

THEN AND NOW

By Robert “Bob” P. Schuler, PLS



I was in my office one afternoon when an old friend stopped by to say hello. We both sat for our test to become registered land surveyors back in 1975.

We started talking about the tools and equipment we use today, compared to the tools we had to use when we were first in practice.

I was introduced to surveying when I was still in high school. My father had a land surveying business and, during the summers, he would give me a job working on one of his field crews.

Back in the late 1960s, field crews consisted of three, and sometimes four, individuals. Standard equipment was a plumb-bob and sheath, chaining pins, a 200-foot long steel tape, a 20- or 30-second transit, and a level.

Let us say a request was received for a 10-acre boundary and topographic survey, without any information on the section of land in which the ten acres were located. The first task would be to traverse the four sides of the section, locating the section corners along the way. This was done with a transit and 200-foot steel tape. Once completed, the traverse was balanced and adjusted. Depending on the conditions crossed, such as heavy wooded areas or hills, this could take three to four days to complete. When the section work was completed, the breakdown of the ten acres could then be calculated. This was accomplished with a mechanical calculator and trigonometry tables. Then the boundary corners could be established in the field, and grid lines set, so the topographic phase of the survey could begin. This phase of the project was done with the level, level rod and a field book in which to keep level notes and observations. If brush and bushes were encountered on the grid line, a machete was used to open the lines of sight for observations on the grid points. This part of the project could take another three to four days to complete. Now the field portion of the survey could be turned over for drafting the 10-acre boundary and topographic survey. The field work would take seven to ten days to complete.

I can remember daydreaming about the day that there would be some type of instrument that would guide you to the corner location and collect all this data automatically, but there was no such device and I didn't know if there ever would be—after all this was a dream.



Steel tape with tape stretcher. Photo courtesy of National Oceanic and Atmospheric Administration, U.S. Department of Commerce.



All female survey crew - Minidoka Project, Idaho 1918. Photo from the U.S. Bureau of Reclamation, of the U.S. Department of the Interior.

That was then.

Over the next twenty years, technology improved. Computers and other measuring and recording devices were created and perfected. We now have tools like the electronic distance meter (EDM), which is basically an electronic transit with a data collector that attaches to it. The data collector records all of the operations that occur in the electronic transit. Together they are known as a total station. The total station has EDM built right into it. The tool I most prefer is the Global Positioning System (GPS). A GPS receiver processes the data signal which is broadcast from a global position satellite. The onboard computer in the receiver triangulates these signals being logged from a

number of satellites—sometimes as many as ten, but no less than three. The receiver then calculates the horizontal and vertical position of the GPS receiver.

This is now.

The same 10-acre boundary and topographical survey is requested. The field crew will now consist of one or two individuals. They will locate the section corners and then GPS their location. This can usually be accomplished in one day. Now a vertical network will be created—usually at the exterior limits of the project. Once this has been completed, the GPS receiver can be calibrated to the horizontal and vertical control points that have been established. The vertical network and calibrating might take another day. GPS can collect horizontal and vertical data while you move with the use of a QUV or small, 4-wheel drive, all-terrain vehicle, with the GPS receiver mounted on the vehicle. The topographic phase of the project can usually be completed in one or two. The project can now be turned in for drafting. The field work for the 10-acre boundary and topographic survey has taken three to four days.



Chastain-Skillman survey crew (2005).

another day

With today's equipment, a job can be completed in less time than thirty years ago but, back then, the cost to equip a field crew was probably ten times less than the cost to equip a crew today, so the technology we use now comes at a higher rate than the devices we had in the past.

One can't help but wonder what technology in the next thirty years will bring to the surveying field.

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