

Chapter 3
Short answer question

This question is about early radar systems which used radio waves with a wavelength of 1.5m to detect other aircraft. The radio waves were emitted from an aerial mounted in the nose of the plane.

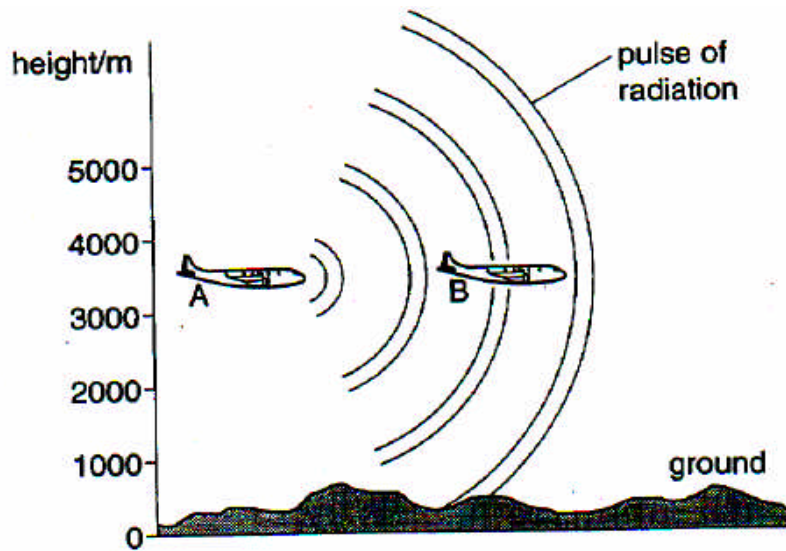


Fig. 1

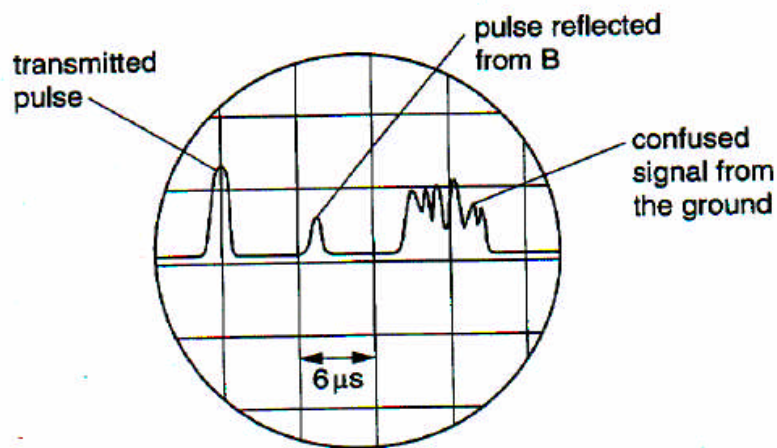


Fig. 2

Fig. 1 shows pulses of 1.5m radiation emitted from aircraft A travelling towards aircraft B.

Fig. 2 shows the oscilloscope screen in the cockpit of aircraft A. The trace shows the transmitted pulse and the resulting reflections.

(a) Use Fig. 2 to estimate the distance separating aircraft A and B.

$$c = 3.0 \times 10^8 \text{ m s}^{-1}$$

(b) The 'confused signal' shown in Fig. 2 is due to radio waves reflected from the ground below aircraft A. How do ground reflections limit the usefulness of the system?