year, that the spring equinox coincides with gales, that the summer gales come mostly from the east, the autumnal ones from the west and the winter ones from the south or westerly quadrants.

I don't know any yachtsman in the Med who has a copy of the Coptic Chart who does not pay attention to what it says. It's circulating hand-to-hand as people meet. It's not accurate to a day or even, on occasions, at all, but it is quite certain that if the weather seems dubious at or about the time when a Coptic gale can be expected, the chances are strongly that a gale will come. And, of course, it must be interpreted in the light of distance and direction from Alexandria and other local conditions.

I should be most interested in the comments of other yachtsmen, and in particular what conclusions they come to, if anyone studies their local gale pattern. To encourage researchers, here's the Coptic Chart in full. I apologise if I infringe someone's copyright: I just don't know how to find out whose! After all, it was 2,000 years ago!

Up the pole

with John Campbell

NECESSITY, THEY SAY, is the mother of invention. I had intended to get an emergency aerial ready for the VHF radio, just in case we ever lost the mast, but you know how it is.The job kept appearing on the work list, but never got crossed off . . .

Finally, necessity reared its ugly head, luckily though not in the form of the mast going over the side. Actually, it was the Sat Nav that broke down, (again!). I hear the cries already: what's the Sat Nav got to do with VHF aerials? Well, the answer is that a Sat Nav is really just a glorified, very, very, high-frequency radio with a nifty little computer built in. My problem was that all the diagnostic checks which the machine could perform indicated that everything within the black box was performing as it should. Yet, the wretched thing wouldn't pick up a single satellite. Perhaps the aerial was at fault?

We weren't relying on the Sat Nav at the time (we never do), in fact we weren't even using it. I just noticed it had stopped working. Living as we do in the eastern Caribbean, it's not easy finding people able to work on sophisticated equipment; usually, repairs have to be done on the US mainland. Before sending the black box back to America, I wanted to be sure it was nothing simple I could fix. It bothered me that all those diagnostic checks said that the beast was working.

The first thing I did was to make sure that the satellites themselves were running. It's not unknown for them to give problems, but, unfortunately, that was not the case this time — everybody elses Sat Navs were performing normally. So, if the satellites are running, the machine doesn't think it has a problem. Perhaps, then, the problem was with the aerial. Now was the time to make a spare one. I could use it to test the Sat Nav, then keep it as a ready-to-go spare for the VHF.

For it to operate efficiently, the aerial for any radio must be tuned, or matched, to the frequency on which it's trying to transmit or receive. The wavelength of a radio signal varies with its frequency. The higher the frequency, the shorter the wavelength. So the length of the aerial depends on the wavelength of the radio wave, and when the aerial matches the wavelength, it's said to 'resonate' at that frequency. All I had to do was to make an aerial which was resonant at the frequency on which the satellites transmit, which is 399.968MHz (which is shorthand for 399,968,000 cycles per second).

There are literally hundreds of types of radio aerials, but one aerial which is easy to make, and works quite well is a dipole. This is basically a piece of wire, half a wavelength long, with the feedline, which connects it to the radio, fastened to its centre.

In practice, because the radio waves don't travel as quickly in copper wire as they do in air, a copper wire dipole is just a little shorter than a half wavelength long. Fortunately, there's a simple formula for finding the length of a dipole for any frequency that we are likely to be concerned with. The formula says that the length of the dipole in feet is 462 divided by the frequency in MHz. So for the Sat Nav this becomes:

$$\frac{462}{399.968\text{MHz.}}$$

which works out o be 1.155 feet, or 1 foot 1.9 inches. So, to test the Sat Nav I made a dipole 1 foot 2 inches long.

On the VHF radio, the ship transmit frequencies vary from 156.275 to 157.425MHz. Channel 16 has a frequency of 156.8MHz which is more or less in the middle of the frequency range. If we apply the formula to make a dipole for channel 16 we get:

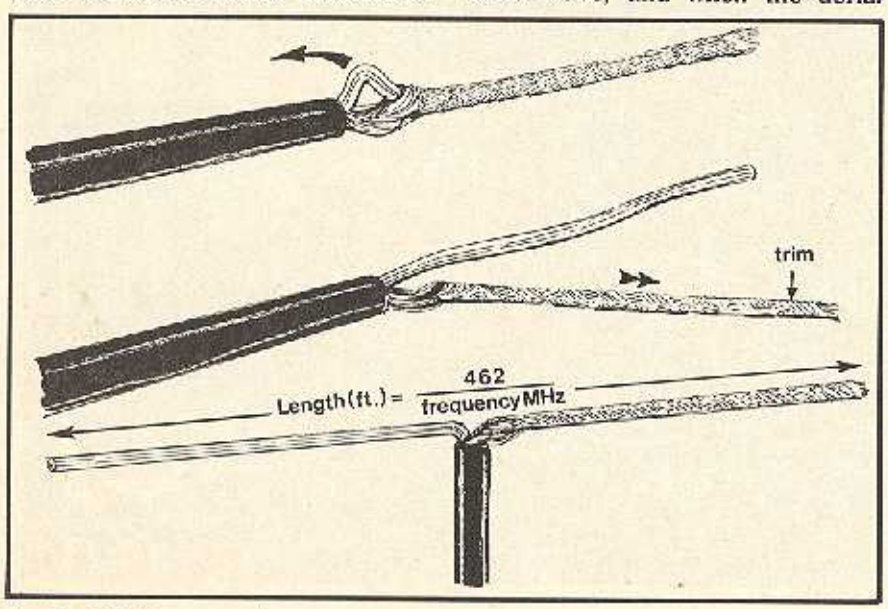
$$\frac{462}{156.8\text{MHz.}}$$

which works out to be 2.946 feet, or 2 feet 11.4 inches.

A convenient way to make a small dipole is to use a piece of the same type of coaxial cable used to feed the 'proper' aerial. In a dismasting there's likely to be enough cable left between the radio and the mast to make up a suitable dipole. However, if you wish to experiment, or make up an aerial ahead of time, then use what they call 50 ohm coax cable.

To make up the dipole, strip back the outer plastic insulation for a distance equal to half the length of the desired dipole. For the VHF aerial, this will be 18 inches, and seven inches for the Sat Nav.

Once the insulation is stripped off, the outer woven metallic braid, the shield will be exposed. By pushing



the shield back towards the insulation, the mesh will open up enough to allow the insulated centre conductor to be pulled out.

With the centre conductor pulled out, stretch the outer braid alongside the conductor. You will find the braid has stretched quite a bit, and it's now longer than the centre conductor. Trim off the excess, so the two are the same length.

Now separate the two wires, stretching them out to make a straight line. The rest of the coax cable should be led away from the dipole at right angles, making the whole thing look like a letter 'T'. All that remains is to check the measurement across the top of the aerial. The measurement from end to end should be the same as we calculated for the desired frequency. If it's too long, trim the ends as required. It's important, though, to keep the two sides of the dipole equal in length.

The aerial should be placed on a non-conductive surface, or suspended using nylon line. Just try to keep the top part a straight as possible, and the coax leaving the aerial at right-angles. If using the aerial to transmit a signal, then don't touch it while it's being used; you may get a shock. It's not necessary to strip the insulation off the centre conductor. The other end of the coax can now be plugged into the radio, and it should work!

Using this little dipole on the Sat Nav, we started getting good fixes at once. So all I have to do now is to find out what's wrong with the 'proper' aerial, but at least I don't have to trust the black blox to the not-so-tender mercies of the Post Office.

Once the Sat Nav was working I stripped off a little more insulation, pulled out some more of the centre conductor, and extended the dipole to 2 feet 11½ inches, and plugged it into the VHF radio. Since I was trying to be a bit scientific about the whole thing, I put a watt meter into the circuit and found that the radio would happily transmit at its full 25 watts. With the dipole just laying on the glassfibre deck, we succesfully talked to several vessels a couple of miles away. Remember, though, that with any aerial used on a VHF radio, the higher up the aerial is, the greater the range of the radio will be.

Such a dipole will work for any radio that one is likely to use on board, so it's perhaps worth remembering the formula, or maybe even calculating the length of the dipole required for each frequency used on each radio on board. These lengths could be noted, then should the need arise, you will be all set to make a new one.

Now, what's the problem with this Sat Nav aerial? Better go up the mast for a look . . .

Inland to Châteaulin

with Peter Phelan

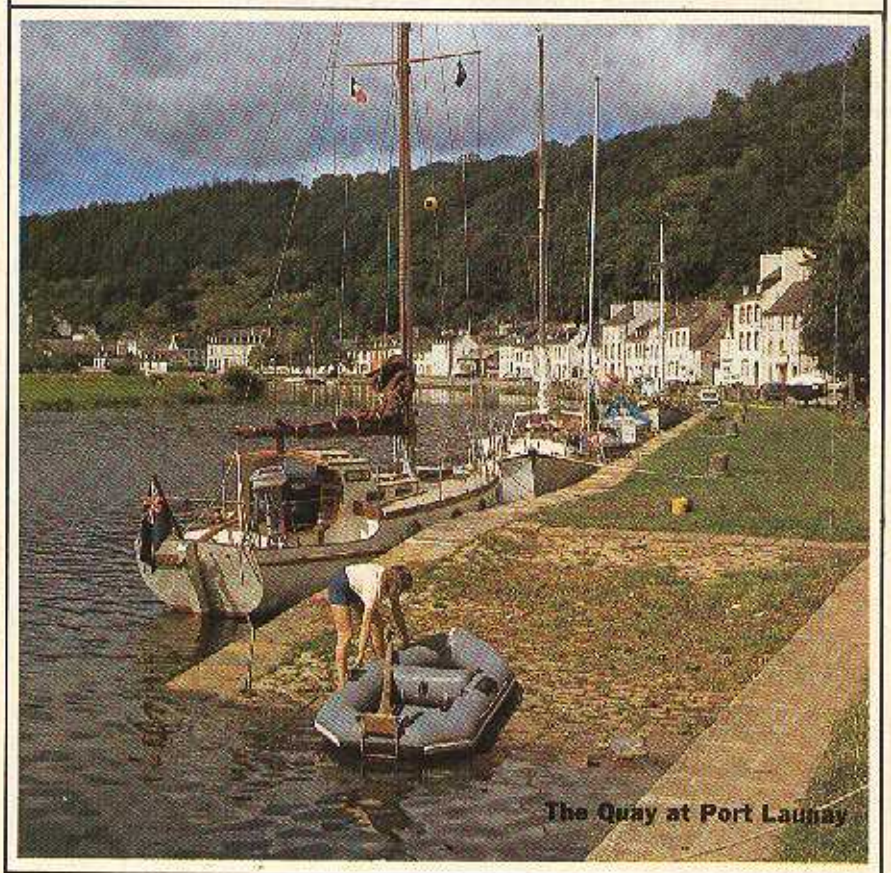
THE SOUTHERN coast of Brittany is a magnificent cruising ground. With its infinite variety of secluded anchorages, picturesque harbours and smart new marinas, there's something to suit all tastes. And despite the Bay of Biscay's reputation for gales, during the summer months especially, the weather is for the most part considerably better than that experienced nearer home.

For the British yachtsman, the chief difficulty lies in getting there and back in the course of a normal two or three weeks summer holiday, but this problem can be overcome to a large extent by working the boat westwards to say Falmouth a week or so beforehand, and then at the start of the holiday proper, making the passage direct from there to the Chenal du Four. Reversing the procedure at the end of the trip is worth considering too, for with so much to see, the temptation to linger is great!

The NW coast of France can be a distinctly nasty landfall in bad weather or visibility and the crossing should not be undertaken lightly. Nevertheless, with a fair wind and perhaps a little motorsailing if conditions are light, the one hundred mile or so crossing can usually be accomplished in less than 24hrs. And if due attention is paid to the general weather pattern in addition to the actual shipping forecast, the yacht is unlikely to be overtaken by completely unforeseen weather conditions. In this respect, although you will officially be in sea area Plymouth throughout the passage, in practice, being this far west, I have found that the forecast for Sole and Lundy often gives a better indication of what to expect.

Having reached the Chenal du Four, most yachts tend to make for Camaret before continuing southwards. Certainly if you are bound that way in a hurry this is a sensible choice since you will be conveniently placed to time your passage through the notorious Raz de Sein. Lying only a few miles to the east however, and in itself a fascinating cruising ground, the Rade de Brest has much to offer the visiting yachtsman so it's well worth making the detour; indeed with only limited time, there's much to be said for restricting yourself to this area almost entirely.

On occasions it can become quite rough in the Goulet de Brest, particularly with a strong wind against the spring ebb, so it pays to



The Quay at Port Launay