

WHOI NSDF-MISO Tide Gauge For Tolstoy EPR ISS Deployment

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These instructions describe the NDSF SeaBird26 deep-sea tide gauge that has been prepared for deployment from R/V Knorr on the Forsyth/Saal EPR cruise, during recovery/deployment of the Tolstoy OBSs at the East Pacific Rise crest near $9^{\circ} 50'N$. It will record tidal pressure data every 15 min.

The deployment position should at the following coordinates with the ship in DP during lowering: $104^{\circ} 17.5272'W$ $9^{\circ} 50.3778'N$ at 2510 m depth.

The photo below was taken by the WHOI TowCam at this site showing lobate/sheet flows.



Lobate/sheets in the AST floor at deployment site.

The Tide Gauge frame has been provided by the MISO Facility (Multidisciplinary Instrumentation in Support of Oceanography) at WHOI for this deployment. The frame is fitted with a Sonardyne “Homer” Beacon that is **programmed to respond on channel ‘70’** (see red arrow in right photo below) for ease of recovery by Alvin in January 2007 during the Lutz et al. program when Tolstoy will recover the tide gauge. **All pressure cases have been Alvin certified to 3000 meters operating depth.**



Left photo shows ‘pointy’ end of tripod frame with the small pressure housing being the additional battery pack and the larger housing the SBE26 tide gauge. The PVC pipes on the 3 corners of the frame contain lead weights, each 25#, which are to be lifted out by Alvin upon recovery. The CTD is recording and the battery pack is connected. **NO FURTHER ACTION IS REQUIRED FOR THE CTD PRIOR TO DEPLOYMENT.** The Homer beacon is self-starting when it is pinged, it responds, so no further action is required for it as well.



Left photo shows top view of the frame and right view shows end on view. Note the yellow polypro lines to be used by Alvin manipulators for lifting out the lead weights **MAKE SURE THAT THESE LINES ARE FREE** prior to deployment. There are bungee loops around the PVC pipes that house the weights, these are to help keep the weights in on descent. The bungees are designed to be pulled to the side by Alvin. See photos below.



One of the weight holders showing the bungee pulled over the weight (left) and with the bungee pulled to the side -- which is what Alvin will do prior to removing the weights.

Weight Specifications for the complete Tide Gauge Frame are:

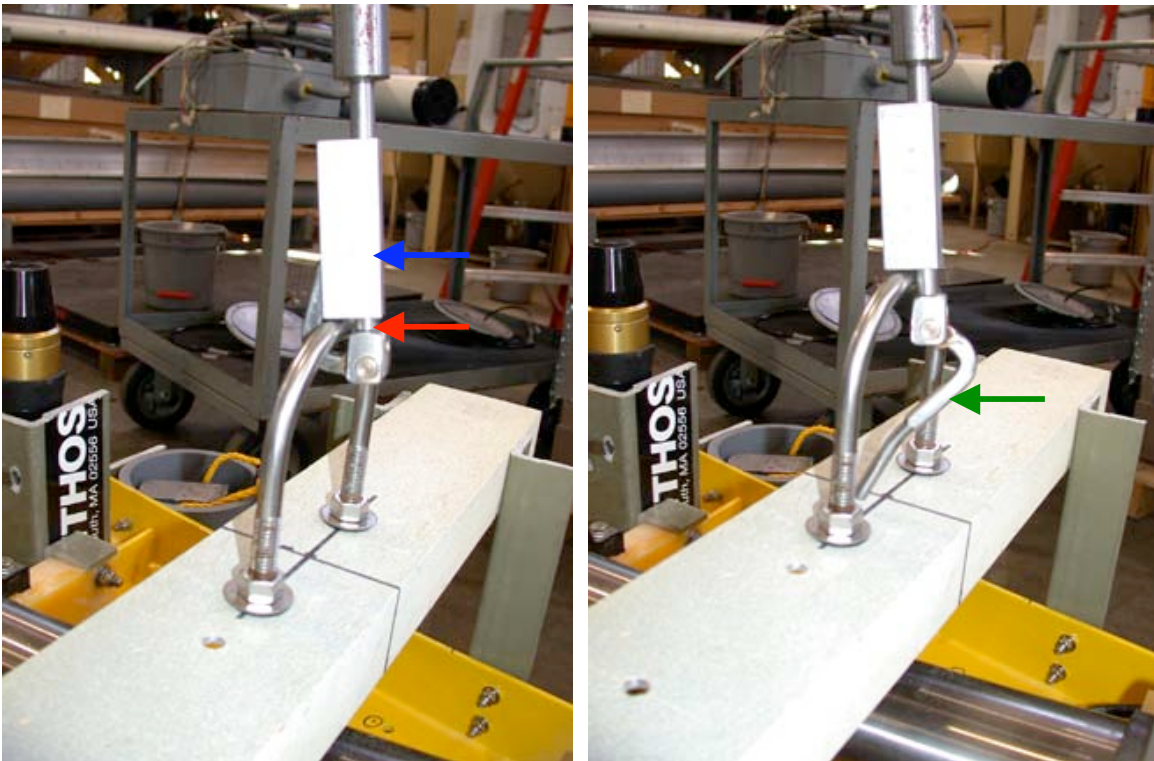
Total air weight = 189#

Total water weight WITH lead weights = 127#

Total Alvin recovery water weight = 52# (with lead weights removed)



Left photo shows detail of Homer beacon, hose-clamped to fiberglass angle. Be sure to remove all packing from around the Homer beacon prior to deployment. Right photo shows detail of the release mechanism installed on the bail.



Left photo shows what happens when the frame just touches bottom so that the rectangular slider (blue arrow) starts to move upwards on the round shaft of the release. The small $\frac{1}{4}$ " space (red arrow) reflects the slider starting to move upwards and will eventually result in the release as shown in the right photo. Note that when the release arm (green arrow) is free of the slider it falls down thereby releasing the wire from the frame. **It will be important to look closely at the wire out and tension to try to notice the 125# decrease in the load that means that the package has been deployed successfully.** If you are in the correct position and the water depth beneath the ship (by SeaBeam) is 2510 meters, and the wire angle is vertical and the weather good, you should not have to deploy more than an additional ~5-10 m of wire over the water depth. Look at wire tension carefully when approaching bottom.



The mechanical release is designed to be used with a pull-pin (purple arrow in right photo) that is inserted during the launch to prevent accidental release. The small hole in the rod (red arrow in left photo) just above the slider is where the pin gets inserted (right photo). A light line of sufficient length to reach down to the water should be tied to the pin so that it can be pulled once the package is fully in the water and under tension. Care should be taken to ensure that the pin can pull out freely. **DON'T DEPLOY WITH THE PIN IN PLACE OR THE RELEASE WILL NOT WORK WHEN THE PACKAGE TOUCHES THE SEAFLOOR.**

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