

XXL

RECEIVER OPERATION MANUAL



THE NOVAK XXL RECEIVER

The Novak XXL is an extra-small, extra-light two channel receiver with ultra-narrow band 10 kHz channel spacing. The XXL is extra-big on performance with outstanding range, superior noise rejection, low voltage operation down to 3.0 volts DC, and solid state reverse voltage protection. When inserted, the crystal is fully enclosed within the receiver's case and extra plastic crystal holders are included. The XXL receiver works with all popular radio systems and accepts Futaba, JR, Sanwa, Hitec, new KO, and AirZ connectors, and accepts all DSC connections.

SPECIFICATIONS

Case Size	1.29" x 1.11" x 0.53" (3.28x2.82x1.35cm)
Weight	0.48 ounce (13.61 grams)
Number of Channels	Two
Usable Sensitivity	3.0 microvolts
Selectivity	6 dB down @ ±3.0 kHz
Bandwidth	50dB down @ ±7.5 kHz
Adjacent Channel Rejection	>60 dB @ ±10.0 kHz
3OIP (Third Order Intercept Point)	+4 dBm
Voltage Range	3.0 to 10.0 volts DC
Antenna Length	18 inches (45.72 cm)
Current Consumption	8.0 mA (over full voltage range)

STEP 1 RADIO CRYSTAL SELECTION, CARE, & INSTALLATION

The XXL receiver has been factory tuned and requires no further tuning. *Crystals are not included with the receiver.*

1. Only use **single conversion crystals**.
2. The receiver's **frequency is indicated by the color of the antenna wire**. The different frequencies are marked on the receiver's case label.
3. **On 75 MHz it is VERY IMPORTANT that you use the XXL receiver made for your brand of transmitter**. The XXL uses an ultra-narrow band ($\pm 7.5\text{kHz}$) ceramic filter for 10 kHz channel spacing. Using it with a different radio brand will result in less than optimum performance. The frequency tolerance of all crystals other than 75 MHz are close enough that **27, 29, and 40 MHz XXL receivers are not brand specific**.
4. Transmitter and receiver **crystals MUST be made by the transmitter maker and be on the same modulation, band, and frequency** (Example: Futaba FM/75 MHz/Ch.90 transmitter crystal must be used with Futaba FM/75 MHz/Ch.90 receiver crystal). Receiver crystals are usually marked "RX".
5. Crystals are sensitive to vibration and should not be dropped. **A hard crash can damage receiver crystals**.
6. **Carefully insert the receiver crystal into the receiver** by guiding the two prongs into the receiver's crystal socket holes. Most crystal plastics will fit into the XXL receiver, so it is not necessary to remove the crystal's plastic housing if it was supplied with one. Spare plastic crystal holders are also included in case your crystal does not have one. *Crystals are non-polarized and can be inserted in either direction.*

Always use FM crystals in FM receivers & AM crystals in AM receivers

STEP 2 INPUT PLUGS (Futaba, JR, Hitec, new KO, & AirZ)

The XXL receiver will accept Futaba, JR, Hitec, and new-style Sanwa & KO input plugs. JR style plug plastics are included to change over other styles. The next two sections describe how to change the plug plastics and wiring for the type of radio system you have.

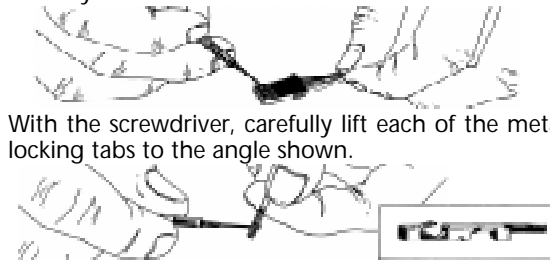
Futaba style connectors will fit into the XXL without modification or wiring sequence change.

JR, Hitec, new-style KO, and Airtronics Z connectors will fit into the XXL without modification or wiring sequence change. However, you **MUST** be sure that the **brown wire on the JR, and the black wire on the Hitec, new KO, and AirZ harnesses are closest to the outside/left edge of the case**.

STEP 2 INPUT PLUGS (Sanwa/Airtronics & old KO)

This section describes how to change **old-style KO and Sanwa/Airtronics connectors** to the JR style.

1. With a small standard screwdriver, press on each of the three metal locking tabs on the sockets until the wires are easy to remove. Remove wires.

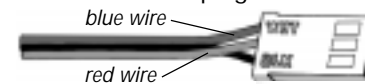


2. With the screwdriver, carefully lift each of the metal locking tabs to the angle shown.

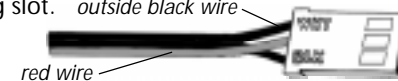


3. Sockets should "click" into place. The locking tab must not extend outside plug housing.

4. **Old-style KO harness**—Insert **black wire** into **BLK** plug slot. Insert **red wire** into the **center** plug slot. Insert **blue wire** into the **WHT** plug slot.



5. **Old-style Sanwa/Airtronics harness**—Insert **middle black wire** into the **BLK** plug slot. Insert **outside black wire** into the **WHT** plug slot. Insert **red wire** into the **center** plug slot.



Improper wiring sequence may damage receiver, servo, and ESC.

STEP 3 MOUNTING INSTRUCTIONS

This section describes how to properly mount the receiver and avoid damage due to vibration or shock.

1. **Electric Cars & Boats**—Mount the XXL with the included double-sided tape as close to the antenna as possible, where the receiver's case will not contact the chassis or other rigid surfaces.
2. **Gas Cars & Boats**—The XXL should be mounted in foam rubber and protected from fuel and water. **Do not use glue to mount the receiver!**
3. **Tubular Plastic Antennas**—Run the antenna wire up through the plastic antenna tube and let the excess wire trail out the top of the tube.
4. **Rigid Antennas**—Wrap antenna wire around the mast with 1/4" spacing. Shrink wrap or tape the top to secure the wire and let the excess trail off the top. **Do not cut or coil excess wire—Range will be reduced!**

STEP 4 HOOK-UP INSTRUCTIONS

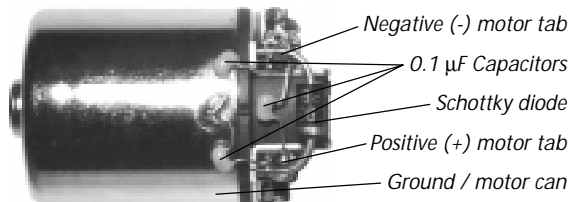
1. INSTALL MOTOR CAPACITORS

Electric motors generate radio noise that can cause radio interference. Included are three 0.1 μF (50V) non-polarized, ceramic capacitors. These capacitors must be installed on every motor to help reduce the noise generated by the motor and also to prevent possible damage to the speed control.

Solder 0.1 μF (50V) capacitors between:

- POSITIVE (+) motor tab & NEGATIVE (-) motor tab.
- POSITIVE (+) motor tab & GROUND tab*.
- NEGATIVE (-) motor tab & GROUND tab*.

**If your motor does not have a ground tab, solder the capacitor leads to the can of the motor as shown below.*



Extra 0.1 μF capacitors are available in Novak kit #5640.

2. INSTALL SCHOTTKY DIODE (if required)

Consult your speed control's operation manual to determine if an external Schottky diode is required. Use of an external Schottky diode (even if your ESC already has one in it) will increase the efficiency and reduce the operating temperature of the ESC.

NEVER USE A SCHOTTKY WITH A REVERSIBLE ESC

- Solder the lead **CLOSEST** to the silver stripe on the Schottky diode to the **POSITIVE (+)** motor tab.
- Solder the lead **OPPOSITE** the silver stripe on the Schottky diode to the **NEGATIVE (-)** motor tab.

Schottky diodes are available in Novak kit #5640.

3. CONNECT STEERING SERVO

After the proper input plug plastic has been installed on the steering servo (Refer to Step 2), plug the servo into channel 1 on the XXL.

4. CONNECT SPEED CONTROL OR THROTTLE SERVO

After the proper input plug plastic has been installed on the speed control or throttle servo (Refer to Step 2), plug the speed control or servo into channel 2.

5. OPTIONAL USE OF EXTERNAL BATTERY PACK

A 4 or 5-cell external receiver battery pack can be used if erratic radio operation is experienced during hard acceleration. Consult your ESC's operation manual for proper installation and usage.

The external battery pack's plug inserts into the XXL with the **positive (+)** wire in the **middle** and the **negative (-)** wire towards the **outside** edge of the case.

STEP 5 DSC CONNECTION

Futaba, Sanwa, and JR DSC cords can all be used with the XXL receiver's BAT/DSC input slot without modifications. Refer to the manufacturer's operating instructions for details on using the DCS cord feature.

TROUBLE-SHOOTING GUIDE

Servo And/Or Speed Control Does Not Work

- Make sure steering servo is plugged into **CH.1** of receiver and throttle servo or speed control is in **CH.2**.
- Check color sequence of input plugs—Refer to Step 2.
- ESC or electronics are not connected to battery pack.
- Check wiring and connections.
- Bad receiver and/or transmitter crystals—Check with a different set.

Receiver Glitches/Throttle Stutters On Acceleration

- Motor capacitors broken or missing—Refer to Step 4.
- Receiver or antenna too close to speed control, power wires, battery, or motor—Relocate receiver.
- Bad connections—Check wiring and connections.
- Motor brushes worn—Replace brushes. Motor may also be worn and need to be rebuilt.
- Excessive current going to motor—Use a milder motor or a smaller pinion gear.
- Bad receiver and/or transmitter crystals—Check system with a different set.
- Voltage to receiver is too low—Try using an external receiver battery pack. Refer to Step 4.
- Possible internal damage—Refer to service procedures.

FCC APPROVAL 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 this instruction manual, 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 correcting the interference by one or more of the following measures: (1) Reorient or relocate the receiver's antenna; (2) Increase the separation between the equipment and receiver; (3) Consult an experienced radio/TV technician for help.

NOVAK ELECTRONICS, INC.
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SERVICE PROCEDURES

Before sending your receiver for service, review the Trouble-Shooting Guide and instructions. The receiver may appear to have failed when other problems exist.

PLEASE NOTE: Receivers that operate normally when received will be charged a minimum service fee and return shipping charges.

WHAT TO SEND: Fill out all of the information requested on the enclosed **RECEIVER SERVICE CARD** (also available on our website) and return it with your receiver.

WARRANTY WORK: For warranty work, you **MUST CLAIM WARRANTY** on the **RECEIVER SERVICE CARD** and include a valid cash register receipt with purchase date on it, or an invoice from previous service work. If warranty provisions have been voided there will be a service charge.

SERVICE COSTS: Customer is responsible for all service costs (parts, labor, and shipping/handling charges). See **RECEIVER SERVICE CARD** for payment and shipping options.

ADDITIONAL NOTES:

- Hobby dealers or distributors are not authorized to replace receivers thought to be defective.
- If a hobby dealer returns your receiver for service, submit a completed **RECEIVER SERVICE CARD** to the dealer and make sure it is included with the receiver.
- Novak Electronics, Inc. does not make any electronic components (transistors, resistors, etc.) available for sale.
- To provide the most efficient service possible to our customers, it is not our policy to contact customers by phone or mail.

PRODUCT WARRANTY



Novak Electronics, Inc. guarantees the XXL receiver to be free from defects in materials and workmanship for a period of 120 days from original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use or excessive force, altering the antenna, exceeding the recommended input voltage, using the wrong crystal(s), improper use of an external receiver battery pack, using the receiver without its case, tampering with the electronics, allowing water, moisture, or any foreign material to enter receiver or come in contact with the PC board, incorrect installation of alternate input plug plastics, or any damage caused by vibration, shock, or a crash. In no case shall our liability exceed product's original cost. We reserve the right to modify warranty provisions without notice.

Because Novak Electronics, Inc. has no control over connection and use of receiver, no liability may be assumed nor will be accepted for damage resulting from the use of this product. Every receiver is thoroughly tested and tuned before leaving our facility, and is therefore considered operational. By the act of connecting/operating receiver, the user accepts all resulting liability.

CUSTOMER SERVICE

Monday-Thursday: 8:00am-5:00pm (PST)

Friday: 8:00am-4:00pm (closed every other Fri.)

(949) 833-8873 • FAX (949) 833-1631

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