

## Digital Barometer – a New Equipment for Hong Kong Voluntary Observing Ships

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Accurate atmospheric pressure reading is crucial for mariners to appreciate the general weather conditions at high seas, as normally high pressure suggests stable weather and low pressure implies unsettled weather. Hence, every ship at seas is equipped with a barometer on board for monitoring atmospheric pressure. The aneroid barometer (Figure 1) which provides instantaneous atmospheric pressure readings is most commonly used.

Besides information on the current atmospheric pressure, observations of pressure change and tendency are also crucial for safe navigation at seas and provide mariners with indications on the weather trends and changes as well as the movement of weather systems relative to the ships, such as the approach or departure of low pressure systems or even a typhoon. The larger the change in pressure, the more significant change in weather can be expected. For example, rapid pressure drop within a short period of time would suggest the approach of a significant low pressure system and a greater chance of stormy conditions.

To facilitate the measurement of pressure change and tendency, all ships under the Hong Kong Voluntary Observing Ship (VOS) scheme are equipped with an aneroid barograph (Figure 2) by the Hong Kong Observatory. While a typical aneroid barograph is constructed based on exactly the same principle as the aneroid barometer, it can also record the instantaneous pressure readings continuously by the movement of a pen over a chart or barogram (Figure 3) so that the pressure change and tendency can be readily determined. Regular maintenance for the aneroid barograph is required such as replacing the barogram paper, replenishing the ink for the pen, changing batteries, adding clock oil to the gear and cleaning the bearing to reduce friction on the mechanical parts of the barograph.

In recent years, with the advance of technology, digital barometers have been developed and made available commercially. The observations are stored digitally and the pressure change and tendency are computed and displayed automatically (Figure 4). Some models are even customized with the function of providing the output readings in a format compatible with popular e-logbook software (e.g. TurboWin+) such that the observations can be directly downloaded into the e-logbook for archival by Port Meteorological Officers or for direct transmission to meteorological centres. Comparing with the aneroid barograph, a digital barometer is compact, requires much less regular maintenance and can reduce the chance of human errors in the taking, recording and dissemination of observations. The first digital barometer on board a Hong Kong VOS has been successfully installed on Dapeng Moon (Figure 5) on 15 June 2016 and the Observatory will continue to implement the replacement plan for the rest of the VOS fleet in the coming years.



Figure 1. Aneroid barometer



Figure 2. Aneroid barograph

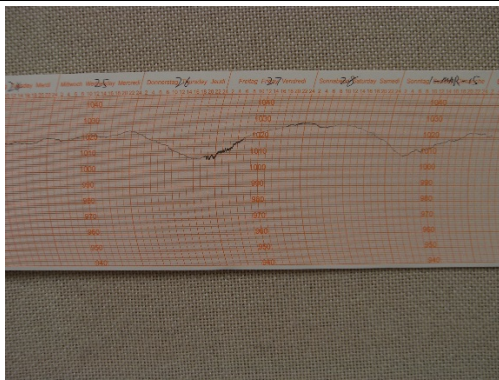


Figure 3. A traditional barogram

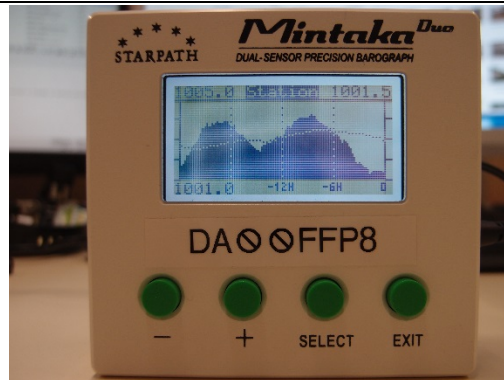


Figure 4. Barograph display on a digital barometer



Figure 5. First digital barometer installed on board  
Hong Kong VOS Dapeng Moon in 2016