

Visual feedback to sonar clicks

It is well known that dolphins use echolocation but how about watching what actually happens? A device that shows the audience some of the information contained within the emitted ultrasonic waves.

It is a small fish look-alike device that is created to simulate how the dolphins behave while hunting. By picking up the echolocation signals sent out from the dolphins and process the signals to extract some information hidden within. The device was thought of to show the audience of dolphin shows, how the animals behave while hunting. The audience will be informed with flashing lights located on the top of the device. Different frequencies on the light depending on the distance between device and dolphin and different color on the light depending on which of the frequency domains that is prominent in the signal.

A major problem during the creation of the device was disturbance. Disturbances picked up by the device from the surrounding, from the plug in the wall and even self oscillating operational amplifiers. How to get rid of noise in the setup? Most of these disturbances were managed, such as: using a battery instead of the plug, using bypass capacitors and bypass resistors to avoid the self oscillating operational amplifiers. However, at the end there still remained some noise. This is suspected to be the noise picked up from the surrounding. By changing to shielded coaxial cables instead of regular copper the amplitude decreased some, but still remained. Recreating the circuit with a PCB (Printed circuit board) did decrease it even more, but still not enough for the ultrasonic wave to appear on the measuring equipment.

Although the end results were inconclusive it gives a head start for future development. Future work may focus more on dampening disturbance or even take this as a hint to make the solution all digital, thereby almost fully removing the chances of disturbance. This would also increase the accuracy of the signal processing. In addition it would enable the possibility to implement more features to the device.