

Bottom Discrimination

By John Adams

Interpreting the bottom echo signal recorded on the display screen is an important part to echo sounder fishing and is known as bottom discrimination or ground discrimination. The recording of this signal contains information about the nature of the bottom because the different bottom types produce a unique echo signal on the display screen. Being able to identify different bottom types will open up a complete new world to the fisher. The signals recorded on the display will become recognisable and have a meaning that can be applied to catching fish

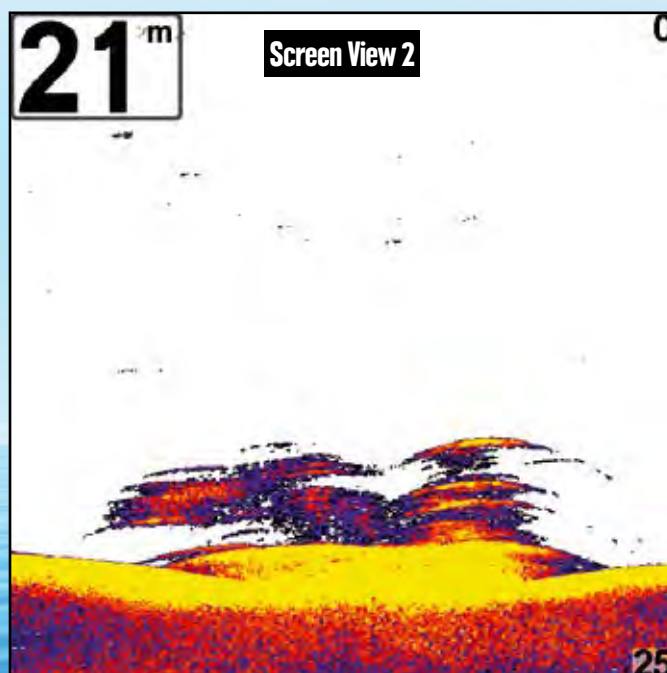
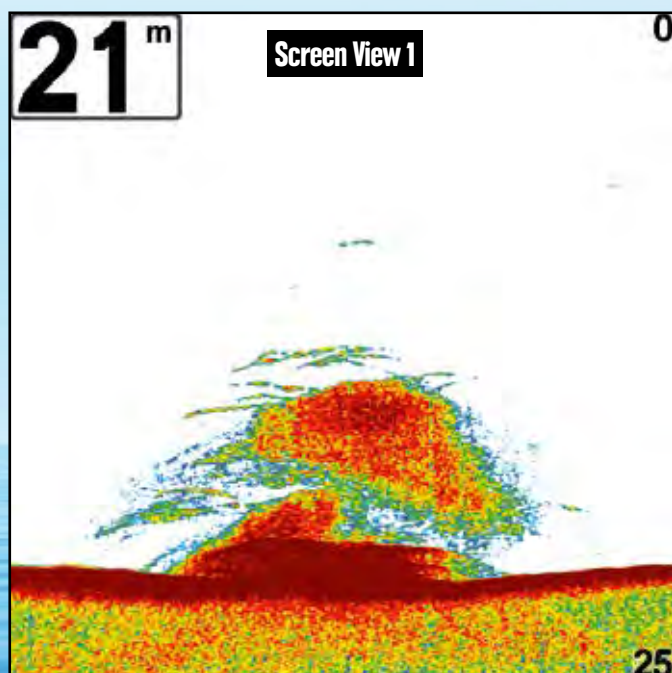
The bottom is be made up of many different surfaces, including mud, shells, gravel, coral, stone and rock. Some bottoms are layered, for example mud over sand, or sand over rock, while others are covered in marine plant life.

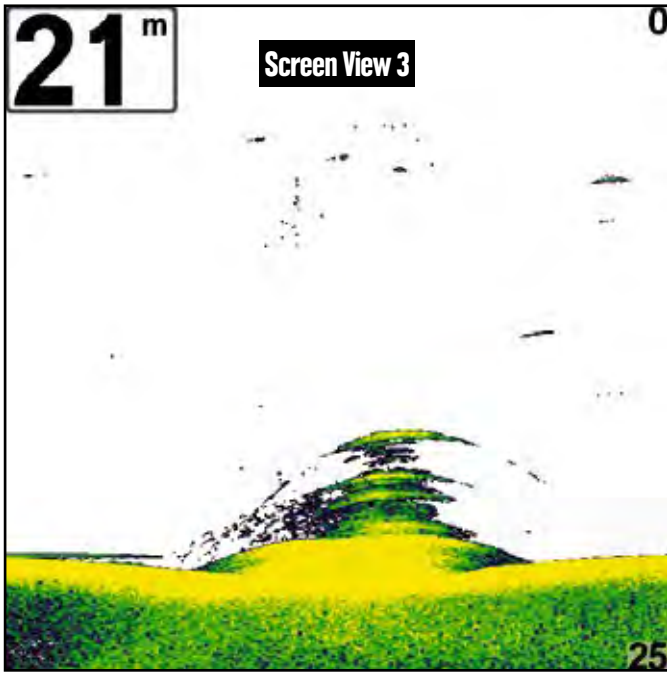
The bottom echo signal is the most prominent signal recorded on the display screen. When the sounder is turned ON an ultra-sonic sound wave is transmitted through the water column at 1500 metres per second. When the sound wave strikes a fish target or the bottom, an echo is instantly

reflected back to the transducer's receiver, where the signal is processed and recorded in colour in proportion to the signal strength of the target.

The signal strength of the return echo is measured in -dB (decibels). The higher the decibel reading the stronger the signal; the lower the decibel reading the weaker the signal. Soft bottom surfaces, such as ooze, clay and sand, have a soft reflective surface, whereas rocky bottoms have a hard reflective surface. The softer the bottom surface, the weaker the signal because much of the acoustic energy of the sound wave is absorbed into the soft surface. The opposite will occur when the sound wave strikes a hard rocky bottom surface.

The colours of the echo signals recorded on the display screen also provide information about the nature of the bottom. Colour palettes on the display screen can range from 8 to 64 colours, depending on the sounder model. The colours that are recorded on the display screen are proportionally divided into units of signal strength - the





more colours the palette has, the greater the differentiation is within the signal.

To determine which colour produces the strongest signal in your sounder's colour palette, simply look at the bottom echo signal, and there will be your answer. Examples of this are given in screen captures one to four, which are a recording of a small boat wreck sitting on the bottom. Echo signals from fish can also be seen in this picture.

Screen view(1) - the stronger signal in the bottom echo signal is dark red and the weaker signal is light blue.

Screen view (2) - the stronger signal in the bottom echo signal is yellow and the weaker signal is dark blue.

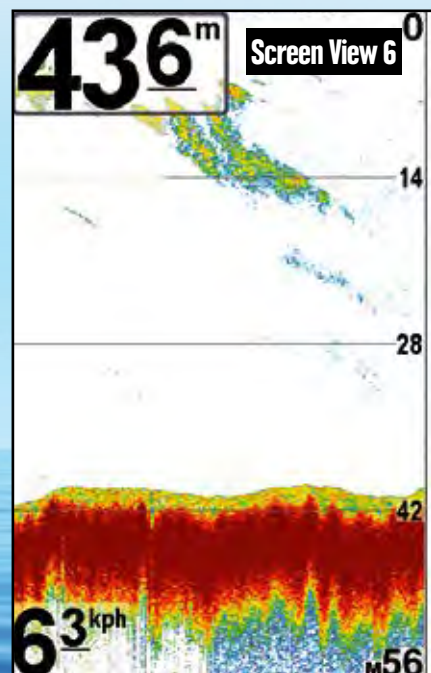
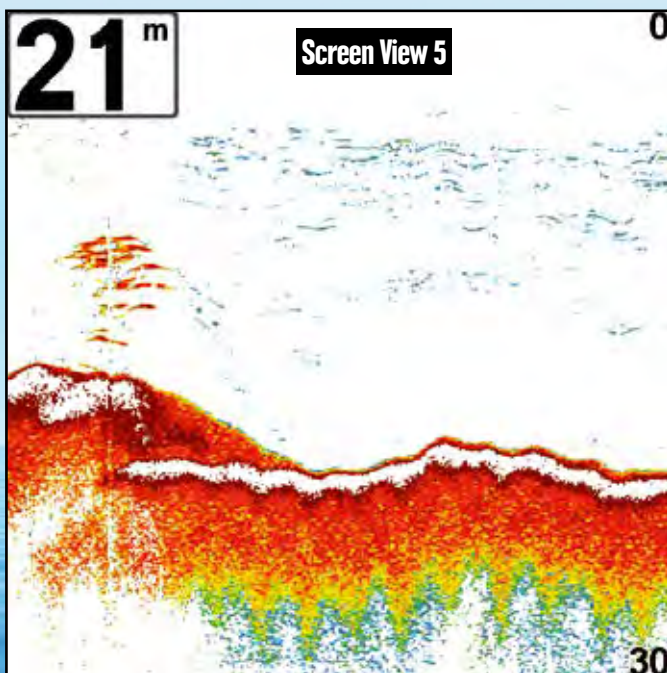
Screen view (3), the stronger signal in the bottom echo signal is yellow and the weaker signal is dark blue.

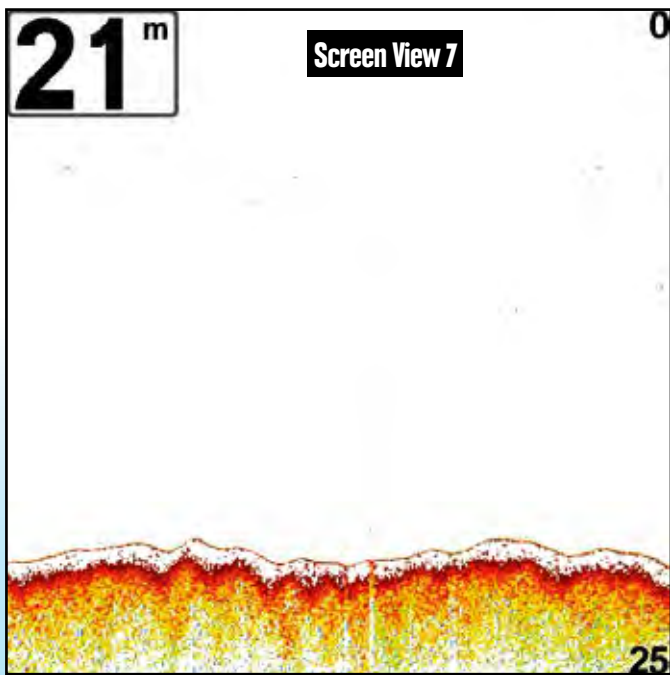
Screen view (4), the stronger signal in the bottom echo signal is green and the weaker signal is dark blue.

When targeting fish it is important to understand the nature of the bottom. Bottom dwelling fish tend to live around hard bottoms with rocky outcrops and ledges. These areas provide food and protection for many larger fish. A soft bottom consisting of sand, seagrasses, algae and other marine plant life does not provide much protection for larger fish, but they can provide attractive hiding places for smaller fish. Where hard rocky and soft sandy bottoms meet, some of the larger fish often come out from the crevasses and ledges to feed on the smaller fish and other organisms that live on the softer bottoms with its seagrasses and algae.

In practice, I often fish along depth contour lines marked on marine charts. When the boat passes over a depth contour line, there is often a sudden change in depth, and the nature of the bottom can change.

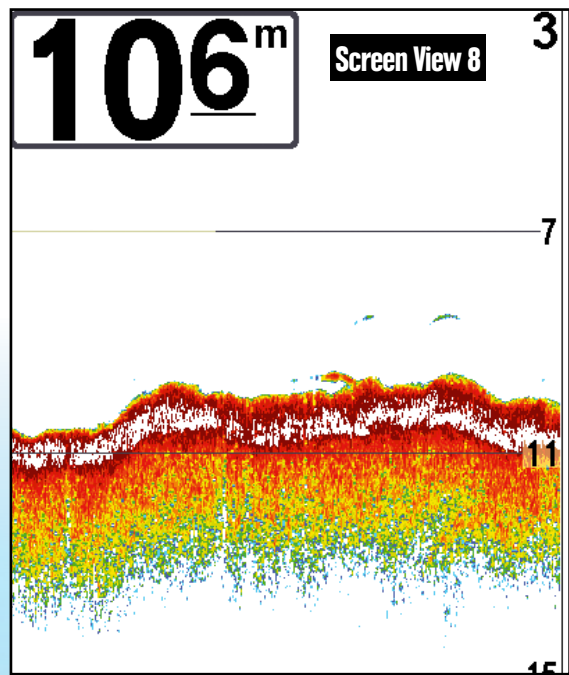
By observing the bottom echo signal, the observer can determine whether the bottom has a flat or uneven surface. For example, in screen view (5) the bottom echo





signal shows two different bottom surfaces. Notice in the left part of the recording the bottom echo signal is thick, indicating a hard raised bottom surface, where rocky outcrops, crevices and ledges potentially exist. Now notice in the right section of the recording the bottom echo signal is thin, indicating this section of the bottom has a flat surface, typically a sand bottom, which produces a thinner bottom echo signal because it has a soft reflective surface.

The bottom can also be composed of several different layers, for example silt, mud, sand and rock. These can be distinguished by the colour intensity of the bottom



echo signal as shown in screen view (6), where the colour intensity of the upper surface (yellow/ green) indicates a soft bottom surface. The echo sounder transmissions have penetrated this soft upper layer and have produced a further echo signal, which is thick, dark and red, indicating a hard bottom. The tails in the bottom echo signal indicate that the lower surface of the bottom is rough.

One of my most favourite pastimes is whiting fishing, because the fish are plentiful, and it's a nice easy day out and you are always guaranteed of being able to catch a nice feed of fresh fish.

The first step to finding some whiting ground is to find a flat sandy bottom surface, where whiting will typically be found foraging for worms and small crustaceans. Whiting are most commonly found in depths of less than six metres, but I prefer to fish for them in around 20 metres.

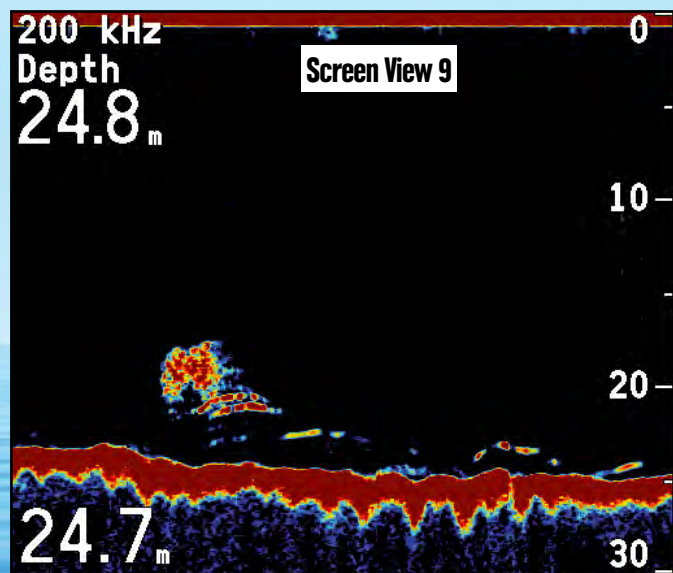
With the echo sounder turned ON, I will be looking for a thin bottom echo signal that has a flat surface as seen in screen view (7) I will avoid any bottom surface that shows small rocky lumps and marine plant life and tails within the signal, as seen in screen view (8). This type of broken bottom will generally have fish living on it that I don't want to catch, such as Wrasse. Using the white line function will also enhance my understanding of the nature of the bottom.

When a suitable type of bottom is found, as in screen view (7), I will drop the anchor and fish. If none are caught within five minutes, the anchor will be retrieved and the boat moved to a new location, and the whole process will start all over again until fish are found. If the fish caught are small I will move to a new location until I find the bigger ones.

Anchoring in large sandy patches surrounded by seagrass can also produce an array of other small fish such as flathead, silver trevally, King George whiting, and the occasional gummy shark. I have caught the odd Western Australian dhufish whilst fishing for sand whiting.

Once I have caught a feed of whiting, I will head off to the nearest depth-contour line - these lines are marked on a marine chart and connect points of equal depth, where often two different types of bottom meet, such as sand and rock.

I will then target larger fish, such as pink snapper, which are often found schooling on sandy bottoms adjacent to rocky outcrops. This type of bottom can be seen in screen view (5), where a school of fish with high target strength can be seen on the top of the rocky outcrop. Once found, I then anchor the boat on the edge where the two bottoms meet and, after 20 minutes, if no fish are caught, the boat is moved and repositioned to another location nearby, and the process starts all over.



Lachlan Klingburge with a nice Pinky

When fishing the edges of a rocky outcrop, the strategy is to try and draw the fish out from the ledges and crevices that may exist. Some of my best catches have come from this method. Fish located close to a structure are not detectable by echo sounding, because they are positioned in what is known as the 'dead zone' where detection of fish by acoustic means is not possible. The 'dead zone' is caused by the bottom echo signal merging with the signals from the fish. This is also known as target masking.

A word of caution about anchoring the boat: check the height of the swells. One of the most dangerous situations a fishermen can put themselves in, is to anchor the boat where waves can potentially break. Swells are generated from winds a very long distance away, and for this reason it is very difficult to predict when a wave will break. Some years ago, I was fishing on a small rocky outcrop at the Abrolhos Islands in a 12 metre boat, when a wave broke onto the boat, resulting in all the front windows being knocked out, and a small section of the wheel house roof being lifted off. If I had been in a small recreational vessel I probably would not be writing this article. This type of accident can happen to even the most experienced boater, and for that very reason I am extremely cautious where I anchor. As a general rule, I will only anchor in deeper water when fishing.

Recently, I had the pleasure of taking my grandson out for a fishing trip at Cervantes. It was his birthday. As we were heading out to the fishing grounds, to my disappointment the wind increased and I knew the weather conditions were going to make it difficult to anchor the boat and to fish. I knew we would have to drift fish with a sea anchor out. With the echo sounder ON, I found a section of bottom that produced tails in the bottom echo signal. See screen view (9).

The golden rule is: the longer and thicker the tails and the closer they are together, the rougher and harder are the bottom surface. These tails are created by the stronger echoes being reflected off the rough hard ground from the outer edges of the beam, and returning back to the transducer at an oblique angle rather than from directly under the boat, which is what occurs when the bottom is flat and level.

We fished the ground for a few hours and caught some really nice fish, which included Western Australian dhufish, baldchin groper, pink snapper and red throat emperor. When we were bringing some of the fish near the surface we could see the outline of a large object under the boat,

probably a large tiger shark. It was a hard windy morning's fishing and I was glad when it was over, but my grandson reckoned it was his best day fishing he has ever had.

This exercise proved that being able to properly interpret what your sounder is telling you can often turn what may be an average day into a great day.

To learn more about echo fishing, readers can purchase my new book, titled "How to Use an Echo Sounder / Fish Finder" by going to: www.howtouseafishfinder.com.

I hope you will enjoy learning about echo fishing as much as I have.

