



**Customer  
Instructions/Notes  
for a Successful  
Deployment of  
North Star's  
PHOENIX tags**

## General Instructions/Notes (All devices, solar & battery)

### Magnet

- The purpose of the magnet is to control an internal switch in the electronics (i.e., a reed switch) that controls whether the device is ON/OFF. When the magnet is firmly in place, the unit is OFF. To activate the device (i.e., to turn it ON), simply remove the magnet. The PHOENIX tag will begin transmitting within a few minutes. Data will be immediately available at [www.spotmyglobalstar.com](http://www.spotmyglobalstar.com) using your assigned user name and password.
- Placement of the magnet is specified by the affixed "Magnet" sticker or insignia.
- **NOTE:** Sometimes the magnetic switch can "stick" in either position (ON or OFF), in which case you should consult the troubleshooting section of this document (below).

### Pre-deployment

- It is strongly recommended that devices be tested at some point prior to deployment. **This is solely the User's responsibility!** This procedure will verify that nothing detrimental has happened during shipping and that the magnetic switch is working correctly, etc.. A proper test would be to allow the unit to run for 1-2 days and then check the Globalstar data for verification that all is well. The magnet should then be re-applied securely until deployment.
- All testing should occur in an open area, away from buildings, metal structures, etc.. Place the PHOENIX on something made of wood or plastic (or cardboard) up off the ground by at least 2-3 feet (the more the better). **Make sure there is NOTHING metal within 20 feet of the tag that you are testing.**
- If the unit is a solar device, it should be placed outside so as to receive ample sunlight on the solar panels. [These tags only charge when they are ON, so please remember that.]
- After testing is complete, solar devices should be placed in the sun for approximately 1 day with the unit turned ON to allow the battery(s)/capacitors to get a good charge **immediately before deployment**. If the solar unit(s) sit for more than 2 weeks before deployment, place them in the sun for 1 more day prior to deployment, with the unit turned ON. The rechargeable batteries in solar tags will self-discharge at a rate of about 1-2% per day when they are just sitting.
- If you have straight battery devices (no solar panels) and there will

be a long period of time before they are deployed, it is a good idea to let the devices run for a few hours every 1-2 months to burn off the passivation layer (that is typical in lithium batteries). Also, if the devices have been sitting for more than 2 months, they should be turned ON and left ON for at least 2 days of transmission time immediately before deployment. [**NOTE:** Primary lithium batteries passivate. Essentially, a layer of material grows on the anode end of the battery when the battery is just sitting and not being used. This is a natural process, and in some ways it is a good thing because it helps to prevent self-discharge of the battery. The passivation layer grows very slowly in cold temperatures and much more quickly in hot temperatures. Running the tag burns the passivation layer off of the battery and restores the proper voltage.]

- If you have solar devices and there will be a long time before deployment, please see the "Storage of tags" section below.
- For devices that have been equipped with VHF transmitters, be sure to remove the VHF magnet also, as the magnetic field from the VHF magnet could prevent the PHOENIX from turning ON. Also, remove any tape, string, etc. from the enclosure and/or antennas that were used as precautions during shipping.

## Deployment

- When it is time for deployment, and you are deploying multiple devices at the same time, simply remove the magnet(s) from the devices.
- If not all devices are being deployed at the same time, but will within days of each other, it is still advisable to remove the magnets all together.

**\*\*\* Note:** North Star also sells a "Signal Finder" device for \$65 (see attached fact sheet) that can also verify that a Phoenix has come ON when you remove the magnet. The Signal Finder is a very simple device, but a useful one when turning a Phoenix ON. Remember that the tags do not make any noises or blink any lights when they turn ON, so it is always nice to verify when they do come ON (although data will be available immediately on the [spotmyglobalstar.com](http://spotmyglobalstar.com) www site to see for yourself).

## Storage of PHOENIX

- For battery tags, if you are going to store any PHOENIX tags for any length of time (i.e., more than a few weeks), you should store them in a cool, dry place. A refrigerator is a perfect place because the cool temperatures will

slow the growth of the passivation layer on the lithium batteries. Solar PHOENIX tags do not have the same lithium batteries, and thus they can be stored in any dry place.

- Make sure that all PHOENIX magnets are securely in place and tight on the tag. Sometimes, the tape holding the magnet down can get loose; and if it gets too loose, the magnet could come free of the tag, and the unit could turn ON. Rubber bands may be used to hold the magnet firmly in place.
- Also, if you are storing more than 1 tag, try to be sure that they are not touching one another, as the magnets could cancel each other out if they are too close together.
- For solar tags, their batteries/ capacitors require some (periodic) “exercise” in order to maintain their chemistry. **They should not be left in the sun with the magnets attached for long periods of time, as this will overcharge (and overheat) the batteries.** Rather, they should be charged in the sun (and turned ON) for 1-2 days every 2-4 weeks.
- We have learned through experience that if solar tags are left sitting for long periods of time, like six months or more, the batteries/capacitors can degenerate (due to lack of charging and discharging) enough to permanently FAIL. So be warned.

## Trouble-Shooting

- If you have tested your PHOENIX, and there is no Globalstar data or there is a problem with your Globalstar data (e.g., it does not look correct, it does not include any resolved locations, wrong format, anything), please contact North Star immediately. Contact Blake Henke, 410-961-6692, or [blakehenke@msn.com](mailto:blakehenke@msn.com). Most problems can be resolved quite easily, but it is always better to get issues resolved BEFORE you deploy a PHOENIX on a bird and let it go, because at that point you might not get the PHOENIX back.
- By far the most likely problem that you might experience is a stuck magnetic switch. This is very rare, but occasionally it does happen that a magnetic switch does not open when the magnet is removed. If you think you have a stuck magnetic switch, you can try the following things, in order:
  1. Place the magnet on the side of the PHOENIX, adjacent to where the “Magnet” sticker is located (but not on top of the “Magnet” sticker), hold it there for 20 seconds or more, and remove it quickly. This usually does the trick. But if not...
  2. Find a larger magnet and place it over the “Magnet” sticker on the Phoenix, leave it there for 20 seconds or more, and then remove it quickly. If this fails, try the same procedure again, but place the magnet to the side of the “Magnet” sticker, as explained above.
  3. Remove the magnet and smartly flick the PHOENIX with your

forefinger.

4. Remove the magnet and drop the PHOENIX from about 1-2 feet onto a hard surfaced table or something similar.
5. Keep trying the above procedures till the PHOENIX activates. If you cannot get it started after trying for a good while, we may need to have you send it back to us. But this is a last resort.

### Attachment (IMPORTANT NOTES FOR SOLAR PHOENIX USERS):

- Many researchers use **Teflon ribbon** to attach their PHOENIX tags to their birds. This is a tried and true method, and it is still quite popular. If you need Teflon ribbon for your project, North Star stocks it in 0.44" width, 0.33 inch width, and 0.25" width. We can provide it for \$8.50 per foot.
- A growing number of researchers are now using **neoprene straps** to affix their tags to their birds. The neoprene seems to hold up well over time, and it has the advantage of being able to stretch.
- **Solar units:** **It is extremely important with solar PHOENIX tags to do everything in your power to prevent feathers from covering up the solar panels, since feather cover could cause the unit to stop working for long periods of time. Clip all feathers above the PHOENIX to prevent them from protruding over the solar panels, if possible. They will grow back, in time, but at least by clipping them you ensure many months of proper operation. [NOTE: Not all auxiliary marking permits allow for feather clipping, so follow your permit in all cases.] Also, it is a very wise idea to use a secondary neoprene pad under the PHOENIX. We recommend using a thick neoprene pad, like an old mouse pad for a computer mouse, in addition to the thin neoprene pad that we supply with the PHOENIX. We can supply the thicker neoprene at no cost, upon request. The use of 2 neoprene pads (or even one thicker one) will elevate the PHOENIX up off the back of the bird and thereby raise it up and away from feather growth. You could also use a much larger neoprene pad (not so much thicker, but wider and longer) to help ensure that feathers do not grow over the top of the PHOENIX. Once feathers grow over the PHOENIX, or the bird preens the PHOENIX under its back feathers, you may not hear from it again.**
- Affix the neoprene pad(s) to your PHOENIX tags using a glue that dries soft, like **contact cement**. Any soft glue will probably work. We do not recommend super glue, as it dries hard and brittle.

### Helpful Hints

**Signal Finder:** This small device will also enable you to verify operation of a PHOENIX (see attached fact sheet.)

### Refurbishment and re-battery of recovered PHOENIX tags:

- If you are able to recover a downed PHOENIX, we may be able to refurbish it for you. We routinely re-battery and refurbish old PHOENIX tags (for a small fee) as a service to our clients. The fees that we charge for this service (\$350-500 each) do not completely cover our expenses, so we offer the refurbishment service as a courtesy to our clients. Let us know if you have a PHOENIX that could use a re-battery or refurbishment, and send it to us for evaluation.
- Clean the tags first, and then send it to:

Blake Henke  
North Star Science and Technology, LLC  
P.O. Box 3981  
Oakton, VA 22124

If you want to use FEDEX or UPS, ship to:

Blake Henke  
North Star Science and Technology, LLC  
3105 Windsong Drive  
Oakton, VA 22124



## Signal Finder



### Features

- **Durable, weather-resistant case.**
- **Push button operation prevents battery drain when not in use.**
- **Microprocessor-controlled signal detection algorithm.**
- **LED & Tone indicators signal that transmitter is operational.**
- **LED & Tone indicators signal that tester battery is functioning.**
- **Lanyard attachment point to prevent loss in the field.**

### Specifications:

#### Dimensions

2.24 x 1.34 x 0.4 in /  
56.8 x 34.7 x 10.2 mm

#### Weight

0.6 oz / 15 g

#### Frequency

120 to 450 MHz /  
No Tuning Required

#### Battery

1 x CR2032 Lithium Coin Cell

**COST=\$65 each**  
**CALL FOR DETAILS!**

**M. Blake Henke**  
**410-961-6692 Cell**  
**blake@northstarst.com**  
**www.northstarst.com**

**Works with virtually ALL TRANSMITTERS AND ALL FREQUENCIES** (though not with Globalstar transmitters)!

### Product Description

The Signal Finder is a compact, wide-band receiver designed to verify the operation of telemetry transmitters. Transmitters equipped with a magnetic switch may be turned on and off with the Signal Finder's internal magnet for single-step operation.

This little device allows you to keep your receiver packed in its case at the end of the hawking day—simply take out the Signal Finder and turn off those transmitters. This is an extremely handy device, and you will appreciate it more and more.

### Operation

The Signal Finder is equipped with a strong, rare earth magnet for use in activating transmitters equipped with a magnetic ON and OFF switch. The magnet is located on the bottom of the Signal Finder opposite the lanyard attachment point (see above photo).

To turn the transmitter ON, simply hold the magnet end of the Signal Finder directly above the area of the transmitter where the magnetically activated switch is located. To verify the transmitter's operation, push and hold the button on the Signal Finder. The Signal Finder will first beep and flash its LED twice to verify that it is operational. It will then beep and flash in cadence with the transmitter.

To turn the transmitter OFF, repeat the above sequence. The Signal Finder will stop beeping and flashing when the transmitter has been successfully deactivated.

[Note: If your transmitter does not have a magnetically operated on/off switch, it may still be tested but cannot be activated or deactivated with the magnet in the Signal Finder.]

**Turning Tracking and Monitoring into Knowledge**