UNAVCO Resources: Permanent GNSS Station Enclosures

UNAVCO has installed and supports a large variety of equipment enclosures for both AC and DC GNSS sites, from enclosures specifically designed for solar systems (the SunWize battery enclosure) to simple storage containers modified to accommodate cable pass-throughs. We can work to find the most suitable enclosure given the budget and the location of each permanent or semi-permanent GNSS installation. Below is a list of enclosures used within the last several years in UNAVCO-supported projects; click on the photographs to see sample content lists and more photos of actual installations. For standard UNAVCO campaign enclosures, check out [UNAVCO Campaign GNSS Systems](#).

<table>
<thead>
<tr>
<th>Enclosure Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>SunWize Premium F-Series Battery Enclosure</td>
<td>The SunWize F-Series 4-battery enclosure is used throughout the Plate Boundary Observatory network, as well as in several other permanent GPS station networks in the US. Benefits include reasonable strength (the enclosure is made of aluminum), security (two key locks secure the enclosure), both internal and external knockouts for passing wires and cables, weatherproof seals, and a generous amount of space. Drawbacks include cost ($700-$1000 as of February 2009), size (if on-site space is limited or if equipment must be shipped), and mounting requirements (enclosure is designed to be mounted on a post, which must be cemented into the ground and strong enough to support batteries).</td>
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<td>Hardigg Case</td>
<td>Hardigg (now owned by Pelican Products) makes rugged, well-sealed plastic enclosures which are stackable, easy to handle, and UV resistant. Connectors are recessed within the ribs of the case to reduce the risk of damage during shipping.</td>
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<td>JOBOX</td>
<td>JOBOX chests, made by Delta Consolidated Industries, Inc., are durable, weatherproof metal enclosures that UNAVCO has used in several long-term installations, including the EarthScope-sponsored Rio Grande Rift network. Chests are secured with key locks. The major drawback of the JOBOX is weight; boxes are heavy and cumbersome, thus not ideal for shipping and for transporting by foot over long distances. Cost of the box shown here is approximately $300-400 (as of February 2009).</td>
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<td>Pelican Case (large)</td>
<td>The Pelican case is easily portable, can be used to transport equipment, and is weatherproof. The case shown here, as deployed in the EarthScope-sponsored Rio Grande network, contains 2 100 amp/hr batteries in addition to the GPS receiver. The case is difficult to destroy and can be locked with padlocks. Cost is approximately $250-$300 (February 2009). Smaller cases are available (see below), and have been used in networks with year-round, reliable sunlight where large battery banks are not required.</td>
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<td>Pelican Case (small)</td>
<td>Like the larger Pelican cases (above), the smaller Pelican case is weatherproof and can be used to transport equipment. A smaller case is ideal if space is not an issue—specifically, if the requirement for amount of power stored is small (e.g. in a year-round sunny environment, as is common near the equator). The case is difficult to destroy and can be locked with padlocks. Networks utilizing small Pelican cases include Afar, Ethiopia, and Sierra Negra, Galapagos. Cost for the case shown here is approximately $125 (February 2009).</td>
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<td>Commercial Electrical Enclosure</td>
<td>Electrical boxes can be often purchased ‘locally,’ in major cities, rather than being shipped. Boxes may include knock-outs for passing cables through and locking options, like the box shown here. Electrical boxes are often sturdy, made of either strong plastic or of metal, and may or may not be weatherproof. Networks utilizing local electrical enclosures</td>
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include Calabria, Italy and Bangladesh. Typical price range is about $100-$300.

| Storage Container | A heavy-duty storage container, such as the **Contigo** Tuff Box, designed for the back of a truck or other outdoor use may work well for an equipment enclosure. They are generally low cost (about $70 for the container shown here, as of February 2009), available in most US cities, rugged, and lockable with padlocks. The case shown here fits four sealed 100 Amphr batteries along with the GPS and communications equipment. Used as enclosures in the Peatland Bog, Minnesota network. |

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