



WARRIOR

CB-9X Console Box Transmitters

Manual U103.0.1

Warrior CB-9X Console Box Transmitters

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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 www.hc-sc.gc.ca/rpb.

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 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.

IC 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 (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Part 2: This radio transmitter (LOBSRF-305) 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.

Le présent émetteur radio (LOBSRF-305) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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Cervis Inc. Safety Precautions

- ✓ **Read and follow all instructions.**
- ✓ **Failure to abide by Safety Precautions may result in 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 system failure, equipment damage, and intermittent operation.**
- ✓ **Changes or modifications made to equipment not expressly approved by the manufacturer will void the warranty.**
- ✓ **Owner/operators of the equipment must abide by all applicable Federal, State, and Local laws concerning installation and operation of the equipment. 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 certain that it is safe to do so.**
- ✓ **Turn off the transmitter and remove power from the receiver before attempting any maintenance. This will prevent accidental operation of the controlled machinery.**
- ✓ **Power can be removed from the receiver by detaching the cable from the receiver or by 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 machine. Failure to disconnect the receiver may result in destruction of or damage to the receiver.**
- ✓ **Operate and store units only within the specified operation and storage temperatures defined in the specifications of this document.**
- ✓ **Keep high-energy RF devices away from transmitters. Activation of high-power communication radios, for instance, in close proximity to transmitters can result in interference and “false” circuit activation.**
- ✓ **Do not key 2-way radios while using the console box transmitter.**

✓ Note:

Refer to custom drawing package provided with each job for specific details not included in this manual!

1.0 Warrior CB-9X Transmitter Introduction

The Warrior CB-9X Console Box is designed for control of overhead bridge cranes. This transmitter offers up to seven single axis bi-directional levers or up to three bi-directional joysticks for crane motions as well as toggle switches, pushbuttons, rotary switches, and potentiometer options for AUX functions. Housed in an extremely durable, sealed glass-filled nylon enclosure, the Warrior CB-9X is ready for duty in harsh environments including outdoor applications. Warrior systems operate in the 900MHz FCC Part 15 License Free radio band. The bi-directional radio transmission is continuously monitored, where each message sent by the transmitter is acknowledged back with a message from the receiver. Transmitter diagnostic LEDs provide radio integrity, battery life, and A/B select feedback to the operator. The reliable, ergonomically designed Warrior CB-9X transmitter can be paired with all Cervis Warrior receivers, including the MU-6E.

1.1 Features

- Up to Seven Single-Axis Bi-Directional Levers, or up to Three Bi-Directional Joysticks
- Stepless or Up To 5-Step Control from Stepless Levers
- Options for Toggles, Potentiometers, Pushbuttons, and Rotary Switches for AUX Functions
- 900MHz @ 100mW FCC Part 15 License Free Operation
- Standard Four System Status/Diagnostic LEDs
- Operates Using Two C-Cell Batteries
- An EOS stop button
- Key on and off (usually on the right side)
- Shoulder Harness Standard, Optional Belt Mounting
- Optional 8-Character LED Display
- Unsurpassed Durability and Environmental Sealing

1.2 Warrior CB-9X Custom Options

Controls and Switches

Warrior CBs offer a variety of controls and switch types that provide an extensively large number of configuration and control options. These include:

- Multiple two or three position momentary or maintained toggle switches on the top deck, and up to three toggles on either side
- A variety of design-dependent pushbuttons, potentiometers, and rotary switches

Figure 1 shows several examples of Warrior CB-9X console boxes and switch/controls variations.

Branding/Labeling Option

Cervis provides for the in-house design of attractive custom labels for engineered system CBs designed per the will of the client. Custom labels—made of durable Lexan™ polycarbonate—can include client logos, specific function text, and specific foreground and background colors.

2.0 Warrior CB-9X Console Box Transmitters



Warrior CB-9X3JS



Warrior CB-9X3L



Warrior CB-9X2JS-DIS



Warrior CB-9X4L



Left Side

S14 S13 S12



Right Side

S18

Figure 1. Warrior CB-9X Wireless Transmitter Examples

2.1 Warrior CB-9X Diagnostic/Status LEDs

Warrior CBs have four red standard diagnostic/status LEDs.

Table 1. Warrior CB-9X Transmitter LEDs

LED	Icon	Function	
L1		Transmit and Receive indication	Flashes when message is sent or received
L2		Battery Status indication	Low battery warning when on (<2.2V)
L3		A Selection	Lights when A selected
L4		B Selection	Lights when B selected

Table 2. Advanced LED Diagnostics

LEDs	Indication	Diagnostic
RF	RF Solid RF Blinking	Transmitting, looking for receiver. Transmitting to and receiving from the mounted receiver.
Bat	RF/A ↔ Bat/B RF/Bat ↔ A/B RF→Bat→A→B→RF→Bat B→A→Bat→RF→Bat Bat	M-Stop Check: Cycle M-Stop, Blinks back-and-forth. Stuck switch: Check switches/proportional not neutral. Scrolling: Tilt Mode active. Scrolling: Signifies Maintenance Mode Blinking: Batteries low, replace with fresh batteries soon.
Select	RF/BAT/A/B	Shutting Off: Unit is shutting down: Inactivity timeout M-Stop engaged Keyswitch moved to OFF Unit wake-up without S12
Select	Bat	Shutting Off: Batteries below operating level shutting unit down; replace batteries with fresh set.
	A/B	Shutting Off: Joystick/Lever command reached out-of-bounds. Condition unsafe, operation turning off.

2.2 Warrior CB-9X Battery Installation and Replacement

The Warrior console box transmitter operates between 2.0VDC to 3.2VDC powered by two 1.5V type “C” alkaline batteries (included when shipped). Nominal battery life expectation is approximately 70 to 100 hours of operation¹ before it becomes necessary to replace the batteries.



Figure 2. Warrior Console Box Battery Installation

Battery Replacement Process

1. Remove the battery cover by unscrewing in the counter-clockwise direction.
2. Remove the discharged batteries and properly dispose in accordance with local regulations.

- Place the two “C” batteries in the terminal cavity observing proper polarity with the negative side inserted first and each positive battery terminal faces toward the cap. The + polarity marking is cut in interior of the cap as shown in Figure 2.

Replace the battery cover by threading it clockwise on to the cavity. You will feel tension as you tighten the cap. Hand-tighten the cap to make sure the compartment O-ring seal embedded in the cap is compressed.

✓ **Note:** *Batteries must be changed soon after the first low battery warning to assure continued reliable operation. Cervis recommends that fresh spare batteries are at hand at all times that the system is in use. The console box transmitter will sense when the voltage is at the low power threshold—approximately 2.2V—at which time the Red battery LED will periodically flash to warn the operator that the batteries must soon be changed. The warning flash while the unit is in use until the batteries are replaced or until the voltage drops below 2.0V, after which the unit will automatically power down (auto-shutdown). The unit will not power-up and operate until the depleted batteries are replaced. Cervis recommends replacing them with two (2) fresh batteries.*

¹ At room temperature. Battery life is affected not only by usage, but also by operating or storing the battery in too high or too low ambient temperatures. For instance, the longer batteries are exposed to extreme cold or hot temperatures, the more likely battery life will be negatively affected. Factors such as the age and initial quality of a battery also may come into play.

2.3 Turn CB-9X Transmitter On

The console box transmitter is turned on and made ready for use as follows:

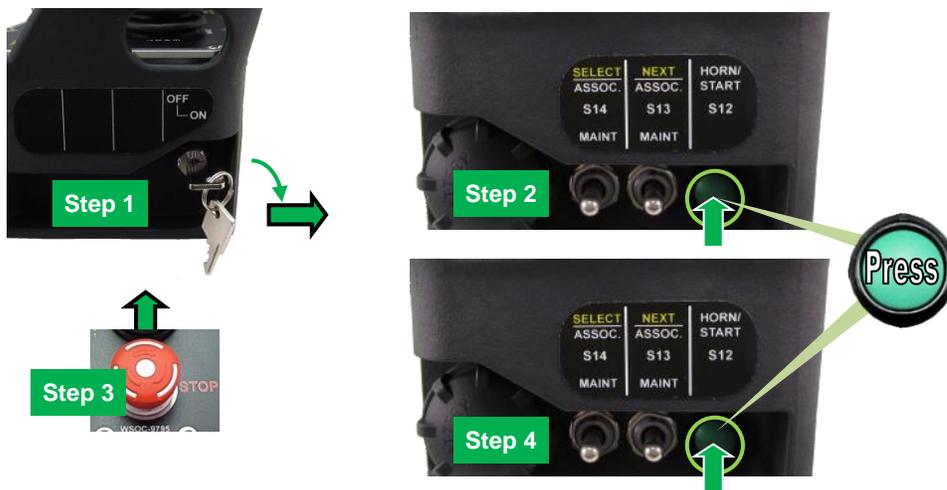


Figure 3. Turn CB-9X Transmitter On

- Move the Keyswitch 90° to the **ON** position.
- Press the Horn/Start pushbutton (**S12**) to wake the transmitter.
- Release the **EOS Stop** button by twisting clockwise until it pops up (spring loaded). If the Stop button is up when beginning, it must be depressed and then raised.
- Press the Horn/Start pushbutton (**S12**) to energize the MLC relays.

2.4 Turn CB-9X Transmitter Off

The console box transmitter can be shut down as follows:

1. Push the **EOS Stop** button down for immediate stop.
2. Do not activate any switch and wait for the console box Switch Inactivity Timeout to expire (standard is four minutes).
3. Turn the Keyswitch to the OFF position.

2.5 Associate CB-9X with the System Receiver

The system CB-9X transmitter must be associated (communications link established) with a system receiver before the system can be used. The target receiver ID is stored by the CB-9X following a successful association with a chosen receiver. Systems are associated at Cervis before leaving the factory, but there may be times when it is necessary to associate while in the field.

The Associate process described in the following steps can be used to associate a receiver with the CB-9X transmitter when needed.

Associate with Receiver (Figure 4)

1. With the Console Box OFF, turn keyswitch **S18** to the **ON** position.
2. Press switch **S12** (Horn/Start) pushbutton to wake the transmitter (TX).
3. Within 2 seconds after pushing the pushbutton, cycle the **EOS Stop Switch** (transition from **OFF** to **ON**).
4. The **B** LED will light for about 1.5 seconds after the stop switch is cycled. While this LED is active (ON), enter **Maintenance Mode** by simultaneously moving **S13 and S14 DOWN** for approximately one second. (The process will have to be restarted if the operator waits too long to perform this operation.) The LEDs will cycle from bottom to top (**B**→**A**→**BAT**→**RF**→**B**→**A**→etc.) indicating Maintenance Mode is entered.
5. Simultaneously lift and hold **S13 and S14 UP** for five seconds to enter **Association Mode**. Release both switches when LED **A** starts to blink.
6. The **B** and **RF** LEDs will be on solid while in Association Mode indicating the console box is attempting to locate any available receivers to which it can **Link**.
7. The **A** and **RF** LEDs will be lit solid when the Console Box has completed its search for available receivers. The operator can now pick which receiver to link.
8. A found receiver will start to pulse its **Associate Relay**. This relay should be wired to an external indicating device. This will alert the operator that a receiver has been indicated for association. Momentarily lift **S13 (NEXT) UP** to bypass the indicated receiver. To select that receiver, momentarily lift **S14 (SELECT) UP**.
8. Press the **S12 (Horn/Start)** pushbutton again to pull in the MLC relays.

Once a receiver has been selected and the MLC relays are energized, the CB-9X is now linked to that unit and the operator can run the crane.

✓ Notes:

- The transmitters for each new system are factory associated before shipped.
- If a spare transmitter is purchased, the customer will need to associate the TX before it will work with that system.

- Each transmitter must be associated one time. Once associated to a receiver, that transmitter will work with that receiver until the ID is cleared (Heading 2.6). The TX will work in a first-come-first-serve fashion, where only one TX can ever be paired to an RX unit at a time.

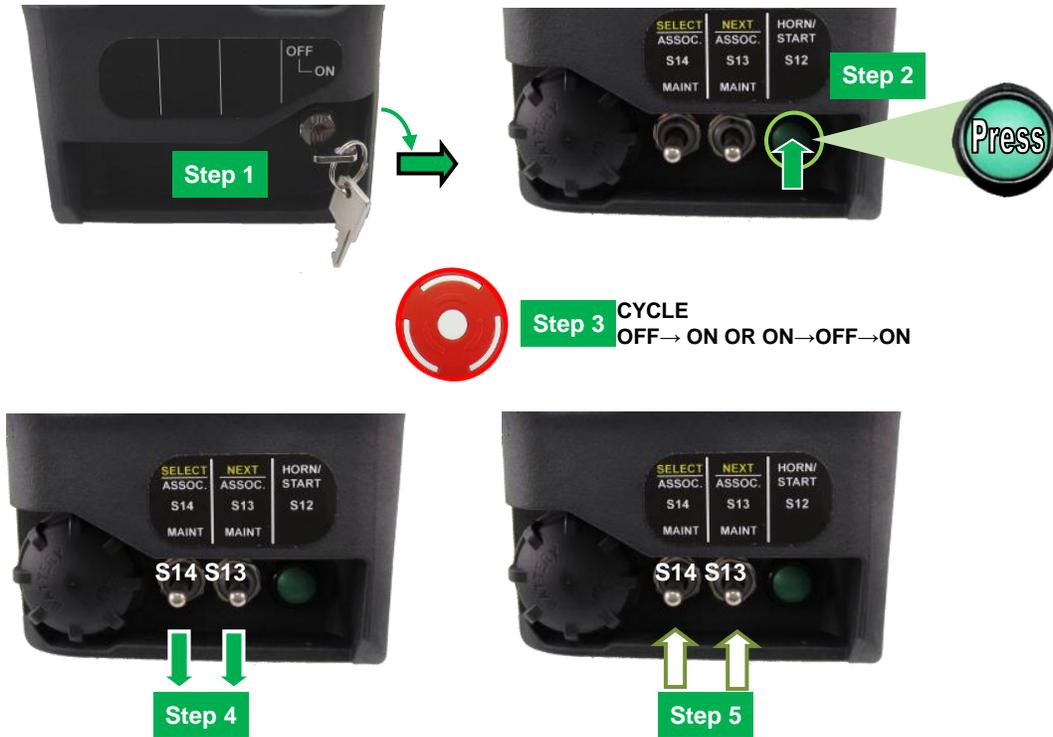


Figure 4. Associate Console Box with Receiver

2.6 Clearing CB-9X Stored Receiver ID (Factory Reset)

The associated receiver ID is stored by the CB-9X transmitter. It may become necessary during instances of severe interference—or perhaps when troubleshooting—to break the established communications link between the console box transmitter and the system receiver. This is known as clearing the ID or Factory Reset. The following steps can be used to clear the ID.

Clear the Stored Receiver ID (Factory Reset)

1. With the Console Box OFF, turn the key switch **S18** to the **ON** position.
2. Momentarily press the **S12 (HORN/START)** pushbutton to wake the TX. Perform the next step within two seconds otherwise the process must be restarted.
3. Cycle (transition from **OFF** to **ON**) the **EOS Stop Switch**.
4. LED **B** will illuminate for about 1.5 seconds after the stop switch is cycled. While this LED is on, enter **Maintenance mode** by simultaneously moving and holding **S13** and **S14** down until the LEDs will cycle from bottom to top (**B**→**A**→**BAT**→**RF**→**B**→**A**→etc. indicating Maintenance Mode is entered).
5. While in **Maintenance Mode**, simultaneously hold **S13** and **S14** Down. Press the **EOS Stop Switch** while the switches are held down.

✓ Notes:

- When a transmitter is not associated to 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 an ID from the transmitter.



Figure 5. Clearing the ID (Factory Reset)

3.0 Warrior CB-9X Console Box Specifications

Table 3. Warrior CB-9X Console Box Specifications

Warrior CB-9X Console Box Specifications		
Power	+2.0 to +3.2VDC	Two "C" 1.5V Alkaline Batteries
Radio	Frequency	904MHz – 926MHz @ 100mW
	License	License Free
	Modulation	Channel Hopping (DSSS)
	Antenna	Internal
	Inactivity Timeout	Standard four (4) minutes (adjustable)
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)	 TX/RX	Flash when a message is transmitted or received
		Slow Blinks – below 2.2V warning (approaching discharge replace batteries)
		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	Two or three single axis, model dependent
	Levers	Up to seven single axis (Y+, Y-)
	Toggles	Two or three position maintained or momentary, model dependent
	Pushbuttons	Two (options available)
	Stop	Two-position EOS

Appendix C: CB-9X Product Family Common Features

Table 4. CB-9X Product Family Common Features

Power:	Two (2) Type C-Cell Batteries
Dedicated Stop Switch:	Oversized, Spring-Loaded 2-Position (EOS)
Activation:	Move Keyswitch 90°. Press S12 to sound Horn/Start. Twist spring-loaded Stop Button clockwise to pop up. Press S12 until LEDs activate.
Discrete Inputs Type:	Momentary or Maintained 2 or 3-Position Toggles. Pushbutton or Potentiometer
Attachment:	Molded Belt Attachments Or Harness Brackets
Diagnostic Indicators:	Four Red LEDs

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