



2008

RV Southern Surveyor

program

voyageplan

SS04-2008

RESEARCH CHARTER

Deep-Ocean Tsunami Detection Buoy (DART)
Scheduled Maintenance Replacement for the
Australian Tsunami Warning System (ATWS)

Itinerary

ACTIVITY	START TIME	DAY	DATE
Mobilise Hobart	0800	Thursday	20th March 2008
Depart Hobart	1600	Thursday	20th March 2008
Arrive Station 55401	0400	Sunday	23rd March 2008
Recover & Deploy DART II	0800	Sunday	23rd March 2008
Relocate SS to ETD site	1200	Sunday	23rd March 2008
Deploy ETD	1800	Sunday	23rd March 2008
Depart site for Hobart	2000	Sunday	23rd March 2008
Arrive Hobart	0800	Wednesday	26th March 2008
De-Mobilise Hobart	1200	Wednesday	26th March 2008

Principal Investigator(s)

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Scientific Objectives

The Australian Tsunami Warning System (ATWS) is a national effort between the Australian Bureau of Meteorology, Geoscience Australia and Emergency Management Australia to provide a comprehensive tsunami warning system capable of delivering timely and effective tsunami warnings to the Australian population by 2009, whilst supporting international efforts to establish an Indian Ocean tsunami warning system, and contributing to the facilitation of tsunami warnings for the South West Pacific.

The generation of tsunami from seismic activity cannot be fully determined in real-time due to a number of uncertainties in the fault movement. Observations of sea level will be used to verify if a tsunami has been generated and its extent of propagation.

Loading of the Southern Surveyor will commence on March 20, 2008 upon the completion of the DART buoy dock-side testing. The Southern Surveyor will depart on March 21, 2008 en route to station 55401. Upon arriving at station 55401 (46° 55'S, 160° 34'E), the team will begin the DART II Maintenance operation.

NOTE: Before beginning buoy ops, it is important that each of the persons involved, know their role on the deck of the ship. Prior to buoy ops, all parties involved must meet to discuss a plan of deployment to ensure the safety of the team.

The scheduled maintenance process consists of the replacement of Tsunameter DART II Buoy, deployed in April 2007. The mission will consist of locating the Tasman Sea DART II Tsunameter Buoy and attaching a recovery cable to lift the Buoy on the stern deck of the Southern Surveyor. The mooring cable will be disconnected from the old Buoy and attached to the replacement DART II Buoy, this new Buoy will then be carefully lifted off the deck and deployed in the same position as the original Buoy.

Following the deployment of new station 55401, the team will remain on site for verification of the next scheduled 6-hour data transmission to the RUDICS server. This will be coordinated with the DAC or assigned DART Engineer. Once the block of hourly transmitted data is verified by SSC, the team will be released from site.

After successful deployment of the DART II Buoy the Southern Surveyor will be repositioned on March 23, 2008 to location 161° 00'E by 46° 40'S approximately 44 kilometres North East from station 55401. At this new location the team will deploy the new ETD (Easy To Deploy) Tsunameter to provide a reference and redundant warning sensor for the Tasman Sea Region.

Following the deployment of the new ETD station, the team will remain on site for verification of the next scheduled 6-hour data transmission to the RUDICS server. This will be coordinated with the DAC or assigned DART Engineer. Once the block of hourly transmitted data is verified by SSC, the team will be released from site.

After a successful deployment, the Southern Surveyor will return to CSIRO Marine facility at Hobart. Upon arrival the ship will be unloaded and the remaining equipment will be inventoried and prepared for shipment to the Bureau Facilities.

Voyage Objectives

To perform a scheduled preventative maintenance visit to the first Tsunameter DART II buoy located in the South East Tasman Sea (46° 55'S, 160° 34'E), some 600 nautical miles from Tasmania.

This Voyage will also be used to deploy (at location 46° 40'S, 161° 00'E) a new ETD Tsunameter, this is a new generation Tsunameter and will provided added security for Australia from this region by establishing a second sensor for Tsunami monitoring.

Voyage Track

This service and deployment mission will be within the grid box 49S 160E; 45S 164E (see diagram 1 below and figure 3). The buoy will be deployed within international waters. The voyage track will be determined by the Captain of the Southern Surveyor.

ESTABLISHMENT OF DART STATION 55401



Diagram 1: Voyage Track

Time Estimates

Day	Activity
1-3	Load DART II and ETD, cruise to first site.
4	Locate and Recover DART II Buoy and Replace with new Buoy. Remain in area to verify operation of new Buoy subsystem.
4	Position Southern Surveyor to second Tsunameter Location (46° 40'S, 161° 00'E) and Deploy the ETD, Remain in area to determine if ETD is correctly functioning.
5 – 7	Steam back to port; unload and pack remaining equipment.

Southern Surveyor Equipment

A-frame
A-Frame winch with block
Knuckleboom crane
Capstan
Some type fair lead from Capstan to A-frame
Tugger winch
Dry Storage for Electrical Equipment close to working deck (Aft)
Echo Sounder for bottom features and water depth determination\D-Ring placed on aft deck 10,000lbs rating for stopper chain and towing
Two 2" x 6' pipe for make shift reel stand
Good cleats and tie offs for tag lines
Chain and Binders to secure equipment on deck
Spare lifting slings rated at 8,000 lbs on basket configuration
Spare taglines
Spare 1 1/8" or larger line for towing or hogging

User Equipment

A details manifest of the equipment will be provided at the earliest opportunity

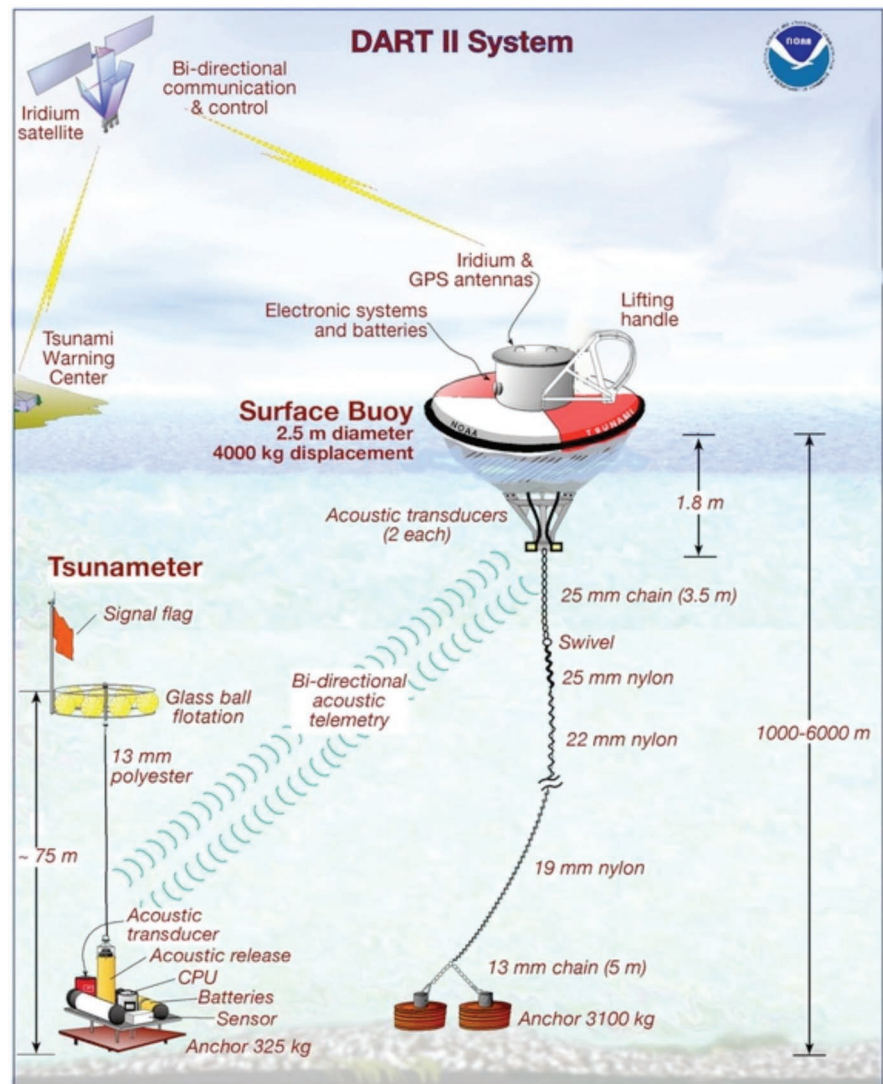


Diagram 2: DART Buoy mooring configuration

Personnel List

Name	Affiliation	Position
Damir Lenc	Bureau	Chief Scientist
Stephen Quinn	Bureau	Deployment Observer
Ross Hibbins	Bureau	Deployment Observer
Scott Stalin	NOAA/PMEL	Engineering Development ETD
Christian Meinig	NOAA/PMEL	Director Engineering Development
Jack Macgregor	SAIC	Deployment Electrical Technician
Paul Trakimas (1)	SAIC	Deployment Mooring Technician
Richard Campagna (1)	SAIC	Deployment Mooring Technician
Hiski Kippo	CSIRO	Computing Support
Stephen Thomas	CSIRO	Voyage Manager/ Electronics Support

(1) – SAIC were unable to confirm which technician was available for this mission and therefore nominated two names, however only one of these will join this mission.

Damir Lenc

Chief Scientist

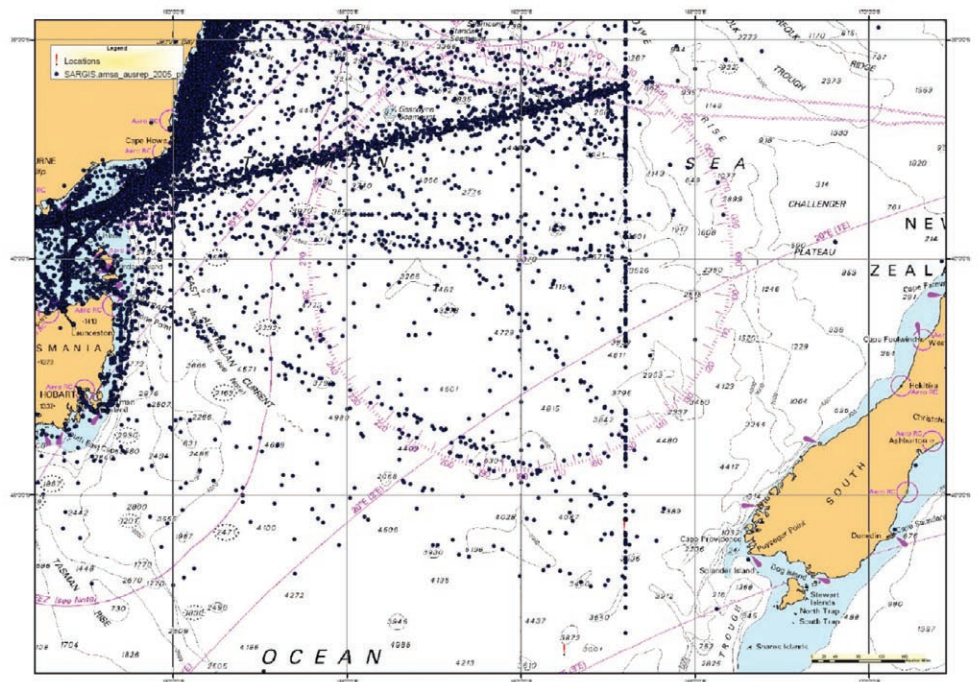


Figure 1: Map of ship route activity between Australia and New Zealand

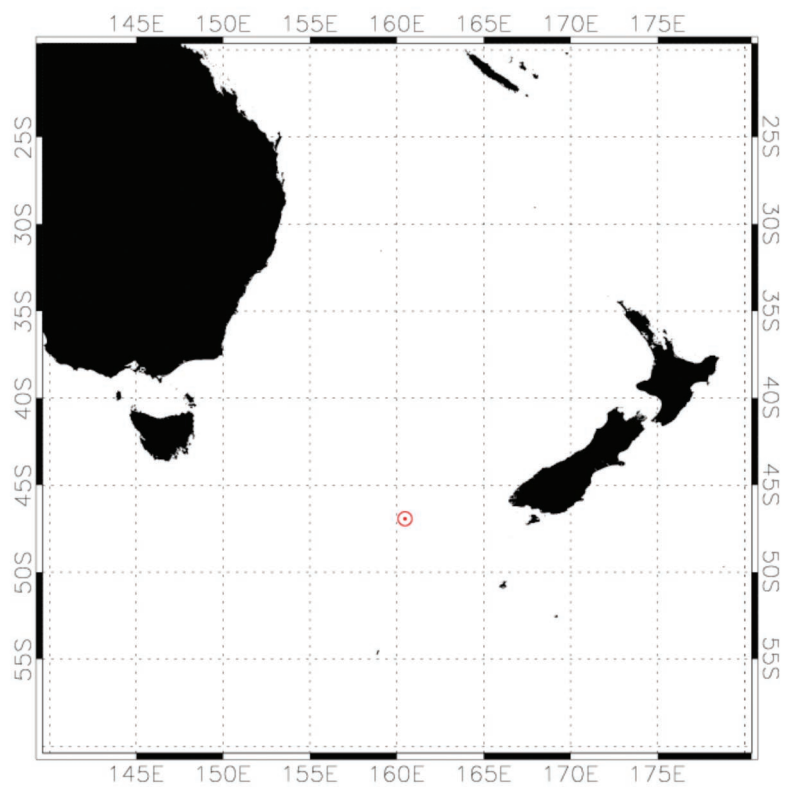


Figure 2: DART buoy deployment location (46° 55'S, 160° 34'E)

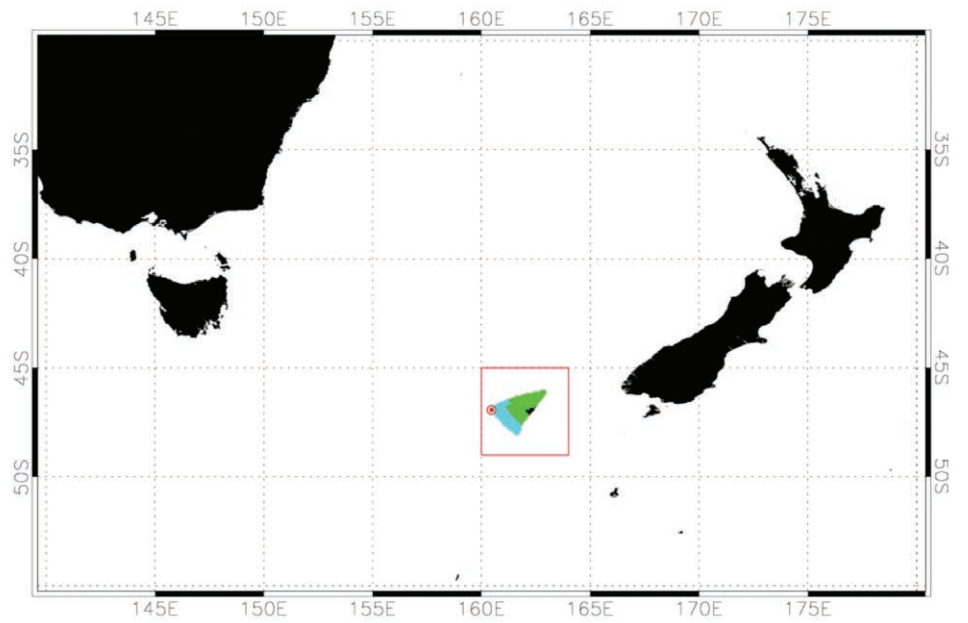


Figure 3: Optimal locations of the DART buoy

Blue = good; Green = better; Black = best

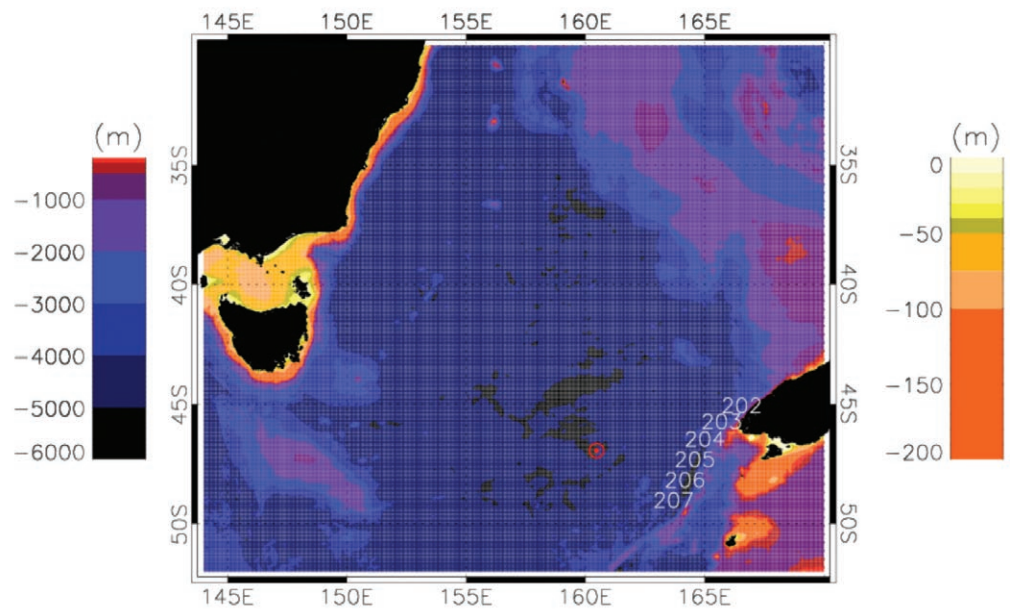
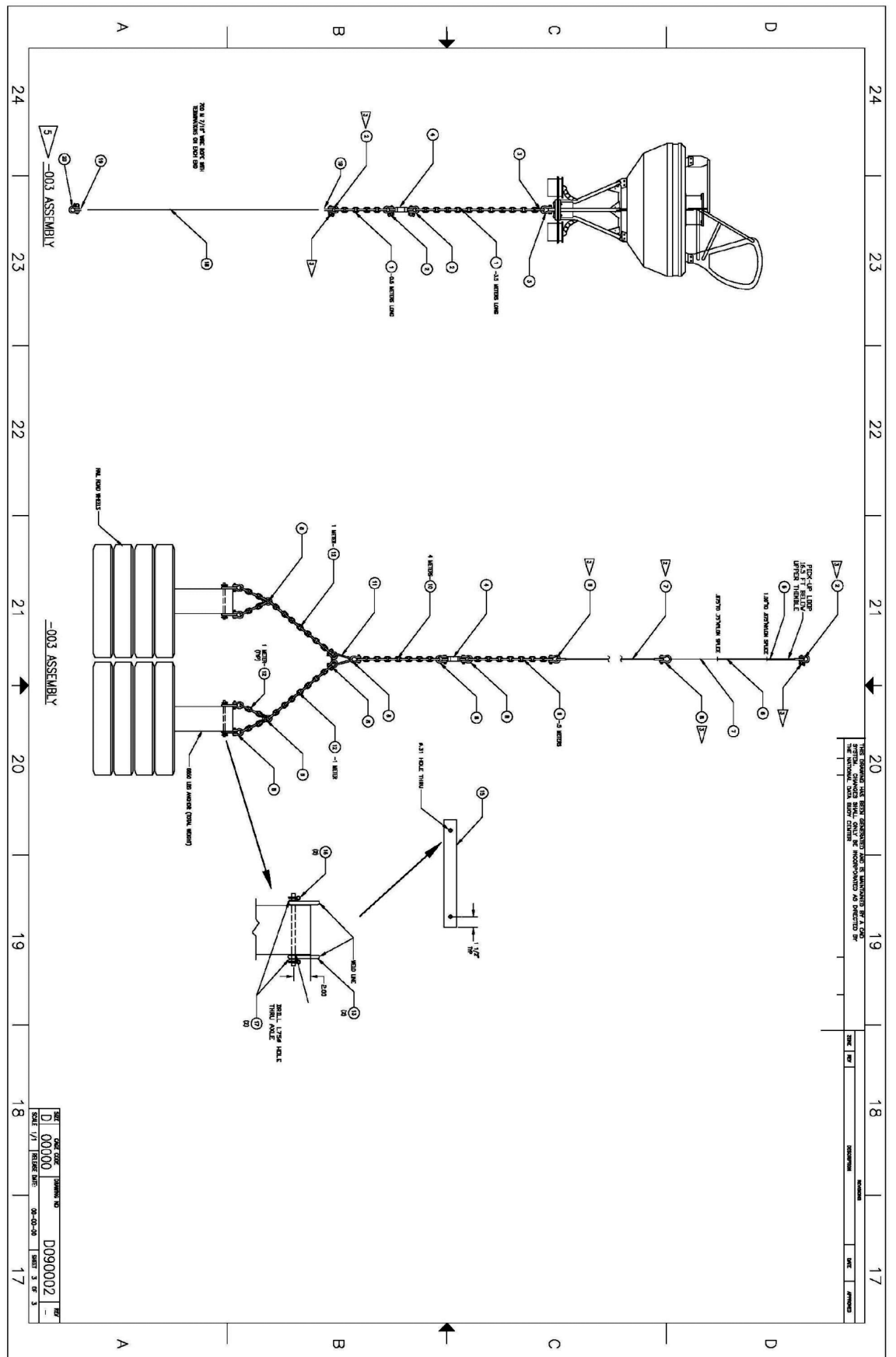


Figure 4: Proposed DART deployment location including bathymetry



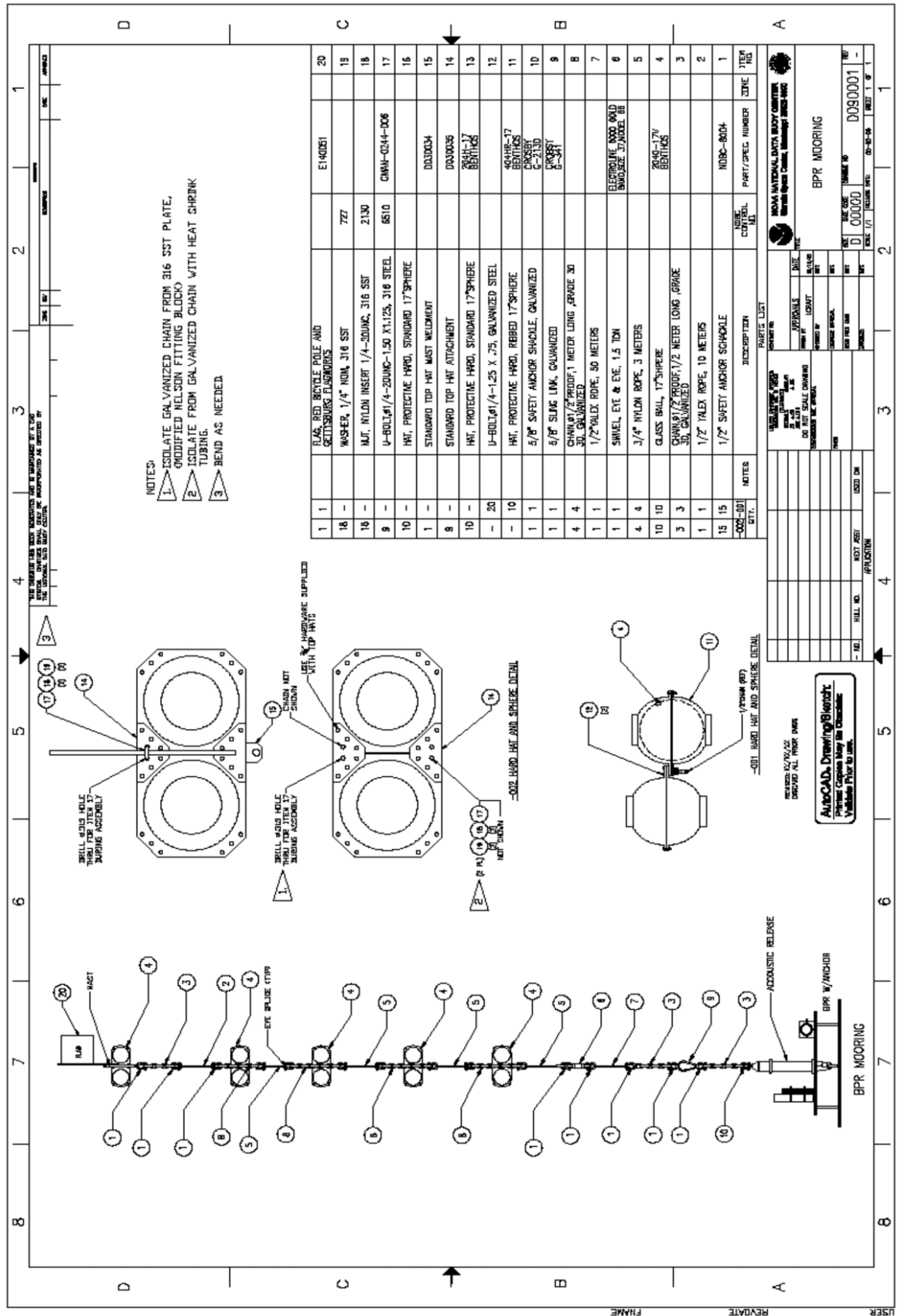


Figure 6: Bottom Pressure Recorder

Figure 7: ETD Pre-Deployment Configuration

Left side of buoy

Right side of buoy



Total weight = ~5000lbs

DART Deployment List

- 1) Remove (2) bolts (shown in picture)
- 2) Cut and remove only the lines marked in the pictures
- 3) Remove Yellow ratchet straps
- 4) Deploy at location given

Figure 8: ETD Deployment Operation.

Lift should be slightly outboard to drag it off deck, or the pallet may be raised with a jack from underneath.



Lifting straps

Lifting force from deck:
~1000 lbs, decreases to
~600 lbs at 45 degrees.

Vertical lift distance is ~70" for
deployment angle of 45 degrees.

