

AOSN MURI: AOSN MOORING DEVELOPMENT AND OPERATIONS

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LONG-TERM GOALS

To create and demonstrate a reactive survey system, capable of long-term unattended deployments in harsh environments. We refer to such a system as an Autonomous Ocean Sampling Network (AOSN). The goal of the mooring program element is the deployment of two functional telemetry moorings in the Labrador Sea in Winter 1998. The moorings will support docking stations for the Odyssey AUV at 500m depth and provide a link to a surface satellite link over an RS 485 communications path.

APPROACH

An S-Tether mooring was designed for 3000m of water and for the harsh surface conditions found in the Labrador Sea in Winter. Figure 1 shows a schematic of the design as used on the Test Cruise in October 1997. Key elements of the design include:

- Steel surface buoy to withstand immersion to several hundred meters depth on deployment and under extreme current events
- Low profile antenna tower to minimize icing conditions
- Compliant hose connection to surface buoy to absorb wave energy and prevent failure of the mechanical and electrical lines where they meet the buoy.
- S-Tether section to provide a non-hocking, slack surface connection for the electrical conductors
- Molded chain sections above and below the subsurface buoy to protect electrical and mechanical lines at this junction
- Four conductor E/M cable from the surface to the dock at 500m depth
- Distributed flotation along the wire rope section of the mooring to provide back-up flotation in case of mooring failure

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WORK COMPLETED

Moorings, buoys, battery cages and housings have been designed. Parts for two systems have been ordered. Fabrication of one system is complete with the exception of the E/M cable which has yet to be delivered.

A Test Cruise was conducted in October 1997 to Site D (39°10'N and 70°00'W - 2700m of water) to test the mooring system and other elements of the AOSN system. The mooring was successfully deployed on 18 October and recovered the following day. All elements of the mooring functioned properly. A previously used S-Tether and a 425m section of CTD wire (three-conductor) was used to replace the E/M cable that is back-ordered at Vector Cable. No significant changes in the mooring design are anticipated prior to the Labrador Sea cruise.

IMPACT/APPLICATIONS

The mooring design used for the AOSN Labrador Sea program has utility for other programs requiring robust subsurface moorings with surface telemetry capabilities. Similar designs are also appropriate for shallow water applications.

TRANSITIONS

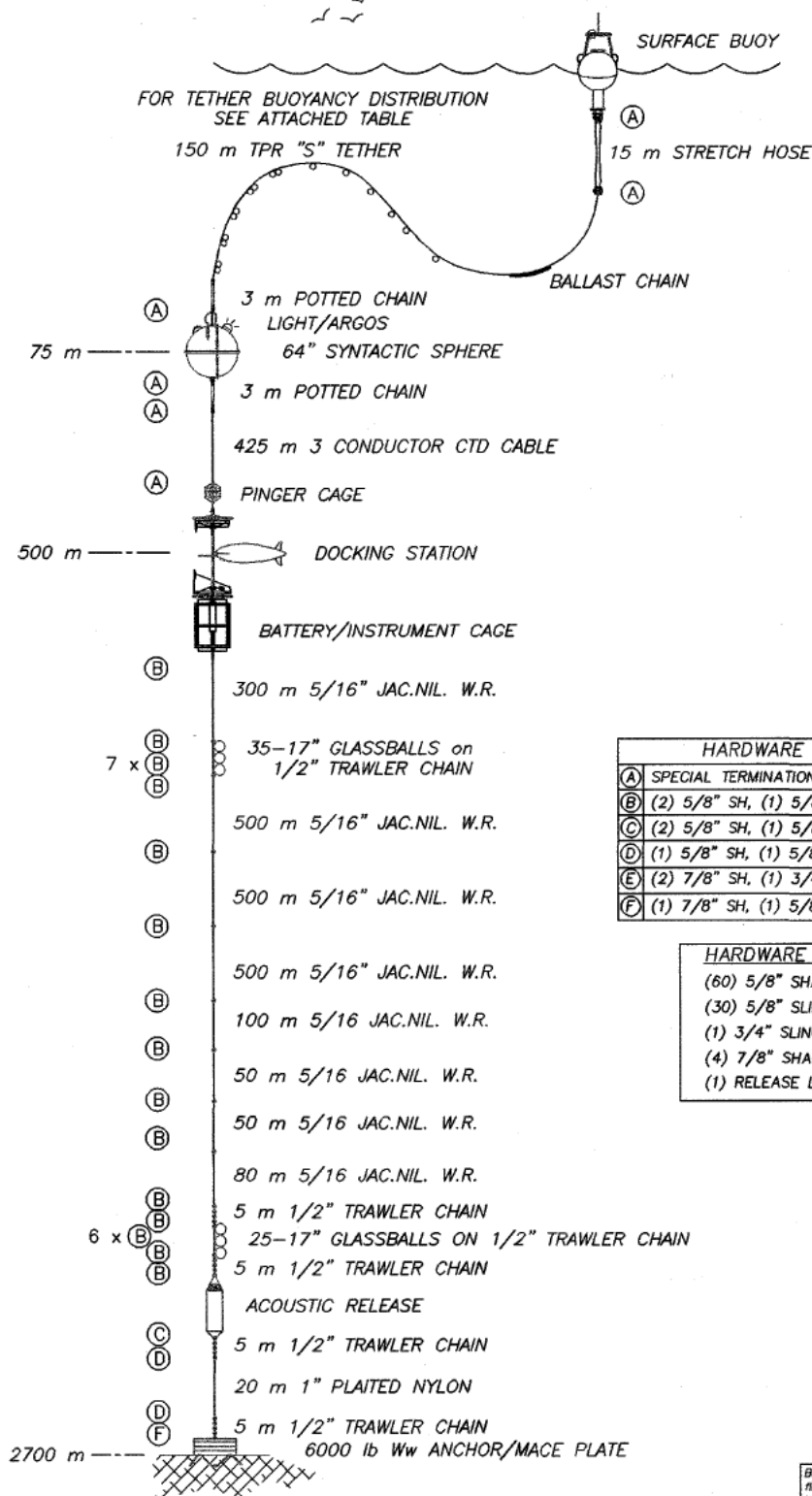
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RELATED PROJECTS

The AOSN-MURI is the blanket project under which the mooring work is being conducted under a subcontract from Massachusetts Institute of Technology. The MURI has various components - AUV operations, AUV docking, data telemetry, glider development, and modeling, which are all related.

REFERENCES

1. Thomas B. Curtin, J. G. Bellingham, J. Catipovic, and D. Webb, "Autonomous oceanographic sampling networks," *Oceanography*, Vol. 6, No. 3, 1993.



HARDWARE DESIGNATION	
(A)	SPECIAL TERMINATION
(B)	(2) 5/8" SH, (1) 5/8" SL
(C)	(2) 5/8" SH, (1) 5/8" SL, (1) RELEASE LINK
(D)	(1) 5/8" SH, (1) 5/8" SL, (1) 7/8" SH
(E)	(2) 7/8" SH, (1) 3/4" SL
(F)	(1) 7/8" SH, (1) 5/8" SL, (1) 5/8" SH

HARDWARE REQUIRED	
(60)	5/8" SHACKLES
(30)	5/8" SLING LINKS
(1)	3/4" SLING LINK
(4)	7/8" SHACKLES
(1)	RELEASE LINK

BETSEY DOHERTY date: 09/10/97
file: ODYS_MRG revised: 10/16/97
KEMP

M.I.T. ODYSSEY MOORING. Site "D" Revision 2

Figure 1: AOSN mooring