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Mapping

# The California Surveyor

**THE VOICE OF THE LAND SURVEYORS OF CALIFORNIA**

NO. 51

SUMMER EDITION

1978

## CONTRIBUTIONS TO THE PROGRESS OF THE SURVEYING PROFESSION BY CALTRANS\*

*George P. Katibah  
Chief, Office of Geometronics  
California Department of Transportation*

In a public works-type agency, such as Caltrans, surveying is a service-oriented activity which provides support to design, right of way, and construction of engineering facilities. As a service-oriented activity, it can be forced into a secondary role behind the functional areas it serves. While it is recognized that in a public works-type agency surveying is not an end in itself, the efficiency of other engineering functions suffer if surveying is relegated to providing just incidental service.

Many years ago, prior to the formation of the Department of Transportation (Caltrans), the management of the old Division of Highways addressed the problem of fractionalized surveying activities. Reports of several studies had indicated that the effectiveness of surveying services, with regard to design, right of way, and construction could be greatly improved if they were consolidated into one organizational unit. The consolidated survey unit would allow for better utilization of manpower, equipment, and technology to provide improvement in levels of service.

In FY 1969-70, engineering management of the old Division of Highways directed that all surveying activities be consolidated into a single surveys function in each of the eleven District offices. At the same time, a Sacramento Headquarters surveys unit was created in a new Surveys and Photogrammetry office. A few years ago, when the Department of Transportation replaced the Department of Public Works, an internal reorganization created the Office of Geometronics comprised of the Surveys Branch and the Photogrammetry Branch.

Our centralized surveys concept has fared quite well even in view of pressures brought to bear on Caltrans with regard to the downscoping of the highway program. As many of you will recall, we have suffered a traumatic layoff of personnel which was especially disastrous in technical and engineering ranks. Along with other functional areas, surveys had to take

reductions, and many talented and experienced individuals were lost to us either from direct layoffs and transfers, or from resignations. We seem to have stabilized for the time being, although the continuing battle over highways as California's primary mode of transportation does not allow us to become complacent with our functional role in the current organizational structure. Surveys continues to have a vital part in transportation engineering, and we can continue to look forward to accomplishments that benefit the engineering functions we serve directly as well as outside entities and the public in general.

I would like to review with you some of the contributions to survey progress that Caltrans has made in five broad categories, as follows: Training of Personnel; Technological Developments; Policies and Procedures; Survey Programs; and Liaison.

### Training of Personnel

There had been a definite demand for coordinated training at the party chief and survey supervisor levels. To satisfy this need a survey academy was held in the early 1970's. The academy ran for seven sessions of one-week each. The subject areas included control surveys; California Coordinate System; land surveys and monumentation; surveys for design, right of way, and construction; survey instruments and equipment; electronic data processing; notekeeping; survey safety; etc. The instructors came from among survey personnel who had demonstrated teaching skills and who were particularly well-versed in their subject areas. We were especially pleased to discover that our survey personnel included people who had exceptional knowledge in their chosen specialties, each of whom fortified his knowledge through dedication and energy. There was not a shortage of talent. The academy also served as a rallying ground for people with a common community of interest. They became acquainted with one another, shared their backgrounds and experiences, and found that they could learn something from colleagues whom they had not met before. Furthermore, they discovered that they all belonged to the same organization—not just to eleven district offices, each with a different heritage. The academy went a long way to establish professional bonds among personnel who had been left, for too long a time, to ponder their frustrations and interests in relative silence.

\*Presented at the meeting of the California Land Surveyors Association, March 31, 1978.

*(Continued on Page 16)*

CALIFORNIA LAND SURVEYORS ASSOCIATION  
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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."

### Advertising

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### 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*, P.O. Box 3707, Hayward, California 94540.

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### DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

FALL . . . . . AUGUST 18, 1978

WINTER . . . . . NOVEMBER 17, 1978

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

Editor

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Written Examination Schedule  
1978

#### Examination Dates

##### Land Surveyor-in-Training—LSIT

November 4, 1978

##### \*\*Land Surveyor—LS

November 4, 1978

#### \*Final Filing Dates

August 14, 1978

July 10, 1978

\*Applications filed after the final filing date specified will be considered for the following examination.

\*\*Until further notice, these exams will be given only once a year.





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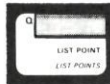
**As an example:** Here's how easy it is to break down a regular section into 64ths . . .

INPUT:

```

*****
REGULAR SECTION
BREAKDOWN
*****
ENTER NORTHINGS
AND EASTINGS
OF CORNERS
-----
11.
10182.23
10108.32
-----
51.
10145.75
12422.37
-----
91.
10208.92
15357.64
-----
95.
7756.17
15129.68
-----
99.
4985.36
15408.96
-----
59.
5127.85
12374.64
-----
19.
4875.36
9976.34
-----
15.
7539.83
9864.87
-----
IF CENTER IS
KNOWN, ENTER 55
THEN COORDINATES
DONE!
*****
  
```

Then, for a list of points using the built-in printer:



```

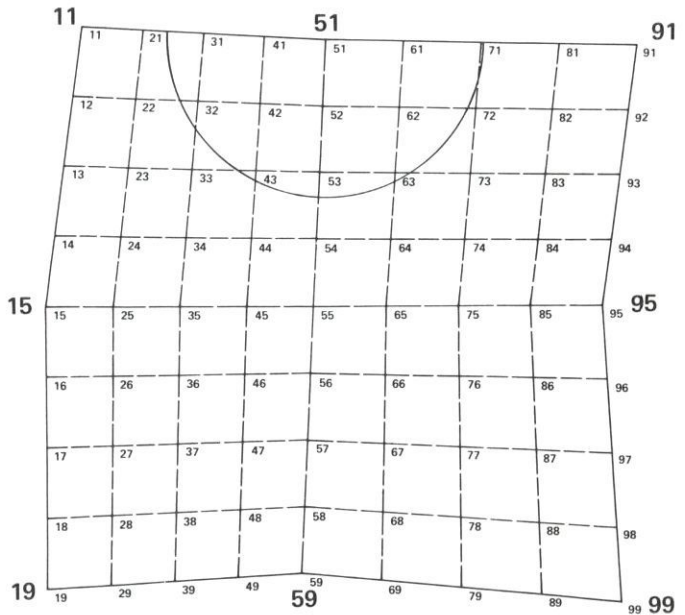
FROM POINT?
TO POINT?
-----
11.
10182.2300
10108.3200
-----
12.
9521.6300
10047.4575
-----
13.
15269.3200
-----
98.
5678.0625
15339.1400
-----
99.
4985.3600
15408.9600
  
```

and, for staking out all points within a 1500' radius of #51:



```

FROM POINT?
BACKSIGHT POINT?
RADIUS?
-----
51.
11.
1500.
  
```



. . . with the stakeout data printed on an optional page printer:

TO PT:	BEARING	N AZIMUTH	TURNED<	2XTURNED<	DEFLECTED<	2XDEFLECTED<	DISTANCE	NORTHING	EASTING
31.	NW 89.05486	270.54114	360.00000	360.00000	180.00000	360.00000	1157.17	10163.9900	11265.3450
32.	SW 62.18278	242.18278	331.24164	302.48327	151.24164	302.48327	1344.43	9520.9643	11231.9391
41.	NW 89.05486	270.54114	360.00000	360.00000	180.00000	360.00000	578.58	10154.8700	11843.8575
01.	NE 88.46017	88.46017	177.51503	355.43405	- 2.08097	- 4.16195	1467.97	10177.3350	13890.0050
62.	SE 49.41370	130.18230	219.24116	78.48232	39.24116	78.48232	937.73	9539.1570	13137.4781
63.	SE 29.32168	150.27432	239.33318	119.07037	59.33318	119.07037	1412.57	8916.7716	13118.7686
71.	NE 88.46017	88.46017	177.51503	355.43405	- 2.08097	- 4.16195	1467.97	10177.3350	13890.0050

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## PRESIDENTS' MESSAGE

My year as your president is half over, and if it were over I would not be able to say it was uneventful.

This year's convention was super in San Diego and the local chapter and the convention committee deserve a hardy thanks from all of us. They even capped off a wet year with a little more rain and allowed me another opportunity to pay my annual tax to Mexico.

An issue that garnered the most attention at the convention was Senate Bill 1850, which had to do with the civil engineers exemption to the Land Surveyors Act. Our legislative committee has let that bill die in committee. The legislative committee is presently revising this bill with plans to submit a new bill later this year.

I have appointed a committee of three people to meet with other professional organizations to gain their support in this revised bill. The most obvious revision will be the inclusion of some type of 'grandfathers' provision to allow civil engineers who practice land surveying to continue. Anyone who has any ideas concerning this legislation please contact me.

Other areas of increased activity this year are liaison with the student chapter of California State University at Fresno, our activity with the American Congress on surveying and mapping at both national and state levels, and our committee on the New North American Adjustment.

We have many dedicated people working very hard for the Land Surveying profession, and when times are as busy as they are now, it takes twice the effort. I want to ask each of you to take a little time out to work for your profession. If you are not on a committee and want to be, let me know. If you would rather work independently, you should solicit another professional land surveyor to join CLSA and become active in support of the land surveying profession.

*Michael K. Welch*

## EDITORIAL

It appears that we may be closer than ever to achieving the primary goals of our association, and with those goals becoming a reality, it is more important than ever that we stimulate membership and participation. It is imperative that we have the broadest base of support in order to get our programs accepted.

Every member should take responsibility for personally contacting a potential member and seeing that they are invited to join C.L.S.A. Our Association has been taking more and more responsibility for the profession and those added responsibilities require a greater commitment of manpower and money.

Our continued efforts in writing and correcting the Land Surveyor's examination must be supported. The Legislative Committee is always in need of more manpower to tackle the monumental task of monitoring legislation. We need to be continually active with our Accreditation Monitoring Committee, in order to insure that only qualified programs get approved. In addition, there are numerous other active, hard working committees which need help.

It is a sad commentary on our own profession when a few must carry the banner for the apathetic many. We are not so large a group that we can afford to have less than total commitment. Make it a point to recruit a new member and help your profession.



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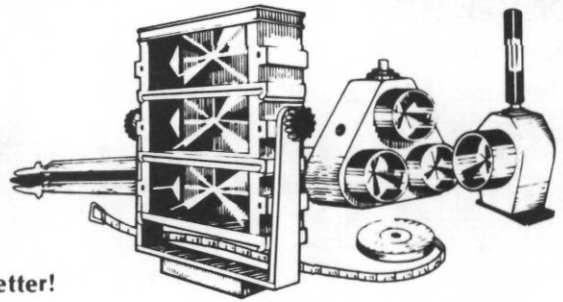
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†Hewlett-Packard 3810 Total Station	60.00	36.00	24.00
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## CONVENTION

by Robert Baldwin, L.S.

On March 30, 31, and April 1, CLSA held its annual convention at the Town & Country Hotel in San Diego. Members and their families, along with others involved in the profession, enjoyed a variety of social activities and informative technical sessions, as well as a chance to renew old friendships.

Friday's luncheon was highlighted by a screening of the film of Birdseye's original mapping expedition of the Colorado River through the Grand Canyon in 1923. Prior to then, only about 50 people had braved the river; today approximately 10,000 people enjoy relatively leisurely commercial raft trips down the Colorado each year. The expedition went during low-water which was good for topographic purposes, but exposed treacherous rocks on the rapids. Also at Friday's luncheon, we enjoyed hearing from Jon M. Leverenz, ACSM's president.

Saturday's luncheon was highlighted by Bob Becker's fascinating talk and slide presentation on the fraudulent Mexican Land Grant claims which proliferated upon California's admission to the union. Even rock jetties, worthless for farming, suddenly became valuable—for sale to the government for fortifications. Mr. Becker told of forged Land Grant documents and of the detective work involved in disproving some of the claims, notably the Limantour case.

Mr. Becker is Deputy Clerk of the U.S. Courts at the Bancroft Library in Berkeley which houses the original Mexican Land Grant documents as well as the court records pertaining thereto.

As always, the technical sessions were varied and informative. Ed Ferguson of Smith, Dennis and Gaylord described the tremendous technical advances in the computer industry and how to shop for an in-house computer system tailored to one's own special requirements.

Roy Minnick of Landmark Enterprises gave us practical methods of assessing our own particular requirements for books and then choosing the right books to meet those needs.

George Katibah of Cal-Trans spoke on the re-organization of their surveying departments, their development of a surveying manual, formation of a surveying academy, and establishment of EDM base lines.

Professor Nadar of California State University at Fresno introduced us to the new field of solar surveys. One part of English common law which was not incorporated into that of the U.S. is the right to sunlight. Mr. Nadar discussed its importance as more and more people turn to solar energy, and mentioned several court cases in which the question has been raised.

Dan Radman of Genge/Murray McCormick discussed two surveys in Santa Clara County in which boundaries were set utilizing photogrammetric methods.

Ralph C. Brown of the American Right-of-Way Association discussed the various techniques which can be used in communicating with groups. Of particular interest were techniques for dealing with large, hostile, committed groups. He also made available information on the Association's seminars on communications.

Neil Cummins presented a paper entitled "The Surveyor as a Public Calamity" in which he discussed the treatment of monuments in boundary retracement, monument classification, and potential future difficulty resulting from recent legislation.

Curtis Brown reminded us that, while there are no recent decisions in case law pertinent to surveyors, we still have to

deal with the many not-so-recent decisions. He particularly noted the differences between State and Federal Rules, and the use of the neap tide in boundary determination in California.

Winfield Wilson, attorney with Nossaman, Krueger, and Marsh, discussed a court case now being tried in Eureka and the methods employed in attempting to determine the water boundary involved in that case.

Curtis Bunch proved that technical sessions can be as much fun as they are informative when, under the topic listed as "Surveying in Oklahoma," he entertained us with some fancy guitar playing and country singing.

Twenty-eight exhibitors attended the convention, bringing with them not only the latest refinements in surveying equipment, but also the answers to a lot of questions enabling us to better use our existing equipment, and an open ear to some of our suggestions.

Our special thanks to Cable Car Seminars for the ladies' activities, and to all the speakers who gave of their own time to appear at the technical sessions and luncheons, to those who donated gifts to be given as door prizes, and to the convention committee—thanks to everyone for all their work in making the 1978 convention a memorable one.

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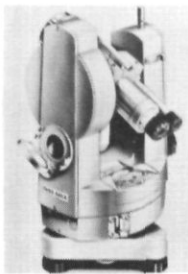


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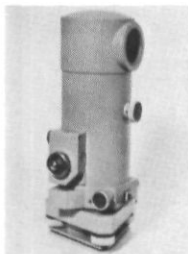
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## EX-FRESNAN WILL HEAD THE USGS

Dr. H. William Menard, 57, a native of Fresno, has been named director of the U.S. Geological Survey, the Department of the Interior announced.

The new director, a marine geologist and oceanographer, was installed April 3 at the USGS National Center in Virginia by Secretary of the Interior Cecil D. Andrus.

Menard will become the tenth director of the 11,000-man federal agency, which is responsible for identifying, classifying and mapping lands within the territorial boundaries.

He was born in Fresno in 1920. Menard received his bachelor's and master's degrees from the California Institute of Technology and his doctorate from Harvard.

The appointment of the scientist was based on recommendations from the National Academy of Sciences, nomination by President Carter, and confirmation by the Senate.

Since 1955, Menard has served as professor of geology at Scripps Institute of Oceanography in Southern California.

From 1949 to 1955, Menard was a marine geologist with the U.S. Navy Electronics Laboratory.

During World War II, Menard was a photo interpreter and air intelligence officer with the U.S. Navy in the South Pacific.

## CORRECTION

The following information regarding AGA Corporation, a sustaining member, is intended to replace material which appeared in the convention issue of *The California Surveyor*.

# AGA

## The EDM Pioneers

AGA was founded in 1904, is headquartered in Lidings, Sweden, and has been engaged in the design and manufacture of electro-optical instruments since 1947. AGA's diverse product lines also include industrial gases, welding products, radiators, electronics and medical equipment.

The name Geodimeter, a registered trademark of AGA, represents the ultimate in distance measuring instruments. The Geodimeter Division has just introduced two new models, the Model 14 which is a compact, easy-to-use "mount-on" with a range of six miles, and the Model 600 which provides precision measurement of distances up to 25 miles. Together with the short range, autotracking Model 12A and the 6-mile range Model 78, AGA offers the most complete line of EDM equipment in the industry.

In California, Nevada and six other western states, AGA Corporation also distributes the high quality Jenaoptics line of Theodolites and Levels. Jenaoptics is one of the world's largest manufacturers of surveying and photogrammetric equipment, with over 125 years of experience in high quality instrumentations.

Complete sales and service of all AGA products is offered through western offices located in San Rafael and San Diego.

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in Southern California

## NEWS BRIEFS

... As a beginning of their new active legislative attitude, the A.C.S.M. Board of Directors have adopted a resolution which would seek to amend the "Surface Mining Control and Reclamation Act of 1977" to allow Land Surveyors to participate. Land Surveyors were omitted from the act and registered engineers were the only ones allowed to practice under it.

... C.L.S.A. is continuing to push for the appointment of a Land Surveyor member to the Board of Registration. At this time, no real progress has been made.

... Life membership in C.L.S.A. has been presented to Paul H. Hopkins, L.S. No. 2223. "Hoppy" is a member of the Central Coast Chapter.

## CORRECTION

ERRATA for "Notice Afforded by Record of Survey Maps in California," *The California Surveyor*, Spring, 1978, 50:11.

1. Pg. 11, col. 1, line 5: for "prepartation," read "preparation."
2. . . . , line 29: after "registered," insert "civil engineer shall file with the county."
3. . . . , line 44: after "of," insert "such map without trigonometric calculations. Any."
4. Pg. 12, col. 1, line 7: for "since," read "Since."
5. . . . , col. 2, line 2: "26" should be superscripted.
6. FN 3: for "nicht," read "might."
7. FN 10: for "Stats. 1955, c. 1953," read "Stats. 1955, c. 1593."
8. FN 27: for "Trots," read "Torts."

## ELECTRONIC DISTANCE MEASURING EQUIPMENT RENTALS

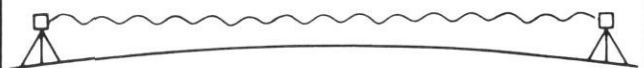
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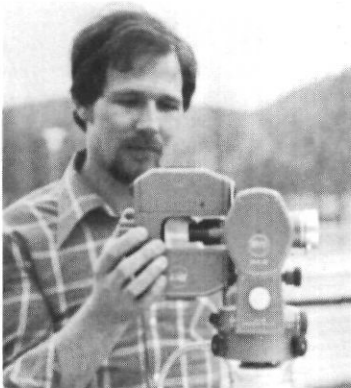
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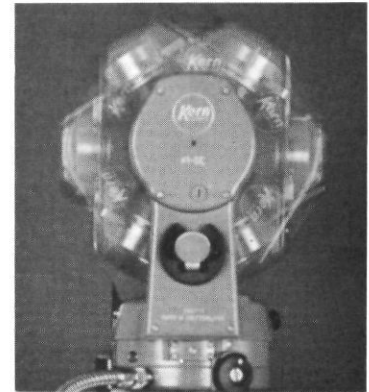


# The Kern DM 501 Survey System

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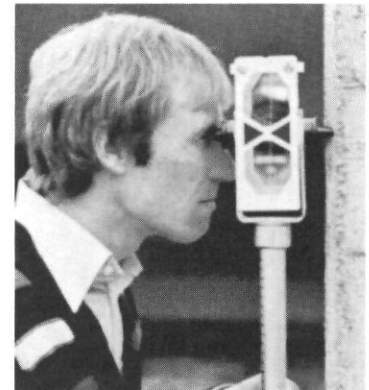
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# HISTORICAL SOCIETY MEETS IN SAN DIEGO

by Robert Baldwin, L.S.

The Surveyor's Historical Society held an informal meeting on March 31, during the San Diego Convention.

There are now 21 Charter Members, some of whom are from states other than California. A total of 100 Charter Memberships, the purpose of which are to provide "seed money" for the Society, are being offered.

The major concern expressed at the meeting is for the Society to establish clearly stated goals and objectives in conjunction with attaining non-profit corporate status. To this end, a committee was appointed to write a rough draft and then solicit comments from the membership, with the goal of being fully organized and chartered prior to the 1979 Convention at Lake Tahoe. In addition, various members agreed to start searching for temporary housing for the Society's collection until such time as a permanent site can be obtained. The possibility of using the Society's collection as a "lending library" was also discussed.

Members in attendance were:

Bud Uzes	Ray Carlson
Bob Curtis	Joe Scherf
Neal Campbell	Roy Minnick
Mike Welch	Curtis Brown
Eugene Lockton	Pat O'Connor
Donald Bender	Bob Baldwin

It was agreed to continue to hold informal meetings at the various conventions at which members are in attendance. We invite you to join us.

In stressing the importance of continually updating our education and technology, it is possible to lose sight of the fact that as Surveyors we are in a very real sense practicing historians, relying upon and perpetuating the work of others before us. Old maps and documents are not merely historical curiosities, they are of substantial practical importance to the Surveyor. The same holds true for "antique" instruments and the knowledge of the quality of work they could deliver when used with care. The Surveyor's Historical Society is now in its formative stages and invites your active participation in determining what direction it is to take.

-----  
 \_\_\_\_\_ Enroll me as a Charter member of the Surveyor's Historical Society. Enclosed is \$100 membership fee and I understand that if I am not among the first 100 enrollees, my money will be refunded.

\_\_\_\_\_ Enroll me as a contributing member of the Surveyor's Historical Society. Enclosed is \$20 membership fee.

These dues cover first year annual dues. All dues are anticipated as \$20 for next year.

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 Distance-Distance Intersect  
 Sideshots  
 Area  
 Enter & Assign  
 Curve Computations  
 Coordinate List  
 Point to Point Area  
 Radial Stake-out  
 Lot Summary  
 Predetermined Area  
 Point to Point Angles  
 Auto Traverse  
 Street Corner  
 Street Intersection  
 Cul-de-sac  
 Right of Way  
 Offset from a Line  
 Circle Thru 3 Points  
 Tangent to a Circle  
 Tangent to Two Circles  
 Re-number





# California Legislature Resolution

BY THE HONORABLE JAMES R. MILLS, 40TH SENATORIAL DISTRICT; AND  
THE HONORABLE WADIE P. DEDDEH, 80TH ASSEMBLY DISTRICT

RELATIVE TO PROCLAIMING THE WEEK OF APRIL SECOND THROUGH EIGHTH  
AS "LAND SURVEYORS' WEEK IN CALIFORNIA

WHEREAS, SINCE THE DAWN OF RECORDED HISTORY, THE PROFESSION OF LAND SURVEYING HAS BEEN A VITAL PART OF THE CIVILIZED WORLD; AND

WHEREAS, THE LAND SURVEYORS OF CALIFORNIA HAVE MADE A SIGNIFICANT CONTRIBUTION TO THE ORDERLY GROWTH OF THE STATE OF CALIFORNIA BY CREATING, PRESERVING AND MARKETING THE LAND HOLDINGS OF ITS CITIZENS; AND

WHEREAS, PROPERTY RIGHTS OF THE CITIZENS OF THIS STATE HAVE BEEN MADE MEANINGFUL AND CERTAIN BY THE PRODUCTS AND SERVICES OF LAND SURVEYORS WHO LOCATE, LANDMARK, DESCRIBE AND MAP THESE RIGHTS; AND

WHEREAS, THE PROFESSIONAL LAND SURVEYORS OF THIS STATE SUBSCRIBE TO A STRICT CODE OF ETHICS AND PRACTICES WHICH EMPHASIZES SERVICE BEFORE PROFIT AND PUBLIC INTEREST ABOVE THEIR OWN INTERESTS; AND

WHEREAS, THE LAND SURVEYING PROFESSION OF THIS STATE IS VIGOROUSLY AND CONTINUALLY STRIVING TO IMPROVE ITS PRODUCTS AND SERVICES IN THE PUBLIC INTEREST BY ADAPTING TECHNOLOGICAL ADVANCES TO AGE-OLD PRACTICES AND CONCEPTS; AND

WHEREAS, IN VIEW OF THE IMPORTANCE OF THE PRACTICE OF LAND SURVEYING TO THIS STATE AND THE NATION, IT IS FITTING AND PROPER THAT THIS PROFESSION BE GIVEN OFFICIAL RECOGNITION; NOW, THEREFORE, BE IT

RESOLVED BY THE JOINT RULES COMMITTEE OF THE SENATE AND THE ASSEMBLY, THAT THE MEMBERS PROCLAIM THE WEEK OF APRIL 2 TO APRIL 8, 1978, AS "LAND SURVEYORS' WEEK"; AND BE IT FURTHER

RESOLVED, THAT A SUITABLY PREPARED COPY OF THIS RESOLUTION BE TRANSMITTED TO THE CALIFORNIA LAND SURVEYORS ASSOCIATION AND TO MICHAEL K. WELCH, ITS PRESIDENT.

RESOLUTION NO. 158  
APPROVED BY THE JOINT RULES COMMITTEE

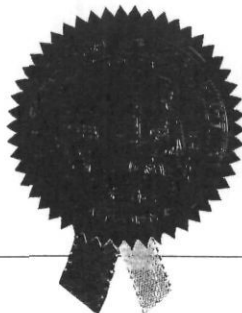
SUBSCRIBED THIS 23RD DAY OF MARCH, 1978

*James R. Mills*  
JAMES R. MILLS, CHAIRMAN  
SENATE RULES COMMITTEE

*Louis J. Papan*  
LOUIS J. PAPAN, CHAIRMAN  
ASSEMBLY RULES COMMITTEE

*Mervyn M. Dymally*  
MERVYN M. DYMALLY  
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*Leo T. McCarthy*  
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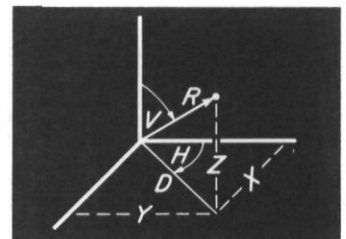
- A. VECTRON Surveying Instrument: for angle measurement and calculation of surveying coordinates
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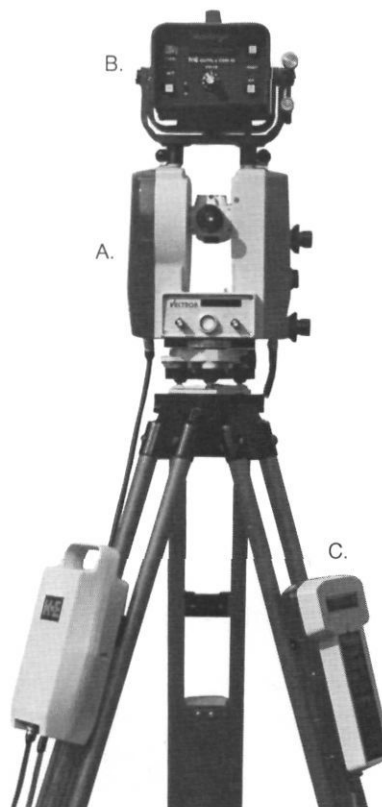


- automatically measures, displays and records slope range, 1m to 2km (3 feet to 1 1/4 miles) (R)
- horizontal angle (H)
- vertical angle (V)
- automatically computes, displays and records horizontal distance (D)
- departure (X)
- latitude (Y)
- difference in elevation (Z)
- automatically accumulates and averages readings for slope range, horizontal and vertical angles
- automatically senses and corrects for mis-level of vertical angle.
- converts slant range to horizontal and vertical range
- converts horizontal range and azimuth to x and y coordinates
- averages data
- reads out in angular units of degrees, grads or mils
- permits repeating horizontal angle readings to 9999.999
- stores measured data and calculated results, identified alphanumerically
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## A.C.S.M. LAND SURVEYS DIVISION REPORT

by Donald E. Bender, L.S.

### Organization and Membership

ACSM has adopted a new staff communication policy that is expected to remedy past problems.

ACSM will request all members to donate \$20.00 to a newly created legal and agency liaison fund (see items under legislation).

The membership will be asked to permit the Board of Direction to increase dues to cover a very large deficit and to provide needed funds for legislation activities.

Future publication of ACSM's membership will be grouped by state.

The ACSM Organization Committee, with Bob Carpenter as a member, will investigate: relationships with other societies; internal operation; and technicians.

The Land Surveys Nominating Committee with Don Bender representing Region 7, will operate under the new bylaws.

ACSM adopted a policy on the formation of sections and their relationship with affiliates.

The Indiana "Hoosier Surveyor" received the 1977 Newsletter Award.

Jake Dalton was appointed to serve as the LSD Area 7 Director for one year as a result of the untimely death of Ed Griffin.

### Legislation

ACSM will seek legislative change to the 1977 Surface Mining Control Act which denies rights to land surveyors provided for by several state statutes.

ACSM created a Legislation Action Committee consisting of five representatives, including the chairman and two members from the Land Surveys Division, and one representative each from the Cartography and Control Survey Divisions.

Federal legislative search services were obtained, including some legislator notification, for \$4,800 per year.

Sunset legislation is being investigated by a Land Survey Division committee.

### Boards of Registration

Compilation of state land surveyor laws is to be available by March 15, 1978.

Guidelines for Board of Registration discipline received a great deal of discussion (see ethics).

### Education

ACSM requested the Engineers Council on Professional Development (ECPD) to develop accreditation procedures for independent surveying programs which fall outside engineering and engineering technology.

ACSM will provide financial support and will ask its sections and affiliates to support the next surveying teachers conference scheduled for Denver.

States in the southeastern United States are investigating regional use of the land surveying curriculum at the University of Florida.

The President will encourage publication of geodesy articles in ACSM publications.

### Ethics and Standards

Land Surveys Division is planning a publication of definitions.

A joint right-of-way policy manual by ASCE, ARWA, ALTA, and ACSM is in draft form.

ACSM will request AIA and ASCE to provide for "as built" surveys by registered land surveyors in construction specifications.

Investigations by LSD of guidelines in the area of competency, negligence, and gross negligence will continue.

### Conclusion

The national sum total of education seminars, workshops, and legislation activity is truly impressive. The land surveying profession, nationally, is vibrant and growing at a rapid pace. Is California ready to accept the role of a national leader in the burgeoning profession of land surveying?

## UNIVERSITY OF CALIFORNIA, LOS ANGELES TO PRESENT LAND SURVEYING REVIEW COURSE

The U.C.L.A. Extension course, *Review of Land Surveying Fundamentals, Engineering 466.1*, will again be presented by Mr. Richard J. Mitchell, Division Engineer, Los Angeles County Engineer's Survey Division.

The course, which provides four quarter units of university credit, will be given at the University's Downtown Center beginning Thursday evening, August 10, and ending October 26, 1978, one week prior to the L.S. exam.

Registration information is available from U.C.L.A. Extension. Mastercharge and Visa cardholders can complete registration BY PHONE by calling (213) 747-2433 or (213) 825-4100. Advance registration is recommended, but registration can be completed at the first class. The Downtown Center is at 1100 South Grand, Los Angeles, and class time is 7:00 to 10:00 p.m.

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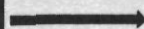
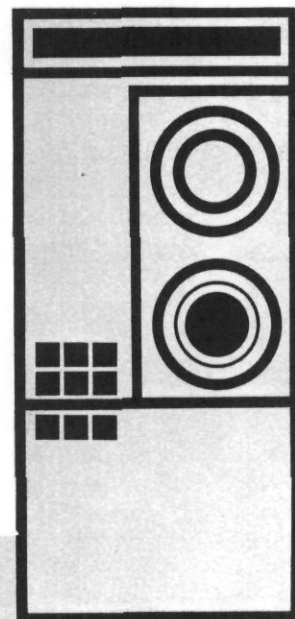
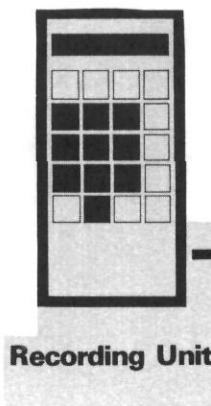
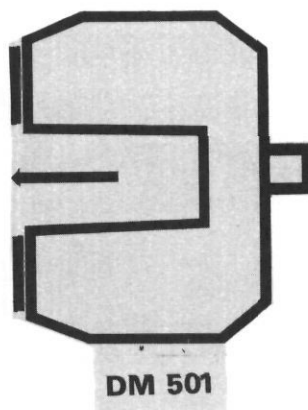
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\_\_\_\_\_  
(SIGNATURE)

## CONTRIBUTIONS *(Continued from Page 1)*

Today, survey training is confined to specialized technical areas, such as proper operation and care of EDM instruments. Recently, NGS presented specialized training in their new formatting of geodetic control data. Training at some level is pretty much an on-going effort, though much reduced in scope compared with our original survey academy.

### Technological Developments

Caltrans has been on top of the tremendous advances in (1) surveying instrumentation, (2) hand-held calculators, and (3) electronic data processing. These advances are major causes for significant changes in surveying procedures, which in turn impact design, right of way, and construction.

(1) Under the heading of surveying instrumentation is EDM, electronic distance measurers. For our purposes we group EDM in three categories: short range, up to 1-2 miles; medium range up to 8-9 miles; long range, up to 20-25 miles.

We have one long range instrument. This meets our total statewide need between the eleven District offices.

Each District office has at least one medium range instrument. Both the long range EDM and the medium range EDMs are used primarily for control surveys.

With regard to short range EDMs, it has long been our goal to have one assigned to each survey party. Only recently, however, have we met this goal.

Short range EDMs, in addition to distance classification, must be capable of being mounted on a theodolite. This requirement has always been very important to us, as had been explained to instrument manufacturers. The obvious reason is that this permits the setting of horizontal and vertical angles in the theodolite, which in conjunction with a slope distance allows for direct staking of construction layout. Also, the vertical angle capability provides for the reduction of slope distance to horizontal distance from data obtained from one instrument set-up.

Our intensive utilization of EDMs is backed up by a procedure of instrument testing. For this purpose, we established a 1st-order baseline in Yolo County within short driving time from our Sacramento office. It is on the taxiway of the airport located near the intersection of County Roads 29 and 95. There are ten monuments spaced at intervals from 28 feet to 6800 feet.

We have established or have helped to establish other baselines throughout the State, as follows:

Newcastle Baseline. The instrument station is located on Indian Hill Road, 0.5 miles east of the Newcastle Interchange on I-80. There are seven other monuments along the baseline ranging in distance from the instrument station from 2,900 metres to 14,500 metres. Each distance represents the mean of many EDM measurements established by Caltrans.

Sharpe Army Depot Baseline. This was established by Caltrans by 1st-order taping methods. There are seven monuments with intermediate distances from 50 feet to 900 feet. It is located inside the Depot along the railroad track.

NGS Calibration Baseline—San Francisco. This was established by a combined effort of NGS, Caltrans, and San Francisco. It is located on the north side of Marina Blvd. There are six monuments with intermediate distances from 150 metres to 1,400 metres, determined by 1st-order taping and EDM measurements.

NGS Calibration Baseline—Ontario. This was established by a combined effort of NGS, Caltrans, San Bernardino County, and Riverside County. It is located on Mission

Blvd. (old Hwy 60) near Ontario. There are six monuments with intermediate distances from 150 metres to 1,400 metres determined by 1st-order taping and EDM measurements.

Calibration Baseline—San Diego. This was established by Caltrans and San Diego County. It is located on the south side of Miramar Naval Air Base. There are ten monuments with intermediate distances from 100 feet to 6,200 feet determined by 1st-order taping and EDM measurements.

Additionally, each District office has some type of baseline established for their immediate use as needs arise.

(2) Hand-held calculators are now indispensable to survey parties. Some District survey offices have developed field procedures based on programmable models. The innovative uses of hand-held calculators has created much interest, and a variety of procedures and programs continue to be developed.

(3) Electronic data processing (EDP) alone has caused a revolution in survey procedures. Many programs have been developed by Caltrans, and others have been adapted from other sources. Following is a list of programs available to our surveyors.

<i>Program Name</i>	<i>Program Number</i>
HIDES (Highway Design System)	Eng-001
Traverse & Horizontal Alignment	Eng-002
Vertical Alignment	Eng-003
Geodimeter Calculation	Eng-006
Site Fanning	Eng-008
6-Factor Computation	Eng-009
Three-wire Precise Levels	Eng-013
HALO	Eng-019B
Curve Deflections	Eng-026
Layout Plot	Eng-044
ICES-COGO	Eng-065
State Plane Coordinate System	Eng-072
Geodetic Inverse	Eng-073
Point Coordinates by Intersection	Eng-076
Inverse Generator (2-dimensional)	Eng-104
COSMOS	Eng-108
Slope Distance Reduction	Eng-114
3-dimensional Inverse Generator	Eng-119
AGENT	Eng-132

### Policies and Procedures

In an agency such as Caltrans, policies and procedures are often expressed in manuals, supplemented with official memoranda. Caltrans is in the process of developing a Surveys

*(Continued on Page 18)*

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BEETLE 500 Precision International	5.5 lbs.	1,640 ft.	\$3,495	\$ 4,435 <sup>b</sup>	No	Instrument or Yoke	± .03	ft. or m selectable
BEETLE 500S Precision International	5.5 lbs.	1,640 ft.	\$3,995	\$ 4,935 <sup>b</sup>	Yes	Instrument or Yoke	± .03	ft. or m selectable
BEETLE 1000 Precision International	5.5 lbs.	3,300 ft.	\$3,995	\$ 4,935 <sup>b</sup>	No	Instrument or Yoke	± .03	ft. or m selectable
BEETLE 1000S Precision International	5.5 lbs.	3,300 ft.	\$4,495	\$ 5,435 <sup>b</sup>	Yes	Instrument or Yoke	± .03	ft. or m selectable
AutoRanger K & E	5.2 lbs.*	3,200 ft.	\$4,990 <sup>a</sup>	\$ 5,860 <sup>a</sup>	No	Instrument or Yoke	± .02 + 6ppm mse	ft. or m selectable
CD6 Tellurometer	7.5 lbs.	3,300 ft.	\$4,800	\$ 5,442 <sup>b</sup>	No	Instrument or Yoke	± .015 + 5ppm	meters
DI3 S Wild	14.1 lbs.	3,200 ft.	\$11,435 <sup>a</sup>	\$12,325 <sup>a</sup>	Yes	Only Wild Theodolites	± (.5mm + 5 ppm)	ft. or m selectable
DM501 Kern	3.5 lbs.	3,200 ft.	\$9,350	\$12,185 <sup>a</sup>	No	Only Kern Theodolites	± .5mm + 5 ppm mse	meters
Model 12A AGA	6.2 lbs.	4,000 ft.	\$7,300 <sup>a</sup>	\$ 8,225 <sup>a</sup>	No	Instrument or Yoke	± .02 + 10 ppm	ft. or m selectable
Model 14 AGA	6.2 lbs.	19,800 ft.	\$10,500 <sup>a</sup>	\$11,435 <sup>a</sup>	No	Instrument or Yoke	± .5mm + 10 ppm	meters
Model 3805 Hewlett-Packard	17 lbs.**	5,200 ft.	\$4,350	\$5,290	No	Yoke	± .02 + 10 ppm mse	ft. or m selectable
Model 3810 Hewlett-Packard	26 lbs.**	5,200 ft.	\$10,400	\$11,440 <sup>a</sup>	Yes	Yoke	± .015 + 10 ppm mse	ft. or m selectable

- a. Including Battery
- b. Including Battery, Instrument Adapter, and Triple Prism
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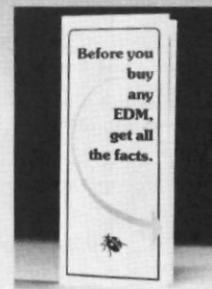
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## CONTRIBUTIONS *(Continued from Page 16)*

Manual, and about one-half of the planned chapters have been published. These are:

Chapter 1—GENERAL: Organization, Public Relations, Safety, etc.

Chapter 2—SURVEY EQUIPMENT

Chapter 3—SURVEY DATUMS AND THE CALIFORNIA COORDINATE SYSTEM

Chapter 4—ERRORS AND CLASSIFICATION OF ACCURACY

Chapter 5—SURVEYING PROCEDURES

Chapter 6—NOTEKEEPING

APPENDIX

Presently being worked on are chapters on Land Surveys, and Construction Surveys.

Chapters still to be developed are those on Control Surveys, Survey Planning, and Photogrammetry.

While the Manual is mainly technical in scope, it includes policy statements to guide survey personnel and users of survey data. It is available for public sale and can be obtained at the following address:

State of California  
Central Publication Distribution Unit  
6002 Folsom Boulevard  
Sacramento, CA 95819

## Survey Programs

As a service oriented organization, Surveys has little opportunity to develop its own programs. We have responsibility for two specific programs, one based on Federal Highway Administration (FHWA) guidelines and the other based on legal requirements:

Basic Control Surveys is a program designed to extend the National Network of Horizontal Control through the State Highway System. Under the rules of FHWA, to qualify for reimbursement of costs we must comply with National Geodetic Survey standards in all respects. Additionally, because these surveys are directed primarily toward highways, the rules require that geodetic markers be established at intervals of 3 to 5 miles along highway corridors.

Consequently, we work in close cooperation with NGS. They approve our reconnaissance plans, inspect our monument construction, review our procedures for making observations and records, adjust the data on the National Datum, and publish final values. The only evidence that Caltrans was a party to the survey is gleaned from the actual station marker and from the final published descriptive data.

When speaking of Basic Control Surveys it is convenient for us to think of it in the following 3 ways:

**New Work**—We have established over 1,500 new, permanently monumented 2nd-order stations. These stations are adjusted by NGS and are included in the National Network. All data is published by, or is available from, NGS for use by all surveyors.

**Old Work**—These new stations have been established on over 70 projects, on which an average of 10 existing stations were recovered. In addition to filing Recovery Notes, recovery often includes upgrading station condition by adding reference marks. The NGS Mark Maintenance Man is notified if the station has been lost or is in danger of being destroyed. Many existing 3rd-order stations have been included in our work, thereby upgrading them to 2nd-order positions.

**New Datum**—Work we have done to supplement the National Network will provide many readily accessible stations with published information when the 1983 readjust-

ment is made and a new datum is established. Since it will not be possible to make a mathematical transformation from the current 1927 datum to the new 1983 datum, these stations will be especially valuable to all surveyors for basing their future work on the 1983 datum.

Monumentation is our adopted term for responsibilities of a public agency in accordance with provisions of the Land Surveyors Act. Accordingly, we have a mandated program to place monuments in the ground which, by virtue of survey ties to the network of section and property corners, permits

1. the reestablishment of any corner whose monuments are destroyed by construction,
2. the recovery of land lines obstructed by new facilities.

Additionally, the monuments we place in the ground enable any surveyor to recover our right-of-way lines. Our minimum policy requirement is the filing of a monumentation map which complies with the Land Surveyors Act. Some of our districts file Record of Survey maps rather than monumentation maps to assure perpetuation of record data. Of course, data is maintained in District survey files, and any surveyor can obtain information by direct contact with the appropriate District Office.

As part of our Monumentation Program, we are required to respond to requests by private surveyors to reference any monument within freeway right of way to a usable point outside of the access control line. This type of monument referencing is provided at no cost to the surveyor.

## Liaison (or Cooperation)

CLSA has been active in sponsoring new legislation relative to surveyors and their activities. Whenever our Legislative Affairs people are made aware of pending legislation which could directly or indirectly affect Caltrans, they seek recommendations from the Offices most likely to be involved. In this way we are frequently informed of CLSA sponsored legislation. You may not realize that Caltrans, through the Office of Geometrics, has input to the legislative process. Therefore, it may be of interest to your membership to list legislation which Caltrans supported.

Bills that passed:

AB 1272 (1973)—Requires State to reference monument within a freeway right of way to a usable point outside the access control line when requested by a surveyor.

AB-1614 (1973)—Provides for filing of "corner record" by an LS or RCE for public land corner, as defined, and accessory thereto. Permits filing a "corner record" for property corner, property controlling corner, reference monument, or accessory to property corner.

AB 3195 (1974)—Permits record of survey to be amended to correct certain specified survey errors and permits correction of subdivision maps to correct certain specified errors.

AB 3518 (1974)—Authorizes the use of a retired person's name in the title of an entity rendering professional engineering services.

AB 3519 (1974)—Provides that additional time, in excess of 20 days provided for the county surveyor review of a record of survey, shall be mutually agreed upon by LS or RCE and the county surveyor.

SB 977 (1974)—Revision of Subdivision Map Act.

SB 379 (1977)—Removes exception of Division of Highways' monuments from having to be tagged with an LS or RCE number. Substitutes provision that monuments set by public agency be marked with name of agency and political subdivision it serves.\* Also adds circumstance where record of survey is not required (i.e., when survey is a retracement

*(Continued on Page 20)*



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## CONTRIBUTIONS *(Continued from Page 18)*

of lines shown on a subdivision or parcel map of record—provided that a corner record is filed for any property corners which are reset on such survey).

*\*Caltrans had always supported the concept behind removal of the exception but initially objected to wording of the bill as introduced. Upon agreement of the wording, our objection was removed.*

The following are bills that did not pass, along with our response to each:

AB 687 (1975)—“MacDonald Survey Monument Preservation Act”. Bill would require Board of Supervisors to pay necessary expenses incurred in any remonument survey performed in a county. Legislature would reimburse ½ of such costs up to \$100,000. (Caltrans opposed unless amended to limit surveys to original public land surveys.)

AB 1511 (1975)—Bill provided educational qualifications for first division (LSIT) examination of not less than graduation from a four-year curriculum containing an emphasis on land surveying, or its equivalent. (Caltrans was neutral since we were unaffected.)

From the foregoing legislative information, I hope you are assured that Caltrans cooperates with the community of surveyors as represented by CLSA.

Caltrans' surveyors take considerable pride in their work. There are several of our present and former employees attending your conference today, which in itself is an expression of interest and pride. Despite questions being raised about the role of highways in the so-called multi-modal transportation concept (which definitely impacts our programs and personnel), our survey people continue to pursue their work with enthusiasm and dedication. We foresee continued contributions by Caltrans to the progress of the surveying profession.

## ENGINEERING BID RULING BY SUPREME COURT

### Washington

The Supreme Court ruled 8 to 0 yesterday that professional engineers must be free to bid competitively for jobs, despite their claim that bidding would endanger public health and safety.

The opinion by Justice Paul Stevens was another blow to the “learned professions” and a victory for the Justice Department, which sought an end to the National Society of Professional Engineers' ban on competitive bidding by its 69,000 members.

The society's ethics code prohibited members from submitting price information on a particular project to a prospective client until he has selected a firm and starts negotiations.

Stevens said the society's code of ethics is not exactly price fixing, but had worked as “an absolute ban on competitive bidding, applying with equal force to both complicated and simple projects and to both inexperienced and sophisticated customers.”

The engineers' attempt to justify their restraint on the basis of a threat to public safety and the ethics of the profession “is nothing less than a frontal assault on the basic policy of the Sherman Act,” he said.

Four members joined Stevens' opinion. Justices Harry Blackmun and William Rehnquist agreed with Stevens but indicated he may have gone too far in applying the antitrust act to all professional societies' ethical rules involving anti-competitive conduct.

Chief Justice Warren Burger, also with the majority, felt the society's right to free speech included a statement that competitive bidding is unethical.

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## FRESNO STATE STUDENT CHAPTER

by James E. Adams, L.S.

Three CSU-Fresno students attended our convention. They were Tiit Veske (Spring '78), David Robin (Fall '78) and Mark Van Zuuk (Spring '79). Messrs. Veske, Robin and Van Zuuk gave a speech on the Surveying & Photogrammetric program Thursday morning at the convention. Their attendance at the convention was sponsored by the association and a \$50.00 donation by the East Bay Chapter.

Since February the student chapter has been sending a representative to the monthly legislative committee meetings. This has greatly increased the chapter awareness in legislative matters. The San Diego Chapter donated \$100.00 to the student chapter for legislative activities.

Garland "Russ" Shaw, President of the CLSA Student Chapter, informs me that the chapter has at least seven projects that are finished or are in the process of being worked on.

They are as follows:

1. Write a history of the Land Surveyors Act.
2. Review past civil engineering examinations to see what type of questions have been used to test the CE in surveying.
3. Review civil engineering curriculums in California colleges, to see what type of surveying courses are offered, both mandatory and optional.
4. Obtain the names and addresses of California legislators and the districts they represent.
5. Draft letters of support for CLSA legislation.
6. Develop an alumni association.
7. Have a chapter representative at our legislative committee meetings.

## A.E. Griffin Memorial Grant Fund

To honor the late Ed Griffin's dedication to the surveying profession, particularly his support of the Surveying and Mapping program at CSU, Fresno, the CLSA has established the "A. E. Griffin Memorial Grant Fund" to give financial aid to students in the program.

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## SCHEDULE OF EVENTS

July 10, 1978

Final filing date, November 4, 1978 LS Examination.

July 12, 1978

Board of Registration meeting, Board office, Sacramento.

July 29, 1978

C.L.S.A. Board of Directors meeting.

August 9, 1978

Board of Registration meeting, Pacifica Hotel, Culver City.

August 14, 1978

Final filing date, November 4, 1978—E.I.T. Examination.

Final filing date, November 4, 1978—L.S.I.T. Examination.

August 18, 1978

Deadline, Fall issue, *The California Surveyor*.

September 9, 1978

Southern California Section, ACSM Convention.

September 11, 1978

Southern California Section, ACSM Board meeting.

September 13, 1978

Board of Registration meeting, Airport Marina Hotel Burlingame.

October 9, 1978

Southern California Section, ACSM Board meeting.

October 11, 1978

Board of Registration meeting, Pacifica Hotel, Culver City.

October 16, 1978

Fall ACSM Convention, Albuquerque, New Mexico.

October 21, 1978

C.L.S.A. Board of Directors meeting.

November 4, 1978

L.S.I.T. Examination. E.I.T. Examination. Feather River/Northern Counties Chapter—Annual Conference, Chico.

November 8, 1978

Board of Registration meeting, Airport Marina Hotel, Burlingame.

November 13, 1978

Southern California Section, ACSM Board meeting—Technical session (Ventura Co. area) Installation of new officers.

December 11, 1978

Southern California Section, ACSM Board meeting.

December 13, 1978

Board of Registration meeting, Pacifica Hotel, Culver City.

March 28–31, 1979

Western States Regional Conference, "New Shape of the Surveying World," Sáhara Tahoe, Stateline, Nevada.

## Thank You!

As a CLSA sustaining member and well-satisfied advertiser in *The California Surveyor*, I wish to thank Mr. & Mrs. Mike McKissick for the many hours of effort they have voluntarily contributed to making *The California Surveyor* the fine publication it is. With much appreciation.

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Berry, Michael Sliney	4700 Perris Way	Bakersfield, 93309
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Butcher, Phillip Stanley	5412 Por Techo Ct.	San Diego, 92124
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Chadwell, Thomas William	401 N. Powderhorn Dr.	Anaheim, 92806
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DeWitt, Birchard Bliss	4004 Skyline Road	Carlsbad, 92008
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Eddy, Jr. James Quincy	225 W. Etiwanda Ave.	Rialto, 92376
Fitzpatrick, Francis Wm.	202 Avenida Chapala	San Marcos, 92069
Fuller, Jan M.	218 Hanover Drive	Costa Mesa, 92626
Green, William Lee	26101 Via Marejada	Mission Viejo, 92675
Harlan, Wayne Richard	1428 Pluto Road	Vista, 92083
Harris, William Lee	533 Kensington Rd.	Orange, 92669
Harrison, Dan Dennis	10308 Santana Street	Lakeside, 92040
Horn, Danny Freeman	77 W. Willey Street	Ojai, 93023
Horn, Robert Alan	2711 Monticello St.	Claremont, 91711
Iacobellis, Thomas D.	9911 Wystone Ave.	Northridge, 91324
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Prescott, William Allen	1584 Lillian Lane	Highland, 92346
Pritchett, James Henry	4031 Chippewa Ct.	San Diego, 92117
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Tucker, John Edward	15945 Simonds St.	Granada Hills, 91344
Wright, Reynolds Wesley	12215 Columbia	Yucaipa, 92399
Young, John Francis	615 Rytko Street	San Diego, 92114

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**The California Surveyor**

Published Quarterly by the  
**CALIFORNIA LAND SURVEYORS ASSOCIATION**  
POST OFFICE BOX 7400  
SANTA ROSA, CALIF. 95401

BULK RATE  
U.S. POSTAGE  
PAID  
PERMIT NO. 302  
Santa Rosa, Calif.

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