

Adding an Auxiliary Battery Case to a Red Dot Finder

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Orion EZ Finder II Red Dot Finders (RDF) are manufactured to use a 3-Volt coin type battery to power the LED lamp within the body of the device. The battery has a limited current capacity due to its small size. Frequent or extended use of the battery will drain its power relatively quickly. This results in the need to replace the battery frequently to maintain RDF functions.

Replacing the battery with a battery system of higher capacity can greatly extend the span of time between battery replacements. One approach to achieve more battery life is to mount an auxiliary battery case onto the side of the RDF. The case is sized to hold two 1.5V AA sized batteries, in electrical series, to provide 3.0V of power. The AA batteries have considerably larger current capacity than the original coin style battery. Their operational life span is much greater.

To make an electrical circuit to power the LED the red and black lead wires from the auxiliary battery case must be attached to the battery contacts in the battery chamber of the RDF. The contacts are made of nickel plated metal. The best and most electrically secure connection of the lead wires to these contact surfaces is to make solder connections. Soldering to the contacts requires the contact surfaces be properly cleaned and fluxed so that solder can flow and bond properly to the metal. The procedure below details a method for adding an auxiliary battery case to the RDF making the solder connections for improved performance.

CAUTION: This procedure requires the use of a small pencil style soldering iron. The tip of such equipment is hot enough to severely burn the user. Understand the proper and safe use of such equipment before attempting this procedure.

PROCEDURE STEPS:

1. Attach the auxiliary battery case to the left side of the RDF body (as viewed from the rear) with 30# test double stick tape (3M or equivalent tape).
2. Remove the coin battery from the battery chamber of the RDF.
3. With the RDF battery compartment lid mounted to the RDF, make a notch in the sidewall of the lid on its left side. Using a 1/8" dia. drill bit, drill into the seam between the lid and RDF body deep enough to enter the battery chamber. This will prove passage of the lead wires into the battery chamber. Remove lid from the coin battery compartment.
4. Stretch the lead wires along the side of the RDF body and across the width of the coin battery compartment. Cut the length of the wires to the far edge of the compartment.
5. Strip 1/8"- 1/4" of the insulation from the wire ends.
6. Solder-tin the ends of the stripped wires.
7. Using a Q-tip clean the positive & negative battery contacts with 91% isopropyl rubbing alcohol.
8. Apply a very small amount of tinning flux (see attached photos) to the battery contacts. A small syringe (without needle) is a useful tool to meter the flux compound application with.
9. Apply a small patch of rosin core electrical solder (photos) to each battery contact. With a small soldering iron tip heat the solder until it flows out to a low-profile dome on each contact. Position the solder patch near the upper end of the spring contact (positive contact) and towards the front of the negative contact.

10. Reheat each patch to attach the tinned wire ends. Hold the tinned wire end in the pool of melted solder. When the wire tinning melts remove the heat so that the melt solidifies to secure the wire. The black wire attaches to the negative contact and the red wire attaches to the positive contact.
11. Using the Q-tip and 91% alcohol, re-clean the flux from the solder joints. Over time flux can be corrosive to the metal of the contacts.
12. Insert an isolation barrier between the battery contacts to prevent a dead short between the contacts. An easy approach to this is to use a 3/16" I.D. X 1/2" long piece of heat shrink tubing slid over the positive contact spring. The heat from the soldering iron tip can be used to shrink it into place.
13. TEST: Put two AA batteries into the auxiliary battery case and test that the LED in the RDF works when the control switch is activated. Assuming it works go to next step.
14. Using hot melt glue, apply a small bead around the front lip of the battery compartment. Press the compartment lid into place to close the compartment. Make sure the lead wires are positioned in the lid notch for them. Work quickly as the glue cools and sets up quickly. It can also be sticky and stringy if you get your fingers into it.

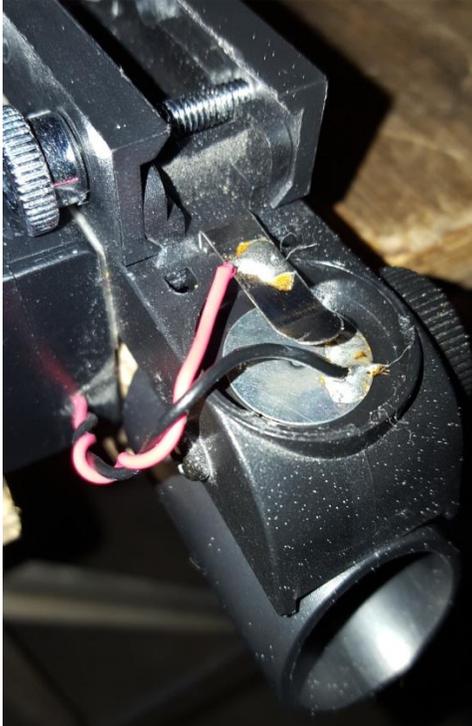
That completes the process of soldering wires to the RDF contacts. There are other modifications that I make to the RDF to make it as durable and robust as possible for use by library patrons. When you are ready, I will be happy to discuss the modifications with you. Feel free to ask any questions you may have. You can contact me via email, TXT, or telephone. If by phone you will need to leave me a V-mail on the first call until I can get a telephone number into my contact list. My contact information is shown below.

PHOTOS:

Suggested Solder & Flux



Solder Connections & Heat Shrink Isolater



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