

Bottom Locked Display

By John Adams

This article has been written to give the reader a clearer understanding of the different applications the Bottom Locked Display can be used for in fish detection and bottom discrimination.

Bottom Locked Display systems are nothing new - they have been around for decades, and were designed for echo sounding systems used by deep sea commercial fishing fleets, engaged in bottom trawling. These systems originally recorded the echo signals from fish and bottom structure on paper recorders. When the technology of colour TV became available in the 1950's, echo sounding systems were then manufactured and designed to record signals in colour on a display screen and not on paper.

The recording of the bottom echo signal on a colour display screen as shown in screen view (1) is referred to as "Transmission Locked Display"; in this example a full view of the water column is recorded, from 0 - 50 metres. The echo signals, recorded in the middle of the water column, are from a school of Spanish mackerel.

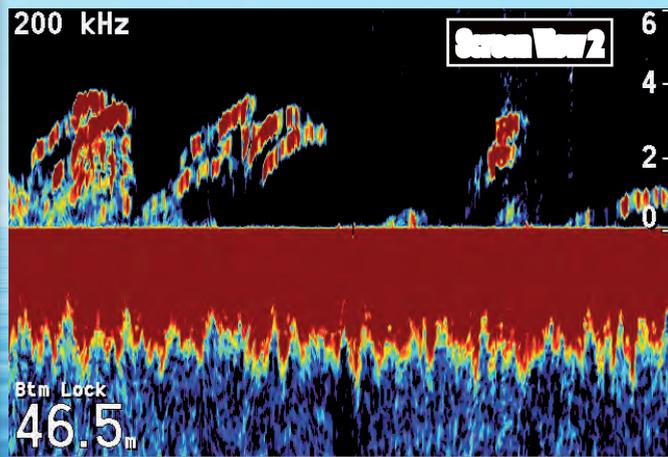
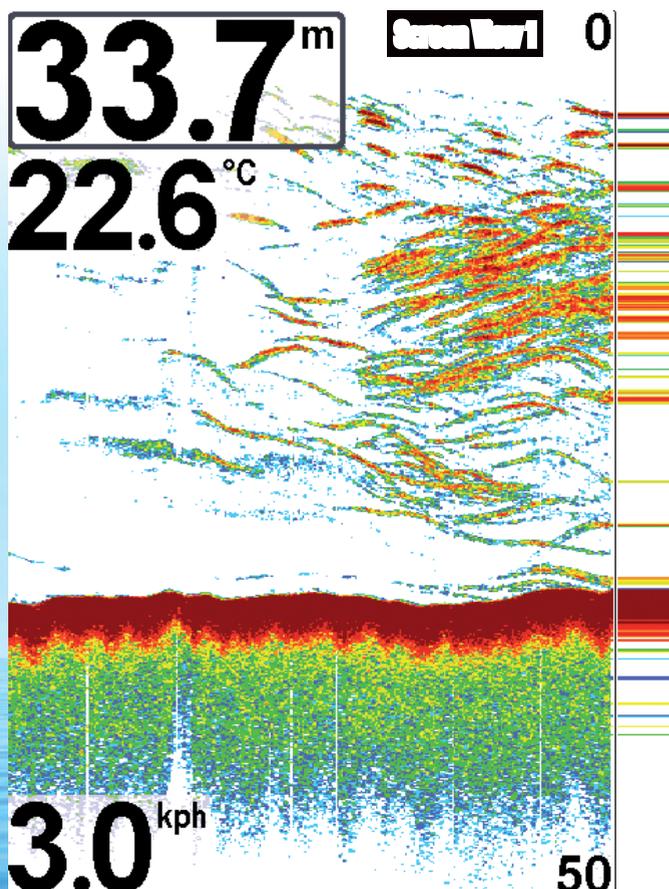
Flat calm surface conditions always provide the most stable platform to accurately record an impression of the seabed. The recording of the seabed in rough windy

conditions, when large swells are present, will not provide a true account of what the bottom looks like, and the recording of the bottom surface and fish targets will become ambiguous. This is because the sounder is continually recording the distance from the transducer to the bottom; therefore as the boat rises and pitches over the waves and swells, the distance from the transducer to the bottom can dramatically change in excess of 3-5 metres which affects the accuracy of the recording. When fishing in these conditions a "Bottom Locked Display" system becomes invaluable.

When the echo sounder is being operated in a "Bottom Locked Display", the transmission signal is locked to the bottom, and will appear on the display screen as a straight line. Any fish targets detected are recorded above this line, as in screen view (2) where the bottom lock range has been set to view an area of 0-6 metre above the seabed. The Bottom Lock range is adjusted by the operator according to depth and how high the fish are expected to rise off the bottom.

Fish that are found living near the bottom are generally referred to as demersal fish, and are predominantly bottom feeders that graze on marine plants, forage and filter through the sand, feeding on small invertebrate, worms and other small fish. Bottom feeders, depending upon the species, tend to stay within a certain distances from the bottom. For example, demersal fish found in shallow water of 30 - 100 metres often will not rise more than four metres above the bottom. In this depth the Bottom Locked view should be set from 0 - 8 metres off the bottom. Fish found in deeper water, such as 200 metres, are often caught 20 metres off the bottom. In this depth the bottom lock view should be set 30 metres off the bottom. Pink snapper can be found in any depth often forming into large schools on the surface even in 300 metres of water.

The "Bottom Locked Display" is a remarkable tool which can also be used to discriminate different types of bottom - this is known as ground discrimination or signal



discrimination. By closely observing the recording of the bottom echo signal within the “Bottom Locked Display”, the observer can distinguish different bottom surfaces. Surfaces are categorised as hard or soft, flat and rough. Hard bottoms, such as rock, granite and coral, have a hard reflective surface and reflect stronger echoes back to the transducers / receiver, resulting in a thick bottom echo signal being recorded on the display screen. Soft bottoms, such as sand or mud, absorb much of the acoustic energy transmitted by the transducer and have a soft reflective surface, reflecting weaker echoes signals back to the transducers/ receiver, resulting in a thin bottom echo signal being recorded.

When targeting fish it is important to understand the nature of the bottom. In practice I often fish and anchor the boat along depth contour lines, which are lines marked on a marine chart that connect points of equal depth. This is also where the nature of the bottom often changes, as seen in screen view (3), which is a “Transmission Locked Display”. Notice the left part of the recording is raised and thick, representing a rocky outcrop, whereas the right section of the recording is flat and thin, typical of a sandy bottom. Within this recording you can distinctively see where the two different bottoms

meet. Larger fish often leave the protection of crevasses and ledges within rocky outcrops to feed on the smaller fish and other organisms that live on the softer sandy bottoms.

The information obtained about the nature of the bottom as seen in screen view (3) can also be achieved by using a “Bottom Locked Display”, which will give the same information about the bottom but from a different perspective. In this situation you still observe the thickness of the bottom echo signal below the Bottom Lock line, as seen in screen view (4). Notice how the right part of the recording below the Bottom Lock line is thick, indicating a hard raised bottom surface, typical of a rocky outcrop. Now notice the left part of the recording below the Bottom Lock line - it is thin, indicating a soft flat bottom surface, typically a sandy bottom. Within this recording you can distinctively see where the two different bottoms meet, and where the echo signals from fish are present.

“Transmission Locked Display” and “Bottom Locked Display” can be viewed simultaneously on a split screen, as shown in screen view (5). Notice the “tails” within the bottom echo signal. “Tails” are created by the stronger echoes being reflected off the rough ground from the outer edges of the beam and returning to the transducer/ receiver at an oblique angle, rather than from directly under the boat, as occurs when the bottom is flat and level.

In this article I have covered some of the points to consider, when using “Bottom Locked Display”. I hope you will find this information useful and that you will enjoy learning about the underwater world as much as I have.

John Adams.
Fremantle Boat School.

To learn more about echo fishing, readers can purchase John Adam’s new book, titled “How to Use an Echo Sounder/Fish-finder”. Visit www.howtouseafishfinder.com to find more information about the book and to purchase on-line.

