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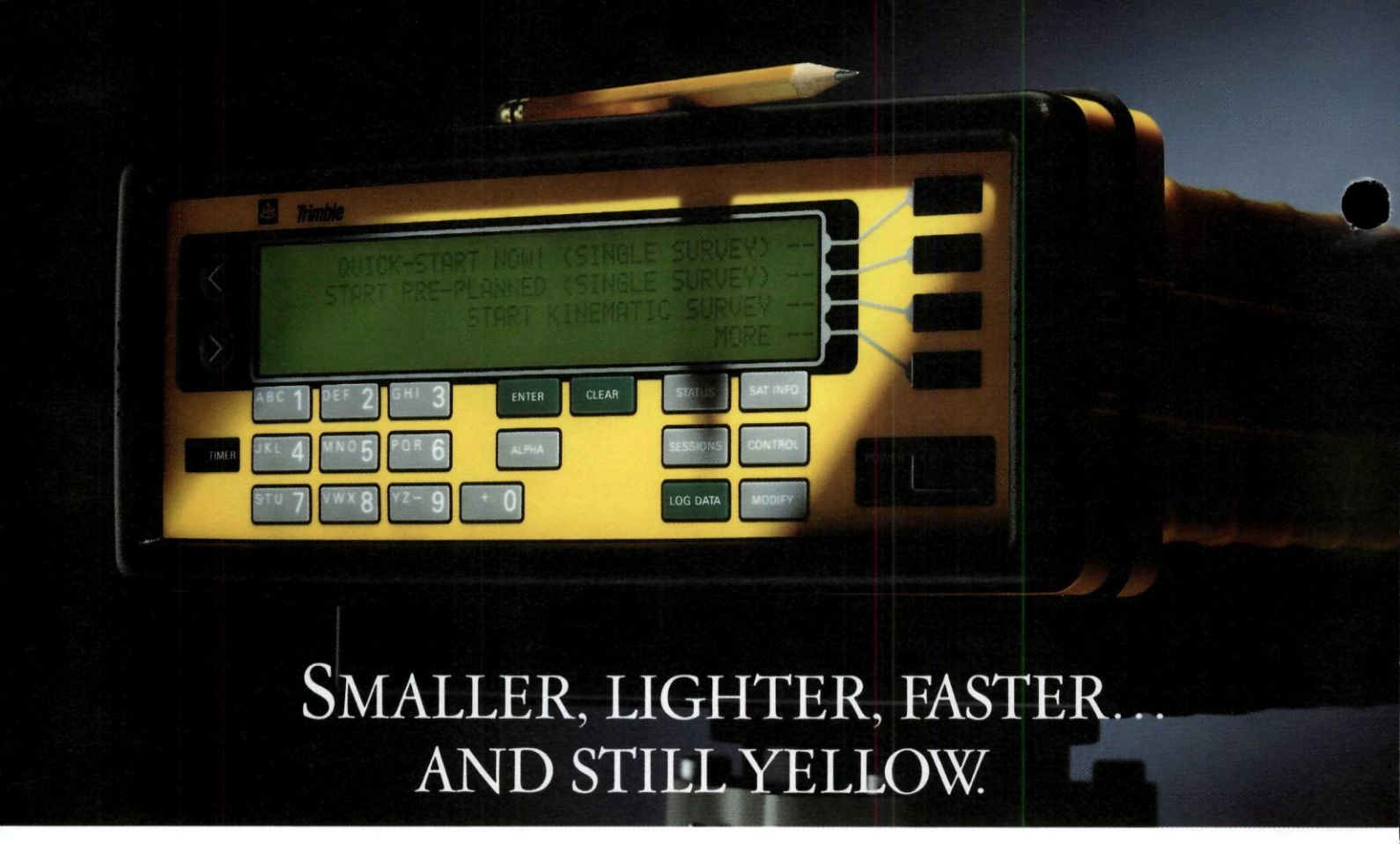
The California Surveyor

No. 101 The Voice of the Land Surveyors of California SUMMER 1993

Curtis M. Brown

1908-1993



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The California Surveyor

is the quarterly publication of the California Land Surveyors Association, Inc. and is published as a service to the land surveying profession of California. It is mailed to all Licensed Land Surveyors in the State of California as well as to all members of California Land Surveyors Association, Inc. *The California Surveyor* is an open forum for all surveyors, with an editorial policy predicated on the preamble to the Articles of Incorporation of the California Land Surveyors Association, Inc. 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 land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in the Land Surveyors and their work."

PERSONNEL

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Membership in the California Land Surveyors Association, Inc. 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 CLSA Central Office, P.O. Box 9098, Santa Rosa, CA 95405, (707) 578-6016, Fax (707) 578-4406.

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, Inc. Contributions submitted on floppy diskette medium is encouraged. For compatibility, disks should be 5.25 or 3.5 inch, MS-DOS (IBM compatible) format. We can accept ASCII text files or word processor files from the following programs: WordPerfect, and Microsoft Word.

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The California Surveyor

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Winter	October 10, 1993	Summer	April 10, 1994

Articles, reports, letters, etc., received after the above mentioned date will be considered for the next edition.

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CURTIS M. BROWN
December 16, 1908 — March 4, 1993

Cover photo courtesy of Thelma R. Brown. The Editor also wishes to thank Michael Pallamary for his efforts.

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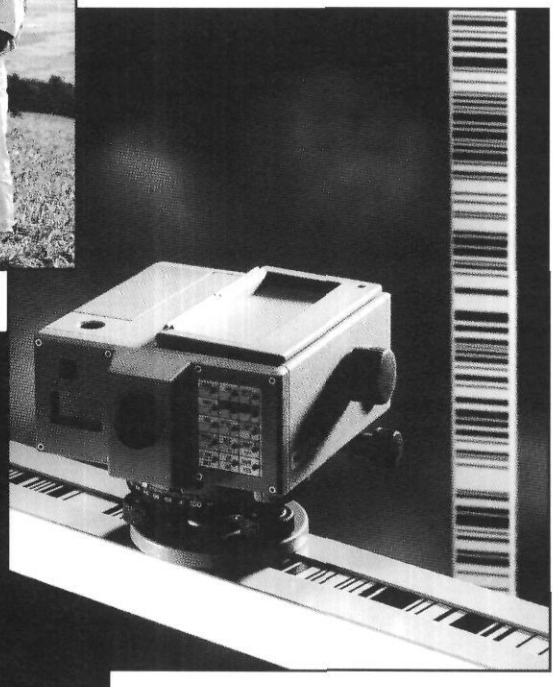

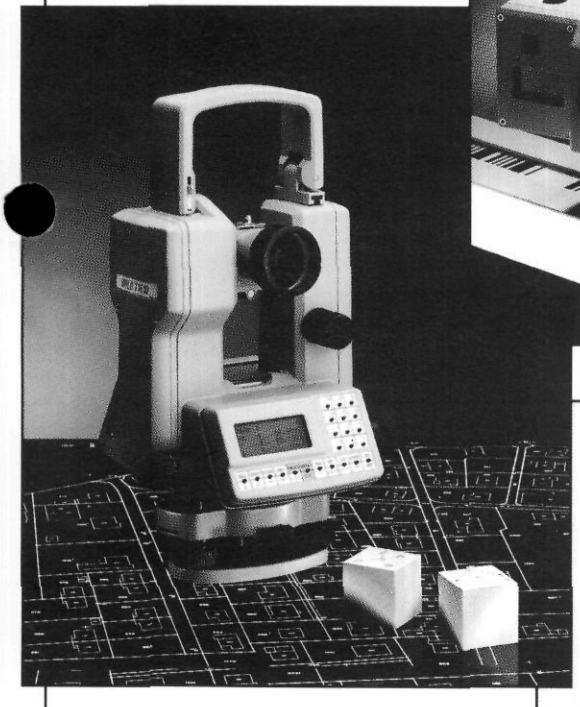

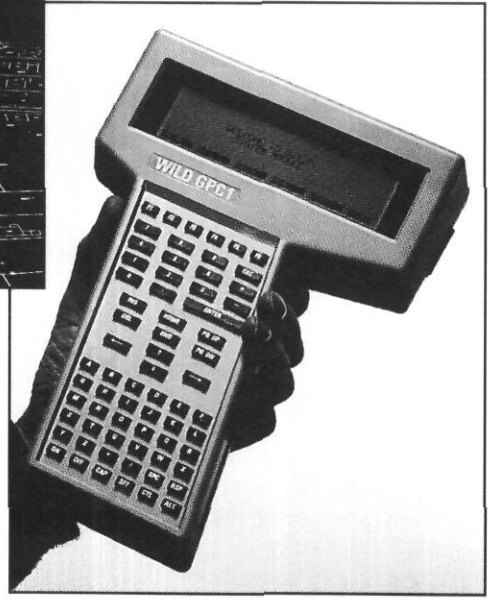

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FROM THE EDITOR

By Tom Mastin, P.L.S.

HERE WE ARE 34.11% through the '90s and the rest of society is still working hard at defining what this decade will be. It's still up for grabs. Will it be the resurgence decade, the recession decade, the decade of world realignment, the decade of self fulfillment or just the decade of yuppies on Harley's? No one has decided. However, the surveying profession in California seems to have taken its stance early in this decade. We know what we want. All indications point to this being the death of the Record of Survey decade. During the '60s and '70s the profession worked hard at making Record of Surveys truly represent the surveys being done, now we have decided that it is just too hard for us to continue to act professionally.

The Record of Surveys (R/S) slow unpleasant death began after Prop. 13 forced public agencies to look with a fervor for alternate funding. This brought about some hard hits to the R/S. First the Counties started requiring checking fees for inspection of the record of surveys. This in turn made the Corner Record the most popular method of filing surveys, not because the corner record could better represent what was done in the field but for the fixed filing fee. Corner records went from a legal size document showing how an obliterated public lands corner was reestablished and what monument was set at the location, to showing the reestablishment of multiple lots, that would take at least ten sheets if it was being done on a R/S. Over the last few years the land surveying profession has worked hard to loosen up the restrictions on what can be shown on a corner record. I see the day when we will be able to file final maps with a corner record.

As County Surveyors were being asked why it cost more to check maps than it did to prepare the maps they started considering what really needed to be checked on each record of survey. Was it really important to make sure the north arrow was in the upper right? The emphasis of the counties appears to be checking the record of survey to recoup costs. This in theory makes sense, as it limits the County Surveyors to checking that it is a complete and correct survey as it shows on the map. However, one of two things happened. Either the Counties really dropped the ball in checking the maps for completeness; i.e. is the map a record of the survey performed, showing what was found, accepted, rejected and set, and the reason behind the decisions made; or I was just not aware of how poorly some Counties checked R/S until the mid '80s.

The hardest hit to R/S is in the fact that there are more and more monuments being set in California with no record or filing on them. Some of them are by unlicensed individuals who figure they know how to survey because they took a surveying class for the landscape architect degree. However, during the tough economic times some surveyors are setting monuments without filing in order to make ends meet. These surveyors are not forgetting to file once or twice, they begin every job never intending to file. They use the excessive checking cost as an excuse to not file when questioned. They usually don't even try to file a corner record, for fear that they will be told a R/S is required. Many of these surveyors could not explain why or what they did to determine the location of the monuments they set. It is easier to go record distances and bearings from a couple of found monuments than it is to survey the area and resolve all the incongruities that are found. Besides, the owner is happy because the dimensions are the same as shown on the assessor's maps. These types of surveyors are training new young surveyors to do the same, that old "Follow the footsteps" axiom sometimes can have a chilling ring.

So, why should I or anyone else care? As the Record of Survey dies, so does our profession. We have moved, admittedly grudgingly, into the age of advanced technology. These technologies effect every aspect of surveying, from the field work to the office work. The harmful side effect of all this is that we store everything in abbreviated digital formats. Think of this, we as surveyors have gone from keeping detailed notes showing what was done out in the field including references to terrain and vegetation, marking and referencing corners with substantial monuments, and preparing a map that puts all this information together for the public to see what was done; to where we keep digital data in an abbreviated form, set minimal monumentation and avoid at any cost preparing a map that shows what we did out in the field. For many offices, the R/S is the only single source reference that shows the complete boundary work done on a project; with the added benefit of being filed and indexed by the County Recorder, so that it can always be found. If the R/S does truly represent all that was done to establish and monument the boundary, then it is a valuable document for the public, as well as the client and surveyors. If it is a digital printout just showing points found and set with a few measured dimensions and line work, then it has little value to anyone.

If we are successful in eliminating the R/S then we are successful in making the profession a profession of data collectors. When we go to the "Black Box" method of data collection, then we become a profession of simpletons collecting data. We will have gone from a profession that aided the public in the pursuit of the constitutional right of property ownership, to a profession that will never have to render a judgement nor be respected for the judgements made.

The advent of the advanced technologies is making it more and more practical for areas to develop GIS systems that use GPS to create not only their base mapping but to locate all the geographic features. Soon we will start seeing property boundaries that are established using GIS systems and GPS units to place the corners. This will be done by experts in GIS and GPS who think that Land Surveyors are those people who stand out in the road with a stick. They will be able to show statistically that the corners are placed with a high degree of precision. Unless land surveyors continue to be a profession who makes sound judgements, we will not be able to explain to a court that the measurement was very accurate but not at all precise when it comes to property boundaries.

It is a time for all of us in California to decide if we should be working so hard at eliminating the use of the Record of Survey, or if we should be channeling those efforts towards ways of showing the public the true benefits of those Record of Surveys. ⊕

LETTERS TO THE EDITOR

CONGRATULATIONS

I would like to extend my congratulations to *The California Surveyor* for being selected to received the NSPS/ACSM Excellence in Professional Journalism Award for 1992. I know that you must be as proud as I am, and as Jeremy Evans is; for blazing the trail ahead of us and setting the standard for us to follow.

There are so many individuals that I would like to thank for their contributions to *The California Surveyor*, the contributing authors, the membership at large, the commitment of our advertising vendors, the support of the Board of Directors of CLSA, and the Presidents, both past and present, and Dorothy Calegari for her experience and advice. Finally, and maybe most importantly, I would like to thank Cheryle Belli and the Central Office for her courage in taking the publication on during the transition of editors and for standing by me, through thick and thin, to get the job done to the highest of excellence standards.

Congratulations again Tom, and may your '93 be better than your '92.

Brett K. Jefferson, PLS

REMEMBERING JEANNIE COOK

When someone active in the surveying community leaves us suddenly, it is a sad time for us all. It brings forth a time of reflection. We will each stop and examine our own lives, at least for a moment. We're ask the ageless question, who am I, where did I come from and where am I going?

So it is when Jeannie Cook, wife of Lloyd Cook, suddenly left us on Saturday, April 24, 1993.

Who am I? we are land surveyors. The independent breed of people who typify the small independent business man. We are in pursuit of the American dream, a right bestowed upon us by our founding fathers.

Where did I come from? From hard work and constant on the job training. Seeking not only to be technically competent, but to have some measure of business success. Typical of so many surveying efforts, there is an office to run, bills to pay, monies to collect, books to keep, business to promote and surveying to be done.

As in so many small business endeavors, the partnership of husband and wife is the driving force that leads to success. Lacking such support there would not be time for the "other efforts" that we involve ourselves in. How tedious and boring life would be.

Where do we come from? As surveyors in America, the right of boundary practice, is the symbol of our heritage. Our founding fathers provided that each American had the right to own property. As surveyors, we help protect those rights. No, we do not do it alone, for as in all things, success only comes from a total effort, a sum of all its parts.

Without the support of the other half of the team, there would be a lot less surveying and a lot less time to the "other endeavors."

All surveying in California has lost a friend. She is typical of what makes the surveying effort complete.

Where are we going? A line a little straighter, for now we have footpaths to follow, a line that has been previously run and influenced by the heritage of our Country and the value of the family unit, a line that is defined by the two elements of a line, and support that as a team set the example that will help the rest of us keep good line.

Jim Dorsey

CELSOC RESPONDS

Subject: President's Message, Winter 1992-93 Issue

Mr. Betit, in his President's Message, refers to "the old Cal Council...being absorbed into a much larger and much more diversified engineering advocacy organization that feels surveying is a minor issue."

In point of fact, the old Cal Council merged with an equivalent sized California organization, the Consulting Engineers Association of California, to form the Consulting Engineers and Land Surveyors of California (CELSOC). This merger also made CELSOC a member of the American Consulting Engineers Council, a nationwide organization which now gives California engineers and land surveyors an influential voice on a national level.

Emphasizing its commitment to land surveying, CELSOC has created an Academy of Land Surveying (ALS) with broad participation addressing issues facing land surveyors in California and the nation.

Just as land surveyors in the old Cal Council influenced the policies and direction of that organization, we believe that land surveyors in the ALS will have the same sort of influence on CELSOC policies and direction.

We believe land surveyors will benefit from the additional clout to be gained by having an organization like CELSOC behind them.

We are excited about the future of the ALS and CELSOC.

George D. Shambeck, PLS
Chairman, Academy of Land Surveyors

THE IMPORTANCE OF CLSA

It would be difficult to imagine what the state of Surveying would be without CLSA. For that matter, it would be difficult for me to imagine my career growth without CLSA.

Every profession requires a platform for representation, legislation, self promotion, education and communication if it wishes to sustain. In 1983 I was looking to find an organization made up of members that were interested in surveying matters and issues. In pursuit of this, I found that in the State Of California that platform is our organization, The California Land Surveyors Association.

Upon attending that first meeting, as

a guest, in March of 1983 I was "hooked." It was overwhelming to be in a room with nothing but surveyors discussing surveying topics! What was equally impressive was the caliber of these people in attendance. I knew then that I wanted to be associated with an organization that was so positive and professional as this one. I joined the organization the following meeting and have been an active member ever since. I have yet to attend a meeting without coming away with some sort of information that I hadn't known before.

While being a member I have been exposed to the way CLSA is very active in its support to it's members in the way of legislative activity, both in presenting bills and in being a watch dog in scrutinizing any legislation being prepared by others that would adversely affect the Land Surveyor, Photogrammetrist, or the consumer. This kind of activity is something that the individual practitioner cannot do on their own. That is why we must stand together, through our professional organization, to better expand our professional services to our clients. This type of commitment is vital to our livelihood and CLSA does an outstanding job in handling legislative matters for all California Surveyors.

Membership dues are vital to keeping this diligent effort going.

I am grateful to CLSA (local chapters as well) for all the wonderful seminars and workshops they sponsor throughout the State. I'll bet I've attended well over a dozen of these events and as a whole they have been well prepared, informative, and stimulating. I for one would like to thank the organization for it's commitment to keeping us up to date and informed of new technologies, and new methodologies. The California Surveyor has been chock full of Technology articles as of late and Michael McGee has done an outstanding job of educating us with his wonderful and informative articles.

Thanks for all the worth while things you all do for us members.

Rich Ray, PLS

[Editor's Note: This letter is in response to a request by CLSA Membership Committee for reasons why members joined CLSA. See Issues 98 and 99 for other responses.]

REMEMBERING PECOS CALAHAN

Show me a Registered Civil Engineer in this great state and I will show you a man (or woman) who has more than one time or another asked himself (or she herself) who in the world was Albert Givan and how he came to be Number One Civil Engineer in the roster. My compliments to Mr. Bender and "California Surveyor" for his masterly history of our Board of Registration. (Summer 1989 issue)

Mr. Bender recalls Governor Young's first Board of Registration for Civil Engineers held its organization meeting October 28, 1929, and when they paused for lunch Donald M. Baker, consulting engineer, H.J. Brunnier, structural engineer, and Albert Givan, chief engineer and general manager of Sacramento MUD emerged as president, vice president, and secretary, respectively.

At the afternoon session and as the second order of business, the new board employed Mr. Pecos H. Calahan of Glendale to be the board's first special investigator. Mr. Calahan was also expected to manage the registration of all practicing civil engineers and those who would follow. Mr. Calahan would serve without pay.

Mr. Bender wonders aloud whether the Board that October 28th in evening session gave thought to the October slump in Wall Street which even as they pondered, was spawning "Black Thursday" a scant half-night away. Those men had indeed given thought to that subject. They were businessmen and prescient beyond belief. They had forebodings of imminent economic disaster when they hired their special investigator to serve without pay.

True to his mandate Mr. Calahan saddled up and when the first roster took shape Secretary Albert Givan's name led all the rest!

First Roster:

1. Albert Givan
2. Donald M. Baker
3. H.J. Brunnier
4. Everett N. Bryan
5. Pecos H. Calahan

After that came the line-up to register. Like the PX at Mather Field, the big names, the Grumms, the O'Shaughnessys, the Purcells and the lesser lights as well, were assigned R.E. numbers on Mr. Calahan's swelling roster but no one has ever told me who Everett N. Bryan was or how he squeezed in ahead of Pecos for fourth place. Don?

* * *

At first sight I pegged him as a man who did not get enough sleep. He was a little wizened guy who stood up about to my shoulders and seemed to have a problem getting his words out, but once he got them out, I knew where he stood, shoulders not withstanding and that there were problems enough to go around. After forty-nine years and with Don Bender's recall of that first meeting of the Board of Registration in 1929, I realize it was not sleep he needed when we met on that far away summer day. What he needed was a square meal. That man, as the chief and only investigator for the Board of Registration had been probing the peculiarities of all the civil engineers of our great state, north to south and east to west, in the great cities and homely hamlets alike, without pay. Poor Mrs. Calahan. I wish I had known.

The year was 1940. My mentor, Mr. Arnold Baldwin had been elected County Surveyor of Santa Cruz County two years before and I was left in charge of his private surveying and engineering office. I had taught myself surveying and in that year at age 26 I was, although unlicensed, far and away and by all odds the most knowledgeable and most expert land surveyor in California.

After the election in 1938, I had allied myself with Clayton Staples, a civil engineer. The firm was known as Staples and Smith and survived until the war.

Our stationery and business cards read "Staples and Smith, Civil Engineers and Surveyors" with Clayton's name on his cards and my name on mine. On our two upstairs office windows facing Cooper Street, one read "Clayton Staples" over "Civil Engineering" and the other had "Stanley R. Smith" over "Surveying." Staples and Smith was a nonprofit company from the start but Clayton and I had a lot of fun. His mother ran a bake shop and her leftover stale pies sustained our late night labors. Clayton had a welding outfit and to mark our survey monument pipes we ran a bronze strip along the top 3 inches and then stamped it with Clayton's RE 1165 number. That was

before the common tags in use today were invented. Students of archaeology will find the inscription "S&S RE 1165" on every lot corner in Hushbeck Subdivision in Watsonville, California, and it was there as I was driving those pipes that Pecos nailed me.

This was the moment of truth and you are on the edge of your chair to learn how I conducted my first interview with Mr. Calahan. When he asked for my card, I thought Staples and Smith had a customer. That was not to be. His card had a fancy seal and read "State of California, Board of Registration for Civil Engineers, Pecos H. Calahan, Executive Secretary." I was courteous in manner as I answered his questions in a respectful but well modulated tone. I stood with my thumbs along the seams of my trousers and my feet at an angle of forty-five degrees. Mr. Calahan admired my new 20 second K & E Paragon and seemed taken with the effort we had made to identify our monuments. He was less taken with my business card. "No names on cards without a license," said Mr. Calahan. With two "aye" votes and no discussion, the meeting adjourned to an evening session at 20 Cooper Street, main office of Staples and Smith. Pecos let me keep my shoe laces and belt.

You can take the same elevator today if you have business with Wyckoff and Ritchie, attorneys at law, time to spare and your group numbers no more than three, and you don't mind the crowding. I blessed the old skip that evening for it brought the three of us closer together. During the five minutes we ascended to the second floor, Clayton reminisced how like it was to the cage in the Argonaut Mine at Jackson when he went in with the rescue team in 1922. I built a fire in the fireplace, made coffee and told Pecos about my monument at 37°N - 122°W. After that we got to know each other pretty well. Pecos told us how he drove all over the state to get acquainted with his Civil Engineers and hear their problems. Since I had already put in for Surveyors' examination, he forbore to bring charges but said we would have to dump our stationery and cards and change the windows. Then we ate some stale pie and everyone went home. Next week, the left hand window read "Clayton Staples, Civil Engineer and Surveyor" and the right hand window showed "Stanley R. Smith, Blueprinter."

After my surveyor's test, I received a formal notice to appear before the Board of Registration to review my examination papers. Mr. Calahan was in charge of the meeting. He had me subdivide Section 6, which I should have done during the examination when it would have counted, instead of the interior section which I had mistakenly chosen. Someone made a motion and after the vote I found myself to be a land surveyor. The Board shook my hand and Pecos shook my hand and when I reached the door and looked back, Pecos had a big smile clear across his face. I almost didn't recognize him.

Stanley R. Smith, PLS

CALIFORNIA GEODETIC CONTROL COMMITTEE

At an open forum following the annual conference of the California Land Surveyors Association on March 13, 1993, the California Geodetic Control Committee (CGCC) was formed. The Committee was born out of the rapidly changing needs and capabilities regarding geodetic control and the unique issues facing the geodetic community in California.

Presently, the CGCC is preparing the final versions of two documents. The first document is a proposal to establish an official horizontal reference system for California, based upon the B-Order High Precision GPS Network (HPGN), completed in 1992. The second document establishes guidelines and defines procedures for the implementation and utilization of kinematic, fast (static) ambiguity resolution, and other high production GPS techniques as they apply to precise geodetic control surveys.

The CGCC is also addressing other current issues including how California should respond and prepare for a National Ocean Service proposal to restructure the roll of the National Geodetic Survey in the maintenance and dissemination of geodetic data, and how land surveyors and geodesists can cooperate with the scientific community to help model and project the movement of geodetic monuments due to crustal motion and seismic events.

Plans for the Committee call for preparation of a geodetic control manual covering those issues and others such as vertical control datums and GPS-derived vertical control. The subject manual is anticipated to be completed and made available to geodetic control users, providers, and consumers in early 1994.

The Committee can be reached by contacting:

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COMPUTERIZED INDEXES OF SURVEYING MAPS AND MONUMENTS

By Michael Hollins, P.L.S.

TECHNOLOGY IS FINALLY catching up with the surveying community and computers have found their way into almost everyone's office. Computations, map drafting, and word processing are the usual applications for the surveyor; I have found another task for my computer, that of keeping track of maps and monuments. I am going to describe two different systems that I have worked on in the past 7 years, the first system is a computerized index of recorded maps in Humboldt County and the second system is a computerized database of control monuments for The California Department of Transportation District Two Survey Department.

BACKGROUND

In Humboldt County before 1991, the Recorder maintained a hand annotated index of recorded maps. The people maintaining the index were not trained in nor had any suitable knowledge of surveying; thus, not surprisingly, the index had numerous errors and omissions. Not all of the fault was with the Recorder's office, if a surveyor made an error in the township listed on the map that error was perpetuated in the index, and no provision was made to correct the index even if a certificate of correction was filed. A private index similar to the Recorder's index was started in the 1950s and maintained by people with some survey training, but there were no set guidelines adopted in the preparation of this index and the indexing was inconsistent and error prone. The poor state of these indexes made research of recorded maps time consuming, frustrating, and many times dependent on luck. These two indexes were limited, for practical researching purposes, to looking up maps by township, range, and section; there were often times when additional information about the maps would have saved a lot of research time. There was also a considerable number of unrecorded maps on microfilm and old fieldnote books in the county that contained valuable information and needed to be indexed to be of much use.

I wanted to produce a customized computer indexing system of Humboldt County records for use by surveyors, and other professionals, that could manage many different types of records such as recorded surveys, unrecorded surveys, corner records, field notebooks, and BLM notes and plats. I also wanted the system to be consistent, accurate, easy to use, and fast. To do this, I decided to start from scratch and not utilize the existing indexes, but go straight to the documents themselves. This allowed me to gather information from the maps that could be used to simplify research by giving the researcher a better idea of the extent of the map and give more options to doing research than just by township, range, and section. I chose a d-base compatible database management program to develop the database structures and to write programs to input information into the databases and extract the information back out. A computerized database is a file made up of individual records which are in turn made up of one or more fields. The fields contain the information that is used to make a search of a database, the format of the fields is called the database structure. The power of the system comes from being able to specify what to search for. For example, to search by Township, Range, and Section each database record must contain a separate field for each of the three search parameters containing that information. The first step was to select which fields would be included in the databases. Figure 1 shows the database structure and an example of each field for an individual record in the database. I made separate databases for each map type to be indexed, Record of Surveys, Parcel Maps, Corner Records etc. All the databases have the same structure so that the same data entry programs and extraction programs can be used on all of them. The structure is also versatile, for example, microfilmed maps can be referenced by roll and frame number instead of book and page or rancho divisional sections can be used in place of township, range, and section. This can allow the same structure to be used, for example, with notebooks as well as maps; maintaining the same structure means that one program can extract information from many different databases without a lot of complicated modification.

DATA COLLECTION

Now I had a database structure but no information in it. Figure 2 shows the data collection form I designed to collect data when I went to the Recorder's office to index each map. I refer to the process of filling out the data collection forms as indexing. The forms were filled out for an entire book before they were processed, each book had about 150 pages of maps in it. But, before I started filling out the forms I had to set

Field	Field Name	Type	Width	Example
1	BOOK	Numeric	3	20
2	FIRSTPAGE	Numeric	3	73
3	LASTPAGE	Numeric	3	73
4	RECDATE	Date	8	12/24/62
5	SURVEYOR	Character	20	R. KLEINER
6	DONEFOR	Character	20	B. ZOLLO
7	TOWNSHIP	Character	3	06N
8	RANGE	Character	2	1E
9	SECTION	Character	40	8,9
10	DESCRIP	Character	60	SW/4 NW/4 S9

Figure 1. Map Database Structure and an Example of the Data.

RECORD OF SURVEY BOOK _____ DAY _____

PARCEL MAP PAGE _____ MONTH _____

MAP PAGE _____ YEAR _____

CORNER RECORD

SURVEYED BY: _____ . _____

SURVEYED FOR: _____

T___ ___R___ ___						T___ ___R___ ___						T___ ___R___ ___					
6	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1
7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
30	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36
T___ ___R___ ___						T___ ___R___ ___						T___ ___R___ ___					
6	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1
7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
30	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36
T___ ___R___ ___						T___ ___R___ ___						T___ ___R___ ___					
6	5	4	3	2	1	6	5	4	3	2	1	6	5	4	3	2	1
7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
18	17	16	15	14	13	18	17	16	15	14	13	18	17	16	15	14	13
19	20	21	22	23	24	19	20	21	22	23	24	19	20	21	22	23	24
30	29	28	27	26	25	30	29	28	27	26	25	30	29	28	27	26	25
31	32	33	34	35	36	31	32	33	34	35	36	31	32	33	34	35	36

DESCRIPTION: _____

YOUR INITIALS _____ COMMENTS: _____

Figure 2. Data Collection Form for Humboldt County Recorded Map Index.

some guidelines to make the results consistent and reliable. That way, when someone used the final product they would know exactly how to interpret the results. To help insure consistency, I wrote guidelines used for filling out the data collection forms, see Figure 3. For example, all the sections that a particular map pertains to are included in each record, so if someone searches for maps in section 10 they will automatically get maps in surrounding sections pertaining to section 10 without having to search specifically in those sections. This is a guideline that a person using the program must be able to count on making consistency critical. I also wanted to insure accuracy, everybody that did the indexing was well qualified and instructed on the guidelines to be used. Also the maps were checked against an independent source to verify the location and other information on the map. Because the descriptions turned out to be such an important and complicated part of the process, I wrote an additional memorandum, see Figure 4. It took about 10 hours to index a book of maps after a little practice.

After the data collection forms are filled out, they had to be entered on the computer into the database. I wrote the data entry program to query each field individually and then edit the entire record after it had been entered and then start over again for the next record. The guidelines for using the data entry program are shown in Figure 5. The data entry program can be written to simplify data entry by using menus to input information with the touch of a single key, for example, I included the names of the most active surveyors in the county so that they could be inserted into the surveyor field by typing the first letter of their first name or by moving a curser to their name and pressing the enter key. Also, the page number of the record defaulted to the last page number plus one and the function keys were programmed to type out commonly repeated text. It usually took about 3 hours to enter in the data collection sheets for an entire book of maps. The data collection sheets are saved for future reference, they come in very handy when someone calls in about a possible error in one of the records.

VERIFICATION AND MAINTENANCE

After the book is entered into the database the information is printed back out and checked against the map by someone, other then the person doing the indexing, to ensure accuracy; then any mistakes found were edited. After a little more practice It took about 8 hours to check an entire book.

I have to mention a few words about the maintenance of the master databases, you will quickly find out from the amount of time required to generate these files that they are very valuable. I recommend that one person who is familiar with database management be responsible for their maintenance, this includes keeping backup copies of the programs and the databases and performing the editing of the databases. If several people get involved with the maintenance it becomes more difficult to track down what mistakes

GUIDELINES FOR THE FILLING OUT OF THE COMPUTERIZED INDEX FORM

Document Type
Circle the type of document being indexed.

Book
Enter the book number. In the case of unrecorded work on microfilm enter the roll number. Some of the older books were given "A" or "B" designations, many times this can be ignored because the page numbers carry over into the next book, if there is confusion enter a whole number in the space provided and make a note in the description.

Page to Page
Enter the first and last page number of the document. If the document is only one page then only enter the first page number. In the case of unrecorded work on microfilm enter the first and last frame numbers. In some of the older books some maps were given pages, in these cases enter the whole number and make a note in the description. Some older books also have multiple page maps with the same page numbers, so just enter the one number and state how many pages are in the map in the description. In some books more then one map is placed on a page, fill out separate forms for each survey all with the same page numbers.

Date
Enter the date the document was recorded. In the case of unrecorded work enter the date that appears on the map.

Surveyor (20 characters)
Enter the first initial and last name of the surveyor. In the case of multiple surveyors enter the surveyor with the lowest L.S. number.

Surveyed For (20 characters)
In the case of subdivision maps and parcel maps enter the name of the subdivision, for surveys enter the name of the client. In the case of unrecorded work enter the name that is most appropri-ate in helping to define the map.

Sections & Townships
These are the sections that the map is indexed on, it is important to circle all appropriate sections. Points shown on vicinity maps usually are not appropriate. If there is a point in the survey within or even on the exterior line of a section then circle it (i.e. if a section corner is tied then four sections would be circled, if all four section corners are tied then 9 sections would be circled). Even if the point on the section line does not pertain to the section, such as a closing corner on a standard parallel circle it anyway. Even circle sections that have a point in or on them that is called from the survey (i.e., "This point is 500' South and 200' East of the North corner." You would circle the section to the north of the section the survey is in.). If a map shows a tie to a section several miles away also circle those sections in-between the ties. Label the townships with a number and a N,S,E, or W as appropriate (i.e., T 6 N R 3 E or T 3 S R 2 W). Do not differentiate between record and non-record ties and data.

Description (60 characters)
This part of the form is what helps a surveyor find a particular map he is looking for, it is not meant to eliminate the possibility that this map is pertinent to a portion of the section not described. List the sections that the map is in, and give the ¼ or ¼ ¼ section description as well (i.e., NW/4 NE/4 S12 & SW/4 SE/4 S1 or W/2 S2, etc.). Also, list the Township and Range if the map is being indexed on multiple Townships (i.e., NW/4 S2 5N,1W). If the survey is near street or road intersections list them (i.e., First and Main St. or North of Green Hts. Rd.). On larger maps you can use the streets as a grid to define the location of the map (i.e., 10th & Main St. - 7th & G St.). In cases of road surveys comments such as "road alignment," etc. are helpful. If the map has a certificate of correction it is listed at the end of the description as follows: CC 1024 O.R. 196. Use your imagination and try to key on things that locate where the survey was done and what type of survey it is.

Your Initials
Put some identifying mark here so that it will obvious who filled out the form.

Comments
Feel free to write anything that helps explain why you indexed the map the way you did or that will aid the person entering the data into the computer and the one checking the data.

General Instructions
Check the location of the map against another source such as the Assessor's parcel map or a topo quad to insure that the information (Township, Range, and Section) listed on the map is correct. This can also lead to additional information such as road names and surprises such as section lines running through the survey not shown on the map.

Figure 3. Guidelines for Filling Out the Data Collection Forms.

were made and when. One person doing the database maintenance does not need to concern themselves with what or how somebody else did something to the database and how that will affect what they want to do to the database. Developing good careful procedures is important and keeping backups in a safe place is more important. The computer is very good at catching mistakes that human eyes easily overlook, to aid in the maintenance of the databases, I wrote some error finding routines that go through the databases and look for such things as missing or duplicate

INDEX DESCRIPTION INTERPRETATION

The description in the indexing system has three purposes:

A. To provide the general location of the subject of the map.
B. To provide Miscellaneous information pertinent to the map.
C. To allow "filtered" type searches.

The description of the map is given in a standardized format 60 characters in length designed to save space and at the same time be suitable for computerized searching. If the subject of a map conveniently falls into the NE quarter of Section 3 the description would look like the following: "NE/4 S3." If the map fell conveniently into the SW quarter of the NE quarter of Section 3 the description would look like this: "SW/4 NE/4 S3." Location of comas and spaces is critical for computerized searches of the description, the computer can only search for matching character strings if a coma or space is out of place no match will occur. Also note that only capital letters are used. Other examples are as follows: "N/2 N/2 S34" or "S/2 W.LINE S20." If a map falls in two of more sections the descriptions are separated with an "&" as follows: "S/2 S17 & N/2 S20." If a map is indexed in multiple townships then the township and range are included in the description as follows: "W/2 S34 5N,1W." If sections from separate townships are given in the description they are separated by a "+" as follows: "E/2 S25 & E/2 S36 5N,1W + SW/4 S30 & NW/4 S31 5N,1E." The township is only mentioned after the last section described in the township. With maps that cover a large area sometimes just the sections are listed as follows: "S1,S2,S3,S4 5N,3E." It is very important to keep in mind the differentiation between the description and what sections the map is indexed on. The description is always more focused than the indexing, so, just because the map is not described in the section that you are working in does not mean that there is not information pertinent to that section.

In addition to the above "quarter section location" street intersections are given in urban areas. The simplest example is as follows: "5TH & D ST." This does not necessary mean that the subject of the map is on the corner of 5th & D St., but it is somewhere in the vicinity and other ties on the map may be blocks and blocks away. Where two intersections are given as follows: "HARRIS & CALIF. ST. - HENDERSON & SUMMER ST." The streets have been used as a grid system to form two corners of a "rubberband box". Sometimes these streets do not actually intersect on the ground, but are just used as latitude and longitude in the grid system. In the case of three streets being mentioned, as follows: "SPEARS RD. & MYRTLE AVE. & PIGEON POINT RD." A fourth intersecting street is not available and the subject of the map is in the vicinity of where two of the roads intersect the other. Please keep in mind that when the streets listed in the description are not in the vicinity of where your project is located does NOT mean that there is no information pertinent to your project.

Other types of information are included in the description to give a better picture of the map without actually seeing it. Statements like the following are typical: "ROAD ALIGNMENT" or "R/W SURVEY" or "FIELDBROOK" or "SOUTH OF THE EEL RIVER." Certificates of Correction and Amended Maps are listed in the description like this: "CC 1234 OR 123." The "OR" above stands for official records other abbreviations used for CCs are R/S, PM, and MAPS.

The early surveyors used to number their maps, and because these numbers are referred to by other surveys it is nice to be able to find them. A "#" symbol precedes the survey number as follows: "#161." Note that there is no space between the "#" symbol and the number. When all the elements are put together a description might look like the following:

NE/4 SW/4 S27 5N,1W LONG & B ST. CC 10 R/S 23 #50

Now lets look at how we can put this information to work for us using the above description as an example. After doing a Township, Range, and Section search we get a thick printout of maps to look at, in theory these are all the references pertinent to the section. If we do a second search, a "filtered" search if you will, using the same Township, Range, and Section plus searching the description for "S27." We get a shorter list of maps, these being inside the section, we've filtered out the ones that only tie exterior points on the section. If we took it a step further and searched the description for "SW/4 S27" we would wind up with yet a smaller list of maps. Note that if a map were indexed in the south half of Section 27 ("S/2 S27") it would not appear in the second filtered search. These are ways to get to specific maps more quickly not ways to eliminate the possibility of a map being pertinent.

If you want to see all the maps with Certificate of Corrections you would search for "CC," but not only would those maps with Certificate of Corrections be listed, maps with any double "C" in the description would be listed, for example: "MCCORMICK ST." *If you are reading a deed that gives reference to John Does survey No. 50, but no book and page listing, you can search for* surveyor and "#50" in the description and if the map is in the data base it will be listed.

Figure 4. More Guidelines for Writing and Using the Descriptions.

page numbers, townships or sections that are out of range, duplicate records, etc. This helped weed out several potential errors and omissions.

USES AND BENEFITS

Now that the databases are formed the fun begins. We can use the retrieval program to extract records out of the databases based on the information contained in the fields. Figure 6 shows an example of the printout of a search since 1990 of section 27 in T 5 N, R 1 W.

BRIEF INSTRUCTIONS FOR THE USE OF THE DATA ENTRY PROGRAM

At startup of the program select the database that you wish to enter data into.

Book, Page. Enter the Book, First page, and Last page of the "map." For In-House records you may wish to chose some other identifier for these values.

Date. Enter whatever date is appropriate for the "map." For In-House records you might chose the completion date of the project or something.

Surveyor. Enter the Surveyors name with one first initial, use the light-bar selections when possible. For In-House records this is a good place for the job number.

Surveyed For. Enter the name of the person the survey was done for or the subdivision name depending on the type of map it is. For In-House records use the clients name.

Description. See handout entitled "INDEX DESCRIPTION INTERPRETATION." For In-House records you may make up your own set of codes.

Township. Use light-bar to select the Township. When editing make certain that a preceding "0" is included in single digit townships.

Range. Use light-bar to select the Range.

Section. Enter the sections one at a time in increasing order. When editing sections be very sure that a preceding and trailing "comma" is included in the section string and that sections are separated by a "comma." Caution - The Section String is not large enough to hold more than about 13 sections or so. In the editing stage you should verify that all sections are included in the string and that there is a trailing "comma," if there are a lot of sections to be indexed on one map . If all sections do not fit in one record then split them up into two or more records, use the "For Township Only" option described below.

Editing. Editor commands are listed at the top of the screen. Always check your input for accuracy. Always enter Uppercase letters when editing.

For Maps or In-House records that are to be indexed on multiple townships select the "For Township Only" option and the previous record will be duplicated except for the Township, Range, and Sections that you enter.

Figure 5. Guidelines for Using the Data Entry Program.

All databases were searched, no Recorded Maps or Unrecorded Surveys were found. The databases are sorted by Book and Page, and printed out in that order. The In-House Records database is an available option to allow a firm to enter their private records into a database and thus eliminate one more place to have to search for information. The program uses light-bar menus to guide one through the process of selecting values for the individual fields and generates a filter to select only the records in the database that meet the input constraints. For example, you could search by township, range, and section and by surveyor if you knew what surveyor made the particular map you are looking for, and you would have fewer map references printed out to consider. You can specify a range of books, pages, or dates to search by or any of the fields alone or in combination. However, because of the system design, to do thorough research you should search by township, range, and section to be sure that you get all the maps pertinent to the section you are researching. If you are looking for specific maps there are many ways to narrow down the amount of references to go through.

Updates for the databases are done every 6 months, this includes filling out the data input forms, entering the data into a temporary database, and mailing out disks to the users of the system who run an update program that appends the new information on to the end of the existing databases. As people use the system they may find errors in the databases. When the errors are reported they are included with the updates and the update program corrects them as well. After the indexing was complete I sold copies of the system to most of the surveyors in the area and a modified version of the program to the County Recorder for use by the public. The whole system fits on less than 5 megabytes of harddisk space and takes much less than 30 seconds to do a search on an 80486 based IBM compatible personal computer. The system has also been installed on MacIntosh Computers. An advantage to having the maps indexed on a standardized database like d-base could facilitate the first step in a transition to a Geographic Information System.

NEW USES FOR THE SAME SYSTEM

When I left the private sector to work in the field for Caltrans, I came up against another problem, that of keeping track of our control monuments (the system will work just as well for right-of-way monuments or other property corners). The existing system (I'm using the term loosely) was difficult to use and required looking in separate books for the coordinates and elevations of control monuments, and if you wanted a description of the point you often had

TODAYS DATE IS 28-03-1993 Single User License to Michael J. Hollins

SEARCH DATES 01-01-1990 TO 07-07-1993; T.05 N.; R.1 W.; IN SECT. 27

RECORD OF SURVEYS

51-58	5-10-1990	By M. O'HERN	For MARILYN A. BENNETT
T.05 N. R.1 W. S. 26,27,34			
NW/4 SW/4 S26		CARSON & J ST.	
52-8	21-05-1991	By M. O'HERN	For GERRY PAVLICH
T.05 N. R.1 W. S. 27,28			
NW/4 S27 & NE/4 NE/4 S28		HAWTHORN & UNION - 14TH & KOSTER	
52-133	14-02-1992	By M. O'HERN	For JAMES HOFF
T.05 N. R.1 W. S. 27		C ST. & HUMBOLDT ST. - F ST. & WILLIAM ST.	
SW/4 NE/4 S27			

PARCEL MAPS

25-131,132	08-11-1991	By K. OMSBERG	For WINCO & DAVENPORT
T.05 N. R.1 W. S. 22,27			
NW/4 NE/4 S27		GRANT & B ST. - WABASH & E ST.	
26-35	02-04-1992	By N. PENFOLD	For DANNY KNAPEK
T.05 N. R.1 W. S. 27			
NW/4 NW/4 S27		BROADWAY & 14TH ST.	

RECORDED MAPS

CORNER RECORDS

1-24	12-03-1990	By H. KELLY	For
T.05 N. R.1 W. S. 27			
NW/4 NW/4 S27		14TH & UNION ST.	
4-7	16-08-1991	By M. O'HERN	For
T.05 N. R.1 W. S. 27			
NW/4 S27		WABASH & ALBEE ST.	

UNRECORDED SURVEYS

IN-HOUSE RECORDS

Figure 6. *Sample Printout of a Map Search.*

to find someone with a combination to access a vault in another building and look through a thousand books for one that might have the description in it (I'm not joking). Benchmarks are in completely different books as is work done by other agencies like USC&GS. Research took a long time and sometimes you just could not find what you were looking for.

This time the problem was a little different, instead of indexing maps, I wanted to have an easy way to search for information about particular points and be able to access it from a single source. I developed a little different database structure to accommodate this problem, see Figure 7. the DESC field is a special type of field called a Memo and is a variable length text field containing monument descriptions and other needed information. The actual text in the Memo field is kept in a separate file and is called up when the record is printed out, the draw back is that searches cannot be made of Memo type fields. The north and east coordinates are on the state plane coordinate system on the 27 or 83 datum or both, and the elevations are on the 29 or 88 datum or both. The CF field is a combined factor used for grid reductions and the TYPE field is a single character representing what type of monument it is, for example C is a control monument and B is a bench mark.

The data collection form we use is shown in Figure 8. The process starts in the field when a crew finds or sets a control monument and fills out the information on the data collection form such as the county, route, and postmile. Next, in the office the coordinates, elevation, township, section, and combined factor are recorded. Two checks are made on the data, the first check is done before the data is input on the computer, to insure that information on the data collection sheet is correct. After the information is entered into the database it is checked again to insure that it was entered correctly. The data entry program is very similar to the one used for Humboldt County. To protect the master database, the new data is input into an intermediate temporary database first until it is checked and edited. Then the data is moved into the master database, and for those points having

Field	Field Name	Type	Width	Dec	Example
1	COUNTY	Character	8		LASSEN
2	ROUTE	Numeric	3		36
3	POSTMILE	Numeric	6	2	29.03
4	NAME	Character	20		CM 29.03
5	TYPE	Character	1		C
6	TOWNSHIP	Numeric	2		29
7	RANGE	Numeric	3		12
8	SECTION	Numeric	2		11
9	NORTH27	Numeric	10	3	385531.587
10	EAST27	Numeric	11	3	2390835.780
11	NORTH83	Numeric	11	3	.
12	EAST83	Numeric	11	3	.
13	LATITUDE	Numeric	12	9	40.225899471
14	LONGITUDE	Numeric	13	9	120.354910080
15	CF	Numeric	13	11	0.99972940000
16	ELV29	Numeric	9	3	4135.700
17	ELV88	Numeric	9	3	4137.616
18	DESC	Memo	10		memo

Figure 7. Control Monument Database Structure and an Example of the Data.

State of California — Department of Transportation

CONTROL MONUMENT INPUT

District 2 – Redding
2-PS-2 (Rev. 4/92)

DATE

COUNTY | ROUTE | POSTMILE

MONUMENT NAME | MONUMENT TYPE (Use Code From Below)

B - Bench Mark
C - Control Monument
T - Triangulation Station
H - HPGN
P - Prop Corner
G - GPS
S - PLS Corner
R - R/W Monument
N - NGS
A - ℄ Mon

T___ ___R___ ___

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

NAD 27			NAD 83			
NORTH			NORTH			
EAST			EAST			
LATITUDE			LONGITUDE			
COMBINED FACTOR			ELEVATION NGVD 29	ELEVATION NAVD 88		
FIELD CHECK	INPUT	INPUT CHECK	ELEVATION TYPE	3 WIRE	PHILLY	TRIG

DESCRIPTION

FIELD BOOK NUMBER

Figure 8. Data Collection Form for Control Monument Database.

coordinates the latitude and longitude is calculated. Monuments that do not have coordinates, like bench marks, have their latitude and longitude scaled off a map, placed on the data collection form and entered in the database with the rest of the information. When we are finished entering in the monuments we file the data collection sheets by county, route, and postmile for future reference.

A separate database is kept for monuments that are destroyed. They are moved out of the master database into the lost database using one of the features of the edit program to manage the master database. The edit program is also used to append the temporary databases, sort the master database, and delete records as well as edit records. The master database is sorted by county, route, and postmile which determines the order in which the monuments are printed out.

The data retrieval program for the monuments is a little less versatile than the map retrieval program, because most search's are based on location. Figure 9 shows a sample printout from a search done by county, route, and postmile. Searches are possible by name, township, range and section, and by latitude and longitude. There are two ways to search by latitude and longitude. First, by entering in the latitude and longitude and a radius in miles, and second by entering in the latitude and longitude of the northeast and southwest corners of a rectangular box. Points that fall within the radius or in the box are printed out. I keep a copy of the control monument database on my portable computer behind the seat of my pickup. Now, I don't have to go back to the office to get coordinates, let alone spend 3 hours looking through dozens of books.

One nice thing about keeping the database in the standard d-base format is the importing of database files made by other agency's. A little bit of file manipulation usually has to be done to rectify format differences, but it utilizes the work someone else has done for us and there is no entry and checking. When all the time is added up counting the crew time spent writing the descriptions, entering, and checking etc., each point entered into the system takes about 1 hour of time.

I hope other folks in similar situations can use some of these ideas to develop a useful system of their own. These are not the kind of projects that require extensive funding and resources, they can be accomplished on a very modest computer and a $300 database program, but they do require time and a knowledge of computer programming. I found d-base easier to learn than BASIC, FORTRAN, or Pascal. If you can program in a higher level language you can probably learn d-base in a short time. This could also be a good project for a beginning surveyor that wants to gain some valuable research experience and become intimately familiar with the surveying in an area.

Michael J. Hollins, P.L.S., is a Land Surveyor Supervisor in the District 2 Survey Department of the California Department of Transportation in Redding. He is also a Computer Programmer and Consultant and has been a member of the C.L.S.A. since 1983. ⊕

TODAYS DATE IS 31-03-1993 Single User License to CALTRANS DIST. 2

SEARCH SHASTA COUNTY, ROUTE 273, POSTMILE 15.00 TO 16.00

CM 15.16 C SHASTA RT.273 PM 15.16 T.31 N., R.5 W., S.0
N27= 0.000 E27= 0.000 N83= 2089182.718 E83= 6453999.981 LAT= 40.335240285 LONG= 122.231517310 CF= 0.99987765000 EL29= 488.117 EL88= 0.000

Set a 2 1/4" brass cap flush in the sidewalk at northeast corner of Ellis St. & Hwy 273, stamped "CALIFORNIA DEPT. OF TRANSPORTATION CM 15.16". The point is 48.0' right of Hwy 273 centerline and 45.0 northerly of Ellis yellow stripe. A lightpole is East, 4.0' to the center. A "walk sign" is S 35 E, 22.0. Set by M. Hollins 9 Sep 92. Fieldbook # 260961.001. Starnet Adjustment, Elev NAVD 88

CM 15.41 C SHASTA RT.273 PM 15.41 T.31 N., R.5 W., S.0
N27= 0.000 E27= 0.000 N83= 2090472.908 E83= 6453945.098 LAT= 40.340515037 LONG= 122.231595830 CF= 0.99987765000 EL29= 500.588 EL88= 0.000

Set a 2 1/4" brass cap flush in the sidewalk westerly of theparking lot of the Lime Tree restaurant, stamped "CALIF. DEPT. OF TRANSPORTATION CM 15.41", 48' right of centerline. A fire hydrant is S 10 W, 51.8'. The "Lime Tree" sign is N 30 E, 80'. Set by M. Hollins 9 Sep 92. Starnet Adj. Fieldbook # 260961.001.

CM 15.63 C SHASTA RT.273 PM 15.63 T.31 N., R.5 W., S.0
N27= 0.000 E27= 0.000 N83= 2091697.326 E83= 6453807.122 LAT= 40.341724428 LONG= 122.231781660 CF= 0.99987765000 EL29= 508.283 EL88= 0.000

Set a 2 1/4" brass cap flush in the sidewalk at the southwest corner of Angelo/California St. and Hwy 273, stamped"CALIF. DEPT. OF TRANSPORTATION CM 15.63", The point is 53' left of Hwy 273 centerline and 129' southerly of California St.yellow stripe. A sewer manhole is S 20 E, 43.7'. A light pole is N 10 W, 25.2'. Set by M. Hollins 9 Sep 92. Starnet Adj. Fieldbook # 260961.001.

L118 B SHASTA RT.273 PM 15.80 T.31 N., R.5 W., S.0
N27= 0.000 E27= 0.000 N83= 0.000 E83= 0.000
LAT= 40.342500000 LONG= 122.230600000 CF= 0.00000000000 EL29= 499.221 EL88= 0.000

Found a 3 5/8" brass cap in a 9" x 9" concrete post flush with the ground near the southeast corner of Parkview Ave. & Hwy 273, stamped "U. S. COAST & GEODETIC SURVEY BENCH MARK ELEV. 496.285 L118 1932", 83.0' right of the center stripe for the northbound lanes and 36.0 southerly of Parkview yellow stripe. A powerpole #1275 is S 85 E, 5.9'. The northeasterly corner of "Gene's Hamburger Stand" is S 20 W, 43.0'.Fd. by M. Hollins 5 Oct 92. Fieldbook # 260961.001. Elev. NAVD 88

Figure 9. Sample Printout of a Control Monument Search.

WHOSE VIEW IS IT ANYWAY?

PRIVATE PROPERTY RIGHTS AND THE ACQUISITION OF PRIVATE VIEW EASEMENTS

PART II

By Michael J. Pallamary, P.L.S.

"Where the telescope ends, the microscope begins. Which of the two has the grander view?"
— Victor Hugo

[See previous issue of the California Surveyor for Part I; including the historical background, California view on views and the Wesley Palms Case.]

City of Rolling Hills Case

IN THE YEARS FOLLOWING the Pacifica decision, public sentiment relative to coastal development has drawn more attention by local municipalities. In May of 1987, a lawsuit was filed by one Kenneth Ross and others against the City of Rolling Hills Estates et al. in the Second District Court of Appeal, Division 4 challenging a local view ordinance. The dispute was not resolved until it reached the Superior Court.

The case involved a petition for writ by a group of homeowners to compel the city planning commission to issue certain zoning variances. When the matter was heard, Judge Abraham Gorenfeld denied the petition and an appeal was filed.

The discord involved an addition to a single family home in an affluent Los Angeles suburb. The proposed construction would have affected a local view corridor, coveted by surrounding property owners. Ross argued that the proposed addition would "significantly impair neighbors' view" and furthermore that the owners had failed to "mitigate (the) impact on existing views through design alterations" in conflict with the City's view protection ordinance.

The dispute began on December 21, 1984, when the appellants filed an application for a variance to permit a two-story addition to their home. The addition would have resulted in an encroachment into a code-required 15-foot street-yard setback. The variance also sought to allow the proposed lot coverage to exceed the code permitted 30 percent limit. Six months later, the commission denied the zone variance request. No appeals were filed.

Two weeks later the appellants submitted revised plans for the addition. The new plans eliminated the need for the variance. But because the project would still have an effect on adjacent property owners' views, they were notified by the city that they had a right to file objections if they opposed the project. If they so chose, they could appear before the commission to voice their concerns. In August, the commission ruled that the proposed addition did not conform to the "objectives" of the view protection ordinance and as a result, denied the plans.

The city's controversial view protection ordinance provided that:

"The hillsides of the City constitute a limited natural resource in their scenic value to all residents of and visitors to the City and their potential for vista points and view lots. It is found that the public health, safety and welfare require prevention of needless destruction and impairment of views and promotion of the optimum utilization and discouragement of the blockage and misuse of such sites and view lots. The purpose of this ordinance is to promote the health, safety and general welfare of the public through:

a) The protection, enhancement, perpetuation and use of sites and view lots that offer views to the residents because of the unique topographical features which the Palos Verdes Peninsula offers, or which provide unique and irreplaceable assets to the City and its neighboring communities or which provide for this and future generations examples of the unique physical surroundings which are characteristic of the City.

b) The maintenance of settings which provide the amenity of a view.

c) The establishment of a process of design review by which the City may render its assistance toward the objective that views enjoyed by residents of the City will not be significantly obstructed."

The appellants argued that the view protection ordinance was unconstitutionally vague and denied them due process. Words such as "needless," "discourage," "view," "impairment," and "significantly obstructed," were subjective and "unintelligible concepts" they argued.

The court disagreed opining that the ordinance was not vague. "A reasonably certain standard in light of the need for view protection can be determined."

Inadvertently, the appellants aided the City's case by arguing that their addition was located in an area where the scenic view had already been "significantly altered." Unwittingly their own use and admission of such language defeated their argument that the language was vague.

While not a zoning ordinance, the court ruled that the view protection ordinance was closely related and as such "a certain amount of vagueness is permitted in California zoning ordinances" in order to permit delegation of broad discretionary power to administrative bodies. The need to protect the rural character of the area, which is a stated goal of the view protection ordinance, was considered by the council members.

The Council's confirmation of the Planning Commission ruling was

deemed a confirmation of the findings. The ruling thus meant that the proposed addition "would have an adverse impact on existing views and that appellants had failed to provide design alterations to minimize the view impact of the proposal."

View Taxes

Across the state, such infringements on private property rights can be found in local ordinances and regulations. In Port Hueneme, California, beachfront property owners were recently levied with a new assessment dubbed the "view tax." Despite objections from hundreds of homeowners, the council approved the controversial assessment placed only on beach-front homeowners. The assessment was adopted as a source of revenue for the financially strapped city and range from $66 to $184 a year, based upon a formula that takes into account how much of the ocean a property owner can actually see combined with the size of the home.

In defense of the controversial ordinance, City Manager Dick Velthoen argued that beach-front residents should have a higher burden because their property benefits from a well kept beach front. The ordinance is believed to be the first of its kind to link an assessment to a sea view.

Similar to the Rolling Hills ordinance, the City of San Diego adopted a Planned Development Ordinance (PDO) in 1976 covering the La Jolla Shores area. According to proponents, the PDO allowed planners to reject building projects if they obstructed private views. After years of implementation, in 1991 local residents argued that the ordinance was being ignored.

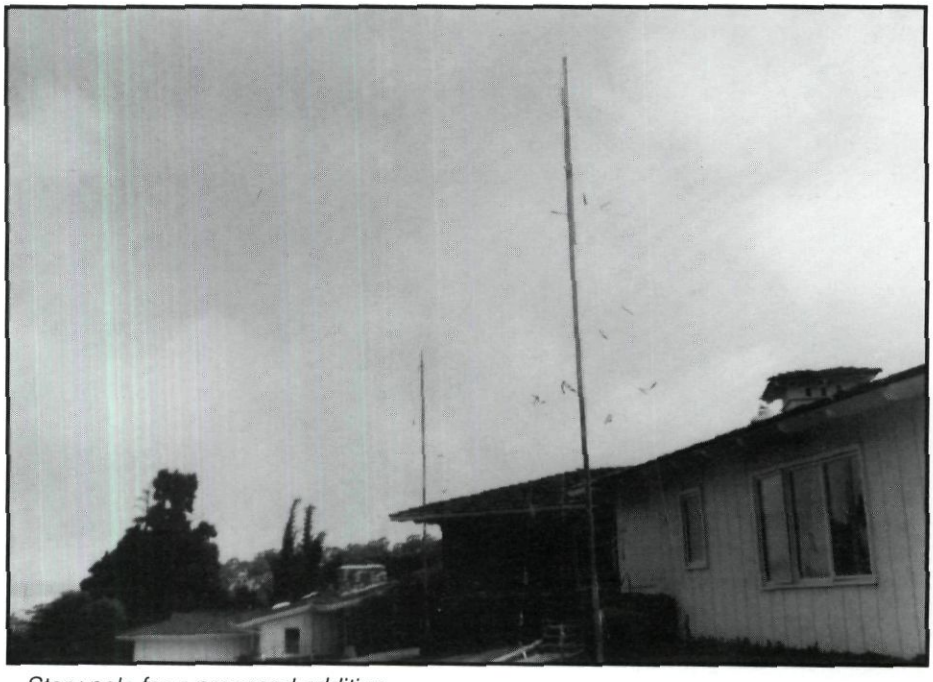
When pressed, a city planning official stated that the PDO was too "ambiguous" when it came to the issue of private views, and furthermore the ordinance might not hold up in court. "Subject to a legal challenge, I do not believe that we're in a particularly strong position," said Tom Story, deputy director of the city's Development and Environmental Planning Division. Deputy City Attorney Fred Conrad agreed stating: "It doesn't give us a great deal to work with."

Throughout City halls across the state, City planners are becoming regularly besieged with complaints about the height of nearly every new building or remodel in various upscale communities. In one instance a property owner on scenic La Jolla Mesa Drive in San Diego faced opposition when he proposed to construct a new home. When the project was presented to City officials, the owners were sent back to the drawing board. The City's denial was based upon their opposition to the design of the family garage siding with opponents who argued that the new building would block part of a southerly view of San Diego Bay, visible to passersby.

In order to construct the garage so as not to "impair" the contested view, the owners of the property requested a building variance. Despite the support of community advisory groups, the La Jolla Town Council trustees voted 16-3, with eight abstentions to oppose the variance. City planner Bob Manis, representing the planning director, stated that "We have an obligation to protect public views as much as possible."

In the Sun Gold Point section of La Jolla, neighboring property owners have found themselves on opposing

Story poles showing horizontal and vertical limits of a proposed residence.



Story pole for a proposed addition.

sides of a controversial issue. Should property owners be allowed to build second stories on to their single family homes? Because no second story homes had been constructed in the thirty-five year old tract, none should be allowed argued opponents. Permitting them would "destroy" the beauty of the neighborhood.

Development within the scenic tract had long been governed by private covenants which provided that a resident manned architectural jury had private jurisdiction over the development standards of the neighborhood. As contemporary redevelopment progressed, a Mason-Dixon line was drawn in the sands of the adjoining beach. On one side were those who opposed allowing second story homes and on the other, were those who supported such construction. Not surprisingly, those who lived adjacent to the bluffline were in support of two story homes while those owning properties of lesser value were opposed.

As the debate ensued, board members in support of second story homes were reportedly "hounded" off the neighborhood architectural review board. Others were threatened with lawsuits. One member reported to local newspapers that he had the "hell scared out of him." When local reporters attempted to interview neighbors, they agreed only when it was stipulated that the paper would not disclose their names as they too feared harassment. In the end, five properties were approved for second story homes.

In Mission Beach, south of La Jolla, homeowners Richard and Ruth Cohen filed a lawsuit when the City upgraded an antiquated sewer system by installing a modern pump station. The Cohens' suit contended that the pump station had "ruined" their view of Mission Bay and thus, the city was liable for damages.

In Hollywood Hills pop diva Madonna was faced with a lawsuit when she purchased a new home and entered into an agreement with her uphill neighbor. The provision provided that a pine tree and a hedge were "to be maintained at a prescribed height." The hedges were not to exceed 8 feet while the pine tree was to be kept below the roof line of the multimillion-dollar home. The trees exceeded the terms of the agreement and the neighbor sued Madonna for $1 million in damages for his loss of view.

The Superior Court judge ruled that Madonna violated the agreement by letting the trees exceed the agreed upon height. He rejected the $1 million claim although he required Madonna to pay the neighbor's attorney fees.

In nearby Beverly Hills, entertainment mogul Merv Griffin's request to cut down pine trees on his three acres of undeveloped land was denied by unanimous vote of the Planning Commission. Griffin made the application in order to accommodate future development on his $15.5 million site. City spokesman Fred Cunningham stated that the reasons for the denial were "pretty much environmental — the view, the vista..." The commission did allow Griffin to subdivide the property but it reserved the right to approve all future development — including tree removal.

Nationwide Interest in Views

Such extraordinary rulings are not limited solely to California. In New York City, typified by highrise development, views are as important there as they are on the West coast.

In 1985 in downtown Manhattan, Parkview Associates, the developer of a 31-story condominium project, was issued a building permit for the construction of a high rise building. In the following year, Civitas, a civic group active on Manhattan's upper east side, brought to the attention of the City the fact that the Department of Buildings had incorrectly issued a building permit for the building. In July of the following year, a stop work order was issued.

A review by City officials revealed that the City had erroneously issued the building permit because the permit was based upon an erroneous zoning map. In actuality, the site fell within a zone restricting all new construction to 19 stories. Jeffrey L. Braun, an attorney for the developers, stated that it would cost his clients $1,025,000 to demolish the upper portion of the building and another $874,000 to construct a new roof. Nonetheless, the city ruled against the developer.

In 1988, the New York Court of Appeals upheld the previous ruling opining that the developer should have "recognized" that the City map was in error. As a result, the developer was ordered to tear down the top 12 stories of the building. "Reasonable diligence would have readily uncovered for a good-faith inquirer the existence of the unequivocal limitations," stated the court.

Seeking Supreme Court review the City argued that because the permit was issued without statutory authority, there was nothing arbitrary about its revocation. In addition, the City argued that Parkview had a "duty" to make sure that its permit complied with existing zoning laws before undertaking construction. Because of increasing attention with views and building heights, the analysis and quantification of view corridors as well as the preliminary establishment of building heights has become of paramount importance to builders, planners and City officials. As a result, it has become commonplace for City officials and private property owners to seek some assurance as to what the effects will be of a proposed building.

In order to delineate the potential impact of a view-obstructing building, a relatively new procedure has developed within the professional land surveying community. Given the physical constraints of steeply sloped lands and the technical constraints in defining eccentric focal points and vista points the quantification of the focal view corridor requires the application of complex surveying sciences.

Determining View Corridors

In an effort to assist in this quantification process, municipalities such as California's Monterey County have adopted guide lines intended to govern the evaluation of view impacting projects. Entitled the "County-Wide Staking and Flagging Criteria," the 1990 adopted pamphlet serves as a guide for the City's planning and building inspection departments.

According to the directions contained in the pamphlet, "story pole" staking may be required for projects located in the coastal zone and "for other situations where it is important to determine precisely the location and/or visual impacts of a proposed project" as well as those seeking height variances. The staking, if required, must be carried out according to specified criteria including the requirement that the

upper limits of the stakes be topped with interconnecting visual netting, at least two feet in width and made of woven plastic snow fencing in "international orange" or some other suitable color. The netting must be sup ported by stakes or supports capable of maintaining the height and outline of the building for a prescribed period of time.

A typical development scenario in Monterey and other coastal municipalities commences when the property owner contacts an architect familiar with local development regulations. In most cases before the site constraints can be identified, an accurate topographic survey is prepared by a professional Land Surveyor. Utilizing this as a base map, the Architect prepares his conceptual site design in accordance with local building ordinances and restrictions.

Once the initial design is completed, the proposed building outline is staked by the Surveyor. Of particular importance is the location of the upper vertical limits of the roof line delineated by the story poles. Once the poles are placed, the project is reviewed by neighbors and City officials. Assuming there are no objections, the Architect proceeds to working drawings and subsequently building permits are issued.

In cases where the proposed building site is located in a visually sensitive area, the Surveyor supplements the base topographic map by locating and defining surrounding focal points and measuring the incidence of the surrounding zenith angles. This may require the positioning of numerous offsite locations, all mathematically related to the design site. These eccentric positions may be located in a neighbor's bedroom, dining room, and at nearby street corners. In most cases, the prescribed view corridor needs to be sufficiently defined so that it can be described in legally sufficient and unambiguous terms.

Once the eccentric positions are established, the reference planes and vertical datum are established. Because of ever changing conditions and potential conflicts in recreating the original focal points, they must be related to the boundaries of the subject property. Of equal importance is the establishment of a common and accepted benchmark, one preferably related to a standard government datum such as the United States Coastal and Geodetic established mean sea level reference.

If sufficient steps are not taken to assure accurate position relocation, problems can surface years later when subsequent parties attempt to decipher agreements executed between parties long since gone. In an effort to avoid such a problem, California has adopted recent legislation which makes it illegal for anyone other than a duly licensed Land Surveyor to describe easement and property lines. Because of past activity, well-intentioned, but incorrect descriptions have been recorded. Because the agreement must stand on its own, difficulty in interpretation in later years is not uncommon.

Once the view corridors have been defined, the Surveyor will oftentimes assist the design architect in evaluating the effects of the view sheds on the design plans.

Once the site has been satisfactorily designed, story poles are erected and the critical focal points are revisited. The devised view corridor descriptions are compared with the proposed deed description and if there are no further objections, the project commences to construction. After construction, many City officials require the issuance of a building height certification from a licensed Land Surveyor to ensure that the erected building does not exceed the permitted height.

Unless the building configuration is molded by the discretionary review process, many design modifications are done for the benefit of neighboring property owners, as an act of good faith by the project applicant in the hopes of avoiding challenges to the project in a public forum. The primary objective of which is to gain community support. In most cases, project opposition results in significant delays and appearances before sympathetic planning groups and City officials. Denials inevitably force the project through long and arduous public debates, requiring the input of private attorneys and potential review before politically charged community groups and municipal bodies.

In instances where there is limited jeopardy to public views, disputes surrounding the oftentimes subjective view impairment is left to the developer of the property and the affected property owner. If the good neighbor tact fails, then a view protection easement must be procured.

In approved, privately disputed developments, aggrieved neighbors will oftentimes meticulously monitor building construction to insure that the building is not built in excess of the permitted height. When such a monitoring program commences, Professional Land Surveyors are retained to take the necessary off-site measurements of the building site. In the event there are any infractions, a complaint is filed and the project is subjected to microscopic review by City building inspectors and zoning officials.

In the cases where the roofline is visible from the street or adjacent properties, roof heights can be accurately measured by precise surveying observations from triangulated baselines. Utilizing trigonometric calculations in both the horizontal and vertical planes, the eccentric measurements will disclose the building height.

When access to a site is limited or when discrete measurements are to be made, photogrammetry or aerial photography is employed. Extremely accurate, controlled aerial mapping will attain precise measurements of rooflines and surrounding structures. This data can then be used to evaluate either ongoing or proposed site development.

As property values continue to rise, the coastal areas of California and other visually sensitive areas will draw the ever restrictive attention of local officials. When the status quo of older neighborhoods is jeopardized, political pressure will continue to frame the view debate. Combined with a sometimes subjective concern for "environmental" view protection, coastal development will continue to be at the forefront of contemporary legislation. In the process, constitutional rights will be reworked in order to accommodate the whims of the public while private property rights will be continually subjected to this latest element of home ownership.

Michael Pallamary is the President of Precision Survey & Mapping and Land Survey Service of La Jolla. He is a regular contributor to the California Surveyor magazine and is currently writing a book with Roy Minnick and Paul Cuomo about the preparation of legal descriptions. Pallamary is authoring the sections dealing with preparing view easements and three dimensional property descriptions. ⊕

TIDAL WATER BOUNDARIES

By Michael R. McGee, P.L.S.

Title Boundary

AT STATEHOOD, California, acquired from the Federal Government, ownership of the beds of navigable waters and waters under tidal influence. This included 800 miles of coastline and many more miles of inland waterways affected by the rise and fall of the tide.

California therefore, claims the ownership of the beds of all navigable and tidal waters up to the ordinary high water mark and a public trust easement up to the line of high water. This claim is clearly stated in the statutory laws of California at Civil Code Section 670 "The State is the owner of all land below tide water, and below ordinary high-water mark," Civil Code Section 830 "Except where the grant under which the land is held indicates a different intent, the owner of the upland, when it borders on tidewater, takes to ordinary high-water mark" and Code of Civil Procedure Section 2077(5) "When tide water is the boundary, the rights of the grantor to the ordinary high-water mark are included in the grant". The courts have addresses these claims in Marks v. Whitney 6 Cal3d 251 & People v. Calif. Fish Co. 166 Cal 576.

The boundary between the state and an upland (riparian) owner is the ordinary high water mark in its last natural condition with the exception noted above "where the grant under which the land is held indicates a different intent". California courts have defined the ordinary high-water mark as the limit reached by the Neap Tides in Teschemacher v. Thompson, 18 Cal. 11, 21 (1861), and People v. William Kent Estate Co., 242 Cal. App. 2d 156 (1966), to name a few.

Tides

Tides are the result of astronomical and meteorological forces interacting with the physical configuration of the shoreline and sea bed. As a result, the mean tide level will vary at every location along a shoreline. The tides along the Pacific Coast are semidiurnal, meaning that two highs and two lows occur daily. Tides are also distinguished by a periodical variation related to the stages of the Moon as it orbits the Earth. Tides occurring during the second and fourth stages have a larger range due to the re-enforcing gravitational forces of the sun, and the moon when it is new or full. These tides are called the "Spring Tides." Tides occurring during the first and third stages of the Moon are more moderate and referred to as "Neap Tides." The average Neap high tide may be half a foot lower than the mean of all high tides.

Tidal Boundary Rule

The Federal Court in 1935 in Borax Consolidated, Ltd. v. Los Angeles 296 U.S. 10 (1935), defined the Ordinary High Water Mark to be the Mean High Water based on the average of all high waters occurring over a tidal epoch of 18.61 years (period of regression of the Moon's nodes). The Federal Rule has been followed in California for the practical reason that tidal data is published by the National Ocean Survey for all high tides over a 19 year period and no information is readily available to determine the height of Neap High Tide.

The California State Lands Commission has followed the Federal Rule since 1938. The California Land and Title Association, the California Land Surveyors Association and the California Society of Professional Engineers are in agreement as reflected in their amicus curiae briefs submitted to the court in People v. William Kent Estate Co. arguing that the mean of all high waters or the Federal Rule should be followed.

A 1992 California case, Antoine v. California Coastal Commission, 8 Cal. App. 4th 641, 10 Cal. Rptr. 2d 471, 479-81 presented a very informative and complete discussion of the "Mean High Tide Line" and ended with "we conclude that today the rule in California is the same as the federal rule". Unfortunately, this case was ordered depublished by the Supreme Court; however, it is only a matter of time before the court explicitly states that which has been implicitly followed.

Artificial Accretion

The natural location of the mean high tide is the usual criteria for boundary determination. Artificial accretions caused by man made improvements, such as jetties, belong to the State or its municipal tideland grantee. If artificial accretion or erosion has occurred, then the mean high water in its last natural location must be determined. It will be necessary to conduct a thorough research for historical information that may identify the locations of the mean high tide line at times in the past. The area between the last natural and present mean high tide line may become the subject of litigation or hopefully an agreement with the state. The opinion of a water boundary attorney and the State Lands Division will be most helpful. See Carpenter v. City of Santa Monica, 63 Cal. App. 2d 772, 783-94 (1944), and People v. Hecker, 179 Cal. App. 2d 823, 832-35, 837-39 (1960).

Tidal Datums

The height of Mean High Water, and all water heights will vary along the shoreline. If the slope of the shore is gradual then the vertical component should be accurate to 0.1 feet. Precise determination of the elevation of mean high water at a specific location requires observations of the tide for 18.6 years (taken as 19 years to round

out seasonal events). Continuous observations for 13 months will yield an elevation within 0.1 feet; whereas, observations for 30 days will yield an elevation within 0.2 feet.

The National Ocean Survey of the Federal Government monitors the tides at 26 primary and numerous secondary and tertiary tide stations around North America. Local water heights are determined for Mean High Water, Mean Sea Level, Mean Low Water, Mean Lower Low Water etc. The heights at these stations are published based on a 19 year epoch with the present Epoch being 1960-1978. Mean Lower Low Water is taken as a local reference datum of zero at each station. This local datum is referenced to permanent bench marks in the vicinity called Tidal Bench Marks which are connected to the National Geodetic Vertical Datum of 1929 (NGVD 1929) and the North American Vertical Datum of 1988 (NAVD88).

Determining Local Mean High Water

An accurate height of mean high water can be determined in a practical manner by observing the tide as it rises to the level of mean high water at a known tide station and simultaneously at a local site. This can be done in one or more sessions. For a detailed explanation of this method see "Survey Procedures for Determining Mean High Water" described in an article published in the Proceedings of the ACSM at Seattle Washington, September 30, 1976, by Jack E. Guth. This procedure has been adopted by the Florida State Legislation (see also "Water Boundaries" by George M. Cole, 1983, Landmark Enterprises).

Research Sources

State Lands Division (responsible for state boundaries, excellent data source); State Department of Water Resources (river gauges); Caltrans; National Ocean Survey (tide stations, sea level datum, hydrographic surveys over 100 years old, publications such as "Tide Tables 199? of the West Coast of North and South America," "Tidal Datum Planes" Special Publication 135, "Shore & Sea Boundaries" by Shalowitz, 1962); National Geodetic Survey (horizontal and vertical survey control both historical and present); Corps/Engineers; United States Geological Survey; Bureau of Land Management; National Information Center; Farm Bureau (old aerial photos); County Assessor (aerial photos and old maps); County Recorder (record of surveys, deeds, land patents, Swamp & Overflow Patents and Surveys, Tideland Patents and Surveys); Title Companies (title reports, chain of title); City & County agencies (maps, photos); National Archives; Coast Guard (continuously monitors tide); Private Surveyors; California Room at the Bancroft Library at Berkeley; References, see "Bibliography On Tidal Datum Determinations And Survey Techniques For Tidal Boundaries," 1987 published by the American Congress on Surveying & Mapping, Falls Church, Virginia 22046.

Michael R. McGee, PLS has over twenty years experience, has served as State President of the California Land Surveyors Association and holds a Bachelor of Science Degree in Surveying from the California State University at Fresno. He offers consulting services to surveyors and engineers on boundary, geodetic and general surveying problems, trains companies in the application of GPS technology and works with attorneys as an expert witness.

NEW HORIZONTAL-VERTICAL CONTROL DATA BASE FOR CALIFORNIA

By Advanced Technologies Committee

CLSA PREVIOUSLY MADE available to its members, a listing of the National Geodetic Survey's "horizontal" control stations in California on disk. The disk contains only the horizontal stations and their coordinates. In July 1992 the NGS came on line with a new integrated data base. This base is intended to collectively hold all data for all "horizontal and vertical" control (about 150 megabytes for California). CLSA now has this new data base available on 3.5" IBM compatible disks for each county. The amount of data varies with each county from 0.4 to 14 megabytes.

The information is in a readable ASCII format. Each control station is considered a record which will fill one to several pages when printed. Each record contains the station name, geodetic latitude and longitude, state plane coordinates in meters and feet, convergence angle, elevation, geoid height, reference marks, azimuth marks, recovery information, how to find and more (see example). The new HPGN stations are also included.

A program called "DSX.EXE" (by NGS) is provided for file management and data search. Some third party software is also available that will search the data more efficiently.

The data can be purchased directly from the National Geodetic Survey for a $98 per county download fee. CLSA will make this data available to its members for substantially less. The cost is $50 for the first county to members and $85 to non-members. Each additional county is $40 to members and $75 to non-members. The entire state can be purchased by members for $500. A few counties require two or three disks at a cost of $10 per additional disk. To order, fill out the form, include check or Master/Visa card number and mail to the CLSA Central Office. ⊕

The really happy person
is the one who can enjoy the scenery
when he has to take a detour.

— Unknown

TRANSIENT ARRESTED ON ARSON SUSPICION AFTER FIELD SET AFIRE

POLICE ARRESTED a 46-year-old transient Tuesday afternoon for allegedly setting a fire in a field off Taylor Road in north Roseville.

Allen McDonald told police he was making bacon on a piece of metal when the fire got out of hand.

A surveyor working nearby in the field spotted smoke and took a closer look through his "surveyor scope," Officer Jim Plympton said.

The surveyor saw McDonald walking toward Roseville along the railroad tracks and called police, who found him a short time later.

Roseville fire investigators checked McDonald's bacon alibi, but it didn't pan out, police said.

The only bacon that was cooked was McDonald's, who was arrested on suspicion of misdemeanor arson.

Our thanks to Bud Uzes for sending us this story of surveyors in action, from *The Press-Tribune*, Wednesday, May 26, 1993. ⊕

NGS Horizontal & Vertical Data Base for California
Order Form

CLSA has previously made available to its members and non-members, a listing of the National Geodetic Survey's "horizontal" control stations in California on disk. This disk only contains the horizontal stations and their coordinates. In July 1992 the NGS came on line with a new integrated data base. This base is intended to collectively hold all data for all "horizontal & vertical" control.

The information is available in a readable ASCII format, that has been compressed onto a 3.5" IBM compatible disk. Each control station is considered a record which will fill one to several pages when printed. Each record contains the station name, geodetic latitude and longitude, state plane coordinates in meters and feet, azimuth marks, recovery information, and the new HPGN stations.

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POSITIVE NEWS ON THE NGS STATE GEODETIC ADVISORS PROGRAM

By Nancy Parke
Government Affairs Director

THE CLINTON Administration budget for fiscal year 1994 went to Capitol Hill last week. The National Oceanic and Atmospheric Administration (NOAA) held a budget briefing for interested parties on April 8. Dr. Stanley Wilson, Assistant Administrator, National Ocean Service (NOS) informed me of the briefing. He was there providing responses to audience questions concerning the NOS budget.

The positive news is the NOS budget contains an increase of $2.5 million for the geodesy line item. It appears that our grassroots efforts last Fall and our recent NGS Forum in New Orleans were effective. The NOAA budget summary for NOS noted the following: "An increase of $2.5 million is proposed in this sub-activity [Mapping, Charting, and Geodesy] for maintaining critical operations in the Geodesy Program. The proposed increase is for traditional geodetic activities, including the National Geodetic Reference System, at on-going levels."

Following the meeting, I questioned Stan Wilson on the increase and whether it was intended for the State Geodetic Advisors Program. He indicated that the State Geodetic Advisors Program should be in good shape for fiscal 1994, barring any changes as its goes through the congressional appropriations process.

There are still congressional hurdles to go through, however, this year it would have been almost impossible to add money to the budget. We are in a much better position with the funding included in the Administration proposal.

On a related topic, Dr. Wilson is in the process of organizing four separate groups to provide input on the NOS Budget Initiative for 1995. He has asked Nick Bodnar, ACSM President-Elect to chair the private sector group. Wilson requested Coast & Geodetic Survey to recommend individuals to serve on the private sector group. They prepared a list for Wilson that includes individuals in leadership positions in ACSM/ASPRS, MAPPS, state and local groups. Wilson plans to review the list given him last week and make final decisions soon. I will keep you informed of further progress. ⊕

FROM THE DESK OF REAR ADMIRAL J. AUSTIN YEAGER

NOAA DIRECTOR, COAST AND GEODETIC SURVEY

THE REVOLUTION produced by satellite-based Global Positioning System (GPS) technology is making accurate, low-cost positioning systems increasingly available, not only to the professional, but also to the general public. Small GPS receivers capable of providing positions accurate to a few tens of meters are now available. These receivers are already being used by business and government to track their car, bus, truck, and train fleets. Soon GPS receivers will be commonplace on private cars, boats, etc. Furthermore, at higher accuracy levels, increasing use of GPS positioning, coupled with Geographic Information Systems (GIS) capabilities, is revealing the inadequacies of using local coordinate systems as local government entities and others begin to implement GIS-based records management and service delivery systems. Similarly, the need to standardize and integrate the masses of environmental data being produced by a multitude of private and public organizations within a coherent national geographic information framework is becoming widely recognized to be a national priority. For these reasons, the Coast and Geodetic Survey is encouraging and cooperating with state and local government agencies to modernize their surveying techniques and improve the accuracy and availability of their spatial reference systems. The High Accuracy Reference Network program is but one example of cooperative Federal and state agency efforts to improve the National Spatial Reference System. These efforts are vital because the Nation can ill afford the severe limitations and extravagant expense of incompatible data sets and unreconcilable local reference systems while it attempts to modernize its land records, environmental management, transportation, and communication systems for a highly competitive 21st Century.

NEW VERTICAL DATUM CONVERSION (VERTCON) SOFTWARE

The National Geodetic Survey Division (NGSD) announces the availability of a new vertical datum transformation software program. Program VERTCON computes the modeled difference in orthometric height between the North American Vertical Datum of 1988 (NAVD 88) and the National Geodetic Vertical Datum of 1929 (NGVD 29) for a given location specified by latitude and longitude. This conversion is sufficient for many mapping purposes. The VERTCON software and data base operate on standard disk-operating-system (DOS) controlled computers with a math coprocessor. The VERTCON software and two files of modeling coefficients are available on a single computer disk.

The horizontal geodetic datum, either the North American Datum of 1927 (NAD 27) or the North American Datum of 1983 (NAD 83), to which the latitude and longitude are referenced, should not affect the height difference that VERTCON computes because the height differences change very little with changes in horizontal position of less than 100 meters. The root-mean-square error of the actual NGVD 29 / NAVD 88 height differences at bench marks of the National Geodetic Reference System compared with the computed height differences from the model is +/-1 cm: the estimated maximum error is +/-2.5 cm. Depending on the network design and terrain relief, larger differences may occur the further a control point is located from the survey control that is used to establish the model's coefficients. VERTCON costs $98 per copy; prepayment is required. Checks, money orders, VISA, MasterCard, and American Express are acceptable for payment.

Inquiries:

National Geodetic Information Center
Telephone: (301) 443-8631;
FAX: (301) 881-0390

* See order form from CLSA page 27.

FCC ADOPTS DATUM CONVERSION TO NAD 83 AND NAVD 88

After the Federal Aviation Administration (FAA) adopted the North American Datum of 1983 (NAD 83) in October 1992, the Federal Communications Commission (FCC) began investigating the impact of datum conversion on its licensing process, data transfer policy, and positional accuracy requirements. The FCC is required to transfer information including latitude, longitude, and ground height on radio and television tower and antenna locations to the FAA for evaluation as possible obstructions to air navigation.

Current regulations permit the use of North American Datum of 1927 (NAD 27) and National Geodetic Vertical Datum of 1929 (NGVD 29) values; the FCC must provide support for converting coordinate information for more than 1 million physical structures. The NGSD has been providing technical assistance to the FCC in recent months in order to verify the accuracy of existing FCC location information, correlate the structures with data held in the National Geodetic Reference System (NGRS), and educate FCC personnel about datum transformation procedures and adoption of Global Positioning System positioning techniques. ⊕

IN MEMORY OF CURTIS M. BROWN

CURTIS M. BROWN was born in Auburn, Maine, on December 16, 1908, the third of five children born to Ona May (Wright) and Royal Caleb Brown.

When Curtis was 15 months old, the family moved to San Diego, where he attended school through high school then on to San Diego State College, transferring to University of California, Berkeley, where he graduated with honors in Engineering in 1932.

After a short time in the Oklahoma oil fields, he returned to San Diego and worked for a time at San Diego Natural History Museum. In 1936, he and Thelma Lakin, also of San Diego, were married.

They bought their first home in 1938, the same year their first son Patrick, was born. In 1940, they moved to the Rancho Santa Fe area where they built their own home, the first of six houses which Curtis personally built, In 1941, Thomas, their second son, was born.

Returning to the San Diego area in 1947, they settled in La Mesa where they were to remain for 41 years. In 1948, Curtis was licensed as a Land Surveyor and became a principal in the Surveying/Engineering firm of Daniels, Brown & Hall.

Over the next 30 years, Curtis made a great contribution to his profession, in the form of writing four books and dozens of articles. He was a monthly contributor to his national magazine for years. He taught at Purdue University as a guest professor for one semester using one of his books (a pioneer book in its field of land law) as the text. He returned to Purdue many times to teach summer Science Foundation classes.

He also taught at San Diego State University, as well as many local Community Colleges. He was a consultant and expert witness in several landmark boundary suits for the State of California. Until he finally became weary of traveling, he was much in demand for Seminars all over the country.

Curtis helped organize the California Council of Civil Engineers and Land Surveyors, served as president, and received an award from that group in 1971 for outstanding contributions to his profession. Curtis was a Fellow of the American Society of Civil Engineers, and a past President and Board Member of the American Congress of Surveying & Mapping.

While Curtis was pursuing his career, he and Thelma were also busy actively following the progress of two sports oriented sons, who played football and ran track through high school and college at the University of Arizona.

In 1938, Curtis and Thelma began showing purebred dogs; first Beagles, later Poodles and Dachshunds. Curt actively participated in the early day and later, when Thelma began judging dog shows in 1954, they collaborated on a book "The Art and Science of Judging Dogs." Also they shared many seminar assignments in this field, all over the world. Curtis at a later date wrote "Canine Locomotion and Gait Analysis" combining his dog knowledge and his engineering background.

Another hobby of geneology resulted in much research, and two trips to Maine and Scotland. The end result was a book "Geneology of the Brown Family," published 1988.

In the 1950s, Curtis began surveying in the Kentwood area of Julian, California, for Ashley Bishop, a realtor. He became active in the Julian area, doing land development with Rose Steadman, Leon Lyon, and his son Patrick (later Patrick Engineering). Curtis also personally built four houses in the Kentwood area, one of which the family still owns. He served as President of the Water District and saw it through its reorganization and acceptance by the County of San Diego.

Curtis retired from his firm in 1971, but certainly not from all his varied activities. He continued writing, consulting work, building activities in the Julian area, his gardening, and playing bridge until finally incapacitated by a series of strokes in 1989.

He is survived by his wife, Thelma; two sons, Patrick of Julian and Thomas of San Diego, five grandchildren, and three great-grandchildren. ⊕

Curt Brown at the 1985 Conference in San Diego.

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

Representation

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

Education Opportunities

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

Business and Professional Services

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

Join CLSA Today!

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NGS 1983 California Horizontal Control Coordinates, Data Disk (*see article Page 26*)	$ 35.00	$ 70.00		
NGS Search Program (for use with NGS data disk)	$ 20.00	$ 40.00		
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