1 Introduction

"Does anyone know how the radar works?"

Radar has become much more accessible for small craft in recent years. This is chiefly because the display has become smaller and flatter, and far easier to install on a small yacht or motor boat. The same technological advances have also meant that it consumes less power (a major consideration in sailing boats), and can be usefully integrated with other devices, such as GPS and chart plotters (it can even be built into the same display). It's also quite a bit cheaper than it was (and anyway, people seem to have more money to spend on electronic gadgets!).

Radar really does have an element of magic about it. This is because it can 'see' things that cannot be seen by eye – in conditions when very little, or nothing, *can* be seen by eye – and determine a few very useful things about them, such as their exact distance and direction from the boat. On the other hand, what it tells you has limitations; and it is important to understand those limitations – and the reasons behind them – in order to use radar effectively. And with a radar system (no less than with other devices such as chart plotters), you need to know how to control the equipment in order to get a useable picture. Only a bit of learning can enable you to do this.

Most people sense this as soon as they look at a radar display. With a chart plotter, the designers have made it as obvious as possible for the user (or casual viewer) to interpret what is displayed to them on the screen, and in any case it is pretty easy to interpret as long as you have seen a chart or map before. With radar, you get a picture, sure – but it is rather different to any picture that you normally have to deal with. Although you can generally see what is going on, it is basically a slightly confusing pattern of blobs. Most people would definitely think 'I need to understand what is going on here', and it is for them that this book is written.

The recent technological advances have mainly been in the part of the device which processes and displays the picture. This has benefited hugely from modern microprocessing, which enables you to do almost anything with the picture that the radar detects: move it, turn it around, zoom in to areas of interest, etc. The basic technology for getting the picture, however, has not really changed very much; and it is this underlying process that you need to understand – a bit – in order to understand the picture you are getting. At the same time, I do appreciate that, generally, people reading this book will prefer to go boating than to spend ages learning about the finer points of microwave physics (or, indeed, staring at a radar screen).

So in this book I try to take a fairly direct approach to the task of getting you into a position where you can use radar. First, I explain what radar is and how it works (which isn't very different from when it was invented in its current form in the early 1940s). Then, in Chapter 3, I explain how to operate the machine and controls to get a good picture. At this stage I deliberately ignore the more advanced and exciting functionality of modern radar, because I want to get you to a point where you can use it as quickly as possible.

Having got a picture, what do you use it for? Well, Chapters 4 and 5 tackle the practical approach to two things that the radar can help you with: collision avoidance (Chapter 4), and navigation and pilotage (Chapter 5). This, of course, is the exciting bit. Radar can give you a lot more confidence, particularly when the visibility is poor or things are confusing at night. Radar is particularly useful for less experienced mariners who might want to confirm or quantify something, for example about a ship that they can just see in the distance. Radar can tell you how big it is, and how far away.

I return to the physics in Chapter 6, and explain some of the confusion and anomalies that you can get with the picture. These are pretty much commonsense once you know about them – what happens when the radar signal is reflected twice, etc – but they are the sort of effects that you are going to get occasionally, and need to be confident in interpreting.

Chapter 7 considers some of the more advanced functions that modern radars provide, and when they might be useful. What this book can't do, of course, is explain the controls and user interface of any particular radar system, because they are all different. But after reading this chapter you will know what you are looking for when you start reading the *Owner's Handbook* for your own radar.

Chapter 8 is a very brief 'how to' guide for choosing and installing a radar system – principally what to look for in the performance and features of different makes and models, and the issues that need to be considered for installation.

A glossary/index, and further references are also included.

I hope that you will get a great deal of satisfaction in overcoming the initial challenges of using radar, and in building up a new and very useful skill. To begin with, you will not have anywhere near the skills and abilities of a trained radar operator, and you won't want to rely on this device excessively (it would be mad to go out in thick fog just to see how you get on!). After a while, you will probably find that this is a very useful device for backing up other observations; and if you use it regularly you will:

- become familiar with the control interface on your own radar; and
- be able to place more confidence in your radar observations for collision avoidance and pilotage.

Also, you will learn more about what radar can do, and what its limitations are. This is a very useful lesson in itself, because most of the large ships we encounter use radar a great deal for detecting and avoiding small craft like our own. Learning what is involved, and seeing how well our own radar performs in different conditions, is an important lesson. At the very least, it will probably make you go out and buy a better radar reflector for your own boat!

Good luck and good boating!