CHIPS Communications System

Operating Manual

⚠ WARNING

THIS MANUAL MUST BE CAREFULLY READ BY ALL INDIVIDUALS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any piece of complex equipment, this product will perform as designed only if it is used and serviced in accordance with the manufacturer's instructions. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED AND PERSONS WHO RELY ON THIS PRODUCT FOR THEIR SAFETY COULD SUSTAIN SEVERE PERSONAL INJURY OR DEATH.

The warranties made by Mine Safety Appliances Company with respect to the product are voided if the system is not used and serviced in accordance with the instructions in this manual. Please protect yourself and others by following them. We encourage our customers to write or call regarding this equipment prior to use or for any additional information relative to use or repairs.

In North America, to contact 1-800-MSA-2222

This manual is available on the internet at www.msanet.com

Manufactured by

MSA

P.O. Box 427, Pittsburgh, Pennsylvania 15230

(L) Rev 1 **10100799**

Table of Contents

Chapter 1, CHIPS Communications System Overview

The CHIPS Communications System is an unobtrusive communication and hearing protection system designed for rugged use and maximum flexibility.

The complete system consists of:

- three user-selectable headsets including:
  - a high-noise, circum-aural headset
  - a high-noise, in-ear system
  - a low-noise/high-noise, bone conduction headset
- an intelligent PPT/control module capable of functioning in a tri-com configuration
- rugged Military cables and connectors that interface with Military radios and vehicle intercom systems
- canvas carrying bag.

Chapter 2, High-Noise Circum-aural Headset

The High noise headset:

- is for use in noisy environments
- consists of:
  - a circum-aural muff-based headset with speakers and spy microphone assemblies that provide talk through capabilities
  - a boom microphone for communication
- uses a neckband or headband head assembly that allows use of an ACH Ballistic Helmet while providing situational awareness communications and hearing protection.

Level Dependent/ Return Guarantee (FIGURE 2-1)

The High noise headset is equipped with a sound pressure level-dependent function. It consists of two externally-mounted spy microphones that pick up the ambient sound (A1).

Figure 2-1.

Ambient sound is reproduced in stereo to maintain or improve situational awareness in environments where it is desirable that ambient sound be heard, e.g., warning signals, conversation, traffic, etc. Internal electronics limit the ambient sound pressure level inside the headset to a safe level (82 dB).

Battery Installation and Replacement (FIGURE 2-2)

The product is equipped with two standard 1.5 V AAA/LR03 batteries.

NOTE: Rechargeable batteries (such as NiMH 1.2 V or NiCd 1.2 V) should **not** be used as they may significantly reduce the operational life of the product.

The batteries are:

- completely enclosed to protect against moisture and dirt
- housed in the unique battery compartment located in the right side cup.

Battery Installation (FIGURE 2-2)

1. Hold the cup upside down and unscrew the battery cover (B1).
2. Insert the first battery with the (-) pole facing inward (B2).
3. Shake the cup lightly so that the battery falls into place(B3).
4. Insert the second battery with the (+) pole facing inward (B4).
5. Refit the battery cover (B5).

NOTE: Ensure that positive (+) and negative (-) battery poles are correctly aligned.

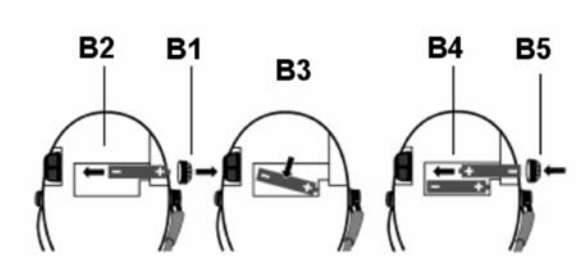


Figure 2-2.

Function Keys (See FIGURE 2-3)

Figure 2-3.

ON and OFF, (O)

- Press (O) key to turn ON the electronic functions.
- To switch OFF the electronic functions, press and hold the same (O) key for two seconds.

Volume Adjustment, (+) (-)

- Briefly press the (+) key to turn up the volume.
- Briefly press the (-) key to turn down the volume.
- The volume starts at the level at which it was switched OFF.
- The volume can be adjusted in five steps.
- The output signal will not exceed known risk levels for hearing damage. Speaker sound is limited to maximum 82 dB.

Battery-Saving Mode

- This mode ensures maximum battery life.
- If no key is pressed during a four-hour period, the unit automatically switches OFF.
- To restart, push the (O) key, located at the middle of the keypad.

Amplification

- At the two highest volume levels, the Communication Headset amplifies the ambient sound by up to 12 dB.

Battery-Saving Function – Warning before Switching OFF

- About two minutes before automatic switch-off, a tone sounds as a warning that sound will be switched OFF.
- Press any key to delay the switch-off by an additional four hours.

Battery Warning

- A tone sounds when about 40 hours of battery life remain.
- This battery warning sounds after 10 seconds at startup.

Fitting Instructions

The Communication Headset is designed to be worn with the neckband behind the head.

1. Brush excess hair back and out from beneath the ear seals with your hand as much as possible.
2. With the neckband behind the head, place the ear cups so as to completely enclose the ears.
   - To obtain the best performance, be sure the ear seals seal tightly against the head with no interference from objects such as glasses or respirator headbands.
3. Adjust the net over the head so the headset does not fall off.

NOTE: To ensure a good seal on the earseals, do not pull the net too tight; the net must hold the headset in place, not pull the headset upward.

⚠ WARNING

Improper fit of this device will reduce its effectiveness in attenuating noise.

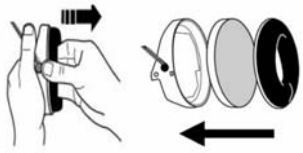


Figure 2-4.

Noise Cancelling Boom Microphone (mic)

The ear muffs are equipped with:

- a noise-canceling boom microphone for noisy environments
- an electret or dynamic microphone, depending on the intended application.

1. Adjust the boom microphone so it is level with, and 3 to 5 mm from, user's mouth.
    - Do not move boom microphone further away when working in a noisy environment.
2. Keep microphone in this position when not talking.
3. Use a wind protector to prevent wind noise interference.

NOTE: The boom microphone assembly must be installed so the flat section of the microphone element is positioned toward the user's mouth. This flat surface has a foam cover.

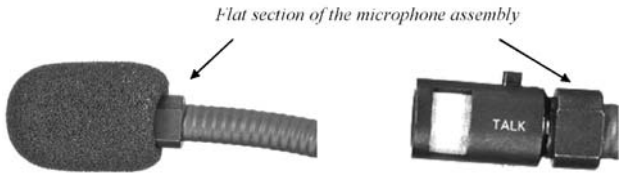


Figure 2-5.

Cleaning

After use, wipe the product with a soft, wet cloth.

NOTE: Do not immerse in water.

Maintenance

1. Inspect the headset regularly to ensure good condition.
2. Clean the outside of the muff and the sealing ring with soap and water, as needed.
3. Regularly inspect earmuffs and sealing rings for cracks and leakage due to possible deterioration with use and age.

- The sealing rings are replaceable. Worn or damaged parts are easily replaced (FIGURE D). Use only hygiene kits designed for these MSA headsets. To ensure that performance is maintained, replace the hygiene kit twice a year in normal use.

  NOTE: This product may be adversely affected by certain chemicals. Further information can be obtained from MSA.

4. Moisture can build up inside the hearing protector if used for long periods. To avoid long-term affects of moisture on the electronic components, regularly remove the acoustic absorbent to allow the inside of the muffs to dry out, e.g., overnight (FIGURE 2-4).

⚠ CAUTION

When removing the cushion and absorbent, be careful not to touch the electronics or cables. Changing the position of cables can cause interference in the system. Do not subject the headset to rough handling, such as dropping it from heights; otherwise damage to the electronics can occur.

Do not immerse the headset in water; performance can be significantly reduced.

Storage

- Store the headset in a dry, cool place; do not leave it sitting in high heat or direct sunlight.
- When the headset is not in use, ensure that the neckband is not extended and that the sealing rings are not compressed.
- Keep the headset dry, clean and at normal room temperature.
- Do not allow the headset to lie in direct sunlight.
- If the product is to be stored for a long period, remove the batteries from the battery holder to prevent damage.
- Store the product in an unfolded position in order to avoid damage to the ear seals.

High Noise Circum-Aural Headset Troubleshooting Guidelines

PROBLEM	SOLUTION
Electronics cease to function	Replace the batteries
	Ensure batteries are correctly fitted in the hearing protector.
	Ensure battery plates make good contact with the batteries.
	Ensure battery plates are not coated
Moisture build-up on electronic components inside muffs due to extended use	Regularly remove the acoustic absorbent so the muff interior can dry out, e.g., overnight
NOTE: If these measures do not help, consult MSA	

⚠ WARNING

Inspect the system before each use. If any deficiency is found, replace the damaged item before use.

The function may deteriorate with battery usage. In normal use, the estimated life of the batteries is about 600 hours

The estimated A-weighed sound level inside the muff, with consideration taken to attenuation values, shall not exceed 82 dB(A).

⚠ WARNING

Remember that hearing protectors generally can shut out ambient sound,

such as warning shouts, alarms and other important signals. Therefore, be extra cautious of your surroundings when wearing hearing protectors.

The integrated microphones for reproduction of ambient sound increase safety considerably in your daily activities. The output signal from the level dependent function can exceed the actual external sound level.

The level dependent function may deteriorate in rain or moist conditions. If deterioration occurs, immediately allow the microphones in the hearing protector to dry (with open muffs for 24 hours) until the function is fully restored.

The product and the batteries are to be disposed of in conformance with national regulations.

Failure to follow the above can result in hearing loss.

Tested to ANSI Specifications, ANSI S3.19-1974

The level of noise entering a person's ear, when hearing protection is worn as directed, is closely approximated by the difference between the A-weighted environmental level and the NRR.

Example:
The environmental noise level at the ear is 92 dB(A). The NRR is 23 decibels (dB). The level of noise entering the ear is approximately equal to 69 dB(A).

Attenuation Data – Headband Foam Seal

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR (dB)
Mean (dB)	15.7	19.8	24.7	25.8	27.9	33.7	38.5	41.6	43	20
Standard deviation (dB)	3.9	3.2	2.8	2.6	2.1	2.2	3.3	3	3.7	20

Attenuation Data – Headband Gel Seal

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR (dB)
Mean (dB)	17.5	20.9	24.9	31.5	30.6	34.5	37.4	41.8	42.5	21
Standard deviation (dB)	3.2	3.2	3	2.7	3.5	4.2	3.8	3.6	4.1	21

Attenuation Data – Neckband Foam Seal

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR (dB)
Mean (dB)	13	16.9	21.9	27	27.3	32.9	35.2	38.8	40.3	18
Standard deviation (dB)	3.3	2.6	2.5	3.3	3.2	3.1	4	4.2	4.4	18

Attenuation Data – Neckband Gel Seal

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR (dB)
Mean (dB)	15.9	18.4	22.9	29.6	27.2	33.1	36.7	39.8	40.4	19
Standard deviation (dB)	3.7	3.3	3.4	3.3	2.7	4.2	4.4	3.2	3.1	19

⚠ CAUTION

For noise environments dominated by frequencies below 500 Hz, the C-weighted environmental noise level should be used. The EPA has selected the NRR as a measure of a hearing protector's noise reducing capabilities. There is no warranty as to the suitability of the NRR as a measure of the actual workplace protection since such protection is highly dependent on user training, motivation, and utilization. Refer to the above instructions for proper fit.

Although hearing protectors can be recommended for protection against the harmful effects of impulsive noise, the Noise Reduction Rating (NRR) is based on the

attenuation of continuous noise and may not be an accurate indicator of the protection attainable against impulsive noise such as gunfire.

The noise reduction capability of this hearing protector against impulsive noise may be estimated by referring to the attenuation performance of the hearing protector at the frequency of the impulsive noise exposure as provided in the attenuation data on the package.

To estimate the noise reduction capability of this hearing protector against impulsive noise, refer to the Attenuation Data below or on the product package. If the frequency of the impulsive noise is 2000 hertz (Hz), for example, the mean (average) reduction of noise attained by test subjects at that frequency was 32.1 decibels (dB). Using the standard deviation of +2.8 dB, the estimated noise reduction at 2000 Hz would range from 29.3 dB to 34.9 dB. Refer to manufacturer of equipment producing the impulsive noise to determine the frequency.

⚠ WARNING

An appropriate hearing conservation program must be utilized that includes adequate monitoring and audiometric testing to ensure effective hearing protection. Improper use of the hearing protector or failure to conduct adequate monitoring and testing can result in hearing loss or other serious personal injury.

Throat Microphone (optional accessory)

The throat microphone assembly is designed to provide high speech recognition in environments with high background noise.

Donning the Throat Microphone

1. Unfasten the buckle assembly.
2. With one hand holding one half of the buckle and the other hand holding the other half of the buckle:
   a. position the bridge in front of the throat.
   b. bring the buckle section behind the neck.
3. Once in position, fasten the buckle and ensure it snaps properly in place.

Figure 2-6.

   - The microphone receiving unit can be worn on the user's left or right side.
4. Adjust the throat strap to ensure the microphone assembly is secure.

- If the strap fit is too loose or too tight, adjust the length of the strap.

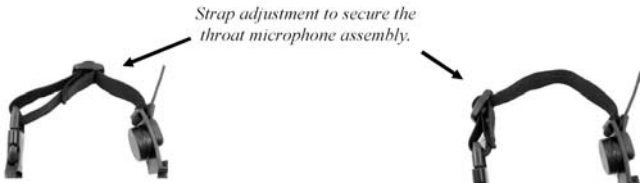


Figure 2-7.

Adjusting the Throat Microphone Position

It is important that the microphone is positioned in the proper location in order to obtain optimal audio and transmission ability.

1. Locate the “hollow” of the throat area.
2. Carefully position the throat microphone housing at that particular position.

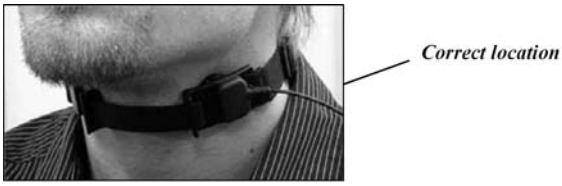


Figure 2-8.

3. Adjust the strap length so the throat microphone is pressed firmly against the skin, but is still comfortable.

Chapter 3, High-Noise In Ear Communication System

The High Noise In-Ear Communication System:

- consists of an in-ear headset positioned in the user's left and right ears.
- includes a speaker and spy microphones that offer the user talk-through and communication capabilities.
- uses an external bone conductive microphone to capture vibrations in the user's jawbone converting them to crisp, clear sound.

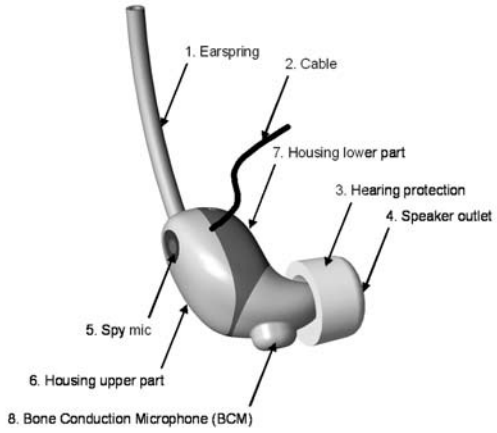


Figure 3-1.

Figure 3-2.

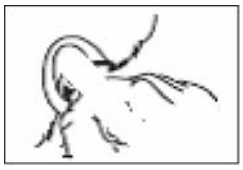
The In-Ear Communication Headset includes:

- Dual headset (one left and one right) with:
  - Cable
  - One common connector for both earpieces
  - Spy microphone, protection mounted
  - Speaker, protection mounted
  - Wind protection, mounted
  - Replaceable ear-spring, mounted
  - Hearing protection plugs in different sizes
  - Cable retainer
  - Cable clips for connecting cable on the user
  - Protective, lightweight and non reflective storage case.

Operation

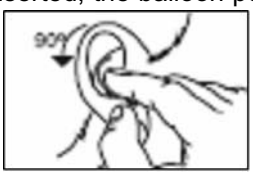
1. Inspect the Earpiece to ensure the correct earpiece version is inserted in the respective right or left ear canal.
2. Roll the foam insert back and forth between your fingers to compress it so that it can be easily inserted into the ear canal. The foam expands after a few minutes, creating a good seal.
3. Hold the earpiece in your right hand with the first three fingers. (For the left ear, use the left hand.)
   - The soft spring points forward, with the tip towards user's ear.
   - The cable points downward.

   Place an index finger on the flat part between the spring and cable.



4. Insert the earpiece in user's right ear and twist it counter-clockwise approximately 90° while lightly pressing the index finger on the flat part. (For left ear, insert earpiece clockwise 90°.)

- Once inserted, the balloon points downward.



5. Use an index finger to apply pressure on the soft spring, until it bends; insert spring in the upper bend of your ear.
   - The soft spring ensures that the earpiece stays in place and that soft moderate pressure is applied for the microphone/ jawbone contact.

6. Place the wire behind user's ear and add a final light pressure on the flat part of the earpiece. For an even more comfortable fit, you may wish to use the supplied cable retainer.

Cleaning

On a regular basis, gently clean the earpiece with a soft tissue or cloth and water or a mild, non-alcohol detergent. Make sure the loudspeaker tube is not blocked. Use a non-alcohol antiseptic if others have previously used the earpiece.

Understand and apply the following precautions during operation and maintenance.

- Do not expose the In-ear Communication System to direct sunlight or extremely high or low temperatures for prolonged periods of time.
- Avoid dropping, hitting, throwing or bending the In-ear Communication System.
- Do not open the system outside of an approved repair facility. Opening the system can prevent the unit from maintaining environmental and operational requirements.
- Do not use harsh chemicals, strong detergents, solvents, or corrosives to clean the In-ear Communication System.
- Before transferring an earpiece from one user to another, use a non-alcohol antiseptic cleaning solution to clean the earpiece.
- When not in use, store In-ear Communication System in a safe place where it will not be bent or crushed.

- Keep the In-ear Communication System away from children to prevent swallowing of small and detachable parts.

⚠ WARNING

To reduce the risk of electric shock, do not disassemble this product.

Opening or removing cabinet parts, other than specified access doors, may damage the product and expose you to dangerous voltages or other risks. Incorrect reassembling can cause electric shock when the product is subsequently assembled. Users are not permitted to change or modify the device in any way. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Do not replace or make adjustments to internal components of the product when the power is turned ON. Dangerous voltages may exist when the product is turned ON due to changes retained by capacitors. Always remove power and discharge and ground a circuit before touching it to avoid injury.

Tested according to ANSI Specifications, ANSI S3.19-1974

The level of noise entering a person's ear, when hearing protection is worn as directed, is closely approximated by the difference between the A-weighted environmental level and the NRR.

Example:
The environmental noise level at the ear is 92 dB(A). The NRR is 23 decibels (dB). The level of noise entering the ear is approximately equal to 69 dB(A).

Attenuation Data – MSA In-Ear Communication System

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR
Mean (dB)	32.2	33.3	36.0	36.9	38.2	42.3	42.2	45.2	44.7	29
Standard deviation (dB)	4.1	3.8	3.3	3.7	3.5	4.7	5.0	3.9	4.0	

⚠ CAUTION

For noise environments dominated by frequencies below 500 Hz, the C-weighted environmental noise level should be used. The EPA has selected the NRR as a measure of a hearing protector's noise reducing capabilities. There is no warranty as to the suitability of the NRR as a measure of the actual workplace protection since such protection is highly dependent on user training, motivation, and utilization.

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Although hearing protectors can be recommended for protection against the harmful effects of impulsive noise, the Noise Reduction Rating (NRR) is based on the attenuation of continuous noise and may not be an accurate indicator of the protection attainable against impulsive noise such as gunfire.

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An appropriate hearing conservation program must be utilized that includes adequate monitoring and audiometric testing to ensure effective hearing protection. Improper use of the hearing protector or failure to conduct adequate monitoring and testing can result in hearing loss or other serious personal injury.

Chapter 4, Low-Noise/High-Noise Communication Headset

The Low-Noise Communication Headset System converts incoming transmissions into vibrations that are transmitted through bone to the user's auditory organs for listening purposes. The System consists of:

- a headset that that is fitted with a noise-canceling microphone
- two bone conductive listening devices.

Figure 4-1.

The Low-Noise/High-Noise headset is a specially designed, low-noise communication headset system that allows the user to communicate effectively, regardless of the level of ambient noise.

When the user must listen to the environment with both ears, the user can "hear" the incoming messages through the bone conductors, while still listening to the surroundings with both ears. In high noise environments, where the user needs to don earplugs for protection, the bone conductors still effectively transmit the incoming messages intelligibly.

The Low-Noise/High-Noise headset:

- is designed to be worn behind the user's head, in a neckband style configuration
- is **not** to be worn over the user's head like headband style headsets.

To don the Low-Noise/High-Noise headset:

1. Hold the headset in front of you with the correct orientation.
2. Grasp the ear-loops and spread them apart slightly.
3. Place the headset behind the head and slip it over the ears.
4. Adjust the frame's fit by positioning the stretchable band:

- Moving the band forward on the neckband applies more tension on the speaker transducers.
- If the frame is too tight, reposition the band to the back of the neckband frame, reducing the amount of tension on the speaker's transducers.

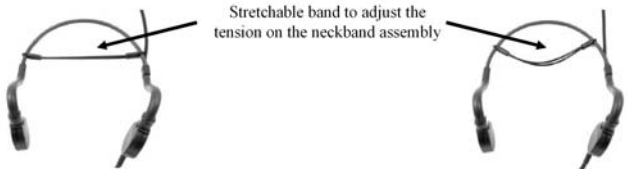

Figure 4-2.

Positioning the Conduction Transducers

Ensure the left and right side bone conduction transducers are positioned just in front of each ear and firmly in contact with the skin.

Figure 4-3

Adjusting the Microphone Position

1. Adjust the flexible boom so it follows the contours of your face.
2. Position the microphone right in front on the mouth, at a distance no further than 4 to 5 mm from the lips.

Cleaning

After use, wipe the product with soft wet cloth.
Do not immerse in water. See Chapter 3, "Cleaning" for details.

Storage

- Store in a dry, cool place; do not leave it sitting in high heat or direct sunlight.

Chapter 5,
CHIPS PTT Control Module

The PTT Control Module is the central component of the CHIPS Communications System.
The PTT Control Module integrates and controls the communication headsets and radio/intercom connections.

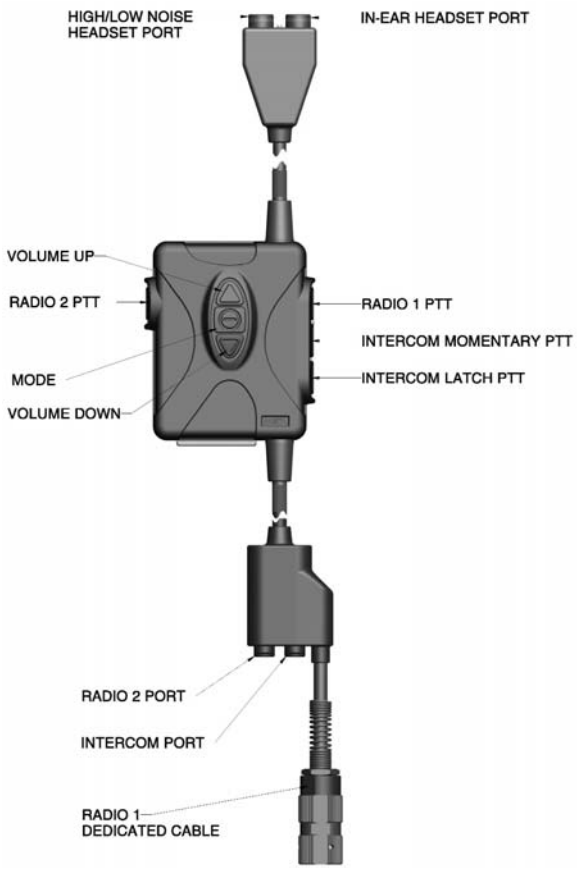
HIGH/LOW NOISE
HEADSET PORT
IN-EAR HEADSET PORT
VOLUME UP
RADIO 2 PTT
RADIO 1 PTT
INTERCOM MOMENTARY PTT
MODE
INTERCOM LATCH PTT
VOLUME DOWN
RADIO 2 PORT
INTERCOM PORT
RADIO 1
DEDICATED CABLE

Figure 5-1.

Port and Button Descriptions

1. Two-Port Headset Junction Block

The two-port headset junction block accommodates:

- a High Noise Circum-Aural headset
- a Low Noise headset and
- a High Noise In-Ear headset.

- The port with the Red dot indicator accepts a High Noise headset or a Low Noise headset.

  The mating headset connectors also have this Red dot for port identification and quick connector alignment and mating.

- The port with the White dot indicator accepts the High Noise In-Ear headset.

  The mating High Noise In-Ear headset connectors also have this White dot for port identification and quick connector alignment and mating.

- The connector ports are keyed to prevent a headset from being plugged into the wrong port.

2. Three-Port Radio/Intercom Junction Block

The three-port Radio/Intercom junction block is the interface for two radios and a VIC-3/Intercom system. The radios, VIC-3 or Intercom can be used in any combination.

- The dedicated cable with the six-pin Audio connector is the Radio 1 port.
- The port with the White dot indicator is the Radio 2 port. This port accepts a radio cable with a six-Pin Audio connector. The mating connector on the radio cable also has a White dot indicator for ease of identification for proper mating.
- The center port with the Red dot indicator is the VIC-3/Intercom port. This port accepts a VIC-3 interface cable (terminated with an AP-107 plug) or an Intercom cable (terminated with a U-174 type plug).

  Both the VIC-3 cable and Intercom cable have Red dot indicators for easy identification and mating to the corresponding junction block port.
- The connector ports are keyed to prevent plugging a radio cable into the center Intercom port or plugging a VIC-3/Intercom cable into the radio port.

3. Radio 1 PTT Button

If Radio 1 is connected to the PTT box:

- When pushed and held, this button activates the Radio 1 Push-To-Talk transmit function.

4. Radio 2 PTT Button

If Radio 2 is connected to the PTT box:

- When pushed and held, this button activates the Radio 2 PTT transmit function.

5. VIC-3 Momentary PTT Button

When the PTT box is connected to a VIC-3 system:

- When pushed and held, this button activates the VIC-3 Radio PTT transmit function or the VIC-3 Intercom PTT transmit function, according to settings on the VIC-3 FFCS (Full Function Crew Station) box located in the vehicle to which the PTT box is connected.

6. VIC-3 PTT Latch Button

When the PTT box is connected to a VIC-3 system:

- When pushed and held for three seconds, this button activates the PTT latch function on the VIC-3 system.

  This allows the user to talk hands-free over the VIC-3 intercom without pushing any buttons. Pushing the button again for three seconds deactivates the latch.

7. Intercom Interface

When an Intercom cable (U-174/U type plug) is connected to the PTT box:

- the unit provides a "hot mic" to external equipment, allowing the equipment's own PTT device, or switch, to be used.

8. Volume Up Button

- When consecutive presses are performed, the Volume Up button increases the Radio or VIC-3/Intercom listening volume for:
  - a High Noise Circum-Aural headset
  - a Low Noise headset or
  - a High Noise In-Ear headset.
- Additionally, when an In-Ear headset is plugged into the PTT box:

  consecutive presses of the Volume Up button, in conjunction with the MODE button, increases the volume of the In-Ear ambient listening speakers.
- Pressing the Volume Up and Volume Down button at the same time for three seconds turns OFF the PTT box.

9. Volume Down Button

- When consecutive presses are performed, the Volume Down button decreases the Radio or VIC-3/Intercom listening volume for:
  - a High Noise Circum-Aural headset
  - a Low Noise headset or
  - a High Noise In-Ear headset.
- Additionally, when an In-Ear headset is plugged into the PTT box:

  consecutive presses of the Volume Down button, in conjunction with the MODE button, decreases the volume of the In-Ear ambient listening speakers.
- Pushing the Volume Up and Volume Down button at the same time for three seconds turns the PTT box OFF.

10. MODE Button

The MODE button serves three functions:

a. To turn ON the PTT box, push and hold the MODE button for three seconds.

b. To turn ON/OFF the In-Ear ambient listening function (if an In-Ear headset is plugged into the PTT box and the box is powered up):

   - A short press of the MODE button turns ON the ambient listening feature.
   - Pressing and holding the MODE button for three seconds turns OFF the ambient listening feature.

c. To select between Radio/VIC-3/Intercom listening volume control and High Noise In-Ear ambient volume control (if an High Noise In-Ear headset is plugged into the PTT box and the box is powered up):

   - A short press of the MODE button turns ON the ambient listening feature; the Volume Up and Volume Down buttons increase or decrease ambient listening feature volume. An audio prompt "Ambient Volume" alerts user that ambient volume control is selected.

- Another short press of the MODE button selects Radio/VIC-3/Intercom volume control; the Volume Up and Volume Down buttons increase or decrease the volume of any radio or intercom connected to the PTT box. An audio prompt, "Radio Volume", alerts user that radio/Vic-3/Intercom volume control is selected.
- Continuous short presses of the MODE button cause toggling between In-Ear ambient volume control and In-Ear Radio/Vic-3/Intercom volume control. In each case, the audio prompt tells user what volume control mode is selected.

NOTE: When a High Noise or Low Noise headset only is plugged into the box, the MODE button serves only to turn ON the PTT box.

The volume control function of the MODE button functions only when an In-Ear headset is plugged into the headset junction block.

11. Pressing the VOLUME UP, VOLUME DOWN and MODE buttons at the Same Time

Pressing the VOLUME UP, VOLUME DOWN and MODE buttons at the same time forces a complete PTT Box shutdown.

Mode 1:
In-Ear Headset Communication System

In this mode:

- Only an In-Ear Communication System is connected to the PTT Control Module
- Transmit and Receive communication is done via the in-ear mics and speakers
- The ambient sound function (spy mics) is controlled by the MODE button, Volume Up and Volume Down buttons on the PTT box.

Mode 2:
In-Ear and Circum-Aural Headset Communication System

In this mode:

- The following are connected to the PTT Control Module:
  - The In-Ear Headset
  - The High Noise Headset
- Transmit and Receive communication is done via the in-ear bone mics and speakers
- The ambient sound function (spy mics) is obtained by routing the ambient sound spy mic signals from the High Noise Headset to the in-ear speakers. Ambient volume control is obtained by using the volume control buttons on the High Noise headset. In this mode, the volume control buttons on the PTT box are not used.

Mode 3:
Circum-Aural Headset
Communication System Only

In this mode:

- Only the High Noise Headset is connected to the PTT control module
- Transmit and Receive communication is done via the boom mic and headset speakers
- The ambient sound function (spy mics) is obtained by using the spy mics located on the High Noise Headset. ON/OFF and Volume control of ambient sound is done by using the ambient sound control buttons on the High Noise headset.

Mode 4:
In-Ear and Low Noise Headset

In this mode:

- The following are connected to the PTT Control Module:
  - The In-Ear Headset
  - The Low Noise Headset
- Transmit and Receive communication is done via the in-ear bone mics and speakers
- The ambient sound function (spy mics) is obtained via the spy mics on the High Noise In-Ear headset and is controlled by the MODE button, Volume Up and Volume Down buttons on the PTT box.

Mode 5:
Low Noise Headset

In this mode:

- Only the Low Noise Headset is connected to the PTT Control Module
- The low noise headset speaker and boom mic are used
- Ear plugs can be used to provide hearing protection while maintaining communication capabilities.

Mode 6 -
Failsafe Mode

In a situation where a total system failure occurs and the PTT box appears to be “dead”:

1. Remove the In-Ear headset if it is connected.
2. Plug a High Noise or Low Noise headset into the headset junction block.
3. Use the dedicated cable (Radio 1) on the PTT box to connect to a radio for communication.
    - The headset boom mic is used for transmitting audio.
    - Received audio is in the left headset speaker.

Mode 7:
Stand-alone Circum-Aural High-noise Headset

In this mode:

- Only the High Noise Circum-Aural Headset is used, without connection to the PTT Control Module.
- The circum-aural high noise headset is used for hearing protection and talk-through capabilities when long range communications are not required, e.g., training shooting ranges.

Additional Functions and Features

Automatic Single Comm/Dual Comm Speaker configuration

Depending on how many radios are connected to the system, automatic speaker configuration occurs, which enables single comm and dual comm listening.

High Noise Headset

If a single radio (Radio 1 or Radio 2) is connected to the PTT system:

- received audio is routed to both headset speakers, providing a "single comm" headset configuration.

If two radios are connected to the PTT system:

- Radio 1 received audio is heard in the left ear headset speaker and
- Radio 2 received audio is heard in the right ear headset speaker.

If two radios and a VIC-3/Intercom are connected to the PTT box:

- Radio 1 received audio is heard in the left ear headset speaker
- Radio 2 received audio is heard in the right ear headset speaker and
- VIC-3/Intercom audio is heard in both ears.

In-Ear Headset

If a single radio (Radio 1 or Radio 2) is connected to the PTT system:

- received audio is routed to both In-Ear speakers, providing a "single comm" headset configuration.

If two radios are connected to the PTT system:

- Radio 1 received audio is heard in the left In-Ear speaker and
- Radio 2 received audio is heard in the right In-Ear speaker.

When a VIC-3/Intercom is connected to the PTT box while In-Ear speakers are used:

- all received audio is routed to the right In-Ear headset. This includes Radio 1, Radio 2, and VIC-3/Intercom audio.

Battery Run Time

Install a fresh CR123 battery after 65 hours of continuous battery use; this means that the battery supplied the power when used with radios that do not supply power.

When the battery is low:

- a short audio burst of five beeps every five minutes is heard by the user.

If the battery is not changed and becomes weaker:

- the audio burst then occurs every two minutes, alerting the user that the batteries must be changed within the next two or three hours.

Auto Shutdown

When the battery is supplying the power for the PTT box:

- If the PTT box is powered up and no button was pressed for four hours, the unit automatically shuts down to conserve battery power.

Voice Annunciation

Voice annunciation alerts the user when radio and intercom cables are plugged or unplugged. Voice annunciation also aids in in-ear volume control for the ambient volume and radio/intercom volume.

Battery Replacement

1. Loosen the screw holding the battery compartment cover in place.
2. **Carefully** open the top cover.
3. Replace the CR123 battery using the web guide to lift the battery from the battery compartment. Install a fresh battery.
4. Replace the battery cover, making sure to seat it properly.
5. Make sure the battery cover seal is free of dirt and debris.
6. Tighten the screw loosened in step 1.
    - The screw must be tightened thoroughly to ensure that the battery compartment remains waterproof.

Maintenance

1. Make sure all connectors are free of dirt or debris.

2. Make sure the battery compartment cover is properly seated and securely tightened.

   NOTE: Do not over-tighten screws.

3. Change the PTT battery and high-noise circum-aural headset batteries at every pre-combat inspection.
4. Make sure all components are dry before storing.
5. After salt water exposure, rinse with fresh water and dry all exterior components.

CHIPS PTT Troubleshooting Guidelines

PROBLEM	SOLUTION
Comm System stops operating	Ensure batteries are installed correctly
	Replace batteries before all pre-combat inspections
Comm System receives but does not transmit	Ensure batteries are installed correctly
	Replace batteries
System is inoperable after Maritime use	Fresh water rinse all connectors; reconnect, and perform comm checks
Comm System is not working with a compatible radio/intercom	Disconnect all cables from the PTT and reconnect them
	Ensure that cables are properly attached to connectors, using color-coded label as a guide

Fully Integrated System

- If mission requires hearing protection, use the High-Noise Circum-Aural Headset or the High-Noise In-Ear Communication System.

⚠ CAUTION

Use double hearing protection (high-noise circum-aural headset and high noise in-ear communication) when headsets are used in very high noise environments, such as track vehicles, for eight hours or longer; otherwise, hearing damage will occur.

- Determine if:
  - the CHIPS Communication System will be used in a single radio or dual radio
  - intercom communications are required.
- Connect Low- Or High-Noise Communication Headset(s) to the PTT using the quick disconnect connector(s).
- Connect the PTT to the radio using appropriate radio cable connectors.
  - The Single-comm PTT has the fixed primary cable.
  - Dual-comm radio and intercom cables can be added to the suite using quick-disconnects, expanding the system to Dual and CHIPS communication capabilities.

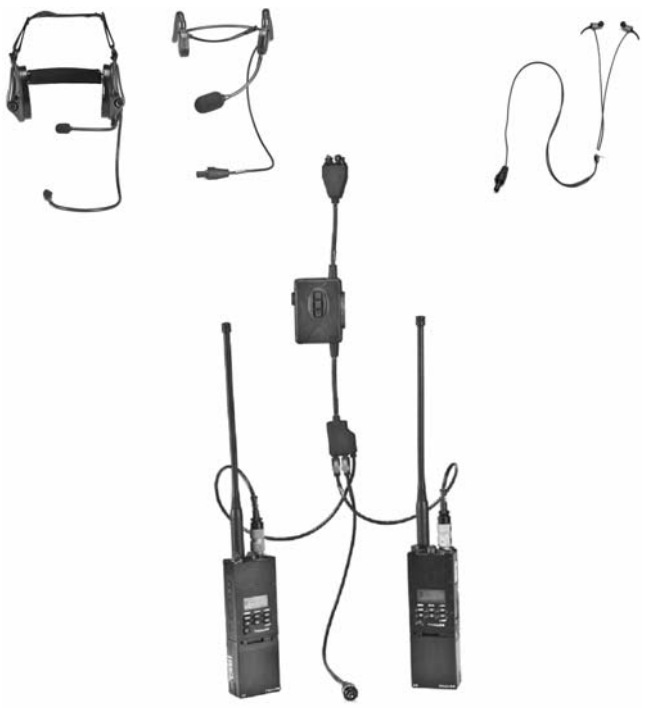

Figure 5-2.

Key Points to Proper Mounting

1. Mount the PTT on the vest MOLLE.
2. Route the cabling on the PTT (away from user's firing side).
3. Ensure that cabling is secured and not loose from the user's load carriage system.
4. After the system is mounted, check the range of motion and key mission-related tasks to ensure that the comm(s) package does not interfere with these tasks.

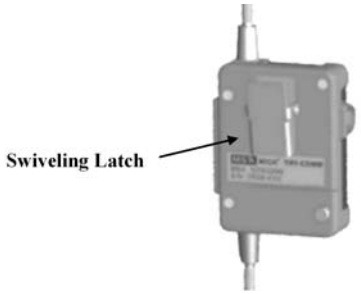

Figure 5-3.

Mounting Checklist

1. Is the system mounted on your non-firing side?
2. Is the cabling routed away from the firing side and away from equipment needed for your mission? Use flex-ties and rigger tape, if necessary.
3. Do you have access to both push-to-talk buttons on the CHIPSm box?
4. Do you have full range of motion while wearing all gear needed for your mission?
5. Have you used tie-downs and routed cables to prevent snagging hazards?
6. Have you considered the best way to place and route this equipment? It may take a few tries before the kit is placed correctly for the individual user.

Chapter 6,
CHIPS Communication System Specifications

Specifications

System Performance	Guaranteed when temperature of use is between -40°F to +140°F			
Storage Temperature	Between -40°F to +160°F			
Relative Humidity	Tolerated from 0 to 100%			
Water Resistant	Rated for IP67			
Typical Battery LIfe	65 hours			
Weight	**Headset**	**Circum-Aural** **In-Ear** **Low-Noise**	445 g 363 g 91 g	(.98 lbs.) (.80 lbs.) (.20 lbs.)
	PTT Control Module With Battery		372 g	(.82 lbs.)
	Interface Cables with Connectors	**PRC Connector** **VIC 3 Cable**	91 g 73 g	(.20 lbs.) (.16 lbs.)
	Carry Bag		735 g	(1.62 lbs.)
	Complete System		2,170 g	(4.8 lbs.)
Hearing Protection	Above 82 dB			
Ambient Noise Amplification	Below 82 dB			

NOTE: Inspect system before each use. If any deficiency is found, replace damaged item before use.

General
Communication System Warranty

1. **Warranty-** Seller warrants that this product will be free from mechanical defect or faulty workmanship for a period of two years from date of shipment, provided it is maintained and used in accordance with Seller's instructions and/or recommendations. This warranty does not apply to expendable or consumable parts whose normal life expectancy is less than one (1) year such as, but not limited to, non-rechargeable batteries, filament units, filter, lamps, fuses etc. The Seller shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from physical abuse or misuse of the product. No agent, employee or representative of the Seller has any authority to bind the Seller to any affirmation, representation or warranty concerning the goods sold under this contract. Seller makes no warranty concerning components or accessories not manufactured by the Seller, but will pass on to the Purchaser all warranties of manufacturers of such components. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. SELLER SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**

2. **Exclusive Remedy-** It is expressly agreed that Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of Seller, or for any other cause of action, shall be the repair and/or replacement at Seller's option, of any equipment or parts thereof, which after examination by Seller is proven to be defective. Replacement equipment and/or parts will be provided at no cost to Purchaser, F.O.B. Seller's Plant. Failure of Seller to successfully repair any non-conforming product shall not cause the remedy established hereby to fail of its essential purpose.
3. **Exclusion of Consequential Damage-** Purchaser specifically understands and agrees that under no circumstances will seller be liable to purchaser for economic, special, incidental or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of non-operation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct or any other cause of action against seller.

Contact:

- MSA Customer Service
  P.O. Box 426
  Pittsburgh, PA 15230-0426
- Commercial Phone:
  - In U.S.: 1-800-MSA-2222
  - From outside U.S.: 412-967-3000.

Unit Warranty Procedures

The unit:

- may send CHIPS Communication Systems made unserviceable due to fair wear and tear or an expired warranty period to MSA for repair or replacement.
- must include completed work requests form (such as a DA Form 2407 maintenance request or similar component work request form) when shipping to SOFSA.

Maintenance Request Minimum Information

- Unit designation
- Unit point of contact (POC)
- Unit shipping address
- Telephone number of POC
- Nomenclature of CHIPS Communication System item
- Description of component failure or damage.

Parts LIst

PART NO.	DESCRIPTION
10093514	Radio/Intercom Interface Junction Block
10093513	Headset Interface Junction Block
10088357	In-Ear Headset
10094783	Low Noise Headset, Dual Bone Speakers
10102430	Low Noise Headset Mic Wind Guard, 10 per pkg.
10102619	High Noise Circum-Aural Headset Boom Mic WindGuard
10095584	Clothing Clip, Rotating
10102621	In-Ear Foam Replacement Pack, Standard
10102617	Large Left Soft Spring
10102616	Large Right Soft Spring
10102615	Small Left Soft Spring
10102614	Small Right Soft Spring
154008A	High Noise Circum-Aural Foam Hygiene Kit
10082377	High Noise Circum-Aural Gel Hygiene Kit
10088358	High Noise Circum-Aural Headset, Neckband, Electret Mic On Left, Foam Seal
10088359	High Noise Circum-Aural Headset, Neckband, Dynamic Mic On Left, Foam Seal
10088360	High Noise Circum-Aural Headset, Neckband, Electret Mic On Left, Gel Seal
10099068	High Noise Circum-Aural Headset, Neckband, Dynamic Mic On Left, Gel Seal

10099069	High Noise Circum-Aural Headset, Neckband, Electret Mic On Right, Foam Seal
10099070	High Noise Circum-Aural Headset, Neckband, Dynamic Mic On Right, Foam Seal
10099071	High Noise Circum-Aural Headset, Neckband, Electret Mic On Right, Gel Seal
10099072	High Noise Circum-Aural Headset, Neckband, Dynamic Mic On Right, Gel Seal
10098930	High Noise Circum-Aural Headset, Headband, Electret Mic On Left, Foam Seal
10099061	High Noise Circum-Aural Headset, Headband, Dynamic Mic On Left, Foam Seal
10099062	High Noise Circum-Aural Headset, Headband, Electret Mic On Left, Gel Seal
10099063	High Noise Circum-Aural Headset, Headband, Dynamic Mic On Left, Gel Seal
10099064	High Noise Circum-Aural Headset, Headband, Electret Mic On Right, Foam Seal
10099065	High Noise Circum-Aural Headset, Headband, Dynamic Mic On Right, Foam Seal
10099066	High Noise Circum-Aural Headset, Headband, Electret Mic On Right, Gel Seal
10099067	High Noise Circum-Aural Headset, Headband, Dynamic Mic On Right, Gel Seal