

1.0.The Instrument:

The configuration of the McLane Moored Profiler (MMP) acquired three types of time-series data during each vertical profile:

- **Engineering** - time, motor current, battery voltage, pressure. Some instruments also log additional parameters here such as fluorometer and optical back scatter.
- **CTD** - conductivity, temperature, pressure
- **ACM** - acoustic current meter, split into a velocity and compass tilt file (four channels of raw velocity data, three channels of compass readings and two axes of tilt)

For each vertical profile, one binary file of each type is written.

2.0. Summary of data types within each text file.

2.1.Engineering File

evolt: battery voltage
fluor_gain: fluorometer gain
fluor_mV: fluorometer in millivolts
obs_gain: optical backscatter gain
obs_mV: optical backscatter in millivolts

2.2.CTD file

pressure: decibars
temperature: nominal degrees C
conductivity: nominal mmho/cm.

2.3. ACM velocities:

Vab Vcd Vef Vgh: raw path velocities (nominal cm/s)

2.4. ACM Compass and Tilt

aHx aHy aHz: horizontal (x,y) and vertical (z) normalized compass readings
aTx aTy: tilt in fore-aft and athwartships (degrees) as below:
aTx: tilt in fore-aft and athwartships degrees
aTy: tilt in fore-aft and athwartships degrees
aHx: horizontal (x) normalized compass readings
aHy: horizontal (y) normalized compass readings
aHz: vertical normalized compass readings

2.4. Time file

time of each engineering scan coded with matlab function datenum.m – includes:
starttime: profile start time encoded with datenum.m
endtime: profile ending time encoded with datenum.m

Conceptually, the data from the CTD and ACM are checked to insure that all variables are with sensible range (specified by the user) and pass a first difference check. Bad raw data are interpolated. Time is logged in the engineering file along with a pressure reading. These data are used to interpolate a time estimate for each CTD scan. Apart from the logged times when the MMP starts and stops the external sensors, there are no cross-referenced time marks between the CTD and ACM apart from a manufacturer-stated common sample rate. To align the CTD and ACM data streams, the program automatically locates the starting and ending transients at the top and bottom of the profile interval and assumes constant (but not necessarily the same) sample rate for each sensor. This is sufficient to define the time value for each ACM scan, allowing common binning of all data against pressure.