



Marine Engineering and Electronics

On Board IT

Contents

Introduction.....	2
What devices do we want to use.....	2
Marina Wifi.....	2
3G and 4G.....	3
Figure 1 Wi-Fi Network Diagram.....	4
Offshore IT.....	4
Radio Communications.....	4
Figure 2 SSB Comms and Pactor Modem.....	5
Satellite Communications.....	5
Figure 3 On Board IT Network Diagram.....	6

On Board IT

Introduction

What do we expect from our On Board IT while we are at sea. If we are expecting our iphone to be wi-fi'ed to a broadband internet with the same speed as we have at home, or it is something akin to the American Air Force 1. I feel some disappointment about to happen.

In a marina with Wi-Fi, we can do something to improve the performance by enhancing our reception with an Wi-Fi antenna outside the boat and with some elevation, a good signal strength will give a good speed.

Away from the marina, on costal passages, there is the possibility of being able to connect to a 3G or 4G network. we need to remember that these are land based systems. The antennas used in these systems forming cells are configured to cover the land, and resources are not wasted pointing out to sea. The range offshore will be very limited, the sales man I'm sure will quote figures and examples of people achieving a good signal way offshore. Take these claims with a pinch of salt as they say, and remember 3G and 4G is a land based system, and you are at sea.

Satellite systems are the only way to get IT when on blue water crossings. Don't be fooled by the name "fleet broadband" it is not at the speed of your home broadband, and the call rates (either air time or download data rates) is high.

I hope this hasn't put you off, we can still use the internet/email, but like water on an ocean crossing we have to be a little careful.

What devices do we want to use

Are we going to be using a Ships PC, Laptop, or iphone/pad type device. the type of device will determine how we will be connected to the outside world. With a fixed PC, or Laptop we can used a physical connection. a LAN connection (RJ45). If using iphone/ipad we will need to connect with Wi-Fi, the boat becoming a Wi-Fi hotspot.

Marina Wifi

This is probable the easiest to provide a solution, and get a good connection (speed). Our laptop, Iphone etc all have Wi-Fi, and are capable of connecting to the marinas Wifi without any other device. However we are often using these devices below deck, if we think about where we are physically, we are at the water line, with the route for the Wifi signal to get to

On Board IT

the device having to go through a lot of fiberglass and other boats. With poor signal strength we get slow speed.

We need to get an antenna outside, with a little height in it. This will clear it of all the boats around us, and bring it above the water line. There is a compromise here the higher the antenna the longer the lead from the antenna to the receiver, which can introduce a loss in the signal. If we are not careful any gain with height is lost with cable run.

If we have a fixed PC, or we plan to connect our device with a LAN cable, we just need a simple and cheap device to bring the Wi-Fi onboard. The connection could be either USB or LAN, most of the cheap and simple devices are USB, as they are in effect a Wireless adaptor card just like the one in the PC.

If we need to have a Wifi connection to our device, we will need an addition to the system to make the Wifi hotspot on the boat.

3G and 4G

With this we have a similar problem to getting marina Wi-Fi. our Iphone/ipad or PC with a dongle is below deck and close to the water line. We need to get an antenna outside the boat, and bring in the signal.

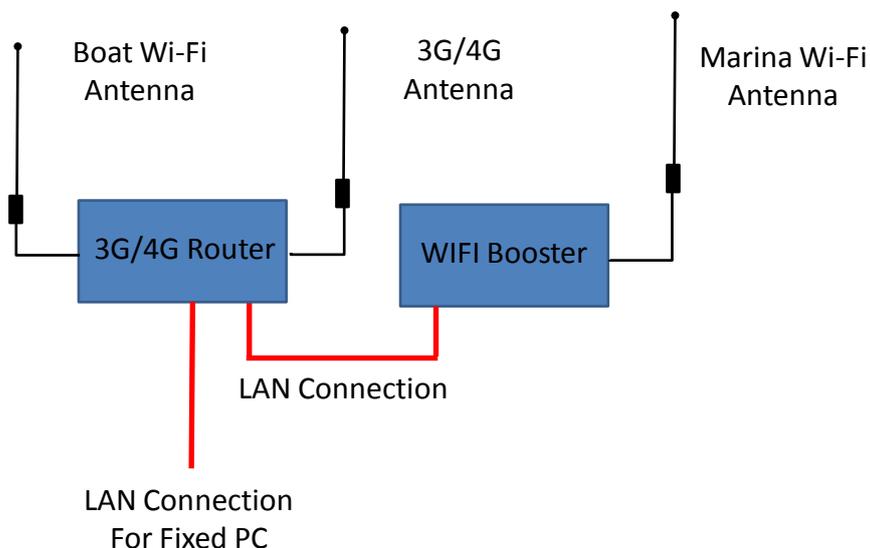
The solution is in the form of a 3G/4G router, this is the same sort of device you have for your home broadband internet 3G/4G dongle 3G/4G router are in fact the same thing, the router is just a bigger box.

The router will probably have a LAN connection and its own Wifi connection. So it can be used with the fixed PC or the Iphone/ipad. It is going to get a little confusing now with so many Wi-Fi's

Marina Wi-Fi = the Wi-Fi from the marina and connected through a Wi-Fi booster antenna
Router Wi-Fi = the Wi-Fi connecting your device to the 3G/4G router.

The Marina Wi-Fi can be connected to the 3G/4G router if it has LAN capability. your device connects to the 3G/4G network and the Marina Wi-Fi using the Router Wi-Fi link.

On Board IT



31/05/2014

www.northwalessailing.co.uk

For Illustration purposes only

Figure 1 Wi-Fi Network Diagram

Offshore IT

First we need to understand that offshore IT is limited, web searching is possible, but we should consider offshore IT as email only. Surely we are in the middle of the Atlantic to get away from things.

If we think now in terms of emails only, we have two solutions. Satellite communications, Radio communications.

Radio Communications.

Lets start with what it is called, as it can be referred to in a number of ways. Long Range Comms, HF (High Frequency), MF (Medium Frequency), SSB (Single Side Band), they all talk about the same box. You could talk to someone on the other side of the world with this equipment, as long as you are on the same frequency (channel).

Its main function is for speech transmissions, and has DSC capability. With the addition of a Packtor Modem, it can now send data. Which equates to emails. The data rate is very slow, and the way the signal has to travel, can be time of day dependant.



Figure 2 SSB Comms and Pactor Modem

Satellite Communications.

There are 4 satellite communication systems available, but only 2 of them are appropriate for Blue water cruising. Iridium, and Inmarsat. Inmarsat is part of the GMDSS system, so has a role for emergencies, and weather information. Both have the ability to send and receive data, along with speech, and operate very much like your mobile phone.

Inmarsat is generally a fixed boat system, although recently you can now get a Inmarsat handset. While Iridium is a handset only system. Both can be connected to a PC for emails.

There is a big price difference in and Inmarsat set up and an Iridium set up of about £4000, Inmarsat costing the most. Although call packages on Inmarsat are cheaper than Iridium.

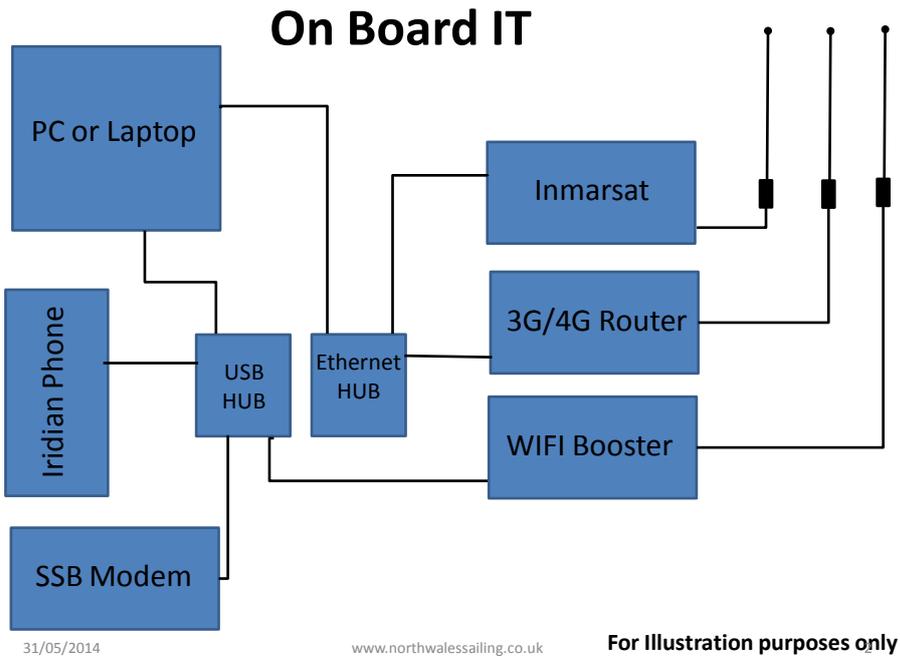


Figure 3 On Board IT Network Diagram