Skipper's Mate Manual

Software Version	0.9.1.3	4 Aug 2016
Documentation Version	0.9.0.8	21 Aug 2016

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Section 1 - All About The System

Documentation

Firstly, the documentation. The help has been written as the system has developed and we trust that it will be present for all features. However the manual in this form is newly-produced and so we plan to complete or enhance various sections/chapters at a later date. This version is intended to get you all going but may not be as complete as we would wish.

This User Manual is intended to cover all versions of Skipper's Mate. Those wishing to use the Open Source versions (either as sources or a downloadable ISO) should also refer to the Getting Going manual which is also available from the Downloads Page on the web site.

We believe this documentation to be correct to the best of our knowledge – E&OE.

Penny 21 August 2016

What the Skipper's Mate System Comprises

The Skipper's Mate System is comprised of 2 parts :

- the Boat Server (essential)
- the Central Server (optional)

If you only use Skipper's Mate for entertainment and use of the Internet when you're on board then you don't need to use the Central Server. But, if you want to use any of the Security Features (cameras, alerts from motion, alerts from sensors) or to see or be notified about what's happening on your boat remotely (e.g. monitoring sensors such as voltage and humidity) then you need access to a Central Server.

You can use the Skipper's Mate Central Server. After the initial trial period a small fee may be charged for this. Or you can use the Open Source code to set up your own Central Server to provide the same services – see the Open Source download from the web site http://www.skippersmate.co.uk.

Hardware

The Skipper's Mate System on the boat consists of one essential part and two optional extras :

- the Boat Server (essential) – we recommend a Raspberry Pi Model B
- any Relay Servers – almost any Raspberry Pi will suffice
- any Sensor Servers – we recommend the Arduino Uno

Chapter 1. Features & Versions

The **Skipper's Mate Boat Communications Kit** is required for all Skipper's Mate functions. Additional kits/features can then be added according to your requirements.

The **Communications Kit** provides you with :

- ◆ a fully-featured, powerful desktop computer running a mature operating system – capable of running almost anything a standard desktop can run, including office applications, web streaming and marine applications

- ◆ hardware particularly suitable for marine applications with very low power consumption – typically less than 0.5 amps per hour at 12 volts

- ◆ a system which will run from 12V (or 24V) power via a step-down

- ◆ a system accessible either by tablet/smart phone/laptop wirelessly (through a web browser and/or virtual network server)

- ◆ able to act as a local Wi-Fi hotspot providing web access from multiple devices (e.g. tablet, laptop) from your boat – includes WPA passphrase protection

- ◆ multi-user simultaneous access e.g. chart table, cockpit and even the skipper's berth

- ◆ accessible via browser (industry-compliant) on tablet, smart phone, laptop, desktop

- ◆ secure login to allow access for you and those you authorise (e.g. family, agent, marina) - includes WPA passphrase protection

- ◆ outside world connections supported – external Wi-Fi (e.g. marina, yacht club, public Wi-Fi) and mobile broadband dongle

Skipper's Mate Entertainment Kit - optional

The **Entertainment Kit** provides you with **:**

- ◆ live FreeView TV and radio – without the costs of streaming via the Internet

- ◆ provides access to stored media – video, music, pictures – using either a memory stick/flash drive or a solid state drive (SDD)

- ◆ provides each user with a choice of media or live streaming (within the constraints of a single FreeView dongle) so you don't have to watch CBeebies if they do !

Skipper's Mate Security Kit - optional

You can also obtain security, geo-fencing, cameras, sensors and relays with the **Skipper's Mate Boat Security Edition** and the **Sensor** and **Relay** Modules :

- ◆ Security system which runs off 12V, 24V or mains power

- ◆ Accessible from anywhere where you have Internet access

- ◆ GPS tracking of boat movement & positions

- ◆ Motion detection allowing you to check for intruders

- ◆ Camera views/footage of what's happening on board

- ◆ USB and/or IP cameras

- ◆ Remote access to the boat when you're not on board

- ◆ Outside connections supported – Wi-Fi (e.g. marina) and mobile broadband dongle

- ◆ Alerts via email (and optionally SMS messages) to indicate that something untoward may be occurring

- ◆ Alerts to up to 5 contacts, specified by you

- ◆ Real-time GPS updates (within reach of a 3G/4G signal) to track your boat or your passage – position, speed, heading

- ◆ Plotting on Google Maps or Google Satellite Maps to see where your boat currently is and where she's been

- ◆ Ability to store snapshots and video (optional) for up to 12 months – useful evidence if your boat is broken into or stolen

- ◆ Reports by email/PDF – coming shortly

- ◆ All configuration via easy-to-use screens

Skipper's Mate Sensor Kits - optional – requires **Security Kit**

- ◆ Alerts from boat sensors (e.g. voltage, PIR, doors/hatches etc.) via email and/or SMS – to up to 5 email addresses and 5 mobile numbers

- ◆ Graphs of data (current and historic) from analogue sensors e.g. voltage, temperature, humidity, dew point – visible via the Central Server

- ◆ All configuration via easy-to-use screens

Skipper's Mate Relay Kits - optional – requires **Security Kit**

- ◆ Remote control of on-board devices via relays e.g. switch on your heating and refrigerator while you're still on the motorway … arrive at your cosy boat to find a cold beer waiting – all via an Internet-enabled browser (e.g. phone, tablet, laptop)

- ◆ All configuration via easy-to-use screens

Skipper's Mate is free Open Source software licensed under the GNU GPL (General Public License). You can download the software as sources ready for compilation, or as an ISO ready to burn. You can then supply and configure your own hardware.

Alternatively Skipper's Mate offers kits which include all hardware (excluding mobile broadband SIM) and pre-configured software – ready to go. No soldering required !

Chapter 2. Getting Started

You may already have been through the initial steps here but we list them for completeness.

Step 1 - Optional - Buy a Skipper's Mate Kit from the http://www.skippersmate.co.uk – alternatively you can download the free Open Source software as soon as you've registered your email address.

Step 2 - Register your details at the Skipper's Mate web site Follow the steps to confirm the registration and keep the email with the User Name and Password you chose.

Step 3 - Plug together and power up Skipper's Mate (details available with the packaging or the **Getting Going** document.

Step 4 – Connect wirelessly to the Skipper's Mate Wi-Fi Hotspot - use a laptop/tablet/phone/desktop to connect wirelessly to the Skippers Mate Wi-Fi Hotspot. Browse to http://192.168.51.254 ; login with the temporary User Id **Skipper** and Password **Mate**

Step 5 -Setup a broadband connection (or two) :

Note that you should only have one of the two broadband connections live at any one time - **Control / Control Panel** switches will switch these on/off.

◆   **External Wi-Fi Connection** - you can test this easily at home by attaching to your Home Wi-Fi router or whatever you use for wireless distribution around the house - emulating the use of a yacht club, marina or other Wi-Fi. From the menus select **Broadband / Connect to Wireless Signal.** Highlight the Wireless Access Point you want to connect, enter the WPA Passphrase and hit the Connect button. You should receive a message saying you have connected and showing the IP address the Skipper's Mate Boat Server has been given by the external Wireless Access Point.

◆   **3G/4G Broadband Connection** - select **Broadband / 3G/4G Settings** from the menu. If this is the first time you have used this you will need to enter the User Name and Password supplied with your mobile broadband SIM. Now visit **Control / Control Panel** and use the **3G/4G switch** to enable mobile broadband.

 Checking Your Broadband Connection - if you want to be sure that you have a connection to the outside world, select **Control / Check Broadband Connection** and hit the OK button. You should see a message "Connection O.K. Your IP address: ". If there is no connection the message should warn you of this.

Step 6 - Synchronise Your Registered Details - in order to update your Skipper's Mate system with the details you entered on the web site when you registered, select **Control / Synchronise**. Enter the User Name and Password you used when registering - and which will have been sent to you via email. Hit the OK button and you should receive a message indicating that the details have been transferred to the Boat Server.

Step 7 – Log out as the temporary user and Login as You - Yes - the last step ! Logout (by using the back arrow twice or closing the browser tab – according to the type of device you are using). Log in again to Skipper's Mate (http://192.168.51.254) with **your own User Name and Password -** as entered in Step 6. The system should now be ready to use.

Note that the ~~Synchronise~~ option will be struck through - this is a one-time use option. If you see other options struck through this means that they are not available in the Kit you have. Open Source users should have all options available but obviously you need to provide the requisite hardware. For details on this please refer to the Skipper's Mate web site for details.

Boat Server Ready for Use

Having completed these steps, your Boat Server is ready for use. You should now be able to access all menu options which match the attached hardware.

Central Server Login Ready for Use

You should also be able to use the Central Server options to Visit Your Boat and, if you have the appropriate sensors, to view voltage graphs etc. by visiting the web site and using the Login button. Login using the details entered during the Registration process – see Step 2 above and the email you should have received.

Section 2 - Communications Kit

As with all aspects of the Skipper's Mate system, you are free to use the Open Source software and source your own hardware. There is separate detailed documentation available from the website as a downloadable PDF to assist.

This document assumes that you have available either a kit obtained from Skipper's Mate or the same equipment configured using that PDF.

A Skipper's Mate Communications Kit comprises :

- a low-consumption Boat Server

- On-Board Comms - a Wi-Fi Hotspot to share facilities amongst devices/users on board via wireless-enabled

- External Internet Access via a 3G/4G Mobile Broadband dongle – unlocked (but to which you will need to add a SIM) to utilise Mobile Broadband backhaul

    or

- via a wireless receiver (with removable antenna) to use locally-available Wi-Fi backhaul

Straight from the Package – What To Do Next

Your Skipper's Mate Boat Server will require a single power source – either 12V or 24V. The external interface to the Skipper's Mate Kit is a 5V step-down which we send out with trailing wires for you to make your connection.

If you have ONLY the Boat Server / Communications Kit there will be 2 USB extension cables to which the Mobile Broadband Dongle and the external Wireless dongle will be attached.

IMPORTANT NOTE ! Skipper's Mate is a low-consumption system and is therefore limited in the number of peripherals which can be powered from the Boat Server itself. If you want more peripherals you may need a powered hub – see the Skipper's Mate web site for more details. This hub can also be powered from the same step-down using the USB A-B cable (supplied with the hub) so you still only need the single power source.

Once you have provided power and booted the Skipper's Mate Boat Server you should be able to proceed to **Chapter 4** – to use the Boat Wi-Fi Hotspot, to access the Internet (see subsequent chapters on Mobile Broadband and external Wireless) and the features of Skipper's Mate.

Chapter 3. Features of the Communications Kit

The Communications Kit is fundamental to all the other features available with Skipper's Mate. It offers 2 main features :

- On-Board Comms - your own Boat Wi-Fi Hotspot which allows you to attach to the Skipper's Mate Boat Server and all its features – including sharing an Internet connection among wireless-enabled devices used by you and your crew or family

- Choice of Internet Backhaul - the ability to connect to either Mobile Broadband (3G/4G) or external Wireless/Wi-Fi as the backhaul to your Skipper's Mate Boat Hotspot – so that all users can use the Internet simultaneously

- Switch Backhaul at the flick of a switch – via the Control Panel – between Mobile Broadband and external Wireless sources

Skipper's Mate is a low-consumption system where the Boat Server is intended to consume less than 10 amp hours per 24 hour period (obviously this depends on the number of peripherals you choose to add). It derives its power from either a 12V or 24V system.

Features Which Can Be Added to Your Communications Kit

In order to use any of the other Skipper's Mate Kits and features you will first need a Communications Kit.

You can add any or all of the following :

- **Entertainment** – share FreeView Live TV/Media and/or stored video, music and photos – *without using your Internet allowance*

- **Security** – geo-fencing, cameras, alerts and remote access to the boat via the Internet from anywhere world-wide using your Skipper's Mate Internet connection

- **Sensors** – to view and monitor critical system data using Bluetooth Sensor Server(s) with a wide range of analogue and make-or-break sensors – includes viewing via sensor panel, alerts and graphing of trends – available locally and remotely via the Internet using your Skipper's Mate Internet connection

- **Relays** – via Wireless Relay Server(s) to control your on-board systems remotely using your Skipper's Mate Internet connection

Chapter 4. Getting Started with the Communications Kit

Your Boat Wi-Fi Hotspot – Changing the Identifier and Password

When you first boot your Skipper's Mate Boat Server your Wi-Fi Hotspot will be available with its default configuration.

Step 1 – Use a wireless-enabled personal device (tablet, laptop, smartphone) to connect to the HotSpot SSID **SkippersMate** (mixed case) – the default password is **skippersmate** (all lower case).

Step 2 – Optional – We recommend that you change the password to a strong password. You may change the name of the HotSpot Identifier (SSID) to one of your own choice. Use the menu option **Settings / Hotspot Configuration**.

Note 1 - that you cannot turn off the Boat Wi-Fi Hotspot (as this would mean losing all connection to the Boat Server) – other than by de-powering which you would not wish to do if you are using remote connectivity for security, alerts etc. The password will normally only need to be typed once on a device so why not make it a strong mixture of upper and lower case and numbers to secure your backhaul ? **PLEASE ENSURE THAT YOU MAKE A NOTE OF THIS – IF YOU FORGET IT YOU WILL BE UNABLE TO COMMUNICATE WITH YOUR SKIPPER'S MATE SYSTEM**

Note 2 – a WPA2 passphrase must be a minimum of 8 characters/numbers.

Use the OK button to save the hotspot and then reconnect your personal device to the new Hotspot Identifier wireless signal.

What You Can Do with the Boat Wi-Fi Hotspot

Connecting a device wirelessly to the Boat Wi-Fi Hotspot is central to any use of the Skipper's Mate features. Whether you want to :

- browse the Internet or use email

- stream TV without using the Internet (see **Section 3 – Entertainment Kit**)

- access any of the Skipper's Mate Boat menu options

- access the Skipper's Mate web site

you will need to be connected to the Boat Wi-Fi Hotspot via wireless

Chapter 5. Mobile Broadband – 3G / 4G

Using Mobile Broadband or external Wi-Fi Backhaul

You can connect to the Internet from your Boat Server with **EITHER** Mobile Broadband **OR** external Wi-Fi backhaul at any one time. You cannot have both active simultaneously.

Switching Between Sources

Once configured, you can switch between the two Internet sources by using the switches on the **Control Panel** (see the Control Menu on the Boat Server). Using the Control Panel to switch on one source will cause the other to be toggled off automatically.

Choosing Backhaul to Suit Your Location

To the end user on the boat using a personal device (e.g. tablet, laptop, smartphone) to access the Internet via the Boat Server, this should be seamless. Obviously it depends on what signal is available to you in any given location. You might, for example, if you are in your home berth wish to use the marina Wi-Fi if it is already included in your berthing package. Then when you cruise elsewhere you may want to use Mobile Broadband (3G/4G).

Which Mobile Broadband Supplier Should I Use ?

This has to be up to you, based on the supply of Mobile Broadband in the areas where you cruise. Skipper's Mate doesn't care what you use. The dongle supplied with the Communications Kit is unlocked so you can use any SIM you choose – and, of course, any subscription or Pay As U Go plan which suits you. Nor is there any reason why you cannot change the SIM to use a different ISP according to location and sources available. If you do change SIM you will need to use the **Broadband / 3G / 4G Settings** option to change the User Name and Password to those provide by the "new" ISP.

Getting Started with Mobile Broadband

Step 1 – Use the **Broadband / 3G / 4G Settings.** Most of the information is ONLY REQUIRED IF YOU PROVIDE YOUR OWN DONGLE, rather than the one in the Communications Kit.

You WILL need to enter the User Name and Password provided by your SIM supplier.

Step 2 – Make sure that you switch on the 3G/4G switch on the **Control / Control Panel** menu option.

Step 3 – Assuming that your Boat Server Wi-Fi Hotspot is working (which is covered in the previous chapter), any user on the boat, once connected to the Boat Server Wi-Fi Hotspot, will be using the 3G/4G Internet connection.

Not sure if the Internet connection is working ?

Choose the menu option **Control / Check Broadband Connection**. Hitting the OK button should, if you are connected, show you the IP address in the Status Bar. If not, it will give you an error. The help gives more details on what to check if it is not working.

Chapter 6. External Wi-Fi Backhaul

Choosing an External Wireless Connection as Your Backhaul

Don't confuse this with your Boat Wi-Fi Hotspot. This refers purely to an external wireless or Wi-Fi service such as that provided by a marina, yacht club or commercial supplier.

You can use any available local Wi-Fi hotspot (whether it's one you have an account for or one where you need to pay for time). *See the Quick Tip further down about wireless connectivity outdoors and at a distance.*

Step 1 – Ensure through **Control / Control Panel** that **Wless** is switched on. (Note that activating the wireless backhaul will toggle off the 3G/4G connection)

Step 2 - Select the menu option **Broadband / Connect to Wireless Signal**

If you have recently connected to/used this external wireless signal then it may simply reconnect. If not, use this task to display available signals and connect. You may sometimes need to use the **Rescan** button to refresh the list if nothing is found or you can't see the signals you want to connect to.

(**Hit Rescan and still get "Nothing found" ?** - check that you have turned **Wless** on in the Control / Control Panel. You can have either **3G/4G** OR **Wireless** connected at any one time.)

This program allows you to view the available EXTERNAL Wi-Fi signals and select the one you wish to connect your Boat Server to - allowing your on-board users/devices to share that connection to the Internet.

Open Only ? - If you wish to connect to an open or unsecured connection - such as a public or marina hotspot - then you can select **Open Only ?** to filter out the secured connections. This can be particularly useful in a busy place where there may be rafts of private secured hotspots.

If you want to connect to a secured connection - such as yacht club Wi-Fi where you have been given the WPA Passphrase - then leave this field clear.

Wireless Access Points - The list of available access points should appear in the list box when you open the program. **Note** that on some mobile devices you may need to click/expand the dropdown list to see the signals. You can use the **Rescan** 🔍 button to refresh the list. It should give you the message in the Status Bar "Searching for APs please wait". It may take a while. Once the APs have been found they will be displayed in a listbox. Secured/password-protected hotspots will be shown in red, unsecured hotspots in green. When your list of signals is displayed, click on the hotspot name (SSID) of your choice. It should appear in the **Selected Access Point** and then click on the **Connect** button.

WPA Passphrase - If the hotspot you choose to connect to is WPA2 protected, you will be asked for the passphrase. If the external Wi-Fi uses an older insecure protocol you will need to connect elsewhere.

Once the SSID is selected, the program should show a message "Trying to connect". This may take some while so be patient. If successful, you should see the Status Message "Connected to 'SSID': IP 'nnn.nnn.nnn.nnn'". You should then be able to access the Internet. Of course, if you are connecting via a hotspot with a walled garden (e.g. a marina Wi-Fi hotspot) then you will need to enter the details they have provided in order to get to the web.

Quick Tip

Don't forget the old truism - no matter how large the megaphone the hotspot provider is using, if your own wireless device can't shout back then you can't hold a meaningful conversation. This means you may well find the connection is interrupted or fails entirely.

Re-siting your wireless receiver where it has good line of sight to the external wireless transmitter may help -

possibly by using a USB extension cable (note that typically 3 metres is the maximum for a standard USB extn.). In some circumstances a more powerful receiver be needed.

The wireless units supplied with the Skipper's Mate kit also make allowance for an external antenna.

Not sure if the Internet connection is working ?

Choose the menu option **Control / Check Broadband Connection**. Hitting the OK button should, if you are connected, show you the IP address in the Status Bar. If not, it will give you an error. The help gives more details on what to check if it is not working.

Section 3 - Entertainment Kit

Once you have completed the steps in **Chapter 2 – Getting Started** you should have access to the Skipper's Mate Boat Server and the services it offers from any wireless-enabled device on the boat. This offers you the following options :

- browse the Internet (using either the 3G/4G mobile broadband or the external wireless – whichever you have enabled on the boat server)

- stream Live TV or Radio via FreeView

- play/view stored media – video, music, pictures – on a pre-prepared memory stick/flash drive or solid-state drive (SSD)

Using the Internet requires no further steps once you have connected a device wirelessly to your Skipper's Mate Wi-Fi Hotspot.

Accessing live TV/radio or stored media needs some further setup – please consult the chapters below.

Chapter 7. Starting Live TV on the Boat Server

The Open Source TV streaming server TVHeadEnd will have been installed and configured as part of the **Skipper's Mate Entertainment Kit** will also have been installed as part of the Open Source ISO.

It is intended to allow you and your crew to watch FreeView TV and listen to FreeView radio using a DVB-T device. This should enable you to watch or listen to one (or more) channels without incurring the costs of Internet streaming over your phone or broadband dongle. A single movie in standard definition will be 1 to 2 Gb. In HD this can rise to 5Gb – assuming you have a dongle which supports HD – we do not issue one as standard with Skipper's Mate for this reason. Obviously this could be very expensive or unaffordable using Internet contracts. FreeView is, naturally :) free !

We cannot guarantee that FreeView coverage will be available where you moor or anchor your boat. Please consult the Internet to locate FreeView transmitters in the area and the coverage they offer. There are, however, free TV signals available world-wide (as you will see from the list of Pre-defined muxes from which you can pick for pre-configured connections – as well as those you choose to enter for less populous/popular places).

What is available

If FreeView is available, any device on board can be configured to use the **Skipper's Mate** Live TV service to view or listen to live programs – all using a single channel (e.g. BBC). More than one channel can be watched – providing they share a single transponder. For example, the BBCA mux will typically carry BBC1, BBC2, BBC4, CBBC, CBeebies, BBC News plus the BBC Radio services. So if you wished to see BBC1, your children wanted to watch CBeebies and your spouse wanted to listen to The Archers on Radio 4 you could do all these simultaneously.

If you wanted to watch BBC1 and your family wanted ITV then you could choose another mux (e.g. BBCB) which shows BBC1 HD and ITV HD amongst others.

What is not available

As you will find at home, using FreeView you cannot watch programs from 2 different muxes simultaneously. So if one of the family wanted to watch ITV2 or Channel 4 – which are generally available from a different mux to that used by the BBC – while you wanted BBC1 then you would have to fight it out. (At a later date we may add multiple DVB-T devices to allow more than one mux to stream simultaneously – but at present the system supports only a single DVB-T device and therefore only one mux at a time.)

TVHeadEnd – Tuning for Your Current Location

If you have purchased the **Skipper's Mate Entertainment Kit** you will receive a DVB-T and Boat Server already configured – barring the selection of your nearest/best FreeView transmitter.

These instructions are intended to help you to get FreeView tuned on the Boat Server. Please refer to the next chapter for the steps required to get each tablet/laptop/phone set up to receive the TV/radio.

Finding Your Transmitter

TVHeadEnd contains a list of lots of free transmitters world-wide. If the area where you plan to locate the boat is covered by one of the pre-defined muxes then life is easy. If not, then you can find the details from the Internet. A useful web site for FreeView information is UKFree TV – Google for **ukfreetv**. If you enter a suitable postcode then you should be able to see a map of the coverage – for example, this one for Dartmouth :
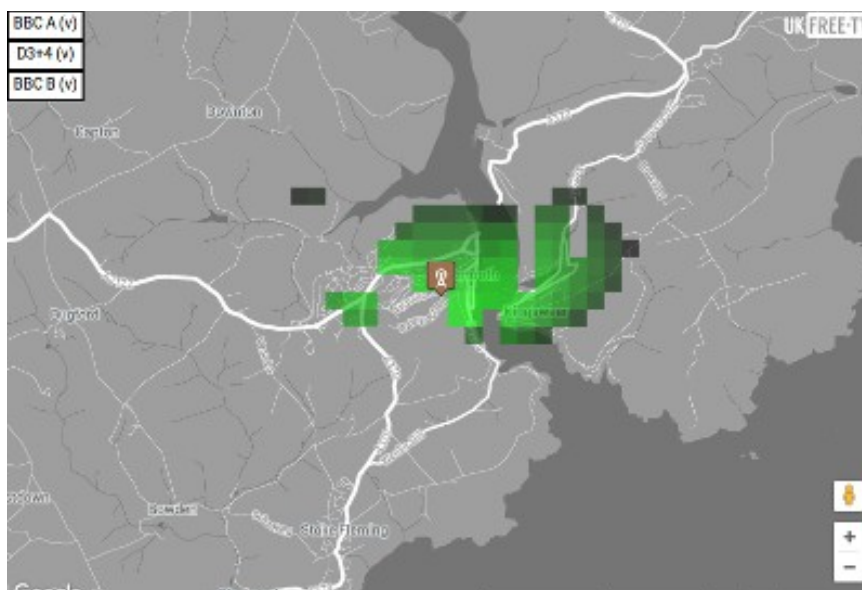
It shows the 3 muxes available (top left) and, scrolling down the web page provides further information - two of the muxes are shown here. For any transmitter not on the pre-defined muxes list you will need to note the frequency and then enter the muxes manually (see below).

Mux	H/V	Frequency	Height	Mode	Watts
PSB1 BBCA	V max	C41+ (634.2MHz)	107m	DTG-3	2W

1 BBC One South West, 2 BBC Two England, 7 BBC Three, 9 BBC Four, 120 CBBC, 121 CBeebies, 130 BBC News, 131 BBC Parliament, 601 BBC Red Button 1, plus 13 others

Mux	H/V	Frequency	Height	Mode	Watts
PSB2 D3+4	V max	C47 (682.0MHz)	107m	DTG-3	2W

3 ITV (West Country), 4 Channel 4 South ads, 5 Channel 5, 6 ITV 2, 13 Channel 4 +1 South ads, 14 More4, 15 Film4, 24 ITV4, 28 E4, 33 ITV +1 (West Country),

What to do to find your transmitter and channels ?

Login

Make sure your Boat Server is up, its HotSpot is running and you are connected to it wirelessly. Browse to your Boat Server with the port 9981 :

   http://192.168.51.254:9981

To log in you will need :

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User Name   : **Skipper**

Password   : **Mate**

Check the DVB-T Adapter

Select **Configuration** from the top level menu and then **DVB Inputs** from the second level. Then **TV Adapters** from the third level. This should show you the DVB-T adapter you have installed.

If you highlight the device (e.g. Realtek in this example) then you will see a detail window :

You will see that the DVB-T device is enabled, is set for Initial scanning and for obtaining the Electronic Program Guide over the air (Over-the-air EPG). *In this example, a network called "Mendip" has already been created.* So the device is working.
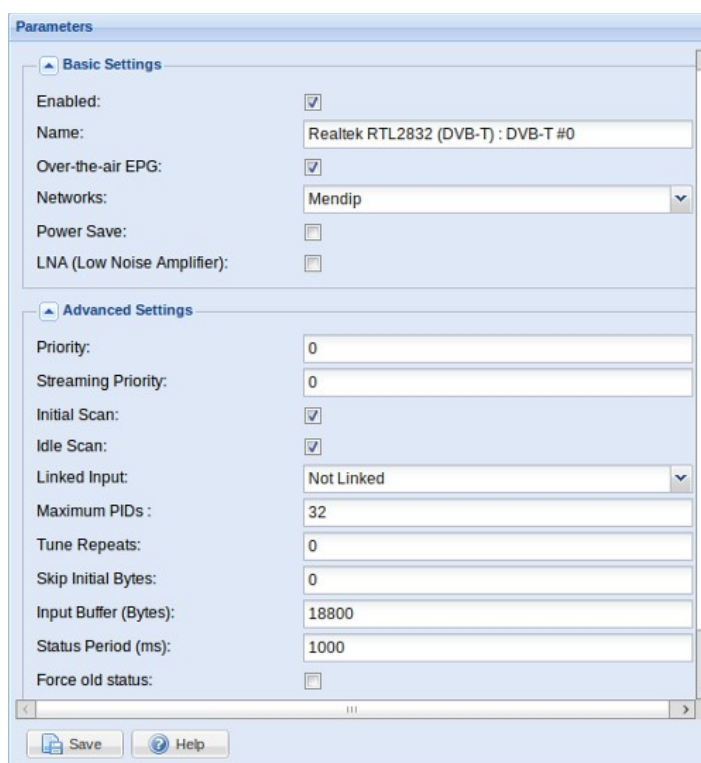
Creating a (Location) Network

If you plan to go cruising setting up a Network for a specific location is useful, saving you recreating it if you visit again (or return to your home port).

Select the Network tab (third line), click on the **Add** button and then select **DVB-T Network** from the Type drop-down list.
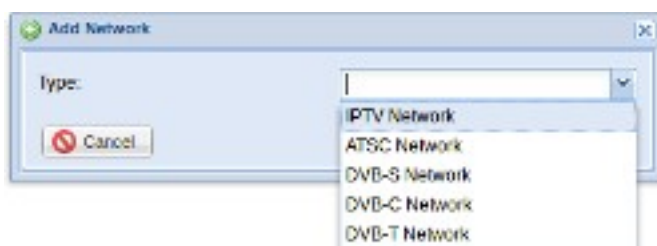
Enter the name of the Network/Location e.g. Plymouth and then select from the list of pre-defined muxes :
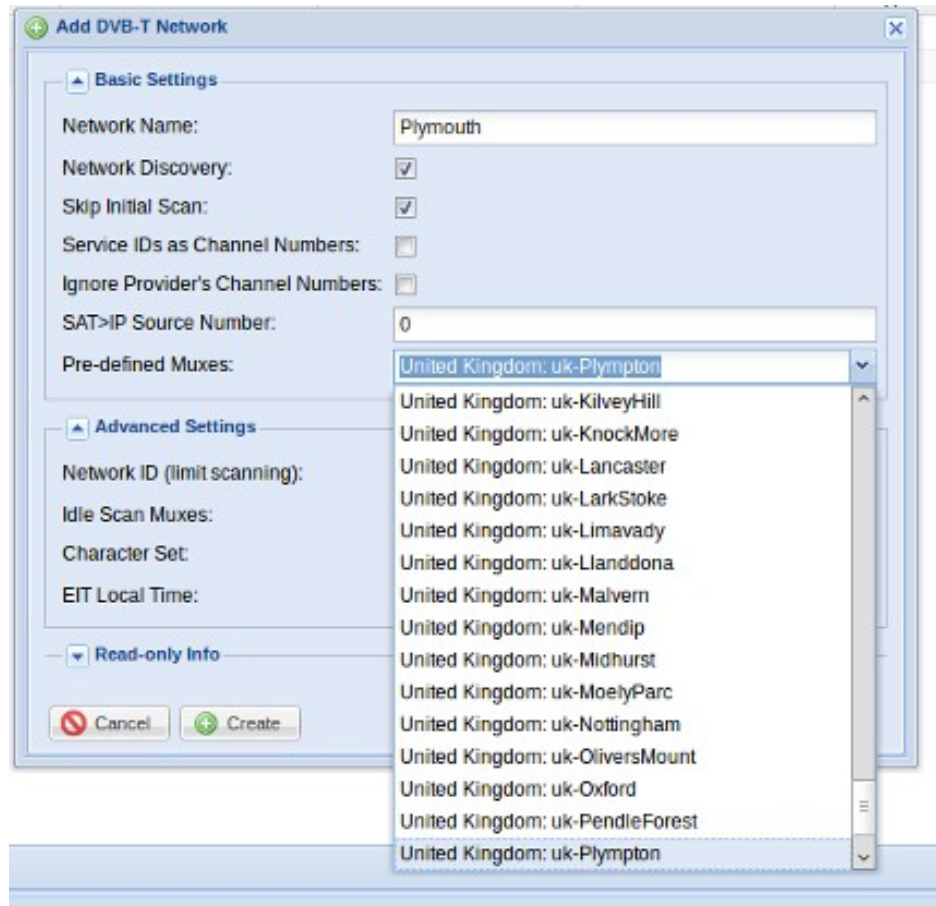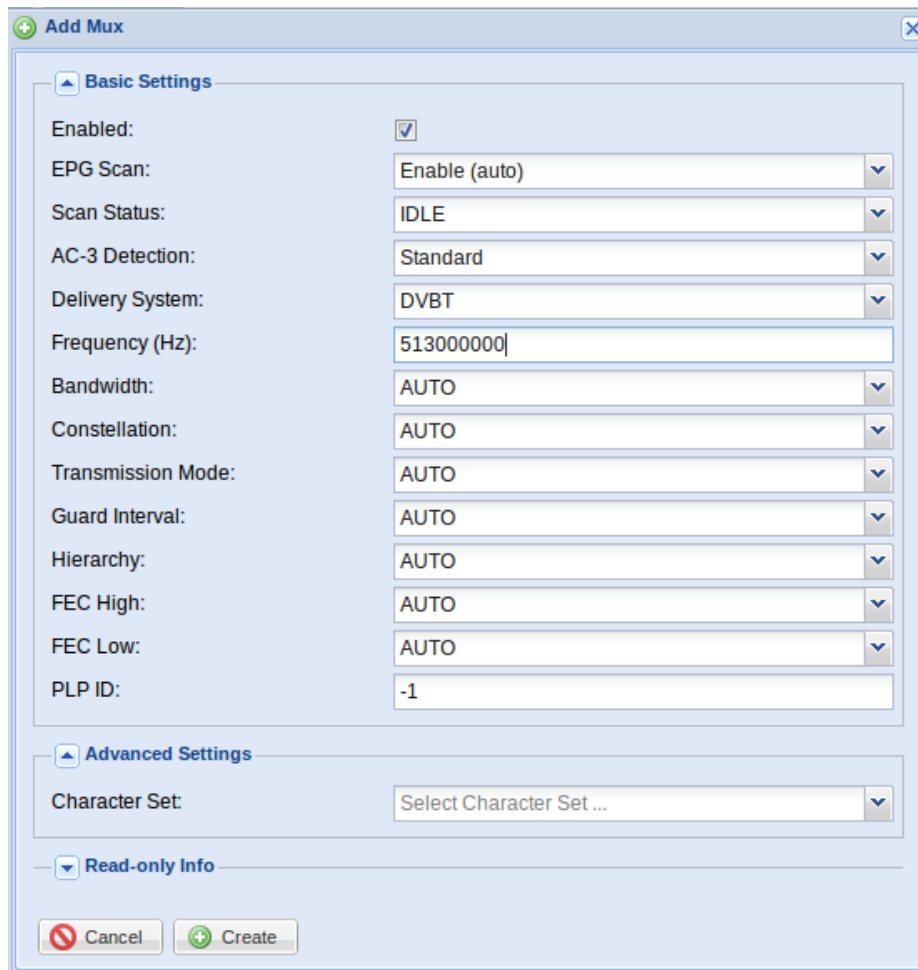
Hit the **Create** button and the muxes will be visible when you click on the **Muxes** tab next to **Networks.** The status, unless you are at the location, will be shown as Pending.
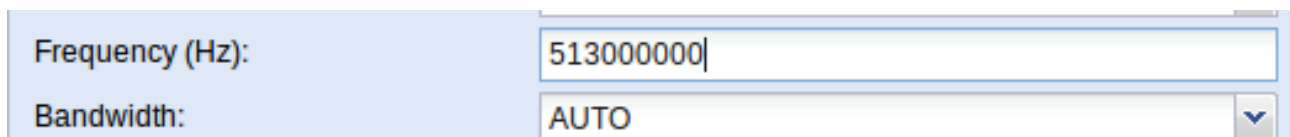
Setting up Muxes Manually

If your location is not found in the Pre-defined Muxes, use the **Muxes / Add Mux** option :

Enter into the **Frequency (Hz)** field the first number in MHz you found – e.g. 513. You can enter this with or without the 6 trailing zeroes.

Then hit the **Create** button.

Repeat this for each mux (for example, there are 3 identified from the Dartmouth transmitter).

Then you should be able to return to the **Muxes** page which should look something like this :

Play	E...	EPG Scan	Network ▼	Name	Ori...	Tra...	Scan Status	Scan Result	# S...	# C...	AC-3 Detection
Play	☑	Enable (auto)	Dartmouth	490.167MHz	9018	8213	IDLE	FAIL	0	0	Standard
Play	☑	Enable (auto)	Dartmouth	730.167MHz	9018	8213	IDLE	OK	11	10	Standard
Play	☑	Enable (auto)	Dartmouth	481.833MHz	9018	205...	IDLE	FAIL	0	0	Standard
Play	☑	Enable (auto)	Dartmouth	762.167MHz	655...	655...	IDLE	FAIL	0	0	Standard
Play	☑	Enable (auto)	Dartmouth	570MHz	655...	655...	IDLE	FAIL	0	0	Standard
Play	☑	Enable (auto)	Dartmouth	666MHz	9018	205...	IDLE	OK	31	29	Standard
Play	☑	Enable (auto)	Dartmouth	785.833MHz	9018	4162	IDLE	OK	23	22	Standard
Play	☑	Enable (auto)	Dartmouth	714MHz	9018	246...	IDLE	OK	33	28	Standard

You will see that here the Scan Status is shown as Idle and the Scan Result as either OK or FAIL. When you first set up the muxes they should show a Status of PENDING. When the system attempts to map these it will come back with a Scan Result. If this does not happen – i.e. the scanning does not start you can force it to scan by choosing the **Networks** tab to the left of **Muxes** :

Network Name ▲	Network Disco...	Skip Initial Scan	Service IDs as...	Ignore Provide...	SAT>IP Source Num...	# Muxes
Dartmouth	☑	☑	☐	☐	0	13

Highlight the Network (e.g. Dartmouth) and hit the **Force Scan** button.

The **Muxes** window should show the results. Not all muxes may be successfully scanned – this will depend on your signal strength and the boat's position. If you have some Scan Results showing as OK then the **Services** page should show these :

Play	Det	E...	Channel	Service Name ▲	Automatic Checking	Prio...	E...	Network	Mux
Play	ⓘ	☑	BBC Devon	BBC Devon	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC FOUR	BBC FOUR	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC NEWS	BBC NEWS	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC ONE S West	BBC ONE S West	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC Parliament	BBC Parliament	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC R1X	BBC R1X	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC R5L	BBC R5L	Auto Check Enabled	0	☐	Dartmouth	785.833MHz
Play	ⓘ	☑	BBC R5SX	BBC R5SX	Auto Check Enabled	0	☐	Dartmouth	785.833MHz

Note that BBC services often seem to have poorer signal strength than commercial stations – this seems to make them particularly subject to the boat swinging or heeling.

Electronic Program Guide

Once the muxes are working the EPG should be downloaded. Access this from the top level menu (left hand side).

Details	Progress	Title	SubTitle	Episode	Start Time	Duration	Num...	Channel
	84%	This is ITV3+1	This is ITV3+1.		Sun, Apr 17, 23...	18 hrs, 46 min	34	ITV3+1
	56%	Programmes start at 11pm			Mon, Apr 18, 0...	18 hrs, 15 min	174	ADULT Babestn
	50%	Programmes start at 10pm			Mon, Apr 18, 0...	17 hrs	173	ADULT smileTV3
	52%	Programmes start at midnight			Mon, Apr 18, 0...	19 hrs	172	ADULT smileTV2
	43%	Programmes start at 4am			Mon, Apr 18, 0...	23 hrs	176	ADULT Blue
	70%	This is BBC Four	BBC Four is the BBC channel for people w...		Mon, Apr 18, 0...	13 hrs, 28 min	9	BBC FOUR
	41%	This is ITV4+1	This is ITV4+1.		Mon, Apr 18, 0...	22 hrs	62	ITV4+1

Recording

Your Skipper's Mate Entertainment Kit is not currently set up for recording. Nor is there space on the card to record. If you wish to record programs you will need either a memory stick or an SSD drive.

Chapter 8. Live TV on Personal Devices

Live TV and stored media can be streamed on personal devices around the boat – tablets, laptops, smartphones. To run Live TV on each personal device you will need some software which can communicate with Tvheadend. These will depend on your device.   We have tested some of these products – but it's up to you to try them – both Tvheadend and the Skipper's Mate front-end are free.

Clients for Personal Devices – Android, Apple, Linux and Windows

Android – TVHGuide, Kodi, Movian

Apple - refer to the Apple Store. Kodi, Movian, TvhClient and TvhPlayer are listed on the tvheadend.org web site.

Linux - Kodi, Movian

Windows - Kodi, VLC HTSP plug-in

For instructions on using stored media please refer to Chapter 5.

Some instructions on TVH Guide and Kodi are shown below. For further details please refer to the appropriate product web site.
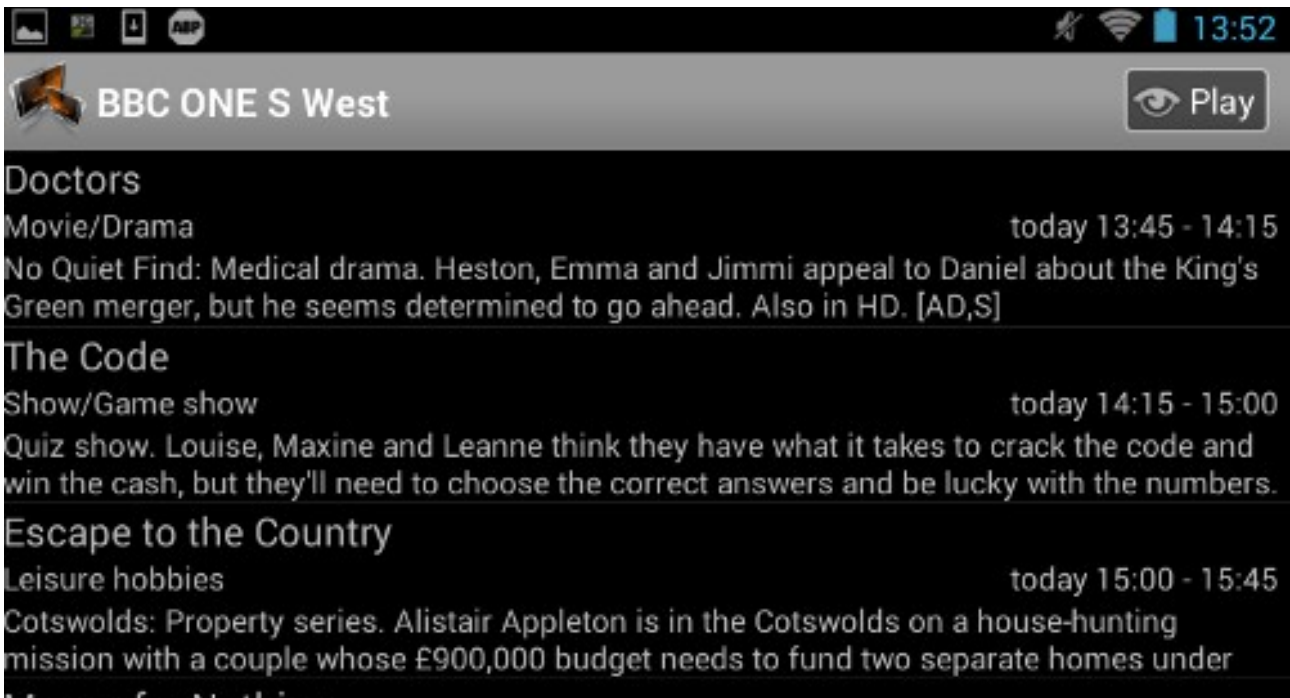
TVHGuide - Android

Install from the Android Play Store.

Assuming that Tvheadend has been set up and has muxes available you should simply be able to open the application and see the channels available :

Click on one of the channels and a program summary/EPG will be shown :

Hit the **Play** button (top right) to stream the programme. You should be offered a choice of apps on your device to use – e.g. VLC, Kodi ...

Kodi

You will need a copy of the Open Source package KODI on each tablet or device on which you wish to watch Live TV. KODI is available for Android, Windows, Linux, Mac OS and IOS. Please refer to the Downloads page for further details of the requirements. The instructions below have been tested on several Android versions and several Linux versions. We include instructions for Android since the majority of tablets and phones now run a version of Android.

KODI on Android

Visit the Android Playstore, search for Kodi, select and install :

Run the KODI app. It should say :

Preparing for first run. Please wait ....

When the ribbon menu appears, swipe sideways, highlight **System** and then **System Info.**

Skipper's Mate Manual
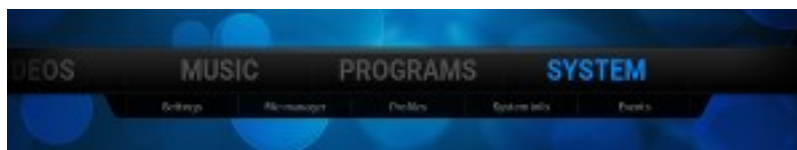
You should see the Summary screen :
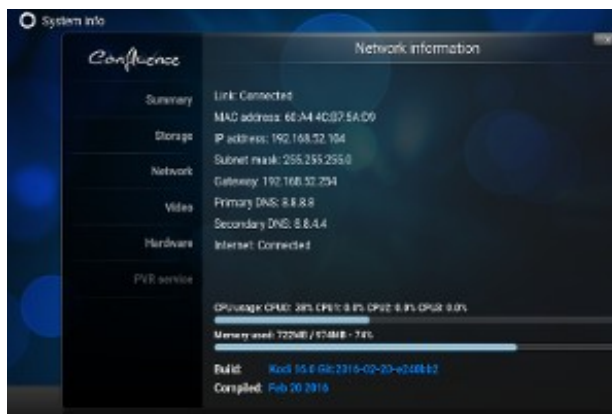
The version should be shown as Kodi 16.0 or higher :

Using the left arrow (bottom right of the Kodi screen), return to the ribbon menu, select System and Settings. You should see the **Change Your Settings** screen.

Select **Add-ons** :

and then **My add-ons** :
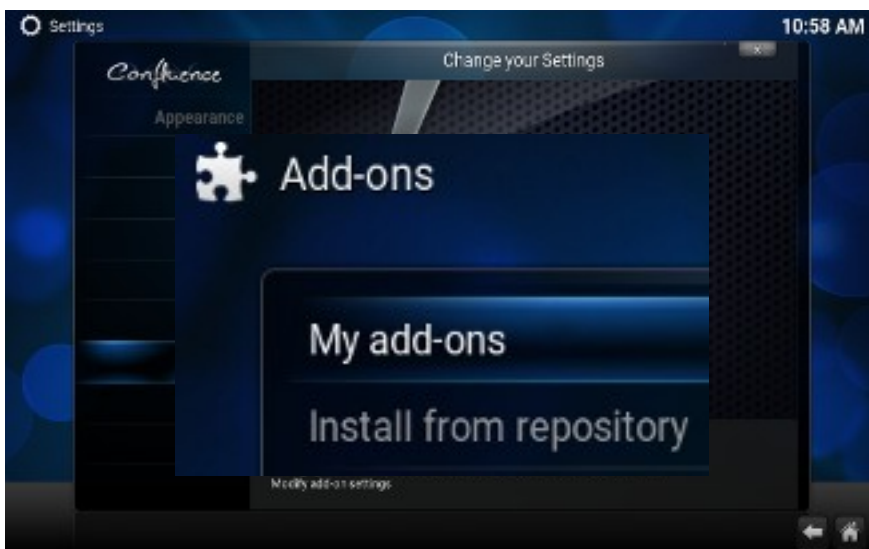
Select **PVR clients** - scroll down and select **TvHeadend HTSP Client**. Choose the **Configure** option :

Page 28
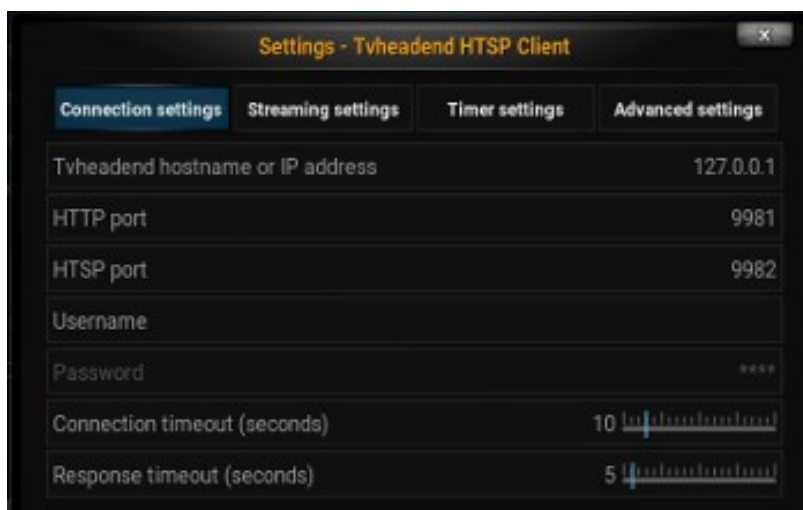
You need to change the following 3 fields :

        Tvheadend host name or IP address :   192.168.51.254

        Username   :   Skipper

        Password   :   Mate

Ensure that you press the **Done** button to save each field (not OK).

When you have finished editing **all 3 fields** then hit the **OK** button to save the information.

DO NOT ENABLE the Tvheadend HTSP Client YET !

Use the X in the top right hand corner to get you back to the **Add-ons – PVR clients menu** and use the left arrow (bottom right) until you get back to the **Settings** menu and choose the **TV** option.
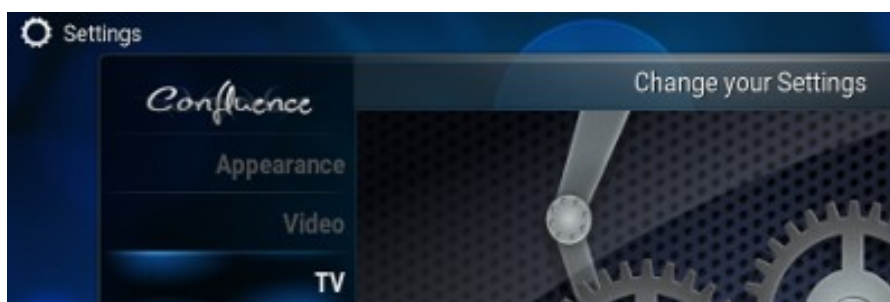
which should display this screen :
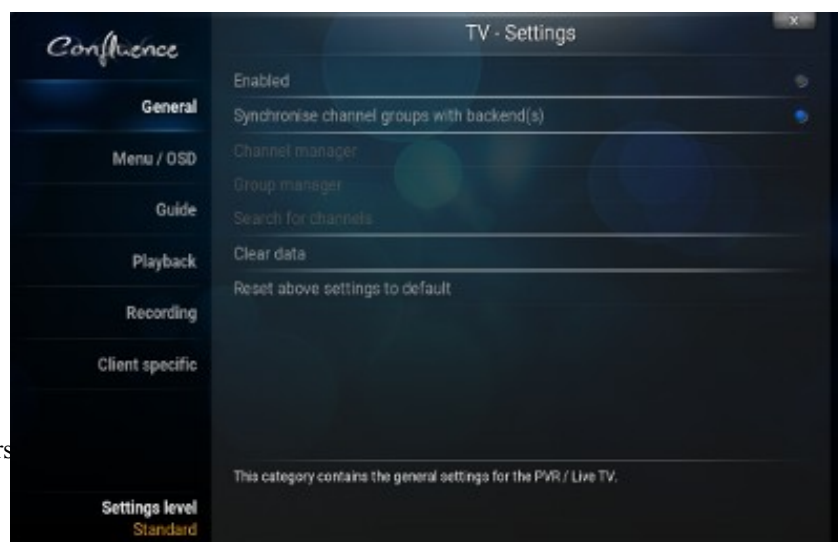
Click on the **Settings level** (bottom left) and change this to **Advanced** :

You should now see additional options on the screen. Select **Enabled**.
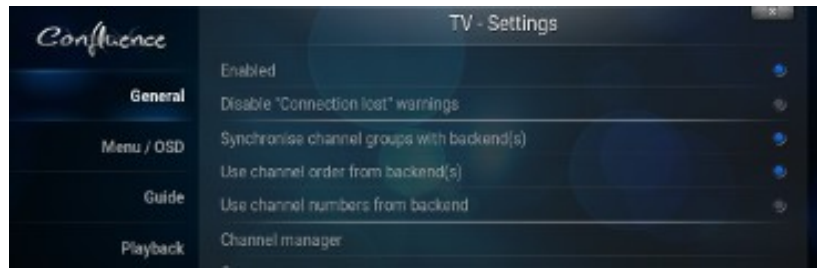
You should see a message in a small coloured window – top right – saying "Scanning for PVR Services".
This should generate an error message :
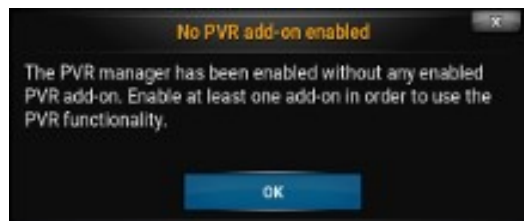
Once you hit the **OK** button you should see the **Add-ons – PVR Clients** menu displayed. Select
TvHeadend HTSP Client. NOW SELECT **Enable**. Use the X to exit. Use the left arrows to return to the **TV**
option on the **Settings** menu.

Now click on **Disable**, wait a moment, and then click on **Enable**. If you now select **Channel Manager** you
should see a screen similar to the one below showing the current channels:
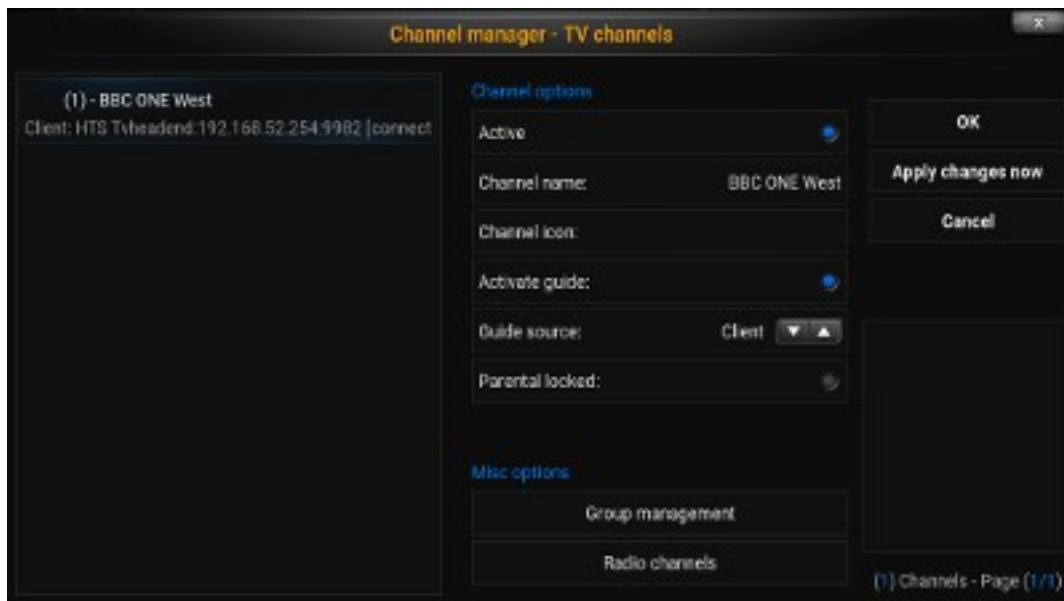
Can't see the Channel Manager screen ? Check that your Boat Server is running TVHeadEnd. If it is working, try disabling the Tvheadend HTSP client then disable and re-enable the TV settings. This should return you to the TVheadend settings with the "No PVR add-on enabled" so that you can repeat the enabling of this and TV settings disable + enable. If that doesn't fix the problem then try uninstalling Kodi and reinstalling it, following these instructions closely.

Close this screen and return to the ribbon menu where a new **TV** option should have appeared (where on the ribbon menu varies**)**.

Select **Channels** from the **TV** menu and you should see the **All Channels** screen :
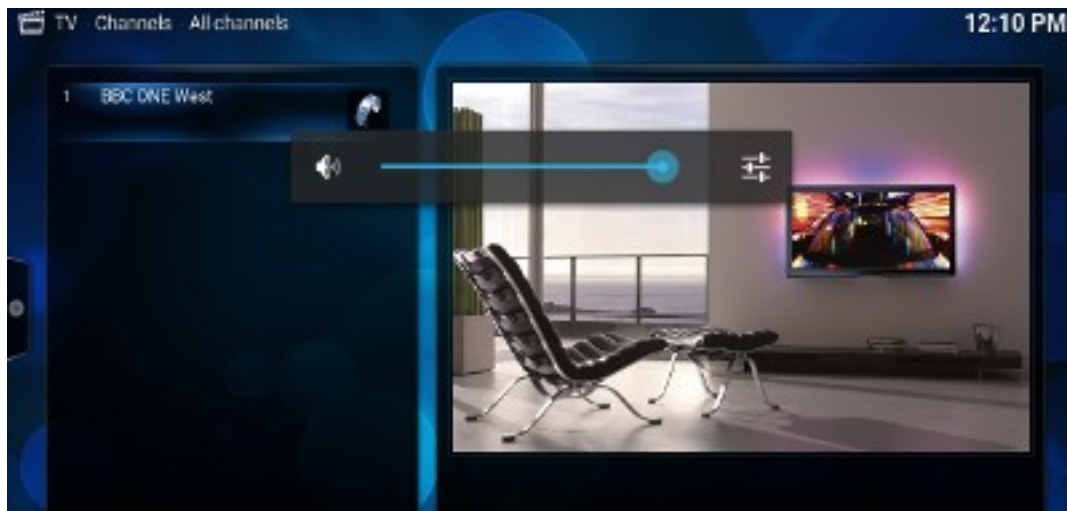
Phew ! Finally you're there !

Chapter 9. Streaming Stored Media on Personal Devices

You may play or view stored video, music and pictures stored on a central USB device attached to the Skipper's Mate server. This can be shared between various people/devices on the boat so you could be watching a video while several people are playing music or looking at photos.

Stored media can currently be stored on a single removable device – either :

- memory stick/flash drive

- solid-state drive (SSD)

We supply these from the Skipper's Mate web site http://www.skippersmate.co.uk pre-tested and pre-configured. You can then load onto them whatever video, music and pictures you wish.

***Why do we supply removable media ? Can't you use any removable media ?*** *Skipper's Mate is designed to consume small quantities of power and some drives simply require more power than is available. Even with reputable makes it is difficult to know what will and won't work so we supply only those that we have tested successfully. We also format the devices so that they can be written to by a variety of operating systems (including Windows) and read on the Skipper's Mate Boat Server which runs a version of Linux.*

Transferring Files to a Memory Stick or SSD

If you have purchased either from the Skipper's Mate website http://www.skippersmate.co.uk it will be formatted with three folders/directories :

- Music

- Pictures

- Video

You can attach the removable device to a machine which has USB and transfer either individual files or sub-folders/directories to these e.g.

Music (folder) - **.mp3 files**

JanisJoplin (sub-folder)

Try (Just a Little Bit Harder)

Kosmic Blues

Maybe

Work Me, Lord

ThePogues (sub-folder)

The Sunny Side of the Street

Fairytale of New York

Pictures (folder) - **.jpg**

Video (folder) - **.avi, .mpg, .mp4**

Accessing Stored Media on Your Boat Server

Once you have written the files to the removable device you can then attach this to one of the Skipper's Mate Boat Server USB extension leads. It should now be accessible from Kodi on your device (tablet, smart phone, laptop) as follows.

To Add Music to Your Device

Run up Kodi, select **Music** from the ribbon menu and then choose **Files** and **Add Music…**

In the box :

Enter a name for this music source

provide a meaningful name for all the music e.g. **smmusic**

Then use the **Browse** button and select **Windows Network (SMB)** :

Highlight the **PCL** group and then the folder displayed on the *Browse for new share* screen e.g. SKIPPERSMATECB and then choose the Music share i.e. SkipMusic :

Hit the **OK** button

.

Section 4 - Sensor Kits

Chapter 10. Features of the Sensor Kits

Sensor Kits each comprise a Bluetooth-enabled computer with a single sensor and a matched step-down.

Sensors are available as :

- ◆ analogue e.g. voltage, temperature/humidity/dew point – which can be viewed via the Sensor Panel and monitored in graph (line or bar) via the Central Server

- ◆ make-and-break – e.g. PIR, door/hatch, float/bilge – which can send alerts to warn you of problems and can be switched on/off via the Control Panel

Chapter 11.   Getting Started with a Sensor Kit

Each sensor requires a Bluetooth Sensor Server, configured to match the sensor and sensor type.

What a Sensor Server Comprises

A sensor server comprises :

- low-consumption board and software

- Bluetooth dongle

- 9V step-down (from 12V or 24V power source)

- plus one sensor – analogue or make-and-break

Straight from the Package – What To Do Next

Each Sensor Server will require a single power source – either 12V or 24V. The external interface to the Sensor Kit is a 9V step-down which we send out with trailing wires for you to make your connection.

Ensure that the Sensor Server is booted before your Boat Server – so if you're adding one or more Sensor Servers at a later date, reboot the Boat Server once they're powered up. The Sensor Servers should now be feeding data to your Boat Server and receiving commands as required.

Chapter 12. Analogue Sensors - Voltage

What a Voltage Sensor Server Provides

A Voltage Sensor Server will communicate with the Boat Server via Bluetooth. It requires power from a 12V or 24V source.

It will provide :

- live frequent readings visible via the Sensor Panel

- stored readings (on the Central Server) of data once an hour

- graph of stored readings

- configurable view showing "within viewing range" and outside range as green or red figures on the Sensor Panel

- optional alerts according to "within alert range" and outside range configurable by the boat ownership

- configurable graphs showing low and high Y range plus "within display range" and outside range bands

- click-per-day graphs

- date choice of graphs

How to Configure a Voltage Sensor Server

Select the **Settings / Voltage Settings.**   You may then choose to :

- Set Alert range values (-999 to 999 means no alerts will be sent)

- Set Graph Values – Y Axis and "within limits" Display Range

• Calibrate Current Reading by percentage via slider or drop-down box

Chapter 13. Analogue Sensors - Temperature, ,Humidity, Dew Point

A Temperature / Humidity / Dew Point Sensor Server will communicate with the Boat Server via Bluetooth. It requires power from a 12V or 24V source.

It will provide :

- live frequent readings visible via the Sensor Panel

- stored readings (on the Central Server) of data once an hour

- graph of stored readings

- configurable view showing "within viewing range" and outside range as green or red figures on the Sensor Panel

- optional alerts according to "within alert range" and outside range configurable by the boat ownership

- configurable graphs showing low and high Y range plus "within display range" and outside range bands

- click-per-day graphs

- date choice of graphs

How to Configure a Temperature/Humidity/Dew Point Sensor Server

Select the **Settings / Temp/Humid/DewPt Settings.** For each reading, select the appropriate tab. You may then choose to :

- Set Alert range values (-999 to 999 means no alerts will be sent)

- Set Graph Values – Y Axis and "within limits" Display Range

- Calibrate Current Reading by percentage via slider or drop-down box (Temp & Dew Point only)

Chapter 14. Make-and- Break Sensors

Make-and-Break Sensors include any device which has on/off functionality. The list of these continues to grow but if you find a make-and-break sensor which isn't on the list do get in touch.

Currently it includes :

- PIR

- door and hatch sensors

- bilge and float sensors

Each Sensor Server requires power – either from 12V or 24V. The Sensor Server communicates with the Boat Server via Bluetooth.

Features of Make-and-Break Sensors and Sensor Servers

Frequency – The make-and-break sensors will be checked once a minute.

Functionality – They can be configured to send alerts with legends according to your requirements.

Section 5 - Relay Kits

Chapter 15. Features of Relay Kits

Wireless Remote Relay Servers

All relay servers are compact units separate from the boat server, allowing them to be sited pretty much anywhere on the boat. The remote relay server(s) communicate via the Wi-Fi Hotspot. No wiring to the Boat Server is necessary. Each remote server requires power (12V/24V/mains).

Each relay server can service up to 2 relays.

Access to Relays and Switches via Control Panel

Access to the Control Panel (switch panel for relays and other on/off devices (e.g. GPS, cameras, PIRs) is via a single screen which looks much like a traditional switch panel on a boat with toggle switches. The Control Panel can be controlled from any device with a web browser - either locally on the boat - or remotely via the Skipper's Mate service.

Legends for the Control Panel functions may be modified by the user.

Chapter 16. Getting Started with a Relay Kit

Relay Kit

What a Relay Kit Comprises

Your kit will include :

- a Raspberry Pi
- wireless capability – either on-board or as a separate USB wireless unit to be plugged into the Raspberry Pi
- a 5 volt stepdown from which to power the Pi using the USB to micro USB cable
- a 2-channel relay

Wiring

1) Provide 12V or 24V power to the stepdown

2) Connect each relay to the device which is to be controlled

Wi-Fi Connection

When you receive a pre-configured Skipper's Mate Relay Kit it will be set to communicate with the Skipper's Mate default Wi-Fi Hotspot.

If you change the SSID (name to which you connect) of the hotspot, the Relay Kits should be updated automatically.

Section 6 - Security Kit

Chapter 17. Features of the Security Kit

The Skipper's Mate Security Kit is an add-on to the Communications Kit, utilising the connectivity provided by the Comms Kit.

The **Security Kit** can provide security, geo-fencing and cameras. Sensors and relays can also be added to the **Skipper's Mate Boat Security Edition** with **Sensor** and **Relay Kits** to add further security features :

- ◆ Security system which runs off 12V, 24V or mains power

- ◆ Accessible from anywhere where you have Internet access

- ◆ GPS tracking of boat movement & positions

- ◆ Motion detection allowing you to check for intruders

- ◆ Camera views/footage of what's happening on board

- ◆ USB and/or IP cameras

- ◆ Remote access to the boat when you're not on board

- ◆ Outside connections supported – Wi-Fi (e.g. marina) and mobile broadband dongle

- ◆ Alerts via email (and optionally SMS messages) to indicate that something untoward may be occurring

- ◆ Alerts to up to 5 contacts, specified by you

- ◆ Real-time GPS updates (within reach of a 3G/4G signal) to track your boat or your passage – position, speed, heading

- ◆ Plotting on Google Maps or Google Satellite Maps to see where your boat currently is and where she's been

- ◆ Ability to store snapshots and video (optional) for up to 12 months – useful evidence if your boat is broken into or stolen

- ◆ Reports by email/PDF – coming shortly

- ◆ All configuration via easy-to-use screens

The **Security Kit** comes as standard with one USB camera. Additional cameras can be added :

- ◆ more USB cameras

- ◆ optional one or more IP cameras – *note that these require more power than USB cameras and are only recommended if you have mains power available*

Cameras can provide current views, archived snapshots and video footage and alerts via email and/or SMS if motion is detected. (Additional motion detection can be provided by PIRs if Sensor Server(s) are added.)

The **Security Kit** comes with a GPS dongle which provides :

- ◆ GPS tracking of boat position and movement – plotted on Google maps/satellite maps with details of each plot (position, speed, heading)

- ◆ Real-time GPS updates to show the current position, heading, speed and distance from Base Position (set by you – e.g. mooring/berth/current anchorage)

- ◆ Alerts by email/SMS if the boat moves a greater distance from her Base Position than you have specified

Chapter 18. Geo-fencing and GPS

Skipper's Mate operates with an individual GPS (not interfaced to any existing GPS system you may have) and thus provides a low current draw geo-fencing option which should be usable by any boat with a solar panel to keep your batteries topped up when you are not on board.

Skipper's Mate Security Kit offers, from the GPS menu :

- Plot Your Position – plots (with details) of current and recent positions on Google maps/satellite maps

- GPS – Real-Time Update – screen showing Metres from Base (Base position set by you as and when you choose – i.e. permanent berth/mooring, current anchorage/berth/mooring), position (DMS and decimal), heading (true), speed (knots, mph, kph) and the number of satellites currently obtained by the GPS

- GPS Settings – allows you to configure a range of settings such as Minimum Viable No. of Satellites, GPS polling period (seconds), Alert Distance (metres) – at which point an email/SMS alert will be triggered, plus logging parameters and GPS configuration (baud rate, parity etc – only required if you are running the Open Source version where you source your own equipment)

- Plot Your Cruise – using historic data – available shortly

Geo-fencing

Geo-fencing is available when a 3G/4G or Wi-Fi signal is available to your Boat Server. If you are using remote access to your boat then this is assumed to be the case. Of course, if your boat were to be stolen and move beyond the current Internet connection then at that point communication would cease – your only option would be satellite which for most boat users is over budget. However, if you use a 3G/4G mobile broadband dongle then Skipper's Mate would transmit when it came within range of a suitable connection.

Geo-fencing is available in 3 ways :

- using remote access to your boat to view the GPS – Real-Time Update screen on your Boat Server to observe Metres from Base, Position, Heading and Speed

- using remote access to your boat to view Plot Your Position so you can see your Base Position and recent plots on Google maps or Google satellite maps
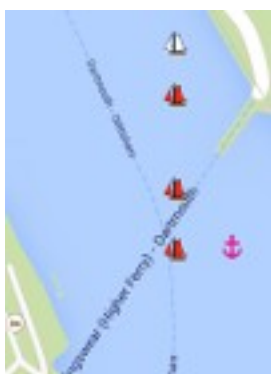
◆ setting up email and/or SMS alerts to be sent if your boat moves more than your chosen distance from the Base Position

Chapter 19.   Cameras and Viewing

Cameras

One USB camera comes as part of the **Security Kit**. This may be sufficient for many yachts. You can currently have up to 4 cameras on a single Boat Server. USB cameras take far less current than IP cameras – the disadvantage is that the images are smaller and of lower resolution than IP cameras. However, they are frequently used as security cameras in land-based applications. Using the Skipper's Mate system all cameras can detect motion and capture images or video for subsequent use (e.g. for the police or insurers).

For details of the kind of cameras available please see the web site.

Cameras can be viewed both remotely (via the Central Server) – so you can see your boat when you're at home, in the office or anywhere you can get an Internet connection – or while you're on board via the Boat Wi-Fi Hotspot (so you shouldn't need to get out of your berth !).

Skipper's Mate allows you to configure a wide range of options relating to the camera(s) – motion detection, when to send an alert, when to capture a snapshot or video, quality, size to store, size to view, frame rate etc. - see menu option Cameras / Camera 1 (or 2, 3, 4). Skipper's Mate also provides a number of parameters to help ensure that you don't receive spurious alerts (e.g. from someone walking down the marina pontoon beside the boat).

Alerts are set to send only one occurrence until you reset them – saving you being bombarded with messages or emails all relating to the same incident.

In addition to motion detection via camera you can add as many PIRs as you wish (using Sensor Servers) to supplement your security system

Viewing – Current View(s)

By logging into your account at the Central Server you can view the camera(s) on board to provide peace of mind – whether it's the weather you're worried about or you've received an alert from Skipper's Mate indicating that motion has been detected.

Viewing – Archived View(s)

Video and snapshots will be retained for up to 12 months in your account – longer if you need it (e.g. insurance claim). Details of the small subscription fee required are shown on the web site Shopping Cart.

You can view/browse these via the Central Server account at any time.

Chapter 20.   Alerts – Email and SMS

What triggers alerts ? What can I configure ?

Alerts (email and/or SMS) are available from various Skipper's Mate features :

- boat movement (geo-fencing) via GPS (Security Kit)

- motion detection via camera (Security Kit – either USB or IP camera(s))

- motion detection via Sensor Kit (e.g. PIR)

- intruder detection via Sensor Kit (e.g. door, hatch)

- on-board problems detected by Sensor Kit (e.g. volts, temperature, dew point, bilge level)

The system permits up to 5 email addresses and 5 mobile numbers for SMS which can be notified when an alert is generated.

Where do I configure alert recipients ?

All alerts are channelled via the Central Server. Recipients of alerts (email and SMS) can be configured from the web site login to the Central Server (your boat account) using the **Settings** menu – **Email Contacts** and **SMS Contacts**.

PLEASE ensure that anyone to whom alerts may be sent is aware that they may receive these and have consented to do so.

Section 7 - System Functions

Chapter 21.   Updates and Boat Upgrades

Updates

Updates to the system – including new features, bug fixes and enhancements – are available from the Central Server. You may **choose** to apply updates. Updates apply to all users of the Skipper's Mate system.

To check for updates, from the Boat Server menus, select System and Apply Updates. This option requires you to have a connection to the Internet in order to function.

On opening the task Apply Updates should download details of available updates from the Central Server giving a brief description and a link to an html page with more information. You may choose to check the **Install?** box for any or all updates and then hit the Apply button.

If the update is successful you should see the "System update successful message".

> WARNING ! Please ensure you reboot the Skipper's Mate Boat Server after applying any updates or upgrades.

Boat Upgrades

Upgrades are specific to you and will include any features you have obtained through purchasing extra kit(s).

These do not apply to users of the Open Source version who should have a full download and will need to supply and configure their own hardware.

To check for upgrades, from the Boat Server menus, select System and Apply Boat Upgrades. You will be advised – normally by email accompanying any purchase – if the kit requires you to apply an upgrade. This option requires you to have a connection to the Internet in order to function.

> WARNING ! Please ensure you reboot the Skipper's Mate Boat Server after applying any updates or upgrades.

Chapter 22.   Executing Commands and Rebooting

Rebooting the Boat Server

From time to time it may be necessary to reboot the boat server – although most of the time you will want it to remain up and running, especially if you wish to access it remotely.

Several programs within the system will prompt you to reboot when it is necessary – for example, if you change the **Hotspot Settings** (Boat Server **Settings** menu) then a reboot is required.

If you add features to the system – such as Sensor Servers or Relay Servers – then the system will also require a reboot

How to Reboot the Boat Server

From the Boat Server menus, select **System / Reboot Skippers Mate**. The process can take 2 or 3 minutes.

You should see a screen like this – hit the Panic button and the Boat Server will be rebooted :

Hit the big red button to reboot. Go on you know you want to.

Panic

Once the Skipper's Mate Boat Server has rebooted you should be able to access it via the Boat Wi-Fi Hotspot to check that all is functioning as you would wish. Obviously if you have changed the **Hotspot Settings** – say from an SSID of **SkippersMate** (default) to one of your choice (e.g. **Spray**) then you should attach to the newly-chosen SSID – Spray – pretty obvious since the Skipper's Mate wireless AP should have disappeared and been replaced by one called Spray.

Executing Commands

This option runs command line options under Linux. It is available on the Boat Server menus from **System / Execute** Commands. You may find it useful if you are familiar with Linux. In particular, if you need some support we may suggest some commands to be entered here to help in diagnosing or fixing a problem.

PLEASE BE AWARE that using the command line is potentially dangerous and could result in the loss of your system so don't play with anything you don't understand :) - as the warning message on the screen says.

Here is an example showing a listing of the ramdisk (used for temporary files and logs) :

Execute Commands ✖

WARNING. Use of this program is dangerous and you use it at your own risk.
It will do exactly as you tell it with no "Are you sure", "Really, really sure" type warnings

If it abducts your first born, eats your cat or burns your dinner it's entirely your fault.

Guarantee - If you break it you get to keep all the pieces. Gettit?

Command

ls /mnt/ramdisk -latr

Result

```
total 876
-rwxrwxrwx 1 pi pcl 11264 Apr 2 09:54 sm.db
drwxr-xr-x 4 root root 4096 Apr 23 15:54 ..
-rwxrwxrwx 1 root root 327 Jun 23 11:17 gps.js
drwxrwxrwx 2 root root 40 Jun 23 11:17 cam1
drwxrwxrwx 2 root root 40 Jun 23 11:17 cam2
drwxrwxrwx 2 root root 40 Jun 23 11:17 cam3
```

? Help

.

Section 8 - Using the Central Server Features

As mentioned in **Section 1 – All About the System** the Skipper's Mate System is comprised of 2 parts :

- the Boat Server (essential)

- the Central Server (optional)

If you only use Skipper's Mate for entertainment and use of the Internet when you're on board then you don't need to use the Central Server. But, if you want to use any of the Security Features (cameras, alerts from motion, alerts from sensors) or to see or be notified about what's happening on your boat remotely (e.g. monitoring sensors such as voltage and humidity) then you need access to a Central Server. You can use the Skipper's Mate Central Server, for which there is a small recurring fee after the initial trial period, or you can use the Open Source code to set up your own Central Server to provide the same services – see the Open Source download from the web site http://www.skippersmate.co.uk.

Chapter 23. Visit Boat

This option should redirect you, via a network tunnel, to your boat. This should permit all users to access their boat, even if their Internet Service Provider (ISP) uses DHCP (which changes your IP address on a regular basis) or Carrier Grade NAT (CGN) which bundles your IP address with others.

The system will also refer to the browsing (http) port number as specified in **Settings / Port Forwarding** on the Central Server menus.

Virtual Private Network (VPN)

If you need a secure connection for work, financial transactions over the web – or any other reason – you can choose the Boat VPN option via the Central Server – see web site for details.

Choosing Visit Boat

To visit your boat you need firstly to visit the Skipper's Mate web site and choose the **Login** button from the home page. This will ask you for the login details which you created when you registered and which will have been emailed to the email address you provided.

Once you select **Boat / Visit Boat** you will be presented with a second login screen which is the system on the boat herself where you will be required to login again.

Note that the 2 logins are maintained separately so if you change the password on either system make sure you keep a note of it.

Once you have used the local Boat login you can utilise the system as if you were physically on board.

Chapter 24.   Settings

Email Contacts

You may list up to 5 email addresses, with names, to which any alert will be sent.

PLEASE MAKE SURE THAT RECIPIENTS ARE AWARE OF THIS AND ARE PREPARED TO ACCEPT EMAILS.

SMS Contacts

You may list up to 5 mobile numbers, with names, to which any alert will be sent. However, to activate the sending of SMS messages you need to have a subscription since this service costs money.

PLEASE MAKE SURE THAT RECIPIENTS ARE AWARE OF THIS AND ARE PREPARED TO ACCEPT MESSAGES.

Alert Settings

Not currently available

Port Forwarding

In order to allow access to your boat from the outside world (via the Internet and the Skipper's Mate Central Server) Skipper's Mate needs to create a network tunnel for permitted protocols e.g. http and ssh.

If you obtain the Mobile Broadband Dongle as part of the Skipper's Mate Communications kit these will have been pre-configured for you.

Chapter 25. Browse

The **Browse** menu on the Central Server allows you to view video and snapshots captured on the Boat Server and transferred to the Central Server to be retained. The standard retention period is 12 months but if you need longer for any reason then just get in touch.

If you are not running the **Security Kit** with one or more cameras then there will be no stored video or snapshots.

More details on how and when video and snapshots will be stored will be available shortly.

Section 9 - How Skipper's Mate Works

The system comprises 3 parts -

- your local browser which can be a desktop PC, laptop, tablet, smartphone or any wireless-enabled browsing device you choose to use

- a Central Server (on the Internet backbone in the case of that provided by Skipper's Mate systems)

- equipment installed on your boat (Boat Server, Sensor and Relay Servers)

The Equipment on Your Boat

This comprises :

- **Boat Server** – *essential* - low-consumption board running from either 12V or 24V supply, stepped-down to 5V, running Wi-Fi Hotspot and Bluetooth communications on-board and Mobile Broadband and Wireless externally

- **Sensor Servers** – *optional* – low-consumption board running from either 12V or 24V supply, stepped down to 9V, commnicating with the Boat Server via Bluetooth, each running a single sensor (though some units provide more than one feed – e.g. temperature, humidity and dewpoint run on a single Sensor Server)

- **Relay Servers** – *optional* – low-consumption board running from either 12V or 24V supply, stepped down to 5V, communicating via Wi-Fi with the Boat Server, each of which may activate up to 2 relay circuits to control on-board systems of your choice.

The Boat Server can have a range of optional devices which are grouped into Kits – Entertainment, Security, Relays and Sensors :

- GPS dongle

- USB camera(s)

- IP cameras

- DVB-T Freeview TV/Radio dongle

- Media storage – memory stick/flash drive and/or solid state drive (SSD)

- Sensors – voltage, temperature, humidity, dewpoint, plus a range of make-and-break sensors (e.g. float switch, door and hatch sensors, PIR)

- Relays – to operate on-board devices/circuits

The low-consumption board has sufficient power to support only a certain number of devices. You will need a powered hub in many instances if you want to use additional peripherals. Please refer to the KnowledgeBase for more details of power requirements.

Making Contact with Your Boat

To utilise the security features, it is necessary to go through a Central Server because the 3G dongle/Wi-Fi receiver on your boat will change its IP address at the whim of your 3G or Wi-Fi supplier. This can sometimes be several times a day. In addition, many ISPs are now implementing Carrier Grade NAT (CGN) as the result of the shortage of IPv4 addresses and will "bundle" your IP address with those of other users.

(The extra software to build the Central Server is included in the download.)

To make contact, we need to know the IP address. To achieve this, Skipper's Mate establishes a network tunnel connecting your boat to the central server.   So to access the cameras, GPS etc. on your boat you log in to the central server with your unique id and password which automatically redirects you to the Boat Server on your boat.

This is completely transparent to the end user – you simply use the menus presented to you in your browser to access cameras, GPS etc.

The Boat Server has limited storage space available locally so any video recorded and snapshots taken and GPS plots are periodically uploaded to the server where they are kept for a minimum of 12 months.   Any irregular activity on your boat (motion detected or movement of the boat herself) is communicated to the central server which is responsible for contacting you (and up to 4 nominated representatives) with details in an email and/or SMS.

A Wi-Fi Access Point and Bluetooth Master provide :

- a Wi- Fi Hotspot when you're on board

- access to the Boat Server when you're on board

- communication with any wireless cameras or other devices such as Sensor or Relay Servers

The data are stored in an industrial-strength relational database – PostgreSQL. Since SD cards, unlike hard disks, can only be written a limited number of times any temporary information is stored on a ramdisk in an SQLite database. Selected data are transferred from the Boat Server ramdisk to more permanent storage in the PostgreSQL database on the Boat Server and/or the PostgreSQL database on the Central Server.

Some information (e.g. sensor readings) is transferred hourly to the Central Server to provide graphs of data trends and historic data.

Chapter 26.   The Boat Server

The Boat Server is the essential part of Skipper's Mate – it provides communications throughout the boat to any brower-enabled devices on board and offers the option to communicate with the outside world via a Mobile Broadband Dongle or via external Wi-Fi.

Wi-Fi Hotspot and External Connections to the Internet

All other servers are a matter of choice but without a Skipper's Mate Boat Server you're not going anywhere ! For example, if you only want a Wi-Fi Hotspot for you and your crew then you don't need sensors, relays or remote access via the Central Server – but you do need a Boat Server.

The Boat Server is able to communicate via a Wi-Fi Hotspot on board and, externally via a 3G/4G Mobile Broadband Dongle or an external Wi-Fi device (e.g. to the marina or yacht club wireless system).

The Boat Server also uses the Wi-Fi Hotspot to talk to any Relay Servers you may have on the boat controlling systems such as heating, fridge etc.

Bluetooth Communications

The Boat Server also comes with Bluetooth enabled so that you can add Bluetooth Sensor Servers for any sensors you wish to use – voltage, hatch/door, PIR, temperature etc. Please see the web site for the latest list of sensors – and if you can't find what you want, do get in touch.

Wire-free... barring power

Well it's not strictly wire-free – what is ? But all the Skipper's Mate Sensor and Relay Servers use Wi-Fi or Bluetooth so, barring providing power to each from your boat supply, you don't need to run trailing wires back to the Boat Server. This means you can largely site them where you need them and where you have access to the boat electrical outlets – subject, of course, to testing that a signal can get through to/from the Boat Server (signal can, of course, be affected by the construction of your boat and, in particular, metal such as engines).

Chapter 27.   The Central Server

If you want to access your boat remotely – to view cameras, to observe data (e.g. voltages), to switch relays on or off – you need to go via the Central Server.

This option for remote access is, after the initial period, available for a small fee – it is entirely optional – you can run a Boat Server without remote access if you wish.

Alternatively, if you use the Open Source source download for Skipper's Mate, the sources to create your own Central Server are available.

Skipper's Mate Central Server

The Central Server is on the Internet backbone and provides network tunnelling to your boat – provided that the boat has a 3G/4G mobile broadband signal or an external Wi-Fi signal (e.g. marina/yacht club).

The server retains certain current and historic information – such as that provided by sensors and cameras. It also stores details of the people to whom you want alerts sent (via email and/or SMS).

Visit Boat

Your Central Server login gives you an option to access the same software on your Boat Server as you would do if you were on board. This means you can not only look at current readings (GPS, sensors) and your camera(s) but you can switch systems on or off via the Control Panel. Boat configuration (e.g. cameras, alerts, GPS settings, sensor calibration can all be carried out remotely.

So wherever you are in the world, if you've got access to the Internet you can get to your boat to soothe your troubled brow or tweak a setting here and there, view the camera(s) to make sure your lines or furled sails are as you would wish … or turn on the heating and the fridge in anticipation of getting back to your boat.

Chapter 28.   Sensor Servers

You may have any number of **Sensor Servers** around the boat, each controlling a single sensor. The Sensor **Servers** can be sited anywhere you wish, within reason – they communicate with the Boat Server over Bluetooth. You need to provide 12V or 24V power and to protect the equipment.

Analogue sensors - graphs

Analogue sensors are currently available for battery voltage and temperature/humidity/dew point. These sensors, if installed, will report back to the Central Server once an hour and the data can be viewed either as line or bar charts, paging through day by day.

These can be seen from the Central Server menus for your account under Graphs. Temperature, humidity and calculated dew point can be seen on a single overview screen or individual tabs.
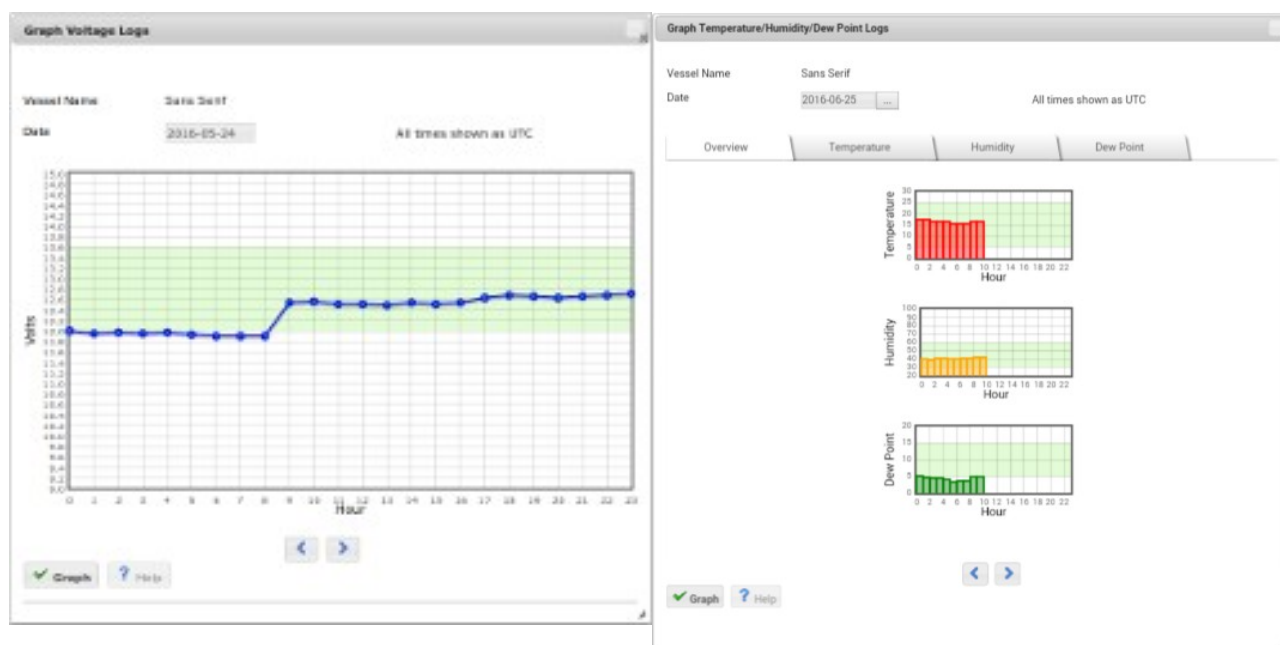
Analogue Sensors - Current values

Current values can also be seen via the Sensor Panel :

Make-and-Break Sensors

A wide range of make-and-break sensors are available – please see the web site. If you don't find what you want do get in touch as we are happy to add any further sensors which may be required. As sailors our requirements are probably less complex than many of you stinkies ! Or indeed those bigger wafties !

Where appropriate, make-and-break sensors can be associated with the Control Panel which can be used to turn them on or off as required. So you could turn off your PIRs, hatch and door sensors when you're on board, for example. The screenshot below shows only a PIR but you can have multiple switches for sensors on the Control Panel.

Sensors and their legends can be configured by you – for example, you could set up a hatch sensor as the Forecabin Hatch so that if an alert were sent it would tell you which sensor had initiated the message. The message will provide a link to allow you to reset the alert.

Sample email text

An alert has been triggered on sensor Forecabin Hatch on your vessel Spray. No further alerts will be sent from this sensor until you re-enable them by clicking Here
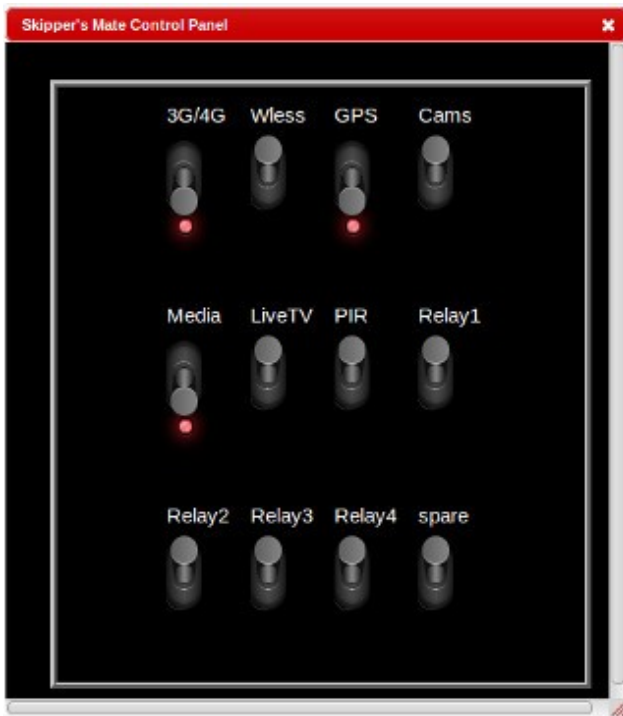
Chapter 29. Relay Servers

You may have any number of **Relay Servers** around the boat, each capable of controlling up to 2 devices/circuits. The **Relay Servers** can be sited anywhere you wish – you need to provide 12V or 24V power and to protect the equipment.

Relay servers communicate with the Boat Server via the Wi-Fi Hotspot.

How do I control the relays ?

Relays are accessed via the **Control Panel** from the **Control** menu. Switches on the Control Panel can be configured by the Boat Owner to fulfil a variety of functions (e.g. switching between Mobile Broadband and external Wireless, GPS, cameras, the Media System, sensors and relays. In the example screenshot below, relays have been set up for Fridge, Heating, electronic Anti-Fouling and the Battery Charger.