



Institutional Affiliate of American
Congress on Surveying and
Mapping

The California Surveyor

THE VOICE OF THE LAND SURVEYORS OF CALIFORNIA

NO. 44

WINTER EDITION

1976

“CHANGING TIMES” IS THEME FOR 1977 CLSA CONVENTION

by Chuck Wooldridge

It is hard to conceive of any surveyor not making plans right now to attend the CLSA Convention March 17 through 19 at the San Francisco Airport Marina. The program promises to be one of those spell binders where you won't want to miss a single session. It gets underway with an innovation in the Board Meeting being devoted to an investigation into the Corner Record law. Each Chapter is being asked to report on local filing under this CLSA sponsored requirement, with the possibility of future action by the Association hanging over the session.

Another innovation involves innovations! There is one split session, where you will have to decide which topic has the most interest or value. Eugene Cook, President of E. F. Cook and Associates, Ltd. of San Diego will describe innovations in maps and plans that he has developed and uses in his practice, along with his expectations for the future. At the same time Jack Van Eden, Manager of the Photogrammetric Division of VTN Consolidated will discuss the What and Why of Photo-Control. This is a direct response to requests from members who would like to understand a little bit about the fine art of where to set control points, and why they should be that certain size.

Another innovation to be described is the 1000 Mile Campus! The Fresno State University degree in Surveying can now be made available at virtually any State University or College, if there is enough demand. And the courses can be offered day or night, depending on local demand. Do you dare to miss this one?

So you've already seen the USGS installation in Menlo Park! Are you sure you've seen them all including their recent additions and innovations? And have you heard of the recent methods and programs? Do you know how they can help you in your every day business? You may be in for a surprise!

Walt Robillard, nationally renown surveyor lecturer will attempt to do what a special committee has been unable to do for a year to the satisfaction of the CLSA Board of Directors. He is going to define Land Surveying. (I dare you to write your own definition first, and still proclaim it to be correct after Walt gets done!)

The federal government has protected the public by virtually requiring price competition and advertising. When will all this reach the surveyor, or will it. Can Ethics by Government Regulation work? Is it ethical to advertise? Or, for that matter, is it even good business? And what happens when we are forced to advertise prices? Does advertised prices mean cost for the job or hourly rates? Will you even recognize your profession in another ten years?

While along the theme of changing times and conditions, what's happening to the moonlighting situation? Bob Curtis is putting together a panel discussion on this ever present topic, but probably will have to define moonlighting first. After all, until it's been defined, how can you address the questions and decide if it is good, bad, acceptable under certain conditions, a good training operation, or none of the above?

Another article describes the non-technical side of the convention. If there was nothing of interest so far maybe you can find the social aspects appealing. But if you've really decided not to attend, don't let your wife see this issue of the California Surveyor, or you may be sunk! What, you are interested? Look carefully, you may find a registration form in here some place! ▲

**1977 CONVENTION
MARCH 17-19**

NO. COUNTIES/FEATHER RIVER HOLD ONE-DAY SEMINAR

by William C. Johnson

The combined Northern Counties/Feather River Chapters of C.L.S.A. held their 3rd Annual Conference on October 30, at the Holiday Inn in Chico where surveyors, engineers, title officers, and exhibitors made up the more than 120 in attendance. The one-day meeting was privileged to have such guest speakers as Roy Minnick (State Lands Commission), Eugene Lafferty (Great Basin Aerial Services), Larry Hyder (Forester), A.E. Griffin (B.L.M. and President of C.L.S.A.), Richard Fultz (Chairman, C.L.S.A. Legislative Committee), and Gurdon Wattles (Author, Lecturer, and Title Consultant). Between presentations, participants had the opportunity to examine the latest equipment available in the field of surveying. Nine representatives of various suppliers were present and well received.

The ladies had the opportunity to tour Bidwell Mansion, a State Historical Monument, go on a shopping tour, and observe an interesting demonstration on home-canning processes.

The evening meal was wrapped up with a lecture and slide presentation on modern Israel by Casimir Lanowick, a very exciting speaker.

Northern Counties/Feather River Chapters recognizes the value in seminars of this nature as being an integral part in the advancement of professionalism. The Chapter wishes to thank the speakers, exhibitors, but primarily the registrants for making this the most successful conference yet. See you next year. ▲

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

Commercial advertising is accepted by "The California Surveyor" and advertising rates and information can be obtained by contacting the Editor, P.O. Box 3707, Hayward, CA 94540.

Classified advertising is published at the rate of \$2 per line for members of C.L.S.A. and \$4 per line for non-members and should also be directed to the Editor of "The California Surveyor."

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

SPRING FEBRUARY 25, 1977

SUMMER MAY 13, 1977

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

Editor



**SERVICE
IS
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MIDDLE
NAME**

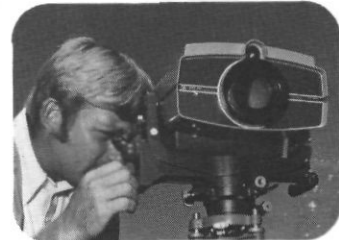
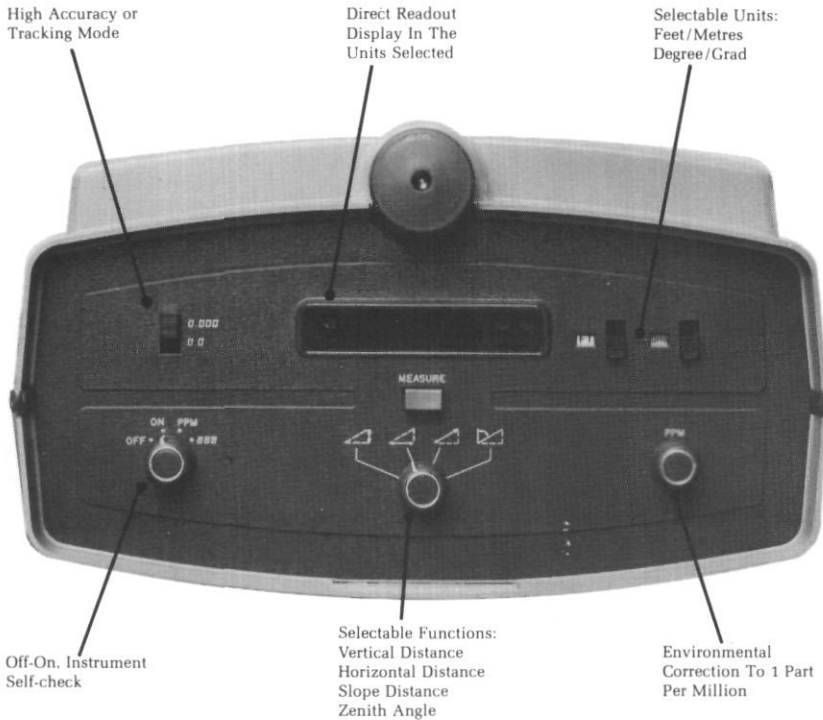


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With the 20-second least count horizontal angle base, you can estimate horizontal angles to 5 seconds. Imagine, complete angle and distance measuring capability in one compact package—with no need for cables, clamp on's, transit or theodolite. An ideal solution for layout and location work.

You'll also like the other features that make field work easier. For example, the flashing light indicator that tells you when the beam is obstructed. The one mile (1.6 km) range that means you don't have to break down those long shots, the feet/metres switch that allows you to select the units, and the built-in handle for out of the case carrying convenience.

These are just the highlights of this remarkable instrument. You can get full details by simply mailing in the coupon. One good look at the new HP Total Station and you'll know you've seen the measuring instrument of the future—today.

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LEWIS & LEWIS

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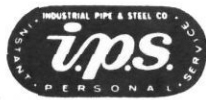
Lewis & Lewis Company was originally started by Mr. R.B. Lewis as a locally oriented Civil Engineer-Land Surveyor Company in Ventura, California. During 1953, a partnership was formed by Mr. R.B. Lewis and his son, Mr. R.T. Lewis. In 1953, Mr. Robert T. Lewis took over active management of the firm.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

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

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

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

The company is headquartered at 1600 Callens Road, Ventura, CA 93001 (telephone 805/644-7405). ▲



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INDUSTRIAL PIPE & STEEL CO. has been located in South El Monte (approx. 15 mi. east of Los Angeles) for the past 20 years. INDUSTRIAL PIPE & STEEL CO. has serviced industry and the "Do-It-Yourselfers" with steel, metals, and industrial hardware.

Over the past 20 years INDUSTRIAL PIPE & STEEL CO. has grown from 2 employees to 30 employees.

The President is Joe Schorr, Vice President-General Manager in charge of steel and metals is Tom Plumley. The Vice-President-General Manager in charge of industrial hardware is Allen Horowitz.

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

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

I ENGINEERING

III COMPUTER

IIIIII SERVICES

ENGINEERING COMPUTER SERVICES has expanded during the past year and has added many new features in both equipment and software which enhance our capabilities. We have added capabilities for offset staking information as well as vertical and horizontal curve staking, condominium plotting, control plotting for aerial photography and base mapping capabilities for cities, counties and public utility agencies. We also compute earthwork quantities for grading plans, roads, canals, etc. You provide us with the information on our forms and we do the rest. We still provide the computing and plotting of subdivision maps including base maps for grading plans, FHA type plot plans, plan and profiles of streets and sales maps. Brochures are available by contacting Jim Butler at 2200 "F" Street, Bakersfield, California 93301, (805) 325-1251. A firm quote will be prepared upon request. ▲

ENGINEERING SERVICES COMPANY

14604 205th S.E.
Renton, Washington 98055

Engineering Services Company of Renton, Washington manufactures and distributes computers and peripheral equipment specifically designed for the Surveying and Civil Engineering professions.

According to Bill Watson of Engineering Services Company, the SURVEY 31 computer is programmed to provide fast and complete solutions to surveying and related civil engineering problems. Many of the more commonly used surveying solutions such as traversing, inverses, curves and area computations, are "built-in" to SURVEY 31 with a "ROM" (Read-Only-Memory). Other problems such as intersections, vertical curves, section breakdown, etc., can be added to the existing ones by loading programs stored on magnetic tape cartridges.

In addition to the unmatched power of its memory, the other important feature of SURVEY 31 is its utter simplicity of operation. There are 45 surveying function keys appropriately labeled so that an operator may easily select the solution to a specific problem. These, combined with prompting messages, make SURVEY 31 all but fool proof to use. As opposed to other computers, requirements of using codes to select different programs has been kept to an absolute minimum.

300 coordinate points (optionally 100 at less cost) can be stored directly into the memory of SURVEY 31. Any point can be instantaneously recalled by number. Data tape cartridges allow an unlimited number of points to be stored for later recall and use.

SURVEY 31 overcomes the two major causes of obsolescence in computers. These are lack of memory expansion and the ability to interface with peripheral equipment. A disc memory is available that allows memory expansion to over 500,000 program steps or nearly 35,000 coordinate points all of which are available in less than one second. Most any peripheral desired can be interfaced to SURVEY 31. These include thermal printers, typewriters, typewriter/plotters, flat bed plotters, drum plotters, digitizers, graphic plotting displays plus other devices. ▲

The Ranger IV EDM System can get you out of a hole, even if it's 8 miles wide.

The new Ranger IV EDM System incorporates the latest advances from K&E, a leader in EDM. Here's what we've done to make EDM an even better answer to the kind of surveying problems you have today . . . for distances of 3 feet to 8 miles:

- Power requirements have been reduced significantly compared to previous equipment. Which means more use between battery charges. A big point when you're in remote locations like the Grand Canyon!
- Illumination of signal meter and telescope makes night use easier.
- New highly stable yoke design.
- A key lock prevents unauthorized use.
- Cable release for cold weather use.

Plus all previous Ranger advantages.

All the good features of Ranger III have been incorporated into the new Ranger IV. Like highly accurate readings $\pm (0.02 \text{ ft.} + 2 \text{ ppm})$.



Simple, automatic operation, with dialed-in corrections for environmental and offset correction. Auto-ranging feature. And all at a very moderate price for a laser-type instrument.

Substantial cost savings in operation.

With speed and accuracy like that, users can enjoy big savings compared to conventional methods.

For instance, 2 men surveyed 300 square miles of the Grand Canyon in just 3 days. Versus an estimated 100 men working for one year using traditional techniques.

Excellent service too.

We won't leave you in a hole there either. The Ranger IV is designed with plug-in modular construction which permits quick parts replacement. Service centers are conveniently located around the country.

The Ranger IV is available only from K&E branches and dealers. Write for details to Keuffel & Esser Company.



KEUFFEL & ESSER COMPANY

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Phone: 415 873-6850 Phone: 213 747-7601



1977 Convention Program

THURSDAY, MARCH 17TH

- 9:00- 5:00 Registration desk and ladies hospitality room open
- 9:00- 1:00 Committee meetings
- 1:00- 2:00 Make-up demonstration (ladies hospitality room)
- 1:00-5:00 Exhibitors set-up
- 2:00-2:30 Opening remarks —
Steve Fischer, Convention Chairman
Jim Adams, 1977 President
- 2:30- 5:00 Board of Directors, President presiding
- 6:00- 7:00 Exhibitors cocktail party
- 7:00 Location map of nearby restaurants for individual dinner plans will be available

FRIDAY, MARCH 18TH

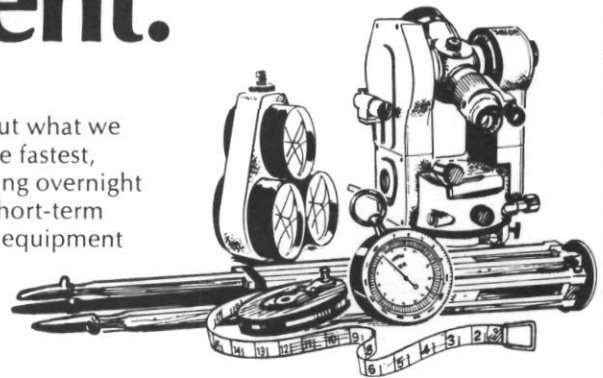
- 7:30- 8:00 Coffee and donuts with exhibitors (registration desk open)
- 8:00- 5:00 Ladies hospitality room open
- 9:00- 3:00 Ladies tour of San Francisco
- 9:00-11:30 U.S.G.S. Tour
- 12:00- 1:30 Lunch, keynote speaker (Board of Registration — Lay Member)
- 1:30- 3:00 U.S.G.S. guest, Dean T. Edson (speaking on rectangular survey system) in the digital cartigraphic data base)
- 3:00- 3:30 Coffee with the exhibitors
- 3:30- 5:00 Robert Wilhelm, Attorney and Civil Engineer, (speaking on "Surveyors Liability")
- 6:45-11:45 Quarter horse racing and dinner at Bay Meadows

SATURDAY, MARCH 19TH

- 7:30- 2:00 Exhibits and registration open
- 7:30- 8:00 Coffee and donuts with exhibitors
- 8:00- 5:00 Ladies hospitality room open
- 8:00- 9:15 "Moonlighting," speaker Bob Curtis
- 9:15-10:30 "Bachelor of Science in Surveying," Fresno State speaker, Dr. James Matheny
- 10:30-11:00 Coffee and donuts with the exhibitors
- 11:00- 1:00 Ladies brunch and fashion show
- 11:00-12:00 Guest speakers E. F. Cook and Jack Van Eden
- 12:00- 2:00 "Land Surveying Defined" by Walt Robillard (lunch)
- 3:30-10:30 Winery tour and dinner

We rent profits, not just equipment.

We probably don't have to tell you that renting pays off. But what we would like to tell you is that Lewis & Lewis offers one of the fastest, most flexible rental programs you'll find anywhere, including overnight delivery to any of the fifty states, low rates (especially on short-term rentals) and complete recovery of rental costs on selected equipment through later purchase. Check our price list and try us next time — you'll see why we're really renting you profits, not just equipment!



EQUIPMENT	1st 10 DAYS PER DAY	AFTER 10 DAYS PER DAY	AFTER 90 DAYS PER DAY
*†CUBIC DM-60 CUBITAPE DISTANCE METER	\$ 25.00	\$ 15.00	\$ 10.00
†HEWLETT-PACKARD 3800A OR 3805 DISTANCE METER	15.00	10.00	10.00
†HEWLETT-PACKARD 3810 TOTAL STATION	60.00	36.00	24.00
*†K&E MICRORANGER DISTANCE METER	30.00	18.00	12.00
*†PRECISION INTERNATIONAL BEETLE 500 DISTANCE METER	20.00	12.00	8.00
*RETRO-RAY SINGLE PRISM ASSEMBLY FOR ALL DISTANCE METERS	1.00	.60	.40
*RETRO-RAY TRIPLE PRISM ASSEMBLY FOR ALL DISTANCE METERS	2.50	1.50	1.00
CUBIC DM-20 ELECTROTAPES — Two units	40.00	24.00	16.00
ELECTROTAPE TILTING HEADS — Two units	2.50	1.50	1.00
*MAGNETIC LOCATOR — SCHONSTEDT OR TELEDYNE-GURLEY	4.00	2.40	1.60
*KERN #173W TRIPOD WITH 5/8 x 11 ADAPTOR	1.50	.90	.60
*LIETZ #7512-50 OR EQUAL WIDE FRAME 5/8 x 11 TRIPOD	.75	.45	.30
*LIETZ #7311-35 TRIBRACH WITH OPTICAL PLUMMET	.75	.45	.30
*LIETZ #7311-38 5/8 x 11 TRIBRACH PRISM ADAPTOR	.50	.30	.20
*LIETZ #7312-45 TRAVERSE SET	5.00	3.00	2.00
*LIETZ TM-1A OR ASKANIA A-2a DIRECTIONAL THEODOLITE	15.00	9.00	6.00
*LIETZ TM-20C OR ASKANIA A-1a 20" REPEATING THEODOLITE	10.00	6.00	4.00
*LIETZ T-60D 1-MINUTE REPEATING THEODOLITE	10.00	6.00	4.00
*LIETZ BT-20 20" SURVEYORS TRANSIT	4.00	2.40	1.60
*LIETZ B-1 AUTOMATIC LEVEL	4.00	2.40	1.60
*LIETZ B-2 AUTOMATIC LEVEL	3.00	1.80	1.20
*CUBIC DM-40 AUTOTAPE WITH TWO RESPONDERS	300.00	150.00	100.00
MOTOROLA MINI-RANGER WITH TWO CODED TRANSPONDERS	200.00	90.00	60.00
EACH ADDITIONAL MINI-RANGER CODED TRANSPONDER	30.00	15.00	10.00
AUTOTAPE OR MINI-RANGER PRINTER	15.00	6.00	4.00
RAYTHEON DE-719 RECORDING FATHOMETER	25.00	15.00	10.00
RAYTHEON DE-119D RECORDING FATHOMETER	20.00	12.00	8.00
SPECTRA-PHYSICS LT-3 LASER TRANSIT LITE WITH FAN BEAM ATTACHMENT	20.00	12.00	8.00
AMERICAN PAULIN MODEL M-2 SURVEYING ALTIMETER — 0 to 10,000 feet. 2 foot graduation	4.00	2.40	1.60

NOTE: For 30-day minimum contract rate, disregard "1st 10 days" column above.

*New and used equipment available for purchase. Option to purchase included in rental agreement. Additional equipment available for rent or purchase — information on request. Authorized Lietz dealer.

†All short-range E.D.M. units are supplied with power supply, altimeter, thermometer and one single prism assembly.

Lessee pays all round trip shipping charges on rented equipment. Rental charges commence on the day the equipment leaves Ventura, California, and terminate on the day the equipment is returned or shipped for return from Lessee's location. Rates for longer periods available on request. Rates subject to change without notice.



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Hewlett-Packard—"Creators of Working Tools for People Who Measure and Compute"—is one of the world's leading designers and manufacturers of electronic measuring and test instruments and systems; electronic calculators, computer and computer systems; medical instruments and systems; instruments and systems for chemical analysis; and high-technology, solid-state components.

Founded in 1939, with headquarters in Palo Alto, California, the company is an international organization with some 29,000 employees. Hewlett-Packard produces more than 3,000 products at 22 domestic divisions in California, Colorado, Oregon, Idaho, Massachusetts, New Jersey and Pennsylvania and at eight overseas plants located in the German Federal Republic, United Kingdom, France, Japan, Singapore, and Malaysia. These products are marketed throughout the world, primarily through the company's own network of 172 sales and service offices in 65 countries.

A large share of Hewlett-Packard's resources are devoted to the design and manufacture of distance/angle measuring systems, programmable desk-top calculators and peripherals, and powerful pocket-sized calculators for the surveyor.

The latest contribution from HP's Civil Engineering Division is the new HP3810A Total Station. Now, for the first time, a low cost surveying instrument is available that allows the surveyor to measure horizontal, vertical and slope distances, plus vertical and horizontal angles from a single cable-free instrument. This instrument also incorporates a tracking mode which is ideally suited for layout and location surveys.

In the expanding programmable calculator line, the latest contribution is the new HP9815A Surveying Calculator. The HP9815A is almost as portable as HP's hand held calculators, but has the problem solving power of a mini-computer.

Complete information on Hewlett-Packard Surveying Products is available from local HP Sales and Service Offices in Sacramento, Santa Clara, Fullerton, North Hollywood, Los Angeles, San Diego, or from Hewlett-Packard Civil Engineering Division, P.O. Box 301, Loveland, Colorado 80537, (303) 667-5000. ▲

CALIFORNIA BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

Written Examination Schedule 1976

Examination Dates

*Final Filing Dates

Land Surveyor-in-Training—LSIT

April 16, 1977

January 31, 1977

Land Surveyor—LS

November 5, 1977

July 11, 1977

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

NOTE: This schedule is subject to change at any time without prior notice. ▲

Kern & Co., Ltd., Aarau, Switzerland, has manufactured geodetic and photogrammetric instruments of highest precision since 1819. Today Kern offers, besides a complete set of levels and theodolites, an advanced line of EDM equipment.

The DM2000 is fully automatic and has a maximum range of 2.5 miles. The DM 500 has a range of 500 meters and weighs 3½ pounds. It is intended for use with the DKM 2-AE one-second theodolite and the new, thirty-second repeating transit K 1-SE. The DM 500 is unique in that it fits over the telescope of these theodolites yet does not impair plunging. The ME 3000 Mekometer is the most precise distance meter available on the open market today. It has an accuracy of ± 0.15 mm and a range of 3000 meters. The Mekometer is intended for base-line and deformation measurements of highest precision.

All surveying and distance meters are available from stock.

Private, state and federal mapping organizations have found the PG Stereoplotter to be the best solution for updating their photogrammetric equipment. The versatility of this instrument is enhanced by a number of unique accessories such as the earth-curvature correction device, digital X Y and Z coordinate readout ECR2 and PS-2E cross-sectioning guide bar with Y encoder.

The 12.5 × PG 2-At Semi-Automatic Stereoplotter System, which was introduced in 1974 at the ACSM-ASP Convention in St. Louis, Mo., has found tremendous worldwide acceptance. A new, low-priced Digitizer-Calculator System and a profiling guide, which will further expand the versatility and automatic plotting features of the PG 2-AT System, was introduced during the convention in March of 1975 in Washington, D.C.

The Kern Orthophotoscope OP 2, can be driven on-line from the PG 2 Stereoplotter or as a stand-alone unit off-line. The OP 2 is in production and available on short notice.

Fully Analytical Aerotriangulation increasingly replaces the semi-analytical method. Thus, the MK 2 Monocomparator enjoys an ever greater market.

The sale and service of Kern geodetic and photogrammetric instruments is handled in the United States by Kern Instruments, Inc., 111 Bowman Avenue, Port Chester, New York 10573, phone (914) 939-0200 and Kern Instruments, Inc., Western Division, 25L Commercial Blvd., Novato, California, phone (415) 883-0616.

FOR SALE OR LEASE: 1" Zeiss

Theodolite 1970, THEO 1A (inverted image), New condition \$100.00 per mo lease or purchase for \$1,500.00. 3 mo. lease can be applied to purchase. Call (916) 878-0795 evenings or write: Ronald P. Monson, Rt. 1, Box 1881, Meadow Vista, CA 95422.



SURVEY 31

Twice the computing power at 1/2 the cost!

Compare **SURVEY 31** with some computers selling for over \$10,000 and you will likely find that it's at least twice as powerful. And, because **SURVEY 31** was specifically designed as a surveying computer, it's easier for you to use.

- A surveying computer? Yes, most of the more commonly used surveying solutions (traverse, inverse, curves, area, etc.) are "hard-wired" into the circuitry of **SURVEY 31**. They are immediately available by simply touching one or two appropriately labeled keys.
- What about other uses? Other solutions are achieved by using programs loaded into the programmable memory through a built-in magnetic tape reader.
- How large is the program memory of **SURVEY 31**? 10,000 program steps, including the surveying solutions and the programmable memory. This is approximately equal in computing power, to 32,000 "words" of memory on computers that use Basic language.
- How many coordinate points can **SURVEY 31** store? 300 points (coordinate pairs) may be stored **directly into memory** and instantaneously recalled by point number. Over 16,000 points may be stored on an optional disc memory with access to any point in less than 1 second.
- Why do you emphasize "directly into memory"? To clarify what we consider to be misleading advertising claims by some other companies. One highly respected company claims "2,000 coordinate pairs can be stored for immediate use." The actual fact is that only 50 pairs may be stored directly into memory. The rest are stored on magnetic tape with an access time of up to 18 seconds per coordinate pair!
- How long is the guarantee period? One year. Service is performed either at our factory (we pay the freight both ways as well as providing a loaner) or you may take or ship the equipment to any of 45 service centers in the United States and Canada.
- What peripheral equipment is available? All those shown in the above picture (Typewriter, Plotter, Digitizer, Disc Memory) plus more.
- What is the cost of **SURVEY 31**? \$5,275 for the computer and the program library. Or, it may be leased for \$125 per month on a five year lease-purchase plan. (If you want to save \$400, it's also available with 100 point storage for just \$4,875 which leases for \$115 per month).
- Wouldn't it be foolish to buy something else without at least looking at **SURVEY 31**? Yes, we would think so.

FOR MORE DETAILS, (including the name of your nearest authorized Survey 31 Dealer), call or write:

ENGINEERING SERVICES COMPANY

14604 205th S.E.
Renton, Washington 98055

(206) 226-7950
Bill Watson, President

CLSA SUSTAINING MEMBER

WE WANT TO KNOW MORE ABOUT SURVEY 31

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Company _____

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Fashions, Make-up, Cable Cars, Racing, Wine Tour All Planned for the Ladies at "Convention 77"

by Shirley Fischer

The 1977 C.L.S.A. convention will officially start Thursday morning at the Airport Marina Hotel. The committee researched prices in the whole area and we are being offered the lowest room rates available. We have reserved a large block of rooms so let's all stay at the Airport Marina and be one big happy family.

THURSDAY, MARCH 17TH

1:00-2:00

Make-up demonstration in the ladies hospitality room. Which lucky lady will receive a beauty treatment from an expert from Merle Normans?

6:00-7:00

Exhibitors cocktail party . . . a great way to celebrate "St. Patrick's Day," meet new and old friends and this years exhibitors.

FRIDAY, MARCH 18TH

9:00-3:00

Ladies sightseeing tour of San Francisco, conducted by Hi-Way Tours. Everything you've always wanted to see in the beautiful "City by the Bay" . . . Nob Hill, Cable cars, Chinatown, Golden Gate Park, Twin Peaks, etc. Tour includes lunch at the famous A. Sabella's Restaurant on Fisherman's Wharf.

9:00-11:30

Men's tour of U.S.G.S. facilities in Menlo Park. Tour will include the new rectangular survey system in the digital cartographic data base. Mr. Dean T. Edson from U.S.G.S. will talk to our group on this system from 1:00-3:00. After the break, we will have the pleasure of hearing a very interesting and

informative speaker, Attorney and Civil Engineer Mr. Robert Wilhelm. "Surveyors Liability" will be the subject of his speech.

6:45-11:45

An evening at the Quarter Horse Race. "Wine and dine and catch all 9" will be the theme for this event! We will have a tour of Bay Meadows Race Track and a race named in honor of our group. Let's watch those winners come in while we enjoy a delicious buffet in the Turf Club. Dresses or pant suits for the ladies and sport clothes for the gentlemen will be the appropriate attire for the evening.

SATURDAY, MARCH 19TH

8:30-10:00

Drawing for prizes in the ladies hospitality room.

11:00-1:00

Ladies brunch and fashion show in the Airport Hotel dining room. Some of our gals will model the latest styles from the "Butterfly Boutique."

12:00-2:00

Lunch and the pleasure of hearing a well known and interesting personality, Mr. Walt Robillard speak to us on "Land Surveying Defined."

3:30-10:30

"DO YOU KNOW THE WAY TO SAN JOSE?" WE DO! The bus will deliver us to the front door of the quaint Novitiate Winery where Brother Korte will greet us and give us a guided tour and a wine tasting of their many excellent varieties. Taste buds all set? Then, on to dinner at the Villa Feliz, music and dancing to complete an evening that promises to be great fun for all. ▲

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PRESIDENT'S CORNER

by A.E. Griffin, L.S.

Will you please spend a couple of minutes of your time with me. We are always hearing about professionalism and the land surveyor. I hope that I can restate the problem in some ways that you may not have thought about before.

Is land surveying really a profession? Are those who provide land surveying services, either to the public or to their own employers, professionals? The dictionary defines a profession as a calling requiring specialized knowledge and often long and intensive academic preparation. What does the dictionary define a professional as? It is one characterized by or conforming to the technical or ethical standards of a profession.

The established professions such as doctors, lawyers and scientists are called professional because they have subjected themselves to a body of specialized knowledge and training that makes them capable of doing something that others cannot do and therefore they must be paid to render their services. These professionals share the common foundation of any profession. They have a separate and distinct body of knowledge and skills and they have a discrete certification process to validate the attainment of these professional prerequisites for all those who can practice within their sphere.

What about land surveyors, are they in a professional field? Go back to the dictionary definition as the basic yardstick for measuring your answer. Does land surveying have a body of specialized knowledge and training? Of course it does — the books that contain our learning such as Brown, Eldridge, Wattles, Clark and the Manual — the various laws and court decisions that spell out the legal basis of our work — the common law rules that have developed over the years to guide our procedures. These contain our body of specialized knowledge. The workshops being put on by the colleges, ACSM, and CLSA are designed to provide additional training opportunities for the land surveyor to develop professionally.

Does land surveying have a discrete certification process to validate the attainment of its professional prerequisites? In forty-two of the fifty states land surveying does have a discrete certification process, which validates the attainment of the minimum professional prerequisites for all those who can engage in its sphere. Can an occupation be professional in forty-two states and not in the other eight? I don't know. I do not think that complete public recognition will come until the conditions are met in all fifty states.

What about the land surveyor, does he use the specialized knowledge and learning of his profession? When making a property survey does he always check to see if senior rights apply? When he has an unusual problem does he review Brown or Clark to see if his solution agrees with the experts in his field? Does he always check the public records to obtain all publicly available information on the previous surveys of the area he is delineating? Is he really familiar with the legal standards that govern his practice? Does he put the boundary line on the ground in such a manner that it would be in exactly the same place whether he is being paid by his client or an abutting owner? Does he provide his client with monuments and accessories that mark the boundary in a permanent and identifiable manner? Does he file a record of survey or corner

Continued on page 13

C.L.S.A. MEMBERSHIP

C.L.S.A. MEMBERSHIP

Members as of July 1, 1976	658
Sustaining Members	11
Regular Members	410
Associate Members	152
Affiliate Members	40
Student Members	44
Life Members	1

NEW MEMBERS AS OF JULY 1, 1976

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DO OUR LAWS WORK?

by Chuck Wooldridge

The California Land Surveyors Association has had some success in the legislature, despite rumors to the contrary. One such success is Section 8773 of the Business and Professions Code being that portion of the Land Surveyors Act providing for Corner Records. Board rule 464 further prescribes the responsibilities of anyone practicing land surveying to file Corner Records.

Now the question arises, is the law working? Are we, in fact, perpetuating corners and records of them as the law envisioned? Or do we ignore and circumvent the law as we previously did with the Record of Survey requirements?

You are being asked to find out, to discuss the matter at your local Chapter meetings, and be prepared to report and discuss the subject at the Board of Directors meeting March 17, 1977. This Board meeting is a part of the program of the annual convention. It is planned to ask each Chapter to report the number of Corner Records that have been filed in each County in their area. The question will be asked of each Chapter Representative, President, other officer or any member in attendance.

Don't let your Chapter down. Discussion at your Chapter meetings should prepare anyone attending to be prepared to answer, so that your Chapter will not be the one without a report. ▲

PRESIDENTS' CORNER

(Continued from page 12)

record whenever they might be required by law? Does he represent land surveying to the public in the best possible light?

These are the things that the public expects a professional land surveyor would do. If the land surveyor does use the knowledge of his profession he will attain the status that Webster defines as professional. ▲

WHICH CHAPTER?

by Chuck Wooldridge

Which Chapter? That is always the question. Which Chapter donated the door prize that I won? This year your convention committee has devised a better method to ensure proper credit to the Chapter.

When you submit the door prize donation from your Chapter, please make sure that there is a sticker attached to each bottle, case, bag or whatever, with your chapter name. If you don't have any stickers, contact Steve Fisher, P.O. Box 4182, Woodside, CA 94062. But don't forget to get your door prize donation in. You don't want your Chapter to be missing from the list of door prizes in the next issue of the Surveyor, do you? ▲

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Water Boundaries Workshop A Great Success

by James N. Dowden L.S.

On November 5th and 6th, the Education Division of the California Land Surveyors Association presented its Water and Water Related Boundaries Workshop at the Airport Marina Hotel in Burlingame.

The presence of nearly 120 attendees including panel and Committee members is indicative of the concern of the surveying community with this emerging class of boundary.

A review of the workshop evaluation sheets indicated a well balanced presentation — which — coupled with an outstanding panel of experts — combined to reflect the past, present and future of the art of water boundary determination in California and the other coastal states of America.

Under the able direction of program moderator, Leroy Weed, all sessions began and ended "on time" and "in time."

Jim Dowden, Workshop Committee Chairman, kicked off the proceedings with a provocative sally into the field of water boundary pornography — stressing the need for development of a good vocabulary and a clear understanding of its terms and terminology.

Dr. Warren Thompson, a physical scientist at the Naval Post Graduate School in Monterey, discussed in detail tides, tidal datum planes, longshore transport and littoral drift. Doctor Thompson's presentation was supplemented by two outstanding films which with use of hydraulic models and time lapse photography, clearly demonstrated the complex nature of the physical forces which sculpt the ever changing coastline of California.

Col. H. A. Flertzheim, District Engineer San Francisco District, U. S. Corps of Engineers, briefly traced the history of the Corps and its surveyors in the winning of the west. Col. Flertzheim also discussed the Rivers and Harbors Act of 1899 and the historic jurisdictional boundaries of the navigable waters of the United States, and under the new interim regulations now in effect, the implementation of Phase I, II and III of the recent expansion of the Corps' jurisdiction mandated by the National Environmental Policy Act of 1972.

Peter H. F. Graber, Deputy Attorney General, Land Law Section of the Department of Justice discussed the present State of California law regarding Water Boundaries and admonished surveyors that "what are boundaries are matters of law; where they are are matters of fact."

Ned Washburn, Attorney at Law with the firm of Landels, Ripley and Diamond — a specialist in the field of water boundary law — while taking exception to some of Mr. Graber's and Col. Flertzheim's remarks — complimented the law portion of the program by an outstanding presentation on how the Civil Code Boundaries of Ordinary High and Ordinary Low Water Marks are to be ultimately determined, stressing the parameters of the recent "Mansell" opinion.

Jim Dorsey, Assistant Vice President, Safeco Title Co., addressed his remarks to the insurability of title to lands having one or more water boundary and to the lender's endorsement as to improvements on the land.

Ray Thinggaard, Assistant Manager of Real Property, Leslie

Salt Company, traced the origin and history of the San Francisco Bay Conservation and Development Commission and the California Coastal Zone Conservation Commission and described the jurisdictional boundaries of both and the seemingly complex permit process. Ray emphasized that the permit process is certainly one area into which California's Surveyors should enter to better assist and inform clients with their land development projects.

Ed Griffin, Chief Cadastral Surveyor for the Bureau of Land Management discussed the "meander line" as a traditional mode of locating a shoreline as a matter of surveying practice and discussed conflicts between federal and State law as applied to water and water related boundaries.

Cal Thurlow, Deputy Chief, Oceanographic Division of the National Ocean Survey discussed the marine boundary program of the N.O.S. and the present Federal/State tide survey now under way in California.

Jack Guth, President of Coastal & Tidal Engineering Ltd., Herndon, Virginia, spoke on the Florida Coastal Mapping Program and described the field method prescribed by Florida law, to be used by surveyors in locating the mean high water line. Florida has over 12,000 miles of mean high water shoreline to be located.

Bill Wright, President of Wm. B. Wright, Surveyors, Burlingame, chaired the final segment of the program in which all speakers participated. In his opening remarks, Bill gave an excellent overview of various sources of evidence regarding changes in shoreline position and the role of the surveyor as a fact finder and interpreter for the client and attorney in water boundary problems.

The question and answer phase of the panel discussion was limited only by the time available and would have proceeded into the evening but for Leroy Weed's prompt and ready gavel.

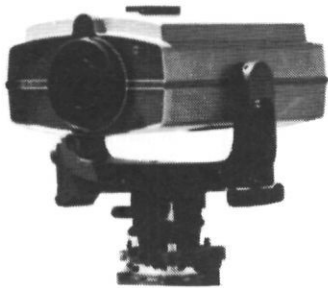
In all, a well balanced program designed to provide a blend of the four essential elements of the water or water related boundary determination process; the law; the title; the facts; and the processes which result in the ambulatory nature of a water boundary.

Workshop hand-outs and instructional material, too numerous to list, should keep the midnight oil burning in many a household for many months to come — experts included — for we all learn from each other. And that's what workshops are really all about! ▲



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Letters to the Editor

Gentlemen:

In preparation for a forthcoming meeting of the Academy of Surveyors, CCCE & LS, I've had occasion to review two chapters of the League of California Surveyors proposed manual and have some thoughts and opinions I'd like to share with you and if you feel they are appropriate they may be published in the "California Surveyor."

The first chapter reviewed was entitled "Accuracy" which is a misnomer since I find no mention of accuracy within the chapter. Rather the chapter deals only with precision when used in the context of *Land Surveying*.

As an example, in a recent dispute an Engineer proudly assured me his traverses all closed with a mathematical precision of 1:40,000 or greater, this in steep, heavily wooded mountain terrain, however, his "corners" were all 75 feet or more on an adjoiners property. My subsequent survey was open ended with no way of determining precision but since reasonable care was exercised in the measurement of all angles and distances I'm sure they were precise within 1:5000 or more, however, because I recovered and perpetuated the *original* corners my survey was 100% (zero error) accurate.

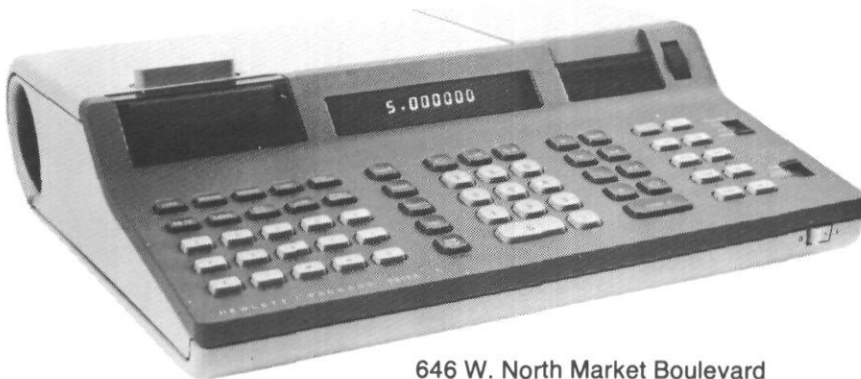
This great to do about "accuracy" is simply encouragement to the technical hacker in the field and a marvelous tool for the bureaucratic hacker assigned the task of checking maps, and ignores a basic tenet of both law and land surveying that bearings and distances are simply an aid to be used in recovering original corners and in reporting the location of new corners established.

Another example: an engineer found and accepted one corner then using an "Astronomical Bearing" (his term, not mine) proceeded to precisely layout the bearings and distances recited in the Deed, while ignoring physical and record monument calls, fences, and witness trees. The deed incidentally did not close so he had to apply a monkey wrench to a couple of closing courses. I have no occasion to find fault with his precision, however he was as much as 150 feet from where he belonged (one of the record monuments recited was to and along a section line to the section corner thence along a section line). A second engineer came in and being a little more astute recovered the $\frac{1}{4}$ corners to the east and west and set a "Section Corner" by single proration, also very precisely. When our firm got into the act we proceeded to follow the original and resurvey notes and in about 4 hours recovered the original post, as found and perpetuated by the County Surveyor in the late 1800's, this corner is some 10 feet south and 40 feet east of the second engineer's location and over 150 feet south of the first engineer's location. Both prior surveys had records of survey filed, both had written descriptions calling along the section line and to the section corner, each reciting his own bearings but with no reference to his filed maps or monuments set. Now comes our Record of Survey, and to further complicate matters, later, someone removed the post but the County Surveyor upon being alerted to this fact perpetuated the location with a permanent monument and filed a corner record. The point I'm trying to make is that both of the gentlemen who preceded me were undoubtedly precise in their measurements but neither were accurate nor did they, in my opinion, exercise the care

Continued on page 20

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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



that a prudent surveyor would, and I suspect the area will undergo 20 years of litigation to straighten out the mess.

So much for the chapter on "Accuracy." We, as Land Surveyors, are not geodists and no number of manuals published can determine the amount of judgement used in locating land lines nor can any manual on accuracy substitute itself for good judgement in keeping with the rules of evidence. A manual such as this will only offer encouragement to incompetent technicians who are quite positive that their one second bearings and distances shown to 0.001 of a foot are the epitome of "Accuracy" and that their tape is the only tape in the world that is *Exactly* 100.00 feet long!

In this chapter great to do is made of "Positional Accuracy" of 0.01 of a foot. Has any rational thought been given to the methods and equipment needed to achieve this? Even USGS in their first order work do not make any claim for this type of precision. I am not a foe of precision, I am all for it! If I receive a traverse with more than 1 minute angular misclosure regardless of the number of angles turned, I am disturbed. But remember an error of 1 minute in a course 20 feet long is inconsequential while an error of 1 minute in a course 10,000 feet long is far too much to be tolerated usually.

To advocate the use of a 1" theodolite using 4 positions while in mountainous terrain where backsights and foresights are often less than 100 feet is sublimely ridiculous! And might be compared to using a surgeons scalpel to butcher a side of beef. You could probably get the job done eventually but would no longer have the fine instrument that you started with, when the occasion arose where it was truly needed.

There is no substitute for professional judgement and in my opinion this chapter is a crutch for the technical hacker and would do much to inhibit professionalism while encouraging incompetence under the guise of technical accuracy both in the preparation and checking of maps, and *Land* surveys, and if widely accepted would throw our presently accepted methods of land conveyancing into utter chaos.

The second chapter reviewed was entitled "Record of Survey" and my biggest beef is with the statement contained therein, Quote "2. The survey establishes lines or points. Lines or points are not "established" by written or verbal documents, but only when physically located on the ground. Hence, the survey and monumentation of a piece of property not previously surveyed, but for which a recorded deed exists, requires that a record of survey be filed." end quote.

My fault with this statement is that regardless of whether a record of survey is filed, the subsequent survey *did not* establish the deed points or lines but only establishes the surveyors' opinion of where these lines or points are, and as in the chapter on "Accuracy" leads one to believe that this map is the answer regardless of the amount of judgement used in the establishment of these lines, and such is not the case. At the risk of belaboring a point that has been made hundreds of times before, any retracement of the record is only the surveyor's opinion and is only as good as the evidence and judgement of the surveyor and in case of a dispute the only recourse to settlement, other than by agreement, is through the courts.

In this chapter is also a checklist and one of the items is "Deed Interpretation Correct?" Perhaps it is planned that each

Department of Public Works or County Surveyor will have a *Superior Court Judge on this staff? or that he and he alone* is qualified to make this value judgement—patently ridiculous!

In summation: In this day of increasing bureaucratic regulation a "manual" such as this can only encourage technical incompetence and a loss of good sound professional judgement and add to the confusion. I can teach any reasonably intelligent high school student how to set up an instrument and measure an angle in a day, and with supervision to become proficient at it in a couple of weeks at most, but this will not make a "Surveyor" out of him, nor will the ability to punch keys on a computer keyboard. There is no way we can regulate the incompetents, they come and they go but most don't stay in one location long, Thank God! But let's not help them stay around. If we are truly professional in our approach to a problem and in conducting our surveys, a manual such as this is not needed and will not help. As for the incompetent and/or the unscrupulous, no number of manuals published will change them. As a group they are always around, as individuals, they don't usually last too long.

I feel this Manual is trying to reduce an honorable profession to a technology and I deeply resent this. Land Surveying is *NOT* a science, albeit we employ the science of mathematics and the technology of the instrument makers, Land Surveying is an Art!

GEORGE R. DUNBAR, LS

CHRISTO'S FENCE

by Bob Floyd L.S.

Christo and his wife, Jeanne Claude, first entered our office on July 13, 1973, requesting a property sketch showing ownership of the parcels of land in Sonoma and Marin Counties along the proposed route of Christo's project "Running Fence." The sketch was provided at 2000 scale and Christo's organization (spear-headed by Jeanne Claude) began the monumental task of acquiring land use agreements from the owners of the fifty seven parcels over the 24.5 mile route. Over and over again the continuity of the 18 feet high nylon polyamide fence was threatened while owners either refused to sign or changed their minds. (No condemnation proceedings for this project!)

By late summer of 1974, signed agreements were in hand and Christo asked our office to provide a surveyor for his project. The primary purpose of the survey along the fence route was to provide information for the structural calculations, with special attention given to wind loading. These computations were made by Christo's Engineer, Dr. Ernest Harris of Colorado, who gained further information from recording weather stations set at each end of the job.

Stakes for the posts were set along the route chosen by Christo at the 62 feet maximum distance for the 18 feet high nylon panels, as allowed by Dr. Harris. Distances were measured along the ground with a cloth tape. Vertical and horizontal angles between posts were measured in degrees using an abney hand level or a brunton compass. Cross slopes at each pole location were recorded in the same manner. Not a fancy survey, but serving the purpose for which it was intended. We

later supplied detailed topography over a six hundred foot strip of land where the fence was to make its plunge into the Pacific. The final panel going into the ocean was 558 feet in length. We also provided aerial control over a three mile section running through Valley Ford. The aerial map will supply information for a 20 scale model being constructed to cover that portion of the project. This model (some 60 feet in length) will be shown in European museums prior to being exhibited in this country.

All in all, this was a fun project on which to work and I met some very knowledgeable — friendly people both professional and ranchers. Jobs were supplied to numerous local people, many of whom had been out of work for some time. You may not agree about the "art" of the project, but few people would disagree that the "Running Fence" was a sight to behold. I take my hat off to Christo for dreaming up this project, raising the money to build it, and completing it with all the odds against him. (It took 17 public hearings, an \$18,000 Environmental Impact Report and three years to start construction on this project.) I feel very fortunate indeed to have played a part in Christo's Running Fence.

The nylon fence has now been removed and the area restored to its natural state. The folded nylon (52½ acres in all), stacked poles, and coiled cables were left on the individual parcels to become the property of the owners. Fond memories will linger on for the people in this area and especially for those who worked on the project.

The California Historical Society has asked that Christo replace one pole adjacent to the Post Office in Valley Ford so that they may place a plaque there to commemorate the event. ▲

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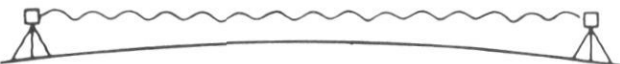
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California State University, Fresno
School of Engineering
Fresno, California 93740

Exhibitors contact Dr. F. Nader

Speakers contact Dr. K. Jeyapalan

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Planning has begun for the Fresno State University 16th Annual Surveying and Photogrammetric Convention (formerly called The San Joaquin Valley Surveyors Conference).

This convention which deals with modern techniques of surveying and photogrammetry is sponsored by the various professional societies such as, CLSA, ACSM, ASP, and ASCE and also the School of Engineering as represented by The Surveying and Photogrammetry Club of California State University, Fresno (CSUF) which is comprised of student

chapters of CLSA, ACSM, and ASP.

The convention will be held January 14th & 15th, 1977 on the CSUF Campus in Fresno, California. For general information please contact Professor Edward F. Kulhan. Persons interested in presenting papers please contact Dr. K. Jeyapalan, and those firms interested in obtaining booths for exhibiting please contact Dr. Fareed Nader at California State University, Fresno, School of Engineering, Fresno, CA. 93740. ▲

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