

Pycnocline-Tracking Turbulence Measurements (Stanton, McPhee and Shaw)

The lowest (within-pycnocline) instrument package will be raised and lowered to track the depth of a specified isopycnal using a computer-controlled winch with input from the profiling CTD system. The instrumentation on the mast will consist of two McPhee turbulence instrument clusters, downward- and upward-looking ADCP's and a thermistor string. The total weight of instrument package is 200 lbs in water and is 300 lbs (excluding the cable weight) in air. The instruments will be attached to 500 m of cable, with expected operating depths of 150-400 m.

The 2 hp winch will be housed in a wood-framed enclosure that will be tied down on the foredeck, near the forward crane ('forward option') OR that will be tied down in the Baltic room ('Baltic option'). See Figure 1. The winch, cable, and enclosure will weigh approximately 600 lbs and have nominal dimensions of 4'(L)x2'(W)x3'(H).

In the forward option, the entire winch apparatus (winch, cable, enclosure), which will be stored in the hanger bay during transit, will be moved from the bay to the foredeck during sampling by lowering the apparatus onto the ice with the fantail crane, pulling it over the ice, and lifting it onto the foredeck with the forward crane. While collecting data, the instrument cable will run from the winch to a sheave attached to the end of the crane, and then outboard and down to a sheave on an ice-tethered tripod (located about 30 m from the ship) and finally down into the water through a hole drilled in the ice (Figure 1). For deployment, the individual 'sections' of the package will be attached sequentially and inter-wired on the ice within a protective shelter.

In the Baltic option, the instrument cable will run from the winch to a sheave attached to the boom and then outboard and down to the tripod as in the forward option (Figure 1).

The Baltic option is logistically preferable. However, we believe it is important to have the forward option available in case of entanglement problems with the profiling CTD, which will be lowered through the moon pool, that may occur in the Baltic option.

Logistic Needs

- 208 V, 3-phase, 20 amp power for winch motors and heating element
- 10/100 base-T ethernet
- wind shelter on ice with kerosene heater

forward option

- capability to move winch apparatus from hanger to foredeck
- dedicated use of forward crane, with sheave, during sampling
- tie-down/bolt-down points on foredeck
- comm/data (ethernet and a three twisted pair cable) and power cabling access to foredeck

Baltic option

- dedicated use of Baltic room boom during sampling
- tie-down/bolt-down points in the Baltic room

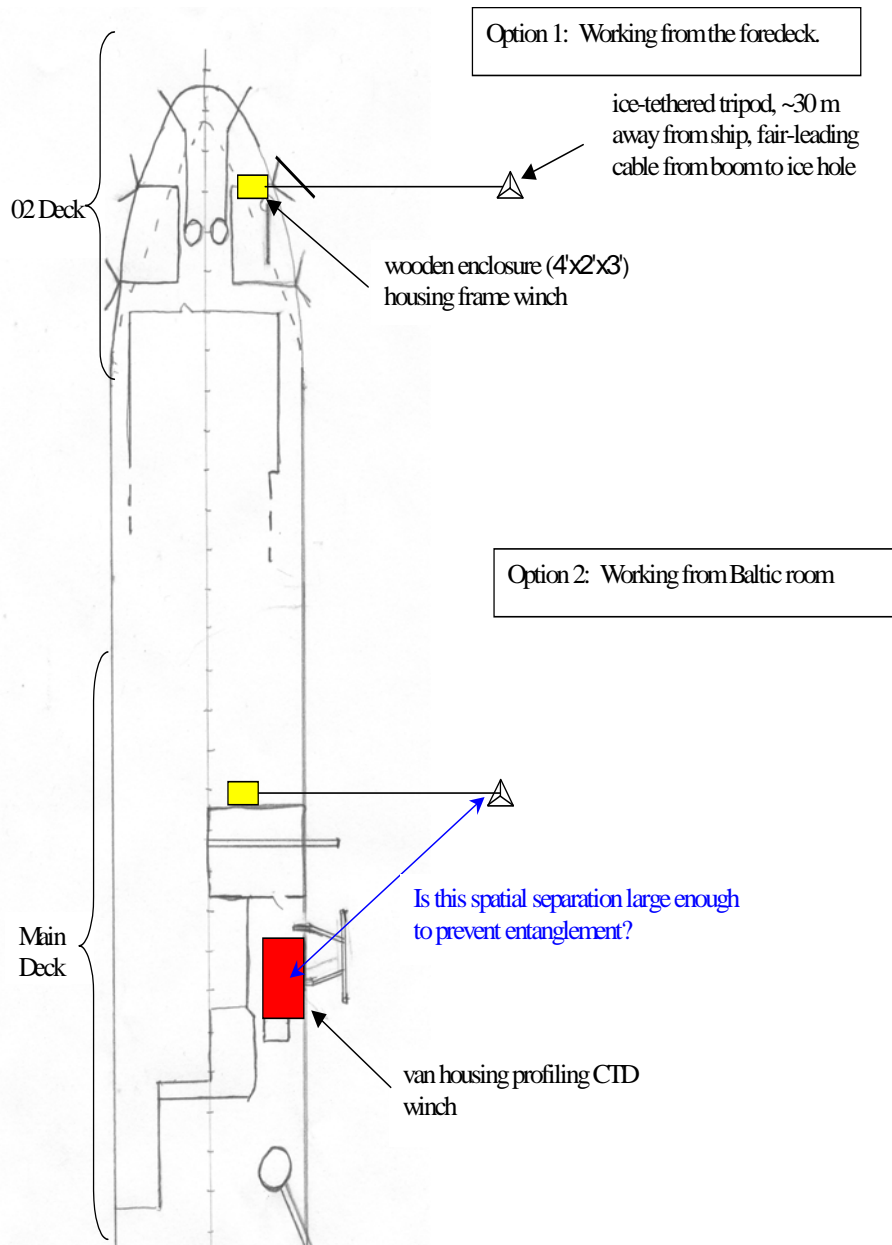


Figure 1. Plan view of O2 Level Foredeck and Main Level Fantail showing positions of turbulence frame winch apparatus in the 'forward' and 'baltic' options and the location of the profiling CTD van over the moon pool. In both options the instrument cable goes outboard and down to an ice-tethered tripod.