

“Personally I think owner operators are better placed to get benefits from GPS technology than are contracting companies” — Michael Thorpe, of Hepburn & Thorpe.

GPS FOR THE OWNER OPERATOR

You’ve heard a lot about the deployment of GPS systems by larger contractors and the majors. This is a story about how profitably it can be put to use by an owner operator.

Ted Volz, based in southeast Queensland, runs a D6R-XL dozer. When there’s a golf course to be built his reputation often earns him a phone call, but most of his wide experience has been in general contracting.

About two years ago Ted rigged his D6 with the Leica product marketed by CR Kennedy that now goes under the name of *GradeStar*. If you’ve heard of Leica’s *Dozer 2000*, of which there are about forty installations at mines around Australia—well, *GradeStar* is an enhancement that is better suited to civil construction applications.

Taking the plunge into GPS was actually the result of an understanding reached between Ted Volz and the prominent Queensland contractor Hepburn & Thorpe. As an owner operator, Ted had done quite a bit of work for Hepburn & Thorpe in recent years and a good level of confidence had been established.

The handshake deal between Ted Volz and Michael Thorpe, with no binding commitment on either part, was that if Ted went in for GPS, Hepburns would back him as strongly as possible when jobs came up that suited the technology.

Contractor Looks for Expertise and Motivation

This is an arrangement that suits both parties. It wasn’t a matter of cost—Hepburn & Thorpe are using GPS on their own excavator and grader. “Ted is a top operator,” says Michael Thorpe. “The attraction for us is to have a GPS-equipped dozer available on our jobs that’s handled by a bloke who has the brains and motivation to really get the most out of the technology.”

“This has re-invented the dozer, as far as our business is concerned. We run eight excavators and had got rid of our own dozer a while back, because we were only getting six to eight hundred hours use out of it—the excavators were being used for trimming and doing much of the dozer’s work.”

“The situation has now turned around completely,” continues Michael. “The great increase in productivity that GPS brings to the job has seen Ted Volz and his D6 pretty much on continuous hire with us over the past year—well over 2000 hours.”

There are unexpected side benefits for the contractor, says Michael Thorpe. The data in Ted’s on-board computer—the survey points file for a particular job—is available for surveyors and engineers who may unexpectedly need it in the field. And that information can be used by Ted to establish pegs where needed.

GradeStar is Less Expensive

The Leica *GradeStar* system marketed by CR Kennedy keeps the cost down by using a single GPS antenna rather than two. To achieve the required accuracy of 25/30mm this antenna is fitted to a shockproof post mounted directly on the dozer blade—the idea of course always being to know where the blade is, rather than where the machine is. The system gets its pitch and roll information from a motion sensor fitted just under the antenna.

“It gives me a very satisfactory level of accuracy—about 30mm,” says operator Ted Volz, who uses the ‘indicate’ version (full automatic control of the hydraulics is an available upgrade, if needed) and is very comfortable with it. External indicator lights are available (see picture) but Ted has chosen to use the digital indicators provided on-screen

by the *GradeStar* software. This guides him via up/down arrows (which get longer or shorter, depending upon the amount of cut/fill required, and also change colour; cut = red; fill = blue, on grade = green). A green bulls eye appears when the grade tolerance has been achieved.

“It’s a very powerful tool in the hands of an experienced operator. There’s no question that my output has greatly increased, and it’s made the work more interesting—I’m more in touch with the jobs I’m working on.”

Ted points out that his GPS makes the machines working around him more productive, too, in such matters as advising where fill can usefully be deposited.

Portability is the Key to Wider Usefulness

Leica’s *GradeStar* has another strong feature, which is its portability. There’s hard wiring of course, but the system can readily be transferred from one pre-wired machine (say, a dozer) to another (say a grader, or quad bike) by unplugging three components—the computer with integral touch screen, the antenna, and a pelican case that contains the GPS and radio receivers.

Apart from simplicity in removing the hardware for security reasons, the operator can take advantage of this portability to harness other *GradeStar* software features that are of considerable importance to an owner operator.

Before we describe these, let’s take a broad overview. The usefulness of a GPS system is limited if an owner operator needs to constantly work off a digital model supplied by the contractor for whom he’s working. Where does that leave him, if there’s no work that justifies the expense of setting up a model, and he’s out doing general contracting until another job comes up?

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This is where some powerful features of GradeStar come into play.

Do Topographical Mapping and Design Your Own Jobs

Says Michael Manning of C R Kennedy, "With nothing at all set up in the on-board computer, an operator can design his own complex surfaces in the field, using the 'Ramp' feature of *GradeStar's* software.

Take the example of a road rising uphill at a slope of 10%, required to slope down 3% each side of a crown at the centreline, reversing the slope and rising again 5% to create table drains either side. That's a cross section of four surfaces in all. This can all be set up in the field with the *GradeStar* software, by the operator keying in his requirements."

Using another approach, the GPS gear could be transferred onto a quad bike, and used as a survey instrument to take off points all over a proposed work area—many thousands of points if necessary. The data could then be downloaded from the *GradeStar* computer and used by an engineer to create a topographical model of the site, from which a work design could be produced. (Of course, this could also be done by leaving the equipment in the dozer, at a greater fuel cost).

Unless you had strong computer skills you'd need an engineer or surveyor to set up the digital model from the points recorded by *GradeStar*, but you'd be saving a great deal on the field work side of survey costs.

GradeStar Can Facilitate Setouts

Another software mode is termed 'Navigate' and permits the operator to perform setout tasks.

Given that a design is installed in the *GradeStar* computer, the operator can enter one or more points and the system will tell him the direction to travel to get to those points, and tell him when he's arrived at each.



Ted Volz is a D6R-XL owner operator who has set up his machine with Leica's GradeStar GPS supplied by CR Kennedy, and now does most of his work for one contractor, Hepburn & Thorpe. "Young blokes with their own machines who expect to be around for a while in the industry should certainly be looking seriously at acquiring this gear," he says.

This is useful for such tasks as setting out pipelines and manhole locations, etc.

Finally, for such simple tasks as creating a house pad, the system only needs a known level to be keyed in and will then provide accurate guidance both as to vertical level and horizontal dimensions.

In summary, the software has the potential to empower an operator to set up many jobs himself. Admittedly, we've tried to avoid complexity and nothing is ever as simple as it seems, but the other side of the coin is that the more they use GPS systems, in our experience the more

operators get out of them. It's a constant learning experience.

"*GradeStar* is a cutting edge product with the advantage of a lower entry price," says Lawrie Watson, CR Kennedy's machine control manager. "We're confident that it will establish both Leica and CR Kennedy as major players in this field."

Ted Volz is certainly a GPS convert. "Young blokes with their own machines who expect to be around for a while in the industry, and are keen to develop a higher level of expertise, should certainly be looking seriously at acquiring this gear." 