



Sorry, but it's not good news for surveyors –

Trimble's Revolutionary SCS-900 Software for GPS Rovers Puts You in Total Control of your Site.

Once in a pancake day a stand-out product comes along that is exciting, and offers new horizons. Unless we are badly mistaken, Trimble's new SCS-900 is one that'll change peoples' working lives. We think you'll look back on it in days to come as the best seven hundred bucks you ever spent.

It's a pity that SCS-900 has such a nondescript name. Trimble might well have called it *'The Genius'*. The 'SCS' stands for "Site Controller System" and that's exactly what it offers to the contractor, site supervisor, or foreman who knows what he needs to know about surveying, but basically is a

hands-on bloke who wants quick answers on the spot, out in the field. Or wants to get on with the job without calling in a surveyor.

It's New User-Friendly Software for a GPS Rover

We are all familiar with the GPS rover so often seen on sites these days, usually in the hands of a surveyor. It has a GPS unit on a pole and a controller (data collector) beneath, or in a backpack. Some contractors have mastered, to a degree, the survey software that runs on the rover but it can be a complex challenge for many.

We're not suggesting that you get the whole shooting match for \$700. The SCS-900 product, distributed by Ultimate Positioning, is a software routine that can be installed on Trimble's ACU or TSCe data collectors to enable them to perform a new role.

It's designed to work hand in hand with SiteVision. In any day's work, the rover then becomes a tool that the surveyor can work with if he needs to, but can function just as usefully in the hands of the foreman when he switches to SCS-900 mode.

Calculates the Volume of a Stockpile — Instant Answer in the Field

The key is simplicity. This software uses earthworks terminology, not surveyors' terminology. It offers choices of doing a multitude of practical tasks, such as calculating the volume of a soil stockpile, and asks simple questions to lead you through the process of getting a quick answer.

"This is a new direction for Trimble, and for the construction market," says Alan Sharp, the father of SCS-900. Alan's title is Segment Manager for Construction, and he's based at Westminster, Colorado.

"The concept is to give contractors access to data in the field so that they can make decisions on the spot without waiting on computations to be done in the office," says Alan.

"It's also a measurement system and report generator designed to improve confidence between contractor and client, by satisfying the client that measurement technology is in place to ensure one stage is within specs before moving on to the next."

Alan continues; "Our early experience in the U.S. is that it helps to remove the barriers that are often erected by clients to protect the quality of the job—in doing so, it speeds up the work and expedites payment claims."

Obviously, we are magazine people, not surveyors or contractors. But when Paul Andrews of Ultimate Positioning gave us a demo for an hour or two, we thought; "This is idiot proof

—even we could make ourselves useful around a site with one of these.” In fact, with SCS-900 in hand, we reckon we’d be the blokes most people on the site would be looking to talk to.

Controls All Phases of the Job

Whilst it’s remarkably simple to use, this is not just a product—it’s a surprisingly sophisticated system covering all phases of a job. Let’s run through a scenario.

The site supervisor has an assistant, a chap with a smattering of knowledge who understands an RL, an offset, and a bearing. A useful bloke to have around, but definitely not a trained surveyor.

Here’s What it Can Do

The supervisor sits at his office computer running the desk-bound version of SCS-900, and sets up a dozen work orders he wants done around the site. A work order ‘folder’ is created for each, containing all the data needed to do the job, and recording the results obtained.

In simple English, detailed instructions can be typed in, such as “I want the volume of the soil stockpile over near the western dam. Phone me when you get it, so I can redirect the trucks and start another pile on the eastern boundary if we have enough fill over there for that part of the job.”

Work order 2 might be to check a section of compacted fill to determine if it’s within tolerance. The supervisor’s instructions may be to set up an imaginary two metre grid over the area, and then walk it—or drive it—accumulating GPS ‘shots’. High spots and low spots are identified in different colours on the screen which indicate how far they are out of tolerance.

“Let’s say an area of fill has been watered,” says the software’s designer, Alan, “and you have a deadline of a few hours to get the material to grade. SCS-900 will identify in the field just what extra work may need to be done, and later generate a report to validate the action taken.”



Work order 3 might be to check the thickness of a layer of gravel or topsoil and thereby avoid material wastage.

Job 4 might be the stakeout of a road alignment, a pipeline, a culvert or whatever. Perhaps it’s a large site—machines with SiteVision are working on a section of it, but SiteVision costs money and machines on another section need some stakes to work to.

Work order 5 might be to calculate an area to be turfed. No point wasting expensive turf—better to order exactly what’s needed. The operator merely needs to take GPS shots at six, eight, ten points around a perimeter and SCS-900 will calculate bearings and distances, displaying the resultant area in square metres. The order can be phoned through on the spot.

Phone in from Home

When the operator takes the rover to each part of the site, he selects that specific work order on the tap screen, and the data he produces is stored in the appropriate folder. Back at the

office using a cable, or perhaps from home over his mobile phone, the rover is linked to the office computer and a mirror image of data in each unit is automatically produced—that is, the operator has uploaded the data from his first set of jobs, and the supervisor has downloaded his instructions for the next lot.

Can Handle Multiple Job Sites

We’ve talked about one job site, but the work orders might well relate to a dozen different sites. A contractor can carry around with him in the rover all the data he needs for each site.

For any work order, a detailed report can be generated. SCS-900 is compatible with Microsoft Excel, or produces text files that can be massaged into any common format. So the SCS-900 can generate ‘as built’ reports to expedite progress claims.

To give an example of how the volume of a stockpile is calculated, let’s imagine a mound fifty metres

Continued on Page 27

A Report from the Field

When we wrote our main story about SCS-900 we'd only had an opportunity to observe a demo run of one of the first arrivals in the country.

Just prior to going to print, we were able to get some comments on how this product works in the field—Jason Gale, Construction Manager for the Grove Group, had been putting it to use for a couple of weeks on the construction of the Henley Golf Course near Lilydale. Amongst other things, this job involves knocking the top off a couple of pretty substantial hills, and carting a lot of rock.

"I'd really call this a break-through product," says Jason. "There are a couple of very strong features that have had an immediate impact on this site."

Production Volumes Calculated Instantly

"The most important is the capacity it gives us to work out volumes on the spot.

"For instance, on rock excavation to produce fill, we've walked over the work area with the SCS-900, recording points to establish a starting profile—we can then repeat the process on a daily basis, or at whatever frequency is appropriate, and immediately calculate the volume we've taken out of that area.

"We can do rough volumes, or if we want to spend more time walking over the area and recording a lot more points, then the result can be very accurate. Either way, there's nothing complicated about doing it."

"Compared with calling in surveyors and waiting for the results, we are much more comfortably in control of what's actually going on from day to day, in production terms. Not to mention the saving in survey costs."

"I'm sure that other contractors would agree that you can get into a spot of bother on a job if you are under-producing and fail to identify that fact and quickly get on top of the problem, whatever it is. With conventional methods, there might be a couple of week's delay in getting the information to act upon. With this tool, you can easily monitor volumes on a daily basis."

Timely Reports for Client

The 'SCS' in the name of this Trimble product stands for 'Site Control Software', and Jason agrees that the 'control' bit is pertinent - he feels his site has been under much tighter control since he put the SCS-900 to work.

"Another strong point," he continues, "is the facility to put out progress reports to clients much more easily than would normally be the case. The software puts the data into a choice of easily understood formats with little effort on our part - we feel this is assisting in building a relationship of confidence with the client."

"The impression I get after a relatively short time," concludes Jason, "is that it's a powerful tool and we'll continue to learn new ways of profitably applying SCS-900 to our work." □

long and twenty metres wide, with two separate peaks, one higher than the other. A complex job by conventional means, right? The operator sets his rover to 'walk' mode ('drive' is another option, or 'standing shot'—there's a little screen graphic of a car, a man walking, and a man standing, if you had a few beers the night before).

He walks around the perimeter of the stockpile, defining it by the GPS shots that the rover is taking every metre or so (whatever he set it to) as he walks. He then clambers across the mound to get its width and slope. He clambers up and over the two peaks, to bring them into the calculations. While he's doing all this clambering, the rover is recording. Obviously, the more he crisscrosses the stockpile, the more accurate will be the result. Finally, he presses button A, and bingo!—an accurate volume is calculated and recorded.

Now how easy is that? Instant results in the field, no surveyor involved, no waiting for him to go back to his office and figure out the answer, spending the last five minutes dreaming up his charge for the job (oops, nearly overlooked travelling time).

If it's a stockpile that can be driven over, the clambering is avoided.

Set up on Quad Bike

Melbourne contractor Rob McMahon has a quad bike set up with a bracket on the front for the staff and antenna, and a bracket on the handlebar for the controller. Which brings us to another important point—if you're using the latest Trimble TSCe controller and 5800 GPS Total Station, they can talk to each other via Bluetooth, a wireless communication system that dispenses with cables and allows you to place each unit



wherever you want it, within about eight metres. So you could have a bracket on the bull bar of your 4WD, and the controller inside the cab with you.

This introduces the facility of driving an entire site perhaps daily or weekly, creating a new model as work progresses, and being able to calculate overall progress towards the final objective.

Validate Client's Data

Now this is all pretty practical stuff, but it's only the start of it. Before you even started the job, you'd have driven the whole site with the rover recording. You now have a detailed topographical model, to compare with the one supplied to you by the client. No more moving dirt for free—comparison of your topographical model with the design model will tell you exactly what volume is to be moved on the whole project.

Create Your Own Digital Models

Or perhaps you're proposing to develop your own subdivision. You have two alternative parcels of land available to you. Without buying either, you drive over both, hand the models to your engineer, and ask him which one is going to be the most economical to produce—this assumes that you own a base station that can be taken along.

You'd simply take shots at points around the perimeter, say the four corners, if it's a rectangle. None of those needs to be a known point—an arbitrary datum can be used. After all, you're not identifying the site—it doesn't matter if it's half a mile out in any direction. All you want to know is the accurate topography of what's inside the boundaries.

Which introduces another good point—sorry, they just keep cropping up! Trimble has incorporated into the SCS-900 a simple automatic set-up routine for linking the rover to the base station. If you've tackled the complexity of conventional survey software on a rover, you'll know that there's a rather daunting set of parameters to be entered before you ever get started: ID of base station, type, frequency, etc. The SCS-900 bypasses all that rigmarole by proactively trying to find the base station, and inviting you to confirm that it's got hold of the right one. It then does all the initialising itself.

Empowering the Foreman

Trimble has addressed the problem on work sites that although the operators using SiteVision knew what they were doing—they had a screen in the cab to tell them—the foremen were becoming disenfranchised. It was becoming an awkward situation.

In so doing, they have gone a lot further by putting an invaluable tool in the hands of contractors. We believe that in practical day to day operations a multitude of tasks will be found for this gear that Trimble may not yet have thought of. That's the way it went, when SiteVision was originally introduced—operators kept learning, and changing their work practices to take advantages of the technology.

SCS-900 is Suited to Small Operations and Owner Operators

Whilst it will be very useful on large projects, further reducing the involvement of surveyors, SCS-900 will also encourage small operators (even owner-operators) to get involved in GPS technology. Linking up with an engineer who doesn't get carried away with his charges, an owner/operator could produce a topographical model of Farmer Brown's alternatives for siting his new dam, and work out which will cost the least and store the most. For that matter, taking things a bit further, it could also calculate which alternative site had the greater catchment area.

The possibilities go on and on. 