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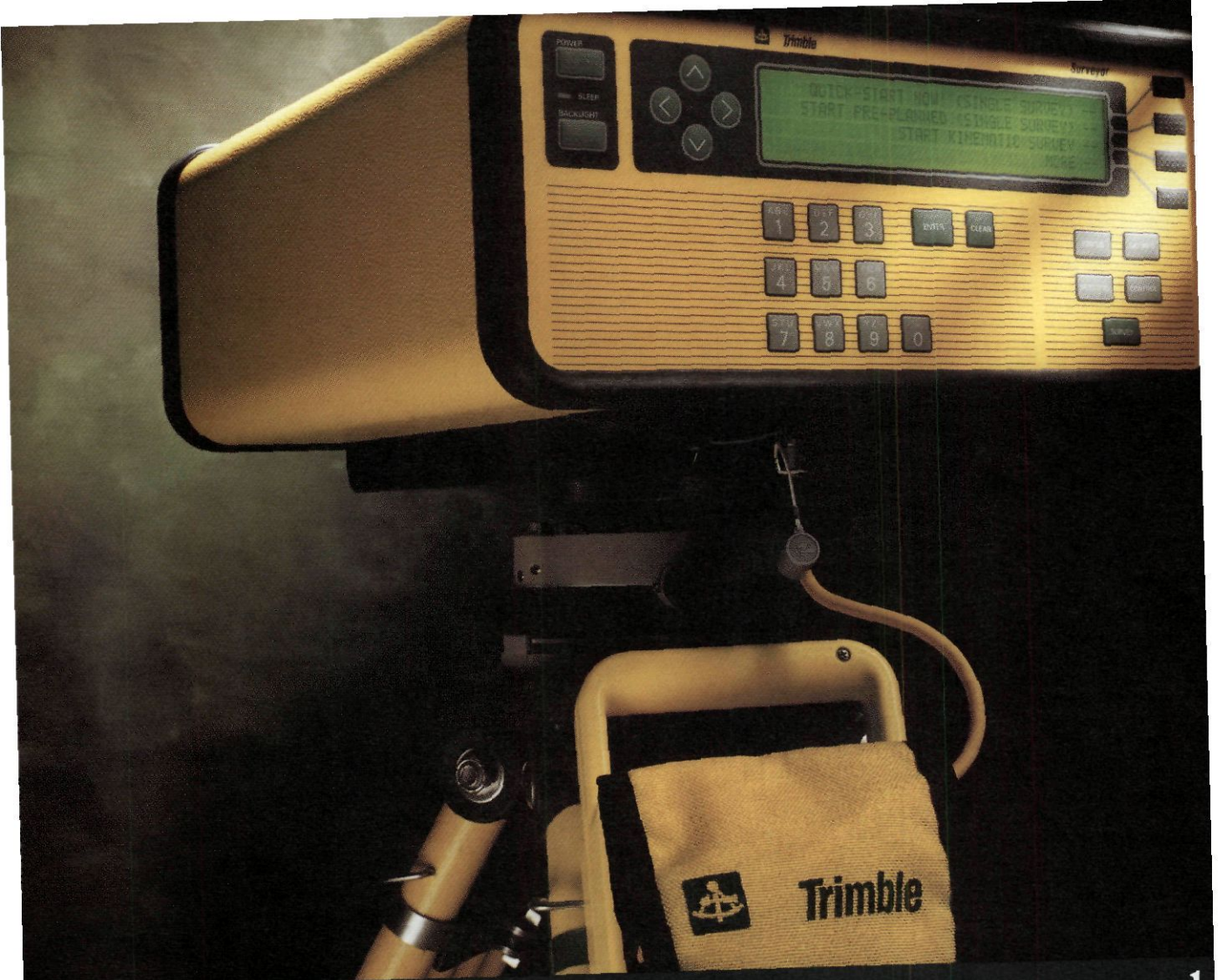
The California Surveyor

No. 92 The Voice of the Land Surveyors of California Summer 1990



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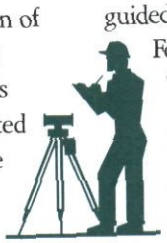

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The California Surveyor

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"Recognizing that the true merit of a profession is determined by the value of its services to society, the 'California Land Surveyors Association' does hereby dedicate itself to the promotion and pro tection of the profession of land surveying as a social and economic influence vital to the welfare of society, community and state."

"The purpose of this organization is to promote the common good and welfare of its members in their activities in the profession of land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in the Land Surveyors and their work."

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EDITOR
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Cover Photo: Initial point of the San Bernardino Base and Meridian. Photo by James Morrell, CLSA member.

Opinions or assertions expressed in articles in this publication do not necessarily represent the official views of the Association.

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President's Message

AS WE MOVE TOWARD the turn of the century and a new millennium, it is my observation that Land Surveyors are enjoying a professional status not previously acknowledged by governmental agencies and other professions during this century. Most of the credit for this recognition can be given to the dedicated Land Surveyors who selflessly devote their time, and contribute money, to their professional associations. They make a difference to their profession. They know that by uniting and pooling their resources, they have a chance to make their voices heard. They are giving something back to the profession that provides their livelihood.

With a broader member base of Professional Land Surveyors voicing their concerns, we can help ensure that the direction taken by CLSA will be in accord with the interests of the Land Surveyors in California.

In California, the only association that truly represents the Land Surveyor, whether in public or private practice, is the California Land Surveyors Association. CLSA provides a forum for the sharing of ideas and the exchanging of technical and professional topics related to Land Surveying and business matters.

To the members of CLSA, and to its officers, board members, and committee chairmen, I would like to express my thanks. Without your dedication, the Association would not exist. Land Surveying would merely be a technical function and not a profession. To those of you who are not yet members, I would like you to consider this: As a Land Surveyor in California, you are, by default, being represented by an Association that speaks for you without your having had an opportunity to voice your opinions on matters of importance to you. Wouldn't you like to have a part in the molding of the future of Land Surveying?

I often hear a Surveyor complain about what needs to be done to take care of a problem, and then find out that he or she is not a member of CLSA. I have no sympathy for those who would rather complain than unite to solve the problems. Any proposed solutions or new suggestions this person might have had are cast into the wind and benefit no one. If you find yourself complaining about positions CLSA has taken on certain issues, or criticizing legislation that CLSA has proposed, I urge you to join the Association and let your voice be heard. Support your profession and make a difference!

In closing, I would like to encourage each CLSA member reading this article to try to bring a new member into the Association. With a broader member base of Professional Land Surveyors voicing their concerns, we can help ensure that the direction taken by CLSA will be in accord with the interests of the Land Surveyors in California.

Howard W. Brunner, P.L.S.
President

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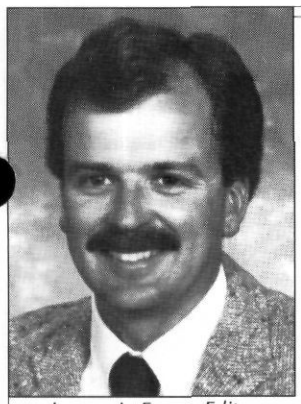


Jeremy L. Evans, Editor

Letters to the Editor

CONTINUING EDUCATION

Your editorial in the Fall issue of the California Surveyor brought back some fond, and not so fond, memories for me. I recall the long hours, weeks, even years, of preparation and how nervous I was before taking the LS exam. What a relief it was when the infamous letter arrived notifying me that I had joined a group of elite professionals.

I am not sure what your definition of professional is, but to me it meant no longer an amateur; no longer would I have to prove myself, for now I was a professional at a level shared with a select few. This was a standard of excellence, not something achieved from a home study course or part time classes. This required six years of hard labor and endless hours of study just to qualify! You must recall this — unless you are very fortunate or we passed a different exam.

"Continuing Education" is a buzz phrase used in many professions. I also have a professional license as a realtor which I felt was necessary to deal with the changing world of property values. My realtor license requires Continuing Education every four years for renewal. I find this acceptable because of the changing laws, policies, disclosure mandates, and exposure to liability. The basics for surveying have not changed. We still are governed by the Manual of Surveying Instructions and survey law and principals that have for years been cast in stone. While the application is different, a chain is still 66 feet no matter how it is measured; old monuments and fences do not become obsolete or change stature. Our methods have greatly improved, as has the accompanying paper work in our profession, but this alone is not justification for **compulsory** Continuing Education

As licensed surveyors, we are constantly besieged by new county law, codes, changes in the Map Act, state and federal law, not to mention the persons we all work with who impose their own law. If you are, in fact, a professional, you deal with these changes everyday and "on-the-job training" teaches you when and how to deal with these rules and laws. All counties and cities have different laws or interpretations of these laws so it is erroneous to believe that simply attending some classes will provide a curriculum that will educate beyond what one learns while on the job or at the various seminars we attend when time allows.

I see compulsory Continuing Education serving those surveyors employed by the government agencies who will pay the tuition fees and provide time for attendance. If you are proposing a person be required to attend four, three unit classes each four years, what classes will be available and how far would you expect a person to travel for such a class? You can only take Surveying Principals so many times — as we all have already.

I have no plans to travel to a college that could provide "proper" (and who defines proper) curriculum when it could be hundreds of miles away. I did that years ago and thought that was behind me. This idea is ludicrous for those of us who do not live in the vicinity of a state college or university, and you can bet very few junior colleges will offer specialized courses that we have not already had.

If a surveyor is, in fact, a professional, why do you feel compelled to question this status? Continuing Education is everyone's responsibility as a professional, and you pay the price for not keeping up. Your suggestion of compulsory Continuing Education is just another tangent to so many other government-imposed mandates we confront that dilute our human rights and professionalism.

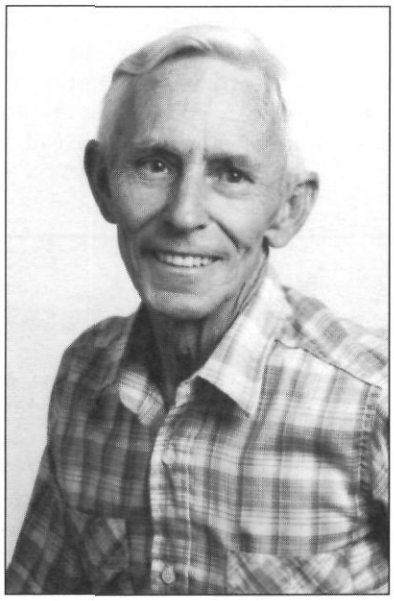
You seem to be worried about the person who does shoddy work and how you can straighten them out. The solution is simpler than your Continuing Education approach, which the shoddy surveyor won't attend anyway. We have a Board of Registration that keeps us in line. If someone is not aware of the law or is violating the rules, enforcement is only a phone call away. Why badger the

CONTINUED ON PAGE 6

In Memory of
Charles Adrian "Chuck" Wooldridge, Jr.

November 21, 1923 – April 11, 1989

Charles Adrian "Chuck" Wooldridge, Jr., was born in Seattle, Washington, on November 21, 1923; the oldest in a family of six children. He was raised in Washington with his three brothers and two sisters. As a young boy, Chuck's father took him into the field for fresh air and exercise, gradually teaching him surveying theory and practice.



During his senior year of high school, he quit to earn some of the "high" wartime wages, a move he later thought had been foolish. However, after moving to California, he received his diploma in June of 1950 from Oakland Adult Evening High School. He continued his education through various schools, colleges, seminars, workshops, and home study.

A third generation engineer and surveyor, Chuck had over forty years of experience in public and private offices. His experience in the development process was obtained while working with public agencies, before entering the private sector as a consultant. Over the years, Chuck was involved in many aspects of land development, planning, engineering, design, surveying, construction, supervision, and management. His diverse background also included experience as a developer's representative and as a principal in consulting firms.

In the later years of his career, recognizing the invaluable assistance computers could offer the engineer, Chuck acquired a working knowledge of computers, learning to program them to serve the specific needs of a given project.

Although residential design was an important activity to Chuck, it did not preclude his wide range of endeavors from encompassing major road and utility projects, as well as industrial, commercial, and educational development.

Among his more unusual accomplishments in design and construction were the creation of more than 6,000 on-base housing units for all branches of the United States military in California, as well as the design of the first recreational theme park in the Arab world for the Government of Kuwait.

Chuck was licensed as a Registered Civil Engineer and Land Surveyor in California, Nevada, Oregon, Utah, and Arizona. His membership in several professional societies reflected his belief that professional society participation produced experiences directly beneficial and applicable to his career. Chuck felt the most interesting of these pursuits was testifying before committees of the state legislature; the most rewarding, the tasks performed while on committees appointed by the State Board of Registration.

Chuck was a Past Fellow, Past Director, and Past State President of the American Congress on Surveying and Mapping (ACSM) and served one year as the Chairman of ACSM's Northern California Section. A Past Director of the Bay Counties Civil Engineers and Land Surveyors Association, Chuck served on that Association's Negotiating Committee during contract negotiations for two contracts, and served on its Labor Management Committee between contracts.

A very active member of CLSA, Chuck was a Life Member and Past President. He served on numerous Committees and was a member of the Board of Directors for many years. Chuck's contribution to the land surveying profession is greatly appreciated; he will certainly be missed.

Chuck is survived by his wife, five daughters, fifteen grandchildren, fourteen great-grandchildren, and many nieces, nephews, and cousins. ⊕

Letters . . .

CONTINUED FROM PAGE 5

vast majority who pride themselves in their profession and strive to keep informed?

I will not support Continuing Education. In fact, I cannot support CLSA any longer if it is not going to protect us against legislation that will eliminate some of us from our profession. Rather, I would very actively campaign against anyone jeopardizing our professional standing in the form of a larger-than-you-could-believe class action, if necessary.

Your proposal is a slap in the face. I think many of us "professionals" feel, or will feel, betrayed by our own association if your article is an indication of how our directors are thinking. I worked too hard for this license, and am too proud of having met the standards necessary over many years, to let it all slip away because a chosen few have misconstrued ideas that compulsory education is the answer to an imaginary problem.

Sincerely,
Andrew E. Johnston, P.L.S.

CHANGES OF ADDRESS

There is an increasing number of professional engineers and professional land surveyors whose licenses become delinquent or expired because they have not notified the Board office of a change of address.

The licensed registrants are not receiving their renewal notices timely because the renewal notices are sent to the address of record, which many times is an incorrect address.

The Board is requesting your organization to incorporate an article in your newsletter stating it is the responsibility of the licensee/registrant to notify the board office within 30 days of any change of address.

Your cooperation in this matter is greatly appreciated.

Sincerely,
Darlene Atkinson Stroup
Executive Officer
Board of Registration
for Professional Engineers
and Land Surveyors
P.O. Box 659005
Sacramento, CA 95865-9005

LETTERS CONTINUED ON PAGE 21

Wells Fargo Comes Through For Small Business Again.

In early California, it took more than good intentions for small business to survive. Often it took the resources and personal service of a Wells Fargo agent. Since 1852, Wells Fargo has been coming through for small business.

Today our agents are called Wells Fargo Business Bankers.™ And they're still coming through for small business customers, like Dale and Luana Fullerton, owners of Action Fire Protection.

When Business Banker Muriel Haney saw how many hours it was costing the owners of this company to keep track of all their outstanding loans, she came through with a better way: a loan consolidation plan that made their time more productive. And their enterprise more efficient.

Wells Fargo Business Bankers are expert problem solvers. And they're backed up by our proven 24-hour person-to-person phone service. Plus longer, more convenient office hours to meet the needs of small business. Even on Saturdays.

If you'd like to sit down with a Wells Fargo Business Banker, just let us know when it would be convenient for you. Simply visit your local Wells Fargo office. Or, call our Business Banking Hotline at 1-800-642-BANK, ext. 504.

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WELLS FARGO BANK

Stop Losing Money Through Estimate Overruns

By Ron Murphy

SURVEYORS are losing money through estimate overruns. The money is lost when an estimate of costs is given to a client, and costs overrun that estimate but are not collectable. For example, if an estimate is given for $1,000 and the actual billable cost of the survey is $1,500, the surveyor has lost $500. Had the surveyor done the work at an hourly rate without an estimate, he or she would have been paid for all of the billable time.

I work for a firm of consulting engineers and land surveyors that lost $40,000 last year in surveying estimates that ran over the proposed costs. That was about eight percent of our gross surveying billing for the year. If we can make a ten percent profit, we think we've had a good year. Reducing that ten percent profit margin by eight percent of our billings leaves a whopping profit of two percent.

Other surveyors I talked to recently are having similar problems with estimates. One is losing nine percent on estimate overruns, which totals about $160,000 in his firm. Another is in about the same boat as we are, and yet another is losing about one percent. A look at the industry itself, using the 60 firms listed as members in the Minnesota Land Surveyors Association's 1988 roster as a base, shows how extensive the damage can be. Assuming that the average annual surveying billing for these firms is $200,000 and using the eight percent loss by estimate overrun as an average, we can see that the loss to the industry per year is about $960,000. But let's just say that all other private surveyors are twice as intelligent in their estimates as we are, and only lost four percent by estimate overrun; that's still about a half million dollars per year that the surveyor works for but doesn't get. If that is the case, and I think it is, estimates should be a major concern for this industry.

The heart of the problem apparently lies in the concept of the estimate. Potential clients request an estimate of costs from us so they will know approximately what a project costs, to see if they can afford it and to budget for those costs. We provide that estimate based on certain assumptions and experience. We do a minimal amount of office research on most estimates, usually looking at aerials if the project is in outlying areas or half section maps where they are available. We seldom have the time to go out and visit the site, and many of our projects aren't large enough to justify a site visit. We thus provide the potential client an estimate, and we either get the job or we don't.

Surveyors often find their profits substantially reduced by estimate overruns. To reverse the trend the key may be the work order.

Once a client gives us a go-ahead, the estimated cost becomes a fixed figure which the land surveyor had better not exceed without some exceedingly good reasons. In the client's mind, the figure is carved in stone — much more permanently that the Ten Commandments, the Constitution of the United States, or any marriage vows.

What has occurred here is that the surveyor has taken a guess at what certain services cost, based on general assumptions, which in the progress of the survey will usually prove to be incorrect or inadequate. The surveyor's computations are based on an average survey cost, and we know 50 percent of surveys cost more that the average. Until the survey is completed, the surveyor doesn't really know what the actual costs are going to be. There are just too many variables: monuments that existed a month ago somehow disappeared; a series of buildings and encroachments standing over the line; the two monuments the client said were in place are for playing horseshoes; what appeared to be a few trees turned out to be an alder thicket; the old survey done 25 years ago came off a wrong section corner; the surveyor blew a distance or angle, or it does not agree with the present description by 40 feet; or the neighbor is armed and nasty with a reputation for violence.

Land surveyors are known as easy-going folks who want to help their clients as much as they can, so they give out estimates that aid the client and hurt the surveyor. They give out estimates with a not-to-exceed figure, estimates for a figure between X and Y, and lump-sum estimates. And they overrun those estimates to their loss. The client is happy as a clam, having paid $1,000 for $1,500 worth of work, or gotten an $800 survey for $375. The surveyor wonders what went wrong, why he can't make any money at his job, and why the whole world is against him.

I think that giving a proposed client an estimate is a good idea, if it is done correctly. If done correctly, the client has an idea of what the survey will cost and will sign the contract or work order allowing the surveyor to start surveying. If done correctly, the surveyor can usually stay within the bounds of the estimate. My firm has revised its work order form, which is a contract between the client and the surveyor, to clarify what an estimate is to the client, and to list certain standard assumptions made for each estimate. We go to great lengths to state

that our estimate is based on certain assumptions which, if invalid, will probably increase the cost of surveying services. We are stating that the estimate, say for $1,000, is a dependent figure; it depends upon what is actually discovered in the course of the survey. We say that the estimate could run over the figure given the client by as much as 40 percent without informing the client. And we say it all up front on our contract.

We send out a standard signed work order with a sheet for the client to sign and return, and a sheet for the client to sign and keep. Both sides get copies of this contract.

Stapled to the top of the sheets we send out is the following statement:

"Please sign the white copy and return to this office in the self-addressed envelope enclosed. Retain the blue copy for your records.

"Read both sides of the work order to be aware of the hourly rates, the basis of an estimate of costs and the standard assumptions for that estimate, as well as the State requirements for Certificates of Location of Government Corners, where applicable."

We thereby make the client aware that the estimate is based upon certain assumptions and that the work is done at hourly rates.

On the front side of the work order we have an area set aside for the estimate and information specific to that estimate. We cite whether the project is to be done by standard hourly rates, per our attached proposal, for a

CONTINUED ON PAGE 10

Figure 1: An Example of a Work Order Agreement

SURVEYING COMPANY, INC.

Address, State, Zip _____
Phone Number _____
Client _____
Date Ordered _____
Address _____
Date Promised _____ Order Taken By _____
Phone _____ Ordered By (Name) _____
Location _____ Address _____
Description of Work Ordered: _____

WORK ORDER AGREEMENT – 1. The net accrued bill resulting from the preceding month's work performed is due and payable within 10 days of the billing. If the bill goes unpaid, then said bill shall automatically be declared delinquent. 2. Twelve (12) percent annual interest at the rate of one (1) percent per month will be charged for all delinquent bills. 3. It is understood that work described to be performed in this agreement by Surveying Company, Inc. will not be undertaken until this work agreement is signed by the requesting responsible party. 4. Bills not paid after 60 days will be automatically liened or filed with conciliation court unless the client makes suitable arrangements for payment.

PLEASE TAKE NOTICE:

PERSONS OR COMPANIES FURNISHING LABOR OR MATERIALS FOR THE IMPROVEMENT OF REAL PROPERTY MAY ENFORCE A LIEN UPON THE IMPROVED LAND IF THEY ARE NOT PAID FOR THEIR CONTRIBUTIONS, EVEN IF SUCH PARTIES HAVE NO DIRECT CONTRACTUAL RELATIONSHIP WITH THE OWNER.

STATE LAW PERMITS THE OWNER TO WITHHOLD FROM HIS CONTRACTOR SO MUCH OF THE CONTRACT PRICE AS MAY BE NECESSARY TO MEET THE DEMANDS OF ALL OTHER LIEN CLAIMANTS, PAY DIRECTLY SUCH LIENS AND DEDUCT THE COST THEREOF FROM THE CONTRACT PRICE, OR WITHHOLD AMOUNTS FROM HIS CONTRACTOR UNTIL THE EXPIRATION OF 120 DAYS FROM THE COMPLETION OF SUCH IMPROVEMENT UNLESS THE CONTRACTOR FURNISHES TO THE OWNER WAIVERS OF CLAIMS FOR MECHANIC'S LIENS SIGNED BY PERSONS WHO FURNISHED ANY LABOR OR MATERIAL FOR THE IMPROVEMENT AND WHO PROVIDED THE OWNER WITH TIMELY NOTICE.

Surveying Company, Inc. _____ Date _____
Authorized By _____ Date _____

Estimate Overruns . . .

CONTINUED FROM PAGE 9

lump sum, or is an estimate based on standard assumptions. We will state what the estimate figure is in this area and list any specific assumptions we based our figures on, such as the north and northeast government corner being in place, or the 1961 survey we were given being done correctly, or two of the four monuments being still in place, or the work to be done prior to snowfall.

On the back side of the work order we state the basis of our hourly rate. Usually we just state an hourly rate per person or job classification, which is based on salary cost multiplied by a factor of 2.2.

The next section states the basis of the estimate. We state that we don't really know what's out there in the unknown territory of this survey, that we therefore must make certain assumptions, that they could be incorrect and, if incorrect, the cost of the survey will probably increase. We state that as follows:

"This estimate of costs is based upon certain assumptions made at the time of the estimate which will be found to be valid or invalid by actual field survey, computation, and record and title review as the survey progresses. Should any of these assumptions prove invalid, the cost of the survey will most likely increase. This is your notice that this estimate is subject to change, based upon those assumptions, and is a firm figure only where those assumptions prove correct.

"Where unexpected developments increase the scope of the work from that defined by the work order and the assumptions of the estimate, Comstock & Davis, Inc. shall make reasonable effort to contact the client and discuss changes. The client, by agreeing to the change, recognizes that the estimate of cost may also change.

"The actual cost of a survey will not exceed the estimate by 40 percent without consultation with or notification of the client."

The next section discusses certain standard assumptions we make for estimates. The first paragraph deals with government corners, their existence and reestablishment or correctness. The second considers monumentation and lot surveys. The third states that the surveyor will charge additionally for delays in the work not anticipated in the estimate. The fourth places the record title documentation responsibility on the client, and finally states that the estimate does not include extra work which the survey may disclose and was not cited in the work order or estimate. It does this as follows:

"Record monumentation of Government Corners and/or their accessories are existing, correct and as assumed for the estimate. Evidence to establish a Government Corner position by obliterated methods is available within a 100 foot radius of its position. Lines of occupation or topographic calls used on the estimate are sufficient to locate the Government Corners or property lines and are existent upon the ground at the time of the survey.

Some feel what I've done would send a client running for the nearest attorney or another surveyor.

"Monuments found on the ground are in their correct positions and capable of being proved correct. Record monuments placed on surveys used to establish the lines or monuments or the estimated survey are existent and correct and the plat and field notes of those surveys are available to the surveyor. Lot surveys are able to be established within the block and the block need not be separately established. Lot lines and monuments can be reestablished by existing monumentation within the adjacent three lots in the block.

"There will be no delays in the work caused by the client, or its representative, or an involved government body, which require additional job review and set up or work in inclement weather or ground conditions, or extend the scope of the work beyond that anticipated in this estimate.

"The title and description of the property is as represented by the client. Title documents necessary for the depiction and/or location of record surveyable rights will submitted to the surveyor in a timely manner. There are no easements, rights-of-way or court adjudicated lines, or title problems such as gaps, overlaps, encroachments, adverse possession, practical location disagreement with adjoiners or conflicts with adjoining deeds except as stated by the client at the time of the estimate."

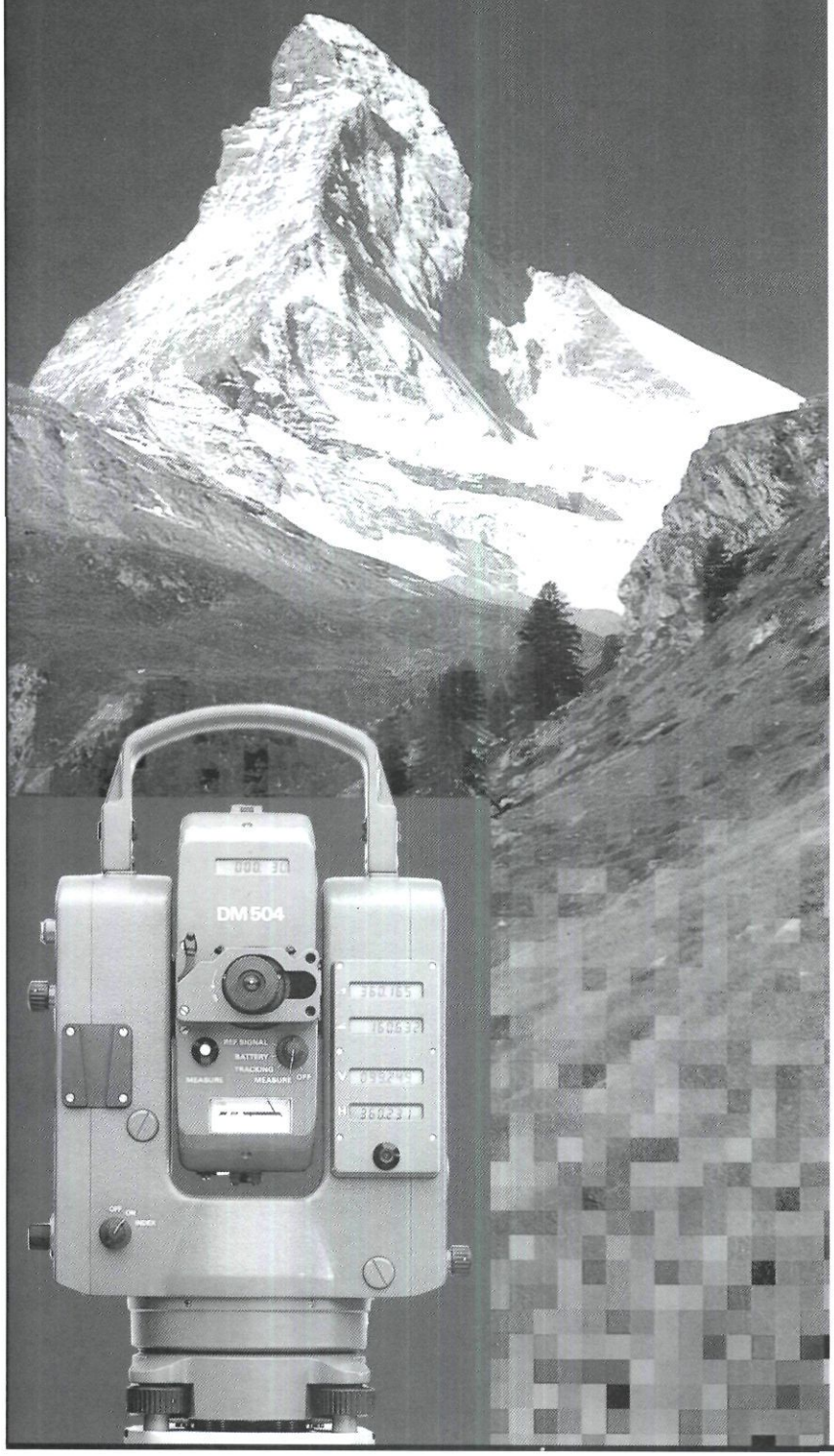
Each one of the items addressed above reflects a problem we've been tagged with in the past. We have encountered corners having Certificates of Location of Government Corner on record which appear to be 60 to 90 feet off. Evidence to establish an obliterated corner was from monuments 1,320 feet and 660 feet away, not in the general area. We've picked out fence lines for estimate purposes on old aerials that turn out to be 300 feet off of a proper location, or no longer existed. A record survey was incorrectly done 10 years ago, or the office work was correctly done and the monuments along one side of the tract area were all six feet off. Our client delayed through fall into winter, causing us to work in three feet of snow. A client gave us the requirements of a title company for a full ALTA Survey which was not mentioned when we discussed the project; he didn't know the difference. To him, a survey is a survey.

As the examples show, the estimate is dependent and therefore subject to change. The language in our work order form is new so I can't give any comments on its success or acceptance by our clients. Some surveyors I've discussed this with feel that what I've done here would send a client running for the nearest attorney or another surveyor. Perhaps it would be better handled in a friendly letter form sent with the contract. The way I've done this, it's a part of the contract and the client has been told to read it. I think that it will be usually treated like the disclaimers on a package of cigarettes or the small print in an insurance policy. On the other hand, the client may ask, "What is going on here? All I wanted was an estimate, not the Bill of Rights; just tell me exactly what the survey is going to cost." We can only reply that it takes what it takes. The final bill will be the exact costs.

RON MURPHY is vice president of surveying for Comstock & Davis in Minneapolis, Minnesota.

Reprinted from the *Professional Surveyor*, July/August 1989. ⊕

KERN AND THE MATTERHORN:
UNMISTAKABLY SWISS



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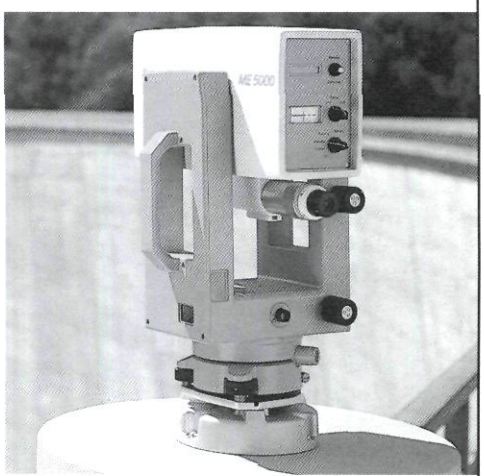

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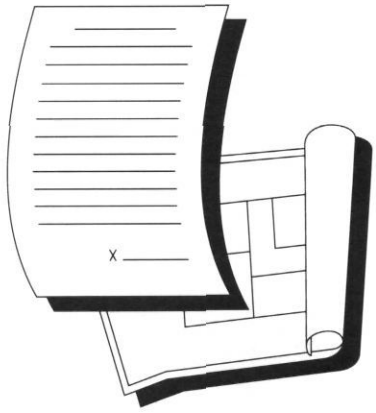
Parol Evidence



By Raymond E. Connin

OBTAINING and preserving parol evidence is one of the most basic tasks that a professional surveyor must address. For some reason many current surveyors are reluctant to be involved with any type of information other than the deed descriptions and the measurements. This might be due to the fact that they never learned how to collect this evidence from their mentors. All too often survey crews are sent to the field armed only with instructions of "find all the evidence." Frequently these instructions really mean "only locate existing survey monuments."

WHAT IS PAROL EVIDENCE?

Few licensed surveyors or their party chiefs really understand what constitutes evidence. From *Black's Law Dictionary,* the definition of the word "evidence" states, "Testimony, writings, material objects, or other things present to the senses that are offered to prove the existence or nonexistence of a fact." The same source defines"parol" as, "A word; speech; hence, oral or verbal. Expressed or evidenced by speech only." The surveyor is the professional who is charged with the responsibility to collect these elements of evidence. The surveyor must then take further actions to preserve this evidence for later use and support of rights of ownership or use of real property.

It does not matter which side of the fence a surveyor sits on regarding the topic of making decisions as to boundary location and/or ownership. Surveyors must agree that a proper survey is a collection and a record of the facts as they existed at the time of the survey. These facts should not be limited to the measurements of distance and direction derived between found or set survey monuments. Often facts of evidence are recorded in the field books and plats that relate to the location of improvements and land use in the area of the property boundaries. These are the items referred to as writings and material objects in the definition of evidence.

How does the element of parol evidence enter into the picture? In *Boundary Control and Legal Principles,* Brown states, "The mere loss of original monument positions does not void the land title. Land is located as based upon the best available evidence, even rumor if necessary." Many books and seminars address parol evidence and the relation to real property ownership, but few give any procedures to conduct these investigations.

Interviews may be formally scheduled and held in an office or can take place just as casual conversation over the hood of a truck.

Most title insurance policies contain standard exceptions for types of losses that will not be covered. One of these exceptions normally refers to loss or damage due to "any facts, rights, interest, or claims which are not shown by public record but which could be ascertained by an inspection of said land or making inquiry of persons in possession thereof." Another standard exemption states that there will be no compensation for losses due to "Discrepancies, conflict in boundary lines, shortages in area, encroachments, and any other facts that a correct survey would disclose." It should be obvious that unless the surveyor has contacted all the concerned parties it would be impossible to meet these requirements of a "correct survey."

FINDING CONTACTS

Most surveys commence with a records research at the local government office responsible for the recording of deeds. This is also a good location to commence the search for parol evidence. This is where names and/or addresses of current and past adjacent land owners are available. These records may also include references to surveyors or members of other related professions that may have been involved with projects conducted in that area. It takes little extra effort to list these for future reference.

Once the names and addresses are known, these people can be sent copies of a simple letter stating that a survey is to be conducted in that area. This letter should solicit any information that they might have concerning the subject property. The letters should include the name, address and telephone number of the surveyor conducting the survey, and may also indicate a specific date on which the field work is scheduled to commence. This request for information should include a response cut off date clause such as, "If I have not heard from you by the 15th of this month then I will assume that you have no information regarding this property, its ownership, or location." The deadline needs to provide a reasonable amount of time, normally two to three weeks.

Any written responses would be included with the other documents regarding this survey project to be preserved as evidence.

VERBAL INFORMATION

The art of conducting an interview is fairly easy to learn. Interviews may be formally scheduled and held in an office or can take place just as casual conversation over the hood of a truck. Either way, the purpose is to find out

CONTINUED ON PAGE 14

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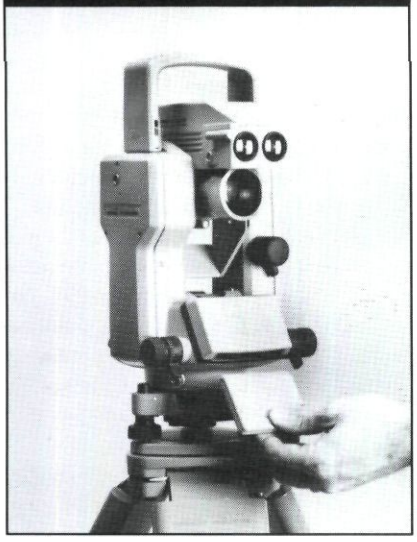

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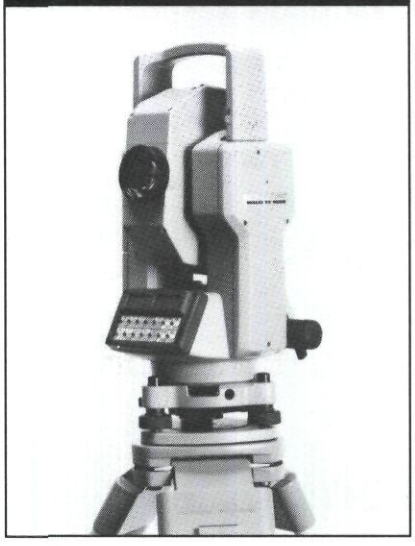

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Parole Evidence . . .

CONTINUED FROM PAGE 12

what a person knows about the property. Many times the information that is obtained depends directly on the questions that are asked. A good interviewer will not imply which answer may be preferred. Questions must not be stated so that the person being interviewed is unduly influenced by the phrasing of the question. An example of this type of question might be, "Did you build and repair that fence as a representation of the extent of your ownership and boundary?" Attorneys refer to these type questions as "leading the witness." A better way to ask this question might be, "Do you know who constructed the fence and why it was built at that location?" If the interviewer is asking the right type of questions, the conversation will stay on track regarding the subject property, and the persons being interviewed will be encouraged to express the information in their own words.

The particular subject matter that needs to be addressed will vary depending on the witnesses and the information that they might have. In general, most items will fall into the following categories:

A) Who are they and what is their relationship to the property?

B) What do they know about the property?

C) When was this information first known to them?

D) Were any actions taken based on this knowledge?

E) How did they come by this knowledge?

In the newspaper business this referred to as the "who, what, where, when and how" type interview. Even if the information proves to be false or in error, it still needs to be documented. This is not the time to challenge any statements or to attempt to disqualify the information or the witness. The interview is to collect information as it is known to the person being interviewed, not to conduct a cross examination. Only after all the evidence is collected and compiled can knowledgeable decisions be reached.

In the Bureau of Land Management's publication, entitled *Manual of Surveying Instructions 1973*, the elements of parol evidence are addressed in Chapter V, "Restoration of Lost or Obliterated Corners." Sections 5–11 and 8–18 of that manual include the instructions on how to incorporate parol evidence and testimony into the official notes. This would be a good example to the private sector surveyors to follow.

DOCUMENTING THE EVIDENCE

The spoken word may have great value as evidence, but if others are to benefit from this information it must be preserved in document form. One of the best means of preserving the interview would be to have a stenographer present and to have the person being interviewed sign the original transcription of the interview. Except in connection with a civil litigation, the expense of this type of documentation is not necessary. Many times, a brief written summary of the information received will be satisfactory. This summary could be included in the field book for that project, the same way that the GLO and BLM guidelines suggest, or the summary could be scribed on a separate document. Either way, it should be signed and dated by both parties. Copies of these statements must be included with the final survey report.

When making a summary of the interview, the surveyor must be careful to not slant the information. It must be preserved as a true representation of the content of the statements. It is best if these summaries can be made at the time of the interview, and the person being interviewed is asked to read it and to make a sworn statement regarding its truth as they know it.

A tape recording may be used; however, starting and ending time should be noted on the tape. Also, the person being interviewed should be notified that the interview is being recorded and should be asked for permission to do so.

Many states will allow a licensed surveyor to administer an oath and record a sworn statement. If this is not the case in your state, then it becomes advisable for all surveyors and/or crew members who will be taking such statements to become notary publics in the states in which they practice. By having the person being interviewed make a sworn statement and having it properly notarized, the information will be easier to use later if the survey is subject to litigation.

Most states have rules and guidelines on how evidence should be referred to when preserving parol evidence. In many cases a standard state-

CONTINUED ON PAGE 16

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Parole Evidence . . .

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ment as to truth and authenticity can be developed or located that will be sufficient for administering the oath.

ADDRESSING THE VALUE OF PAROL EVIDENCE

The value or the weight placed on each item of evidence must depend on its credibility or supporting evidence. These are the questions that require the use of professional expertise and experience prior to making a judgement that will affect real property ownership rights. One unsupported claim of undocumented ownership may not be enough to grant clear title, but it must be addressed in order to remove any clouds on the title. A claim of ownership that is supported by actions, and recognition of these actions, may well be sufficient to transfer ownership. Often this type of situation, or the supporting facts, will never be recorded if the surveyor does not assume the responsibility of documenting them. A claim of adverse possession could be easily countered if a "proper survey" conducted a year prior showed an acknowledgment of permissive use.

In a recent IBLA case (*Stoddard Jacobsen and Robert C. Dower vs. Bureau of Land Management*, IBLA #86-45. Decided May 8, 1987.), the Administrative Law, Judge L. K. Luoma, "did not accept BLM's location of the south ¼ corner, referring to the lack of testimony regarding the state highway department's methodologies and BLM's reconstruction of the purported monument." The Judge went on to say, "Moreover, the location of this corner is not supported by other collateral evidence . . . ." The judgement in this case clearly shows that due to the lack of supporting evidence (testimony) the highway department's ¼ corner could not be held as correct.

CREATING A PERMANENT RECORD

The best statement made by the best source in the world is of no value if it is not preserved in order to be available for later use and reference. The procedures used to preserve survey records by the GLO, and later the BLM, are good examples to follow with all real property surveys. Not only were the finished plats recorded, but also the supporting documents (field notes) were included in the records. Most surveyors in the "rectangular states" know, when commencing a survey based on the Public Land Survey System, a copy of both the original plat and the original field notes must be examined. The same holds true for any survey representing real property ownership. Every sheet of paper on which each calculation was computed need not be recorded, but the public records should contain enough information so that a later examination of these records will represent what was done and why. Many times the "whys" are of greater evidential importance than the "whats."

Regardless of whether a state has a law requiring recordation, every professional surveyor should welcome the concept and actively engage in recording the plats and reports of all property surveys. If the survey is to be of any value to the client and others that could be expected to rely on the survey, it must be in the public records. A paper trail must be created to allow a researcher to find all the documents and related information that have been placed in the public records. This can be facilitated by interconnecting references of documents and recording numbers.

In some locations, getting documents recorded in an orderly, retrievable system is more difficult than conducting the survey. Unfortunately some of the government offices directed to maintain these records do not allow easy and direct access to this information. Documents may have to be recorded on separate dates so that a recording number of one document may be referenced on a second document. Another means of creating the paper trail might be to create a quit claim deed to the property in order to include it and its references in the "grantee-grantor" files and for the title companies to find. The exact process that must be used will differ with both location and project.

SUMMARY

How many times have surveyors placed new monuments in the ground without checking to see if prior monuments existed? How often do surveyors commence to measure, without asking adjacent property owners to direct them to any known corners or monuments? How many times have surveyors set up over a piece of pipe or iron bar, or even "found hub and tack" without any knowledge of the pedigree of that "monument"? How many hours have been wasted with crews searching for monuments they never found because they did not know where to look or what to look for? Most importantly, how often could the project have been completed much more easily by simply asking the people in the area what they know about the property?

If real property and boundary surveying is to continue and grow as a profession, we must take the time and effort today to leave a legacy that will be of value in the future. We cannot afford to continue to hoard and stockpile "private" survey records and notes. We cannot afford to only stake the "deed-lines" with a complete lack of consideration or documentation of other forms of evidence. We must realize that the information really does belong to the same public that allows us to practice as licensed surveyors. We must realize that we are not the supreme decision makers, but we do have the burden of compiling all the evidence and preserving it as a "snapshot" of the true conditions as they existed at the time of the survey.

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Bureau of Land Management. 1973. *Manual of Instruction for the Survey of the Public Lands of the United States*, Technical Bulletin 6. Washington: U.S. Government Printing Office.

Raymond E. Connin has been licensed as a Professional Land Surveyor in three states and has diverse domestic and foreign field experience. His education includes training as a paralegal in real estate and boundary law. He is currently pursuing a degree in computer-based Management Information Systems and Geographical Information Systems. Connin formerly taught surveying and mapping at the Denver Institute of Technology and was Director of Education for the Survey Sciences Division of the American Institute in Phoenix, Arizona.

Reprinted from *The Nebraska Surveyor*, Summer 1989.

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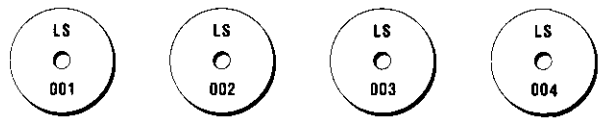

Untagged Monuments

In response to the article entitled "Found Untagged Monument," by Warren McDowell (*The California Surveyor,* Fall 1989), you'll find these letters indicate that not tagging found monuments violates the Land Surveyors Act.

May 24, 1990

Darlene Atkinson Stroup
Executive Officer
State Board of Registration for Professional Engineers and Land Surveyors
1428 Howe Avenue, Suite 56
Sacramento, CA 95825

Subject: Tagging untagged monuments used for control on a Record of Survey

Dear Ms. Stroup,

Copies of the enclosed correspondence from the Board of Registration (dated September 19, 1989, and September 18, 1974) clearly interprets the Land Surveyors Act to require tagging untagged monuments used for control on a Record of Survey.

There is a need for the Board to clearly interpret and publish the requirement of tagging untagged monumentation in compliance with the Land Surveyors Act.

This office, the League of California Surveying Organizations, the County Engineer's Association of California Surveying and Land Use Committee, and the Orange County Professional Practices Committee strongly support the interpretation of the Land Surveyors Act to require tagging untagged monuments when used for control.

Acceptance and recordation of R/S 80-1191 by William C. Ells, R.C.E. 10880, is awaiting your written opinion. Specifically in this case, Mr. Ells has accepted two untagged, no-reference monuments for street center line control.

Your early response will be appreciated by this office and Mr. Ells.

Very Truly Yours,
John Canas
County Surveyor
County of Orange
Environmental Management Agency

September 19, 1989

Reid Penland
County of Alameda
Public Works Agency
399 Elmhurst Street
Hayward, CA 94544-1395

Dear Mr. Penland:

We have received your letter dated July 21, 1989, with information enclosed highlighting the following information:

> TAGGING OF MONUMENTS
> "The Board has interpreted Sections 8762 and 8772 of the Land Surveyors Act to require that a corner monument, when found, used, and accepted as a monument by a registered civil engineer or land surveyor, should be perpetuated by placing his identification tag on the monument if no such tag is affixed at the time he uses the monument."

As you suggested, the item was probably in a 1974 newsletter published by the Board and did not reflect the Board's position at that time.

There have been many changes of the Professional Land Surveyors Act since 1974; in fact, both Sections 8762 and 8772 have been changed. However, the changes do not seem to have affected that portion of the Act in force in 1974 with respect to tagging monuments.

We have also reviewed our files and found no reference to any changes in interpretation; therefore, the Board's opinion would still be the same as it was in 1974 as quoted above.

Please feel free to contact me at (916) 920-7428 if you have any further questions.

Sincerely,
Gerald R. Hurlbert, L.S.
Program Manager
State Board of Registration for Professional Engineers and Land Surveyors

---

September 18, 1974

Mr. Stanley R. Smith
P.O. Box 84
Aptos, CA 95003

Dear Mr. Smith:

The Board of Registration responds to letters of inquiry and is obligated to render technical opinions and make regulations with regard to land surveying problems. Section 8710 of the Land Surveyors Act states:

> "The State Board of Registration for Professional Engineers is vested with the power to administer the provisions and requirements of this chapter and may make and enforce rules and regulations."

All land surveying performed by a licensed or registered professional in this state must comply with this act and any rule or regulations enacted pursuant to it.

The Board has determined that when an **untagged monument** is found and used by a surveyor in his survey, he is stating the corner is valid. He may identify it by affixing his tag to it; replace it with a more durable tagged monument, if the old monument is in a state of deterioration; or may place a durable tagged witness monument a short distance from it, depending on the nature of

the found monument or terrain in which the monument is found. This is what is known as **perpetuation of monuments.** When perpetuating a monument, a land surveyor or civil engineer shall file a Record of Survey or, when appropriate, a Corner Record, in accordance with the Land Surveyors Act. The filing of a Record of Survey Map applies also to newly set monuments.

Enclosed is the Attorney General Opinion on material evidence. When a land surveyor or civil engineer tags or sets a corner that is not of record, a Record of Survey shall be filed except when a Parcel Map, Subdivision Map, or Corner Record is filed pursuant to law showing such data. (See Sections 8762 and 8772 of the Land Surveyors Act.)

When these maps are of record, it will enable another surveyor following in the footsteps of the surveyor filing the map, and he may agree or disagree with his professional judgement. More important, the Record of Survey will indicate what has taken place and may be used as prima facia evidence in court proceedings over unrecorded maps.

Sincerely,
Donald R. Wright, Executive Secretary
State Board of Registration for Professional Engineers and Land Surveyors

[**Editor's Note:** I would suggest any land surveyors interested in this subject read Sections 8762–8771 of the Land Surveyors Act with an open mind and formulate your own opinion. To order a copy of the Land Surveyors Act, turn to the order form on page 30.] ⊕

When Computers Cause Discomfort

YOU CAN EASE the eye strain and neck and shoulder discomfort often caused by using a computer. *How:* Talk with your eye doctor about adding a pink or gray tint to your next pair of eyeglasses. The tint will soften the glare of the computer screen and lessen eye strain.

If you wear bifocals, ask that your next pair be made with the reading section placed slightly higher that usual. This will allow you to read what's on the screen without having to crane your neck.

Or try trifocals, lenses that have a third prescription area, which will suit your viewing needs at the computer.

Reprinted from *Communications Briefings.* ⊕

What Do These Bosses Lack?

By Frank Grazian

WHY DO SOME BOSSES with graduate degrees and management training violate many rules of good management?

Why, for example, do they bawl out employees in front of others or demean subordinates by continually berating them?

These actions are so regressive that they would seem to be the deeds of prehistoric creatures instead of modern-day leaders.

Essentially, we believe these managers lack people skills, and are unable to translate learning into action.

Let's look at some studies that show why managers fail:

■ **One study** disclosed that most managers fail because they are insensitive to others. They are unable to understand things from other people's perspectives.

■ **That study** also brought forth these additional reasons for failure: a cold, arrogant personality; betrayal of trust; and the lack of ability to build a team.

■ **Another study** found that more than half of the employees surveyed said their managers fail to make employees feel important as individuals. Interestingly, 77 percent of these workers said they were thinking of looking for another job.

How can companies improve the situation? Although rigid managers are difficult to change, we offer these suggestions:

■ **Modify the** climate of the organization, if possible. Even today, too many companies emphasize short-term efficiency and production at the expense of human relations. These organizations tend to be autocratic and reward the kind of manager who gets the job done at any cost.

■ **Send these** managers for listening training. When managers improve their listening skills, they tend to be more open to ideas and less rigid.

■ **Try to get** managers to perceive themselves as coaches — not quarterbacks. This approach allows them to be powerful without needing to dominate.

■ **Adopt a concept** that allows managers to see themselves as developers — not heroes who must solve every problem themselves. In *Managing for Excellence* (John Wiley & Sons), the authors recommend that managers put together a team of key subordinates who are jointly responsible with the manager for a department's success. The leader stretches the subordinates by asking, "How can each problem be solved in a way that further develops my subordinates' commitment and capabilities?"

Excellent companies promote productivity through people. And they require managers with people skills to get the job done.

Reprinted from *Communications Briefings.* ⊕

Letters . . . CONTINUED FROM PAGE 6

BLM SURVEYS APPROVED

This letter is to inform you of cadastral survey plats approved by the Chief Cadastral Surveyor for California during the third quarter of FY 1989, April 1 – June 30, 1989.

These plats are now on file in the Survey Records Office, Bureau of Land Management, California State Office, 2800 Cottage Way, Room E-2841, Sacramento, CA 95825.

TP	RG	MER	APPROVAL DATE	TYPE OF SURVEY/PLAT
T4S	R5W	MDM	04/05/89	Survey
Tps7&8N	Rs4&5E	HM	04/05/89	Dependent Resurvey & Survey
T11S	R4W	SBM	04/07/89	Dependent Resurvey & Subdivision
T6N	R5E	HM	04/14/89	Supplemental Plat
T6S	R8E	SBM	04/26/89	Supplemental Plat
T16N	R9E	MDM	05/04/89	Supplemental Plat
T17N	R8E	MDM	05/08/89	Supplemental Plat
T16S	R37E	MDM	05/09/89	Dependent Resurvey & Subdivision
T11N	R18E	MDM	05/17/89	Dependent Resurvey & Subdivision
T10N	R6W	MDM	05/22/89	Supplemental Plat
T3S	R20E	MDM	05/22/89	Dependent Resurvey, Subdivision, & Metes-and-Bounds Survey
T36N	R1E	MDM	05/24/89	Dependent Resurvey & Subdivision
T42N	R15E	MDM	05/26/89	Dependent Resurvey & Subdivision
T9N	R22E	SBM	05/26/89	Dependent Resurvey, Subdivision, & Metes-and-Bounds Survey
T10N	R6W	MDM	06/13/89	Supplemental Plat
T6S	R20E	SBM	06/30/89	Dependent Resurvey, Subdivision, & Metes-and-Bounds Survey

You may circulate this letter among your membership as well as publish it in your bulletin if you so desire.

Sincerely,
Clifford A. Robinson, Chief, Branch of Cadastral Survey
U.S. Dept. of the Interior, Bureau of Land Management

MORE BLM SURVEYS APPROVED

This letter is to inform you of cadastral survey plats approved by the Chief Cadastral Surveyor for California during the fourth quarter of FY '89, July 1, – September 30, 1989.

These plats are now on file in the Survey Records Office, Bureau of Land Management, California State Office, 2800 Cottage Way, Room E-2841, Sacramento, CA 95825.

TP	RG	MER	APPROVAL DATE	TYPE OF SURVEY/PLAT
T33N	R9W	MDM	07/31/89	Dependent Resurvey & Subdivision
T41N	R8W	MDM	08/28/89	Subdivision
T24N	R9W	MDM	08/28/89	Corrective Dependent Resurvey
T37N	R7W	MDM	09/01/89	Dependent Resurvey
T42N	R7W	MDM	09/01/89	Dependent Resurvey & Subdivision
T30N	R8W	MDM	09/06/89	Dependent Resurvey & Subdivision
T18S	R21E	MDM	09/06/89	Supplemental Plat
T29N	R9W	MDM	09/06/89	Dependent Resurvey
T16N	R11E	SBM	09/28/89	Dependent Resurvey & Subdivision

You may circulate this letter among your membership as well as publish it in your bulletin if you so desire.

Sincerely,
Clifford A. Robinson, Chief, Branch of Cadastral Survey
U. S. Dept. of the Interior, Bureau of Land Management

NGS INFORMATION PRODUCTS AVAILABLE

The National Geodetic Survey (NGS) would like your help in communicating information about its products and services to those in the surveying and mapping professions. NGS' information products include geodetic data, software and publications. In addition, NGS conducts workshops

CONTINUED ON PAGE 22

Orange County Chapter President's Night

THE ORANGE COUNTY CHAPTER celebrated their 15th anniversary at the January 11, 1990, dinner meeting. To mark the occasion, all of the past presidents were invited to share their memories and to commemorate the President's Plaque. The plaque recognizes each of their efforts, and will be held by the current president during his/her term of office.

Over 90 of the 210 members attended President's Night to mingle with some of the founding fathers, witness the passing of the gavel from John Pavlik (1989) to Kurt Hoehn (1990), and hear our guest speaker, State Past President Paul Cuomo, discuss issues facing the profession today. ⊕

CAPTION: Past Presidents of Orange County Chapter: *Seated (left to right),* Chuck Krepp (1977), Kevin McHugh, Sr. (1981), Roger Frank (1978), Kurt Hoehn (1990), John Pavlik (1989), Paul Cuomo (1985), Lon Maddox (1988). *Standing (left to right),* Dave DeGroot (1979), Ruel del Castillo (1975/76 & 1984), Dave Williams (1980 & 1982), Doug Foster (1983), Robert Ozibko (1986). *Not Shown, Larry Truman (1987).*

What Managers Don't Know

DON'T ASSUME that managers know the best way to deal with people. Results of an employee relations IQ test indicate that many managers aren't doing what most of the experts feel they should when working with colleagues and others.

Some findings:

- **Almost half** of the managers did not understand that people repeat behavior that is rewarded.
- **More than** 60 percent didn't think it was right to brag about their subordinates' accomplishments.
- **Almost 70** percent did not believe that finding a mutually satisfactory solution to a problem was a way to handle a grievance.
- **Almost half** did not understand that improving quality would reduce operating cost.
- **Almost 80** percent of the managers did not understand that the observations made in performance reviews should be specific rather than general.

Reprinted from *Communications Briefings.* ⊕

Letters . . .

CONTINUED FROM PAGE 21

and other cooperative projects to benefit the broad range of professions that depend on geodetic data.

Feel free to contact me for a copy of the NGS Booklet of Information Flyers highlighting some of our most important information products and cooperative programs.

Sincerely yours,
John F. Spencer, Jr., Chief
National Geodetic Information Center
National Geodetic Survey
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Rockville, MD 20852 ⊕

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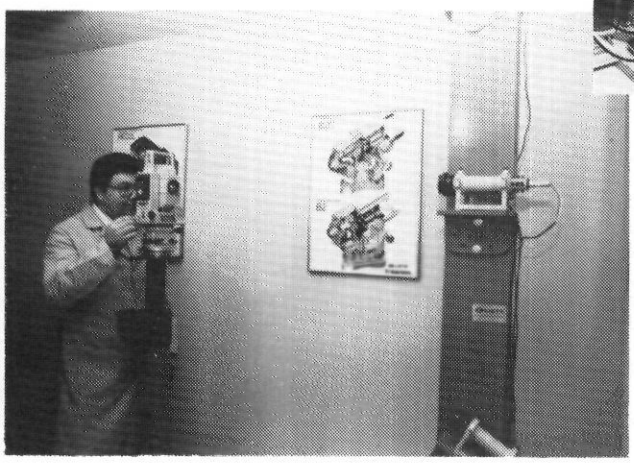

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Here's Some Important Information About CLSA

The goal of the California Land Surveyors Association is to promote and enhance the profession of surveying, to promote the common good and welfare of its members, to promote and maintain the highest possible standards of professional ethics and practice, and to elevate the public's understanding of our profession. CLSA represents all land surveyors, whether they are employees or proprietors, whether in the public or the private sector.

Representation

■ LOCAL: Your local chapter represents you in local issues. Through your chapter representative to the State Board of Directors, the individual member can direct the course CLSA will take. ■ STATE: The surveyor is represented at the state level through an active legislative program, legislative advocate, and liaison with the State Board of Registration. ■ REGIONAL: CLSA is an active member of the Western Federation of Professional Land Surveyors. This federation is composed of associations throughout the western United States and addresses regional issues. ■ NATIONAL: Through institutional affiliation with the National Society of Professional Surveyors and the American Congress on Surveying and Mapping, CLSA is represented at the national level.

Education Opportunities

CLSA presents annual conferences which provide technical and business programs, as well as exhibits of the latest in surveying and computing technology. Seminars and workshops are presented to assist in continuing education. CLSA publishes the *California Surveyor* magazine and the *CLSA News* to keep the membership abreast of changing legislation, legal opinions, and other items which affect our profession.

Business and Professional Services

CLSA provides a fully staffed central office which is available to answer questions or to provide up-to-date referrals concerning legislation, educational opportunities, job opportunities, or other issues concerning our membership. Health and professional liability insurance programs are available to members.

Join CLSA Today!

Application for Membership in the California Land Surveyors Association

Mail Your Completed Application To:

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Santa Rosa, CA 95405-9990

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The 2nd Annual

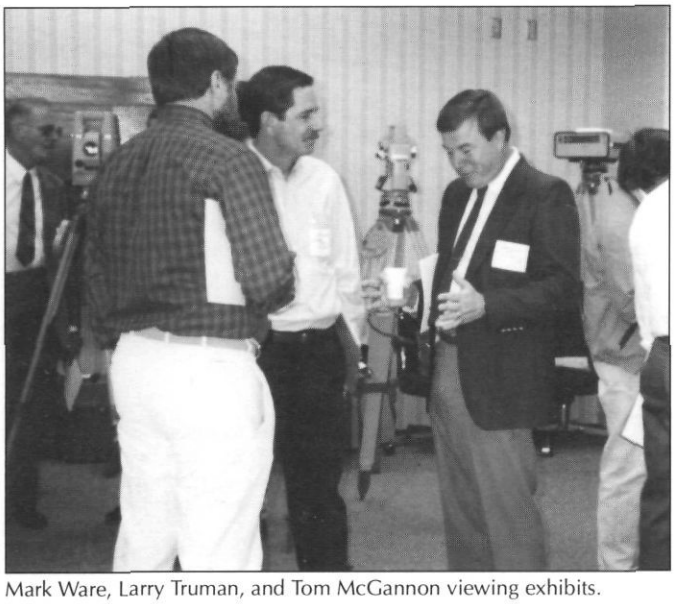
Cal Poly Pomona Surveying & Mapping Conference

By Pat Mercado

THE SECOND ANNUAL Surveying and Mapping Conference was held at the Kellogg West Conference Center on the campus of California State Polytechnic University at Pomona, on October 28, 1989. Presented by the Surveying/Engineering Department, this conference attracted surveyors from throughout the state by presenting a full agenda of professional speakers providing panel discussions and presentations on a variety of surveying topics that appealed to the surveying professionals as well as the students in attendance.

The conference was sponsored by the California Foundation for Land Surveying Education (CFLSE) and was an excellent opportunity to meet the staff and students of the surveying program at Cal Poly, which is gaining in enrollment and national recognition as a significant addition to surveying education programs.

The 1989 President of State CLSA, Paul Cuomo, welcomed over 185 participants to the day's presentation. As the Past President of CFLSE and as an educator, Paul has consistently promoted the surveying education programs throughout the state as the key to success of the profession. Paul coordinated with Cal Poly survey option students to present the conference speakers, and as moderator he introduced Dr. Howard Turner, Ph.D., P.L.S., who is the surveying coordinator at Cal Poly. Since starting at the University in January of 1989, Dr. Turner has established an excellent track record in his successful efforts in student recruitment, curriculum developments, and equipment and system acquisitions for the surveying program. He has become actively involved with CLSA, as well as assisting the Southern California Joint Apprenticeship Committee. Dr. Turner was an assistant professor in the School of Engineering at Purdue University, and his talk provided highlights of his illustrious career and an overview of the development of the survey option at Cal Poly and its future potential. Dr. Turner introduced Dean Edward C. Hohmann, the head of the School of Engineering at Cal Poly. Dean Hohmann provided insights into the university's continued commitment to providing support for the surveying program and expressed enthusiasm for its first graduates.



Mark Ware, Larry Truman, and Tom McGannon viewing exhibits.

The keynote speaker for the conference was Robert F. Packard, Engineer of Surveys with the City of Los Angeles. Mr. Packard presented some interesting glimpses of how the professional surveyor has played a significant role in the shaping of society in the past, how public demands affect the surveyor of the present, and how the development of land information systems offer the surveyor of the future the potential to be at the forefront of technical advances.

Dean Hohmann provided insights into the university's continued commitment to providing support for the surveying program and expressed enthusiasm for its first graduates.

The next speaker in the morning session was Mr. Eric Weitzman of the Environmental Systems Research Institute. Mr. Weitzman specializes in Geographic Information System (GIS) development. He provided a very interesting theory of applications and how important the role of the surveyor is in the conception of any geographical or land information system.

James B. McCavitt, P.L.S. was the next speaker. A graduate of the Surveying and Photogrammetry Program at California State University, Fresno, Jim has been employed by the Bureau of Land Management since 1976, where he holds the position of Land Surveyor in the Survey Examination Unit. Mr. McCavitt provided several examples of the complexity of government land surveys, and the task that the BLM undertakes in their review and examination of surveys of public lands by private surveyors.

Conferees were provided with the opportunity to view the latest technology in a "hands-on" environment presented by exhibitors representing the who's-who in surveying equipment and software. The latest available in total stations, computing systems, and GPS technology made it evident that today's surveyor is truly on the "cutting edge" of advancement.

The first speaker of the afternoon session was Roy Minnick, known to many in the profession by his continued efforts on the lecture circuit, his support of CLSA, and his involvement with making a variety of surveying manu-

als and publications available to the public. As a member of the State Lands Commission, Roy was well-suited to address his specific topic of water boundary situations.

The next speaker was Clifford A. "Skip" Robinson, P.L.S. Skip is the Cadastral Survey Branch Chief for the Bureau of Land Management in California, a position he has held for the past nine years. He is a Registered Land Surveyor in Wyoming, Montana and California. Skip's experience in instruction at the Bureau's advanced Cadastral Survey training courses translated well at this conference as he presented several studies in actual surveying situations that the BLM has encountered. The evidence recovered, existing records and other information were presented for group discussion followed by a presentation of the BLM's decisions and final solutions.

After the afternoon break a most interesting segment was presented by William F. Carr, a private surveyor in Southern California. It seems Mr. Carr has been quite involved with a project in the Long Beach Harbor, consisting of the construction of large man-made reefs that is accomplished by the placement of large quantities of rock. The rock is quarried and transported from Catalina Island. The unusual surveying effort involves the control for exact placement of the underwater fill operation to achieve specified slope ratios. While posing some unusual problems, Mr. Carr's approach was kept simple, and, with the aid of lasers, baselines from barge to barge were established and the ultimate goal was accomplished.

Closing the conference was Donald E. Bender, P.L.S., attorney at law, past president of ACSM. Mr. Bender is with the Department of Water and Power, City of Los Angeles. Mr. Bender's closing presentation was an impressive glimpse at where the surveyor fits into the development of many countries and cultures. He addressed the fact that the surveyor in many countries, even today, is held with the highest esteem. This is true in modern England, as well as Australia, where the surveyor is often the local magistrate also. Mr. Bender suggests that while the technological advancements we are experiencing will certainly provide for a more accurate and technically correct product from the surveyor of the future, the surveyor can use the advantages of the time saved to become more involved with legal aspects and responsibilities, providing for the welfare of the general public. This can be accomplished by the involvement of the surveyor in investigations of water supplies as well as other environmental issues.

Mr. Bender's overview was an excellent response to that age old question: "What is a surveyor?"

Paul Cuomo closed a full day of interesting speakers, an array of exhibitors, and an overall, very successful conference (interspersed with the traditional raffles) by commending the college, its staff, and dedicated surveying students for their tremendous effort. Cal Poly Pomona, in conjunction with the California Foundation for Land Surveying Education, are very proud of the substantial strides the surveying program has made in its relatively short history. And we, as professional surveyors, can take pride in the obvious rewards of a successful graduate program in surveying. ⊕

GPS Applies To The Practical Surveyor

By Robert W. Foster, P.E., P.L.S.

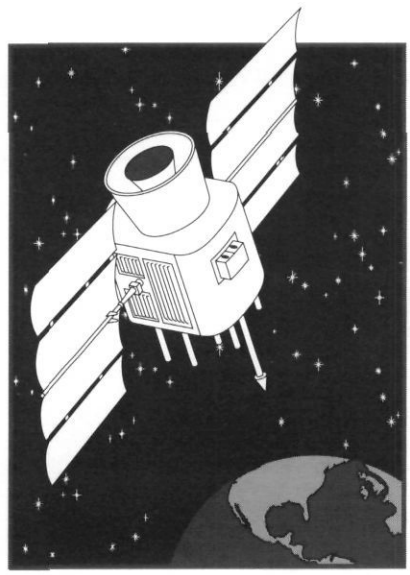
IT IS NOT too early in the evolution of the global positioning system to examine some of its practical applications. In the surveying profession, GPS has progressed from prototype to appliance. Many of the large surveying engineering firms have invested in the equipment, of which there are several models and manufacturers to choose from.

Much has been written about the use of GPS in grand and dramatic applications. Mountains have been measured, the earth's crustal deformation has been calibrated, and regional geodetic networks have been established. What about GPS use for the more pedestrian surveying applications?

My company has purchased four Trimble 4000SL receivers which read the civilian L1 beacon signal from the Global Positioning Systems NAVSTAR satellites. The receivers automatically acquire and track up to five satellites, precisely measure the carrier and code phases, and store them in an internal, solid-state, battery backed-up RAM memory. Data is processed on Trimvec Plus GPS software. To date, our experience indicates an unprecedented speed of positioning and a precision of measurement that meets or exceeds other surveying and mapping systems.

There is a subtle difference in the positioning and measuring functions as recognized by surveyors and mappers. Whereas in mapping the professional is interested in position relative to the earth's surface, or national or regional boundaries, the local surveying engineer may be more interested in measuring the relativity of features within his neighborhood of interest. Whereas the mapper may have latitude and longitude concerns, the local surveyor must relate a structure to a property line, or a property line to a highway layout.

The original objective in the development of GPS was to allow the United States military to track their planes, ships, and personnel. Towards this end, most early research and implementation was for point positioning where a single satellite receiver could be used to determine fairly accurate (± meters) geographic position. The receivers track several satellites, transmitting coded radio signals. Any precise positioning in this mode depends upon certain data that the U.S. Military holds as classified.



It is possible, however, to use the signals to determine precise relative positions without the use of classified codes, and in this mode the application is recognizable to any surveyor. GPS receivers may be used to measure a direction and distance between two points. When two receivers are used, a routine traverse procedure applies beginning at a known point, establishing new stations along a traverse route, and ending at another known point. Additional receivers allow more new stations to be established in a given time period and more redundancy for a stronger survey. In this mode, GPS makes it possible for the surveyor to do what he has always done — measure direction and distance — without regard to visibility or distance between points.

The first thing we did after unpacking the boxes last Fall was test our new equipment against a calibrated baseline. As the accompanying chart indicates, the only question was whether the baseline itself was of an accuracy commensurate with the precision of the equipment.

Note that the shortest line was measured in the shortest observation time. This was unplanned; the vehicle battery powering the receiver went dead after only 19 minutes of observation. And yet the apparent accuracy of this observation was over one in twenty-seven thousand (1/27,000). The longer lines, with longer observation times, yielded apparent accuracies of from one in a half-million (1/500,000) to one in nearly three million (1/3,000,000). We find no precision related reasons to doubt the applicability of the global positioning system for normal surveying work.

One of our first practical applications of GPS surveying was in establishing the location of a town line. A cartographer was having trouble positioning a housing subdivision on a parcel map being prepared for the town. The question was raised as to the method by which the town line — a boundary of the subdivision — had been determined. In Massachusetts a town line may only be determined by

occupying the town corner monuments. There are road stones which purport to show where the town line crosses roads, but these are good for showing a snow plow operator where *to turn around — and not much* more. The Massachusetts Department of Public Works publishes coordinate data for town corners but these are not considered legally reliable for establishing town line locations.

Since the housing subdivision in question was several thousand feet from the town corners in each direction, our solution was to relate several points within the subdivision to the town corner monuments by GPS survey; an application of the global positioning system was a natural for this problem. The results of our survey showed that the town line was seventy feet from where the developer thought it was. As a result, large portions of five-house lots are in the wrong town; one house is totally over the line. The legal and political solution to that problem must be found by methods other than GPS.

There is no longer a question of the practicability of GPS surveying methods for the difficult and unusual applications. More to the point, GPS is a practical solution to the normal surveying problems facing the practitioner. Consider establishing ground control for aerial photogrammetry, an exercise common to many surveyors in private practice. Evaluation of the GPS alternative is a simple matter of time and cost: how long will it take, and at what cost, to establish control by conventional methods as compared to GPS survey?

Conventional methods, defined as tape and transit or electronic distance measuring and theodolite, are limited by crew efficiency, labor requirements, weather and visibility conditions, and access to control. The major limiting factors in GPS surveying are number of receivers used and access to the satellites. Because the government has not yet launched a full constellation of satellites, the window of access is only about five hours each day, occurring at different times of the day at different times of the year. In a GPS survey application where four receivers are used, a reasonably well-trained crew can establish six to nine control positions per day given a five-hour window of access. It is not difficult to compare production by GPS survey to production by conventional survey. Allowing for manpower and equipment costs, the applicability of GPS surveying to control work for a specific project can be determined. On certain projects a production rate of six to nine control points by conventional survey methods is not attainable due to local conditions, accessibility of existing control, and so on. GPS is a method of survey whose time has come, even without a full array of NAVSTAR satellites.

Robert W. Foster is Executive Vice President of Schofield Brothers, Inc. of Framingham, Massachusetts. Foster is also Treasurer of ACSM and serves on the Board of Direction of that organization. Additionally, he is Chairman of the ACSM Public Relations Committee and NSPS Professional Liability Committee.

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Figure 1: GPS-Base Line Comparison Table

GPS Measurements vs. Calibrated Base Line*

Base Line Distance (feet)	GPS Distance (feet)	DIFF (GPS-Base Line) (feet)	Apparent Accuracy	Obversation Time (minutes)
492.123	492.105	-0.018	1:27,340	19
918.658	918.660	+0.002	1:459,329	67
2952.680	2952.679	-0.001	1:2,952,680	42
3871.332	3871.329	-0.003	1:1,290,444	42
4593.190	4593.185	-0.005	1:918,638	38

*Marlboro base line established by the National Geodetic Survey in congunction with the Massachusetts Geodetic Survey in 1979. GPS observations made by Schofield Brothers, Inc., Geodetic Survey Division in December 1988.

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