

Making sense of sound underwater

■ BY VICTORIA VAUGHAN

UNDERWATER communication could soon be as easy as a phone call, with efforts under way to help divers and submersibles to “talk”.

Researchers are studying how sounds move underwater with a mini Panda (Pop-up Ambient Noise Data Acquisition), a robot which collects underwater sounds to help build up a bank of ambient noise common in the sea.

Said Mr Venu Pallayil, manager of operations and senior research fellow at the National University of Singapore’s

Tropical Marine Science Institute (TSMI): “Underwater, you can’t communicate with radio waves, but sound can travel much farther than on land.

“We will look at how sound moves underwater and what affects it, to help people such as divers and naval sonar operators communicate better.”

The Panda, which can be modified to measure water quality, is anchored to the seabed and can record data for 54 hours. It is considered eco-friendly as, unlike other devices, the anchor can be recovered. A cluster of Panda can be used for an underwater communication network to track boats overhead.

The university has signed a licensing agreement with ST Engineering (InfoComm) to produce the system commercially, making it the first product being licensed for production by TSMI.

The devices will travel the seas on board a custom-built boat, which the university launched last week. The Galaxea, which took about seven months to build and cost about \$500,000, is equipped with an electronic navigation system and extra work space. The 12m by 5m vessel will be shared by TSMI and the university’s Department of Biological Sciences.

Other research gadgets include:

■ An underwater torpedo-shaped robot which can survey and monitor the ocean more cheaply than traditional ship-based technology.

Under project Starfish (Small Team of Autonomous Robotic Fish), scientists at TSMI hope to build up a number of these robots to work together

to collect data about Singapore’s waters, ranging from salinity and temperature to sedimentation and noise. Each robot, which costs between \$300,000 and \$500,000, can travel at 5 knots for five hours, and is equipped with a transmitter to feed data to the boat.

■ The Romanis (Remotely Operated Mobile Ambient Noise Imaging System), which can “take pictures” of sounds and sent them back to the boat, which processes the images on site.

Previously, researchers would have to return to the lab to do so. Romanis sends out no signal while looking about the murky depths, unlike sonar. This could lead to undetectable surveillance. It is set to be put to the test at Selat Pauh – an area of sea off Singapore.

The boat will also be used to study aquatic life here. The project leader, Assistant Professor Peter Todd, said: “The boat is a great platform to dive from and as it is faster, it allows us to visit more reefs in one day.”