum comfort and stability.
- It is best to cover hardware with pads in all situations. However, hardware **MUST** be covered with pads in high-risk situations, for example air assault and rappelling/mountaineering

The previous illustration shows the standard pad configuration. For reasons of clarity only, the illustration shows pads in either horizontal or vertical positions but not in diagonal positions. However, the pads can be placed diagonally, at any angle.

---

## PAD SUSPENSION ADJUSTMENT

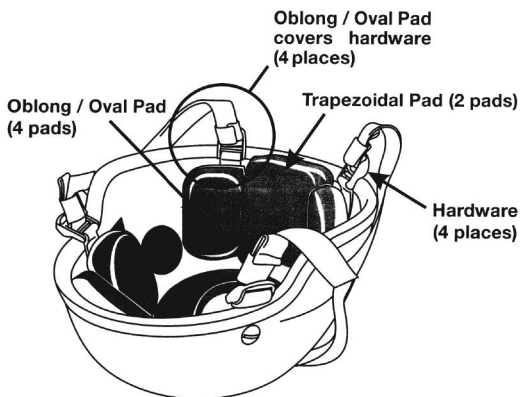
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This work package provides information about the adjusting the pad suspension system. This unique suspension system is fully adjustable. The system has the following requirements and restrictions:

### WARNING

The hardware (p-clamp, ladder lock, screw, and nut) inside the helmet--where the chinstrap retention system webbing attaches to the helmet shell--must be covered by padding during airborne and other high risk operations such as air assault and rappelling/mountaineering. The oblong/oval pad must be placed flush with the rim (edge) of the helmet and completely cover the hardware--See illustration Pad Placement over Hardware (Front) and Pad Placement over Hardware (Rear). Failure to observe this precaution could result in serious injury or death to personnel because a hard-point contact the wearer's head.

For more detail on the hardware configuration see figure on page 54.



---

**⚠ WARNING**

**All seven (7) helmet pads must be worn during airborne operations and other high-risk operations such as air assault and rappelling/mountaineering. Failure to observe this precaution could result in serious injury or death because all seven (7) pads provide maximum impact protection.**

**⚠ WARNING**

**If you experience fit problems, tightness/looseness, or helmet profile is too high or too low refer to Sizing and Fitting Troubleshooting guidelines.**

**Note:** When donning the helmet for the first time in a cold environment, it may be necessary to wear the helmet for a few minutes or otherwise to warm the pads, such as by placing in pockets, so that the pads will conform to the shape of your head. Hardware rim (edge) of helmet trapezoidal pad oblong/oval pad. As the pads warm up and conform to the shape of your head, it may be necessary to retighten the chinstrap retention system.

---

**Note:** If you experience hot spots or discomfort, try rearranging the pad system to accommodate a more comfortable fit. If discomfort persists, try resizing your shell (See Sizing and Fitting Instructions, or Sizing and Fitting Troubleshooting, later in this manual.)

The direction of the side oblong/oval pads may be changed to maximize comfort. These pads may be routed vertically from bolt to crown. This configuration maximizes airflow for better temperature regulation. These pads may be routed horizontally to make a seal around the user's head. This configuration is better suited for cold weather environments. (See Pad Configurations in the previous section.)

---

## SIZING AND FITTING TROUBLESHOOTING

---

This work package provides sizing and fitting troubleshooting techniques.

1. If helmet is too tight:

- Try arranging side pads in a horizontal configuration or diagonal direction (see configuration illustrations in the previous section).
- Try re-positioning the front and rear pad.
- If rearranging the pads does not alleviate the tightness try the next smaller (thinner) pad size.
- If this does not alleviate the tightness try the next larger shell.

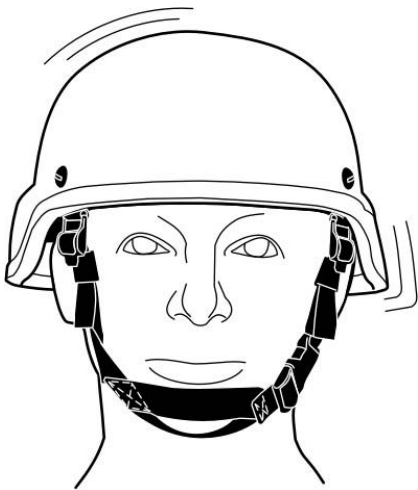


**Helmet too tight**

---

2. If too loose (Shake head from side to side while eyes are closed. If helmet slides on head, it is too loose.)

- Try tightening the chinstrap retention system.
- Rearrange side pads in an alternate direction (horizontal, vertical or diagonal).
- Try a larger (thicker) pad set.
- Increase the number of pads in the helmet.
- Select the next smaller shell size.



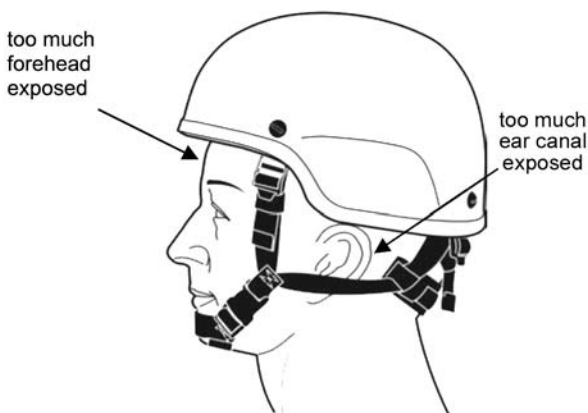
**Helmet too loose**

3. If too high: (i.e., too much forehead exposed, crown and does not touch top of head, or wearer does not see edge of rim):

- Try smaller (thinner) sized pad set.
- Try rearranging pads (horizontal, vertical or diagonal—see pad configuration illustrations in the previous section.)
- Try a larger shell size.

**Note:** It is extremely important that the helmet not be sized and fitted to sit too high on the head. Here are some things to look for:

If too much of forehead is exposed (approximately more than 1/2 inch above eyebrow), then the helmet is too high.



**Helmet too high (too much forehead exposed)**  
**The edge of the helmet shall cover at or slightly above the ear canal.**

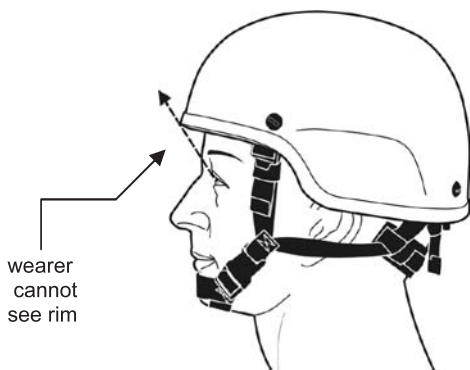
- If crown pad does not touch the head (wearer cannot feel pad), then helmet may be too high.

space between  
pad and head



**Helmet too high (Crown pad not touching head)**

- When fitting, have subject look upward by moving eyes, but without moving head. If subject cannot see rim of helmet, helmet may be too high.

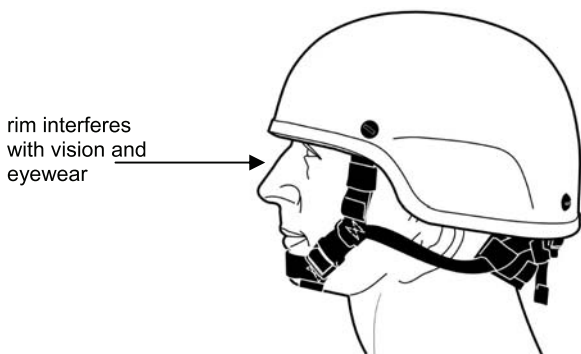


Helmet too high (looking past rim)

---

4. If too low: (i.e. helmet too low on brow, helmet not compatible with eyewear, or has other similar compatibility issues)

- Try larger (thicker) pad set.
- Try rearranging pads (horizontal, vertical or diagonal—see pad configuration illustrations in diagonal the previous section.)
- Try a smaller helmet shell.



**Helmet too low**

---

## DONNING AND REMOVING

---

This section provides instructions for donning and removing the helmet, including adjusting the chinstrap to optimize fit and comfort.

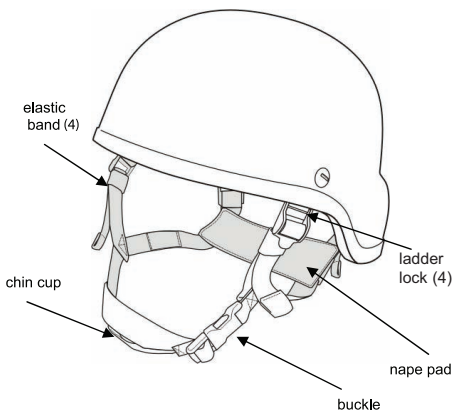
### WARNING

**Ensure that all the helmet adjustment mechanisms are properly adjusted for a snug, secure fit at all times when the helmet is worn. Failure to do so can result in an unstable helmet that will reduce protection to the soldier.**

Donning: To don (put on) the helmet:

Step 1. Check number and placement of pads-- (see pad configuration in the previous section).

Step 2. Prior to donning helmet, loosen all adjustment straps (2 ladder-locks in front, 2 ladder-locks in back and the nape pad). Unbuckle chinstrap buckle.



**Chin Strap Retention System with Hardware**

---

Step 3. Position helmet on head and buckle chinstrap. Hold helmet in place with one hand on top of helmet for initial adjustment.



**Note:** If you pull too tightly on any strap during Steps 4 and 5—or if you don't position helmet on head and hold in place with one hand on top of helmet for initial adjustment as instructed in Step 3—the helmet may become uncomfortable and tilted on your head and chin cup may become un-centered.

Step 4. Partially tighten 2 back adjustment straps (one side at a time).



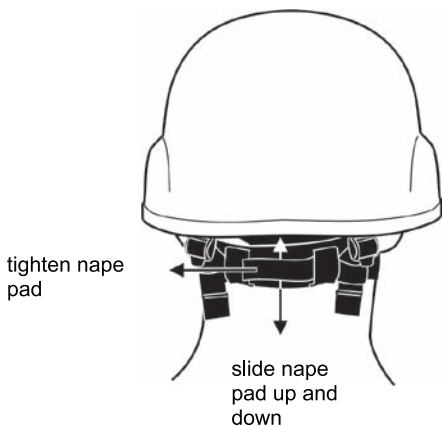
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Step 5. Partially tighten 2 front adjustment straps (one side at a time).



Step 6. With both hands, fully tighten front and back adjustment straps.

Step 7. The nape pad can be slid up and down along the rear legs of the chinstrap. It can be positioned according to personal comfort. When tightened (see figure below) against the nape by pulling on end of webbing, the nape pad adds additional stability to the helmet such as when wearing NVGs. Keep the nape pad away from the ladder-locks while adjusting the chinstrap to prevent jamming.



**Removing: To remove the helmet:**

To doff the helmet, press the sides of the center section of the buckle on the chinstrap retention system inward. Once the buckle releases, remove the helmet. To just loosen the chinstrap, push up on the ladder-lock.

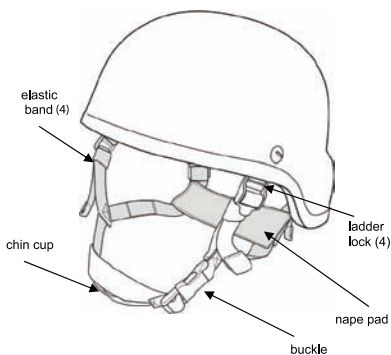
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## REMOVING AND REPLACING CHINSTRAP RETENTION SYSTEM

---

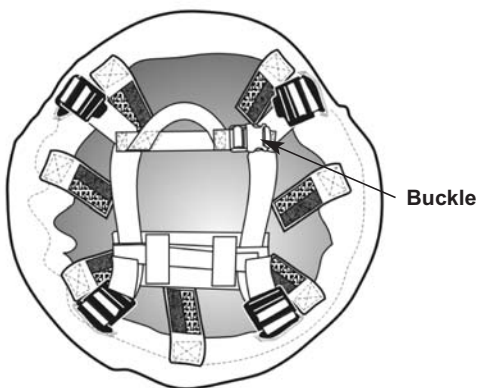
This work package provides instructions for replacing the ACH's chinstrap retention system.

1. Slide the elastic band down.
2. Unthread the chinstrap retention system webbing from the ladder-lock.
3. Lay the helmet on its crown with the front of the helmet away from you (the chinstrap buckle is oriented on right side of helmet.) Drape the replacement chinstrap retention system over the helmet with the nape-strap pad facing down on the back/rear of the helmet (see Chinstrap Retention Orientation illustration on the next page.)
4. Insert and thread the four legs of the chinstrap into their corresponding ladder locks. (See Routing of Chinstrap Retention System Webbing through Ladder Lock illustration on the next page). Take care to ensure that webbing is not twisted.
5. Slide elastic band over loose ends of webbing.



**Chinstrap Retention System with Hardware**

**Note:** Use only authorized MSA replacement straps with an MSA logo on an MSA helmet.



**Routing of Chinstrap Webbing through Ladder Lock**

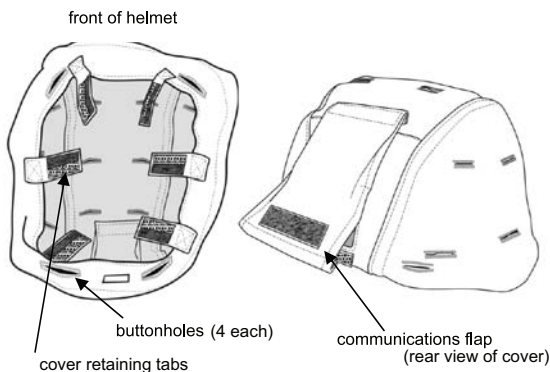
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## ATTACHING HELMET COVER

---

This work package provides instructions for attaching the camouflage helmet cover to your ACH.

There are three covers available for the ACH: a reversible woodland/desert cover, non-reversible white (Arctic) cover & a non-reversible universal camouflage cover.



1. Remove the suspension pads from the inside of the helmet shell.
2. Remove the chinstrap retention system webbing (See previous section). LEAVE THE HARDWARE (P-CLAMPS AND LADDER LOCKS) ATTACHED TO THE SHELL.
3. Select the camouflage pattern to be worn and orient the cover so that the desired pattern is on the outside if using the reversible cover.
4. Helmet covers without communications flaps will be aligned by the front of the helmet cover to the front of the helmet. The front of the helmet cover has a single 1-1/4" long button hole aligned in the front to back direction. Helmet covers with communications flaps will be aligned with the communications flap towards the rear of the helmet.

- 
5. Pull the cover over the back and sides of helmet shell.
  6. Thread each ladder-lock through the corresponding buttonhole in the cover.
  7. Pull the cover retaining tabs down and attach tabs to hook disks inside helmet shell. Ensure tight smooth fit of cover by pulling the retaining tabs until tight.
  8. Place suspension pads back into shell. (See Pad Configuration section, page 25).
  9. Replace chinstrap for retention system webbing.

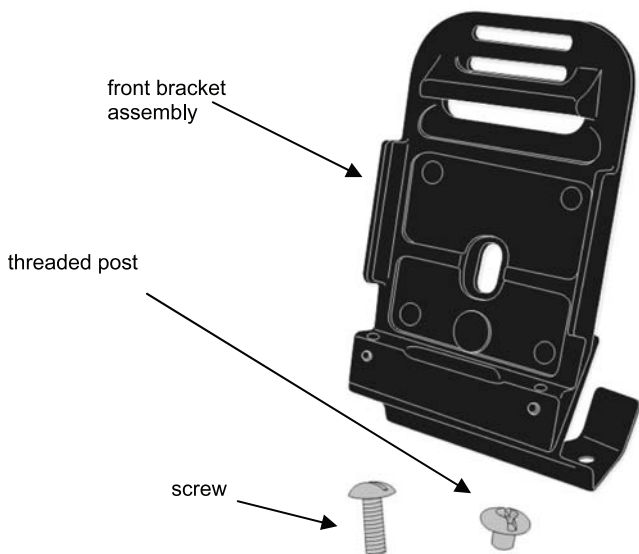
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## FRONT BRACKET ASSEMBLY KIT INSTALLATION

---

This work package provides instructions for installing the front bracket assembly kit on the ACH.

1. Make sure that the front bracket assembly kit has all the components. You should have a front bracket assembly, a screw, and a threaded post (see illustration below). See Chapter 4 Associated and Repair Items List, for appropriate NSN.
2. Install the helmet cover on your helmet. See previous section for attaching helmet cover instructions.



### Front Bracket Assembly Kit Contents

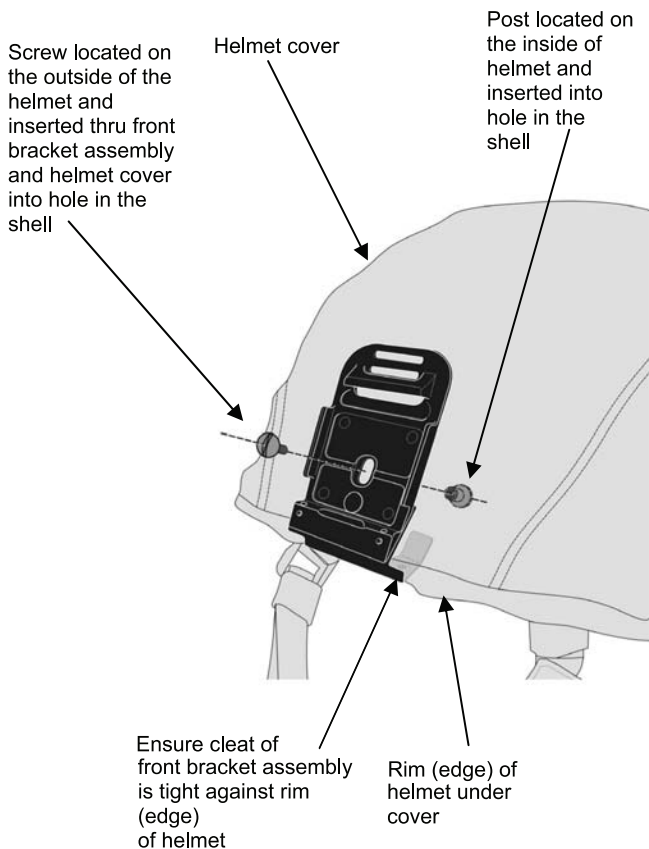
3. Place the front bracket assembly on the helmet over the helmet cover. Line up the hole in the front bracket assembly, the front buttonhole in the cover, and the hole in the helmet shell (see “Front Bracket Assembly Position on Helmet” illustration on the next page.) It may be necessary to move the cover around to line up the buttonhole in the cover.

4. Insert the screw through the front bracket assembly, cover, and into shell from the outside of the helmet. Insert the threaded post from inside the helmet. Start to tighten the screw and post (see “Front Bracket Assembly Positioned on Helmet” illustration on the next page.)

5. Before completely tightening the screw, ensure that the cleat of front bracket assembly is tight against the rim of the helmet (see “Front Bracket Assembly Positioned on Helmet” on the next page). Push the bracket up so that the cleat is tight against the rim (edge) of the helmet while tightening the screw and post using a screwdriver or coin. It may be helpful to have another person assist with this step.

 **CAUTION**

**DO NOT** overtighten the screw or the front bracket assembly may break.



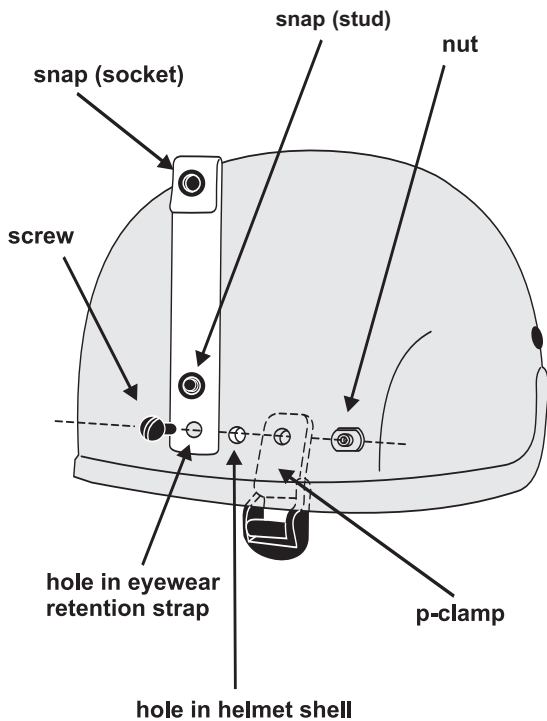
**Front Bracket Assembly Positioned on Helmet**

---

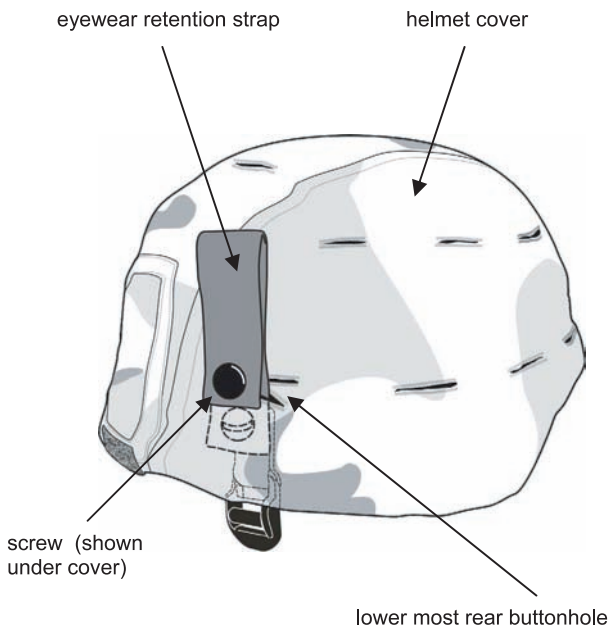
## EYEWEAR RETENTION STRAP INSTALLATION INSTRUCTIONS

---

1. Remove the rear pads.
2. If the helmet cover is installed, unfasten the rear cover retaining tabs to expose the two rear nuts.
3. Remove the rear screw and position an eyewear retention strap over the hole with the snap socket and stud facing away from the helmet. (See Eyewear Retention Strap and Screw Assembly illustration on the next page.)
4. Insert the screw through the eyewear retention straps hole into the helmet. Ensure the helmet cover caught between the eyewear retention strap and screw (it must be free to cover the screw).
5. Align the p-clamp and nut on the screw and tighten. (See Chapter 3 which shows screw and nut installation, for replacing the hardware.)
6. Repeat these steps for the second eyewear retention strap.
7. Secure the cover retaining tabs and reinstall the new pads.



**Eyewear Retentions Strap and Screw Assembly**



**Helmet with Eyewear Retention Strap Installed**

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## CONFIGURATION FOR AIRBORNE OPERATIONS

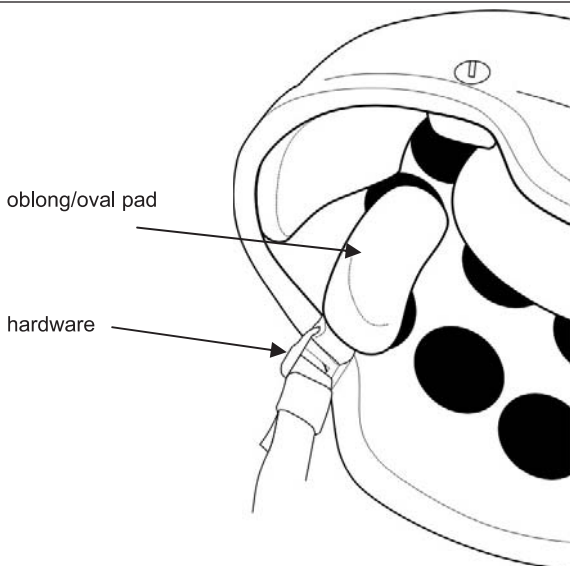
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This work package provides instructions for configuring the ACH for airborne operations as well as other high-risk operations such as air assault and rappelling/mountaineering. No other parts or components are required for airborne use of the helmet.

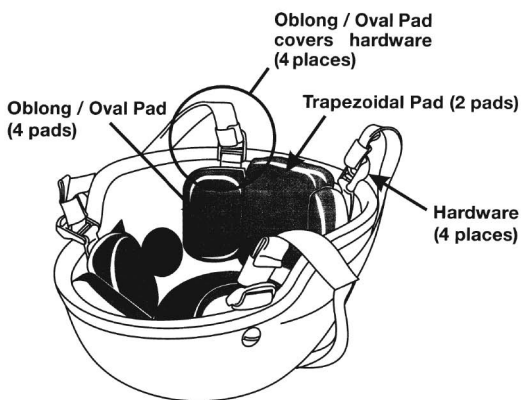
### **WARNING**

**The rear trapezoidal pad must be placed flush with the rim (edge) of the helmet for airborne operations. If you experience helmet rotation during airborne operations the rear trapezoidal pad can be placed so that it extends 1/2" beyond the rim of the helmet. Placement of the rear trapezoidal pad flush or beyond the rim (edge) of the helmet prevents the hard shell from hitting your neck. (See Pad Placement over Hardware (Front) and Pad Placement over Hardware (Rear) illustrations.)**

1. Reposition the rear trapezoidal pad flush with the rim (edge) of the helmet.
2. Reposition the oblong pads (4 each) to cover the chinstrap retention system hardware. See illustrations on the following page.
3. If fore-aft rotation is experienced during airborne operations, then the rear trapezoidal pad may be positioned a 1/2 inch beyond the rim (edge) of the helmet.



**Pad Placement over Hardware (Front)**



**Pad Placement over Hardware (Rear)**

**CHAPTER 3**  
**MAINTENANCE PROCEDURES**  
**FOR**  
**ADVANCED COMBAT HELMET**

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## REPLACING THE HARDWARE

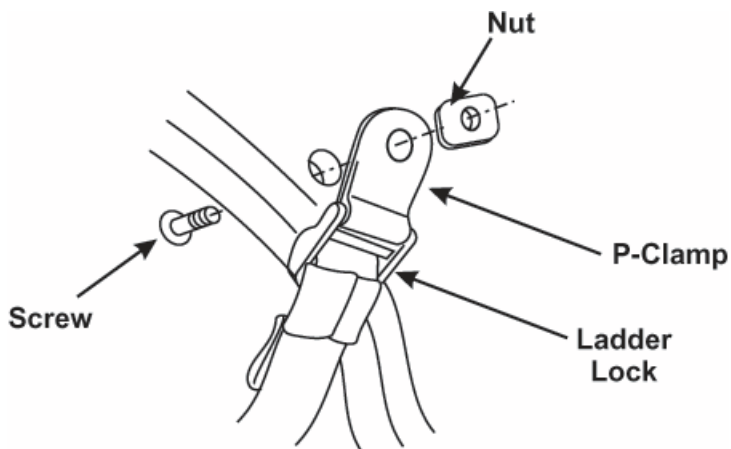
---

This work package provides instructions for replacing the ACH's hardware (ladder lock, p-clamp, screw, or nut).

### NOTE

To replace hardware, use a standard flathead screwdriver. If this tool is unavailable, a coin may be used.

1. Remove the chinstrap retention system as described in previous chapter.
2. Remove the screw with a standard flathead screwdriver and lift the ladder lock and p-clamp out. It may be necessary to use pliers or wrench to hold or turn the inside nut.
3. Replace the necessary portion (ladder-lock or p-clamp). Replace screw and nut. Tighten the screw.
4. Inspect the screws to ensure tightness. If loosening persists, use the sealing compound (thread-locking compound) (See Expendable and Durable Items List in the back of this manual.) Follow directions on container.



## Hardware

---

## REPLACING THE PAD SUSPENSION

---

This work package provides information on replacing the pad suspension.

### Replacing Pad Suspension

#### NOTE

On one side the pads are covered with a loop material. On the other side, the pads are covered by moisture-wicking fabric. **ONLY THE LOOP SIDE OF THE PAD WILL ATTACH TO THE HOOK DISKS ON THE HELMET SHELL.** Press the pad against the hook disks. The loop side of the pad is green.

1. Pull the individual pads off the inner helmet hook disks.
2. Reattach suspension pads as needed. (see Pad Configurations and Pad Suspension Adjustment sections.)

#### CAUTION

**If the pads do not have the MSA logo, replace complete pad set with an authorized pad set from MSA. Do not mix different types of pads.**

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## **CLEANING INSTRUCTIONS**

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This work package provides instructions for cleaning the ACH.

### **Helmet Shell**

1. Clean with mild soap and water. Use a soft brush or cloth.
2. Allow to air dry.

A small brush is useful in removing dirt from the hook disks on the inside of the shell.

### **Chinstrap, Helmet Cover, and Pad Suspension**

1. Clean with mild soap and water. Wash by hand or in machine in the gentle cycle, cold water.
2. Allow to air dry. DO NOT MACHINE DRY.

Keeping the hook and loop clean will help to maintain its ability to stick together.

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## PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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### Introduction

#### General

Preventive maintenance checks and services (PMCS) are performed to keep the ACH in operating condition. The checks are used to find, correct, and report problems. The operator is to do the PMCS tasks shown in PMCS Table 1. PMCS is to be done before, during, and after use of the ACH.

Before you use the ACH, perform PMCS.

During use of the ACH, periodically perform PMCS.

After you have used the ACH, perform PMCS.

#### PMCS Column Description

ITEM – The order the PMCS should be performed and a reference number for maintenance forms. INTERVAL – Tells when the check should be performed. ITEM TO BE CHECKED OR SERVICED – Tells which items to perform the PMCS procedure on. PROCEDURE – Tells the procedure to perform. If item cannot be repaired, it must be replaced. EQUIPMENT NOT READY IF – Tells what conditions render the ACH unfit to perform the mission.

---

**Table 1. Preventive Maintenance Checks and Services - BEFORE USE**

ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF
Chinstrap Retention System	<p>Check for: 1) Cuts, frays or other damage or loose or damaged stitching in the webbing. If webbing is frayed more than 1/2" or has a discernable cut, or loose or damaged stitching, replace.</p> <p>2) Cracked, worn, or damaged hardware (pclamp, ladderlock, nut, screw) and buckle. Replace.</p> <p>3) Loose screws. Tighten screws or refer to higher level maintenance if loose.</p>	<p>Chinstrap webbing has cuts, frays, or other damage.</p> <p>Hardware or buckle is cracked, worn, or damaged.</p> <p>Screws loose.</p>

<p>Pads</p>	<p>1) Cuts, tears or other damage to outer fabric or inner foam. If pads are torn or cut exposing the inner padding, replace.</p> <p>2) Check pads for compressibility. Pads in service should resist compression the same as new pads when squeezed with hands. If pads are torn or cut exposing the inner padding material, or if pads have lost compressibility, replace.</p>	<p>Pads torn, cut or otherwise damaged.</p>
<p>Shell</p>	<p>1) Gouges, scrapes, cracks, delamination or other damage to shell. If gouges, scrapes, or damage extends below the surface (below the paint), replace.</p> <p>2) Loose or damaged edging. Replace.</p> <p>3) Loose or damaged hook disks. Replace.</p>	<p>Gouges, scrapes, cracks, delamination or other damage extends below the surface (below the paint).</p> <p>Edging is excessively loose or damaged.</p> <p>Hook disks are damaged such that they will not securely hold the pads in place.</p>

Cover	Cuts, frays or other damage to the fabric or cut or frayed stitching. Replace	Excessive cuts, frays, or other damage to the fabric or cut or frayed stitching.
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**Table 2. Preventive Maintenance Checks and Services - DURING USE**

Chinstrap Retention System	Inspect for damaged components (see Item 1)	Chinstrap components are damaged.
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**Table 3. Preventive Maintenance Checks and Services - AFTER USE**

Chinstrap Retention System, Hardware, Pads, Shell	Perform all PMCS steps in Items 1-4 after use.	See above.
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**CHAPTER 4**  
**SUPPORTING INFORMATION**  
**FOR**  
**ADVANCED COMBAT HELMET (ACH)**

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## REFERENCES

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This work package lists related field manuals, forms, technical manuals, and miscellaneous publications.

### FIELD MANUALS

FM 3-5	Tactics of Chemical Warfare
FM 21-11	First Aid for Soldiers
FM 3-21.220	Static Line Parachuting Techniques and Training

### FORMS

DA Form 2028	Recommended changes to Publications and Blank Forms
SF 368	Product Quality Deficiency Report

### TECHNICAL MANUALS

TM 10-8400-203-23	Unit and Direct Support Maintenance Manual for General Repair Procedures for Individual Equipment
TM 11-5855-262-10-2	Night Vision Goggles AN/PVS-7B (NSN 5855-01-228-0937) (EIC: LPS) and AN/PVS-7D (NSN 5855-01-422- 54) (EIC: N/A) (TO 12S10-2PVS7-11; TM 09500A-10/1A; NAVSEA SW215-AT
TM 11-5855-306-10	Monocular Night Vision Device AN/PVS-14 (NSN 5855-01-432-0524) (EIC: N/A) (TM 10271A-10/1)

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## ACH HELMET PARTS LIST

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CAGEC (Commercial and Government Entity Code)

CAGEC — Murrysville 55799

CAGEC — Newport INEL7

**Table 1: ACH Parts List**

<b>MSA Part Number</b>	<b>National Stock Number</b>	<b>Description, CAGEC, and Part Number</b>	<b>U/I</b>	<b>QTY</b>
	8470-01-476-2605	Strap, Chin Retention size M/L	ea	1
	8470-01-519-4200	Strap, Chin Retention, size XL	ea	1
160003A	8470-01-476-5643	Pad, Suspension System, ACH (set of size 6 pads)	set	1
160004A	8470-01-476-5648	Pad, Suspension System, ACH (set of size 8 pads)	set	1

<b>MSA Part Number</b>	<b>National Stock Number</b>	<b>Description</b>	<b>U/I</b>	<b>QTY</b>
300236A	8415-01-521-8806	Nonreversible Cover ACH (univ camo pattern) with communication flap size, S/M	N/A	1
	8415-01-515-4662	Cover, Helmet, Reversible, woodland/desert, with communication flap, size S/M	N/A	1
10055698	8415-01-515-4663	Cover, Helmet, Reversible, woodland/desert with communication flap, size L/XL	N/A	1
	8415-01-521-8808	Nonreversible Cover ACH (univ camo pattern) with communication flap size, L/XL	N/A	1
	8415-01-515-4286	Cover, Helmet, Non-reversible, white, with communication flap, size S/M	N/A	1

<b>MSA Part Number</b>	<b>National Stock Number</b>	<b>Description</b>	<b>U/I</b>	<b>QTY</b>
	8415-01-515-4288	Cover, Helmet, Non-reversible, white, with communication flap, size L/XL	N/A	1
	8415-01-521-8357	Cover, Helmet, Non-reversible (univ camo pattern) without communication flap, size S/M	N/A	1
	8415-01-515-4671	Cover, Helmet, Reversible, woodland/desert, without communication flap, size S/M	N/A	1
	8415-01-515-4674	Cover, Helmet, Reversible, woodland/desert, without communication flap, size L/XL	N/A	1
	8415-01-521-8360	Cover, Helmet, Non-reversible (univ camo pattern) without communication flap, size L/XL	N/A	1

MSA Part Number	National Stock Number	Description,	U/I QTY	
	8415-01-515-4289	Cover, Helmet, Non-reversible white, without communication flap, size S/M	ea	1
	8415-01-515-4290	Cover, Helmet, Non-reversible, white, without communication flap, size L/XL	ea	1
	8470-01-487-1605	Strap, Eyewear, Retention green (483)	ea	1
	5340-01-509-1467	Bracket, Lever (NVG Front Bracket Assembly)	Kit	
10054781	8470-01-506-6625	Clamp, P, Helmet, Advanced Combat	box of 50	
101014A	8470-01-506-6742	Fastener Tape, Hook (Hook Disks)	roll of 500	
	8415-01-521-8802	Strap, Eyewear, Retention, Foliage Green 504	ea	1

<b>MSA Part Number</b>	<b>NSN</b>	<b>Nomenclature</b>	<b>U/I</b>	<b>Qty.</b>
300647A	8470-01-506-6373	Helmet, Advanced Combat (green with one NVG mounting hole, size medium shell, size 8 pads)	ea.	1
300189A	8470-01-506-6375	Helmet, Advanced Combat (green with one NVG mounting hole, size large shell size 6 pads)	ea.	1
300648A	8470-01-506-6377	Helmet, Advanced Combat (green with one NVG mounting hole, size large shell size 8 pads)	ea.	1
10050873	8470-01-513-6411	Helmet, Advanced Combat (green with one NVG mounting hole, size extra large shell size 6 pads)	ea.	1
10050874	8470-01-513-6414	Helmet, Advanced Combat (green with one NVG mounting hole, size extra large shell size 8 pads)	ea.	1
301059A	8470-01-506-6721	Helmet, Parts Kit includes 9 sets of size 6 pads, (1) set of size 8 pads, (400) fastener tapes (hook disks), (10) chinstrap retention systems, (10) mounting screw set, and (10) reversible covers.	Kit	
153006A	8470-01-506-6451	Ladder Lock, Helmet, Advanced Combat	box of 50	
150005A	8470-01-506-6503	Mounting Screw, Helmet, Advanced Combat	box of 50	
150006A	8470-01-506-6488	Nut, Helmet, Advanced Combat	box of 50	
	8470-01-529-6329	Helmet, Advanced Combat (foliage green with one NVG hole, size medium shell size 6 pads)	ea	1
	8470-01-529-6344	Helmet, Advanced Combat (foliage green with one NVG hole, size large shell size 6 pads)	ea	1

MSA Part Number	NSN	Nomenclature	U/I	Qty.
	8470-01-529-6365	Helmet, Advanced Combat (foliage green with one NVG hole, size extra large shell size 6 pads	ea	1
160012A	8470-01-506-6626	Pad, Helmet, Advanced Combat (circular crown pad, size 6)	ea.	1
160013A	8470-01-506-6627	Pad, Helmet, Advanced Combat (circular crown pad, size 8)	ea.	1
160010A	8470-01-506-6454	Pad, Helmet, Advanced Combat (oblong/oval pad, size 6)	ea.	1
160011A	8470-01-506-6456	Pad, Helmet, Advanced Combat (oblong/oval pad, size 8)	ea.	1
160014A	8470-01-506-6851	Pad, Helmet, Advanced Combat (trapezoidal pad, size 6)	ea.	1
160015A	8470-01-506-6855	Pad, Helmet, Advanced Combat (trapezoidal pad, size 8)	ea.	1
	8470-01-144-5367	Post, Helmet (for attaching NVG Front Bracket Assembly)	box of 50	
	5305-00-182-9265	Screw, Machine (8-32x 3/8 in long) for plugging front NVG hole	hd	
	8470-01-476-5631	Screw Set, Mounting includes (4) p-clamps, (4) ladder-locks, (4) bolts, (4) nuts MSA #300107A	set	
10054157	8470-01-519-4200	Strap, Chin, Retention, size XL (green 483)	ea	
300031A	8470-01-487-1605	Strap, Eyewear Retention (green 483)	pr	
	8470-01-476-2605	Strap, Chin, Retention, size M/L Green 483	ea	
	8470-01-521-8319	Strap, Chin, Retention, size M/L Foliage Green 504	ea	
	8470-01-521-8320	Strap, Chin, Retention, size XL Foliage Green 504	ea	

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## EXPENDABLE AND DURABLE ITEMS LIST

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**Table 2. Expendable and Durable Items List**

<b>(1) ITEM #</b>	<b>(2) LEV- EL</b>	<b>(3) NATIONAL STOCK NUMBER</b>	<b>(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER</b>	<b>(5) U/I</b>
1		5210-01-434-9493	Caliper	ea
2			Cloth	ea
3		8315-00-782-3520	Measuring tape	ea
4			Mild Soap	ea
5			Soft Brush	ea
6		8030-01-104-5392	Sealing Compound	bx

---

## RECORD OF HIT

---

### OPERATOR RECORD OF HIT

Name: \_\_\_\_\_

Rank: \_\_\_\_\_ Serial #: \_\_\_\_\_

Unit: \_\_\_\_\_

Phone: \_\_\_\_\_

HELMET Size: \_\_\_\_\_ Date of Issue: \_\_/\_\_/\_\_

Duty Being Performed When Hit: \_\_\_\_\_

Hit Caused by (circle): Fragmentation (Mine, Grenade, Booby Trap  
Artillery, Other)

Date of Hit: \_\_/\_\_/\_\_

Estimated range from point of detonation: \_\_\_\_\_

Location of Hit(s) on Advanced Combat Helmet:

Continued to Perform Mission (circle one)? Yes No

Was Personal Injury Sustained (circle one)? Yes No

Description of Injury: \_\_\_\_\_

---

**OPERATOR  
RECORD OF HIT (cont'd)**

Mail Record of Hit to postal address or responses to electronic mail address:

Postal Address:

Commander  
U.S. Army Soldier and Biological Chemical Command  
ATTN: AMSRD-NSC-IP-A Kansas Street Natick, MA  
01760

Electronic Mail Address:

<http://www.sbccom.army.mil/feedback/index.htm>

Mailing Address

Defense Technologies  
MSA  
1100 Cranberry Woods Drive  
Cranberry Township, PA 16066 USA

Electronic Mailing Address

military.cs@msanet.com











For More Information: Call (1-800-MSA-2222) or Visit Our Website at ([www.MSAnet.com](http://www.MSAnet.com))



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