Sphere Research Corporation
https://www.sphere.bc.ca/test/index.html
Prepared by Walter Shawlee 2 (walter2@sphere.bc.ca)

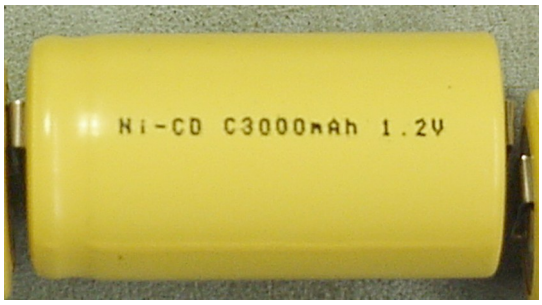
Thanks to everyone that responded with info on the THS720, and my dead battery.
I made up a new pack, and took pictures, so anybody with the same problem can easily re-build theirs as well. By the way, the TH720 is the first Tek product I have ever had that DID NOT have the model number on the front, just TekScope, most odd. It only appears on the rear label as shown below:

TH720 Battery Replacement

In my case, I started with a filthy dirty unit, covered in foam crumbles from the storage bag. It had both a dead battery, and dead wall-wart charger. In addition, the twist cap that holds the battery in place broke apart. I replaced the wall-wart with a nice stock 12VDC/1A linear unit, and that worked great. The battery was much more of a problem. In my unit, the original Tek pack had failed, and somebody had made a replacement using NiCad cells as shown below:

The original Tek design is a custom pack of 4 ea. 2600mA nicads in series with a very strange positive contact assembly. The replacement I inside found had 4 ea. 2000MAh cells (the white cells at the top), and was totally dead, with several very bad solder joints. I chose to remake it using NiCads (not NiMH as suggested) for many reasons, using the yellow cells shown at the bottom, and the end result fits correctly, works and charges correctly and has more capacity than the original. A total win, in my opinion.

I used **full-sized** C **(NOT 2/3C!)** 3000mAh NiCads off ebay with **welded tabs** (very important!), they cost about $7 each. The tabs allow the cells to be soldered together without damaging the cells themselves, but keep the connection as thin and flat as possible.



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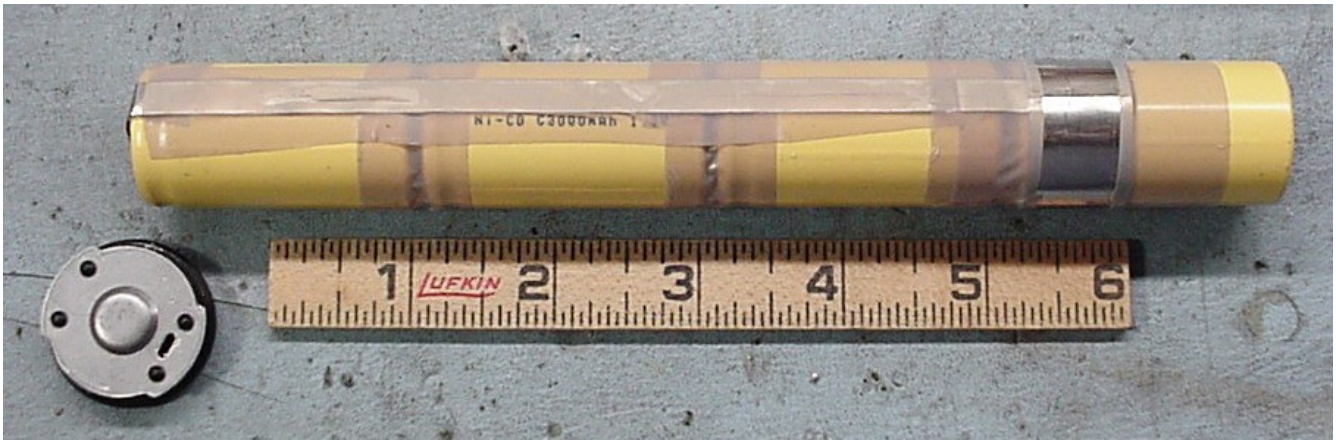
Note the strange metal band on the original cells, we will recycle that later as the positive (+) battery contact. I left it in place so I would know the correct position it needed.

I attached the new cells in a series string as shown above, with **minimal cell-to-cell spacing**, and then secured them together with a **single turn** of thin adhesive teflon tape (not the plumbers kind) as shown below, this tape slides very smoothly into the battery compartment. I do not think vinyl tape will work well. Mark the positive end (at the left below).

I removed the contact ring from the old pack, and attached the positive contact ring and runner to the + end of the pack **(now at the RIGHT in the picture above) insulate under with teflon tape to prevent shorts when soldering**, and secured it in place with tape, so that the contact was correctly positioned and secure. Its top end lines up close to the top of the first cell at the left (**whose negative terminal forms the negative contact**).



I then taped the edges of the contact carefully in place, so it would not catch on anything when inserted, and covered as little metal as possible. I also epoxied the battery cap back together, and heated it to be certain the epoxy would cure properly. I left that for 24 hours to set. Do not try any form of crazy glue, it won't work.

Once assembled, I marked it with a directional arrow (it's very easy to put it in backwards!). **As seen above, the RIGHT end goes in first**. It fit fine, and both **charged and ran the unit**, so I consider it a success.

Note that the negative end of the cell string is the negative (-) battery contact, and the surrounding ring is the positive (+) contact.

where the battery goes.

Working!

I measured the AC charger line input current to the unit (0.05A unconnected, waste energy in the transformer, etc.) it rises to 0.12-0.13A powering the unit and charging the battery. It drops to 0.09A just charging the battery (unit off)

120V @ 0.04A = 4.8W charging.
120V @ 0.08A (max) = 9.6W running and charging.

These figures seem very reasonable to me, so I am going to do some endurance testing now to see how well everything performs, but at this point, I am pretty happy.

Using high capacity NiCads allows the internal charger and protection to work correctly, **everything fits well**, and the extra capacity is an operating time bonus. I do not recommend a NiMH or Lithium battery as internal charging and any safety features are then defeated, negating any other benefit that might magically occur

-all the best,
walter