FIGURE 1.1

Radar systems band or letter classification.

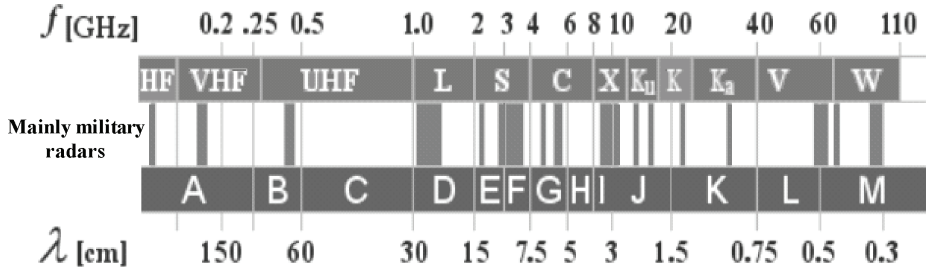


FIGURE 1.2

U. S. Navy over-the-horizon Radar. Photograph obtained via the Internet *(http://www.fas.org/nuke/guide/usa/airdef/an-tps-71.htm).*

FIGURE 1.3

Russian Woodpecker OTHR radar. Photograph obtained via the Internet *(http://passingstrangeness.wordpress.com/2010/04/23/the-russian-woodpecker/).*

FIGURE 1.4

Fylingdales BMEWS, United Kingdom. Photograph obtained via the Internet *(http://en.wikipedia.org/wiki/File:Radar_RAF_Fylingdales.jpg).*

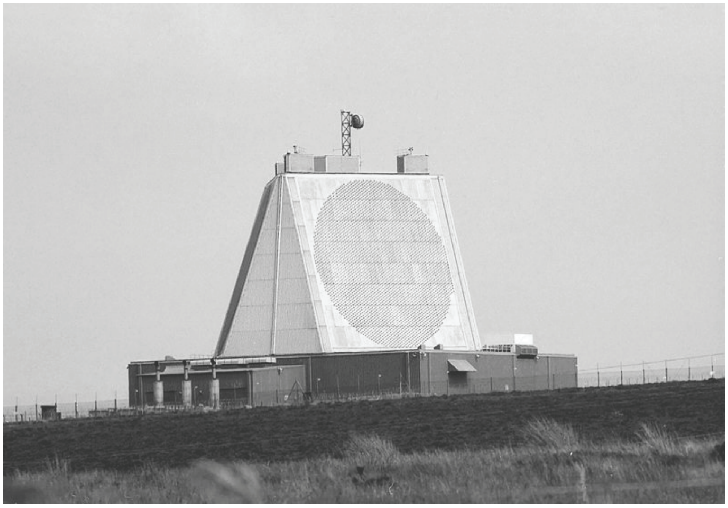


FIGURE 1.5

U. S. Navy AEGIS. Photograph obtained via the Internet *(http://mostlymissiledefense.com/2012/08/03/ballistic-missile-defense-the-aegis-spy-1-radar-august-3-2012/).*

FIGURE 1.6

U. S. Air Force AWACS. Photograph obtained via the Internet *(http://www.globalsecurity.org/military/systems/aircraft/e-3-pics.htm).*

FIGURE 1.7

A simplified pulsed radar block diagram.

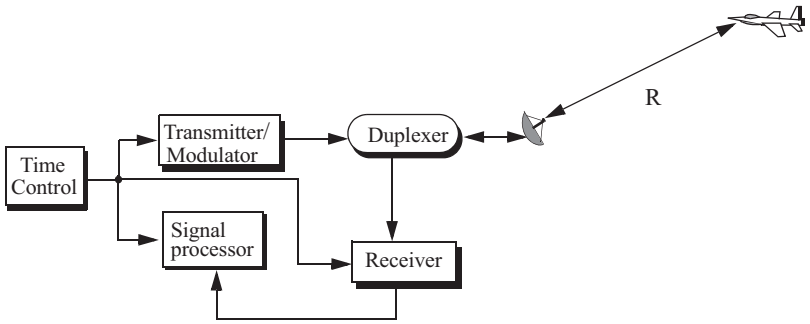


FIGURE 1.8

Train of transmitted and received pulses.

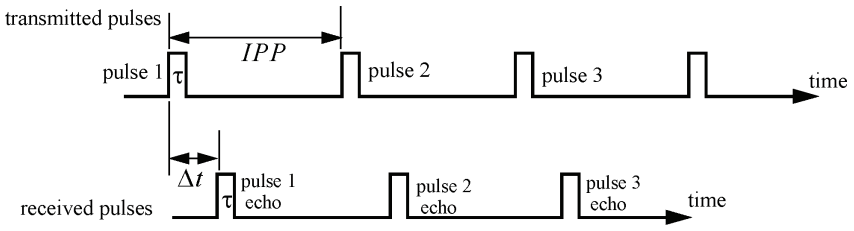


FIGURE 1.9

Illustrating range ambiguity.

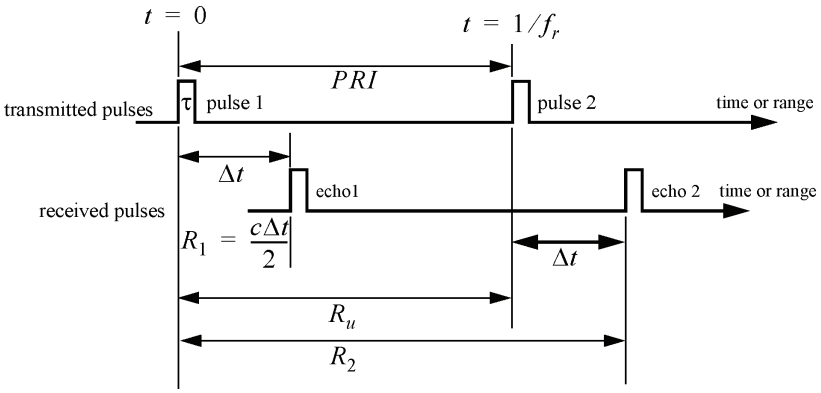


FIGURE 1.10

Resolving targets in range and cross range.

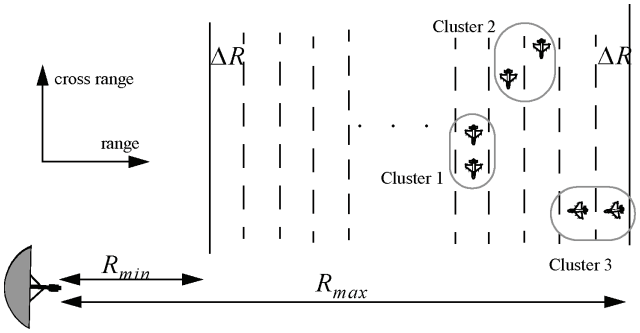


FIGURE 1.11

(a) Two unresolved targets. (b) Two resolved targets.

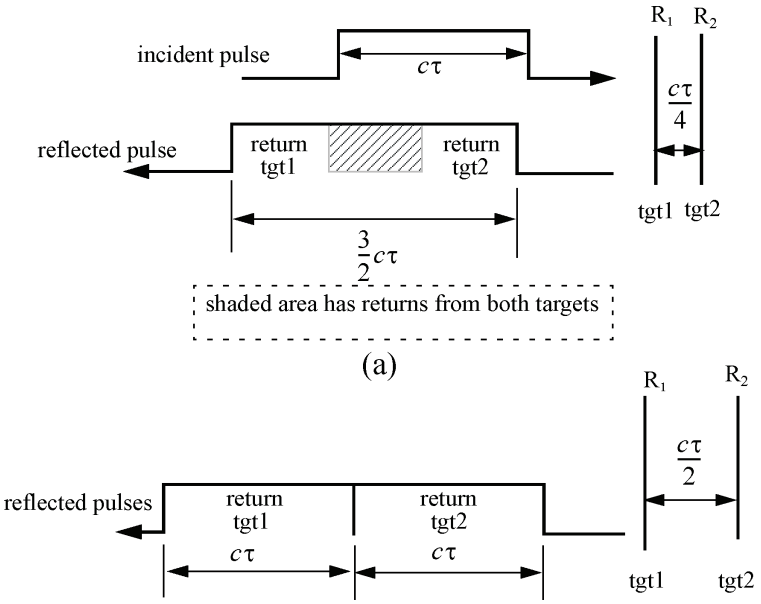


FIGURE 1.12

Effect of target motion on the reflected equiphase waveforms.

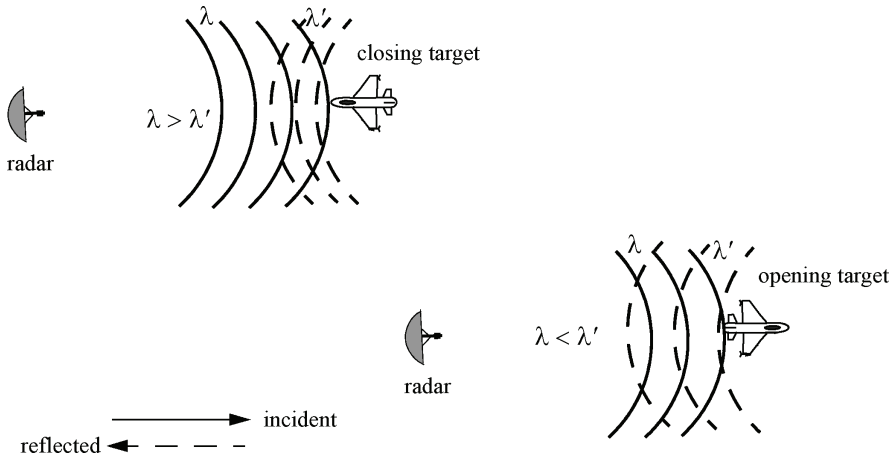


FIGURE 1.13

Illustrating the impact of target velocity on a single pulse.

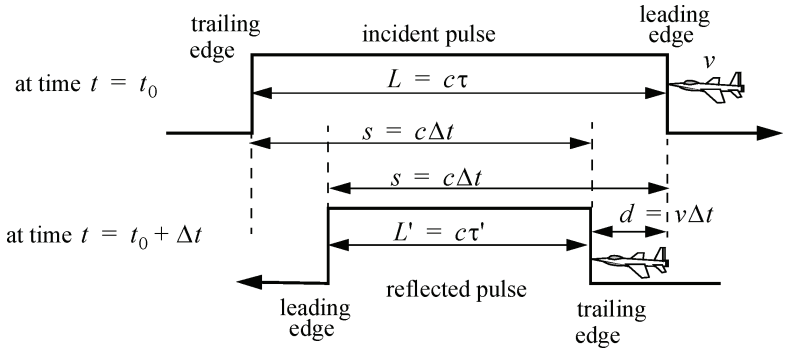
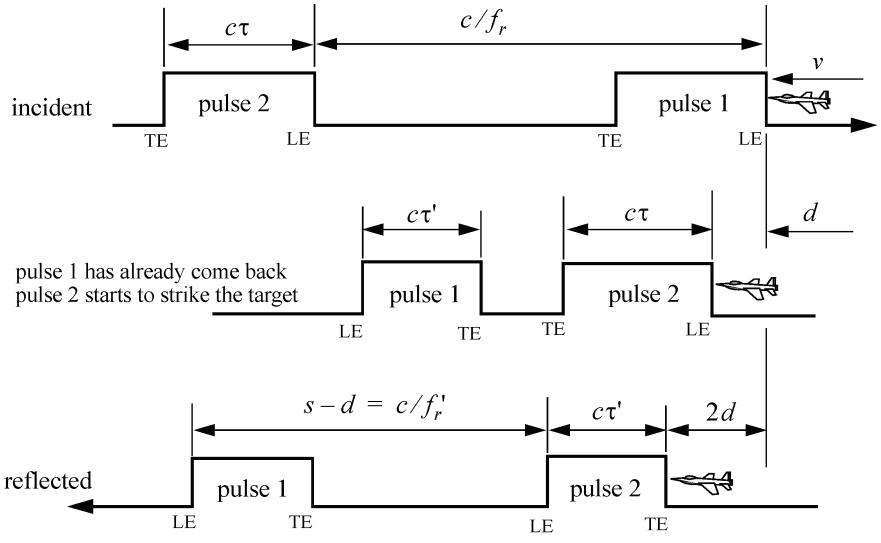


FIGURE 1.14

Illustration of target motion effects on the radar pulses.



LE: Pulse leading edge.
TE: Pulse trailing edge.

FIGURE 1.15

Closing target with velocity *v*.

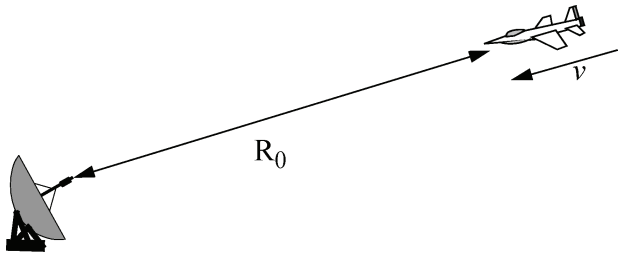


FIGURE 1.16

Spectra of received signal showing Doppler shift.

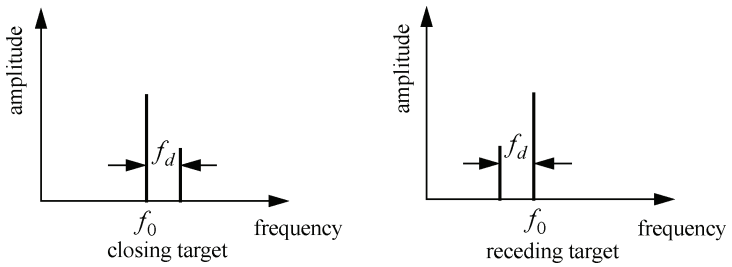


FIGURE 1.17

Target 1 generates zero Doppler. Target 2 generates maximum Doppler. Target 3 is in between.

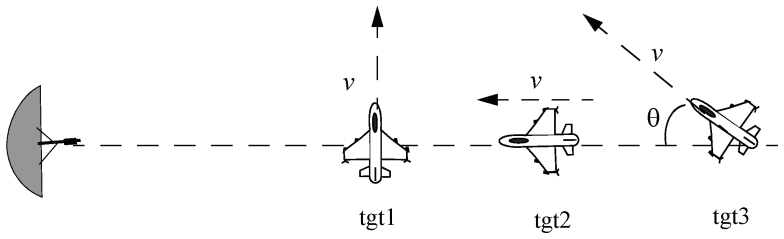


FIGURE 1.18

Radial velocity is proportional to the azimuth and elevation angles.

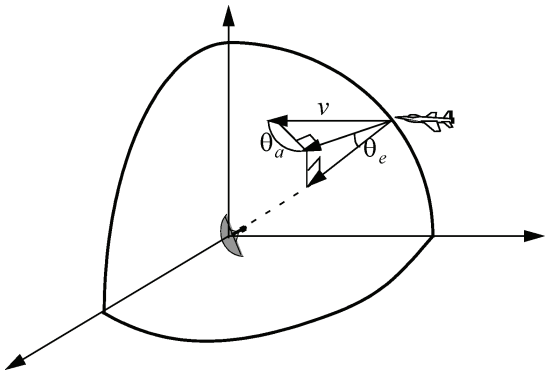


FIGURE 1.19

(a) Phase continuity between consecutive pulses. (b) Maintaining an integer multiple of wavelengths between the equiphase wavefronts of any two successive pulses guarantees coherency.