

## **DST Group Radar Technology**

### **For: Year 11 and 12 Physics Students**

This program links with the 'Waves' section of the SACE Stage 1 Physics curriculum, and links to the 'Energy and Momentum' section of the SACE Stage 1 Physics curriculum are also included.

This program has been developed in collaboration with the Defence Science and Technology (DST) Group to demonstrate applications of radar technology. Students use an audio radar as a learning tool in an experimental workshop looking at the radar concepts of reflection and Doppler shift.

Students work through two procedures during the session. The first procedure uses reflection to determine the distance of an object and the speed of sound in air, while the second uses Doppler shift to determine the speed of an object.

### **What will Students do?**

Students:

- Learn about the development of radar in the Australian defence industry.
- Use a pulse emitting audio radar signal to collect data which, when graphically analysed, enables the determination of the speed of sound through air.
- Use continuous wave radar to measure the Doppler shift of a sound wave that reflects from a swinging pendulum, and determine the speed of the pendulum using graphical and mathematical analysis.
- Analyse the results through calculation of percentage error and discussion of random and systematic errors

### **Foundation of Physics Full Day Program**

At the Mawson Lakes Campus, teachers can combine this program with one of the two other programs suitable for Year 11 Physics students – Nuclear Physics or Sensor Technology – to create a Full Day Program.

Please consult the descriptions on the website for program details or contact UniSA Connect for more information.

### **Conditions**

- As this program is a practical activity, students and accompanying adults will be required to wear closed in shoes and appropriate dress.
- High frequencies, and therefore high pitched sounds, are produced and used in this workshop. We recommend students that may be affected by these sounds, such as those with sensitive hearing or a condition in which they may be sensitive to sounds, such as sensory processing disorder, bring ear muffs or other sound-reducing protection.
- Teachers will receive confirmation of booking and pre-visit information.