

# Digital Mapping with OziExplorer / oziTarget

Part 1 by Sean Kavanagh

## **Going Digital 1 - Navigation with computers for the masses**

If there is one thing that the recent National Championship in Canowindra showed me, it is that Digital mapping and flying with computers is here for the mainstream.

The second thing it showed me is that most people are still playing catch up with all the new technology and there is a gulf between those of us that use this without drama and those that are kicking and screaming and not understanding how it all works or how it could work better.

There are a number of solutions out there but all of my competition experience had been with OziExplorer.

I have played with Memory Map and CompeGPS/TwoNav and I keep coming back to Ozi. Maybe because it is what I know, and probably because I have customised it so heavily that so far none of the others can offer the tools I use in competition flight planning and flying.

## **Why use a digital map?**

As silly as the question sounds, it is not un-reasonable considering one of the great things about flying a balloon is that ability to just feel what you and the aircraft are doing and directly connecting with the air around you.

Typically, the more connected and aware of the atmosphere around you, the better you can fly and the more likely you are to be aware of changes that can help you plan and plot a successful flight.

There is a risk that the more toys you have in the basket, the greater the potential distraction and disconnection from the conditions you are flying in.

Having just gone through hours of video of me flying at the Nationals I am pleased to say that for me at least, the computer is a Nav Aid only. I spent very little time looking at it or playing with it. Most of that happens before I take off.

During a flight I quickly check the info it is giving me then get my head back out there where the flying is happening.

The why, if you can get there, is that flying with a digital map can give you more time to connect with your flying. A digital finger on the map means you can spend less time checking you are not flying into a PZ, less time picking goals and less time trying to work out exactly where you are.

It is all the goodness that a handheld GPS brought to the sport with the bonus of visually showing you where you are.

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For everyone, this should be the goal. You want to make the computer as unobtrusive as you possibly can. It should confirm what you are doing and give you options that reduce your workload and that is it. If you need to fly staring at the screen then you will be dangerous to yourself and those around you.

A big part of this is familiarity. It needs to be practiced and second nature before you take off with it in the basket.

## Getting started with OziExplorer

First of all you need to choose your computer and operating system. OziExplorer is available for both PC and Android but the Android version is very new and still in early testing.

I use the Android version for in car navigation as it allows our crew to have a finger on the map with a cheap Android Tablet (Nexus 7) that has the GPS built in. The tablet requires no cables and can be passed around between crew with ease and safety.

The Android version of Ozi is not the best for in flight competition work as it lacks easy access to the key information that you need but for general flying it is easy enough to use. Customisation of Ozi for Android is a whole other article so I may cover that in another issue but just be aware that if you are feeling geeky there is a PC program for editing the screens in the Android version of Ozi so you can tweak it to your heart's content.

In the past, most people have found the Motion LE1600 tablet computer to be a great solution in the basket. It is an older tablet PC that is often available on eBay relatively cheap.

If buying one you want to get one with the VIEWANYWHERE display. This is what they call a transfective display that uses reflected sunlight to brighten the screen when viewing in daylight.

Normal laptop displays can be hard to see or need the brightness turned up so much that they chew through batteries. Newer tablets are out there but it all comes down to cost. The mapping software is not very demanding so an older machine will do just fine and these are reasonably rugged.

A tablet PC is the best way to go in my opinion as interaction with a map is so much more intuitive and faster using a stylus. The main problem with a normal laptop and touchpad is finding the mouse pointer. The time wasted looking for and moving the mouse pointer compared to just touching what you want with a stylus cannot be under estimated.

*Update: June 2014*

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As of early 2014 there are more and more cheap Windows 8 Tablets hitting the market with great battery life due to the latest intel chipsets. Most still have the smaller 10" screens but larger 11.6" or 12" screens are coming out such as the Surface Pro 3.

In all cases, a tablet that uses the Wacom digitiser (an active digitiser) and pen for input is going to be nicer to work with than a touch only display that you use your fingers with (a capacitive digitiser).

In short, capacitive digitisers like your phones screen are okay but you will be taking your gloves off or use it or using one of those rubber tipped stylus pens that are rubbish. An active digitiser will have a pen with a fine point that is very accurate.

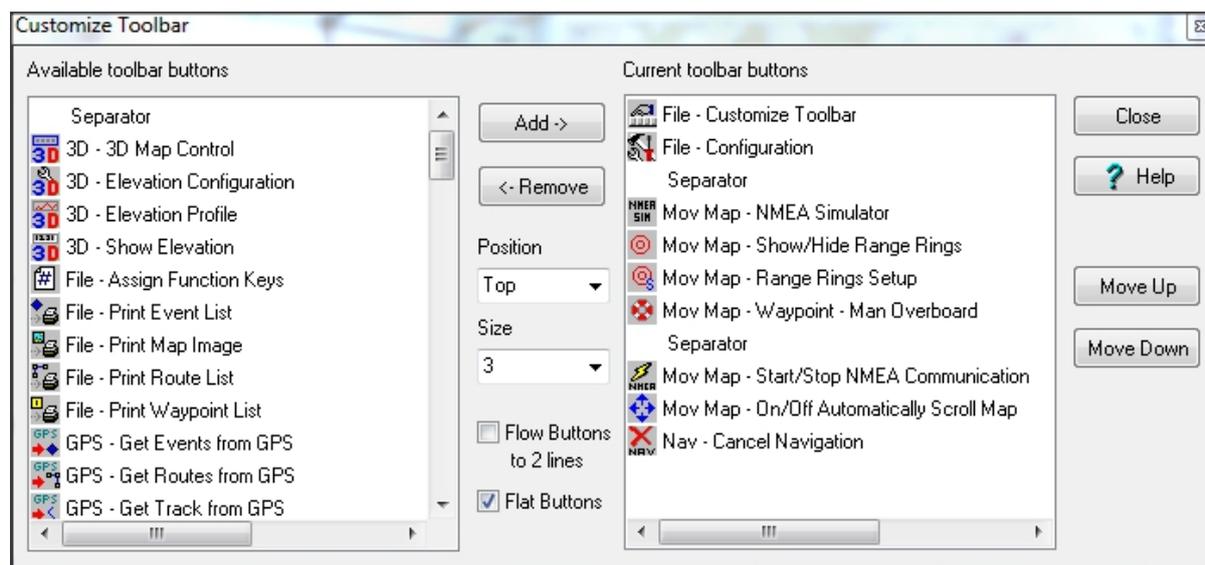
## PC OziExplorer and the basic set up

The first thing you want to do when setting up OziExplorer is clear some of the clutter away and customise the tool bar so it only shows what you want to use. I tend to leave the main tool bar where it is and then use the Custom Toolbar for the icons I use all the time.

If the custom toolbar is not turned on go to the top menu tab, select VIEW > SHOW and check USER TOOLBAR.

You can then customise it but selecting FILE > CUSTOMISE TOOLBAR

Once in there Remove all the stuff you won't use by selecting it from the right hand column and selecting REMOVE. Once clear start again by organising what is left and adding anything else you want.

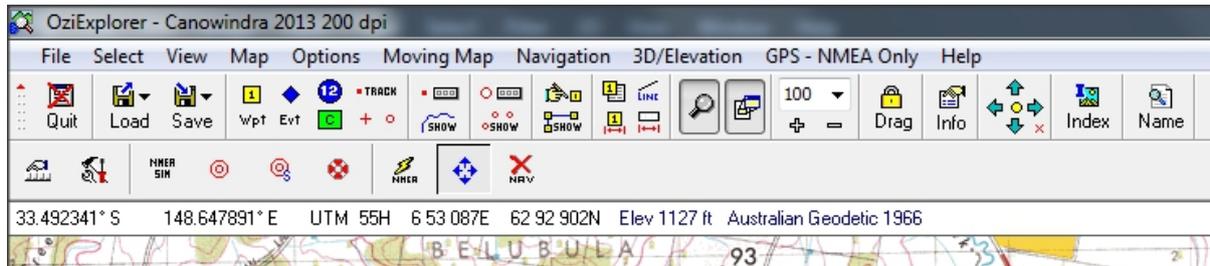


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As you can see from my example, I keep it to a minimum.

The Custom toolbar shows up under the main one by default but you can adjust the size of the icons and the location of the bar to your needs from the above customisation control.



The advantage of this is that you don't have to spend time remembering where key settings are and when you do need them they are one click away.

## GPS set up

Sadly this is one of the black arts with all computers and mapping programs. Because it can be such a pain, here are a few of the tricks that may save you a lot of grief.

1) Pick a single USB port to connect your GPS to. Always use this one port and double check you have the right one before you plug the GPS in! It may sound silly but even put electrical tape over the other ports if you need to because it can really mess with you as you are about to take off if you plug into the wrong port and Ozi and the GPS won't talk.

Why? Because pretty well all GPS communication via USB is done using a simulated serial com port.

The driver software for the GPS makes a virtual COM port for the GPS and gives that USB port a specific COM port number while the GPS is plugged in. When you get the GPS working with Ozi you set the COM port number to match and all is well with the world.

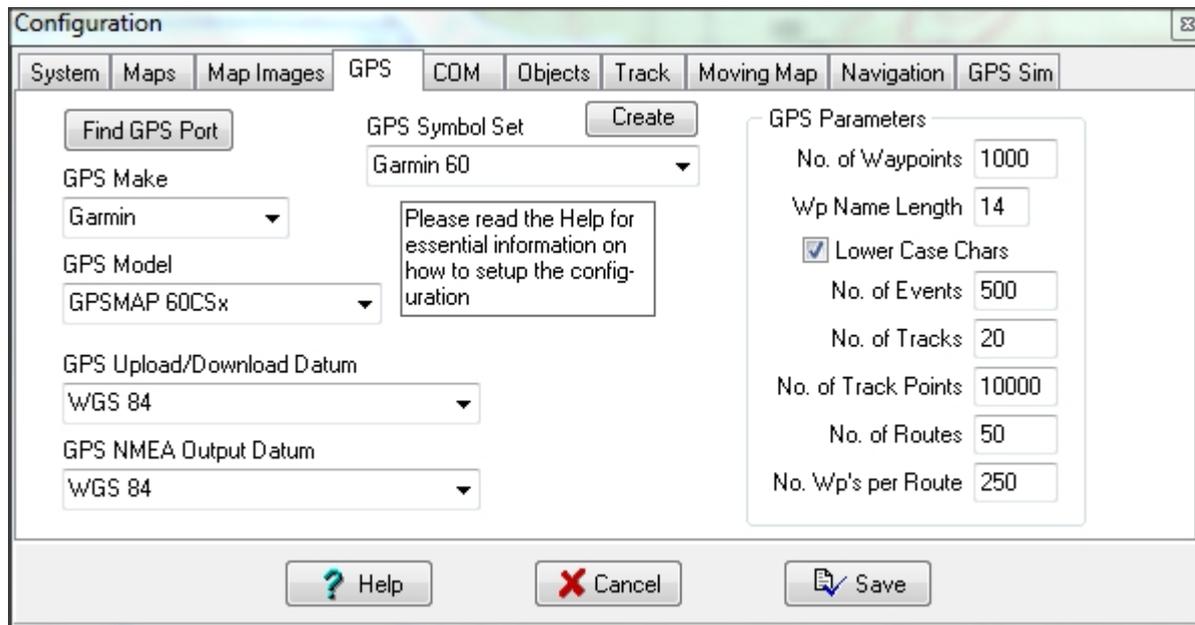
If you then plug the GPS into another USB port, you may get messages about installing driver software or if that has been done in the past, it may just set the GPS on a new COM port number and now OziExplorer will not be able to communicate with the GPS as planned.

The simple rule - one USB port and one only once you have it working.

2) Finding the COM port. All newer versions of Ozi have a com port finder tool in the configuration screen under the GPS tab.

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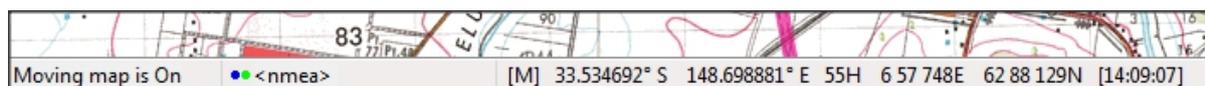
It is a little slow as it scans all the available COM ports and different speeds but once it has found your GPS set up should be straight forward.

3) Read the help file. The help file for OziExplorer is comprehensive and does answer lots of this stuff to do with setting up your GPS. There are specific sections for each GPS manufacturer. If you have a little USB GPS mouse then that will be a NMEA only type device.

4) Know that NMEA is another way of saying talk to my GPS. What is NMEA? NMEA is the data format that is used to send position info from your GPS to Ozi. The fact that Ozi uses the technically correct terms can be off putting but just keep in mind that if you want Ozi chatting to your GPS, it will be doing so via NMEA.

5) If you don't have the NMEA button on your custom menu (the little yellow lightning bolt) then communication with the GPS can be set from the main menu : MOVING MAP > START NMEA COMMUNICATION WITH GPS and stopped from the same place.

6) Know where the communications indications are. In the bottom left of the OziExplorer Screen a message will show up when Ozi is communicating with your GPS. It will flash the green and blue dots on and off with each exchange of information. If this is not happening then something is wrong.



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## Maps...where to get your maps.

Digital maps were and still can be a real pain to get and set up. It is less of a drama now but here are a few pointers and tricks.

Competition maps like the Canowindra map and other events around the world will often be available in a format that is compatible with OziExplorer for some simple reasons - the officials tend to use OziExplorer and the calibration and map files can often be converted to other systems easier than they can be converted from other systems back to OziExplorer.

Why? Because OziExplorer uses an open file format with simple text files to store the calibration data. Anyone with a small amount of skill and notepad on a PC can get to that information and play with it.

In most cases you will not have to get your hands dirty calibrating maps however it is a good skill to have and gives you options down the track as you get more comfortable with the software.

The biggest trick with maps to understand is that you will have an image file for the actual map and a second file that is the text file that holds the calibration information. It is the calibration file or \*.map file that you select and open in OziExplorer.

If you took the Canowindra map as an example you have a file called Canowindra\_2013-150dpi.ozfx3 which was the image file and Canowindra\_2013-150dpi.map

## Image formats

OziExplorer can work with all sorts of image formats but which format your map is in will directly affect performance.

A simple JPG image works fine for a map but it will slow down the software. Likewise a TIFF image works well but if it is not formatted correctly it will be a huge file and potentially slow too.

The Ozi specific OZFX format is by far the fastest and best quality for use in OziExplorer. The downside is that you can't open it in anything other than OziExplorer once you have converted a map to it.

If you get a map in another file format I would strongly recommend looking for the img2ozf tool on the OziExplorer website and using it to convert your map. It will load faster and render better on the screen.

Turning the geek up to 11 for a moment - this is my workflow in setting up a nice map.

Presuming the original map image was a JPG file and we have that calibrated.

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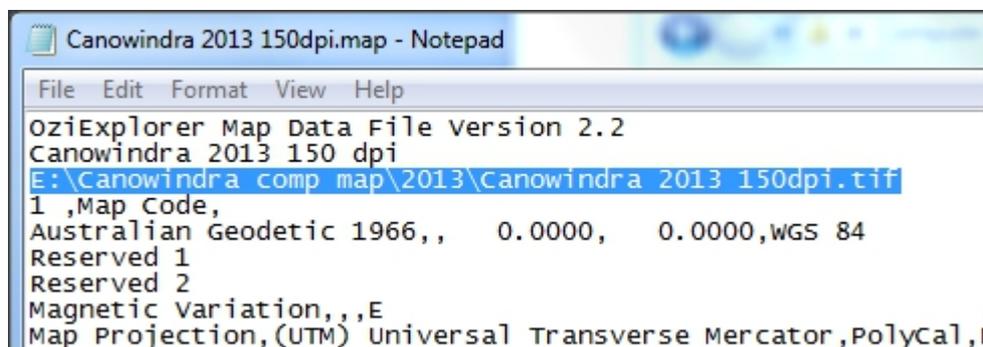
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Open the JPG image in Photoshop or similar and change it to an indexed image with only 256 colours. Play with dithering until you are happy with the appearance at 100% zoom.

Save it as a TIFF file

Save a copy of your \*.map file with another name so you know this is the version that will open the TIFF image.

Open the \*.map file in notepad and change the map image name to the TIFF version you just saved from photoshop etc.



```
Canowindra 2013 150dpi.map - Notepad
File Edit Format View Help
OziExplorer Map Data File Version 2.2
Canowindra 2013 150 dpi
E:\Canowindra comp map\2013\Canowindra 2013 150dpi.tif
1 ,Map Code,
Australian Geodetic 1966,, 0.0000, 0.0000,WGS 84
Reserved 1
Reserved 2
Magnetic Variation,,,E
Map Projection,(UTM) Universal Transverse Mercator,PolyCal,
```

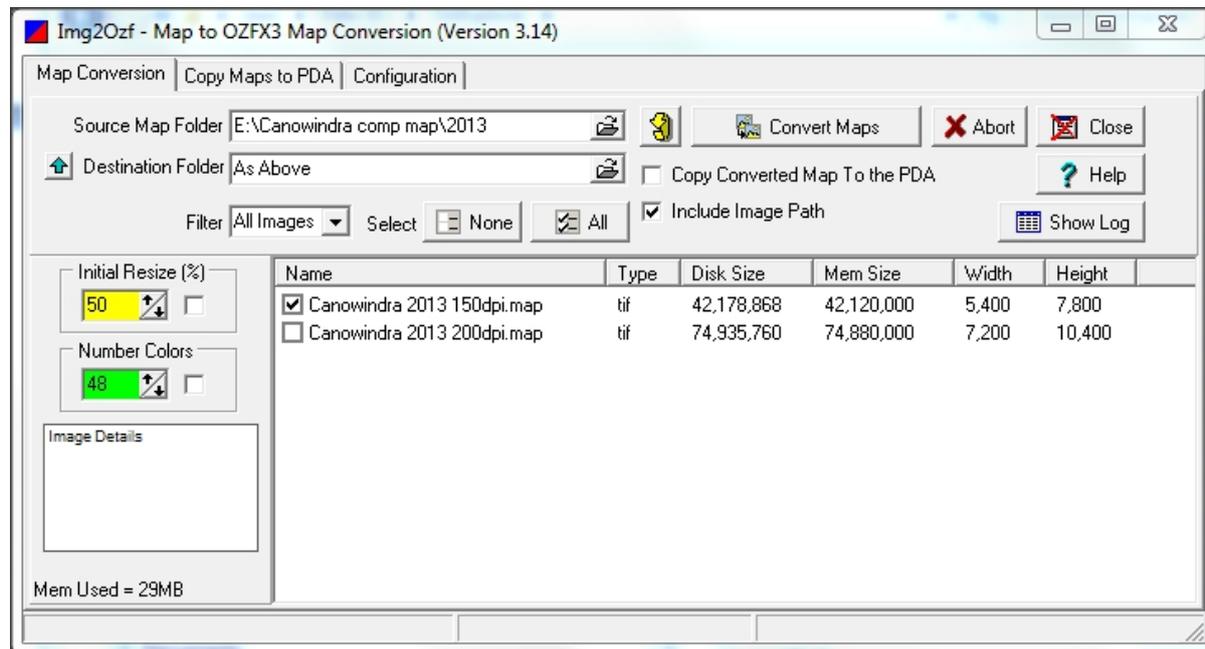
Save the file from notepad and open it in OziExplorer to make sure it works as expected.

Provided you have not changed the size of the image in pixels wide and high, it will open and work exactly as the original map did.

Now we can convert it to OZFX format using the img2ozf tool

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Note: You could just do this straight from the original map and jpg image but I have found that the img2ozf tool is pretty average at reducing colours. The above workflow will give you a much sharper and cleaner map.

## Google maps and other online maps with OziExplorer

One of the least documented and best hidden features of OziExplorer is the use of internet maps.

You will have to look carefully on the web site to find the link to the information - here it is to save you some time : <http://www.OziExplorer2.com/eng/osm.html>

If you download and install the internet maps file, it will install all the bits you need to view Google maps or open street map images in OziExplorer.

Once installed you need to load the internet.maps.map file which will be in your OziExplorer/maps/internet map directory.

Now obviously you need to be online so it can download and show you the map tiles from Google etc. but every map tile you view is being saved to your computer which means that when you are offline, you will still be able to see the map at the zoom level that you looked at while online.

So say you wanted to fly in new area that you don't have a digital map for.

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Go online and open your internet map. Zoom out so you can find the area you want save for later use. You then need to simply zoom in and pan around the flying area to record all the map tiles at the various zoom levels.

It can be a bit tedious but I would start at say zoom level 10 and go down to about 14 or 15 depending on your patience and level of detail you want keeping in mind that if you have not downloaded a tile for that zoom level, it will not be available when flying.

When you start up the internet map file while offline you will get a warning that you can ignore and the map tiles will load from your hard drive as needed.

**End of part 1**