

COX-BOX® SYSTEM

Operation, Maintenance & Troubleshooting Guide



NK

OPERATION 1

COX-BOX OPERATION

On/Off

To use your Cox-Box, simply place the unit in the cup bracket and plug it into the wiring harness. Be sure to align the plug and receptacle properly! There is an arrow molded into the rubber for help visually aligning the parts. The P5 is often damaged because of frequent improper alignment.

The large knob turns the unit on and off, and controls the volume. Twist the knob clockwise to turn the Cox-Box on. Find an appropriate volume so that everyone in the crew can hear the coxswain. Adjusting the speakers slightly may help with this. Keep the volume as low as possible to prolong the battery life.

Pausing/Stopping Timer

If you do not want the timer to run, flip the toggle switch up to "HOLD"—this freezes the time display—the rate meter and counter will continue to operate. When ready for the timer to begin or resume, set the toggle switch back to "RUN." Putting the unit in hold is useful to start and stop the timer (for example, just prior to or immediately following a race) or to pause the time (in between pieces or while turning). The timer will not start unless the Cox-Box is in Ready Mode.

While the timer is running, the unit will store stroke rates in the memory. The data will not store if the unit is in "HOLD" mode.

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2 OPERATION

COX-BOX® SYSTEM

Recalling the Memory

The Cox-Box unit will store stroke rates during a timed piece for up to 25 minutes and 40 seconds (81 points of memory—in increments of 10 seconds for the first minute [0, 10, 20...] then every 20 seconds thereafter).

Each time you push the toggle switch down, the unit will scroll through each of the stored data points. The increments will continue until the time at which the unit was stopped or 25:40 is reached.

If the Cox-Box unit is turned off and back on again—the memory is not lost. To clear memory, you must press the toggle switch down and hold it for at least ½ second.



If any of these functions do not work properly, review each step of the installation, checking all distances and alignments. Also review the "Troubleshooting" section for help pinpointing the problem.

If you still are having problems, please contact our Repair Department at 610-447-1555 x211 or write to support@nkhome.com.

CARING FOR YOUR COX-BOX SYSTEM

Nielsen-Kellerman equipment is designed, built and tested to withstand the rigors of everyday use, but it is **not** invincible and it can be damaged. The following information is intended to help you maintain your equipment and prevent unnecessary repairs.

Charging

- Place the unit on charge whenever it is not in use, but do not leave the unit charging indefinitely. The unit should never be charged continuously for longer than 2 days.
- If the battery light comes on, be sure to charge the unit for at least 12 hours.
- Do not continue to use a unit with the low battery warning light illuminated. Repeated use with the low battery light on may damage the batteries and unit.
- Under normal conditions, a fully charged battery should last at least 4 hours. If your unit is not providing this much operational time, it may be time to return it to NK to have new batteries installed. We expect our batteries to need replacement after three years of normal full-season use.



NOTE: The NK warranty covers defects in materials and workmanship. It **DOES NOT** cover damage caused by abuse, misuse, or attempts to repair the microphone on your own.

REGULAR MAINTENANCE SCHEDULE AND TIPS

Daily Maintenance

1. If you row on salt water, rinse the Cox-Box off with fresh water and dry it after every use.
2. Charge the unit whenever it is not in use, but do not leave the unit on charge indefinitely. The unit should not be charged for longer than 2 days straight.
3. Slip the metal microphone bayonet on the Cox-Box panel jack without twisting to lock it. Do not tighten it fully.
4. Inspect the toggle-switch seal for integrity. This is especially important if you row in salt water and wash your unit regularly.



Care of Your Microphone

Your microphone is shipped attached to a headband and ready for use. The microphone is fully waterproof, and may be fully immersed, but it will not float on its own. Unless it is attached to a Cox-Box, the microphone will sink. Microphones should be treated with care.

- Do not attempt to bend the aluminum boom or twist the mouthpiece.
- Do not drop the microphone.
- Do not yank or pull on the microphone cable when disconnecting from the Cox-Box.
- Do not tighten the bayonet connector on the microphone to the panel jack on the Cox-Box. Just slip it into place.
- Do not carry the Cox-Box by the microphone.



Often, when a customer attempts to replace a microphone BNC, the replacement connector pin is of an incorrect diameter and damages the center conductor of the Cox-Box panel mount BNC.

Once a Month

This maintenance is easy to perform with a Cox-Box Maintenance Kit, available from NK for \$20. All components of the kit can be found in a hardware store as well.

1. Wash the Cox-Box display panel with warm water and mild soap. Rinse well and dry.
2. Use the drill bit from the Cox-Box Maintenance kit to clean out the metal sockets inside the rubber plug on the unit. Rotate the bit inside the sockets to dislodge any dirt or debris.
3. Check the inside of the rubber plug on the wiring harness for any dirt. Inspect the wires leading to the plug for any nicks or cuts. If these exist, contact NK about repairing them.
4. Apply silicone grease to the outside of the rubber plug on the Cox-Box. This helps to minimize the damage done by repeatedly removing the unit from the boat. Try not to get silicone into the plug itself. If you are using the P5 Protective Jumper, unplug the jumper and grease the plug on the Cox-Box and the plug on the end of the Protective Jumper.

5. Microphone BNC and Panel BNC Connector: You can **greatly** reduce microphone static with regular maintenance of these connectors. Use the provided small screwdriver to gently spread the contact fins in the center of the mic BNC. The Socket Maintenance kit includes instructions and photos of this step. Use the syringe to run a generous bead of Nyogel on the inside diameter of the BNC connector on the Cox-Box panel. This grease will transfer to the mic BNC when it is next connected.
6. Inject a small amount of electrical contact grease (Nyogel) into the sockets on the rubber Cox-Box plug. Connect the unit to the harness. This will coat the pins with Nyogel and push some Nyogel deeper into the sockets, protecting them as well.

End of the Season

1. Inspect the toggle switch seal. Perform this step before washing the unit.
2. Wash the Cox-Box with fresh water and dry it carefully.
3. Repeat the cleaning and lubricating steps under “Once a Month” maintenance.
4. Fully charge the Cox-Box then unplug it and store it in a cool, dry place.

- Having the Coxswain turn the volume down as low as possible will help prolong the battery life.
- A fully drained Cox-Box battery requires 12 hours on charge to attain maximum capacity.
- It is not necessary to try to discharge the Cox-Box batteries fully between charging—there is virtually no memory effect in modern nickel cadmium batteries.
- If your Cox-Box unit is more than three years old, the battery performance will decrease. Simply return the unit to NK for a new battery replacement. If the unit has been serviced within the past five years, the age of the battery is usually indicated on the bottom of the can (month/year). If you would like to determine the age and/or repair history of a unit, please send an e-mail to support@nkhome.com.

Avoid overcharging your Cox-Box. NK chargers are current-limiting and help prevent battery damage from overcharging. However, leaving the unit plugged in for many days or weeks (past full charge) may still cause damage. Please be sure to unplug and store your units during your off season breaks.

Inspecting the Toggle Switch

After several years of use, the gray rubber seal around the ON/OFF toggle switch may crack, tear, or otherwise lose its ability to properly seal the switch. If this happens, water may enter the unit, potentially doing permanent damage. Examine this seal regularly for any signs of splitting, tearing, or incomplete sealing around the toggle lever when it is moved to the two extremes. If such damage is noticed, the unit should be immediately returned to NK.

Battery Life

The life of your battery depends upon many things: the age of the battery pack, the volume and used by the coxswain and the extent of charge. Here are some performance guidelines that should help you plan your Cox-Box use.

- A fully charged battery will power a Cox-Box with NO audio (volume turned all the way down) for 16 hours.
- With the volume turned all the way up, the battery can supply power for 50 minutes of continuous talk.
- Therefore, with an average volume setting and a coxswain talking less than half the time, a fully charged Cox-Box will provide at least two to three hours of power, and usually more.

TROUBLESHOOTING

A Cox-Box system consists of four major components: the Cox-Box unit, the microphone, the wiring and the speakers. All of these components must function for your system to work properly. If you are having a problem with your system, the best diagnostic tool is to swap out each component, one at a time, with a working component. When the problem disappears, you know you have pinpointed the trouble area.



If problems persist after checking the unit against this guide, please call our Repairs Department at 610-447-1555 x211 or e-mail support@nkhome.com.

Cox-Box Will Not Take or Hold a Charge

—Is the Cox-Box being charged correctly?

Review the “Charging” section under Maintenance above and confirm that proper procedures are being observed when charging the Cox-Box.

—Is the correct charger being used?

Our chargers are rated 12VDC and 300mA and are sent to the user with a special plug attached. We recommend that all chargers be purchased from NK, and that you do not modify a charger purchased elsewhere for use with a Cox-Box.

—Is the charger working?

- Is the red LED illuminated when the charger is plugged in?
- Is the charger warm? A normal charger will be very warm after less than one hour’s operation. If the charger is not warm then it is not operating correctly. However, chargers can be warm, but **not** work properly.



NOTE: NK NO LONGER REPAIRS CHARGERS!

A new charger (NK Part No. 0202) costs \$14. If you wish to repair a charger plug, you may obtain pins and instructions from NK. However, for most people, the most cost- and time-effective approach is simply replacement.

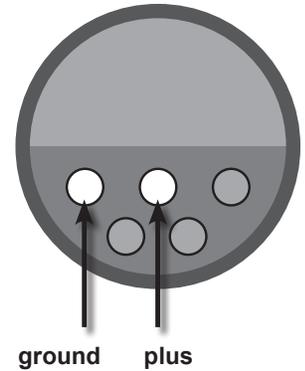
- If the charger is not working correctly and you did get a voltage reading, it is probable that one of the pins has become disconnected or misaligned. Pins usually become misaligned due to debris in the plug—it is important to keep the plugs clean.

—Have the batteries exceeded their lifespan?

A Cox-Box Battery is expected to provide 3 years of normal use (daily practices for approximately six to nine months of the year). If you know your unit’s batteries are older than three years, we recommend that the unit be returned to NK for new batteries and servicing. We can often check our records to determine the age of your unit’s batteries.

- Does the unit charge with a different charger? If so, then the first charger is bad. If you suspect that your charger is not working correctly you can perform the following test:

Obtain a multimeter—almost any type will do. Turn the multimeter on and set it at 20 VDC. After plugging the charger in (be VERY careful, the charger is ON!), place the positive lead from the multimeter on the plus pin, and the negative lead from the multimeter onto the ground pin. The multimeter should read 18V. Any deviation from this range indicates that the charger is not working. If you do not get any voltage reading on the multi-meter, the internal transformer is damaged the charger must be replaced.



No Stroke Rate or Intermittent/Incorrect Reading

—Is the switch in the HOLD position?

If the toggle switch is in the HOLD (top) position, the unit will not read. Place the switch in the RUN (middle) position.

—Is there a problem with the unit?

When there is no reading or there are irregular readings, the problem usually lies with the sensor, not the unit itself. To test the unit:

- Turn the unit on; clear the memory and place in ready mode.
- Using a pair of tweezers or a bent paperclip (unfolded into a “U” shape) repeatedly poke into the two exterior holes of the CB plug (“A” & “D” sockets of the P5).
- The stroke rate should update every other poke. If this happens, the Cox-Box is functioning properly and the problem exists with the rate sensor in the wiring harness. Order a replacement rate sensor (NK Part No. 0212) and install it according to the directions supplied.



- If the rate does not update during this test, check the sockets to confirm that they are the same height within the plug and have not been pushed into the plug. If the sockets have become recessed, gently use a pair of needle-nose pliers to work the socket out to the same level as the other sockets.
- Use the Socket Maintenance Kit (NK Part No. 0242) to clean any imbedded dirt or debris from the sockets and inject a small amount of Nyogel into the sockets to prevent corrosion and ensure good electrical contact.
- If the stroke updates, but the timer does not reset, clear the display with the toggle switch. If this does not solve the problem, your switch may be faulty.

—Is the wiring intact?

Check the wiring for pin alignment and cuts or nicks. Check the sensor and seat magnet placement for proper positioning and security.

—Is the audio signal balanced?

If you are familiar with how to use an ohmmeter, you can verify if the audio signal of the CB is balanced. Measure from the ground socket “A” to the audio socket “B”. It should read approximately 3.1 volts. Measure from the ground socket “A” to audio socket “C” it should read the same as “A” to “B”. If they are not balanced, return the unit to NK.



Additional Information

Never attempt to repair the Cox-Box unit yourself. The units are specially sealed to make them watertight. Breaking this seal often causes very expensive damage and will void the warranty. The only accessory that we will repair is the microphone. We do encourage and will support experienced individuals to repair and maintain wiring harnesses and speakers.

Additional information can be found on our website at www.nkhome.com. You may also contact our Repair Department at 610-447-1555 x211. Our hours are 9:00 to 5:00 EST Monday to Thursday, and 9:00 to 4:00 Friday.

No Audio/Intermittent Audio/Static

—Is the wiring clean of cuts or nicks?

Cuts or nicks in the wiring are the most frequent causes of audio problems. Be sure that all of the connectors (pins, sockets, plugs, receptacles) are not damaged and are positioned properly.

—Is the microphone working properly?

The microphone may be the cause of failure. It is the most delicate component of the CB system. Test the system with a microphone you know is good. Note: A damaged microphone often causes static.

—Are the connectors (pins, sockets, plugs, receptacles) properly positioned?

See installation.

—Are the speakers working properly?

Be sure all of the speakers are plugged in properly and are in working order (replace one at a time with a known good speaker to test). If you are getting a loud squealing noise, try pointing the speakers away from the coxswain to minimize feedback.



Airline Travel

With increased airport security, traveling with your Cox-Box is trickier than ever. We recommend you check the Cox-Box in with your luggage. Include product literature that explains what the Cox-Box is. Brochures can be obtained from NK, or product literature can be printed from the website.

Another option that may work when traveling overseas is to ship your units through UPS. If you do so, be very clear that these are used units, being imported temporarily. Put a low replacement value on them, but do note that you run the risk of the replacement value being used for customs. VAT (tax) is quite expensive and if they decide to hold the units in customs until you pay, you could be without your Cox-Box for the race.

You certainly do **not** want to try to carry them onto an airplane. Cox-Boxes have been thrown into bomb chutes in the UK even before 9/11.

ACCESSORIES FOR YOUR COX-BOX SYSTEM

**Cox-Box Maintenance Kit (NK Part 0230; \$20)**

This kit contains all the tools you need to take care of your Cox-Box, wiring and microphone. Instructions included.

**NK Gear Bag (NK Part 0117; \$49)**

Replace your black carry case with the new gear bag. Padded and water resistant with lots of pockets and compartments for all your gear.

**Cox-Box Radio/Audio Recording Adapter (NK Part 0237 & 0239; \$45)**

This adapter allows you to attach a 2-way radio to the Cox-Box so a coach can speak directly to the crew. Also works with audio recording!

NK Rowing Electronics Warranty

NK does not believe in “disposable electronics.” We know that our products don’t lead a pampered life, and we design them for years of performance in tough conditions. We guarantee every NK product to be free of defects in materials and workmanship for a period of **two years** from your date of purchase (HD wiring carries a 3-year warranty). We will repair or replace any defective product or part when notified within the warranty period, and will return the product via domestic ground shipping at no charge.

The following issues do not result from a manufacturing defect and are not covered under this warranty: damage due to improper use or neglect (including corrosion), impact damage, modifications or attempted repairs by someone other than an authorized NK repair agent, normal wear from use of the product, failed batteries.

NK wants you to be an NK customer for life, so we take care of you even beyond the terms of the above warranty with our Customer Care Program. Trade-in any control unit, no matter the age or condition, and receive a generous discount on the replacement product. Visit www.nkhome.com at any time for detailed product specifications, troubleshooting, and online ordering.



Register your Cox-Box online at www.nkhome.com.

**Coxswain's Fanny Pack (NK Part 4050; \$45)**

This fanny pack holds all the tools a well-prepared coxswain will ever need, plus a handy cox-box and mic holder.

**P5 Protective Jumper (NK Part 0277; \$45)**

Keep this jumper permanently attached to the Cox-Box to prevent wear and tear on the P5 connector. Especially helpful in salt water.

**Car Charger (NK Part 0234; \$23)**

Charge your Cox-Box from any car cigarette lighter. Great when traveling to regattas!

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Register your Cox-Box online at www.nkhome.com.