

Dimensions

all shook up?

Imagine you are excavating a 500-metre tunnel under central Brisbane. It will snake under a city street and civic square flanked by commercial buildings, the Town Hall and two significant churches.

How will you know if the delicate columns, towers and steeples above are beginning to move—before it's too late to do something about it?

This was the situation facing the surveyors preparing to monitor the \$278 million, 1.3 kilometre Stage 2 of Brisbane's Inner Northern Busway project.

Geocomp Systems provided the solution with a neat plan to automatically watch the buildings for movement.

'We mounted three Trimble S6 units: on the Carlton Crest Hotel, the former Reserve Bank Building and the Commonwealth Bank Building,' said Brad Quick, a Director of Geocomp Systems.

'We designed specific mounts and weather-proof housings for the units, then went up in a cherry-picker to attach 100 prism targets high on building facades along the central corridor.'

Every hour, every day, the total stations locate each visible target. The S6 units measure angles to the nearest 2 seconds and the distance to within 2 mm. They track movement in direction and distance then report any shifts to the main computer via an external radio link.

'We began observing in February 2006, compiling baseline data to give us a picture of how much these buildings normally move,' said Brad.

'We've taken 650,000 shots already.'

'The monitoring system alerts the project Survey Manager, Mick McMillan, via email each hour so we can be sure the units are continuing to

function. The system sends an urgent email and SMS if it detects any movement beyond baseline tolerance.'

The construction consortium has started boring the tunnel's pile holes and expects to complete the entire project by 2008.

Mick said 'Geocomp Systems came up with a cost-effective system with proven reliability over three months and lots of flexibility to accept changing project needs. We also add digital level readings and manual observations to the same database for easy access by our Geotech team.'



Above: the Brisbane Town Hall, built from sandstone.

Below: A Trimble S6 opposite the historic Uniting Church.



Terramodel on the teev

Have you seen any of those historical detective TV programs like Time Team, Battlefield Detectives, Two Men in a Trench, and so on? Have you also noticed there is often someone wandering around with a GPS on a pole? Our support engineer, Garth, was especially watchful when one episode dug up his ancestral village. Terramodel users across the world could hardly fail to notice three people crowding around a notebook with Terramodel 3D Visualizer showing what the landscape at the Battle of Waterloo might have looked like.

World forum

Jerry Cresp highly recommends attending Trimble's Dimensions 2006 conference in November for Terramodel users. This conference in Las Vegas gathers together the leading users and developers for Terramodel and Trimble equipment. It runs training sessions for products and Terramodel, and brings users together in informal way.

This conference is well worthwhile in terms of discovering what's new and how to better use what you have. See www.trimbleevents.com for more details.

Getting real

Sport shows place golfers on simulated greens. Movies place actors into fictional landscapes. Computer games and simulators need realistic backgrounds. Multi-user internet domains have virtual land sales and construction projects. The common factor is they could all do with spatial data management or straight-forward surveying. If you have been involved in one of these projects, you might have a story we can tell in *Dimensions*. Let us know.

performance plus

Training

We are continuing to run our popular monthly training sessions in Terramodel and Geocomp at our headquarters in Melbourne, and on-site as required. Ring us to find out more.

Websites

www.bluebeam.com

Bluebeam Lite is a Windows printer driver. Since it is written for CAD, it has plug-ins for common CAD programs and impressive sample vector images.

One of our clients, Terry Clark says:

'The main advantage of Bluebeam is the option to create plots in numerous file types such as TIFF, GIF, JPEG and PDF.

'Its JPEGs of Terramodel plots with photos are usually less than 10% the size of the PDF. The JPEG quality is not quite as sharp but this is easily compensated by the ability to keep projects moving. It means you can deliver Terramodel plans and drafts quickly to clients for their approval, which is particularly handy during the concept stages.'

www.annoiances.org

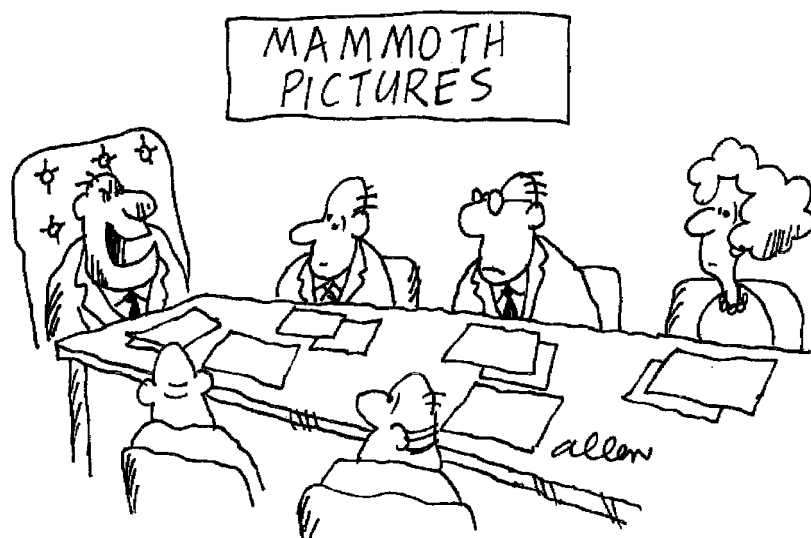
Do you want to get rid of a Ctrl-Alt-Del prompt when your computer starts up? Does your computer beep too loud in Geocomp?

The site claims to be the most complete collection of information assembled for and by actual users of Microsoft Windows.

As well as hints for dealing with computer problems it runs forums according to which version of Windows your machine is running, and even offers a Geeks book for the very avid.

Free viewers

- Autodesk.com now has free downloads of DWGTrueView for viewing DWG files and DWGTrueConvert for converting from one version to another.
- Bentley.com also has Bentley View for viewing DWG, DXF and DGN files.
- [Bentley](http://Bentley.com) also has Redline, which you can use in demo mode to convert V8 DGN files for use in Geocomp or Terramodel. Simply rename the DGN to RDL, open it in Redline, then save as DWG or DXF.



'Our next picture wil incorporate ground-breaking technology-- we're going to use real people with real backgrounds!'

in pursuit of the millimetre



Steve Rawling was working as a surveyor in Papua New Guinea in the mid-1980s when he first began working with Geocomp, running v4.2 on an NEC AP3.

‘Those days were all about DTMs, contour plans, and the struggle to master field coding. I recall doing my first data editing using EDLIN working backwards so I would not lose the link between block number and line number!’

In 1989, he moved to Thailand and worked on surveying projects throughout SE Asia and Indo-China, often gaining employment because of his Geocomp skills.

Steve became Survey Manager for the John Holland Asia Track Rehabilitation Project in 1997, which required survey, design and construction of 600 kilometres of railway in Thailand. He later joined Barclay Mowlem to become the Alignment Designer on Phase 2 of the same project.

‘The new track had to line up exactly with the old one at junction points, stations and bridges,’ said Steve. ‘The trains had to keep using the track, so we could only do track work for 5 hours each day.’

At the start of the project, he began using Terramodel (v 9.3). ‘I remember deciding to dump my beloved Geocomp for this impressive new product, thinking it would be quick to master. To aid long-time devotees like me, Geocomp Systems kept releasing TMLs as a bridge to Terramodel’s radically different approach to road design and the field data interface. Even so, with my Geocomp skills I didn’t have the drive to learn to harness Terramodel’s power, and it took 6 years to wean myself off Geocomp.’

‘I relied heavily on Geocomp’s vertical alignment design module to handle the flat profiles and large vertical curves.’

‘I can still remember the phone call when Garth suggested using SDS123 to scale eastings and northings differently.’

‘As it turned out, using the 2 programs in combination was very successful.’



Steve Rawling on site at Sydney’s Warragamba Dam.

I designed 600 km of vertical and 500 km of horizontal realignment using Geocomp, and then used Terramodel to present the design to the client (one km per sheet) for construction approval. Eventually, I handed survey management over to the Thai team—a great satisfaction.

‘I returned to Australia with my Thai wife and young family in 2000. I continued to work on the railway project for two more years from a home office.’

‘I was reasonably proficient with Terramodel, but it wasn’t until I became Project Surveyor of Dam Safety with the Sydney Catchment Authority in 2004 that I understood the potential of one of its less well-understood options—the Raw Data Editor’s Least Squares Adjustment tool.’

Steve is responsible for monitoring movements in the walls of Sydney Catchment Authority’s 23 dams. At each dam, he observes local but very dense 3D networks of angles and distances to check surrounding control pillars and to monitor on-dam marks to a 95 per cent confidence of better than 2mm.

‘I also observe separate networks of precise level runs with a DNA03. I didn’t like the conventional RDE method of handling 1D data-restricted fields, so I developed a way using height difference that would allow infinite

looping, back-tracking reruns and side shots observed in any order for easy processing.’

‘I feel privileged to be able to spend my time in pursuit of the millimetre—it’s important work for the safety of Sydney’s water supply. Terramodel helps me keep processing time to a minimum, so I can chase more millimetres while being surrounded by the natural beauty of Sydney dams, reservoirs, pristine bushland and abundant wildlife.’

Exploring the Raw Data Editor

RDE can handle large complex networks. You can enter every vertical slope and horizontal distance and angle, not just an average, and see residuals for every observation.

For a technical explanation of how Steve uses RDE for monitoring and leveling, and how another surveyor uses RDE for tunnel control, please see www.geocomp.com.au/news/rde

For an explanation of RDE Least Squares Computations, please read [rdewhitepaper.pdf](#) which is on your Terramodel CD.



Dongles

If you have Terramodel and you need to swap your old dongle for a USB one, let us know. If you have Geocomp, check for an LPT port before buying a new computer.

Making selections

In Terramodel, remember that Window and Crossing only select visible objects. Use View to select all objects, even invisible objects on invisible layers.

Wheelies

AutoCAD users wanting to zoom with the wheel while in a Terramodel command can do so by simply holding down the Control key at the time. Otherwise you scroll through the selection modes.

Use workspaces more

In Terramodel 10.42, we have added more toolboxes in geocomp.ws. These help with training by guiding processes. One toolbox is similar to the default toolbar, so by placing it over the toolbar you can get "tooltips" on your "toolbar" buttons.

Dirty MOSS?

Do you find yourself spending a lot of time cleaning up MOSS models before you can set them out? New GC92 command reports duplicate points in detail to help you do just that.

Large point numbers

Set "Max Objects" to no more than 3,000,000, and only if you have over 1 GB RAM free. Otherwise you could create a project you can't open. If you have a total of 512 MB RAM, generally 3,000,000 is a suitable value for Max Objects.

Terramodel won't open a project containing a point number over the Max Objects and less than the maximum integer point number (set in POINTSET). Point numbers larger than the maximum integer point number are treated as alpha points. They each need more memory, but you don't need the memory you would otherwise use storing empty point

number ranges. If you need help or advice, contact Geocomp support.

TVLITE

You don't need to close Terramodel 3D Visualiser (TVLITE command) before you use another Terramodel command. This means you can have several TVLITE windows at the same time each showing different surfaces or the same surface from different directions or with different shading. You can even change the DTM in between to have "before" and "after" views.

iWitness 1.2

With iWitness software you can use digital camera photos to compute the location of points on common photos. Now with version 1.2, you can also build a composite photo image.

GCTURN

Do you need Terramodel to compute swept vehicle paths? Ask us about GCTURN.

Contour in any view

Terramodel contours the view which has the most points on the nominated layer. This is usually the Plan View, but it could easily be the Profile View if you wanted. One good use for this is to check for deformation in walls after using the FLIPUP command.

TERRAMODEL 10.42 RELEASED

Since the last issue of *Dimensions*, we've been improving Terramodel in lots of little ways. Here are just a few of the new features in Terramodel 10.42:

- Transfer a Terramodel project directly to Trimble Site Controller Software SCS900 v2.
- Transfer to and from RoadRunner software for Leica 1200 series instruments.
- Explode blocks on to their original layers.
- Easily label subdivision lot dimensions, lot numbers and areas using text that

automatically updates as the lot corners move yet can be easily edited, deleted and moved.

- Import your Geocomp plots as either PLT or PLF, edit in Terramodel if you want, then plot directly to any Windows printer or plotter, even if it does not support DOS, HP/GL/2 or LPT ports. You can also import plots from other sources that use the most common HP-GL/2 codes.
- Extend a DTM on grade using GC90 or GC91.
- Sorting out string-based road design models can be a nightmare. Use GC92 to report duplicate points and move or delete unwanted interface strings before setting out a DTM or roadway.

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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
iWitness	Paydirt	Sitework & Roadwork

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