Lesson 1
Radar Detection and
Search Thoroughness, or Lack of It

RCC New Zealand **BASICS**

R. Baird, January 30, 2014

The search and rescue authorities claim that they did a thorough search for the schooner Nina after they delayed the search 21 days after the schooner went missing. The purpose of these lessons are to show how modern search and rescue radar systems work from a military aircraft with the latest equipment. The last lesson will show actual radar aircraft tracks and how much of the claimed search area was actually cleared by those in-charge of saving lives at sea.

We are making an assumption that those in-charge did not do the search themselves, but instead delegated the search to others in a different agency with the equipment and training necessary to perform this search. This baton-passing can be improved and a better understanding of the search patterns and capabilities of the radar detection coverage will enable future radar air searches to be better planned and more complete.

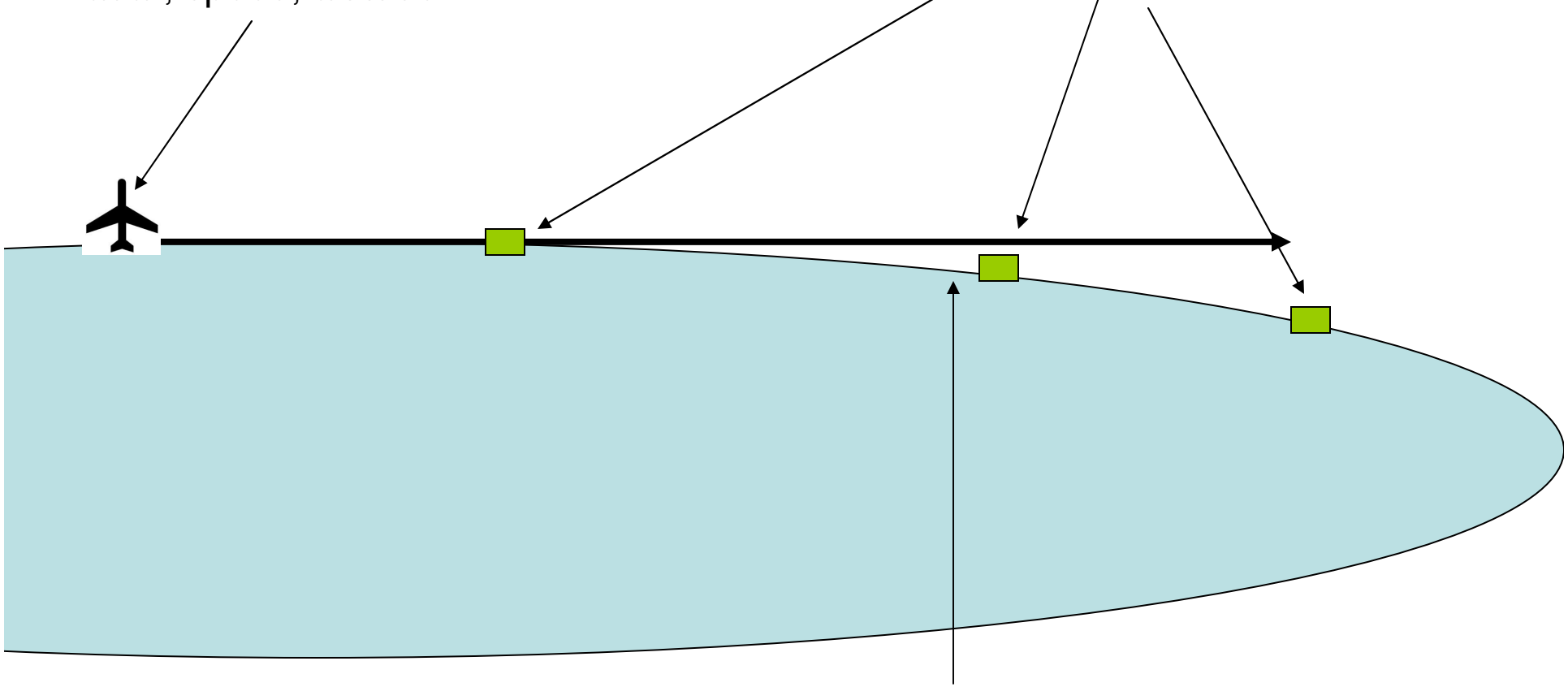
Today, this is Lesson 1 and an introduction to airborne search radar. Our plans are to share with you lessons 2 through 6 at a later date.

Reference:

2012 June 01, Electronic Warfare and Radar Systems Engineering Handbook, Report Number NAWCWD TP 8347, sponsored by the NAVAIR Director of Electronic Warfare / Combat Systems, approved for public release, 398 pages.

US made Lockheed Martin Orion P-3 with Israeli made Elta radar, speed, altitude

RCS: Radar Cross Section of the Nina – **size matters** and materials matter (wood not metal)



Range: Curvature of the Earth and flight altitude- radar is **line of sight**

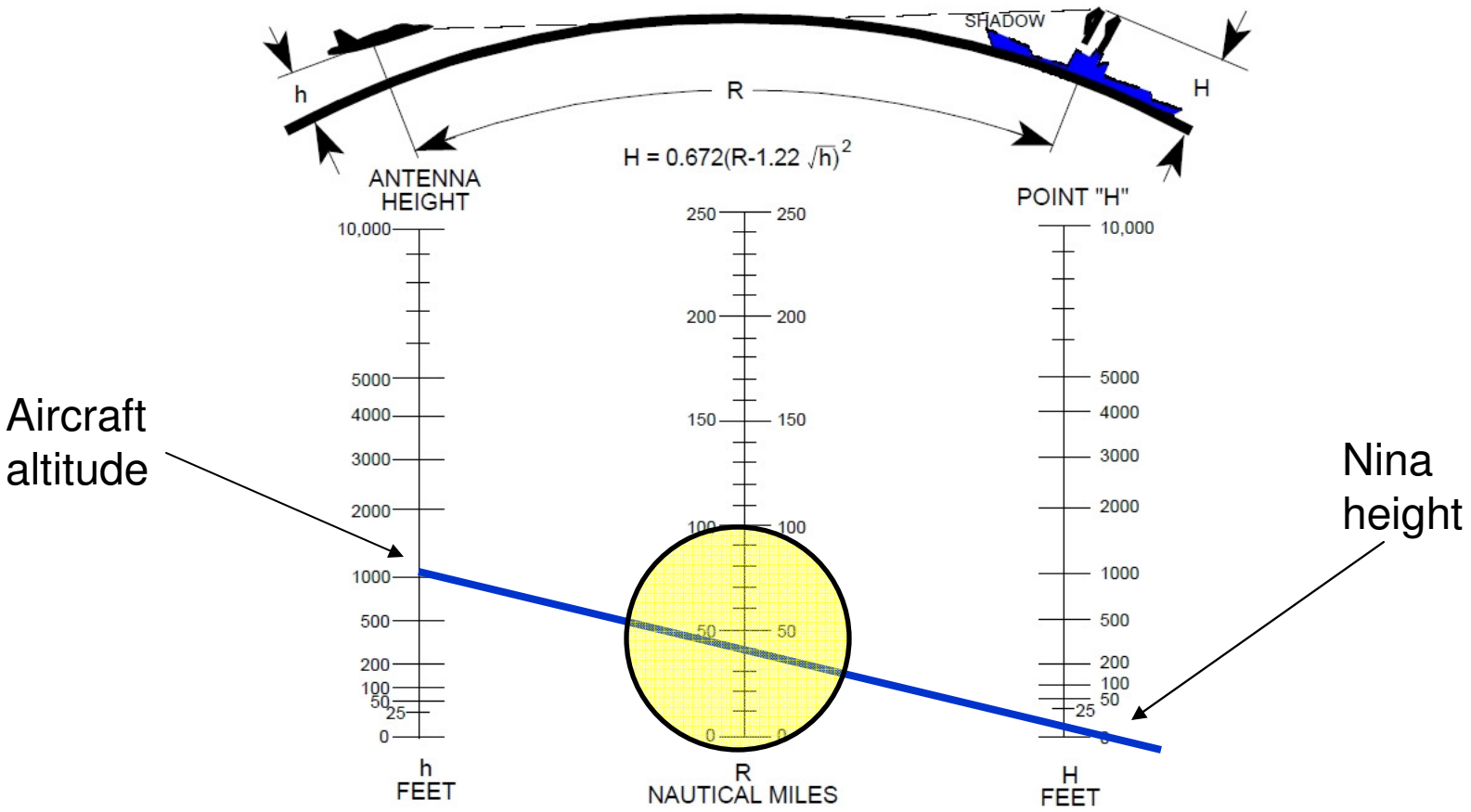


Figure 2. Earth Curvature Nomograph

Theoretical Maximum for a ‘not so small’ metal target - - -

Targets	**RCS** [m^2]	**RCS** [dB]
bird	0.01	-20
man	1	0
cabin cruiser	**10**	**10**
automobile	100	20
truck	200	23
corner reflector	20379	43.1

Table 2: RCS for Point-Like Targets

RCS: Radar Cross Section: detectability