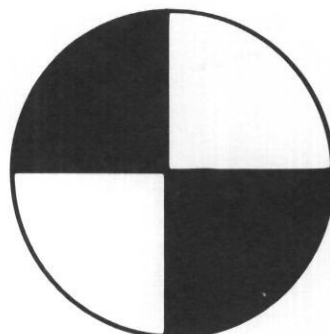
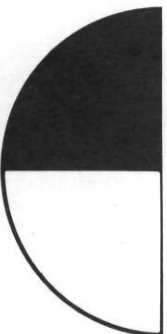
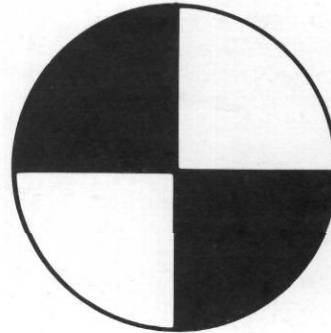
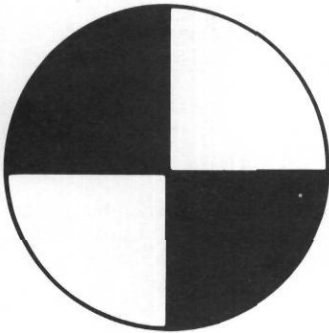
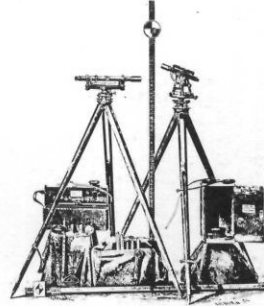
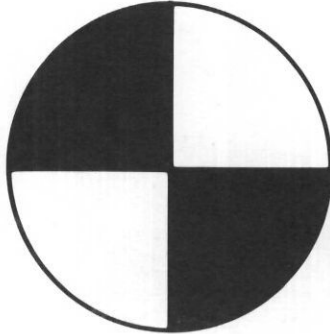
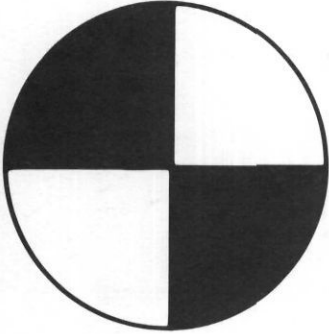
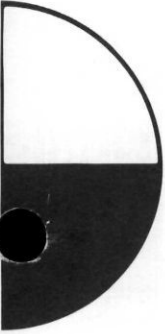
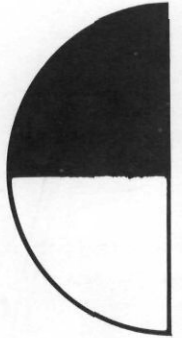
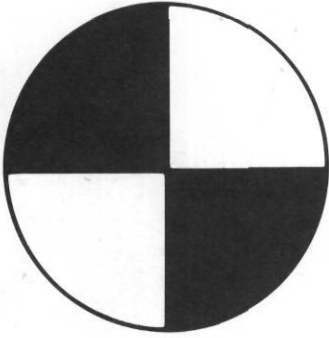


# The California Surveyor

No. 64

The Voice of the Land Surveyors of California

Spring 1981



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## The California Surveyor

is the quarterly publication of The California Land Surveyors Association and is published as a service to the Land Surveying profession of California. It is mailed to all Licensed Land Surveyors and Land Surveyors in Training in the state of California as well as to all members of California Land Surveyors Association. *The California Surveyor* is an open forum for all surveyors, with an editorial policy predicated on the preamble to the constitution of the California Land Surveyors Association and its stated aims and objectives, which read:

"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 protection 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."

### Personnel

Owner: California Land Surveyors Association  
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Membership in the California Land Surveyors Association as a sustaining member is open to any individual, company or corporation who, by their interest in the Land Surveying profession, is desirous of supporting the purposes and objectives of this association. For information regarding sustaining membership, contact the Editor of *The California Surveyor*.

### Editorial Material.

All articles, reports, letters and contributions are accepted and will be considered for publication regardless of the author's affiliation with the California Land Surveyors Association. Material should be sent to *The California Surveyor*.

Unless indicated, all articles in this publication are prepared by the editor

EDITOR: **R. E. Baldwin, L.S.**  
1345 California St.  
Berkeley, CA 94703

### DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

SUMMER ..... MAY 18, 1981  
FALL ..... AUGUST 17, 1981

Articles, Reports, Letters, etc., received after the above mentioned date will be placed in the next edition.

Editor

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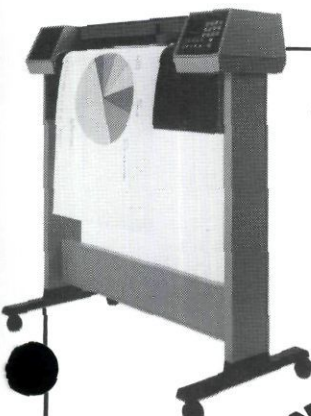
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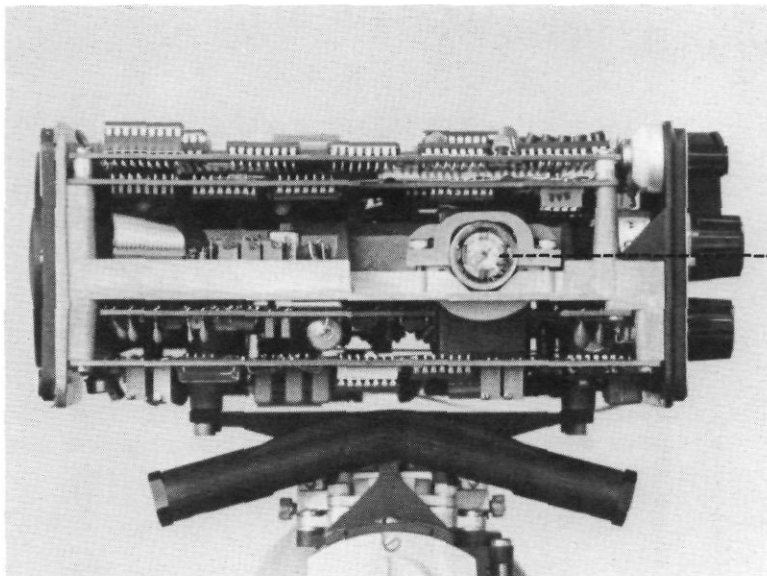
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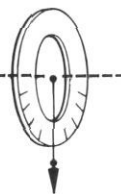
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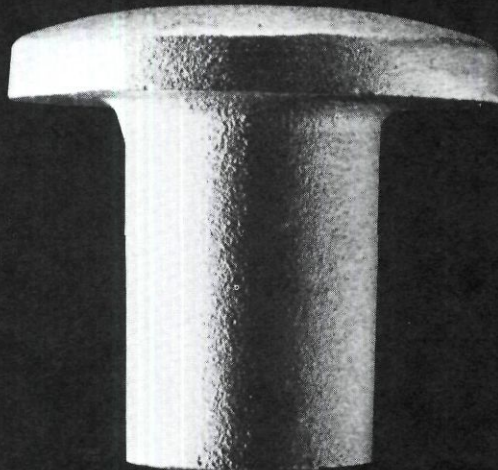
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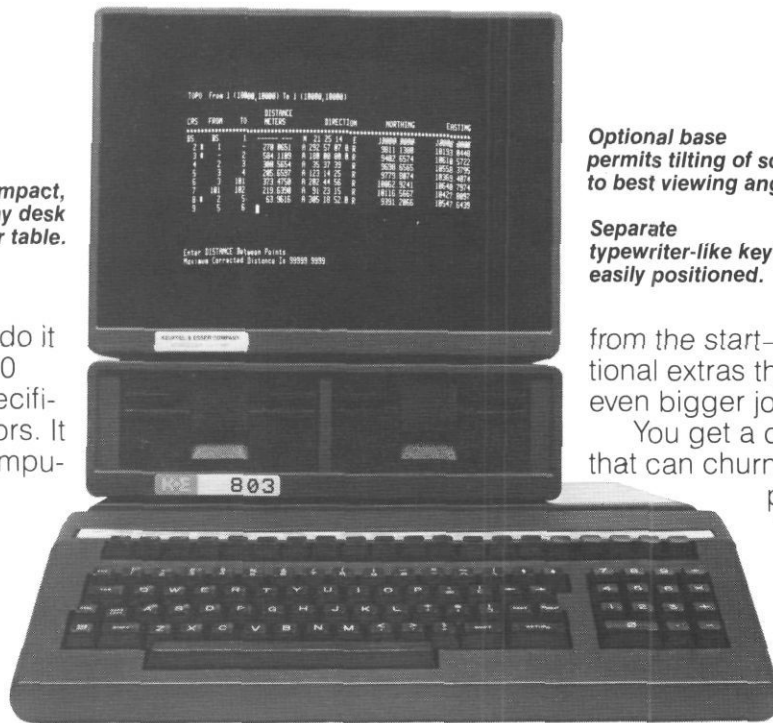
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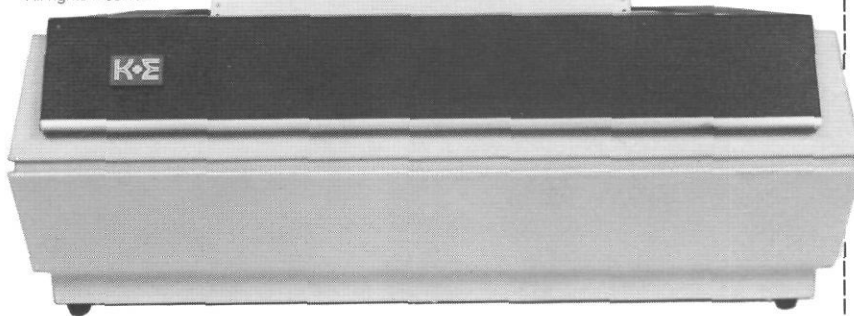
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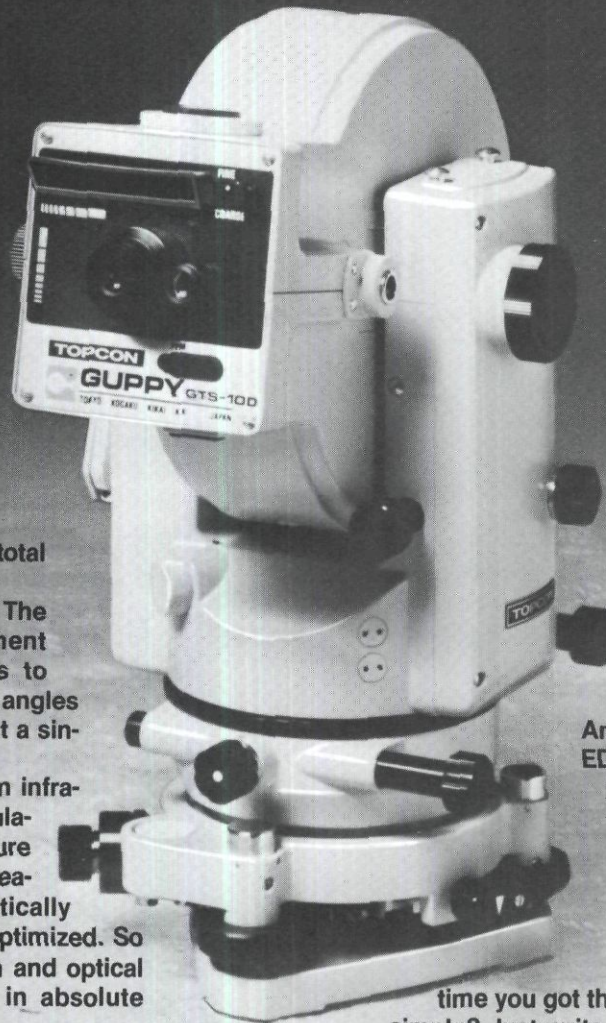
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All properly prepared applications are processed faster...no red tape!  
Guaranteed Loans...Direct Loans...and Immediate Loans are available now!

Most men and women seriously interested in starting their own business are eligible to apply — including those who already own a business and need capital fast for expansion...or to stay afloat...even if they’ve been flatly refused by banks and turned down elsewhere! Yet, too, many never qualify, simply because they do not know how to “properly” prepare the loan application...

In order to help those people applying for these guaranteed and direct loans fill out their loan applications the “right way,” ICC Business Research, through its diligent compilation and research efforts, has successfully assembled and published a comprehensive, easy-to-follow seminar manual: The Money Raiser’s Guaranteed and Direct Loans Manual, that will quickly show you practically everything you’ll need to know to prepare a loan application to get federally Guaranteed and Direct Loans.

Here are just some of the many important benefits the Money Raiser’s Guaranteed and Direct Loans Manual provides you with:

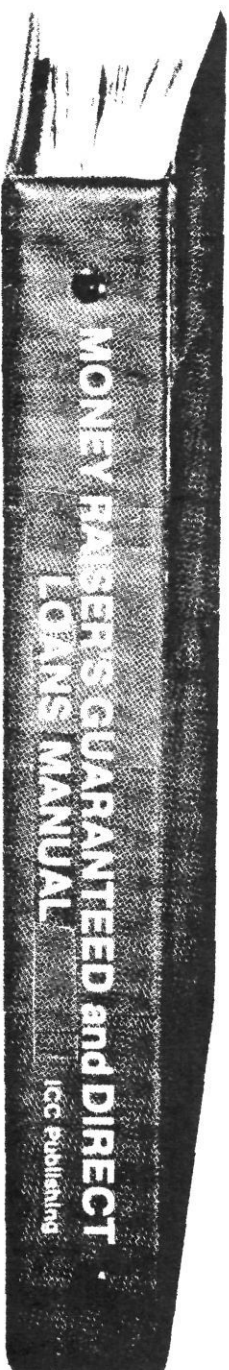
- a completely filled in sample set of actual SBA loan application forms, all properly filled in for you to easily follow— aids you in quickly preparing your own loan application the right way. Each line on the sample application forms is explained and illustrated in easy-to-understand language.
- fast application preparation procedures for getting loans for both new start up business ventures and established firms.
- advises you on how to properly answer key questions necessary for loan approval and in order to help avoid having your application turned down— gives you advice on what you should not do under any circumstances.
- what simple steps you take to guarantee eligibility—no matter if you do not presently qualify.
- where you can file your application for fastest processing.

At this point the most important question you want answered is: Just where is all this loan money coming from? Incredible as it may sound—these Guaranteed Loans...Direct Loans...and Immediate Loans are indeed available right now — from the best, and yet, the most overlooked and frequently the most ignored and sometimes outright ridiculed...“made-fun-of” source of ready money...fast capital, in America — THE UNITED STATES GOVERNMENT. Of course, there are those who upon hearing the words “UNITED STATES GOVERNMENT” will instantly freeze up and frown and say:

“...only minorities can get small business loan money from the government!”

Yet, on the other hand (and most puzzling) others will rant on and on and on that:

“...don’t even try, it’s just impossible — all those Business Loans Programs are strictly for the Chryslers, the Lockheeds, the big corporations...not for the little guy or small companies” etc.



Still there are those who declare:

“...I need money right now...and small business government loans take too darn long. It’s impossible to qualify. No one ever gets one of those loans.”

Or you may hear these comments:

“...My accountant’s junior assistant says he thinks it might be a waste of my time!” “Heck, there’s too much worrisome paperwork and red tape to wade through!”

Frankly — such rantings and ravings are just a lot of “bull” without any real basis — and only serve to clearly show that lack of knowledge...misinformation...and not quite fully understanding the UNITED STATES GOVERNMENT’S Small Business Administration’s (SBA) Programs have unfortunately caused a lot of people to ignore what is without a doubt — not only the most important and generous source of financing for new business start ups and existing business expansions in this country — but of the entire world!

Now that you’ve heard the “bull” about the United States Government’s SBA Loan Program — take a few more moments and read the following facts:

- Only 9.6% of approved loans were actually made to minorities last year
- What SBA recognizes as a “small business” actually applies to 97% of all the companies in the nation
- Red tape comes about only when the loan application is sent back due to applicant not providing the requested information...or providing the wrong information
- The SBA is required by Congress to provide a minimum dollar amount in business loans each fiscal year in order to lawfully comply with strict quotas. (Almost 5 billion this year)

Yet, despite the millions who miss out — there are still literally thousands of ambitious men and women nationwide who are properly applying — being approved — and obtaining sufficient funds to either start a new business, a franchise, or buy out or expand an existing one. Mostly, they are all just typical Americans with no fancy titles, who used essentially the same effective know-how to fill out their applications that you’ll find in the Money Raiser’s Guaranteed and Direct Loans Manual.

So don’t you dare be shy about applying for and accepting these guaranteed and direct government loans. Curiously enough, the government is actually very much

**GUARANTEE #1**  
Simply — look over this most effective money raising loan preparation assistance manual for 15 days — and, then, if you are not convinced that it can actually help you obtain the Business Loan you need right away — just return it for a full and prompt refund.

interested in helping you start a business that will make a lot of money. It’s to their advantage — the more money you make the more they stand to collect in taxes. In fiscal 1981, our nation’s good old generous “uncle” will either lend directly or guarantee billions of dollars in loan requests, along with technical assistance and even sales procurement assistance. Remember, if you don’t apply for these available SBA funds somebody else certainly will.

Don’t lose out — now is the best time to place your order for this comprehensive manual. It is not sold in stores. Available only by mail through this ad, directly from ICC Business Research, the exclusive publisher, at just a small fraction of what it would cost for the services of a private loan advisor or to attend a seminar. For example:

Initially, this amazing Guaranteed and Direct Loans Manual was specially designed to be the basis of a Small Business Loan Seminar — where each registrant would pay an admission fee of \$450. But our company felt that since the manual’s quality instructions were so exceptionally crystal-clear that anyone who could read, could successfully use its techniques without having to attend a seminar or pay for costly private loan advisory assistance services.

Therefore, for those purchasing the manual by mail, no 3 day class, no course and accommodations are required. And rather than \$450 we could slash the price all the way down to just a mere \$35 — a small portion of a typical seminar attendance fee — providing you promptly fill in and mail coupon below with fee while this special “seminar-in-print” manual offer is still available by mail at this relatively low price!

Remember, this most unique manual quickly provides you with actual sample copies of SBA Loan application and all other required forms—already properly filled in for you to easily use as reliably accurate step-by-step guides— thus offering you complete assurance that your application will be properly prepared and thereby immediately putting you on the right road to obtaining fast, no red-tape loan approval

**GUARANTEE #2**  
Even after 15 days — here’s how you are still strongly protected — if you decide to keep the manual — and you apply for an SBA Loan anytime within 1 year...your loan must be approved and you must actually receive the funds or your money will be refunded in full!

**YOU GET NOT 1 BUT 2 STRONG BINDING GUARANTEES! YOUR LOAN MUST ACTUALLY BE APPROVED OR YOUR MONEY BACK**

Of course, no one can guarantee that every request will be approved — but clearly we are firmly convinced that any sound business request properly prepared — showing a reasonable chance of repayment and submitted to SBA — will be approved. Only because we are so confident that this is a fact do we dare make such a strong binding seldom-heard-of Double Guarantee. No stronger guarantee possible! It actually pays for you to order a copy of this remarkable manual — 100% tax deductible as a business expense...Don’t delay—send for yours right now!

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# President's Message



## PRESIDENT'S MESSAGE

The following memorandum by Hans Koch, Chief Surveyor, Construction Management Division, City of Fresno, and a member of the San Joaquin Valley Chapter of CLSA, illustrates positive action towards the prevention of destruction of block property corners without references. Another result of the installation of wheel chair ramps is the removal of tie crosses to center-

line or street monuments and these should be moved and referenced also. Hopefully other agencies throughout California will become more responsible and accept their role in the protection and preservation of *all* property corners and other control monuments.

William O. Gentry, President  
California Land Surveyors  
Association

## ABRIDGED TEXT OF MEMORANDUM:

*Private surveying and engineering people have been highly critical of the City Survey Section for allowing block property corners to be destroyed. These monuments are very important to surveyors when lot surveys are made in a block and also for other types of surveys. A great amount of cost is added to a survey when it becomes necessary to re-*

*establish the location of these monuments.*

*The destruction of these block corners often occurs when wheel chair ramps are placed in the curb return. If a section is cut out of the return and no excavation occurs beyond the two intersecting property lines, usually no damage occurs; however, if it becomes necessary to encroach behind the existing landing, by removing a triangular section of property at the intersection of these two property lines, the block corner is destroyed.*

*In order to help prevent the loss of these valuable monuments, please call the Construction Management Division Office and a survey party will be scheduled to tie out the location of the original property corner and then reset it when construction is completed.*

# Letters

Editor:

The CLSA position that it speaks for the surveyors of California is a noble one. If CLSA refers to surveying practice as performed in California, it must of necessity consider that done by registered civil engineers — to pretend that civil engineers are not doing surveying in California is absurd.

Even after 1982, the number of Civil Engineers who may legally perform surveys will be many times that of the land surveyors, and this will continue for some years to come. Therefore, I would recommend letting them join CLSA. Sitting in the rear row of the bus does not provide much incentive for good professional inter-relationships!

For land surveyors to argue that they have exclusive needs, and therefore do not need the association of others who are doing the same work, patent nonsense.

Very truly yours,  
**Ira H. Alexander**  
L.S., C.E.  
Los Angeles, CA.

## Would you go into the field ill-equipped?

Not today you wouldn't! The competition would outdistance you. But there's more than your equipment to worry about. **What about you?** Are you prepared to exercise the technical and discretionary judgements required by your profession? Maybe you are, but a library of background and reference material wouldn't hurt you. And we know where to get it . . .

### The American Congress on Surveying and Mapping (ACSM) . . .

- Publishes a quarterly journal filled with articles of importance to the land surveyor and cartographer.
- Publishes a quarterly bulletin aimed specifically at the land surveyor.
- Has a "bookstore" of published materials on various aspects of land surveying and cartography available to its members.

There are many benefits in belonging to ACSM, but just those that make you a better-informed surveyor are well worth the cost of membership. Write or call today for a membership application.

American Congress on Surveying and Mapping  
210 Little Falls Street  
Falls Church, Virginia 22046  
Telephone: (703) 241-2446



# EDM Baseline

By Wendle Whipple, L.S.

The cooperative program with NGS and ACSM to establish monumented baselines suitable for checking and calibrating electronic distance measuring instruments has been completed in Concord, Fremont, San Francisco, Santa Cruz and Sacramento.

The East Bay Chapter of California Land Surveyors in cooperation with the Northern California Chapter of ACSM has established a 4000-foot monumented baseline in Central Contra Costa County. E.B.M.U.D. has made available a portion of their aquaduct right-of-way on the westerly side of U.S. Route 680 in Pleasant Hill for this baseline. Jake Dalton, surveying supervisor for E.B.M.U.D. coordinated efforts with their Land Division to obtain necessary permits. A written entry permit is required for use of the baseline. To obtain an annual permit, write E.B.M.U.D. Land Division, 2130 Adeline St., Oakland, CA 94623. Users without a permit will be considered trespassers.

Contra Costa County, E.B.M.U.D., Central Contra Costa Sanitary and PG&E have contributed personnel and materials in establishing the line, constructing monuments, putting in frames, covered guard posts and concrete surface blocks to protect the monuments. Gary Fitch of Brunson Instrument Co. arranged for that organization to donate engraved bronze discs for the reference monuments on the five baselines.

NGS provided discs for the principle monuments and measured the line with the assistance of survey crews from the City of Concord, East Bay M.U.D. and Central Contra Costa Sanitary District. Their data and the procedure for using the baseline will be published.

Twenty-five surveying companies also contributed money and personnel: Leptien-Cronin-Cooper, Bruce Schremp, Kinney Engr., Tetrad Engr., Schell & Martin, Melvin Gee, Debolt Engr., Bates & Baley, John Lowes, The Humahn Co., Bryan &

Murphy, Earl Gray, Brian-Kangas-Foulk, AAA Engr., Isakson & Assoc., E.S. Moran Jr., Crabtree Engr., William Laird, Kister-Savio & Rei, Raymond Vail, Ferguson & Wollman, Vince Cunha, Paul Soltow Engr., Gary Freitas, and Santina & Thompson. Sabotka Specialty Services of Walnut Creek drilled the holes and poured the concrete for the monuments, and is the only local organization that charged for their work.

Wendle Whipple, Central Contra Costa Sanitary District Surveyor, is chairman of the baseline committee for the East Bay Chapter of CLSA and will coordinate the use of this line. Bert Berger, Engineer with Santa Clara Water District, is chairman of the baseline committee for Northern California ACSM and is coordinating the work with NGS.

*Editor's note: Refer to the article in this edition of the California Surveyor by Raymond Tomlinson on Calibration Baseline Use.* ▲



Wendle Whipple, Central Contra Costa Sanitary District Surveyor, will coordinate use of new baseline.

# Procedures

## CALIBRATION BASELINE USE IS CRITICAL

By Raymond W. Tomlinson  
National Geodetic Survey (Retired)

*Editor's Note: The general data in this article reprinted from Arkansas July 1980 HI & PI applies to all calibration lines.*

Development of short-range distance measuring instruments give the Land Surveyor and Geodetic Engineer better accuracy, increase production, and lower cost per mile of traverse projects. Operating these instruments requires very little operator training and they are light-weight and operate on small battery power supplies. Most surveyors feel that the results obtained with short-range instruments are accurate and reliable, calibration is automatic, and all distances will satisfy the courts.

Instruments must be calibrated over calibrated base lines to insure accurately measured distances and instrument constants. Numerous registered land surveying associations have installed calibration base lines to be used by the private surveyor, but these are only as good as the surveyors make them. All surveyors utilizing a base line must submit his measurements to a central location in order to have a history of each base line.

### USE OF CALIBRATION BASE LINES

WHY should you use a calibration base line? Do you have liability insurance — probably so, and you have it for protection. A calibration base line is your insurance for the EDM instrument you are using. These base lines should be used to provide you with:

- A check on instrument and prism constants
- A check on the accuracy of measured distances
- A check for scale errors
- Detect calibration changes due to aging electronic components
- Provides documented instrument history for legal evidence, your INSURANCE

WHEN should you calibrate your instrument? Instruments should be calibrated:

- Upon receipt of a new instrument
- Immediately after each servicing

Anytime the operator feels the instrument is malfunctioning and /or closures are excessive.

WHERE do you calibrate?

Over an NGS established calibration base line

Over a precise taped base line of three or more stations

Over three stations placed on line with one length precisely taped

Over one known distance

HOW DO you calibrate? Calibrating an instrument means more than just driving out to the base line, taking a few readings and returning to the office. You should perform the following:

Check and adjust optical plumbets, bulls-eye bubble, & plumbing rods.

Check thermometers and barometers/altimeters.

Make sure all tripods are rigid and stable.

Prisms should be clean.

Batteries should be fully charged.

Recording forms should have spaces for all data needed.

Permission to use calibration base has been obtained.

Set instrument over the 1st station and measure to all stations (after proper instrument warm-up time and accurate plumbing of instrument and reflectors).

Take vertical angles or measure heights of EDM and prisms.

Make sure to shade thermometers and barometers/altimeters.

Take temperature and pressure at both ends of a line exceeding 1000 meters.

Compute temperature, pressure, and humidity corrections.

Reduce all measurements to horizontal or geodetic lengths.

Project all lengths to common lines (0-150, 150-430 to 0-430, etc.). A four mark base line has five projections.

Sum the difference of all projections and find the average (this is your total constant — instrument and prisms).

Apply this constant to the horizontal distances.

Compare your reduced distances to the calibration base line values to obtain instrument accuracy.

If you want to refine the values,

perform a least square adjustment.

If you are working on projects to 1/50,000 or more, take measurements on two different days.

### SOURCES OF ERROR

Errors are common it seems, but there is no excuse for them. Watch for the following: improper plumbing, improper pointings, voltage or readings, improper operating procedures of the instrument, height of EDM and reflectors, improper meteorological data, recording errors, etc.

### RECORDS

Numerous states have NGS established calibration base lines and all of them are having trouble with surveyors using these base lines but never sending copies of their field sheets to a local source. I feel that I, NGS, and the State Land Surveyors Associations have not put enough emphasis on what these field measurements mean to you and your fellow surveyor. Submission of your field sheets is like paying that insurance premium — if you do not submit this data and your fellow surveyor does not submit his, we will not have a history built-up to support you in court.

History of each base line must be started immediately in order to evaluate all measurements over each monument, and to detect any movement of monuments. If we have two or more surveyors submitting data that indicates possible movement, then we can get NGS back to remeasure the base. They don't know if and when a monument will move, and could care less if you don't care. Monuments could move due to unstable ground conditions, construction equipment, etc. If a central source has all the measurements, they can see in the data that something has occurred and take proper action.

If you are in court about one of your surveys and the attorney questions you about the accuracy of your measurements, and did you use standardized tapes to measure the distances, you would probably answer that all measurements were made with my little black box that measures accurately at all times, as stated here in the manufacturer's

manual. Do you have standardization papers for this black box similar to tape standardization? No, but I do have calibration measurements taken over an NGS base line to prove the accuracy. Since your instrument is in question, when did NGS establish the base line? It was established 2-3 years ago. Has NGS re-calibrated the base line since it was established or do you have proof of other black boxes using this base? It was used by various surveyors, but their measurements are not available to me.

The attorney has you cornered and all he has to do is suggest to his honor that one or more monuments have been moved, and the black box is wrong, and accuracy has not been proved. Your insurance is delinquent. If you and your fellow surveyors had submitted their field sheets you could have been prepared and stopped this earlier by stating that the black box had been calibrated and here is certified proof from the State Surveyor's Office.

If you do not get but one thing out

of this paper, it should be RECORDS & HISTORY. In order to make these calibration base lines beneficial, it will take each surveyor using these lines to submit field sheets each and every time they are used. A lot of time, effort, and money has gone into the establishment of these lines, and our hats are off to all personnel assisting NGS, but more especially to Mr. Raford Hudson, Arkansas State Surveyor, who really made it happen.

Submit your field notes each and every time you use any line, making sure to give all information needed for computations, etc.

Measurements station to station designations  
Instrument model and serial number  
Reflector model  
Date and time of observations  
Instrument & reflector constants  
Height of EDM & reflectors or vertical angles  
Temperature, pressure, & psychrometer readings

Information dialed into instrument  
State all units of measure for distance, temperature, etc.  
State any unusual conditions or possible damage to monuments.  
It is possible that the Association will design a recording form to be used that will have a carbon copy to be mailed to the local source, but until then, you should mail in a copy of your actual field notes and reductions to the State Surveyor, making sure to give your identity and telephone number in case additional data is needed.

Some of you will object to sending in field sheets, as it might make your instrument look bad, since you missed some of the lengths, but just maybe other surveyors have missed that measurement too, and the monument may have moved. If you are too ashamed to let people see the actual measurements, go back to Gunter's Chain or take up another profession.

## Perspectives

### "TOGETHER WE STAND"

by Jerald Miller,  
President, C.S.U.F. Surveying and  
Photogrammetry Association

The Surveying and Photogrammetry program at C.S.U.F. has grown into a mature curriculum. From the first few students that entered the program some twenty years ago to the much-expanded 160 students that now seek this education, we find ourselves with higher expectations to strive for. Along with the increase in population, the Surveying and Photogrammetry Association (formerly the Surveying and Photogrammetry Club), which includes the student chapters of CLSA, ACSM and ASP, has had a surge of enthusiastic involvement as shown at the recent WFPLS convention in Reno, Nevada.

We all felt a great unity among the local, regional, and even the national level of affiliations which help to bind our profession as *one!* We too, as pre-professionals, are in the process of "rounding up" our fellow students of Surveying and Photogrammetry to work together as one and strive for the goals set forth. This

is a rough-up-hill climb that needs expert guidance from the experienced leaders of our field. Together we can conquer this chasm and help each other out of the pitfalls that try to stifle our progression. We need to work as one, professionals and pre-professionals together, to get the job done, no matter at what level it exists. We should all remember "... many hands make for light work!" We have set forth an allegiance with ourselves to keep our profession just that, a *profession!*

Goals that we at C.S.U.F. have set for the future are: (1) Generate and maintain the truly professional education here at C.S.U.F. and further the participation in the educational conferences and conventions — local, regional, and national. (2) To form a more cohesive alliance with the professionals in our field. To work together to conquer the obstacles before us and in the future. (3) To create an alliance of interested individuals in the Surveying and Photogrammetry field throughout the country and abroad, at all levels of interest — university, Junior College, technical school, professional, etc. (4) To start an LSIT review for

future exams. This program would not only be for the benefit of the students, but also for any other interested individuals. We currently run a small-scale program of this type, but we are ready to expand. We would like to encourage all professionals to lend a hand in supplying anything that could benefit this worthwhile program. (5) I continue to entertain the motion that any and all interested professionals support student programs (senior projects, work study, summer-part time employment, etc.) either monetarily or only if by "planting a seed of interest" in some anxiously-awaiting student.

I would like to once again thank our friends of the profession who have shown their support and those of the profession who may feel so moved as to follow suit and join the others in continuing this greatly-appreciated participation. Thank you.

Direct questions and comments to the Surveying and Photogrammetry Association C.S.U.F. School of Engineering, Fresno, CA 93740.

# WFPLS Conference

## WFPLS CONFERENCE

Hundreds of surveyors from across the nation have taken over the MGM Grand Hotel in Reno. No, all States except Nevada have not gone "dry" — this is the Conference of the Western Federation of Professional Land Surveyors. The Conference, which was one of the best publicized in memory, met and exceeded all expectations. Top names in surveying from the United States and Canada were featured speakers, and recognized experts in fields ranging from management to employee relations, from law to historical research conducted technical sessions.

A new approach to technical sessions was used at this conference: a system of "concurrent" sessions, in which individual sessions were held several times on different days, and in which registrants had a choice of sessions to attend each day. There was a great variety to choose from, and it was practically impossible to find a time when there was *not* a session that caught one's interest.



Exhibitors are an indispensable part of any conference; in Reno there were some 37 who not only displayed the latest in technology but answered many questions as to how that technology might best be applied.

The social functions were also top notch — a bodacious Basque buffet complete with bota bags (to fill with pecon punch, of course), a trip to Virginia City, skiing outings, and MGM's famous "Hello, Hollywood, Hello" dinner show. Not to mention the many other activities which Nevada is able to offer.

One could go on and on about the Conference, but if you attended you already know what a blast it was. If you didn't, you missed one of the best ever, so plan to attend the CLSA Conference next year in San Diego. They get better each year, folks, and while we surveyors may not be the most stimulating of company, we do know how to put on an informative and educational conference and have a good time to boot. See you all next year.



*Hal Davis (L) presents Bill Gentry joint legislature resolution proclaiming Land Surveyors Week.*

# News Digest

## IS THE RISK WORTH IT?

By Gary R. Harris  
Editor, *Minnesota Disclosures*

Reprinted From  
"The Nebraska Surveyor,"  
January, 1981, Winter Issue

Three days ago, while in midst of completing a survey project for a proposed subsidized apartment project, a request was made of me to alter my certification verbiage of the survey.

The request was made by a representative of the mortgage company involved with financing the project. They, in turn, were prompted by a demand from the title company which was contracted with to insure the title of the project. The request was for me to certify to the existence or non-existence of all easements of record. I refused and a discussion as to the alternative solutions to the dilemma ensued. I reiterated my refusal to do so.

To say the least, the mortgage company representative was angry but also confused and flustered. I believe that after additional discussion, he began to understand my position when I asked him if he would sign a document guaranteeing the same. The shoe, all of sudden, did not fit. Increasingly, this exact request is being made to us when dealing with title, mortgage and insurance companies. The requests are made matter of factly as if it is routine. This scares the hell out of me and raised my curiosity as to how many surveyors are also considering it routine and complying with it.

I, for one, am not in the habit of providing title searches or title opinions. Making such a certification without qualification is doing just that. If my interests were in that direction, I would have become an abstractor or attempted law school. In the surveying profession, research is a number one priority; that is, research of adjoining and underlying descriptions which may lead to a hiatus in the client's property lines, not searches for every easement that may affect the property.

To withstand this assault by those in the financial and title companies and survive without getting skinned, we must all be united in our refusals

to grant this blatant attempt at passing liability to the surveyor for title defects that rightfully belong to those making the request.

Qualification is the key to remaining unscathed but professional in our approach to the solution to this problem. Surveyors should take a lesson from the law profession in their approach to title opinions. The final paragraphs to the majority of title opinions issued, removes any liability they may have appeared to incur in the preceding opinion and statements. Qualify your statements and certification as to the origins of your data and the limits to which you will warrant the statements. If the easements shown are due to your own research and efforts, decide the extent that you wish to warrant and state it in your certification. If you wish to certify to all visible easements, do so, but with caution.

To sum, when a request is made of you to certify to all easements of record, either follow the guidelines as discussed herein or the following in descending order:

- 1) Check your errors and omissions insurance
- 2) Pray
- 3) Retire

## SURVEYING EXHIBIT PROVES POPULAR

Submitted by F.D. Uzes,  
Chairman,

*Surveyor's Historical Society*

Auburn, California — Large numbers of visitors toured the Placer County Museum on Saturday, February 28, 1981, viewing the Surveyors Historical Society's display of old surveying artifacts, according to the staff of the museum. Featured were items dating from the mid-1600's to the early 1900's, including transits, compasses, solar instruments, levels, alidades, a European theodolite, chains, texts, catalogs, deeds, etc.

Spectators were in abundance as the opening of the surveying exhibit coincided with the local Mardi Gras parade and celebration, an Arts and Crafts show, and a Flea Market sale. Skeptics, not wanting the surveying show to receive an undue share of the credit, pointed out the museum was only packed shoulder-to-shoulder during the intermittent rain squalls.

## C.L.S.A. STUDENT CHAPTER OF C.S.U. — FRESNO

By Nathan C. Willless, President

The student chapter has been active since the reorganization of the Surveying and Photogrammetry Association, formerly the S&P Club.

The chapter was a strong force in the success of the C.S.U.F. S&P Conference, which was held January 16-17. Approximately 180 people attended the two day event. The theme of the conference was "Directions for Tomorrow's Mapping Professionals." Some of the topics covered were "Locating Boundaries when Conflicting Maps are Available," "Readjusting California to the 1983 Datum," presented by C.L.S.A. members Ray Thinggaard, L.S. and James Dowden, L.S.. The conference committee thanks both of you for your support.

The conference awards dinner was on Friday, January 16, and there were eleven awards given out — nine by the conference itself and two by CLSA. The Ed Griffin Memorial Scholarship and a new CLSA \$100.00 Scholarship were received by this author and Craig Lee. The Neil Nelson Scholarship was awarded to Kathleen Cline. The eight conference scholarships were received by Tod Coleman, Gerald Dildine, Vince Duda, Dave Edson, Karin Have, Jerald Miller, Mary Neiderberger and Scott Taylor.

More recently, 16 members of CLSA Student Chapter have returned from the WFPLS Conference in Reno. The students were sponsored by the CLSA local chapter that contributed to the Student Sponsorship Fund. This fund was used for rooms and transportation for the students. The meals were provided by WFPLS. The students would like to thank CLSA and WFPLS for all that was done for them. This was a great opportunity for all the students to meet real professionals. The students that enjoyed helping this conference run so smoothly were: Joe Beitit, Kathleen Cline, David Edson, David Grainger, Stan Gray, Rina Molari, Mary Neiderberger, Paul Reichardt, Gary Renard, Scott Taylor, Ross



Thompson, Nathan Willess, Mike Zweifel and, from San Bernardino Valley College, Donna Harmon.

If more information is needed, please write to CSU-Fresno Student Chapter, CLSA, P.O. Box 482, Clovis, CA 93612.

## FIELD TECHNIQUE

### *Humor from the Surveying and Mapping Society of Georgia*

Sixteen or more years ago, Sandstone Sam of *Geotimes* fame reported that in an exam in Field Geology, a geology major who had had summer field experience answered the question, "How to measure the height of a cliff with an altimeter" by saying there are four ways:

1. Tie a string to the altimeter and lower it from the top of the cliff to the base; then measure the string.

2. Measure the thickness of the altimeter, then place the instrument against the cliff, mark the top with a pencil, raise the bottom to the pencil mark, and repeat the procedure until the top of the cliff is reached, tally the number of marks and multiply by the measured thickness of the altimeter.

3. Using an accurate stop watch, drop altimeter from top of cliff and time its descent to the base of the cliff. Apply the standard formula,  $S = \frac{1}{2} gt^2$ .

4. (And least accurate) Read elevation from altimeter at base of cliff, and read elevation again at the top of the cliff. The difference between the two readings should equal the approximate height of the cliff.

## TRESPASS?

### California Civil Code:

**§846.5. [Access to property affected by monuments or control stations for purpose of making surveys: Monuments within freeways.]** (a) Right of entry to investigate and utilize boundary evidence is a right of surveyors legally authorized to practice land surveying and it shall be the responsibility of the owner or tenant who controls property to provide reasonable access without undue delay for making surveys with respect to property affected by the monuments of control stations of

record needed.

(b) The requirements of subdivision (a) do not apply to monuments within access-controlled portions of freeways.

(c) When required for a property survey, monuments within a freeway right-of-way shall be referenced to usable points outside the access control line by the agency having jurisdiction over the freeway when requested in writing by the registered civil engineer or licensed land surveyor who is to perform the property survey. The work shall be done within a reasonable time period by the agency in direct cooperation with the engineer or surveyor and at no charge to him. [1973 ch 435 § 1.]

## ACSM SIGNS AGREEMENT WITH BLM

A Memorandum of Understanding between the American Congress on Surveying and Mapping and the Bureau of Land Management was signed on January 30, 1981 calling for a cooperative program of workshops on cadastral surveying. The purpose of the agreement is to help improve the surveyors' knowledge of the Public Land System and Federal Survey Law.

Under the terms of the agreement, BLM will provide the instruction while ACSM will make all the arrangements for presentation, pay the costs, and assume the financial risks. Continuing Education Units (CEU's) will be awarded to participants for completion of the courses.

It is expected that about ten courses a year will be presented at various locations across the country covering such topics as Subdivision of Sections, Restoration of Lost Corners, Monumentation and Corner Point Identification, and Water Boundaries. The first course is being planned for June, 1981.

## VALTEC ONE-INCH PRISM

The Valtec Optical Group has announced the marketing of its new, lower cost POCKETRANGER 1" Prism. The small POCKETRANGER size and weight make it a piece of equipment for those "pack-in" jobs over rough terrain. In either

*Tilting or Stake-mounted Set-Ups*, it is ideal for medium-range shots and/or where multiple shots are needed such as down a roadside.

For complete info, contact:

Valtec Optical Group  
Precision Optical Division  
869 W. 17th Street  
Costa Mesa, CA 92627  
Tel: (714) 646-0206  
Telex: 68-5688

## MICROCOMP RELOCATES

MICROCOMP, Civil Engineering Software Systems, announced the relocation of their offices to 125 E. Ball Road, Suite 211, Anaheim, CA 92085, telephone (714) 774-5580.

MICROCOMP, which has been developing and marketing surveying software for microcomputers since 1978, has recently expanded, and is now marketing microcomputer programs authored by other professional engineers in the areas of subdivision geometry, hydraulics and hydrology, slope analysis and structural steel beam design. A free program catalog is available upon request.

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# Education

## “CRISIS IN SURVEYING EDUCATION”

*A Professionally Accredited Degree for the Surveying Profession – Will the California State University, Fresno S & P Program Be But a Brief Experiment?*

by Dr. J.D. Matheny  
Dean of Engineering  
Calif. State University, Fresno

When I was asked to extend a few words of greeting to a surveying and photogrammetry conference held on the campus at Fresno recently, I stated that I hoped there was a program with some faculty in Fresno to host the next conference. This resulted in an invitation to further explain my meaning in the *California Surveyor*. And so now I must attempt to explain a complex problem, hopefully in an interesting manner, in short fashion to a group who are unfamiliar with the working of academe.

ACCOUNTABILITY of publicly supported agencies appears to be the central issue. Most all the problems we face are sets, and subsets of that principal issue.

Some examples with which you are familiar are various federal and state regulatory agencies set up over the last fifteen or twenty years. If one of these agencies issues a whimsical but expensive regulation, and the agency finds that you are in violation of its edicts, you may sue — only to find the court's interest is whether the law gave the agency authority to act in regulating the activity in question. The matters of fairness, appropriateness, cost, or benefit are not of interest to the court. Congress has found it can establish the regulatory organization, but cannot overturn its regulations. So we have created something that answers only to itself. The weekly oath of a popular radio hero of years ago “that this government of the people, by the people, and for the people shall not perish from the earth.” should now be rephrased to state “that this government of the bureaucracy . . . etc.”

I would not want to claim that all regulations from regulatory agencies are bad, however, it does appear that good or bad there is little we can do about them. An example of what I

believe to be a bad regulation is the 2.5 m.p.h. rear bumper and 5 m.p.h. front bumper required on our automobiles. This was to make them more rugged and to save the consumer money. Now we find each of 10,000,000 cars a year cost \$500 more to buy, more to insure, and more to repair. The bumpers do not affect safety. The additional indirect cost of maintaining the government bureaucracy I leave to you the reader to imagine. I feel certain that you who are surveyors can think of your own examples of a lack of *accountability* of public agencies to the public.

If regulatory agencies seem to be free of accountability, just imagine publicly supported universities. Over a period of the last fifteen years the internal administration of universities has evolved starting with “consultation” by the administration with an organized faculty governance, and progressing to a point of shared government. Now one wonders if university administration has not evolved to abandoned responsibility.

Faculty of a major university are primarily specialists in science, humanities, social sciences, and arts. This group makes up 60 to 70% of the faculty of a typical campus. Many of these faculty members would have great difficulty finding employment outside of the university environment. *University governance is exercised to:*

- a. create job security
- b. increase faculty power
- c. decrease faculty work loads and accountability
- d. assure “equality” of raises by subject matter area
- e. assure maximum salaries and raises for all.

California's public institutions of higher learning offer the highest average faculty salaries of all states save one (Alaska), however, California's two university systems have automatic lock-step salary systems that offer the same salaries and same automatic “merit” raises to all faculty who are at the same level (unlike other states). We laughed at the legislature of a southern state when it considered legislating that would be 3 so that students of that state would have an easier time of mathematics, however, we in Cali-

fornia have legislated that the law of supply and demand will not apply to professors who work in our universities.

Professorial ranks in this faculty are:  
Assistant Professor (entry level)  
Associate Professor  
Professor

We at Fresno may not hire an Assistant Professor unless he holds a Ph.D. We want faculty with a minimum of three years professional experience in order to provide practical as well as theoretical education for surveyors and photogrammetrists. The salary earned by an Assistant Professor is just under \$18,000 per academic year. That's considerably less than you are paying our BS graduates.

Another problem we face is providing diversity of background among our engineering faculty. I am extremely anxious to have a mix of faculty including individuals with first degrees from foreign institutions. But we cannot allow our engineering faculty in California to be primarily from a particular background, university, or area. Unfortunately, these days few Americans are willing to go through the years of education necessary to achieve a Ph.D. in Surveying or Photogrammetry, especially when they see the low salaries awaiting them as university professors. Consequently we have had to recruit many of our new faculty from foreign countries. Even though they are very competent and most of them are partially educated in American universities, they generally lack practical experience and/or intimate familiarity with American history and methods, especially those of California. Students of these professors are missing a vital “American attitude” in their education.

With the faculty governance setting curriculum, teaching loads, administrative time allowed to units, and the like, we find in Engineering that:

We do not have the administrative time we need;

We are going to have curriculum requirements voted into being that will harm or destroy our programs;

Our replacement equipment budget is about 1% of our equipment holdings each year, and is decreas-

ing;

We do not have the secretarial help, or technical help we need.

The begged question is will things get better? The answer is no, it will get worse primarily for two reasons. First, the legislature gives money to the universities, and they decide how it is used. Since engineering makes up a small percentage of most universities, they have little influence under the "shared governance" accountability system and engineering will continue to receive insufficient funding. Secondly, the California State Universities and Colleges will most likely have a faculty union in place before June of 1981. Under typical union rules it will be impossible to give engineering faculty higher salaries or lighter work loads than are

received by the rest of the faculty, and without salaries competitive with the rest of the faculty.

Is there a proposed solution? Yes, there is. The legislature must act to set the engineering schools of the CSUC system as separately administered units, separately funded. This will probably not happen until we've lost several of our engineering schools. We Americans do not react to developing situations until there is a major crisis, and that crisis becomes the major, or primary crisis. As a "one crisis" society we deal with that one. California is a major industrial state, and the major source of engineering graduates for her industry is the California State University and Colleges System. The State cannot afford the luxury of an indif-

ferent or hostile faculty acting to damage the ability of the engineering schools to graduate sufficient numbers of engineers of high quality. We can, and well may, lose our industrial base in California. With a decreased industrial base we will have fewer jobs in our State, and a decreased ability to support all governmental activities including education, social services, welfare or whatever.

The engineering schools are a trust. The universities must be held accountable for the management of this trust, or as an alternative, the trust — the engineering schools — must be removed from the universities. ▲

## Know your Sustaining Members

*Sustaining Members support CLSA's efforts to improve the position, education, and standards of surveyors in California through financial contributions to the association and are, in turn, deserving of special recognition. In this section, CLSA hopes to acquaint readers with these organizations which have shown concern for the profession.*

 **Geodimeter®**

**AGA Geodimeter, Inc.**

AGA Geodimeter, Inc., is the U.S. subsidiary of AGA AB, Swedish developer of the original electro-optical distance meter. It is headquartered at 385F Bel Marin Keys Blvd., Novato, CA 94947. California surveyors may contact sales or service departments toll-free at 800-772-2664.

The company currently is marketing a family of five EDM instruments, all designed for theodolite or standards mounting and each with differing operational capabilities and features for high productivity on different types of jobs. These range from Geodimeter 110, a basic traversing tool, to Geodimeter 120, which, mounted on your theodolite, delivers "total station" performance. Two of the instruments, Geodimeter 120 and Geodimeter 116, are automatic slope-reduction instruments, giving instant and continuous horizontal distance readouts in tracking a moving reflector.

California sales efforts are handled by John Weir, regional sales manager, who works out of the Novato head office, and Fred Murray, 1295 DyAnna Court, Vista, CA 92083 (714-469-8346). The Novato office also houses a complete service department, equipped and staffed by trained technicians.

The parent firm, a major high technology conglomerate with international operations in industrial and medical gases, infra-red temperature measuring systems, processing and transport of frozen and refrigerated foods as well as optical and electronic equipment, pioneered the EDM concept more than 30 years ago.

**ALLIED SURVEYOR SUPPLIES MFG. CO.**  
DIVISION OF ALLIED MANUFACTURING CO., INC.  
P. O. BOX 27367, TUCSON, AZ 85726 (602) 622-6011

Allied Surveyor Supplies Mfg. Co. is a division of Allied Manufacturing Inc., an Arizona corporation, doing business since 1964. Esther Feldman, her two sons, Gil and Rick, have actively participated in the development, manufacture and sales since September, 1976.

This highly noncorrosive, aluminum product line is used to permanently mark property, road boundaries or wherever a survey point is required. Expansion from the well-known "Rebar Kaps" now include a variety of SURV-KAPS for rebar, pipe and concrete. Also available are the larger magnetic Monuments, such as the Detachable, Flarable and "Sta-put", as

well as the Extension Rod Series (Patented). Accessories and installation tools include Driving Kaps, Rebar Drivers, Anvils and Letter & Number Stamping Sets. SURV-KAPS may be pre-marked at our factory or stamped easily while out in the field.

SURV-KAP products are unique insofar as the manufacturing process is concerned. They are constructed of a highly noncorrosive aluminum ranging 99.6% pure or better, and are COLD FORGED, not casted. This method increases the material strength and durability. SURV-KAP's are guaranteed NOT to crack, chip or break.

Sales are primarily direct to the end users throughout the United States and Canada. Custom requirements for a specific surveying job are welcomed and encouraged. Orders are usually shipped within two days after receipt of same, due to a large inventory of standard products.

A catalog, Model/Price Listing, and samples are available upon request. Government Agencies please note: We have a GSA contract (GS-00S-85156), write for information to the same address.

As a family and woman-owned business, exceptional pride is shown in a quality product, excellent service, and reasonable prices.



**THEODOLITE REPAIRS:** The Brunson Instrument Company has recently developed an instrument repair training program. There was the growing concern that young men were not being trained in theodolite and precise level repairs. To meet this demand we brought to America one of Europe's finest repairmen, Geoffrey Allies. Mr. Allies comes to us from Worcester, England where he was employed and trained for the past ten years by Europe's finest theodolite instructors, earning the title Senior Instrument Technician. He is satisfied with nothing less than perfection in theodolite and precise level repairs.

The Brunson Instrument Company has five locations serving the United States. Most of you are familiar with our Los Angeles Branch with Jim Hayden as the manager. August 1, 1978 we opened a new branch in San Jose with C.J. Wynn as the manager. At both of these locations we offer a complete line of surveying equipment for sale or rental.

Brunson Instrument Company goes back to 1927 when Mr. A.N. Brunson gained his reputation by replacing old spindles with completely sealed ball bearings. It had been tried before, here and in Europe, but no one had made it work with acceptable accuracy. His initial patent covered that first successful application of precision ball bearings to surveying instrument design.

Mr. Brunson's optical instrumentation for the historic Apollo 11 and 12 moon projects was designated an "Engineering Wonder in Missouri - 1969" by the state Society of Professional Engineers. The many awards and honors accorded the Brunson company over the years include among the more recent ones the Outstanding Civilian Service Award and medal given A.N. Brunson for his personal effort in training Armed Services personnel in the field of optical tooling and the formal acknowledgment of Hughes Aircraft, Aerospace Group, for the part played by the Brunson Company and its employees in the success of the Surveyor Spacecraft mission.



#### CALIFORNIA LAND TITLE COMPANY

Although relatively young in terms of years, if measured against the "giants" of the title insurance industry, California Land Title Company, since its inception in 1961, has become one of the fastest growing companies in the industry in California. Dynamic management and innovative thinking, together with the finest title men and women available anywhere, have brought "Cal-Land" to the top percentage bracket in virtually every county in which the company operates.

California Land Title Company main-

tains its Los Angeles County operations and corporate headquarters in Universal City and is currently serving the counties of Orange, Riverside, San Bernardino, Ventura and Solano. A wholly owned subsidiary, California World Title Company, serves San Diego County.

California Land Title Company is incorporated under the laws of the State of California and is a member of the California Land Title Association and as such issues that association's form policies of title insurance. Our underwriter, Lawyers Title Insurance Co. of Richmond, VA, one of the country's oldest and most financially responsible insurers, is a member of both the California Land Title Association (CLTA) and the American Land Title Association (ALTA); thus, Cal-Land is able to provide the form policies of both associations.

Our company can be of real value to the surveyor through its Preliminary Title Report, the Preliminary Subdivision Report, the Preliminary Condominium Report, all of which are accompanied by copies of all supporting documentation, copies of boundary deeds and boundary surveys (if of record) and of course, the Subdivision and Condominium Plan Guarantees; moreover, our title and engineering people can be of substantive assistance to the surveyor in the areas of boundary determination, water and water related boundaries, Federal and State Patents, title company requirements for the ALTA Survey and in many other problem areas.

Should any CLSA member have specific requests or need more definitive information, he is invited to telephone Mr. Loren Black, Chief Title Engineer, Los Angeles County office, (800) 232-2718 or Jack Wilcox, Engineering and Subdivision Supervisor, Orange County office (714) 835-5575.

California Land Title Company has propounded and firmly believes in the philosophy that title people and land surveyors can be of tremendous benefit to each other by entering into and maintaining cogent dialogue; learning from each other and sharing the technical and intellectual aspects of our respective disciplines which converge on many levels.

California Land Title Company is proud to be a sustaining member of the California Land Surveyors' Association and we salute the land surveyor of California.



Cartwright Aerial Surveys, Inc., has for thirty-three years provided government agencies and private industry world-wide with professional services in aerial photography, photogrammetry and remote sensing. The firm occupies a modern 16,000 square feet building and hangar facility, and maintains a staff of certified photogrammetrists, professional engineers, photo interpreters, cartographers and computer programmers, in addition to the flight and laboratory personnel.

Photogrammetric services offered include full analytical aerotriangulation, volumetric calculations, topographic map compilation, computer-plotted base sheets, cross sectioning, and computer processed and produced maps, including databanks with demographic ties. Data-map Systems, Inc., a computergraphics service bureau corporation was acquired and merged with the survey corporation in 1979 to further enhance its capabilities in computer cartography and analytical aerotriangulation, and to complement the entire interactive graphics department.

These services and products are accomplished with a WILD PUG-III, a Foster nonocomparator, a Foster 42"x72" flatbed plotter, Data General and Digital Equipment Company computers, three Foster digitizing input stations complete with macro keyboards, Tektronics and Digital Equipment Company CRTs, Diablo disc drives and Wangco nine-track tape transports. The corporation's three Santoni IIC stereoplotters are equipped for digital terrain models and ortho photo operations and are tied to Altek and AutoTrol digitizing stations. Data is recorded offline on a Texas Instruments digital tape console controller and reduction is accomplished in the computer graphics department.

The aerial survey corporation's flight department uses their Beechcraft twin engine Turbo Baron and a Turbo Cessna 206 as airborne platforms for low and medium altitude work. A Lear Jet is on standby lease for high altitude work. Precision photography is performed by experienced flight crews with specialized cameras ranging in focal length from 70mm (2.75 inches) to 324mm (36 inches) and includes Zeiss RMK-A 15/23 and RMK-A 21/25 precision mapping cameras. In addition a Bendix thermal infrared scanner (8 to 14 micron) complete with a Sangamo 16-channel airborne recorder and Tektronics scopes is used for airborne heat sensing. To round out the remote sensing data acquisition equipment, the company uses their I<sup>2</sup>S multi-spectral camera and four Barnes radiometers and four Itek correlations consoles.

Film is processed and photographic reproductions produced in their highly automated black-and-white and color laboratory. Major equipment includes a Pako color processor, two Kodak ver-

samat processors, continuous contact and reduction black-and-white LogEtronic contact printers, a Zeiss SEG-V computer controlled rectifying enlarger, Filmaster automatic film titlers, and a DuPont Cronaflex ERF automatic film and paper processor. An Eastman Kodak Royal print processor is used for small runs.

Associated with the aerial survey company, the Cartwright Research Corporation, under the same management team, performs basic research in photogrammetry and aerial photography instrumentation, and currently holds a patent on an aerial film numbering machine, the Filmaster Titler.

Cartwright Aerial Surveys, Inc., is located at the Executive Airport, Sacramento, California, 95822. Telephone (916) 421-3465.



**disco  
tech**  
T.M.

Surveyors can all get in on the Age of Computers, no matter what size office they have. DISCO-TECH offers an efficient, low-cost computer system with a full-range of on-target, highly professional programs for land surveyors. It's the *Survey 80* package developed by Morton Technologies, Inc., a Santa Rosa, California civil and structural engineering firm.

If you already have a microcomputer, *Survey 80* is probably compatible with your system. DISCO-TECH computer programs are written on CP/M in CBASIC, which makes them compatible with most microcomputers, including Apple, TRS-80 Model II, Northstar, and Cromemco. *Survey 80* versions are also available for TRS-80 Models I and III.

*Survey 80* consists of four land surveying programs: Field Note Data Reduction (FiNDeR-1), Coordinate Geometry (CoGo-1), Stadia Reduction, and Horizontal Curve Staking. Programs for Vertical Curve Design and Earthwork Computation are in development.

*Survey 80* programs may be purchased individually or at a package price which varies according to the version you require.

You don't have to be a computer whiz

to run DISCO-TECH programs. They're developed for people who are professionals in technical fields other than computer science, people who have neither the time nor interest in becoming computer experts.

The computer is simply a tool to save your time and improve your accuracy. Instruction manuals are written in easy-to-follow conversational English. Information is presented on the video screen logically and legibly. Printouts are straightforward, uncluttered, and usable.

DISCO-TECH's *Survey 80* programs were developed and extensively field-tested by a team composed of California land surveyors and highly-skilled professional programmers who insisted on pinpoint accuracy, maximum flexibility, and simplicity of operation.

*Survey 80*'s unique double-precision routines assure 15-digit accuracy in all the programs. Point storage and instant access capacity varies according to the computer system on which the programs are used, of course; but *minimum* storage and access is 4,549 points per job.

Write or call DISCO-TECH for complete information on the *Survey 80* programs, as well as their engineering, architectural, business, and utility programs. DISCO-TECH, Morton Technologies, Inc., 1150 Coddington Center, P.O. Box 11129, Santa Rosa, CA 95406; telephone 707/523-1600.



ELECTRONIC  
SURVEY  
RENTALS, INC.

Land, Aerial, & Hydrographic Systems

Electronic Survey Rentals was created to fill the rapidly growing needs of the precision surveying field where versatile, advanced equipment and world wide service are required. Our carefully maintained stock of aerial, land and hydrographic systems are available to you on short or long term rental plans enabling you to avoid costly shelf time and off season cost liability. Expenses occur only when we can make you money.

Another advantage of our rental concept is that it enables you to compete in larger projects where accuracy and time are the money-makers. In the event that you have a need for one of our systems and require operator/technicians, E.S.R.'s staff is on call to operate or train your personnel on site, anywhere in the world.

Where rental for some is the ideal solution, for others our liberal lease-purchase plan is the answer, being especially useful for the companies with a sustained need for any of our instruments. We'd like a chance to help your business grow, and hope our services will establish us as a dependable member of your crew.

## ENGINEERING SERVICES COMPANY



With the intent of offering the finest in instrument service for the western surveyor, Hans K. Haselbach and sons operate Haselbach Surveying Instruments in Burlingame, California. New instrument sales with professional service is our business.

Hans K. Haselbach has been involved with precision instruments for over 40 years. After completion of his precision mechanical apprenticeship at the Wild school in Heerbrugg, Switzerland, he worked for several years in the assembly and adjustments departments. After WWII, he established for Wild a service department in another European country. Upon returning to the Heerbrugg plant in 1948, management requested that he establish and manage a service department for their products in the United States. He maintained the position as U.S. service manager of all Wild geodetic, photogrammetric, and microscopy equipment for 30 years. In addition, he organized and taught the service technician training schools for most of Wild's U.S. dealers.

At Haselbach Surveying Instruments, Hans Sr. now supervises the service and repair of the instruments as well as offering technical advice on geodetic and photogrammetric applications. Hans Jr. and Erik, both mechanical engineers handle instrument sales and service.

We insist upon offering prompt first class service on most makes of instruments and honest straightforward answers to your technical questions. We are pleased to offer professional assistance in the selection of new instrumentation, consultation on applications, field demonstrations and training of personnel.

Our instrument inventory includes products from Wild, Jena, Nikon, Topcon, Benchmark, and Lufkin, among others. We offer factory authorized service for the instruments we sell.



Hewlett-Packard — "creators of working tools for people who measure and compute" — is one of the world's leading designers and manufacturers of electronic measuring and test instrument systems; electronic calculators; computers and computer systems; medical instruments and systems; instruments and systems for chemical analysis; and high

technology, solid-state components. Founded in 1939, with headquarters in Palo Alto, Calif., Hewlett-Packard is an international organization with over 52,000 employees. Hewlett-Packard produces more than 4,000 products at 31 domestic divisions, located in California, Colorado, Oregon, Idaho, Massachusetts, New Jersey, and Pennsylvania, and at eight\* overseas locations. Hewlett-Packard products are marketed and sold in the United States and 64 countries abroad, primarily through the company's own network of sales and service offices.

In 1971, Hewlett-Packard created the Civil Engineering Division. During the last ten years, the division has introduced and marketed several distance meters and Total Stations, along with a broad line of related surveying calculators, data collectors, and peripherals. At its Loveland, Colo., headquarters, the Civil Engineering Division maintains a staff of engineers, technicians, and production specialists dedicated to pioneering new product ideas for use in the surveying profession.

The latest contribution from HP's Civil Engineering Division is the Total Survey System — a system designed to let you do more work in less time and with much less chance for error. In brief, the Total Survey System allows the surveyor to make all of the required field measurements using one of HP's surveying field instruments, and then transfer the data to a data collector. Back in the office, the field data is transferred electronically from the data collector to one of HP's Surveying Computation Systems and computed in a fraction of the time normally spent on the same task. The final component of the system is the HP 7580A Surveying Plotter. Designed with the surveyor in mind, the HP 7580A draws lines at an incredible 24 inches per second and letters up to 7 characters per second — without sacrificing quality.

In short — HP is revolutionizing the way surveying data is handled. From Electronic Total Stations — to Electronic Data Collection — to automated data processing — to automated plotting — time savings are substantial, and the potential for error is all but eliminated.

Complete information on Hewlett-Packard surveying products is available from local HP sales and service offices in Sacramento, Santa Clara, Fullerton, North Hollywood, Los Angeles, San Diego, and Anaheim, or from Hewlett-Packard, Civil Engineering Division, P.O. Box 301-C, Loveland, Colorado 80537, (303) 667-5000.



INDUSTRIAL PIPE & STEEL CO. has been located in South El Monte (ap-

proximately 15 miles east of Los Angeles) for the past 20 years. INDUSTRIAL PIPE & STEEL CO. has serviced industry and the "Do-It-Yourselfers" with steel, metals, and industrial hardware.

Over the past 20 years INDUSTRIAL PIPE & STEEL CO. has grown from 2 employees to 50 employees.

The President is Joe Schorr; Vice President-General Manager is Tom Plumley.

INDUSTRIAL PIPE & STEEL supplies surveyors with large assortments of the finest steel surveyor-stakes. At very low prices.

Their business has enjoyed tremendous growth and they are looking forward to equal or greater growth in the years to come.

For more information or a current price list please feel free to call (213-443-9467) or outside of Calif. (1-800-423-4981).



For over 160 years, the name "Kern" has been synonymous with Swiss precision. First in mechanics, then optics, and most recently in electronics, Kern has led the industry in innovative and reliable state-of-the-art instruments. The present line of Kern surveying instruments embodies the best of modern technology coupled with decades of experience in the surveying field.

The full line of levels and theodolites, one for every need, includes the new tribrach-compatible theodolites, K1-S, K1-M and DKM2-A.

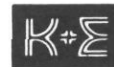
A new model of the famous 500 series distance meter, the DM502, is now available. It features increased range, up to 2 miles, and an easy-to-read liquid crystal display. Like previous models, it is a fully self-contained unit which allows 360° rotation of the trunion axis.

Distometer ISETH continues to enjoy ever increasing attention. With its 0.01mm accuracy, it is in great demand for deformation and displacement measurements, where conventional methods require extensive measurement procedures producing inferior results.

Likewise, the ME 3000 Mekometer has established itself as the most accurate electronic distance measuring instrument. With a range of 3,000 meters and accuracy of ±0.1 millimeters, it well outdistances its competitors.

In the photogrammetric field, Kern offers a full range of instruments to meet every need. From conventional stereoplotter to the newest concept in computer support, Kern is leading the way.

Kern offices are located in Switzerland, U.S.A., Canada, Brazil and Denmark, while authorized representatives provide instruments and service throughout the world.



KEUFFEL & ESSER CO.

Keuffel & Esser Company manufactures and markets a complete line of quality surveying equipment, including field equipment, transits, theodolites, alidades, short and long-range EDM's and map-making materials.

K&E's complete line of EDM equipment includes: AUTORANGER® Instrument (range: 1 mi.), AUTORANGER-II (2 mi.), AUTORANGER-S (2 mi.), UNIRANGER (6 mi.), RANGER®IV (8 mi.), RANGER V (15 mi.), and RANGEMASTER®III (40 mi.).

The new VECTRON Electronic Surveying System from K&E is a modular surveying system that brings electronic technology to standard surveying operations. The VECTRON System makes both angle and distance measurements electronically, calculates surveying coordinates in the field, and stores all data without manual transcription. The 800 Series Office Computer and 11/75 Flat-bed Drafting System complete the K&E line of electronic surveying equipment.

K&E also manufactures STABILENE® Film, a stable-base polyester film designed for precision cartographic applications. STABILENE Film is available in a variety of surfaces, both sensitized and unsensitized, for scribing, drafting and masking.

For additional information, contact Keuffel & Esser Company, 1327 South Olive Street, Los Angeles, CA 90015 (213-747-7601); or Keuffel & Esser Company, 223 Lawrence Avenue, South San Francisco, CA 94080 (415) 873-6850.

## LEWIS & LEWIS

surveying equipment

Lewis & Lewis Company was originally started by Mr. R.B. Lewis as a locally oriented civil engineer-land surveyor company in Ventura, California. During 1953, a partnership was formed by Mr. R.B. Lewis and his son, Mr. R.T. Lewis. In 1953, Mr. Robert T. Lewis took over active management of the firm. During the next few years, "Bob" Lewis became one of the first to actively pursue the burgeoning off-shore and navigational work. Using the most modern techniques, the company became world-wide in scope and operation sending men and equipment wherever the need arose.

In the natural course of events, another facet of the business was born. Because much of the precision equipment used by the firm was too costly for many individuals and companies to own, a rental division was started and has grown to include most types of survey equipment.

In conjunction with the Rental Divi-

sion, the firm of Lewis & Lewis has recently begun sales of selected quality surveying equipment. One of the first items distributed on a national scale was the Retro-Ray line of retro-reflectors — originally used as tested in the operational side of the business. A rental/purchase plan for distance measuring equipment and related survey equipment has also been created.

Future plans include a broadening of the marketing base of the company. As more equipment is tested and added to the line, Lewis & Lewis will continue to offer the options of lease, rental, purchase or a combination of these plus full service capability anywhere there is a need.

The company is headquartered at 1600 Callens Road, Ventura, CA 93001 (telephone 805/644-7405 or toll-free 800/235-3377 outside California).



The LIETZ Company has been a leading supplier of precision instruments to surveyors, engineers and contractors since 1882.

It all began with Adolph Lietz, who was born in Lubeck, Germany, on April 25, 1860. A mechanical genius, Lietz was manufacturing transits and levels by the time he was 22. As a young man he designed and built a unique dividing engine, which is still operational today after more than a century.

Lietz moved to the United States and his surveying instruments, manufactured in San Francisco, played a significant role in projects around the world, including our own Golden Gate Bridge. Lietz transits were used on many of the primary triangulation projects that contributed to the "building of the West" and the Lietz name became synonymous with quality whenever surveyors, engineers or contractors spoke of land measuring equipment.

In 1965 The Lietz Company expanded its marketing of surveying instruments manufactured by Sokkisha, Ltd., Japan, the largest exclusive manufacturer of surveying instruments in the world. During 1970 Sokkisha granted Lietz exclusive U.S. distribution of its product line and since has served as the manufacturer of Lietz specified units. This expansion necessitated the opening of the first Lietz sales office east of the Rockies in 1973 and has contributed materially to Lietz ever-increasing national sales.

On January 15, 1978, Lietz moved their national headquarters to Kansas City, and established there a major distribution center and service facility for the eastern 38 states. The western 12 states continue to be served from a branch distribution center and service facility in the Los Angeles area. Regional sales offices are

now located in the Nashville, Pittsburgh, Chicago, Dallas/Fort Worth, Los Angeles and Sacramento metro areas.

Today, Lietz's products are marketed through a nationwide network of 150 Authorized Distributors and 600 dealers. The Lietz product catalog is recognized as the finest and most complete source of instruments, equipment and supplies for the surveying industry. It also serves as their primary retail customer advertising media.

Lietz can best be described as a growing, dynamic marketing, physical distribution and service organization. Surveying instruments, manufactured by Sokkisha, are the nucleus of the Lietz line. They include everything from builder's/contractor's instruments to sophisticated automatic levels, theodolites and electronic distance measuring units. Lietz complete line of quality products at affordable prices is constantly gaining recognition for its value, performance, ease of maintenance and service ability. Lietz products are becoming the new standard for the surveying industry and its professionally trained employees constantly strive to live up to its motto: "It's easy to do business with Lietz!"

For more information and the name of the Lietz retailer nearest you, call toll free 800-262-1702.



McHENRY SYSTEMS, INC.

## SAGE MICRO SYSTEMS



Sage Micro Systems was begun in 1977 to provide data processing services to land development engineers and surveyors, and to develop an inexpensive engineering computer based on an 8080 S-100 bus microcomputer system. Since then, Sage Microsystems has calculated and plotted over 4000 lots, while computer development has progressed in the background.

Subdivision computations are currently run on a large commercial system with a CalComp flat bed plotter to provide high quality, precise drawings. Automated drafting capabilities include base maps, improvement plans, grading plans, and fully annotated record maps. Plots can be drawn on your own media, can be superimposed onto existing drawings, and can even be drawn on either the top or bottom surface (thus effecting a separation between two aspects of the job). Printed output typically includes boundary, block, lot, and center line closures, and field staking data.

For further information on subdivision

services, the purchase of a microcomputer system, or for independent computer advice, contact Michael Sage at 5333 James Ave., Oakland, Ca. 94618 or phone (415) 658-1926.



Seco Surveying Equipment, Inc. and Ogden's Surveying Equipment Co. have been providing the surveyor and engineer of Oregon, California and Nevada goods and services for over 35 years.

Ivan Ogden, the founder of Ogden's, started business in 1945. Located in Sacramento, Ogden's provides a complete line of equipment and supplies featuring the largest retail inventory in Northern California. Viola Ogden is the working Chairwoman of the Board. Bruce Ogden, an attorney-at-law, is the Store Manager. The repair facility is operated by "Buck" Buckhalter and Guy Vidales. Ogden's courteous sales staff provides everything from plumb bob tips to electronic distance meters. Rental equipment of all types is also available.

Seco Surveying Equipment, Inc. is based in Redding, Medford, and Bend, with a sales force covering from Eugene, Oregon to Reno, Nevada. The Redding store features its new repair facility with some of the most highly qualified repair technicians on the West Coast. Jerry Culwell, Duard Wilson and Joe Svedeen operate in the Redding store, with Jeff Whittaker and Ed Garfield in Medford specializing in Wild, Kern, Zeiss and Lietz.

Founded and located in Redding in 1965, Seco stocks a complete line of surveying and architectural supplies and provides blueprint service in both Medford and Redding. An authorized distributor for GAF Diazo products, Seco sells and services blueprint machines and prides itself on having the largest inventory of retail blueprint papers between Sacramento and Portland. Seco also specializes in theodolites, electronic distance meters and accessories, featuring Topcon, Wild, Zeiss, Pentax and Lietz. The Redding store is managed by Corporate President Paul Ogden, with 25 years experience in the industry, and Mike Dahl, Corporate Vice-President.

Seco Manufacturing Co, Inc. was developed in 1977 and distributes surveying accessories world-wide. With two locations in Redding, including an anodizing plant, Seco manufactures prism poles, prism housings, distance meter yokes and mounts, rods, hand levels and targets.

The staff and management of Ogden's and Seco stand ready to provide service and quality merchandise to the membership of the California Land Surveyors Association.



Sierra Cybernetics continues to offer a complete computer system, called the *Pioneer I*, designed by and for Land Surveyors. Offering such "most wanted" features as letter quality printing, floppy disk storage of data, and full screen print-outs, Sierra Cybernetics has become one of the leading suppliers of complete turn-key systems today.

With over 80 systems delivered in California alone, Sierra Cybernetics offers one of the most sophisticated and easy-to-use systems on the market, at a price far below the competition for the features offered. Since Sierra Cybernetics is utilizing a full scale computer, features such as word processing, bookkeeping, and data processing using the full capability of a computer are offered. Time sharing, phone hook-ups to services such as CONCAP, remote terminals, on screen graphics, and full plotter capabilities are all possible with the *Pioneer I*. All software is written in BASIC, and the user may list and modify any programs, and most variations in survey technique already have modifications written to accommodate those users. The *Pioneer I* also supports most data collectors, and is capable of transferring data between most popular computer systems, including the HP series.

Complete systems start at under \$10,000, and that includes all survey software, 64K bytes of memory, two floppy disks, a letter quality printer that plots points to within 1/60", and a full size terminal. Options include earthwork, subdivision volumes, civil engineering solutions, word processing, and a complete line of business software.

For a complete information package, call or write Sierra Cybernetics, 105 Willow Valley Road, Nevada City, California, 95959, (916) 265-6439.



After more than 50 years of service to Western land surveyors and civil engineers, CLSA's sustaining member, Surveyors Service Co., of Costa Mesa, takes special pride in their long record of conscientious and expert service to the land surveying profession.

A resident of Los Angeles (then Costa Mesa) for 54 years, SERVCO has added two new stores: (1) Engineers Service & Supply Co., a Division of Surveyors Service Co., in Phoenix, Arizona, and (2) Surveyors Service Co., Dallas, Texas.

These are fully stocked stores with repair facilities. Also, the better to serve the West, Steve Carlon and Ralph Nilssen cover Northern California, Oregon and Nevada from their residences in Vacaville, California. Jerry Alexander covers Northern Oregon and the State of Washington from his Lynnwood, Washington, residence. These additions are part of SERVCO's plan for regional expansion throughout the west.

SERVCO is especially proud of their pioneering on behalf of Wild-Heerbrugg and TOPCON instruments. For over 30 years they have been promoting Wild-Heerbrugg geodetic equipment and, more recently, the TOPCON line. SERVCO is the only factory-authorized distributor for WILD and TOPCON instruments and are a good source for all your instrument needs. Specializing in the field needs of surveyors and engineers, and alert in promoting products aimed at increasing the efficiency and skill of their customers, they take particular pride in the high reputation they have established for competent and reliable service and repair of the equipment they handle. Their instrument and EDM service is on the premises. A recent addition to their line are the Hewlett-Packard mini-calculators.

For your requirements, from plumb bobs and hand levels to theodolites and total EDM stations, users of surveying equipment will find SERVCO's staff to be courteous, capable and anxious to be of service.



Pride and precision in repairs for today's highly sophisticated surveying equipment is the hallmark of Swiss Precision Instruments. Since 1978, Swiss Precision Instruments has been well-known for incomparable service in diagnosing and solving the problems of complex optical and mechanical equipment.

In fact, owner Peter Muller has deservedly earned the nickname of "Kingpin" of technical services. He brings old-world craftsmanship to the new technology in Theodolites and EDM's.

Prior to establishing Swiss Precision Instruments, Peter spent more than a decade as a technical repair expert for a leading Swiss instrument manufacturer. This experience has aided him immeasurably in providing skillful, uncompromising service to his many clients.

In addition to the service area, Swiss Precision offers a full line of exceptional equipment (such as Wild, Kern, Topcon & Lietz) as well as general supplies. All are offered at a professional trade discount to qualified buyers.

Swiss Precision Instruments is located

at 154 Hamilton Drive in Novato, California and offers easy access through its series of local phone offices and a nationwide toll-free hotline.

California phone numbers are: (415 Area Code) 883-7866, (707 Area Code) 585-2904, (209 Area Code) 252-2994, (408 Area Code) 649-5556.

Please note that all repair orders are usually completed and shipped within 10 days and fully guaranteed to meet factory specifications.



## ZEISS

TECHNICAL ASSISTANCE  
AND INSTRUMENT REPAIR

ZEISS has incorporated in the ELTA-2S design, the state-of-the-art in electronics and computers.

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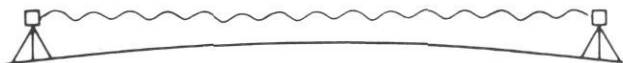
1. *Shore and Sea Boundaries* (1962) Reprint 1975—Aaron L. Shalowitz, U.S. Department of Commerce Publication No. 10-1  
*Vol. II—The Interpretation and Use of U.S. Coast and Geodetic Survey Data* . . . . . \$11.95 ea.
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4. *Coastal Zone Map #TP-00189—Florida, Palm Beach County, Lantana to Boynton Beach—1:10,000 (1970)*  
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  - b. *Tides, Time and Shoreline Processes*—Dr. Warren C. Thompson, Professor of Physical Oceanography, U.S. Naval Post Graduate School, Monterey.
  - c. *California Law Looks at the Water Boundary*—Peter H. F. Graber, Esq., Deputy Attorney General, Land Law Section, Department of Justice.
  - d. *The Ordinary High Water Mark — How Determined!*—Ned Washburn, Esq., Attorney at Law, Landes, Ripley & Diamond, San Francisco, CA
  - e. *To Insure or Not to Insure—That is the Exception!*—James R. Dorsey, L.S., Executive Vice President, Winter, Durnford, Dorsey and Associates, Land Consultants.
  - f. *More Muddles in the Puddle—The Jurisdictional Aspects and Boundaries of the Cali-*

- fornia Coastal Zone Commission and San Francisco Bay Conservation and Development Commission*—Raymond B. Thinggaard, L.S., Assistant Manager Real Property, Leslie Salt Co.
- g. *Internal Conflicts—State V. Federal Rules, Sovereign Lands and Rights*—Ed Griffin, L.S., Chief, Branch of Cadastral Surveys, California State Office of U.S. Bureau of Land Management.
  - h. *The Restless Tides and the Marine Boundary Program of the National Ocean Survey*—Carrol I. Thurlow, Deputy Chief, Oceanographic Division, Office of Marine Surveys and Maps, N.O.S.
  - i. *Slope and Undulations of Tidal Datum Planes and Quantification of Accuracy of Various Methods*—Cdr. A. Nicholas Bodnar, R.C.E. (California) Principal Engineer, Requirements and Facilities Section, Tides and Water Levels Branch, Oceanographic Division, Office of Marine Surveys and Maps, N.O.S.
  - j. *Survey Procedures For Determination of Mean High Water*—Jack E. Guth, Capt. N.O.S. (Ret.), President of Coast Survey Limited, Herndon, VA.

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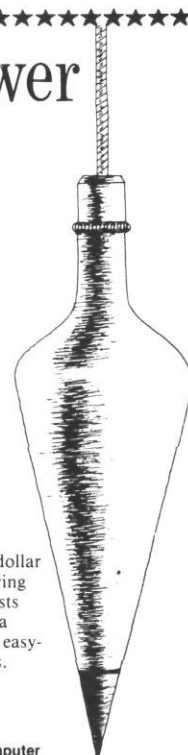
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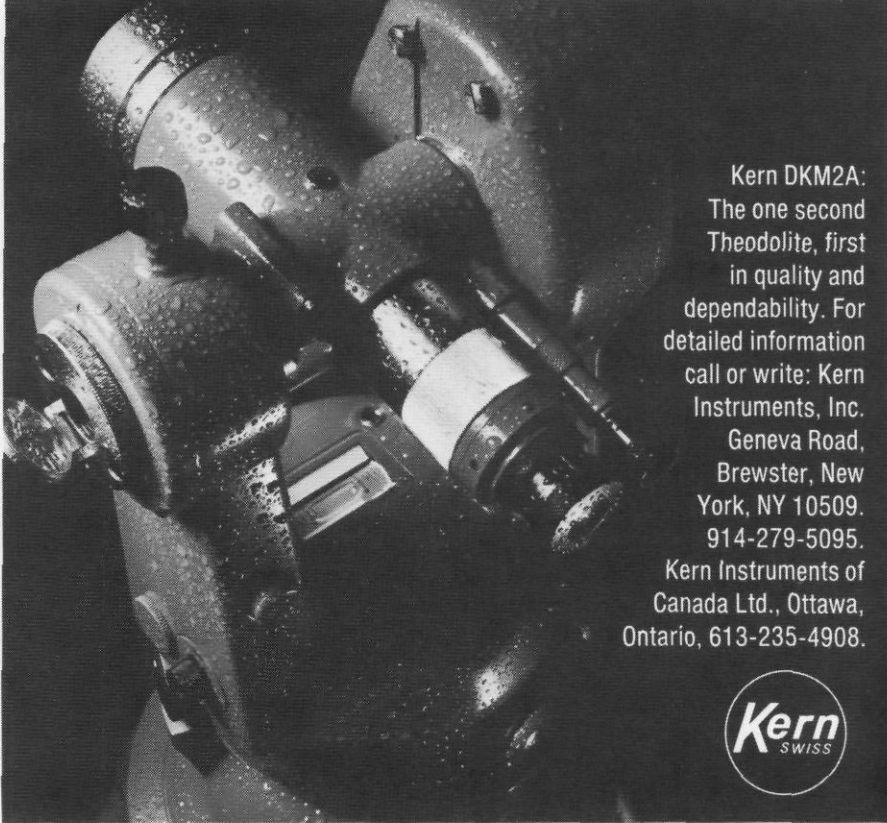
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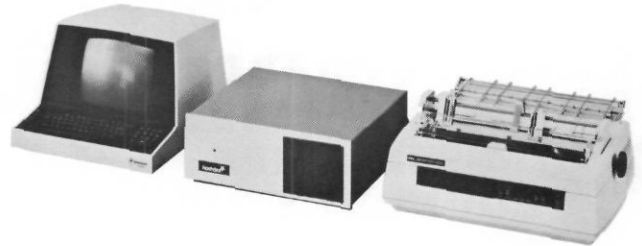
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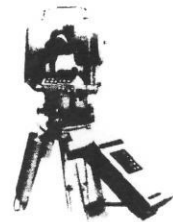
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