SOTA Mapping Instructions

Apart from checking a different area, these instructions should be applicable to all states, although examples given are related to the Hunter area of NSW.

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Based on details for VK7 Summits from - Justin Giles-Clark VK7TW (vk7tw@wia.org.au)

Updates from Ed Durrant VK2JI (VK2JI@wia.org.au)

These are instructions for mapping summits for SOTA in Australia – there may be better ways of doing it and I would love to hear from people who have improved or simplified the process.

Table of Contents

1. Document Overview:

Aim of document: To describe options and tools available to assist in classifying summits for the Summits On The Air (SOTA) award scheme.

Deliverable: The deliverable from your work guided by this document will be a spreadsheet in the correct form, for submission to the regional SOTA coordinator so that he can combine all submitted regions into a submission for the association to the SOTA Management team for consideration for approval to enter into the worldwide SOTA system.   Other data gathered by this process may also be used to update the ARM.

2. Introduction - Joining the team and getting the tools.

- Become a member of the Yahoo Group: SOTA_Australia@yahoogroups.com.au

- Access the SOTA_Australia Yahoo group site at http://au.groups.yahoo.com/group/SOTA_Australia/ – click on the database link on the left hand side followed by your states database (these have the naming format of "SOTA VK**x** Regions" where "**x**" is 2 or 7 or 4 etc.   You should now see a list of the planned regions with the association (state). in the case of New South Wales it's been split on weather regions:

Tables > SOTA VK2 Regions

Code	Region
CT	Central Tablelands
CW	CW Slopes & Plains
HU	Hunter
IL	Illawarra
LW	Lower Western
MN	Mid North Coast
NR	Northern Rivers
NT	Northern Tablelands
NW	NW Slopes & Plains
RI	Riverina
SC	South Coast
SM	Snowy Mountains
ST	Southern Tablelands
SW	SW Slopes & Plains
SY	Sydney Metro
UW	Upper Western

- This page will also indicate whether someone is already working on that region (contact field) and the current status of the work.

- If you find a region not yet assigned contact the regional coordinator to ensure you wont be duplicating work. Once a region is assigned to you the database will be updated.

- You will need the following free applications and data files installed on a Windows PC:

    - Adobe Acrobat (http://get.adobe.com/reader/) - (version X or later works).

    - Install the Terrago Toolbar for Adobe Acrobat from their downloads page at ***http://www.terragotech.com/software/TerraGo_Toolbar.exe*** *(please refer to appendix 2- Using TerraGo for how to use this tool).*

    - Download and install the Google Earth application (http://www.google.com/earth/download/ge/agree.html - the Google Earth application will download some LARGE files. There is also a Google Earth plug-in for browsers but this does not provide all the features we need. NOTE: measurements (lat / long / height etc. are **APPROXIMATE** they are not accurate and should not be relied upon for the submitted data. Data from Geoscience Australia is the best data for accurate elevation information. Google Earth is only a good tool to give you an idea of where summits are located.

    - Download the full Shuttle spacecraft SRTM VK KML file (KML files are used by Google Earth, they often appear as KMZ which is simply a zipped version of the KML to reduce the size of the file). Brenton VK2MEV has provided this file for

download here: http://www.fireflydesign.net.au/srtm/all_peaks.kml (~850KB, 6432 "candidate" peaks). This file can then be loaded into Google Earth to display where the candidate peaks are. Alternatively you could create a new map in Google Maps and then import the kml or kmz file you are using. Unfortunately there are some false positives and missed peaks in the all_peaks file, but it is a good basis to start classifying a region from.

• Now you need to get the maps of the area you are going to qualify

1. Download the relevant 1:250K topographic PDF map file(s) from the Geoscience Australia website: http://www.ga.gov.au/cedda/maps/279?p=4&&ms=250000&&s=TITLE&

If you can find the "georeferenced PDF map" for your area this is what you are looking for

2. I have found that the mapconnect web site is the quickest way to obtain the required maps for the area you are "surveying". Start at the mapconnect website -

http://mapconnect.ga.gov.au/MapConnect/?site=250K&accept_agreement=on

(Please refer to the appendix for step by step details on how to download these maps).

3. If you prefer to use an online mapping service then maps.six.nsw.gov.au is a very valuable resource however this service is ONLY for New South Wales. Perhaps there are other " Spatial Information eXchange " map sites for other states?

3. What data do we need to gather to classify a summit for SOTA?

There is data to be gathered both for the ARM document and for the submission template. The submission template concentrates on qualifying summits to be valid for SOTA classification while the ARM gives useful information for those wishing to activate the summit – we need to collect data for both of these documents.

The following will be the fields that you need to gather. Some will be used to complete the template spreadsheet – this will be sent to you by the coordinator when you volunteer to qualify a regions summits, the other fields are for the ARM. You will need to keep your data in case the SOTA management team wish to query your findings.

A. Summit Name – not all summits have names but if they do it is good to state them – see appendix C: useful URLs for places you might find these if they are not on the map you are working with. If the summit has no name enter "no-name" and it's SOTA code will be used as its name for activations.

B. SOTA Code – this code will have the form shown below however you do not need to complete this field – it will be completed by the association coordinator. **Leave this field blank in the spreadsheet.**

1	Central Tablelands	VK2/CT-xxx
2	CW Slopes & Plains	VK2/CW-xxx
3	Hunter	VK2/HU-xxx
4	Illawarra	VK2/IL-xxx
5	Lower Western	VK2/LW-xxx
6	Mid North Coast	VK2/MN-xxx
7	Northern Rivers	VK2/NR-xxx
8	Northern Tablelands	VK2/NT-xxx
9	NW Slopes & Plains	VK2/NW-xxx
10	Riverina	VK2/RI-xxx
11	South Coast	VK2/SC-xxx
12	Snowy Mountains	VK2/SM-xxx
13	Southern Tablelands	VK2/ST-xxx
14	SW Slopes & Plains	VK2/SW-xxx
15	Sydney Metro	VK2/SY-xxx
16	Upper Western	VK2/UW-xxx

C. Region – Select the region name you are working on from the association table in the ARM document. The one above is the one for VK2.

D. Points – this value is relative to the height of the summit and points awarded, it can vary from association to association and will be filled in by the association coordinator. **Leave this field blank in the spreadsheet.**

E. Zone – this is displayed at the bottom of the GeoPDF maps and normally will be the same for all of a region.

F. & G. Easting & Northing – these fields can be obtained either from the GeoPDF map using the TerraGo tool or are displayed when using the "coordinate tool" at maps.six.nsw.gov.au (take the GDA94-MGA56 option). Alternatively the earthpoint web site that takes your spreadsheet and adds UTM (Zone, Northing, Easting) values into it. See Appendix D - Useful resource URLs for the link. This data is particularly useful to summit activators.

H. Height – in metres and feet – note for feet simply have the spreadsheet multiply the field containing the height in metres as =round(H2*3.2808399,0) to create the value in feet - where H2 is the field with height in metres.

 Google earth will display the summits height, however this is only approximate, so you should check the value on one of the other maps or mapping tools. Maps using Geoscience Australia data give the most accurate elevation information.

I. & J. - Latitude & Longitude – this you can take from Google Maps however you will then have to convert it from Degrees / minutes / seconds into decimal values (see appendix D. for information on how to do this) – I prefer to use the "coordinate tool" in SIX maps.

K. L. & M. - Saddle Height and location (lat/long) – this is the hardest part of the qualification work – please see the details later explaining what a saddle (or Col) is and how to find its data.

N. Saddle Notes – this should contain the compass direction from the summit to where the saddle is located.

O. Comments – any general comments you may have, from looking at the summit on the map, such as how easy access is and where from.

P. Prominence – This is the difference in height from the saddle to the summit and can be done with a simple formula in the spreadsheet such as "=H2-L2" or similar depending upon the spreadsheet column labels.

 When completed – get someone to check your data.

Submit the validated spreadsheet to the association manager (for VK2 it is Andrew VK2UH – Andrew at vk1da dot net) for inclusion in the Association Reference Manual (ARM) document.

Remember to keep copies of all of your working data as the SOTA management team can come back and request explanations to justify the data you submit.

Suggested steps to perform to gather the data after installing the tools.

1. Get list of potential summits (see appendix C. if you wish to start from the all_peaks.kml file)

2. Start at one point (e.g. NW corner) of the region you are classifying and work across and down (i.e. East and then south). In other words work methodically across the area, do not jump from place to place within the area.

3. For each potential summit assess its likely viability before spending more time on it (for example a summit that is very close to another summit is likely to be ruled out on Prominence).

4. Get the elevation of the summit from one of the maps or the tools (remember Google Earth is not accurate so do not use it except to guide you to a location in a more accurate source).

5. Get the name of the Summit from the map or if it's not there try the Geoscience gazeteer.

6. Assess prominence of the summit to its saddle (see later for details how to do this).

7. Add the summit to the spreadsheet and capture/calculate the other required fields.

8. Once you have completed your region exchange with someone working on another region and each verify the others work. If you are comfortable with Google Earth you could compile a kml file of all of your summits to supply to the reviewer as it will make his/her work easier.

9. Submit the final document to the regional coordinator.

4. How to work out prominence of a summit over its saddle.

Guidelines from the SOTA rules:

(http://www.sota.org.uk/RulesAndGuidelines)

• Where there are a number peaks close together or there is a lack of contour detail – we suggest   you consult other maps.

• The reference level that makes a summit's "prominence" needs to be logged as well. This is   referred to as the saddle in the spreadsheet.
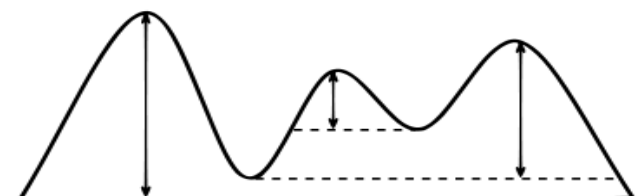

Figure 1. Vertical arrows show the topographic prominence of three peaks on an island. The dotted horizontal lines show the lowest contours which do not encircle higher peaks (Sourced from Wikipedia - http://en.wikipedia.org/wiki/Prominence).

The first vertical line is the height of the first prominence and this is referenced to the height of the first saddle where the contours surround it. If that was the only prominence and it was an island in the sea then the saddle height would be 0 m. However, in the example above there are three prominences – the second prominence is referenced to the second saddle at the lowest contours that surround it and the third prominence is referenced to the first saddle which are the lowest contours that surround both the second and third prominence.

The SOTA VK Rules state that summits need to have at least 150m prominence in other words there must be a 'vertical separation' of at least the 150m between the summits and their associated saddles (also known as cols).

What is relative height / prominence ? For SOTA, for a summit to have 150m prominence it must have a contour completely around it at 150m below its highest point. A peak is not a SOTA peak if it does not have the 150 m prominence.

Questions to ask to guide you whether a summit meets SOTA requirements

1. If you look at the peak's height (e.g. 550m) and then look at the contours around the peak as they go down in height, is there still a complete contour surrounding this peak at

150m down from the summit (at 400m in our example) – if not, the peak does not have enough prominence to qualify.

2.   Is there another peak within the surrounding contour that we found at 400m in the example above? If so – if that summit is less than the height of the first summit it cannot be a SOTA summit HOWEVER it does not disqualify our first summit. If this second summit is higher than our first summit, and more than 150m up from the joint contour it becomes a second SOTA summit.

 Count down the contours for 150m from the summits height and then track this around – if it joins up where you started (even after many kms) the summit is within that prominence loop and qualifies as a SOTA summit.

Whichever tool, map or website you prefer to use it is important that the contours around summit are clearly visible to avoid mistakes.

Ben, VK5TX has come up with an innovative way of checking this using Google Earth and the flooding function rather than the laborious tracing of the contour around the summit on the map. Set the flood level to the summit height minus 150m and flood. You can then see where the contour at that height is by the water level on the resulting image (your summit becomes an Island). By adjusting the flood level down, you will then find the saddle point (or col) where the "island area" then connects to other land as the flood goes down.

Any other SRTM points on your 150m high island cannot count as summits in themselves. The highest summit on the "island" is the SOTA summit, the others are simply "bumps on the side" of the SOTA summit.

Please remember that Google Earth data is not totally accurate and you will need to check your conclusion on a Geoscience Australia map or website.
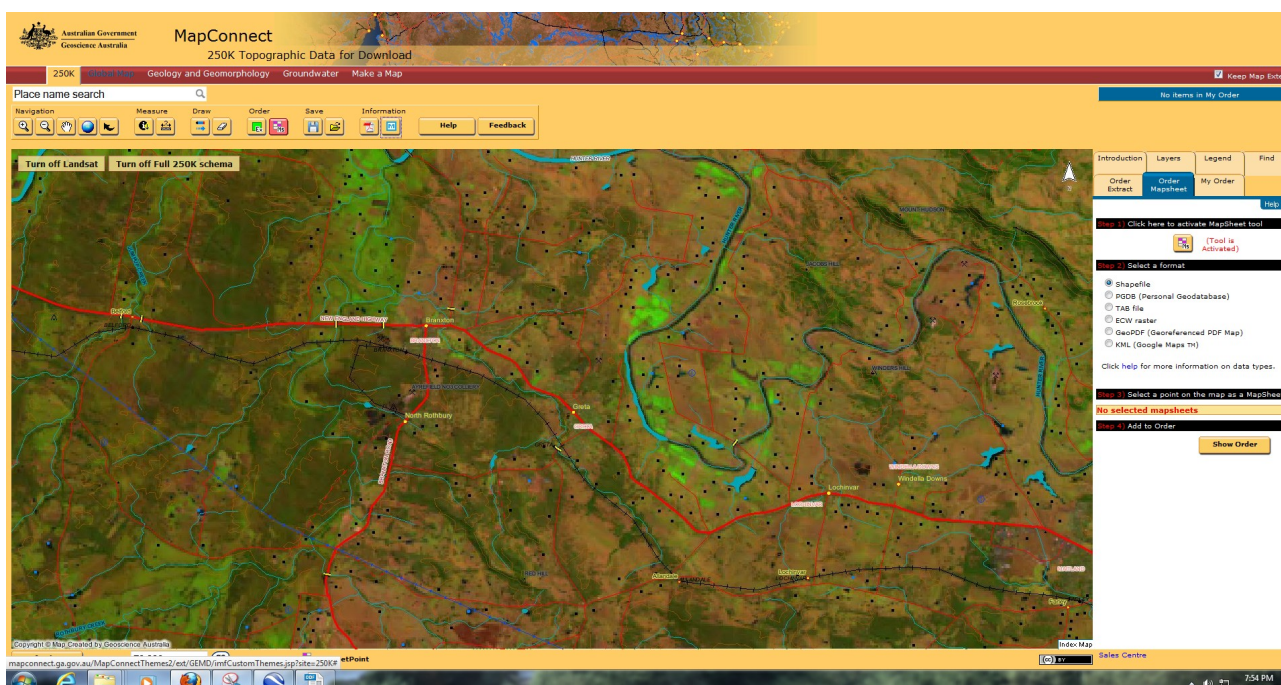
 Get the "flooding" kml file and full instructions on how to install from http://sterzbach.de/geflood.html.

Appendix A: Obtaining and using the Map Connect series of maps.


The mapconnect map areas are cover different sized areas of Australia. This diagram above shows the ones of Interest for the NSW SOTA regions – Hunter, Sydney Metro and Illawarra.


Note – *the following pages contain a very detailed step by step description of how to obtain these maps for those used to mapping sites, you can probably go to the mapconnect site and download what is required without these instructions – however as I had some issues working around the site, I have added these details to help.*

When you get to the mapconnect site – to navigate to the area you want you should select the appropriate tool from the list at the top
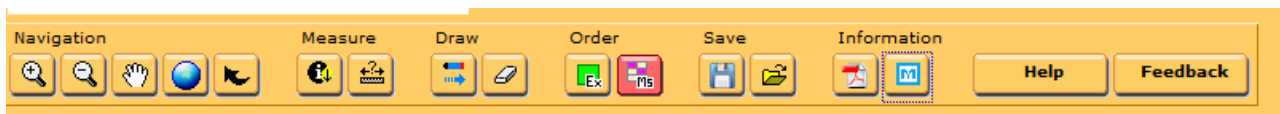
The tool selected is indicated by the "active map tool" at the bottom of the map:
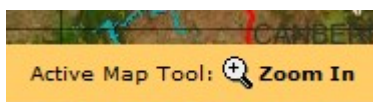
Useful tools are The navigation + and – magnifying glasses – to increase or reduce the displayed map coverage area and the hand to move the "window" of what is visible N, S, E W or diagonally. Another alternative if the area is now too large or you need to go away from the centre of the presented area simply draw a square of the area that you wish to go to with the mouse and when you release the mouse key the map will relocate to the chosen area. Now that you are in the correct area make sure you click on the "250K" tab (the first one on the line of tabs)

Once you wish to select the map to be saved in any of the formats displayed on the "order mapsheet" tab (we are interested in the GeoPDF and KML options – click on the appropriate option) you should select the red Ms symbol either at the top of the screen or the top of the "order mapsheet" tab page. Once you have done that and "(Tool is activated)" is displayed, clicking on the map will enter into the form (step 3) the name of the map that covers the area you are interested in.

Now click on the (Add to Order) button. After clicking on add to order the message no sheet

selected will come up – this is not the best user interface – what it has done is added the map you requested to the order and cleared itself ready for you to select another area, but to keep it as simple as possible, lets just download one map at a time – so now on the right hand side we need to move to the "My Order" tab where we see the following:


Click on the blue ready text and a standard download from your browser will take place – depending upon how you have configured your browser. I use Firefox with it configured to always prompt me and ask for where I wish to store any downloaded files – so I get the following dialog box displayed – your system may be slightly different.
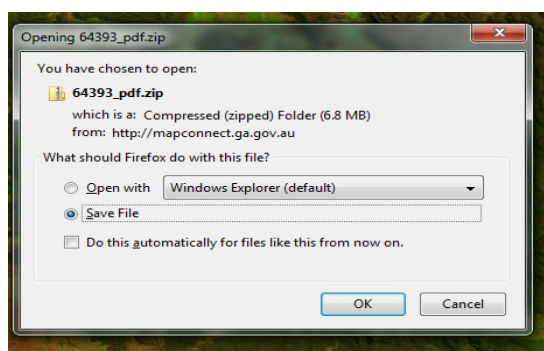

Note this is a **ZIP** file containing a file structure with the actual PDF map located a couple of levels down make sure when you download this file the file extension stays as "zip" otherwise windows won't know to handle it as a compressed package of files!

Once you open the zip file you will find the PDF Form map along with the copyright & creative commons rules for its use – as we are not using this data in any commercial way – the Australian government provides these maps as a free service (well our tax dollars paid for their creation – so that seems fair!).

Here you can see the structure within the zip file before you get to the actual map file.
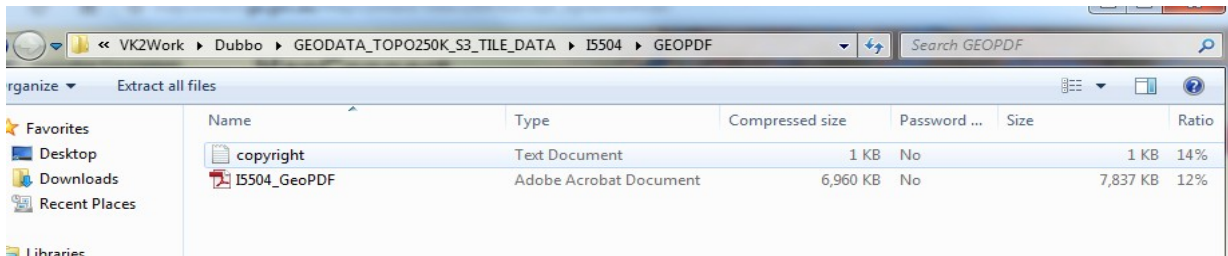
Copying the file out of the zip file and renaming it (making sure to keep the pdf extension this time) , and opening the file in Adobe reader, we see the following:
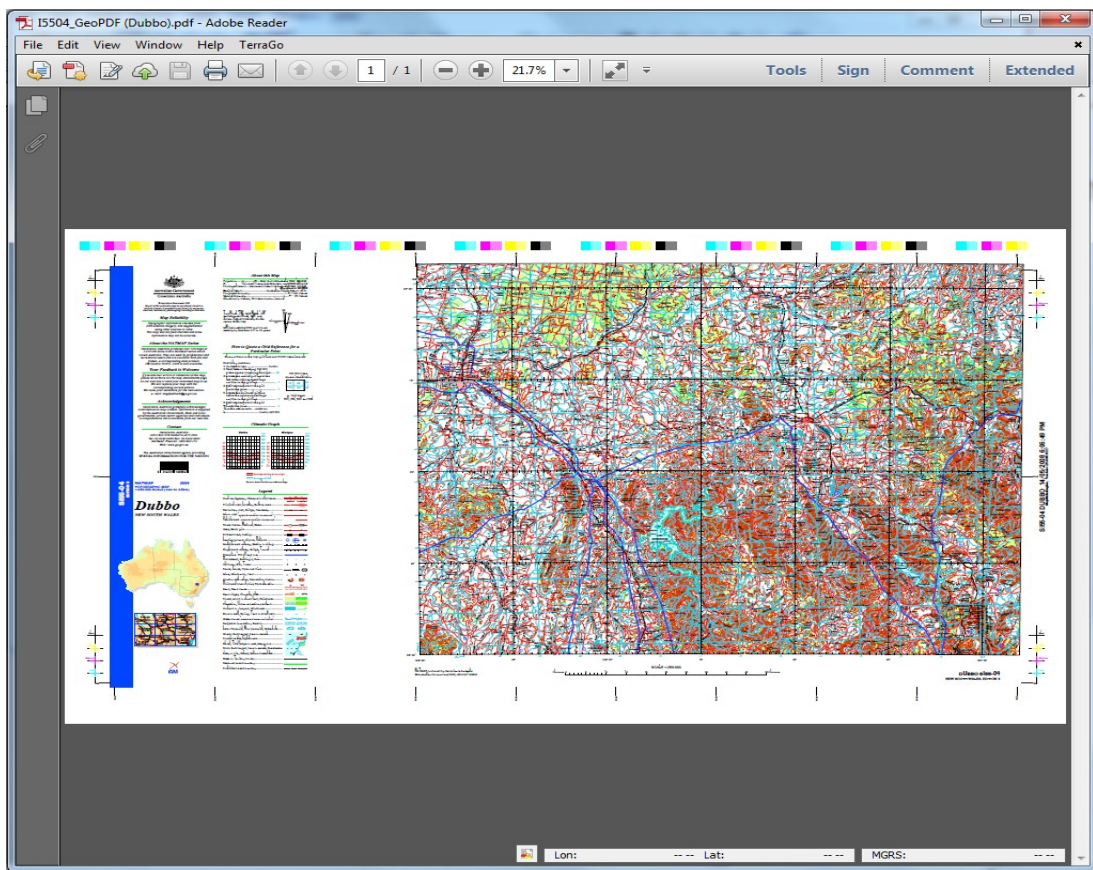

This may look rather small and not practical until you realise it is displaying a VERY LARGE map at 21.7% of its real size and it can be enlarged up to a size more than large enough for us to be able to use.

Appendix B: Using TerraGo:

• Start on the 1:250K PDF map that covers the region you are looking at. Familiarise yourself with the map and the regional boundaries.

• In Adobe Acrobat turn on the Terrago Extension, this allows you to scan the 250K PDFs and click on locations with the cross hairs and get the Long/Lat and Eastings and Northings in one go. To turn it on in Adobe Acrobat – click on the "Extended" pull Quick service down and click on the cross-hairs symbol.
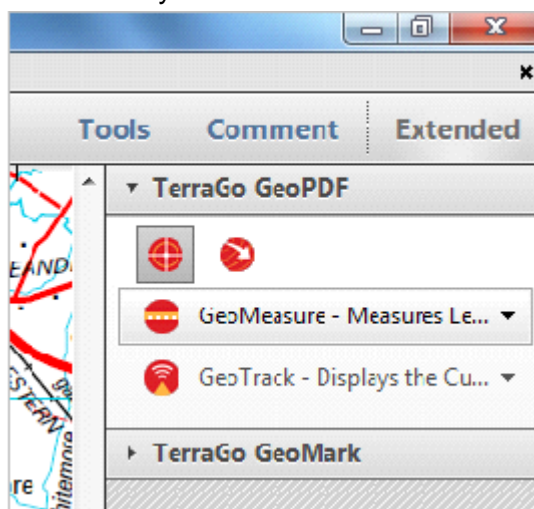
• To get the height right click on the location selected and click "Google Mapit" and this will take you to the browser Google Maps view of that location.

• Copy and paste the Long/Lat from the Google Map view into Google Earth - click on the location to get the height. Double check as to whether that is the highest point in that vicinity. You will also see the Shuttle SRTM data points and do a double check with them and add the SRTM data point to the comment on the spreadsheet. Add the height data to the spreadsheet as well as any other comments that may be helpful like nearby roads, etc.
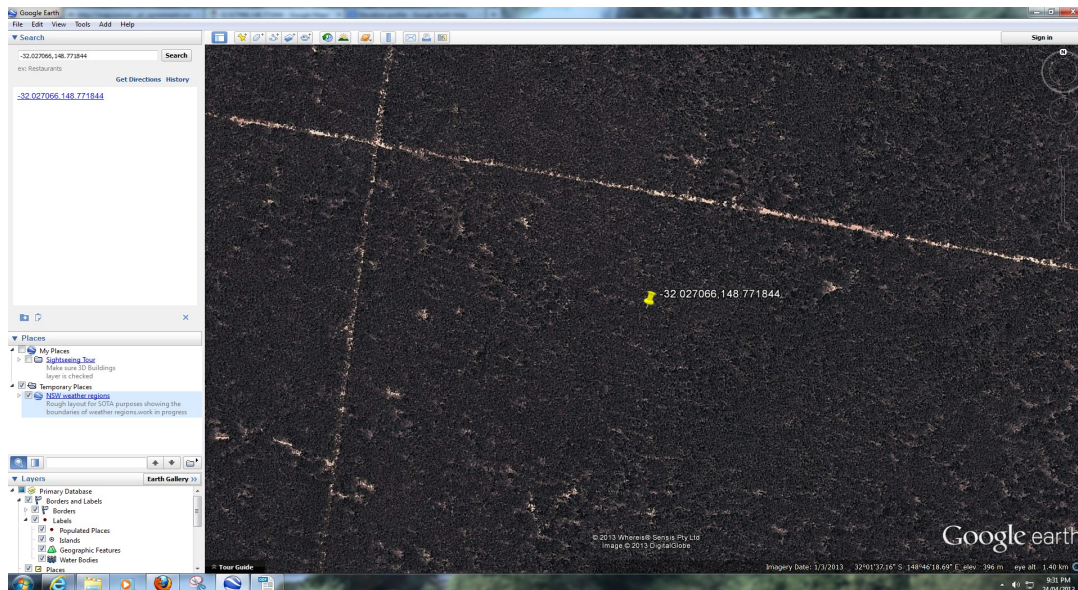
Appendix C: using All Peaks.kml.

Brenton VK2MEV has mathematically created a Google Earth (KML) file of likely peaks which may have 150m or more of prominence for all of Australia. While this data is not 100% accurate positioning being based on NASA SRTM data captured from Space Shuttle passes, it is a good place to start and once you confirm a summit is valid for SOTA the exact location can be checked from the GeoPDF or other maps.

Zoom in on the Google Earth screen to get as far as you can, just the area you are surveying on the screen and then enter all of the SRTM numbers into the spreadsheet to ensure you don't miss any later. I prefer to print out the screen and then run down it with a ruler noting each SRTM number as I go. I then enter these numbers into the spreadsheet and sort the sheet data on the SRTM column.

Going back to the Google Earth screen and selecting each SRTM point (the pin raises a little when selected) and pressing the right mouse button you can select properties. This will supply you with the latitude and longitude values for the point. By default these are in degrees, minutes and seconds and the form required for our data is decimal values – In Google Earth go to Tools/Options/3D View tab and select "Decimal Degrees" in place of the default "Degrees, Minutes, Seconds" and apply the change, now when you go into the properties of any SRTM point, the lat & long will be displayed in decimal degrees values as we require.

On a different tab of the Properties panel the altitude in metres is displayed. Please note however that this value is not always accurate and is best checked using one of the GeoPDF based maps.

The Eastings, Northings & zone can also come from the GeoPDF or SIX map or they can be calculated using the earthpoint web site using the latitude & longitude values.

Appendix D: Useful Resource URLs:

Mapping:

Google maps: maps.google.com

Google Earth – this program uses "kml" or "kmz" files to load extra data.
http://www.google.com/earth/download/ge/agree.html

To Find Mountain Names - **http://www.bonzle.com/c/a?a=br&o=36728724**

Geoscience Australia Gazeteer – please note the Gazeteer is inaccurate as a data source
however it contains summit names not found elsewhere.
http://www.ga.gov.au/meta/ANZCW0703014255.html

SIX (Spatial Information eXchange **)** maps http://maps.six.nsw.gov.au/ (this (unfortunately NSW
only) site also has mountain names on all peaks that have names). This map site has a co-
ordinates tool where you type in co-ordinates (in decimal lat/long form) and press the go button to
go to that point on the map OR click on the map and the co-ordinates of where you are are
displayed within the tool. This tool also handles Northings / Eastings and various other
measurement types.

Map connect 1:25000 PDF form maps (use with Terratec tool) -
http://mapconnect.ga.gov.au/MapConnect/?site=250K&accept_agreement=on

Calculations:

To convert lat/long to Northing / Easting -
http://www.ga.gov.au/geodesy/datums/redfearn_geo_to_grid.jsp

or better as it takes the spreadsheet in as input and adds columns as long as you have one
column labeled latitude and one longitude (without a log-in account to this site it only does 5 lines
at a time however):

http://www.earthpoint.us/BatchConvert.aspx

To convert lat/long to decimal versions - http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-
decimal.html

To convert m to ft – http://www.metric-conversions.org/length/meters-to-feet.htm

Presentations:

http://prezi.com/-h4r0ax4vadn/sota-summits-on-the-air/

http://prezi.com/h0ncptfeqklr/sota-summits-on-the-air/?utm_source=website&utm_medium=prezi_landing_related&utm_campaign=prezi_landing_related_author