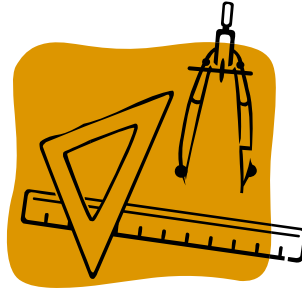




Charts and Great Circle Navigation Module 1f

Chart Scale



We will be dealing largely with Lambert charts and how any development method distorts scale.

Scale is $\frac{\text{Earth Distance}}{\text{Chart distance}}$

Example: Earth distance of 10 nm is represented on the chart by 1.0 nm. Chart scale then is 10:1. Ten on the earth vs one on the chart.

Scales vary according to how much of the earth you are trying to fit on a fixed size piece of paper. If you try and fit in a large earth area, little detail can be shown. This is called a “Small scale chart” (e.g. WAC, 1: 1, 000,000). Refer to Fig 39.



Small scale = Small detail.

Large scale = Large detail.

If you try and fit in a small area into the same sized piece of paper, you will produce a “Large scale chart”, such as a TAC, or VTC chart. (1:250, 000). Refer fig 40 below.



Fig 39. Small scale chart 1:5, 000, 000.

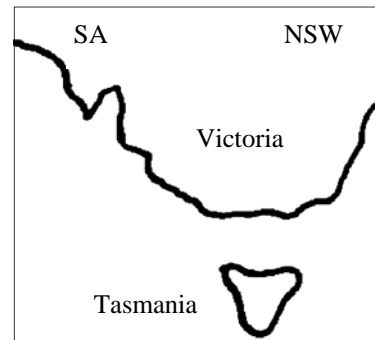


Fig 40. Larger scale chart 1:2, 000, 000.



EXAM TYPE SCALE QUESTIONS

Often in ATPL exams, the question will mix imperial measure (nautical miles) and metric measure (metres or centimetres), and ask you to calculate the scale. You must remember that there are 1,852 m in a nm, and 1000 m in a kilometre, and 100 cm in a metre. Your navigation computer has these graduations/conversions on it also.

Example 1. One cm on a particular chart represents 30 nm. What is the scale ?

Working:

Step 1. Convert 30 nm to metres. There are 1,852 m in 1 nm, so in 30 nm there is 55,560 m (ie: $1,852 \text{ m} \times 30$).

Step 2. There are 100 cm in a metre, so in 55,560 metres there will be 5,556,000 cm.

Step 3. The scale then is 1:5,556,000. (i.e. 1 cm on the chart represents 5,556,000 cm on the real earth).

Example 2. One cm on a particular chart represents 40 nm. What is the scale ?

Working:

Step 1. Convert 40 nm to metres. There are 1,852 m in 1 nm, so there is 74,080 m in 40 nm (i.e. $1,852 \text{ m} \times 40$).

Step 2. There are 100 cm in a metre, so in 74,080 metres there will be 7,408,000 cm.

Step 3. The scale then is 1:7,408,000. (i.e. 1 cm on the chart represents 7,408,000 cm on the real earth).



Now attempt corresponding chart assignment.