



▲ The author staking a new road

Transportation Pac for the HP 50g Graphing Calculator

The HP 50g Transportation Pac (Version 2) is a new release by D'Zign. This package expands upon D'Zign's Survey Pac that I reviewed in the January 2005 "Hands On" column (see the *Professional Surveyor Magazine* archives: www.profsurv.com). (Sold separately is the D'Zign file converter that allows data to be imported and exported from a coordinate list.) It is important to realize that Transportation Pac is not data-collection software with the ability to control surveying field equipment, but it is a tool box of routines that runs on an HP 50g calculator and is able to handle almost any surveying calculation.

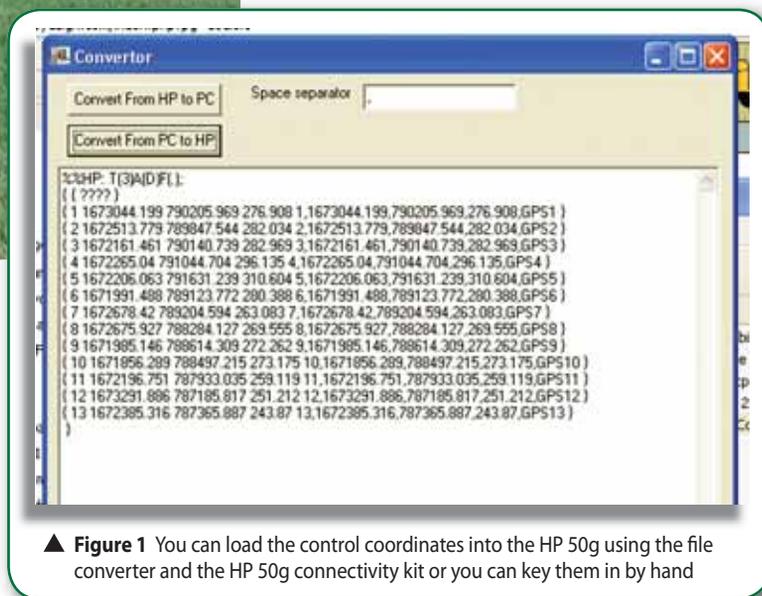
Transportation Pac includes the capabilities of road alignments, cross sections, and slope staking. The road alignment routine models the centerline geometry of a road using tangents, curves, and spirals, and then establishes the coordinates of stations and offsets for any points. Alignments can also be used to represent any other linear feature, such as a sewer or utility line.

While preparing this review, I was involved with a project that required staking out portions of a new 5,000-foot-long road, which seemed like an ideal opportunity to test the software. Since I had already run a static GPS control network and put the project on state plane coordinates, I was able to use the file converter and the HP 50g connectivity kit (available from HP for no charge) to load the control coordinates into the HP 50g (Figure 1). (These coordinates could also have been keyed in by hand.) There is also an option to add a scale factor for the site.

To enter the road centerline I needed to provide the coordinates and a reference bearing of any station on the road near where I was working and then enter either

the starting station and bearing of each tangent or the starting station, radius, and delta (central) angle of each curve. My road alignment did not use spirals, but I could also have entered in the spiral lengths if needed. Unfortunately, the existing mapping for the road did not include the delta angles of each curve. There are several methods to solve curves included in the software, so I used a combination of the circular curve solver and the difference between bearings routine to calculate the deltas for the alignment (Figure 2).

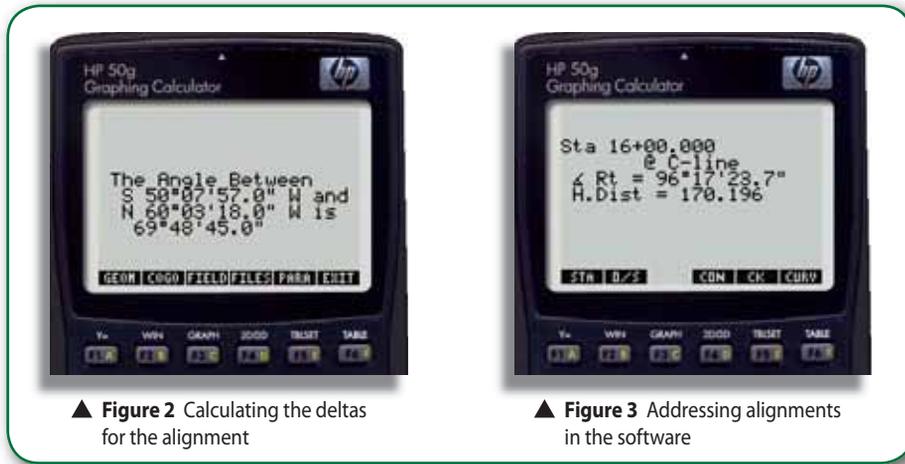
There are two ways to address alignments in the software. One way is to



▲ Figure 1 You can load the control coordinates into the HP 50g using the file converter and the HP 50g connectivity kit or you can key them in by hand

create coordinates points for each centerline station and its offset and then stake them out by point number, and the other way is to create the angle and distances needed for radial stake-out for any station and offset on the fly (Figure 3). I decided to use the second method. After entering the instrument and backsight point, I was able to enter the portion of the alignment I was working on. As I entered each tangent or curve, I could then enter the station and offset I needed and radially stake-out each point. When you enter a station that is off the end of the current alignment segment, you are prompted for the next segment. Alignments can be saved if they will be needed again in the future.

I found the package was easy to pick up and use. The real power of the package gives you the ability to arrive on a site, be handed a set of plans, and



▲ **Figure 2** Calculating the deltas for the alignment

▲ **Figure 3** Addressing alignments in the software

calculate anything you need on the spot. In my example, I had existing control and a coordinate list of the road alignment points, and it allowed me to stake any station and offset that was required. Another nice feature is that you need only to enter the portion of the alignment you are working on and not the entire thing from the beginning.

The manual that is included is easy to use and full of examples, and I thought the learning curve to be minimal. The package is also quite inexpensive, with an HP 50g calculator retailing for between \$135-\$145, the Transportation Pac for \$375, and File Converter for \$65 (most dealers give an additional discount when software and calculator are purchased together). There are no special cables or batteries required, as you are not connected to the instrument, and the HP 50g uses normal AAA batteries.

Transportation Pac now runs on an HP 50g calculator. The HP 50g is very similar in functionality to older HP 49g+ but has a new (improved) feel to the keyboard as well as both a USB port and a serial port.

Overall, the package is perfect for its intended use. It is not intended to be a data collector, but it makes solving almost any surveying calculation easy. If you do not have the luxury of pre-calculating the coordinates of all the points you may need in the office before going out and cannot read the mind of the contractor to know what he or she might ask you when you arrive, this package may just save the day. ♪

For more information visit www.SoftwareByDZign.com or see their ad in our classifieds.

JIM WHITE, LS owns a private practice in Schenectady, New York that provides surveying and software development services. He is also the software reviewer for Professional Surveyor Magazine.