White's Electronics currently has two battery packs available for the V3i and VX3. The first is the newest model battery pack with 2200mAh which costs $79.95. It can also be used with the DFX, XLT, MXT, M6, and the Slim Line TDI (SL) models. The second is the standard 1800mAh battery pack which costs $59.95 and can be used with all of the models above EXCEPT the Slim Line TDI.

These battery packs require the new Spectra V3 NiMH Charger Stand P/N 802-5285 and the Spectra V3 NiMH Charger P/N 509-0037. This is the unit that uses a middle post and can only be inserted into the stand one way. This battery pack can be built with higher rated NiMH batteries for less than $40.00. Below are the instructions on how to do it.

### Parts List

1. Penlight battery holder from White's or Kellyco.
2. .22 gauge wire.
3. Plastic insulator material.
4. Strip of metal.
5. 1/16" and 3/16" heat shrink tubing.
6. 10K thermistor.
7. Aluminum foil tape.
8. Solder (not shown)
9. Batteries (not shown)

### Where to buy the parts:

1. Penlight battery holder White's part number P/N 802-7150, Kellyco part number 960-8027150 for $9.95.

5. Heat shrink tubing can be purchased at Radio Shack, Home Depot, Lowes, Grainger and McMaster-Carr.

6. The 10K thermistor can be purchased at Digi-Key (www.digikey.com). Part number 615-1016-ND for $.80 cents each. Shipping was $2.05.

7. Aluminum foil tape can be purchased at automotive stores, Home Depot, or Lowes.

8. Powerex AA 2700mAh NiMH Rechargeable Batteries w/holder- 4 Batteries Per Pack $12.95 at Amazon.com and requires 2 packs and qualifies for free shipping. eBay has Powerex 8 pack for $27.17 with free shipping. Newegg has the Powerex 8 pack batteries for $24.98 with shipping and received a 5 Egg rating out of 73 reviews. The rest of the items should be found in the home or garage.
Read all of the steps before proceeding to the actual build. This build requires basic soldering skills.

1. The first step is to drill a 5/16” hole directly in the center between the two battery contacts on the new penlight holder. Take the time and measure right. Drill a small hole first and gradually step up to a 5/16” bit.

![Original tab and reworked tab](image)

2. Next change the size of the tab. The original tab pull is 3/4” wide. It needs to be filed down to 1/2” to fit inside the charger stand. File both sides equally so it fits. Dry fit the tab cover in the charger stand if needed.

3. Flatten the tab as shown in the photo below, left. Cut a plastic insulator strip and insert as shown in photo, right.
4. Cut a metal strip 1/2" wide by 2 5/8" in length. The left photo shows the sanded area to make a good solder connection. Bend the metal strip with pliers and fit as shown in the photo on the right. Drill a 1/8" hole in the metal strip as marked. The strip should not reach above the front lip of the holder. Trim to fit.

5. Solder an 8" .22 gauge length of wire onto the metal strip. Feed the wire through the hole as shown in photo, below left. Insert the soldered assembly into the holder as shown in the photo on the right. Cut another strip of plastic insulator and insert as shown. This will keep the metal strip firmly against the holder.
6. Feed the wire under the terminal as shown below left. At this point the holder should look like the photo on the left. Solder an 8” .22 gauge wire onto the NEGATIVE terminal in the position shown. Soldering on the top of the terminal can inhibit the lid cover being closed.

7. Trim both .22 gauge wires so that the end of the thermistor can seat between the second row of batteries. Cut about an inch strip of 1/16” heat shrink and place on the end of the wires. Solder each wire to an end of the thermistor. Do one wire at a time and heat shrink (photo Thermistor 1, 2, & 3). Cut an 3/16” piece of heat shrink and place over the end (photo Thermistor 4). Heat shrink in place and use a pair of pliers to seal the end (photo Thermistor 5).
8. Thermistor location. Insert the batteries. Run the wires along the side of the holder and place the thermistor as shown below and secure with the foil tape. Be careful not to allow the foil tape to touch the battery contacts. The thermistor MUST be in the second row of batteries. If it is placed in the first row (nearest the charging contacts) it will not fully charge as these batteries warm up faster than the second row. **Note:** Do not use electrical tape, duct tape, or masking tape as it will heat up and melt.
9. Insert the cover. The completed project should look like this:

![Completed project image]

10. Place the battery pack in the charging stand. If everything was done correctly, the red LED should illuminate. It will charge in about 3 hours to a voltage ~11.80 vdc. While charging, the battery pack will get warm. The thermistor will keep it from overheating.

![Charging stand image]
11. The project time will be approximately 1 hour or less. Your new battery pack will fit V3i, VX3, DFX, XLT, MXT, M6, and the Slim Line TDI (SL) models.

**NOTE:** While relic hunting in Virginia I noticed that the two White’s factory battery packs that I use will last around 6 hours of continual use. I now have two of these custom built battery packs with the 2700mAh batteries in them and they last 8 hours or longer. I can only relic hunt for around 8 hours, but there is still plenty of battery power left in the custom packs.