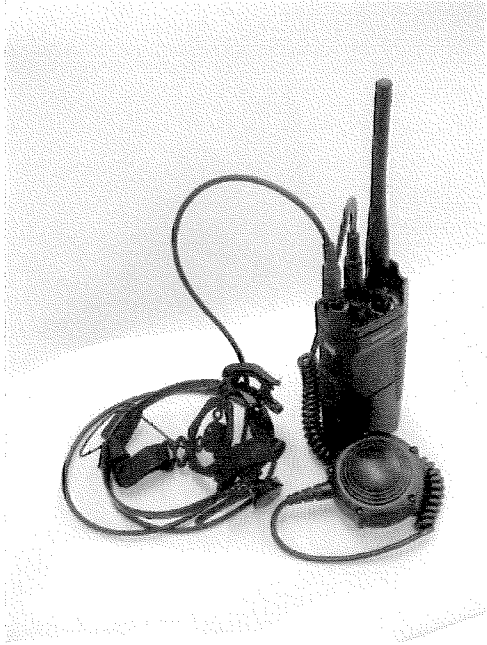


VADER
VOICE-ACTIVATED DIGITALLY ENHANCED RADIO
PROFESSIONAL SECURE RADIO SYSTEM
USER'S MANUAL

ABOUT THE VADER SYSTEM



The VADER communication system was developed for professional use in mobile communications within a small group that has tasks requiring high confidentiality.

To secure the communication, the VADER radio features a scrambling transmission along with a high-speed frequency scanning that makes group's communication hard to be intercepted.

The RF output power is selectable between LO (10mW) and HI (100mW) according to the group's range of activities. Minimizing the RF output power prevents detection from outside of the group.

The VADER radio does not come with a built-in microphone or a speaker. You can use this radio by connecting the external audio device either a Headgear or an Ear Microphone both applies Temco's bone conduction technology.

Neither the Headgear nor the Ear Mic prevents you from wearing a helmet. Furthermore, neither device sets its microphone near your mouth. The system's complete face-free configuration assists your active tasks.

A remarkable feature of the VADER radio is to have the DSP (Digital Signal Processor) that makes VOX (Voice Activation) work steadily even in highly noisy condition. This achieved to

offer the enhanced VOX that first meets the tasks of professional communications. The DSP activates the VOX circuitry only when the input signal is recognized as the human voiced sounds, and switches the radio to the transmit mode.

The DSP also enables to temporarily store the speech on memory and send them to transmit with a slight delay. This completely prevents clipping the voice syllable at the beginning of speech that the conventional VOX currently in use could never achieve. You can also enjoy the noise cancellation function featured by the DSP that suppresses noise elements through digital processing and creates the clear audio to transmit. Along with Temco's noise-resistant bone conduction microphones, the higher the ambient noise level is, the more you can feel its performance.

The Radio Housing is made from magnesium alloy that allows the unit to be light but sturdy.

An easy detachable battery housing is made from reinforced polycarbonate resin that resists against heat and shock. You can fill size AA dry batteries or same-sized rechargeable cells into the pack.

Both the radio transceiver and the battery pack are submersible. You can use the VADER radio under any weather conditions in outdoors.

The VADER secure radio system is the most suitable equipment for professional tasks requiring high security and confidentiality.

FEATURES

- Hands-free, Face-free
- Waterproof, submersible radio (in 6.5 feet / 30 minutes)
- Waterproof Headgear HG17 and Body PTT Switch BP210
- Enhanced DSP VOX. No clipping the speech. No miss-operation by ambient noise.
- DSP noise canceling
- High speed channel scanning
- Scrambling transmission
- Emergency and Homing signal alerting function
- Small & Light-weight

INSPECTION

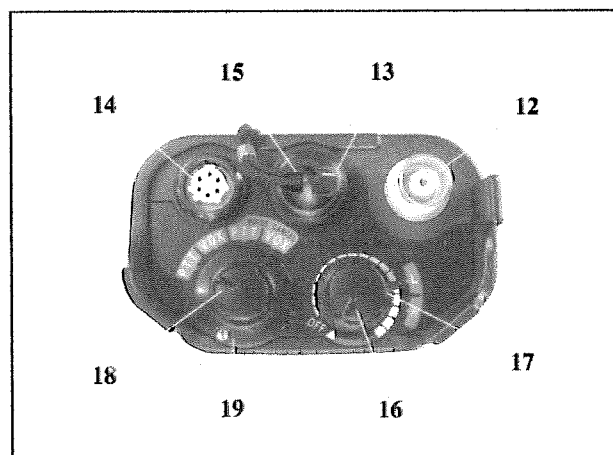
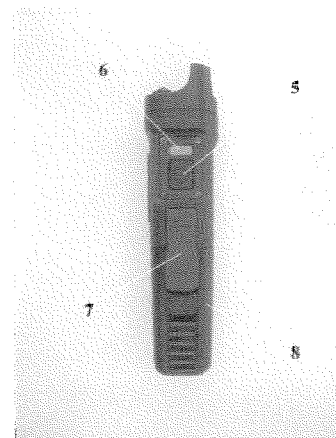
When you receive your packaged VADER system, inspect the shipping carton for any signs of damage. Then, remove and check the contents of the packing case to be certain that all items ordered have been included. Contents of the packing case may be different from those listed below if optional accessories were ordered.

Standard kit	Optional accessories
1. Radio Transceiver SR20 2. Antenna AT20 3. Battery Clip BC20 4. Headgear HG17 5. Body PTT Switch BP210 6. Ear Mic EM7 7. Replacement Eartip, size L 8. User's Manual	1. Programming Cable 2. Cloning Cable 3. Headgear HG16

Inspect the equipment thoroughly. If any part of the equipment has been damaged in transit, report the extent of the damage to Temco Japan Co., Ltd., or Temco Communications, Inc. immediately.

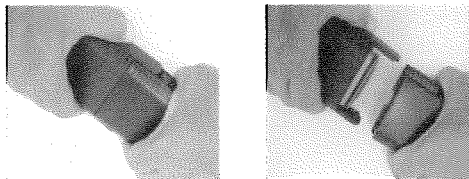
NAME OF PART & CONTROLS

- ①. VADER radio transmitter/receiver
- ②. Headgear
- ③. Ear Mic
- ④. Body PTT Switch
- ⑤. PTT Button
- ⑥. Homing Button
- ⑦. Latch Lever
- ⑧. Battery Clip
- ⑨. Battery Housing
- ⑩. Battery Cap
- ⑪. Clamp
- ⑫. Antenna Connector
- ⑬. Program Connector
- ⑭. AF Connector
- ⑮. Water-seal Plug
- ⑯. Power/Volume Switch
- ⑰. RF Output Power Selector
- ⑱. Mode Selector Switch
- ⑲. Group Selector Switch



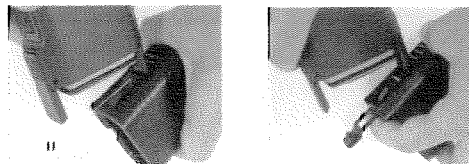
BATTERY INSTALLATION (OR REPLACEMENT)

1. Press and hold the 2 Latch Levers on the side of Radio Housing at the same time and pull down the Battery Clip to remove from the Radio Housing.

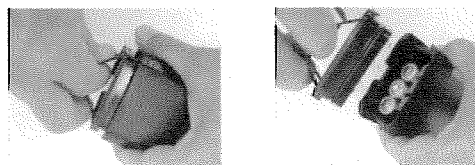


2. Release the Clamp located at both sides of Battery Cap by using the right hand side of Latch Lever on the Radio Housing.

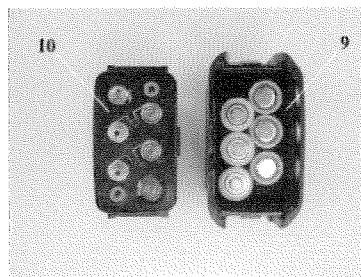
Remarks: The left hand side of Latch Lever is wider than the right hand side, so it is not convenient to use for releasing the Clamp.



3. Pull the Battery Cap to remove from Battery Housing.



4. Insert 6 cells of fresh AA Alkaline battery in the Battery Housing. Remember to install the batteries with correct direction of polarity as shown on the figure.



5. Align the Battery Cap and Battery Housing and press down until the Cap is firmly seated in the Housing.

Caution: Ensure that the O-ring gasket on Battery Clip and inside of Battery Housing is clean. Sticking of dirt on this area may cause improper performance of waterproof.

6. Fasten the Clamps at both sides of Battery Cap and ensure being tightly closed by hearing “click”.
7. Align the Battery Clip and Radio Housing (recessed grooves along the right hand side of Radio Housing and Battery Clip are to be linked) and press in the Battery Clip to the Radio Housing. The Latch Levers guide a right positioning of Battery Clip to the Radio Housing. Ensure to firmly attach the Battery Clip on to the Radio Housing by hearing “click!” at both Latch Levers.

Remarks: The Battery Clip CAN NOT be attached if it is aligned at the opposite side to the Radio Housing.

Caution: Ensure that the O-ring gasket on Radio Housing and inside of Battery Cap is clean. Sticking of dirt on this area may cause improper performance of waterproof.

Warning: DO NOT THROW AWAY THE USED BATTERIES INTO FIRE. Please dispose the used batteries in ecological manner.

FUNCTIONING METHOD OF VADER RADIO

1. The VADER radio has programmable frequencies in 1-16 Groups. Each Group from #1-#15 has max. 10 channels where appropriate frequencies are to be programmed. In Group #16 (in other words, position #16 at the Group Selector Switch), the Emergency signal alerting frequency is to be programmed. This frequency is also used for transmitting the Homing signal.
 2. When the radio is powered by turning the Power/Volume Switch to clockwise, an immediate scanning of each channel (max. of 10) within the Group being selected by the Group Selector Switch is commenced to search any transmission of carrier wave on the destined frequencies.
 3. When the carrier wave on the destined frequency is received, the radio recognizes the ID signal and compares it with the radio's preset ID. If the ID in the received carrier wave coincides with the preset ID of the radio, squelch is opened and the radio is engaged in the Receive mode. If no ID is detected, or if the detected ID does not coincide with the radio's preset ID, then the radio keeps on scanning the channels in the Group.
 4. When PTT Button is pressed, or when the radio is turned to Transmit mode by VOX, channel scanning is immediately stopped and searches the existence of any carrier wave in that frequency in air. If the radio detects the carrier wave from other transmission in that channel, no Transmit mode is engaged. In this case, release the PTT Button and make the radio restart to scan the channels, and press the PTT Button once again to catch the "open" channel. If no carrier wave is detected, the radio is engaged in Transmit mode and starts to transmit its ID signal. When the Transmit mode is engaged, you can hear a short "Pip!" tone via a speaker of Headgear or Ear Mic for letting you know that your transmission becomes ready.
 5. When sending the ID is completed, the Mic line to process the audio signals from Headgear or Ear Mic is turned to be ON, and you can start to transmit your message in air. Virtually, the time required for sending the ID is very small, so that you can start to speak right after your hearing of Transmit indication signal via your Headgear or Ear Mic.
 6. When PTT Button is released, or when the radio is turned to Receive/Stand-by mode by no detection of voiced sounds to trigger the VOX circuitry, the Mic line is to be OFF and send the End-of-Transmit signal for indicating to terminate transmission. When the Transmit mode is disengaged, you can hear a short "Pip! Pip!" tone via a speaker of Headgear or Ear Mic for letting you know that your transmission is now terminated, and the radio returns to scan the channels.
- Remarks:** If the Transmit mode keeps on engaging for more than 30 seconds*, the transmission is automatically shut off and the radio returns to scan the channels. (* adjustable factor)
7. On the radios that have been receiving the message, the channel scanning is restarted when they receive the End-of-Transmit signal. If the radio(s) can not, or failed to, receive the End-of-Transmit signal, the channel scanning starts after 2.5 seconds* from the end of carrier wave being tuned in. (* adjustable factor)
 8. When the Group Selector Switch is set at #16, the Emergency and Homing signal is able to transmit. The programmed frequency for Emergency and Homing transmission at #16 of each radio is automatically monitored by the other radios in each Group, and is received when the preset ID coincides.

Emergency : Press and hold on the PTT Button. The Emergency signal (Peep! Peep!) is transmitted while the PTT Button is depressed. During the Emergency Transmit, the carrier wave is continuously transmitted and the Mic line is kept engaged, so that the voice message can also be transmitted with the Emergency signal. The preset interval of Emergency signal is 5 seconds*. (* adjustable factor)

Caution: While the Emergency signal is being transmitted from one radio in the Group, other radios having coinciding ID keep on receiving and are not able to transmit. Be sure not to continuously transmit the Emergency signal. It is recommended to transmit the Emergency signal intermittently, so that the other radios are able to transmit rescue order in the interval of Emergency signal.

Homing : Press the Homing Button. The Homing signal (Pip! Pip!) is automatically transmitted after the Homing Button is released until the Group Selector Switch is changed to set other than #16 or the radio is powered off. The carrier wave is intermittently transmitted in tune of the Homing signal for saving battery. The preset interval of Homing signal is 10 seconds*. (* adjustable factor)

Remarks: Though the Homing signal is being automatically generated, its carrier wave is intermittently transmitted in tune of the Homing signal, so that the other radios are able to transmit in its interval of 10 seconds*.

SET-UP

1. Hands tighten the Antenna by turning it clockwise on to the Antenna Connector on the top panel of radio.
2. Mate the key guide of audio connector of Headgear or Ear Mic with the AF Connector (6 pin) on the top panel of radio and press in. Turn the Lock Screw clockwise until it is firmly tightened.
3. If required, unscrew and take off the water-sealed cap on the Program Connector (7 pin) on the top panel of radio, and mate the key guide of the audio connector of Remote PTT Switch and press in. Turn the Lock Screw clockwise until it is firmly tightened.

Caution: Be sure to securely tighten the Antenna and all other audio connectors on right position. Insufficient tightening of Antenna and connectors may cause improper performance of waterproof.

4. Put the Headgear or Ear Mic on position.

Caution: Remember to steadily contact the Microphone and Speakers of Headgear to your head. Loose contact may cause insufficient audio performance as like deterioration of microphone sensitivity or low audio volume from the speakers.

When Ear Mic is used, remember to select the eartip either Medium or Large for your comfortable fit to your ear, and insert the earpiece as deep as possible into your ear canal. Loose contact of Ear Mic to your ear may cause insufficient audio performance as like deterioration of microphone sensitivity or lack of intelligibility in transmit audio.

Caution: Ear Mic is NOT waterproof. DO NOT use in the water or under heavy rain or splash of water.

OPERATION

1. Select the communication mode as appropriate for your operation.

Operation Mode	Function
PTT	Either PTT Button on the radio or Remote PTT Switch connected to the radio is being in function.
VOX	Built-in VOX is being in function. The transmission is automatically keyed on by your speech. Your message is sent with slight delay at 0.5 sec for avoiding clipping of the first part of speech. PTT operation via PTT Button on the radio or Remote PTT Switch remains in function.
NOISE CANCEL PTT	Either PTT Button on the radio or Remote PTT Switch connected to the radio is being in function. Digital noise suppression is added on the transmit signals. This DSP controlled noise cancellation is to selectively suppress the audio elements that are not being recognized as human voiced sounds. Due to this digital processing, a slight deterioration of audio quality is observed.
NOISE CANCEL VOX	Built-in VOX is being in function. The transmission is automatically keyed on by your speech. Your message is sent with slight delay at 0.5 sec for avoiding clipping of the first part of speech. Digital noise suppression is added on the transmit signals. This DSP controlled noise cancellation is to selectively suppress the audio elements that are not being recognized as human voiced sounds. Due to this digital processing, a slight deterioration of audio quality is observed. PTT operation via PTT Button on the radio or Remote PTT Switch remains in function.

2. Select the RF output power between Hi (100mW) and Lo (10mW) by RF Output Power Selector according to the Group's range of activity.
3. Select the Group number by Group Selector Switch where your communication is to be established.
4. Power the radio ON by turning the Power/Volume Switch clockwise, and set the volume level at 12 o'clock position. You can adjust the volume level as appropriate for your operation.
5. In PTT operation, press and hold on the PTT Button on the radio, or press and hold on the Remote PTT Switch, to engage Transmit status for sending your message. Release the PTT Button, or Remote PTT Switch, to return in Receive/Stand-by status.
6. In VOX operation, start to speak in normal voice to automatically engage the Transmit status. If the VOX circuitry detects no voiced sound for 0.7 sec, it shuts off the transmission and makes the radio return to Receive/Stand-by status.

Caution: When the radio is engaged in Transmit status, you can hear a short "Pip!" via a speaker of Headgear or Ear Mic. Remember that your transmission is not completed if no "Pip!" tone is heard.

In this case, release the PTT Button (in PTT operation) or mute your speech more than 0.7 sec (in VOX operation) to make the radio return in Receive/Stand-by status, and retry to press the PTT Button or start speaking for establishing the transmission.

Especially in VOX operation, you should always aware of "Pip!" tone for starting speech and "Pip! Pip!" tone for ending the transmission.