

(Great Planes® logo) GREAT PLANES

(ElectriFly™ logo) ELECTRIFLY

5-CHANNEL MINI FM RECEIVER 72MHZ - WITH 30A ELECTRONIC SPEED CONTROL

INSTRUCTION MANUAL FOR R/C AIRCRAFT USE

Congratulations on your purchase of the ElectriFly™ 5-Channel Mini FM Receiver with ESC! This single-conversion receiver with built-in electronic speed control is a perfect choice for use in park flyer and smaller electric R/C airplanes and gliders. As an FM (frequency modulated) narrow-band system, it's far less vulnerable to interference than AM receivers. While few receivers of the same physical size and weight can match it's in-flight range, the ElectriFly 5-Channel FM Rx exhibits excellent interference rejection characteristics for clean, trouble-free flights. With an operating range that is great for smaller aircraft, this receiver is not as well suited for large aircraft. An extra step has been taken to help reduce the size and weight of equipment on-board the aircraft, by incorporating a 30A (max.) electronic speed control into the receiver itself. With features that include "Safe Start" to prevent accidental motor starts, BEC circuitry, low voltage cut-off for maintaining radio control, thermal shutdown and more, the ESC circuitry is more than just a novelty, it is a convenient, intelligent, and powerful addition to the receiver. Please read this entire manual carefully and use your radio system safely. Pay special attention to all precautions and warnings to ensure the safest operation.

WARNINGS

- * Do not fly simultaneously on a frequency that is already being used in your area. Doing so could cause unwanted interference and cause a crash, and possibly bodily harm.
- * Do not fly in the rain or at night. Water can permanently damage many of the components in the radio system, possibly causing loss of control and a crash.
- * Only fly at licensed R/C flying fields. Fly at safe distances away from other people, objects in the air, buildings, electrical lines, or any other object which could possibly impede safe flying. Failure to do so could cause a crash and possibly bodily harm, and physical damage to other property.
- * Extend the Rx antenna to maximum length when flying. Failure to do so could reduce the effective range of the radio system, possibly resulting in a crash. Always test the radio system before use. Failure to ensure proper radio operation before flight could result in a crash.
- * Do not store the radio system in extreme heat (exceeding 104°F) or cold (below -14°F), in direct sunlight, in high humidity, in high vibration environments, or in dusty areas.
- * Never use more than 10 cells (12 volts) for the main battery pack.
- * The ceramic capacitors must be properly installed on the motor to prevent radio interference.
- * Always disconnect the motor battery from the ESC when not in use.
- * Always switch on the transmitter before switching on the ESC.
- * Use heat shrink to insulate any bare wires from the motor battery to the ESC and from the ESC to the motor to prevent a short circuit.
- * Allow the ESC to cool before touching.

MOUNTING THE RECEIVER / SPEED CONTROL

Determine the best location for the Rx/ESC inside the fuselage. The location should be such that allows good airflow for proper cooling, and closely enough so that the motor wires can reach the motor. It is highly recommended to put cooling air intake holes in the front of the fuselage and exit holes towards the aft end.

The best method to mount the Rx/ESC in the fuselage is with Velcro®. This allows the ESC to be removed and repositioned easily. If the ESC will be mounted on wood, first saturate the wood with thin CA and allow to dry. This will provide a good surface for the Velcro to adhere to. Cut a piece of Velcro (both hook and loop) approximately 1/2" x 1". Remove the backing from the hook (hard) material and attach it to the inside of the fuselage. Clean the bottom of the ESC with rubbing alcohol and attach the loop (soft) material.

INSTALL THE MOTOR CAPACITORS

Motors generate radio noise which can interfere with your receiver and cause problems. Your ESC includes two 100 μ F (104) and one 47 μ F (473) non-polarized, ceramic capacitors. These capacitors must be used at all times, and on every motor to help reduce the radio noise generated by the motor and prevent possible damage to the ESC.

- A. Cut a piece of heat shrink tubing long enough to cover one of the leads on both of the 100 μ F capacitors, leaving approximately 1/4" of the lead exposed at the bottom.
- B. Solder one exposed capacitor lead to the positive (+) brush terminal on the motor.
- C. Solder one exposed lead on the *second* capacitor to the negative (-) brush terminal on the motor.
- D. Solder the remaining leads from both capacitors to the metal side of the motor case.
- E. Cut two pieces of heat shrink tubing long enough to cover both leads on the 47 μ F capacitor, leaving approximately 1/4" of the lead exposed at the bottom.
- F. Solder one lead to the positive brush terminal, and the other lead to the negative brush terminal.
- G. Connect the positive (red) lead from the ESC to the positive brush terminal on the motor and the negative (black) lead to the negative brush terminal.

SCHOTTKY DIODE

Installing the schottky diode will provide a slight increase in the ESC efficiency and reduce its operating temperature. To avoid damage to the diode, it must be installed correctly, as follows:

- A. Solder the lead **closest** to the silver band on the diode body to the positive (+) terminal on the motor.
- B. Solder the lead **opposite** the silver band to the negative (-) terminal on the motor.

TRANSMITTER ADJUSTMENTS

Adjusting the transmitter is critical for proper ESC operation. The transmitter throttle adjustments should be set as follows:

1. Set the transmitter's throttle travel adjustment, ATV, EPA or ATL to maximum.
2. Set the throttle trim and sub-trim to neutral or zero.
3. Set the throttle reversing switch to reverse.

RECEIVER OPERATION

(Show pic of receiver, call out channels, antenna, etc.)

- A. Connect servos and input battery pack as shown above.
- B. Turn "ON" the power switch on the Tx, then the power switch on the Rx. Make sure all servos operate in the proper directions according to the movement of the Tx stick. When the Tx stick is at center position, the servo horn should be perpendicular to the servo itself. When connected to the airplane's control surface, it should be at neutral position when the stick is at center. If neutral position of the control surface has been changed, even though the stick is still at center, change the length of the pushrod by adjusting the clevice on the end of the rod. Make sure each control surface is set per the instructions of your airplane.
- C. Turn off the system, receiver first, then transmitter.
- D. Wrapping the Rx in foam rubber (HCAQ1000 or HCAQ1050) can greatly help protect the Rx from excess vibration. Covering the Rx with a plastic bag can also help prevent excess moisture from penetrating the Rx and damaging the circuitry.
- E. Install the Rx into the model as shown in the model's instruction manual. Do not cut or bundle the Rx antenna in any way. It is important the antenna is extended to its maximum length before use so to maximize operational distance, or "range". It's also helpful to route the antenna as far away from servo and battery leads as possible, to help prevent interception of unwanted stray signals. For most aircraft, the antennas are routed down the tail.
- F. Range test the radio system prior to flight. Because electric motors generate electrical noise it is critical to range test the airplane with the motor on. With the transmitter antenna collapsed and a helper holding the airplane, operate the flight controls while walking away from the airplane. Acceptable range should

be approximately 75' to 100' away before losing control of the airplane. Next, check the range with the motor running at half throttle. The range should be close to the range observed with the motor off. If not, it may be necessary to move the Rx/ESC, antenna, or servo leads to a different location. Refer to the Troubleshooting Guide at the end of this manual if problems exist during the range check.

SPEED CONTROL SET-UP

Before you begin this step, remove the propeller from the motor and adjust the transmitter. Before you connect the motor battery pack to the ESC, make sure the ESC is switched off. Connect the motor battery pack to the ESC.

1. Switch on the transmitter.
2. Move the throttle stick to idle (towards you).
3. Switch on the ESC. The idle or motor off is now set.
4. Move the throttle stick to full power (away from you). The red LED will blink indicating full power has been set.
5. Move the throttle stick back to idle (towards you). The red LED will go off.
6. The ESC is now ready to operate.
7. As a safety precaution to prevent the motor from starting when the ESC is first switched on, you will need to move the throttle to full and off every time the ESC is switch on.

FCC STATEMENT

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.

The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SPECIFICATIONS

RECEIVER SECTION:

Channels:	5-channel
Receiving frequencies:	72MHz FM
Filters:	single conversion, narrow-band
Intermediate frequencies:	455kHz IF
Receiving range:	850 yards air
Avg. Current drain:	12.0mA (no servo or ESC load)
Sensitivity:	3.0 microvolts
Selectivity:	6dB at +/-3kHz
Input power:	3.0 – 10.0V DC
Dimensions:	0.71 x 0.59 x 1.5" (18 x 15 x 36mm)
Weight:	30g (1.05oz -without crystal)
FCC ID#:	IYFR5FM-72

ELECTRONIC SPEED CONTROL SECTION:

Max. Rated Current:	30 amps
BEC Voltage:	5V / 1.5A
Low Voltage Cutoff:	4.8V
Battery Plug:	Standard Type
Switching Frequency:	1.5 KHz

TROUBLESHOOTING GUIDE

- A. Possible causes and cures for short receiver range.
 - a. Collapsed or loose Tx antenna. Fully extend antenna and make sure it is tight.
 - b. Interference. Check frequencies in area. Check Rx installation
 - c. Rx antenna poorly routed. Re-route antenna away from other wiring.

- d. Severed Rx antenna. Send to Hobby Services for new antenna.
 - e. Lower Tx or Rx battery. Fully charge batteries prior to use.
 - f. Rx or Tx out of tune. Send to Hobby Services for re-tuning.
 - g. Crash damage. Send to Hobby Services for inspection and repair.
 - h. Faulty Rx or Tx crystal. Install new crystal and perform range check.
- B. Possible causes and cures for interference, glitching servos, or uncontrollable ESC operation:
- a. Another system is operating on your channel. Do not operate your system until other user is finished.
 - b. Outside environmental interference. Check local R/C club to learn of dangerous frequencies in your area.
 - c. Engine or motor noise. Re-route antenna or servo leads as far away from motor as possible. Install good quality capacitors on the motor to filter electrical noise.
 - d. Malfunctioning servo. Replace servo and try again.
 - e. Improper transmitter set-up. Re-set speed control set-up with the transmitter.
 - f. The three motor capacitors are not installed correctly or have broken.
 - g. The motor battery/ESC plugs do not fit tightly.
- C. Possible causes and cures for inoperative ESC circuitry:
- a. Weak input power. Make sure motor battery is charged.
 - b. Poor electrical contacts. Make sure the plug between the motor battery and ESC are making good contact.
- D. Possible causes and cures for motor failures after only a few minutes of operation:
- a. The propeller may be too large, causing high current draw and overheating the speed control. The thermal cutoff is switching the motor off.
 - b. The motor may be damaged (bent shaft, tight bearing or shorted winding) causing high current draw.
 - c. The ESC may need more cooling air flowing over it.
- E. Possible causes and cures for motor spinning in the reverse direction:
- a. The ESC is wired to the motor backwards.

SERVICE PROCEDURES

Note: Rx/ESCs that operate normally when received will be charged a minimum service fee and return shipping charges. Before sending your ESC in for service, it is important that you review the Trouble-Shooting Guide completely. The ESC may appear to have failed when other problems exist in the system — such as a defective transmitter, receiver or servo, or incorrect adjustments/installation. Hobby dealers are not authorized to replace ESCs thought to be defective. Do not cut the input wires or switch harness of the ESC before sending it for service. A fee will be charged for cut wires which must be replaced for testing.

WARRANTY

1-YEAR LIMITED WARRANTY

*U.S.A. and Canada Only

Great Planes warrants this product to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. During that period, Great Planes will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt) for warranty service. This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Great Planes will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may have other rights, which vary from state to state.

For service on your Great Planes product, warranty or non-warranty, send it post-paid and insured to:
 Hobby Services
 1610 Interstate Drive

Champaign, IL 61822
Phone: (217) 398-0007