

# ABC Lasers: 'Grade Indicate' is a Home-Grown Aussie Solution to GPS Machine Guidance

**E**arthmoving is basically cutting or filling, so the essential question, at any given location, is 'to what depth?'

ABC Lasers have shown that Aussies, too, can develop a GPS system to answer that question.

Three of their systems have already been installed, and have been at work since late January.

Mike Forrest explains that the various components of their system (which goes under the product name of 'Grade Indicate') have been sourced from separate suppliers both here and overseas. ABC Lasers have supplied the know-how to put them together, and make the system work.

"Apart from appointing dealers around the country, we've also established a network of surveyors who have been brought up to speed on our system. They thoroughly understand it, and can assist contractors in getting their designs set up without delay," Mike says.

The software used for ABC Lasers' *Grade Indicate* comes from Carlson of the U.S., who are long established and well respected players in the mining industry, amongst others.

### ***The Emphasis is on Ruggedness and Value for Money***

The other hardware components—GPS receivers, UHF radios, and antennas—have all been selected from various sources based upon the need to be rugged, reliable, simple, and reasonably priced.

A very robust computer with a high contrast touch screen is used on board the earthmoving machine—it was developed for Arctic exploration, so it's built to take a fair thumping.

"Our objectives are twofold," says Mike Forrest, principal of ABC Lasers.

"Firstly, rather than supplying an expensive solution designed to cover all possible requirements, we seek to find out exactly what our clients want from GPS guidance, and provide a less

expensive solution designed to serve those specific needs.

"Our approach has the flexibility to allow the bells and whistles to be added later, if and when required."

"Secondly, we are here to show that this technology doesn't need to be imported in its entirety.

"It can be assembled in this country. We are sourcing our components from wherever we find the best performance and value, and are creating a technological base by Australians for Australians."

### ***Shows Depth of Cut or Fill at any Location***

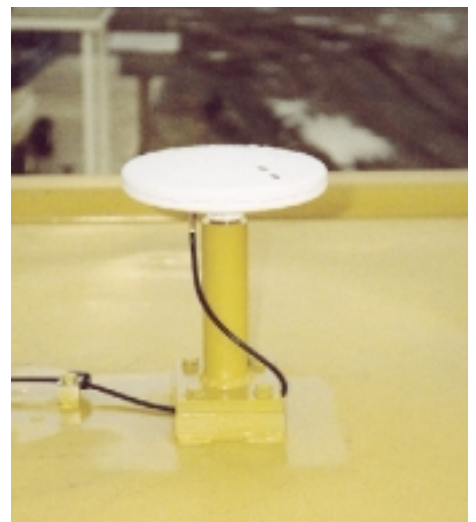
*Grade Indicate* presents its information in a very simple format. A screen display shows the position of the GPS rover—whether it's installed on a machine, or held in your hand—relative to various features of the design. An adjacent read-out shows the depth of cut or fill required at that specific point.

Greg Bachmann of Bachmann Earthmoving was the first buyer, using ABC Lasers' system on a scraper working at a new subdivision near Bond University on the Gold Coast.

"The improvement in productivity depends upon the complexity of the job," says Greg.

"Over the five or six weeks we had the system in use at Bond Uni, we found that we were constantly learning more ways of getting the most out of the information it provides."

He adds, "As far as survey activity is concerned, I'd say we certainly halved the amount of re-pegging, at the very least."



***Top: Wesley Klein of ABC Lasers with the two key base station components, less power source. Below: for security, the GPS antenna on top of the Cat D6 cab can be removed in a few seconds.***

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### *He Sees Three Benefits*

Rod is looking to use the *Grade Indicate* system in three ways.

Firstly, his D6 dozer is set up with GPS equipment feeding the computer that carries the design, so the operator will constantly know whether he needs to cut or fill at a particular point, and exactly how much.

The system can also tell him how far he is from the centreline of a designed road, for instance, if he needs that information.

Secondly, Rod will be doing a lot of the less-precise survey work himself, using a GPS rover. It's basically a stick with an antenna on top, a levelling bubble, and a sharp point at the business end, connected to GPS equipment that's carried around in a small back-pack.

With an accuracy of 20-30mm, Rod will be able to whack a few pegs in wherever he needs them, to identify levels and boundary points of localised cut and fill work, and get the



***Compact components in the cab don't get in the way of the operator. Removal each evening, if necessary, is a three minute job, as Wesley demonstrates below.***

### *Rod Peachey Steps Into the Ring*

I went to Rodney Peachey's place at Ormeau last week to see the installation of the new system he's acquired from ABC Lasers.

For the next month or so, Rod will familiarise his people with the technology on his own subdivision surrounding the premises of Peachey Constructions, and is expecting to start work soon after that on a large new residential subdivision that will test it to the full.

"I wish we'd had this technology two years ago, when we were doing the Pelican Lakes job at Caloundra," says Rod.

"On the golf course there, we had more stakes than you could count. The surveying cost ran to about \$250,000 and I reckon we'd have saved \$150,000 of it, if we'd had GPS available."



## —an Aussie-Developed GPS Solution



**The GPS rover (above) has a convenient back pack. Computer is tiny— it attaches with a Velcro pad.**

dozer operator to work quickly when he moves from one location to another.

The subdivision job he'll soon be starting is on fairly hilly terrain, with a lot of individual house lots at different levels. Hence it involves a good deal of movement of the dozer, from one work location to another.

"We had a job like this near Nerang, not so long ago. It was a pain in the neck, having the surveyor coming and going all the time, pegging out work locations as we moved around.

"When he was delayed, we were delayed. With this GPS equipment accurate to an inch or so—which is

enough, in this sort of application— I can easily peg out where cuts are to start, and where fill is to be placed.

"I've already pretty much got the hang of it, and we'll soon have the foreman taking over from me."

The third way Rod will use the system is to transfer the GPS rover equipment to his car, plug it into the cigarette lighter and put a magnetic antenna on to the roof, so he can periodically drive over the whole site doing level checks wherever he goes.

### **Compact and Portable Equipment**

Our pictures show the actual equipment involved in Rod's set up.

The base station is basically just a small GPS receiver and an even smaller UHF transmitter. ABC Lasers supply a foam-lined case, so it can be taken home at night.

The antenna is presently erected on Rod's building, but would normally sit on a tripod at the work site, and is very easily demountable.

"Being 12 volt equipment, the base station can operate off a regular truck battery for a few days, or use a power source if one is available at the site office," points out Wesley Klein of ABC, who was there to assist with the installation.

Locating the base station antenna is a one-off task. The rover-on-a-stick is taken to three or more established points on the design grid, previously surveyed in. Such as survey stations, perhaps on the boundaries.

A small computer is velcro'd on to a bracket on the pole. When the rover is at the right spot, and exactly

perpendicular, button "A" is pressed on the computer, to record that point.

The procedure is repeated at several other points, including the position selected for the tripod and antenna.

The computer then does a few sums, and tells the GPS base station exactly where it is located, in relation to the actual job site.

Having stuck a peg in the ground with a tack head showing, the next day the base station can be very easily re-positioned using a vertical sight on the tripod to locate it dead square over the tack.

### **For Security, Equipment is Easily Removed**

On the dozer, the first impression that strikes you is how small the components are, and how little they interfere with the driver's workspace.

The touch screen (eliminating the need for a keyboard) is integrated with the computer, and the whole thing is only about eight inches square and three inches thick, attached to a ceiling mounted bracket.

It is perfectly visible to the operator, but doesn't come even close to getting in his way.

The GPS and UHF receivers are also compact. Campbell Hay of ABC Lasers designed the in-cab installation, using velcro for the radio and quick-release clips for the GPS, so that it is literally a three minute job to detach a few cables and have the whole system off the dozer—including the antenna, which simply undoes by screwing it off its base on the cab roof. This would be a daily ritual at an insecure site, and Campbell wanted to make it a simple and quick operation.

The visual difference between ABC Laser's *Grade Indicate* and Trimble's *SiteVision* (see our field report in the November/December issue of *The Bulletin*) is that whereas *SiteVision* provides the operator with guidance in the form of lighting arrays adjacent to his windscreen, ABC's *Grade Indicate* simply tells him, at any given point, the depth of cut or fill required.

We'll be checking with Rod Peachey in a few weeks, and will tell you how he's getting on.

