Detailed Raspberry Pi Setup Documentation

SEPTEMBER 20, 2013 [7 COMMENTS](https://mvcesc.wordpress.com/2013/09/20/detailed-raspberry-pi-setup-documentation/#comments)

This is the detailed documentation of every step necessary to create the Raspberry Pi chartplotter computer. I upsized my SD card to an 8-gig version so I could have more room for charts and other programs, and when I did so, I documented the process. This is the same process that was [done](https://mvcesc.wordpress.com/2013/08/21/its-alive/)[before](https://mvcesc.wordpress.com/2013/08/22/a-diy-chartplotter/), but this time it is documented much more thoroughly.

Setting Up Raspberry Pi

1. Format a new SD card.  
   On my windows machine, I used the SDCard.org application as the OOB Windows format apparently doesn’t work (I didn’t try it, just going off of forum posts).The only option I changed was to set FORMAT SIZE ADJUSTMENT = ON and give the volume a name.
2. Download the NOOBS package from raspberrypi.org and extract onto the SD card
3. Connect the RPI hardware
   * HDMI connection to a monitor
   * Ethernet connection to a router with internet connectivity
   * USB Keyboard & Mouse
4. Insert the SD card into the Raspberry Pi and boot. Install the OS of your choice (I used Raspbian)  
   Confirm overwriting of the data
5. On first load, set a few settings. I used the following:
   * Boot to Desktop: ON
   * Overclock: Medium (950MHz ARM, 250MHz Core, 2 overvolt)
   * Update internationalization for US
     + Raspberry pi is a UK product, set the Locale, timezone, and keyboard layout to the US versions.
   * Reboot
6. It’s always smart to get the latest updates for the OS, so:
   * sudo apt-get update
   * sudo apt-get upgrade
7. Next I want to set the video resolution to something fast, and yet of high quality. I settled on [1280×720@60Hz](http://elinux.org/RPiconfig#Which_values_are_valid_for_my_monitor.3F) (720p CEA : Group 1, Mode 4)
8. I also don’t want the screen to get turned off, since it’s probable that the chartplotter will run for long periods unattended. I found a forum post that fixed it, by editing [lightdm.conf](http://www.raspberrypi.org/phpBB3/viewtopic.php?f=35&t=15390)
9. I want to use a [wireless keyboard with built in trackpad](http://www.amazon.com/Logitech-Wireless-Keyboard-Multi-Touch-920-003070/dp/B005DKZTMG), so the next step is to set that up
   * This was a very rigorous and difficult process that entailed inserting the USB dongle and turning on the power switch on the keyboard!
10. Up to this point, I was using wired Ethernet for internet access. I don’t have a hub on the boat, so I got a [wireless USB adapter](http://www.adafruit.com/products/814)to connect through instead. Setup was a 2-minute task:
    * Turn off the Pi
    * Plug the adapter into the Pi, and disconnect Ethernet
    * Reboot
    * Open the WiFi Gui
    * Click scan. double-click the network you want to connect to.
    * Enter WiFi password
    * Click connect
11. Install Geany for C/C++/Python development
    * sudo apt-get install geany
12. Enable I2C communication (for Arduino and sensors)
    * edit /etc/modules
      + add i2c-bcm2708 and i2c-dev
    * edit /etc/modprobe.d/raspi-blacklist.conf
      + #blacklist i2c-bcm2708
    * sudo apt-get install python-smbus i2c-tools

At this point I have a RPI device up and running.

Setup OpenCPN

1. Rather than replicate the instructions, and to make sure that they stay up to date as new versions are released, I refer to the instructions at <http://www.agurney.com/raspberry-pi/pi-chart>  since that is line-for-line what I did to install OpenCPN
   * I did update config.txt for vector charts so that if I change my mind it won’t crash
   * I did update opencpn.config for MEMCacheLimit=40 NCacheLimit=10 (Must be done after running OpenCPN for the first time)
2. Reboot
3. Download the appropriate [NOAA charts](http://www.nauticalcharts.noaa.gov/staff/charts.htm), and extract them into a directory
   * You can use Raster or Vector charts. I use raster charts as I think they look cool, and they seem to perform better on the Raspberry Pi
4. Add the directory to the charts directory in OpenCPN, and allow them to be scanned and indexed
5. As you zoom in and pan, more charts will be indexed and scanned. This takes a while on the RPI, but it seems to be pretty stable. Spend some time getting the most common areas in your cruising grounds stored, I simply pan, zoom, and wait until the charts are indexed. I took 3 iterations until I got all the charts indexed
6. Install the Konni Logbook plugin from <http://opencpn.org/ocpn/downloadplugins>

References

* <http://www.raspberrypi.org/downloads>
* <http://elinux.org/RPi_Easy_SD_Card_Setup>
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