CERVIS

CERVIS™ INC.

WARRIOR

CB-xW Transmitters

Manual U114.3.0

CERVIS

FCC Statements

15.19 – Two Part Warning
This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
- **(1)** **This device may not cause harmful interference and**
- **(2)** **This device must accept any interference received, including interference that may cause undesired operation.**

15.21 – Unauthorized Modification
NOTICE: The manufacturer is not responsible for any unauthorized modifications to this equipment made by the user. Such modifications could void the user's authority to operate the equipment.

15.105(b) – Note:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- **Reorient or relocate the receiving antenna.**
- **Increase the separation between the equipment and receiver.**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**

Industry Canada Statement

This device complies with Canadian RSS-210.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html.

Le présent appareil est conforme à la norme CNR-210 d'Industrie Canada.

L'installateur de cet équipement radio doit s'assurer que l'antenne est située ou orientée de façon à ne pas émettre un champ RF dépassant les limites de Santé Canada pour la population générale; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/safety-code-6-health-canada-radiofrequency-exposure-guidelines-environmental-workplace-health-health-canada.html.

Industry Canada Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Industry Canada Unlicensed Devices EIRP Statements for Removable Antennas

Part 1: Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that necessary for successful communication.

Partie 1 : Conformément à la réglementation d'Industrie Canada, cet émetteur radio ne peut fonctionner qu'avec une antenne dont le type et le gain maximal (ou inférieur) sont approuvés pour l'émetteur par Industrie Canada. Pour réduire les interférences radioélectriques potentielles avec d'autres utilisateurs, le type d'antenne et son gain doivent être choisis de telle sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne soit pas supérieure à celle nécessaire pour une communication réussie.

Part 2: This radio transmitter (LOBSRF-310) has been approved by Industry Canada to operate with the antenna type listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Partie 2 : Cet émetteur radio (LOBSRF-310) a été approuvé par Industrie Canada pour fonctionner avec le type d'antenne indiqué ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Il est strictement interdit d'utiliser avec cet appareil un type d'antenne ne figurant pas dans cette liste ou ayant un gain supérieur au gain maximum indiqué pour ce type.

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Cervis, Inc. Safety Precautions

- ✓ **Read and follow all instructions.**

- ✓ **Failure to abide by Safety Precautions may cause equipment failure, loss of authority to operate the equipment, and personal injury.**

- ✓ **Use and maintain proper wiring. Follow equipment manufacturer instructions. Improper, loose, and frayed wiring can cause intermittent operation, equipment damage, and system failure.**

- ✓ **Changes or modifications made to equipment not expressly approved by the manufacturer will void the warranty.**

- ✓ **Equipment owner/operators must abide by all applicable Federal, State, and Local laws concerning equipment installation and operation. Failure to comply could result in penalties and could void user authority to operate the equipment.**

- ✓ **Make sure that the machinery and surrounding area is clear before operating. Do not activate the transmitter control system until you are certain that it is safe to do so.**

- ✓ **Turn off the transmitter and disconnect power from the receiver before attempting any maintenance. This will prevent accidental operation of the controlled machinery.**

- ✓ **Disconnect power from the receiver by either detaching the cable from the receiver or removing the source power from the receiver.**

- ✓ **Use a damp cloth to keep units clean. Remove mud, concrete, dirt, etc. after use to prevent obstructing or clogging the buttons, levers, joysticks, wiring, and switches.**

- ✓ **Do not allow liquid to enter the transmitter or receiver enclosures. Do not use high-pressure equipment to clean the transmitter or receiver.**

- ✓ **Disconnect the receiver before welding on the connected machinery. Failure to disconnect the receiver may cause destruction of or damage to the receiver.**

- ✓ **Operate and store units only within the specified operating and storage temperatures defined in this document's specifications.**

- ✓ **Keep high-energy radio frequency (RF) devices away from transmitters. Activating high-power communication radios, for instance, close to transmitters can cause interference and "false" circuit activation.**

- ✓ **Do not key two-way radios while using the console box transmitter.**

✓ **Note**: Refer to the custom drawing package provided with each job for specific details not included in this manual!

1.0 Warrior CB-xW Transmitter Introduction

The Warrior CB-xW transmitter works in conjunction with any Warrior receiver—including the MU-x6E and MU-9x15—to control cranes, machines, locomotives, trucks, and other industrial equipment. Housed in an extremely durable, sealed, glass-filled nylon enclosure, the Warrior CB-xW transmitter is ready for duty in harsh environments, including outdoor applications.

Warrior systems operate in the 900MHz United States Federal Communications Commission (FCC) Part 15 License-Free radio band. The system uses continuously monitored bi-directional radio transmissions, where the receiver acknowledges each message the transmitter sends via its own acknowledge message. Four transmitter diagnostic light-emitting diodes (LEDs) indicate:

- Radio transmission integrity
- Battery life
- A/B select feedback to the operator (two LEDs)

(For more information on Warrior receivers, see their respective manuals.)

1.1 Features

- Up to six single-axis, bi-directional levers; or up to four bi-directional joysticks
- Options for toggles, potentiometers, pushbuttons, and rotary switches for auxiliary functions
- 900MHz @ 100mW FCC Part 15 license-free operation
- Four standard system status/diagnostic LEDs
- Operates using two type "C" cell batteries
- Pull-Up Stop switch
- On/off keyswitch (optional – usually on the right-hand side)
- Neck/shoulder harness standard; optional belt mounting
- Optional eight-character LED display
- Unsurpassed durability and environmental sealing

CERVIS

2.0 Warrior CB-xW Console Box Transmitters

Figure 1. Warrior CB-xW Wireless Transmitter Examples

2.1 Warrior CB-xW Diagnostic/Status LEDs

Warrior CB-xW transmitters have four red diagnostic/status LEDs.

Table 1. Warrior CB-xW Transmitter LEDs

LED	Icon	Function	Receiver Communication	Association
L1		Radio Frequency (RF) Transmit and Receive indication	Flashes when message is sent or received	Used for Maintenance Mode (MM) indication
L2		Battery Status indication	Low battery warning when on (< 1 hour remaining)	Used for MM indication
L3		Used for diagnostics (see Table 2) or A/B Select	Solid – if select switch is in "A"	Used for MM indication
L4		Used for diagnostics (see Table 2) or A/B Select	Solid – if select switch is in "B"	Solid – indicated when MM can be selected

Table 2. Advanced LED Diagnostics

LED GRAPHIC KEY

BLINKING   LIT SOLID   UNLIT
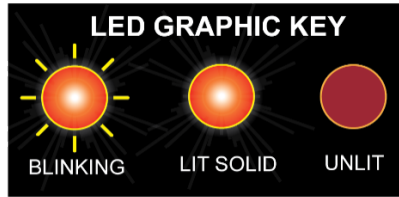
Indication	Definition
	1. Signal to receiver inactive. 2. Command being selected and confirmed.
	1. Signal to receiver active. 2. Direction disagreement or interlocked status. 3. Loss of messages. (Inconsistent flashing.)
	Alternating: Stop Check, Cycle Stop.
	Alternating: Stuck Switch. Check switches/proportional not neutral.
	Scrolling: Indicates Maintenance Mode. (See Section 2.6.)
	Scrolling: Tilt Switch Active in Maintenance Mode. (See Section 2.9.1.)
	Alternating: Tilt Switch Inactive in Maintenance Mode. (See Section 2.9.1.)
	Batteries low; replace with fresh batteries soon. (Receiver also warns of low transmitter battery. See respective Warrior receiver manual for more information.)
	Power Off: All four LEDs simultaneously light solid for a moment, then go out.
	Shutting Off: Batteries below normal operating level (replace batteries with fresh set.)
	Shutting Off: Joystick/Lever command reached out-of-bounds. Operation turning off. Remove from service and seek repairs. (Not usually seen unless problem is present.)

2.2 Warrior CB-xW Battery Installation and Replacement

The Warrior CB-xW transmitter is powered by either 2 C-Cell batteries or a rechargeable NiMH battery pack. The transmitter operates between 2.0VDC to 3.2VDC when powered by two 1.5V type C Cell batteries or from 2.7 VDC to 4.2 VDC when powered by the rechargeable NiMH

battery pack. Nominal battery life expectancy is approximately 70 to 100 operating hours[1] when using C Cell batteries or approximately 25 to 30 operating hours when using the rechargeable NiMH battery pack.

2.2.1 To Replace C Cell Batteries:

Caution ⚠️	*Observe proper polarity when placing batteries into the battery compartment. Improper battery placement can cause excessive heat, battery explosion, operator injury, and transmitter damage.*

1. Before proceeding, press the **STOP** button DOWN to cut transmitter power.

2. Remove the battery cover by twisting it counter-clockwise.

3. Remove the discharged batteries and properly dispose according to local regulations.

4. Place two new "C" cell batteries in the terminal cavity. Observe proper polarity, with the negative side (-) down and each positive battery terminal up. The battery cap interior has the positive polarity marking (+) cut into it, as illustrated in Figure 2.
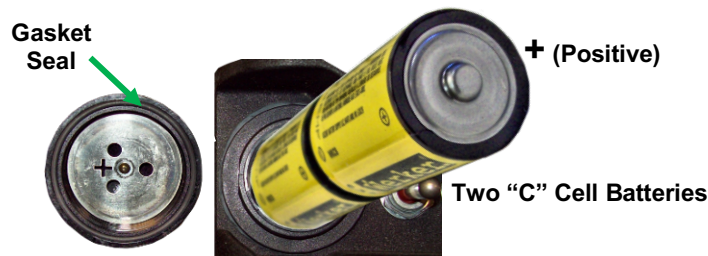

Figure 2. Warrior CB-xW Console Box Battery Installation

Replace the battery cover by threading it clockwise onto the cavity. You will feel tension as you tighten the cap. Hand-tighten the cap to compress the compartment O-ring gasket seal embedded in the cap.

✓*Notes:*

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[1] At room temperature. Usage alone does not affect battery life; so does operating or storing the battery in too-high or too-low ambient temperatures. For instance, the longer you expose batteries to extreme cold or hot temperatures, the more likely it will negatively affect battery life. Factors such as battery age and initial quality may also come into play.
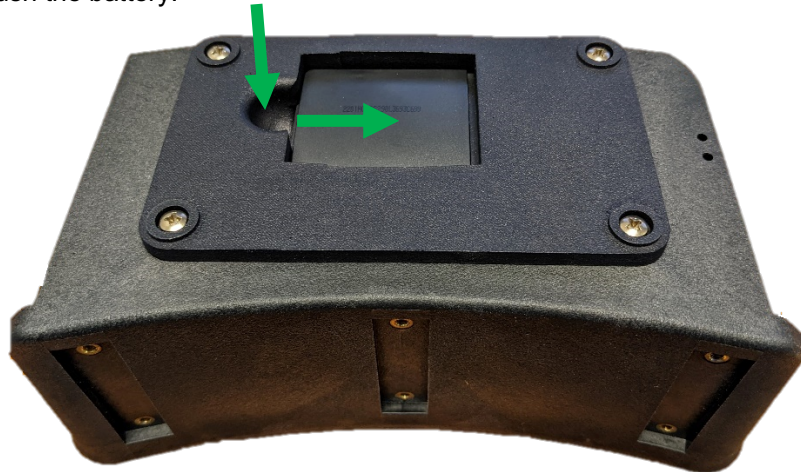
- *Do not overtighten the battery cap or you could damage it.*

- *To ensure continued reliable operation, change batteries soon after the first low battery warning. Cervis, Inc. recommends having fresh spare batteries on hand at all times that the system is in use. The transmitter senses when the voltage is at the low-power threshold—approximately 2.2V—at which time, the red Battery LED periodically flashes to warn you to change the batteries soon. The warning flashes while the unit is in use either until you replace the batteries or the voltage drops below 2.0V–after which, the unit automatically powers down (auto-shutdown). The unit will not power-up and operate until you replace the depleted batteries. Cervis, Inc. recommends replacing them with two fresh batteries.*

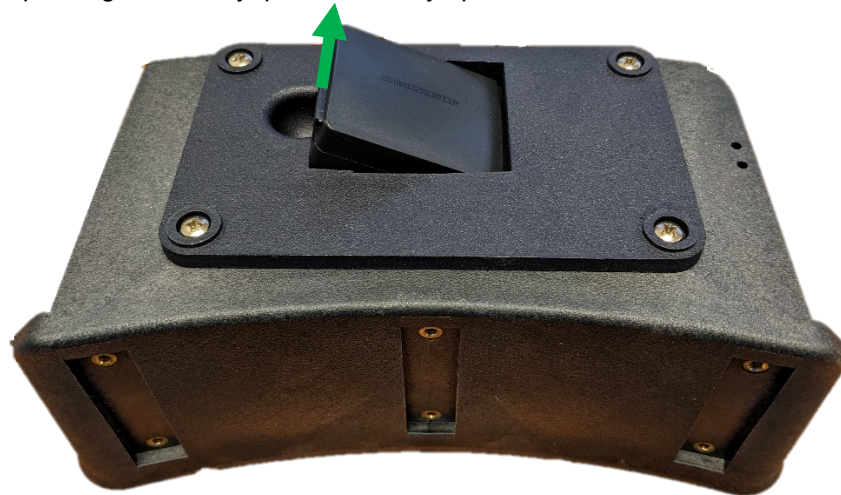### 2.2.2 To replace the Rechargeable NiMH Battery Pack

1. Before proceeding, press the **STOP** button DOWN to cut transmitter power.
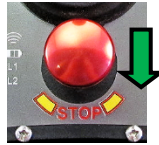
2. To remove the battery from the enclosure, place a finger in the designated cutout and push the battery.
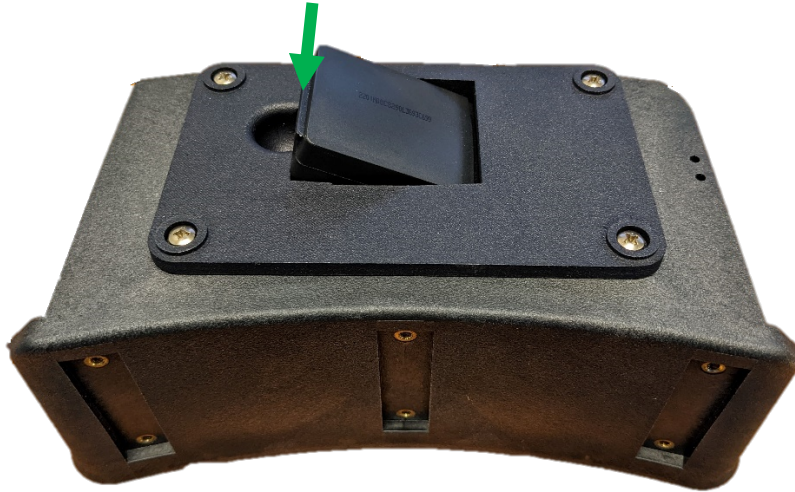

3. While pushing the battery, pull the battery up to release it from the holder.

4. The battery is now loose and can be removed from the holder.

5. To insert the battery, place the battery in the holder as shown, then push down on the battery. The battery will then be seated in the holder.

- *To ensure continued reliable operation, change batteries soon after the first low battery warning. Cervis, Inc. recommends having a fresh spare battery on hand at all times that the system is in use. The transmitter senses when the voltage is at the low-power threshold—approximately 3.4V—at which time, the red Battery LED periodically flashes to warn you to change the batteries soon. The warning flashes while the unit is in use either until you replace the batteries or the voltage drops below 2.7V–after which, the unit automatically powers down (auto-shutdown). The unit will not power-up and operate until you replace the depleted battery.*

2.2.3 Charging the Rechargeable NiMH Battery Pack

1. Ensure the battery charger is plugged in. Use only the provided power supply.

2. Insert the battery into the charger by placing the battery in the holder, then pushing down on the battery.
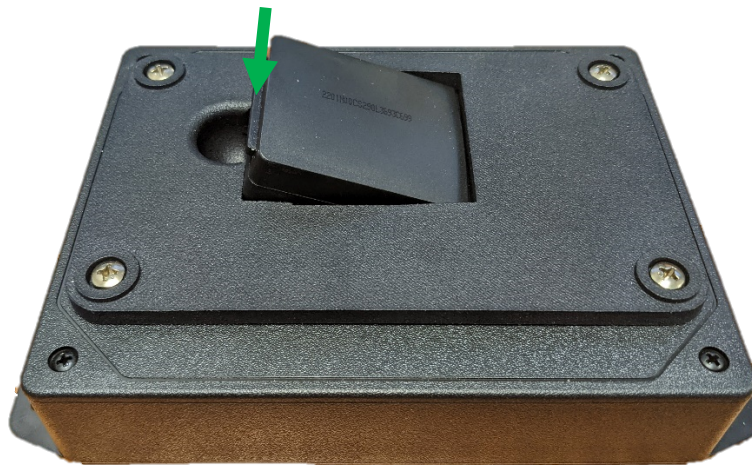
3. Once the battery is inserted, the LED will illuminate to indicate the status of the charge. The LED indication is as follows:

Solid Green	Battery is charging
Blinking Green	Battery is faulty or overly discharged
Off	Power is not applied

4. When the battery charge is complete, the solid green LED will turn off. It is safe to leave the battery in the charger beyond the end of the charge period. The charger will enter a top off maintenance mode upon charge completion to keep the battery full and prevent and self-discharge.

2.3 Neck/Shoulder Harness

The 1¾" wide neck/shoulder harness lets you conveniently and comfortably strap the CB-xW around your neck or shoulder for easy access and operation. Adjustable to lengths up to 60 inches (~1.5m), the harness conforms to most body lengths; and its rugged, heavy-duty construction and quick-release fasteners keep a single CB-xW securely against your body. Plus, its polypropylene webbing resists wear, and its bright orange color gives it high visibility against even the lightest colored garments.

2.3.1 Adjusting the Harness

Before you attach the harness to your CB-xW, adjust the blue strap to the most comfortable operating length for your individual body type.

The harness' left strap features a 6" (152mm) long quick release hook-and-loop Nylon rip cord.
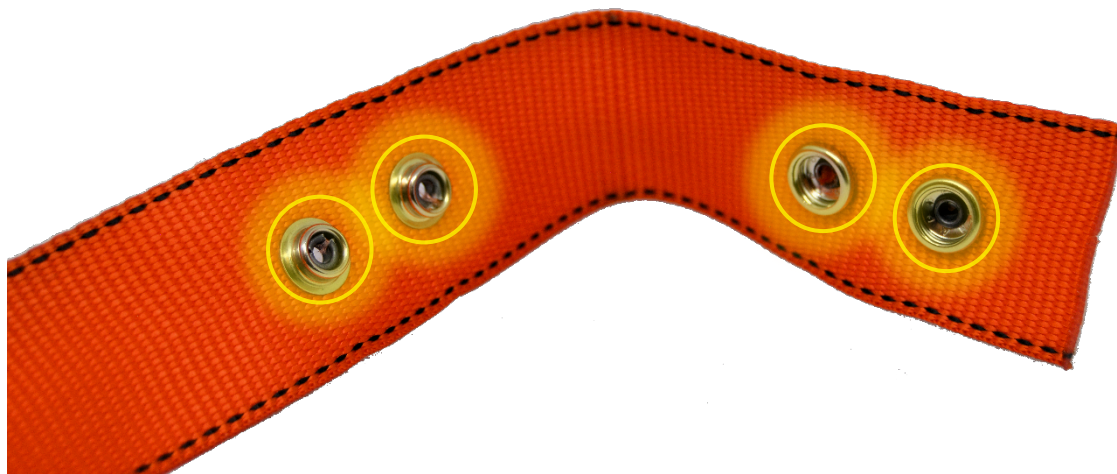

Connect the two parts of the rip cord together, and press down to secure the connection.
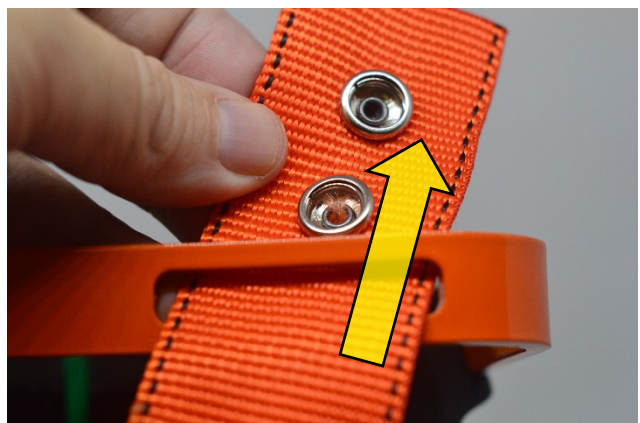

2.3.2 Attaching the Harness to the CB-xW

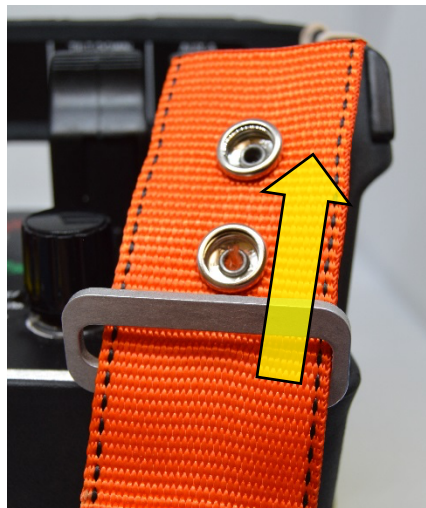Both ends of the high-visibility orange straps feature a pair of heavy-duty metal button snaps at the ends.

To attach the harness to your CB-xW, locate either the two T-shaped harness clips on the front of your CB—one is on the left side; the other is on the right—or the orange bar across the top of it.
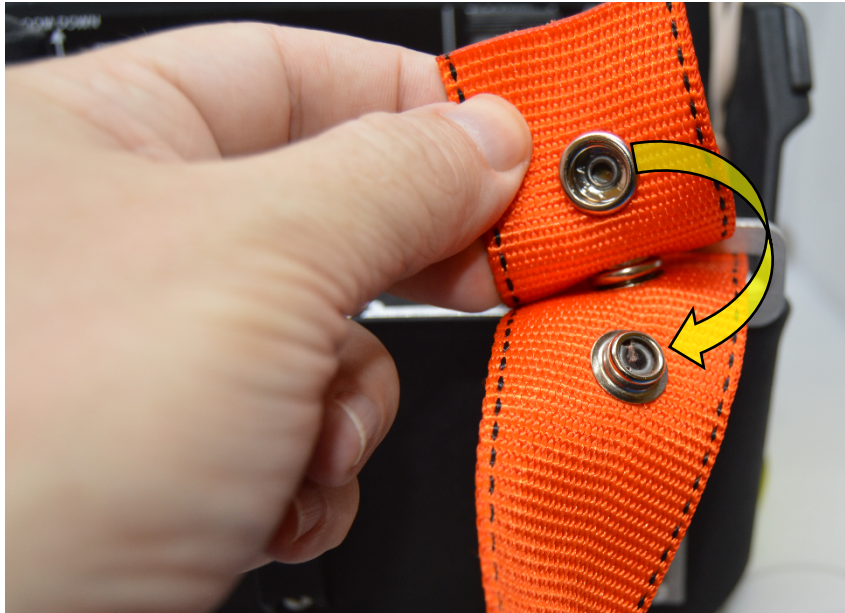

Thread the high visibility orange straps through the harness mounts or bar—snap side up—past the first two (female) snaps.

Fold the strap over onto itself, and fasten the female snaps to their male counterparts.

✔ *Note: You'll know the snaps are secured when you hear a clicking sound.*
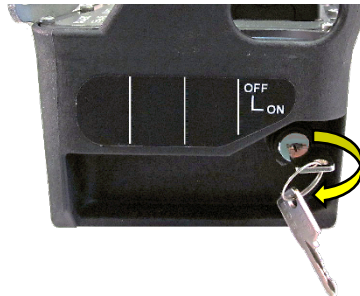
When you have the harness securely together, hang it around your neck—or drape it over your shoulder—and begin operating your CB-xW.

2.4 Turn CB-xW Transmitter On

Turn the CB-xW transmitter on and make it ready for use as follows:

1. Turn the keyswitch 90° to the **ON** position.

✓ *Notes:*

- *The standard Warrior CB-xW console box transmitter has a keyswitch on the right-hand side. Typically, this keyswitch enables/disables transmitter power.*

- *It is also possible to use the keyswitch to disable another feature (other than power). Refer to the project documents for more information.*

- *Some transmitter models do not have a keyswitch installed. If your transmitter does not have a keyswitch, skip to step 2.*

2. Pull the **STOP** button UP to the **ON** position.

If the **STOP** button is not up – nothing will happen. If the **STOP** button is already up, push it down; then pull it back up again.

All four LEDs light solid for 0.5 second:

Then, LED **B** lights solid for 1.5 seconds:

3. When the **RF** LED begins blinking rapidly:

The transmitter has established a communications link with the receiver. (This entire process takes approximately five seconds.)

4. Press the green **HORN/START** pushbutton to energize the receiver's Main Line Contactor (MLC) relays and begin remote operation of the equipment.

2.5 Turn CB-xW Transmitter Off

Three methods are available to turn the transmitter off:

- To immediately stop all operations, push the **STOP** button down.

- Do not activate any switch. Wait for the transmitter's built-in Switch Inactivity Timeout to expire (standard time=four minutes).
- Turn the keyswitch to the OFF position.

✓**Note:** *Disregard Step 3 if your transmitter does not have a keyswitch.*

All outputs deactivate after the communications link is lost.
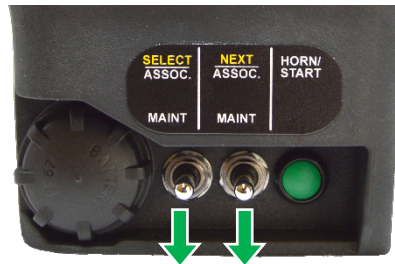
2.6 CB-xW Maintenance Mode

Maintenance mode is the gateway to the CB-xW transmitter's various adjustable operating functions – including association (Section 2.7), tilt switch activation/deactivation (Section 2.9.1), and switch test mode (Section 2.9.2).

To Enter Maintenance Mode:

1. Turn the transmitter on. (See Section 2.4, steps 1–2).
2. When LED B lights steadily:

Quickly move both the **SELECT and NEXT** switches on the left-hand side of the transmitter **DOWN** for approximately one second.

✓ *Note: If you wait too long to perform this operation, restart the process from Step 1.*

3. The LEDs scroll from right to left:

The unit is now in **Maintenance Mode**. Release the switches to perform further operations.

To Exit Maintenance Mode:

1. Press the **STOP** switch DOWN.

This also shuts the transmitter down. Pull it up again to begin operations. (Section 2.4).

2.7 Associate CB-xW with the System Receiver

Before you can use the Warrior remote control system, system transmitter(s) must establish a communications link—or be "associated"—with the system receiver. The CB-xW stores the target receiver identity (ID) in its core memory following successful association with the chosen receiver. Systems are pre-associated at Cervis, Inc. before leaving the factory; but there may be times when it is necessary to associate transmitters and receivers while in the field.

Use the process outlined in the following steps to associate a receiver with the CB-xW transmitter when needed.

To Associate with Receiver:

1. Turn the transmitter on. (See steps 1–2 in Section 2.4).
2. Enter **Maintenance Mode**. (See steps 1–3 in Section 2.6).
3. While in Maintenance Mode, simultaneously lift and hold the **SELECT and NEXT** switches on the transmitter's left side UP for five seconds.
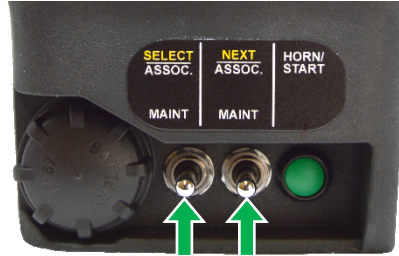
   Release both switches when LED **A** starts blinking:

   You are now in **Association Mode**.

4. While in Association Mode, the **B** and **RF** LEDs light steadily:

   This indicates that the transmitter is attempting to locate any available receivers to **Link** to. The transmitter builds a list of all possible receiver identities (IDs) that are in range (usually only one).

5. When the **A** and **RF** LEDs light steadily:

   The transmitter has completed its search for available receivers. You can now pick which receiver to link to.

6. The **Association Relay** on a found receiver starts pulsing. Often, this relay is wired to an external indicating device, such as a light or horn. The horn/light alerts you that the receiver is ready for association.

   To select the indicated receiver, momentarily lift the **SELECT** switch UP.

   To bypass that receiver and move to the next one in the transmitter's memory, momentarily lift the **NEXT** switch UP.
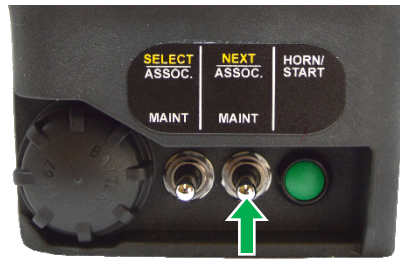
7. When you have found the receiver you want to control, press the green **HORN/START** pushbutton again to pull in the MLC relays.

Press

✓ *Note: Once you have selected a receiver and energized the MLC relays, the CB-xW transmitter and receiver are linked (associated), and you can run the attached machinery.*

✓ *Notes:*

- *If you purchase a spare transmitter <u>after</u> the original system ships, you will need to associate it yourself before it will work with that system.*

- *Each transmitter must to be associated one time. Once associated with a receiver, <u>that</u> transmitter will work with <u>that</u> receiver until the receiver ID is cleared (see Section 2.8). The transmitter will work in a first-come/first-serve fashion, where only one transmitter can ever be linked to a receiver unit at a time.*

### 2.7.1 Virtual Receiver Unlock

When the receiver's Association functionality is disabled (DIP Switch 8 is **DOWN/OFF**), you cannot link any transmitters to that receiver. To completely enable association again, you must access the receiver mounted to the machinery and physically flip DIP Switch 8 to the **UP/ON** position (see receiver manual).

However, if you cannot immediately reset the receiver's Association DIP Switch physically—but still need remote machinery control enabled—the transmitter can create a temporary *virtual* association.

To Virtually Unlock Your Receiver:

✓ *Note: First, make sure that at least one transmitter was previously associated with the target receiver.*

1. With the transmitter **OFF**, turn the keyswitch to the ON position.
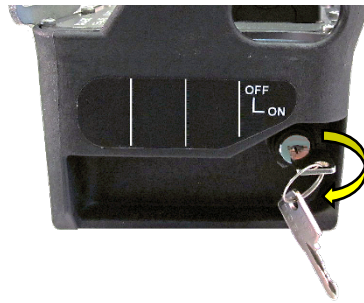
✓ *Note: If your transmitter does not have a keyswitch, skip to Step 2.*
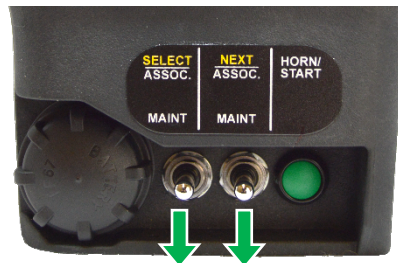
2. Flip the **STOP** switch UP.

Verify that there is a radio frequency link (the **RF** LED is blinking):

✓ *Note: Do not press the green HORN/START pushbutton to pull in the MLC relays.*

3. Simultaneously hold the **SELECT and NEXT** switches DOWN, and press the **STOP** switch DOWN.

As soon as you press the **STOP** switch down, an internal five-minute timer begins counting down on the receiver. You now have five minutes to associate the second transmitter (if necessary). Use the standard Association procedure for the type of transmitter you're using. (Section 1.0 or see appropriate manual.)

After five minutes—or one attempt to associate the transmitter—the timer clears and the receiver locks out again.

2.8 Clearing CB-xW Stored Receiver ID (Factory Reset)

The CB-xW transmitter stores its associated receiver ID in its internal memory. During instances of severe interference—or perhaps when troubleshooting—it may become necessary to break the established communications link between the transmitter and the system receiver. This is called "clearing the stored ID" or "Factory Reset."

To Clear the Stored Receiver ID (Factory Reset):

1. Turn the transmitter on. (See steps 1–2 in Section 2.4).

2. Enter **Maintenance Mode**. (See steps 1–3 in Section 2.6).

3. To reset the transmitter, simultaneously hold the **SELECT and NEXT** switches on the transmitter's left side UP and push the green **HORN/START** pushbutton.
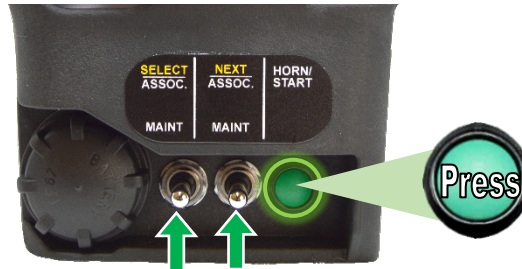
Keep holding the switches and pushbutton in position while the transmitter resets the receiver ID. LEDs **A** and **B** illuminate steadily when the reset is complete:

4. Release the **SELECT and NEXT** switches and green **HORN/START** pushbutton to return to Maintenance Mode.

✓*Notes:*

- *When a transmitter is not associated with a receiver, the transmitter will illuminate all the LEDs and then power down shortly after it is turned on.*

- *The receiver does not need to be on when clearing a receiver ID from the transmitter.*

2.9 CB-xW Advanced Functions

2.9.1 Tilt Switch Activation/Deactivation

The CB-xW transmitter has an internal accelerometer that detects when the unit is in an angled position (up to 60° from level). If the transmitter is tilted at 60° or greater for four seconds, the accelerometer triggers an internal tilt switch in the transmitter. This, in turn, energizes the receiver's HORN RELAY, sounding an audible alarm. If the unit remains in the tilted position for five seconds, the alarm sounds again, and all motion commands stop.

To stop the alarm, return the transmitter to level and reset all controls to their neutral state. Remote machine control will become available again.

Cervis, Inc. ships all CB-xW transmitters with the tilt switch enabled, as a safety feature. And while you can briefly maintain equipment motion control during the first three seconds of the warning period, you should return the transmitter to a level position before it expires.

However, if it is necessary to operate the CB-xW transmitter in an angled position for prolonged periods, you can disable the factory-set tilt switch as follows:

To Enable/Disable the Tilt Switch:

1. Turn the transmitter on. (See steps 1–2 in Section 2.4).

2. Enter **Maintenance Mode**. (See steps 1–3 in Section 2.6).

3. Tilt the transmitter 60° or more:
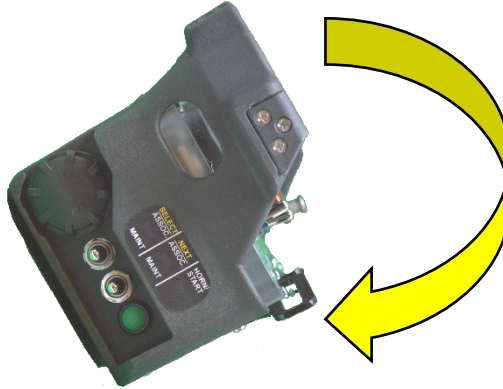
4. After three seconds, the LEDs flash in the following pattern:

 – sequence repeats.

This pattern indicates that the **Tilt Switch** is enabled.

5. To disable the tilt switch, press and release the green **HORN/START** pushbutton.

The LEDs flash in the following pattern:

 – sequence repeats.

This pattern indicates that the tilt switch is disabled.

✓ *Note: While the transmitter is tilted, press the green HORN/START pushbutton to alternate between the two patterns.*

6. Once you've selected your desired mode, return the transmitter to its normal operating position.
7. Press the green **HORN/START** pushbutton again to set the desired mode.

2.9.2 Switch Test Mode

Switch Test Mode allows you to diagnose the Warrior CB-xW transmitter when troubleshooting a potential problem.

While in switch test mode, you can test the transmitter switches, levers, and joysticks without energizing the relays in the receiver (and consequently, unnecessarily manipulating the attached machinery). As you manipulate the controls, the LEDs will light to let you know that the transmitter's printed circuit board (PCB) recognizes that switch movement.

✔ **Note:** *You can test all switches except for the* **SELECT** *switch UP. (This switch allows you to enter Switch Test Mode).*
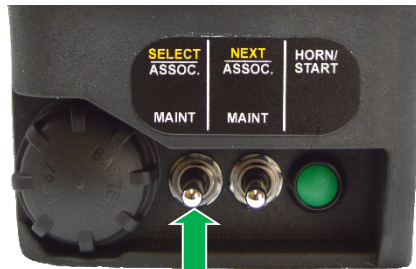
In switch test mode, the **Battery**, **A**, and **B** LEDs are used.

LED		Analog Input	Digital Input	Mode Indicator

To Enter Switch Test Mode:

Before beginning, make sure the transmitter off.

1. Turn the transmitter on. (See steps 1–2 in Section 2.4).
2. Enter **Maintenance Mode**. (See steps 1–3 in Section 2.6).
3. While in maintenance mode, hold the **SELECT** switch UP for five seconds.

4. After five seconds, LED **B** starts blinking:

Indicating that the transmitter is in **Switch Test Mode**.

✔ **Note**: *LED* **B** *will continue blinking for as long as you are in Switch Test Mode.*

When you move a switch on the transmitter (all switches are digital inputs), LED **A** lights solid for 0.5 second then goes out.

When you move a lever or joystick (these are analog devices with a digital input), LED **A** will again turn on momentarily:

Then the **Battery** LED comes on and stays on solid:

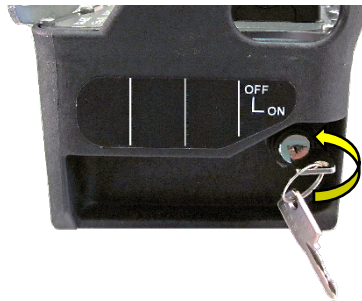Indicating that there is a positive connection to one of the analog inputs.

To Exit Switch Test Mode

Either:

1. Press the **STOP** button.

2. Turn the keyswitch to the **OFF** position.

✔*Note: Disregard Step 2 if your transmitter does not have a keyswitch.*

3.0 Warrior CB-xW Console Box Specifications

Table 3. Warrior CB-xW Console Box Specifications

Warrior CB-xW Console Box Specifications		
Power	**+2.0 to +3.2 VDC**	Two "C" 1.5V Cell Batteries
	+2.7 to +4.2 VDC	Rechargeable NiMH Battery Pack
NiMH Battery Pack	**Voltage**	3.6 VDC Nominal
	Capacity	2000 mAh Nominal
	Cervis P/N	2208001
Radio	**Frequency**	904MHz – 926MHz @ 100mW
	License	License-Free
	Modulation	Channel-Hopping (Direct Sequence Spread Spectrum [DSSS])
	Antenna	Internal
	Inactivity Timeout	Standard four minutes
Environment	**Operating Temp.**	-4°F to 131°F (-20°C to 55°C)
	Storage Temp.	-40°F to 185°F (-20°C to 85°C)
	Humidity	0 to 95% Non-Condensing
Indicators (4)		Flashes when a message is transmitted or received
		Slow Blinks – less than 1 hour of runtime remaining
		Lit when A is selected
		Lit when B is selected
Enclosure	**Dimensions**	10.4" x 5.6" x 5.5" (263.5mm x 141.5mm x 139mm)
	Durability	Glass-filled nylon Aluminum faceplate
	Weight	3.95 lbs. (1.8kg)
Function Controls	**Joysticks**	Up to four single-axis, model-dependent
	Levers	Up to six single-axis (Y+, Y-)
	Toggles	Two- or three-position maintained or momentary; model-dependent
	Pushbuttons	One (options available)
	Stop	Two-position

Appendix A: Exposure to Radio Frequency Energy

Warrior system transmitter and receiver units contain radio transceivers. When active, transmitters/receivers send out radio frequency (RF) energy through an internal (or external) antenna. The Warrior CB-xW transmitter complies with limits set by the FCC for operating distance from human tissue.

Appendix B: RF Exposure Considerations

Radio modules may be used in a variety of host applications falling into two general categories:

1. **Mobile** applications: Any operating locations where the transmitting equipment is **not** on a human body. In mobile applications, the host application is typically fixed to mobile equipment, with either an internal or external antenna.

2. **Portable** applications: Any operating locations where the transmitting equipment **is** located on the hand, arm, or other part of the human body. In portable applications, the equipment is either held in the hands of an operator or affixed to either a belt or harness on the torso.

Equipment containing the radio module was evaluated for RF exposure hazards by two approaches:

1. Maximum Permissible Exposure (MPE) for mobile applications.

2. Specific Absorption Rate (SAR) for portable applications.

Required separation distances are measured from the actual location of the radiating part of the antenna. An antenna may be inside the host application, affixed to the host application enclosure, or at the end of an optional extension coaxial cable.

Mobile Applications

Equipment must be located at least 20cm away from areas likely to be occupied by an unaware person.

Transmitter Applications

All operators of transmitter equipment with any type of antenna require proper equipment operation training, and such training must include RF exposure safety instructions. They are then considered "aware" persons once training is completed.

If the portable operating position is on the hand or arm, a 5mm separation is required between the radiating part of the antenna and nearby human tissue.

Required Training

All installers and operators of host applications that include an SRF310 FT module **must** be trained to use proper RF safety precautions as presented in this Appendix.

Appendix C: Agency Identification Label Location

✔ *Note: The Agency ID label for all transmitters that use the removable battery pack can be found in the position shown.*

✔ *Note: The Agency ID label for all transmitters with a battery tube can be found in the position shown.*

Figure 3. Agency Identification Label Locations

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Appendix D: CB-xW Product Family Common Features

Table 4. CB-xW Product Family Common Features

Power:	**Two Type "C" Cell Batteries** **Rechargeable NiMH Battery Pack**
Dedicated Stop Switch:	**Two-Position**
Activation:	**Turn Keyswitch 90°** **Press green HORN/START pushbutton to sound horn/light light** **Pull up STOP switch** **Press the green HORN/START pushbutton until LEDs activate**
Discrete Inputs Type:	**Momentary or Maintained Two- or Three-Position Toggles** **Pushbutton or Potentiometer**
Attachment:	**Molded Belt Attachments or Harness Brackets**
Diagnostic Indicators:	**Four Red LEDs**
Firmware:	**Version 77 and later**