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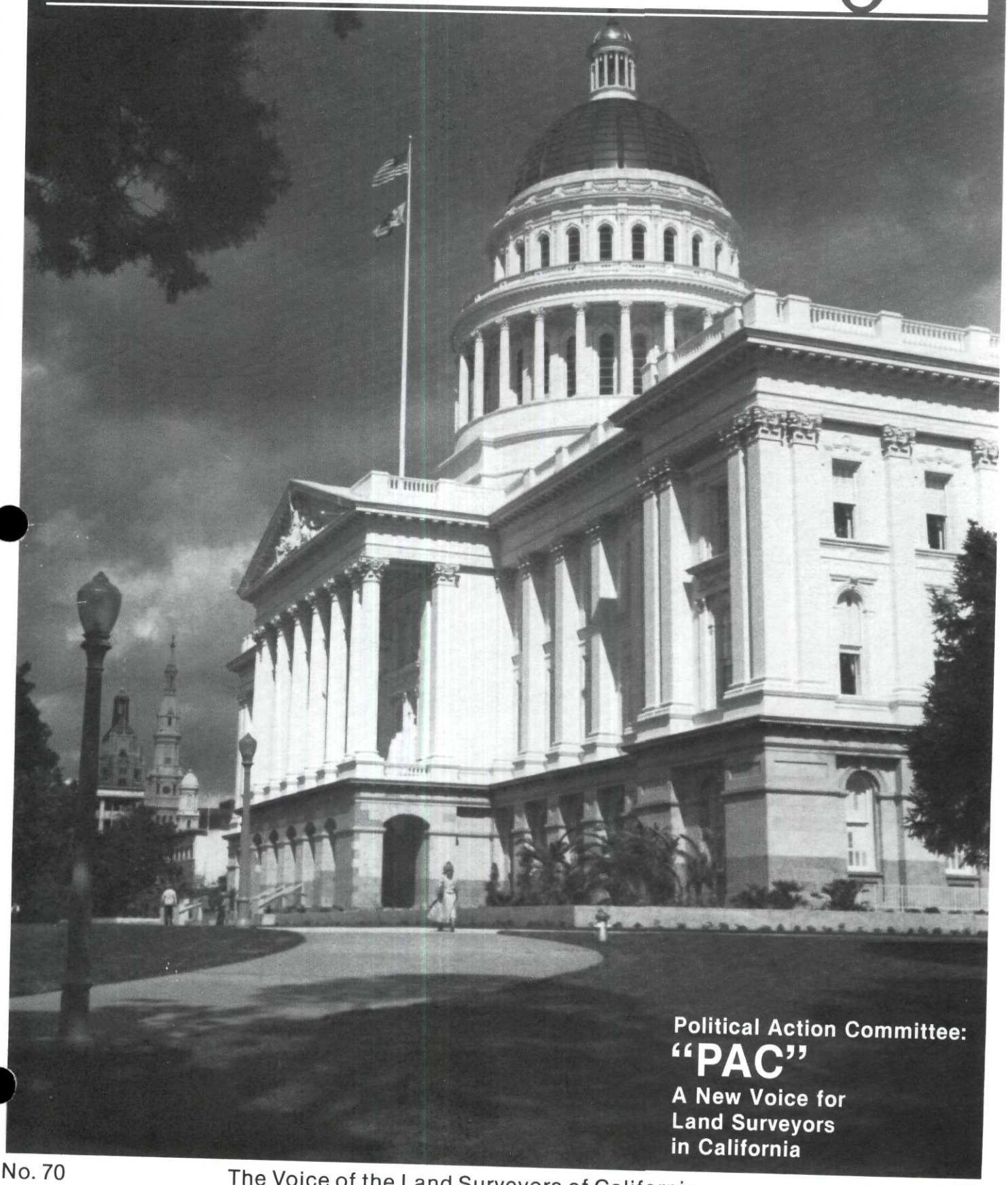
The California Surveyor



Political Action Committee: "PAC"

A New Voice for Land Surveyors in California

No. 70 The Voice of the Land Surveyors of California Winter 1983

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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
Editor: J. E. Terry
Sales Manager: D. Calegari

Advertising

Commercial advertising is accepted by *The California Surveyor.* Advertising rates and information can be obtained by contacting Dorothy Calegari / Lisa Reese, P.O. Box 9098, Santa Rosa, CA 95405, phone (707) 539-3633

Sustaining Membership

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: **J. E. Terry**
6059 Harwood Ave.,
Oakland, CA 94618

DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

Spring ..... March 15, 1983

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

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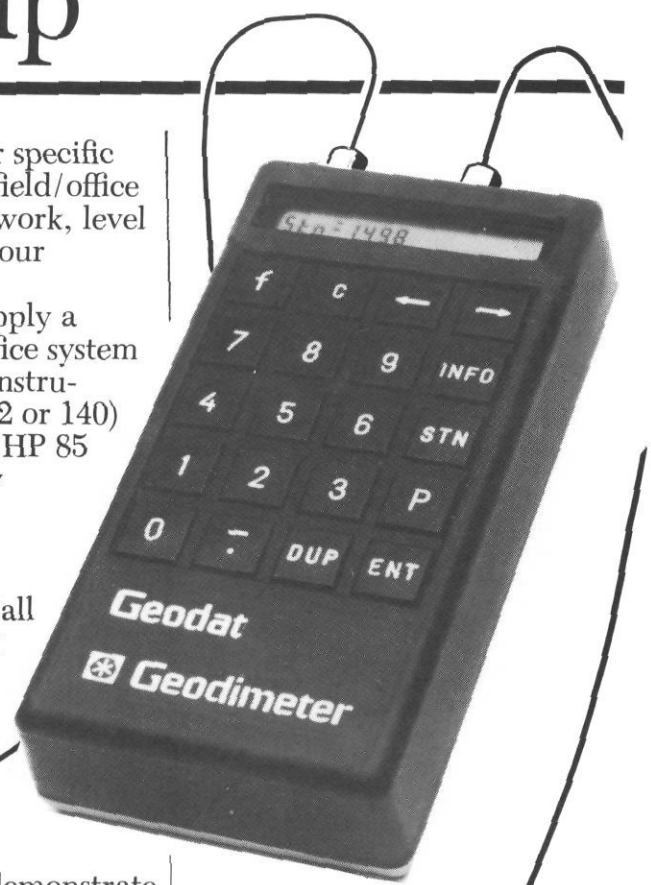

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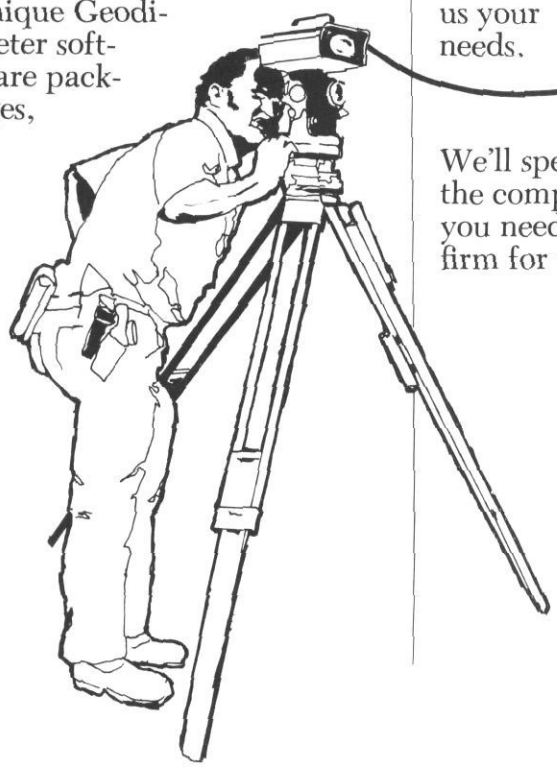

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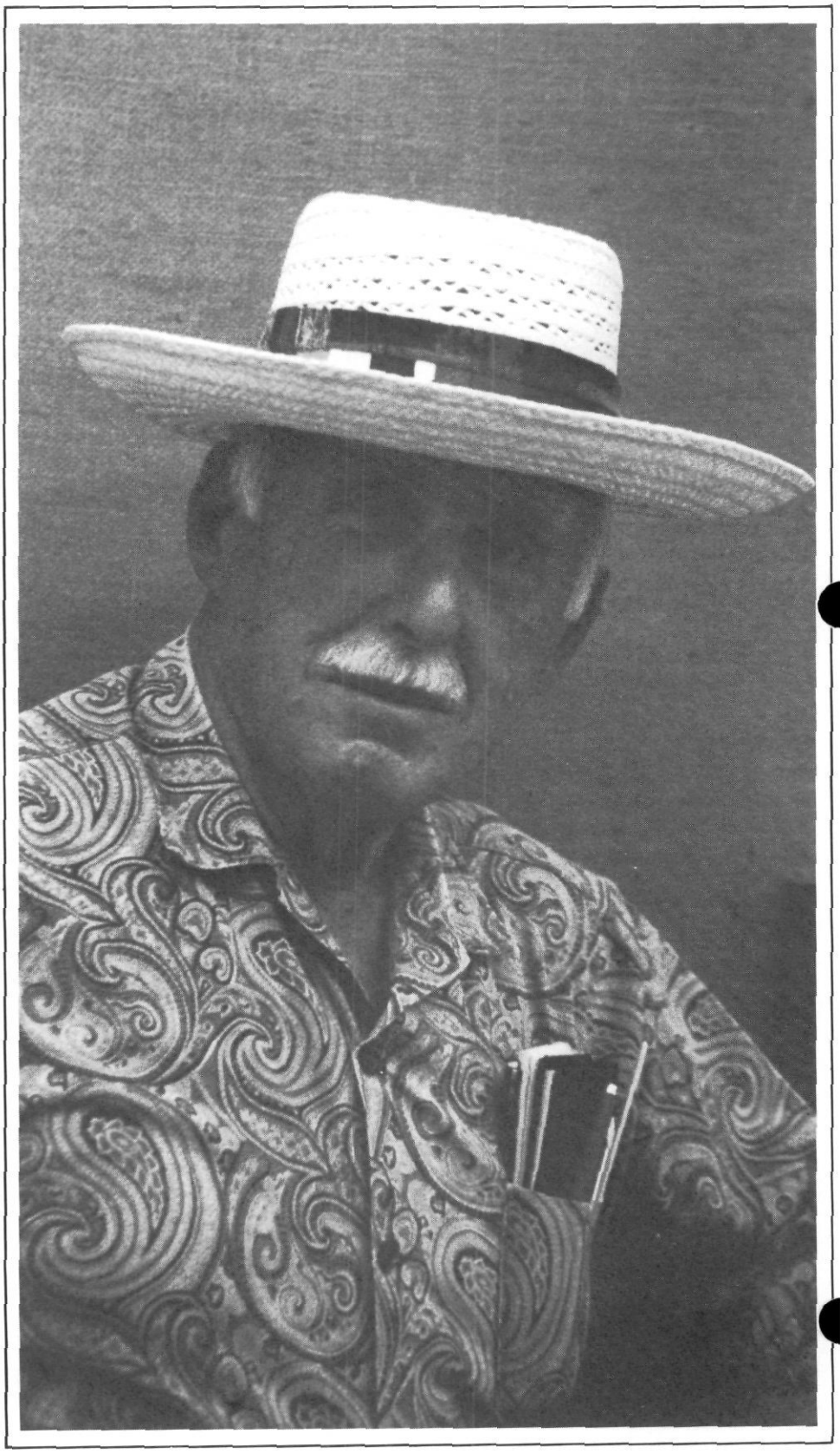
President's Message

IN MEMORIAM
EUGENE LOCKTON
L.S. 2535 (1904-1982)

It is with great sadness that we note the recent death of Eugene Lockton. Gene was a charter member of CLSA (CLLSA to you old-timers). In 1973 he served as president of the state CLSA organization. He was also past president of the Marin chapter and for a number of years was active as the Marin chapter representative during that early and difficult period when CLSA was struggling to establish its identity and searching for direction. That was the time when there were basic differences between surveyors whether to accept or reject Plan A as proposed by California Council, which would have included surveying under the definition of engineering. This plan would have grandfathered the then present surveyors as engineers, and as such would not have affected them. There never was any doubt in Gene's mind how he felt on this issue. He was adament in his opposition to Plan A, and would debate eloquently (as only he could) both with surveyors and engineers on the subject. He felt strongly that the surveyor provides a unique service to the community and as such needs to be separate and independent from the engineer. Our present organizational strength and influence is due in no small part to his contribution.

Gene also took great pride in the fact that for many years he was the oldest practicing surveyor in Marin County, both in years of service as well as age. It is unfortunate that we have lost his insight and contribution to our organization while he was in his prime at a youthful age (for him) of 78 years. His professionalism, keen mind and humor will be missed by all of us who were fortunate enough to have known him.



Political Action Committee

POLITICAL ACTION COMMITTEE "PAC"

A NEW VOICE FOR LAND SURVEYORS IN CALIFORNIA

WHY A PAC?

We in a profession must do our personal, individual best to guarantee association involvement in public affairs.

The *California Land Surveyors Association (CLSA)* created a PAC in 1982 in order to:

- Respond more effectively and quickly to the political challenges of the 1980's.
- Upgrade the efforts being made on behalf of Land Surveyors in California.

Collective action has always been the greatest and most visible important element in electing candidates. By reason of a PAC's very existence, candidates recognize us.

A PAC provides the Association with a powerful tool to insure that their individual voices are strengthened through voluntary, collective effort.

WHAT IS PAC?

A PAC, is a separate entity from CLSA. It is:

- Voluntary
- Distributes monies to candidates for public office who support the interest of the association.

Creation of a PAC is only one part in telling our story to the legislature. A PAC increases our credibility by giving us added leverage in our overall legislative activities.

A PAC states that it has been established to provide an opportunity to individuals interested in the pugure of the profession to contribute to the support of candidates for office who believe, and have demonstrated their beliefs, in the principles to which the association is dedicated.

WHO IS A PAC? You Are!

The explosive growth of PACs during the last decade has increased the ability of the average individual to compete for that rare commodity—the legislator's attention.

A PAC reflects the belief that we must develop higher visibility and increased recognition in order to promote our interests.

We can help by electing candidates who understand, or are at least willing to listen to, our individual concerns.

QUESTIONS AND ANSWERS

Q: How can I contribute to the California Land Surveyors PAC?
A: You may write your personal check payable to CLS-PAC by completing the contribution card and enclosing both the check and the card in a prepaid, preaddressed envelope provided. PAC contributions should be sent directly to: California Land Surveyors—Political Action Committee (CLS-PAC), P.O. Box 9098, Santa Rosa, CA 95405.

Q: If I choose not to participate in the PAC, will it affect my membership?
A: No, Federal laws insure that your participation is voluntary and free of any pressure. Your decision to not participate has no effect on membership, just as your decision to participate does not affect your membership status.

Q: Can I get a tax credit for my contribution?
A: Yes! Federal income tax allows you to take a credit of up to $50 for an individual return or $100 for a joint return for one-half of the amount you contribute. In other words, it only costs you $1.00 to give $2.00.

Q: How does the PAC Committee decide which candidates to support?
A: Decision about contributions must sometimes be subjective, especially in the case of a challenger who may not have an established voting record. In most cases, however, recipients are selected on the basis of meeting general criteria, including:

- Personal qualifications for office - the candidate's demonstrated capacity to render effective, able, and honest public service in the office being sought.
- Issue and program positions -the candidate's known position and record on issues and programs of importance to CLSA and its members, as well as the degree to which the candidate supports the overall needs of the association community.
- Electibility - the degree to which the candidate stands a reasonable chance of being elected or re-elected.
- Position - any particular leadership role, policy-making position, or unusual stature in government held by the candidate which makes him or her of special importance to CLSA and to the land surveying community in general.
- Financial need - whether or not the candidate has other sources of financial assistance.

Q: Can contributors suggest candidates they feel the PAC should support?
A: Any PAC contributor is welcome to make recommendations at any time to the PAC Committee.

Q: Why should I make a contribution to the CLS-PAC instead of giving directly to the candidate of my choice?
A: Because there is strength in numbers. By letting CLS-PAC transmit your contributions to the candidate, our contributions have a greater impact. The candidate understands that he or she is being supported by many people, who have an interest in issues of importance to land surveying generally. Further, by contributing to CLS-PAC we strengthen the voice of land surveyors among the many competing interests in Sacramento.

Q: When is the best time to give to CLS-PAC?
A: Now! CLS-PAC accepts contributions at any time, but early contributions allow the PAC to plan the most effective means of disbursement.

Articles

DETERMINATION OF MEAN BEARING IN A FRACTIONAL SECTION

The existence of hundreds of Mexican Land Grants has created thousands of fractional sections. Several other factors have also created fractional sections. A surveyor will encounter these sections, from time to time, and perhaps consult a reference text for guidance on the subdivision of the fractional section. All references agree; when there is no opposite corresponding quarter corner mean bearings will be employed to fix the direction of the required line. Now, what is a mean bearing, and how do we determine one?

Mean indicates average. There are several methods one might employ to determine an "average." Some of these methods make more sense than others. In the following discussion we will examine a typical case, compare some methods and draw a conclusion.

Shown herein is Fractional Section 14, T.4S., R.7W., S.B.M., made fractional by the Rancho La Sierra. In the sketch shown, all controlling corners are found replacements for original corners or proper re-establishments thereof. The N-S and E-W center of section lines will have to be determined by mean bearing. Let us consider only the E-W line as the N-S line will be determined in a like manner.

METHOD 1

Consider each of the three governing lines as having equal weight, therefore the sum of the three azimuths divided by three will yield a mean bearing:

89° 46' 38" (1425.93')
90° 08' 04" (2610.49')
89° 40' 46" (2632.67')

269° 35' 28" / 3 = 89° 51' 49"
mean bearing: N 89° 51' 49" E
(distances not considered)

METHOD 2

Consider the straight line between section corners to be the mean course on the South and "average" that with that portion of the North line which we have. Therefore the sum of the two azimuths divided by two will yield a mean bearing:

89° 46' 38" (1425.93')
89° 54' 22" (5243.12')

179° 41' 00" / 2 = 89° 50' 30"
mean bearing: N 89° 50' 30" E
(distances not considered)

METHOD 3

Weight the bearing of each governing line by distance. To do this we will compute the mean bearing from the summation of the latitudes and departures of the governing courses. In practice we will establish a three leg "traverse" from the governing lines and inverse beginning to end to obtain the mean course:

Traverse (by azimuth)
89° 46' 38" 1425.93' Thence
90° 08' 04" 2610.49' Thence
89° 40' 46" then inverse:
89° 52' 42" 6669.05'
mean bearing: N 89° 52' 42" E
(distances not considered)

Methods 1 and 2 were suggested by various surveyors. Method 3 was suggested by the B.L.M. and I think it makes the most sense (I am informed that the B.L.M. uses this method most of the time - but not exclusively). The fact that Method 3 weights each course by distance is what makes this method an equitable one.

In the case shown above, each of the three methods yields a bearing very close to that of the other two. Now, let us consider a case where one line is rather short, say 500 feet. If that short line should skew two or three degrees, perhaps because it's terminus is proportioned, the results would vary widely. It is in this situation that the equity of Method 3 becomes apparent. Since the short course will be weighted by distance, its overall effect on the sub-section lines will be tempered with that of the long course. Method 3 will allow the section to be subdivided into parcels which, for the most part, are regular. The irregular parcels will be confined to the area abutting the skewed line. The equity of placing errors and irregularities where they occur is obvious.

DESCRIPTION V.S. SPECIFICATION

by: Eugene Lockton

It has frequently been stated that "surveying is hand-maiden to the law." This stems from the fact that while the law governs the rights of a land owner, those rights are physically limited by the surveyor who establishes his boundaries. A transfer of title to land, nearly always requires a deed with a description of the parcel being conveyed but the description must yield to monumentation. This is because the boundary is, "where the surveyor put it, not where he said he put it," the description serving only to guide in the location of corners in the original survey, which presumably came first. A civil engineering project, on the other hand, starts with the design by the C.E. and takes the form of a specification whose terms are mandatory. Perhaps this explains why civils who undertake property surveys follow the deed descriptions literally, frequently arriving at the conclusion that an original monument was found to be in error as to location, confusing a "description" with a "specification."

Let him who is without sin cast the first stone. Once upon a time, setting the corners for a lot, I found my measured call to fall upon a job with the original surveyor's tag about ½ inch distant. So along side of the original monument, I set my tag, L.S. 2535, but recently assigned to me. That was over thirty years ago, and I have since changed my viewpoint considerably. Sometimes it takes a crystal ball to decide what to accept as original monumentations. I have in mind a large parcel which was divided down the middle by a line which closed mathematically but which was not staked.

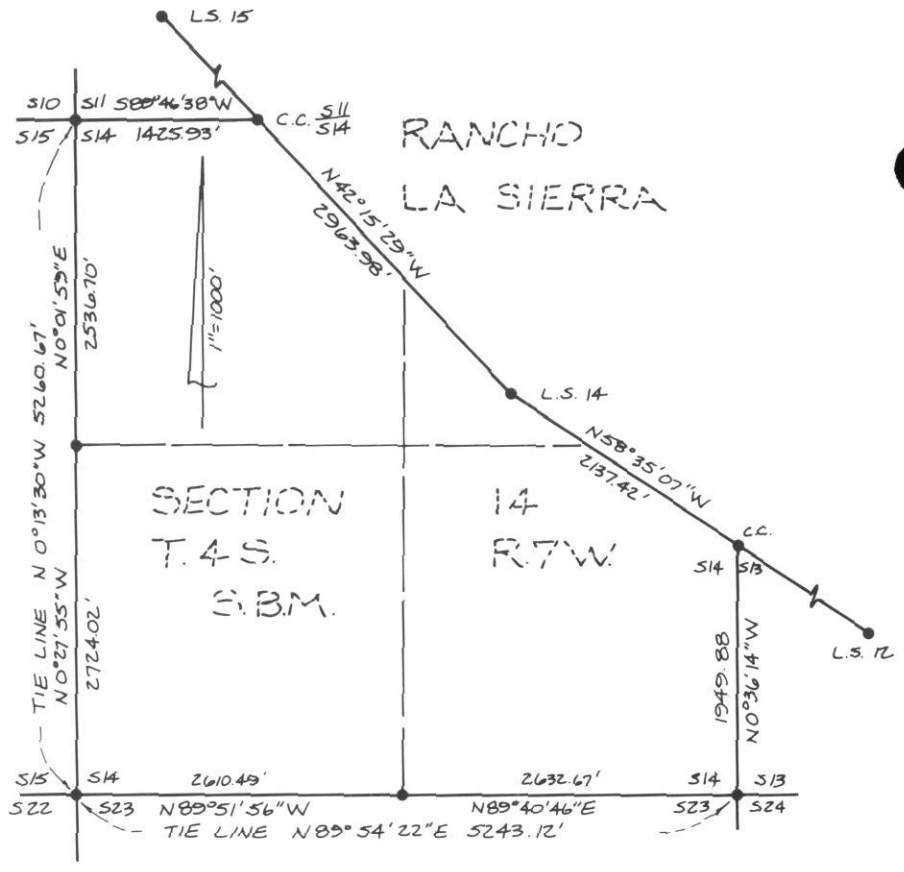
One of the parcels was subdivided into lots by A.C.E. who filed a map but was too involved with engineering to stake the lots. After about a year the owner demanded lot stakes, so the engineer engaged an L.S. to stake the lots according

to the map. The L.S. quite properly marked the lot corners with his tags. Some of the lot corners fell up on what would be the periphery of the original unstaked division. Could they unequivocally be held against claims by the owner of the unsubsidized parcel? I think not. Although they were an L.S.'s best measure of a geometrically adequate line, even L.S.'s don't do perfect work and the location of the lot corners by the L.S. do not constitute original monumentation.

Some 100 years ago, a supreme court judge handed down a decision stating that "the peace of the community is not to be lightly disturbed by measurements made from monuments of uncertain origin." So a surveyor is additionally charged with keeping the peace. Accordingly, I held to the lot corner hubs in subsequent work that I undertook.

"ARTICLES"

(continued on page 15)



From the Editor

Thank You. Those are the words each of us should speak to our friend and colleague, Robert E. Baldwin, retiring Editor of California Surveyor. Bob had been editing this magazine for approximately three years, and as is the case in all our lives, must move on to other things. Just having started this job, I can already appreciate the time and effort he put into making sure the surveyor in our state had a "professional" publication.

Again, all of our thanks for a job well done!

I would also like to take this opportunity to introduce myself to the membership. My name is Julie Terry, I'm an LSIT and have been in surveying since 1975. I started working on a field crew part time, and found myself infatuated with this profession. In 1980, I obtained my LSIT and have made an effort to be employed in this field ever since on a full time basis. I hope to serve my fellow surveyors by continuing to produce a magazine worthy of merit. I ask everyone now to be certain to contact me with questions, comments and criticism. I may be the one to determine what is chosen to be printed, but you are the ones who should help decide what kind of publication *The California Surveyor* will be. Good Luck to us all.

Of Interest

SONOMA COUNTY CHAPTER PRESENTS SCHOLARSHIP

The Sonoma County Chapter has presented its first annual, E.R. Jacobson Memorial Scholarship to a civil technology student at Santa Rosa Junior College. Receiving the award for the 1982 school year was Aileen Ryan, a second year student in the technology program. The scholarship is to be awarded annually to a second year student in the civil tech program whose area of interest is surveying.

The scholarship is a memorial to "Bob" Jacobson, a founding member of the C.L.S.A. Bob , who lived and practiced in Sebastopol, was killed in a plane crash in 1981.

Santa Rosa Junior College is planning to expand its civil technology program to include a specific surveying technology curriculum in the near future.

Richard Coughlan
Geo-Graphics Aerial Survey

Letters

Editor: This is a letter of reply to Mr. George R. Dunbar's letter on implied accuracy in the spring edition.

You invite rebuttal—Mister, you will get rebuttal.

The answer as to why things are shown on record maps as they are, has absolutely nothing to do with the art of surveying. It has to do with Science of Mensuration and Computer Application.

In April, 1981, I spent two solid hours defending the technical correctness of a parcel map before the Planning Commission of Lyon County, Nevada. The argument began when I submitted a parcel map whose boundary went through a non tangent highway curve with a radius of 4,950 feet. The Public Works Department, in running the closure calculations, came out with a closure reflecting an area that fell short of the 2 acre zoning requirement by 0.00005 acres. I argued, I lost. I took back the map and converted the bearings to my H.P. 85A readout to 100th of a second and distances rounded to ten thousandths of a foot. The public works *Wang* computer reran my H.P. garbage. The closure reflected a shortage of one ten millionth of an acre. I withdrew the map at the request of the County Engineer, a registered expert Civil Engineer licensed both in California and the State of Nevada; did a boundary adjustment survey and map with the consent of the neighboring land owner; moved the property boundary north one ten thousandth of one foot, redrew and re submitted the Parcel Map. The *Wang* computer then ran an overage of one billionth of one acre which satisfied our Public Works Department and our technically oriented planning commission. I, however, with my own overriding inferiority complex (and having become a true believer) investigated further. The bearings and distances shown on my recorded maps, when pushed through M.I.T.'s 16 Room, 7 story computer with the funny name, shows a shortage of 3 Quad billionths of an acre. I am currently in the process of readjusting my north boundary to the north by 0.000001' to correct the deficiency. Once I have recorded a new record of survey and new deeds, I shall then file an amended parcel map thus legitimizing the Parcel Map to a great deal of prideful satisfaction. The record will be satisfactory.

It's my damned field crew that is presenting the problem. Although we can, by repetition, work up a satisfactory probability factor for the overall measurement, they are having a problem finding a one millionth of a foot diameter center punch with which to mark the precise point in the middle of our 2" Brass Cap. It's people such as they who hold us land surveyors back from the eminence enjoyed by our more technically oriented brethen in the civil engineering profession.

You sir, should be ashamed in advocating a return to a system that allows such sloppiness. How can we even consider allowing an error of such magnitude, as is on my parcel map, to exist. Think of the *Pain* to the retracement surveyor 40 years hence.

by: George H. Denson, R.L.S.

Editor: I read the letter from George R. Dunbar on "Implied Accuracy," where he rightfully questioned the propriety of showing map or plat bearings to the nearest second of arc. This implied precision is, as he states, usually a result of calculator or computer number manipulation. The practice of showing bearings, distances, areas and other measurements to significant digits not warranted by the measurement methods is not unique to California, but is done to some extent everywhere. The cause isn't simply that of the surveyor copying numbers from a computer printout of the adjusted measurements, but is more accurately diagnosed as a basic misunderstanding of measurements. Understanding measurement requires understanding measurement theory, error sources, the geometry of instruments, and knowing how to analyze data. I agree that all measurements should be shown to the proper significant figures. A statement of precision could be given which would be even better. To do this, analysis of the data is required. The computer can assist in doing that too, *if* it is given the proper uncertainties in each individual measurement and propagation equation. Naturally, the surveyor must supply these, which requires full knowledge of measurement beyond knob — turning and basic geometric relationships.

by: R.B. Buckner, Ph.D.

STOLEN EQUIPMENT?

Multi-witnessed purchase of ZE155 TH2 Theodolite and K&E MICRORANGER EDM (+). Origin: unknown, possibly east coast. If equipment yours, please provide serial numbers or other personalized I.D. Contact: J. Buckley, P.O. Box "H", Boulder Creek, CA 95006. (408) 338-2153 (Bus.)—(408) 475-8826 and/or (408) 476-7608—(Res.) Reimbursement required and reward greatly appreciated.

News Briefs

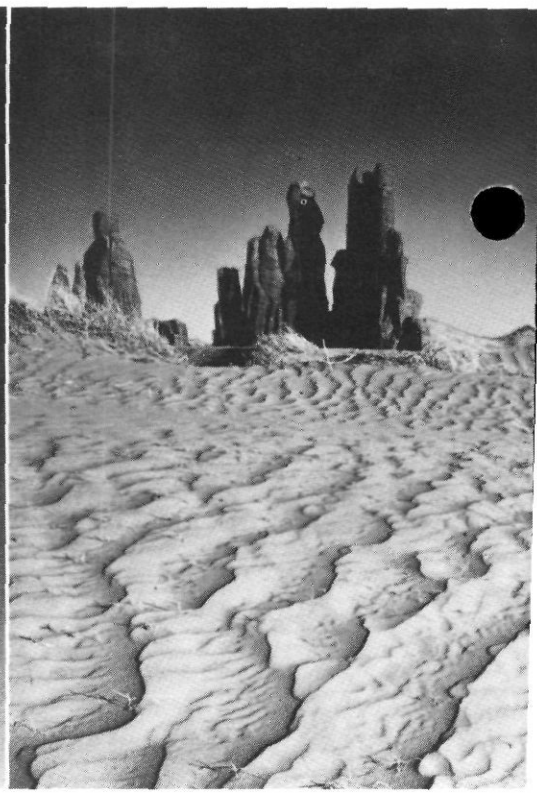
LIFE MEMBERSHIP FOR ROBERT R. BALDWIN

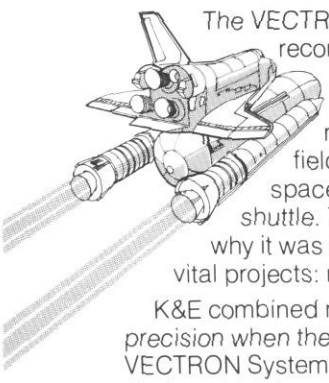
Robert R. Baldwin, L.S. 2678, was given Life Membership in the California Land Surveyors Association at the August meeting of the Board of Directors for his many years of support for the Land Surveyor in California.

SALARY SURVEY DATA

P.O.B. has summarized regional results of a salary survey submitted by respondants who indicated they were registered Land Surveyors. Anyone wishing a copy of this survey may request it from the Editor of THE CALIFORNIA SURVEYOR.

You can go to extremes...





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K&E combined ruggedness with precision when they developed the VECTRON System. This modularly-designed total surveying station provides an easy-to-operate system that reduces the potential for error and increases productivity in the field.

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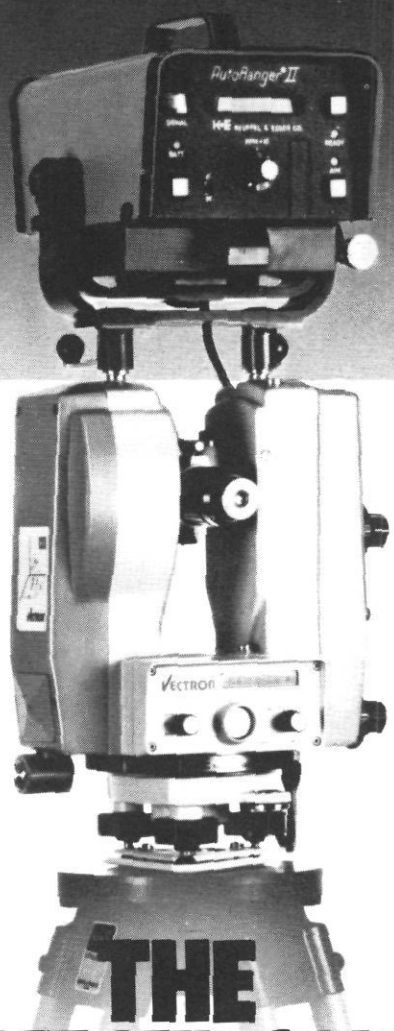
So whether you're headed for the arctic, the tropics, or the moon, you can depend on the VECTRON System for totally reliable performance. The system is fully described in a free 24-page catalog. For your copy, or a demonstration, contact your nearest K&E Branch or Dealer, or write Keuffel & Esser Company, 1327 S. Olive St. Los Angeles, CA 90015



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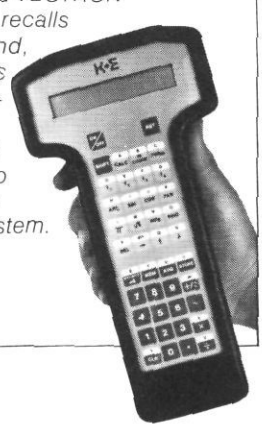
VECTRON Field Computer accepts, verifies and stores data transmitted from the AUTORANGER and VECTRON Instruments, recalls it on command, and performs in-field computations. Data may be transferred to any RS232C computer system.



Keuffel & Esser Company

New Products

LIETZ INTRODUCES NEW TACHEOMETER, SDM3E

The Lietz Company introduces the newest addition to its line of Lietz/Sokkisha instruments, the SDM3E Tacheometer. An automatic attenuation EDM and rugged ten-second digital-reading theodolite combined in one unit, the SDM3E provides simultaneous distance and angle measurement with a single pointing.

For bright, clear erect images, the SDM3E features a coaxial telescope, and with variable audio tone, a visual indicator light and dual collimator target finders, sighting is quick and easy. The SDM3E measures up to 6,560 feet to six prisms in less than 4 seconds in the measuring mode and 0.5 seconds in the tracking mode. Accuracy is ±(5mm + 5ppm)m.s.e. at −20 °C to +50 °C. For error-free readings, the intelligent eight-diget LED readout is monitored constantly by a self-checking microprocessor; not only does it prompt the user for simple operations, the self-diagnosis system will also display the proper correction code if necessary.

A microscope eyepiece adjacent to the telescope displays both horizontal and vertical angle readings directly to ten seconds, and by estimation, to five seconds. The horizontal angle reading is the mean of readings from opposite sides of the circle to eliminate eccentricity errors, and automatic vertical circle indexing with "Rare Earth" magnetic damping assures fast, accurate vertical angle readings. With the built-in SF3 keyboard, a variety of calculating functions (slope, horizontal and vertical distance, N-coordinate and E-coordinate computation, stakeout measurement and data recall) are within easy reach, without cables or extra equipment.

An insertable, rechargeable 6V D/C NiCd battery gives 900 continuous measurements on a single charge; one-hour quick charging systems (A/C or D/C) are also available. Automatic power cut-off saves battery life.

Selectable prism constant, feet/meters, atmosphic correction, optical plummet in the upper section for precise positioning, detachable tribrach, hinged carrying handle, transiting telescope and earth curvature and refraction index corrections are standare features of the SDM3E. For more information, contact Kristy Lantz, The Lietz Company, 9111 Barton, Box 2934, Overland Park, KS 66201.

McHENRY SYSTEMS, INC. INTRODUCES DATA-MAC

McHenry introduces their new DATA-MAC pocket data collector. The DATA-MAC is designed to be as small, as rugged, and as easy to use as a field book—especially by those who know their jobs, but not computers. Through its powerful electronic brain, it fills the gap between the field and the office.

The DATA-MAC's most remarkable feature is its *Fully Defined "Second-Function" Keyboard.* Every key has a "second function" such as *Vertical Angle, Meters or Right Deflection.* Alternate keyboard and display functions may be specified by the user when ordered.

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The DATA-MAC is available for immediate delivery and includes a *10 Day "Money-Back Satisfaction Guarantee*: and a *One Year Parts and Labor Warranty.*

For more information write: McHenry Systems, Inc., P.O. Box 378, Donald, Oregon, U.S.A. 97020, or call (503) 678-1271.

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Articles

HENRY D. THOREAU, SURVEYOR

For many years I was self-appointed inspector of snow-storms and rain-storms, and did my duty faithfully; surveyor, if not of highways, then of forest paths and all across-lot routes, keeping them open, and ravines bridged and passable at all seasons, where the pulbic heel had testified to their utility. From **Walden**

Many of us know Henry D. Thoreau as a naturalist, philosopher and writer, but how well do we know him as a surveyor? From the fall of 1840 when he purchased surveying equipment to introduce a practical application of the mathematics he taught in his short-lived school, to December 1860 when he recorded his last entry in his field notes, Henry Thoreau surveyed farms, house lots, woodlots, roads, ponds and rivers for the people of Concord, Massachusetts. He subdivided an estate in Haverhill into sixty house lots in 1850; in 1852 he travelled to New Jersey to divide a failed cooperative community of 200 acres into small tracts for New York City commuters, setting out a vineyard and an orchard there as well. As Walter Harding said in **The Days of Henry Thoreau** (1970), "It (surveying) enabled him simultaneously to earn a living and to spend most of his time out of doors in the fields and woods he loved."

But it was not always his first choice. He said: "I can get surveying enough, which a hundred others in the country can do as well as I, though it is not boasting much to say that a hundred others in New England cannot lecture as well as I on my themes." Though he worked as a fence builder, mason, carpenter, gardener, painter and pencil maker at various times during his brief lifetime, it was as a surveyor that he came the closest to being "regularly employed"; even so, in response to a request from the class secretary for personal information for a celebration marking the tenth anniversary of Thoreau's graduation from Harvard, he replied that his "steadfast employment, if such it can be called, is to keep myself at the top of my condition, and ready for whatever may turn up in heaven or on earth."

Surveying did provide an adequate income for Thoreau, and he obviously underestimated his abilities as a land surveyor, for his neighbors were constantly demanding his services. The demand brought financial gains, but not the rewards he hungered for most. He said: "All I find is old boundmarks, and the slowness and dullness of farmers reconfirmed." In his journal entry for April 5, 1854, he notes, "I rode with my employer a dozen miles today, keeping a profound silence almost all the way as the most simple and natural course. I treated him simply as if he had bronchitis and could not speak, just as I would a sick man, a crazy man, or an idiot."

Nevertheless, Thoreau was known for the quality of his survey work. The town report of Concord for March 1874-1875, twelve years after his death, notes:

Miss Sophia E. Thoreau has deposited in the iron safe of the Library building the unpublished manuscripts of her brother, Henry D. Thoreau. They fill three trunks or boxes. One contains a complete survey of almost every farm in town, which will be of great value in the future in regard to the boundary lines of different estates, especially so when we consider the established accuracy of Mr. Thoreau's surveys and measurements.

Thoreau himself was not ill-disposed to advertising his profession or trade; at one time he had a broadside printed which read as follows:

LAND SURVEYING

Of all kinds, according to the best methods known; the necessary data supplied, in order that the boundaries of Farms may be accurately described in Deeds; Woods lotted off distinctly and according to a regular plan; roads laid out, &c., &c. Distinct and accurate plans of farms furnished, with the buildings thereon, of any size, and with a scale of feet attached, to accompany the Farm Book, so that the land may be laid out in a winter evening.

Areas warranted accurate within almost any degree of exactness, and the variation of the Compass given, so that the lines can be run again. Apply to

HENRY D. THOREAU.

What qualities marked his survey work? A collection of his survey plats exists as the Thoreau Society Booklet 28: *A Catalog of Thoreau's Surveys in the Concord Free Public Library,* edited by Marcia Moss in 1976. Over fifteen of his survey plats, as well as fence, cow stanchion, water mill, and machine drawings are included. On the various survey plats, true and magnetic north arrows are often shown (with sometimes a declination); orchards, hills buildings, roads and fences are depicted; distances are given to the inch or hundredth of a foot or chain; and bearings are recorded to one-eighth of a degree. Running the calls of one tract gives a calculated precision of 1 in 1300. These are for surveys of the 1850's. As Thorkild Hoy put it in his article "Thoreau as a Surveyor" in the March 1976 *Surveying and Mapping,* "His ability for and inclination to precise and accurate observations undoubtedly made him a reliable professional." How many of us wish the old surveys we often work with were of this caliber? Thoreau's surveyor's compass and drafting materials are on display in the Concord Free Public Library.

We can each recall highlights of our surveying experiences—the farmer's well-meaning son who cut through the chain with his brush-hook; the payment of $50 per month; the day you fell in the creek. Henry Thoreau had his memorable projects as well. In 1859 Thoreau was hired to make a study of the depth of the Concord River and the heights of dams and bridge abutments; a controversy had arisen concerning the flooding of meadows and the possible illegal raising of a grain mill dam.

After the heated court case Thoreau thought the river "damned at both ends and cursed in the middle." In the late 1840's Thoreau refused to perform a survey to settle a dispute between Ralph Waldo Emerson and his neighbor unless he was paid in advance, due to his prior dealings with that neighbor. At the request of Emerson he did resurvey the two tracts ten years later, and found both tract locations to be in error.

During a survey of a woodlot for lumberman James B. Wood, darkness was approaching as the last line was to be run. After he had set his compass, Thoreau pulled a candle and a match from his pocket, lighted it, and told Wood to hold it on the last bounds. Finishing the work that evening would save Wood from travelling out to the woodlot again and from having to pay for another day's survey work of three dollars. But to no avail; in his field notes Thoreau records for that day: "The distance can be relied on. The last two bearings are useless being taken after dark."

In his journal for January 11, 1857, Thoreau relates an experience that seems timeless:

The other day a man came "just to get me to run a line in the woods." This is the usual request. "Do you know where one end of it is?" I asked. "No," said he, "I don't know either end; that is what I want to find." "Do you know either of the next sides of the lot?" Thinking a moment, he answered, "No." "Well, do you know any one side of the whole lot, or any corner?" After a little hesitation he said that he did not. Here, then, was a woodlot of half a dozen acres, well enough described in a deed dated 1777, courses and distances given, but he could not tell exactly in what part of the universe any particular part of it was, but he expected me to find out. This was what he understood by "running."

Frequently, when my employe does not know where his land lies, and has put into my hands an ancient and tattered piece of paper called his deed, which throws no light at all on the question, he turns away, saying, "I want you to make it all right. Give me all that belongs to me."

Henry D. Thoreau, the reluctant surveyor who approached whatever work he undertook with discipline, skill and integrity, surveyed Walden Pond in the winter of 1846 and sounded its depths; about it Marcia Moss says, "There have been several surveys made of Walden Pond in the last few years, but the results have not proven Thoreau wrong in his conclusions made from a cod line and a stone weighing about a pound and a half. He was a surveyor."

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(continued from page 16)

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Western Federation News

The 1983 Western Federation Convention will be better than the others. Mark the date, March 27-31, 1983, on your calendars, and send in your registration forms before the deadline to obtain the discount. In these times of poor economic conditions, one needs all of the tools and skills you can get to just survive. This conference has several workshops which will help you do just that. Some of the highlights are as follows:

Black Box Geodesy — James Collins, President of GEO-HYDRO, Inc., registered land surveyor and certified photogrammetrist will talk about the Macrometer 1000 three dimensional positioning from satellite signals. This space age equipment is operational today and every surveyor and photogrammetrist should learn about its uses. 1 cm (.03') accuracy in x,y and z coordinates for stations 1 km (0.62 mi) apart is useable for most of our work.

Federal Contracts — Joe Reeder of Patten, Boggs & Blow, the ACSM's National Lobbyist.

In order to successfully compete for government contracts, it is necessary to be familiar with current policies and available alternatives if current federal policies do not satisfy your needs. This session covers the following topics:

1. Competing under Professional Surveying Requirements of the Federal Government.
2. Competitive Negotiations, the Brooks Bill, and Bidding Procedures; Pre-Award Protests.
3. Contract changes and claims.
4. Current Administrative and Legislative Development Impacting on the Surveying and Mapping Professions.

Frequently, federal representatives will only consider current policy and may not be aware of alternative remedies to problems you may have. The purpose of this session is to help you become aware of ways you can solve your problems when contracting with the federal government.

Diane Creel from CH_2M Hill will discuss how you can improve your marketing communications skill and target your efforts in today's highly competitive market to get new business. Learn how to tip the balance in your firm's favor.

Improve your technical skill and competence by attending the technical papers given by the American Society of Photogrammetry; workshops on Boundaries and Possession, Game Plan of a Trial and Planning for your Organization's Future. Other technical sessions on Mining Surveys, 1983 Spheroid, Liability, Celestial Orientation and Interface with other Professions.

Learn where we should be expanding our horizons in sessions on Self Regulation, Modernization of the Survey Profession, and Multi-disciplinary Projects and other related topics.

You should INVEST IN YOUR FUTURE and attend the 1983 Conference in Las Vegas. Caesars Palace is giving a very special convention rate and it is not all work and no play. Relax on Tuesday with a tour to Hoover Dam. On Wednesday we will have a private rodeo, western barbeque, square dance, beer bust and all around good time. If you came to the last two conferences and felt that they were worthwhile, you cannot afford to miss this one.

Surveyors Historical Society

SURVEYING ARTIFACTS DISPLAYED AT CALIFORNIA STATE RAILROAD MUSEUM —SACRAMENTO

The largest collection of historical surveying artifacts ever exhibited are on display at the California State Railroad Museum complex, from October 9, 1982 through April 8, 1983.

The display focuses on 19th century public land surveys in the western United States, complemented by numerous tools from a variety of other specialized branches. It also includes Roman surveying items dating from the 1st century A.D. and surveying textbooks spanning five centuries. Over 100 antique instruments will be available for viewing, along with many early photographs and maps.

It is not generally realized that pioneer surveyors played a major role in opening up the West. To help remedy this, the Surveyors Historical Society, in conjunction with the California State Railroad Museum, is presenting the current display to commemorate their efforts in exploring, charting, and subdividing the vast western territory, and helping to build the railroads, highways, and waterworks that span the continent.

The society is a non-profit organization formed in 1977 to help preserve the heritage of surveying in maps, documents, books, and instruments. Eventually they hope to have a museum of their own to house their collection, and to provide a place for research for persons interested in surveying, property boundaries, and real estate.

The display is located in the Big Four Building at 111 I Street next to the State Railroad Museum, and is open *Free* of charge from 10 a.m. until 5 p.m., Tuesday through Sunday.

1983 WESTERN FEDERATION
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MARCH 27-31, 1983
CAESARS PALACE, LAS VEGAS, NEVADA

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Book Nook

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.

2. *Tide and Current Glossary*—U.S. Department of Commerce, N.O.A.A.—National Ocean Survey (1949) Revised 1975. Special Publication No. 228. . . . . $1.00 ea.

3. *Coastal Zone Map #TP-00189—Florida, Palm Beach County, Lantana to Boynton Beach—1.10,000 (1970)*

An extremely interesting map format which contains detailed printed instruction to Surveyors on How to Locate a Mean High Water Line According to Law, adopted by the Florida State Legislature. A real collector's item . . . . . $2.50 ea.

4. *Restoration of Lost or Obliterated Corners & Subdivision of Sections*—a guide for surveyors—United States Department of Interior, Bureau of Land Management—1974 Edition . . . . . $.75 ea.

5. *Metric Practice Guide for Surveying and Mapping*—American Congress on Surveying and Mapping. This Metric Practice Guide has been prepared to aid those engaged in surveying and mapping in the use of the International System of Units (SI) in accordance with recommendations contained in the Metric Conversion Act of 1975, Public Law 94-168 $1.50 ea.

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HP41CV SURVEY NOTES

QUESTION: How do I store and recall coordinates using the HP41CV and the HP82161A Digital Cassette Drive?

ANSWER: Use the following program as a subroutine.

```
00 LABEL 00
01 CLA Clears the Alpha register
02 DATA    "DATA" is the data
                file name.
03 2
04 *
05 SEEKR   This positions the
                cassette file.
06 20.021
07 WRTRX
08 RTN
```

This program uses registers 20 and 21 as temporary storage registers. Before using this subroutine, store your northing in register 20 and your easting in register 21. Enter your point number in the "X" register or display and press XEQ 00. This program stores your northing and easting on the cassette. To recall your northing and easting, change step 07 to READRX, enter your point number in the display, and press XEQ 00.

Questions and comments may be directed to the Editor, or Keith Houseman, Houseman & Assc., 12337 Jones Road, Houston, Texas 77070.

Advertisers' Index

Sustaining Members

SUSTAINING MEMBERS (Continued)

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