Machine Control for Excavators — an Affordable Starting Point

Some months ago C R Kennedy signalled their plans to become a major contender in the machine guidance field, with appropriate emphasis on GPS.

The impressive first fruits of their labours have recently reached the market, in the form of *DigStar,* a GPS/TPS system for excavators.

Kennedy's unique approach will be an attractively affordable one for excavator owners who want to position themselves to take advantage of GPS technology, but don't want to make that investment until a job arises that justifies it.

Their solution is to 'upwardly enable' the popular *Mikrodigger* system, for which CR Kennedy are now distributors, by providing hardware and software add-ons that make it the stepping stone to the full GPS/TPS *DigStar* product.

This is a marketing approach that's unique, as far as excavators are concerned. It's similar to the modular upgrades available for motor graders, where cross slope hydraulic control systems can in some cases be upgraded to TPS and GPS.

It also has a very valuable side benefit. During the brief periods of low satellite reliability each day, the machine can continue to operate using *Mikrodigger* until satellite lock is re-acquired, in all probability with little effect on accuracy. This is a feature no other excavator system can offer.

Simple Mikrodigger controls at lower right — the DigStar computer display is above, and can easily be removed along with GPS and radios in pelican case (above).

The first DigStar GPS installation is on a PC300 operated by Hepburn & Thorpe, Gold Coast contractors who are experienced at pipe laying. The machine is engaged on a 450mm trunk sewer installation, one of the first to utilise Iplex Pipelines' new *Sewer Max*.

Mikrodigger is a Valuable Stand-Alone Enhancement

Mikrodigger is a great platform for C R Kennedy to have built upon. It has been well established for some time as an affordable, reliable and very precise guidance system for excavators, easy to learn and operate, with an estimated 100 units in use around the country.

Costing around $13,000, *Mikrodigger* uses sensors on the boom, stick and bucket to show the operator exactly where the cutting edge is at any time, in relation to a pre-set depth, a keyed-in slope, etc.

In the case of blind cuts (underwater, perhaps) a simple display of seven lights shows the relative position of the bucket on its arc of travel through a pull. Alarm heights can be entered where power lines are an issue, and up to 20 different bucket settings can be stored.

The cost of fitting an optional rotation sensor to *Mikrodigger* is so relatively slight that few buyers leave it out. From a limitation of straight-ahead digging, this adds the facility of controlled digging all the way around the excavator (360 degrees).

One of the strengths of *Mikrodigger* is that, starting from an established datum, it 'takes its reference point with it' when the machine moves.

The operator simply rotates the cab, touches an identifiable object behind him with the bucket (the top of a rock, a stump, or perhaps just a piece of ground), presses a button to lock in that point, moves the machine to its new digging position, and then touches the reference point a second time to re-establish the correct RL.

Where consistent millimetre accuracy is required, laser can be used—the sensor on the stick incorporates a laser receiver.

Hepburn & Thorpe's highly experienced operator on the PC300, Colin Gray, has used *Mikrodigger* for over a year and is keen on the system. "It makes a bad operator good, and a good operator better," says Colin. In these days of strong demand for machine operators, that's a pretty attractive point.

Divorcing the Excavator from the Pipe Layers

The main benefit sought by Michael Thorpe of Hepburn & Thorpe is to enable his excavator to move ahead of the pipe laying team and work at its own pace—to break the usual nexus of the excavator operator needing to depend on the pipe laser to give him a fresh reference point every time he moves.

"On this sort of job we'd normally average 80 to 90 metres a day, but we've obtained the productivity gains we'd hoped for—a consistent 150 metres a day," says Michael. "We also expect a saving in bedding material, since the base of the trench is more accurate."

He points out that *Mikrodigger* alone will deliver these requirements up to a point, but for directional accuracy when the excavator has moved well ahead of the pipe layers, and for changes in direction, GPS adds the missing ingredient. "And on stormwater jobs, GPS is accurate enough to allow us to make a start without waiting for a surveyor to show up, which is a common cause of lost time."

"Experienced pipe laying teams are increasingly hard to secure," Michael Thorpe observes. "The choice of whether to have this new technology is being taken out of our hands—it's the only way we can contain costs and achieve good results with people of lower skills."

Michael Manning, machine control specialist (L) with Lawrie Watson, who heads up CR Kennedy's machine guidance division. "Mikrodigger makes a bad operator good, and a good operator better," says Col Gray, (R), PC300 operator for Hepburn & Thorpe, who has over a year's experience with the system.