

DIMENSIONS

NEAR ENOUGH!

Since his first job as a surveyor, Bernard O'Sullivan has been using Terramodel 'and in ten years, we've done some pretty wacky things that it was never designed for,' he says.

'For instance, on one job we used the irrigation module developed for ricefield planning to do surface analyses for steel-framed submarine cradles that are placed on a floating dock to dry dock the submarines, then run on rail tracks to move the submarine to the work area.'

He now runs Survey Results, and is contracting for Australian aerial photography company nearmap.com. As with Google Earth, you can find your house on nearmap.com, but there the similarity ends. Google's images from high altitude and satellite photos are blurry

and roughly located compared to nearmap.com photos which have much higher resolution and are rectified and adjusted for terrain, camera and continental drift.

Bernard explains, 'They've invented a camera system called a Hyper Pod. Rather than being a giant lens on a plane belly, this pod has seven cameras in it, taking pictures angled in different ways all at once to create a 3D impression. These pods could be attached to almost any plane in Australia.'

There's an added advantage: because they fly frequently, you can see a site change over time. For example, you can look at ten images of the area around Geocomp Systems in Blackburn, Victoria taken over the past year.

Starting in Australia, nearmap.com eventually aims to update images monthly in cities world-

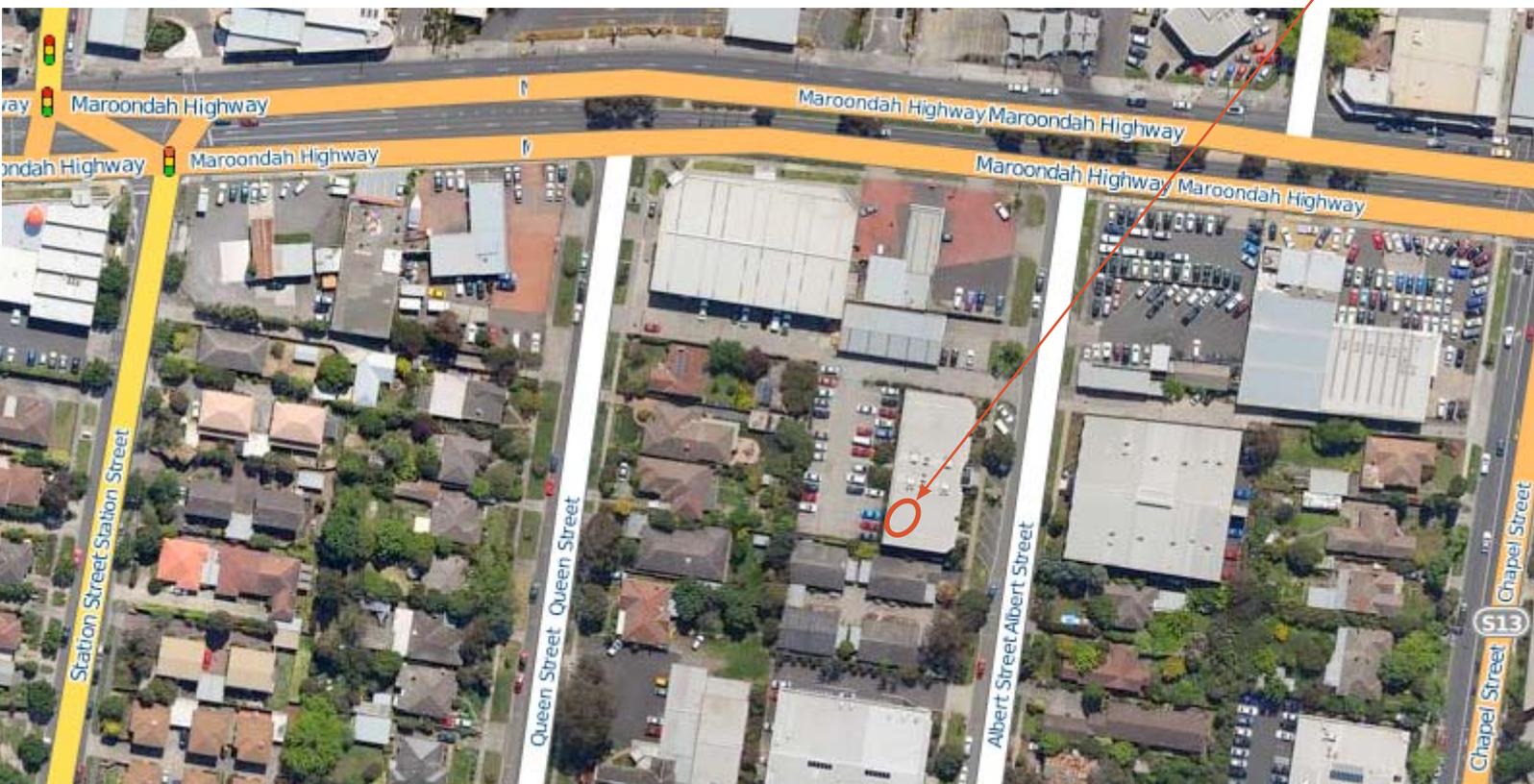
wide, or as clients might require. Government agencies pay a licence to use the images, which are free to the general public and for small-scale commercial use. Local governments benefit from using nearmap.com because it enables them to track developments in their municipalities more thoroughly.

Bernard's mission is to bring greater accuracy to the mapping. 'There are always errors in aerial photography, no matter how carefully planned the flights are,' he says. 'For example, if the plane swings about in the wind or veers slightly off line, it will affect the accuracy of the positioning and make it trickier to join photos together.'

Generally, aerial photos are rectified manually by a photogrammetrist, but

(continued page 2)

Geocomp Systems head office on a NearMap image: Garth sits here



WEBSITES

Street Wise!

www.openstreetmap.org

Open Street Map is a bold attempt to map every street in the world without the usage restrictions imposed by map publishers.

Using an all-volunteer approach similar to Wikipedia, anyone may add, edit, publish or adapt the map using computers or phones. For example, NearMap uses Open Street Map to display road names over their aerial photos.

www.autocadws.com

This free app from Autodesk lets you view and edit AutoCAD DWG and DXF files (2D only) on the web using a computer, iPad or iPhone.

www.draftsight.com

Another free 2D CAD program. This one can load Geocomp SHX files and can import and export a wide range of DWG and DXF versions without losing Z values. And it's a lot easier to download and use than Trimble Business Center.

INDUSTRY NEWS

iWitness and iWitnessPRO 2.0

Improvements in Version 2 of iWitness and iWitnessPRO make them both more functional, easier to use and faster for image-based 3D measurement.

iWitness is now the premier close-range photogrammetry software for a host of measurement tasks using inexpensive, off-the-shelf digital cameras. It can perform accurate 3D measurements for an extraordinary range of purposes, including forensics, dimensional inspection in engineering and construction, architectural measurement, heritage recording, and model building for the animation industry.

The simple user interface is coupled with a powerful and accurate photogrammetric engine. It can also carry out automatic camera calibration.

iWitnessPRO can reduce processing time from hours for large projects down to a matter of minutes, and more images and points can be used.

Notable improvements in Version 2

- Overlapping projects can be linked into a common coordinate system.
- Point fields from two projects can be seen in a single 3D View.
- Points can be georeferenced so measured networks can be viewed in Google Earth.
- Triplet offset targets in iWitnessPRO help measure untargetable curves.
- Automatically centre high-contrast dot-targets.
- Reference an image in 3D view.
- 'Flatten' to the XY plane (i.e. Z=0) for 2D DXF output for manufacturing.
- 3D texture models can be exported as VRML.

To find out more, contact Jerry Cresp at Geocomp Systems.

(continued from page 1)

this would be impossible for the amount of photos nearmap.com is producing, so they are automating the process. Bernard is creating on-ground control points that are matched to their positions on a photo, meaning locations can be accurately logged and photos can match up near-perfectly (he's aiming for accuracy to 5 cm!).

'nearmap.com is collecting an extraordinary amount of data,' Bernard says. 'I'm working with Jerry Cresp at Geocomp Systems to work out how to upload HyperTiles into the Image Manager in Terramodel. The potential is huge: small survey firms who may have said 'Use aerial photos? You must be dreamin'!' could soon see their wishes come true. They'll be able to overlay aerial photos on to all their surveys.'

All this and terrain elevation models as well! These functions will open up even more unexpected uses for Terramodel, and you can bet Bernard will be one of the first to test them out.

Survey Results was recently Highly Commended in the Western Australian Spatial Excellence Awards, for their work on the Woodman Point Egg-Shaped Digester. 'Essentially a seven-storey concrete egg,' says Bernard.



Bernard O'Sullivan and crew set up a NearMap.com control point.

EXPERT ADVICE

The latest hints and tips from our experts

Import AutoCAD 2010 files using Trimble Business Center

Terramodel (10.61G) will read most 2008 DWG and DXF files. Until Terramodel is upgraded, you can read 2010 DWG and DXF files using this method:

- Download and install Trimble Business Center Heavy Construction Edition (TBC) from www.trimble.com/tbc-hce.shtml
- Run Trimble Business Center.
- From File menu, create a new project.
- Using Windows Explorer, browse to the location of the DWG or DXF file.
- Drag and drop your DWG or DXF into the TBC plan view.
- From the File menu, select Export.
- From File Format, select DWG exporter or DXF exporter from Data, click on Options and Select All.
- Specify a DWG or DXF file name and path.
- In Settings, specify a DWG or DXF version and Export Points as points.
- Click on the Export button at the bottom.
- Open Terramodel.
- From File menu, select Download/Import.
- Import AutoCAD (dwg or dxf).

You're now ready to go!

Leica instruments and Terramodel

Thanks to the cooperation of staff at C R Kennedy, we now have better ways of transferring data to and from Leica instruments. Please contact us with your Leica instrument model and on-board software.



Windows 7 and Terramodel

Terramodel will run nicely on Windows 7, although there are a few minor issues to consider:

- New Windows 7 computers generally don't come with parallel ports. Contact Geocomp Systems to swap your old dongles for USB dongles.
- Install Terramodel from the green and white 10.60G CD, then the upgrades to 10.61G. Do not attempt to run Terramodel until you have completed Steps 1, 2 and 3.
- From the Terramodel Help menu, select Contents. If Terramodel Help is disabled, follow the prompts to download and install WinHelp32.
- In Control Panel, set the User Account Control to Never Notify and under Appearance and Personalization, set the Mouse Properties for the wheel to Middle-Click so you can zoom and pan easily.
- Try a DWG conversion. If you cannot see some of the buttons in the dialog box, adjust the Windows Display text size under Appearance and Personalization.

Windows 7 and Geocomp

For Geocomp, you need the Professional edition of Windows 7 and a USB Geocomp dongle. Install Virtual Machine software such as VirtualPC, VirtualBox or VMware Player. Then install Windows XP on that Virtual Machine from CD. XP Mode is not enough! Then install Geocomp 10.2 as normal including the Sentinel driver.

We tested Geocomp on VMware Player and found that it works well.

64-bit and Terramodel

If you have a 64-bit computer, and reuse tmodwin.ini from a 32-bit computer, run GCTSP command to add C:\Program files (x86)\Trimble\Terramodel\Geocomp\ to the Terramodel Search Path.

Blacking out

If after installing Terramodel, your cursor is dark blue on black, we suggest that you use PALETTE command to change the palette to Geocomp_64 and the colourmap to One_to_one_64.



Surveying challenge with the lot

Up on the Great Papuan Plateau, oil rigs have pumped out their black gold since the 1990s.

Now, the largest project in PNG is under way: construction of a 217 km natural gas pipeline from the plateau region down the Kikori River Basin to the Gulf of Papua, where it will be piped underwater to a refinery in Port Moresby.

Arman Larmer Surveys is doing all the survey work, and 80 per cent of the staff on the project are local people.

This is a surveying challenge like few others. The area is under consideration as a World Heritage site: it is geologically dramatic, with needle karsts, extensive caves, a volcano, waterfalls and the

magnificent Hegigio Gorge (featured previously in *Dimensions*). The river basin and plateau contain one of the largest undisturbed forests in the southern hemisphere and includes nearly all forest types found in PNG, and the largest mangrove forest in the Pacific.

The whole of North America has only twice as many bird species as live in this region.

It has three Centres of Plant Diversity, a RAMSAR-listed lake and 16 ethnic groups dependent on subsistence farming. According to UNESCO, all these qualities 'put the Kikori Basin on the map as an exceptional global treasure.'

The oil project was PNG's first major oil development. It spawned a partnership between the oil consortium and World Wildlife Fund, which as a result now protects over 86,000 hectares.

Ecotourism Melanesia says tourist numbers barely reach double figures annually, with the main visitors being government officials and Coca Cola salesmen.

Arman Larmer are long-time Geocomp users, but are moving to Terramodel for this project for the first time. Jerry Cresp and Ben Craig have been training staff and customising the software.

The flatter terrain has been surveyed and the team has limbered up with the new software. However, the real challenge begins as attention now turns to the more physically and ethnographically complex regions.

Stay tuned!

Damaged river crossing, Papua New Guinea
Photo: Andersen Oystein,
www.istockphoto.com

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HELP HOTLINE

For Customer Care Members with queries about using our software.

We aim to respond to your call within 1 hour.

Toll free: 1800 800 754 (in Australia)

Email: support@geocomp.com.au

8.30 am-5.30 pm Melbourne time,
each working day

PRODUCTS

GeoCalc	GeoNav	Geocomp
Terramodel	Visualizer	GCGeocode
TerraPos	iWitness	Paydirt Sitework

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A story of frontier surveying

'Over 44 years, we've had surveyors climbing all over the place,' said Michael Larmer, of Arman Larmer Surveys (ALS), Papua New Guinea.

A Measure of Papua New Guinea—the Arman Larmer Surveys Story was featured in *Dimensions*, November 2008 (see the Geocomp website). The book is available from Focus Publishing Interactive, Woolloomooloo, Australia.
www.focus.com.au