

# Operation Claw

The Royal New Zealand Navy uses many different types of uncrewed systems. These are drones that operate on the water, underwater and in the air without people on board.

They can carry lots of different sensors such as a video camera and radar which send live video to the people on board the ship controlling it. They are super useful as they can go into places that are hard to reach.

A good example is the Remote Environmental Monitoring Units (REMUS). They are used for seafloor surveying and underwater investigations. The people that control these are hydrographers, who map out the oceans, ports, rivers and harbours so that others can navigate there safely.

The REMUS sends out a signal which bounces off objects and creates a "shadow". It uses the same technology as the Mars Rover. The data is downloaded and displayed on a computer screen where specialists analyse the information to figure out what the object could be.

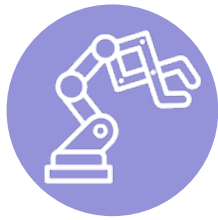
HMNZS Matataua is not a ship but a special team of people that include hydrographers and divers. The teams are sent to help when there is a disaster like the Kaikoura earthquake or the Tongan volcanic eruption.

## NAVY HYDROGRAPHERS AT WORK



The Navy also has a "Bluebottle". It doesn't carry people and is controlled remotely from the Operations Room of the Naval Base. It is close to 7m long and is powered by renewable energy from the sun, wind or waves. If it's cloudy and calm, the Bluebottle has a nifty flipper and rudder device that uses the wave energy to move forwards. The Bluebottle has a range of surveillance equipment on board that can be used to help stop illegal fishing, protect our border and provide data about the weather.

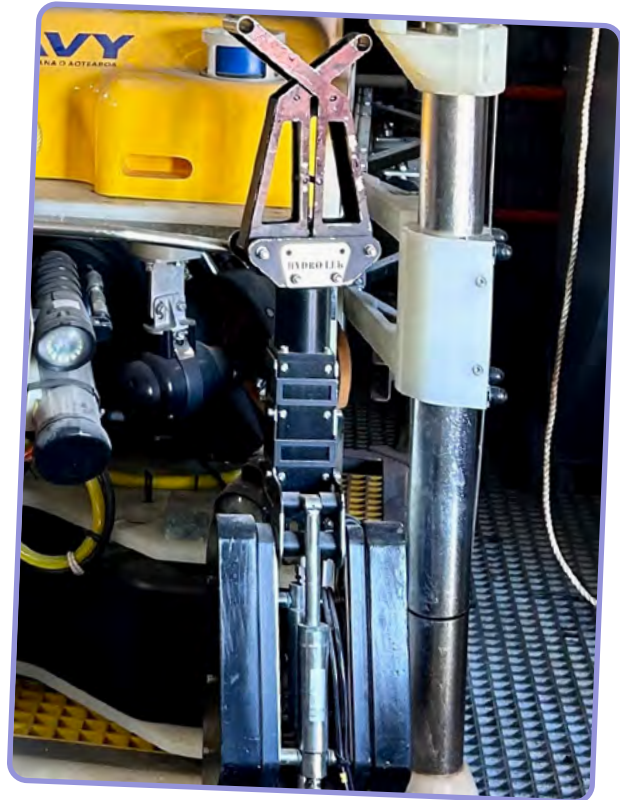
## CHALLENGE



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In 2022 another of the Navy's remotely operated vehicles (ROV) explored the wreck of the Royal Mail Ship Niagara off the Northland Coast. The ship was sunk by a German mine during the Second World War with 590 gold bars on board. 585 gold bars were recovered but five are still unaccounted for.

The ROV has a **manipulator arm**. It is like a robot claw that can be used to pick up small items or attach a hook to a heavy object so it can be lifted to the surface.



### YOU WILL NEED

- 7 cardboard strips – 4cm by 22cm
- Ruler
- 4 split pins
- Rubber band
- 40cm string
- Tape

### YOUR CHALLENGE

Make a basic robot arm using the supplied instructions.

Use your own materials and design to make a claw for the end of the arm so it can pick up the objects.