

RadioFire Owner's Guide

Congratulations on your purchase of the RadioFire remote deployment backup device. This document contains information that will help you to have a safe and satisfying experience using your RadioFire unit.

Compatibility

Because of the electronics on the RadioFire board, it can only be used with R/C receivers that run on a 4.8-volt power supply.

The RadioFire was designed to be used with low-current electric matches! Although we have successfully tested the unit with "standard" electric matches, we do not recommend that they be used, because the current delivered by the unit is at the lower end of what is required to fire standard electric matches. We recommend that you use your RadioFire with Daveyfire 28B, Oxral, M-Tek or equivalent matches, or AG1 flashbulbs. Because of this, the RadioFire unit is recommended only for recovery system deployment and similar applications, not for staging or other motor-ignition tasks.

Connecting the RadioFire to your receiver

Your RadioFire unit is equipped with a universal servo connector. This will allow you to connect the RadioFire to any Futaba receiver that uses a "J" style connector, or any Airtronics or Hitec receiver that uses a "Z" style connector. However, in order to accommodate this wide range of R/C receivers, the RadioFire connector does not have a mechanical means of ensuring that you orient the plug correctly. You must take care to plug the device into your receiver with the correct orientation.

Take a look at the servos that came with your R/C receiver. There is no standard color-coding for R/C servos, but most have a "dark" color, usually brown or black, on one side of the three-conductor cable. The middle connector is often red, and the remaining connector is usually white, yellow, blue or orange. Observe how your servo connects to your receiver, and follow the same color orientation when connecting your RadioFire.

Testing

Before installing the R/C gear and RadioFire unit in your rocket, it is important to test the equipment, both to ensure compatibility of the RadioFire with your receiver, and to determine the correct channel and stick orientation. The two LEDs that came with your RadioFire can be used for this purpose.

1. Orient the RadioFire horizontally, with the servo cable extending from the left-hand end of the board and the words "Radio Fire" at the top of the board.
2. Install one LED into each of the two terminal blocks at the lower right-hand corner of the board. The longer lead on each LED goes to the left-hand terminal on each terminal block.
3. Connect your charged 4.8-volt battery to your receiver, and the RadioFire to your selected servo output.
4. Set the transmitter trim for the channel in use to approximately the center of its throw, and turn on power to both the transmitter and the receiver. Nothing should happen!
5. Gradually move the joystick toward one of its extremes. At some point near but not all the way to the end of the joystick travel, one of the LEDs should begin to blink. (If it does not, you may have the device connected to the wrong servo channel, or the trim may need to be adjusted.)
6. Now gradually move the joystick toward the other extreme. The blinking LED will extinguish, and shortly before you reach the opposite end of the joystick travel, the other LED will blink.
7. Take note of which LED is associated with which stick position. Normally, with the stick in the "up" position, the left LED will blink, but your channel may be reversed.
8. If necessary, adjust the trim so that an equal throw of the joystick in either direction activates that direction's LED. Take note of the trim position, and use that setting when you use the system in your rocket.
9. Occasionally, you may see one of the LEDs blink when the RadioFire unit is turned off. This is normal behavior, and the pulse in this case is far too small to activate any electric match or flashbulb.

Installation

- Mount the receiver, receiver battery and RadioFire securely in your electronics bay. Number 2 machine screws can be used to mount the unit. An external switch to turn on the receiver power is a good idea, as is an external safety shunt capable of disabling the electric match.
- Try to arrange the receiver antenna to that it covers the greatest possible linear area. Stretching out its full length and mounting it on the outside of the rocket will give you the greatest range, but if that is not possible, at least stretch it out as much as possible within the electronics bay.
- Do not mount the antenna within a metallic enclosure or near substantial metallic components within the rocket.
- Using the LEDs and an assistant, test range of your transmitter on the ground once the receiver is mounted in your rocket. Your range in air (line-of-sight) will be significantly greater, but the ground test will give you some idea if your receiver antenna is appropriately mounted.

Deployment with RadioFire

The RadioFire unit uses a microprocessor to discriminate between a valid control signal and random radio-frequency noise. One of the safety algorithms used by the unit is to look for a consistent signal over a brief period of time. Because of this algorithm, there is a brief delay between the stick reaching the extent of its throw, and the electric match being fired. This delay amounts to less than one-quarter second, but if you quickly “tap” the control stick toward the firing position, the microcomputer will assume that the resulting spike is just noise, and will ignore it! When deploying your parachute, hold the stick in position until you see an “event” aloft.

Safety

We respect that most prospective users of a device like the RadioFire are experienced and responsible high-power rocketry enthusiasts. However, we request that you read and consider the following safety suggestions.

- Use this device as a backup only.
- Use modern R/C gear (some of the old stuff was really sloppy), and use only FM radios. There is inexpensive AM equipment available, but it far less reliable and far more subject to interference than FM equipment.
- Use radio frequencies approved for model aircraft use.
- **BE ABSOUTELY CERTAIN THAT NO ONE ELSE IN THE AREA IS USING RADIO-CONTROL EQUIPMENT ON THE SAME RADIO FREQUENCY THAT YOU ARE!** Serious R/C model aircraft clubs generally use transmitter impound to prevent accidents from individuals inadvertently “sharing” a channel. If that is not practical at your rocket launch, use whatever means necessary to ensure that you alone are using your selected channel. If multiple people at your launch are using R/C equipment, it is advisable to use only every other available channel (i.e.- use only the even-numbered channels) to avoid interference. Consider whether there might be R/C flyers not connected with your launch -- at a nearby park, for example -- who might be close enough to cause interference.
- Use the safety procedures that are standard for all electronic deployment devices:
 1. Design your rocket with external power and arming capability.
 2. Utilize a prep checklist to ensure that everything goes together in the right order.
 3. Keep all deployment charges pointed away from people at all times.
 4. Arm your electronics only after the rocket is at the launch pad.
- If you do not use your manual override during the course of a flight, the rocket, once it lands, may still be potentially explosive. Do not let strangers (especially kids) recover your rocket.

If you have questions or comments about your RadioFire, please contact radiofire@newlon.net.