

M A P P I N G

with Ease

BY JIM Q. EDDY JR., PLS

I started surveying for the state of California in 1968, just one month after graduating from high school. I was assigned to one of the approximately 25 four-man survey crews. A typical crew consisted of a party chief, an instrument man and two chainmen. A 20-second transit was the instrument usually available, and distances were measured using steel chains and spring balances. Thermometers were carried to correct for temperature differences. We did not use any electronic measuring equipment. Battery-operated digital calculators didn't exist and the term "personal computer" was not in our vocabulary. I feel fortunate to see what technology has done for the surveying profession since then.

In 1998, I remember telling my wife that if there were a program that put quad maps in digital format so that they could be viewed on a computer, I would buy it immediately. Soon after that, I received a call from someone offering that very product. He was selling a program called Topo Scout made by the company Maptech (Amesbury, Mass.). At the time, I really didn't care who made it as long as it had quad maps. The sales rep came to my office to demonstrate the software. It seemed to do everything I expected and had features that I had not even thought of. Needless to say, I bought the software and began using it immediately.

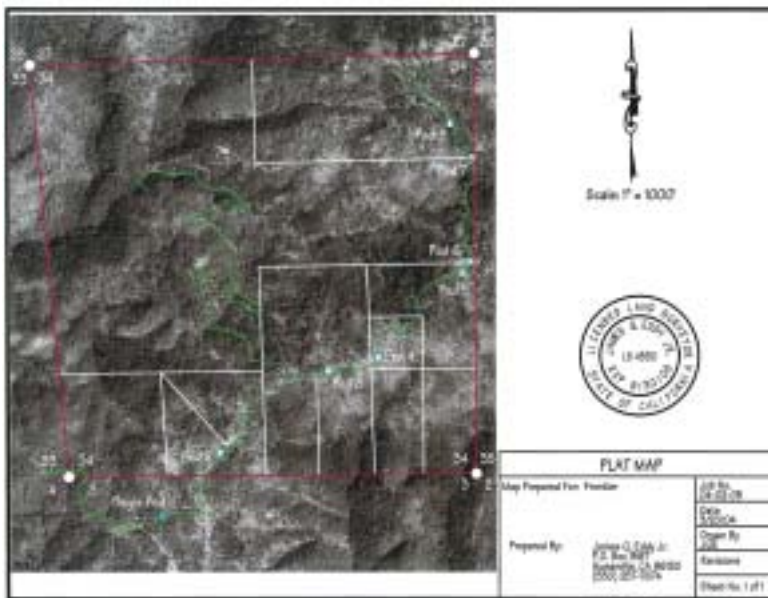
A Good Foundation

The software covered the northern part of my state, which included every area that we worked in. I was no longer missing the right quad maps! I had bought my first handheld GPS unit just shortly before buying the Topo Scout software. The ability to scale geographic coordinates on the quad maps using the computer and then enter those coordinates into the handheld became a routine for my wife and me before going into the field. The quad maps could be viewed individually and used NAD 27 coordinates. I did, however, have to change the format on the handheld to accept that format. I thought it might be nice if the quad maps could be scaled using the newer NAD 83 coordinates. At that time, two adjacent maps could be viewed on the same screen but it was not a seamless view.

As the years passed, I began to use the program frequently to see what an area looked like. I especially liked the feature of determining line of sight and profiles. This gave a 3D type view and let me know if I could see between two anticipated control points. I did incorporate quad maps into my own maps, but features for exporting were limited to the screen view.

Improving on Something Good

Several years ago I got a message on my voicemail from the person who sold me the Topo Scout program. He told me about a new program from Maptech called Terrain Navigator Pro. He said it contained all the same great features and had many improvements, and wanted to know if I might like to update my program. I wasn't really interested, although I suspected that some of the features might come in handy. About a year later, my curiosity got the best of me. I called him to find out what new features were available in this Terrain Navigator Pro program. Seamless viewing of quad maps



With Terrain Navigator Pro, users can get a ready digital image of an area to survey without having to piece together several quad maps.

Today, my wife and I survey as a team, providing services in an area of northeast California. Our clients include individuals as well as utility companies and government agencies. We perform lot surveys, topographic surveys and easement surveys, and do a significant amount of cadastral surveying for establishing boundaries of larger parcels.

As surveyors know, an important tool for conducting many survey jobs is the government quad map. These maps are instrumental in researching an area to determine terrain, road accessibility and location of section corners in relation to those features. When a client calls wanting to know what a survey might cost, a check of the quad map is one of the first places to look. But, in the past, all too many times, the map I needed was not in my inventory. All too many times the project was located on two quad maps—or the location fell in the corner of four quad maps.

How mapping software has served as a beneficial research and reconnaissance tool for a small firm in California.

was available; 3D rendering and the availability of aerial photos online also got my attention. I decided to update my program and am really glad I did. I don't even like to remember what work was like just a few short years ago without the programs.

Terrain Navigator Pro includes as many as 3,500 maps in one region, which can be viewed seamlessly or individually. Both topo and aerial maps can be viewed three-dimensionally. Map datums include NAD27, NAD83, WGS84, MGRS, UTM, State Plane and Lat/Long. Data can be transferred between a PC and a handheld GPS receiver. Using a laptop with a GPS unit connected, the program can be used as a moving map display. Line of sight, profiles and acreage calculations can be performed. Drawing of lines, and placement of notes and symbols can be placed on a map and printed. NGS bench marks are shown right on the maps and data sheets can be printed right from the program. Maps can be exported in the .BMP, .TIF or .JPG formats.

Terrain Navigator Pro works with Windows 95, 98, 2000, ME, NT and XP, and requires a Pentium-class CPU, CD-ROM and 32 MB of RAM. An Internet connection is required to access aerial photos.

Terrain Navigator Pro can be used by many professionals. Surveyors, engineers, foresters, real estate agents, search and rescue professionals, and firefighters and police officers can benefit from the program. It can also be used for recreational purposes by hunters, hikers and geocachers.

Specific Benefits

I use the program primarily as a research and reconnaissance tool. In this area of northeast California, the terrain varies significantly. A lot of property is in the forest, which makes surveying more challenging. We have conducted surveys in eight or nine counties in this region. Much of the land has not been surveyed of record since the time of the original government surveyors. When a client wants his property surveyed, we do not always know what the property looks like, especially if it is some distance from our office. I locate the property on the government quad map using the Terrain Navigator Pro program and have a ready idea of the topography. By going online and viewing the aerial pictures of the area I can see what roads might provide access, whether the area is cultivated and even if there are fences along section lines—the detail of the maps is that good. By using the profile part of the program I can determine if there is a line of sight between two points.



I can plan where additional control points will have to be placed without ever being on the property. If I am asked to conduct the survey, I print a copy of the quad map as well as the aerial map to take in the field. Terrain Navigator Pro helps me gain a better perspective of the job before I ever step into the field. When a potential client starts to mention the details of terrain and roads, I am familiar with their references.

The 3D ability of the program is extremely helpful. I can take a flight around the property in a 360-degree view and really get familiar with the lay of the land. As a private pilot, I have flown over several projects beforehand to see how things look. I can get the same perspective with the 3D aerial maps.

Another benefit of Terrain Navigator Pro is the ability to determine geographic coordinates for points that have had no survey history since Day One. After entering those coordinates into a handheld GPS, I have gone into the field and found original government corners without having to survey into an area first. Many times monuments are found within minutes, saving a lot of time.

The Program in Action

One particular job we performed in which Terrain Navigator Pro was really helpful involved surveying 6,000 acres of mining claims located in 16 different sections of land. The area was in a somewhat remote location, and access was not the best. I was able to pre-determine geographic coordinates from available surveys for the 175 corners that needed to be found or set. I imported those coordinates into Terrain Navigator Pro and then exported the quad map to my survey program. Normally I have a handful of points that I enter by hand into my handheld GPS. With the push of a button I was able to download all 175 into my GPS in a matter of seconds. I printed nearly a dozen aerial maps on glossy

Maptech's program allows for the download of detailed aerial photos into the software, which lets users see what roads might be accessible to a site and if there are fences along section lines.

paper and had a high quality reference in the field showing the terrain, including roads that did not show up on the quad maps, and the location of all points. I produced a map with the quad map as an overlay to my client's, showing all the corners and the specific claims.

Documentation, Training and Subscription

All the necessary documentation for using Terrain Navigator Pro is conveniently located in the Help menu of the program. It completely describes the functions of the program and how to accomplish numerous tasks. The only training I had was from the person who originally sold me the Topo Scout software. From there, things were easy. I have never needed to call for technical support. The program has performed well. When my one-year free subscription for the aerial maps was up, it was a breeze to update it online.

Improving Surveying Practice

I have looked at other quad map programs but have not seen any that integrate aerial maps into their software. Plus, Terrain Navigator Pro was really easy to learn. Software that allows you to start using the program immediately without looking at the instruction manual first is what I call user-friendly. Of course, the instruc-

tions do come in handy for more specific purposes. I found that I could maneuver easily from the very start.

The only obstacle that I would say that I ran into was in the importing and exporting of points (markers). I can easily transfer the markers to my handheld GPS, but I have had to use third-party software on occasion to convert the Terrain Navigator Pro .MXF format to a usable ASCII format. It would be nice to have the ability to import and export markers in an ASCII format so that points can be transferred to and from my survey program.

I don't want to remember what it was like to research a possible survey and find I didn't have the right quad map. If I needed geographic coordinates before, I had to scale off a map. Having maps for the whole state at our fingertips allows us to venture farther into other areas. We do work for several utility companies who have a need for our services in other counties that we are not familiar with. Seeing the quad map and aerial maps ahead of time familiarizes us with the area and helps us provide quality service to our clients. Overall, I cannot say enough about Maptech and its Terrain Navigator Pro software. It has changed the way I survey. 🌐

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