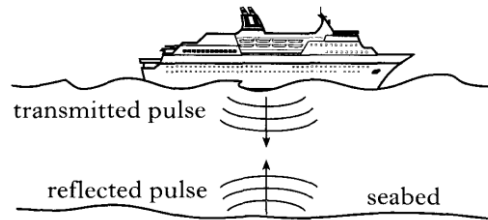


Dalkeith High School
S3 Physics home learning
Ultrasound

1. The depth of the seabed is measured using pulses of ultrasound waves. The ultrasound waves are transmitted from a stationary ship. The waves are reflected from the seabed as shown and are detected by equipment on the ship. The transmitted ultrasound waves have a frequency of 30 kHz. The speed of sound in water is 1500 metres per second.



One pulse of ultrasound waves is received back at the ship 0.2 s after being sent out. Calculate the depth of the seabed.

2. (a) Name one use for ultrasound in medicine. The diagram may give you a hint!



- (b) Name one **non-medical** use for ultrasound.
3. Read the following passage about sound.

Sound with a frequency below 20 hertz is called infrasound. Sound with a frequency above the range of human hearing is called ultrasound.

Elephants communicate using infrasound. Elephants can detect low level infrasound through their feet.

Bats use ultrasound to navigate. They send out ultrasound pulses that reflect off objects.

The bats note how long it takes the pulses to return. Ultrasound is also used in medicine.

- (a) Suggest a frequency that could be detected by an elephant through its feet.
- (b) State the highest frequency that humans can hear.